REQUEST FOR PROPOSALS (RFP) **D-B**

RENOVATE 926 WG BUILDING 332

NELLIS AFB, NEVADA

RFP NO.	XXXXXXX
SPECIFICATION FILE NUMBER	2164
DRAWING FILE NUMBER	229-25-0715
PROJECT NUMBER	RKMF17-0065

US Army Corps of Engineers

Sacramento District

15 OCTOBER 2018

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RENOVATE 926 WG BUILDING 332

Nellis Air Force Base, NV

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GENERAL REQUIREMENTS
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2017) National Electrical Code

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual
ER 415-1-15	(1989) Construction Time Extensions for Weather

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction

1.2 VETERANS EMPLOYMENT EMPHASIS FOR U.S. ARMY CORPS OF ENGINEERS CONTRACTS

In addition to complying with the requirements outlined in FAR Part 22.13, FAR Provision 52.222-38, FAR Clause 52.222-35, FAR Clause 52.222-37, DFARS 222.13 and Department of Labor regulations, U.S. Army Corps of Engineers (USACE) contractors and subcontractors at all tiers are encouraged to promote the training and employment of U.S. veterans while performing under a USACE contract. While no set-aside, evaluation preference, or incentive applies to the solicitation or performance under the resultant contract, USACE contractors are encouraged to seek out highly qualified veterans to perform services under this contract. The following resources are available to assist USACE contractors in their outreach efforts:

Federal Veteran employment information at
http://www.fedshirevets.gov/index.aspx

Department of Labor Veterans Employment Assistance
http://www.dol.gov/vets/

Department of Veterans Affairs-VOW to Hire Heros Act
http://benefits.va.gov/vow/

Army Wounded Warrior Program -

http://wtc.army.mil/modules/employers/index.html

U.S. Chamber of Commerce Foundation-Hiring Our Heros
http://www.hiringourheroes.org/

Guide to Hiring Veterans - Reference Material
http://www.whitehouse.gov/sites/default/files/docs/white_house_business council - guide to hiring veterans 0.pdf

1.3 SUBMITTALS

Government approval is required for all submittals with a "G" designation; submittals not having a designation are for information only. The following must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

Worker's Compensation Claims

Submit written summary of worker's compensation claims filed by workers on the project at the 50 percent and 100 percent points of project completion.

1.4 SCRAP MATERIAL

Materials specified to be removed and become the property of the Contractor are designated as scrap, and the Contractor, by signing this contract, hereby acknowledges that he has made due allowance for value, if any, of such scrap in the contract price.

1.5 WRITTEN GUARANTEES AND GUARANTOR'S LOCAL REPRESENTATIVE

Prior to completion of the contract, obtain and furnish to the Contracting Officer's representative written guarantees for all the equipment and/or appliances furnished under the contract. Furnish with each guarantee: The name, address, and telephone number of the guarantor's representative nearest to the location where the equipment and/or appliances are installed, who, upon request of the Using Service's representative, will honor the guarantee during the guaranty period and will provide the services prescribed by the terms of the guarantee.

1.6 PRICING OF CONTRACTOR-FURNISHED PROPERTY

Promptly furnish and must cause any sub-contractor or supplier to furnish, in like manner, unit prices and descriptive data required by the Government for Property Record purposes of fixtures and equipment furnished and/or installed by the Contractor or sub-contractor, except prices do not need to be provided for Government-Furnished Property. List this information on Resident Management System (RMS) Contractor Quality Control (CQC) Module furnished by the Government. See example forms at the end of this section.

1.7 TEMPORARY ELECTRIC WIRING

1.7.1 Temporary Power and Lighting

Provide construction power facilities in accordance with the safety requirements of the NFPA 70 and EM 385-1-1. Enforce all the safety requirements of electrical extensions for the work of all subcontractors.

All work must be accomplished by skilled electrical tradesmen in a workmanlike manner, as approved by the Contracting Officer.

1.7.2 Construction Equipment

In addition to the requirements of EM 385-1-1, all temporary wiring conductors installed for operation of construction tools and equipment must be either Type TW or THW contained in metal raceways, or may be multiconductor cord. Temporary wiring must be secured above the ground or floor in a workmanlike manner and must not present an obstacle to persons or equipment. Open wiring may only be used outside of buildings, and then only in strict accordance with the provisions of the National Electrical Code.

1.7.3 Circuit Protection

In addition to the present requirements in EM 385-1-1 and NFPA 70, all 15 and 20-ampere receptacle outlets used for obtaining power during construction must have ground fault circuit interrupters (GFCI) for personnel protection. Block and brick saws must also be equipped with GFCI. The Contracting Officer may allow an exception to this requirement for circuits for concrete vibrators or circuits operating at other than 60 Hertz normal (in both cases an assured grounding program as described in the NFPA 70, except utilizing the daily inspection frequency of the grounding means of such equipment, may be permitted). The assured grounding program will not be permitted as a substitute for usage of GFCI'S except as described above. All generator-powered 15- and 20-ampere, 60 Hertz receptacle outlets must have GFCI'S, and must be properly grounded. Provide a testing means which will impose a measured fault of 5 milliamperes, plus or minus 1 milliamperes, and result in tripping the GFCI unit.

1.8 UTILITIES

Immediately notify the Contracting Officer in writing if utilities not shown on the plans and not visible as to the date of this contract are encountered within the construction limits of the entire project, and such utilities will interfere with construction operations, to enable a determination by the Contracting Officer as to the necessity for removal or relocation. If such utilities are removed or relocated as directed by the Contracting Officer, an equitable adjustment in the contract price must be made pursuant to the Contract Clause CHANGES to cover the cost of any additional pertinent work or delay.

1.9 GENERAL SAFETY REQUIREMENTS

1.9.1 General

For information regarding specific Safety Requirements see Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Refer to EM 385-1-1, (see Contract Clauses, Section 00 73 00, ACCIDENT PREVENTION) and the Occupational Safety and Health Act (OSHA) Standards for Construction 29 CFR 1926; General Industry Standards 29 CFR 1910; and the National Fire Protection Association Codes are applicable to this contract. In case of conflict the most stringent requirement of the standards is applicable.

1.9.2 The Prime Contractor's Superintendent

The Prime Contractor's superintendent must take an active role in enforcing

the safety requirements by participation in safety conferences, hazard analysis (see below), tool box meetings, walk-through inspections, correction of violations, etc., and including that of the subcontractor's work.

1.9.3 Activity Hazard Analysis

Based on the construction schedule, submit a activity hazard analysis of each major phase of work prior to entering that phase of activity. The analysis must include major or high risk hazards, as well as commonly recurring deficiencies that might possibly be encountered for that operation, and must identify proposed methods and techniques of accomplishing each phase in a safe manner. The Prime Contractor's superintendent must take active participation in the Activity Hazard Analysis, including the subcontractors' work. Prior to start of actual work a meeting must be held with Prime Contractor, Government, and affected subcontractor to review the Activity Hazard Analysis. In addition, job site meetings must be held to indoctrinate foreman and workers on details of this analysis.

1.9.4 Violations

If recurring violations and/or gross violation indicate that the safety performance is unsatisfactory, corrective action must be taken as directed, and at the discretion of the Contracting Officer the retention or some part thereof will be withheld from the progress payment until corrective action has been completed.

1.9.5 Fire Prevention

Fourteen calendar days notice must be given to the Contracting Officer for coordination with the Facility Fire Department prior to conducting any fire hazardous operation. Cutting or welding will be permitted only in areas that are or have been made fire safe. Where possible, all combustibles must be located at least 35 feet horizontally from the work site. Where such location is impracticable, combustibles must be protected with fire blankets and/or protective welding screens to prevent slag from running out of the work area. Edges of covers at the floor must be tight to prevent sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile. Do not allow any welding/cutting or open flame operations in facilities that are protected by a wet pipe fire sprinkler or an automatic detection system, if the system is out of service. First priority of work will be to return the suppression/detection system to operational condition. Return the fire detection and/or suppression system back to an operational status (if possible) during periods that the facility is unoccupied, and at the end of the work day. Post a fire guard for a 24 hour period (or certify to the Fire Department that the facility is safe) after welding, cutting, and open flame operations in a facility when: (a) fire detection and suppression system can not be returned to service; (b) fire detection or suppression systems do not exist. Other fire prevention precautions must be in accordance with the latest National Fire Codes.

1.9.5.1 Inspections

All construction sites are subject to fire and safety inspections without notice. Any violation of fire and safety standards may result in a work stoppage at the expense of the Contractor.

1.9.6 Recordkeeping/Reporting Requirements

On all contract operations, record and report all accident exposure and experience incident work. (This includes exposure and experience of the prime contractor and sub-contractor(s)). As a minimum these records must include exposure work-hours and a log of occupational injuries and illnesses. (OSHA Form 300 or state equivalent as prescribed by 29 CFR 1904) Refer to EM 385-1-1, 01.D.04.

1.9.7 Accident Reporting

In addition to the requirements for reporting accidents in accordance with EM 385-1-1, Section 1, submit at the 50 percent point and 100 percent of project completion, a written summary of worker's compensation claims filed by workers on the project. The report will include all subcontractors. The main report covering the Prime Contractor claims will be certified as "correct and true" by the Contractor's compensation insurance carrier. The same certification will be required for subcontractor reports. Per AFI 91-204, Contractor shall promptly report pertinent facts regarding mishaps involving reportable damage or injury to the Air Force and shall cooperate in any Air Force safety investigation. Cooperation may include toxicology testing.

1.10 PLANNED UTILITY OUTAGES AND STREET CLOSURES

All utility outages and street closures must be of as short a duration as possible and must be scheduled as far in advance as possible with the Contracting Officer, in no case less than 28 calendar days before the outage or closure. Obtain from the Contracting Officer in writing a statement or schedule giving the permissible times of outages or closures for particular installations and the maximum time allowed for each. Strictly observe such schedules and the contractor will be held responsible for any violations.

a. Street Closure:

Obtain approval in writing from the Contracting Officer before he can close any street or parking lot access. The request for closure must be submitted in writing to the Contracting Officer 7 working days prior to planned closing and must include the section to be closed and length of time of closure.

1.11 EXCAVATION PERMITS

All excavation permits will be issued to the Contractor from the Base Civil Engineer (BCE) through the Contracting Officer. The appropriate form, for this request, may be obtained from the Contracting Officer. Processing time required by the BCE is 14 calendar days. Questions concerning the excavation permit should be directed to the Contracting Officer.

a. Excavation Permit:

The Contractor will be required to obtain an excavation permit on AF Form 103 from the Base Civil Engineer prior to performing any required excavation under this contract. The form must be accompanied by a sketch showing size, depth, location, and extent of all excavation and trenching included in the contract. The completed form must be submitted to the Base Civil Engineer with a copy to the Resident Engineer at least 28 working days prior to intended date of

excavation. During the 28-day period the Base Civil Engineer and Base Communications Officer will make known to the Contractor by drawings, staking, or both, the location of all known buried utilities and communication lines. In these identified areas, only hand excavation will be permitted.

Reference is made to the article of the contract entitled "Permits and Responsibilities," which obligates the Contractor to obtain all required licenses and permits.

1.12 WELDING PERMIT

Where welding of any nature is to be performed on Nellis Air Force Base, apply for a welding permit, see ENVIRONMENTAL PERMITS/AUTHORITY TO PROCEED GUIDANCE within the appendices to this RFP for contact information. A permit will be issued within two working days with instructions for welding, fire prevention.

1.13 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the CONTRACT CLAUSE, Section 00 73 00, entitled "DEFAULT (FIXED-PRICE CONSTRUCTION)".. In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

1. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

2. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

MEAN INCLEMENT DAYS PER MONTH

LOS ANGELES DISTRICT MILITARY INSTALLATIONS

STATE

NEVADA

INSTALLATION

NELLIS AFB

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(03)	(01)	(00)	(00)	(00)	(02)	(04)	(01)	(01)	(01)	(01)	(03)

Upon execution of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. Refer to ER 415-1-15.

1.14 SPECIAL CONSTRUCTION PROCEDURES

a. Haul Route Cleanup:

Clean, sweep, or pick up, as necessary, mud, rocks, trash, or any other type of debris spilled along haul routes, immediately after passage. Cleanup must be performed to the satisfaction of the Contracting Officer.

b. Tree Relocation:

Trees, plants, shrubs, etc., designated for salvage must be carefully removed and replanted at locations on Nellis AFB as shown on the drawings. Excavation must be accomplished so as to avoid unnecessary damage to roots, limbs and foliage, and the plant must be maintained in good condition until replanted in its new location.

c. Pavement Excavation:

Notify the Contracting Officer of the starting date, location, and scope of any cutting and removal of pavement. Also report the length of time necessary to complete the work, replace the pavement and make the parking lot or street fully operational. When pavement excavation will be continuous for more than 5 days, the schedule of work for each day must be submitted. The daily schedule must be updated as necessary by each Monday if total duration is greater than 5 working days. The notification will be in writing and submitted to the Contracting Officer for approval at least 7 work days prior to the start of work.

1.15 CONTRACTOR SAFETY PERSONNEL REQUIREMENTS

See Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS for all safety requirements.

1.16 HAZARDOUS NOISE AREA

Work area for this contract is located within a high noise area and can be hazardous to the human ear. The Contractor is responsible for providing adequate ear protection as may be required for Contractor's personnel at the job site.

1.17 COLOR SCHEME FOR CONTRACTOR FACILITIES

a. All Contractor storage and operational facilities including temporary structures, signs and fencing, that remain at the site must be compatible with the color scheme used on the project signs as directed by the Contracting Officer.

PART 2 PRODUCTS

2.1 GOVERNMENT FURNISHED MATERIALS

The Government will provide an optical disk at the preconstruction conference that contains the following:

a. One set of "as-designed" electronic CADD drawing files in the specified software and format, revised to reflect all amendments, of the Government's conceptual site and facility design.

b. A submittal register data file in comma separated value (CSV) format for import into the Resident Management System (RMS).

c. Informational copies of the contract specifications and drawings, the original solicitation drawings and specifications, plus all amendments in Portable Data Format (PDF).

PART 3 EXECUTION

3.1 AFTER AWARD DOCUMENTS

a. After AWARD the Government will provide, without charge one copy of the CAD drawings of the Government's conceptual site and facility design.

b. Provide hard copy sets in the quantities identified in Section 01 33 16 DESIGN AFTER AWARD. Provide these documents within 5 work days after the Government releases the Contractor's design for construction.

c. Provide the Resident Engineer a copy ("hard" and "PDF") of the signed Bond and Notice to Proceed within 5 working days after receipt from the Contracting Officer.

-- End of Section --

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 10 10

SPECIFIC TECHNICAL ENGINEERING AND DESIGN CRITERIA

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1. SCOPE

1.1 Design and construct the renovation of Building 332 at Nellis Air Force Base, Nevada, in accordance with the criteria contained herein and using industry standard materials and efficient practices. The objective of this contract is to design and construct the required facility as described in this document and Section 01 10 11, Room-by-Room Requirements, and to meet the operational requirements of the Air Force. The Contractor shall provide all labor, equipment and material to perform the design and construct the complete, operational facility. The Contractor is responsible for visiting the site during a prescheduled site visit of all bidders prior to submitting his proposal

1.2 The Contractor shall be responsible for the professional quality, technical accuracy and coordination of all designs, drawings, specifications and other documents or publications upon which construction is based. The design of architectural, interior design, structural, mechanical, electrical, civil, landscape and other engineering features of the work shall be accomplished, reviewed, approved and sealed by engineers, architects and interior designers who are licensed professionals with a minimum of six years' experience to practice in their respective professional field in a state or possession of the United States

1.3 The design and construction of this facility shall conform to Nellis & Creech AFBs Installation Facility Standards (IFS), see Appendix of this RFP and the requirements issued in this solicitation. Features differing from the IFS and the requirements in this RFP may be allowed if said changes otherwise provide the same level of function, quality and performance established in Solicitation. The Government will be the sole authority in determining if changes are acceptable.

1.4 The Contractor is responsible and liable for the complete design and shall not assume that the provided design criteria and drawings in this solicitation will alleviate him from performing any additional design as required to produce a complete set of construction documents. The following provisions shall be maintained in the Contractor's design:

1.4.1 **Provision 1: Gross Square Feet**: The Contractor's design shall provide at least the same square foot area overall, and on a room by room basis as shown in the Government's conceptual design.

1.4.2 **Provision 2: Equivalent Functional Arrangement:** The Contractor's design shall provide equivalent functional arrangement of rooms and spaces as shown in the Government's conceptual design

1.4.3 **Provision 3: Overall Site Limits**: The Contractor's design shall be limited to the general extents of the Project site shown in the Government's conceptual design

1.4.4 **Provision 4: Gross Glazing Area**: The Contractor's design shall provide at a minimum, the same overall glazing area as shown in the Government's conceptual design. Glazing area may be increased, but not decreased from that indicated in the Government's conceptual design.

1.4.5 **Provision 5**: **Sustainable Design:** The Contractor's design is required to meet the sustainable design guidelines required by this RFP. If the Contractor determines that alternate assemblies or functional arrangements are better suited for the

achievement of sustainable design goals, the Contractor may propose those changes. Changes can only be incorporated under the review and approval of the Government. See paragraph 5.

1.5 The Government's conceptual facility design provided in the RFP documents illustrates intent and functional relationships and does not indicate all necessary construction requirements or components. The written RFP describes associated technical, performance and systems requirements. The Contractor is responsible for the complete Project design, shall retain all responsibilities, and be recognized as the Designer of Record.

2. SUMMARY DESCRIPTIONS

2.1 This project will repair and renovate existing Building 332, an Unaccompanied Enlisted Personnel Housing facility into an approximately 24,686 square foot, three story office building at Nellis Air Force Base. The project shall be designed within the criteria prescribed in *UFC 1-200-01*, *UFC 3-600-01*, and operations and maintenance manuals. See paragraph 4.14 for a list of applicable codes and criteria.

2.1.1 This project is intended to accommodate the 926 WG authorized full time and part time personnel and associated missions. The 926 WG currently occupies half of Building 332 and will request Host authority to occupy remaining space.

2.1.2 The project is a complete gut of the facility. Work to include renovate interior to open office concept with use of demountable furniture to maximum extent, add new elevator for ABA access, complete replacement of HVAC, plumbing, electrical, and communications, replace old exterior stairs with new stairs, remove exterior metal studs walls with stucco and 'motel' access doors and windows and replace with new 6” x 20 gauge metal studs assembly with stucco, install new window panel with glazing, remove exterior balcony walkways and restore shading fins (original design), remove selected parking spaces to achieve unobstructed zone of 33 feet , and modify existing mechanical yards to comply with AT/FP criteria..

2.1.3 Demolition will also include a hazardous material removal of asbestos, lead-based paint and any other known hazardous substances in accordance with paragraph 4.8 and UFGS 02 82 13 and 02 83 13 included with this RFP. Demolition also includes the removal of selected parking spaces to achieve AT/FP best practices. See Appendix Section.

2.1.4 Part of the project will be the site preparation of existing parking lot for temporary trailers swing space. Trailers/relocatable facilities will be used to house personnel displaced by this project until the beneficial occupancy date (BOD) is achieved. See 01 50 00 for temporary trailer requirements.

2.2 **SITING SUMMARY.** The existing building is sited in the Main Base (Area I), west of the flightline, bounded in the north by Devlin Drive, south by Holloman Ave, and in-between Plattsburg Avenue on the west and Ellsworth Avenue on the east.

2.3 **BUILDING CONSTRUCTION SUMMARY:** The existing building consist of stucco exterior walls on metal studs, reinforced concrete slab on grade, footing and foundation, concrete floor slabs on 2nd and 3rd floor supported by concrete columns and beams, and standing seam metal roof.

3. DESCRIPTION OF CONDITIONS AND OPERATIONS

3.1 **BASE DESCRIPTION:** The "Home of the Fighter Pilot," Nellis Air Force Base is home to the U.S. Air Force Warfare Center, the largest and most demanding advanced air combat training mission in the world. Nellis provides training for composite strike forces which include every type of aircraft in the Air Force inventory. Training is conducted in conjunction with air and ground units of the Army, Navy, Marine Corps and air forces from our allied nations. The crews do not come to learn how to fly, but instead how to be the best combat aviators in the world.

3.2 **BACKGROUND:**

Existing building is a Barracks facility built in the 1960's. The 926 WG currently occupies half of Building 332 and will request Host authority to occupy the remaining space. This project will renovate existing and remaining space to obtain the total space authorization. Without this project, operational inefficiencies caused by overcrowding, failing facility infrastructure, and inadequate communications capabilities will continue.

Overall, the building has significant deterioration in finishes, HVAC, plumbing, electrical, and communications systems and current functional layout is not conducive to training and administration. Facility interiors are extremely worn and damaged. Exterior door access, glazing, and infill panels provide little sound deadening from aircraft noise and do not comply with minimum AT/FP standards. HVAC fan coil units are old and many are non-functional due to being plugged with sediment. Boiler is over 18 years old. Chiller is new, but sizing will need to be checked during design. Plumbing system leaks and multiple toilets are nonfunctioning. Electrical panel boards and switchboards are old and parts are difficult to obtain. Communication system is inadequate and electrical and wiring need replacement. Building does not comply with ABA access and an elevator is required.

4. DESIGN SUBMITTAL REQUIREMENTS

4.1 The design requirements within this Section 01 10 10 and the following Section 01 10 11 represent the minimum quality and quantity acceptable for the proposals and project submittals. The standards, documents, and criteria referenced within this RFP, although not all attached within this RFP document, are modified to the extent indicated within this section. Each Offeror shall be responsible for obtaining any documents not attached as part of this RFP but referenced as criteria for the project. Requirements of this section may delete, revise, add to, or substitute for criteria contained in the referenced documents and this section shall be deemed the controlling authority of any changes to the other referenced documents and criteria

4.2 **DESIGN STANDARDS.** Equipment, hardware, and materials shall be standard manufactured domestic items unless otherwise specified. Replacement parts shall be standard and readily available through commercial means. Discontinued products will not be accepted unless approved by the Contracting Officer.

4.3 **CODES.** The design, materials, equipment, and installation shall be in accordance with the requirements of the listed codes and design manuals, with the requirements of this section, and with the listed specifications. The building will be of a noncombustible construction classification. Wood structural elements will not be acceptable.

4.4 **IMPERIAL DESIGN.** This project shall be designed in Imperial/English inch-pound (I-P) units per the preference of the Using Agency and Major Command.

4.5 **DRAWINGS.** Attached drawings provide information on the project site and functional arrangement and relationships of internal components. Changes and adjustments to the site and building plan arrangement are allowed subject to provisions established in Paragraphs 1.3 and 1.4.

4.6 **FIELD INFORMATION.** The utility and as-built information provided in the drawings is the best information available. It is provided to assist the offerors in preparing their proposal and then during the design of this project. The Contractor is responsible for field verifying all information given. The Contractor is also responsible for obtaining all information necessary to properly design and install all work. Gathering information during design shall be coordinated through the Contracting Officer. Any survey required to provide utility locations, manhole inverts, verification of existing features, etc. shall be the responsibility of the Contractor and shall tie into the project datum.

4.7 **DESIGN DETAILS AND STANDARDS.** The Contractor shall create design details as required, but shall conform to the requirements of the RFP, and are subject to approval by the Government.

4.8 **ASBESTOS AND LEAD BASED PAINT (LBP) SURVEY.** Contractor shall perform a HAZMAT (asbestos, lead, PCB, etc) survey of the building prior to any renovation or demolition work; to identify and quantify any HAZMAT to be abated or removed from the structure to be renovated/demolished. A full report of the survey findings shall be provided to the Technical POC. Any Asbestos Containing Material (ACM) will be abated IAW USACE EM 385-1-1, Safety and Health Requirement Manual, and all applicable federal, state and local laws and regulations. All other Regulated Materials shall be disposed IAW all applicable federal, state and local laws and

regulations. Past surveys have been attached for the Contractor's reference attached to the end of specification 02 82 13.

4.9 **SPECIFICATIONS.** The Contractor shall follow all Unified Facilities Guide Specifications (UFGS) already included in this RFP, and the Contractor shall also provide all other applicable, edited UFGS sections as required for the design and construction of this project. The Unified Facilities Guide Specifications can be retrieved at http://www.wbdg.org/ccb/. Items to be deleted from the specifications shall use the "strikethrough" formatting process to delete any portion of the specifications. Additions to the specifications shall be shown in a color font. Unless noted otherwise, material specifications, equipment efficiencies, equipment listing (i.e., UL, ANSI, NEMA, etc,), testing requirements, execution, etc., shall not be changed unless dictated by more stringent requirements in this RFP, including technical criteria such as codes and government and industry publications that are referenced in this RFP.

4.9.1 **UFGS Selection.** UFGS that have been unified for use by all participating agencies have a level 3 or level 4 MasterFormat™ number. UFGS that are agency-specific have a fifth level number indicating it as an agency specific specification. A specification that has a fifth level number "10" indicates USACE, a "20" indicates NAVFAC, a "30" indicates AFCESA and a "40" indicates NASA. Preparing agencies are indicated in the UFGS header of each specification. The DB Contractor must adhere to the following order of precedence in selecting UFGS sections: first, a UFGS specific to the project's installation; second, a USACE specification; third, a unified UFGS if one is available; and lastly, a UFGS specific to another DoD agency.

4.9.2 The Contractor shall not edit the UFGS sections to the point that they no longer contain any original information. Edits to the UFGS sections is permitted only in such instances that the language becomes specific to this project.

4.10 **SUSTAINABLE DESIGN.** The Contractor's design shall comply fully with the requirements of *UFC 1-200-02, High Performance and Sustainable Building Requirements*. See also paragraph 5 **SUSTAINABLE DESIGN** for more information and additional requirements.

4.11 **ANTI-TERRORISM/FORCE PROTECTION (AT/FP).** This project will comply with the AT/FP requirements of *UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings.* Current level of protection is LOW.

4.12 **BARRIER FREE DESIGN.** This facility shall be fully accessible to all handicapped individuals in accordance with the Architectural Barriers Act (ABA) Accessibility Standard for Department of Defense Facilities.

4.13 **ENVIRONMENTAL PROTECTION.** All work and Contractor operations shall comply with the requirements imposed by all applicable federal, state, county, local and base regulations and permits concerning environmental protection. Project schedule shall reflect time required to acquire permits and provide copies to the Contracting Officer prior to commencing work. Contractor shall coordinate with the Nellis AFB Environmental Engineer for all applicable permits.

4.14 **CONSOLIDATED LIST OF CODES AND STANDARDS.** Each design discipline cites references to various codes and standards that govern the design of the

project. A listing of the majority of codes and standards required for compliance with the requirements of this RFP follows. Note: Unless otherwise noted, use the latest edition for all reference standards or criteria listed in this section.

4.14.1 Nellis & Creech Air Force Bases Installation Facility Standards (IFS), January 2019

4.14.2 Air Force Reserve Command, Comprehensive Interior Design Policy Manual

4.14.3 Executive Order 13693, Planning for Federal Sustainability in the Next Decade, 15 March 2015

4.14.4 Department of Defense Sustainable Buildings Policy, 10 November 2013

4.14.5 Air Force Sustainable Design and Development (SDD) Implementing Guidance, 02 June 2011

4.14.6 DODI 4170.11, Installation Energy Management, dated 11 December 2009

4.14.7 Architectural Barriers Act (ABA) Accessibility Standards

4.14.8 UFC 1-200-01, General Building Requirements

4.14.9 UFC 1-200-02, High Performance and Sustainable Building Requirements

4.14.10 UFC 3-101-01, Architecture

4.14.11 UFC 3-110-03, Roofing

4.14.12 UFC 3-120-01, Design: Sign Standards

4.14.13 UFC 3-120-10, Interior Design

4.14.14 UFC 3-190-06, Protective Coatings and Paints

4.14.15 UFC 3-201-01, Civil Engineering

4.14.16 UFC 3-201-02, Landscape Architecture

4.14.17 UFC 3-210-10, Low Impact Development

4.14.18 UFC 3-220-01, Geotechnical Engineering

4.14.19 UFC 3-220-04FA, Backfill for Subsurface Structures

4.14.20 UFC 3-220-05, Dewatering and Groundwater Control

4.14.21 UFC 3-220-10N, Soil Mechanics

4.14.22 UFC 3-230-01, Water Storage, Distribution, and Transmission

4.14.23 UFC 3-230-06A, Subsurface Drainage

4.14.24 UFC 3-240-01, Wastewater Collection

4.14.25 UFC 3-250-01, Pavement Design for Roads and Parking Areas

4.14.26 UFC 3-250-03, Standard Practice Manual for Flexible Pavements

4.14.27 UFC 3-250-04, Standard Practice for Concrete Pavements

4.14.28 UFC 3-250-07, Standard Practice for Pavement Recycling

4.14.29 UFC 3-250-11, Soil Stabilization for Pavements

4.14.30 UFC 3-270-01, Asphalt Maintenance and Repair

4.14.31 UFC 3-270-04, Concrete Repair

4.14.32 UFC 3-301-01 Structural Engineering

4.14.33 UFC 3-310-04, Seismic Design for Buildings

4.14.34 UFC 3-400-02, Design: Engineering Weather Data

4.14.35 UFC 3-401-01, Mechanical Engineering

4.14.36 UFC 3-410-01, Heating, Ventilating and Air Conditioning Systems

4.14.37 UFC 3-410-02, Lonworks® Direct Digital Control for HVAC and Other Local Building Systems

4.14.38 UFC 3-410-04N, Industrial Ventilation

4.14.39 UFC 3-420-01, Plumbing Systems

4.14.40 UFC 3-420-02FA, Compressed Air

4.14.41 UFC 3-450-01, Noise and Vibration Control

4.14.42 UFC 3-501-01, Electrical Engineering

4.14.43 UFC 3-520-01, Interior Electrical Systems

4.14.44 UFC 3-520-05, Stationary Battery Areas

4.14.45 UFC 3-530-01, Design: Interior and Exterior Lighting and Controls

4.14.46 UFC 3-550-01, Exterior Electrical Power Distribution

4.14.47 UFC 3-550-03FA, Electrical Power Supply and Distribution

4.14.48 UFC 3-560-02 O&M Electrical Safety

4.14.49 UFC 3-570-02A, Cathodic Protection

4.14.50 UFC 3-570-02N, Electrical Engineering Cathodic Protection

4.14.51 UFC 3-575-01, Lightning and Static Electricity Protection Systems

4.14.52 UFC 3-580-01, Telecommunications Building Cabling Systems Planning and Design UFC 3-600-01, Fire Protection Engineering for Facilities

4.14.53 UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings

4.14.54 UFC 4-021-02, Electronic Security Systems

4.14.55 UFC 4-021-01, Design and O&M: Mass Notification Systems

4.14.56 UFC 4-023-03, Design of Buildings to Resist Progressive Collapse

4.14.57 A-E Guide, Volume 1, General Instructions for Air Force Projects, Sacramento District

4.14.58 A-E Guide, Volume 2a & 2b, Cost Estimating, Sacramento District

4.14.59 A-E Guide, Volume 3, Specifications, Sacramento District

4.14.60 Unified Facilities Guide Specifications (UFGS)

4.14.61 International Building Code (IBC) 2015, except as modified in UFC 1-200-01 & UFC 3-310-01,

4.14.62 International Existing Building Code (IEBC) 2015

4.14.63 International Plumbing Code (IPC)

4.14.64 International Mechanical Code (IMC)

4.14.65 NFPA 10, Standard for Portable Fire Extinguisher

4.14.66 NFPA 13, Installation of Sprinkler Systems

4.14.67 NFPA 17A, Standard for Wet Chemical Extinguishing Systems

4.14.68 NFPA 20, Installation of Stationary Pumps for Fire Protection

4.14.69 NFPA 24, Installation of Private Fire Service Mains

4.14.70 NFPA 30, Flammable and Combustible Liquids Code

4.14.71 NFPA 54, National Fuel Gas Code

4.14.72 NFPA 70, National Electrical Code

4.14.73 NFPA 70E, Standard for Electrical Safety in the Workplace

4.14.74 NFPA 72, National Fire Alarm Code

4.14.75 NFPA 72H, Guide for Testing Procedures for Local Auxiliary Remote Station and Proprietary Protective Signaling Systems

4.14.76 NFPA 75, Fire Protection of Information Technology Equipment

4.14.77 NFPA 80, Fire Doors and Fire Windows

4.14.78 NFPA 90A, Installation of Air Conditioning And Ventilating Systems

4.14.79 NFPA 90B, Installation of Warm Air Heating and Air-Conditioning Systems

4.14.80 NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

4.14.81 NFPA 101, Life Safety Code 2018

4.14.82 NFPA 110, Emergency and Standby Power Systems

4.14.83 NFPA 111, Stored Electrical Energy Emergency Standby Power Systems

4.14.84 NFPA 780, Lightning Protection Systems

4.14.85 Federal Specification (FS) HH-I-558, Insulation, Blankets, Thermal (Mineral Fiber, Industrial Type)

4.14.86 Manual on Uniform Traffic Control Devices (MUTCD), US Department of Transportation, Federal Highway Administration

4.14.87 National Earthquake Hazard Reduction Program (NEHRP), US Geological Survey (USGS)

4.14.88 ACI 318-14, Building Code Requirements for Structural Concrete

4.14.89 ACI 530-13/ASCE 5-13/TMS 402-13, Building Code Requirements for Masonry Structures

4.14.90 AISI Cold Formed Steel Design, 2010

4.14.91 ASCE 7-10, Minimum Design Loads for Buildings and Other Structures

4.14.92 ANSI A136.1, Installation of Ceramic Tile

4.14.93 ANSI A137.1, Ceramic Tile

4.14.94 ANSI/BHMA A156.1, Butts and Hinges

4.14.95 ANSI/BHMA A156.2, Bored and Preassembled Locks and Latches

4.14.96 ANSI/BHMA A156.3, Exit Devices

4.14.97 ANSI/BHMA A156.4, Door Controls - Closers

4.14.98 ANSI/BHMA A156.5, Cylinders and Input Devices for Locks

4.14.99 ANSI/BHMA A156.6, Architectural Door Trim

4.14.100 ANSI/BHMA A156.13, Mortise Locks & Latches

4.14.101 ANSI/BHMA A156.18, Materials and Finishes

4.14.102 ANSI/BHMA A156.36, Auxiliary Locks

4.14.103 ANSI A440, Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors

4.14.104 ANSI A250.8, Standard Steel Doors and Frames

4.14.105 ANSI C2, National Electrical Safety Code

4.14.106 ANSI C57.12.00 General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers

4.14.107 ANSI C57.12.26 Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers for use with Separable Insulated High-Voltage Connectors, High-Voltage, 34500GrdY/19920 Volts and Below; 2500 kVA and Smaller

4.14.108 ANSI C57.12.27 Conformance Requirements for Liquid-Filled Distribution Transformers Used in Pad-Mounted Installations, Including Unit Substations

4.14.109 ANSI C57.12.28 Switchgear and Transformers - Pad-Mounted Equipment - Enclosure Integrity

4.14.110 ANSI C62.41 Surge Voltage in Low Voltage AC Power Circuits

4.14.111 ANSI C84.1, Electric Power Systems and Equipment - Voltage Ratings

4.14.112 ANSI C502, Dry-Barrel Fire Hydrants

4.14.113 ANSI C900, Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 inches through 12 inches, for Water Transmission and Distribution

4.14.114 ANSI C901, Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ inch through 3 inches, for Water Service.

4.14.115 ANSI Z83.11, Gas Food Service Equipment

4.14.116 ANSI Z124.3, Plastic Lavatory Units

4.14.117 ANSI Z124.6, Plastic Sinks

4.14.118 ANSI Z358.1, Emergency Eye Wash: Fountain

4.14.119 ANSI/AISC 341-05, Seismic Provisions for Structural Steel Buildings

4.14.120 ANSI/AISC 360-05, Specifications for Structural Steel Buildings

4.14.121 ANSI/IEEE Std. 141, Recommended Practice for Electric Power Distribution for Industrial Plants – IEEE Red Book

4.14.122 ANSI/IEEE Std. 142, Recommended Practice for Grounding of Industrial and Commercial Power Systems – IEEE Green Book

4.14.123 ANSI/IEEE Std. 241, Recommended Practice for Electric Power Systems in Commercial Buildings – IEEE Gray Book

4.14.124 ANSI/IEEE Std. 242, Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems – IEEE Buff Book

4.14.125 ANSI/IEEE Std. 399, Recommended Practice for Industrial and Commercial Power Systems Analysis – IEEE Brown Book

4.14.126 ANSI/IEEE Std. 446, Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications – IEEE Orange Book

4.14.127 ANSI/IEEE Std. 493, Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems – IEEE Gold Book

4.14.128 ANSI/IEEE Std. 519, Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems-Second Printing

4.14.129 ANSI/IEEE Std. 1100, Recommended Practice for Powering and Grounding Electronic Equipment – IEEE Emerald Book

4.14.130 ANSI/IEEE Std. 1584, IEEE Guide for Performing Arc Flash Hazard Calculations

4.14.131 ANSI/TIA/EIA-TSB-67, Transmission Performance Specifications for Field Testing of Unshielded Twisted Pair (UTP) Cabling System

4.14.132 ANSI/TIA/EIA-526-7, Measurement of Optical Power loss of Installed Single-Mode Fiber Cable Plant - OFSTP-7

4.14.133 ANSI/TIA/EIA-526-14, Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant - OPSTP-14

4.14.134 ANSI/TIA/EIA-568-B, Commercial Building Telecommunications Cabling Standard

4.14.135 ANSI/TIA/EIA-568-C, Commercial Building Telecommunications Cabling Standards

4.14.136 ANSI/TIA/EIA-569-A, Commercial Building Standard For Telecommunications Pathways and Spaces

4.14.137 ANSI/TIA/EIA-598, Optical Fiber Cable Color Coding

4.14.138 ANSI/TIA/EIA-606-A, The Administration Standard For the Telecommunications Infrastructure of Commercial Buildings

4.14.139 ANSI/TIA/EIA-607, Commercial Building Grounding and Bonding Requirements for Telecommunications

4.14.140 ANSI/TIA/EIA 758, Customer Owned Outside Plant Telecommunications Cabling Standard

4.14.141 ASME A112.19.1M, Enameled Cast Iron Plumbing Fixtures

4.14.142 ASME A112.19.2M, Vitreous China Plumbing Fixtures and Hydraulic Requirements for Water Closets and Urinals

4.14.143 ASTM A36, Carbon Structural Steel

4.14.144 ASTM A53, Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

4.14.145 ASTM A446, Standard Specifications and Operating Instructions for Glass Capillary Kinematic Viscometers

4.14.146 ASTM A463, Steel Sheet, Aluminum-Coated, by the Hot-Dip Process

4.14.147 ASTM A500, Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

4.14.148 ASTM A572, High-Strength Low-Alloy Columbium-Vanadium Structural Steel

4.14.149 ASTM A615, Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

4.14.150 ASTM A653, Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

4.14.151 ASTM A706, Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

4.14.152 ASTM A792, Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

4.14.153 ASTM A1011, Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

4.14.154 ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus

4.14.155 ASTM B209, Aluminum and Aluminum-Alloy Sheet and Plate

4.14.156 ASTM B221, Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

4.14.157 ASTM B88, Seamless Copper Water Tube

4.14.158 ASTM C33, Concrete Aggregates

4.14.159 ASTM C90, Loadbearing Concrete Masonry Units

4.14.160 ASTM C94, Ready-Mixed Concrete

4.14.161 ASTM C270, Mortar for Unit Masonry

4.14.162 ASTM C373, Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products

4.14.163 ASTM C475, Joint Compound and Joint Tape for Finishing Gypsum Board

4.14.164 ASTM C476, Grout for Masonry

4.14.165 ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

4.14.166 ASTM C534, Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form

4.14.167 ASTM C552, Cellular Glass Thermal Insulation

4.14.168 ASTM C578, Rigid, Cellular Polystyrene Thermal Insulation

4.14.169 ASTM C612, Mineral Fiber Block and Board Thermal Insulation

4.14.170 ASTM C636, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels

4.14.171 ASTM C645, Nonstructural Steel Framing Members

4.14.172 ASTM C648, Breaking Strength of Ceramic Tile

4.14.173 ASTM C665, Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing

4.14.174 ASTM C734, Low-Temperature Flexibility of Latex Sealants After Artificial Weathering

4.14.175 ASTM C834, Latex Sealants

4.14.176 ASTM C919, Standard Practice for Use of Sealants in Acoustical Applications

4.14.177 ASTM C954, Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness

4.14.178 ASTM C955, Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases

4.14.179 ASTM C1002, Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs

4.14.180 ASTM C1028, Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method

4.14.181 ASTM C1047, Accessories for Gypsum Wallboard and Gypsum Veneer Base

4.14.182 ASTM C1060, Standard Practice for Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings

4.14.183 ASTM C1178, Coated Glass Mat Water-Resistant Gypsum Backing Panel

4.14.184 ASTM C1289, Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

4.14.185 ASTM C1396, Gypsum Board

4.14.186 ASTM D217, Standard Test Methods for Cone Penetration of Lubricating Grease

4.14.187 ASTM D522, Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings

4.14.188 ASTM D523, Standard Test Method for Specular Gloss

4.14.189 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

4.14.190 ASTM D714, Standard Test Method for Evaluating Degree of Blistering of Paints

4.14.191 ASTM D968, Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive

4.14.192 ASTM D1003, Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics

4.14.193 ASTM D1056, Flexible Cellular Materials - Sponge or Expanded Rubber

4.14.194 ASTM D1308, Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes

4.14.195 ASTM D1556, Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method

4.14.196 ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

4.14.197 ASTM D1586, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils

4.14.198 ASTM E1592, Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference

4.14.199 ASTM D1654, Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

4.14.200 ASTM D1785, Poly(Vinyl Chloride) (PVC) Plastic Pipe

4.14.201 ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

4.14.202 ASTM D2244, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

4.14.203 ASTM D2247, Standard Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity

4.14.204 ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

4.14.205 ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

4.14.206 ASTM D2794, Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

4.14.207 ASTM D3359, Standard Test Methods for Measuring Adhesion by Tape Test

4.14.208 ASTM D3441, Standard Test Method for Mechanical Cone Penetration Tests of Soil

4.14.209 ASTM D4060, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

4.14.210 ASTM D4214, Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films

4.14.211 ASTM D4226, Standard Test Methods for Impact Resistance of Rigid Poly(Vinyl Chloride) (PVC) Building Products.

4.14.212 ASTM D4397, Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications

4.14.213 ASTM D4434, Poly(Vinyl Chloride) Sheet Roofing

4.14.214 ASTM D4643, Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating

4.14.215 ASTM D4959, Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating

4.14.216 ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

4.14.217 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials

4.14.218 ASTM E90, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

4.14.219 ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials

4.14.220 ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials

4.14.221 ASTM E136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

4.14.222 ASTM E514, Standard Test Method for Water Penetration and Leakage Through Masonry

4.14.223 ASTM E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

4.14.224 ASTM E779, Standard Test Method for Determining Air Leakage Rate by Fan Pressurization

4.14.225 ASTM E814, Standard Test Method for Fire Tests of Penetration Firestop Systems

4.14.226 ASTM E1186, Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems

4.14.227 ASTM E1745, Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs

4.14.228 ASTM E1827, Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door

4.14.229 ASTM E2178, Standard Test Method for Air Permeance of Building Materials

4.14.230 ASTM F1066, Vinyl Composition Floor Tile

4.14.231 ASHRAE Handbook, Fundamentals

4.14.232 ASHRAE Handbook, HVAC Systems and Equipment

4.14.233 ASHRAE Handbook, HVAC Applications.

4.14.234 ASHRAE Handbook, Refrigeration

4.14.235 ASHRAE Standard 15 Revision, Safety Code for Mechanical Refrigeration

4.14.236 ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality

4.14.237 ASHRAE Standard 70, Method of Testing the Performance of Air Outlets and Air Inlets

4.14.238 ASHRAE Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings

4.14.239 ASHRAE Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings (IESNA cosponsored), I-P Edition (ANSI approved)

4.14.240 Plumbing and Drainage Institute (PDI) WH 201, Water Hammer Arresters Standard

4.14.241 Plastic Pipe Institute Technical Report PPI-TR21, Thermal Expansion and Contraction of Plastic Pipe

4.14.242 SMACNA Architectural Sheet Metal Manual

4.14.243 SMACNA, HVAC Systems – Duct Design Manual

4.14.244 ISO 6781, Thermal Insulation - Qualitative Detection of Thermal Irregularities in Building Envelopes - Infrared Method First Edition

4.14.245 UL Fire Resistance Directory, Vol. 1 and 2

4.14.246 UL 50, Enclosures for Electrical Equipment

4.14.247 UL 263, Fire Tests of Building Construction and Materials

4.14.248 UL 268, Smoke Detectors for Fire Protective Signaling Systems

4.14.249 UL 300, Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment

4.14.250 UL 464, Audible Signal Appliances

4.14.251 UL 497, Protectors for Paired Conductor Communication Circuits

4.14.252 UL 580, Tests for Uplift Resistance of Roof Assemblies

4.14.253 UL 723, Test for Surface Burning Characteristics of Building Materials

4.14.254 UL 762, Outline of Investigation for Power Roof Ventilators for Restaurant Exhaust Appliances

4.14.255 UL 790, Standard Test Methods for Fire Tests of Roof Coverings

4.14.256 UL 910, Test for Flame-Propagation and Smoke-Density Values for Electrical and Optical-Fiber Cables Used in Spaces Transporting Environmental Air

4.14.257 UL 1046, Grease Filters for Exhaust Ducts

4.14.258 UL 1286, Office Furnishings

4.14.259 UL 1479, Fire Tests of Through-Penetration Firestops

4.14.260 UL 1480, Speakers for Fire Alarm, Emergency, and Commercial and Professional Use

4.14.261 UL 2085, Protected Aboveground Tanks for Flammable and Combustible Liquids

4.14.262 Illuminating Engineering Society of North America (IES) Lighting Handbook, Reference and Application Volume, 9th Edition

4.14.263 Architectural Woodwork Standards, joint publication of AWI/AWMAC/WI

4.14.264 Glass Manufacturer Standards

4.14.265 Gypsum Association, Fire Resistance Design Manual

4.14.266 Tile Council of North America (TCNA) Handbook for Ceramic Tile Installation

4.14.267 Insulating Glass Manufacturers Alliance (IGMA) TR-1200, Guidelines for Commercial Insulating Glass Dimensional Tolerances

4.14.268 Aluminum Association Designation System

4.14.269 National Sanitation Foundation (NSF), Standard 2, Food Service Equipment

4.14.270 Rural Utility Service, Bulletin 1753F-201 (PC-4), Standard for Acceptance Tests and Measurements of Telecommunications Plant

4.14.271 Steel Deck Institute (SDI)

4.14.272 Steel Joint Institute (SJI)

4.14.273 Masonry Institute of America

4.14.274 National Concrete Masonry Association Publications

4.14.275 Manufacturers Standardization Society (MSS) Standards.

5. SUSTAINABLE DESIGN

5.1 GENERAL

5.1.1 The Contractor is required to comply with all state and federal laws regarding sustainable design. See UFC 1-200-02 for more information and additional requirements not listed here.

5.2 The Air Force MILCON Sustainability Requirements Scoresheet must be filled out by the Contractor and submitted as part of this contract. The Contractor is responsible for keeping this and other compliance reporting documents updated throughout the course of design and construction. Updated documents are required to be submitted at 65% design, 95% design, design completion, and construction completion.

5.3 PROJECT REGISTRATION.

5.3.1 The Contractor is responsible for registering project using the DoD version of Guiding Principles (GPs) Compliance certification of either the 1) US Green Building Council (USGBC)/ Green Business Certification Inc. (GBCI), or 2) Green Building Initiative (GBI) rating systems. See AGRAM 17-01 for more information.

5.4 **EPA'S "DESIGNED TO EARN THE ENERGY STAR."** The Contractor shall select appropriate appliances, fixtures, and equipment so that the project meets the requirements of the Environmental Protection Agency's (EPA) "Designed to Earn the Energy Star" program for Commercial New Construction.

5.4.1 The Contractor shall use the "Target Finder" program to analyze the energy use. The design shall achieve a rating of 75 or higher. Analysis shall be conducted per the EPA guidelines and documented as part of the Contractor's Design Analysis. Results of the "Target Finder" analysis shall be submitted to the EPA for review. Once accepted, they will provide the Architect of Record an electronic file with the "Designed to Earn the Energy Star" graphic. The Contractor shall place this graphic in the title block on all construction drawings and on the cover of all Contract Documents. More information about the "Designed to Earn the Energy Star" program and requirements can be found at the EPA Energy Star website: http://www.energystar.gov/buildings/facility-owners-and-managers/new-construction.

5.5 **FEDERAL HIGH PERFORMANCE AND SUSTAINABLE BUILDINGS.** As required by federal law, the Contractor shall design a building that meets all of the Federal Requirements for High Performance Sustainable Buildings (HPSB). See UFC 1-200-01, the Air Force Sustainable Design Development (SDD) Implementing Guidance, and the Air Force High Performance Sustainable Buildings Scorecard for more information. Currently UFC 1-200-02 mandates the use of ASHRAE 90.1-2013. See also the Whole Building Design Guide's website for more information http://www.wbdg.org/ffc/af-afcec/sustainable-design-development-sdd.

5.5.1 Energy Compliance Analysis. An Energy Compliance Analysis must be completed to verify compliance with *UFC 1-200-02*. The ECA must include a

completed “Energy Cost Budget Compliance Report” as shown in Appendix G of the *ASHRAE 90.1 User’s Manual*. The ECA shall also include three LCCA narratives prepared by the project’s lead architect, mechanical engineer, and electrical engineer. Each of the three disciplines will prepare a narrative that addresses the various alternatives considered for each of the HPSB Guiding Principles, the alternative that was chosen, and any supporting LCCA calculations or documentation. The ECA shall include all other LCCA studies and supporting documentation. The ECA shall be submitted during each design phase submittal, and shall be updated throughout the design process.

6. CIVIL DESIGN

6.1 **GENERAL.** The project consists of new utility connections, minor paving and site prep work for temporary swing space trailers. See Paragraph 2 **SUMMARY DESCRIPTIONS** for more details.

6.1.1 New utility service connections are required for water, sewer, gas, electric and communication.

6.2 **BASE ENTRY.** Contractor must conform to all base regulations and directives pertaining to security, safety, traffic, and personnel clearances. Employees of the contractor must be placed on an Entry Authority List (EAL) to be processed by base security forces to gain access to base. The Contractor must become acquainted with these requirements of the Air Base during the proposal phase. More information on restrictions are outlined in the Nellis AFB Requirements/ Guidance document included in the Appendices to this RFP.

6.3 **PROJECT PHASING.** Prior to repair and renovate existing Building 332, prepare site work for temporary trailers swing space as shown in C-102. Trailers/relocatable facilities will be used to house personnel displaced by this project until the beneficial occupancy date (BOD) is achieved.

6.4 **SITE.** See section 3.2.

6.5 **TECHNICAL CRITERIA AND STANDARDS.** See paragraph 4.14.for all applicable codes and design standards. Contractor must also comply with the Nellis & Creech AFBs IFS/ Guidance for Construction Projects attached to this RFP.

6.6 **PROJECT SITE FIELD SURVEY.** The Contractor shall be responsible for performing any survey to be used for construction and as required to complete the design. Aerial photos shown on drawings are dated and should not be relied upon for accurate site details.

6.7 **SITE DEMOLITION** The Contractor shall demolish all existing site and building features as required to construct project per contract. Demo work includes but is not limited to: the existing pavements, hardscapes and landscapes, and all necessary utility relocations. Where pavement is demolished next to adjacent remaining, use of full-depth saw cuts are required**.** See Section 10 and C-101.

6.7.1 **Waste Disposal.** Project demolition and construction waste shall be disposed of off post at a location approved by the Contracting Officer. There are no landfills located at Nellis AFB. Per the Engineering Construction Bulletin (ECB) 2015-19, the minimum construction and demolition debris to be diverted from non-sustainable waste streams is 60%. Requirements related to demolition and waste handling procedures are covered in more detail within the specification sections 02 41 00 – Demolition, and 01 74 19 – Construction and Demolition Waste Management

6.7.2 **Haul Route.** See G-101 for commercial haul route path and access gates. Contractors may access the base through the Main Gate, Simmons Gate, and the Area II Gate. However, all commercial vehicles and vehicles larger than pickup trucks will be required to access the base through Area II gate only. After Area II gate, Contractor will travel approximately 3.5 miles on base roads indicated on sheet to project site. Gate hours vary and it is the Contractor's responsibility to

coordinate gate operations with construction activities. Installation roadways sustaining damage from construction activities must be repaired at the Contractor's expense after project completion.

6.8 **EARTHWORK.**

6.8.1 **General.** During construction, minimize disturbed areas, stockpile excavated soils, and protect excavated soils from wind and water erosion. Replace or remove soils when construction is complete. Temporary erosion control measures should follow the requirements outlined in Section 01 57 23, Temporary Storm Water Pollution Control.

6.8.2 **Excavation.** There are no known contaminant or contaminated soil at the site. If contaminants are encountered or suspected either by detecting suspicious odors or discolored soil, the Contractor shall notify the Contracting Officer immediately.

6.8.2.1 If the Contractor discovers unidentified hazardous conditions after construction commencement, he/she shall notify the Contracting Officer immediately. The Contractor shall stop construction for up to ten (10) days to allow time for Environmental Management (EM) representatives to sample and analyze suspected contamination. If the soil is determined to be contaminated, the Contractor shall set the contaminated soil aside on some contained area (asphalt, plastic lining, etc). The contained area shall first be covered with minimum 15 mil plastic before any soil is placed there. After the soil has been placed there it shall be entirely covered with minimum 15 mil plastic sufficiently anchored to remain in place during windy/stormy conditions. Storm water shall be diverted away from the stockpile, and any runoff from the stockpile area shall be contained and properly disposed of.

6.8.3 **Borrow.** All borrow shall be obtained off post at Contractor expense from an off-site source acceptable to the Contracting Officer and meeting gradation requirements of Geotechnical Report, and all excess materials shall be disposed of at an approved municipal landfill. The Contractor shall submit material certification for approval prior to placement.

6.8.4 **Geotechnical Report.** Contractor is required to obtain the services of a Geotechnical Engineer. All explorations and Geotechnical evaluations and recommendations are the responsibility of the Contractor. See paragraph 8 "Geotechnical Design Requirements" for additional information and requirements regarding the Contractor's Geotechnical Report.

6.9 **SITE DEVELOPMENT**

6.9.1 **Building Siting.** Building location and orientation of the renovation facility is shown on the Civil and Architectural sheets. The final site design shall be determined by the Contractor meeting the minimum provisions of all applicable references indicated in these RFP documents and with the final approval of the Contracting Officer. The Contractor shall confine proposed development to the project area as shown on C-102.

6.9.2 **Staging Area.** The Contractor staging area shall be located within the project limits with approval of the Contracting Officer.

6.9.3 **Parking Area.** Existing parking pavement that is to remain with the exception for pavement demolition as shown on C-101. Provide two ABA compliant spaces with ABA compliant route to main building by converting the existing parking spaces as shown on C-102. Ponding of surface wall shall not be permitted.

6.9.4 **Permits** Contractor is required to apply for, pay required fees and obtain all required permits for the project work. Required permits to receive Authority to Construct (ATC) are outlined under section 01 33 16 – Design After Award, these include but are not limited to: hazmat, dust, work clearance, storm water, and cultural resources. Additional permitting information for ATC is also contained in Appendix P.

6.9.5 **Roof Drainage.** The Contractor must make provisions for roof drainage from the building to be included in the site drainage system. Where finished grade is not pavement, downspout outlets must be provided with concrete splash blocks. Runoff from downspouts must drain away from the new facility. Where underground collection of rainwater is used, no more than three (3) downspouts may be collected together for discharge into storm water structure. Minimum pipe sizing must be designed in accordance with International Plumbing Code (IPC) or 6-inches minimum. See UFC 3-201-01 for additional requirements.

6.10 **SITE IMPROVEMENTS.**

6.10.1 **Standard Details.** Site details shall be constructed per Nellis & Creech AFBs IFS.

6.10.2 **Pavement Design.** The Contractor shall determine the pavement design requirements after their geotechnical investigation has been completed (see paragraph 8 for the Geotechnical Design Requirements). The Contractor shall complete the investigation and provide copies of these documents to USACE prior to site design commencement.

6.10.3 **Concrete Exterior Slab and Paving.** The Contractor shall design and construct concrete slabs, pavements, sidewalks, etc. based on the recommendations of their geotechnical engineering analysis. Refer to paragraph 8 GEOTECHNICAL DESIGN REQUIREMENTS for shallow boring data to be used for bidding purposes.

6.10.4 **Curb and Gutter.** Concrete shall be utilized for all curb and/or gutter work. Curb and gutter shall be provided around all landscaped areas, all parking lot island and along the edges of new pavement.

6.10.5 **Walkways.** Paved walkways shall be provided from the vehicle parking area to the main entrance to the building and around the building to provide access to all exterior doors, including mechanical and electrical rooms. Walkways providing access to a building shall be centered on the doorway served. Walkways from the parking lot to the main entrance shall be a minimum of 8 feet wide and walkways connected to the storage room, exterior double doors connected to corridor, electrical room, and mechincial rooms shall be a minimum of 6 feet wide and provide sloped stoop and curb ramp for wheeled access from the parking area into the storage rooms. All other walkways shall be a minimum of 5 feet wide. All

walkways shall comply with the *Uniform Federal Accessibility Standards* and ABA requirements.

6.10.6 **Concrete Door Stoops.** Contractor shall place concrete stoops approximately 5' by 5' in size at all exterior doors. The stoops shall be at least 6" thick and be of the same elevation as the interior floor and shall slope away from building.

6.10.7 **Pavement Marking & Signage.** Provide pavement markings and traffic control signage in accordance with the *Manual on Uniform Traffic Control Devices (MUTCD)* and per Nellis AFB standards.

6.10.8 **Equipment Enclosures.** Mechanical/electrical equipment shall be mounted on concrete pads, enclosed with CMU screen walls, and secured with a gate. Equipment enclosures shall be located in accordance with the minimum AT/FP requirements. CMU screen walls shall be integrally colored split-face CMU and walls shall be high enough to visually screen from view all equipment in the enclosure. All mech/elec yards shall have concrete pavement.

6.11 **STORM RUNOFF AND DRAINAGE.**

6.11.1 **Storm Runoff.** Storm runoff shall be calculated using the US Army Corps of Engineers (USACE) criteria. The storm frequency for the collection system shall be the 10-year storm and for surface drainage design shall be the 100-year storm.

6.11.2 **Existing/New Storm Drainage System.** The Contractor shall perform a complete analysis taking into consideration existing and proposed conditions using the USACE criteria and design an acceptable surface or underground storm drainage system to handle storm water runoff. Any additional stormwater inlets shall be constructed in accordance with applicable standards, matching existing at Nellis AFB. Due to north parking lot demolition, relocate or modify the existing storm water drain inlet currently located in the southeast corner of parking lot. Should a new storm drainage pipe system be required, the pipe should be designed to provide a minimum velocity of 0.76 m/sec (2.5 ft/sec). Storm drainpipes shall be verified and/or sized by computation of backwater surface profiles. Calculations for the flows shall utilize a value no smaller than 0.013 for Manning's "n" factor. New manholes shall be provided where required to route the system around the building footprint if required. Manholes shall be constructed in accordance with Installation Standards.

6.11.3 **Roof Drainage.** The Contractor must make provisions for roof drainage from the project. Runoff from downspouts must be connected to the existing storm drainage systems where applicable using underground storm piping or routing to LID features and must be included in the design of the storm drainage system. The storm drainage system may include but is not limited to, sidewalk drains, drop inlets, curb inlets, pipes, culverts, earth swales, concrete valley gutters, splash blocks, etc. Preference should be given towards LID features where technically feasible.

6.11.4 **Storm Drain Line Materials.** Piping for storm drainage shall be industry standard for the drainage of commercial facilities. Examples of acceptable piping material are: polyvinyl chloride (PVC) pipe, acrylinitrile-butadiene-styrene (ABS) pipe, non-

reinforced concrete pipe, reinforced concrete pipe, and corrugated metal pipe. Installation shall be per manufacturer's instructions. Drain structures such as curb inlets, catch basins, and manholes shall be pre-cast. Rims, covers and grates for drain structures shall be rated for H-20 traffic loading in traffic areas. Minimum design velocity of storm water underground systems shall be 0.76 m/sec (2.5 ft/sec).

6.11.5 **Drainage Swales.** Utilize as required.

6.12 **UTILITIES.**

6.12.1 **Utility Connections.** Utility upgrades and connections shall be provided by the Contractor for the new facility as required. Service connection locations for water, sanitary sewer, natural gas, and electrical shall be shown on the Contractor's Utility Plan. These connection locations must be verified using the criteria referenced in this specification and may require adjustment during final design. Ferrous materials for utilities are not allowed, except for fire hydrants.

6.12.2 **Existing Utilities.** Existing utilities are described based upon surface observations and information provided by the Installation. The Contractor is responsible for verifying the existence, location, size, depth and condition of existing utilities for the final design. Utilities found within the footprint of the building shall be located and marked. No utility shall be removed and relocated prior to receiving approval from the Contracting Officer. Existing utilities requiring relocation shall be relocated at least 5 feet outside of the building/structure footprint.

6.12.3 **Water.** Interruption of potable water service to facilities during construction shall be minimized and restricted to the hours determined by the Contracting Officer. Final domestic water hook-up to the potable system (site and building) shall be disinfected. All piping, joints, fittings, valves, valve boxes, fire hydrants, backflow prevention devices, and thrust restraint shall comply with *UFC 3-600-01* and the *National Fire Code*. A new exterior backcheck assembly and meter (gallons) will be provided prior to entering building.

6.12.3.1 **Domestic Water Service.** The domestic water line shall be designed with a line velocity of less than 5 ft/sec to prevent possible water hammer effects. A water meter shall be provided and installed. The service connection shall be sized per demand of all fixture units.

6.12.3.1.1 Pressure Test. All new water lines shall be leak-tested at 100 psig with no pressure drop in not less than 4 hours or tested to manufacturer's recommendations whichever is most stringent. Backflow prevention devices are required on both domestic water supplies and fire protection systems

6.12.3.1.2 Pipe Material. Acceptable pipe materials for domestic water service lines are PVC conforming to *ASTM D1785* and polyethylene plastic (PE) conforming to *ANSI/AWWA C901*. If water lines are Polyvinyl Chloride (PVC) they shall be pressure pipe Class 165 DR 18 and shall conform to the *ANSI/AWWA C900*. Pipe materials shall comply with the Installation Design Guide. Pressure and leakage test shall be per pipe manufacturer's requirements. Fittings and appurtenances shall be per manufacturer's requirements for installation.

6.12.3.2 **Fire Protection Water Service.** A new fire service line is required for the building. See paragraph 13 Fire Protection for more information. The minimum depth of piping for fire service connections is three feet below finish grade. Piping shall comply with National Fire Protection Association (NFPA). The fire protection system shall be designed in accordance with the national fire codes prepared by the National Fire Protection Association.

6.12.3.3 **Fire Hydrants.** New fire hydrants shall be located and installed in accordance with the requirements of *UFC 3-600-01* and *NFPA*. All hydrants shall be wet-barrel type painted to match the Installation hydrant color. The Contractor shall coordinate the hydrant color with the Contracting Officer. All hydrants shall conform to *ANSI/AWWA C502,* and be approved by the Installation Fire Marshall. Hydrant laterals shall be 6 inches in diameter with a 6-inch gate valve. The Installation Fire Marshall shall make a determination if any new hydrants are required in accordance with *UFC 3-600-01,* and shall approve all new fire hydrant locations. Existing test results shall be included in the Contractor's Design Analysis. The backflow prevention devices shall be equipped with a test hydrant.

6.12.3.3.1 **Fire Flows.** A water and fire flow analysis shall be conducted to ensure adequate flow. See appendixes for past five year flow data.

6.12.3.4 **Valves and Valve Boxes.** Valve boxes shall be provided for each new valve. Cast iron boxes shall be bonded with the ferrous valve and be cathodically protected. Cast iron valve boxes shall have a protective coating applied using a coal tar epoxy. Valve boxes in traffic areas shall be selected to sustain anticipated loads.

6.12.3.5 **Burial Depth.** Water lines shall have a minimum cover of 3 feet and shall be below the ground frost penetration depth, whichever is more stringent

6.12.3.6 **Water Meters.**. A water meter must be provided and installed as required per UFC 1-200-02, and be compatible for future use with base Electronic Monitoring System (EMS). The meter must read in gallons. See paragraph 12 – Plumbing Design for more informationSee Appendix Q-Nellis Meter Requirements.

6.12.3.7 **Existing Water System Pressures.** See fire flow data in Appendix B.

6.12.3.8 **Post Indicator Valves.** Post Indicator Valves shall be installed per requirements of *NFPA 24*.

6.12.3.9 **Backflow Preventer.** A Backflow Prevention Device is required for the new facility and shall be UL listed and FM approved. For domestic water service, a 'Reduced Pressure Backflow Preventer' shall be used. A Double Check Valve Backflow Preventer shall be used for fire water connection. Contractor shall submit manufacturer's certificates. See paragraph 12.3 Plumbing Design for additional requirements.

6.12.4 **Sanitary Sewer.** A sanitary sewer lateral shall be designed to convey sewage from the building and shall connect to the existing sewer system as shown on sheet C-102. Existing sewer is 12" diameter running on the south side of Holloman Avenue per As-Builts in Appendix W. The building lateral shall provide the maximum slope attainable while meeting the burial depth criteria for the line. Sanitary

sewerbrances shall have a minimum diameter of 6 inches. Sewer service lines may have a minimum diameter of 4 inches. Minimum wastewater flow velocity is 2 ft/sec.

6.12.4.1 **Burial Depth.** Sanitary sewer lines shall have a minimum cover of 2.5 feet in areas not subjected to vehicle loads and 3 feet if subjected to vehicular traffic.

6.12.4.2 **Cleanouts.** Cleanouts shall be provided for the sanitary sewer lateral on the exterior of the building where it exits the new facility.

6.12.4.3 **Sewer Manholes.** Manholes are required at junctions of gravity sewers and at each change in pipe direction, size or slope. A manhole shall be used for the building connection if the connection is more than 100 feet from the building cleanout.

6.12.4.4 **Sanitary Sewer Line Materials.** Piping for sewer service connections shall be industry standard for sewer service for commercial facilities. Examples of acceptable pipe are: polyvinyl chloride (PVC) pipe, and acrylinitrile-butadiene-styrene (ABS) pipe. Pipe and joints shall be per manufacturer's requirements. Cleanouts or manholes are required at all direction changes. Minimum slope of pipe shall allow for self-cleaning velocities as prescribed in the *National Plumbing Code*.

6.12.5 **Gas Service.** The Contractor will provide a new gas connection to the building. Contract plans should identify connections. Gas lines shall have maxium working pressure 60 pounds per square inch gauge (PSIG). Underground piping shall be non-metallic.

6.12.6 **Pipe Bedding and Trench Backfill.** Pipe bedding shall be per pipe manufacturer's requirements. Trench backfill shall be compacted in lifts not to exceed 8 inches in loose thickness. Minimum relative compaction under paved areas shall be 95% per *ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort*. An alternate backfill is to use controlled density fill (CDF) manufactured at a concrete batch plant. Jetting will not be allowed under any circumstances.

6.13 **ANTI-TERRORISM/FORCE PROTECTION.** Contractor shall comply with current AT/FP requirements of the UFC 4-010-01. Bollards and/or access control gates shall be utilized where appropriate. Building is considered within a controlled perimeter and the facility is inhabited. The 21 standards within Chatper 3 of the UFC shall be followed. .

7. LANDSCAPE ARCHITECTURE.

7.1 **Landscaping.** Landscaping design and construction shall be in accordance with the Nellis & Creech AFBs IFS. A licensed Landscape Architect shall produce the landscape design, plans and specifications. Generally, project landscaping is limited to the 30 feet perimeter around Building 332. Provided a total of fifteen (15) trees, 24 inch box size. Selected trees shall be climate and location appropriate, drought resistant/ tolerant, and low maintenance. Provide a total of twenty (20) large size boulders, thirty (30) medium boulders, and forty 940) small boulders. Install red granite rock mulch or river rock on all non-hardscaped areas of project site. Three-quarter (3/4) inch" size granite rock shall be used on flat areas and 1 ½ inch size granite rock on slope areas. Drainage swales and retention basins shall have 3 to 12 inch river rock. No areas on project site shall have exposed native soil. See Nellis IFS for tree, decorative boulder, and rock much requirements.

7.2 **Irrigation System.** Provide an underground, permanent, complete, and fully automatic irrigation system. System shall be designed and circuited for hydro zones and water conservation. In landscape design drawings, provide an estimation of irrigation system's annual water usage in gallons (after initial plant establishment period). Reference Nellis IFS for landscape irrigation design requirements. All tree plantings shall receive irrigation from low flow bubbler and micro spray irrigation methods with water basins constructed around each plant. Irrigation system shall meet current industry standards for water conservation and system shall have automatic rain shut off and a climate controller. Controllers shall be vandal resistant and wall mounted on the interior of the facility, accessible by base maintenance personnel. The Backflow Prevention Unit (BPU) unit shall be insulated and provided with a freeze blanket cover and be located in a non-conspicuous location. All existing irrigation piping, conduit, controls, wiring, and boxes shall be demolished within the 30 ft. perimeter around building. All existing trees and bushes within the 30 ft. area shall be demolished. Removal of existing trees shall include root mass. Where existing roots extend underneath building foundation, the roots shall be cut off flush within the 5-foot building line and backfilled locally with flowable fill minimizing potential water migration in the future.

8. GEOTECHNICAL DESIGN REQUIREMENTS.

8.1 **GENERAL**. The Contractor's Geotechnical support for design documentation shall be written in units consistent with the RFP requirements for the overall project design. The requirements and information contained in paragraphs 8.1 through 8.5 herein represent minimum requirements to be used for preparing design and construction documents. The more stringent/conservative of these geotechnical design requirements, any Contractor Final Geotechnical Report (FGR) recommendations, the applicable UFGS Section requirements and notes, or applicable UFC documents, as approved by the Contracting Officer, shall govern when preparing the final construction drawings and specifications. See paragraph 8.6 "Preliminary Data" and related appendix/attachment for additional Geotechnical information to be used, except as otherwise stipulated in this Section 01 10 10, for preparing bids.

8.1.1 Design and construction shall be supported with appropriate geotechnical engineering. The Contractor is fully responsible for the design and construction of pavement repairs, utility earthwork, concrete pads, elevator and stairwell foundations, fill and backfill, and any other geotechnical related items. Appropriate design parameters and material requirements shall be used for producing drawings for construction and for editing applicable Unified Facility Guide Specifications (UFGS). All Geotechnical-related laboratory testing performed to support both design and construction shall be by an approved certified laboratory in accordance with USACE Sacramento District-provided UFGS *Section 01 45 00 (or similar number) Quality Control*. *ASTM D1557* (Modified Proctor) shall be specified for all design and construction compaction testing; *ASTM D698* (Standard Proctor) will not be allowed and shall be stricken from all UFGS Sections edited for this project. All fill materials shall be placed in maximum 8-inch loose lifts, or in maximum 5-inch loose lifts for compaction with hand-operated equipment. Fill within building footprint including stairwells and below concrete pads shall be compacted to at least 95/92 percent of ASTM D 1557 maximum laboratory density for cohesionless/cohesive materials, respectively, except where special sub-slab materials are specified.

Pavement section materials of the highest quality listed in the latest edition of State of Nevada DOT Standard Specifications for Road and Bridge Construction, and meeting or exceeding the requirements of the Nellis & Creech AFBs IFS, may be specified for pavement repairs. The more stringent/conservative of the specified RFP requirements or applicable UFGS Section requirements and "NOTES", shall govern when preparing the final construction drawings and specifications.

8.1.2 The Contractor shall include drawings for construction showing the actual locations of any Contractor-performed explorations as well as site-specific exploration locations and boring logs provided with this RFP. The drawings shall include appropriate elevator foundation preparation and over-excavation details. The Contractor shall also provide with their FGR and with their final specifications for construction, complete logs of any performed explorations (prepared in general accordance with ASTM D2488 and generated with approved software, e.g. gINT) and summarized laboratory data, depicting the subsurface conditions encountered at the project site.

8.1.3 The following paragraphs shall replace UFGS paragraph “3.18 TESTING” and related subparagraph “3.18.3 Check Tests on In-Place Densities” in the Contractor’s final edited specification *Section 31 00 00 Earthwork*.

3.18 TESTING

Perform testing by a Corps validated commercial testing laboratory meeting the requirements of Section 01 45 00 (or similar number) Quality Control and approved by the Contracting Officer. Determine field in-place density in accordance with the sand cone method ASTM D1556, except the nuclear gauge method ASTM D6938 may be used, as further qualified hereinafter, to determine in-place density of materials verified to be free of mica or other materials known to give inconsistent nuclear gauge results. When nuclear gauge testing per ASTM D6938 is used, check the calibration curves as described in ASTM D6938, and using ASTM D2937 for fine-grained soils and ASTM D1556 for granular soils when performing any necessary test site calibration as described in in Annex 2 paragraph A2.1.6. Check the calibration of the density gauge prior to the first use of each different type of material encountered and at intervals as directed by the Contracting Officer. Both ASTM D1556 and ASTM D6938 result in a wet unit weight of soil and when using either of these methods, use only method ASTM D2216 to determine the moisture content for calculating in-place dry density of the soil. For a rough estimate of in-place density to control field activities only, the Contractor may perform moisture content testing by method ASTM D4643 or ASTM D4959 in conjunction with density testing by method ASTM D6938. Density results determined by sand cone method ASTM D1556 shall govern, and shall be used at the frequency specified below to adjust the results determined for similar materials by nuclear gauge method ASTM D6938. If differing results are consistently determined, use of the nuclear gauge shall be discontinued and only method ASTM D1556 shall be used. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, remove the material, replace and recompact to meet specification requirements. Perform tests on recompacted areas to determine conformance with specification requirements. For all tests required by these specifications, appoint a registered professional civil engineer to certify inspections and test results. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.18.3 Check Tests on In-Place Densities

If nuclear gauge method ASTM D 6938 is used, check in-place densities by the sand cone method ASTM D 1556 at a minimum frequency of one sand cone test per lift for every ten or fraction thereof tests by the nuclear gauge method. Use these sand cone "check test" results to adjust the nuclear gauge results for representative materials as described in paragraph "TESTING" above.

8.1.4 The following paragraphs shall replace UFGS subparagraph “1.6.2.4 Field Density Tests” and paragraph “3.7 MAINTENANCE” in the Contractor’s final edited specification *Section 32 11 23 Aggregate Base Course*:

1.6.2.4 Field Density Tests

Determine the in-place density in accordance with ASTM D 1556, except that method ASTM D 6938 may be used, as further qualified hereinafter, to determine in-place density of materials verified to be free of mica or other materials known to give inconsistent results with the nuclear gauge. When nuclear gauge testing per ASTM D6938 is used, check the calibration curves as described in ASTM D6938, and using ASTM D1556 for granular soils when performing any necessary test site calibration as described in Annex 2 paragraph A2.1.6. Check the calibration of the density gauge prior to the first use of each different type of material encountered and at intervals as directed by the Contracting Officer, and submit curves and results within 24 hours of running the test. Both ASTM D 1556 and ASTM D 6938 result in a wet unit weight of soil and when using either of these methods, use only method ASTM D 2216 to determine the moisture content for calculating in-place dry density of the soil. For a rough estimate of in-place density to control field activities only, the Contractor may perform moisture content testing by method ASTM D 4643 or ASTM D 4959 in conjunction with density testing by method ASTM D 6938. If the nuclear gauge method ASTM D 6938 is used for compliance testing, those test values shall be checked against tests performed in accordance with the sand cone method ASTM D 1556 at a minimum frequency of one sand cone test per lift for every ten or fraction thereof tests by the nuclear gauge method. Density test results determined by ASTM D 1556 shall govern over those determined by ASTM D 6938. If differing results are consistently obtained, use of the nuclear gauge shall be discontinued and only sand cone method ASTM D 1556 shall be used

3.7 MAINTENANCE

The base course shall be maintained in a satisfactory condition including preservation of moisture and density until the full pavement section is completed and accepted. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep the area intact. Any base course that is not paved over within 7 days of completion or that has received measurable rainfall prior to paving, shall be retested to verify that it still complies with the requirements of this specification. Any area of base course that is damaged or out of compliance shall be reworked or replaced as necessary to comply with this specification. The Contractor may elect to help preserve the base course by applying a prime coat meeting local air quality standards, but such application will not relieve the Contractor from compliance with the maintenance, verification, and re-work requirements specified herein.

8.1.5 Native soils at Nellis AFB are generally found to have moderate to severe collapse and/or swell potential, and therefore existing soils shall be removed to a minimum depth of 18 inches below the bottom of new foundations/slabs, or deeper as determined by the Contractor's Geotechnical Engineer, and replaced with granular material meeting or exceeding UFGS Section 31 00 00 Earthwork "Select Granular Material" (SGM) requirements (percent fines<35, LL<35, PI<12) with a maximum dimension of 2 inches and having very low expansive characteristics. The Contractor shall assume that native soils alone will not qualify as SGM, but blending with imported granular material will be allowed provided that laboratory testing confirms the resulting material meets the specified requirements. Native or import materials having relatively low hydraulic conductivity and containing at least 35 percent fines are recommended for exposed (unpaved) backfill against exterior footings/foundation walls and extending outward at least 10 feet or to the limits of footing excavations, to minimize the potential of rainfall saturating collapsible existing subgrade soils post-construction. Soils exhibiting relatively high blow counts and with varying degrees of cementation and/or reaction to HCl, locally known as "caliche", were encountered during the original (1966) building investigations as evidenced by the RFP-provided boring logs (see 8.6 "Preliminary Data"), and are commonly encountered at Nellis AFB. These materials can cause excavation difficulty particularly in tight conditions, e.g. when trenching, and therefore the use of powerful excavation equipment with 'rock teeth' and 'hoe'rams' shall be anticipated. For utility excavations beyond the footprint of the building, use hydro excavation to the maximum extent possible; see the RFP-provided Nellis AFB Requirements and Guidance (Jul 2014). Native soils at Nellis AFB are generally found to be severely corrosive, as was confirmed by site-specific testing (see the Preliminary Data provided with this RFP), and therefore cathodic protection or similar approved protection of buried metal utilities and appurtenances is required; see UFC 3-570-02A and UFC 3-570-06 for applicable requirements.

8.2 **GEOTECHNICAL ENGINEERING FIRM:** The Geotechnical Engineering Firm shall be familiar with seismic, geologic and geotechnical conditions, hazards and issues in the North Las Vegas, Clark County, NV area where the project is located. The Geotechnical Engineering Firm shall have at least five (5) years of experience in the region. All geotechnical engineering work products (report, specifications, details, etc.) shall be reviewed and approved by a Senior Civil or Geotechnical Engineer. Approving engineers shall affix their stamp indicating professional registration in the State of Nevada. Lastly, the firm shall provide engineering support during project earthwork, foundation, and pavement construction

8.3 **GEOTECHNICAL WORK.** The Geotechnical Engineering Firm shall prepare and submit a Final Geotechnical Report (FGR) through the Contractor to the Government. The FGR and the Contractor's final design shall be based upon any site-specific explorations and field and laboratory testing performed by the Contractor, as well as any relevant RFP-provided explorations/soils data, and these RFP requirements. All field and laboratory work shall be conducted in accordance with paragraph "Contractor-Performed Geotechnical Investigations" below and all appropriate ASTM Standards. Final design parameters shall be based upon the most stringent/conservative criteria as required by paragraph 8.1 above. Manuals, publications, etc. for design parameters and calculations shall be specifically referenced in the FGR. The FGR and computations, including copies of instructions and input/output data sheets for all proprietary

models/programs, shall be submitted for Government approval. The FGR and/or the Contractor's final design drawings and specifications shall include but not be limited to:

8.3.1 Inspection of nearby building structures, pavements, and walls noting their foundation design and any distress from excessive expansion or settlement.

8.3.2 Description of site-specific soil conditions including at least the soil type(s)/classification(s), subsurface stratigraphy, densities-consistencies, shrink-swell-collapse potential and groundwater conditions as applicable.

8.3.3 Site-specific soil parameters: including design native and borrow material unit weight(s); shear strength(s); phi φ angle(s); and the site seismic soil profile.

8.3.4 Lateral design coefficients including K_a, K_p, and K_o, and applicable seismic coefficients.

8.3.5 Foundation design parameters including bearing capacity(s) minimum footing dimensions (minimum column footing horizontal dimension = 24 inches, minimum continuous wall footing width = 18 inches); consideration of separation from and/or attachment to existing adjacent structures; considerations for demolition or abandonment of any existing foundations; consideration of protection and/or monitoring of existing adjacent foundations; and estimates of total and differential settlement.

8.3.6 Concrete and slab-on-grade requirements including thickness(s); concrete strength(s) (minimum 4,500 psi 28-day strength and maximum 0.45 water content; subgrade preparation including over-excavation and replacement requirements; backfill and compaction requirements; new heavy-duty (minimum 8-inch thick) and light-duty (minimum 6-inch thick) slab-on-grade materials, including vapor barrier (2 inches slightly moist *ASTM C33* fine aggregate on minimum 15-mil *ASTM E1745* Class A poly sheeting) for any slabs to receive floor coverings or coatings/sealers or other moisture-sensitive finishes, and capillary water barrier (minimum 6 inches *ASTM C33* Size No. 57 or No. 67 coarse aggregate) placed on compacted subgrade; isolation of slab-on-grade from foundations, walls, and other abutting surfaces, i.e. "floating slabs"; and any special installation and inspection recommendations for thrust anchors (if applicable)".

8.3.7 Utility earthwork requirements, including trench slopes/safety shoring; minimum depth of cover; backfill material parameters; minimum compaction requirements; and all necessary recommendations for any proposed jack & bore utility installation.

8.3.8 Grading earthwork requirements, including drainage/subdrainage, minimum and maximum slopes, material requirements, and the minimum compaction requirements for building areas, pavement areas, and open areas.

8.3.9 Minimum recommendations (test methods and required test values) for laboratory testing of all Geotechnical-related materials during construction.

8.3.10 Design calculations and recommendations for temporary dewatering during construction, and for maximum excavation slopes and/or certified shoring system design, as applicable.

8.3.11 Any miscellaneous geotechnical design items required by the Contractor for the satisfactory completion of the project.

8.4 **ACCEPTANCE:** The Contractor's FGR and geotechnical basis of design shall meet the standards outlined herein and in the applicable UFC and ASTM publications. The Contractor shall be notified of any errors and/or incomplete work (note: lack of notification does not relieve the Contractor of contract requirements), and shall require the Geotechnical Engineering firm to provide any additional information, testing, and/or explorations as required to ensure a complete design meeting RFP requirements as approved by the Government. No additional compensation shall be forthcoming for the correction of errors or incomplete work.

8.5 **CONTRACTOR-PERFORMED GEOTECHNICAL INVESTIGATIONS:** The Contractor and their Geotechnical Engineer, consistent with all applicable RFP requirements and after careful evaluation of the available soils information as referenced in paragraph "Preliminary Data" hereinafter, shall be solely responsible for the scope and performance of any geotechnical investigations they deem necessary at the project site. Contractor-performed investigations shall comply with and be coordinated with all applicable RFP requirements, including Part 6 Civil and/or Part 9 Structural of this Section 01 10 10.

8.5.1 **Explorations:** Borings accompanied by standard penetration (SPT) testing shall be performed in general accordance with *ASTM D1586*, with the recommended testing to be continuous to at least a depth of 10 feet and thereafter to the bottom of the hole at intervals not to exceed 5 feet. Relatively undisturbed (i.e. intact) samples for testing of in-situ engineering properties (e.g. collapse/swell potential, direct shear, etc.) shall be collected in general accordance with ASTM D3550, or in accordance with ASTM D1587 where soil conditions allow. All soil materials shall be field logged in accordance with *ASTM D2488*, and final construction-document logs that are updated with applicable soil laboratory testing results shall be prepared in accordance with *ASTM D2487*. Borings accompanied by cone penetration (CPT) testing shall be performed in general accordance with *ASTM D3441*.

8.5.2 **Laboratory Testing and Field Testing:** All necessary laboratory and/or field testing shall be performed in general accordance with applicable ASTM publications, or in accordance with widely-accepted publications and practices when not addressed by an appropriate ASTM publication. Methods and supporting documentation for non-ASTM methods shall be provided as an appendix to the Contactor's FGR.

8.6 PRELIMINARY DATA:

8.6.1 **Available Soils Data:** Exploration logs are appended/attached to this RFP. These data were obtained from 1966 USACE field investigations, and represent the best-available subsurface information.

9. STRUCTURAL DESIGN

9.1 **GENERAL.** Building 332 is three stories high and built in 1968 of reinforced concrete. The floor framing system consists of cast-in-place floor slabs supported by cast-in-place concrete columns. Lateral loads in the transverse direction are resisted by exterior reinforced concrete shear walls at column lines A, T and G. Lateral loads in the longitudinal direction are resisted by interior concrete shear walls located near column lines 2 and 3. This structure is designated as Risk Category II per Table 2-2 of UFC 3-301-01.

9.2 **Seismic Evaluation**. A Tier 1 and Tier 2 seismic screening of the building was performed by USACE in accordance with Chapter 5, UFC 3-310-04 and ASCE 41-13 criteria. Based on a BSE-1E Earthquake Hazard Level and ASCE 41 Life Safety Checklists, no seismic deficiencies in the *main lateral load* resisting system of the building were found that need to be mitigated in this project.

9.3 **AT/FP Deficiencies**. Progressive collapse design and mitigation is no longer a requirement within the current UFC 4-010-01 on existing facilities. The structural work consists of design and construction of, but not necessarily limited to, the following items:

a. The Contractor shall modify Building 332 to meet the current requirements of UFC 4-023-03, UFC 4-401-01, IBC 2015, IEBC 2015 and UFC 3-301-01.

b. Connection details of structural members.

c. Special Conditions, such as expansion, construction and contraction joints, changes in floor levels, and catwalks if needed. Replace exterior stairs per architectural requirements.

d. Seismic attachment provisions for architectural, mechanical, and electrical elements.

e. Interior and exterior equipment pads as needed.

9.4 **GEOTECHNICAL RECOMMENDATIONS.** Refer to paragraph 8 Geotechnical Design Requirements above and Appendix A “Geotechnical Information” regarding required Contractor Geotechnical Report and minimum foundation recommendations.

9.5 **ENGINEER OF RECORD.** All structural calculations shall be checked, reviewed and initialed by a registered structural and/or civil engineer other than the original EoR. The EoR shall stamp final structural calculations and final structural drawings.

9.6 **APPLICABLE STANDARDS/CRITERIA.** See paragraph 4.14.

9.7 **GENERAL DESIGN CRITERIA.**

9.7.1 The design drawings shall contain structural notes which shall contain loading criteria, a list of the strengths of the engineering materials used, the design soil values, and any other data that would be pertinent to this building.

9.7.2 Diaphragms shall have continuous chord members on all edges and positive connection for transferring load to all members of the main lateral load system.

9.7.3 Gypsum wallboard shall not be used as a lateral resisting element of the lateral support system.

9.8 **DESIGN CRITERIA.**

9.8.1 **Serviceability.** The provisions of *IBC 2015*, *UFC 3-301-01* and *UFC 3-310-04* shall be followed.

9.8.2 **Construction Tolerances.** Allowable variations from level, or specific slopes, shall be as follows:

a. For overall length, or surface of 10 feet or less: plus or minus 1/8-inch.

b. Up to 20 feet: plus or minus 1/4-inch.

c. Up to 40 feet: plus or minus 3/8-inch.

9.8.3 **Durability - Time Reliability.**

c. Structural components shall be protected from condensed moisture that could impair their structural adequacy through deterioration.

d. Special attention shall be given to protection for corrosion or oxidation of metals, spalling of concrete, leaching of mortar, and deterioration of adhesives. Prevention of these hazards shall be especially important.

e. The materials used in structural elements, components, and assemblies shall be resistant to or protected from damage by exposure to normal climatic conditions.

f. Replace the exterior stairs. See architectural drawings and specifications for additional information.

9.5 **DESIGN LOADS.**

9.5.1 **General.** Design loads shall be included in the structural notes on the contract drawings. See *UFC 3-301-01* for minimum floor live loads, ground snow loads, wind speed and seismic data. For Important Factors for snow, wind and seismic refer to *UFC 3-301-01* Table 2-2.

9.5.2 **Dead Loads.** The structural system shall be designed and constructed to safely support all dead loads, permanent or temporary.

9.5.3 **Live Loads.**

a. Minimum Roof Live Load = 20 pounds per square foot (reducible).

b. Minimum Floor Live Load = See *UFC 3-301-01*.

9.5.4 **Snow loads.** See UFC 3-301-01.

9.5.5 **Wind Loads.** See UFC 3-301-01 for wind speed, Exposure C.

9.5.6 **Seismic Loads.** The EoR shall use the web-based United States Geological Survey (USGS) Earthquake Ground Motion Parameters Calculator, Version 5.1.0 to determine the seismic data**.**

9.5.7 **AT/FP Loads.** See UFC 4-010-01 for minimum requirements*.*

9.6 **CONCRETE DESIGN.**

9.6.1 **General.** All foundation walls and footings shall be constructed of reinforced cast-in-place concrete. All project concrete shall have a minimum compressive strength of 4500 pounds per square inch at 28 days and a maximum water/cement ratio of 0.45. Concrete mixtures shall be stronger/richer as determined necessary by the Structural Engineer and/or specialty material supplier as applicable.

9.6.2 **Testing.** Testing of concrete work shall be done at the contractor's expense by an approved independent testing laboratory.

9.6.3 **Forms.** Materials for forms shall be plywood, metal, metal-framed, reinforced fiberglass, or plywood-faced, to provide continuous, straight, smooth, exposed surfaces.

9.6.4 **Reinforcing Materials.** Reinforcing bars shall meet the minimum requirements of *ASTM A615* and/or *ASTM A706*, minimum Grade 60, deformed.

9.6.5 **Concrete Mixing Operation.** *ASTM C94*.

9.7 **FOUNDATION DESIGN:** The contractor's EoR shall design the new stair foundation in accordance with the provisions set forth in the Final Geotechnical Report.

9.7.1 **General.** Foundation notes shall be included in the structural drawings. Refer to the general notes provided for the minimum required standards.

9.7.2 **Minimum Footing Depth.** The minimum footing depth from bottom of footing outside finish grade for earth cover shall be 18 inches.

9.7.3 **Type of Foundation.** The foundation system shall be designed by the contractor's EoR.

9.7.4 **Design Loads.** The allowable soil bearing pressure and pertinent soil properties shall be given in the Final Geotechnical Report.

9.7.5 **Continuous Footings.** The foundation continuous footings shall be reinforced concrete with a minimum thickness of 12 inches.

9.7.6 **Slabs-On-Grade.** Floor slabs-on-grade for lightly-loaded areas shall be a minimum of 6 inches thick reinforced with a minimum size No. 4 bar with a minimum area of reinforcing of 0.14 percent of the slab cross sectional area per foot wide slab located 2 inches clear from the top surface of the slab. The preferred slab-on-grade reinforcing is No. 4 at 16 inches on center in each direction. Fiber mesh reinforcing in the slab concrete will not be allowed as a replacement for steel.

9.7.6.1 **Slab-On-Grade Sensitive Floor Finishes.** In floor areas with ceramic tile floor finish, the floor shall be structurally reinforced to minimize cracking of the floor finish.

9.7.7 **Slab-On-Grade Control Joints.** Slab-on-grade control joints shall be located at a spacing no greater than 15 feet on center each direction. The length of this area shall not exceed 1-1/4 times the width. The joints can be either contraction joints (weakened plane joints) or construction joints. Reentrant corner bars shall be required as part of the reinforcement requirements.

9.7.8 **Foundation Stem Walls.** The foundation stem walls shall be a minimum 8 inches thick reinforced concrete.

9.7.9 **Stoops, Ramps and Porches.** Small stoops, ramps and porches shall be soil supported, turned-down-edge typ and be slip-doweled to the building foundation.

9.7.10 **Equipment Pads.** Pads for interior and exterior mechanical and electrical equipment shall be shown on the contract drawings.

9.8 **STEEL.**

9.8.1 After erection, the field bolt heads and nuts, field welds, and any abrasions in the shop coat shall be cleaned and primed with paint of the same quality as that used for the shop coat.

9.8.2 Connection for structural steel will be welded, or bolted with high strength bolts. All connections shall be detailed on the final plans.

9.8.3 **Steel Material.**

a. Deformed Reinforcement (*ASTM A615*) shall have a minimum yield strength, Fy = 60,000 psi.

b. Deformed Reinforcement (*ASTM A706*) shall have a minimum yield strength, Fy = 60,000 psi.

c. Wide Flange Shapes shall have a minimum yield strength (*ASTM A572* Gr. 50 or *ASTM A992*), Fy = 50,000 psi.

d. Hollow Structural Section (HSS) shall have minimum yield strength (*ASTM A500* Gr. B), Fy = 46,000 psi.

e. Round Pipe (PS) shall have a minimum yield strength (*ASTM A53*, Type E or S), Fy = 35,000 psi.

f. Angles and Channels shall have a minimum yield strength (*ASTM A36),* Fy = 36,000 psi.

g. Plates and Construction Material shall have minimum yield strength, Fy = 36,000 psi.

h. Anchor Rods shall be determined by the EoR.

i. Roof Deck shall be galvanized, conform to *ASTM A653*, have a minimum thickness of 0.0359 inches and have a minimum depth of 1.5 inches.

j. Structural Cold Formed Steel framing shall be galvanized, conform to *ASTM A653* and have a minimum thickness of 0.047 inches. Galvanizing is not required for metal building system components such as purlins, girts, and clips.

9.8.4 **Steel Deck.**

9.8.4.1 Where steel deck is used show required section modulus and moment of inertia on drawings. Steel decks shall be minimum 20 gage with galvanized G90 coating. Button-punching of metal deck panels shall not be authorized. Mechanical fasteners, either powder actuated, pneumatically driven, or self-drilling screws may be used in lieu of welding, provided product data has been submitted and approved.

9.9 **MASONRY.**

9.9.1 All structural masonry walls shall be fully grouted. CMU (*ASTM C90*, Type I or II) shall have minimum compressive strength of 1500 psi.

9.9.2 Mortar shall conform to *ASTM C270*, Type S, with Portland cement

9.9.3 Masonry grout shall conform to *ASTM C476* and shall have a minimum compressive strength at 28 days (f'm) of 2,000 psi

9.9.4 All horizontal wall reinforcement shall be placed using bond beam type masonry units. Lintel units will not be used in lieu of bond beam units. Exterior masonry walls shall be in accordance with *TMS 402-13/ACI 530-13/ASCE 5-13.*

9.9.5 All new CMU wall construction and modification of existing CMU walls shall be performed in accordance with the contract documents provided by the EoR which shall be in accordance with the applicable codes.

10. ARCHITECTURAL DESIGN

10.1 SCOPE.

10.1.1 **General.** The design provided within this RFP has been developed with coordination for the Installation and their various user groups. While the intent of this RFP is to allow the Contractor the flexibility to construct this facility in an economical manner without sacrificing good engineering practices, the Contractor's flexibility must also comply with the requirements and intents of this RFP. The Government desires low and/or no maintenance finish materials to the greatest extent possible. Deviations from the Nellis & Creech AFBs IFS for exterior materials must be approved by the Contracting Officer.

10.1.2 **Floor Plans.** The Government's intent in providing floor plans is to establish maximum allowable building footprints, general arrangement and relationships of spaces of the user's organization and to identify areas of the facility that have specific requirements developed during the Design Charrette. Building dimensions are provided for general information only. Changes from the Government's conceptual design are allowed under the provisions described in Paragraph 1.4. Rooms 100, 133, 134, 200, 230, 300, and 326 are new construction and are not within existing Building 332 footprint. Floor levels in this building addition shall be the same elevation as existing floors. Interior and exterior appearance between existing building and building addition shall be seamless.

10.1.3 **Elevations.** The Government's intent in providing conceptual elevations with the new elevator/entry addition is to demonstrate general intent in the facility massing, identify key design elements and establish overall scale. The Contractor's design should likewise incorporate and demonstrate similar massing, major design elements and appropriate scale. Changes to the exterior walls will receive appropriate Government evaluation and review.

10.1.4 **Asbestos**. Asbestos containing materials shall not be used in the new construction.

10.1.5 **Demolition.** Project scope includes but is not limited to the demolition of all building systems, ceilings, walls, doors, door frames, finishes and including removal and disposal of all miscellaneous furnishings. Exterior work includes but is not limited to demolition of north and south walls including doors and windows, stairs, balcony walkways, light fixtures, exposed conduits, boxes, and fire extinguisher cabinets. See demolition drawings and attached specification 02 41 00.

10.1.6 **Phasing**. The Contractor shall develop a phasing plan in coordination with the Installation and the user group currently occupying the building.

10.2 CODES AND STANDARDS. See paragraph 4.14.

10.3 **EXTERNAL ACTIVITIES.** Vehicular access shall be provided for garbage pick-up, loading and unloading access to the utility rooms, and access for emergency response vehicles. Personnel access the facility by privately owned vehicles,

bicycle, or by walking. Dedicated circulation paths for each of these modes of transit shall be provided. Additional paved walkways shall be provided for ABA accessible path to the facility. See paragraphs 6 and 7 for more information on exterior site use requirements.

10.4 **INTERNAL ACTIVITIES.** The facility will be occupied by military and civilian personnel. The building provides Training Facilities, Private & Open Office Areas, Conference Rooms, Break Room, Storage, Copy Rooms, etc., and Support Areas. Required corridor or room exits are secured to the outside. Secondary points of egress are located around the facility.

10.5 **SPACE ALLOCATIONS.** See Section 01 10 11

10.6 **BARRIER FREE DESIGN** See paragraph 4.12.

10.7 **SUSTAINABLE DESIGN.** See paragraph 5.

10.8 **LIFE SAFETY.** See paragraph 0 Life Safety.

10.9 **FIRE SAFETY.** Fire Department access shall be provided around the perimeters of this facility. Contractor is responsible for providing all design and construction to meet *UFC 3-600-01*, *NFPA 101,* and applicable portions of the *International Building Code.*

10.9.1 **Fire Extinguishers.** General purpose portable fire extinguishers are not required when the *Facility* is provided with complete automatic sprinkler protection and a fire alarm system in accordance with UFC 3-600-01.

10.10 **SECURITY.** The threat severity level for this facility has been set at “minimum” by the Nellis AFB Security, as described in *UFC 4-010-01*. The project requires security design features. Annunciation of threats to occupants will be provided. See paragraph 15.1 Building Security System for further information.

10.11 **ACOUSTICAL DESIGN.** Building 332 is within a 75 DNL (Day-night average sound level) noise area. AFI32-7063 requires that the DNL for Professional Services (office use, SLUCM code 67) be reduced to 30 DNL (indoors) through the incorporation of noise attenuation into the design and construction of the structure.

10.12 **BUILDING ENVELOPE**

10.12.1 **Exterior Walls.** The existing exterior curtain wall is constructed of 3-5/8” studs (contractor to verify). The Contractor shall replace the existing exterior metal stud wall system with new metal stud wall system to meet the UFC 4-010-01 minimums for an inhabited building, within a controlled perimeter, with a low level of protection. The unobstructed distance of 33’ is desired per Standard 2 of the UFC and therefore the nearby parking will be removed IAW with the drawings.

10.12.1.1 <u>Stucco.</u> New stucco walls shall match existing Building 334 in texture and shall be finish flush. Exterior building color shall match Frazee paint #213 Travatan.

Stucco shall be applied in three coats to a thickness of not less than 1 inch as measured from the back plane of metal reinforcement, exclusive of ribs or dimples or from the face of solid backing or support, with or without metal reinforcement, to the finish stucco surface. Stucco application shall conform to the applicable requirements of ASTM 926. Repair and paint existing stucco soffit, trim, and fascia under existing roof overhang.

10.12.1.1.1 Portland cement shall conform to ASTM C 150, white Portland cement, Type I.

10.12.1.2.2. Building paper shall conform to FS UU-B-790, Type I, Grade B and D.

10.12.1.2.3. Lime shall conform to ASTM C 206, Type S.

10.12.1.2.4. Sand aggregate for job-mixed base coat and job-mixed finish coat stucco shall conform to ASTM C 897.

10.12.1.2.5. Accessories shall be roll formed galvanized steel, galvanized welded wire zinc alloy or rigid polyvinyl chloride (PVC) vinyl per ASTM D 1784 except that cornerite and strip lath shall be formed from steel sheets with manufacture's standard galvanized coating. Welded wire corner reinforcements shall be zinc coated, galvanized 17 gauge steel wire conforming to ASTM A 185 and ASTM C 841.

10.12.2. Masonry Screen Walls. New screen walls shall use integrally colored CMU. Color shall match Nellis & Creech AFBs IFS or that of surrounding buildings. Masonry units and mortar shall be manufactured using a clear, integral water repellant as an efflorescence barrier. All exterior finished masonry shall also be sealed against water using an impregnating sealer. See paragraph 9 Structural Design for additional information.

10.13 **Roof Systems.** Existing standing seam metal roof will remain. New roof systems for the new elevator/entry addition shall comply with the requirements of *UFC 3-101-01* and *UFC 3-110-03*. Low slope roofs shall have a minium slope of ½:12 to achieve positive drainage. Steep slope roofs are those with a slope of 3:12 or more. All roof must withstand 90 mph wind loads. Acceptable new roofing materials shall be in accordance with Nellis & Creech AFBs IFS (see appendix).

10.13.1 Warranty. All new roof systems shall provide a minimum no dollar limit 20 year warranty from the single source manufacturer. The warranty shall cover all roof system materials, installation, workmanship, flashing, insulation, and accessories necessary for a complete watertight roof system. All warranties shall start upon final acceptance of the work, or the date on which the Government takes possession of the building, whichever is earlier.

10.13.2 Gutters and Downspouts. The Contractor shall design gutters and downspouts following the method identified by the Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) *Architectural Sheet Metal Manual*, using rainfall data from *UFC 3-400-02*. At a minimum, provide direct connection to an underground storm water drainage system via downspout boots. In all

cases, roof water shall be diverted away from entrances and foundations. Scuppers may be used in conjunction with low slope roof systems.

10.13.3. Standing Seam Metal Roof (SSMR)

10.13.3.1 Roof Panels. Panels shall be steel and shall have a factory color finish. Roof deck assemblies shall be Class 90 as defined in UL 580. Length of sheet shall be sufficient to cover the entire length of any unbroken roof slope when such slope is 30 feet or less. When length of run exceeds 30 feet and panel splices are provided, each sheet in the run shall extend over three or more supports. Sheets longer than 30 feet may be furnished if approved by the Contracting Officer. Width of sheets shall provide not more than 24 inches of coverage in place. SSMRS with roofing panels greater than 12 inches in width shall have standing seams rolled during installation by an electrically driven seaming machine. Height of standing seams shall be not less than 1 inch. All sheets shall be cut in the shop to correspond to the roof slope and may have a horizontal joint at the eave line.

10.13.3.2 Steel Panels. Zinc-coated steel conforming to ASTM A446, G 90 coating designation; aluminum-zinc alloy coated steel conforming to ASTM A792, AZ 55 coating; or aluminum-coated steel conforming to ASTM A463, Type 2, coating designation T2 65. Panels shall be 0.03-inch thick minimum.

10.13.3.3 Factory Color Finish. Roof panels shall have a factory finish on the exposed side. The exterior finish shall consist of a polyvinylidene fluoride coating. Finish shall be coil-coated custom color. Color shall be in accordance with Nellis IFS and be approved by the Contracting Officer. The dry film thickness of the exterior coating shall be not less than 0.8 mil over a primer coat with a dry film thickness of 0.3 mils. The interior color finish shall consist of a mill finish. The exterior color finish shall meet the test requirements specified below. The manufacturer shall have conducted tests on previously manufactured sheets of the same type and finish as proposed for the project. The term "appearance of base metal" refers to the metal coating on the steel base metal. The dry film thickness of the interior prime coat shall be not less than 0.3 mils.

10.13.3.4 Accessories. Accessories shall be furnished with the Standing Seam Metal Roof System. Flashing, gutters, soffits, fascias, trim, metal closure strips, caps, and similar metal accessories shall be not less than the minimum thicknesses specified for roofing panels. Exposed metal accessories shall be finished to match the panels furnished. Molded closure strips shall be closed-cell or solid-cell synthetic rubber or neoprene, or polyvinyl chloride premolded to match configuration of the covering and shall not absorb or retain water. Thermal spacer blocks and other thermal barriers at concealed clip fasteners shall be as recommended by the manufacturer.

10.13.3.5 Concealed Anchor Clips. Concealed anchor clips shall be as recommended by the manufacturer for the roofing system furnished. Clip bases shall have factory punched or drilled holes for attachment. Clips used with panel width greater than 12 inches shall be made from multiple pieces with the allowance for the total thermal movement required to take place within the clip.

10.13.4 Ethylene Propylene-Diene Monomer (EPDM) Roofing Membrane System

10.13.4.1 General. Provide a EPDM roofing membrane system as part of complete construction of new lobby, elevator shaft and elevator equipment room addition to building. EPDM Roofing Membrane System shall be rated Class A for fire resistance in accordance with ASTM E108, FM 4470, or UL 790.

10.13.4.2 Membrane. Ethylene Propylene Diene Terpolymer (EPDM) membrane shall comply with ASTM D4637/D4637M, Type II, scrim or fabric reinforced, 0.090 inch nominal thickness for mechanically fastened application. All seems will be double-sided synthetic rubber tape, minimum 0.03 inch thick, minimum 3 inch wide. A 6 inch wide tape is required for seam seals along lines of mechanical attachment of membrane. Width and length of sheet must be as recommended by the manufacturer.

10.13.4.3 Membrane Flashings and Flashing Accessories. Membrane flashing, including self-adhering membrane flashing, perimeter flashing, flashing around roof penetrations, and prefabricated pipe seals, must be minimum 0.045 inch minimum cured EPDM, as recommended by the roof membrane manufacturer or minimum 0.055 inch thick uncured EPDM sheet in compliance with ASTM D4811/D4811M, Type I.

10.13.4.4 Membrane Fasteners and Plates. Coated, corrosion-resistant fasteners as recommended by the roof membrane manufacturer and meeting the requirements of FM 4470 and FM APP GUIDE for Class I roof deck construction and the wind uplift resistance specified. As supplied and warranted for the substrate type(s) by EPDM sheet manufacturer and recommended by EPDM sheet manufacturer's printed data.

10.14 **Building Envelope Insulation and Sealing.**

10.14.1 General. The building envelope shall be sealed against moisture and air by a layer of continuous insulation as required by *UFC 3-101-01* and *UFC 1-200-02*. Thermal resistance of insulation shall be not less than the R-values determined from the “U” factors indicated in *ASHRAE 90.1*. R-values shall be determined at 75 degrees F in accordance with *ASTM C518*. Provide only thermal insulating materials recommended by the manufacturer for the type of application required. Insulation shall be a standard product of a manufacturer, factory marked or identified with manufacturer's name or trademark and R-value. Identification shall be on individual pieces or individual packages.

10.14.2 Rigid Block or Board Insulation. Rigid block or board insulation shall be as follows: Cellular Glass per *ASTM C552*; Extruded Cellular Polystyrene per *ASTM C578*; Mineral Fiber Block and Board per *ASTM C612*; Rigid Polyurethane and Polyisocyanurate per *ASTM C1289*, Type I or II. Insulation shall have a maximum flame spread of 25 and a maximum smoke developed rating of 450 when tested in accordance with *ASTM E84*. Insulation shall have a flame spread not in excess of 25 and a smoke developed rating not in excess of 50 when tested in accordance with *ASTM E84* Insulation shall have a facing providing a permeability of 0.1 perm or less when tested in accordance with *ASTM E96*. Facing shall be white, either of reinforced foil with a vinyl finish or sheet vinyl except unreinforced foil with a natural finish may be used in concealed locations. Insulation shall have a facing providing a permeability of 0.02 perm or less when tested in accordance with *ASTM E96*. Facing shall be of 2 mil thick white vinyl backed with 6 inch by 6 inch glass scrim and 0.7 mil thick metal foil laminate. Reinforced foil with a natural finish may be used for facing in concealed locations. Facings and finishes shall be factory applied.

10.14.2.1 Mineral Fiber Blanket Insulation. Blanket insulation shall conform to ASTM C 665. Exposed Insulation shall have a facing providing a permeability of 0.1 perm or less when tested in accordance with *ASTM E96*. Facing shall be white, either of reinforced foil with a vinyl finish or sheet vinyl except unreinforced foil with a natural finish may be used in concealed locations. Insulation shall have a facing providing a permeability of 0.02 perm or less when tested in accordance with *ASTM E96*. Facing shall be of 2 mil thick white vinyl backed with 6 inch by 6 inch glass scrim and 0.7 mil thick metal foil laminate. Reinforced foil with a natural finish may be used for facing in concealed locations. Facings and finishes shall be factory applied. Sound Attenuating Fire Batts (SAFB) may be installed to attain the required Sound Transmission Class (STC) ratings at the facility envelope.

10.14.2.2 Sealant. Sealants shall be elastomeric type containing no oil or asphalt. Exposed sealant shall cure to a rubber like consistency. All sealants shall be the non-hardening type. Roof panel standing seam ribs shall have a continuous sealant that is factory installed.

10.14.2.3 Gaskets and Insulating Compounds. Gaskets and insulating compounds shall be nonabsorptive and suitable for insulating contact points of incompatible materials. Insulating compounds shall be non-running after drying.

10.14.2.4 Vapor Retarder. Vapor retarder material shall meet the requirements of the *International Building Code*, Article 1405 and conform to the requirements of *ASTM D4397*. A fully compatible tape shall be provided which has equal or better water vapor control characteristics than the vapor retarder material. A general purpose tape which has some resiliency and cushioning abilities shall also be provided, as required by B415-02 of the most recent edition of the *TCNA Handbook*. See *UFC 3-101-01* for additional Vapor Retarder requirements at specific situations.

10.14.2.5 Masonry Water Repellant. Concrete/masonry water repellant for exterior application shall conform to the requirements of *ASTM E514*. Repellant shall be a breathable silane or siloxane based, meeting all local VOC requirements.

Repellant must dry clear with no glaze, gloss, or sheen, nor will it yellow or discolor over time. Repellant should also be moisture vapor permeable.

10.15 **Envelope Openings.**

10.15.1 Exterior Doors. All unglazed exterior door assemblies, excluding storefront assemblies, shall have a polyurethane core foamed-in-place or laminated to each outer panel, with a minimum compressive strength of 20 pounds per square inch and a minimum density of 1.8 pounds per cubic foot. All hollow metal door and frame assemblies shall be constructed as required by *ANSI A250.8* to meet or exceed a heavy duty, Grade 11, Model 2, seamless hollow steel construction, and shall be constructed with flush end closures at the top and flush closures or recessed channels at the bottom. All steel door frames shall be of welded construction. All doors shall be a minimum of 3 feet wide by 7 feet high. Exterior acoustically rated door assemblies shall be per Section 10.16.6.4 Acoustically Rated Doors. All exterior doors shall open out to the exterior.

10.15.1.1 Door Frames. Exterior steel door frames shall be of welded construction, factory or field finished.

10.15.1.2 Exterior Storefront. Exterior storefront or curtain wall type assembly shall minimize hazardous glazing fragments and meet minimum requirements of UFC 4-010-01. Storefront entrance assemblies and windows shall be from the same manufacturer and coordinated for appearnace, stile and rail sizing, and glazing position.Exterior assemblies shall be of thermal break construction. Doorframe and trim moldings shall be extruded of 6063-T5 aluminum allow and tempter (ASTM B221 alloy G.S. IOPrT5). Glazing gasket for doors and frames shall be EPDM elastomeric extrusions. All screws and miscellaneous fasteners shall be aluminum, stainless steel or zinc plated steel. All doors shall be a minimum of 3 feet wide by 7 feet high.

10.15.1.3 Door Hardware**.** See Section 10.16.7.

10.15.2 Exterior Windows**.** Exterior windows shall be Fixed Type, Heavy Commercial Class, Grade 40 (F-HC40), extruded 6063-T3 aluminum alloy framed, with anodized finish complying with Nellis & Creech AFBs IFS. Frames shall be a manufacturer's standard configuration and shall meet performance requirements of AAMA/WDMA/CSA 101/I .S.2/A440.. All windows facing south (exposed to sun) shall have aluminum sunshade devices to shade window glazing. Reference Nellis IFS for requirements. Exterior windows and storefronts shall comply with minimums of the Anti-Terrorism/Force Protection requirements of UFC 4-010-01 "Department of Defense Minimum Antiterrorism Standards for Buildings".

10.15.2.1 Insulated Glass Unit. All glazing shall use insulated glass units with a minimum of two panes of glass (depending on STC, or other applicable requirements) separated by a dehydrated airspace, hermetically sealed. Dimensional tolerances shall be as specified in *IGMA TR-1200*. The units shall conform to *ASTM E773* and *ASTM E774*, Class A. Spacer shall be roll-formed, with bent or tightly welded or keyed and sealed joints to completely seal the spacer periphery and eliminate moisture and hydrocarbon vapor transmission into airspace

through the corners. Primary seal shall be compressed polyisobutylene and the secondary seal shall be a specially formulated silicone. Glazing shall consist of a clear outboard pane of light-reducing ¼-inch thick glass, and a clear inboard pane consisting of two 1/8-inch panes laminated with a minimum 0.030 inch clear PVB interlayer. All insulated glazing units shall have a minimum Total Visible Light Transmittance of 40%, minimum shading coefficient of 0.29, maximum solar heat gain coefficient of 0.28, and a maximum solar transmittance of 36%.

10.15.3 Miscellaneous Metal. All exterior metal, including handrails, guardrails, louvers, and miscellaneous shapes or trim shall be anodized or factory painted aluminum, or factory painted steel. Anodized aluminum finishes shall be medium or dark bronze AA-M12 C22 A42, minimum 0.7 mils, Class I, per *Aluminum Association Designation System*. All miscellaneous prefabricated components shall be specified to have factory applied finishes, colors to coordinate with the facility. All other miscellaneous metal items, exposed to view, that do not have a factory finish, shall be painted with urethane gloss enamel (automotive type finish). Louvers shall have bird or insect screens, as appropriate, and should withstand 60 MPH winds without moisture penetration.

10.15.3.1 Sheet Metalwork. Flashing shall be installed in conformance with the *SMACNA Architectural Sheet Metal Manual*.

10.15.3.2 Seismic Joint Covers. Where required, seismic joint covers shall be constructed of extruded aluminum with anodized satin finish for walls and ceilings and with standard mill finish for floor covers and exterior covers.

10.15.3.3 Exterior Stairs. Exterior stairways at east and west ends of building shall have concrete structure and have non-slip edging at all stair tread nosing. Guardrails and handrails shall be factory finish metal with concealed fasteners and shall have vertical pickets.

10.15.4 Elevator. Provide Hydraulic elevator with minimum size and arrangement to accommodate an ambulance stretcher 24-inch by 84-inch with not less than 5-inch radius corners, in the open, horizontal position. Elevator system must comply with ASME A17.1/ in its entirety. Telescopic plunger, and inverted cylinder/plunger elevator designs are not permitted in DOD facilities. For finishes see Note 7 on drawingds I-610 to I-612 (Interior Finish/Color Schedules).

- Type: In-Ground Plunger
- Rated load: 3500 lb
- Rated speed 150 fpm
- Door Type: Single-speed center opening
- Car Door Opening Width: 3”-6”

10.15.5 Shading Fins. Existing concrete shading fins (at 2 levels) that are currently part of exterior walkways, shall remain and be refurbished. Fins shall be appropriately repaired, resurfaced, and painted. Finish shall be uniform and smooth and top of fins shall have appropriate waterproof finish. Fins shall be modified as required to meet current structural requirements.

10.15.6 Air Barrier Requirements. Contractor must comply with the air barrier design, construction, and testing requirements of *UFC 3-101-01*, UFGS 07 27 10.00 10 BUILDING AIR BARRIER SYSTEM and UFGS 07 05 23 PRESSURE TESTING AN AIR BARRIER SYSTEM FOR AIR TIGHTNESS. Provide a continuous air barrier around the building, in accordance with *ASHRAE 90.1-2013*. Clearly identify all air barrier components of each envelope assembly on construction documents and detail the joints, interconnections and penetrations of the air barrier components. Clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness on the drawings. Provide plans, sections, and design details as indicated in UFC 3-101-01 and UFGS 07 27 10.00 10 BUILDING AIR BARRIER SYSTEM.

10.15.6.1 Air Barrier Performance: The air barrier material(s) shall have an air permeance not to exceed 0.004 cfm / sf at 0.3" wg when tested in accordance with *ASTM E2178*. Building air leakage must not exceed 0.4 cfm/sf at 0.3" water.

10.15.6.2 Air Barrier Joints: Join and seal the air barrier material of each assembly in a flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of these assemblies and components.

10.15.6.3 Air Barrier Support: Support the air barrier so as to withstand the maximum positive and negative air pressure to be placed on the building without displacement, or damage, and transfer the load to the structure.

10.15.6.4 Air Barrier Penetrations: Seal all penetrations and openings. Any unavoidable penetrations of the air barrier by electrical boxes, plumbing fixture boxes, and other assemblies are must be made airtight by sealing the assembly and the interface between the assembly and the air barrier or by extending the air barrier over the assembly. Do not install lighting fixtures with ventilation holes through the air barrier.

10.15.6.5 Air Barrier Service Life: The air barrier must be durable and last the anticipated service life of the assembly.

10.15.6.6 Air Intakes: Damper and control to close all ventilation or make-up air intakes and exhausts, etc. when leakage can occur during inactive periods.

10.15.6.7 Compartmentalize Spaces Under Negative Pressure: Compartmentalize spaces under negative pressure such as boiler rooms and mechanical rooms and provide make-up air for combustion.

10.15.6.8 Inspection & Testing: Submit the qualifications and experience of the testing entity for approval. Demonstrate performance of the continuous air barrier for the opaque building envelope by *ASTM E779* or *ASTM E1827-96*:

10.15.6.8.1 Accomplish tests as identified in UFGS 07 05 23 PRESSURE TESTING AN AIR BARRIER SYSTEM FOR AIR TIGHTNESS. Do not test the building until verifying that the continuous air barrier is in place and installed without failures in accordance with installation. Notify the Contracting officer at least 10 working days prior to performing the pressure tests. Provide written test results confirming the results of all tests.

10.15.6.8.2 *Required Corrective Measures if Test Fail*. If the pressure test fails, use diagnostic test methods described in 07 05 23 PRESSURE TESTING AN AIR BARRIER SYSTEM FOR AIR TIGHTNESS to discover the leak locations. Provide additional permanent sealing measure to reduce or eliminate leak sources. Retest and repeat until the building envelope passes the pressure test. Document diagnostic tests, corrective measure, and retesting procedures in the test reports.

10.16 **INTERIORS.**

10.16.2 **Interior Partitions.** Interior partitions shall be constructed of steel framing with gypsum wall board facings. Where required to be sound attenuation or fire rated, wall construction shall extend from floor slab to structure above.

10.16.2.1 Non-Load Bearing Metal Framing & Furring. Provide framing smaller than 6 inches complying with *ASTM C645*, 20 gauge (0.0329-inch thickness) minimum. Provide steel framing with galvanized G-60 coating per *ASTM A653*, G-60 or a TI-25 Aluminum coating per *ASTM A463.*

10.16.2.2 Load Bearing Metal Framing & Furring. Provide framing 6 inches and larger that complies with *ASTM C955*, 16 gauge (0.0598-inch thickness) and heavier. Provide framing with a galvanized G-60 coating per *ASTM A653*; SS Grade 50; or carbon steel per *ASTM A1011*, Grade 50, and painted. Also, coordinate requirements with the structural engineer.

10.16.2.3 Gypsum Wallboard. All gypsum wallboard to be painted shall be finished to Level 4 or 5, as appropriate.

10.16.2.3.1 *Fire and Mold Resistant.* Unless otherwise specified, use 5/8” gypsum wall board with a fire and water resistant core with tapered edges, conforming to the requirements of *ASTM C1396*, Type X. Face paper shall be moisture/mold/mildew resistant with a score of 10, when tested in accordance of *ASTM D3273*.

10.16.2.3.2 *Fire, Abuse and Mold Resistant.* Use 5/8” gypsum wallboard with a fire, water, surface indentation, and impact resistant core and tapered edges, conforming to the requirements of *ASTM C1396*. Surface abrasion shall be no greater than 0.009 inches in depth when tested at 50 cycles in accordance with *ASTM D4977*. Indentations shall be no greater than 0.132 inches in depth when tested at an impact load of 72 inch-pounds in accordance with *ASTM D5420*. Impact/penetration resistance shall be no less than 210 foot-pounds when tested in accordance with *ASTM E695*. Face paper shall be moisture/mold/mildew resistant with a score of 10, when tested in accordance of *ASTM D3273,* and be abrasion resistant.

10.16.2.3.3 *Interior Glass Mat.* Use 5/8” glass mat gypsum wallboard on the interior side of exterior walls as required by *UFC 3-101-01*. Wallboard shall also be moisture/mold/mildew resistant, with a rating of 10 when tested in accordance with *ASTM D3273.*

10.16.2.3.4 *Acoustically Enhanced.* Use 5/8" Type X acoustically enhanced gypsum wallboard, conforming to *ASTM E90*. Face paper and gypsum core should also be moisture/mold/mildew resistant, with a rating of 10 when tested in accordance with *ASTM D3273.*

10.16.2.3.5 *Joint Treatments.* Joint treatment compounds & tapes shall conform to the requirements of *ASTM C475*.

10.16.2.3.6 Screws. Screws shall conform to the requirements of *ASTM C1002* and *ASTM C954* where applicable.

10.16.2.3.7 *Accessories.* Corner beads, edge trim, casing, and control/expansion joints shall conform to the requirements of *ASTM C1047*, and shall be corrosion protective-coated steel designed for its intended use. Flanges shall be free of dirt, grease, and other materials that may adversely affect the bond of joint treatment.

10.16.3 Cement Board/Cementitious Backer Unit. Use 5/8" cement board for tile base in high-moisture areas such as bathrooms and kitchens, as required by *UFC 3-101-01*. Use ½" wallboard in UL listed fire rated wall assemblies. Cementitious water-durable wall board with fiberglass reinforcing faces shall comply with *ANSI A118.9* and *ASTM C1325*. Cement board shall also be moisture/mold/mildew resistant, with a rating of 10 when tested in accordance with *ASTM D3273*. Density shall be 72 pounds per cubic foot. Water absorptions shall not be greater than 8% when tested for 24 hours in accordance with *ASTM C473*.

10.16.3.1 *Joint Reinforcement.* Use a 2 inch wide alkali resistant fiberglass mesh tape.

10.16.3.2 *Bonding Materials.* Use latex-Portland cement mortar complying with *ANSI A118.1* or *ASTM A118.4*. Type 1 organic adhesive complying with *ANSI A136.1* may be used.

10.16.3.3 *Fasteners.* Use corrosion resistant as recommended by the cement board manufacturer, complying with *ASTM C1002*.

10.16.4 **Ceilings.**

10.16.4.1 Gypsum Board Ceiling System. Use a designated gypsum ceiling board, complying with *ASTM C1396* suspended on a drywall suspension system. In humid areas, provide water-resistant gypsum board ceilings with a smooth plaster finish.

10.16.4.2 Acoustical Ceiling System. Provide 24-inch by 24-inch by ¾-inch thick acoustical units (having an LR-1 Light Reflectance Coefficient of 0.75 (minimum) and a Noise Reduction Coefficient of 0.75 (minimum). Units to be Class A, non-combustible, with a maximum flame spread rating of 25 and a maximum smoke development rating of 450 per *ASTM E84*. Installation of acoustical ceilings shall comply with *ASTM C636*.

10.16.4.3 Exposed Structural. Where spaces are moisture-prone, exposed structural members will be hot dipped zinc galvanized. Where spaces are fire rated, exposed structural members will have a fireproofing material applied to them.

10.16.5 **Floors.**

10.16.5.1 Porcelain Paver Tile. All tile shall conform to the strength requirements of *ANSI A137.1*. Provide impact resistant tile with a minimum floor breaking strength for floor tile of 250 lbs in accordance with *ASTM C648*. Provide floor tile with a minimum coefficient of friction of 0.06 wet and dry in accordance with *ASTM C1028*, and a minimum dynamic coefficient of friction (DCOF) test value of 0.42 when wet in accordance with *ANSI A137.1*. Floor (field) tile shall be matte finish, and a minimum 12" X 12". Conventional trim pieces are required; butt joints are not acceptable. Tile in horizontal dimension shall not be less than ¾ of the manufactured dimension. Tile shall be installed over existing concrete floors with a thin-bed installation method F113-14 and F113A-14. Provide marble thresholds under doors where a porcelain tile floor meets a different floor finish.

10.16.5.1.1 *Grout.* Select the latex-Portland cement mortar in darkest complimentary neutral grout color to coordinate with the tile color for floors. Grout must be of a high strength, non-shrink, sanded type with latex admixture. Grout shall be prepared and installed in accordance with TCNA handbook. Ensure that all grout is properly sealed to prevent excess soiling. Wipe away excess grout as soon as possible so as to avoid staining of the tiles.

10.16.5.2 Carpet. Carpet shall meet the requirements of The Carpet and Rug Institute for acoustics, recycled content, construction, flammability, static control and Indoor Air Quality (IAQ). Carpet shall be Modular tile, 24 inch square with 0.15 percent growth/shrink rate in accordance with ISO 2551; level loop; solution dyed; type 6 or 6.6 continuous filament nylon; minimum 23 oz./yd^2 (881.66 gm/m^2) face weight; 6000 minimum pile density (heavy wear level); 1/12 gauge; minimum 10 stitches per inch; antimicrobial (guaranteed for life of carpet), soil and stain resistant, Class I per *ASTM E648*, with static controlled to below human threshold (guaranteed for life of carpet). Patterns shall be non-linear and non-geometric and contain a minimum of three distinct colors (not two shades or tones of the same color).

10.16.5.2.1 *Carpet Cushion.* Provide a factory attached cushion of chemically frothed polyurethane with minimum weight of 18 oz/sq. yard; minimum density of 11 lb/cubic foot; minimum thickness of 0.100 inch; maximum compression resistance of 5 psi; compression set of 15 percent in accordance with *ASTM D3676*. The carpet cushion shall pass the accelerated aging test in accordance with *ASTM D3676* for the cushion. The cushion shall be certified to meet the requirements of the Carpet and Rug Institute's (CRI) Green Label Plus test protocol. The pad shall be installed with the direct glue-down method. The double glue-down method is not acceptable.

10.16.5.3 Vinyl. Sheet vinyl shall be homogeneous. Colors and patterns shall run all the way through the product. Provide minimum .080 inch or 2 mm thick in minimum 6' rolls. Seams shall be heat-welded. Welding rod color shall coordinate with vinyl floor color.

10.16.5.4 Linoleum. Conform to *ASTM F2034* and consist of a homogeneous layer of a mixture of linoleum cement (binder in linoleum consisting of a mixture of linseed oil, pine rosin, fossil, or other resins or rosins, or an equivalent oxidized

oleoresinous binder), cork and/or wood flour, mineral fillers, and pigments bonded to a jute backing. Provide a minimum 6 feet wide and overall thickness not less than 0.125 inch for linoleum. Provide welding rods as recommended by the manufacturer for heat welding of joints.

10.16.5.5 Rubber. Stairs shall have an integrated tread with riser. Tread thickness shall be minimum 1/8" with a raised profile, and warning detection strip for the visually impaired. Provide stringers on the wall, banister sides and landing trim. Rubber tile at landings shall conform to *ASTM F 1344 Rubber Floor Tile.* Provide 24"x24" tile with minimum tile thickness of 0.125 inch.

10.16.5.6 Electrostatic Dissipative Tile. Provide Class 2, through pattern tile conforming to *ASTM F 1066.* Tile shall conform to ASTM 150 with electrical resistance of 10e6 to 10e9. Flooring shall be connected to building ground. Tile shall be minimum 12"x12" with tile thickness of 0.0125 inch.

10.16.5.7 Sealed Concrete. Floor hardener shall be a colorless aquenous solution containing zinc silicofluoride, magnesium, or sodium silicofluoride. These silicofluorides can be used individually or in combination. Proprietary hardeners may be used in approved in writing by the Contracting Officer.

10.16.6 **Interior Doors.**

10.16.6.1 Wood Doors. Interior wood doors shall be solid core wood, custom grade, balance matched, quarter sawn or plain sliced veneer. Wood doors shall be factory or field finished with tinted polyurethane stain with low gloss sheen.

10.16.6.2 Interior Hollow Metal Doors. Interior doors shall be factory finished, Level 4 Maximum Duty, full flush hollow metal units complying with *ANSI A250.8*. Fire rated doors shall comply with *NFPA 80*. Door finish color shall be coordinated with interior color palette.

10.16.6.3 Hollow Metal Frames. Comply with *ANSI A250.8*, Level 4, with welded corners. Fire rated frames shall comply with *NFPA 80* Finish color of frames shall be coordinated with interior color palette.

10.16.6.4 Acoustically Rated Doors. Interior doors shall be hollow metal or solid core wood. Solid core wood doors shall be custom grade, with AA grade red oak, quarter sawn or plain sliced veneer except as noted. Doors shall be factory finished with tinted polyurethane with a low gloss sheen. All doors shall be a minimum of 7 feet high. Hollow metal frames shall be painted to be compatible with interior color scheme. Rated doors in hallways, storage areas and other areas requiring ratings are to have full neoprene gasketing and hardware as required by code. Provide acoustically rated doors and frames as required to meet the noise reduction ratings indicated elsewhere in this document. STC ratings for doors shall include the entire door and frame assembly.

10.16.6.5 Vision Lites. Vision lites must meet code requirements for fire ratings where applicable.

10.16.6.6 Electrical Room Doors. Doors to electrical closets shall swing outward 180 degrees to provide easy access.

10.16.7 **Door Hardware.**

10.16.7.1 General. Provide hardware manufactured to template and complying with *BHMA A156* Series requirements. Hardware for fire-rated door assemblies shall be listed and comply with requirements of *NFPA 80*. Exit hardware shall comply with *NFPA 101* criteria. Hardware at security doors shall be coordinated with [Installation] access control and alarm system requirements.

10.16.7.2 Hinges. Comply with *BHMA A156.1*. Hinges shall be ball-bearing, stainless steel with BHMA 630 finish. Hinges at exterior and security doors shall be constructed with non-removable pins. Hinges for exterior electrical room doors shall allow door to swing open 180 degrees.

10.16.7.3 Mortise Locks and Latches. Comply with *BHMA A156.13*, Series 1000, Operational Grade 1, Security Grade 2. Levers or knobs are acceptable.

10.16.7.4 Bored Locks and Latches. Comply with *BHMA A156.2*, Series 4000, Grade 1. Levers or knobs are acceptable.

10.16.7.5 Mechanical Push Button Locks. Comply with *BHMA A156.36*. Provide heavy-duty mechanical push button ("cipher") locks on all exterior entry doors, communication rooms, and SIPR room. Levers or knobs are acceptable.

10.16.7.6 Exit Devices. Comply with *BHMA A 156.3*, Grade 1. Coordinate with security requirements for alarms and re-entry criteria. See paragraph 16.

10.16.7.7 Cores and Cylinders. Comply with *BHMA A156.5.* Provide cylinders for new locks that are fully compatible with products of the Best Lock Corporation having interchangeable cores compatible with the Nellis AFB keying system per the Nellis AFB security criteria.

10.16.7.8 Closers. Door closers shall be in accordance with *BHMA A156.4*.

10.16.7.9 Finishes and Materials. Architectural builder's hardware shall be per *BHMA A156.18*.

10.16.7.10 Kick-Plates. Comply with *BHMA A156.6.* Doors in utility rooms and support areas will have stainless steel kick plates (10 inches tall x 2 inches less the width of the door) each side.

10.16.8 **Insulation and Sealants**

10.16.8.1 Blanket Insulation. Interior partition blanket insulation shall comply with *ASTM C665*, Type 1. Insulation shall be UL-labeled mineral wool.

10.16.8.1.1 *Sound Attenuation Fire Blankets (SAFB).* SAFB shall be mildew-proof and moisture-resistant. Nominal density shall be 2.5 pcf with an R-value of 3.7 per inch of thickness. Blankets shall be rated non-combustible when tested

according to *ASTM E136*, and have 0 flame spread and 0 smoke developed ratings in accordance with *ASTM E84*.

10.16.8.2 Caulking and Sealants. Caulking and sealants shall be selected according to materials they are being applied to for compatibility. These sealants and caulks shall be either a two component, rubber base, chemical-curing compound based on polysulfide and/or polyurethane; or a single-component, rubber base, chemical-curing compound such as polysulfides, polyurethanes, and silicones. Caulking shall occur around all door frames, all window frames, and at all material changes. The minimum joint width shall be 1/4 inch, and joint widths shall have a back stop material provided in the joint, in excess of 1/4 inch and the depth of all joints shall be equal to the width. Color of caulking and sealants shall match adjacent materials.

10.16.8.2.1 *Acoustical Sealants.* Latex rubber or polymer-based acoustical sealant conforming to *ASTM C834* and *ASTM C919* and having a maximum flame spread of 25 and a maximum smoke developed rating of 50 when tested in accordance with *ASTM E84*. Acoustical sealant must have consistency of 250 to 310 when tested in accordance with *ASTM D217*, and must remain flexible and adhesive after 500 hours of accelerated weathering as specified in *ASTM C734*. Sealant shall be paintable and must be non-staining.

10.16.9 **Cabinets and Casework.**

10.16.9.1 General. As a minimum, cabinets/casework shall be custom grade in accordance with AWI, plastic laminate or stained wood panels over plywood, per AWI custom grade standards. Interior cabinet finishes shall be plastic laminate or melamine. Plastic laminate concealment panels for pipes under countertops shall be removable for maintenance accessed in toilet rooms.

10.16.9.2 Cabinet Finish. The finished material of exposed fronts and ends of cabinets, door and drawer fronts shall be plastic laminate in the bathrooms and kitchen. Vinyl edge banding on cabinetry is not permitted.

10.16.9.3 Cabinet Guides. Top-mounted center drawer guides will not be permitted. Cabinet drawer guides shall be a minimum of 20 gage steel with double rollers, heavy-duty commercial type with soft close feature.

10.16.9.4 Cabinet Hardware. Cabinet hardware shall conform to *BHMA A156.9*. Cabinet hinges shall be concealed offset and spring-loaded, "European" style, commercial grade with soft close feature.

10.16.10 **Countertops.**

10.16.10.1 Ceramic Tile. Ceramic tile countertops shall not be permitted.

10.16.10.2 Solid Surface Material Countertops. Countertops shall be a homogeneous, non-porous, solid surfacing polymeric material; not coated, laminated or of a composite construction; meeting *ANSI Z124.3* and *ANSI Z124.6* requirements. Exposed outside corners shall be filleted, chamfered, or radius profiles. Edge

treatment for countertops shall be eased, rounded edges. Variegated, through color shall be used on countertops and vanities for ease of maintenance.

10.16.11 **Wall Finishes.**

10.16.11.1 Paint. Interior surfaces, except factory prefinished material shall be painted a minimum of one prime coat and two coat finish. All spaces shall have satin or eggshell or semi-gloss finish on walls, semi-gloss finish on trim and eggshell or semi-gloss finish on ceilings per the finish schedule on drawings. Exposed interior masonry walls in equipment rooms shall be painted.

10.16.11.1.1 *Application of Paint.* Paint shall be applied by brush or roller. Spray painting method shall be used only under approved conditions. Spraying shall be done only when there is no wind, or under very low wind velocity. When wind velocity increases, all spraying operation shall be stopped as directed by the Contracting Officer. Before start of spraying, all surfaces that do not require painting shall be completely masked and protected. Adequate drop cloths shall be provided over floors, adjacent sidewalks, and over all cars parked nearby that may be stained or damaged from the spray work. The Contractor shall be liable for all damage resulting from the spray painting operation. All such damages shall be satisfactorily repaired and resolved at no additional cost to the Government. Adequate ventilation shall be provided during paint application. Respirators shall be worn by all persons engaged in spray painting. Adjacent areas shall be protected by approved precautionary measures.

10.16.11.2 Exposed Concrete. Exposed painted concrete or CMU for interior spaces is permitted in utilitarian spaces, such as mechanical rooms.

10.16.11.3 Wall Base. Allowable materials shall be porcelain paver tile, ceramic tile and rubber. Rubber base shall conform to ASTM F1861 and be continuous roll rather than 4-foot lengths in order to give a smooth finished appearance with a minimum of joints between corners.

10.16.11.4 Corner Guards. Provide 2-inch wide, surface mounted corner guards at all exterior wall corners of gypsum board walls. Assembly shall consist of a snaptop of edge guards shall be a minimum of 6 feet above finished floor, unless approved by the Contracting Officer. Bottom of guard shall be to floor in areas of no base and to top of base at all other areas.

10.16.11.5 Chair Rails. Provide 4 to 5-inch high solid wood chair rails with integrated vinyl bumper inserts and solid wood matching end trim. Minimum 0.75 inch thickness. Provide concealed fasteners, and install chair rails securely to wall in accordance with manufacturers instruction.

10.16.11.6 Solid Surface Units. Backsplashes shall be of solid surface material, homogeneous, solid polymer (not coated, laminated or of a composite construction) meeting *ANSI Z124.3* and *ANSI Z124.6* requirements. Back splashes shall be 1/4” thick minimum and shall be 4” high.

10.16.11.7 Ceramic Tile. All tile shall conform to the strength requirements of *ANSI A137.1*. Wall tile and trim shall be cushion edged. Conventional trim pieces are required,

butt joints are not acceptable. Ceramic wall tile shall be a minimum 6” x 6”, preferred size is 8” x 8”. Tile in vertical dimension shall be a whole tile. Wainscot height shall be adjusted to the nearest whole tile. Substrate for wall tile shall be mortar setting bed or cement backer board (gypsum board is not acceptable) as required by *UFC 3-101-01*. Wall tile may be installed over water proof cement backer board/underlayment over stud framing or over a setting bed, methods W241-14 or W244-14, per *TCNA Handbook for Ceramic Tile Installation*.

10.16.11.7.1 *Grout.* Select the latex-Portland cement mortar in a lighter color grout for vertical surfaces to coordinate with the tile color for walls. Grout must be of a high strength, non-shrink, sanded type with latex admixture. Grout shall be prepared and installed in accordance with TCNA handbook. Ensure that all grout is properly sealed to prevent excess soiling. Wipe away excess grout as soon as possible so as to avoid staining of the tiles

10.16.12 **Specialties**

10.16.12.1 Interior Window Sills. Interior window sills shall be standard ½ inch thick resinous solid surface material. Exposed outside corners shall be filleted, chamfered, or radius profiles. Surfaces shall not be affected by Class I reagents. Color shall be standard off-white or gray neutral for window sills.

10.16.12.2 Window Coverings. Manually operated solar shades shall be provided for all exterior windows. Shade cloth shall have 0.5 mm (.020 inch) diameter symmetric perforations for a 5% openness factor to provide the ability to see through closed blind and still deliver up to a 42% reduction in solar heat gain. Provide dual roller shades with perforated cloth and black-out cloth in rooms with darkening requirements such as Conference and Training Rooms. Shade roller tubes shall be heavy-duty, extruded aluminum, and include steel end caps. Valance shall conceal shade roller and hardware. Color for shades shall be a neutral gray, beige or off-white. Shades shall be inside mounted. All windows shall be field measured to ensure correct number and proper fit.

10.16.12.3 Toilet Accessories. Toilet accessories (toilet paper holder, shower curtain and rod, integral soap dish, etc.) shall be provided in all restrooms, as appropriate. Provide heavy-duty steel waste receptacles, toilet paper dispensers, paper towel dispensers, soap dispensers, and mirrors per acceptable industry practice. All toilet accessories shall be brushed stainless steel or chrome finished steel. Soap dispensers in Men and Women Restroom are to be counter-mounted, top fill accessible.

10.16.12.4 Toilet Partitions and Urinal Screens. Panels shall be not less than 1 inch thick with face sheets not less than 0.0396 inches thick. Partitions & screens shall be floor supported. Finish surface shall be water resistant, graffiti resistant and non-absorbent. Reinforce panels that are to receive toilet paper holders, etc. to support mounting of items required. Toilet partition hardware shall include manufacture’s standard hinges, latch and pull, and coat hook, and be resistant to alkalies, urine and other common toilet room acids. Secure wall hung urinal screens with 42 inch long continuous flanges. Use corrosion-resistant steel fittings and fasteners.

10.16.12.5 Hand Sanitizer Dispenser. Hand sanitizer dispensers shall be wall mounted, battery operated, top fill, automatic, touchless type that dispenses sanitizer when a hand is placed in proximity of a sensor. Dispenser shall have a view window to monitor quantity of hand sanitizer product remaining. Dispenser shall have a small tray below the dispensing portal to catch wasted sanitizer. Batteries shall have a small tray below the dispensing portal to catch wasted sanitizer. Batteries shall be of a standard size such as AA cells. Dispenser shall be similar to products manufactured by Purell, Sloan or approved equal. Contractor shall supply and install sanitizer dispensers complete with mounting brackets, batteries as recommended by manufacturer, sanitizer solution, and one bottle of refill sanitizer solution for each dispenser installed.

10.16.12.6 Adjustable Shelves. Adjustable shelves shall be designed for heavy use (weight capacity of minimum 130 pounds per bracket under uniformly distributed weight) and shall have wall-mounted uprights at 16 inches apart, anchored directly into studs in the wall. Brackets shall be supplied at each upright at each shelf in numbers as required for the number of shelves and uprights shown on the drawings.

10.16.12.7 Projection Screens. Projections screens shall be standard duty, concealed, recessed ceiling type with an electric operator and a glass bead reflecting surface. Projector stand shall be ceiling mount.

10.17 **SIGNAGE.** Provide signage throughout the facility (interior, exterior, and site) in accordance with *UFC 3-120-01* and Nellis IFS. Provide three building number "332" signs. Exterior Room name/number signs shall be weatherproof and UV resistant type.

10.17.2 **Building Identification.** Building identification shall be in accordance with Nellis & Creech AFBs IFS.

10.17.3 **Interior Signage.** Identify all rooms which will require room identification signage. Color for signage shall be coordinated with the interior color scheme for the facility.

10.18 **FIRESTOPPING.**

10.18.2 Material shall have a flame spread of 25 or less, a smoke developed rating of 50 or less, and a fuel contribution of 50 or less when tested in accordance with *ASTM E84* or *UL 723*.

10.18.3 The materials shall be nontoxic to human beings at all stages of applications and during fire conditions.

10.18.4 Firestopping materials for through-penetrations of fire resistance rated construction shall provide fire resistance rating in accordance to *ASTM E814* or *UL 1479*.

10.18.5 Firestopping materials for construction joints in fire resistance rated construction shall provide a fire resistance rating in accordance to *ASTM E119* or *UL 263*.

Construction joints include those joints used to accommodate expansion, contraction, wind or seismic movement of the building.

10.18.6 Firestopping materials shall be non-combustible when tested in accordance with *ASTM E136.*

10.19 **FURNITURE, FIXTURES & EQUIPMENT.** See specification section 01 33 16, Comprehensive Interior Design (CID).

10.19.2 *Demountable Partitions:* Demountable walls are a furniture system, and traditional construction specs/requirements are not applicable. Demountable walls are specified within the CID.

10.19.2.1 Demountable Wall Systems shall consist of a framing system and pre-fabricated individual panels, which are floor supported and span floor-to-ceiling. Panels shall be between 2.5 to 4 inches thick. Sound-rated partition assemblies shall have a minimum Sound Transmission Coefficient (STC) of 45. Panels shall accommodate 3'-0" x 7'-0" x 1-3/4 inch thick solid core wood veneer doors (note: barn sliding doors are not desired). Door frames shall be extruded aluminum, and include the resilient sound seal; and shall be mortised and reinforced for hardware. Doors and door hardware type and finish shall match other doors in project. Framing systems for panels shall consist of extruded anodized aluminum or roll-formed steel components, and include ceiling runners, floor track, bracing, and suitable treated fasteners to prevent corrosion; minimum ½ inch gypsum shall cover framing system. System shall allow for installation on hard surface or carpeted flooring without the use of destructive mechanical fasteners. Panel to panel fasteners shall align panel faces while providing a continuous light and sound seal. All aluminum frame and trim pieces finish shall be factory powder coat paint finish. Provide electrical conduit in panels for electrical connectivity to the receptacles. Panels shall include factory installed light switches, receptacles and double-gang outlet boxes for data/voice jacks. Panel finish shall be painted (note: wall-covering is not preferred).

10.20 **KITCHEN & OTHER EQUIPMENT.** See paragraph 12.3 Plumbing Design.

11. LIFE SAFETY

11.1 **GENERAL.** This facility shall be designed to meet or exceed the minimum construction and life safety standards as required by the referenced national and internal federal codes and criteria. The Contractor shall provide a design analysis as required by *UFC 3-600-01 Design: Fire Protection Engineering for Facilities*, with a complete life safety analysis citing the appropriate code references. The preliminary life safety analysis below does not relieve the Contractor from this obligation.

11.2 **REFERENCES.**

11.2.1 *UFC 1-200-01, Unified Facilities Criteria, Design: General Building Requirements, 20 June 2016*

11.2.2 *UFC 3-600-01, Unified Facilities Criteria, Design: Fire Protection Engineering for Facilities, 8 August 2016, Change 1, 28 November 2016.*

11.2.3 *International Building Code (IBC), 2015.*

11.2.4 *International Existing Building Code, 2015*

11.2.5 *NFPA 101, Life Safety Code, 2018.*

11.2.6 *NFPA 80, Standard for Fire Doors and Fire Windows, 2016.*

11.2.7 *NFPA 76, Protection of Telecommunications Facilities,2016 NFPA 13, Installation of Sprinkler Systems, 2010.*

11.3 **BUILDING CONSTRUCTION AND HAZARDS.**

11.3.1 Construction:

Renovated DoD facilities must comply with UFC 1-200-01
UFC 1-200-01, 1-2

Existing Facilities must comply with NFPA 101, Life Safety Code for existing occupancies
UFC 3-600-01, 1-3.1

Existing Structures must comply with IBC Chapter 34 and Section 3410 of UFC 3-600-01
UFC 1-200-01, 2-34

11.3.2 Basic Criteria:

Use IEBC 2015 for types of building construction, allowable floor area, building height limits, occupancy separation and building separation distance, except as modified by UFC 1-200-01 and UFC 3-600-01.

UFC 1-200-01, 1-4.1

UFC 3-600-01, 1-12.13

Use NFPA 101 for means of egress, safety to life, interior finish ratings and fire resistance ratings of non-bearing partitions. For conflicts between IBC and NFPA 101, conform to NFPA 101.

UFC 3-600-01, 3-3.1.1

11.3.3 Occupancy: Per IEBC 302.5 use Chapter 3 IBC

Business B	IBC, 304.1
Business	NFPA 101, 6.1.11.1

Note: IEBC para. 302.5: When determining the appropriate application of the referenced sections of this code, the occupancy and use of a building shall be determined in accordance with Chapter 3 of the *International Building Code*.

11.3.4 Hazard: Light Hazard: Offices UFC 3-600-01, Appendix B-1.3

Light (Low) Hazard for Class A fires
NFPA 10, 5.4.1.1

Class A: ordinary combustible materials
NFPA 10, 5.2.1

11.3.5 Type of Construction:

Type II (000)	NFPA 76, 6.1.4.1(3)
Type IIB	UFC 3-600-01, Appendix E
Type IIB	IBC, Tables 503, 601 & 602

Note: NFPA 76 requires Type II (000) construction, as identified in NFPA 220. The IBC equivalent is given in UFC 3-600-01, Appendix E as Type IIB.

11.3.6 Automatic Sprinklers:

Fully sprinklered required	UFC 3-600-01, 6-1.1

11.3.7 Separation of Occupancies:

For fully sprinklered buildings:

1 hour separation required	IBC, Table 508.4

11.4 **BUILDING AREA.**

11.4.4 For Type IIB construction: B IBC, 506.1

$A_a = [A_t + (A_t \times I_f) + (A_t \times I_s)]$
A_a = Allowable building area per story
A_t = Tabular building area per story per Table 503
I_f = Area increase factor due to frontage per 506.2
I_s = Area increase factor due to sprinkler protection per 506.3
A_t = 24,686 SFIBC, Table 503
$I_f = 0$
$I_s = 3$ IBC, 506.3
A_a = [24,686 SF + (24,686 SF x 0) + (24,686 x 3)]
A_a = [24,686 SF + 0 + 74,058 SF] = 90,744 SF allowable

24,686 gross square feet Business/B

11.5 **BUILDING HEIGHT.**

11.5.4 For Type IIB Construction: B

3 Stories, 55 feet IBC, Table 503

Height and Story Modification (increase)
IBC, 504.2
Increase by 20 feet and 1 story by Automatic Sprinkler throughout building

Allowed: 4 stories, 75 feet

For Type IIB Construction: F-1

2 Stories, 55 feet IBC, Table 503

Height & Story Modification (increase)
IBC, 504.2
Increase by 20 feet and 1 story by Automatic Sprinkler throughout building

Allowed: 3 stories, 75 feet

Actual: 3 stories, 22’ 11” at roof ridge

11.6 **EXIT REQUIREMENTS.**

11.6.4 Occupant Load Factor

Business Occupancy:

100 sf/person NFPA 101, Table 7.3.1.2
Max. Occupancy: 24,686 sf/(100 sf/person) = 247 persons

Expected probable occupancy: 85 FTE

Using Maximum Occupancy for Design, Worst Case = 247 persons

11.6.5 Egress Capacity

Level Components:
0.2 inches/person NFPA 101, Table 7.3.3.1

Business Occupancy:
247 persons X (0.2 inches/person) = 49 inches of exit width required

Actual: 3 exit x 36 inches = 108 inches of exit width provided

Stair Components: 0.3 inches/person

Business occupancy: 247 person x (0.3)/person) = 74.1 inches of stair exit width required

Actual: 2 new stairs, each 44 inches (2 x 44 =88 inches of stair exit width provided)

1 existing stair approximately 40 inches (1x40)= 40 inches

Total stair width provided = 128 inches

11.6.6 Minimum Number of Exits:

Business Occupancy: 2 NFPA 101, 38.2.4.1

Actual: 3 exit provided

11.6.7 Minimum Width of Doors.

32 inches NFPA 101, 7.2.1.2.4

Pair of doors: at least one must be 32 inches in width.

Actual: all exit doors must be minimum 32 inches.

11.6.8 Capacity of Doors.

.2 inches/person NFPA 101, Table 7.3.3.1

Business

(3 doors) x (36 inches) / (0.2 inches/person) = 540 persons

Actual: 540 persons provided for, 85 persons required

11.6.9 Common Path of Travel:

Business: 100 feet (with sprinklers)

NFPA 101, 38.2.5.3.1

11.6.10 Distance to Exits:

Business: 300 feet (with sprinklers)
6.1.4, 38.2.6.3

Actual: ~ 2 feet measured from Room 105 Conference Room.

11.6.11 Dead End Corridors:

Business: 50' (with sprinklers)

NFPA 101, 38.2.5.2.1

Actual: 0 feet

11.6.12 Minimum Width of Corridor:

44 inches NFPA 101, 38.2.3.2

Actual, minimum: 44 inches

11.6.13 Protection of Openings:

For walls & partitions with 1 hour fire-resistant-rated construction, provide ¾ hour fire-resistance-rated doors

NFPA 101, Table 8.3.4.2

Maximum area of glazing in fire rated door: 1296 square inches, no dimension exceeding 54 inches.

NFPA 80, Table 4.4.5, 4.4.5.1.

11.6.14 Interior Wall & Ceiling Finishes: UFC 3-600-01, 2-6.1

Business:
Exits & exit access corridors: Class A or Class B

NFPA 101, 38.3.3.2.1

All other areas: Class A, Class B or Class C

NFPA 101, 38.3.3.2.2

11.6.15 Interior Floor Finishes UFC 3-600-01, 2-6.2

Business:
Exit enclosures: Class I or Class II
NFPA 101, 38.3.3.3.2

All other areas: comply with as applicable
NFPA 101, 38.3.3.3.1

11.7 **FIRE EXTINGUISHING SYSTEM.**

11.7.1 Entire building must have sprinkler protection
UFC 3-600-01, 6-9.4

Actual: Fire sprinklers are provided

11.8 PORTABLE FIRE EXTINGUISHERS. General purpose portable fire extinguishers are not required when the *Facility* is provided with complete automatic sprinkler protection and a fire alarm system in accordance with UFC 3-600-01.

11.8.1 Light (Low) Hazard Occupancy, Class A Hazards (If required)

Minimum rated extinguisher: 2-A
NFPA 10, Table 6.2.1.1

Maximum floor area per unit of A: 3000 square feet
NFPA 10, Table 6.2.1.1

Total floor area: 2,454.03 square feet

8,186 SF per floor/(2 x 3,000 SF) = 1.36 ~ 2 extinguishers required

Maximum floor area per extinguisher: 11,250 square feet
NFPA 10, Table 6.2.1.1

Actual: 2,454.03 square feet total

Maximum travel distance to extinguisher: 75 feet
NFPA 10, Table 6.2.1.1

11.9 **FIRE ALARM SYSTEM:** See paragraph 15 Fire Alarm and Mass Notification Systems.

12. MECHANICAL DESIGN

12.1 GENERAL REQUIREMENTS.

12.1.1 **Criteria Sources and References.** See paragraph 4.14.

12.1.2 **Design Submittal.** Complete mechanical systems design calculations shall be submitted in accordance with requirements indicated in RFP Section 01 33 16 DESIGN AFTER AWARD and the succeeding paragraphs.

12.1.2.1 Design Analysis**:** Provide a design analysis/narrative for the criteria usage, outdoor and indoor design conditions, HVAC system selection, U-factors, ventilation rates, control strategies, personnel loads, equipment loads, domestic water, domestic waste, natural gas, systems; domestic plumbing fixtures, fire protection, force protection requirements, etc.

12.1.2.2 Calculations: Provide calculations leading to sizing of distribution systems, selection of equipment, power requirements, controls, fans, ductwork, air handling units, cooling coils, filters, unit heaters, diffusers, grilles, registers, condensing units, louvers, domestic water heater, domestic water pump, booster pump, plumbing fixture count, domestic waste pipe size, domestic water pipe size, building loads, fire sprinklers, fire pumps, etc.

12.1.2.3 Drawings: Drawings shall be complete and detailed showing the location of all major equipment components, routing of major ductwork, layout of HVAC zones, routing of all fluid lines, location of all fire risers, system type (wet pipe, dry pipe, etc.), water density for the various buildings/rooms, etc. Listed are examples of required drawings: legend and abbreviations, ductwork drawings, domestic water drawings, control drawings including schematics, ladder diagrams, I/O schedule, and sequence of operation for all HVAC equipment, equipment schedule drawings, elevations/cross-sections, enlargements of mechanical rooms, details, fire pump details, fire protection drawings, etc.

12.1.2.4 Equipment Catalogue Sheets: Provide catalogue cuts of all major components.

12.1.2.5 Seismic Protection: All equipment per UFGS 13 48 00.00 10 SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT shall be seismically braced.

12.1.2.6 Sustainable Design: Refer to requirements in paragraph 1 and paragraph 4.

12.1.2.7 Equipment: Equipment selection and layout shall comply with the manufacturer's recommended clearances and code clearances and shall be annotated on the drawings.

12.1.2.8 Ancillary Equipment: All ancillary equipment such as unions, strainers, shut-off valves, check valves, gauges, air vents, relief valves, sight glasses, vibration dampers, escutcheons, expansion joints, dirt legs, balancing valves, regulators, switches, sleeves, caulking, sealants, etc., shall be provided for the proper installation, operation, servicing, and removal of all equipment without the need to shut down an entire system. Details shall show all ancillary equipment.

12.1.2.9 Concrete Pads: All floor mounted and ground mounted equipment indoors and outdoors shall be mounted on 6-inch thick concrete housekeeping pads, unless otherwise indicated. Drawings shall indicate the size and locations of all housekeeping pads.

12.1.2.10 Expansion Joints/Anchors/Guides: Expansion of all piping will be computed by the method outlined in the *ASHRAE Handbook, Equipment*. Expansion of plastic piping will be determined from the *Plastic Pipe Institute Technical Report PPI-TR21, Thermal Expansion and Contraction of Plastic Pipe*. If expansion joints are required, drawings and calculations shall be provided.

12.1.2.11 Insulation: Hot water, hot water re-circulation, ductwork, air handlers, pumps, and other applicable equipment shall be insulated. Insulation applied to piping located outside of the facility or underground within a concrete trench shall be cellular glass conforming to *ASTM C552*, Type II, and Type III and the insulation shall be installed with the manufacturer's recommended factory applied jacket. The use of flexible cellular insulation conforming to *ASTM C534* or *ASTM D1056* is prohibited. Insulation materials and installation shall be in accordance with UFGS 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Insulation requirements will be indicated in the contract documents.

12.1.2.12 Cathodic Protection: See paragraph 14.3.14.

12.1.2.13 Elevation: Design and selection of all equipment shall take into account the effects of elevation, provide calculations.

12.1.2.14 Testing, Adjusting, and Balancing (TAB): Submit all Testing, Adjusting, and Balancing (TAB) reports. TAB will be required on HVAC, plumbing, and fire protection systems. The "Design Agent's Representative" will be a member of the design team, i.e. from the AE. The "Design Agent's Representative" will actively participate in the process, including review of all submittals contained herein and participation in TAB verification. The use of UFGS 23 05 93.00 10 TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS is mandatory.

12.1.2.15 Commissioning: Submit all commissioning reports. Commissioning of all HVAC, plumbing, and fire protection systems is mandatory and shall be in accordance with *ETL 90-10* (Commissioning of Heating, Ventilating, and Conditioning (HVAC) Systems Guide Specification) and UFGS 01 90 00.15 TOTAL BUILDING COMMISSIONING. The "Design Agent's Representative" will be included as a member of the commissioning team for the pre-commissioning checklists and will participate in the functional performance tests. The following representatives will participate in the commissioning process**:**

a. Contractor's Chief Quality Control Representative

b. Contractor's Mechanical Representative

c. Contractor's Electrical Representative

d. Contractor's Testing, Adjusting, and Balancing Representative Contractor's Controls Representative

e. Design Agent's Representative

f. Contracting Officer's Representative

g. Using Agency's Representative

h. EMCS Agency's Representative

i. VEA Electrical Representative

12.1.2.16 Training: A training plan shall be submitted. Training shall be provided for the operation, trouble-shooting guide lines, part ordering, controls, sequence of operation, preventative maintenance, preventive maintenance schedules, safety guidelines, etc., for the base maintenance personnel, building occupants/battalion chief, energy manager, etc. Training shall be done on-site, and all equipment Operation and Maintenance manuals shall be provided. Eight personnel shall be trained on the following for the hours specified below:

a.	HVAC Systems	2 hours
b.	HVAC Controls	2 hours
c.	Plumbing Systems	1 hour
d.	Fire Protection System	4 hours

12.1.2.17 Access Panels: Access panels/doors shall be provided as required for all HVAC, Plumbing, and Fire Protection equipment and appurtenances such as fire dampers, valves, water hammer arrestors, etc.

12.2 **HVAC DESIGN:**

12.2.1 **Facility Operational Hours:** 24 hours per day, 7 days per week

12.2.2 **Fuel Sources**:

12.2.2.1 Heating: Liquid Petroleum Gas

12.2.2.2 Cooling: Electric.

12.2.3 **Site Criteria:** The attached engineering weather data shall be used for this location. The following site data is provided for initial reference:

Project Location:	Nellis AFB, NV
Latitude:	36.24^{o} N
Longitude:	115.04^{o} W
Elevation:	1870 ft.
Cooling Degree Days (Base 50):	7478

Cooling Degree Days (Base 65): 3774

Heating Degree Days (Base 65): 2328

ASHRAE Standard 90.1 Climate Zone: 3B

12.2.4 **Outside Design Temperature Requirements:** Design Temperatures shall be based on engineering weather data from Appendix [H]. The following design temperatures are provided for initial reference:
Outside Summer (1.0%): 109° F DB, 67° F WB

Outside Winter (99.0%): 32° F DB

12.2.5 **Indoor Design Temperatures:** Indoor design temperatures shall be as indicated in SECTION 01 10 11. If not listed refer to *UFC 4-730-10*.

12.2.6 **Summer Indoor Design for Mechanical and Electrical Rooms:** See Section 01 10 11 for specific room requirements.

12.2.7 **Energy Conservation:** The facility shall be designed in accordance with the Energy Policy Act of 2005 as required in *UFC 3-400-01.* The facility shall achieve an energy consumption level that is at least 30 percent below the level required under *ASHRAE Standard 90.1* in a life cycle cost effective manner. If 30% energy consumption cannot be achieved based on life cycle cost effective manner, then the Contractor shall step the percentage down until a life cycle cost effective manner is achieved. See also paragraph 5 Sustainable Design for more information.

12.2.7.1 An Energy Compliance Analysis (Building Simulation Program) utilizing TRANE Trace version 700, Carrier Hourly Analysis Program (HAP), or another full simulation software to provide system energy consumptions is required.

12.2.7.2 The Building Simulation Program shall document all input and output

12.2.7.3 Provide a summary sheet detailing the building components (insulation values, fenestration, envelope construction, etc), lighting parameters, HVAC parameters, equipment efficiencies, energy consumption savings, etc., for the Baseline Design versus the Proposed Design as defined per the latest *ASHRAE Standard 90.1*

12.2.7.4 Provide a short report giving the estimated utility consumption for building HVAC, lighting, water etc. The utility consumption estimates will not need to include user process loads as those are not predictable, but may include estimated plug loads for administration areas.

12.2.8 **Life Cycle Cost Analysis.** Provide a Life Cycle Cost Analysis (LCCA) report using the Building Life Cycle Costing (BLCC) program, available from the National Institute of Standards and Technology, a link to BLCC (under Energy Economics) at the Department of Energy's building energy tools web site.

12.2.8.1 The BLCC program reports will document all input and output.

12.2.8.2 The actual site utility costs at the installation shall be input into the BLCC program for the LCC equipment selection.

12.2.8.3 Evaluation of cooling and heating systems shall include a comparison of three or more system types based on the region, building design features and available energy sources. The final design shall include a short (a few pages describing results, methods, reason for selection and why, etc.) summary report and Building Life Cycle Cost (BLCC) program output and input.

12.2.8.4 Provide reasonably detailed cost estimates for each systems studied as part of the design analysis.

12.2.8.5 The life cycle cost analysis shall run for a minimum of 25 years and shall include any final salvage values and annual costs for operation and maintenance based upon ASHRAE estimation methods for those costs. Salvage costs shall be documented in cost estimates and should generally be restricted to larger equipment items such as boilers, chillers, cooling towers, pumps, and large air handlers, for example.

12.2.8.6 The maintenance report shall within a few pages provide detail for major equipment such as, air handlers, condensers, chillers, pumps, the proprietary maintenance and replacement intervals and material requirements.

12.2.9 **Cooling Systems:**

12.2.9.1 Cooling System Selection Criteria: Cooling systems for the facility shall be selected based on energy conservation and life cycle cost requirements. The purpose of life cycle cost analysis is to select a system with the best long-term value. Life cycle cost analysis can also evaluate chilled water operating temperatures if applicable. Cooling system shall serve air-handling unit coils, fan-coil unit coils, or other component that will provide uniform, consistent and comfortable space conditions with zoned temperature control. The system(s) selected shall provide individual temperature control capability for multiple small zones. Ventilation system may be part of the main heating or cooling system or separate dedicated ventilation/outside air system. For all systems, equipment shall be located for ease of maintenance. Locating terminal units above the ceiling in the corridor is an acceptable location provided that hinged access panels with adequate access to maintain the equipment is provided.

12.2.9.2 Cooling System Types: Cooling systems to be evaluated may include, but are not limited to, variable air volume air handling units, air-cooled chiller, packaged heat pump, fan coil units, DX Split systems, Dedicated Outdoor Air System, or a combination of these.

12.2.9.3 Cooling System Sizing Requirements: The capacity of the HVAC system shall be selected based upon the maximum and minimum cooling needs of the facility. System capacity shall be selected such that it is able to turn down and meet the minimum cooling and dehumidification needs of the facility during cooler seasons when only minimal cooling is required. Cooling equipment may be oversized by up to 10% to account for recovery from night set forward if applicable. Where

winter outside design temperatures are below freezing, propylene glycol solutions adequate for the winter outside design temperature shall be provided. Pumps, cooling coils and chillers are to be selected based on the appropriate glycol solution concentration.

12.2.9.4 Personnel Loads: The number of assigned personnel per room shall be based on SECTION 01 10 11. If a room does not give the assigned number of personnel, then the Occupant Density per square footage as outlined in *ASHRAE Standard 62.1-2010* shall be utilized.

12.2.9.5 Equipment Loads: Equipment loads shall be based on SECTION 01 10 11 and typical office equipment not listed i.e., printers, coffee pots, fax machines (miscellaneous loads).

12.2.9.5.1 Equipment Loads Operations Floor Server Room: In addition to the equipment loads in the previous paragraph, the equipment loads for the simulator server rooms shall be based on the equipment rack layouts provided by the electrical section and user.

12.2.9.5.2 Controls: Controls shall have factory furnished battery back-up or non-volatile memory to facilitate automatic re-start upon restoration of stand by or normal power.

12.2.10 **Heathing Systems:**

12.2.10.1 Heating System Selection Criteria: Unless specifically noted otherwise within this RFP, heating systems for the facility shall be selected based on energy conservation and life cycle cost requirements in paragraph above. Terminal units shall provide uniform, consistent and comfortable space conditions with zoned temperature control. Minimum ventilation rates shall be maintained according to *AHSRAE Standard 62.1* during heating. For all systems, equipment shall be located for ease of maintenance access with minimal disruptions. Locating terminal units above the ceiling in the corridor is an acceptable location provided that adequate access to maintain the equipment is provided.

12.2.10.2 Heating System Types: Heating systems to be considered for occupied spaces include, but are not limited to hydronic heating systems. Heating system shall serve air-handling unit coils (if applicable), terminal reheat coils, fan-coil unit coils, unit heaters, and other terminal heating elements.

12.2.11 **Outdoor Air Requirements for Ventilation:** The building shall be provided with outside air in accordance with *ASHRAE Standard 62.1*, based on occupancy and/or type of space. Air distribution systems shall be designed to insure that minimum outside air requirements are provided to the building year round. Infiltration shall not be considered as supplementing the outside air requirements.

12.2.12 **Exterior Ground Mounted Equipment:** Ground mounted equipment may include air cooled chillers. All other mechanical equipment shall be located indoors.

12.2.12.1 Ductwork and Piping: All ductwork and piping shall run under the roof and/or inside when possible. Ductwork and piping exposed to outdoors shall be insulated per Unified Facilities Guide Specification Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS.

12.2.12.1.1 Provide a chilled water system connection in the mechanical yard for a temporary portable chiller.

12.2.12.2 Equipment Access: Access to floor mounted mechanical equipment shall be by permanently constructed standard walkways to all equipment. To the greatest extent possible, floor mounted equipment shall be located in a central area to provide convenient access for maintenance personnel.

12.2.12.3 Visual Screening: All rooftop equipment and ductwork shall be screened from view. See architectural section for requirements.

12.2.13 **Antiterrorism and Force Protection:** All outside air intake louvers shall be located a minimum of 10 feet above finish grade.

12.2.14 **Pressurization:**

12.2.14.1 Building Pressurization: The building as a whole with the exception for rooms as noted in Section 01 10 11 shall be maintained at a slight positive pressure with respect to the outside air. Monitor and control building pressure such that pressure gradients are maintained at a maximum pressure of 0.1 inches of water column.

12.2.14.2 Space Pressurization: Requirements for differential pressurization shall be analyzed for adjoining spaces especially for spaces such as restrooms, janitor's closets, and other areas as outlined in Section 01 10 11, etc. to prevent infiltration of toxic vapors, exhaust fumes, etc. from entering into the administrative and personnel living spaces. Control strategies for HVAC systems shall be incorporated to maintain the proper differential pressure between adjoining spaces as required by building codes and regulatory agencies.

12.2.15 **Sound and Vibration Control:** The entire HVAC system to include all ductwork, piping, etc., shall be designed and installed to insure that the required acoustical environments for all occupied spaces are met. HVAC systems shall be designed in accordance to *UFC 3-450-01*. Also, it is highly recommended that the HVAC designer consult the Sound and Vibration Control and the Sound and Vibration Fundamentals chapters of the ASHRAE Handbooks. The use of UFGS 22 05 48.00 20 MECHANICAL SOUND, VIBRATION, AND SEISMIC CONTROL is mandatory. The designer of record shall provide calculations of expected sound levels and provide detailed drawings showing the methodology to counter any excessive sounds and vibrations. Sound pressure testing shall be conducted per *UFC 3-450-01* with COR present. The contractor shall submit testing procedures four weeks prior to testing and notify witnessing agencies two weeks prior to actual testing. If testing fails, contractor shall remediate all problems and retest. Typical room criteria are listed below:

Large Offices (open plan): RC 30-40 (N)

Small Offices (private):	RC 25-35 (N)
Small Conference/Class Rooms:	RC 25-35 (N)
Circulation and Public Lobbies:	RC 40-45 (N)
Break Rooms:	RC 40-45 (N)
Bed Rooms:	RC 20-30 (N)

12.2.15.1.1 Sound quality (N) Neutral (Bland) shall be the only sound–quality descriptor used.

12.2.16 **Duct System Design:** Ducted return system and not a plenum system shall be employed. All supply, return, intake, and exhaust ductwork shall be constructed of galvanized sheet metal, unless otherwise not permitted, and shall be as specified in the Unified Facilities Guide Specifications. All duct fittings (including elbows, tees, and offsets) shall be constructed of rigid sheet metal. Non-metallic flexible duct run outs to air distribution devices shall be insulated and shall be limited to 5 ft. in total length. Flexible duct shall only be used on straight runs of ducts (horizontal or vertical) and shall not be installed with elbows or with offsets greater than 1/2 duct diameter. The ductwork shall be insulated in accordance with UFGS Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Duct and air distribution devices shall meet the velocity requirements indicated in the *ASHRAE Handbook – HVAC Applications*.

12.2.17 **Louvers:** Louvers shall be constructed of extruded aluminum and shall be factory finished as required to match the architectural features of the building. The location of all louvers shall be located a minimum of 10’-0” above finish grade. All louvers shall utilize bird/insect screens.

12.2.18 **Volume Dampers:** Manual balancing dampers shall be furnished with accessible operating mechanisms. Where operators occur in finished portions of the building, operators shall be chromium plated with all exposed edges rounded. Volume dampers shall be provided for all supply ducts to diffusers, and outside, return, and exhaust air ducts to ensure proper balancing and mixing within the system. Dampers integral with registers or diffusers will not be considered volume dampers for the purpose of balancing.

12.2.19 **Air Filters:** Air filters shall be provided in accordance with *UFC 3-410-01FA* and UFGS 23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. The air filters shall be located in the air handling equipment. Placement of filters within ceilings, ducts or factory/field assembled filter banks is prohibited.

12.2.20 **Fire Dampers:** Fire dampers shall be provided according to *NFPA 90A* when required by code. Fire dampers shall be as specified in UFGS 23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. The designer shall indicate on the construction drawings the location of each fire damper and details of the damper installations.

12.2.21 **Diffusers, Grilles and Registers:** Air distribution devices shall be factory fabricated of steel, corrosion resistant steel, or aluminum and shall distribute the specified quantity of air evenly over space intended without causing noticeable drafts and air movements in occupied zones or dead spots anywhere in the conditioned area. Inlets and outlets shall be sound rated and certified according to *ASHRAE 70*. Diffusers and registers shall be as specified in UFGS 23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM and shall be color coordinated with the architectural design.

12.2.22 **HVAC System Selection and Design**: HVAC system selection and design shall be in accordance with the following criteria with the order of precedence as follows: (1) RFP requirements (both Section 01 10 10 and Section 01 10 11), (2) *UFC 3-410-01FA*, and (3) other applicable criteria.

12.2.22.1 Administration Areas, Break Rooms, Offices, Conference Rooms, Circulation Areas, and Similar Occupancies: Refer to paragraphs above for cooling and heating system types and Section 01 10 11 for specific room requirements.

12.2.22.1.1 Note: Rooms such the maintenance, and storage rooms may or may not be permitted to be supplied from the centralized variable air volume air handling unit and/or return air shall not be permitted back to the air handling unit. A/E designer shall review requirements in Section 01 10 11 and determine the appropriate HVAC application for all zones.

12.2.22.2 Operations Floor Server Rooms:

12.2.22.2.1 Ventilation: Consider use of a Dedicated Outdoor Air System to provide ventilation in the Server Rooms. Ventilation rate shall be in accordance with applicable ASHRAE guidance.

12.2.22.3 Telecommunications Room: This room shall be conditioned 24 hours-per-day, 365 days-per-year with a dedicated system per *EIA/TIA 569 (TI-800-01)*. Provide with low ambient package.

12.2.22.4 Electrical Rooms: Maintain slight positive pressure with outdoor air ventilation supply and exhaust fans. Control exhaust with line-voltage thermostat. Provide louver, bird screen, and OSHA screen guard around ventilation fans.

12.2.22.5 Bathrooms: These areas shall be indirectly conditioned by transfer air from adjacent spaces. The exhaust fans shall be inter-locked with the room's individual light switch with a 5 minute shut off delay. Air drawn from adjacent spaces into the restrooms shall not be through door louvers; instead, lined transfer duct (duct jumper) shall be used for noise attenuation. Ductwork shall be sized adequately to insure proper air movement through transfer duct. All ductwork shall be designed to prevent "cross-talk" between adjacent rooms. Exhaust discharge vents shall not be located near outdoor air intakes to prevent short-circuiting of exhaust air. Provide direct heating for the restrooms if determined appropriate by load analysis.

12.2.22.6 Heritage Room: An exhaust hood shall be provided above the electric range. The hood will be provided with an integral self-contained fire suppression system.

The exhaust duct from the hood shall extend through an exterior wall and shall terminate more than 10 feet from any normally occupied area (e.g. patio areas, sidewalks, etc.)

12.2.22.7 Seismic Bracing. Seismic bracing shall comply with UFGS 13 48 00.00 10 SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT.

12.2.23 **Equipment Efficiency:** Minimum equipment efficiencies shall be in accordance with the latest version of *ASHRAE 90.1*.

12.2.24 **HVAC Controls:**

12.2.24.1 Control System: Provide a BACnet building automation system. The Contractor shall be responsible for correct operation of the control system including, but not limited to, software, graphics, programming, control relays, and control wiring. Provisions shall be made for the BACnet control system to be fully compatible with, but not connect to, the existing base-wide JCI Metasys EMCS. When multiple chillers are specified, provide connection and communication between the chiller panels and the DDC system.

12.2.24.2 Building Control Systems: Building level controls shall be in accordance with UFGS 23 09 23.02 BACnet DIRECT DIGITAL CONTROL FOR HVAC AND OTHER BUILDING SYSTEMS. The DDC system shall include all application software and equipment to implement the sequences of operation listed in UFGS 23 09 93 SEQUENCES OF OPERATION FOR HVAC CONTROL. Pneumatic operated control devices shall not be used. Building shall be provided with tamper-proof temperature sensors with remote adjustment.

12.2.24.3 Point Schedule: As a minimum, Point Schedule requirements shall be based on the following (Note: Where there are two numbers for a system, the first number is for the AHU itself and the number below it is an additional number per zone):

12.2.24.3.1 Input/Output Hardware Points for the Building Automation System shall be based on the following table:

System	**Points**
All Air Small Package Unit	11
Heating and Ventilating Unit	14
Single Zone with Heating and DX Coils	16
Single Zone with Heating and Cooling Coils	16
Single Zone with Dual Temperature Coils	17
Single Zone with Heating and Cooling Coils and Return Air Bypass	19
Single Zone with Humidity Control	22

Dual Duct with Return Fan	19 3
Mutizone with Return Fan	17 4
Multizone with Hot Deck Bypass with Return Fan	17 4
VAV with Return Fan (not including VAV boxes)	26
- VAV Box with Reheat	12
- Fan Powered VAV Box with Reheat	13
- Cooling Only VAV Box	9
Perimeter Radiation	9
Unit heater and Cabinet Unit Heater	11
Gas-Fired Infrared Heater	8
Dual Temperature Fan Coil unit	13
Hydronic Secondary with Constant Speed Pumping	3

12.2.24.3.2 Software points for Display, Trends, Alarms, and Schedules at the Centralized Base-wide Supervisory Monitoring and Control System shall be based on the following the table:

System	**Points**
All Air Small Package Unit	9
Heating and Ventilating Unit	14
Single Zone with Heating and DX Coils	18
Single Zone with Heating and Cooling Coils	19
Single Zone with Dual Temperature Coils	19
Single Zone with Heating and Cooling Coils and Return Air Bypass	20

Single Zone with Humidity Control	24
Dual Duct with Return Fan	22 4
Mutizone with Return Fan	22 3
Multizone with Hot Deck Bypass with Return Fan	18 4
VAV with Return Fan (not including VAV boxes)	32
- VAV Box with Reheat	11
- Fan Powered VAV Box with Reheat	10
- Cooling Only VAV Box	7
Perimeter Radiation	7
Unit heater and Cabinet Unit Heater	8
Gas-Fired Infrared Heater	5
Dual Temperature Fan Coil unit	10
Hydronic Heating Hot Water from Single-Building Boiler	12
Hydronic Dual-Temperature System, with Steam Heat Exchanger and Chilled Water	15
Hydronic Dual-Temperature System, with HTHW Exchanger and Chilled Water	18
Hydronic Secondary with Constant Speed Pumping	3
Hydronic Secondary with Variable Speed Pumping	5

-- For systems not listed, refer to *UFC 3-410-02 Direct Digital control for HVAC and Other Building control Systems*, and base point schedules on HVAC system type that most resembles the type of system being designed.

- The point types shall be coordinated with the Energy Management Staff during the design charrette.

12.2.26.4.3 Pulse Initiators: The Contractor shall provide water, and electric meters with pulse initiators per base standards.

12.3 **PLUMBING DESIGN**

12.3.1 **Materials: Supply, Drain, Waste, and Vent Piping Systems:** Piping system for outside of the five-foot line of the building is to be as specified under the civil portion of the design criteria. Vent piping shall be combined wherever possible to reduce the number of roof penetrations required. The minimum size of vents through the roof shall be 4 inches.

12.3.2 **Vibration/Noise Isolation:** Water hammer arresters shall be used to minimize water system noise in accordance with *PDI-WH 201*. Velocities in Domestic Water shall be a maximum of 6 feet per second.

12.3.3 **Domestic Water:**

12.3.3.1 Domestic Water Supply Pressure: See paragraph 6 Civil Design for domestic water supply pressure and paragraph 13 Fire Protection for requirements.

12.3.3.2 Insufficient Water Pressure: If the water supply is inadequate, the contractor shall supply a booster pump and a diaphragm expansion tank. The diaphragm expansion tank shall be sized to prevent the booster pump from cycling on-off excessively.

12.3.3.3 Domestic Water Supply: Water service for the facility shall be brought into the Riser Room. The building domestic water main shall be a minimum 3" or larger if determined by calculations.

12.3.3.4 Water Softener: Provide water softener to supply softened water to domestic water fixtures, and cold water make-up to the boiler and chilled water systems. Maintain dissolved mineral concentration levels recommended by selected hydronic equipment manufacturers.

12.3.3.5 Domestic Water Piping System Requirements: All domestic water pipe within and attached to the building shall be replaced with new properly sized type K copper pipe. The domestic cold and hot water piping systems shall be designed for a maximum system piping loss of 10 psig at full system flow. Maximum fluid flow rates in the hot or cold piping system shall not exceed 6 feet per second. The piping shall be extended to fixtures, outlets, and equipment. The domestic hot water and cold-water piping system shall be arranged and installed to permit draining. The supply line to each item of equipment or fixture, except faucets, flush valves, or other control valves that are supplied with integral stops, shall be equipped with a shutoff valve to enable isolation of the item for repair and maintenance without interfering with operation of other equipment or fixtures. Supply piping to all fixtures shall be anchored to prevent movement.

12.3.3.6 Domestic Water Heating Systems: Domestic water heaters shall be provided and located in the Mechanical Room to serve each bathroom and janitor's closet to serve lavatories and service sink. Size new domestic water heater to adequately

serve these areas. Design shall be in accordance with ASHRAE Handbook – HVAC Applications, “Service Water Heating.” Minimum thermal efficiency shall be no less than 80 percent unless noted otherwise. All water heaters shall be provided with fully automatic and safety controls. Per EISA Section 523, meet at least 30% of the domestic hot water demand through the installation of solar water heating if life cycle cost effective.

12.3.3.7 Diaphragm Expansion Tank: Provide a diaphragm expansion tank on the cold water line between the backflow preventer and the domestic hot water storage tank.

12.3.3.8 Hose Faucets: Provide a minimum of 5 hose bibs on building exterior.

12.3.3.9 Landscape Irrigation Connection: Provide water connection for landscape irrigation system. Provide backflow devices on site as required.

12.3.3.10 Backflow Prevention Devices: Backflow prevention devices shall be provided as needed to prevent cross-contamination of the domestic water within the confines of the building and at the service entrance.

12.3.3.11 Cold Water Service for Appliances: Water line connections for refrigerators, ice machines, and the like shall be provided. Each water connection shall terminate in a bronze angle valve. Valves shall be fitted with provisions for a 1/4" stainless steel braided tubing screw fitting. Each valve shall be provided in a manufacturer's standard recessed wall box constructed of sheet steel or plastic. Steel wall boxes shall have a corrosion resistant epoxy enamel finish and color shall be coordinated with the architectural design. Refer to Plumbing Fixtures for the type and quantity of appliances.

12.3.3.12 Maximum Velocity: The design flow rate for domestic water shall not exceed 6 feet per second.

12.3.4 **Domestic Waste:** All lavatory and sink drains and P-traps shall be coordinated with architectural work. The building Sanitary Sewer shall be designed in accordance with the *International Plumbing Code*. Coordinate location of floor sinks and floor drains with the structural discipline for floor sloping requirements. Provision shall be made to collect condensate drains and drain to the sanitary sewer.

12.3.4.1 Domestic Waste Piping: Minimum buried waste or vent pipe size shall be 2-inch diameter and minimum building drain size shall be 4-inch diameter.

12.3.4.2 Floor Drains: Floor drains shall be provided for all bathrooms, and in other areas as noted. All floor drains to have trap primers installed. Drains for condensate lines to have trap primers or other automatic means to flush and dilute condensate.

12.3.4.3 Floor Sinks: Floor sink shall be provided in the Mechanical Rooms. Floor sinks shall be 12 inch nominal overall width or diameter and 10 inch nominal overall

depth. The outlet pipe size shall be the same size as the connecting pipe, provide floor sinks with grates.

12.3.4.4 Traps: Traps for lavatories and sinks shall be chromium-plated, adjustable-bent tube, 20-gauge brass, or plastic (ABS) if not exposed.

12.3.4.5 Stops: Stops will be provided on water supply lines to all plumbing fixtures. All incoming water lines to sinks and toilets shall have 90 degree turn wall shutoffs (stops) with separate braided stainless steel supply lines. No combination shutoffs with supply lines are permitted. Supply lines must be removable without removal of shutoff from supply.

12.3.4.6 Cleanouts: Interior cover plates for cleanout plugs shall be brass or stainless steel. Floor cleanouts shall not be allowed in admin areas, corridors, break rooms, and other similar type rooms, especially for any room that has carpeting, wood floors, vinyl coverings, etc. Cleanouts shall be the same size as the pipe. Provide an approved two-way cleanout immediately outside of the facility at the lower end of the building drain.

12.3.4.7 Waste Connections for Appliances: Provide waste connections for all required appliances.

12.3.4.8 Condensate Drain Piping and Insulation: Condensate drains from HVAC equipment shall meet the requirements set forth in the *International Plumbing Code*. All drain piping shall be copper. The piping shall include a trap of sufficient depth to overcome static pressure of the unit. All piping shall be insulated with 1-inch thick mineral fiber or 1-1/2 inch thick cellular glass. Piping shall be extended to the floor drain or floor sink. If condensate drains in occupied rooms cannot be located in an aesthetically ideal location, provide condensate pumps to drain condensate elsewhere.

12.3.4.9 Cross Tees: Use of cross tees prohibited on drain lines. All straight cross tees on sewer piping are to be replaced with 2 single wye or 2 sanitary tees where possible to avoid future cross snaking of the lines. If not possible due to space constraints, a double combination wye tee may be used with written approval in advance of the base CE project manager.

12.3.4.10 Vent Stacks: Vent stacks in attic spaces shall have expansion joints to keep piping from cracking.

12.3.5 **Plumbing Fixtures:** The type, quantity, and requirements of fixtures required shall be based on the architectural narrative, any floor plan provided, and the requirements listed below. Fixtures shall adhere to the requirements indicated in UFGS 22 00 00 PLUMBING, GENERAL PURPOSE. Low water consumption fixtures shall be utilized unless otherwise indicated. Flush fixtures shall have both automatic infrared flush control and manual flush control.

12.3.5.1 Water Closets: Flushometer valve, dual flush, 1.6/1.1 gallons per flush maximum, siphon-jet, elongated bowl, top supply spud, floor/wall mounted. Seat: White plastic, elongated, open front.

12.3.5.2 Urinals: Urinals shall be low flow, maximum 0.6 GPF.

12.3.5.3 Service (Mop) Sinks: Provide service sink in Janitor's closet. Precast terrazzo, 6-inch drop front, 24 by 24 by 12, corner. Trap standard, floor mounted.

12.3.5.4 Lavatories: All lavatories shall be manufacturer's standard sink depth, enameled cast iron or vitreous china, oval type, and shall comply with *ASME A112.19.1M* or *ASME A112.19.2M*. Strainer shall be copper alloy or stainless steel. Countertop lavatories shall be self-rimming. Wall hung lavatories shall be carrier supported.

12.3.5.5 Kitchen Sink: Kitchen sink shall be a double bowl constructed of 18 gauge stainless steel. Sink shall be self-rimming stainless steel ledge and seamlessly drawn. Sink shall be fully undercoated to dampen sound and prevent condensation. Sink to have four holes. Provide with 12" swing spout, separate hot and cold water cross handles, retractable hand spray, brass valve bodies, polished chrome finish. Sink to accept disposer.

12.3.5.6 Drinking-Water Coolers with Bottle Filling Station: Provide three (3) drinking water coolers conforming to AHRI 1010 with more than a single thickness of metal between the potable water and the refrigerant in the heat exchanger, wall-hung, bubbler style, air-cooled condensing unit, 4.75 gph minimum capacity, stainless steel splash receptor and basin, bottle filler and stainless steel cabinet. Bubblers shall be controlled by push levers or push bars, front mounted or side mounted near the front edge of the cabinet. Bubbler spouts shall be mounted at maximum of 36 inches above floor and at front of unit basin. Spouts shall direct water flow at least 4 inches above unit basin and trajectory parallel or nearly parallel to the front of unit. Provide ASME A112.6.1M concealed steel pipe chair carriers. See architectural section for locations.

12.3.6 **Appliances:** All appliances provided under this contract shall be Energy Star Compliant, provided by same manufacturer, and shall be color coordinated. The following appliances and/or utility connections shall be provided or accommodated for:

12.3.6.1 Refrigerator (NIC): Provide cold water stub-out and shut-off valves.

12.3.7 **Valves:** All plumbing fixture valves shall be provided in accordance with the *International Plumbing Code*. Valves shall be provided on supplies to equipment and fixtures. Valves 2-1/2 inches and smaller shall be chrome plated bronze with threaded bodies for pipe and solder-type connections for tubing. Valves 3 inches and larger shall have flanged iron bodies and bronze trim. Pressure ratings shall be based upon the application.

12.4 **Thermostatic Mixing Valves:** Combination thermostatic and pressure-balanced shall be provided for each showerhead and shall be line size and shall be constructed with rough or finish bodies either with or without plating. Each valve shall be constructed to control the mixing of hot and cold water and to deliver water at a desired temperature regardless of pressure or input temperature changes. The control element shall be of an approved type. The body shall be of heavy cast bronze, and interior parts shall be brass, bronze, corrosion-resisting steel or copper. The valve shall be equipped with necessary stops,

check valves, unions, and sediment strainers on the inlets. Mixing valves shall maintain water temperature within 5 degrees F of any setting.

13. FIRE PROTECTION

13.1 **GENERAL**: The entire facility shall be fully protected by an automatic sprinkler system that is designed and installed in accordance with the requirements of *UFC 3-600-01* with the exceptions noted below. The use of Unified Facilities Guide Specifications is mandatory.

13.1.1 **Designer Qualifications:** All hydraulic calculations and drawings showing the layout of the sprinkler system shall be done by a registered Fire Protection Engineer, or a NICET Level 4 technician who has had at least four (4) years of current experience in the design of fire protection systems. Written proof of registration and experience shall be submitted to the Contracting Officer for approval.

13.2 **OCCUPANCY CLASSIFICATION:** The facility contains multiple occupancy classifications as stipulated per *NFPA 13*. Examples of such occupancy classifications are listed below:

13.2.1 **Light Hazard**: Administrative Areas, Conference Rooms, Break Rooms, Corridors, Restrooms, etc.

13.2.2 **Ordinary Hazard**: Janitor's Closets, Communication Rooms, Mechanical Rooms, Electrical Rooms, etc.

13.3 **SPRINKLER DENSITY REQUIREMENTS:** All Ordinary Hazard Occupancy areas shall be provided with a minimum sprinkler design density of 0.20 gpm/ft^2. All Light Hazard Occupancy areas shall be provided with a sprinkler design density of 0.10 gpm/ft^2.

13.4 **DESIGN AREA:** The sprinkler system design shall be hydraulically calculated to protect a minimum floor area of 1,500 sq. ft. unless noted otherwise in *UFC 3-600-01*. A sufficient number of hydraulic calculation runs shall be provided in order to prove the hydraulically most demanding areas.

13.4.1 **Increased Design Area:** There are circumstances where the design area shall be increased: 1) Design area must be increased by 30 percent for sloped ceilings that exceed a pitch of one in six; 2) For dry pipe systems (if applicable), the design area of sprinkler operation must be increased by 30 percent per *NFPA 13*. Note that 1) and 2) are additive if both conditions exists (i.e. 3000 square feet X 1.3 X 1.3 = 5070 square feet).

13.5 **HOSE DEMAND:** A 250-gpm exterior hose demand shall be included in the hydraulic calculations. The demand shall be assumed to occur at a fire hydrant located nearest to the building's sprinkler service line point-of-connection to the water distribution system and for a 60 minute duration.

13.6 **WATER SUPPLY:** Fire sprinkler water supply shall be brought into the Riser Room.

13.7 **UNDERGROUND EQUIPMENT REQUIREMENTS:** All equipment, piping, etc. shall be UL Listed and/or FM Approved for fire protection service; all system

components shall be designed for a working pressure of not less than 175 psi unless otherwise indicated.

13.7.1 **Pipe Material:** Unless otherwise indicated, the new underground sprinkler service line shall be PVC pressure pipe intended for use in underground fire service systems. Pipe shall conform to *AWWA C900*.

13.7.2 **Transition:** The sprinkler service line entering the building shall be ductile iron. Transition shall occur at a point 5 feet beyond the perimeter of the building.

13.8 **ABOVEGROUND EQUIPMENT REQUIREMENTS:** All equipment, piping, etc., shall meet the requirements of UFGS 21 13 13.00 10 WET PIPE SPRINKLER SYSTEM, FIRE PROTECTION and as specified herein. All equipment, piping, etc., shall be UL Listed and/or Fire Marshall approved for fire protection service. All system components shall be designed for a working pressure of not less than 175 psi unless otherwise indicated.

13.8.1 **Double Check Valve Backflow Prevention Assembly:** A double check valve backflow prevention assembly, U.L. listed, State of Nevada approved, shall be provided at the new building water service connection. The backflow prevention assembly shall be located outside of the building riser room. The manual control valves provided for this assembly shall be butterfly valves. A pressure gauge with a shut-off valve shall be provided upstream of the backflow assembly. Provide a test header to test the double check valve backflow prevention assembly for full design flow.

13.8.2 **Check Valves:** Alarm check valves or riser check valves shall be provided for each system riser with a flanged inspection plate. A flow indicating device and all other appurtenances required per *NFPA 13* shall be provided. Flow indicator shall be connected to a local-alarm circuit, transmitted-alarm circuit, and power supply.

13.8.3 **Local Alarm:** An electrically operated bell shall be located on an outside wall adjacent to the sprinkler riser. See paragraph 15 Fire Alarm and Mass Notification Systems for more information on the transmitted alarm signal to the Fire Department.

13.8.4 **Valves:** Manually operated sprinkler control valves shall be butterfly valves. Each valve shall be supervised with a tamper switch.

13.8.5 **Flow and Tamper Switches:** Each flow switch and tamper switch shall be connected to the fire alarm control panel.

13.8.6 **Fire Department Connection:** Fire department connection shall be projecting type with cast brass body, matching wall escutcheon lettered "Auto Spkr" with a polished brass finish. The inlets shall be 2-1/2 inch diameter.

13.8.7 **Sprinkler Pipe:** Sprinkler pipe shall be schedule 40, unless otherwise indicated.

13.8.8 **Pipe Reducers:** Pipe reducers shall be made with one-piece tapered reducing fittings. Grooved-end or rubber-gasket reducing couplings are not allowed for use.

13.8.9 **Sprinklers:** Sprinklers shall be used in accordance with their listed spacing limitations. Sprinkler temperature classification shall be in accordance with *NFPA 13*. All sprinklers in light hazard and ordinary hazard locations shall be quick response type. Pendant sprinklers shall be either recessed or concealed type. Pendant sprinklers shall have a polished chrome or white enamel finish. No mixing of head types, including finishes is allowed. If necessary for use, sidewall sprinklers shall be specifically listed for use in the respective hazard occupancy protected. Sidewall sprinklers shall have a polished chrome or white enamel finish. Provide 155 degree F heads in the simulator/server room to protect from head activation in case of HVAC shutdown caused temperature excursions. Provide K- factors as indicated in the UFC 3-600-01.

13.8.10 **Computer Equipment Shutdown:** Provide flow switch activated shunt-trip breakers to shut down power to the computer equipment upon activation of wet pipe sprinkler system the simulator/server bay. The designer shall coordinate with the user to install as many as four flow switches and shunt-trip breakers to allow a zoned shutdown of the computers within the simulator/server room.

13.8.11 **Installation Requirements:** The underground fire sprinkler service line shall be laid, and joints anchored, in accordance with *NFPA 24*. The service entrance piping shall be provided with a concrete thrust block at the elbow where the pipe turns up toward the floor. In addition, joints shall be anchored in accordance with *NFPA 24* using pipe clamps and steel rods from the elbow to the flange above the floor and from the elbow to a pipe clamp in the horizontal run of pipe.

13.8.12 **Sprinkler System:** The entire sprinkler system shall be seismically protected. Seismic protection shall include flexible couplings, sway bracing, seismic separation assemblies where piping crosses building seismic separation joints, and other features as required per *NFPA 13* for protection of piping against damage from earthquakes. Branch lines shall also be equipped with sway braces at the end sprinkler head and at intervals not exceeding 30 ft (exception: when pipe support hangars are less than 6” long).

13.8.13 **Main Drains:** Main drain piping shall discharge at a safe location outside of the building. The discharge shall be arranged so as not to cause damage to adjacent construction during discharge.

13.8.14 **Auxiliary Drains:** Auxiliary drains shall be provided where required by *NFPA 13*. Drain valves shall be used where drain plugs are otherwise permitted by *NFPA 13*. Where branch lines terminate at low points and form trapped sections, such branch lines shall be manifold to a common drain line and routed to an auxiliary drain.

13.8.15 **Witnessing Tests:** The Fire Department shall witness all flush tests, flow tests, and hydrostatic tests. In addition, the Fire Prevention Office shall be contacted prior to any testing of the new automatic fire suppression system.

14. ELECTRICAL DESIGN

14.1 **GENERAL.** Electrical work in this project includes the demolition, rewiring and reconfiguration of electrical power, lighting, communication and fire alarm systems inside the existing building to comply with applicable UFCs, standards and codes. Minimum electrical design includes primary feeder riser, distribution panels, lighting, receptacles, and all associated conduit, wiring, and connections for these systems.

14.1.1 **References.** See paragraph 4.14.

14.1.2 **Demolition.** Demolition shall also include demolition of existing exterior 150KVA transformer bank installation feeding this building and replacing the 100A fuse on the existing switchgear. Demolition shall include secondary feeder wiring and conduit. Demolition shall include the complete removal of equipment, conduit, wiring, fixtures and/or devices with all its accessories and attachments, unless stated otherwise. Contractor is responsible for disposal of all demolished materials according to Nevada and Federal Regulations.

14.1.3 **Outage Coordination.** Electrical work including any outage requirements for connections to existing electrical system shall be coordinated through the Contracting Officer. Contractor shall submit a formal outage request a minimum of 21 days in advance of any power utility outages required.

14.1.4 **Digging Permits.** Digging permits shall be obtained in coordination with the Installion.

14.1.5 **UL Label.** All electrical material and equipment shall be Underwriters Laboratories, Inc. (UL) listed, UL labeled (if not available), or be labeled by a similar organization acceptable to the Government. The label or listing will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency.

14.1.6 **PCB Standards.** Electrical equipment supplied shall be supplied without Polychlorinated Biphenyl's (PCB).

14.1.7 **New Equipment.** All electrical equipment/materials provided by Contractor shall be new.

14.1.7.1 Capacity. All feeders, main service switchboard(s), transformers, distribution panel boards, and panel boards shall have 20% spare capacity. Use the demand and diversity factors as recommended in *NFPA 70.*

14.1.7.2 Short Circuit. All equipment protective devices shall be properly coordinated to provide selective tripping. Series rated protective equipment and/or devices will not be allowed.

14.1.7.3 Arch Flash. All electrical systems shall comply with *NFPA 70E.*

14.1.8 **Warning Signs and Safety Labels.** Provide and install all warning signs and safety labels required for the installation, operation, and maintenance of the building's electrical systems including the following:

a. General use safety labels.

b. Arc flash warning labels shall be generic as per figure 2-1 in *UFC 3-501-01*.

c. Short circuit rating and load information labels on panels.

14.1.8.1 Safety labels and warning signs shall be readable from each accessible side. Space the signs in accordance with *NFPA 70E*.

14.1.9 **Nameplates and Identification Tags.** Provide and install all nameplates and identification tags required for the installation, operation, and maintenance of the building's electrical systems including the following:

a. Panel Nameplates: Include panel numbers, motor control centers, disconnects, motors, electrical devices, and controls. All electrical equipment, devices, and controls shall be clearly identified and tagged.

b. Laminated plastic nameplates for each switchboard, panelboard, equipment enclosure, motor controller, relay, and switch identifying its function, number and, when applicable, source of power and location of source of power. Provide melamine plastic nameplates, 0.125 inch (3 mm) thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 1-inch by 2-1/2 inches (25 mm by 65 mm). Lettering shall be a minimum of 0.25 inch (6.35 mm) high normal block style.

c. Cable and Wire Numbers: Provide cable numbers on all cables (both ends) and wire numbers on all wires at their termination points.

d. Motor Numbers: Tag motors with motor numbers on permanently attached tags. Motor number shall be as shown on power one line and control schematics.

e. Control Stations: Tag all control stations with the control station number, description of motor, and motor number with a laminated plastic nameplate.

f. Controls: Tag and identify all controls and control wiring (such as HVAC controls). Tag and identification shall agree with the control schematics provided.

14.2 **DESIGN REQUIREMENTS.**

14.2.1 **Studies and Calculations.** Provide design studies and calculations for all facility spaces and loads as applicable in accordance with this Request For

Proposal. Design studies and calculations to be provided by Contractor shall include the following:

14.2.1.1 Load calculations and electrical load summary: Include connected loads, demand loads, and diversity factors for each panelboard, switchboard, etc. in the electrical distribution system. Include 20% spare capacity when sizing feeders, main service switchboard(s), transformers, distribution panel boards, and panel boards. Use the following demand and diversity factors as recommended in *NFPA 70*.

14.2.1.2 Short circuit calculations: Include a circuit breaker protective device coordination study. All equipment protective devices shall be properly coordinated to provide selective tripping. Series rated protective equipment and/or devices will not be allowed. Surge protection shall be incorporated in the coordination analysis. The studies shall be performed by a registered professional engineer with demonstrated experience in power system coordination in the last three years.

14.2.1.3 Voltage drop calculations: Calculations shall demonstrate the worst-case voltage drop for the main electrical service, distribution panels, branch circuit panels, and any other devices/equipment indicated on the one-line diagram. The maximum voltage drop shall be no greater than 3% at the farthest outlet and total voltage drop on both feeders and branch circuts shall not exceed 5%.

14.2.1.4 Arc flash analysis: Include all electrical systems per requirements set forth in the current version of *NFPA 70E*. The calculations shall be performed according to the *IEEE Standard 1584*. The flash protection boundary and the incident energy shall be calculated at significant locations in the electrical distribution system (switchboards, panelboards, etc.) where work could be performed on energized parts. Panels should be labeled as per *UFC 3-501-01*, Figure 2-1.

14.2.1.5 Lighting calculations for all exterior and interior spaces shall utilize computational software to provide “point-by-point” values for each room and/or area. Exterior lighting calculations shall include iso-footcandle curves for all parking lot and sidewalk areas.

14.2.2 **Drawings and Documents.** Provide all drawings and documentation required to install, operate, and maintain the building’s electrical systems. Include the following:

a. Drawing Index: Provide and keep current throughout the life of the project a drawing list with current revision number for each drawing.

b. Building Services Power and Lighting Plan Drawings: Provide plan drawings showing all lighting, exit signs, emergency lighting, convenience outlets, specialty outlets, and power to all building service and HVAC equipment. The building services power and lighting plans shall show circuits and luminaire and device type for all indicated lighting and devices. Lighting Plan Drawings shall show lighting controls, such as switches, occupancy sensors, vacancy sensors, photosensors and all other lighting controls. In addition, drawings shall include a summary table

of building load, voltage drop calculations, and any other applicable calculations related to the project.

c. Building Telecommunications Drawings: Provide telecommunications plans showing all communications equipment, such as wall data/voice outlets, communications tray (if used), communications rack/cabinets, patch panels, and all other communications equipment.

d. Building Fire Alarm and Mass Notification Drawings: Provide fire alarm and mass notification system plans showing pull stations, speaker/strobes, bells, panels, batteries, and all other Fire Alarm & Mass Notification System equipment. Provide plans showing Fire Alarm & Mass Notification System Matrix and Riser Diagram.

e. Security Systems Drawings: Provide security systems plans showing door keypads and all other security systems equipment.

f. Power One-Line Drawings: Provide a power one-line showing the distribution of power as a single line representation including feeder cables, switchgear with protective devices and rating, power systems, panelboards, and motor control systems.

g. Grounding Drawings: Provide grounding drawings detailing all ground rod placements, ties to building steel, major electrical equipment, and exterior process equipment and storage tanks. Include installation details of components, connections, and test grounding stations.

h. Power and Lighting Panel Schedules: Provide power and lighting panel schedules for lighting and instrument power panels. Panel schedules shall show in tabular and schematic format the electrical connections in the distribution boards.

i. Installation Details and Schematics: Provide details and schematics as required to clearly identify installation conditions and/or special building systems.

j. Fire Alarm and Communication Riser diagrams and Installation details: Provide riser diagrams and details of new installed systems

14.3 EXTERIOR ELECTRICAL.

14.3.1 General Requirements.

14.3.1.1 Labeling. All materials, equipment, fixtures and appurtenances shall be Underwriters Laboratories, Inc. (UL) listed, or if not available with the UL listing, be labeled by a similar organization acceptable to the Government.

14.3.1.2 Routing and Location. The routing of the new underground feeders both primary and secondary shall be approved by and coordinated with the Contracting Officer. Except for crossings, electrical and communications utilities shall not be located under streets or sidewalks.

14.3.1.3 Available Fault Current. Contractor shall use available fault current contribution of the transformer and utility grid based upon actual impedance and characteristics for the basis of the final system design.

14.3.1.4 Fault and Overcurrent Protection. Overcurrent and fault protection devices shall be coordinated with line-side and load-side fuses or circuit breakers to isolate any electrical fault or overload from the rest of the system. Some breaker sizes may not coordinate under some fault conditions. However, good engineering practices shall be used and devices shall coordinate for all overload conditions. All new work shall use circuit breakers only (no fuses).

14.3.1.5 Cable Ducts. Provide 4" secondary multiple conduits per *UFC 3-520-01*. Provide manholes, handholes and pullboxes as required per the UFC and good engineering practice.

14.3.1.6 Burial Depths. For power, the ducts shall be buried with the top of the concrete at 18 inches below grade (minimum) and 24" minimum depth under roads and pavement as directed per *UFC 3-550-01*. Provide 3" of concrete cover around type EB PVC ducts.

14.3.1.7 Warning Tape. Warning tapes shall be installed directly above the pipe or duct bank, at least 12 inches above the pipe or ductbank, but not to exceed the depth in the manufacturer's recommendations. All warning tape shall be polyethylene plastic tape with tracer wire, a minimum width of 6 inches, and imprinted with the words "WARNING – POWER CABLE BELOW" for power lines or "WARNING - TELECOMMUNICATION CABLE BELOW" for telecommunication lines at not more than 48 inch intervals to permit easy location of the duct line. Warning tape color shall be as follows: RED for power and ORANGE for telecommunications. Provide and inform Nellis AFB personnel of the warning tape color convention.

14.3.1.8 Equipment Grounding. All equipment shall be grounded in accordance with UFC and *NEC* requirements.

14.3.2 **Exterior Demolition and Rerouting.** Demolish and disconnect existing pad-mounted transformer completely. Also disconnect and remove existing secondary service conductors feeding the existing building. Abandon secondary conduits in place. Demolition of existing transformer enclosure and existing generator containment shall be done only after approval by Contracting Office.

14.3.3 **Primary Power.** Reuse existing primary connection from existing switchgear. Replace primary switch fuse to match building loads. Contractor shall determine the exact size of new transformer. Preliminary estimate indicates that 300kVA, 480/277V, 3-phase transformer may be adequate size.

14.3.3.1 Secondary service entrance conductors from a exterior transformer into electrical room and subsequent terminations on to service entrance equipment inside electrical room. Power interruptions shall be kept to a minimum.

14.3.4 **Transformers.** Provide a new transformer. Actual size shall be calculated by Contractor to accommodate all possible electrical loads, including HVAC and kitchen appliances, etc.

14.3.5 **Spare Conduits.** Provide a 1-4" spare conduit one for secondary power conduits, with 1/4-inch nylon pull rope.

14.3.6 **Facility Service Entrance.** The facility shall be fed via secondary service conductors from a new transformer, in duct(s) to the service entrance equipment located inside existing electrical room. The service entrance conductors shall be only copper, and not larger than 500 Kcmil. If the ampacity of the total load exceeds the ampacity of a single wire, then parallel runs of conductors shall be used and sized with accordance to NFPA 70.

14.3.7 **Lightning Protection.** Provide Lightning Risk Assesment in accordance with NFPA 780. If it is determined that lightning protection is required, provide Lightning Protection in accordance with the latest *NFPA 780*, *UFC 3-575-01 and AFM 88-9*.

14.3.8 **Grounding and Bonding.** Provide grounding and bonding bar in electrical room, with all grounding leads (including communication, grounding electrode, etc.) brought on this bar. This bar will act as a main grounding inspection and testing point for all ground leads. The grounding system shall adhere to the requirements of *IEEE Standard 142* and the overall grounding system shall not exceed a maximum acceptable resistance of 25 ohms between the grounding electrode system and ground.

14.3.9 **Exterior Lighting.** Provide exterior lighting at all building entrances in accordance with the *UFC 3-530-01* requirements. Lamps shall be LED and shall be controlled both by photocell and exterior motion sensors.

14.3.9.1 **Exterior Lighting Levels.** Follow *UFC 3-530-01* and *IES Lighting Handbook* recommendations for lighting levels of exterior lighting. Where conflicting lighting intensity levels are given between documents, follow the light level specified in the *UFC 3-530-01* first, and then the *IES Lighting Handbook* second.

14.3.9.2 **Exterior Lighting Fixtures.** Cutoff fixtures, louvers and/or hoods shall be used to minimize light trespass.

14.3.9.3 **Exterior Lighting Coordination.** Coordinate exterior fixtures and lighting with requirements of *UFC 3-530-01*. All exterior fixtures shall be submitted to the Contracting Officer for review and approval.

14.3.9.4 **Controls and Wiring.** Each lighting circuit shall carry its own neutral. Shared neutrals between lighting circuits are not allowed. Provide photoelectric controls for exterior lighting.

14.3.10 **Exterior Receptacles.** Provide exterior duplex receptacles, located as required by the UFCs and *NEC*, and/or at 100-foot maximum intervals along the building perimeter. Receptacles shall be GFCI type with "in-use", weatherproof cover. In addition, locate receptacles near exterior mechanical equipment for maintenance.

14.3.11 **Road Crossings.** Contractor shall provide proper coordination and obtain all necessary permits, approvals, etc., before installing any road crossings.

Crossings shall be bored and steel sleeved, or saw-cut, depending on the installation. Saw-cut vs. bore shall be approved by and coordinated with the Contracting Officer. Any saw-cut to an existing roadway and/or pavement shall be restored to original condition by the Contractor.

14.3.12 **Utility Crossings.** Clearances from existing and new utilities (water, gas, sewer, etc.) shall be as specified in *ANSI C2* and the UFCs.

14.3.13 **Underground Splices.** Underground connections or splices shall not be permitted in primary or secondary conductors.

14.3.14 **Cathodic Protection.** Coodinate the soil resistivity around the project site to determine if cathodic protection is necessary. If deemed necessary, provide cathodic protection on all buried or submerged ferrous piping, tanks, and related facilities. This requirement includes ferrous materials such as cast iron. Cathodic protection design shall be in accordance with Nellis & Creech AFBs IFS and UFC 3-570-01.

14.4 **INTERIOR ELECTRICAL.**

14.4.1 **General.** Design, furnish, install, and test a complete new interior electrical system. Provide power and controls for all new equipment and coordinate installation with the User. Restore power to any accidentally disconnected equipment. Some equipment will be provided by the Government. For Government provided equipment, Contractor shall be responsible for matching power, voltage, and receptacle type required for proper operation. Coordinate all Government-furnished, Contractor-installed equipment prior to any rough-ins. All power devices including telecommunications and fire alarm devices, shall not be installed on demountable walls. Power and telecommunication stub-outs and connections points shall be provided above the ceiling inside open area offices where demountable walls are present and shall have location and quantity that will provide flexibility for the users even when furniture layout changes. Approximate locations of power and communications outlets above the ceiling shall be every 10’-0”.

14.4.2 **Protective Coordination.** Overcurrent and fault protection devices shall be coordinated with line-side and load-side fuses or circuit breakers to isolate any electrical fault or overload from the rest of the system. Some breaker sizes may not coordinate under some fault conditions. Good engineering practices shall be used and devices shall coordinate for all overload conditions. No series rated protective equipment shall be used.

14.4.3 **Electric Power Metering.** Provide a power digital meter on or near the main switchboard to allow monitoring and verifications of various electrical functions. PDM shall have a KYZ pulse output connectivity taken to a nearby fused termination box for connection to future Building Automation System. Coordinate with BCE electrical for type of electrical metering connection.

14.4.4 **Service Entrance.**

14.4.4.1 **Service and Distribution Equipment.** Facility service entrance equipment shall be service rated, consisting of a main switchboard sized per load calculations per the UFCs and *NEC* located in electrical room. The main panel shall be equipped with a digital, multi-function, power monitor, capable of displaying all typical electrical parameters (voltage, current, power factor, power, etc.) and an integral surge suppressor with externally visible indicator lights identifying fault. The main switchboard shall be a minimum of 400A @ 3 phase 480 volts.

14.4.4.1.1 Interior building distribution voltage shall be 208/120 volt except HVAC motor loads which can be served at 480 volts. Provide additional distribution panels to cover the entire building. Voltage drop shall be limited to 5 percent per the *NEC* (combined voltage drop on both feeders and branch circuits to the furthest outlet of power, heating, and lighting loads shall be 5% or less). All circuit breakers shall be 100% rated. All electrical equipment buses shall be copper. Provide 20% spare capacity in the panelboards. To reduce voltage drop, cable length between panel and load shall be kept to a minimum. All 208/120 volt panels shall be located within a maximum of 150 feet of their connected loads. Provide a voltage drop calculation for each branch circuit over 100ft at 208/120 volts.

14.4.4.2 **Existing Distribution Panel(s).** All of existing electrical service equipment shall be demo. Feeder for any reuseable existing distribution panel shall be new.

14.4.5 **Panelboard Feeders.** Size of panelboard feeders, panelboards, and main circuit breakers (in the panelboard) shall be calculated per *NEC* and UFCs to ensure proper device coordination. Provide for a minimum of 20% spare capacity.

14.4.6 **Panelboards.** Distribution and branch circuit panels shall be fully rated for the available fault current, and furnished with a main circuit breaker, unless fed from an upstream panel breaker in the same room. Provide panels with full-sized, bolt-on, branch breakers, copper main busses, insulated copper neutral bus and bonded equipment grounding bus. Provide a minimum of 10% spare circuit breakers and 10% space for future use in each panel. The Contractor shall provide and install printed panel labels with descriptive names for all installed circuits and electronic copies of the labels for future modification. Dedicated panels for telecommunications/computer loads shall have a surge suppressor.

14.4.6.1 **Grounding Systems.** Provide new grounding system for the new electrical service per the UFCs and *NEC*. Provide separate grounding systems for both the electrical and telecommunication systems per the UFC (both electrical and telecommunications) and *NEC* Article 250. However both grounding systems shall be brought to a common Master Ground Bar located in electrical room. This master ground shall be wall mounted copper bar. Master ground bar is optimum way of meeting the intents of Article 250 of *NEC*, both for verification and measurement purposes.

14.4.6.2 **Load Separation.** Provide a dedicated separate panel with branch circuits for telecommunications equipment, sensitive equipment, and receptacles intended for workstation computers.

14.4.7 **Non-Linear Loads.** Provide K-factor rated transformer and 200% rated neutral buses in dedicated computer panels to accommodate non-linear loads. K-4

rated transformer shall be used to feed between 50% and 90% non-linear loads. K-13 rated transformer shall be used to feed 90% to 100% non-linear loads.

14.4.8 **Conduits and Conductors.** Wiring shall consist of 600-volt insulated single conductors type THWN, THHN, or THW conforming to UL 83, installed in raceways consisting of electrical metallic tubing, or rigid galvanized steel conduit (RGS). Insulation type shall be suitable for the application according to the *NEC*. Flexible metallic conduit shall be provided to vibrating equipment where required. Use of Metal Clad (MC), Armored Cable (AC), Non-Metallic Sheathed Cables (NMC), and Electrical Non-Metallic Tubing (ENT) are prohibited. All conductors shall be copper. The minimum branch-circuit conductor size shall be No. 12 American Wire Gauge (AWG). Number of current-carrying conductors per conduit shall be 6 maximum. Provide each single 20 amp branch circuit for either lighting or convenience receptacles with a dedicated neutral conductor. Shared neutrals are not allowed on this project. Class 1 remote control and signal circuit conductors shall be not less than No. 14 AWG. Class 2 remote control and signal circuit conductors shall be not less than No. 16 AWG. Class 3 low-energy, circuit conductors shall be not less than No. 22 AWG.

14.4.8.1 Routing of raceways and cables shall be parallel or perpendicular to walls and ceilings. Conduit coupling fittings shall be compression type. No set screws fittings shall be accepted. Fire-stop any cable or raceway penetrations through rated wall assemblies to maintain fire resistance ratings. Provide labels identifying the manufacturer of the fire-stopping system and date of installation next to each location. Raceways shall be concealed within finished walls, suspended ceilings, and floors. Raceways crossing structural expansion joints or seismic joints or wall foundations shall be provided with suitable expansion fittings on both sides or other suitable means to compensate for the building expansion and contraction. The minimum conduit size for power to equipment and fire alarm circuits shall be ¾" (20 mm). The minimum conduit size for telecommunications cabling systems shall be 1-inch (27 mm). Conduit can be ½", as a minimum size, for lighting and receptacle circuits such as 2#12 with 1#12 ground conductors feeding a receptacle or a light. All wiring and conduit shall be concealed except in mechanical rooms, electrical/telecommunication utility rooms, supply areas.

14.4.8.2 **Wiring Temperature Rating.** Where wiring is connected to devices rated at 100 amperes or less, utilize the ampacity limit listed for 60 degrees C wire in allowable ampacity table 310-15(B)(16) in the *NEC* whether or not the wire is rated at a higher temperature. For wiring over 100 amperes, wiring rated at 75 degrees C or greater shall be used.

14.4.9 **Conduit Stub-Ups.** Where conduits are to be stubbed up through concrete floors, a short sweep shall be installed below grade to transition from the horizontal run of conduit to a vertical run. A conduit coupling fitting, threaded on the inside shall be installed, to allow terminating the conduit flush with the finished floor. Wiring shall be extended in rigid threaded conduit (RGS) only, to equipment, except that where required, flexible conduit may be used 6 inches above the floor. Empty or spare conduit stub-ups shall be plugged flush with the finished floor with a threaded, recessed plug.

14.4.9.1 **Below Slab-On-Grade or in the Ground.** Electrical wiring below slab-on-grade or in the ground shall be protected by a conduit system. Conduit passing vertically through slabs-on-grade shall be PVC-RGS (factory coated). Conduits installed below slab-on-grade or in the earth shall be PVC-RGS (factory coated). At changes in direction provide PVC-RGS (factory coated) elbows.

14.4.9.2 **Installing Conduit in Slabs Including Slabs on Grade.** Horizontal installation of conduits in slabs is not allowed.

14.4.9.3 **Conduit Supports.** Except where otherwise permitted by *NFPA 70*, conduits and electrical metallic tubing (EMT) shall be securely and rigidly fastened in place at intervals of not more than 10 feet and within 3 feet of boxes, cabinets, and fittings, with approved pipe straps, wall brackets, conduit clamps, conduit hangars, threaded C-clamps, beam clamps or ceiling trapeze. Loads and supports shall be coordinated with supporting structure to prevent damage or deformation to the structure. Loads shall not be applied to joist bridging. Attachment shall be by wood screw-type nails to wood; by toggle bolts on hollow masonry units; by expansion bolts on concrete or brick; by machine screws, welded threaded studs, heat-treated or spring-steel-tension clamps on steel work. Nail-type nylon anchors or threaded studs driven in by a powder charge and provided with lock washers and nuts may be used in lieu of expansion bolts or machine screws. Raceways or pipe straps shall not be welded to steel structures. Cutting the main reinforcing bars in reinforced concrete beams or joists shall be avoided when drilling holes for support anchors. Holes drilled for support anchors, but not used, shall be filled. In partitions of light steel construction, sheet-metal screws may be used. Raceways shall not be supported using wire or nylon ties. Raceways shall be independently supported from the structure. Upper raceways shall not be used as a means of support for lower raceways. Supporting means will not be shared between electrical raceways and ceiling grids. Except where permitted by *NFPA 70*, wiring shall not be supported by ceiling support systems. Conduits shall be fastened to sheet-metal boxes and cabinets with two locknuts where required by *NFPA 70*, where insulating bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, a single locknut and bushing may be used. Thread-less fittings for electrical metallic tubing shall be of a type approved for the conditions encountered. Additional support for horizontal runs is not required when EMT rests on steel stud cutouts.

14.4.10 **Motors.** Motors above 1/2 horsepower shall be three-phase. 1/2 horsepower and smaller motors may be rated at 115 volts single phase. Provide protection against single phasing when a phase loss occurs for all three phase motors. Provide high efficiency motors for those motors operating over 750 hours per year or as directed by the UFCs. Unless otherwise specified, all motors shall be continuous-duty classification based on a 40 degree C ambient temperature reference. Polyphase motors shall be squirrel-cage type, having normal-starting-torque and low-starting current characteristics, unless other characteristics are specified in other sections of these specifications or shown on contract drawings. The Contractor shall be responsible for selecting the actual horsepower ratings and other motor requirements necessary for the applications indicated. When electrically driven equipment furnished under other sections of these specifications materially differs from the design, the Contractor shall make the

necessary adjustments to the wiring, disconnect devices and branch-circuit protection to accommodate the equipment actually installed.

14.4.11 **Motor Control.** Each motor or group of motors requiring a single control and not controlled from a motor-control center shall be provided with a suitable controller and devices that will perform the functions as specified for the respective motors. Each motor of 1/8 hp or larger shall be provided with thermal-overload protection. Polyphase motors shall have overload protection in each ungrounded conductor. The overload-protection device shall be provided either integral with the motor or controller, or shall be mounted in a separate enclosure. Unless otherwise specified, the protective device shall be of the manually reset type. Single or double pole tumbler switches specifically designed for alternating-current operation only may be used as manual controllers for single-phase motors having a current rating not in excess of 80 percent of the switch rating. Automatic control devices such as thermostats, float or pressure switches may control the starting and stopping of motors directly, provided the devices used are designed for that purpose and have an adequate horsepower rating. When the automatic-control device does not have such a rating, a magnetic starter shall be used, with the automatic-control device actuating the pilot-control circuit. When combination manual and automatic control is specified and the automatic-control device operates the motor directly, a double-throw, three position tumbler or rotary switch shall be provided for the manual control; when the automatic-control device actuates the pilot control circuit of the magnetic starter, the latter shall be provided with a three-position selector switch marked MANUAL-OFF-AUTOMATIC. Connections to the selector switch shall be such that only the normal automatic regulatory control devices will be bypassed when the switch is in the Manual position; all safety control devices, such as low- or high-pressure cutouts, high-temperature cutouts, and motor-overload protective devices, shall be connected in the motor-control circuit in both the Manual and the Automatic positions of the selector switch. Control circuit connections to any MANUAL-OFF-AUTOMATIC switch or to more than one automatic regulatory control device shall be made in accordance with wiring diagram approved by the Contracting Officer unless such diagram is included on the drawings. All controls shall be 120 volts or less unless otherwise indicated.

14.4.12 **Branch Circuits, Receptacles and Outlets.** All general receptacle and lighting circuits shall be 20-ampere circuits, minimum, fed by 20-ampere circuit breakers, minimum. Provide dedicated branch circuits required by this RFP, the UFCs and the *NEC*. Receptacles on opposite sides of common walls shall be horizontally offset.

14.4.12.1 **Separate Circuits.** Lighting and receptacles shall be on separate branch circuits.

14.4.12.2 **Receptacles.** Receptacles shall be provided in accordance with UFCs and Room by Room Criteria requirements of Section 01 10 11. Select color and wall plate to coordinate with room finishes. Provide receptacles to serve all user equipment including but not limited to printers, copiers, fax machines etc. All receptacles shall have a label on device plate with circuit and panel designations. The density of receptacles per circuit shall take into account the expected quantity of large loads to avoid overloading of branch circuits.

14.4.12.3 **Ground Fault Current Interrupting (GFCI) Receptacles.** GFCI receptacles shall be provided as required by the *NFPA 70*, and within 6' of each sink or wet basin. Provide at least one GFCI receptacle in each restroom, janitor's closet and exterior near entrances. Provide GFCI receptacles in mechancial equipment yard. Except as otherwise noted, receptacles that are required to have ground-fault protection may either be fed by a ground fault interrupting circuit breaker or have integral ground fault trip.

14.4.12.4 **Telecommunication Room Receptacles.** Provide 120 volt, 20-amp duplex convenience receptacles in each telecommunications room at a minimum of 6 ft intervals around the perimeter walls. Convenience receptacles in the telecommunications room shall be provided such that there are at least two circuits for convenience outlets in this room and no more than two or three receptacles on one circuit. Provide a dedicated 20-amp circuit and a quadraplex receptacle for each 19 in rack or cabinet. In addition, provide one twistlock type receptacle (208v, single phase) fed from a 30-amp circuit, located above every data/voice rack or future rack location. Label each outlet with its respective circuit breaker number.

14.4.13 **Equipment Power.** Provide hard-wired dedicated circuits for power equipment or receptacles adjacent to equipment, as required by applicable sections of *NFPA 70* and/or the equipment manufacturer, to serve equipment listed herein and in other narrative paragraphs that form a part of this RFP.

14.4.14 **Surge Protection.** The facility power supply system shall include a complete surge protection system. The system shall consist of surge protection devices installed in Main Switchboard, MCC, Distribution panels as per *UFC 3-520-01* and to dedicated telecommunication/computer panels.

14.4.15 **Grounding.** Provide a separate, green, insulated ground conductor for all branch circuits or feeders. Connect ground wire to ground bus in panel, outlet box, and grounding terminal on outlet.

14.4.15.1 **Electrostatic Distribution (ESD).** Provide a grounding busbar inside Room 106 connected to main building ground. Grounding busbar shall serve as the grounding point connection for ESD equipment/furniture. Grounding system installation shall be in accordance with NFPA 70.

14.4.16 **Interior Lighting.** Lighting fixtures shall be provided for all rooms, corridors and interior areas. All lighting fixtures used shall be LED type. The lighting design shall meet the requirements of *UFC 3-530-01*, *UFC 4-730-10*, the Room by Room Criteria sheets of Section 01 10 11 and these specifications. The fixture types and specifics spelled out in the notes of the Room-by-Room Lighting Summary Table in paragraph 14.3.17.2 “Lighting Illumination Levels” are to be interpreted as taking precedence over fixtures called out in *UFC 4-730-10*. The color temperature for LED fixtures shall be 3500K and have a CRI of 86 or better. In offices, corridors, common spaces, lobbies and/or higher finish areas, utilize architectural fixtures such as direct\indirect pendants or volumetric troffers, down lights, track lights or accent sconces as appropriate for the space.

14.4.16.1 **Light Fixture Quality.** All light fixtures and their components shall be "specification-grade" or better, painted after fabrication.

14.4.16.2 **Lighting Illumination Levels.** Lighting for the facility shall be designed per the Room-by-Room Lighting Summary Table below, UFC, and the *IES Lighting Handbook*. Where conflicting lighting intensity levels are given between documents, follow the light level specified in the Room-by-Room Lighting Summary Table first, *UFC 3-530-01* second, and then the light level specified in the *IES Lighting Handbook* third. Provide detailed lighting calculations with average foot-candle levels in every room. The table below is a summary of the major spaces with lighting requirement.

Room-by-Room Lighting Summary Table

Space Name	**FC**	**Comments**
Corridors	5	
Stairways	10	Note 1
Electrical/Mechanical Room	20	
Lounge Areas	15	
Storage	10	
Telecommunication Room	50	
Office	30	Note 1
Open Office	30	Note 1
Conference Room	30	

Note 1: Provide room with occupancy sensors. See also paragraphs 14.4.16.10 "Lighting Control" and 14.4.16.11 "Occupancy Sensors."

14.4.16.3 **Fixture Installation.** Install fixtures in such a manner that illumination is not obstructed and is suitable for the finished area. Provide the initial installation of lamps throughout, so that at the date of formal acceptance of the work, all fixtures and lamps are functional.

14.4.16.4 **Fixture Selection Considerations.** The fixtures selected shall meet requirements as stated in the Room-By-Room Lighting Summary Table and the UFCs. Lighting fixtures shall not be provided with receptacles. In bathrooms, provide adequate light at the mirror and within water closets compartments. Provide industrial LED fixtures with protective wire grills and 8 to 15 percent up-

light for rooms where the ceiling is exposed to the roof (Mechanical and Electrical Rooms). See Section 01 10 11 for additional description.

14.4.16.5 **Pendant Mounted Fixtures.** Pendant mounted fixtures shall be mounted such that bottom of fixture is 8' minimum above finished floor. Fixtures shall not be supported from the underside of the roof deck, but rather beams, joists or other structural supports.

14.4.16.6 **LED Fixtures.** Fixtures shall have drivers which are compatible with the specified type and rating of LED indicated and shall comply with applicable provisions of the publications referenced. LED fixtures shall meet the requirements as stated in *UFC 3-530-01*.

14.4.16.7 **Exit and Emergency Lighting.** Provide exit and emergency lighting in accordance with the requirements of *NFPA 101* and *NFPA 70* in all areas. Provide battery backup for a minimum of 90 minutes for exit and emergency lighting fixtures. Exit lighting fixtures shall use a light emitting diode (LED) light source and shall be red color. The exit and emergency lighting shall meet requirements as stated in *UFC 3-530- 01*.

14.4.16.8 **Lighting Circuiting Requirements.** Lighting circuits shall not be loaded above 12 amps. This is to allow for future modifications/additions while staying under 16 amp maximum branch circuit continuous lighting loading. Each circuit shall have its own neutral. No shared neutrals shall be used.

14.4.16.9 **Light Fixture Sources.** Provide labeling on each fixture with lamp type, wattage, manufacturers name, mailing address and phone number for obtaining of replacement parts.

14.4.16.10 **Lighting Control.** Control switches or manual overrides for general room lighting shall be located at room entrances for all locations. Each room or distinct functional area within each room shall be individually switched. Provide three and four way switching for rooms with multiple entrances. Use of daylight photocell sensors is required in areas where applicable.

14.4.16.11 **Occupancy Sensors.** Occupancy sensors are required in the open offices. Provide manual overrides for all occupancy sensor locations in coordination with paragraph 14.3.18.12 "Lighting Control" above.

14.4.17 **Seismic Considerations.** Provide seismic bracing or restraints for electrical equipment (transformers, lighting fixtures, etc.) in accordance with the requirements of this RFP and *TI 809-04*, and per specification Section 26 05 48.00 10, Seismic Protection for Electrical Equipment. Seismic drawings and calculations shall be stamped and signed by a Registered Professional Structural Engineer.

14.4.18 **Device Body and Coverplate Colors and Labeling.** Device bodies and coverplates for wall switches and power and communications outlets shall be a color which harmonizes with the room in which they are located. All devices in the same room shall be the same color, unless otherwise noted or required. Label all junction boxes showing all the panel and circuit numbers for conductors

contained in junction box. Use a printed label in finished areas and a marker in unfinished areas.

14.4.19 **Bonding.** All metallic conductive parts including steel structures, heating, ventilating, and air conditioning (HVAC) ducts, process, media delivery systems, utility ducts and electrical conduits shall be bonded at separation joints throughout the length of the system to assure grounding continuity and safety of personnel from accidental contact. All external metallic penetrations such as electrical conduits, ducting and steam lines shall be bonded to the building grounding system.

14.4.20 **Fire Alarm.** See Paragraph 15 “Fire Alarm and Mass Notification Systems.”

15. FIRE ALARM AND MASS NOTIFICATION SYSTEMS

15.1 **REFERENCES.** See Section 4.14.

