Report By:

National TAB - Kansas City
1126 Swift St
N Kansas City, MO 64116

NATIONAL TAB

Comfort. Under control.

Report: CERTIFIED TAB REPORT
Function: Test, Adjust, & Balance
Date: 05/30/2023

PROJECT

Boot Barn (Kansas City, MO)

9900 NW Global Ave

Kansas City, MO 64153

Client

Metro Air Conditioning

8151 McCoy

Shawnee, KS 66227

CERTIFICATION

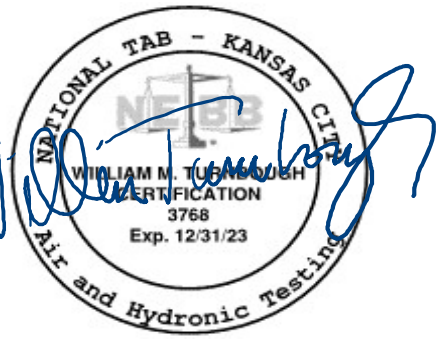
PROJECT: BOOT BARN - KANSAS CITY, MO

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 NEBB Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems. The measurements shown, and the information given, in this report are certified to be accurate and complete, at the time and date information was gathered. Any variances from design quantities, which exceed NEBB tolerances, are noted in the TAB report project summary.

NEBB TAB FIRM: National TAB - Kansas City
REGISTRATION NO: 3768
CERTIFIED BY: Will Turnbough
DATE: 6/7/2023

Submitted and Certified by:

NEBB TAB FIRM: National TAB - Kansas City
TAB PROFESSIONAL: Will Turnbough
REGISTRATION NO: CP-24289
CERTIFICATION EXP: 12/31/2023



Comfort. Under control.

Boot Barn (Kansas City, MO)

Project Issue Information

Issue Name : CEF2 low on flow, speed at max

Description : CEF2 for the women's restroom in the main office area is low on flow and above hard ceiling so tech cannot get above it. It is likely that the backdraft damper is closed. Opening the damper should give the flow needed.

Created By : National TAB

Assigned To : National TAB - Jacob Davidson

Status : Open

Originated Date : 04/26/2023 - Jacob Davidson - National TAB

Project Issue File Details

Fannumber
04/26/2023

fan
06/07/2023

Project Issue Response Details

- **05/22/2023 National TAB - Jacob Davidson**
  - Performed return trip to re-test airflow. CEF2 still only performs at 50CFM at max speed. Operating at maximum speed. Verified ductwork is not restricted and that the discharge on the roof was not obstructed.

National TAB

Project: Boot Barn (Kansas City, MO)

System/Unit: AHU/RTU

Comfort. Under control.

Asset: RTU-1 AREA:MAIN OFFICE

Unit Data		
	Design	**Actual**
MFG	NA	CARRIER
Serial Num	-	0123C05467
Model Num	NA	48FCEA05A2A6A0A0A0
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1 METAL MESH
OA Filter Size 1	-	14X28
Num PreFilter 1	-	2
PreFilter Size 1	-	16X25X2

Motor Data		
	Design	**Actual**
Motor MFG	-	UTO
Frame	-	UTO
Horsepower	-	1.1
Motor Rpm	-	UTO
Phase	-	3
Rated Voltage	-	460
Rated Amperage	-	1.7
Service Factor	-	UTO

Test Data		
	Design	**Actual**
SF CFM	1600	1578
RA CFM	1380	1347
OA CFM	220	231
RL Voltage	-	487/489/488
RL Amperage	-	0.96/0.94/0.98
OA Damper Position	-	2.90V 11% HIGH/ 3.55V 19% LOW
Brake Horse Power	-	0.647

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.24"
Fan Suction SP	-	-0.42"
Fan Discharge SP	-	0.47"
Total ESP	-	0.71"
Fan Total SP	-	0.89"

Completed By: Jacob Davidson on 06/05/2023

Date: 6/7/2023

National TAB

Project:Boot Barn (Kansas City, MO)

AHU/RTU

Comfort. Under control.

Diffuser Supply (GRD)

RTU-1/MAIN OFFICE

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
SGRD1	RESTROOM	SD-2	8	100	162	96	96.0
SGRD2	MAIN OFFICE	SD-1	10	350	432	324	92.6
SGRD3	MAIN OFFICE	SD-1	10	350	447	332	94.9
SGRD4	MAIN OFFICE	SD-1	10	400	306	414	103.5
SGRD5	MAIN OFFICE	SD-1	10	400	391	412	103.0

National TAB

Project: Boot Barn (Kansas City, MO)

System/Unit: AHU/RTU

Comfort. Under control.

