allred stolarski architects

January 8, 2023

PASCAGOULA PUBLIC LIBRARY
REPAIRS AND RENOVATIONS
JACKSON COUNTY BOARD OF SUPERVISORS
PASCAGOULA, MISSISSIPPI

00.910 ADDENDUM NO 1.
This Addendum contains 6 pages and 20 pages of attachments for a total of 26 pages.

The Bidder acknowledges that it is the Bidder's responsibility to ascertain whether any Addenda have been issued and if so, to obtain copies of such Addenda. Bidder therefore agrees to be bound by all Addenda that have been issued for this Bid.

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents. The following clarifications, changes, additions, or deletions shall be made to the following documents as indicated and all other conditions shall remain the same.

CHANGES TO THE PROJECT MANUAL

A. FORM OF PROPOSAL
   1. Remove and Replace with the attached FORM OF PROPOSAL - REVISED

   2. Section 01.803 ALLOWANCES
      a. Add the following:
         "C. Dehumidification Allowance:
            1. Contractor shall include in the Base Bid contract the following lump sum allowance amount: Fifty Thousand Dollars ($50,000) to provide and install temporary rental of dehumidification system equal to 80 ton Air-Cooled CGAM by Trane. See cut sheet attached for reference."

   3. Section 01.900 ALTERNATES
      a. Add the following:
         "ALTERNATE #3 (DEDUCTIVE)
            A. A Deductive Alternate Proposal is required to delete the Dehumidification Allowance for all material, equipment and labor as indicated in the specifications via Addendum."

   4. Section 07.521 STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING

711 Church Street
Ocean Springs, MS 39564
T (228) 762-1975

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Hoppy Allred, AIA
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Patrick Wilber, AIA

a. Part 2.04, B. Cover-Board, 1a. Change to read as follows:
"a. Thickness: 1/4 in" in lieu of 1/8".

b. Part 2.04, add the following:
"N. Thermal Barrier
1. National Gypsum Company, DEXcell Glass Mat Roof Board, DEXcell FA Glass Mat Roof Board
    a. Gypsum core, glass fiber-faced, roof board:
    b. Thickness: 5/8"
    c. Dimensions: 4 x 8 foot boards
    d. Facer: Glass fiber
    e. Meets or exceeds ASTM C1177/C1177M
2. Georgia Pacific Gypsum, LLC, DensDeck Roof Board, DensDeck Prime Roof Board: Gypsum Core, fiber-reinforced roof board:
    a. Thickness: 5/8"
    b. Dimensions: 4 x 8 foot boards
    c. Facer: Glass Fiber
    d. Meets or exceeds ASTM C1177/C1177M
3. Unites States Gypsum, Securock Brand Gypsum-Fiber Roof Board: Gypsum core, fiber-reinforced roof board
    a. Thickness: 5/8"
    b. Dimensions: 4 x 8 foot boards
    c. Facer: None"

5. Section 09.680 – CARPETING
a. Part 2.01 Materials.
1. Change B. CF-1 and C. CF-2 to read as follows:
"B. CF-1A (Tile)
1. Entwined Collection: Ramie Acorn 84334 as manufactured by Mannington Commercial.
    a. Product Size: 24" x 24" Tile
    b. CRI Green Label Plus Certification
    c. Face Construction: Textured Patterned Loop
    d. Face Fiber: Type 6,6 Nylon
    e. Dye Method: Solution/Yarn
    f. Gauge: 5/64
    g. Pile Thickness: 0.140"
    h. Weight: 22 oz/yd2
    i. Backing: Infinity 2 Modular
    j. Adhesive: Infinity 2 Adhesive

CF-1B (Broadloom)
1. Entwined Collection: Ramie Acorn 84334 as manufactured by Mannington Commercial.
    a. CRI Green Label Plus Certification
    b. Face Construction: Textured Patterned Loop
    c. Face Fiber: Type 6,6 Nylon

d. Dye Method: Solution/Yarn
e. Gauge: 5/64
f. Pile Thickness: 0.140”
g. Weight: 22 oz/yd2
h. Backing: UltraBac RE, Integra HP
i. Adhesive: Mannington Ultra Adhesive
j. Size: 12’-6”