15.2 **FIRE ALARM EQUIPMENT.** Provide a combined Fire Alarm/Mass Notification Control Panel, compliant with UFC. Locate it in electrical room or elsewhere in consultation and coordination with Fire Marshall. New Fire Alarm and Mass Notification System shall be compatible with the existing Nellis AFB Fire Station's central fire receiving system. Provide a Knox Box, installed at Fire Department business entrance. The box shall be installed so that it may be seen from the street or parking lot. Provide a tamper switch on the transmitter housing and Fire Alarm Control Panel which will transmit a Monaco Tamper Message when the switch is tripped. Provide lightning protection as recommended by fire alarm equipment supplier. Each transmitter and interface device shall be the manufacturer's current commercial product completely assembled, wired, tested at the factory and delivered ready for installation and operation.

15.3 **INTERFACE TO EXISTING FIRE ALARM REPORTING SYSTEM:** The tranceiver for this building must have the capability for point to point communication to base dispatch utilizing Monaco communication protocol. Monaco MAAP-X panels have a combination of FACP, MNS, BTXM type transceiver in an all in on package which is the base preferred option.

15.4 **FIRE ALARM SYSTEM.** Provide a fully operational addressable (with built in intelligence) fire alarm control panel (FACP) and fire alarm system that is solid state microprocessor-based, and in strict accordance with *NFPA 72*. Locate the FACP in the electrical room and/or at a location as required by Fire Marshall. The system shall include not only a FACP\MNS combination panel but also radio transmitter, power supplies, initiating devices, notification appliances, conduit, wire, fittings, and all accessories required to provide a complete operating system. Combination FACP/MNS is meant not only to alert local people but also send signal over existing fiber optic infrastructure to Nellis AFB Fire Station. The complete Fire Alarm System shall be the product of only one manufacturer. The FACP shall provide dynamic supervision of system electronics, wiring, manual pull stations, smoke detectors, software, and other detection devices. The FACP shall be capable of measuring and adjusting the sensitivity of detectors from the FACP.

15.4.1 An alphanumeric display shall be provided to display custom messages and give readings of detector sensitivity, detector by detector. The FACP shall have the ability to perform multiple operations at the same time. These operations shall include but not be limited to timed functions and multiple configured sequences. Provide main fire alarm control panel with the local capacity to accept the total number of analog/digital inputs and signaling line circuits. Provide additional fire alarm local processors as required. The number of signaling line circuits and indicating appliance circuits required for the initiating and indicating devices shown on the plans shall be determined by the manufacturer's limit of devices per circuit. The contractor shall not exceed the maximum resistance and capacitance values specified by the manufacturer for each signaling device circuit or indicating appliance circuit.

15.4.2 Each device on a signaling line circuit shall be checked continuously to include the following: sensitivity, response, opens, shorts, ground faults, functionality and status. Provide a 20% spare capacity for future modifications. Combined FACP/transceiver shall be provided with a 24 volt D.C. battery backup & re-charging system sized to meet system requirements in accordance with *NFPA 72*. FACP back-up battery shall be capable of operating the systm under quiescent load for a minimum of 48 hours and then shall be capable of operating the system during a fire or other emergency condition for a period of 10 minutes at maximum connected load. Spare parts shall be distributor stocked within 90 miles. Provide separate power branch circuits for the fire alarm control panel/transceiver, including the appropriate conduit, wires, dedicated circuit breakers, and ground wiring. Label each branch circuit at the panel board as Fire Alarm Control Panel/Transceiver respectively.

15.4.3 **Initiating and Indicating Circuits.** Required detectors shall be installed in accordance with *NFPA 72*. Any required smoke detectors provided shall be photoelectric. Provide supervision of water flow switch(es) to annunciate a general building alarm upon a sprinkler system activation. Provide supervised circuits for the tamper switches of the Post Indicator Valves and OS&Y shut-off valves to annunciate a trouble condition if the shut-off valves are in the closed position. Provide duct smoke detectors in main return air ducts and in main supply air ducts of the building HVAC systems, where duct air flows are above levels stipulated in the *NFPA 72*. Duct smoke detectors shall be addressable and 100% compatible with the FACP.

15.4.3.1 Provide control interlocking circuits via the duct detectors to shut down the air handler motor starter. Wherever required, HVAC interlocks shall be provided in fire alarm control panel to shutdown selected ventilation equipment upon alarm activation. Provide indicating circuits with sufficient number of combination alarm audible & visual or visual-only indicating appliances within building to notify all occupants upon alarm. All interior audio speakers shall conform to the applicable requirements of *UL 464* and *UL 1480*, and shall generate a unique audible sound from other devices provided in the building and surrounding area.

15.4.3.2 The fire alarm system shall use the MNS system for notifications. Speaker installation shall comply with paragraph 4-6 of *UFC 4-021-01* to provide acceptable sound quality in large or noisy areas. Speakers shall incorporate a high efficiency speaker for maximum output at minimum power across a frequency range of 400Hz to 4000Hz. Speakers used in exterior locations shall be specifically listed or approved for outdoor use and be provided with metal housing and protective grills. A weather-proof alarm speaker shall be located on the wall outside of each sprinkler riser room.

15.4.3.3 Zone alarm shall indicate appliance circuits separately to aid troubleshooting. Each fire alarm initiation and signaling circuit shall be Class A. Each fire alarm notification circuit shall be Class B. All fire alarm initiation devices shall be on Class A for initiating device circuits and for signaling line circuits. Wiring for signaling line circuits shall be minimum #16 AWG twisted pair with shielded jacket per *NFPA 72*. Indicating appliance circuits for combination audible speaker & visual strobes or visual strobes-only notification appliances shall be Class B, , #14 AWG minimum. Fire alarm visual strobes shall be ABA rated, clear

color, marked “Fire,” one to three Hertz flash rate, and candela output in conformance with the guidance in Section 18.5 of *NFPA 72*. Conduit for all fire alarm system shall be minimum ¾ inch. All applicable cables shall be per the transceiver or FACP manufacturer's recommendations. All conduits in rooms with finished ceilings shall be installed concealed above acoustical ceiling or in walls. Conduit in areas without finished ceilings may be exposed. Sprinkler water flow switch alarm and PIV tamper switch shall be required to be distinguished by device type, and a room number for water flow switch only.

15.4.4 **User Coordination.** Contractor shall closely coordinate with the User on the installation of Fire Alarm System smoke detectors throughout the facility to include all necessary audible/visual signals to the satisfaction of Fire Marshall or Fire Chief. Design-build contractor shall closely coordinate the locations of Audible/Visual signals with the User so that future arrangements of the demountable partitions shall provide adequate signal coverage.

15.4.5 **Annunciator Panel.** Provide an annunciator panel (non graphic), collocated with the Fire Alarm/MNS panel.

15.4.6 **Minimum Designer Qualifications.** Design of fire alarm system shall be done by a registered National Institute for Certification in Engineering Technologies (NICET) Level 4 Designer, with at least 3 years of current and applicable experience in similar designs. The design drawings must bear the Designer's NICET Level 4 Certification and signature.

15.4.7 **Submittals.** Fire alarm system submittals shall include spare parts data, and battery, charger and voltage drop calculations for the fire alarm system. Submittals shall include detail drawings and instructions for the fire alarm reporting system. Submittals shall also include Fire Alarm and MNS Operations Matrix and battery back-up calculations. Drawings shall include but are not limited to the system’s riser diagram, device layout and point-to-point wiring. Submittals shall include detailed test procedures, submitted 60 days prior to performing system tests. Test reports in booklet form showing all field tests performed to prove compliance with the specified performance criteria, upon completion and testing of the installed system, shall be submitted. Each test report shall document all readings, test results and indicate the final position of controls. All submittals shall be signed and stamped by the qualified fire alarm system installer.

15.4.8 **Testing.** The Contractor shall notify the Contracting Officer 30 days before the preliminary and acceptance tests are to be conducted. The tests shall be performed in accordance with the approved test procedures in the presence of the Contracting Officer. The control panel manufacturer's representative shall be present to supervise all tests. The Contractor shall furnish all instruments and personnel required for the tests.

15.4.8.1 **Preliminary Tests.** Upon completion of the installation, the system shall be subjected to functional and operational performance tests including tests of each installed initiating and notification appliance. Tests shall include the meggering of all system conductors to determine that the system is free from grounded, shorted, or open circuits. The megger test shall be conducted prior to the

installation of fire alarm equipment. If deficiencies are found, corrections shall be made and the system shall be retested to assure that it is functional.

15.4.8.2 **Acceptance Test.** Testing shall be in accordance with *NFPA 72H*. The recommended tests in *NFPA 72H* shall be considered mandatory and shall verify that all previous deficiencies have been corrected. The test shall include but are not limited to the following:

a. Test of each function of the control panel.

b. Test of each circuit in both trouble and normal modes.

c. Tests of alarm initiating devices in both normal and trouble conditions.

d. Tests of each control circuit and device.

e. Tests of each alarm notification appliance.

f. Tests of the battery charger and batteries.

g. Complete operational tests under emergency power supply.

h. Visual inspection of all wiring connections.

i. Opening the circuit at each alarm initiating device and notification appliance to test the wiring supervisory feature.

j. Ground fault

k. Short circuit faults

l. Stray voltage

m. Loop resistance

n. Intelligibility testing of the system shall be accomplished in accordance with *NFPA 72* for Voice Evacuation Systems, *IEC 60268-16* and *ASA S3.2*.

15.4.9 **Field Training.** Provide field training course (minimum 8 hours) in operation and maintenance of the fire alarm system for Nellis AFB Fire personnel as stipulated by Contracting Officer.

15.4.10 **Fire Alarm Reporting Zones and Zone Schedule.** As a minimum, provide separate dedicated fire alarm zones for: 1 zone for each water flow switch, 1 zone for Post Indicator Valve (PIV) supervisory switch, 1 zone for OS&Y valves in riser room, 1 zone for all duct smoke detectors. Each of the above distinct zones shall be reported to the Fire Department. Confirm zone schedule defined herein with the Fire Department and modify to comply with Fire Department directions as necessary.

15.4.11 **Closure of Fire-Rated Openings.** If any fire-rated openings exist in any facilities, then provide interlocks between the FACP and all “fire-rated openings” to automatically close them upon the FACP going into an ALARM condition, as required.

15.4.12 **Smoke Damper Detectors.** Smoke dampers shall close upon activation of detection device as required by *NFPA 72* and as acceptable to the base Fire Marshall.

15.4.13 **Fire Alarm and Detection System Authority Having Jurisdiction.** The Authority Having Jurisdiction (AHJ) for the fire alarm and detection systems designed and installed for this project is the Nellis AFB Fire Marshall. The fire alarm system design drawings and specifications shall be submitted to the Fire Marshall for review and approval. Submittal shall be through the Contracting Officer.

15.4.14 **Fire Alarm System Disconnecting Means.** A dedicated circuit shall feed the fire alarm system and shall be provided with a clearly marked circuit breaker.

15.5 **MASS NOTIFICATION SYSTEM.** The entire facility shall receive a Mass Notification System (MNS) in accordance with *UFC 4-021-01*. Collocate mass notification system control panel with fire alarm control panel equipment in electrical room only when approved by the Nellis AFB Fire Marshall. LOC shall be located near MNS panel. Combine functionality of both systems in one panel if possible. Mass Notification System shall be wired Class B per *NFPA 72*. Mass Notification System strobes shall be color amber and labeled “ALERT”. Operating mass notification audible signals shall take precedence over and mute audible signals from the fire alarm system and also from the local audio system. Coordinate preferred type of mass notification system with Nellis AFB through the Contracting Officer.

16. BUILDING SECURITY SYSTEM

16.1 **GENERAL.** All security systems shall have primary monitoring and control from the Comm. Room. All security cabling shall be placed in conduit and shall be routed to the appropriate security panel. All security panels shall be placed in the telecommunications room. See Section 01 10 11 for descriptions of equipment types.

16.2 **INTRUSION DETECTION SYSTEM (IDS).** There is no requirement for an intrusion detection system.

16.3 **ELECTRONIC ACCESS CONTROL SYSTEM (ACS)**. Provide new Access Control System (ACS) keypad at entry doors, Comm. Rooms, and SIPR Room. ACS keypad shall be 8-bit burst compatible. Provide raceways and power support for ACS equipment only. Wiring shall be done by the Installer. ACS wiring and devices shall be Government furnished, Government installed (GFGI). Installation shall be coordinated with the Installer during design.

17. TELECOMMUNICATIONS DESIGN

17.1 **REFERENCES.** See Section 4.14.

17.2 **COMMUNICATIONS SYSTEMS ENGINEERING.** Communications Systems Engineering and Design shall be performed by a BICSI Registered Communications Distribution Designer (RCDD). The shop drawings shall be Stamped and Signed by the RCDD certifying compliance with the applicable EIA/TIA standards as required.

17.2.1 The RCDD shall design the Building Telecommunication Cabling System (BTCS) for this facility. The designed system shall be a Certified Structured Cabling System with a minimum of 15 years of product, application, and performance assurance warranty similar to Panduit or Hubbell Certified Warranties. The Building Telecommunication Cabling System shall consist of, but not limited to, cable, outlets, terminal blocks, backboards and patch panels for voice and data networks. The Building Telecommunication Cabling System shall include copper cables. The outlet at each workstation shall include connectors for both voice and data terminals. All work area outlets provided shall be 4-port modular type with two voice and two data cables terminated on RJ-45 modular jacks, unless otherwise noted. The voice and data connections shall be identical and interchangeable in all aspects. One 4-pair Category 6 rated or higher UTP cable shall serve every voice or data jack. UTP cables shall be terminated in a new rack located in the Telecom room on modular patch panels.

17.2.2 See paragraph 14.1 “General” regarding coordination of various applicable telecommunications requirements, including the relocation of an existing wall-mounted rack, a new rack, fiber backbone cable, new fusion splicing and patch panels.

17.2.3 **Premises Distribution System (PDS)**. The RCDD shall design the PDS for this facility. All connections shall be rated Category 6 or higher. The Communications Systems Engineer (CSE) shall insure that all UTP outlet jacks and terminations are rated at the same category or higher as the connected cable. Voice backbone cable shall be terminated on insulation displacement connectors on the back of new or existing wall-mounted rack mounted modular 110-type patch panels. All communications cables shall be routed in cable trays and shall be plenum rated. All terminations shall be performed by Contractor, not by Installation IT technicians.

17.3 **TELEPHONE AND DATA SYSTEM.** Provide *EIA/TIA-568B* Category 6 type (8p8c) telephone and data modular jack assemblies in each room as required. See *UFC 4-730-10* for location requirements. The system shall be installed in accordance with EIA/TIA criteria as a complete system, including raceway, conduit cable, connection and termination devices and equipment racks.

17.4 **BUILDING TELECOMMUNICATIONS BACKBONE SYSTEM.** The multipair copper backbone will be terminated on 110 style blocks and patch panels for cross connection in the originating telecommunications space and terminated on rack mounted patch panels at the destination telecommunications space(s), one

pair per port. The copper UTP backbone cabling will be sized in accordance with *UFC 3-580-01*.

17.5 **TELECOMMUNICATIONS SERVICE.** The existing telecommunications service from the outside plant is both fiber optic and copper and both shall remain.

17.5.1 **Telephone Terminal Backboards (TTB).** At least one large wall shall be covered with rigidly fixed 3/4 inch A-C grade plywood, void free, 8 ft high, capable of supporting attached equipment. Plywood must be fire-rated. Do not paint the manufacturers “Fire-treated” stamp. Provide power receptacles as specified in paragraph 14 “Electrical Design.”

17.5.2 **Connecting Patch Panels.** Provide rack-mounted Category 6 rated (jack pin configuration T568A) modular patch panels in the new rack. Provide quantity as required to terminate all the Category 6 unshielded twisted pair (UTP) work area outlet cables and fiber cables plus 20% spare.

17.5.3 **Cable Tray.** Provide cable tray throughout the building for installing data/voice drops in accordance with *UFC 3-580-01*. In general, cable tray shall be extended from new telecommunication room above corridor ceilings throughout the facility.

17.5.4 **Communications Conduit and Outlet Boxes.** All work area outlets will be served with a minimum 1-inch conduit from the cable tray to the outlet box. All communications conduits shall comply with *NFPA 70* guidelines for bends and fill ratios. Outlet boxes will be 4-11/16” sq x 2-1/2” deep with a single gang reducing ring. Mount outlet boxes at same height as adjacent power receptacles: 18-inches above finished floor or 6-inches above countertop, unless otherwise noted or directed by Owner.

17.5.5 **Data Rack.** Provide a new 19 inch wide equipment rack (for 19 inch-wide racked equipment) located in the center of new telecommunications room, only if existing relocated wall-mounted rack is deemed inadequate to service reconfigured facility. Rack shall be equipped with Category 6 (type T568A) voice and data patch panels. All Category 6 UTP data cables are to terminate on these devices. Furnish one (1) rack mounted copper equipment bonding kit, 1U in height, located at the top of each rack. All equipment bonding kits shall be connected to the Telecommunications Main Ground Bar (TMGB) via a #6 insulated ground conductor.

17.5.6 **Work Area Outlets and Jacks.** Work area outlets shall accept multiple modular 4-pair, 23 AWG, Category 6 UTP cables. All work area outlet labeling shall comply with *TIA/EIA 606-A-1* labeling standards. Typical work area outlets shall contain 2 data and 2 voice cables terminated on 8p8c modular jacks in rooms as required. Location of work area outlets shall follow the coordinated and/or anticipated equipment layout and outlets densities shall comply with *UFC 3-580-01*.

17.5.7 **Data Transmission Tests.** The Contractor shall notify the Contracting Officer a minimum of 21 days before the acceptance tests are to be conducted. The Category 6 data transmission system shall be tested to confirm that each Category 6 telephone & data cable & outlet will transmit data at the industry

standard rated capacity of 250 Mbps for Category 6 data transmissions per *TIA/EIA-568C*, using the basic link test configuration and level 2 accuracy. Contractor shall provide all necessary test equipment required to properly test the telephone & data cables & outlets.

17.5.8 **Copper Cable Entrance & Building Distribution Cable Tests.** Cable tests shall be performed with all cables in place. A Cable Status Certificate form shall be used to document cable tests. Testing shall be performed in accordance with *RUS Bulletin 1753F-201 (PC-4)* Standard for Acceptance Tests and Measurements of Telecommunications Plant and *TIA/EIA-568C* for attenuation, capacitance, and near-end crosstalk. All defective pairs, except those noted by the manufacturer in accordance with the applicable cable specifications, shall be repaired or replaced by the Contractor.

17.5.9 **Contractor Submittals.** The Contractor shall provide a complete shop drawing set including, but not limited to, the system's riser diagram, equipment and device layout, and sequence of operations.

17.5.10 **Other Considerations.** See paragraph 14.1 "General" regarding coordination of various applicable telecommunications requirements, including the relocation of an existing wall-mounted rack, a new rack, fiber backbone cable, new fusion splicing and patch panels.

17.6 **TESTING AND COMMISSIONING.** Test each system and subsystem in the presence of Contracting Officer and/or his designated Representative.

--End of Section--

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 10 11

FUNCTIONAL DESIGN CRITERA
ROOM BY ROOM REQUIREMENTS

1.1 This section defines the requirements of the project on an exterior space and room-by-room basis, in conjunction with Section 01 10 10 Specific Technical Engineering and Design Criteria. The Contractor is responsible for coordinating with the Using Agency, the Corps of Engineers, and Nellis AFB personnel to verify that the requirements are still valid and complete. The intent of this section is to clarify the functional requirements of the building and site for the offerors before the final design is complete; however, the Contractor is responsible for providing a complete design, and to construct a facility ready for operations.

Note: Areas listed are for conceptual design purposes only. Flexibility to alter room sizes is allowable, provided total square footage does not exceed amounts authorized by the 1391 programming document.

1.2 **ENVIRONMENTAL INTERIOR DESIGN.** The selection of finishes shall take environmentally sustainable attributes into consideration when selections are made. See UFC 1-200-02 for interior finish selection requirements. Consider products as much as possible that are closed-loop recyclable. At a minimum, the manufacturer's product shall contain a recovered materials preference program, to assure the use of recovered materials to the maximum extent possible without jeopardizing the intended use of the item. Products should meet or exceed the requirements of UFC 1-200-02, unless written justification is provided that a product is not available competitively within a reasonable time frame, does not meet appropriate performance standards, or is only available at an unreasonable price. See Section 01 10 10 for additional sustainability requirements.

1.3 **FINISH NOTICE.** Color/texture and finishes listed by manufacturer are suggestions to research only and are not intended to limit the selection to products of the manufacturers indicated. The selections named serve only to indicate the color and qualities which are minimum requirement guidelines, though several other materials may be appropriate. Finishes shall be durable, suitable for the function and area in which they are used, and aesthetically pleasing. Finishes will conform to Architectural and Interior Design Standards of Nellis AFB and the Air Force. Interior finishes can be found in drawings I-610, I-611 & I-612.

1.4 **ROOM NUMBERS.** The room numbers referred to in this document correlate to the room numbers indicated on the drawing sheets. The Contractor and their chosen design agent may renumber the rooms as appropriate during their design process.

1.5 **DESIGN OPTIONS**

1.5.1 There are no design options identified.

RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Lobby -100	Transition from exterior to interior areas.

Room Classification				
	Mission Critical Space		Size (SF):	
			79	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
Note 3	
Note 4	
Note 5	
Note 6	
Note 7	
Note 8	
Note 9	
Note 10	
Note 11	
Note 12	
Note 13	

RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Flight Chief-101	Provides space for private office for FSS/SC Flight Chief.

Room Classification				
	Mission Critical Space		Size (SF):	
			109	
	Non Critical Space	X	Occupants:	Level:
			1	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Client Service Center-102	Provides open office space in support of FSS/SC area function.

Room Classification			Size (SF):	
	Mission Critical Space		112	
	Non Critical Space	X	Occupants: 2	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Knowledge Ops-103	Provides open office space in support of FSS/SC area function.

Room Classification			Size (SF):	
	Mission Critical Space		296	
	Non Critical Space	X	Occupants:	Level:
			2	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Network System-104	Provides open office space in support of FSS/SC area function.

Room Classification			Size (SF):	
	Mission Critical Space		196	
	Non Critical Space	X	Occupants: 2	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
Special Equip & Power Req		Utilities		Security & TeleCom			
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Office Storage-105	Provides space for storage in support of AW/HC area function.

Room Classification			Size (SF):	
	Mission Critical Space		176	
	Non Critical Space	X	Occupants: 0	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Computer Maintenace & Workbench Equipment Storage-106	Provides space for office supply in support of AW/HC area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			729	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
	Emergency Lighting		
	Blue Warning System		
x	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold	x	Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Full height chain link fence with (2) 4 feet gates separating Main Storage and Comp. & Equipment Storage.
Note 2	Devices for FA/MNS shall be provided per Codes and Standards.
Note 3	Lighting fixtures shall be surface mounted.
Note 4	Space shall have Electrostatic Dissapitive Flooring throughout. Workbenches located in this room shall have grounding points.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Main Storage-107	Provides storage space in support of LRF area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			973	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Log Plans-108	Provides open office space in support of LRF area function.

Room Classification			Size (SF):	
	Mission Critical Space		181	
	Non Critical Space	X	Occupants: 2	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Material Management-109	Provides open office space in support of LRF area function.

Room Classification			Size (SF):	
	Mission Critical Space		139	
	Non Critical Space	X	Occupants: 1	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
Special Equip & Power Req		Utilities		Security & TeleCom			
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Readiness Officer-110	Provides space for private office for LRF Readiness Officer.

Room Classification			Size (SF):	
	Mission Critical Space		139	
	Non Critical Space	X	Occupants: 1	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Training Space-111	Provides space for meeting or training room.

Room Classification				
	Mission Critical Space		Size (SF):	
			211	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Communication Room-112	Provides space for communication equipment.

Room Classification			Size (SF):	
	Mission Critical Space		101	
	Non Critical Space	X	Occupants: 0	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
x	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
x	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
x	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold	x	Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes	x	See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be suspended from the ceiling.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Electrical Room-113	Provides space for electrical panels and equipment.

Room Classification				
	Mission Critical Space		Size (SF):	
			100	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
x	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
x	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Mechanical Room-114	Provides space for mechanical equipment.

Room Classification				
	Mission Critical Space		Size (SF):	
			161	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
x	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
x	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
x	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Mechanical Room-115	Provides space for mechanical equipment.

Room Classification				
	Mission Critical Space		Size (SF):	
			203	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
x	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
x	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
x	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Breakroom-116	Provides space where employees relax during breaks.

Room Classification				
	Mission Critical Space		Size (SF):	
			159	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Provide ten feet length of base cabinets with solid surface countertop and sink, and ten feet length of forty inches high upper cabinets.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Men Restroom-117	Provides restroom space for male personnel.

Room Classification				
	Mission Critical Space		Size (SF):	
			134	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Provide full height and full width mirror above sink counter backsplash.
Note 3	Provide additional recessed linear light above the mirrors per UFC 3-530-01.
Note 4	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Janitor-118	Provides space for janitorial equipment and supplies.

Room Classification				
	Mission Critical Space		Size (SF):	
			25	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
	Emergency Lighting		
	Blue Warning System		
x	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
Note 3	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Women Restroom-119	Provides restroom space for female personnel.

Room Classification				
	Mission Critical Space		Size (SF):	
			134	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
x	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Provide full height and full width mirror above sink counter backsplash.
Note 3	Provide additional recessed linear light above the mirrors per UFC 3-530-01.
Note 4	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Reception-120	Provides open office space in support of AW/HC area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			75	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Chaplain Assistant-121	Provides open office space in support of AW/HC area function.

Room Classification			Size (SF):	
	Mission Critical Space		102	
	Non Critical Space	X	Occupants: 2	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Senior Chaplain-122	Provides space for private office.

Room Classification			Size (SF):	
	Mission Critical Space		144	
	Non Critical Space	X	Occupants: 1	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Junior Chaplain-123	Provides space for private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			114	
	Non Critical Space	X	Occupants:	Level:
			1	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
Special Equip & Power Req		Utilities		Security & TeleCom			
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Counseling-124	Provides private room for counseling to accommodate a table and 4 seats.

Room Classification				
	Mission Critical Space		Size (SF):	
			88	
	Non Critical Space	X	Occupants:	Level:
			1	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
EEO Office-125	Provides space for private office.

Room Classification			Size (SF):	
	Mission Critical Space		198	
	Non Critical Space	X	Occupants: 1	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
EEO Office-126	Provides space for private office.

Room Classification			Size (SF):	
	Mission Critical Space		163	
	Non Critical Space	X	Occupants: 1	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Meeting Room-127	Provides space for meetings, a table and 4 seats.

Room Classification				
	Mission Critical Space		Size (SF):	
			190	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Senior Judge Advocate-128	Provides space for private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			217	
	Non Critical Space	X	Occupants:	Level:
			1	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Junior Judge Advocate-129	Provides space for private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			197	
	Non Critical Space	X	Occupants:	Level:
			1	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Parralegal & Storage-130	Provides open office space in support of AW/JA area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			145	
	Non Critical Space	X	Occupants:	Level:
			1	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Reception-131	Provides open office space in support of AW/JA area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			69	
	Non Critical Space	X	Occupants:	Level:
			1	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
Special Equip & Power Req		Utilities		Security & TeleCom			
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Stair-132	Existing space for vertical circulation.

Room Classification			Size (SF):	
	Mission Critical Space		147	
	Non Critical Space	X	Occupants: 0	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
x	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Demolish all handrails, guardrails, wallpaper, rubber tread/risers, floor tile, exposed conduit, etc.
Note 2	Devices for FA/MNS shall be provided per Codes and Standards.
Note 3	Guardrails and handrails shall be factory finish metal with concealed fasteners and have vertical pickets
Note 4	Modify stairs as required to meet current code.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Elevator-133	Provides space for elevator.

Room Classification				
	Mission Critical Space		Size (SF):	
			44	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Elevator Machine-134	Provides space for elevator machine.

Room Classification				
	Mission Critical Space		Size (SF):	
			33	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
x	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
x	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold	x	Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Display Area-135	Provides space for display areas.

Room Classification				
	Mission Critical Space		Size (SF):	
			41	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-136	Provides space for horizontal circulation.

Room Classification				
	Mission Critical Space		Size (SF):	
			120	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-137	Provides space for horizontal circulation.

Room Classification				
	Mission Critical Space		Size (SF):	
			1218	
	Non Critical Space	X	Occupants:	Level:
			0	First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Lobby -200	Transition from exterior to interior areas.

Room Classification				
	Mission Critical Space		Size (SF):	
			79	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Medical Records-201	Provides space for private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			307	
	Non Critical Space	X	Occupants:	Level:
			1	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Nurses-202	Provides open office space in support of AMDS area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			210	
	Non Critical Space	X	Occupants:	Level:
			2	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Physicians-203	Provides open office space in support of AMDS area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			175	
	Non Critical Space	X	Occupants:	Level:
			3	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Knowledge Ops-204	Provides open office space in support of AMDS area function.

Room Classification			Size (SF):	
	Mission Critical Space		132	
	Non Critical Space	X	Occupants: 1	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Unit Training Manager-205	Provides open office space in support of AMDS area function.

Room Classification			Size (SF):	
	Mission Critical Space		142	
	Non Critical Space	X	Occupants: 1	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Optometrist-206	Provides open office space in support of AMDS area function.

Room Classification			Size (SF):	
	Mission Critical Space		178	
	Non Critical Space	X	Occupants: 3	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Lab Techs-207	Provides open office space in support of AMDS area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			223	
	Non Critical Space	X	Occupants:	Level:
			2	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Dental Admin-208	Provides open office space in support of AMDS area function.

Room Classification			Size (SF):	
	Mission Critical Space		370	
	Non Critical Space	X	Occupants: 4	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Storage-209	Provides storage space in support of AMDS area function.

Room Classification				
	Mission Critical Space		Size (SF):	
			118	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Training Room-210	Provides space for large training room to accommodate 45 seats.

Room Classification			Size (SF):	
	Mission Critical Space		689	
	Non Critical Space	X	Occupants: 0	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Skills Lab-211	Provides space for laboratory work with movable partition between training room.

Room Classification			Size (SF):	
	Mission Critical Space		698	
	Non Critical Space	X	Occupants: 0	Level: First Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Communication Room-212	Provides space for communication equipment.

Room Classification				
	Mission Critical Space		Size (SF):	
			113	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
x	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
x	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
x	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold	x	Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes	x	See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Drain Condensate to perimeter wall
Note 2	Devices for FA/MNS shall be provided per Codes and Standards.
Note 3	Lighting fixtures shall be suspended from the ceiling.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Electrical Room-213	Provides space for electrical panels and equipment.

Room Classification				
	Mission Critical Space		Size (SF):	
			102	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
x	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Mechanical Room-214	Provides space for mechanical equipment.

Room Classification			Size (SF):	
	Mission Critical Space		194	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power	x	Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
x	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
x	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Exam Room-215	Provides space where employees get medical examination.

Room Classification				
	Mission Critical Space		Size (SF):	
			86	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Exam Room-216A	Provides space to accommodate dental chair, countertop with sink & 2 chairs.

Room Classification				
	Mission Critical Space		Size (SF):	
			71	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Exam Room-216B	Provides space to accommodate dental chair, countertop with sink & 2 chairs.

Room Classification				
	Mission Critical Space		Size (SF):	
			68	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Med Techs-217	Provides private office for 2 med techs.

Room Classification				
	Mission Critical Space		Size (SF):	
			190	
	Non Critical Space	X	Occupants:	Level:
			2	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Men Restroom-218	Provides restroom space for male personnel.

Room Classification				
	Mission Critical Space		Size (SF):	
			175	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Provide full height and full width mirror above sink counter backsplash.
Note 3	Provide additional recessed linear light above the mirrors per UFC 3-530-01.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Janitor-219	Provides space for janitorial equipment and supplies.

Room Classification			Size (SF):	
	Mission Critical Space		23	
	Non Critical Space	X	Occupants: 0	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
Special Equip & Power Req		Utilities		Security & TeleCom			
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
Note 3	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Women Restroom-220	Provides restroom space for female personnel.

Room Classification				
	Mission Critical Space		Size (SF):	
			178	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Provide full height and full width mirror above sink counter backsplash.
Note 3	Provide additional recessed linear light above the mirrors per UFC 3-530-01.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Commande Support Staff-221	Provides open office space in support of the AMDS Commander's Office.

Room Classification			Size (SF):	
	Mission Critical Space		350	
	Non Critical Space	X	Occupants: 4	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
Note 3	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Office Storage-222	Provides open office space in support of the Commader's Office.

Room Classification				
	Mission Critical Space		Size (SF):	
			35	
	Non Critical Space	X	Occupants:	Level:
				Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
Note 3	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Conference Room-223	Provides space to accommodate a table and 10 seats.

Room Classification				
	Mission Critical Space		Size (SF):	
			199	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Commander Office-224	Provides space for AMDS Commander's private office with 2 guest chairs.

Room Classification				
	Mission Critical Space		Size (SF):	
			154	
	Non Critical Space	X	Occupants:	Level:
			1	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
First Sergeant-225	Provides space for private office with 2 guest chairs.

Room Classification			Size (SF):	
	Mission Critical Space		143	
	Non Critical Space	X	Occupants: 1	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Superintendent-226	Provides space for private office with 2 guest chairs.

Room Classification				
	Mission Critical Space		Size (SF):	
			142	
	Non Critical Space	X	Occupants:	Level:
			1	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Commader's Reception-227	Provides open space for the receptionist area.

Room Classification			Size (SF):	
	Mission Critical Space		84	
	Non Critical Space	X	Occupants:	Level:
			1	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

		Lighting	Proximity Reqmts
		Pendant	SCIF
		x Recessed	Non-SCIF
		Wall Mounted	
		x Task Lighting	
		Explosion Protected	
		x Emergency Lighting	
		Blue Warning System	
		See Notes	See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Med Techs- 228	Provides open space for the Med Techs.

Room Classification				
	Mission Critical Space		Size (SF):	
			611	
	Non Critical Space	X	Occupants:	Level:
			8	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Stair-229	Existing space for vertical circulation.

Room Classification			Size (SF):	
	Mission Critical Space		159	
	Non Critical Space	X	Occupants: 0	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
x	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Demolish all handrails, guardrails, wallpaper, rubber tread/risers, floor tile, exposed conduit, etc.
Note 2	Devices for FA/MNS shall be provided per Codes and Standards.
Note 3	Guardrails and handrails shall be factory finish metal with concealed fasteners and have vertical pickets
Note 4	Modify stairs as required to meet current code.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Elevator-230	Provides space for elevator.

Room Classification				
	Mission Critical Space		Size (SF):	
			44	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-231	Provides space for horizontal circulation.

Room Classification				
	Mission Critical Space		Size (SF):	
			105	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
Special Equip & Power Req			Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-232	Provides space for horizontal circulation.

Room Classification			Size (SF):	
	Mission Critical Space		884	
	Non Critical Space	X	Occupants: 0	Level: Second Floor

Room Condition:

	Temp Required		Humidity Required:	
	Summer Setpoint(F	75	Max	60%
	Winter Setpoint(F	68	Min	40%
	Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements

Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-233	Provides space for horizontal circulation.

Room Classification			Size (SF):	
	Mission Critical Space		205	
	Non Critical Space	X	Occupants: 0	Level: Second Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Lobby -300	Transition from exterior to interior areas.

Room Classification				
	Mission Critical Space		Size (SF):	
			81	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Flight Chief-301	Provides open office space in support of AMXS area function.

Room Classification			Size (SF):	
	Mission Critical Space		511	
	Non Critical Space	X	Occupants: 6	Level: Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
Special Equip & Power Req		Utilities		Security & TeleCom			
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Training Room-302	Provides space to accommodate 30 seats with mobile furniture.

Room Classification				
	Mission Critical Space		Size (SF):	
			511	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Superintendent-303	Provides space to accommodate 30 seats with mobile furniture.

Room Classification				
	Mission Critical Space		Size (SF):	
			145	
	Non Critical Space	X	Occupants:	Level:
			1	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpoint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Current Ops - 304	Provides space for private office.

Room Classification				
	Mission Critical Space	x	Size (SF):	
			142	
	Non Critical Space		Occupants:	Level:
			3	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Deputy Commander-305	Provides space for private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			242	
	Non Critical Space	X	Occupants:	Level:
			1	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Commander (OG)-306	Provides space for private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			274	
	Non Critical Space	X	Occupants:	Level:
			1	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Executive Officer-307	Provides space for private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			101	
	Non Critical Space	X	Occupants:	Level:
			1	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Career Advisor-308	Provides open office space in support of OG area function.

Room Classification			Size (SF):	
	Mission Critical Space		86	
	Non Critical Space	X	Occupants: 1	Level: Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Commander's Support Staff-309	Provides open office space in support of OG area function.

Room Classification			Size (SF):	
	Mission Critical Space		490	
	Non Critical Space	X	Occupants: 3	Level: Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Conference Room-310	Provides space to accommodate a table and 15 seats.

Room Classification				
	Mission Critical Space		Size (SF):	
			401	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Unit Training Manager- 311	Provides open office space in support of AMXS area function.

Room Classification			Size (SF):	
	Mission Critical Space		97	
	Non Critical Space	X	Occupants: 1	Level: Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Storage-312	Provides enclosed space for storage.

Room Classification				
	Mission Critical Space		Size (SF):	
			93	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
Special Equip & Power Req		Utilities		Security & TeleCom			
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Communication Room-313	Provides space for communication equipment.

Room Classification				
	Mission Critical Space		Size (SF):	
			101	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
x	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
x	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
x	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold	x	Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Provide door with 5-button mechanical lock (cypher).
Note 2	Devices for FA/MNS shall be provided per Codes and Standards.
Note 3	Lighting fixtures shall be surface mounted.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Electrical Room-314	Provides space for electrical panels and equipment.

Room Classification				
	Mission Critical Space		Size (SF):	
			100	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
x	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
Note 3	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
SIPR/Intel-315	Provides space for SIPR and an Intel Office to accommodate 2 people within the SIPR.

Room Classification				
	Mission Critical Space	x	Size (SF):	
			467	
	Non Critical Space		Occupants:	Level:
			3	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer	x	SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold	x	Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes	x	See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Provide a separate HVAC unit
Note 2	Devices for FA/MNS shall be provided per Codes and Standards.
Note 3	
Note 4	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Breakroom-316	Provides space for employees to relax during breaks.

Room Classification				
	Mission Critical Space		Size (SF):	
			189	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Provide ten feet length of base cabinets with solid surface countertop and sink, and ten feet length of forty inches high upper cabinets.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Men Restroom-317	Provides restroom space for male personnel.

Room Classification				
	Mission Critical Space		Size (SF):	
			171	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Provide full height and full width mirror above sink counter backsplash.
Note 3	Provide additional recessed linear light above the mirrors per UFC 3-530-01.
Note 4	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Women Restroom-318	Provides restroom space for female personnel.

Room Classification				
	Mission Critical Space		Size (SF):	
			176	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
x	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Provide full height and full width mirror above sink counter backsplash.
Note 3	Provide additional recessed linear light above the mirrors per UFC 3-530-01.
Note 4	
Note 5	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Janitor-319	Provides space for janitorial equipment and supplies.

Room Classification				
	Mission Critical Space		Size (SF):	
			28	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
				x	See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle	x	Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage	x	Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles	x	Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	Lighting fixtures shall be surface mounted.
Note 3	
Note 4	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Maintenance Officer-320	Provides space foor private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			251	
	Non Critical Space	X	Occupants:	Level:
			2	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
Note 3	
Note 4	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Commander Support Staff-321	Provides open office space in support of the Commader's Office (AMXS).

Room Classification				
	Mission Critical Space		Size (SF):	
			353	
	Non Critical Space	X	Occupants:	Level:
			4	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
x	Recessed		Non-SCIF
	Wall Mounted		
x	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Commander (AMXS)-322	Provides space for private office.

Room Classification				
	Mission Critical Space		Size (SF):	
			169	
	Non Critical Space	X	Occupants:	Level:
			1	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
Note 2	
Note 3	
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
First Sergeant-323	Provides space for private office with 2 guest chairs.

Room Classification				
	Mission Critical Space		Size (SF):	
			142	
	Non Critical Space	X	Occupants:	Level:
			1	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Superintendent-324	Provides open office space in support of the AMXS area function.

Room Classification			Size (SF):	
	Mission Critical Space		398	
	Non Critical Space	X	Occupants: 3	Level: Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Computer Workstations-325	Provides open office space 6 minimum touchdown computer stations in support of AMXS area function.

Room Classification			Size (SF):	
	Mission Critical Space		327	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
NELLIS AFB

ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Shop Chief-326	Provides open space for the Shop Chief.

Room Classification			Size (SF):	
	Mission Critical Space		155	
	Non Critical Space	X	Occupants: 1	Level: Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
				x	Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Stair-327	Existing space for vertical circulation.

Room Classification			Size (SF):	
	Mission Critical Space		167	
	Non Critical Space	X	Occupants:	Level:
			0	Second Floor

Room Condition:

Temp Required		Humidity Required:	
Summer Setpoint(F	**75**	Max	60%
Winter Setpopint(F	**68**	Min	40%
Air Quality	ASHRAE 62.1		

	Lighting		Proximity Reqmts
	Pendant		SCIF
	Recessed		Non-SCIF
x	Wall Mounted		
	Task Lighting		
	Explosion Protected		
x	Emergency Lighting		
	Blue Warning System		
	See Notes		See Notes

	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements

Note 1	Demolish all handrails, guardrails, wallpaper, rubber tread/risers, floor tile, exposed conduit, etc.
Note 2	Devices for FA/MNS shall be provided per Codes and Standards.
Note 3	Guardrails and handrails shall be factory finish metal with concealed fasteners and have vertical pickets
Note 4	Modify stairs as required to meet current code.
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Elevator-328	Provides space for elevator.

Room Classification				
	Mission Critical Space		Size (SF):	
			44	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
					Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
					Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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ROOM DATA SHEET
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ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-329	Provides space for horizontal circulation.

Room Classification			Size (SF):	
	Mission Critical Space		88	
	Non Critical Space	X	Occupants: 0	Level: Third Floor

Room Condition:

	Temp Required		Humidity Required:	
	Summer Setpoint(F	75	Max	60%
	Winter Setpoint(F	68	Min	40%
	Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		EPO with alarmed cover
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment		Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
					Telephone		Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-330	Provides space for horizontal circulation.

Room Classification				
	Mission Critical Space		Size (SF):	
			752	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		Special Reqmts
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		x
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
							Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-331	Provides space for horizontal circulation.

Room Classification				
	Mission Critical Space		Size (SF):	
			215	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:			
Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
	Special Equip & Power Req		Utilities		Security & TeleCom		Special Reqmts
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		x
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
							Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements	
Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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RENOVATE BUILDING 332
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ROOM DATA SHEET
SPEC #2164

ROOM NAME AND NUMBER	ROOM FUNCTION
Corridor-332	Provides space for horizontal circulation.

Room Classification				
	Mission Critical Space		Size (SF):	
			169	
	Non Critical Space	X	Occupants:	Level:
			0	Third Floor

Room Condition:

Temp Required		Humidity Required:	
Summer Setpoint(F	75	Max	60%
Winter Setpopint(F	68	Min	40%
Air Quality	ASHRAE 62.1		

					Lighting		Proximity Reqmts
					Pendant		SCIF
				x	Recessed		Non-SCIF
					Wall Mounted		
					Task Lighting		
					Explosion Protected		
				x	Emergency Lighting		
					Blue Warning System		
					See Notes		See Notes
Special Equip & Power Req		Utilities		Security & TeleCom		Special Reqmts	
	208V Receptacle		Domestic Hot water		ACS (Card Reader)		x
	Low Voltage		Domestic Cold Water		ACS (Keypad)		Floor drains
	UPS Power		Chilled Water		IDS		No roof Drainage Thru Area
	Generator Power		Cooling Water Tower		CCTV		Liquid leak detection
	Special Purpose Receptacles		Sanitary Sewer		SIPR		SCADA
	Power Equipment	x	Heating Hot Water		Special Networks		Hydrogen Detection
	Surface Raceway or Plugmold		Condensate Drain from Fan Coil		Audio		Purge System
	Isolated Ground				Isolated Networks		Dedicated HVAC Systen
							Redundant (N+1)HVAC
	See Notes		See Notes		See Notes		See Notes

General Notes and Special Requirements

Note 1	Devices for FA/MNS shall be provided per Codes and Standards.
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SECTION 01 32 01

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02/15

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PROJECT SCHEDULE
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AACE INTERNATIONAL (AACE)

AACE 29R-03	(2011) Forensic Schedule Analysis
AACE 52R-06	(2006) Time Impact Analysis - As Applied in Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(1995) Administration -- Progress, Schedules, and Network Analysis Systems

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G

Bar Chart Schedule

Project Schedule; G

Design Package Schedule; G

Preliminary Project Schedule; G

Initial Project Schedule; G

Data Optical Discs

Periodic Schedule Update; G

Justification of Delay; G

Time Impact Analysis; G

Forensic Schedule Analysis; G

Schedule Status Report; G

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of 2-years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

PART 2 PRODUCTS

2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.

2.1.1 Government Default Software

The Government intends to use Primavera P6, Release 7.0. Save all files in the Primavera PM XER format.

2.1.2 Contractor Software

Use commercially available scheduling software with vendor software support agreements available. The software routine used to create the required SDEF file must be created and supported by the software manufacturer.

2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the XER export file in a version of P6 importable by the Government system.

2.1.2.2 Other Than Primavera

If the contractor chooses software other than Primavera P6, that is compliant with this specification, provide for the Government's use two licenses, two computers, and training for two Government employees in the use of the software. These computers will be stand-alone and not connected to Government network. Computers and licenses will be returned at project completion.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15, SCHEDULE FOR CONSTRUCTION CONTRACTS. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of design and construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Designers, subcontractors and

suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

3.1.1 Schedule Status Reports

Provide a Schedule Status Report on at least a monthly basis. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, take steps necessary to improve its progress including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

3.1.2 Default Terms

Failure of the Contractor to comply with the requirements of the Contracting Officer must be grounds for a determination, by the Contracting Officer, that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2 BASIS FOR PAYMENT AND COST LOADING

The approved Project Schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment. Lack of an approved schedule update, or qualified scheduling personnel, will result in the inability of the Contracting Officer to evaluate contract earned value for the purposes of payment. Failure to provide all required information will result in the disapproval of the preliminary, initial and subsequent schedule updates. The aggregate value of all activities coded to a contract Contract Line Item Schedule (CLIN) must equal the value of the CLIN.

3.2.1 Activity Cost Loading

Activity cost loading must be reasonable and without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.

3.2.2 Withholdings / Payment Rejection

Failure to meet the requirements of this specification may result in the disapproval of the preliminary, initial or periodic schedule updates and subsequent rejection of payment requests until compliance is met.

In the event that the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may withhold 10 percent of pay request amount from each payment period until such revisions to the project schedule have been made.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

3.3.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities must have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.3.3 Design and Permit Activities

Include design and permit activities with the necessary conferences and follow-up actions and design package submission dates. Include the design schedule in the project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. Provide at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Also include review and correction periods associated with each item.

3.3.4 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

3.3.5 Mandatory Tasks

Include the following activities/tasks in the initial project schedule and all updates.

a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).

b. Submission, review and acceptance of design packages.

c. Submission of mechanical/electrical/information systems layout drawings.

d. Long procurement activities

e. Submission and approval of O & M manuals.

f. Submission and approval of as-built drawings.

g. Submission and approval of DD1354 data and installed equipment lists.

h. Submission and approval of testing and air balance (TAB).

i. Submission of TAB specialist design review report.

j. Submission and approval of fire protection specialist.

k. Submission and approval of Building Commissioning Plan, test data, and reports: Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements. All tasks associated with all building testing and commissioning will be completed prior to submission of building commissioning report and subsequent contract completion.

l. Air and water balancing.

m. Building commissioning - Functional Performance Testing.

n. Controls testing plan submission.

o. Controls testing.

p. Performance Verification testing.

q. Other systems testing, if required.

r. Contractor's pre-final inspection.

s. Correction of punch list from Contractor's pre-final inspection.

t. Government's pre-final inspection.

u. Correction of punch list from Government's pre-final inspection.

v. Final inspection.

3.3.6 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: acceptance, design reviews, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements. Show Government approval of shop drawings activities with at least the minimum duration allowed by the contract. Failure to provide reasonable durations in the schedule for Government activities does not establish or change the Government's review or approval path periods and the durations established for Government's activities are subject to approval by the Contracting Officer.

Allow 30 calendar days total duration prior to current contract completion date for the following activities. Refer to specification Section 01 45 00 QUALITY CONTROL. Include and properly schedule the following critical tasks:

a. Submission of Contractor Quality Control (CQC) for all mechanical/electrical/information systems tests.

b. Government QA for all mechanical systems acceptance/operational tests.

c. Government QA for all electrical systems acceptance/operational tests.

d. CQC completion inspection of the entire project.

e. Contractor works off CQC punchlist.

f. Prefinal inspection performed when the facility is completed such that it can be used for it intended function, as determined by the Contracting Officer.

g. Contractor works off prefinal punchlist.

h. Final/acceptance inspection of the entire project.

i. Contractor works off final punchlist.

3.3.7 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. Develop and assign all Activity Codes must activities as detailed herein. A template SDEF compatible schedule backup file is available on the RMS CM web site: http://rms.usace.army.mil.

The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per day
2	RESP	4	Responsible party
3	AREA	4	Area of work
4	MODF	6	Modification Number
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of work
7	CATW	1	Category of work
8	FOW	20	Feature of work*
*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.			

3.3.7.1 Workers Per Day (WRKP)

Assign Workers per Day for all field construction or direct work activities, if directed by the Contracting Officer. Workers per day is based on the average number of workers expected each day to perform a task for the duration of that activity.

3.3.7.2 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity.

a. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.

b. Activities cannot have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE).

3.3.7.3 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities cannot have more than one Work Area Code.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

3.3.7.4 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer. Key all Code values to the Government's modification numbering system. An activity can have only one Modification Number Code.

3.3.7.5 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. An activity can have only one BIDI Code.

3.3.7.6 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are design phase, procurement phase, and construction phase. Each activity can have only one Phase of Work code.

a. Code proposed fast track design and construction phases proposed to allow filtering and organizing the schedule by fast track design and construction packages.

b. If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

3.3.7.7 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to design, design submittal, design reviews, review conferences, permits, construction submittals, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Each activity can have no more than one Category of Work Code.

3.3.7.8 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan.

Definable Feature of Work is defined in Section 01 45 00 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.3.8 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.

Mandatory constraints that ignore or effect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

3.3.8.1 Project Start Date Milestone and Constraint

The first activity in the project schedule must be a start milestone titled "NTP Executed," which must have a "Start On" constraint date equal to the date that the NTP is executed by the Contracting Officer.

3.3.8.2 End Project Finish Milestone and Constraint

The last activity in the schedule must be a finish milestone titled "End Project."

Constrain the project schedule to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.3.8.3 Interim Completion Dates and Constraints

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

3.3.8.3.1 Start Phase

Use a start milestone as the first activity for a project phase. Call the start milestone "Start Phase X" where "X" refers to the phase of work.

3.3.8.3.2 Design phase

See Section 01 33 16 Design After Award for all design phase.

3.3.8.3.3 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

3.3.9 Calendars

Schedule activities on a Calendar to which the activity logically belongs. Develop calendars to accommodate any contract defined work period such as a 7-day calendar for Government Acceptance activities, concrete cure times, etc. Develop the default Calendar to match the physical work plan with non-work periods identified including weekends and holidays. Develop seasonal Calendar(s) and assign to seasonally affected activities as applicable.

If an activity is weather sensitive, assign it to a calendar showing non-work days on a monthly basis, with the non-work days selected at random across the weeks of the calendar, using the anticipated days provided in the contract clause TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Assign non-work days over a seven-day week since weather records are compiled on seven-day weeks, which will cause some of the weather related non-work days to fall on weekends.

3.3.10 Open Ended Logic

Only two open ended activities are allowed: the first activity "NTP Executed" must have no predecessor logic, and the last activity -"End Project" must have no successor logic.

Predecessor open ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.

3.3.11 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.3.12 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. Address out of sequence progress or logic changes in the Narrative Report and in the periodic schedule update meetings.

3.3.13 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.3.14 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.

3.3.15 Leads, Lags, and Start to Finish Relationships

Lags must be reasonable as determined by the Government and not used in place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic.

a. Leads (negative lags) are prohibited.

b. Start to Finish (SF) relationships are prohibited.

3.3.16 Retained Logic

Schedule calculations must retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity(s) starts and the predecessor activity(s) has not finished (out-of-sequence progress). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") are not be allowed.

3.3.17 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

3.3.18 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

3.3.19 Cost Loading of Closeout Activities

Cost load the "Correction of punch list from Government pre-final inspection" activity(ies) not less than 1 percent of the present contract value. Activity(ies) may be declared 100 percent complete upon the Government's verification of completion and correction of all punch list work identified during Government pre-final inspection(s).

3.3.19.1 As-Built Drawings

If there is no separate contract line item (CLIN) for as-built drawings, cost load the "Submission and approval of as-built drawings" activity not

less than $35,000 or 1 percent of the present contract value, which ever is greater, up to $200,000. Activity will be declared 100 percent complete upon the Government's approval.

3.3.19.2 O & M Manuals

Cost load the "Submission and approval of O & M manuals" activity not less than $20,000. Activity will be declared 100 percent complete upon the Government's approval of all O & M manuals.

3.3.20 Anticipated Adverse Weather

Paragraph applicable to contracts with clause entitled TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Reflect the number of anticipated adverse weather delays allocated to a weather sensitive activity in the activity's calendar.

3.3.21 Early Completion Schedule and the Right to Finish Early

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed before the contractually required completion date.

a. No IPS indicating an Early Completion will be accepted without being fully resource-loaded (including crew sizes and manhours) and the Government agreeing that the schedule is reasonable and achievable.

b. The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

3.4 CONTRACTS WITH MULTIPLE BUILDINGS/FACILITIES

Prepare a separate detailed schedule for each building/facility indicating its critical path for specified interim completion dates or critical milestone date. The master schedule must indicate the interface/lag/link between buildings/facilities to maximize/level the labor and other resources. The master schedule critical path must be indicated through the various buildings/facilities and total duration equal to the contract duration.

3.5 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. Submit a bar chart schedule for the first 30 calendar days of the contract at the Preconstruction conference. The data Optical Disc, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

3.5.1 Preliminary Project Schedule Submission

Submit the Preliminary Project Schedule within 15 calendar days after the NTP is executed defining the planned operations detailed for the first 90

calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design packages, permitting activities, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI), Responsibility Code (RESP) and Feature of Work code (FOW).

3.5.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. Include in the design-build schedule detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences; permit submissions and any required Government actions; and long lead item acquisition prior to design completion. Also cover in the preliminary design-build schedule the entire construction effort with as much detail as is known at the time but, as a minimum, include all construction start and completion milestones, and detailed construction activities through the dry-in milestone, including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities concurrent with the monthly schedule updating process. Constrain construction activities by Government acceptance of associated designs. When the design is complete, incorporate into the then approved schedule update all remaining detailed construction activities that are planned to occur after the dry-in milestone. If applicable, include in the design-build schedule detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences, permit submissions and any required Government actions, and long lead item acquisition prior to design completion. Also cover in the preliminary design-build schedule the entire construction effort with as much detail as is known at the time but, as a minimum, include all construction start and completion milestones, and detailed construction activities through the dry-in milestone, including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities. No payment will be made for work items not fully detailed in the Project Schedule.

3.5.2.1 Design Package Schedule Submission

With each design package submitted to the Government, submit a fragnet

schedule extracted from the then current Preliminary, Initial or Updated schedule which covers the activities associated with that Design Package including construction, procurement and permitting activities.

3.5.3 Periodic Schedule Updates

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at the schedule update meetings as prescribed in the paragraph PERIODIC SCHEDULE UPDATE MEETINGS. These updates will enable the Government to assess Contractor's progress. Update the schedule to include detailed construction activities as the design progresses, but not later than the submission of the final un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission if such activity is authorized.

a. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting.

b. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish.

3.6 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.6.1 Data Optical Discs

Provide two sets of data optical discs containing the current project schedule and all previously submitted schedules in the format of the scheduling software (e.g. .xer). Also include on the data optical discs the Narrative Report and all required Schedule Reports. Label each optical disc indicating the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

3.6.2 Narrative Report

Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:

a. Identify and discuss the work scheduled to start in the next update period.

b. A description of activities along the two most critical paths where the total float is less than or equal to 20 work days.

c. A description of current and anticipated problem areas or delaying factors and their impact and an explanation of corrective actions taken or required to be taken.

d. Identify and explain why activities based on their calculated late dates should have either started or finished during the update period

but did not.

e. Identify and discuss all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. Include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.

f. Identify and discuss out-of-sequence work.

3.6.3 Schedule Reports

The format, filtering, organizing and sorting for each schedule report must be as directed by the Contracting Officer. Typically, reports contain Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in PDF format. Provide 5 set(s) of hardcopy reports. The following lists typical reports that will be requested:

3.6.3.1 Activity Report

List of all activities sorted according to activity number.

3.6.3.2 Logic Report

List of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.6.3.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.6.3.4 Earnings Report by CLIN

A compilation of the Total Earnings on the project from the NTP to the data date, which reflects the earnings of activities based on the agreements made in the schedule update meeting defined herein. Provided a complete schedule update has been furnished, this report serves as the basis of determining progress payments. Group activities by CLIN number and sort by activity number. Provide a total CLIN percent earned value, CLIN percent complete, and project percent complete. The printed report must contain the following for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Earnings to Date, Earnings this period, Total Quantity, Quantity to Date, and Percent Complete (based on cost).

3.6.3.5 Schedule Log

Provide a Scheduling/Leveling Report generated from the current project schedule being submitted.

3.6.4 Network Diagram

The Network Diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities

and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.6.4.1 Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.6.4.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.6.4.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

3.6.4.4 Banding

Organize activities using the WBS or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by major elements of work, category of work, work area and/or responsibility.

3.6.4.5 Cash Flow / Schedule Variance Control (SVC) Diagram

With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and 2) Earned Value to-date.

3.7 PERIODIC SCHEDULE UPDATE

3.7.1 Periodic Schedule Update Meetings

Conduct periodic schedule update meetings for the purpose of reviewing the proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Conduct meetings at least monthly within five days of the proposed schedule data date. Provide a computer with the scheduling software loaded and a projector which allows all meeting participants to view the proposed schedule during the meeting. The Contractor's authorized scheduler must organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or Government. The meeting is a working interactive exchange which allows the Government and Contractor the opportunity to review the updated schedule on a real time and interactive basis. The meeting will last no longer than 8 hours. Provide a draft of the proposed narrative report and schedule data file to the Government a minimum of two workdays in advance of the meeting. The Contractor's Project Manager and scheduler must attend the meeting with the authorized representative of the Contracting Officer. Superintendents, foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work. Following the periodic schedule update meeting, make corrections to the draft submission. Include only those changes approved by the Government in the submission and invoice for payment.

3.7.2 Update Submission Following Progress Meeting

Submit the complete Periodic Schedule Update of the Project Schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 work days after the periodic schedule update meeting.

3.8 WEEKLY PROGRESS MEETINGS

Conduct a weekly meeting with the Government (or as otherwise mutually agreed to) between the meetings described in paragraph entitled PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the weekly progress meeting, address the status of RFIs, RFPs and Submittals.

3.9 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.

3.9.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple impacts consider any concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and all future schedule updates upon approval by the Contracting Officer.

3.9.2 Submission Requirements

Submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request must be in accordance with the requirements of other appropriate Contract Clauses and must include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number. Identify activities impacted in each justification for change by a unique activity code contained in the required data file.

b. A brief explanation of the causes of the change.

c. An Time Impact Analysis of the overall impact of the changes proposed.

d. A Fragmentary Network of the affected area.

3.9.3 Time Impact Analysis (Prospective Analysis)

Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes may be incorporated into the schedule being used to justify the time impact.

3.9.4 Forensic Schedule Analysis (Retrospective Analysis)

Prepare an analysis for approval based on industry standard AACE 29R-03.

3.9.5 Fragmentary Network (Fragnet)

Prepare a proposed fragnet for time impact analysis consisting of a sequence of new activities that are proposed to be added to the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.

3.9.6 Time Extension

The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.9.7 Impact to Early Completion Schedule

No extended overhead will be paid for delay prior to the original Contract Completion Date for an Early Completion IPS unless the Contractor actually performed work in accordance with that Early Completion Schedule. The Contractor must show that an early completion was achievable had it not been for the impact..

3.10 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

3.10.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to,

revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

3.10.2 Failure to Perform

Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and/or may result in corrective action directed by the Contracting Officer pursuant to FAR 52.236-15 Schedules for Construction Contracts, FAR 52.249-10 Default (Fixed-Price Construction), and other contract provisions.

3.10.3 Recovery Schedule

Should the Contracting Officer find it necessary, submit a recovery schedule pursuant to FAR 52.236-15 Schedules for Construction Contracts.

3.11 OWNERSHIP OF FLOAT

Except for the provision given in the paragraph IMPACT TO EARLY COMPLETION SCHEDULE, float available in the schedule, at any time, may not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.12 TRANSFER OF SCHEDULE DATA INTO RMS CM

Import the schedule data into the Quality Control System (QCS) and export the QCS data to the Government. This data is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and matching electronic export from QCS of the application for progress payment.

3.13 PRIMAVERA P6 MANDATORY REQUIREMENTS

If Primavera P6 is being used, request a backup file template (.xer) from the Government, if one is available, prior to building the schedule. The following settings are mandatory and required in all schedule submissions to the Government:

a. Activity Codes must be Project Level, not Global or EPS level.

b. Calendars must be Project Level, not Global or Resource level.

c. Activity Duration Types must be set to "Fixed Duration & Units".

d. Percent Complete Types must be set to "Physical".

e. Time Period Admin Preferences must remain the default "8.0 hr/day, 40 hr/week, 172 hr/month, 2000 hr/year". Set Calendar Work Hours/Day to 8.0 Hour days.

f. Set Schedule Option for defining Critical Activities to "Longest Path".

g. Set Schedule Option for defining progressed activities to "Retained Logic".

h. Set up cost loading using a single job resource. The Price/Unit must be $1/hr, Default Units/Time must be "8h/d", and settings "Auto Compute Actuals" and "Calculate costs from units" selected.

i. Activity ID's must not exceed 10 characters.

j. Activity Names must have the most defining and detailed description within the first 30 characters.

-- End of Section --

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SECTION 01 33 00

SUBMITTAL PROCEDURES
09/14

PART 1 GENERAL

1.1 SUMMARY

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Contractor's Designer of Record, if applicable, must check and approve all items prior to submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals.

Submittals requiring Government approval are to be scheduled and made prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

A submittal register showing items of equipment and materials for when submittals are required by the specifications is provided as "Appendix A - Submittal Register."

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ENG FORM 4025	(2012) Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificates of Compliance

1.3 DEFINITIONS

1.3.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections.

Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to start of construction (work).

Certificates of insurance

Surety bonds

List of proposed Subcontractors

List of proposed products

Construction progress schedule

Network Analysis Schedule (NAS)

Submittal register

Schedule of prices

Health and safety plan

Work plan

Quality Control(QC) plan

Environmental protection plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

Design submittals, design substantiation submittals and extensions of

design submittals.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. Unless specified in another section, testing must have been within three years of date of contract award for the project.

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or Subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (MSDS)concerning impedances, hazards and safety precautions.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Submittals required for Guiding Principle Validation (GPV) or Third Party Certification (TPC).

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

Interim "DD Form 1354" with cost breakout for all assets 30 days prior to facility turnover.

1.3.2 Approving Authority

Office or designated person authorized to approve submittal.

1.3.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

SD-02 Shop Drawings

Mechanical Room Layout Drawings

1.5 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.5.1 Designer of Record Approved (DA)

Designer of Record (DOR) approval is required for extensions of design, critical materials, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings." Contractor to provide the Government with the number of

copies designated hereinafter of all DOR approved submittals. The Government may review any or all Designer of Record approved submittals for conformance to the Solicitation, Accepted Proposal and the completed design. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below. Design submittals to be in accordance with Section 01 33 16 DESIGN DATA (DESIGN AFTER AWARD). Generally, design submittals should be identified as SD-05 Design Data submittals.

1.5.2 Government Approved (G)

Government approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.5.3 Government Conformance Review of Design (CR)

The Government will review all intermediate and final design submittals for conformance with the technical requirements of the solicitation. Section 01 33 16 DESIGN DATA (DESIGN AFTER AWARD) covers the design submittal and review process in detail. Review will be only for conformance with the applicable codes, standards and contract requirements. Design data includes the design documents described in Section 01 33 16 DESIGN DATA (DESIGN AFTER AWARD). Generally, identify design submittals as SD-05 Design Data submittals.

1.5.4 Designer of Record Approved/Government Conformance Review (DA/CR)

1.5.4.1 Deviations to the Accepted Design

Designer of Record approval and the Government's concurrence are required for any proposed deviation from the accepted design which still complies with the contract before the Contractor is authorized to proceed with material acquisition or installation. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings." If necessary to facilitate the project schedule, the Contractor and the DOR may discuss a submittal proposing a deviation with the Contracting Officer's Representative prior to officially submitting it to the Government. However, the Government reserves the right to review the submittal before providing an opinion, if deemed necessary. In any case, the Government will not formally agree to or provide a preliminary opinion on any deviation without the DOR's approval or recommended approval. The Government reserves the right to non-concur with any deviation from the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and concurred design.

1.5.4.2 Substitutions

Unless prohibited or provided for otherwise elsewhere in the Contract, where the accepted contract proposal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, and the Contractor desires to substitute manufacturer or model after award, submit a requested substitution for Government concurrence. Include substantiation, identifying information and the DOR's approval, as meeting the contract requirements and that it is equal in function, performance, quality and salient features to that in the accepted contract proposal. If the Contract otherwise prohibits

substitutions of equal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, the request is considered a "variation" to the contract. Variations are discussed below in paragraphs: "Designer of Record Approved/Government Approved" and "VARIATIONS."

1.5.5 Designer of Record Approved/Government Approved (DA/GA)

In addition to the above stated requirements for proposed deviations to the accepted design, both Designer of Record and Government Approval and, where applicable, a contract modification are required before the Contractor is authorized to proceed with material acquisition or installation for any proposed variation to the contract (the solicitation and/or the accepted proposal), which constitutes a change to the contract terms. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings." The Government reserves the right to accept or reject any such proposed deviation at its discretion.

1.5.6 For Information Only

For Design-build construction all submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.5.7 Sustainability Reporting Submittals (S)

Submittals for Guiding Principle Validation (GPV) or Third Party Certification (TPC) are indicated with an "S" designation. Submit the information required by the technical sections that demonstrates compliance with the sustainable requirement, and for inclusion in the Sustainability Notebook as required by Section 01 33 29 SUSTAINABILITY REPORTING. A full submittal for an item may be provided under another SD; however, for the "S" submittal, only provide that portion of the submittal that demonstrates compliance with the sustainable requirement. If the sustainable submittal does require Government Approval, it may be tagged under another SD with a "G."

Schedule submittals for these items throughout the course of construction as provided; do not wait until closeout.

1.6 PREPARATION

1.6.1 Transmittal Form

Use the attached sample transmittal form in Appendix B ENG FORM 4025-R for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractorand are included in the RSM CM software required for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.6.2 Source Drawings for Shop Drawings

The entire set of Source Drawing files (DWG) will be provided to the Contractor. Only those requested by the Contractor to prepare shop

drawings may be provided. Request the specific Drawing Number only for the preparation of Shop Drawings. These drawings may only be provided after award.

1.6.2.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic Source Drawing files are not construction documents. Differences may exist between the Source Drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic Source Drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source Drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic Source Drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.6.3 Electronic File Format

Provide submittals in electronic format, with the exception of material samples required for SD-04 Samples items, SD-02 ANSI D size shop drawings, and SD-11 ANSI D size as-built record drawings, on two optical discs (compact disc or data versatile disc (CD/DVD)). In addition to the electronic submittal, provide three hard copies of the submittals. Provide only PDF files, unless otherwise specified or directed by the Contracting Officer. Compile the entire submittal file as a single, complete PDF document, to include ENG FORM 4025 as the first page. Bookmark all subsequent transmittal items. Do not provide separate files for each item listed on a single ENG FORM 4025. Name the electronic submittal file using the following naming convention, "Contract Number_Contract Short Title_Transmittal Number." Only one transmittal per submission of optical discs is permitted. Electronic files must be of sufficient quality that all information is legible. Generate PDF files from original documents with bookmarks so that the text included in the PDF file is both searchable and can be copied. If documents are scanned, Optical Character Recognition (OCR) routines are required. Index and bookmark files exceeding 30 pages to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature, or scan of a signature. Submittals will be logged in as received by the Government when the optical

discs and hard copies are delivered to the Administering Resident Office.

Email electronic submittal documents fewer than 10MB to an email address as directed by the Contracting Officer. Provide electronic documents over 10MB on an optical disc, or through an electronic file sharing system such as the AMRDEC SAFE Web Application located at the following website: https://safe.amrdec.army.mil/safe/.

Provide hard copies of submittals when requested by the Contracting Officer. Up to 2 additional hard copies of any submittal may be requested at the discretion of the Contracting Officer, at no additional cost to the Government.

1.7 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. The Government will retain 2 copies of information only submittals for design-build construction.

1.8 SUBMITTAL REGISTER

A SUBMITTAL REGISTER showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. The Government will provide the initial submittal register in electronic format with the following fields completed, to the extent that will be required by the Government during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Thereafter, track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

The Designer of Record must develop a complete list of submittals during design and identify required submittals in the specifications, and use the list to prepare the Submittal Register. The list may not be all inclusive and additional submittals may be required by other parts of the contract. Complete the submittal register and submit it to the Contracting Officer for approval within 30 calendar days after execution of the Notice to Proceed. The approved submittal register will serve as a scheduling

document for submittals and will be used to control submittal actions throughout the contract period. Coordinate the submit dates and need dates with dates in the Contractor prepared progress schedule. Submit monthly or until all submittals have been satisfactorily completed, updates to the submittal register showing the Contractor action codes and actual dates with Government action codes. Revise the submittal register when the progress schedule is revised and submit both for approval.

1.8.1 Use of Submittal Register

Submit the submittal register with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.8.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.8.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.8.4 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.9 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.9.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.9.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government, including the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.
Check the column "variation" of ENG FORM 4025 for submittals which include proposed deviations requested by the Contractor. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.9.3 Warranting That Variations Are Compatible

When delivering a variation for approval, Contractor, including its Designer(s) of Record, warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.9.4 Review Schedule Extension

In addition to normal submittal review period of 35 calendar days, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.10 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals.

a. Coordinate scheduling, sequencing, preparing and processing of

submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.10.1 Government Reviewed Design

The Government will review design submittals for conformance with the technical requirements of the solicitation. Section 01 33 16 DESIGN DATA (DESIGN AFTER AWARD) covers the design submittal and review process in detail. Government review is required for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. The Government may, but is not required, to review extensions of design such as structural steel or reinforcement shop drawings.1.11 SUPPLEMENTAL SUBMITTAL PROCEDURES

Submittals must be made as follows:

1.11.1 Supplemental Procedures

Submittals required by the CONTRACT CLAUSES and other non-technical parts of the contract are not included in this section. Submit one PDF electronic set, six copies for approval, and four copies for information only, of all shop drawings, certificates of compliance, materials, fixtures and equipment lists called for under the various headings of these specifications. These drawings, certificates and lists must be complete and detailed and, prior to submission, must be reviewed and certified correct by the Contractor as required by the CONTRACTOR QUALITY CONTROL (CQC) PLAN paragraph of the SECTION 01 45 00 QUALITY CONTROL. If approved by the Contracting Officer, four sets of all submittals will be retained by the Contracting Officer and two sets will be returned. Submittals for information only usually will not be returned. Submit paper documents that are printed/copied double-sided on recycled paper that has at least 20 percent post consumer material when required.

Changes to the number of copies transmitted may be negotiated at the project kickoff meeting upon at the Contractor's request.

Email is the preferred method of delivery. However, files too large to be sent by emailmust use optical discs (OD) or file transfer sites. Note that the USACE has a 20 MB limit on email sizes that it will accept. Use OD sparingly as this would defeat the cost savings purpose. Also be aware that the USACE has a standing ban on the use of portable USB media, such as

pensticks and external hard drives.

The preferred submittal recipients will be identified at the kickoff meeting.

1.11.1.1 Resubmittals

If a submittal is returned for correction or is not satisfactory and is disapproved by the Contracting Officer, the Contractor must resubmit the corrected material in the same quantity, including reproducibles as specified for the original submittal for approval within 14 days after receipt by him of the disapproved material.

1.11.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG FORM 4025 must be checked. The Contractor must set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.11.3 Format

Format and organization requirements will be necessary to make this process effective, however. Please review the following list and verify that all requirements have been met prior to submitting. Failure to meet the formatting requirements may result in disapproval of the submittal.

1) All submittals must be in PDF format.

2) All submittals must be "searchable" whenever possible. "Searchable" means that Adobe acknowledges text as being text and not an image, and a user can use Edit > Find to locate words in the document. These can be made using the "Print to PDF" feature available in most word processing software. On the other hand, an example of a "non-searchable" document would be a scanner's image of a document; Adobe only understands these as pictures.

3) Compile each submittal into a single file. Separate files and/or separate cover sheets will not be accepted. Again, this condition may be waived when the submission of other file formats are a requirement.

4) Each file name must start with the submittal number, followed by a brief description. Do not delete preceding zeros. For example, "01352-34 Accident Report.pdf" is the preferred layout for a file name.

5) The cover sheet (ENG FORM 4025) must be the first page of every file. Lone 4025's will not be accepted. When the USACE returns the submittal, the approver will copy the 4025 transmittal form into the page one position.

6) At times material sample submittals are required. These, too, must have a corresponding electronic version. They must include, at minimum, one digital photograph (converted to PDF) of the sample and the cover sheet. Photos must be formatted as follows:

   a) Include something of known size in the picture, to provide a reference scale. Normally this is done by stretching a measuring

tape on or beside the sample.

b) Shrink the photograph as necessary to reduce its file size. Excessively large files may get rejected by the network or may otherwise slow it down. Sizes around 1 MB normally works well for submittal tracking purposes. (Resizing photographs can be done in Microsoft Paint, but must be done before converting into PDF format. Paint comes standard on most computers.)

7) All electronic submittals must still have a valid signature on the cover sheet. Electronic signatures are preferred, but scans of wet-ink signatures may be accepted at the Contracting Officer's discretion.

8) The electronic copy and the hard copy must agree with each other. Double-check this before submitting.

Other Electronic Documents Required:

Contract Administration Documents
Appointment letter, PCO Reviews, Preconstruction Documents (35, 65, 100% drawings, etc.); Monthly COR Reports; List of Subcontractors; Performance and Payment Bonds; Insurance Certificates; Contractor Photos; Other Contract Documents (Awarded RFP, Specifications, Drawings)

Correspondence
Correspondence Logs; Letters from the Contractor; Letters to Others; Memos; RFI Log; RFI's (Request for Information)

Labor
Weekly Payrolls; Payroll Record 3180 (at end of project); Apprentice Certificates

Payments
Progress Payments; Final Payment

Schedules
Baseline Schedule; Schedule Updates; Schedule Narratives

Modifications
Contractors Proposals

Quality Assurance & Quality Control
Contractor Quality Control Plan; Contractor QC Reports (daily rpt, meeting minutes, agenda, attendance list)

Safety
Contractor Safety Plan; Accident Report; Safety Violation Log

Submittals
Submittal Register
Transmittal Log
Transmitted submittals Closeout
Form 1354; As Built Drawings; TAB (testing and balancing) report

1.12 MECHANICAL ROOM LAYOUT DRAWINGS

Submit a layout drawing, including appropriate elevations and sections as required, for each Mechanical Room showing the room arrangement he proposes

for all pieces of equipment and appurtenances thereto (via., air-conditioning equipment, boilers, compressors, hot water tanks, pumps, electrical control panels, ducts, piping, etc.), that are to be located in the room. The Mechanical Room floor slab will not be placed until the complete Mechanical Room layout drawing has been submitted and approved. No payment will be made for any of the equipment for the room or its installation until these drawings have been approved. Identify and submit Mechanical Room Layout Drawings in the manner specified for "Shop Drawings." Equipment rooms shown on the drawings are of adequate size to accommodate equipment of required capacities, as available from several manufacturers, with sufficient space left for access, servicing, removal, etc. The use of equipment items with dimensions such as to crowd the space will not be permitted.

1.13 SPARE PARTS LIST AND MAINTENANCE OPERATIONS MANUALS

Within 30 calendar days after approval of shop drawings and equipment lists, submit six copies of spare parts lists and operating and maintenance manuals as required under the various headings of these specifications. Provide one reproducible, unfolded copy of all operating instructions, control diagrams, etc., that are larger than 8-1/2-inches by 11-inches; this does not apply to standard manufacturer's data.

a. Spare parts lists must contain the following listed information:

(1) Quantity of parts required for 120 days and one year of operation.

(2) Description of each spare part.

(3) Drawing number and shop drawing reference.

(4) Part equipment code number.

(5) Unit price of each item.

(6) Total price of all items.

(7) Procurement lead time with particular attention to long lead times.

(8) Name and address of nearest supplier.

(9) Such remarks and data as the manufacturer may consider pertinent.

(10) Complete parts list of all replaceable items.

b. Operation, Maintenance, and Repair Manuals and Instructions:

(1) The requirements for furnishing operating, maintenance, and repair data/manuals and field instructions under this contract are specified in the Technical Specifications. Submit not later than 60 calendar days after the Notice to Proceed, an outline showing the proposed submittal date(s) of operation and maintenance manuals to be furnished the Government and the scheduled date(s) of all required field instructions to be provided by Contractor furnished personnel or manufacturer's representatives. Furnish all operation and maintenance manuals not later than 60 calendar days prior to turnover of the facility to the Government.

(2) Failure to comply with requirements of this clause will result in no further payment until all required O&M data/manuals are submitted and accepted.

(3) Enter all O&M data/manuals submittal data in a separate section of the master submittal register. Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Four copies of the submittal will be retained and two copies of the submittal will be returned to the Contractor.

1.14 COLOR BOARDS

Five sets of color boards must be submitted within 90 calendar days after receipt of Notice to Proceed for all projects which involve building construction or building modifications. The board must include samples of colors and finishes of all interior surfaces such as walls, floors, and ceilings. Submit material in a standard 8-1/2 inches by 11 inches three-ring binder. Fold-outs may be employed to 25-1/2 inches by 33 inches as long as they refold within the standard binder. Display actual material samples showing color, texture, pattern, finish, thickness, etc., for all appearance related items where choice exists. These samples must be large enough to indicate true patterns. However, care should be taken to present materials in proportion to that which may be installed in a given situation. Organize samples by color schemes with a separate sample for each scheme. Coordinate the schemes by room names and numbers shown on the architectural floor plans. Label colors with generic color names. Place project title and location (Base) in the lower right-hand corner of each module. Where special finishes such as architectural concrete, carpet, or prefinished textured metal panels are required, submit separate samples not less than 8 inches x 10 inches square with the board. If more space is needed, submit more than one board per set. Certify detailed review of color boards and that they are in strict accordance with the contract drawings and specifications except as may be otherwise explicitly stated. Submittal of the color board must not relieve the Contractor of the responsibility to submit the samples required by the Technical Specifications.

1.15 TYPICAL ROOM MOCK-UP (QUALITY CONTROL)

1.15.1 Samples

Submit color and finish samples for approval.

1.15.2 Receipt of Approval

Following receipt of approval for all color and finish selections from the Contracting Officer, completely mock-up one typical room unit to include; living/sleeping area, closet, bath and kitchen with approved finish materials. These finish materials must include all wall covering, paint, floor coverings, trim, doors, hardware, woodwork, casework, countertops, glass, electrical, mechanical, and plumbing fixtures and appliances as called for in the contract. If mock-up is not approved by the Contracting Officer, refabricate and reinstall until approval is secured. Remove all rejected materials and finishes from the project site. The Contracting Officer will indicate acceptance of the quality of the finishes prior to permitting the Contractor to complete the remainder of the units. Maintain the level of quality approved for the typical room unit throughout the project.

1.16 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

a. Note date on which submittal was received.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph REVIEW NOTATIONS and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date approved submittals. Four copies of the approved submittal will be retained by the Contracting Officer and two copies of the submittal will be returned to the Contractor. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

1.16.1 Review Notations

Contracting Officer review will be completed within 30 calendar days after date of submission. Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.

b. Submittals marked "approved as noted" "or approved except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work must proceed for this item until resubmittal is approved.

d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.17 DISAPPROVED OR REJECTED SUBMITTALS

Make corrections required by the Contracting Officer. If any correction or notation on the returned submittals constitute a change to the contract drawings or specifications; notice as required under the FAR clause entitled, CHANGES, is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.18 APPROVED/ACCEPTED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal.

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.19 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned, at Contractor expense, upon completion of the contract. Samples not approved will also be returned at Contractor expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 00 00	SD-11 Closeout Submittals															
			Worker's Compensation Claims	1.9.7														
		01 32 01	SD-01 Preconstruction Submittals															
			Project Scheduler Qualifications	1.3	G													
			Bar Chart Schedule	3.5														
			Project Schedule	3.1	G													
			Design Package Schedule	3.5.2.1	G													
			Preliminary Project Schedule	3.5.1	G													
			Initial Project Schedule	3.5.2	G													
			Data Optical Discs	3.6.1														
			Periodic Schedule Update	3.5.3	G													
			Periodic Schedule Update	3.7.2	G													
			Justification of Delay	3.9.1	G													
			Time Impact Analysis	3.9.3	G													
			Forensic Schedule Analysis	3.9.4	G													
			Schedule Status Report	3.1.1	G													
		01 33 00	SD-01 Preconstruction Submittals															
			Submittal Register	1.8	G													
			SD-02 Shop Drawings															
			Mechanical Room Layout	1.12														
			Drawings															
		01 33 29	SD-01 Preconstruction Submittals															
			Preliminary Sustainability	1.5.2.1	G DO													
			Notebook															
			Preliminary High Performance	1.5.2.1														
			and Sustainable Building Checklist															

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		01 33 29	SD-07 Certificates															
			Third Party Certification (TPC)	1.4.5														
			SD-11 Closeout Submittals															
			Final Sustainability Notebook	1.5.2.1	G													
			Final High Performance and	1.5.2.1	G	DO												
			Sustainable Building Checklist															
			Amended Final Sustainability	1.5.2.1	G	DO												
			Notebook															
			Third Party Certification	3.2.1	G	RO												
			Certificates															
		01 35 26	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.6	G													
			Health Hazard Control Plan	1.6.2.15	G													
			Emergency Action Plan	1.6.2.16	G													
			Standard Lift Plan	1.6.2.2	G													
			Critical Lift Plan	1.6.2.3	G													
			Activity Hazard Analysis (AHA)	1.7														
			SD-06 Test Reports															
			Monthly Exposure Reports	1.11.3														
			Notifications and Reports	1.11														
			Accident Investigation Reports	1.11.2	G													
			LHE Inspection Reports	1.11.4														
			Regulatory Citations and	1.11.6														
			Violations															
			SD-07 Certificates															
			Crane Operators/Riggers	1.5.1.4														

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		01 35 26	Confined Space Entry Permit	1.8.1														
			Hot Work Permit	1.8.1														
			Certificate of Compliance	1.11.5														
			Excavation Permit	3.7														
			Proof of Current Qualification	1.5.1.4														
		01 45 00	SD-01 Preconstruction Submittals															
			Contractor Quality Control Plan	3.2	G													
			Design Quality Control plan	3.2.2	G													
			MTC validation	3.7.2.1	G													
			SD-05 Design Data															
			Discipline-Specific Checklists	3.2.2														
			SD-06 Test Reports															
			Verification Statement	3.9.2														
		01 50 00	SD-01 Preconstruction Submittals															
			Construction Site Plan	1.3	G													
			Traffic Control Plan	3.1.6.1	G													
			Temporary Earthwork Plan	1.4	G													
			Dust Control Methods And	3.1.6.4	G													
			Procedures															
			SD-06 Test Reports															
			Backflow Preventer Tests	2.4														
			SD-07 Certificates															
			Backflow Tester	1.7.1														
			Backflow Preventers	1.7														
			Backflow Prevention Training	1.7.2														
			Certificate															

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		01 57 19	SD-01 Preconstruction Submittals															
			Environmental Protection Plan	1.6	G													
			ATC application	3.4.1	G													
			Dust Control Permit	1.6.2	G													
		01 57 23	SD-01 Preconstruction Submittals															
			SWPPP	1.5.1	G DO													
			SWPPP	1.5.1	G DO													
			NOI and NOC	1.5.2	G DO													
			SD-03 Product Data															
			BMP Product Data	1.5.1.2														
			BMP Product Data	3.1.1														
			BMP Product Data	3.1.1														
			BMP Product Data	3.1.1														
			SD-06 Test Reports															
			SWPPP Amendments	3.1.1														
			SWPPP Amendments	3.2.1														
			SWPPP Amendments	3.2.1														
			SWPPP Amendments	3.2.1														
			SWPPP Amendments	3.2.1														
			SWPPP Amendments	3.2.1														
			SD-10 Operation and Maintenance															
			Data															
			Post-Construction Storm Water	3.1.2	G DO													
			Management Plan															
			Post-Construction Storm Water	3.1.2	G DO													
			Management Plan															

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		01 57 23	SD-11 Closeout Submittals															
			Final SWPPP	3.1.2	G DO													
			Final SWPPP	3.2.1	G DO													
			NOT Application	3.1.2	G DO													
			NOT Application	3.1.2	G DO													
			NOT Application	3.1.2	G DO													
		01 74 19	SD-01 Preconstruction Submittals															
			Waste Management Plan	1.5	G													
			SD-11 Closeout Submittals															
			Records	1.6														
		01 78 00	SD-03 Product Data															
			Warranty Management Plan	1.7.1														
			Warranty Tags	1.7.5														
			Spare Parts Data	1.5														
			SD-06 Test Reports															
			Working as-built drawings	3.1.4	G													
			Final as-built record drawings	3.2	G DO													
			SD-08 Manufacturer's Instructions															
			Instructions	1.7.1														
			SD-10 Operation and Maintenance															
			Data															
			Operation and Maintenance	3.9														
			Manuals															
			SD-11 Closeout Submittals															
			Record Drawings	1.3.4	G DO													

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		01 78 00	Certification of EPA Designated	2.3	G													
			Items															
			Final Approved Shop Drawings	3.6	G													
			Construction Contract	3.7	G													
			Specifications															
			As-Built Record Of Equipment	3.8														
			And Materials															
		01 78 23	SD-10 Operation and Maintenance															
			Data															
			O&M Database	1.3	G													
			Training Plan	3.1.1	G													
			Training Outline	3.1.3	G													
			Training Content	3.1.2	G													
			SD-11 Closeout Submittals															
			Training Video Recording	3.1.4	G													
			Validation of Training Completion	3.1.6	G													
		01 91 00.15	SD-01 Preconstruction Submittals															
			Commissioning Firm	1.6	G													
			Lead Commissioning Specialist	1.6.1	G													
			Technical Commissioning	1.6.2	G													
			Specialists															
			Commissioning Firm's Contract	1.6	G													
			SD-05 Design Data															
			Design Phase Commissioning	3.1.2	G													
			Plan															
			SD-06 Test Reports															

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		01 91 00.15	Design Review Report	3.1.3	G													
			Interim Construction Phase	3.2.2.1	G													
			Commissioning Plan															
			Final Construction Phase	3.2.2.2	G													
			Commissioning Plan															
			Template Building Envelope	3.2.2.1.2	G													
			Inspection Checklists															
			Building Envelope Inspection	3.2.4.2	G													
			Checklists															
			Pre-Functional Checklists	3.2.4.3	G													
			Issues Log	1.8														
			Commissioning Report	3.3	G													
			Post-Construction Trend Log	3.4.1	G													
			Report															
			SD-07 Certificates															
			Certificate of Readiness	1.9	G													
			SD-10 Operation and Maintenance															
			Data															
			Training Plan	3.2.5	G													
			Training Attendance Rosters	3.2.5	G													
		02 41 00	SD-01 Preconstruction Submittals															
			Demolition Plan	1.2.1	G													
			Deconstruction Plan		G													
			Existing Conditions	1.9														
			SD-07 Certificates															
			Notification	1.6	G													

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ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 41 00	SD-11 Closeout Submittals															
			Receipts	3.3.2														
		02 82 13	SD-02 Shop Drawings															
			Detailed Drawings	1.3	G													
			SD-03 Product Data															
			Asbestos Waste Shipment	3.10.3.1	G													
			Records															
			Encapsulants	2.1	G													
			Respiratory Protection Program	1.8.1	G DO													
			Cleanup and Disposal	3.10	G													
			Qualifications	1.5.1	G													
			Training Program	1.10														
			Licenses, Permits and	1.7.1														
			Notifications															
			Asbestos Management Plan	3.10.3.2	G DO													
			SD-06 Test Reports															
			Exposure Assessment and Air	3.8														
			Monitoring															
			Local Exhaust System	1.6.3														
			SD-07 Certificates															
			Local Exhaust System	1.6.3														
			Encapsulants	2.1	G													
			Medical Surveillance	1.8														
			Requirements															
		02 83 13	SD-01 Preconstruction Submittals															
			Lead Compliance Plan	1.5.2.2	G													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Nellis AFB Bldg 332 Renovation

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 83 13	Competent Person	1.5.1.1	G													
			Training Certification	1.5.1.2	G													
			Lead waste management plan	1.5.2.8	G													
			Written evidence	3.5.2.1	G													
			Medical Examinations	1.5.2.4	G													
			SD-06 Test Reports															
			Sampling results	1.5.2.3	G													
			Occupational and Environmental	1.5.2.3	G													
			Assessment Data Report															
			SD-07 Certificates															
			Testing laboratory	1.5.1.3														
			Clearance Certification	3.5.1.1														
			SD-11 Closeout Submittals															
			hazardous waste manifest	3.5.2.1														
			turn-in documents or weight	3.5.2.1														
			tickets															
		02 84 16	SD-06 Test Reports															
			Testing Results	3.3.1	G													
			SD-07 Certificates															
			Qualifications of CIH	1.8.1														
			Training Certification	1.8.1														
			PCB and Lamp Removal Work	1.8.2	G													
			Plan															
			PCB and Lamp Disposal Plan	1.8.3	G													
			Certification of Decontamination	3.2.4	G													
			SD-11 Closeout Submittals															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Nellis AFB Bldg 332 Renovation

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 84 16	Transporter certification	3.5.2	G													
			Certificate of Disposal and/or	3.5.2.1														
			recycling															
			DD Form 1348-1	3.5.3														

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE

For use of this form, see ER 415-1-10; the proponent agency is CECW-CE.

DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (*This section will be initiated by the contractor*)

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. (*Cover only one section with each transmittal*)	PROJECT TITLE AND LOCATION	THIS TRANSMITTAL IS FOR: (*Check one*) ☐ FIO ☐ GA ☐ DA ☐ CR ☐ DA/CR ☐ DA/GA

ITEM NO. (*See Note 3*) a.	DESCRIPTION OF SUBMITTAL ITEM (*Type size, model number/etc.*) b.	SUBMITTAL TYPE CODE (*See Note 8*) c.	NO. OF COPIES d.	CONTRACT DOCUMENT REFERENCE		CONTRACTOR REVIEW CODE g.	VARIATION Enter "Y" if requesting a variation (*See Note 6*) h.	USACE ACTION CODE (*Note 9*) i.
				SPEC. PARA. NO. e.	DRAWING SHEET NO. f.			

REMARKS	I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.	
	NAME OF CONTRACTOR	SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (*List by item No.*)	NAME AND TITLE OF APPROVING AUTHORITY	SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each Transmittal shall be numbered consecutively. The Transmittal Number typically includes two parts separated by a dash (-). The first part is the specification section number. The second part is a sequential number for the submittals under that spec section. If the Transmittal is a resubmittal, then add a decimal point to the end of the original Transmittal Number and begin numbering the resubmittal packages sequentially after the decimal.

3. The "Item No." for each entry on this form will be the same "Item No." as indicated on ENG FORM 4288-R.

4. Submittals requiring expeditious handling will be submitted on a separate ENG Form 4025-R.

5. Items transmitted on each transmittal form will be from the same specification section. Do not combine submittal information from different specification sections in a single transmittal.

6. If the data submitted are intentionally in variance with the contract requirements, indicate a variation in column h, and enter a statement in the Remarks block describing he detailed reason for the variation.

7. ENG Form 4025-R is self-transmitting - a letter of transmittal is not required.

8. When submittal items are transmitted, indicate the "Submittal Type" (*SD-01 through SD-11*) in column c of Section I.
   Submittal types are the following:
   SD-01 - Preconstruction SD-02 - Shop Drawings SD-03 - Product Data SD-04 - Samples SD-05 - Design Data SD-06 - Test Reports
   SD-07 - Certificates SD-08 - Manufacturer's Instructions SD-09 - Manufacturer's Field Reports SD-10 - O&M Data SD-11 - Closeout

9. For each submittal item, the Contractor will assign Submittal Action Codes in column g of Section I. The U.S. Army Corps of Engineers approving authority will assign Submittal Action Codes in column i of Section I. The Submittal Action Codes are:

   A -- Approved as submitted.
   B -- Approved, except as noted on drawings. Resubmission not required.
   C -- Approved, except as noted on drawings. Refer to attached comments. Resubmission required.
   D -- Will be returned by separate correspondence.
   E -- Disapproved. Refer to attached comments.
   F -- Receipt acknowledged.
   X -- Receipt acknowledged, does not comply with contract requirements, as noted.
   G -- Other action required *(Specify)*
   K -- Government concurs with intermediate design. (*For D-B contracts*)
   R -- Design submittal is acceptable for release for construction. (*For D-B contracts*)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract.

SECTION 01 33 16

DESIGN AFTER AWARD

1.1 GENERAL INFORMATION

1.2 INTRODUCTION

1.3 DESIGNER OF RECORD

2.0 PRODUCTS (NOT APPLICABLE)

3.0 EXECUTION

3.1. PRE-CONSTRUCTION WORK ACTIVITIES & CONFERENCES
3.1.1. **Design Quality Control Plan**
3.1.2. **Post Award Conference**
3.1.3. **Partnering & Project Progress Processes**
3.1.4. **Initial Design Conference**
3.1.5. **Pre-Construction Conference**
3.1.6 **Design Review Meetings**

3.2. STAGES OF DESIGN SUBMITTALS
3.2.1. **Site/Utilities**
3.2.2. **Interim Design Submittals**
3.2.3. **Over-the-Shoulder Progress Reviews**
3.2.4. **Final Design Submissions**
3.2.5. **Design Complete Submittals**
3.2.6. **Holiday Periods for Government Review or Actions**
3.2.7. **Late Submittals**

3.3. DESIGN CONFIGURATION MANAGEMENT
3.3.1. **Procedures**
3.3.2. **Tracking Design Review Comments**
3.3.3. **Design and Code Checklists**

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES
3.4.1. **General**
3.4.2. **Procedures**
3.4.3. **Conference Documentation**

3.5. INTERIM DESIGN REQUIREMENTS
3.5.1. **Drawings**
3.5.2. **Design Analysis**
3.5.3. **Specifications**
3.5.4. **Computer Rendering**
3.5.5. **Interim Building Design Contents**

3.6. DESIGN REVIEWS AND CONFERENCES

3.7. FINAL DESIGN REQUIREMENTS
3.7.1. **Drawings**
3.7.2. **Design Analysis**
3.7.3. **Specifications**
3.7.4. **Submittal Register**
3.7.5. **Preparation of DD Form 1354 (Transfer of Real Property)**
3.7.6. **Acceptance and Release for Construction**

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES
3.9.1. **Submittal Distribution Addresses**
3.9.2. **Mailing of Design Submittals**
3.9.3. **Submittal Distribution and Quantities**

3.10. AS-BUILT DOCUMENTS

3.11 COORDINATION
3.11.1 **Written Record**
3.11.2 **Design Needs List**

3.12. Operation & Maintenance (O&M) Manuals

1.0 GENERAL INFORMATION

The contractor shall follow the design submission requirements as listed below. In addition, the contractor shall comply with other design submission requirements as listed and required in other areas of the RFP.

1.1 INTRODUCTION

1.1.1 The information contained in this section applies to the design required after award of the Building 332 Renovation at Nellis AFB, Nevada. The design begins with the pre-contract proposal, which must conform to all requirements of the Solicitation. After award, the Contractor will develop the accepted proposal into the completed design, as described herein.

1.1.2 The Contract consists of, but is not limited to: the Solicitation requirements, pre-contract proposal, basis of design, design narrative, and the accepted proposal.

1.1.3 See Sections **01 33 00** Submittals and **01 32 01** Project Schedule for requirements for identifying and scheduling the design packaging plan in the submittal register and project schedule. See also Environmental Protection in Section **01 57 19** of this solicitation for any special requirements.

1.1.4 As proposed by the successful Design-Build Contractor and as accepted by the Contracting Officer, this project will follow either a "fast track" or normal method (construction starts after design is complete) for design-build. All review comments for a particular portion of the work must be appropriately addressed and applicable construction techniques for unusual construction conditions must be properly defined and accepted. The contractor may begin construction for which the Government has reviewed the completed final design submission and the contractor has satisfactorily addressed all Government review questions/concerns and the Contracting Officer provides authorization to proceed.

The Contractor may elect to "fast track" the design and construction (that is, proceed with construction of parts of the site work and utilities prior to completion of the overall design) but that choice is up to the contractor and it must be approved by the Contracting Officer (or the Administrative Contracting Officer). To facilitate fast tracking, the Contractor may elect to divide the design into no more than ten (10) design packages per major facility type and no more than three (3) design packages for site and associated work. The Contractor shall designate how it will package the design, consistent with the overall plan for permitting (where applicable) and construction of the project. If early procurement of long-lead item construction materials or installed equipment, prior to completion of the associated design package, is necessary to facilitate the project schedule, the Contractor shall also identify those long-lead items and how it will assure design integrity of the associated design package to meet the contract requirements. Once the Government is satisfied that the long-lead items meet the contract requirements, the Contracting Office will allow the Contractor to procure the items as its own risk.

Every feature of the project must be fully designed prior to the start of the construction process for that feature. The Contractor may proceed with the construction work included in a separate design package after the Government has reviewed the final (100%) design submission for that package, review comments have been addressed and resolved to the Government's satisfaction and the Contracting Officer (or the Administrative Contracting Officer) has agreed that the design package may be released for construction.

1.1.5 If this work is sensitive to weather (heat, cold, rain, snow, or any other weather situation) or any other situation precluding normal construction techniques, the contractor shall also submit to the Contracting Officer a plan to conduct this work (referencing and following industry standards or more stringent government standards) for compliance review.

1.1.6 Permits. Contractor shall pay for and obtain all permits required for the successful execution

of this project. Submittal of the Environmental Permits to the Regulatory Agencies shall be the Contractor's responsibility accomplished with coordination of the Contracting Officer and the Nellis AFB Environmental Division. *[NOTE: Please refer to 99 CES/CEI Environmental Permits/Authority to Proceed Guidance in the Appendices of this RFP Solicitation for required permits and contact information.]*

1.2 DESIGNER OF RECORD

The Design-Build Contractor, (also known as "Design-Builder", "DB", or simply "Contractor") shall identify for approval, the Designer of Record ("DOR") that will be responsible for each area of design. One DOR may be responsible for more than one area. All areas of design disciplines shall be accounted for by a listed, Professionally Registered, DOR. Each DOR(s) shall stamp, sign, and date each design drawing and other design deliverables under their responsible discipline at each design submittal stage (see contract clause Registration of Designers). The DOR(s) shall also be responsible for maintaining the integrity of the design and for compliance with the contract requirement through construction and documentation of the as-built condition by coordination, review, and approval of extensions of design, material, equipment and other construction submittals, review and approval or disapproval of requested deviations to the accepted design or to the contract, coordination with the Government of the above activities, signing and stamping the as-built documentation and by performing other typical professional designer responsibilities. The DOR must ensure the integrity of all extensions to their design and that all equipment and materials meet the design and design criteria requirements.

2.0 PRODUCTS (NOT APPLICABLE)

3.0 EXECUTION

3.1 PRE-CONSTRUCTION WORK ACTIVITIES & CONFERENCES

3.1.1 Design Quality Control Plan

The DB Contractor shall submit for Government Approval, a Design Quality Control Plan in accordance with Section 01 45 00.00 10 before design may proceed. The Design Build Contractor shall correct this plan and re-submit until such time as the Contracting Officer accepts it. The Contracting Officer will not entertain a design deliverable until the Contracting Officer accepts this plan.

The Design Build Contractor's DQC Plan shall provide and maintain an effective quality control program, which will assure that all services required by this design-build contract are performed and provided in a manner that meets Nevada professional architectural and engineering quality standards.

CAUTION: A SUBMITTAL NOT READY FOR A GOVERNMENT QUALITY ASSURANCE REVIEW WILL WASTE GOVERNMENT RESOURCES AND POSSIBLY DELAY EXPECTATIONS OF THE DESIGN BUILD CONTRACTOR AT THE DESIGN BUILD CONTRACTOR'S EXPENSE. IT IS EXTREMELY IMPORTANT EACH SUBMITTAL RECEIVE AN INTERNAL CONTRACTOR/DOR QUALITY CONTROL REVIEW AND CORRECTIONS BEFORE SUBMITTING TO THE GOVERNMENT. THE GOVERNMENT'S QUALITY ASSURANCE REVIEW IS DESIGNED TO BE A SPOT CHECK – ADEQUATE RESOURCES TO ACCOMPLISH ANYTHING MORE ARE NOT PROVIDED BY THE GOVERNMENT. THE DESIGN BUILD CONTRACTOR MUST PERFORM QUALITY CONTROL ON ALL DESIGN AND CONSTRUCTION SUBMITTALS.

3.1.2 Post Award Conference

The Government shall conduct a post award administrative conference with the Contactor at the project site, as soon as possible after contract award. This will be coordinated with issuance of the contract notice to proceed (NTP). The Contractor and major sub-contractors

representatives shall participate. Government representatives will include COE project delivery team members, facility users, facility command representatives, and installation representatives. The Government will provide a meeting place and meeting time to participants prior to the meeting.

The Post Award Conference shall include determination and introduction of contact persons, their authorities, contract administration requirements, discussion of expected project progress processes, and coordination of subsequent meetings for quality control (see Sections 01 45 00.00 10) and Partnering (see below the Partnering and Initial Design Conference).

The Government shall introduce COE project delivery team members, facility users, facility command representatives, and installation representatives. The DB Contractor shall introduce major subcontractors, and other needed staff. Expectations and duties of each person shall be defined for all participants. A meeting roster shall be developed and distributed by the Government with complete contact information including name, office, project role, phone, mailing and physical address, and email address.

The Government shall prepare the agenda and meeting minutes, for concurrence of the information contained therein, within 10 calendar days prior to and following the conference and email a copy to all attendees. The meeting minutes shall list all action items discussed along with tasking (Contractor or Government), all issues discussed with decisions, and latest schedule of upcoming events as a minimum.

3.1.3 **Partnering and Project Progress Processes**

The initial Partnering Conference may be scheduled and conducted at anytime with or following the post award conference. The need for future follow-up Partnering Conferences will be mutually determined by the Partnership. The Government proposes to form a partnership with the DB Contractor to develop a cohesive building team. This Partnership will involve the COE project delivery team members, facility users, facility command representatives, installation representatives, Designers of Record, major subcontractors, contractor quality, safety, and security staff, and contractor construction management staff. This Partnership will strive to develop a cooperative management team drawing on the strengths of each team member in an effort to achieve a quality project with budget and on schedule and of good quality. This Partnership will be bilateral in membership and participation will be totally voluntary. All costs, excluding labor and travel expenses shall be shared equally between the Government and the Contractor. The Contractor and Government shall be responsible for their own labor and travel costs. Normally, Partnering meetings will be held at or in the vicinity of the project installation.

As part of the Partnering process, the Government and Contractor shall develop, establish, and agree to comprehensive design development processes including conduct of conferences, expectations of design development at conferences, fast-tracking, design acceptance, Structural Interior Design (SID)/Comprehensive Interior Design (CID) approval, project closeout, etc. The Government will explain contract requirements and the DB Contractor shall review their proposed project schedule and suggest ways to streamline processes.

The Partnering Conference will be facilitated by an independent third party agreed upon by the Partnership. The Facilitator shall prepare the agenda and meeting minutes, for concurrence of the information contained therein, within 10 calendar days prior to and following the meeting and email a copy to all attendees. The meeting minutes shall list all action items discussed along with tasking (Contractor or Government), all issues discussed with decisions, and latest schedule of upcoming events as a minimum.

3.1.4 **Initial Design Conference**

The Initial Design Conference may be scheduled and conducted at the project Installation at any time after the post award conference, although it is recommended that the partnering

process be initiated with or before the initial design conference. Any design work conducted after award and prior to this conference shall be limited to site development and is discouraged for other items. All Designers of Record shall participate in the conference. The purpose of the meeting is to introduce everyone, to make sure any needs the Contractor has are assigned and to establish due dates as well as determine who will get the information. The Contractor has the responsibility to establish the design of the project in accordance with the contract. Therefore, the Initial Design Conference is intended to allow the Contractor an opportunity to discuss, clarify, and obtain an understanding, in a face-to-face setting, on issues, opportunities, or mission restraints still in question. Design submission and review procedures specified herein, preliminary design schedules, and any other appropriate pre- design items shall be discussed.

The Contractor shall conduct the Initial Design Conference and shall prepare the agenda and meeting minutes, for concurrence of the information contained therein, within 1 0 calendar days prior to and following the conference and email a copy to all attendees. The meeting minutes shall list all action items discussed along with tasking (Contractor or Government), all issues discussed with decisions, and latest schedule of upcoming events as a minimum.

3.1.5 Pre-Construction Conference

Before starting construction activities, the Contractor and Government shall jointly conduct a pre-construction administrative conference at the project Installation to discuss any outstanding requirements and to review local Installation requirements for the start of construction.

The Contractor shall prepare the agenda and meeting minutes, for concurrence of the information contained therein, within 7 calendars following the conference and email a copy to all attendees. The meeting minutes shall list all action items discussed along with tasking (Contractor or Government), all issues discussed with decisions, and latest schedule of upcoming events as a minimum.

3.1.6 Design Review Meetings

Design review conferences shall be held for each stage of design at Nellis AFB; location on Base to be determined prior to each conference. Conferences shall be held at the conclusion of the Government review of the Preliminary (60%), Final (90%) and Corrected Final (95%) submittals.

The Contractor shall be represented at these review conferences by each design discipline and the construction manager as a minimum.

Each conference shall be planned to occur over a two day period with travel days separate.

The Contractor shall prepare the agenda and meeting minutes for each conference within 10 calendar days prior to and following each conference and email a copy to all attendees. The meeting minutes shall list all action items discussed along with tasking (Contractor or Government), all issues discussed with decisions, and latest schedule of upcoming events as a minimum.

3.2 STAGES OF DESIGN SUBMITTALS

The Stages of Design Submittals described below define Government expectations with respect to process and content. The Contractor shall determine how to best plan and execute the design and review process for the Renovate 926 WG Building 332 project, within the parameters listed herein. The Contractor may sub-divide the design into separate packages for each stage of design and may proceed with construction of a package after the Government accepts the final design for that package. The Contractor is responsible for the full, complete, and use for its intended purpose, design of this new Facility.

The submittals shall include the design drawings, specifications, and design analysis

(including calculations). The contractor shall minimize the number of design submittals to no more than four (correction submittals not counted) as follows, unless approved by the Contracting Officer, and the fifth set shall constitute the Contractor's revised 100% submittal of the design documents that have been backchecked and accepted by the Government for use during construction. Submittal copies and distribution is per paragraph 3.9.1

For the Preliminary Design (60% complete) submittal. Each sheet of the drawings and each page of the specifications and Design Analysis shall be labeled "For Compliance Review Only - 60% Preliminary Design", accordingly. The CID (color/material boards) only needs to have the cover sheet of the binder stamped "For Compliance Review Only- 60% CID". Electronic files on CD shall be provided to each of the addressees listed in paragraph 3.9.1. Drawings (including native BIM models), specifications and design analysis shall be in PDF.

For the Final Design (90% complete) submittal. Each sheet of the drawings and each page of the specifications and Design Analysis shall be labeled "For Compliance Review Only - 90% Final Design", accordingly. Electronic files on CD shall be provided to each of the addressees listed in paragraph 3.9.1. Drawings (including native BIM models), specifications and design analysis shall be in PDF.

For the Corrected Final Design (95% complete) submittal. Each sheet of the drawings and each page of the specifications and Design Analysis shall be labeled "For Compliance Review Only – 95% Corrected Final Design", accordingly. Electronic files on CD shall be provided to each of the addressees listed in paragraph 3.9.1, Submittals Distribution, Media and Quantities. Drawings (including native BIM models), specifications and design analysis shall be in PDF.

Once the Corrected Final Design submittal is back checked by the Government and all review comments have been successfully resolved and concurred with for construction, each sheet of the drawings and each page of the specifications and Design Analysis shall be stamped "For Construction-100% Final Design", accordingly. See paragraph 3.9.1 for the number of copies and submittal distribution requirements. Final Design (100%) "For Construction" electronic drawings and specifications shall be provided on compact disc in the quantity shown in paragraph 3.9.1. Drawings shall include in their native BIM model, as well as in AutoCad dwg and PDF formats. Specifications shall be in both SpecsIntact and PDF.

Once the "For Construction" design package is concurred with, any changes to the plans and specifications shall be submitted as a deviation in accordance with section 01 33 00 Submittal Procedures. The "For Construction" design, after final review has been conducted, in addition to the all the other items which constitute the formal contract, will be used by all parties involved in construction and in administration of the contract. Therefore, it is imperative that the "For Construction" design documents be kept up to date and an effective system of making and distributing changes be implemented. Since changes to the "For Construction" design increase risk of construction errors and deplete available administrative resources, every effort shall be made to minimize revisions to the accepted "For Construction" design. One of the measures of the Contractor's effectiveness of management and design will be how well the goal of minimizing changes to the accepted "For Construction" design is met. The use of effective quality control during design, and utilization of experienced and capable designers are some of the means that are to be used to accomplish this goal. If revisions to the reviewed "For Construction" design become necessary, the procedures described in Section 01 33 00 SUBMITTAL PROCEDURES will be used to accomplish the revisions. The revisions will be considered a "Variation" and shall be submitted as a "GA" submittal. All the requirements in paragraph: "Variations" in 01 33 00 SUBMITTAL PROCEDURES will apply to revisions to the accepted "For Construction" design. All design analysis and calculations necessary to establish that the proposed revision satisfies applicable design, project, and end user requirements shall be included in the submittal. All such submittals must be approved by the DOR and accompanied by a stamped and signed letter by the Designer of Record, which clearly describes the changes to be made to "For Construction" design drawings and/or specifications and the reasons for the revisions. All revisions accepted by the Government shall be reflected in the as-built drawings and/or specifications at no change in time or cost to the contract. Drawings and

specifications are to be kept current throughout all stages of construction with accepted revisions.

3.2.1 **Site and Utilities**

The Government has supplied minimal but sufficient topographic and geotechnical information to understand the basic site conditions. Additional topographic and geotechnical information is required and is the responsibility of the Contractor and considered engineering services after contract award.

These services shall be procured and paid for by the Contractor. The Contractor is required to conduct all geotechnical and foundation site explorations, laboratory analysis and results, and generate a geotechnical report with log of explorations in accordance with the information contained herein. This report shall be the basis for the design of the Geotechnical related features of the project. The Contractor is required to provide topographic data for the site for all areas affected by this project showing all identifiable physical features, site conditions and utilities above and below ground. All surface and subsurface features include paving, trees, walks, buildings, and abandoned construction. The Contractor is responsible for the full, complete, and use for its intended purpose, design of this new Facility. Copies of all exploratory investigation data, samples, tests, results, and reports of any kind shall be submitted to the Government within seven calendar days of receipt by Contractor in PDF.

The Contractor shall verify field conditions that are significant, by field inspection, field exploration, and researching and obtaining all necessary as-built drawings and reproducing them for his/her own use, while discussing status with knowledgeable personnel. The information shall be reflected in the documents.

The Contractor shall procure any and all site and utility maps to ensure that no utilities lines, pipelines, or fiber optical cable are in the way of design-construction. To facilitate fast-tracking design-construction activities, the contractor may submit a Final (90%) site and utility design as the first design submittal or it may elect to submit interim and final site and utility design submittals as explained below. Following review, resolution, and incorporation of all Government comments, and submittal of a satisfactory set of site/utility design documents, after completing all other pre-construction requirements in this contract and after the pre-construction meeting, the Government will allow the Contractor to proceed with site development activities, including demolition where applicable, within the parameters set forth in the accepted design submittal. For the first site and utility design submission, whether an interim or final, the submittal review, comments, and resolution times from this specification apply, except that the Government will require a maximum 21 calendar day review period, exclusive of mailing time. No on-site construction activities shall begin prior to written Government clearance to proceed.

3.2.2 **Interim Design Submittals**

General Note. Any design submission is the Government's primary opportunity to review the design for conformance to the solicitation and to the accepted contract proposal. It provides the opportunity for the Authorities Having Jurisdiction to review for compliance with applicable Federal, DoD, Air Force, State, County, and local building codes at a point where required revisions may be still made. Thus, helping to minimize lost design efforts and keep the design on track with the contract requirements.

The Contractor shall submit either a single interim design for review, representing a complete package with all design disciplines, or split the interim design into smaller, individual design packages as it deems necessary for fast-track construction purposes. As required in Section 01 32 01, the Contractor shall schedule its design and construction packaging plan to meet the contract completion period. The requirements for the interim design review submittals and review conferences are described hereinafter. This is not necessarily a hold point for the design process. The Contractor may designate the interim design submittal(s) as a snapshot and proceed with design development at its own risk.

SUBMITTAL CERTIFICATIONS: Every design submittal shall be accompanied with a letter from each sub-contractor or supplier having direct construction, materials, and/or equipment defined within the submittal. The purpose of the letter is to bring together and coordinate the designers and the sub-contractors slated to accomplish the work and the suppliers of the material and equipment. Each sub-contractor and supplier shall briefly state their involvement in the preparation of the submittal, their proposed activity during the design-build contract associated with the contents of the submittal, and state the design is appropriate for their related field and appropriate for their capabilities/expertise. Each letter shall be on the sub-contractor's/supplier's letter head and signed by a principal of the firm.

The criteria specified in this Contract are binding contract criteria and in case of any conflict, after award, between the Contract and Contractor's submittals, the Contract will govern unless there is a written and signed agreement between the Contracting Officer and the Contractor waiving a specific requirement.

Deviations from the Contract requirements (shall be identified in the cover letter on the respective submittal) may be considered by the Government, and where appropriate, may be specifically approved by the Contracting Officer. Deviations from the Contract requirements shall not be assumed or considered approved unless specifically approved by the Contracting Officer in writing. Such deviations, when not specifically approved by the Contracting Officer or when subsequently found at any time during the Contract, shall be immediately corrected by the Contractor at no additional time or cost to the Government. It is the Contractor's responsibility to clearly note features/aspects in his design or construction that are deviations to the contract requirements. The Contractor shall not assume silence on these issues by the Government to be a sign of acceptance. Government review does not constitute approval or acceptance of any variations from the RFP or from the Contractor's proposal unless such variations have been specifically pointed out by the Contractor in writing and authorized in writing by the Government. The responsibility for a total design for its intended use in accordance with the Contract will remain with the Contractor.

3.2.3 Over-the Shoulder Progress Reviews

In order to facilitate a streamlined design-build process, the Government and the Contractor may agree to one-on-one reviewer or small group reviews, electronically, on-line (if available with the Contractor's standard design practices) or at the Contractor's design offices, when practicable. The Government and Contractor will coordinate such reviews to minimize or eliminate disruptions to the design process. Any data required for these reviews should normally be provided in electronic format, rather than in hard copy.

3.2.4 Final Design (90%) Submissions

This submittal is required for each design package prior to Government acceptance of that design package for construction. The requirements for the Final Design (90%) submittal review conferences and the Government's acceptance for start of construction are described herein after.

3.2.5 Design Complete Submittals

After the Final (90%) Design submission and review conference for the design package, the Contractor shall revise the design package to incorporate the comments generated by DrChecks as resolved in the Final Review Conference, submit the Corrected Final Design (95%) complete documents and then perform and document a back-check DrChecks review. This back-check and revision process of the Corrected Final Design (95%) may take several iterations before all the comments are resolved. Once the final back-check review reveals all closed comments, then that Corrected Final Design (100%) should represent a document package that is suitable to be released for construction. The requirements for the design complete submittals are described hereinafter.

3.2.6 **Holiday Periods For Government Review or Actions**

The Contractor shall not schedule meetings, Government reviews, or responses during the last three weeks of September, the week of Thanksgiving in November, the last two weeks of December, or other designated Government Holidays and shall exclude such dates and periods from any durations specified herein for Government actions.

3.2.7 **Late Submittals**

Proposed submittal date revisions must be made in writing at least seven calendar days prior to the submittal. If a design submittal is over one (1) calendar day late in accordance with the latest design schedule, the Government review period may be extended up to seven additional calendar days to accommodate Government reviewers other scheduled activities.

3.3 DESIGN CONFIGURATION MANAGEMENT

3.3.1 **Procedure**

The Contractor shall develop and maintain effective, acceptable design configuration management (DCM) procedures to control and track all revisions to the design documents from the Initial Design Conference through submission of the As-Built documents. During the design process, this will facilitate and help streamline the design and review schedule. After the final design is accepted, this process provides control of and documents revisions to the accepted design (see special contract requirement: Deviating from the Accepted Design). The system shall include appropriate authorities and concurrences to authorize revisions, including documentation as to why the revision must be made. The DCM data shall be available in a format readable, acceptable, and readily available to Government reviewers at all times. The Contractor may use its own internal system with interactive Government concurrences where necessary or may use the Government's Design Review and Checking System (“DrChecks”).

3.3.2 **Tracking Design Review Comments**

Although the Contractor may use its own internal system for overall design configuration management, the Government and the Contractor shall use the DrChecks Design Review and Checking System to initiate, respond to, resolve and track Government Design compliance review comments. This system may be useful for other data which needs to be interactive or otherwise available for shared use and retrieval. Assistance with DrChecks can be received by calling Ms Char Woffinden, DrChecks Administrator, (916) 557-7612. The Contractor will need to contact Ms Woffinden to register and receive a login and password.

Copies of comments will be made available to all parties before or during the review conference. Unresolved comments/issues at the conference shall be resolved by immediate follow-on action. All comments shall be incorporated and/or addressed to the satisfaction of the Government. Responses in DrChecks shall indicate where the correction was made and what the correction consists of to assist the reviewers to quickly find the adjustment. Simply indicating the comment as "done", "will be done"' or "not done" is not acceptable. The Contractor annotations in the DrChecks web site shall be made before the next submittal is received by the reviewers. Therefore, addressing and bringing to closure the DrChecks comments(s) are a part of the submittal requirements.

3.3.3 **Design and Code Checklists**

The Contractor shall develop and complete various discipline-specific checklists to be used during the design and quality control of each submittal. These completed checklists shall be submitted with each design submittal, as applicable, as part of the project documentation. See Section 01 45 00.00 10, Quality Control.

3.4 INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1 General

At least one interim design submittal, review and review conference is required for each design package (except that, per paragraph 3.2.1, the Contractor may skip the interim design submissions and proceed directly to Final Design (90%) on the site work and utilities package if fast tracking is approved). The DB Contractor may include additional interim design conferences or over-the shoulder reviews, as needed, at no additional cost to the Government, to assure continued Government concurrence with the design work. The interim submittal review periods and conference shall be included in the project schedule and shall indicate what part of the design work is at what percentage of completion. The required interim design conferences shall be held when interim design requirements are reached as described below.

3.4.2 Procedures

The Government will review each submittal and provide written comments in the DrChecks review management system. **The Contractor will provide a minimum of 14 calendar day notification of each review submittal and with this notification, after receipt of an Interim Design submission, the Government will be allowed twenty-one (21) calendar days to review and comment on the interim design submittal.** For smaller design packages, especially those that involve only one or a few separate design disciplines, the parties may agree on a shorter review period or alternative review methods (e.g. over-the-shoulder or electronic file sharing), through the partnering process. For each interim design review submittal, the Government Project Manager will furnish, to the Contractor, a single consolidated listing of all comments from the various design sections and from other concerned agencies involved in the review process using the DrChecks Design Review and Checking System. The review will be for conformance with the requirements of the solicitation and the Contractor's RFP proposal. If the Contractor disagrees with any comment or comments, and does not intend to comply with the comment, Contactor must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comment(s) in order that the comment(s) can be resolved. The Contractor shall furnish disposition of all comments in writing through DrChecks. The Contractor is cautioned that if it believes the action required by any comment exceeds the requirements of this Contract, then Contractor should take no action and notify the Contracting Officer in writing immediately. The Interim Review conference will be held for each design submittal at the installation. The Contractor shall bring the personnel that developed the design submittal to the review conference. The conference should take place approximately one week after the receipt of the comments by the Contractor. For smaller fast-track packages that involve only a few reviewers, the parties may agree to alternative conferencing methods, such as teleconferencing, or video-conferencing, where available, as determined through Partnering. The Contracting Officer will make sure that USACE High Desert Area Office and Nellis Resident Office receive two copies of the Design submissions for review. Copies for other team members may be distributed as agreed by Contractor and Contracting Officer.

The design documents will not be considered 100% complete and ready for construction, until all comments for correction have been incorporated to the Government's satisfaction and further back check reviews are deemed no longer necessary. Review comments for correction will be based on compliance with the Contract document requirements. This back check process could involve several iterations but during these stages, the Contactor will only need to produce those particular drawing sheets or documents which require correction. NOTE: The Contractor is encouraged to append PDF files of the corrections to the DrChecks file for quicker resolution --- but --- the Contractor shall notify each comment maker via telephone or email of such action --- the comment maker must be notified and that notification acknowledged by the recipient.

The Government reserves the right to question the completeness of the design document submittals if Government comments are of too numerous or of great significance. In this

case, every effort shall be made during follow-up action between the Contractor and the Government to resolve conflicts and problems. However, if final submittal(s) are incomplete or deficient, at the sole discretion of the Government, requiring correction and resubmittal by the Contractor, the Government will not add time to the contractual period of service.

3.4.3 Conference Documentation

In order to facilitate and accelerate the Government code and contract conformance reviews, the Contractor shall identify, track resolution of and maintain all comments and action items generated during the design process and make this available to the designers and reviewers prior to the Interim and subsequent design reviews.

The DB Contractor shall prepare meeting minutes and shall enter final resolution of all comments into DrChecks, Copies of comments, annotated with comments and action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Valid comments shall be incorporated. The Government reserves the right to reject design document submittals if comments are numerous and significant. Participants shall determine if any comments are critical enough to require further design development prior to government concurrence. Participants shall also determine how to proceed in order to obtain Government concurrence with the design work presented.

3.5 INTERIM DESIGN REQUIREMENTS

3.5.1 Drawings

Drawings shall include comments from any previous design conferences incorporated into the documents to provide an interim design for the "part" submitted.

Submit drawings complete with all contract requirements incorporated into the documents to provide a 100% design for each package submitted. Prepare all drawings with the chosen Building Information Modeling (BIM) system, organized and easily referenced electronically, presenting complete construction information. Drawings shall be complete. The Contractor is encouraged to utilize graphics, views, notes, and details which make the drawings easier to review or to construct but are also encouraged to keep such materials to those that are necessary. Provide detail drawings that illustrate conformance with the contract. Drawings shall also include room finish schedules, corresponding color/finish/special items schedules, and exterior finish schedules. The design documents shall consist of drawings on a 34" x 22" (ANSI D) format. The DB Contractor shall use standard Corps of Engineers title blocks and borders on all drawings with the appropriate firm name included with the title block area. See paragraph 3.7.1 of this specification for more information.

3.5.2 Design Analysis

The Designers of Record shall prepare and present design analyses with calculations necessary to substantiate and support all design documents submitted. For parts including site work, site specific civil calculations shall be included. For parts including structural work, seismic and structural calculations shall be included. For parts including architectural work, life safety and building code analysis and building load area analysis shall be included. For parts including mechanical work, HVAC analysis and calculations, and sprinkler system analysis shall be included. For parts including electrical work, electrical load analysis and calculations, electrical short circuit and protective device coordination analysis and calculation and arc fault calculations shall be included. The Contractor shall submit the geotechnical evaluation report of soil borings and any other foundation investigations performed in support of design of site work, utilities, foundations, etc., with the appropriate design package(s).

Sustainable Design Documentation. In order to show compliance with the High Performance Sustainable Building (HPSB) and Third Party Certification (TPC) requirements, the Contractor

shall follow all documentation and reporting requirements outlined in section 01 33 29. See also section 01 10 10 for minimum design requirements.

Advanced Modeling Project Execution Plan (PxP): IAW with ECB 2018-7, the contractor shall submit a PxP with the Design Analysis which details the process for executing the Advanced Modeling on this project. The PxP template is provided in the Appendices. More information including the template, submittal review checklist, Minimum Modeling Matrix (M3) can be found at USACE CAD/BIM Technology Center website: https://cadbimcenter.erdc.dren.mil/.

3.5.3 Specifications

The specification number for this project is **2150**, the drawing file number is **229-25-0715**. Information on format and other design guidance can be found for Army/Corps of Engineers projects contained in the Whole Building Design Guide's Construction Criteria Base library (http://www.wbdg.org/ccb/ccb.php) and in the A/E/C CADD Standard, Release 6.0.

The specifications shall be produced in SpecsIntact with the Standard Generalized Markup Language (SGML) using the Unified Facilities Guide Specifications (UFGS). Specification files shall also be delivered in Portable Document Format (PDF). (NOTE: Any Specifications included in the RFP shall be followed for technical content when editing the UFGS in SpecsIntact. However, all references shall be updated to the most current standards/criteria.)

The Designers of Record shall edit and expand the appropriate Specifications to ensure that all project design requirements, current code requirements, most current references, HPSB requirement, environmental and regulatory requirements are met.

3.5.4 Exterior Architectural Rendering

Contractor shall provide with the Preliminary Design submittal, a three-dimensional colored/rendered design drawing of the building exterior. The perspective drawing shall be from a slightly overhead view of the building to encompass building elevations, roof configuration and adjacent site work. An image file in JPG format shall be provided on the CD that is delivered to the addresses provided in this specification. The architectural rendering shall also be provided in black/white on its own sheet in all submittals of the project design drawings. The 95% Final Design and 100% Corrected Final Design submittals shall incorporate any review comments made on the rendering. After approval of the final rendering, the Contractor shall have a color image professionally printed on photography paper and provide three (3) copies to the government. Copies shall be mounted, framed by a mat and enclosed in a black metal frame with glass. The overall frame size shall be approximately 24 inches by 30 inches.

3.5.5 Interim Building Design Contents

Design documents shall include construction drawings, specifications and design analysis for categories such as, but not limited to, civil, architectural, landscaping, structural, fire protection, mechanical, electrical, communications, interior design, and any outside utility services. Specifications shall be in sufficient detail to fully describe and demonstrate the quality of materials, the installation and performance of equipment, and the quality of workmanship. Detailing and installation of all equipment and materials shall comply with NAFB Standards, end user requirements, and manufacturer's recommendations.

The design analysis shall be for each discipline of work and shall include all features with the necessary calculations; tables, methods and sources used in determining equipment and material sizes and capacities, and shall provide sufficient information to support the design. The Contractor shall identify, for approval, the Designer of Record for each area of work. One Designer of Record may be responsible for more than one area. All areas of design disciplines shall be accounted for by a registered Designer of Record. The Designer(s) of Record shall stamp, sign, and date all design drawings under their responsible discipline at each design submittal stage.

The following design grouping table describes the areas of design to be submitted. The contractor shall designate how they will package the design, consistent with its overall plan for permitting and construction of the project.

MAJOR AREA / Submittals	1	2	3	4	5
Site Work and Site Utilities (Civil)	60%*	90%	95%	Constr	
Foundations/Architectural/Interior/Structural		60%	90%	95%	Constr
Mechanical/Fire Protection/Electrical/Communications		60%	90%	95%	Constr
Comprehensive Interior Design	--	60%	90%	--	Constr

Where: 60% = Preliminary Design Submittal (60%) in accordance with paragraph 3.5.5.1.
90% = Final Design Submittal (90%) in accordance paragraph 3.5.5.2.
95% = Corrected Final Design Submittal (95%) for Backcheck Review (paragraph 3.5.5.3)
Constr = ALL review comments have been successfully resolved and concurred with for construction

* = Final Design Submittal (90%) allowed for first Civil Submittal if Fast Tracking allowed per paragraph 1.1.2.

The contractor shall have the freedom to establish the design and construction schedule within the contract period of service, identified in this Solicitation, at the approval of the Contracting Officer.

The Contractor shall submit one detailed schedule for the design activities and for construction activities. These two schedules shall be updated and submitted at each design stage prior to the review conference.

Weather Days. See Section 00800.

Each submittal, all disciplines, shall be completed to the stage/level commensurate with the stage of completion, i.e., 60%, 90% and 95%/100%. All of these deliverables shall be labeled as stated in paragraph 3.2 above.

The design schedule shall be submitted within the first 21 calendar days after the date of Notice To Proceed. The design schedule shall include all activities associated with each respective phase.

The Contractor shall submit the initial construction baseline schedule not later than 45 days prior to the desired start of the construction activities; which includes site work. The construction schedule shall contain all activities associated with the construction of the project, complete and useable for its intended purpose. Construction performance shall not begin until Contracting Officer acceptance of the construction schedule has occurred. Re-submittals due to Contractor controlled deficiencies will not constitute a time or cost change to the Contract. The Contracting Officer will have 21 calendar days to conduct review and provide comments to the Contractor for the submittal and each re-submittal.

Design Packages and Specifications: Following Notice to Proceed (NTP), the Contractor shall complete design packages in such detail and prepare specifications as required to tie together the shop drawings, catalog cuts, and installation requirements into a comprehensive package that defines the work in detail and enables the Government to conduct reviews and perform detailed cost estimation.

Design Submittal: See paragraph 3.9.1 of this section for submittal distribution and quantity information. The drawings will be assembled in a manner that enables the Government to conduct thorough reviews as well as perform detailed cost estimation. The design submittal shall include individual sections for each of the topics defined below. Each of the sections shall be separated with labeled section tabs.

3.5.5.1 **Preliminary Design (60%):** The primary purpose of this submittal is to finalize all major design/engineering decisions, verify that the Customer's functional and technical needs have been met, and to confirm that the designer's approach to the solution of the functional and technical aspects of the project is sound and the appropriate controlling criteria has been adhered to leading to a set of finished construction contract documents.

The Preliminary Design shall be prepared in full accordance with the format and instructions for Army/Corps of Engineers projects contained in the Whole Building Design Guide's Construction Criteria Base library (http://www.wbdg.org/ccb/ccb.php) and in the A/E/C CADD Standard, Release 6.0. The design shall be accomplished by further developing the schematic design as presented in the Solicitation Package. The following are the minimum Preliminary Design Submittal requirements:

Civil/Site Design:

a. Overall site layout (largest scale to fit on one drawing sheet) showing existing features, project boundaries, features to be removed/relocated including existing storm drains, location of streets, new roads, parking, walks and the new Facility.
b. Layout plans showing circulation, building expansion, detail plans.
c. Grading plans, detail plans.
d. Utility plans.
e. PCASE design, joint plan and joint details in accordance with UFC 3-260-02 figure 12-31.
f. Spot Elevations at joint intersections.
g. Profiles and Details.

Landscape Design:

a. Overall plan (largest scale to fit on one drawing sheet) showing anticipated tree, shrub, and site furnishing locations.
b. Layout plans showing kind, size and quantity of trees, shrubs, site furnishings and ground coverings.
c. Irrigation Plans. Provide an irrigation system supply line plan and profile showing location and elevation of pipe, thrust blocks, connections, etc. Materials and appurtenances shall be indicated and specifications shall be provided.
d. Planting details.

Architectural:

a. Composite floor plans - largest scale to fit on one drawing sheet.
b. Floor plans showing all floors, circulation, rooms and spaces with room names and number, electrical/mechanical/communications rooms, programmed and as-designed net areas.
c. All exterior elevations, identify construction materials.
d. All major building sections, identify construction materials.
e. Room finish schedules.
f. Door schedules.
g. Reflected ceiling plans and details including acoustical treatment, lighting fixtures, HVAC supply and return grilles, changes in ceiling heights, ceiling mounted speakers and strobe lights.
h. Roof plans and details.
i. Interior elevations.
j. Toilet room plans, elevations and details.
k. Partition types and details including acoustical treatment.
l. Window and glazing schedules and details.
m. Wall sections and details.

Comprehensive Interior Design: The A/E shall comply with the Comprehensive Interior Design Policy Manual (AFRC) dated 22 September 2010. Comprehensive Interior Design (CID) unless otherwise directed, shall include Structural Interior Design (SID) and Furniture Fixtures and Equipment

(FF&E) Design. The Contractor shall prepare and submit for approval the complete CID package per the Comprehensive Interior Design Policy Manual (AFRC). Reviews and Final approval for all CID submittals will be by HQ AFRC/Design Center. This effort shall include designing and selecting all interior building materials, finishes and special effects necessary to complete the interior environment. The overall objective is to create an integrated visual design theme (architectural and interior design) that reflects the interior atmosphere desired by the User. (NOTE: The furniture shall be procured by the Government/User, except demountable wall partitions, which are provided and installed by A&E; therefore, finishes need to coordinate with this furniture.)

Structural Interior Design: This phase of the work includes specification and coordination of interior materials and finishes that includes structural surfaces, built-in features and features that are integral or attached to the building structure. This includes cabinetry and such amenities as tack boards. One presentation color board shall be required at the 60% submittal and one presentation color board shall be provided at the 90% submittal. Structural interior design materials and finishes must include all wall, floor and ceiling finishes, door and window trim, cabinet finishes, signage, and other miscellaneous items requiring the selection of colors, patterns, and textures in accordance with the Comprehensive Interior Design Policy Manual (AFRC). Exterior building-related materials and finishes samples shall be provided on separate boards and clearly labeled. The Interior Designer shall coordinate this effort with the Architectural Designer's requirements in order to compile a complete design package.

Furniture, Fixtures & Equipment (FF&E): This phase of the work includes coordination with structural related specifications as well as the specification, space planning and coordination of the furnishings package in order to provide the service and working environment for this facility. Provide FF&E for furnishings in all spaces where appropriate. Furniture plans provided in this RFP shall be further developed to accommodate the building occupants' needs. Furnishings (other than demountable wall partitions) shall not be provided nor installed by the A/E; however, the A/E shall assure coordination between the FF&E, SID, building structure, and building utilities including location of light switches, electrical outlets, communication outlets, utility panels, and HVAC units within furnished areas. In case of demountable walls the A/E shall assure no ancillary items such as thermostats, emergency lighting, fire strobes, and etc. will be mounted on demountable walls. The A/E shall interview Government personnel to determine FF&E requirements. Furniture to be obtained from General Services Administration (GSA). Note: Air Force Reserve Command (AFRC) is not mandated and is exempted from the Air Force Systems and Modular Furniture Programs. FF&E items shall be in compliance with the FAR, Part 8. The furnishings package shall be designed in accordance with the Comprehensive Interior Design Policy Manual (ARFC) to include all furniture items to buildout the facility. This submittal shall be separate from the contract documents package (i.e. drawings and specifications) and comply with the following distribution requirements.

Distribution: The Interior Designer shall provide the FF&E information to each entity listed in Paragraph 3.9.1 in accordance with the Comprehensive Interior Design Policy Manual (AFRC):

Structural:

a. Foundation and Floor Plan.

b. Floor Framing Plan.

c. Roof Framing Plan. Show locations of framing members, overall shape and dimensions, diaphragm, etc.

d. Structural data. Calculations. State the soil bearing values, concept foundation design, and other pertinent information from the minimal geotechnical information provided, design live loads for various areas of the building; design wind load; seismic zone; whether or not the building has been designed for future horizontal or vertical loads; and any other notes necessary to clarify or complete the information shown on the drawing. All structural data shall appear on the first sheet of the structural drawings. Check all general structural notes for conflicts with the specifications. The notes should not repeat the specifications. All

structural data shall be consistent with Contractor-prepared Final Geotechnical Report and shall appear on the first sheet of the structural drawings.

Mechanical:

a. Schematic Drawings. Provide separate flow and control (as applicable) schematics for all mechanical systems, including but not limited to those listed below. Include existing systems modified or extended for this project. Label all equipment with a unique identifier corresponding to equipment schedules.

(1) Chilled water, heating water, steam, a condensate piping systems.

(2) Plumbing systems. Using schematic or riser diagram, indicate relative system locations of all major system components, including isolation and zone shutoff valves, and sensor locations for master and area alarms.

(3) Controls diagrams and Input/Output tables.

b. Plan Drawings. Scale floor plans at minimum 1/8-inch per foot scale and mechanical equipment rooms and the congested areas of energy plants at 1/4-inch per foot scale. Show mechanical equipment against the appropriate, up-to-date, architectural floor plan background. Plant and equipment room plans shall be developed to a conceptual level, subject to modifications found necessary in further design development. Other plans as listed shall be developed to an approximately 60 percent completion level.

(1) Ductwork plans showing all main, run-out, and branch ducts with duct-mounted, terminal, and fixture equipment. Include existing equipment where this affects, or is affected by, project work. Show the location of all ducted equipment, including airflow monitoring stations, fans, humidifiers, filters, balancing and automatic dampers and splitters, terminal units, and reheat coils. The locations of zone thermostats and humidistat's shall also be shown.

(2) Distribution piping plans showing the size and locations of

mechanical system equipment including mains, run-outs, branches, risers, pumps, expansion tanks, air removal equipment, isolation and balancing valves, and other associated equipment. Summarize the results of all Life Cycle Cost Analyses and other economic analyses.

(3) Equipment schedule for all mechanical equipment to include capacity, performance, dimensional, and/or connection requirements, as applicable. Capacity information should be available for all major plant equipment and air handling units at this design stage.

(4) Equipment space drawings. Show equipment room, plumbing fixture, and exterior equipment locations and layouts including all equipment and distribution elements for all disciplines, including architectural and structural elements, thermal insulation, NEC dedicated space requirements, equipment maintenance and access space. Plans shall include a minimum of two elevation views for each major air handling unit and equipment room. Include existing equipment and equipment rooms included in project work.

c. Miscellaneous Drawing Requirements. The following drawings shall be developed to an approximately 60% completion level:

(1) Equipment details showing the correct installation, arrangement, support, bracing, connection, and any special fabrication requirements for all mechanical equipment items. These shall show all ancillary components for equipment including, but not limited to, shutoff, balancing or control valves, flexible fittings or connectors, strainers, instrumentation, vibration isolation features, condensate drains, air removal fittings, and housekeeping pads.

(2) Sequences of operation shall be provided for all automatically controlled mechanical

equipment.

(3) Equipment schedule for all mechanical equipment to include capacity, performance, dimensional, and/or connection requirements, as applicable. Capacity information should be available for all major plant equipment and air handling units at this design stage.

Electrical: The plans shall contain the electrical legend, list of abbreviations, site plans with the primary distribution, site lighting, and equipment location and layout; the location and layout of all electrical rooms including closets and swing of doors; lighting fixtures and switching; general purpose receptacles and special receptacles and outlets for equipment rooms; power one-line diagrams and interface connection points; power riser diagram; grounding one-line diagram (including power and communication); lighting fixture schedule (Including lamp types, color rendering index, and color temperature); point-to-point power and lighting wiring for each room and area; and panel schedules. The abbreviation and legend symbols shall conform to ANSI standard Y32-9 and ANSI Y32.2.

Plans submitted at 60% design level shall at a minimum include:
Drawing List
Legend and Abbreviations Electric Site Plan
Electric Yard Layout
Set Aside Plan for Electric Yard Expansion
Utility Corridors and Future Building Utility Pathways Power Single Line Diagram for 12kV through208/120V and 240/120V and 24/12V systems.
Load Calculations for Electric Service
Manufacturer Data used as basis for electrical equipment in electric yard and electric rooms for determining physical space requirements.
Floor (1, 2 and roof) Lighting and Power Plans
Floor (1, 2 and roof) Electrical Systems Plans (voice, data, public address, fire alarm and cable television systems).
Communication, Voice, Data and Internet Connection Diagrams and Pathways.
Fire Alarm Riser Diagrams.
Data/Electric and Mechanical Room Layouts.
Conduit and Cable Schedule.
Load and Preliminary Calculations.

a. Electrical site plans shall indicate all utility infrastructure on the site including but not limited to underground primary feeders; location of pathways for connecting the various building structures and equipment as futures; duct banks and manholes; planned set aside areas for expansion and future connections; electric yard; utility owned switches and equipment; utility service meter locations; location and rating of outdoor switchgear and transformers and secondary wiring; location of fiber optic and communication paths and manholes; exterior lighting (type and location including street, parking, walkway, security, obstruction, controls and wiring. Electrical Site plan shall be inclusive of entire site and may consist of no more than 4 sheets as necessary for adequate scale.

b. Electrical plans shall be grouped legend (symbols, abbreviations, general notes, etc.), electrical demolition, salvage, existing and new electrical, power floor plans, power single-line diagrams, riser diagram, grounding one-line diagram (including power and communication), connection diagrams, conduit and cable schedules, details, panel schedules, feeder schedules, lighting floor, lighting fixture schedules, light fixture guide plates (details), etc.). Conduit plans and cable schedules shall provide unique identifier for equipment and shall include labeling of all electrical field equipment and conductors that corresponds with the schedule. This labeling shall be used as identifiers for the arc flash hazard calculations.

Communications: The plans shall contain Riser diagrams for selected zones of all communications systems including all major system components, such as Public Address system, CATV System, indicating proposed locations for all equipment; Communications site utility plans for voice, data and TV systems indicating any and all communications ductwork,

manholes, hand-holes, and cable routing required to tie the new facility into the existing installation-wide networks/systems. Indicate all existing communications cables on, or adjacent to the immediate project site. Provide details of each communications pathway, duct bank, each type of manhole and handhole. Provide a Communications Symbols List showing a symbol for each type of telephone/data outlet. Provide communications floor plans showing the locations of all communications outlets and equipment. Floor plans showing the communication equipment layout shall include minimum working space requirements and dimensions for equipment. Minimum conduit and cable bending radii shall be accounted for including conduit installations and cable terminations into equipment. Identification of ownership demarcation points shall be included in plans. The minimum acceptable scale for the communications floor plans is 1 to 50. Connection Diagrams shall be included for Communication systems. Provide supporting communications details, as a minimum, provide enlarged communications room plans, room elevations, cable tray, outlets and communications ground bar. Provide detail drawings for each communications outlet.

Fire Protection:

a. **Life Safety/Building Code Composite Plans** (minimum scale 1:100 or 1/8"-1'). Provide a set of architectural floor plans with room names and numbers, including primary and secondary circulation, stairs, elevators, vertical openings, utility rooms and shafts, and structural support elements with the following indications superimposed:

(1) Indicate occupancy classification and sub-classification per NFPA 101, and Use Group Classification per International Building Code (IBC) of all fire areas.

(2) Indicate Smoke Compartmentation zones.

(3) Indicate location of all fire-rated walls and partitions including fire-rated doors and dampers with identification as applicable (fire area separation, smoke barrier, occupancy and exit separation, horizontal exit, and smoke partition, etc.) including specific fire-resistance ratings.

(4) Indicate locations of all required exits, exit capacities (number of people per exit), means of egress and travel distances.

(5) Indicate actual maximum travel distances on each floor and compartment, both to an exit and to a smoke barrier (where smoke compartments are code-required), as required by NFPA 101.

b. **Fire Protection System Plans.** Plans shall indicate location of all sprinkled areas (including system, type, classification of hazard of contents, and respective sprinkler design densities), the zoning of which shall be coordinated with the building smoke compartments and indicate locations of areas protected by other automatic extinguishing and suppression systems. The sprinkler system shall be supervised by the building FDAS.

c. **Fire Detection, and Alarm System (FDAS) and Mass Notification Systems (FMNS)**. Plans shall be provided to show all interfaces between the FDAS, FMNS and the required end user and/or NAFB systems, i.e., utility control system, elevator control panel, HVAC, etc. Plans shall be coordinated with responding organization and shall indicate manufacturer equipment models and component identification tags. Plans shall include connection diagrams, cable types, cable identifiers, conduits and pathways. Indicate connection points for panels and equipment requiring AC power, the location of all FDAS control and annunciation panels, and connections for notification, monitoring and control. Indicate zoning of FDAS initiating and indicating circuits and locations of connected devices, which shall be coordinated with the smoke compartments (zone) layout.

(1) Provide single line riser diagram for all initiating, signaling and alarm supervisory devices and circuits. Indicate all central equipment and system zoning arrangements.

(2) Provide a matrix of the sequence of operations indicating all combinations of input/output alarm and supervisory functions.

(3) Floor plans shall indicate specific types and locations of control panels, batteries and chargers, transmitter, annunciator, fusible safety switch, remote trouble device, alarm initiating and indicating devices, and connections to appliances and fire extinguishing system switches and controls. In addition, show the location of fire alarm master box, circuit runs to installation fire alarm system (if telegraphic or telephonic), and to building control panel. Provide mounting details for master box including radio antenna installation for transmitter. Indicate connection points for panels and equipment requiring AC power. Provide a layout drawing of the control room indicating the location of all central FDAS and fire protection equipment, power supplies, and annunciator section.

d. **Automatic Fire Extinguishing System**.

(1) Provide a Riser diagram to include all valves and appurtenances, controls, switches, drains and drain discharge locations, and pipe sizes. Where diagram requires more than two risers, provide an isometric riser layout. Include standpipe, and fire/booster and jockey pump arrangements.

(2) Floor Plans for Sprinkler and Standpipe System. Indicate limits of different sprinkler and standpipe systems types. Clearly define which areas receive different design densities. Show locations of risers, valves, fire department connection, system supervisory alarms, drains, inspector's test connection, fire and jockey pumps, pump controllers and floor control valves. Show size and location of feed and cross-mains. Indicate location of hydraulically most remote areas. Installation of fire and jockey pumps includes layout of supply and discharge piping, valves, meters, testing devices, control equipment, etc. as required. Include water storage tank design as required. Where fire pump is enclosed in separate room, include a layout of all supply and discharge piping, pumps, controller and accessory equipment to ensure adequate space for installation, maintenance, inspection, testing and supervision.

Smoke Management Plans.

(1) Schematic diagrams of interface features for building systems HVAC/utility control/sprinkler/FDAS systems) for smoke control and management functions.

(2) Schematic diagrams and details for the coordination of smoke control features.

(3) Provide a coordinated layout of all smoke compartments with HVAC system layout sprinkler zones, and FDAS initiating and indicating circuits.

(4) Provide coordination and sequence of operations of controls for HVAC/smoke control outputs with FDAS inputs.

(5) Provide a matrix for the sequence of operations of fire alarm inputs and smoke control outputs.

3.5.5.1.1 **Design Analysis.** Provide comprehensive narratives, catalog data, and calculations as indicated below, or as necessary to clarify or explain the basis of design.

Site/Civil Design. Reference Specification Section 01 10 10 and the following specific requirements. Discuss all aspects of design as developed. Confirm availability of adequate capacities of site utilities or provide descriptions, and related costs, of necessary modifications to provide adequate capacities. Include a drainage report for the site and any geotechnical and/or topographic information.

Landscape Design. Reference Specification Section 01 10 10 and the following specific requirements. Discuss all aspects of design as developed.

Architectural. Reference Specification Section 01 10 10 and the following specific requirements. Address overall architectural concept including interior finishes, exterior finishes (in accordance with Installation Design Guide, as applicable), wall systems, roofing systems, acoustics, net and gross area tabulations, net-to-gross conversion summary, floor-to-floor heights, contingency and mobilization features, energy conservation features, UFAS features, functionality, circulation, etc.

Structural. Reference Specification Section 01 10 10 and the following specific requirements. Discuss basis of design, loads assumptions, allowable unit stresses, ATFP considerations, and seismic design provisions as applicable.

Seismic. Reference Specification Section 01 10 10 and the following specific requirements. Describe seismic bracing, restraint and protection features to be provided for non-structural building systems and installed equipment.

Sustainability and Energy Conscious Design. Reference Specification Section 01 10 10 and the following specific requirements. Describe proposed sustainability and energy conservation building and system features. Address compliance with ASHRAE 90.1 for architectural, mechanical, and electrical building features.

Heating, Ventilating, Air Conditioning: Reference Specification Section 01 10 10 and the following specific requirements.

a. Describe design intent and basis of design. Describe all aspects of HVAC design including a summary of building loads and service demands and the considerations that went in to system and equipment selection. Describe all sources of HVAC and utility services.

b. Describe the proposed HVAC control system and the required extent of interface with the Energy Monitoring and Control System (EMCS).

c. Describe the anticipated acoustical treatment requirements (structural/airborne transmission and duct-borne noise), including silencers, duct lining and other acoustical insulating materials as needed. Reserve space in fan rooms for supply fan attenuation, unless preliminary calculations clearly indicate this will not be required.

d. Describe seismic design elements and aspects of the HVAC design. If piping systems subject to thermal expansion must be seismically braced, describe the approach to coordinating the design of piping supports and thermal expansion equipment with provisions (including anchors, guides, "ells"' offsets, etc.) for seismic bracing.

e. Discuss water treatment requirements for chilled water, heating water, or steam generating systems or equipment.

f. Describe the approach to equipment sizing including ductwork and piping (equipment redundancy, duct/piping velocity limitations, pressure loss per unit of length, etc.)

g. Catalog cuts with dimensional and performance data for the major equipment upon which preliminary establishment of mechanical room space has been based. For air handling units, include data from at least two manufacturers, including data for all major components.

h. HVAC Air Balance Summary Table listing each conditioned or ventilated room or space. This table shall show the required maximum and minimum airflow rates to meet conditioning and ventilation requirements, relative pressurization, and whether room or space air is returned or exhausted. See Air Balance Form for format.

i. Calculations. Room-by-room, block (per air handling unit), and building heating and cooling design loads or demands for the project. Cooling loads for individual room lighting and equipment loads shall be determined by analysis of actual as- designed conditions for each

individual space. The contractor is advised, however, that any calculations showing occupied space airflow "engineering check figures" of less than 5-6 L/s/m^2 will potentially be closely questioned.

(1) Life Cycle Cost Analyses for system and equipment selections.

(2) Sizing information for major equipment. Include sizing calculations for all system components including, but not limited to, heat exchangers, air handlers, boilers, chillers, cooling towers, storage tanks and manifolds, reserve supplies, coils, filters, humidifiers, diffusers, registers, grilles, pumps, steam traps, water heaters, and water treatment equipment, as applicable to the project.

(3) Relative humidity level projection calculations may be deferred to final design, providing the designer reserves adequate space in air handling equipment rooms to accommodate in-unit or in- duct humidifiers if later proven to be required.

(4) Calculate airborne (duct-borne, duct breakout, equipment room breakout) noise generation and the necessary attenuation to maintain the specified room noise criteria levels. For duct-borne noise, as a minimum calculate noise transmission from the supply and return fans to the first room served by the respective system, including noise regeneration at terminal units. If the "first room served" experience noise problems, extend analysis to succeeding rooms.

(5) Calculate room supply, return, ventilation or exhaust air requirements based on the heat gain/loss calculations, total and outside air change/ventilation requirements and temperature, humidity, ventilation and pressurization criteria for each room or space.

(6) Calculate duct and pipe main sizes, including risers and size the run-outs from the mains.

(7) Calculate outside air ventilation rates for each space and air handling system, showing compliance with ASHRAE Standard 62-2001.

(8) Provide piping calculations for all HVAC systems. Where existing utilities are "tapped into" to provide services for the new facility, show that they can adequately handle new demands.

Plumbing. Reference Specification Section 01 10 10 and the following specific requirements.

a. Comprehensive description of design intent and basis of design. Describe all aspects of the plumbing design, including a summary of service demands with the considerations that went into system and equipment selection. Explain the sources of all utility services.

b. Describe seismic design elements and aspects of the plumbing design. If piping systems subject to thermal expansion must be seismically braced, describe the approach to coordinating the design of piping supports and thermal expansion equipment with provisions (including anchors, guides, "ells"' offsets, etc.) for seismic bracing.

c. Discuss water treatment requirements for domestic water, or steam generating systems or equipment.

d. Catalog cuts with dimensional and performance data for the major equipment upon which preliminary establishment of mechanical room space has been based.

e. Calculations. Calculate pipe main sizes, including risers, and size the run-outs from the mains.

(1) Provide equipment sizing calculations for all system components including, but not limited to, heat exchangers, storage tanks and manifolds, reserve supplies, pumps, steam traps, water heaters, and water treatment equipment, as applicable to the project.

(2) Provide piping calculations for all plumbing systems, as applicable. Where existing utilities are "tapped into" to provide services for the new facility, show that they can adequately handle new demands.

Electrical. Reference Specification Section 01 10 10 and the following specific requirements.

a. Provide a comprehensive description of design intent and basis of design.

b. Power and lighting design to include the service transformers, connections interfaces, power distribution centers and distribution systems to be used throughout the building; essential electrical system and subsystems; alternate power sources; lighting systems; isolated power systems; lightning protection system; corrosion control; electrical seismic requirements; and special requirements for selected areas.

c. Survey results of existing primary system and site conditions.

d. Electrical Systems Analysis and Equipment Section with Life Cycle Cost Analyses results where applicable, alternative systems or equipment considered and rejected, and justification for that selected. Rationale for selection of reduced voltage starting, Power Factor correction and power conditioning equipment.

e. Lighting Criteria Schedule. All areas will be listed numerically, with room names, criteria illumination levels (maintained and initial illumination levels) for general and task lighting, and type lamps (with color rendering index, and color temperature). Repetitive areas may be cross-referenced. Note special design features requirements.

f. An Energy Impact Analysis or statement for all systems or equipment considered.

g. Calculations for normal and emergency power systems. Load calculations for determining ratings of transformers, generator capacity (if applicable), switchboards, automatic transfer switches, motor control centers, and power distribution panels. Load calculations shall be based on watts per square meter for lighting and small appliances.

h. Lighting Criteria Schedule. All areas will be listed numerically, with room names, criteria illumination levels (maintained and initial illumination levels) for general and task lighting, and type lamps (with color rendering index, and color temperature). Repetitive areas may be cross-referenced. Note special design features requirements.

i. Lighting calculations for typical rooms, the remaining rooms, and typical exterior areas.

j. Short circuit calculations, power system short circuit analysis.

k. Voltage drop calculations as necessary to support system or wiring method chosen.

Communications. Provide communications narrative describing the design history, purpose, operational features, configurations, logistical responsibilities, interfaces with existing and other systems, and established locations of each communications system. Provide a list of contacts from all offices and agencies with which the Communications Systems Engineer has coordinated the design.

a. Identify in every space: Room number and description; Numbers and types of outlets; Numbers and type of lines.

b. Prepare sizing calculations/rationale for all communications rooms, raceways, service entrance conduits, risers and trunk cables and Public Address System amplifier sizes.

Fire Protection. Reference Specification Section 01 10 10, and the following specific requirements.

a. Develop narrative addressing the fire protection and life safety features of the project. All provisions pertaining to fire protection and life safety features shall be addressed. Indicate "NA" for those items that are not applicable. List applicable codes and criteria and the edition of each.

b. Type of occupancy classification, including mixed occupancies, special occupancy definitions, classification of hazard of contents and occupant load.

c. Analysis of allowable fire area and height increases per UFC 3-600-01, including type of building construction, use group classification, height (feet and number of stories), fire area and separation requirements, fire-resistance requirements of building construction elements, extent of application of spray applied fire proofing and fire stopping methods, and fire ratings of materials.

d. Exposure protection and building separation from other buildings and/or property lines.

e. Occupancy separations per NFPA 101 and UFC 3-600-01 criteria.

f. Subdivision of building spaces with locations of all fire and smoke barriers and fire walls including International Building Code and NFPA 101 fire resistance and separation requirements.

g. Life safety egress considerations per NFPA 101, including types and numbers of exits, capacity, arrangement and protection of means of egress; maximum travel distances; discharge from exits; exit marking and illumination of means of egress; emergency lighting; special security features; etc.

h. Fire suppression/extinguishing systems including functional description, design criteria requirements, and type and location of system equipment. Where both systems are required, determine benefits of separate systems versus a combination sprinkler/standpipe system.

i. Fire Detection and Alarm System (FDAS) and voice communication requirements for field devices, central equipment and installation reporting systems with a description of the central station fire alarm reporting system. Indicate facility operations that impact selection of FDAS with consideration given to type of evacuation, evacuation procedures, and layout of smoke/fire compartments. Include functional description of alarm initiating and alarm indicating requirements, signaling circuits and appliances, circuit performance styles, sequences of operations, zoning and annunciation of alarm and supervisory signals, and interface with building and fire protection systems. Indicate system configuration (conventional hardwired, addressable, multiplex, intelligent, etc.), and type of signal communication (digital, analog, etc.). Indicate FDAS requirements for coordination with other building systems, i.e., HVAC, elevators, fire extinguishing systems, etc.

j. Analysis and description of available primary and secondary water supply and water storage requirements. Include types and locations of system equipment, design criteria requirements, and preliminary building fire flow demand and water duration.

(1) If a standpipe system is proposed, preliminary analysis shall include a combination sprinkler/standpipe system.

(2) If water flow test results support a fire pump and/or tank installation, indicate design criteria in accordance with NFPA criteria, equipment type, arrangement, capacity, and pump ratings. Include pump equipment power, alarm and supervision requirements, automatic and manual fire pump control requirements, and FDAS interface and supervision requirements.

k. Smoke management performance criteria; indicate the objective and scope for smoke control and management within the building. Indicate the type(s) of smoke control and management proposed to meet criteria. Identify building systems that must be interfaced to provide smoke

management. Include a summary of design considerations, control parameters and operational features.

l. Layout requirements for fire extinguisher cabinets.

m. Facility features for emergency power distribution, including control and switching requirements for life safety, critical and equipment loads with load shedding and restoration features as applicable.

n. Special hazards and features which may impact fire protection, such as:

(1) Security (electric door releases, door hardware, locking arrangements, etc.).
(2) Malls/atriums.
(3) Automatic data processing and electronic facilities.
(4) Elevator control/FDAS interface.
(5) Emergency power.
(6) Emergency vehicle easements.
(7) Explosion prevention.
(8) Flammable and combustible liquids handling and storage.
(9) High-frequency electrical equipment.
(10) Radio Frequency Interference (RFI) shielding.
(11) Underground structures/areas.
(12) Windowless structures/areas.
(13) Integration of Building Systems (IBS) Design.

o. Provide a section in the narrative titled "Approaches and Concerns". This section shall include complete description and documentation of any issue, such as a deviation from or a waiver of established criteria, conflicts of criteria or any other problem that arises during design development and could become problematic during construction or operation.

p. Interior wall finish and interior floor finish including class, flame spread and smoke developed ratings. Indicate extent of plastics to be provided as finish materials.

q. Protection of vertical openings, including enclosure requirements for stairs, elevators, escalators, conveyors, dumbwaiters, chutes, atriums, malls, light wells, etc.

r. Water Flow Test and Report. Perform a water flow test and provide the test report in accordance with Specification Section 01 10 10.

(1) Report shall include a diagram of the water distribution system and flow test arrangement, a description of the test, hydraulic characteristics of flow and test hydrants, and water flow test data, including available static pressure, water capacity and residual pressure, and a graph of the water supply curve with demand points indicated.

s. Calculations.

(1) Exiting calculations per NFPA 101, including occupant load, exit width, exit and exit access capacity (number of people per exit), remoteness of exits, and exit passageway and convergence

capacity. For "total" evaluation of high-rise facilities, provide occupant egress flow-time calculations per NFPA 101A.

(2) Provide hydraulic calculations per UFC 3-600- 01, NFPA 13 and NFPA 14 for the sprinkler or combination sprinkler/standpipe system when complete system design is required. For performance designs, provide preliminary calculations for the assessment of system demand. Include end head flow and pressure, flow increase due to balancing, system friction loss, hose stream flow with associated pressure loss, etc.

(3) Provide calculations per UFC 3-600-01 and NFPA 22 for required water storage capacity, supply and sizing calculations for water storage vessels.

(4) Provide calculations to verify the water supply can meet the fire flow and pressure demand of the sprinkler and/or combination sprinkler/standpipe system. Investigate capability of existing water storage and duration to meet the demand of the proposed system.

(5) If a fire pump is required, provide fire pump/booster pump sizing calculations per UFC 3- 600-01 and NFPA 20. Design pump(s) capacity between 125-140 percent of capacity for a standard size pump.

Security Systems. Summarize the security systems design parameters and the major features of the design.

Anti-Terrorism/Force Protection. Provide a narrative, demonstrating compliance with the standards in UFC 4-0101-01. Where sufficient standoff distance is not being provided, show calculations for blast resistance of the structural system and building envelope. For 3-story and higher buildings, provide calculations to demonstrate compliance with progressive collapse requirements.

Wayfinding and Signage. Summarize the wayfinding and signage systems design parameters and the major features of the design.

Structural Interior and Exterior Design. Prepare and present for approval an interior and exterior building finishes scheme in accordance with AFRC CID Policy Manual

Draft Specifications. Provide electronic "marked up" UFGS specification sections. Provide other draft specification sections for requirements where UFGS sections are not available or inadequate.

Draft Submittal Register. Provide draft ENG Form 4288, Submittal Register.

3.5.5.2 **Final Design (90%):** The purpose of this submittal is to provide 100% complete, constructible documents, and include an interdisciplinary, in- house quality assurance review. This submittal shall represent a ready- to-construct set of documents but will not be considered at that stage until a review has been conducted of this submittal and all comments have been incorporated and closed from follow-on back check reviews. The Final Design shall be prepared in full accordance with the format and instructions for Army/Corps of Engineers projects contained in the Whole Building Design Guide's Construction Criteria Base library (http://www.wbdg.org/ccb/ccb.php) and in the A/E/C CADD Standard, Release 6.0. The design shall be accomplished by developing the design as presented in the Preliminary Design Submittal and as modified by the review comments.

Plans. Update all plans of all disciplines, elevations, sections, details, etc. to incorporate all review comments and guidance from the previous submittal. This final version of the plans shall fully support the design intent, systems selection, and specified materials.

Electrical Plans submitted at the 90%-100% design level shall at a minimum include:

Drawing List
Legend and Abbreviations Electric Site Plan
Electric Yard Layout
Set Aside Plan for Electric Yard Expansion
Utility Corridors and Future Building Utility Pathways
Power Single Line Diagrams for 12kV through 208/120V and 240/120V and 24/12V Systems.
Manufacturer Data used as basis for determining physical space requirements, and load calculations and basis of design. All required equipment and component manufacturer

datasheets, cut sheets and specifications.
Floor (1, 2 and roof) Lighting Plans
Floor (1, 2 and roof) Power Plans
Floor (1, 2 and roof) Electrical Systems Plans (voice, data, public address, fire alarm and cable television systems).
Communication, Voice, Data and Internet Connection Diagrams Fire Alarm Riser Diagrams
Data/Electric and Mechanical Room Layouts Conduit and Cable Schedule
Electrical Installation Details
Required Final Electrical Calculations Connection Diagrams

The plans submitted at the 100% design level shall meet the Army Corps of Engineers standards for BCOES and be biddable, constructible, operable (operate in accordance with end user, manufacturer, and designer intent--meet all working space criteria), environmental (be energy efficient) and possess sustainability requirements. Refer to USACE Engineering Regulation 415-1-1 for additional BCOES information.

Contractor shall perform arc flash hazard calculations and labeling after and during start up, commissioning and check out of electrical systems. Arc flash hazard calculations shall be done in conjunction with as builts of the electrical system and establishing device set points. These calculations shall be submitted at project completion and shall meet NFPA70e 2009.

3.5.5.2.1 **Design Analysis.** Update all narratives, catalog cuts, and calculations to incorporate all review comments and guidance from the previous submittal. This final version of the Design Analysis shall fully support the design intent, systems selection, and specified materials.

Final Specifications. Provide all specification sections in final format. Provide a Submittal Register in the SpecsIntact format.

All comments generated during the Preliminary Design review will be incorporated and completely annotated in DrChecks as to what action was taken. Annotated comments shall be completed concurrent with the Final Design submittal. Responses in DrChecks shall indicate where and what was done to resolve the comment, simply indicating the comment as "done" or "will be done" is not acceptable.

Comprehensive Interior Design: This effort shall include designing and selecting all interior building materials, finishes and special effects The overall objective is to create an integrated visual design theme (architectural and interior design) that reflects the interior atmosphere desired by the User. The design shall be accomplished by developing the design as presented in the Preliminary Design Submittal and as modified by the review comments.

Structural Interior Design: Update this information based on comments received on the Preliminary Design submittal.

3.5.5.3 **Corrected Final Design (95%-100%):** The purpose of this submittal is to provide "For Construction" documents, updated as necessary from the review comments generated from the Final Design (90%) review. All review comments generated during the review of the Final Design (90%) documents shall be incorporated. Responses in DrChecks shall be completely annotated prior to submitting the Corrected Final Design (95%) documents. The Corrected Final Design (95%) will be backchecked by the Government and all remaining discrepancies resolved by the contractor. This backcheck process could involve several iterations. Final (100%) "For Construction" documents shall be provided when directed by the Contracting Officer when all remaining discrepancies have been resolved.

3.6 DESIGN REVIEWS AND CONFERENCES

A Design Review Conference will be held in person at the project Installation for the 60% Preliminary, 90% Final Design and 95% Corrected Final Design packages to receive Government acceptance to allow release of the design package for construction. The Contractor shall include

the Concept, Preliminary, Final and Corrected Final design conferences in the project schedule and shall indicate what part of the design work is considered to be at each percentage of completion. The design conference will be held after the Government has had a minimum of twenty-one (21) calendar days to review the design package and supporting data. NOTE: The elements of the Final Design Submittal shall be considered 100% complete but is titled 90% Final Design until it has been vetted through the review process. If any comments are received, the next Final Design Submittal shall be titled 95% Corrected Final Design. This package shall be back checked and revised until all comments are closed. At that time the Final Design will be officially 100% complete.

3.7. FINAL DESIGN REQUIREMENTS

Final design deliverables for a design package shall consist of 100% complete drawings, specifications, and design analysis for Government review and acceptance. The 100% design presentation shall consist of drawings, specifications, and design analysis for each package submitted. In order to expedite the final design review, prior to the conference, the Contractor shall ensure that the design configuration management data and all review comment resolutions are up-to-date. The Contractor shall have performed independent technical reviews and back-checks of previous comments resolutions, as required by Section 01 45 00.00 10, Quality Control.

3.7.1. Drawings

Submit drawings complete with all contract requirements incorporated into the documents to provide a 100% design for each package submitted. Prepare all drawings with the chosen Building Information Modeling (BIM) system, organized and easily referenced electronically, presenting complete construction information. Drawings shall be complete. The Contractor is encouraged to utilize graphics, views, notes, and details which make the drawings easier to review or to construct but are also encouraged to keep such materials to those that are necessary. Provide detail drawings that illustrate conformance with the contract. Drawings shall also include room finish schedules, corresponding color/finish/special items schedules, and exterior finish schedules. The design documents shall consist of drawings on a 34" x 22" (ANSI D) format. The DB Contractor shall use standard Corps of Engineers title blocks and borders on all drawings with the appropriate firm name included with the title block area.

3.7.1.1. Software Requirement

See Attachment 6 Building Information Modeling Requirements for specific software requirements, including graphic standards. Design documentation must be produced as identified in Attachment 6.

3.7.1.2. Electronic Drawing Files

In addition to the native BIM model files, provide separate electronic drawing files for each project drawing in Portable Document Format (pdf). Each file shall contain all the data for one complete drawing, including the date, submittal phase, and border. Each drawing file shall be completely independent of any data in any other file. Drawing files with external references such as reference file attachments or special fonts are not acceptable. The drawing file shall not contain any graphic element that is not part of the drawing image.

3.7.1.3. Drawing Index

Provide an index of drawings on its own sheet as part of the drawings set. Include the sheet number and the sheet title for each drawing in the drawing set. Provide also an electronic list of drawings in Microsoft Excel of all drawings included in each submittal. Include the electronic file name, the sheet reference number, the sheet number, and the sheet title for each drawing.

3.7.1.4. Hard Copies

Submitted hard copies of all electronic drawing files in the quantities and sizes indicated in the distribution list at the end of this specification section. The original hard copy of the “for construction” set shall be stamped and signed by the Designers of Record for “Release For Construction”, and copies for distribution shall be made from the original set.

3.7.2 **Design Analysis**

The designers of record shall prepare a design analysis with calculations necessary to validate and support all design work submitted. For parts including site work, include site specific civil calculations. For parts including structural work, include structural calculations. For parts including architectural work, include life safety and building code analysis and building floor area analysis. For parts including mechanical work, include HVAC analysis and calculations, and sprinkler system analysis. For parts including mechanical work, include HVAC analysis and calculations, and sprinkler system analysis. For parts including electrical work, include electrical load analysis and calculations, electrical short circuit and protective device coordination analysis and calculations. The responsible DOR shall stamp, sign, and date the design analysis. Identify the software used where, applicable (name, version, and vendor). Generally, provide design analyses, individually, in an original (file copy) and one copy for the assigned Government reviewer. Do not combine multi-disciplined volumes of design- analysis, unless multiple copies are provided to facilitate multiple reviewers (one copy per each separate design analysis included in a volume).

3.7.3 **Specifications**

All specification sections provided shall be 100 percent (%) complete and in final form for the Final Design submittal. Provide a Submittal Register in the SpecsIntact format. All comments generated during the Preliminary Design (60%) review will be incorporated and completely annotated in DrChecks as to what action was taken. Annotated comments shall be completed concurrent with the Final Design submittal. Responses in DrChecks shall indicate where and what was done to resolve the comment, simply indicating the comment as "done" or "will be done" is not acceptable.

3.7.4. **Submittal Register**

The DB Contractor shall prepare and update the Submittal Register and submit it with the 100% design specifications (see Specification Section 01 33 00). Include the required submittals for each specification section in a design package in the submittal register.

3.7.5. **Preparation of DD Form 1354 (Transfer of Real Property)**

This form itemizes the types, quantities and costs of various equipment and systems that comprise the project. For the purpose of transferring the new construction project from the Corps Construction Division to the Installation's inventory of real property. The Government will facilitate a discussion between the DB Contractor’s design manager and the Installation Real Property Manager in order to produce a draft Form 1354 . The completed draft Form DD 1354 shall be submitted with the Design Analysis of the Final Design (90%) Submittal. The Corps and Contractor will use these documents to complete the final DD 1354 upon completion of construction.

Refer to UFC 1-300-08, Criteria for Transfer and Acceptance of DoD Real Property for an explanation of the 1354 process, along with a copy of the actual Form. Possible requirements to be included on this Form are as follows:

REQUIRED REAL PROPERTY DATA

1. New Construction/Additions - Facility
2. New Construction - Infrastructure
3. Demolition - Facility
4. Demolition - Infrastructure

1. New Construction/Additions

Project#----------Work Order # ----------

Facility#---------- Installation---------- Category Code----------

Total Unit of Measure (SF, SY, Other) ---------- (--)
$----------
(cost excludes systems)

Dimensions
Outside ------x------ FT
Wings ------x------ FT
Offsets ------x------ FT

Number of floors ----------

Type Construction (Concrete, block, metal, etc.)
Foundation ----------
Floor ----------
Wall ----------
Roof ----------

Utilities (Check when applicable)
Water ----
Sewage ----
Electric ----
Gas ----
Steam ----
Heat Source (Specify type: Gas, Steam, Fuel Oil, Electric, etc.) ----------

Fire Detection
Automatic Fire Detection System ----- EACH ---------- SF $----------
Automatic Fire Alarm/Reporting ----- EACH ---------- SF $----------
Manual Alarm System
Exterior ---------- BOXES $----------
Interior ---------- BOXES $----------

Sprinkler Systems
Closed Head Automatic ------ HDS ---------- SF $----------
Open Head Deluge ------ HDS ---------- SF $----------
Pre-Action ------ HDS ---------- SF $----------
AFFF Pre-Action ------ HDS ---------- SF $----------

Other Fire Suppression System
High Expansion Foam ---------- EACH $----------
Carbon Dioxide ---------- EACH $----------
Protein Foam/Water Deluge ---------- EACH $----------
Halon ---------- EACH $----------
Dry Chemical System ---------- EACH $----------
Foam Systems (Tank Farm) ---------- EACH $----------
Other ---------- EACH $----------

Air Conditioning /Evaporative Cooler

Less than 5 ton	---------- SF	----------TN	$----------
5 to 25 ton	-------# of Units	----------TN	$----------
25 to 100 ton	-------# of Units	----------TN	$----------
Over 100 ton	-------# of Units	----------TN	$----------

Heating

750/3500 MB		---------- MB	$----------
Over 3500 MB		---------- MB	$----------
From Central Plant		---------- SF	$----------
Fuel Oil Storage		---------- GA	$----------
Gas Source	---------- SF	---------- MB	$----------

Energy Monitoring and Control Systems (EMCS)

Central Station Equipment	---------- EACH	$----------
Field Equipment	---------- EACH	$----------
Data Lines	---------- LF	$----------

Security Alarm System	---------- EACH	$----------
Air Compressor	---------- HP	$----------
Compressed Air Distribution Lines	---------- LF	$----------

Electric Emergency Power

Generator	----------KW	$----------
Storage Tank for Fuel (Type)	---------- GA	$----------

2. <u>New Construction/Additions- Infrastructure</u>

Installation-------- Project#--------- Work Order #---------

Roads	---------- SY	---------- LF	$----------
Curb & Gutter		---------- LF	$----------
Driveway		---------- SY	$----------
Vehicle Parking Areas			
Organization Vehicles		---------- SY	$----------
Private Owner Vehicles		---------- SY	$----------
Refueling Vehicles		---------- SY	$----------
Sidewalk		---------- SY	$----------
Street Lights		---------- EACH	$----------
Boundary Fence			
Chain Link		---------- LF	$----------
Block Wall		---------- LF	$----------
Interior Fence			
Chain Link		---------- LF	$----------
Block Wall		---------- LF	$----------
Security Fence			
Chain Link		---------- LF	$----------
Block Wall		---------- LF	$----------

Exterior Lighting

Street Lights	---------- EACH	$----------
Security Lights	---------- EACH	$----------
Apron Floodlighting	---------- EACH	$----------
Electric Aircraft Outlets	---------- EACH	$----------
Water Distribution Mains	---------- LF	$----------
Non potable	---------- LF	$----------
Fire Protection Main	---------- LF	$----------
Fire Hydrants	---------- EACH	$----------
Fire Pumps (internal combustion, steam or electric drivers)	------- GM---------- SF	$----------
Fire Protection Water Storage	---------- KG	$----------
Storm Drains	---------- LF	$----------
Sanitary Sewage Main	---------- LF	$----------
Industrial Waste Main	---------- LF	$----------
Industrial Waste Fuel Spill Collector	---------- KG	$----------
Gas Mains	---------- LF	$----------
Primary Electrical Distribution Lines		
Overhead	---------- LF	$----------
Underground	---------- LF	$----------
Secondary Electrical Distribution Lines		
Overhead	---------- LF	$----------
Underground	---------- LF	$----------
Utility Line Ducts	---------- LF	$----------
Steam Heat Mains	---------- LF	$----------
Sanitary Sewage Mains	---------- LF	$----------
Pad (for propane tank)	---------- SY	$----------
Pre-Engineered Revetment	---------- LF	$----------
Other	----------	$----------

3. <u>Demolition - Facility</u>

Project#---------- Work Order # ----------

Facility#---------- Installation----------

4. <u>Demolition - Infrastructure</u>

Installation---------- Project#---------- Work Order # ---------

Roads	---------- SY	---------- LF	$----------
Curb & Gutter		---------- LF	$----------
Driveway		---------- SY	$----------
Vehicle Parking Areas			
Organization Vehicles		---------- SY	$----------
Private Owner Vehicles		---------- SY	$----------
Refueling Vehicles		---------- SY	$----------
Sidewalk		---------- SY	$----------
Street Lights		---------- EACH	$----------
Boundary Fence			
Chain Link		---------- LF	$----------
Block Wall		---------- LF	$----------
Interior Fence			
Chain Link		---------- LF	$----------
Block Wall		---------- LF	$----------
Security Fence			
Chain Link		---------- LF	$----------
Block Wall		---------- LF	$----------
Exterior Lighting			
Street Lights		---------- EACH	$----------
Security Lights		---------- EACH	$----------
Apron Floodlighting		---------- EACH	$----------
Electric Aircraft Outlets		---------- EACH	$----------
Water Distribution Mains		---------- LF	$----------
Non potable		---------- LF	$----------
Fire Protection Main		---------- LF	$----------
Fire Hydrants		---------- EACH	$----------
Fire Pumps (internal combustion, steam or electric drivers)	------- GM	---------- SF	$----------
Fire Protection Water Storage		---------- KG	$----------
Storm Drains		---------- LF	$----------
Sanitary Sewage Main		---------- LF	$----------
Industrial Waste Main		---------- LF	$----------
Industrial Waste Fuel Spill Collector		---------- KG	$----------
Gas Mains		---------- LF	$----------
Primary Electrical Distribution Lines			
Overhead		---------- LF	$----------
Underground		---------- LF	$----------
Secondary Electrical Distribution Lines			

Overhead	----------	LF	$----------
Underground	----------	LF	$----------
Utility Line Ducts	----------	LF	$----------
Steam Heat Mains	----------	LF	$----------
Sanitary Sewage Mains	----------	LF	$----------
Pad (for propane tank)	----------	SY	$----------
Pre-Engineered Revetment	----------	LF	$----------
Other	----------		$----------

3.7.6 **Acceptance and Release for Construction**

At the conclusion of the Final Design Review (after resolutions to the comments have been agreed upon between DOR and Government reviewers), the Contracting Office or the ACO will accept the Final Design Submission (100% Corrected Final Design Submittal) for the design package in writing and allow construction to start for that design package. The Government may withhold acceptance until all major corrections have been made or if the final design submission requires so many corrections, even though minor, that it isn't considered acceptably complete.

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

After the Final Design (90%) Submission and Review Conference and after Government acceptance of the Final Design (90%), the Contractor shall revise the design documents for the design package to incorporate the comments generated and resolved in the final review conference, perform and document a back-check review and submit the Corrected Final Design (95%) documents. The following deliverables are required for distribution and field use. The deliverables include all documentation and supporting design analysis in final form, as well as the final review comments, disposition and the back-check. As part of the quality assurance process, the government may perform a back-check of the released for construction documentation. The Contractor shall promptly correct any errors or omissions found during the Government back-check. The Government may withhold retainage from progress payments for work or materials associated with a final design package until this submittal has been received and the Government determines that it is complete.

3.9. SUBMITAL DISTRIBUTION, MEDIA AND QUANTITIES

3.9.1. **Submittal Distribution Addresses**

The documents which the Contractor shall submit to the Government for each submittal are listed and generally described in preceding paragraphs in this Section. The Contractor shall submit hard copies and electronic files (i.e. native BIM model files and PDF format files) of the review documents in the quantity and to the addresses indicated below for each review.

Agency Mailing Address	Agency Code		Agency Mailing Address	Agency Code
99 CES/CENMP Attn: Gary Faron 6020 Beale Ave (Bldg-812) Nellis AFB, NV 89191	1/BCE		USACE Attn: Peter Pupparo 4551 Devlin Dr, Bldg 899 Nellis AFB, NV 89191	4/RES

702-652-9427			702-852-3544	
HQ AFRC/A4CM Attn: Mike Klug 255 Richard Ray Blvd. Robins AFB, GA 31098-1637 (478)327-1108	2/AFRC/A4CM		USACE Attn: Char Woffinden 1325 J Street Sacramento, CA 95814-2922 916-557-7612	5/SPK
USACE Attn: Rob Lewis 5205 E. Comanche St, Bldg-1605 Davis-Monthan AFB, AZ 85707 Phone: (520) 906-7780	3/PM			

NOTES:

a. Each design analysis manual shall contain calculations, catalog cuts, DD Form 1354, DrChecks comments & responses and all other relevant supporting permits and certifications.

b. Electronic copies saved to CD shall include the following:
   1. One composite PDF copy of the entire submittal
   2. Specifications in native SpecsIntact, MS Word and PDF copy
   3. Design Analysis in MS Word and PDF copy
   4. Drawings in AutoCAD and PDF formats [Note: Revit Viewing Software "IFC" shall be provided.]

c. Back Check submittals shall include drawings/pages necessary to support closing out DrChecks comments. Repeat the cycle until all comments have been closed.

d. Provide Construction Set seven (7) calendar days after notification of compliance review acceptance of all DrChecks comments.

e. All document submission packages must contain a transmittal letter and an index of contents. Copies of all the transmittal letters plus the original Los Angeles District transmittal letter shall be included with the package sent to the Los Angeles District Office.

3.9.2. **Mailing of Design Submittals**

All design submittals shall be mailed to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor with the addresses to which each copy shall be mailed after award of the contract. The submittals and submittal quantities shall be mailed to the addresses listed in paragraph 3.9.1 of this section above.

Each design submittal shall have an accompanying transmittal letter that indicates the date, percentage of design, type of submittal, list of items submitted, number of the transmittal, and point of contact with telephone number.

3.9.3 **Distribution Submittals and Quantities**

Refer to following Table: [NOTE: The quantities identified represent “hard copy” sets. But, each address listed shall “always” receive 1 CD that contains “all” the information included in each submittal (i.e. drawings, specifications, design analysis and HPSB Checklist).]

DISTRIBUTION LIST – AGENCY CODE	1/BCE	2/AFRC/A4CM	3/PM	4/RES	5/SPK
Submittal #1: Kick-Off/Charrette Meeting					
Design Quality Control Plan (CD ROM)	1	1	1	1	1
Report/Meeting Minutes (CD ROM)	1	1	1	1	1
Updated Drawings – if revised during mtg (CD)	1	1	1	1	1
Submittal #2: Preliminary Design 60%					
Drawings at 11” x 17”	5	1	1	2	2
Drawings at 22” x 34”					
Specifications	1			2	1
Design Analysis Manual	1			2	1
Color Boards	1				
HPSB Checklist	1	1	1		1
Rendering (CD ROM)	1				
Compact Disk (CD ROM)	5	1	1	2	1
Required Permits					
BIM: Model and Facility Site Data					1

DISTRIBUTION LIST – AGENCY CODE	1/BCE	2/AFRC/A4CM	3/PM	4/RES	5/SPK
Submittal #3: Final Design 95%					
Drawings at 11” x 17”	5	1	1	2	2
Drawings at 22” x 34”					
Specifications	1			2	1
Design Analysis Manual	1			2	1
Color Boards	1				
HPSB Checklist	1	1	1		1
Rendering (CD ROM)	1				
Compact Disk (CD ROM)	5	1	1	2	1
Required Permits					
BIM: Model and Facility Site Data					1
Submittal #4: Corrected Final Design 100%					
Drawings at 11” x 17”	3	1		2	2
Drawings at 22” x 34”					
Specifications	1			2	1
Design Analysis Manual	1			2	1
Color Boards	1			1	
HPSB Checklist	1	1			1
Rendering (CD ROM)	1		1		
Compact Disk (CD ROM)	5	1	1	2	1
Required Permits					
BIM: Model and Facility Site Data					1

DISTRIBUTION LIST – AGENCY CODE	1/BCE	2/AFRC/A4CM	3/PM	4/RES	5/SPK
Submittal #5: Construction Set					
Drawings at 11” x 17”	2	1	1	2	1
Drawings at 22” x 34”				1	
Specifications	1			1	
Design Analysis Manual	1			1	
Color Boards – submit if changed at Back Check	1			1	
HPSB Checklist	1	1	1		1
Rendering (CD ROM and matted/framed)	3				
Compact Disk (CD-ROM)	5	1	1	1	1

3.10. AS-BUILT DOCUMENTS

As-built drawings and specifications are to be provided in accordance with Section 01 78 00 "CLOSEOUT SUBMITTALS."

3.11 COORDINATION

3.11.1 Written Records

The Contractor shall prepare a written record of each design site visit, meeting, or conference, either telephonic or personal, and furnish copies to the Contracting Officer and all parties involved within seven working days. The written record must include the subject, names of participants, outline of discussion, and recommendation or conclusions. Each written record is to be numbered for the particular project under design in consecutive order.

3.11.2 Design Needs List

Throughout the life of the Contract, the Contractor shall furnish the Contracting Officer, as required, a "needs" list for design-related items. This list shall itemize in an orderly fashion design data required by the Contractor to advance the design in a timely manner. Each list shall include a sequence number, description of action item, and the name of the individual or agency responsible for satisfying the action item and remarks. The list is to be maintained on a continuous basis with satisfied action items checked off and new action items added as required. Once a Request for Information is initiated, that item shall remain on the list until the requested information has been furnished or otherwise resolved. Copies of the lists shall be mailed to both the Contracting Officer and the agencies tasked with supplying the information.

3.12 Operation & Maintenance (O&M) Manuals:

Prior to final inspection, the Contractor shall submit five (5) complete copies of O&M manuals in bound 8-inch by 11-inch booklets and on a CD in PDF. Submittal shall include a brief description of all building systems including exterior and interior items that require maintenance including but not limited to coatings and finishes, doors, windows and hardware, flooring, roofing, drainage, irrigation and landscaping systems, HVAC systems, plumbing systems, fire protection systems, lighting systems, power systems, communications systems, and fire alarm systems. Information should include the manufacturer's name, model number, service manual, parts list and simplified wiring and control diagrams of the systems as installed. In addition, the submittal shall list step-by-step procedures required for system startup, operation, shutdown, routine maintenance procedures, possible breakdowns and repairs, and a trouble-shooting guide.

--End of Section--

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02/15

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SUSTAINABILITY REPORTING
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 189.1	(2011; Errata 1-2 2012; INT 1 2013; Errata 3-8 2013) Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

ANSI/SMACNA 008	(2007) IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition

U.S. DEPARTMENT OF ENERGY (DOE)

ISWG Guiding Principles	(2008) High Performance and Sustainable Buildings Guidance

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2 SUMMARY

This specification includes general requirements and procedures for this project to be constructed and documented per the federally mandated "Guiding Principles" (GP), Third Party Certification (TPC) requirements, UFC 1-200-02 High Performance and Sustainable Building Requirements, and other requirements identified in this specification.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor QC approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to this section. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preliminary Sustainability Notebook; G, DO

Preliminary High Performance and Sustainable Building Checklist

SD-07 Certificates

Third Party Certification (TPC)

SD-11 Closeout Submittals

Final Sustainability Notebook; G

Final High Performance and Sustainable Building Checklist; G, DO

Amended Final Sustainability Notebook; G, DO

Third Party Certification Certificates; G, RO

1.4 GUIDING PRINCIPLES VALIDATION (GPV)

Provide sustainability documentation to verify achievement of ISWG Guiding Principles Validation (GPV). Provide the following for GPV:

a. Refer to Attachment 1, HPSB Checklist at the end of this specification section.

b. Obtain approval of any changes to the HPSB Checklist from the Contracting Officer at the Initial Design Conference. Contracting Officer's approval establishes identified ISWG Guiding Principles Requirements as the project's sustainability goals.

   No variations or substitutions to the HPSB Checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any changes that impact meeting the approved ISWG Guiding Principles Requirements for this project and demonstrate that change will not incur additional construction cost or increase the life cycle cost.

c. Include all work required to incorporate the applicable ISWG Guiding Principles Requirements indicated on the HPSB Checklist and in this contract.

d. Include construction related documentation to maintain an up-to-date Sustainability Notebook. Supplement construction related documentation containing the following components;

   (1) HPSB Checklist

   (2) Sustainability Action Plan

   (3) Documentation illustrating Guiding Principle (GP) Requirements compliance

   (4) Commissioning Plan and Reports

1.4.1 Sustainability Action Plan

Include the following information in the Sustainability Action Plan:

a. Contractor's planned method to achieve each GP requirement.

b. For each designated construction related ISWG Guiding Principles Requirements that is not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

c. Name and contact information for: Contractor's POC responsible for ensuring sustainability goals are accomplished and documentation is assembled.

1.4.2 Costs

Contractor is responsible for all costs associated with constructing and demonstrating that project complies with approved ISWG Guiding Principles Requirements.

1.4.3 Calculations

Provide calculations, product data, and certifications required in this section to demonstrate compliance with the ISWG Guiding Principles Requirements.

1.4.4 Third Party Certification (TPC) Documentation

This project must be designed and constructed to achieve a compliant rating using the GBCI GP Assessment. Provide all documentation in the format required by the TPC Organization to the Contracting Officer for approval and for final approval by the TPC organization. Third Party Certification is met when Government receives TPC organization certificate. Include the following:

a. The TPC Checklist as approved by the Contracting Officer at the Initial Design Conference.

No variations or substitutions to the approved TPC checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any project changes that impact meeting the approved TPC Requirements for this project. Demonstrate that change will not: incur additional construction cost; increase the life cycle cost; impact previous TPC Design Review; or impact required TPC certification level.

b. All work required to incorporate the applicable TPC Requirements into the design and construction of the project.

d. All related information, and provide replacement pages, in the Sustainability Notebook pertaining to additions and changes to the approved sustainability requirements. The Sustainability Notebook is in electronic format and is explained in the paragraph entitled "SUSTAINABILITY NOTEBOOK". The Sustainability Notebook contains the following components in addition to the GPV components above:

(1) TPC Checklist

(2) Sustainability Action Plan

(3) Completed TPC documentation for each identified prerequisite and credit. Upload onto the TPC Online documentation website.

(4) Copy of all correspondence with the TPC organization.

e. Include the following information in the Sustainability Action Plan. Provide this TPC information in addition to the GPV Sustainability Action Plan items above:

(1) Contractor's planned method to achieve each TPC requirement.

(2) For each required TPC credit that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

(3) Provide the commissioning plan and schedule for performance testing.

(4) Name and contact information for: Contractor's Sustainability POC and other names of sustainability professionals on the Contractor's Staff responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled. Contractor's Sustainability POCs are also responsible for ensuring GPV required in paragraph GUIDING PRINCIPLES VALIDATION (GPV) above.

f. Contractor is responsible for all costs associated with constructing and demonstrating that project complies with approved TPC requirements, including but not limited to:

(1) TPC coordination with Government's AE and other consultants, TPC website requirements, and management of related documentation.

(2) Submittals required to demonstrating compliance with Government approved TPC checklists.

g. Provide all calculations, product data, and certifications required in this contract to demonstrate compliance with the TPC Requirements of this section.

1.4.5 Third Party Certification (TPC)

Contractor is responsible for registering and meeting all requirements to achieve Third Party Certification (TPC) GP compliance certification using the GBCI GP Assessment, or other Government-approved equivalent TPC sustainability certification. An equivalent TPC organization must demonstrate equivalency for Government consideration, prior to use on the project. Third Party Certification is met when Government receives TPC organization certificate

Register project with TPC organization using the following format and content:

a. Project Title First Line: US Air Force, Building Name (if known)

b. Project Title Second Line: MILCON P#, DD1391 Project Name

c. Project Address: UIC (Installation code), Category code, RPUID (Real Property Unique Identifier) Number

d. Project Owner Organization: US Air Force

e. Primary Contact, Owner: Agency Project Manager

f. Additional Contact, Building Owner: Civil Engineering Officer or Designee

The TPC Certification requires the following:

a. Refer to Attachment 1, HPSB Checklist at the end of this specification section.

b. Complete all work required to incorporate the applicable TPC Requirements.

c. Maintain related information, and provide replacement pages, in the Sustainability Notebook pertaining to additions and changes to the approved sustainability requirements. The Sustainability Notebook is in electronic format and is explained in the paragraph entitled "SUSTAINABILITY NOTEBOOK". The Sustainability Notebook contains the following components in addition to the GPV components above:

(1) TPC Checklist

(2) Completed TPC Online forms for each GP requirements

(3) Copy of all correspondence with the TPC organization including proof of TPC registration

(4) Documentation illustrating compliance with TPC requirements

(5) TPC Award Certificate

d. Include the following information in the Sustainability Action Plan. Provide this TPC information in addition to the GPV Action Plan items above:

(1) Contractor's planned method to achieve each TPC requirement.

(2) For each required TPC credit that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

(3) Name and contact information for: Contractor's Sustainability POC and other names of sustainability professionals on the Contractor's Staff responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled

(4) Provide the plan and schedule for performance testing, data collection, and commissioning to take place during first year of facility usage.

e. Contractor is responsible for all costs associated with constructing and demonstrating that project complies with approved TPC requirements, including but not limited to:

(1) Initial TPC registration fees

(2) Final TPC review and certification fees

(3) Online TPC management and documentation.

(4) Obtaining TPC certification based on Government-approved sustainability goals.

(5) Construction work required to incorporate TPC prerequisites and credits.

(6) Submittals required to demonstrate compliance with Government approved TPC checklists.

f. Provide all calculations, product data, and certifications required in this specification to demonstrate compliance with the TPC Requirements.

g. Provide all online TPC management and documentation.

h. Contractor is responsible for all required responses to TPC.

i. Provide TPC Certificates. Use format below to create the Certificate and Letter of Congratulations. Forward to parties designated by Contracting Officer:

Certificate:

Project Title, first line: P-(X); Form DD1391 Project Name).

Project Title, second line: UIC (Installation code)

(3) Letter Congratulations:

Address letter to Facility's Installation commander Name. Address the letter to an individual person.

1.5 SUSTAINABILITY SUBMITTALS

Provide documentation in the Sustainability Notebook and the HPSB Checklist to indicate compliance with the sustainability requirements of the project.

1.5.1 "S" Submittals for Sustainability Documentation

Submit the GPV and TPC sustainability documentation required in this specification as "S" submittals. Highlight GPV and TPC compliance data in "S" submittal.

1.5.2 SUSTAINABILITY NOTEBOOK

Provide and maintain a comprehensive Sustainability Notebook to document compliance with the sustainability requirements identified in the approved HPSB and TPC Checklists. Sustainability Notebook must contain all required data to support full compliance with the ISWG Guiding Principles Requirements and TPC requirements. Sustainability Notebook is in the form of an Adobe PDF file, bookmarked at each ISWG Guiding Principles and TPC requirement, and sub-bookmarked at each document. Match format to ISWG Guiding Principles numbering system indicated in UFC 1-200-02 Maintain up to date information, spreadsheets, templates, and other

required documentation with each current submittal. For TPC projects, provide a second Table of contents using TPC numbering system. Locate documentation unique to TPC here. Where TPC documentation would repeat GP documentation, insert note referring reviewer to GP documentation.

Contracting Officer may deduct from the monthly progress payment accordingly if Sustainability Notebook information is not current, until information is updated and on track per project goals.

1.5.2.1 Sustainability Notebook Submittal Schedule

Provide Sustainability Notebook Submittals at the following milestones of the project:

a. Preliminary Sustainability Notebook

Submit preliminary Sustainability Notebook for approval at the Pre-construction conference. Include Preliminary High Performance and Sustainable Building Checklist.

b. Construction Progress Meetings. Update GP and TPC documentation in the Sustainability Notebook and TPC Online tool for each meeting.

c. Final Sustainability Notebook

Submit updated Sustainability Notebook within 60 days after the Beneficial Occupancy Date (BOD). Final progress payment retainage may be held by Contracting Officer until final sustainability documentation is complete. Submit three (3) electronic copies of the Final Sustainability Notebook on DVDs to the Government. Include Final High Performance and Sustainable Building Checklist.

d. Amended Final Sustainability Notebook

Amend and resubmit the Final Sustainability Notebook to include commissioning, testing and balancing, and collection of performance requirements. Submit three (3) final electronic copies of the Amended Final Sustainability Notebook Submittal on DVDs to the Government no longer than 30 days after the GP, TPC, and Cx designated data collection period.

1.5.3 HIGH PERFORMANCE SUSTAINABLE BUILDING (HPSB) CHECKLIST

Provide construction documentation that provides proof of and supports compliance with the completed HBSP Checklist.

1.5.3.1 HPSB Checklist Submittals

Submit an updated copy of the HPSB Checklist with each Sustainability Notebook submittal. Attach HPSB Checklist to DD1354 Real Property Record Submittal.

1.5.3.2 HPSB Checklist Public Access

Where not included as attachment to this specification section, use the following as HPSB Checklist for respective service branch. Where Internet address appears on two lines, copy full address into Internet browser.

a. Air Force - Air Force MILCON Sustainability Requirements

Scoresheet, Attachment 3 of "AF Sustainable Design Development Implementing Guidance Memo"
http://www.wbdg.org/ccb/browse_cat.php?c=265

1.6 DOCUMENTATION REQUIREMENTS

Documentation used to demonstrate TPC compliance may be used to demonstrate GP compliance.

Incorporate each of the following ISWG Guiding Principles Requirements into project design and construction and provide documentation that proves compliance with each listed requirement. Items below are organized according to the ISWG Guiding Principles. For projects that require TPC, refer to Third Party Certifier's reference manuals for TPC requirements.

1.6.1 Commissioning

Work with the Commissioning Authority (CxA) to achieve requirements of the Commissioning plan and other contract document requirements at each stage of commissioning. Maintain up-to-date records of commissioning activities in the Sustainability Notebook, to include commissioning plan and summary commissioning report.

1.6.2 Energy Efficient Equipment

Provide only energy-using equipment that is Energy Star rated, or has the Federal Energy Management Program (FEMP) recommended efficiency. Where Energy Star or FEMP recommendations have not been established, provide equipment with efficiency in the top 25 percent for the type of equipment procured. Provide only energy using equipment that meets FEMP requirements for low standby power consumption. Energy efficient equipment can be found at: http://www1.eere.energy.gov/femp/ and http://www.energystar.gov/. Provide the following documentation:

Proof that equipment is energy efficient and complies with the cited requirements.

1.6.3 Benchmarking

Provide report of initial actual energy performance with the energy design targets. Provide the following documentation:

Prefinal Performance Report with data collected from the first 60 days of operation of the facility after Beneficial Occupancy Date (BOD). Submit this information with the Final Sustainability Notebook Submittal.

1.6.4 Reduce Volatile Organic Compounds (VOC)

Provide materials and products with low pollutant emissions, including composite wood products, adhesives, sealants, interior paints and finishes, carpet systems, and furnishings. Meeting the requirements of ASHRAE 189.1 Sections 8.4.2 (Prescriptive Option: Materials) or Section 8.5.2 (Performance Option: Materials) demonstrates compliance. Provide the following documentation:

a. Demonstrate that materials do not exceed maximum VOC emissions of cited standards. VOC averaging is allowed where coatings are subject to human contact or harsh environmental conditions.

b. Demonstrate that flooring materials comply with VOC emissions of cited

standards.

c. Demonstrate that composite wood and agrifiber products and associated laminating adhesives contain no added urea-formaldehyde.

d. Demonstrate that furniture and seating complies with low emissions requirements.

e. Create and maintain a list of above listed products used on the project within the building vapor barrier. Demonstrate how product meets cited standards.

1.6.5 Indoor Air Quality During Construction

Prior to construction, create indoor air quality plan. Implement IAQ plan during construction and flush building air before occupancy.

a. Construction submittal documentation required:

(1) For new construction and for renovation of unoccupied existing buildings, comply with ASHRAE 189.1 Section 10.3.1.4. (Indoor Air Quality (IAQ) Construction Management), with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent. For renovation of occupied existing buildings, comply with ANSI/SMACNA 008 IAQ Guidelines for Occupied Buildings Under Construction.

(2) Provide required documentation showing that after construction ends and prior to occupancy, new HVAC filters were installed, and building air was flushed out in accordance with UFC 1-200-02.

1.6.6 Recycled Content

Provide materials on this project with aggregated total recycled content greater than 10 percent. In addition, comply with 40 CFR 247. Refer to http://www.epa.gov/cpg/products.htm for assistance identifying products cited in 40 CFR 247. Provide the following documentation:

a. Total amount of recycled content contained in building materials as a percentage of total cost of all building materials on the project (mechanical, electrical, and plumbing components, fire protection equipment and transportation are excluded).

b. Substitutions: Contractor may submit for Government approval, proposed alternative products or systems that provide equivalent performance and appearance and have greater contribution to project recycled content requirements. For all such proposed substitutions, submit with the Sustainability Action Plan accompanied by product data demonstrating equivalence.

1.6.7 Bio-Based Products

Utilize products and material made from biobased materials to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. Use only supplies and materials of a type and quality that conform to applicable specifications and standards.

Biobased products that are designated for preferred procurement under the

USDA BioPreferred Program must meet the required minimum biobased content. Refer to http://www.biopreferred.gov for the product categories and BioPreferred Catalog. Provide the following documentation:

a. For biobased products used on this project, provide biobased content and biobased source of material. Indicate name of the manufacturer, cost of each product and the use of each product on this project.

1.6.8 Landfill Disposal

Divert construction debris from landfill disposal in accordance with Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT. Provide the following documentation:

a. Documentation showing total amount of construction debris diverted from landfill as a percentage of all construction debris on the project.

b. Include project's Construction Waste Management Plan and all dumpster haul tickets.

1.6.9 Ozone Depleting Substances

Eliminate the use of ozone depleting substances during and after construction where alternative environmentally preferable products are available. Meet the requirements of ASHRAE 189.1 Section 9.3.3 Refrigerants for no CFC-based refrigerants in heating ventilation, air conditioning and refrigeration systems (except for fire suppression system requirements, covered elsewhere in this specification). Provide the following documentation:

a. MSDS sheets for all refrigerants provided

b. Products that meet the criteria of U.S. EPA Significant New Alternatives Policy, available at http://www.epa.gov/ozone/snap/index.html.

1.6.10 Validation and Certification Restrictions

The Contractor's purchase of renewable energy certificates (RECs) specifically to meet project sustainability goals is prohibited.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 SUSTAINABILITY COORDINATION

3.1.1 Coordinating Sustainability Documentation Progress

Provide sustainability focus and coordination at the following meetings to achieve sustainability goals. Contractor's designated TPC accredited sustainability professional responsible for GP and TPC documentation must participate in the following meetings to coordinate documentation completion.

a. Pre-Construction Conference: Discuss the following: TPC and HPSB

Checklists, Sustainability Action Plan, Construction submittal requirements and schedule, individuals responsible for achieving each Guiding Principle Requirement and TPC prerequisite and credit.

b. Construction Progress Meetings: Review GP and TPC sustainability requirements with project team including contractor and sub-contractor representatives. Demonstrate GP and TPC documentation is being collected and updated to the Sustainability Notebook and TPC Online tool.

(1) Facility Turnover Meetings: Review Sustainability Notebook, and TPC Online submission for completeness and identify any outstanding issues relating to final documentation requirements.

(2) Final Sustainability Notebook Review

3.2 SUSTAINABILITY AWARD

Finalize the sustainability certification process and obtain the TPC Certification Certificates, indicating completion of the projects sustainability goals.

3.2.1 Third Party Certification Certificates

Obtain and install plaque and provide one original framed copy of the certificate. Mount certificates in 1 inch deep metal frames, with double matt, and wire hangers. Obtain 3 additional certificates, and deliver to Contractor Officer, unless otherwise instructed. Hang the Plaque in a prominent interior location approved by the Contracting Officer.

-- End of Section --

Air Force Sustainability Requirements Scoresheet

HPSB COMPLIANCE (Updated Jan 2017)

* required entry

SURVEY INCOMPLETE

General Information		INCOMPLETE	
		Project ID (e.g. ABCD12345)	*
		Real Property Unique ID (RPUID)	*
		Facility Number	*
		Building Name	*
		Installation	*
		City	
		State	
		CONUS	
		MAJCOM	
		Construction Agent	*
		AFCEC DM/CM (Last Name, First Name)	*
		PA	*
		Building Size (SF)	*
		Program Year (FY####)	*
		Project Phase	*
		Design Started (MM/DD/YY)	*
		BOD (MM/DD/YY)	*
		Guiding Principles Compliance Certification Method	*
		Date Project Registered (MM/DD/YY)	
		Date Project Certified (MM/DD/YY)	
	0%	HPSB Compliant	
	0%	Energy Efficiency Achieved (% below ANSI/ASHRAE/IESNA Standard 90.1-2013)	
	2017V1	Scoresheet version	

Air Force Sustainability Requirements Scoresheet

HPSB COMPLIANCE (Updated Jan 2017)

* required entry

Color Coding: See Instructions Tab for more detail

Drop-Down Box	Yes or N/A
No Entry Required	No
Custom Entry	Recommended not Required

90.1-2013

HPSB I: Employ Integrated Design Principles (UFC 1-200-02 para 2-2)

Total Points 0 | INCOMPLETE | Possible Points 2

	HPSB I.1	**Integrated Design**	1	*
	HPSB I.2	**Commissioning**	1	*

HPSB II: Optimize Energy Performance (UFC 1-200-02 para 2-3)

Total Points 0 | INCOMPLETE | Possible Points 5

	HPSB II.1	**Energy Efficiency**	1	
		Reduce energy use 30% below ANSI/ASHRAE/IESNA Standard 90.1-2013 or IECC, or if not - achieve maximum energy efficiency that is lifecycle cost effective		*
		Insert percentage below ANSI/ASHRAE/IESNA Standard 90.1-2013 or IECC, in terms of energy use (e.g. 32)		*
		Insert building energy intensity (kBtu/yr-sqft) calculated IAW 10 CFR 433		*
		Roof Attributes (Recommended)		
		Select roof types (Check below)		
		☐ Cool roof ☐ Solar electric ☐ Solar Passive ☐ Green roof ☐ Solar thermal		
		Energy Efficient Products	1	
				*
	HPSB II.2	**On-site Renewable Energy**	1	
		Installed renewable energy elements or projects were not lifecycle cost effective		*
		Renewable energy types (check below)		
		☐ Solar PV ☐ Geothermal ☐ Hydro ☐ Waste to Energy ☐ Solar CP ☐ GSHP ☐ Wind ☐ Renewables were not lifecycle cost effective ☐ Solar Thermal Electric		
		Insert generation capacity (kW)		*
		Insert percentage of total building		*
	HPSB II.3	**On-site Renewable Energy - Solar Hot Water Heater System**	1	
		Installed solar hot water heater system or found installation not lifecycle cost effective		*
		Insert generation capacity (MMBtu/yr)		*
		Insert percentage of demand		*
	HPSB II.4	**Metering**	1	
		Electric Metering: Select N/A if no service		*
		Natural Gas Metering: Select N/A if no service		*
		Steam Metering: Select N/A if no service		

HPSB III: Protect and Conserve Water (UFC 1-200-02 para 2-4)

Total Points 0 | INCOMPLETE | Possible Points 6

	HPSB III.1	**Indoor Water**	1	*
		Indoor Water Metering	1	*
	HPSB III.2	**Outdoor Water**	1	*
		Outdoor Water Metering	1	*
	HPSB III.3	**Alternative Water**	1	*
	HPSB III.4	**Stormwater Management (LID Documentation per UFC 3-210-10)**	1	
		Change in Impervious Area (SF)		*
		Pre-Award Cost Estimate ($)		*
		Project addressed EISA 438		*
		EISA Technical Constraints		
		☐ Retaining stormwater impact receving water flow ☐ Shallow bedrock, contaminated soil, high ground water table, underground utilities ☐ Soil infiltration capacity limited ☐ Site too small to infiltrate significant volume ☐ Non-potable water demand to small ☐ Structural, plumbing, and other mods not feasible ☐ State or local restrict water harvesting ☐ State or local restrict use of green infrastructure or LID ☐ Other		
		Percent Increase in Stormwater Runoff for 95 Percentile Storm (%) -or- Percent Increase in Stormwater Runoff from continuous simulation model, published data, studies, or other established tools (Reference UFC 3-210-10 Figure 2-1 Implementation of EISA Section 438)		
		LID Features Locations		
		Integrated Management Practices Employed		

Air Force Sustainability Requirements Scoresheet

HPSB COMPLIANCE (Updated Jan 2017)

* required entry

- ☐ Bio-Retention
- ☐ Dry Wells
- ☐ Filter Strips
- ☐ Grassed Swells
- ☐ Infiltration Trench
- ☐ Inlet Pollution Removal Device
- ☐ Permeable Pavement/Pavers
- ☐ Rain Barrels/Cisterns
- ☐ Soil Amendments
- ☐ Tree Box Filters
- ☐ Vegetated Buffers
- ☐ Vegetated Roof
- ☐ Other

	Final LID Construction Cost ($)
	Post Construction Analysis (Name of DOR)

HPSB IV: Enhance Indoor Environmental Quality (UFC 1-200-02 para 2-5)					
Total Points	0	INCOMPLETE	Possible Points	8	
	HPSB IV.1	**Thermal Comfort**		1	*
	HPSB IV.2	**Ventilation**		1	*
	HPSB IV.3	**Daylighting**		1	*
	HPSB IV.4	**Moisture Control**		1	*
	HPSB IV.5	**Low Emitting Materials**		1	*
	HPSB IV.6	**Protect Indoor Air Quality during Construction**		1	*
	HPSB IV.7	**Environmental Tobacco Smoke Control**		1	
	HPSB IV.8	**Occupant Health and Wellness**		1	*
HPSB V: Reduce Environmental Impact of Materials (UFC 1-200-02 para 2-6)					
Total Points	0	INCOMPLETE	Possible Points	5	
	HPSB V.1	**Recycled Content**		1	*
	HPSB V.2	**Biologically-based Products**		1	*
	HPSB V.3	**Ozone Depleting Substances**		1	
	HPSB V.4	**Waste and Materials Management - Recycling**		1	*
	HPSB V.5	**Waste and Materials Management - Divert 60% from Disposal**		1	
		60% or greater diverted			*
		Insert percentage diverted from landfill			*
HPSB VI: Address Climate Change Risk (UFC 1-200-02 para 2-7)					
Total Points	0	INCOMPLETE	Possible Points	1	
	HPSB VI.1	**Address Climate Change Risk**		1	*
			Possible Points	**27**	
0	**Federal Requirements - Yes or N/A**				
0	**Federal Requirements - No**				
0%	**Percentage of Federal Requirements Met**				

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GOVERNMENTAL SAFETY REQUIREMENTS

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GOVERNMENTAL SAFETY REQUIREMENTS
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH 0117	(2017) TLVs and BEIs

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2016) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2017) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2016) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems

ASSE/SAFE Z359.2	(2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2007) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
ASSE/SAFE Z359.6	(2009) Specifications and Design Requirements for Active Fall Protection Systems
ASSE/SAFE Z359.7	(2011) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)

ASME B30.20	(2013; INT Oct 2010 - May 2012) Below-the-Hook Lifting Devices
ASME B30.22	(2016) Articulating Boom Cranes
ASME B30.26	(2015; INT Jun 2010 - Jun 2014) Rigging Hardware
ASME B30.3	(2016) Tower Cranes
ASME B30.5	(2014) Mobile and Locomotive Cranes
ASME B30.9	(2014; INT Feb 2011 - Nov 2013) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F2413	(2011) Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear
ASTM F855	(2015) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2016) Guide for Protective Grounding of Power Lines
IEEE C2	(2017) National Electrical Safety Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2013) Standard for Portable Fire Extinguishers
NFPA 241	(2013; Errata 2015) Standard for

	Safeguarding Construction,Alteration, and Demolition Operations
NFPA 51B	(2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2017) National Electrical Code
NFPA 70B	(2016) Recommended Practice for Electrical Equipment Maintenance
NFPA 70E	(2015; ERTA 1 2015) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-560-01	(2015; Change 5; 2006) Electrical Safety, O & M

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.38	Emergency Action Plans
29 CFR 1910.134	Respiratory Protection
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.333	Selection and Use of Work Practices
29 CFR 1915.89	Control of Hazardous Energy (Lockout/Tags-Plus)
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.59	Hazard Communication
29 CFR 1926.1400	Cranes and Derricks in Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
29 CFR 1926.652	Safety and Health Regulations for Construction; Subpart P, Excavations; Requirements for Protective Systems
CPL 02-00-100	(1995) Application of the Permit-Required

Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Action Level (AL)

A concentration designated in 29 CFR part 1910 for a specific substance, calculated as an eight (8)-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

1.2.2 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.3 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA’s Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the

fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.7 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.8 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.9 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.10 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.11 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.12 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a

physician or registered personnel.

1.2.13 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.14 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.15 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.16 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.17 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are any work-related injury or illness that results in:

a. Death, regardless of the time between the injury and death, or the length of the illness;

b. Days away from work (any time lost after day of injury/illness onset);

c. Restricted work;

d. Transfer to another job;

e. Medical treatment beyond first aid;

f. Loss of consciousness; or

g. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (f) above.

1.2.18 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

1.2.19 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document any mishap .

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

Health Hazard Control Plan; G

Emergency Action Plan; G

Standard Lift Plan; G

Critical Lift Plan; G

Activity Hazard Analysis (AHA)

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Investigation Reports; G

LHE Inspection Reports

Regulatory Citations and Violations

SD-07 Certificates

Crane Operators/Riggers

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

Excavation Permit

Proof of Current Qualification

1.4 REGULATORY REQUIREMENTS

Abide by all local, state and federal environmental, occupational health and safety standards (i.e. noise, dust, etc). Also the contractor will be required to procure, maintain, calibrate and provide personnel properly trained to use contaminant specific industry recognized monitoring devices/instruments to validate to the GDA that they are within said standards (federal standards are typically found in 29 CFR and 40 CFR; Air and Noise standards vary by state and municipality). In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, and all applicable federal, state, Air Force, and local laws, ordinances, criteria, rules and regulations including the following: 29 CFR 1910 & 29 CFR 1926. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.5 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.5.1 Personnel Qualifications

1.5.1.1 Site Safety and Health Officer (SSHO)

The Contractor shall employ a minimum of one Competent Person at each project site to function as the SSHO (primary), depending on job complexity, size and any other pertinent factors. The SSHO shall:

(1) Be a full-time responsibility and shall have no other duties other than safety unless a waiver is approved. The SSHO shall be present at the project site, located so they have full mobility and reasonable access to all major work operations during the shift.

(2) Be an employee other than the supervisor, unless specified differently in the contract and coordinated with the local SOH Office, and

(3) Report to a senior corporate official.

(4) Administer the Contractor's safety program and government-accepted Accident Prevention Plan.

(5) The SSHO's training, experience, and qualifications shall be as required by EM 385-1-1 paragraph 01.A.17, entitled Contractor Site Safety and Health Officer (SSHO) and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO.

1.5.1.2 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical

work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the Contracting Officer for information in consultation with the Safety Office.

1.5.1.2.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space.

1.5.1.2.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.5.1.2.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

1.5.1.3 Qualified Trainer Requirements

Individuals qualified to instruct must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards,Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements.

b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

c. Update training course materials whenever an update of the EM 385-1-1 becomes available.

d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

e. Request, review and incorporate student feedback into a continuous course improvement program.

1.5.1.4 Crane Operators/Riggers

Provide Operators meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

1.5.2 Personnel Duties

1.5.2.1 Duties of the Site Safety and Health Officer (SSHO)

The SSHO must:

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors. Post and maintain the Form 300A on the site Safety Bulletin Board. Use OSHA Form 301 to report injuries.

d. Maintain applicable safety reference material on the job site.

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them. Ensure they are reflective of the work being done.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Be empowered to stop work when necessary and to ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.

k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not

be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.5.3 Meetings

1.5.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, alternate SSHO, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

1.5.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.5.3.3 Training

a. New employee indoctrination. New employees (prime and sub-contractor) must be informed of specific site hazards before they begin work. Documentation of this orientation must be kept on file at the project site.

b. Periodic training. Provide Safety and Health Training in accordance with USACE EM 385-1-1 and the accepted APP. Ensure all required training has been accomplished for all onsite employees.

c. Activity Hazard Analysis (AHA). Prior to beginning a new Definable Features of Work (DFOW), training must be provided to all affected employees to include a review of the AHA to be implemented.

1.6 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed IAW EM 385-1-1 Appendix A. The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Government Designated Authority (GDA) immediately and NLT one hour of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.6.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.

b. Qualifications of competent and of qualified persons. As a minimum,

designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.6.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.6.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1 Section 34, applicable OSHA standards 29 CFR 1910, and 29 CFR 1926, OSHA Directive CPL 02-00-100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

1.6.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.6.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

a. For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

b. Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.6.2.4 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.6.2.5 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.6.2.6 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.6.2.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1.

1.6.2.8 Occupant Protection Plan

Identify the safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 83 13 LEAD IN CONSTRUCTION.

1.6.2.9 Asbestos Hazard Abatement Plan

Identify the safety and health aspects of asbestos work, and prepare in accordance with Section 02 82 13 ASBESTOS ABATEMENT.

1.6.2.10 PCB Plan

Identify the safety and health aspects of Polychlorinated Biphenyls work, and prepare in accordance with Sections 02 84 16 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCB AND MERCURY.

1.6.2.11 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 DEMOLITION and referenced sources.

1.6.2.12 Drug Prevention Program

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employee uses illegal drugs or consumes alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test must be made available to the Contracting Officer upon request.

1.6.2.13 Training Records and Requirements

Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, vehicle operator, forklift operators, personal protective equipment); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

1.6.2.14 Hazard Communication Program

Because of the various hazards, the contractor must include a hazard communication program in accordance with 29 CFR 1926.59. The Hazard Communication Program must address all hazardous materials brought to the site in support of site activities.

1.6.2.15 Health Hazard Control Plan

The Contractor must designate a competent and qualified person to establish and oversee a Health Hazard Control Program in accordance with EM 385-1-1, Section 6. The program must ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical and biological agents and the necessary controls and protective actions are instituted to ensure health.

1.6.2.16 Emergency Action Plan

Develop an emergency action plan in accordance with 29 CFR 1910.38 to cover those designated action employers and employees must take to ensure employee safety from fire and other emergencies.

1.7 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section

1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.7.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.7.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.8 DISPLAY OF SAFETY INFORMATION

1.8.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.07. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

c. Map denoting the route to the nearest emergency care facility.

d. Copy of the most up-to-date APP

e. Emergency phone numbers.

f. Current AHAs

g. OSHA 300 Form

h. OSHA Safety and Health Protection-On-The-Job Poster

i. A sign indicating the number of hours worked since last lost workday accident.

j. Safety and Health Warning Posters

1.8.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.9 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.10 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.11 NOTIFICATIONS and REPORTS

1.11.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, load handling equipment (LHE) or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used) using SPK Form 385-1-R. Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap. Report all accidents,

incidents and Near Miss/Close Calls as soon as possible to the Government Designated Authority (GDA).

1.11.2 Accident Investigation Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: Near miss reports are considered positive and proactive Contractor safety management actions.

c. Conduct an accident investigation for any load handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

d. In addition to the above, any mishap occurring in any of the following high hazard areas shall be immediately reported to the GDA IAW EM 385-1-1 par 01.D.05. These mishaps shall be investigated in depth to identify all causes and to recommend hazard control measures.

(1) Electrical - to include Arc Flash, electrical shock, etc.;
(2) Uncontrolled Release of Hazardous Energy (includes electrical and non-electrical);
(3) Load Handling Equipment (LHE) or Rigging;
(4) Fall-from-Height (any level other than same surface), and
(5) Underwater Diving.

1.11.3 Monthly Exposure Reports

Attach monthly exposure reporting to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.11.4 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.11.5 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.11.6 Regulatory Citations and Violations

Contact the Contracting Officer immediately of any OSHA or other regulatory agency inspection or visit, and provide the Contracting Officer with a copy of each citation, report, and contractor response. Correct violations and citations promptly and provide written corrective actions to the Contracting Officer.

1.11.7 Contamination Control

During project activities, protect against contamination of soil, water, plant life, and all adjacent building areas, and must ensure that there is no airborne release of hazardous materials and dust. The Contracting Officer may collect air and wipe samples in adjacent areas to evaluate the Contractor's performance. Evidence of settled dust or airborne levels of contaminants above background will require the implementation of additional controls at no increase to contract price.

1.12 HOT WORK

1.12.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Fire Division. A permit is required for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or longer as specified on the hot work permit.

When starting work, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Division phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DIVISION IMMEDIATELY.

1.12.2 Work Around Flammable Materials

Obtain services from a NFPA Certified Marine Chemist or equivalent for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.13 PERSONAL PROTECTIVE EQUIPMENT (PPE)

1.13.1 Site Specific PPE Program

Onsite personnel exposed to contaminants and safety hazards must be provided with appropriate PPE. PPE must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Only respirators approved by NIOSH must be used. Protective equipment and clothing must be kept clean and well maintained. The PPE section of the APP must include site-specific procedures for onsite fit testing of respirators, cleaning, maintenance, inspection, and storage. Mandatory PPE includes:

a. Hard Hats. IAW EM 385-1-1 par 05.D.01, all persons working in or visiting hard hat areas shall be provided with and required to wear Type I or Type II, Class G (General - not to exceed 2,200 volts) or Class E (Electrical-not to exceed 20,000 volts) headgear as appropriate. The selection of the type of hardhat shall be based on the activity and identified in the AHA.

b. Protective Footwear. IAW EM 385-1-1 par 05.E.05, personnel shall, as a minimum, wear safety-toed boots meeting ASTM F2413 while working on construction sites unless it can be demonstrated by a PHA/AHA to the GDA's satisfaction that a different type of foot protection is required.

c. High-visibility vests. IAW EM 385-1-1 par 05.F.01, high-visibility apparel meeting, at minimum, ANSI/ISEA 107, Performance Class 2 requirements, shall be worn by workers.

d. Other PPE i.e safety glasses, hearing protection etc. as required.

1.13.2 Levels of Protection

The SSHO must establish and evaluate the levels of protection for each work activity as the work progresses. The SSHO must also establish action levels for upgrade or downgrade in the levels of PPE. Protocols and the communication network for changing the level of protection must be described in the APP. The PPE evaluation protocol must address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc. IAW EM 385-1-1, Section 06.

1.13.3 Respiratory Protection Program

Establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1910.134 and AIHA Z88.6. The Contractor must establish minimum respiratory protection requirements based on measured or anticipated levels of chemical and biological hazards encountered during the performance of the work.

1.14 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Prepare and implement an exposure monitoring/air sampling program (personal and area) to identify and quantify safety and health hazards and airborne levels of hazardous substances (i.e. dust, silica, drilling fluids, etc.) in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. Personal exposures must not equal or exceed the OSHA permissible exposure limits (PELs) or the ACGIH 0117.

1.15 SAFETY DATA SHEETS

Include in the APP a Safety Data Sheet (SDS) for each known or anticipated chemical brought to the site in support of the construction activities.

1.16 PROTECTION OF EXISTING AREAS

All project-associated activities must be performed without damaging or contaminating adjacent work and areas. Where such work or areas are damaged or contaminated, restore work and areas to the original condition at no additional cost to the Government.

1.17 COORDINATION WITH OTHER WORK

Coordinate project activities with work being performed in adjacent areas. Explain coordination procedures in the APP and describe how to prevent exposures to other contractors and/or government personnel performing work unrelated to activities associated with this project.

1.18 CONFINED SPACE ENTRY REQUIREMENTS.

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 02-00-100. Any potential for a hazard in the confined space requires a permit system to be used.

1.18.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.18.2 Forced Air Ventilation

Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its action level.

1.18.3 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.19 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government must not be closed or obstructed without written permission from the Contracting Officer.

1.20 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Hard Hat

b. Long Pants

c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.3 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. Do not continue with any work that would create a hazardous condition or violate federal, or state regulations regarding asbestos, lead, or LBP. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4, "Changes" and FAR 52.236-2, "Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 5 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

(1) Contractor shall ensure that each employee is familiar with and complies with these procedures and USACE EM 385-1-1, Section 12, Control of Hazardous Energy.

(2) Contracting Officer will, at the Contractor's request, apply lockout/tagout tags and take other actions that, because of experience and knowledge, are known to be necessary to make the particular equipment safe to work on for government owned and operated systems.

(3) No person, regardless of position or authority, shall operate any switch, valve, or equipment that has an official lockout/tagout tag attached to it, nor shall such tag be removed except as provided in this section. No person shall work on any energized equipment including, but not limited to activities such as erecting, installing, constructing, repairing, adjusting, inspecting, un-jamming, setting up, trouble shooting, testing, cleaning, dismantling, servicing and maintaining machines equipment of processes until an evaluation has been conducted identifying the energy source and the procedures which will be taken to ensure the safety of personnel. All work on electrical circuits shall be performed by trained and qualified electricians.

(4) Any supervisor required to enter an area protected by a lockout/tagout tag will be considered a member of the protected group. He/she must

notify the holder of the tag stub each time they enter and depart from the protected area.

(5) Identification markings on building light and power distribution circuits shall not be relied on for established safe work conditions.

(6) Before clearance will be given on any equipment other than electrical (generally referred to as mechanical apparatus), the apparatus, valves, or systems shall be secured in a passive condition with the appropriate vents, pins, and locks.

(7) Pressurized or vacuum systems shall be vented to relieve differential pressure completely. Vent valves shall be tagged open during the course of the work.

(8) Where dangerous gas or fluid systems are involved, or in areas where the environment may be oxygen deficient, system or areas shall be purged, ventilated, or otherwise made safe prior to entry.

(9) Tag Placement

a. Lockout/tagout tags shall be completed in accordance with the regulations printed on the back thereof and attached to any device which, if operated, could cause an unsafe condition to exist.

b. If more than one group is to work on any circuit or equipment, the employee in charge of each group shall have a separate set of lockout/tagout tags completed and properly attached.

c. When it is required that certain equipment be tagged, the Government will review the characteristics of the various systems involved that affect the safety of the operations and the work to be done; take the necessary actions, including voltage and pressure checks, grounding, and venting, to make the system and equipment safe to work on; and apply such lockout/tagout tags to those switches, valves, vents, or other mechanical devices needed to preserve the safety provided. This operation is referred to as "Providing Safety Clearance."

(10) Tag Removal

When any individual or group has completed its part of the work and is clear of the circuits or equipment, the supervisor, project leader, or individual for whom the equipment was tagged shall turn in his signed lockout/tagout tag stub to the Contracting Officer. That group's or individual' lockout/tagout tags on equipment may then be removed on authorization by the Contracting Officer.

3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M,ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.O through 21.O.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 6 feet of an edge, on a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by use of personal fall arrest/restraint systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized. Provide in accordance with 29 CFR 1926.500.

(2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and EM 385-1-1, Section L.

b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:1 (vertical to horizontal) requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also applies to residential or housing type construction.

3.4.4 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.5 WORK PLATFORMS

3.5.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling shall be under supervision of a Competent Person.

e. Scaffold must be capable of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet.

k. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.5.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the

operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated in writing as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

c. Operators of forklifts or power industrial trucks must be certified in accordance with 29 CFR 1926.602(d).

3.6.2 Load Handling Equipment (LHE)

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated.Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards and other applicable safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

g. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure

the activity and AHA are thoroughly reviewed by all involved personnel.

h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

i. All employees must keep clear of loads about to be lifted and of suspended loads.

j. Use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

m. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.6.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.6.4 USE OF EXPLOSIVES

Explosives must not be used or brought to the project site.

3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926.652, 29 CFR 1926 and EM 385-1-1. Obtain an excavation

permit for any excavation in excess of 5 feet into which a person is required to enter.

3.7.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.7.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Use hand digging within 2 feet of a known utility. If construction is parallel to an existing utility, expose the utility by hand digging every 100 feet if parallel within 5 feet of the excavation.

3.7.3 Trenching/Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems must be readily available on-site for review. Job-made shoring or shielding must have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

Trenching machines with digging chain drives must be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers must be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training must be kept on file at the project site.

3.7.4 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.8 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.8.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit IAW NFPA 70E requirements. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Base Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. Contractor shall comply with applicable electrical safety requirements contained in the Unified Facilities Criteria(UFC) UFC 3-560-01. This document also references ANSI C2, National Electrical Safety Code (NESC); NFPA 70, National Electrical Code (NEC); NFPA 70B, Electrical Equipment Maintenance; NFPA 70E, Electrical Safety in the Workplace; and AFI 32-1064, Electrical Safe Practices. All assigned personnel are required to wear the appropriate PPE according to the conditions and task at hand. Guidelines set forth in NFPA 70E, Unified Facilities Criteria, and the NEC shall be adhered to at all times. Proper use of appropriate PPE protects you from the devastating effect of arc flash/blast. The level of PPE required for each instance may be different and is dependent on voltage and approach distance.

Some general guidelines are as follows:

1. 0-240 Volts: Work on energized parts including testing, removal/installation of circuit breakers or fused switches or removal of bolted covers exposing live parts, or work in an energized light

fixture. This work is classified as Category 1: FR lightweight coveralls or heavyweight pants and long sleeved shirt, safety glasses, and low voltage gloves are required.

2. 277-480 Volts: Turning circuit breakers or fused switches on and off with covers off, or opening hinged covers to expose live parts is classified as (Category 1 see above). Removing bolted covers to expose bare and energized parts and testing or working on energized equipment is classified as Category 2: FR coveralls over cotton pants and shirt, sock hood, face shield, safety glasses, and low voltage gloves are required.

3. Over 1000 volts without hot stick: Category 2: Flame Resistant coveralls over cotton pant and long sleeve shirt, sock hood, face shield, safety glasses, and high voltage gloves are required for: Work on 120 volt control circuits while exposed to over 1000 volts, inspection of insulated cable in open area, operation of S&C type switch, circuit breaker with doors closed, or air switch operation.

4. Over 1000 volts without hot stick: Category 4: Flame Resistant NFPA 70E compliant Arc Clothing such as FR Carhartts, sock hood, face shield, safety glasses, and high voltage gloves are required for: Switch operation with doors open, opening high voltage side of transformer, removing bolted parts to expose live parts, testing, insulated cable examination in a manhole or confined area, and all substation work including breaker operations and racking in/out breakers with doors open or closed.

5. 7200/12470 volts at greater than 8 feet hot stick distance: Category 2: Flame Resistant lightweight coveralls, high voltage gloves, hardhat, safety glasses (or face shield hardhat combo), arc flash rated safety harness are required for: Phasing/testing of lines, ground set installation, fused cutout operation, saddle/tap installation on overhead lines.

6. 7200/12470 volts at less than 8 feet hot stick distance: Category 4: Flame Resistant NFPA 70E compliant Arc Clothing such as FR Carhartts, sock hood, face shield, safety glasses, high voltage gloves, and arc flash rated safety harness are required for all operations at less than 8 feet hot stick distance.

3.8.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State and Local requirements applicable to where work is being performed.

3.8.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless

permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.8.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.8.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

3.9 WORK IN CONFINED SPACES

Comply with the requirements in Section 34 of USACE EM 385-1-1, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, OSHA Directive CPL 02-00-100 and OSHA 29 CFR 1926. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 34 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space must be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.

c. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

3.10 CRYSTALLINE SILICA

Construction operations encountering materials containing crystalline silica, comply with OSHA regulations, EM 385-1-1, Sect 06.N and 29 CFR 1926.1153. Develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

3.11 HOUSEKEEPING

All debris in work areas must be cleaned up daily or more frequently if

necessary. Construction debris may be temporarily located in an approved location, however garbage accumulation must be removed each day.