Asset: RTU-2 AREA:MAIN OFFICE

Unit Data		
	Design	**Actual**
MFG	NA	CARRIER
Serial Num	-	0123C05465
Model Num	NA	48FCEA05A2A6A0A0A0
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1 METAL MESH
OA Filter Size 1	-	14X28
Num PreFilter 1	-	2
PreFilter Size 1	-	16X25X2

Test Data		
	Design	**Actual**
SF CFM	1600	1609
RA CFM	1340	1342
OA CFM	260	267
RL Voltage	-	490/488/488
RL Amperage	-	0.91/0.92/0.94
OA Damper Position	-	HIGH 3.95V LOW 4.60V
Brake Horse Power	-	0.602

Motor Data		
	Design	**Actual**
Motor MFG	-	UTO
Frame	-	UTO
Horsepower	-	1.1
Motor Rpm	-	UTO
Phase	-	3
Rated Voltage	-	460
Rated Amperage	-	1.7
Service Factor	-	UTO

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.20"
Fan Suction SP	-	-0.39"
Fan Discharge SP	-	0.48"
Total ESP	-	0.68"
Fan Total SP	-	0.87"

Completed By: Jacob Davidson on 04/26/2023

National TAB

Project:Boot Barn (Kansas City, MO)

AHU/RTU

Comfort. Under control.

Diffuser Supply (GRD)

RTU-2/MAIN OFFICE

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
SGRD1	RESTROOM	SD-2	8	150	206	159	106.0
SGRD2	MAIN OFFICE	SD-1	10	325	416	295	90.8
SGRD3	MAIN OFFICE	SD-1	10	325	428	311	95.7
SGRD4	MAIN OFFICE	SD-1	10	400	340	408	102.0
SGRD5	MAIN OFFICE	SD-1	10	400	375	436	109.0

National TAB

Project: Boot Barn (Kansas City, MO)

System/Unit: AHU/RTU

Comfort. Under control.

Asset: RTU-3 AREA:MAIN OFFICE

Unit Data		
	Design	**Actual**
MFG	NA	CARRIER
Serial Num	-	0123C05466
Model Num	NA	48FCEA05A2A6A0A0A0
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1 METAL MESH
OA Filter Size 1	-	14X28
Num PreFilter 1	-	2
PreFilter Size 1	-	16X25X2

Test Data		
	Design	**Actual**
SF CFM	1600	1601
RA CFM	1480	1479
OA CFM	120	122
RL Voltage	-	488/489/491
RL Amperage	-	0.34/0.32/0.41
OA Damper Position	-	HIGH 2.70V LOW 3.30V
Brake Horse Power	-	0.239

Motor Data		
	Design	**Actual**
Motor MFG	-	UTO
Frame	-	UTO
Horsepower	-	1.1
Motor Rpm	-	UTO
Phase	-	3
Rated Voltage	-	460
Rated Amperage	-	1.7
Service Factor	-	UTO

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.22"
Fan Suction SP	-	-0.36"
Fan Discharge SP	-	0.52"
Total ESP	-	0.74"
Fan Total SP	-	0.88"

Completed By: Jacob Davidson on 04/26/2023

Date: 6/7/2023

National TAB

Project:Boot Barn (Kansas City, MO)

AHU/RTU

Comfort. Under control.

Diffuser Supply (GRD)

RTU-3/MAIN OFFICE

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
SGRD1	MAIN OFFICE	SD-1	8	175	224	165	94.3
SGRD2	MAIN OFFICE	SD-1	8	175	228	185	105.7
SGRD3	MAIN OFFICE	SD-1	8	175	216	179	102.3
SGRD4	MAIN OFFICE	SD-1	10	375	323	360	96.0
SGRD5	MAIN OFFICE	SD-1	10	300	331	313	104.3
SGRD6	MAIN OFFICE	SD-1	10	400	336	399	99.8

National TAB

Project: Boot Barn (Kansas City, MO)

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: CEF-1 AREA:RESTROOM

Unit Data		
	Design	**Actual**
MFG	NA	GREENHECK
Model Num	NA	SP-A110
Serial Num	-	20620943
Type	-	CEILING

Test Data		
	Design	**Actual**
CFM	150	162
RL Voltage	-	121
RL Amperage	-	0.40
Total ESP	-	UTO

Motor Data		
	Design	**Actual**
Motor MFG	-	MCMILLAN
Frame	-	NL
Horsepower	-	1/50
Motor Rpm	-	1400
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	0.45
Service Factor	-	NL

Completed By: Jacob Davidson on 04/26/2023

Date: 6/7/2023

National TAB

Project: Boot Barn (Kansas City, MO)

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: CEF-2 AREA:RESTROOM

Unit Data		
	Design	**Actual**
MFG	NA	GREENHECK
Model Num	NA	SP-A190
Serial Num	-	20620940
Type	-	CEILING

Test Data		
	Design	**Actual**
CFM	150	50
RL Voltage	-	116
RL Amperage	-	0.37
Total ESP	-	UTO

Motor Data		
	Design	**Actual**
Motor MFG	-	MCMILLAN
Frame	-	NL
Horsepower	-	1/50
Motor Rpm	-	1400
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	0.45
Service Factor	-	NL

Notes: Speed is at max and motor rotation is correct. The ductwork above ceiling also looks adequate.