C. CF-2 (Tile)
1. Cartography 04843 (Boundary 15604) as manufactured by Tarkett.
a. Construction: Stratatec Patterned Symtex
b. Face Weight: 20 oz/yd2
c. Dye Method: 100% solution dyed
d. Gauge: 5/64
e. Pile Thickness: 0.097”
f. Fiber System: Dynex SD Nylon (Permanent Stain Resistance)
g. Primary Tufting Substrate: Synthetic Non-Woven
h. Pattern Match: 6’ W x 105.15” L – End Seam Only”

D. Delete, CF-3 and CF-4 as they are not used.

6. Section 15010 – Mechanical General Provisions
a. VFD’s for pumps to be provided by Division 15C and VFD’s for AHU’s to be factory mounted with AHU.
b. Airflow measuring stations to be provided by Div 15C and installed by Div 15.

7. Section 15900 – Energy Management and Control System
a. Replace paragraph 1.3C with the following:
“1.3C. EMCS for the Pascagoula Library shall be stand-alone for this facility only and is not required to be integrated into an existing EMCS.”
b. Clarification: Remove all references to integrating the new EMCS into the Owner’s existing EMCS.
c. Modify paragraph 2.1 Manufacturer’s (Product Line) to the following:
A. Johnson Controls (Metasys)
B. Siemens (Desigo)
C. Trane (Tracer SC)

CHANGES TO THE DRAWINGS

1. SHEET D101 1st FLOOR DEMOLITION PLAN
A. Clarification: Existing Brick Paver Flooring is to remain in 123 Lobby, 103 Circulation, 126 Corridor Vestibule, 122 Vestibule, 100 Vestibule, 124 Corridor.

Carpeted areas and all rubber base in these spaces is to be removed and replaced if Alternate 2 is awarded.

2. SHEET A105 ROOF PLAN
   A. Roof Plan Notes: Change all Bottom Board / Cover Board Thickness to ¼" in lieu of ½".

3. SHEET A601 ROOF DETAILS
   A. Change all Bottom Board / Cover Board Thickness to ¼" in lieu of ½", except at the Retrofit Roof Drain locations, the thickness is to be 1" as shown.

4. SHEET A602 ROOF DETAILS
   A. Change all Bottom Board / Cover Board Thickness to ¼" in lieu of ½", except at the Retrofit Roof Drain locations, the thickness is to be 1" as shown.

5. SHEET A603 ROOF DETAILS
   A. Change all Bottom Board / Cover Board Thickness to ¼" in lieu of ½", except at the Retrofit Roof Drain locations, the thickness is to be 1" as shown.

6. SHEET M001
   A. Delete and Replace with M001R.

7. SHEET M101
   A. Delete and Replace with M101R.

8. SHEET M102
   A. Delete and Replace with M102R.

9. SHEET M103
   A. Delete and Replace with M103R.

10. SHEET M104
    A. Delete and Replace with M104R.

11. SHEET M601
    A. Delete and Replace with M601R.

12. SHEET M602
    A. Delete and Replace with M602R.

13. SHEET M702
    A. Delete and Replace with M702R.

14. SHEET M703
    A. Delete and Replace with M703R.

15. ADD SHEET M503

A. Update Index Accordingly.

16. ADD SHEET M504
    A. Update Index Accordingly.

17. ADD SHEET M505
    A. Update Index Accordingly.

18. ADD SHEET M506
    A. Update Index Accordingly.

19. Refer to SHEETS M701 thru M706
    A. Add the following General Note to each sheet M701 thru M706:
    "The water and air HVAC system Sequences of Operation shall be in accordance with ASHRAE Guideline 36-2021. The complete Guideline 36-2021 sequences are not included in the Construction Documents for brevity. The contractor shall refer to ASHRAE Guideline 36-2021 for additional information and commentary. If the contractor has specific questions or suggestions regarding the final programmed sequences, they shall be submitted to the Architect in the EMCS Submittal Package 2 for responses / clarifications."