3.12 BIOLOGICAL HAZARDS

Raw Water may contain bacteria, funguses, parasites, and viruses that can cause intestinal, lung and other infections. Develop a standard operating procedure (SOP) addressing engineering controls, work practices, PPE, hygiene, training and medical surveillance to protect workers from exposures to biological hazards.

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SOURCES FOR REFERENCE PUBLICATIONS
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PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization (e.g. ASTM B564 Standard Specification for Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

AACE INTERNATIONAL (AACE)
1265 Suncrest Towne Centre Drive
Morgantown, WV 26505-1876 USA
Ph: 304-296-8444
Fax: 304-291-5728
E-mail: info@aacei.org
Internet: http://www.aacei.org

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)
2111 Wilson Blvd, Suite 500
Arlington, VA 22201
Ph: 703-524-8800
Fax: 703-562-1942
Internet: http://www.ahrinet.org

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)
1330 Kemper Meadow Drive
Cincinnati, OH 45240
Ph: 513-742-2020 or 513-742-6163
Fax: 513-742-3355
E-mail: mail@acgih.org
Internet: http://www.acgih.org

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA)
3141 Fairview Park Dr, Suite 777
Falls Church, VA 22042
Tel: 703-849-8888
Fax: 703-207-3561
E-mail: infonet@aiha.org
Internet http://www.aiha.org

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)
1791 Tullie Circle, NE
Atlanta, GA 30329
Ph: 800-527-4723 or 404-636-8400
Fax: 404-321-5478
E-mail: ashrae@ashrae.org
Internet: http://www.ashrae.org

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)
1800 East Oakton Street
Des Plaines, IL 60018
Ph: 847-699-2929
Internet: http://www.asse.org

AMERICAN WATER WORKS ASSOCIATION (AWWA)
6666 West Quincy Avenue
Denver, CO 80235-3098
Ph: 303-794-7711
E-mail: distribution@awwa.org
Internet: http://www.awwa.org

ASME INTERNATIONAL (ASME)
Two Park Avenue, M/S 10E
New York, NY 10016-5990
Ph: 800-843-2763
Fax: 973-882-1717
E-mail: customercare@asme.org
Internet: http://www.asme.org

ASSOCIATED AIR BALANCE COUNCIL (AABC)
1518 K Street, NW
Washington, DC 20005
Ph: 202-737-0202
Fax: 202-638-4833
E-mail: info@aabc.com
Internet: http://www.aabc.com/

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 877-909-2786
Internet: http://www.astm.org

COMPRESSED GAS ASSOCIATION (CGA)
14501 George Carter Way, Suite 103
Chantilly, VA 20151-1788
Ph: 703-788-2700
Fax: 703-961-1831
E-mail: cga@cganet.com
Internet: http://www.cganet.com

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)
University of South California
Research Annex 219
3716 South Hope Street
Los Angeles, CA 90089-7700

Ph: 213-740-2032 or 866-545-6340
Fax: 213-740-8399
E-mail: fccchr@usc.edu
Internet: http://www.usc.edu/dept/fccchr

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 and 501 Hoes Lane
Piscataway, NJ 08854-4141
Ph: 732-981-0060 or 800-701-4333
Fax: 732-562-9667
E-mail: onlinesupport@ieee.org
Internet: http://www.ieee.org

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)
1901 North Moore Street
Arlington, VA 22209-1762
Ph: 703-525-1695
Fax: 703-528-2148
Internet: http://www.safetyequipment.org/

LAS VEGAS VALLEY STORMWATER QUALITY MANAGEMENT COMMITTEE AND CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (LVVSWQMC)

600 S. Grand Central Pkwy.
Las Vegas, NV 89106
Phone: (702) 685-0000
Fax: (702) 685-0001
E-mail: pio@regionalflood.org
Internet: http://lvstormwater.com/

NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB)
8575 Grovemont Circle
Gaithersburg, MD 20877
Ph: 301-977-3698
Fax: 301-977-9589
Internet: http://www.nebb.org

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000
Fax: 617-770-0700
Internet: http://www.nfpa.org

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)
395 E Street, S.W.
Suite 9200
Patriots Plaza Building
Washington, DC 20201
Ph: 800-232-4636
Fax: 513-533-8347
E-mail: nioshdocket@cdc.gov
Internet: http://www.cdc.gov/niosh/

NEVADA DEPARTMENT OF TRANSPORTATION (NDOT)

1263South Stewart Street
Carson City, Nevada 89712
Ph: 775-888-7000

Email: info@dot.nv.gov
Internet:https://www.nevadadot.com/

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
4201 Lafayette Center Drive
Chantilly, VA 20151-1219
Ph: 703-803-2980
Fax: 703-803-3732
Internet: http://www.smacna.org

STATE OF NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION (NDEP)

The Carson City Office is located at:
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701
Phone (775) 687-4670
Fax (775) 687–5856

The Las Vegas Office is located at:
2030 E. Flamingo Road, Suite 230
Las Vegas NV 89119
Phone (702) 486-2850
Fax (702) 486-2863
Internet: https://ndep.nv.gov/

U.S. ARMY CORPS OF ENGINEERS (USACE)
CRD-C DOCUMENTS available on Internet:
http://www.wbdg.org/ccb/browse_cat.php?c=68
Order Other Documents from:
USACE Publications Depot
Attn: CEHEC-IM-PD
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
E-mail: pubs-army@usace.army.mil
Internet: http://www.publications.usace.army.mil/
or
http://www.hnc.usace.army.mil/Missions/Engineering/TECHINFO.aspx

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT (CESPK)
1325 J Street
Sacramento, CA 95814
Ph: 916-557-7670
E-mail: CESPK-ED-EQS

U.S. ARMY CORPS OF ENGINEERS, SOUTH PACIFIC DIVISION (CESPD)
1455 Market Street
San Francisco, CA 94103-1398

Ph: 415-503-6517
Internet: http://www.spd.usace.army.mil/

U.S. CODE (USC)
Office of the Law Revision Counsel
Internet: http://uscode.house.gov/

U.S. DEFENSE LOGISTICS AGENCY (DLA)

Fort Belvoir, VA

Internet: http://www.dla.mil

U.S. DEPARTMENT OF DEFENSE (DOD)
Order DOD Documents from:
Room 3A750-The Pentagon
1400 Defense Pentagon
Washington, DC 20301-1400
Ph: 703-571-3343
FAX: 215-697-1462
E-mail: customerservice@ntis.gov
Internet: http://www.ntis.gov
Obtain Military Specifications, Standards and Related Publications from:
Acquisition Streamlining and Standardization Information System (ASSIST)
Department of Defense Single Stock Point (DODSSP)
Document Automation and Production Service (DAPS)
Building 4/D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Ph: 215-697-6396 - for account/password issues
Internet: http://assist.daps.dla.mil/online/start/; account registration required
Obtain Unified Facilities Criteria (UFC) from:
Whole Building Design Guide (WBDG)
National Institute of Building Sciences (NIBS)
1090 Vermont Avenue NW, Suite 700
Washington, CD 20005
Ph: 202-289-7800
Fax: 202-289-1092
Internet: http://www.wbdg.org/references/docs_refs.php

U.S. DEPARTMENT OF ENERGY (DOE)
1000 Independence Avenue Southwest
Washington, D.C. 20585
Internet: www.eere.energy.gov

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)
HUD User
P.O. Box 23268
Washington, DC 20026-3268
Ph: 800-245-2691 or 202-708-3178
TDD: 800-927-7589
Fax: 202-708-9981
Internet: http://www.huduser.org

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004
Ph: 202-272-0167
Internet: http://www2.epa.gov/libraries
--- Some EPA documents are available only from:
National Technical Information Service (NTIS)

5301 Shawnee Road
Alexandria, VA 22312
Ph: 703-605-6050 or 1-688-584-8332
Fax: 703-605-6900
E-mail: info@ntis.gov
Internet: http://www.ntis.gov

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)
Order for sale documents from:
Superintendent of Documents
U.S. Government Printing Office (GPO)
710 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: http://www.gpoaccess.gov
Order free documents from:
Federal Aviation Administration
Department of Transportation
800 Independence Avenue, SW
Washington, DC 20591
Ph: 1-866-835-5322
Internet: http://www.faa.gov

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)
FHWA, Office of Safety
1200 New Jersey Ave., SE
Washington, DC 20590
Ph: 202-366-4000
Internet: http://www.fhwa.dot.gov
Order from:
Superintendent of Documents
U. S. Government Printing Office (GPO)
710 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: http://www.gpoaccess.gov

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
Internet: http://www.archives.gov
Order documents from:
Superintendent of Documents
U.S.Government Printing Office (GPO)
710 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: http://www.gpoaccess.gov

UNDERWRITERS LABORATORIES (UL)
2600 N.W. Lake Road

Camas, WA 98607-8542
Ph: 877-854-3577
E-mail: CEC.us@us.ul.com
Internet: http://www.ul.com/
UL Directories available through IHS at http://www.ihs.com

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

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QUALITY CONTROL
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C1077	(2016) Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM D3666	(2016) Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D3740	(2012a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E329	(2014a) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-12	(2006; Change 1) Engineering and Design -- Quality Management

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT (CESPK)

CESPK PAM 415-1-2	(1989) Construction Control Manual

U.S. ARMY CORPS OF ENGINEERS, SOUTH PACIFIC DIVISION (CESPD)

CESPD R 1110-1-8	(2002) Quality Management Plan

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all associated costs will be included in the applicable Bid Schedule unit or job prices.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;

submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control Plan; G

Design Quality Control plan; G

MTC validation; G

SD-05 Design Data

Discipline-Specific Checklists

SD-06 Test Reports

Verification Statement

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with the Contract Clause titled "Inspection of Construction." QC consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The QC system coverS all design and construction operations, both onsite and offsite, and be keyed to the proposed design and construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintainS a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit no later than 15 days after execution of notice to proceed, the Contractor Quality Control Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." Design and construction will be permitted to begin only after acceptance of the CQC Plan.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all design andconstruction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, designers of record, consultants,

architect/engineers (AE), and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager who reports to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. copies of these letters to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer must be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

j. Coordinate scheduled work with Special Inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections. Where the applicable Code issue by the International Code Council (ICC) calls for inspections by the Building Official, include the inspections in the Quality Control Plan and perform the inspections required by the applicable ICC. Perform these inspections using independent qualified inspectors. Include the

Special Inspection Plan requirements in the QC Plan.

3.2.2 Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control plan:

a. Submit and maintain a DQC Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. Prepare the DQC Plan in accordance with CESPD R 1110-1-8, Appendix D. As a minimum, all documents must be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product must not perform the independent technical review (ITR). Correct errors and deficiencies in the design documents prior to submitting them to the Government.

b. Include the design schedule in the master project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Include review and correction periods associated with each item. This should be a forward planning as well as a project monitoring tool. The schedule reflects calendar days and not dates for each activity. If the schedule is changed, submit a revised schedule reflecting the change within 7 calendar days. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit at each design phase as part of the project documentation these completed discipline-specific checklists. ER 1110-1-12 provided some useful information in developing checklists.

c. Implement the DQC Plan by an DQC Manager who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated. This individual must be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Contracting Officer, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

The Contracting Officer will notify the Contractor in writing of the acceptance of the DQC Plan. After acceptance, any proposed changes are subject to the acceptance of the Contracting Officer.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, including the CQC Manager, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. Submit the CQC Plan a minimum of 14 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the Government, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager must report directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization who is responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager must be a graduate engineer, graduate architect, or a graduate of construction management, of a 4 year degree with a minimum of 3 years construction experience on construction similar to this contract. This CQC System Manager must be on the site at all times during construction and be employed by the prime Contractor. The CQC System Manager must be assigned no other duties. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

3.4.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: electrical, mechanical, civil, structural, environmental, architectural. These individuals are employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on the specialized personnel's areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals can perform other duties but need to be allowed sufficient time to perform the specialized personnel's assigned quality control duties as described in the Quality Control Plan.

Experience Matrix	
Area	Qualifications
Civil	Graduate Civil Engineer or Construction Manager with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience.
Mechanical	Graduate Mechanical Engineer with 2 yrs experience or person 5 years of experience supervising mechanical features of work in the field with a construction company.
Electrical	Graduate Electrical Engineer with 2 yrs related experience or person 5 years of experience supervising electrical features of work in the field with a construction company.
Structural	Graduate Civil Engineer (with Structural Track or Focus) or Construction Manager with 2 yrs experience or person 5 years of experience supervising structural features of work in the field with a construction company.
Architectural	Graduate Architect with 2 yrs experience or person with 5 yrs related experience.
Environmental	Graduate Environmental Engineer with 3 yrs experience.
Submittals	Submittal Clerk with 1 yr experience.
Occupied Family Housing	Person, customer relations type, coordinator experience.
Concrete, Pavements and Soils	Materials Technician with 2 yrs experience for the appropriate area.
Testing, Adjusting and Balancing (TAB) Personnel	Specialist must be a member of AABC or an experienced technician of the firm certified by the NEBB.

Experience Matrix	
Area	Qualifications
Design Quality Control Manager	Registered Architect or Professional Engineer.

3.4.4 Additional Requirement

In addition to the above experience and education requirements the CQC System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is offered quarterly by the Los Angeles District, contact the Contracting Officer for more information.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

3.4.5 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, must comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 01 91 00.15 TOTAL BUILDING COMMISSIONING the submittals must be coordinated with Section 01 33 00 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

Contractor Quality Control (CQC) is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control must be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.

b. Review of the contract drawings.

c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government must be notified at least 48 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing are in compliance with the contract.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. Notify the Government at least 48 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for future reference and comparison with follow-up phases.

g. Repeat the initial phase for definable feature of work for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

h. Coordinate scheduled work with Special Inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work. Coordinate scheduled work with Special Inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

Validate all testing laboratories through the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at:The listing of validated testing laboratories is available at http://www.erdc.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/9254/Article/476661/materials-testing-center.aspx.

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel must meet criteria detailed in ASTM D3740, ASTM C1077, ASTM D3666, and ASTM E329.

Use an independent commercial laboratory that has been validated by abbreviated audit by the Corps of Engineers, Materials Testing Center (MTC), for the required test methods. To receive validation by abbreviated audit by the MTC, the laboratory must complete the required form and submit copies of its AASHTO accreditation certificate, applicable AMRL and/or CCRL inspection reports, and responses to any deficiencies to the MTC no later than 7 days after the Notice to Proceed. The cost for the validation by the MTC is the responsibility of the Contractor.

Any on-site laboratory that is used by the Contractor will require a separate validation by this MTC. All costs associated with this validation will be the responsibility of the Contractor.

Submit the above MTC validation for Government Approval as part of the Contractor's Quality Control Plan. No materials testing must be performed until the laboratory has been validated by the MTC and approved by the Resident Engineer. Include the inspection report(s) and the written response(s) to any noted deficiencies with the Contractor Quality Control Plan and is subject to approval by the Contracting Officer.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials are borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government must be delivered to the QA laboratory designated by the Contracting Officer.

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC Manager near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph must be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The CQC Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer must attend the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the

final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction."

3.9 DOCUMENTATION

3.9.1 Quality Control Activities

Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis Schedule (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identification of the Independent Technical Review (ITR) team, the ITR review comments, responses and the record of resolution of the comments.

3.9.2 Verification Statement.

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work

period. All calendar days must be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports must be signed and dated by the CQC System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 IMPLEMENTATION OF GOVERNMENT RESIDENT MANAGEMENT SYSTEM FOR CONTRACTOR QUALITY CONTROL OF CONTRACT

Use the Government furnished CQC Programming Module (A computerized executable file which is Windows 7 based and operates on a minimum of 1000 MHz Pentium IBM compatible computers). Use the Daily CQC Reporting System form in the CQC Module. This form may be in addition to other Contractor desired reporting forms. However, all other such reporting forms are consolidated into this one Government furnished Daily CQC Report Form. Complete Government furnished Module elements which includes, but is not limited to, Prime Contractor staffing; letter codes; planned cumulative progress earnings; subcontractor information showing trade, name, address, point-of-contact, and insurance expiration dates; definable features of work; pay activity and activity information; required Quality Control tests tied to individual activities; planned User Schooling tied to specific specification paragraphs and Contractor activities; Installed Property Listing, Transfer Property Listing and submittal information relating to specification section, description, activity number, review period and expected procurement period. The sum of all activity values must equal the contract amount, and all Bid Items, Options and Additives separately identified, in accordance with the PRICING SCHEDULE. Bid Items may include multiple Activities, but Activities may only be assigned to one such Bid Item. Complete this Module to the satisfaction of the Contracting Officer prior to any contract payment (except for Bonds, Insurance and/or Mobilization, as approved by the Contracting Officer) and must be updated as required.

a. During the course of the contract, the Contractor will receive various Quality Assurance comments from the Government that will reflect corrections needed to Contractor activities or reflect outstanding or future items needing the attention of the Contractor. Acknowledge receipt of these comments by specific number reference on the Daily CQC Report, and also reflect on the Daily CQC Report when these items are specifically completed or corrected to permit Government verification.

b. The schedule system must include, as specific and separate activities, all Preparatory Phase Meetings (inspections); all O&M Manuals; and all Test Plans of Electrical and Mechanical Equipment or Systems that require validation testing or instructions to Government representatives.

3.11 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.12 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work

until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.13 CONSTRUCTION CONTROL MANUAL

In addition to the requirements specified in the various Technical Specifications hereinafter, test procedures and minimum number of tests will be performed in accordance with CESPK PAM 415-1-2. Neither the specified minimum number of tests nor the lack of them must in any way limit or relieve the Contractor of his responsibility to perform adequate tests to assure compliance with the quality requirements of these specifications. The referenced standards listed in this Construction Control Manual must be of the latest issue unless otherwise specified.

CESPK PAM 415-1-2 may be examined in the following office locations, and will be furnished to the Contractor:

-- End of Section --

(Sample of typical Contractor's Test Report)

TEST REPORT

STRUCTURAL OR BUILDING _____

CONTRACT NO. _____

DESCRIPTION OF ITEM, SYSTEM OR PART OF SYSTEM TESTED: _____

_____

_____

_____

DESCRIPTION OF TEST: _____

_____

_____

_____

_____

NAME AND TITLE OF PERSON IN CHARGE OF PERFORMING TESTS FOR CONTRACTOR:

NAME _____

TITLE _____

SIGNATURE _____

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED ITEM, SYSTEM OR PART OF SYSTEM HAS BEEN TESTED AS INDICATED ABOVE AND FOUND TO BE ENTIRELY SATISFACTORY AS REQUIRED IN THE CONTRACT SPECIFICATIONS.

_____

SIGNATURE OF CONTRACTOR QUALITY CONTROL INSPECTOR

DATE _____

REMARKS: _____

_____

_____

_____

_____

(Sample of Typical DAILY CONSTRUCTION QUALITY CONTROL REPORT)

CONTRACTOR'S NAME
(Address)

DAILY CONSTRUCTION QUALITY CONTROL REPORT

Date: _____ Report No. _____

Contract No.: _____

Name and Location of Project: _____

WEATHER: (Clear) (P. Cloudy) (Cloudy) Temperature: _____

Rainfall _____ Inches Min., _____ Max., _____

Contractor/Subcontractors	Area of Responsibility
a. _____	_____
b. _____	_____
c. _____	_____
d. _____	_____
e. _____	_____
f. _____	_____
g. _____	_____

1. WORK PERFORMED TODAY: (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in Table above.)

_____

2. PREPARATORY INSPECTION FOR NEXT ITEM OF WORK: (Materials/shop drawings approved, required control testing arranged, all preliminary work has been accomplished as per plans and specifications.)

3. INITIAL INSPECTION: (Address quality of workmanship, assure control testing and materials being used in all work are in compliance with plans and specifications).

---

4. FOLLOW-UP INSPECTIONS: (Assure control testing performed as required and all work performed continues to be in compliance with plans and specifications).

---

5. VERBAL INSTRUCTIONS RECEIVED: (List any instructions given by Government personnel on construction deficiencies, retesting required, etc., with action to be taken.)

---

6. REMARKS: (Cover any conflicts in plans, specifications, or instructions or any delay to the job attributable to weather conditions.)

7. RESULTS OF SAFETY INSPECTION: (Note safety violations and corrective action taken. Indicate phase of work where violations occurred.)

---

8. UPCOMING WORK: (Indicate next major phase of work anticipated and approximate date of Preparatory Inspection meeting to cover this work.)

EQUIPMENT DATA: (Indicate items of construction equipment, other than hand tools, at the job site and whether or not used.)

CONTRACTOR'S VERIFICATION: The above report is complete and correct and all material and equipment used and work performed during this reporting period area in compliance with the contract plans and specifications except as noted above.

_____

Contractor's Approved/Authorized Representative

(Sample of Typical Form)

PREPARATORY INSPECTION OUTLINE
(PART-I)

Contract No.: _____ Date: _____

Title and No. of Technical Section: _____

_____

Reference Contract Drawings: _____

A. PLANNED ATTENDANTS:

	NAME	POSITION	COMPANY
1.			
2.			
3.			
4.			

B. SUBMITTALS REQUIRED TO BEGIN WORK:

	ITEM	SUBMITTAL NO.	ACTION CODE
a.			
b.			
c.			
d.			

I HEREBY DECLARE THAT THE ABOVE REQUIRED MATERIALS DELIVERED TO THE JOBSITE ARE CERTIFIED TO BE THE SAME AS THOSE SUBMITTED AND APPROVED.

_____
QUALITY CONTROL REPRESENTATIVE

C. EQUIPMENT TO BE USED IN EXECUTING WORK:

a. _____
b. _____
c. _____

D. WORK AREAS EXAMINED TO ASCERTAIN THAT ALL PRELIMINARY WORK HAS BEEN COMPLETED:

_____
_____

E. METHODS AND PROCEDURES FOR PERFORMING QUALITY CONTROL - INCLUDING SPECIFIC TESTING REQUIREMENTS:

_____
_____

F. COMPLIANCE WITH AND UPGRADING OF THE SAFETY PLAN AND ACTIVITY HAZARD ANALYSIS INCLUDING REVIEW OF THE ACTIVITY ANALYSIS WITH EACH WORKER:

_____
_____

THE ABOVE METHODS AND PROCEDURES OUTLINED ARE CERTIFIED TO COMPLY WITH THE CONTRACT REQUIREMENTS AND WILL BE PERFORMED AS PLANNED AND SPECIFIED.

_____
QUALITY CONTROL REPRESENTATIVE

(Sample of Typical Form)

PREPARATORY INSPECTION OUTLINE
(PART - II)

A. PERSONS IN ATTENDANCE:

	NAME	POSITION	COMPANY
1.			
2.			
3.			
4.			
5.			
6.			

B. ITEMS OF MUTUAL UNDERSTANDING DEVELOPED DURING REVIEW OF PREPARATORY OUTLINE AND CONTRACT REQUIREMENTS: (Contract items not specifically covered during the preparatory inspection conference are assumed to be in strict conformance with the contract requirements.)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

THE ITEMS NOTED ABOVE CONSTITUTE A MEMORANDUM OF MUTUAL UNDERSTANDING AND WILL BE PERFORMED AS PLANNED AND SPECIFIED.

_____
CONTRACTOR'S APPROVED/AUTHORIZED REPRESENTATIVE

(Sample of Typical Form)

INITIAL PHASE CHECK LIST

Contract No.: _____ Date: _____

Specification Paragraph or Section: _____

Description and Location of Work Inspected: _____

_____

REFERENCE CONTRACT DRAWINGS: _____

A. PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.			
2.			
3.			
4.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS: YES_____ NO_____

IF NOT, EXPLAIN: _____

_____

_____

C. PROCEDURES AND/OR WORK METHODS WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES_____ NO_____

IF NOT, EXPLAIN: _____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE: YES_____ NO_____

STATE AREAS WHERE IMPROVEMENT IS NEEDED: _____

_____

_____

E. SAFETY VIOLATIONS NOTED: YES_____ NO_____

IF YES, CORRECTIVE ACTION TAKEN: _____

_____

_____

_____

QUALITY CONTROL REPRESENTATIVE

MATERIALS TEST SUMMARY

(See reverse for instructions)

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
2 _____ GRADING	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY*						
	* *(Select materials with gradation)*						
2 _____ BUILDINGS	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY*						
	* *(Select materials with gradation)*						
2 _____ UTILITIES SYSTEM	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY*						
	* *(Select materials with gradation)*						
2 _____ DRAINAGE SYSTEM	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY*						
	* *(Select materials with gradation)*						

MATERIALS TEST SUMMARY

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
2 _____ SUBGRADE ROADWAYS	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY						
2 _____ SUBBASE COURSE	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY						
2 _____ BASE COURSE	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY						
2 _____ BITUMINOUS COURSE	A. MARSHALL METHOD						
	B. EXTRACTION (HOT MIX)						
	C. GRADATION (HOT MIX)						
	D. GRADATION (HOT BINS)						
	E. FIELD COMPACTION (CORES)						

MATERIALS TEST SUMMARY

(See reverse for instructions)

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
2 _____ CONCRETE-PAVEMENT *(Compressive) *(Flexural)	A. *STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. GRADATION						
2 _____ SIDEWALK, CURB, & GUTTER	A. COMPRESSIVE STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. GRADATION						
2 _____							
2 _____							

MATERIALS TEST SUMMARY

(See reverse for instructions)

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
3 _____ CONCRETE-BUILDING	A. COMPRESSIVE STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. GRADATION						
3 _____ CONCRETE - LITEWEIGHT	A. COMPRESSIVE STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. UNIT WEIGHT (PLASTIC)						
	E. UNIT WEIGHT (28-DAY DRY)						
	F GRADATION						
3 _____ CONCRETE - TILT UP	A. COMPRESSIVE STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. GRADATION						
3 _____							

MATERIALS TEST SUMMARY

(See reverse for instructions)

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
4 _____ MASONRY	A. MORTAR COMPRESSIVE STRENGTH						
	B. GROUT COMPRESSIVE STRENGTH						
	C. GRADATION						
	D. CMU - SHRINKAGE, AIR DRY						
	CONDITION, UNIT WEIGHT &						
	COMPRESSIVE STRENGTH						

INSTRUCTIONS FOR COMPLETION OF CESPK FORM 437

1. ***ALL ENTRIES SHALL BE MADE WITH PEN***.

2. SECTION/TITLE: Sections which require contractor quality control testing during the placement of construction materials are listed. The titles are condensed versions of the full specification title. Review the technical specifications and complete as follows:

A. Insert after a number the applicable letter to complete the section designation. For example, 2 ___ grading to 2 __A_ grading.

B. If a section is not a part of the technical specifications, insert "N/A" (not applicable) after a number. For example, 2 ___ grading to 2 _N/A_ grading.

C. Blank spaces are provided to permit the addition of other sections as required by the specifications.

3. TEST: Tests that are specified to be performed by the technical specifications are listed for each section. Blank spaces are provided for additional tests as required by the specifications. An asterisk indicates that action should be taken as noted. For example, gradation must be taken when testing field density for select materials in **SECTION: GRADING**.

4. MINIMUM TESTS (ESTIMATED): Under the Contractor Quality Control (CQC) column, enter the minimum number of tests required to accomplish the specified work. For the prelisted selections, the test frequencies are specified in the Construction Control Manual (CCM). For an additive section, the CCM may not indicate the test frequency. In this case, check the technical specifications or the contract drawings for requirements. Quality Assurance (DQA) column will be completed by the Contracting Officer Representative (COR).

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RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)
07/14

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

1.2 PAYMENT

No separate payment will be made for the work covered under this section and all costs in connection therewith will be considered a subsidiary obligation of the Contractor. This includes establishing and maintaining the RMS database.

1.3 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Government accesses the system using the Government Mode of RMS (RMS GM) and the Contractor accesses the system using the Contractor Mode (RMS CM). The term RMS will be used in the remainder of this section for both RMS GM and RMS CM. Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Import/Export of Data

1.3.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible. Some correspondence, including pay requests and payrolls, are also to be provided in paper format with original signatures.. Paper documents will govern, in the event of discrepancy with the electronic version.

1.3.2 Other Factors

Other portions of this document have a direct relationship to the reporting

accomplished through RMS. Particular attention is directed to Contract Clause, 52.236-15 "Schedules for Construction Contracts"; Contract Clause, 52.232-27 "Prompt Payment for Construction Contracts"; Contract Clause, 52.232-15 "Payments Under Fixed-Priced Construction Contracts"; Section 01 32 01PROJECT SCHEDULE; Section 01 33 00 SUBMITTAL PROCEDURES; Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS; and Section 01 45 00 QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through RMS.

1.4 RMS SOFTWARE

RMS is a Windows-based program that can be run on a Windows-based PC meeting the requirements as specified in Paragraph: SYSTEM REQUIREMENTS. Download, install and be able to utilize the latest version of the RMS software within 7 calendar days of receipt of the Notice to Proceed. RMS software, user manuals, access and installation instructions, program updates and training information are available from the RMS website (http://rmsdocumentation.com). The Government and the Contractor will have different access authorities to the same contract database through RMS. The common database will be updated automatically each time a user finalizes an entry or change.

1.5 SYSTEM REQUIREMENTS

The following is the recommended system configuration to run the Contractor Mode RMS for full utilization of all features for all types and sizes of contracts. Smaller, less complicated, projects may not require the configuration levels described below. Required configuration also noted below.

Recommended RMS System Requirements	
Hardware	
Windows-based PC	1.7 GHz i3; AMD A6 3650 GHz or higher processor (REQUIRED)
RAM	8 GB
Hard drive disk	100 GB space for sole use by RMS system
Monitor	Screen resolution 1366 x 768
Mouse or other pointing device	
Windows compatible printer	Laser printer must have 4 MB+ of RAM
Connection to the Internet	minimum 4 Mbs per user
Software	
MS Windows	Windows 7 x 64 bit (RMS requires 64 bit O/S) or newer (REQUIRED)
Word Processing software	Viewer for MS Word 2013, MS Excel 2013 or newer (REQUIRED)
E-mail	MAPI compatible (REQUIRED)

Virus protection software	Regularly upgraded with all issued Manufacturer's
updates and is able to detect most zero day viruses (REQUIRED)

1.6 CONTRACT DATABASE - GOVERNMENT

The Government will enter the basic contract award data in RMS prior to granting the Contractor access. The Government entries into RMS will generally be related to submittal reviews, correspondence status, and Quality Assurance(QA)comments, as well as other miscellaneous administrative information.

1.7 CONTRACT DATABASE - CONTRACTOR

Contractor entries into RMS establish, maintain, and update data throughout the duration of the contract. Contractor entries generally include prime and subcontractor information, daily reports, submittals, RFI's, schedule updates and payment requests. RMS includes the ability to import attachments and export reports in many of the modules, including submittals. The contractor responsibilities for entries in RMS typically include the following items:

1.7.1 Administration

1.7.1.1 Contractor Information

Enter all current Contractor administrative data and information into RMS within 7 calendar days of receiving access to the contract in RMS. This includes, but is not limited to, Contractor's name, address, telephone numbers, management staff, and other required items.

1.7.1.2 Subcontractor Information

Enter all missing subcontractor administrative data and information into RMS CM within 7 calendar days of receiving access to the contract in RMS or within 7 calendar days of the signing of the subcontractor agreement for agreements signed at a later date. This includes name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed.

1.7.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C" or "RFP".

1.7.1.4 Equipment

Enter and maintain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.7.1.5 Reports

Track the status of the project utilizing the reports available in RMS. The value of these reports is reflective of the quality of the data input. These reports include the Progress Payment Request worksheet, Quality Control (QC) comments, Submittal Register Status, and Three-Phase Control worksheets.

1.7.1.6 Request For Information (RFI)

Create and track all Requests For Information (RFI) in the RMS Administration Module for Government review and response.

1.7.2 Finances

1.7.2.1 Pay Activity Data

Develop and enter a list of pay activities in conjunction with the project schedule. The sum of pay activities equals the total contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities assigned to a CLIN equals the amount of each CLIN.

1.7.2.2 Payment Requests

Prepare all progress payment requests using RMS. Update the work completed under the contract at least monthly, measured as percent or as specific quantities. After the update, generate a payment request and prompt payment certification using RMS. Submit the signed prompt payment certification and payment request as well as supporting data either electronically or by hard copy. Unless waived by the Contracting Officer, a signed paper copy of the approved payment certification and request is also required and will govern in the event of discrepancy with the electronic version.

1.7.3 Quality Control (QC)

Enter and track implementation of the 3-phase QC Control System, QC testing, transferred and installed property and warranties in RMS. Prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements in RMS. Maintain all data on a daily basis. Insure that RMS reflects all quality control methods, tests and actions contained within the Contractor Quality Control (CQC) Plan and Government review comments of same within 7 calendar days of Government acceptance of the CQC Plan.

1.7.3.1 Quality Control (QC) Reports

The Contractor's Quality Control (QC) Daily Report in RMS is the official report. The Contractor can use other supplemental formats to record QC data, but information from any supplemental formats are to be consolidated and entered into the RMS QC Daily Report. Any supplemental information may be entered into RMS as an attachment to the report. QC Daily Reports must be finalized and signed in RMS within 24 hours after the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.7.3.2 Deficiency Tracking.

Use the QC Daily Report Module to enter and track deficiencies. Deficiencies identified and entered into RMS by the Contractor or the Government will be sequentially numbered with a QC or QA prefix for tracking purposes. Enter each deficiency into RMS the same day that the deficiency is identified. Monitor, track and resolve all QC and QA entered deficiencies. A deficiency is not considered to be corrected until the Government indicates concurrence in RMS.

1.7.3.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS. Worksheets for the three-phase control meetings are generated within RMS.

1.7.3.4 Labor and Equipment Hours

Enter labor and equipment exposure hours on a daily basis. Roll up the labor and equipment exposure data into a monthly exposure report.

1.7.3.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. The Contractor will monitor, track and show resolution for safety issues in the QC Daily Report area of the RMS QC Module. In addition, follow all reporting requirements for accidents and incidents as required in EM 385-1-1, Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS and as required by any other applicable Federal, State or local agencies.

1.7.3.6 Definable Features of Work

Enter each feature of work, as defined in the approved CQC Plan, into the RMS QC Module. A feature of work may be associated with a single or multiple pay activities, however a pay activity is only to be linked to a single feature of work.

1.7.3.7 Activity Hazard Analysis

Import activity hazard analysis electronic document files into the RMS QC Module utilizing the document package manager.

1.7.4 Submittal Management

Enter all current submittal register data and information into RMS within 7 calendar days of receiving access to the contract in RMS. The information shown on the submittal register following the specification section 01 33 00 SUBMITTAL PROCEDURES will already be entered into the RMS database when access is granted. Group electronic submittal documents into transmittal packages to send to the Government, except very large electronic files, samples, spare parts, mock ups, color boards, or where hard copies are specifically required. Track transmittals and update the submittal register in RMS on a daily basis throughout the duration of the contract. Submit hard copies of all submittals unless waived by the Contracting Officer.

1.7.5 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange

Format (SDEF) file, based on the requirements in Section 01 32 01 PROJECT SCHEDULE.

1.7.6 Closeout

Closeout documents, processes and forms are managed and tracked in RMS by both the Contractor and the Government. Ensure that all closeout documents are entered, completed and documented within RMS.

1.8 IMPLEMENTATION

Use of RMS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS system. RMS is an integral part of the Contractor's required management of quality control.

1.9 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within 7 calendar days after receipt of notice of RMS non-compliance by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

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SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
08/09

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C511	(2007) Standard for Reduced-Pressure Principle Backflow Prevention Assembly

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR List	(continuously updated) List of Approved Backflow Prevention Assemblies
FCCCHR Manual	(10th Edition) Manual of Cross-Connection Control

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction,Alteration, and Demolition Operations
NFPA 70	(2017) National Electrical Code

NEVADA DEPARTMENT OF TRANSPORTATION (NDOT)

NDOT STANDARD PLANS	(2017) Standard Plans for Road and Bridge Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP 310-1-6a	(2006) Sign Standards Manual, VOL 1
EP 310-1-6b	(2006) Sign Standards Manual, VOL 2, Appendices

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1	(2015; Rev L) Obstruction Marking and Lighting

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009) Manual on Uniform Traffic Control Devices

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Site Plan; G

Traffic Control Plan; G

Temporary Earthwork Plan; G

Dust Control Methods And Procedures; G

SD-06 Test Reports

Backflow Preventer Tests

SD-07 Certificates

Backflow Tester

Backflow Preventers Certificate of Full Approval

Backflow Prevention Training Certificate

1.3 CONSTRUCTION SITE PLAN

Prior to the start of work, submit a construction site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

1.4 TEMPORARY EARTHWORK PLAN

Prepare and submit a Temporary Earthwork Plan. Indicate the proposed location of temporary access ramps and detail any temporary earthwork to be done.

1.5 IDENTIFICATION OF EMPLOYEES

Furnish each employee and require each employee engaged on the work to display identification as approved and directed by the Contracting Officer. Deliver prescribed identification immediately to the Contracting Officer for cancellation upon release of any employee. When required, obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel must wear identifying markings on hard hats clearly identifying the company for whom the employee works.

1.6 EMPLOYEE PARKING

Park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Parking must not interfere with existing and established parking requirements.

1.7 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.7.1 Backflow Tester Certificate

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the regulatory agency. Tester must not be affiliated with any company participating in any other phase of this Contract.

1.7.2 Backflow Prevention Training Certificate

Submit a current certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

Provide project, safety, bulletin board, and hard hat signs at locations designated by the Contracting Officer. The Construction Project Signs requirements are shown in Section 16 of EP 310-1-6a and specified in EP 310-1-6b Appendix B. Erect signs within 15 days after receipt of the notice to proceed.

TEMPORARY SIGNAGE							
Sign	Sign Type	Number of Signs	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
Project Sign	CID-01	1	4'x6'	4"x4"	HDO-3	48 inches	WH-RD/BK
Safety Sign	CID-02	1	4’x4’	4"x4"	HDO-3	48 inches	WH/BK-SG
Hard Hat Signs	SDA-13	1 each site	2'x2'	4"x4"	HDO-5	48 inches	SR-SW/SK

TEMPORARY SIGNAGE							
Sign	Sign Type	Number of Signs	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
Bulletin Board	CID-02	1	3'x4'	4"x4"	HDO-3	48 inches	WH/BK

2.1.1 Bulletin Board

Immediately upon beginning of work, provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer.

2.2 TEMPORARY TRAFFIC CONTROL

Provide access and temporary relocated roads as necessary to maintain traffic. Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Provide measures to protect and divert traffic, including watchmen and flagmen, barricades, lights around and in front of equipment and the work, and the adequate warning, danger, and direction signs, as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site must interfere as little as possible with public traffic. Investigate the adequacy of existing roads and the allowable load limit on these roads. Repair any damage to roads caused by construction operations.

2.2.1 Access and Haul Roads

Construct access and haul roads necessary for proper prosecution of the work under this contract. Construct with suitable grades and widths; avoid sharp curves, blind corners, and dangerous cross traffic. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. Provide adequate dust control, to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads are subject to approval by the Contracting Officer. Provide adequate lighting to assure full and clear visibility for full width of haul road and work areas during any night work operations. Remove access and haul roads upon completion of the work, unless otherwise directed by the Contracting Officer.

2.2.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic barricades will be required. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the

hazard during both day and night.

2.2.3 Fencing

Provide fencing along the construction site at all open excavations and tunnels to control access by unauthorized people.

a. Provide a high visibility orange colored safety fencing, high density polyethylene grid or approved equal, a minimum of 48 inches high and maximum mesh size of 2 inches, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. Install fencing to be able to restrain a force of at least 250 pounds against it.

2.3 TEMPORARY WIRING

Provide temporary wiring in accordance with NFPA 241 and NFPA 70, Article 305-6(b), Assured Equipment Grounding Conductor Program. Include frequent inspection of all equipment and apparatus.

2.4 BACKFLOW PREVENTERS

Reduced pressure principle type conforming to the applicable requirements AWWA C511. Provide backflow preventers complete with 150 pound flanged cast iron, bronze mounted gate valve and strainer, 304 stainless steel or bronze, internal parts. Select the particular make, model/design, and size of backflow preventers to be installed from the latest edition of the List of Approved Backflow Prevention Assemblies issued by the FCCCHR List and include a Certificate of Full Approval from FCCCHR List. After installation conduct Backflow Preventer Tests and provide test reports verifying that the installation meets the FCCCHR Manual Standards.

PART 3 EXECUTION

3.1 AVAILABILITY AND USE OF UTILITY SERVICES

3.1.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.1.2 Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system. Any penalties and / or fines associated with improper discharge will be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Maintain these conveniences at all times without nuisance. Include provisions for pest control and elimination of odors. Government toilet facilities will not be available to Contractor's personnel.

3.1.3 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.1.4 Obstruction Lighting of Cranes

Provide a minimum of 2 aviation red or high intensity white obstruction lights on temporary structures (including cranes) over 100 feet above ground level. Light construction and installation must comply with FAA AC 70/7460-1. Lights must be operational during periods of reduced visibility, darkness, and as directed by the Contracting Officer.

3.1.5 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials daily to minimize potential hazards.

3.1.6 TRAFFIC PROVISIONS

3.1.6.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close any thoroughfare or interfere in any way with traffic on railways or highways except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan must be in accordance with NDOT STANDARD PLANS and local regulations and the MUTCD, Part VI. Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.

b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.

c. Provide, erect, and maintain, at contractors expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

3.1.6.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of any damage to roads caused by construction operations.

3.1.6.3 Rush Hour Restrictions

Do not interfere with the peak traffic flows preceding and during normal operations without notification to and approval by the Contracting Officer.

3.1.6.4 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Treat dust abatement on access roads with applications of calcium chloride, water sprinklers, or similar methods or treatment.

3.2 CONTRACTOR'S TEMPORARY FACILITIES

Contractor-owned or -leased trailers must be identified by Government assigned numbers. Size and location of the number must be approved by the Contracting Officer. Apply the number to the trailer within 14 calendar days of notification, or sooner, if directed by the Government.

3.2.1 Safety

Protect the integrity of any installed safety systems or personnel safety devices. If entrance into systems serving safety devices is required, the Contractor must obtain prior approval from the Contracting Officer. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the Contracting Officer.

3.2.2 Administrative Field Offices

Provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

3.2.3 Storage Area

Construct a temporary 6 foot high chain link fence around trailers and materials. Include plastic strip inserts, colored green, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Do not place or store Trailers, materials, or equipment outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site. Trailers, equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on any given day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the fenced area at the end of each work day.

3.2.4 Supplemental Storage Area

Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site. Fencing of materials or equipment will not be required at this site; however, the Contractor is responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area

by the Government.

3.2.5 Appearance of Trailers

a. Trailers utilized by the Contractor for administrative or material storage purposes must present a clean and neat exterior appearance and be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on installation property.

b. Paint using suitable paint and maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

3.2.6 Maintenance of Storage Area

Keep fencing in a state of good repair and proper alignment. Grassed or unpaved areas, which are not established roadways, will be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways, should the Contractor elect to traverse them with construction equipment or other vehicles; gravel gradation will be at the Contractor's discretion. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers must be edged or trimmed neatly.

3.2.7 New Building

In the event a new building is constructed for the temporary project field office, it will be a minimum 12 feet in width, 16 feet in length and have a minimum of 7 feet headroom. Equip the building with approved electrical wiring, at least one double convenience outlet and the required switches and fuses to provide 110-120 volt power. Provide a work table with stool, desk with chair, two additional chairs, and one legal size file cabinet that can be locked. The building must be waterproof, supplied with a heater, have a minimum of two doors, electric lights, a telephone, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation, and a supply of approved drinking water. Approved sanitary facilities must be furnished. Screen the windows and doors and provide the doors with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins will be non-removable. Arrange the windows to open and to be securely fastened from the inside. Protect glass panels in windows by bars or heavy mesh screens to prevent easy access. In warm weather, furnish air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 20 degrees F below the outside temperature when the outside temperature is 95 degrees F. Any new building erected for a temporary field office must be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work become the property of the Contractor and removed from the site. All charges for telephone service for the temporary field office will be borne by the Contractor, including long distance charges up to a maximum of $75.00 per month.

3.2.8 Security Provisions

Provide adequate outside security lighting at the Contractor's temporary facilities. The Contractor will be responsible for the security of its own equipment; in addition, the Contractor will notify the appropriate law enforcement agency requesting periodic security checks of the temporary

project field office.

3.2.9 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

3.2.9.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions must include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

3.3 GOVERNMENT FIELD OFFICE

3.3.1 Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds.

3.3.2 Temporary 926 WG Swing Space Trailers

Provide temporary swing space trailers with approximately 3,500 square feet for the use of 926 WG personnel. Trailer shall also include additional spaces for restrooms, bresakroom/kitchenette room and circulation. See list below for space requirements. The trailers must be waterproof, supplied with heat pumps for cooling and heating, have a minimum of two doors, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation, and electric lights and switches. Equip the trailer with approved electrical panel and associated wiring per the NEC Code. Provide power outlets and data outlets for supporting the number of computers as indicated below in notes, and additional convenience outlets for supporting miscellaneous electrical equipments. Provide hardwired service wiring for temporary trailer from nearest existing transformer. Provide temporary patch panel for temporary distribution of telephone and data services. Screen the windows and doors and provide the doors with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins will be non-removable. Arrange the windows to open and to be securely fastened from the inside. The trailer shall be securely anchored to the ground at all four corners to guard against movement during high winds. Trailers shall meet ABA requirements for accessibility. See sheets Civil sheet for trailer swing space location. Trailers shall be in-placed at the approved locations 30 days prior to start of work of Building 332. Trailers shall be emptied of government furnished equipments by the government 30 days after Beneficial Occupancy Date (BOD) of the new renovated Building 332 and will be turned over to the Contractor for removal from the site. Utilities will be

connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer.

Space Requirements:
3- JAG Offices @ 100 SF
2- Chaplain @ 100 SF
1- AMDS Commander Office @ 150 SF
1- AMDS 1st Sgt Office @ 100 SF
4- AMDS Cubicles full time @ 64 SF
2- Logistic Cubicles full time @ 64 SF
1- Supply Cubicles full time @ 64 SF ea.
30- "Kiosk" type workstations for part time/temporary employee @ 36 SF ea.
2- AMDS Training Room @ 400 SF ea.
1- LRF supply room @ 400 SF
Male Restroom
Female Restroom
Small breakroom/kitchenette
Circulation

Private offices, conference rooms, and training rooms shall be provided with free standing furnishings, similar in type and quantity to the FF&E Package for the renovated building. Free standing furnishings shall include, but are not limited to, desks, chairs, swivel chairs, conference tables, credenzas, lecterns, file storage systems and book shelves. Open office workstations shall include panel based workstations complete with task lighting hung on wall panel, panel hung counter space and free-standing swivel chair. Workstations shall include two (2) undercounter pedestal files (one box/box/file and one file/file). Each work station shall have powered panels wired with convenience outlets, LAN and Telephone Lines."

3.4 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, install a satisfactory means of communication, such as telephone or other suitable devices and made available for use by Government personnel.

3.5 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing at the work site. Maintain the safety fencing during the life of the contract and, upon completion and acceptance of the work, will become the property of the Contractor and be removed from the work site.

3.6 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, haulroads, and any other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence that will become the property of the Contractor. Restore to the original or better condition, areas used by the Contractor for the storage of equipment or material, or other use. Remove gravel used to traverse grassed areas and restore the area to its original condition, including top soil and seeding as necessary.

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SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS
08/16

PART 1 GENERAL

1.1 PAYMENT

No separate payment will be made for work covered under this section. Payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations are the Contractor's responsibility. All costs associated with this section must be included in the contract price.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. Code (USC)

16 USC 703-712	Migratory Bird Treaty Act (MBTA)

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual
WETLANDS DELINEATION MANUAL	(1987) Corps of Engineers Wetlands Delineation Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328	Definitions of Waters of the United States
40 CFR 150 - 189	Pesticide Programs
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
40 CFR 68	Chemical Accident Prevention Provisions

49 CFR 171 - 178	Hazardous Materials Regulations
50 CFR 10.12	Definitions for Taking, Possession, Transporation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants

1.3 DEFINITIONS

1.3.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.3.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.3.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners,excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.3.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan.

1.3.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor must discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Land Application must be in compliance with all applicable Federal, State, and local laws and regulations.

1.3.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for

use as a plant regulator, defoliant or desiccant.

1.3.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.3.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers,creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.3.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.3.10 Wetlands

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLANDS DELINEATION MANUAL.

1.4 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work must be protected during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.

1.4.1 Subcontractors

Ensure compliance with this section by subcontractors.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G

ATC application; G

Authority to Construct (ATC) permit application to Clark County Department of Air Quality and Environmental Management (DAQEM) for emission equipment.

Dust Control Permit; G

1.6 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern must be defined within the Environmental Protection Plan as outlined in this section. Address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but are considered necessary, must be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan must be current and maintained onsite by the Contractor.

1.6.1 Compliance

No requirement in this Section will relieve the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor will be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.6.2 Contents

Include in the environmental protection plan, but not limit it to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan must include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) prepared in accordance with Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL may be

substituted for this plan.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. Drawing showing the location of borrow areas.

j. Include in the Spill Control plan the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1 . Include in this plan, as a minimum:

(1) The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual will immediately notify the Contracting Officer and Base Environmental Office in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. Include in the plan a list of the required reporting channels and telephone numbers.

During normal working hours, immediately report all spills in quantities of five (5) gallons or more to the Asset Management Office at (702) 652-4123 or (702) 652-6106.

After 4:30 p.m. or on weekends, immediately contact the Nellis Command Post at (702) 652-2446.

Forward a written, completed spill report to the Contracting Officer within three (3) working days after the occurrence.

(2) The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

(3) Training requirements for Contractor's personnel and methods of accomplishing the training.

(4) A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

(5) The names and locations of suppliers of containment materials and

locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

(6) The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris and schedules for disposal.

The plan shall identify estimated quantities to be generated, characterization data or a sampling/analysis plan, spill containment and response measures, and all required permits for the storage and transport of materials.

All waste materials generated by any work under the contract performed on a government installation shall be handled, transported, stored, and disposed of by the contractor and by his subcontractors at all times in accordance with all applicable Federal, state, or local laws, ordinances, regulations, court orders, or other types of rulings having the effect of the law, including, but not limited to Executive Orders 12088 as amended by E.O. 13143, 12580, 11988, and 11990; the Clean Air Act, (42 U.S.C. 7401-7671); the Clean Water Act (33 U.S.C. 1251-1387); the Endangered Species Act (16 U.S.C. Sec 1531-1544); the Toxic Substances Control Act (15 U.S.C. Sec 2601-2671); the National Historic Resources Protection Act (16 U.S.C. Sec 740-470w-6); the Solid Waste Disposal Act (42 U.S.C. 6901-6991); the Archaeological Resources Protection Act (16 U.S.C. 470aa-470-11); the Safe Drinking Water Act (42 U.S.C. 300f - 300j); the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136-136y); the Sikes Act Administration Regulations (29 CFR 1910); the Environmental Protection Agency regulations (40 CFR 50-87, 110, 112, 122, 136, 141-13, 162, 165, 166, 171, 240-246, 260-271, 280, 300, 302, 355, 370, 372, 403, 405-471, and 761); the Department of Transportation regulations (49 CFR 171-177); the Nevada Revised Statutes (Title 40, Sections 445.131-445.710 and 459.400-856) and the Nevada Administrative Code provisions implementing those code sections; and environmental planning, assessment, monitoring, and regulatory compliance provisions of the county codes of Clark, Lincoln, and Nye Counties.

The Contractor shall prepare a waste disposal plan prior to construction.

Waste Disposal. Project demolition and construction waste shall be disposed of off post at a location approved by the Contracting Officer. There are no landfills located at Nellis AFB. The Clark County Apex Regional Landfill is operated by Republic Services. http://www.clarkcountynv.gov/comprehensive-planning/eco-county/Pages/RepublicService

The Contractor shall follow UFC 1-900-01 Selection of Methods for the Reduction, Reuse and Recycling of Demolition Waste.

Carpet will be reclaimed where possible See UFGS 02 42 51 Carpet Removal and Reclamation. Carpet America Recovery Effort is at:

http://www.carpetrecovery.org

Haul Route: As indicated on the drawings. Base roadways sustaining

damage from construction activities shall be repaired at the Contractor's expense after project completion.

(1) Identify any subcontractors responsible for the transportation and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility.

(2) Evidence of the disposal facility's acceptance of the solid waste must be attached to this plan during the construction. Attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. Submit the report for the previous quarter on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted (e.g. the first working day of January, April, July, and October).

(3) Indicate in the report the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

(4) A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. Detail in the plan the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

l. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

The Contractor shall be held responsible for dust control as defined by Clark County and State of Nevada Ordinances. A Dust Control Permit is required to be obtained from the Clark County DAQEM (Department of Air Quality and Environmental Management) and submitted to the Nellis Air Program Manager (nellisairquality@nellis.af.mil) for all construction activity that triggers permitting as outlined in AQR Section 94 Permitting and Dust Control for Construction Activities which includes but is not limited to grading, clearing and grubbing operations, trenching, and any disturbance of the topsoil involving more than one-quarter acre of land, 100 linear feet of trenching, or demolition of a structure larger than 1000 square feet. All processing fees associated with obtaining a dust permit shall be the responsibility of the Contractor.

Government Coordination: The contractor shall submit to the Contracting Officer for coordination with the Nellis Air Program Manager the application for the dust permit. After coordination has been completed, the contractor will proceed with obtaining the permit.

A copy of the approved permit shall be provided to the Contracting Officer who will provide a copy to the Nellis AFB Air Program Manager.

Compliance with the Dust Control Permit is the sole responsibility of the Contractor. Failure to comply with the Dust Control Permit that results in regulatory action or fines will be the responsibility of the Contractor at no cost to the Government.

m. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions

to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Safety Data Sheets (SDSs) and the maximum quantity of each hazardous material to be onsite at any given time must be included in the contaminant prevention plan. Update the plan as new hazardous materials are brought onsite or removed from the site. All SDSs shall be kept on the project site, be readily available for any hazardous material to be used in the construction and provide essential information for emergency response personnel on Base.

n. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan must include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan must include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan must include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

o. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plan methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer.

p. Include and update a pesticide treatment plan, as information becomes available. Include in the plan: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements are the Contractor's responsibility in conformance with for data required to be reported to the Installation.

q. Hazardous Waste: It is the responsibility of the Contractor to identify hazardous waste materials to be encountered during construction and demolition. Contractor shall develop a hazardous waste disposal plan during design for the approval of the Contracting Officer. Contractor shall label, store, manifest, and transport all hazardous waste in accordance with all applicable federal, state, and local regulations pertaining to transport, storage, use, or disposal of

hazardous materials/wastes. Contractors and subcontractors shall be properly trained for hazardous waste operations through OSHA. Coordination of these efforts will be through the Contracting Officer and Nellis AFB 99th CES/CEA. The nearest hazardous waste landfill is about 72 miles in Beatty, Nevada.

See https://www.usecology.com/Locations/All-Locations/US-Ecology-Nevada.aspx

Hazardous waste manifesting is done through the Nevada Department of Environmental Protection at: https://ndep.nv.gov/bwm/hazard.htm

If the Contractor discovers unidentified hazardous conditions after construction commencement, he/she shall notify the Contracting Officer immediately. If unexpected contaminants greater than small quantity (5 gallons) are encountered or suspected either by detecting suspicious odors, or discolored soil the Contractor shall notify the Contracting Officer immediately. The Contractor shall stop construction for up to ten (10) days to allow time for Environmental Management (EM) representatives to sample and analyze suspected contamination. If the soil is determined to be contaminated, the Contractor shall set the contaminated soil aside on some contained area (asphalt, plastic lining, etc). The contained area shall first be covered with minimum 15 mil plastic before any soil is placed there. After the soil has been placed there it shall be entirely covered with minimum 15 mil plastic sufficiently anchored to remain in place during windy/stormy conditions. Storm water shall be diverted away from the stockpile, and any runoff from the stockpile area shall be contained and properly disposed of per the waste disposal plan and coordination with 99th CES/CEA.

r. Utility Clearance: Prior to commencing excavation activities, the Contractor shall, after notifying Underground Service Alert North at http://usanorth811.org, physically expose key utility lines such as primary power and communications lines that were identified (marked in the field or shown on provided drawings) by the Air Force by using hand digging, hydro excavation, or other similar non-destructive methods. The lines need to be exposed in as many locations as necessary in order to be able to determine the precise location of the utility lines that are in the project area to be excavated. When hydro-excavation is not feasible the Contractor may dig by hand. No mechanical excavation shall be used unless approved by the Contracting Officer.

1.6.3 Appendix

Attach to the Environmental Protection Plan, as an appendix, copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents.

1.7 ENVIRONMENTAL LICENSES, PERMITS, AND COMMITMENTS

Obtaining, paying for, and complying with all environmental licenses, permits, and commitments required by Federal, State, Regional, local, and base environmental laws and regulations are the Contractor's responsibilities. This includes, but is not limited to Clark County DAQEM Authority to Construct/Modification to the Operating Permit and Dust Control Permit, and applicable Notice of Intent to Nevada Division of Environmental Protection (NDEP) for storm water protection.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer will make a joint condition survey. Immediately following the survey, the Contractor will prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report will be signed by both the the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor must protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the work under the contract.

1.9 SPECIAL ENVIRONMENTAL REQUIREMENTS

Comply with the special environmental requirements listed here.
Comply with Nellis AFB Stormwater Management Plan

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations from the drawings,plans and specifications, requested by the Contractor and which may have an environmental impact, will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. After receipt of such notice, the Contractor will inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS

2.1 COMPLIANT MATERIALS

Provide the Government a list of all hazardous materials proposed for use on site and the MSDS. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements. The Government may alter or limit use of specific materials as needed to meet installation permit requirements for emissions.

2.2 PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing it onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements.

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult with the Installation Environmental Office, regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of the Installation Environmental Office or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.1.2 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

3.1.3 Streams

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with any required permits including, but not limited to, Clean Water Act Section 404, and Section 401 Water Quality.

The Contracting Officer's approval and appropriate permits are required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.2 LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Identify any land resources to be preserved within the work area prior to the beginning of any construction. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval, except in areas indicated on the drawings or specified to be cleared. Ropes, cables, or guys will not be fastened to or attached to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times, as defined in the following subparagraphs. Remove stone, soil, or other materials displaced into uncleared areas.

3.2.1 Work Area Limits

Mark the areas that need not be disturbed under this contract prior to commencing construction activities. Mark or fence isolated areas within the general work area which are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. The Contractor's personnel must be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved must be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. Restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

Providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations is the Contractor's responsibility. Select and maintain the erosion and sediment controls such that water quality standards are not violated as a result of construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. Construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as specified in Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. The Contractor's best management practices must also be in accordance with the National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Prevention Plan (SWPPP) which may be reviewed at the Nellis AFB Environmental Office. Remove any temporary measures after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities will be made only when approved. Erosion and sediment controls must be provided for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant

and/or work areas must be controlled to protect adjacent areas.

3.3 WATER RESOURCES

Monitor all water areas affected by construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation unless otherwise indicated. For construction activities immediately adjacent to impaired surface waters, the Contractor must be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits. Cross connection between storm water drainage and sanitary is prohibited.

3.3.1 Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.3.1.1 Storm Water Construction Permit (Soil Erosion)

The Contractor shall provide protective barriers to prevent soil erosion on all required excavations. The Contractor shall provide environmental protection to prevent sediment drainage of silts into storm drains. Contractor shall minimize disturbed area, stockpile excavated soils, and protect excavated soils from wind and water erosion. If one (1) acre or more of total area is disturbed, including equipment lay down area, Contractor shall obtain a Nevada Storm Water Construction Permit by electronically submitting a Notice of Intent (NOI) to the Nevada Division of Environmental Protection (NDEP) and preparing a Storm Water Pollution Prevention Plan (SWPPP). Contractor shall coordinate the submittal with the Nellis Storm Water Manager through the Contracting Officer on an AF 3000, in accordance with Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL.

3.4 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Authority to Construct Permit

Before construction begins, Contractor shall acquire an Authority to Construct (ATC) permit from Clark County for all equipment or emission units defined by Clark County Air Quality Regulations (AQR) Section 00 as any stationary source that has the potential to emit any regulated air pollutant (i.e. Carbon Monoxide (CO), Nitrogen Oxides (NOx), Sulfur Oxides (SOx), Volatile Organic Compounds (VOC) or Particulate Matter less than 10 microns (PM10)) or any pollutant listed under Section 112(b) of the Clean Air Act (i.e. Hazardous Air Pollutants (HAPS)). Contractor shall coordinate permitting process with the Nellis Air Program Manager through the Contracting Officer. The Contractor will prepare an ATC application package in accordance with AQR Section 12 Pre-construction Review for New or Modified Stationary Sources for all emission units or activities requiring permitting in the project. The complete ATC application must be submitted to Nellis Air Program Manager (nellisairquality@nellis.af.mil) for review and approval prior to submittal to the Department of Air Quality and Environmental Management (DAQEM). Once the ATC application has been submitted to DAQEM, the Nellis Air Program will handle all coordination with DAQEM and will contact the Contractor if additional information is

required. The Contractor will be notified by the Nellis Air Program Manager through the Contracting Officer when the ATC permit has been issued and construction may proceed on the emission units.

Approval process through DAQEM can take an extended amount of time and should be initiated early in the project. Any emission unit found on the construction site before a permit is secured is subject to a notice of violation (NOV). This includes any units in storage and awaiting installation. Any NOV or enforcement action caused as a result of the actions of the Contractor shall be the responsibility of the Contractor, to include payment and processing of all fees or fines.

All emission units that emit any of the regulated air pollutants or any pollutant listed under Section 112(b) of the Clean Air Act must meet the emission standards or implement the controls outlined in 40 CFR Par 60, Standard of Performance for New Stationary Sources. Furthermore, any emission limitation or controls identified in the Best Available Control Technology (BACT) or Lowest Achievable Emission Rate (LAER) analysis done during the permitting process shall be implemented. If there is a failure to meet any of the emission standards or implement any of the controls outlined in 40 CFR Par 60 or identified in the BACT/LAER analysis, the Contractor shall remove the emission unit and replace it with an acceptable emission unit that meets the emission standards or implements the controls at no additional cost to the government.

3.4.2 Particulates

Keep dust down at all times, including during nonworking periods. Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; must be controlled at all times, including weekends, holidays and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with all State and local visibility regulations.

3.4.2.1 Best Available Control Methods for Dust

Best Available Control (BAC) methods shall be used at all times for any quantity of soil disturbance, including but not limited to grading, clearing and grubbing operations, trenching, any disturbance of the topsoil, and traffic on unpaved roads. BAC methods include paving, watering, revegetation, chemical stabilization, phased construction, and applying dust palliative. A visible dust plume cannot exit the property or extend over 100 (one hundred) feet from the point of origin within the property boundary.

3.4.2.2 DAQEM Dust Control Permit

A Clark County Dust Control Permit shall be required if more than ¼ acre

(10,890 sq ft) of soil is disturbed (including access road, material laydown/storage area, parking and maneuver areas, and pedestrian areas); involves mechanized trenching of 100 (one hundred) linear feet or more; or mechanical demolition of greater than 1,000 (one thousand) sq ft of a structure. Contact the Air Quality Office (nellisairquality@nellis.af.mil) to initiate the permit. The Contractor is responsible for the permit fee, keeping daily records and posting the dust sign.

3.4.2.3 High Winds and Air Quality

When warnings of winds of gale force or stronger are issued, the Contractor shall take every practicable precaution to minimize damage to persons, work, and adjacent property. These precautions may include removing all stored materials, tools, and/or equipment from exposed locations and removing or securing any temporary structures.

Especially when a high wind advisory or alert is issued by Clark County, the Contractor shall take every practicable precaution to minimize fugitive dust from the construction site. Precautions may include increased wetting of material, implementing additional controls, and cease operations until the activity can be continued without creating excessive fugitive dust.

3.4.3 Odors

Odors from construction activities must be controlled at all times. The odors must be in compliance with State regulations and/or local ordinances and may not constitute a health hazard.

3.4.4 Sound Intrusions

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State of Nevada rules.

3.4.5 Burning

Burning is prohibited on the Government premises.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes will be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Handling, storage, and disposal must be conducted to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste.

3.5.2 Chemicals and Chemical Wastes

Dispense chemicals ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. This documentation will be periodically reviewed by the Government. Collect chemical waste in corrosion resistant, compatible containers. Collection drums must be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes will be classified, managed, stored, and disposed of in accordance

with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, manage and store hazardous waste in compliance with 40 CFR 262 in accordance with the Installation hazardous waste management plan. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage. Storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations is the Contractor's responsibility. Transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials must be immediately reported to the Nellis AFB Fire Department (dial 911 while on base), Contracting Officer and the Facility Environmental Office. Cleanup and cleanup costs due to spills are the Contractor's responsibility. Coordinate the disposition of hazardous waste with the Facility's Hazardous Waste Manager and the Contracting Officer.

Should any hazardous substance or oil spills occur on this project, in addition to containing and removing such spill, the Contractor shall:

a. During normal working hours, immediately report all spills in quantities of five (5) gallons or more to the Asset Management Office at (702) 652-4123 or (702) 652-6106.
b. After 4:30 p.m. or on weekends, immediately contact the Nellis Command Post at (702) 652-2446.
c. Forward a written, completed spill report to the Contracting Officer within three (3) working days after the occurrence.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles must be conducted in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded must be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. Storage of fuel on the project site will be in accordance with all Federal, State, and local laws and regulations.

3.5.5 Waste Water

Disposal of waste water will be as specified below.

a. Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. will not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction related waste water in accordance with all

Federal, State, Regional and Local laws and regulations.

b. For discharge of ground water, the Contractor will surface discharge in accordance with all Federal, State, and local laws and regulations.

c. Water generated from the flushing of lines after hydrostatic testing will be discharged into the sanitary sewer with prior approval and/or notification to the Waste Water Treatment Plant's Operator.

3.6 RECYCLING AND WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Contractor shall participate in Nellis AFB's Qualified Recycling Program (QRP). Participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Information about existing historical, archaeological, and cultural resources within Nellis Air Force Base are at the Environmental Office office. Protect these resources and be responsible for their preservation during the life of the Contract.

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources will be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities.

Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

The Contractor shall comply with the following:

(1) Construction activities associated with this undertaking have the potential to expose unknown subsurface cultural resources and/or affect known historic properties in an unanticipated manner.

If cultural resources are inadvertently discovered, work shall be redirected 30-meters (100-feet) away from the find until it can be evaluated by the Nellis Cultural Resource Manager and/or a qualified professional archaeologist. Per 36 CFR 61, the minimum professional qualifications in archeology are a graduate degree in archeology, anthropology, or closely related field plus:

1a. At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management;

lb. At least four months of supervised field and analytic experience in general North American archeology, and

lc. Demonstrated ability to carry research to completion.

In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

(2) Inadvertent discoveries will require implementation of procedures set forth in the Nellis AFB, Creech AFB, and NTTR Integrated Cultural Resource Management Plan (ICRMP) and AF Instruction 32-7065, which includes consultation procedures and planning requirements in Section 106 of the National Historic Preservation Act (16 USC. 470f; 36 CFR Part 800). Section 106 consultation may include archaeological investigations to determine the boundary of the site in relation to the undertaking's Area of Potential Effect and to determine the sites eligibility for listing on the National Register of Historic Places.

(3) If an inadvertent discovery of human remains occurs, work shall cease within 30-meters of the find and immediate notification must be made to the Nellis Cultural Resource Manager. The Cultural Resource Manager will preliminarily determine if the remains are from a recent crime scene (50 years old or less) or are of Native American descent and will immediately notify the Base Civil Engineer. If the remains appear recent, a30-meter radius will be declared off limits to everyone except authorized personnel and the AF Criminal Investigation will assume control of the crime scene. If the remains appear to be of Native American descent, the Clark County Coroner's Office will make the final determination that the remains are not of recent origin potentially interested Native American Tribes will be notified.

(4) An Inadvertent discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony will require implementation of procedures set forth in the Nellis AFB, Creech AFB, and NTTR Integrated Cultural Resource Management Plan (ICRMP) and AF Instruction 32-7065, which includes consultation procedures and planning requirements in Section 106 of the National Historic Preservation Act (16 USC. 470f; 36 CFR Part 800) and Section 3 and Section 5 of the Native American Graves Protection and Repatriation Act (25 USC. 3001 et seq.; 43 CFR 10).

3.8 BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The protection of threatened and endangered animal and plant species, including their habitat, is the Contractor's responsibility in accordance with Federal, State, Regional, and local laws and regulations.

3.8.1 Migratory Birds and Burrowing Owls

Protect migratory birds and raptors (birds-of-prey, e.g. burrowing owls) in accordance with Migratory Birth Treaty Act (MBTA), 16 USC 703-712. The

MBTA prohibits destruction or removal of any active migratory bird or raptor nest that results in bird or egg mortality or abandonment of an active nest. Destruction or removal of any structure containing an active nest, including trees or burrowing owl burrows, which results in unpermitted take (i.e. results in death, wounding, possession, or collection) of protected bird species or eggs is illegal (50 CFR 10.12). To ensure MBTA compliance, avian breeding and nest surveys must be conducted by an experienced and qualified biologist. Surveys help to ensure no nests or burrows are impacted by construction activities. Burrowing owls survey is required prior to any earth disturbing activities. Conducting initial nest/burrow surveys before nesting season can help avoid potential MBTA violations and minimize any possibility of construction restrictions. Contact natural resources manager (702)652-4354 to schedule a survey at least two weeks prior to the start of construction activities. Recommend construction start outside of nesting season (March 1 - August 31) to avoid potential delays due to owl nesting activies on site.

3.8.2 Fish and Wildlife

Minimize interference with, disturbance to, and damage of fish and wildlife. Species that require specific attention along with measures for their protection shall be listed by the Contractor prior to beginning of construction operations.

a. Wildlife Encounters During Construction:

It is not anticipated that there will be an abundance of wildlife encounters at the project site. However, should the Contractor discover animals living within the construction boundaries, suspend operations at the site of discovery and continue in other areas. Notify the Contracting Officer and Biological Monitor immediately of the finding. Include a brief statement to the Contracting Officer and Biological Monitor of the location and the findings with the notification. How to identify sensitive animals that may be discovered will be provided at the Preconstruction Conference.

b. Desert Tortoise:

Employees must not touch, harm, harass, or kill desert tortoises. Notify the Biological Monitor immediately of all desert tortoise sightings. The Biological Monitor is responsible for removing desert tortoises out of immediate dangers. Should construction activities threaten the survival of any desert tortoises, cease those activities immediately until the Biological Monitor safely removes the tortoise(s). The Biological Monitor shall perform clearance surveys in all areas of planned disturbance. The Biological Monitor will be available to accompany construction crews during period of tortoise activity to provide protection of these animals and their burrows.

(1) Implement an employees environmental awareness program which will be provided to construction and operation employees with information to encourage awareness and preservation of the desert ecosystem and the resources found in the Western Mojave Desert. Distribute this information to and discuss with all employees during employee orientation sessions. Also provide this information to all visitors and subcontractors that will be on-site. All persons participating in the environmental awareness program must sign and affidavit declaring that the individual

understands and will adhere to the guidelines set forth in the program material.

(2) Develop a strict trash and litter control program. Supply an adequate number of covered trash and litter receptacles in all appropriate locations.

3.9 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor through the Contracting Officer, must coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application. Discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with these specifications. Installation Pest Management personnel will be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 150 - 189.

3.9.1 Pesticide Delivery and Storage

Deliver pesticides to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Store pesticides according to manufacturer's instructions and under lock and key when unattended.

3.9.2 Qualifications

For the application of pesticides, use the services of a subcontractor whose principal business is pest control. The subcontractor must be licensed and certified in the state where the work is to be performed.

3.9.3 Pesticide Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Furnish Safety Data Sheets (SDSs) for all pesticide products.

3.9.4 Application

Apply pesticides using a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator must wear clothing and personal protective equipment as specified on the pesticide label. The Contracting Officer will designate locations for water used in formulating. Do not allow the equipment to overflow. All equipment must be inspected for leaks, clogging, wear, or damage and repaired prior to application of pesticide.

3.10 MAINTENANCE OF POLLUTION FACILITIES

Maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.11 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, the Contractor will immediately stop work in that area and immediately inform the Contracting Officer.

3.12 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel must be trained in all phases of environmental protection and pollution control. Conduct environmental protection/pollution control meetings for all personnel prior to commencing construction activities. Additional meetings must be conducted for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.13 POST CONSTRUCTION CLEANUP

The Contractor will clean up all areas used for construction in accordance with Contract Clause FAR 52.236-12: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area must be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

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TEMPORARY STORM WATER POLLUTION CONTROL

07/13

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SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL
07/13

PART 1 GENERAL

1.1 SUMMARY

The work consists of implementing the storm water pollution prevention measures to prevent sediment from entering streams or water bodies as specified in this Section in conformance with the requirements of Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, and the requirements of the National Pollutant Discharge Elimination System (NPDES).

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

LAS VEGAS VALLEY STORMWATER QUALITY MANAGEMENT COMMITTEE AND CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (LVVSWQMC)

LVVSWQMC	(2009) Las Vegas Valley Construction Site Best Management Practices Guidance Manual

STATE OF NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF ENVIRONMENTAL PROTECTION (NDEP)

NDEP SGP	(2007) State of Nevada Department of Conservation and Natural Resources Division of Environmental Protection Stormwater General Permit. Permit No. NVR 100000.
NDEP BMPS	(2008) Nevada Contractor's Field Guide for Construction Best Management Practices (BMPs).

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 136	Guidelines Establishing Test Procedures For The Analysis Of Pollutants

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

Submit all submittals with sufficient lead-time to allow for government review and contractor revisions to ensure the project schedule is not delayed. Unless otherwise noted, the USACE will require a minimum of 15 calendar days to review documents.

SD-01 Preconstruction Submittals

SWPPP; G, DO

A site-specific Storm Water Pollution Prevention Plan (SWPPP).

NOI and NOC; G, DO

Notice of Intent (NOI) and Notice of Change (NOC) Registration Documents to obtain or update permit coverage.

SD-03 Product Data

BMP Product Data

Manufacturer's installation instructions of Best Management Practices (BMPs) to be used.

SD-06 Test Reports

SWPPP Amendments

Amend the SWPPP as needed to reflect current site conditions.

SD-10 Operation and Maintenance Data

Post-Construction Storm Water Management Plan; G, DO

Operation and maintenance data to support the long-term maintenance plan , this information can be built into the SWPPP.

SD-11 Closeout Submittals

Final SWPPP; G, DO

NOT Application; G, DO

Notice of Termination (NOT) Application.

1.4 GENERAL REQUIREMENTS

This specification shall be used in conjunction with SECTION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS that addresses the project's environmental requirements and the Civil Design and Landscape Architecture portions of Section 01 10 10 SPECIFIC TECHNICAL ENGINEERING AND DESIGN CRITERIA that addresses the project's long-term BMPs.

This specification was written to ensure that all project activities will be in accordance with the State of Nevada Department of Conservation and Natural Resources Division of Environmental Protection Stormwater General Permit. Permit No. NVR 100000 (NDEP SGP). The Contractor's compliance to this permit and subsequent requirements/updates is mandatory. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action and/or removal from General Permit coverage.

The NDEP SGP does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems (MS4) or other watercourses within their jurisdictions. Obtain and include the required

local permits and/or agency's approval(s) in the SWPPP.

The NDEP SGP does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.

1.4.1 Required Stormwater Meetings

A required meeting shall be conducted the week after receiving NTP. The meeting shall be conducted by the Contractor and held at the USACE Resident Office. At a minimum, the Contractor's Project Manager, or appropriate technical person, the Qualified SWPPP Inspector (QSI) and the SWPPP Developer (SD) are required to be present. (See paragraph titled TRAINING REQUIREMENTS for position details.)

This meeting is the equivalent of a preparatory meeting for the SWPPP submittal. The SD and QSI shall discuss the Contractor's proposed stormwater management plan for this project. This meeting is required prior to government approval of the SWPPP submittal.

Hold additional meetings for completion of the SWPPP or other required information as needed, including but not limited to the required meetings detailed in 01 45 00 QUALITY CONTROL, paragraph 3.6. The SD shall attend all stormwater related 3-phase process meetings.

1.4.2 TRAINING REQUIREMENTS

This contract requires that all personnel responsible for the writing and implementation of the SWPPP be specifically trained in the subject of storm water permitting and erosion and sedimentation controls. Requirements for training are based on the level of responsibility and shall be provided in the SWPPP. Below are the requirements for the position(s) of the SD and the QSI, which shall be in place for the entire duration of the project, until meeting the termination requirements as detailed in paragraph "Termination Of SWPPP Responsibilities."

1.4.2.1 SWPPP Developer (SD)

Ensure that SWPPPs are written, amended and certified by a SD. An SD shall have appropriate experience to design a plan to manage stormwater and the associated permit appliance requirements. The SD must be knowledgeable in the principles and practice of erosion and sediment controls and who possesses the skills to assess conditions at the site that could impact stormwater quality and the effectiveness of the BMPs selected to control the quality of the stormwater discharges.

The SD shall be available throughout the life of the project to review and amend the SWPPP when necessary. Provide a copy of the SD's qualifications within the SWPPP. .

The SD shall be actively involved in the project throughout the life of the contract. The SD shall inspect the site in person prior to SWPPP development to aid in the creation of the site specific SWPPP.

1.4.2.2 Qualified SWPPP Inspector (QSI)

Ensure that all BMPs required to be in compliance with the NDEP SGP are implemented by a Qualified SWPPP Inspector (QSI). A QSI is a person responsible for non-storm water and storm water visual observations,

sampling and analysis. A QSI shall be a person knowledgeable in the principles and practice of erosion and sediment controls and who possesses the skills to assess conditions at the site that could impact stormwater quality and the effectiveness of the BMPs selected to control the quality of the stormwater discharges.

The QSI shall be available throughout the life of the project to address and implement the SWPPP when necessary. A copy of the QSI's qualifications shall be provided in the SWPPP.

The QSI shall be readily available and located within a reasonable distance from the project site in order to respond quickly to any stormwater related emergencies. The QSI shall be able to respond and be physically present onsite within one hour of notification from the Contracting Officer.

1.5 DEVELOPMENT AND DESIGN

1.5.1 SWPPP Development

The SWPPP is a requirement of the NDEP SGP permit and compliance is mandatory. Guidance for creating a SWPPP can be found at the Nevada Department of Environmental Protection website . Once the SWPPP has been completed, submit it to USACE for government approval no later than 15 days upon receiving the NTP. Government approval will be based on the document meeting these specifications, and the NDEP SGP permit requirements. Resubmit the SWPPP to the government within 10 days of receiving government review comments until an acceptable action code is issued.

After government approval, the SWPPP shall be updated and made available to the NDEP as needed.

Include a narrative section as well as figures in the Site Maps. At a minimum, include the locations of all BMPs (temporary and post-construction), discharge points, sampling collection points, drainage patterns across the project area, storm drain inlets and temporary concentrated flow drainage patterns in the Site Maps.

1.5.1.1 Non-Visible Pollutants

Designate trained personnel to collect any potential water quality samples. Sampling may be required in the event of a spill or per the direction of the NDEP. Document the personnel and training in the SWPPP. Training shall consist of the following elements:

1. SWPPP review,

2. Health and safety review, and

3. Sampling simulations.

The SWPPP shall describe the following water quality sampling procedures:

a. Sampling preparation,

b. Collection,

c. Quality assurance and quality control,

d. Sample labeling,

e. Collection documentation,

f. Sample shipping,

g. Chain of custody,

h. Sample numbering, and

i. Precautions from the construction site health and safety plan.

When discharges to water quality-impaired waters that are contained in the current 303(d) Impaired Water Body listing issued by the Nevada Division of Environmental Protection, Bureau of Water Quality Planning, the permittee must investigate whether discharges from the permittee's site will contribute significantly to any 303(d) listing, and when the permittee discharges into a water body with an established Total Maximum Daily Load ("TMDL"), the permittee shall comply with all applicable TMDL requirements. This information can be found on the following NDEP website: http://ndep.nv.gov/bwqp/standard.htm

This project has the potential to discharge non-visible pollutants in storm water from the construction site. Include a description of the sampling and analysis strategy of potential non-visible pollutants in the SWPPP.

Identify potential non-visible pollutants that will be present on the construction site associated with the following:

a. Construction materials and wastes;

b. Existing contamination due to historical site usage; or

c. Application of soil amendments, including soil stabilization products, with the potential to alter pH or contribute toxic pollutants to storm water.

Show the locations planned for storage and use of the potential non-visible pollutants on the Site Maps.

In the event that samples need to be collected, samples to be analyzed by a laboratory shall be sampled, preserved, and analyzed by a State-certified laboratory in conformance with the requirements in 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants." Identify the laboratory, sample containers, preservation requirements, holding times, and analysis method in the SWPPP.

Ensure that the analyzing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples. Water quality analytical results, and quality assurance and quality control data shall be kept for a period of three years, and retained on-site while construction is ongoing. Also, provide an evaluation of whether the downhill or downstream samples show levels of the tested parameter higher than in the control sample. If downhill or downstream samples show increased levels, the Contractor will assess the water pollution control measures, site conditions, and surrounding influences to determine the probable cause for the increase. As determined by the assessment, the Contractor will repair or modify water pollution control measures to address increases and amend the SWPPP as necessary.

Electronic results (in one of the following file formats: .xls, .txt) shall have the following information:

a. Sample identification number.

b. Contract number.

c. Constituent.

d. Reported value.

e. Analytical method.

f. Method detection limit.

g. Reported limit.

Maintain the water quality sampling documentation and analytical results with the SWPPP on the project site. If construction activities or knowledge of site conditions change such that discharges or sampling locations change, amend the SWPPP as necessary.

1.5.1.2 Best Management Practices (BMPs)

The QSD shall select BMPs to include in the SWPPP in accordance with these specifications and the NDEP SGP. The selection and implementation of BMPs is based on the pollution risks associated with the construction activity. The BMP's installation and maintenance schedule and on-site location shall be included in the SWPPP. Guidance on stormwater BMPs can be found in NDEP BMPS and LVVSWQMC. Installation, maintenance and inspection details are listed in the appropriate LVVSWQMC BMP manual. Include the following water pollution control practices in the SWPPP as needed for compliance with NDEP SGP:

Erosion Control
Sediment Control
Wind Erosion Control
Tracking Control
Non-Storm Water Management
Waste Management and Materials Pollution Control
Active Treatment System Plan (if needed)

Implement erosion control practices for all disturbed soil on the project site. Select a variety of erosion control measures to protect the soil surface and prevent soil particles from being detached by rainfall, flowing water, or wind. The minimum required erosion control BMPs to be implemented onsite are listed in paragraph 2.1.1, Erosion Control BMPs.

Implement sediment control BMPs to capture any soil that becomes eroded. Implement these BMPs to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Establish effective perimeter controls; consider installing silt fences or placing straw wattles below slopes. The minimum required sediment control BMPs to be implemented onsite are listed in paragraph 2.1.2, Sediment Control BMPs.

Include the Wind Erosion Control BMP in the SWPPP, BMP details are listed in the appropriate LVVSWQMC manual.

Implement proper tracking control BMPs to reduce the tracking of sediments off-site. The minimum required tracking control BMPs to be implemented onsite are listed in paragraph 2.1.4, Tracking Control BMPs.

The discharge of materials other than storm water and authorized non-storm water discharges is prohibited. The minimum required Non-Stormwater control BMPs and waste management and pollution control BMPs to be implemented onsite are listed in paragraph 2.1.5 Non-Stormwater Management BMPs, and paragraph 2.1.6, Waste Management and Materials Pollution Control BMPs, respectively.

BMP fact sheets can be found at the CASQA website and shall be included as an appendix of the SWPPP. Include BMP Product Data, see paragraph titled "BMP Installation and Removal" for submittal details. Implement, maintain, inspect, and remove BMPs in accordance with the fact sheets, product data sheets, and the NDEP SGP requirements.

Document each BMP in both a narrative section and site map in the SWPPP. Indicate all BMPs to be implemented, where they will be located, and when they will be installed in the SWPPP. In cases where information about BMP installation, implementation, and management are not available on the CASQA website or in NDEP SGP, include the BMP specifications and manufacture instructions in the SWPPP, or in a SWPPP amendment, for approval prior to installation.

Include a discussion of the inspection and maintenance program for all BMPs as identified to be utilized throughout the entire duration of the project in the SWPPP. A qualified person (QSI, or persons appropriately trained by the QSI) will be assigned the responsibility to conduct inspections. List the name and telephone number of that person in the SWPPP.

Select temporary stabilization methods with a minimum longevity period of enter project duration, in months months to meet the duration of the project and replace as needed. The BMPs with long longevity will improve relative effectiveness. Additionally, temporary stabilization methods shall be selected which are habitat sensitive, including, but not limited to: biodegradable or photodegradable materials and materials compatible with existing vegetation.

1.5.2 Notice of Intent (NOI) and Notice of Change (NOC) Registration Documents to obtain or update permit coverage.

Submit all NOI and NOC documents for Government Approval. The documents include the following:

a. Site Maps

b. Storm Water Pollution Prevention Plan (SWPPP)

c. Signed Certification Statement by a Duly Authorized Representative

d. Notice of Intent (NOI)

e. Annual Fee

Upon approval of the NOI submittal, the contractor will submit the information to the NDEP. Unless determined otherwise in coordination with the installation the Contractor will act as the Duly Authorized Representative and and apply to be under permit coverage once government

approval is obtained. The contractor is responsible for finding a Duly Authorized Representative at the installation if required by the NDEP.

All permit application documents must be submitted and accepted by the NDEP prior to construction commencement. Do not commence Land Disturbance activities until the complete NOI package and the annual fee are received by the NDEP, and a permit identification number number has assigned. Provide annual permitting fees to the NDEP each year until the NOT submittal has been approved by the Government and the NDEP.

PART 2 PRODUCTS

SWPPP and CSMP development details are provided in Part 1 of these specifications. This section defined which BMPs are required to be utilized and included in the SWPPP, as well as a list of additional BMPs that are available for use. All BMPs shall follow the specified LVVSWQMC manual and NDEP BMPS except where more stringent requirements are stated in these specifications or in the BMPs' manufacturer's recommendations. Additional design requirements for particular BMPs are stated in Part 1: GENERAL of this specification. Additional mobilization/demobilization, maintenance, and inspection requirements are stated in Part 3: EXECUTION of this specification.

2.1 REQUIRED BEST MANAGEMENT PRACTICES

2.1.1 Erosion Control BMPs

Install and maintain all of the following required erosion control BMPs. A combination of two or more of the following five erosion control BMPs shall be used for soil protection in each area: hydraulic mulch, soil binders, straw mulch, or geotextiles and mats. Follow the additional recommendations as provided in the Civil Design and Landscape Architecture portions of Section 01 10 10 SPECIFIC TECHNICAL ENGINEERING AND DESIGN CRITERIA to be in compliance for long-term BMPs. Choose the following BMPs with minimum longevity to meet the duration of the project, and those which offer habitat sensitive, biodegradable or photodegradable features, when allowed by site conditions.

2.1.1.1 Scheduling

Utilize scheduling as an erosion control BMP in accordance with the LVVSWQMC manual PL-2 "Scheduling" and NDEP BMPS. Schedule work to eliminate soil disturbance activities during rain events. If work is to be done when rainfall is predicted, adjust the construction schedule to allow the implementation of erosion and sedimentation controls on all disturbed area prior to rainfall.

2.1.1.2 Preservation Of Existing Vegetation

Utilize this BMP as an erosion control BMP in accordance with the LVVSWQMC manual EC-2 "Mulching" and NDEP BMPS. Identify and protect vegetation that provides erosion and sedimentation control benefits when possible. Provide temporary fencing prior to the commencement of soil disturbing activities to protect existing vegetation, especially on areas designated as Environmentally Sensitive Areas (ESAs) as described in Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

2.1.1.3 Hydraulic Mulch

This BMP shall meet the standards described in the LVVSWQMC manual and NDEP BMPS.

2.1.1.4 Soil Binders

This BMP shall meet the standards described in the LVVSWQMC manual and NDEP BMPS.

2.1.1.5 Straw Mulch

This BMP shall meet the standards described in the LVVSWQMC manual and NDEP BMPS.

2.1.1.6 Geotextiles And Mats

The use of plastic liners are discouraged, plastic material shall only be used where deemed necessary and shall be approved by the Contracting Officer prior to use. Material selection, site preparation, anchoring, and installation requirements are detailed in the LVVSWQMC manual and NDEP BMPS. This BMP shall meet the LVVSWQMC manual EDC-1 "Erosion Control Mats" standards.

All areas disturbed during blanket installation shall be re-seeded. Ensure blankets are anchored and are uniformly in contact with the soil. If direct contact with the soil cannot be maintained (such as on rocky slopes) alternate erosion control methods shall be used.

2.1.1.7 Soil Preparation/Roughening

Prepare/roughen surface soils prior to applying hydraulically applied stabilization methods, compost blankets, or straw mulch. Surface soils shall not be roughened in combination with Erosion Control Blankets. The SD shall consider the type of erosion controls BMPs to be utilized and detail the soil preparation/roughening requirements for each BMP in the SWPPP. This BMP shall be utilized to meet the LVVSWQMC manual standards.

2.1.2 Sediment Control BMPs

Install and maintain the following sediment control BMPs. Choose the following BMPs with minimum longevity to meet the duration of the project, and those that offer habitat sensitive, biodegradable or photodegradable features, when allowed by site conditions. Use of sandbags and straw bales shall not be used unless otherwise directed by the Contracting Officer.

2.1.2.1 Silt Fence

Install and maintain silt fences as a sediment control BMP in accordance with the LVVSWQMC manual SPC-5 "Silt Fence" and NDEP BMPS. Secondary to fiber rolls, silt fences are temporary linear sediment barriers of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff. Properly trench and key in silt fences for full effectiveness. Remove and properly dispose damaged silt fences and replace with new ones. Remove sediment when the sediment accumulation reaches 1/3 of the barrier height.

2.1.2.2 Sediment Basin

If necessary, install and maintain sediment basins as a sediment control BMP in accordance with the LVVSWQMC manual SPC-8 "Temporary Sediment Basins" , NDEP BMPS, and NDEP SGP. Use sediment basins where sediment-laden water may enter the drainage system or watercourse and/or in association with dikes, temporary channels, and pipes used to convey runoff from disturbed areas. Use sediment basins in conjunction with erosion control practices to reduce the amount of sediment flowing into the basin.

The QSI shall inspect the sediment basin prior to any likely forecasted rain event, daily during rain events, after rain events, and a minimum of once per week when a rain event is not likely. Periodically remove accumulated sediment in order to maintain BMP effectiveness. The QSI shall ensure the sediment is removed when sediment accumulation reaches one-half the designated sediment storage volume. The QSI shall ensure all standing storm water from the basins is removed within 96 hours after accumulation.

Basins with an impounding levee greater than 4.5 feet tall, measured from the lowest point of the impounding area to the highest point of the levee, and basins capable of impounding more than 35,000 square feet, shall be designed by a Registered Civil Engineer.

2.1.2.3 Fiber Rolls

Install and maintain fiber rolls as a sediment control BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. Preferred over silt fences, fiber rolls (or straw wattles) consists of straw, flax, or other similar materials bound into a tight tubular roll. Use fiber rolls containing biodegradable materials with photodegradable netting. Properly trench and stake fiber rolls for full effectiveness. Split, torn, unraveling or slumping fiber rolls shall be repaired within 48 hours of identification. Remove sediment when sediment accumulation reaches 1/3 the designed sediment storage depth.

2.1.2.4 Street Sweeping And Vacuuming

Utilize this BMP as a sediment control BMP in accordance with the LVVSWQMC manual GH-6 "Road Sweeping/Tracking Cleaning" and NDEP BMPS. Implement this BMP anywhere sediment is tracked from the project site onto public or private paved roads, especially at points of ingress/egress. Self-propelled or walk-behind equipment shall be used to remove sediment and clean paved areas. Kick brooms or sweeper attachments shall not be allowed. Visible sediment tracking shall be swept and/or vacuumed in such a manner as to eliminate unauthorized non-storm water discharge from reaching surface water or drainage systems. When tracked or spilled sediment is observed outside the construction limits, it shall be removed immediately; continuous removal may be required. If sediment is wet or when tracked soil is caked, scrape the soil loose. The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste) is prohibited. After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

2.1.2.5 Storm Drain Inlet Protection

Install and maintain this BMP as a sediment control BMP in accordance with the LVVSWQMC manual SPC-7 "Storm Drain Inlet Protection" and NDEP BMPS. Every storm drain inlet potentially receiving sediment-laden runoff from any construction related areas must be protected against permitting the

transmission of polluted waters. One of the three following types of storm drain inlet protection devices shall be chosen by the contractor based on site conditions. Specify the type in the SWPPP detailing maintenance and installation, and locations shown on the Site Maps.

a. Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment.

b. Gravel bag barrier: Used to create small sediment trap upstream of inlets on sloped paved streets. Appropriate for sheet flow or when concentrated flow may exceed 0.5 cfs, and where overtopping is required to prevent flooding.

c. Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.

2.1.3 Wind Erosion Control BMP

Utilize the wind erosion control BMP as a minimum BMP requirement. Utilize the wind erosion control BMP in accordance with LVVSWQMC manual standards and NDEP BMPS. Apply water or other dust palliatives as necessary to prevent or alleviate dust nuisance. Provide covers for haul trucks transporting materials. Provide rapid clean up of sediments deposited on paved roads.

2.1.4 Tracking Control BMPs

Tracking control BMPs consists of preventing or reducing vehicle tracking from entering a storm drain or watercourse. Tracking control BMPs include: stabilized construction entrance/exit, stabilized construction roadway, and entrance/outlet tire wash. Utilize these BMPS to preclude dirt or mud from being tracked onto public roads or to adjacent water bodies. Utilize Tracking Control BMPs in accordance with LVVSWQMC manual standards as detailed below.

2.1.4.1 Stabilized Construction Entrance/Exit

Utilize this BMP in accordance with the LVVSWQMC manual SPC-11 "Construction Entrance/Exit Tire Wash" and NDEP BMPS. Design the stabilized entrance/exit to support the heaviest vehicles and equipment that will use it. Use of constructed/manufactured steel plates with ribs must be detailed in the SWPPP for approval. If the aggregate method is selected, it must follow the size and depth as detailed in the fact sheet and shall be detailed in the SWPPP for approval.

2.1.5 Non-Stormwater Management BMPs

Provide source control BMPs to prevent or reduce pollution of stormwater. These BMPs are referred to as "good housekeeping practices" which involve keeping a clean, orderly construction site. The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste) is prohibited.

2.1.5.1 Illicit Connection/Illegal Discharge Detection And Reporting

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. Illicit connection/illegal discharge detection and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site. Notify the Contracting Officer of any illicit connections and illegal dumping or

discharge incidents at the time of discovery. The Contracting Officer will notify the appropriate organizations for reporting.

2.1.5.2 Vehicle And Equipment Cleaning

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. On-site vehicle and equipment washing is discouraged; however, when it must occur onsite, insure the wash area is located away from storm drain inlets, drainage facilities or watercourses, and pave (with concrete or asphalt) and berm the area to contain wash waters and to prevent run-on and runoff, configured with a sump to allow collection and disposal of wash water. Wash waters shall not be discharged to storm drains or watercourses. See specification 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS for additional vehicle cleaning requirements.

2.1.5.3 Vehicle And Equipment Fueling

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. Follow the standards and specifications as described in the LVVSWQMC fact sheet. Immediately clean up spills up and properly dispose of contaminated cleanup materials.

2.1.5.4 Vehicle And Equipment Maintenance

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. Use drip pads or absorbent pads during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area. Inspect vehicles and equipment on each day of use; leaks shall be repaired immediately or the problem vehicle or equipment shall be removed from the project site.

2.1.6 Waste Management And Materials Pollution Control BMPs

Provide source control BMPs to prevent or reduce pollution of stormwater. These BMPs involve day-to-day operations of the construction site and are under the control of the Contractor. They are additional "good housekeeping practices".

2.1.6.1 Material Delivery And Storage

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. The products requiring BMP implementation with delivery and storage are the following: hazardous chemicals, soil stabilizers and binders, fertilizers, detergents, plaster, petroleum products, asphalt and concrete components, pesticides and herbicides, or any other materials that may be detrimental if released to the environment. Include Material Safety Data Sheets (MSDS) Safety Data Sheets (SDS) in the SWPPP and supplied to the Contracting Officer for all stored materials.

2.1.6.2 Material Use

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. These procedures apply when the following materials are used or prepared on site: hazardous chemicals, soil stabilizers and binders, fertilizers, detergents, plaster, petroleum products, asphalt and concrete components, pesticides and herbicides, or any other materials that may be detrimental if released to the environment. Safety Data Sheets (SDS) shall be supplied to the Contracting Officer for all materials and included in

the SWPPP.

2.1.6.3 Stockpile Management

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. Protect any stockpile on site from wind and erosion caused by storm water. Cover and protect stockpiles with a temporary linear and sediment barrier prior to the onset of precipitation. The use of plastic liners are discouraged. Plastic material shall only be used where deemed necessary and shall be approved by the Contracting Officer prior to use. Securely protect all stockpiled waste materials from wind and rain at all times unless actively being used. Divert runoff around or away from the stockpile on the upstream perimeter. Repair and/or replace perimeter control and covers as needed, or as directed by the Contracting Officer, to keep them functioning properly. Sediment shall be removed when sediment accumulation reaches one-third (1/3) of the barrier height.

2.1.6.4 Spill Prevention And Control

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. Implement spill control procedures anytime chemicals and/or hazardous substances are stored. Substances may include, but are not limited to: soil stabilizers/binders, dust palliatives, herbicides, growth inhibitors, fertilizers, deicing/anti-icing chemicals, fuels, lubricants, or other petroleum distillates.

Include a Spill Control Plan as part of the Environmental Protection Plan, as detailed in specification SECTION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, paragraph ENVIRONMENTAL PROTECTION PLAN, Contents. Educate employees on how to meet cleanup and storage procedures, as well as any other information provided in the fact sheet.

2.1.6.5 Sanitary/Septic Waste Management

Utilize this BMP in accordance with the LVVSWQMC manual standards and NDEP BMPS. The QSI shall monitor onsite sanitary/septic waste storage and disposal procedures. Provide proper containment for each temporary sanitary facility to prevent discharge of pollutants to the stormwater drainage system. The Contractor is responsible for the education, storage and disposal procedures as detailed in the fact sheet.

2.2 AVAILABLE BEST MANAGEMENT PRACTICES

The Contractor is not required to utilize these specific BMPs, however in order to comply with this specification and the NDEP SGP requirements, additional BMPs will be necessary in addition to the required BMPs listed in paragraph 2.1 of these specifications. If any of the following BMPs are to be utilized, the requirements in their specific BMP shall be followed and included in the SWPPP, if they are not to be used, provide justification. Additional BMPs include, but are not limited to:

AVAILABLE BMPs	
BEST MANAGEMENT PRACTICE	BMP FACT SHEET REFERENCE NUMBER
Wood Mulching	EC - 8

AVAILABLE BMPs	
BEST MANAGEMENT PRACTICE	BMP FACT SHEET REFERENCE NUMBER
Earth Dikes and Drainage Swales	EC - 9
Velocity Dissipation Devices	EC - 10
Slope Drains	EC - 11
Streambank Stabilization	EC - 12
Compost Blankets	EC - 14
Soil Preparation / Roughening	EC - 15
Non-Vegetative Stabilization	EC - 16
Sediment Basin	SE - 2
Sediment Trap	SE - 3
Check Dam	SE - 4
Gravel Bag Berm	SE - 6
Sandbag Barrier	SE - 8
Straw Bale Barrier	SE - 9
Active Treatment System	SE - 11
Temporary Silt Dike	SE - 12
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Biofilter Bags	SE - 14
Stabilized Construction Roadway	TC - 2
Entrance/Outlet Tire Wash	TC - 3
Water Conservation Practices	NS - 1
Dewatering Operations	NS - 2
Paving and Grinding Operations	NS - 3
Temporary Stream Crossing	NS - 4
Clear Water Diversion	NS - 5
Potable Water/Irrigation	NS - 7
Pile Driving Operations	NS - 11
Concrete Curing	NS - 12
Concrete Finishing	NS - 13
Material and Equipment Use	NS - 14
Demolition Adjacent to Water	NS - 15

AVAILABLE BMPs	
BEST MANAGEMENT PRACTICE	BMP FACT SHEET REFERENCE NUMBER
Temporary Batch Plant	NS - 16
Solid Waste Management	WM - 5
Hazardous Waste Management	WM - 6
Contaminated Soil Management	WM - 7
Concrete Waste Management	WM - 8
Liquid Waste Management	WM - 10

PART 3 EXECUTION

3.1 MOBILIZATION AND DEMOBILIZATION

All mobilization and demobilization efforts will comply with the following requirements:

3.1.1 BMP Installation And Removal

Install and remove all BMPs per their specific manufacturers' recommendations, their specific LVVSWQMC manual or guidance in NDEP BMPS. Submit all BMP Product Data no later than 72 hours prior to installing BMPs listed in the approved SWPPP. Submit a SWPPP Amendments and BMP Product Data sheets to add new BMPs to the SWPPP prior to installation. BMP product data sheets shall contain product specifications and manufacturer's recommendations to include the following: application, limitations, longevity, replacement frequency, installation instructions, inspections, ecological information and removal instructions. Include all installation and removal details for each BMP in the SWPPP. Design details are available in PART 1: GENERAL of this specification. BMP product information details are available in PART 2: PRODUCTS of this specification.

Through the duration of the project, the QSI shall certify that all BMPs are installed properly, certification shall be documented in the inspection reports no later than 48 hours after installation.

3.1.2 Termination Of SWPPP Responsibilities

Upon completion of construction activities, the Post-Construction Storm Water Management Plan, Final SWPPP, and NOT Application submittals shall be submitted before the contractor's stormwater management obligation for the site is terminated. Continue to implement permit and specification requirements until the NOT submittal has been first approved by the Government, then approved by the NDEP. The Final SWPPP submittal details can be found in the paragraph titled "SWPPP And Amendments."

The Post-Construction Storm Water Management Plan submittal shall provide information required for the long-term maintenance plan designated for a minimum of five years. Identify the parties responsible for the site's short and long-term maintenance plan. It shall describe the procedures to ensure that the post-construction storm water management measures are

adequately maintained. It shall also provide product data information for each post-construction BMP to be left onsite after the permit is terminated, including BMP warranty information, design and operation information, and manufacturer's maintenance and removal instructions..

The NOT Application shall be submitted for government approval prior to submitting it to the NDEP. .. The NOT Application will be approved only when the SD certifies that all of the following site conditions have been met:

a. For purposes of "final stabilization," the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;

b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;

c. Final stabilization has been reached;

d. Construction materials and wastes have been disposed of properly;

e. Post-construction storm water management measures have been installed and a long-term maintenance plan (minimum of five years designation to describe the procedures to ensure that the post-construction measures are adequately maintained) has been established; and

f. All construction-related equipment, materials and any temporary BMPs no longer needed have been removed from the site and properly disposed of.

Final stabilization is determined by the 70% final cover method. No computational proof required. Final stabilization is to be demonstrated with photographs that compare pre and post site conditions. Final stabilization is achieved when all soil disturbing activities at the site have been completed and a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures have been employed. In such parts of the country, background native vegetation will cover less than 100% of the ground. Establishing at least 70% of the natural cover of the native vegetation meets the vegetative cover criteria for final stabilization (e.g., if the native vegetation covers 50% of the ground, 70% of 50% would require 35% total cover for final stabilization; on a beach with no natural vegetation, no stabilization is required).

3.1.3 Records

Records of all storm water monitoring information and copies of all reports shall be retained for a period of at least three years, and shall be provided to the government at the contract termination. Retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation;

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements;

c. The date and approximate time of analyses;

d. The individual(s) who performed the analyses;

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms;

f. Rain gauge readings from site inspections;

g. Quality assurance/quality control records and results;

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records;

i. Visual observation and sample collection exception records; and

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

3.2 MAINTENANCE, MONITORING AND INSPECTIONS

Noncompliance with the SWPPP or this specification may trigger enforcement action by the NDEP for violating the Clean Water Act. The Contracting Officer will notify the Contractor in writing of any observed noncompliance with the Federal, State or local laws or regulations, permits, and other elements of the SWPPP. Upon receipt of this notice, inform the Contracting Officer of proposed corrective actions and take such action when approved. If the Contractor fails to begin correcting deficiencies within 24 hours of the Contracting Officer's notification, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or costs or damages allowed to the Contractor for any such suspensions.

Initiate stabilization practices no more than 14 days where construction activities have ceased, in any portion of the site. No variance to the start date will be allowed unless given in writing by the Contracting Officer. The SWPPP shall identify the responsible party for long-term maintenance.

Implement good site management (i.e., "housekeeping") measures that could potentially be a threat to water quality if discharged. These measures include, but are not limited to: construction materials, waste management, vehicle storage and maintenance, landscape materials, potential pollutant sources, and air deposition of site materials and from site operations. The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste) is prohibited. Document all housekeeping BMPs in the SWPPP in accordance with the nature and phase of the construction project.

Provide 100% soil cover for inactive areas and all finished slopes, open spaces, utility backfill, and completed lots to eliminate sediment transportation. Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days. Inactive areas shall not be deliberately kept active for the sole purpose of avoiding stabilization requirements. Use sustainable and environmentally friendly materials; plastic material shall only be used where deemed necessary and shall be approved by the Contracting Officer. Waste disposal containers shall be covered at the end

of every business day and during rain events.

Establish and maintain effective perimeter controls. Implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active construction. Active areas of construction are areas undergoing land surface disturbance. Ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire wash off locations) are maintained and protected from activities that reduce their effectiveness. The CSWRCB will require the Contractor to conduct all required sampling, inspections, and reports as well as implement additional site specific sediment control requirements if the implementation of the requirements in this section is not adequately protecting the receiving waters. All immediate access roads shall be inspected daily, sediment or other construction activity related materials that are deposited on the roads shall immediately be removed by vacuuming or sweeping.

3.2.1 SWPPP And Amendments

The Contractor is responsible for complete, year-round, implementation and modification of the SWPPP throughout the duration of this contract. The SWPPP shall remain onsite and available until the Contractor is released specifically from the storm water management responsibilities, obtained through an approved NOT from the NDEP as detailed in paragraph Termination Of SWPPP Responsibilities.

An accurate copy of the SWPPP shall be available onsite during working hours while construction is occurring and shall be made available upon request by USACE, State or Municipal inspectors. When the original SWPPP is retained by a crew member in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

The SWPPP is to be considered a "living" document, and shall be amended as often as needed comply with the NDEP SGP. SWPPP Amendments include, but are not limited to: inspection and maintenance sheets, BMP design changes/updates, exceedance reports, sampling reports, Change of Informations (COIs), and any change of authorization. Submit SWPPP Amendments as often as needed to ensure the SWPPP reflects current site conditions . Provide updated project schedules as SWPPP Amendments submittals as often as available. The SWPPP shall be continuously updated to include all amendments. Additionally, the SWPPP may require periodic amendments to capture regulatory requirements and unforeseen problems. The SD or QSI shall immediately notify the Contracting Officer when the SWPPP has been updated/amended. BMP design changes including deletion or addition of BMPs in the pre-approved SWPPP submittal shall be certified by the SD and submitted as a SWPPP Amendments.

Within fifteen (15) days of receipt of the notification by NDEP that the SWPPP is deficient, the SD must make the required changes to the SWPPP and submit to NDEP a written certification that the requested changes have been made.

The Change of Information (COI) form can be used to reduce or add acreage to the permit coverage, this form shall be submitted as a SWPPP amendments for review prior to submitting to the NDEP. If a reduction of acreage is requested, the areas to be removed from permit coverage shall meet the stabilization requirements detailed in the paragraph titled "Termination Of

SWPPP Responsibilities."

The Final SWPPP shall be submitted upon completion of all construction activities. The final SWPPP shall provide the records of all storm water monitoring information throughout the life of the project. It shall include all amendments, inspection and maintenance sheets, BMP design changes and updates, exceedance reports, sampling reports, annual reports and any change of authorization.

3.2.2 Monitoring And Inspections

Ensure that all inspection, maintenance, repair and sampling activities at the project site shall be performed or supervised by the QSI. The QSI may delegate any or all of these activities to an employee appropriately trained to do the task(s). Training records shall be kept in the SWPPP.

The QSI must ensure routine inspections are performed at the site to ensure the BMPs are functional and that the SWPPP is being properly implemented. The QSI must have the site inspected at least once every seven (7) calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

a. Inspection date and date the inspection report was written;

b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches from rain gauge reading;

c. Site information, including stage of construction, activities completed, and approximate area of the site exposed;

d. A description of any BMPs evaluated and any deficiencies noted;

e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, tracking controls, non-storm water controls, and waste management and materials pollution controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities;

f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges;

g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates;

h. Photographs taken during the inspection, if any; and

i. Inspector’s name, title, contact phone number, and signature.

j. QSI signature verification that all BMPs have been properly installed.

k. Rain gauge readings from the contractor's maintained onsite rain gauge.

l. Weather forecast details from the National Weather Service Forecast Office (e.g., by entering the zip code of the project’s location at http://www.srh.noaa.gov/forecast).

Inspections shall record the time, date, and rain gauge reading of all qualifying rain events.

prior to each likely rain event, inspect the following:

a. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, implement appropriate corrective actions. Observe the presence or absence of floating and suspended materials, sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants;

b. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, implement appropriate corrective actions; and

c. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard. Observe the presence or absence of floating and suspended materials, sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

Within 24 hours after each qualifying rain event, conduct post rain event visual observations (inspections) to:

(1) Identify whether BMPs were adequately designed, implemented, and determine their effectiveness, and

(2) Identify additional necessary BMPs and revise the SWPPP accordingly.

Inspect each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources. A minimum of one visual observation shall be conducted each week. Visual observation are only required during daylight hours (sunrise to sunset). Visual observations shall document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source, and shall be recorded on the inspection checklist and kept available in the SWPPP.

Maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

Do not conduct inspections during dangerous weather conditions such as flooding and electrical storms. If no visual observations are collected due to dangerous weather conditions, include an explanation in their SWPPP and in the Annual Report documenting why the inspections were not conducted.

For each inspection conducted, prepare a report summarizing the scope of the inspection. The completed checklist above must be inserted in the inspection report. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily Contractor Quality Control (CQC) Report. A copy of the inspection reports shall be maintained on the job site and kept in the SWPPP. Frequency of inspections shall be summarized in a table within the SWPPP and at a minimum be carried out using the following guidelines:

a. A minimum of once per week when likely precipitation events are not predicted

b. Before a likely precipitation event (any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area)

c. At 24-hour intervals during extended precipitation events

d. Within 24-hours after each qualifying rain event (producing 1/2 inch or more at time of discharge)

The Contractor's daily CQC Report and SWPPP shall include the following:

a. The dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and grading);

b. When construction activities temporarily or permanently cease on a portion of the site; and

c. When stabilization practices are initiated.

d. When SWPPP Inspections identify the need for a SWPPP Amendment..

Inspection reports shall be submitted with the submittal a minimum of once per week or once per rain event, whichever occurs first. inspection reports may be bundled to form one submittal per qualifying rain event. shall be submitted no later than 2 days after the conclusion of each storm event, or a minimum of one week when likely precipitation events are not predicted. A copy of all Inspection Reports shall also be kept in the onsite SWPPP.

3.2.2.1 Inactive Construction Inspections

100% Soil cover shall be provided for inactive areas and all finished slopes, open space, utility backfill, and completed lots. Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days. All inspections and inspection reports shall follow the requirements described in these specifications.

3.2.3 Correcting Deficiencies

The QSI/SD is responsible for correcting deficiencies found after the SWPPP has been approved as soon as possible. The QSI shall notify the government field representative of any corrective actions taken to repair the deficiencies found during construction activities. In general, adding a new BMP to comply with the NDEP SGP requirements does not require specific government approval since compliance is mandatory. However, deleting or removing an existing BMP that is already documented in the SWPPP or the Site Maps will require government approval. In addition, replacing an existing BMP that is documented in the SWPPP or Site Maps with a BMP that is more appropriate will require government approval. The SWPPP is considered a "living" document and ongoing changes to accurately reflect site conditions are required at no additional cost.

Upon identifying failures or other shortcomings, the QSI and/or SD shall begin implementing repairs or design changes to BMPs within 48-hours of identification. Repairs shall be completed as soon as possible depending

upon field conditions, preferably before the next likely storm event. Equipment, materials, and workers shall be available for rapid response to failures and storm water management emergencies. See the paragraph titled "Training Requirements" for specific QSI and SD availability requirements. Upon identifying failure that requires a design change, the SD shall submit a SWPPP amendment no later than one week after the failure has been identified. Failures maybe identified by the RWQCB or USACE inspectors, which will be brought to the attention of, and shall be immediately addressed by, the QSI.

3.2.4 Non-Storm Water Discharge Sampling

Sample effluent at all discharge points where authorized non-storm water is discharged off-site per regulatory requirements or direction by NDEP. All non-storm water samples shall be sent to a State-certified laboratory in conformance with the requirements in 40 CFR 136 and the State Department of Health Services. Run-on from surrounding areas shall be monitored and reported if there is reason to believe run-on may contribute to stormwater pollution.

-- End of Section --

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CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

01/07

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SECTION 01 74 19

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
01/07

PART 1 GENERAL

1.1 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. Divert a minimum of 60 percent by weight of total project solid waste from the landfill.

1.2 MANAGEMENT

Develop and implement a waste management program. Take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste, consider the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. Implement any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling accrue to the Contractor. Appropriately permit firms and facilities used for recycling, reuse, and disposal for the intended use to the extent required by federal, state, and local regulations. Also, provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Management Plan; G

SD-11 Closeout Submittals

Records;

1.4 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section QUALITY CONTROL. At a minimum, discuss environmental and waste management goals and issues at the following additional meetings:

a. Pre-bid meeting.

b. Preconstruction meeting.

c. Regular meetings.

d. Work safety meetings.

1.5 WASTE MANAGEMENT PLAN

Submit a waste management plan within 15 days after notice to proceed and not less than 10 days before the preconstruction meeting. The plan demonstrates how to meet the the project waste diversion goal. Also, include the following in the plan:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.

c. Description of the regular meetings to be held to address waste management.

d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.

e. Characterization, including estimated types and quantities, of the waste to be generated.

f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.

g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.

h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Identify the recycling facilities by name, location, and phone number, including a copy of the permit or license for each facility.

i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.

j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.

k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

l. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

Revise and resubmit Plan as required by the Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the Contracting Officer.

1.6 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Make the records available to the Contracting Officer during construction, and deliver to the Contracting Officer upon completion of the constructioninclude in the Sustainability Notebook a copy of the records.

1.7 COLLECTION

Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management and clearly and appropriately identify them. Provide materials for barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable. Locate out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors. Recycling and waste bin areas are to be kept neat and clean, and handle recyclable materials to prevent contamination of materials from incompatible products and materials. Clean contaminated materials prior to placing in collection containers. Use cleaning materials that are nonhazardous and biodegradable. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Separate materials by one of the following methods:

1.7.1 Source Separated Method.

Separate waste products and materials that are recyclable from trash and sorted as described below into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum

contamination, and other substances deleterious to the recycling process). Separate materials into the following category types as appropriate to the project waste and to the available recycling and reuse programs in the project area:

a. Land clearing debris.

b. Asphalt.

c. Concrete and masonry.

d. Metal (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, lead brass, bronze).

(1) Ferrous.

(2) Non-ferrous.

e. Wood (nails and staples allowed).

f. Debris.

g. Glass (colored glass allowed).

h. Paper.

(1) Bond.

(2) Newsprint.

(3) Cardboard and paper packaging materials.

i. Plastic.

Type	
1	Polyethylene Terephthalate (PET, PETE)
2	High Density Polyethylene (HDPE)
3	Vinyl (Polyvinyl Chloride or PVC)
4	Low Density Polyethylene (LDPE)
5	Polypropylene (PP)
6	Polystyrene (PS)
7	Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

j. Gypsum.

k. Non-hazardous paint and paint cans.

l. Carpet.

m. Ceiling tiles.

n. Insulation.

o. Beverage containers.

p. .

1.7.2 Co-Mingled Method.

Place waste products and recyclable materials into a single container and then transport to a recycling facility where the recyclable materials are sorted and processed.

1.7.3 Other Methods.

Other proposed methods may be used when approved by the Contracting Officer.

1.8 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, dispose of in accordance with the following:

1.8.1 Reuse.

Give first consideration to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Coordinate reuse with the Contracting Officer. Consider sale or donation of waste suitable for reuse.

1.8.2 Recycle.

Recycle waste materials not suitable for reuse, but having value as being recyclable. Recycle all fluorescent lamps, HID lamps, and mercury-containing thermostats removed from the site. Arrange for timely pickups from the site or deliveries to recycling facilities in order to prevent contamination of recyclable materials.

1.8.3 Waste.

Dispose of materials with no practical use or economic benefit to waste-to-energy plants where available. As the last choice, dispose of materials at a landfill or incinerator.

1.8.4 Return

Set aside and protect misdelivered and substandard products and materials and return to supplier for credit.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used. -- End of Section --

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SECTION 01 78 00

CLOSEOUT SUBMITTALS
08/16

PART 1 GENERAL

1.1 PAYMENT

No separate payment will be made for record drawings required under this contract, and all costs accrued in connection with such drawings are considered a subsidiary obligation of the Contractor.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ERDC/ITL TR-12-1	(2015) A/E/C Graphics Standard, Release 2.0
ERDC/ITL TR-12-6	(2015) A/E/C CAD Standard - Release 6.0

1.3 DEFINITIONS

1.3.1 As-Built Drawings

As-built drawings are the revised contract drawings that show the project as it was built and constructed, primarily buildings and vertical structures. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to Contractor submitted Requests for Information; direction from the Contracting Officer; designs which are the responsibility of the Contractor, and differing site conditions. The revisions from Markup Drawings and field inspection notes are transferred to the Final as-built drawings. The final as-built drawings include Revisions during construction, field requested changes, shop drawing Revisions, and contractor designs. These files serve as the basis for the creation of the record drawings.

1.3.2 As-Constructed Drawings

The revised contract drawings that show the project as it was constructed, primarily Civil Works Projects covering large areas, including flood control, roads, parking lots, and recreational areas. The terms As-Built and As-Constructed used in these instructions are synonymous.

1.3.3 Working As-Built Drawings

Two sets of paper and red-lined PDF files of drawings and specifications that are marked and annotated, also known as redlined, to track changes, additions or deletions from the contract drawings during construction. Update working as-built drawings on a weekly basis and keep at least one paper and PDF set available on the jobsite at all times.

1.3.4 Record Drawings

The final Portable Data Format (PDF) record drawings are the PDF files produced from the revised electronic Computer Aided Design and Drafting (CAD) ANSI D size drawing files in the specified format, showing the revisions of the approved Working As-Built Record Drawings. All hard copy prints of the final as-built record drawings must be produced from the PDF record drawings files.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with a "S" are for inclusion in the Sustainability Notebook to fulfill Federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Warranty Management Plan
Warranty Tags
Spare Parts Data

SD-06 Test Reports

Working as-built drawings; G
Final as-built record drawings; G, DO

SD-08 Manufacturer's Instructions

Posted Instructions

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals

SD-11 Closeout Submittals

Record Drawings; G, DO

Certification of EPA Designated Items; G

Final Approved Shop Drawings; G
Construction Contract Specifications; G
As-Built Record Of Equipment And Materials

1.5 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

1.6 QUALITY CONTROL

Additions and corrections to the contract drawings must be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols must conform to ERDC/ITL TR-12-6.

1.7 WARRANTY MANAGEMENT

1.7.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit one set of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Include within the warranty management plan , but not limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subContractors, manufacturers or suppliers involved.

b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

c. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

d. A list for each warranted equipment, item, feature of construction or system indicating:

    (1) Name of item.
    (2) Model and serial numbers.
    (3) Location where installed.
    (4) Name and phone numbers of manufacturers or suppliers.
    (5) Names, addresses and telephone numbers of sources of spare parts.
    (6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
    (7) Cross-reference to warranty certificates as applicable.
    (8) Starting point and duration of warranty period.
    (9) Summary of maintenance procedures required to continue the

warranty in force.

(10) Cross-reference to specific pertinent Operation and Maintenance manuals.

(11) Organization, names and phone numbers of persons to call for warranty service.

(12) Typical response time and repair time expected for various warranted equipment.

e. The plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

f. Procedure and status of tagging of all equipment covered by extended warranties.

g. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.7.2 Performance Bond

The Performance Bond must remain effective throughout the construction period .

a. In the event of failure to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.7.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.7.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Life Safety Systems
(1) Fire suppression systems.
(2) Fire alarm system(s) in place in the building.

Code 1-Air Conditioning Systems
(1) Recreational support.
(2) Air conditioning leak in part of building, if causing damage.
(3) Air conditioning system not cooling properly.

Code 1-Doors
(1) Overhead doors not operational, causing a security, fire, or safety problem.
(2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors
(1) Overhead doors not operational.
(2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical
(1) Power failure (entire area or any building operational after 1600 hours).
(2) Security lights
(3) Smoke detectors

Code 2-Electrical
(1) Power failure (no power to a room or part of building).
(2) Receptacle and lights (in a room or part of building).

Code 3-Electrical
Street lights.

Code 1-Gas

(1) Leaks and breaks.
(2) No gas to family housing unit or cantonment area.

Code 1-Heat
(1) Area power failure affecting heat.
(2) Heater in unit not working.

Code 2-Kitchen Equipment
(1) Dishwasher not operating properly.
(2) All other equipment hampering preparation of a meal.

Code 1-Plumbing
(1) Hot water heater failure.
(2) Leaking water supply pipes.

Code 2-Plumbing
(1) Flush valves not operating properly.
(2) Fixture drain, supply line to commode, or any water pipe leaking.
(3) Commode leaking at base.

Code 3 -Plumbing
Leaky faucets.

Code 3-Interior
(1) Floors damaged.
(2) Paint chipping or peeling.
(3) Casework.

Code 1-Roof Leaks
Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks
Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)
No water to facility.

Code 2-Water (Hot)
No hot water in portion of building listed.

Code 3-All other work not listed above.

1.7.5 Warranty Tags

At the time of installation, tag each warranted item with a durable, oil and water resistant tag approved by the Contracting Officer. Attach each tag with a copper wire and spray with a silicone waterproof coating. Also, submit two record copies of the warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

Type of product/material	
Model number	

Serial number	
Contract number	
Warranty period from/to	
Inspector's signature	
Construction Contractor	
Address	
Telephone number	
Warranty contact	
Address	
Telephone number	
Warranty response time priority code	
WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.	

PART 2 PRODUCTS

2.1 GOVERNMENT FURNISHED MATERIALS

The Government will provide an optical disc at the preconstruction conference that contains the following:

a. One set of "as-designed" electronic CAD files in the specified software and format revised to reflect all amendments of the Government's conceptual site and facility design.. The CAD files are provided to enable preparation of . If discrepancies exist between the CAD files and the contract PDF drawings, correct the CAD files to show the contract PDF drawings.

b. A submittal register data file in comma separated value (CSV) format for import into the Resident Management System (RMS).

c. Informational copies of the contract specifications and drawings, the original solicitation drawings and specifications, plus all amendments in PDF.

2.1.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse must be at the sole risk of the Contractor and without liability or legal exposure to the Government. Make no claim and waive to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the

use of these electronic files. To the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished source drawing files, the signed and sealed construction documents govern. Determine if any conflict exists. Use of these source drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. Remove all previous indicia of ownership (seals, logos, signatures, initials and dates) if the electronic source drawing files are used, duplicated or modified for use in producing construction drawings and layout drawings, shop drawings and data related to this contract.

2.2 SYSTEM DESCRIPTION

Prepare the CAD drawing files in AutoCAD Release 2017 and Autodesk Revit 201 7 format compatible with a Windows 7 or newer operating system. Provide all program files and hardware necessary to prepare final record drawings.

2.3 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items". Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials:

1) The product does not meet appropriate performance standards;
2) The product is not available within a reasonable time frame;
3) The product is not available competitively (from two or more sources);
4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product)."

Record each product used in the project that has a requirement or option of containing recycled or biobased content in accordance with SECTION S, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, total value of biobased content, exemptions (1, 2, 3, or 4, as indicated), and comments. Recycled and biobased content values may be determined by weight or volume percent, but must be consistent throughout.

PART 3 EXECUTION

3.1 WORKING AS-BUILT DRAWINGS

Accomplish additions and corrections to the contract drawings using the Government furnished CAD files. Provide and maintain two black line print copies of the PDF contract drawings for As-Built Drawings.

3.1.1 Rename the CAD Drawing files

Rename the CAD Drawing files using the contract number as the Project Code field,(i.e., W91238-15-C-10A-102.DGN) as instructed in the preconstruction conference. Use only those renamed files for the Marked-up changes. Make all changes on the layer/level as the original item.

a. For AutoCAD files (DWG), enter all as-built delta changes and notations on the AS-BUILT layer.

3.1.2 Additional Drawings

If additional drawings are required, prepare them using the specified electronic file format applying ERDC/ITL TR-12-6 and ERDC/ITL TR-12-1. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings.

3.1.2.1 Sheet Numbers and File Names

If a sheet needs to be added between two sequential sheets, append a Supplemental Drawing Designator to the end of the prior sheet file name in accordance with ERDC/ITL TR-12-6 (i.e. W91238-15-C-10A-102A.DWG, W91238-15-C-10A-102B.DWG) when adding a drawing sheet. Also refer to ERDC/ITL TR-12-1 for index sheet procedures when adding or deleting drawing sheets.

3.1.3 Markup Guidelines

Markup black line prints of the PDF contract drawings. Make comments and markup the drawing complete without reference to letters, memos, or materials that are not part of the As-Built drawing. Show what was changed, how it was changed, where items(s) were relocated and change related details. These working as-built markup prints must be neat, legible and accurate as follows:

a. Use "base" colors of red, green, and blue. Color code for changes as follows:

   (1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

   (2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

   (3) Additions (Green) - Added items, lettering in notes and leaders.

b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.

c. Add and denote any additional equipment or material facilities, service lines, etc., incorporated under As-Built Revisions if not already shown

in legend.

d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.

e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.

f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.

g. For deletions, cross out all features, data and captions that relate to that revision.

h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.

i. Indicate one of the following when attaching a print or sketch to a markup print:

   1) Add an entire drawing to contract drawings

   2) Change the contract drawing to show

   3) Provided for reference only to further detail the initial design.

j. Incorporate all shop and fabrication drawings into the markup drawings.

3.1.4 As-Built Drawings Content

Revise Working As-Built Drawings in accordance with ERDC/ITL TR-12-1 and ERDC/ITL TR-12-6. Provide 2 sets of paper copies from PDF drawings to show the as-built conditions by red-line process during the execution of the project. Keep these working as-built drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract drawings which are made in the work or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Submit the working as-built drawings for approval prior to submission of each monthly pay estimate. For failure to maintain the working and final record drawings as specified herein, the Contracting Officer will withhold up to 10 percent of the monthly progress payment until approval of updated drawings. Show on the working and final as-built record drawings, but not limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building

structure.

c. Layout and schematic drawings of electrical circuits and piping.

d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

e. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

g. Changes or Revisions which result from the final inspection.

h. Where contract drawings or specifications present options, show only the option selected for construction on the final as-built prints.

i. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.

j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

k. Changes in location of equipment and architectural features.

l. Actual location of anchors, construction and control joints, etc., in concrete.

m. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

n. Location, extent, thickness, and size of stone protection particularly where it will be normally submerged by water.

o. Modifications (include within change order price the cost to change working as-built markup drawings to reflect modifications).

3.2 FINAL AS-BUILT RECORD DRAWING PREPARATION

Prepare final as-built record drawings after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). Transfer the changes from the approved working as-built marked prints to the original electronic CAD files. Modify the final as-built record drawings to correctly show the features of the project as constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. Refer to ERDC/ITL TR-12-1 Chapter 7 Drawing Revisions. Jointly review the working as-built marked prints with printouts from final as-built CAD file drawings for accuracy and completeness. Monthly review of working as-built CAD printouts must cover all sheets revised since the previous review. These drawings are part of the permanent records of this project. Any drawings damaged or lost must be satisfactorily replaced at

no expense to the Government.

a. Drawing revisions (include within change order price the cost to change working and final record drawings to reflect revisions) and compliance with the following procedures.

(1) Follow directions in the revision for posting descriptive changes.

(2) The revision delta size must be 5/16 inch diameter unless the area where the delta is to be placed is crowded. Use a smaller size delta for crowded areas.

(3) Place a revision delta at the location of each deletion.

(4) For new details or sections which are added to a drawing, place a revision delta by the detail or section title.

(5) For minor changes, place a revision delta by the area changed on the drawing (each location).

(6) For major changes to a drawing, place a revision delta by the title of the affected plan, section, or detail at each location.

(7) For changes to schedules or drawings, place a revision delta either by the schedule heading or by the change in the schedule.

3.3 RECORD DRAWING FILES

The Contracting Officer will review final as-built record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions. Within 20 days after approval of all of the working record drawings for a phase of work, prepare the final CAD record drawings for that phase of work and submit PDF drawing files and two sets of prints for review and approval. When final revisions have been completed, show the wording "RECORD DRAWINGS AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high on the cover sheet drawing. Mark all other drawings either "RECORD" drawing denoting no revisions on the sheet or "REVISED RECORD" denoting one or more revisions. Date RECORD DRAWING AS-BUILTS" drawing revisions in the revision block.

3.4 Final Record Drawing Package

The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days revise the CAD files accordingly at no additional cost and submit one PDF set with final prints for the completed phase of work to the Government. Within 20 days of substantial completion of all phases of work, submit the final record drawing package for the entire project. Prepare AutoCAD files for transmittal using e-Transmit. Make any transactions or adjustments necessary to accomplish this. The package must be complete in all details and identical in form and function to the CAD drawing files furnished by the Government. Submit one set of approved record drawing ANSI D size PDF files and CAD files on three optical discs with two sets of prints. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CAD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final record PDF drawing files, CAD files and marked prints as specified will be cause for withholding any payment due under this contract. Approval and acceptance of final record drawings must be

accomplished before final payment is made.

3.5 Autodesk Revit 2017

Accomplish additions and corrections to the BIM file. Prepare contract record drawings using the specified electronic file format applying ERDC/ITL TR-12-6 and ERDC/ITL TR-12-1. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings. Provide all program files and hardware necessary to prepare final record drawings. Prepare Autodesk Revit files for transmittal using the Revit E-TRANSMIT command. The Contracting Officer will review final record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions. Approval and acceptance of final record drawings must be accomplished before final payment is made.

3.6 FINAL APPROVED SHOP DRAWINGS

Submit final approved project shop drawings 30 days after transfer of the completed facility.

3.7 CONSTRUCTION CONTRACT SPECIFICATIONS

Submit final PDF file as-built record construction contract specifications, including revisions thereto, 30 days after transfer of the completed facility.

3.8 AS-BUILT RECORD OF EQUIPMENT AND MATERIALS

Furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Submit Two sets of final record of equipment and materials 10 days after final inspection. Key the designations to the related area depicted on the contract drawings. List the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA				
Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

3.9 OPERATION AND MAINTENANCE MANUALS

Provide project operation and maintenance manuals as specified in Section 01 78 23 OPERATION AND MAINTENANCE MANUALS DATA. Submit one PDF file and 6 hard copies of the Operation and Maintenance Manuals. Submit for approval within 30 calendar days of the Beneficial Occupancy Date (BOD). Update and resubmit files for final approval at BOD.

3.10 CLEANUP

Leave premises "broom clean." Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean filters of operating equipment. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

-- End of Section --

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SECTION 01 78 23

OPERATION AND MAINTENANCE DATA
08/15

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

O&M Database ; G

Training Plan ; G

Training Outline ; G

Training Content ; G

SD-11 Closeout Submittals

Training Video Recording ; G

Validation of Training Completion ; G

1.2 OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data for the provided equipment, product, or system, defining the importance of system interactions, troubleshooting, and long-term preventive operation and maintenance. Compile, prepare, and aggregate O&M data to include clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.2.1 Package Quality

Documents must be fully legible. Operation and Maintenance data must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions.

1.2.2 Package Content

Provide data package content in accordance with paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES. Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system

designated for data package submission, except as follows. Use Data Package 3 for commissioned items without a specified data package requirement in the individual technical sections. Provide a Data Package 3 instead of Data Package 1 or 2, as specified in the individual technical section, for items that are commissioned.

1.2.3 Changes to Submittals

Provide manufacturer-originated changes or revisions to submitted data if a component of an item is so affected subsequent to acceptance of the O&M Data. Submit changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data within 30 calendar days of the notification of this change requirement.

1.2.4 Commissioning Authority Review and Approval

Submit the commissioned systems and equipment submittals to the Commissioning Authority (CxA) to review for completeness and applicability. Obtain validation from the CxA that the systems and equipment provided meet the requirements of the Contract documents and design intent, particularly as they relate to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. The CxA communicates deficiencies to the Contracting Officer. Submit the O&M manuals to the Contracting Officer upon a successful review of the corrections, and with the CxA recommendation for approval and acceptance of these O&M manuals. This work is in addition to the normal review procedures for O&M data.

1.3 O&M DATABASE

Develop an editable, electronic spreadsheet based on the equipment in the Operation and Maintenance Manuals that contains the information required to start a preventive maintenance program. As a minimum, provide list of system equipment, location installed, warranty expiration date, manufacturer, model, and serial number.

1.4 OPERATION AND MAINTENANCE MANUAL FILE FORMAT

Assemble data packages into electronic Operation and Maintenance Manuals. Assemble each manual into a composite electronically indexed file using the most current version of Adobe Acrobat or similar software capable of producing PDF file format. Provide compact disks (CD) or data digital versatile disk (DVD) as appropriate, so that each one contains operation, maintenance and record files, project record documents, and training videos. Include a complete electronically linked operation and maintenance directory.

1.4.1 Organization

Bookmark Product and Drawing Information documents using the current version of CSI Masterformat numbering system, and arrange submittals using the specification sections as a structure. Use CSI Masterformat and UFGS numbers along with descriptive bookmarked titles that explain the content of the information that is being bookmarked.

1.4.2 CD or DVD Label and Disk Holder or Case

Provide the following information on the disk label and disk holder or case:

a. Building Number

b. Project Title

c. Activity and Location

d. Construction Contract Number

e. Prepared For: (Contracting Agency)

f. Prepared By: (Name, title, phone number and email address)

g. Include the disk content on the disk label

h. Date

i. Virus scanning program used

1.5 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

The following are a detailed description of the data package items listed in paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES.

1.5.1 Operating Instructions

Provide specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.5.1.1 Safety Precautions and Hazards

List personnel hazards and equipment or product safety precautions for operating conditions. List all residual hazards identified in the Activity Hazard Analysis provided under Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS. Provide recommended safeguards for each identified hazard.

1.5.1.2 Operator Prestart

Provide procedures required to install, set up, and prepare each system for use.

1.5.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.5.1.4 Normal Operations

Provide Control Diagrams with data to explain operation and control of systems and specific equipment. Provide narrative description of Normal Operating Procedures.

1.5.1.5 Emergency Operations

Provide Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Provide Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable

contingencies. Provide guidance and procedures for emergency operation of utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.5.1.6 Operator Service Requirements

Provide instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gauge readings.

1.5.1.7 Environmental Conditions

Provide a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.5.1.8 Operating Log

Provide forms, sample logs, and instructions for maintaining necessary operating records.

1.5.1.9 Additional Requirements for HVAC Control Systems

Provide Data Package 5 and the following for control systems:

a. Narrative description on how to perform and apply functions, features, modes, and other operations, including unoccupied operation, seasonal changeover, manual operation, and alarms. Include detailed technical manual for programming and customizing control loops and algorithms.

b. Full as-built sequence of operations.

c. Copies of checkout tests and calibrations performed by the Contractor (not Cx tests).

d. Full points list. Provide a listing of rooms with the following information for each room:

(1) Floor

(2) Room number

(3) Room name

(4) Air handler unit ID

(5) Reference drawing number

(6) Air terminal unit tag ID

(7) Heating or cooling valve tag ID

(8) Minimum cfm

(9) Maximum cfm

e. Full print out of all schedules and set points after testing and acceptance of the system.

f. Full as-built print out of software program.

g. Marking of system sensors and thermostats on the as-built floor plan and mechanical drawings with their control system designations.

1.5.2 Preventive Maintenance

Provide the following information for preventive and scheduled maintenance to minimize repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.5.2.1 Lubrication Data

Include the following preventive maintenance lubrication data, in addition to instructions for lubrication required under paragraph OPERATOR SERVICE REQUIREMENTS:

a. A table showing recommended lubricants for specific temperature ranges and applications.

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.

c. A Lubrication Schedule showing service interval frequency.

1.5.2.2 Preventive Maintenance Plan, Schedule, and Procedures

Provide manufacturer's schedule for routine preventive maintenance, inspections, condition monitoring (predictive tests) and adjustments required to ensure proper and economical operation and to minimize repairs. Provide instructions stating when the systems should be retested. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

a. Define the anticipated time required to perform each of each test (work-hours), test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventive maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize repairs.

b. Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include electrical and mechanical schematics and diagrams and diagnostic techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.5.3 Repair

Provide manufacturer's recommended procedures and instructions for correcting problems and making repairs.

1.5.3.1 Troubleshooting Guides and Diagnostic Techniques

Provide step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.5.3.2 Wiring Diagrams and Control Diagrams

Provide point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.5.3.3 Repair Procedures

Provide instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.5.3.4 Removal and Replacement Instructions

Provide step-by-step procedures and a list of required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Use a combination of text and illustrations.

1.5.3.5 Spare Parts and Supply Lists

Provide lists of spare parts and supplies required for repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.5.3.6 Repair Work-Hours

Provide manufacturer's projection of repair work-hours including requirements by type of craft. Identify, and tabulate separately, repair that requires the equipment manufacturer to complete or to participate.

1.5.4 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.5.4.1 Product Submittal Data

Provide a copy of SD-03 Product Data submittals documented with the required approval.

1.5.4.2 Manufacturer's Instructions

Provide a copy of SD-08 Manufacturer's Instructions submittals documented with the required approval.

1.5.4.3 O&M Submittal Data

Provide a copy of SD-10 Operation and Maintenance Data submittals documented with the required approval.

1.5.4.4 Parts Identification

Provide identification and coverage for the parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing must show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Group the parts shown in the listings by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.

1.5.4.5 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary componentsof the system. Provide copies of warranties required by Section 01 78 00 CLOSEOUT SUBMITTALS.

1.5.4.6 Extended Warranty Information

List all warranties for products, equipment, components, and sub-components whose duration exceeds one year. For each warranty listed, indicate the applicable specification section, duration, start date, end date, and the point of contact for warranty fulfillment. Also, list or reference the specific operation and maintenance procedures that must be performed to keep the warranty valid. Provide copies of warranties required by Section 01 78 00 CLOSEOUT SUBMITTALS.

1.5.4.7 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.5.4.8 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components. Provide final set points.

1.5.4.9 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms. Provide final set points.

1.5.4.10 Field Test Reports

Provide a copy of Field Test Reports (SD-06) submittals documented with the required approval.

1.5.4.11 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.6 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Provide the O&M data packages specified in individual technical sections. The information required in each type of data package follows:

1.6.1 Data Package 1

a. Safety precautions and hazards

b. Cleaning recommendations

c. Maintenance and repair procedures

d. Warranty information

e. Extended warranty information

f. Contractor information

g. Spare parts and supply list

1.6.2 Data Package 2

a. Safety precautions and hazards

b. Normal operations

c. Environmental conditions

d. Lubrication data

e. Preventive maintenance plan, schedule, and procedures

f. Cleaning recommendations

g. Maintenance and repair procedures

h. Removal and replacement instructions

i. Spare parts and supply list

j. Parts identification

k. Warranty information

l. Extended warranty information

m. Contractor information

1.6.3 Data Package 3

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Environmental conditions

g. Operating log

h. Lubrication data

i. Preventive maintenance plan, schedule, and procedures

j. Cleaning recommendations

k. Troubleshooting guides and diagnostic techniques

l. Wiring diagrams and control diagrams

m. Maintenance and repair procedures

n. Removal and replacement instructions

o. Spare parts and supply list

p. Product submittal data

q. O&M submittal data

r. Parts identification

s. Warranty information

t. Extended warranty information

u. Testing equipment and special tool information

v. Testing and performance data

w. Contractor information

x. Field test reports

1.6.4 Data Package 4

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Operator service requirements

g. Environmental conditions

h. Operating log

i. Lubrication data

j. Preventive maintenance plan, schedule, and procedures

k. Cleaning recommendations

l. Troubleshooting guides and diagnostic techniques

m. Wiring diagrams and control diagrams

n. Repair procedures

o. Removal and replacement instructions

p. Spare parts and supply list

q. Repair work-hours

r. Product submittal data

s. O&M submittal data

t. Parts identification

u. Warranty information

v. Extended warranty information

w. Personnel training requirements

x. Testing equipment and special tool information

y. Testing and performance data

z. Contractor information

aa. Field test reports

1.6.5 Data Package 5

a. Safety precautions and hazards

b. Operator prestart

c. Start-up, shutdown, and post-shutdown procedures

d. Normal operations

e. Environmental conditions

f. Preventive maintenance plan, schedule, and procedures

g. Troubleshooting guides and diagnostic techniques

h. Wiring and control diagrams

i. Maintenance and repair procedures

j. Removal and replacement instructions

k. Spare parts and supply list

l. Product submittal data

m. Manufacturer's instructions

n. O&M submittal data

o. Parts identification

p. Testing equipment and special tool information

q. Warranty information

r. Extended warranty information

s. Testing and performance data

t. Contractor information

u. Field test reports

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TRAINING

Prior to acceptance of the facility by the Contracting Officer for Beneficial Occupancy, provide comprehensive training for the systems and equipment specified in the technical specifications. The training must be targeted for the building maintenance personnel, and applicable building occupants. Instructors must be well-versed in the particular systems that they are presenting. Address aspects of the Operation and Maintenance Manual submitted in accordance with Section 01 78 00 CLOSEOUT SUBMITTALS.. Training must include classroom or field lectures based on the system operating requirements. The location of classroom training requires approval by the Contracting Officer.

3.1.1 Training Plan

Submit a written training plan to the Contracting Officer for approval at least 60 calendar days prior to the scheduled training. Training plan must be approved by the Commissioning Authority (CxA) prior to forwarding to the Contracting Officer. Also, coordinate the training schedule with the Contracting Officer and CxA. Include within the plan the following elements:

a. Equipment included in training

b. Intended audience

c. Location of training

d. Dates of training

e. Objectives

f. Outline of the information to be presented and subjects covered including description

g. Start and finish times and duration of training on each subject

h. Methods (e.g. classroom lecture, video, site walk-through, actual operational demonstrations, written handouts)

i. Instructor names and instructor qualifications for each subject

j. List of texts and other materials to be furnished by the Contractor that are required to support training

k. Description of proposed software to be used for video recording of training sessions.

3.1.2 Training Content

The core of this training must be based on manufacturer's recommendations and the operation and maintenance information. The CxA is responsible for overseeing and approving the content and adequacy of the training. Spend 95 percent of the instruction time during the presentation on the OPERATION AND MAINTENANCE DATA. Include the following for each system training presentation:

a. Start-up, normal operation, shutdown, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting, and alarms.

b. Relevant health and safety issues.

c. Discussion of how the feature or system is environmentally responsive. Advise adjustments and optimizing methods for energy conservation.

d. Design intent.

e. Use of O&M Manual Files.

f. Review of control drawings and schematics.

g. Interactions with other systems.

h. Special maintenance and replacement sources.

i. Tenant interaction issues.

3.1.3 Training Outline

Provide the Operation and Maintenance Manual Files (Bookmarked PDF) and a written course outline listing the major and minor topics to be discussed by the instructor on each day of the course to each trainee in the course. Provide the course outline 14 calendar days prior to the training.

3.1.4 Training Video Recording

Record classroom training session(s) on video. Provide to the Contracting Officer two copies of the training session(s) in DVD video recording format. Capture within the recording, in video and audio, the instructors' training presentations including question and answer periods with the attendees. The recording camera(s) must be attended by a person during the recording sessions to assure proper size of exhibits and projections during the recording are visible and readable when viewed as training.

3.1.5 Unresolved Questions from Attendees

If, at the end of the training course, there are questions from attendees that remain unresolved, the instructor must send the answers, in writing, to the Contracting Officer for transmittal to the attendees, and the training video must be modified to include the appropriate clarifications.

3.1.6 Validation of Training Completion

Ensure that each attendee at each training session signs a class roster daily to confirm Government participation in the training. At the completion of training, submit a signed validation letter that includes a sample record of training for reporting what systems were included in the training, who provided the training, when and where the training was performed, and copies of the signed class rosters. Provide two copies of the validation to the Contracting Officer, and one copy to the Operation and Maintenance Manual Preparer for inclusion into the Manual's documentation.

3.1.7 Quality Control Coordination

Coordinate this training with the CxA.

-- End of Section --

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05/16

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SECTION 01 91 00.15

TOTAL BUILDING COMMISSIONING
05/16

PART 1 GENERAL

Commission the building systems listed herein. Employ the services of an independent Commissioning Firm. The Commissioning Firm must be a 1st tier subcontractor of the General or Prime Contractor and must be financially and corporately independent of all other subcontractors. The Commissioning Firm must employ a Lead Commissioning Specialist who must coordinate all aspects of the commissioning process. Conform to the commissioning procedures outlined in this specification.

1.1 SYSTEMS TO BE COMMISSIONED

Commission the following systems:

Heating, Ventilating, Air Conditioning, and Refrigeration Systems (HVAC)
Building Automation System
Utility Monitoring and Control System
Lighting Systems
Power Distribution Systems
Power Generation Systems
Renewable Energy Systems
Service Water Heating Systems
Plumbing Systems
Natural Gas and Propane Systems
Water Pumping and Mixing Systems
Irrigation Systems
Compressed Air and Vacuum Systems
Energy and Water Utility Metering Systems and Sub-Meters
Building Envelope: moisture and thermal integrity and air tightness
Fenestration Control Systems

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 202	(2013) Commissioning Process for Buildings and Systems

ASSOCIATED AIR BALANCE COUNCIL (AABC)

ACG Commissioning Guideline	(2005) Commissioning Guideline

NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB)

NEBB Commissioning Standard	(2009) Procedural Standards for Whole

Building Systems Commissioning of New Construction; 3rd Edition

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA 1429 (1994) HVAC Systems Commissioning Manual, 1st Edition

1.3 COMMUNICATION WITH THE GOVERNMENT

The Lead Commissioning Specialist (CxC) must submit all plans, schedules, reports, and documentation directly to the Contracting Officer Representative concurrent with submission to the CQC System Manager. The Lead Commissioning Specialist must have direct communication with the Contracting Officer's Representative regarding all elements of the commissioning process; however, the Government has no direct contract authority with the Lead Commissioning Specialist.

1.4 SEQUENCING AND SCHEDULING

1.4.1 Sequencing

Complete the following prior to starting Functional Performance Tests of mechanical systems:

a. All equipment and systems have been completed, cleaned, flushed, disinfected, calibrated, tested, and operate in accordance with contract documents and construction plans and specifications.

b. Performance Verification Tests of the controls systems have been completed and the Performance Verification Test Report has been submitted and approved in accordance with Specification Section .

c. Testing, Adjusting, and Balancing has been completed and the Testing, Adjusting, and Balancing Report, has been submitted and approved in accordance with Specification Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC.

d. The building envelope is enclosed according to contract documents with final construction completed.

e. The Pre-Functional Checklists have been submitted and approved.

f. The Certificate of Readiness for mechanical systems has been submitted and approved.

Complete the following prior to starting Functional Performance Tests of the electrical systems:

a. All electrical, power generation, and lighting equipment and systems have been completed, calibrated, tested, and operate in accordance with contract documents and construction plans and specifications.

b. The building envelope is enclosed according to contract documents with final construction completed.

c. Ceiling tiles, floor coverings, and window coverings are in place.

d. The Certificate of Readiness for electrical systems has been submitted and approved.

e. Lamps have completed a minimum 100 hour burn-in period.

1.4.2 Project Schedule

Include the following tasks in the project schedule required by Section 01 32 01 PROJECT SCHEDULE. Ensure sufficient time is scheduled to accommodate the requirements of this specification section. The order of items listed below is not intended to imply a specified sequence:

a. Submission and approval of the Commissioning Firm and Commissioning Specialist

b. Submission and approval of the Testing, Adjusting, and Balancing (TAB) Firm and TAB Specialist specified in Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC

c. Submission of the Design Review Report specified herein.

d. Submission of the Design Review Report specified in Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC.

e. Submission and approval of the Construction Phase Commissioning Plan

f. Installation of permanent utilities (gas, water, electric)

g. Building Envelope Construction

h. Submission and approval of the Building Envelope Inspection Checklists

i. Air Barrier Pressure Tests specified in Section 07 05 23 PRESSURE TESTING AN AIR BARRIER SYSTEM FOR AIR TIGHTNESS

j. Drainage and Vent, Building Sewers, Water Supply Systems and Backflow Prevention Assembly Tests specified in Section 22 00 00 PLUMBING, GENERAL PURPOSE

k. Factory Acceptance Testing for each of the systems to be commissioned as required by technical specifications

l. Manufacturer's Equipment Start-Up for each of the systems to be commissioned.

m. Potable Water System Flushing specified in Section 22 00 00 PLUMBING, GENERAL PURPOSE

n. Operational Tests of the plumbing system specified in Section 22 00 00 PLUMBING, GENERAL PURPOSE.

o. Potable Water System Disinfection specified in Section 22 00 00 PLUMBING, GENERAL PURPOSE

p. Submission and approval of the TAB Schematic Drawings, Report Forms, and Procedures specified in Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC.

q. Submission and approval of Duct Air Leakage Test Procedures specified

in Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC

r. Duct Air Leakage Test Execution specified in Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC

s. Submission and approval of the Final Duct Air Leakage Test Report specified in Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC

t. Testing, Adjusting, and Balancing (TAB) Field Work required by Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC

u. Submission and approval of the TAB Report specified in Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC

v. TAB Field Acceptance Testing required by Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC

w. Submission and approval of the Start-Up Testing Report specified in Section .

x. Submission and approval of the Performance Verification Test Procedures specified in Section .

y. Performance Verification Tests required by Section

z. Performance Verification Test Report specified in Section

aa. Pre-Functional Checklist Submittal

bb. Functional Performance Testing for each system to be commissioned

cc. Integrated Systems Tests

dd. Post-Test Deficiency Correction for each system to be commissioned

ee. Re-Testing

ff. Training for each of the systems to be commissioned

gg. Seasonal Testing

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Commissioning Firm; G

Lead Commissioning Specialist; G

Technical Commissioning Specialists; G

Commissioning Firm's Contract; G

SD-05 Design Data

Design Phase Commissioning Plan; G

SD-06 Test Reports

Design Review Report; G

Interim Construction Phase Commissioning Plan; G

Final Construction Phase Commissioning Plan; G

Template Building Envelope Inspection Checklists; G

Building Envelope Inspection Checklists; G

Pre-Functional Checklists; G

Issues Log

Commissioning Report; G

Post-Construction Trend Log Report; G

SD-07 Certificates

Certificate of Readiness; G

SD-10 Operation and Maintenance Data

Training Plan; G

Training Attendance Rosters; G

1.6 COMMISSIONING FIRM

Provide a Commissioning Firm that is certified in commissioning by one of the following: the AABC Commissioning Group (ACG); the National Environmental Balancing Bureau (NEBB); the International Certification Board/Testing, Adjusting, and Balancing Bureau (ICB/TABB), the Building Commissioning Association (BCA); the Association of Energy Engineers (AEE). The Commissioning Firm may employ a commissioning professional certified by the University of Wisconsin-Madison or the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) as required in paragraph LEAD COMMISSIONING SPECIALIST as an alternative to certification of the Commissioning Firm. The Commissioning Firm must be certified in all systems to be commissioned to the extent such certifications are available from the certifying body. Describe any lapses in certification or disciplinary action taken by the certifying body against the proposed Commissioning Firm or Lead Commissioning Specialist in detail. Any firm or commissioning professional that has been the subject of disciplinary action by the certifying body within the five years preceding contract award is not eligible to perform any duties related to commissioning.

a. Submit the Commissioning Firm's certification of qualifications including the name of the firm and certifications no later than 30

calendar days after Notice to Proceed. Submit one hard copy and an electronic copy.

b. The Commissioning Firm's and Commissioning Specialists' certifications must be maintained for the entire duration of the duties specified herein. If, for any reason, the firm or a specialist loses a certification during this period, immediately notify the Contracting Officer's Representative and submit another Commissioning Firm or Commissioning Specialist for approval. All work specified in this specification section performed by the Commissioning Firm or associated Commissioning Specialists is invalid if the Commissioning Firm or Commissioning Specialist loses its certification prior to contract completion and must be performed by an approved successor.

c. The Commissioning Firm must oversee and assist the General or Prime Contractor with the work specified herein. Submit the Commissioning Firm's Contract including the Scope of Work associated with the paragraph POST-CONSTRUCTION SUPPORT no later than 30 calendar days after approval of the Commissioning Firm. Submit one hard copy and an electronic copy.

d. The Commissioning Firm may act as the Pressure Test Agency required by Section 07 05 23 PRESSURE TESTING AN AIR BARRIER SYSTEM FOR AIR TIGHTNESS provided that all qualification requirements of that specification section are met.

1.6.1 Lead Commissioning Specialist

The Commissioning Firm must provide a Lead Commissioning Specialist (CxC) that has a minimum of five years of commissioning experience, including two projects of similar size and complexity, and that is one of the following: a NEBB qualified Systems Commissioning Administrator (SCA); ACG Certified Commissioning Authority (CxA); ICB/TABB Certified Commissioning Supervisor; BCA Certified Commissioning Professional (CCP); AEE Certified Building Commissioning Professional (CBCP); University of Wisconsin-Madison Qualified Commissioning Process Provider (QCxP); ASHRAE Commissioning Process Management Professional (CPMP).

a. Submit the Lead Commissioning Specialist's certification of qualifications including the name of the specialist and firm; certifications; years of experience; and a listing of representative projects of similar size and complexity no later than 30 calendar days after Notice to Proceed. Submit one hard copy and an electronic copy.

b. The Lead Commissioning Specialists certifications must be maintained for the entire duration of the duties specified herein. If, for any reason, the specialist loses a certification during this period, immediately notify the Contracting Officer's Representative and submit another Lead Commissioning Specialist for approval. All work specified in this specification section to be performed by the Lead Commissioning Specialist is invalid if the Lead Commissioning Specialist loses its certification prior to contract completion and must be performed by an approved successor.

c. The Lead Commissioning Specialist must lead and oversee the commissioning work specified herein and be the primary point of contact for the Government regarding the commissioning work.

1.6.2 Technical Commissioning Specialists

Technical Commissioning Specialists, employed by the Commissioning Firm and that have the following qualifications, must perform the technical work specified herein associated with each system to be commissioned:

a. The technical work associated with mechanical systems including Heating, Ventilating, Air Conditioning, and Refrigeration Systems; Building Automation System; Utility Monitoring and Control System; Service Water Heating Systems; Plumbing Systems; Water Pumping and Mixing Systems; Irrigation Systems; Compressed Air and Vacuum Systems; Energy and Water Utility Metering Systems must be performed by a Commissioning Specialist certified by NEBB, ACG, ICB/TABB, or BCA in the commissioning of HVAC systems with five years of experience in the commissioning of HVAC systems.

b. The technical work associated with electrical systems including Lighting Systems; Power Distribution Systems; Power Generation Systems; Renewable Energy Systems must be performed by an engineering technician certified by the InterNational Electrical Testing Association (NETA) or the National Institute for Certification in Engineering Technologies (NICET) with five years of experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

c. The technical work associated with the Building Envelope system must be performed by a registered architect with five years of building envelope design or construction experience. The Commissioning Firm team member with the required experience related to the building envelope may act as the Air Barrier Inspector required by specification section 07 27 10 BUILDING AIR BARRIER SYSTEM provided that all qualification requirements of that specification section are met. The Commissioning Firm team member with the required experience related to the building envelope may act as the thermographer required by specification section 07 05 23 PRESSURE TESTING AN AIR BARRIER SYSTEM FOR AIR TIGHTNESS provided that all of the qualification requirements of that specification section are met.

d. Submit the Technical Commissioning Specialist's certification of qualifications including the name of the specialist and firm; certifications; years of experience; and a listing of representative projects of similar size and complexity no later than 30 calendar days after Notice to Proceed. Submit one hard copy and an electronic copy.

1.6.3 Commissioning Standard

Comply with the requirements of the commissioning standard under which the Commissioning Firm and Specialists qualifications are approved. When the firm and specialists are certified by BCA, AEE, ASHRAE, or the University of Wisconsin-Madison, comply with the requirements of one of the acceptable standards unless otherwise stated herein. The acceptable standards are ACG Commissioning Guideline, NEBB Commissioning Standard, SMACNA 1429, or ASHRAE 202. Comply with applicable NETA and NICET testing standards for electrical systems.

a. Implement all recommendations and suggested practices contained in the Commissioning Standard and electrical test standards.

b. Use the Commissioning Standard for all aspects of Commissioning,

including calibration of instruments.

c. Where the instrument manufacturer calibration recommendations are more stringent than those listed in the Commissioning Standard, adhere to the manufacturer calibration recommendations.

d. All quality assurance provisions of the Commissioning Standard such as performance guarantees are part of this contract.

e. The Commissioning Specialists must develop commissioning procedures for any systems or system components not covered in the Commissioning Standard.

f. Use any new requirements, recommendations, and procedures published or adopted prior to contract solicitation by the body responsible for the Commissioning Standard.

1.7 SUSTAINABILITY THIRD PARTY CERTIFICATION (TPC)

The Commissioning Specialists must execute and document the commissioning activities required of the Commissioning Authority for the purposes of complying with the Third Party Certification (TPC) requirements for the project in accordance with Section 01 33 29 SUSTAINABILITY REPORTING. Provide all commissioning documentation required to meet the TPC requirements.

1.8 ISSUES LOG

The Lead Commissioning Specialist must develop and maintain an Issues Log for tracking and resolution of all deficiencies discovered through commissioning review, inspection, and testing. Include the date of final resolution of issues as confirmed by the Commissioning Specialist. Submit the Issues Log on a monthly basis at a minimum. At any point during construction, any commissioning team member finding deficiencies may communicate those deficiencies in writing to the Commissioning Specialist for inclusion into the Issues Log.

Track construction deficiencies identified in the Issues Log using QCS as specified in Specification Section 01 45 00.150 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM).

1.9 CERTIFICATE OF READINESS

Prior to scheduling Functional Performance Tests for each system, issue a Certificate of Readiness for the system certifying that the system is ready for Functional Performance Testing. The Certificate of Readiness must include, for each system to be commissioned, all equipment and system start-up reports; Performance Verification Test Reports; completed Building Envelope Inspection Checklists; completed Pre-Functional Checklists; Testing, Adjusting, and Balancing (TAB) Report; HVAC Controls Start-Up Reports; and the Air Leakage Test Reports and Diagnostic Test Reports to the extent applicable to the system. The Contractor; the Lead Commissioning Specialist; the Contractor's Quality Control Representative; the Mechanical, Electrical, Controls, and TAB subcontractor representatives must sign and date the Certificate of Readiness. Submit the Certificate of Readiness for each system no later than 14 calendar days prior to Functional Performance Tests of that system. Submit one hard copy and an electronic copy. Do not schedule Functional Performance Tests for a system until the Certificate of Readiness for that system receives approval by the

Government.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 DESIGN PHASE

3.1.1 Design Commissioning Coordination Meeting

The Lead Commissioning Specialist must lead a meeting prior to the interim design submittal for any system required to be commissioned to discuss the commissioning process including contract requirements, lines of communication, roles and responsibilities, schedules, and documentation requirements. The Contractor's Superintendent or Project Manager, the Contractor's Quality Control Representative, the Designers of Record for the commissioned systems, and the Government must attend this meeting. The User and a Base Civil Engineer Office Representative may attend this meeting.

3.1.2 Design Phase Commissioning Plan

The Lead Commissioning Specialist (CxC) must prepare the Design Phase Commissioning Plan. Submit the Design Phase Commissioning Plan no later than 14 calendar days after approval of the Commissioning Specialists. Submit one hard copy and an electronic copy.

Outline the commissioning process, commissioning team members and responsibilities, lines of communication, and documentation requirements for the design phase of the project in the Design Phase Commissioning Plan. Identify the Commissioning Standard chosen for the project.

3.1.3 Design Review

The Lead Commissioning Specialist and Technical Commissioning Specialists must review the design-build construction contract, Design Plans and Specifications, the Basis of Design, and the Owner's Project Requirements prior to 60 percent completion of the design. The Owner's Project Requirements are attached as Appendix A. The Owner's Project Requirements are not contract requirements and are provided for commissioning review purposes only. The Commissioning Specialists must assess the completeness and clarity of the Owner's Project Requirements, verify that the requirements stated in the design-build construction contract and the Owner's Project Requirements are addressed in the Basis of Design, and verify that the Design Plans and Specifications are prepared in accordance with the Basis of Design, the design-build construction contract, the Unified Facilities Criteria (UFC) referenced by the design-build construction contract, and the Owner's Project Requirements. The Commissioning Specialists must also identify any deficiencies that would prevent the building systems from operating or performing effectively. The Commissioning Specialists must backcheck the reviewed documents at all subsequent design documentation submissions.

The Commissioning Specialists must provide a Design Review Report for each submittal identifying any discrepancies between the reviewed documents or deficiencies that would prevent the building systems and features from

operating or performing effectively in accordance with the design-build construction contract and Owner's Project Requirements and from being adequately maintainable. Individually list each deficiency and the corresponding proposed corrective action necessary for proper system performance in the Design Review Report. Submit one hard copy and an electronic copy of the report with the corrected final design submission. The Contracting Officer's Representative , the Lead Commissioning Specialist, and the Designers of Record for the associated systems must meet, discuss, and resolve any outstanding items contained in the report no later than 14 calendar days after submission of the report.

3.2 CONSTRUCTION PHASE

3.2.1 Construction Commissioning Coordination Meeting

The Lead Commissioning Specialist must lead a Construction Commissioning Coordination Meeting no later than 30 days following construction notice to proceed to discuss the commissioning process including contract requirements, lines of communication, roles and responsibilities, schedules, documentation requirements, inspection and test procedures, and logistics as specified in this specification section. The Contractor's Superintendent or Project Manager, the Contractor's Quality Control Representative, and the Government must attend this meeting. The User and a Base Civil Engineer Office Representative will be invited and may attend this meeting.

3.2.2 Construction Phase Commissioning Plan

3.2.2.1 Interim Construction Phase Commissioning Plan

The Lead Commissioning Specialist (CxC) must prepare the Interim Construction Phase Commissioning Plan. Submit the Interim Construction Phase Commissioning Plan no later than 30 calendar days after the Construction Commissioning Coordination Meeting and no later than 14 days prior to the start of construction of the building envelope. Submit one hard copy and an electronic copy.

Identify the commissioning and testing standards and outline the overall commissioning process, the commissioning schedule, the commissioning team members and responsibilities, lines of communication, documentation requirements for the construction phase of the project, and Template Building Envelope Inspection Checklists in the Interim Construction Phase Commissioning Plan.

3.2.2.1.1 Checklists

Download example Building Envelope Inspection Checklists, Pre-Functional Checklists, Functional Performance Test Checklists, and Integrated Systems Test Checklists for specification section 01 91 00.15 TOTAL BUILDING COMMISSIONING at the following location: http://wbdg.org/ccb/NAVGRAPH/graphtoc.pdf. The checklists submitted in the Interim and Final Construction Phase Commissioning Plans must contain the same level of detail shown in the examples. The submitted checklists are not required to match the format of the examples.

3.2.2.1.2 Template Building Envelope Inspection Checklists

The Building Envelope Technical Commissioning Specialist must develop the Template Building Envelope Inspection Checklists. Include items that verify

the building materials and construction maintain the required thermal and moisture integrity and air tightness of the building envelope system in the Building Envelope Inspection Checklists.

3.2.2.2 Final Construction Phase Commissioning Plan

The Lead Commissioning Specialist (CxC) must prepare the Final Construction Phase Commissioning Plan. Submit the Final Construction Phase Commissioning Plan no later than 30 calendar days prior to the start of Pre-Functional Checks. Submit one hard copy and an electronic copy.

Include the information provided in the Interim Construction Phase Commissioning Plan. In addition, the Technical Commissioning Specialist must develop the Pre-Functional Checklists, Integrated Systems Test Checklists, and Functional Performance Test Checklists for each building, for each system required to be commissioned, and for each component for inclusion in the Final Construction Phase Commissioning Plan.

3.2.2.2.1 Pre-Functional Checklists

The Pre-Functional Checklists must include items for physical inspection or testing that demonstrate that installation and start-up of equipment and systems is complete. See paragraph Pre-Functional Checks for more information. Functional Performance and Integrated Systems Test test procedures must explain, step-by-step, the actions and expected results that will demonstrate that the system performs in accordance with the contract in the Functional Performance Test and Integrated Systems Test Checklists. See paragraph Functional Performance and Integrated Systems Tests for more information.

3.2.2.2.2 Functional Performance Test Checklists

Functional Performance Test Checklists must include procedures that explain, step-by-step, the actions and expected results that will demonstrate that the system performs in accordance with the contract. See paragraph Functional Performance and Integrated Systems Tests for more information. Include the following sections and details appropriate to the systems being tested in the Functional Performance Test Checklists:

a. Notable system features including information about controls to facilitate understanding of system operation

b. Conclusions and recommendations. Conclusions must clearly indicate if system does or does not perform in accordance with contract requirements. Recommendation must clearly indicate that the system should or should not be accepted by the Government.

c. Test conditions including date, beginning and ending time, and beginning and ending outdoor air conditions

d. Attendees

e. Identification of the equipment involved in the test

f. Control system feature identification

g. Point-to-point observations including demonstrating system flow meters and sensors have been calibrated and are correctly displayed on the Operator work station

h. Actuator operation observations demonstrating actuator responses to commands from the control system

i. As-found condition of the system operation

j. List of test items with step numbers along with the corresponding feature or control operation, intended test procedure, expected system response, and pass/fail indication.

k. Space for comments for each test item.

3.2.2.2.3 Integrated Systems Test Checklists

Integrated Systems Test Checklists must include test procedures that explain, step-by-step, the actions and expected results that will demonstrate that the system performs in accordance with the contract. See paragraph Functional Performance and Integrated Systems Tests for more information. Include the following sections in the Integrated Systems Test Checklists:

a. Notable features of the interconnected systems organized by discipline including information to facilitate understanding of system operation

b. Conclusions and recommendations. Conclusions must clearly indicate if the systems do or do not perform in accordance with contract requirements. Recommendation must clearly indicate that the systems should or should not be accepted by the Government

c. Test conditions including date and beginning and ending time

d. Attendees

e. Identification of the equipment and systems involved in the test

f. List of test items with step numbers along with the corresponding feature or control operation, intended test procedure, expected system response, and pass/fail indication.

g. Space for comments for each test item.

3.2.3 Construction Submittals

Provide all submittals associated with the systems to be commissioned, including shop drawings; equipment submittals; test plans, procedures, and reports; and resubmittal's to the Commissioning Specialists. The Technical Commissioning Specialist must review the submittals to the extent necessary verify that the equipment and system installation will comply with the contract requirements, the Unified Facilities Criteria (UFC) referenced by the design-build contract, and the requirements of the Basis of Design and the Owner's Project Requirements.

3.2.4 Inspection and Testing

Demonstrate that all system components have been installed, that each control device and item of equipment operates, and that the systems operate and perform, including interactive operation between systems, in accordance with contract documents and the Owner's Project Requirements. Requirements in related specification sections are independent from the requirements of

this section and do not satisfy any of the requirements specified in this specification section. Provide all materials, services, and labor required to perform the Pre-Functional Checks, Building Envelope Inspection, Integrated Systems Tests, and Functional Performance Tests.

3.2.4.1 Commissioning Team

Provide a commissioning representative for each sub-contractor associated with the systems to be commissioned. Each commissioning representative is responsible for coordination of their respective sub-contractor's execution of the commissioning activities and participation in the inspection and testing required by this specification section. The designers listed below are the designers of record for their respective systems. Substitutes must be approved by the Contracting Officer's Representative.

3.2.4.1.1 Building Envelope Inspections Team

The following team members must participate in building envelope inspections:

Designation	Function
CxB	Building Envelope Technical Commissioning Specialist
QAR	Contracting Officer's Quality Assurance Representative
CQC	Contractor's Quality Control Personnel
BEC	Contractor's Building Envelope Commissioning Representative
AD	Architectural Designer
CxG	Government's Commissioning Agent

3.2.4.1.2 Mechanical System Pre-Functional Checks Team

The following team members must participate in Pre-Functional checks of mechanical systems:

Designation	Function
CxM	Mechanical System Technical Commissioning Specialist
QAR	Contracting Officer's Quality Assurance Representative
CQC	Contractor's Quality Control Personnel
MC	Contractor's Mechanical Commissioning Representative
EC	Contractor's Electrical Commissioning Representative
CC	Contractor's Controls Commissioning Representative
TABC	Contractor's TAB Commissioning Representative

Designation	Function
PC	Contractor's Plumbing Commissioning Representative
IC	Contractor's Irrigation Commissioning Representative
CxG	Government's Commissioning Agent

3.2.4.1.3 Electrical System Pre-Functional Checks Team

The following team members must participate in Pre-Functional checks of electrical systems:

Designation	Function
CxE	Mechanical System Technical Commissioning Specialist
QAR	Contracting Officer's Quality Assurance Representative
CQC	Contractor's Quality Control Personnel
EC	Contractor's Electrical Commissioning Representative
CxG	Government's Commissioning Agent

3.2.4.1.4 Mechanical Systems Test Team

The following team members must participate in Functional Performance, Seasonal, and Integrated Systems Testing of mechanical systems:

Designation	Function
CxM	Mechanical System Technical Commissioning Specialist
QAR	Contracting Officer's Quality Assurance Representative
CQC	Contractor's Quality Control Personnel
MC	Contractor's Mechanical Commissioning Representative
EC	Contractor's Electrical Commissioning Representative
CC	Contractor's Controls Commissioning Representative
TABC	Contractor's TAB Commissioning Representative
PC	Contractor's Plumbing Commissioning Representative
IC	Contractor's Irrigation Commissioning Representative
MD	Mechanical Designer

Designation	Function
PD	Plumbing Designer
ID	Irrigation Designer
CxG	Government's Commissioning Agent

3.2.4.1.5 Electrical Systems Test Team

The following team members must participate in Functional Performance and Integrated Systems Testing of electrical systems:

Designation	Function
CxE	Mechanical System Technical Commissioning Specialist
QAR	Contracting Officer's Quality Assurance Representative
CQC	Contractor's Quality Control Personnel
EC	Contractor's Electrical Commissioning Representative
ED	Electrical Designer
CxG	Government's Commissioning Agent

3.2.4.1.6 Other Pre-Functioanl and Functional Performance Participants

The following may participate as team members during Pre-Functional Checks and Functional Performance Testing:

Designation	Function
BCE	Base Civil Engineer Office Representative
User	Using Agent's Representative

3.2.4.2 Building Envelope Inspection

Document building envelope inspection by the commissioning team using the approved Template Building Envelope Inspection Checklists. Indicate commissioning team member inspection and acceptance of each Building Envelope Inspection Checklist item by initials at the time they are inspected and found to be in conformance with contract requirements. Inspect checklist items before they become hidden as construction progresses.

a. Submit the completed and initialed Building Envelope Inspection Checklists no later than 7 calendar days after completion of inspection

of all checklists items. Submit one hard copy and an electronic copy.

b. The Building Envelope Technical Commissioning Specialist must make at least two site visits to the site to observe construction of the building envelope in-progress. On each visit, the Building Envelope Commissioning Specialist must review the Contractor's in-progress checklists to ensure that the commissioning team is inspecting the building envelope as required.

c. The Building Envelope Technical Commissioning Specialist must witness the building envelope pressure tests and diagnostic tests specified in Specification Section 07 05 23 PRESSURE TESTING AN AIR BARRIER SYSTEM FOR AIR TIGHTNESS. The Building Envelope Technical Commissioning Specialist must review the resulting reports and provide recommendations for correction of any deficiencies or further testing.

3.2.4.3 Pre-Functional Checks

Pre-Functional Checklists from the approved Final Construction Phase Commissioning Plan must be completed by the commissioning team. Complete one Pre-Functional Checklist for each individual item of equipment or system for each system required to be commissioned including, but not limited to, ductwork, piping, equipment, fixtures (lighting and plumbing), and controls. Indicate commissioning team member inspection and acceptance of each Pre-Functional Checklist item by initials. Acceptance of each Pre-Functional Checklist item by each team member indicates that item conforms to the construction contract and accepted design requirements in their area of responsibility. Technical Commissioning Specialist acceptance of each Pre-Functional Checklist item indicates that each item has been installed correctly and in accordance with contract documents and the Owner's Project Requirements. Submit the completed and initialed Pre-Functional Checklists no later than 7 calendar days after completion of inspection of all checklists items for each system. Submit one hard copy and an electronic copy. Include manufacturer start-up checklists associated with equipment with the submission of the Pre-Functional Checklists.

3.2.4.4 Testing, Adjusting, and Balancing (TAB) Report and Field Acceptance Testing

The Mechanical System Technical Commissioning Specialist must review the pre-final TAB Report required by Specification Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC. Identify any deficiencies to the Contracting Officer's Representative and the Contractor's Quality Control Personnel. Resolve all deficiencies prior to TAB Field Acceptance Testing.

The Mechanical System Technical Commissioning Specialist must witness the TAB Field Acceptance Testing specified by Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC. Include a certification by the Mechanical Technical Specialist that no outstanding deficiencies exist in the systems relative to Testing, Adjusting, and Balancing with the final TAB Report submittal.

3.2.4.5 HVAC Controls Test Reports

The Mechanical System Technical Commissioning Specialist must review the . Include a certification by the Mechanical System Technical Commissioning Specialist that the submittals contain no deficiencies or that the submittals do not indicate any deficiencies in the HVAC systems or HVAC

control systems with each of these submittals.

3.2.4.6 Tests

3.2.4.6.1 Functional Performance and Integrated Systems Tests

Schedule Functional Performance Tests for each system only after the Certificate of Readiness has been approved by the Government for the system. Correct all deficiencies identified through any prior review, inspection, or test activity before the start of Functional Performance Tests. Perform Integrated Systems Tests only after the Functional Performance Tests for each associated system are completed with all deficiencies resolved and after the related Functional Performance Test Checklists have been signed by each commissioning team member.

a. Functional Performance Tests and Integrated Systems Tests must be performed with the Contracting Officer's Quality Assurance Representative present.

b. Abort Functional Performance Tests or Integrated Systems Testswhen any system deficiency prevents the successful completion of the test.

c. Technical Commissioning Specialists must lead and document all Functional Performance Tests and Integrated Systems Tests for the systems to be commissioned with the Contractor and appropriate sub-contractors performing the Functional Performance Tests and Integrated Systems Tests. The representatives listed in the paragraph Commissioning Team must attend the tests. Abort Functional Performance Tests or Integrated Systems Tests when any required commissioning team member is not present for the test.

3.2.4.6.1.1 Checklist

Use the Functional Performance Test and Integrated Systems Test Checklists from the approved Final Construction Phase Commissioning Plan to guide the Functional Performance Tests and Integrated Systems Tests. Functional Performance Tests must be performed for each item of equipment and each system required to be commissioned and verify all sensor calibrations, control responses, safeties, interlocks, operating modes, sequences of operation, capacities, lighting levels, and all other performance requirements comply with construction contract and accepted design requirements regardless of the specific items listed within the Functional Performance Test and Integrated Systems Test Checklists provided. Testing must progress from equipment or components to subsystems to systems to interlocks and connections between systems. Integrated Systems Tests must be performed for the interactive operation between systems such as HVAC systems, fire protection systems, back-up electrical supply, energy generation systems, and other systems, and verify correct interactive operation, acceptable speed of response, and other contract requirements for both normal and failure modes. Examples of Integrated Systems Tests include the correct operation of HVAC systems during emergency system activation, correct operation of uninterruptible power supplies or energy generators and connected systems, or lighting system operation during power outage or emergency system activation.The order of components and systems to be tested must be determined by the Technical Commissioning Specialists.

3.2.4.6.1.2 Acceptance

Indicate acceptance of each item of equipment and systems tested by

signature of each commissioning team member for each Functional Performance Test or Integrated Systems Test Checklist. The Contractor's Quality Control Representative and the Technical Commissioning Specialists must indicate acceptance after the equipment and systems are free of deficiencies.

3.2.4.6.2 HVAC Test Methods

Perform Functional Performance Tests in accordance with the following:

3.2.4.6.2.1 Prior to Testing

Prior to testing operating modes, sequences of operation, interlocks, and safeties, complete control point-to-point observations, test sensor calibrations, and test actuator commands.

3.2.4.6.2.2 Simulating Conditions

Over-writing control input values through the controls system is not acceptable, unless approved by the Contracting Officer's Representative . Identify proposed exceptions in a protocol submitted to the Contracting Officer's Representative for approval. Before simulating conditions, overwriting values (if approved), or changing set-points, calibrate all sensors, transducers and devices. Below are several examples of exceptions that would be considered acceptable:

a. When varying static pressures inside ductwork can not be simulated within the duct, and where a sensor signals the controls system to initiate sequences at various duct static pressures, it is acceptable to simulate the various pressures with a Pneumatic Squeeze-Bulb Type Signaling Device with gauge temporarily attached to the sensing tube leading to the transmitter. It is not acceptable to reset the various set-points, nor to simulate an electric analog signal (unless approved as noted above).

b. Dirty filter pressure drops can be simulated using sheets of cardboard at filter face.

c. Freeze-stat safeties can be simulated by packing portion of sensor with ice.

d. High outside air temperatures can be simulated with a hair blower.

e. High entering cooling coil temperatures can be used to simulate entering cooling coil conditions.

f. Do not use signal generators to simulate sensor signals unless approved by the Contracting Officer's Representative , as noted above, for special cases.

g. Control set points can be altered. For example, to see the air conditioning compressor lockout work at an outside air temperature below 55 degrees F, when the outside air temperature is above 55 degrees F, temporarily change the lockout set point to be 0 degrees F above the current outside air temperature. Caution: Set points are not to be raised or lowered to a point such that damage to the components, systems, or the building structure and/or contents will occur.

h. Test duct mounted smoke detectors in accordance with the manufacturer's

recommendations. Perform the tests with air system at minimum airflow condition in ductwork.

i. Test current sensing relays used for fan and pump status signals to control system to indicate unit failure and run status by resetting the set point on the relay to simulate a lost belt or unit failure while the unit is running. Confirm that the failure alarm was generated and received at the control system. After the test is conducted, return the set point to its original set-point or a set-point as indicated by the Contracting Officer's Representative .

3.2.4.6.2.3 Setup

Perform each test under conditions that simulate actual conditions as close as is practically possible. Provide all necessary materials and system modifications to produce the necessary flows, pressures, temperatures, and other conditions necessary to execute the test according to the specified conditions. At completion of the test, return the affected building equipment and systems to their pre-test condition.

3.2.4.6.3 Sample Strategy

Perform Functional Performance Tests and Integrated Systems Tests for all equipment and systems. Prepare and complete a Functional Performance Test Checklist for each item of equipment or system. Prepare and complete an Integrated Systems Test Checklist for each item of equipment or system.

3.2.4.6.4 Seasonal Tests

3.2.4.6.4.1 Initial Functional Performance Tests

Perform Initial Functional Performance Tests as soon as all contract work is completed, regardless of the season. Develop and implement means of artificial loading to demonstrate, to a reasonable level of confidence, the ability of the HVAC systems to handle peak seasonal loads.

3.2.4.6.4.2 Full-Load Conditions

In addition to the Initial Functional Performance Tests, perform Functional Performance Tests of HVAC systems under full-load conditions during peak heating and cooling seasons during outdoor air condition design extremes. Test cooling equipment and systems with the building fully occupied when performing the Functional Performance Tests during peak cooling season.

Schedule Seasonal Functional Performance Tests in coordination with the Government.

3.2.4.6.4.3 System Acceptance

Systems may be partially accepted prior to seasonal testing if they comply with all construction contract and accepted design requirements that can be tested during initial Functional Performance Tests. All Functional Performance Test procedures must be completed prior to full systems acceptance.

3.2.4.6.5 Aborted Tests and Re-Testing

Abort Functional Performance Tests, Integrated Systems Tests, or Seasonal Tests if any deficiency prevents successful completion of the test or if

any required commissioning team member is not present for the test. reimburse the Government for all costs associated with effort lost due to re-testing due to test failures and aborted tests. These costs must include salary, travel costs, and per diem for Government commissioning team members. Re-test only after all deficiencies identified during the original tests have been corrected.

3.2.4.6.5.1 100 Percent Sample

Systems or equipment for which 100 percent sample size are tested fail if one or more of the test procedures results in discovery of a deficiency and the deficiency cannot be resolved within 5 minutes during the test.

Re-test to the extent necessary to confirm that the deficiencies have been corrected without negatively impacting the performance of the rest of the system.

3.2.5 Training Plan

Develop a training plan which identifies all training required by specification sections associated with commissioned systems. Include a matrix listing each training requirement, content of the training, the trainer name, trainer contact information, and schedule and location of training. Submit one hard copy and an electronic copy of the Training Plan to the Commissioning Specialists and the Government no later than 30 calendar days prior to the associated training.

Document training attendance using training attendance rosters and provide completed attendance rosters to the Commissioning Specialists and the Government no later than 7 calendar days following the completion of training for each system to be commissioned. Submit one hard copy and an electronic copy..

3.3 COMMISSIONING REPORT

Following the completion of Functional Performance Tests and Integrated Systems Tests, with the exception of Seasonal Tests, the Lead Commissioning Specialist must prepare a Commissioning Report.

a. Include an executive summary describing the overall commissioning process, the results of the commissioning process, any outstanding deficiencies and recommended resolutions, and any seasonal testing that must be scheduled for a later date. Indicate, in the executive summary, whether the systems meet the requirements of the construction contract and accepted design and the Owner's Project Requirements.

b. Detail any deficiencies discovered during the commissioning process and the corrective actions taken in the report. Include the completed Building Envelope Inspection Checklists, Pre-Functional Checklists, Functional Performance Test Checklists, Integrated Systems Test Checklists,the Commissioning Plans, the Issues Log, Performance Verification Test Reports, Training Attendance Rosters, the Design Review Report, the final TAB Report.

c. Submit the Commissioning Report no later than 14 calendar days following commissioning team acceptance of all Functional Performance Tests and Integrated Systems Tests with the exception of Seasonal Tests. Submit three hard copies and an electronic copy.

d. Following any Seasonal Tests or Post-Construction Activities, update the Commissioning Report to reflect any changes and resubmit.

3.4 POST-CONSTRUCTION SUPPORT

3.4.1 Post-Construction Endurance Test

The Mechanical System Commissioning Specialists must review the trend logs from the Endurance Tests to ensure that the systems have stable operation and operate as required by the construction contract,the accepted design, and the Owner's Project Requirements. The Commissioning Specialists must provide a Post-Construction Trend Log Report that identifies any deficiencies noted in operation and includes a graphical representation of the trends. Provide one Trend Log Report for the peak cooling season and one Trend Log Report for the peak heating season. Submit one hard copy and one electronic copy of the Post-Construction Trend Log Reports no later than 14 calendar days following receipt of the trend log data by the Commissioning Specialist.

3.4.2 Post-Construction Site Visit

The Commissioning Specialists must visit the building site concurrent with the 9 month warranty inspection to inspect building system equipment and review building operation with the building operating/maintenance staff. The Commissioning Specialists must identify any deficiency of the building systems to operate in accordance with the contract and accepted design requirements and the Owner's Project Requirements. The Commissioning Specialists must advise the Contracting Officer's Representative of any identified deficiencies and the proposed corrective action. Submit an updated commissioning report and systems manual documenting the results of the post-construction inspection.

APPENDIX A - OWNER'S PROJECT REQUIREMENTS

OWNER'S PROJECT REQUIREMENTS DOCUMENT

Project: Project, Location, PN #####

Approved: _____

Name Design Agent's Representative Date

_____

Name Owner's Representative Date

OWNER'S PROJECT REQUIREMENTS DOCUMENT

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    a. Facility Operation
    b. UMCS (EMCS or FMCS)
    c. Occupant Training and Orientation
    d. O&M Staff Training and Orientation

1. Owner and User Requirements

a. Primary Purpose, Program, and Use

Explain the purpose, program, and use of the facility. (i.e. Army Reserve Center used for training reserve units. Training includes spaces such as weapons, medical, vehicle repair, cooking, etc.)

b. Project History

Explain the history of the project related to design/construction (i.e. D/B/B, D/B, IDIQ, JOC, COE in-house, A/E, etc.). Explain any additional project background that would impact energy/sustainability goals.

c. Broad Goals

i. Future Expansion: Explain goals related to potential future expansion.

ii. Flexibility: Explain goals related to flexibility for layout and use of the building. (i.e. high rate of office churn, expected frequency of renovation, etc.)

iii. Quality of Materials: Explain goals related to quality of materials. (i.e. highest quality materials, 50 yr life, 25 yr life, highest quality within budget, etc.)

iv. Construction Costs: Explain goals related to construction costs. (i.e. how low can you go, set project amount, select simplest systems for low cost, etc.)

v. Operational Costs: Explain goals related to operational costs. (i.e. low utilities based on water and energy conservation, trade-off allowable on maintenance costs to reduce utility cost, utility cost unimportant compared to construction cost, etc.)

2. Environmental and Sustainability Goals

a. LEED/Green Globes Goal

Set LEED/Green Globes goal and explain sustainable features permissible or preferred to be incorporated. Explain relative importance of LEED/Green Globes goal within project scope. Indicate requirement from service or agency specific criteria and policy.

b. Other

Explain any special sustainability or environmental goals associated with the project. Identify specific sustainability features that may be required or desired. (i.e. hydro-power, solar power, on-site water treatment, on-site water infiltration, impervious cover reduction, parking capacity, etc.)

3. Energy Efficiency Goals

a. Goals/Policy

Explain the specific project goals and requirements regarding energy efficiency. Incorporate the requirements of UFC 1-200-02 High Performance and Sustainable Building Requirements and/or other relevant agency policies.

b. Systems and Feature Energy Impacts

Identify and explain envelope, system, or site and building features that will be incorporated to maximize energy efficiency. Identify features that must be incorporated that will reduce or limit energy efficiency.

4. Indoor Environmental Quality Requirements

a. Space Type 1

i. Intended Use: Explain how the space will be used (i.e. classroom occasionally used as conference room).

ii. Occupancy Schedule: Describe the occupancy including number of people at various times (i.e. drill weekend-maximum capacity, weekdays-20 percent; or 0700-0900 - none, 0900-1400 - 30 people, 1400-1600 - none).

iii. Environmental Requirements: Describe the environmental requirements of the space. Include description of temperatures, humidity levels, ventilation rates, air quality, lighting levels, or any other specific parameters desired (i.e. 75 deg F, 50 percent rh, 30 fc, etc.).

iv. Occupant System Control Ability: Describe the desired level of control the occupants will have over the thermal comfort and lighting systems. (i.e. adjustable thermostat for every person, adjustable thermostat in all private offices, no adjustable thermostats, adjustable thermostat in senior rank also controlling other offices, occupancy sensors for lighting, adjustable dimming, etc.)

v. Type of Lighting: Describe the type of lighting desired (i.e. task lighting with minimal overhead, maximize daylight with dimming on overhead, accent lighting, particular fixtures, etc.).

vi. After-hour Use Accommodations: Describe whether and how often the space may be used after hours. Describe the systems that activate when an occupant uses the building after-hours. Describe the level of control of after-hour use HVAC.

(Example: Space is rarely used after-hours by few occupants. HVAC and lighting system should activate when occupants enter after-hours. The HVAC operation will be limited to that required to provide heating, A/C, and ventilation to the occupied space alone.) (Example: Space is rarely used after-hours by few occupants. Lighting and heating systems should activate. Ventilation and cooling should remain in normal after-hour operation.)

b. Space Type 2

5. Equipment and System Expectations

a. HVAC Systems

i. Quality and Reliability: Explain the level of quality and reliability required of the HVAC systems.

(Example: Equipment efficiency should meet and FEMP/Energy Star requirements. Due to critical nature of facility, additional redundancy in the cooling and heating systems is required, i.e. multiple chillers, boilers, and pumps.) (Example: No specific quality or reliability requirements specified. Equipment should remain serviceable over life of building or to the extent typical of the type of equipment.)

ii. Type: Explain the type of equipment desired.

(Example: Boilers should be condensing type. Use hydronic heating and cooling. Use self-contained A/C units in computer rooms.)

iii. Automation: Explain the level of automation in the HVAC System desired.

(Example: Single loop HVAC systems permissible. Use packaged controls only.) (Example: Control HVAC systems from DDC system connected to the base UMCS.) (Example: Boilers should have packaged controls connected to the DDC system.)

iv. Flexibility: Describe the desired level of flexibility of the HVAC system.

(Example: System should accommodate frequent office layout changes including private office wall movement.) (Example: Layout will remain mostly unchanged; no flexibility required.) (Example: Accommodate potential for conference and classrooms to change to offices.)

v. Maintenance Requirements: Describe the level of maintenance available or the requirements of the equipment regarding maintainability.

(Example: Equipment should be located to allow easy maintenance access. Equipment vendors or repair service should be able to respond within 24 hrs.)

b. Lighting Systems

i. Quality and Reliability: Explain the level of quality and reliability required of the lighting system controls.

(Example: The building lighting system should meet ASHRAE 90.1 - IP requirements.)

ii. Type: Explain the type of lighting or control equipment desired.

(Example: High-efficiency fluorescent lamps with high-efficiency ballasts will be specified. Indirect lighting will be used in all office and classroom spaces. Lighting foot-candle levels may be reduced to 45 foot-candles in lieu of the typical 50 foot-candles when indirect lighting is used.)

iii. Automation: Explain the level of automation in the lighting control

system desired.

(Example: Provide occupancy sensors in restrooms, corridors, and storage areas.)

iv. Flexibility: Describe the desired level of flexibility of the lighting system and control systems.

(Example: Provide dual level switching in classrooms and conference rooms.)

v. Maintenance Requirements: Describe the level of maintenance available or the requirements of the equipment regarding maintainability.

(Example:)

c. Domestic Hot Water Systems

i. Quality and Reliability: Explain the level of quality and reliability required of the domestic hot water systems.

(Example: Equipment efficiency should meet ASHRAE and FEMP/Energy Star requirements. Due to critical nature of facility, additional redundancy in the water heating systems is required, i.e. multiple hot water heaters and circulation pumps.) (Example: No specific quality or reliability requirements specified. Equipment should remain serviceable over life of building or to the extent typical of the type of equipment.)

ii. Type: Explain the type of equipment desired.

(Example: Gas-fired storage tank water heater with mixing valve for temperature control.) (Example: Instantaneous electric water heater at lavatories.) (Example: Instantaneous electric water heater with integral control system for eyewash/showers.)

iii. Automation: Explain the level of automation in the domestic hot water control system desired.

(Example: Occupancy schedule control for recirculation loop and gas burner. Connect package controls to DDC system.)

iv. Flexibility: Describe the desired level of flexibility of the domestic hot water systems.

(Example: No anticipated changes to restroom layout; no additional flexibility required.)

v. Maintenance Requirements: Describe the level of maintenance available or the requirements of the equipment regarding maintainability.

(Example: Equipment should be located to allow easy maintenance access. Equipment vendors or repair service should be able to respond within 24 hrs.)

d. On-site Power Systems

i. Quality and Reliability: Explain the level of quality and reliability required of the on-site power system.

ii. Type: Explain the type of on-site power system desired.

iii. Automation: Explain the level of automation in the on-site power system desired.

iv. Flexibility: Describe the desired level of flexibility of the on-site power system.

v. Maintenance Requirements: Describe the level of maintenance available or the requirements of the on-site power system regarding maintainability.

e. Other Systems

i. Quality and Reliability: Explain the level of quality and reliability required of the system.

ii. Type: Explain the type of system desired.

iii. Automation: Explain the level of automation in the system desired.

iv. Flexibility: Describe the desired level of flexibility of the system.

v. Maintenance Requirements: Describe the level of maintenance available or the requirements of the system regarding maintainability.

6. Building Occupant and O&M Personnel Requirements

a. Facility Operation

Describe how the facility will be operated. Who operates the facility? Who maintains the facility? Who pays the utility bills?

b. UMCS (EMCS or FMCS)

Will the building be tied to an UMCS/EMCS/FMCS? What system will be connected to? Provide information regarding connection requirements, protocols, and control, scheduling and monitoring points.

c. Occupant Training and Orientation

How much training and orientation is desired for building occupants? Will training need to be provided for all systems? To what extent do the occupants need to understand and use the systems?

d. O&M Staff Training and Orientation

How much training and orientation is desired for building occupants? Will training need to be provided for all systems? To what extent do the occupants need to understand and use the systems?

-- End of Section --

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SECTION 02 41 00

DEMOLITION
05/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)

AHRI Guideline K	(2009) Guideline for Containers for Recovered Non-Flammable Fluorocarbon Refrigerants

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6	(2006) Safety Requirements for Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25	(Jun 2000; Reaffirmed Oct 2010) Storage and Handling of Liquefied and Gaseous Compressed Gases and Their Full and Empty Cylinders http://www.aviation.dla.mil/UserWeb/aviationengineering/

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M	(2006) MILSTRIP - Military Standard Requisitioning and Issue Procedures
MIL-STD-129	(2014; Rev R) Military Marking for Shipment and Storage

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 82	Protection of Stratospheric Ozone
49 CFR 173.301	Shipment of Compressed Gases in Cylinders and Spherical Pressure Vessels

1.2 PROJECT DESCRIPTION

1.2.1 Demolition

Prepare a Demolition Plan and submit proposed demolition and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Coordinate with Waste Management Plan. Provide procedures for safe conduct of the work in accordance with EM 385-1-1. Plan shall be approved by Contracting Officer prior to work beginning.

1.2.2 General Requirements

Do not begin demolition or deconstruction until authorization is received from the Contracting Officer. Remove rubbish and debris from the project site; do not allow accumulations inside or outside the building. The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 ITEMS TO REMAIN IN PLACE

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Contracting Officer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload structural elements . Provide new supports and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Contracting Officer prior to performing such work.

1.3.1 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

1.3.2 Weather Protection

For portions of the building to remain, protect building interior and materials and equipment from the weather at all times. Where removal of existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas.

1.3.3 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.3.4 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Government and disconnected and sealed by the Contractor.

1.3.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished or deconstructed, unless directed otherwise by the Contracting Officer. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

1.4 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted. Where burning is permitted, adhere to federal, state, and local regulations.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Demolition Plan; G

Existing Conditions

SD-07 Certificates

Notification; G

SD-11 Closeout Submittals

Receipts

1.6 QUALITY CONTROL

Submit timely notification of demolitionand renovation projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the Regional Office of the United States Environmental Protection Agency (USEPA), State's environmental protection agency, local air pollution control district/agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSE/SAFE A10.6. Comply with the Environmental Protection Agency requirements specified. Use of explosives will not be permitted.

1.6.1 Dust and Debris Control

Prevent the spread of dust and debris to occupied portions of the building and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Vacuum and dust the work area daily.

1.7 PROTECTION

1.7.1 Traffic Control Signs

a. Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning such work.

1.7.2 Protection of Personnel

Before, during and after the demolition work continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the project site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.8 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Contracting Officer.

1.9 EXISTING CONDITIONS

Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent

to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results.

PART 2 PRODUCTS

2.1 FILL MATERIAL

a. Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill voids, depressions or excavations resulting from demolition of structures.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse onsite whenever possible.

3.1.1 Structures

a. Remove existing structures indicated to be removed to grade. Interior walls, other than retaining walls and partitions, shall be removed to to top of concrete slab on ground. Remove sidewalks, curbs, gutters and street light bases as indicated.

b. Demolish structures in a systematic manner from the top of the structure to the ground. Complete demolition work above each tier or floor before the supporting members on the lower level are disturbed. Demolish concrete and masonry walls in small sections. Remove structural framing members and lower to ground by means of derricks, platforms hoists, or other suitable methods as approved by the Contracting Officer.

c. Locate demolition and deconstruction equipment throughout the structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing.

d. Building, or the remaining portions thereof, not exceeding 80 feet in height may be demolished by the mechanical method of demolition.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contracting Officer. Do not

interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition or deconstruction work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities , as indicatedand terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered but are not indicated on the drawings, notify the Contracting Officer prior to further work in that area. Remove meters and related equipment and deliver to a location in accordance with instructions of the Contracting Officer.

3.1.3 Paving and Slabs

Remove sawcut concrete and asphaltic concrete paving and slabs including aggregate base to existing adjacent new finish grade. Provide neat sawcuts at limits of pavement removal as indicated. Pavement and slabs designated to be recycled and utilized in this project shall be moved, ground and stored as directed by the Contracting Officer. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.1.4 Concrete

Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

3.1.5 Structural Steel

Dismantle structural steel at field connections and in a manner that will prevent bending or damage. Salvage for recycle structural steel, steel joists, girders, angles, plates, columns and shapes. Do not use flame-cutting torches. Transport steel joists and girders as whole units and not dismantled. Transport structural steel shapes to a designated recycling facility and area as directed by the Contracting Officer, stacked according to size, type of member and length, and stored off the ground, protected from the weather.

3.1.6 Miscellaneous Metal

Salvage shop-fabricated items such as access doors and frames, steel gratings, metal ladders, wire mesh partitions, metal railings, metal windows and similar items as whole units. Salvage light-gage and cold-formed metal framing, such as steel studs, steel trusses, metal gutters, roofing and siding, metal toilet partitions, toilet accessories and similar items. Scrap metal shall become the Contractor's property. Recycle scrap metal as part of demolition and deconstruction operations. Provide separate containers to collect scrap metal and transport to a scrap metal collection or recycling facility, in accordance with the Waste Management Plan.

3.1.7 Carpentry

Salvage for recycle lumber, millwork items, and finished boards, and sort by type and size. recycle salvaged wood unfit for reuse, except stained, painted, or treated wood.Remove windows, doors, frames, and cabinets, and similar items as whole units, complete with trim and accessories. Brace the open end of door frames to prevent damage.

3.1.8 Patching

Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces, using on-site materials when available. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

a. Concrete and Masonry: Completely fill holes and depressions, left as a result of removals in existing masonry walls to remain, with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

b. Where existing partitions have been removed leaving damaged or missing resilient tile flooring, patch to match the existing floor tile.

c. Patch acoustic lay-in ceiling where partitions have been removed. The transition between the different ceiling heights shall be effected by continuing the higher ceiling level over to the first runner on the lower ceiling and closing the vertical opening with a painted sheet metal strip.

3.1.9 Mechanical Equipment and Fixtures

Disconnect mechanical hardware at the nearest connection to existing services to remain, unless otherwise noted. Disconnect mechanical equipment and fixtures at fittings. Remove service valves attached to the unit. Salvage each item of equipment and fixtures as a whole unit; listed, indexed, tagged, and stored. Salvage each unit with its normal operating auxiliary equipment. Transport salvaged equipment and fixtures, including motors and machines, to a designated storage area as directed by the Contracting Officer. Do not remove equipment until approved. Do not offer low-efficiency equipment for reuse.

3.1.9.1 Preparation for Storage

Remove water, dirt, dust, and foreign matter from units; tanks, piping and fixtures shall be drained; interiors, if previously used to store flammable, explosive, or other dangerous liquids, shall be steam cleaned. Seal openings with caps, plates, or plugs. Secure motors attached by flexible connections to the unit. Change lubricating systems with the proper oil or grease.

3.1.9.2 Piping

Disconnect piping at unions, flanges and valves, and fittings as required to reduce the pipe into straight lengths for practical storage. Store

salvaged piping according to size and type. If the piping that remains can become pressurized due to upstream valve failure, end caps, blind flanges, or other types of plugs or fittings with a pressure gage and bleed valve shall be attached to the open end of the pipe to ensure positive leak control. Carefully dismantle piping that previously contained gas, gasoline, oil, or other dangerous fluids, with precautions taken to prevent injury to persons and property. Store piping outdoors until all fumes and residues are removed. Box prefabricated supports, hangers, plates, valves, and specialty items according to size and type. Wrap sprinkler heads individually in plastic bags before boxing. Classify piping not designated for salvage, or not reusable, as scrap metal.

3.1.9.3 Ducts

Classify removed duct work as scrap metal.

3.1.9.4 Fixtures, Motors and Machines

Remove and salvage fixtures, motors and machines associated with plumbing, heating, air conditioning, refrigeration, and other mechanical system installations. Salvage, box and store auxiliary units and accessories with the main motor and machines. Tag salvaged items for identification, storage, and protection from damage. Classify broken, damaged, or otherwise unserviceable units and not caused to be broken, damaged, or otherwise unserviceable as debris to be disposed of by the Contractor.

3.1.10 Electrical Equipment and Fixtures

Salvage motors, motor controllers, and operating and control equipment that are attached to the driven equipment. Salvage wiring systems and components. Box loose items and tag for identification. Disconnect primary, secondary, control, communication, and signal circuits at the point of attachment to their distribution system.

3.1.10.1 Fixtures

Remove and salvage electrical fixtures. Salvage unprotected glassware from the fixture and salvage separately. Salvage incandescent, mercury-vapor, and fluorescent lamps and fluorescent ballasts manufactured prior to 1978, boxed and tagged for identification, and protected from breakage.

3.1.10.2 Electrical Devices

Remove and salvage switches, switchgear, transformers, conductors including wire and nonmetallic sheathed and flexible armored cable, regulators, meters, instruments, plates, circuit breakers, panelboards, outlet boxes, and similar items. Box and tag these items for identification according to type and size.

3.1.10.3 Wiring Ducts or Troughs

Remove and salvage wiring ducts or troughs. Dismantle plug-in ducts and wiring troughs into unit lengths. Remove plug-in or disconnecting devices from the busway and store separately.

3.1.10.4 Conduit and Miscellaneous Items

Salvage conduit except where embedded in concrete or masonry. Consider corroded, bent, or damaged conduit as scrap metal. Sort straight and

undamaged lengths of conduit according to size and type. Classify supports, knobs, tubes, cleats, and straps as debris to be removed and disposed.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition or deconstruction work in areas occupied by structures to be demolished or deconstructed until all demolition and deconstruction in the area has been completed and debris removed. Fill holes, open basements and other hazardous openings.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition, deconstruction, and removal procedures, and authorization by the Contracting Officer to begin demolition and deconstruction. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.2 Disposal of Ozone Depleting Substance (ODS)

Class I and Class II ODS are defined in Section, 602(a) and (b), of The Clean Air Act. Prevent discharge of Class I and Class II ODS to the atmosphere. Place recovered ODS in cylinders meeting AHRI Guideline K suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. Recovered ODS shall be removed from Government property and disposed of in accordance with 40 CFR 82. Products, equipment and appliances containing ODS in a sealed, self-contained system (e.g. residential refrigerators and window air conditioners) shall be disposed of in accordance with 40 CFR 82. Submit Receipts or bills of lading, as specified. Submit a shipping receipt or bill of lading for all containers of ozone depleting substance (ODS) shipped to the Defense Depot, Richmond, Virginia.

3.3.2.1 Special Instructions

No more than one type of ODS is permitted in each container. A warning/hazardous label shall be applied to the containers in accordance with Department of Transportation regulations. All cylinders including but not limited to fire extinguishers, spheres, or canisters containing an ODS shall have a tag with the following information:

a. Activity name and unit identification code

b. Activity point of contact and phone number

c. Type of ODS and pounds of ODS contained

d. Date of shipment

e. National stock number (for information, call (804) 279-4525).

3.3.2.2 Fire Suppression Containers

Deactivate fire suppression system cylinders and canisters with electrical charges or initiators prior to shipment. Also, safety caps must be used to cover exposed actuation mechanisms and discharge ports on these special cylinders.

3.3.3 Transportation Guidance

Ship all ODS containers in accordance with MIL-STD-129, DLA 4145.25 (also referenced one of the following: Army Regulation 700-68, Naval Supply Instruction 4440.128C, Marine Corps Order 10330.2C, and Air Force Regulation 67-12), 49 CFR 173.301, and DOD 4000.25-1-M.

3.3.4 Unsalvageable and Non-Recyclable Material

Dispose of unsalvageable and non-recyclable noncombustible material in the disposal area . The fill in the disposal area shall remain below current elevation and after disposal is completed, the disposal area shall be uniformly graded to drain. Dispose of unsalvageable and non-recyclable combustible material in the sanitary fill area located off the site.

3.4 CLEANUP

Remove debris and rubbish from basement and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified in the Waste Management Plan. Storage of removed materials on the project site is prohibited.

3.5.2 Burning on Government Property

Burning of materials removed from demolished and deconstructed structures will not be permitted on Government property.

3.5.3 Removal to Spoil Areas on Government Property

Transport noncombustible materials removed from demolition and deconstruction structures to designated spoil areas on Government property.

3.5.4 Removal from Government Property

Transport waste materials removed from demolished and deconstructed structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

3.6 REUSE OF SALVAGED ITEMS

Recondition salvaged materials and equipment designated for reuse before

installation. Replace items damaged during removal and salvage operations or restore them as necessary to usable condition.

-- End of Section --

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ASBESTOS ABATEMENT
02/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE Z9.2	(2012) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

ASTM INTERNATIONAL (ASTM)

ASTM D4397	(2016) Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E1368	(2014) Visual Inspection of Asbestos Abatement Projects

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7	(2014) Compressed Air for Human Respiration; 6th Edition

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z87.1	(2015) Occupational and Educational Personal Eye and Face Protection Devices

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701	(2015) Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 2003-154	(2016; 5th Ed) NIOSH Manual of Analytical Methods

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual
EP 1110-1-11	(1992; Change 1 1997) Engineering and Design -- Asbestos Abatement Guideline Detail Sheets

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90/018	(1990) Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.134	Respiratory Protection
29 CFR 1910.141	Sanitation
29 CFR 1910.147	Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1926.1101	Asbestos
29 CFR 1926.32	Safety and Health Regulations for Construction - Definition
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 763	Asbestos
42 CFR 84	Approval of Respiratory Protective Devices
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009; Reprint Dec 2017) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Amended Water

Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter.

1.2.2 Asbestos-Containing Material (ACM)

Any materials containing more than one percent asbestos.

1.2.3 Authorized Person

Any person authorized by the Contractor and required by work duties to be present in the regulated areas.

1.2.4 Building Inspector

Individual who inspects buildings for asbestos and has EPA Model Accreditation Plan (MAP) "Building Inspector" training; accreditation required by 40 CFR 763, Subpart E, Appendix C, has EPA/State certification/license as a "Building Inspector".

1.2.5 Class I Asbestos Work

Activities defined by OSHA involving the removal of thermal system insulation (TSI) and surfacing ACM.

1.2.6 Class II Asbestos Work

Activities defined by OSHA involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos - containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Certain "incidental" roofing materials such as mastic, flashing and cements when they are still intact are excluded from Class II asbestos work. Removal of small amounts of these materials which would fit into a glovebag may be classified as a Class III job.

1.2.7 Class III Asbestos Work

Activities defined by OSHA that involve repair and maintenance operations, where ACM, including TSI and surfacing ACM, is likely to be disturbed. Operations may include drilling, abrading, cutting a hole, cable pulling, crawling through tunnels or attics and spaces above the ceiling, where asbestos is actively disturbed or asbestos-containing debris is actively disturbed.

1.2.8 Clean Room

An uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

1.2.9 Competent Person

In addition to the definition in 29 CFR 1926.32(f), a person who is capable of identifying existing asbestos hazards as defined in 29 CFR 1926.1101, selecting the appropriate control strategy, has the authority to take prompt corrective measures to eliminate them and has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training; has EPA/State certification/license as a "Contractor/Supervisor".

1.2.10 Contractor/Supervisor

Individual who supervises asbestos abatement work and has EPA Model Accreditation Plan "Contractor/Supervisor" training; has EPA/State certification as a "Contractor/Supervisor".

1.2.11 Critical Barrier

One or more layers of plastic sealed over all openings into a regulated area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a regulated area from migrating to an adjacent area.

1.2.12 Decontamination Area

An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

1.2.13 Demolition

The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

1.2.14 Disposal Bag

A 6 mil thick, leak-tight plastic bag, pre-labeled in accordance with 29 CFR 1926.1101, used for transporting asbestos waste from containment to disposal site.

1.2.15 Disturbance

Activities that disrupt the matrix of ACM, crumble or pulverize ACM, or generate visible debris from ACM. Disturbance includes cutting away small amounts of ACM, no greater than the amount which can be contained in 1 standard sized glovebag or waste bag, not larger than 60 inches in length and width in order to access a building component.

1.2.16 Equipment Room or Area

An area adjacent to the regulated area used for the decontamination of employees and their equipment.

1.2.17 Fiber

A fibrous particulate, 5 micrometers or longer, with a length to width ratio of at least 3 to 1.

1.2.18 Friable ACM

A term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material which contains more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Polarized Light Microscopy (PLM), that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

1.2.19 Glovebag

Not more than a 60 by 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

1.2.20 High-Efficiency Particulate Air (HEPA) Filter

A filter capable of trapping and retaining at least 99.97 percent of all

mono-dispersed particles of 0.3 micrometers in diameter.

1.2.21 Intact

ACM which has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. Removal of "intact" asphaltic, resinous, cementitious products does not render the ACM non-intact simply by being separated into smaller pieces.

1.2.22 Model Accreditation Plan (MAP)

USEPA training accreditation requirements for persons who work with asbestos as specified in 40 CFR 763.

1.2.23 Negative Initial Exposure Assessment

A demonstration by the Contractor to show that employee exposure during an operation is expected to be consistently below the OSHA Permissible Exposure Limits (PELs).

1.2.24 NESHAP

National Emission Standards for Hazardous Air Pollutants. The USEPA NESHAP regulation for asbestos is at 40 CFR 61, Subpart M.

1.2.25 Nonfriable ACM

A NESHAP term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material containing more than 1 percent asbestos that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

1.2.26 Nonfriable ACM (Category I)

A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos.

1.2.27 Nonfriable ACM (Category II)

A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos.

1.2.28 Permissible Exposure Limits (PELs)

1.2.28.1 PEL-Time Weighted Average(TWA)

Concentration of asbestos not in excess of 0.1 fibers per cubic centimeter of air (f/cc) as an 8 hour time weighted average (TWA).

1.2.28.2 PEL-Excursion Limit

An airborne concentration of asbestos not in excess of 1.0 f/cc of air as averaged over a sampling period of 30 minutes.

1.2.29 Regulated Area

An OSHA term defined in 29 CFR 1926.1101 meaning an area established by the Contractor to demarcate areas where Class I, II, and III asbestos work is

conducted; also any adjoining area where debris and waste from such asbestos work accumulate; and an area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit.

1.2.30 Removal

All operations where ACM is taken out or stripped from structures or substrates, and includes demolition operations.

1.2.31 Thermal System Insulation (TSI) ACM

ACM which contains more than 1 percent asbestos and is applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain or water condensation.

1.2.32 Transite

A generic name for asbestos cement wallboard and pipe.

1.2.33 Worker

Individual (not designated as the Competent Person or a supervisor) who performs asbestos work and has completed asbestos worker training required by 29 CFR 1926.1101, to include EPA Model Accreditation Plan (MAP) "Worker" training; accreditation if required by the OSHA Class of work to be performed or by the state where the work is to be performed.

1.3 SYSTEM DESCRIPTION

This section covers all operations in which asbestos-containing materials (ACM) are encountered during the Nellis Bldg 332 Renovation Project. An asbestos survey was accomplished (see attached survey report) to provide information as to what needs to be abated prior to start of this project. These procedures and equipment are required to protect workers and building occupants from airborne asbestos fibers and ACM dust and debris. Activities include OSHA Class I Class II and Class III work operations. This section also includes containment, storage, transportation and disposal of the generated ACM wastes. Submit Detailed Drawings in accordance with EP 1110-1-11 and containing descriptions, and site layout to include worksite containment area(s), local exhaust systems locations, decontamination units and load-out units, other temporary waste storage facility, location of temporary utilities (electrical, water, sewer) and boundaries of each regulated area.

1.3.1 Abatement Work Tasks

The specific ACM to be abated is identified on the attached Asbestos surveys.

1.3.2 Unexpected Discovery of Asbestos

For any previously untested building components suspected to contain asbestos and located in areas impacted by the work, notify the Contracting Officer (CO) who will have the option of ordering up to 3 bulk samples to be obtained at the Contractor's expense and delivered to a laboratory accredited under the National Institute of Standards and Technology (NIST) "National Voluntary Laboratory Accreditation Program (NVLAP)" and analyzed by PLM. If the asbestos content is less than 10 percent, as determined by a method other than point counting, the asbestos content shall be verified

by point counting. Any additional components identified as ACM that have been approved by the CO for removal shall be removed and will be paid for by an equitable adjustment to the contract price under the CONTRACT CLAUSE titled "changes". Sampling shall be conducted by personnel who have successfully completed the EPA Model Accreditation Plan (MAP) "Building Inspector" training course and is EPA/State certified/licensed as a "Building Inspector".

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detailed Drawings; G

SD-03 Product Data

Asbestos Waste Shipment Records; G
Encapsulants; G
Respiratory Protection Program; G, DO
Cleanup and Disposal; G
Qualifications; G
Training Program
Licenses, Permits and Notifications
Asbestos Management Plan; G, DO

SD-06 Test Reports

Exposure Assessment and Air Monitoring
Local Exhaust System

SD-07 Certificates

Local Exhaust System
Encapsulants; G
Medical Surveillance Requirements

1.5 QUALITY ASSURANCE

In addition to detailed requirements of this specification, work performed under this contract shall comply with EM 385-1-1, applicable federal, state, and local laws, ordinances, criteria, rules and regulations regarding handling, storing, transporting, and disposing of asbestos waste materials. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5.1 Written Qualifications and Organization Report

Submit a written qualifications and organization report providing evidence of qualifications of the Contractor, Contractor's Project Supervisor, Designated Competent Person, supervisors and workers; Designated IH;

independent testing laboratory; all subcontractors to be used including disposal transportation and disposal facility firms, subcontractor supervisors, subcontractor workers; and any others assigned to perform asbestos abatement and support activities. Include in the report an organization chart showing the Contractor's staff organization chain of command and reporting relationship with all subcontractors. The report shall be signed by the Contractor, the Contractor's onsite project manager, Designated Competent Person, Designated IH, designated testing laboratory and the principals of all subcontractors to be used. Include the following statement in the report: "By signing this report I certify that the personnel I am responsible for during the course of this project fully understand the contents of 29 CFR 1926.1101, 40 CFR 61, Subpart M, and the federal, state and local requirements for those asbestos abatement activities that they will be involved in."

1.5.2 Specific Requirements

Designate in writing, personnel meeting the following qualifications:

a. Asbestos Abatement Contractor: Certified/licensed by applicable state agencies to perform asbestos-related activities.

b. Designated Competent Person: Qualified in accordance with 29 CFR 1926.32 and 29 CFR 1926.1101, has EPA MAP "Contractor/Supervisor" training accreditation, has EPA/State certification/license as a "Contractor/Supervisor" and is experienced in the administration and supervision of asbestos abatement projects The Designated Competent Person shall be responsible for compliance with applicable federal, state and local requirements, the Contractor's Accident Prevention Plan (APP) and Asbestos Hazard Abatement Plan (AHAP). Submit the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training, EPA/State certification/license with the employee "Certificate of Worker Acknowledgment". Submit evidence that this person has a minimum of 2 years of on-the-job asbestos abatement experience relevant to OSHA competent person requirements. The Designated Competent Person shall be onsite at all times during the conduct of this project.

c. Project and Other Supervisors: Have EPA MAP "Contractor/Supervisor" training accreditation. Submit the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training, EPA/State certification/license with the employee "Certificate of Worker Acknowledgment". Also submit evidence that the Project Supervisor has a minimum of 2 years of on-the-job asbestos abatement experience relevant to project supervisor responsibilities and the other supervisors have a minimum of 1 year on-the-job asbestos abatement experience commensurate with the responsibilities they will have on this project.

d. Designated Industrial Hygienist: Resume for the Industrial Hygienist (IH) selected to prepare the Contractor's AHAP, prepare and perform training, direct air monitoring and assist the Contractor's Competent Person in implementing and ensuring that safety and health requirements are complied with during the performance of all required work. The Designated IH shall be a person who is board certified in the practice of industrial hygiene as determined and documented by the American Board of Industrial Hygiene (ABIH), has EPA MAP "Contractor/Supervisor" training accreditation, has EPA/State certification/license, and has a minimum of 2 years of comprehensive experience in planning and

overseeing asbestos abatement activities. Submit the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training and EPA/State certification/license with the employee "Certificate of Worker Acknowledgment". The Designated IH shall be completely independent from the Contractor according to federal, state, or local regulations; that is, shall not be a Contractor's employee or be an employee or principal of a firm in a business relationship with the Contractor negating such independent status. A copy of the Designated IH's current valid ABIH certification shall be included. The Designated IH shall be onsite at all times for the duration of asbestos activities and shall be available for emergencies. In addition, submit resumes of additional IH's and industrial hygiene technicians (IHT) who will be assisting the Designated IH in performing onsite tasks. IHs and IHTs supporting the Designated IH shall have a minimum of 2 years of practical onsite asbestos abatement experience. Indicate the formal reporting relationship between the Designated IH and the support IHs and IHTs, the Designated Competent Person, and the Contractor.

e. Asbestos Abatement Workers: Meet the requirements contained in 29 CFR 1926.1101, 40 CFR 61, Subpart M, and other applicable federal, state and local requirements. Worker training documentation shall be provided as required on the "Certificate of Workers Acknowledgment". Training documentation is required for each employee who will perform OSHA Class I, Class II, Class III, or Class IV asbestos abatement operations. Such documentation shall be submitted on a Contractor generated form titled "Certificate of Workers Acknowledgment", to be completed for each employee in the same format and containing the same information as the example certificate at the end of this section. Training course completion certificates (initial and most recent update refresher) required by the information checked on the form shall be attached.

f. Physician: Resume of the physician who will or has performed the medical examinations and evaluations of the persons who will conduct the asbestos abatement work tasks. The physician shall be currently licensed by the state where the workers will be or have been examined, have expertise in pneumoconiosis and shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1926.1101. The physician shall be familiar with the site's hazards and the scope of this project.

g. Independent Testing Laboratory: identify the independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by federal, state or local regulations. Written verification of the following criteria, signed by the testing laboratory principal and the Contractor, shall be submitted:

(1) Phase contrast microscopy (PCM): The laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926.1101, OSHA method ID-160, the most current version of NIOSH 2003-154 Method 7400 as shown in Table 3 at the end of this Section. The laboratory shall be currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in the American Industrial Hygiene Association (AIHA) Proficiency Analytical

Testing (PAT) Program or by participating in the AIHA PAT Program, and being judged proficient in counting samples.

(2) Polarized light microscopy (PLM): The laboratory is fully equipped and proficient in conducting PLM analyses of suspect ACM bulk samples in accordance with 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for bulk asbestos analysis and will use analysts with demonstrated proficiency to conduct PLM analyses.

(3) Transmission electron microscopy (TEM): The laboratory is fully equipped and proficient in conducting TEM analysis of airborne samples using the mandatory method specified by 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for airborne sample analysis of asbestos by TEM; the laboratory will use analysts with demonstrated proficiency under NVLAP.

(4) PCM/TEM: The laboratory is fully equipped and each analyst is proficient in conducting PCM and TEM analysis of airborne samples using NIOSH 2003-154 Method 7400 PCM and NIOSH 2003-154 Method 7402 (TEM confirmation of asbestos content of PCM results) from the same filter.

h. Disposal Facility, Transporter: Written evidence that the landfill to be used is approved for asbestos disposal by the USEPA state and local regulatory agencies. Copies of signed agreements between the Contractor (including subcontractors and transporters) and the asbestos waste disposal facility to accept and dispose of all asbestos containing waste shall be provided. The Contractor and transporters shall meet the DOT requirements of 49 CFR 171, 49 CFR 172, and 49 CFR 173 as well as registration requirements of 49 CFR 107 and other applicable state or local requirements. The disposal facility shall meet the requirements of 40 CFR 61, Sections .154 or .155, as required in 40 CFR 61 150(b), and other applicable state or local requirements.

1.5.3 Preconstruction Conference

The Contractor and the Contractor's Designated Competent Person, Project Supervisor, and Designated IH shall meet with the Contracting Officer (CO) prior to beginning work at a safety preconstruction conference to discuss the details of the Contractor's submitted APP to include the AHAP and AHAs appendices. Deficiencies in the APP will be discussed. Onsite work shall not begin until the APP has been accepted.

1.6 SAFETY

Prepare a written comprehensive site-specific Accident Prevention Plan (APP) at least 30 days prior to the preconstruction conference. The APP shall be in accordance with the format and requirements in Appendix A of EM 385-1-1. The APP shall incorporate an Asbestos Hazard Abatement Plan (AHAP), and Activity Hazard Analyses (AHAs) as separate appendices into one site-specific document. The APP shall take into consideration all the individual asbestos abatement work tasks See Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS for additional requirements.

1.6.1 Asbestos Hazard Abatement Plan Appendix

The AHAP shall be IAW EM 385-1-1 par 06.C.03 and include, but not be

limited to, the following:

a. The personal protective equipment to be used;

b. The location and description of regulated areas including clean and dirty areas, and decontamination unit (clean room, shower room, equipment room, storage areas such as load-out unit);

c. Initial exposure assessment in accordance with 29 CFR 1926.1101;

d. Level of supervision;

e. Method of notification of other employers at the worksite;

f. Abatement method to include containment and control procedures;

g. Interface of trades;

h. Sequencing of asbestos related work;

i. Storage and disposal procedures and plan;

j. Type of wetting agent and asbestos encapsulant;

k. Location of local exhaust equipment;

l. Air monitoring methods (personal, environmental and clearance);

m. Bulk sampling and analytical methods (if required);

n. A detailed description of the method to be employed in order to control the spread of ACM wastes and airborne fiber;

o. Fire and medical emergency response procedures;

p. The security procedures to be used for all regulated areas.

1.6.2 Activity Hazard Analyses Appendix

AHAs for each major phase of work, shall be submitted and updated during the project. The AHAs format shall be in accordance with Figure 1-2 of EM 385-1-1. The analysis shall define the activities to be performed for a major phase of work, identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the AHA has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the onsite Government representatives. The AHAs shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations.

1.6.3 Local Exhaust System

Local exhaust units shall conform to ASSE Z9.2 and 29 CFR 1926.1101. Filters on local exhaust system equipment shall conform to ASSE Z9.2 and UL 586. Filter shall be UL labeled. Submit pressure differential recordings and Manufacturer's certifications showing compliance with ASSE Z9.2 for:

a. Vacuums.

b. Water filtration equipment.
c. Ventilation equipment.
d. Other equipment required to contain airborne asbestos fibers.

1.7 SECURITY

Fenced and locked security area shall be provided for each regulated area. A log book shall be kept documenting entry into and out of the regulated area. Entry into regulated areas shall only be by personnel authorized by the Contractor and the CO. Personnel authorized to enter regulated areas shall be trained, medically evaluated, and wear the required personal protective equipment.

1.7.1 Licenses, Permits and Notifications

Obtain necessary licenses, permits and notifications in conjunction with the project's asbestos abatement, transportation and disposal actions and timely notification furnished of such actions as required by federal, state, regional, and local authorities. Notify the Regional Office of the USEPA state's environmental protection agency responsible for asbestos air emissions local air pollution control district/agency state OSHA program and the CO in writing, at least 10 days prior to the commencement of work, in accordance with 40 CFR 61, Subpart M, and state and local requirements to include the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents. Notify by Certified Mail, Return Receipt Requested. Furnish copies of the receipts to the CO, in writing, prior to the commencement of work. Notify the local fire department 3 days before fireproofing material is removed from a building and the notice shall specify whether or not the material contains asbestos. The Contractor is responsible for the associated fees/costs for licenses, permits, and notifications.

1.7.2 Regulated Areas

All Class I, II, and III asbestos work shall be conducted within regulated areas. The regulated area shall be demarcated to minimize the number of persons within the area and to protect persons outside the area from exposure to airborne asbestos. Control access to regulated areas, ensure that only authorized personnel enter, and verify that Contractor required medical surveillance, training and respiratory protection program requirements are met prior to allowing entrance.

1.7.3 Warning Signs and Tape

Warning signs and tape printed bilingually in English and Spanish shall be provided at the regulated boundaries and entrances to regulated areas. Signs shall be located to allow personnel to read the signs and take the necessary protective steps required before entering the area. Warning signs, and displaying the following legend in the lower panel:

DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY
WEAR RESPIRATORY PROTECTION
AND PROTECTIVE CLOTHING IN THIS AREA

1.7.4 Warning Labels

Warning labels shall be affixed to all asbestos disposal containers, asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements are acceptable.

1.8 MEDICAL SURVEILLANCE REQUIREMENTS

Medical surveillance requirements shall conform to 29 CFR 1926.1101. Asbestos workers shall be enrolled in a medical surveillance program that meets 29 CFR 1926.1101 (m) requirements and other pertinent state or local requirements. This requirement shall have been satisfied within the last 12 months. Submit required medical certification and the Physician's written opinion.

1.8.1 Respiratory Protection Program

The Contractor shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134. The Contractor shall establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations.

1.8.2 Respiratory Fit Testing

The Contractor shall conduct a qualitative or quantitative fit test conforming to Appendix A of 29 CFR 1910.134 for each worker required to wear a respirator, and any authorized visitors who enter a regulated area where respirators are required to be worn. A respirator fit test shall be performed prior to initially wearing a respirator and every 12 months thereafter. If physical changes develop that will affect the fit, a new fit test shall be performed. Functional fit checks shall be performed each time a respirator is put on and in accordance with the manufacturer's recommendation.

1.8.3 Respirator Selection and Use Requirements

Provide respirators, and ensure that they are used as required by 29 CFR 1926.1101 and in accordance with CGA G-7 and the manufacturer's recommendations. Respirators shall be approved by the National Institute for Occupational Safety and Health NIOSH, under the provisions of 42 CFR 84, for use in environments containing airborne asbestos fibers. The initial respirator selection and the decisions regarding the upgrading or downgrading of respirator type shall be made by the Contractor's Designated IH based on the measured or anticipated airborne asbestos fiber concentrations to be encountered.

1.8.4 Personal Protective Equipment

Three complete sets of personal protective equipment shall be made available to the CO and authorized visitors for entry to the regulated area. The CO and authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of personal protective equipment and the site safety and health requirements. Provide workers with personal protective clothing and equipment and ensure that it is worn properly. The Designated IH and Designated Competent Person shall select and approve all the required personal protective clothing and equipment.

1.8.5 Whole Body Protection

Personnel exposed to or having the potential to be exposed to airborne concentrations of asbestos that exceed the PELs, or for all OSHA Classes of work for which a required negative exposure assessment is not produced, shall be provided with whole body protection and such protection shall be worn properly. Disposable whole body protection shall be disposed of as asbestos contaminated waste upon exiting from the regulated area. Reusable whole body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the regulated area or be properly laundered in accordance with 29 CFR 1926.1101. The Contractor's Designated Competent Person, in consultation with the Designated IH, has the authority to take immediate action to upgrade or downgrade whole body protection when there is an immediate danger to the health and safety of the wearer.

1.8.5.1 Coveralls

Disposable-breathable coveralls with a zipper front shall be provided. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles.

1.8.5.2 Gloves

Gloves shall be provided to protect the hands where there is the potential for hand injuries (i.e., scrapes, punctures, cuts, etc.).

1.8.5.3 Foot Coverings

Cloth socks shall be provided and worn next to the skin. Footwear, as required by OSHA and EM 385-1-1, that is appropriate for safety and health hazards in the area shall be worn. Reusable footwear removed from the regulated area shall be thoroughly decontaminated or disposed of as ACM waste.

1.8.5.4 Head Covering

Hood type disposable head covering shall be provided. In addition, protective head gear (hard hats) shall be provided as required. Hard hats shall only be removed from the regulated area after being thoroughly decontaminated.

1.8.5.5 Protective Eye Wear

Eye protection shall be provided, when operations present a potential eye injury hazard, and shall meet the requirements of ANSI/ISEA Z87.1.

1.9 HYGIENE

Establish a decontamination area for the decontamination of employees, material and equipment. Ensure that employees enter and exit the regulated area through the decontamination area.

1.9.1 3-Stage Decontamination Area

A temporary decontamination unit that is adjacent and attached in a leak-tight manner to the regulated area shall be provided. The decontamination unit shall have an equipment room and a clean room separated by a shower that complies with 29 CFR 1910.141, unless the

Contractor can demonstrate that such facilities are not feasible. Equipment and surfaces of containers filled with ACM shall be cleaned prior to removing them from the equipment room or area. Two separate lockers shall be provided for each asbestos worker, one in the equipment room and one in the clean room. Wastewater shall be collected and filtered to remove asbestos contamination. Filters and residue shall be disposed of as asbestos contaminated material Filtered water shall be discharged to the sanitary sewer system. Wastewater filters shall be installed in series with the first stage pore size of 20 microns and the second stage pore size of 5 microns. The floor of the decontamination unit's clean room shall be kept dry and clean at all times. Proper housekeeping and hygiene requirements shall be maintained. Soap and towels shall be provided for showering, washing and drying. Any cloth towels provided shall be disposed of as ACM waste or shall be laundered in accordance with 29 CFR 1926.1101.

1.9.2 Load-Out Unit

A temporary load-out unit that is adjacent and connected to the regulated area shall be provided . The load-out unit shall be attached in a leak-tight manner to each regulated area.

1.9.3 Single Stage Decontamination Area

A decontamination area (equipment room/area) shall be provided for Class I work involving less than 25 feet or 10 square feet of TSI or surfacing ACM, and for Class II and Class III asbestos work operations where exposures exceed the PELs or where there is no negative exposure assessment. The equipment room or area shall be adjacent to the regulated area for the decontamination of employees, material, and their equipment which could be contaminated with asbestos. The area shall be covered by an impermeable drop cloth on the floor or horizontal working surface. The area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area.

1.9.4 Decontamination Area Exit Procedures

Ensure that the following procedures are followed:

a. Before leaving the regulated area, remove all gross contamination and debris from work clothing using a HEPA vacuum.

b. Employees shall remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers for disposal and/or laundering.

c. Employees shall not remove their respirators until showering.

d. Employees shall shower prior to entering the clean room. If a shower has not been located between the equipment room and the clean room or the work is performed outdoors, ensure that employees engaged in Class I asbestos jobs: a) Remove asbestos contamination from their work suits in the equipment room or decontamination area using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area; or b) Remove their contaminated work suits in the equipment room, without cleaning worksuits, and proceed to a shower that is not adjacent to the work area.