Date: 06/07/2023

National TAB

Project: Boot Barn (Kansas City, MO)

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: CEF-3 AREA:RESTROOM

Unit Data		
	Design	**Actual**
MFG	NA	GREENHECK
Model Num	NA	SP-A190
Serial Num	-	20620938
Type	-	CEILING

Test Data		
	Design	**Actual**
CFM	75	77
RL Voltage	-	121
RL Amperage	-	0.40
Total ESP	-	UTO

Motor Data		
	Design	**Actual**
Motor MFG	-	MCMILLAN
Frame	-	NL
Horsepower	-	1/50
Motor Rpm	-	1400
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	0.45
Service Factor	-	NL

Completed By: Jacob Davidson on 04/26/2023

National TAB

Project: Boot Barn (Kansas City, MO)

System/Unit: FAN - Exhaust

Comfort. Under control.

Asset: CEF-4 AREA:RESTROOM

Unit Data		
	Design	**Actual**
MFG	NA	GREENHECK
Model Num	NA	SP-A110
Serial Num	-	20620942
Type	-	CEILING

Test Data		
	Design	**Actual**
CFM	75	79
RL Voltage	-	121
RL Amperage	-	0.15
Total ESP	-	UTO

Motor Data		
	Design	**Actual**
Motor MFG	-	GREENHECK
Frame	-	NL
Horsepower	-	NL
Motor Rpm	-	950
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	0.19
Service Factor	-	NL

Completed By: Jacob Davidson on 04/26/2023

Date: 6/7/2023

National TAB

Project: Boot Barn (Kansas City, MO)

System/Unit: Split Sys Furnace

Comfort. Under control.

Asset: AHU-2 AREA:NORTH OFFICE

Unit Data		
	Design	**Actual**
MFG	NA	PAYNE
Model Num	NA	PG95ESAA30040A
Serial Num	-	2921A50966
Configuration	-	HORIZONTAL
Filter Size Size 1	-	12.5X23 MESH

Motor Data		
	Design	**Actual**
Motor MFG	-	BROAD OCEAN
Frame	-	NL
Horsepower	-	1/2
Motor Rpm	-	NL
Phase	-	NL
Voltage	-	115
Amperage	-	2.2

Test Data		
	Design	**Actual**
SF CFM	800	828
Motor Speed SetPt	-	YELLOW ON COOL
RL Voltage	-	NOT SAFE
RL Amperage	-	NOT SAFE
RA CFM	720	707
OA CFM	80	121

Performance Data		
	Design	**Actual**
Suction ESP	-	-0.12"
Discharge ESP	-	0.14"
Total ESP	0.5	0.26"

Completed By: Jacob Davidson on 04/26/2023

Date: 6/7/2023

National TAB

Project:Boot Barn (Kansas City, MO)

Split Sys Furnace

Comfort. Under control.

Diffuser Supply (GRD)

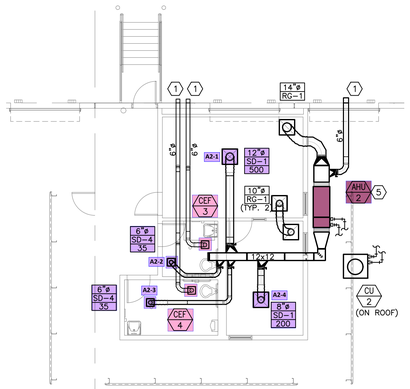
AHU-2/NORTH OFFICE

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
SGRD1	NORTH OFFICE	SD-1	12	500	645	546	109.2
SGRD2	RESTROOM	SD-4	6	35	37	32	91.4
SGRD3	RESTROOM	SD-4	6	35	39	34	97.1
SGRD4	NORTH OFFICE	SD-1	8	200	278	216	108.0