20. Refer to SHEET M704
    A. Add the following General Note:
    "The chilled water control valves for both AHU-1 and AHU-3 shall be 3-way control valves."
    B. Remove the following note: Humidity sensors only at selected zones – see floor plans and specs.
    C. Clarification: Provide humidity sensors (HT-2) at each zone for AHU-1 & AHU-3.
    D. In the Freeze Protection Sequence of Operation, replace references to leaving pre-heat coil temperature with mixed air temperature. Paragraph 1 shall be replaced with: If the mixed air temperature drops below 40F for 5 minutes, send two (or more, as required to ensure the heating plant is active) Hot Water Requests and override the outside air damper to the minimum position.
    E. Clarification: AHU-1 has a motorized impeller (EC motor directly connected to fan shaft). Fan control points shall include: Fan Status (CS-1), Fan Start/Stop (Connect to ECM "Run" contact, Fan Speed (Connect to ECM "Speed" contact).

21. Refer to SHEET M705
    A. Add the following General Note:
    "The chilled water control valves for both AHU-2 and AHU-4 shall be 3-way control valves."

22. SHEET E203 – First Floor New Power, Fire Alarm, and Mechanical Systems Plan
    A. Delete (3) electrical connections and circuit for motorized dampers at AHU/2.

B. Add (2) circuit connections at AHU/2. One for ‘Controls’ and one for ‘Marine Light’. Electrical contractor responsible for circuits and connections only at the unit. Circuits shall be 2-#12, 1-#12G and routed Panel LB, specific note #1.

23. SHEET E204 – 2nd Floor New Power, Fire Alarm and Mechanical Systems Plan
    A. Delete (3) electrical connections and circuit for motorized dampers at AHU/4.
    B. Add (2) circuit connections at AHU/4. One for ‘Controls’ and one for ‘Marine Light’. Electrical contractor responsible for circuits and connections only at the unit. Circuits shall be 2-#12, 1-#12G, and routed Panel LC, specific note #1.

24. SHEET E205 – Enlarged First Floor Electrical Plans
    A. Add (2) circuit connections at AHU/1. One for ‘Controls’ and one for ‘Marine Light’. Electrical contractor responsible for circuits and connections only at the unit. Circuits shall be 2-#12, 1-#12G and routed Panel LA, specific note #4.
    B. Add (2) circuit connections at AHU/3. One for ‘Controls’ and one for ‘Marine Light’. Electrical contractor responsible for circuits and connections only at the unit. Circuits shall be 2-#12, 1-#12G, and routed Panel LA, specific note #4.”

END OF ADDENDUM #1 (Plus 20 Pages of Attachments)

FORM OF PROPOSAL - REVISED

A. INTRODUCTION

Two copies of this form, which is the Bidder's proposal, are to be completed, signed, and delivered to the Chancery Clerk of Jackson County, Jackson County Services Complex, 2915 Canty Street, Suite R, Land Records Office, Pascagoula, Mississippi, prior to the bid time specified. Contractors submitting a bid must complete this form and attach to one of the copies the bid bond or cashier's check as indicated in order to constitute a complete bid proposal.

B. PROJECT

PASCAGOULA PUBLIC LIBRARY
REPAIRS AND RENOVATIONS

C. ARCHITECT

Allred Stolarski Architects, PA
711 Church Street
Ocean Springs, Mississippi 39564

D. PROPOSAL

Pascagoula Public Library
Repairs and Renovations

BASE BID

I (or we) do hereby declare that I (or we) have carefully examined the contract documents, including all addenda, prepared by the consultant listed in Item C. of this proposal and I (or we) have a clear understanding of said documents and premises, and hereby propose to provide the necessary tools, machinery, apparatus and other means of construction, and to furnish all labor, materials, and services specified in the contract or called for in the said contract documents, including all taxes necessary, for the Project listed in Item B. above, for the lump sum price of:

_____

_____ Dollars $_____

E. ALTERNATES

(See Descriptions in Section 01.900, ALTERNATES in the Project Manual)

ADDITIVE ALTERNATE #1

_____

_____ Dollars $_____

ADDITIVE ALTERNATE #2

_____

_____ Dollars $_____

DEDUCTIVE ALTERNATE #3

_____

_____ Dollars $_____

F. CONTRACT TIME

If the undersigned is notified of the acceptance of the bid within ninety (90) days of the time set for opening of bids, he agrees to execute a contract for the work as described in the contract documents. The undersigned also guarantees completion of this contract within Three Hundred (300) calendar days of the Notice to Proceed.

