

Prepared for:

TOWNSEND ENGINEERING INC.

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☒ APPROVED

☐ REVISE & RESUBMIT

☐ APPROVED AS NOTED ☐ NOT APPROVED

Hoyt's Heating and AC, Inc

APPROVAL IS FOR QUALITY STANDARDS, CAPACITY &
CONFORMANCE ONLY.

Project:

PHYSICAL SIZE AND OPERATING CHARACTERISTICS AND
COORDINATION WITH OTHER TRADES ARE
CONTRACTORS RESPONSIBILITY.

REVIEWED BY



DATE:

6/12/25

Shaw Air Force Base B417

Sumter, South Carolina

M&M Test and Balance LLC

P.O. Box 31435

Greenville, South Carolina 29608

864-382-6500

Date:

May 14, 2025

Prepared for:

Shaw AFB B417

TABLE OF CONTENTS

Date: May 14, 2025

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CERTIFIED

Test, Adjust and Balance Report

PROJECT: B417
Shaw Air Force Base
Sumter, South Carolina 29152

ARCHITECT: PM Architecture
1642 Madison Avenue
New York, New York 10029

ENGINEER: 20th Civil Engineering Squadron
428 Chapin Street
Sumter, South Carolina 29152

CONTRACTOR: Hoyt's Heating and AC, Inc.
710 North Wise Drive
Sumter, South Carolina 29153

CERTIFICATION

PROJECT:

B417

Shaw Air Force Base

Sumter, South Carolina 29152

The data presented in this report is an exact record of system performance and was obtained in accordance with NBC standard procedures. Any variances from design quantities, which exceed NBC tolerances, are noted thought this report and summarized on the Summary Report.

The air distribution systems have been tested & balanced and final adjustments have been made in accordance with NBC PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS and the project specifications.

NBC Contractor:

M & M Test and Balance

Certification # CTP-1018-2016

Certified By:

Jeff Powell

Date: 5/14/2025

The hydronic distribution systems have been tested & balanced and final adjustments have been made in accordance with NBC "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS" and the project specifications.

NBC Contractor:

M & M Test and Balance

Certification # CTP-1018-2016

Certified By:

Jeff Powell

Date: 5/14/2025

SUBMITTED AND CERTIFIED BY:

NBC TAB FIRM:

M & M Test and Balance LLC

110 Deborah Lane

Greenville, South Carolina 29611

CERTIFIED SUPERVISOR:



Jeffrey A Powell

Prepared for:

Shaw AFB B417

ABBREVIATIONS

Date: May 14, 2025

#	<i>Number</i>	GPM	<i>Gallons per Minute</i>
bHP	<i>Brake Horsepower</i>	kw	<i>Kilowatts</i>
CFM	<i>Cubic Feet per Minute</i>	LAT	<i>Leaving Air Temperature</i>
CONT'D	<i>Continued</i>	N/A	<i>Non Applicable</i>
°F	<i>Degree Fahrenheit</i>	OA	<i>Outside Air</i>
DIAM	<i>Diameter</i>	%	<i>Percent</i>
Db	<i>Dry Bulb</i>	P.F.	<i>Power Factor</i>
ERU	<i>Energy Recovery Unit</i>	PSI	<i>Pounds per Square Inch</i>
EAT	<i>Entering Air Temperature</i>	ΔP	<i>Pressure Differential</i>
EF	<i>Exhaust Fan</i>	ROT	<i>Rotation</i>
EFF	<i>Efficiency</i>	RPM	<i>Rotations per Minute</i>
FLA	<i>Full Load Amps</i>	S.F.	<i>Service Factor</i>
FPM	<i>Feet per Minute</i>	SQFT	<i>Square Feet</i>
FT	<i>Feet</i>	S.P.	<i>Static Pressure</i>
FT H₂O	<i>Feet of Water</i>	SF	<i>Supply Fan</i>
HP	<i>Horsepower</i>	T.P.	<i>Total Pressure</i>
IN	<i>Inches</i>	VAV	<i>Variable Air Volume</i>
IN H₂O	<i>Inches of Water</i>	VFD	<i>Variable Frequency Drive</i>
IN W.C.	<i>Inches Water Column Pressure</i>	Wb	<i>Wet Bulb</i>

M&M Test and Balance LLC

<i>Prepared for:</i>	Shaw AFB B417
SUMMARY REPORT	
Date: <u>May 14, 2025</u>	

The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NBC "Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems". Any variances from design quantities, which exceed NBC tolerances, are noted on this Summary Report.