Function		Range	Minimum Accuracy	Instrument Information	Calibration Date	Date Due
AIR	AIR PRESSURE	0 in wg to 10 in wg	2% +/- 0.001 in wg	Evergreen Telemetry S-PVF-1 2300177A	2/23/2023	2/23/2024
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Evergreen Telemetry S-PVF-1 2300177A	2/23/2023	2/23/2024
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 5 % +/- 7 cfm	Evergreen Telemetry CH-15D 2300114	2/20/2023	2/23/2024
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Fluke 323 S/N 35491023WS	8/11/2022	8/11/2023
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Fluke 323 S/N 35491023WS	8/11/2022	8/11/2023
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Shimpo DT 207Lp S/N D1690029R	8/11/2022	8/11/2023
HYDRONIC	PRESSURE MEASUREMENT	-30 in Hg to 200 psi	±2% of reading +/- 1 psi	Hydronic Manometer - Dwyer 490W-6-HKIT S/N: 359515093207912	8/12/2022	8/12/2023
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Hydronic Manometer - Dwyer 490W-6-HKIT S/N: 359515093207912	8/12/2022	8/12/2023

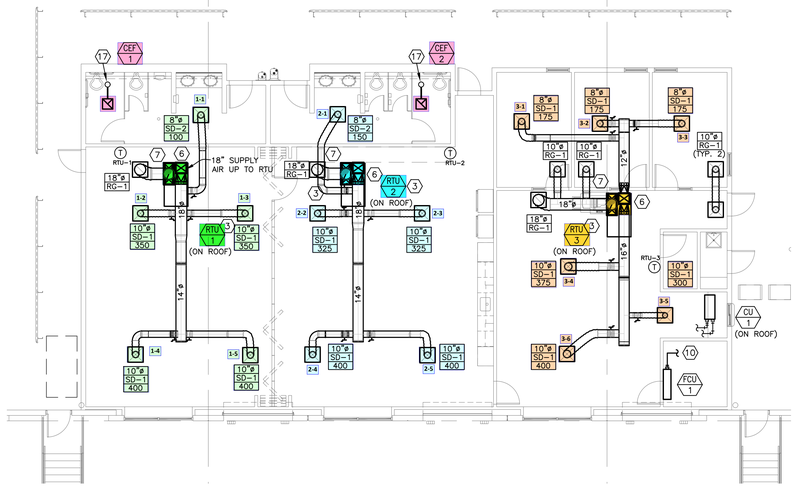
Abbreviation List

A = Area (ft^2)	S.F. = Service Factor
AHU = Air Handling Unit	SF = Supply Fan
A_k = Effective Area	SP = Static Pressure
BHP = Brake Horsepower (IP) HP	SR = Supply Register
Btu = British Thermal Unit	T = Temperature
Btu/h = Btuh = BTUH = BTU/Hour	T_{ma} = Mixed Air Temperature
CL = Center Distance (used in belt formula)	T_{oa} = Outside Air Temperature
CD = Ceiling Diffuser	T_{ra} = Return Air Temperature
CF = Correction Factor	H = Head (in wc, ft wc, psi)
CFM = Volumetric Flow: Cubic Feet Per Minute	h = Enthalpy
CO2 = Carbon Dioxide	HP = Horsepower
CO = Carbon Monoxide	hr = Hour
C_v = Flow Constant	K_v = Flow constant (SI)
d = Diameter (in.) IP	kW = Kilowatt = 1000 Watts
Δ = Difference or Change (Final - Initial)	LAT = Leaving Air Temperature
DB = Dry Bulb	lb = Pounds
EA = Exhaust Air	LWT = Leaving Water Temperature
EAT = Entering Air Temperature	ma = Mixed Air
EF = Exhaust Fan	MIN = Minimum
Eff = Efficiency	MAX = Maximum
EG = Exhaust Grille	N/A = Not Applicable
ESP = External Static Pressure	NA = No Access
EWT = Entering Water Temperature	NL = Not Listed
°F = Degrees Fahrenheit, °F	NPSHA = Net Positive Suction Head Available
FPB = Fan Powered Box	NS = Not Specified
FLA = Full Load Amps	OA = Outside Air
fpm = Feet per Minute (fpm)	OAT = Outside Air Temperature
ft = Foot	PD = Sheave Pitch Diameter
gal = Gallons	P.D. = Pressure Drop
GPM = Gallons Per Minute (GPM)	PF = Power Factor
h = Enthalpy (BTU/lb dry air)	SG = Supply Grille
P = Pressure	SR = Supply Register
ppm = parts per million	TP = Total Pressure
psi = Pounds Per Square Inch	T_{ra} = Return Air Temperature
psid = PSI Differential	TS = Tip Speed (fpm) IP, (m/s) SI
r = Radius (in)	TSP = Total Static Pressure
$\%_{ra}$ = % of Return Air	V = Velocity
RA = Return Air	VAV = Variable Air Volume
RAT = Return Air Temperature	VD = Volume Damper
RF = Return Fan	VFD = Variable Frequency Drive
RG = Return Grille	W = Watt
RH = Relative Humidity	WB = Wet Bulb
RPM = Revolutions Per Minute	wg = wc = water gauge = water column
RTU = Roof Top Unit	WHP = Water Horsepower (IP)
SA = Supply Air	ω = Humidity Ratio