G. DAMAGES

The undersigned agrees that the Owner may retain from this contract the sum indicated below from the amount of compensation to be paid him for each day after the above mentioned completion time, Sundays and Holidays included, that the work remains incomplete. This amount is agreed upon as the proper measure of the Liquidated Damage that the Owner will sustain per day, by failure of the undersigned to complete the contract, at the stipulated time, and is not to be construed, in any sense, as a penalty.

LIQUIDATION DAMAGES PER DIEM: $500.00 per day

H. BOND

The undersigned agrees, if awarded the contract, to execute and deliver to the Owner at the time the contract documents are executed, a performance bond and a materials and labor bond in a form acceptable to the Owner, and in an amount equal to the contract sum. Failure to submit this bond at the time of the contract, or contracts, will cause forfeiture of bid security as liquidated damages.

I. BID SECURITY

The bid security attached in the sum of five percent (5%) of the Base Bid, in the amount of:

_____

_____. Dollars $_____

The Bid Security is to become the property of the Owner, as set forth in DIVISION 0, Section 00.118. Attached to this Proposal is the Bid Bond, executed as required.

J. DOCUMENTS

Each bidder by submittal of his bid represents and warrants that he has satisfied himself as to the requirements and provisions of the contract, or contracts, for this project and the documents included in this contract or contracts.

K. ADDENDUM

I/We acknowledge receipt of the following addenda:

No. _____ No. _____

No. _____ No. _____

L. SIGNATURES

Respectfully submitted,

_____

Name of Bidding Corporation or Company

_____

Authorized Signature Title

_____

Typed (or Printed) Name of Signatory

Address (city and state)

Current Certificate of Responsibility Number

Classification of Work Permitted Under
Certificate of Responsibility

NOTE: If bidder is a corporation, write state of incorporation under signature, and if a partnership, give full name of all partners.
Stamp or emboss corporate seal on this Proposal.

IMPORTANT: Non-resident (out of state) bidders shall attach to their bids a copy of their resident state's, city, county, parish, province, nation or political subdivision current law pertaining to such state's treatment of non-resident contractors. See DIVISION 0, Paragraph 00.102, NON-RESIDENT (OUT OF STATE) BIDDER REQUIREMENTS.

Non-Collusion/Debarment Affidavit: All bidders shall execute (in duplicate) the attached form.

80 ton Air-Cooled CGAM

General – CSCA0080F0-F2

Model Number CGAM080

Nominal tons 80

Refrigerant R410A

Refrigerant Charge ..... 74 lb

Microchannel Refrigerant Charge[2] ..... 45 lb

Water Connection Size ..... 4 in Victaulic

Ambient Operating Conditions ..... 0 – 125°F

Extreme Low Ambient Operating Conditions[3] ... -20°F – 125°F

Chilled Water Setpoint Limits[1] ..... 0 – 65°F

Number of Electrical Circuits 1

Number of Refrigerant Circuits 2

[1]The listed refrigerant charge is per refrigeration circuit for all round tube and plate fin condenser coils.

[2]The listed refrigerant charge is per refrigeration circuit for all extreme low ambient Microchannel condenser coils.

[3]For CGAM models with Microchannel condenser coils.

[4]When leaving solution is below 42°F a glycol solution is required for all low temperature and ice-making applications.

Electrical Data

Voltage 460V 3-phase

Frequency ..... 60 Hz

F0 Power Supply Connections[5,6] – Lugs or Series 16 Cam-Type Connections

F2 Power Supply Connections[6] – Series 16 Cam-Type Connections Only

[5]Maximum Wire Size Lug(s) Can Accept - 350 MCM

[6]Depending on chiller MCA and wire used, multiple wires per phase may be required.

Without Integral Pump

Minimum Circuit Ampacity (MCA) ..... 162 A

Maximum Overcurrent Protection (MOP) ..... 175 A

Full Load Amps (FLA) ..... 152 A

With Integral Pump

Minimum Circuit Ampacity (MCA) ..... 189 A

Maximum Overcurrent Protection (MOP) ..... 200 A

Full Load Amps (FLA) ..... 179 A

For additional electrical information contact Trane Rental Services.