Prepared for:

Shaw AFB B417

Fan Test Report

System: AHU - 1

Test Apparatus: Shortridge 860

Date: May 14, 2025

Certified Tester: Jeff Powell

UNIT DATA

Location	MECH ROOM
Service	CAFETERIA
Manufacturer	TRANE
Model Number	CSAA030UAMOO
Serial Number	H24D35068
Classification	AIR HANDLER
Filter Type	MERV 10
Filters	7-20x24x2
	1-16x20x2
	3-12x24x2

MOTOR DATA

Fan Motor Manufacturer	BALDOR
Motor HP/RPM/Frame	(2) 10 1770 215T
Voltage/Phase/Hertz	208 3 60
FLA/S.F.	29.5 1.15
EFF%	97.7%
P.F. %	80.0%
Rotation	COUNTER CLOCKWISE
Service Factor Amps	33.9

FAN DATA

Motor Sheave Manufacturer	DIRECT DRIVE
Motor Sheave Diam/Bore	DIRECT DRIVE
Fan Sheave Manufacturer	DIRECT DRIVE
Fan Sheave Diam/Bore	DIRECT DRIVE
# Belts/Manufacturer/Size	DIRECT DRIVE
Sheave Center Distance	DIRECT DRIVE

TEST DATA

TEST DATA	DESIGN	ACTUAL
Total CFM	14900	15231
Fan RPM		1235
Motor Volts	208	206/10/09
Motor Amps	59.0	30.0 AVG
Outside Air	6230	6291
Return Air		
SP In/Out		.60/.65
ESP		1.25
Hz	60	65
ΔP SET POINT		.64

REMARKS:

M&M Test and Balance LLC

Prepared for:

Shaw AFB B417

Fan Test Report

System: AHU - 2

Test Apparatus: Shortridge 860

Date: May 14, 2025

Certified Tester: Jeff Powell

UNIT DATA

Location	MECH ROOM
Service	CAFETERIA
Manufacturer	TRANE
Model Number	CSAA025UAMOO
Serial Number	H24D35076
Classification	AIR HANDLER
Filter Type	MERV 10
Filters	6-20x20x2
	2-16x20x2
	3-12x24x2

MOTOR DATA

Fan Motor Manufacturer	BALDOR
Motor HP/RPM/Frame	(2) 7.5 1770 213T
Voltage/Phase/Hertz	208 3 60
FLA/S.F.	23.3 1.15
EFF%	91.0%
P.F.%	77.0%
Rotation	COUNTER CLOCKWISE
Service Factor Amps	26.8

FAN DATA

Motor Sheave Manufacturer	DIRECT DRIVE
Motor Sheave Diam/Bore	DIRECT DRIVE
Fan Sheave Manufacturer	DIRECT DRIVE
Fan Sheave Diam/Bore	DIRECT DRIVE
# Belts/Manufacturer/Size	DIRECT DRIVE
Sheave Center Distance	DIRECT DRIVE

TEST DATA

TEST DATA	DESIGN	ACTUAL
Total CFM	10000	10181
Fan RPM		1235
Motor Volts	208	210/12/13
Motor Amps	46.6	25.5 AVG
Outside Air	5100	5132
Return Air		
SP In/Out		.52/.48
ESP		1.00
Hz	60	52.5
ΔP SET POINT		.40

REMARKS:

M&M Test and Balance LLC

M&M Test and Balance LLC

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Prepared for:

Shaw AFB B417

PUMP TEST REPORT

System: P - 1

Date: May 14, 2025

Certified Tester: Jeff Powell

PUMP DATA

LOCATION	MECH ROOM
SERVICE	CHILL WATER
MANUFACTURER	TACO
MODEL #	F12513E4HA1L0DX81943D
SERIAL #	F0485475
MOTOR MFG.	BALDOR
NAME PLATE H.P.	15
NAME PLATE RPM	1770
VOLTAGE/PHASE	208/3/60
F.L. AMPERES/ S.F.	36.4/1.15
DESIGN GPM	265
DESIGN FT. OF HEAD	120
DESIGN IMPELLER IN.	11.15
REQ NPSH	11
PUMP RPM	1750
IMPELLER DIAM	11.15
EFF/P.F.	.93/.83
FRAME	254T

TEST DATA

READING

VALVE SHUT DIFF PSI	57
VALVE SHUT HEAD FT	132
WIDE OPEN DIFF. PSI	57
WIDE OPEN HEAD FT.	132
WIDE OPEN GPM	280
FINAL SUCTION PSI	56.3
FINAL DISCHARGE PSI	1.6
FINAL HEAD FT.	125
FINAL GPM	271
PUMP OFF-PRESS PSI	12.3
VOLTAGE	210/12/13
AMPERE	26
HERTZ	58
ACTUAL IMP. DIA.	11.15
ΔP SET POINT	48

REMARKS: _____

M&M Test and Balance LLC

Prepared for:

Shaw AFB B417

PUMP TEST REPORT

System: P - 2

Date: May 14, 2025

Certified Tester: Jeff Powell

PUMP DATA

LOCATION	MECH ROOM
SERVICE	CHILL WATER
MANUFACTURER	TACO
MODEL #	F12513E4HA1L0DX81943D
SERIAL #	F0485475
MOTOR MFG.	BALDOR
NAME PLATE H.P.	15
NAME PLATE RPM	1770
VOLTAGE/PHASE	208/3/60
F.L. AMPERES/ S.F.	36.4/1.15
DESIGN GPM	265
DESIGN FT. OF HEAD	120
DESIGN IMPELLER IN.	11.15
REQ NPSH	11
PUMP RPM	1750
IMPELLER DIAM	11.15
EFF/P.F.	.93/.83
FRAME	254T

TEST DATA

READING

VALVE SHUT DIFF PSI	58
VALVE SHUT HEAD FT	134
WIDE OPEN DIFF. PSI	57
WIDE OPEN HEAD FT.	132
WIDE OPEN GPM	280
FINAL SUCTION PSI	57
FINAL DISCHARGE PSI	2
FINAL HEAD FT.	127
FINAL GPM	274
PUMP OFF-PRESS PSI	12.3
VOLTAGE	210/12/13
AMPERE	27.1
HERTZ	56
ACTUAL IMP. DIA.	11.15
ΔP SET POINT	48

REMARKS: _____

M&M Test and Balance LLC

Prepared for:

Shaw AFB B417

PUMP TEST REPORT

System: P - 3

Date: May 14, 2025

Certified Tester: Jeff Powell

PUMP DATA

LOCATION	MECH ROOM
SERVICE	BOILER WATER
MANUFACTURER	TACO
MODEL #	KV3011DE2KCXAC719D
SERIAL #	F0485642
MOTOR MFG.	BALDOR
NAME PLATE H.P.	10
NAME PLATE RPM	1770
VOLTAGE/PHASE	208/3/60
F.L. AMPERES/ S.F.	25
DESIGN GPM	160
DESIGN FT. OF HEAD	100
DESIGN IMPELLER IN.	9.85
REQ NPSH	9
PUMP RPM	1750
IMPELLER DIAM	9.85
EFF/P.F.	91.7/82
FRAME	215JM

TEST DATA

READING

VALVE SHUT DIFF PSI	46
VALVE SHUT HEAD FT	106
WIDE OPEN DIFF. PSI	43
WIDE OPEN HEAD FT.	100
WIDE OPEN GPM	160
FINAL SUCTION PSI	1
FINAL DISCHARGE PSI	43
FINAL HEAD FT.	100
FINAL GPM	160
PUMP OFF-PRESS PSI	10.5
VOLTAGE	210/12/11
AMPERE	12.8
HERTZ	60
ACTUAL IMP. DIA.	9.85
ΔP SET POINT	40

REMARKS: _____

M&M Test and Balance LLC

Prepared for:

Shaw AFB B417

PUMP TEST REPORT

System: P - 4

Date: May 14, 2025

Certified Tester: Jeff Powell

PUMP DATA

LOCATION	MECH ROOM
SERVICE	BOILER WATER
MANUFACTURER	TACO
MODEL #	KV3011DE2KCXAC719D
SERIAL #	F0485642
MOTOR MFG.	BALDOR
NAME PLATE H.P.	10
NAME PLATE RPM	1770
VOLTAGE/PHASE	208/3/60
F.L. AMPERES/ S.F.	25
DESIGN GPM	160
DESIGN FT. OF HEAD	100
DESIGN IMPELLER IN.	9.85
REQ NPSH	9
PUMP RPM	1750
IMPELLER DIAM	9.85
EFF/P.F.	91.7/82
FRAME	215JM

TEST DATA

READING

VALVE SHUT DIFF PSI	46
VALVE SHUT HEAD FT	106
WIDE OPEN DIFF. PSI	43
WIDE OPEN HEAD FT.	100
WIDE OPEN GPM	160
FINAL SUCTION PSI	1
FINAL DISCHARGE PSI	43
FINAL HEAD FT.	100
FINAL GPM	160
PUMP OFF-PRESS PSI	10.5
VOLTAGE	210/12/12
AMPERE	13.1
HERTZ	60
ACTUAL IMP. DIA.	9.85
ΔP SET POINT	40

REMARKS: _____

M&M Test and Balance LLC

Prepared for:

Shaw AFB B417

Fan Test Report

System: EF - 3

Test Apparatus: Shortridge 860

Date: May 14, 2025

Certified Tester: Jeff Powell

UNIT DATA

Location	ROOF
Service	N/A
Manufacturer	GREENHECK
Model Number	G-100-A-4-1-19-X
Serial Number	2543220324I
Classification	EXHAUST