1 M2.01 DETAIL MECHANICAL PLAN
SCALE: 1/8" = 1'-0"

NORTH



2 M2.01 DETAIL MECHANICAL PLAN
SCALE: 1/8" = 1'-0"

NORTH

SPLIT SYSTEM EQUIPMENT SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	SUPPLY FAN CFM	SUPPLY FAN ESP (IN)	COOLING COIL TH (MBH)	COOLING COIL SH (MBH)	GAS HEATING INPUT MBH	GAS HEATING OUTPUT MBH	GAS HEATING STAGES	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL V/PH	VENTILATION (CFM)	SEER	WEIGHT (LBS)	NOTES
AHU-2	CARRIER	CAPM	FURNACE	800	0.5	22	17	40	38	1	7	15	120/1	80	---	200	D
CU-2	CARRIER	CA13	CONDENSING UNIT	---	---	---	---	---	---	---	15	25	208/1	---	14	150	A, B, C

NOTES:

A. PROVIDE WITH PROGRAMMABLE THERMOSTAT, LOW AMBIENT KIT TO 40 DEGREE F, AND 5 YR PARTS ONLY COMPRESSOR WARRANTY.
B. INSTALL CONDENSING UNIT ON ROOF BLOCKING.
C. PROVIDE PRE-INSULATED LINESET AS REQUIRED.
D. ROUTE FULL SIZE CONDENSATE TO PER PLAN NOTES.

PACKAGED ROOFTOP UNIT (DX COOLING/GAS HEAT)

MARK	MANUFACTURER	MODEL	NOMINAL TONNAGE	QUANTITY	SERVICE	UNIT TYPE	SUPPLY FAN CFM	SUPPLY FAN ESP (IN)	SUPPLY FAN HP	SUPPLY FAN VFD (Y/N)	COOLING COIL SA (DB/WB)	COOLING COIL TH (MBH)	COOLING COIL SH (MBH)	GAS HEATING INPUT (MBH)	GAS HEATING OUTPUT (MBH)	GAS HEATING STAGES	MINIMUM VENTILATION (CFM)	DESIGN/MAX VENTILATION (CFM)	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL V/PH	ELECTRICAL DISC. TYPE	WEIGHT (LBS)	ARI SEER	NOTES
RTU-1	CARRIER	48FCEA05A2M6	4	1	MAIN OFFICE	CV	1,600	0.50	1.1	N	60/58	48	34	110	88	2	220	220	12	15	460/3	NF	1,000	14.0	A - G
RTU-2	CARRIER	48FCEA05A2M6	4	1	MAIN OFFICE	CV	1,600	0.50	1.1	N	60/58	48	34	110	88	2	260	260	12	15	460/3	NF	1,000	14.0	A - G
RTU-3	CARRIER	48FCEA05A2M6	4	1	MAIN OFFICE	CV	1,600	0.50	1.1	N	60/58	48	34	110	88	2	120	120	12	15	460/3	NF	1,000	14.0	A - G

NOTES:
A. EQUIPMENT SIZED FOR 95 DEGREE F AMBIENT TEMPERATURE.
B. PROVIDE WITH 2", 30% EFFICIENT PLEATED THROWAWAY AIR FILTERS.
C. PROVIDE WITH MANUFACTURERS STANDARD 14" INSULATED ADJUSTABLE ROOF CURB.
D. PROVIDE WITH FACTORY MOUNTED NON-FUSED DISCONNECT SWITCH, PLEATED FILTERS AND HAIL GUARDS.
E. PROVIDE WITH FACTORY MOUNTED ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF DAMPER.
F. PROVIDE WITH 7-DAY PROGRAMMABLE THERMOSTAT.
G. RETURN AIR SMOKE DETECTOR FURNISHED AND INSTALLED BY OTHERS.

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	QUANTITY	MODEL	LOCATION/ MOUNTING	SERVICE	FAN CFM	FAN ESP (IN)	FAN RPM	FAN HP/WATTS	ELECTRICAL (V/PH)	WEIGHT (LBS)	NOTES
CEF-1	GREENHECK	1	SPA-A190	CEILING	RESTROOM EXHAUST	150	0.25	1400	60	120/1	20	E, F
CEF-2	GREENHECK	1	SPA-A190	CEILING	RESTROOM EXHAUST	150	0.25	1400	60	120/1	20	E, F
CEF-3	GREENHECK	1	SPA-A110	CEILING	RESTROOM EXHAUST	75	0.25	950	25	120/1	20	E, F
CEF-4	GREENHECK	1	SPA-A110	CEILING	RESTROOM EXHAUST	75	0.25	950	25	120/1	20	E, F