1.9.5 Smoking

Smoking, if allowed by the Contractor, shall only be permitted in designated areas approved by the CO.

1.10 TRAINING PROGRAM

Establish and submit a training program as specified by EPA MAP, training requirements at 40 CFR 763, OSHA requirements at 29 CFR 1926.1101 (k)(9). Contractor employees shall complete the required training for the type of work they are to perform and such training shall be documented and provided to the CO.

a. Class I and II operations 32 hours Asbestos Worker Training
b. Class II generic removal 8 hour Asbestos Worker Training
c. Class III operations 16 hour O & M Training

Prior to commencement of work the Contractor's Designated IH and Competent Person shall instruct each worker about:

a. The hazards and health effects of the specific types of ACM to be abated; and

b. The content and requirements of the Contractor's APP to include the AHAP and AHAs and site-specific safety and health precautions.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent. Submit certificates stating that encapsulants meet the applicable specified performance requirements.

2.2 EXPENDABLE SUPPLIES

2.2.1 Glovebag

Glovebags shall be provided as described in 29 CFR 1926.1101 . The glovebag assembly shall be 6 mil thick plastic, prefabricated and seamless at the bottom with preprinted OSHA warning label.

2.2.2 Duct Tape

Industrial grade duct tape of appropriate widths suitable for bonding sheet plastic and disposal container.

2.2.3 Disposal Containers

Leak-tight (defined as solids, liquids, or dust that cannot escape or spill out) disposal containers shall be provided for ACM wastes as required by 29 CFR 1926.1101 . Disposal containers can be in the form of:

a. Disposal Bags

b. Fiberboard Drums

c. Cardboard Boxes

2.2.4 Sheet Plastic

Sheet plastic shall be polyethylene of 6 mil minimum thickness and shall be provided in the largest sheet size necessary to minimize seams Film shall be clear, frosted or black and conform to ASTM D4397, except as specified below:

2.2.4.1 Flame Resistant

Where a potential for fire exists, flame-resistant sheets shall be provided. Film shall be frosted or black and shall conform to the requirements of NFPA 701.

2.2.4.2 Reinforced

Reinforced sheets shall be provided where high skin strength is required, such as where it constitutes the only barrier between the regulated area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between 2 layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

2.2.5 Mastic Removing Solvent

Mastic removing solvent shall be nonflammable and shall not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used onsite shall have a flash point greater than 140 degrees F.

2.2.6 Leak-tight Wrapping

Two layers of 6 mil minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags. Upon placement of the ACM component or material, each layer shall be individually leak-tight sealed with duct tape.

2.2.7 Viewing Inspection Window

Where feasible, a minimum of 1 clear, 1/8 inch thick, acrylic sheet, 18 by 24 inches, shall be installed as a viewing inspection window at eye level on a wall in each containment enclosure. The windows shall be sealed leak-tight with industrial grade duct tape.

2.2.8 Wetting Agents

Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM greater than or equal to that provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS above.

2.2.9 Strippable Coating

Strippable coating in aerosol cans shall be used to adhere to surfaces and to be removed cleanly by stripping, at the completion of work.

2.3 EQUIPMENT

2.3.1 Scales

Scales used for measurement shall be public scales. Weighing shall be at a point nearest the work at which a public scale is available. Scales shall be standard truck scales of the beam type; scales shall be equipped with the type registering beam and an "over and under" indicator; and shall be capable of accommodating the entire vehicle. Scales shall be tested, approved and sealed by an inspector of the State of Nevada. Scales shall be calibrated and resealed as often as necessary and at least once every three months to ensure continuous accuracy. Vehicles used for hauling ACM shall be weighed empty daily at such time as directed and each vehicle shall bear a plainly legible identification mark.

2.3.2 Tools

Vacuums shall be equipped with HEPA filters, of sufficient capacity and necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system. Reusable tools shall be thoroughly decontaminated prior to being removed from regulated areas.

2.3.3 Rental Equipment

If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment.

2.3.4 Air Monitoring Equipment

The Contractor's Designated IH shall approve air monitoring equipment. The equipment shall include, but shall not be limited to:

a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to 16 liters per minute.

b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute, and a self-contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours. The pumps shall also be equipped with an automatic flow control unit which shall maintain a constant flow, even as filter resistance increases due to accumulation of fiber and debris on the filter surface.

c. Single use standard 25 mm diameter cassette, open face, 0.8 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive extension cowl, and shrink bands for personal air sampling.

d. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 4 to plus 140 degrees F and traceable to a NIST primary standard.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Asbestos abatement work tasks shall be performed as summarized in the scope of work. Use the engineering controls and work practices required in 29 CFR 1926.1101(g) in all operations regardless of the levels of exposure. Personnel shall wear and utilize protective clothing and equipment. Do not permit eating, smoking, drinking, chewing or applying cosmetics in the regulated area. Personnel of other trades, shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions of the Contractor's APP are complied with. Power to the regulated area shall be locked-out and tagged in accordance with 29 CFR 1910.147, and temporary electrical service with ground fault circuit interrupters shall be provided as needed. Temporary electrical service shall be disconnected when necessary for wet removal. Stop abatement work in the regulated area immediately when the airborne total fiber concentration: (1) equals or exceeds 0.01 f/cc, or the pre-abatement concentration, whichever is greater, outside the regulated area; or (2) equals or exceeds 1.0 f/cc inside the regulated area. Correct the condition to the satisfaction of the CO, including visual inspection and air sampling. Work shall resume only upon notification by the CO. Corrective actions shall be documented.

3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

Perform asbestos abatement without damage to or contamination of adjacent work or area. Where such work or area is damaged or contaminated, it shall be restored to its original condition or decontaminated at no expense to the Government. When spills occur, work shall stop in all effected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and air sampling analysis results are obtained and have been evaluated by the Contractor's Designated IH and the CO, work shall proceed.

3.3 OBJECTS

3.3.1 Stationary Objects

Stationary objects, furniture and equipment shall remain in place and shall be precleaned using HEPA vacuum followed by adequate wet wiping. Stationary objects and furnishings shall be covered with 2 layers of polyethylene and edges sealed with duct tape.

3.4 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

Building ventilation system supply and return air ducts in a regulated area shall be isolated by airtight seals to prevent the spread of contamination throughout the system. The airtight seals shall consist of 2 layers of polyethylene. Edges to wall, ceiling and floor surfaces shall be sealed with industrial grade duct tape.

3.5 METHODS OF COMPLIANCE

3.5.1 Mandated Practices

The specific abatement techniques and items identified shall be detailed in the Contractor's AHAP. Use the following engineering controls and work practices in all operations, regardless of the levels of exposure:

a. Vacuum cleaners equipped with HEPA filters.

b. Wet methods or wetting agents except where it can be demonstrated that the use of wet methods is unfeasible due to the creation of electrical hazards, equipment malfunction, and in roofing.

c. Prompt clean-up and disposal.

d. Inspection and repair of polyethylene.

e. Cleaning of equipment and surfaces of containers prior to removing them from the equipment room or area.

3.5.2 Control Methods

Use the following control methods:

a. Local exhaust ventilation equipped with HEPA filter;

b. Enclosure or isolation of processes producing asbestos dust;

c. Where the feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PELs, use them to reduce employee exposure to the lowest levels attainable and shall supplement them by the use of respiratory protection.

3.5.3 Unacceptable Practices

The following work practices shall not be used:

a. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.

b. Compressed air used to remove asbestos containing materials, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

c. Dry sweeping, shoveling, or other dry clean up.

d. Employee rotation as a means of reducing employee exposure to asbestos.

3.5.4 Class I Work Procedures

In addition to requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

a. A Competent Person shall supervise the installation and operation of the control methods.

b. For jobs involving the removal of more than 25 feet or 10 square feet of TSI or surfacing material, place critical barriers over all openings to the regulated area.

c. HVAC systems shall be isolated in the regulated area by sealing with a double layer of plastic or air-tight rigid covers.

d. Impermeable dropcloths (6 mil or greater thickness) shall be placed on surfaces beneath all removal activity.

e. Where a negative exposure assessment has not been provided or where exposure monitoring shows the PEL was exceeded, the regulated area shall be ventilated with a HEPA unit and employees must use PPE.

3.5.5 Specific Control Methods for Class I Work

3.5.5.1 Negative Pressure Enclosure (NPE) System

The NPE system shall provide at least 4 air changes per hour inside the containment. The local exhaust unit equipment shall be operated 24 hours per day until the containment is removed. The NPE shall be smoke tested for leaks at the beginning of each shift and be sufficient to maintain a minimum pressure differential of minus 0.02 inch of water column relative to adjacent, unsealed areas. Pressure differential shall be monitored continuously, 24 hours per day, with an automatic manometric recording instrument and Records shall be provided daily on the same day collected to the CO. The CO shall be notified immediately if the pressure differential falls below the prescribed minimum. The building ventilation system shall not be used as the local exhaust system for the regulated area. The NPE shall terminate outdoors unless an alternate arrangement is allowed by the CO. All filters used shall be new at the beginning of the project and shall be periodically changed as necessary and disposed of as ACM waste.

3.5.5.2 Glovebag Systems

Glovebags shall be used without modification, smoke-tested for leaks, and completely cover the circumference of pipe or other structures where the work is to be done. Glovebags shall be used only once and shall not be moved. Glovebags shall not be used on surfaces that have temperatures exceeding 150 degrees F. Prior to disposal, glovebags shall be collapsed using a HEPA vacuum. Before beginning the operation, loose and friable material adjacent to the glovebag operation shall be wrapped and sealed in 2 layers of plastic or otherwise rendered intact. At least 2 persons shall perform glovebag removal. Designated boundary limits for the asbestos work shall be established with rope or other continuous barriers and all other requirements for asbestos control areas shall be maintained, including area signage and boundary warning tape .

a. Attach HEPA vacuum systems to the bag to prevent collapse during removal of ACM.

b. The negative pressure glove boxes shall be fitted with gloved apertures and a bagging outlet and constructed with rigid sides from metal or other material which can withstand the weight of the ACM and water used during removal. A negative pressure shall be created in the system using a HEPA filtration system. The box shall be smoke tested for leaks prior to each use.

3.5.5.3 Wrap and Cut Operation

Prior to cutting pipe, the asbestos-containing insulation shall be wrapped with polyethylene and securely sealed with duct tape to prevent asbestos becoming airborne as a result of the cutting process. The following steps shall be taken: install glovebag, strip back sections to be cut 6 inches from point of cut, and cut pipe into manageable sections.

3.5.6 Class II Work

In addition to the requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

a. A Competent Person shall supervise the work.

b. For indoor work, critical barriers shall be placed over all openings to the regulated area.

c. Impermeable dropcloths shall be placed on surfaces beneath all removal activity.

3.5.7 Specific Control Methods for Class II Work

3.5.7.1 Vinyl and Asphalt Flooring Materials

When removing vinyl and asphalt flooring materials which contain ACM , use the following practices. Resilient sheeting shall be removed by adequately wet methods. Tiles shall be removed intact (if possible); wetting is not required when tiles are heated and removed intact. Flooring or its backing shall not be sanded. Scraping of residual adhesive and/or backing shall be performed using wet methods. Mechanical chipping is prohibited unless performed in a negative pressure enclosure. Dry sweeping is prohibited. Use vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) to clean floors.

3.5.7.2 Roofing Material

When removing roofing materials which contain ACM as described in 29 CFR 1926.1101(g)(8)(ii), use the following practices . Roofing material shall be removed in an intact state. Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards. When removing built-up roofs, with asbestos-containing roofing felts and an aggregate surface, using a power roof cutter, all dust resulting from the cutting operations shall be collected by a HEPA dust collector, or shall be HEPA vacuumed by vacuuming along the cut line. Asbestos-containing roofing material shall not be dropped or thrown to the ground, but shall be lowered to the ground via covered, dust-tight chute, crane, hoist or other method approved by the CO. Any ACM that is not intact shall be lowered to the ground as soon as practicable, but not later than the end of the work shift. While the material remains on the roof it shall be kept wet or placed in an impermeable waste bag or wrapped in plastic sheeting. Intact ACM shall be lowered to the ground as soon as practicable, but not later than the end of the work shift. Unwrapped material shall be transferred to a closed receptacle. Critical barriers shall be placed over roof level heating and ventilation air intakes.

3.5.7.3 Cementitious Siding and Shingles or Transite Panels

When removing cementitious asbestos-containing siding, shingles or transite panels use the following work practices . Intentionally cutting, abrading or breaking is prohibited. Each panel or shingle shall be sprayed with amended water prior to removal. Nails shall be cut with flat, sharp instruments. Unwrapped or unbagged panels or shingles shall be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and

lowered to the ground no later than the end of the work shift.

3.5.7.4 Gaskets

Gaskets shall be thoroughly wetted with amended water prior to removal and immediately placed in a disposal container. If a gasket is visibly deteriorated and unlikely to be removed intact, removal shall be undertaken within a glovebag. Any scraping to remove residue shall be performed wet.

3.5.8 Specific Control Methods for Class III Work

Class III asbestos work shall be conducted using engineering and work practice controls which minimize the exposure to employees performing the asbestos work. The work shall be performed using wet methods and, to the extent feasible, using local exhaust. Use impermeable drop cloths and shall isolate the operation, using mini-enclosures or glovebag systems, where the disturbance involves drilling, cutting, abrading, sanding, chipping, breaking, or sawing of TSI or surfacing material.

3.5.9 Specific Control Methods for Class IV Work

Class IV jobs shall be conducted using wet methods and HEPA vacuums. Employees cleaning up debris and waste in a regulated area where respirators are required shall wear the selected respirators.

3.5.10 Sealing Contaminated Items Designated for Disposal

Contaminated items designated for removal shall be coated with an asbestos lockdown encapsulant before being removed from the asbestos control area. The asbestos lockdown encapsulant shall be tinted a contrasting color and shall be spray applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces.

3.6 FINAL CLEANING AND VISUAL INSPECTION

After completion of all asbestos removal work and the gross amounts of asbestos have been removed from every surface, any remaining visible accumulations of asbestos shall be collected. For all classes of indoor asbestos abatement projects a final cleaning shall be performed using HEPA vacuum and wet cleaning of all exposed surfaces and objects in the regulated area. Upon completion of the cleaning, conduct a visual pre-inspection of the cleaned area in preparation for a final inspection before final air clearance monitoring. The Contractor and the CO shall conduct a final visual inspection of the cleaned regulated area in accordance with ASTM E1368 and document the results . If the CO rejects the clean regulated area as not meeting final cleaning requirements, reclean as necessary and have a follow-on inspection conducted with the CO. Recleaning and follow-up reinspection shall be at the Contractor's expense.

3.7 LOCKDOWN

Prior to removal of plastic barriers and after final visual inspection, a (lockdown) encapsulant shall be spray applied to ceiling, walls, floors, and other surfaces in the regulated area.

3.8 EXPOSURE ASSESSMENT AND AIR MONITORING

3.8.1 General Requirements

a. Exposure assessment, air monitoring and analysis of airborne concentration of asbestos fibers shall be performed in accordance with 29 CFR 1926.1101, and the Contractor's air monitoring plan. Results of breathing zone samples shall be posted at the job site and made available to the CO. Submit all documentation regarding initial exposure assessments, negative exposure assessments, and air-monitoring results.

b. Worker Exposure.

(1) The Contractor's Designated IH shall collect samples representative of the exposure of each employee who is assigned to work within a regulated area. Breathing zone samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of 2, whichever is greater. Air monitoring results at the 95 percent confidence level shall be calculated as shown in Table 2 at the end of this section.

(2) Workers shall not be exposed to an airborne fiber concentration in excess of 1.0 f/cc, as averaged over a sampling period of 30 minutes. Should a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside a regulated work area, stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Do not restart work until authorized by the CO.

c. Environmental Exposure

(1) All environmental air monitoring shall be performed by the Contractor's Designated IH .

(2) Environmental and final clearance air monitoring shall be performed using NIOSH 2003-154 Method 7400 (PCM) with optional confirmation of results by TEM.

(3) For environmental and final clearance, air monitoring shall be conducted at a sufficient velocity and duration to establish the limit of detection of the method used at 0.005 f/cc.

(4) When confirming asbestos fiber concentrations (asbestos f/cc) from environmental and final clearance samples, use TEM in accordance with NIOSH 2003-154 Method 7402. When such confirmation is conducted, it shall be from the same sample filter used for the NIOSH 2003-154 Method 7400 PCM analysis. All confirmation of asbestos fiber concentrations, using NIOSH 2003-154 Method 7402, shall be at the Contractor's expense.

(5) Monitoring may be duplicated by the Government at the discretion of the CO and at the Government's expense.

(6) Maintain a fiber concentration inside a regulated area less than or equal to 0.1 f/cc expressed as an 8 hour, time-weighted average (TWA) during the conduct of the asbestos abatement.

(7) At the discretion of the Contracting Officer, fiber concentration may exceed 0.1 f/cc but shall not exceed 1.0 f/cc expressed as an 8-hour TWA. Should an environmental concentration of 1.0 f/cc expressed as an 8-hour TWA occur inside a regulated work area, stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the CO.

3.8.2 Initial Exposure Assessment

The Contractor's Designated IH shall conduct an exposure assessment immediately before or at the initiation of an asbestos abatement operation to ascertain expected exposures during that operation. The assessment shall be completed in time to comply with the requirements, which are triggered by exposure data or the lack of a negative exposure assessment, and to provide information necessary to assure that all control systems planned are appropriate for that operation. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the Contractor which indicate the levels of airborne asbestos likely to be encountered on the job. For Class I asbestos work, until the employer conducts exposure monitoring and documents that employees on that job will not be exposed in excess of PELs, or otherwise makes a negative exposure assessment, presume that employees are exposed in excess of the PEL-TWA and PEL-Excursion Limit.

3.8.3 Negative Exposure Assessment

Provide a negative exposure assessment for the specific asbestos job which will be performed within 3 days of the initiation of the project and conform to the following criteria:

a. Prior Asbestos Jobs: Where the Contractor has monitored prior asbestos jobs for the PEL and the PEL-Excursion Limit within 12 months of the current job, the monitoring and analysis were performed in compliance with asbestos standard in effect; the data were obtained during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations; the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job; and these data show that under the conditions prevailing and which will prevail in the current workplace, there is a high degree of certainty that the monitoring covered exposure from employee exposures will not exceed the PEL-TWA and PEL-Excursion Limit.

b. Initial Exposure Monitoring: The results of initial exposure monitoring of the current job, made from breathing zone air samples that are representative of the 8-hour PEL-TWA and 30-minute short-term exposures of each employee. The monitoring covered exposure from operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

3.8.4 Environmental Air Monitoring During Abatement

Until an exposure assessment is provided to the CO, environmental air monitoring shall be conducted at locations and frequencies that will accurately characterize any evolving airborne asbestos fiber concentrations. The assessment shall demonstrate that the product or material containing asbestos minerals, or the abatement involving such product or material, cannot release airborne asbestos fibers in concentrations exceeding 0.01 f/cc as a TWA under those work conditions having the greatest potential for releasing asbestos. The monitoring shall be at least once per shift at locations including, but not limited to, close to the work inside a regulated area; preabatement sampling locations; outside entrances to a regulated area; close to glovebag operations; representative locations outside of the perimeter of a regulated area; inside clean room; and at the exhaust discharge point of local exhaust system ducted to the outside of a containment (if used). If the sampling outside regulated area shows airborne fiber levels have exceeded background or 0.01 f/cc, whichever is greater, work shall be stopped immediately, and the Contracting Officer notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the CO.

3.8.5 Air-Monitoring Results and Documentation

Air sample fiber counting shall be completed and results provided within 24 hours (breathing zone samples), and 48 hours (environmental/clearance monitoring) after completion of a sampling period. The CO shall be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results shall be provided within 5 working days of the date of collection. The written results shall be signed by testing laboratory analyst, testing laboratory principal and the Contractor's Designated IH . The air sampling results shall be documented on a Contractor's daily air monitoring log. The daily air monitoring log shall contain the following information for each sample:

a. Sampling and analytical method used;

b. Date sample collected;

c. Sample number;

d. Sample type: BZ = Breathing Zone (Personal), P = Preabatement, E = Environmental, C = Abatement Clearance;

e. Location/activity/name where sample collected;

f. Sampling pump manufacturer, model and serial number, beginning flow rate, end flow rate, average flow rate (L/min);

g. Calibration date, time, method, location, name of calibrator, signature;

h. Sample period (start time, stop time, elapsed time (minutes);

i. Total air volume sampled (liters);

j. Sample results (f/cc and S/mm square) if EPA methods are required for final clearance;

k. Laboratory name, location, analytical method, analyst, confidence level. In addition, the printed name and a signature and date block

for the Industrial Hygienist who conducted the sampling and for the Industrial Hygienist who reviewed the daily air monitoring log verifying the accuracy of the information.

3.9 CLEARANCE CERTIFICATION

When asbestos abatement is complete, ACM waste is removed from the regulated areas, and final clean-up is completed, the CO will allow the warning signs and boundary warning tape to be removed. After final clean-up and acceptable airborne concentrations are attained, but before the HEPA unit is turned off and the containment removed, the Contractor shall remove all pre-filters on the building HVAC system and provide new pre-filters. Dispose of such filters as asbestos contaminated materials. HVAC, mechanical, and electrical systems shall be re-established in proper working order. The Contractor and the CO shall visually inspect all surfaces within the containment for residual material or accumulated debris. Reclean all areas showing dust or residual materials. The CO will certify in writing that the area is safe before unrestricted entry is permitted. The Government will have the option to perform monitoring to certify the areas are safe before entry is permitted.

3.10 CLEANUP AND DISPOSAL

3.10.1 Title to ACM Materials

ACM material resulting from abatement work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified and in accordance with applicable federal, state and local regulations.

3.10.2 Collection and Disposal of Asbestos

All ACM waste shall be collected including contaminated wastewater filters, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing and placed in leak-tight containers. Waste within the containers shall be wetted in case the container is breeched. Asbestos-containing waste shall be disposed of at an EPA, state and local approved asbestos landfill . For temporary storage, sealed impermeable containers shall be stored in an asbestos waste load-out unit or in a storage/transportation conveyance (i.e., dumpster, roll-off waste boxes, etc.) in a manner acceptable to and in an area assigned by the CO. Procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M, state, regional, and local standards. Submit manufacturer's catalog data for all materials and equipment to be used, including brand name, model, capacity, performance characteristics and any other pertinent information. Test results and certificates from the manufacturer of encapsulants substantiating compliance with performance requirements of this specification. Safety Data Sheets for all chemicals to be used onsite in the same format as implemented in the Contractor's HAZARD COMMUNICATION PROGRAM. Data shall include, but shall not be limited to, the following items:

a. High Efficiency Filtered Air (HEPA) local exhaust equipment

b. Vacuum cleaning equipment

c. Pressure differential monitor for HEPA local exhaust equipment

d. Air monitoring equipment

e. Respirators

f. Personal protective clothing and equipment

g. Glovebags. Written manufacturer's proof that glovebags will not break down under expected temperatures and conditions.

h. Duct Tape

i. Disposal Containers

j. Sheet Plastic

k. Wetting Agent

l. Strippable Coating

m. Prefabricated Decontamination Unit

n. Safety Data Sheets (for all chemicals proposed)

3.10.3 Records and Management Plan

3.10.3.1 Asbestos Waste Shipment Records

Complete and provide the CO final completed copies of the Waste Shipment Record for all shipments of waste material as specified in 40 CFR 61, Subpart M and other required state waste manifest shipment records, within 3 days of delivery to the landfill. Each Waste Shipment Record shall be signed and dated by the Contractor , the waste transporter and disposal facility operator.

3.10.3.2 Asbestos Management Plan

Provide a summary, in electronic form, of site activities (bulk samples, asbestos removed, repaired, encased, etc.) for updating the installation Asbestos Management Plan.

TABLE 2

FORMULA FOR CALCULATION OF THE 95 PERCENT CONFIDENCE LEVEL
(Reference: NIOSH 7400)

Fibers/cc(01.95 percent CL) = X + {(X) * (1.645) * (CV)}

Where: X = ((E)(AC))/((V)(1000))

E = ((F/Nf) - (B/Nb))/Af

CV = The precision value; 0.45 shall be used unless the analytical laboratory provides the Contracting Officer with documentation (Round Robin Program participation and results) that the laboratory's precision is better.

AC = Effective collection area of the filter in square millimeters

V = Air volume sampled in liters

E = Fiber density on the filter in fibers per square millimeter

F/Nf = Total fiber count per graticule field

B/Nb = Mean field blank count per graticule field

Af = Graticule field area in square millimeters

TWA = C1/T1 + C2/T2 = Cn/Tn

Where: C = Concentration of contaminant

T = Time sampled.

TABLE 3
NIOSH METHOD 7400
PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NON-PERSONAL)

Sample Location	Minimum No. of Samples	Filter Pore Size (Note 1)	Min. Vol. (Note 2) (Liters)	Sampling Rate (liters/min.
Inside Abatement Area	0.5/140 Square Meters (Notes 3 & 4)	0.45 microns	3850	2-16
Each Room in 1 Abatement Area Less than 140 Square meters		0.45 microns	3850	2-16
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:
1. Type of filter is Mixed Cellulose Ester.
2. Ensure detection limit for PCM analysis is established at 0.005 fibers/cc.
3. One sample shall be added for each additional 140 square meters. (The corresponding I-P units are 5/1500 square feet).
4. A minimum of 5 samples are to be taken per abatement area, plus 2 field blanks.

TABLE 4
EPA AHERA METHOD: TEM AIR SAMPLING PROTOCOL

Location Sampled	Minimum No. of Samples	Filter Pore Size	Min. Vol. (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	5	0.45 microns	1500	2-16
Outside Abatement Area	5	0.45 microns	1500	2-16
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:
1. Type of filter is Mixed Cellulose Ester.
2. The detection limit for TEM analysis is 70 structures/square mm.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____ CONTRACT NO. _____
PROJECT ADDRESS _____
CONTRACTOR FIRM NAME _____
EMPLOYEE'S NAME _____,_____,_____,
(Print) (Last) (First) (MI)

Social Security Number: _____-_____-_____,__(Optional)

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that you be provided and you complete formal asbestos training specific to the type of work you will perform and project specific training; that you be supplied with proper personal protective equipment including a respirator, that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you. The Contractor's Designated Industrial Hygienist will check the block(s) for the type of formal training you have completed. Review the checked blocks prior to signing this certification.

FORMAL TRAINING:
_____ a. For Competent Persons and Supervisors: I have completed EPA's Model Accreditation Program (MAP) training course, "Contractor/Supervisor", that meets this State's requirements.

b. For Workers:
_____ (1) For OSHA Class I work: I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (2) For OSHA Class II work (where there will be abatement of more than one type of Class II materials, i.e., roofing, siding, floor tile, etc.): I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
(3) For OSHA Class II work (there will only be abatement of one type of Class II material):
_____ (a) I have completed an 8-hour training class on the elements of 29 CFR 1926.1101(k)(9)(viii), in addition to the specific work practices and engineering controls of 29 CFR 1926.1101(g) and hands-on training.
_____ (b) I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (4) For OSHA Class III work: I have completed at least a 16-hour course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, Section .92(a)(2) and the elements of 29 CFR 1926.1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926.1101, and hands-on training.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

_____ (5) For OSHA Class IV work: I have completed at least a 2-hr course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, (a)(1), and the elements of 29 CFR 1926.1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926.1101(g) and hands-on training.

_____ c. Workers, Supervisors and the Designated Competent Person: I have completed annual refresher training as required by EPA's MAP that meets this State's requirements.

PROJECT SPECIFIC TRAINING:
_____ I have been provided and have completed the project specific training required by this Contract. My employer's Designated Industrial Hygienist and Designated Competent Person conducted the training.

RESPIRATORY PROTECTION:
_____ I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair and contact lens use policy of my employer.

RESPIRATOR FIT-TEST TRAINING:
_____ I have been trained in the proper selection, fit, use, care, cleaning, maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.

EPA/STATE CERTIFICATION/LICENSE

I have an EPA/State certification/license as:
Building Inspector/Management Planner; Certification #_____
Contractor/Supervisor, Certification # _____
Project Designer, Certification # _____
Worker, Certification # _____

MEDICAL EXAMINATION:
_____ I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made a determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's Industrial Hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

_____ were no limitations to performing the required work tasks.
_____ were identified physical limitations to performing the required work tasks.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

Date of the medical examination _____

Employee Signature _____ date _____

Contractor's Industrial
Hygienist Signature _____ date _____

-- End of Section --

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 9/20/2011

Nellis Work Order: 18180

Macrotec Job Number: 11853

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Check ceiling to install electrical.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building

Dustin R. McAllister
Nevada – OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Inspector
Certificate #NV-I-16781-1

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #11853 - WO #18180 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

1 Concrete Ceiling **No Asbestos Detected**

AB1	2nd Floor - Cubical Area - Center	None Detected

2 Spray Texture on Concrete Ceiling **No Asbestos Detected**

AB2	2nd Floor - Cubical Area - Center	None Detected
AB3	2nd Floor - Cubical Area - W End	None Detected
AB4	2nd Floor - Cubical Area - E End	None Detected

Macrotec
Consulting, LLC.

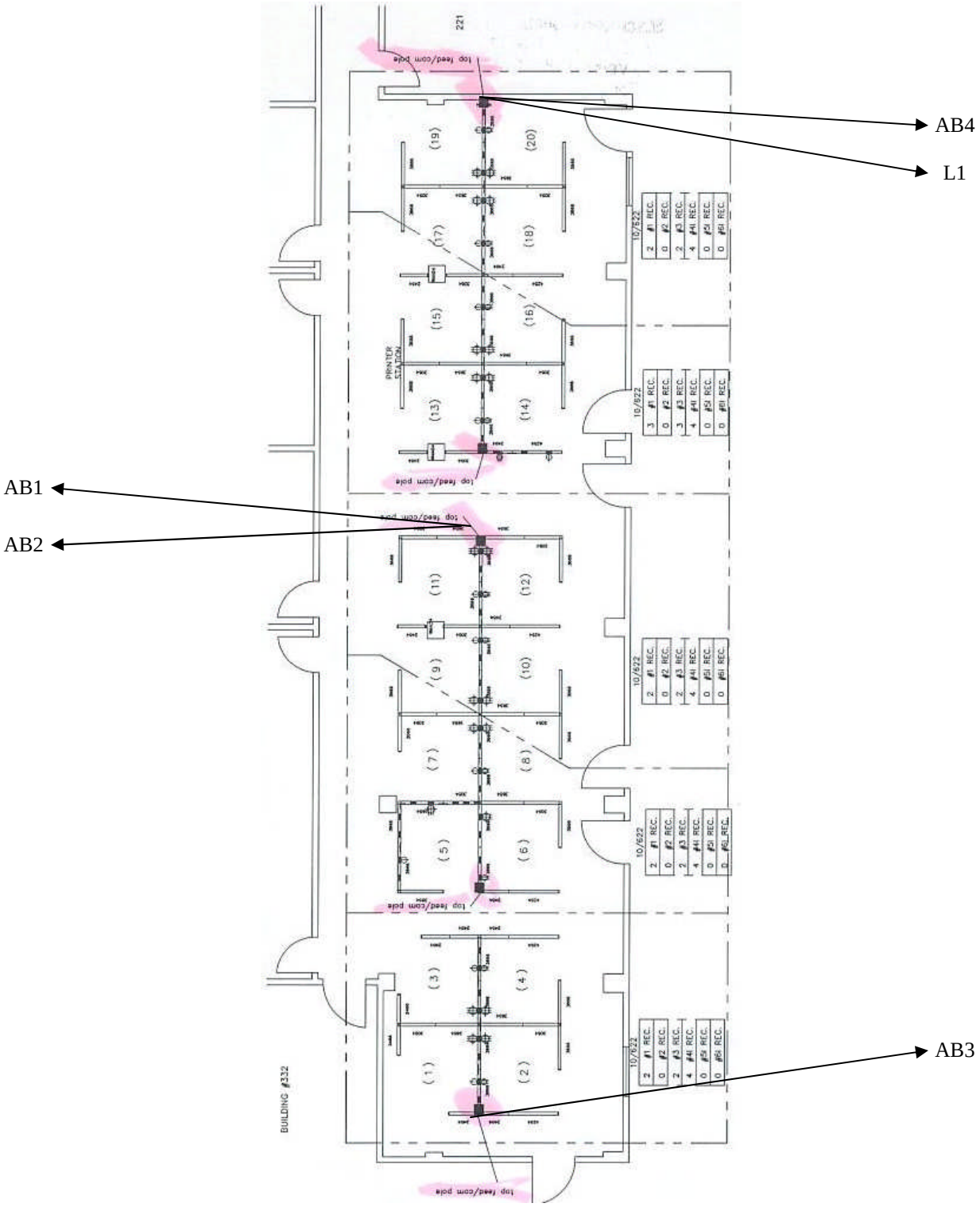
Appendix B - Lead Assessment

Macrotec Job #11853 - WO #18180 - Bldg. 332

The following table lists each of the painted surfaces suspected to contain lead at the subject site. For each painted surface, the sample number, location and laboratory result are listed.

Sample #	Painted Surface Description	Sample Location Description	Lab Result (Parts per Million)
L1	Lt. Blue Concrete Ceiling	2nd Floor - Cubical Area - W End	Below Reportable Limit

Sample Location Diagram



* Diagram Not Drawn To Scale

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110921B

DATE OF RECEIPT: 9/21/2011
DATE OF ANALYSIS: 9/21/2011
DATE OF REPORT: 9/21/2011

CLIENT JOB/ #: **11853**

JOB SITE: Bldg 332

ANALYST: F. Jiang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / Gray granular, white powder	**NAD**		100%
2	AB2 / White powder	**NAD**		100%
3	AB3 / White powder	**NAD**		100%
4	AB4 / White powder	**NAD**		100%

Total Samples/Layers Analyzed: 4

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA/600/R-93-116, July 1993 (EPA-600/M4-82-020, Dec 1982), or the current US EPA method for the analysis of asbestos in building material. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report must not be reproduced except in full with approval of Triangle Environmental Service Center, Inc. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[LEGEND NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

11UP213

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NELLIS
Project Number: 71853
Project Name:
Collection Date: 9/20/11
Project Location: BLDG 332
PO Number:
Technician: [illegible]
Turn Around Time: Rush
Laboratory: TEK
Method of Analysis: PLM
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
1	AS1	CONCRETE CEILING	2ND FLOOR - CUBICAL AREA - CENTER
2	AS2	SPRAY TEXTURE ON CONCRETE CEILING	↓ ↓ ↓
2	AS3	↓	↓ ↓ W END
2	AS4		↓ ↓ E

Relinquished By: [signature] Date: 9/20/11 Received By: [signature] Date: 9/21/11 11:20

Relinquished By: Date: Received By: Date:

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112 • 804-739-1751 • fax: 804-739-1753

LEAD IN PAINT SAMPLE ANALYSIS SUMMARY

(EPA METHOD 7420)

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110921C

DATE OF RECEIPT: 9/21/2011
DATE OF ANALYSIS: 9/21/2011
DATE OF REPORT: 9/21/2011

CLIENT JOB #: **11853**

JOBSITE: Bldg 332

ANALYST: S. Al-Johani

TESC SAMPLE #	CLIENT SAMPLE #	SAMPLE WEIGHT (mg)	TOTAL LEAD (ug)	LEAD CONCENTRATION (% by Weight)	LEAD CONCENTRATION PPM
1	L1	333	< 10.0	< 0.003	< 30

Total Sample(s) Analyzed: 1

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the customer. Sample information was provided by the customer. This report must not be reproduced, except in full,without the written consent of Triangle Environmental Service Center, Inc. The test report related only to the item(s) tested. This analysis was performed by an AHIA accredited laboratory. AIHA/ELLAP ID: 100527, NYELAP/NELAC ID: 11413.
Minimum Reporting Limit: 20 ug. Lead Based Paint contains 0.5% lead by weight per Federal statute. The OSHA Lead in Construction Standard, 29 CFR 1926.62, is invoked if any lead is present in the sample. Lead-free paint is defined as <0.06% by weight (CPSC).
[LEGEND: mg= milligram, ug= microgram, ppm= parts per million]

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

1109210

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NEILIS
Project Number: 11853
Project Name:
Collection Date: 9/20/11
Project Location: BLAG 332
PO Number:
Technician: [illegible]
Turn Around Time: Rush
Laboratory: TEL
Method of Analysis: AA FLAME
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix: PAINT CHIP.

Sample # H #	Sample # Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
–	21	LT. BLUE CONCRETE COLUMN	2ND FLOOR – CONCRETE AREA – W END

Relinquished By: [illegible] Date: 9/20/11
Received By: [illegible] Date: 9/21/11 10:30
Relinquished By: Date:
Received By: Date:

BASE CIVIL ENGINEER WORK REQUEST

(See Reverse for Instructions)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM *(Organization)*	2. OFFICE SYMBOL	3. DATE OF REQUEST	4. WORK REQUEST NO. *(For BCE Use)*
926 AMDS	SGA	20110722	18180

5. NAME AND PHONE NO. OF REQUESTER	6. REQUIRED COMPLETION DATE	7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED
TSGT LATEASHA GOINS 702 652-0968	20110722	BLDG 332

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED *(Include Sketch or Plan, when appropriate)*

Electrical work to tie in electrical feeds into cubicle. Please see attached

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED *(Not required for maintenance and repair)*

To provide electricity to cubicles. Please see attached.

10. DONATED RESOURCES

[X] FUNDS	[ ] LABOR	[ ] MATERIAL	[X] CONTRACT BY REQUESTER	[ ] NONE

11. NAME OF REQUESTER	12. GRADE OF REQUESTER	13. SIGNATURE OF REQUESTER *(See Reverse of Form)*
LaTeasha T. Goins	TSgt	

14. COORDINATION
99 CES/CEAO 8/11/11 TO
99 ABW/SE 11 AUG 11 ABW
99 CES/CEAO 11 AUG 11 VR
CEANP 11 Aug 11
Asbestos factory regd. LBP
11 Aug 11
99 CEAO

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER *(Place an "X" in the appropriate box.)*

[ ] IN-SERVICE	[ ] SELF-HELP	[ ] CONTRACT	[ ] SABER

16. DIRECT SCHEDULED WORK *(Place an "X" in the appropriate box.)*

[ ] EMERGENCY	[ ] URGENT	[ ] ROUTINE	[ ] SELF-HELP	[ ] M/C

17. SELF-HELP *(Place an "X" in the appropriate box.)*

[ ] BRIEFING REQUIRED	[ ] ADEQUATE COORDINATION	[ ] INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST

[✓] 23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2) A2.3.B	[ ] 24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED	[ ] 25. APPROVED	[X] 26. DISAPPROVED

27. REMARKS
IAW NFPA 70. - CE to inspect work after contractor completes work

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE *(Please Type or Print)*	29. SIGNATURE	30. DATE
Eddie Cain WS-15		19 Sep 2011

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos Hazard Inspection Report

Building Number: 332

Introduction:

On 9/22/2015, Jason R McAllister, a certified asbestos inspector for Macrotec Consulting, LLC., performed an inspection to identify the presence or absence of asbestos hazards in the mechanical room(s) of the building. Specifically, Macrotec inspected for the presence of asbestos containing Thermal System Insulation (TSI) and Surfacing Material and made a determination of the condition of these materials, if present. Note that this inspection is not a NESHAP inspection that would identify asbestos containing building materials for the purpose of renovating the rooms or components in the rooms.

No asbetos containing TSI or Surfacing Material were found in the mechanical room(s) of building 332. Please note that these materials and other suspect asbestos containing materials may be present in other areas of the building.

Building 332 Inspection Details:

There is a single mechanical room, which appears to have had a separating wall previously removed. Almost all of the copper pipes in the room were bare, potentially indicating a recent abatement. There is also a mechanical yard south of the building. No suspect TSI or SM were found in either location.

Report Limitations:

The information contained in this report pertains only to the specific rooms identified. Macrotec made an effort to identify and inspect each of the building's mechanical rooms, however there may be instances where they may have not been identified or been in high security rooms, etc. Building diagrams were not always provided and when they were, were sometimes out of date. Macrotec also noted if there are suspicions of, or visual evidence of suspect TSI or Surfacing Materials in areas other than the mechanical room, however, Macrotec cannot warrant that there are not additional suspect materials outside of the mechanical rooms identified. Only proper personnel should interpret this report to determine whether the information herein can be utilized.

Mechanical yard south of the building.

West side of the mechanical room with bare pipes throughout.

East side of the mechanical room with bare pipes and tank.

Bare pipes causing “sweating”. Suspect mold growth on the drywall walls.

Macrotec Consulting, LLC.

Appendix B - Assessment

Macrotec Job #15630 - Building 332

Combined Large Mechanical Room

No suspect TSI or surfacing material (SM) was found in this area.

No ACM Present : No Suspect TSI or SM to Sample :

Mechanical Yard

No suspect TSI or surfacing material (SM) was found in this area.

No ACM Present : No Suspect TSI or SM to Sample :

: :

: :

: :

Laboratory reports are attached with this report (if samples were collected). Please note that the primary purpose of this inspection was to determine the presence of TSI or Surfacing Material in the mechanical rooms/areas. Additional suspect asbestos containing TSI or Surfacing Material may be present in other rooms/areas of the building.

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 4/29/2016

Nellis Work Order: 25557

Macrotec Job Number: 16567

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Install projector in the ceiling of Room 113.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building

Dustin R. McAllister
Nevada-OSHA Certified Asbestos Abatement Consultant
License # IPM0961
US EPA Lead Risk Assessor
Certificate # NV-R-16781-2

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #16567 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

---

1 2X2 Ceiling Tile - **No Asbestos Detected**

This material is located on the ceiling of Room 113.

AB1	1st Floor - Room 113 - Center	None Detected

---

2 Concrete - Ceiling **No Asbestos Detected**

This material is located above the ceiling throughout the fist floor.

AB2	1st Floor - Room 113 - Center	None Detected

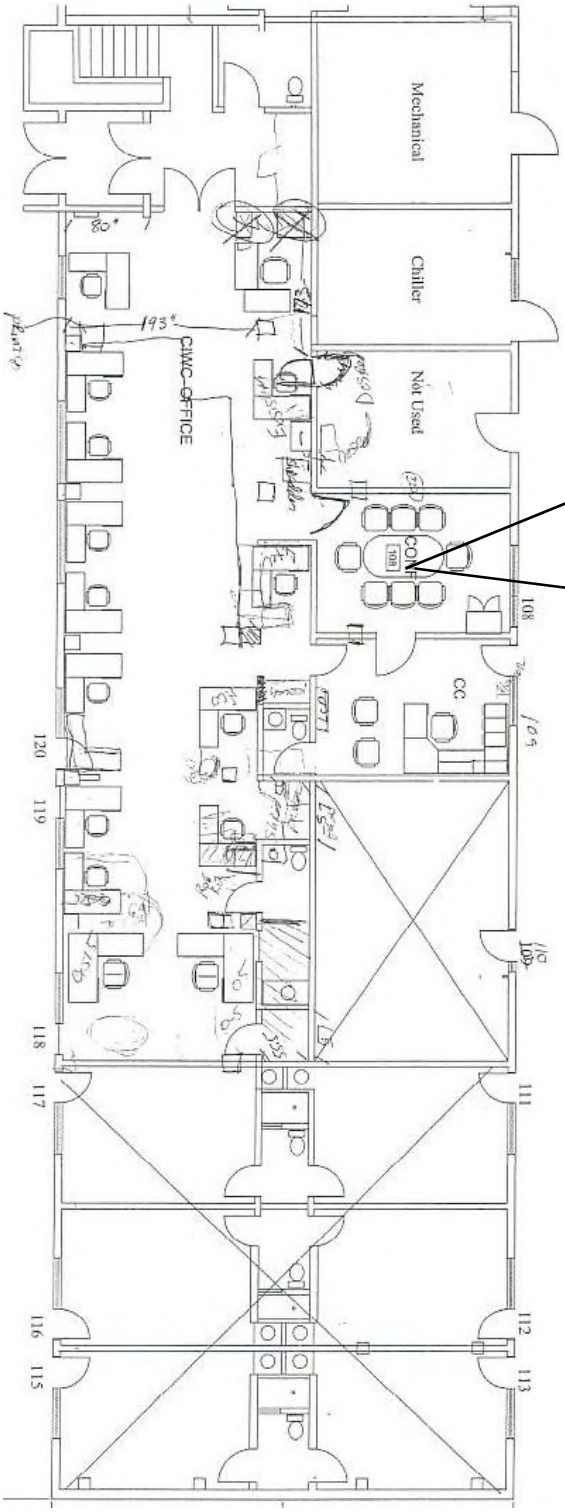
Macrotec
Consulting, LLC.

Appendix B - Lead Assessment

Macrotec Job #16567 - Bldg. 332

No suspect lead paint was identified during this investigation, based on the specific scope of work for the project. If suspect materials are found during renovation activities outside what was identified in this report, stop work immediately until further testing can be completed.

Sample Location Diagram



TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 160504K

DATE OF RECEIPT: 5/4/2016
DATE OF ANALYSIS: 5/4/2016
DATE OF REPORT: 5/4/2016

CLIENT JOB: **16567**

JOB SITE: WO#25557 - Bldg. 332

ANALYST: B.Trimmer

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / Gray fibers	**NAD**	85% Cellulose 10% Fiberglass	5%
2	AB2 / Gray granular	**NAD**	5% Cellulose	95%

Total Samples/Layers Analyzed: 2

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA 600/M4-82-020, Dec. 1982 and "Method for the Determination of Asbestos in Bulk Building Materials", EPA 600/R-93/116, July 1993. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report shall not be reproduced, except in full written approval of Triangle Environmental Service Center, Inc. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[**LEGEND** NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

160504K

office@macrotecconsulting.com

Macrotec Consulting, LLC

Phone: (702) 949-6225
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: Nellis

Project Number: 16567

Project Name: Bldg. 332

Collection Date: 4/29/2016

Project Location: WO #25557 - Bldg. 332

WO Number: 25557

Technician: Dustin R McAllister

Turn Around Time: 2 Day

Laboratory: TESC

Method of Analysis: PLM

Stop at 1st Positive?: Y / N Composite Wall Substrate?: Y / N Matrix: Bulk

Sample # H #	Sample # Count	Sample Description (Material Type : Color / Description)	Sample Location (General : Room : Specific)
1	AB1	2X2 Ceiling Tile -	1st Floor - Room 113 - Center
2	AB2	Concrete - Ceiling	1st Floor - Room 113 - Center

Relinquished By: [signature] Date: 4/29/16 Received By: [signature] Date: 5/4/16

Relinquished By: Date: Received By: Date: 945 am

CIVIL ENGINEERING WORK ORDER Date: 20150406 Time: 0849

Work Order: RKMFA 25557 Title: INSTALL OUTLET FOR PROJEC SI Code: 3B Status:
Facility #: RKMF 00332 Work Zone: Gen/Senior Qtrs:
Fac Mgr: LIBERATI, PHILIP J Phone #: 7026520 Orgn: 926 GP

Requestor: TSGT FIGUEROA Phone #: 2174 Orgn: 57 WG, ATG
Location: RM.114 Cust Code: 329

Service (Work Description)

REQUESTING AN ELECTRICAL OUTLET ON METAL CEILING TILE FOR PROJECTOR PLACEMENT IN ROOM 114OFBLDG.332
REQUESTING A METAL CEILING TILE FOR THE SAME,AND PLACEMENT OF PROJECTOR ONTO THE METAL CEILING TILE.
THE PROJECTOR PLACEMENT AND POWER IS REQUIRED TO SUPPORT FORTHCOMING MISSION EXERCISES FROM ROOM 113

EPS Noun: EPS TTS: Est Hours:
Type Service: PRI 3B - Medium Mission Impact DIN Truck #:
Commit Date: 20180331 Adjusted Commit Date: 20180331

Shops		Name	Actual Hours	Status
451	CA	STRUCTURE SHOP		OPEN
471	IT	ELECTRICAL SHOP	4.0	OPEN

Work Order Remarks

Work Order: RKMFA25557 INSTALL OUTLET FOR PROJECTOR

Remarks entered by: MORGAN DONALD User ID: X42
ASSIGNED TO MR.BARNES/A1C KRANTZ; BUILDING IS A SCIF TYPE BUILDING. ONCE CREW WAS ABLE TO GET IN THEY FOUND THAT THE CUSTOMER WAS NOT READY AND HAD NOT HAD THE PROJECTOR HUNG YET. WILL DO THE WORK WHEN CUSTOMER HAS DONE THIS.

Remarks entered by: GIBBS CHRISTOPHER User ID: X45
PER MR.OELSCHLAGER(ELECTRICAL):J-LOAD WORK ORDER AND MAKE A 3B.
SENT TO ELECTRICAL FOR AN ESTIMATE
ASB/LBP TEST REQUIRED PER MR.COLLINS

** End of Remarks **

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 3/3/2015

Nellis Work Order: 25353

Macrotec Job Number: 15536

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Check panels below windows.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building.

Dustin R. McAllister
Nevada - OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Risk Assessor
Certificate #NV-R-16781-2

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #15536 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

1 Transite Window Panel - **Non-Friable, Category II**

This material is located behind the metal below the window in the exterior of the building.

AB1	Exterior - - NE corner	15% Chrysotile

2 Insulation - In Window **No Asbestos Detected**

This material is located in inside the window panel.

AB2	Exterior - - NE corner	None Detected

Macrotec
Consulting, LLC.

Appendix B - Lead Assessment

Macrotec Job #15536 - Bldg. 332

No suspect lead paint was identified during this investigation, based on the specific scope of work for the project. If suspect materials are found during renovation activities outside what was identified in this report, stop work immediately until further testing can be completed.

Sample Location Diagram

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 150304I

DATE OF RECEIPT: 3/4/2015
DATE OF ANALYSIS: 3/4/2015
DATE OF REPORT: 3/5/2015

CLIENT JOB/ #: **15536**

JOB SITE: WO# - Bldg. 332

ANALYST: F. Jiang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / Gray cement	**15% Chrysotile**		85%
2	AB2 / Gray fibers	**NAD**	85% Cellulose 5% Fiberglass	10%

Total Samples/Layers Analyzed: 2

Samples are analyzed in accordance with “Interim Method for the Determination of Asbestos in Bulk Insulation Samples”, EPA 600/M4-82-020, Dec. 1982 and "Method for the Determination of Asbestos in Bulk Building Materials", EPA 600/R-93/116, July 1993. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report shall not be reproduced, except in full written approval of Triangle Environmental Service Center, Inc. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[**LEGEND** NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

150304 I

Macrotec Consulting, LLC

office@macrotecconsulting.com
Phone: (702) 949-6225
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: Nellis
Project Number: 15536
Project Name: Bldg. 332
Collection Date: 3/3/2015
Project Location: WO # - Bldg. 332
WO Number:
Technician: Dustin R McAllister
Turn Around Time: 3 Day
Laboratory: TESC
Method of Analysis: PLM
Stop at 1st Positive?: Y / N Composite Wall Substrate?: Y / N
Matrix: Bulk

Sample # H #	Count	Sample Description (Material Type : Color / Description)	Sample Location (General : Room : Specific)
1	AB1	Transite Window Panel -	Exterior - - NE corner
2	AB2	Insulation - In Window	Exterior - - NE corner

Relinquished By: [signature] Date: 3/3/15 Received By: [signature] Date: 03/04/15 10:20

Relinquished By: Date: Received By: Date:

BASE CIVIL ENGINEER WORK REQUEST
(See Reverse for Instructions)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM *(Organization)*	2. OFFICE SYMBOL	3. DATE OF REQUEST	4. WORK REQUEST NO. *(For BCE Use)*
99 CES	CEOSM	20150304	25353

5. NAME AND PHONE NO. OF REQUESTER	6. REQUIRED COMPLETION DATE	7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED
VINCE BOWERS 2-2218		BLDG 332

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED *(Include Sketch or Plan, when appropriate)*

ASBESTOS / LEAD BASED PAINT TEST BELOW FIRST AND SECOND FLR WINDOWS FROM THE OUTSIDE

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED *(Not required for maintenance and repair)*

REQUIRED TO CHECK ASB/LBP PRIOR TO WORK

10. DONATED RESOURCES

	FUNDS		LABOR		MATERIAL		CONTRACT BY REQUESTER	✓	NONE

11. NAME OF REQUESTER	12. GRADE OF REQUESTER	13. SIGNATURE OF REQUESTER *(See Reverse of Form)*
VINCE BOWERS	GS-09	Click to sign

14. COORDINATION

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER *(Place an "X" in the appropriate box.)*

	IN-SERVICE		SELF-HELP	X	CONTRACT		SABER

16. DIRECT SCHEDULED WORK *(Place an "X" in the appropriate box.)*

	EMERGENCY		URGENT		ROUTINE		SELF-HELP		M/C

17. SELF-HELP *(Place an "X" in the appropriate box.)*

	BRIEFING REQUIRED		ADEQUATE COORDINATION		INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST
	3A			

	23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2)		24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED	X	25. APPROVED		26. DISAPPROVED

27. REMARKS

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE *(Please Type or Print)*	29. SIGNATURE	30. DATE
Eddie N Au WS15	Click to sign	4 MAR 15

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 6/27/2014

Nellis Work Order: 23516

Macrotec Job Number: 14619

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Replace chiller.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building.

Dustin R. McAllister
Nevada - OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Risk Assessor
Certificate #NV-R-16781-2

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #14619 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

1 Gasket - North Gasket — No Asbestos Detected

This material is located on the pipes adjacent the HVAC unit.

AB1	Exterior - - S side	None Detected

2 Gasket - South Gasket — No Asbestos Detected

This material is located on the pipes adjacent the HVAC unit.

AB2	Exterior - - S side	None Detected

Macrotec
Consulting, LLC.

Appendix B - Lead Assessment

Macrotec Job #14619 - Bldg. 332

No suspect lead paint was identified during this investigation, based on the specific scope of work for the project. If suspect materials are found during renovation activities outside what was identified in this report, stop work immediately until further testing can be completed.

Sample Location Diagram

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 140630S

DATE OF RECEIPT: 6/30/2014
DATE OF ANALYSIS: 7/1/2014
DATE OF REPORT: 7/1/2014

CLIENT JOB: **14619**

JOB SITE: WO #23516 - Bldg. 332

ANALYST: Y. Fang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / Black rubber & white fibers	**NAD**	3% Synthetic	97%
2	AB2 / Black rubber & white fibers	**NAD**	3% Synthetic	97%

Total Samples/Layers Analyzed: 2

Samples are analyzed in accordance with “Interim Method for the Determination of Asbestos in Bulk Insulation Samples”, EPA 600/M4-82-020, Dec. 1982 and "Method for the Determination of Asbestos in Bulk Building Materials", EPA 600/R-93/116, July 1993. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report shall not be reproduced, except in full written approval of Triangle Environmental Service Center, Inc. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[**LEGEND** NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

140630S

office@macrotecconsulting.com

Macrotec
Consulting, LLC

Phone: (702) 949-6225
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: Nellis
Project Number: 14619
Project Name: Bldg. 332
Collection Date: 6/27/2014
Project Location: WO #23516 - Bldg. 332
WO Number: 23516
Technician: Dustin R McAllister
Turn Around Time: 3 Day
Laboratory: TESC
Method of Analysis: PLM
Stop at 1st Positive?: Y / N Composite Wall Substrate?: Y / N
Matrix: Bulk

Sample # H #	Sample # Count	Sample Description (Material Type : Color / Description)	Sample Location (General : Room : Specific)
1	AB1	Gasket - North Gasket	Exterior - - S side
2	AB2	Gasket - South Gasket	Exterior - - S side

Relinquished By: [signature] Date: 6/27/14
Received By: [signature] Date: 6/30/14 10:00

Relinquished By: Date:
Received By: Date:

BAS **IVIL ENGINEER WORK REQUEST**
(See Reverse for Instructions)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM *(Organization)*	2. OFFICE SYMBOL	3. DATE OF REQUEST	4. WORK REQUEST NO. *(For BCE Use)*
99 CES	CEOIH	20140416	23516

5. NAME AND PHONE NO. OF REQUESTER	6. REQUIRED COMPLETION DATE	7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED
James Romero, 2-8145	20141231	332

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED *(Include Sketch or Plan, when appropriate)*

Replace existing chiller with state of the art high efficiency chiller.

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED *(Not required for maintenance and repair)*

Existing chiller has served well beyond its expected service life and in comparison to the newest chiller technology is extremely inefficient in its operation. Furthermore, this chiller has demonstrated an extreme pattern of unreliability that has made maintaining its operation unreasonable and economically unfeasiable.

10. DONATED RESOURCES

	FUNDS		LABOR		MATERIAL		CONTRACT BY REQUESTER	X	NONE

11. NAME OF REQUESTER	12. GRADE OF REQUESTER	13. SIGNATURE OF REQUESTER *(See Reverse of Form)*
JAMES R. ROMERO	WS-10	James R. Romero

14. COORDINATION

99 ABW/SE 24 APR 14 ATBM | 99 CES/CEOPD 24 APR 14 TR | 99 CES/CENPD 24 Apr 14 TO | 24 APR 14

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER *(Place an "X" in the appropriate box.)*

X	IN-SERVICE		SELF-HELP		CONTRACT		SABER

16. DIRECT SCHEDULED WORK *(Place an "X" in the appropriate box.)*

	EMERGENCY		URGENT		ROUTINE		SELF-HELP		M/C

17. SELF-HELP *(Place an "X" in the appropriate box.)*

	BRIEFING REQUIRED		ADEQUATE COORDINATION		INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST
	3A			

✓	23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2) A2.3.9		24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED	X	25. APPROVED		26. DISAPPROVED

27. REMARKS

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE *(Please Type or Print)*	29. SIGNATURE	30. DATE
	Mark R St	1 MAY 14

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 9/20/2011

Nellis Work Order: 18180

Macrotec Job Number: 11853

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Check ceiling to install electrical.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building

Dustin R. McAllister
Nevada – OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Inspector
Certificate #NV-I-16781-1

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #11853 - WO #18180 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

1 Concrete Ceiling **No Asbestos Detected**

AB1	2nd Floor - Cubical Area - Center	None Detected

2 Spray Texture on Concrete Ceiling **No Asbestos Detected**

AB2	2nd Floor - Cubical Area - Center	None Detected
AB3	2nd Floor - Cubical Area - W End	None Detected
AB4	2nd Floor - Cubical Area - E End	None Detected

Macrotec
Consulting, LLC.

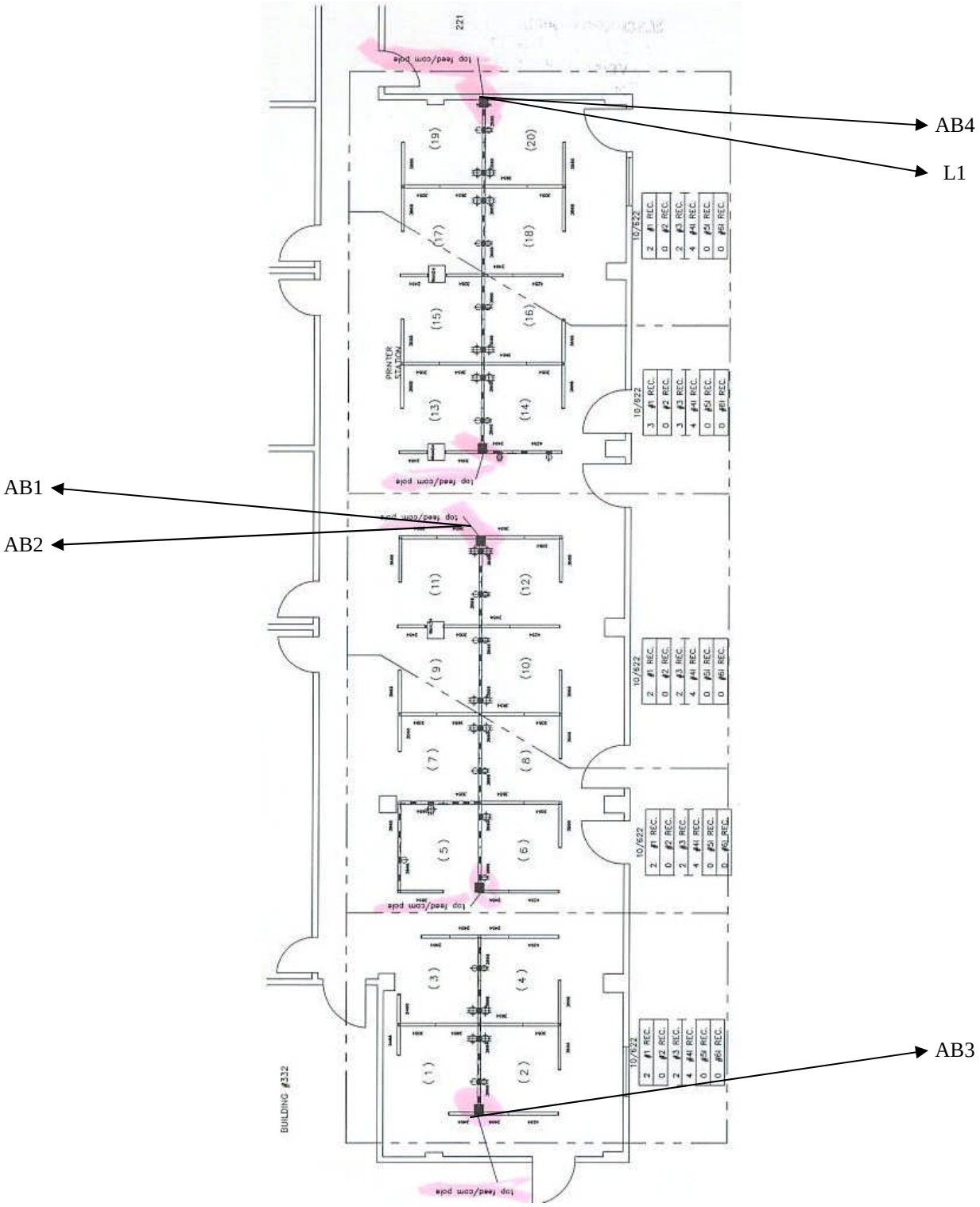
Appendix B - Lead Assessment

Macrotec Job #11853 - WO #18180 - Bldg. 332

The following table lists each of the painted surfaces suspected to contain lead at the subject site. For each painted surface, the sample number, location and laboratory result are listed.

Sample #	Painted Surface Description	Sample Location Description	Lab Result (Parts per Million)
L1	Lt. Blue Concrete Ceiling	2nd Floor - Cubical Area - W End	Below Reportable Limit

Sample Location Diagram



* Diagram Not Drawn To Scale

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110921B

DATE OF RECEIPT: 9/21/2011
DATE OF ANALYSIS: 9/21/2011
DATE OF REPORT: 9/21/2011

CLIENT JOB/ #: **11853**

JOB SITE: Bldg 332

ANALYST: F. Jiang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / Gray granular, white powder	**NAD**		100%
2	AB2 / White powder	**NAD**		100%
3	AB3 / White powder	**NAD**		100%
4	AB4 / White powder	**NAD**		100%

Total Samples/Layers Analyzed: 4

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA/600/R-93-116, July 1993 (EPA-600/M4-82-020, Dec 1982), or the current US EPA method for the analysis of asbestos in building material. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report must not be reproduced except in full with approval of Triangle Environmental Service Center, Inc. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[LEGEND NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

11UP213

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NELLIS
Project Number: 71853
Project Name:
Collection Date: 9/20/11
Project Location: BLDG 332
PO Number:
Technician: [illegible]
Turn Around Time: Rush
Laboratory: TEK
Method of Analysis: PLM
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
1	AS1	CONCRETE CEILING	2ND FLOOR - CUBICAL AREA - CENTER
2	AS2	SPRAY TEXTURE ON CONCRETE CEILING	↓ ↓ ↓
2	AS3	↓	↓ ↓ W END
2	AS4		↓ ↓ E

Relinquished By: [signature] Date: 9/20/11 Received By: [signature] Date: 9/21/11 11:20

Relinquished By: Date: Received By: Date:

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112 • 804-739-1751 • fax: 804-739-1753

LEAD IN PAINT SAMPLE ANALYSIS SUMMARY

(EPA METHOD 7420)

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110921C

DATE OF RECEIPT: 9/21/2011
DATE OF ANALYSIS: 9/21/2011
DATE OF REPORT: 9/21/2011

CLIENT JOB #: **11853**

JOBSITE: Bldg 332

ANALYST: S. Al-Johani

TESC SAMPLE #	CLIENT SAMPLE #	SAMPLE WEIGHT (mg)	TOTAL LEAD (ug)	LEAD CONCENTRATION (% by Weight)	LEAD CONCENTRATION PPM
1	L1	333	< 10.0	< 0.003	< 30

Total Sample(s) Analyzed: 1

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the customer. Sample information was provided by the customer. This report must not be reproduced, except in full,without the written consent of Triangle Environmental Service Center, Inc. The test report related only to the item(s) tested. This analysis was performed by an AHIA accredited laboratory. AIHA/ELLAP ID: 100527, NYELAP/NELAC ID: 11413.
Minimum Reporting Limit: 20 ug. Lead Based Paint contains 0.5% lead by weight per Federal statute. The OSHA Lead in Construction Standard, 29 CFR 1926.62, is invoked if any lead is present in the sample. Lead-free paint is defined as <0.06% by weight (CPSC).
[LEGEND: mg= milligram, ug= microgram, ppm= parts per million]

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

1109210

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NEILIS
Project Number: 11853
Project Name:
Collection Date: 9/20/11
Project Location: BLAG 332
PO Number:
Technician: [illegible]
Turn Around Time: Rush
Laboratory: TEL
Method of Analysis: AA FLAME
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix: PAINT CHIP.

Sample # H #	Sample # Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
–	21	LT. BLUE CONCRETE COLUMN	2ND FLOOR – CONCRETE AREA – W END

Relinquished By: [illegible] Date: 9/20/11
Received By: [illegible] Date: 9/21/11 10:30
Relinquished By: Date:
Received By: Date:

BASE CIVIL ENGINEER WORK REQUEST

(See Reverse for Instructions)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM *(Organization)*	2. OFFICE SYMBOL	3. DATE OF REQUEST	4. WORK REQUEST NO. *(For BCE Use)*
926 AMDS	SGA	20110722	18180

5. NAME AND PHONE NO. OF REQUESTER	6. REQUIRED COMPLETION DATE	7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED
TSGT LATEASHA GOINS 702 652-0968	20110722	BLDG 332

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED *(Include Sketch or Plan, when appropriate)*

Electrical work to tie in electrical feeds into cubicle. Please see attached

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED *(Not required for maintenance and repair)*

To provide electricity to cubicles. Please see attached.

10. DONATED RESOURCES

[X] FUNDS	[ ] LABOR	[ ] MATERIAL	[X] CONTRACT BY REQUESTER	[ ] NONE

11. NAME OF REQUESTER	12. GRADE OF REQUESTER	13. SIGNATURE OF REQUESTER *(See Reverse of Form)*
LaTeasha T. Goins	TSgt	

14. COORDINATION
99 CES/CEAO 8/11/11 TO
99 ABW/SE 11 AUG 11 ABW
99 CES/CEAO 11 AUG 11 VR
CEANP 11 Aug 11
Asbestos factory regd. LBP
11 Aug 11
99 CEAO

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER *(Place an "X" in the appropriate box.)*

[ ] IN-SERVICE	[ ] SELF-HELP	[ ] CONTRACT	[ ] SABER

16. DIRECT SCHEDULED WORK *(Place an "X" in the appropriate box.)*

[ ] EMERGENCY	[ ] URGENT	[ ] ROUTINE	[ ] SELF-HELP	[ ] M/C

17. SELF-HELP *(Place an "X" in the appropriate box.)*

[ ] BRIEFING REQUIRED	[ ] ADEQUATE COORDINATION	[ ] INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST

[✓] 23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2) A2.3.B	[ ] 24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED	[ ] 25. APPROVED	[X] 26. DISAPPROVED

27. REMARKS
IAW NFPA 70. - CE to inspect work after contractor completes work

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE *(Please Type or Print)*	29. SIGNATURE	30. DATE
Eddie Cain WS-15		19 Sep 2011

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 8/8/2011

Nellis Work Order: 18157

Macrotec Job Number: 11830

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Install LAN lines in room 213

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building

Dustin R. McAllister
Nevada – OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Inspector
Certificate #NV-I-16781-1

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #11830 - WO #18157 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

1 Sheet Rock, Mud & Tape **No Asbestos Detected**

AB1	2nd Floor - Room 213 - SE Corner	None Detected
AB2	2nd Floor - Room 213 - NW Corner	None Detected

2 Spray Texture on Sheet Rock **No Asbestos Detected**

AB3	2nd Floor - Room 213 - S Wall	None Detected
AB4	2nd Floor - Room 213 - N Wall	None Detected
AB5	2nd Floor - Room 213 - W Wall	None Detected

Macrotec
Consulting, LLC.

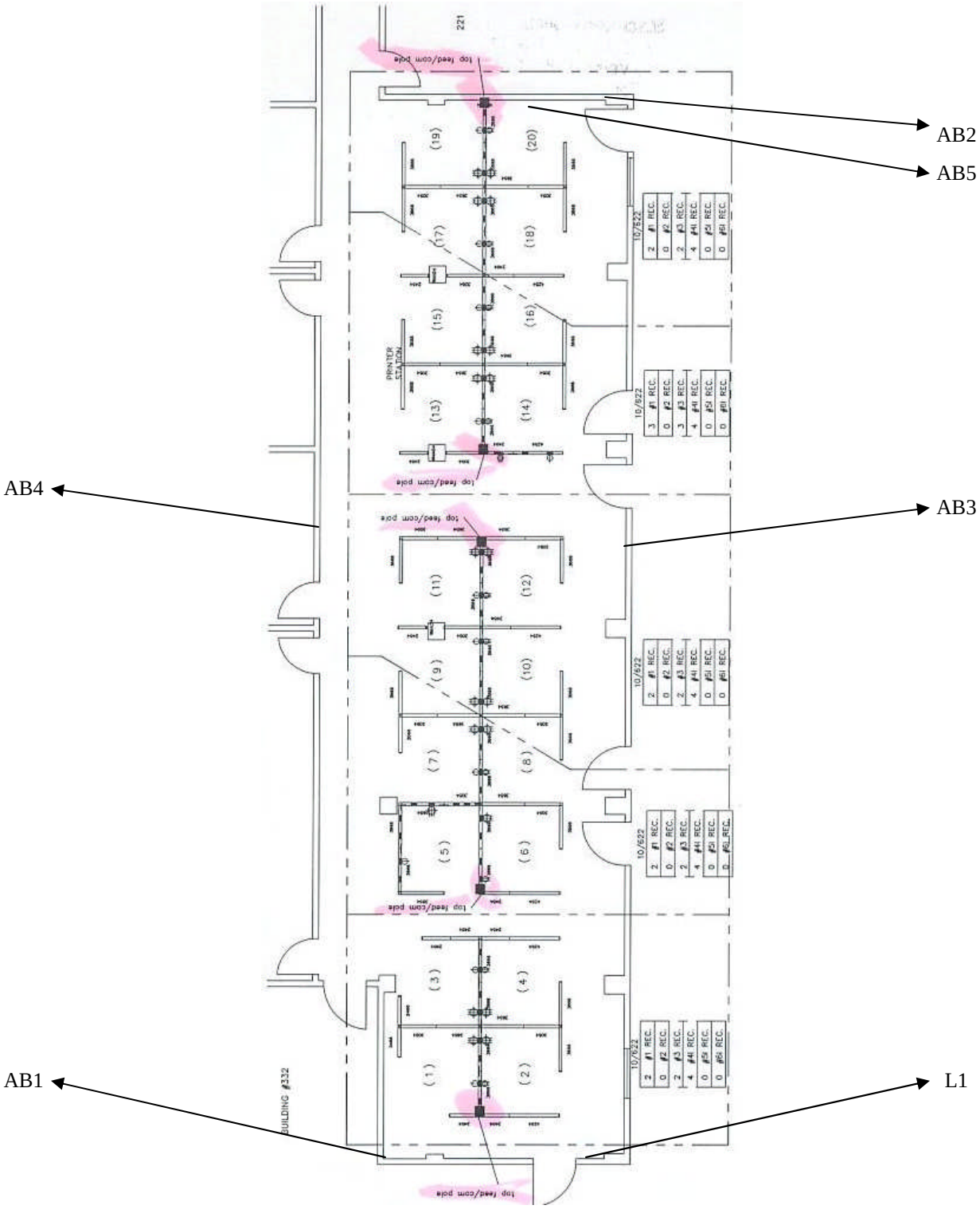
Appendix B - Lead Assessment

Macrotec Job #11830 - WO #18157 - Bldg. 332

The following table lists each of the painted surfaces suspected to contain lead at the subject site. For each painted surface, the sample number, location and laboratory result are listed.

Sample #	Painted Surface Description	Sample Location Description	Lab Result (Parts per Million)
L1	Light Blue Sheet Rock Wall	2nd Floor - Room 213 - E Wall	51

Sample Location Diagram



* Diagram Not Drawn To Scale

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110809C

DATE OF RECEIPT: 8/9/2011
DATE OF ANALYSIS: 8/10/2011
DATE OF REPORT: 8/10/2011

CLIENT JOB/ #: **11830**

JOB SITE: Bldg 832

ANALYST: F. Jiang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / White powder	**NAD**		100%
2	AB2 / White powder	**NAD**		100%
3	AB3 / White powder	**NAD**		100%
4	AB4 / White powder	**NAD**		100%
5	AB5 / White powder	**NAD**		100%

Total Samples/Layers Analyzed: 5

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA/600/R-93-116, July 1993 (EPA-600/M4-82-020, Dec 1982), or the current US EPA method for the analysis of asbestos in building material. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report must not be reproduced except in full with approval of Triangle Environmental Service Center, Inc. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[LEGEND NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

11080PC

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: Nellis
Project Number: 11P30
Project Name:
Collection Date: 8/8/11
Project Location: BLDG 332
PO Number:
Technician: [illegible]
Turn Around Time: 30 day
Laboratory: TESC
Method of Analysis: PLM
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
1	A01	SHEETROCK, MUD + TAPE	2ND Floor - Rm 213 - SE CORNER
1	A02	↓	- NW "
2	A03	SPRAY TEXTURE ON SHEETROCK	- S WALL
2	A04	↓	- N WALL
2	A05	↓	- W WALL

Relinquished By: [signature] Date: 8/8/11 Received By: [signature] Date: 8/9/11 1015

Relinquished By: Date: Received By: Date:

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112 • 804-739-1751 • fax: 804-739-1753

LEAD IN PAINT SAMPLE ANALYSIS SUMMARY

(EPA METHOD 7420)

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110809D

DATE OF RECEIPT: 8/9/2011
DATE OF ANALYSIS: 8/11/2011
DATE OF REPORT: 8/11/2011

CLIENT JOB #: **11830**

JOBSITE: Bldg 332

ANALYST: M. Eltilib

TESC SAMPLE #	CLIENT SAMPLE #	SAMPLE WEIGHT (mg)	TOTAL LEAD (ug)	LEAD CONCENTRATION (% by Weight)	LEAD CONCENTRATION PPM
1	L1	333	16.8	0.005	51

Total Sample(s) Analyzed: 1

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the customer. Sample information was provided by the customer. This report must not be reproduced, except in full,without the written consent of Triangle Environmental Service Center, Inc. The test report related only to the item(s) tested. This analysis was performed by an AHIA accredited laboratory. AIHA/ELLAP ID: 100527, NYELAP/NELAC ID: 11413.
Minimum Reporting Limit: 20 ug. Lead Based Paint contains 0.5% lead by weight per Federal statute. The OSHA Lead in Construction Standard, 29 CFR 1926.62, is invoked if any lead is present in the sample. Lead-free paint is defined as <0.06% by weight (CPSC).
[LEGEND: mg= milligram, ug= microgram, ppm= parts per million]

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

11UPOPD

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NEHES
Project Number: 11830
Project Name:
Collection Date: 8/8/11
Project Location: SLOG 332
PO Number:
Technician: Ora
Turn Around Time: 3DAY
Laboratory: TGL
Method of Analysis: AM FIAME
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
	2'	LT. BLUE SHEET Rock WALL	2ND Floor - Rm 213 - E WALL

Relinquished By: [signature] Date: 8/8/11 Received By: [signature] Date: 8/8/11 10:00

Relinquished By: Date: Received By: Date:

BASE CIVIL ENGINEER WORK REQUEST

(See Reverse for Instructions)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM *(Organization)*	2. OFFICE SYMBOL	3. DATE OF REQUEST	4. WORK REQUEST NO. *(For BCE Use)*
926 AMDS	SGA	20110722	17157

5. NAME AND PHONE NO. OF REQUESTER	6. REQUIRED COMPLETION DATE	7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED
~~TSGT LATEASHA~~ GOINS 702 652-0968	20110722	BLDG 332 2nd FLOOR

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED *(Include Sketch or Plan, when appropriate)*

I am requesting to have an asbestos test completed for electrical/comm cubicle. Please see attached diagram.

Rm. 213
COMM ROOM

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED *(Not required for maintenance and repair)*

Implementation of cubicle system. Please see attached.

10. DONATED RESOURCES

	FUNDS		LABOR		MATERIAL		CONTRACT BY REQUESTER		NONE

11. NAME OF REQUESTER	12. GRADE OF REQUESTER	13. SIGNATURE OF REQUESTER *(See Reverse of Form)*
LaTeasha T. Goins	TSgt	

14. COORDINATION

Asbestos/LBP testing reqd.
KGR 3 Aug 11
99 CEAU

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER *(Place an "X" in the appropriate box.)*

	IN-SERVICE		SELF-HELP		CONTRACT		SABER

16. DIRECT SCHEDULED WORK *(Place an "X" in the appropriate box.)*

	EMERGENCY		URGENT		ROUTINE		SELF-HELP		M/C

17. SELF-HELP *(Place an "X" in the appropriate box.)*

	BRIEFING REQUIRED		ADEQUATE COORDINATION		INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST

	23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2)		24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED		25. APPROVED		26. DISAPPROVED

27. REMARKS

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE *(Please Type or Print)*	29. SIGNATURE	30. DATE
Arturo G Rivera		04 Aug 11

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 3/22/2011

Nellis Work Order: W3870

Macrotec Job Number: 11672

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Replace ceramic floor tile in the stairwell.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building

Dustin R. McAllister
Nevada – OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Inspector
Certificate #NV-I-16781-1

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #11672 - WO #W3870 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

1 Mortar - Beneath Ceramic Floor **No Asbestos Detected**

AB1	Stairwell - 2nd Floor	None Detected

2 Yellow Mastic on Mortar **No Asbestos Detected**

AB2	Stairwell - 2nd Floor	None Detected

3 Grout on Ceramic Tile **No Asbestos Detected**

AB3	Stairwell - 2nd Floor	None Detected

4 White Floor Fill **No Asbestos Detected**

AB4	Stairwell - 2nd Floor	None Detected

Macrotec
Consulting, LLC.

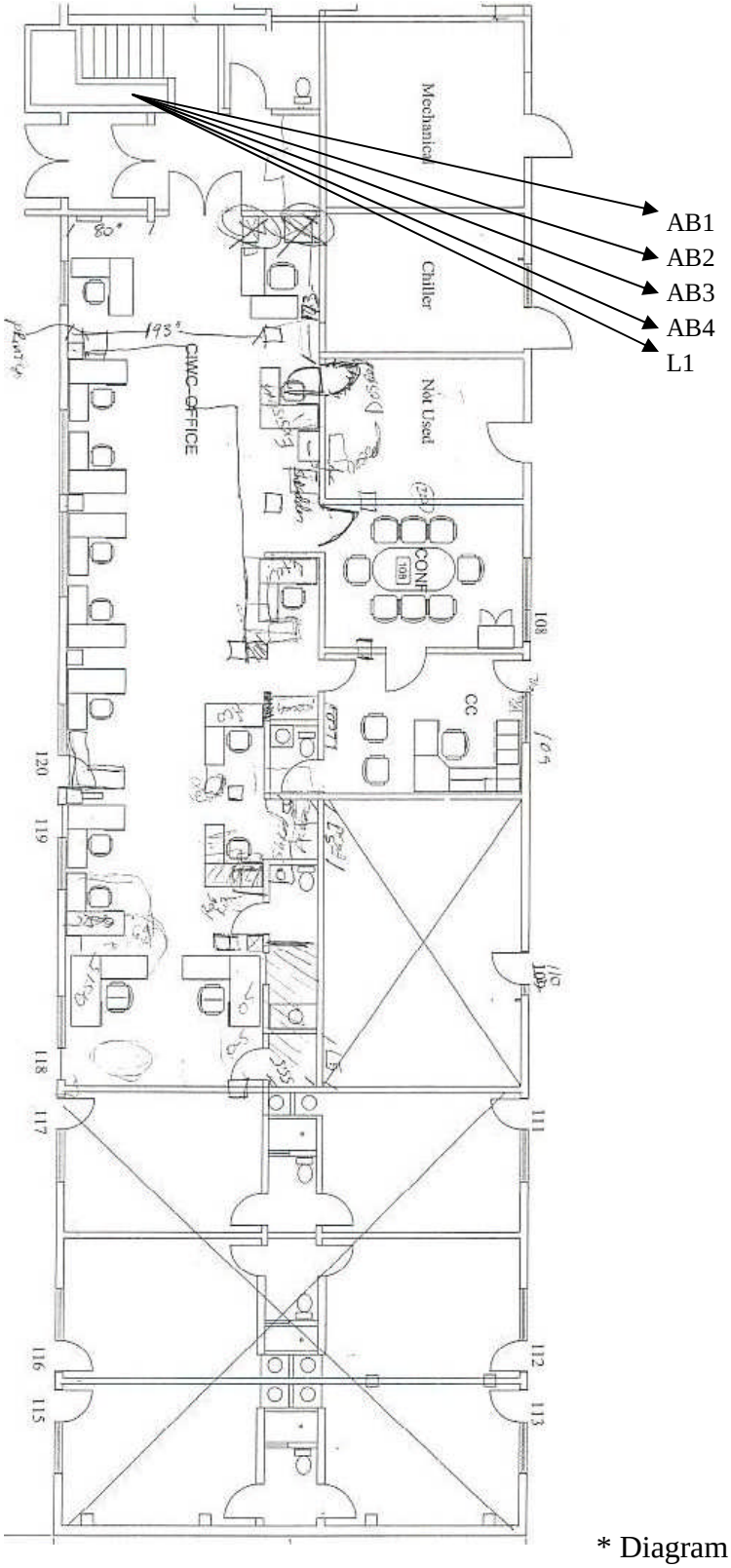
Appendix B - Lead Assessment

Macrotec Job #11672 - WO #W3870 - Bldg. 332

The following table lists each of the painted surfaces suspected to contain lead at the subject site. For each painted surface, the sample number, location and laboratory result are listed.

Sample #	Painted Surface Description	Sample Location Description	Lab Result (Parts per Million)
L1	Gray Ceramic Floor Tile	Stairwell - 2nd Floor	None Detected

Sample Location Diagram



* Diagram Not Drawn To Scale

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110324E

DATE OF RECEIPT: 3/24/2011
DATE OF ANALYSIS: 3/25/2011
DATE OF REPORT: 3/25/2011

CLIENT JOB/ #: **11672**

JOB SITE: Bldg 332

ANALYST: Y. Fang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / White granular	**NAD**		100%
2	AB2 / Yellow adhesive	**NAD**		100%
3	AB3 / Gray granular	**NAD**		100%
4	AB4 / White powder	**NAD**		100%

Total Samples/Layers Analyzed: 4

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA/600/R-93-116, July 1993 (EPA-600/M4-82-020, Dec 1982), or the current US EPA method for the analysis of asbestos in building material. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report must not be reproduced except in full with approval of Triangle Environmental Service Center, Inc. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[LEGEND NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

110324E

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: WEIIZS
Project Number: 11672
Project Name:
Collection Date: 3/22/11
Project Location: SLAC 332
PO Number:
Technician: [illegible]
Turn Around Time: SDAY
Laboratory: TEM
Method of Analysis: PLM
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
1	AS1	MORTAR	STAIRWELL - 2ND FLOOR
2	AS2	YELLOW MASTIC ON MORTAR	↓
3	AS3	GRAY ON CERAMIC TILE	↓
4	AS4	WHITE FLOOR FILL	↓

Relinquished By: [signature] Date: 3/22/11 Received By: [signature] Date: 3/24/11 11:45

Relinquished By: Date: Received By: Date:

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112 • 804-739-1751 • fax: 804-739-1753

LEAD IN PAINT SAMPLE ANALYSIS SUMMARY

(EPA METHOD 7420)

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110324J

DATE OF RECEIPT: 3/24/2011
DATE OF ANALYSIS: 3/28/2011
DATE OF REPORT: 3/28/2011

CLIENT JOB #: **11672**

JOBSITE: Bldg 332

ANALYST: S. Al-Johani

TESC SAMPLE #	CLIENT SAMPLE #	SAMPLE WEIGHT (mg)	TOTAL LEAD (ug)	LEAD CONCENTRATION (% by Weight)	LEAD CONCENTRATION PPM
1	L1	220	< 10.0	< 0.005	< 45

Total Sample(s) Analyzed: 1

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the customer. Sample information was provided by the customer. This report must not be reproduced, except in full,without the written consent of Triangle Environmental Service Center, Inc. The test report related only to the item(s) tested. This analysis was performed by an AHIA accredited laboratory. AIHA/ELLAP ID: 100527, NYELAP/NELAC ID: 11413.
Minimum Reporting Limit: 20 ug. Lead Based Paint contains 0.5% lead by weight per Federal statute. The OSHA Lead in Construction Standard, 29 CFR 1926.62, is invoked if any lead is present in the sample. Lead-free paint is defined as <0.06% by weight (CPSC).
[LEGEND: mg= milligram, ug= microgram, ppm= parts per million]

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

11034 J

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NEITZS
Project Number: 11672
Project Name:
Collection Date: 3/22/11
Project Location: 4L06-332
PO Number:
Technician: L
Turn Around Time: 3DAY
Laboratory: TEL
Method of Analysis: AA FLAME
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Sample # Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
	L'	GRAY CERAMIC FLOOR TILE	STAIRWELL 2ND FLOOR

Relinquished By: [signature] Date: 3/22/11 Received By: [signature] Date: 3/24/11 11:45

Relinquished By: Date: Received By: Date:

6214

CIVIL ENGINEERING WORK ORDER Date: 20110217 Time: 1516

Work Order: RKMFA W3870 Title: REPLACE FLOOR TILES SI Code: Status: R
Facility #: RKMF 00332 Work Zone: Gen/Senior Qtrs:
Fac Mgr: LIBERATI, PHILIP J Phone #: 7026520 Orgn: 926 GP

Requestor: SGT LIBERATI Phone #: 2-0886 Orgn: 926 GP AFRC
Location: STAIRWELL Cust Code: 850

Service (Work Description)

REPLACE 5 MISSING/BROKEN FLOOR TILES

EPS Noun: EPS TTS: Est Hours:
Type Service: ROUTINE DIN Truck #:
Commit Date: 20110319 Adjusted Commit Date: 20110319

Shops		Name	Actual Hours	Status
451	CA	STRUCTURE SHOP		OPEN

NEED PB/ASB TEST

CONTACT JOHN C IF NEEDED

WILL BE CONTRACT GPC

PoC
Mr. Ceballos
2-4124

Stairwell steps / area

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 3/8/2011

Nellis Work Order: 16826

Macrotec Job Number: 11656

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Build walls to create offices in CIWC office on 1st floor.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building

Dustin R. McAllister
Nevada – OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Inspector
Certificate #NV-I-16781-1

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #11656 - WO 16826 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

1 Textured Sheet Rock Mud & Tape — **No Asbestos Detected**

AB1	1st Floor - CIWC Office - NW Corner	None Detected

2 Texture on Sheet Rock — **No Asbestos Detected**

AB2	1st Floor - CIWC Office - NW Corner	None Detected
AB3	1st Floor - CIWC Office - NW Corner	None Detected
AB9	1st Floor - CIWC Office - NW Corner	None Detected
AB10	1st Floor - CIWC Office - NW Corner	None Detected

3 Texture on Concrete Pillar — **Friable, Non-Regulated**

AB4	1st Floor - CIWC Office - NW Corner	<1% Chrysotile
AB5	1st Floor - CIWC Office - NW Corner	None Detected
AB6	1st Floor - CIWC Office - NW Corner	None Detected
AB7	1st Floor - CIWC Office - NW Corner	None Detected
AB8	1st Floor - CIWC Office - NW Corner	None Detected

Macrotec
Consulting, LLC.

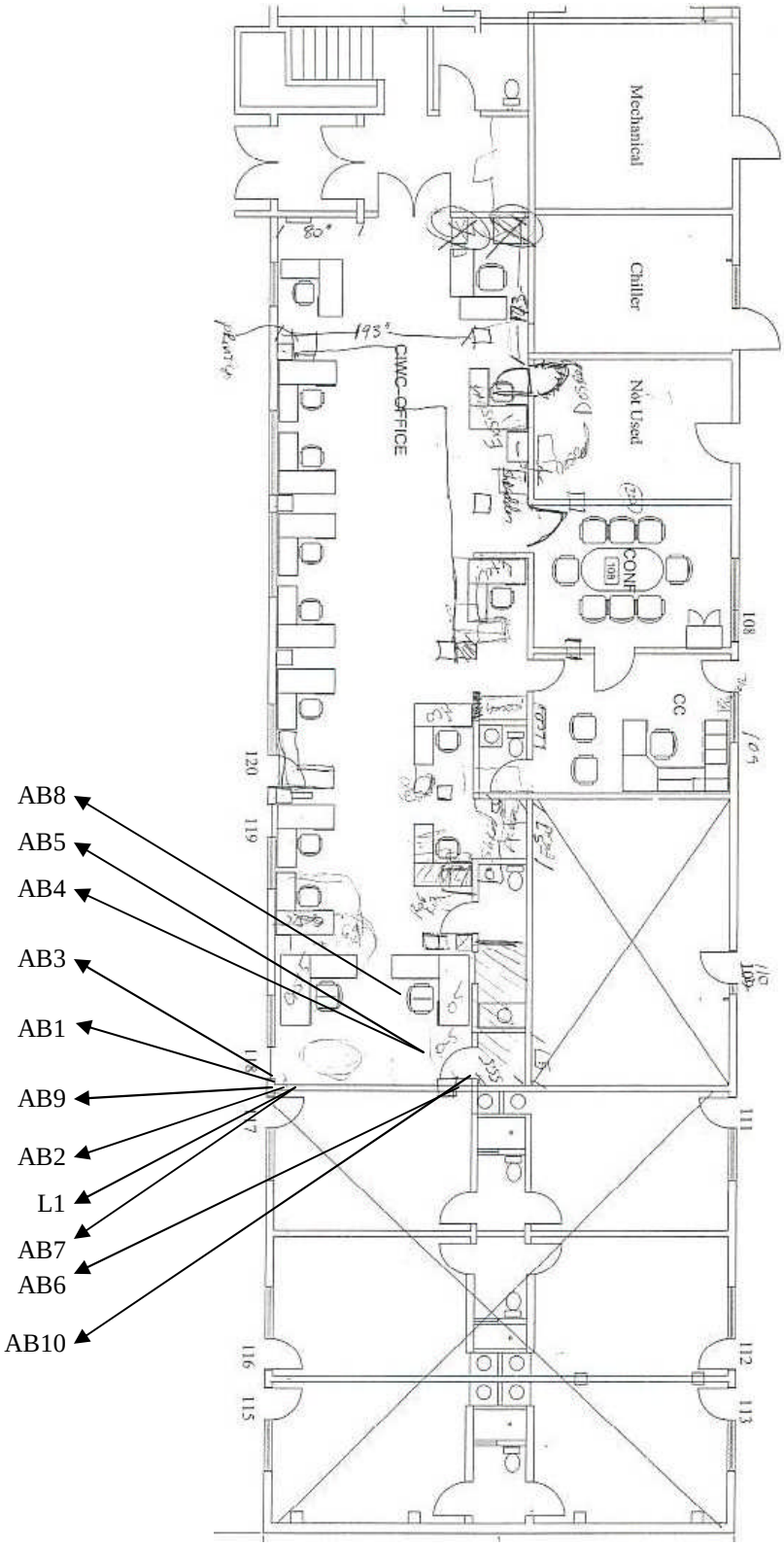
Appendix B - Lead Assessment

Macrotec Job #11656 - WO 16826 - Bldg. 332

The following table lists each of the painted surfaces suspected to contain lead at the subject site. For each painted surface, the sample number, location and laboratory result are listed.

Sample #	Painted Surface Description	Sample Location Description	Lab Result (Parts per Million)
L1	Gray Sheet Rock Wall	1st Floor - CIWC Office - NW Corner	74

Sample Location Diagram



* Diagram Not Drawn To Scale

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110309H

DATE OF RECEIPT: 3/9/2011
DATE OF ANALYSIS: 3/10/2011
DATE OF REPORT: 3/10/2011

CLIENT JOB/ #: **11656**

JOB SITE: Bldg 332

ANALYST: F. Jiang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / White powder, brown fibers	**NAD**	20% Cellulose	80%
2	AB2 / White powder	**NAD**		100%
3	AB3 / White powder	**NAD**		100%
4	AB4 / Off-white powder	**<1% Chrysotile**		100%

Total Samples/Layers Analyzed: 4

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA/600/R-93-116, July 1993 (EPA-600/M4-82-020, Dec 1982), or the current US EPA method for the analysis of asbestos in building material. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report must not be reproduced except in full with approval of Triangle Environmental Service Center, Inc. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[LEGEND NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting

11030PH

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NELLIS
Project Number: 11656
Project Name:
Collection Date: 3/8/11
Project Location: BLDG 332
PO Number:
Technician: [illegible]
Turn Around Time: 30DAY
Laboratory: TESC
Method of Analysis: PLM
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
1	AS1	TEXTURED SHEETROCK MUD + TAPE	CNC OFF. 1ST FLOOR - E/W OPEN A - NW COR
2	AS2	TEXTURE ON SHEETROCK	" - " - "
2	AS3	"	" - " - "
2	AS4	"	" - " - "

Relinquished By: [signature] Date: 3/8/11 Received By: [signature] Date: 3/8/11 11:5-

Relinquished By: Date: Received By: Date:

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110316F

DATE OF RECEIPT: 3/16/2011
DATE OF ANALYSIS: 3/17/2011
DATE OF REPORT: 3/17/2011

CLIENT JOB/ #: **11656**

JOB SITE: Bldg 332

ANALYST: L. Holder

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB5 / White powder	**NAD**		100%
2	AB6 / White powder	**NAD**		100%
3	AB7 / White powder	**NAD**		100%
4	AB8 / White powder	**NAD**		100%
5	AB9 / White powder	**NAD**		100%
6	AB10 / White powder	**NAD**		100%

Total Samples/Layers Analyzed: 6

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA/600/R-93-116, July 1993 (EPA-600/M4-82-020, Dec 1982), or the current US EPA method for the analysis of asbestos in building material. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report must not be reproduced except in full with approval of Triangle Environmental Service Center, Inc. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[LEGEND NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting, LLC

110316F

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NEUDES
Project Number: 11656
Project Name:
Collection Date: 3/8/11
Project Location: BLDG 332
PO Number:
Technician: [illegible]
Turn Around Time: 3 day
Laboratory: TOS
Method of Analysis: PLM
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
3	AB5	TEXTURE ON CONCRETE PILLAR	1ST FLOOR - LIBRARY OFF - NW CORNER
3	AB6	"	"
3	AB7	"	"
3	AB8	"	"
4	AB9	TEXTURE ON SHEET ROCK	"
4	AB10	"	"

Relinquished By: [signature] Date: 3/8/11 Received By: [signature] Date: 3/16/11 10:00

Relinquished By: Date: Received By: Date:

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112 • 804-739-1751 • fax: 804-739-1753

LEAD IN PAINT SAMPLE ANALYSIS SUMMARY

(EPA METHOD 7420)

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 110309K

DATE OF RECEIPT: 3/9/2011
DATE OF ANALYSIS: 3/10/2011
DATE OF REPORT: 3/11/2011

CLIENT JOB #: **11656**

JOBSITE: Bldg 332

ANALYST: S. Al-Johani

TESC SAMPLE #	CLIENT SAMPLE #	SAMPLE WEIGHT (mg)	TOTAL LEAD (ug)	LEAD CONCENTRATION (% by Weight)	LEAD CONCENTRATION PPM
1	L1	331	24.6	0.007	74

Total Sample(s) Analyzed: 1

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the customer. Sample information was provided by the customer. This report must not be reproduced, except in full,without the written consent of Triangle Environmental Service Center, Inc. The test report related only to the item(s) tested. This analysis was performed by an AHIA accredited laboratory. AIHA/ELLAP ID: 100527, NYELAP/NELAC ID: 11413.
Minimum Reporting Limit: 20 ug. Lead Based Paint contains 0.5% lead by weight per Federal statute. The OSHA Lead in Construction Standard, 29 CFR 1926.62, is invoked if any lead is present in the sample. Lead-free paint is defined as <0.06% by weight (CPSC).
[LEGEND: mg= milligram, ug= microgram, ppm= parts per million]

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting

11030P/S

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NELLIS
Project Number: 11656
Project Name:
Collection Date: 3/8/11
Project Location: BLDG 332
PO Number:
Technician: [illegible]
Turn Around Time: 3 day
Laboratory: TESL
Method of Analysis: AA FLAME
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
-	21	GRAY SHEET Rock WALL	CUT OFF 1st Floor - NW OPEN A - NW CORN.

Relinquished By: [illegible] Date: 3/9/11 Received By: [illegible] Date: 3/9/11 11:5

Relinquished By: Date: Received By: Date:

BA CIVIL ENGINEER WORK REQUEST
(See Reverse for Instructions)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM (Organization)	2. OFFICE SYMBOL	3. DATE OF REQUEST	4. WORK REQUEST NO. (For BCE Use)
57 OSS	DO	20101217 20	16826

5. NAME AND PHONE NO. OF REQUESTER	6. REQUIRED COMPLETION DATE	7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED
Major Solomon Garrett 652-6592	20110228	Building 332

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED (Include Sketch or Plan, when appropriate)

Build three, floor-to-ceiling walls to create two offices for unit senior level leaders (drawing attached). Install a single locking door for each office. No electrical or HVAC work anticipated. Affected office space is currently unoccupied to allow immediate work.

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED (Not required for maintenance and repair)

As approved by the Dec 2010 FUB, the 57 OSS staff is relocating to Bldg 332. The walls are required to prepare the facility for expected Feb 11 move-in date. This work order will create office space for the Director of Operations and Chief Enlisted Manager.

10. DONATED RESOURCES

✓ FUNDS	LABOR	MATERIAL	CONTRACT BY REQUESTER	NONE

11. NAME OF REQUESTER	12. GRADE OF REQUESTER	13. SIGNATURE OF REQUESTER (See Reverse of Form)
Solomon Garrett	Maj	

14. COORDINATION
99CES/CEAD CEANP 390m11 1/5/2011 VR
99LGN/SEG 2011/01/06/N
99 AMDS SGPB
99CES/CEN 1/6/11 TO
ZC 6JAN11
Asbestos and Lead Base Paint testing required VR 6JAN11

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER (Place an "X" in the appropriate box.)

X IN-SERVICE	SELF-HELP	CONTRACT	SABER

16. DIRECT SCHEDULED WORK (Place an "X" in the appropriate box.)

EMERGENCY	URGENT	ROUTINE	SELF-HELP	M/C

17. SELF-HELP (Place an "X" in the appropriate box.)

BRIEFING REQUIRED	ADEQUATE COORDINATION	INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST

✓ 23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2) A2.3.8	24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED	X 25. APPROVED	26. DISAPPROVED

27. REMARKS
MAY REQUIRE ADDITIONAL FIRE DETECTION DEVICE

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE (Please Type or Print)	29. SIGNATURE	30. DATE
	[signature]	2/11/11

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 9/21/2010

Nellis Work Order: 16204

Macrotec Job Number: 10857

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Install shades in the windows of the 2nd floor.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building

Dustin R. McAllister
Nevada – OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Inspector
Certificate #NV-I-16781-1

Macrotec
Consulting, LLC.

Appendix B - Lead Assessment

Macrotec Job #10857 - WO #16204 - Bldg. 332

No suspect lead paint was identified during this investigation, based on the specific scope of work for the project. If suspect materials are found during renovation activities outside what was identified in this report, stop work immediately until further testing can be completed.

Macrotec
Consulting, LLC.

Appendix B - Lead Assessment

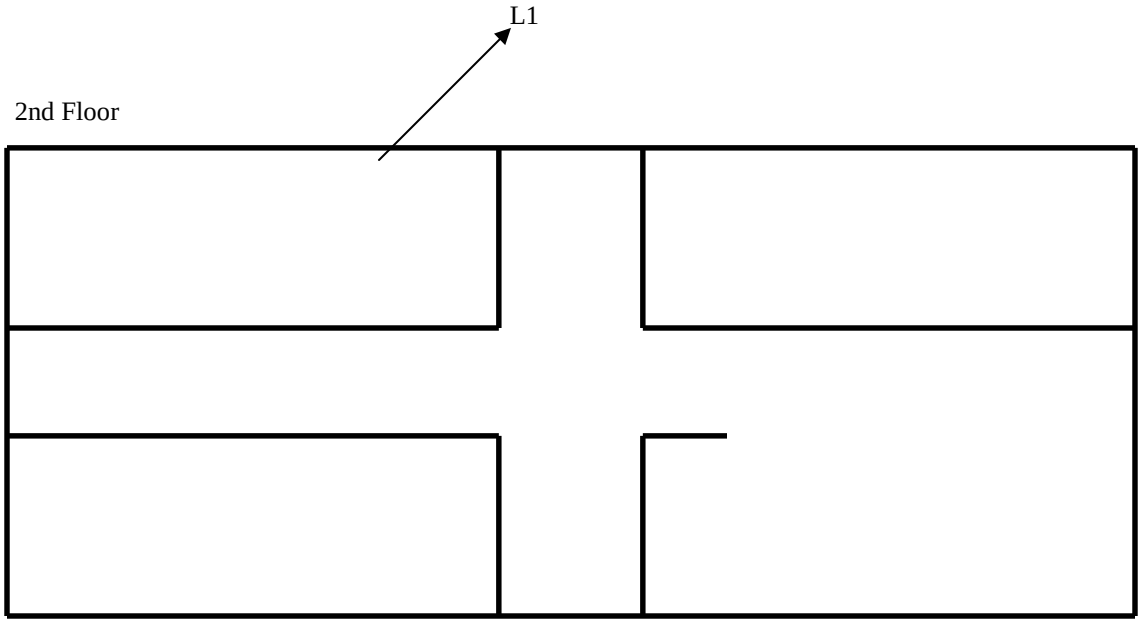
Macrotec Job #10857 - WO #16204 - Bldg. 332

The following table lists each of the painted surfaces suspected to contain lead at the subject site. For each painted surface, the sample number, location and laboratory result are listed.

Sample #	Painted Surface Description	Sample Location Description	Lab Result (Parts per Million)
L1	White Metal Window Frame	2nd Floor - Various	Below Reportable Limit

Sample Location Diagram

N



* Diagram Not
Drawn To Scale

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

13509 East Boundary Road, Suite B, Midlothian, VA 23112 • 804-739-1751 • fax: 804-739-1753

LEAD IN PAINT SAMPLE ANALYSIS SUMMARY

(EPA METHOD 7420)

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 100922I

DATE OF RECEIPT: 9/22/2010
DATE OF ANALYSIS: 9/22/2010
DATE OF REPORT: 9/23/2010

CLIENT JOB #: **10857**

JOBSITE: Bldg 332

ANALYST: B. Stone

TESC SAMPLE #	CLIENT SAMPLE #	SAMPLE WEIGHT (mg)	TOTAL LEAD (ug)	LEAD CONCENTRATION (% by Weight)	LEAD CONCENTRATION PPM
1	L1	257	< 10.0	< 0.004	< 39

Total Sample(s) Analyzed: 1

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the customer. Sample information was provided by the customer. This report must not be reproduced, except in full,without the written consent of Triangle Environmental Service Center, Inc. The test report related only to the item(s) tested. This analysis was performed by an AHIA accredited laboratory. AIHA/ELLAP ID: 100527, NYELAP/NELAC ID: 11413.
Minimum Reporting Limit: 20 ug. Lead Based Paint contains 0.5% lead by weight per Federal statute. The OSHA Lead in Construction Standard, 29 CFR 1926.62, is invoked if any lead is present in the sample. Lead-free paint is defined as <0.06% by weight (CPSC).
[LEGEND: mg= milligram, ug= microgram, ppm= parts per million]

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting

(UUP 22 I

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NELLYS

Project Number: 10857

Project Name:

Collection Date: 9/21/10

Project Location: BLDG 332

PO Number:

Technician: a

Turn Around Time: 3 DAY

Laboratory: TEL

Method of Analysis: AA FLAME

Stop at 1st Positive?: Y / N Composite Sheet Rock?: Y / N

Matrix:

Sample # H #	Sample # Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
	L1	WHITE METAL WINDOW FRAME	2ND FLOOR - VARIOUS

Relinquished By: [signature] Date: 9/21/10 Received By: [signature] Date: 9/22/10 (0:11)

Relinquished By: Date: Received By: Date:

BASE CIVIL ENGINEER WORK REQUEST

(See Reverse for Instructions)

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM *(Organization)*	2. OFFICE SYMBOL	3. DATE OF REQUEST	4. WORK REQUEST NO. *(For BCE Use)*
926 AMDF	SGA	20100914	16204

5. NAME AND PHONE NO. OF REQUESTER	6. REQUIRED COMPLETION DATE	7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED
TSGT LATEASHA GOINS 702 652-0968	20100917	BLDG 332

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED *(Include Sketch or Plan, when appropriate)*

I am requesting to have Mecho Shades installed on all windows located on the 2nd floor of BLDG 332.

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED *(Not required for maintenance and repair)*

We are currently working out of the old dorm rooms in bldg 332 that do not have any blinds to help with the sunlight. We are requesting the Mecho Shades to help with the glare and brightness control they also will lower energy consumptions and greater use of natural light. They will provide a significant reduction in solar heat gain and greater comfort with less air conditioning (that constantly goes out).

10. DONATED RESOURCES

X	FUNDS		LABOR		MATERIAL	X	CONTRACT BY REQUESTER		NONE

11. NAME OF REQUESTER	12. GRADE OF REQUESTER	13. SIGNATURE OF REQUESTER *(See Reverse of Form)*
MSGT DAWN STREICHER-MILLS	E7	Dawn Streicher-Mills, MSgt, USAFR Senior Health Services Administrator

14. COORDINATION

99CES/CEAO 16 Sep 10 / CEAO 16 Sep 10 / CEAO 16 Sep 10 / CEAO 16 Sep 10 / 99AMDS / 99ABW/JAG 17 Sep 2010

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER *(Place an "X" in the appropriate box.)*

	IN-SERVICE		SELF-HELP	X	CONTRACT		SABER

16. DIRECT SCHEDULED WORK *(Place an "X" in the appropriate box.)*

	EMERGENCY		URGENT		ROUTINE		SELF-HELP		M/C

17. SELF-HELP *(Place an "X" in the appropriate box.)*

	BRIEFING REQUIRED		ADEQUATE COORDINATION		INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST

✓	23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2) A2.3.8		24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED	X	25. APPROVED		26. DISAPPROVED

27. REMARKS

If external, ensure meets base architectural standards

SEE ATTACHED CEP COORDINATION SHEET

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE *(Please Type or Print)*	29. SIGNATURE	30. DATE
Maj Tanya Anderson	Tanya Anderson	21 Sep 2010

Macrotec Consulting, LLC.

Nellis Air Force Base
Asbestos and Lead Based Paint Inspection Report

Building Number: 332

Inspection Date: 10/16/2009

Nellis Work Order: 09963

Macrotec Job Number: 09716

Introduction:
Macrotec Consulting, LLC. performed an inspection for Asbestos Containing Building Materials and Lead Based Paint. The intent of this inspection was to identify materials containing asbestos and lead, within the subject site, that may be impacted during planned renovation activities.

Work Order Scope of Work:

Install new meters in the building.

Report Limitations:
The information contained in this report pertains only to the specific area defined in the above scope of work. This summarized report is for reference purposes, only. A detailed generic report is on file with Nellis Air Force Base Civil Engineering. Only proper personnel should interpret this report to determine whether the information herein can be utilized for current and future renovation activities within the building

Dustin R. McAllister
Nevada – OSHA Certified Asbestos Abatement Consultant
Certificate #IM0961
US EPA Lead Inspector
Certificate #NV-I-16781-1

Macrotec
Consulting, LLC.

Appendix A - Asbestos Assessment

Macrotec Job #09716 - WO #09963 - Bldg. 332

The following table lists each of the materials suspected to contain asbestos at the subject site. For each material the sample number, location and laboratory result are listed. If the material was found to contain asbestos, the friablity and NESHAP classification is identified.

---

1 Stucco **No Asbestos Detected**

This material is located on the exterior walls

AB1	Exterior - Adj. Mech. Room	None Detected
AB2	Exterior - Adj. Mech. Room	None Detected

---

2 Sheet Rock Mud & Tape **Non-Regulated**

This material is located on the walls of the Boiler Room B.

AB3	Boiler Room B - E Side of Door	<1% Chrysotile
AB4	Boiler Room B - E Side of Door	<1% Chrysotile

Macrotec
Consulting, LLC.

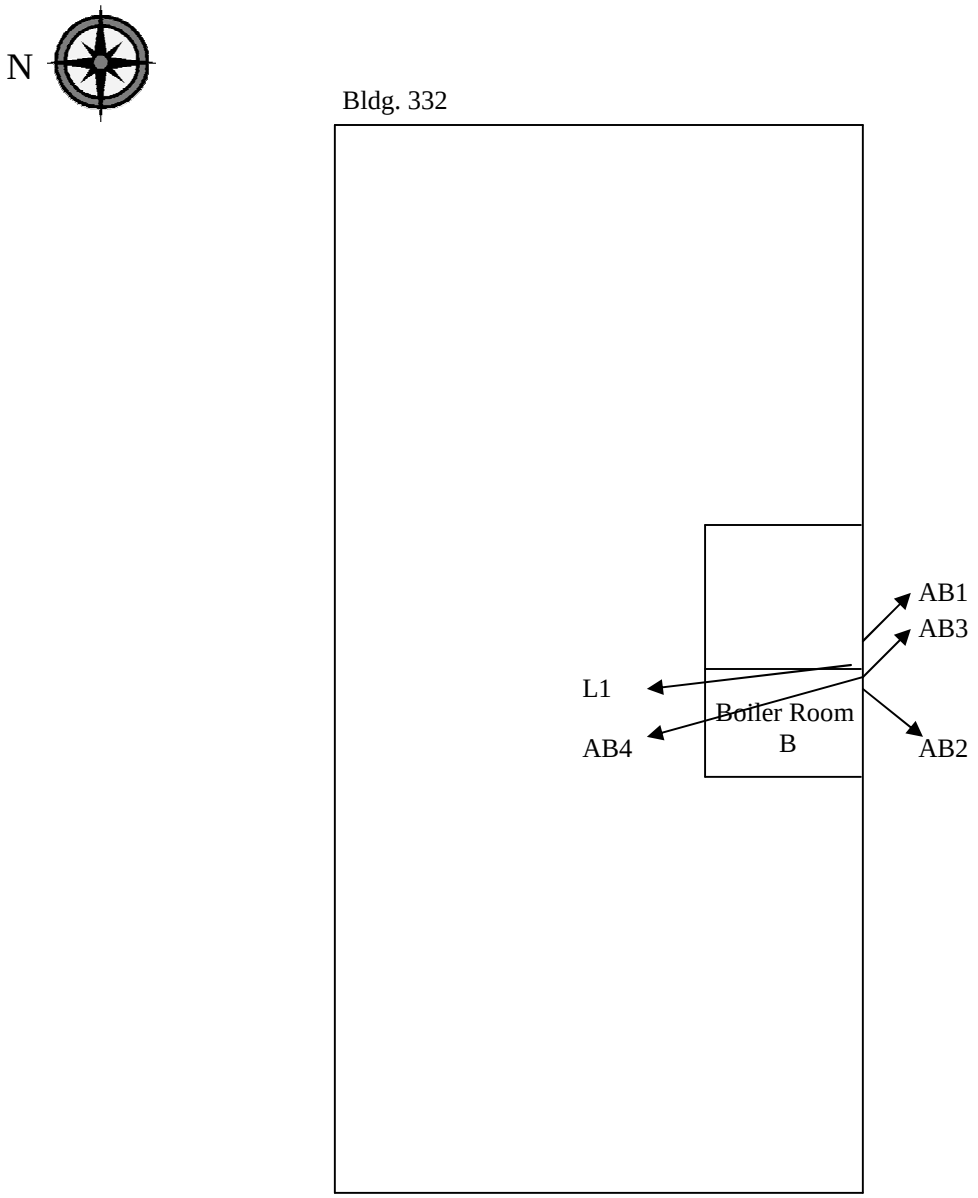
Appendix B - Lead Assessment

Macrotec Job #09716 - WO #09963 - Bldg. 332

The following table lists each of the painted surfaces suspected to contain lead at the subject site. For each painted surface, the sample number, location and laboratory result are listed.

Sample #	Painted Surface Description	Sample Location Description	Lab Result (Parts per Million)
L1	White Sheet Rock Wall	Boiler Room B - E Side of Door	49

Sample Location Diagram



* Diagram Not
Drawn To Scale

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

15549 Fox Cove Circle • Moseley, VA 23120-1608
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 091019T

DATE OF RECEIPT: 10/19/2009
DATE OF ANALYSIS: 10/20/2009
DATE OF REPORT: 10/20/2009

CLIENT JOB/ #: **09716**

JOB SITE: Bldg 332

ANALYST: F. Jiang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / Gray granular	**NAD**		100%
2	AB2 / Gray granular	**NAD**		100%

Total Samples/Layers Analyzed: 2

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA/600/R-93-116, July 1993 (EPA-600/M4-82-020, Dec 1982), or the current US EPA method for the analysis of asbestos in building material. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report must not be reproduced except in full with approval of Triangle Environmental Service Center, Inc. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[LEGEND NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting 091018T

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NELLIS
Project Number: 09716
Project Name: JOHNSTON CONTROLS
Collection Date: 10/16/09
Project Location: BLDG 332
PO Number:
Technician: [illegible]
Turn Around Time: 3 DAY
Laboratory: TOX
Method of Analysis: PLM
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
1	A01	STUCCO	EXTERIOR - ADJ MECH RM
2	A02	↓	↓ - ↓

Relinquished By: [illegible] Date: 10/16/09 Received By: [illegible] Date: 10/19/09 11:00

Relinquished By: Date: Received By: Date:

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

15549 Fox Cove Circle • Moseley, VA 23120-1608
804-739-1751 • fax: 804-739-1753

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 091026E

DATE OF RECEIPT: 10/26/2009
DATE OF ANALYSIS: 10/26/2009
DATE OF REPORT: 10/27/2009

CLIENT JOB/ #: **09716**

JOB SITE: Bldg 332

ANALYST: F. Jiang

TESC SAMPLE #	CLIENT SAMPLE ID & GROSS DESCRIPTION	ESTIMATED % ASBESTOS	NON ASBESTOS % FIBERS	NON FIBROUS % MATERIALS
1	AB1 / White powder, brown fibers	**<1% Chrysotile (<1% Chrysotile in JC)**	25% Cellulose	75%
2	AB2 / White powder, brown fibers	**<1% Chrysotile (<1% Chrysotile in JC)**	70% Cellulose	30%

Total Samples/Layers Analyzed: 2

Samples are analyzed in accordance with "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA/600/R-93-116, July 1993 (EPA-600/M4-82-020, Dec 1982), or the current US EPA method for the analysis of asbestos in building material. None Detected: not detected at/or below the detected limit of method (Reporting limit: 1% Asbestos). Glass fiber is analyzed for quality control blank. TESC recommends by point count or Transmission Electron Microscopy (TEM), for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by Polarized Light Microscopy (PLM). Both services are available for an additional fee. This report must not be reproduced except in full with approval of Triangle Environmental Service Center, Inc. This test report relates only to the item(s) tested.

NVLAP Lab Code: 200794-0

[LEGEND NAD=No Asbestos Detected, Lino.=Linoleum, JC=Joint Compound]

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting

OP1026E

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NELLIS
Project Number: 09716
Project Name: JOHNSON CONTROLS
Collection Date: 10/23/09
Project Location: BLDG 332
PO Number:
Technician: R
Turn Around Time: 3DAY
Laboratory: TCL
Method of Analysis: PLM
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
1	A1	SHEET RK MUD + TAPE - SMOOTH	BOILER RM B · E SIDE OF DOOR
1	A2	↓ - ↓	↓ - ↓

Relinquished By: [signature] Date: 10/23/09 Received By: [signature] Date: 10/26/09 11:45

Relinquished By: Date: Received By: Date:

TRIANGLE ENVIRONMENTAL SERVICE CENTER, INC.

15549 Fox Cove Circle • Moseley, VA 23120-1608 • 804-739-1751 • fax: 804-739-1753

LEAD IN PAINT SAMPLE ANALYSIS SUMMARY

(EPA METHOD 7420)

CLIENT: Macrotec Consulting
9724 Mild Weather Ct.
Las Vegas, NV 89148

TESC LOGIN #: 091026G

DATE OF RECEIPT: 10/26/2009
DATE OF ANALYSIS: 10/28/2009
DATE OF REPORT: 10/28/2009

CLIENT JOB #: **09716**

JOBSITE: Bldg 332

ANALYST: I. Hosn

TESC SAMPLE #	CLIENT SAMPLE #	SAMPLE WEIGHT (mg)	TOTAL LEAD (ug)	LEAD CONCENTRATION (% by Weight)	LEAD CONCENTRATION PPM
1	L1	567	28.0	0.005	49

Total Sample(s) Analyzed: 1

Reviewed By Authorized Signatory:

Feng Jiang, MS Senior Geologist, Laboratory Director
Yuedong Fang, Senior Geologist

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the customer. Sample information was provided by the customer. This report must not be reproduced, except in full,without the written consent of Triangle Environmental Service Center, Inc. The test report related only to the item(s) tested. This analysis was performed by an AHIA accredited laboratory. AIHA/ELLAP ID: 100527, NYELAP/NELAC ID: 11413.
Minimum Reporting Limit: 20 ug. Lead Based Paint contains 0.5% lead by weight per Federal statute. The OSHA Lead in Construction Standard, 29 CFR 1926.62, is invoked if any lead is present in the sample. Lead-free paint is defined as <0.06% by weight (CPSC).
[LEGEND: mg= milligram, ug= microgram, ppm= parts per million]

9724 Mild Weather Ct.
Las Vegas, NV 89148

Macrotec Consulting

OP10266

Phone: (702) 338-8213
Fax: (702) 629-5677

Bulk Sampling Chain of Custody Form

Client Name: NELLIS
Project Number: 09716
Project Name: JOHNSON CONTROL
Collection Date: 10/23/09
Project Location: BLDG 32
PO Number:
Technician: [illegible]
Turn Around Time: 3DAY
Laboratory: TESC
Method of Analysis: AA FIAMO
Stop at 1st Positive?: Y / N
Composite Sheet Rock?: Y / N
Matrix:

Sample # H #	Sample # Count	Sample Description (Material Type : Description : Color)	Sample Location (General : Room : Specific)
-	L1	WHITE SHEET ROCK WALL	BOILER RM 6 - E SIDE OF DOOR

Relinquished By: [illegible] Date: 10/23/09 Received By: [illegible] Date: 10/28/09 (11:00)

Relinquished By: Date: Received By: Date:

239-4958

BASE CIVIL ENGINEER WORK REQUEST

(See Reverse for Instructions)

Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM *(Organization)*	2. OFFICE SYMBOL	3. DATE OF REQUEST	4. WORK REQUEST NO. *(For BCE Use)*
99CES	CEAO	20090428	~~13022~~ 09963
5. NAME AND PHONE NO. OF REQUESTER		**6. REQUIRED COMPLETION DATE**	**7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED**
JEFFREY F. BLAZI DSN# 682-7790		20090531	Multiple Facilities

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED *(Include Sketch or Plan, when appropriate)*

Asbestos and Lead Based Testing for Advanced Electric Meter install project. In order to install the meters holes will need to be drilled. The will be used to install 1/2" to 1" conduit. The following facilities will need to be tested: ~~200, 201, 202, 300, 324,~~ ~~322~~, 336, ~~1022~~, ~~1033~~, 10210. Please see project manager Mr. Jeffrey Blazi for sketches showing the hole locations.
~~625~~, 245, 290, 586, ~~431~~, [redacted]
332. JB

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED *(Not required for maintenance and repair)*

In order to install the advanced metering system holes will need to be drilled for conduit. Energy Policy Act of 2005 mandates advanced metering of large facilities.

10. DONATED RESOURCES

	FUNDS		LABOR		MATERIA		CONTRACT BY REQUESTER		NONE

11. NAME OF REQUESTER	12. GRADE OF REQUESTER	13. SIGNATURE OF REQUESTER *(See Reverse of Form)*
JEFFREY F. BLAZI	YD-2	Jeffrey Blazi

14. COORDINATION

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER *(Place an "X" in the appropriate box.)*

	IN-SERVICE		SELF-HELP		CONTRACT		SABER	X	ASB/LBP SAMPLING

16. DIRECT SCHEDULED WORK *(Place an "X" in the appropriate box.)*

	EMERGENCY		URGENT		ROUTINE		SELF-HELP		M/C

17. SELF-HELP *(Place an "X" in the appropriate box.)*

	BRIEFING REQUIRED		ADEQUATE COORDINATION		INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST

	23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2)		24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED	X	25. APPROVE		26. DISAPPROVED

27. REMARKS

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE *(Please Type or Print)*	29. SIGNATURE	30. DATE
	[signature]	29 APR 09

Nellis Air Force Base

Asbestos and Lead Based Paint Project Database

Building Number: 332

Inspection Date: 1/9/2009

Nellis Work Order: 08306

<u>WO Scope of Work:</u>
Removal of door and doorway of the former laundry room.

The information contained in this report pertains only to the specific area defined in the above work order scope of work. Only proper personel should interperet this report to determine whether the information herein can be utilized for future renovation activities within this building.

This project was conducted by DGM Environmental.
DGM's Job Number:
109003

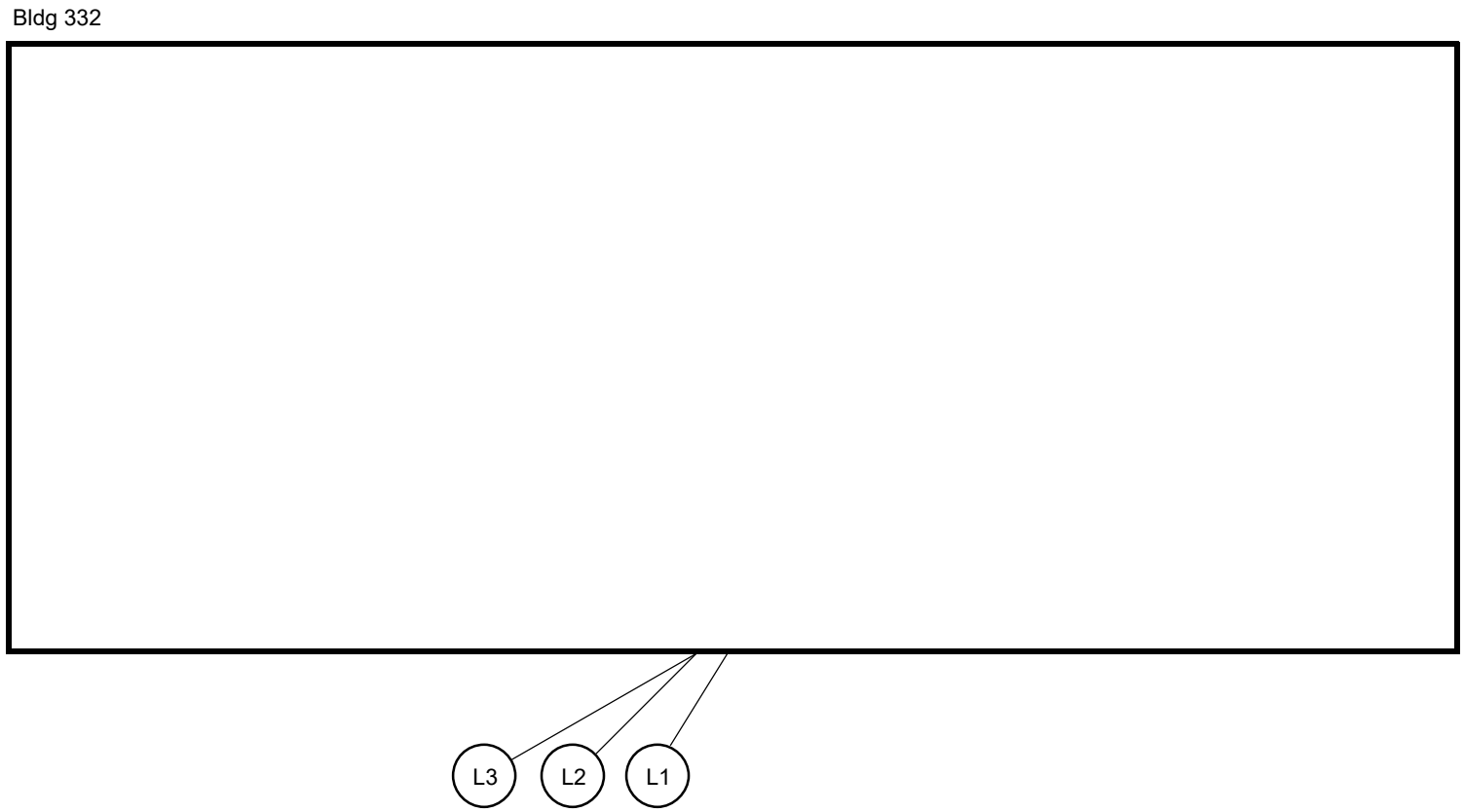
Lead Sample Results

Work Order: 08306
Building: 332

The following table provides an **inventory of the suspect lead based paint** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

Description	Sample ID	Weight %	PPM
Brown Metal Door Frame Exterior- - Door To Old Laundry Room	109003- L1	0.058	580
White Metal Door - Interior Exterior- - Door To Old Laundry Room	109003- L2	Below Reportable Limit	
Brown Metal Door - Exterior Exterior- - Door To Old Laundry Room	109003- L3	Below Reportable Limit	

Sample Location Diagram



* Diagram Not
Drawn To Scale

Nellis Air Force Base

Asbestos and Lead Based Paint Project Database

Building Number: 332

Inspection Date: 9/8/2008

Nellis Work Order: 10008

<u>WO Scope of Work:</u>
Clean-up sheet rock debris in the two boiler rooms.

The information contained in this report pertains only to the specific area defined in the above work order scope of work. Only proper personel should interperet this report to determine whether the information herein can be utilized for future renovation activities within this building.

This project was conducted by DGM Environmental.
DGM's Job Number:
108180

Asbestos Sample Results

Work Order: 10008
Building: 332

The following table provides an **inventory of the suspect materials containing asbestos** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

#	Description	Sample ID	Content
1	**Sheet Rock Mud & Tape - -**		
	- E Boiler Room - NW Corner	108180 - AB1	<1% Chrysotile L1 - Mud = <1% Chrys. L2 - Sheet Rock = ND
	- W Boiler Room - NE Corner	108180 - AB2	None Detected
	- W Boiler Room - W Wall	108180 - AB3	None Detected

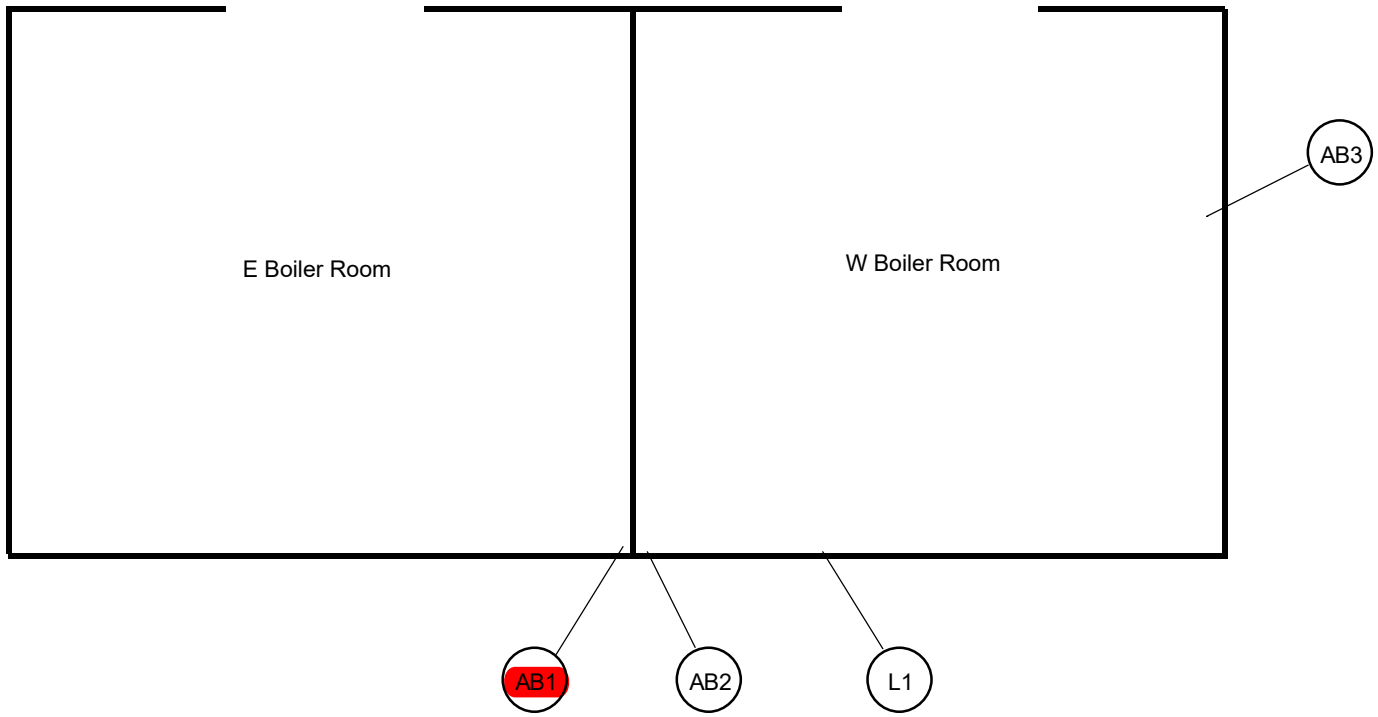
Lead Sample Results

Work Order: 10008
Building: 332

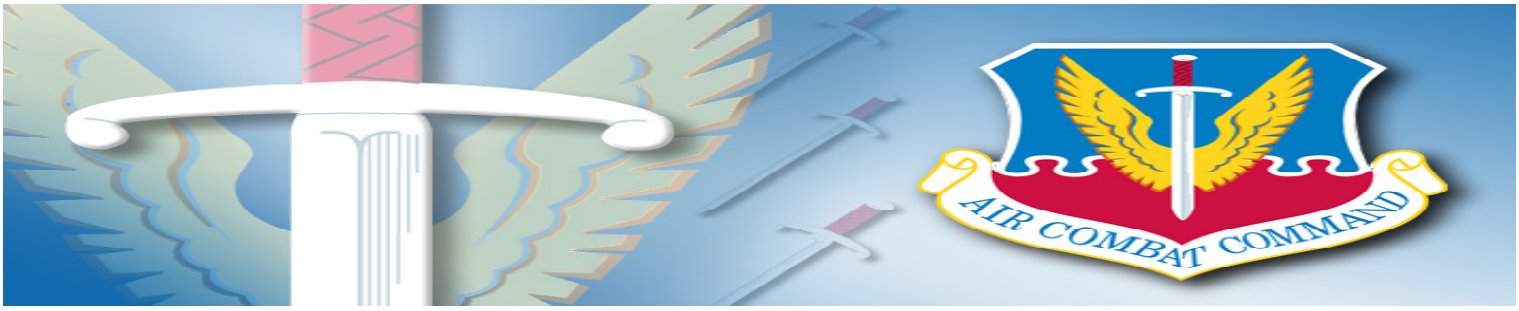
The following table provides an **inventory of the suspect lead based paint** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

Description	Sample ID	Weight %	PPM
White Sheet Rock Wall - W Boiler Room - N Wall	108180- L1	Below Reportable Limit	

Sample Location Diagram



* Diagram Not
Drawn To Scale



Nellis Air Force Base

Asbestos and Lead Based Paint Project Database

Building Number: 332

Inspection Date: 4/24/2008

Nellis Work Order: 08306

WO Scope of Work:
Check the boiler rooms pipes, valves, and tanks for asbestos .

The information contained in this report pertains only to the specific area defined in the above work order scope of work. Only proper personel should interperet this report to determine whether the information herein can be utilized for future renovation activities within this building.

This project was conducted by DGM Environmental.
DGM's Job Number:
108074

Asbestos Sample Results

Work Order: 08306
Building: 332

The following table provides an **inventory of the suspect materials containing asbestos** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

#	Description	Sample ID	Content
1	**TSI - On Tank -**		
	- Boiler Room A - NE Corner	108074-AB1	18% Chrysotile
	- Boiler Room A - NE Corner	108074-AB2	18% Chrysotile
	- Boiler Room A - NE Corner	108074-AB3	18% Chrysotile
2	**TSI - On Elbows -**		
	- Boiler Room A - NW Corner	108074-AB4	10% Chrysotile 5% Amosite
	- Boiler Room A - SW Corner	108074-AB5	10% Chrysotile 5% Amosite
	- Boiler Room B - NW Corner	108074-AB6	10% Chrysotile 5% Amosite
3	**TSI - On Valves -**		
	- Boiler Room A - SE Corner	108074-AB7	10% Chrysotile 10% Amosite
	- Boiler Room B - SW Corner	108074-AB8	10% Chrysotile 10% Amosite
	- Boiler Room B - SW Corner	108074-AB9	10% Chrysotile 10% Amosite
4	**Pipe Wrap - On Valves -**		
	- Boiler Room A - SE Corner	108074-AB10	None Detected

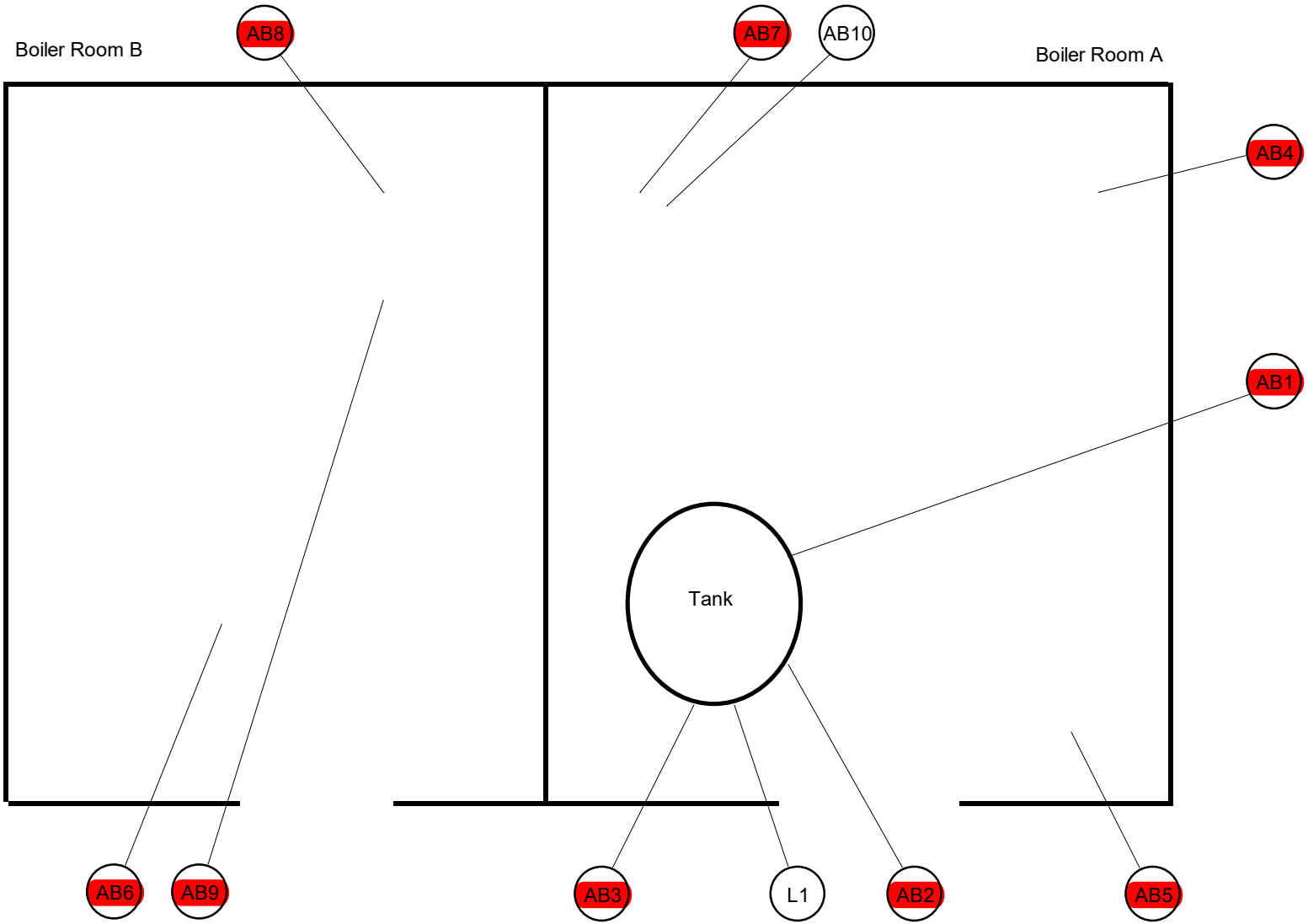
Lead Sample Results

Work Order: 08306
Building: 332

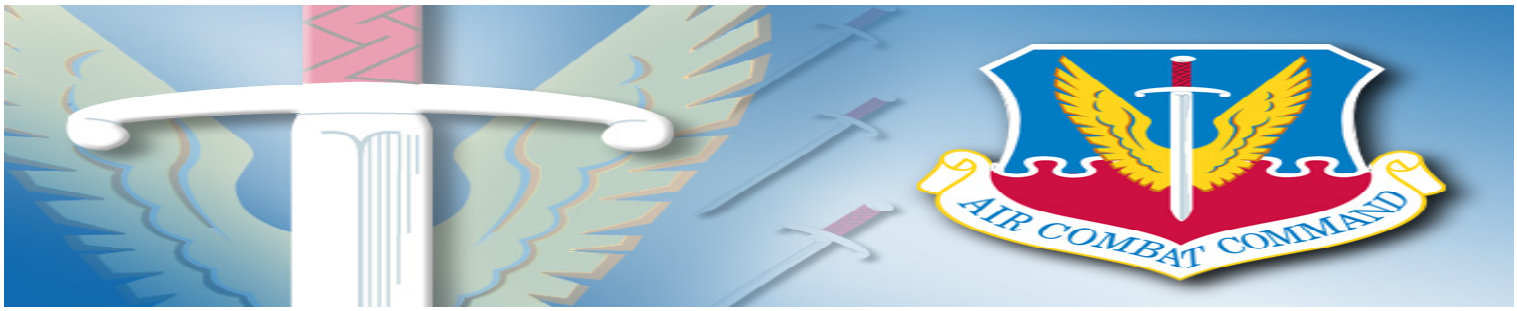
The following table provides an **inventory of the suspect lead based paint** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

Description	Sample ID	Weight %	PPM
White Metal Tank - Boiler Room A - NE Corner	108074- L1	Below Reportable Limit	

Sample Location Diagram



* Diagram Not Drawn To Scale



Nellis Air Force Base

Asbestos and Lead Based Paint Project Database

Building Number: 332

Inspection Date: 8/12/2006

Nellis Work Order: CH2M Hill

WO Scope of Work:
Test portions of the first and second floors.

The information contained in this report pertains only to the specific area defined in the above work order scope of work. Only proper personel should interperet this report to determine whether the information herein can be utilized for future renovation activities within this building.

This project was conducted by DGM Environmental.
DGM's Job Number:
19706

Asbestos Sample Results

The following table provides an **inventory of the suspect asbestos containing materials** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

#	Description	Sample ID	Content
1	**Acoustical Ceiling - Spray on -**		
	1st Floor - Room 115 - S end	197 - AB1	None Detected
	1st Floor - Room 114 - N end	197 - AB2	None Detected
	1st Floor - Lounge - Center	197 - AB3	None Detected
	2nd Floor - Room 216 - SW corner	197 - AB4	None Detected
	2nd Floor - Room 211 - NE corner	197 - AB5	None Detected
	2nd Floor - Room 220 - SW corner	197 - AB6	None Detected
	2nd Floor - Room 221 - SE corner	197 - AB7	None Detected
	2nd Floor - Room 223 - SE corner	197 - AB8	None Detected
	2nd Floor - Room 201 - NE corner	197 - AB9	None Detected
2	**Sheet Rock Mud & Tape - Textured -**		
	1st Floor - Room 118 - Adj. sink	197 - AB10	None Detected
	1st Floor - Room 109 - Adj. sink	197 - AB11	None Detected
	2nd Floor - Room 215 - Bath - Adj. room 215	197 - AB12	None Detected
	2nd Floor - Room 218 - Adj. sink	197 - AB13	None Detected
	2nd Floor - Room 222 - Bath - Adj. shower	197 - AB14	None Detected
3	**Texture - Atop Sheet Rock -**		
	1st Floor - Room 118 - Bath - Adj. shower	197 - AB15	None Detected
	1st Floor - Room 120 - Adj. bathroom	197 - AB16	None Detected
	2nd Floor - Room 217 - Bath - W wall	197 - AB17	None Detected
	2nd Floor - Room 219 - Adj. sink	197 - AB18	None Detected
	2nd Floor - Room 226 - Bath - Adj. shower	197 - AB19	None Detected
4	**Sheet Rock Mud & Tape - Smooth -**		
	1st Floor - Room 118 - Bath - Adj. toilet	197 - AB20	None Detected
	2nd Floor - Room 216 - Bath - Adj. room 216	197 - AB21	None Detected
	2nd Floor - Room 218 - Bath - Adj. shower	197 - AB22	None Detected

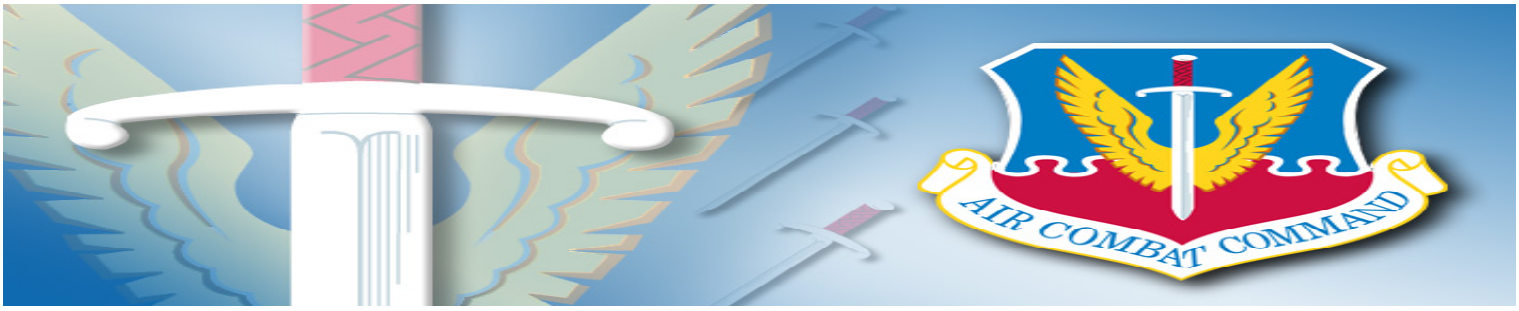
#	Description	Sample ID	Content
5	**Plaster Substrate - Beneath Acoustical -**		
	1st Floor - Room 115 - S end	197 - AB23	None Detected
	1st Floor - Room 114 - N end	197 - AB24	None Detected
	2nd Floor - Room 220 - SW corner	197 - AB25	None Detected
6	**Floor Tile - 12”x12” - Dark Gray**		
	2nd Floor - Laundry Room - Center	197 - AB26	None Detected
7	**Sheet Flooring - Pebble Pattern - Gray**		
	2nd Floor - Laundry Room - Center	197 - AB27	None Detected
8	**Floor Tile - 12”x12” - Beige**		
	1st Floor - Lounge - SE corner	197 - AB28	None Detected
9	**Floor Tile - Bottom Layer - Gray**		
	1st Floor - Lounge - SE corner	197 - AB29	None Detected
10	**Mastic - Beneath Gray Floor Tile - Black**		
	1st Floor - Lounge - SE corner	197 - AB30	None Detected
11	**Floor Tile - Bottom Layer - Tan**		
	1st Floor - Laundry Room - Center	197 - AB31	None Detected
12	**Sheet Flooring - Pebble Pattern - Beige**		
	1st Floor - Room 114 - Bath - Adj. door	197 - AB32	None Detected
13	**Base Cove & Mastic - 4” - Blue**		
	1st Floor - Room 114 - Bath - Adj. door	197 - AB33	None Detected
14	**Mastic - Beneath Sheet Flooring - Black**		
	1st Floor - Room 114 - Bath - Adj. door	197 - AB34	5% Chrysotile
15	**Stucco - Exterior - Gray**		
	2nd Floor - Exterior - Center of E side	197 - AB35	None Detected

#	Description	Sample ID	Content
16	**Base Cove & Mastic - 4” - Dark Brown**		
	2nd Floor - Reading Room - NE corner	197 - AB36	None Detected
17	**Sheet Flooring - Pebble Pattern - Brown**		
	2nd Floor - Reading Room - Adj. door	197 - AB37	None Detected
18	**Mastic - Beneath Carpet - Black**		
	1st Floor - Room 120 - NE corner	197 - AB38	5% Chrysotile

Lead Sample Results

The following table provides an **inventory of the suspect lead based paint** identified during **DGM's** inspection of the subject site.. The table provides each of the materials unique sample identification number and corresponding laboratory result.

Description	Sample ID	Weight %	PPM
Brown 4”x4” Ceramic Tile 2nd Floor- Room 219 - Bathroom shower	197- L1	0.00502	50.2
Tan 4”x4” Ceramic Tile 2nd Floor- Room 219 - Bathroom shower	197- L2	0.00783	78.3
Brown 1”x1” Ceramic Tile 2nd Floor- Room 219 - Bathroom shower	197- L3	Below Reportable Limits	
Beige Sheet Rock Wall 1st Floor- Room 118 - Bath - Adj. shower	197- L4	0.3400	3400
Brown Metal Door Frame 1st Floor- Room 118 - Door to bath	197- L5	0.0110	110
Beige Concrete Wall 2nd Floor- Exterior - W end	197- L6	Below Reportable Limits	
White Sheet Rock Wall 2nd Floor- Room 225 - Bath - W wall	197- L7	0.2150	2150
Brown Metal Door 2nd Floor- Room 225 - Door to bath	197- L8	0.00511	51.1
Beige Concrete Wall 2nd Floor- Exterior - E end	197- L9	Below Reportable Limits	



Nellis Air Force Base

Asbestos and Lead Based Paint Project Database

Building Number: 332

Inspection Date: 10/26/2004

Nellis Work Order: M3948

WO Scope of Work:
Water leak needs to be fixed in room 316.

The information contained in this report pertains only to the specific area defined in the above work order scope of work. Only proper personel should interperet this report to determine whether the information herein can be utilized for future renovation activities within this building.

This project was conducted by DGM Environmental.
DGM's Job Number:
104155

Asbestos Sample Results

Work Order: M3948
Building: 332

The following table provides an **inventory of the suspect materials containing asbestos** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

#	Description	Sample ID	Content
1	**Sheet Rock Mud & Tape - Light Texture -**		
	3rd Floor - Room 316 - NW Corner	104155 - AB1	None Detected
	3rd Floor - Room 316 - SW Corner	104155 - AB2	None Detected
	3rd Floor - Room 316 - SW Corner	104155 - AB3	None Detected
2	**Base Cove - 4" - Green**		
	3rd Floor - Room 316 - NW Corner	104155 - AB4	None Detected
3	**Mastic - Behind Base Cove - White**		
	3rd Floor - Room 316 - NW Corner	104155 - AB5	None Detected

Lead Sample Results

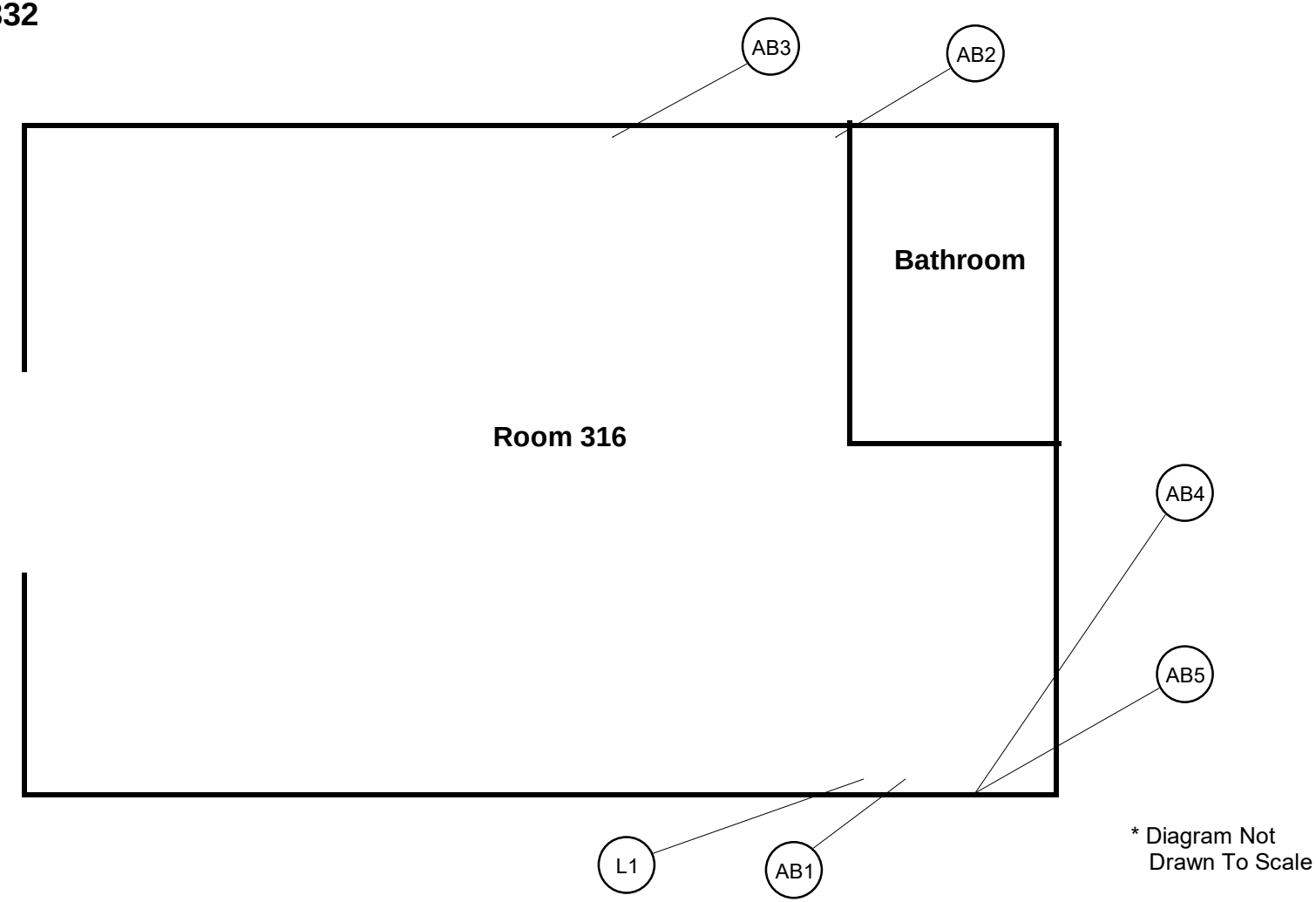
Work Order: M3948
Building: 332

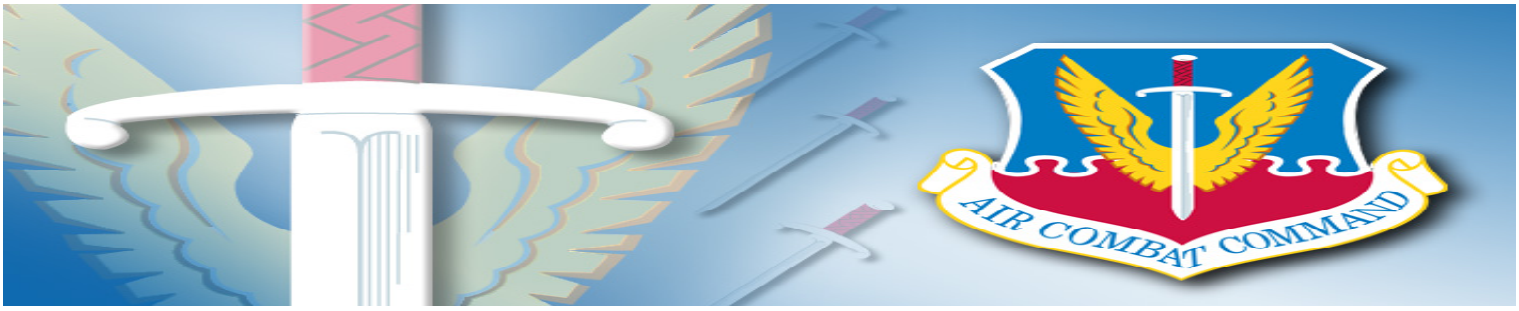
The following table provides an **inventory of the suspect lead based paint** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

Description	Sample ID	Weight %	PPM
Beige Sheet Rock Wall 3rd Floor- Room 316 - NW Corner	104155- L1	Below Reportable Limit	

Sample Location Diagram

NAFB
BUILDING # 332





Nellis Air Force Base

Asbestos and Lead Based Paint Project Database

Building Number: 332

Inspection Date: 1/28/2004

Nellis Work Order: 03567

WO Scope of Work:

Installation of a communications sattalite dish to be attached to room 226.

The information contained in this report pertains only to the specific area defined in the above work order scope of work. Only proper personel should interperet this report to determine whether the information herein can be utilized for future renovation activities within this building.

This project was conducted by DGM Environmental.

DGM's Job Number:

10425

Asbestos Sample Results

Work Order: 03567
Building: 332

The following table provides an **inventory of the suspect materials containing asbestos** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

#	Description	Sample ID	Content
1	**Sheetrock Mud & Tape - Light Texture -**		
	Bldg 332 - Room 226 - NE corner	10425 - AB1	None Detected
	Bldg 332 - Room 226 - NE corner	10425 - AB2	None Detected
	Bldg 332 - Room 226 - Adj door to exterior	10425 - AB3	None Detected
2	**Stucco - -**		
	Bldg 332 - Exterior - NE corner	10425 - AB4	None Detected
	Bldg 332 - Exterior - NE corner	10425 - AB5	None Detected
	Bldg 332 - Exterior - Adj guard rail	10425 - AB6	None Detected

Lead Sample Results

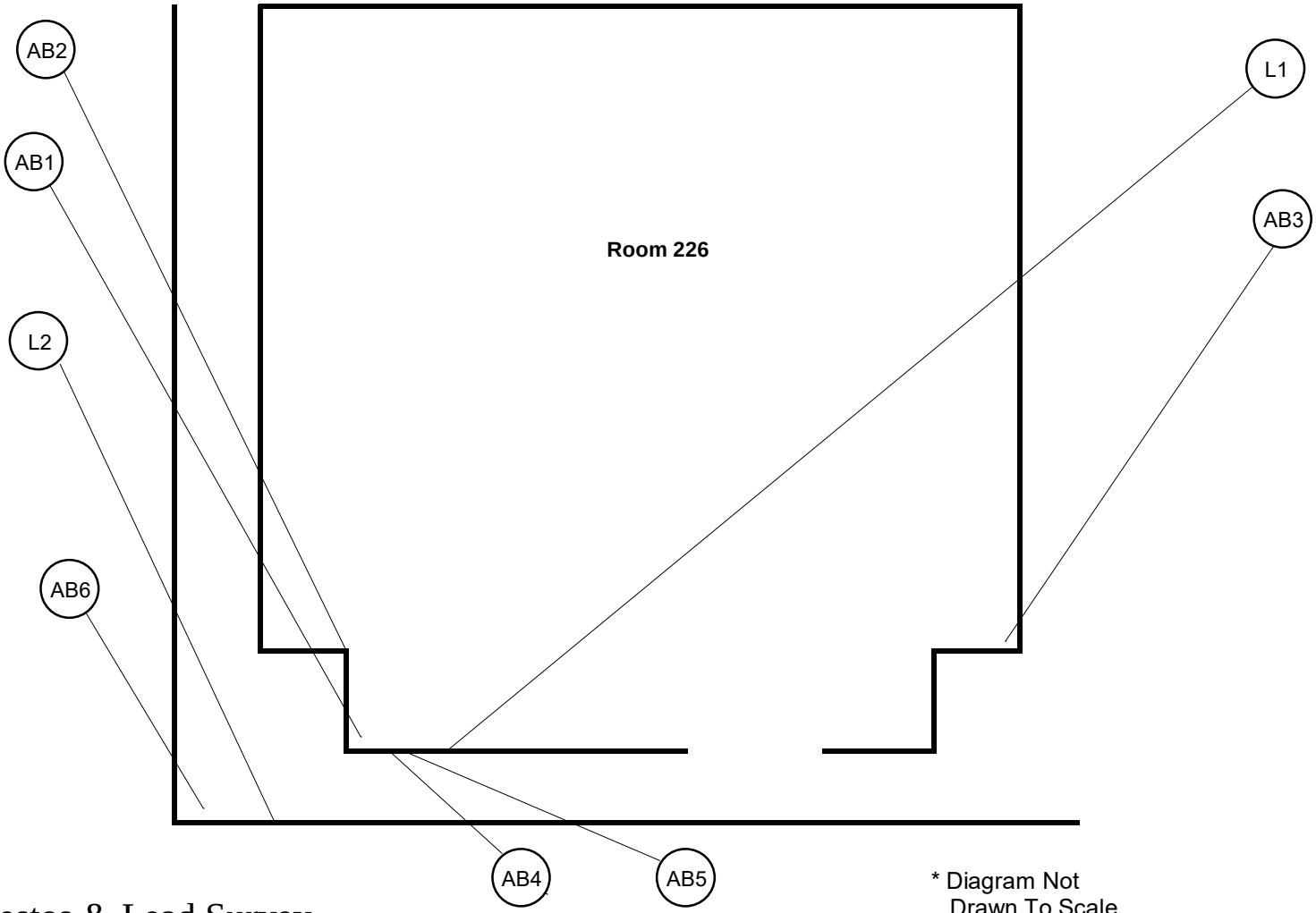
Work Order: 03567
Building: 332

The following table provides an **inventory of the suspect lead based paint** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

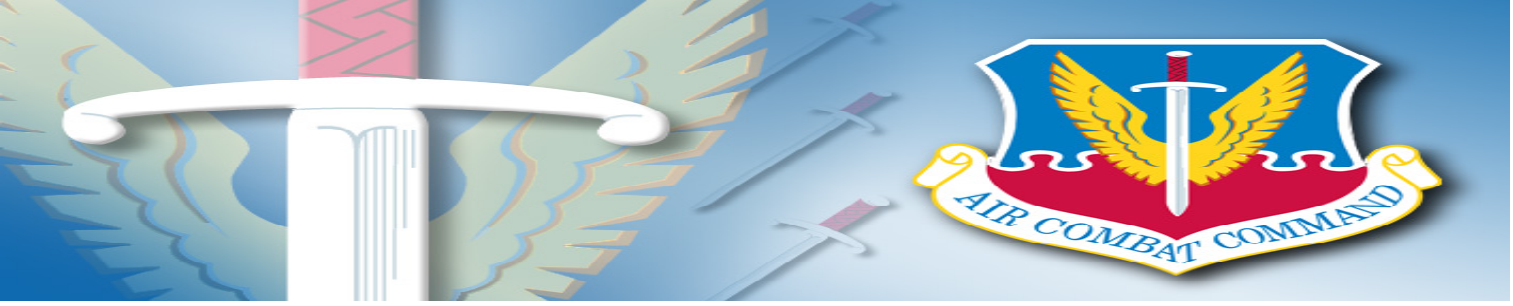
Description	Sample ID	Weight %	PPM
Green Wall Sheetrock Bldg 332- Room 226 - NE corner	10425- L1	0.017	170
Beige Wall Concrete Bldg 332- Exterior - NW corner	10425- L2	Below Reportable Limit	
Brown Guard rail Metal Bldg 332- Exterior - NW corner	10425- L3	2.67	26700

Sample Location Diagram

NAFB
BUILDING # 332



* Diagram Not Drawn To Scale



Nellis Air Force Base

Asbestos and Lead Based Paint Project Database

Building Number: 332, 334, 336

Inspection Date: 7/9/2001

Nellis Work Order: 99th CE Squadron

WO Scope of Work:

The information contained in this report pertains only to the specific area defined in the above work order scope of work. Only proper personel should interperet this report to determine whether the information herein can be utilized for future renovation activities within this building.

This project was conducted by DGM Environmental.

DGM's Job Number:

20601

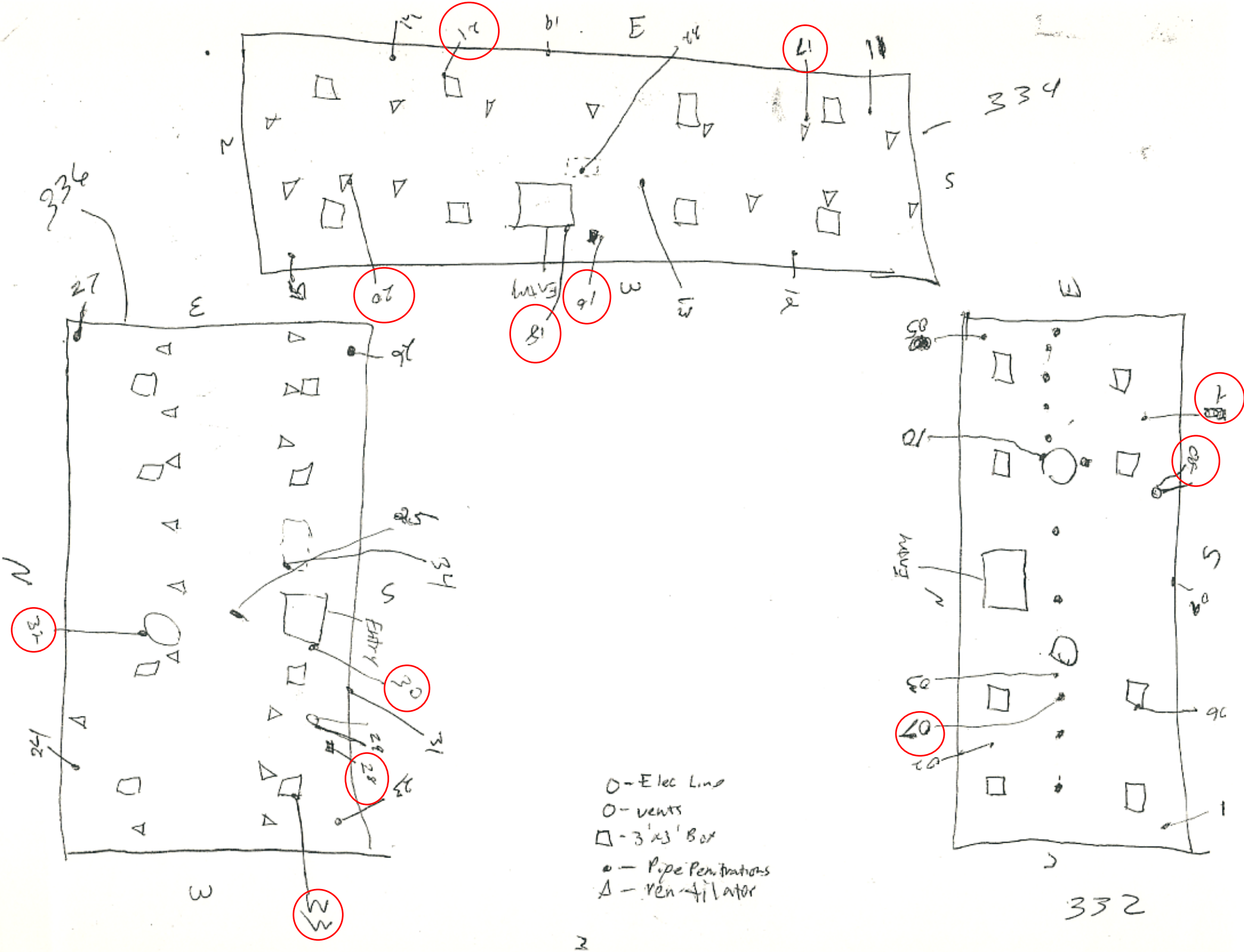
Asbestos Sample Results

The following table provides an **inventory of the suspect asbestos containing materials** identified during **DGM's** inspection of the subject site. The table provides each of the materials unique sample identification number and corresponding laboratory result.

#	Description	Sample ID	Content
1	**Roof Paper - Core sample - Black**		
	Building 332 - Roof - SW corner	206 - 01	None Detected
	Building 332 - Roof - NW corner	206 - 02	None Detected
	Building 332 - Roof - W corner	206 - 03	None Detected
	Building 332 - Roof - SE corner	206 - 04	None Detected
	Building 332 - Roof - NE corner	206 - 05	None Detected
2	**Roof Mastic - Around A/C Box - Gray**		
	Building 332 - Roof - SW corner	206 - 06	12% Chrysotile
3	**Roof Mastic - Pipe Penetration - Gray**		
	Building 332 - Roof - W corner	206 - 07	15% Chrysotile
4	**Roof Mastic - Electrical line pipe - Gray**		
	Building 332 - Roof - SE corner	206 - 08	12% Chrysotile
5	**Felt Paper - Roof edge - Black**		
	Building 332 - Roof - S corner	206 - 09	None Detected
6	**Mastic - Roof vent - Gray**		
	Building 332 - Roof - E corner	206 - 10	None Detected
7	**Roof Paper - Core sample - Black**		
	Building 334 - Roof - SE corner	206 - 11	None Detected
	Building 334 - Roof - SW corner	206 - 12	None Detected

#	Description	Sample ID	Content
	Building 334 - Roof - Center	206 - 13	None Detected
	Building 334 - Roof - NE corner	206 - 14	None Detected
	Building 334 - Roof - NW corner	206 - 15	None Detected
8	**Mastic - Solar panel support - Gray**		
	Building 334 - Roof - W center	206 - 16	5% Chrysotile
9	**Mastic - Pipe Penetration - Gray**		
	Building 334 - Roof - SE corner	206 - 17	5% Chrysotile
10	**Mastic - Hatch - Gray**		
	Building 334 - Roof - W center	206 - 18	2% Chrysotile
11	**Felt Paper - Roof edge - Black**		
	Building 334 - Roof - E center	206 - 19	None Detected
12	**Mastic - Roof vent - Gray**		
	Building 334 - Roof - NW corner	206 - 20	8% Chrysotile
13	**Mastic - Around A/C Box - Gray**		
	Building 334 - Roof - E center	206 - 21	10% Chrysotile
14	**Pad - 4 X 3 roof protector - Black**		
	Building 334 - Roof - center	206 - 22	None Detected
15	**Roof Paper - Core sample - Black**		
	Building 336 - Roof - SW corner	206 - 23	None Detected
	Building 336 - Roof - NW corner	206 - 24	None Detected
	Building 336 - Roof - Center	206 - 25	None Detected
	Building 336 - Roof - SE corner	206 - 26	None Detected

#	Description	Sample ID	Content
	Building 336 - Roof - NE corner	206 - 27	None Detected
16	**Mastic - Solar panel support - Gray**		
	Building 336 - Roof - SW corner	206 - 28	8% Chrysotile
17	**Mastic - Pipe Penetration - Gray**		
	Building 336 - Roof - SW corner	206 - 29	None Detected
18	**Mastic - Hatch - Gray**		
	Building 336 - Roof - S center	206 - 30	6% Chrysotile
19	**Felt Paper - Roof edge - Black**		
	Building 336 - Roof - S center	206 - 31	None Detected
20	**Mastic - Roof vent - Gray**		
	Building 336 - Roof - N center	206 - 32	8% Chrysotile
21	**Mastic - Around A/C Box - Gray**		
	Building 336 - Roof - SW corner	206 - 33	6% Chrysotile
22	**Pad - 4 X 3 roof protector - Black**		
	Building 336 - Roof - S center	206 - 34	None Detected


334
336
332
Entry
Entry
Entry
O - Elec Line
O - vents
□ - 3'x3' Box
• — Pipe Penetrations
Δ — ventilator

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08/11

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SECTION 02 83 13

LEAD IN CONSTRUCTION
08/11

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780	(1995; Errata Aug 1996;Rev Ch. 7 - 1997) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.33	Access to Employee Exposure and Medical Records
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009; Reprint Dec 2017) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period.

1.2.2 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel (approximately 5 to 6 feet above the floor).

1.2.3 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations and has the authority to take prompt corrective actions to control the lead hazard. A Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.4 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment (PPE).

1.2.5 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.6 High Efficiency Particulate Arrestor (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated particulate. A high efficiency

particulate filter demonstrates at least 99.97 percent efficiency against 0.3 micron or larger size particles.

1.2.7 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.

1.2.8 Lead Control Area

A system of control methods to prevent the spread of lead dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.9 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a work day, the PEL shall be determined by the following formula:

PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

1.2.10 Material Containing Lead/Paint with Lead (MCL/PWL)

Any material, including paint, which contains lead as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of lead are found using a quantitative method for analyzing paint or MCL using laboratory instruments with specified limits of detection (usually 0.01 percent). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.11 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.12 Physical Boundary

Area physically roped or partitioned off around lead control area to limit unauthorized entry of personnel.

1.3 DESCRIPTION

1.3.1 Description of Work

Construction activities impacting PWL or material containing lead which are covered by this specification include the removal of material containing lead in areas where the Nellis AFB Bldg 332 Renovation Project will be accomplished to prevent worker exposure. A detailed Lead Based Paint Survey was accomplished (see attached Lead Based Paint Survey reports) to provide information as to what needs to be abated prior to start of this

project.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Lead Compliance Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead activities.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Lead Compliance Plan including CP approval (signature, date, and certification number); G

Competent Person qualifications; G

Training Certification of workers and supervisors; G

Lead waste management plan; G

Written evidence that TSD is approved for lead disposal; G

Certification of Medical Examinations; G

SD-06 Test Reports

Sampling results; G

Occupational and Environmental Assessment Data Report; G

SD-07 Certificates

Testing laboratory qualifications;

Clearance Certification;

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility;

Waste turn-in documents or weight tickets for non-hazardous wastes that are disposed of at sanitary or construction and demolition landfills.

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Competent Person (CP)

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide documented construction project-related experience with implementation of OSHA's Lead in Construction standard (29 CFR 1926.62) which shows ability to assess occupational and environmental exposure to lead, experience with the use of respirators, personal protective equipment and other exposure reduction methods to protect employee health. Submit proper documentation that the CP is trained and certified in accordance with federal, State and local laws. The competent person shall be a licensed lead-based paint abatement Supervisor/Project Designer in the State of Nevada.

1.5.1.2 Training Certification

Submit a certificate for each worker and supervisor, signed and dated by the accredited training provider, stating that the employee has received the required lead training specified in 29 CFR 1926.62(l)and is certified to perform or supervise deleading, lead removal or demolition activities in the state of Nevada.

1.5.1.3 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the air and wipe analysis, testing, and reporting of airborne concentrations of lead. Use a laboratory participating in the EPA National Lead Laboratory Accreditation Program (NLLAP) by being accredited by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

a. Verify training meets all federal, State, and local requirements.

b. Review and approve Lead Compliance Plan for conformance to the applicable referenced standards.

c. Continuously inspect PWL or MCL work for conformance with the approved plan.

d. Perform (or oversee performance of) air sampling. Recommend upgrades or downgrades (whichever is appropriate based on exposure) on the use of PPE (respirators included) and engineering controls.

e. Ensure work is performed in strict accordance with specifications at all times.

f. Control work to prevent hazardous exposure to human beings and to the environment at all times.

g. Supervise final cleaning of the lead control area, take clearance wipe samples if necessary; review clearance sample results and make recommendations for further cleaning.

h. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead Compliance Plan

Submit a detailed job-specific plan IAW EM 385-1-1 par 06.C.02 of the work procedures to be used in the disturbance of PWL or MCL. The plan shall include a sketch showing the location, size, and details of lead control areas, critical barriers, physical boundaries, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include a description of equipment and materials, work practices, controls and job responsibilities for each activity from which lead is emitted. Include in the plan, eating, drinking, smoking, hygiene facilities and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and dust containing lead and debris, air sampling, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that lead is not released outside of the lead control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training and strategy, sampling and analysis strategy and methodology, frequency of sampling, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multicontractor worksites to inform affected employees and to clarify responsibilities to control exposures.

The plan shall be developed by a certified planner/project designer in the State of Nevada with certification.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

a. The initial monitoring shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of 29 CFR 1926.62 with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, rivet busting, cleanup of dry expendable abrasives, abrasive blast enclosure removal, abrasive blasting, welding, cutting and torch burning where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the lead compliance plan per 29 CFR 1926.62.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62 and 29 CFR 1926.103. Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62. Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.

1.5.2.5 Training

Train each employee performing work that disturbs lead, who performs MCL/PWL disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. Establish and implement a respiratory protection program as required by AIHA Z88.6, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Lead Waste Management

The Lead Waste Management Plan shall comply with applicable requirements of federal, State, and local hazardous waste regulations and address:

a. Identification and classification of wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of hazardous waste manifests .

d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.

g. Work plan and schedule for waste containment, removal and disposal.

Proper containment of the waste includes using acceptable waste containers (e.g., 55-gallon drums) as well as proper marking/labeling of the containers. Wastes shall be cleaned up and containerized daily.

h. Include any process that may alter or treat waste rendering a hazardous waste non hazardous.

1.5.2.9 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, State, and local authorities regarding lead. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply. Comply with all State laws, ordinances, criteria, rules and regulations regarding removing, handling, storing, transporting, and disposing of lead-contaminated materials as applicable.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the Lead Waste Management Plan and the Lead Compliance Plan, including procedures and precautions for the work.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust, fume and mist. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable protective whole body clothing, head covering, gloves, eye, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during PWL or MCL handling and disposal, notify the rental agency in writing concerning the intended use of the equipment.

1.6.4 Vacuum Filters

Use UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the lead removal work within the lead controlled area. Personal protective equipment shall include disposable whole body

covering, including appropriate foot, head, eye, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.

1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better as determined by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

Notify the Contracting Officer 20 days prior to the start of any lead work.

3.1.1.2 Lead Control Area

a. Physical Boundary - Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside of the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area. Provide temporary HVAC system for areas in which HVAC has been shut down outside the lead control area.

3.1.1.4 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.5 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.6 Mechanical Ventilation System

a. To the extent feasible, use local exhaust ventilation or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.

b. Vent local exhaust outside the building and away from building ventilation intakes or ensure system is connected to HEPA filters.

c. Use locally exhausted, power actuated tools or manual hand tools.

3.1.1.7 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Lead Control Area Requirements

Establish a lead control area by completely establishing barriers and physical boundaries around the area or structure where PWL or MCL removal operations will be performed.

Full containment - Contain removal operations by the use of critical barriers and HEPA filtered exhaust . For containment areas larger than 1,000 square feet install a minimum of two 18 inch square viewing ports. Locate ports to provide a view of the required work from the exterior of the enclosed contaminated area. Glaze ports with laminated safety glass.

3.3 APPLICATION

3.3.1 Lead Work

Perform lead work in accordance with approved Lead Compliance Plan. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when the work is performed in accordance with 29 CFR 1926.62 , and as specified herein. Dispose of all PWL or MCL and associated waste in compliance with federal, State, and local requirements.

3.3.2 Paint with Lead or Material Containing Lead Removal

Manual or power sanding or grinding of lead surfaces or materials is not permitted unless tools are equipped with HEPA attachments or wet methods. The dry sanding or grinding of surfaces that contain lead is prohibited. Provide methodology for removing lead in the Lead Compliance Plan. Select lead removal processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris or waste and to ensure that unprotected personnel are not exposed to hazardous concentrations of lead. Describe this removal process in the Lead Compliance Plan.

3.3.2.1 Paint with Lead or Material Containing Lead - Indoor Removal

Perform manual removal in the lead control areas using enclosures, barriers or containments . Collect residue debris for disposal in accordance with federal, State, and local requirements.

3.3.2.2 Paint with Lead or Material Containing Lead - Outdoor Removal

Perform outdoor removal as indicated in federal, State, and local regulations and in the Lead Compliance Plan. The worksite preparation (barriers or containments) shall be job dependent and presented in the Lead Compliance Plan.

3.3.3 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn in the control area:

a. Vacuum all clothing before entering the contaminated change room.

b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.

c. Wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing, move to an appropriate shower facility, shower.

d. Change to clean clothes prior to leaving the clean clothes storage area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Conduct sampling for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

a. The CP shall be on the job site directing the air and wipe sampling and inspecting the PWL or MCL removal work to ensure that the requirements of the contract have been satisfied during the entire PWL or MCL operation.

b. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least twenty-five percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

c. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken.

d. Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of

air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval.

e. Surface Wipe Samples - Collect surface wipe samples on floors at a location no greater than 10 feet outside the lead control area at a frequency of once per day while lead removal work is conducted in occupied buildings. Surface wipe results shall meet criteria in paragraph "Clearance Certification.

3.4.1.2 Sampling After Removal

After the visual inspection, collect wipe samples according to the HUD protocol contained in HUD 6780 to determine the lead content of settled dust in micrograms per square meter foot of surface area .

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of dust and debris. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use pressurized air to clean up the area. At the end of each shift and when the lead operation has been completed, clean the controlled area of visible contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the Lead Compliance Plan. Reclean areas showing dust or debris. After visible dust and debris is removed, wet wipe and HEPA vacuum all surfaces in the controlled area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before clearance testing.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the lead control area during paint removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification. Clear the lead control area of all visible dust and debris.
For exterior work, soil samples taken at the exterior of the work site shall be used to determine if soil lead levels had increased at a statistically significant level (significant at the 95 percent confidence limit) from the soil lead levels prior to the operation. If soil lead levels either show a statistically significant increase above soil lead levels prior to work or soil lead levels above any applicable federal or state standard for lead in soil, the soil shall be remediated.

3.5.2 Disposal

a. All material, whether hazardous or non-hazardous shall be disposed in accordance with all laws and provisions and all federal, State or local

regulations. Ensure all waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

b. Contractor is responsible for segregation of waste. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261.

c. Dispose of lead-contaminated material classified as hazardous waste at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.

d. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved containers. Properly label each container to identify the type of waste (49 CFR 172) and the date the container was filled. For hazardous waste, the collection container requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-container. Do not store hazardous waste containers in interim storage longer than 90 calendar days from the date affixed to each container.

e. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

3.5.2.1 Disposal Documentation

Submit written evidence to demonstrate the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA, State or local regulatory agencies. Submit one copy of the completed hazardous waste manifest, signed and dated by the initial transporter in accordance with 40 CFR 262. Contractor shall provide a certificate that the waste was accepted by the disposal facility. Provide turn-in documents or weight tickets for non-hazardous waste disposal.

3.5.2.2 Payment for Hazardous Waste

Payment for disposal of hazardous and non-hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials or non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

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SECTION 02 84 16

HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY

04/06

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SECTION 02 84 16

HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.1000	Air Contaminants
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 273	Standards For Universal Waste Management
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 178	Specifications for Packagings

1.2 REQUIREMENTS

This specification provides guidance on the proper removal and disposal of PCB containing lighting ballasts and associated mercury-containing lamps encountered during the Nellis AFB Bldg 332 Renovation Project. A HAZMAT (PCB/Mercury, etc.)survey need to be accomplished as part of this contract to determine the amount of hazardous materials, PCB containing lighting ballasts and associated mercury-containing lamps that need to be properly

disposed. Contractor may encounter leaking PCB ballasts.

1.3 DEFINITIONS

1.3.1 Certified Industrial Hygienist (CIH)

A industrial hygienist hired by the contractor shall be certified by the American Board of Industrial Hygiene.

1.3.2 Leak

Leak or leaking means any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

1.3.3 Lamps

Lamp, also referred to as "universal waste lamp", is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

1.3.4 Polychlorinated Biphenyls (PCBs)

PCBs as used in this specification shall mean the same as PCBs, PCB containing lighting ballast, and PCB container, as defined in 40 CFR 761, Section 3, Definitions.

1.3.5 Spill

Spill means both intentional and unintentional spills, leaks, and other uncontrolled discharges when the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases.

1.3.6 Universal Waste

Universal Waste means any of the following hazardous wastes that are managed under the universal waste requirements 40 CFR 273:

(1) Batteries as described in Sec. 273.2 of this chapter;
(2) Pesticides as described in Sec. 273.3 of this chapter;
(3) Thermostats as described in Sec. 273.4 of this chapter; and
(4) Lamps as described in Sec. 273.5 of this chapter.

1.4 QUALITY ASSURANCE

1.4.1 Regulatory Requirements

Perform PCB related work in accordance with 40 CFR 761. Perform mercury-containing lamps storage and transport in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, 40 CFR 273 .

1.4.2 Training

Certified industrial hygienist (CIH) shall instruct and certify the training of all persons involved in the removal of PCB containing lighting

ballasts and mercury-containing lamps. The instruction shall include: The dangers of PCB and mercury exposure, decontamination, safe work practices, and applicable OSHA and EPA regulations. The CIH shall review and approve the PCB and Mercury-Containing Lamp Removal Work Plans.

1.4.3 Regulation Documents

Maintain at all times one copy each at the office and one copy each in view at the job site of 29 CFR 1910.1000, 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 265, 40 CFR 268, 40 CFR 270, 40 CFR 273 and of the Contractor removal work plan and disposal plan for PCB and for associated mercury-containing lamps.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Testing Results; G,

SD-07 Certificates

Qualifications of CIH

Training Certification

PCB and Lamp Removal Work Plan; G

PCB and Lamp Disposal Plan; G

Certification of Decontamination; G,

SD-11 Closeout Submittals

Transporter certification of notification to EPA of their PCB waste activities and EPA ID numbers; G

Certificate of Disposal and/or recycling. Submit to the Government before application for payment within 30 days of the date that the disposal of the PCB and mercury-containing lamp waste identified on the manifest was completed.

DD Form 1348-1

1.6 ENVIRONMENTAL REQUIREMENTS

Use special clothing:

a. Disposable gloves (polyethylene)

b. Eye protection

c. PPE as required by CIH

1.7 SCHEDULING

Notify the Contracting Officer 20 days prior to the start of PCB and mercury-containing lamp removal work.

1.8 QUALITY ASSURANCE

1.8.1 Qualifications of CIH

Submit the name, address, and telephone number of the Industrial Hygienist selected to perform the duties in paragraph entitled "Certified Industrial Hygienist." Submit training certification that the Industrial Hygienist is certified, including certification number and date of certification or re certification.

1.8.2 PCB and Lamp Removal Work Plan

Submit a job-specific plan within 15 calendar days after award of contract of the work procedures to be used in the removal, packaging, and storage of PCB-containing lighting ballasts and associated mercury-containing lamps. Include in the plan: Requirements for Personal Protective Equipment (PPE), spill cleanup procedures and equipment, eating, smoking and restroom procedures. The plan shall be approved and signed by the Certified Industrial Hygienist. Obtain approval of the plan by the Contracting Officer prior to the start of PCB and/or lamp removal work.

1.8.3 PCB and Lamp Disposal Plan

Submit a PCB and lamp Disposal Plan within 15 calendar days after award of contract. The PCB and Lamp Disposal Plan shall comply with applicable requirements of federal, state, and local PCB and Universal waste regulations and address:

a. Estimated quantities of wastes to be generated, disposed of, and recycled.

b. Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location. Furnish two copies of EPA and state PCB and mercury-containing lamp waste permit applications and EPA identification numbers, as required.

c. Names and qualifications (experience and training) of personnel who will be working on-site with PCB and mercury-containing lamp wastes.

d. Spill prevention, containment, and cleanup contingency measures to be implemented.

e. Work plan and schedule for PCB and mercury-containing lamp waste removal, containment, storage, transportation, disposal and or recycling. Wastes shall be cleaned up and containerize daily.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 WORK PROCEDURE

Furnish labor, materials, services, and equipment necessary for the removal of PCB containing lighting ballasts, associated mercury-containing fluorescent lamps, and high intensity discharge (HID) lamps in accordance with local, state, or federal regulations. Do not expose PCBs to open flames or other high temperature sources since toxic decomposition by-products may be produced. Do not break mercury containing fluorescent lamps or high intensity discharge lamps.

3.1.1 Work Operations

Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with 40 CFR 761, 40 CFR 262 40 CFR 263, and the applicable requirements of this section, including but not limited to:

a. Obtaining suitable PCB and mercury-containing lamp storage sites.

b. Notifying Contracting Officer prior to commencing the operation.

c. Reporting leaks and spills to the Contracting Officer.

d. Cleaning up spills.

e. Inspecting PCB and PCB-contaminated items and waste containers for leaks and forwarding copies of inspection reports to the Contracting Officer.

f. Maintaining inspection, inventory and spill records.

3.2 PCB SPILL CLEANUP REQUIREMENTS

3.2.1 PCB Spills

Immediately report to the Contracting Officer any PCB spills.

3.2.2 PCB Spill Control Area

Rope off an area around the edges of a PCB leak or spill and post a "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to a drip pan or other container.

3.2.3 PCB Spill Cleanup

Initiate cleanup of spills IAW 40 CFR 761, subpart G as soon as possible, but no later than 24 hours of its discovery. Mop up the liquid with rags or other conventional absorbent. The spent absorbent shall be properly contained and disposed of as solid PCB waste.

3.2.4 Records and Certification

Document the cleanup with records of decontamination in accordance with 40 CFR 761, Section 125, Requirements for PCB Spill Cleanup. Provide test results of cleanup and certification of decontamination.

3.3 REMOVAL

3.3.1 Ballasts

As ballast are removed from the lighting fixture, inspect label on ballast. Ballasts without a "No PCB" label shall be assumed to contain PCBs and containerized and disposed of as required under paragraphs STORAGE FOR DISPOSAL and DISPOSAL. If there are less than 1600 "No PCB" labeled lighting ballasts dispose of them as normal demolition debris. If there are more than 1600 "No PCB" labeled ballasts, establish whether the "No PCB" labeled ballasts contain diethylhexyl phthalate (DEHP) either by test or by checking with the ballast manufacturer indicated on the label. Submit testing results and/or written confirmation from the manufacturer to the Contracting Officer. If the ballasts do not contain DEHP, dispose of them as normal construction debris. If they do contain DEHP, dispose of them as hazardous material in accordance with Federal, State, and local regulations. As a basis of bid assume ballasts with "No PCB" labels do not contain DEHP and may be disposed of as normal construction debris. If 1600 or more DEHP ballasts are disposed of in a 24 hour period, notify the National Response Team at 800-424-8802.

3.3.2 Lighting Lamps

Remove lighting tubes/lamps from the lighting fixture and carefully place (unbroken) into appropriate containers (original transport boxes or equivalent). In the event of a lighting tube/lamp breaking, sweep and place waste in double plastic taped bags and dispose of as universal waste as specified herein.

3.4 STORAGE FOR DISPOSAL

3.4.1 Storage Containers for PCBs

Store PCB in containers approved by DOT for PCB IAW 49 CFR 178.

3.4.2 Storage Containers for lamps

Store mercury containing lamps in appropriate DOT containers. The boxes shall be stored and labeled for transport in accordance with 40 CFR 273.

3.4.3 Labeling of Waste Containers

Label with the following:

a. Date the item was placed in storage and the name of the cognizant activity/building.

b. "Caution Contains PCB," conforming to 40 CFR 761, CFR Subpart C. Affix labels to PCB waste containers.

c. Label mercury-containing lamp waste in accordance with 40 CFR 273. Affix labels to all lighting waste containers.

3.5 DISPOSAL

Dispose of off Government property in accordance with EPA, DOT, and local regulations at a permitted site.

3.5.1 Identification Number

Federal regulations 40 CFR 761, and 40 CFR 263 require that generators, transporters, commercial storers, and disposers of PCB waste posses U.S. EPA identification numbers. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Uniform Hazardous Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work. For mercury containing lamp removal, Federal regulations 40 CFR 273 require that large quantity handlers of Universal waste (LQHUW) must provide notification of universal waste management to the appropriate EPA Region (or state director in authorized states), obtain an EPA identification number, and retain for three years records of off-site shipments of universal waste. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Universal Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work.

3.5.2 Transporter Certification

Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Government. Return a signed copy to the Government before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities (EPA Form 7710-53).

3.5.2.1 Certificate of Disposal and/or Recycling

Certificate for the PCBs and PCB items disposed shall include:

a. The identity of the disposal and or recycling facility, by name, address, and EPA identification number.

b. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

c. A statement certifying the fact of disposal and or recycling of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

d. A certification as defined in 40 CFR 761.

3.5.3 DD Form 1348-1

Prepare DD Form 1348-1 Turn-in Document (TID), which will accompany the PCB to the storage site. Ensure that a responsible person from the activity that owns the PCB signs the DD Form 1348-1.

-- End of Section --

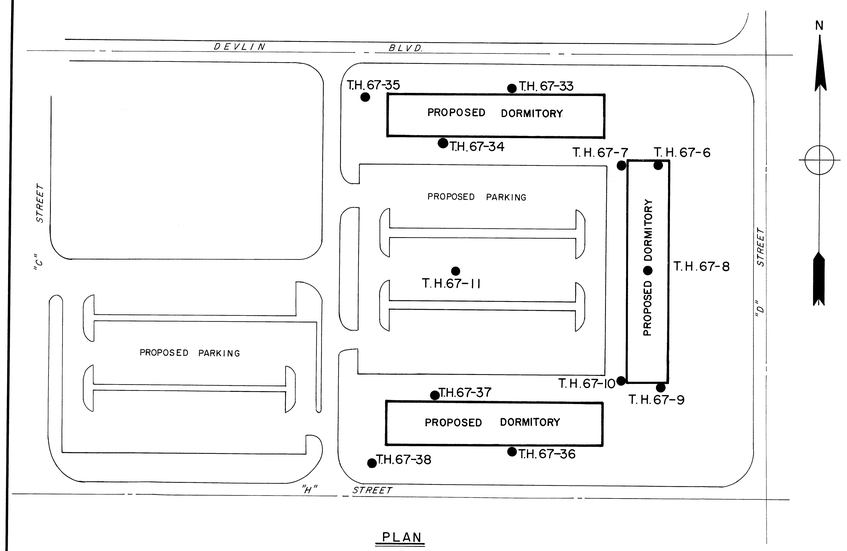
005 APPENDICES

APPENDIX A

GEOTECHNICAL DATA

U.S. ARMY ENGINEER DISTRICT

CORPS OF ENGINEERS



PLAN

SCALE 50 0 50 100 FEET

T.H.67-6

EL.860±		MC	LL	PI	-4	-200	N	
3.0'	SM SC	4	21	5	100	48	11	SILTY SAND-CLAYEY SAND, buff and brown, some caliche cementation, easily drilled, medium dense.
							15	
6.0'	CH	16	52	32	100	60	25	SANDY CLAY, buff, light tan and brown, slight to well cemented caliche layers, difficult to drill between 14' to 17', soft to hard.
							22	
	CL	13	35	17	100	69	60	
							30	
11.5'		15	42	16	100	63	12	
							12	
14.0'	CH	28	59	32	100	70	14	
	CL	14	45	25	100	66	60+	
							60+	
18.0'		15	25	8	100	57	16	
	CH	25	56	35	100	57	4	
							8	
22.5'		28	87	62	100	68	9	
24.0'		25	45	25	100	41	8	CLAYEY SAND, brown and light tan, dense.
	SC	12	22	9	65	27	17	CLAYEY GRAVELLY SAND, light tan, some caliche cementation, medium dense to dense.
							11	
28.0'							34	GRAVELLY CLAYEY SAND, light tan, some caliche cementation, medium dense to dense.
30.0'		17	32	14	69	50	18	

T.H.67-7

EL.860±		MC	LL	PI	-4	-200	N	
3.0'	SC	8	35	16	100	50	19	CLAYEY SAND, buff and brown, some caliche cementation but easily drilled, medium dense.
							13	
		12	41	26	100	56	9	SANDY CLAY, buff and brown, some caliche cementation but easily drilled, stiff to hard.
							9	
9.0'	CL	15	40	23	100	64	40	
							49	
11.5'		18	40	18	100	89	29	CLAY, light tan to brown, some caliche cementation but easily drilled, stiff to very stiff.
							11	
13.0'		21	59	32	100	86		
	CH	43	96	70	100	83	19	SANDY CLAY, buff to brown, some caliche, cementation but easily drilled, stiff to hard.
16.0'		26	66	45	100	81	12	
							60+	CLAYEY GRAVELLY SAND, buff and brown, well cemented caliche, difficult to drill, very dense.
19.0'	SC	12	48	29	60	33	60+	
							60+	
21.0'		10	25	9	83	42	60+	GRAVELLY CLAYEY SAND, light tan, well cemented caliche, difficult to drill, very dense.
23.0'	CH	21	55	29	87	64	12	SANDY CLAY, brown and buff, some gravel, some caliche cementation, stiff.
		21	60	35	92	48	18	CLAYEY SAND, brown, occasional caliche cemented layers 1" thick, some gravel, medium dense.
							11	
27.5'	SC	19	37	19	100	48	12	
		19	35	17	57	40	31	CLAYEY GRAVELLY SAND, light tan, some caliche cementation, medium dense to dense.
30.0'							23	

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS More than half of material is larger than no. 200 sieve size.	GRAVELS More than half of coarse fraction is larger than no. 4 sieve size.	Clean gravels	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS More than half of coarse fraction is smaller than no. 4 sieve size.	Clean sands	SW	Well-graded sands, gravelly sands, little or no fines.
			SP	Poorly-graded sands, gravelly sands, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS More than half of material is smaller than no. 200 sieve size.	SILTS AND CLAYS	Low liquid limit.	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts, with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
		High liquid limit.	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
Highly organic soils			Pt	Peat and other highly organic silts.

NOTES:

1. Boundary Classification: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well-graded gravel-sand mixture with clay binder.
2. All sieve sizes on this chart are U. S. Standard.
3. The terms "silt" and "clay" are used respectively to distinguish materials exhibiting lower plasticity from those with higher plasticity. The minus no. 200 sieve material is silt if the liquid limit and plasticity index plot below the "A" line on the plasticity chart (Plate 2, Technical Memorandum No. 3-357), and is clay if the liquid limit and plasticity index plot above the "A" line on the chart.
4. For a complete description of the Unified Soil Classification System, see "Military Standard 619 A," prepared for Office, Chief of Engineers by Waterways Experiment Station, Vicksburg, Mississippi, March 1962.

LEGEND

T.H.67-6 ● LOCATION AND NUMBER OF TEST HOLE.

MC FIELD MOISTURE CONTENT IN PERCENT OF DRY WEIGHT.

LL LIQUID LIMIT.

PI PLASTICITY INDEX (LIQUID LIMIT MINUS PLASTIC LIMIT).

NP NONPLASTIC

-4 PERCENT OF MATERIAL BY WEIGHT PASSING NO. 4 SIEVE.

-200 PERCENT OF MATERIAL BY WEIGHT PASSING NO. 200 SIEVE.

N NUMBER OF BLOWS OF A 140-POUND DROPHAMMER FALLING 30 INCHES REQUIRED TO DRIVE A SAMPLING SPOON ONE FOOT. OUTSIDE DIAMETER OF SPOON IS 2 INCHES; INSIDE DIAMETER IS 1-3/8 INCHES. PROCEDURE IS CALLED STANDARD PENETRATION TEST.

T.H.67-8

El. 860±		MC	LL	PI	-4	-200	N	
	SC	7	37	17	71	46	14	GRAVELLY CLAYEY SAND, buff and brown, some caliche cementation, medium dense.
							13	
		10	42	24	67	46	23	
7.0'							14	
	CH	21	52	29	75	56	18	GRAVELLY SANDY CLAY, buff & brown some caliche cementation, very stiff.
9.0'							16	
11.0'	CL	7	41	22	66	53	60	GRAVELLY SANDY CLAY, light tan, some, caliche cementation, hard.
							32	GRAVELLY SANDY CLAY, buff and brown, some caliche cementation, easily drilled, stiff to hard.
		22	69	44	81	66	15	
16.0'	CH						26	
		19	106	86	83	67	13	
18.0'		27	69	45	100	80	17	SANDY CLAY, buff and brown, caliche zone encountered, stiff to very stiff.
							10	CLAYEY GRAVELLY SAND, light tan, some caliche cementation, loose.
21.5'	SC	17	37	18	53	32	9	
23.0'	CL	32	46	28	100	80	5	SANDY CLAY, brown and tan, easily drilled, loose.
25.0'	SC	18	36	16	100	37	13	CLAYEY SAND, brown, some caliche, medium dense.
							19	
27.0'		16	26	10	72	32	60	GRAVELLY CLAYEY SAND, light tan, slight to well caliche cementation, medium dense to very dense.
							60	
30.0'	CL	11	24	10	100	51	60	SANDY CLAY, light tan, well cemented caliche, difficult drilling, hard.

T.H.67-9

El. 860±		MC	LL	PI	4	200	N	
2.5'	SM SC	5	23	6	82	45	17	GRAVELLY SILTY SAND-GRAVELLY CLAYEY SAND, buff, caliche encountered, loose to med. dense.
							6	
5.0'	SC	20	43	22	100	47	7	CLAYEY SAND, brown, loose.
8.0'		11	32	16	64	40	60	GRAVELLY CLAYEY SAND, light grayish tan, some caliche cementation, difficult to drill, very dense.
							60	
							3	SANDY CLAY, light brown to brown, soft.
11.0'	CH	43	74	49	100	78	5	GRAVELLY SANDY CLAY, brown to light brown, very stiff.
12.5'	CL	17	37	17	83	68	19	
							9	CLAY, brown and buff, some caliche encountered, stiff to medium stiff.
		38	87	58	100	85	13	
	CH	43	79	49	100	88	11	
							5	
20.0'		33	73	48	100	87	7	
22.5'	CL	18	40	21	100	60	11	SANDY CLAY, brown and buff, caliche encountered, stiff.
							7	
24.5'	CH	40	87	65	100	74	10	
	SC	18	29	16	100	45	13	CLAYEY SAND, brown and light tan, caliche cementation, medium dense to very dense.
							22	
30.0'		10	22	10	100	45	60	
							60	

T.H.67-10

EL.860±		MC	LL	PI	-4	-200	N	
		7	27	11	90	55	17	SANDY CLAY, buff and brown, existing fill 0' to 10', pieces of 3" thick concrete from existing construction, some caliche, easily drilled, stiff to very stiff.
							10	
							15	
7.0'	CL	10	32	16	86	56	24	
							18	GRAVELLY SANDY CLAY, buff and brown, some caliche cementation, very stiff to hard.
		18	48	25	82	61	21	
11.0'		15	42	24	85	55	60+	
		26	71	46	100	83	4	SANDY CLAY, buff and brown, some caliche cementation, soft to very stiff.
		10	57	34	87	77	15	
	CH						6	
		21	68	36	100	76	4	
							4	
		21	52	28	100	77	22	
							19	
		40	61	35	100	78	5	
							7	
24.5'							12	
	SC	15	25	8	100	42	60+	CLAYEY SAND, brown and light tan, well cemented caliche, easily drilled, dense to very dense.
28.0'		11	29	15	92	50	60+	
30.0'	CL	21	48	29	100	81	21	SANDY CLAY, light tan, mostly caliche cemented layers, very stiff.

T.H.67-11

EL.860±		MC	LL	PI	-4	-200	N	
3.0'	SC	5	24	9	87	43	18	CLAYEY SAND, buff and light brown, some caliche encountered, medium dense.
							24	
6.0'	CL	7	38	21	86	57	17	SANDY CLAY, buff and light brown, some caliche encountered, stiff to very stiff.
							8	
8.0'	SC	10	43	24	74	49	10	GRAVELLY CLAYEY SAND, buff and light brown, some caliche encountered, medium dense.
10.0'	CL	7	37	17	76	51	19	GRAVELLY SANDY CLAY, buff, medium stiff to very stiff.
							6	

NOTES:

1. TEST HOLES 67-6 THROUGH 67-11 WERE DRILLED DURING JUNE 1967 WITH A 16-INCH-DIAMETER, BUCKET-TYPE, POWER AUGER.
2. GROUND WATER WAS NOT ENCOUNTERED.
3. THIS DRAWING IS TO BE USED FOR LOCATIONS AND LOGS OF TEST HOLES ONLY. SEE OTHER SHEETS FOR DETAILS OF PROPOSED CONSTRUCTION.

RECORD DRAWING-AS BUILT
CONT. NO. 68-C-0115 REV. — DATE 11 SEPT 69 BY NO CHANGE

VERT. SCALE 5 0 5 10 FEET

332
334
336
715

REVISION	DATE	DESCRIPTION	BY

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: R.A.G.
DRAWN BY: H.K.
CHECKED BY: R.A.G.
SUBMITTED BY: CHIEF, SOIL DESIGN SECTION

NELLIS AIR FORCE BASE
LAS VEGAS, NEVADA

DORMITORY, AIRMEN
FOUNDATION EXPLORATION

APPROVAL RECOMMENDED: CHIEF, FOUNDATION & MATERIALS BRANCH — DATE: 2 196 — CHIEF, ENGINEERING DIVISION

APPROVED: NORMAN E. PETERSON, Colonel, CE, District Engineer

DRAWING NO. AW 21-01-04
SHEET 79 OF

SCALE: AS SHOWN

SPECIFICATIONS NO. DACA09-68-B-0041

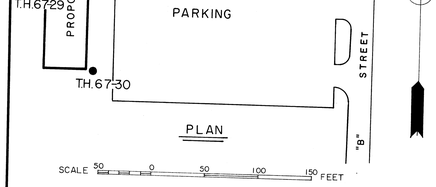
D. O. SERIES AW 1734/79

332-334-336-715

DORM AMN

DIETERICH-POST CLEARPRINT 1000H

MW-5



T.H. 67-32

EL. 1881±		MC	LL	PI	-4	-200	N		
2.5'	CL	4	24	8	90	52	31		SANDY CLAY, buff, some concrete pieces, hard.
	SC							60+	
		11	29	12	65	41	60+		GRAVELLY CLAYEY SAND, buff, caliche cemented, difficult to drill, very dense.
7.5'								60+	
		8	29	12	54	26	60+		CLAYEY GRAVELLY SAND, light tan, caliche cemented, very difficult to drill, very dense.
10.0'	CH	17	61	39	91	70	9		SANDY CLAY, buff and brown-gray, stiff.
							10		

T.H. 67-33

EL. 1860±		MC	LL	PI	-4	-200	N		
1.0'	SC	6	27	10	83	46	14		CLAYEY SAND, brown and buff, some caliche fragments, medium dense.
2.5'	CL	12	36	19	100	80	13		SANDY CLAY, buff, some caliche fragments, stiff.
4.0'	CH	21	54	35	100	70	60+		CLAYEY GRAVELLY SAND, buff, caliche cemented, difficult to drill, very dense.
6.0'	SC	11	40	22	53	30	60+		GRAVELLY SANDY CLAY, tan, stiff.
9.0'	CL	16	47	25	80	56	16		CLAY, tan, soft.
							11		SANDY CLAY, brown, stiff.
	CH	28	63	39	100	85	4		
							10		
		29	78	50	100	77	10		
							9		
16.0'							60+		GRAVELLY CLAYEY SAND, light tan, caliche cemented, difficult to drill, very dense.
18.5'	SC	14	37	20	71	40	60+		
20.5'	CH	19	56	26	91	64	9		SANDY CLAY, light tan and brown, stiff.
							20		
	SC	13	38	20	90	34	60+		CLAYEY SAND, light brown, medium dense.
		10	27	13	73	31	60+		GRAVELLY CLAYEY SAND, tan, caliche cemented, difficult to drill, very dense.
25.5'							60+		
	CL	17	35	18	100	71			SANDY CLAY, brown, some cemented layers, hard.
30.0'									

T.H. 67-34

EL. 1860±		MC	LL	PI	-4	-200	N		
0.5'									FILL MATERIAL, buff.
2.0'	SC	4	25	10	63	25	22		CLAYEY GRAVELLY SAND, brown and buff, caliche clods, slightly cemented, medium dense.
	CL							34	
		6	35	17	93	62	40		SANDY CLAY, light tan, caliche cemented layers, hard to medium.
							34		
8.5'		8	35	16	100	84	7		
							7		GRAVELLY SANDY CLAY, buff, some caliche cemented layers, hard to medium.
	CH	13	51	29	79	67	43		
							8		
13.0'							60+		GRAVELLY CLAYEY SAND, buff, caliche cemented, very difficult to drill, refusal @ 15.5', very dense.
15.5'	SC	9	38	20	72	34	60+		

T.H. 67-35

EL. 1860±		MC	LL	PI	-4	-200	N		
2.0'	SC	5	27	10	63	26	60+		CLAYEY GRAVELLY SAND, buff and brown, cemented layers of caliche, very dense.
4.0'	CL	7	28	11	100	52	15		SANDY CLAY, light brown, stiff.
							14		
6.5'	SC	10	30	12	58	31	60+		CLAYEY GRAVELLY SAND, buff, caliche cemented, difficult to drill, very dense.
							60+		SANDY CLAY, light tan and brown, some caliche cementation, difficult to drill, hard to stiff.
9.5'	CL	15	41	21	100	77	28		
							12		
12.0'	CH	38	89	55	100	83	60+		
							60+		CLAYEY GRAVELLY SAND, buff, caliche cemented, difficult to drill, very dense.
15.5'	SC	12	40	21	59	36	60+		
	CH	25	72	47	75	57	13		GRAVELLY SANDY CLAY, brown, stiff.
		23	70	46	100	58	12		SANDY CLAY, brown, slightly cemented, stiff.
20.0'		25	63	37	88	65	15		
	SC	15	43	20	100	38	17		CLAYEY SAND, brown, medium dense.
22.5'							14		
	CL	13	37	22	100	52	13		SANDY CLAY, light brown and light tan, some caliche cementation, stiff to very stiff.
26.5'		23	43	25	90	56	20		
							55		
28.0'	SC	17	50	29	71	47	60+		GRAVELLY CLAYEY SAND, brown and light tan, caliche cemented, difficult to drill, very dense.
30.0'	CH	27	70	42	91	55	11		SANDY CLAY, brown and light tan, caliche cemented layers, very stiff.

T.H. 67-36

EL. 1860±		MC	LL	PI	-4	-200	N		
	SC	8	30	9	81	36	16		GRAVELLY CLAYEY SAND, light tan, cemented caliche clods, medium dense to loose.
		9	38	16	77	48	8		
5.5'							9		SANDY CLAY, buff and brown, some cemented layers, stiff to hard.
7.0'	CH	16	83	50	100	74	7		
	SC	10	46	26	70	38	60+		GRAVELLY CLAYEY SAND, brown and light tan, caliche cemented layers, some difficulty in drilling, medium dense.
							37		
		8	39	20	68	39	20		
							14		
14.5'		10	58	33	78	50	30		
							60+		CLAY, buff and brown, some caliche cementation, hard to very stiff.
17.0'	CH	30	94	61	100	89	19		
18.5'	SC	15	67	40	60	40	33		GRAVELLY CLAYEY SAND, buff, some cemented layers, dense.
	CH						19		SANDY CLAY, brown and light tan, caliche cemented layers, very stiff to hard.
		17	58	35	100	69	60+		
							*		
		30	73	46	100	78	11		
25.5'							13		
27.0'	SC	15	31	14	100	49	26		CLAYEY SAND, light brown and brown, medium dense.
30.0'	CL	17	31	14	100	53	16		SANDY CLAY, light brown, caliche cemented, stiff to hard.
							60+		

* No Penetrometer

T.H. 67-37

EL. 1860±		MC	LL	PI	-4	-200	N		
	SC	5	30	13	89	45	15		CLAYEY SAND, buff, caliche cemented clods, medium dense.
3.0'							13		
	CH	15	55	33	100	57	6		SANDY CLAY, light brown and brown, stiff.
							16		
8.0'		14	81	55	100	68	16		GRAVELLY CLAYEY SAND, brown and buff, caliche cemented, very dense.
9.0'	SC	8	42	23	79	46	55		
	CL	7	23	16	100	71	35		SANDY CLAY, buff, hard.
							60+		
		33	35	16	78	61	6		GRAVELLY SANDY CLAY, brown and buff, some cemented layers, stiff.
16.0'							18		
							13		
18.0'	CH	14	131	81	100	72	33		SANDY CLAY, buff, some caliche cemented layers, hard.
19.0'	SC	20	62	38	75	41	19		GRAVELLY CLAYEY SAND, brown, medium dense.
21.0'	CH	12	65	38	100	64	44		
	CL	19	47	27	100	70	60+		SANDY CLAY, light brown and brown, some caliche cemented layers, hard.
							21		
25.5'							31		
27.0'	CH						60+		
	CL	13	42	23	100	63	60+		
30.0'							39		

T.H. 67-38

EL. 1860±		MC	LL	PI	-4	-200	N		
	SC	8	28	9	68	31	15		CLAYEY GRAVELLY SAND, light brown, caliche cemented clods, medium dense.
		9	34	14	92	48	7		CLAYEY SAND, light brown, caliche cemented clods, loose.
							8		
		10	36	19	74	38	15		GRAVELLY CLAYEY SAND, light gray, loose to medium dense.
6.0'							10		
7.5'	CH	27	78	47	100	69	10		SANDY CLAY, brown and buff, stiff.
	SC	10	42	23	74	50	23		GRAVELLY CLAYEY SAND, buff and light tan, caliche cemented, difficult to drill, medium dense to medium dense.
		12	42	21	67	44	60+		
							39		
14.0'		11	52	29	67	36	60+		
							*		SANDY CLAY, brown and buff, medium dense.
	CH	31	90	61	90	69	14		
18.0							22		
	SC	13	43	24	91	44	39		CLAYEY SAND, brown and buff, caliche cemented layers, dense.
20.5'							16		
22.0'	CL	15	45	22	81	52	8		GRAVELLY SANDY CLAY, light tan, stiff.
	CH	33	84	56	100	84	8		SANDY CLAY, brown, stiff.
25.0'		36	90	63	100	76	16		
	SC	12	29	16	66	29	60+		CLAYEY GRAVELLY SAND, light brown, caliche cemented, difficult to drill, very dense.
		12	28	12	67	32	60+		
30.0							60+		

SCALE 5 0 5 10 15 FEET

NOTES:

1. TEST HOLES 67-28 THROUGH 67-38 WERE DRILLED DURING OCTOBER 1967 WITH A 16-INCH-DIAMETER, BUCKET-TYPE, POWER AUGER.
2. GROUND WATER WAS NOT ENCOUNTERED.
3. THIS DRAWING IS TO BE USED FOR LOCATIONS AND LOGS OF TEST HOLES ONLY. SEE OTHER SHEETS FOR DETAILS OF PROPOSED CONSTRUCTION.
4. FOR UNIFIED SOIL CLASSIFICATION, NOTES AND LEGEND SEE D.O. SERIES AW1734/54.

RECORD DRAWING-AS BUILT
CONT. NO. 68-C-0115 REV. — DATE 11 SEPT 69 BY NO CHANGE

REVISION	DATE	DESCRIPTION	BY

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
LOS ANGELES, CALIFORNIA

DRAWN BY: R. A. G.
TRACED BY: R. C. & W. J. H.
CHECKED BY: G. J. R.
SUBMITTED BY:
CHIEF, SOIL DESIGN SECTION

NELLIS AIR FORCE BASE
LAS VEGAS, NEVADA
DORMITORY, AIRMEN
FOUNDATION EXPLORATION

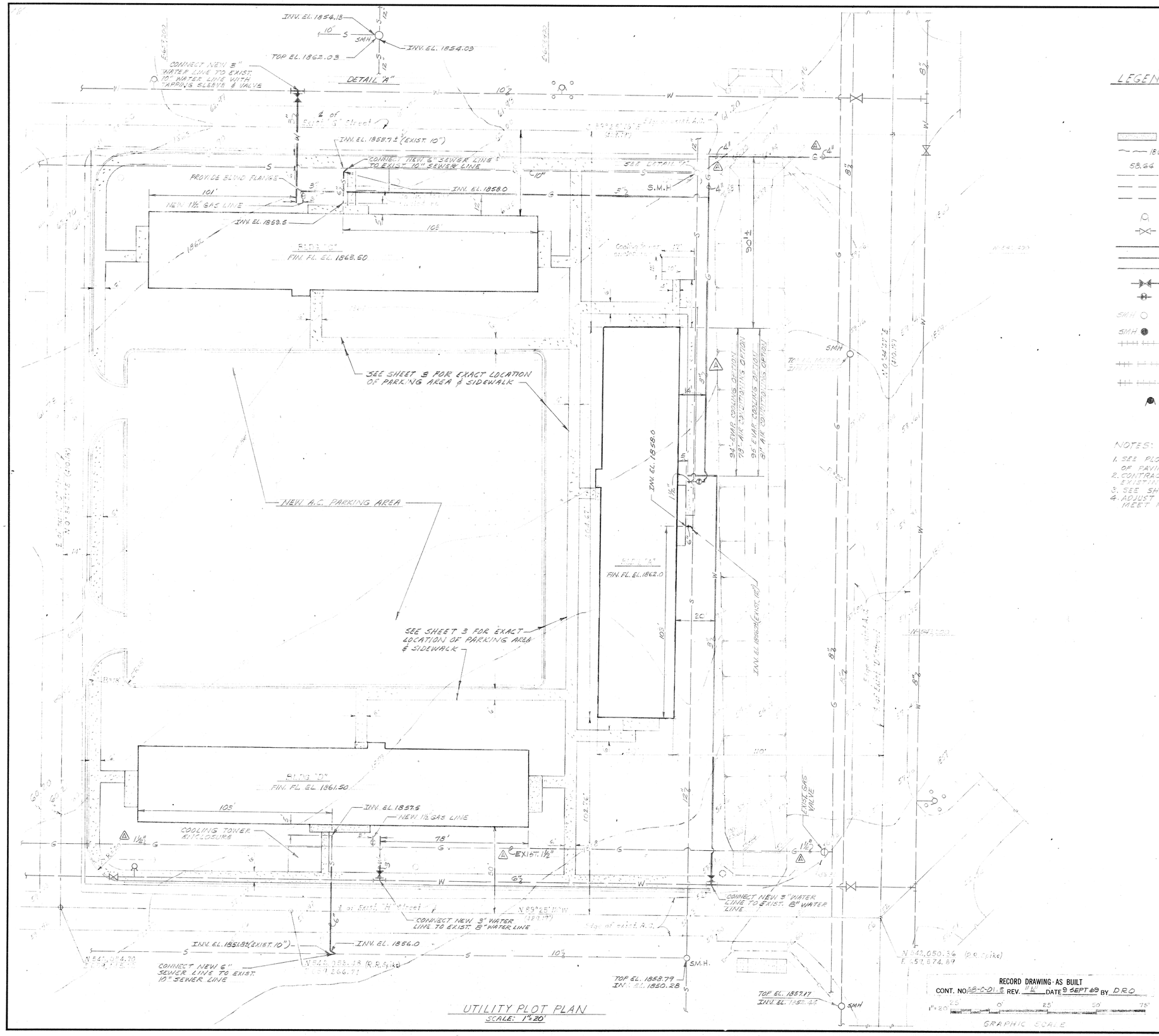
APPROVAL RECOMMENDED: CHIEF, FOUNDATION & MATERIALS BRANCH — CHIEF, ENGINEERING DIVISION — DATE: 10 JUL 1968
APPROVED: NORMAN E. PEHRSON, Colonel, CE, District Engineer

DRAWING NO. AW 21-01-04
SHEET 30 OF
SCALE: AS SHOWN
SPECIFICATIONS NO. DACA09-'68-B-0041
D. O. SERIES AW1734/30

332
334
336
715

DORM AMN

DIETERICH-POST CLEARPRINT 1020



UTILITY PLOT PLAN
SCALE: 1" = 20'

LEGEND

	NEW CONC. SIDEWALK OR SLAB
1860	EXISTING CONTOURS
58.64	EXISTING SPOT ELEVATION
W	EXISTING WATER LINE
S	EXISTING SANITARY SEWER LINE
G	EXISTING GAS LINE
	EXISTING FIRE HYDRANT
	EXISTING WATER VALVE AND BOX
W	NEW WATER LINE
S	NEW SANITARY SEWER LINE
G	NEW GAS LINE
	NEW WATER VALVE AND BOX
	NEW GAS VALVE AND BOX
SMH	EXISTING SANITARY SEWER MANHOLE
SMH	NEW SANITARY SEWER MANHOLE
S	EXISTING SANITARY SEWER LINE TO BE ABANDONED OR REMOVED (SEE SHEET 21)
G	EXISTING GAS LINE TO BE ABANDONED OR REMOVED (SEE SHEET 5)
W	EXISTING WATER LINE TO BE ABANDONED OR REMOVED. (SEE SHEET 21)
	NEW FIRE HYDRANT

NOTES:

1. SEE PLOT & GRADING PLAN FOR FINISHED GRADING, LIMITS OF PAVING & ETC. (SHEET 3)
2. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES DURING CONSTRUCTION.
3. SEE SHEET FOR SPRINKLING SYSTEM PLAN.
4. ADJUST ALL VALVE BOXES & MANHOLES AS REQUIRED TO MEET FINISHED GRADE

RECORD DRAWING - AS BUILT
CONT. NO. 68-C-0115 REV. "A" DATE 9 SEPT 69 BY D.R.O.

REVISION	DATE	DESCRIPTION	BY
1	9 SEPT 69	REVISED EXISTING GAS LINE "AS-BUILT"	DRO

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: E.G.C.
DRAWN BY: E.T.
CHECKED BY:
SUBMITTED BY:

NELLIS AIR FORCE BASE
NEVADA
DORMITORY, AIRMEN

UTILITY PLOT PLAN
AREA 1

APPROVAL RECOMMENDED: Edward Kostka, CHIEF, ENGINEERING DIVISION
APPROVED: Norman E. Robinson, COLONEL, CE DISTRICT ENGINEER

OCE CATEGORY: AW 21-01-04	SCALE: 1" = 20'	SPEC. NO. DACA09-'68-B-0041	SHEET NO 20
REFERENCE: SHEET NO:	DATE: MAR 1968	DIST FILE NO. AW 1734.20 REV "A"	

Bldg. 332 334 336 338

APPENDIX B

HYDRANT FLOW DATA

HYDRANT FLOW TEST DATA

Location: Bldy 332	Date: 02/06/18
Test made by: MJT & AJL	Time: 14:30
Representative of: Fire chief of the AFB	
Witness:	
Representative of:	
State purpose of test:	
Height from static/residual hydrant to building finished floor elevation (feet) =	

	Static/Residual Hydrant (R)	Flowing Hydrant 1 (F1)	Flowing Hydrant 2 (F2)	Flowing Hydrant 3 (F3)
	No. 4315	No. 4304	No.	No.
Outlet size(inches)				
Outlet Coef.				
Static (psig) before test	80 static			
Pressure (psig) 1 hydrant open	52 residual	12 pitot		
Pressure (psig) 2 hydrants open	residual	pitot	pitot	
Pressure (psig) 3 hydrants open	residual	pitot	pitot	pitot
Static (psig) after test	static			

Hydrant outlet discharge coefficients

Outlet with Akron FK-25 (2.5" stream straightener):	FK-25
Outlet smooth and rounded:	0.90
Outlet square and sharpe:	0.80
Outlet square and projecting into barrel:	0.70

Flow rate Hydrant 1 (F1)	Flow rate Hydrant 2 (F2)	Flow rate Hydrant 3 (F3)	Flow rate Total
581 gpm			gpm
gpm	gpm		gpm
gpm	gpm	gpm	gpm

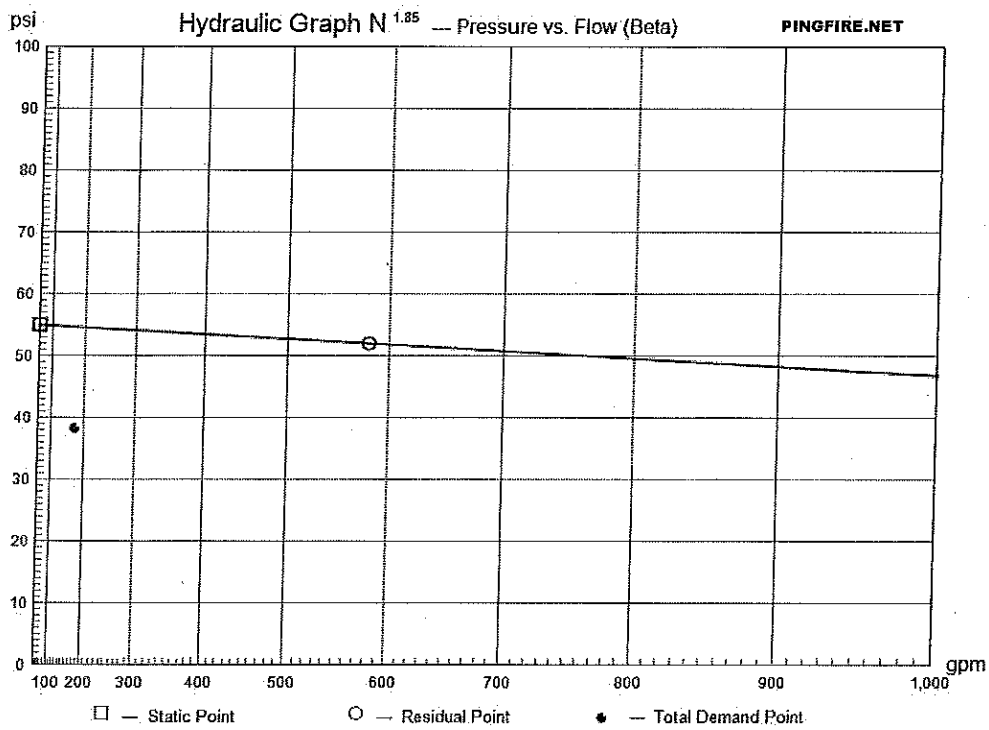
Pitot Press (psig)	GPM 2.5" outlet	GPM FK-25	GPM x.90	GPM x.80	GPM x.70
10	590	608	531	472	413
11	619	635	557	495	433
12	646	662	581	517	452
13	672	687	605	538	470
14	698	711	628	558	489
15	722	734	650	578	505
16	746	756	671	597	522
17	769	777	692	615	538
18	791	797	712	633	554
19	813	816	732	650	569
20	834	835	751	667	584
22	875	871	788	700	613
24	914	906	823	731	640
26	951	938	856	761	666
28	987	969	888	790	691
30	1022	998	920	818	715
(Avoid pitot pressures above 30 psig)					
32	1055	1031	950	844	739
34	1087	1062	978	870	761
36	1119	1093	1007	895	783
38	1150	1123	1035	920	805
40	1180	1152	1062	944	826
42	1209	1177	1088	967	846
44	1237	1188	1113	990	866
46	1265	1205	1139	1012	886
48	1292	1220	1163	1034	904
50	1319	1284	1187	1055	923

Sketch of location:

Hydrant flow test checklist (per NFPA 291)

- Conduct flow test in accordance with NFPA 291 (2007).
- Portable radios to facilitate communications between team members.
- Conduct flow test during a period of ordinary demand.
- Select static/residual hydrant between hydrant being flowed and the large mains.
- Discharge sufficient flow to cause 25% drop in residual pressure OR flow maximum demand.
- Static/residual gage should have 200 psig range, liquid filled, 1 psig graduations.
- Pitot gage should have 50-60 psig range, liquid filled, 1 psig graduations.
- All gages should be calibrated at least every 12 months, or more frequently depending on use.
- Flow table on this form is for 2.5" diameter outlet (a dollar bill is 2.6" wide) *.
- * Correction factors for outlet diameters less than 2.5" ($d^2/2.5^2$) [2.25" = 0.81] [2.0" = 0.64] [1.75"=0.49].
- Pitot tube held 1/2 outlet diameter away from outlet in center of stream.
- Pitot readings of less than 10 psig and more than 30 psig should be avoided, if possible.

Form updated 2/20/2007 by Scott L.Barmann - for free electronic copies call (916) 557-7387



Project Location: bldg 332 @ nellis, AFB

Flow Test: Hydrant Elev.= 27 ft., Static Pressure= 55 psi, Residual Pressure= 52 psi, Flow= 581 gpm

Tester and/or Witness By: Phone: Date:

System Demand Data: Pressure = 38 psi, Flow= 180 gpm, Hose Stream= gpm

Designer: MJI Phone: A.H.J.