Pump Data

Horsepower ..... 20 HP

Min Flow ..... 91.3 gpm @ 166.6 ft

Max Flow ..... 380.5 gpm @ 123 ft

Pump is mounted within the chiller frame with a bypass and shall be controlled by the chiller's standalone control system if not connected to end user's building automation system.

Cooling Capacity (Tons)

Leaving Water Temp	Propylene Glycol (%)	Estimated Capacity (Tons) at 2.4 GPM / Nominal Ton				
		Ambient Air Temp				
		85°F	95°F	105°F	115°F	125°F
65°F	0	115.6	108.1	100.3	92.5	N/A
55°F	0	99.9	93.5	86.7	79.9	73.1
45°F	0	84.8	79.5	73.8	67.9	62
35°F	15	70	65.7	61	56.1	51.2
25°F	25	56.6	53.2	49.5	45.5	N/A
15°F	35	44.6	41.9	39	N/A	N/A
5°F	45	34.7	32.5	N/A	N/A	N/A

Actual Tons of refrigeration in table above are based on chiller models with round tube and plate fin condenser coils.

Water Flow Rates & Pressure Drops

Flow Rate (GPM)	Pressure Drop (FT H_2O)
92 (min flow)	4.26
110	5.96
130	8.19
150	10.7
170	13.6
190	16.8
210	20.3
230	24.2
250	28.4
275 (max flow)	34.1

Maximum water side pressure is 150 psi (2.31 ft H_2O = 1 psi)