NOTES:

A. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.
B. PROVIDE WITH 14" INSULATED ROOF CURB, BACKDRAFT DAMPER AND BIRD SCREEN.
C. FAN TO OPERATE CONTINUOUSLY.
D. FURNISH WITH WALL MOUNTED LINE VOLTAGE THERMOSTAT. THERMOSTAT TO BE INSTALLED BY ELECTRICAL CONTRACTOR AND INTERLOCKED WITH ASSOCIATED LOUVER.
E. INTERLOCK EXHAUST FAN WITH LIGHTSWITCH (BY OTHERS)
F. PROVIDE WITH UNIT MOUNTED SPEED CONTROLLER, HANGING BRACKET, BACKDRAFT DAMPER, HARD CEILING MOUNTING KIT AND WHITE GRILLE.
G. FAN TO BE EXPLOSION PROOF.

OUTSIDE AIR CALCULATIONS

UNIT SERVED	OCCUPANCY CLASSIFICATION	AREA (SQ. FT.)	PEOPLE PER 1,000	FIXED SEATING	QUANTITY OF	REQUIRED OUTSIDE AIR	REQUIRED OUTSIDE AIR	TOTAL REQUIRED	NOTES
RTU-1	TRAINING/CONFERENCE	820	50	31	41	5	0.06	204	A
	RESTROOMS	220	---	---	---	---	0.06	13	A
						REQUIRED VENTILATION		217 CFM	C
RTU-2	BREAK	1,010	25	36	25	5	0.06	241	B
	RESTROOMS	220	---	---	---	---	0.06	13	A
						REQUIRED VENTILATION		254 CFM	C
RTU-3	OFFICE	1,315	5	---	7	5	0.06	112	A
						REQUIRED VENTILATION		112 CFM	C
AHU-1	OFFICE	400	5	---	2	5	0.06	34	A
	RESTROOMS	145	---	---	---	---	0.06	9	A
						REQUIRED VENTILATION		43 CFM	C

NOTES:
A. VENTILATION RATES ARE TAKEN FROM ASHRAE 62.1-2010 - VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY.
B. VENTILATION IS BASED ON TOTAL QUANTITY OF PEOPLE TAKEN FROM NUMBER OF ACTUAL SEATING SHOWN ON ARCHITECTURAL FLOOR PLAN.
C. REFER TO RTU SCHEDULE FOR ACTUAL VENTILATION AIRFLOWS.

GRILLE, REGISTER & DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	SIZE	MOUNTING	FINISH	MATERIAL	NOTES
SD-1	PRICE	SPD	SQUARE PLAQUE	24" x 24"	LAY-IN	WHITE	STEEL	G
SD-2	PRICE	SPD	SQUARE PLAQUE	24" x 24"	SURFACE	WHITE	STEEL	B, G
SD-3	PRICE	SPD	SQUARE PLAQUE	12" x 12"	LAY-IN	WHITE	STEEL	G
SD-4	PRICE	SPD	SQUARE PLAQUE	12" x 12"	SURFACE	WHITE	STEEL	B, G
VAV-1	PRICE	VARITHERM	VAV	24" x 24"	LAY-IN	WHITE	STEEL	G
LSD-1	PRICE	TBD	LINEAR SLOT	4'-0" X (3) 1" SLOT	LAY-IN	WHITE	STEEL	H
SG-1	PRICE	520D	WALL MOUNT	AS NOTED	WALL/DUCT	WHITE	STEEL	A
SG-2	PRICE	SDGE	SPIRAL MOUNT	AS NOTED	DUCT	MILL	STEEL	A, C
RG-1	PRICE	PDDR	PERFORATED	24" x 24"	LAY-IN	WHITE	STEEL	G
RG-2	PRICE	PDDR	PERFORATED	12" x 24"	LAY-IN	WHITE	STEEL	G
EX-1	PRICE	APDDR	PERFORATED	24" x 24"	SURFACE	WHITE	ALUMINUM	A, B, G
EX-2	PRICE	APDDR	PERFORATED	24" x 24"	LAY-IN	WHITE	ALUMINUM	G
EX-3	PRICE	APDDR	PERFORATED	12" x 12"	SURFACE	WHITE	ALUMINUM	A, B, G
EX-4	PRICE	APDDR	PERFORATED	12" x 12"	LAY-IN	WHITE	ALUMINUM	G

NOTES:
A. PROVIDE WITH DAMPER OPERABLE FROM FACE OF DEVICE.
B. PROVIDE WITH SURFACE MOUNT FRAME KIT FOR MOUNTING IN HARD CEILING/WALL
C. PROVIDE WITH OPPOSED BLADE DAMPER AND MILL FINISH.
D. NOT USED
E. NOT USED
F. NOT USED
G. PROVIDE WITH INSULATED BACKING
H. PROVIDE WITH FACTORY INSULATED SUPPLY PLENUM.