Note:

APPENDIX C

ENGINEERING WEATHER DATA

NELLIS AFB NV	
Latitude = 36.23 N	Station ID = ICAO_KLSV
Longitude =115.03 W	Elevation = 1870 Feet
Period of Record = 1983 To 2012	Average Pressure = 27.97 inches Hg

Design Criteria Data

	Mean Coincident (Average) Values				
Dry Bulb Temperature (T)	**Design Value (°F)**	**Wet Bulb Temperature (°F)**	**Humidity Ratio (gr/lb)**	**Wind Speed (mph)**	**Prevailing Direction (NSEW)**
Median of Extreme Highs	113	68	39	10.9	S
0.4% Occurrence	109	67	41	10.3	S
1.0% Occurrence	107	67	41	10.6	SSW
2.0% Occurrence	105	66	41	10.6	SSW
Mean Daily Range	24	-	-	-	VRB
97.5% Occurrence	35	29	17	3.2	VRB
99.0% Occurrence	32	27	15	2.6	VRB
99.6% Occurrence	28	23	11	2.7	VRB
Median of Extreme Lows	23	19	8	2.9	N

Wet Bulb Temperature (T_{wb})	**Design Value (°F)**	**Dry Bulb Temperature (°F)**	**Humidity Ratio (gr/lb)**	**Wind Speed (mph)**	**Prevailing Direction (NSEW)**
Median of Extreme Highs	75	96	101	8.5	VRB
0.4% Occurrence	73	95	91	8.2	S
1.0% Occurrence	71	95	81	8.1	S
2.0% Occurrence	70	94	76	8.1	S

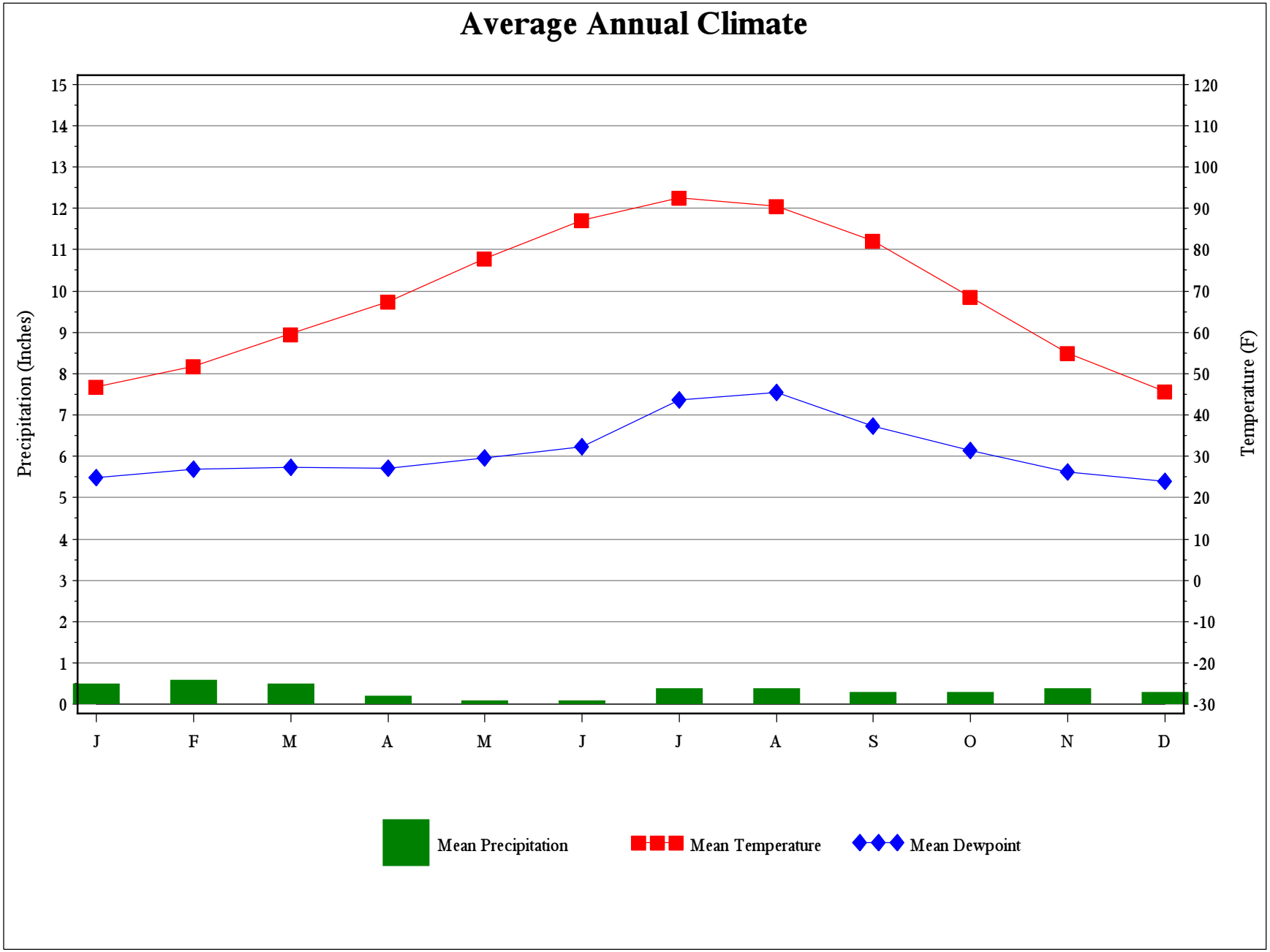
Humidity Ratio (HR)	**Design Value (gr/lb)**	**Dry Bulb Temperature (°F)**	**Vapor Pressure (in. Hg)**	**Wind Speed (mph)**	**Prevailing Direction (NSEW)**
Median of Extreme Highs	118	78	0.74	5.8	VRB
0.4% Occurrence	104	82	0.65	7.1	VRB
1.0% Occurrence	95	82	0.6	5.6	E
2.0% Occurrence	85	86	0.54	7.6	VRB

Air Conditioning/ Humid Area Criteria	**Threshold**	**T ≥ 93°F**	**T ≥ 80°F**	**Twb ≥ 73°F**	**Twb ≥ 67°F**
	# of Hours	1206	2842	40	641

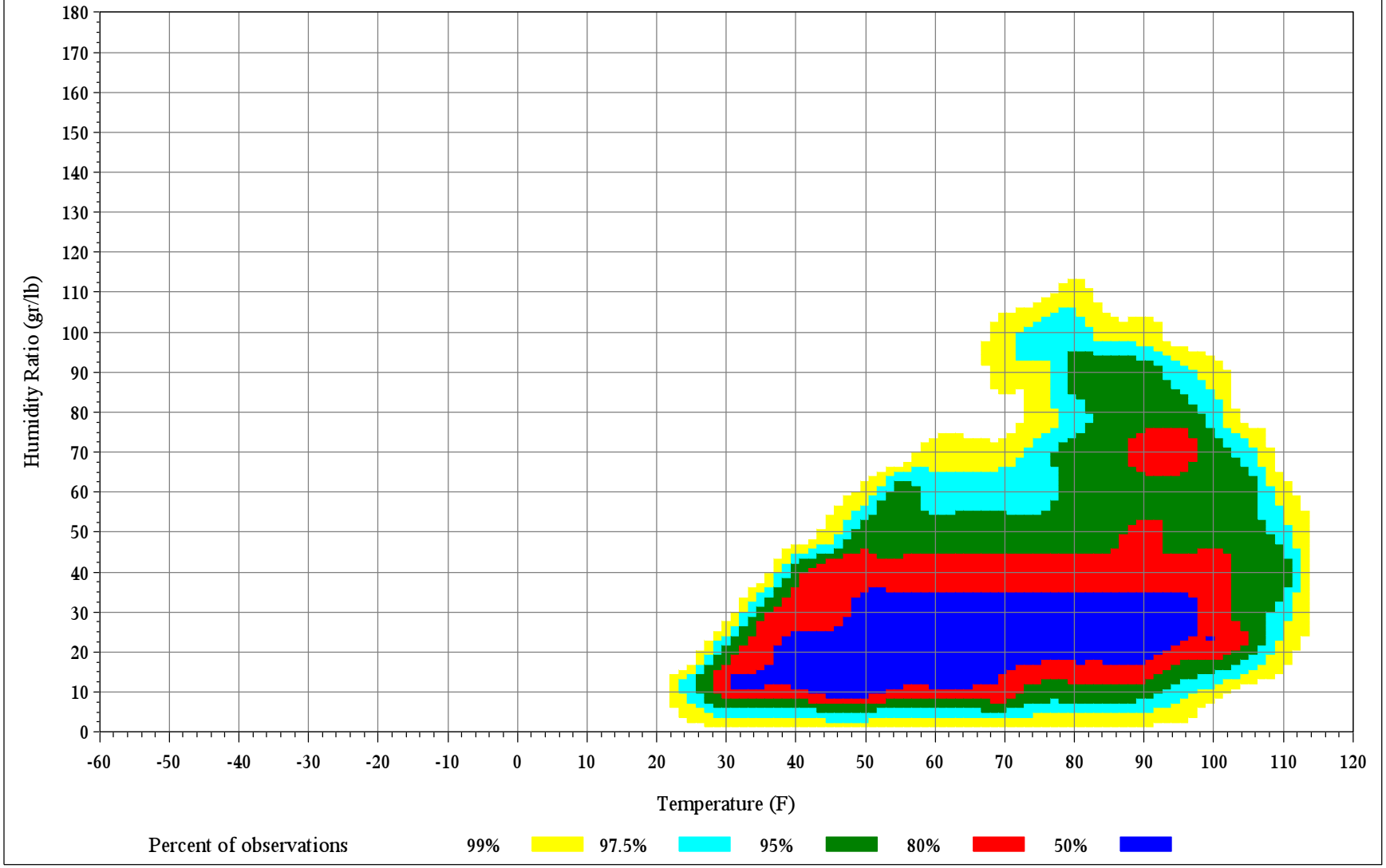
Other Site Data

Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
11	1.5	90	0.1 + 4.4
Ground Water Temperature (°F) 50 Foot Depth*	Frost Depth 50 Year Recurrence (in)	Ground Snow Load 50 Year Recurrence (lb/ft^2)	Average Annual Freeze-Thaw Cycles (#)
71.6	7	3	20

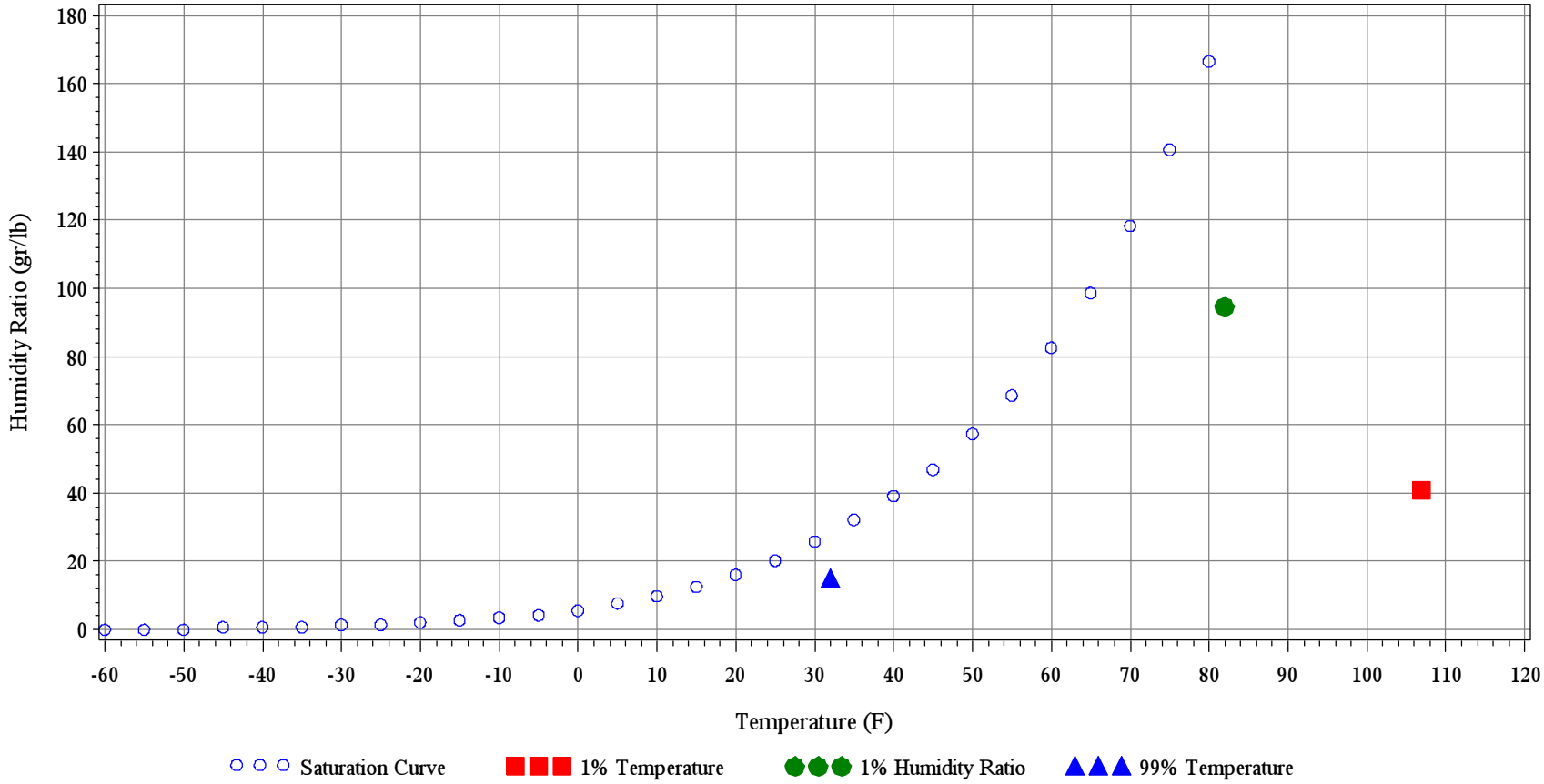
*Note: Temperatures at greater depths can be estimated by adding 1.5 °F per 100 feet additional depth.


Average Annual Climate
Precipitation (Inches)
Temperature (F)
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
J
F
M
A
M
J
J
A
S
O
N
D
Mean Precipitation
Mean Temperature
Mean Dewpoint

Long Term Psychrometric Summary



Psychrometric Summary of Peak Design Values



	(°F) / (gr/lb)	MCDB (°F)	MCWB (°F)	MCDP (°F)	MCHR (gr/lb)	Enthalpy (btu/lb)
1.0% Dry Bulb	107.0		67		41.0	32.7
99.0% Dry Bulb	32.0				15.0	10.0
1.0% Humidity Ratio	95.0	82.0	69.5	64.0		34.5

Dry-Bulb Temperature Hours For An Average Year

	January					February					March				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)
115/119															
110/114															
105/109															
100/104															
95/ 99															
90/ 94												1	0	1	56.8
85/ 89							0		0	57.7		4	1	5	56
80/ 84							1	0	1	55.2		16	5	21	54
75/ 79		0		0	55		4	1	5	52.7	0	32	14	46	52.3
70/ 74	0	2	0	2	51.2		17	4	21	50.1	1	42	28	71	50.2
65/ 69	0	15	2	17	48.3	0	29	11	40	48.4	7	42	32	81	48.6
60/ 64	1	40	10	51	46.2	2	45	26	73	46.5	25	53	51	129	46.5
55/ 59	5	58	29	92	44	14	53	47	114	44.6	45	35	53	133	44.4
50/ 54	17	58	57	132	41.6	39	45	59	143	42.3	73	18	40	131	42.1
45/ 49	42	42	67	151	38.6	62	20	47	129	39	58	5	18	81	38.8
40/ 44	51	20	46	117	35.3	49	7	19	75	35.3	25	0	5	30	35.4
35/ 39	69	10	28	107	31.5	39	3	8	50	31.5	12	0	1	13	31.8
30/ 34	50	2	8	60	27.6	14	1	2	17	26.7	1		0	1	26.2
25/ 29	12	0	1	13	23.1	4	0	0	4	22.1	0			0	20.3
20/ 24	1	0	0	1	17.7	1			1	18.7					
15/ 19	0			0	13										
10/ 14	0			0	10										

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

Dry-Bulb Temperature Hours For An Average Year

	April					May					June				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
115/119												0	0	0	67.7
110/114							0		0	67		3	1	4	66.7
105/109							3	1	4	64.8		22	6	28	65.1
100/104							12	4	16	62.6	0	52	25	77	63.1
95/ 99		3	1	4	59.8	0	28	11	39	60.6	1	60	37	98	61.4
90/ 94		13	4	17	58.1	2	49	26	77	58.8	12	49	54	115	59.6
85/ 89	0	20	9	29	56.4	5	41	32	78	57.1	27	24	40	91	57.9
80/ 84	1	40	20	61	54.4	18	44	48	110	55.4	55	17	39	111	56.2
75/ 79	6	47	35	88	52.4	39	34	47	120	53.3	66	8	22	96	54
70/ 74	17	44	44	105	50.4	58	21	38	117	51.2	47	3	10	60	51.8
65/ 69	29	30	39	98	48.3	45	10	20	75	49.3	20	1	4	25	49.9
60/ 64	55	25	43	123	46.4	45	5	14	64	46.9	10	0	1	11	48.4
55/ 59	62	13	29	104	44.3	26	1	5	32	44.7	2	0	0	2	47.7
50/ 54	47	3	14	64	41.7	9	0	1	10	42.7	1		0	1	48.8
45/ 49	20	1	3	24	38.9	1			1	42.6					
40/ 44	3	0	0	3	36.6	0			0	41					
35/ 39	1		0	1	33.3										
30/ 34															
25/ 29															
20/ 24															
15/ 19															
10/ 14															

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

Dry-Bulb Temperature Hours For An Average Year

	July					August					September				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)
115/119		2	0	2	69.1		0		0	71.8					
110/114		10	3	13	68.2		4	1	5	68.4		0		0	70
105/109		49	20	69	67.1		34	10	44	67.8		4	0	4	66.7
100/104	1	76	43	120	66.2	0	74	34	108	66.5		25	5	30	64.6
95/ 99	9	62	60	131	65.4	4	69	55	128	65.6		57	19	76	63.2
90/ 94	41	31	59	131	64.1	29	40	65	134	64.7	2	62	37	101	61.4
85/ 89	58	10	34	102	62.6	50	15	43	108	63.6	10	38	40	88	60.1
80/ 84	72	6	19	97	61.2	75	7	27	109	62.2	33	30	52	115	58.6
75/ 79	45	2	6	53	58.7	55	3	11	69	59.8	57	15	43	115	56.3
70/ 74	18	1	2	21	57	26	1	3	30	56.3	62	6	26	94	53.9
65/ 69	3	0	0	3	52.5	8	0	0	8	52.1	41	3	11	55	50.9
60/ 64	0	0		0	53.2	1			1	47.5	26	0	3	29	47.6
55/ 59	0			0	49						6		0	6	43.8
50/ 54											1		0	1	40
45/ 49											0			0	35.2
40/ 44															
35/ 39															
30/ 34															
25/ 29															
20/ 24															
15/ 19															
10/ 14															

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

Dry-Bulb Temperature Hours For An Average Year

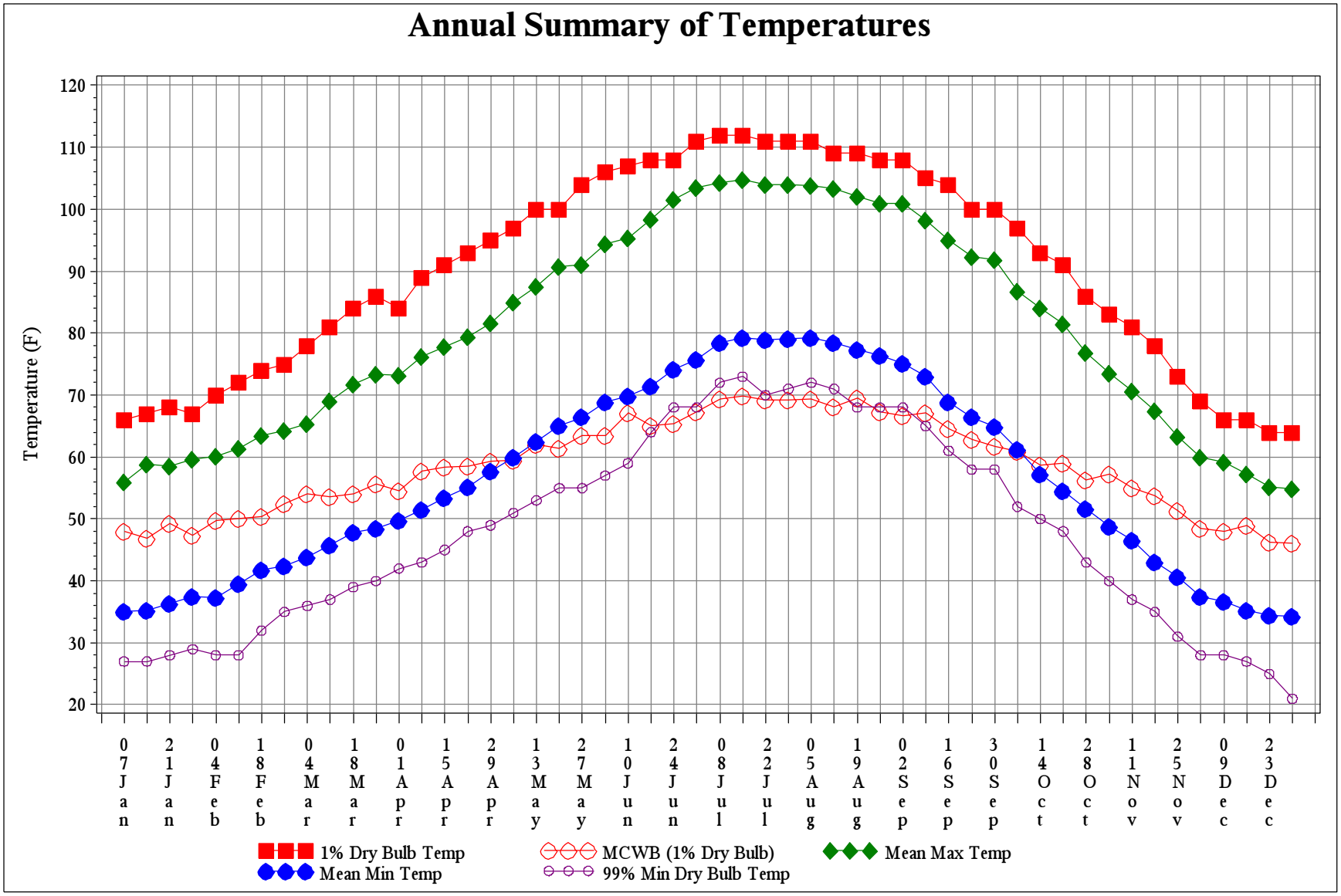
	October					November					December				
Temperature Range (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)	01 To 08 LST	09 To 16 LST	17 to 00 LST	Total Obs	MCWB (°F)
115/119															
110/114															
105/109															
100/104		0		0	62.5										
95/ 99		6	1	7	60.5										
90/ 94		19	3	22	59.7										
85/ 89	0	31	8	39	57.5		0		0	58.2					
80/ 84	1	51	21	73	56.1		5	0	5	55.2					
75/ 79	8	46	34	88	54.3		19	2	21	53.4		0		0	52
70/ 74	21	41	48	110	52.3	1	35	11	47	51.4		1	0	1	50.7
65/ 69	33	25	43	101	50.3	3	37	18	58	49.1		8	0	8	48.2
60/ 64	59	19	46	124	48.1	12	53	38	103	46.9	1	35	5	41	46.1
55/ 59	65	8	30	103	45.3	26	45	53	124	44.2	4	60	21	85	44
50/ 54	40	2	11	53	41.7	52	26	55	133	41.4	15	62	50	127	41.4
45/ 49	17	0	3	20	37.6	65	13	38	116	38	38	46	66	150	38.3
40/ 44	4		0	4	33.5	39	4	16	59	34.3	46	21	51	118	35
35/ 39	1		0	1	30.3	29	1	8	38	30.6	72	11	38	121	31.5
30/ 34	0			0	25	11	0	1	12	26.8	51	3	13	67	27.5
25/ 29						2		0	2	21.9	17	0	2	19	23.1
20/ 24						0			0	18	2	0	1	3	18.3
15/ 19											1	0	0	1	13.4
10/ 14											0			0	9.4

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

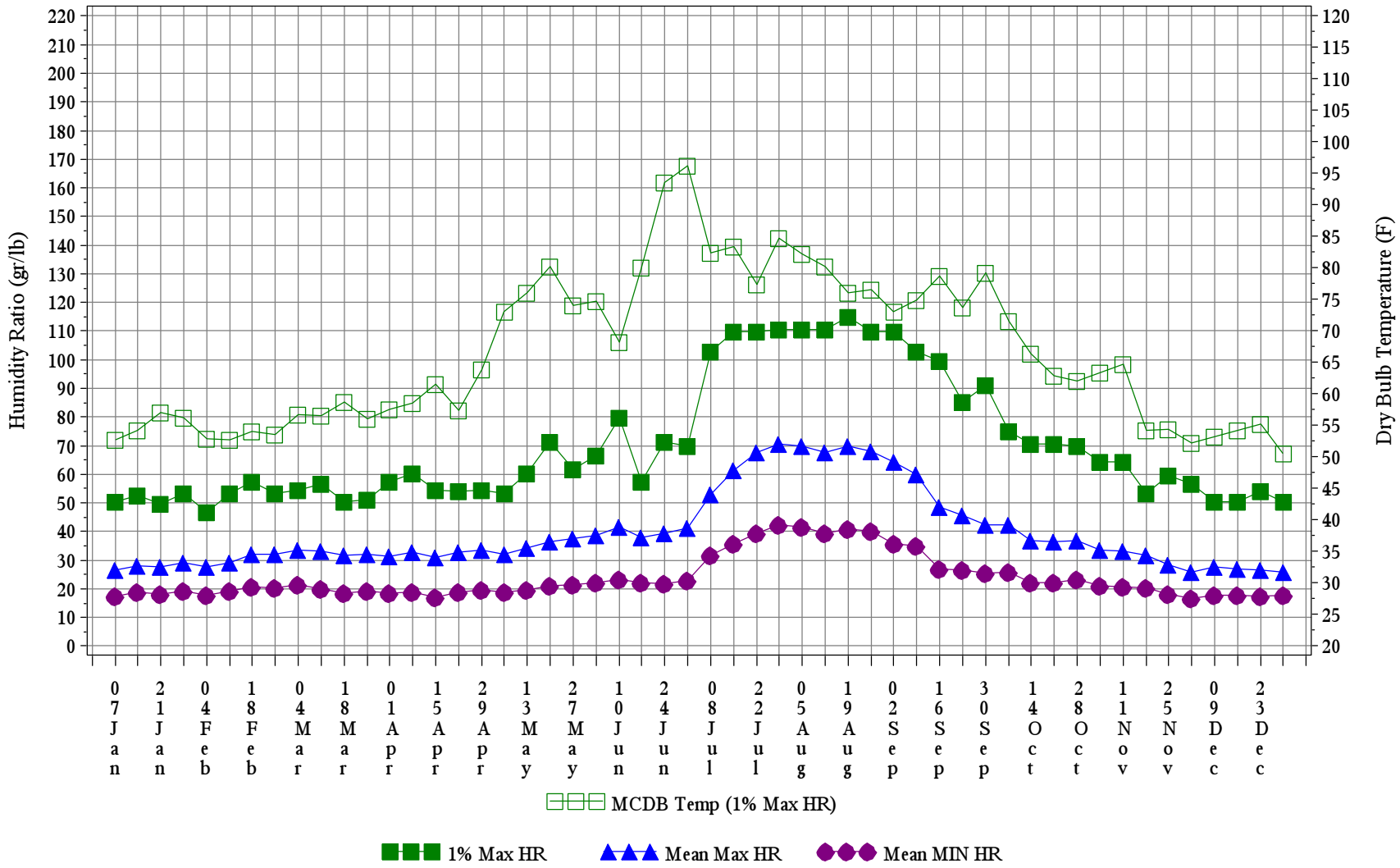
Dry-Bulb Temperature Hours For An Average Year

	Annual				
Temperature Range (°F)	**01 To 08 LST**	**09 To 16 LST**	**17 to 00 LST**	**Total Obs**	**MCWB (°F)**
115/119		3	0	3	69.1
110/114		18	5	23	68
105/109		113	38	151	66.8
100/104	1	242	112	355	65.3
95/ 99	14	288	186	488	63.8
90/ 94	88	266	251	605	61.9
85/ 89	152	186	209	547	60
80/ 84	259	220	235	714	57.8
75/ 79	281	212	219	712	54.9
70/ 74	253	217	216	686	52
65/ 69	193	200	181	574	49.3
60/ 64	241	272	238	751	46.9
55/ 59	256	269	267	792	44.4
50/ 54	293	210	283	786	41.8
45/ 49	299	124	237	660	38.5
40/ 44	212	51	135	398	35.1
35/ 39	216	24	80	320	31.4
30/ 34	123	5	23	151	27.4
25/ 29	33	1	3	37	22.9
20/ 24	4	0	1	5	18.2
15/ 19	1	0	0	1	13.3
10/ 14	0			0	9.6

Caution: This summary reflects the typical distribtion of temperature in a typical year. It does not reflect the typical mositure distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.


Annual Summary of Temperatures
Temperature (F)
120
110
100
90
80
70
60
50
40
30
20
07Jan
21Jan
04Feb
18Feb
04Mar
18Mar
01Apr
15Apr
29Apr
13May
27May
10Jun
24Jun
08Jul
22Jul
05Aug
19Aug
02Sep
16Sep
30Sep
14Oct
28Oct
11Nov
25Nov
09Dec
23Dec
1% Dry Bulb Temp
MCWB (1% Dry Bulb)
Mean Max Temp
Mean Min Temp
99% Min Dry Bulb Temp

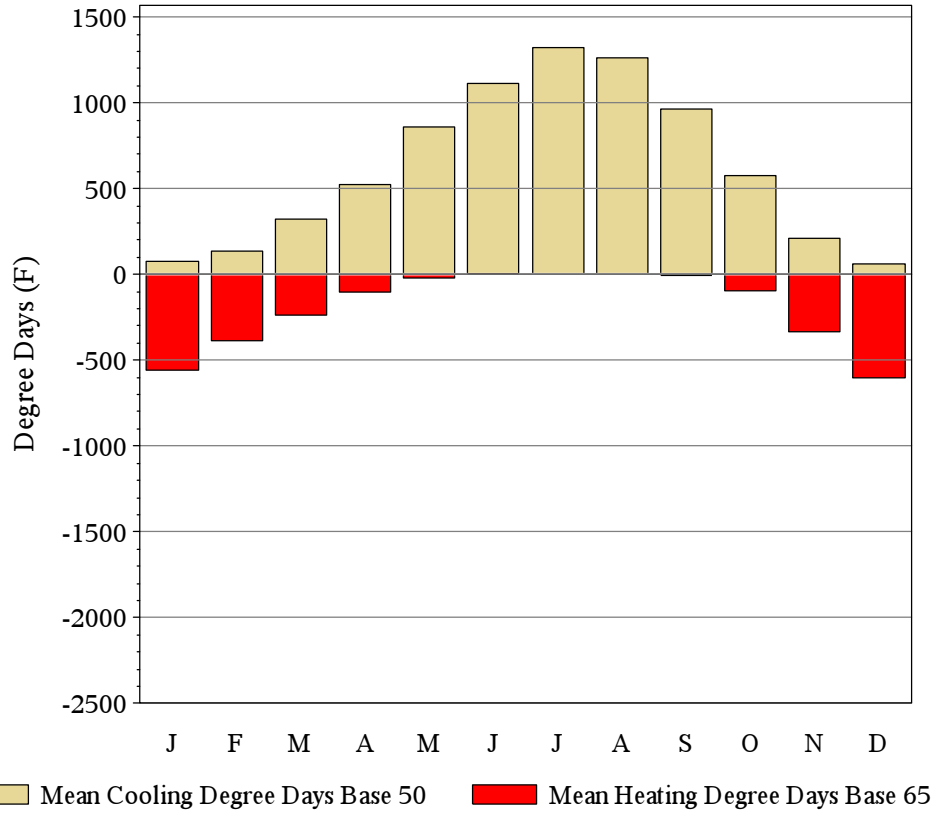
Long Term Humidity and Dry Bulb Temperature Summary



Long Term Humidity and Dry Bulb Temperature Summary

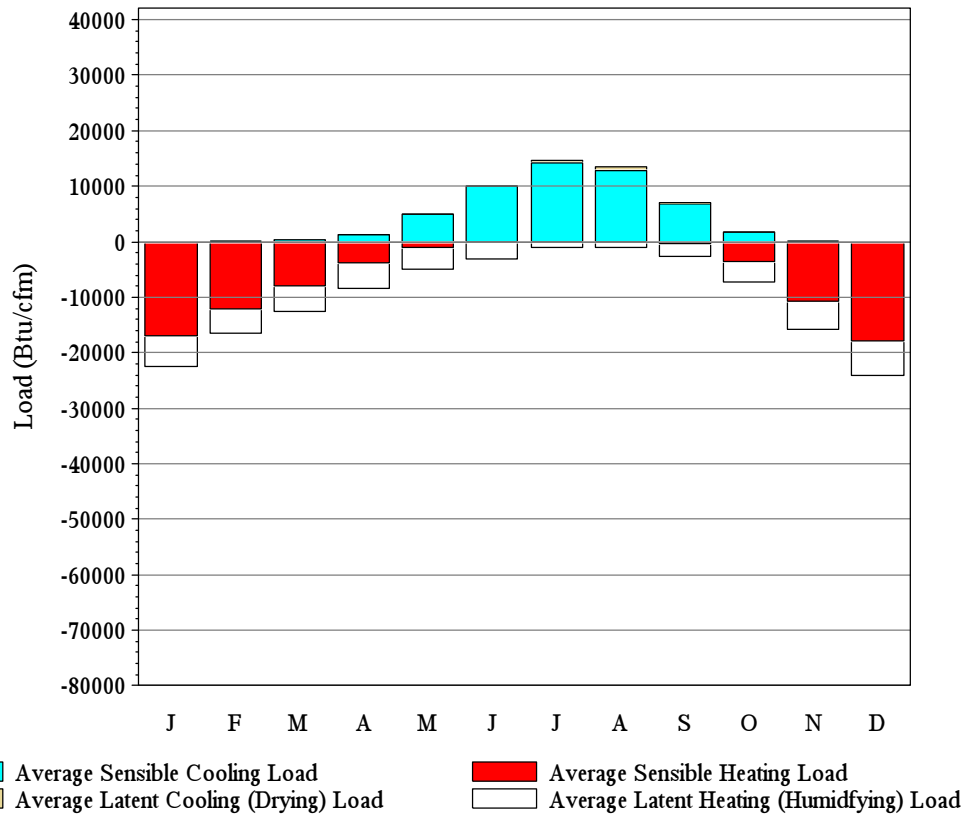
Week Ending	1.0% Temp (°F)	MCWB@ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB@ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	66	48	55.9	35.1	27	50.4	52.8	26.7	17.5
14-Jan	67	46.8	58.8	35.3	27	52.5	54.3	28	18.9
21-Jan	68	49.2	58.5	36.4	28	49.7	57	27.5	18.1
28-Jan	67	47.3	59.7	37.4	29	53.2	56.2	29.2	19.1
4-Feb	70	49.8	60.1	37.3	28	46.9	52.9	27.8	17.7
11-Feb	72	50.1	61.4	39.5	28	53.2	52.7	29.3	19.3
18-Feb	74	50.3	63.5	41.8	32	57.4	54.1	32.2	20.7
25-Feb	75	52.5	64.2	42.4	35	53.2	53.6	31.9	20.3
4-Mar	78	54.1	65.4	43.8	36	54.6	56.8	33.4	21.3
11-Mar	81	53.5	69	45.8	37	56.7	56.6	33	20
18-Mar	84	54	71.8	47.9	39	50.4	58.7	31.6	18.4
25-Mar	86	55.7	73.3	48.4	40	51.1	56.1	32.2	19.1
1-Apr	84	54.5	73.1	49.8	42	57.4	57.6	31.2	18.4
8-Apr	89	57.7	76.2	51.5	43	60.2	58.5	32.9	18.8
15-Apr	91	58.4	77.8	53.4	45	54.6	61.6	31	16.9
22-Apr	93	58.5	79.4	55.1	48	53.9	57.4	32.9	19
29-Apr	95	59.3	81.7	57.7	49	54.6	63.9	33.6	19.5
6-May	97	59.4	85	60	51	53.2	73	32.1	18.8
13-May	100	62	87.5	62.5	53	60.2	76.1	34.2	19.7
20-May	100	61.3	90.7	65	55	71.4	80.2	36.4	21
27-May	104	63.4	91.1	66.4	55	61.6	74	37.5	21.6
4-Jun	106	63.4	94.4	68.8	57	66.5	74.8	38.6	22.1
10-Jun	107	67.1	95.3	69.9	59	79.8	68.3	41.6	23.2
17-Jun	108	65.1	98.3	71.5	64	57.4	80	38	22.1
24-Jun	108	65.3	101.6	74.2	68	71.4	93.6	39.3	21.9
1-Jul	111	67.2	103.5	75.7	68	70	96.2	41.4	23
8-Jul	112	69.3	104.3	78.5	72	102.9	82.4	53.1	31.6
15-Jul	112	69.8	104.7	79.2	73	109.9	83.4	61.4	35.6
22-Jul	111	69.2	103.9	78.9	70	109.9	77.4	67.6	39.4
29-Jul	111	69.2	104	79.1	71	110.6	84.8	70.4	42.3
5-Aug	111	69.3	103.8	79.3	72	110.6	82.3	69.8	41.6
12-Aug	109	68.1	103.3	78.5	71	110.6	80.2	67.6	39.3
19-Aug	109	69.5	102.1	77.3	68	114.8	76.1	69.9	41
26-Aug	108	67.3	101	76.4	68	109.9	76.6	67.9	40.3
2-Sep	108	66.7	101	75.1	68	109.9	73.1	64.2	35.6
9-Sep	105	67.1	98.2	73	65	102.9	74.9	60	35
16-Sep	104	64.5	95.1	68.9	61	99.4	78.7	48.7	27.1
23-Sep	100	62.8	92.3	66.4	58	85.4	73.8	45.7	26.6
30-Sep	100	61.7	91.8	64.9	58	91	79.3	42.5	25.4
7-Oct	97	60.9	86.8	61.2	52	74.9	71.5	42.5	26
14-Oct	93	58.6	84	57.2	50	70.7	66.4	36.9	22.2
21-Oct	91	59	81.5	54.5	48	70.7	62.9	36.5	22.3
28-Oct	86	56.2	76.8	51.7	43	70	62	36.9	23.3
4-Nov	83	57.2	73.5	48.8	40	64.4	63.4	33.6	21.2
11-Nov	81	55	70.7	46.5	37	64.4	64.8	33.2	20.8
18-Nov	78	53.7	67.5	43.1	35	53.2	54.2	31.7	20.4
25-Nov	73	51.3	63.3	40.7	31	59.5	54.4	28.4	18.2
2-Dec	69	48.4	59.9	37.5	28	56.7	52.3	25.8	16.8
9-Dec	66	48	59.1	36.6	28	50.4	53.3	27.7	17.7
16-Dec	66	49	57.2	35.2	27	50.4	54.3	27	17.8
23-Dec	64	46.2	55.1	34.5	25	53.9	55.2	26.4	17.5
31-Dec	64	46.1	54.9	34.2	21	50.4	50.5	26	17.7

Degree Days, Heating and Cooling
(Base 65 F) & Cooling (Base 50F)



Month	Mean Cooling Degree Days (°F) Base 50	Mean Cooling Degree Days (°F) Base 65	Mean Heating Degree Days (°F) Base 65
JAN	78	1.8	560.6
FEB	135.8	11.8	385.8
MAR	324.2	67.8	236.2
APR	524.2	173.6	103.7
MAY	861.5	418.9	22.5
JUN	1113.9	665.9	2
JUL	1318.8	853.9	0
AUG	1258.6	793.7	0
SEP	964.3	519.6	5.3
OCT	579.3	204.2	93.8
NOV	210.7	31	337.8
DEC	61.3	0.9	601
ANN	7430.6	3743.1	2348.7

Average Ventilation and Infiltration Loads
(Outside Air vs 75F, 60% RH summer; 68F, 30% RH winter)



Month	Average Sensible Cooling Load (Btu/cfm)	Average Sensible Heating Load (Btu/cfm)	Average Latent Cooling Load (Btu/cfm)	Average Latent Heating Load (Btu/cfm)
JAN	0	-16903	0	-5650
FEB	15	-12033	0	-4532
MAR	303	-7909	0	-4740
APR	1387	-3838	1	-4675
MAY	5001	-1007	1	-3965
JUN	10022	-121	10	-3006
JUL	14187	-5	581	-1119
AUG	12700	-10	714	-941
SEP	6890	-316	173	-2251
OCT	1791	-3529	2	-3675
NOV	78	-10744	0	-5050
DEC	0	-17972	0	-6048
ANN	52374	-74387	1482	-45652

Average Annual Solar Radiation - Nearest Available Site
Source: National Renewable Energy Laboratory, Golden CO, 1995

Station Information		Shading Geometry in Dimensionless Units	
City, State, WBAN	LASVEGAS, NV 23169	Window:	1.000
Lat, Lon, Elev	36.08N 115.17W 2179ft	Overhang:	1.123
Press, Stn_Type	13.6psia Primary	Vert Gap:	0.659

AVERAGE INCIDENT SOLAR RADIATION (Btu/sq.ft./day) Percentage Uncertainty = 9

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ.	Global	950	1270	1710	2190	2480	2650	2490	2280	1950	1500	1070	870	1790
	Std.Dev.	79	88	103	109	82	83	118	131	102	68	58	61	48
	Minimum	730	1090	1510	1920	2280	2490	2090	1900	1700	1280	950	690	1660
	Maximum	1080	1420	1910	2340	2630	2820	2650	2480	2110	1620	1170	960	1840
	Diffuse	300	400	520	590	640	610	650	570	450	360	310	260	470
Clear Day	Global	1100	1470	1950	2420	2700	2800	2710	2460	2070	1590	1180	1000	1960
NORTH	Global	230	300	380	480	620	740	670	510	390	310	250	210	420
	Diffuse	230	300	380	450	510	530	520	460	390	310	250	210	380
Clear Day	Global	210	260	340	440	610	740	670	480	360	290	220	190	400
EAST	Global	660	830	1080	1310	1420	1480	1400	1340	1200	970	730	610	1090
	Diffuse	280	370	470	570	610	620	610	570	480	380	310	260	460
Clear Day	Global	810	1010	1260	1450	1540	1560	1530	1440	1290	1060	840	730	1210
SOUTH	Global	1600	1610	1490	1230	940	810	840	1070	1430	1690	1650	1580	1330
	Diffuse	400	470	540	560	550	540	540	530	510	460	420	370	490
Clear Day	Global	2070	2060	1810	1340	960	810	860	1150	1600	1950	2060	2030	1550
WEST	Global	660	830	1040	1260	1370	1450	1370	1280	1170	960	710	600	1060
	Diffuse	290	370	490	580	630	630	630	570	490	390	310	260	470
Clear Day	Global	810	1010	1260	1450	1540	1560	1530	1440	1290	1060	840	730	1210

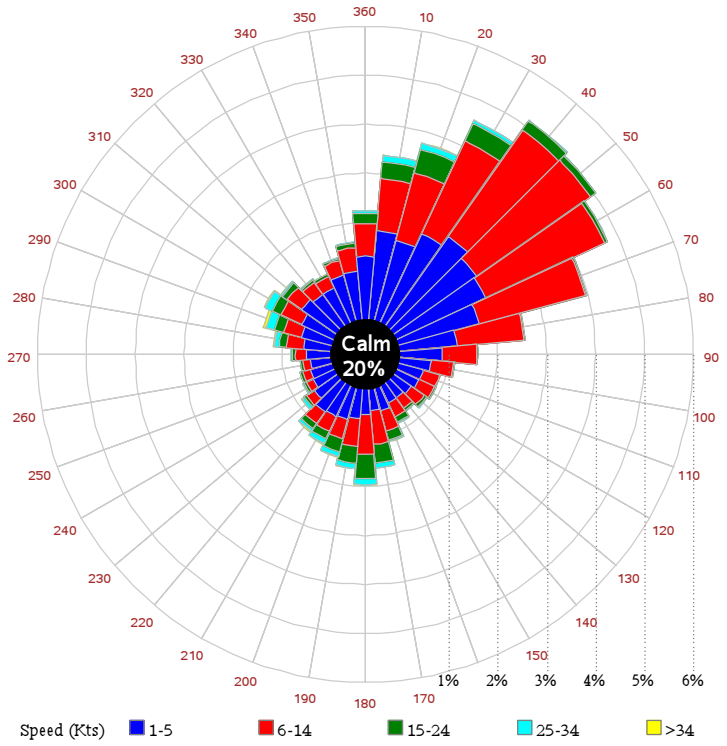
Average Annual Solar Radiation - Nearest Available Site
Source: National Renewable Energy Laboratory, Golden CO, 1995

AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING Percentage Uncertainty = 9														
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ.	Unshaded	620	880	1220	1600	1820	1960	1830	1670	1410	1050	720	560	1280
NORTH	Unshaded	160	210	260	320	390	450	420	330	270	220	170	140	280
	Shaded	140	180	230	280	340	390	360	290	240	190	150	120	240
EAST	Unshaded	460	580	770	940	1020	1060	1000	960	860	690	510	420	770
	Shaded	380	470	610	720	770	800	760	740	670	560	430	350	610
SOUTH	Unshaded	1200	1170	1010	760	540	450	480	640	930	1200	1230	1190	900
	Shaded	1140	920	460	330	340	330	330	320	330	790	1110	1160	630
WEST	Unshaded	450	580	740	910	980	1040	980	920	840	680	500	410	750
	Shaded	380	470	590	710	750	790	750	710	660	550	420	350	590

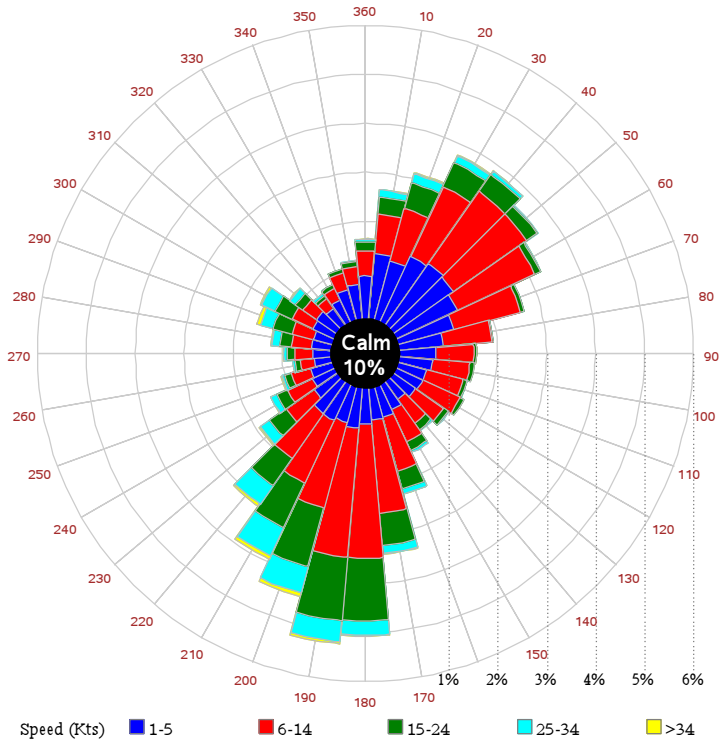
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS Percentage Uncertainty = 9											
				March					June		
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	53	83	90	67	22	58	94	110	100	67
	M.Cloudy	40	67	70	51	16	46	81	97	84	52
NORTH	M.Clear	11	15	15	13	7	18	16	16	16	16
	M.Cloudy	12	17	18	15	7	18	18	19	19	16
EAST	M.Clear	82	51	15	13	7	87	68	21	16	13
	M.Cloudy	51	41	18	15	7	59	59	23	19	15
SOUTH	M.Clear	49	76	82	61	21	12	30	42	34	13
	M.Cloudy	33	57	60	42	12	14	30	41	33	15
WEST	M.Clear	11	15	35	78	65	12	16	16	63	87
	M.Cloudy	12	17	30	52	31	14	18	19	54	60
M.Clear	(% hrs)	55	54	49	45	48	80	78	76	72	72

				Sept					Dec		
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	40	79	94	82	45	26	52	54	30	0
	M.Cloudy	29	62	76	63	32	19	39	41	23	0
NORTH	M.Clear	10	14	16	15	10	7	11	11	8	0
	M.Cloudy	10	17	19	17	11	7	12	13	8	0
EAST	M.Clear	81	68	19	15	10	56	36	11	8	0
	M.Cloudy	44	51	21	17	11	29	26	13	8	0
SOUTH	M.Clear	29	61	75	64	32	58	91	94	64	0
	M.Cloudy	20	47	59	47	22	30	55	57	34	0
WEST	M.Clear	10	14	16	64	82	7	11	32	58	1
	M.Cloudy	10	17	19	47	44	7	12	24	31	0
M.Clear	(% hrs)	79	80	78	74	73	55	55	53	52	54

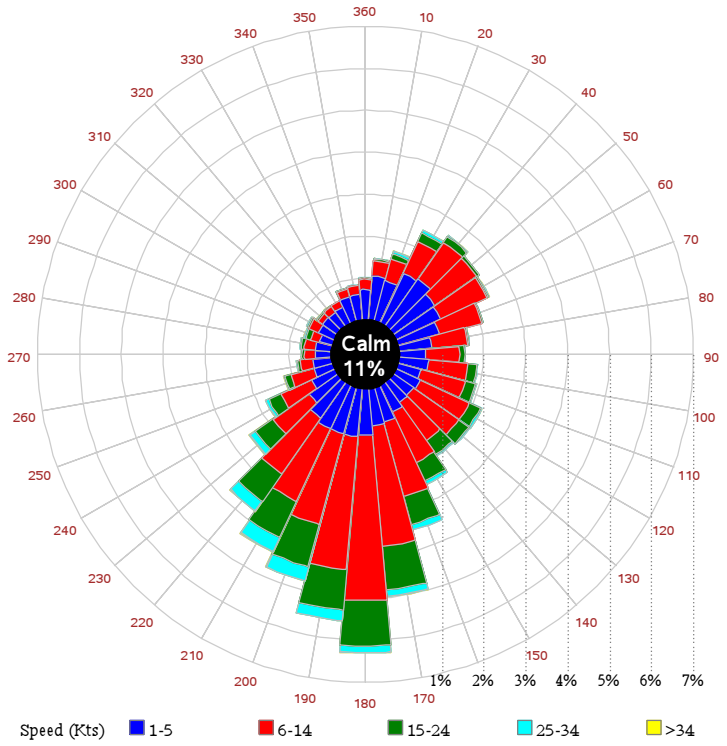
Wind Summary - December, January, and February



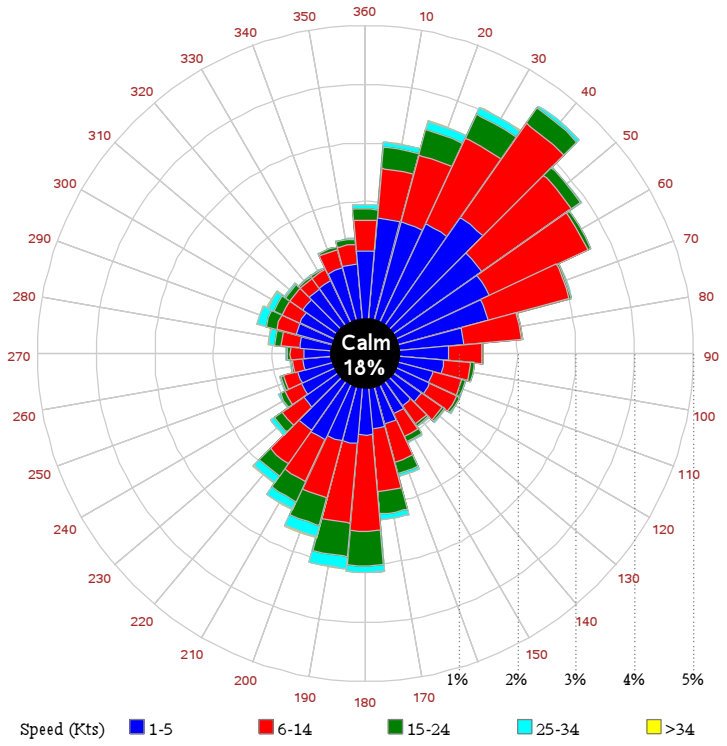
Wind Summary - March, April, and May



Wind Summary - June, July, and August



Wind Summary - September, October, and November



APPENDIX D

ROOM AREA COMPUTATIONS

Nellis AFB
Renovate 926 WG Bldg 332

Room #	Spaces	NSF/Room	Occupants	Remarks
	926 FSS/SC (Floor 1)			
100	Lobby/Entry	79		New addition. Prominent Entrance, Adjacent to Elevator
101	Flight Chief	120	1	Full Height Demountable
102	Client Service Center	109	2	Cubicle; Service Counter, dutch door system
103	Knowledge Ops	296	2	Cubicle
104	Network Systems	196	2	Cubicle
105	Storage (AW/HC)	176	0	Demountable Full Wall
106	Computer Maint & Workbench Equip Storage	729	0	Hard Wall; Power & Comm to workbench for 10 computers.
	926 LRF (Floor 1)			
107	Storage	973	0	Hard Wall. Try to colocate with FSS/SC storage, conditioned, located on one end of bldg; ext and interior access; 4ft interior door, double doors for exterior
108	Log Plans	181	2	Cubicle
109	Material Management	139	1	Cubicle
110	Readiness Officer	139	1	Full Height Demountable
111	Training Space 2	211	0	Full Height Demountable
112	Comm Room	101		
113	Electrical Room	100		
114	Mechanical Room	161		
115	Mechanical Room	203		
116	Break Room	159		
117	Mens Bathroom	134		
118	Janitor's Closet	25		
119	Womens Bathroom	134		
	926 AW/HC (Floor 1)			
120	Reception	75	1	Co-locate with Chaplain assistants space; nook/display area outside of door for materials/distribution, pamphlets. Full space could not be fit into the floorplan.
121	Chaplain Assistants	102	2	Cubicles
122	Senior Chaplain	144	1	Hard Walled Private Office; Desk and 2 Visitor Chairs
123	Junior Chaplain	114	1	Hard Walled Private Office; space could be shared with Sn Chaplain, partitioned space
124	Counseling Room (4 seats)	88	0	Demountable Full Wall
125	EEO Office	198	1	Hard Wall Private Office; round table, 4 chairs; wall mount for pamphlets outside of door
126	EEO Office	163	1	Hard Wall Private Office; round table, 4 chairs; wall mount for pamphlets outside of door
	926 AW/JA (Floor 1)			
127	Meeting Room (4 seats)	190	0	Demountable Full Wall; Library consolidated with the room
128	Senior Judge Advocate	217	1	Hard Walled Private Office; Upgraded Wood Veneer Furnishing, round table with 4 guest chairs
129	Junior Judge Advocate	197	1	Hard Walled Private Office; Upgraded Wood Veneer Furnishing, 2 guest chairs
130	Paralegal + Storage	145	1	Cubicles w/shelf storage
131	Reception	69	0	Cubicle. Not provided.

Nellis AFB
Renovate 926 WG Bldg 332

Room #	Spaces	NSF/Room	Occupants	Remarks
132	Stairwell	147		Existing Stairwell; Roughly 8'x20'
133	Elevator	44		New addition
134	Elevator Machine Room	33		New addition
135	Display Area	41		
136	Corridor	146		
137	Corridor	1218		
	Subtotal	**7,696**	**21**	
	926 AMDS (Floor 2)			
200	Lobby	79		
201	Medical Records	307	1	Hard Wall Closed Office; flip door cabinets
202	Nurses	210	2	Cubicles; (1) Chief Nurse Office, 1 PT cubicle
203	Physicians	175	3	Cubicles Open Office
204	Knowledge Ops	132	1	Cubicles Open Office
205	Unit Training Manager	142	1	Cubicles Open Office
206	Optometrist	178	3	Cubicles Open Office
207	Lab Techs	223	2	Cubicles Open Office
208	Dental Admin	370	4	Cubicles Open Office
209	Storage	118	0	Demountable Full Height; medical training equipment, tdy material, comm storage
210	Training Room (45 Seats)	689	0	Demountable Full Height; mounted TV, podium up front w/connections, outlets along the wall; wifi capability; comm outlets along wall
211	Skills Lab	698	0	Demountable Full Height; Vinyle tile flooring; partitioned space between training room
212	Comm Room	113		
213	Electrical Room	102		
214	Mechanical Room	194		
215	Exam Room-Optometry	86	0	Hard Wall; Vinyl tile flooring, accessible to visitors, close to lobby, sink & cabinets; exam table and 2 chairs
216A	Exam Room-Dental	71	0	Hard Wall; Vinyl tile flooring, accessible to visitors, close to lobby, sink & cabinets; dental chair and 2 chairs
216B	Exam Room-Dental	68	0	Hard Wall; Vinyl tile flooring, accessible to visitors, close to lobby, sink & cabinets; detal chair and 2 chairs
217	Med Techs	190	2	Shared private office for 2 med techs
218	Mens Bathroom	175		
219	Janitor's Closet	23		
220	Womens Bathroom	178		
221	Commanders Support Staff	350	4	Cubicle open office
222	Office Storage	35	0	Demountable Full Wall; Office materials; adjacent to commander support staff.
223	Conference Room (10 seats)	199	0	Demountable Full Height; Central Table, 8 seats along the table 2 on back wall
224	Commander	154	1	Hard Wall Closed Office; Two guest chairs, round table
225	First Sergeant	143	1	Hard Wall Closed Office; Two guest chairs
226	Superintendent	142	4	Hard Wall Closed Office; Two guest chairs

Nellis AFB
Renovate 926 WG Bldg 332

Room #	Spaces	NSF/Room	Occupants	Remarks
227	Commanders Reception	84		Part of CSS space above; Counter by the door for processing, pull down cage
228	Med Techs	611	8	Cublicle - Open Office
229	Stairwell	159		Existing Stairwell
230	Elevator	44		New addition
231	Corridor	**109**		
232	Corridor	884		
233	Corridor	205		
	Subtotal	**7,640**	**37**	
	926 AMXS (Floor 3)			
300	Lobby	78		New addition
301	Flight Chief	511	6	Cubicles
302	Training Room (30 Seats)	511	0	Demountable Full Height; Podium w/connection to TV monitor, mobile furniture, electrical and comm connections spaced around the room
303	Superintendent	145	1	Demountable Full Height
304	Current Ops	145	1	Demountable Full Height
305	Deputy Commander	242	1	Hard Wall Office
306	Commander	274	1	Hard Wall Office; Upgraded Wood Veneer Furnishing
307	Executive Officer	101	1	Demountable Full Height
308	Career Advisor	86	1	Cubicle
309	Commanders Support Staff	490	3	Cubicles
310	Conference Room (15 seats)	401	0	Demountable Full Height
311	Unit Training Manager	97	1	Cubicles
312	Storage	93	0	Demountable Full Height
313	Comm Room	101		
314	Electrical Room	100		
315	SIPR/Intel	467	1	Hard Wall; (2) 4-drawer safes GSA approved, access control room with STC 48 reqs; 8 SIPR & 1 NIPR Connections; central table with central monitor; sep HVAC. Provide 2 seats for Intel. Provide VTC capability. Space accomodated in SIPR room (168 SF).
316	Breakroom	189		
317	Mens Bathroom	171		
318	Womens Bathroom	176		
319	Janitor's Closet	28		
320	Maint Officer	251	2	Demountable Full Height
321	Commanders Support Staff	353	4	Cubicles
322	Commander	169	1	Hard Wall Office
323	First Sergeant	142	1	Demountable Full Height
324	Superintendent	398	3	Cubicles
325	Computer Workstations	327	0	Cubicles/Open Space; 6 minimum touchdown computer stations, space enough for computer and portfolio on countertop, small privacy partitions
326	Shop Chief	155	1	Cubicles
327	Stairwell	167		Existing Stairwell
328	Elevator	44		New addition
329	Corridor	88		
330	Corridor	752		
331	Corridor	215		
332	Corridor	169	0	
	Subtotal	**7,636**	**29**	
		22,972	**87**	**TOTAL NET**
		1,714	@6.91%	**GROSSING FACTOR**
		24,686		BUILDING TOTAL GROSS

APPENDIX E

DRAWING FORMAT

RENOVATE BUILDING 332

NELLIS AFB, NEVADA

DRAWING FORMAT

1.0 **Policy:** Drawings shall be prepared in accordance with the applicable provisions of the "A/E/C CADD Standard, Release 6.0" except as noted herein for title block/borders, drawing size, and file naming conventions. All subsequent references to the A/E/C CADD Standard, Release 6.0 will be referenced simply as "A/E/C CADD Standard." The A/E/C CADD Standard, Release 6.0 is available for download at:

https://cadbim.usace.army.mil/default.aspx?p=a&t=1&i=7

2.0 **Title and Border Sheets:** Current, standard CADD title blocks and border files used by Sacramento District for contract documents can be downloaded from:

https://cadbim.usace.army.mil/default.aspx?p=a&t=1&i=7

See the drawings at the end of this attachment to clarify who and what titles should be shown in the title blocks, including "Drawn By", "Designed By", "Reviewed By" and "Submitted By". Border sheets have an instruction layer that enumerates the various layers and settings required for the Proposer to set.

3.0 **Drawing Size:** The paper size for drawings shall be 22 inches x 34 inches (ANSI D) and Sacramento District border sheets reflect this size. The border size provided conveniently reduces to half size 11 inches x 17 inches and will successfully plot from a standard laser printer that supports 11" x 17" paper.

4.0 **File Naming Convention and Directory Structure:** File names for this project shall be as indicated in this paragraph, and conform to the A/E/C CADD Standard. See the CADD Directory Structure listing at the end of this paragraph for an example of the recommended organization of electronic files delivered to the Sacramento District. This is Sacramento District's interpretation of the current A/E/C CADD Standard.

4.1 **Production Drawings:** Production drawings (sheet files) shall be stored under files names consisting of the project code N15 followed by a letter and hyphen (-) to indicate design discipline that produced the sheet as follows (page 11 of the A/E/C CADD Standard); Drawing organization shall conform to this order:

G General
H Hazardous Materials
V Surveys
B Geotechnical
C Civil
L Landscape
S Structural
A Architectural
I Interior Design

Q Equipment
F Fire Protection
P Plumbing
M Mechanical
E Electrical
T Telecommunications

Sheet type shall be indicated by the following Sheet Type Designators (page 22 of the A/E/C CADD Standard):

0	General (Symbols, Legends, Notes, etc.)
1	Plans (horizontal views)
2	Elevations (vertical views)
3	Sections (sectional views)
4	Large Scale Views (enlarged plans, elevations, or sections that are not details)
5	Details
6	Schedules and Diagrams
7	User Defined
8	User Defined
9	3D Representations (isometrics, perspectives, photographs)

The complete drawing sheet file name will thus conform to the following:

N15	Project Code
A-	Discipline Designation
1	Sheet Type Designator
01	Sheet Sequence Number
XXX	User Definable
.DWG	CADD File Extension

Examples:

N15C-101XXX.dwg	Civil Site Plan
N15A-101XXX.dwg	Architectural Key Plan
N15A-203XXX.dwg	Intermediate Architectural Elevations
N15A-515XXX.dwg	Architectural Detail Sheet
N15A-620.XXX.dwg	Possible Door Schedule Sheet

(all drawing sets must start with the number 1, i.e. 101, 201, 301, etc. Use of 00 as in 000, 100, 200, 300 is prohibited.)

4.2 **Reference File Drawings:** Reference file drawings (model files) of floor plans, elevations, sections, etc., used to generate production drawings shall be stored under file names consisting of the project code [M17]followed by a designator of the discipline that produced the sheet, as indicated in Table 2-1 (page 11 of the A/E/C CADD Standard). This is followed by a hyphen (-) and a Model File Type designator (Table 2-3, page 17 through 21 of the A/E/C CADD Standard):

Example Model File Type designators (may vary by discipline):

FP	Floor Plan
EL	Elevation
SH	Schedule

SC	Section
PR	Profile
LG	Legend
DG	Diagram
DT	Detail
3D	Isometric/3D

The complete reference file (model file) drawing name will thus conform to the following:

N15	Project Code
A-	Discipline Designation (note: some CADD software programs automatically place a hyphen before the discipline designator as in -A-; this is acceptable, as long as all reference files are named consistently.)
FP	Sheet Type Designator
XXXX	User Definable
.DWG	CADD File Extension

Examples:

N15-A-FPXXXX.dwg	Architectural Reference Plan
N15-A-ELXXXX.dwg	Architectural Reference Elevations
N15-A-SCXXXX.dwg	Architectural Reference Building Sections
N15-A-SHDOOR.dwg	Architectural Reference Door Schedule

Example: Reference model file N15-A-FPXXXX.dwg would be used to create the production drawing of the floor plan named N15A-101XXX.dwg.

5.0 **Layer/Level Convention, Line Symbologies, Font Libraries and Color/Pen Tables:** The Architect-Engineer shall use the AIA version of the CADD layer/level convention, line symbologies (including layer color, line weight, and line type), font libraries (restrict font usage on drawings to AutoCAD font Romans (Roman Simplex), with a 0.8 width factor and Arial Bold for title sheet fonts), and color tables as indicated in the appendices of the A/E/C CADD Standard.

6.0 **Hard Copy Data to be Included:** Existing hard copy data to be included in construction drawings shall be scanned to raster format (however, vectorized is preferred), and incorporated into the electronic files or may be included as references following the reference file paragraph above.

7.0 **Plot Configuration Documentation:** The plot configuration file for each drawing shall be provided. This ASCII text format documentation shall include the plotter configuration (e.g., name and model of plotter, pen settings, colors, widths, drawing orientation, drawing size, and other special instructions). Acceptable plot configuration or plot documentation files end in the following file extensions:
*.pcp, *.pc2, or *.pc3.

APPENDIX F

AIR FORCE BIM REQUIREMENTS

USACE ADVANCED MODELING PROJECT EXECUTION PLAN

(PxP)

VERSION 3.0

FOR:

[OWNER OF PROJECT]

ON

[PROJECT NAME]

[PROJECT LOCATION]

[AGENT PROJECT NUMBER(S)]

DEVELOPED BY

[AUTHOR COMPANY]

US Army Corps of Engineers®

INSTRUCTIONS AND REFERENCE INFORMATION

This template is a tool that is provided to assist in the development of an Advanced Modeling Project Execution Plan (PxP) as required per Awarded Contract or Proposal Submission Requirements. It was adapted from the National BIM Standard (NBIMS) – US Version 3, Section 5.4 BIM Project Execution Plan Content – Version 2.1, BIM Project Execution Plan Template. For Reference Information only on content in this template, such as Model Use definitions, please see the NBIMS Chapter 5 Practice Documents and related Section 5.3 BIM Project Execution Planning Guide at www.nationalbimstandard.org.

The U.S. Army Corps of Engineers is an Alliance Sponsor Member of the National Institute of Building Sciences (NIBS) http://www.nibs.org/?page=organizations. NBIMS is a product of the buildingSMARTalliance (bSa) which serves as a Council of NIBS http://www.nibs.org/?page=bsa.

Instructions and examples to assist with the completion of this guide are currently in grey. The un-bracketed grey text is to remain, and bracketed grey text is to be modified to suit the needs of the organization filling out the template. If modified, the format of the text should be changed to match the rest of the document. This can be completed, in most cases, by selecting the normal style in the template styles. Contractor shall not to delete any sections or paragraphs. If a section or paragraph is not applicable to the project, mark it as such.

Questions pertaining to an individual solicitation shall be directed to the advertising district's contracting specialist for that solicitation.

The table below denotes changes between versions of the Template.

TEMPLATE CHANGE LOG – FOR OFFICAL USE ONLY	
Section	**DESCRIPTION**
All	Updated to PxP to include change BIM/CIM to Advanced Modeling Requirements.
A	Added Contractors PROJECT PxP CHANGE LOG
B	Added GIS Lead
H.2	Added GIS
I.2	Added Advanced Modeling Submittal Checklist (CHX)
J.1	Added GIS
J.2	Added Graphics Standard Added SDSFIE (GIS)
K.1	Added content for File Naming Conventions
K. 3	Changed Coordinate Systems information requirements
L	Added CHX, Drawing files in PDF, and GIS
M	Changed Section M to Geographic Information System (GIS)
N	Changed Section N to Government Furnished Material
O	Changed Section O to Attachments

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SECTION A: PROJECT INFORMATION

To successfully execute Advanced Modeling on a project, [AUTHOR COMPANY] has developed this detailed Advanced Modeling PxP. The PxP defines Model Uses on the project (e.g. Design Authoring, Design Reviews, 3D Coordination, and Record Modeling), along with a detailed process for executing Advanced Modeling on this project.

[INSERT OPTIONAL INFORMATION: FOR EXAMPLE, AN ADVANCED MODELING MISSION STATEMENT. This is the location to provide additional Advanced Modeling overview information up to one paragraph. Additional detailed information can be included as an attachment to this document.]

This section defines basic project reference information.

1. **FACILITY OWNER:** [E.G. US ARMY, ETC.]
2. **PROJECT NAME:** [E.G. BARRACKS, TEMF]
3. **PROJECT LOCATION:** [E.G. Joint Base Lewis-McChord, WA]
4. **CONTRACT TYPE:** [E.G. DESIGN-BUILD]
5. **FACILITY TYPE:** [LIST ALL FACILITIES IN THE CONTRACT]
6. **BRIEF PROJECT DESCRIPTION:** [NUMBER OF FACILITIES, GENERAL SIZE, ETC]
7. **ADDITIONAL PROJECT INFORMATION:** [UNIQUE ADVANCED MODELING PROJECT CHARACTERISTICS AND REQUIREMENTS]
8. **AGENT:** [E.G. USACE]
9. **PROJECT NUMBERS:**

PROJECT INFORMATION	NUMBER
AGENT CONTRACT NUMBER:	[E.G. W9126G-08-D-0000]
TASK ORDER:	[E.G. 0001]
AGENT PROJECT NUMBER:	[E.G. PN055198]
CONTRACTOR INFORMATION	**NUMBER**
PROJECT NUMBER(S):	[IF APPLICABLE]

10. **PROJECT PxP CHANGE LOG:**

Log all changes to the approved PxP below providing a description and page number of the change. Consult with the District BIM Manager or Delegate to determine if a resubmittal of the PxP is required.

DATE	SECTION	DESCRIPTION

SECTION B: KEY PROJECT CONTACTS

The following is a list of the lead Advanced Modeling contacts for each organization on the project. Additional contacts can be included later in the document.

ROLE	ORGANIZATION	NAME	EMAIL	TIME ZONE	PHONE
Project Manager	[USACE / AGENT]	[John Doe]			
District Advanced Modeling Manager	[USACE / AGENT]				
Project Manager(s)	[Company]				
Advanced Modeling Manager(s)	[Company]				
Architecture Lead	[Company]				
Structural Lead	[Company]				
Furnishings Lead	[Company]				
Equipment Lead					
Landscape Architect Lead					
Civil Lead					
Fire Protection Lead					
Mechanical Lead					
Plumbing Lead					
Electrical/Telecom Lead					
GIS Lead					
Other Project Roles					

SECTION C: PROJECT GOALS / ADVANCED MODELING OBJECTIVES

Describe how the Models and Facility Data are utilized to maximize project value (e.g. design alternatives, life-cycle analysis, energy analysis, sustainability analysis scheduling, estimating, material selection, pre-fabrication opportunities, site placement, etc.) Reference www.nationalbimstandard.org for the BIM Goal & Use Analysis Worksheet.

1. MAJOR ADVANCED MODELING GOALS / OBJECTIVES:

State Advanced Modeling Goals / Objectives

ADVANCED MODELING GOAL	DESCRIPTION
[GOAL A]	[DESCRIPTION]

2. MODEL USES:

The Model Uses currently highlighted/shaded and checked with an (X) are required by USACE. Contractor to identify with a (C) additional Model Uses for the project selected as Contractor Electives. Reference BIM Project Execution Planning Guide at www.nationalbimstandard.org for Model Use descriptions. Include additional Model Uses as applicable in empty cells of Design and Construct columns. Do not complete Plan and Operate Columns.

	PLAN (NIC)		DESIGN		CONSTRUCT		OPERATE (NIC)
	PROGRAMMING	X	DESIGN AUTHORING		SITE UTILIZATION PLANNING		BUILDING SYSTEM ANALYSIS
	SITE ANALYSIS	X	PROGRESS REVIEWS		CONSTRUCTION SYSTEM DESIGN		ASSET MANAGEMENT
		X	INTERFERENCE MANAGEMENT (3D COORDINATION)	X	INTERFERENCE MANAGEMENT (3D COORDINATION)		SPACE MANAGEMENT / TRACKING
			STRUCTURAL ANALYSIS		DIGITAL FABRICATION		DISASTER PLANNING
			LIGHTING ANALYSIS		3D CONTROL AND PLANNING		
			ENERGY ANALYSIS	X	RECORD MODELING		OPERATION & MAINTENANCE RECORD MODELING
			PROGRAM VALIDATION		FIELD / MATERIAL TRACKING		
			MECHANICAL ANALYSIS		DIGITAL LAYOUT		
			OTHER ENG. ANALYSIS				
			SUSTAINABILITY (LEED) EVALUATION				
			CODE VALIDATION				
	PHASE PLANNING (4D)		PRELIMINARY CONSTRUCTION SCHEDULING (4D)		CONSTRUCTION SCHEDULING (4D)		BUILDING MAINTENANCE SCHEDULING (4D)
	COST ESTIMATION (5D)		COST ESTIMATION (5D)		COST ESTIMATION (5D)		COST ESTIMATION (5D)
	EXISTING CONDITIONS MODELING		EXISTING CONDITIONS MODELING		EXISTING CONDITIONS MODELING		EXISTING CONDITIONS MODELING
	CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)		CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)		CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)		CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)

SECTION D: ORGANIZATIONAL ROLES / STAFFING

For each Model Use required and Contractor Elective, identify the team within the organization (or organizations) who will staff and perform that Use. Staff members may fill multiple project roles.

DESIGN PHASE MODEL USE	ORGANIZATION	LOCATION(S)	LEAD CONTACT
DESIGN AUTHORING	[Contractor A]		
PROGRESS REVIEWS	[B]		
DESIGN 3D COORDINATION	[C]		
[CONTRACTOR ELECTIVE]	[D]		

CONSTRUCTION PHASE MODEL USE	ORGANIZATION	LOCATION(S)	LEAD CONTACT
CONSTRUCTION 3D COORDINATION	[E]		
RECORD MODELING	[F]		
[CONTRACTOR ELECTIVE]	[G]		

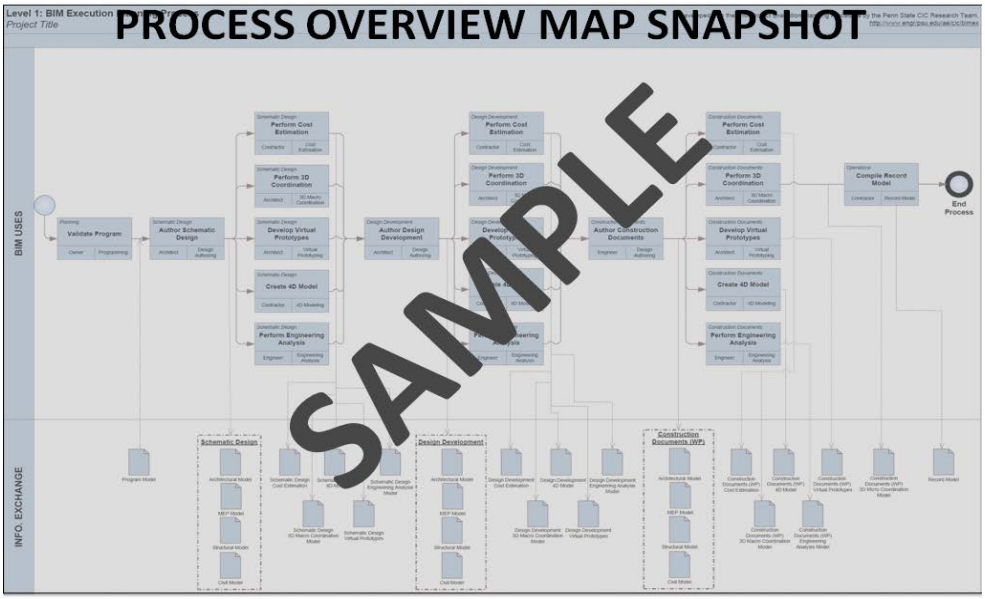
List enhancements from minimum Model Uses as selected in Section C.2. **Note: Enhancements must exceed minimum Contract requirements for Model Uses.** (i.e. performing structural analyses on specific areas versus whole facility, performing cost / quantity take- off on specific floors versus whole facility, etc.,) All documents and files related to the Model Uses shall be provided to the government as a submittal.

CONTRACTOR ELECTIVE MODEL USES	DESCRIPTION / ADDED VALUE
[CONTRACTOR ELECTIVE]	[D]
[CONTRACTOR ELECTIVE]	[G]

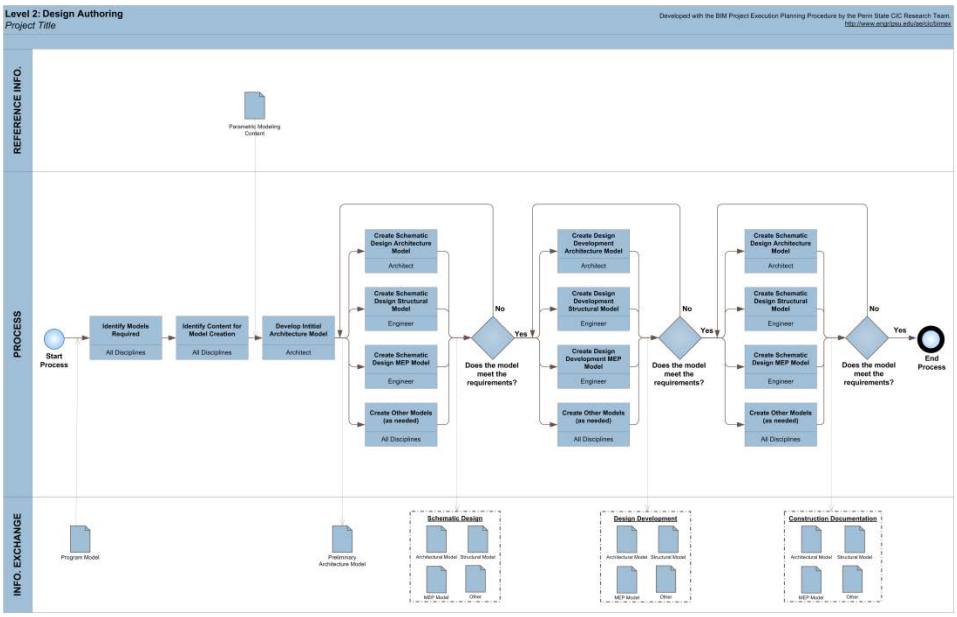
SECTION E: ADVANCED MODELING PROCESS DESIGN

Provide an Overview Process Map for all Model Uses (Level 1). Provide Detailed Process Maps for each REQUIRED (marked with X) and Contractor-Elected (marked with C) Model Use in Section C (Level 2). Sample Process Maps may be downloaded from www.nationalbimstandard.org for your use. (Please note that these are sample maps and should be modified based on project specific information and requirements and contractor internal procedures and processes). **Use the Process Maps format for all Mandatory and Contractor Elective Model Uses.**

LEVEL ONE PROCESS OVERVIEW MAP: ATTACHMENT 1



LEVEL TWO DETAILED PROCESS MAP: ATTACHMENT 2



SECTION F: ADVANCED MODELING INFORMATION EXCHANGE WORKSHEET

Model elements by discipline, level of detail, and any specific attributes important to the project are documented using information exchange worksheet. Reference Chapter Four: Defining the Requirements for Information Exchanges in the BIM Project Execution Planning Guide for details on completing this template. Submittal of these worksheets to USACE IS CURRENTLY NOT REQUIRED, however, it is suggested that the Contractor review and apply these worksheets with their Project Team.

1. LIST OF INFORMATION EXCHANGE WORKSHEET(S): ATTACHMENT 3

(The following are examples. **Modify for specific project**. Some Information Exchanges may need to be removed, while some information exchanges may need to be added.)

- Existing Conditions Modeling
- Programming
- Site Analysis
- Cost Estimation
- 4D Modeling
- Design / Progress Reviews
- Design Authoring
- Energy Analysis
- Structural Analysis
- Lighting Analysis
- 3D Coordination
- Site Utilization Planning
- 3D Control and Planning
- Record Modeling
- Maintenance Scheduling
- Building System Analysis
- Construction Operations Building Information Exchange (COBie)
- GIS Data
- **[Delete unused and add additional information exchange worksheets from list]**

SECTION G: MINIMUM MODELING AND DATA REQUIREMENTS

1. MINIMUM MODELING MATRIX (M3): ATTACHMENT 4

Provide an M3 with Column 'F' filled to reflect the actual scope of work for the facility and site. Use the Minimum Modeling Matrix (M3) Template located at the USACE CAD/BIM Technology Center https://cadbimcenter.erdc.dren.mil/ and submit as part of the PxP in Section M, Attachment 4 as a PDF and an excel file.

Column 'F' of the M3 shall represent the actual scope of work and should not be filled out according to Contractor preference. The Contractor shall identify items in Column 'F' which are NOT included in the project scope for the facility and site.

2. ELECTIVE MODELING ENHANCEMENTS

List enhancements from minimum modeling requirements as specified in Contract. **Note: Enhancements must exceed minimum Contract requirements of the M3.** (i.e., using newer release of AEC CAD Standard or IFC Version, modeling all plumbing/HVAC system and not only 1.5" and above,)

ENHANCEMENT	JUSTIFICATION

SECTION H: COLLABORATION PROCEDURES

1. COLLABORATION STRATEGY:

Describe how the project team will collaborate in development and execution of modeling for the project. Include items such as electronic communication requirements and procedures, document management, transfer, and updating, and record storage, etc.

2. COLLABORATION ACTIVITIES:

The following are examples of activities that should be considered.

ACTIVITY TYPE	REQUIRED PER CONTRACT	PROJECT STAGE	FREQUENCY	PARTICIPANTS	LOCATION
ADVANCED MODELING PxP DEMONSTRATION	YES		ONCE	w/ USACE DISTRICT ADVANCED MODELING MANAGER	WEB MEETING OR AGREED LOCATION
DESIGN COORDINATION	YES				
OVER-THE-SHOULDER PROGRESS REVIEWS	YES			w/ AGENT	
GIS					
[ANY OTHER ADVANCED MODELING ACTIVITY THAT OCCURS WITH MULTIPLE PARTIES]					

SECTION I: QUALITY CONTROL

1. OVERALL STRATEGY FOR QUALITY CONTROL

Describe the strategy to control the quality of the model.

2. QUALITY CONTROL CHECKS

The following checks should be performed to assure quality.

CHECKS	DEFINITION	RESPONSIBLE PARTY	SOFTWARE PROGRAM(S)	FREQUENCY
ADVANCED MODELING SUBMITTAL CHECKLIST	Refer to Contract requirements, Paragraph titled *Advanced Modeling Submittal Checklist.*			AT EVERY SUBMITTAL
MODEL STANDARDS	Refer to Contract requirements, Paragraph titled *Model Standards Checks and Reports.*			AT EVERY SUBMITTAL
GRAPHICS STANDARD	Refer to Contract requirements, Paragraph titled *Graphic Standards Checks and Report.*			AT EVERY SUBMITTAL
CAD STANDARD	Refer to Contract requirements, Paragraph titled *CAD Standards Checks and Report*			AT EVERY SUBMITTAL
INTERFERNCE MANAGEMENT (3D COORDINATION)	Refer to Contract requirements, Paragraph titled *Interference Management (3D Coordination) Checks and Report.*			AT EVERY SUBMITTAL
ADDITIONAL PARAMETERS	Refer to Contract requirements, Paragraph titled *Additional Parameters*			

SECTION J: TECHNOLOGICAL INFRASTRUCTURE NEEDS

1. SOFTWARE:

List software used to deliver Advanced Modeling. Remove Model Uses and software that is not applicable. Approved software versions in this PxP cannot be changed without prior acceptance by the USACE Advanced Modeling Manager and approval by the Contracting Officer Representative.

MODEL USE	USER	SOFTWARE	VERSION
DESIGN AUTHORING	ARCHITECTURAL	XYZ DESIGN APPLICATION	
DESIGN AUTHORING	STRUCTURAL	XYZ DESIGN APPLICATION	
DESIGN AUTHORING	MECHANICAL	XYZ DESIGN APPLICATION	
DESIGN AUTHORING	ELECTRICAL/TELECOM	XYZ DESIGN APPLICATION	
DESIGN AUTHORING	PLUMBING	XYZ DESIGN APPLICATION	
DESIGN AUTHORING	FIRE PROTECTION	XYZ DESIGN APPLICATION	
DESIGN AUTHORING	CIVIL	XYZ DESIGN APPLICATION	
PROGRESS REVIEWS			
INTERFERENCE MANAGEMENT (3D COORDINATION)			
STRUCTURAL ANALYSIS			
LIGHTING ANALYSIS			
ENERGY ANALYSIS			
PROGRAM VALIDATION			
MECHANICAL ANALYSIS			
OTHER ENG. ANALYSIS			
SUSTAINABILITY (LEED) EVALUATION			
CODE VALIDATION			
PRELIMINARY CONSTRUCTION SCHEDULING (4D)			
COST ESTIMATION (5D)			
EXISTING CONDITIONS MODELING			
CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)			
SITE UTILIZATION PLANNING			
CONSTRUCTION SYSTEM DESIGN			
DIGITAL FABRICATION			
3D CONTROL AND PLANNING			

RECORD MODELING			
FIELD / MATERIAL TRACKING			
DIGITAL LAYOUT			
CONSTRUCTION SCHEDULING (4D)			
EXISTING CONDITIONS MODELING			
GIS			

2. ADVANCED MODELING AND CAD STANDARDS:

Identify items such as the Advanced Modeling and CAD graphical, naming, and protocol standards, BIM Workspace version, and the version of IFC, etc.

STANDARD		VERSION
Platform Configurations		Refer to USACE CAD/BIM Technology Center https://cadbimcenter.erdc.dren.mil/ for latest version of Revit Templates and the A/E/C Work Structure.
A/E/C CAD Standard	ERDC/ITL TR 12-6	[A/E/C CAD Standard ver. X.0]
A/E/C Graphics Standard	ERDC/ITL TR-12-1	[A/E/C Graphics Standard ver. X.0]
IFC		[IFC2x3]
COBie (if required by contract)		[COBie 2.4]
SDSFIE (GIS)		[SDSFIE version]

SECTION K: MODEL ORGANIZATION

1. FILE NAMING STANDARD:

As applicable in each category below, list examples of proposed file names by discipline, e.g. Civil, Structural, Architectural, etc.

a. CAD FILE NAMING CONVENTION:

[Must comply with A/E/C CAD Standard file naming convention. Insert samples here]

b. CIM FILE NAMING CONVENTION:

[Provide File naming convention and samples here]

c. BIM FILE NAMING CONVENTION:

[Provide File naming convention and samples here]

d. GIS FILE NAMING CONVENTION:

[Provide File naming convention and samples here]

2. MODEL STRUCTURE:

Describe or diagram how Models are divided up. For example by; building, floors, zone, areas, and/or discipline.

3. MEASUREMENT AND COORDINATE SYSTEMS:

Describe the measurement system (Imperial or Metric) and coordinate system (geo-referenced) used

Project Coordinate System:
a. Coordinate System: [State Plane] [UTM]
b. Zone: [_____]
c. Horizontal Units of Measure: [Meters] [US Survey Feet] [International Feet]
d. Vertical Units of Measure: [Meters] [Feet]
e. Horizontal Datum: [NAD 83/2011] [_____]
f. Vertical Datum: [NAVD 88] [_____]

SECTION L: PROJECT DELIVERABLES

List the deliverables for the project and the format in which the information will be delivered. Reference the awarded contract language for requirements.

ADVANCED MODELING SUBMITTAL ITEM	STAGE	FORMAT	NOTES
List of all submitted files (Excel spreadsheet preferred)	ALL		
Advanced Modeling Submittal Review Checklist (CHX)	ALL		
BIM Files	ALL		
CIM Files	ALL		
GIS Files	ALL		
CAD Files	ALL		
PDF Electronic Drawing Files	ALL		
3D Interactive Review Model	ALL		
IFC Coordination View	ALL		
Model Standards Checks and Reports	ALL		
Graphics Standards Checks and Report	ALL		
CAD Standards Checks and Report	ALL		
Interference Management (3D Coordination) Checks and Report	ALL		
Drawing Index	ALL		
[Other Advanced Modeling Deliverables]	ALL		

SECTION M: GEOGRAPHIC INFORMATION SYSTEM (GIS)

NOTE: RESERVED FOR FUTURE USE

SECTION N: GOVERNMENT FURNISHED MATERIAL (GFM)

NOTE: RESERVED FOR FUTURE USE

SECTION O: ATTACHMENTS

1. **LEVEL 1 PROCESS OVERVIEW MAP** [FROM SECTION E]
2. **LEVEL 2 DETAILED MODEL USE PROCESS MAP(S)** [FROM SECTION E]
3. **INFORMATION EXCHANGE REQUIREMENT WORKSHEET(S)** [FROM SECTION F]
4. **MINIMUM MODELING AND DATA REQUIREMENTS (M3)** [FROM SECTION G]
5. **FILE NAMING STANDARD** [FROM SECTION L]
6. **OTHER** [AS APPLICABLE]

APPENDIX G

NELLIS AFB REQUIREMENTS AND GUIDANCE

NELLIS AFB REQUIREMENTS AND GUIDANCE
Base Construction Projects

JUL 2014

1. PART 1 – GENERAL

1.1 LOCATION: The project site is located at Nellis AFB, NV.

1.1.1 Nellis Air Force Base (NAFB) is located approximately nine (9) miles north of downtown Las Vegas on Highway U.S. 93 (Las Vegas Blvd). NAFB consists of three main areas: the Main Base, Area II, and Area III. This specific project location is on the Main Base and is indicated on drawings accompanying this contract. The project haul route uses the Area II Gate for base entry.

1.1.2 Requirements Documents: Contractors shall be responsible for obtaining copies of all codes and regulations referenced in this document. Department of Defense criteria can be retrieved at: http://www.wbdg.org/.

1.2 WORKING HOURS: Standard working hours are from 6:00 a.m. to 6:00 p.m. Monday through Friday excluding Federal Holidays and the day after Thanksgiving. Contractor requested deviations to this schedule will be considered if it is in the best interest of the government as determined by the Contracting Officer. If the Contractor desires working hours other than 6:00 am to 6:00 pm, Monday through Friday, he must submit to the Contracting Officer a work schedule at least five working days prior. The schedule shall note the activities planned, the planned hours of work, and the reason for the additional hours so that the construction inspectors can plan their work schedule .

1.3 AIR FORCE BASE ENTRY, REGULATIONS, & RESTRICTIONS

1.3.1 Conformance with Regulations/Directives: The Contractor shall conform to base regulations and directives pertaining to security, safety, traffic, fire and personnel clearances, insofar as they pertain to the Contractor's activities as directed by the Contracting Officer. Contractor employees and visitors are subject to the same restrictions as government personnel. Some of these are noted in the following paragraphs.

1.3.1.1 Smoking: Smoking is permitted in designated, outside smoking areas only. No smoking will be allowed within any base facility.

1.3.1.2 Seatbelts: The use of seatbelts by all vehicle operators and passengers is mandatory on Nellis AFB and in the state of Nevada. On Nellis AFB, vehicle operators and passengers not wearing their seatbelt will be issued a traffic citation and may lose on-base driving privileges.

1.3.1.3 Firearms/Illegal Drugs: No firearms or illegal drugs are allowed to be brought onto Nellis AFB. By accepting a vehicle pass, each person gives their consent to a search of their vehicle while it is entering, while on, or while leaving Nellis AFB.

1.3.1.4 **Speed Limit:** Unless otherwise posted, the speed limit on base is 25 MPH and in base housing areas and flightline it is 15 MPH.

1.3.1.5 **Cell Phones:** Use of hands-free cell phones while driving on an AF installation is required.

1.3.1.6 **Parking:** Contractor vehicles and equipment will be parked in common parking areas or as otherwise approved in writing by the Contracting Officer.

1.3.2 **Enhanced Security Measures:** During elevated force protection levels there may be increased security and more restricted access to Nellis AFB.

1.3.3 **Additional Information:** The following procedures and requirements for construction contractors requiring access, if followed, will assist in reducing delays in gaining access to work areas.

1.3.3.1 At Nellis AFB, construction contractors may access the base through the Main Gate, Tyndall Gate, Beale Gate, and Area II Gate. However, all commercial vehicles and vehicles larger than pickup trucks shall be required to access the base through the Area II gate only; the turnoff to the Area II gate is across from the LV Motor Speedway on Las Vegas Blvd approximately 3 miles north of the Main Gate.

1.3.3.2 Upon arrival at a gate, all vehicle occupants will be required to show identification. A pictured identification such as a driver's license will be required. The person will be required to identify himself/herself and the firm he/she works for and the information will be verified against the Entry Authority List (EAL) and may then proceed to obtain their long term pass.

1.3.3.3 Personnel cannot show up at the gate without prior notification for access and expect to gain access. Verbal access cannot be provided.

1.3.3.4 Each employee and their vehicle may be subjected to search before entry. Each employee will be expected to comply with all directions provided by security personnel at the access gates. Failure to fully comply with directions provided by security personnel will result in access being denied. Before attempting access, ensure there are no weapons or other prohibited items in the vehicle as they will be confiscated if found. Further, no practical jokes or wise remarks will be tolerated. Security of Nellis AFB is treated as serious business and full cooperation is required.

1.3.3.5 Once access to the base has been granted, each contractor employee will be expected to proceed to the work site and not go to other facilities except in the performance of their work. Access to the flightline can only be allowed through additional authorization.

1.3.3.6 Expect some delays in gaining access to the base especially between the hours of 6:30 AM to 8:00 AM due to heavy traffic.

1.3.3.7 Gate Hours: Gate hours are subject to change by the Government at any time due to military activities. Contractor shall be responsible for coordinating with the Contracting Officer for base access.

1.3.4 Unauthorized Activity: The contractor shall inform all personnel working under his/her jurisdiction (including subcontractor and supplier personnel) that access to areas outside of the immediate work area (excluding cafeterias and restrooms near the work site, direct haul and access routes, Contracting and Civil Engineering offices, and points of supply and storage) is prohibited. Circulation of said personnel will be limited to official business only. Persons engaged in unauthorized reconnaissance of other contractor or government activity will be referred to the Contracting Officer for disposition. Infractions involving possible compromise of national security will be turned over to the FBI for disposition.

1.3.5 FAA Notification: Contractor will submit the required FAA Form 7460-1 to the FAA via https://oeaaa.faa.gov/oeaaa/external/portal.jsp for all new construction, work on the exterior of existing facilities, and all crane usage. Contractor shall follow any and all requirements dictated by the FAA or Nellis AFB Airfield Operations personnel in response to the FAA Form 7460-1 submittal. Contractor shall provide a copy of the FAA response and FAA requirements to the Contracting Officer.

1.4 HAUL ROUTE

1.4.1 Specified Haul Route: The Contractor shall follow specified haul routes for this project, unless otherwise directed. The Contractor may make changes to the route only with the prior approval of the Contracting Officer at no additional cost to the Government. The Contractor shall restore the area to its original condition at the end of the contract period unless specific, written approval has been granted by the Contracting Officer.

1.4.2 Haul Route Cleanup: In an effort to minimize Foreign Object Damage (FOD) potential to aircraft, all mud, dirt, debris, foreign objects, or spills of any kind from the Contractor's operations (including subcontractors and suppliers) on taxiways, runways, parking aprons, hard surfaces, streets, and parking lots used as access to the work or staging areas, shall be cleaned immediately after use. Cleanup shall be performed to the satisfaction of the Contracting Officer and the Airfield Manager. Contractor may be held responsible for FOD to aircraft, if the FOD is attributable to his negligence or failure to comply with contract requirements.

1.5 MATERIAL STORAGE

1.5.1 Storage Area: Unless otherwise indicated, no on-base storage facilities are available for contractor owned supplies, tools, materials or equipment. Buildings and structures which are part of the contract may be used for storage provided the space is not required for government occupancy and the contractor accepts full responsibility for the material stored therein. The Contractor shall be responsible for protecting all construction materials from weather damage.

1.5.2 Storage Site: the Contracting Officer shall designate a storage site for contractor-owned supplies, tools, materials, and/or equipment in close proximity to the jobsite. All job equipment and

material not in use, but to be installed in or used on the project by the Contractor may only be stored in this area. Security for the equipment and material storage shall be provided by the Contractor at his risk. Contractor shall install and maintain temporary fencing around storage area. Fence shall be a minimum of six feet high and have tan screening material so visibility through fence is obstructed. Fence shall be of sufficient strength to withstand high wind loads, shall remain in place for the duration of the contract, and be removed at the end of the contract at the contractor's expense. Site shall be returned to its original condition.

1.6 UTILITIES SERVICES NELLIS

1.6.1 Water and Electricity: All reasonable amounts of domestic water and electricity will be made available to the Contractor by the Government from existing system outlets and supplies. Normal quantities of electricity and water necessary to make final tests of completely installed systems will be furnished by the Government. With prior coordination with the Contracting Officer, the Contractor shall be given access to water hydrants to obtain water for construction activities. The Contractor shall provide and install a double back flow preventer with meter to all water hydrants made available to them for project use.

1.6.2 Telephone: Commercial telephone lines are not available to the contractor. Separate communication arrangements must be made by the Contractor as necessary.

1.6.3 Temporary Utility Connections: The Contractor shall, at his own expense, make all temporary connections and install distribution lines. The Contractor shall furnish to the Contracting Officer a complete system layout drawing showing type of materials to be used and method of installation for all temporary electrical systems. All temporary lines shall be maintained by the Contractor in a workmanlike manner satisfactory to the Contracting Officer and shall be removed and the area restored to its original (or better) condition by the Contractor prior to final acceptance of the construction. The point of connection shall be coordinated with the Government technical representative prior to connection. If additional outlets are needed, they will be provided at the Contractor's expense.

1.7 UTILITY SERVICE INTERRUPTIONS: If any utility will require interruption in service the following would apply:

1.7.1 Advance Notification: The Contractor shall submit written notification not less than 28 calendar days in advance of each interruption of each utility and/or communication service to or within existing buildings and facilities being used by others.

1.7.2 Duration: No single outage will exceed four (4) hours at a time or more than once in any two week period unless approved in writing by the 99th Civil Engineering Customer Service Department. The time and duration of all outages will be coordinated with the Using Agency by Customer Service. Utility outages required shall be scheduled so as to provide the minimum interference to the government. Outages shall occur on weekends and/or during non-standard work hours depending on facilities affected and Using Agency operations.

1.7.3 Clearance: No outage may begin until the Contractor has applied for and obtained an Air Force Form 103, *Base Civil Engineering Work Clearance Request.* The Contractor shall apply for the clearance on Nellis at Building 843, 99th Civil Engineer Customer Service. Permit application shall be submitted a minimum of four (4) weeks prior to any outage.

1.8 EMERGENCY MEDICAL TREATMENT: The *Mike O'Callaghan Federal Medical Center* (MOFMC) will provide emergency medical treatment to employees of the Contractor for injuries incurred while working at Nellis AFB, NV. The Contractor will be required to reimburse the Government at an established rate for non-beneficiaries in accordance with DoD Regulation 6010.15. After receiving initial emergency treatment, the Contractor will provide the hospital with the name of a physician and/or hospital to which injured personnel can be transferred for further treatment and care. Follow-on care after initial emergency treatment will not be provided.

1.9 SECURITY:

1.9.1 Physical Security: The Contractor shall provide physical security for the materials and work under his control, and shall immediately notify the Contracting Officer when equipment, material or work area is damaged or removed.

1.9.2 Security Personnel: If the Contractor elects to provide security personnel, Contractor security personnel shall not carry weapons on base (including MACE and night sticks). It is the responsibility of the Contractor to notify security police, through the Contracting Officer, of security personnel who will be in the area.

1.9.3 Communications: In accordance with Air Force Instruction 33-211, all communications with DoD organizations are subject to communications security (COMSEC) review. Contractor personnel will be aware telephone communications networks are continually subject to intercept by unfriendly intelligence organizations. The DoD has authorized the military departments to conduct COMSEC monitoring and recording of telephone calls originating from, or terminating at, DoD organizations. Therefore, civilian contractor personnel are advised any time they place a call to, or receive a call from, a USAF organization, they are subject to COMSEC procedures. The contractor will assume the responsibility for ensuring wide and frequent dissemination of the above information to all employees.

1.10 SAFETY AND ACCIDENT PREVENTION

1.10.1 General: Compliance with the current U.S. Army Corps of Engineers "*Safety and Health Requirements Manual*", EM 385-1-1; *Occupational Safety and Health Act* (OSHA) Public Law 1910 and 1926; *Air Force Occupational Safety and Health* (AFOSH) standards, and current Nellis AFB safety regulations is mandatory. The prime Contractor shall be held responsible to insure that his/her workforce and any subcontractor or supplier workforce comply with the above safety requirements.

1.10.2 Personnel Safety: Adequate protection of all persons shall be provided at all times. Work shall proceed in a manner to prevent hazard.

1.10.3 Temporary Barriers: Contractor shall install and maintain temporary barriers around construction work areas to prevent unauthorized personnel from area.

1.10.4 Road Closures/Lane Restrictions: The Contractor shall be responsible for submitting a closure/lane restriction plan to Contracting Officer for approval at least 30 days in advance of any anticipated closure/restriction. All road closures and/or lane restrictions will be properly advertised to base personnel to make them aware of the restrictions. The Contractor shall be responsible for providing and placing all barricades, lighting, closure markers, and safety devices during any road work.

1.10.5 Safety Briefings: Contractors operating on base shall be responsible to brief and ensure their employees, subcontractors, and suppliers comply with all traffic rules and regulations, as well as entry procedures.

1.10.6 Security Police: All instructions given by Security Police personnel will be complied with immediately. All on-base traffic rules are contained in Air Force Instruction (AFI) 31-204, *Motor Vehicle Traffic Supervision*.

1.10.7 Equipment and Tools: Equipment to be used on the project shall be safe and in good operating condition. The Contracting Officer reserves the right to inspect any on-base equipment and reject such equipment if he considers it unsafe, in poor operating condition, or inappropriate for work.

1.10.8 Explosive Operated Hand Tools: The Contractor shall comply with OSHA (Occupational Safety and Health Act) Standard 1910.215(c) when utilizing explosive operated hand tools. Storage of explosive cartridges on the installation will be in metal containers and limited to one day's supply. The contractor will provide adequate controls to prevent loss/theft of cartridges used and stored on the installation. An explosive storage license must be obtained from the 99 Air Base Wing Safety Office prior to bringing explosives onto the installation as well as storing them.

1.10.9 Use of Radioactive Devices on Government Property: Under no circumstances will an unlicensed radioactive device be used on Nellis Air Force Base. Prior to using a radioactive device (i.e., soil or asphalt density meter) on government property, the contractor shall submit an application to the Contracting Officer for approval by the Base Radiation Protection Officer (99th Medical Group/SGPB). In accordance with Nellis AFB Instruction 48-101, and AF40-201 paragraph 3.4.5 the application shall be submitted forty-five (45) calendar days prior to the anticipated use and will consist of the following:

- A copy of the appropriate NRC license or State Permit to operate/own the radioactive device.
- A copy of the operator's qualifications and/or radiation safety training.
- Radiation dosimetry results for the operator for the past calendar year.
- A statement of the expected start date and the length of the contract (task order).
- A statement of expected storage and security requirements or other peculiar needs of the contractor.

- A statement allowing inspection of use and adherence to safety procedures by Government personnel while on base.
- Copies of the last two leak tests.

1.11 FIRE PREVENTION AND PROTECTION

1.11.1 Nellis AFB Fire Regulations: The Contractor shall comply strictly with the Base fire regulations and become thoroughly familiar with and brief employees and subcontractors on the fire safety requirements applicable to this contract.

1.11.2 Welding Permit: No welding, cutting or open flame will be permitted without obtaining a W*elding/Cutting/Burning Permit* issued by the Base Fire Department, Bldg 277. This permit shall be requested by the Contractor a minimum of fourteen (14) calendar days prior to the required need. A permit must be obtained each time any welding, cutting, or open flame is required.

1.11.3 Clean-Up: The Contractor shall at all times maintain good housekeeping practices to reduce the risk of fire damage. All scrap materials, rubbish, and trash shall be removed daily from, in, and about the site. No debris shall be permitted to be scattered on adjacent property.

1.11.4 Fire Extinguishers: The Contractor shall provide fire extinguishers in accordance with the recommendations of the base fire regulations. Proper type fire extinguisher shall be available at each location where cutting and welding is being performed. Where electric or gas welding or cutting is done, interposed shields of incombustible material shall be used to protect against fire damage due to sparks and hot metal.

1.12 ENVIRONMENT PROTECTION:

1.12.1 Regulations and Permits: All work and Contractor operations shall comply with the requirements imposed by all applicable Federal, State, local, and base regulations and permits concerning environmental protection. Contractor shall pay for and obtain all Federal, State, local, and Nellis AFB permits required for the successful execution of the project. The time required to process and receive such permits is included in the performance period. The project schedule shall reflect time required to acquire permits prior to commencing work on any affected work.

1.12.2 Hazardous Materials

1.12.2.1 Definitions: Any material defined as hazardous under the latest version of Federal Standard No. 313, or any item or class of items covered in the Emergency Planning and Community Right-to-Know Act (EPCRA) tracking requirements, OSHA HAZCOM Standard, and all Class I, and Class II Ozone Depleting Substances (ODS). The following items are a few examples of type of products that may be required to be tracked in the Air Force Environmental Management Information System (AF-EMIS):

- Items with the flash-point of 141 degrees or below.
- All paints, Lacquer, Enamels, and Thinners (water-based, non-lead, non-polyurethane Latex paints are exempt from HAZMART tracking, however, MSDS is still required).

- Adhesive, Sealants, Glues, some types of caulking.
- Some Cleaning Supplies: Bleach, some types of glass cleaner, Drain cleaners, some floor waxes and stripers and others.
- Pesticides, Insecticides, Herbicides, Fungicides. Usages of these products are to be used only if explicitly specified in the contract, otherwise usage of these materials is not permitted on Nellis AFB. Usage must be reported to 99 CES/CEOUE, Building 1037. Phone number: 652-5613.
- Compressed gases.
- Any type of material with a PH of 2 and below or 10.5 and above.

1.12.2.2 Material Safety Data Sheets (MSDS): Prior to use, the Contractor shall submit MSDS for chemical or hazardous materials as a submittal item. Each MSDS shall be submitted in 3 copies, and the Contractor shall retain a copy for on-site use. All hazardous materials must be authorized before being used or brought on to the job site. The MSDS shall be kept on the project site and be readily available for any hazardous materials (solvents, acids, combustibles, etc.) that may be used in this construction. In case of an accident, the MSDS will provide essential information for emergency response personnel on the Base.

1.12.2.3 Hazardous Materials Authorization Procedures for Contractors: The Contractor is responsible for the proper handling and management of all hazardous waste generated from his/her work. The contractor will be held fully liable for any contractor activity/non-activity that results in a Notice of Violation (NOV) or any other regulatory penalty. Contractors using hazardous material (HAZMAT) on NAFB must comply with the authorizations procedures described below and in conformance with AFI 32-7086, 2.5.5.

1.12.2.3.1 Contractors must provide to the Contracting Officer, as a submittal item, a list of proposed HAZMAT, including MSDS that it plans to use on the installation during the performance of the contract. The Contracting Officer will then forward this information to the Quality Assurance (QA) evaluator or Inspector.

1.12.2.3.2 This information will be forwarded to the HAZMART office (Building 811) by the Inspector. HAZMART office will review the information and determine which contractor-identified materials need to be tracked.

1.12.2.3.3 For each contractor-identified HAZMAT that does not meet the Air Force definition of a HAZMAT, these requirements do not apply.

1.12.2.3.4 For each contractor-identified HAZMAT that does meet the Air Force definition of a HAZMAT, the HAZMART office will notify the Inspector of the material requiring authorization and tracking. An Enterprise Environmental, Safety, and Occupational Health Management Information System (EESOH-MIS) worksheet will be completed and submitted as a submittal item to the Contracting Officer. The following information is required to be provided for each hazardous material used on NAFB: material name, manufacturer, unit of issue, and the amount used. If requested, the HAZMART office can assist the Contractor in completing the EESOH-MIS worksheet.

1.12.2.3.5 The HAZMART office will enter the contractor supplied information into the HAZMAT tracking system to generate an AF Form 3952.

1.12.2.3.6 The Contractor will be issued tracking labels (barcodes) to assist in tracking and reporting the material used during the performance of the contract. It is encouraged that the labels be affixed to the material. A Form 3952 will also be issued for the Contractors files. Copies of the AF Form 3952 must be kept on-site for the duration of the project. The contractor will be added to the authorized users list (AUL) by the HAZMART office.

1.12.2.3.7 Contractor will be required to report to the inspector on a monthly basis (by the 5th of the month) and within 10 working days after the completion of the project, the material used (see Contractor's Monthly HAZMAT Usage Report).

1.12.2.3.8 Inspector will forward this information to the HAZMART by the 10th of every month.

1.12.2.3.9 HAZMART office will assist the QA, Inspector, and Contractor in any way possible and to answer any questions.

1.12.2.3.10 Material brought on the installation that was not originally identified by the contractor must be authorized. MSDS and other related information, provided by the contractor, must be given to the HAZMART office.

1.12.2.3.11 Hours of operation for the HAZMART are 0700 to 1600 hours Monday through Friday, located in Building 811. HAZMART phone numbers: 652-9856 or 652-4352.

1.12.3 Asbestos and Lead Based Paint:

1.12.3.1 Ten (10) days prior to the removal of any asbestos from any government facility, the Contractor shall obtain and submit an approved copy of the asbestos demolition permit to the Contracting Officer.

1.12.3.2 The Contractor shall not install any asbestos containing material (ACM) or apply LBP materials. If such material is detected, the Contractor shall remove it and replace it with acceptable material at no additional cost to the government.

1.12.3.3 The Contractor shall immediately notify the Contracting Officer when encountering any material which has not been previously identified is suspected of containing asbestos or lead-based paint. The Contractor shall cease operation in the affected part of the facility until suspected materials are verified and abated.

1.12.4 Dust Control

1.12.4.1 Dust Control Permit: The Contractor shall be held responsible for dust control as defined by Clark County, State of Nevada Ordinances. A *Dust Control Permit* is required to be obtained from the District Board of Health of Clark County and submitted to the Government for all

construction activity (including but not limited to grading, clearing and grubbing operations, trenching, and any disturbance of the topsoil) involving more than one-quarter acre of land or 100 linear feet of trenching or demolition in excess of 1,000 square feet. All processing fees associated with obtaining a dust permit shall be the responsibility of the Contractor. Clark County performs regular dust inspections of Nellis AFB construction projects and if there is a violation, Contractor shall be responsible for payment of all fines imposed.

1.12.4.1.1 Government Coordination: The contractor shall submit to the Contracting Officer for coordination the application for the dust permit. After coordination has been completed, the contractor will proceed with obtaining the permit from Clark County.

1.12.4.1.2 Permit: A copy of the approved permit shall be provided to the Contracting Officer who will provide a copy to the NAFB Air Program Manager.

1.12.5 Authority to Construct Permit: Before construction begins, the Contractor shall acquire an Authority to Construct (ATC) permit from Clark County for all installed equipment or units that has the potential to emit Carbon Monoxide (CO), Nitrogen Oxides (NOx), Sulfur Oxides (SOx), Volatile Organic Compounds (VOC) or Particulate Matter less than 10 microns (PM10). Examples of types of equipment or units are:

- Any fuels related systems, including bulk storage tanks
- External combustion boilers
- Incinerators
- Parts degreasers
- Hush house
- Engine power generators
- Rock crushers or any mineral processing equipment
- Use of storage of VOCs
- Paint booths
- Media blasting
- Bag houses
- Cooling towers
- Any other unit that meets the definition of an emission unit per Clark County Air Quality Regulations, found at the following website: http://www.clarkcountynv.gov/Depts/daqem/Pages/CurrentRulesandRegulations.aspx. Section 00 defines an emission as any stationary source that has the potential to emit any regulated air pollutant (i.e. CO, NOx, SOx, VOC or PM10) or any pollutant listed under Section 112(b) of the Clean Air Act.

1.12.5.1 For work done in Clark County (Nellis AFB), the actual permit will be issued by Clark County Department of Air Quality and Environmental Management through the Air Quality Office (nellisairquality@nellis.af.mil) at Nellis AFB. The Contractor shall be responsible for all fees. All emission units shall be permitted BEFORE the ordering and installation of the emission unit.

1.12.5.2 Any emission unit found on the construction site before a permit is secured is subject to a notice of violation (NOV). This includes any units in storage and awaiting installation. Any NOV or enforcement action caused as a result of the actions of the Contractor shall be the responsibility of the Contractor, to include payment and processing of all fees or fines.

1.12.5.3 Emission Limitations and Controls: All emission units that emit any of the regulated air pollutants or any pollutant listed under Section 112(b) of the Clean Air Act must meet the emission standards or implement the controls outlined in 40 CFR Par 60, Standard of Performance for New Stationary Sources. Furthermore, any emission limitation or controls identified in the Best Available Control Technology (BACT) or Lowest Achievable Emission Rate (LAER) analysis done during the permitting process shall be implemented. If there is a failure to meet any of the emission standards or implement any of the controls outlined in 40 CFR Par 60 or identified in the BACT/LAER analysis, the Contractor shall remove the emission unit and replace it with an acceptable emission unit that meets the emission standards or implements the controls at no additional cost to the government.

1.12.6 Protection of Air, Dust Control: Best Available Control (BAC) methods shall be used at all times for any quantity of soil disturbance, including but not limited to grading, clearing and grubbing operations, trenching, any disturbance of the topsoil, and traffic on unpaved roads. BAC methods include paving, watering, re-vegetation, chemical stabilization, phased construction, and applying dust palliative. A visible dust plume cannot exit the property or extend over 100 (one hundred) feet from the point of origin within the property boundary.

1.12.6.1 For work done in Clark County (Nellis AFB), a permit shall be required if more than ¼ acre (10,890 sq ft) of soil is disturbed (including access road, material laydown/storage area, parking and maneuver areas, and pedestrian areas); involves mechanized trenching of 100 (one hundred) linear feet or more; or mechanical demolition of greater than 1,000 (one thousand) sq ft of a structure. Contact the Air Quality Office (nellisairquality@us.af.mil) to initiate the permit. The Contractor is responsible for the permit fee, keeping daily records and posting the dust sign.

1.12.6.2 Contractor shall coordinate the permitting process with the Nellis Air Program Manager through the Civil Engineer Representative. Approval process through Clark County can take an extended amount of time and should be initiated early in the project.

1.12.7 Trackout: The Contractor shall employ methods to prevent trackout from the construction/storage/laydown site(s). Accumulation shall not exceed Clark County Air Quality Regulation limits: "Mud or dirt shall not be allowed to be tracked out onto a paved road where such mud or dirt extends fifty (50) feet or more in cumulative length from the point of origin or allow any trackout to accumulate to a depth greater than 0.25 inch. Notwithstanding the preceding, all accumulations of mud or dirt on curbs, gutters, sidewalks or paved roads including trackout less than fifty (50) feet in length and 0.25 inch in depth, shall be cleaned and maintained to eliminate emissions of Fugitive Dust. At a minimum all trackout must be cleaned up by the end of the workday or evening shift, as applicable."

1.12.8 Storm Water Construction Permit (Soil Erosion): The Contractor shall provide protective barriers to prevent soil erosion on all required excavations. The Contractor shall provide

environmental protection to prevent sediment drainage of silts into storm drains. Contractor shall minimize disturbed area, stockpile excavated soils, and protect excavated soils from wind and water erosion. If one (1) acre or more of total area is disturbed, including equipment lay down area, Contractor shall obtain a Nevada Storm Water Construction Permit by electronically submitting a Notice of Intent (NOI) to the Nevada Division of Environmental Protection (NDEP) and preparing a Storm Water Pollution Prevention Plan (SWPPP). Contractor shall coordinate the submittal with the Nellis Storm Water Manager through the Contracting Officer on an AF 3000.

1.12.9 Protection of Water Resources: The Contractor shall not pollute any streams, rivers, or waterways through direct discharge or by storm water runoff. The Contractor shall comply with all applicable Federal, State and local laws.

1.12.10 Waste and Disposal:

1.12.10.1 There are no waste or disposal areas available on the base property. The Contractor shall make arrangements at an off-base location in accordance with local and state codes for disposal of waste generated from the site. All hazardous and non-hazardous waste materials (whether solid, liquid, or gaseous) generated by any work under the contract shall be handled, transported, stored, and disposed of by the contractor and by his subcontractors at all times in accordance with all applicable Federal, state, or local laws, ordinances, regulations, court orders, or other types of rulings having the effect of the law, including, but not limited to the following:

- Executive Orders 12088 as amended by E.O. 13143, 12580, 11988, and 11990;
- Clean Air Act, (42 U.S.C. 7401-7671);
- Clean Water Act (33 U.S.C. 1251-1387);
- Endangered Species Act (16 U.S.C. Sec 1531-1544);

- Toxic Substances Control Act (15 U.S.C. Sec 2601-2671);
- National Historic Resources Protection Act (16 U.S.C. Sec 740-470w-6);
- Solid Waste Disposal Act (42 U.S.C. 6901-6991);
- Archaeological Resources Protection Act (16 U.S.C. 470aa-470-11);
- Safe Drinking Water Act (42 U.S.C. 300f - 300j);
- Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136-136y);
- Sikes Act Administration Regulations (29 CFR 1910);
- Environmental Protection Agency regulations (40 CFR 50-87, 110, 112, 122, 136, 141-13, 162, 165, 166, 171, 240-246, 260-271, 280, 300, 302, 355, 370, 372, 403, 405-471, and 761);
- Department of Transportation regulations (49 CFR 171-177);
- Resource Conservation and Recovery Act (RCRA) (40 CFR 260 – 271)
- Nevada Revised Statutes (Title 40, Sections 445.131-445.710 and 459.400-856); and
- Nevada Administrative Code provisions implementing those code sections; and environmental planning, assessment, monitoring, and regulatory compliance provisions of the county codes of Clark, Lincoln, and Nye Counties.

- Contact the Hazardous Waste Program Manager (HWPM) (702-652-3159 or 702-652-4123) prior to shipment of hazardous waste off site. The HWPM (or designee) will verify waste profile sheets and manifests. The waste must have supporting documentations (e.g. MSDS) with the correct manufacturer analytical or laboratory analytical.

1.12.10.2 Recycling Requirements: Contractors shall participate in Nellis AFB's Qualified Recycling Program (QRP).

1.12.10.2.1 At least three weeks prior to the start of the contract, contractors shall include an estimation of potential quantities of material that can be reused and recycled plus the amount disposed to a landfill for the project.

1.12.10.2.2 Contractor shall provide a monthly report including the following information:

- Type of material (i.e. construction debris, plastics, gravel, etc)
- Amount generated (tons)
- Amount reused (tons)
- Amount recycled (tons)
- Diversion rate (see Executive Order 13514 below)
- Location of landfill
- All dump receipts

1.12.10.3 Executive Order (EO) 13514, Federal Leadership in Environmental, Energy, and Economic Performance mandates diversion of at least 50% of construction and demolition materials and debris by the end of fiscal year 2015. Use the following formula to determine the diversion rate for any reporting period: [(Amount reused (tons)) + (Amount recycled (tons))]/ (Amount generated (tons))

1.12.11 Spills:

1.12.11.1 Should any hazardous substance or oil spills occur on this project, in addition to containing and removing such spill, the Contractor shall:

1.12.11.1.1 During normal working hours, immediately report all spills in quantities of five (5) gallons or more to the Asset Management Office at 652-4123, 652-2072 or 652-6121.

1.12.11.1.2 After 4:30 p.m. or on weekends, immediately contact call 702-277-1977 (after-hours spill phone) and the Nellis Command Post at 652-2446.

1.12.11.1.3 Forward a written, completed spill report to the Contracting Officer within three (3) working days after the occurrence.

1.12.11.1.4 All contaminated material shall be removed, transported and disposed of in accordance with all applicable laws, regulations and policies. The contractor shall also submit a copy of all permits and disposal certificates to the Contracting Officer as a submittal item for review.

All costs incurred for the disposal of contaminated soils, as a result of Contractor negligence or error will be the Contractor's responsibility.

1.12.12 Historical/Archaeological Artifacts: The Integrated Cultural Resources Management Plan (2007, page V) provides guidance on the discovery of historical or archaeological artifacts. If artifacts, features, or structural remains are discovered during, but not exclusive to, mission actions, personnel should implement the following:

1.12.12.1 Activities at the location should immediately cease and efforts should be taken to ensure protection until arrival of the Cultural Resources Manager;

1.12.12.2 The site shall be marked to provide efficient relocation, while also taking efforts to minimize the types of signs that would attract personnel, thereby placing the location in additional danger;

1.12.12.3 It is illegal to collect or disturb archaeological materials under the Archaeological Protection Act; thus, artifacts shall be left in place;

1.12.12.4 The Cultural Resources Manager shall be notified within 24 hours of discovery (99 CES/CEAN (702) 652-9365 or 4123); and

1.12.12.5 Contractor personnel should make efforts to be available to assist in identifying the location.

1.12.13 Protection of Flora and Fauna: The Contractor shall perform all work and take such steps required to minimize interference with or disturbances to flora and fauna. The Contractor shall not be allowed to alter water flows or otherwise disturb native habitat adjacent to the work area, which in the opinion of the Contracting Officer/Natural Resources Program Manager are critical to flora and fauna. The Contractor shall contact the Natural Resources Program Manager (702-652-3173 or 652-4123) to discuss required Natural Resources Program concerns, constraints and requirements. The Contractor will salvage, maintain and transplant all cactus and yucca plant species to remain compliant with applicable Federal and State laws as directed by the Natural Resources Program Manager prior to any project or construction earth disturbing activities occurring on undisturbed lands or habitats. The Contractor will provide Natural Resources Biological Monitors to remain compliant with applicable Federal and State laws as required and directed by the Natural Resources Program Manager prior to project development/construction activities. The Contractor shall, as directed by the Natural Resources Program Manager, remain compliant with applicable Federal and State laws and conduct section 404 of the Clean Water Act consultation with the United States Army Corps of Engineers (COE) on the potential of Jurisdictional Waters of the United States that may be impacted by project development or construction activities. The contractor shall conduct required delineations, obtain required permits and implement permit requirements as directed by the COE.

1.12.14 Generator Requirements: All generators installed on base must comply with ETL 11-21 dated 16 Mar 2012. Approval of all generators installed must be received from the Authority having jurisdiction, AFCESA. The Contractor should allow up to three months for the approval

process to be completed. The following data shall be submitted by the Contractor for generator approval:

Generator Design Information:

- Service Transformer Ampacity:
- Service Voltage:
- Service Entrance Ampacity:
- ATS Ampacity:
- Emergency Panel Ampacity:
- Emergency Linear Load:
- Emergency Non-Linear Load:
- Emergency connected load:
- Emergency diversified load:
- Generator rating: kW: kVA: PF:
- Generator duty:
- Fuel Supply:
- Day tank capacity:
- Sub-base capacity:
- External tank capacity:
- Enclosure Type:
- Cooling Type:
- Integral temperature monitoring (Y/N):
- Integral load bank (Y/N): kW:
- One-line diagram
- Emergency Panel Schedule

1.12.15 Fuel Storage Requirements: All fuel storage tanks installed shall meet the following codes:

- UL-142 - Underwriter Laboratories Steel Aboveground Tanks for Flammable and Combustible Liquids
- UL-2085 - Underwriter Laboratories Protected Aboveground Tanks for Flammable and Combustible Liquids
- NFPA 30 - Flammable and Combustible Liquids Code
- NFPA 30A - Code for Motor Fuel Dispensing Facilities and Repair Garages
- AFH 32-1084 FACILITY REQUIREMENTS
- 29 CFR 1910.106, Drainage and Diking, http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9752
- 40 CFR 112, Oil Pollution Act, http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr112_main_02.tpl

- 40 CFR 264, Subpart J, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities - Tank Systems, http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=d4c8bee9d152f9302aa0c7c9b202dd31&rgn=div6&view=text&node=40:26.0.1.1.5.10&idno=40
- 40 CFR 279, Standards for the Management of Used Oil, http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr279_main_02.tpl
- AFI 32-7044, Storage Tank Compliance, http://www.e-publishing.af.mil/shared/media/epubs/AFI32-7044.pdf
- AFI 23-204, Organizational Fuel Tanks, http://www.e-publishing.af.mil/shared/media/epubs/AFI23-204.pdf
- UFC 3-460-03, Operation and Maintenance of Petroleum Systems, http://www.wbdg.org/ccb/DOD/UFC/ufc_3_460_03.pdf
- ACC Manual 32-7051, Environmental Quality Manual, http://www.e-publishing.af.mil/shared/media/epubs/ACCMAN32-7051_HOLLOMANAFBSUP_I.pdf
- UFC 3-460-01, Design: Petroleum Fuel Facilities, http://www.wbdg.org/ccb/DOD/UFC/ufc_3_460_01.pdf
- UFC 3-570-06, Operation and Maintenance: Cathodic Protection Systems, http://www.wbdg.org/ccb/DOD/UFC/ufc_3_570_06.pdf
- API Standard 650, Welded Steel Tanks for Storage,
- API Recommended Practice 651, Cathodic Protection of Aboveground Petroleum Storage Tank,
- API Recommended Practice 652, Lining of Aboveground Petroleum Storage Tank Bottoms,
- API Standard 653, Tank Inspection, Repair, Alteration, and Reconstruction,
- Steel Tank Institute SP001-01, Fifth Edition, STI Standard for Inspection of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids,
- T.O. 37-1-1, General Operation and Inspection of Installed Fuel Storage and Dispensing Systems,
- MIL-STD-161G Department of Defense Standard Practice Identification Methods for Bulk Petroleum Products Systems Including Hydrocarbon Missile Fuels
- UFGS-33 56 10 (UNIFIED FACILITIES GUIDE SPECIFICATIONS)Factory-Fabricated Fuel Storage Tanks
- UFGS-33 52 44 (UNIFIED FACILITIES GUIDE SPECIFICATIONS) Aviation Fueling Systems
- Steel Tank Institute SP031 Standard for Repair of Shop Fabricated Aboveground Tanks for Storage of Flammable and Combustible Liquids
- Steel Tank Institute INSTALLATION INSTRUCTIONS FOR SHOP FABRICATED STATIONARY ABOVEGROUND STORAGE TANKS FOR FLAMMABLE, COMBUSTIBLE LIQUIDS R912

1.13 WEATHER CONDITIONS

1.13.1 Weather Hazards: The Contractor shall satisfy himself/herself as to the hazards likely to arise from weather conditions. Complete weather records and reports may be obtained from any U.S. Weather Bureau Office.

1.13.2 High Winds: When warnings of winds of gale force or stronger are issued, the Contractor shall take every practicable precaution to minimize damage to persons, work, and adjacent property. These precautions may include removing all stored materials, tools, and/or equipment from exposed locations and removing or securing any temporary structures.

1.13.3 Time Extension Due to Weather: Only unusually severe weather will be considered by the Contracting Officer in determining if the time for completing the work is excusable as a result of weather and the performance period should be extended.

1.14 FACILITIES DAMAGES

1.14.1 Responsibility: Contractor shall be responsible for any and all damages to existing buildings, facilities, structures, pavements, curbs, walks, utilities etc. incurred by his work forces or equipment. Damaged areas shall be patched, repaired or replaced, and restored to original conditions by the Contractor to the satisfaction of the Contracting Officer.

1.14.2 Damage to Utilities:

1.14.2.1 Notification Requirements**:** In the event of any contractor-caused utility failure and/or disruption, the contractor shall first make the area safe, then immediately contact the Contracting Officer and Civil Engineering Base Service Call Desk (652-2652 or 652-7785).

1.14.2.2 Liability to Repair**:** If the damaged utilities were previously known or shown to the Contractor, or there is negligence on his part, the utilities shall be repaired by the Contractor in a timely manner at no cost to the government.

1.15 LAYING OUT WORK

1.15.1 Layout: The Contractor shall verify dimensions and elevations indicated in layout of work. Discrepancies between drawings, specifications and existing conditions shall be referred to the Contracting Officer in writing before work affected is performed. Failure to make such notification shall place responsibility upon the Contractor to carry out work in satisfactory, workmanlike manner at no additional cost to the Government. Any duplication of work made necessary by failure or neglect on the Contractor's part to comply with this function shall be done at his sole expense.

1.15.2 Field Dimensions: Any drawings that may accompany these specifications indicate generally the design and arrangement of all apparatus, fixtures, accessories, etc., necessary to complete the work required. The exact location or arrangement of equipment is subject to minor changes necessitated by field conditions and shall be made as required without additional cost to the Government. Measurements shall be verified by actual observations at the construction site, and the

Contractor shall be responsible for all work fitting into place in a satisfactory and workmanlike manner meeting the approval of the Contracting Officer.

1.16 EXCAVATION:

1.16.1 Marking Excavation Area(s): Prior to beginning any excavation, the contractor shall stake and/or mark with white paint areas scheduled for excavation.

1.16.2 Digging Permit: No excavation work may begin until the Contractor has applied for and obtained an Air Force Form 103, *Base Civil Engineering Work Clearance Request*, commonly called a "***Digging Permit***." The Contractor shall apply for the Digging Permit on Nellis at Bldg 843, Civil Engineer Customer Service, and on Creech at Bldg 231, Civil Engineering. Permit application shall be submitted a minimum of two (2) weeks prior to any excavation or digging as the Air Force portion of the permit typically takes 10-14 working days to complete. This permit is only effective for ninety (90) days and must be renewed by the contractor for each subsequent ninety-day period required. A seven (7) day advance notice of such renewal is required. If the area to be disturbed is greater than ¼ acre (10,890 square feet) or is for trenching of more than one hundred (100) linear feet, submit a copy of an approved dust control permit with the Form 103 if in Clark County. Outside of Clark County, submit a copy of an approved dust control permit for disturbances greater than five (5) acres. If the total area disturbed is greater than one (1) acre (43,560 square feet), submit a copy of the notice of intent (Contractor-provided to the Nevada Division of Environmental Protection) with the Form 103. "Area disturbed" is defined as the total area of excavation plus material laydown area, plus maneuver area. Maneuver area includes vehicular and pedestrian traffic areas.

1.16.3 Liability: Locations of existing underground lines are based on the best available sources. The Contractor shall exercise extreme care in locating and identifying these lines before excavating in adjacent areas. The utilities shown on the digging permit or marked on the ground at the construction site are considered to be within ten feet (10') (horizontal) of the location shown. Any utility which is damaged and is not shown or is not within the ten-foot (10') horizontal tolerance will be repaired by the Government or repaired by the Contractor at the Government's expense. Any utility which is damaged and is marked or within the ten-foot horizontal tolerance shall be repaired by the contractor or repaired by the Government at the Contractor's expense. The Contractor shall not conduct any excavation prior to receipt of a signed and approved digging permit (AF Form 103).

1.16.4 Hydro-Excavation: Due to the criticality of the mission at NAFB, the risk of accidently damaging buried key utility lines in the execution of a construction project has to be mitigated to the greatest extent reasonably possible. Prior to commencing excavation activities, the Contractor shall physically expose key utility lines such as primary power and communications lines that were identified (marked in the field or shown on provided drawings) by the Air Force by using hand digging, hydro excavation, or other similar non-destructive methods. The lines need to be exposed in as many locations as necessary in order to be able to determine the precise location of the utility lines that are in the project area to be excavated. Markings can be unreliable and can be off line by several feet. Contractor shall also use hydro-excavation for all utility excavation activities. When hydro-excavation is not feasible the Contractor may dig by hand. No mechanical excavation shall be used unless approved by the Contracting Officer.

1.17 CLEANUP

1.17.1 Work Site: The Contractor shall maintain the work site free from debris and trash. Contractor is responsible for the removal of debris and trash daily. No trash or debris shall be disposed of on the base or any other Federal Lands, nor shall it be disposed of in violation of any Municipal, County, or State Ordinances. Contractor may provide trash bins for debris but the bins must not be filled beyond the height of the bin walls and shall be emptied regularly.

1.17.2 Final Cleanup: Final clean-up and removal of equipment from the site shall be completed by the contract completion date.

APPENDIX H

NELLIS ACCESS SECURITY REQUIREMENTS

Nellis AFB Access Requirements

SECURITY

1. GENERAL

1.1 General. The Contractor shall provide site security (e.g., fencing or guard service) as required. However, as a minimum the Contractor shall maintain the site and all other Contractor controlled areas in such a manner as to minimize the risk of injury or accident to site personnel or others who may be in the area. Work on or near roadways shall be carefully marked with lights and barricades meeting State, local, and Nellis AFB regulations, or where such regulations are not applicable and adequate, to minimize the risk of an accident. Open excavations which pose a danger to site personnel or others shall be fenced to prevent accidental entry. Side slopes of excavations shall be shored or left at a safe angle of repose as defined by EM 385-1-1, Section 25. All equipment, when not in operation, shall be left in a safe manner (e.g., wheels blocked and buckets on the ground). Near residential areas where there may be children, special consideration will be given to site security/safety needs.

1.2 Security at an Installation or Facility. When work is performed at a Federal, State, or local installation or facility, the Contractor shall comply with all security requirements of that installation or facility.

1.2 Contract Work Area. All contractor personnel will be expected to stay within or near the designated contract work area or common area (eating establishments, disposal areas, etc.). Foreign nationals shall be accompanied by a United States citizen when outside the designated contract work area.

2. IDENTIFICATION AND ACCESS

2.1 Identification

The Contractor shall be responsible for furnishing an identification badge/card to each individual working on the site. The identification badge/card shall be furnished prior to the individual working on the site. Each individual shall be required to display his or her identification badge/card. The Contractor shall collect and cancel all identification badges/cards upon the release of any individual or at the completion of work on the site, whichever occurs first. All individuals who are foreign nationals must provide legal documentation for presence and employment the United States.

2.1.1 Access For Contractor Employees

The Contractor shall submit, on an as needed basis, to the Contracting Officer a listing of all individuals requesting access to Nellis Air Force Base (see attached Contractor Mass List) as a result of this project. Upon approval of the list, individuals will be issued an NAFB Badge for identification. The required information for the list will include the following:

Prime or subcontractor name
Individuals Full Name
Country of citizenship
Resident Alien Identification Number
If nationalized, provide naturalization number, port of entry and date

Date of birth
Social Security number
Driver license number and state
Access duration required
Project location and access areas on base

All individuals will be required to have a Nellis issued badge in possession, and picture identification, such as a driver's license, in order to gain access to Nellis Air Force Base. All prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon the release of an individual or at the completion of work on the site, whichever event occurs first.

In addition, all Contractor personnel must sign a Secrecy (Non-disclosure) Agreement and attend a Security and Safety Briefing with the prime contractor's site safety and health officer prior to the commencement of work.

Upon access approval for a foreign national, the Contractor shall designate an employee who is a United States citizen to be responsible for the foreign national.

2.1.2 Long-Term Pass Pick Up

The contractor must submit a Contractor Mass List to the Corps of Engineers for delivery to the Base Pass & ID office. Pass & ID will require three to five working days to process pass requests. The Security Forces Group at Nellis AFB will run the required National Crime and Information Center (NCIC) and provide feedback on which contractor employees are eligible to work on the base and which contractors are not eligible to work on the base. The seven disqualifying factors are:

1. U.S. citizenship, immigration status, or Social Security Account Number cannot be verified.
2. Barred from entry/access to any military installation or facility.
3. Wanted by federal or civil law enforcement authorities, regardless of offense or violation.
4. Conviction of firearms or explosives violation within the past three years.
5. Incarcerated for 12 months or longer within the past three years, regardless of offense or violation.
6. Conviction of espionage, sabotage, treason or terrorism, murder, sexual assault, armed assault/robbery, rape, child molestation, drug possession with intent to sell, or drug distribution.
7. Name appears on any federal agency's "watch list" or "hit list" for criminal behavior or terrorist activity.

Once Pass & ID has completed background investigations on all submitted employees, the employees will need to stop at the Nellis Visitor Center and approved employees will receive a temporary 1 day pass to access the base to retrieve their long-term passes. Contractor and its subcontractors shall pick up long-term passes at Building 20, Room 114 Pass and ID. Base Pass & ID working hours are Monday to Friday from 08:00 to 16:00 hours.

Any worker that does not pass the background check will not be permitted to work on Nellis/Creech AFB.

2.1.3 Short-Term Passes

The *Nellis Visitor's Center* may issues short-term passes for durations of up to three days in the event that a worker needs access to the base and has not yet acquired a long-term pass. *The Corps of Engineers Construction Representative may sponsor the worker in need of a pass. The prime contractor contact must arraign with the Corps of Engineers representative a time to meet at the Nellis Visitor Center to obtain base access.*

2.1.4 Entry Control

Nellis and Creech Air Force Base (AFB) are closed bases. Entry to the installation requires the permission of the Installation Commander. Vehicles entering the installation are subject to search. The main gate and contractor gates are manned by armed contract guards. It is a violation of federal statute to enter the installation at any point other than these designated locations without authorization. The following are the hours for installation gates, but are subject to change without notice.

1. Creech Air Force Base Main Gate: 24 hours, 7 days a week.
2. Nellis Air Force Base Main Gate: 24 hours, 7 days a week.
3. Nellis Air Force Base Tyndall Gate: 0500-2100, 7 days a week.

4. Nellis Air Force Base Area II Gate: 0600-1730 Saturday through Thursday and 0600-2030 Friday.
5. Nellis Air Force Base Visitor Control Center, 24 hours, 7 days a week.

2.1.5 Deliveries

Tractor-trailer delivery vehicles requesting entry onto Nellis will be directed to Area II gate, an NCIC check will be conducted on the occupants and the vehicle will be authorized entry. Computer generated delivery tickets *that include the contract title; Superintendant's Name and telephone number* are required.

3. PROPERTY REMOVAL

3.1 Property Removal Authorization

All property that is being removed from the NAFB shall be accompanied by a property removal pass. Property that is not accompanied by the appropriate removal authorization will be confiscated and held, pending an investigation of the incident.

3.2 Property Removal Procedures

All Contractor property and equipment must be clearly marked. An inventory shall be submitted of property and equipment that the Contractor will bring on NAFB. The inventory shall include make, model and serial number of high value equipment (i.e., power tools). Hand tools shall be included on the inventory, listed as "tool box with assorted carpentry tools." The inventory will be used to issue Property Removal Passes.

4. SEARCH, INSPECTION, AND SEIZURE

All vehicles, personnel, and hand-carried items, entering or exiting any control point, or while on the NAFB, are subject to search and inspection and seizure of any prohibited item, at any time. Random, unannounced and regular searches and inspections will be conducted. These searches and inspections are intended to assure the prohibited articles are not introduced into, and Government property is not removed, from the NAFB or its facilities.

5. VEHICLES

Contractor Vehicle Authorization: Contractor vehicles may be permitted on NAFB, provided the driver has been authorized by the appropriate authority to drive on NAFB and that the vehicle is currently registered, licensed, insured and used by personnel who have been authorized NAFB access. All contractor personnel must adhere to the proper signage in and around NAFB.

5.1 Rental Vehicles

Rental Vehicles are permitted, provided a current rental agreement is produced and that the rental vehicle is currently registered, licensed and used by personnel who have been authorized NAFB access to conduct official business.

5.2 Prohibited Travel

Travel by personnel in any area that is outside of their regular assigned duty area is prohibited. Should special assignments require personnel to travel off roads, or into areas where they would not normally be expected to work, prior written permission must be obtained from the Security Administrator and the affected NAFB user.

5.3 Sightseeing

Sightseeing is strictly prohibited. Personnel who violate this requirement are subject to disciplinary action, withdrawal of access authorization, or arrest and prosecution.

5.4 Military Customs and Courtesies

All persons located outside and all vehicles must stand at attention and/or stop vehicle movement during the playing of Reveille at 06:30 hours and at Retreat at 16:30 hours.

6. SENSITIVE EQUIPMENT

Certain equipment is considered sensitive and, without written authorization, this equipment is prohibited from use on NAFB. Sensitive equipment shall not be brought onto NAFB without specific written authorization from the appropriate Installation Commander. Personnel who are found to be in possession of sensitive equipment without the appropriate authorization, will be challenged and the item confiscated pending an investigation. Personnel in possession of sensitive equipment without authorization, or suspected of improper use of sensitive equipment, are subject to withdrawal of access authorization, or arrest and prosecution.

6.1 The following is a list of sensitive equipment:

a. Recording or copying devices of any type.

b. Electronic equipment that is equipped with a data exchange port which could be used to connect Automated Information System (AIS) equipment (excludes items such as pocket calculators, wrist watches or data diaries, not equipped with a data exchange port).

c. Computers and associated hardware.

d. Cameras and photograph equipment.

d. Binoculars and optical magnifying equipment.

e. Night Vision Devices.

6.2 Request for Authorization

Sensitive equipment may be authorized for official use on NAFB by the NAFB Security Office. To obtain sensitive equipment passes, the Contractor will submit a letter that identifies the personnel who will operate the equipment. Requests for sensitive equipment passes shall contain the following:

a. Name of the responsible person and Social Security Number.

b. Period of use of the sensitive item.

c. Area of use.

d. General purposes of use.

e. Method of identification.

f. Identification of item(s) by description, specific serial number and Government control number.

g. Copy of any licensing (e.g., FCC).

h. Use of sensitive equipment will be subject to current Government restrictions.

7. PROHIBITED ITEMS

Certain items are prohibited on NAFB. Personnel who are found to be in possession of prohibited items will be challenged and the item confiscated pending an investigation. Personnel in possession of prohibited items are subject to disciplinary action, withdrawal of access authorization, or arrest and prosecution. The following non-Government owned items are prohibited on NAFB, unless an exception is noted:

a. Alcohol.

b. Controlled substances including illegal drugs and associated paraphernalia, except for prescription medicine.

c. Firearms, ammunition and other dangerous or deadly weapons.

d. Explosives, incendiary, and explosives or deadly weapons.

e. Weapons: Mace, stun guns, clubs.

f. Two-way radios and CB Radios (Except two-way or CB radios which are permanently installed in a commercial vehicle who’s frequency has been approved by the installation commander). Use of cellular devices is prohibited while driving a vehicle on NAFB.

g. Recording or copying devices of any type.

h. Electronic equipment which is equipped with a data exchange port which could be used to connect Automated Information System (AIS) equipment. (Excludes items such as pocket computers, wrist watches or data diaries, that are not equipped with a data exchange port.)

i. Computers and associated media.

j. Binoculars, optical magnifying equipment.

k. Night Vision Devices.

l. Recreational vehicles.

m. Pets, wild or domestic.

n. Children under 18 years of age.

o. Other items prohibited by law.

-- End of Section --

APPENDIX I

NELLIS & CREECH AFBs INSTALLATION FACILITY STANDARDS (IFS)

with Appendices

Electrical Requirements

Lighting Requirements

Fire Protection Requirements

Mechanical/Plumbing Requirements

Utility Meter Requirements

Communications Requirements

NELLIS & CREECH AIR FORCE BASES INSTALLATION FACILITIES STANDARDS (IFS)

Installation Elements

Site Development

Facilities Exteriors

Facilities Interiors

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AIR FORCE INSTALLATION FACILITIES STANDARDS

2018

Nellis & Creech Air Force Bases IFS

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A. OVERVIEW

Comply with Air Force Corporate Standards for Overview:
http://afcfs.wbdg.org/index.html

This Installation Facilities Standards (IFS) document is part of the Air Force Corporate Facilities Standards (AFCFS) program to assist bases in implementing and maintaining facilities standards as appropriate for efficient operations within the respective climate region. IFS fully replaces, consolidates and simplifies existing facilities standards documents, such as the Architectural Compatibility Plan (ACP) or ACGs, FEPs, etc., and organizes information using the same structure, or Table of Contents, as the AFCFS website.

IFS reflects the AFCFS' concepts of "Facility Hierarchy" (categorizing facilities into group numbers) and "Facility Quality" (assigning an appropriate level of quality to each group number) and applies these principles at the base level. Applicable DoD and Air Force criteria such as UFCs, AFIs, Memoranda, and UFGSs (Guide Specs) are referenced and linked within IFS to ensure the document is always current.

Navigating within this IFS is efficient and straightforward. Please use the interactive Table of Contents to locate subject matter, and click on the title of a section to access it. From any page, click on the "Back to Table of Contents" footer to return. Content is organized into 4 major sections: Installation Elements, Site Development, Facilities Exteriors and Facilities Interiors.

This IFS document begins as a fill-in PDF form, which is fully editable, and becomes a "living document" that can be regularly updated by base-level personnel following a format that is consistent across the Air Force. While the format is standardized, IFS content is customized for base operations and the local climate to ensure mission success while emphasizing reduced maintenance and reduced initial costs, life-cycle costs, energy use, and water use.

1. Conformance to Air Force Corporate Facilities Standards (AFCFS) and Installation Facilities Standards (IFS) are required by Air Force Instruction (AFI) 32-1023 and Air Force Memorandum. Please refer to the AFCFS website for links to documentation on current policy.

2. Requests to deviate from any installation facilities standards, that are Unified Facilities Criteria (UFC) requirements, will follow the process outlined in the AFCFS for UFC waivers and exemptions.

3. The IFS is a component plan of the Installation Development Plan (IDP) per Air Force Instruction (AFI) 32-7062 (replacing the Architectural Compatibility Plan). All military construction projects and Non-Appropriated Funds (NAF) facilities are required to comply with the IDP and its IFS component plan by AFI 32-1023. The Base Civil Engineer (BCE) maintains and implements the IDP and its component plans, to include the IFS.

4. Please refer to the AFCFS website as a portal to reference materials and requirements documents for design and construction projects (via links). Specific references to current DoD memoranda and Air Force criteria are updated periodically to provide the most current guidance and requirements. Programming, design and contract documents should list "current edition" for all reference and requirements documents. The documents in force at the date of execution of the design and/or construction contract shall be the governing version.

5. *Advanced Modeling Requirements:*
   For all Air Force projects requiring advanced modeling, to include 3D visualization, Building Information Modeling (BIM), facility data, quantity take-off, geospatial, etc., follow the Army standards. Refer to USACE Minimum Model Matrix (M3) and Project Execution Plan (PxP) which outline required model uses. Refer to CAD BIM Technology Center (Contract Requirements) *for more information on M3 and PxP.*

6. Joint Bases shall implement IFS under their Joint-Base designation with volume numbers for individual installations following the IFS Development Tool template. For example, for Joint Base Langley-Eustis, provide: Vol. 1 Langley AFB and Vol. 2 Fort Eustis.

7. References and Supplementary Documents listed in Appendix G are included in these Installation Facilities Standards by reference and are fully part of this document. Please refer to Appendix G for a listing of documents, which are available via hyperlink for viewing and downloading.

◉ Applicable ◯ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

Nellis AFB and Las Vegas Valley

A01. FACILITY HIERARCHY

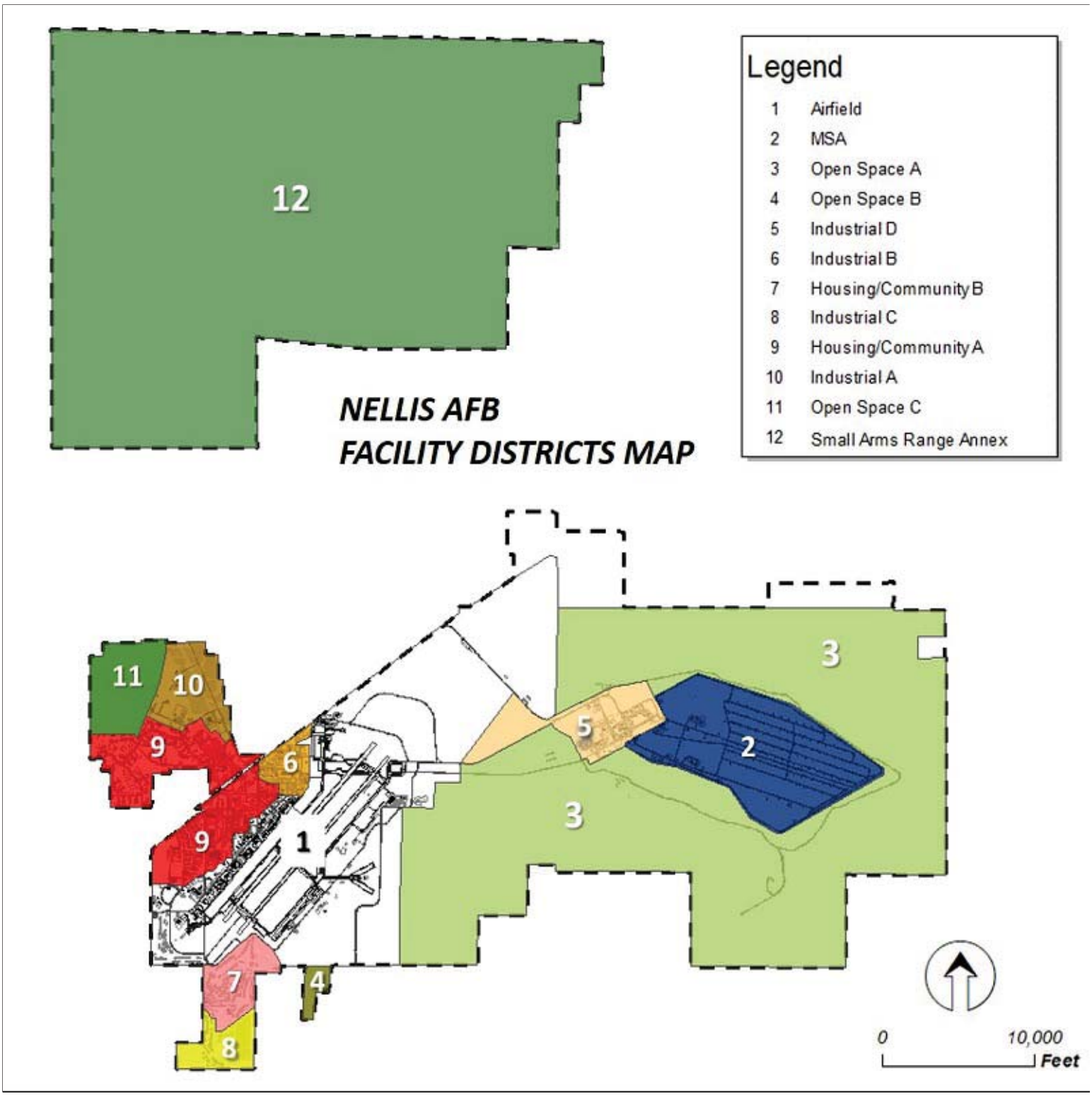
Comply with AF Corporate Standards for Facility Hierarchy (and subsections):
http://afcfs.wbdg.org/facility-hierarchy/index.html

A02. FACILITY QUALITY

Comply with AF Corporate Standards for Facility Quality (and subsections):
http://afcfs.wbdg.org/facility-quality/index.html

A03. FACILITY DISTRICTS

Comply with AF Corporate Standards for Facility Districts (and subsections):
http://afcfs.wbdg.org/facility-districts/index.html



Note: *Apply the base-wide standards in this IFS for Installation Elements, Site Development, Facilities Exteriors and Facilities Interiors (products, materials, color, etc.). Following application of the base-wide standards, refer to the Appendix and apply any additional requirements specifically related to the Facility District.*

B. INSTALLATION ELEMENTS

Comply with Air Force Corporate Standards for Installation Elements:
http://afcfs.wbdg.org/installation-elements/index.html

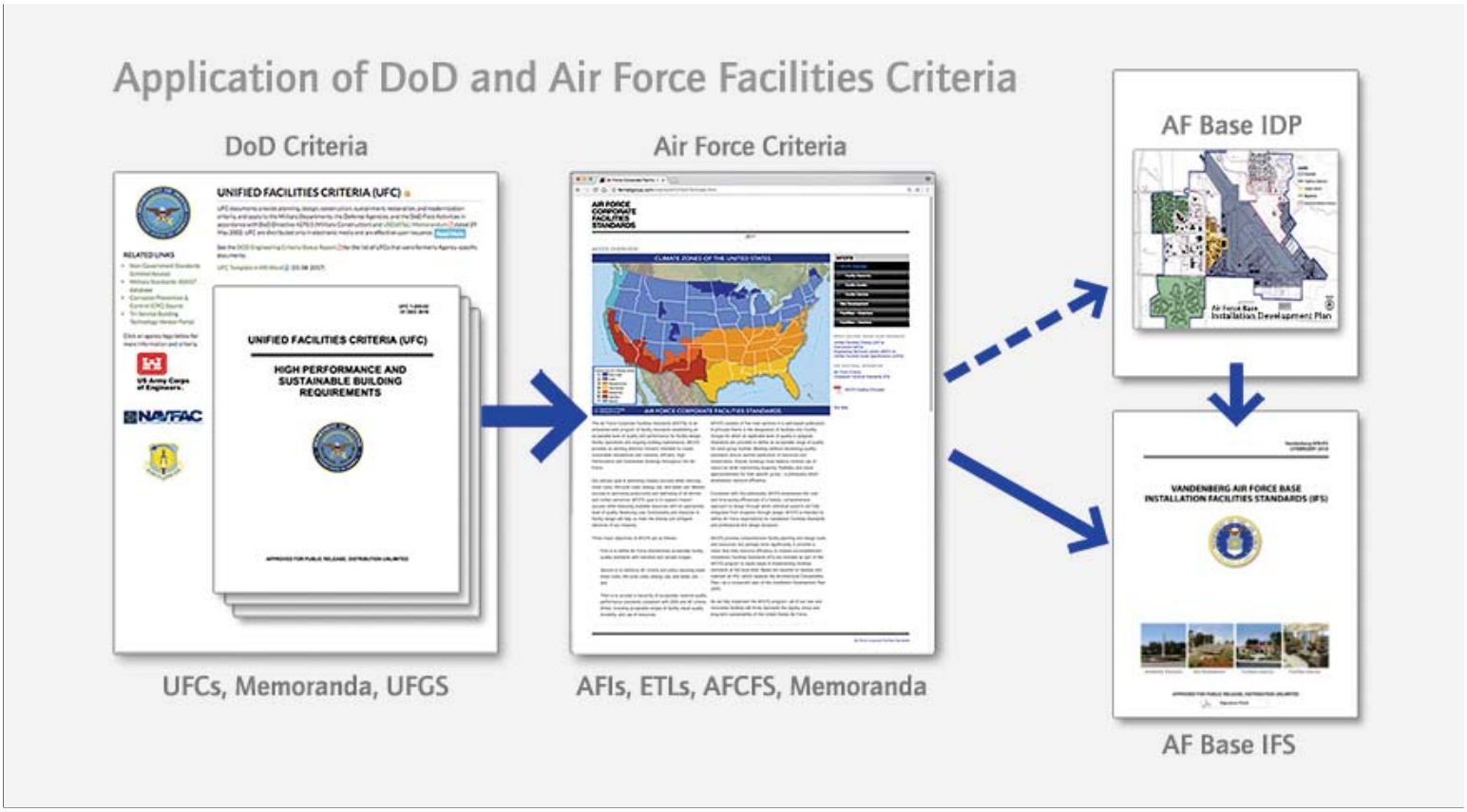
B01. COMPREHENSIVE PLANNING

Comply with Air Force Corporate Standards for Comprehensive Planning:
http://afcfs.wbdg.org/installation-elements/comprehensive-planning/index.html

B01.1. Installation Development Plan (IDP)

◉ Applicable ◯ N/A Large graphics

◯ Applicable ◉ N/A Small graphics



Department of Defense, Department of the Air Force and Air Force Base Criteria

1. The Base Civil Engineer is responsible for developing, maintaining and implementing the installation's Comprehensive Planning documents and to ensure that the Installation Development Plan (IDP) is prepared, maintained, and implemented following AFI 32-7062.

B01.1.1. IFS Component Plan of IDP

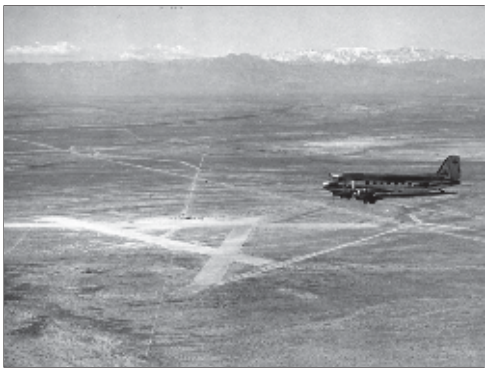
◯ Applicable ◉ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

B01.1.2. Brief History of Base

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics



Las Vegas Army Air Field 1941

Nellis AFB 1956

Nellis AFB and USAF Thunderbirds 1958

In 1929 Las Vegas Airport opened eight miles northeast of downtown Las Vegas. In 1932, the airfield was purchased by Western Air Express, which carried passengers in between Los Angeles and Salt Lake City. The U.S. Army surveyed the field in 1940 for use as the Army Air Forces Flexible Gunnery School due to the good flying weather throughout the year, nearby vacant land for gunnery ranges, and being located away from the Pacific Ocean's coastline. After the survey was completed, the city of Las Vegas purchased the airfield on Jan. 2, 1941 for $10. The U.S. Army leased the airfield three days later. In October 1941, the airfield was dedicated as the Las Vegas Army Air Field. Aircraft assigned to present day Nellis have “WA” tail code which represents Western Air.

Starting in 1942, gunnery training at Las Vegas Army Air Field commenced with student gunners progressing from skeet shooting from atop moving vehicles to mobile sperry ball turrets and stationary top turrets for the B-17 Flying Fortress, and by 1945 for the B-29 Superfortress. The training produced approximately 55,000 B-17 and 3,500 B-25 Mitchell gunners for World War II. From July to August 1942, a training film called "The Rear Gunner" which starred Ronald Reagan and Burgess Meredith, was produced at Las Vegas Army Air Field to generate military flying volunteers.

Operations at the base wound down after World War II came to an end which ultimately put the base in stand-by status in December 1946. The base re-opened in January 1949 for advanced pilot training with the first gunnery meet and the opening of the Aircraft Gunnery School in May 1949. On May 1, 1950, Las Vegas Army Air Field was officially renamed Nellis Air Force Base, after the late 1st Lt. William Nellis, a southern Nevadan who was shot down while flying during the Battle of the Bulge. Many of the Korean War aces trained at Nellis AFB or served as instructors after their combat tours. Later in 1950, Nellis AFB opened its first base chapel and a movie theatre, which provided Airmen an escape from the base's mission during their off-duty time. The airfield was expanded between 1951 -1954 with longer jet-capable runways, reconfigured taxiways, and a larger aircraft parking ramp. In the 1950s World War II era wooden structures were replaced with concrete and steel structures. In 1956, the Air Force's official air demonstration team was assigned to Nellis AFB and is formally known as the U.S. Air Force Air Demonstration Squadron, the Thunderbirds.

Today, Nellis AFB and the U.S. Air Force Warfare Center, having the world's largest and most demanding advanced air combat training mission, help crews learn to be the best combat aviators in the world. Nellis AFB hosts many diverse missions and operations that include Red Flag, Green Flag, the Thunderbirds, and the U.S. Air Force Weapons School. All contribute to the “Home of the Fighter Pilot” mission of "Testing, Training, and Tactics." Nellis provides advanced combat training on every type of aircraft in the Air Force inventory for composite strike forces. Training is commonly conducted in conjunction with air and ground units of the Army, Navy, Marine Corps, and air forces from allied nations. Nellis conducts operational testing and evaluation in addition to supporting combat search and rescue and unmanned aircraft system operations worldwide. Nellis AFB covers more than 14,000 acres and is home to approximately 15,000 military and civilian personnel. The larger “Nellis Air Force Base Complex” military region includes Creech Air Force Base and the 4,700 square mile Nevada Test and Training Range (NTTR).

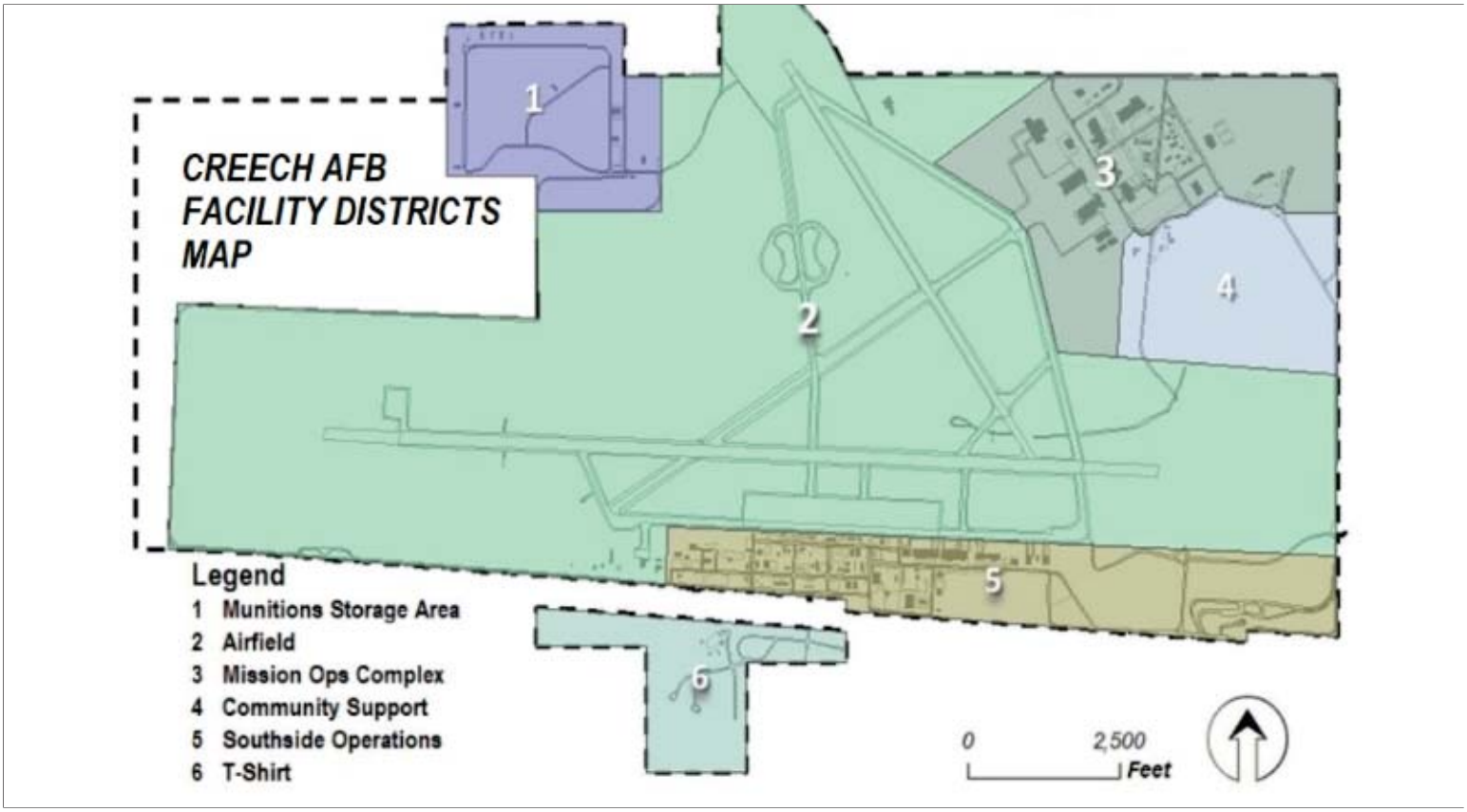
B01.1.3. Future Development

◉ Applicable ◯ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

Nellis AFB, Area I and Area III, 2018

Creech Air Force Base 2018



1. Follow AFI 32-7062 for Air Force Comprehensive Planning, the Comprehensive Planning Process, Comprehensive Planning Requirements, and Geospatial Mapping.

2. Address all future development under the Installation Development Plan (IDP).

B02. STREET ENVELOPE STANDARDS

Comply with Air Force Corporate Standards for Installation Elements:
http://afcfs.wbdg.org/installation-elements/index.html

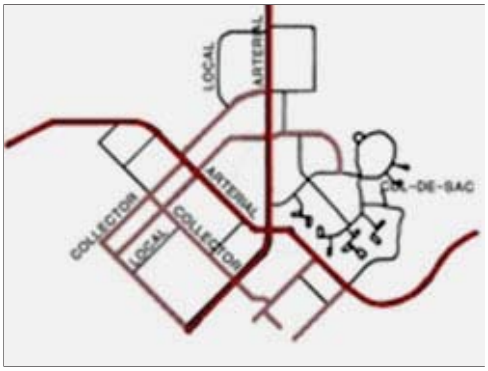
Comply with AF Corporate Standards for Street Envelope Standards:
http://afcfs.wbdg.org/installation-elements/street-envelope-standards/index.html

B02.1. Hierarchy of Streets

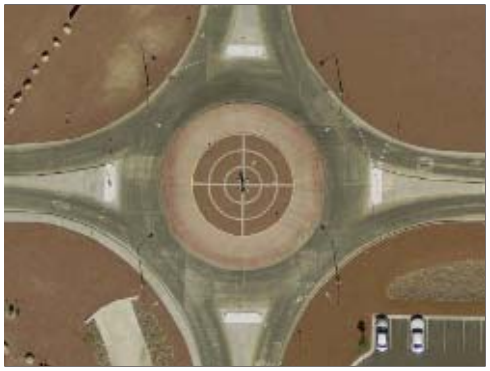
◉ Applicable ◯ N/A Large graphics

◉ Applicable ◯ N/A Small graphics

Nellis AFB, Main Base Area and Flightline



Hierarchy of Streets


Roundabout

Arterial Street

1. Develop and evolve a hierarchical transportation network of arterial, collector and local streets following UFC 3-201-01 and its industry references.

2. Provide consistent functionality throughout the installation and a level of visual quality relating to the adjacent Facility Group number.

3. Routes along facilities in Group 1 may have materials, finishes and features with a higher visual quality than Groups 2, 3 and 4. Reduce maintenance requirements by installing highly durable materials and finishes in routes along Group 3 industrial facilities.

4. Special routes may have a visual quality comparable to those along facilities in Group 1.

5. Create and maintain arterials with two lanes of traffic in each direction with landscaped or paved medians as applicable to the desert climate and adjacent facility group designation / land use.

6. Minimize stops and turns along arterials. Eliminate on-street parking along arterials and collector streets.

7. Connect arterials to local streets with appropriately scaled collector streets.

8. Provide appropriate landscape setbacks and pedestrian buffers along all streets.

9. Minimize and consolidate curb cuts along streets.

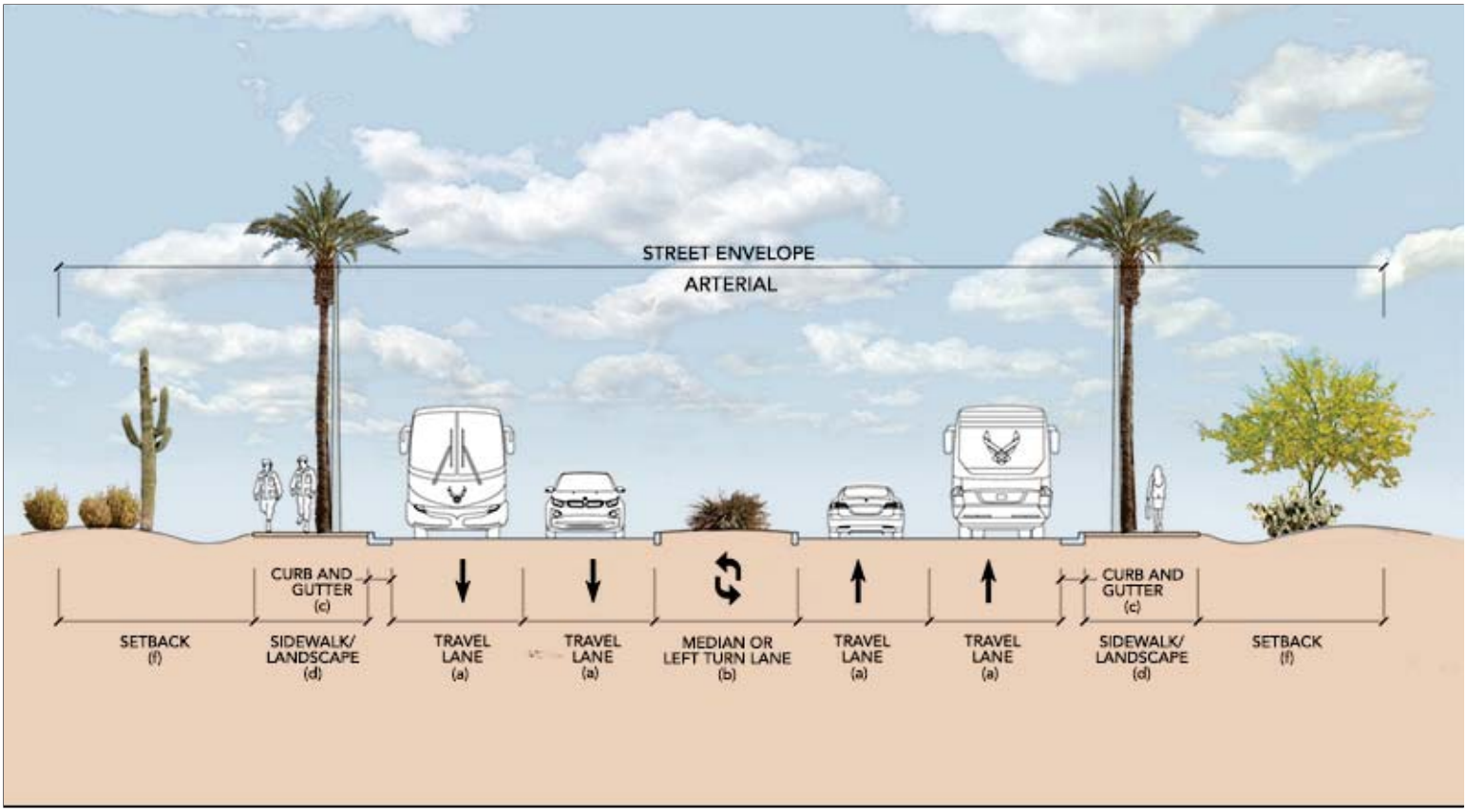
10. Ensure access for emergency and service vehicles.

11. Define bicycle traffic routes in the Installation Development Plan or its applicable component plans.

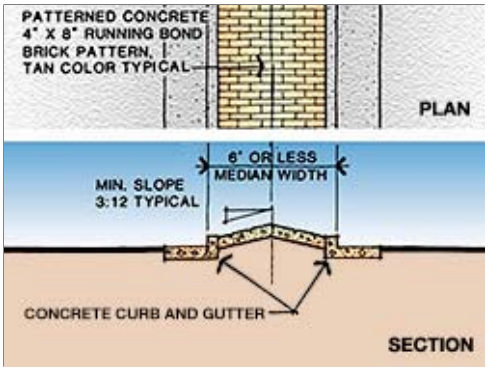
B02.1.1. Arterial Streets

◉ Applicable ◯ N/A Large graphics

◉ Applicable ◯ N/A Small graphics



Travel Lane (a): 12′ Median (b): 12′ Curb and Gutter (c): 2′ Sidewalk / Landscape (d): 12′) Setback (f): Min. 30' or per ATFP



Paved Median

Arterial Street

Roundabout

1. Stops and turns should be minimized and on-street parking shall not be allowed at any point along arterial streets.

2. Provide sidewalks on at least one side of arterial streets and both sides of arterial streets in developed areas. Provide a 6 foot buffer between the road and sidewalk where space allows.

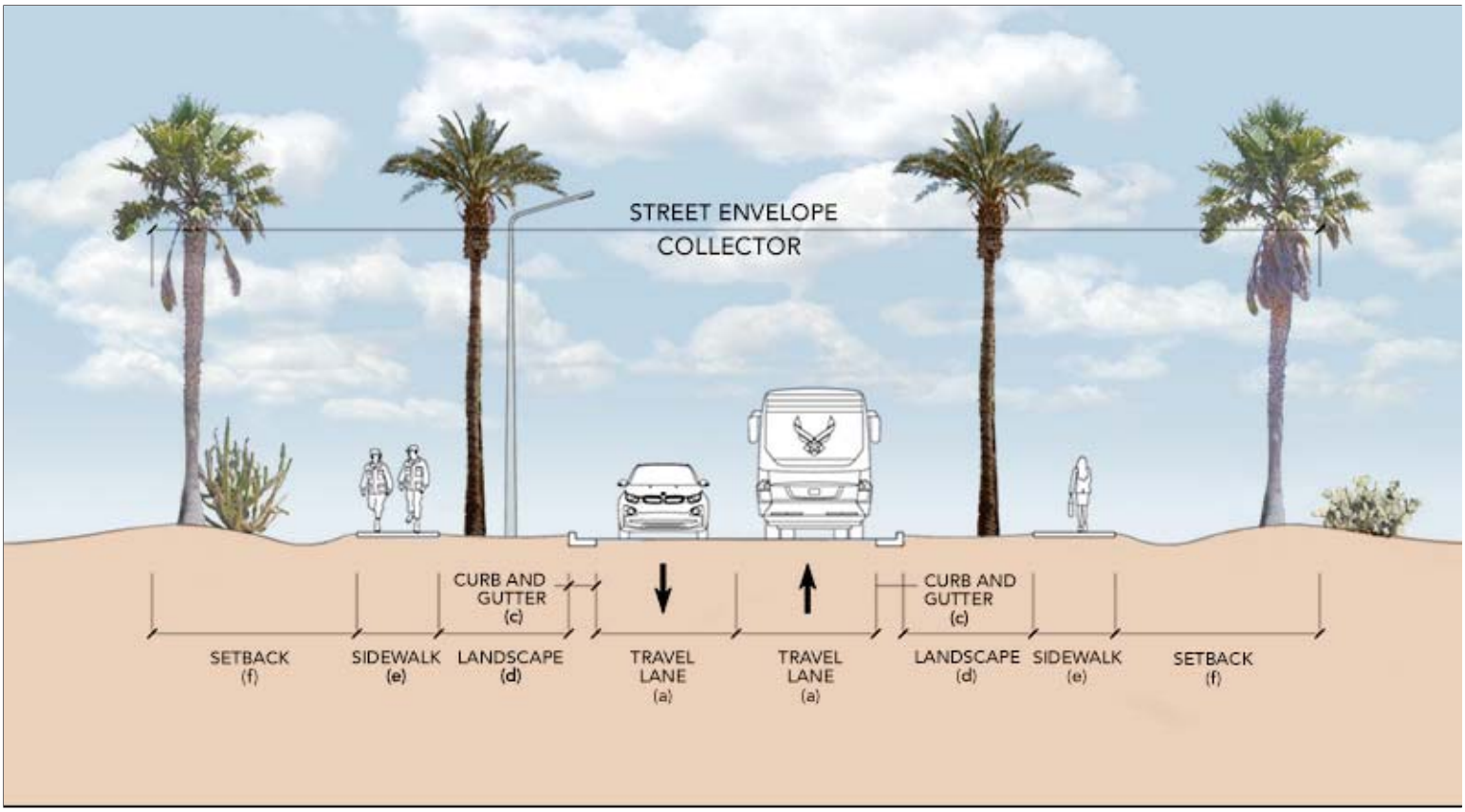
3. Limit curb cuts on arterial streets to entries into major facilities, building groups and major parking areas.

4. Reinforce the importance of arterial streets with appropriate signs, plantings and street lighting.

B02.1.2. Collector Streets

◉ Applicable ◯ N/A Large graphics

◯ Applicable ◉ N/A Small graphics



Travel Lane (a): 12′ Median (b): N/A Curb and Gutter (c): 2′ Landscape (d): 10′ Sidewalk (e): 6′ Setback (f): Min. 30' or per ATFP

1. Frequent traffic stops and low speeds are permitted on collector streets.

2. Provide sidewalks on at least one side of collector streets and both sides of collector streets where functionally required. Buffers are preferred but not required on collector streets.

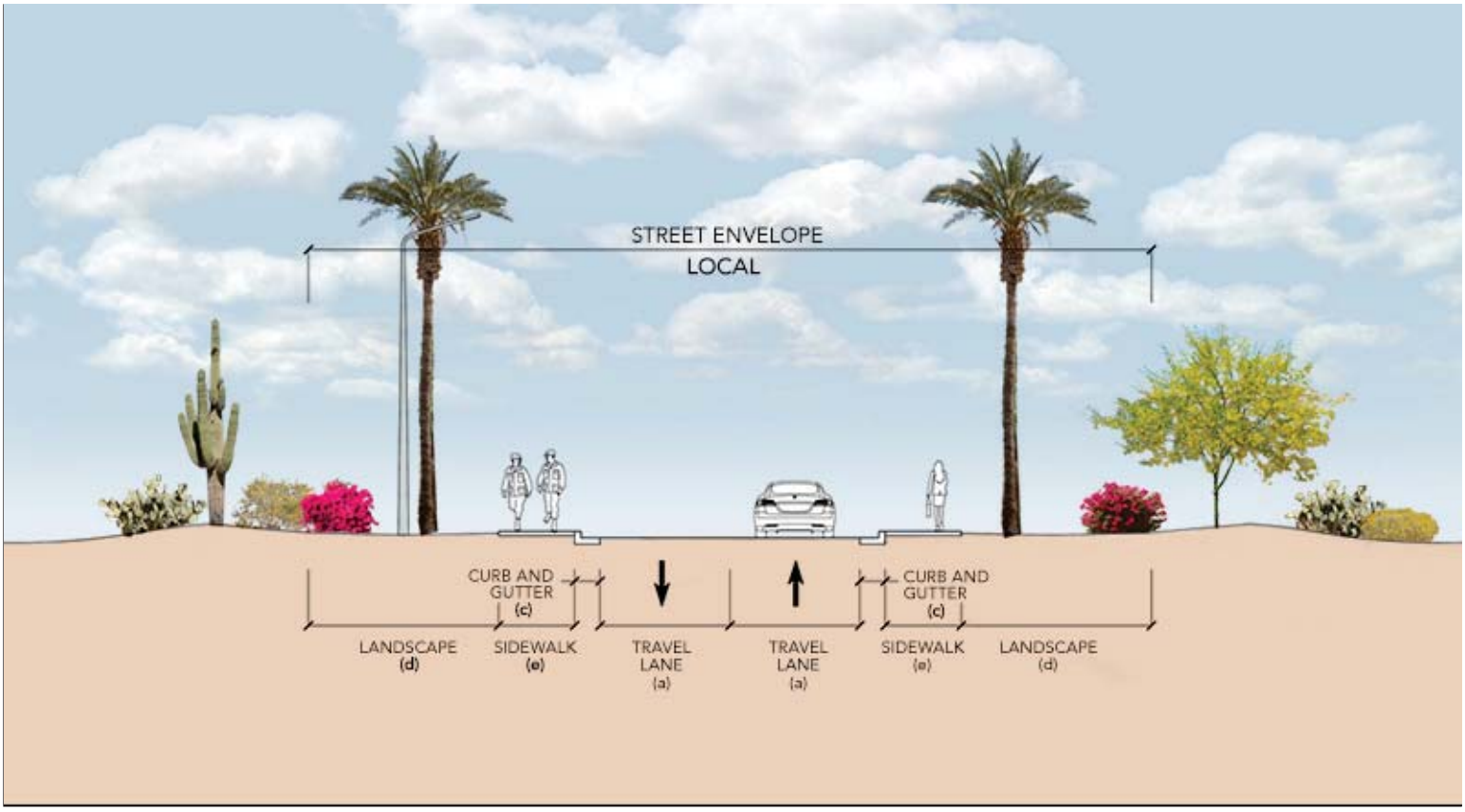
3. On street parking may be allowed on one side where secondary roads are over 28 feet wide but not less than 34 feet wide. Parking shall not interfere with intersections or traffic flow.

4. Signs, plantings and street lighting should reinforce the designation of "collector" street.

B02.1.3. Local Streets

◉ Applicable ◯ N/A Large graphics

◯ Applicable ◉ N/A Small graphics



Travel Lane (a): 11′ Median (b): N/A Curb and Gutter (c): 1.5′ Landscape (d): 15′ Sidewalk (e): 6′

1. Frequent traffic stops and low speeds are permitted on local streets.
2. Provide sidewalks on both sides of local streets where functionally required.
3. On street parking may be allowed following UFC industry references.
4. Signs, plantings and street lighting should reinforce the designation of “local” street.
5. Cul-de-sacs are only permitted in family housing areas.

B02.1.4. Special Routes

◯ Applicable ◉ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

1. Develop all special routes consistently with those adjacent to Group 1 facilities.

B02.2. Hierarchy of Intersections

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide a hierarchy of intersections to include arterial, arterial-collector, collector, collector-local and local following UFC 3-201-01 and its industry references.

2. Passive systems such as roundabouts are preferred to active systems such as signalized intersections. Aggressively pursue passive systems to lower maintenance requirements and reduce energy use.

3. Use a level of visual quality for an intersection equal to the quality found in the related streetscape, which corresponds to the adjacent Facility Group number.

B02.2.1. Arterials

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide an informal grouping of low lying shrubs with trees as a backdrop at all four corners. Accent boulders and rock mulch may be appropriate. Monument walls with signage are appropriate adjacent to Group 1 facilities. Maintain appropriate sight lines at all intersections.

B02.2.2. Arterial/Collector

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide an informal grouping of low lying shrubs with trees as a backdrop where appropriate. Accent boulders and rock mulch may also be appropriate. Maintain appropriate sight lines at all intersections.

B02.2.3. Collectors

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide an informal grouping of low lying shrubs with trees as a backdrop where appropriate. Accent boulders and rock mulch may also be appropriate. Maintain appropriate sight lines at all intersections.

B02.2.4. Special Intersections

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Develop all special intersections consistently with those adjacent to Group 1 facilities.

B02.2.5. Street Frontage Requirements

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Consistently maintain open space buffers following B03.2.3. Preserves.

2. Refer to C06.1.7. Streetscape Landscaping for planting and screen wall requirements along street frontage.

B02.2.6. Sight Lines

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide adequate sight lines for an effective and safe traffic operation per American Association of State Highway and Transportation Officials (AASHTO) standards and Clark County guidelines.

2. Maintain a 45 foot clear zone free of visual barriers over 18 inches in height at uncontrolled intersections. Maintain a 15 foot clear zone free of visual barriers over 18 inches in height at controlled intersections with vehicle speeds of 30 mph or less.

B02.3. Street Elements

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Emulate the streetscape area's pre-development hydrology using passive and active design features to help sustain the adjacent desert or xeriscape landscape. Coordinate with the base Stormwater Management Plan.

2. Employ systems, materials and techniques to maximize streetscape sustainability. Consider pervious paving and high reflectivity of surfaces, appropriate for the desert climate.

3. Install raised-profile curb and gutter to direct stormwater to drainage swales that connect to retention / detention basins. Provide 2 ft. wide curb cut at drainage swale location. Do not paint concrete curbing.

4. Provide all on-site utility service lines and equipment below grade when adjacent to Facility Group 1. In routes along Group 2, 3 and 4, when mounting elements such as utility cabinets, communications equipment and water valves above grade is unavoidable, paint these consistently and provide visual screening following Installation Facilities Standards (IFS).

5. Provide traffic control devices including access control point/entry control facility signs, speed limit signs and street name signs following the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) per UFC 3-120-01.

6. Lane delineation in all streets shall be appropriately sized and colored ceramic traffic buttons and reflectors. Painted lines shall not be installed.

7. Crosswalk markings shall follow the MUTCD for Streets and Highways, current edition. Provide white markings that define the crosswalk. Markings shall be durable and low maintenance.

8. Follow Clark County Public Works and Nevada Dept of Transportation (NDOT) standards for all street elements.

9. Follow UFC 3-120-01 for directional and wayfinding signs and address both vehicular and pedestrian traffic.

10. Reduce energy consumption and reduce maintenance requirements by providing street lighting only when functionally required to ensure safety and to address antiterrorism following UFC 4-010-01. Ensure the quality and quantities of lighting and fixtures are appropriate for the adjacent Facility Group number.

B02.3.1. Paving

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Pavement design shall comply with UFC 3-250-01. Ensure appropriate analysis and design of subgrade conditions to promote low maintenance, high performance pavements. Apply all applicable best practices from Appendix B of the UFC.

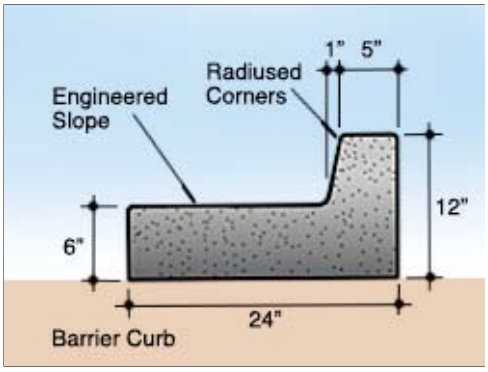
2. Materials shall be specified in accordance with UFC 3-250-01 and must conform to requirements set forth in the Unified Facility Guide Specifications (UFGS) for concrete and bituminous pavement.

3. Underground utility lines: Lateral boring shall be used where possible to eliminate road and parking lot cuts. Trenches cut in asphalt pavement shall be backfilled with slurry cement to prevent settlement. Install spare conduit or sleeve in trench for future needs where possible. Pavement patches shall have a minimum width of 15 ft. plus actual width of trench.

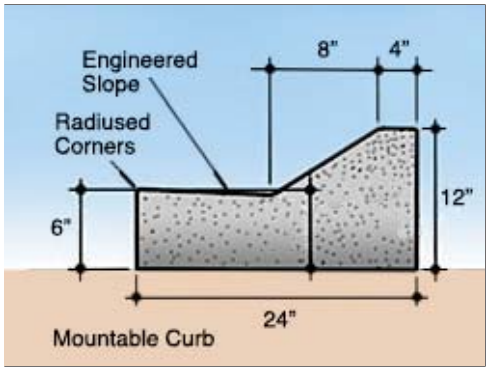
B02.3.2. Curb and Gutter

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics



Barrier Curb



Mountable Curb

Street Curb and Gutter

1. Curb all streets except remote/isolated roads and rock-paved service roads.

2. All streets should have integral concrete curbs and gutters. Painted curbs are prohibited due to required maintenance.

3. Use concrete for sidewalks and curbs. Do no use asphalt curbs.

B02.3.3. Utility Service Elements

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide all utility service lines below grade when streets are adjacent to Facility Group 1.

2. When mounting elements (such as utility cabinets, communications equipment and water valves) above grade is unavoidable, paint these consistently and provide visual screening following Site Development, Landscaping.

3. Overhead service lines along streets adjacent to Facility Groups 2, 3 and 4 are discouraged.

B02.3.4. Traffic Signs

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Refer to Exterior Signs, Colors and Types for Traffic Control Devices, which includes signs.

B02.3.5. Street Lighting

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Refer to the Lighting section for appropriate applications along streets.

B02.3.6. Other

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

B03. OPEN SPACE / PUBLIC SPACE

Comply with Air Force Corporate Standards for Installation Elements:
http://afcfs.wbdg.org/installation-elements/index.html

Comply with AF Corporate Standards for Open Space / Public Space:
http://afcfs.wbdg.org/installation-elements/open-space-public-space/index.html

B03.1. Plazas, Monuments and Static Displays

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Natural features and culturally or historically significant features or events may be recognized and acknowledged with physical elements such as plazas, monuments and static displays. However, limit these elements on the base to ensure judicious use of resources and to reduce ongoing maintenance requirements.

2. Design highly durable plazas, monuments and static displays with a level of quality comparable to Facility Group 1.

3. Link plazas, monuments and static displays to the pedestrian circulation system. Install landscaping, site furnishings and lighting appropriate for the application and desert climate following Installation Facilities Standards (IFS).

4. Select systems, products and materials for paving, walls, and structures following IFS.

B03.1.1. Paved Plazas

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Colored Concrete Paving

Accent Colored Paving

Natural Concrete

1. Mitigate heat island by providing high-albedo, shaded plazas. Pervious pavers shall be used on all plazas and courtyards in Facility Groups 1 and 2; use pervious concrete in Groups 3 and 4. The designer shall incorporate appropriate expansion and construction joints.

2. Pavers shall match the color of pavers used on adjacent sidewalks using base standard range of earth tone colors. Pavers used on plazas shall typically be 4" x 8" size or larger.

B03.1.2. Sculptures, Markers and Statuary

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Ground Mounted Aircraft Display

Bronze Plaque

Ground Mounted Vehicle Display

1. Relate new sculpture, markers and statuary to the base's architectural design theme. Generally limit these elements to frequently used locations adjacent to Facility Group 1 and highly traveled community pedestrian spaces.

2. Consider entry gates as possible sites for new displays.

3. All proposed memorials shall follow AFI 36-3108 and be limited to highly deserving individuals or groups as deemed appropriate by the installation leadership. Living memorials (tree plantings / etc.) are discouraged due to added maintenance requirements.

4. When sculpture requires a base, match the materials and / or color palette of adjacent buildings.

5. Use direct or indirect lighting to accentuate features or enhance an intended effect.

6. Ensure that all sculpture, markers and statuary are honorable and inspiring, provide a sense of place, positively contribute to the base's visual quality, and encourage pride for the community and the US Air Force.

7. All displays shall be sited and approved by BCE office. Unit specific motivational/moral displays are prohibited but may be approved on a case basis by BCE office.

B03.1.3. Static Display of Aircraft

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Dynamic Mounting

Dramatic Cantilever Mount

Post Mounted Displays

Park Setting

Entrance Plaza Setting

Streetscape Setting

1. Follow IFS base-wide standards for all elements of the display area with specific attention to traffic sight lines, pedestrian circulation, site furnishings, signs, and lighting. Address requirements for the Facility District as well.

2. Generally locate concrete base/foundation structures for static displays below grade.

3. At static displays where pedestrian paths are provided, a minimum of one trash receptacle and one bench shall be provided. Receptacle and bench design must conform to IFS requirements.

B03.2. Grounds and Perimeters

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide formal spaces for parade and review functions, recreational areas and parks following the base's Installation Development Plan (IDP) and Installation Facilities Standards (IFS). Refer to the Site Furnishings topic for additional information.

2. Maintain preservation areas following the IDP and IFS.

3. Comply with UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings and UFC 4-022-03 Security Fences and Gates for all elements associated with the base's gates and perimeter fence.

4. Identify and describe base-wide utility corridors in the IDP.

5. Base-wide utility infrastructure shall be inconspicuous. Bury utility service lines below grade when adjacent to Facility Group 1 and when economically feasible for Facility Groups 2, 3 and 4. When service lines are located above grade, create an ordered, coordinated appearance.

6. Follow the requirements of this IFS regarding all utility structures and service lines located above grade that visually impact the installation.

7. Where screening of utility equipment and structures is provided, allow adequate and proper clearance for safety and maintenance.

8. Reduce visual clutter and visual impact of the following items through a combination of careful placement, screen walls, landscaping and painting:
   - Electrical switch-stations
   - Sewage lift stations
   - Water well pumps, storage tanks and/or related structures
   - Gas piping, conduit, meters and similar incidental items
   - Above ground fuel storage tanks
   - Any ground-mounted freestanding utility item exposed to view

9. Larger structures such as electrical switch-stations, sewage lift stations, fuel storage tanks and mechanical/electrical equipment shall be screened from view, using materials, forms, and colors in the screen walls which match those respective design elements present at adjacent buildings.

10. All above-ground equipment and associated components such as electrical conduit, boxes, or exposed plumbing lines shall be painted Sierra Tan color.

11. Maintain currently buried utility service lines as a visual asset.

12. Bury the following exposed above-grade items in future projects when economically feasible:
    - Electrical power grid and service lines
    - Telephone lines
    - Cable TV lines
    - Communications lines
    - Exterior lighting service lines
    - Any similar system of above-ground lines serving the base

13. Consolidate and enclose service utility lines in underground utility corridors when feasible. Create routes along the inside edge of parking lot islands.

B03.2.1. Parade Grounds

◯ Applicable ◉ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

B03.2.2. Parks

◉ Applicable ◯ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

Recreation Field Being Used for Base Community Function

1. Permanent bleachers may be installed only when there is a documented requirement at parks and fields for recreational events. Nonferrous metals that do not require painting or ongoing maintenance are preferred. The Base Civil Engineer (BCE) office shall determine quantities, sizes, and products on a case basis. Pavement shall be provided under bleachers

2. Picnic pavilions and shade structures may be provided in parks and recreation areas where there is a documented need.

B03.2.3. Preserves

◯ Applicable ◉ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

1. Preserve areas adjacent to runways, taxiways, aprons, golf course roughs, storage areas, antenna facilities, and ammunition storage areas, as open space.

2. Minimal ground maintenance should be required to control bird behavior for airfield safety or to eliminate fire, safety or security hazards.

B03.2.4. Perimeter Fence

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Design, install and maintain the base's perimeter fence following UFC 4-022-03.

2. Stringently comply with ATFP requirements following UFC 04-010-01 for all spaces adjacent to the base's perimeter fence and all gates.

3. Fencing, gates and other elements that are associated with the main gates shall be a level of quality equivalent to Facility Group 1.

4. Maintain a positive visual quality along the traffic corridor on both sides of the main gates. Specifically address pedestrian access, circulation and common areas.

C. SITE DEVELOPMENT

Comply with Air Force Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

C01. SITE DESIGN

Comply with Air Force Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Site Design / NEPA:
http://afcfs.wbdg.org/site-development/site-design-nepa/index.html

C01.1. Site Design Considerations

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Nellis and Creech AFBs lie in the northeastern portion of the Mojave Desert. With the Sierra Nevada Range approximately 90 miles to the west and the Wasatch Range 135 miles to the east, the bases lie within the Colorado River drainage area. Separated from the moderating influence of the Pacific Ocean by hundreds of miles and by the lofty Sierra Nevada, the bases are dominated by a continental climate with pronounced winter and summer seasons and low rainfall. The bases are separated by a distance of 43 miles.

2. The climate at Nellis and Creech AFBs is typical of the desert southwest: sunny and arid with an average humidity of 18 to 39 percent and precipitation of approximately 4 inches annually. Most rainfall occurs during January-February and July-August and rainfall can be heavy at times, causing flash flooding. Summers are very hot, with an average high of 104°F in July. Winters are mild with an average high of 57°F and an average low of 37°F in January. Windy conditions are typical throughout the year.

3. Collect documentation to validate approvals and completion of the NEPA process.

4. Ensure site design compliance with the Installation Development Plan (IDP) and its component plans and Installation Facilities Standards (IFS).

5. Promote integrated design with on-site solutions such as engineered small-scale hydrologic controls verses base-wide infrastructure; consider open space, natural features, swales, berms, building roofs, streets, and paved surfaces.

6. Limit the impact of development on land and water resources. All site elements and infrastructure shall reinforce an image of sustainability, with reduced energy demand, renewable-energy usage, and water conservation.

7. Consider energy conservation during site design for the following categories: building and site lighting, auxiliary systems and equipment (refrigerators, elevators, etc.), building envelope, electric power and distribution, HVAC systems and equipment, and energy management (metering, EMCS).

8. Coordinate on-site renewable-energy systems and components to minimize area requirements and maximize efficiencies. Appropriately buffer and screen these and other mechanical systems and equipment.

9. New building projects should preserve open space and protect natural habitat.

10. Conform to existing topography to the greatest extent possible and use slopes to increase site and building efficiencies. Design sites to minimize irrigation and impacts to stormwater runoff.

11. Study new project sites to identify the character of adjacent buildings, streets, landscaping, and site design elements. Reinforce the existing character in new site design.

12. Consider relationships to adjacent facilities and district / centralized heating and cooling infrastructure and cost effectively connect building systems to harvest heat, grey water or other beneficial byproducts.

13. Purposefully integrate service access, receiving and storage areas to eliminate the need for visual screening.

14. Appropriately connect to the base network of streets, sidewalks and trails using drive aisles, parking areas, walkways, paths, and bicycle routes addressing both vehicles and pedestrians.

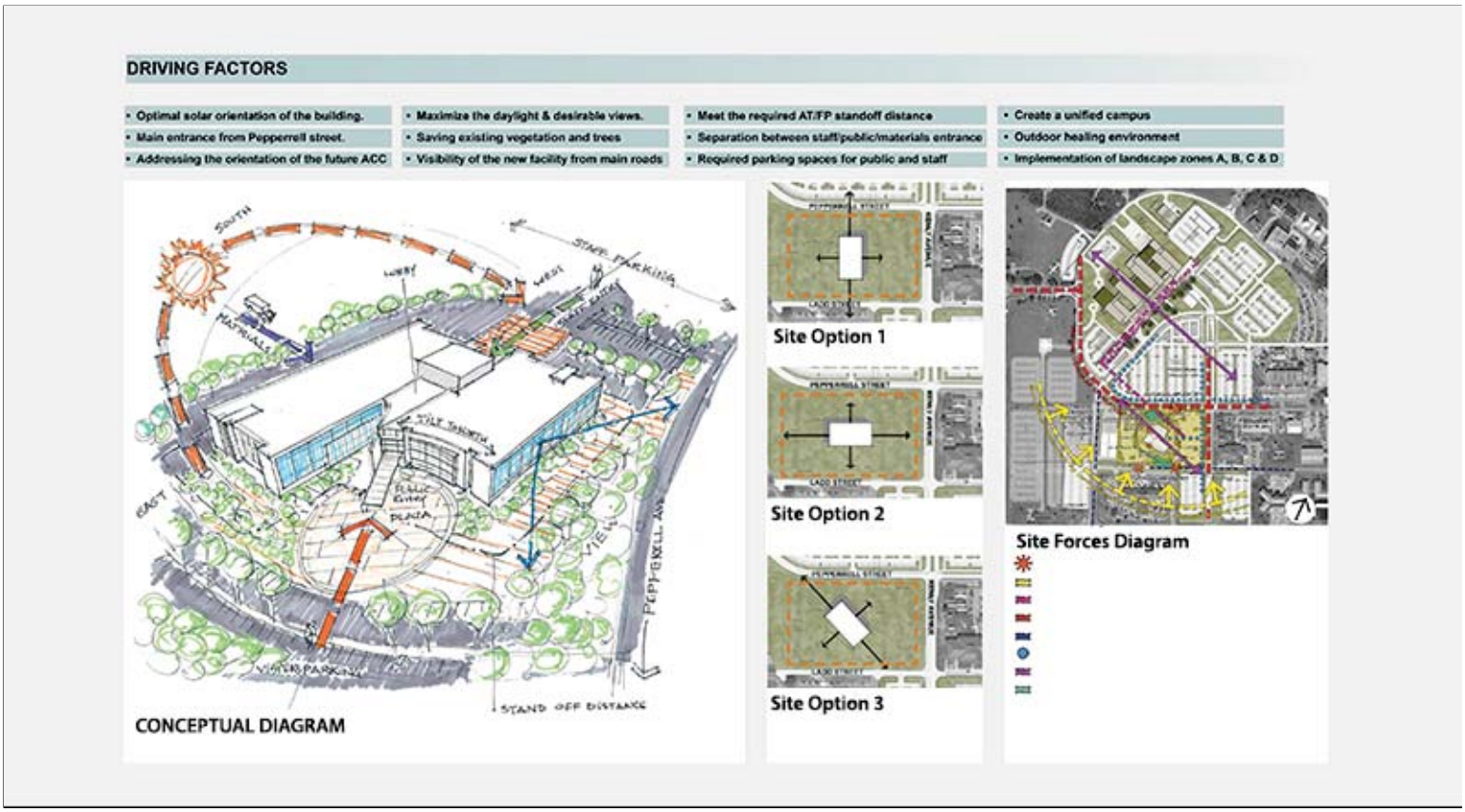
15. Consider heat island mitigation in paving and roof designs when implementing an integrated approach to stormwater management.

16. Consider the location of "Designated Tobacco Areas."

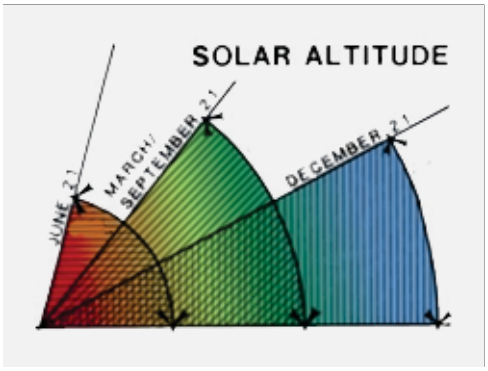
C01.2. Building Orientation

◉ Applicable ◯ N/A Large graphics

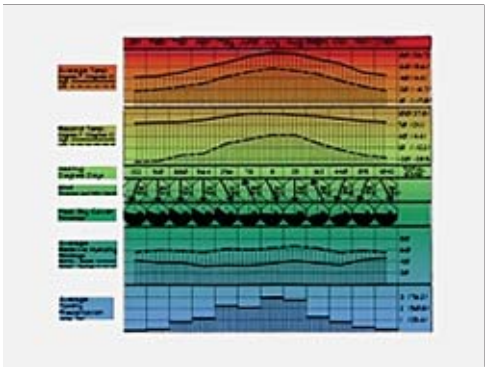
◉ Applicable ◯ N/A Small graphics



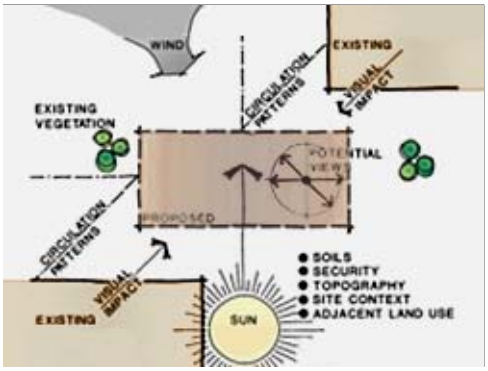
Conceptual Site Analysis and Site Design Diagram



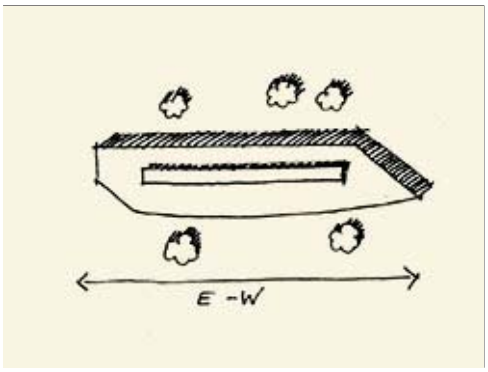
Local Solar Data



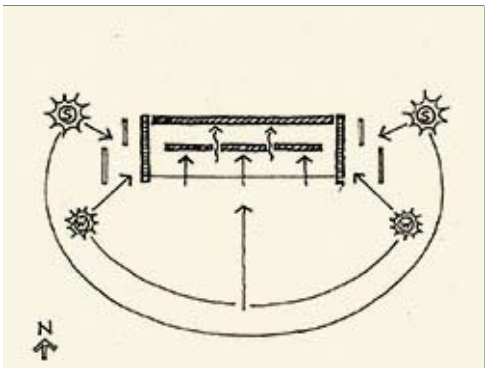
Local Climate Data



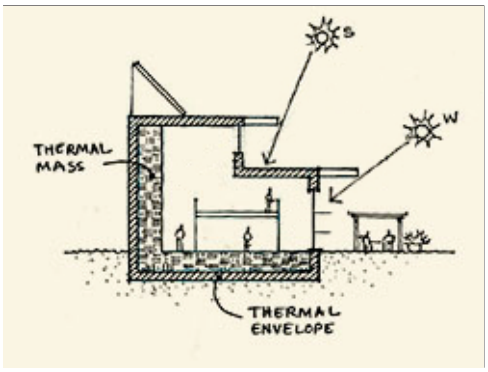
Site Data



East-West Axis



Optimum Solar Control



Maximized Shading

1. Strongly consider optimum requirements for building orientation, which is with the long axis parallel to the east/west direction for rectilinear buildings.

2. Meet Installation Facilities Standards (IFS) requirements for the locations of the building's passive and renewable-energy systems --including geothermal and solar systems --and exterior shading systems.

3. Strongly consider locating the building(s) and permitted ancillary structures to promote solar shading of main entrance and windows, natural ventilation, wind buffering and other beneficial passive systems. Consider natural ventilation during the design of HVAC systems.

4. Consider relationships to adjacent sites and their facilities and infrastructure, and cost effectively integrate building systems to harvest heat, grey water or other beneficial byproducts.

5. Consider the "public side" of the building, its views and the location of the main entrance.

C02. UTILITIES

Comply with AF Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Utilities:
http://afcfs.wbdg.org/site-development/utilities/index.html

C02.1. Utility Components

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Mechanical Yard Enclosure and Access Drive

Mechanical Yard Enclosure and Access Drive

Mechanical Yard Enclosure

1. Provide all on-site utility service lines below grade for Facility Group 1; when mounting elements (such as utility cabinets, communications equipment and water valves) above grade is unavoidable, paint these Sierra Tan color or provide visual screening following Installation Facilities Standards (IFS).

2. Provide installation of utility infrastructure to support near term and future electric vehicle charging stations after a thorough analysis determining viability.

3. Define all service entry points into the building and route distribution below grade into an interior space within the facility; exposed conduits, pipes, cables and boxes on exterior walls are not permitted for Facility Group 1.

4. Comply with Utility Meter Requirements listed in Section G Appendix. Meters shall be connected to the base's Advanced Meter Reading System (AMRS) and support Automated Revenue Management Services (ARMS).

5. Limit exterior mechanical distribution systems such as exterior steam, chilled water, and hot water distribution to Group 3 facilities; when required for Group 1 and 2 facilities integrate with the architecture and provide visual screens following IFS.

6. Direct roof drainage to underground collection when feasible or provide concrete splash blocks / concrete channels to intercept roof drainage at grade.

C03. PARKING AREAS

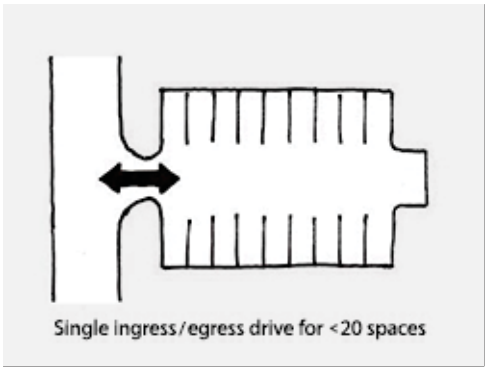
Comply with AF Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Parking Areas:
http://afcfs.wbdg.org/site-development/parking-areas/index.html

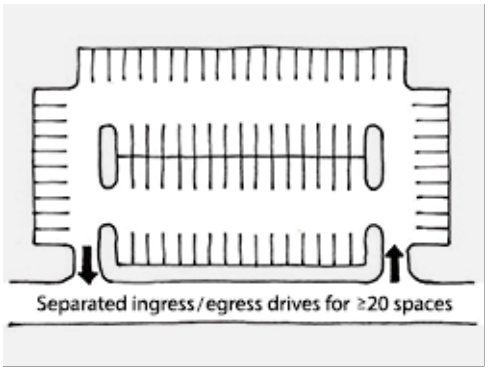
C03.1. Configurations and Design

○ Applicable ◉ N/A Large graphics

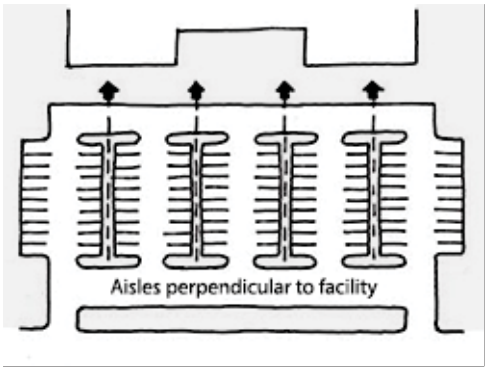
◉ Applicable ○ N/A Small graphics



Small Lot Configuration



Large Lot Configuration



Facility Group 1 Configuration

1. Evaluate adjacent sites and cost-effectively consolidate parking areas to maximize efficient use; ensure that all areas meet accessibility guidelines.

2. Where possible, provide drop-offs at facility main entrance. Consider buffering parking areas from the facility main entrance with a transition space. Comply with IFS standards while meeting ATFP requirements.

3. Integrate at-grade and raised-profile curbing, permeable paved areas, and parking islands with the stormwater system and direct stormwater to swales and basins.

4. Define pedestrian access with approved hardscape and consider providing shading along the primary path from the parking area to the main entrance of the building.

5. Parking lot aisles shall be a minimum of 26 ft wide. Standard parking spaces shall be a minimum of 9 ft wide by 18 ft deep.

6. Coordinate suitable landscape or barriers integrated with walls and fences to ensure adequate force protection.

7. Accessible parking spaces shall be marked according to UFC 3-120-01 and its references in ABAAS and the MUTCD.

8. Consider locations and requirements of near term and future electric vehicle charging stations.

9. Designate preferred parking spaces for electric vehicles and carpools near the main entrance.

10. Consider cost-effectively integrating solar photovoltaic arrays into covered parking structures.

11. Limit reserved parking spaces and comply with AFI31-204.

12. On-street parking is discouraged except in multi-use areas. When used, provide approved on-street parking configurations following UFC 3-201-01.

13. Access and service drives should accommodate the largest vehicle serving the facility.

C03.1.1. Paving and Striping

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

GOV Access Drive

Flightline Equipment Parking

POV Parking

Facility Group 1 paving materials shall be as follows.

Primary:	Asphaltic concrete
Secondary:	Concrete
Accent:	Permeable pavers

Facility Group 2 paving materials shall be as follows.

Primary:	Asphaltic Concrete
Secondary:	N/A
Accent:	N/A

Facility Group 3 paving materials shall be as follows.

Primary:	Concrete where operationally required
Secondary:	Asphaltic Concrete
Accent:	N/A

Facility Group 4 paving materials shall be as follows.

Primary:	Asphaltic Concrete
Secondary:	N/A
Accent:	N/A

1. All new parking lots in Groups 1 and 2 shall be constructed of asphaltic concrete or concrete and meet requirements of UFC 3-250-01.

2. Porous paving may be considered on a case basis.

3. Cost-effectively provide light-colored concrete to reduce heat island effect; otherwise install asphaltic concrete paving. Native dirt or gravel lots are generally not allowed.

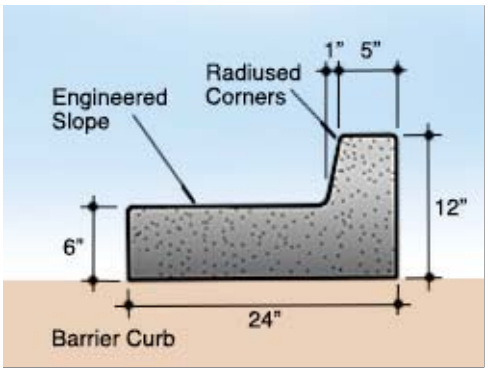
4. Use consistent striping, angles and stall sizes in all parking areas.

5. All parking shall be marked with white stripes of paint or applied vinyl coatings. Red or yellow markings shall only be used for safety purposes and must be kept to a minimum. All lines shall be four inches (4") wide.

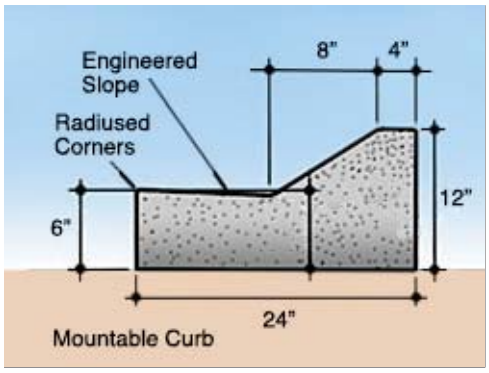
C03.1.2. Curbing

○ Applicable ◉ N/A Large graphics

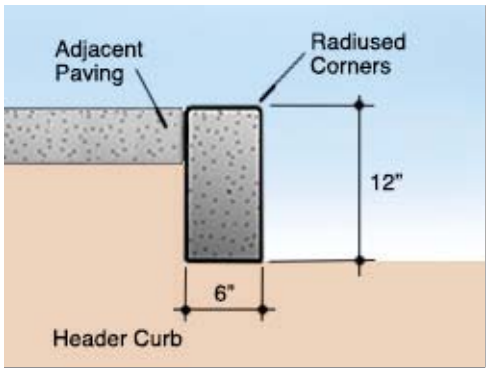
◉ Applicable ○ N/A Small graphics



"Barrier" Curb



"Mountable" Curb



Header Curb

Facility Group 1 curbing / edging materials shall be as follows.

Primary: Concrete

Secondary: N/A

Accent: N/A

Facility Group 2 curbing / edging materials shall be as follows.

Primary: Concrete

Secondary: N/A

Accent: N/A

Facility Group 3 curbing / edging materials shall be as follows.

Primary: Concrete

Secondary: N/A

Accent: N/A

Facility Group 4 curbing / edging materials shall be as follows.

Primary: Concrete

Secondary: N/A

Accent: N/A

1. Define all parking lots with either raised profile or at-grade curbing to promote drainage and protect paving edges.

2. Install curbs and gutters to direct stormwater to drainage swales that connect to retention / detention basins. Provide 2 ft. wide curb cut at drainage swale location. Consider providing 2 ft. wide concrete gutter from curb cut to basin. Do not paint concrete curbing.

3. Wheel stops are not permitted except at sidewalks and locations where car bumpers could contact adjacent items such as poles or signs.

4. Building and mechanical room access drives used by GOVs should typically have retractable bollards at access point and have continuous at-grade (0 inch) concrete curbing along drive.

C03.1.3. Internal Islands and Medians

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Install landscape islands and medians as visual breaks, to reduce heat island effects and to accommodate stormwater. Consider shade trees to shade parking spaces. Coordinate suitable landscape or barriers integrated with walls and fences to ensure adequate force protection.

2. When lighting is necessary, contain fixture bases within medians or internal landscape islands.

C03.2. Parking Structures

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Parking structures should only be considered in land-constrained locations and when economically feasible. Parking structures should not be considered when adequate surface parking can be provided within a reasonable walking distance from facility.

2. Consider near term and future electric vehicle charging stations and renewable energy generation development during the analysis and design.

3. Consider opportunities for integrating parking structures into multi-use developments with pedestrian-oriented uses located on the ground floor and parking on upper levels; ensure ATFP guidelines are fully addressed.

C03.3. Connectivity

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Refer to the Installation Development Plan (IDP) for locations of transit stops and pedestrian and cycling networks; provide appropriately sized sidewalks and bike paths to connect facilities and users to these networks.

2. Provide amenities such as rain and shade shelters, trees, and benches to encourage and facilitate use of public transportation.

3. Evaluate the IDP for the current and planned network of roads and optimally develop vehicular access to and from the site.

C04. STORMWATER MANAGEMENT

Comply with AF Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Stormwater Management:
http://afcfs.wbdg.org/site-development/stormwater-management/index.html

C04.1. Stormwater Requirements

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Curb Cut and Swale

Curb Outlet and Swale

Curb Cut and Swale

Curb Cut and Swale

Retention Basin

Curb Outlet and Swale

1. Design all stormwater systems including retention basins, detention basins, channels, swales, etc. as on-site amenities that are consistent with natural systems and drainage patterns. Systems can provide aesthetic appeal when combined with landscape plan.

2. Comply with Clark County Regional Flood Control District requirements (www.ccrfcd.org). Coordinate system with base Stormwater Management Plan.

3. Incorporate drainage swales into the design of all roadway, parking and facility roof systems to enhance water quality and support the overall stormwater system.

4. Stormwater systems shall be designed to limit the accumulation of sediment and debris in the rock mulch ground cover as having sediment results in an abundance of weeds in the rock mulch.

5. Permeable paving may be used in areas that are not subjected to severe freeze-thaw cycles.

6. When underground drainage systems are required, establish a maintenance program to include removal of sediments and debris; inspect joints seasonally for alignment to prevent leakage and the development of voids and surface failures.

7. Cost-effectively integrate stormwater systems with ATFP measures.

C05. SIDEWALKS, BIKEWAYS AND TRAILS

Comply with AF Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Sidewalks, Bikeways and Trails:
http://afcfs.wbdg.org/site-development/sidewalks-bikeways-trails/index.html

C05.1. Circulation and Paving

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Alignment with Main Entrance

Bollards for Controlled Access

Entrance Plaza

Concrete Paving at Facility

Concrete Paving at Plaza

Concrete Paving at Pavilion

Facility Group 1 sidewalks, plazas, and courtyards paving materials shall be as follows.

Primary:	Pervious Pavers or Concrete Paving
Secondary:	Concrete Paving and Edging
Accent:	Colored Concrete

Facility Group 2 sidewalks, plazas, and courtyards paving materials shall be as follows.

Primary:	Pervious Pavers or Concrete Paving
Secondary:	Concrete Paving and Edging
Accent:	Colored Concrete

Facility Group 3 sidewalks, plazas, and courtyards paving materials shall be as follows.

Primary:	Concrete Paving
Secondary:	N/A
Accent:	N/A

Facility Group 4 sidewalks, plazas, and courtyards paving materials shall be as follows.

Primary:	Concrete Paving
Secondary:	N/A
Accent:	N/A

1. Maintain efficient geometry and accessibility to connect building entrances to adjacent parking areas and activity areas and to the base transportation system following ATFP. Efficiently use materials to optimize life-cycle costs and to minimize maintenance.

2. Generally conform horizontal layouts of sidewalks to the geometric configuration of adjacent buildings, streets, parking lots, and other adjacent related site amenities. Occasional meanders and/or jogs may be included to capture views, to coordinate with landscaping or accommodate site constraints.

3. Walks in parking areas shall provide a direct path using "safe islands" and "peninsulas" to encourage safety. Walks parallel to streets shall follow streetscape guidelines. Clearly mark pedestrian crossings at vehicular routes.

4. Mitigate heat island by providing high-albedo, shaded sidewalks. Consider using pervious pavers for sidewalks, plazas and courtyards in Facility Groups 1 and 2; use concrete in Groups 3 and 4. Design shall incorporate appropriate expansion and construction joints.

5. Use experienced contractors to install pervious pavements.

6. Consider an integrated approach that could include stormwater management (permeable surfaces) and complement the design of the storm drainage system when appropriate.

7. Pedestrian paths should be at least 5' in width to allow for comfortable side-by-side walking.

8. Sidewalks leading to a building main entrance and at the interior of parking lots shall be a minimum width of 6 ft. Walks greater than 10 ft. wide may be used at high-density pedestrian areas where volumes of traffic justify added material.

9. All sidewalks shall have positive drainage to prevent ponding of water. Walks with a slope greater than 4.2% shall be designed as ramps following accessibility guidelines. All walks shall have a minimum cross slope of 2.1%.

10. Pavers shall be natural earth tone colors and pavers used on walks shall be a minimum of 4” x 8”.

11. Connect to the bicycle circulation system and provide bicycle parking with a suitable means for securing bicycles following IFS. Consider changing/shower facilities for use by cyclists.

12. Refer to the Installation Development Plan for future trails, bicycle paths, and sidewalks.

C05.1.1. Ramps and Stairs

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Use ramps instead of stairs for sidewalks, bikeways and trails and at all buildings where possible. Where steps are unavoidable, follow UFC 1-200-01 and its references to the International Building Code.

C05.1.2. Lighting

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide lighting for all stairs and landings where traffic warrants.

2. Refer to the Lighting section for path lighting along sidewalks, bikeways and trails.

C06. LANDSCAPE

Comply with AF Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Landscape:
http://afcfs.wbdg.org/site-development/landscape/index.html

C06.1. Climate-based Materials

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Limited Plantings with Rock Mulch

Xeric Plant Materials

Desert Trees and Shrubs

1. Use Mojave Desert appropriate, drought tolerant, and low water use plant species. Use natural non-decomposing rock mulch and boulders per IFS for ground cover.

2. Follow details and specifications of the American Standard for Nursery Stock, current edition. Also follow recommendations provided by Southern Nevada Water Authority Water Smart Landscape Program.

C06.1.1. Landscape Design Concept

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Limited Turf Area

Desert Palette of Materials

Allee of Trees

1. Follow UFC 3-201-02 Landscape Architecture. All Facility Groups and developed sites shall have rock mulch installed throughout entire site. Use of unimproved exposed native soil around facilities (with no rock mulch ground cover) is prohibited. Concentrate landscape plantings in Facility Groups 1, 2 and 3 and along major thoroughfares and integrate these landscaped areas into the base's stormwater management plan. Refer to the Streetscape Envelope Standards in this IFS.

2. Facility Group 3 sites may have only rock mulch ground cover and boulders, and no trees or shrubs.

3. Over-planting should be avoided for all facility groups and it's more desirable to have trees for shade and visual interest than to have an abundance of shrubs. Multi-sized accent boulders may be provided in place of shrubs on a case basis. All drainage swales and retention / detention basins shall have river rock mulch ground cover.

4. Provide open spaces as transitions between developed and native desert areas that promote quality of life, provide visual relief and allow walkable connections between areas.

5. Use formal landscape planting arrangements only where appropriate. Consider using landscape plantings and walls as windbreaks.

6. Integrate security requirements into the landscape design. Coordinate heights, density, and location of trees and shrubs with ATFP requirements and restrictions stated in UFC 4-010-01.

7. Berms may be used as an integral part of the overall landscape strategy for screening, security and/or visual interest.

C06.1.2. Xeriscape Design Principles

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Red Granite Rock Mulch

Red Granite Rock Mulch and River Rock

Red Granite Rock Mulch and River Rock

1. Apply xeriscape principles following UFC 3-201-02, Appendix B, and Air Force Corporate Facilities Standards.

2. Ground cover shall be rock mulch and boulders as follows:

<u>Rock Mulch</u>:
- Flat areas: ¾ inch granite: Rebel red color, installed 3 inches deep min.
- Sloped areas: 1 ½ inch granite: Rebel red color, installed 3 inches deep min.
- Accent areas, retention basins, and drainage swales: 3 inch to 12 inch river rock: Red, tan, and gray color, installed 4 inches deep min. Rock shall be naturally smooth, stream bed river run stone.

<u>Boulders</u>:
- Decorative rock boulders shall be red, tan, and/or brown color and be installed in a natural looking manner with bottom 1/3 buried. Sandstone shall not be used.
- Variety of sizes shall be installed. "Small" size boulders shall be 2 foot diameter, "Medium" size 3 foot diameter, and "Large" size 4 foot diameter.

C06.1.3. Minimizing Water Requirements

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Boulders, Berms and Rock Mulch

Joshua Tree and Rock Mulch

Artificial Turf Field

1. Reasonably reduce demand on potable water while seeking opportunities to increase alternative water sources for irrigation. Consider using boulders, berms, swales, etc, in place of shrubs to provide visual interest in the landscape. Use low maintenance artificial turf in place of irrigated natural turf.

C06.1.4. Plant Material Selection

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Drought Tolerant Species

Trees for Shading

Trees as Focal Point

Trees Used for Visual Interest

Trees Used for Shading

Specimen Planting

1. Use Mojave Desert appropriate, drought tolerant, low water use, and low maintenance plant species. Landscape plants should provide shade, cooling, and visual interest and also prevent erosion and improve air quality.

2. Base Landscape Plant List is available from the Base Civil Engineer (BCE) office. Plant selection is subject to BCE approval. Selection of plants shall be based on overall landscape design, project location, facility type, and microclimates such as protected areas, shaded areas, high heat areas, high wind areas, etc.

3. New tree planting container size shall be a minimum of 2 ft x 2 ft box. New shrub planting container size shall be a minimum of 5 gallons.

4. All plant material shall have a 1-year warranty and a 1-year maintenance contract from landscape contractor.

5. Trees should be the focus of landscape plantings and, where possible, should be a mix of deciduous and evergreen species for variety.

6. Natural and artificial turf areas should be limited to recreation and park areas. Artificial turf is preferred due to lower maintenance cost and no water use.

7. Analyze soils and provide organic amendments as needed to improve plant growth and conserve water.

C06.1.5. Water Budgeting (Hydrozones)

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Comply with DoD and Air Force policy on potable-water irrigation systems and follow "Water for Landscaping" in UFC 1-200-02. Nellis and Creech AFB receive less than 4 inches of annual precipitation. Majority of plants require irrigation after plant establishment period due to the very limited rainfall that occurs sporadically and the extreme heat during summer months.

2. Provide permanent underground, fully automatic irrigation system that supports all landscape plants. System shall be designed and circuited for hydro zones and water conservation. Controllers shall be wall mounted in mechanical room or in mechanical yard, be lockable, and be easily accessible by base maintenance personnel. Backflow Prevention Unit (BPU) unit shall be insulated and provided with a freeze blanket cover and be located in a non-conspicuous location.

3. When life-cycle cost effective and permitted by local laws, new buildings should consider alternative water sources following UFC 1-200-02.

4. Provide irrigation design following UFC 3-201-02. Install drip irrigation products and components following UFGS Section 32 84 24 Irrigation Sprinkler Systems. Match the color of valve box lids to the adjacent ground treatment (i.e. green at turf areas, tan/brown at rock mulch areas).

5. When life-cycle cost-effective, equip irrigation systems to sense soil moisture, rainfall and wind to minimize unnecessary watering; incorporate drip irrigation systems as the primary source.

C06.1.6. Base Entrance Landscaping

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. At the main gate, reinforce a sense of arrival through a well-designed concentration of landscape elements consistent in visual quality with Facility Group 1.

2. Ensure landscaping has seasonal features with spring and fall color and a combination of evergreen and deciduous trees and shrubs for winter interest.

3. Integrate base signs and street and pedestrian lighting whenever feasible.

C06.1.7. Streetscape Landscaping

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide landscape designs with plant materials appropriately representing the level of quality of the adjacent Facility Group number. Refer to the Installation Elements section.

2. Select a variety of Mojave Desert appropriate streetscape plantings, boulders, rock mulch, and swales / berms to create visual interest.

C06.1.8. Pedestrian Circulation Landscaping

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Define walkways with landscaping where appropriate.

2. Where appropriate, provide rest areas along the pedestrian circulation network with human-scaled deciduous shade trees. Supplement tree plantings with finely textured shrubs or multi-sized accent boulders.

3. Provide wind breaks where required.

C06.1.9. Parking Lot Landscaping

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Integrate appropriate landscaping elements into parking areas to visually soften the appearance. Provide trees in parking lot islands for shade and visual interest. Avoid trees that drop sap, fruit, or seeds, and only use long-lived species.

2. Stormwater from parking lots may be directed to adjacent basins which will absorb the water. Appropriate landscape plants may be installed in the basins. Swales and basins shall be designed to limit the accumulation of sediment and debris. Sediment results in an abundance of unwanted weeds and overgrowth in the rock mulch which is unsightly and a maintenance issue.

C06.1.10. Screen/Accent Landscaping

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1 Where appropriate, provide accent landscaping at monuments and static displays. Consider providing landscaping adjacent to freestanding monument signs. Provide landscape screening of utility elements as appropriate.

C06.1.11. Other

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

C07. SITE FURNISHINGS

Comply with AF Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Site Furnishings:
http://afcfs.wbdg.org/site-development/site-furnishings/index.html

C07.1. Furnishings and Elements

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Provide a coordinated consistent inventory of site furnishings to positively contribute to the visual environment, image, and identity of the base; ensure durability, low maintenance, reduced visual clutter, and compatibility with the adjacent architecture.

2. Remove poorly located or redundant litter / ash receptacles, bicycle racks, vending machines, walls and fences to reduce visual clutter and to lessen the requirements for maintenance.

3. Install needed outdoor seating (benches and low walls) in public gathering spaces near main and secondary building entrances. Low walls shall match facility architecture. Install concrete under benches and do not install benches on/ within walkways. Install adjacent to walkways.

4. Benches and picnic tables in all facility groups shall be precast concrete. Metal benches and metal picnic tables may be allowed on a case basis per BCE office approval. Typically, metal benches and tables are only allowed if installed under shade canopies.

5. Integrate functional bicycle racks with the design of the building's main entrance grounds in Facility Groups 1 and 2 while meeting ATFP requirements. Bicycle racks shall be stainless steel.

6. Limit the use of bollards, but when necessary for force protection use precast tan colored concrete bollards at Groups 1, 2, and 4. Use concrete filled steel bollards at Group 3 and where appropriate. Use retractable bollards to block traffic at roads and service driveways. Lighted bollards may be used along walkways as appropriate. Steel bollards shall be painted Sierra Tan.

7. Locate architecturally coordinated containers for recycling, litter, ash, vending, etc., to minimize visual clutter and not visible from the building's main entrance. Minimize the use of freestanding planters.

8. Generally limit picnic tables, barbeque grills and drinking fountains to lodging, dormitories, parks and recreation areas following IFS.

9. The Installation Flagpole location shall comply with the guidance for the display of flags in AFI 34-1201. Each Air Force installation is authorized to fly one United States Flag, normally in front of the installation headquarters. USAF Thunderbirds and USAF Schools may have their own US flagpoles. Waivers for non-authorized locations must be submitted in accordance with AFI 33-360 and approved waivers (AF Form 679) must be maintained by the installation protocol office.

10. Refer to the Overview Section “Facility Hierarchy” topic of this AFCFS for guidelines regarding ancillary structures such as pavilions and shade shelters. Shade structures may have angled louvers, concrete tile or SSMR as appropriate for the use and location. Structures with fabric or PTFE membrane (tensile fabric) shall be approved by BCE office on a case basis. Structure's columns shall be CMU or steel with CMU enclosure.

11. Bus shelters shall be provided only where there is a documented need and when approved on a case basis. Generally emulate design of existing bus shelters with factory finish low maintenance materials.

12. Monuments and static displays shall be limited. New elements are generally discouraged unless these are fully vetted through the base's approval process and designed following IFS.

13. When visual screening is necessary, provide CMU walls with integral color, texture and pattern that matches adjacent facility. Screen all mechanical yards. Walls shall be high enough to screen all equipment and design shall meet ATFP requirements. Provide lockable doors / metal gates to mechanical yards and provide concrete pavement in entire yard.

14. For fencing, apply the standards for “Products, Materials and Color” in the following section. Limit those with the highest visual quality to Facility Group 1 where there is sustained maintenance. Define all levels of security and visual quality.

15. Chain-link fencing at Group 1, 2 or 4 facilities may only be used on a case basis. Limit the use of barbed-wire outriggers on chain-link fencing at industrial sites, unless required for additional security or protection of assets.

16. Wood fencing shall not be used except in Facility Group 4 on a case basis.

17. Provide trash dumpster enclosures at all concrete dumpster pads. Enclosure wall shall be CMU with integral color, texture, and pattern that matches adjacent facilities. Gates shall be factory finish metal, Sierra Tan color. Gates shall be stable/locked when in open and in closed position and meet all building wind load requirements.

18. All materials on screen walls shall be factory finish and not require painting or maintenance.

19. Provide kiosks only where there is a documented need for visual communication of posted messages. When used, match adjacent facilities in materials and detailing and consolidate kiosks with other site furnishings within 30 feet of major pedestrian paths. Limit kiosks to facility Groups 1 and 2 and parks.

20. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

C07.2. Site Furnishings Products, Materials and Color

Note: *Apply the below base-wide standards for Site Furnishings (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

C07.2.1. Barbeque Grills

◉ Applicable ◯ N/A Number of base standards 1

Type: **Charcoal**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: Most Dependable Fountains, Inc.

Color: Natural stainless steel

Finish: Mill

Model #: SS BBQ Grill

Other: Concrete foundation

UFGS: N/A

C07.2.2. Benches

◉ Applicable ◯ N/A Number of base standards 2

Type: **Precast Concrete**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: Belson

Color: Tan

Finish: Standard Finish (Smooth)

Model #: TF5029

Other: 6 foot length min.

UFGS: N/A

Type: **Metal**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: Patterson Williams

Color: Tan or Medium Brown

Finish: Powder Coat

Model #: Xander Series Bench with Back

Other: 6 foot length min.

UFGS: N/A

C07.2.3. Bike Racks

◉ Applicable ◯ N/A Number of base standards 1

Type: **Stainless Steel**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: N/A

Color: Stainless Steel

Finish: Factory

Model #: N/A

Other: N/A

UFGS: N/A

C07.2.4. Bike Lockers

◯ Applicable ◉ N/A

C07.2.5. Bollards

◉ Applicable ◯ N/A Number of base standards 3

Type: **Lighted**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☒ Other

Mfr: AccuLite

Color: Dark bronze

Finish: Anodized aluminum

Model #: PL2 Series

Other: All aluminum LED Fixture

UFGS: N/A

Type: **Retractable, Stainless Steel**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: Calpipe Industries and Reliance Foundry

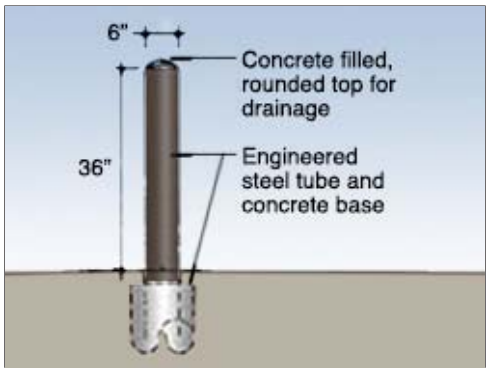
Color: Stainless Steel

Finish: A316 Stainless Steel

Model #: Calpipe Product STP 4000-TH and Reliance Foundry Model R-8471

Other: Used to block streets and service driveways for ATFP.
Install retractable bollards a minimum of 4 ft. on center.
4 in. diameter with lifting handle and key locking mechanism.

UFGS: N/A



Type: **Fixed, Steel**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: N/A

Color: Sierra Tan

Finish: Field painted

Model #: 6" Steel pipe, concrete filled

Other: Height varies per use and location

UFGS: N/A

C07.2.6. Bus Shelters

○ Applicable ◉ N/A

C07.2.7. Drinking Fountains

○ Applicable ◉ N/A

C07.2.8. Dumpster Enclosures / Gates

◉ Applicable ◯ N/A Number of base standards 1

Type: **CMU and Steel**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Custom

Color: Reference CMU Exterior Walls

Finish: Reference CMU Exterior Walls

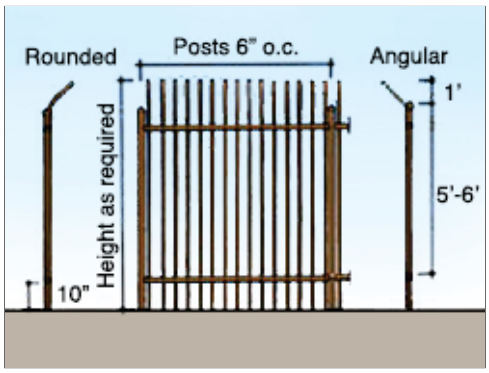
Model #: N/A

Other: Reference Section C07.1.17

UFGS: Section 04 20 00 Unit Masonry; Section 05 50 13 Misc. Metal

C07.2.9. Fencing

◉ Applicable ◯ N/A Number of base standards 3



Type: **Style A Barrier: High security, high visibility**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Custom

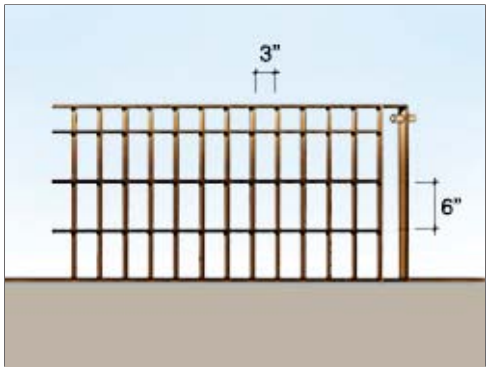
Color: Dark bronze/brown

Finish: Powder coat

Model #: Steel posts, rails and pickets (vertical, bent outward at top)

Other: CMU piers may be used

UFGS: Section 05 50 13 Miscellaneous Metal Fabrications



Type: **Style B Barrier: High security, medium visibility**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Custom

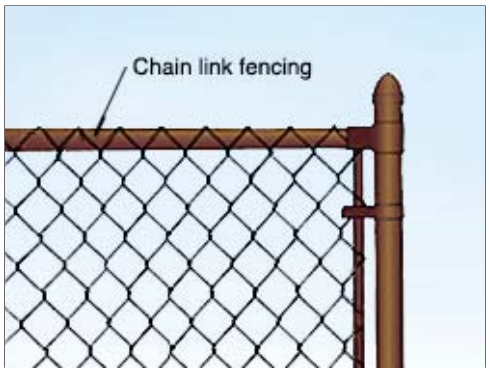
Color: Dark bronze/brown

Finish: Powder coat

Model #: Steel grid: flat bar stock verticals, round rod horizontals

Other: Steel posts, horizontal bars, braces, and accessories, in heights, lengths, and gauges as required; Close all ends of tubing

UFGS: Section 05 50 13 Miscellaneous Metal Fabrications



Type: **Style C Barrier: High security, low visibility**

Applies to: ☐ Group 1 ☐ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: Custom

Color: Dark bronze/brown

Finish: Powder coated galvanized steel

Model #: Chain link, steel posts and rails, gates and accessories

Other: Posts and rails in heights, lengths and gauges as required

UFGS: Section 32 31 13 Chain Link Fences and Gates

C07.2.10. Flagpoles

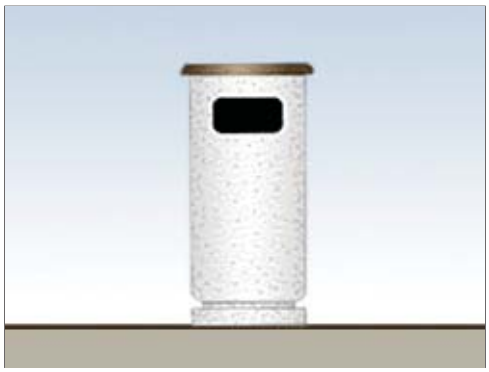
○ Applicable ◉ N/A

C07.2.11. Lighting – Landscape / Accent

Please refer to the Lighting section.