80 ton Air-Cooled CGAM

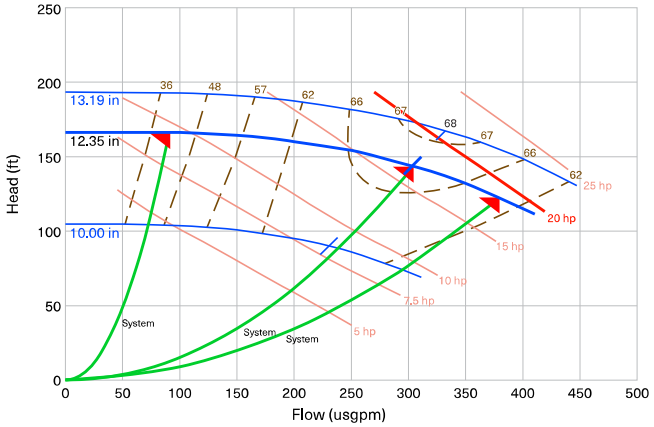
General – CSCA0080F0

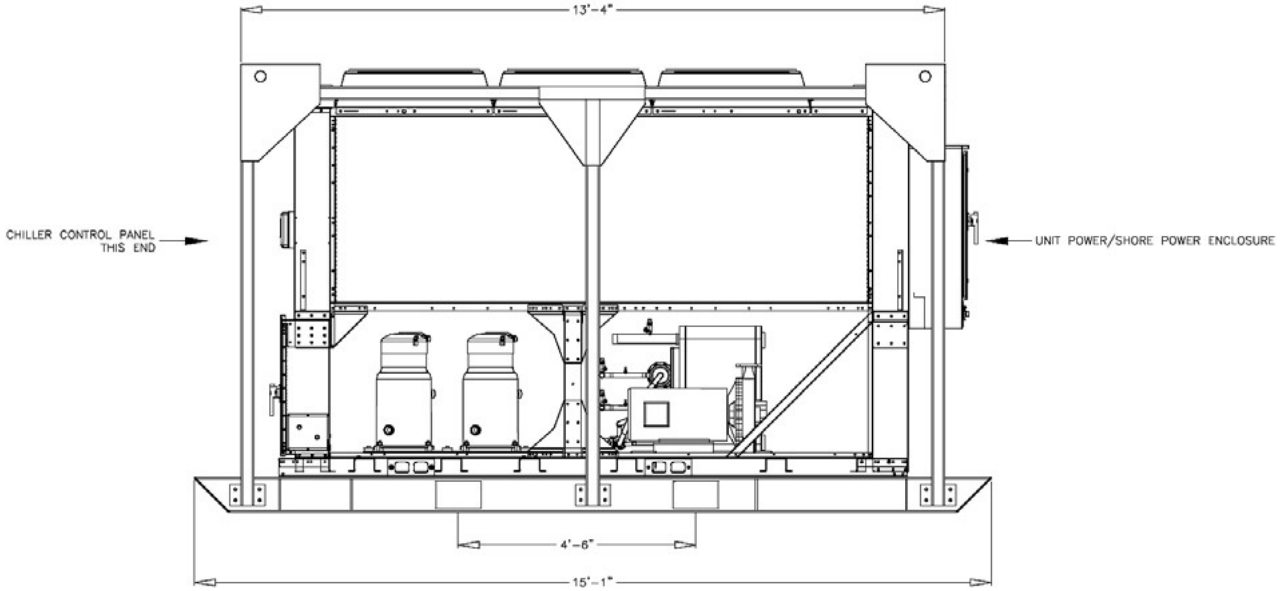
Dimensions and Weights

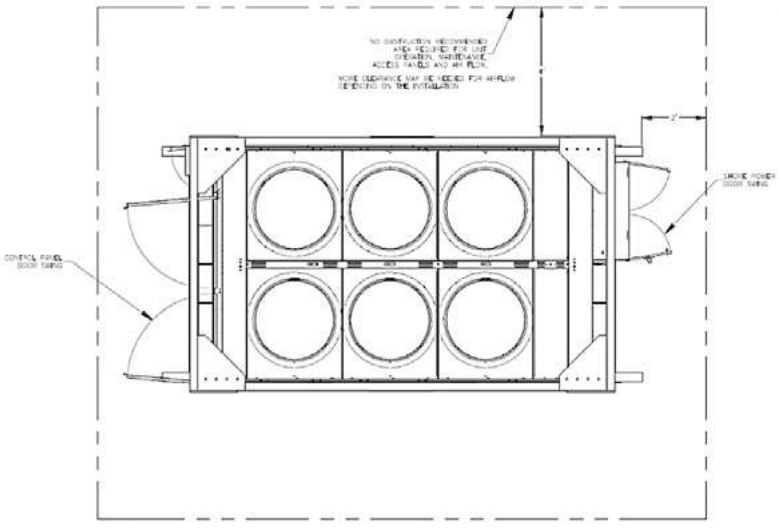
Length	15’ 1”
Width	8’ 1”
Height	8’ 6”
Shipping Weight (lbs)	10,100
Operating Weight (lbs)	10,300
Fork Pocket Dimensions	9.25” x 5.25” x 7’ 4.75”
Fork Pocket Cent to Center Distance	4’ 6”

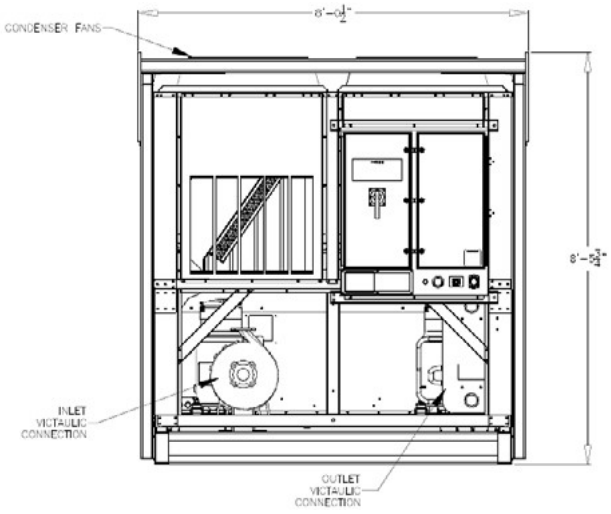
Lifting Device: Fork Lift or Crane

All weights and dimensions listed above are subject to change without notice or liability.