MOTOR DATA

Fan Motor Manufacturer	CHINA		
Motor HP/RPM/Frame	1/4	1725	48
Voltage/Phase/Hertz	115	1	60
FLA/S.F.	3.1	1.0	

FAN DATA

Motor Sheave Manufacturer	DIRECT DRIVE
Motor Sheave Diam/Bore	DIRECT DRIVE
Fan Sheave Manufacturer	DIRECT DRIVE
Fan Sheave Diam/Bore	DIRECT DRIVE
# Belts/Manufacturer/Size	DIRECT DRIVE
Sheave Center Distance	DIRECT DRIVE

TEST DATA

DESIGN

ACTUAL

Total CFM	840	836
Fan RPM	1365	DIRECT
Total Static Pressure	.375	.31
Motor Volts	115	122
Motor Amps	3.1	3.0

REMARKS:

M&M Test and Balance LLC

Prepared for:

Shaw AFB B417

Fan Test Report

System: EF - 4

Test Apparatus: Shortridge 860

Date: May 14, 2025

Certified Tester: Jeff Powell

UNIT DATA

Location	ROOF
Service	N/A
Manufacturer	GREENHECK
Model Number	G-080-D-1-17X
Serial Number	25432204246
Classification	EXHAUST

MOTOR DATA

Fan Motor Manufacturer	MCMILLAN		
Motor HP/RPM/Frame	1/15	1550	48
Voltage/Phase/Hertz	115	1	60
FLA/S.F.	1.2	1.0	

FAN DATA

Motor Sheave Manufacturer	DIRECT DRIVE
Motor Sheave Diam/Bore	DIRECT DRIVE
Fan Sheave Manufacturer	DIRECT DRIVE
Fan Sheave Diam/Bore	DIRECT DRIVE
# Belts/Manufacturer/Size	DIRECT DRIVE
Sheave Center Distance	DIRECT DRIVE

TEST DATA

DESIGN

ACTUAL

Total CFM	200	210
Fan RPM	1254	DIRECT
Total Static Pressure	.25	.20
Motor Volts	115	122
Motor Amps	1.2	1.0

REMARKS:

M&M Test and Balance LLC

Prepared for:

Shaw AFB B417

Fan Test Report

System: EF - 5

Test Apparatus: Shortridge 860

Date: May 14, 2025

Certified Tester: Jeff Powell

UNIT DATA

Location	ROOF
Service	N/A
Manufacturer	GREENHECK
Model Number	G-097-C-8-1-19-X
Serial Number	2543220524I
Classification	EXHAUST

MOTOR DATA

Fan Motor Manufacturer	CHINA		
Motor HP/RPM/Frame	1/8	860	48Y
Voltage/Phase/Hertz	115	1	60
FLA/S.F.	2.3	1.0	

FAN DATA

Motor Sheave Manufacturer	DIRECT DRIVE
Motor Sheave Diam/Bore	DIRECT DRIVE
Fan Sheave Manufacturer	DIRECT DRIVE
Fan Sheave Diam/Bore	DIRECT DRIVE
# Belts/Manufacturer/Size	DIRECT DRIVE
Sheave Center Distance	DIRECT DRIVE

TEST DATA

DESIGN

ACTUAL

Total CFM	90	93
Fan RPM	843	DIRECT
Total Static Pressure	.25	.22
Motor Volts	115	123
Motor Amps	2.3	2.1

REMARKS:

M&M Test and Balance LLC

Prepared for:

Shaw AFB B417

Fan Test Report

System: EF - 6

Test Apparatus: Shortridge 860

Date: May 14, 2025

Certified Tester: Jeff Powell

UNIT DATA

Location	ROOF
Service	N/A
Manufacturer	GREENHECK
Model Number	G-100-A-4-1-19-X
Serial Number	2543220624I
Classification	EXHAUST

MOTOR DATA

Fan Motor Manufacturer	CHINA		
Motor HP/RPM/Frame	1/4	1725	48
Voltage/Phase/Hertz	115	1	60
FLA/S.F.	3.1	1.0	

FAN DATA

Motor Sheave Manufacturer	DIRECT DRIVE
Motor Sheave Diam/Bore	DIRECT DRIVE
Fan Sheave Manufacturer	DIRECT DRIVE
Fan Sheave Diam/Bore	DIRECT DRIVE
# Belts/Manufacturer/Size	DIRECT DRIVE
Sheave Center Distance	DIRECT DRIVE

TEST DATA

DESIGN

ACTUAL

Total CFM	1100	1036
Fan RPM	1627	DIRECT
Total Static Pressure	.375	.29
Motor Volts	115	120
Motor Amps	3.1	2.9

REMARKS:

M&M Test and Balance LLC