DUCTLESS HEAT PUMP SPLIT SYSTEM EQUIPMENT SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	SUPPLY FAN CFM	SUPPLY FAN ESP (IN)	COOLING TH (MBH)	COOLING SH (MBH)	HEATING TH (MBH)	HEATING °F	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL V/PH	WEIGHT (LBS)	NOTES
FCU-1	LENNOX	MWMA018S4	WALL MOUNT FAN-COIL	530	---	17	14	18	47-F	1	---	---	30	F, G
CU-1	LENNOX	MLA018D4	CONDENSING UNIT	---	---	---	---	---	---	18	25	208/1	120	A - E

NOTES:

A. PROVIDE WITH WIRELESS TEMPERATURE CONTROLLER AND LOW-AMBIENT WIND BAFFLE KIT.
B. FAN-COIL TO BE POWERED FROM CONDENSING UNIT POWER CIRCUIT. REFER TO INSTALLATION INSTRUCTIONS.
C. INSTALL CONDENSING UNIT ON TREATED 4X4 WOOD BLOCKING.
D. PROVIDE WITH 50'-0" PRE-INSULATED LINESET AS REQUIRED (1/4" & 1/2").
E. ELECTRICAL CONTRACTOR TO PROVIDE ASSOCIATED POWER WIRING BETWEEN CU AND FCU.
F. PROVIDE WITH INTEGRAL CONDENSATE PUMP AND DISCHARGE CONDENSATE AS SHOWN.
G. PROVIDE WITH WALL MOUNTED WIRELESS THERMOSTAT.

MECHANICAL GENERAL NOTES:

1. ALL MECHANICAL DUCTWORK SHALL BE GALVANIZED STEEL, CONSTRUCTED ACCORDING TO SMACNA STANDARDS.
2. ALL CONCEALED SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 2" THICK, 3/4 LB DENSITY FIBERGLASS DUCT WRAP.
   ALL EXPOSED (WAREHOUSE) SUPPLY AIR DUCTWORK AND RETURN AIR DUCTWORK SHALL BE INTERNALLY INSULATED WITH 1" THICK, 2 LB DENSITY FIBERGLASS DUCT LINER.
3. HVAC CONTRACTOR WILL CHECK EACH SYSTEM FOR PROPER OPERATION.
4. HVAC CONTRACTOR SHALL HAVE AN INDEPENDENT CONTRACTOR TO TEST & BALANCE HVAC SYSTEM TO THE PROPER AIRFLOWS AND STATIC PRESSURES. A COPY OF THE BALANCING REPORT WILL BE SUBMITTED TO THE OWNER UPON COMPLETION. AIR TO (+/-) 10% , WATER TO (+/-) 5%.
5. FLEXIBLE RUN-OUTS TO BE U.L. LISTED AND HAVE A MAXIMUM LENGTH OF 8'-0". DUCT RUNS TO BE SAME SIZE AS DIFFUSER NECK SIZE SHOWN.
6. AIR HANDLING UNITS SUPPLYING 2,000 CFM OR MORE SHALL HAVE A SMOKE DETECTOR INSTALLED IN THE RETURN AIR DUCTWORK. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO SHUT DOWN ALL SUPPLY FANS UPON ALARM.
7. MAINTAIN MINIMUM 10'-0" FROM ALL PLUMBING VENTS AND EXHAUST VENTS TO ALL OUTSIDE AIR INTAKES.
8. DO NOT INSTALL PIPING OR DUCTWORK OVER ELECTRICAL PANELS.

MECHANICAL PLAN NOTES:

1. PROVIDE 6" EXHAUST OR OUTSIDE AIR VENT THROUGH WALL WITH WEATHERCAP.
2. EXISTING SHELL BUILDING EQUIPMENT TO REMAIN AS CURRENTLY INSTALLED.
3. COORDINATE LOCATION OF RTU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE INTERNALLY LINED SUPPLY AIR RETURN AIR DUCT DROP THRU ROOF. TRANSITION SUPPLY AIR AND RETURN AIR DUCTWORK BELOW ROOF DECK TO SPIRAL DUCTWORK AS SHOWN AND PROVIDE WITH EXTERNAL DUCT INSULATION PER GENERAL NOTES.
4. COORDINATE LOCATION OF EXHAUST WITH FIRE SUPPRESSION PIPING AND STRUCTURE. TRANSITION EXHAUST AIR DUCTWORK BELOW ROOF DECK TO SPIRAL DUCTWORK AS SHOWN.
5. ROUTE CONDENSATE PIPING TO DRAIN TAIL PIECE FURNISHED BY PLUMBER.
6. TRANSITION SUPPLY AIR FROM CURB OPENING TO 18"ø BELOW ROOF.
7. TRANSITION RETURN AIR FROM CURB OPENING TO 18"ø BELOW ROOF.
8. PROVIDE EXHAUST AIR DUCTWORK DROP FROM EXHAUST FAN AND TRANSITION TO SPIRAL DUCTWORK AS SHOWN.
9. HVLS FAN WITH STAND ALONE CONTROLLER AND ASSOCIATED CONTROL WIRING ON ADJACENT COLUMN. ALL CONDUIT BY OTHERS INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND COORDINATE WITH LIGHTING AND FIRE SUPPRESSION SYSTEM. (TYP.)
10. DISCHARGE CONDENSATE TO MOP SINK.
11. GAS-FIRED RADIANT TUBE HEATER. (TYP. 5 @ 50'-0" TUBE LENGTH)
12. PROVIDE 4" COMBUSTION AIR VENT UP THRU ROOF WITH WEATHER CAP FOR SINGLE TUBE HEATER.
13. PROVIDE 4" FLUE UP THRU ROOF WITH WEATHER CAP FOR SINGLE TUBE HEATER.
14. PROVIDE 8" COMBUSTION AIR VENT UP THRU ROOF WITH WEATHER CAP FOR TWO TUBE HEATERS.
15. PROVIDE 6" FLUE UP THRU ROOF WITH WEATHER CAP FOR TWO TUBE HEATERS.
16. BURNER SIDE OF TUBE HEATER. PROVIDE GAS AND ELECTRICAL CONNECTIONS AS REQUIRED.
17. PROVIDE 8" VENT UP THRU ROOF. TERMINATE WITH WEATHER CAP.

LEGEND

- SD-1 SUPPLY AIR DIFFUSER - AS SCHEDULED
- RG-1 RETURN AIR GRILLE - AS SCHEDULED
- RG-2 RETURN AIR GRILLE - AS SCHEDULED
- EX-1 EXHAUST AIR GRILLE - AS SCHEDULED
- EX-2 EXHAUST AIR GRILLE - AS SCHEDULED
- SG-1 SUPPLY AIR GRILLE - AS SCHEDULED
  SG-2 SUPPLY AIR GRILLE - AS SCHEDULED
- RETURN AIR GRILLE - AS SCHEDULED
- T RTU-1 THERMOSTAT WITH ZONE/UNIT DESIGNATION. MOUNT AT 48" A.F.F.

HVLS 1 GREENHECK (OR EQUAL) 24'-0" DS-3-24-170 HVLS FAN. 2 HP @ 460/3 PHASE. MINIMUM OF 3-BLADES. PROVIDE WITH HANGING KIT AND CONTROLLERS. CONDUIT BY OTHERS (TYP. 5)

EWH 1 ELECTRIC WALL HEATER - RAYWALL OR EQUAL. 3KW @ 277/1 PHASE. PROVIDE WITH RECESS MOUNTING FRAME, DISCONNECT, INTEGRAL THERMOSTAT, 29 LBS. MODEL # AFC7130T (TYP. 2)

IR 1/3 THRU IR 3/3 GAS-FIRED RADIANT TUBE HEATER. DETROIT RADIANT MODEL HL3-50-150/100N 2-STAGE HEATERS. PROVIDE WITH GRIPPLE HANGERS, TH-P721 TWO-STAGE 24V DIGITAL THERMOSTAT, WIV-4 INLET AIR CAP & #RTVP-4 ROOF VENT KITS OR AS NOTED. 120/1 PHASE, 150 MBH. (TYP.)
COORDINATE EXACT MOUNTING HEIGHT WITH TENANT.

MetroAir

BOOT BARN

KCI LOGISTICS CENTER VIII - 9900 NW GLOBAL AVE, KCMO

SCALE: AS NOTED	DATE: 6/2/22	DRAWN BY: M.D.K.
APPROVED BY: G.M.M.	DWG # M2	
PERMIT		OF 3

GRAY DESIGN GROUP

9 Sunnen Drive, Suite 110
Saint Louis, Missouri 63143
Telephone 314.646.0400
www.graydesigngroup.com

Contact:	Matt Kelso
Produced By:	MDK
Reviewed By:	JDG

No.	Description	Date

Construction Documents For:

BOOT BARN

LOGISTICS CENTRE VIII
KCI INTERMODAL BUSINESS CENTRE

MECHANICAL DETAIL PLANS

TRAMMELL CROW COMPANY

Tobias Heddinghaus
Architect
No. A-2007011296

gray

Job: 22202.00

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