80 ton Air-Cooled CGAM

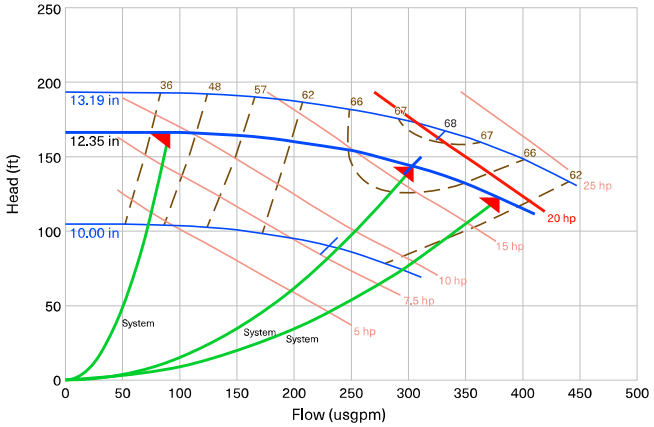
General – CSCA0080F2

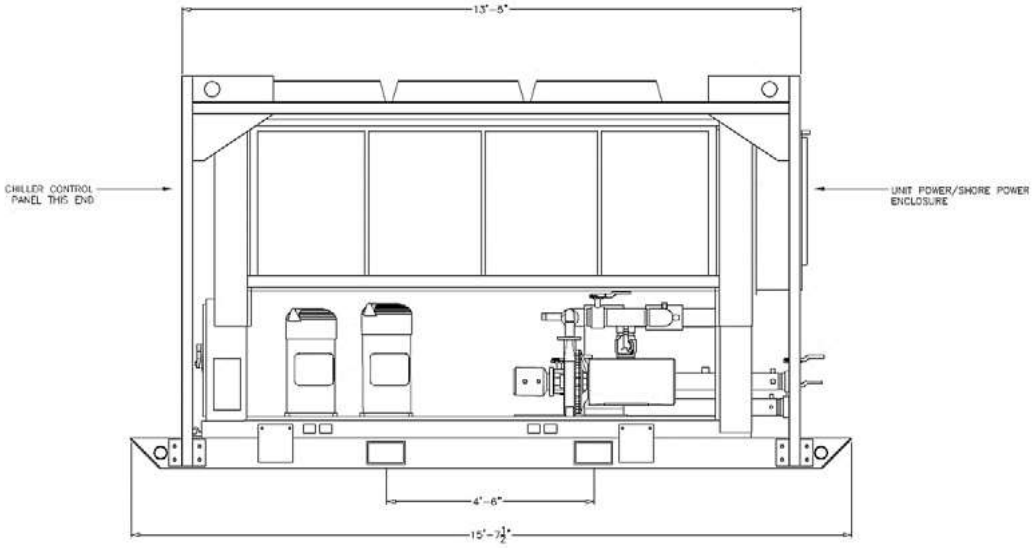
Dimensions and Weights

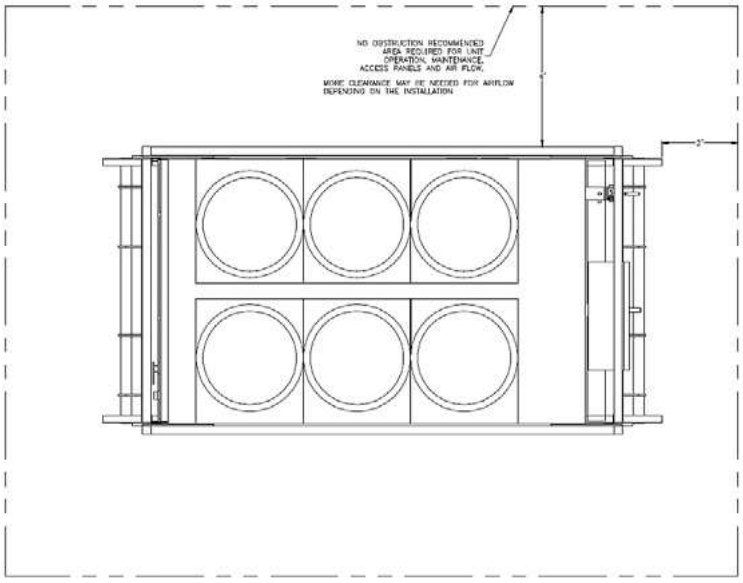
Length	15’ 7.5”
Width	8’ 0.5”
Height	8’ 6”
Shipping Weight (lbs)	9,800
Operating Weight (lbs)	10,000
Fork Pocket Dimensions	9.25” x 5.25” x 7’ 5”
Fork Pocket Cent to Center Distance	4’ 6”