C07.2.12. Litter and Ash Receptacles

◉ Applicable ◯ N/A Number of base standards 2



Type: **Precast Concrete**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: Materials, Inc.

Color: Tan

Finish: Smooth

Model #: TR-3225 Sante Fe (Round)

Other: Rigid plastic internal liner

UFGS: N/A

Type: **Metal**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: The Park Catalog

Color: Tan or Medium Brown

Finish: Powder Coat

Model #: 398-8002, Plaza Steel Strap Trash Receptacle - 36 Gallon

Other: Flat top lid

UFGS: N/A

C07.2.13. Picnic Tables

◉ Applicable ◯ N/A Number of base standards 2

Type: **Precast Concrete**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: Belson

Color: Tan

Finish: Ground and polished, or acid washed

Model #: TF312512, 4 seats

Other: N/A

UFGS: N/A

Type: **Metal**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☒ Other

Mfr: The Park Catalog

Color: Tan or Medium Brown

Finish: Powder Coat

Model #: 145-1636, 46 Square WEB Style Classic (4 Post)

Other: N/A

UFGS: N/A

C07.2.14. Planters

◯ Applicable ◉ N/A

C07.2.15. Play Equipment

◉ Applicable ◯ N/A Number of base standards 1

Type: **Steel**

Applies to: ☐ Group 1 ☒ Group 2 ☐ Group 3 ☒ Group 4 ☒ Other

Mfr: Little Tikes Commercial

Color: Varies

Finish: Powder Coated Steel

Model #: N-R-G Freestyle

Other: Coordinate with Base Civil Engineer office and Child Development Center office. Provide shade structure or canopy.

UFGS: N/A

C07.2.16. Screen Walls

◉ Applicable ◯ N/A Number of base standards 1

Type: **CMU**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Custom

Color: Reference CMU Exterior Walls

Finish: Reference CMU Exterior Walls

Model #: N/A

Other: Reference Section C07.1.13

UFGS: Section 04 20 00 Unit Masonry

C07.2.17. Tree Grates

◯ Applicable ◉ N/A

C07.2.18. Other

◯ Applicable ◉ N/A

C08. EXTERIOR SIGNS

Comply with AF Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Exterior Signs:
http://afcfs.wbdg.org/site-development/exterior-signs/index.html

C08.1. Colors and Types

◯ Applicable ◉ N/A Large graphics

◉ Applicable ◯ N/A Small graphics

Sign at Main Entrance

Sign on CMU

Monument Sign

Sign on Metal Panel

Monument Sign with Uplighting

Sign Coordinated with Wall Pattern

1. Provide concise functional signs as a visually unifying element with consistent colors and types for all Installation and Gate Identification Signs; Building Identification Signs; Traffic Control Devices; Directional and Wayfinding Signs; and Informational and Motivational Signs.

2. All exterior signage shall be approved by Base Civil Engineer (BCE) office.

3. Provide signs with the lowest overall life-cycle costs considering initial cost, ongoing maintenance and lifespan while meeting quality standards.

4. Reduce the number of signs, reduce visual clutter and provide only essential signs required for identification, directions, instructions, and customer service following UFC 3-120-01. Remove non-conforming signs during renovation projects. Signage should help create a unified, cohesive and professional appearance throughout the base.

5. Use clear concise terms for content consistent with UFC 3-120-01. Lettering style for all exterior building signs shall be Helvetica. Helvetica Medium or Bold shall be used for primary information and Helvetica Regular shall be used for secondary information.

6. Building identification signs shall consist of wall mounted letters / numbers and shall be limited to the main facility functional name or unit identification. Abbreviations are preferred. If two main functions share a facility, both titles can be displayed. Individual letters/numbers shall be three-dimensional and be constructed of dark bronze colored anodized aluminum. Font shall be uppercase Helvetica medium style with letter height proportional to signage location and facility size. Letters on majority of facilities are 12 inches high. Letters shall be pin mounted directly to the exterior material of the facility and not be mounted to a separate metal panel. Provide an appropriate space between the letters and the wall material. Plastic and Styrofoam lettering should not be used.

7. Installation of wall mounted unit patches or emblems shall be limited to the unit headquarters facility and only one patch per unit is allowed. Patch should be located near the main building entrance and near the unit/building name signage, if provided. Vertical dimension of patch shall not be greater than 4 feet. Patch shall be professionally manufactured and be factory-painted on a silhouetted aluminum panel. Panel shall have an appropriate gauge thickness and be mounted approximately 1 inch from the wall surface to create a shadow. USAF Thunderbirds, USAF Weapons School, and Red Flag are exempt from limits on size and number of unit patches.

8. All facilities shall have a minimum of two building number signs. Signs shall be wall-mounted and be 8 inches high by 16 inches long and installed approximately 8 feet above ground, typically near building corner. Signs are one-piece brown color metal with Helvetica Medium font numbers in white.

9. All facilities shall have room identification signage at all exterior service doors. Signage shall be approximately 4 inches high by 8 inches long and state room name and number. Color shall be brown with white typeface and material shall be weatherproof and UV resistant.

10. Post-mounted, freestanding building identification signs with building name and street address / building number are prohibited.

11. Monument signs may be appropriate for certain high profile facilities and shall be approved by BCE on a case basis. Signs shall be appropriately sized, located, lighted, and coordinated with landscape design.

12. Traffic Control Devices, which regulate vehicular traffic on the installation, shall conform to the standards in the Manual of Uniform Traffic Control Devices (MUTCD) published by the Federal Highway Administration. Coordinate street signs with this IFS.

13. Provide Directional and Wayfinding Signs and address both pedestrian and vehicular traffic following UFC 3-120-01 for size, layout and content.

14. Reserved parking signs should be kept to a minimum. When approved, provide post-mounted sign faces in base standard materials and colors or provide curb mounted signs.

15. Parking lot identification signs may be used to identify areas or rows within large lots.

16. Follow the guidelines and requirements in ABAAS and the MUTCD for accessible parking signs.

17. Symbols or pictographs (graphic expressions of actual objects) may be used to indicate service, mandatory / prohibitory, sports, and recreation when rapid communication is necessary.

18. Refer to UFC 3-120-01 for prohibited signs, which include those with animated, blinking, chasing, flashing, or moving effects. If lighting is required for signs, appropriate LED light fixtures shall be installed at the appropriate location. Internally lighted signs are limited to special commercial applications and shall be approved by BCE office.

C08.1.1. Materials and Color Specifications

○ Applicable ◉ N/A Large graphics

○ Applicable ◉ N/A Small graphics

1. Fabricate sign panels from aluminum flat sheet for Typical Sign Face. Sign posts shall be Extruded aluminum with capped top ends for Typical Sign Post in a concrete base.

2. Fence mounted sign panels may be attached with exposed fasteners.

3. All signage shall follow Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) using standard colors. Refer to MUTCD color specifications, which provide cross-referenced Pantone Matching System (PMS) numbers:
   a. Standard Blue
   b. Standard Dark Bronze (also Federal Standard Color 30040)
   c. Standard Red
   d. Standard Black (non-reflective)
   e. Standard White
   f. Standard Brown

Materials and Color Specifications

○ Applicable ◉ N/A

C08.1.2. Installation and Gate Identification Signs

○ Applicable ◉ N/A

C08.1.3. Building Identification Signs

◉ Applicable ○ N/A Number of base standards 4

Type: **Wall Mounted Letters**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Color: Dark Bronze

Finish: Anodized Aluminum

Model #: N/A

Other: Reference Section C08.1, Paragraph 6

UFGS: N/A

Type: **Wall Mounted Emblems**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Custom

Color: Reference Section C08.1

Finish: Reference Section C08.1

Model #: N/A

Other: Reference Section C08.1, Paragraph 7

UFGS: N/A

Type: **Wall Mounted Building Numbers**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Custom

Color: Reference Section C08.1

Finish: Reference Section C08.1

Model #: N/A

Other: Reference Section C08.1, Paragraph 8

UFGS: N/A

Type: **Sign Monuments**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Custom

Color: Reference CMU Exterior Walls

Finish: Reference CMU Exterior Walls

Model #: N/A

Other: Reference Section C08.1, Paragraph 11

UFGS: N/A

C08.1.4. Traffic Control Devices (Street Signs)

◉ Applicable ○ N/A Number of base standards 1

Type: **Street Signs**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☐ Other

Mfr: Custom

Color: White reflective lettering on a Standard Brown background

Finish: Powder coat or vinyl sign face

Model #: Aluminum sign face, control arm or pole mounted

Other: Mount 7' above grade minimum, pictographs and logos are prohibited on street name signs per UFC.

UFGS: Section 05 50 13 Miscellaneous Metal Fabrications

C08.1.5. Directional and Wayfinding Signs

◉ Applicable ◯ N/A Number of base standards 1

Type: **Vehicular**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☒ Other

Mfr: Custom

Color: Medium Brown face, white letters, Sierra Tan posts.

Finish: Powder coat or vinyl sign face

Model #: Aluminum flat sheet, extruded aluminum posts

Other: Mount to square posts. Provide sizes following UFC

UFGS: Section 05 50 13 Miscellaneous Metal Fabrications

C08.1.6. Informational Signs

◯ Applicable ◉ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

1. Minimize informational signs such as static display signs, hours of operation, and project signs to reduce visual clutter.

2. Static display signs shall have standard medium brown face and white vinyl lettering.

3. Hours of operation signs shall have a level of quality equivalent to the Facility Group number.

4. Temporary signs are not permitted except for construction signs. Temporary commercial signs that advertise sales and promotions are prohibited. Construction signs may be allowed during project construction and shall be removed promptly after project completion. Sign should be parallel to the street with location approved by the Contracting Officer. Sign should include project name, project number, contracting agency, general contractor name, and contact phone number. If required, provide a separate Clark County dust permit sign and a Nevada SWPPP permit sign. Signs shall be free-standing, ground-mounted type, and not be attached to buildings or walls. Contractor shall not install any additional signs on temporary trailers and subcontractor signs are not allowed.

C08.1.7. Motivational Signage

◯ Applicable ◉ N/A Large graphics

◯ Applicable ◉ N/A Small graphics

1. Provide professionally produced motivational signs as important elements of campaigns to boost morale, improve safety, aid in recruiting, and accomplish other motivational objectives. Consolidate this signage to reduce visual clutter. Minimize the number of motivational signs to avoid a distractive and cluttered base appearance.

2. Motivational signs shall be limited to an electronic "marquee" type changeable sign near each gate. Temporary signs are not permitted. Motivational information may also be posted in a small, printed format on kiosks in specified, high pedestrian use areas. Refer to kiosks under Site Furnishings.

3. Follow UFC 3-120-01 for color and layout. Note that animated, blinking, chasing, flashing, or moving effects are prohibited by the UFC.

4. Unit motivational/morale signs on exterior of facilities or on sign monuments are prohibited.

C08.1.8. Parking Lot Signs

○ Applicable ◉ N/A

C08.1.9. Regulatory Signs

○ Applicable ◉ N/A

1. Regulatory signage, which restricts, warns and advises, shall be limited to those mandated under Highway/Traffic, Government Warning, and/or Parking Regulation. Follow UFC 3-120-01 and its industry references for color and layout.

2. Provide a comprehensive, systematic approach to regulatory signage to avoid clutter and confusion from "over signage."

3. Maintain base warning signs for safety and security at the base perimeter and at specific secure areas. Use these to notify visitors of restrictions governing conduct on the base, as well as other security procedures.

C08.1.10. Other

○ Applicable ◉ N/A

C09. LIGHTING

Comply with AF Corporate Standards for Site Development:
http://afcfs.wbdg.org/site-development/index.html

Comply with AF Corporate Standards for Lighting:
http://afcfs.wbdg.org/site-development/lighting/index.html

C09.1. Fixtures and Lamping

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Lighting at Main Entrance

Security and Accent Lighting

Decorative and Accent Lighting

1. Provide, coordinate and efficiently install street, parking lot, sidewalk and facility lighting with appropriate luminaires, lamping, placement and spacing following UFC 3-530-01 and Installation Facilities Standards (IFS); ensure the level of quality is consistent with the adjacent facility group number. Pole-mounted, wall-mounted and bollard fixtures are permitted.

2. Comply with Nellis-Creech Lighting Requirements in Section G Appendix. All interior and exterior lamps shall be LED.

3. Integrate controls to automatically reduce lighting power during periods of non-activity; automatically turn off power when sufficient daylight is available.

4. Ensure continuity and consistency of lighting elements. Light fixtures and poles shall have a dark bronze finish unless a tan color is approved by BCE office on a case basis. In new construction generally match post types, fixture types, styles, heights, sizes, materials, colors, and lamp types of adjacent facilities and the facility district.

5. Economically provide renewable-energy power sources such as solar photovoltaic when feasible.

6. Use appropriately designed or shielded luminaires to direct light downward to minimize light pollution and intrusion onto adjacent sites.

7. Calculate illuminant levels for all lighting applications following UFC 3-530-01 and ensure compliance with pre-curfew maximum brightness level requirements.

8. Sufficiently address environmental factors to prevent corrosion and weathering of fixtures, plinths and other components.

9. Wall mounted fixtures should respond to the architectural character of the facility.

10. Efficient accent lighting of architectural and landscape features may be provided for Group 1, lodging and other appropriate applications. Accent lights in ground-mounted locations may be provided for static displays and signs when these do not conflict or cause hazards with base operations.

11. Provide round tapered, square non-tapered, or round non-tapered aluminum poles and aluminum fixtures with square, rectangular or circular housings in colors and shapes to match adjacent facilities and the facility district. Exceptions may be made on a case basis.

12. Install lighted bollards only at Group 1 and high-traffic Group 2 facilities. Reference Section C07.2.5 for information on lighted bollards.

13. Install natural warm gray color, smooth finished concrete bases for all poles. Top of concrete base should match adjacent grade except at poles in parking lots and adjacent to vehicles and moveable equipment. At those locations the top of concrete shall be a minimum of 2'-6" above grade.

14. When parking lot lighting is necessary, provide an illuminated path to the building's main entrance. Pole bases should be contained within an internal landscape median or island.

15. Consistently install lighting for sidewalks, bikeways and trails to match adjacent facilities.

16. Landscape accent lighting may be used in public gathering spaces and in Group 1 facilities. Coordinate the design, luminaire selection, and placement with the location of trees, shrubs, and site furnishings.

C09.2. Light Fixture Types

Note: *Apply the below base-wide standards for Light Fixtures (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

C09.2.1. Street Lighting

○ Applicable ◉ N/A

C09.2.2. Parking Lot Lighting

○ Applicable ◉ N/A

C09.2.3. Lighted Bollards

○ Applicable ◉ N/A

C09.2.4. Sidewalk Lighting

○ Applicable ◉ N/A

C09.2.5. Walls / Stairs Lighting

○ Applicable ◉ N/A

C09.2.6. Other

○ Applicable ◉ N/A

D. FACILITIES EXTERIORS

Comply with Air Force Corporate Standards for Facilities Exteriors:
http://afcfs.wbdg.org/facilities-exteriors/index.html

○ Applicable ◉ N/A Large graphics

◉ Applicable ○ N/A Small graphics

Integrated Shading

Limited Use of Windows

Coordinated Wall Materials

D01. SUPPORTING THE MISSION

Comply with AF Corporate Standards for Supporting the Mission:
http://afcfs.wbdg.org/facilities-exteriors/supporting-the-mission/index.html

D02. SUSTAINABILITY

Comply with Air Force Corporate Standards for Sustainability:
http://afcfs.wbdg.org/facilities-exteriors/supporting-the-mission/index.html

D03. ARCHITECTURAL FEATURES

Comply with AF Corporate Standards for Facilities Exteriors:
http://afcfs.wbdg.org/facilities-exteriors/index.html

Comply with AF Corporate Standards for Architectural Features:
http://afcfs.wbdg.org/facilities-exteriors/architectural-features/index.html

Group 1

Group 2

Group 3

Group 4

D03.1. Orientation, Massing and Scale

1. Orient new buildings to maximize energy efficiency, passive solar and daylighting potential of the building; narrow buildings oriented along an east-west axis are preferred to minimize heat gain in the summer months and maximize heat gain in the winter months resulting in less overall energy usage.

2. Provide orthogonal geometry for principal building form; angular geometry may be used sparingly for Group 1 and used only for emphasis at specific areas such as building entrances and stairwells.

3. Maintain a human scale and reduce the visual scale of large buildings with sub-massing related to interior functional operations; create consistent form and scale in adjacent buildings with compatible profiles or silhouettes.

4. Building heights shall not be limited; however, building heights over 2 stories shall be considered on a case basis.

5. Combine functions where practical to avoid a proliferation of small, independent structures.

6. Use and coordinate shading devices with orientation and for function.

D03.2. Architectural Character

1. Develop architectural features, materials and detailing appropriate for the Facility Group designation. Refer to Building Entrances, Wall Systems and Roof Systems.

2. Respond to the Mojave Desert climate and regional influences with environmentally functional architectural features.

3. For new facilities design generally maintain consistency and visual unity in the character of the adjacent buildings through compatible architectural features: repeated use of similar forms such as roofs, and through recurring elements such as doors, windows, materials and colors.

4. Reinforce the base's campus environment and complement adjacent facility design.

5. All facilities shall express sustainability through their orientation, massing, shape, form, materials, and detailing. Provide louvers, fins and other shading devices to control heat gain and glare and to and improve energy efficiency.

6. Strive for economical construction without compromising a high-quality, professional appearance.

D03.3. Details and Color

1. Provide a palette of earth-tone colors related to the native landscape in concrete masonry units (CMU), powder coated metals, and stucco. Refer to wall systems for detailed material listings.

2. Relate the level of architectural detailing to the Facility Group number.

3. Use only integrally colored materials as the predominant exterior building material; do not use materials that require field painting and ongoing maintenance.

4. Provide consistent and compatible colors for every exterior building feature, including walls, roofs, doors, windows, gutters, downspouts, utility and mechanical elements, and other visible elements.

5. Noncorrosive metals with factory applied color finishes are required.

6. Combine details and color with orientation, massing, scale and architectural character to maintain base compatibility.

7. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

D03.3.1. Climate-based Data and Life-Cycle Cost-Effective Passive and Natural Design Strategies:

- [x] Climate dominated by mechanical cooling
- [ ] Climate dominated by mechanical heating
- [ ] Climate with similar mechanical cooling / heating needs
- [ ] Climate with minimal mechanical cooling / heating needs

- [ ] Climate with high humidity
- [ ] Climate with moderate humidity
- [x] Climate with low humidity

- [x] High Solar Insolation
- [ ] Moderate Solar Insolation
- [ ] Low Solar Insolation

- [ ] Soils with High Thermal Conductivity
- [x] Soils with Average Thermal Conductivity
- [ ] Soils with Low Thermal Conductivity

Other: Consider effects of high wind and localized heavy rain/flash flooding.

Other: North or south facing exposures are preferred for main entrances.

Facility: Narrow buildings along E-W axis are preferred for buildings with windows.

Wall: Integral shading features and devices. interior masonry thermal mass walls (for cooling).

Doors: Recessed are preferred for shading and high wind.

Windows: Provide insulating glazing on all windows. Shade all east, west, and south facing windows and entrances.

Roof: High to medium albedo. Minimal to moderate slope.

Structure: Do not expose ferrous metals. Provide factory finished non-ferrous metals or concrete.

MEP: Ground-source following LCCA.

Other: Internal thermal mass walls may be used for cooling following LCCA.

Other: N/A

Note: *Apply the below base-wide standards for Architectural Features (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

D03.3.2. Natural Ventilation System

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1 Aluminum Windows**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Kawneer (or equivalent)

Color: Dark Bronze (or clear anodized as approved by BCE)

Finish: Anodized

Model #: 2x4, slider or awning type

Other: Provide thermally broken frames.

UFGS: Section 08 41 13 Aluminum-Framed Entrances and Storefronts

D03.3.3. Thermal Mass

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1 Interior Wall Material**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Custom, TBD

Color: Brown, sandstone, or tan

Finish: Ground face

Model #: Coursed unit masonry

Other: 4" high CMU units preferred.

UFGS: Section 04 20 00 Unit Masonry

D03.3.4. Thermal Shading

◉ Applicable ◯ N/A Number of base standards 2

Type: **Style 1 Wall Devices**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Kawneer (or equivalent) or custom

Color: Dark bronze, natural aluminum, or wall panel color

Finish: Factory

Model #: Louver/airfoil

Other: Shading devices may be attached to frames or structure

UFGS: Section 08 41 13 Aluminum-Framed Entrances and Storefronts

Type: **Style 2 Window Devices**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Kawneer (or equivalent) or custom

Color: Dark bronze or natural aluminum

Finish: Factory, to match frames

Model #: Louver/airfoil

Other: Shading devices may be attached to frames or structure

UFGS: Section 08 41 13 Aluminum-Framed Entrances and Storefronts

D03.3.5. Renewable Heating/Cooling

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1 Geothermal (Ground Source)**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☐ Other

Mfr: Climate Master

Color: N/A

Finish: N/A

Model #: N/A

Other: Vertical ground loop well field. Coordinate with BCE.
Creech AFB test well data indicated favorable conditions for Ground Source Heat Pump (GSHP) and should be considered when feasible.

UFGS: Section 23 81 47 Water-Loop and Ground-Loop Heat Pump Systems

D03.3.6. Solar Photovoltaic System

◉ Applicable ◯ N/A Number of base standards 2

Type: **Ground-Mounted PV Panels**

Applies to: ☐ Group 1 ☐ Group 2 ☐ Group 3 ☐ Group 4 ☒ Other

Mfr: TBD

Color: Factory

Finish: Matte

Model #: Flat plate collector, fixed or tracking

Other: Coordinate with BCE.

UFGS: Section 48 14 00 Solar Photovoltaic Systems

Type: **Roof-Mounted PV Panels**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☐ Other

Mfr: TBD

Color: Factory

Finish: Matte

Model #: Flat plate collector

Other: Coordinate with BCE. Roof mounted panels approved on a case basis. Preference is for installation of panels on steel structures in parking lot to provide vehicle shading and easier maintenance.

UFGS: Section 48 14 00 Solar Photovoltaic Systems

D03.3.7. Solar Thermal System

◉ Applicable ○ N/A Number of base standards 1

Type: **Wall-Mounted or Roof-Mounted Panels**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☐ Other

Mfr: TBD

Color: Factory

Finish: Matte

Model #: Flat plate collector

Other: Coordinate with BCE.

UFGS: Section 48 14 13 Solar Liquid Flat Plate and Evacuated Tube Collectors

D04. BUILDING ENTRANCES

Comply with AF Corporate Standards for Facilities Exteriors:
http://afcfs.wbdg.org/facilities-exteriors/index.html

Comply with AF Corporate Standards for Building Entrances:
http://afcfs.wbdg.org/facilities-exteriors/building-entrances/index.html

Group 1

Group 2

Group 3

Group 4

D04.1. Primary Entrances

1. Emphasize the primary entrance in the overall building design with a projecting or recessed covering for weather protection and shading following Installation Facilities Standards (IFS) for Facility Group designations.

2. Provide vestibules at entries in Groups 1, 2 and 3 unless used infrequently or serving unconditioned space following ASHRAE 90.1.

3. Fully integrate all elements including the design of handicap ramps in the overall design of the primary entrance in an organized uncluttered appearance.

4. Install paved transitional spaces sized for the building function and occupancy.

5. Install appropriate lighting and site furniture following ATFP and IFS.

6. Protect entrances from direct sun. North-facing entrances are preferred.

7. Provide porte cocheres or covered drop-offs when justified for lodging and medical facilities; do not use for prestige or architectural accents.

D04.2. Secondary Entrances

1. Provide vestibules at entries in Groups 1, 2 and 3 unless used infrequently or serving unconditioned space following ASHRAE 90.1; use of stair towers as vestibules for multi-story buildings is encouraged when building and/or energy codes are satisfied.

2. Reflect the character of the primary entrance to a lesser extent with a smaller scale.

3. Include a recess or projection for weather protection and shading.

4. Integrate service and egress doors and loading areas with the building design by matching the materials and detailing and reflect the overall quality of the facility.

5. Incorporate egress structures such as stair towers into the facility design.

6. Canopies may be used for service and loading areas; weather protection beyond weather stripping is not required at doors used only for life safety egress.

7. Develop building massing and orientation to minimize the appearance of service and loading areas; physically and visually separate these from primary entrances.

8. Loading areas must be organized, orderly and have an uncluttered appearance.

D05. WALL SYSTEMS

Comply with AF Corporate Standards for Facilities Exteriors:
http://afcfs.wbdg.org/facilities-exteriors/index.html

Comply with AF Corporate Standards for Doors and Windows:
http://afcfs.wbdg.org/facilities-exteriors/wall-systems/index.html

Comply with AFCFS Recommended Materials:
http://afcfs.wbdg.org/facilities-exteriors/wall-systems/materials/index.html

Group 1

Group 2

Group 3

Group 4

D05.1. Hierarchy of Materials

1. Group 1 facilities may have more refined detailing than Group 2, and Group 2 may have more definition than Group 3.

2. Group 1 and Group 2 facilities shall be predominately CMU and/or architectural metal panels. Architectural precast concrete may be used as an accent material. CMU may be split face, ground face or smooth face. Majority of CMU shall be split face.

3. Group 3 facilities shall be predominately insulated or uninsulated metal panels and/or structural CMU. CMU may be split face, ground face, or smooth face. Majority of CMU shall be split face.

4. Group 4 shall be traditional 3-coat stucco system.

5. Color of metal wall panels shall match Sherwin Williams color SW 7713 “Tawny Tan”. In limited cases on smaller facilities and with BCE office approval, metal wall panel color may match Drexel Metals “Sierra Tan” (a standard color from various manufacturers). At Creech AFB, metal wall panel color may match Englert Metals "Sandstone" (a standard color from various manufacturers). On larger facilities, some areas may have dark brown wall panels as an accent color. USAF Thunderbirds facility may have white wall panels with red and blue accent colors. Provide Kynar-500 factory finish on all metal.

6. Multi-story facilities may include a transition in material, color or detailing to create a visual base. Generally, limit CMU to one field color and one accent color. CMU accents may have a variety of CMU finishes and unit heights.

7. Use high-performance building envelopes following UFC 1-200-02.

8. Use detailing not subject to excessive weathering. Provide wall accents consistently throughout the base.

9. Use integrally colored materials and factory-finished metals. Do not paint CMU. CMU and mortar shall have additives to prevent efflorescence.

10. Translucent insulated wall panels may be used in Facility Groups 1, 2 and 3. Protect from direct solar gain with shading appropriate for the orientation and exposure.

11. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

D05.2. Layout, Organization and Durability

1. Organize wall components including doors, windows, accents, shading devices, control joints, etc., to provide an ordered, professional appearance.

2. Integrate shading devices into the overall composition of the wall.

3. Integrate fixed shading devices as at all exterior glazing exposed to summer UV heat gain as a passive design measure to reduce energy use. Ensure adequate shading at west entrances. Deciduous trees may be used for shading.

4. Shading systems may be included as part of a manufacturer's window system or may be custom systems integrated into the wall.

5. Provide appropriate transitions between dissimilar materials to mitigate effects of thermal expansion and galvanic action.

6. All joint sealants shall be slightly darker than adjacent surfaces.

7. Materials requiring regular maintenance are not permitted; do not use exposed structural steel or other materials that require painting.

8. Refer to C07.2.16. Screen Walls for materials and colors of freestanding walls.

9. Refer to D07. Roofs for downspouts.

D05.3. Equipment, Vents and Devices

1. Arrange all mechanical, electrical, fire alarm, lightning protection and other system components to create an orderly appearance that integrates with the wall system.

2. Do not expose conduits, cables, piping, lightning protection components, etc. on exterior walls; if unavoidable in renovations, finish these elements to match the adjacent wall surface.

3. Avoid visual clutter, and where surface-mounted elements are required they shall match the wall color.

D05.4 Wall Systems Materials

Facility Group 1 wall materials shall be as follows.

Primary:	CMU or architectural metal panels
Secondary:	Architectural precast
Accent:	Alternate material color/finish

Facility Group 2 wall materials shall be as follows.

Primary:	CMU or architectural metal panels
Secondary:	Architectural precast
Accent:	Alternate material color/finish

Facility Group 3 wall materials shall be as follows.

Primary:	CMU or metal panels
Secondary:	N/A
Accent:	Alternate material color/finish

Facility Group 4 wall materials shall be as follows.

Primary:	3-coat stucco
Secondary:	N/A
Accent:	Stone veneer

Note: *Apply the below base-wide standards for Wall Systems (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

D05.4.1. Flat Metal Panels

◉ Applicable ◯ N/A Number of base standards 3

Type: **Architectural Insulated Metal Panel System**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Centria

Model #: Formawall Dimension Series

Color: Refer to IFS Section D05.1.5

Finish: Light stucco embossed factory finish

Other: Reveals at panel joints; no trim pieces at outside panel corners

UFGS: Section 07 42 13 Metal Wall Panels:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 42 13.pdf
Section 07 42 63 Fabricated Wall Panel Assemblies:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 42 63.pdf

Type: **Insulated Metal Panel System**

Applies to: ☐ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Metl-Span

Model #: CF Santa Fe Insulated Metal Wall System

Color: Refer to IFS Section D05.1.5

Finish: Light stucco embossed factory finish

Other: Horizontal or vertical installation

UFGS: Section 07 42 13 Metal Wall Panels:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 42 13.pdf
Section 07 42 63 Fabricated Wall Panel Assemblies:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 42 63.pdf

Type: **Standing Seam Metal Panel**

Applies to: ☐ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Model #: Appearance to match standing seam metal roof panel.

Color: Refer to IFS Section D07.4.1 and Section D05.1.5

Finish: matte, smooth

Other: Vertical installation

UFGS: Section 07 42 13 Metal Wall Panels:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 42 13.pdf
Section 07 42 63 Fabricated Wall Panel Assemblies:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 42 63.pdf

D05.4.2. Brick Veneer

○ Applicable ◉ N/A

D05.4.3. Architectural Precast

◉ Applicable ○ N/A Number of base standards 1

Type: **Precast Concrete**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Local, TBD

Model #: Smooth Casting

Color: Brown, Sandstone, or Tan

Finish: Very Light texture

Other: N/A

UFGS: Section 03 45 00 Precast Architectural Concrete:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 03 45 00.pdf

D05.4.4. Stucco Over Sheathing

◉ Applicable ◯ N/A Number of base standards 1

Type: **3-Coat Cementitious Stucco**

Applies to: ☐ Group 1 ☐ Group 2 ☐ Group 3 ☒ Group 4 ☒ Other

Mfr: La Habra

Model #: Traditional 3-coat system

Color: natural earth tones, primary and accent colors

Finish: Sand

Other: May be used at roof soffit and eaves for Groups 1, 2 and 3.

UFGS: Section 09 24 23 Cement Stucco:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 24 23.pdf

D05.4.5. Curtain Wall

◯ Applicable ◉ N/A

D05.4.6. Cast-In-Place Concrete

◯ Applicable ◉ N/A

D05.4.7. Tilt-Up Concrete

◯ Applicable ◉ N/A

D05.4.8. Ribbed Metal Sheeting

◉ Applicable ◯ N/A Number of base standards 1

Type: **Lap Seam Panel**

Applies to: ☐ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Model #: Lap Seam

Color: Refer to IFS Section D05.1.5

Finish: Factory Finish

Other: Horizontal or vertical installation

UFGS: Section 07 42 13 Metal Wall Panels:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 42 13.pdf

D05.4.9. EIFS

◉ Applicable ◯ N/A Number of base standards 1

Type: **Exterior Insulation and Finish System**

Applies to: ☐ Group 1 ☐ Group 2 ☐ Group 3 ☐ Group 4 ☒ Other

Mfr: Dryvit

Model #: TBD

Color: Brown, Sandstone, or Tan

Finish: Sand

Other: Per BCE approval, may be used for building renovations/roof soffits

UFGS: Section 07 24 00 Exterior Insulation and Finish Systems:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 24 00.pdf

D05.4.10. GFRC

◯ Applicable ◉ N/A

D05.4.11. Concrete Block

◉ Applicable ◯ N/A Number of base standards 4

Type: **Concrete Masonry Unit (CMU) Split Face**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Local TBD

Model #: 8x8x16 Nominal, face and corner units

Color: Brown, Sandstone, or Tan

Finish: Heavy Texture

Other: N/A

UFGS: Section 04 20 00 Unit Masonry:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 04 20 00.pdf

Type: **Concrete Masonry Unit (CMU) Ground Face**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Local TBD

Model #: 8x8x16 nominal, face and corner units

Color: Brown, Sandstone, or Tan

Finish: Ground/honed smooth with exposed aggregate

Other: N/A

UFGS: Section 04 20 00 Unit Masonry:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 04 20 00.pdf

Type: **Concrete Masonry Unit (CMU) Smooth Face**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Local TBD

Model #: 8x8x16 nominal, face and corner units

Color: Brown, Sandstone, or Tan

Finish: Smooth with single vertical score in center

Other: 8" x 8" grid appearance

UFGS: Section 04 20 00 Unit Masonry:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 04 20 00.pdf

Type: **Concrete Masonry Unit (CMU) Fluted**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Local TBD

Model #: 8x8x16 nominal, face and corner units

Color: Brown, Sandstone, or Tan

Finish: Fluted with split face ribs

Other: Overall depth of 10" nominal at flutes

UFGS: Section 04 20 00 Unit Masonry:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 04 20 00.pdf

D05.4.12. Fiber Cement Siding

○ Applicable ◉ N/A

D05.4.13. Other

○ Applicable ◉ N/A

D06. DOORS AND WINDOWS

Comply with AF Corporate Standards for Facilities Exteriors:
http://afcfs.wbdg.org/facilities-exteriors/index.html

Comply with AF Corporate Standards for Doors and Windows:
http://afcfs.wbdg.org/facilities-exteriors/doors-and-windows/index.html

Comply with AFCFS Recommended Materials:
http://afcfs.wbdg.org/facilities-exteriors/doors-and-windows/materials/index.html

Group 1

Group 2

Group 3

Group 4

D06.1. Types

1. Use dark bronze or clear anodized aluminum doors, windows, and frames with thermal breaks. Door and frame color/finish shall match. For renovation projects, the color of new windows, doors, and frames may match the existing ones.

2. Aluminum clad wood windows are preferred for Facility Group 4.

3. Standard-sized hinged doors are preferred. Use sliding, folding, overhead, sectional and other door configurations only to support mission operations.

4. Automatic doors are allowed only where functionally necessary.

5. Limit hollow metal doors and frames to security doors, utility rooms and mechanical rooms in Groups 1 and 2 and to any application in Group 3 facilities.

6. Utility and emergency egress doors shall match the exterior wall color.

7. Passive thermal comfort methods of ventilation are encouraged where life-cycle cost justified.

8. Doors and windows shall meet force protection and antiterrorism requirements.

9. Adjacent joint sealants should be slightly darker than the frame color.

10. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

D06.2. Layout and Geometry

1. Visually and functionally compose openings in walls for the climate-specific exposure. Recessed openings are encouraged to reduce solar gain. Window units should be set back from face of exterior wall surface a minimum of 2 inches.

2. Consistently use opening type, size, placement, mullion pattern, and color to reinforce the overall architectural design.

3. Openings shall augment interior lighting and space conditioning needs.

4. Protect against vandalism and intrusion and coordinate sound ratings.

D06.3. Glazing and Shading

1. Tinted, energy-efficient, low-e, double-pane glazing is required; provide triple-pane glazing in extreme environments.

2. Glazing color shall follow Installation Facilities Standards (IFS).

3. Translucent wall panels may be integrated into wall systems. Panel frame shall be clear anodized aluminum.

4. Do not use mirrored glazing.

5. Fully integrate applicable shading designs for overhangs, louvers, light shelves, and grilles.

6. Where appropriate, install window screens to take advantage of natural ventilation.

D06.4. Hardware

1. Provide hardware appropriate for the Facility Group while considering activity and frequency of use and climate; hardware may be of higher visual quality for Facility Group 1.

2. Ensure hardware will perform throughout the facility's lifespan without showing extreme wear.

3. Select finishes that will not degrade by intensity of operation or exposure to the elements.

4. Use consistent finishes and color on window and door systems throughout a facility. For renovation projects the color of new hardware may match the existing hardware.

5. Exterior and Interior locksets shall be BMHA Series 4000m Grade 1 with removable cores. Locks shall be "Best" brand or "Best" compatible. Cylinders and cores shall be interchangeable and have 7-pin tumblers. Provide "A" keyway at Nellis AFB and "G" keyway at Creech AFB.

6. Secured facilities shall have door hardware and door assemblies that meet requirements of the applicable security regulations. Sensitive Compartmented Information Facilities (SCIF) shall meet requirements of the Intelligence Community Standard 705-1 and 705-2 and the Intelligence Community Technical Specification for ICD/ICS 705.

7. Design building systems to eliminate the need for security screens whenever possible.

D06.5. Doors and Windows Materials

Note: *Apply the below base-wide standards for Doors and Windows (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

D06.5.1. Anodized Aluminum

◉ Applicable ◯ N/A Number of base standards 1

Type: **Anodized Aluminum Doors, Windows and Frames**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Kawneer (or equivalent)

Color: Natural aluminum or dark bronze

Finish: Clear anodized aluminum

Model #: 2x4, thermally broken framing

Other: Group 1 may use larger openings with larger framing sections

UFGS: Section 08 41 13 Aluminum-Framed Entrances and Storefronts: http://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 41 13.pdf

D06.5.2. Hollow Metal

◉ Applicable ◯ N/A Number of base standards 1

Type: **Hollow Metal Doors, Windows and Frames**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Steelcraft

Color: SW 7713 "Tawny Tan" or Drexel Metals "Sierra Tan"

Finish: Powder Coat, Satin

Model #: 2x4, thermally broken framing

Other: Group 1 use only for secondary entrances or emergency egress.

UFGS: Section 08 11 13 Steel Doors and Frames:
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 11 13.pdf

D06.5.3. Aluminum-clad Wood

◉ Applicable ◯ N/A Number of base standards 1

Type: **Aluminum-clad Residential**

Applies to: ☐ Group 1 ☐ Group 2 ☐ Group 3 ☒ Group 4 ☐ Other

Mfr: Marvin

Color: White or light Earth tones

Finish: Powder coat, Satin

Model #: Aluminum-clad wood doors and windows

Other: Double hung windows

UFGS: Section 08 14 00 Wood Doors
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 14 00.pdf

D06.5.4. Other

◯ Applicable ◉ N/A

D07. ROOF SYSTEMS

Comply with AF Corporate Standards for Facilities Exteriors:
http://afcfs.wbdg.org/facilities-exteriors/index.html

Comply with AF Corporate Standards for Roof Systems:
http://afcfs.wbdg.org/facilities-exteriors/roof-systems/index.html

Comply with AFCFS Recommended Materials:
http://afcfs.wbdg.org/facilities-exteriors/roof-systems/materials/index.html

Group 1

Group 2

Group 3

Group 4

D07.1. Roof Type and Form

1. Use proven, cost-effective roof systems with high durability, weather resistance, and low maintenance that are compatible with Installation Facilities Standards (IFS) and requirements for the designated Facility Group.

2. Generally match the roof type and form of existing adjacent facilities in new construction.

3. Group 1, 2, and 3 buildings shall have sloped standing seam metal roof (SSMR) system or minimal sloped single-ply membrane system (EPDM or TPO). Some buildings may have sloped concrete tile. Roof system selected shall be based on facility's location, size, desired appearance, and geometry. SSMR and concrete tile roofs typically have overhangs and membrane roofs typically have parapets.

4. Group 4 buildings shall have concrete tile.

5. Provide visual screens for roof-mounted appendages and equipment. Screen material shall match SSMR roof or match/complement exterior wall material.

6. Minimal sloped roofs are typically used for larger facilities or to match existing conditions on an expansion project. Larger facilities may have a combination of SSMR and minimal slope roof system.

7. Roof eaves and soffits shall be factory finish metal. In some cases stucco or EIFS material may be allowed.

8. Roof eaves shall extend beyond the exterior wall for roof drainage and shading. Provide overhangs for shading in response to Mojave Desert conditions, sized and proportioned to the height of the facility and to the window openings being shaded. Eaves shall coordinate with adjacent wall-mounted shading devices.

9. Keep roofs uncluttered and minimize penetrations.

10. Diminish massive roofs into coordinated smaller components consistent with adjacent facilities; avoid random, arbitrary changes.

11. Increase the insulation value of existing roofing systems during renovations if supported by life-cycle cost and structural analysis.

12. Roofs shall be maintained for the life of the system and replaced in accordance with UFC 3-110-04 and AFI 32-1051. A warranty shall be provided for all roof installations.

13. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

D07.2. Roof Slope

1. SSMR should generally have a 3:12 slope. Slope may be less or greater depending on building design.

2. Concrete tile roofs shall have a 3:12 slope. In some cases slope may be greater.

3. Minimal sloped roofs with membrane material shall have an appropriate slope for drainage and as required for roof assembly warranty.

4. Ensure adequate drainage, and connect to the subsurface rain collection system where available.

5. Provide appropriate roof slopes to accommodate solar photovoltaic, solar thermal, and passive systems when applicable following UFC 1-200-02.

6. Provide underlayments as required for the roofing type as directed by the UFC.

D07.3. Parapets and Copings

1. Extend wall materials vertically above the roof line and provide metal copings to match exterior wall. Ensure copings are properly flashed and detailed to avoid roof leaks.

D07.4. Color and Reflectivity

1. Color of SSMR shall match Sherwin Williams color SW 7713 “Tawny Tan”. In limited cases on smaller facilities and with BCE office approval, SSMR color may match Drexel Metals “Sierra Tan” (a standard color from various manufacturers). At Creech AFB, SSMR color may match Englert Metals "Sandstone" (a standard color from various manufacturers). Provide Kynar-500 factory finish on all metal.

2. Concrete tile shall match Boral Saxony 900 Slate product, color “Desert Terra Cotta” or “Desert Sage”.

3. Minimal slope membrane roofs shall use only use high-albedo, high reflectivity color to help decrease the temperature around the buildings and minimize damage to human and wildlife habitat.

4. Comply with UFC 3-110-03 and ASHRAE 90.1 for Solar Reflectance Index (SRI) and thermal requirements.

5. All roof flashing shall match the color of the predominant background material and have a factory finish.

D07.5. Gutters, Downspouts, Scuppers, Drains

1. Sloped roofs shall have gutters where appropriate.

2. Internal roof drainage systems are generally not permitted. Minimal sloped roofs shall be sloped to drain to the building perimeter through scuppers into downspouts.

3. Gutters, fascia, trim, and metal soffit panels on SSMR roofs shall match metal roof color. Provide Kynar-500 factory finish on all metal.

4. Gutters, fascia, trim and soffit color on concrete tile roofs shall match Drexel Metals “Sierra Tan”. Dormitory buildings may have “Dark Bronze” color.

5. Size roof drainage system per IBC and SMACNA for the region.

6. Use scuppers as required in parapet walls.

7. Integrate downspouts and scuppers with the architectural details of the wall system and arrange in an orderly, non-prominent appearance.

8. Fabricate downspouts and scuppers from non-corrosive materials such as aluminum or zinc-coated steel and provide Kynar-500 factory finish. Downspouts shall be solid.

9. Downspouts and scuppers on metal panel walls shall match color of metal panels. Downspouts and scuppers on CMU walls shall match Drexel Metals “Sierra Tan” color.

10. Provide angled transitional pieces for downspouts to fit closely against the wall for their entire length.

11. Coordinate locations of downspouts to conceal control joints in masonry walls when possible.

12. Place downspouts away from building entries. Water discharged should not run across sidewalks.

D07.6. Roof Vents and Elements

1. Minimize and consolidate roof penetrations into a single, inconspicuous point whenever possible.

2. On sloped roofs clad pipe penetrations to match the roofing material.

3. Roof mounted mechanical equipment is prohibited. However for some renovation projects and unavoidable configurations, roof equipment may be allowed on a case basis per BCE office approval.

4. All roof equipment shall be screened from view and easily accessible for maintenance. Provide access points and service routes to equipment that protect the roof.

5. Screen all large vents.

6. Ensure attic spaces are properly vented at ridges and soffits.. Match roof color for all exposed equipment and vents. Avoid roof-mounted antenna systems.

7. Match roof color for all exposed equipment and vents.

8. Avoid roof mounted antenna systems.

9. Arrange Lightning Protection Systems (LPS) components in an ordered, uncluttered, inconspicuous appearance and integrated into the organization of the roof and wall systems.

10. Ensure that LPS roof mounting systems are approved by the roofing manufacturer.

11. Additions to a roof shall not interfere with LPS or other rooftop systems that may be required.

11. Permanent fall protection will be considered with any new roof with a slope steeper than 3:12 per UFC 3-110-03.

D07.7. Clerestories and Skylights

1. Translucent panelized wall system clerestories and tubular daylight-type skylights are permitted in Group 1, 2 and 3 facilities. These are allowed in Group 3 facilities only when serving passive systems and are justifiable by life-cycle cost analysis.

2. Clerestories are preferred to skylights to avoid roof penetrations. Skylights, when permitted, must be simple in shape and integrated with the roof system to eliminate leakage.

3. Design clerestories and skylights using the same principles for seasonal shading that are required for walls and roof overhangs.

4. Translucent panelized wall system clerestories are preferred to standard glass clerestories due to less maintenance required.

5. Translucent panelized wall system framing shall be aluminum and have natural clear aluminum color. Panel color shall be white or off-white.

6. Clerestories and skylights shall comply with UFC 4-10-01.

D07.8. Vegetated Roof

Not applicable.

D07.9. Roof Systems Materials

Note: *Apply the below* <u>*base-wide standards*</u> *for Roof Systems (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

D07.9.1. Standing Seam Metal

◉ Applicable ◯ N/A Number of base standards 1

Type: **Shed, Gabled, or Hip Standing Seam Metal Roof (SSMR)**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Color: Refer to IFS Section D07.4.1

Finish: Matte, smooth

Model #: TBD

Other: 22 gauge thickness min.
25 year min. warranty

UFGS: Section 07 61 14 Steel Standing Seam Roofing
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 61 14.00 20.pdf

D07.9.2. Membrane Single-ply

◉ Applicable ◯ N/A Number of base standards 1

Type: **TPO or EPDM**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Color: White or Off-white

Finish: Smooth

Model #: TBD

Other: TPO (Thermoplastic Polyolefin): 20 year min warranty; .080" min. thick
EPDM: 20 year min. warranty; fiber reinforced; mechanically fastened; .060" minimum thickness

UFGS: Section 07 53 23 Ethylene-Propylene-Diene-Monomer Roofing
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 53 23.pdf
Section 07 54 50 TPO Thermoplastic Single-Ply Roofing
(Not Available on UFGS)

D07.9.3. Built-up Multi-ply

◯ Applicable ◉ N/A

D07.9.4. Concrete Tile

◉ Applicable ◯ N/A Number of base standards 1

Type: **Concrete Roof Tile**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☒ Group 4 ☐ Other

Mfr: Boral

Color: Saxony 900 Slate: "Desert Terra Cotta" or "Desert Sage"

Finish: Factory

Model #: Saxony 900 Slate

Other: Standard Weight
25 year min. warranty including underlayment

UFGS: Section 07 32 16 Concrete Roof Tile
(Not Available on UFGS)

D07.9.5. Clay Tile

◯ Applicable ◉ N/A

D07.9.6. Slate Shingles

◯ Applicable ◉ N/A

D07.9.7. Vegetated System

◯ Applicable ◉ N/A

D07.9.8. Ribbed Metal Sheeting

◯ Applicable ◉ N/A

D07.9.9. Composite Shingles

◉ Applicable ◯ N/A Number of base standards 1

Type: **Shed, Gabled, or Hip Shingle Roof**

Applies to: ☐ Group 1 ☐ Group 2 ☐ Group 3 ☐ Group 4 ◉ Other

Mfr: TBD

Color: Earth Tones

Finish: Factory

Model #: TBD

Other: Composite shingles shall only be used in repair projects, not new construction. 20 year min. warranty.

UFGS: Section 07 31 13 Glass-fiber-reinforced Asphalt Shingles
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 07 31 13.pdf

D07.9.10. Other

◯ Applicable ◉ N/A

D08. STRUCTURAL SYSTEMS

Comply with AF Corporate Standards for Facilities Exteriors:
http://afcfs.wbdg.org/facilities-exteriors/index.html

Comply with AF Corporate Standards for Structural Systems:
http://afcfs.wbdg.org/facilities-exteriors/structural-systems/index.html

Comply with AFCFS Recommended Materials:
http://afcfs.wbdg.org/facilities-exteriors/structural-systems/materials/index.html

Group 1

Group 2

Group 3

Group 4

D08.1. Systems and Layouts

1. Pre-engineered structural steel framing may be used for Groups 1, 2 and 3 facilities; Installation-appropriate thermal envelopes, materials and detailing are required.

2. Select economical structural systems that integrate roof and wall systems.

3. Narrow buildings 60' or less in width with column-free interiors are preferred for office, administrative and personnel spaces; when interior columns are required optimize the structural grid layout for open-plan arrangements.

4. Fully coordinate structural grids with exterior window systems to align columns with window frames or wall systems.

5. When structure is exposed provide an organized appearance and coordinate with mechanical, electrical, plumbing, fire protection, information technology, and communications systems.

6. Limit the use of specialty systems (such as space frames, vaults or domes) and of structure as a visual feature.

7. Cost-effectively design interior bearing walls as thermal mass.

8. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

D08.2. Structural Systems Materials

Note: *Apply the below base-wide standards for Structural Systems (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

D08.2.1. Concrete

◉ Applicable ◯ N/A Number of base standards 1

Type: **Concrete Framing**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Color: Natural gray

Finish: Light texture

Model #: TBD

Other: N/A

UFGS: Section 03 30 53 Miscellaneous Cast-In-Place Concrete
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 03 30 53.pdf
Section 03 33 00 Cast-In-Place Architectural Concrete
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 03 33 00.pdf
Section 03 47 13 Tilt-Up Concrete
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 03 47 13.pdf

D08.2.2. Insulated Concrete Forming (ICF)

◉ Applicable ◯ N/A Number of base standards 1

Type: **Concrete Wall**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Color: White

Finish: Smooth

Model #: TBD

Other: N/A

UFGS: Section 03 30 53 Miscellaneous Cast-In-Place Concrete
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 03 30 53.pdf
Section 03 11 19 Insulating Concrete Forming
(Not Available on UFGS)

D08.2.3. Steel

◉ Applicable ◯ N/A Number of base standards 1

Type: **Rigid Framing**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Color: Shop primed

Finish: Matte

Model #: Structural steel shapes

Other: N/A

UFGS: Section 05 12 00 Structural Steel
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 05 12 00.pdf

D08.2.4. Pre-Engineered Steel

◉ Applicable ◯ N/A Number of base standards 1

Type: **Moment Frame**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Color: Factory primed

Finish: Matte

Model #: TBD

Other: N/A

UFGS: Section 13 12 00 Steel Building Systems
(Not Available on UFGS)
Section 13 34 19 Metal Building Systems
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 13 34 19.pdf

D08.2.5. Masonry

◉ Applicable ◯ N/A Number of base standards 1

Type: **Concrete Masonry Unit (CMU)**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: TBD

Color: Exposed: Brown, Tan, Sandstone. Unexposed: Gray

Finish: Split Face, Smooth Face, Honed Face, Fluted

Model #: TBD

Other: See IFS Section D05.4.11 for exposed CMU

UFGS: Section 04 20 00 Unit Masonry
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 04 20 00.pdf

D08.2.6. Heavy Timber

◯ Applicable ◉ N/A

D08.2.7. Light-gauge Steel

◉ Applicable ◯ N/A Number of base standards 1

Type: **Steel Framing**

Applies to: ☐ Group 1 ☐ Group 2 ☐ Group 3 ☒ Group 4 ☐ Other

Mfr: Steelrite

Color: Factory

Finish: Galvanized

Model #: Structural framing shapes

Other: N/A

UFGS: Section 05 45 00 Light Gauge Steel Framing System
(Not Available on UFGS)

D08.2.8. Lumber Framing

◯ Applicable ◉ N/A

D08.2.9. Other

◯ Applicable ◉ N/A

D09. MECHANICAL, ELECTRICAL AND PLUMBING

Comply with AF Corporate Standards for Facilities Exteriors:
http://afcfs.wbdg.org/facilities-exteriors/index.html

Comply with AF Corporate Standards for Mechanical, Electrical and Plumbing:
http://afcfs.wbdg.org/facilities-exteriors/machanical-electrical-and-plumbing/index.html

Group 1

Group 2

Group 3

Group 4

D09.1. Passive and Active Systems

1. Comply with Mechanical, Plumbing, Electrical, Lighting, Fire Protection, and Telecommunication requirements listed in Section G Appendix.

2. Fully integrate passive heating and cooling systems into facility designs whenever practical for the desert climate prior to the design of active mechanical systems.

3. Provide optimized passive and active systems; design active mechanical systems to supplement thermal mass walls and floors.

4. Develop renewable energy systems including geo-exchange (ground source heat pumps) when life-cycle cost effective.

5. Performance display screens, which report energy performance and utility savings, are encouraged; when provided locate these in building lobbies or common areas.

6. Solar domestic hot water systems are required when life-cycle cost effective for the climate.

7. Integrate shading into building exteriors to reduce solar heat gain during hot seasons.

D09.2. Functionality and Efficiency

1. Fully coordinate mechanical, electrical, plumbing, and fire protection systems with each other and with the building structure, enclosure, thermal envelope and interior design.

2. Provide direct exterior access to main mechanical and electrical rooms.

3. Screen exterior equipment from primary views (landscape, building masses, screen walls) and comply with ATFP requirements.

4. Keep equipment away from main building entrances; locate service area/yard on least visible side of a building.

5. Design emergency generator systems integrally with all other building systems and avoid incompatible building additions; locate generators near service areas and ensure they are not visible from primary entrances.

6. When structure is exposed as a finished ceiling, fully integrate MEP and fire protection systems to provide an organized uncluttered appearance.

7. Conceal ducts, piping, conduits, devices, etc., when permanent walls, suspended ceilings or raised floors are provided; locate fire sprinkler heads in orderly configuration.

8. Limit interior wall-mounted equipment in occupied personnel spaces; avoid surface-mounted conduit and pipes.

9. Provide efficient mechanical and electrical rooms with layouts to facilitate system performance and maintenance; provide convenient access to controls, clearly label systems and include operating and maintenance instructions.

10. Separate mechanical, electrical and communications rooms.

11. Integrate recessed and wall-mounted fixtures such as fire standpipe cabinets and drinking fountains within permanent walls. Provide integrated bottle filling stations at all drinking fountains.

12. Building systems in secured facilities shall meet requirements of the applicable security regulations. Sensitive Compartmented Information Facilities (SCIF) shall meet requirements of the Intelligence Community Standard 705-1 and 705-2 and the Intelligence Community Technical Specification for ICD/ICS 705. This includes facility perimeter construction, openings, mechanical, electrical, communications, security, and fire protection systems.

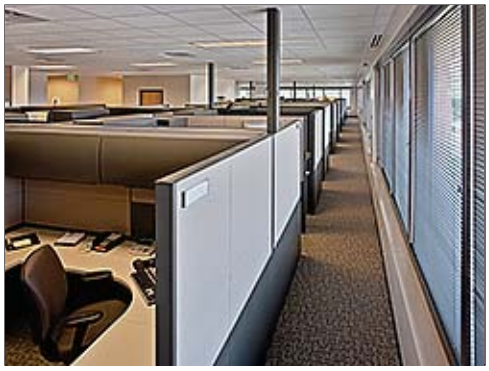
13. Provide electrical, water, and natural gas meters and connections that fully support the base's Advanced Meter Reading System (AMRS) and Automated Revenue Management Services (ARMS). Comply with Utility Meter Requirements listed in Section G Appendix.

E. FACILITIES INTERIORS

Comply with Air Force Corporate Standards for Facilities Interiors:
http://afcfs.wbdg.org/facilities-interiors/index.html

Group 1

Group 2



Group 3

Group 4

E01. Building Configurations

Comply with Air Force Corporate Standards for Building Configurations:
http://afcfs.wbdg.org/facilities-interiors/buildings-configurations/index.html

1. Provide open-plan configurations for office, administrative, operational and related activities and spaces for maximum flexibility. Use a "core and shell" approach in which all building systems, infrastructure and permanent interior partitions anticipate two or more uses (operations) during a facility's lifespan.

2. Create flexible interior configurations using Furniture, Fixtures & Equipment (FF&E) and limit private offices and private rooms. Refer to AFMAN 32-1084 for space requirements. To the greatest extent, limit permanent partitions to core areas such as toilet rooms, stairs, mechanical and utility rooms.

3. Use more durable long-lasting finishes in core areas for walls, ceilings, floor coverings and built-in casework. Coordinate interior FF&E layouts with structural grids during space planning.

4. Provide high-performance building configurations following UFC 1-200-02. Ensure passive design strategies are cost effectively incorporated before active mechanical systems are designed.

5. Comply with Electrical, Lighting, Fire Protection, Telecommunication, Mechanical, and Plumbing requirements listed in Section G Appendix.

6. Comply with UFC 1-200-01, general building requirements. UFC 1-200-01 provides applicability of model building codes and government unique criteria for typical design disciplines and building systems, as well as for accessibility, antiterrorism, security, high performance and sustainability requirements, and safety.

7. Meet security and force protection requirements in UFC 4-010-01: DoD Minimum Antiterrorism Standards for Buildings.

8. Comply with AFCFS for supporting mission requirements, addressing human comfort and well being, and creating highly flexible interiors while satisfying metrics for high performance and sustainable buildings.

9. Provide a level of quality for interior features, materials and finishes that is appropriate for the Facility Group number. Group 1 may receive higher quality than Groups 2 thru 4. Refer to Facility Hierarchy.

10. Through open-plan configurations, preserve all passive and natural design strategies and fully integrate facility interiors with overall building systems.

11. Professional interior designers, or architects with significant interior design experience, must accomplish the design and review of applicable new construction, renovations and maintenance projects.

12. Consult with the State Historic Preservation Officer (SHPO) and base-level Historic Preservation offices regarding proposed changes to properties listed on or eligible for listing on the National Register of Historic Places. Follow requirements of The National Historic Preservation Act and Secretary of the Interior Standards for the Treatment of Historic Properties.

13. Maintain architectural compatibility following AFCFS and this Installation Facilities Standards (IFS) document to create continuity while avoiding monotony.

E01.1. Layout and Common Areas

Comply with Air Force Corporate Standards for Layout and Common Areas:
http://afcfs.wbdg.org/facilities-interiors/buildings-configurations/layout-and-common-areas/index.html

1. Create open-plan interior environments to accommodate changes.

2. Limit interior partitions, private offices and rooms; use furniture or modular systems to provide privacy and acoustic control.

3. When partitions are functionally justified such as for conference rooms, use systems furniture and moveable (demountable) floor-to-ceiling wall systems for acoustical or visual privacy.

4. Proportion lobbies and common spaces based on type of function, activity and facility group.

5. Allow no direct sight lines into restrooms.

6. Situate utility and core areas to minimize impact on daylighting and to maximize use as thermal buffers.

7. Ensure electrical, lighting and communications system can be adaptable to configuration changes.

8. Avoid power poles to the maximum extent; when poles are necessary minimize the number and coordinate locations with furniture placement and other elements.

9. Avoid sloping floors to maintain flexibility and eliminate future structural changes.

10. Special consideration may apply to Sensitive Compartmented Information Facilities (SCIFs).

E01.1.1. Interior Design Process

1. Comply with UFC 3-120-10 for the Comprehensive Interior Design (CID,) which includes both Structural Interior Design (SID) and Furniture, Fixtures & Equipment (FF&E) design services.

2. Use a collaborative, integrated planning and design team, composed of user, government support staff, and appropriate professionals. Integrate architectural features using simple detailing to create a professional appearance; avoid extravagant or excessive detailing.

3. Ensure interior designs satisfy the functional requirements within the context of flexibility, sustainability and the building's energy performance.

4. Base space planning on square foot allocations from AFM 32-1084. Identify special requirements if any, such as privacy separation, VIP areas, gathering spaces and storage. Note: The occupant's rank and position will influence the square footage and selection of materials.

5. Provide clear circulation and pathway finding for both horizontal and vertical directions that accommodate the number of personnel in the facility.

6. Maximize efficiencies in the space plan for functional relationships and adjacencies for all facility users. Efficiently create and situate rooms and support rooms such as conference / meeting rooms and break rooms.

7. Provide interior design building-related illustrations, drawings, schedules, materials selections, specifications and cost estimates as listed in UFC 3-120-10. Refer to Furnishings in this IFS also.

8. SID shall follow UFC 3-120-10 Interior Design.

9. Base the FF&E package on the furniture footprint developed in the SID. Identify all new or existing equipment needed and its users within each facility or each area of the facility. Provide specific information on: equipment sizes, electrical requirements, ventilation requirements, weight (if heavy), quantity, and security level if required. Presume all administrative spaces have computers and supporting equipment.

E01.1.2. Codes and Regulations

1. Refer to UFC 1-200-01 for modifications to the International Building Code (IBC) to determine applicable sections of the IBC. Both the IBC Chapter 3 and UFC 3-600-01 govern “Use and Occupancy Classification” for example.

2. Fire code requirements shall be as defined in the International Building Code (IBC) and must be used where dictated by UFC 1-200-01 DoD Building Code (General Building Requirements) except where noted in UFC 3-600-01 (Fire Protection Engineering For Facilities).

3. National Fire Protection Association (NFPA) 101 must be utilized to determine the occupancy classification as it relates to fire/smoke resistance rating of interior non-load bearing partitions (other than occupancy separation), means of egress, interior finish, features of fire protection (including vertical openings) and associated requirements.

E01.2. Quality and Comfort

Comply with Air Force Corporate Standards for Quality and Comfort:
http://afcfs.wbdg.org/facilities-interiors/buildings-configurations/quality-and-comfort/index.html

1. Include durability in the life-cycle cost analysis for best-value material selections with long life expectancies that do not show excessive wearing.
2. Select long-lasting materials and finishes for permanent core areas such as lobbies, restrooms and stairs.
3. Select low-maintenance materials and products that reduce ongoing servicing and repair and that are easy to clean.
4. Relate the visual quality of finishes to the Facility Group number.
5. Building and interior configurations should address both operations and climatic responses.
6. Convey a professional image; avoid trendy patterns and textures.
7. Use materials and finishes that provide a healthy indoor environment.
8. Orient interior spaces toward views while maintaining cost-effective building performance and efficiency.
9. Promote air movement and daylighting for human health and wellbeing.
10. In restrooms, provide light fixtures directly above lavatory sinks (wall mounted or recessed in ceiling).

E02. Floors

Comply with Air Force Corporate Standards for Floors:
http://afcfs.wbdg.org/facilities-interiors/floors/index.html

E02.1. Floor Materials

Facility Group 1 floor materials shall be as follows.

Primary:	Prepared Slabs (Ground, Polished)
Secondary:	Porcelain tile
Tertiary:	Carpet, Rubber Stair Treads

Facility Group 2 floor materials shall be as follows.

Primary:	Prepared Slabs (Ground, Polished)
Secondary:	Porcelain or Ceramic tile
Tertiary:	Carpet, Rubber Stair Treads

Facility Group 3 floor materials shall be as follows.

Primary:	Prepared Slabs (Ground)
Secondary:	Ceramic Tile
Tertiary:	N/A

Facility Group 4 floor materials shall be as follows.

Primary:	Carpet
Secondary:	Ceramic tile
Tertiary:	N/A

1. Resilient and rapidly renewable flooring may be used in low traffic areas in Group 1, 2 and 4.

2. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

Note: *Apply the below base-wide standards for Floors (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

E02.1.1. Prepared Slabs

◉ Applicable ◯ N/A Number of base standards 2

Type: **Style 1, Ground and Polished**

Applies to: ☒ Group 1 ☐ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Local (TBD)

Color: Natural gray cement, light to dark beige aggregates

Finish: Fine polished texture

Model #: Medium to small aggregate

Other: N/A

UFGS: Section 03 35 45 Polished Concrete Finishing
(Not Available on UFGS)

Type: **Style 2, Ground and Polished**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Local (TBD)

Color: Natural gray cement, light to dark beige aggregates

Finish: Medium polished texture, slip resistant

Model #: Medium to small aggregate

Other: N/A

UFGS: Section 03 35 45 Polished Concrete Finishing
(Not Available on UFGS)

E02.1.2. Natural Stone and Terrazzo

○ Applicable ◉ N/A

E02.1.3. Quarry Tile

◉ Applicable ○ N/A Number of base standards 1

Type: **Style 1**

Applies to: ☐ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Daltile

Color: Earth tones

Finish: Matte, slip resistant

Model #: N/A

Other: Use in commercial kitchen flooring.

UFGS: Section 09 30 10 Ceramic, Quarry, and Glass Tiling
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 30 10.pdf

E02.1.4. Ceramic Tile

◉ Applicable ○ N/A Number of base standards 2

Type: **Style 1 Porcelain**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Daltile

Color: Earth tones

Finish: Matte, slip resistant

Model #: Porcelain tile

Other: Use in high traffic areas. Epoxy grout is recommended.

UFGS: Section 09 30 10 Ceramic, Quarry, and Glass Tiling
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 30 10.pdf

Type: **Style 2 Ceramic**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☐ Other

Mfr: Daltile

Color: Earth tones

Finish: Matte, slip resistant

Model #: Ceramic tile

Other: Use in low traffic area toilet rooms.

UFGS: Section 09 30 10 Ceramic, Quarry, and Glass Tiling
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 30 10.pdf

E02.1.5. Resilient Floor

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1 Stair Treads**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Roppe

Color: Neutral tones

Finish: Factory

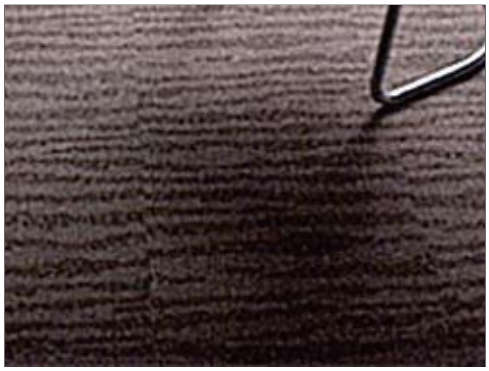
Model #: Raised design rubber tread

Other: Stair treads material

UFGS: Section 09 65 00 Resilient Flooring
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 65 00.pdf

E02.1.6. Carpet

◉ Applicable ◯ N/A Number of base standards 2



Type: **Style 1**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Mohawk Group

Color: Neutral multi-colored tones/patterned/solid

Finish: Yarn: Nylon 6 or 6.6/cut pile or loop pile

Model #: Broadloom, 6' wide rolled, carpet tiles, entry walk-off carpet

Other: N/A

UFGS: UFGS 09 68 00 Carpeting
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 68 00.pdf

Type: **Style 2**

Applies to: ☐ Group 1 ☐ Group 2 ☐ Group 3 ☒ Group 4 ☐ Other

Mfr: Mohawk Group

Color: Earth tones

Finish: Factory

Model #: Broadloom, residential loop, "Smartstrand"

Other: N/A

UFGS: UFGS 09 68 00 Carpeting
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 68 00.pdf

E02.1.7. Rapidly-Renewable Products

◯ Applicable ◉ N/A

E02.1.8. Other

◯ Applicable ◉ N/A

E03. Walls

Comply with Air Force Corporate Standards for Walls:
http://afcfs.wbdg.org/facilities-interiors/walls/index.html

E03.1. Wall Materials

Facility Group 1 wall materials shall be as follows.

Primary:	Gypsum board (painted)
Secondary:	N/A
Tertiary:	Ceramic tile (restrooms)

Facility Group 2 wall materials shall be as follows.

Primary:	Gypsum board (painted)
Secondary:	N/A
Tertiary:	Ceramic tile (restrooms)

Facility Group 3 wall materials shall be as follows.

Primary:	Gypsum board (painted)
Secondary:	N/A
Tertiary:	Ceramic tile (restrooms)

Facility Group 4 wall materials shall be as follows.

Primary:	Gypsum board (painted)
Secondary:	N/A
Tertiary:	Ceramic tile (restrooms)

1. Follow UFC 3-450-01 (Vibration and Noise Control) for acoustic design issues including speech privacy, sound isolation or sound masking.
2. Select and apply paint with sheens (gloss levels) appropriate for the application following UFGS Section 09 90 00 Paints and Coatings.
3. Provide ceramic tile on wet walls of kitchens, toilet rooms, locker rooms, etc., in all facility groups. Provide ceramic tile on wall behind drinking fountains.
4. Group 1 and 2 high visibility areas may have ground face CMU, wood paneling, smooth architectural metal panels, or other durable higher quality material used on an accent wall.
5. Group 3 industrial areas requiring durability may have exposed smooth face CMU.
6. Provide rubber base on drywall partitions in Groups 1 and 2.
7. Hardwood base may only be used in Group 1 as approved on a case basis.
8. Hardwood chair rails / bumper rails may be used in high-use areas of Groups 1 and 2; aqueous clear finishes are preferred to reduce maintenance; plastic chair rails are permitted only in medical applications.
9. Decorative moldings may be used only in Group 1 when approved on a case basis.
10. Corner guards are permitted only in high traffic spaces with wheeled or cart use such as private service areas in Groups 1 and 2; stainless steel corners guards with a brushed finish may be judiciously used in Group 3.
11. Group 4 may use painted composite wood base.
12. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

Note: *Apply the below base-wide standards for Walls (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

E03.1.1. Concrete

○ Applicable ◉ N/A

E03.1.2. Masonry

◉ Applicable ○ N/A Number of base standards 1

Type: **Ground Face CMU**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Local (TBD)

Color: Brown or Tan

Finish: Honed Smooth

Model #: Coursed unit masonry

Other: 4 or 8 inch high unit used as accent walls.

UFGS: Section 03 33 00 Cast-In-Place Architectural Concrete
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 03 33 00.pdf

E03.1.3. Ceramic Tile

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☐ Other

Mfr: Daltile

Color: Earth tones

Finish: Gloss, Semi-gloss

Model #: Ceramic wall tile

Other: Located on wet walls in restrooms, at drinking fountains, and on accent walls.

UFGS: Section 09 30 10 Ceramic, Quarry, and Glass Tiling
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 30 10.pdf

E03.1.4. Gypsum Board

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☐ Other

Mfr: US Gypsum

Color: Solid Earth tone colors

Finish: Paint (Sheen per UFGS)

Model #: Tapered edge

Other: N/A

UFGS: Section 09 29 00 Gypsum Board
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 29 00.pdf
Section 09 90 00 Paints and Coatings
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 90 00.pdf

E03.1.5. Metal Panels

◯ Applicable ◉ N/A

E03.1.6. Wood Paneling

○ Applicable ◉ N/A

E03.1.7. Rapidly-Renewable Products

○ Applicable ◉ N/A

E03.1.8. Other

○ Applicable ◉ N/A

E04. Ceilings

Comply with Air Force Corporate Standards for Ceilings:
http://afcfs.wbdg.org/facilities-interiors/ceilings/index.html

E04.1. Ceiling Materials

Facility Group 1 ceiling materials shall be as follows.

Primary:	Exposed Framing (Roof / Floor Structure Above)
Secondary:	Grid and Acoustical Tile
Tertiary:	Gypsum board (painted)

Facility Group 2 ceiling materials shall be as follows.

Primary:	Exposed Framing (Roof / Floor Structure Above)
Secondary:	Grid and Acoustical Tile
Tertiary:	Gypsum board (painted)

Facility Group 3 ceiling materials shall be as follows.

Primary:	Exposed Framing (Roof / Floor Structure Above)
Secondary:	Grid and Acoustical Tile
Tertiary:	Gypsum board (painted)

Facility Group 4 ceiling materials shall be as follows.

Primary:	Gypsum board (painted)
Secondary:	N/A
Tertiary:	N/A

1. Accent ceiling materials such as metal, wood, and rapidly renewable may be used in Group 1 as approved on a case basis.
2. Follow UFC 3-450-01 (Vibration and Noise Control) for acoustic design issues including speech privacy, sound isolation or sound masking.
3. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

Note: *Apply the below base-wide standards for Ceilings (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

E04.1.1. Exposed Framing (Roof / Floor Structure Above)

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Vulcraft

Color: Neutral colors reviewed on a case basis

Finish: Field painted (Sheen per UFGS)

Model #: Formlok floor and roof decking

Other: N/A

UFGS: Section 05 30 00 Steel Decks
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 05 30 00.pdf

E04.1.2. Exposed Concrete

◯ Applicable ◉ N/A

E04.1.3. Grid and Acoustical Tile

◉ Applicable ◯ N/A Number of base standards 2

Type: **Style 1 All Purpose**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Armstrong

Color: White

Finish: Factory

Model #: 2'x2' Tegular with reveal edge and fine texture, grid 15/16"

Other: Performance characteristics are Class A; NRC-0.70; CAC-40; LR-0.86; minimum recycled content 82%.

UFGS: Section 09 51 00 Acoustical Ceilings
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 51 00.pdf

Type: **Style 2 Kitchen**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Armstrong

Color: White

Finish: Factory

Model #: Kitchen – 2′ x 2′ Ceramaguard

Other: Grid 15/16″ Prelude (Ceiling and grid: Fire rated when applicable)

UFGS: Section 09 51 00 Acoustical Ceilings
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 51 00.pdf

E04.1.4. Gypsum Board

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☒ Group 4 ☐ Other

Mfr: US Gypsum

Color: Solid neutral colors

Finish: Paint (sheen per UFGS)

Model #: Tapered edge

Other: N/A

UFGS: Section 09 29 00 Gypsum Board
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 29 00.pdf
Section 09 90 00 Paints and Coatings
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 09 90 00.pdf

E04.1.5. Metal Panels

◯ Applicable ◉ N/A

E04.1.6. Wood

◯ Applicable ◉ N/A

E04.1.7. Rapidly-Renewable Products

○ Applicable ◉ N/A

E04.1.8. Other

○ Applicable ◉ N/A

E05. Doors and Windows

Comply with Air Force Corporate Standards for Doors and Windows:
http://afcfs.wbdg.org/facilities-interiors/doors-and-windows/index.html

E05.1. Doors and Windows and Frames Materials

Facility Group 1
door (frame) and window frame materials shall be as follows.

Primary:	Aluminum, clear or dark bronze anodized
Secondary:	Hollow metal (painted)
Tertiary:	N/A

Facility Group 1
door (leaf) materials shall be as follows.

Primary:	Hardwood veneer
Secondary:	Hollow metal (painted)
Tertiary:	N/A

Facility Group 2
door (frame) and window frame materials shall be as follows.

Primary:	Aluminum, clear or dark bronze anodized
Secondary:	Hollow metal (painted)
Tertiary:	N/A

Facility Group 2
door (leaf) materials shall be as follows.

Primary:	Hardwood veneer
Secondary:	Hollow metal (painted)
Tertiary:	N/A

Facility Group 3
door (frame) and window frame materials shall be as follows.

Primary:	Hollow metal (galvanized, painted)
Secondary:	Hollow metal (galvanized, painted)
Tertiary:	N/A

Facility Group 3
door (leaf) materials shall be as follows.

Primary:	Hollow metal (galvanized, painted)
Secondary:	Hollow metal (galvanized, painted)
Tertiary:	N/A

Facility Group 4
door (frame) and window frame materials shall be as follows.

Primary:	Wood
Secondary:	N/A
Tertiary:	N/A

Facility Group 4
door (leaf) materials shall be as follows.

Primary:	Wood solid core
Secondary:	Composite solid core
Tertiary:	N/A

1. Hardwood casings may be provided over metal frames in Group 1 as approved on a case basis.

2. Paneled textured doors are preferred in Group 4.

3. Do not use hollow-core wood doors.

4. Generally match original hardware in renovations.

5. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

Note: *Apply the below base-wide standards for Doors and Windows (products, materials and color). Then refer to the Appendix and apply any additional requirements specifically related to the Facility District in which the project is located.*

E05.1.1. Aluminum

◉ Applicable ◯ N/A Number of base standards 1

Type: **Aluminum Doors and Frames**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Kawneer

Color: Clear or dark bronze anodized

Finish: Factory

Model #: InFrame Interior Framing, (2x4 nominal framing)

Other: Satin stainless steel hardware

UFGS: Section 08 41 13 Aluminum-Framed Entrances and Storefronts
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 41 13.pdf
Section 08 71 00 Door Hardware
https://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 71 00.pdf

E05.1.2. Hollow Metal

◉ Applicable ◯ N/A Number of base standards 2

Type: **Steel Doors**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Steelcraft

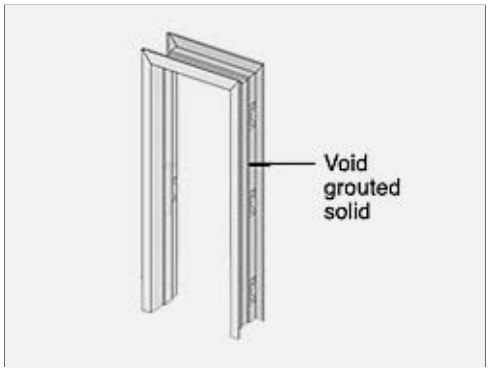
Color: Neutral colors

Finish: Paint (Sheen per UFGS)

Model #: Hollow metal, 2" w. frames, 16 gauge (welded corners) grouted solid

Other: Provide in Group 3 and in utility areas of Group 1 and 2. Provide A25 "galvannealed" coating. All interior steel doors shall have a factory applied primer finish. Provide satin stainless steel hardware.

UFGS: Section 08 11 13 Steel Doors and Frames
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 11 13.pdf
Section 08 71 00 Door Hardware
https://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 71 00.pdf



Type: **Steel Frames**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Steelcraft

Color: Neutral colors

Finish: Paint (Sheen per UFGS)

Model #: Hollow metal, frame grouted solid

Other: Satin stainless steel hardware

UFGS: Section 08 11 13 Steel Doors and Frames
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 11 13.pdf
Section 08 71 00 Door Hardware
https://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 71 00.pdf

E05.1.3. Wood

◉ Applicable ◯ N/A Number of base standards 2

Type: **Style 1, Administrative**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Simpson

Color: Natural hardwood veneer

Finish: Clear Sealer, satin (aqueous)

Model #: 3'x7'x 1 ¾", solid core

Other: Satin stainless steel hardware, Glass lites may be used. Stained birch veneer face, 5 ply construction, rotary cut finish.

UFGS: Section 08 14 00 Wood Doors
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 14 00.pdf
Section 08 71 00 Door Hardware
https://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 71 00.pdf

Type: **Style 2, Residential**

Applies to: ☐ Group 1 ☐ Group 2 ☐ Group 3 ☒ Group 4 ☐ Other

Mfr: Simpson

Color: Natural hardwood veneer or paint grade

Finish: Clear Sealer or paint, satin (aqueous)

Model #: Full slab or panels

Other: Satin nickel hardware

UFGS: Section 08 14 00 Wood Doors
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 14 00.pdf
Section 08 71 00 Door Hardware
https://www.wbdg.org/FFC/DOD/UFGS/UFGS 08 71 00.pdf

E05.1.4. Other

◯ Applicable ◉ N/A

E06. Casework Systems

Comply with Air Force Corporate Standards for Casework Systems:
http://afcfs.wbdg.org/facilities-interiors/casework-systems/index.html

E06.1. Casework Materials

1. Select casework systems and materials considering durability, maintenance requirements and LCCA.

2. Natural stone and cast stone countertops may only be used in Group 1 with approval on a case basis.

3. Metal cabinets and countertops shall be provided in heavy-use operations and in Group 3.

4. Refer to AFCFS for approved materials.

5. Manufacturers listed below are only provided to establish a baseline of equivalency among all applicable manufacturers.

E06.1.1. Plastic Laminate

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1, Low Use Areas**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Formica

Color: Medium Earth tones and neutral tones

Finish: Light textured

Model #: High pressure laminate

Other: Combine with matching solid-surface banding on casework edges.

UFGS: Section 06 41 16.00 10 Plastic-Laminate-Clad Architectural Cabinets
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 06 41 16.00 10.pdf

E06.1.2. Solid Polymer Surface

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1, High Use Areas**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Corian

Color: Medium Earth tones and neutral tones

Finish: Light textured

Model #: Solid Surface

Other: Faces and edge banding

UFGS: Section 12 36 00 Countertops
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 12 36 00.pdf

E06.1.3. Rapidly-Renewable Products

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1, Moderate Use Areas**

Applies to: ☒ Group 1 ☒ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Plyboo

Color: Natural or amber

Finish: Satin

Model #: Flat grain bamboo plywood

Other: FSC® Certified 100%.

UFGS: Section 12 32 00 Manufactured Wood Casework
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 12 32 00.pdf

E06.1.4. Metal

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1**

Applies to: ☐ Group 1 ☐ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Steel Sentry

Color: Natural stainless steel or neural colors (steel)

Finish: Mill (stainless) or Powder coat (steel)

Model #: Lab, workbench, computer workstation

Other: Provide highly durable fabrications and finishes in Group 3 which are subjected to heavy use.

UFGS: Section 12 31 00 Manufactured Metal Casework
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 12 31 00.pdf

E06.1.5. Other

◯ Applicable ◉ N/A

E06.2. Countertop Materials

E06.2.1. Plastic Laminate

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1, Low Use Areas**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Formica

Color: Medium Earth tones and neutral tones

Finish: Light textured

Model #: High pressure laminate

Other: Only use rounded half or full bullnose and integral backsplash. Do not use plastic laminate edge banding on front edges.

UFGS: Section 06 41 16.00 10 Plastic-Laminate-Clad Architectural Cabinets
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 06 41 16.00 10.pdf

E06.2.2. Solid Polymer Surface

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1, High Use Areas**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Corian

Color: Medium Earth tones and neutral tones

Finish: Light textured

Model #: Solid Surface

Other: Faces and edges

UFGS: Section 12 36 00 Countertops
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 12 36 00.pdf

E06.2.3. Natural Stone

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1, Group 1 High Visibility, Heavy Use**

Applies to: ☒ Group 1 ☐ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Local (TBD)

Color: Neutral tones

Finish: High polish, sealer

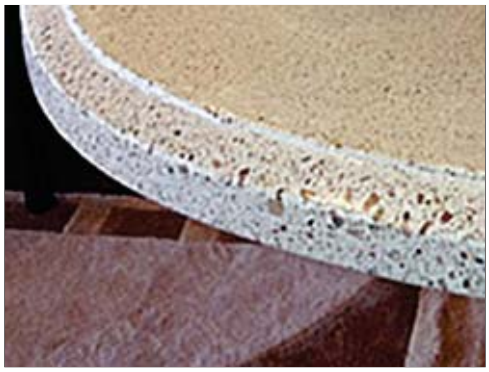
Model #: Custom cut slabs

Other: N/A

UFGS: Section 12 36 00 Countertops
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 12 36 00.pdf

E06.2.4. Cast Stone

◉ Applicable ◯ N/A Number of base standards 1



Type: **Style 1, Group 1 High Visibility, Heavy Use**

Applies to: ☒ Group 1 ☐ Group 2 ☐ Group 3 ☐ Group 4 ☐ Other

Mfr: Local (TBD)

Color: Neutral tones

Finish: High polish, sealer

Model #: Custom cast or cut slabs

Other: N/A

UFGS: Section 12 36 00 Countertops
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 12 36 00.pdf

E06.2.5. Metal

◉ Applicable ◯ N/A Number of base standards 1

Type: **Style 1**

Applies to: ☒ Group 1 ☒ Group 2 ☒ Group 3 ☐ Group 4 ☐ Other

Mfr: Local (TBD)

Color: Natural stainless steel

Finish: Mill

Model #: Custom fabricated countertops

Other: Provide integral fronts, sides and backsplash

UFGS: Section 12 31 00 Manufactured Metal Casework
http://www.wbdg.org/FFC/DOD/UFGS/UFGS 12 31 00.pdf

E06.2.6. Other

◯ Applicable ◉ N/A

E07. Furnishings

Comply with Air Force Corporate Standards for Furnishings:
http://afcfs.wbdg.org/facilities-interiors/furnishings/index.html

E07.1. Durability and Serviceability

Comply with AF Corporate Standards for Durability and Serviceability:
http://afcfs.wbdg.org/facilities-interiors/furnishings/durability-and-serviceability/index.html

E07.2. Accessories

Comply with AF Corporate Standards for Accessories:
http://afcfs.wbdg.org/facilities-interiors/furnishings/accessories/index.html

E08. Interior Signs

Comply with Air Force Corporate Standards for Interior Signs:
http://afcfs.wbdg.org/facilities-interiors/interior-signs/index.html

E08.1 Types and Color

Comply with Air Force Corporate Standards for Types and Color:
http://afcfs.wbdg.org/facilities-interiors/interior-signs/types-and-color/index.html

E08.2. Interior Signs Materials

Natural and cast stone signs may only be used in Group 1 with approval on a case basis.

E09. Lighting, Power and Communication

http://afcfs.wbdg.org/facilities-interiors/lighting-power-and-communication/index.html

E09.1. Functionality and Efficiency

Comply with Air Force Corporate Standards for Functionality and Efficiency:
http://afcfs.wbdg.org/facilities-interiors/lighting-power-and-communication/functionality-and-efficiency/index.html

E09.2. Types and Color

Comply with Electrical, Lighting, Fire Protection, Telecommunication, Mechanical, and Plumbing requirements listed in Section G Appendix. Interior facility lighting fixtures shall be controlled by motion detectors and daylight controls where appropriate for energy conservation. All fixture lamps shall be LED.

F. APPENDIX - Facility Districts

- ○ Applicable
- ◉ N/A

G. APPENDIX - References

Comply with Air Force Corporate Standards:
http://afcfs.wbdg.org/index.html

Comply with Nellis-Creech **Electrical** Requirements:
Copy provided by Base Civil Engineer office or Contracting Officer

Comply with Nellis-Creech **Lighting** Requirements:
Copy provided by Base Civil Engineer office or Contracting Officer

Comply with Nellis-Creech **Fire Protection** Requirements:
Copy provided by Base Civil Engineer office or Contracting Officer

Comply with Nellis-Creech **Mechanical-Plumbing** Requirements:
Copy provided by Base Civil Engineer office or Contracting Officer

Comply with Nellis-Creech **Utility Meter** Requirements:
Copy provided by Base Civil Engineer office or Contracting Officer

Comply with Nellis-Creech **Telecommunications** Requirements:
Copy provided by Base Civil Engineer office or Contracting Officer

NELLIS AND CREECH AFB
INSTALLATION FACILITIES STANDARDS (IFS)
ELECTRICAL REQUIREMENTS

22 JAN 2019

This document is an appendix to Nellis & Creech Air Force Bases IFS which is located here: https://www.wbdg.org/ffc/af-afcec/installation-facilities-standards-ifs/nellis-creech-afb-ifs

LOW VOLTAGE (50v-600v) SYSTEM REQUIREMENTS:

1. All electrical receptacles and panels shall be labeled. Receptacle Labels must include panel number, circuit number, and voltage. Labels shall be made of polyethylene printed tags and will be attached with High Tack Adhesive rated at 140degF if outdoors or Permanent Adhesive if indoors. Panel labels shall be laminated (with black lettering on a white background), engraved with 1/2" high letters. Attach to front exterior of enclosures. Labels shall match plan designations. Panel circuit directory label shall be engraved laminated plastic with black lettering on a white background. Outdoor panels will have circuit directory mounted on inside with screw and nuts, no rivets permitted. Indoor panels shall not have labels or circuit directory riveted to enclosure. No handwritten or typed paper labels will be accepted.
2. Electrical equipment, wires, cables etc. installed in non-air conditioned rooms, i.e., mechanical rooms, utility rooms, electrical rooms, and hangar bays shall be de-rated or re-rated based on ambient temperature. Mechanical and boiler rooms shall use 140 degrees F or 60degC. Hangar bays between 5ft below and up to the door openings and above door openings shall use 140 degrees F. Hangar bays below 5ft of the hangar door openings shall use 122degF if air circulation is present to keep the bay temperature below 122degF. or 131degF if not. Electrical rooms may use 50degC or 122degF if no large sources of heat are present. The use of HVAC in mechanical rooms, utility rooms, electrical rooms will specifically waivered by the base regardless of any UFC requirements to the contrary.
3. All electrical equipment, wires, cables etc. installed outdoors above ground in non-classified areas shall be de-rated or rerated based on the ambient temperature of 140 degrees F if in unshaded areas or 122degF if in shaded areas without direct sunlight impingement. Rooftop mounted equipment shall use a minimum of 140degF. Enclosures shall be NEMA 3R/12(meets both 3R and 12 ratings) or NEMA 3 or NEMA 4 minimum.
4. All Low Voltage Underground circuits other than Service Entrance cables shall be installed in conduits and encased in 300 PSI concrete slurry when routed under parking areas, roads, sidewalks and other traffic areas.
5. All exterior light fixtures including LED drivers shall be rated for ambient temperature of 120 Degrees F or greater. Photocells shall be rated for operation in 140degF ambient.
6. All standard normal computer workstations shall use 300 VA at continuous duty in the load calculations and shall be on dedicated receptacle circuit(s) different from general purpose

receptacles. Install a maximum of four standard computer workstations with or without one 6-Amp printer on a single circuit. Heavy duty computer workstations have higher VA continuous duty requirements and less computers allowed per each dedicated circuit.

7. Large fax machines, large printer/copiers with or without an associated printer server computer, and large shredders shall have dedicated branch circuits for each unit.
8. All offices shall have at least one (1) general purpose duplex receptacle not used for computers or other loads. All areas within a building/facility i.e., offices, corridors, shall be within 15-feet of a general purpose receptacle.
9. Provide dedicated electrical circuits to each panel that serves ACS, IDS, CCTV, EMCS, Fire Alarm & MNS system and to other control systems.
10. Electrical circuits serving loads exterior of a facility must not be connected to loads inside of the facility. Exterior located ground fault receptacles shall not have downstream receptacles tied to ground fault load terminals. Mechanical yard receptacles used for servicing equipment shall be on dedicated circuits from all other ground fault receptacles.
11. Panelboards: Specify breakers, no fuses. Square D or GE are preferable.
12. Contactors: Specify magnetic contactors, not manual. Lighting contactor with photocell, locate photocell as high as possible. Photocells shall be rated for inductive load use and be rated for the ambient temperature seen at the location.
13. Motor Starters: Always specify thermal overload usually with class 20 protection. Use of electronic overloads in starters is generally not permitted due to ease that the overload settings may be adjusted too high. Specify with a hand-off-auto switch so that it can be manually started if necessary.
14. Wire: All wiring shall be copper. No aluminum is allowed. All wires larger than #10 shall be stranded copper. For indoor and general wiring, specify THHN-2 insulation. For outdoor underground wire, specify either THWN-2 or XHHW-2. Note that for all motors that over 1/4HP or larger at 208/240/480v and larger than 1/8HP at 115v, the final termination to motor junction boxes shall be made with stranded wire.
15. Dry Type Transformers mounted indoors: Specify copper windings, 115 Deg C rise over a 40 Deg C ambient. Outdoors: 105 DegC rise over a 50 DegC ambient.
16. Wiring Devices: Provide new devices whenever an area is renovated. All devices shall be recessed except in mechanical rooms, utility rooms, and secure areas. Provide devices rated at 20 amps minimum. Devices must be of internal copper construction unless waived in writing by Base Civil Engineer (BCE) office (99CES/CENMP) which waiver shall not assumed to be given.
17. Controllers: Provide battery backup for landscape irrigation system controllers having appropriate temperature ratings. Automatic setback thermostats shall use battery backup for backup memory only and shall generally be operated from line power or from power supplies for operation at 50v or less not from batteries.
18. Over-Current Protective Devices: The minimum sized over-current device for receptacle and lighting branch circuits is 20 amps. Ensure proper coordination and withstand ratings for all over-current protection devices. No Fuses allowed on panelboards and switchboards except for specialty applications.
19. No series rating of circuit breakers permitted.

20. Demonstrate coordination with first upstream existing protective device. Replace old circuit breakers with new when remodeling facilities or if no AIC rating is listed on circuit breakers. If replacement breakers are unavailable, the replacement of entire panelboard is required.

21. Provide non-ferrous phase and circuit identification labels in all enclosures for feeder circuit conductors. Provide underground marker tapes for all underground conductors. If underground conductors are not in metallic conduit, provide marker tape with foiled backing to facilitate detection.

22. Add PF capacitors to induction motors (50 HP or larger) to correct PF to 0.95 (+ .00, - .05). Switch PF capacitors with the motor with the capacitors connected before the overloads. Size capacitor IAW Institute of Electrical and Electronics Engineers (IEEE) 141, National Electrical Manufacturers Association (NEMA) MG2, and motor manufacturer recommendations. Not required if a VFD is to operate the motor.

23. Power requirements for buildings shall be either 480Y277 or 208Y120 for three phase or 240/120 for single phase. Selection of voltage depends on several criteria: If the building has large HVAC units(better energy efficiencies) or large UPSs(smaller footprint at 480v) or large amount of stationary or portable inverters for powering aircraft or a large amount of motors(better energy efficiencies) will tend to require the use of 480Y277. All buildings requiring more than 50KVA shall use 3phase. All buildings requiring 500KVA service transformer or larger will use 480Y277. It is base policy to have one service transformer and one main service entrance per building. If 208Y120 is required for a building that has 480v service, the 208Y120 will be supplied by one or more drypack stepdown transformer(s) located inside the building. Balance loads on phases within 10 percent at all panelboards.

24. All electrical penetrations through fire-resistance rated walls shall be fire stopped.

25. All meters shall comply with Nellis-Creech IFS Utility Meter Requirements document listed in IFS Appendix G. Meters shall generally be located inside building and near service entrance. Meters shall meet Energy Management (AMRS) requirements. Cat-6 data port shall be installed to support all meters and ran to the main comm. room. The preferred location for the meter CTs is immediately downstream of the main service circuit breaker and ahead of all feeder breakers. A 3pole feeder circuit breaker of 20A or less is to be furnished in the main switchgear to provide power to the meter and/or the meters' PT leads. If photovoltaic arrays are supplied with or connected to a building then a second meter for the PV array shall be furnished. This meter's CTs and PTs shall be connected immediately downstream of the main switchgear or panelboard's feeder breaker that the PV array inverter(s) is connected to. Meters or their CTs are not to be mounted in or on service transformers.

26. Provide lightning protection system (LPS) as required. Reference Annex L of NFPA 780 (Lightning Protection Code) and complete risk assessment for project. If LPS is required, design and install per NFPA 780 and AFM 88-9, Chapter 3. Mission critical, mission support facilities, and facilities with extensive electrical and communications equipment shall have LPS. Note that if the lightning protection grounding ring or counterpoise also serves as the main electrical and communication grounding counterpoise, the lightning protection ring conductors and ground rods will be upgraded and installed to the base standards for grounding counterpoises.

27. All service entrance panels rated over 225A shall have all 100% rated breakers.

Service entrance panels rated 200 or 225A shall have the main panel circuit breaker rated at 100%.

28. Heaters and other similar resistive loads 5KWand over at 208v and 10KW and over at 480v shall have their voltage drop limited to 2% (4% power loss) or less as computed starting with 208.0v or 480.0v at the service transformer secondary terminals.

29. Service entrance conduits from transformer to service entrance panel shall be a minimum of 2" in diameter. There shall be 25% spares with at least one spare conduit with pull rope and #10 THWN Cu tracer.

30. Depth of Secondary Entrance conduit shall be a minimum of 24inches. These conduits will be concrete encased at 500 PSI concrete if the distance from transformer to building is greater than 10ft. These conduits shall be encased in 3000 PSI rated concrete if routed under traffic areas and 4,000 PSI if routed under heavy traffic areas; i.e. aircraft, Tractor Trailers and other loads greater than 26000lb.

31. Install a ground ring around the perimeter of new or renovated building/facilities. Counterpoise ground ring shall consists of multiple (minimum of 4) 3/4" x 10 ft long ground rods interconnected with bare 4/0 copper wire for the ring. The counterpoise must be terminated either at the main service switchgear grounding buss bar or at a separate main grounding buss mounted in the main electrical room. Main service switchgear grounding buss bar shall be connected with 4/0 copper to the separate main grounding buss. The counterpoise serves as the primary grounding electrode for the building.
    All other grounding systems (including ufer, water pipes, metal gas pipes, comm., building steel) shall be each separately connected to the main grounding buss with bolts for future testing of each ground. Note that 5 or 10 ohms to ground required by comm is more restrictive than the 25ohms required by NEC or the higher values required for lighting protection.
    a. All grounding connections shall be cad welded and tested.
    b. The main connections for all grounding systems shall be accessible and permanently labeled.
    c. Ufer ground is always to be furnished on new construction. Additions to building will either connect to the existing ufer or run a separate 4/0 ufer ground to the main grounding buss bar.
    d. Bldg. steel connections shall be made to the main grounding buss with 4/0 Cu, not directly to the counterpoise grounding ring.
    e. Comm. room ground buss bars shall be made to the main grounding buss with 4/0 Cu, not directly to the counterpoise grounding ring.
    f. A minimum of four (more on large buildings) inspection ports to be furnished.
    g. Counterpoise grounding rings are necessary due to the high resistivity soils of 2k-40kohm-cm seen in Southern Nevada and 40ft+ deep water tables.

32. Low voltage switchboards, panels, disconnect switches, VFD enclosures, and above ground junction boxes are not to be rated NEMA 3R due to the presence of wind blown dust in southern Nevada (see NEC section 110.28). All of these items are to be rated for NEMA 3 or NEMA 4 or NEMA 3R/12 (ie meets both NEMA 3R and NEMA 12 ratings). Conduits entering these enclosures are to be sealed to avoid dust and water infiltration. All gaskets

and adhesives on enclosures are to be rated for 122degF (50degC) if shaded or 135deg F (56degC) if at or within 5ft of ground level. Non-shaded roof top items or located above 5ft. above grade are to be rated for a minimum of 140degF (60degC).

33. Disconnect switches or other enclosures with disconnects are to be flange mounted or side mounted or similar and are not to be thru the door type. They are to have heavy duty HP ratings, not general purpose ratings.

34. Building drypack transformers are to be numbered 1T, 2T, 3T…Bldg. Service Transformers generally will be numbered as T-xxxxx where xxxxx is the building number of one of the buildings or main building served by this transformer.

35. All motors used outdoors and in non-HVAC mechanical rooms are to be rated or derated for use at 50 deg C (122 deg F) if in shaded areas. Motors mounted on rooftops and in non-shaded areas will require 60degC (140 deg F) ratings due to direct sunlight impingement. ODP type of motors are prohibited outdoors and in non-conditioned mechanical rooms. Note that rooms utilizing swamp coolers do not make a space conditioned.

36. Security Systems: Provide all electrical service, conduits, and junction boxes for Access Control System (ACS), Intrusion Detection System (IDS) and CCTV in secured facilities or special access areas. ACS, IDS, and CCTV will be installed as GFGI equipment by the building tenant unless otherwise stated. Design, layout, and construction shall be coordinated with building tenant and their security representative.

37. PLC control systems requirements: Drawings for PLC systems shall include a power schematic, control schematic that includes an PLC I/O schematic, a drawing that shows all cables between PLC processor and I/O racks and all dip switch settings(and their meanings) for processor, I/O cards, I/O racks. Other drawings required are pushbutton station layouts and detail wiring, main panel layout, main panel terminal block layout, and main panel detail wiring, interconnection drawings, and system conduit layouts.
    a. E-Stop circuit shall be hardwired at 120v. PLC 120v inputs shall be controlled by NO contacts, PLC outputs shall be controlled by a NO timed contacts with timer set at a max. of 50 msec(3 AC cycles) allowing for the PLC to turn off outputs before the control power is interrupted.
    b. The I/O power shall be at 120v wherever possible. Solenoid valves, starters, contactors, starter aux. contacts, circuit breaker aux. contacts, float switches, temp switches, photocells, pushbuttons, pilot lights, etc. shall be powered at 120v.
    c. The base reserves the right to specify the manufacturer of the PLC processor to ones that the base is familiar with. Allen-Bradley or Modicon currently. Other ones may be proposed subject to BCE acceptance. No additional charge shall be incurred for this change. The contractor shall include in his contract the tuition price for 2 electrical personnel from BCE shops to attend sufficient programming /maintenance /documentation classes to gain experience on the PLC used. The contractor also shall reimburse the travel and per diem expenses (not salary costs incurred) to the government.
    d. The PLC must be programmed in relay logic, and all logic must be viewable and editable. Logic shall not be password protected. I/O, storage coils and registers must

have names associated with them in the logic documentation (printouts and on screen displays).

e. Contractor utilizing PLCs must furnish to the government, a laptop with all necessary licensed software including Windows, Excel, Word, antivirus software, PLC software with 5 years worth of prepaid software updates as part of the contract. The licenses shall be assigned to the government (BCE). The licenses shall not expire and shall be able to view, edit, and document the program at all times. All software shall be furnished on CD or CDRW and it shall not be required to have internet connection to activate the software as this laptop cannot be attached to the AF network.

38. Hangar bays. Disconnects switches, motor control centers, panelboards, control panels, junction boxes, and other similar electrical equipment located below top of hangar door opening(usually 22-25ft high) in non-classified electrical area (as defined in NEC) shall be rated Nema 4 or Nema 4X depending on corrosiveness and/or chemical composition of fire suppression foam used. Any dry type transformer used in hangar bays shall be of the sand-filled epoxy type, with rubber waterproof boots around the terminal connections including any voltage tap connections, and shall have all conduit entries to the transformer sealed to prevent water infiltration from transformer to conduit. Note that the first 18”AFF is considered in hangars to be a classified area per NEC 513.3(B).

39. Buildings containing rooms with fire pumps: Fire pumps shall be powered by one of the two methods listed below in a or b:
    a. A separate service transformer whose full load rating exceeds the total of 150% of sum of all fire pumps and jockey pumps plus 100% of house load for the fire pump room if any. Contractor shall provide a MLO main switchboard in the fire pump room or in the main electric room containing 1 CB per fire pump controller and with 1 CB per jockey pump controller and 1CB for feeding a small house transformer if any. Service entrance conductors to be sized at 625% of the first or largest fire pump plus 125% of the second fire pump plus 125% of the jockey pumps plus 100% of the house load.
    b. The other scheme is one transformer with service conductors feeding a main switchgear having a center section with MLO connections feeding a horizontal buss sized at locked rotor amps of the largest fire pump plus the building main circuit breaker amps. The left vertical section will have 1 CB per fire pump controller and with 1 CB per jockey pump controller with vertical buss rated at twice the locked rotor amps of a fire pump. The right vertical section will have the main circuit breaker for the building with additional feeder sections extending to the right.
    Service entrance conductors to be sized at 625% of the first or largest fire pump plus 125% of the second fire pump plus 125% of the jockey pumps plus 100% of the building main circuit breaker.
    Service transformer to be sized at whose full load rating exceeds the total of 300% of the first or largest fire pump plus 125% of the second fire pump plus 125% of the jockey pumps plus 100% of the building main circuit breaker size. In this instance the house load for the fire pump room will be supplied from the regular building supply.

40. Buildings having an out building with fire pumps: Fire pumps shall be powered by the following method:

a. A separate service transformer whose full load rating exceeds the total of 150% of sum of all fire pumps and jockey pumps plus 100% of house load for the fire pump room if any. Contractor shall provide a MLO main switchboard in the fire pump room or in the main electric room containing 1 CB per fire pump controller and with 1 CB per jockey pump controller and 1CB for feeding a small house transformer if any. Service entrance conductors to be sized at 625% of the first or largest fire pump plus 125% of the second fire pump plus 125% of the jockey pumps plus 100% of the house load.

41. Reference separate Nellis-Creech IFS appendix documents for Lighting, Fire Protection, Mechanical-Plumbing, Utility Meter, and Telecommunications Requirements.

MEDIUM VOLTAGE (4160v, 12.47Kv, 25Kv) SYSTEM REQUIREMENTS:

42. All High and Medium Voltage equipment and materials shall be submitted to the base electrical engineer in the Base Civil Engineer (BCE) office for approval before ordering.

43. It is base policy that medium voltage conductor sets contain a 100% neutral conductor equal in size to the phase conductors generally composed of 1/3 copper concentric neutral on each phase conductor for proper grounding of the base medium voltage electrical system.

44. All Medium Voltage Underground circuits shall be installed in conduits and encased in Red Dye 500PSI concrete if in unimproved area, 3000PSI if in light traffic roads and parking lots, and 4000 PSI in high traffic roads, parking lots, and aircraft areas.
    a. The top of conduits/ducts shall be a minimum of 36 inches below grade.

45. The design of underground distribution systems shall be based on the calculated demand with sufficient electrical capacity for expansion and for crossties to other base circuits. Note that all main base circuit conductor sizes and major crossties between base circuits conductor size will be determined by the base electrical engineer in the BCE office (99CES/CENMP). Any required replacement of existing undersized conductors will be upgraded to the current required size.

46. Manholes shall only be installed if multiple medium voltage circuits are required and bending radius mandate their use. Use of manholes must be preapproved by the base EE before any use is contemplated. The base mandates that vaults be installed. Nevada Power Company (local utility dba NV Energy) Style RS-82A units are preferred. These units must contain torsion-assisted lids and a maximum depth of 5’9”.
    a. Any manholes permitted shall contain drainage leech fields sized to allow all water to drain from manhole within 24hours. This is due to poor drainage of the soils.
       This drainage shall be tested by contractors before energization of any primary circuit in the manhole.
       Other measures must also be taken to prevent water infiltration.
    b. Vaults or Manholes shall have racking systems to support all cables.
    c. Each Underground enclosure shall contain its own grounding electrode system. Grounds shall be interconnected to the circuit/system ground.

47. No splices, Load-break or Dead-break junctions are permitted in manholes or vaults. T and Y splices are never allowed. If standard splices must be installed, the contractor must gain advance written permission from the base electrical engineer in BCE office. This will not normally be granted as the base will generally require the installation of a switch or a sectionalizer.

48. All Medium Voltage cables shall be tagged with labels that meet the Nellis Standard. Labels shall be installed on cables at all equipment and in all underground enclosures. Contractors must contact the base Electrical AHJ for an example of the approved labels.

49. All Medium Voltage cables installed shall be looped and racked in underground enclosures and where required for support. These cables shall also be wrapped in Fire Tape when installed in these areas.

50. All 15KV Medium Voltage 3phase UG cables shall be a set of three 133% EPR insulated Cu MV105 cables with 1/3 copper concentric neutrals. Standard 3 phase cable sizes are #2, 1/0, 2/0, 250MCM, 500MCM, 750MCM. Single phase cables shall be 133% EPR insulated Cu MV105 cables with 100% copper concentric neutrals. Standard single phase sizes are #2, 1/0, 2/0, and 250MCM.

51. All newly installed medium and high voltage cables shall be tested using a High-Potential-Pot or Very Low frequency (VLF) alternating voltage withstand method before being placed in service. Test results shall be submitted to the government immediately upon completion.

52. A counterpoise ground ring shall be installed around all Medium Voltage transformers, switches, sectionalizers, and other equipment. It consists of four (4) 3/4" x 10 ft deep ground rods at each corner interconnected with bare 4/0 copper wire ground ring.

    a. Transformer secondary grounding electrode conductor will also be separately connected to the ground ring with 4/0 THWN.

    b. Transformer primary grounding electrode conductor will be separately connected to the ground ring with 4/0 THWN.

    c. MV switches will have two 4/0 THWN connections to ground ring (one on each side with 4/0 Cu)

    d. One side of transformer counterpoise may be incorporated into building counterpoise if located close enough. Service transformer and building grounding counterpoises will tied together with 4/0 conductor if located within 10ft of the building. Location of crosstie will be shown and DIMENSIONED on drawings.

53. Sectionalizers(12.47KV) shall meet the following requirements:

    a. Sectionalizer will have one 4/0 connection to ground ring.

    b. Enclosures shall be constructed of mild steel and be factory painted Sierra Tan color or close equivalent. Use of fiberglass and other non-metal type of enclosures is prohibited.

    c. Must have sufficient parking positions for all 15KV cables.

    d. Sectionalizer mounting Pads are to have hand-holes underneath the pad openings. Pads are to be similar to Jensen precast pads used by Nevada Power with pad window openings to match the sectionalizer. Conduits shall not be grouted into the pad. All pads shall be detailed on drawings.

    e. Provisions for anchoring top opening doors to prevent closing in 70MPH winds.

f. Sectionalizers shall have adequate working room. Use of compact type sectionalizers prohibited as the base considers these to have inadequate working room.

g. Cooper SpecTer type sectionalizers are the basis for comparison for all others.

54. All Medium Voltage Switches (4KV-25KV) shall meet the following requirements:

a. All switches shall be dead-front type construction, shall be double sided, and contain parking positions for each Load-break or Deadbreak Elbow. (No Pothead Terminations allowed).

b. Only these (Cooper) switch style configurations will be permitted:

Style 9	2 Mains, 2VFI laterals	
Style 10	4 Mains	* Used at major switching points only.
Style 11	3 Mains, 1VFI lateral	
Style 12	1 Main, 3VFI laterals	* Not usually permitted. Use 5W2 style.
Style 5W2	2 Mains, 3VFI laterals	
Style 6W2	2 Mains, 4VFI laterals	
Style 6W3	3 Mains, 3VFI laterals	

All other proposed styles (which are special cases) must be approved in advance in writing by the base electrical engineer in BCE office. Approval is typically not provided. Note that the base has had several recent episodes of replacing styles 5, 6, and 7 switches with style 9.

c. All Loadbreak or Deadbreak Elbows shall be rated 15KV minimum.

d. All switch laterals shall be VFI type. (No fuse type switches are allowed).

e. VFI to be Triphase with Ground type having either EF or KF trip curves. All three phases shall trip on a fault.

f. Each switch section shall have an on-off switch and a viewable switch window.

g. All switches shall be oil insulated type. Oil shall be FR3 or biodegradable seed oil. No airbreak switches or gas insulated switches allowed.

h. Generally the main sections of all switches shall be 600Amp minimum with an occasional use of 900A in locations determined by the base. 200A may be allowed with advance approval of the base electrical engineer in BCE office.

i. The Lateral sections of all switches shall be 200 Amps minimum.

j. Terminate all grounds and neutral connections on NEMA ground pads or flat ground bars. Use of ½-13 single bolts not permitted due the number of connections required.

k. Oil filler and drain valves with oil sampler shall be provided.

l. No Air-break or SF6 switch sections permitted.

m. No key interlock type switches shall be permitted.

n. Switches shall be factory painted Sierra Tan color or close equivalent.

o. All switches are to have sideways opening doors with pentabolts and padlocking provisions for the doors. No main doors to open upwards. No low profile switches or clamshell type.

p. Switch mounting Pads are to have hand-holes underneath the pad openings. Pads are to be similar to Jensen precast pads used by Nevada Power with pad window openings to

match the switch. Conduits are not to be grouted into the pad. All pads to be detailed on drawings. Use of precast pads is preferred.

q. Cooper Kyle switches are preferred. Others may be approved by BCE office if they have similar specifications and characteristics and have sufficient working room inside. Use of so called compact switches is prohibited.
r. All switches shall have a 10KA (12KA preferred) minimum interrupting rating.
s. Switches shall not be installed on top of vaults or on Manholes.

55. All Medium Voltage Transformers(primary at 4160v or 12.47KV or 25Kv) shall meet the following requirements:
    a. All Medium Voltage Transformers greater than 50KVA shall be 3-phase, not single phase. Buildings and trailers requiring 480v secondary voltage shall be only 3-phase, not single phase.
    b. 3 phase primaries shall be 3 phase delta connected. 3 phase secondaries shall be wye connected. Use of 3 phase transformer secondaries having one phase centertapped to create 120v or 240v to ground is generally not permitted by the base.
    c. All transformers shall be dead-front construction in the primary compartment and contain parking stands.
    d. All transformers shall be pad mounted type only. No Clamshell type transformer allowed. Installation or use of any pole mounted transformer or transformer bank shall require advance written approval by the base electrical engineer.
    e. Transformer mounting pads shall contain hand-holes underneath the pad openings. Pads are to be similar to Jensen precast pads used by Nevada Power with pad window openings to match the transformer. Conduits are not to be grouted into the pad. Note that use of precast pads is preferred.
    f. Transformer shall be loop feed, with three (3) 2-position on-off 3phase oil immersed switches (one switch each for A, B, T). Use of four, five or six position switch is not permitted.
    e) Provide 3-nominal 9KV (8.4KV actual) or nominal 10KV (9.0KV actual) MOV in 15KV elbows on B feed connected phase to ground on all transformers that are last on a lateral circuit.
    f) Provide metal isolation between the Primary and secondary compartments of each transformer. Mild-steel construction shall be used.
    g) Provide 5-Position oil immersed primary tap changer (+5.0%, +2.5%, 0%, -2.5%, -5.0%).
    h) Provide parking positions for Loadbreak Elbows on A and B feeds.
    Parking positions to be provided for A and B feeds. Note that 2 parking positions are to be provided between the two C phases. (total of 6 required)
    i) Doors to swing out, not up. Pentabolts on doors. Doors to be padlockable. This is also true of any single phase transformer.
    j) Fuses to be bayonet type oil immersed removable in primary compartment having cups below them in series with in-tank current limiters. No bolt-on fuses are allowed as these are considered to be non-dead-front connections.
    k) Units shall have Copper primary and secondary windings only.
    l) Units shall have Pressure-vacuum gauge, temperature gauge, oil filler and oil sampler.
    m) NEMA ground pads in primary compartment for termination of 100% incoming and outgoing primary neutrals and grounds and 4/0 from ground ring.

n) NEMA ground pads in secondary compartment for termination of secondary connection (4/0) from ground ring.
o) Transformer to be oil filled. No SF6 or dry type permitted. Oil shall be seed type oil such as FR3 or other environmentally friendly oil.
p) Transformers shall be factory painted Sierra Tan color or close equivalent.
q) Transformers to be rated for operation at 45degC (113degF) average ambient and with 50degC winding rise instead of the normal ratings of 30degC ambient with 65degC rise, maintaining the average hot spot temperature rating of 95degC. Note that this transformer must be suitable for operating at 43degC (109.4degF) for 12 hours per day with included ambient peaks up to 117degF for 4 hours.
r) Transformers shall not be installed on top of vaults or on Manholes.

56. Designs shall include the size and impedance of the new or existing transformer. Minimum impedance shall be 2.50% for transformers up to 125KVA; 3.00% for 150, 225, and 300KVA; 4.00% for 500 and 750KVA and 5.00% for 1000KVA and larger. If impedance is greater than 5.00% the contractor shall receive written pre-approval from base electrical engineer in BCE office. Maximum impedance allowed is 6.5%. Transformer impedance must be shown on electrical single-line drawing.

57. Designs shall include the size and impedance of new or existing transformer(s). Minimum impedance shall be 2.50% for transformers up to 125KVA; 3.00% for 150, 225, and 300KVA; 4.00% for 500 and 750KVA and 5.00% for 1000KVA and larger. If impedance is greater than the maximum of 6.75% (greater than 6.75% is a specialty transformer) the contractor shall receive written pre-approval from the Base Electrical Engineer. MINIMUM transformer impedance must be shown on electrical single-line drawing.

58. Design shall include the short circuit calculations. Basis of short circuit calculations is that infinite primary utility current is always available on the primary when calculating secondary short circuit current. MINIMUM allowed impedance shall be shown on the singleline for all transformers. Downstream panels from all transformers shall have a maximum calculated short circuit of approximately 90% of panel AIC rating available per the following chart:

Panel AIC rating	Maximum Calculated short circuit amps allowed.
10KAIC	9.0KA
14KAIC	12.5KA
18KAIC	16.0KA
22KAIC	20.0KA
28KAIC	25.0KA
35KAIC	31.5KA
42KAIC	38.0KA
65KAIC	59.5KA

59. The following shall be shown on the electrical drawings, not solely in the technical analysis or in calculation booklet:
    a. Summary charts of short circuit calculations.
    b. Summary charts of voltage drop calculations.
    c. AIC Ratings of all panels.

END OF ELECTRICAL REQUIREMENTS

NELLIS AND CREECH AFB
INSTALLATION FACILITIES STANDARDS (IFS)
LIGHTING REQUIREMENTS

22 JAN 2019

This document is an appendix to Nellis & Creech Air Force Bases IFS which is located here: https://www.wbdg.org/ffc/af-afcec/installation-facilities-standards-ifs/nellis-creech-afb-ifs

1. Codes and Standards: All design and construction shall be in compliance with the most recent versions of the following:

- Nellis & Creech Air Force Bases Installation Facilities Standards (IFS)
- Unified Facilities Criteria (UFC) 3-530-01 Design: Interior, Exterior Lighting and Controls
- Unified Facilities Guide Specification (UFGS) 26 51 00.00 40 for interior lighting
- UFGS 26 56 00 for exterior lighting
- UFGS 26 56 19.00 40 for roadway lighting
- UFGS 26 56 23.00 40 for area lighting
- UFGS 26 56 36 00 40 for flood lighting
- UFGS 26 56 20.00 10 for airfield and heliport lighting
- AFI 31-101 Integrated Defense for security applications

2. All interior and exterior lighting fixtures shall comply with the following:

2.1 Fixtures shall be solid-state LED luminaires designed specifically for LED technologies (typically flat to compliment the directional characteristics of LEDs) with integrated controls and remote lighting level adjustment/dimming capabilities.

2.2 Fixtures shall have a color temperature in KELVIN of between 4000K and 4500K. Fixtures shall have appropriate illumination volume (foot candle/lumen) output to meet work surface UFC guidelines per fixture/space photometric analysis (using typical manufacturer software).

2.3 LED Luminaires shall have a minimum warranty of 10 years.

2.4 LED Drivers shall have a minimum warranty of 5 years.

2.5 Ballasts and lamps shall have a minimum rated life of 50,000 hours.

2.6 Fixtures shall be rated to operate at ambient temperatures between 0 degrees F and 120 degrees F or higher. This requirement does not apply to Interior Recessed, Downlight, and Wall Wash Fixtures.

2.7 T-8, T-5, Induction, and High Intensity Discharge fixtures are prohibited.

2.8 All interior (and all practicable exterior) facility lighting fixtures shall be controlled by motion detectors. Any exceptions shall be requested by Contractor for approval by the Contracting Officer. No exceptions will be made for restroom and conference room fixtures. Wall switches shall be installed to turn sensors/lights on and off as needed (i.e. lights off in a conference room in order to view wall screens). Sensors shall be placed in a location not affected by movement outside of open doorways. Daylighting wall switches shall be installed to allow dimming/turn-off of fixtures located nearest to windows, hangar/truck doors or similar daylighting sources. This may also be accomplished with photocell controls for automatic dimming/turn-off.

3. Interior Fixtures located 20 feet or less above finished floor:

3.1 Luminaires shall be solid-state LED Luminaires (preferably flat plate as opposed to Silver Bowl, recessed, or light scattering fixtures) with full remote dimming controls.

3.2 LED linear replacements for existing fluorescent fixtures may be used provided that the following conditions are met:

3.2.1 The existing ballast shall be replaced with LED Driver or electronic ballast specifically for LED applications.

3.2.2 Fixtures shall have a color temperature as indicated in 2.2. Other color temperatures may be considered in housing applications, hospitality applications, and in maintenance facilities. See UFC 3-530-01 for additional information.

3.3 Provide wire guards for all open LED linear replacements.

4. Interior High Bay Fixtures located higher than 20 feet above work surface: Each fixture shall have on/off motion sensors (with partial shutoff delay before full off), and be remotely adjustable (infrared or Bluetooth) light output/on-off control.

5. Exterior Street and Parking Lot Fixtures:

5.1 All street and parking lot light fixtures shall include appropriate controls for dusk till dawn photocells (one photocell per fixture). Parking area fixtures shall have automatic dimming for late-night to dawn operation to increase energy savings when parking lots are typically vacant.

5.2 Glass fixture lens are preferred.

6. Exterior Wall Pack and Walkway Fixtures:

6.1 All wall pack lighting fixtures shall include dusk till dawn photocells; wall-packs away from ingress/egress points and not illuminating Air Force assets (mechanical and electrical equipment, trash enclosures, etc.) shall also have motion sensor controls to eliminate energy waste and night sky pollution.

6.2 All walkway lighting fixtures shall include dusk till dawn photocells.

6.3 Glass fixture lens are preferred.

6.4 Light bollards shall be full cutoff type and vandal resistant. Bollards shall not have exposed vertical plastic/acrylic lens. Electrical service shall be 208v maximum with 120v to ground.

7. Exterior Area, Flood, Canopy, and Security Lighting Fixtures:

7.1 As appropriate, Contractor shall obtain lighting design approval from base Security Forces and/or base Antiterrorism Force Protection (ATFP) office.

7.2 Fixtures shall be compatible with CCTV, and night vision goggles.

7.3 Fixtures shall meet appropriate illumination requirements for security and ATFP.

7.4 Certain large area security lighting applications may employ individual fixture motion sensor on-controls to identify intrusion points with lighting where otherwise fixtures remain off, saving energy.

7.5 Automatic dimming/on-off and motion sensors shall be used to allow energy savings during low use times while maintaining some illumination for adequate security when dimmed.

8. Exterior Airfield / Apron Lighting Fixtures:

8.1 As appropriate, Contractor shall obtain lighting design approval from Airfield Operations office, base Security Forces, and/or base ATFP office.

8.1.1 Fixtures shall be compatible with CCTV, and night vision goggles.

8.1.2 Fixtures shall meet appropriate illumination requirements for aircraft and equipment operations and ATFP/security.

8.2 Glass fixture lens are preferred.

8.3 Automatic Bi-level dimming with occupancy sensors shall be explored to allow energy savings when lights are used infrequently, or when instant-on LED capabilities enhance security achievement. Certain locations (i.e. personnel/vehicle doors or gates) shall have motion sensors that only dim lighting to maintain access point illumination.

9. Reference separate Nellis-Creech IFS appendix document for non-lighting Electrical Requirements.

END OF LIGHTING REQUIREMENTS

NELLIS AND CREECH AFB
INSTALLATION FACILITIES STANDARDS (IFS)
FIRE PROTECTION REQUIREMENTS

22 JAN 2019

This document is an appendix to Nellis & Creech Air Force Bases IFS which is located here: https://www.wbdg.org/ffc/af-afcec/installation-facilities-standards-ifs/nellis-creech-afb-ifs

1. DESIGN:

A. All facility design and construction shall comply with UFC 3-600-01 (Fire Protection Engineering), UFC 4-021-01, UFGS 28-31-76, and current edition of all National Fire Protection Association (NFPA) codes and standards to include the requirements called for in this document. The Fire Protection Engineer of record (FPEOR) shall ensure that the design meets the requirements of UFC 3-600-01 or stricter requirements noted herein. The FPEOR shall review all shop drawings for approval and shall witness all operational tests for acceptance of the fire protection systems. FPEOR shall be identified at the beginning of the project. As required, the FPEOR shall be available to respond to design review comments.

B. All projects shall include building code analysis, life safety code analysis and a water supply analysis in accordance with UFC 3-600-01.

C. Base-level projects that do not involve full A-E services, the above requirements for the FPEOR still apply. If detailed designed documents are not being provided, the FPEOR shall prepare at a minimum a building code, life safety code, and water supply analysis as applicable to the statement of work, specifications, and a narrative description (performance specification) of the required systems.

D. These requirements supersede all previous Nellis-Creech Air Force Base Fire Protection Standards. Fire protection for all facilities shall follow these requirements.

E. These requirements are not all inclusive and any disputed items shall be decided by the Authority Having Jurisdiction (AHJ), the Air Combat Command (ACC) Fire Protection Engineer. Nellis-Creech Fire Emergency Services Flight (Fire Department) and the Engineering Flight (Base EE) share the responsibility as the local AHJ. Both flights are part of Base Civil Engineer (BCE) office (99th Civil Engineer Squadron).

2. PLANS:

A. CODE ANALYSES:

Life Safety Code analysis and Building Code analysis shall be included as separate plans following the format shown above. The designer shall ensure that below values are shown on each project design and the final as-built for each particular project.

BUILDING CODE ANALYSIS:

1) Occupancy classification

2) Required (or allowed) and designed
   a. Building area
   b. Building height
   c. Construction type
   d. Exterior exposure protection
   e. Height/area increases (provide calculations)
   f. Interior fire rated occupancy separation
   g. Internal fire area separations

LIFE SAFETY CODE ANALYSIS:

1) Occupancy classification

2) Occupant load factor(s) (with calculations)

3) Required (or allowed) and designed
   a. Common path of travel
   b. Dead-end corridor
   c. Egress capacity
   d. Exit discharge
   e. Flame spread/smoke development ratings for interior finishes
   f. Horizontal exits
   g. Number of exits
   h. Remoteness of exits
   i. Separation of exits and exit access
   j. Separation of hazardous areas
   k. Travel distance

4) Total calculated load (per floor and total for building)

5) Location of fire walls

6) Location of extinguishers:
   a. The design must show that all fire extinguisher cabinets are sized to support a 20-lb ABC Dry chemical fire extinguisher. Provide a recessed or semi-recessed fire extinguisher cabinet.
   b. The design must show that a 10-lb ABC Dry chemical fire extinguisher is being supplied and installed.
   c. Fire extinguisher will be mounted on a hook inside cabinet IAW NFPA 10.

7) All exit door(s), including those in SCIF areas, shall not take more than one physical action to exit (open door); only one action is allowed IAW NFPA, LSC 101.

B. CIVIL PLANS:

1) Civil drawings shall show all fire water mains to include positive identification of test fire hydrants (both pressure and flow hydrants). Plans shall show water main from the test point to the building riser.

2) Show all fire hydrants and control valves. Provide dry barrel fire hydrants meeting all requirements stated in UFC 3-600-01. Fire hydrants at hangars shall also meet requirements of UFC 4-211-01 Aircraft Maintenance Hangars (Section 3-6.3).

3) Roads, parking lots, and access drives shall comply with UFC 3-600-01 and NFPA 1 for accessibility to building by emergency vehicles. Coordinate design with fire department.

C. ARCHITECTURAL PLANS:

1) Architectural plans and Life Safety Code plans shall both show fire walls and partitions and architectural plans shall identify the UL number or other standard such as FM for fire rated assemblies. Additionally, these plans shall show the location of the fire extinguishers.

2) Door Schedule shall identify fire rating of all fire doors. Fire doors shall be coordinated with fire walls.

D. MECHANICAL PLANS:

1) Mechanical plans shall positively identify all fire and/or smoke dampers and provide a detail for installation. Smoke dampers shall include a smoke detector for activation of the damper. Fire dampers shall be shown to comply with NFPA 90A and smoke dampers shall comply with NFPA 101.

2) Mechanical plans shall include smoke detectors on the control diagram. Smoke detectors shall not activate the building evacuation alarm system but shall report as an alarm to the fire department as a separate zone on the fire alarm panel.

3) Duct smoke detectors shall be 24V and resettable through the Fire Alarm Control Panel.

4) An electrical control schematic and wiring detail shall be included in the fire alarm drawing set for each fire damper. Fire dampers shall be designed as failsafe.

E. FIRE ALARM / MASS NOTIFICATION SYSTEM (MNS) / ELECTRICAL PLANS:

1) Plans shall show exit signs and emergency lights. Exit signs shall be RED in color. Exit sign batteries shall be located in air-conditioned rooms or the battery lives (minimum of 7 years) are to be rated for the temperature seen at non-air conditioned location (usually 135degF).

2) Switchgear shall show power for the fire alarm system as a separate breaker.

3) Fire Alarm and MNS panels shall be in a climate controlled (air conditioned) room.

4) Mark each breaker for each fire alarm box, NAC panel etc.

5) Use of MONACO MAAP-X panels (combines FACP, MNS, and the Monaco transceiver into one unit, are point to point compatible, and is an addressable system) is required for the following: a) all facilities with MNS (including trailers), b) all facilities with fire pumps, c) all facilities with VESDA system, d) all facilities larger than 20,000 square feet, and e) all dormitories. This applies for Nellis, Creech, Point Bravo, and all other NTTR facilities.

   Creech and Point Bravo require the use of Monaco panels for all smaller facilities with a separate MONACO BTXM radio with a minimum of 16 zones or use of MAAP-X or similar. Use of Hochiki Firenet panels with a minimum of two signaling/indicating circuits and other Monaco panels for the FACP and with a separate MONACO BTXM radio with a minimum of 16 zones is permitted at Nellis AFB. Monaco panels or Hochiki Firenet panels are required for FACP due to base operations and maintenance requirements.

Generally, all buildings shall have their own fire alarm panel with an exception for associated fire pump building and small storage buildings. Use of dialup phone systems for communication between fire alarm panel and fire department dispatch is not permitted at Nellis, Creech, and Point Bravo. Frequency for fire alarm system at Creech AFB is 138.9750 MHZ. Monaco # -86 is assigned to Creech AFB. Frequency for the fire alarm system at Nellis AFB is 138.250 MHZ. Monaco # -01 is assigned to Nellis AFB. System shall use combination speaker/strobes and the strobes shall be as specified in UFC 4-021-0. Clear strobes shall be used fire and amber strobes shall be used for MNS.

6) Signaling and indicating circuits shall use Class A unless otherwise noted below. Notification circuits shall use Class B unless otherwise noted below. Separate dedicated signaling or indicating dedicated circuits shall be used for the following:

   A. Devices detecting Ansul or similar type of kitchen hood fire suppression units have tripped. If Ansuls are electrically operated, they shall also detect loss of electrical power.
   B. Hangar bay IR fire detection systems interfaces to fire panels.
   C. Hangar bay foam type fire suppression controller interfaces to fire panels including loss of power to foam controller. This may be combined with item B only if located in the same room.
   D. Interfaces to fire pump controllers.
   E. Interfaces to VESDA type or similar early smoke detection systems used principally in server rooms and in raised floor applications.
   F. The base may waive in some applications the requirement for Class A circuits to have separate source and return conduits. For example: connections to two fire pump controllers located in the same fire pump room will require only one conduit from the FACP location to the fire pump room where it will split into two conduits. In this application the return lines will have separate different colored wires (different from the normal source wire color code) from the last interface unit back to the FACP.
   G. SCIFs and SAPFs: All indicating and/or signaling circuits going into SCIFs and/or SAPFs shall be dedicated to that SCIF and/or SAPF with direct home runs to FACP and shall be class B circuits. If the only signaling devices inside the secured area is NAC and MNS fault contacts located immediately upon entry, the EOL resistors will be located inside the MNS or NAC amplifier unit. Signaling or indicating circuits shall not use the SCIF and/or SAPF as a passageway to a non-secured area.

   Separate dedicated notification circuits shall be used for the following:

   A. Notification circuits feeding NAC and MNS panels located at the entrance to SCIF and SAPF areas shall be fed directly with home runs from the FACP and shall be class B.
   B. Notification circuits feeding NAC and MNS panels in locations other than SCIF and SAPF areas shall be fed in one of two ways:
      1) Shall be fed directly with home runs from the FACP unless they are immediately adjacent to each other in which case 1 set of home runs is required. Class B may be used.
      2) May be directly fed with a class A circuits for multiple locations of NACs and MNSs from the FACP with no other types of notification devices installed on these circuits.

7) SCIF and SAPF rooms and areas:
   A. Small SCIFs and SAPFs consisting of only one room with small storage room using only one combination strobe(s) and speaker located therein immediately (less than 2” to the strobe mounting boxes) on the conduit entrance to the room: If room is large enough to require more than one combination strobe and speaker, then a NAC and a MNS amplifier unit shall be installed immediately upon conduit entry along with the necessary battery box.

B. Large SCIFs and SAPFs consisting of more than one room shall require a NAC and a MNS amplifier unit installed immediately upon conduit entry along with the necessary battery box. Notification circuits shall not use the SCIF and/or SAPF areas as a passageway to a non-secured area. Exterior speakers shall not be connected to any notification circuit within the SCIF or SAPF.

C. LOCs shall not be located inside SCIFs or SAPFs.

8) Multi-floor buildings shall have at a minimum separate dedicated signaling or indicating circuit and notification circuits for each floor regardless of the number of devices on each floor. Large numbers of signaling or indicating devices (50 or more, dormitories 20 suites or more) on a floor shall require use of multiple dedicated signaling or indicating circuits. Large numbers of notification devices on a floor may require the use of multiple dedicated strobe or speaker circuits. Number of devices on a strobe circuit may be limited by the number of speakers on the associated speaker circuit.

9) All strobe amplifiers (aka remote power supplies) shall be labelled "NACxx" or "NACx" where xx or x is a sequential number for a facility starting 01(for 10 or more) or 1 (for 9 or less). Each NAC unit shall have a unique number. All speaker amplifiers shall be labelled "MNSxx" or "MNSx" where xx or x is a sequential number for a facility starting at 01 (for 10 or more) or 1 (for 9 or less). Each MNS unit shall have a unique number.

   Outgoing strobe circuits from NACs shall be numbered as follows: ASxxy or CSxxy where xx or x is the NAC number and y is the outgoing circuit number from that NAC. AS refers to amber (MNS) strobes and CS refers to clear (Fire) strobes. Outgoing speaker circuits from MNSs shall be numbered as follows: Sxxy where xx or x is the MNS number and y is the speaker output circuit number from that MNS unit.

   Speaker circuits shall follow the conduit layout of the strobe circuits (ie a given speaker circuit shall NOT be shared with more than one fire strobe circuit or one amber strobe circuit). MNS amplifier panels may use splitter card(s) provided that if a splitter output is open or shorted it shall not affect the other splitter outputs and if a splitter output is open or shorted, it shall signal a fault to the main FACP panel. Speaker circuits fed from main FACP panel shall be labeled Sx where x is the circuit number. Clear strobe circuits fed from main FACP panel shall be labeled CSx where x is the circuit number. Amber strobe circuits fed from main FACP panel shall be labeled ASx where x is the circuit number. Amber and Clear strobe circuit numbers shall not overlap.

10) Mandatory use of separate conduits for initiating or signaling circuits from notification circuits is required.

11) White colored wire shall not be used for any positive data or power wire as this is reserved for negative signal or power wire.

12) Strobe and speaker locations: All offices having a space for a visitor to stand in or a space for a chair for a visitor are considered to be two-man offices and will require the installation of strobes and speakers therein. All offices separated by walls from other rooms having STC45 or STC50 ratings shall have strobes and speakers installed therein. Walk-in closets and other storage spaces such that a door may be closed with a person inside shall have strobes and speakers installed. Janitor closets large enough such that a door may be closed with a person inside shall have strobes and speakers installed. Mechanical rooms, utility rooms, electrical rooms, comm. rooms, and riser rooms shall have strobes and speakers installed if large enough for 2 or more persons to be present in the room.

13) Plans shall show all fire alarm and mass notification devices. Visual devices shall show the

candela rating of each device. Speakers will show power output setting. As-built drawings shall be revised to show the actual conduit locations and locations of all junction boxes employed.

14) Riser diagram shall show all power connections, initiating devices, alarm devices and any interconnections of shutdowns such as AHUs or door releases and the room numbers for the location of all devices and the sequential number of the device on that circuit. Separate drawing shall show all external connections to the FACP including all strobe, speaker, indicating, signaling lines and how connected to the FACP (class A or class B), batteries, antenna, 120v power connections, and any required circuit termination resistors. This drawing shall contain a listing of all I/O slots and the cards inserted therein and the unused slots shall be listed as spares, along with all dip switch settings set in the normal operating mode. This drawing shall be used as a maintenance drawing allowing a base technician to see if all proper connections are made to the FACP panel.
A similar drawing shall be required for each NAC panel and each MNS panel.

    AHU shutdowns shall be arranged such that any EMCS (JCI) controller located in that unit will NOT lose control power, will be able to detect shutdown of the AHU, and transmit that status to the base EMCS master station. An electrical detail will show the details of interconnection of how the shutdown of each AHU or each door release is accomplished. If not known at time of construction, the necessary details shall be incorporated into the as-built drawings.

    As-built drawings shall show on the singleline or riser diagram all 120v. power sources for the fire alarm system by panel name and circuit number. Electrical drawing as-builts shall show the 120v conduit runs from electrical panel to fire equipment panels.

15) Provide a matrix showing what action each device will initiate.

16) Fire department shall approve all fire alarm panel locations. Panels shall be accessible to the fire department when the building is not occupied.

17) Nellis-Creech AFB fire alarm reporting system is a Monaco D-21 radio transceiver communication system using an addressable panel. Monaco radio transceivers (BTX, BTXM, or a transceiver card installed in a MAAP-X panel) shall be used in all fire alarm/MNS systems. Connections to Fire Alarm Control Panel(s) (FACP) to BTXM or BTX shall be by a serial port or Data line using Monaco communications protocol. No keying relays shall be used between the FACP and Monaco radio. Work shall be IAW manufacturer's specifications for Nellis-Creech AFB transmission system.

18) Provide transmitter zone schedule. A minimum of 16 Zones shall be supplied with the capability to expand to 32 or 64 depending on the size of the facility. This is not required where point to point reporting is used with a MAAP-X panel and the transceiver is installed inside the MAAP-X panel. When point to point reporting is used, trouble and supervisory items shall give individual messages allowing the fire department and the alarm shop to see the remote messages before arrival at the building. The Monaco D-21 system is a point to point reporting system. MAAP-X panels shall utilize point to point reporting instead of zone reporting.

19) Connect any and all wiring in fire alarm systems with LEVER NUTS. However the use of any splices is to be limited and must be preapproved by the local AHJ.

20) The last device installed shall have an engraved sign stating the value and location of the end of

line resistor if not located at this device.

21) All “J” box covers for fire alarm system shall be painted "RED" IAW NFPA and all couplings painted RED.

22) On all false ceiling grids, the cross tees shall be marked with a RED dot indicating the location of fire 'J' boxes.

23) Manual fire pull stations shall be key reset only (no other type reset will be allowed). Manual fire pull stations shall NOT have glass rods. Fire Pull stations to be single action. Pull stations will be installed at all MAJOR exits from a facility.

24) 'T' tapping is generally not permitted. In special situations the local AHJ may give approval to do so or where required to do so in the statement of work generated by BCE office.

25) All fire panels, associated panels, and fire pull stations shall be keyed the same. #415A key is recommended.

26) Antenna shall have direct line of sight and be 3 ft. above edge of roof line.

27) Smoke detector over fire alarm panel shall be no higher than 2 ft.

28) Supply certifications of all Installers, Testers, Certifiers, Fire Protection Engineers and other persons involved in the installation of Fire Alarm, Fire Suppression systems, or any item connected to Fire Protection system.

29) All NAC panels shall be individually zoned with trouble and battery fault conditions with a visual monitor module appropriate for the system.

30) All wires shall be clearly identified and labeled.

31) The AHJ shall be notified after conduit is installed for visual inspection. No panels shall be installed without coordination of location(s).

32) All fire alarm and MNS notification system panels and accessories panels shall reset on their own after a power bump or electrical outage.

33) Gutter systems shall be installed above and in between all fire alarm panels. In finished areas, the gutter and panels shall be flush mounted/recessed. Panels will not be flush mounted in SCIF and SAPF areas.

34) All devices shall be addressable and duct detectors will be 24 volt, resettable through the fire alarm panel.

35) Circuits operating at nominal 24 volts DC shall use 20.4 (85% of nominal battery voltage) as the starting point for voltage drop calculations. Total voltage calculated at any device shall not be less than 16.8Vdc provided that all devices will operate at 16.8Vdc on battery. Battery calculations, voltage drop calculations, and speaker db loss calculations shall be included in the fire alarm drawings.

F. FIRE SUPPRESSION PLANS:

1) Plans shall show the hazard classification for each area.

2) Provide a chart showing the density, area of application and hose stream demand for each hazard classification. The data shall comply with most current UFC 3-600-01.

3) Provide a riser diagram for the sprinkler system. Test connection for the backflow preventer shall be included. Air Force uses “shotgun" risers.

4) The inspector's test connection shall be located at the most remote end of the system. Install a large splash block on the outside discharge head for inspector test if the area is not concrete.

5) All fire sprinkler systems shall have a PIV shut off valve unless otherwise approved by Fire Department.

6) Provide a final inspection and acceptance checklist with the Material Register for each project. The FPEOR shall attend the final inspection for the Fire Protection System and sign/certify all documents confirming to the Government that the systems were installed to meet the required standards. During final acceptance testing a check list shall be provided by the contractor IAW NFPA and/or UFC standards prior to the final inspection.
   a. Each checklist shall provide procedures to test all installed Fire Protection systems.
   b. This checklist shall comply with the current edition of the NFPA 72 and shall incorporate the procedures to test all aspects of the Fire Protection System: Fire Alarms, Fire Suppression, Mass Notification, and other systems as applicable.
   c. If the contractor installs the Fire Protection system different from that shown in the design, a revised final inspection and acceptance checklist shall be submitted for review, two weeks prior to the final acceptance for the system. All checklists shall be approved by the local AHJ. Aircraft maintenance hangar foam system checklists require approval by the Air Force Fire Protection Engineer and the local AHJ.

7) Post a laminated schematic drawing next to the FACP/MNS panel and clearly mark on the drawing the location of all fire 'J' boxes.

8) All tamper switches arms on OS&Y valve stems shall be in the groove of the valve stem for proper alignment.

9) Fire suppression system shall have an external electric bell to indicate water flow. Install bell near fire riser room. Wiring detail of bell shall be incorporated into the fire alarm drawings.

G. TESTING:

1) Specifications must clearly indicate the testing of the fire protection systems and the A/E shall develop a commissioning plan that indicates how each system will be tested and who will witness the testing for acceptance, IAW NFPA 3, current edition. The FPEOR shall be the lead for the commissioning plan and the plan shall be approved by contracting officer prior to testing. The FPEOR shall write a commissioning letter stating that the systems are in full compliance with the plans and specifications.

2) All batteries for the Fire Protection System shall provide 72 hours of backup power followed by 15 minutes of alarm operation and must also have 60 minutes of operation immediately after loss of 120v power unless otherwise approved by local AHJ for lower backup power. Mandatory system tests: All systems installed shall be tested on the battery backup power supply for the rated time of backup power provided IAW NFPA 72 or the times listed above whichever is longer. All systems must still be functional after testing.

3) A THIRD PARTY shall be used to perform all testing of installed Fire Protection System.

The FPEOR can be used as the third party if no conflict of interest exists.

3. SPECIFICATIONS:

A. CIVIL

1) Verify all fire protection devices such as fire hydrants, control valves, etc. greater than 5 feet from building are included in the civil design specifications.

B. FIRE SUPPRESSION / FOAM SYSTEMS

1) All requirements in UFC 3-600-01, UFGS, and applicable Fire and Life Safety codes shall be met. Aircraft maintenance hangars shall meet requirements of UFC 4-211-01 (Section 3-6).

2) Designer must include the loss from the test connection to the base of the riser.

3) All sprinkler piping shall be schedule 40 for dry pipe and pre-action. No dyno flow piping.

4) Where fire pump(s) is required and the base power is determined to be reliable (see UFC 3- 600-01 paragraph 3-6.4), use electric motor driven pumps operated by variable frequency drives (VFD). BCE office has determined that base power at Nellis AFB is reliable.

5) If power is not reliable, use electric motor driven pumps operated by variable frequency drives (VFD) and supply a generator for starting and operating the fire pumps. DO NOT use diesel engines with direct connected pumps.

6) Base personnel (BCE maintenance shop and fire department) shall be trained on the operation, testing and maintenance of the FACP and devices, with a minimum of 4 each 2 hours training sessions. Four sessions are required to ensure all personnel can attend training. This training will be separate from the testing of the systems.

7) Contractor shall train and certify base personnel on newly installed systems that are not already installed on base. All software or materials needed by base personnel for maintenance and programming said systems shall be supplied to the Government.

8) Foam vertical bladder tanks are not permitted in new installations. Vertical bladder tanks may only be allowed in existing facilities with approval by the ACC FPE. Tanks will be located such that the bladder can be replaced without moving the tank.

9) Atmospheric tanks with concentrate pumps are preferred on all foam solution systems as the bladder tanks are often ruptured due to improper filling or over pressurization.

10) Test headers shall be provided for a permanent method of flow testing proportioner(s).

11) Deluge valves listed and approved for use with foam concentrate will be used for automatic foam concentrate control. When abort (dead-man) switches are provided, flow control valves shall be used. Fire alarm manual pull stations shall be at least 5 feet from the foam manual discharge station. Foam release pull station box will be yellow.

12) Isolation control valves shall be full port ball type with operating handle that indicates the on/off position of the valve. Unit shall be socket weld or flanged type. Valve body and ball

shall be of 316 stainless steel complying with ASTM A351.

13) Foam tanks shall be provided with spill control, sized to contain the tank capacity.

14) Foam concentrate piping shall be stainless steel. Piping shall have either flanged joints and fittings, rolled groove fittings or welded joints and fittings. If welded joints and fittings are used, then flanged joints shall be provided for equipment maintenance.

15) The foam discharge panel shall be located in a climate controlled space in accordance with NFPA 72 and per the manufacturer's recommendations.

C. UNIFIED FACILITIES GUIDE SPECIFICATION (UFGS SECTION 28 31 76):

1) Recommended practices stated in the manufacturer's literature or documentation shall be considered as mandatory requirements.

2) Paint junction boxes and surface metal raceways RED in unfinished areas.

3) Contractor shall provide training records for all personnel involved with installation of fire protection system elements.

4) Control units shall be located in a climate controlled (air conditioned) space where the ambient temperature is maintained between 60 and 85degreesF.

5) Install control panel components in cabinets adequately sized to accommodate all components and to allow ample gutter space for interconnection of panels and field wiring.

6) Provide a recessed KNOX box (rapid entry system) in exterior wall near facility's main entrance door. System shall be supervised and code is ML-03-0038-07-10.

7) On complex facilities provide the annunciator at a location IAW NFPA 72. Generally, annunciators shall be provided at all main entrances. If FACP is mounted near a main entrance, annunciators shall be provided at the other main entrances.

8) Include a color code schedule for all fire related wiring.

9) Contact the Fire Department or BCE office to determine what action is appropriate for the salvaging of existing fire alarm equipment. BTXs and BTXMs shall be provided to the BCE Alarm Shop.

10) New system transmitter shall be activated shortly before Pre-Final inspection.

11) Testing procedures shall be submitted NLT 30 days before testing and shall be signed by Fire Protection Engineer of Record.

END OF FIRE PROTECTION REQUIREMENTS

NELLIS AND CREECH AFB
INSTALLATION FACILITIES STANDARDS (IFS)
MECHANICAL & PLUMBING REQUIREMENTS

22 JAN 2019

This document is an appendix to Nellis & Creech Air Force Bases IFS which is located here: https://www.wbdg.org/ffc/af-afcec/installation-facilities-standards-ifs/nellis-creech-afb-ifs

1. **Design Conditions**:
   - **a.** Cooling Design: 0.4 % cooling design dry bulb is 117 deg F at WB temp of 67.6 deg F.
   - **b.** Heating Design: 99.6 % heating dry bulb temp is 28.2 deg F (99 percent temp is 31.5 deg F).
   - **c.** Summer Cooling Tower Designs: 0.4 percent evaporation wet bulb at a mean coincident dry bulb of 72.5 deg F wet bulb at 95 deg F dry bulb.
   - **d.** Altitude above sea level: 1,900 feet.

2. **General Requirements:**
   - **a.** Design of mechanical systems shall take into consideration all factors that will ensure a quiet, comfortable, and appropriate environment for the occupants.
   - **b.** Meet requirements of UFC 1-200-02 High Performance and Sustainable Building Requirements. Perform a Life-Cycle Cost Analysis (LCCA) for all projects to determine facility HVAC design.
   - **c.** Acoustical impact to building occupants shall be considered when designing the mechanical systems.

3. **Special System Criteria:**
   - **a.** Provide air conditioning and ventilation for proper operation of computers, equipment, machinery, etc.
   - **b.** Provide for the ventilation of mechanical rooms where refrigerant may be present.
   - **c.** Reference TRANE application engineering manual “Refrigeration Equipment Room Design” (REF-AM-2, AUG 1992).

4. **Maintenance Considerations:**
   - **a.** Each piece of equipment shall be installed so it can be properly maintained.
   - **b.** Clearances shall be provided around all equipment to allow it to be serviced, removed, and replaced as required.
   - **c.** Plans and specifications should be examined to minimize large maintenance costs in the future.
   - **d.** Provide convenient access to all utilities, cleanouts, HVAC equipment and systems, and gas fittings, in the mechanical room, underground and in the building.
   - **e.** Work performed in the overhead ceiling plenum space is to be completed with the least disruptions to building occupants and mission.
   - **f.** Provide direct vehicular access to mechanical rooms, if possible.
   - **g.** Ensure adequate means of removing interior equipment without demolition.

h. Construction contract shall include training for base maintenance personnel so they are able to maintain and service all installed equipment. Length of training shall reflect the complexity of each system.

i. Training shall be recorded and four DVD copies of the training shall be provided to the Base Civil Engineer (BCE) office.

5. Corrosion Control / Cathodic Protection:

a. Apply cathodic protection on all buried or submerged ferrous piping, tanks, and related facilities.

b. Under no circumstance will underground facilities be installed without cathodic protection. This requirement includes ferrous materials such as cast iron.

c. All buried or submerged cast iron pipe joints shall be bonded with number 2 AWG insulated wire.

d. Thermite wire connections shall be coated.

e. All cathodic protection design must be performed by an engineer accredited by the National Association for Corrosion Engineers (NACE).

f. All cathodic protection design shall be based upon specific field tests made at the construction site. Tests will include soil resistivity and water conductivity.

g. Cathodic protection systems shall be sacrificial anode or impressed current and shall comply with corrosion protection criteria outlined in NACE Standard RP-01-69-9 (revised), ETL 87-3, AFM 88-45, AFI-105 and UFC 3-570-06 O&M.

6. Potable Water Source:

a. Coordinate with the Base Civil Engineer (BCE) office for location of water mains and operating pressure ranges in the area of connection. Contractor or designer shall verify existing flows and pressures.

7. Piping Materials and Special Outlets System-Material:

a. Water (Underground): PVC type C-900

b. Water (Aboveground, Outside): Galvanized Steel

c. Water (Aboveground, Inside): Hard Copper Type 1

d. Sanitary Drain, Waste (Building, Three Stories and Less): ABS or PVC-vent sanitary sewer

e. Sanitary Drain, Waste (Buildings taller than Three Stories): Cast Iron

f. Storm Drain: RCP only

g. Chilled Water PVC: Schedule 80 or Hard Copper, Type L

h. Heating Hot Water: Schedule 40 black steel or hard copper, Type L

i. Natural Gas (Underground): Polyethylene with tracer wire

j. Natural Gas (Aboveground): Black Iron

k. Provide dielectric union when connecting dissimilar metals.

l. Provide lead-free plumbing components.

m. Provide identification labels for pipes in mechanical rooms.

n. Label all flow directions.

8. Piping System:

a. Provide valves to isolate portions of building to avoid shutdown of entire building when performing repair and maintenance.

b. Energy conservation washer-less fixtures shall be all metal construction, not chrome-plated plastic. All techniques shall be considered, including 1 GPM or lower-flow restrictors for faucets, 0.5 to 2 GPM low-flow shower heads, single control mixing type faucets, low-volume flush water closets, and self-closing faucet valves. Low-flow fixtures shall meet the standards of EPA Water Sense. Showers shall have valves with pressure balance feature. Provide freeze-proof wall hydrants and interior

wall access. Provide wall-mounted drinking fountains with integral bottle filling stations.

c. In buildings that will be normally occupied by more than 15 persons, provide separate toilet rooms for each sex; position them together and use a common wall for plumbing chase. In buildings occupied by 1-15 persons, a single toilet to serve both sexes may be provided. Furnish one water closet, one lavatory, and a room door that can be locked from the inside.

d. All applications of plumbing fixtures shall be considered for usage by people with disabilities, as directed by the Architectural Barriers Act (ABA) Standards.

e. Consider the inclusion of shower facilities.

f. Plumbing fixture types: Note the plumbing code defined maximum flow rates and consumption for all types of plumbing fixtures.

- Water Closets (Institutional): Flushometer valve, siphon-jet, elongated bowl, top supply spud, floor or wall mounted, minimum 1.5 gpm/flush. Seat: plastic, elongated, open front.
- Water Closets (ADA-Compliant, Institutional): Top rim of bowl shall be 18-inches above the floor. (All others same as previous).
- Lavatories (Institutional): Enlarged cast iron or vitreous china, counter top. Faucet: as required.
- Urinal (Institutional): Wall hung. Siphon-jet or washout. Minimum 1 gpm/flush Waterless type urinals should be installed where proper maintenance of the units can be provided.
- Kitchen Sinks (Institutional): Single or double bowl. Ledge back with holes for faucet and spout. Enameled cast iron, porcelain enameled steel or stainless steel. Faucet: As required.
- Service Sinks (Institutional): Enameled cast iron. Trap Standard, wall or floor mounted. Faucet: As required.
- Food Service Sinks (Institutional): Stainless steel with drain board. Faucet: As required.
- Water Coolers (Institutional): Self-contained. Exposed surfaces shall be stainless steel. Wall mounted surface. Wall mounted semi-recessed. Wall mounted recessed. ADA-compliant; free standing.
- Showers (Institutional): Wall mounted for stall or bathtub. Valves as required.

9. HVAC:

a. Air conditioning units shall be Carrier or Trane. Units shall be designed for an ambient temperature of 117 deg F.

b. Variable Refrigerant Flow (VRF) systems are prohibited due to limited maintenance capabilities of base maintenance shops. Other systems shall be used to provide heating and cooling.

c. Wi-Fi-enabled mechanical equipment is prohibited due to security issues.

d. Provide Variable Air Volume (VAV) systems in new projects and in major renovations where entire mechanical system is being replaced.

e. HVAC unit(s) installed to provide 10 tons or greater of cooling to one area shall be connected to the base-wide Energy Management and Control System (EMCS).

f. Provide water cooled chillers for units greater than 40 tons.

g. Variable Frequency Drives (VFDs) shall be installed on HVAC pumps and air handling equipment where appropriate to reduce HVAC energy consumption during off peak periods. VFDs shall be monitored and controlled via the Johnson Controls EMCS and be installed in climate controlled mechanical rooms.

h. Utilize demand ventilation controls where appropriate. Demand ventilation controls include CO2 sensors and operable damper systems (economizers) to limit the amount

of outside air admitted into the building to meet the actual requirements of the facility as determined by the CO2 sensors in the return air handling units.

i. Roof mounted mechanical equipment is prohibited. However for some renovation projects and unavoidable configurations, roof equipment may be allowed on a case basis per BCE office approval.

j. All mechanical equipment shall be screened from view and easily accessible for maintenance.

k. Around all equipment, provide a safe environment for maintenance personnel meeting all OSHA requirements.

l. Fresh air intake shall be at least 10 feet above ground level and meet ATFP requirements.

m. Provide natural gas heating where natural gas is available. Confirm availability at start of project. Typically do not install heat pumps when natural gas is available.

n. Provide screw type compressors for chillers greater than 40 tons up to 450 tons. Provide centrifugal chillers at higher efficiencies for chillers larger than 400 tons.

o. Provide economizer when appropriate.

p. Provide water treatment for all water systems, heating or cooling. These systems shall be maintenance free systems. Systems should have loops installed as part of the system.

q. Provide washable pleated air filters.

r. Provide phase protection for all HVAC equipment (i.e. pumps, chillers, air handling units).

s. Refrigerant shall be hydro chlorofluorocarbon (HCFC) type only.

t. Provide recommended manufacturing clearance around boilers, chillers, pumps, and air handlers for maintenance purposes.

u. Provide external ductwork insulation, not fiberglass duct liner inside of duct.

v. If LNG or propane tank is provided for a facility it shall be located at least 50 feet from facility and enclosed by CMU screen walls.

w. Provide fan speed controls (2-speed or variable speed) for cooling tower fans.

x. Consider variable flow and/or variable speed chillers to minimize pumping and compressor power requirements.

y. Access to equipment for servicing is an extremely important consideration when designing new systems. Consider servicing and removal of coils, filters, valves, pumps, and tubes during design.

z. Exterior equipment shall be hidden from view.

aa. For all projects Contractor shall balance and test the air and hydronic HVAC systems. This includes projects where HVAC system has been modified, repaired, and/or replaced.

10. HVAC Controls:

a. Provide Direct Digital Controls (DDC) that are manufactured by Johnson Controls and part of the Metasys System. DDC shall have direct communication with base EMCS.

b. Existing base EMCS is Johnson Controls Metasys System, which is a microprocessor-based network installed on the base LAN and designed for maintenance management, trouble-shooting, and energy management. The system is comprised of a network of stand-alone units, each capable of DDC and supervisory control with direct LAN connection accessible by any desktop computer with appropriate software installed. The system allows for the base to perform manual operation, coordinate systems for energy reduction, view facility status in real time and generate run-time reports on equipment.

c. Provide a fully labeled control schematic that details all set points, throttling ranges, actions, spaces, proportional bands, and any other adjustment.

d. Provide a fully labeled elementary diagram (ladder diagram).
e. Provide a sequence of control on drawings cross-referenced to the control schematic and elementary diagram.
f. Provide a generic, functional description of each control component shown on the drawings.
g. Provide for remote monitoring, including advance meters, HVAC, generators, etc. Use remote sensors so that controllers can be centrally located in the mechanical room.
h. Provide logical grouping of controllers, adapters, relays, and power supplies in an easily accessible controls cabinet mounted away from vibrating machinery.
i. Provide electronic system terminal strips cross-referenced to the control schematic to facilitate troubleshooting and calibration. Maximize "self-help" software.
j. Provide control schematic, elementary diagram, control sequence, description of components, control panel details, legends and schedules in the design.
k. All possible "clog" points shall have differential pressure checks on them.
l. Connect all HVAC controls to JCI Metasys System. Building Systems shall be fully functional on their own in case connection to main EMCS is lost.
m. Drawings shall identify all confined spaces.

11. Heating:

a. Designer shall perform LCCA and select most appropriate heating system for the facility.
b. Use ASHRAE Standards for calculating heating loads.
c. The use of cast iron boilers is prohibited. Provide boiler water testing sample points on all hot water systems. Provide chemical feeding systems on all hot water heating systems. Provide automatic, pilotless, ignition systems on all gas-fired equipment. Install thermostats on heating supply and return lines. Install pressure gauges with valves on suction and discharge lines to all pumps. Install gas pressure gauges with valves on all gas trains on boilers.
d. Consideration should be given to electric boilers due to Clark County requirement for construction and operating permit for natural gas fueled boilers and their emissions.
e. Where humidification is required, steam humidifiers shall be used.
f. The fuels available for use are natural gas for furnaces and boilers, and electric for heat pumps.
g. Equipment types to be used:

- Type-1: HVAC boilers smaller than 3,000 mbh shall be steel tube condensing type with a minimum 90 percent efficiency at worst-case design conditions. Domestic hot water boiler shall be copper tube.
- Type-2: Heat exchanges shall be shell and tube type or plate type.
- Type-3: Heat pumps shall be air-to-air or water-to-air.
- Type-4: Circulating pumps shall be centrifugal base mounted, inline horizontal or vertical.
- Type-5: Unit heaters shall be horizontal or vertical.
- Type-6: Air handling units shall be blow through or draw through packaged type.
- Type-7: Fan coil units shall be horizontal, vertical, or through-the-wall type. Fan Coils shall have bleeder ports on all units with isolation valves before the bleeders, canvas connection on return and supply duct connection, and filters shall be built on return registers.
- Type-8: Radiant heaters shall be gas-fired combination.

i. Distribution piping and ducting shall be in accordance with the Uniform Mechanical Code (UMC), Sheet Metal and Air Conditioning Contractors National Association (SMACNA), and applicable ASHRAE design criteria. Flexible duct runs shall be limited to 5 feet in length.

j. All piping installed to serve building and within building shall be thermally insulated IAW the latest edition of ASHRAE 90.1 Energy Conservation.

k. No asbestos-containing materials shall be used in equipment or insulation.

l. For heating plant and systems, water softeners and water treatment equipment, verify water softeners are properly sized to allow soft water to be introduced into the plant at all times, including emergency shutdown. Provide soft/conditioned water for all large boiler systems. Install adequate water treatment equipment on boilers/plant.

12. Ventilation / Air Conditioning / Refrigeration System:

a. Evaporative coolers shall be installed at the 2-foot to 3-foot level. Select air-cooled condensers based on 117 deg F ambient temperature. Central mechanical systems shall normally be provided unless Life-Cycle Cost Analysis (LCCA) indicates sub systems to be more economical.

b. LCCA shall be completed for air-cooled and/or water-cooled chillers. Larger air conditioning units work more efficiently with cooling towers. Use of a screw type compressor chiller may be more efficient for chiller sizes of 40 to 450 tons. Centrifugal chillers are typically long lasting.

c. Access to equipment for servicing shall be an important consideration when designing new systems. Removal or servicing of coils, filters, valves, pumps, and tubes shall be considered when designing mechanical systems.

d. Exterior equipment shall be hidden from view and not located near main entry of building.

e. Equipment shall not be located on roof.

f. Chillers shall have Integral/Storage buffer tank.

g. Mechanical refrigeration shall be fueled by electricity.

h. Equipment shall be suitable for the application:

- Type-1: Chillers shall be packaged air-cooled type or water-cooled screw or centrifugal type.
- Type-2: Evaporative coolers shall be up-blast, or vertical-discharge closed-circuit type, or cellulose material impregnated with anti-rot salt and rigidifying saturants. Media efficiency shall be 76 percent at 600 FPM face velocity with no entrainment of pad water. Open evaporative coolers shall be designed to provide an indoor temperature of 80 deg F.
- Type-3: Heat pumps shall be air-to-air, water-to-air, or geothermal closed loop.
- Type-4: Circulating pumps shall be centrifugal base mounted, inline horizontal, or vertical.
- Type-5: Air handling units shall be flow through or draw through packaged type.
- Type-6: Fan coil units shall be horizontal, vertical, or through-the-wall type. Fan Coils shall have bleeder ports on all units with isolation valves before the bleeders, canvas connection on return and supply duct connection, and filters shall be built on return registers.

i. All occupied spaces shall have air conditioning. All mechanical rooms, electrical rooms, and telecommunication rooms shall have air conditioning.

j. Air conditioning system shall be chosen on the basis of economy, efficiency, and ease of maintenance.

k. When calculating cooling loads, use ASHRAE standards.

l. The peak or maximum cooling load for selecting the room side cooling equipment will consist of the following but no limited to:

- Exterior heat gain through building construction;
- Personnel occupancy;
- Electrical lighting not to exceed one watt per square foot for rooms and 1.5 watts per square foot for office and shop space;

- Design occupancy ventilation air total heat (outside air design minimum room design condition);
- 10 percent safety factor

m. Window shading devices on the exterior and interior shall be implemented in an effort to reduce the room solar heat gain.

n. Minimum room supply air rate or fan-coil capacity shall be 0.80cfm/sq.ft.

o. The building peak or block cooling load for central refrigeration capacity will be determined on the identical parameters outlined above with the following exceptions:

- Personnel occupancy will be 40 percent total occupancy;
- No interior electrical lighting;
- 10 percent minimum safety factor to include motor horsepower and heat gain to coolant distribution system.

p. Chilled water supply temperature will normally vary between 40 and 50 deg F, which shall be determined from the designer's analysis of the optimum balance for the cooling unit, water distribution, and water chiller.

q. Normal air infiltration should be evaluated in an effort to meet the requirement for range hood exhaust.

r. The building peak heat gain analysis shall include the personnel ventilation rate or continuous restroom exhaust where the air flows through the occupied space.

s. Provision shall be made for removal of equipment for maintenance. Tube bundles shall have provision of easy removal for maintenance (i.e. A-frame or monorails structurally adequate to support the loads and provide proper distance between system components and walls to ensure ability to clean, repair, or replace tube bundles).

t. Install bypasses on all strainers to allow cleaning without plant shutdown.

u. Distribution piping and/or ducting specification shall be the same as for heating.

v. Design conditions shall be per ASHRAE unless stated elsewhere in IFS. Ventilation requirements shall be per ASHRAE.

13. Utilities / Pipelines:

a. Fire hydrants shall be dry barrel type and meet requirements of UFC 3-600-01 and for aircraft hangars, UFC 4-211-01.

b. Sufficient clearance shall be provided for construction equipment to repair or replace utility lines in future.

c. Provide valves to isolate portions of utility lines to allow shut down for maintenance/repair without impacting neighboring facilities.

d. Reference IFS Section B02.3.1 for pavement cuts and underground utility line installation requirements.

e. Separation / depth requirements shall be IAW the International Plumbing Code or other referenced documents.

f. Depths of cover:

- 18 inches minimum for utilities within 5 ft. of building.
- 30 inches average for utilities in general unless an alternate depth is allowed/required per referenced documents or determined by detailed engineering.

14. Fire Suppression System:

a. Comply with separate Nellis-Creech IFS Fire Protection Requirements document and UFC 3-600-01.

END OF MECHANICAL & PLUMBING REQUIREMENTS

NELLIS AND CREECH AFB
INSTALLATION FACILITIES STANDARDS (IFS)
UTILITY METER REQUIREMENTS

22 JAN 2019

This document is an appendix to Nellis & Creech Air Force Bases IFS which is located here:
https://www.wbdg.org/ffc/af-afcec/installation-facilities-standards-ifs/nellis-creech-afb-ifs

1. **Installed Equipment:** All design and construction shall be in compliance with the most recent versions of the following:

1.1 Air Force Facility Metering Policy Memorandum (06 May 2010)

1.2 Advanced Meter Reading System (AMRS) Meter Specifications (06 Feb 2018)
See attachment at end of document (Pages 4 to 6)

1.3 Electric Meters Unified Facilities Guide Specification (UFGS) section 26 27 13.10 30

1.4 Natural-Gas Metering UFGS section 33 51 13.00 30

1.5 Water Utility Metering UFGS section 33 12 33.00 30

1.6 Nellis and Creech AFB Installation Facilities Standards (IFS)

2. Any discrepancies between code or standards provisions and the contract documents shall immediately be brought to the Contracting Officer's attention, and the more stringent requirements shall apply unless otherwise directed. Contractors shall be responsible for obtaining any copies of all items referenced in this paragraph. The most current versions of UFGS can be found at http://www.wbdg.org/ccb/ccb.php. The most current AMRS Meter Specification is attached to this document.

2.1 **VLAN Connection:** All meter installs are required to be connected to the base VLAN with following exceptions:

2.1.1 HVAC systems less than 10 tons. Total tonnage is calculated by summing all air condition units installed on the facility.

2.1.2 When a VLAN connection is not available in the facility.

2.2 **Electric Meter:** Contractor shall install meters that are UFGS compliant and will function on the AMRS platform. The AMRS native Data Access communication protocol is "MODBUS/TCP".

2.2.1 The installed electric meter must be listed in the AMRS Meter Specifications as listed in section 1.2.

2.2.2 The contractor shall install a RJ45 jack, within 6 feet of the meter, and install Ethernet Cat 5/6 cable from the communication switches to the RJ45 jack.

2.2.3 The meter should comply with the most current AMRS Meter Specifications as listed in section 1.2.

2.2.4 All new and replacement meter installations, shall be provided with voltage and current safety disconnect devices or equivalent, so that the meter assembly can be worked on safely over the life of the meter installation and not require utility outages for servicing.

2.2.5 The Contractor shall include all disconnects, mounting hardware, enclosures, wiring and conduit, and safety equipment as required and appropriate to complete the task and provide fully functioning meters and a meter data management system. The Contractor shall provide all wiring equipment, and conduit required to connect the new meter to a ”RJ 45” connector VLAN drop that will allow transmission of the metering data to the AMRS platform. Electric Meter shall not be mounted on or attached to outdoor transformers.

2.2.6 All current, power, and voltage circuit termination points for wires entering the meter or enclosure must be clearly marked, to avoid installation error and simplify future identification of wires for maintenance purposes. These identifying markings shall be reflected on the As-Built drawings.

2.2.7 Meter voltage taps shall be downstream of building main breaker.

2.2.8 Meter installation shall comply with UFGS section 26 27 13.10 30

2.3 **Gas Meter:** Contractor shall install an “Elster American Standard” meter with “KY” or “KYZ” pulse output or approved equal.

2.3.1 Meter shall be a positive displacement type.

2.3.2 Meter shall have an odometer style display.

2.3.3 The contractor shall use one of two options to connect the meter pulse output to the AMRS platform.

2.3.3.1 Using a “KY” or “KYZ” pulse interface, the contractor shall connect to the advanced electric meter’s “KY” or “KYZ” input terminals. The contractor shall be responsible for ensuring that the pulse output interface is compatible with the existing advanced electric meter. The Contractor shall provide all wiring, equipment and conduit required to connect the new meter to the advanced electric meter’s “KY” or “KYZ” input terminals.

2.3.3.2 Using a “KY” or “KYZ” pulse interface, the contractor shall connect to a Pulse Accumulator and “MODBUS/TCP” Converter. The contractor shall provide the accumulator and converter equipment. Connect the resulting output to a “RJ 45” connector VLAN drop. The Contractor shall provide all wiring, equipment and conduit required to connect the new meter to a “RJ 45” connector VLAN drop that will allow transmission of the metering data to the AMRS platform.

2.3.4 The meter should comply with the most current AMRS Meter Specifications as listed in section 1.2.

2.3.5 Meter installation shall comply with UFGS section 33 51 13.00 30

2.4 **Water Meter:** Contractor shall install a "McCrometer” water meter with pulse output or approved equal.

2.4.1 The water meter shall meet or exceed the flow characteristics of the following chart with special emphasis on the “Typical Low Flow (95% Minimum).

Meter Size	Typical Low Flow (95% Minimum)	Typical Operating Range (100% ± 2%)	Maximum Continuous Operation	Maximum Intermittent Flow
3/4”	1/2 GPM	1 to 30 GPM	25 GPM	35 GPM
1”	3/4 GPM	1-1/2 to 50 GPM	35 GPM	55 GPM
1-1/2”	1-1/2 GPM	2 to 100 GPM	70 GPM	110 GPM
2”	2 GPM	3 to 160 GPM	115 GPM	175 GPM
3”	2-1/2 GPM	4 to 350 GPM	240 GPM	390 GPM
4”	3-1/2 GPM	5 to 650 GPM	450 GPM	715 GPM
6”	5 GPM	15 to 1300 GPM	910 GPM	1430 GPM

2.4.2 Contractor shall use one of two options to connect the meter pulse output to the AMRS platform.

2.4.2.1 Using a “KY” or “KYZ” pulse interface, the contractor shall connect to the advanced electric meter’s “KY” or “KYZ” input terminals. The contractor shall be responsible for ensuring that the pulse output interface is compatible with the existing advanced electric meter. The Contractor shall provide all wiring, equipment and conduit required to connect the new meter to the advanced electric meter’s “KY” or “KYZ” input terminals.

2.4.2.2 Using a “KY” or “KYZ” pulse interface, the contractor shall connect to a Pulse Accumulator and “MODBUS/TCP” Converter. The contractor shall provide the accumulator and converter equipment. Connect the resulting output to a “RJ 45” connector VLAN drop. The Contractor shall provide all wiring, equipment and conduit required to connect the new meter to a “RJ 45” connector VLAN drop that will allow transmission of the metering data to the AMRS platform.

2.4.3 The meter should comply with the most current AMRS Meter Specifications as listed in section 1.2.

2.4.4 Meter installation shall comply with UFGS section 33 12 33.00 30

3. Contractor shall verify exact equipment and coordinate connection details with Energy Management Control System (EMCS) personnel in Base Civil Engineer (BCE) office (99 CES personnel in Building 812).

4. Meters shall be tested, adjusted and commissioned in accordance with manufacturer's recommendations and also in accordance with the UFGS.

5. Standalone meters may be used on facilities with less than 10 tons of installed cooling AND having no access to a communication rack in the facility. Total tonnage is calculated by summing all air condition units installed in the facility.

6. Meters shall be installed inside of buildings, typically in mechanical room near service entrance. Exterior meters may be allowed on a case basis and shall receive approval from BCE office. If approved, exterior meters shall be installed in a lockable weatherproof enclosure or shall be exterior rated type.

Attachment:

AMRS Meter Specifications v.2.6.18

(06 February 2018)

1.0 AMRS AMRS Electric Meter Specifications

The AMRS Compliant Electric Meter shall meet Department of Defense cybersecurity in addition to the following requirements:

- Current Inputs:
- Nominal 5A (Class 0.2s)
- Measured Current: 50mA to 10A
- Withstand: 20A Continuous
- Poly Phase (3 voltages and 3 currents)
- Internal storage for recording 2 values or channels for 90 days, configurable using manufacturer supplied configuration software. Must support interval consumption (15 minute) and demand (15 minute block average)
- Clear and concise manufacturer's published procedure or method for extracting the internally recorded values, register sets (buffer) or channel data via Modbus and Ethernet
- Shall support time of use recording
- Onboard ethernet communications, base 10/100 with RJ45 connector or pigtail with receptacle connector
- Modbus/TCP communication protocol is required.

- Front display with ability to display all measured values
- Minimum of two external dry contact inputs that shall count pulses from other devices
- Minimum of one (1) external RS485 serial port
- The above requirements are for new, electric meter installations.
- Firmware version must be approved in the AMRS ATO, contact Contracting Officer to request approved version upon award

1.1 New Meter Installations

All new meter installations, including relocated existing meters, shall be provided with voltage and current safety disconnect devices or equivalent so that the meter assembly can be worked on safely over the life of the meter installation and not require utility outages for servicing. All new meter installations, including relocated existing meters, shall include the installation of new properly sized split or solid core current transformers (CTs). All new meter installations, including relocated existing meters, shall be connected from the meter, to a RJ45 jack in the mechanical room, to a patch panel in the communications room, and then to the Air Force switch in the communications room. Base communication installation guidelines shall be followed at all times. The final connection to the Air Force switch may have to be performed by the base communications organization. In that event, three (3) feet of additional communications cabling shall be left for the third party to make the final connection.

1.2 AMRS Compliant Meter List

- Electro Industries Nexus 1500+
- Schneider Electric ION 8650
- Schneider Electric PM8000
- Electro Industries Nexus 1272
- Electro Industries Nexus 1262
- Schneider Electric PM5560
- Schneider Electric PM850SD

2.0 AMRS Compatible Gas Meter Specifications

AMRS compatible gas metering solutions consist of a componential system to achieve the goal of delivering gas consumption data into the AMRS. To accurately scale output pulses the contractor shall obtain building gas usage from base personnel, taking into account peak demand when sizing the components that are necessary as well as determining peak pulse rate as to not saturate the receiving device and risk losing captured pulse data. The various components that may be necessary include but are not limited to the following: Gas Meter, Pulse Kit, High Speed Dividing Pulse Relay, Surge Suppression Device, Accumulator, Electric Meter with digital input availability. All exterior to interior communication links shall have surge suppression.

- Pulse kit must be able to produce a two-wire (Form A) pulse output
- Pulse output shall be delivered to a high speed dividing pulse relay that has the capability of producing a wetting voltage if necessary
- High speed dividing pulse relay shall provide isolated pulse outputs (Form A) that shall be delivered to an AMRS compatible electric meter
- In the event a facility does not have a compatible AMRS electric meter, a high speed

dividing pulse relay shall provide isolated pulse outputs (Form A) that shall be delivered to an accumulator that speaks the Modbus protocol natively and can communicate to AMRS via the Modbus/TCP protocol

- Gas Meters that can communicate to AMRS via the Modbus/TCP protocol may be acceptable if they can pass technical and cybersecurity evaluations directed by the AMRS PMO. At this time there are no tested or approved Modbus /TCP gas meters

3.0 AMRS Compatible Translation Devices and Accumulators

3.1 The following devices are compatible with the AMRS platform, are consistent with the need of the existing site conditions, and have been tested and passed cybersecurity requirements:

- Advantech ADAM-6051 I/O Modbus TCP Module with firmware v5.04 B01
- Perle IOLAN SDS1P Serial to Ethernet Device Server with firmware v4.6 F1

4.0 Typical AMRS Electric Meter Parameter

Measured Parameter
• Voltage Phase A-N and A-B, Typical settings
• Voltage Phase B-N and B-C, Typical settings
• Voltage Phase C-N and C-A, Typical settings
• Current Phase A
• Current Phase B
• Current Phase C
• Current Phase N, Neutral
• Power (Real) or Active, Total
• Power Reactive, Total
• Power (Volts Amps) or VA, Total
• Power Factor Total, COS
• Frequency in HZ
• Demand, Block Average (15 Minute) (BWA)
• Energy, KWH (Active or Real)
• Meter I/O

END OF UTILITY METER REQUIREMENTS

DEPARTMENT OF THE AIR FORCE
99TH COMMUNICATIONS SQUADRON (ACC)
NELLIS AIR FORCE BASE NEVADA

MEMORANDUM FOR 99 CES/CEN
99 CONS/LGC

FEB 9 2017

FROM: 99 CS/CC

SUBJECT: Communications Installation Standards, NC 2710

1. The following documents define the communications installations standards for Nellis AFB and Creech AFB. These standards apply to MILCON, SABER, Red Horse, 8A, REM, and all renovations or construction builds where communications wiring is required. This includes wireless communications and networks.

a. UFC 3-580-01: Telecommunications Building Cabling Systems Planning and Design, http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4
b. Unified Facilities Guide Specifications (UFGS) 2710 00, http://www.wbdg.org/ccb/browse_cat.php?c=3
c. NC Addendum 2710 (NC 2710); Building Telecommunications Cabling System

2. Nellis and Creech Addendum 2710, dated April 2016 supersedes NC 2710, dated June 2012 in its entirety. The April 2016 edition is attached.

3. Any conflicts between the standards will be resolved by the local communications squadron authority, and must be coordinated through the 99 CS/SCX, Plans and Resources office of the respective base.

ROBERT D. CURRAN, Lt Col, USAF
Commander

Attachment: Nellis and Creech AFB Addendum, 2710, dated April 2016

NELLIS AND CREECH AFB ADDENDUM

BUILDING TELECOMMUNICATIONS CABLING SYSTEM

DIVISION 27-COMMUNICATIONS

SECTION 27 10 00

01/17

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NOTE: This guide specification covers Nellis and Creech AFB requirements for building telecommunications cabling systems and shall be used in conjunction with the specifications outlined in Unified Facilities Guide Specifications (UFGS) Section 27 10 00 and appendixes listed below. This document does not replace, but further details the specifications in UFGS Section 27 10 00 and appendixes. Specifications and requirements in UFGS Section 27 10 00 must be adhered to while meeting the requirements and specifications within this document. UFGS Sections are not covered in its entirety in this addendum, only specific paragraphs are addressed. All paragraphs directly correspond with UFGS Section 27 10 00, Building Telecommunications Cabling System, dated 08/11 and listed appendixes. Additionally, requirements and specifications not outlined in this document but required by UFC-3-580-01 must be met. The base communications squadron will make the final determination on any and all telecommunications cabling systems and related components.

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SECTION 27 10 00 - BUILDING TELECOMMUNICATIONS CABLING SYSTEM

APPENDIX

A.1 SECTION 26 20 00 - INTERIOR DISTRIBUTION SYSTEM

A.2 SECTION 33 71 02.00 10 - ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND

A.3 SECTION 33 82 00 - TELECOMMUNICATIONS, OUTSIDE PLANT

A.4 ATTACHMENT 1, SECTION 33 82 00, GEOSPATIAL INFORMATION

A.5 FIGURES - COMM ROOM & FRONT PANEL EXAMPLES

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NELLIS AND CREECH
ADDENDUM SECTION 27 10 00
BUILDING TELECOMMUNICATIONS CABLING
SYSTEM
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NOTE: This guide specification covers Nellis and Creech AFB requirements for building telecommunications cabling systems and shall be used in conjunction with the specifications outlined in Unified Facilities Guide Specifications (UFGS) Section 27 10 00 and appendixes listed below. This document does not replace, but further details the specifications in UFGS Section 27 10 00 and appendixes. Specifications and requirements in UFGS Section 27 10 00 must be adhered to while meeting the requirements and specifications within this document. UFGS Sections are not covered in its entirety in this addendum, only specific paragraphs are addressed. All paragraphs directly correspond with UFGS Section 27 10 00, Building Telecommunications Cabling System, dated 08/11 and listed appendixes. Additionally, requirements and specifications not outlined in this document but required by UFC-3-580-01 must be met. The base communications squadron will make the final determination on any and all telecommunications cabling systems and related components.

1.1 REFERENCES

ENGINEERING TECHNICAL LETTER

ETL 01-18	Fire Protection for Electronic Equipment

Installations UNIFIED FACILITIES CRITERIA

UFC-3-580-01	Telecommunications Building Cabling Systems Planning and Design

AIR FORCE INSTRUCTIONS

AFI 32-1065	Grounding Systems

1.3 DEFINITIONS

a. ITB = Information Transfer Building - All network backbone facilities that are designated as OSP cable concentration points requiring direct redundant OSP connections to at least two other ITB facilities.

b. CEB = Critical Edge Building - All facilities that support command and control missions that have been identified as requiring redundant OSP connections to at least two ITB facilities (either via diverse fiber cable paths to two different ITBs or via redundant uplink connections through a single fiber cable or path from the CEB to two different ITBs [referred to as logical diversity by BITI]).

c. EB = Edge Building - All remaining facilities that have OSP connectivity to at least one ITB (preferably by a direct fiber connection, however indirect connections through SONET, DWDM, daisy chained Ethernet switches, DSL, point to point wireless, or other means is allowed when direct fiber connectivity is either not possible or not economically feasible).

d. CEL = Communications Equipment Locations - For Nellis and Creech the CEL (also referred to as a Communications Closet or Intermediate Distribution Frame) is a location within a building where network equipment (switches, routers) is located. Within the CEL the network equipment is connected to the horizontal station cabling to attach end-users and patched to upstream network equipment to connect to the network backbone. CELs shall have sufficient heating, ventilation, air conditioning, cable pathway access, and space to allow for maintenance and operation of all equipment contained within it IAW equipment manufacturers installation recommendations. The CEL shall be a physically controlled area, with lockable room entrances or with

lockable cabinets. Communication Equipment Locations must be kept clear and may not be used as storage facilities. CEL may be a combination of the TR (telecommunications room), EF (entrance facility), & ER (entrance room).

1.5 SUBMITTALS
Government approval is required for submittals with a 'GA' designation; submittals having a 'FIO' designation are for information only. The following shall be submitted in accordance with Section entitled,

SUBMITTAL PROCEDURES:
Pre-construction Drawings - Communications Distribution System (FIO)
Detail drawings including a complete list of equipment and material. Detail drawings shall contain complete wiring and schematic diagrams and other details required to show that the system has been coordinated and will function properly as a system. Drawings shall include vertical riser diagrams, equipment rack details, and elevation drawings of telecommunications closet walls, outlet faceplate details for all outlet configurations, sizes and types of all cables, conduits, and cable trays. Drawings shall show proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of the work including clearance for maintenance and operation.

Post-construction Drawings (As-Built Drawings) – Communications Distribution Systems (FIO)
As-built drawings for the installed wiring systems infrastructure shall be submitted per TIA/EIA-606. The drawings shall show the location of all cable terminations, the location and routing of all cable terminations, and the location and routing of all backbone and horizontal cables. The identifier for each termination and cable shall appear on the drawings. The Base Communications Squadron shall be provided a copy of as-built drawings within 14 days after completion of installation on a CD or DVD in AutoCad & Adobe format (.dwg).

1.6.1.1 Telecommunications Drawings
Telecommunications drawings must be stamped and approved by a Registered Communications Distribution Designer (RCDD).

1.6.2 Telecommunications Qualifications
All work under this section shall be performed by and all equipment shall be furnished and installed by a Building Industry Consulting Services International (BICSI) certified Telecommunications Contractor. The contractor must be a BICSI Registered Cabling Installer at the Technician Level. The Electrical Contractor shall not perform the installation of communications distribution system cables, equipment, and associated hardware with the exception of furnishing and installing conduit, electrical boxes, grounding equipment and components, cable tray, and pull-wires.

1.6.2.2 Key Personnel
All installers assigned to the installation of this system or any of its components shall have a minimum 3 years of experience in the installation of the specified copper wire, fiber optic cable and components. General electrical trade staff (electricians) shall not be employed for the installation of the communications distribution system cables, equipment, and associated hardware.

Supervisors and installers assigned to the installation of this system or any of its components shall be BICSI Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification for each of the key personnel.

NOTE: Each installer may be required to make an approved dummy splice for each type to be employed in the execution of this contract in the presence of the Contracting Officer and a Quality Assurance Evaluator from the base communications squadron. Splices shall be in accordance with the cable manufacturer's instructions. The contractor shall furnish all materials needed for dummy splices, at no cost to the government.

1.6.3 Test Plan
Provide a complete and detailed test plan for the telecommunications cabling system including a complete list of test equipment for the UTP, STP and optical fiber components and accessories 21 days prior to the proposed test date. The following tests and testing procedures shall be provided and followed:

Written test results and as-built drawings shall be provided to the Base Communications Squadron within 14 days after completion of tests on a CD or DVD; in Adobe Acrobat format (.pdf). This applies to all fiber optic cable and copper wire installations.

1.6.4 TESTING

1.6.4.1 Telecommunications Cabling Testing
Perform telecommunications cabling inspection, verification, and Performance/Certification tests in accordance with the most recent revision of the ANSI/TIA/EIA-568. Perform optical fiber field inspection tests via attenuation measurements on factory reels and provide results along with manufacturer certification for factory reel tests. Remove failed cable reels from project site upon attenuation test failure.

1.6.4.2 Inspection
Visually inspect UTP and optical fiber jacket materials for UL or third party certification markings. Inspect cabling terminations in telecommunications rooms and at workstations to confirm color code for T568A or T568B pin assignments, and inspect cabling connections to confirm compliance with the most recent revision of the ANSI/TIA/EIA-568 standards. Visually confirm marking of outlets, cover plates, outlet/connectors, and patch panels. Patch panel wiring should conform to manufacturer's specifications and be available upon request.

1.6.4.3 Verification Tests
UTP backbone copper cabling shall be tested for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors, and between conductors and shield, if cable has overall shield. Test operation of shorting bars in connection blocks. Test cables after termination but prior to being cross-connected.

All category FO circuits shall be tested using a test set that meets the accuracy requirements of the most recent revision of the ANSI/TIA/EIA-568 standards for cabling. Unless otherwise stated, FO testing methods should conform to TIA/EIA-526-7.

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NOTE: For verification/troubleshooting purposes of length or overall loss OTDR tests using a launch cable are acceptable. For all Performance/Certification tests a Bi-directional Measurement, using both wavelengths applicable to the FO cable type, is required.

****

1.6.4.4 Performance/Certification Tests
All Performance tests shall meet the accuracy requirements of the most recent revision of the ANSI/TIA/EIA-568 standards for cabling.

1.6.4.4.1 Perform Category 6 link tests.
Tests shall include wire map, length, insertion loss, NEXT, PSNEXT, ELFEXT, PSELFEXT, return loss, propagation delay, and delay skew.

****

NOTE: Though most smart test meters (i.e. Fluke DTX-1800) will show a pass with an asterisk for NEXT with a value less than 1 dB; that value is indicative of a sharp bend or improper termination. No Cat6 testing will be accepted with a NEXT value of less than 1 dB.

****

1.6.4.4.2 All Performance/Certification tests
Tests will be completed via Bi-directional Measurement, using both wavelengths applicable to the FO cable type. When testing Multimode a mandrel will be used. The most recent revision of the ANSI/TIA/EIA-526 shall be used as reference for testing methods.

1.6.4.5 Determining a FO loss budget
Unless otherwise stated for specific equipment requirements, all loss budgets shall conform to the values in the ANSI/TIA/EIA-568. Cable transmission performance values can be referenced in 568 Section 4.2 Table 1. 0.75 dB

loss will be allowed for mated connector pairs (i.e. patch panel transitions/bulkheads) and 0.3 dB loss will be allowed for fusion or mechanical fiber splices.

For example: An OS1 Single-mode cable installed from bulkhead to wall jack with 361m in length will have an acceptable loss value of 1.86 dB for both wave lengths. This is determined as both the bulkhead and jack count as mated connector pair. The transmission performance is rated at 1 dB/km for both wavelengths. (.75 dB x 2) + (.361km x 1 dB) = 1.86 dB

1.6.4.6 Final Verification Tests
Perform verification tests for UTP and optical fiber systems after the complete telecommunications cabling and workstation outlet/connectors are installed. Detailed test results will be provided to 99th Communication Sq. for verification and acceptance.

1.6.4.6.1 Voice Tests.
These tests assume that dial tone service has been installed. Connect to the network interface device at the demarcation point. Go off-hook and listen for a dial tone. If a test Number is available, make and receive a local, long distance, and DSN telephone call.

1.6.4.6.2 Data Tests.
These tests assume the Information Technology Staff has a network installed and are available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.

1.8 ENVIRONMENTAL REQUIREMENTS
Equipment shall be rated for continuous operation under the ambient environmental temperature, pressure, humidity, and vibration conditions specified or normally encountered for the installed location. Reference TIA-569-C for Dew Point and HVAC requirements.

PART 2: PRODUCTS

2.1 COMPONENTS
Each major component of equipment shall have the manufacturer's name, address, type or style, model and/or serial number, and catalog number on a plate firmly secured to the equipment. The nameplate of the distributing agent is not an acceptable replacement.

2.2 TELECOMMUNICATIONS PATHWAY
Raceway or cable tray fill rate shall not exceed 40 percent. Primary mode of transport infrastructure will be cable tray unless authorized by base Communication Squadron.

2.3 TELECOMMUNICATIONS CABLING
Optical fiber and copper patch cords shall be provided. Provide cords with varying lengths accounting for cable management. Patch cords will be the same or greater quality of the cables installed.

1. Jacket color for all unclassified (e.g. NIPRNet, Data, & Voice) fiber and copper shall be Green.
2. Jacket color for all classified Secret (e.g. SIPRNet &/or secure Voice) fiber and copper shall be Red.
3. CENTRIX jacket color shall be purple (Creech AFB Only)
4. All other networks or systems shall be approved by the government customer and system accreditation authority.
5. Fiber optic patch cables must be factory-assembled using single coupling SC-type FOC connectors except where other connector types are required to interface with existing equipment

2.3.1.1 Backbone Copper
Copper backbone cable shall be solid conductor, 24 AWG, 100 ohm, minimum 25-pair, Category 3, UTP. Only install backbone copper cable between the 110 block in the entrance facility (EF) to patch panels in the Communications Equipment Locations (CEL). Home run the backbone copper from the patch panels in the CELs to the 110 block in the EF. 110 blocks are only installed in the EF.

2.3.1.2 Backbone Optical Fiber
Install a minimum of 12 strands fiber optic cable between each CEL and entrance facility. Install Single-Mode (OS1) backbone cable. The government will specify fiber optic adapters/connectors for renovation or addition to existing facilities requiring interface with existing equipment. Hybrid Laser Optimized (OM3) Multimode fiber optic cable and cable bundles are only approved by change requests.

2.3.2.1 Horizontal Copper
Horizontal cable shall meet the requirements of TIA-568 for Category 6 horizontal cable as a minimum.

2.3.2.2 Horizontal Optical Fiber
Inside Plant (ISP) cabling is all indoor fiber optic cables installed from the first fiber optic distribution panel (FODP) or splice case and interconnects between CELs. The minimum cable size between closets shall be 12 strands. Existing inter-CEL cable with less than 4 available strands is a candidate for replacement rather than re-use. ISP cable shall be single-mode (OS1) or multimode (OM3). The FODP or splice case is the boundary between OSP and ISP. The government will specify fiber optic adapters/connectors for renovation or addition to existing facilities requiring interface with existing equipment. Minimum four strands (Dual Duplex) per outlet/receptacle. Single-Mode (OS1) may also be required.

2.4 TELECOMMUNICATIONS SPACES

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NOTE: AFOSH Standard 91-50, Section 2.10.2 – Storage is not allowed in the electrical and (or) electronic areas. Storage is permitted in approved areas only.

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Provide connecting hardware and termination equipment in the telecommunications entrance facility and Communications Equipment Locations (CEL) to facilitate installation as shown on design drawings for terminating and cross-connecting permanent cabling. Provide telecommunications interconnecting hardware color coding in accordance with the latest revision of TIA/EIA-606. Floors, walls, and ceiling shall be treated to eliminate dust. Finishes shall be light in color to enhance room lighting. Floor shall have anti-static properties. Carpet is not allowed in the entrance facility. Suspended ceilings are not allowed; open to full ceiling without obstructions to allow for cable trays. Sealed Concrete is acceptable in warehouses and limited occupancy facilities. Provide additional 120VAC duplex outlets placed at 6-foot intervals around the perimeter of the telecommunications room. The door shall have a 5 button mechanical lock with passage (similar to Simplex L1031). Provide environmental controls IAW the latest revision of TIA-569. If sprinklers are installed, the heads shall be provided with wire head cages to protect against accidental discharge. Provide additional services for Core 1 Facilities IAW ETL 01-18, Fire Protection for Electronic Equipment Installations (Ref para 2.14 CRITICAL COMM FACILITES and NODES.)

2.4.1 Backboards
Provide void-free, interior grade A-C plywood, 3/4 inch thick, 4 by 8 feet. Backboards shall be fire rated by manufacturing process. Fire stamp shall be clearly visible. Backboards shall be provided on a minimum of three walls, excluding the wall containing the door, in the telecommunications spaces. Install no greater than 0.3 meter (1 foot) above the finished floor level to no less than 2.1 meters (7 feet) above the finished floor level in the telecommunications spaces. Painting is not authorized.

2.4.2 Equipment Support Frame
Install equipment cabinet(s) to allow for future expansion (additional cabinet). Do not center the cabinet in the room. Cabinets will have clearance of 3 feet front and back, 2 ½ feet on the sides. Multiple cabinets may be mounted together on the sides (ref: para 3.1.7.3.). Provide a minimum of two dedicated un-switched 20-amp, 120-VAC, 60Hz duplex receptacle power outlets, each on a separate branch circuit for communication equipment to the rack/cabinet. Increase these minimum requirements as necessary to meet equipment loads. Mount mid-cabinet level a 19 inch rack mounted power strip with surge protection and minimum 6 outlets. Install a UL-listed horizontal rack grounding bus bar (RGB). Connect the RGB to the telecommunications main ground bar (TMGB), telecommunications ground bar (TGB) or the telecommunications equipment bonding conductor (TEBC) with a #6 AWG ground cable and 2-hole compression lugs. Install an electrostatic discharge strap port on the front of the cabinet. All cabinets shall be keyed alike.

2.4.2.1 Bracket, wall mounted 8 gauge aluminum. This item is not authorized for installation or use unless authorized by an approved change request.

2.4.2.2 Racks, floor mounted modular type. This item is not authorized for installation or use unless authorized by an approved change request.

2.4.2.3 Cabinets, freestanding modular type, must be lockable. Cabinets, freestanding modular type will be permanently anchored to the floor and shall have an inside width of 19 inches and be minimum 41 RU (77”). Cabinets shall be enclosures with side panels, acrylic plastic lockable front doors and mesh, metal, louvered rear doors with identical keys, depth-adjustable front and rear mounting rails, and louvered top. When cabinets are connected together, remove adjoining side panels for cable routing between cabinets. Top mounted ventilation fans shall be included. A/C shall enter the cabinet from the ceiling to the top of the cabinet, or through the floor to the bottom if on raised floor. Verify all cabinet placement with the 99CS prior to installation.

****

NOTE: ENSURE CABINET SIZE MEETS REQUIREMENTS TO SUPPORT NETWORK EQUIPMENT

****

2.4.2.4 Cabinets, wall-mounted modular type, shall be mounted on a backboard. Mount cabinet so height of highest panel does not exceed 78 inches above floor. Cabinets shall have an inside width of 19 inches and be minimum 26 RU (45.50”). Cabinets shall be enclosures with side panels, acrylic plastic lockable front, depth-adjustable front and rear mounting rails, and louvered top. Top mounted ventilation fans shall be included. Include vertical cable management.

2.4.3 Connector Blocks
Install wall mounted IDC type 110 punch down block on the telecommunications backboard in the entrance facility. Rack mount is not authorized. 110 blocks are only permitted in the entrance facility. The 110 type punch down block shall be labeled to identify corresponding RJ-45 jacks in the patch panel. All wiring and components shall be TIA-568 compliant, wired to T568A wiring configuration. Label IAW TIA/EIA-606.

2.4.4 Cable Guides:
Hook and Loop (Velcro) style guides are only permitted as cable management in cabinets. Hook & Loop may be used in cable tray to separate copper & fiber, and to meet security separation requirements.

2.4.5 Patch Panels
Category 6 Common LAN/VOICE (CLV) patch panels shall consist of RJ-45 8-pin modular jacks (front of patch panel) with rear-installation type 110 insulation displacement terminations. Patch panels are wired identically to allow voice or data to be connected to any outlet. Wire 8-pin modular ports to T568A configuration. All wiring and components shall be TIA-568 compliant. Label patch panels IAW TIA/EIA-606.

2.4.5.1 Modular to 110 Block Patch Panel
Voice Frequency (VF) patch panels shall consist of RJ-45 8-pin modular jacks (front of patch panel), with rear-installation type 110 insulation displacement terminations. Panel shall provide minimum 48 non-keyed ports wired to T568A configuration. All 8 wires of each RJ-45 jack shall be wired to the 110 type punch down block. Install 24 AWG backbone copper cable from the back of VF patch panels to type 110 punch down blocks mounted on the telecommunications room plywood backboard. The 110 type punch down block shall be labeled to identify corresponding RJ-45 jacks in the patch panel. All wiring and components shall be TIA-568 compliant. Label patch panels IAW TIA/EIA-606.

2.4.5.2 Fiber Optic Patch Panel
The government will specify fiber optic adapters/connectors for new construction or renovation of existing facilities requiring interface with communications equipment. Provide panels for maintenance and cross-connecting of optical fiber cables. Each panel shall provide adapters in accordance with the most recent revision of TIA/EIA-568 with zirconia ceramic alignment sleeves. Patch panels shall be sized to correspond to the number of fibers installed, plus 25 percent. Patch panels shall be a complete system of components by a single manufacturer, and shall

provide termination, splice storage, routing, radius limiting, cable fastening, storage, and cross-connection. Panel shall be constructed of 11 gauge aluminum minimum and shall be cabinet/wall mounted and compatible with ECIA EIA/ECA 310 equipment rack. Provide dust cover for unused adapters. The rear of each panel shall have a cable management tray a minimum of 203 mm [8 inches] deep with removable cover, incoming cable strain-relief and routing guides. Panels shall have each adapter factory numbered and be equipped with laminated plastic nameplates above each adapter.

2.4.6 Optical Fiber Distribution Panel
Cabinet/Wall mounted optical fiber distribution panel (OFDP) shall be constructed in accordance with ECIA EIA/ECA 310 utilizing 11 gauge aluminum minimum. Panel shall be divided into two sections, distribution and user. Distribution section shall have strain relief, routing guides, splice tray and shall be lockable, user section shall have a cover for patch cord protection. Each panel shall provide adapters. Provide dust cover for unused adapters. Provide optical fiber patch cords with LC connectors attached for patch panels. Provide patch cords, as complete assemblies, with matching connectors. Provide fiber optic patch cables with crossover orientation in accordance with TIA-568-C.3. Patch cords shall meet minimum performance requirements specified in TIA-568-C.1, TIA-568-C.2 and TIA-568-C.3 for cables, cable length and hardware specified.

2.5 TELECOMMUNICATIONS OUTLET/CONNECTOR ASSEMBLIES
All telecommunications outlets, fiber optic & copper, shall be dual duplex or quad (SC type) receptacles unless otherwise noted. Provide a single RJ-45 outlet for each elevator. Provide a dual RJ-45 outlet within 3 feet of civil engineering Industrial Control System (ICS)/Utility Monitoring and Control System (UMAC), e.g. Johnson Controls. Run the CAT6 cable to the nearest UNCLAS copper patch panel.

****
NOTE: Provide a single outlet for interior/exterior wall mounted telephones Reference UFC 3-580-01 para 2-3.5 for receptacle/outlet density
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2.5.1 Outlet/Connector Copper
Wire each 8-pin outlet/connector to T568A configuration.

2.5.2 Optical Fiber Couplers
Do not use couplers for new construction unless specifically required for interface with existing equipment reused on installations.

2.5.3 Optical Fiber Connectors
Provide in accordance with TIA-455-21. Optical fiber connectors shall be non-keyed duplex LC in accordance with TIA/EIA-604-10 with zirconia ceramic alignment sleeves compatible with OM3 multimode or OS1 single-mode fiber. The connectors shall provide a maximum attenuation of 0.3 dB with less than a 0.2 dB change after 500 mating cycles. Provide duplex fiber optic adapters and connectors with zirconia ceramic alignment sleeves for new construction. The government will specify fiber optic adapters/connectors for renovation or addition to existing facilities requiring interface with existing equipment. The government will specify fiber optic adapters/connectors for secure systems as required by the customer and accreditation authority.

2.5.4 Cover Plates
Telecommunications cover plates shall comply with UL 514C, and TIA-568 series flush design constructed to match color of receptacle/switch cover plates specified in Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. Provide labeling in accordance with TIA/EIA-606-A.

2.13 ALARM CIRCUITS
Government provides Voice Grade copper, dry-pair, circuits only. Provide thirty (30) calendar days' notice for alarm circuit activation. The equipment must be compatible with the existing alarm system and telephone circuits.

2.14 ACCESS CONTROLS & IDS
The government will specify cable and connectors for Access Controls and IDS systems as required by the

customer and accreditation authority.

2.15 CRITICAL COMM FACILITIES and NODES
All Core 1 facilities require the telecommunications cabinet(s) dedicated electrical outlets be connected to the facility generator, or facility UPS if installed. Information Transfer Node (ITN) facilities require four (4) dedicated NEMA L6-30R 208(240V), and one (1) dedicated 5-20R 120V quad outlet per cabinet. Reference ETL 01-18, Fire Protection for Electronic Equipment Installations for additional fire protection requirements. Per 99 CS do not place any sprinkler heads directly above communications equipment.

2.16 HEAT RESISTANT BULKHEADS IN OUTDOOR ENCLOSURES
When installing bulkheads in NEMA or metal outdoor enclosures, use heat resistant bulkheads due to the extreme desert temps in Southern Nevada.

PART 3 EXECUTION

3.1.1.1 Open Cable
Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items. Placement of cable parallel to power conductors shall be avoided, if possible; a minimum separation of 300 mm [12 inches] shall be maintained when such placement cannot be avoided.

3.1.1.2 Backbone Cable
Only install backbone copper cable between the 110 block in the entrance facility (EF) to patch panels in the Communications Equipment Locations (CEL). Home run the backbone copper from the patch panels in the CELs to the 110 block in the EF. 110 blocks are only installed in the EF.

3.1.6.1 Terminations
Terminate UTP cable to T568B wiring configuration. Validate configuration to currently installed cabling.

3.1.7.2 Patch Panels
Patch panels shall be mounted in equipment cabinets with sufficient ports to accommodate the installed cable plant plus 25 percent spares.

3.1.7.3 Equipment Support Frames
Install equipment cabinet(s) to allow for future expansion (additional cabinet). Cabinets will have a clearance of 3 feet front and back, 2 ½ feet at the sides (ends of cabinet run). Each cabinet will have a rack grounding bus bar (RGB). Connect each cabinet RGB to the TMGB, TGB or TEBC with a #6 AWG ground cable and 2-hole compression lugs.

a. Bracket, wall mounted, 8 gauge aluminum. This item is not authorized for installation or use unless authorized by an approved by a change request.

b. Racks, floor mounted modular type. This item is not authorized for installation or use unless authorized by an approved by a change request.

c. Cabinets, freestanding modular type. When cabinets are connected together, remove adjoining side panels for cable routing between cabinets. Install the rack-mounted fan in the roof of the cabinet. Cabinets will be permanently anchored to the floor. Do not center the cabinet in the room. A/C shall enter the cabinet from the ceiling to the top of the cabinet, or through the floor to the bottom if on raised floor.

d. Cabinets, wall-mounted modular type. Mount cabinet to plywood backboard in accordance with manufacturer's recommendations. Mount cabinet so height of highest panel does not exceed 1980 mm [78 inches] above floor. Install rack-mounted fan in the roof of the cabinet. Cabinets shall open freely and not be obstructed, allowing for maintenance in the back of the cabinet.

3.3.1 Painting Backboards: Painting of Backboards is not authorized

-- End of Section --

A.1- SECTION 26 20 00 INTERIOR DISTRIBUTION SYSTEM

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NELLIS AND CREECH ADDENDUM
SECTION 26 20 00
INTERIOR DISTRIBUTION SYSTEM

****

NOTE: This appendix covers Nellis and Creech AFB requirements for building telecommunications cabling systems and shall be used in conjunction with the specifications outlined in Unified Facilities Guide Specifications (UFGS) Section 26 20 00. This document does not replace, but further details the specifications in UFGS Section 26 20 00. Specifications and requirements in UFGS Section 26 20 00 must be adhered to while meeting the requirements and specifications within this document. UFGS Section 26 20 00 is not covered in its entirety in this appendix, only specific paragraphs are addressed. All paragraph nomenclature directly corresponds with UFGS Section 26 20 00, Interior Distribution System dated 02/14. The base communications squadron will make the final determination on any and all telecommunications cabling systems and related components.

2.5 CABLE TRAYS: Raceway/Cable tray fill shall not exceed 40 percent.

2.6 OPEN TELECOMMUNICATIONS CABLE SUPPORT
J-supports & D-rings are permitted for short cable runs with a minimal number of cables.

2.7.2 OUTLET BOXES FOR TELECOMMUNICATIONS SYSTEM
Outlet boxes for wall-mounted telecommunications outlets shall be 4 inches by 2-1/8 inches by 2-1/8 inches deep. Depth of boxes shall be large enough to allow manufacturers' recommended conductor bend radii. Outlet boxes for all telecommunication outlets shall include a minimum 3/8 inch deep single or two gang plaster ring as shown and be installed using a minimum 1 inch conduit system.

2.28.3. Minimum dimensions of 0.25 inch thick by 4 inches wide by 10 inches long for TMGB and TGB. TMGB/TGB shall be copper. TMGB/TGB will be copper. Perform and provide TMGB/TGB Ground Bus resistance test results (5 ohms or less) in accordance with NEC art 501-510, MIL-STD-188-124B, para 5.1.1.1.7.

3.1.8 CABLE TRAY INSTALLATION
Install and ground in accordance with NFPA 70. In addition, install and ground telecommunications cable tray in accordance with the latest version of TIA-569-C, and TIA-607-B. Install cable trays parallel with or at right angles to ceilings, walls, and structural members. Support in accordance with manufacturer recommendations but at not more than 5 foot intervals. Contact surfaces of aluminum connections shall be coated with an antioxidant compound prior to assembly. Adjacent cable tray sections shall be bonded together by connector plates of an identical type as the cable tray sections. Terminate cable trays 255 mm [10 inches] from both sides of smoke and fire partitions. Conductors run through smoke and fire partitions shall be installed in 4 inch rigid steel conduits with grounding bushings, extending 305 mm [12 inches] beyond each side of partitions. Seal conduit on both ends to maintain smoke and fire ratings of partitions. Penetrations shall be firestopped in accordance with Section 07 84 00, FIRESTOPPING. Provide supports to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction.

3.1.8.1 Vertical Cable Supports, Drop-Outs or Waterfalls will be installed from the cable tray to cabinets to protect cable installation as it exits the cable tray and maintain the cable manufacturer's minimum standard bend radius.

3.1.8.2 Install cable tray system so it is accessible. A minimum of 12 inches should be left above or between installed systems to allow for cable installation and maintenance

3.1.9 Telecommunications Cable Support Installation
Install J-supports & D-rings not to exceed 5 feet apart. Cables routed in a suspended ceiling shall not be draped across the ceiling tiles or light fixtures. Hook & Loop fasteners (e.g. Velcro) will not be used for cable support, but may be used for cable management.

3.1.19.5 TMGB and TGBs shall be a minimum dimensions of 0.25 inch thick by 4 inches wide by 10 inches long. TMGB/TGB will be copper. Install bus bars in all telecommunications equipment rooms. Install between 2 and 4 feet above floor level. Connections to the TMGB/TGB: utilize listed compression two-hole lugs, exothermic

welding, or other irreversible compression type connections as per the UFGS 26 20 00, para 3.1.19.5c. Single-hole lugs are not permitted.

3.1.19.5. Telecommunications Grounding Label: Label near point of connection at panel board and each TMGB and TGB in accordance with the most recent revision TIA-607, "If this connector or Cable is loose or must be removed, please call the building telecommunications manager."

3.1.19.5.1 Ground on each end (one end to TMGB/TGB) and at intervals not to exceed 18m (60 feet). Use a #6 AWG cable with green/yellow stripe to jumper between discontinuous segments on both side rails. The jumper shall be made with 2-hole compression lugs terminated on both ends.

-- End of Section –

A.3 SECTION 33 71 02 - ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND
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NELLIS AND CREECH ADDENDUM
SECTION 33 71 02.
UNDERGROUND ELECTRICAL DISTRIBUTION

****

NOTE: This appendix covers Nellis and Creech AFB requirements for building telecommunications cabling systems and shall be used in conjunction with the specifications outlined in Unified Facilities Guide Specifications (UFGS) Section 33 71 02. This document does not replace, but further details the specifications in UFGS Section 33 71 02. Specifications and requirements in UFGS Section 33 71 02 must be adhered to while meeting the requirements and specifications within this document. UFGS Section 33 71 02 is not covered in its entirety in this appendix, only specific paragraphs are addressed. All paragraph nomenclature directly corresponds with UFGS Section 33 71 02, Electrical Distribution System, Underground, dated 02/15. The base communications squadron will make the final determination on any and all telecommunications cabling systems and related components.

2.14.3 COMMUNICATIONS MANHOLES

Communications manholes (CMH) shall be 7 feet high by 12 feet long by 6 feet wide. The CMH will consist of pre-cast reinforced concrete box, extensions, base and cover. The manhole will be equipped with a standard ladder of hot dipped galvanized steel construction with non-slip rungs.

One end of the ladder will be formed into hooks to engage the manhole step. Provide pulling-in irons installed on each wall, positioned 6" to 12" below duct entrances. Provide four cable support brackets on each sidewall and one cable support bracket on each end wall of manhole. Each cable support will have a minimum of three 7-inch cable steps installed. Finish conduit flush with interior walls and grout around conduits. Bell-ends are required on the end of each conduit and finish grout applied. Install bell-ends flush with wall of the manhole.

The cover for the manhole will be able to withstand traffic load bearing applications. Cover will be marked "TELEPHONE" or "TELECOMMUNICATIONS."

The manhole will be equipped with one 8 foot copper clad ground-rod pounded or the manhole will be grid grounded. Leave ground rod exposed 6" in a corner of the manhole. Install manholes with long wall parallel to the main duct run.

Features and qualities similar to an EMBARQ 6000.
Install ducts in the first available knockout from the bottom of the manhole. Label the destination of installed conduit next to the duct. Label letters shall be a minimum 2 inches high in permanent paint or ink. Communications manholes will be shall be located within 50 feet of the building communications entrance.

2.14.4 COMMUNICATIONS HANDHOLES

Communications handholes (HH) shall be a minimum 3 feet high by 5 feet long by 4 feet wide. HH will have a minimum of 4 total, 2 per side, 18-hole cable racks. 8 total 2 inch terminators will be provided on the HH; each side wall will have 4 terminators. Each end well will contain intercept knockouts.

The cover for the handhole will be able to withstand traffic load bearing applications. Cover will be marked "TELEPHONE" or "TELECOMMUNICATIONS." The HH will consist of aluminum 2 door hinged lay back torsion spring assisted cover. Cover will be capable of being opened 180 degrees to full layback position. Cover will be attached to a galvanized steel frame mounted within a collar riser.

The handhole will be equipped with one 8 foot copper clad ground-rod pounded or the handhole will be grid grounded. Leave ground rod exposed 6" in the corner of a handhole. Install handholes with long wall parallel to the main duct run.

Features and qualities similar to an EMBARQ 400.
Install ducts in the first available knockout from the bottom of the handhole. Label the destination of the installed duct next to the duct. Label letters shall be a minimum 2 inches high in permanent paint or ink. Communications handholes shall be located within 50 feet of the building communications entrance.

-- End of Section -

A.4 SECTION 33 82 00 - TELECOMMUNICATIONS, OUTSIDE PLANT

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NELLIS AND CREECH ADDENDUM
SECTION 33 82 00
TELECOMMUNICATIONS, OUTSIDE PLANT

****

NOTE: This appendix covers Nellis and Creech AFB requirements for building telecommunications cabling systems and shall be used in conjunction with the specifications outlined in Unified Facilities Guide Specifications (UFGS) Section 33 82 00. This document does not replace, but further details the specifications in UFGS Section 33 82 00. Specifications and requirements in UFGS Section 33 82 00 must be adhered to while meeting the requirements and specifications within this document. UFGS Section 33 82 00 is not covered in its entirety in this appendix, only specific paragraphs are addressed. All paragraph nomenclature directly corresponds with UFGS Section 33 82 00, Telecommunications, Outside Plan, dated 04/06. The base communications squadron will make the final determination on any and all telecommunications cabling systems and related components.

SD-12 Geospatial Information (GPS) Submittals
The Contractor shall use GPS technology to locate and collect data on outside plant infrastructure features and communications pathways installed or modified as a result to the Contractor's installation work. See Attachment 1 of this NC Addendum.

1.6.2 TELECOMMUNICATIONS QUALIFICATIONS
All work under this section shall be performed by and all equipment shall be furnished and installed by a Building Industry Consulting Services International (BICSI) certified Telecommunications Contractor who uses BICSI Registered Cabling Installers, Technician Level. The Electrical Contractor shall not perform the installation of communications distribution system cables, equipment, and associated hardware with the exception of furnishing and installing conduit, electrical boxes, grounding equipment and components, cable tray, and pull-wires.

1.6.2.2 KEY PERSONNEL
All installers assigned to the installation of this system or any of its components shall have a minimum of 3 years of experience in the installation of the specified copper wire, fiber optic cable and components.

General electrical trade staff (electricians) shall not be employed for the installation of the communications distribution system cables, equipment, and associated hardware.

Supervisors and installers assigned to the installation of this system or any of its components shall be BICSI Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification for each of the key personnel.

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NOTE: Each installer may be required to make an approved dummy splice of each type to be employed in the execution of this contract in the presence of the Contracting Officer and a Quality Assurance Evaluator from the base communications squadron. Splices shall be in accordance with the cable manufacturer's instructions. The contractor shall furnish all materials needed for dummy splices, at no cost to the government.

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2.2.1 BUILDING PROTECTOR ASSEMBLIES: Use 5-pin self-contained units only.

2.3.1.1 AERIAL CABLE CLOSURES: This item is not authorized for installation or use.

2.3.1.2 UNDERGROUND CABLE CLOSURE: This item is not authorized for installation or use.

2.3.2.1 AERIAL: This item is not authorized for installation or use.

2.8.1.2 AERIAL: This item is not authorized for installation or use.

2.8.1.3 SCREEN: This item is not authorized for installation or use.

2.8.2 Fiber Optic Cable: Indoor-outdoor rated distribution fiber optic cable is not authorized

2.8.2.1 STRENGTH MEMBERS
Use metallic strength members with sufficient tensile strength for installation and residual rated loads to meet the applicable performance requirements in accordance with ICEA S-87-640.

2.9 T-SPAN LINE TREATMENT REPEATERS: This item is not authorized for installation or use.

2.10 POLES AND HARDWARE: This item is not authorized for installation or use.

2.16.1 FACTORY REEL TEST DATA: Enhanced performance air core OSP copper cables are not authorized for installation or use.

3.1.5 Underground Duct
a. Fiber Innerduct - Install three, 3 inch 3-Cell fabric innerduct in one conduit. One of the fabric innerducts shall be detectable (tracer wire embedded in fabric). Features/style similar to MaxCell MX_3456
b. Do not install or mix copper cable and fiber cable in the same conduit
c. Conduit entering the facility shall be sealed at the building end to prevent rodents, water, or gases from entering the facility.

3.1.8 CABLE PULLING: Do not bend cable and wire in a radius less than 20 times the outside diameter of the cable or wire.

3.1.9 AERIAL CABLE INSTALLATION: This item is not authorized for installation or use.

-- End of Section -

Attachment 1, SECTION 33 82 00, GEOSPATIAL INFORMATION
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Nellis & Creech AFB Addendum
SECTION 33 82 00
Attachment 1
COLLECT AND DELIVER GEOSPATIAL INFORMATION
****

1.1 GENERAL: The Contractor shall use GPS technology to locate and collect data on outside plant infrastructure features and communications pathways that are installed or modified as a result to the Contractor's installation work. Outside plant features include manholes, vaults, handholes, pedestals, underground cables, marked direct buried splices, terminals etc. The communications pathways include duct routes, direct-buried cable, and communication pathway entry points on building exterior walls that lead to interior building entry terminals, etc. The Contractor shall augment the GPS survey by using conventional land surveying equipment and electronic cable locating (underground utility toning) equipment when necessary to accurately locate features. The Contractor shall convert the GPS data to an ESRI Shape file set suitable for the Government to load the file and transcribe information from the Shape file into the CVC database.

1.2 GPS DATA COLLECTIONS REQUIREMENTS

1.2.1 GPS ACCURACY STANDARDS: The Contractor shall use GPS to determine the horizontal position of communications outside plant infrastructure and communications pathways features in accordance with the Federal Geographic Data Committee (FGDC)-STD-007.4-2002. FGDC publications are downloadable from the website: http://www.fgdc.gov/.

GPS ACCURACY OF FEATURE LOCATIONS: Each outside plant infrastructure feature and communications pathway requiring geospatial coordinates shall be located to within 50 cm after post processing in the horizontal plane, with a 95% spatial accuracy confidence level as defined in FGDC-STD-007.3-1998 (Refer to paragraph 1.2.2. for documentation requirements). Geospatial coordinates for the location of manholes and cable vaults shall be recorded for the center of the manhole lid. Geospatial coordinates for the location of handholes, pull boxes, pedestals, and marked direct buried splices shall be recorded for the top center of the feature. Geospatial coordinate data for the location of communication pathways lines shall be recorded at a minimum every 50 feet and coordinates for points along the pathway and at each turn or bend in a cable installation pathway a sufficient number of data points must also be collected and recorded so that the coordinates for any point along the pathway will fall within the allowable accuracy.

1.2.2 GPS DATA FORMAT: The Contractor shall format the data dictionary in the GPS data loggers by using the entity naming convention, attribute fields and domain values as specified in Table A. GPS data loggers shall be set up to record and export the GPS Data Collector Setup properties listed in Table B.

1.2 GEOSPATIAL DATA REQUIREMENTS

1.2.1 SHAPE FILES: The GPS collected outside plant infrastructure features and communications pathways attribute, metadata, and location information shall be converted to, stored, and submitted in Environmental Systems Research Institute (ESRI) Shape File format. Each shape file set shall contain all the files that make up the general shape file, i.e., ".shp", ".shx", ".dbf", etc. along with the specified metadata file. Each shape file set shall have a geospatial reference (.prj) file included that specifies the parameters of the spatial reference system. Also, the dbf component of the shape file set shall contain the Table A entities, attributes, and domain values for communication features and the GPS Data Collector Setup Properties listed in Table B.

1.2.1 METADATA: For each set of outside plant infrastructure features and communications pathways data using GPS, the Contractor shall complete all metadata elements marked mandatory as defined by the FGDC–STD-001-1998. Metadata shall be formatted and stored as an XML document that is compatible with the submitted shape files.

1.2.2 ACCURACY WORKSHEETS: Calculation worksheets showing compliance with the National Standard for Spatial Data Accuracy (NSSDA) statement at the 95% confidence level, as required by paragraph 1.1.2, shall be submitted as an Excel (.xls) file. Examples of the Horizontal Accuracy Statistical Worksheet are given in FGDC-STD-007.3-1998, Appendix 3-B (informative) Horizontal Accuracy Computations, Tables 1 and 2. FGDC-STD-007.3-1998. The standard can be downloaded from a FGDC website: http://www.fgdc.gov/.

1.2.3 DATA COMPATIBILITY WITH GEOBASE COMMON INSTALLATION PICTURE: Geospatial Shape file data shall overlay on the installation's most current GeoBase Common Installation Picture (CIP) provided by 99 CES/CEPT, Nellis AFB. The collected data will incorporate the datum and the coordinate and projection system of the CIP for Nellis AFB or Creech AFB, NV UTM, WGS 84 Zone 11N, meters. Datum: World Geodetic System 1984 (WGS1984).

1.2.4 QUALITY CONTROL: The Contractor shall utilize a topology build and clean routine and professional standards to assure the outside plant infrastructure features and communications pathways data for the submitted Shape files have:

a. No erroneous overshoots, undershoots, dangles or intersections in the line work.
b. Features snapped where applicable (for example, GPS Path Segment snapped to GPS Manhole.
c. Continuous lines, with no pseudo-nodes (Nodes should only exist where the attributes of a line change).
d. No sliver polygons.
e. All polygons completely closed and have a single unique centroid.
f. Digital representation of the common boundaries for all graphic features that is coincident, regardless of feature layer.

1.3 SUBMITTAL OF DELIVERABLES: Shape files, metadata XML files, the quality control report and the calculation worksheets validating the NSSDA accuracy statement shall be submitted on CD-ROM storage media to 99 CS/SCXP, Nellis AFB, NV. Government representatives must verify that Shape files graphics and data tables can be visualized in CVC prior to project closeout.

2.0 APPLICABLE DOCUMENTS AND STANDARDS: The following documents are hereby incorporated by reference. The Contractor shall comply with these documents during the performance of the contract requirements: FGDC-STD-001-1998 - Content Standard for Digital Geospatial Metadata FGDC-STD-007.3-1998 - Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy FGDC-STD-007.4-2002 - Geospatial Positioning Accuracy Standards Part 4: Standards for Architecture, Engineering, Construction (A/E/C) and Facilities Management. The contractor shall obtain and comply with any other applicable manuals not identified above that would be required to meet industry standards.

TABLE A
Entities, Attributes, and Domain Values for Recording Required

Communication Feature Data
(BASIC COMM PATH TEMPLATE)

A.1 Feature Attributes for Comm-Path Entities.

A.1.1 GPS_MANHOLE

A.1.1.1 **Definition.** An enclosed structure (manhole, hand hole and pull box). A butterfly layout is used that shows the floor and walls flattened out so that duct openings can be drawn on the walls. This must be represented as one polygon (one row in the table). The point is used to show the center of the manhole/hand hole cover.

A.1.1.2 **Geometry type.** Site (Point).

A.1.1.3 **Attributes.**

Column Name	SDSFIE Common Name	Description	Data Type	Use	Domain Table
NAME	Identifier Name	The standard identifier name (e.g. MH-19).	Char(20)	Required	
MH_TYPE_D		A description for the type of manhole.	Char(16	Recommended	D_MHTYP
MH_MAT_D		Discriminator References D_COSTRM table. Used to describe the material composition of the manhole.	Char(16)	Recommended	D_COSTRM
FLOOR_ELEV	Floor Elevation Dimension	The height (or depth) of the bottom of the manhole measured from grade.	Real	Recommended	
RIM_ELEV	Rim Elevation Dimension	The height of the top of the rim of the manhole measured from grade.	Real	Recommended	
MAPSRC_D	Map Source Discriminator	DISCRIMINATOR - Used to indicate the source of data for the spatial position of this graphic.	Char(16)	Required	D_DATSRC
MAPACU	Spatial Accuracy in Meters	Describes the spatial accuracy of mapsrc_d. in meters, +/- of where the feature may actually be. For example, if you are using GPS and it's only accurate to 1 meter, put a 1 in this field.	Real	Required	

A.1.2 GPS_VAULT

A.1.2.1 **Definition.** An enclosed structure in a facility used for cable entrance.

A.1.2.2 **Geometry type.** Site (Point).
A.1.2.3 **Attributes.**

Column Name	SDSFIE Common Name	Description	Data Type	Use	Domain Table
NAME	Identifier Name	The standard identifier name (i.e. V-19).	Char(20)	Required	
VLT_MAT_D	Vault Material Code	Discriminator References D_COSTRM table. Used to describe the material composition of the vault.	Char(16)	Recommended	D_COSTRM
MAPSRC_D	Map Source Discriminator	DISCRIMINATOR - Used to indicate the source of data for the spatial position of this graphic.	Char(16)	Required	D_DATSRC
MAPACU	Spatial Accuracy in Meters	Describes the spatial accuracy of mapsrc_d. in meters, +/- of where the feature may actually be. For example, if you are using GPS and it's only accurate to 1 meter, put a 1 in this field.	Real	Required	

A.1.3 GPS_GENERAL CONTAINER
A.1.3.1 **Definition. A**n aboveground, enclosed structure that provides access to buried plant and a place to house splices, terminals, etc.
A.1.3.2 **Geometry type.** Site (Point).
A.1.3.3 **Attributes:**

Column Name	SDSFIE Common Name	Description	Data Type	Use	Domain Table
NAME	Identifier Name	The standard identifier name (i.e. PED-19).	Char(20)	Required	
TYPE_D	Type Code	A description for the type of pedestal .	Char(16)	Recommended	D_COPED

Column Name	SDSFIE Common Name	Description	Data Type	Use	Domain Table
MODEL_NO		The model number of the General Container	Char(16)	Recommended	
TERMINAL_D	Terminal Existence Code	A Boolean indicating the presence of a terminal (Y/N).	Char(16)	Recommended	D_BOOLEN
BONDED_D	Bonded Code	A Boolean indicating whether the General Container is bonded. (Y/N).	Char(16)	Recommended	D_BOOLEN
MAPSRC_D	Map Source Discriminator	DISCRIMINATOR - Used to indicate the source of data for the spatial position of this graphic.	Char(16)	Required	D_DATSRC
MAPACU	Spatial Accuracy in Meters	Describes the spatial accuracy of mapsrc_d. in meters, +/- of where the feature may actually be. For example, if you are using GPS and it's only accurate to 1 meter, put a 1 in this field.	Real	Required	

A.1.4 GPS_DBSPLICE

A.1.4.1 **Definition.** An enclosed structure that represents a splice case (aerial or buried).

A.1.4.2 **Geometry type.** Site (Point).

A.1.4.3 **Attributes:**

Column Name	SDSFIE Common Name	Description	Data Type	Use	Domain Table
NAME	Identifier Name	The standard identifier name (e.g. DBS01.1-1200_1-900).	Char(20)	Required	
CAS_MAT_D	Case Material Code	Used to describe the material composition of the splice case.	Char(16)	Recommended	D_SPCMAT
CAS_TYP_D	Case Type Code	Used to describe the type of splice case.	Char(16)	Recommended	D_SPCCAS
MAPSRC_D	Map Source Discriminator	DISCRIMINATOR - Used to indicate the source of data for the spatial position of this graphic.	Char(16)	Required	D_DATSRC
MAPACU	Spatial Accuracy in Meters	Describes the spatial accuracy of mapsrc_d. in meters, +/- of where the feature may actually be. For example, if you are using GPS and it's only accurate to 1 meter, put a 1 in this field.	Real	Required	

A.1.5 GPS_PATH_SEGMENT

A.1.5.1 **Definition.** Link that represents an enclosure path of comm. items outside of a building, manhole, General Container, or other enclosed structure. For duct banks, comm-path segment can represent the virtual path, duct bank, duct, and inner ducts. For ducts, comm-path segment can represent the virtual path, duct, and inner ducts. For direct-buried cables at road-crossings, comm-path segment can represent the virtual path, road-crossing duct, and direct-buried cables. It can also represent the path of aerial cable, cable-bridges, and cable-troughs.

A.1.5.2 **Geometry type.** Polyline.

A.1.5.3 **Attributes:**

‘Column Name	SDSFIE Common Name	Description	Data Type	Use	Domain Table
PATH_TYP_D	Comm-Path Type Code	A discriminator field that describes what type of communications path this segment is representing.	Char(16)	Required	D_COPTHT
COVERDEPTH		The minimum depth of this part of the path from grade, in inches. This is mainly used for digging permits	Real	Recommended	
MAPSRC_D	Map Source Discriminator	DISCRIMINATOR - Used to indicate the source of data for the spatial position of this graphic.	Char(16)	Required	D_DATSRC
MAPACU	Spatial Accuracy in Meters	Describes the spatial accuracy of mapsrc_d. in meters, +/- of where the feature may actually be. For example, if you are using GPS and it’s only accurate to 1 meter, put a 1 in this field.	Real	Required	

A.2 Domain Values for Attributes of Comm-Path Feature Entities.

A2.1 D_BOOLEN: type list.

A.2.1.1 What it does. A table of Boolean data types YES and NO. Use for selecting the existence or non-existence of a value, condition, or feature.

A.2.1.2 Referenced by GPS_GENERAL_CONTAINER

A.2.1.3 Attributes.

Lookup Value	Long Description
YES	The condition is true or the feature does exist
NO	The condition is not true or the feature does not exist

A.2.2 D_COPED: communications - General Container type.

A.2.2.1 What it does. This table contains information about various communications General Container types.

A.2.2.2 Referenced by GPS_GENERAL_CONTAINER.

A.2.2.3 Attributes.

Lookup Value	Long Description
BD	BD - Buried Distribution Closure, size unknown
BOX	BOX - Rectangular box type enclosure, accessed by removing a cover panel
CAB	CAB - Cabinet enclosure, accessed through a hinged door
CAD	CAD - Controlled Access Distribution Closure
PED4	4 inch pedestal
PED6	6 inch pedestal
PED8	8 inch pedestal
PED12	12 inch pedestal
OTHER	Other
TBD	To Be Determined
UNKNOWN	Unknown

A.2.3 D_COPTHT: communications - comm path type.

A.2.3.1 What it does. This table contains information about various communications path types.

A.2.3.2 Referenced by GPS_PATH_SEGMENT.

A.2.3.3 Attributes.

Lookup Value	Long Description
AERIAL	Above ground path between, poles, towers or buildings
CABLE_BRIDGE	Bridge only used for cables
CABLE_TROUGH	Pathway on top of ground for cables
DIRECT_BURIED	Below ground path where soil has direct contact with cable
DUCT	Single communications duct
DUCTBANK	A container for multiple ducts
STUB-OUT	Short duct used with manholes and vaults
SURFACE	Path directly on the surface
UNDER_ROAD	A duct for cables, usually under a road
UNKNOWN	Faulty Source Data

A.2.4 D_COSTRM: structure – material.

A.2.4.1 What it does. This table contains information about various structure materials.

A.2.4.2 Referenced by GPS_MANHOLE, GPS_VAULT.

A.2.4.3 Attributes.

Lookup Value	Long Description
AL	Aluminum
CIS	Concrete Cast inSitu/Cast in Place
COMBINATION	Combination of materials
FIBERGLASS	Fiberglass
PLASTIC	Plastic
PRECAST	Pre-Cast Concrete
STEEL	Steel
UNKNOWN	Unknown

A.2.5 D_DATSRC: source list – data.

A.2.5.1 What it does. Allowable input values for data sources.

A.2.5.2 Referenced by GPS_DBSPLICE, GPS_MANHOLE, GPS_PATH_SEGMENT, GPS_GENERAL_CONTAINER, GPS_VAULT.

A.2.5.3. Attributes.

Lookup Value	Long Description
GPS_FLDLOC	GPS field located and verified data

A.2.6 D_MHTYP: type list - comm manhole.

A.2.6.1 What it does. The type of manhole.

A.2.6.2 Referenced by GPS_MANHOLE.

A.2.6.3 Attributes.

Lookup Value	Long Description
1T1	1T1
4T1	4T1
5T1	5T1
6T1	6T1
6T2	6T2
8T1	8T1
A	A Type
CEMH	Controlled Environment Manhole
HH_Type_A	Handhole Type A
J3	J3 Manhole
J4	J4 Manhole
JC9C	JC9C (2450mm x 1750mm x 1450mm)
L	L Manhole

R2A	R2A Manhole
T	T Manhole
V	V Manhole
OTHER	Other
UNKNOWN	Unknown

A.2.7 D_SPCCAS: communications - splice case type

A.2.7.1 What it does. Allowable values for the type of splice case

A.2.7.2 Referenced by GPS_DBSPLICE

A.2.7.3 Attributes

Lookup Value	Long Description
12.5SS	12.5 Inch Stainless Steel
2 TYPE	2 Type
3BB	3 Inch Better Buried
3RS	3 Inch ReddiSeal
3SS	3 Inch Stainless Steel
4BB	4 Inch Better Buried
4RS	4 Inch ReddiSeal
4SS	4 Inch Stainless Steel
6.5BB	6.5 Inch Better Buried
6.5RS	6.5 Inch ReddiSeal
6.5SS	6.5 Inch Stainless Steel
9.5BB	9.5 Inch Better Buried
9.5RS	9.5 Inch ReddiSeal
9.5SS	9.5 Inch Stainless Steel
FOSC_100_B_H	Raychem FOSC-100 B/H
HS	Heat Shrink
KBV	K&B Vault
LEAD	Lead
OTHER	Other
READY_ACCESS	Ready Access
UC_6_9	Siemens UC 6-9
UCN_7_10	Siemens UCN 7-10

UNKNOWN	Unknown

A.2.8 D_SPCMAT: communications - splice case mat

A.2.8.1 What it does. Allowable input values for the material of the communications splice case

A.2.8.2 Referenced by GPS_DBSPLICE

A.2.8.3 Attributes

Lookup Value	**Long Description**
AL	Aluminum
EVA	Ethylene Vinyl Acetate (Heat Shrinkable Tubing)
FIBER	Fiberglass
LEAD	LEAD
PE	PE - Polyethylene
PP	PP - Polypropylene
PVC	PVC - PolyVinyl Chloride
SS	SS - Stainless Steel
OTHER	Other
UNKNOWN	Unknown

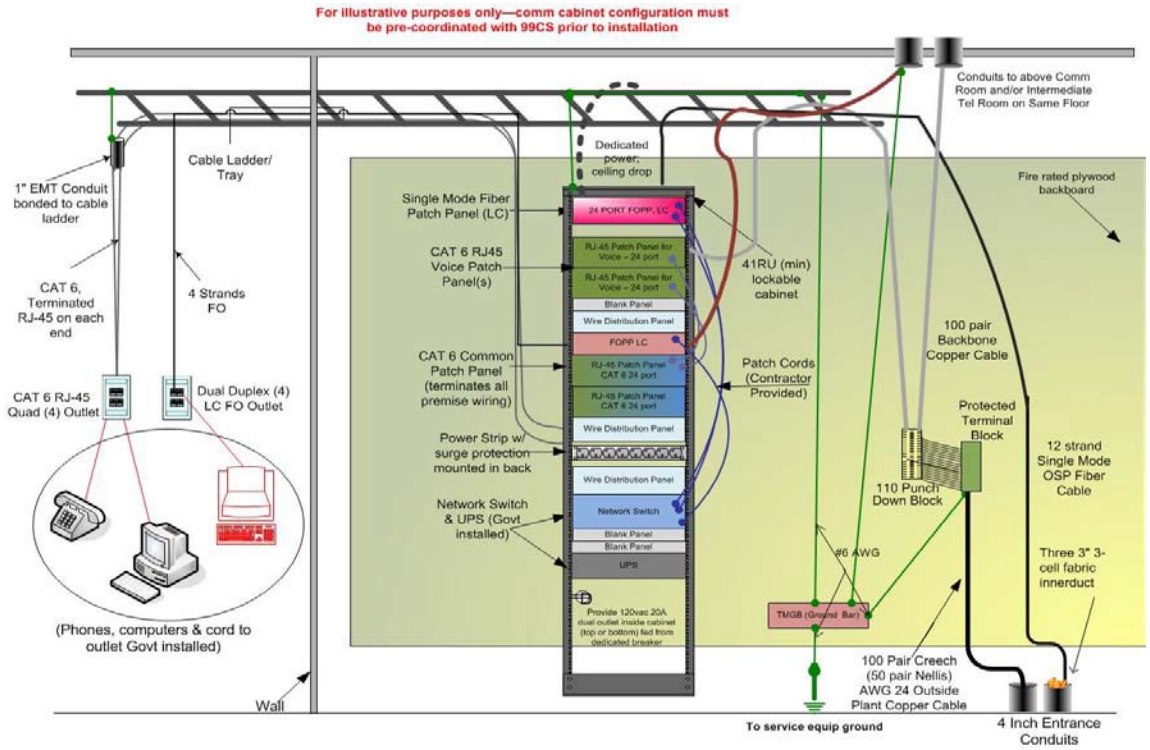
Table B

Numbers GPS Data Collector Setup Properties

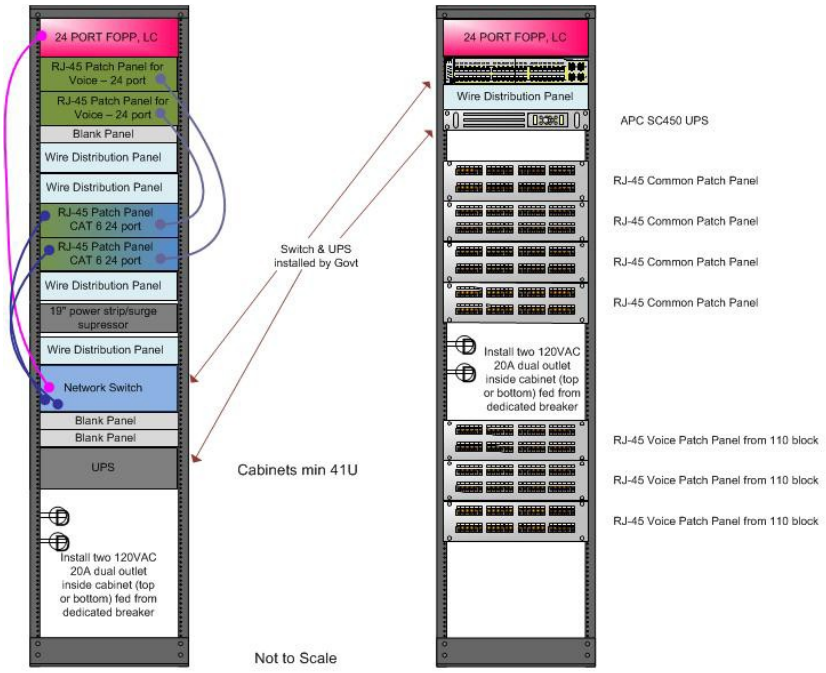
FOR ALL FEATURE TYPES	PDOP Position Dilution of Precision	HDOP Horizontal Dilution of Precision	Correction Status	Receiver Type	Date Recorded	Time Recorded	Update Status
	Feature Name	Data File Name	Total Positions	Filtered Positions	GPS Week	GPS Second	_
IN ADDITION FOR LINE FEATURES	Length (2D)	Length (3D)	Average Vertical Precision	Average Horizontal Precision	Worst Vertical Precision	Worst Horizontal Precision	Line ID

A.5 COMM ROOM & FRONT PANEL EXAMPLES

NOTE: For illustrative purposes only – pre-coordinate with Communications Squadron prior it installation



UNCLASS Comm Room wiring plan NC 2710, 06/12



Creech AFB Example **Nellis AFB Example**

UNCLASS Front Panel Drawing NC 2710, 6/12

APPENDIX

AIR FORCE SUSTAINABILITY GUIDANCE

AFCEC
BATTLE READY...BUILT RIGHT
A-GRAM
AGRAM 17-01
February, 2017

Change to AF New Construction and Major Renovation Certification Requirements

Purpose

This A-Gram provides guidance on the AF switch **from** using Leadership in Energy and Environmental Design (LEED) Silver certification, as required by the Air Force Sustainable Design and Development (SDD) Implementing Guidance Memorandum (Jun 2011); **to** third-party certification using the DoD version of Guiding Principles (GPs) Compliance certification of either the 1) US Green Building Council (USGBC)/ Green Business Certification Inc. (GBCI), or 2) Green Building Initiative (GBI) rating systems, for all applicable projects as described herein.

Discussion

BACKGROUND:
Current public laws and executive orders require all new Federal facilities to meet a comprehensive set of requirements commonly referred to as the Federal High Performance and Sustainable Building (HPSB) GPs. These requirements have been consolidated into UFC 1-200-02, *High Performance and Sustainable Building Requirements.* The Department of Defense Sustainable Buildings Policy Memorandum (10 Nov 2013) states "A building that meets the UFC (1-200-02) requirements shall be considered compliant with the requirements of law and the Guiding Principles." Additionally, the memo requires DOD Components to "… establish an auditable process to ensure applicable new buildings and major renovations meet requirements as defined in the UFC. The auditable process shall include green-building certification …"

The AF has utilized the USGBC LEED rating system as a third-party validation of meeting project sustainability goals since 2001. While the intent of the HPSB GP requirements align somewhat with the LEED rating system, LEED Silver certification does not constitute compliance with the Federal requirements and UFC 1-200-02. In an effort to reduce confusion about project sustainability goals, advance compliance with the Federal requirements, streamline HPSB GP compliance and tracking requirements, and identify a third-party certification that can be used for all new construction and major renovation projects, the AF reviewed newly developed USGBC/GBCI and GBI Guiding Principles Compliance rating systems and determined they can better serve as indicators of HPSB GP compliance.

APPLICABILITY:
The third-party certification requirements contained herein apply to AF construction activity as follows:

1. All new buildings larger than 5,000 SF, with construction costs greater than $3M
2. All renovations to an existing building larger than 5,000 SF with construction costs greater than $3M and 50% estimated replacement costs
3. To the extent practical for:
    a. Buildings not on AF installations in the United States and its territories
    b. Building supporting contingency operations
    c. Non-permanent buildings
    d. Projects marked as "austere" on the DD Form 1391

THIRD-PARTY CERTIFICATION REQUIREMENT:
Effective immediately, the USAF will discontinue use of LEED certification of new buildings and major renovations. Projects already registered for certification under LEED 2009 will continue with the process, and will achieve LEED Silver certification. All projects that have not yet registered for certification will register for Guiding Principles Compliance certification using the DoD version of either USGBC/GBCI or the GBI rating systems, and shall achieve verification of meeting the Federal requirements as detailed in UFC 1-200-02.

CONTACT: **Paula Shaw, P.E., LEED AP, AFCEC/CFTS**
DSN 969.8121/COMM 210.395.8121/Email paula.shaw@us.af.mil
2261 Hughes Ave., Ste. 155
JBSA-Lackland, TX 78236-9853

US Army Corps of Engineers

ENGINEERING AND CONSTRUCTION BULLETIN

No. 2016-30 **Issuing Office:** CECW-CE **Issued:** 21 Dec 16 **Expires:** 21 Dec 18

SUBJECT: Air Force Sustainability Guidance for Third-Party Certification.

CATEGORY: Directive and Guidance.

1. **References**:

a. Unified Facilities Criteria 1-200-02, High Performance and Sustainable Building Requirements, 1 December 2016

b. Briefing Slides, Air Force Civil Engineer Center LEAP Meeting, 10 November 2016

c. E-mail, Chief, Technical Services Division, Facilities Engineering Directorate, Air Force Civil Engineer Center, 1 December 2016

2. **Purpose**: The purpose of this ECB is to update the sustainability guidance for third-party certification of Air Force (AF) projects for which USACE is the Design and Construction Agent.

3. **Applicability**: This guidance applies to all construction projects required to achieve third-party certification in accordance with Unified Facilities Criteria (UFC) 1-200-02 (Reference a), Table 1-1, on permanent Active AF Installations located in the United States (including Alaska and Hawaii) and its territories. This guidance also applies to overseas AF construction projects to the greatest extent practical considering mission objectives and Host Nation agreements.

4. **Policy.** As briefed at the Air Force Civil Engineer Center LEAP Meeting (Reference b) and confirmed by e-mail (Reference c) effective immediately, the AF is discontinuing use of Leadership in Energy & Environmental Design (LEED) for third-party certification. New AF projects will register for the DoD specific Federal High Performance and Sustainable Building Guiding Principles Compliance (GPC) third-party certification using either the US Green Building Council (USGBC) or Green Building Initiative (GBI).

5. **Implementing Guidance.**

a. All AF projects will continue to meet the requirements of UFC 1-200-02, High Performance and Sustainable Buildings.

b. Projects already registered under LEED version 2009 will continue and achieve LEED Silver certification. No new AF projects will register for LEED version 4 certification.

c. All new AF projects, not previously registered under LEED version 2009 by the registration close date of 31 October 2016, will register with USGBC or GBI for DoD specific GPC certification, regardless of funding source, for the following design and construction

activities occurring on permanent Active AF Installations in the United States and its territories (in accordance with the current UFC 1-200-02, Table 1-1, updated 1 December 2016):

(1) All new buildings larger than 5,000 SF, with construction cost greater than $3M.

(2) All renovations to an existing building greater than 5,000 SF, with construction cost greater than $3M and 50% Estimated Replacement Cost (ERC).

d. Guidance documents and the AF Sustainability Requirements Scoresheet will be updated for this new policy and can be found at: http://www.wbdg.org/ffc/af-afcec/policies-and-guidance-af-design-and-construction

6. **Update.** The requirement as described above will be included in the next update of the MILCON AF Annex of the Enterprise Program Management Plan (EPgMP).

7. **Points of Contact.** HQUSACE points of contact for this ECB are Kelli Polzin, CECW-CE, (202) 761-8900 and Jane Smith, CEMP-ID, (202)-761-5771.

//S//
DAVID J. LEACH, P.E.
Acting Chief, Programs Integration Division
Directorate of Military Programs

//S//
ROBERT P. RIZZIERI, P.E.
Acting Chief, Engineering and Construction
Directorate of Civil Works

Encl.
Attachment A - Briefing Slides, Air Force Civil Engineer Center LEAP Meeting
Attachment B - E-mail, Chief, Technical Services Division, Facilities Engineering Directorate, Air Force Civil Engineer Center

U.S. AIR FORCE

New AF Sustainability Policy

Third-Party Certification Requirements

- **Effective immediately the AF is discontinuing use of LEED**
  - New projects will register for Guiding Principles Compliance (GPC) certification using either the US Green Building Council (USGBC) or Green Building Initiative (GBI) GPC certification
  - Projects already registered under LEED 2009 shall continue with the certification and achieve LEED Silver certification
  - No new AF projects will register for LEED v4 certification
- **All AF projects will continue to meet the requirements of UFC 1-200-02, *High Performance and Sustainable Building Requirements***
- **USGBC and GBI will have DoD specific GPC certification processes than align directly with both the current version of UFC 1-200-02 and the revision, which is in final coordination**

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1

U.S. AIR FORCE

New AF Sustainability Policy

Third-Party Certification Requirements

- **GPC certification is required for the following construction activities regardless of funding source:**
  - All new buildings larger than 5,000 sf with construction costs greater than $3M
  - All renovations to an existing building greater than 5000 sf, construction costs greater than $3M, and greater than 50% ERC
  - To the extent practical for:
    - Buildings not on AF installations in the United States and its territories
    - Buildings supporting contingency operations
    - Non-permanent buildings
    - Projects marked as "Austere" on the DD From 1391
- **Guidance documents and the AF Sustainability Requirements Scoresheet can be found at:** http://www.wbdg.org/ccb/browse_cat.php?c=265

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2

Attachment B - E-mail, Chief, Technical Services Division, Facilities Engineering Directorate, Air Force Civil Engineer Center

From:	MESICK, GENE F GS-15 USAF HAF AFCEC/CFT
To:	Smith, Jane A CIV USARMY CEHQ (US); Lea, George O Jr CIV USARMY USACE (US); KRAYNAK, MARK T GS-15 USN NAVFACHQ (EOC) OPS
Cc:	MAY, BRIAN G Col USAF AFCEC AFCEC/CF; BALZANO, JOHN M Col USAF AFMC AFCEC/CF; PRAZAK, MICHAEL D CIV USAF HAF AFCEC/CF; LOZANO, ROGELIO JR GS-15 USAF HAF AFCEC/CFM; SCHULIGER, JOHN D Lt Col USAF AFMC AFCEC/CFS; DOMM, JEFFREY P GS-15 USAF USAFE AFCEC/CFE; WARNER, SCOTT A Col USAF AFCEC PACAF/CFP; KINDT, BENJAMIN T GS-14 USAF HAF AFCEC/CFTP; HAMPTON, RHONDA GS-14 USAF AFCEC AFCEC/CFTD; SHAW, PAULA S GS-14 USAF AFCEC AFCEC/CFTP
Subject:	[EXTERNAL] New Air Force Policy on High Performance and Sustainable Buildings Guiding Principles (HPSB GP)
Date:	Thursday, December 01, 2016 11:01:04 AM

Jane/George/Mark, The Air Force has instituted a new sustainability policy effective immediately. The Air Force will transition from LEED Silver certification to third-party certification of compliance with the Federal HPSB GP requirements, per the revised UFC 1-200-02 "High Performance and Sustainable Building Requirements", dated 1 Dec 2016. This change is an opportunity to eliminate confusion about project sustainability goals, to focus on achieving the Federal requirements, and to align with the priorities and energy strategies of the Air Force.

Projects already registered for certification under LEED 2009 will continue with that process, with a goal of achieving LEED Silver certification. All
new project design starts that have not yet registered for LEED certification will register for Guiding Principles Compliance certification only, using either USGBC or the Green Building Initiative (GBI) rating systems. Specific guidance on registration and the new scoresheet will be released shortly.

If you have questions please contact Ms. Paula Shaw at paula.shaw@us.af.mil, 210-395-8121.

Thanks! Gene

//SIGNED//
GENE F. MESICK, RA, GS-15, DAF
Chief, Technical Services Division
Facilities Engineering Directorate
Air Force Civil Engineer Center
210.395.8029 / DSN 969.8029
gene.mesick@us.af.mil

APPENDIX

BUILDING 332 SEISMIC CALCULATIONS

COMPUTATION SHEET

PROJECT	Building 332 Nellis AFB	SHEET NO ____ OF ____ SHEETS	
ITEM	ASCE 41-13 Seismic Eval	DATE	4/16/18
	Draft RFP Submission	FILE	
COMPUTED BY	BN	CHECKED BY	M.O.
REF DWG. NO.			

CESPD FORM 284, 1 SEP 89

USGS Design Maps Detailed Report

ASCE 41-13 Retrofit Standard, BSE-1E (36.24°N, 115.04°W)

Site Class D – "Stiff Soil"

Section 2.4.1 – General Procedure for Hazard Due to Ground Shaking

20%/50-year maximum direction spectral response acceleration for 0.2s and 1.0s periods, respectively:

From Section 2.4.1.4	$S_{S,20/50}$ = 0.151 g
From Section 2.4.1.4	$S_{1,20/50}$ = 0.057 g

Section 2.4.1.6 – Adjustment for Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Section 2.4.1.6.1.

SITE CLASS	SOIL PROFILE NAME	Soil shear wave velocity, $\bar{v}_s$, (ft/s)	Standard penetration resistance, $\bar{N}$	Soil undrained shear strength, $\bar{s}_u$, (psf)
A	Hard rock	$\bar{v}_s$ > 5,000	N/A	N/A
B	Rock	2,500 < $\bar{v}_s$ ≤ 5,000	N/A	N/A
C	Very dense soil and soft rock	1,200 < $\bar{v}_s$ ≤ 2,500	$\bar{N}$ > 50	>2,000 psf
D	Stiff soil profile	600 ≤ $\bar{v}_s$ < 1,200	15 ≤ $\bar{N}$ ≤ 50	1,000 to 2,000 psf
E	Stiff soil profile	$\bar{v}_s$ < 600	$\bar{N}$ < 15	<1,000 psf
E	—	Any profile with more than 10 ft of soil having the characteristics: 1. Plasticity index *PI* > 20, 2. Moisture content *w* ≥ 40%, and 3. Undrained shear strength $\bar{s}_u$ < 500 psf		
F	—	Any profile containing soils having one or more of the following characteristics: 1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. 2. Peats and/or highly organic clays (*H* > 10 feet of peat and/or highly organic clay where *H* = thickness of soil) 3. Very high plasticity clays (*H* > 25 feet with plasticity index *PI* > 75) 4. Very thick soft/medium stiff clays (*H* > 120 feet)		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Table 2–3. Values of F_a as a Function of Site Class and Mapped Short-Period Spectral Response Acceleration S_s

Site Class	Mapped Spectral Acceleration at Short-Period S_s				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	Site-specific geotechnical and dynamic site response analyses shall be performed				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = D and S_S = 0.151 g, F_a = 1.600

Table 2–4. Values of F_v as a Function of Site Class and Mapped Spectral Response Acceleration at 1 s Period S_1

Site Class	Mapped Spectral Acceleration at 1 s Period S_1				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	Site-specific geotechnical and dynamic site response analyses shall be performed				

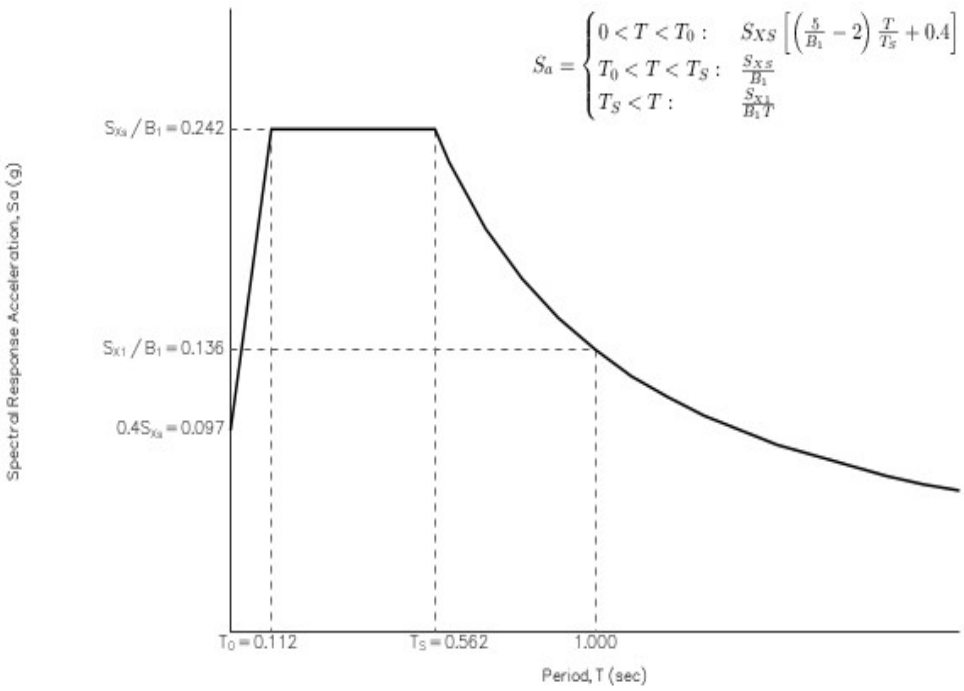
Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.057 g, F_v = 2.400

Provided as a reference for Equation (2-4):	$F_aS_{S,20/50}$ = 1.600 x 0.151 g = 0.242 g
Provided as a reference for Equation (2-5):	$F_vS_{1,20/50}$ = 2.400 x 0.057 g = 0.136 g
Provided as a reference for Equation (2-4):	$S_{XS,BSE\text{-}1N}$ = ⅔ x $S_{XS,BSE\text{-}2N}$ = ⅔ x $F_aS_{S,BSE\text{-}2N}$ = 0.480 g
Provided as a reference for Equation (2-5):	$S_{X1,BSE\text{-}1N}$ = ⅔ x $S_{X1,BSE\text{-}2N}$ = ⅔ x $F_vS_{1,BSE\text{-}2N}$ = 0.240 g
Equation (2–4):	$S_{XS,BSE\text{-}1E}$ = MIN[$F_aS_{S,20/50}$, $S_{XS,BSE\text{-}1N}$] = MIN[0.242g, 0.480g] = 0.242g
Equation (2–5):	$S_{X1,BSE\text{-}1E}$ = MIN[$F_vS_{S,20/50}$, $S_{X1,BSE\text{-}1N}$] = MIN[0.136g, 0.240g] = 0.136g

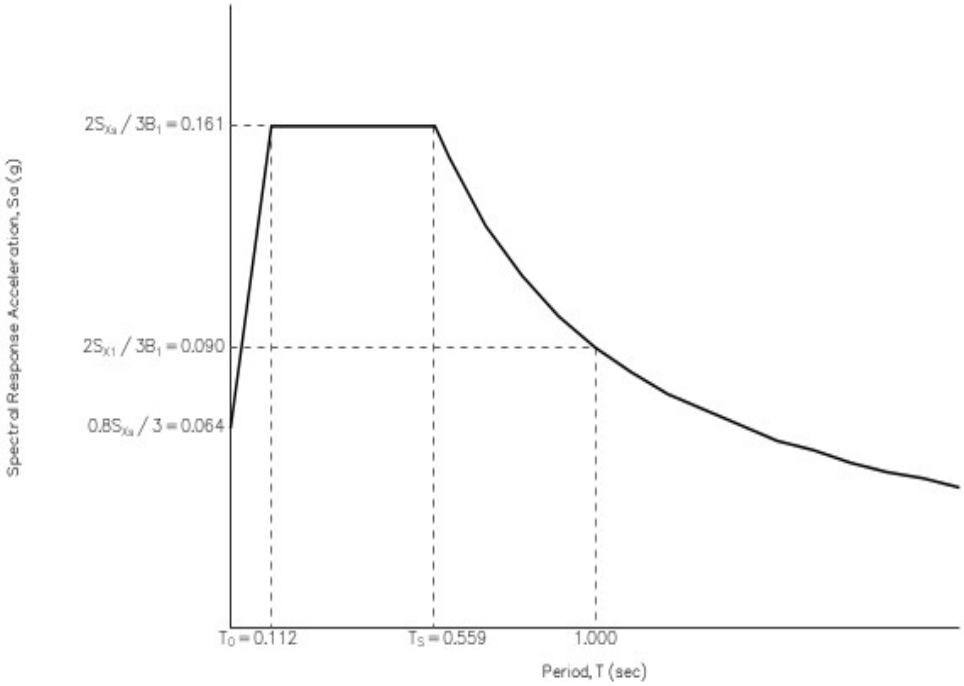
Section 2.4.1.7.1 — General Horizontal Response Spectrum

Figure 2-1. General Horizontal Response Spectrum



Section 2.4.1.7.2 — General Vertical Response Spectrum

The General Vertical Response Spectrum is determined by multiplying the General Horizontal Response Spectrum by ⅔.



USGS Design Maps Detailed Report

ASCE 41-13 Retrofit Standard, BSE-1N (36.24°N, 115.04°W)

Site Class D – "Stiff Soil"

Section 2.4.1 – General Procedure for Hazard Due to Ground Shaking

Provided as a reference for Equation (2-4) and Equation (2-5), respectively:

From Section 2.4.1.1 $S_{S,BSE\text{-}2N}$ = 0.520 g

From Section 2.4.1.1 $S_{1,BSE\text{-}2N}$ = 0.169 g

Section 2.4.1.6 – Adjustment for Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Section 2.4.1.6.1.

SITE CLASS	SOIL PROFILE NAME	Soil shear wave velocity, $\bar{v}_s$, (ft/s)	Standard penetration resistance, $\bar{N}$	Soil undrained shear strength, $\bar{s}_u$, (psf)
A	Hard rock	$\bar{v}_s > 5{,}000$	N/A	N/A
B	Rock	$2{,}500 < \bar{v}_s \leq 5{,}000$	N/A	N/A
C	Very dense soil and soft rock	$1{,}200 < \bar{v}_s \leq 2{,}500$	$\bar{N} > 50$	>2,000 psf
D	Stiff soil profile	$600 \leq \bar{v}_s < 1{,}200$	$15 \leq \bar{N} \leq 50$	1,000 to 2,000 psf
E	Stiff soil profile	$\bar{v}_s < 600$	$\bar{N} < 15$	<1,000 psf
E	—	Any profile with more than 10 ft of soil having the characteristics: 1. Plasticity index $PI > 20$, 2. Moisture content $w \geq 40\%$, and 3. Undrained shear strength $\bar{s}_u < 500$ psf		
F	—	Any profile containing soils having one or more of the following characteristics: 1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. 2. Peats and/or highly organic clays ($H > 10$ feet of peat and/or highly organic clay where H = thickness of soil) 3. Very high plasticity clays ($H > 25$ feet with plasticity index $PI > 75$) 4. Very thick soft/medium stiff clays ($H > 120$ feet)		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Table 2–3. Values of F_a as a Function of Site Class and Mapped Short-Period Spectral Response Acceleration S_s

Site Class	Mapped Spectral Acceleration at Short-Period S_s				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	Site-specific geotechnical and dynamic site response analyses shall be performed				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = D and S_S = 0.520 g, F_a = 1.384

Table 2–4. Values of F_v as a Function of Site Class and Mapped Spectral Response Acceleration at 1 s Period S_1

Site Class	Mapped Spectral Acceleration at 1 s Period S_1				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	Site-specific geotechnical and dynamic site response analyses shall be performed				

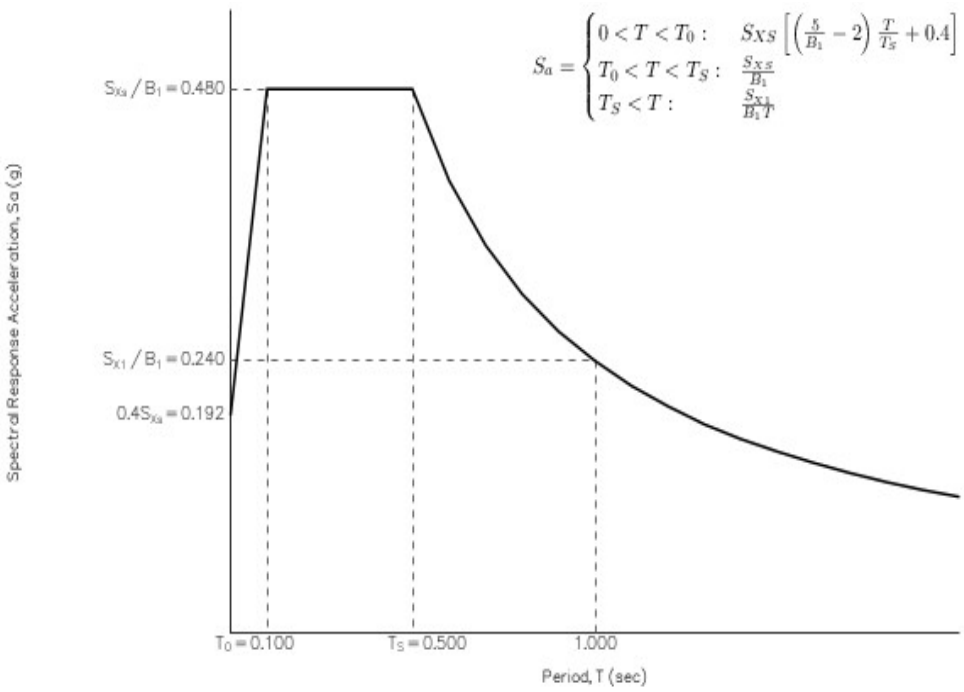
Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.169 g, F_v = 2.123

Provided as a reference for Equation (2-4):	$S_{XS,BSE\text{-}2N} = F_a S_{S,BSE\text{-}2N} = 1.384 \times 0.520\ g = 0.720\ g$
Provided as a reference for Equation (2-5):	$S_{X1,BSE\text{-}2N} = F_v S_{1,BSE\text{-}2N} = 2.123 \times 0.169\ g = 0.359\ g$
Equation (2–4):	$S_{XS,BSE\text{-}1N} = \frac{2}{3} \times S_{XS,BSE\text{-}2N} = \frac{2}{3} \times 0.720\ g = 0.480\ g$
Equation (2–5):	$S_{X1,BSE\text{-}1N} = \frac{2}{3} \times S_{X1,BSE\text{-}2N} = \frac{2}{3} \times 0.359\ g = 0.239\ g$

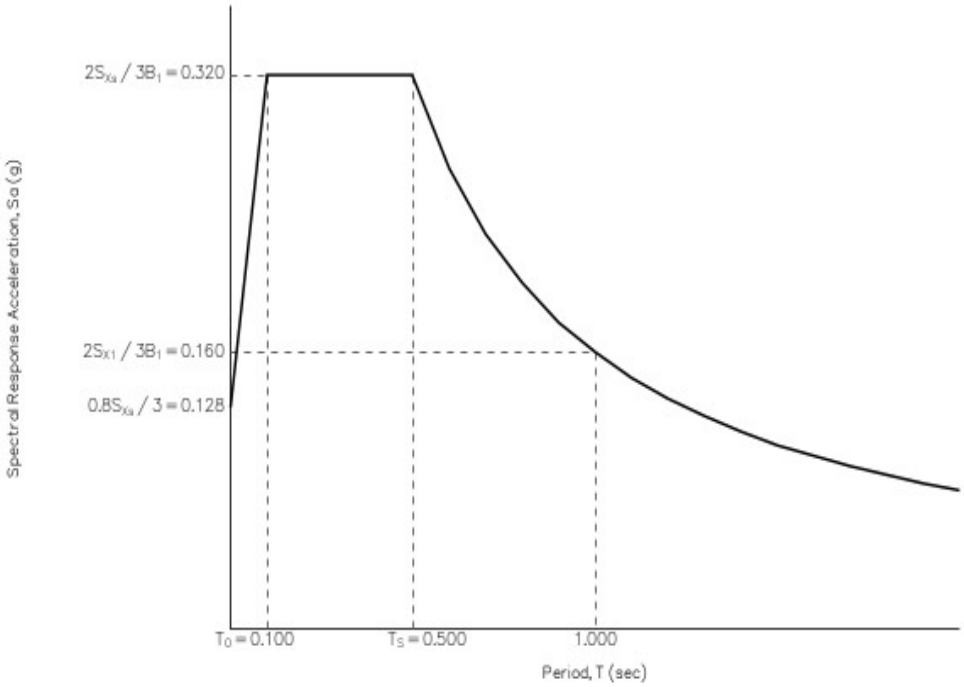
Section 2.4.1.7.1 — General Horizontal Response Spectrum

Figure 2-1. General Horizontal Response Spectrum



Section 2.4.1.7.2 — General Vertical Response Spectrum

The General Vertical Response Spectrum is determined by multiplying the General Horizontal Response Spectrum by ⅔.



By: BN
Checked by: Onines

References:
1. ASCE 41-13, "Seismic Evaluation and Retrofit of Existing Buildings"
2. 1968 As-Built Drawings 21-01-04
3. ASCE 7-10, Minimum Design Loads for Buildings and Other Structures"

Checklists Required:
1. LS Basic Configuration
2. LS for Building Type C2

Evaluation Data:
Site Class- D (assumed)
Risk Category- II
Earthquake Hazard Level- BSE-1E (Table 2-1 Ref 1)

Sxs = **0.242** g USGS 2008 Hazard Maps

Structural Period:

Ct = **0.02** 4.5.2.4 ASCE 41
hn = **29** ft
β = **0.75**
T = 0.25 s Eq 4-5 ASCE 41

Spectral Acceleration:
Sx1 = **0.136** g USGS 2008 Hazard Maps
Sxs = **0.242** g USGS 2008 Hazard Maps
Sx1/T = 0.544 > Sxs
Sa = **0.242** g USGS 2008 Hazard Maps & Eq 4-4

Sds = **0.48** g < 0.5g Table 2-5 ASCE 41
Sd1 = **0.239** g >0.2g Table 2-5 ASCE 41

Level of Seismicity = High

<u>Pseudo Seismic Force In Transverse Direction</u>

C= **1.1** Table 4-8
Sa = 0.242 g

V = C *Sa *W = 0.267 W Eq 4-1, Tier 1 Base Shear

<u>Pseudo Seismic Force In Longitudinal Direction</u>

C= **1** Table 4-8
Sa = 0.242 g

V = C *Sa *W = 0.242 W Eq 4-1, Tier 1 Base Shear

CHECK TORSION IN N-S DIRECTION

Reference Enercalc Torsion Analysis

L = 204.667 ft (length of bldg)

Assume CM is at middle of building, CM = L/2 = 102.3335 ft

ey = 6 ft (Enercalc)

e =ey/L *100 = 3 **% << 20% OK**

Note: tributary col ht to 2nd and 3rd floor = **9.58** ft

Seismic Weights

Floors:	7 inch slabs		88	
	Mech		4	
	Ceiling		2	
	Columns		13	
	Beams		10.5	
	Partitions		10	
	Misc		2.5	
		w(flr) =	130	psf
Roof:	SSMR Roof Assembly		10	
	6.6 inch (average) slab thickness		83	
	Mech		4	
	Ceiling		2	
	Columns		6.5	
	Beams		10.5	
	Partitions		5	
		w(roof) =	121	psf
7" x 3.667' Wide sunshades			88	psf
Concrete End Walls:				
	10 inch thickness	w(wall1) =	**125**	psf
ATFP Window System			**8**	psf

Floor Areas, Af =	7914 sf	Wf =	**1029**	k
Roof Area, Aroof =	7914 sf	Wroof =	**958**	k

Floor Sunshades, Af, shade =	1262	sf	Wf,shade=	112	k
Roof Sunshades, Ar shade =	1882	sf	Wr shade =	166	k
Transv Walls, Atwall =	770	sf	Wtwall =	97	k (trib to each floor)
Transv Walls, Atwall =	385	sf	Wtwall =	49	k (trib to roof)
Long Walls, Alwall =	3922	sf	Wlwall =	32	k (trib to each floor)
Long Walls, Alwall =	1961	sf	Wlwall =	16	k (trib to roof)

Tributary Seismic Dead Loads to Each Level

Roof =	1189	k
3rd Flr =	1270	k
2nd Flr =	1270	k
W =	3729	k

V = CSaW = 993 k Eq 4-1

SHEAR STRESS CHECK IN TRANSVERSE DIRECTION

Determine shear wall area in transverse direction at first floor

Lgross = 118.5 ft

Openings = 17.666 ft

Lnet = Lgross - Openings = 100.834 ft

T = 10 in

Aw = T* Lnet = 12101 in^2

Ms = 4 Table 4-9 ASCE 41 for LS Level of Performance

v,ave = 1/Ms(V/Aw) = 21 psi Eq 4-9

v,ave << 100 psi allowed, OK

SHEAR STRESS CHECK IN LONGITUDINAL DIRECTION

Determine shear wall area in longitudinal direction at first floor

Lgross = 70.67 ft (total for 4 walls between Line 2 and 3)

Openings = 0 ft

Lnet = Lgross - Openings = 70.67 ft

T = 8 in

Aw = T* Lnet = 6785 in^2

Ms = 4 Table 4-9 ASCE 41 for LS Level of Performance

v,ave = 1/Ms(V/Aw) = 37 psi Eq 4-9

v,ave << 100 psi allowed, OK

TRANSVERSE SHEAR WALL REINFORCING STEEL CHECK

Wall reinf per Sheet 54 of 1968 as-builts is #4 @ 16" EW & EF

T = 10 in
As = 0.2 in^2
s = 16 in
ρ = 0.0025 each direction **OK**

LONGITUDINAL SHEAR WALL REINFORCING STEEL CHECK

Wall reinf per Detail 22 on Sheet 56 of 1968 as-builts is #4 @ 16" EW & EF

T = 8 in
As = 0.2 in^2
s = 16 in
ρ = 0.003125 each direction **OK**

WALL ANCHORAGE CHECK AT FLOOR DIAPHRAGMS Note: exterior walls are 10 inches thick

Tc = ΨSxs*wp*Ap Eq 4-13

Ψ= **1.2** Sxs = **0.242** wp= 125 psf

Tc = **36.3** psf (out-of-plane seismic load at floor level)

Ref: 1968 As-Built Detail 4 on Sheet 52 & Sheet 54:

Typical anchorage at transv walls is #4 x 4'-0" long (Grade 40) bars @ 12" with 90-deg hooks

s = **1** ft (anchor spacing) Trib wall ht = **9.58** ft

Ap = s * Trib wall ht = **9.58** SF Tc = **0.4** k/anchor

As =	0.2	in^2
fy =	40	ksi
ϕTn = 0.9Asfy =	7.2	k >> Tc

Transv Ext Wall Diaphragm Anchorage is OK

CHECK FOUNDATION OVERTURNING IN TRANSVERSE DIRECTION (LINE G)

L =	13.8	ft
H =	29	ft
L/H =	0.48	
0.6Sa =	0.1452	**OK**

CHECK FOUNDATION OVERTURNING IN LONGITUDINAL DIRECTION

L =	17.67	ft
H =	29	ft
L/H =	0.61	
0.6Sa =	0.1452	**OK**

TRANSFER TO SHEAR WALL CHECK

Distributed Seismic Loads to 2nd Floor & 3rd and Roof Levels:

$$F_x = C_{vx} V \qquad (7\text{-}24)$$

$$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k} \qquad (7\text{-}25)$$

$$V = C_1 C_2 C_m S_a W \qquad (7\text{-}21)$$

m,max =	4	Table 10-22
C1C2 =	1.4	Table 7-3

Cm = **0.8** Table 7-4

V = **0.272** W Tier 2 Analysis

V = **1015** k

Level	hx	hi	k	Wt	wi*hi^k	Cvx	Fx
Roof	29	29	1	1189	34481	0.482	489.23
3rd	19.4	19.4	1	1270	24638	0.345	350.18
2nd	9.8	9.8	1	1270	12446	0.174	176.61
					71565	1.001	1016.02

Note: Typical minimal floor slab reinf anchorage to shear walls is #4 @ 12" Top & Bott
Typical wall reinf anchorage into roof slab is (2) #4 @ 16"

Check Shear Transfer at Roof of Shear Wall T (see Enercalc sketch)

V(T) = 203 k (See Enercalc)

Lwall = 40 ft

v = V(T)/Lwall = **5.1** kpf (unit shear parallel to shear wall)

Check In-Plane Shear Capacity of Anchorage at Line T

m = 1 Table 10-16
k = 0.75 Table 6-1
fy = 40 ksi (assumed)
Av = 0.3 in^2/ft

Check shear friction per ACI 318-14:

Vn = Avf fyμ (18.12.9.3)
μ = 1.0λ Table 22.9.4.2
λ = 1
Vn = 12 kpf note: gravity loads are 90-deg to seismic loads so are therefore neglected

mκQCE > QUD (7-37)

m kVn = **9** kpf **OK**

Check Shear Transfer at Roof of Shear Wall 3.1 (see Enercalc sketch)

V(3.1) = 122.3 k (See Enercalc)

Lwall = 17.667 ft

v = V(3.1)/Lwall = **7** kpf (unit shear parallel to shear wall)

Check In-Plane Shear Capacity of Anchorage at Line 3.1

m = 1 Table 10-16
k = 0.75 Table 6-1
fy = 40 ksi (assumed)
Av = 0.3 in^2/ft

Check shear friction per ACI 318-14:

Vn = Avf fyμ (18.12.9.3)
μ = 1.0λ Table 22.9.4.2
λ = 1
Vn = 12 kpf note: gravity loads are 90-deg to seismic loads so are therefore neglected
mκQCE > QUD (7-37)

m kVn = **9** kpf **OK**

CHECK DEFLECTION COMPATIBILITY BETWEEN COLUMNS AND SHEAR WALLS

Note: Concrete columns are integral with the shear walls

Reference Enercalc results

Level	Shear Wall	V
Roof	T	203
3rd	T	145
2nd	T	73.5
	Vmax =	421.5 K

Δ/kip = 0.0000235 in/kip

Δmax = Δ/kip * Vmax = 0.1 in **OK by Inspection**

Level	Shear Wall	V
Roof	3.1	122
3rd	3.1	87.5
2nd	3.1	44.3
	Vmax =	253.8 K

Δ/kip = 0.0000717 in/kip

Δmax = 0.1 in **OK by Inspection**

Torsional Analysis of Rigid Diaphragm

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ENERCALC, INC. 1983-2017, Build:10.17.9.13, Ver:10.17.9.13

Lic. # : KW-06001500 **Licensee : usaced - sacramento**

Description : B332 Nellis- Roof Diaphram

General Information

Calculations per IBC 2015, CBC 2016, ASCE 7-1

Applied Lateral Force	489.0	k
.....Additional Orthogonal Force		k
Maximum Load Used for Analysis :	489.0	k

Note: This load is the vector resolved from the above two entries and will be applied to the system of elements at angular increments.

Load Orientation Angular Increment	15.0	deg
Load Location Angular Increment	15.0	deg

Center of Rigidity Location (calculated) . . .

"X" dist. from Datum	96.120	ft
"Y" dist. from Datum	18.90	ft

Center of Shear Application :

Distance from "X" datum point	102.30	ft
Distance from "Y" datum point	20.0	ft

Accidental Torsion values per ASCE 7-05 12.8.4.2

Ecc. as % of Maximum Dimension	0.00	%

Maximum Dimensions :

Along "X" Axis	204.670	ft
Along "Y" Axis	40.0	ft

Accidental Eccentricity +/- from "X" Coord. of Load Application :	0.0	ft
Accidental Eccentricity +/- from "Y" Coord. of Load Application :	0.0	ft

Wall Information

Label :	X Wall C.G. Location	Y Wall C.G. Location	Wall Angle CCW	Wall Fixity	Length	Height	Thickness	E - Bending	E - Shear
Wall 3.1	13 ft	16.4 ft	0 deg	Fix-Fix	17.667 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi
Wall 3.1(R)	191.67 ft	16.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi
Wall 3.8	13 ft	21.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi
Wall 3.8(R)	191.67 ft	21.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi
Wall A	0 ft	20 ft	90 deg	Fix-Fix	40 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi
Wall G (1)	75.6 ft	33.4 ft	90 deg	Fix-Fix	13.8 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi
Wall G(2)	75.6 ft	6.6 ft	90 deg	Fix-Fix	13.8 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi
Wall T	204.667 ft	20 ft	90 deg	Fix-Fix	40 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi

Wall Deflections (Stiffness) for 1.0 kip load :

Label :	Along Wall "y" Dir	Along Wall "x" Dir
Wall 3.1	7.1739E-005 in	4.5795E+002 in
Wall 3.1(R)	7.1725E-005 in	4.5788E+002 in
Wall 3.8	7.1725E-005 in	4.5788E+002 in
Wall 3.8(R)	7.1725E-005 in	4.5788E+002 in
Wall A	2.3520E-005 in	1.0439E+002 in
Wall G (1)	7.7680E-005 in	3.0258E+002 in
Wall G(2)	7.7680E-005 in	3.0258E+002 in
Wall T	2.3520E-005 in	1.0439E+002 in

Torsional Analysis of Rigid Diaphragm

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Lic. # : KW-06001500 **Licensee : usaced - sacramento**

Description : B332 Nellis- Roof Diaphram

ANALYSIS SUMMARY

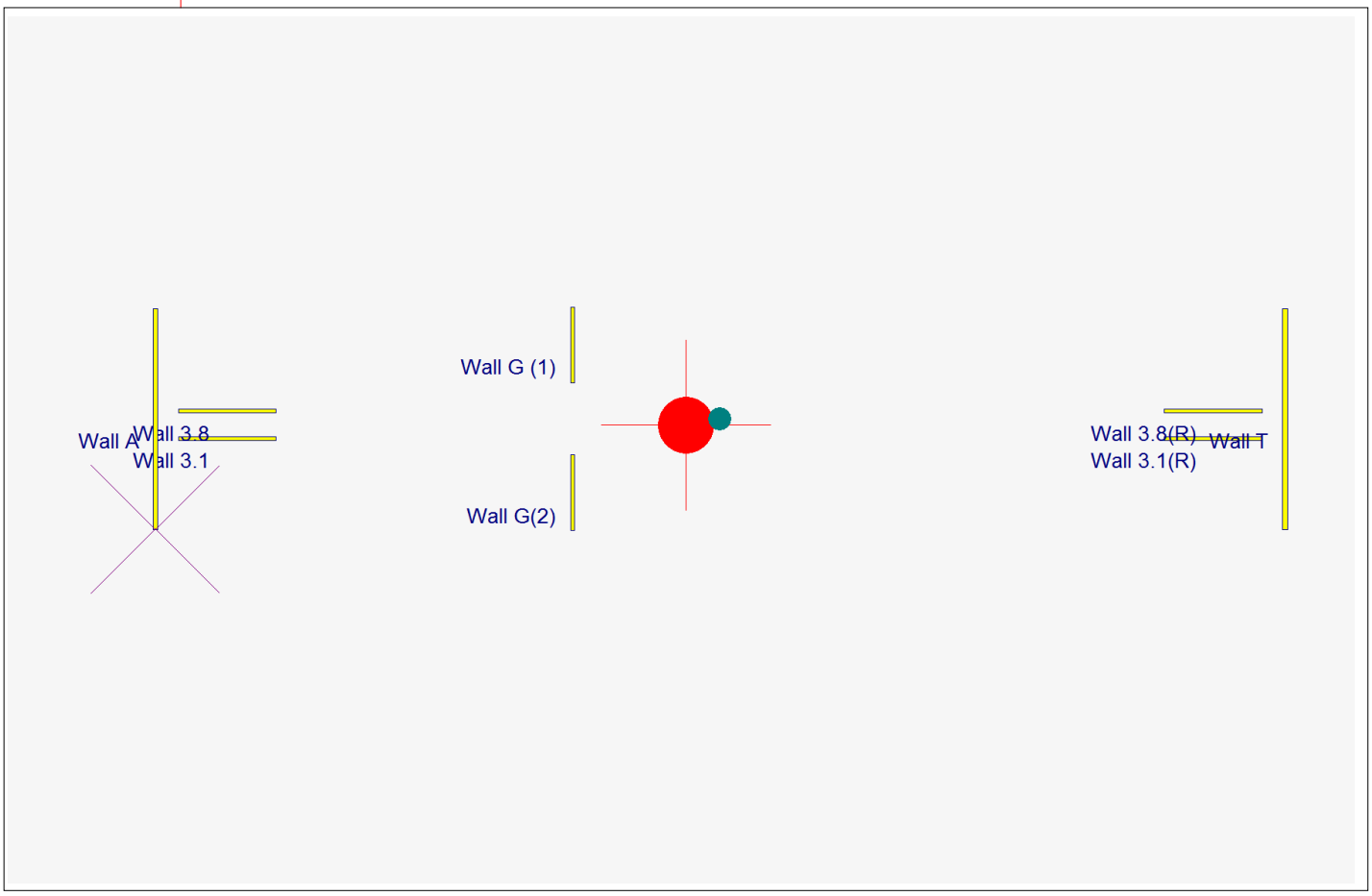
Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

	Max Shear along Member Local "y-y" Axis				Max Shear along Member Local "x-x" Axis			
Resisting Element	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)
Wall 3.1	0	-6.18	1.10	122.252	90	-6.18	1.10	0.000
Wall 3.1(R)	0	-6.18	1.10	122.277	90	-6.18	1.10	0.000
Wall 3.8	0	-6.18	1.10	122.277	90	-6.18	1.10	0.000
Wall 3.8(R)	0	-6.18	1.10	122.277	90	-6.18	1.10	0.000
Wall A	90	-6.18	1.10	187.675	0	-6.18	1.10	0.000
Wall G (1)	90	-6.18	1.10	56.825	0	-6.18	1.10	0.000
Wall G(2)	90	-6.18	1.10	56.825	0	-6.18	1.10	0.000
Wall T	90	-6.18	1.10	203.086	0	-6.18	1.10	0.000

Layout of Resisting Elements

Legend : Defined Wall X Datum

Center of Rigidity Center of Mass Accidental eccentricity application boundary



Torsional Analysis of Rigid Diaphragm

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Description : B332 Nellis- Roof Diaphram

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

Torsional Analysis of Rigid Diaphragm

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Lic. # : KW-06001500 **Licensee : usaced - sacramento**

Description : B332 Nellis- 3rd Floor Diaphram

General Information

Calculations per IBC 2015, CBC 2016, ASCE 7-1

Applied Lateral Force	350.0	k
.....Additional Orthogonal Force		k
Maximum Load Used for Analysis :	350.0	k

Note: This load is the vector resolved from the above two entries and will be applied to the system of elements at angular increments.

Load Orientation Angular Increment	15.0	deg
Load Location Angular Increment	15.0	deg

Center of Rigidity Location (calculated) . . .

"X" dist. from Datum	96.120	ft
"Y" dist. from Datum	18.90	ft

Center of Shear Application :

Distance from "X" datum point	102.30	ft
Distance from "Y" datum point	20.0	ft

Accidental Torsion values per ASCE 7-05 12.8.4.2

Ecc. as % of Maximum Dimension	0.00	%

Maximum Dimensions :

Along "X" Axis	204.670	ft
Along "Y" Axis	40.0	ft

Accidental Eccentricity +/- from "X" Coord. of Load Application :	0.0	ft
Accidental Eccentricity +/- from "Y" Coord. of Load Application :	0.0	ft

Wall Information

Label :	X Wall C.G. Location	Y Wall C.G. Location	Wall Angle CCW	Wall Fixity	Length	Height	Thickness	E - Bending	E - Shear	Wall Deflections (Stiffness) for 1.0 kip load : Along Wall "y" Dir	Along Wall "x" Dir
Wall 3.1	13 ft	16.4 ft	0 deg	Fix-Fix	17.667 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi	7.1739E-005 in	4.5795E+002 in
Wall 3.1(R)	191.67 ft	16.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi	7.1725E-005 in	4.5788E+002 in
Wall 3.8	13 ft	21.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi	7.1725E-005 in	4.5788E+002 in
Wall 3.8(R)	191.67 ft	21.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi	7.1725E-005 in	4.5788E+002 in
Wall A	0 ft	20 ft	90 deg	Fix-Fix	40 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi	2.3520E-005 in	1.0439E+002 in
Wall G (1)	75.6 ft	33.4 ft	90 deg	Fix-Fix	13.8 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi	7.7680E-005 in	3.0258E+002 in
Wall G(2)	75.6 ft	6.6 ft	90 deg	Fix-Fix	13.8 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi	7.7680E-005 in	3.0258E+002 in
Wall T	204.667 ft	20 ft	90 deg	Fix-Fix	40 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi	2.3520E-005 in	1.0439E+002 in

Torsional Analysis of Rigid Diaphragm

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Description : B332 Nellis- 3rd Floor Diaphram

ANALYSIS SUMMARY

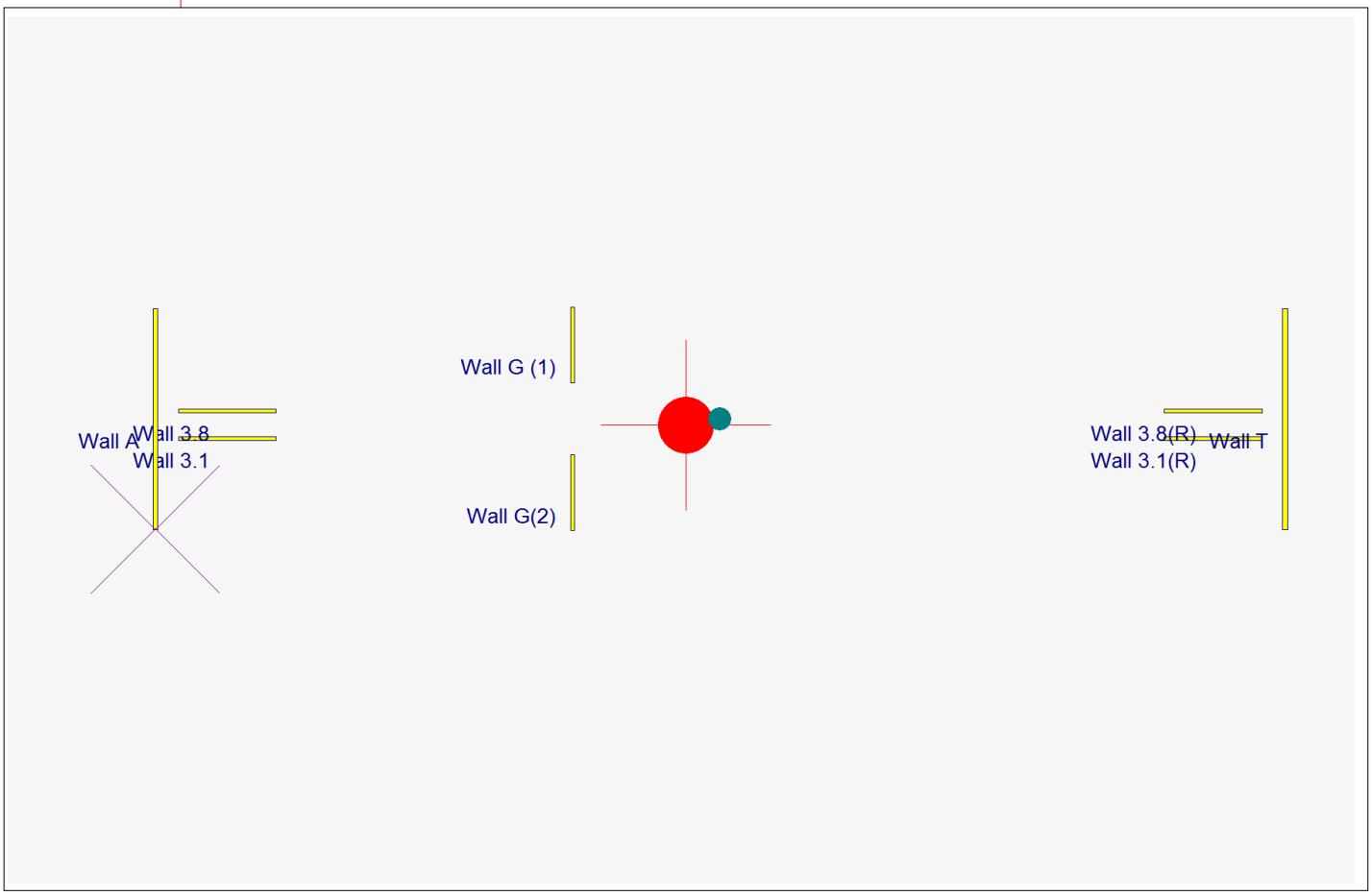
Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

	Max Shear along Member Local "y-y" Axis				Max Shear along Member Local "x-x" Axis			
Resisting Element	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)
Wall 3.1	0	-6.18	1.10	87.502	90	-6.18	1.10	0.000
Wall 3.1(R)	0	-6.18	1.10	87.519	90	-6.18	1.10	0.000
Wall 3.8	0	-6.18	1.10	87.519	90	-6.18	1.10	0.000
Wall 3.8(R)	0	-6.18	1.10	87.519	90	-6.18	1.10	0.000
Wall A	90	-6.18	1.10	134.328	0	-6.18	1.10	0.000
Wall G (1)	90	-6.18	1.10	40.672	0	-6.18	1.10	0.000
Wall G(2)	90	-6.18	1.10	40.672	0	-6.18	1.10	0.000
Wall T	90	-6.18	1.10	145.358	0	-6.18	1.10	0.000

Layout of Resisting Elements

Legend : Defined Wall X Datum

Center of Rigidity Center of Mass Accidental eccentricity application boundary



Torsional Analysis of Rigid Diaphragm

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Description : B332 Nellis- 3rd Floor Diaphram

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

Torsional Analysis of Rigid Diaphragm

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Lic. # : KW-06001500 **Licensee : usaced - sacramento**

Description : B332 Nellis- 2nd Floor Diaphram

General Information

Calculations per IBC 2015, CBC 2016, ASCE 7-1

Applied Lateral Force	177.0	k
.....Additional Orthogonal Force		k
Maximum Load Used for Analysis :	177.0	k

Note: This load is the vector resolved from the above two entries and will be applied to the system of elements at angular increments.

Load Orientation Angular Increment	15.0	deg
Load Location Angular Increment	15.0	deg

Center of Rigidity Location (calculated) . . .

"X" dist. from Datum	96.120	ft
"Y" dist. from Datum	18.90	ft

Center of Shear Application :

Distance from "X" datum point	102.30	ft
Distance from "Y" datum point	20.0	ft

Accidental Torsion values per ASCE 7-05 12.8.4.2

Ecc. as % of Maximum Dimension	0.00	%

Maximum Dimensions :

Along "X" Axis	204.670	ft
Along "Y" Axis	40.0	ft

Accidental Eccentricity +/- from "X" Coord. of Load Application :	0.0	ft
Accidental Eccentricity +/- from "Y" Coord. of Load Application :	0.0	ft

Wall Information

Label :	X Wall C.G. Location	Y Wall C.G. Location	Wall Angle CCW	Wall Fixity	Length	Height	Thickness	E - Bending	E - Shear	Wall Deflections (Stiffness) for 1.0 kip load : Along Wall "y" Dir	Along Wall "x" Dir
Wall 3.1	13 ft	16.4 ft	0 deg	Fix-Fix	17.667 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi	7.1739E-005 in	4.5795E+002 in
Wall 3.1(R)	191.67 ft	16.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi	7.1725E-005 in	4.5788E+002 in
Wall 3.8	13 ft	21.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi	7.1725E-005 in	4.5788E+002 in
Wall 3.8(R)	191.67 ft	21.4 ft	0 deg	Fix-Fix	17.67 ft	9.6 ft	8 in	3.12 Mpsi	1.248 Mpsi	7.1725E-005 in	4.5788E+002 in
Wall A	0 ft	20 ft	90 deg	Fix-Fix	40 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi	2.3520E-005 in	1.0439E+002 in
Wall G (1)	75.6 ft	33.4 ft	90 deg	Fix-Fix	13.8 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi	7.7680E-005 in	3.0258E+002 in
Wall G(2)	75.6 ft	6.6 ft	90 deg	Fix-Fix	13.8 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi	7.7680E-005 in	3.0258E+002 in
Wall T	204.667 ft	20 ft	90 deg	Fix-Fix	40 ft	9.6 ft	10 in	3.12 Mpsi	1.248 Mpsi	2.3520E-005 in	1.0439E+002 in

Torsional Analysis of Rigid Diaphragm

File = C:\Users\L2EDDWBN\Desktop\NELLIS~1\SEISMI~1\NELLIS~1.EC6
ENERCALC, INC. 1983-2017, Build:10.17.9.13, Ver:10.17.9.13

Lic. # : KW-06001500 **Licensee : usaced - sacramento**

Description : B332 Nellis- 2nd Floor Diaphram

ANALYSIS SUMMARY

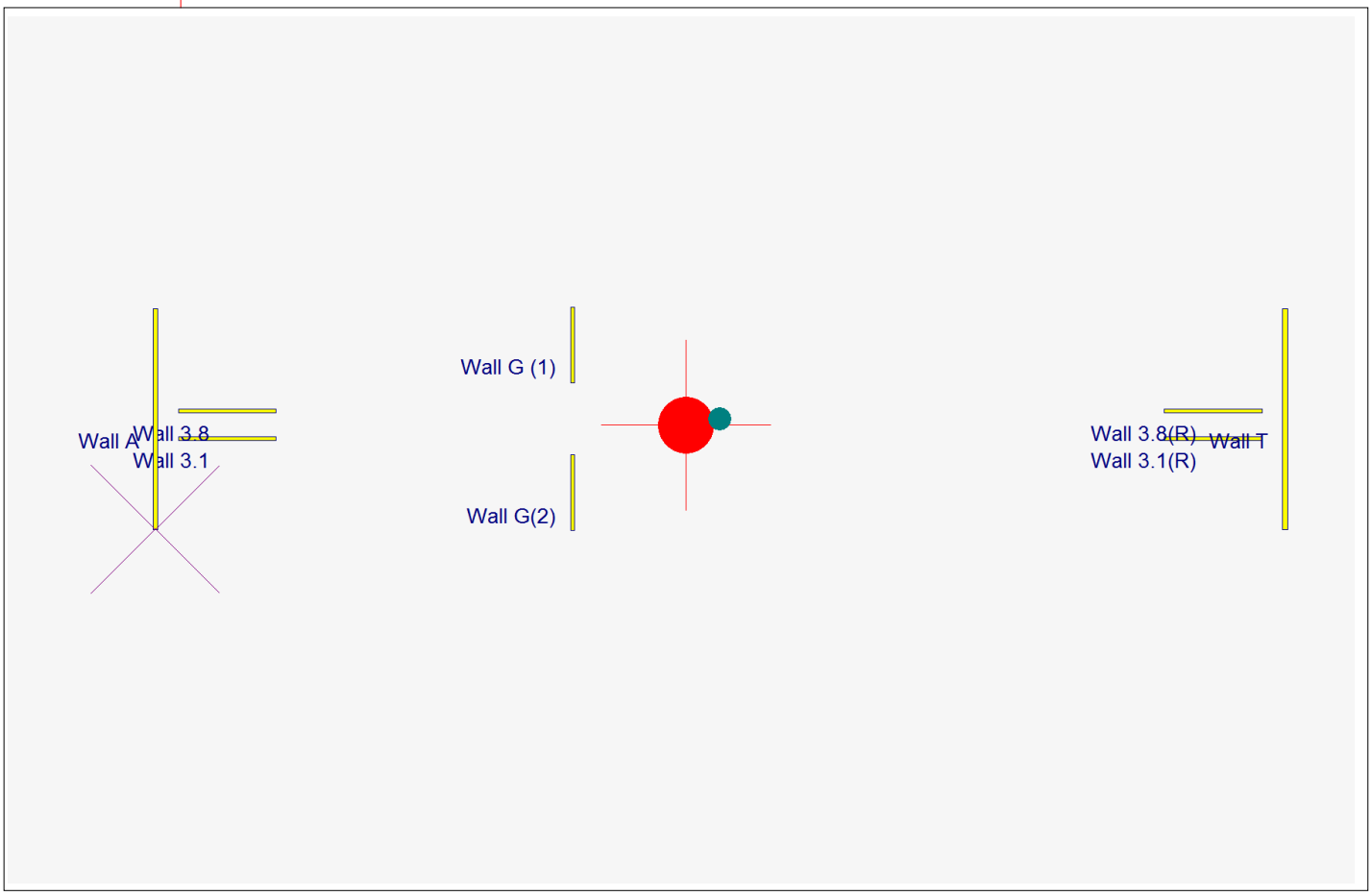
Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

	Max Shear along Member Local "y-y" Axis				Max Shear along Member Local "x-x" Axis			
Resisting Element	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)
Wall 3.1	0	-6.18	1.10	44.251	90	-6.18	1.10	0.000
Wall 3.1(R)	0	-6.18	1.10	44.260	90	-6.18	1.10	0.000
Wall 3.8	0	-6.18	1.10	44.260	90	-6.18	1.10	0.000
Wall 3.8(R)	0	-6.18	1.10	44.260	90	-6.18	1.10	0.000
Wall A	90	-6.18	1.10	67.932	0	-6.18	1.10	0.000
Wall G (1)	90	-6.18	1.10	20.568	0	-6.18	1.10	0.000
Wall G(2)	90	-6.18	1.10	20.568	0	-6.18	1.10	0.000
Wall T	90	-6.18	1.10	73.510	0	-6.18	1.10	0.000

Layout of Resisting Elements

Legend : Defined Wall X Datum

Center of Rigidity Center of Mass Accidental eccentricity application boundary



Torsional Analysis of Rigid Diaphragm

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ENERCALC, INC. 1983-2017, Build:10.17.9.13, Ver:10.17.9.13

Lic. # : KW-06001500 **Licensee : usaced - sacramento**

Description : B332 Nellis- 2nd Floor Diaphram

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA

Building Name: Building 332 Nellis AFB, NV Date: Jan 6, 2018

Building Address:

Latitude: 36.24 deg N Longitude: 115.04 deg W By: BN

Year Built: 1968 Year(s) Remodeled: 1988 Original Design Code: Unknown

Area (sf): Length (ft): 204'-8" Width (ft): 40'-2"

No. of Stories: 3 Story Height: 9'-7" Total Height: 29'-0"

USE ☐ Industrial ☒ Office ☐ Warehouse ☐ Hospital ☐ Residential ☐ Educational ☐ Other:

CONSTRUCTION DATA

Gravity Load Structural System: Flat plate slab system supported by concrete columns

Exterior Transverse Walls: 10" thick reinforced concrete shear walls Openings? Yes

Exterior Longitudinal Walls: Metal stud infilled exterior walls w/ interior R/C shear walls Openings? Yes

Roof Materials/Framing: SSMR

Intermediate Floors/Framing: Flat Plate with R/C perimeter beams

Ground Floor: Slab-On-Grade

Columns: Reinforced concrete columns Foundation: Isolated column footings

General Condition of Structure: Good

Levels Below Grade? None

Special Features and Comments:

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	C2	C2
Vertical Elements:	Concrete columns	Concrete columns
Diaphragms:	Flat Plate	Flat Plate
Connections:	Slab and Beam Reinf	Slab and Beam Reinf

EVALUATION DATA

BSE-1N Spectral Response Accelerations: S_{Ds} = 0.48 S_{D1} = 0.24

Soil Factors: Class = D F_a = 1.38 F_v = 2.12

BSE-1E Spectral Response Accelerations: S_{XS} = 0.242 S_{X1} = 0.136

Level of Seismicity: High Performance Level: LS

Building Period: T = 0.25 s transverse

Spectral Acceleration: S_a = 0.242

Modification Factor: $C_mC_1C_2$ = 1.12 Building Weight: W = 3729 Kips

Pseudo Lateral Force: V= 0.272W

$C_mC_1C_2S_aW$= 1015 Kips

BUILDING CLASSIFICATION:

REQUIRED TIER 1 CHECKLISTS	**Yes**	**No**
Basic Configuration Checklist	☒	☐
Building Type C2 **Structural Checklist**	☒	☐
Nonstructural Component Checklist	☐	☒

FURTHER EVALUATION REQUIREMENT: New equipment installed will be braced per IBC 2015 requirements

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Project: Bldg 332 Nellis AFB Location: _____

Completed by: BN Date: _____

TIER 1 CHECKLISTS

16.1 BASIC CHECKLIST

Very Low Seismicity

Structural Components

C NC N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)

C NC N/A U WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)

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Project: Bldg 332 Nellis AFB Location: _____

Completed by: BN Date: _____

16.1.2LS LIFE SAFETY BASIC CONFIGURATION CHECKLIST

Low Seismicity

Building System

General

C NC N/A U LOAD PATH: The structure shall contain a complete, well defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)

C NC N/A U ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 4% of the height of the shorter building. This statement shall not apply for the following building types: W1, W1a, and W2. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)

C NC N/A U MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)

Building Configuration

C NC N/A U WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1) OK by inspection.

C NC N/A U SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)

C NC N/A U VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3) Shear walls are continuous from

C NC N/A U GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)

C NC N/A U MASS: There is no change in effective mass more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)

C NC N/A U TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)

Moderate Seismicity: Complete the Following Items in Addition to the Items for Low Seismicity.

Geologic Site Hazards

C NC N/A U LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)

C NC N/A U SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)

C NC N/A U SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)

High Seismicity: Complete the Following Items in Addition to the Items for Low and Moderate Seismicity.

Foundation Configuration

C NC N/A U OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)

C NC N/A U TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4) Continuous footings are used to support shear wall loads in the N-S direction

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Completed by: BN Date: _____

16.10LS LIFE SAFETY STRUCTURAL CHECKLIST FOR BUILDING TYPES C2: CONCRETE SHEAR WALLS WITH STIFF DIAPHRAGMS ~~AND C2A: CONCRETE SHEAR WALLS WITH FLEXIBLE DIAPHRAGMS~~

Low and Moderate Seismicity

Seismic-Force-Resisting System

C NC (N/A) U COMPLETE FRAMES: Steel or concrete frames classified as secondary components form a complete vertical-load-carrying system. (Commentary: Sec. A.3.1.6.1. Tier 2: Sec. 5.5.2.5.1) R/C shear walls in both directions

(C) NC N/A U REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

(C) NC N/A U SHEAR STRESS CHECK: The shear stress in the concrete shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in.^{2} or $2\sqrt{f'_c}$. (Commentary: Sec. A.3.2.2.1. Tier 2: Sec. 5.5.3.1.1)

(C) NC N/A U REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. (Commentary: Sec. A.3.2.2.2. Tier 2: Sec. 5.5.3.1.3)

Connections

C NC (N/A) U WALL ANCHORAGE AT FLEXIBLE DIAPHRAGMS: Exterior concrete or masonry walls that are dependent on flexible diaphragms for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1) Concrete diaphragms used at each level

(C) NC N/A U TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)

(C) NC N/A U FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation with vertical bars equal in size and spacing to the vertical wall reinforcing immediately above the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4) See Detail 4 on Sheet 54

High Seismicity: Complete the Following Items in Addition to the Items for Low and Moderate Seismicity.

Seismic-Force-Resisting System

(C) NC N/A U DEFLECTION COMPATIBILITY: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)

(C) NC N/A U FLAT SLABS: Flat slabs or plates not part of the seismic-force-resisting system have continuous bottom steel through the column joints. (Commentary: Sec. A.3.1.6.3. Tier 2: Sec. 5.5.2.5.3) Detail 1 & 3 on sheet 52 shows #4bott lapped at columns 30 bar diameters, OK

(C) NC N/A U COUPLING BEAMS: The stirrups in coupling beams over means of egress are spaced at or less than $d/2$ and are anchored into the confined core of the beam with hooks of 135 degrees or more. The ends of both walls to which the coupling beam is attached are supported at each end to resist vertical loads caused by overturning. (Commentary: Sec. A.3.2.2.3. Tier 2: Sec. 5.5.3.2.1)
Detail 2 on Sheet 54 shows #3 stirrups spaced 6". Beam depth = 14.25", d = 12", d/2 = 6" OK
Detail 2 also shows 135 deg hooks OK

Connections

C NC (N/A) U UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)

Diaphragms (Flexible or Stiff)

(C) NC N/A U DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)

(C) NC N/A U OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)

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APPENDIX L

NELLIS ENVIRONMENTAL PERMIT REQUIREMENTS

99 CES/CEIE
ENVIRONMENTAL PERMITS/AUTHORITY TO PROCEED GUIDANCE
For General Information, call (702) 652-2834/8084
Sep 2018

PERMIT/AUTHORITY TO CONSTRUCT	RESPONSIBLE PARTY TO OBTAIN PERMIT	PERMITTING/COORDINATING AGENCY
Air Program Manager (702) 652-2882/4123		
Clar County Dust Permit: - Trench /= 100 LF - Disturbance /= Acre (10,890 SF) - Structural demo /= 1000 SF	Contractor Nellis Air Quality Manager for in-house CE or RED HORSE proj	Clar County Department of Air Quality (DAQ) (http://www.clar countynv.gov/AirQuality/Compliance/Pages/Compliance DustPermitting.aspx (702) 455-5942)
Authority to Construct (ATC) required prior to commencing construction: - Boilers (low NOx required by regulation in Clar County for certain si es) - Cooling Towers (open drift) - Baghouse/Cyclones - Fuel Dispensing Equipment - Fuel Storage Tan s - Asphalt Batch Plant - Concrete Batch Plant - Roc Crusher/ Mineral Processing - Paint Booths - Media Blasters - Water Heaters (low NOx required by regulation in Clar County for certain si es no requirement for electric) - Generators - Hush House - Degreasers - Fuel Cell Maintenance	Nellis Air Quality Pgm Mgr (nellisairquality@nellis.af.mil (702) 652-2882/4123)	Clar County DAQ Or Nevada Division of Environmental Protection (NDEP)
Drinking Water - Water Program Manager (702) 652-7639		
Engineering Plan Reviews Projects impacting drin ing water must be submitted to the BSDW for review prior to commencing the water project.	Contractor	Nevada Division of Environmental Protection (NDEP) Bureau of Safe Drin ing Water
Waste Water - Water Program Manager (702) 652-7639		
Temporary Discharge to Waters Discharges from remediation and disinfection activities, well pump testing, aquifer drawdown testing, dewatering, underground injection of fluids, and other discharges of a temporary nature.	Contractor	Nevada Division of Environmental Protection (NDEP)
Construction Storm Water Discharge Permit Requires SWPPP– If an acre or more of land is disturbed	Contractor	Submit a copy of SWPPP to base Water Program Manager for approval and provide a copy of NoI. Submit NoT at completion. Provide to base contracting for Civil Engineering to incorporate in project folder
Asbestos/Lead/Toxics Program Manager (702) 652-7606		
Asbestos: - ACM Survey/Abatement - Notification/Demolition Permit - ACM Waste Manifest	Contractor (Bill of Lading signed by Authori ed Pgm Mgr, (702) 652-6410)	DAQ: http://www.clar countynv.gov/AirQuality/Compliance/Pages/Compliance AsbestosForms.aspx (702) 455-5942 Provide to base contracting for Civil Engineering to incorporate in project folder

Lead Based Paint: - LBP Survey/Abatement - LBP Waste Manifest	Contractor (Manifest signed by Authori ed Pgm Mgr, (702) 652-6410)	DAQEM: Bioenvironmental Engineer (702) 653-3348 for XRF/XRD analy er permit prior to use on Nellis/Creech Provide to base contracting for Civil Engineering to incorporate in project folder
Toxics: - PCB disposal - Refrigerants and other O one Depleting Chemicals - Ha ardous Materials - Radon (if encountered) - Ha ardous Waste	Contractor	Nellis Ha ardous Waste Pgm Mgr: (702) 652-3159 DAQEM and obtain HAZMART ((702) 652-4352) approval Nellis Ha ardous Material Pgm Mgr: (702) 652-9722 Bioenvironmental (702) 653-3344 Nellis Ha Waste Pgm Mgr:(702) 652-3159/679-0476
Solid Waste: - Landfills (None on Nellis) - Recycled Materials	Contractor	Nellis Solid Waste Program Manager: (702) 652-6097 Qualified Recycling Program Manager: (702) 652-6097
Fire Protection Services: - Sprin ler Systems - Automated Fire Fighting Foam (AFFF) Systems - Burn Permit/Welding Permit	Contractor	Fire Dept-- Nellis: (702) 652-9626 or Creech: (702) 404-2228/0236
Restoration Sites	Contractor	Restoration Pgm Mgr: (702) 652-9365
Cultural Resources: - Historical Sites/Facilities - Archaeological Sites	Contractor	Nellis Archaeologist: (702) 652-5813
Natural Resources: - Presence of Protected Plant or Animal Species - Presence or Creation of a Wetland - Plants and Landscaping	Contractor	Nellis Natural Resource Program Manager: (702) 652-7606 NTTR Natural Resource Program Manager: (702) 652-4354
AICUZ	Contractor	Base Comprehensive Planner: (702) 652-3198
Electromagnetic Fields	Contractor	Nellis Frequency Management: (702) 652-3417
EMS Awareness Training (https://acc.esohtn.com/start)	Contractor	Nellis EMS Mgr: (702) 652-6115 or create a profile, complete the training, and submit an electronic copy to 99 CES/CEIEA and Contracting Office.
Above-Ground Storage Tan (AST), Underground Storage Tan (UST) and Generator - UST Installation/Upgrade/Repair Permit Application - AST installation, upgrade or repair - Generator installation, upgrade or repair	Contractor	USTs Southern Nevada Health District: (702) 759-0603 ASTs Storage tan s AST/UST/POL Program Manager (702)652-=6121 Fire Dept. Nellis: (702) 652-9626 or Creech: (702) 404-2228 / 0236
Wor Clearance Requests (AF Form 103)	Contractor	Nellis CE Customer Service: (702) 652-2301 Creech CE Customer Service: (702) 404-0215 NOTE: if dust permit, ATC/OP, SWPPP, or NPDES permit required, must provide them with Form 103 submittal

APPENDIX M

AFRC CID APPROVED VENDORS & CID MANUAL

AFRC Design Guidance for Packaged Office CID Packages - Approved Vendors

SYSTEMS FURNITURE / FREESTAND DESKS	SEATING	CASEGOODS (Wood, laminate, conference furniture)	WOOD SEATING	STORAGE	TRAINING ROOM Furniture	MOVABLE WALL SYSTEMS (Floor to Ceiling)
Knoll	Knoll	Knoll	Knoll	Knoll	Knoll	DIRTT
Steelcase	Steelcase	Steelcase	Steelcase	Steelcase	Steelcase	Steelcase
Haworth	Haworth	Haworth	Haworth	Haworth	Haworth	Haworth
AllSteel (No HON series)	AllSteel (No HON series)	KRUG	KRUG	AllSteel (No HON series)	AllSteel (No HON series)	Transwall
Teknion	Teknion	Teknion	Teknion	Teknion	Teknion	Teknion
Herman Miller	Herman Miller	DARRAN	DARRAN	Herman Miller	Herman Miller	Inscape
Kimball	KIMBALL	Kimball	Kimball	Great Openings	Haskell	Nello
Inscape	Humanscale	JASPER	National	Inscape (Office Specialty)	Vecta	
	Gunlocke	Gunlocke	Gunlocke		Bretford	
		Nucraft			Enwork	
					Fixtures	
ANCILLARY SEATING (not to be specified as primary			**SOFT SEATING**	**SOFT SEATING**		
ALLSEATING			Cabot Wren	Hayworth		
SOURCE			Steelcase	Knoll		
SIT on IT			David Edward	Herman Miller		
ARCADIA			Gunlocke	Haworth		
NATIONAL			Kimball	National		
			DARRAN	Brayton		
			KRUG	Lowenstien		

*** AFRC CID Packages are not mandated by the AF Systems, Seating BPA or Casegoods BPA**

*** Unicor is not accepted as part of the AFRC Packaged Office Design**

*** Not inclusive of all product variations/requirements per project**

*** Do not include any OPEN MARKET products in CID**

AIR FORCE RESERVE COMMAND

Robins Air Force Base, Georgia

COMPREHENSIVE INTERIOR DESIGN POLICY MANUAL

Air Force Reserve Headquarters

Date of Issuance: 22 September 2010

Introduction

Purpose

The Air Force Reserve Command (AFRC) has made a commitment to excellent Comprehensive Interior Design (CID) because it believes that the working and living environments directly affect morale, sense of professionalism, esprit de corps, and overall productivity of its personnel. This document was developed to provide supplementary guidance to existing standards in order to define specific requirements for AFRC occupied and or owned facilities. This document also defines the process established to ensure consistent, contemporary interior design that meets the enhanced quality standards of AFRC is provided for all major renovations and new construction.

This CID Manual shall be used for planning, design, and procurement associated with new construction and major renovations unless waived by AFRC Headquarters (HQ).

Document Users

This Manual has been developed for:

- Design team members which include Interior Design Professionals, the Designer of Record (DOR), and the Architects / Engineers (A/E) engaged in developing a comprehensive design that meets all applicable requirements
- Base personnel such as the Base Civil Engineers (BCE) or the Command Interior Designer to identify the criteria for a CID Package and review submissions for applicability or adherence to technical requirements
- Base or AFRC HQ personnel to review, process, and award CID submissions for procurement

This Manual is intended to be a supplement to existing regulations and be used in conjunction with regulations such as:

- Unified Facilities Criteria (UFC)
- Engineering Technical Letters (ETL)
- Unified Facilities Guidance Specifications (UFGS)
- Air Force Interior Design Guide
- Base-specific Design Guidance or Preferences

This Manual and existing regulations are available at the Whole Building Design Guide website (http://www.wbdg.org). A facility type reference list is provided in the Appendix of this Manual. In the event that this Manual creates a discrepancy or contradiction with other regulations noted above, the information in this Manual shall take precedence

unless otherwise approved by the project's Contracting Officer (CO).

Document Organization

The CID Policy Manual is organized to parallel the design process:

Part One – CID Process Standards
Provides a section to cover requirements for the documentation, policies, and processes for the preparation of the entire CID Package, including both the Structural Interior Design (SID) and Furniture, Fixtures and Equipment (FF&E) Submittals; as well as a section to describe the requirements for the Procurement Package.

Part Two – Performance Requirements
Provides sections on AFRC's Interior Design Principles / Color Standards and its approach to LEED® and Environmentally-Conscious Design, as well as two sections of Technical Guide Specifications to address both SID and FF&E Design.

Contact Info

AFRC CONTACT: Jorge Mateo
HQ AFRC/A7PM
255 Richard Ray Blvd.
Robins AFB, GA 31098
Jorge.Mateo@us.af.mil
(478) 327 – 1029

Teresa Kriebel
HQ AFRC/A7PM
255 Richard Ray Blvd.
Robins AFB, GA 31098
Teresa.Kriebel@us.af.mil
(478) 327 – 1050

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Part One Introduction

The complete Comprehensive Interior Design (CID) Package for AFRC consists of a Structural Interior Design (SID) Submittal and a Furniture, Fixtures and Equipment (FF&E) Submittal, both of which are prepared by the Designer of Record (DOR). The CID Package Submittal shall be developed concurrently with the building design to ensure coordination with building design and systems.

All CID Package Submittal requirements shall comply with Unified Facilities Criteria (UFC) 3-120-10 Interior Design Requirements, the standards listed in Part Two of this Manual and project specific requirements dictated by the Government officials designated to each project.

The 100% approved FF&E Submittal is used to produce the FF&E Procurement Package. The DOR shall prepare the Procurement Package in accordance with the specifications included herein. Through the Air Force Material Command (AFRC) Project Manager (PM), the designated Contracting Office (CO) shall utilize this Manual as a checklist to ensure all required documents are provided with acceptable information, in proper detail and format.

The DOR preparing all CID Package Submittals and the FF&E Procurement Package shall be a degreed professional, certified by the National Council for Interior Design Qualification (NCIDQ), state licensed, or professionally certified by the International Interior Design Association (IIDA).

Schedule

The overall schedule and number of submittals for a project shall be determined largely by the project specific scope, budget, and required timeline. The absolute minimum of one (1) interim submittal of the complete CID Package, which includes both the SID and FF&E Submittals, is required to be presented by the DOR and reviewed by the designated Government officials for the project. However, on typical projects, the DOR will be required to prepare and submit the CID Package at the 35%, 65%, Final Phases plus a Corrected Final Package, picking up any remaining comments. Refer to AFRC CID Submittal Requirements Matrix (Exhibit A.3.1) and UFC 3-120-10 for requirements at each specific phase. Based on comments from the Government after each review, the DOR will respond to comments as well as revise, amend and/or modify the submittal(s) to prepare the next submission, leading up to the Corrected Final Submittal. Note: DOR is

expected to pick up comments made on Final Submittal and resubmit as Corrected Final Submittal before design can be approved and proceed into Procurement.

Section A.1
SID Submittal

SID Submittal Requirements

The SID Submittal includes all building related elements and components generally part of the building itself, such as wall finishes, ceiling finishes, floor coverings, marker/bulletin boards, blinds, primary window treatments, signage and built-in casework. For appropriate coordination of these design elements, the SID shall be developed with consideration of the furniture footprint. Note that for renovation projects, DOR must select finish and provide spec information just like he/she would for new construction; DOR cannot merely state “match existing”.

Each SID submission shall be organized in the following order and, at a minimum, include the following:

- **Part I – SID Binder Submittal**
  - Table of Contents
  - Narrative of SID Objectives
  - Interior Color / Sample Boards
  - Exterior Color / Sample Boards

- **Part II – SID Design Drawings**
  - Interior and Exterior Finish Schedules / Legends
  - Interior Finish Plans
  - Furniture Footprint Plans
  - Interior Signage Plans, Schedules and Details
    Interior Elevations. Sections and Details

Each of these submittal components are described in further detail in the following section.

SID Submittals for AFRC shall be formatted and produced to meet the following criteria:

- Number of Copies – Refer to project specific contract document for exact number of submittals. Four (4) copies of the SID Submittal will always be minimum per phase.
- Binder Format:
  - Provide in 8 ½” x 11” format in large “D-ring” binders with pockets inside the cover.
  - Utilize multiple binders as necessary if there are numerous pages with thick samples.

Section A.1
SID Submittal

SID Submittal Requirements

- Utilize page protectors that are strong enough to keep pages from tearing out. Clear-view protectors are preferred for unaltered views of samples and information.
- Provide cover and spine insert sheets identifying the document as "Structural Interior Design" package. Include the project title and location; project/contract number; and Contractor's and A/E's name(s), phone number(s) and address(es); as well as the submittal phase and date.
- Provide division tabs between each part of the SID Package with section labels.

- Color / Sample Boards Format:
  - Adhere samples with velcro or double-faced foam tape. Use of rubber cement or glue is not acceptable.
  - Anchor large or heavy samples with mechanical fasteners.
  - Utilize sturdy backing material to support weight of samples.
  - Fold out items must have a maximum spread of 25-½ inch.
- Design Drawing Format:
  - Preference is for both 11"x17" and full-size copies to be included in binder; however, full-size format is the minimum requirement.
  - Full-size copies of design drawings shall be folded and inserted in binder in page protector sleeves.
- Electronic Copy – One (1) disc of the entire CID Package Submittal to be included at each Phase.
- Pre-addressed and Pre-paid Shipping Label – One (1) label per return destination should be included for Government in order to return the CID Submittal Binders with Government comments to A/E or DOR for revising (excluding Corrected Final Submittal).

SID Content

Part I – SID Binder Submittal

- **Table of Contents**
  Include all of the required components of the Submittal and confirm location of each within binder, or if separately bound and attached.

- **Narrative of SID Objectives**
  Provide a narrative that discusses the design goals for building related finishes. Include topics that relate to AFRC and base standards, life safety, sustainable design issues, aesthetics, budget, durability and maintainability. Discuss the development and features as they relate to the occupants' requirements and the building design.

- **Exterior Color / Sample Boards (See Exhibit A.3.8)**
  Prepare exterior finishes Color/Sample Boards in similar format as the interior finishes Color/Sample Boards. Provide original color samples of all exterior finishes including but not limited to the following:
  - All roof finishes
  - All brick and cast stone samples
  - All exterior insulation and finish samples
  - All glass color samples
  - All exterior metals finishes
  - All window & door frame finishes
  - All specialty item finishes, including trim

- **Interior Color / Sample Boards (See Exhibit A.3.9)**
  Include, at a minimum, original color samples of the following:
  - All wall and ceiling finishes, including corner guards, acrylic wainscoting and wall guards/chair rail finishes
  - All tile information, including tile grout color and tile patterns
  - All flooring finishes, including patterns
  - All door, door frame finishes, and door hardware finishes
  - Any/all decorative light fixtures
  - All signage, wall base, toilet partitions, locker finishes and operable/folding partitions and trim
  - All millwork materials and finishes (cabinets, counter tops, etc.)
  - All window frame and sill finishes
  - All primary window treatments (blinds, etc.)
  - Prepare 8 ½" x 11" Color/Sample Boards with firm backing and heavy duty sheet protectors that will be included in the SID Binder Submittal.
  - Identify and key each item on the Color/Sample Boards to the contract documents to provide a clear indication of how and where each item will be used.
  - Arrange finish samples to the maximum extent possible by room type in order to illustrate room color coordination.
  - Label or key all samples on the Color/Sample Boards with the manufacturer's name, patterns, color name and part or style number.
  - Ensure material and finish samples indicate true pattern, repeat color (if occurs) and texture. Provide photographs or colored photocopies of materials or fabrics to show large overall patterns in conjunction with actual samples to show the actual colors.

- Verify if large-scale Color/Sample Boards are required for presentations in project specific contract requirements.
- Reference UFC 3-120-10, Section 4-5.4 for presentation board requirements.

- **Interior and Exterior Finish Schedules / Legends**
  Provide both Interior and Exterior Finish Color Schedules / Legends in SID Binder Submittal (8.5" x 11" format); each needs to include all finish codes, material type, manufacturer, series and color designations for all interior and exterior materials. Key the finish codes to the interior and exterior samples on Color/Sample Boards and design drawings.

Part II – SID Design Drawings
SID related drawings must indicate the placement and extent of SID material, finishes and colors and must be sufficiently detailed to define all interior work. The following is a list of minimum requirements:

- **Interior and Exterior Finish Color Schedules / Legends**
  Include duplicate copy of both Interior and Exterior Finish Color Schedule(s) / Legend, submitted with the Part I SID Binder, on the appropriate Part II SID Design Drawings for quick reference and in case the drawings are bound separately.

- **Interior Finish Plans**
  Provide the floor plan with the following clearly indicated: wall and floor patterns, color placement, material transitions and extents of all interior finishes.

- **Reflected Ceiling Plans**
  Provide typical plans showing ceiling finishes and heights, lighting fixtures, heating ventilation and air conditioning supply and return, grilles and sprinkler head placement for coordination of furniture.

- **Furniture Footprint Plans**
  Provide furniture footprint plans showing the outline of all planned freestanding and systems furniture for coordination with other disciplines (specifically electrical).

- **Interior Signage Plans, Schedules and Details**
  Include interior signage plans and schedules showing location and

quantities of all interior signage. Key each interior sign to the schedule indicating size, quantity of each type and signage text.

- **Interior Elevations, Sections and Details**
  Include design drawings which illustrate interior material, color and finish placement not included on interior finish plans.

- **Exterior Building Elevations**
  Working with A/E, include building elevations in order to identify placement of each material type/color of the exterior finishes included on the Exterior Color/Sample Boards.

Section A.2 FF&E Submittal

FF&E Submittal Requirements

The FF&E Design is the selection, layout, specification and documentation of furniture including but not limited to workstations, seating, tables, storage and shelving, filing, trash receptacles, clocks, framed artwork, artificial plants and other accessories. The FF&E Submittal shall include the design, selection, specifications and color coordination of the freestanding furnishings, systems furniture, demountable walls and accessories necessary to meet the functional, operational, sustainable and aesthetic needs of the facility.

The selection of furniture style, function and configuration shall be coordinated with the user/customer's requirements. Criteria for furniture selection shall include functional and ergonomic consideration, maintenance, durability, sustainability, comfort and cost. Selections shall be made from established manufacturers with a reputation of producing high quality products, backed by the best warranties in the industry, and known for delivering/installing furniture on schedule. General Service Administration (GSA) Federal Supply Schedule Contracts shall be used exclusively when making selections and for specifications.

The FF&E Package should be based on the furniture footprint developed in the SID portion of the interior design. Development of the FF&E Package should be done concurrently with the building design to ensure that there is coordination between the electrical outlets, switches, J-boxes, communication outlets and connections, heating ventilation and air conditioning (HVAC) systems, architectural elements and lighting as appropriate.

Each FF&E Submission shall be organized in the following order and at a minimum include the following:

- **Part I – FF&E Binder**
  - Table of Contents
  - Narrative of FF&E Design Objectives
  - Point of Contact List
  - Budget Summary / Itemized Furniture Cost Estimate
  - Item Code Index / Installation List
  - FF&E Order Data Sheets (Furniture Spec)
  - Best Value Determination
  - Color / Sample Boards
  - Manufacturer's Resource List
  - Supplemental Data

- **Part II – FF&E Drawings**
  - Overall Keyed Furniture
  - Workstation and Freestanding Desk Plans
  - Panel Plans
  - Demountable Wall Plans
  - Reflected Ceiling Plans
  - Electrical and Telecommunications Plans
  - Artwork Placement Plans
  - Secondary Window Treatment Plans (Drapery Plans)

Each of these FF&E Submittal components are described in further detail in the following section.

FF&E Submittal for AFRC shall be formatted and produced to meet the following requirements:

- Number of Copies – Refer to project specific contract document for exact number of submittals. Four (4) copies of the FF&E Submittal will always be minimum per phase.
- Binder Format:
  - Provide in 8 ½" x 11" format in large "D-ring" binders with pockets inside the cover.
  - Utilize multiple binders as necessary if there are numerous pages with thick samples.
  - Utilize page protectors that are strong enough to keep pages from tearing out. Clear-view protectors are preferred for unaltered views of samples and information.
  - Provide cover and spine insert sheets identifying the document as "Furniture, Fixture, and Equipment" package. Include the project title and location; project/contract number; and Contractor's and A/E's name(s), phone number(s) and address(es); as well as the submittal phase and date.
  - Provide division tabs between each part of the FF&E Package with section labels.
- Color / Sample Boards Format:
  - Adhere samples with velcro or double-faced foam tape. Use of rubber cement or glue is not acceptable.
  - Anchor large or heavy samples with mechanical fasteners.
  - Utilize sturdy backing material to support weight of samples.
  - Fold out items must have a maximum spread of 25 ½ inch.

Section A.2 FF&E Submittal

FF&E Submittal Requirements

- Design Drawing Format:
  - Include both 11”x17” and full-size copies in binder
  - Fold and insert full-size copies of design drawings in binder in page protector sleeves.
- Electronic Copy – Include one (1) disc of the entire CID Package Submittal to be included at each Phase.
- Pre-addressed and Pre-paid Shipping Label – Include one (1) label per return destination should be included for Government in order to return the CID Submittal Binders with Government comments to A/E or DOR for revising at each submittal phase. Note: This excludes Corrected Final Submittal.

FF&E Content

Part I – FF&E Binder Submittal

- **Table of Contents**
  Include all of the required components of the Submittal and confirm location of each within binder, or if separately bound and attached.

- **Narrative of FF&E Design Objectives**
  Provide a narrative description of the goals for furniture design. Include attributes pertaining to the functional, durability, sustainability, aesthetics, safety and ergonomic considerations, and the compatibility with the building design.

- **Point of Contact (POC) List**
  Provide a comprehensive list of POCs for the specific project. List shall include Project Team members necessary to implement the FF&E project: AFRC Project Manager, End User’s Representative, Interior Design representatives, Contractors, Dealer of Record for design, and any others. Include name, address, phone, fax, email, and job function for each.

- **Itemized FF&E Cost Estimate (See Exhibit A.3.2)**
  - Provide an itemized cost estimate of all FF&E items keyed to the plans and specifications of products included in the package.
  - Include separate line items for the following: product, installation, electrical hook-up as applicable for systems furniture or other furniture requiring hardwiring by a licensed electrician, freight charges, 15% general contingency and any other related costs.
  - Add a 4% per year escalation factor into estimate as well, if furniture will not be procured in the next 6 to 12 months

- Utilize installation and freight quotes from vendors in lieu of a percentage allowance when available. If unavailable, use a 10% markup to cover freight and installation.
- Include a written and signed statement that the pricing is based on GSA schedules.
- Provide an estimate developed by a furniture dealership, if desired, as support information for the estimate; but if include, this must be separate from the DOR provided estimate.
- Organize cost estimate in the same order as Item Code Index and FF&E Order Data Sheets.

- **Item Code Index / Installation List (See Exhibit A.3.3)**
  - Provide a table that lists all FF&E furniture, mission unique equipment and building Contractor Furnished/Contractor Installed (CF/CI) items.
  - Give each item a code and name. Also designate whether item will be procured as part of the FF&E furniture, mission unique equipment or the building construction contract. Use the item code to key all FF&E documents including location plans, color boards, data sheets, cost estimate, etc.
  - Organize the FF&E Package into different categories. Categories may include, but are not limited to; Seating, Tables, Casegoods, Workstations, Filing / Storage, Artwork, Drapery and Miscellaneous (clocks, trash cans, etc.).

- **FF&E Order Data Sheets (See Exhibit A.3.4 / A.3.5 / A.3.11)**
  - Prepare one Order Data Sheet Form for each FF&E item specified in the design (i.e., each piece of furniture, accessory, artwork, etc.) This form identifies all specification information required to order each individual item. Each Order Data Sheet must include:
    - Project name and number, Installation, Submittal name and date
    - Item code / numeric key and name which match FF&E Legend and FF&E Cost Estimate
    - GSA Federal Supply Classification (FSC) Group, Part, and Section, Special Item Number (if available), Maximum Order Limit (MOL); GSA contract number and valid expiration date
    - Manufacturer and model number, product name and model number or National Stock Number (NSN)
    - Manufacturer ordering address and contact information (Note: No dealership information is to be provided.)

- Finish name and number (coded to finish samples)
- Fabric name and number, minimum Wyzenbeek Abrasion Test double rubs (coded to fabric samples)
- Product descriptions to include a non-proprietary paragraph listing the salient features including, but not limited to, the following:
  - Item location by room number and room name
  - Quantity per room
  - Dim ensions
  - Required features and characteristics
  - Ergonomic attributes
  - Functional requirements
  - Testing requirements
  - Finish information
  - Construction materials
- Product illustration or image
- Furniture style (where applicable)
- Parts list attachment (typical for items with components, such as Systems Furniture, Desking Systems, Demountable Walls, etc.)
- Minimum warranty
- Special instructions for procurement ordering and/or installation (if applicable)

- **FF&E Color / Sample Boards (See Exhibits A.3.10)**
  - Include, at a minimum, original color samples (not color photocopies) of the following:
    - Paint
    - Lam inate

- Wood Finish
- Fabric
- Demountable Wall Finishes

  - Prepare 8 ½" x 11" Color/Sample Boards with firm backing and heavy-duty sheet protectors that will be included in the FF&E Binder Submittal.
  - Provide Color/Sample Boards for finishes and fabrics of all FF&E items included in the design package.
  - Identify and key each item on the color boards to the Item Code to provide a clear indication of how and where each item will be used, including location (e.g., seat upholstery, back upholstery, trim paint, table edge, etc.).
  - Arrange finish samples (to the maximum extent possible) by room type in order to illustrate room color coordination.
  - Label or key all samples on the Color/Sample Boards with the manufacturer's name, patterns, color name and part or style number.
  - Include material and finish samples which indicate true pattern, color and texture. Provide photographs or colored photocopies of materials or fabrics to show large overall patterns in conjunction with actual samples to show the actual colors. Finish samples must be large enough to show a complete pattern or design where practical.

- **Manufacturer's Resource List (See Exhibit A.3.7)**
  Provide Manufacturer's Resource List that identifies all manufacturers specified in the package. Include manufacturer name, order address, GSA contract number, expiration date, and point of contact information for ordering including name, email, and phone number, along with the total portion of the FF&E Budget allocated to each manufacturer.

- **Supplemental Data**
  Provide all dealer quotes as supporting documentation of design.

Part II – FF&E Drawings

On all FF&E Drawings, the DOR shall <u>not</u> provide manufacturer specific information such as product names and numbers. Item codes shall be used to identify each component that corresponds to the legend/schedule on drawings and used throughout all FF&E documentation.

Section A.2
FF&E Submittal

On each plan, the applicable keyed item codes shall be organized in a legend that provides the item's:

- Descript ion
- Dim ensions
- Quant ity
- Co lor
- Finish (if multiple finishes are used in the same project)
- Additional specific information as noted under each component below

  - **Overall Keyed Furniture Plans**
    Provide floor plans showing locations and quantities of all freestanding and workstation furniture proposed for all of the areas of the building undergoing renovation or construction. The Keyed Furniture Plan shall:
    - Identify where the furniture is located within the building.
    - Key all furniture by Item Code.

  - **Workstation and Freestanding Desk Plans**
    Show each typical workstation or freestanding desk configuration in plan view, elevations, and isometric view (together on one sheet). Dimensioned drawings shall illustrate panels and all major components for each typical workstation or freestanding desk configuration.

  - **Panel Plans**
    Show panel locations and critical dimensions from finished face of walls, columns and panels, including clearances and aisle widths. In addition to the standard legend information, the panels' configuration of frame, powered or non-powered attributes, and wall mount locations shall also be identified.

  - **Demountable Wall Plans**
    Show demountable wall partition layout with panel dimensions, door sizes, glazing panels, sound resistance and fire resistance, along with details. Provide overall dimensions necessary for layout and installation.

- **Reflected Ceiling Plans**
  Provide typical reflected ceiling plans showing ceiling finishes and heights, lighting fixtures, exit / emergency lighting, heating ventilation and air conditioning supply and return grilles, and sprinkler head placement for coordination of furniture.

- **Electrical and Telecommunication Plans**
  Show power provisions including type and locations of feeder components, activated outlets and other electrical or communications components. Identify locations and quantities of outlets for all workstations and demountable wall panels. Clearly distinguish different outlets (i.e., electrical, LAN and telecommunication receptacles) to show each type proposed. Show wiring configuration (circuiting, switching, internal and external connections) as well.

- **Artwork Placement Plans**
  Provide an Artwork Placement Plan to show location of artwork, with a legend to connect each artwork Item Code to each piece of artwork. As an alternative, artwork can be located on the Furniture Plans. In addition to the standard legend information, the artwork's location by room number, framing and installation instructions, and mounting height shall be identified in an artwork schedule.

- **Window Drapery Plans**
  Provide Interior Window Drapery Plans with legend. In addition to the standard legend information, the drapery pattern, material, size, type and draw direction shall be identified.

NOTE: With the AFRC Designer's and PM's approval ahead of submittal, and depending on size / complexity of the specific project, a couple plan types noted above may be combined into one drawing if information can be presented clearly (i.e., demountable walls may be able to be shown on systems furniture or panel plan).

Section A.3 CID Package Exhibits

See Appendix for the following:

Exhibit A.3.1: AFRC CID Submittal Requirements Matrix
Exhibit A.3.2: Itemized FF&E Cost Estimate – Sample
Exhibit A.3.3: Item Code Index / Installation List – Sample
Exhibit A.3.4: FF&E Order Data Sheet – Template
Exhibit A.3.5: FF&E Order Data Sheet – Sample

Exhibit A.3.7: Manufacturer's Resource List – Sample
Exhibit A.3.8: Exterior Finishes Color/Sample Board – Sample
Exhibit A.3.9: Interior Finishes Color/Sample Board – Sample
Exhibit A.3.10: FF&E Color/Sample Board – Sample
Exhibit A.3.11: FF&E Order Data Sheets with Parts List – Sample

Section B.1 Procurement Package

Procurement Package Requirements

The AFRC Procurement Package documents shall be developed only after approval of the Corrected Final CID Package by the AFRC Interior Design Staff. *Note: DOR must confirm with the AFRC PM that all finish items are to be installed in accordance with the approved Corrected Final SID Submittal and that no finish materials or color selections of finishes will be substituted, as such substitutions during construction will impact coordination with the FF&E.*

The Procurement Package, created by the DOR from the approved Corrected Final FF&E Submittal, will be used by AFRC Contracting to obtain competitive bids for the FF&E. The DOR shall utilize the following section to compile the FF&E Procurement Package and the designated AFRC Contracting Office shall utilize this section to verify and check its accuracy.

AFRC prefers that there be no substitutions allowed for FF&E, to simplify the procurement process. Therefore, the accuracy and correctness of the Procurement Package is vital to maintain the complete design as approved. For this reason, it is also important to work within a manufacturer's family of furniture for selections to the greatest extent possible when specifying the FF&E package. When specifying products outside of a furniture manufacturer's family of furniture, selections that are available to a wide range of dealers are to be made.

Note: It is the objective of the AFRC to purchase an entire FF&E package as one (1) procurement action and to award to one (1) responsible vendor. FF&E packages are advertised on GSA E-Buy using an acquisition strategy that best suits the facility type. (I.e., Administrative Office facilities are typically solicited under SIN 71-1 with a Small Business Socio-economic Indicator and Lodging facilities are typically solicited under SIN 71 – 204.)

The **Procurement Package** shall contain all items listed below:

- Procurement Package Checklist
- Market Research Report
- Qualified Dealers List
- Recovered Materials Determination Form
- Affirmative Procurement Determination Form

Section B.1 Procurement Package

Procurement Package Requirements

- Greenguard Environmental Institute Certificates
- Keyed Furniture Plans, Isometric Drawings and Enlarged Plans
- Item Code Index
- Summary Sheet (Bid Form)
- FF&E Order Data Sheets

Each specific component of the Procurement Package is further described in the next section.

The FF&E Procurement Package for AFRC shall be formatted and produced to meet the following criteria:

- Number of Copies – Include two (2) labeled CD-R data storage discs of the completed Procurement Package in *.pdf format. Discs shall contain all of the elements for the Procurement Package that are extracted from the 100% approved CID Package documents and the additional required procurement forms as described herein.
- Divide contents into separate category files (such as Seating, Casegoods, Workstations, etc.).
  - Do not exceed 5MB in size for each file.
  - Title each file with installation, partial project name and category identification (e.g., “Robins_CAC_ODS-Seating 1 of 2.pdf” or “Robins_CAC_Plans.pdf”).
- Label each disc with AFRC project name and number; DOR name and contact information; and date.

Procurement Package Content

Procurement Package

- **FF&E Procurement Package Checklist (See Exhibit B.2.1)**
  DOR to confirm all items listed in Checklist are included, then check the boxes and fill in information before signing the form.
  AFRC PM will also need to sign the form before Procurement Package is accepted by CO.

- **Market Research Report (See Exhibit B.2.2a/b)**
  This document shall include identification of:
  - Project name and project number, and Installation
  - Project background
  - FF&E Cost Estimate
  - Type of funding, (MILCON, BRAC, O&M, etc.)

- Anticipated period of performance for furniture purchase and installation – typically 90 days from procurement to completion of installation.
- Three (3) bid line items for each project contract:
  - Product
  - I nstallation
  - Project Management

- **Qualified Dealers List (see Exhibit B.2.3)**
  The DOR shall identify three (3) vendors who hold GSA contracts under the Federal Supply Class as dictated by the acquisition strategy followed for the package (i.e., SIN 71-1 Packaged Office Contract with Small Business Socio-economic Indicator). The Market Research Report shall include the vendor contact information and GSA contract numbers on the Qualified Dealers List.

- **Recovered Materials Determination Form (See Exhibit B.2.4a/b)**
  This form is to be completed (checked and signed) by the DOR procurement originator when EPA-designated in the Green Procurement Program for Recovered Materials are included in the design and are being procured by outside vendors. The completed form becomes part of the Government's Contracting File at the Contracting Office.

- **Affirmative Procurement Determination Form (See Exhibit B.2.5a/b)**
  This form is to be completed (checked and signed) by the DOR procurement originator to verify that EPA recycled content and recovered material requirements are met. The completed form becomes part of the Government's Contracting File at the Contracting Office.

- **Greenguard (GG) Environmental Institute Certificate or Statement (See Exhibit B.2.6a/b)**
  The DOR shall provide GG Environment Institute Certificates or Statement (depending on which is available) for all major manufacturers included in package. GG Certificates or Statements can be found on the website www.greenguard.org. If there is no information on GG's website for a particular project, see manufacturer's green statement usually found on their website.

- **Keyed Furniture Plans, Isometric Drawings and Enlarged Plans**
  The DOR shall include electronic PDF file copies of:
  - Keyed Furniture Plans
  - Workstation and Freestanding Desk Plans
  - Panel Plans
  - Demountable Wall Plans
  - Isometric Drawings
  - Enlarged Plans
  - Electrical / Telecommunication Plans
  - Artwork Plans
  - Window Drapery Plans

- **Item Code Index (See Exhibit B.2.7)**
  This list, which was developed as part of the CID's FF&E Package, shall indicate item categories, item key code and item description. (See Section B.2). The DOR shall verify:
  - Item descriptions match on all documents including plans, Itemized FF&E Cost Estimate and the FF&E Order Data Sheets.
  - Item Code Index is organized as described in Part One, Section A of this Manual.

- **Summary Sheet (Bid Form) (See Exhibit B.2.8)**
  The Summary Sheet shall be developed using FF&E Cost Estimate with all unit prices and extended prices, shipping and installation pricing removed.
  - This summary shall be organized by functional categories (e.g., Seating, Tables, Casegoods, etc.) and include the item code, name and description. The information shall match the order and wording provided in the Order Data Sheets and on the Keyed Furniture Plans.
  - This summary will contain the quantities of furniture items but no pricing information.
  - Each project's summary will show three (3) sub-totals: Product Cost, Installation, and Project Management, plus the overall Total Project FF&E Costs.
  - This summary may be used by the bidders as a blank bid form in addition to the listing of the furniture items.

- **FF&E Order Data Sheets (See Exhibit B.2.9)**
  The FF&E Order Data Sheets developed for the Procurement Package are modified versions of the FF&E Order Data Sheets in the previously approved FF&E Submittal. The following changes/verifications are necessary:
  - All unit prices and extended prices must be removed.
  - The term “quote” or “dealer quote” must be removed.
  - If the FF&E package contains any Open Market items, the term “Open Market” should be removed from the form. (Note: AFRC prefers to not specify open market items except where absolutely necessary.)
  - All unit quantities must be verified.

Section B.2 Procurement Package Exhibits

See Appendix for the following:

Exhibit B.2.1:	AFRC FF&E Procurement Package Checklist
Exhibit B.2.2a:	Market Research Report – Template
Exhibit B.2.2b:	Market Research Report – Sample
Exhibit B.2.3:	Qualified Dealer List – Template
Exhibit B.2.4a:	Recovered Materials Determination Form – Template
Exhibit B.2.4b:	Recovered Materials Determination Form – Sample
Exhibit B.2.5a:	Affirmative Procurement Determination Form – Template
Exhibit B.2.5b:	Affirmative Procurement Determination Form – Sample
Exhibit B.2.6a:	GG Environmental Institute Certification – Sample
Exhibit B.2.6b:	Manufacturer's Green Statement – Sample
Exhibit B.2.7:	Item Code Index – Sample
Exhibit B.2.8:	Summary Sheet (Bid Form) – Sample
Exhibit B.2.9:	FF&E Order Data Sheet – Sample

Part Two Introduction

Technical Guide Specifications

The Architecture/Engineering (A/E) Design Team and/or the Designer of Record (DOR) for each project shall verify all Comprehensive Interior Design (CID) Package requirements, including both Structural Interior Design (SID) and Furniture, Fixtures & Equipment (FF&E), with the Air Force Reserve Command (AFRC) Project Manager (PM), prior to preparation of the design.

Determination of requirements and quantities may be based on the following:

- Number of personnel to occupy the building
- Room/Building function as it relates to materials of construction durability, color, interiors, furniture, and equipment
- Rank and grade of building occupants
- Budget allocated for design and construction of project

In addition to information on AFRC's Interior Design Principles / Color Standards (Section A) and its approach to LEED® and Environmentally-Conscious Design (Section B), Part Two of this Manual outlines the specifications of the preferred products to be used in the SID Design (Section C) and FF&E Design (Section D) for all AFRC facilities. For some product types, this Manual will supplement the standards, guidance, or requirements already established by the military, Air Force, or AFRC. For all products, this Manual shall establish the minimum or baseline requirements that the DOR shall utilize in conjunction with industry standards, in addition to diligent and good design practices, to ensure a high quality, functional, and safe interior design.

Regarding installation and warranty information pertaining to the SID, the A/E is required to include all requirements in the building specification to ensure the building contractor is responsible for providing and installing products that meet those requirements.

Section A Interior Design Principles / Color Standards

AFRC is committed to providing excellent environments for its personnel. While the other sections of this Manual represent process and technical criteria, this section addresses AFRC's underlying design objectives as well as approach to color.

Interior Finish Selections

All materials, finishes, color and texture selections shall be coordinated and complement the overall building design and image.

Finishes that have a long life should be neutral in color. Long-term finishes include flooring (stone, ceramic, vinyl or wood, etc.), ceramic wall tile, plastic laminates, solid surface countertops and window sills. Neutrality will make it easier to add finish materials in the future when buildings are expanded and/or renovated.

Interior finishes that endure heavy traffic such as flooring and vinyl base should not only be neutral in color but also be medium in tone as well, to help the facility look better longer. Corner guards and transition strips, to match the color of their surrounding finishes, are to be used in heavy traffic areas to withstand the constant abuse.

Interior finishes are to provide a backdrop to the everyday functions performed in each facility. These finishes shall be subtle, allowing the FF&E to provide the color and excitement in the space. Accent paint colors are acceptable in Break and Lounge Areas.

A Command Suite shall receive upgraded finishes. These higher-level finishes are to include flooring, wood trim and panels, wood chair rails and wainscot with wallcovering above, in appropriate areas.

Additional recommendations and guidance on interior design standards, criteria and use of color is available in the USAF Interior Design Guide. The DOR must also comply with installation design guidelines.

FF&E Finish/Fabric Selections

FF&E selections for AFRC facilities shall be moderate in price unless being selected for Command Suites. As detailed in previous sections, good quality furniture shall be used in all areas. Use of custom or high-

end furniture, lighting and artwork is prohibited. Custom sized casegoods are acceptable if an area requires it.

Casegoods, systems furniture, storage cabinets (files) and tables are to be neutral in color. These items should all match as closely as possible when used together in the same space. Laminate worksurfaces of desks and table tops should be a medium neutral tone with a small overall pattern to hide soiling.

The use of color in the FF&E fabrics and finishes should add interest and vitality but not dominate the interior environment. Accent colors in the FF&E fabric and finishes are welcomed in Break and Lounge Areas. Accent panel fabrics on systems furniture can be used but should be kept to a minimum.

Section B Approach to LEED® & Environmentally-Conscious Design

AFRC's approach to interior design as it relates to the LEED® green building certification program is to execute designs that not only result in outstanding environments in its buildings but also incorporate strategies that help to minimize negative environmental impacts. The specific LEED® requirements for each project need to be verified with the AFRC PM at the start of design.

When selecting interior finishes, consider their maintainability, life cycle cost and environmental impact. (For example, Luxury Vinyl tiles (LVT) require no wax or finish. So, even though the initial cost of LVT is more than VCT, it saves up to 30% in maintenance costs and 50% in water, detergent and energy consumption.)

Federal agencies are required to purchase products made with recycled materials whenever possible. The exceptions are when the products do not meet the technical requirements listed in this Manual, they are more costly than comparable virgin material products, they are not available competitively from two (2) or more sources and/or they are not available within the project schedule.

Broadloom and carpet tiles should be specified in a manner that assures eligibility in the said manufacturer's reclamation program at the end of the carpet's useful life.

When selecting FF&E products, consider the following sustainability characteristics and qualities before specifying. Ask the following questions:

- Material Chemistry and Safety of Inputs: What chemicals are used in the construction of the selections?
- Recyclability: Does the product contain recycled content?
- Disassembly: Can the product be disassembled at the end of their useful life for recycling?
- Is the product McDonough Braungart Design Chemistry (MBDC) certified?
- Is the product Forest Stewardship Council (FSC) certified?
- Is the product Green Guard (GG) Certified? It is AFRC's preference that all furniture be Green Guard Certified in the FF&E package.
- Is the product Floor Score Certified? Floor Score Certified products meet the indoor air emissions criteria of LEED® Green Building

Section B Approach to LEED® & Environmentally-Conscious Design

Rating Systems.

Look for “green” materials, when specified properly, will not only aid in accumulating LEED® points for the goal of certification but also meet the AFRC’s standards for quality and enchance the beauty of the interior environment.

All necessary paperwork, including but not limited to warranties, proof of recycled content or end of life recyclability and proof of certification (MBDC, FSC, Green Guard and Floor Score, etc.), should be supplied to the Government Agent upon purchase.

Section C.1 Carpet

Technical Guide Specifications - SID

Design Guidelines

AFRC prefers to use carpet tiles in most facility installations for ease of replacement due to damage or wear. Broadloom (roll goods) is approved for use only in select applications. The following is a condensed list of facility types identified for carpet tile vs. broadloom usage. Refer to the Engineering Technical Letter (ETL) 07-4 Air Force Carpet Standard for detailed requirements for each facility type.

Carpet Tiles can be used in:

- Medical Facilities
- Child Care Facilities
- Administrative Office Building
  - Open/Private Offices
  - Corr idors
  - Meeting / Training Rooms
  - Command Suites

Broadloom Carpet can be used in:

- Lodg ing

Specification Criteria

AFRC Minimum Carpet Tile and Broadloom spec shall have:
(Note that these exceed the current ETL 07-4 in several categories.)

- Face weight to be 23 ounces or greater
- Density to be 6000 or greater
- Multi-colors (tone on tone acceptable for Lodging use only)
- Tufted or woven
- Cut-and-loop or all-loop
- Medium tones of a color and pattern to conceal stains and traffic wear; in addition:
  - Pattern should be non-directional (an organic pattern).
  - Pattern must cover approximately 70% of the carpet surface.
  - Large bold geometric patterns with definite lines or a design that repeats in a linear pattern should be avoided unless tile can be installed “quarter-turned”, “brick ashlar” or another method other than monolithic.
  - Solid colors may be used as accent tiles or borders and are approved for use in Command Suites and Distinguished Visitors’ Quarters in Lodging
- Solution dyed, Type 6 or Type 6, 6 Nylon with soil protection
- Manufactured of environmentally preferable products in accordance

with Air Force Instruction (AFI) 32-7080

- Participation in an end of life reclamation or recycle program
- Third party certification in accordance with NSF 140 2007 e sustainable carpet assessment standard at a “gold” level minimum; carpet manufacturer must supply certificate as part of the procurement documentation.

General Installation

As stated in the A/E’s building specification, carpet shall be installed in accordance with manufacturer’s recommendations to preserve the integrity of the warranty. Submit a copy of the manufacturer’s standard warranty to the Contracting Officer within the first 60 days of government occupancy. Government is to be beneficiary of the terms of this warranty and eligible for the manufacturers end-of-life carpet reclamation program.

During a renovation, the reclamation process of existing carpet is to be determined with potential vendor. A/E will need to address the required documentation regarding reclamation in the project’s building specification. When carpet is replaced, submit certification documentation from the reclamation facility to the Contracting Officer. In addition:

- Low profile transition strips or protective edges must be provided where carpet meets other flooring materials.
- All tiles having a linear pattern shall be installed using the “quarter turned”, “brick ashlar” or any method other than monolithic.
- Green label certified adhesives or alternative installation methods shall be used to eliminate emission of odor and volatile organic compounds (VOCs), such as:
  - Dry Adhesives
  - Mechanical bonding
  - Low-emitting wet adhesives without solvent base

Section C.2 Hard Surface Flooring

Design Guidelines

Hard surface flooring materials are used in AFRC buildings to provide durable, wear resistant flooring in highly trafficked areas. When hard surface flooring is not a programmatic requirement or it is not in the renovation/project scope, other flooring products shall be evaluated for use.

It is Air Force policy to consider environmentally preferable products when selecting hard surface flooring. Hard surface flooring can be various types of tiles or poured flooring, as described in this section. Local, regional materials and those having recycled content may contribute towards Leadership in Energy and Environment Design (LEED®) credits.

Hard Surface Tile products used shall be:

- Natural stone, including granite, marble or terrazzo. (All are for use where appropriate and when included in project scope.)
- Porcelain tile
- Ceramic tile
- Quarry tile

Hard Surface Tile flooring placement shall adhere to the following guidance:

- Terrazzo tile, porcelain tile and natural stone tile shall be used for heavier usage areas. These flooring materials may be used in Corridors, Chapels, Entries/Lobbies of Lodging Facilities, Lobbies, Dining Areas, Upgraded Building Entries and Vestibules, and Public Restrooms.
- Mosaics shall be used as decorative accents only. Mosaic shall be sheet mounted to facilitate handling and installation.
- Ceramic tiles may be considered for lighter usage areas (e.g., Command Suite Toilet Room).
- Quarry tile may be considered for use in Kitchen and Food Serving areas because of its durability.
- Matching base, inside / outside corner trim tile shall be used in entry areas, restrooms and other public spaces where necessary.

Stone, Quarry, Ceramic and Porcelain Tiles shall be standard commercial grade conforming to the current Tile Council of Northern America (TCA) Handbook Guidelines.

Section C.2 Hard Surface Flooring

If porcelain or stone flooring is used in upgraded Building Entries and Vestibules, it should be used in conjunction with walk-off mats that are recessed into the flooring where applicable.

Thresholds: Thresholds shall be of size required by drawings or conditions and to match or coordinate with the adjacent flooring.

Hard Surface Poured products used shall be:

- Epoxy Resin
- Cementitious Urethane
- Terrazzo
- Concrete

Hard Surface Poured flooring placement shall adhere to the following guidance:

- Epoxy Resin shall be used in areas that call for a seamless flooring system that is conducive to being hosed down (e.g., Locker Rooms, Service Vestibules and Medical Facilities).
- Cementitious Urethane shall be used in commercial Kitchens and Food Preparation areas.
- Terrazzo is recommended for use in upgraded Building Entries, Vestibules, Lobbies, Corridors and Chapels.

Stained Concrete is a low cost alternative for new construction or renovation to be used in Break Rooms, Locker Rooms, Service Vestibules, Lobbies and Corridors of facilities such as Weapons Maintenance and Small Arms Firing, etc.

Because Stained Concrete is the synergy of aesthetics, sustainability and economy while providing a durable, low maintenance floor that will last the lifetime of the facility, it is a hard surface flooring worth considering for use on AFRC projects.

All of the above products are conducive to floor patterns. Floor patterns may be used in the design of an upgraded space, when programming requires (way-finding, etc.) and when included in the project scope. In the case of stained concrete, each concrete slab will accept stain in varying degrees of intensity, creating natural color variations that can be

minimized or enhanced through the use of stains and dyes combined. Because stained concrete floors will last the lifetime of the building, the colors and patterns used must be neutral so that they are easy to work with during future renovations. The design and use of floor patterns must be approved by the AFRC Designer.

Specification Criteria

Hard Surface Tiles

In general, all hard surface tiles shall meet the following criteria:

- Tile shall have a minimum rating of 0.60 wet and dry coefficient of friction in accordance with American Society for Testing and Materials (ASTM) C 1028.
- All tiles to have rectified edges to enable narrow grout joints.
- Acceptable floor tile sizes are:
  - Small Spaces (100 SF or less): Minimum 8” x 8”
  - Large Spaces (100 SF or More): Minimum 12” x 12”
  - Accent tile: 2 to 6 inch tiles
  - Mosaics shall be 1” x 1”, 2” x 2” or 3” x 3”

  Note: Accent tile and/or Mosaics to be 10% of tiled floor surface or less – does not include borders.)

C.2.1 Stone Tile

All stone tiles shall be honed and filled.

Stone tile shall be honed when used as a field tile. Polished stone tile may be used as an accent or border tile in upgraded, dry areas (not in Restrooms, Food Prep areas, etc.).

C.2.2 Porcelain / Ceramic / Quarry Tile

Porcelain

Porcelain tile shall be through-body tile with color extending uniformly throughout.

Porcelain tile is available in matte, polished, textured or sculptured finishes. Matte tiles shall be used as field tiles. Polished, textured or sculptured tiles may be used as borders or accents in upgraded, dry areas. Use of textured and sculptured tiles must be approved by the

AFRC Designer.

When mosaic floor tile is used, AFRC prefers porcelain mosaic tiles for durability. Porcelain mosaic finishes may be matte or polished.

Ceramic

Ceramic tile shall be matte finish when used as a field tile. Glossy finish ceramic tile may be used as a border or an accent tile in upgraded, dry areas.

Quarry

Quarry tile and trim shall be unglazed with non-slip surface; finish shall not be abrasive or contain metal particles.

C.2.3 Hard Surface Poured Flooring

- Epoxy Resin shall have a minimum rating of 0.60 wet and dry coefficient of friction in accordance with ASTM C 1028.
- Epoxy Resin shall have a urethane top coat for chemical resistance and color stability.
- Cementitious Urethane shall have a cementitious urethane topcoat for chemical resistance and color stability in food preparation /service environments.
- Epoxy Terrazzo will require 2 to 3 coats of finish and high speed buffing upon installation. The floor will need to be reground and resealed periodically based on the volume of traffic on each individual floor.

C.2.4 Stained Concrete

- Concrete to be stained and sealed using a low-VOC stain/dye and sealer system (Note: When used on a project that meets the criteria of credit 4.1 for low emitting materials this may contribute to LEED® Credits).
- A good indoor Stained Concrete finishing system is (1) one coat of low-VOC solvent based acrylic followed by (1) one top coat of water based acrylic.
- Use a stained as opposed to dyed floor when heavy use/abuse is part of the programming requirements. (Note: Because the staining

process is a chemical reaction, the color becomes a permanent part of the concrete; therefore, no fading, chipping or peeling away is experienced, as can happen with tile and resilient.

- Non UV resistant dyes and stains must be coated with a UV resistant sealer to make them color fast.
- Exterior stained concrete applications must have a solvent based acrylic sealer.
- Stained concrete maintenance costs are low. Only periodic dusting and damp mopping is required.
- Stained concrete will not support the growth of mold of toxic mold, it is recommended for use in warm, moist, humid climates and or conditions.
- When specified properly, a ready-mix supplier can use waste by products from power plants, steel mills and other manufacturing facilities (fly ash, slag cement and silica fume) to reduce the consumption of raw materials. In the very long run, when the building (with concrete floor) is demolished, the concrete is recyclable at the end of its long service life.

General Installation

Hard Surface Tile

All hard surface tile flooring to be installed in accordance with manufacturer's instructions. Tile to be installed with adhesive in thin set method; grout setting bed may be required for shower areas or sloped floor installations. Mortar, grout and adhesives shall conform to TCA handbook and LEED® standards for low/zero VOC materials. Interior adhesives, sealants, primers and "sealants used as filler" must meet the requirements of the "LEED® Low Emitting Materials" credit.

Grout color(s) shall be medium to dark in tone for use on the floor. Grout shall be selected by the DOR and approved by the AFRC Designer.

Poured Flooring and Stained Concrete

- Poured flooring to have integrated base and corners, 4 to 6 inch high.
- Epoxy Resin floors to be poured at 1/8 inch thick.
- Cementitious Urethane floors to be poured at 1/4 inch thick.
- Terrazzo floors to be poured at 3/8 inch thick.
- Concrete, new or existing, must be cleaned and scraped before the

staining process can begin.

Poured flooring to be feathered to meet adjacent flooring as opposed to transition strips.

Section C.3 Resilient Flooring and Accessories

Design Guidelines

Technical Guide Specifications - SID

Resilient Flooring shall be used in Break Rooms, Storage Rooms, Communication Rooms, and Stairwells. It may also be used in Lobbies and Offices depending on facility type (i.e., Weapons Maintenance and Indoor Small Arms Range facilities). All resilient material is to be specified in medium to dark colors to maintain its original appearance longer. Flooring and Accessories in any one continuous area shall be from the same dye lot to ensure the same shade and pattern throughout.

Resilient Flooring products are conducive to floor patterns. Floor patterns may be used in the design of an upgraded space, when programming requires (way-finding, etc.) and when included in project scope. The design and use of floor patterns must be approved by the AFRC Designer.

Resilient Flooring may include the following:

- Vinyl Composition Tile (VCT), which may be used in Building Entry/ Vestibules, Lobbies, Break Rooms, Dry (food) Storage Rooms, Dining Areas and Offices (dependant on building type).
- Sheet Vinyl, which may be used in Break Rooms, Restrooms, and Medical Facility Exam Rooms.
- Rubber Tile, which may be used in Corridors, Stair landings, Shower areas, Food Prep areas, commercial Kitchens, casual Dining Areas, Dressing and Locker Rooms.
- Rubber Sheet Goods, which may be used on stairs, in fitness centers and in healthcare applications (e.g., Operating Rooms, etc.)
- Linoleum Sheet Goods, which may be used in Lobbies and Break Rooms.
- Linoleum Tile, which may be used in Lobbies and Break Rooms.
- Static Dissipative Tile, which shall be used in areas where electronic devices are produced, repaired, stored or used and conductivity is a concern (e.g., Weapons Repair in a Weapons Maintenance Facility and Telecommunications Rooms).
- Luxury Vinyl Tile, which may be used in upgraded spaces such as Lobbies, Corridors, Dining Areas, Community Activity Centers and Bar/Lounge areas.
- Enhanced Vinyl Tile, which may be used in upgraded spaces such as Building Entry/Vestibules, Lobbies, Corridors, Dining Areas, Community Activity Centers, Bar/Lounge Areas and Offices.

Section C.3 Resilient Flooring and Accessories

The publications referenced below establish minimum requirements for resilient materials, systems and execution in addition to what is specified in this Section.

- ASTM D 4078 Water Emulsion Floor Polish
- ASTM E 648 Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
- ASTM E 662 Specific Optical Density of Smoke Generated by Solid Materials

Extra flooring material of each color and pattern shall be furnished at the rate of 5% of total of each color and pattern. Extra materials shall be from the same dye lot as those installed.

Extra base material, 15 ft of each color, shall be furnished in the same dye lot as those installed.

AFRC prefers the use of Floor Score Certified resilient products as this ensures that the specified product contributes to good indoor air quality in order to protect human health.

Specification Criteria

C.3.1 Vinyl Composition Tile (VCT)

AFRC prefers minimal use of VCT flooring; consider use of flooring types that contribute more to gaining LEED® Credits.

VCT flooring shall conform to ASTM F 1066, Class 2, (through pattern tile), and Composition 1, asbestos-free. Tile shall have the color and pattern uniformly distributed throughout the thickness of the tile. Minimum tile thickness shall meet heavy-duty traffic requirements of 0.125 inch. Minimum tile size shall be 12” x 12”. VCT shall contain approximately 6 to 8% vinyl with a 150 psi rating.

VCT requires 6 to 12 coats of finishing wax upon installation and refinishing/waxing approximately twice a year (dependant on volume of traffic) thereafter for maintenance.

C.3.2 Sheet Vinyl

Sheet vinyl shall be a homogeneous product to ensure colors and patterns run all the way through the body of the product.

Sheet vinyl shall be a minimum of .080 inch or 2mm thick and available in 6-1/2' rolls.

Sheet vinyl is to be installed with flash cove base when a seamless floor is required (e.g., healthcare facilities). Provide welding rods as recommended by the manufacturer for heat welding of joints at installation.

Maintenance regime is dependant on the vinyl content of the sheet goods. The higher content of vinyl, the less maintenance required. Apply finish at installation, sweep, damp mop, buff and refinish as per manufacturer's instructions for each individual product.

C.3.3 Rubber Tile

Rubber tile shall conform to ASTM F 1344 Rubber Floor Tile, Class 1A & 1B and ASTM D 2240 Rubber Property – Durometer Hardness. When rubber tile is used in food prep areas, commercial kitchens and dining areas it shall conform to ASTM D 471 Oil and grease resistance and ASTM F 925 Chemical resistance.

Rubber tile is inherently slip resistant; however, textured rubber tile is acceptable when increased slip resistance is requested by End User's Representative.

Minimum tile thickness shall be .0125 inch. Minimum tile size shall be 12" x 12".

When rubber tile is used in sports applications, fitness center, etc., 1/4 inch, 3/8 inch and 1/2 inch thickness shall be used.

Maintenance requirements for rubber floor tiles are sweeping and damp mopping.

C.3.4 Rubber Sheet Goods

Rubber sheet goods shall conform to ASTM D 2240 Rubber Property-Durometer Hardness.

Sheet rubber shall be a minimum of 3mm thick and available in 4 foot rolls. Sheet rubber is to be installed with either flash cove base or a pre-

molded rubber base that performs like flash cove.

Provide welding rods as recommended by the manufacturer for heat welding of joints at installation.

Maintenance requirement for rubber flooring is sweeping and damp mopping.

C.3.5 Linoleum Sheet Goods

Linoleum sheet goods contain rapidly renewable materials. Use of rapidly renewable materials contributes to the MR6 LEED® credit. Linoleum shall consist of homogeneous layers of the following: a mixture of linoleum cement (binder in linoleum consisting of a mixture of linseed oil, pine rosin, fossil, other resins or rosins, or an equivalent oxidized oleo resinous binder), cork and/or wood flour, mineral fillers, and pigments bonded to a jute backing. Provide a minimum 6 feet wide and overall thickness 0.125 inch or greater.

Linoleum sheet goods are to be installed with flash cove base when necessary. However, linoleum flash cove bases become brittle within 5 to 6 years. AFRC prefers the use of resilient base, as it will last longer.

Provide welding rods as recommended by the manufacturer for heat welding of joints at installation.

Maintenance regime for linoleum flooring begins with application of finish at installation, sweeping and damp mopping. Floor will need to be refinished periodically dependant on volume of traffic.

C.3.6 Linoleum Tile

Linoleum tile shall consist of homogeneous layers of the following: a mixture of linoleum cement (binder in linoleum consisting of a mixture of linseed oil, pine rosin, fossil, other resins or rosins, or an equivalent oxidized oleo resinous binder), cork and/or wood flour, mineral fillers, and pigments bonded to a jute backing. Provide at minimum an 18 inch square tile with an overall thickness of 0.100 inch.

C.3.7 Static Dissipative Tile (SDT)

SDT flooring shall conform to ASTM F 1066, Class 2, (through pattern tile), Composition 1, asbestos-free or shall conform to ASTM F 1700 Class 1 (monolithic vinyl tile), Type A.

Tile shall conform to ASTM 150 with an Electrical Resistance of 10e6 to 10e9.

Minimum tile thickness shall be .0125 inch. Minimum tile size shall be 12” x 12”.

SDT requires 6 to 12 coats of finishing wax upon installation and refinishing/waxing approximately twice a year (dependant on volume of traffic) thereafter for maintenance.

C.3.8 Luxury Vinyl Tiles (LVT) and Planks

LVT flooring shall be a layered product with a backing, print film image (e.g., wood or stone) and polyvinylchloride (PVC) wear surface (factory applied polyurethane).

LVT must conform to ASTM F 1700, Class 3 and Type B standard specification for solid vinyl tile.

This durable, 20 to 50% vinyl content tile shall have psi rating of up to 2000.

No wax is required upon installation. The floor will need to be buffed periodically in heavy traffic areas to maintain original shine.

Minimum tile size shall be 12” x 12”. Minimum plank size shall be 6” x 24”.

C.3.9 Enhanced Vinyl Tile (EVT)

EVT flooring shall be a homogeneous product containing approximately 15 to 20% vinyl. This durable, flexible tile shall have between a 600 and an 800 psi rating.

LVT shall conform to ASTM F 1700, class 3, and type B (same category as solid vinyl).

EVT requires one (1) coat of wax upon installation and usually one (1) coat twice a year (dependant on traffic volume) thereafter for maintenance.

C.3.10 Resilient Base

Resilient base may be vinyl or rubber.

Cove base is to be used in conjunction with hard surface flooring materials.

Cove and/or straight base may be used with carpet tile.

All vinyl and rubber bases are to be a minimum of 4 inch H and a medium to dark color to help hide soil.

C.3.11 Stair Treads, Risers, and Stringers

Stair treads, risers, and stringers shall be composition rubber, compounded from a mixture of synthetic and reclaimed rubber. Overall thickness at treads shall be 1/8 inch or greater. Design shall be either a one-piece nosing/tread/riser or a two-piece nosing/tread with a matching coved riser. Surface of treads shall be raised square, rounded or diamond.

The face of all treads must have a warning detection strip.

General Installation

All flooring and accessories to be installed in accordance with manufacturer's instructions. In addition, meet the following requirements:

- Provide a rubber or metal transition strip tapered to meet abutting material.
- Adhesive: Adhesive for flooring and wall base shall be a Floor Score certified product recommended by the flooring manufacturer.
- Polish: As recommended per flooring type, polish shall conform to ASTM D 4078.
- Riser/ tread installation shall include stringers on the wall, banister sides, and landing trim.
- Sheet vinyl is to be installed with flash cove base when a seamless

floor is required (e.g., healthcare facilities). Provide welding rods as recommended by the manufacturer for heat welding of joints at installation.

- All resilient products to be maintained with neutral pH floor cleaner.

Section C.4 Wall Finishes

Design Guidelines

AFRC prefers the majority of wall finishes to be paint. Porcelain or ceramic tile is to be used on wet walls. Wallcovering is to be used in upgraded situations (i.e., Command Suites). Specialty Wall finishes are to be used in areas where walls need more protection than regular paint or wall covering can offer (e.g., commercial Kitchens, Bar/Lounges where pool cues will be hitting the walls, etc.).

Specification Criteria

C.4.1 Paint

- Egg shell finish shall be used on walls and soffits throughout facilities for ease of maintenance and cleanability.
- Epoxy finish shall be used in Janitor's Closets, Food Preparation areas and Locker Rooms.
- Flat finish shall be used on ceilings only.
- Use of painted accent walls to be approved by AFRC Designer.

C.4.2 Tile

- Wall field tile to be ceramic or porcelain. Accent tile and mosaics may be ceramic, porcelain or glass (if budget allows).
- Wall tile to be used in Restrooms (at minimum on wet walls), Food Prep and Serving Areas. Height of wall tile to be 6'-0" minimum in restrooms on wet walls and food prep/ serving areas, due to splattering.
- Field tile to be no less than 4-1/4" x 4-1/4" in size to control amount of joints/grout for maintenance purposes.
- Accent mosaics (1" x 1", 2" x 2" or 3" x 3") and /or patterns may be used sparingly. The percentage of accent tile/mosaics should be 10% or less to prevent large areas of grout for maintenance concerns.
- Grout to be a medium to light color, selected by the DOR and approved by the AFRC Designer.
- Tile to be installed with adhesive in thin set method; grout setting bed may be required for shower areas. Mortar, grout and adhesives shall conform to TCA Handbook and LEED® standards for low/zero VOC materials. Interior adhesives, sealants, primers and "sealants used as filler" must meet the requirements of the "LEED® low emitting materials" credit.
- When mosaics are used, they should be sheet mounted to facilitate handling and installation.

C.4.3 Wallcovering

- AFRC prefers minimal use of wallcovering.
- Use of Vinyl Wallcovering (VWC) on masonry walls is not recommended.
- Wallcovering may be used as a wainscot in Command Suite Private Offices, Dining Areas, Conference Rooms, etc., to add formality to the space.
- Wallcovering may be used in Lodging Facilities at Entrance/Vestibules, Lobby/Reception, Concierge, Corridors and Conference Rooms.
- Wallcovering shall be a minimum 20 oz., Type II, 54 inch wide, Osnaburg/non-woven fabric backed vinyl.
- Use of wallcovering to be approved by AFRC Designer.

C.4.4 Specialty Wall Finishes

- Impact resistant, textured acrylic wall finish shall be used in areas that need more impact protection than paint or Type II Wallcovering can offer.
- Fiberglass reinforced panels shall be used in commercial kitchens for an easily cleaned wall surface in an extra grimy area, by the grill, etc.
- Venetian plaster may be used in Lodging Common Areas and Guest Rooms.

General Installation

Wall surface to be prepared and product to be installed in accordance with manufacturer's instructions.

Section C.5 Acoustical Fabric Panels

Design Guidelines

Acoustical fabric panels are normally specified for large assembly areas that require acoustical control and in upscale administrative executive offices, both as a decorative wall finish and to provide sound absorption.

Acoustical wall panels consist of pre-finished, factory assembled, seamless fabric covered fiberglass or mineral fiber core systems. Where possible, design panels shall be of same width and height to create a panelized wall effect.

Acoustical wall panels may used in the following areas:

- Audito riums
- Training Rooms
- Conference Rooms
- Executive / Command Office Suites (for sound absorption and decorative wall finish)

Specification Criteria

Acoustical fabric panels must have the following characteristics:

- Perimeter edges shall be reinforced by aluminum frame or formulated resin edge hardener.
- Panel width may range in size from 24 to 60 inch wide.
- Fabric shall be seamless cover over width of panel.
- Panel thickness shall be as required to meet the acoustical properties of the use (Noise Reduction Coefficient (NRC) – range of 0.80 to 0.90 for meeting spaces and 0.75 for offices).
- Fabric coverings shall be seamless plain woven 2-ply 100 percent polyester, minimum 15 ounces / linear yard.
- Avoid use of nylon, rayon and viscose for fabric panel applications due to sagging.
- Substrate shall be fiber glass or mineral fiber.
- Be constructed of high impact acoustical panel (at large auditoriums and other meeting spaces).
- Edge detail may be bevel, radius, square or mitered pending design statement.
- Fabric covering shall be stretched free of wrinkles and then bonded to the edges and back of panel a sufficient distance that no seam raveling shall occur.
- Meet a Class A fire rated assembly.

Section C.5 Acoustical Fabric Panels

General Installation

All panels to be installed in accordance with manufacturer's instructions and installed by specialty trade personnel familiar with and normally engaged in installation of acoustical wall panels. In addition, use manufacturer's standard mechanical fasteners for mounting panels – typically "Z" clip system.

Section C.6 Millwork / Casework

Design Guidelines

Millwork / Casework within AFRC facilities shall include:

- Solid surface material countertops and window sills
- Plastic laminate casework
- Wood casework and decorative wood chair rails

Plastic laminate millwork / casework with solid surface countertops shall be provided in all Break Rooms and in public and private Toilet Rooms.

All countertops shall be solid surface material where water is present. Although solid surface material is preferred, plastic laminate countertops may be used in Copy Areas and other work areas.

Upgraded wood millwork / casework with solid surface countertops and decorative wood chair rails shall be provided in Command Suites as well as Executive Offices and Conference Rooms, and may be specified for custom casegoods such as reception counters.

All countertops shall have grommet accessories as necessary. Prepare countertops for 2-1/2 inch diameter plastic grommets.

All millwork / casework shall meet Architectural Woodwork Institute (AWI) Quality standards of construction.

Specification Criteria

C.6.1 Solid Surface

Solid surface countertops and window sills shall meet the following criteria:

- Solid polymer material shall be a homogeneous filled solid polymer; not coated, laminated or of a composite construction.
- Superficial damage to a depth of 0.01 inch shall be repairable by sanding or polishing.
- Countertops and window sills shall be minimum ½ inch thick material.
- Vertical applications may use ¼ inch thick material.
- Consider using recycled content solid surface materials to obtain LEED® Credits.
- Window sills shall be one-piece full width of window opening with eased edges.
- Lavatory countertops shall have under-counter mount vitreous china

sinks.
- Back and side splash shall be 2 to 4 inches high.

C.6.2 Plastic Laminate

Plastic laminate millwork / casework shall meet the following criteria:

- All framing lumber shall be kiln-dried Grade III.
- Frame front shall be nominal 3/4 inch hardwood.
- All particleboard shall be industrial grade, medium density 40 to 50 pounds per cubic foot, 3/4 inch thick.
- A moisture-resistant particleboard in grade Type 2-M-2 or 2-M-3 shall be used as the substrate for plastic laminate covered countertops, backsplashes, doors and components.
- Plastic laminates shall be high-pressure decorative laminates.
- Post formed countertops shall not be used in AFRC installations.
- Use general purpose standard grade plastic laminate as appropriate for horizontal or vertical applications.
- Hardware shall consist of the following components:
  - Door Hinges: Euro-style with concealed knuckle; 170 degrees swing with self closing capability at less than 90 degrees to its closed position.
  - Hinges to be nickel plated.
  - Cabinet Pulls: Wire pulls with center to center dimension of 3-1/2 inch, outer dimension of 0.30 inch in diameter; and a projection of 1-1/4 inch
- Drawer slide shall be side mounted type; Grade I with full extension, with lock-out position and self close/stay close action.
- Adjustable shelf support system shall be metal pin supports.
- All fasteners shall be concealed.
- Adhesives shall be of a formula and type recommended by AWI.
- Adhesives shall be selected for their ability to provide a durable, permanent bond within site conditions.
- Adhesives shall meet local regulations regarding VOC emissions and off-gassing.
- Laminate adhesive used to join high-pressure decorative laminate to wood shall be an adhesive consistent with AWI and laminate manufacturer's recommendations.
- PVC edge banding shall be adhered using a polymer-based hot melt glue.

- Caulk used to fill voids and joints between laminated components and between laminated components and adjacent surfaces shall be clear, 100 percent silicone.

C.6.3 Wood

Wood millwork / casework shall meet the following criteria:

- Wood millwork / casework shall meet all construction standards noted above plus the following, for wood construction:
  - All framing lumber shall be kiln-dried Grade III.
  - Frame front shall be nominal ¾ inch hardwood.
  - Stain grade standing or running trim casework components shall be hardwood species, plain sawn.
  - AWI grade shall be custom.
  - Adhesives used to bond wood members shall be a Type II for interior use as recommended by the manufacturer.

General Installation

All millwork / casework to be installed by specialty trade personnel familiar with and normally engaged in installation of millwork / casework.

Section C.7 Ceiling Tiles

Technical Guide Specifications - SID

Design Guidelines

Acoustical Ceiling Tiles (ACT) shall be used in AFRC facilities in the following areas:

- Private Offices
- Open Office Areas
- Conference and Training Rooms
- Support spaces: Break Rooms, Storage Rooms, Copy Rooms, etc.
- Kitchen / Food Prep Areas

ACT shall not be used in Lodging Guest Rooms or in Toilet Rooms.

Replacement of all existing acoustical ceiling tiles and grid system is required during interior renovations.

The AFRC acoustical ceiling tile system standard is to use a fine texture 24” x 24” x 3/4” tegular reveal ceiling tile, with a 9/16 inch structural grid system.

When a 24” x 48” ceiling structural grid cannot be avoided, use a scored ceiling tile to resemble a 24” x 24” grid system.

ACT systems used in Kitchen / Food Prep Areas shall have a high acoustic rating and be a washable ceiling panel that meets United States Department of Agriculture (USDA) / Food Safety and Inspection Service (FSIS) guidelines for use in food processing areas. The panels shall have a water-repellent paint that is durable and acoustically transparent, and is safe for use with key disinfecting agents.

Tiles in the ACT system help contain sound within the room while preventing outside intrusion. ACT can also absorb some of the distracting sound and reduce reverberation time within an open office area when used with acoustical wall panels or acoustical systems furniture panels.

Specification Criteria

Acoustical Ceiling Tiles in Open Office shall have the following characteristics:

- Class A fire-rated
- Type III (mineral fiber with painted finish), wet-felted
- Minimum recycled material content of 18 percent
- Minimum NRC rating: 0.75
- Pattern: Smooth Texture, non-directional

- Nominal size: 24” x 24” x 3/4”
- Edge detail: Tegular / reveal with beveled edge
- Finish: Factory-applied vinyl latex paint, non-directional
- Color: White
- Minimum Light Reflectance (LR) coefficient: 0.90
- Minimum Ceiling Attenuation Class (CAC): 35
- Minimum Articulation Class (AC): 170

Acoustical Ceiling Tiles in Private Office / Conference shall have the following characteristics:

- Class A fire-rated
- Type III (mineral fiber with painted finish), wet-felted
- Minimum recycled material content of 18 percent
- Minimum NRC rating: 0.60
- Pattern: Smooth Texture, non-directional
- Nominal size: 24” x 24” x 3/4”
- Edge detail: Tegular / reveal with beveled edge
- Finish: Factory-applied vinyl latex paint, non-directional
- Color: White
- Minimum LR coefficient: 0.90
- Minimum CAC: 40
- Minimum AC: 170

Acoustical Ceiling Tile Suspension System shall have the following characteristics:

- Exposed-grid 9/16 inch standard width flange
- Rated for intermediate-duty systems
- Aluminum or steel with a factory-applied white baked-enamel finish on exposed surfaces
- 9/16 inch minimum flange wall molding
- Inside and outside corner caps
- Provide standard corners
- Capability to support finished ceiling, light fixtures, air diffusers, and accessories
- Maximum deflection of 1/360 of span length; Seismic details shall conform to the guidance in ASTM E 580
- Provide seismic clips at areas greater than 2500 square feet.
- Hangers shall be galvanized steel wire
- Hangers and attachment shall support a minimum 300 pound

Section C.7 Ceiling Tiles

ultimate vertical load without failure of supporting material or attachment

All Acoustical Ceiling Tile systems shall provide the following:

- Standard performance guarantee or warranty shall contain an agreement to repair or replace acoustical panels that fail within the warranty period.
- Failures that shall be replaced include, but are not limited to:
  - Sagging and warping of panels
  - Rusting
  - Manufacturer's defects of grid system
- Manufacturer shall offer reclamation of old tiles and new tile at end of life span
- Warranty: Manufacturer's standard performance guarantees or warranties that extend beyond a one (1) year period shall be provided.

General Installation

All ceiling tile shall be installed by specialty trade personnel familiar with and normally engaged in installation of acoustical ceiling systems.

Spare tiles of each color shall be furnished at the rate of 5 tiles for each 100 tiles installed. Tiles shall be from the same lot as those installed.

Section C.8
Signage
Design Guidelines

Technical Guide Specifications - SID

Interior signs used within AFRC facilities shall adhere to design standards of the Air Force UFC 3-120-01 Sign Standard, dated February 6, 2003.

Interior signage forms an orientation system within a building, guiding visitors from the building entry directly to the office or desk of person they are seeking. Interior signs are part of a total orientation system that integrates interior and exterior signage design.

The major types of interior signage include:

- Inform ational
  - Building Directories and Floor Directories
  - Located at Building Entries and Elevators
  - Size: 36” x 72” with 9 inch high permanent header panel; lockable clear glass or acrylic doors and changeable name stripes; directory width may vary

- Dir ectional
  - Floor Directories, and ceiling mounted directional signs
  - Located at Elevators and areas where directions are needed
  - Size: 12” x 18” with 6 inch high permanent floor number header; changeable floor directory insert

- Ident ification
  - Destination Signs, Office and Open Office Identification Signs
  - Located at areas of destination
  - Size:
    - Major areas = 15” x 15”
    - Offices = 9” x 9”
    - Open office areas = range from 6” x 6” to 2” x 9” for counter mounted signs
  - All with permanent header copy for room number and changeable message insert for occupant names

- Regulatory Signs
  - Toilets and other base sign requirements
  - Size: 6” x 9” with regulatory pictographs appropriate for areas of use

- Bulletin Boards
  - Provided in all facilities

- Size: 36” x 72” with 6 inch high permanent header panel; shall have lockable glass or acrylic doors with plastic impregnated cork surface and burlap backing

Overview of Signage Standards

- Standards serves as a guide to standardize all interior signs in terms of:
  - Size
  - Appearance
  - M essage
  - Permitted graphics
  - Layout including font type and size

- Colors of interior signs shall coordinate with the building interior design scheme; generally a dark background with white graphics.

- Fonts
  - Helvetica Medium shall be used for all header copy and for directional arrows.
  - Helvetica Regular shall be used for all body copy.

- Graphic emblems may be used on AFRC Directory signs
  - Air Force Symbol may be used on base identification signs.
  - Air Force Coat of Arm may used in Headquarters’ buildings only.
  - Air Force Shield may be used to display unit emblems.
  - Squadron Emblems Disk may be used for unit identification.
  - Emblems shall be 4” x 4” located on left side of Directory Header Panel.

- For reference colors of Air Force Symbol
  - Air Force Blue Pantone #287 – Symbol Body
  - Pantone Cool Grey #4 (metallic) – Light Edge of symbol and light edge of letters
  - Pantone Cool Gray #9 (metallic) – Shadow edge of symbol
  - Black – Outline of letters and shadow of symbol

- On military installations, any area or building used by civilians or general public must meet ADA Accessibility Guidelines or Uniform Accessibility Standards whichever is more stringent in signage design.
  - Raised Braille characters and symbols are only required on signs

that designate permanent rooms or spaces, including Toilets and Room numbers. Braille must protrude a minimum of 1/32 inch from the surface.

- Interior signs shall be designed so they require minimum maintenance, with changeable message and name inserts. In addition, a computer program shall be furnished with signage, so that building occupant can manage changeable name inserts for floor directories and identification signage.

Specification Criteria

Interior signage shall also have the following characteristics:

- Signage shall conform to EPA requirements for recycled materials.
- Letters and numbers on signs in handicapped-accessible buildings, which do not designate permanent rooms or spaces, shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10. Characters and numbers shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case letter "X". Lower case characters are permitted.
- Suspended or projected overhead signs shall have a minimum character height of 3 inch.
- Letters and numbers which designate permanent rooms and spaces in handicapped-accessible buildings shall be raised 1/32 inch upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille.
- Raised characters shall be at least 5/8 inch in height, but no higher than 2 inch.
- Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 inch minimum in height. Indicated accessible facilities shall use the international symbol of accessibility.
- Room Identification/Directional Signage System shall have:
  - Integrally colored injection molded high impact plastic complete with mounting system, ready for insert installation
  - Corners of signs rounded or square depending on design statement
  - Mounting with double sided tape for wall mounting and Velcro, or manufacturers' recommended factory applied mating strips, for attachment to system furniture
  - Changeable message strip signs made of injection molded high

impact plastic

- Signage graphics for modular identification/directional signs shall conform to the following:
  - Message shall be applied to panel using the silkscreen process
  - Silkscreened images shall be executed with photo screens prepared from original art
  - Handcut screens will not be accepted
  - Original art shall be defined as artwork that is a first generation reproduction of the specified art

- Building Directories shall be lobby directories surface mounted, non-illuminated, wall hung, with changeable message strips
  - Header format shall be Helvetica Medium, uppercase. Imprint color
  - Door glazing shall be clear acrylic sheet
  - Extruded aluminum door frame shall be of same finish as surrounding frame
  - Corners shall be mitered and assembled with concealed fasteners
  - Hinges shall be concealed continuous stainless steel, in natural anodized aluminum finish
  - Glazing shall be set in frame with resilient glazing channels
  - Door locks shall be manufacturer's standard, and shall be keyed alike
  - Extruded aluminum frames and trim shall be extruded aluminum alloy frame surrounding solid backing plate with PVC laminated to solid backing, provide holes in back plate
  - Message Strips: Message strips shall be injection molded plastic with digital computer generated and photo silk screened typography
  - Provide sufficient strips to fill directory, up-datable by
  - Type style shall be Helvetica Medium, size shall be 3/4 inch initial caps
  - Provide strips with self aligning reveal and flex and stack ability for ease of installation and removal

General Installation

All signage to be fabricated and installed by specialty trade personnel familiar with and normally engaged in installation of signage systems. The Contractor shall provide five (5) percent of total extra frames and extra stock of the following:

- Blank plates of each color and size for each sign type

- Changeable message strips for each sign type

Section C.9 Window Treatments – Primary

Design Guidelines

Primary window treatments are specified in the SID Package as part of building bid package, to be covered in general contractor's bid, and should include:

- Solar Shades
- Horizontal Blinds
- Vertical Blinds

Horizontal blinds are used in all building facilities. The use of solar shades or vertical blinds is an aesthetic decision based on type of windows and desire to maximize both the view and natural light while still minimizing direct sunlight and glare. Vertical or horizontal blinds shall not be used in AFRC Lodging Facilities. Refer to Section D.10 for window treatments used in Lodging Facilities.

Decorative window treatments including drapery and blackout shades are considered Secondary window treatments and are specified as part of the Furniture Fixtures & Equipment package. Refer to Section D.9 for Design Guidelines for Window Treatments – Secondary.

Provide the same type of primary window treatment at all windows in a facility for architectural continuity at building perimeter. When using horizontal blinds on the perimeter, upgraded wood horizontal blinds may be specified at Command Suites in Private Offices and Conference Rooms, as appropriate.

Consider manufacturers perpetual use certifications and recycling characteristics of window covering products for LEED® Credits.

Specification Criteria

C.9.1 Solar Shades

Solar Shades shall meet the following criteria:

- Shading Coefficient (or openness factor) of material used for shade shall be determined based on:
  - Type of glass used in building
  - Orientation of building
  - Area of use within the facility (Lobby may need more transparency than General Office)
  - Energy efficiency
  - Shade color (darker colors provide better view through shade

cloth to outside, absorb light and heat, provide glare-free environments for general office areas)

- Shade roller tube shall be extruded aluminum.
- Shade fall shall be connected to the roller tube with spine lock system.
- Valance or fascia aluminum extrusion shall conceal shade roller and hardware.
- No exposed fasteners are permitted.
- End caps shall be stamped steel and match headbox finish.
- Program stops shall be provided for motorized shades and manual operations.
- Solar shades may be manual operated to a maximum size of 12'-0" w x 12'-0" h and powered for window sizes over 12'-0" w x 12'-0" h.
- Sun sensor controls and timer controls shall be provided with a programmable system, activated by LED's detecting daylight intensity and responding automatically adjusting shades in accordance with energy system designed for the building. This system is recommended for Administrative and Lodging Facilities when included in project scope.

C.9.2 Horizontal Blinds

Horizontal Blinds shall meet the following criteria:

- Window treatment shall be provided, complete with necessary brackets, fittings, and hardware.
- Windows to receive a treatment shall be completely covered.
- Blinds shall be inside mount; although, site conditions or aesthetic considerations may allow outside mounting as long as adequate coverage at sides and bottom is provided.
- All parts shall be one (1) color and match the color of the blind slat.
- Horizontal blinds shall be Type II, 1 inch or 2 inch.
- Blind units shall be capable of nominally 180 degree partial tilting operation and full-height raising.
- Head channel shall be aluminum nominal 0.025 inch for Type II.
- Slats shall be aluminum, not less than 0.008 inch thick, and of sufficient strength to prevent sag or bow in the finished blind.
- A sufficient amount of slats shall be provided to assure proper control, uniform spacing, and adequate overlap.
- Tilting wand shall be transparent material hung vertically by it own

weight with swivel for easy operation.
- The tilter control shall be of enclosed construction.
- The tilting wand shall be of sufficient length to reach to within 60 inches of the floor.
- Moving parts and mechanical drive shall be made of compatible materials which do not require lubrication during normal expected life.
- Provide intermediate brackets for blinds over 48 inch wide.
- Provide oval shaped bottom rail and end caps to match slats in color.
- For architectural continuity at windows, provide for full or full down positioning of blinds with one (1) intermediate stop for blinds.
- Avoid use of steel construction for horizontal blinds.
- Blinds to be used for room darkening, for audio visual purposes, shall include light traps at sides and sill, and be constructed of aluminum to match blind color.

C.9.3 Vertical Blinds

Vertical Blinds shall meet the following criteria:

- Vertical blinds shall be outside wall mount to sill or floor.
- Vertical blind shall have a 180 degree partial tilting operation and full stack back.
- Vertical blinds shall be heavy duty strength, with heavy duty hardware, commercial grade.
- Louvers shall be 2-3 ½ inch wide, fire resistant solid vinyl, UV stable, and impact resistant.
- Bottom weight for vertical blinds shall be provided.
- Vertical louvers that are 3-½ inch shall not overlap less than 3/8 inch and be dimensionally stable.
- Vertical louvers that are 2 inch shall not overlap less than 1/4 inch and be dimensionally stable.
- Carriers to support each of the louvers shall be molded plastic to traverse on self-fabricated wheels for smooth easy operation.
- The hook of the carrier shall have an automatic latch to permit easy installation and removal of the louver, and securely lock the louver for tilting and traversing.
- Headrail system shall not be less than .047 inch thick and made of anodized aluminum alloy with baked enamel paint finish.
- Headrail shall extend full width of the bind and be closed with an end

cap at each end.

- Intermediate brackets shall be provided for blinds over 62 inch wide.
- Valance shall be provided at head rail.
- Tilting and traversing controls shall be provided on the right side that hang compactly at the side of the blinds and reach within 60 inches of the floor.

General Installation

All primary window treatments to be installed by specialty trade personnel familiar with and normally engaged in installation of window treatments, and in accordance with manufacturer's instructions.

Section C.10 Toilet Partitions and Accessories

Design Guidelines

AFRC prefers the use of Solid Core Reinforced Composite toilet partitions for strength, durability and appearance. Phenolic toilet partitions are preferred in restrooms that will be hosed down (e.g., locker rooms). Laminate toilet partitions are preferred when project scope does not allow for the solid core or Phenolic toilet partitions.

The minimum specifications for toilet partitions should include (unless otherwise noted):

- 1/2 inch thick panels
- 3/4 inch doors and stiles
- Coat hook with bumper
- Standard colors to be selected unless otherwise approved by AFRC Designer

Toilet Room accessories are to be satin stainless steel finish in all AFRC facilities. Paper towel holders/ waste receptacles, sanitary dispensers and toilet seat cover dispensers are to be recessed. Toilet paper dispensers, grab bars and sanitary waste receptacles to be surface mounted on toilet partitions and/or walls.

Specification Criteria

C.10.1 Toilet Partitions

<u>Toilet Partitions – Solid Core Reinforced Composite</u>

Solid Core Reinforced Composite Toilet Partitions shall have the following characteristics:

- Homogeneous solid core panels with color clear through (Contributes to LEED® certification program TB-77)
- Heavy-Duty stainless steel hardware

<u>Toilet Partitions – Phenolic</u>

Phenolic Toilet Partitions shall have concealed heavy-duty hardware.

<u>Toilet Partitions – Laminate</u>

Laminate toilet partitions shall have through-bolted hardware.

C.10.2 Toilet Accessories

Minimum Paper Towel Holder specification shall be:

- For folded paper towels:
  - Accessible Recessed Paper Towel Dispenser
  - Capacity: 400 C-fold or 525 multi-fold towels
  - Material: Satin Stainless steel, 22-gauge
  - Lockset: Tumbler type
  - Refill Indicators: Pierced slots at front

- For rolled paper towels:
  - Accessible Surface Mount Paper Towel Dispenser
  - Capacity: 7 to 8 inch wide x 8 inch maximum diameter standard cove rolls
  - Material: Durable ABS plastic (grey)

Minimum Waste Receptacle specification shall be:

- Accessible Recessed Waste Receptacle
- Material: Satin Stainless steel, 22-gauge
- Construction: All welded
- Removable front panel for cleaning
- Unit shall be equipped with bag holder for securing disposable plastic trash bags
- Minimum capacity 12.8 gallon

Minimum Toilet Seat Cover Dispenser specification shall be:

- Accessible Surface Mounted Toilet Seat Cover
- Capacity: 250 Minimum
- Material: Satin Stainless steel, 20-gauge
- Construction: One-piece seamless construction with rectangular opening for dispensing toilet seat covers with a concealed opening in bottom for filling

Minimum Toilet Tissue Dispenser specification shall be:

- Accessible Wall Mount Toilet Tissue Dispenser
- Roll-in-reserve dispenser with hinged front secured with tumbler lockset

- Mounting: Recessed with concealed anchorage
- Material: Satin Stainless steel, 22-gauge

Minimum Grab Bar specification shall be:

- Accessible Grab Bar
- Mounting: Concealed
- Material: .05 inch Thick Stainless steel
- Gripping Surfaces: Smooth, satin finish
- Outside Diameter: 1-1/2 inch for medium to heavy-duty applications

Minimum Baby Changing Station specification shall be:

- Surface-Mounted fold-down table
- Material: Durable, injector-molded polypropylene with pneumatic cylinder for controlled opening / closing; changing surface to be concave with replaceable nylon safety-strap
- Installation: Metal mounting chassis with concealed steel-on-steel hinge (not exposed)
- Capacity: 200 lbs minimum
- Built-in Liner Dispenser for use with 3 ply bed liners, instructional graphics and safety messages
- ADA compliant

Minimum Toilet-Stall Metal Shelf specification shall be:

- Surface-Mounted shelf
- Material: Stainless steel shelf and brackets – 18 gauge; all exposed surfaces shall be satin finish and protected during shipment with a PVC film removable after installation; shelf and bracket supports to be welded construction; minimum 3/4 inch return edge; front edge hemmed for safety
- Size / Capacity: 5” d x 16” w minimum
- ADA compliant in ADA stalls and/or at ADA sinks

Minimum Sanitary Waste Receptacles specification shall be:

- Surface-Mounted sanitary napkin disposal
- Material: Satin Stainless Steel; 22-gauge
- Construction: One-piece; cover shall be equipped with a full length

stainless steel piano hinge

Minimum Sanitary Dispenser specification shall be:

- Surface-Mounted sanitary napkin / tampon dispenser
- Material: Satin Stainless Steel; 22-gauge
- Single-coin mechanism for 25¢-operation.

Minimum Liquid Soap Dispenser specification shall be:

- Mounting: Deck
- Capacity: 54 Ounces liquid soap
- Materials: Chrome plated plastic
- Operation: Sensor operated, battery powered
- Refill Indicator: LED low soap and battery indicator

Minimum Mirror specification shall be:

- Custom, size indicated
- Frame: Heavy gauge satin stainless-steel channel, ¾ x ¾ x 7/16 inch
- Mounting: Surface mounted with concealed wall hanger

Minimum Coat/Purse Hook specification shall be:

- Surface-Mounted on side partition or door
- Material: Brass casting with satin nickel-plated finish to match stainless steel
- Construction: One-piece hook and flange
- Capacity: 300 lbs downward pull

General Installation

Toilet Partitions and Accessories are to be installed in accordance with manufacturer's instructions.

Section C.11 Corner Guards and Chair Rails

Design Guidelines

AFRC requires the use of corner guards in all facilities on outside corners of high trafficked areas.

AFRC prefers the use of bumper guards in areas where carts, equipment, machinery, etc. may cause damage to wall surfaces (e.g., in Healthcare Facilities).

Guards shall be color coordinated with adjacent wall finishes.

Specification Criteria

Corner Guards – Flush Mounted

Flush mounted, full height corner guards are preferred whenever possible (i.e., new construction) and shall meet the following minimum criteria:

- 0.75 inch minimum thickness
- 3 inch wing flanges
- Continuous aluminum retainer (helps towards LEED® Credits)
- PVC free (helps towards LEED® Credits)
- Manufacturer's full range of standard colors unless approved by AFRC Designer

Corner Guards – Surface Mounted

Surface mounted corner guards shall be used in renovation projects and meet the following minimum criteria:

- 0.75 inch minimum thickness
- 2 inch wing flanges
- Continuous aluminum retainer (helps towards LEED® Credits)
- PVC free (helps towards LEED® Credits)
- Manufacturer's full range of standard colors unless approved by AFRC Designer

Chair Rails

Chair rails or bumper guards shall be used in all facilities that have medical equipment, carts, etc., that may cause damage to the wall surface. Bumper guards shall meet the following minimum criteria:

- 0.75 inch minimum thickness

Section C.11 Corner Guards and Chair Rails

- 4 to 8 inch high bumper guard; size to be determined by programming requirements
- Continuous aluminum retainer (helps towards LEED® Credits)
- PVC free (helps towards LEED® Credits)
- Manufacturer's full range of standard colors unless approved by AFRC Designer

General Installation

All corner guards and chair rails to be installed in accordance with manufacturer's instructions. Mounting height of chair rails/bumper guards to be determined by chair/cart heights and coordinated with A/E.

Section C.12 Lockers and Locker Room Benches

Design Guidelines

Lockers shall be used in Locker/Changing Rooms, Staff Restrooms or Break Rooms. Lockers are also used as General Storage in many facility types based on programming needs.

AFRC prefers the use of full-height lockers. Half-height lockers may be used depending on the programming needs/space availability.

Locker Room benches shall be used in Locker Rooms and Shower Rooms. AFRC prefers to use fixed benches, specified as part of the SID package. Moveable benches may be specified as part of the FF&E package if necessary.

Specification Criteria

Lockers

AFRC prefers metal lockers with the following characteristics:

- 15” w x 18” d x 72” h (unless half-height requested)
- 24-gauge body (finished with heavy coat baked on enamel)
- 16-gauge single louvered doors and frame (finished with heavy coat baked on enamel)
- Able to receive a pad lock
- Polished Aluminum Number Plates on face of each locker door; numerals to be black, not less than ½ inch high for readability
- Continuous sloping top
- Closed front and end bases for new construction
- “Z Base” for renovation installations
- Standard finishes to be selected unless otherwise approved by AFRC Designer
- Customize installations with sloping top splices, valley corners and hip ends – all with concealed fasteners

Locker Room Benches

The minimum fixed locker room bench specification will include the following:

- Legs to be 1-1/4 inch diameter tubing with 10-gauge steel flanges welded to each end
- Standard heavy coat baked enamel/powder coat finishes for bench legs should be dark in color (e.g., black or bronze, etc.)
- Clear polyurethane sealed, laminated maple bench top with rounded

Section C.12 Lockers and Locker Room Benches

and sanded corners

The minimum moveable locker room bench specification will include the following:

- Moveable benches with pedestal legs, made from aluminum bar stock
- Non-skid pads for each pedestal
- Standard heavy coat baked enamel/powder coat finishes, in dark color, for bench legs (e.g., black or bronze)
- Clear polyurethane sealed, laminated maple bench top with rounded and sanded corners

General Installation

All lockers and locker room benches to be installed in accordance with manufacturer's instructions to preserve the integrity of the warranty. Submit a copy of the manufacturer's standard warranty to the Contracting Officer within the first 60 days of government occupancy.

Fixed benches to be fastened to subfloor using appropriate fasteners, per manufacturers recommendations.

Section C.13 Tackboards / Markerboards

Design Guidelines

AFRC requires a tackboard in each facility to display necessary documents (e.g., occupancy load). Tackboards may also be requested for internal use. Tackboards should be located per programming requirements.

Markerboards / white boards are to be used in Training Rooms, Break Rooms, Conference Rooms, Catering Offices, etc. Placement, style and size of these boards should be decided in conjunction with End User's Representative.

Specification Criteria

Tackboards

AFRC minimum tackboard specification shall meet the following criteria:

- Be found on the GSA schedule
- Be natural cork or equal tack surface
- Be sized according to programming requirements
- Include a lockable clear glass or acrylic door, refer to A.8 Signage section
- Be constructed of satin anodized aluminum frame; use of an oak finish wood frame must be approved by the AFRC Designer
- Be Green Guard Certified

Markerboards

AFRC minimum markerboard specification shall meet the following criteria:

- Be found on the GSA schedule
- Include a porcelain enamel steel writing surface with either a standard or low-gloss finish (Note: A low-gloss surface allows protection as well as writing.)
- Be sized according to programming requirements
- Be constructed of satin anodized aluminum frame; use of powder coat finish aluminum frame or oak finish wood frame must be approved by the AFRC Designer
- Have full length integral marker tray
- Include optional map rail (cork insert and map hooks)
- Include markers and erasers
- Be Green Guard Certified

Section C.13 Tackboards / Markerboards

General Installation

All tackboards / markerboards to be installed in accordance with manufacturer's instructions.

Section D.1
Systems Furniture
Design Guidelines

AFRC planning policy is to maximize open office space in Administrative Facilities. The system furniture configurations for workstations and private offices should meet the needs of the end-user and be consistent throughout the space.

Avoid using systems furniture in a series of adjacent rooms; instead, remove walls and provide open office areas wherever possible. Coordinate style and color of furniture systems with other storage, seating, etc., in open office areas. Minimize the number of different workstation layouts and individual components required for the design, in order to assist in future reconfiguration and inventorying.

Systems furniture products must be fully compatible and interchangeable with each other to avoid costly reconfiguration expenses. All components shall exhibit a high degree of modularity so that components can be used anywhere within the facility.

Systems furniture will allow the facility to be space efficient by making maximum use of vertical space and by providing a highly organized and versatile way of storing materials. Compatibility of the furniture dictates that the systems furniture and files have styling and hardware that coordinate.

Specify high and low panel configurations so that staff is not surrounded by high panels. High and low panels allow for a teaming work environment and create interest within the office landscape.

Wardrobe storage shall be provided in workstations and in freestanding systems furniture used in private offices.

Specify neutral colors for casegoods, furniture systems, storage and tables. Specify desk worksurfaces and table tops that are in a medium color tone and have a pattern to hide soiling. All finishes should be compatible with ordinary household cleaners. Use manufacturer's standard fabrics including textile manufacturer's fabrics that have been graded into the furniture manufacturer's fabric grades and are available through their GSA schedule. All furniture shall have a 10 Year minimum warranty. Manufacturer must have at least 10 years of systems furniture product experience.

Systems Furniture used within AFRC facilities shall consist of the following components:

- Connector Systems
- Panel and Spine Walls
- W orksurfaces
- Storage Components
- Electrical and Information Technology (IT) Connectivity

D.1.1 Connector Systems

Connector systems shall have the following characteristics:

- Removability of a single panel or spine wall within a typical workstation configuration without requiring disassembly of the workstation or removal of adjacent panels
- Durable material construction to withstand the weight of loaded components and the stress of movement under loaded conditions
- Ability to accommodate a variety of panel configurations, including:
  - Straight line connection (180 degrees) of two (2) panels
  - L connections (90 degrees) of two (2) panels
  - T connections (all 90 degrees) of three (3) panels
  - X connection (all 90 degrees) of four (4) panels
  - Hi-Lo connections between panels of different heights
- Allow continuation of electrical and communications wiring within a workstation and from workstation to workstation
- Reusable and tight connections with continuous visual seals
- Continuous acoustical seals at acoustical panels
- Concealed clips, screws, and other construction elements
- Filler posts with finish that matches the finish and color of the panel trim
- All bracketry necessary to form a stable and complete unit

D.1.2 Panels and Spine Walls

Panels and Spine Wall Systems shall have the following characteristics:

- Panels shall be capable of structurally supporting more than one (1) fully loaded component per panel, per side.
- Panels shall not be attached to building walls.
- Panel size and construction:
  - Thickness shall be no greater than 3 to 3-1/2 inches, including

the fabric outer surface skin
  - Widths ranging from 18 to 60 inches, in 6 inch increments
  - Heights ranging from 40 to 78 inches, as indicated in workstation descriptions
- System panels shall have adjustable leveler glides to provide uniform height.
- Return panels used for system structural stability shall meet or exceed the width of the worksurfaces.
- Panels shall be movable as a complete unit.
- Panels shall be modular with the following skins available:
  - Acoustical
  - Tackable surfaces
  - M onolithic
  - T iled
  - G lazed
  - Marker board
  - Perforated steel
  - Painted steel
- Panel fabrics/surfaces shall be replaceable in the field with common tools.
- Panel system shall be capable of structurally supporting multiple-hung appurtenances: cantilevered worksurfaces, fully loaded shelves and overhead bins, files and other components in the configurations.
- Panel support components shall have a positive, integral locking device which secures components to prevent the components from being accidentally pulled or knocked off the panels.
- Covers shall be hinged or removable to allow for easy access to the raceway but be securely mounted (so as to not be accidentally dislodged under normal conditions).
- Cables shall not be threaded through the frame.
- Raceways shall be an integral part of the panel and must be able to support lay-in cabling and have sufficient capacity for electrical and IT.
  - Lay-in cable routing shall be accommodated in the:
    - Base
    - Top cap
    - Horizontal cavity at the beltline levels
- Frames shall allow for both tiled and monolithic appearances.
- Frames shall have preassembled steel hangers with slots at 1 to 1-½ inch increments for suspension of worksurfaces and panel mounted storage.
- Base trim shall install to the panel base with integral hooks without

need for tools.

- Base trims shall have knockouts for power and communication terminations, as well as filler to close any unused openings.
- Accessories and appurtenances for a completely finished wall assembly shall be supplied.

D.1.3 Worksurfaces

Worksurfaces shall have the following characteristics:

- Tops shall be manufactured with a warp resistant composition and balanced construction of a minimum of 0.048 inch thick standard grade high pressure plastic laminate top, core material to be a solid wood 45 pound density furniture grade particleboard of a minimum thickness of 1-¼ inch or greater, with a backer underside.
- Weight bearing capabilities shall support a live load of 200 pounds.
- Height to be adjustable as required by staff or function.
- Unit to be easily relocated and installed without tools.
- Ability to have grommets factory or field installed.
- Capability to suspend under counter mounted storage assembly units (i.e., suspended pedestals).
- Primary edge profiles shall be:
  - 3mm plastic, 3mm wood edgebanding, or solid hardwood.
  - Applied to the entire perimeter of the worksurface to prevent any outgassing from exposed particle board.
  - Self edged impact resistant material of straight vinyl or T-mold on curved surfaces to prevent damage.
- All edges shall be completely finished and sealed against moisture.

D.1.4 Storage and Pedestal Components

Storage and Pedestal Components at each workstation shall, in general, include:

- Interchangeable pedestals (from left to right, and right to left) with locking system capability; Quantity and type of drawers dependent on functional needs
- Lateral file storage
- Pencil drawers
- Overhead storage, which will allow notebooks to be stored vertically
- Task lights shall be provided with all overhead storage or shelving units

Storage and Pedestal Components to have the following characteristics:

- Storage pedestals shall be available in 18, 24, and 30 inch depths
- Drawer fronts shall be 22-gauge steel and drawer body shall be 20-gauge steel.
- Pedestal shall have a finished back and full dustpan.
- Box and file drawers shall have full extension ball bearing glides.
- Lateral file drawers shall have a load capacity of 150 lbs.
- All workstation components shall be keyed alike within a single workstation and master keys provided.

D.1.5 Electrical and IT

Systems Furniture Electrical and IT shall have the following characteristics:

- Wiring entry shall be powered from building walls to eliminate the use of power poles and access at the floor.
- Systems shall be easily accessed in the spine wall and panels without having to move return panels and components.
- Top cap cable management shall be available.
- System will have the ability to exit wires from the top of the panel.
- Power infeeds shall be available at the base and top locations.
- Base raceway shall be able to accommodate duplex outlets in a back to back configuration.
- Phone and data components shall be available as part of the system.
- Power receptacles must snap into power kits on one or both sides of the panel.
- Receptacles must be able to be added or moved.
- Power components shall be color-coded for safety.
- Cables which run through the metal frame must be protected by the frame's construction and not interfere with the ability to hang components.
- Base cable tray shall consist of 20 to 24-gauge steel channel which is field installed between two (2) base trims or support cables in the base of the panel.

General Installation

Systems Furniture is installed by furniture installer who is experienced with installing each particular system according to manufacturer's recommendations and to maintain manufacturers' warranty. Electrical / communication wiring in panels shall be installed by a licensed

electrician under the furniture installer while the connection of wired panels to building power should be by the licensed electrician contractor responsible for building connections.

Section D.2 Demountable Walls

Design Guidelines

Demountable Walls are an AFRC preferred product that provides flexibility for the facility and allows change in mission to be accomplished if office rearrangements are required.

Demountable Walls may earn LEED® Credits based on recycled content and reusability, as well innovative construction methods and techniques which conserve natural resources.

Electrical components, devices, and accessories shall be UL rated.

When specifying Demountable Walls with full height glazing panels provide for seated height privacy using translucent screening.

Specification Criteria

Demountable Walls shall meet the following criteria per section as follows:

- General Panel System Requirements
- Door/Frame and Hardware Requirements
- Electrical Requirements

General Panel System Requirements

- Demountable Wall Systems shall consist of a framing system and pre-fabricated individual panels which are floor- supported and span floor-to-ceiling.
- Wall System shall have a minimum 45 Sound Transmission Class (STC) rating.
- Panels shall include light switches, receptacles, and double-gang outlet boxes for data/voice jacks.
- Panels shall accommodate 3'-0" x 7'-0" solid core wood doors or 3’-0” x 7’-0” barn sliding door as required by design requirements.
- Finish options of panels shall include:
  - Pre-applied vinyl wall covering, Type II, UL Class A
  - Paint
  - Fabric wallcovering
- Panels shall be approximately 4 inches thick.
- Panels shall have an integral and concealed leveling system that eliminates shimming and loose parts.
- Solid panels shall have cut-able panel options to accommodate varying site conditions.
- Framing system for panels shall consist of extruded anodized

aluminum or roll-formed steel components which include ceiling runners, floor track, bracing, and suitable treated fasteners to prevent corrosion; Minimum 1/2 inch gypsum shall cover framing system.

- Top channels, one-piece with continuous factory-installed resilient light and sound seals recessed to panel face, shall hold panels in place and accommodate variation with full height glass and solid panels.
- Glass panels shall be factory installed using extruded clear vinyl glazing beads and a minimum of 3/16 inch thick, clear tempered glass bearing tempered manufacturing mark.
- System shall be able to be installed to the underside of suspended ceilings without removal of adjacent panels or floor track.
- Panel design shall permit extension in two, three or four way conditions without removal of adjacent panels or floor track.
- When assembled, framing system with panels shall form a rigid, stable partition.
- System shall allow for installation on hard surface or carpeted flooring without the use of destructive mechanical fasteners.
- Post covers shall be provided if applicable.
- Base trim shall be nominal 4 inch high without exposed fasteners.
- Panel to panel fasteners shall align panel faces while providing a continuous light and sound seal without the requirement of additional hardware.
- All aluminum frame and trim pieces finishes shall be factory powder coat paint finish.

Doors/Frame and Hardware Requirements

- Frames shall be extruded aluminum and shall include resilient sound seal at jambs.
- Frames shall provide a compatible appearance with other trim components and shall allow for variations in floor level.
- Frames shall be mortised and reinforced for hardware.
- Doors shall be pre-finished 1-3/4 inch thick, flush type solid core wood veneer, of species, style, and finish to match project interior doors wood finish; coordinate with the contractor responsible for all other doors in the project.
- Hardware type and finish shall be coordinated with contractor responsible for the hardware system used throughout the building.
- Coordinate associated door hardware locking system with Base Civil Engineering (BCE) as well as the project contractor to meet

standards.

Electrical Requirements

- Panels shall have factory installed electrical outlets, switches, infeeds and harnesses as designated in the design.
- Panels shall also be equipped with industry standard conventional power and communications outlet boxes as specified.

Demountable Wall System shall have a 10-year minimum warranty. Fabrics and coverings shall have a 3-year warranty.

General Installation

Demountable Wall Systems shall be installed by a certified installer who is normally engaged in installation of Demountable Walls in accordance with manufacturer's instructions and to maintain manufacturers' warranty.

Demountable Wall Systems shall be erected and disassembled in a manner to prevent damage to adjacent building surfaces and elements, including floors, walls, ceilings, columns, and window mullions.

Electrical / communication wiring within the Demountable Walls shall be installed by a licensed electrician under the certified installer while the connection of wired walls to the building power should be by the licensed electrician under the contractor responsible for building connections.

Section D.3 Desking Accessories

Design Guidelines

All AFRC private offices and workstations shall be equipped with ergonomic desking accessories. These tools work together to promote working comfort and health, while minimizing the risk of pain and musculo-skeletal disorders.

Ergonomic Desking Accessories may include:

- **Keyboard Tray –** Provide articulating keyboard supports with negative tilt adjustability to keep wrists straight and protect them from injury.
- **CPU Sling –** CPU supports bring drives and ports into ergonomic reach, and protect valuable hardware from dirt and dust, vacuums, and other workplace hazards.
- **Task Light (supplemental freestanding) –** Task lights provide the right amount of light necessary for viewing hard copy documents and help prevent glare. Task lighting allows lower levels of ambient lighting, yielding significant reductions in energy usage and associated costs. Every workstation and office should receive supplementary free-standing task lighting. AFRC prefers the use of both freestanding and under-cabinet task lights. Refer to Section D.1 Systems Furniture of this Manual for under-cabinet task light guidelines.
- **Monitor Arm –** Monitor arms provide ergonomic positioning of the monitor and clear valuable desktop space for other uses and can make smaller workspaces more productive.

Specification Criteria

D.3.1 Keyboard Tray

The adjustable keyboard tray with mouse pad and wrist support shall have the following characteristics:

- Include a front lip to keep the keyboard from falling forward
- Be constructed of a durable phenolic resin material
- Move forwards and backwards
- Be easily adjustable without the use of locks or levers
- Include a 15 inch minimum metal channel arm mechanism
- Incorporate a negative slope tray to allow for proper positioning for typing
- Be height adjustable to provide total knee clearance
- Provide 0-15° platform tilt adjustment
- Include 6 inch height adjustment, with increments both above and

below track
- Provide 360° swivel base
- Include a non-handed mouse pad
- Incorporate mouse pad that rotates and stores under keyboard
- Meet or exceed all applicable Business and Institutional Furniture Manufacturer's Association (BIFMA) standards
- Include 10 year minimum warranty

D.3.2 CPU Sling

The CPU Sling shall have the following characteristics:

- Be adjustable width and height
- Support up to 40lbs. minimum
- Have 16 inch D minimum track
- Pull out for easy access
- Include 360° swivel for access to rear cables and ports

D.3.3 Task Light

Supplemental freestanding task lights shall have the following characteristics:

- Be available in compact fluorescent and LED options
- Be UL-approved and meet all applicable local codes
- Emit no noise or flicker
- Include a 6' long power cord minimum
- Have a weighted base
- Give 40 foot candles minimum at work surface level
- Be Energy Star rated or equivalent

D.3.4 Monitor Arm

Monitor Arms shall have the following characteristics:

- Include freestanding, desk mounted or panel mounted options
- Incorporate built-in cable management
- Include dual-screen monitor arm option
- Be constructed of die cast and extruded aluminum for strength and stability

Section D.3 Desking Accessories

- Support screens weighing between 7 to 35 pounds
- Have grommet mount to fit worksurfaces up to 7 inch thick
- Include clamp mount fits worksurfaces up to 2-½ inch thick
- Offer 360° rotation for portrait or landscape viewing
- Offer 60° lateral and vertical tilt for viewing adjustability
- Incorporate fast release for easy and quick installation and removal of flat panel monitors

General Installation

These items are to be installed by furniture installer in accordance with manufacturer's instructions.

Section D.4 Seating

Design Guidelines

Technical Guide Specifications – FF&E

Seating selections used within AFRC facilities shall be high quality commercial grade appropriate for the function. Ergonomic design shall be considered for all seating used within AFRC facilities. Each facility may contain all or some of the following types of seating and should meet the general and specific guidelines for each type of seating:

- Task – High performance caster-based seating used in Private Offices and Open Office Areas
- Executive – High performance caster-based task seating used in Command Suites
- Training (Fixed) – Four (4)-leg or sled base seating used in Training Rooms, Classrooms, and Break Rooms
- Conference – Caster-based seating used in Conference and Meeting Rooms (including Computer Training Rooms)
- Lounge – Fully upholstered seating used in Lobbies, Reception Areas, and Command Suites
- Guest – Fixed seating used in Private Offices and Conference Rooms (perimeter seating)

Refer to Section D.10 for seating used in Lodging Facilities

Seating used in 24-hour operational facilities must meet the following warranty criteria in addition to specific seating type criteria given in this section:

- Product must be warranted for 24/7 application. Multi-use applications should not cause warranty to be pro-rated.
- High performance task chair shall carry a lifetime warranty on structure, a minimum 10 year warranty on mechanism and pneumatic cylinders and a 5 year warranty on foam and fabric.
- Product must be tested and warranted for users up to 300 pounds.
- Upholstery and finishes should have a 3-year warranty; 3 years of in-field labor should be included.

All seating with upholstered seating must conform to the following upholstery criteria:

- Fabric shall be soil and stain resistant with minimum of 55,000 double rubs, Wyzenbeek method for fixed and lounge seating; 100,000 double rubs Wyzenbeek method for task seating
- Customers Own Materials (COM) is not allowed
- Leather upholstery shall only be used in upgraded Executive Offices or Command Suites

Section D.4 Seating

- Internal seat structure shall be high-density polyethylene (HDPE) molded foam padding.
- Seat and back shall be constructed of flame retardant foam.
- Upholstery fabric shall be pulled tightly to the foam.

All seating must meet or exceed all ANSI/BIFMA American National Standards.

Specification Criteria

All caster-based seating shall meet the following criteria:

Frame Requirements

- Five star base
- Universal casters preferred for both hard surface and soft surface flooring, otherwise provide appropriate caster type:
  - Hard casters shall be dual wheel casters
  - Soft casters shall be rubber for use on hard surface floors
- 360 Degree Swivel
- Forward tilt and upright tilt lock
- Overall Measurements:
  - Overall width: 25 – 27 inch
  - Overall depth: 25 – 28 inch
- Support a minimum of 300 pounds

Seat Requirements

- Pneumatic gas lift for seat height adjustment
- Adjustable seat height 16 to 21 inch (+/- 1 inch) – minimum 4.5 inch adjustment
- Minimum 19 inch seat width
- Seat pan must have a waterfall edge

Arm Requirements

Refer to specific seating style below for arm requirements.

D.4.1 Task

In addition to the caster-based criteria listed above, task chairs shall be high performance commercial grade having the following characteristics:

- Price range not to exceed $350 to $600 using 2010 GSA Federal Supply Schedule pricing.

- General Office:
  - Mid-back, fully upholstered or mesh back
  - Upholstered or mesh seat
- Private Office and Command Suite Staff:
  - High-back, fully upholstered or mesh back
  - Upholstered or mesh seat
- Height and width adjustable arms provided to meet general population requirements:
  - Arm Height: 6 to 11 inch (+/-1/2 inch)
  - Arm Width: 2 to 4 inch adjustment
- High performance arm options allows for 4 inch height adjustment and 2.5 inch width adjustment. Fore/aft movement shall be 3 to 10 inches.
- Chair shall have advanced control with sliding seat pan with seat depth adjustment 15 to18 inch (+/-1 inch).
- Chair shall have automatic (knee) tilt with tension and tilt preference control.

D.4.2 Executive

In addition to the caster-based criteria listed above, executive task chairs shall be high performance commercial grade having the following characteristics:

- Price range not to exceed $750 to $1000 using 2010 GSA Federal Supply Schedule pricing.
- Private Office and Command Suite Staff:
  - High-back, fully upholstered or mesh back
  - Upholstered seat
  - Leather upholstery at Command Suites only
- Height and width adjustable arms provided to meet general population requirements:
  - Arm Height: 6 to 11 inch (+/-1/2 inch)
  - Arm Width: 2 to 4 inch adjustment
- High performance arm options allows for 4 inch height adjustment and 2.5 inch width adjustment. Fore/aft movement shall be 3 to 10 inches.
- Chair shall have advanced control with sliding seat pan with seat depth adjustment 15 to18 inch (+/-1 inch).
- Chair shall have automatic (knee) tilt with tension and tilt preference control.

D.4.3 Training (Fixed)

Fixed seating shall be ergonomically designed to accommodate long periods of use. Seating may be four (4)-leg or sled base with non-upholstered fixed arms or armless. It should be economically priced consistent with room function. Training chairs shall have the following characteristics:

- Chair may have steel or wood frame
- Four (4)-leg or sled base style
- Mesh, plastic ventilated contoured or upholstered back
- Mesh, plastic or upholstered seat (upholstered seat must be standard option)
- Non-upholstered arms or armless
- Stackable or nesting to allow multipurpose room function
- Flexible seat and back to encourage movement by changing contour
- Seat shall be smooth with a waterfall edge
- Four (4)-leg, caster style shall have soft or hard heavy-duty dual wheel casters
- Four (4)-leg, no caster style shall have glides with stainless steel inserts
- Sled base style shall have glides appropriate for flooring material
- Integral ganging devices
- Break Room seating to be stackable and non-upholstered
- Seating shall be appropriate for table and counter heights as applicable

AFRC prefers use of caster-base task chair where room function requires computer-based training or all-day training sessions. Refer to D.4.1 for Task Seating requirements.

D.4.4 Conference

Conference Room Seating shall be ergonomically designed with adjustable seat height, swivel tilt mechanism, and non-upholstered fixed arms. It should be caster based and economically priced consistent with room function. In addition to the caster-based criteria listed above, task chairs shall be high performance commercial grade having the following characteristics:

- Mid or high-back according to room function
  - General Office Conference: Mid-back

- Executive or Command Suite Conference: High-back
- Mesh or upholstered back
- Mesh or upholstered seat
- Fixed seat pan
- Fixed, non-upholstered or wood cap arm
- Tapered or angled arms to fit under or close to table edge
- Perimeter conference chairs shall be compatible in style, finish and color with table seating. Refer to D.4.6 Guest Seating for non caster-base perimeter chair requirements.

D.4.5 Lounge

Lounge seating shall be commercial grade and economically priced consistent with room function. Seating shall meet the following criteria:

- Frame shall be kiln dried hardwood
- Components including rails, legs, and seat are to be glued and doweled together
- Coil spring suspension system shall be used with multiple densities of foam
- Constructed to allow for field upholstery and repair
- Upholstered arms to have wood arm caps and be cleanable
- Chrome glides used on each exposed wood tapered leg
- Seat height shall be 18 inches above the floor and shall be straight and not angle to the back

D.4.6 Guest Seating

Guest Seating may be wood or metal construction and is used in Private Offices, as side chairs in Open Office areas and as perimeter chairs in upgraded Conference Rooms. Guest seating shall be economically priced consistent with room function and have the following characteristics:

Wood frame construction

- Four (4)-leg style
- Exposed hardwood frame
- Frame shall have dowel, mortise and tenon construction
- Corner blocks used to fasten rails together with dowel construction and glue
- Legs and arms to be fastened with both screws and glue
- Recessed glides at each leg

Section D.4 Seating

- Open arms or upholstered full depth
- Chair has a plywood core back panel bolted to frame
- Chair has an injection molded copolymer plastic seat pan with high density polyurethane foam used in all upholstered areas
- Seat basket is 1 inch thick
- Seat shall be polyurethane foam over an elastic belt suspension
- Wood finish shall be a catalyzed lacquer protective coating

Metal frame construction

- Four (4)-leg or sled base style
- Steel frame and structural moldings construction with contoured lumbar support backrest
- Tubular steel base for durability
- Upholstered or non-upholstered seat with smooth, waterfall edge
- Arm or armless
- Non-upholstered seat shall be flexible
- Internal seat structure shall be high-density polyethylene (HDPE) molded foam padding
- Seat pan shall be polypropylene with plastic flexor slats

General Installation

Seating is installed by a furniture installer who is familiar with and normally engaged in installation of seating.

Section D.5 Tables

Design Guidelines

Tables should be selected for their functionality, durability and aesthetic features for their area of use. Each AFRC facility may contain all or some of the following types of Tables:

- Conference Tables, non-powered and powered
- Training Tables, non-powered and powered
- Facilitator Tables used in Conference Rooms by meeting facilitators to control media presentations
- Multi-Purpose Tables used in Work Rooms, Break Rooms, general office teaming areas and Private Office as conference tables
- Occasional Tables used in Lounge seating areas

Refer to Lodging FF&E, Section D.10 of this Manual, for tables used in Dining Areas and Guest Rooms.

Table top finishes may be wood or laminate and should be appropriate for area of use and status of occupants.

Laminate tops are appropriate for Training Rooms, Break Rooms, and Open Office areas. Tops are to have vinyl or solid wood edging; avoid use of laminate edging.

Wood veneer tops are appropriate for Conference Rooms, Executive Areas, Command Suites and Lobbies.

The following parameters should be considered when designing and selecting tables:

- Allow 24 to 30 inch in width of table edge per person to be seated at the table
- Allow a minimum of 42 inches around all edges of meeting table for seating, for access into/out of chairs and circulation
- Consider height of arms of adjacent lounge seating when specifying height of end tables
- Undersides of table tops, for sitting applications, may not be less than 28 inches from floor
- Table tops, for sitting applications, shall not exceed 30 inches from floor
- Table tops for standing applications must not exceed 36 inches from the floor
- Table top should be constructed of one (1) piece where possible
- Ganging several smaller tables in a Conference Room provides

more flexibility

Training tables and multi-purpose tables shall be reconfigurable, moveable and storable. These may include light-weight folding tables with dollies or tables with casters as required to meet programming needs. Dollies shall be provided when a table storage room is provided in a facility.

Verify and coordinate all power, telecommunications and audio visual requirements per room with End User's Representative.

Specify wire management capability for all training tables where computers are used.

Select table shapes ("V" shape or other) to minimize visual obstructions in Video Teleconferencing (VTC) Rooms.

All bases must be appropriately sized for table top size and be equipped with leveling glides.

Powered conference tables shall receive electrical feed from floor boxes. Ensure that table base covers both electrical and data floor receptacles and has adequate opening size to allow large plug connections. All powered tables shall have access panels in base for power and telecommunications access.

Specification Criteria

All Table top surfaces shall have the following general characteristics:

- Bonded to the core with a PVA adhesive in a cold press or a similar process to prevent delamination
- Include backer sheet on opposite side for a balanced panel construction (plastic laminate and wood veneer)

D.5.1 Conference – Non-Powered and Powered

Wood or Laminate Conference Tables, non-powered and powered shall have the following characteristics:

- Manufactured with 3-ply solid core tops made from 48-pound medium-density particleboard
- Large tops shall be shipped in sections with leveling fasteners for on-site assembly
- Ganging fasteners with steel bars to join adjacent tables (to provide tight fit)

- Variety of edge profiles available in vinyl, solid wood, MDF and veneer self-edge
- Table top power/data access through built-in boxes or grommets
- Factory installed grommets with covers matching the veneer
- Wire management devices
- Base with wire management capabilities and access through door or access-panel

D.5.2 Training – Non-Powered and Powered

Both non-powered and powered training tables shall have the following characteristics:

- General size: 66 to 72 inch long x 18 to 24 inch deep (pending type of training equipment - laptop vs. CPU)
- Rectangular shape
- 1-1/4 inch thick top of 3-ply solid core construction
- Pre-drilled top with die-cast zinc threaded inserts (to accept leg attachments, ganging devices, corner connectors, etc.)
- Receptacle boxes with power infeed
- 4-circuit power distribution
- Wire management
- C-legs -
  - Aluminum extrusion with powder coat finish
  - Separate power and data wiring channels
  - Integral mounting plate (right or left) of sand-cast textured aluminum with powder coat finish
  - Protective textured metallic surface coat (matching leg color) at lower leg

Powered training tables shall have the following electrical components in addition to characteristics listed above:

- Optional modular raceway distribution
- Bundled cable management from floor infeed
- Raceway power outlets and data/comm. outlet openings accessed through a hinged access door in worksurface or from under the table
- Duplex outlets, power infeeds and jumpers between raceways

D.5.3 Facilitator

Facilitator tables shall have the following characteristics:

- General size: 36 to 42 inch wide x 24 to 30 inch deep
- Wood veneer or laminate finish (compatible with adjacent furnishings)
- Equipped with power/data to connect pc/laptop for presentations

D.5.4 Multi-Purpose

Multi-purpose tables can include the following types of tables:

- Meeting tables in Private Offices
- Teaming tables
- Collaborator tables
- Work tables
- Break Room tables

These tables shall have the following characteristics:

- Wood veneer or laminate finish, depending on function
- Powered or non-powered
- Vinyl or wood edges, pending function

D.5.5 Occasional

Occasional tables include the following types:

- Magazine tables
- End tables
- Coffee tables

These tables shall have the following characteristics:

- Compliment the overall design scheme
- Select, straight grain, book-matched veneers on all surfaces to provide proper consistency
- Solid hardwood wood table edge with internal band on all four (4) sides with mitered corners
- Low sheen and mar-resistant finish
- Commercially acceptable color and finish consistency (Note: while

different wood species offer unique textures and grain, minor variations may occur in natural materials)

General Installation

These items are installed by furniture installer who is familiar with and is normally engaged in installation of tables in accordance with manufacturer's instructions.

Section D.6 Casegoods

Design Guidelines

Technical Guide Specifications – FF&E

This section provides the AFRC standards for freestanding office furniture that includes desks, credenzas, computer tables, executive "u" units, bookcases and storage components.

Casegoods within a Private Office or Open Office Area shall be selected from a single manufacturer and style line. Provide upgraded wood veneer casegoods in Executive Areas and Command Suites. Upgraded casegoods to have wood veneer worksurfaces and components including wood drawer interiors. Wardrobe cabinets should be provided in all wood casegood offices for Officers. Provide a tackable panel in every freestanding office system.

Metal casegoods with laminate or veneer worksurfaces are used in all other Private Offices throughout the facility. All furniture components must be provided by one (1) manufacturer and should be compatible or have interchangeable components with systems furniture for flexibility.

Within AFRC facilities, the Commander of that facility is to be provided upgraded wood veneer casegoods; this is not based on overall government rank but on rank level among the occupants within the facility.

Wood casegoods shall be of a high quality commercial grade.

Executive Offices shall include the following typical casegoods:

- "U" or "L" Configuration Desk (with concealed wire management and access panels):
  - "U" Configuration: 84/72 inch x 42/36 inch, bridge and credenza with hutch mounted overhead storage
  - "L" Configuration: 72 inch x 36 inch with side return and hutch mounted overhead storage
- Wardrobe Cabinet
- Filing Cabinet
- Bookcases

Typical casegood systems (wood and metal) shall include the following personal storage components:

- Mobile pedestals
  - Box box file
  - File file

- Two (2)-drawer Lateral File
- Center Drawer (or keyboard tray)
- Overhead cabinet assembly and shelf

Specification Criteria

D.6.1 Freestanding Metal Desk Systems

Freestanding metal desk systems consist of a desk chassis, worksurface top, and storage components. The system shall have the following characteristics:

Overall System:
- Steel construction with powder coat finish (all structural and storage components)
- Gauge of steel requirements:
  - End Support: 18- to 24-gauge
  - Inside Support: 13- to 18-gauge
  - Back Panel: 17- to 23-gauge
- Flush end supports
- Leveling glides on all supports
- Tackable panel full width of overhead component

Worksurfaces:
- Warp resistant
- 1-1/4inch nominal thickness
- Support 200 pound live load
- Wood or plastic edgeband at entire perimeter
- Factory or field installed grommets

Storage Components:
- All storage components shall have keyed locks
- Lateral file drawers to have 150 pound load capacity
- Lateral file fronts shall be of equal construction to the shelf units and flipper door cabinets.
- All drawers to be five (5) sided construction
- All drawers to have full-extension ball bearing suspensions

D.6.2 Freestanding Wood Desk Systems

Freestanding Wood Desks consist of a desk chassis, worksurface top, and storage components. The wood desk system shall have the following characteristics:
Overall system:

Section D.6 Casegoods

- Wood construction of tops, side and back panels, full bottoms, drawers, etc.
- Concealed wire management with access panels
- Either full-height or half -height modesty panels (no greater than 12-3/4 inch high)
- Storage units, pedestals, lateral files, storage cabinets and bookcases can be used as freestanding desk supports in place of an end panel or other support
- Allocated storage space below worksurface for either two-drawer lateral file or storage cabinet

Storage Components:

- Desk-mounted overhead storage cabinets or hutches -
  - Finished backs
  - Tackable panel full width of overhead component
  - Allow side by side mounting of two (2) hutches for wide desk/credenza applications
  - 21 inch vertical clearance (between worksurface and storage cabinet)
  - Height of desk with hutch must align with height of other storage products including lateral files and storage towers
  - Attached securely to the worksurface with concealed fasteners
  - Two-sided tack surfaces below the cabinet, available with either matching or contrasting fabrics
  - Provide standard or electronic ballast model task lights at overhead storage / hutch components
- Shelves and binder bins to have 150 pound load capacity, minimum
- Fixed pedestals for desk applications shall be available in Box/Box/File and File/File drawer configurations
- Pedestals must be 15 inch wide and available in 18, 24 and 30 inch depths
- Freestanding wood bookcases with adjustable shelving

General Installation

These items are installed by furniture installer who is familiar with and is normally engaged in installation of Casegoods in accordance with manufacturer's instructions.

Section D.7
Office Storage
Design Guidelines

Office Storage for AFRC Administrative / Office facilities addresses group storage requirements in the Open Office Area and Filing / Storage Rooms.

Office Storage requirements should be addressed during the initial planning phases of the project. To determine the proper amount of storage, verify with End User's Representative:

- What is stored
- How often is it accessed
- Who uses it
- How often is it purged

Office Storage includes all freestanding vertical storage elements that are aesthetically compatible as a group and with the modular systems furniture components including:

- Wood and metal lateral files
- Wood and metal shelving / bookcases and utility shelving
- High Density Filing systems that are highly customizable based on the programming requirements. They can be provided with lateral files, shelves for bins or boxes, Slatwall with various accessories, etc.

Wood file cabinets and vertical storage units may be used in Command Suites and in upgraded Offices as part of a wood casegoods system.

Select storage and shelving units that meet customer's functional load requirements for stored items. Specify counterweights for filing cabinets when required by the manufacturer for stability. File drawers shall allow only one (1) drawer to be opened at a time. Select finishes matching or coordinating with finish of adjacent furnishings within a space. If information regarding items to be stored is not available, provide heavy duty storage and shelving.

Provide common laminate tops over multiple files for working counter space and places for collaboration over 3-high filing units in open office areas.

Utility shelving shall be specified in Storage Rooms and shall have open metal bracing and frames that allow adjustments every 1 inch in height.

Section D.7 Office Storage

Refer to Systems Furniture and Casegoods Guidelines for individual storage requirements.

Specification Criteria

D.7.1 Filing

Wood and metal lateral files shall have the following characteristics:

- Contemporary styling
- Metal cabinets:
  - Steel top, side and back panels
  - Full bottom
  - Roll-out drawers / shelves mounted on ball bearing suspensions
  - Receding or fixed doors
  - Fixed shelves or interlocking drawers
  - Option of individual locking drawers
- Wood cabinets:
  - Wood case and drawer interiors
  - Dovetail construction
  - Hardwood edges
- Available in a minimum of two, four and/or five drawer and/or shelf units
- Available in widths of 15, 30, 36, and 42 inch with an 18 or 24 inch depth
- Allow side-to-side and front-to-back filing
- Finished back
- Drawers shall open full depth for total access to the contents
- Drawers shall be full depth inside the case utilizing all available space
- Leveling glides
- Ganging hardware available
- Meet or exceed all applicable ANSI/BIFMA standards
- Lifetime warranty

D.7.2 Shelving / Bookcases

Shelving / Bookcases shall have the following characteristics:

- Metal Utility Shelving
  - Closed metal shelving with full back and sides or open x-brace shelving
  - Shelves adjust in 1 inch increments

- 20-gauge steel construction or better
- Heavy duty shelving unit with a distributed weight load of 450 lbs per shelf
- Finishes: Paint (Manufacturer's standard selections)

- Shelving / Bookcases – Wood Veneer
  - Unit consists of base, MDF rim, and shelves
  - Base is bottom shelf
  - Adjustable shelves
  - Top shall be a straight grain book matched veneer with miter corners
  - Adjustable leveling guides
  - Finish:
    - Multi-step catalyzed varnish providing stain and mar-resistance
    - Low VOC's
    - Low sheen

- Bookcases – Metal
  - Closed metal shelving with full back and sides
  - Shelves adjust in 1 inch increments
  - Base is bottom shelf
  - All welded steel construction with 18-gauge (minimum) steel shelves and supports
  - Distributed weight load of 300 lbs per shelf
  - Finishes: Paint (Manufacturer's standard selections)

D.7.3 High Density Shelving

System consisting of storage units mounted on track-guided carriages to form a compact storage system. High density shelving shall have the following characteristics:

- A carriage/rail system that provides uniform carriage movement along the total length of travel
  - System consists of a formed structural steel frame with machined and balanced wheels riding on steel rails, either recessed or surface mounted to the floor
- System design permitting access to any single aisle by manually moving units until desired aisle is open
- A drive mechanism with bearings that are permanently shielded and lubricated

Section D.7
Office Storage

- Drive system with a positive type mechanically-assisted drive which minimizes end play, ensures there is no play in the drive handle, and allows carriages to stop without drifting
  - System shall include a chain sprocket drive system for each movable carriage to ensure that carriages move uniformly along the total length of travel, even with unbalanced loads.
  - Drive system gearing shall be designed to permit 1 lb. of force applied to the drive handle to move a minimum of 4,000 lbs. of load.
  - A tensioning device shall be provided on each chain drive with provision for adjusting tension without removing end panels.
  - All bearings used in the drive mechanism shall be permanently shielded and lubricated.

- Performance Requirements:
  - Design Requirements: Limit overall height to 84 inches
  - Ease of Movement: Provide mechanically assisted units capable of being moved by exerting a maximum horizontal force of 5 pounds on the operating wheel
  - Seismic Performance: Provide mobile storage units capable of withstanding the effects of earthquake movement when required by applicable building codes

- Found on GSA Scedule
- Warranty: The entire movable compact shelving installation shall be warranted against defects in materials and workmanship for a period of five (5) years from date of acceptance by the Owner.

General Installation

Filing and shelving, as well as high density shelving systems, shall be installed by a certified installer who is normally engaged in installation of these items in accordance with manufacturer's instructions. Where system is motorized, the installer shall coordinate with building contractor, and electrical subcontractor, responsible for building systems.

Section D.8 Artwork

Design Guidelines

AFRC uses artwork in the public areas of several facility types to enhance the designed environment. The following is a condensed list of facility types identified for application of artwork.

- Adm inistration
- D ining
- Lodging (See Lodging Section D.10.6)

Artwork may also be used in upgraded Offices such as Executive Offices and Command Suites. Use of artwork in Offices must be approved by the AFRC Designer.

Specification Criteria

AFRC prefers the use of prints, reproductions and photographs.

For most facilities, AFRC prefers to use standard size metal frames proportionate to size of art piece with an art matte. Wood frames with double mattes or fillets should only be used in Command Suites, Lodging and Headquarters buildings. Mattes may be color complimentary to artwork when there is one piece per room or all the same within one area, down a corridor, several in a lobby, etc.

Artwork of a traditional Air Force theme, depicting local nature scenes or architecture is preferred for use in AFRC facilities.

General Installation

All artwork should be installed using “security” hardware, in accordance with manufacturer’s instructions.

Artwork is to be mounted with the image at approximately 5’-0” above finish floor.

Corridor artwork shall be spaced to allow enough viewing distance for each piece. Do not install one piece directly across from another unless corridor or area is greater than 7’-0” wide.

Section D.9 Window Treatments – Secondary

Design Guidelines

Secondary window treatments or decorative window coverings (drapery) are provided as part of the Furniture Fixtures & Equipment package.

Decorative window treatments are often specified in:

- Command Suites (Private Offices and Conference Rooms)
- Lodging Facilities* (Public Spaces and Sleeping Quarters)

Decorative window coverings (drapery) are installed over primary window coverings to maintain architectural continuity of building perimeter.

Drapery specified in administrative facilities is to be a snap tape ripple fold system with 200% fullness minimum and may include decorative valances in a transitional style for commercial installation.

All window treatments, including lining materials, must be fire rated.

Material and fabrication shall be obtained through a drapery fabricator on the GSA Federal Supply Schedule.

Colors and patterns of window treatments are to be coordinated with interior color schemes.

*Refer to Section D.10 – Lodging FF&E for guidelines associated with drapery specified in Lodging Facilities.

Specification Criteria

Drapery in Administrative Facilities shall meet the following criteria:

- Pattern must be matched at seams; seams hidden behind pleats.
- Include permanent finish stiffener of buckram, crinoline, or pellon across entire heading.
- Do not use horizontal stitching across the width of the heading.
- Join widths by serging, overlock and safety stitch.
- When sheer fabrics are used, suitable cotton covered beaded tape should be specified in lieu of standard covered weights.
- Double fold hems (top and bottom) and blind stitch so as not to show on the panel face.
- Provide 1 ½ inch wide side seams and 4 inch deep bottom seams.
- Provide weights sewn ½ inch above hem bottom.
- Provide weights at corners and each vertical seam.

- Valance width to span the window (where valance occurs).
- Depth of valance to permit proper operation of traverse draperies.
- Specify drapery draw (center or one-way – left or right).
- Rods and tracks must be cold-rolled, commercial quality steel minimum 0.030 inch thick.
- Rod and track cross section width and depth must be sufficient to carry the drapery without sagging.
- Provide one-piece rod and track up to 16 feet long.

General Installation

Hardware

- Install ceiling tracks parallel to walls and windows; fasten at 16 inches from each end and with additional intermediate fasteners spaced no more than 48 inches apart.
- Install wall rods with end brackets and provide intermediate support brackets 24 inches from each end with additional intermediate support brackets spaced no more than 48 inches apart.

Drapery

- Press draperies prior to hanging (excluding fiberglass materials).
- Install draperies with a minimum clearance of ¼ inch between the ceiling and top of drapery heading.
- Hang draperies to the length specified per application type:
  - Floor length = 1 inch above finished floor
  - Sill length = ½ inch above sills and heating/air conditioning units
  - Apron length = 1 inch below bottom of window apron
- Insert heading hooks at rear of each pleat as necessary to obtain specified clearance.
- Dress-down and adjust hung draperies to provide best form and appearance.
- Traverse draperies must operate smoothly and easily over the full range of travel.

Valance

- Install with top edge of valance parallel to ceiling.

Section D.10 Lodging FF&E

Design Guidelines

AFRC prefers the use of Air Force Heritage or Regional flavor to be incorporated in furnishings, drapes, artwork and other design elements of their Lodging Facilities.

Lodging Facilities consist of Lobby Areas, Guest Lounge Areas, Administration Offices, Staff Lounge/Breakroom, Guest Rooms, and Support (back of house) Areas.

All casegoods and upholstered furniture pieces shall be an appropriate size and scale for the room they are to be housed in so that rooms do not appear cramped.

Specification Criteria

D.10.1 Checklist

Refer to the **2010 AF Lodging Standards Checklist, 1-Oct-09.**

D.10.2 Casegoods / Upholstery

Casegoods and upholstery to be color coordinated with the carpet, wall finishes and drapery.

Each guest room is to include at a minimum:
- Headboar d
- Nightst and
- Bench or luggage rack
- Desk/working table
- Ergonomic desk chair
- Dresser
- Chest of drawers or TV chest
- Full length mirror
- Lounge chair (if space permits)

A wardrobe shall be specified for all rooms without a built-in closet. When a full length mirror is located in the bathroom, provide an additional mirror in the sleeping room.

Case goods and upholstery are to be installed by the furniture installer in accordance with manufacturer's instructions.

D.10.3 Mattresses

Guest sleeping rooms mattress sizes shall meet the following criteria:

- Large Business Suite: King-sized
- Business Suites: Queen-sized
- Double Bed Rooms & TLF (if the room is too small for a queen): Full-sized
- Extra Bedrooms & Double Bed Rooms (if they are too small for two (2) Fulls): Twin-sized

D.10.4 Draperies / Window Treatments and Bedding

Draperies / Window Treatments and Bedding shall meet the following criteria:

- Draperies and decorative window treatments are specified in Lodging Facilities Public Spaces and Sleeping Quarters.
- Sleeping Rooms to have blackout draperies or draperies combined with a blackout roller shade. (Note: Use solar shades in hot climates.) Non-sleeping rooms shall have decorative window treatments and/or blinds.
- Stairwells that have a window on the landing shall have a decorative window treatment.
- Draperies, bedspreads, duvet covers and bedskirts shall color coordinate with the carpet and wall finishes.
- Beds shall have a bedspread or duvet and bed skirt combination, depending on programming requirements.
- Twin and full-sized beds to have one (1) decorative throw pillow per bed. Queen-sized beds to have two (2) decorative throw pillows per bed. King-sized bed to have two (2) oversized throw pillows per bed.
- Horizontal or vertical blinds are not to be used in Lodging Facilities. Solar shades may be used in guest support (back of house areas).
- Window treatments and bedding are to be installed by the Drapery/ Bedding sub-contractor.
- All fabrics must meet National Fire Protection Association (NFPA) and ASTM requirements for fire rating.

D.10.5 Lamps

Refer to section D.11.7 for general specification criteria of lamps. Lamps in Guest Rooms shall meet the following criteria:

- Each guest room is to have two (2) lamps. Each suite is to have five (5) lamps.
- Provide lamps at:
  - Each end table
  - Each nightstand
  - Desk
- The desk lamp shall have a weighted base with an electrical outlet for additional power at the desk.
- Lamp shades to be square or rectangular and must hug the wall to leave adequate open space on the side table or nightstand.
- Lamps are to be installed by the furniture installer.

D.10.6 Artwork

Framed artwork fitting to the décor or other accessories are to be included in the FF&E package to complete the interiors of a new or renovated Lodging Facility. Specifically, artwork is to be used in public or common areas (Lobbies and Corridors) and Guest Rooms. Artwork shall meet the following criteria:

- Corridor artwork shall be different on each floor.
- Each room (Sleeping Room and Non-Sleeping Rooms alike) is to have at minimum two (2) pieces of art. In Sleeping Rooms, AFRC prefers a piece of art to be hung centered over the headboard(s) and one (1) above the desk.
- No artwork shall be the same in adjacent rooms. AFRC prefers the use of several guest room artwork groupings per facility.
- Artwork or another wall hung design element shall be used in stairwell landings when there is no window.
- Artwork is to be installed using security hardware. Artwork and Accessories to be installed by the furniture installer. Artwork to be hung in accordance with furniture locations.

General Installation

See individual installation instructions above. All installers to be familiar with and normally engaged in installation of these items per manufacturer's instructions.

Section D.11 Special FF&E

Design Guidelines

This section includes Special FF&E items used in AFRC Administrative Office and Training facilities. These items, except for Outdoor Furniture, span all categories of FF&E and shall be categorized as part of the miscellaneous group for the FF&E Binder Submittal.

Special FF&E includes but is not limited to:

- Outdoor Furniture: Includes benches, outdoor dining furniture
- Smoking/Ash Urns: Ash urns should be a fully enclosed housing that eliminates tobacco odor; placed at designated smoking areas outdoors
- Indoor / Outdoor Trash Cans
- Indoor Recycling Receptacles
- Presentation Cabinets: Used in high ranking private offices, conference rooms and briefing rooms.
- Clocks: Used throughout AFRC facilities, usually located in general office areas.
- Lamps: Used in high ranking private offices and reception / waiting areas. They add ambience to a space in addition to complimenting the overall design scheme.
- Artificial Plants: Used in public/common areas such as Lobbies and upgraded Command Suites in Administrative Facilities.
- Lecterns: Used in Conference or Training rooms
- Visual Boards, LCD Monitors, etc.

Specification Criteria

D.11.1 Outdoor Furniture

Outdoor furniture shall be categorized in the Table or Seating group for the FF&E Binder Submittal.

Outdoor furniture selection should be based on aesthetic values, reliability, and cost, and meet the following criteria:

- Materials may include:
  - M etals
  - Structural tubing
  - Cast iron
  - Cast aluminum
  - Aluminum alloy product
  - W ood
  - Fiberglass
  - Precast concrete

- All materials must be treated to be rust resistant and weather proof.
- Anchors are to be provided for fastening site furnishings securely in place in accordance with manufacturer's recommendations.
- All products should be selected to withstand climatic conditions of the region in which site is located.
- No loose cushions for seating.
- Provide mesh or vinyl strapping for outdoor seating.
- Benches and chairs should have no sharp edges or protruding hardware.
- Seat height above finished grade or specified surface shall be between 18 to 20 inch and level.
- The seat surface shall be pitched or slotted to shed water; the seat depth shall be between 12 to 18 inch and pitched down at the back at a 0 to 5 degree angle.
- Seat shall have a minimum width of 24 inches per person, and shall overhang the support base by a minimum of 4 inch for heel space and to facilitate rising from a seated position.
- Back rests height shall be between 15 to 18 inch from the top of the seat and the connection shall be at a 90 to 110 degree angle to the seat.
- When arm rests are required, a minimum of 6 inch height from the seat and a minimum arm rest width of 1-1/2 inch shall be provided
- Seats shall support a minimum 300 lbs for each person they are designed to accommodate.
- Minimum 5 year warranty.

D.11.2 Smoking / Ash Urns

Urns shall have the following characteristics:

- Located outdoors where acceptable per applicable codes / laws
- Materials may include aluminum, concrete, plastic, stainless steel, or powder-coated steel
- A fire-proof metal bowl, screen or sand-filled containers for ash containment
- Ash containers shall be easily removable for cleaning
- Ash receptacles shall have a minimum diameter of 8 inches

D.11.3 Indoor / Outdoor Trash Cans

Trash cans shall meet the following criteria:

Indoor
- One (1) at each work station, office, conference and storage room
- The design of the receptacles shall include the following:
  - Fire retardant plastic construction
  - Soft radius corners, rolled edges
  - Dent and crush resistant
  - Leak-pr oof

Outdoor Waste Receptacles
- May be constructed of:
  - Spun aluminum
  - Reinforced fiberglass
- Shall have removable semi-rigid plastic liner insert
- Waste receptacle shall be furnished with weather protection, odor containment, and insect / animal proofing
- Waste receptacles shall be 30 to 40 inch above the ground
- Anchor trash and litter receptacles used on exterior of facility
- Openings for trash and litter receptacles shall be minimum of 4 inch in diameter. Edges shall be smooth
- Side openings to have spring-loaded flap style doors
- Provide hardware for securing and concealing can liners
- Rated for indoor and outdoor use

D.11.4 Indoor Recycling Receptacles

Receptacles shall meet the following criteria:

- Breakroom Locations: 3-Bin Recycling Unit with Fiberglass liner and lid with round opening for glass, plastic and aluminum
- Copy / Printer Areas Locations: 2-Bin Recycling Unit with Fiberglass liner and lid with rectangular opening for paper and cardboard
- Coordinate types of recycling and recycling collection with Base Civil Engineer and End User's Representative
- Consider specifying recycling containers made from recovered paper, plastic or steel

D.11.5 Presentation Cabinets

Cabinets shall have the following characteristics:

- Cabinet with wood veneer doors; Note: Finish to match adjacent wood finishes (e.g., conference table, desk system, etc.).
- 48” w x 48” h minimum size (closed); 72” w x 48” h minimum size (open)
- Porcelain writing surface with optional pull down projection screen
- Marker groove under whiteboard
- Flipchart with tear bar
- Tackable fabric panel with flipchart option
- Caddy for markers, eraser / cleaning cloth
- Blocking shall be provided in walls for each cabinet location. Installer to provide fastening hardware best suited to wall type and cabinet weight

D.11.6 Clocks

Clocks shall meet the following criteria:

- Coordinate type of clock (digital or analog) and 12-hour or 24-hour clock time methods with End User’s Representative.
- Provide clocks in public areas (e.g., Break Rooms, Conference, Training and Classrooms).
- Coordinate method of synchronization (i.e., wireless if allowed in facility or Ethernet connection) with End User’s Representative.
- Verify need for programmable time zone clocks with End User’s Representative.
- Digital Clock display consists of:
  - Dot matrix LED: red or green
  - 15 Characters
  - 24 hour format
  - Numeric date
  - Numeric year
  - Julian date
  - Metal frame/casing
  - Anti-glare Plexiglas cover
- Analog (12 hour and 24 hour)
  - Graphics: Black Numerals and 4-1/2 inch Center Disk
  - Movement: Quartz Battery

D.11.7 Lamps

Lamps shall meet the following criteria:

- Refer to Section D.10.5 for lamps used in Lodging Facilities.
- Lamp styling is to be commercial in appearance.
- Lamp shades should be straight vertical to minimize collection of dust and to ensure that the lamp can be installed close to the wall.
- All electrical cords must be as short as possible and be concealed from view.
- Compact fluorescent bulbs must not emit a noise or flicker.
- All lighting fixtures must be UL-approved and meet all applicable local codes.
- Base must be weighted to ensure stability.
- UL listed unit shall provide individual lighting capability to selected location with a minimum of one (1) bulb.
- Unit shall be Energy Star rated or equivalent.

D.11.8 Artificial Plants

Artificial silk plants shall meet the following criteria:

- Plant material shall be flame retardant rated.
- Containers shall be commercial grade high quality, in styles / types to reflect the region and compliment the interior finishes and reinforce the design scheme.
- Note: Silk plants may not be used in AFRC Lodging Facilities.

D.11.9 Lecterns

Lecterns used in Conference and Training Rooms shall have the following characteristics:

- Angled document surface with pencil lip on the bottom edge
- Privacy screen on audience side
- M icrophone
- Light with dimmer
- Fixed open shelf on user side
- Two (2) door locking cabinet with shelf below (large lectern)
- Cast ers
- Grommet in base/side for access to floor power

- Four (4)-outlet surge protector, or better, with 20 foot power cord
- Open from base to the floor (small lectern)
- Note: Item to coordinate with other furnishings within the same room.

D.11.10 Visual Presentation Boards and LCD Monitors

Visual presentation boards are considered electronic visual boards or electronic white boards. The DOR must coordinate with the Government, who is likely to procure this equipment, to ensure proper connections and installation. Coordination items include:

- Specific location and power / communication needs for these pieces of equipment
- Location and furniture needs for printer tied to electronic white board
- Type of universal mounting brackets for LCD monitors (to be specified by DOR); mounting brackets are normally installed by contractor
- Power and communication requirements for LCD monitors
- Location of LCD monitors on demountable walls to ensure that the wall manufacturer's integrated bracket will support the weight and size of monitor requested

General Installation

These items are installed by furniture installer familiar with and normally engaged in installation of these items per manufacturer's instructions.

Section D.12
Special Storage
Design Guidelines

AFRC uses Special Storage for a variety of needs in several different facility types. While these items are not typically a critical aspect of the aesthetic design, this storage is mission critical and integral to the functionality of the design.

The following is a condensed list of the types of Special Storage units, along with the types of items stored in them and the type of facilities in which they are typically found.

Heavy Duty Metal Utility Shelving

- Used for Mobility Bags Storage
  - Logistics Readiness Squadron Facilities
  - Unit Administrative Office Buildings

Gun Storage Racks

- Used for Weapons/Ammunition Storage
  - Civil Engineering Facilities
    - Store rifles and hand guns on racks in an Active Armory
  - Weapons Maintenance (Transient Storage) Facilities
    - Typically on high density storage units
  - Logistics Readiness Squadron Facilities
    - Mobility Weapons are sealed in 3-1/2' x 2-1/2' boxes and stored in a Long Term Storage Vault
    - Deployment weapons are stored on racks (rifle and/or pistol) in an Active Armory
  - Security Forces Facilities
    - Store rifles and hand guns on racks in an Active Armory
    - Store weapons in racks on high density storage units
  - Air Craft Weapons Facilities
    - Store weapons in racks on high density storage units
  - Combat Arms Training and Maintenance (CATM) Facilities
    - Store weapons in racks on high density storage units

High Density Storage

- Used for Special Gear Storage
  - Firefighters Facilities
    - Store open Storage Cubbies with cage fronts
  - Security Forces Facilities
    - Store bullet proof vests, helmets, etc., in Open cubbies (4' w x 3' d x 4' h); can range from 50 to 150 cubbies in a squadron, depending on number of people in unit
  - Combat Arms Training and Maintenance (CATM) Facilities

- Para Jumper Facilities

Specification Criteria

D.12.1 Heavy Duty Metal Utility Shelving

Heavy Duty Metal Utility Shelving shall meet the following criteria:

- Construction shall be 20-gauge (minimum) metal.
- Each unit shall have full-height X-braced open shelving and be capable of supporting a distributed weight load of 450 pounds per shelf.
- Finish shall be anodized aluminum finish.
- Unit shall be found on GSA schedule.

Refer to section D.7.2 “Metal Utility Shelving” in this Manual for additional guidelines associated with Heavy Duty Metal Utility Shelving.

D.12.2 Gun Storage Racks

Gun Storage Racks shall meet the following criteria:

Rifle

- M12 Rifle Racks shall be 3’-6-1/2” w x 3’-1/4” h x 10” d (holds 13 rifles), quantity of racks to be dependant upon quantity of guns to be stored.
- 50 Caliber Rifle Racks shall be 3’8” w x 6’4” h x 2’-1” d (holds 8 rifles), quantity of racks to be dependant upon quantity of guns to be stored.
- Rifle racks typically sit flush to the floor and are stacked two (2) high.

Pistol

- Pistol Racks to be standard 3’ w x 9” h x 9” d (holds 16 hand guns), quantity of racks to be dependant upon quantity of guns to be stored.
- Pistol Racks are typically installed sandwiched atop a Rifle Rack that sits flush to the floor with another rifle rack above it.
- Both Rifle and Pistol Racks shall be:
  - Found on GSA schedule
  - Made of all steel construction
  - Bolted to each other and anchored to wall

Section D.12 Special Storage

D.12.3 High Density Storage

Refer to section D.7.3 in this Manual for guidelines associated with High Density Storage.

General Installation

All Special Storage to be installed in accordance with manufacturer's recommendations to preserve the integrity of the warranty. Submit a copy of the manufacturer's standard warranty to the Contracting Officer within the first 60 days of Government occupancy. Government is to be beneficiary of the terms of this warranty.

Referenced in Part One – Section A

CID Package Exhibits

Exhibit A.3.1: AFRC CID Submittal Requirements Matrix
Exhibit A.3.2: Itemized FF&E Cost Estimate – Sample
Exhibit A.3.3: Item Code Index / Installation List – Sample
Exhibit A.3.4: FF&E Order Data Sheet – Template
Exhibit A.3.5: FF&E Order Data Sheet – Sample
Exhibit A.3.6: Best Value Determination Form – Template
Exhibit A.3.7: Manufacturer's Resource List – Sample
Exhibit A.3.8: Exterior Finishes Color / Sample Board – Sample
Exhibit A.3.9: Interior Finishes Color / Sample Board – Sample
Exhibit A.3.10: FF&E Color / Sample Board – Sample
Exhibit A.3.11: FF&E Order Data Sheets with Parts List – Sample

Exhibit A.3.1

AFRC Comprehensive Interior Design (CID) Submittal Requirements Matrix

TASKS	35%*	65%*	FINAL	CORRECTED FINAL
SID Binder				
Cover / Title Page	X	X	X	X
Table of Contents	X	X	X	X
Narrative of SID Objectives	X	X	X	X
Interior Color / Sample Boards	X	X	X	X
Exterior Color / Sample Boards	X	X	X	X
Interior and Exterior Finish Schedules / Legends	X	X	X	X
Drawings				
Interior and Exterior Finish Schedules / Legends	X	X	X	X
Interior Finish Plans	X	X	X	X
Furniture Footprint Plans		X	X	X
Interior Signage Plans, Schedules and Details		X	X	X
Interior Elevations, Sections, and Details		X	X	X
Exterior Building Elevations		X	X	X
FF&E Binder				
Cover / Title Page	X	X	X	X
Table of Contents	X	X	X	X
Narrative of FF&E Design Objectives	X	X	X	X
Point of Contact (POC) List	X	X	X	X
Itemized FF&E Cost Estimate		X	X	X
Item Code Index	X	X	X	X
Installation List			X	X
FF&E Order Data Sheets (identify Mfr. / Product Lines)	X			
FF&E Order Data Sheets (Furniture Spec)		X	X	X
Best Value Determination Form		X	X	X
Color / Sample Boards		X	X	X
Manufacturer's Resource List		X	X	X
Supplemental Data		X	X	X
Drawings				
Overall Keyed Furniture Plans	X	X	X	X
Workstation and Freestanding Desk Plans		X	X	X
Panel Plans		X	X	X
Demountable Wall Plans		X	X	X
Reflected Ceiling Plans		X	X	X
Electrical and Telecommunication Plans		X	X	X
Artwork Placement Plans		X	X	X
Window Drapery Plans		X	X	X
Electronic Copy	X	X	X	X
*Interim Submittal shall meet all submittal requirements for both 35% and 65% when submittal phases are Interim, Final, Corrected Final.				

Exhibit A.3.2

ITEMIZED FF&E COST ESTIMATE - SAMPLE

ITEMIZED FF&E COST ESTIMATE	PROJECT NAME	PAGE
	INSTALLATION NAME	XXXX
A/E / ID FIRM	CITY, STATE	DATE
	Project Number	XXXX

CODE	DESCRIPTION	MFR.	QTY	UNIT COST	TOTAL COST
SEATING					
S-1	General Office Task Seating	Knoll	52	$ 567.00	$ 29,484.00
S-2	Conference Room Seating	Krug	24	$ 567.00	$ 13,608.00
S-3	Conference Room Side Chair	Knoll	8	$ 453.49	$ 3,627.92
S-4	Lounge Chair	Krug	4	$ 165.75	$ 663.00
S-5	High Back Excecutive Task	Krug	1	$ 1,050.00	$ 1,050.00
S-6	Training Room Stack	Knoll	48	$ 227.40	$ 10,915.20
S-7	Guest Side Chair - Wood w/ Arms	Krug	6	$ 453.49	$ 2,720.94
TABLES					
T-1	192" x 60" Conferencee Table w/ p.lam top	Knoll	1	$ 9,359.94	$ 9,359.94
T-2	42" DIA. Meeting Table w/ P.Lam top	Knoll	1	$ 373.62	$ 373.62
T-3	36" DIA. Dining Table	Knoll	2	$ 296.79	$ 593.58
T-4	60" x 30" Training Table w/ P.Lam top	Knoll	2	$ 369.33	$ 738.66
T-5	30" x 30" x 16" Magazine Table	Krug	2	$ 469.22	$ 938.44
FILES					
F-1	5-Drawer Lateral File - 36" wide	Office Specialty	10	$ 716.18	$ 7,161.80
F-2	3-Drawer Lateral File 36" wide	Office Specialty	16	$ 513.50	$ 8,216.00
F-3	P.Lam Worksurface 15" x 72"	Office Specialty	2	$ 206.44	$ 412.88
SHELVING					
SH-1	Open Shelving 60" x 24" x 74"	Lyon	2	$ 175.54	$ 351.08
SH-2	Open Shelving 48" x 24" x 74"	Lyon	1	$ 120.17	$ 120.17
SYSTEMS WORKSTATIONS					
WS-1	6' x 8' Tiled Panel Workstation	Knoll	20	$ 2,869.56	$ 57,391.20
WS-2	8' x 10' Executive Clerical Workstation	Knoll	1	$ 6,508.34	$ 6,508.34
CASEGOODS / DESKING SYSTEMS					
DSK-1	72" x 36" U-Group Desk Unit w/ Bow Front	Knoll	1	$ 7,836.00	$ 7,836.00
DKS-2	U-Group Desk Unit w/ Penisula top	Knoll	2	$ 3,652.92	$ 7,305.84
MISCELLANEOUS					
M-1	Keyboard Tray	Human Scale	40	$ 189.00	$ 7,560.00
M-2	CPU Sling	Human Scale	40	$ 76.89	$ 3,075.60
M-3	Trash Can	Rubbermaid	40	$ 15.18	$ 607.20
M-4	Wall Clock	Peter Pepper	20	$ 24.50	$ 490.00
ARTWORK					
A-1 - A-10	Framed Artwork	Great American	1	$ 2,608.10	$ 2,608.10
		FF&E PRODUCT TOTAL			$ 183,717.51
		FREIGHT ESTIMATE			$ 2,122.90
		INSTALLATION ESTIMATE			$ 36,450.88
		SUBTOTAL			$ 222,291.29
		ESCALATION (4% / YEAR)			$ 8,891.65
		CONTINGENCY (15%)			$ 33,343.69
		PROJECT TOTAL			**$ 264,526.64**

SAMPLE

Exhibit A.3.3

ITEM CODE INDEX / INSTALLATION LIST - SAMPLE

ITEM CODE INDEX	PROJECT NAME INSTALLATION NAME	PAGE XXXX
A/E / ID FIRM	CITY, STATE Project Number:	DATE XXXX

CODE	DESCRIPTION	MANUFACTURER
SEATING		
S-1	General Office Task Seating	Knoll
S-2	Conference Room Seating	Knoll
S-3	High Task Chair	Knoll
S-4	Conference Room Seating	Knoll
S-5	Lounge Chair	Krug
S-6	High Back Excecutive Task	Krug
S-7	Training Room Stack	Knoll
S-8	Conference Room Side Chair	Knoll
S-9	Guest Chair	Krug
TABLES		
T-1	192" x 60" Conferencee Table w/ p.lam top	Knoll
T-1	42" DIA. Meeting Table w/ P.Lam top	Knoll
T-3	36" DIA. Dining Table	Knoll
T-4	60" x 30" Training Table w/ P.Lam top	Knoll
T-5	30" x 30" x 16" Magazine Table	Krug
T-6	72" x 30" Work Table w/ P.Lam. Top	Knoll
FILES		
F-1	5-Drawer Lateral File - 36" wide	Office Specialty
F-2	3-Drawer Lateral File 36" wide	Office Specialty
F-3	P.Lam Worksurface 15" x 72"	Office Specialty
F-4		
SHELVING		
SH-1	Open Shelving 60" x 24" x 74"	Lyon
SH-2	Open Shelving 48" x 24" x 74"	Lyon
SYSTEMS WORKSTATIONS		
WS-1	6' x 8' Tiled Panel Workstation	Knoll
WS-2	8' x 10' Executive Workstation	Knoll
WS-3	U- Group	Knoll
WS-4	Executive U-Group	Knoll
MISCELLANEOUS		
M-1	Keyboard Tray	Human Scale
M-2	CPU Sling	Human Scale
M-3	Trash Can	Rubbermaid
M-4	Wall Clock	Peter Pepper
ARTWORK		
A-1 - A-10	Framed Artwork	Great American

SAMPLE

Exhibit A.3.4

FF&E ORDER DATA SHEET - TEMPLATE

ORDER DATA SHEET	PROJECT NAME	PAGE
	INSTALLATION NAME	XXXX
A/E / ID FIRM	CITY, STATE	ITEM CODE
	Project Number:	XXXX

FURNITURE ITEM: **ITEM NAME**					DATE: Day-Mo-Yr
FSC GROUP:	PART	SIN	MOL	EXPIRATION DATE:	GSA CONTRACT NUMBER:
XX	**XX**	**XXX-XX**	**XXXX**	**Day-Mo-Yr**	**XX-XXX-XXXXX**

SOURCE:

MFGR: NAME

ORDERING ADDRESS
CITY, STATE, ZIP CODE
PHONE
FAX
EMAIL

Point of Contact: CONTACT NAME

PRODUCT NAME :

MODEL NUMBER:

PHOTO:

PLAN

ITEM DESCRIPTION:

DIMENSIONS: *Provide overall plus width, height, arm height, etc.*

ISOMETRIC

FINISHES:

Frame: *Provide finishes for all components - base, trim, worksurface, panel, etc.*

Upholstery: Back-

Seat-

Place Textile / Finish Samples here

LOCATION OF ITEM / QUANTITY (BY ROOM):

RM #	Room Name	QTY	UNIT PRICE	EXT. PRICE
XXX	*Expand to second page if necessary*	x	$ -	$ -
			TOTAL PRICE	$ Total

TOTAL QUANTITY

REMARKS:

SPECIAL INSTRUCTIONS:

Provide room # on carton

TEMPLATE

Exhibit A.3.5

FF&E ORDER DATA SHEET - SAMPLE

FF&E ORDER DATA SHEET	Renovate Building 100 ABC Air Force Base	PAGE 4001
A/E / ID FIRM	Georgia Project Number: XYZ-00-000	ITEM CODE S-1

FURNITURE ITEM: GENERAL OFFICE TASK CHAIR					DATE: 20-Sep-10
FSC GROUP:	PART	SIN	MOL	GSA EXPIRATION DATE:	GSA CONTRACT NUMBER:
71	1	711-18	200k	31-Dec-12	GS-28F-8029H

SOURCE:

MFGR: KNOLL, INC.

P.O. Box 157
1235 Water Street
East Greenville, PA 18041
404-522-1835 (p) 404-522-4836 (f)
kharris@knoll.com

Point of Contact: Kevin Harris

PRODUCT NAME : Essentials Tech Task Chair

MODEL NUMBER: 88WMB2SYHA5SLHC - Hard Caster

PHOTO:

ITEM DESCRIPTION:

Knoll Essentials Tech Task Chair, black finish frame, height adjustable arms, hard casters; 3D Knit Terratex suspension back, mid-back, sliding seat, upholstered molded foam seat

DIMENSIONS: *Provide overall plus width, height, arm height, etc.*

Overall: 29" w x 29" d x 38" - 43" h
SW: 19.25" SD: 20.5"
AH: 6.8" - 10.8"

FINISHES:

Frame: Black
Upholstery: Back- Knoll Textiles 3D Knit Terratex; Black Tie S14
Seat- Knoll Textiles Compass CR, H1183/8, Shade

Place Textile / Finish Samples here

LOCATION OF ITEM / QUANTITY (BY ROOM):

RM #	Room Name	QTY	UNIT PRICE	EXT. PRICE
109	Open Office - South	15	$ 345.00	$ 5,175.00
120	Open Office - North	10	$ 345.00	$ 3,450.00
	Expand to second page if necessary			
		TOTAL PRICE		$ 8,625.00

REMARKS:

SPECIAL INSTRUCTIONS:

Provide room # on carton

SAMPLE

ATTACHMENT G

BEST VALUE DETERMINATION GUIDELINES
$3,000 - $100,000

(Schedule Purchases are subject to FAR 8.4, DFARS 208.4, and DFARS PGI Supplement 208.405-70)

- FAR 8.4 required that you make a best value determination before placing Multiple Award Schedule (MAS) orders above the micro-purchase limit (currently $3,000).
- The Navy Furniture BPAs shall be the primary source for FF&E. Refer to Specification Section E20.
- For orders between $3,000 and $100,000, review pricing and obtain quotes from at least three sources and UNICOR. (FAR 8.405-1(c))
- Seek additional price discounts from the contractor offering the best value. (FAR 8.405-1(d))

1. Brief Description of Item, System or Component to be Procured:

2. Did you review the required number of sources under the BPA and/or Federal Supply Schedule? YES ☐ NO ☐

3. Identify the Navy Furniture BPA or other Federal Supply Schedule utilized or indicate not applicable.

4. Was UNICOR included in the review? YES ☐ NO ☐

5. List the name(s) and contract number(s) of contractor(s) who were considered:

List three or more contractors' names, contract numbers and business size reviewed.

6. Provide copies of all quotes received and reviewed.

7. Identify the contractor recommended as the best value.

8. When you sought additional price reductions, were they received? YES ☐ NO ☐

9. Identify price with discounts for the recommended best value contractor.

10. Is installation, site preparation, design or ancillary services included in this project? YES ☐ NO ☐ If yes, be sure that the installation, site preparation, design or ancillary services are included as separate line items in each quote.

TEMPLATE

11. Are you selecting the lowest priced item? YES ☐ NO ☐ If no, indicate in addition to price, those factors listed below, considered in your decision.

- ☐ Price
- ☐ Special features required in effective program performance:
- ☐ Trade-in considerations
- ☐ Probable life of the item selected as compared with that of a comparable item: .
- ☐ Warranty considerations:
- ☐ Maintenance availability
- ☐ Past performance
- ☐ Environmental and energy efficiency considerations
- ☐ Comfort/suitability of the item:
- ☐ Delivery terms
- ☐ Your administrative costs
- ☐ Training needed or provided
- ☐ Technical qualifications
- ☐ Compatibility with existing furniture / Products / Technology (circle appropriate category)
- ☐ Other (*specify*):

12.
Best Value Determination:
A narrative justification for each box checked above for other than low price selection must be attached. Describe the evaluation factor, how the recommended best value contractor's offer met or exceeded the standard for each factor, and why the offeror represents the best value to the Government compared to the other offerors.

SUBMITTING OFFICIAL (PRIME CONTRACTOR'S INTERIOR DESIGNER)
In accordance with FAR 8.404(b), all agency specific regulations and statutes applicable to this purchase are attached. I have reviewed the findings and documentation attached and I have affirmatively determined them to be complete and accurate.

Name:_____ Title: _____ Date: _____

Telephone: _____ Email: _____

Signature:_____

TEMPLATE

ATTACHMENT H

BEST VALUE DETERMINATION GUIDELINES
Greater than $100,000

(Schedule Purchases are subject to FAR 8.4, DFARS 208.4, and DFARS PGI Supplement 208.405-70)

- FAR 8.4 required that you make a best value determination before placing Multiple Award Schedule (MAS) orders above the micro-purchase limit (currently $3,000).
- The Navy Furniture BPAs shall be the primary source for FF&E. Refer to Specification Section E20.
- For orders greater than $100,000, all BPA holders for the applicable schedule shall be given an opportunity to compete for the requirement. In addition, UNICOR shall also be solicited. (DFARS PGI 208.405-70)
- Seek additional price discounts from the contractor offering the best value. (FAR 8.405-1(d))

1. Brief Description of Item, System or Component to be Procured:

2. Were all BPA holders and/or Federal Supply Schedule holders given the opportunity to propose on the requirement? YES ☐ NO ☐

3. Identify the Navy Furniture BPA or other Federal Supply Schedule utilized or indicate not applicable.

4. Was UNICOR included in the review? YES ☐ NO ☐

5. Provide evidence of affording all BPA holder and/or Federal Supply Schedule holders the opportunity to compete. Also, provide evidence that UNICOR was solicited.

5. List the name(s) and contract number(s) of contractor(s) who responded to the request for proposal for this requirement:

List contractors' names, contract numbers and business size for those who responded.

6. Provide copies of all quotes received and reviewed.

7. Identify the contractor recommended as the best value.

8. When you sought additional price reductions, were they received? YES ☐ NO ☐

9. Identify price with discounts for the recommended best value contractor.

10. Is installation, site preparation, design or ancillary services included in this project? YES ☐ NO ☐ If yes, be sure that the installation, site preparation, design or ancillary services are included as separate line items in each quote.

TEMPLATE

11. Are you selecting the lowest priced item? YES ☐ NO ☐ If no, indicate in addition to price, those factors listed below, considered in your decision.

- ☐ Price
- ☐ Special features required in effective program performance:
- ☐ Trade-in considerations
- ☐ Probable life of the item selected as compared with that of a comparable item:
- ☐ Warranty considerations:
- ☐ Maintenance availability
- ☐ Past performance
- ☐ Environmental and energy efficiency considerations
- ☐ Comfort/suitability of the item:
- ☐ Delivery terms
- ☐ Your administrative costs
- ☐ Training needed or provided
- ☐ Technical qualifications
- ☐ Compatibility with existing furniture / Products / Technology (circle appropriate category)
- ☐ Other (*specify*):

12.
Best Value Determination:
A narrative justification for each box checked above for other than low price selection must be attached. Describe the evaluation factor, how the recommended best value contractor's offer met or exceeded the standard for each factor, and why the offeror represents the best value to the Government compared to the other offerors.

SUBMITTING OFFICIAL (PRIME CONTRACTOR'S INTERIOR DESIGNER)
In accordance with FAR 8.404(b), all agency specific regulations and statutes applicable to this purchase are attached. I have reviewed the findings and documentation attached and I have affirmatively determined them to be complete and accurate.

Name:_____ Title: _____ Date: _____

Telephone: _____ Email: _____

Signature:_____

TEMPLATE

Exhibit A.3.7

MANUFACTURER'S RESOURCE LIST - SAMPLE

MANUFACTURER RESOURCE LIST	PROJECT NAME		PAGE
	INSTALLATION NAME		XXXX
A/E / ID FIRM	CITY, STATE		DATE
	Project Number		XXXX

	MANUFACTURER	CONTRACT No.	Exp. Date	TOTAL COST
Name:	Herman Miller, Inc.	GS-28F-8049H	31-Dec-12	$ 700,950.35
Contact:	Jim Vanderkodde			
Email:	government_care@hermanmiller.com			
Phone:	877-4644681			
Ordering				
Address:	Herman Miller			
	Government Customer Care 0161			
	855 East Main Ave.			
	Zeeland, MI 49464			
Payment				
Address:	Herman Miller			
	Government Customer Care 0161			
	855 East Main Ave.			
	Zeeland, MI 49464			
Name:	Tennsco Corp.	GS-29F-0224G	30-Sep-10	$ 80,000.56
Contact:	Angela Bennett			
Email:	info@tennsco.com			
Phone:	800-251-8184			
Ordering				
Address:	Tennsco Corp.			
	P.O. Box 1888			
	Dickson, TN 37244-0307			
Payment				
Address:	Tennsco Corp.			
	P.O. Box 1888			
	Dickson, TN 37244-0307			
Name:	Peter Pepper Products	GS-07F-5476A	31-Aug-11	$ 22,563.98
Contact:	Malcolm Weiss			
Email:	mweiss@bellsouth.net			
Phone:	800-496-0204			
Ordering				
Address:	Peter Pepper Products			
	17929 S. Susana Road, PO Box 5769			
	Compton, CA 90224			
Payment				
Address:	Peter Pepper Products			
	17929 S. Susana Road, PO Box 5769			
	Compton, CA 90224			

SAMPLE

Exhibit A.3.8

EXTERIOR FINISHES COLOR/SAMPLE BOARD - SAMPLE

Standing Seam Roof/Trim/Gutters
Metallic BLDG. Co: Color "Almond"

Wall Panels / Downspouts / Trim
Metallic BLDG. Co: Color "Brownstone"

Doors and Frames / Window Frame
Color "Dark Bronze"

SAMPLE

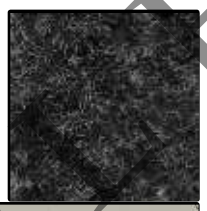
A/E NAME and ADDRESS	PROJECT NAME INSTALLATION NAME CITY, STATE **EXTERIOR FINISHES** *(TITLE OF BOARD)*	Phase:	Date:
		Contract No: *A/E and Construction*	
		AFRC Project No:	
		USACE OR NAVFAC LOGOS	

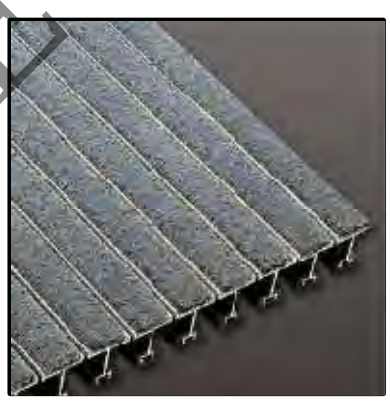
Exhibit A.3.9

INTERIOR FINISHES COLOR/SAMPLE BOARD - SAMPLE

CG1 CORNER GUARD CR1 & WS1

WM1 ACROVYN HANDRAIL





P5 (TOP LEFT) P1 (TOP RIGHT) BD1 PEDIGRID ENTRY MAT

B1 (BASE) P2 (ACCENT) P3 (ACCENT) P4 (ACCENT) OW1

VCT1 VCT2 VCT4 VCT3

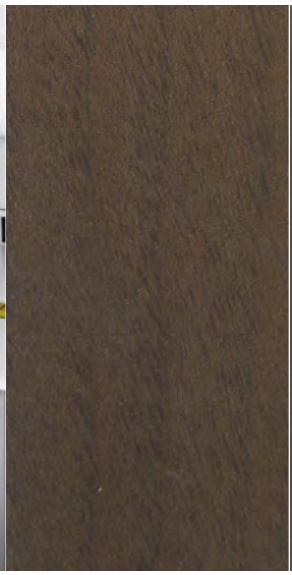
SAMPLE

A/E NAME and ADDRESS	PROJECT NAME INSTALLATION NAME CITY, STATE COLOR ZONE OR AREA NAME *(TITLE OF BOARD)*	Phase:	Date:
		Contract No.: *A/E and Construction*	
		AFRC Project No.:	
		USACE OR NAVFAC LOGOS	

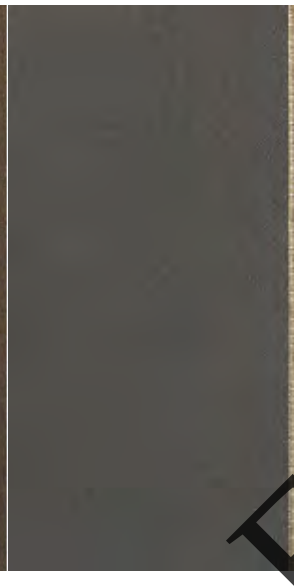
Exhibit A.3.10

FF&E COLOR/SAMPLE BOARD - SAMPLE

W48 TYPICAL WORKSTATION



WORKSURFACE



TRIM PAINT

PANEL FABRIC

WD1 WOOD FINISH

S100 / S502 UPHOLSTERY

S100 / S502 TASK CHAIR

C200 - 300 CASEGOODS

S200 UPHOLSTERY

S200 SIDE CHAIR

SAMPLE

A/E NAME and ADDRESS	PROJECT NAME INSTALLATION NAME CITY, STATE **COLOR ZONE OR AREA NAME** *(TITLE OF BOARD)*	Phase: Date: Contract No: *A/E and Construction* AFRC Project No: *USACE OR NAVFAC LOGOS*

Exhibit A.3.11
ORDER DATA WITH PARTS LIST - SAMPLE

ORDER DATA SHEET	PROJECT NAME	PAGE
A/E	ROBINS AIR FORCE BASE GEORGIA Project Number: W918XX-99-R-1234	1 ITEM CODE DSK-1

FURNITURE ITEM: **Left Hand, U-Shaped Desk Unit** DATE: 31-08-2010

FSC GROUP:	PART	SIN	MOL	EXPIRATION DATE:	GSA CONTRACT NUMBER:
71	1	711-8	XXXX	09-Jul-11	GS-29F-0304

SOURCE:

MFGR: XYZ Line, Inc.

1234 East Street
Anytown, ME 01234-0100
PHONE 800-555-5800
FAX 800-555-7208
EMAIL esmith@xyzline.com
website: www.xyzline.com
Point of Contact: Elizabeth Smith

PRODUCT NAME : First Office: Vegas

MODEL NUMBER: See page 2 for Parts List for all Model Numbers

PHOTO:

ISOMETRIC

ITEM DESCRIPTION:

U-Shaped Desk w/ P-Top, Left Bridge, Center Drawer, Wall-Hung Overhead Storage w/ Mesh Acrylic Insert, Lateral File Credenza, and Mobile Pedestal w/ Drawers

DIMENSIONS: *Provide overall plus width, height, arm height, etc.*

P-Top: 72"W x 32"D Credenza: 72"W x 22"D
Bridge: 42"W x 22"D

FINISHES:

Frame: (CHP) Light Cherry Laminate with 1" Knife Edge
Upholstery: Tackboard Fabric: Momentum: Stance, Color: Totem
Hardware: (VF) Duet Satin Nickel Pull with Black Grommet in Bridge

LOCATION OF ITEM / QUANTITY (BY ROOM):

RM #	Room Name	QTY	UNIT PRICE	EXT. PRICE
300	ATC Office	1	$3,652.92	$3,652.92
400	Chief Controller's Office	1	$3,652.92	$3,652.92
		TOTAL PRICE		$7,305.84

REMARKS:

SPECIAL INSTRUCTIONS:

Provide room # on carton

SAMPLE

Exhibit A.3.11
ORDER DATA WITH PARTS LIST - SAMPLE

ORDER DATA SHEET	PROJECT NAME	PAGE
	ROBINS AIR FORCE BASE	1
A/E	GEORGIA	ITEM CODE
	Project Number: W918XX-99-R-1234	DSK-1

FURNITURE ITEM:	Left Hand, U-Shaped Desk Unit				DATE: 31-08-2010
FSC GROUP:	PART	SIN	MOL	EXPIRATION DATE:	GSA CONTRACT NUMBER:
71	1	711-8	XXXX	09-Jul-11	GS-29F-0304

Item	MFG	Cat	Part Number	Part Description	Category	Qty
1	FOF	FOF	3-7232EBTR2 CHIP FA FR MV G1 G1	72x32 RIGHT BULLET TABLE, VEGAS LIGHT CHERRY ON CHERRY LA…1" KNIFE EDGE NO MEDESTY 3-1/2" SATIN NICEL RIBBED CYL NO GROMMET NO GROMMET	FREESTANDING TABLE	1
2	FOF	FOF	3-2242BR2 CHP FA G3 LJ	22x42 BRIDGE, VEGAS LIGHT CHERRY ON CHERRY LA… 1" KNIFE EDGE GROMMET IN CENTER BLACK	FREESTANDING TABLE	1
3	FOF	FOF	3-7222CRLL2 CHP FA VF LW G3	72x32 LEFT PEDESTAL LATERAL FILE CREDENZA, VEGAS LIGHT CHERRY ON CHERRY LA… 1" KNIFE EDGE SATIN NICKEL DUET PULL UNFINISHED BACK GROMMET IN CENTER	FREESTANDING TABLE	1
4	FOF	FOF	3-7219HDW MLC JJ	72Wx15Dx18-1/2H WALLMOUNT ORGANIZER, VEGAS LIGHT CHERRY ON CHERRY WOOD FRAMED ACRYLIC INSERT	FREESTANDING TABLE	1
5	FOF	FOF	FT2104 3 ETC3 TOR	72Wx23-3/4 FABRIC TACKBOARD GRADE 3 FABRIC MOMENTUM STANCE TOTEM	ACCESSORY	1
6	FOF	FOF	F-TL-1	36Wx8D TASK LIGHT	ACCESSORY	1
7	FOF	FOF	3-1620MP2 CHP VF	15-58x 20 MOBILE PEDESTALS, VEGAS LIGHT CHERRY ON CHERRY LA SATIN NICKEL DUET PULL	FILING	1
8	FOF	FOF	F-OCD1 MLC	23Wx13Dx3H CENTER DRAWER LIGHT CHERRY ON CHERRY	STORAGE	1

SAMPLE

Referenced in Part One – Section B

Procurement Package Exhibits

Exhibit B.2.1:	AFRC FF&E Procurement Package Checklist
Exhibit B.2.2a:	Market Research Report – Template
Exhibit B.2.2b:	Market Research Report – Sample
Exhibit B.2.3:	Qualified Dealer List – Template
Exhibit B.2.4a:	Recovered Materials Determination Form – Template
Exhibit B.2.4b:	Recovered Materials Determination Form – Sample
Exhibit B.2.5a:	Affirmative Procurement Determination Form – Template
Exhibit B.2.5b:	Affirmative Procurement Determination Form – Sample
Exhibit B.2.6a:	GG Environmental Institute Certification – Sample
Exhibit B.2.6b:	Manufacturer's Green Statement – Sample
Exhibit B.2.7:	Item Code Index – Sample
Exhibit B.2.8:	Summary Sheet (Bid Form) – Sample
Exhibit B.2.9:	FF&E Order Data Sheet – Sample

AFRC FF&E Procurement Package Checklist

Name of Project / Location

- ☐ Market Research Report
  - Government Estimate (updated if greater than 1 year old)
  - Project information obtained from Program Managers
  - *To be signed by OPR – AFRC HQ A7PM*
- ☐ Recovered Materials Determination Form (Office Furniture checked)
- ☐ GreenGuard Certificates for major manufacturers
- ☐ Affirmative Procurement Determination Form
  - *To be signed by OPR – AFRC HQ A7PMI*
- ☐ Identification of (3) Qualified Contractors (as per GSA E-Buy)
- ☐ Verify the length of Performance Period, if can vary (shorten) from standard 90 days.
  - ___Standard 90 days OR ___ Other (____ days recommended)
- ☐ FF&E Summary Sheet (no unit costs/totals)
  - Verify quantity totals match Order Data Sheet quantities
- ☐ Order Data Sheets (no unit costs/totals or Dealer names)
- ☐ Floor Plans, Enlarged Plans, and Isometric Drawings
- ☐ Confirmation from AFRC PM that no SID finishes have changed
- ☐ PDF file format of all above documents saved to disc (no hardcopies)

I certify that all items listed above have been included in this package.

_____ Date: _____
Designer

*PM below certifies/confirms the facility has been constructed IAW the Corrected Final Drawings or the construction changes have been incorporated into the final CID package.

_____ Date: _____
Project Manager

MARKET RESEARCH REPORT

DATE

Product / Service Description

This requirement is for the acquisition of a Total Furniture Package to include the comprehensive program management associated with the installation of turn-key furniture products. The furnishings package is valued at $_____ and is for the _____at _____. The contract will consist of three (3) line items: product, installation and project management. The planned period of performance for this effort will be 90 days after receipt of order.

Statement of Need: This procurement of furnishings is needed to support the *O&M/BRAC,etc* construction project, *project number*. The estimated Building Occupancy Date is _____.

Background

This comprehensive Interior Design furniture package was prepared by *(DOR)* of *City/State*. This package will be solicited on GSA E-Buy under GSA contract, FSC _____ and open to *(list socio-economic indicator if applicable).*

Performance Requirements

This proposed contract will be for the best quality commercial furnishings available in the commercial industry and available under GSA contracts. The delivery for this effort will be 90 days after receipt of contract/delivery order.

Product Data

Furniture Order Data Sheets, floor plan drawings and manufacturer's summary listing are available in the solicitation package.

Environmental Impact Considerations & Certification Requirements

This Comprehensive Interior Design furniture package meets Government requirements for Recovered Materials and Affirmative Procurement.

Commercial Opportunities

These are commercial items and will be solicited under GSA Contract, _____, SIN-1, *(list Contract type – Packaged Office, etc)*.

Industry Standards, Commercial Business Practices

(list any)

TEMPLATE

Technology Trends & Technology Insertion Opportunities

list any .

Small Business Opportunities

list any i.e., Small Business Set Aside .

Terms and Conditions

list any .

Government's Presence / Leverage in the Market

The government has no known leverage in this commercial market.

Conclusions and Recommendations

Based on the responses to the market research, this requirement will be solicited as a *(list contract method)* ..

Market Research Techniques Used

Market research was conducted by the DOR and the Program Office through internet searches, telephone calls/e-mails. Our internet search provided (*qty.*) contractors under GSA schedule, *FSC number, contract type.* Of that number, (*qty.*) contractors qualify for *parameters of socio-economic indicator selected* . The systems furniture manufacturer's Government representative was also contacted and recommended three (3) dealers for this installation. All of those recommended qualify under the 71-1 contract. Further attempt was made to limit vendors to other socio-economic indicators, but *list selected socio-economic indicator* was used to maintain the dealer-of-record, *Dealer A*, who worked with the A/E during design.

Submitted:

Program/Project Manager/Requirements Owner Date

TEMPLATE

MARKET RESEARCH REPORT

September 7, 2010

Product / Service Description

This requirement is for the acquisition of a Total Furniture Package to include the comprehensive program management associated with the installation of turn-key furniture products. The furnishings package is valued at $ 1,467,000 and is for the Squadron Operations at Any Base USA. The contract will consist of three (3) line items: product, installation and project management. The planned period of performance for this effort will be 90 days after receipt of order.

Statement of Need: This procurement of furnishings is needed to support the O&M construction project, 000-00-0000. The estimated Building Occupancy Date is 21 March, 2011.

Background

This comprehensive Interior Design furniture package was prepared by Design Company Inc. of Any City, GA. This package will be solicited on GSA E-Buy under GSA contract, FSC 71-1 and open to small business set aside.

Performance Requirements

This proposed contract will be for the best quality commercial furnishings available in the commercial industry and available under GSA contracts. The delivery for this effort will be 90 days after receipt of contract/delivery order.

Product Data

Furniture Order Data Sheets, floor plan drawings and manufacturer's summary listing are available in the solicitation package.

Environmental Impact Considerations & Certification Requirements

This Comprehensive Interior Design furniture package meets Government requirements for Recovered Materials and Affirmative Procurement.

Commercial Opportunities

These are commercial items and will be solicited under GSA Contract, 71-1, SIN-1, Packaged Office contract.

Industry Standards, Commercial Business Practices

None.

Technology Trends & Technology Insertion Opportunities

None.

SAMPLE

Small Business Opportunities

This will be set aside for small business.

Terms and Conditions

None.

Government's Presence / Leverage in the Market

The government has no known leverage in this commercial market.

Conclusions and Recommendations

Based on the responses to the market research, this requirement will be solicited as a Packaged Office Contract with Small Business Set Aside.

Market Research Techniques Used

Market research was conducted by the DOR and the Program Office through internet searches, telephone calls/e-mails. Our internet search provided (93) contractors under GSA schedule, 71-1, Packaged Office. Of that number, (85) contractors qualify for small business set aside. The systems furniture manufacturer's Government representative was also contacted and recommended three (3) dealers for this installation. All of those recommended qualify under the 71-1 contract. Further attempt was made to limit vendors to other socio-economic indicators, but small business set-aside was used to maintain the dealer-of-record, Furniture Dealer A-Z, who worked with the A/E during design.

SAMPLE

Submitted:

Program/Project Manager/Requirements Owner Date

Exhibit B.2.3

QUALIFIED DEALER LIST - TEMPLATE

Qualifying Furniture Dealers

1. Dealer Name
   GSA Contract #
   *Design Dealer of Record

   Address
   City, State, Zip Code
   Phone:
   Fax:
   Contact: (Name)
   E-Mail:

2. Dealer Name
   GSA Contract #

   Address
   City, State, Zip Code
   Phone:
   Fax:
   Contact: (Name)
   E-Mail:

3. Dealer Name
   GSA Contract #

   Address
   City, State, Zip Code
   Phone:
   Fax:
   Contact: (Name)
   E-Mail:

TEMPLATE

Recovered Materials Determination Form

Instructions

This form is to be completed by the procurement originator when EPA-designated items included in the Green Procurement Program for Recovered Materials are being procured from outside vendors. For questions on whether the product counts as "EPA-designated" or what the required recycled content is, refer to product descriptions on EPA's website at **www.epa.gov/cpg/products**. The completed form becomes part of the contracting office contract file.

Procurement Request / Project No._____

The EPA-designated items being procured are:

___ Building insulation

___ Polyester carpet

Cement & concrete containing:

- ___ Coal fly ash
- ___ Ground granulated blast furnace slag
- ___ Cenospheres
- ___ Silica fume

___ Flowable fill

___ Latex paint

___ Floor tiles

___ Laminated paperboard

___ Patio blocks

___ Shower & restroom dividers/partitions

___ Structural fiberboard

___ Railroad grade crossing surfaces

___ Garden and soaker hoses

___ Lawn and garden edging

___ Landscaping timbers and posts (plastic lumber)

___ Hydraulic mulch

___ Compost from yard trimmings or food waste

___ Modular threshold ramps

___ Nonpressure pipe

___ Binders (paper, solid plastic or plastic covered)

___ Plastic presentation folders

___ Plastic file folders

___ Plastic clip portfolios

___ Plastic clipboards

___ Office furniture

___ Office recycling containers

___ Office waste receptacles

___ Plastic desktop accessories

___ Plastic envelopes

___ Plastic trash bags

___ Printer ribbons

___ Toner cartridges

___ Newsprint

___ Commercial/industrial sanitary tissue products

___ Printing and writing papers

___ Paperboard and packaging

___ Tray liners

___ Industrial drums

___ Bike racks

___ Roofing materials

___ Playground surfaces

___ Park and recreational furniture

___ Running tracks

___ Playground equipment

___ Traffic barricades

___ Traffic cones

___ Parking stops

___ Plastic fencing (snow or erosion control, safety barriers)

___ Channelizers

___ Delineators

___ Flexible delineators

___ Rebuilt vehicular parts

___ Engine coolants

___ Re-refined lubricating oils

___ Retread tires

___ Sorbents

___ Awards and plaques

___ Mats

___ Signage

___ Strapping

___ Pallets

___ Blasting grit

TEMPLATE

Recovered Materials Determination Form

Instructions

This form is to be completed by the procurement originator when EPA-designated items included in the Green Procurement Program for Recovered Materials are being procured from outside vendors. For questions on whether the product counts as "EPA-designated" or what the required recycled content is, refer to product descriptions on EPA's website at **www.epa.gov/cpg/products**. The completed form becomes part of the contracting office contract file.

Procurement Request / Project No. Any Base, Georgia: Renovate B000 / Project No. ABCD 00 - 000

The EPA-designated items being procured are:

___ Building insulation
___ Polyester carpet

Cement & concrete containing:
- ___ Coal fly ash
- ___ Ground granulated blast furnace slag
- ___ Cenospheres
- ___ Silica fume

___ Flowable fill
___ Latex paint
___ Floor tiles
___ Laminated paperboard
___ Patio blocks
___ Shower & restroom dividers/partitions

___ Structural fiberboard
___ Railroad grade crossing surfaces

___ Garden and soaker hoses
___ Lawn and garden edging
___ Landscaping timbers and posts (plastic lumber)

___ Hydraulic mulch
___ Compost from yard trimmings or food waste

___ Modular threshold ramps
___ Nonpressure pipe

___ Binders (paper, solid plastic or plastic covered)
___ Plastic presentation folders
___ Plastic file folders
___ Plastic clip portfolios
___ Plastic clipboards

X Office furniture
___ Office recycling containers
___ Office waste receptacles
___ Plastic desktop accessories
___ Plastic envelopes
___ Plastic trash bags

___ Printer ribbons
___ Toner cartridges
___ Newsprint

___ Commercial/industrial sanitary tissue products
___ Printing and writing papers
___ Paperboard and packaging

___ Tray liners
___ Industrial drums

___ Bike racks
___ Roofing materials

___ Playground surfaces
___ Park and recreational furniture
___ Running tracks
___ Playground equipment
___ Traffic barricades
___ Traffic cones
___ Parking stops
___ Plastic fencing (snow or erosion control, safety barriers)
___ Channelizers

___ Delineators
___ Flexible delineators
___ Rebuilt vehicular parts
___ Engine coolants
___ Re-refined lubricating oils
___ Retread tires
___ Sorbents
___ Awards and plaques
___ Mats
___ Signage
___ Strapping
___ Pallets

___ Blasting grit

SAMPLE

Affirmative Procurement Determination

___ EPA recycled content requirements have been met for this procurement action.

****** OR *******

___ The following EPA designated guideline item is included in the specifications for project number _____, however, compliance with EPA standards is not attainable.

Item: _____

I have determined that the EPA guidelines were considered and determined inapplicable, based on the following:

_____ Item is not available within a reasonable period of time.

Need date: _____ Date available: _____

_____ Item fails to meet a performance standard in the specifications.

Describe the standard and why it is needed: _____

_____

_____

Describe how the guideline item fails to meet the standard: _____

_____

_____

_____ Item is not available from 2 or more sources.

Market research was performed by calling ____(insert number) vendors, but only _____ (enter name) was able to supply the item.

_____ Item was only available at an unreasonable price (i.e., recycled item is more expensive).

Price of recycled item: _____

Price of non-recycled item: _____

This determination is made in accordance with FAR 23.405(c).

_____ _____

Technical OPR - Signature and Office Symbol Date

_____ _____

Concurrence - Contracting Officer Date

TEMPLATE

Affirmative Procurement Determination

_X_ EPA recycled content requirements have been met for this procurement action.

****** OR *******

___ The following EPA designated guideline item is included in the specifications for project number _____, however, compliance with EPA standards is not attainable.

Item: _____

I have determined that the EPA guidelines were considered and determined inapplicable, based on the following:

_____ Item is not available within a reasonable period of time.

Need date: _____ Date available: _____

_____ Item fails to meet a performance standard in the specifications.

Describe the standard and why it is needed: _____

_____

_____

Describe how the guideline item fails to meet the standard: _____

_____

_____

_____ Item is not available from 2 or more sources.

Market research was performed by calling ____(insert number) vendors, but only _____ (enter name) was able to supply the item.

_____ Item was only available at an unreasonable price (i.e., recycled item is more expensive).

Price of recycled item: _____

Price of non-recycled item: _____

This determination is made in accordance with FAR 23.405(c).

_____ _____

Technical OPR - Signature and Office Symbol Date

_____ _____

Concurrence - Contracting Officer Date

SAMPLE

Exhibit B.2.6a

GREENGUARD (GG) ENVIRONMENTAL INSTITUTE CERTIFICATION - SAMPLE

GREENGUARD® Indoor Air Quality Certified

Certificate of Compliance

Certification Details:

Certificate No: F10Fw91112-6

Status: Certified - Provisional

Period: 6/2003 - 10/2011

Restrictions: NONE

Knoll Morrison Office System

Knoll, Inc.

This product has been certified according to the GREENGUARD Indoor Air Quality (IAQ) Certification Program for Low Emitting Products

Reference Standard: GGPS.001 GREENGUARD IAQ Standard for Building Materials, Finishes, and Furnishings

Product Type: Furniture, Flooring, and Associated Products

Criteria	Allowable Limits
TVOC[1]	< 0.5 mg/m³
Formaldehyde[2]	< 0.05 ppm
Total Aldehydes	< 0.1 ppm
Individual VOCs[3]	< 0.1 TLV
4-phenylcyclohexene	< 0.0065 mg/m³
Listing of measured carcinogens and reproductive toxins as identified by California Proposition 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (IARC) must be provided.	
Any pollutant regulated as a primary or secondary outdoor air pollutant must meet a concentration that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard (U.S. EPA, code of Federal Regulations, Title 40, Part 50).	

See referenced standard for a complete technical explanation.
Complies with ANSI/BIFMA X7.1 - 2007 and BIFMA e3-2008 Credit 7.6.1.

[1]Defined to be the total response of measured VOCs falling within the C_6–C_{16} range, with responses calibrated to a toluene surrogate.

[2]Defined to be the total response of a target list of aldehydes (2-butenal; acetaldehyde; benzaldehyde; 2, 5-dimethylbenzaldehyde, 2-methylbenzaldehyde; 3-and/or 4-methylbenzaldehyde; butanal; 3-methylbutanal; formaldehyde; hexanal; pentanal; propanal), with each individually calibrated to a compound specific standard.

[3]Any pollutant not listed must produce an air concentration level no greater than 1/10 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4438).

GREENGUARD Certification affirms that products meet the criteria of the referenced standard and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. The testing does not evaluate emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical and particle emissions.

The GREENGUARD Environmental Institute (GEI) is an industry independent, third-party certification organization that qualifies products for low chemical emissions. GREENGUARD Certification programs use defined product standards, test methodologies, product sample collection and handling procedures, program application processes and on-going verification procedures. GREENGUARD standards, methods, and procedures are available at www.GREENGUARD.org.

© 2010 GREENGUARD Environmental Institute

GGPC.001A

SAMPLE

arcadia

SUSTAINABILITY

> Environmental Policy
> Indoor Air Quality

As a matter of corporate philosophy, Arcadia is committed to intelligent environmental policies and practices. Standard recycling procedures and ecologically sensible policies and practices have been implemented throughout all aspects of our operations/ facilities, and as it relates to new product development and project management. Furthermore, we insist on a similar operational philosophy from our vendor-partners.

In accordance with our ongoing efforts to develop and manufacture products that positively contribute to healthy environments, Arcadia has completed testing for Indoor Air Quality certification within our lounge- and executive seating categories, achieving SCS Indoor Advantage Gold (highest certification available for Indoor Air Quality) and SCS Indoor Advantage certification respectively.

With either SCS Indoor Advantage Gold or SCS Indoor Advantage certification, we not only meet the criteria of BIFMA M-7.1 and X-7.1 (low-emitting office furniture systems and seating) but also the LEED-Commercial Interiors EQ 4.5 credit for Indoor Air Quality of office furniture.

We will continue to strive towards certification across all product categories as well as make sustainable improvements in all areas of business. A representative example of other in-force measures Arcadia employs to support intelligent environmental policies include:

Ensure product life-cycle longevity and non-obsolescence via the design, engineering, and manufacturing processes and subsequent product refurbishment and re-use potential.
Design products, and/or re-engineer existing to maximize the use and/or re-use of recycled and/or recyclable components and sub-parts.
Utilize raw materials (such as wood products) only from renewable, sustainable sources.

SAMPLE

Design and implement 'optimizer' manufacturing efficiencies so as to reduce 'scrap' waste throughout production sequences.
Minimize the generation, emission or discharge of waste and harmful or regulated substances and pollutants from manufacturing operations commensurate with current government codes, laws and/or industry regulations.
Specify, and utilize 'engineered pre-cut' foam, which eliminates virtually all on-site scrap foam waste.
Increase the use of recyclable materials as appropriate for all general office, marketing, manufacturing, and shipping applications.
Eliminate use of any non-recyclable packaging materials as well as utilize alternative shipping methods such as 'blanket wrapped delivery'.
Utilize remnant 'COM' materials previously destined to landfills as interior spring-to-foam barrier cloth on upholstered goods.
Contract for the external reuse of scrap woodchip materials and sawdust which are recycled and used for the following: soil enhancement in nurseries, MDF particle board manufacturing and fueling co-generation factories which simultaneously generate both electricity and useful heat.
Contract for the external use of scrap leather cutting remnants.
Minimize the generation of, recycle, and/or ensure the proper disposal of all office generated waste materials.
Donate outdated product marketing and collateral materials to college and university design programs for educational purposes.

We are committed to being a leader in the practical application of current and future technologies that will protect our environment today, and for future generations to come.

Download Environmental Policy

SAMPLE

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Exhibit B.2.7

ITEM CODE INDEX - SAMPLE

ITEM CODE INDEX	PROJECT NAME INSTALLATION NAME CITY, STATE Project Number:	PAGE XXXX DATE XXXX
A/E / ID FIRM		

CODE	DESCRIPTION	MANUFACTURER
SEATING		
S-1	General Office Task Seating	Knoll
S-2	Conference Room Seating	Knoll
S-3	High Task Chair	Knoll
S-4	Conference Room Seating	Knoll
S-5	Lounge Chair	Krug
S-6	High Back Excecutive Task	Krug
S-7	Training Room Stack	Knoll
S-8	Conference Room Side Chair	Knoll
S-9	Guest Chair	Krug
TABLES		
T-1	192" x 60" Conferencee Table w/ p.lam top	Knoll
T-1	42" DIA. Meeting Table w/ P.Lam top	Knoll
T-3	36" DIA. Dining Table	Knoll
T-4	60" x 30" Training Table w/ P.Lam top	Knoll
T-5	30" x 30" x 16" Magazine Table	Krug
T-6	72" x 30" Work Table w/ P.Lam. Top	Knoll
FILES		
F-1	5-Drawer Lateral File - 36" wide	Office Specialty
F-2	3-Drawer Lateral File 36" wide	Office Specialty
F-3	P.Lam Worksurface 15" x 72"	Office Specialty
F-4		
SHELVING		
SH-1	Open Shelving 60" x 24" x 74"	Lyon
SH-2	Open Shelving 48" x 24" x 74"	Lyon
SYSTEMS WORKSTATIONS		
WS-1	6' x 8' Tiled Panel Workstation	Knoll
WS-2	8' x 10' Executive Workstation	Knoll
WS-3	U- Group	Knoll
WS-4	Executive U-Group	Knoll
MISCELLANEOUS		
M-1	Keyboard Tray	Human Scale
M-2	CPU Sling	Human Scale
M-3	Trash Can	Rubbermaid
M-4	Wall Clock	Peter Pepper
ARTWORK		
A-1 - A-10	Framed Artwork	Great American

SAMPLE

Exhibit B.2.8

SUMMARY SHEET (BID FORM) - SAMPLE

BUDGET SUMMARY	PROJECT NAME	PAGE
	INSTALLATION NAME	XXXX
A/E / ID FIRM	CITY, STATE	DATE
	Project Number	XXXX

CODE	DESCRIPTION	MFR.	QTY	UNIT COST	TOTAL COST
SEATING					
S-1	General Office Task Seating	Knoll	52		
S-2	Conference Room Seating	Krug	24		
S-3	Conference Room Side Chair	Knoll	8		
S-4	Lounge Chair	Krug	4		
S-5	High Back Excecutive Task	Krug	1		
S-6	Training Room Stack	Knoll	48		
S-7	Guest Side Chair - Wood w/ Arms	Krug	6		
TABLES					
T-1	192" x 60" Conferencee Table w/ p.lam top	Knoll	1		
T-2	42" DIA. Meeting Table w/ P.Lam top	Knoll	1		
T-3	36" DIA. Dining Table	Knoll	2		
T-4	60" x 30" Training Table w/ P.Lam top	Knoll	2		
T-5	30" x 30" x 16" Magazine Table	Krug	2		
FILES					
F-1	5-Drawer Lateral File - 36" wide	Office Specialty	10		
F-2	3-Drawer Lateral File 36" wide	Office Specialty	16		
F-3	P.Lam Worksurface 15" x 72"	Office Specialty	2		
SHELVING					
SH-1	Open Shelving 60" x 24" x 74"	Lyon	2		
SH-2	Open Shelving 48" x 24" x 74"	Lyon	1		
SYSTEMS WORKSTATIONS					
WS-1	6' x 8' Tiled Panel Workstation	Knoll	20		
WS-2	8' x 10' Executive Clerical Workstation	Knoll	1		
CASEGOODS / DESKING SYSTEMS					
DSK-1	72" x 36" U-Group Desk Unit w/ Bow Front	Knoll	1		
DKS-2	U-Group Desk Unit w/ Penisula top	Knoll	2		
MISCELLANEOUS					
M-1	Keyboard Tray	Human Scale	40		
M-2	CPU Sling	Human Scale	40		
M-3	Trash Can	Rubbermaid	40		
M-4	Wall Clock	Peter Pepper	20		
ARTWORK					
A-1 - A-10	Framed Artwork	Great American	1		
		FF&E PRODUCT TOTAL			$
		INSTALLATION			$
		PROJECT MANAGEMENT			$
		TOTAL PROJECT FF&E COST			**$**

SAMPLE

Exhibit B.2.9

FF&E ORDER DATA SHEET - SAMPLE

FF&E ORDER DATA SHEET	Renovate Building 100 ABC Air Force Base	PAGE 4001
A/E / ID FIRM	Georgia Project Number: XYZ-00-000	**ITEM CODE** **S-1**

FURNITURE ITEM: **GENERAL OFFICE TASK CHAIR**					DATE: 20-Sep-10
FSC GROUP:	PART	SIN	MOL	GSA EXPIRATION DATE:	GSA CONTRACT NUMBER:
71	**1**	**711-18**	**200k**	**31-Dec-12**	**GS-28F-8029H**

SOURCE:

MFGR: KNOLL, INC.

P.O. Box 157
1235 Water Street
East Greenville, PA 18041
404-522-1835 (p) 404-522-4836 (f)
kharris@knoll.com

Point of Contact: Kevin Harris

PRODUCT NAME : Essentials Tech Task Chair

MODEL NUMBER: 88WMB2SYHA5SLHC - Hard Caster

PHOTO:

ITEM DESCRIPTION:

Knoll Essentials Tech Task Chair, black finish frame, height adjustable arms, hard casters; 3D Knit Terratex suspension back, mid-back, sliding seat, upholstered molded foam seat

DIMENSIONS: *Provide overall plus width, height, arm height, etc.*

Overall: 29" w x 29" d x 38" - 43" h
SW: 19.25" SD: 20.5"
AH: 6.8" - 10.8"

FINISHES:

Frame: Black
Upholstery: Back- Knoll Textiles 3D Knit Terratex; Black Tie S14
Seat- Knoll Textiles Compass CR, H1183/8, Shade

Place Textile / Finish Samples here

LOCATION OF ITEM / QUANTITY (BY ROOM):

RM #	Room Name	QTY	UNIT PRICE	EXT. PRICE
109	Open Office - South	15	$	$
120	Open Office - North	10	$	$
	Expand to second page if necessary			
		TOTAL PRICE		$

REMARKS:

SPECIAL INSTRUCTIONS:

Provide room # on carton

SAMPLE

Acronyms and Abbreviations List

AC	Articulation Class – A measure for rating the speech privacy performance of a ceiling in an open plan environment where sound is reflected off the ceiling between two (2) adjacent spaces, divided by partial-height furniture panels.
ACT	Acoustical Ceiling Tile
A/E	Architects / Engineers
AFI	Air Force Instruction (Technical Bulletin)
AFRC	Air Force Reserve Command – A major command (MAJCOM) of the U.S. Air Force with its headquarters at Robins AFB, Georgia.
ASTM	American Society for Testing and Materials – An international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.
AWI	Architectural Woodwork Institute – A professional trade association whose member companies are fabricators of finished woodwork and furniture. AWI has published a Standard of Care for woodworking, called *Quality Standards Illustrated*.
BCE	Base Civil Engineer
BIFMA	Business and Institutional Furniture Manufacturers' Association – BIFMA's mission is to lead, advocate, inform and develop standards for the North American office and institutional furniture industry.
CAC	Ceiling Attenuation Class – A measure for rating the performance of a ceiling system as a barrier to airborne sound transmission through a common plenum between adjacent closed spaces such as offices. A ceiling system with a CAC < 25 is considered low performance, whereas one with CAC > 35 is high performance.
CFR	Code of Federal Regulations – is the codification of the general and permanent rules and regulations (sometimes called administrative law) published in the Federal Register by the executive departments and agencies of the Federal Government of the United States.
CID	Comprehensive Interior Design – The complete Comprehensive Interior

Acronyms and Abbreviations List

	Design (CID) Package for AFRC consists of a Structural Interior Design (SID) Submittal and a FF&E Submittal, both of which are prepared by the Designer of Record (DOR).
CO	Contracting Office / Officer
COMM	Communications
CPU	Central Processing Unit
DOR	Designer of Record
ETL	Engineering Technical Letter
EU	End User
EVT	Enhanced Vinyl Tile
FF&E	Furniture, Fixtures & Equipment – Movable furniture, fixtures or other equipment that have no permanent connection to the structure of a building or utilities.
FSIS	Food Safety and Inspection Service – An agency of the United States Department of Agriculture (USDA), is the public health agency responsible for ensuring that the nation's commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labeled and packaged.
GG	Green Guard – Certification program overseen by the GREENGUARD Environmental Institute (GEI), which has established standards for acceptable indoor products, environments and buildings.
GSA	General Services Administration – An independent agency of the United States government, established to help manage and support the basic functioning of federal agencies.
HDPE	High-Density Polyethylene
HQ	Headquarter Facilities
HVAC Systems	Heating Ventilation Air Conditioning Systems

Acronyms and Abbreviations List

IIDA International Interior Design Association – A professional networking and educational Association of 13,000 Members in 10 specialty practice forums and 29 Chapters around the world.

IT Information Technology

LCD Liquid Crystal Display – A thin, flat electronic visual display that uses the light modulating properties of liquid crystals (LCs); LCs do not emit light directly.

LED Light Emitting Diode – A semiconductor light source increasingly used as indicator lamps in many devices and lighting.

LEED® Leadership in Energy and Environmental Design – An internationally recognized green building rating and certification system, created by the U.S. Green Building Council (USGBC), providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, as well as stewardship of resources and sensitivity to their impacts.

LR Light Reflectance

LVT Luxury Vinyl Tile

MDF Medium Density Fiberboard – An engineered wood product formed by breaking down hardwood or softwood residuals into wood fibers, often in a defibrator, combining it with wax and a resin binder, and forming panels by applying high temperature and pressure. MDF is denser than plywood.

NCIDQ National Council for Interior Design Qualification – An independent group of state and provincial credentialing bodies, which provides the public with the means to identify interior designers who have demonstrated the minimum level of competence needed to practice interior design.

NFPA National Fire Protection Association – An authoritative source that publishes and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks.

Acronyms and Abbreviations List

NRC	Noise Reduction Coefficient – A measure for rating the overall sound absorption performance of a material when used in an enclosed architectural space such as an office, where sound is being reflected at many angles of incidence; specifically, it is the frequency averaged absorption coefficients @ 250, 500, 1000 and 2000 Hz, rounded to the nearest 0.05. A material with NRC < 0.50 is a poor absorber, and NRC > 0.80 is a very good absorber.
psi	Pounds per Square Inch
PM	Project Manager
POC	Point of Contact
PVA Adhesive	Polyvinyl Acetate Adhesive – Also known as PVA, PVAc, or poly (ethenyl ethanoate), "wood glue," "white glue," "carpenter's glue," "school glue," and "PVA glue" – A rubbery synthetic polymer.
PVC	Polyvinyl chloride (or vinyl)
SDT	Static Dissipative Tile
SID	Structural Interior Design – Includes all building related elements and components generally part of the building itself, such as wall finishes, ceiling finishes, floor coverings, marker / bulletin boards, blinds, signage, and built-in casework.
STC	Sound Transmission Coefficient – An integer rating of how well a building partition attenuates airborne sound.
UFC	Unified Facilities Criteria – System of documents which provide planning, design, construction, sustainment, restoration, and modernization criteria, and apply to the Military Departments, the Defense Agencies, and the DoD Field Activities.
UFGS	Unified Facilities Guidance Specifications – A joint effort of the U.S. Army Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC), the Air Force Civil Engineer Support Agency (AFCESA) and the National Aeronautics and Space Administration (NASA). UFGS are for use in specifying construction for the military services.

Acronyms and Abbreviations List

UL	Underwriters Laboratories, Inc – An independent product safety certification organization. UL develops standards and test procedures for products, materials, components, assemblies, tools and equipment, chiefly dealing with product safety.
USDA	United States Department of Agriculture – The United States federal executive department responsible for developing and executing U.S. federal government policy on farming, agriculture, and food.
UV	Ultra-Violet
VCT	Vinyl Composition Tile
VOCs	Volatile Organic Compounds – Refers to organic chemical compounds which have significant vapor pressures and which can affect the environment and human health.
VTC Rooms	Video-Teleconferencing Rooms
VWC	Vinyl Wallcovering

General References

Following is a list of U.S. Air Force Instructions and Manuals, and other documents which were used to write this guide and are very useful for further information on the subject matter in this guide.

- **UFC 3-120-10 -** Interior Design, dated 15 June, 2006, including Change 1, dated July, 2007; http://www.wbdg.org/ccb/DOD/UFC/ufc_3_120_10.pdf

- **UFC 3-120-01 -** Air Force Sign Standard, dated 6 Feb, 2003; http://www.wbdg.org/ccb/DOD/UFC/ufc_3_120_01.pdf

- **ETL 07-4 -** Air Force Carpet Standard, dated 28 March, 2007; http://www.wbdg.org/ccb/AF/AFETL/etl_07_4.pdf

- U.S. Air Force Interior Design Standards, dated July 2002; http://www.wbdg.org/ccb/AF/AFDG/interiordesign.pdf

Building Type References

The following list of U.S. Air Force Building Standards is provided for reference and further study on specific facility types.

All of these standards can be found at http://www.afcee.af.mil/resources/designandconstruction/

- Air Traffic Control Tower and Radar Approach Control Facility Design Guide, dated 15 November, 2001; http://www.wbdg.org/ccb/AF/AFDG/atct_racf.pdf
- U. S. Air Force Dining Facilities Design Guide, Not dated; http://www.wbdg.org/ccb/AF/AFDG/diningfacilities.pdf
- U.S. Air Force Family Housing Guide for Planning, Programming, Design and Construction, dated August 2004; http://www.wbdg.org/ccb/AF/AFDG/familyhousing.pdf
- U.S. Air Force Fire Station Design Guide, dated 1997; http://www.wbdg.org/ccb/AF/AFDG/firestation.pdf
- Air Force Services Facilities Design Guide: Fitness Centers, dated 30 December, 2005; http://www.wbdg.org/ccb/AF/AFDG/fitguide.pdf
- Air Force Center for Environmental Excellence – Facility Planning and Design Guide: HAZMART (Hazardous Material Pharmacy) dated 1 March, 1999; http://www.wbdg.org/ccb/AF/AFDG/hazmatdg.pdf
- U.S. Air Force Interior Design Standards dated July 2002; http://www.wbdg.org/ccb/AF/AFDG/interiordesign.pdf
- U.S. Air Force Base Legal Facilities Design Guide, Not dated; http://www.wbdg.org/ccb/AF/AFDG/legal.pdf
- U.S. Air Force Munitions Facilities Standards Guide, Volume I, dated 31 May, 2004; http://www.wbdg.org/ccb/AF/AFDG/munitions1.pdf
- U.S. Air Force Munitions Facilities Standards Guide, Volume II: Munitions Facilities Assessment Checklists, dated 31 May, 2004; http://www.wbdg.org/ccb/AF/AFDG/munitions2.pdf

Building Type References

- Air Mobility Command - U.S. Air Force Office of Special Investigations Facilities Design Guide, dated May 1995; http://www.wbdg.org/ccb/AF/AFDG/osifacilities.pdf
- U.S. Air Force Recruiting Office Standards, Not dated; http://www.wbdg.org/ccb/AF/AFDG/recruit.pdf
- U.S. Air Force Religious Facilities Design Guide, dated February, 2000; http://www.wbdg.org/ccb/AF/AFDG/religiousfacilities.pdf
- U.S. Air Force Temporary Lodging Facilities Design Guide, dated December, 2001; http://www.wbdg.org/ccb/AF/AFDG/temporarylodging.pdf
- U.S. Air Force Services Facilities Design Guide: Visiting Quarters, dated 29 June, 2005; http://www.wbdg.org/ccb/AF/AFDG/afsdg_4_724_01.pdf
- U.S. Air Force Unaccompanied Housing Design Guide, dated January, 2006; http://www.wbdg.org/ccb/AF/AFDG/unaccompaniedhousing.pdf
- ADA Accessibility Guidelines for Buildings and Facilities (ADAAG), dated (1991, as amended through 2002) http://www.access-board.gov/adaag/html/adaag.htm
- Uniform Federal Accessibility Standards, dated August 7, 1984 http://www.access-board.gov/ufas/ufas-html/ufas.htm

APPENDIX N

PROJECT CLOSEOUT (RED ZONE MEETING)

SUMMARY

Today's meeting established the financial status, as well as milestones, estimated completion dates and OPRs for all the actions necessary to complete the project in question.

A "fill-in the blank" summary of key elements of this data is provided below for your annotation:

COMPLETION MILESTONES

Inspections

- Fire _____
- Safety _____
- Pre-final _____
- Final _____

BOD _____

Furniture installation _____

Comm installation _____

DD Form 1354 compl _____

As built delivery _____

O&M manual delivery _____

Contract complete _____

User move-in _____

Ribbon cutting _____

Financial completion _____

HQ ACC/CEC

129 Andrews St, Suite 102
Langley AFB VA 23665
(757) 764-3108 (DSN 574) Voice
(757) 764-5339 (DSN 574) Fax

ACC MILCON Execution Goals

President's Budget project RTA: 31 Aug FY-1
President's Budget project award: 31 Dec FY

Congressional insert project RTA: 1 Jul FY
Congressional insert project award: 31 Aug FY

Complete projects within original budget

Complete projects within original schedule

Physical completion within 90 days of BOD

Financial closeout within 180 days of BOD

AIR COMBAT COMMAND

CONSTRUCTION DIVISION

RED ZONE MEETING

BRINGING TOGETHER THE TEAM TO COMPLETE A MILCON PROJECT

BASE: _____

PROJECT: _____

ACC Program Mgr: _____

Date: _____

RED ZONE MEETING

What is the Red Zone Meeting?

We're meeting today to discuss, define and achieve consensus on the construction and financial status of a MILCON project. The ultimate goal is to build a schedule of events necessary to achieve project completion and financial closeout. The meeting is held 60 days before anticipated beneficial occupancy.

Why is it called "The Red Zone"?

The name refers to the term used in football to describe the effort required to get the ball the last 20 yards into the end zone. Once you get inside the 20, things start to tighten up, and it takes coordination and a concerted team effort to achieve the goal of getting 6 points.

How does that relate to this project?

Typically, getting to within 60 days of beneficial occupancy is easy. The tough part comes with the final push to complete the project, get the users moved in, finish the financial end of the business and close it out.

Who should be here today?

ACC/CEC Prog Mgr	CoE Program Mgr
Contractor	User
CE Ops Flt	CE Fire Prot Flt
CE Eng Flt	CoE Resident Eng
Communications	Contracting Officer
A/E of Record	

How will this meeting be run?

The HQ ACC/CEC program manager will chair this meeting, and guide the discussion in two main areas; financial and construction status. Key project elements in these areas will be discussed, and consensus achieved on remaining balances for the project funding accounts. Responsibilities will also be assigned for specific actions relative to project completion required to achieve financial completion. The results will be recorded by the ACC program manager and become a part of the project file.

Financial Status

Knowing the funding status is crucial to building the plan to complete and closeout this project. We determine these amounts from the following calculations:

Contract funding

Contract award amount	$ _____
Executed modifications	+ $ _____
Total contract funding	$ _____
Progress payments	- $ _____
Value, unplaced work	$ _____

Contingency funding

Contingency @ award	$ _____
Contingency replenishment	+ $ _____
Total contingency	$ _____
Executed modifications	- $ _____
Unobligated contingency	$ _____

Any use of remaining contingency funds requires ACC approval after this date.

SIOH funding

SIOH @ award	$ _____
SIOH after award	+ $ _____
Total SIOH	$ _____
Billed to date	- $ _____
Unobligated SIOH	$ _____

Construction Status

In order to determine the specific actions required to finish this project and assign responsibilities for those actions, it is necessary to establish the current completion schedule:

Notice to proceed:_____

Original duration:_____

Original contract completion:_____

Executed time extensions:_____

New contract completion date:_____

Key project completion milestones:

Mech test & balance	Ribbon cutting date
Landscaping compl	As built delivery
Final cleaning	O&M manual delivery
Fire inspection	Punchlist completion
Safety inspection	Physical completion
Pre-final inspection	DD Form 1354 signed
BOD	Final invoice
Furniture delivery	Final payment
Equipment delivery	Release of claims
Comm installation	Final SIOH billing
O&M training	Return of unobl funds
User move-in	Financial completion

The ACC program manager will record the agreed to dates for all of the above as well as the OPR for meeting these dates.

SAMPLE

Red Zone Meeting Checklist

Date:_____

Contract No.	
Description / Location	
Contractor	
Contracting Officer	

Action	Completion Milestone	Ö
Inspections		
Fire		
Safety		
Pre-final		
Mechanical Test & Balance		
Commissioning		
Landscaping Complete		
Beneficial Occupancy Date (BOD)		
Furniture Installation		
Comm Installation		
As-Built Contract Drawings		
Provide all O&M manuals, tools, shop drawings, spare parts, etc. provided to customer		
Provide Warranty documents to Customer		
Contract completion		
Final Inspection		
User move-in		
DD Form 1354, Transfer of Real Property completed & signed		
Ribbon cutting		
DD Form 2626 - Construction Contractor Performance Evaluation		
DD Form 2631 – A-E Performance Rated after Construction		
Final Payment Completed		
Release of Claims		
Return of Unobligated Funds		
Move Project from CIP to General Ledger		
Financial completion		

APPENDIX O

PREPARING AS-BUILT DRAWINGS

Preparing As-Built Drawings

Scope

This instruction covers preparing high-quality As-Built drawings to show changes made to the project during construction. As-Built drawings are an official record of the project at the time of construction completion. The original "as-designed" contract drawings and specifications are modified to show all additions, deletions and other changes made during construction. Accurate as-built drawings are very important for project operation and maintenance, and future modifications, particularly for plumbing and electrical systems, which are hidden from view.

References

- *CADD/GIS Technology Center Architectural, Engineering, and Construction (A/E/C) CADD Standards[http://tsc.wes.army.mil/products/standards/aec/intro.asp]*

Definitions.

See the *Glossary of Engineering Quality System Terms and Acronyms [REFQ10L0]*, for definitions.

Contractor Markups - Drawings that are marked and annotated to show the project As-Built and constructed by the contractor. They are part of the working as-built set.

As-Built Drawings - The amended "As-designed" drawings revised to show the project as the contractor built and constructed it. The revisions from Contractor Markups and field inspection notes are transferred to the Final as-built set of drawings. The final as-built drawings include modifications during construction, field requested changes, shop drawing modifications, and contractor designs.

As-Constructed Drawings - These are As-Built Drawings for Civil Works Projects. The term As-Built used in these instructions is synonymous.

Working As-Built

The Contractor shall maintain 2 sets of paper drawings and specifications (marked-up prints) to track changes, additions or deletions from the original design during construction. Working as-built drawings shall be kept current on a weekly basis and at least one paper set of as-built drawings shall be available on the jobsite at all times.

Areas of Concern

There are some general items that need some special checking to ensure that the marked-up prints are complete and accurate. The working as-built shall show, but shall not be limited to, the following:

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(1) The actual location, kinds and sizes of all of existing and new utility lines, especially underground lines within the construction area. Measurements will be shown for all change of direction points and all surface or underground components such as valves, manholes, drop inlets, clean outs, meters, etc. The descriptions of exterior utilities shall include the actual quantity, size, and material of the utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

(2) The location and dimensions of any changes within the building structure.

(3) Layout and schematic drawings of electrical circuits and piping.

(4) Correct dimensions and details transferred from shop drawings.

(5) Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

(6) Actual location of anchors, construction and control joints, etc., in concrete.

(7) Changes in location of equipment and architectural features.

(8) Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints. Cross out such words and phrases as "optimal requirement," "or equal," etc., and list specifically the items of material provided.

(9) Unusual or uncharted obstructions that are encountered in the contract work area during construction.

(10) Location, extent, thickness, and size of stone protection particularly where it will be normally submerged by water.

(11) Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

(12) The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

(13) If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

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(14) Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems

(15) Changes or modifications that result from the final inspection.

Mark-up Guidelines

The following information is provided to improve the quality of the marked-up prints and thereby facilitate preparation of final as-built drawings. The most important guideline is that the marked-up changes on the prints shall be complete and understandable. Visits to the site by the draftsperson, or visits to the draftsperson by the construction superintendent, can be minimized by providing complete and understandable marked-up prints.

(1) Frequently use written explanations on As-Built drawings to describe changes - do not rely totally on graphic means to convey the revision.

(2) Legibility of lettering and digit values shall be precise and clear when marking prints, and clarify ambiguities concerning the nature and application of change involved.

(3) Wherever a revision is made, make changes to affect related section views, details, legend, profiles, plans and elevation views, schedules, notes and call-out designations, and mark accordingly to avoid conflicting data on all other sheets.

(4) When changes are made, cross out all features, data and captions that relate to that revision.

(5) When changes are required on small-scale drawings and in restricted areas, suggest large-scale inserts be drawn or sketched, with leaders to the location where applicable.

(6) Provide a legend if colors other than the "base" colors of red, green, and blue are used. Be sure descriptive markings conform to legend symbols shown.

(7) Be sure to add and denote in legend, any additional equipment or material facilities, service lines, etc., incorporated under As-Built Revision if not already shown in legend.

(8) When attached prints (or sketches) are provided with marked-up print, indicate whether:

   a. Entire drawing shall be added to contract drawings or

   b. Whether the contract drawings shall be changed to agree, or

   c. For reference only to further details not required for initial design.

(9) Make the comments on the drawing complete without reference to letters, memo's, or materials that are not also a part of the As-Built. Annotating the drawing, “Per Change Order #42,” means nothing when the actual change order states, “added an additional 12 duplex” outlets or similar statements. The same is true when the drawing is marked,

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"changed per COE instructions." This office and ultimately the using organizations must know what was changed, how it was changed, where the items(s) were relocated to and how the affected connections were altered. Change Orders usually do not provide information as to how the facility was changed, only what was changed.

(10) The markups shall be accomplished on blue or black line prints of the **most current originals**.

(11) Shop drawings are to be incorporated into the As-Built drawings. They will be provided in electronic CADD file format and conform to the Sacramento District CADD Standards and the A/E/C CADD Standards. Hand drawn or plotted paper shop drawings **will not** be accepted as submittals.

The hand drawn or plotted paper shop drawings are **not** usable as original drawings for several reasons.

a. Deleted

b. The drawings are not of an adequate scale or are drawn to no scale and are not transferable to the CORPS drawings due to lack of information.

c. The limited numbers of reproducible shop drawings that have been received have not been on the Corps of Engineers standard sheets sizes making it difficult to convert these drawings to standard COE drawings.

Any drawing provided by non-COE sources will be drawn in CADD. Sheets shall be drawn at the same scale as similar drawings in the set (example: Fire alarm systems shall be drawn to the same scale as the plumbing or electrical drawings). The drawing shall meet the same standards required for the rest of the drawings set. Sheet number, detail number, etc shall tie details and sketches to existing drawings.

FINAL AS-BUILT DRAWINGS

The contractor will transfer the changes from the working as-built marked prints to the original electronic CADD files. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The Resident Engineer and the Contractor will jointly review the working as-built marked prints, printouts from working as-built CADD file drawings, and final as-built drawings for accuracy and completeness, prior to submission of each monthly pay estimate. Monthly review of working as-built CADD printouts shall at minimum cover all sheets revised since the previous review.

DRAFTING STANDARDS

The Corps requires that standard professional engineering drafting practices be utilized in correcting the original electronic CADD drawings to show as-built conditions. In general, the letter styles, line thickness, and scale will be the same as the original drawings. When shop drawings or other sheets are added, they will be drawn in electronic CADD.

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CADD Standards: File Naming Convention will be maintained on all existing CADD files and followed for any new files added. The Contractor shall revise CADD files as-built drawing layers, to show the as-built conditions during the prosecution of the project. All as-built "triangle" changes shall be on a separate single layer, using a single color, with an associated medium pen width.

- Name the layer AS-BUILT for AutoCAD files (DWG).
- MicroStation files (DGN) use:
  - Level #63
  - Level/Layer Name contains: ANNO-REVS
  - Level/Layer Description: Revisions

The following specific requirements apply to the preparation of as-built drawings:

The Title Sheet (first sheet): The first sheet will be labeled with the word AS-BUILT. The words CONTRACT NUMBER and the actual contract number will be entered as shown on attachment 1. The contract number contains the Fiscal Year, the letter C (for construction), and the sequence number (example: 96-C-0000). No other work need be done on this sheet unless sheets are being added or deleted from the List of Drawings or other actual changes are made on this sheet. (See Attachment 1.)

The second and subsequent sheets: All the sheets following the title sheet will be labeled with the AS-BUILT stamp. (See Attachment 2.)

Signature representation (CADD files only): All signatures that appear on the approved original design drawings need to be represented on all the electronic as-built files. The format for these are /s/Name (i.e. /s/Raymond Dennis). The only name that does not require the /s/ is the District Commander's name that appears only on the cover sheet (the title sheet). (See Attachments 1 & 2.)

Revisions Block entries: Those sheets, which have no changes, will only be labeled AS-BUILT as described above. Those sheets which have changes shown on them will have REVISED AS-BUILT entered in the first available space. This will be revision one and a number 1 will be entered in the triangle at the beginning of that line. In the event the sheet has already been revised and a number and revision appear in the revision lines the next sequential number will be used. Normally the first entry is made in the first line. The completed originals CADD file drawings will be reviewed for accuracy and initialed by the Contractor. (See Attachments 2 & 3.)

Marking Revisions: Place an equilateral triangle (3/8" per side) near the area revised for all changes. One triangle may be placed near the table or detail title where several items in a table or detail are changed or completely redrawn. This same method may be used for general revisions to floor plans and system plans (plumbing, electrical, a/c, heating); when a major portion of the drawing is changed, the triangle may be placed near the diagram, detail, section or plans title. A triangle will be placed near each item when only a few items are revised, added or

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deleted. The triangles will contain the same number as the As-Built revision on that sheet. (See Attachment 4.)

Revision Annotations:

Deletion - to show an item was not installed, cross the item out on the drawing along with any associated devices, connecting lines, ducts, pipes etc., including notes and dimensions. To show a detail is not being used, box the detail and letter NOT USED across the detail. A box will be drawn on the sheet with an X as shown in Attachment 5. The words NOT USED will be in heavy block lettering a minimum of 5/8" high. Place a triangle and revision number inside the box where notes are indicated as not being used.

Notes - draw a line thru the note or line item in a table in lieu of erasing the line item or note. A triangle and number will be placed near the deleted item.

Additions - show a new or additional item or items and associated connections made if the print indicates such connections. A triangle and number will be placed near the new item. All lettering **will conform** to the existing lettering on each sheet.

Relocations - draw the item in the new location and erase it from the old location. All connections will be transferred if applicable, such as wiring, piping, and ducts. Revision triangles with appropriate number will be shown at the new and old location.

Drawing continuity: The applicable drawings shall be marked-up when a change was made, although this will not always be the case. Final responsibility for drawing continuity is with the person doing the As-Built. When one floor plan indicates a wall, room, doors etc., has been changed, the same change shall be made on all other applicable drawings. When the change is applicable to only one discipline such as electrical and does not directly affect other discipline sheets, a note may be added to other discipline sheets such as "See sheet _____ for As-Built Conditions."

Shop drawings: When shop drawings are added to the original contract drawing set they need to be appropriately labeled with the Sacramento District file number, and discipline and sequence sheet number. The Index of Drawings will also need to be revised to show the additional sheet (s) with the appropriate sheet title. In the case where the shop drawing are smaller than the Corps standard sheet size (i.e. 8.5"x11" or 11"x17" etc.) the sheets will be cut into a standard Corps sheet size border sheet and appropriately labeled. (For additional information refer to Mark-up Guidelines, Shop drawings above.)

Distribution

Archives Unit

Contractor*

Resident Engineer*

Specification Engineer

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Ownership

The Archives Unit [Raymond.E.Dennis@usace.army.mil?Subject=INSP05L0-Preparing As-Built Drawings] is responsible for ensuring that this document is necessary and that it reflects actual practice.

Activity Preface

These tasks are performed whenever changes, additions or deletions from the original "as-designed" contract drawings and specifications are made during construction.

Prior Activity

Creation, Packaging, and Delivery of Project Documents [PROP09L0]

Contractor

1. Print two sets of paper drawings and specifications for working as-built.

   The Contractor shall maintain 2 sets of paper drawings and specifications (marked-up prints) to track changes, additions or deletions from the original design during construction.

2. Mark working as-built set to show changes, additions or deletions.

   Place an equilateral triangle (3/8" per side) near the area revised for all changes. One triangle may be placed near the table or detail title where several items in a table or detail are changed or completely redrawn. This same method may be used for general revisions to floor plans and system plans (plumbing, electrical, a/c, heating); when a major portion of the drawing is changed, the triangle may be placed near the diagram, detail, section or plans title. A triangle will be placed near each item when only a few items are revised, added or deleted. The triangles will contain the same number as the As-Built revision on that sheet. (See Attachment 4.)

   Changes, additions or deletions **will immediately** be noted on each of the working as-built set by redline process. **No other** marks, doodles, notes, or annotations shall be put on these sets of working as-built prints. All changes from the contract plans, which are made in the work, or additional information which might be uncovered in the course of construction will be accurately and neatly recorded as they occur by means of details and notes.

   All changes and/or required additions to the paper prints will be clearly identified in color contrasting to black, as follows:

   Colors shall be the "base" colors of red, green, and blue. Color code for changes shall be as follows:

   (1) Deletions (red) - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders.

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(2) Additions (Green) - Added items shall be drawn in green with green lettering in notes and leaders.

(3) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes shall be in blue.

The working as-built sets will be annotated in as much detail as necessary to clarify exactly what construction changes were performed.

3. Transfer the changes from the working as-built marked prints to the "as-designed" electronic CADD files.

   The contractor will transfer the changes from the working as-built marked prints to the original electronic CADD files on a monthly basis. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project).

If Project feature complete, goto task #4. Otherwise, goto task #2.

4. Submit As-Built drawings for review.

   The contractor shall submit the Final As-built conditions on a new CD to the Resident Engineer in the customer specified electronic format as a Government, District Office Approval (G, DO) required submittal.

Resident Engineer

5. Review As-Built drawings.

   The Resident Engineer and the Contractor will jointly review the working as-built marked prints, printouts from working as-built CADD file drawings, and final as-built drawings for accuracy and completeness, prior to submission of each monthly pay estimate. Monthly review of working as-built CADD printouts shall at minimum cover all sheets revised since the previous review.

If As-built OK, goto task #7. Otherwise, goto task #6.

6. Note required corrections on submittal and return to Contractor.

Goto task #3.

7. Notify Contractor of submittal acceptance.

If Final Submittal, End of activity; Goto *Managing As-Built & As-Constructed Drawings [PROQ08L0]*. Otherwise, goto task #2.

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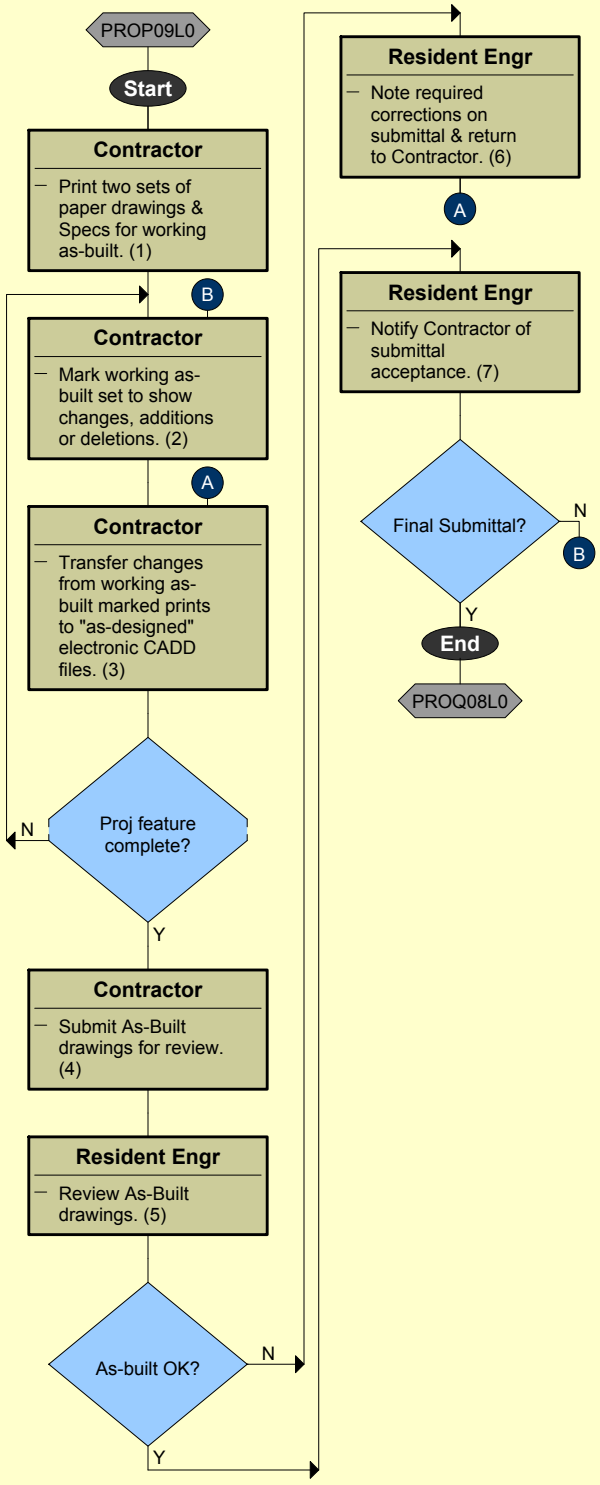
Flow Chart

Preparing As-Built Drawings



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PRIMARY LOCATION

ALTERNATE LOCATION

AS-BUILT
CONTR. NO: XX-C-XXXX

AS-BUILT
CONTR. NO: XX-C-XXXX

AS-BUILT
CONTR. NO: XX-C-XXXX

Sheet reference number:
SHT #
SEQ#

BASE_NAME STATE
PROJECT_TITLE_1
PROJECT_TITLE_2

SHEET_NAME
SHEET_NAME_2
SHEET_NAME_3

Approved Functional Adequacy /s/PRINTED NAME MM/DD/YY Title Date:	Designed by DESIGNER	Drawn by DRAFTER	Approved /s/PRINTED NAME MM/DD/YY Chief, Engineering Division Date:
Prepared by A/E NAME AND ADDRESS /s/PRINTED NAME MM/DD/YY Title Date:	Spec No. SPEC	Design File No: FILE	Prepared Under the Direction of COMMANDERS NAME Col. Corps of Engineers District Engineer
	File Name FILE_NAME	Plot Date PLOT_DATE	

UPDATE

Attachment 1

2

1

Initals of person checking revisions
Initals of person doing revisions

PRIMARY LOCATION

ALTERNATE LOCATION

AS-BUILT

AS-BUILT

Sheet reference number:
SHT#
SEQ#

BASE_NAME STATE
PROJECT_TITLE_1
PROJECT_TITLE_2
SHEET_NAME
SHEET_NAME_2
SHEET_NAME_3

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

A/E NAME AND ADDRESS

Designed by: DESIGNER		Date: DATE_APPROVED	Rev. REV_#
Dwn by: DRAWN_BY	Ckd by: CHECKED_BY	Design file no: FILE_NO.	
Reviewed by: REVIEWED_BY		SPEC. No.: SPEC_NO	
Submitted by: SIGNATURE CHIEF		File name: FILE_NAME Plot date: PLOT_DATE Plot scale: PLOT_SCALE	

Symbol	Description	Date	Approved
1	DISCRIPTION1	DATE1	APPROVAL1
2	DISCRIPTION2	DATE2	APPROVAL2
3	DISCRIPTION3	DATE3	APPROVAL3
4	DISCRIPTION4	DATE4	APPROVAL4
5	DISCRIPTION5	DATE5	APPROVAL5
6	DISCRIPTION6	DATE6	APPROVAL6
7	DISCRIPTION7	DATE7	APPROVAL7
8	DISCRIPTION8	DATE8	APPROVAL8

US Army Corps
of Engineers
Sacramento District

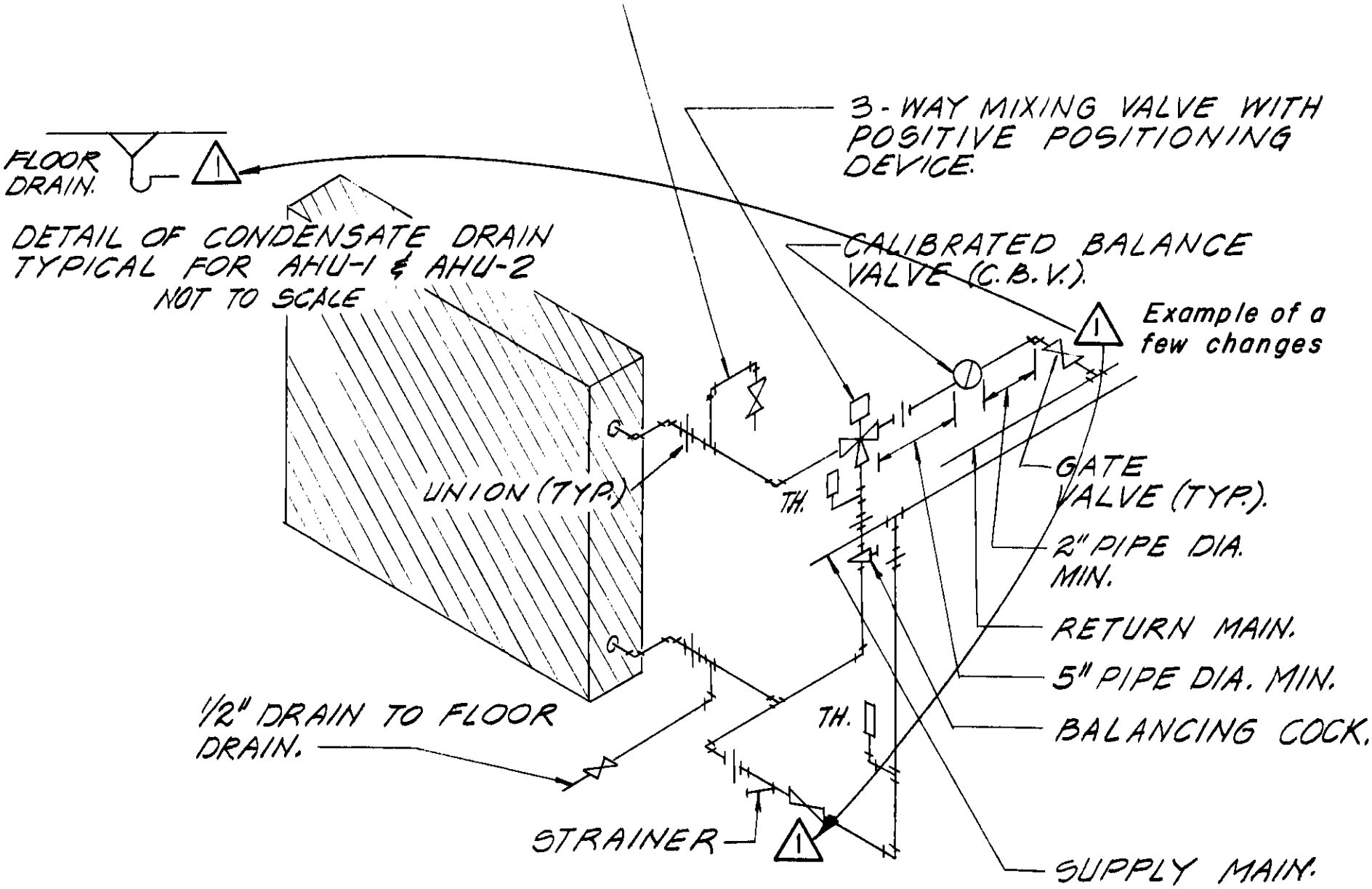
1

US Army Corps
of Engineers
Sacramento District

Symbol	Description	Date	Approved
1	REVISED AS-BUILT	MM/DD/YY	RD

Initals of person checking revisions
Initals of person doing revisions

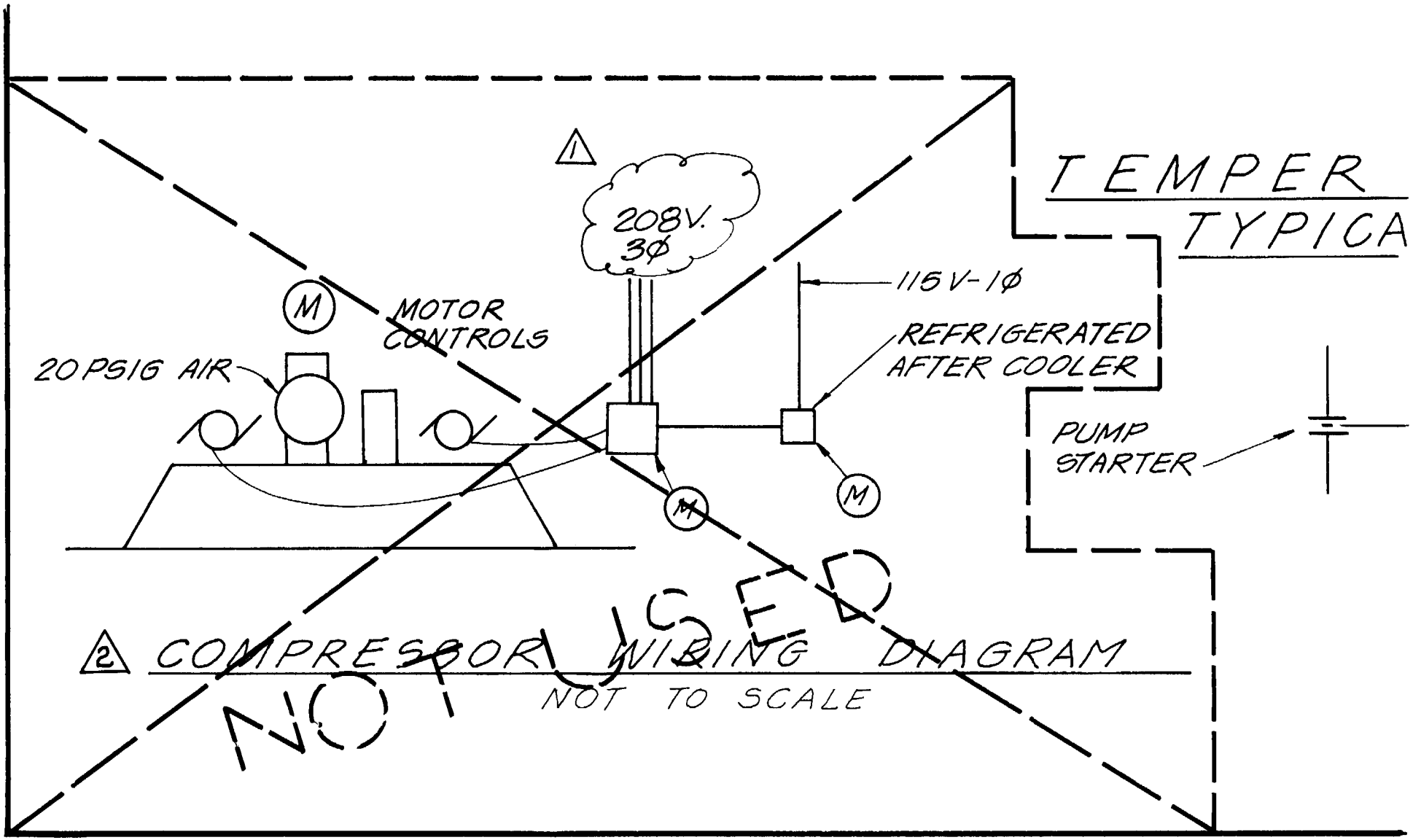
Attachment 3



TYPICAL CONNECTIONS TO CHILLED WATER COILS.

NOT TO SCALE

Example of general revisions

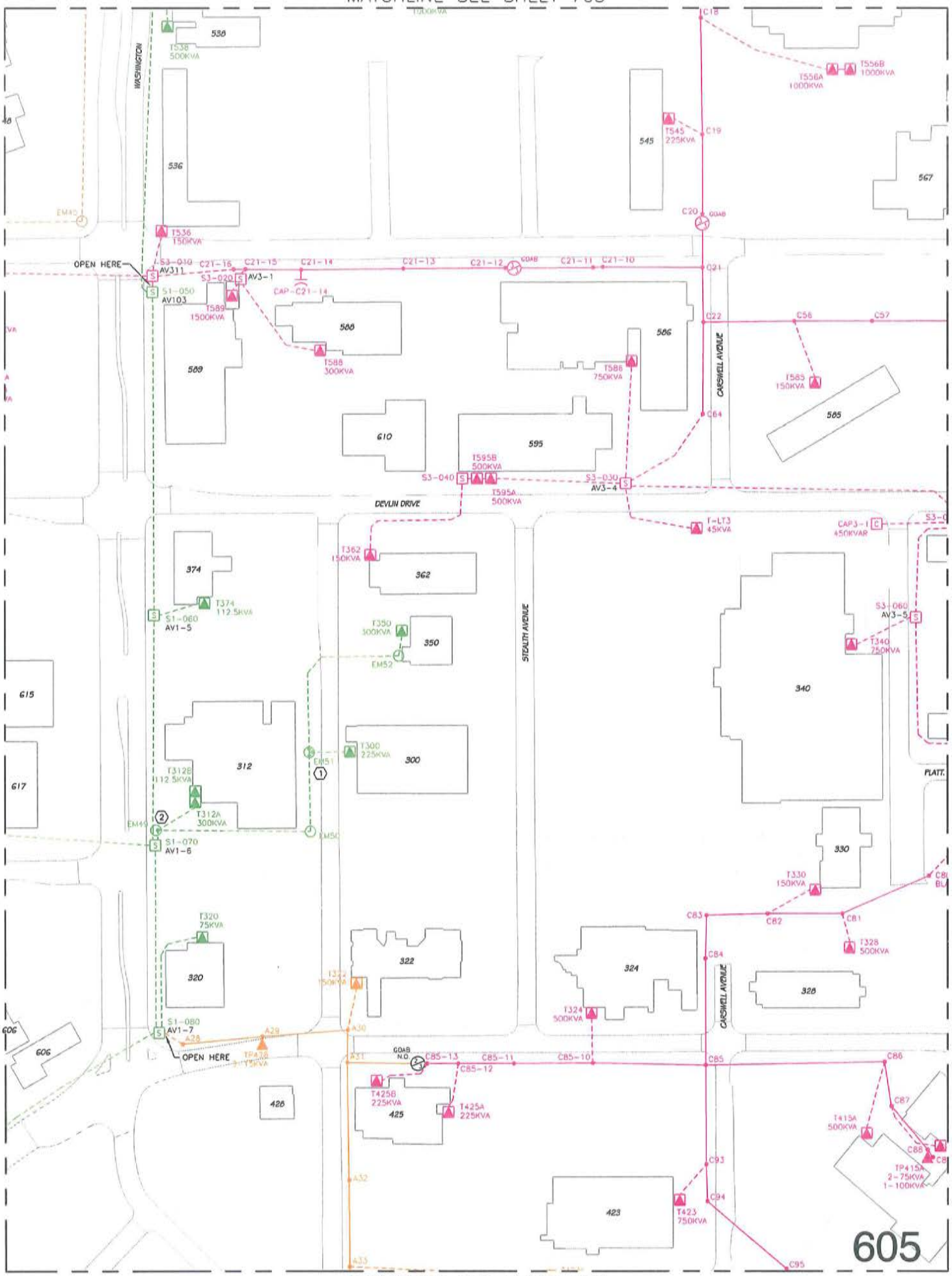


When an entire Detail, Section or View has been deleted it is indicated. Solid heavy lines are drawn on the back side of the sheet. "VOID" or "NOT USED" is lettered on the front. Dashed lines shown here for clarity.

APPENDIX P

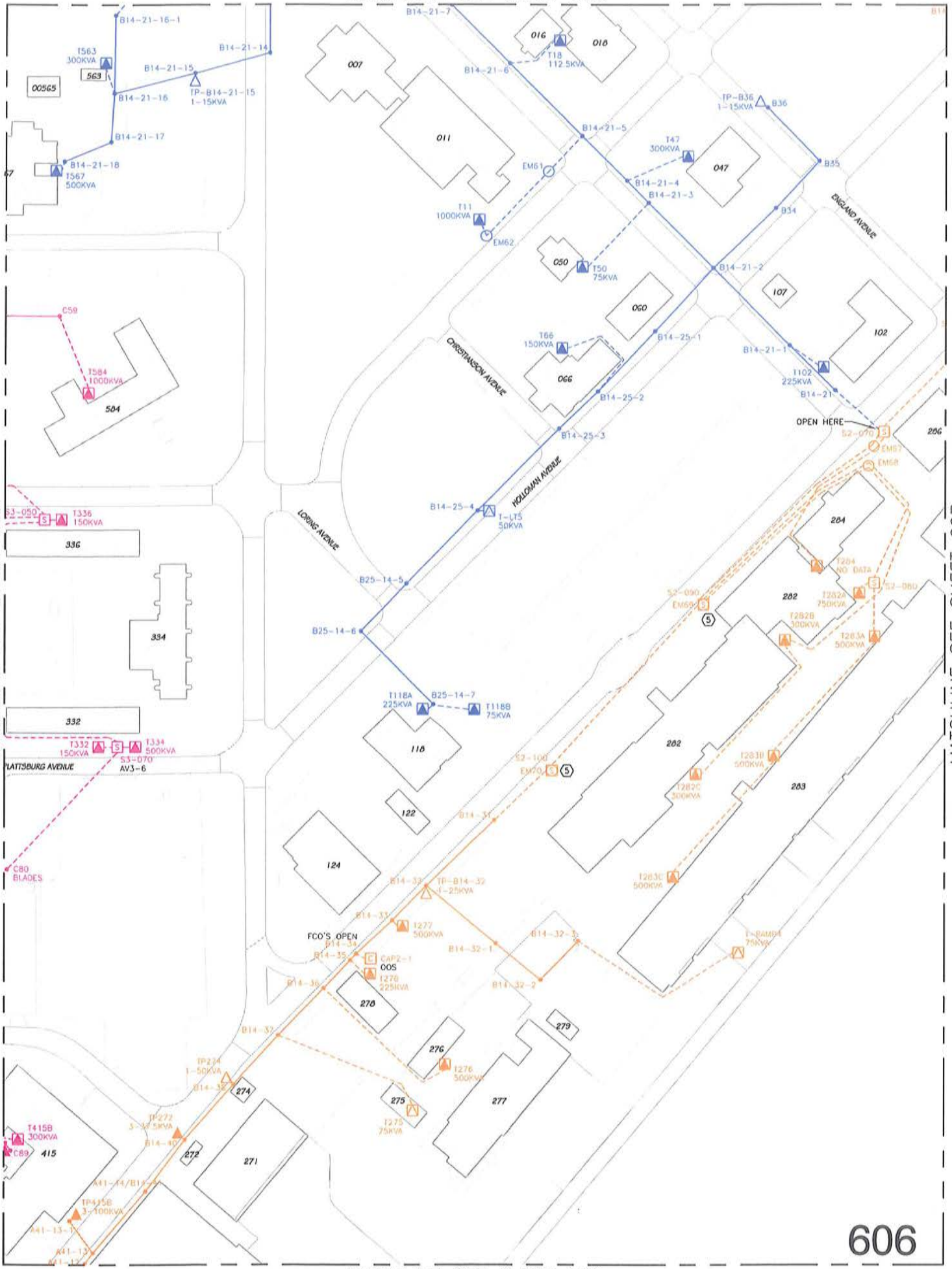
ELECTRICAL PRIMARY MAPS & ONE-LINE

MATCHLINE SEE SHEET 705

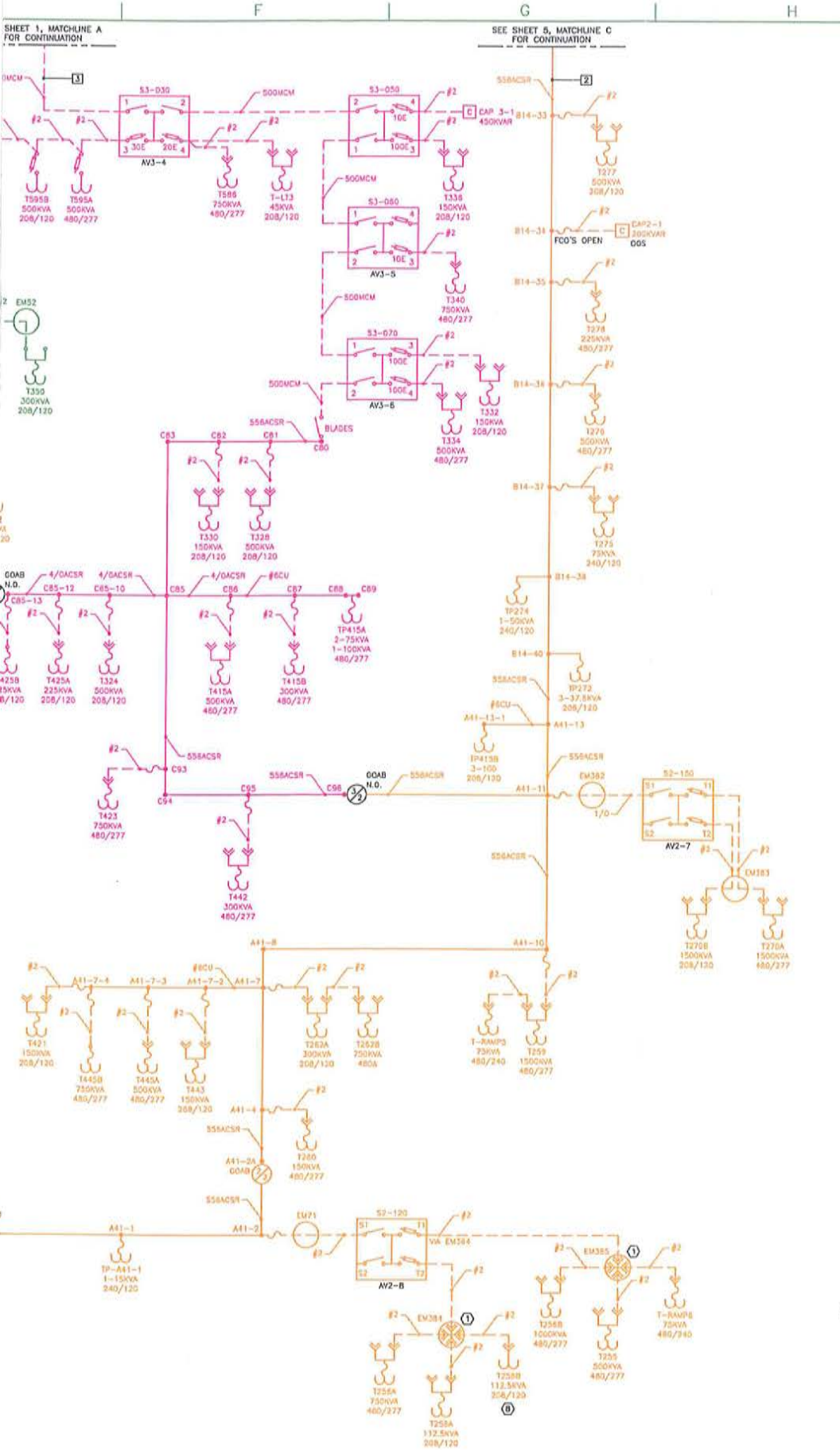


MATCHLINE SEE SHEET 505

MATCHLINE SEE SHEET 706



MATCHLINE SEE SHEET 506



GENERAL NOTES:

A. THIS DRAWING WAS DEVELOPED BY FIELD WALKDOWNS OF THE PRIMARY DISTRIBUTION SYSTEM AND CAN CONTAIN ERRORS. OPEN POINTS BETWEEN FEEDERS MIGHT BE DIFFERENT THAN SHOWN HERE. CHANGES TO THE SYSTEM MIGHT HAVE OCCURRED AFTER THE ISSUANCE OF THIS DRAWING. DO NOT RELY SOLELY ON THIS DRAWING FOR CIRCUIT ISOLATION; ALWAYS FOLLOW ELECTRICAL SAFETY REQUIREMENTS SPECIFIED IN UFC 3-560-01.

B. ALL SWITCHES ARE CLOSED UNLESS STATED (N.O.) TO BE IN THE OPEN POSITION.

C. ALL UNDERGROUND CONDUCTORS ARE COPPER UNLESS NOTED OTHERWISE.

D. ALL OVERHEAD CONDUCTORS SHOW LINE SIZE AND MATERIAL (ACSR OR COPPER).

E. ALL PAD-MOUNTED TRANSFORMERS FED DIRECTLY FROM POLES HAVE CUT-OUTS ON POLE RISER.

F. ALL CABLES INTO AND OUT OF PAD-MOUNTED SWITCHGEAR OFTEN USE THE ASSOCIATED MANHOLE. REFER TO THE ELECTRICAL LAYOUT DRAWING FOR MANHOLE ROUTING INFORMATION.

KEYED NOTES:

1. LOAD JUNCTIONS INSIDE MANHOLE.
2. T-SPLICE INSIDE MANHOLE.
3. CONNECTION SOURCE NOT KNOWN.
4. COULD NOT LOCATE MANHOLE.
5. SWITCHGEAR INSIDE MANHOLE.
6. UNFUSED, UNPROTECTED TRANSFORMER.
7. UNFUSED TRANSFORMER PROTECTED BY UPSTREAM FCO.
8. UNFUSED TRANSFORMER PROTECTED BY UPSTREAM SWITCH.
9. NOT CERTAIN IF MANHOLES ARE USED.
10. CABLES FAILED – OUT OF SERVICE.

LEGEND:

- POLE-MOUNT TRANSFORMER
- PAD-MOUNT TRANSFORMER DEAD FRONT, FUSED, FEED-THROUGH
- PAD-MOUNT TRANSFORMER DEAD FRONT, NOT FUSED, FEED-THROUGH
- PAD-MOUNT TRANSFORMER DEAD FRONT, FUSED, NO FEED-THROUGH
- PAD-MOUNT TRANSFORMER DEAD FRONT, NOT FUSED, NO FEED-THROUGH
- PAD-MOUNT TRANSFORMER LIVE FRONT, FUSED, FEED-THROUGH
- PAD-MOUNT TRANSFORMER LIVE FRONT, NOT FUSED FEED-THROUGH
- PAD-MOUNT TRANSFORMER LIVE FRONT, FUSED
- PAD-MOUNT TRANSFORMER LIVE FRONT, NOT FUSED
- SOLAR POWER SYSTEM
- FUSE OR FUSE CUTOUT
- TERMINATION POINT
- BOLTED CONNECTION
- POLE
- J — JUNCTION CABINET (SECTIONALIZING CUBICLE)
- M — METER
- V — VOLTAGE REGULATOR
- MANHOLE
- MANHOLE WITH LOAD JUNCTIONS OR SEPARABLE SPLICES
- MANHOLE WITH T-SPLICES
- SPST SWITCH (BLADE SWITCH)
- OVERHEAD SWITCH (NUMBERS INDICATE FEEDER ON EITHER SIDE OF SWITCH)
- SWITCH FUSE
- CIRCUIT BREAKER
- 52 — MEDIUM VOLTAGE CIRCUIT BREAKER
- ACSR — ALUMINUM CONDUCTOR, STEEL REINFORCED
- CU — COPPER
- FCO — FUSED CUTOUT
- GOAB — GANG OPERATED AIR BREAK
- MCM — KCMIL
- N.O. — NORMALLY OPEN
- OOS — OUT OF SERVICE
- SHEET # / 0 — MATCHING DESIGNATION / SHEET NUMBER
- 3 — FEEDER DESIGNATOR
- OVERHEAD LINE
- UNDERGROUND LINE
- FEEDER 1
- FEEDER 2
- FEEDER 3
- FEEDER 4
- FEEDER 5
- FEEDER 6
- FEEDER 7
- FEEDER 8
- FEEDER 9

HUGHES ASSOCIATES

AIR COMBAT COMMAND

Rev	Description	Date	Approved
0	INITIAL ISSUE	06/23/14	ED

Designed by: ELD
Dwn by: RL
Chk by: ED
Date: 06/23/14
File Name: NELLISAFB-1001
Plot Date: 06/23/14
Plot Scale: N.T.S.
Drawing Number: NELLISAFB-1001-2

DEPARTMENT OF THE AIR FORCE
AIR COMBAT COMMAND

NELLIS AIR FORCE BASE
NEVADA

CONTRACT: GS-23-F-0107K
ORDER NUMBER: FA0021-12-F-0002

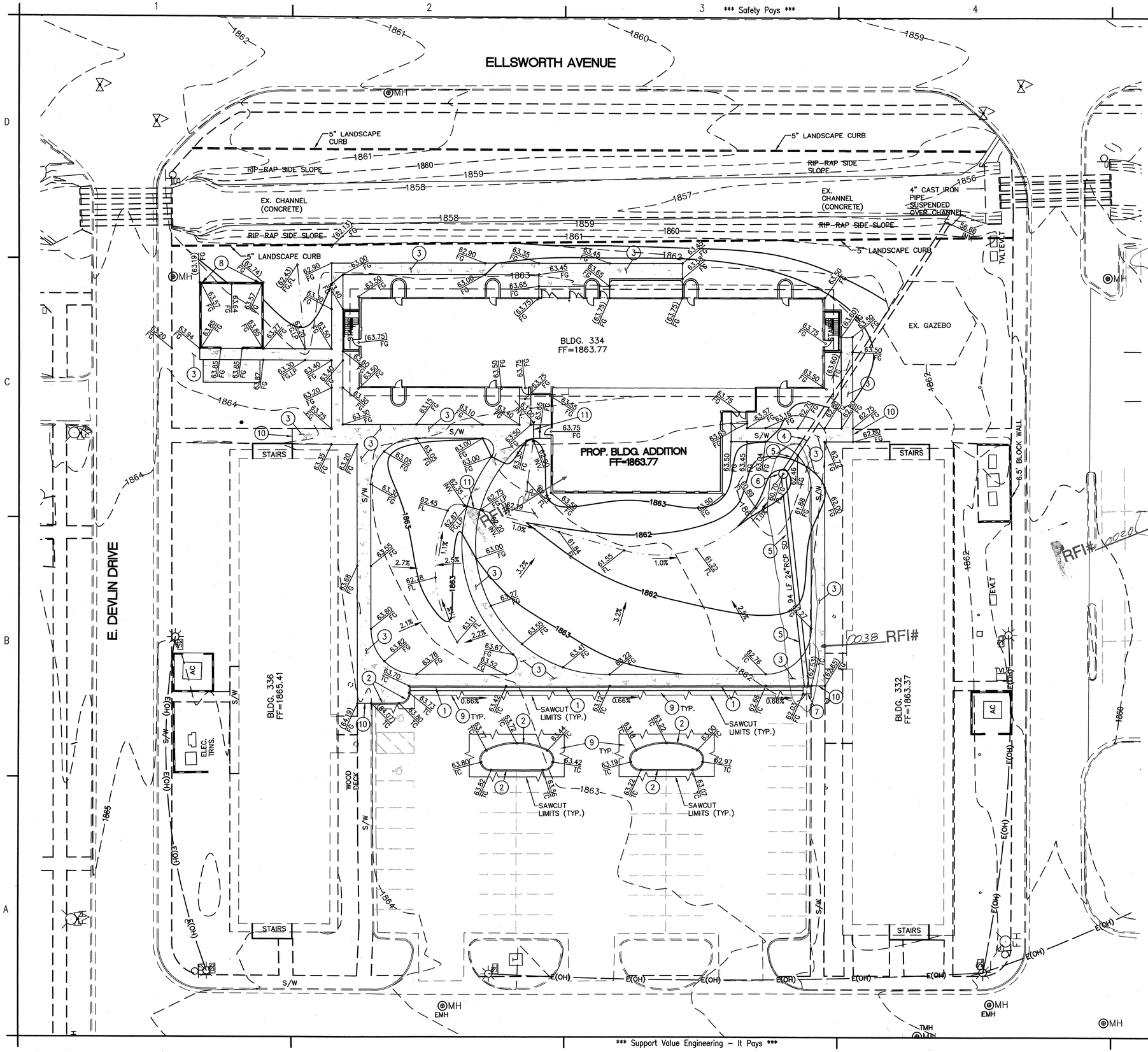
ELECTRICAL ONE-LINE DIAGRAM
PRIMARY ELECTRICAL DISTRIBUTION SYSTEM
NELLIS AIR FORCE BASE

Sheet Reference Number:

Sheet 2 of 9

APPENDIX

AS-BUILT BUILDING 334



SCALE: 1"=20'

US Army Corps of Engineers
Louisville District

CONSTRUCTION NOTES:

1. CONSTRUCT "L" TYPE CURB PER DETAIL 1, SHT. C-501.
2. CONSTRUCT "A" TYPE CURB PER DETAIL 2 SHT. C-501
3. CONSTRUCT SIDEWALK PER DETAIL 3 SHT. C-501.
4. CUT END OF EX. PIPE SQUARE AND INSTALL CONCRETE EXTENSION COLLAR PER DETAIL 4 SHT. C-501.
5. INSTALL 24" CLASS III RCP, SEE DETAIL 5, SHT. C-501 FOR TYPICAL TRENCH BACKFILL.
6. INSTALL NEW 60" DIA. MANHOLE w/ 24" DIA. GRATE COVER.
7. INSTALL NEW PRECAST 36"x36" DROP INLET.
8. PROVIDE WEEP HOLE IN BLOCK SCREEN WALL.
9. 2" AC PAVEMENT OVER 6" CLASS II AGGREGATE BASE.
10. MATCH EX. GRADE
11. INSTALL 3" PVC SIDEWALK DRAIN IN BOTTOM-HALF OF SIDEWALK.

GRADING NOTES:

1. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITION BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND INGRESS/EGRESS FROM SAID CONSTRUCTION.

2. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL EXISTING IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO THE SATISFACTION OF THE ENGINEER AND OWNER.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF ALL EXISTING UTILITY MANHOLES AND VALVE COVERS TO FINAL FINISH GRADES AS NECESSARY.

5. CONTRACTOR TO ENSURE POSITIVE DRAINAGE, NO PONDING ALLOWED. ALL SITE GRADING WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE SITE SOILS REPORT, INCLUDING BUT NOT LIMITED TO EXCAVATION, GRADING, AND COMPACTION.

6. CONTRACTOR SHALL DETERMINE THEIR OWN LIMITS OF EXCAVATION FOR FOOTINGS AND FOUNDATIONS.

BASIS OF BEARING:

S17°25'40"E BEING A BEARING FROM GPS 4 TO CONTROL POINT 229-9 PER NELLIS CONTROL NETWORK (NAD-83)

BENCHMARK:

GPS 4 – 3" BRASS CAP IN THE CONCRETE ISLAND, NORTHWEST OF THE INTERSECTION OF RICKENBACKEN AND WASHINGTON BOULEVARD

ELEVATION 1867.794 FEET (NAVD88)
NELLIS CONTROL NETWORK

UTILITY DISCLAIMER:

EXISTING UTILITY LOCATIONS & SIZES SHOWN HEREIN ARE FROM BEST AVAILABE RECORD INFORMATION AND ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY AND DETERMINE EXACT LOCATION, ELEVATION, SIZE, MATERIAL, PRESSURE, & CONDITION PRIOR TO THE COMMENCEMENT OF WORK. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREIN AND THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR SHOWN INCORRECTLY. ALL DISCREPANCIES MUST BE IMMEDIATELY REPORTED TO THE ENGINEER.

DATE OF SURVEY:

AUGUST, 2006 BY CARTER & BURGESS, INC.

TRUE NORTH

Mark	Description	Date	Appr.	Mark	Description	Date	Appr.

Designed by: MARK WEBER
Dwn by: M.V.W.
Ckd by: J.P.
Reviewed by: ROBERT D. BESANCON
Submitted by: DONALD J. YOUNG
Date: 15 OCT 07
Rev.
Design file no.
Drawing code:
File name: CG101.DWG
Plot date:
Plot scale: 1"=20'

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

Carter-Burgess
Carter & Burgess Inc.
777 Main St., Suite 1000
Fort Worth, TX 76102

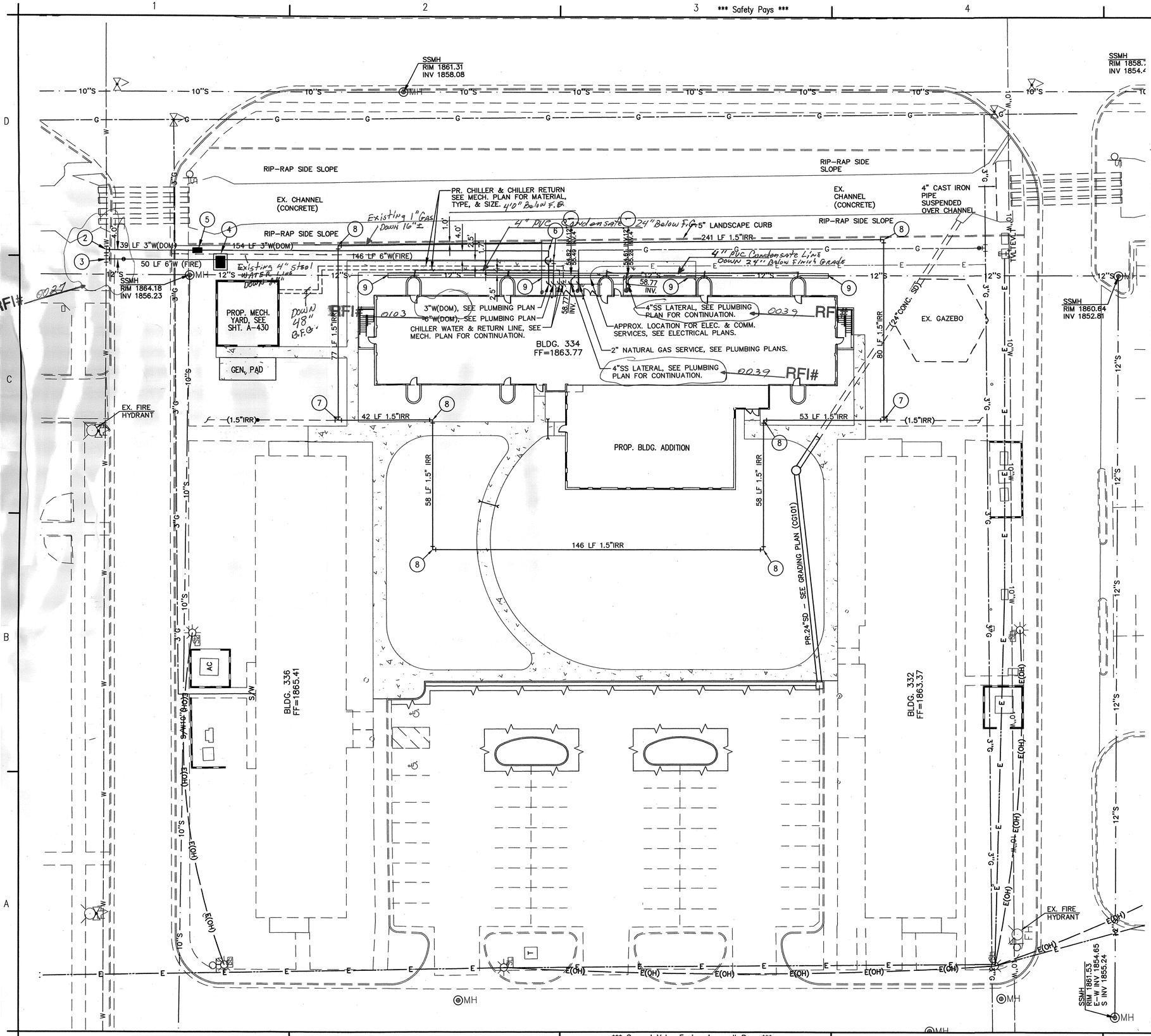
CBS PROJECT NO. 013881011

NELLIS AIR FORCE BASE
BRAC AFR TRAINING FACILITY, NEVADA
PROJECT NUMBER: RKMF093009
P2 NUMBER: 138159
FISCAL YEAR: 07

GRADING PLAN

Sheet reference number: CG101

Sheet 8 of 167



SCALE: 1"=20'

US Army Corps of Engineers
Louisville District

CONSTRUCTION NOTES:

1. INSTALL 45° WYE TYPE FLEXIBLE SEWER SERVICE SADDLE PER MANUFACTURER'S SPECIFICATIONS.
2. INSTALL 10"x 3" SERVICE SADDLE w/ CORPORATION STOP.
3. INSTALL 10"x 6" WET-TAP w/ 6" GATE VALVE.
4. CONSTRUCT 6" FEBCO "N" PATTERN DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) BACKFLOW PREVENTION DEVICE WITH "HOTBOX" ENCLOSURE (OR EQUAL), INSTALL PER MANUFACTURER'S SPECIFICATIONS.
5. INSTALL 3" FEBCO "N" PATTERN REDUCED PRESSURE PRINCIPAL ASSEMBLY (RPPA), IN "HOTBOX" ENCLOSURE (OR EQUAL) PER MANUFACTURER'S SPECIFICATIONS.
6. INSTALL 90° BEND WITH THRUSTBLOCK PER DETAIL 8, SHT. C-501.
7. CUT EX. IRRIGATION LINE AND INSTALL TEE FITTING.
8. INSTALL 90° BEND.
9. FOLLOWING INSTALLATION OF NEW SERVICE LATERALS, INSTALL REINFORCED CONCRETE ENCASE EX. 12" SEWER PER DETAIL 7, SHT. C-501.

BASIS OF BEARING:

S17°25'40"E BEING A BEARING FROM GPS 4 TO CONTROL POINT 229-9 PER NELLIS CONTROL NETWORK (NAD-83)

BENCHMARK:

GPS 4 – 3" BRASS CAP IN THE CONCRETE ISLAND, NORTHWEST OF THE INTERSECTION OF RICKENBACKEN AND WASHINGTON BOULEVARD

ELEVATION 1867.794 FEET (NAVD88)
NELLIS CONTROL NETWORK

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DATE OF SURVEY:

AUGUST, 2006 BY CARTER & BURGESS, INC.

TRUE NORTH

MARK V. WEBER, CIVIL, No. 15519, STATE OF NEVADA
Ex. 6/30/08
10/18/07

Mark	Description	Date	Appr.	Mark	Description	Date	Appr.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

Carter&Burgess
Carter & Burgess Inc.
777 Main Street
Fort Worth, TX 76102

C&B PROJECT NO. 012681011

Designed by: MARK WEBER
Dwn by: M.V.W.
Ckd by: J.P.
Reviewed by: ROBERT D. BESANCON
Submitted by: DONALD J. YOUNG
Date: 15 OCT 07
Design file no.
Drawing code:
File name: CU101.DWG
Plot date:
Plot scale: 1"=20'
Rev.

NELLIS AIR FORCE BASE
BRAC AFR TRAINING FACILITY, NEVADA
PROJECT NUMBER: RKMF093009
P2 NUMBER: 138159
FISCAL YEAR: 07

UTILITY PLAN

Sheet reference number: CU101

Sheet 7 of 167

006 DRAWINGS

US Army Corps
of Engineers
Sacramento District

RENOVATE 926 WG BUILDING 332

NELLIS AFB

NEVADA

PN: RKMF17-0065

Index of Drawings	
SHEET NUMBER	SHEET TITLE
G-001	COVER SHEET
G-101	PROJECT LOCATION AND HAUL PATH
C-101	DEMOLITION PLAN
C-102	SITE PLAN
AD101	FIRST FLOOR DEMOLITION PLAN
AD102	SECOND FLOOR DEMOLITION PLAN
AD103	THIRD FLOOR DEMOLITION PLAN
AD201	NORTH AND SOUTH ELEVATIONS - DEMOLITION
A-101	FIRST FLOOR PLAN
A-102	SECOND FLOOR PLAN
A-103	THIRD FLOOR PLAN
A-201	NORTH AND SOUTH ELEVATIONS
A-202	EAST AND WEST ELEVATIONS
A-620	DOOR SCHEDULE
I-610	FIRST FLOOR INTERIOR FINISH/COLOR SCHDULE
I-611	SECOND FLOOR INTERIOR FINISH/COLOR SCHDULE
I-612	THIRD FLOOR INTERIOR FINISH/COLOR SCHDULE
IF101	1ST FLOOR FURNITURE PLAN
IF102	2ND FLOOR FURNITURE PLAN
IF103	3RD FLOOR FURNITURE PLAN

DISTRIBUTION STATEMENT A
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US Army Corps of Engineers ®

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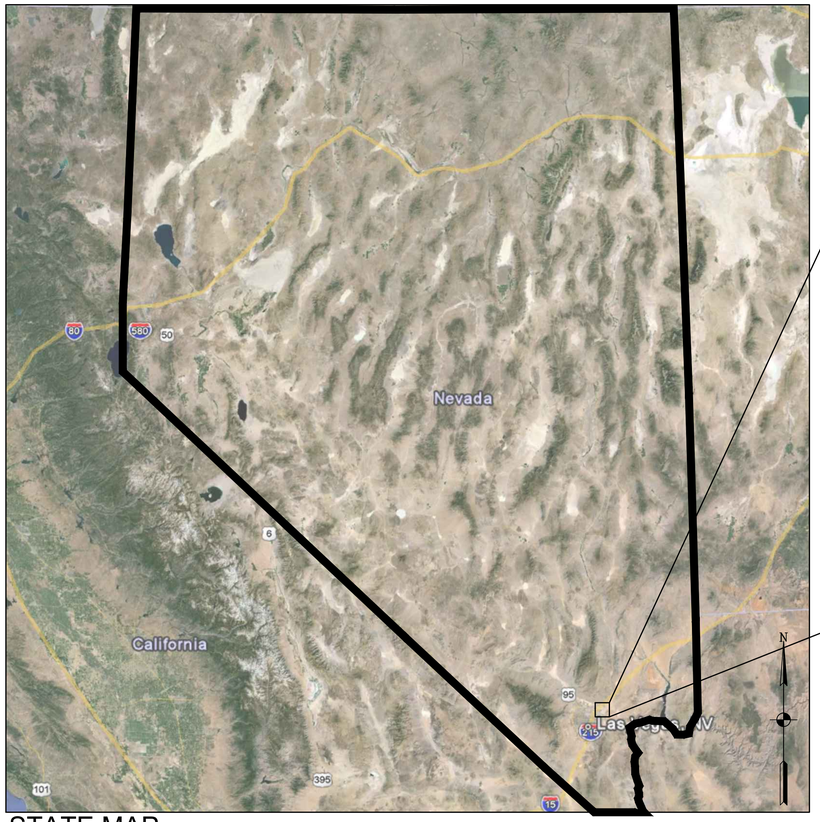
Approved: /s/ Ric Poeppelman, P.E. SEP 2018
Chief, Design Branch Date
Prepared Under the Direction of: Colonel David G. Ray, P.E. SEP 2018
US Corps of Engineers Date

Drawing Code:
Designed by: ORA
Drawn by: ORA
Spec No. 2164
Design File No. 229-25-0715

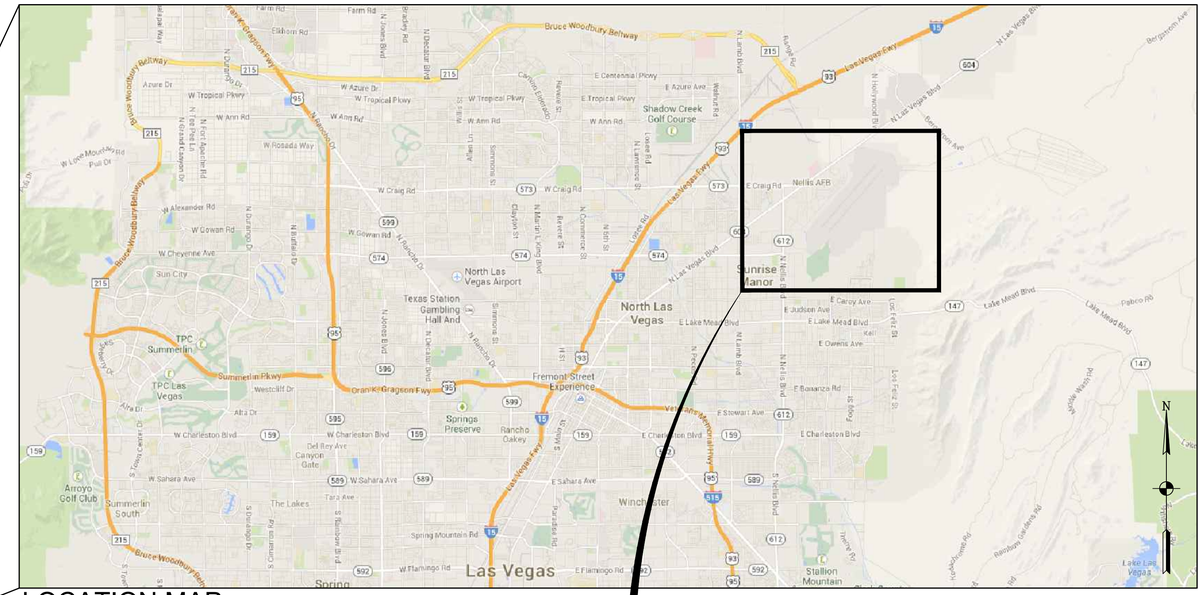
Approved Functional Adequacy: /s/ Scott Tincher, P.E. SEP 2018
Chief, Design Branch Date
Prepared by: SACRAMENTO DISTRICT DESIGN BRANCH
/s/ Matthew Z. Valentine SEP 2018
Chief, Arch. Design Section Date

NELLIS AFB PN: RKMF17-0065 NEVADA
RENOVATE 926 WG BUILDING 332
COVER SHEET

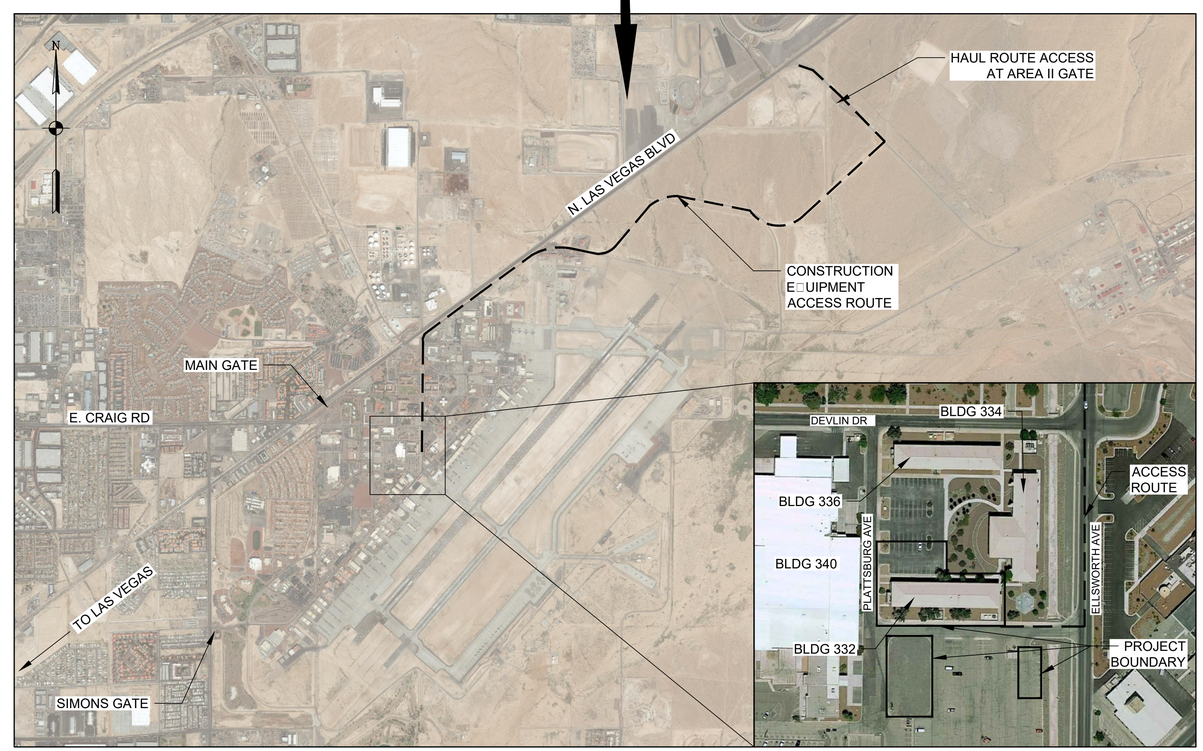
SHEET IDENTIFICATION
G-001



STATE MAP
SCALE: NONE



LOCATION MAP
SCALE: NONE



PROJECT SITE MAP
SCALE: NONE

NOTES:

1. CONSTRUCTION CONTRACTORS MAY ACCESS THE BASE THROUGH THE MAIN GATE, SIMMONS GATE, RANGE ROAD GATE, AND AREA II GATE. HOWEVER, ALL COMMERCIAL VEHICLES AND VEHICLES LARGER THAN PICKUP TRUCKS WILL BE REQUIRED TO ACCESS THE BASE THROUGH THE AREA II GATE ONLY. THE TURNOFF TO THE AREA II GATE IS ACROSS FROM THE RACETRACK ON N. LAS VEGAS BLVD APPROXIMATELY 3 MILES NORTH OF THE MAIN GATE.
2. THE HAUL PATH SHOWN FROM AREA II GATE IS APPROXIMATELY 6 MILES.
3. UPON ARRIVAL AT A SECURITY GATE, ALL VEHICLE OCCUPANTS WILL BE REQUIRED TO SHOW IDENTIFICATION BEFORE ENTERING THE BASE. A PICTURED IDENTIFICATION SUCH AS A DRIVER'S LICENSE WILL BE REQUIRED.
4. SPEED LIMIT: UNLESS OTHERWISE POSTED, THE SPEED LIMIT ON BASE IS 25 MPH AND IN BASE HOUSING AREAS AND FLIGHTLINE IT IS 15 MPH.
5. ALL TRUCKS MUST HAVE COMPANY NAME LOGOS ON THE DOOR SIDES.
6. NO PRIVATELY OWNED VEHICLES (POV) ALLOWED WITHIN THE CONSTRUCTION SITE.
7. THE CONTRACTOR SHALL VERIFY THE WORKING HOURS WITH THE BASE SECURITY FOR APPROVAL. PERSONNEL CANNOT SHOW UP AT THE GATE WITHOUT PRIOR NOTIFICATION FOR ACCESS AND EXPECT TO GAIN ACCESS. VERBAL ACCESS CANNOT BE PROVIDED.
8. ADDITIONAL ACCESS INFORMATION IS INCLUDED UNDER THE APPENDICES - NELLIS REQUIREMENTS/GUIDANCE
9. POINT OF CONTACTS:
   9.1. BASE OPERATOR - (702) 652-1110
   9.2. GATE AREA II - (702) 652-1801

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MARK	DESCRIPTION	DATE

DESIGNED BY: PC	ISSUE DATE: SEP 2018
DRAWN BY: PC	SOLICITATION NO.: XXXX
CHECKED BY: JSE	CONTRACT NO.: XXXX
SUBMITTED BY: /s/ MARKUS BRIDENTKER	FILE NO.: 228-25-0715
SIZE: ANSI D	FILE SPEC NO.: 21564
	FILE NAME: G-101XXX.dwg

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

IN-HOUSE DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

NELLIS AFB, NV
BLDG 332 RENOVATION
RKMF 17-0065
XXXX

PROJECT LOCATION AND HAUL PATH

SHEET ID
G-101

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NOTES:

1. DEMOLISH ALL EXISTING CONCRETE SIDEWALKS, PAVERS, PRECAST CONCRETE EDGING, PLANTS, TREES, IRRIGATION, ROCK MULCH, ETC. WITHIN 30 FEET OF BUILDING 332.
2. DEMOLISH EXISTING CONCRETE CURB ALONG SOUTH SIDE OF PARKING LOT.

LEGEND

DEMOLISH E.CONCRETE SIDEWALK

DEMOLISH TREES

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: PC	ISSUE DATE: SEP 2018
DRAWN BY: PC	SOLICITATION NO.: XXXX
CHECKED BY: JSE	CONTRACT NO.: XXXX
SUBMITTED BY: /s/ MARKUS BOEHTKER	FILE NO: 228-25-0715
SIZE: ANSI D	FSC NO: 2764
FILE NAME: C-101XXX.dwg	

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

IN-HOUSE DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

NELLIS AFB, NV
BLDG 332 RENOVATION
RAMF 17-0065
XXXX

DEMOLITION PLAN

SHEET ID

C-101

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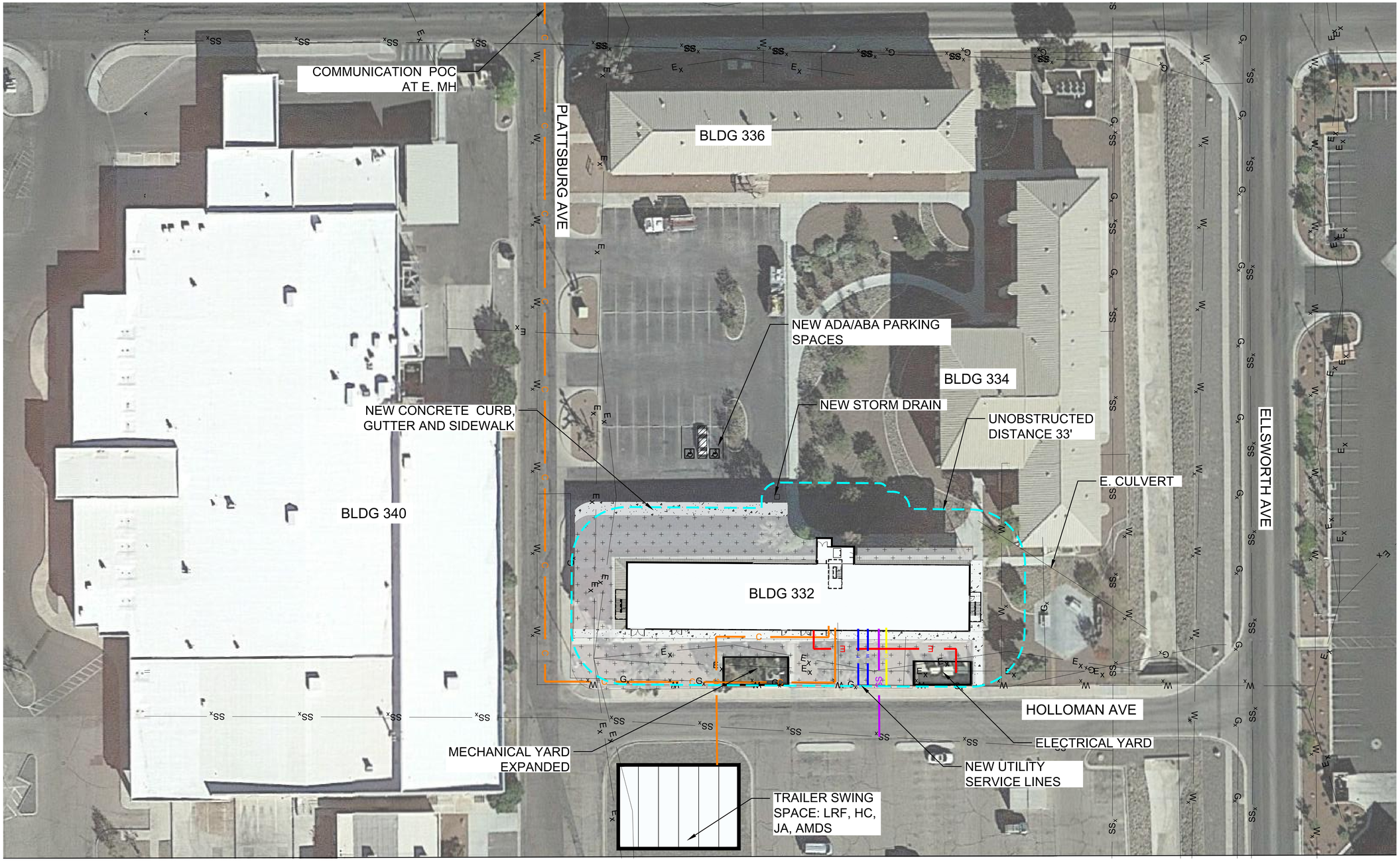

NOTES:

1. PROVIDE NEW CONCRETE WALKWAYS TO ALL BUILDING DOORS AND STAIR WAYS. PROVIDE WALKWAY BETWEEN BLDG 334 AND HOLLOMAN AVE/ SOUTH PARKING LOT.

LEGEND

HARDSCAPE

LANDSCAPED AREA

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

IN-HOUSE DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

DESIGNED BY: PC
DRAWN BY: PC
CHECKED BY: JSE
SUBMITTED BY: M. MARKUS BOEDTKER
SIZE: ANSI D
FSC NO. 21G4
ISSUE DATE: SEP 2018
SOLICITATION NO.: XXXX
CONTRACT NO.: XXXX
FILE NO.: 22825-0715
FILE NAME: C-101XXX.dwg

NELLIS AFB, NV
BLDG 332 RENOVATION
RKMF 17-0065
XXXX

SITE PLAN

SHEET ID
C-102

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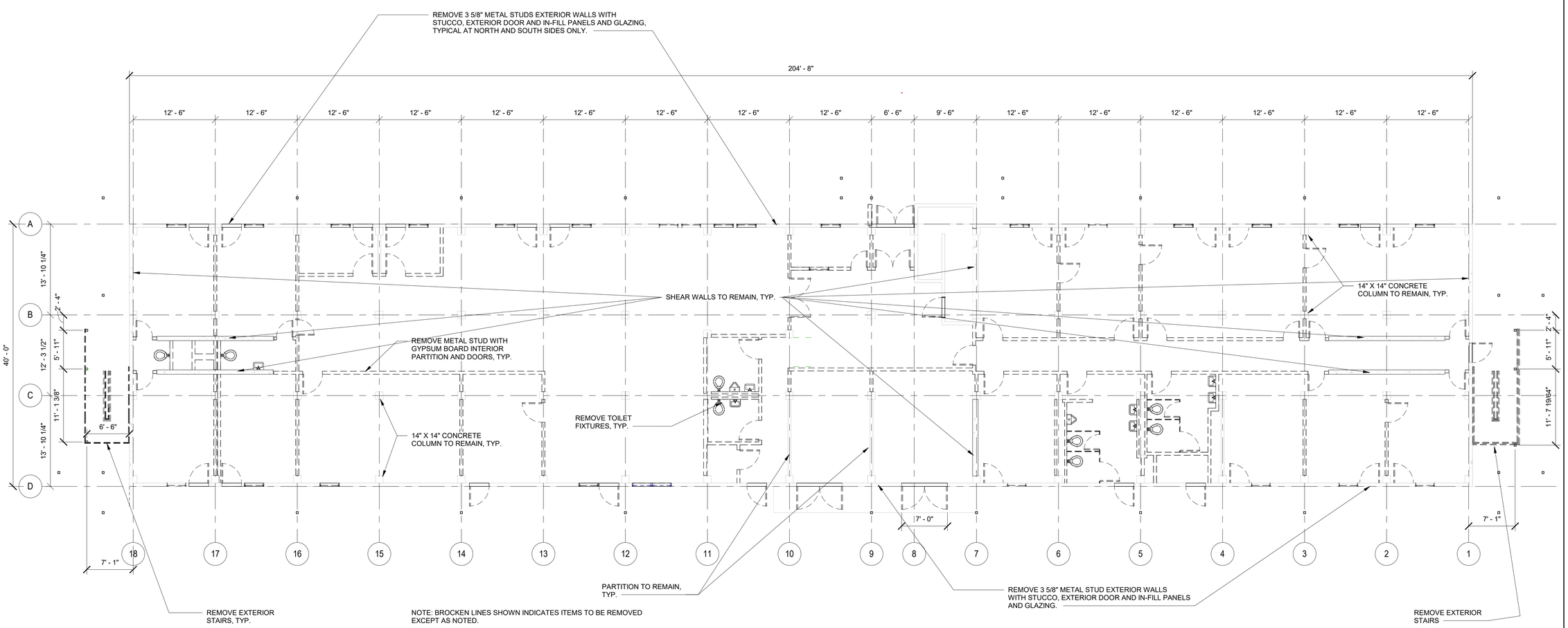
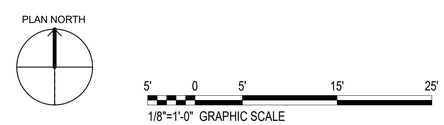


1 / AD101 FIRST FLOOR DEMOLITION PLAN

1/8" = 1'-0"



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MARK	DESCRIPTION	DATE

DESIGNED BY: ORA
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CHECKED BY: MKB
SUBMITTED BY: Matthew Z. Valentine
SIZE: ANSI 'D'
FILE NAME: Enter Revit File Name
ISSUE DATE: SEP 2018
PROJECT # Enter #
Specs 21564
FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

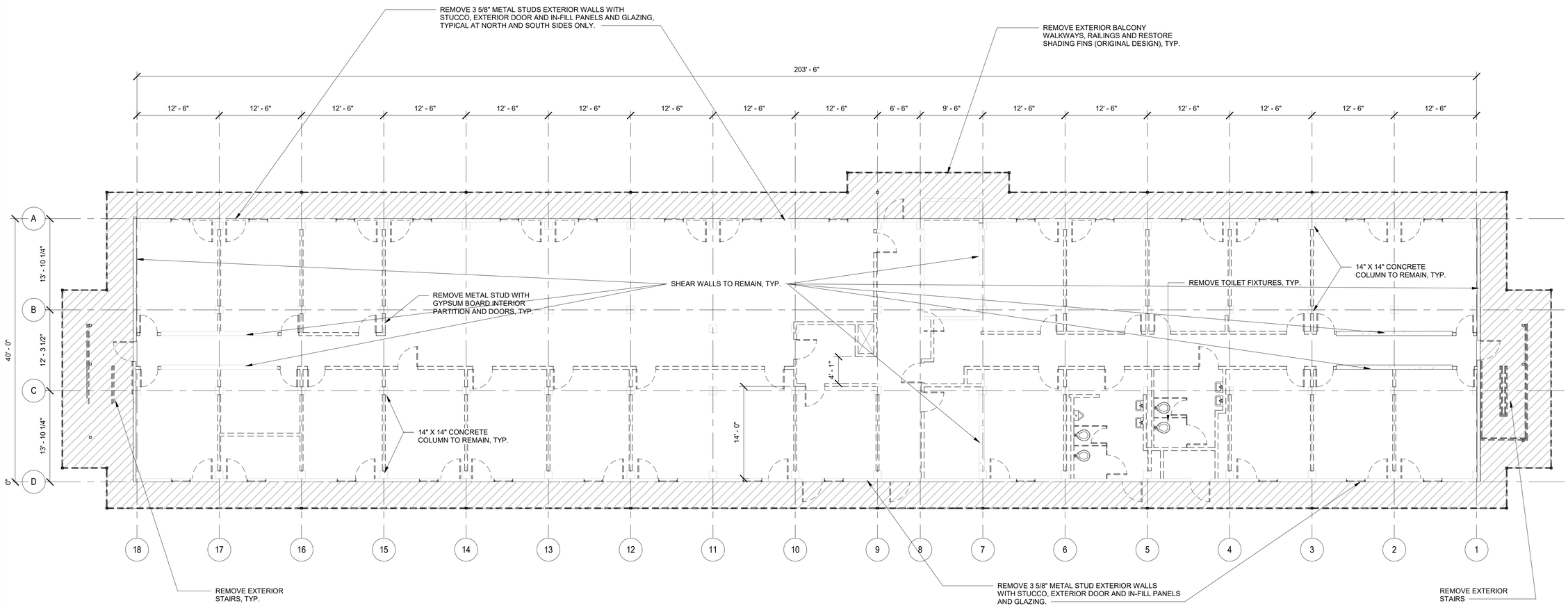
SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

FIRST FLOOR DEMOLITION PLAN

SHEET ID

AD101



NOTE: BROCKEN LINES SHOWN INDICATES ITEMS TO BE REMOVED EXCEPT AS NOTED.

1 / AD102

SECOND FLOOR DEMOLITION PLAN

1/8" = 1'-0"

PLAN NORTH

5' 0 5' 15' 25'

1/8"=1'-0" GRAPHIC SCALE

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MARK	DESCRIPTION	DATE

ISSUE DATE: SEP 2018
PROJECT # Enter #
Specs 21564
FILE NUMBER: 229-25-0715

DESIGNED BY: ORA
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CHECKED BY: MKB
SUBMITTED BY: Matthew Z. Valentine
SIZE: ANSI D'
FILE NAME: Enter Revit File Name

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

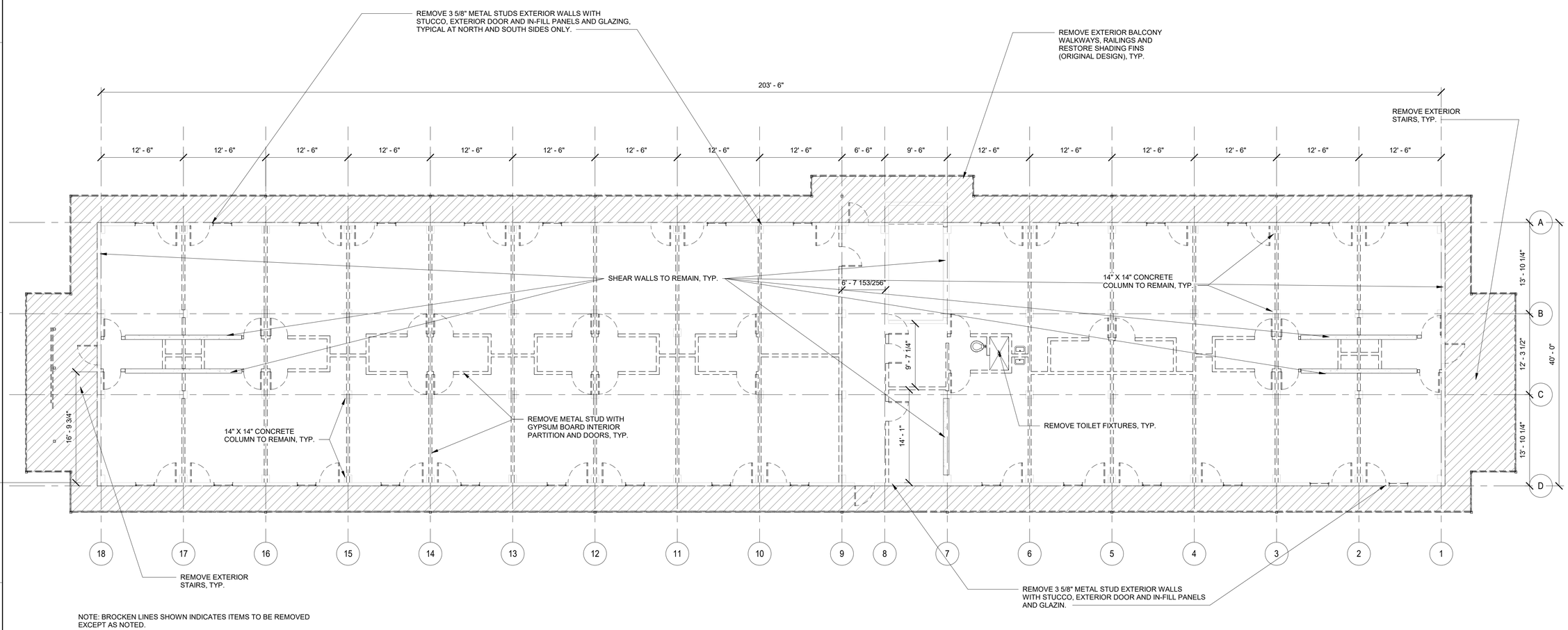
SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

SECOND FLOOR DEMOLITION PLAN

SHEET ID

AD102



NOTE: BROCKEN LINES SHOWN INDICATES ITEMS TO BE REMOVED EXCEPT AS NOTED.

1 / AD103

THIRD FLOOR DEMOLITION PLAN

1/8" = 1'-0"

PLAN NORTH

5' 0 5' 15' 25'

1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: ORA
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SUBMITTED BY: Matthew Z. Valentine
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ISSUE DATE: SEP 2018
PROJECT # Enter #
Specs 21564
FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
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SACRAMENTO DISTRICT
1325 J STREET
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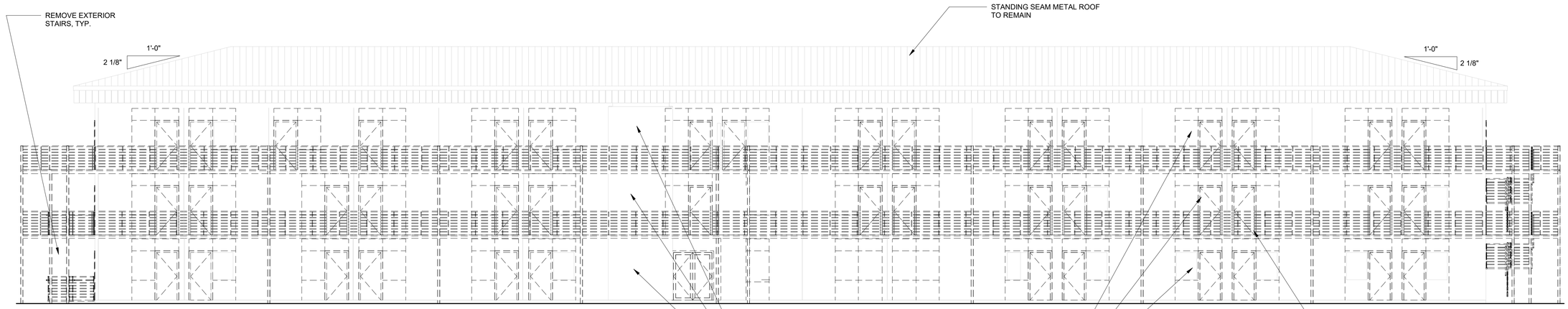
NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

THIRD FLOOR DEMOLITION PLAN

SHEET ID

AD103

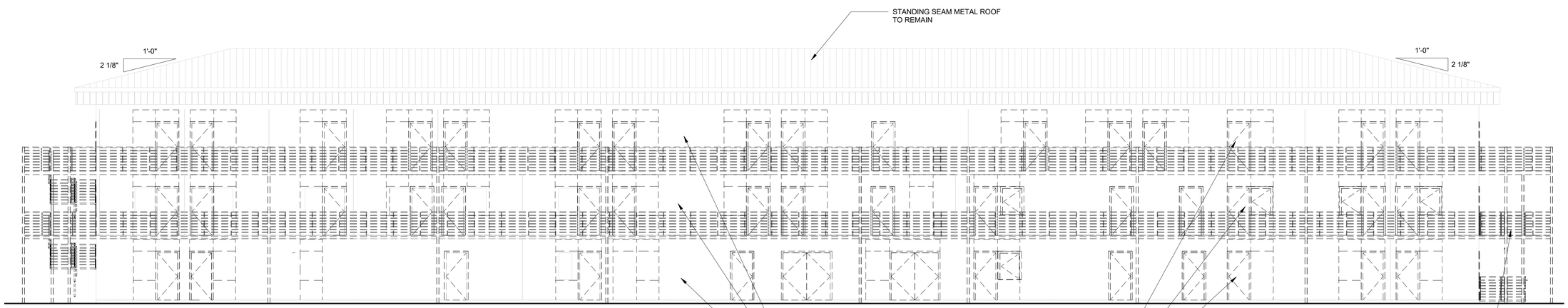


1 AD201

NORTH ELEVATION - DEMOLITION

1/8" = 1'-0"

NOTE: BROCKEN LINES SHOWN INDICATES ITEMS TO BE REMOVED EXCEPT AS NOTED.



2 AD201

SOUTH ELEVATION - DEMOLITION

1/8" = 1'-0"

4' 0 4' 8'

SCALE: 1/4" = 1' - 0"

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Specs 21564
FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

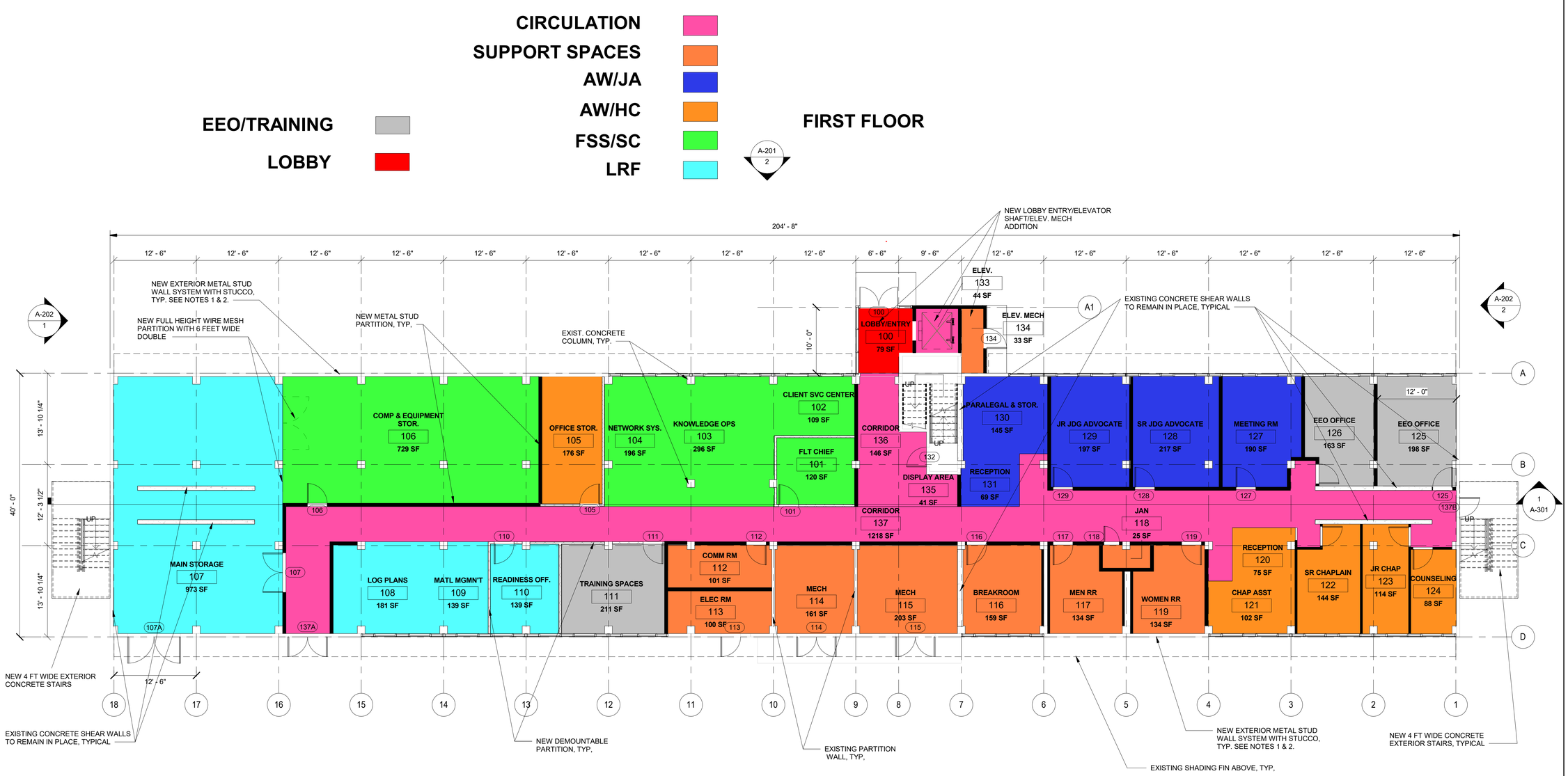
SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

NORTH AND SOUTH ELEVATIONS - DEMOLITION

SHEET ID

AD201



1
A-101

FIRST FLOOR PLAN

1/8" = 1'-0"

NOTE:
1. METAL STUD SHALL BE 600S137-33 @ 16" O.C. ANCHOR TOP AND BOTTOM TRACK INTO EXISTING CONCRETE WITH 0.177" DIA. PAF @ 16" O.C. EMBED PAF 1-1/2" INTO EXISTING CONCRETE.
2. INSTALL NEW EXTERIOR BATT INSULATION, MINIMUM R-19.
3. FOR PREFERRED NEW INTERIOR PARTITION TYPE, SEE REMARK COLUMN OF APPENDIX - ROOM AREA COMPUTATION OF THE RFP.

PLAN NORTH

5' 0 5' 15' 25'
1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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SUBMITTED BY: Matthew Z. Valentine
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ANSI D'
ISSUE DATE: SEP 2018
PROJECT # Enter #
Specs 21564
FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

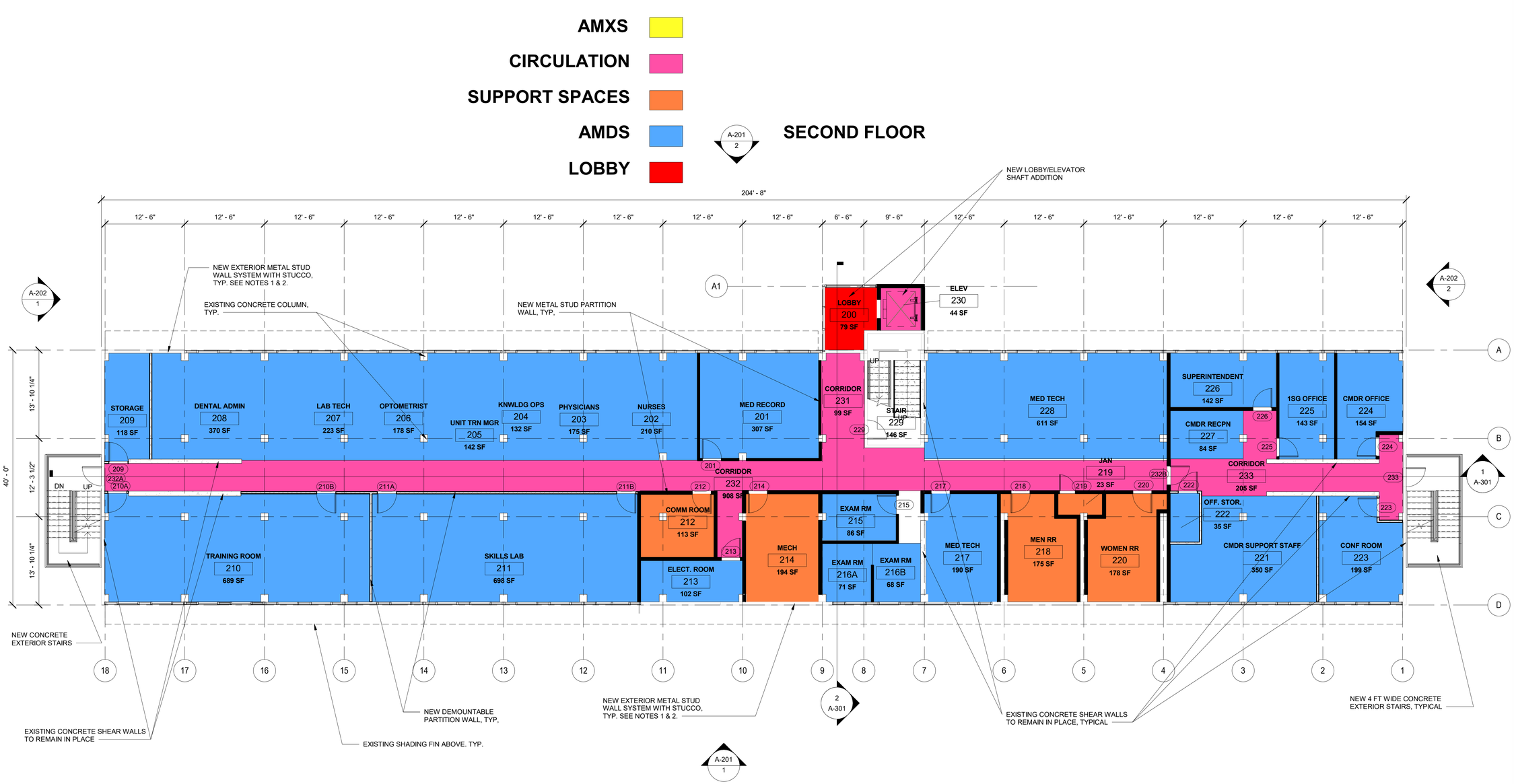
SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

FIRST FLOOR PLAN

SHEET ID

A-101



1 A-102

SECOND FLOOR PLAN

1/8" = 1'-0"

NOTE:
1. METAL STUD SHALL BE 600S137-33 @ 16" O.C. ANCHOR TOP AND BOTTOM TRACK INTO EXISTING CONCRETE WITH 0.177" DIA. PAF @ 16" O.C. EMBED PAF 1-1/2" INTO EXISTING CONCRETE.
2. INSTALL NEW EXTERIOR BATT INSULATION, MINIMUM R-19.
3. FOR PREFERRED NEW INTERIOR PARTITION TYPE, SEE REMARK COLUMN OF APPENDIX - ROOM AREA COMPUTATION OF THE RFP.

PLAN NORTH

5' 0 5' 15' 25'
1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: ORA
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CHECKED BY: MKB
SUBMITTED BY: Matthew Z. Valentine
SIZE: ANSI D'
FILE NAME: Enter/Rest/File Name
ISSUE DATE: SEP 2018
PROJECT # Enter #
Specs 21564
FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

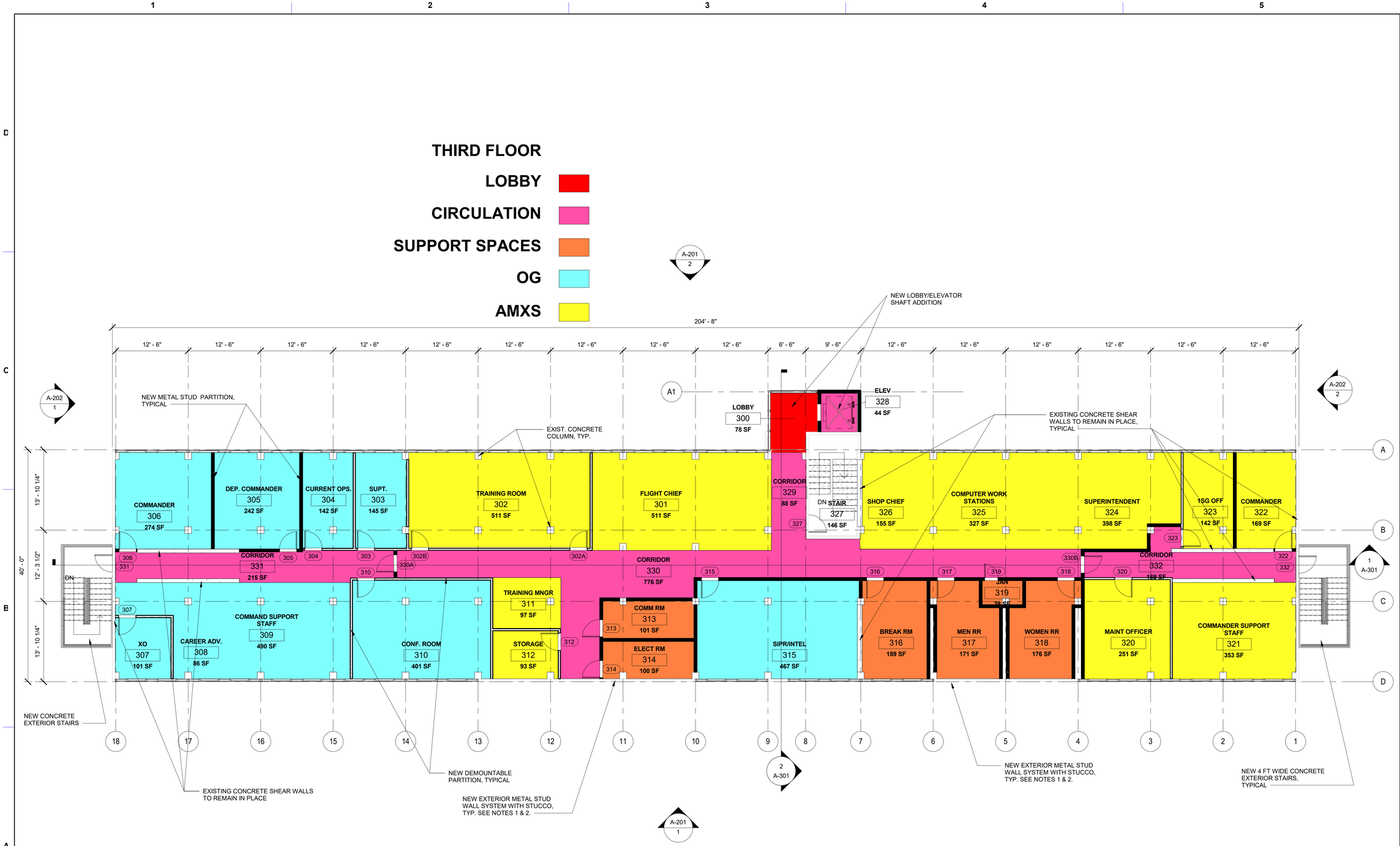
SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

SECOND FLOOR PLAN

SHEET ID

A-102



THIRD FLOOR PLAN

1/8" = 1'-0"

NOTE:
1. METAL STUD SHALL BE 600S137-33 @ 16" O.C. ANCHOR TOP AND BOTTOM TRACK INTO EXISTING CONCRETE WITH 0.177" DIA. PAF @ 16" O.C. EMBED PAF 1-1/2" INTO EXISTING CONCRETE.
2. INSTALL NEW EXTERIOR BATT INSULATION, MINIMUM R-19.
3. FOR PREFERRED NEW INTERIOR PARTITION TYPE, SEE REMARK COLUMN OF APPENDIX - ROOM AREA COMPUTATION OF THE RFP.

PLAN NORTH

5' 0 5' 15' 25'
1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: SEP 2018
PROJECT # Enter #
Specs 2164
FILE NUMBER: 229-25-0715

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SUBMITTED BY: Matthew Z. Valentine
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US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

SACRAMENTO DISTRICT
1325 J STREET
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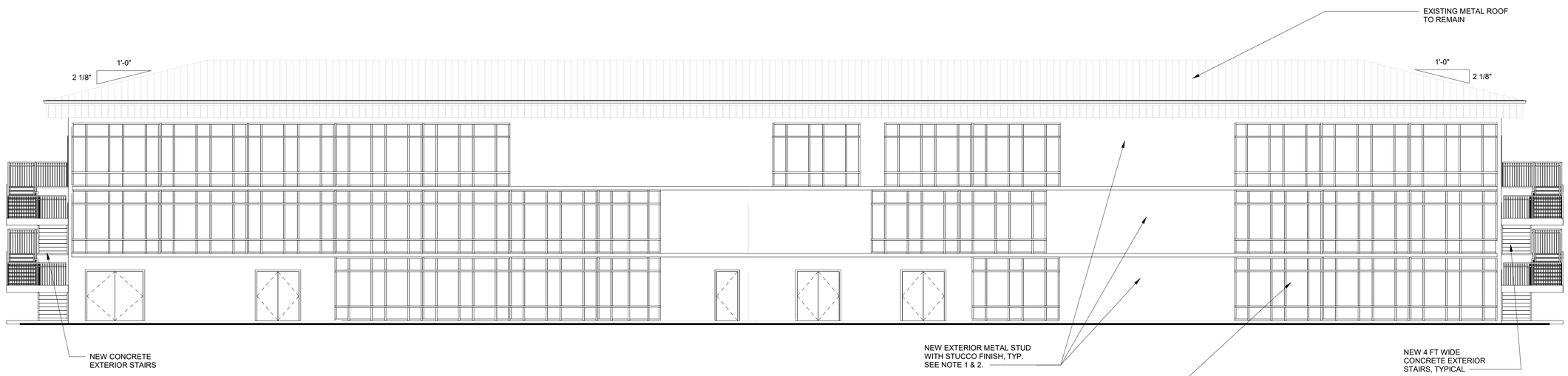
NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065
THIRD FLOOR PLAN

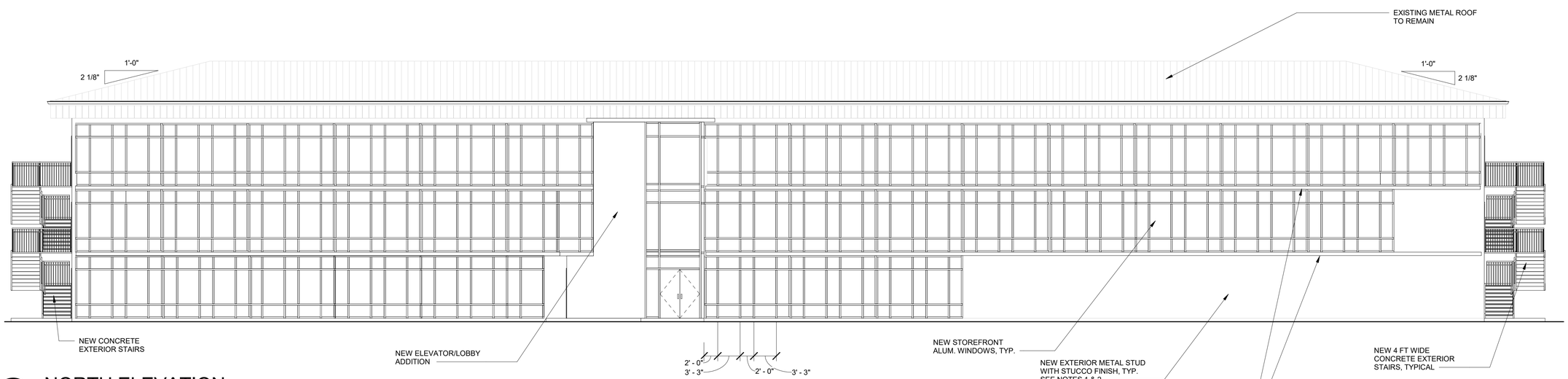
SHEET ID
A-103



1
A-201

SOUTH ELEVATION

1/8" = 1'-0"



2
A-201

NORTH ELEVATION

1/8" = 1'-0"

NOTE:
1. METAL STUD SHALL BE 600S137-33 @ 16" O.C. ANCHOR TOP AND BOTTOM TRACK INTO EXISTING CONCRETE WITH 0.177" DIA. PAF @ 16" O.C. EMBED PAF 1-1/2" INTO EXISTING CONCRETE.
2. INSTALL NEW EXTERIOR BATT INSULATION, MINIMUM R-19.

5' 0 5' 15' 25'
1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

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DESIGNED BY: ORA
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FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
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US DEPT OF ARMY

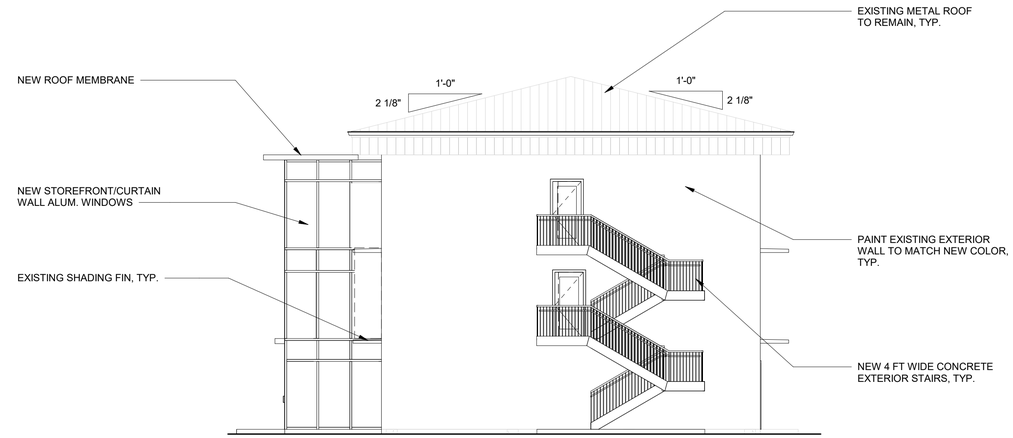
SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

NORTH AND SOUTH ELEVATIONS

SHEET ID

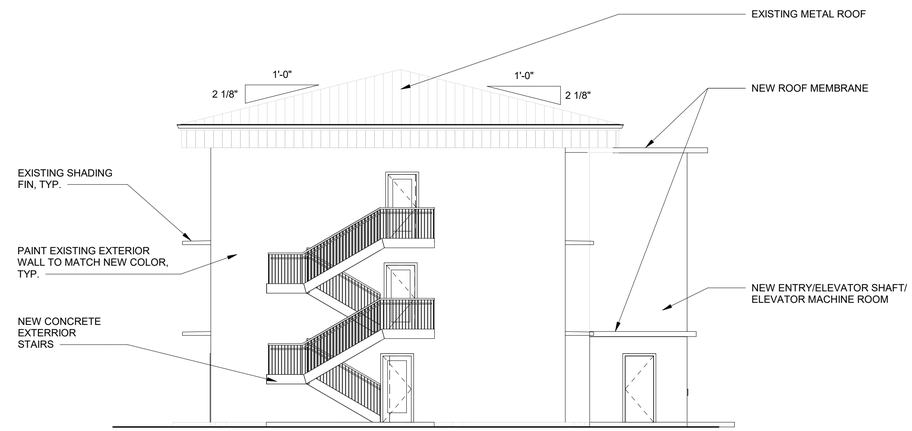
A-201



1
A-202

WEST ELEVATION

1/8" = 1'-0"



2
A-202

EAST ELEVATION

1/8" = 1'-0"

5' 0 5' 15' 25'

1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

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CHECKED BY: MKB
SUBMITTED BY: Matthew Z. Valentine
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ISSUE DATE: SEP 2018
PROJECT # Enter # Specs 21164
FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

EAST AND WEST ELEVATIONS

SHEET ID

A-202

USACE_DOOR SCHEDULE - FIRST FLOOR

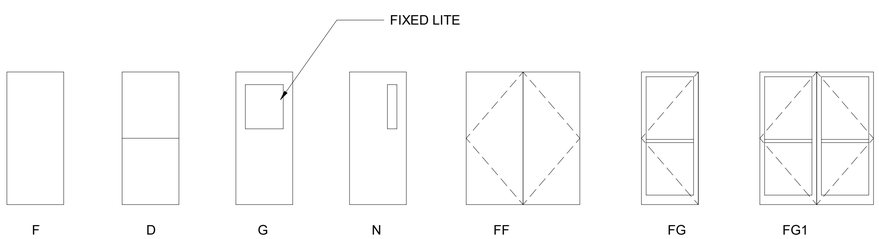
DOOR NO.	TYPE	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR MATERIAL	DOOR FINISH	FRAME MATERIAL	FRAME FINISH	COMMENTS:
100	FG1	6' - 0"	7' - 0"	2"	GLASS		ALUM.	ANOD.	MECHANICAL PUSH BUTTON LOCK
101	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
105	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
106	D	3' - 0"	6' - 8"	1 3/4"	WD	STN	HM	PNT	DUTCH DOOR
107	FF	6' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
107A	FF	8' - 0"	7' - 0"	1 3/4"	HM	PNT	HM	PNT	MECHANICAL PUSH BUTTON LOCK
110	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
111	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
112	F	3' - 0"	6' - 8"	1 3/4"	WD	STN	HM	PNT	
113	F	3' - 0"	7' - 0"	1 3/4"	HM	PNT	HM	PNT	MECHANICAL PUSH BUTTON LOCK
114	FF	6' - 0"	7' - 0"	1 3/4"	HM	PNT	HM	PNT	MECHANICAL PUSH BUTTON LOCK
115	FF	6' - 0"	7' - 0"	1 3/4"	HM	PNT	HM	PNT	MECHANICAL PUSH BUTTON LOCK
116	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
117	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
118	F	2' - 4"	6' - 8"	1 3/4"	WD	STN	HM	PNT	
119	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
125	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
127	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
128	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
129	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
132	N	3' - 0"	7' - 0"	1 3/4"	WD	PNT	HM	PNT	
134	F	3' - 0"	7' - 0"	1 3/4"	HM	PNT	HM	PNT	MECHANICAL PUSH BUTTON LOCK
137A	FF	6' - 0"	7' - 0"	1 3/4"	HM	PNT	HM	PNT	MECHANICAL PUSH BUTTON LOCK
137B	FG	3' - 0"	7' - 0"	2"	ALUM	ANOD	ALUM	ANOD	MECHANICAL PUSH BUTTON LOCK

USACE_DOOR SCHEDULE - SECOND FLOOR

DOOR NO.	TYPE	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR MATERIAL	DOOR FINISH	FRAME MATERIAL	FRAME FINISH	COMMENTS:
201	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
209	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
210A	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
210B	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
211A	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	NPT	
211B	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
212	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
213	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
214	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
215	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
217	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
218	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
219	F	2' - 6"	6' - 8"	1 3/4"	WD	STN	HM	PNT	
220	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
222	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
223	F	3' - 0"	7' - 0"	1 3/4"	HM	PNT	HM	PNT	
224	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
225	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
226	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
229	N	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
232A	FG	3' - 0"	7' - 0"	2"	ALUM	ANOD	ALUM	ANOD	MECHANICAL PUSH BUTTON LOCK
232B	G	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	WITH/ VISION LITE
233	FG	3' - 0"	7' - 0"	2"	ALUM	ANOD	ALUM	ANOD	MECHANICAL PUSH BUTTON LOCK

USACE_DOOR SCHEDULE - THIRD FLOOR

DOOR NO.	TYPE	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR MATERIAL	DOOR FINISH	FRAME MATERIAL	FRAME FINISH	COMMENTS:
302A	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
302B	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
303	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
304	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
305	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
306	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
307	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
310	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
312	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
313	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
314	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
315	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	MECHANICAL PUSH BUTTON LOCK
316	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
317	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
318	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
319	F	2' - 4"	6' - 8"	1 3/4"	WD	STN	HM	PNT	
320	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
322	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
323	F	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
327	N	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
330A	G	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
330B	G	3' - 0"	7' - 0"	1 3/4"	WD	STN	HM	PNT	
331	FG	3' - 0"	7' - 0"	2"	ALUM	ANOD	ALUM	ANOD	MECHANICAL PUSH BUTTON LOCK
332	FG	3' - 0"	7' - 0"	2"	ALUM	ANOD	ALUM	ANOD	MECHANICAL PUSH BUTTON LOCK



DOOR TYPES

1/4" = 1'-0"

NOTE: ALL EXTERIOR STEEL DOOR SHALL BE INSULATED.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: ORA
DRAWN BY: ORA
CHECKED BY: MK
SUBMITTED BY: Matthew Z. Valentine
SIZE: E1 FILE NAME: ANSI D' Enter/Reset File Name

ISSUE DATE: SEP 2018
PROJECT # Enter #
Specs 21564
FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

DOOR SCHEDULE

SHEET ID

A-620

FIRST FLOOR INTERIOR FINISH/COLOR SCHEDULE

RM. NO.	ROOM NAME	FLOOR	BASE	WAINSCOT MATERIAL	WAINSCOT HEIGHT	WALLS NORTH	COLOR	EAST	COLOR	SOUTH	COLOR	WEST	COLOR	CEILING MATERIAL	CEILING COLOR	CEILING HEIGHT	CABINETRY CABINETS	CABINETRY CNTRTOP	DOORS	TRIM	REMARKS
100	LOBBY/ENTRY	PPT1/G1	PPT1/G1	--		GWB	P1	GWB	P6	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	FF/P4	P4	--
101	FLT CHIEF	C1	RB1	--		DMT	P1	GWB	P1	DMT	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
102	CLIENT SVC CENTER	C1	RB1	--		GWB	P1	GWB	P1	DMT	P1	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
103	KNOWLEDGE OPS	C1	RB1	--		GWB	P1	DMT	P1	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
104	NETWORK SYS.	C1	RB1	--		GWB	P1	--	--	--	--	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
105	OFFICE STOR.	R1	RB1	--		GWB	P1	DMT	P1	DMT	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
106	COMP & EQUIPMENT STOR.	ESD1	RB1	--		GWB	P1	GWB	P1	GWB	P1	--	--	GWB	P3	8'-0"	--	--	P4	P4	NOTE 4, 9
107	MAIN STORAGE	CONC1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P3	8'-0"	--	--	P4	P4	--
108	LOG PLANS	C1	RB1	--		GWB	P1	--	--	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
109	MATL MGMN'T	C1	RB1	--		--	--	DMT	P1	GWB	P1	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
110	READINESS OFF.	C1	RB1	--		DMT	P1	DMT	P1	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
111	TRAINING SPACES	C1	RB1	--		DMT	P1	GWB	P1	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	CR, WS2
112	COMM RM	ESD1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P3	8'-6"	--	--	P4	P4	NOTES 3, 4
113	ELEC RM	CONC1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	EXP	P3	VARIES	--	--	P4	P4	--
114	MECH	CONC1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	EXP	P3	VARIES	--	--	P4	P4	--
115	MECH	CONC1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	EXP	P3	VARIES	--	--	P4	P4	--
116	BREAKROOM	R1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P6	ACT	ACT1	8'-0"	PLAM1	SSM1	S1	P4	--
117	MEN RR	PPT1/G1	PPT1/G1	CT1/CT2/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	PLAM2	SSM2	S1	P4	TP1
118	JAN	PPT1/G1	PPT1/G1	CT1/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	--	--	S1	P4	NOTE 1
119	WOMEN RR	PPT1/G1	PPT1/G1	CT1/CT2/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	PLAM2	SSM2	S1	P4	TP1
120	RECEPTION	C1	RB1	--		--	--	GWB	P1	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
121	CHAP ASST	C1	RB1	--		--	--	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
122	SR CHAPLAIN	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
123	JR CHAP	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
124	COUNSELING	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
125	EEO OFFICE	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
126	EEO OFFICE	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
127	MEETING RM	C1	RB1	--		GWB	P1	GWB	P1	DMT	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	CR, WS2
128	SR JDG ADVOCATE	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
129	JR JDG ADVOCATE	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
130	PARALEGAL & STOR.	C1	RB1	--		GWB	P1	GWB	P1	--	--	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
131	RECEPTION	C1	RB1	--		--	--	--	--	--	--	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
132	STAIR	R2/R3	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P3	8'-0"	--	--	P4	P4	NOTE 2
133	ELEV.	CONC1	--	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	--	--	--	--	--	FF	P4	NOTE 7
134	ELEV. MECH	CONC1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4	P4	--
135	DISPLAY AREA	C1	RB1	--		GWB	P1	GWB	P1	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
136	CORRIDOR	C1	RB1	--		GWB	P1	GWB	P1	--	--	GWB	P1	ACT	ACT1	8'-0"	--	--	P4	P4	--
137	CORRIDOR	C1	RB1	--		DMT/GWB	P1	GWB	P1	DMT/GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4/S1	P4	--

SHEET NOTES:

1.) SHELVING IN JANITOR CLOSETS SHALL BE ADJUSTABLE.

2.) HANDRAILS IN STAIRWELLS SHALL BE PAINTED: P5

3.) BACKERBOARDS IN COMM ROOMS SHALL BE 3/4" FIRE-RETARDANT TREATED PLYWOOD (VOID-FREE) PER UFC 3-580-01.

4.) STATIC-CONTROL FLOOR SYSTEM SHALL BE CONNECTED TO BUILDING GROUND.

5.) CORNER WALL GUARDS SHALL BE INSTALLED AT ALL VULNERABLE OUTSIDE CORNERS.

6.) DEMOUNTABLE WALLS ARE CONTRACTOR FURNISHED/CONTRACTOR INSTALLED (CF/CI). ACCOMMODATE BUILDING INFRASTRUCTURE AS REQUIRED.

7.) ELEVATOR CAB FINISHES SHALL BE HIGH-IMPACT PLASTIC LAMINATE FOR WALLS, PORCELAIN PAVER TILES FOR FLOOR, AND FACTORY FINISH CEILING.

8.) ALL WINDOWS LOCATED AT EXTERIOR WALLS RECEIVE WINDOW COVERING: WS1, UNLESS OTHERWISE NOTED (UON).

9.) SEE ARCHITECTURAL SHEETS FOR CHAIN LINK FENCE.

10.) WALL COLUMNS IN FINISH SCHEDULES REPRESENT SUGGESTED WALL CONSTRUCTION MATERIAL.

11.) CEILING COLUMN IN FINISH SCHEDULES REPRESENT SUGGESTED CEILING HEIGHTS. ACCOMMODATE HVAC WORK AS REQUIRED.

GENERAL NOTES:

A. FOR WALLS WITH A WAINSCOT, THE WAINSCOT MATERIAL IS LISTED IN THE WAINSCOT COLUMN. THE MATERIAL LOCATED ABOVE THE WAINSCOT IS LISTED IN THE WALLS COLUMNS.

B. THE DOOR COLUMN DENOTES THE FINISH, NOT THE DOOR MATERIAL.

C. THE COLUMN LABELED AS TRIM IS USED FOR DOOR & WINDOW FRAMES.

FINISH LEGEND:

ACT: ACOUSTICAL CEILING TILES (2'X2', SEE NOTE 11)
ACT1: COLOR: FLAT WHITE

C: CARPET (24"X24" TILES)
C1: COLOR: MULTI-COLOR PATTERN, MEDIUM TONES
C2: C1 WITH CARPET PAD (COMMANDER'S OFFICE)

CG: CORNER GUARDS (SEE NOTE 5)
COLOR: COMPLEMENT WALL COLOR

CONC: CONCRETE
CONC1: SURFACE SEALED CONCRETE WITH HARDENER

CR: CHAIR RAIL (COORDINATE INSTALL HEIGHT WITH GF/GI SEATING)
COLOR: COMPLEMENT WALL COLOR

CT: CERAMIC TILE (WALLS)
CT1: FIELD TILE - COLOR: NEUTRAL, LIGHT TONES (MINIMUM 6"X6")
CT2: ACCENT BAND - COLOR: COORDINATE WITH CT1

DMT: DEMOUNTABLE WALL SYSTEM (SEE NOTES 6 & 10)

ESD: ELECTROSTATIC DISSIPATIVE (GROUNDED TO BUILDING)
ESD1: COLOR: SPECKLED PATTERN

EXP: EXPOSED TO STRUCTURE ABOVE (U.O.N., NO OTHER FINISH REQUIRED)

FF: FACTORY FINISH

G: GROUT (ANTI-BACTERIAL)
G1: COLOR: MEDIUM TO DARK TONES (FLOOR)
G2: COLOR: LIGHT TO MEDIUM TONES (WALL)

GWB: GYPSUM WALLBOARD, USE APPROPRIATE TYPE REQUIRED BY ROOM FUNCTION (SEE NOTES 10 & 11)

P: PAINT
P1: EGGSHELL SHEEN (FIELD COLOR)
P2: SEMI-GLOSS SHEEN (RESTROOMS)
P3: FLAT WHITE (CEILING)
P4: HIGH-GLOSS SHEEN (TRIM)
P5: ENAMEL (HANDRAILS)
P6: EGGSHELL SHEEN (ACCENT COLOR, LOBBIES & BREAKROOMS)

PLAM: PLASTIC LAMINATE (NEUTRAL COLOR)
PLAM1: CABINETS (BREAKROOM)
PLAM2: PLUMBING REVEAL (RESTROOMS)

PROJ: PROJECTOR SCREEN WITH PROJECTOR MOUNT

PPT: PORCELAIN PAVER TILES (FLOORS)
PPT1: COLOR: NEUTRAL, MEDIUM TONES (PREFERRED 12"X12")

R: RESILIENT FLOORING (NEUTRAL, MEDIUM TONE COLOR)
R1: HOMOGENEOUS VINYL (SHEET, HEAT-WELDED WITH SLIGHT PATTERN)
R2: RUBBER STAIR TREAD WITH INTEGRATED RISER (RAISED PROFILE TEXTURE AND CONTRASTING EDGE COLOR FOR VISUALLY IMPAIRED)
R3: RUBBER TILE (24"X24", STAIR LANDINGS)

RB: RESILIENT WALL BASE (4" HIGH)
RB1: COLOR: MEDIUM TONES (COORDINATE WITH CARPET AND RESILIENT FLOORING)

S: STAIN, WOOD
S1: COLOR: CLEAR (OAK)

SSM: SOLID SURFACE MATERIAL (NEUTRAL COLOR)
SSM1: COLOR: MEDIUM TONES WITH SLIGHT PATTERN (BREAKROOM COUNTERTOP)
SSM2: COLOR: LIGHT TONES (RESTROOMS COUNTERTOP)

TP: TOILET PARTITIONS & URINAL SCREENS (SOLID POLYETHYLENE)
TP1: COLOR: NEUTRAL, LIGHT TO MEDIUM TONES

WS: WINDOW SHADES (NEUTRAL COLOR, SEE NOTE 8)
WS1: SINGLE ROLLER - TRANSLUCENT (5 OPENNESS)
WS2: DUAL ROLLERS - TRANSLUCENT (5) AND BLACKOUT

This project was designed by the Sacramento District of the U. S. Army Corps of Engineers.The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: D OWEN
DRAWN BY: D OWEN
CHECKED BY: K STEPHENS
SUBMITTED BY: /s/ Matthew Z. Valentine
SIZE: ANSI D
FILE NAME: B332 INTERIORS CENTRAL (SID)
ISSUE DATE: SEP 2018
PROJECT #: RKMF-17-0065
SPEC #: 2164
FILE NUMBER: 225-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
U.S. DEPT OF ARMY

SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

FIRST FLOOR INTERIOR FINISH/COLOR SCHEDULE

SHEET ID

I-610

SECOND FLOOR INTERIOR FINISH/COLOR SCHEDULE

				WAINSCOT		WALLS								CEILING			CABINETRY				
RM. NO.	ROOM NAME	FLOOR	BASE	MATERIAL	HEIGHT	NORTH	COLOR	EAST	COLOR	SOUTH	COLOR	WEST	COLOR	MATERIAL	COLOR	HEIGHT	CABINETS	CNTRTOP	DOORS	TRIM	REMARKS
200	LOBBY	C1	RB1	--		GWB	P1	GWB	P6	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4	P4	--
201	MED RECORD	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P3	8'-0"	--	--	S1	P4	--
202	NURSES	C1	RB1	--		GWB	P1	GWB	P1	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
203	PHYSICIANS	C1	RB1	--		GWB	P1	--	--	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
204	KNWLDG OPS	C1	RB1	--		GWB	P1	--	--	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
205	UNIT TRN MGR	C1	RB1	--		GWB	P1	--	--	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
206	OPTOMETRIST	C1	RB1	--		GWB	P1	--	--	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
207	LAB TECH	C1	RB1	--		GWB	P1	--	--	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
208	DENTAL ADMIN	C1	RB1	--		GWB	P1	--	--	--	--	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
209	STORAGE	R1	RB1	--		GWB	P1	DMT	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
210	TRAINING ROOM	C1	RB1	--		DMT/GWB	P1	DMT	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	CR, PROJ, WS2
211	SKILLS LAB	R1	RB1	--		DMT	P1	GWB	P1	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	WS2
212	COMM ROOM	ESD1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P3	8'-6"	--	--	P4	P4	NOTES 3, 4
213	ELECT. ROOM	CONC1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	EXP	P3	VARIES	--	--	P4	P4	--
214	MECH	CONC1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	EXP	P3	VARIES	--	--	P4	P4	--
215	EXAM RM	R1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	PLAM1	SSM1	S1	P4	--
216A	EXAM RM	R1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	PLAM1	SSM1	S1	P4	--
216B	EXAM RM	R1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	PLAM1	SSM1	S1	P4	--
217	MED TECH	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
218	MEN RR	PPT1/G1	PPT1/G1	CT1/CT2/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	PLAM2	SSM2	S1	P4	TP1
219	JAN	PPT1/G1	PPT1/G1	CT1/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	--	--	S1	P4	NOTE 1
220	WOMEN RR	PPT1/G1	PPT1/G1	CT1/CT2/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	PLAM2	SSM2	S1	P4	TP1
221	CMDR SUPPORT STAFF	C2	RB1	--		DMT/GWB	P1	DMT	P1	GWB	P1	DMT/GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
222	OFF. STOR.	R1	RB1	--		DMT	P1	DMT	P1	DMT	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
223	CONF ROOM	C2	RB1	--		DMT/GWB	P1	GWB	P1	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	CR, WS2
224	CMDR OFFICE	C2	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
225	1SG OFFICE	C2	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
226	SUPERINTENDENT	C2	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
227	CMDR RECPN	C2	RB1	--		GWB	P1	--	--	--	--	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
228	MED TECH	C1	RB1	--		GWB	P1	GWB	P1	--	--	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
229	STAIR	R2/R3	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P3	8'-0"	--	--	P4	P4	NOTE 2
230	ELEV	--	--	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	--	--	--	--	--	FF	P4	NOTE 7
231	CORRIDOR	C1	RB1	--		--	--	GWB	P1	--	--	GWB	P1	ACT	ACT1	8'-0"	--	--	P4/S1	P4	--
232	CORRIDOR	C1	RB1	--		DMT/GWB	P1	GWB	P1	DMT/GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
233	CORRIDOR	C2	RB	--		GWB	P1	GWB	P1	DMT	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4/S1	P4	--

SHEET NOTES:

1.) SHELVING IN JANITOR CLOSETS SHALL BE ADJUSTABLE.

2.) HANDRAILS IN STAIRWELLS SHALL BE PAINTED: P5

3.) BACKERBOARDS IN COMM ROOMS SHALL BE 3/4" FIRE-RETARDANT TREATED PLYWOOD (VOID-FREE) PER UFC 3-580-01.

4.) STATIC-CONTROL FLOOR SYSTEM SHALL BE CONNECTED TO BUILDING GROUND.

5.) CORNER WALL GUARDS SHALL BE INSTALLED AT ALL VULNERABLE OUTSIDE CORNERS.

6.) DEMOUNTABLE WALLS ARE CONTRACTOR FURNISHED/CONTRACTOR INSTALLED (CF/CI). ACCOMMODATE BUILDING INFRASTRUCTURE AS REQUIRED.

7.) ELEVATOR CAB FINISHES SHALL BE HIGH-IMPACT PLASTIC LAMINATE FOR WALLS, PORCELAIN PAVER TILES FOR FLOOR, AND FACTORY FINISH CEILING.

8.) ALL WINDOWS LOCATED AT EXTERIOR WALLS RECEIVE WINDOW COVERING: WS1, UNLESS OTHERWISE NOTED (UON).

9.) SEE ARCHITECTURAL SHEETS FOR CHAIN LINK FENCE.

10.) WALL COLUMNS IN FINISH SCHEDULES REPRESENT SUGGESTED WALL CONSTRUCTION MATERIAL.

11.) CEILING COLUMN IN FINISH SCHEDULES REPRESENT SUGGESTED CEILING HEIGHTS. ACCOMMODATE HVAC WORK AS REQUIRED.

GENERAL NOTES:

A. FOR WALLS WITH A WAINSCOT, THE WAINSCOT MATERIAL IS LISTED IN THE WAINSCOT COLUMN. THE MATERIAL LOCATED ABOVE THE WAINSCOT IS LISTED IN THE WALLS COLUMNS.

B. THE DOOR COLUMN DENOTES THE FINISH, NOT THE DOOR MATERIAL.

C. THE COLUMN LABELED AS TRIM IS USED FOR DOOR & WINDOW FRAMES.

FINISH LEGEND:

ACT: ACOUSTICAL CEILING TILES (2'X2', SEE NOTE 11)
ACT1: COLOR: FLAT WHITE

C: CARPET (24"X24" TILES)
C1: COLOR: MULTI-COLOR PATTERN, MEDIUM TONES
C2: C1 WITH CARPET PAD (COMMANDER'S OFFICE)

CG: CORNER GUARDS (SEE NOTE 5)
COLOR: COMPLEMENT WALL COLOR

CONC: CONCRETE
CONC1: SURFACE SEALED CONCRETE WITH HARDENER

CR: CHAIR RAIL (COORDINATE INSTALL HEIGHT WITH GF/GI SEATING)
COLOR: COMPLEMENT WALL COLOR

CT: CERAMIC TILE (WALLS)
CT1: FIELD TILE - COLOR: NEUTRAL, LIGHT TONES (MINIMUM 6"X6")
CT2: ACCENT BAND - COLOR: COORDINATE WITH CT1

DMT: DEMOUNTABLE WALL SYSTEM (SEE NOTES 6 & 10)

ESD: ELECTROSTATIC DISSIPATIVE (GROUNDED TO BUILDING)
ESD1: COLOR: SPECKLED PATTERN

EXP: EXPOSED TO STRUCTURE ABOVE (U.O.N., NO OTHER FINISH REQUIRED)

FF: FACTORY FINISH

G: GROUT (ANTI-BACTERIAL)
G1: COLOR: MEDIUM TO DARK TONES (FLOOR)
G2: COLOR: LIGHT TO MEDIUM TONES (WALL)

GWB: GYPSUM WALLBOARD, USE APPROPRIATE TYPE REQUIRED BY ROOM FUNCTION (SEE NOTES 10 & 11)

P: PAINT
P1: EGGSHELL SHEEN (FIELD COLOR)
P2: SEMI-GLOSS SHEEN (RESTROOMS)
P3: FLAT WHITE (CEILING)
P4: HIGH-GLOSS SHEEN (TRIM)
P5: ENAMEL (HANDRAILS)
P6: EGGSHELL SHEEN (ACCENT COLOR, LOBBIES & BREAKROOMS)

PLAM: PLASTIC LAMINATE (NEUTRAL COLOR)
PLAM1: CABINETS (BREAKROOM)
PLAM2: PLUMBING REVEAL (RESTROOMS)

PROJ: PROJECTOR SCREEN WITH PROJECTOR MOUNT

PPT: PORCELAIN PAVER TILES (FLOORS)
PPT1: COLOR: NEUTRAL, MEDIUM TONES (PREFERRED 12"X12")

R: RESILIENT FLOORING (NEUTRAL, MEDIUM TONE COLOR)
R1: HOMOGENEOUS VINYL (SHEET, HEAT-WELDED WITH SLIGHT PATTERN)
R2: RUBBER STAIR TREAD WITH INTEGRATED RISER (RAISED PROFILE TEXTURE AND CONTRASTING EDGE COLOR FOR VISUALLY IMPAIRED)
R3: RUBBER TILE (24"X24", STAIR LANDINGS)

RB: RESILIENT WALL BASE (4" HIGH)
RB1: COLOR: MEDIUM TONES (COORDINATE WITH CARPET AND RESILIENT FLOORING)

S: STAIN, WOOD
S1: COLOR: CLEAR (OAK)

SSM: SOLID SURFACE MATERIAL (NEUTRAL COLOR)
SSM1: COLOR: MEDIUM TONES WITH SLIGHT PATTERN (BREAKROOM COUNTERTOP)
SSM2: COLOR: LIGHT TONES (RESTROOMS COUNTERTOP)

TP: TOILET PARTITIONS & URINAL SCREENS (SOLID POLYETHYLENE)
TP1: COLOR: NEUTRAL, LIGHT TO MEDIUM TONES

WS: WINDOW SHADES (NEUTRAL COLOR, SEE NOTE 8)
WS1: SINGLE ROLLER - TRANSLUCENT (5 OPENNESS)
WS2: DUAL ROLLERS - TRANSLUCENT (5) AND BLACKOUT

This project was designed by the Sacramento District of the U. S. Army Corps of Engineers.The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: D OWEN
DRAWN BY: D OWEN
CHECKED BY: K STEPHENS
SUBMITTED BY: Matthew Z Valentine
SIZE: E1.5
ANSI D E332 INTERIORS CENTRAL (SID)
ISSUE DATE: SEP 2018
PROJECT #: RKMF-17-0065
SPEC #: 2164
FILE NUMBER: 228-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
U.S. DEPT OF ARMY

SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 326 WG BUILDING 332
RKMF 17-0065

SECOND FLOOR INTERIOR FINISH/COLOR SCHEDULE

SHEET ID

I-611

THIRD FLOOR INTERIOR FINISH/COLOR SCHEDULE

RM. NO.	ROOM NAME	FLOOR	BASE	WAINSCOT MATERIAL	WAINSCOT HEIGHT	WALLS NORTH	COLOR	EAST	COLOR	SOUTH	COLOR	WEST	COLOR	CEILING MATERIAL	CEILING COLOR	CEILING HEIGHT	CABINETRY CABINETS	CABINETRY CNTRTOP	DOORS	TRIM	REMARKS
300	LOBBY	C1	RB1	--		GWB	P1	GWB	P6	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4	P4	--
301	FLIGHT CHIEF	C1	RB1	--		GWB	P1	--	--	--	--	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
302	TRAINING ROOM	C1	RB1	--		GWB	P1	DMT	P1	DMT	P1	DMT	P1	GWB	P3	8'-0"	--	--	S1	P4	CR, PROJ, WS2
303	SUPT.	C2	RB1	--		GWB	P1	DMT	P1	DMT	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
304	CURRENT OPS.	C2	RB1	--		GWB	P1	DMT	P1	DMT	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
305	DEP. COMMANDER	C2	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
306	COMMANDER	C2	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
307	XO	C2	RB1	--		DMT	P1	DMT	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
308	CAREER ADV.	C2	RB1	--		GWB	P1	--	--	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
309	COMMAND SUPPORT STAFF	C2	RB1	--		--	--	DMT	P1	GWB	P1	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
310	CONF. ROOM	C2	RB1	--		DMT	P1	DMT	P1	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	CR, WS2
311	TRAINING MNGR	C1	RB1	--		--	--	--	--	DMT	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
312	STORAGE	R1	RB1	--		DMT	P1	DMT	P1	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
313	COMM RM	ESD1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P3	8'-6"	--	--	P4	P4	NOTES 3, 4
314	ELECT RM	CONC1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	EXP	P3	8'-0"	--	--	P4	P4	--
315	SIPR/INTEL	C1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4	P4	WS2
316	BREAK RM	R1	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P6	ACT	ACT1	8'-0"	S1	SSM1	S1	P4	--
317	MEN RR	PPT1/G1	PPT1/G1	CT1/CT2/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	PLAM2	SSM2	S1	P4	TP1
318	WOMEN RR	PPT1/G1	PPT1/G1	CT1/CT2/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	PLAM2	SSM2	S1	P4	TP1
319	JAN	PPT1/G1	PPT1/G1	CT1/G2	4' - 9"	GWB	P2	GWB	P2	GWB	P2	GWB	P2	GWB	P2	8'-0"	--	--	S1	P4	NOTE 1
320	MAINT OFFICER	C1	RB1	--		DMT	P1	DMT	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
321	COMMANDER SUPPORT STAFF	C2	RB1	--		GWB	P1	GWB	P1	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
322	COMMANDER	C2	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
323	1SG OFF	C2	RB1	--		GWB	P1	GWB	P1	GWB	P1	DMT	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
324	SUPERINTENDENT	C1	RB1	--		GWB	P1	DMT	P1	DMT	P1	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
325	COMPUTER WORK STATIONS	C1	RB1	--		GWB	P1	--	--	--	--	--	--	ACT	ACT1	8'-0"	--	--	S1	P4	--
326	SHOP CHIEF	C1	RB1	--		GWB	P1	--	--	--	--	GWB	P1	ACT	ACT1	8'-0"	--	--	S1	P4	--
327	STAIR	R2/R3	RB1	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	GWB	P3	8'-0"	--	--	P4	P4	NOTE 2
328	ELEV	--	--	--		GWB	P1	GWB	P1	GWB	P1	GWB	P1	--	--	--	--	--	FF	P4	NOTE 7
329	CORRIDOR	C1	RB1	--		--	--	GWB	P1	--	--	--	--	ACT	ACT1	8'-0"	--	--	P4	P4	--
330	CORRIDOR	C1	RB1	--		DMT/GWB	P1	GWB	P1	DMT/GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4/S1	P4	--
331	CORRIDOR	C2	RB1	--		DMT/GWB	P1	GWB	P1	DMT/GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4/S1	P4	--
332	CORRIDOR	C2	RB1	--		DMT/GWB	P1	GWB	P1	DMT/GWB	P1	GWB	P1	ACT	ACT1	8'-0"	--	--	P4/S1	P4	--

SHEET NOTES:

1.) SHELVING IN JANITOR CLOSETS SHALL BE ADJUSTABLE.

2.) HANDRAILS IN STAIRWELLS SHALL BE PAINTED: P5

3.) BACKERBOARDS IN COMM ROOMS SHALL BE 3/4" FIRE-RETARDANT TREATED PLYWOOD (VOID-FREE) PER UFC 3-580-01.

4.) STATIC-CONTROL FLOOR SYSTEM SHALL BE CONNECTED TO BUILDING GROUND.

5.) CORNER WALL GUARDS SHALL BE INSTALLED AT ALL VULNERABLE OUTSIDE CORNERS.

6.) DEMOUNTABLE WALLS ARE CONTRACTOR FURNISHED/CONTRACTOR INSTALLED (CF/CI). ACCOMMODATE BUILDING INFRASTRUCTURE AS REQUIRED.

7.) ELEVATOR CAB FINISHES SHALL BE HIGH-IMPACT PLASTIC LAMINATE FOR WALLS, PORCELAIN PAVER TILES FOR FLOOR, AND FACTORY FINISH CEILING.

8.) ALL WINDOWS LOCATED AT EXTERIOR WALLS RECEIVE WINDOW COVERING: WS1, UNLESS OTHERWISE NOTED (UON).

9.) SEE ARCHITECTURAL SHEETS FOR CHAIN LINK FENCE.

10.) WALL COLUMNS IN FINISH SCHEDULES REPRESENT SUGGESTED WALL CONSTRUCTION MATERIAL.

11.) CEILING COLUMN IN FINISH SCHEDULES REPRESENT SUGGESTED CEILING HEIGHTS. ACCOMMODATE HVAC WORK AS REQUIRED.

GENERAL NOTES:

A. FOR WALLS WITH A WAINSCOT, THE WAINSCOT MATERIAL IS LISTED IN THE WAINSCOT COLUMN. THE MATERIAL LOCATED ABOVE THE WAINSCOT IS LISTED IN THE WALLS COLUMNS.

B. THE DOOR COLUMN DENOTES THE FINISH, NOT THE DOOR MATERIAL.

C. THE COLUMN LABELED AS TRIM IS USED FOR DOOR & WINDOW FRAMES.

FINISH LEGEND:

ACT: ACOUSTICAL CEILING TILES (2'X2', SEE NOTE 11)
ACT1: COLOR: FLAT WHITE

C: CARPET (24"X24" TILES)
C1: COLOR: MULTI-COLOR PATTERN, MEDIUM TONES
C2: C1 WITH CARPET PAD (COMMANDER'S OFFICE)

CG: CORNER GUARDS (SEE NOTE 5)
COLOR: COMPLEMENT WALL COLOR

CONC: CONCRETE
CONC1: SURFACE SEALED CONCRETE WITH HARDENER

CR: CHAIR RAIL (COORDINATE INSTALL HEIGHT WITH GF/GI SEATING)
COLOR: COMPLEMENT WALL COLOR

CT: CERAMIC TILE (WALLS)
CT1: FIELD TILE - COLOR: NEUTRAL, LIGHT TONES (MINIMUM 6"X6")
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DMT: DEMOUNTABLE WALL SYSTEM (SEE NOTES 6 & 10)

ESD: ELECTROSTATIC DISSIPATIVE (GROUNDED TO BUILDING)
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EXP: EXPOSED TO STRUCTURE ABOVE (U.O.N., NO OTHER FINISH REQUIRED)

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G: GROUT (ANTI-BACTERIAL)
G1: COLOR: MEDIUM TO DARK TONES (FLOOR)
G2: COLOR: LIGHT TO MEDIUM TONES (WALL)

GWB: GYPSUM WALLBOARD, USE APPROPRIATE TYPE REQUIRED BY ROOM FUNCTION (SEE NOTES 10 & 11)

P: PAINT
P1: EGGSHELL SHEEN (FIELD COLOR)
P2: SEMI-GLOSS SHEEN (RESTROOMS)
P3: FLAT WHITE (CEILING)
P4: HIGH-GLOSS SHEEN (TRIM)
P5: ENAMEL (HANDRAILS)
P6: EGGSHELL SHEEN (ACCENT COLOR, LOBBIES & BREAKROOMS)

PLAM: PLASTIC LAMINATE (NEUTRAL COLOR)
PLAM1: CABINETS (BREAKROOM)
PLAM2: PLUMBING REVEAL (RESTROOMS)

PROJ: PROJECTOR SCREEN WITH PROJECTOR MOUNT

PPT: PORCELAIN PAVER TILES (FLOORS)
PPT1: COLOR: NEUTRAL, MEDIUM TONES (PREFERRED 12"X12")

R: RESILIENT FLOORING (NEUTRAL, MEDIUM TONE COLOR)
R1: HOMOGENEOUS VINYL (SHEET, HEAT-WELDED WITH SLIGHT PATTERN)
R2: RUBBER STAIR TREAD WITH INTEGRATED RISER (RAISED PROFILE TEXTURE AND CONTRASTING EDGE COLOR FOR VISUALLY IMPAIRED)
R3: RUBBER TILE (24"X24", STAIR LANDINGS)

RB: RESILIENT WALL BASE (4" HIGH)
RB1: COLOR: MEDIUM TONES (COORDINATE WITH CARPET AND RESILIENT FLOORING)

S: STAIN, WOOD
S1: COLOR: CLEAR (OAK)

SSM: SOLID SURFACE MATERIAL (NEUTRAL COLOR)
SSM1: COLOR: MEDIUM TONES WITH SLIGHT PATTERN (BREAKROOM COUNTERTOP)
SSM2: COLOR: LIGHT TONES (RESTROOMS COUNTERTOP)

TP: TOILET PARTITIONS & URINAL SCREENS (SOLID POLYETHYLENE)
TP1: COLOR: NEUTRAL, LIGHT TO MEDIUM TONES

WS: WINDOW SHADES (NEUTRAL COLOR, SEE NOTE 8)
WS1: SINGLE ROLLER - TRANSLUCENT (5 OPENNESS)
WS2: DUAL ROLLERS - TRANSLUCENT (5) AND BLACKOUT

This project was designed by the Sacramento District of the U. S. Army Corps of Engineers.The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: SEP 2018
PROJECT #: RKMF-17-0065
SPEC #: 2164
FILE NUMBER: 228-25-0715
FILE NAME: B332 INTERIORS CENTRAL (SID)

DESIGNED BY: D OWEN
DRAWN BY: D OWEN
CHECKED BY: K STEPHENS
SUBMITTED BY: K Matthews/ Z Valentine
SIZE: ANSI D

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
U.S. DEPT OF ARMY

SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE B28 WCS BUILDING 332
RKMF 17-0065

THIRD FLOOR INTERIOR FINISH/COLOR SCHEDULE

SHEET ID

I-612

FURNITURE LEGEND:

TABLE, DINING (36" X 36")

TABLE, CONFERENCE (48" X 48")

TABLE, CONFERENCE (36" DIA.) WITH UPHOLSTERED CONFERENCE CHAIRS

TABLE, CONFERENCE (48" X 96")

5' - 6" / 6' - 6"

DESK, FREESTANDING MODULAR
WITHOUT OVERHEAD HUTCH
WITH OVERHEAD HUTCH

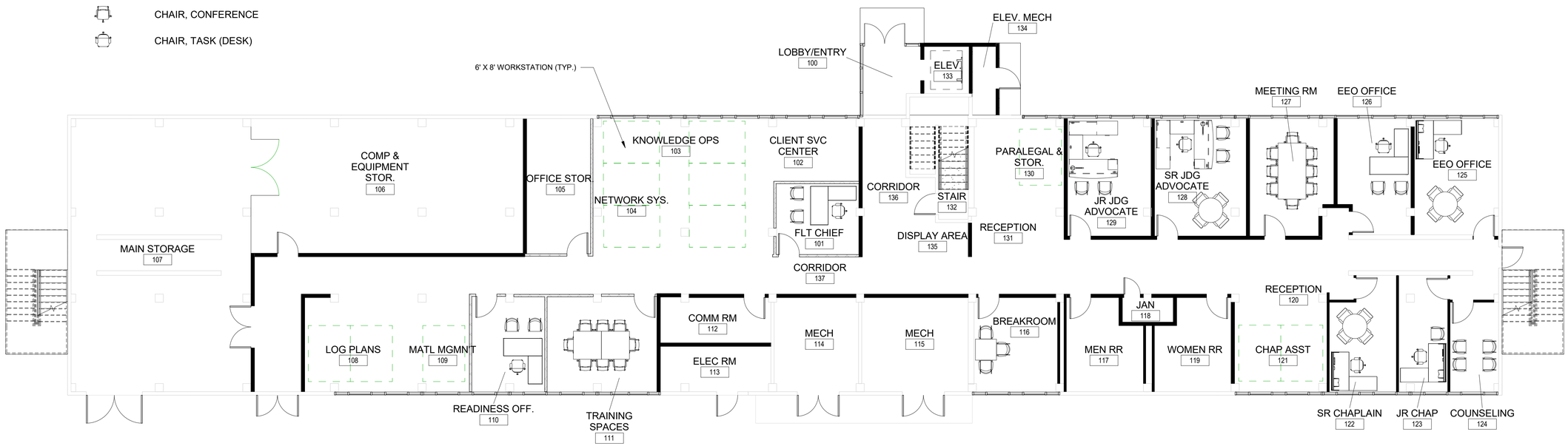
7' - 0" / 8' - 0"

EXECUTIVE (WOOD) DESK WITH TASK CHAIR AND UPHOLSTERED WOOD GUEST CHAIRS

CHAIR, GUEST

CHAIR, CONFERENCE

CHAIR, TASK (DESK)



SHEET NOTES:

1.) REFER TO ARCHITECTURAL SHEETS FOR SUGGESTED WALL CONSTRUCTION TYPES.
2.) PROVIDE DESIGN OF FF&E IN ACCORDANCE WITH THE AIR FORCE RESERVE COMMAND COMPREHENSIVE INTERIOR DESIGN POLICY MANUAL.
3.) DEMOUNTABLE WALLS ARE CONTRACTOR FURNISHED/CONTRACTOR INSTALLED (CF/CI).

1 / IF101 — 1ST FLOOR FURNITURE PLAN

1/8" = 1'-0"

PLAN NORTH

5' 0 5' 15' 25'

1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: SEP 2018
PROJECT # RKMF 17-0065
SPEC # 21640
FILE NUMBER: 229-25-0715

DESIGNED BY: D OWEN
DRAWN BY: D OWEN
CHECKED BY: K STEPHENS
SUBMITTED BY: Matthew K. Valentine
SIZE: FILE NAME: ANSI D B332_INTERIORS_CENTRAL (FF&E)

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

1ST FLOOR FURNITURE PLAN

SHEET ID

IF101

FURNITURE LEGEND:

TABLE, DINING (36" X 36")

TABLE, CONFERENCE (48" X 48")

TABLE, CONFERENCE (36" DIA.) WITH UPHOLSTERED CONFERENCE CHAIRS

TABLE, CONFERENCE (48" X 96")

5' - 6"
6' - 6"

DESK, FREESTANDING MODULAR
WITHOUT OVERHEAD HUTCH
WITH OVERHEAD HUTCH

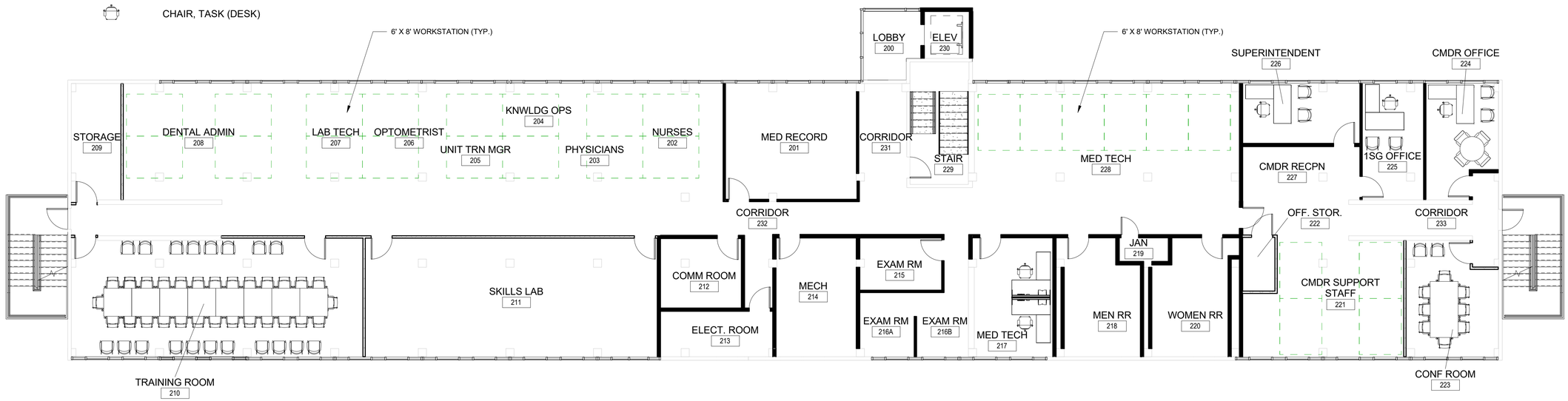
7' - 0"
8' - 0"

EXECUTIVE (WOOD) DESK WITH TASK CHAIR AND UPHOLSTERED WOOD GUEST CHAIRS

CHAIR, GUEST

CHAIR, CONFERENCE

CHAIR, TASK (DESK)



SHEET NOTES:

1.) REFER TO ARCHITECTURAL SHEETS FOR SUGGESTED WALL CONSTRUCTION TYPES.
2.) PROVIDE DESIGN OF FF&E IN ACCORDANCE WITH THE AIR FORCE RESERVE COMMAND COMPREHENSIVE INTERIOR DESIGN POLICY MANUAL.
3.) DEMOUNTABLE WALLS ARE CONTRACTOR FURNISHED/CONTRACTOR INSTALLED (CF/CI).

1 IF102 2ND FLOOR FURNITURE PLAN

1/8" = 1'-0"

PLAN NORTH

5' 0 5' 15' 25'

1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: D OWEN
DRAWN BY: D OWEN
CHECKED BY: K STEPHENS
SUBMITTED BY: /s/ Matthew Z. Valentine
SIZE: FILE NAME: ANSI D' B332 INTERIORS CENTRAL (FF&E)
ISSUE DATE: SEP 2018
PROJECT # RKMF 17-0065
SPEC # 21164
FILE NUMBER: 229-25-0715

US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
US DEPT OF ARMY

SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814

NELLIS AIR FORCE BASE, NEVADA
RENOVATE 926 WG BUILDING 332
RKMF 17-0065

2ND FLOOR FURNITURE PLAN

SHEET ID

IF102

FURNITURE LEGEND:

TABLE, DINING (36" X 36")

TABLE, CONFERENCE (48" X 48")

TABLE, CONFERENCE (36" DIA.) WITH UPHOLSTERED CONFERENCE CHAIRS

TABLE, CONFERENCE (48" X 96")

5' - 6"

6' - 6"

DESK, FREESTANDING MODULAR
WITHOUT OVERHEAD HUTCH
WITH OVERHEAD HUTCH

7' - 0"

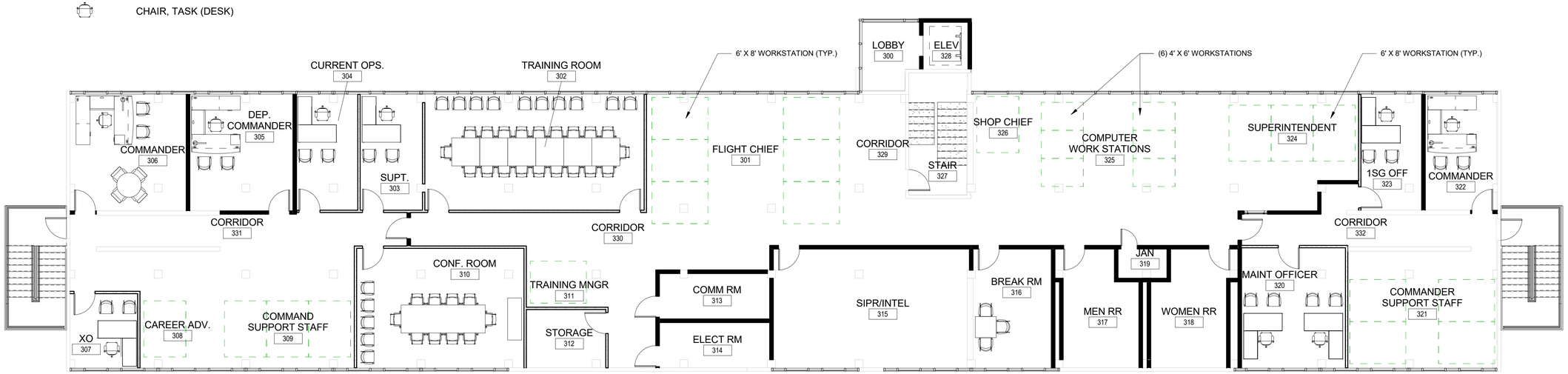
8' - 0"

EXECUTIVE (WOOD) DESK WITH TASK CHAIR AND UPHOLSTERED WOOD GUEST CHAIRS

CHAIR, GUEST

CHAIR, CONFERENCE

CHAIR, TASK (DESK)



SHEET NOTES:

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1 IF103 3RD FLOOR FURNITURE PLAN

1/8" = 1'-0"

PLAN NORTH

5' 0 5' 15' 25'

1/8"=1'-0" GRAPHIC SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: SEP 2018
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DESIGNED BY: D OWEN
DRAWN BY: D OWEN
CHECKED BY: K STEPHENS
SUBMITTED BY: K Matthews / K Valentine
SIZE: ANSI 'D'

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IF103