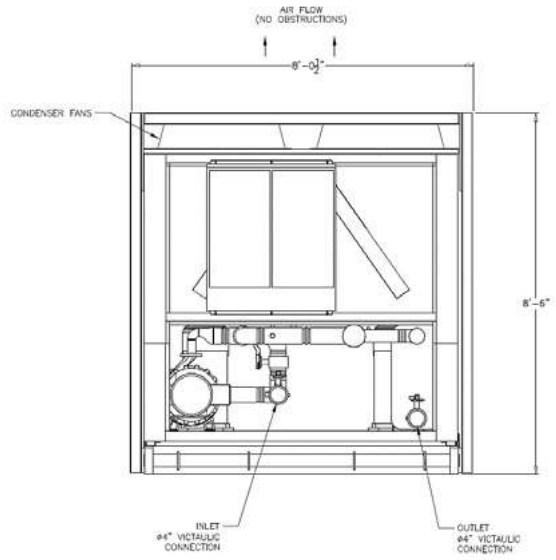
Lifting Device: Fork Lift or Crane

All weights and dimensions listed above are subject to change without notice or liability.









MECHANICAL SHEET INDEX

M001R	MECHANICAL LEGEND, ABBREVIATIONS AND NOTES
MD101	FIRST FLOOR MECHANICAL DEMOLITION PLAN
MD102	SECOND FLOOR MECHANICAL DEMOLITION PLAN
MD103	FIRST FLOOR HVAC PIPING DEMOLITION PLAN
MD104	SECOND FLOOR HVAC PIPING DEMOLITION PLAN
M101R	FIRST FLOOR NEW MECHANICAL PLAN
M102R	SECOND FLOOR NEW MECHANICAL PLAN
M103R	FIRST FLOOR NEW HVAC PIPING PLAN
M104R	SECOND FLOOR NEW HVAC PIPING PLAN
M501	MECHANICAL DETAILS
M502	MECHANICAL DETAILS
M503	AHU DETAILS
M504	AHU DETAILS
M505	AHU DETAILS
M506	AHU DETAILS
M601R	MECHANICAL SCHEDULES
M602R	MECHANICAL SCHEDULES
M701	MECHANICAL CONTROLS
M702R	MECHANICAL CONTROLS
M703R	MECHANICAL CONTROLS
M704	MECHANICAL CONTROLS
M705	MECHANICAL CONTROLS
M706	MECHANICAL CONTROLS
M801	CHILLED WATER SYSTEM PIPING SCHEMATIC
M802	HEATING WATER SYSTEM PIPING SCHEMATIC

CODE REVIEW

APPLICABLE CODES (BASIS OF DESIGN)
CODES REQUIREMENTS INCLUDE BUT NOT LIMITED TO THE FOLLOWING:

2018 INTERNATIONAL BUILDING CODE

2018 INTERNATIONAL MECHANICAL CODE

2018 INTERNATIONAL ELECTRICAL CODE

MECHANICAL LEGEND

PIPING

CHS / CHS	CHILLED WATER SUPPLY
CHR / CHR	CHILLED WATER RETURN

CONTROLS

CO2	CARBON DIOXIDE SENSOR
H	HUMIDITY SENSOR
T	THERMOSTAT
OS	WALL OR CEILING MOTION HEAT SENSOR
WS	WALL SWITCH
ESS	HVAC SYSTEM EMERGENCY SHUT-OFF
EMCS	ENERGY MANAGEMENT AND CONTROL SYSTEM

MISCELLANEOUS

CT 1-1	EQUIPMENT TYPE; EQUIPMENT NUMBER; EQUIPMENT DESIGNATION
	EXISTING EQUIPMENT, PIPING, OR DUCTWORK TO REMAIN IN SERVICE.
	EXISTING EQUIPMENT, PIPING, OR DUCTWORK TO BE REMOVE.
	NEW CONNECTION TO EXISTING PIPING, DUCTWORK AND/OR EQUIPMENT
	NORTH DIRECTION SYMBOL
A-12x12" 200 CFM A	DIFFUSER SCHEDULE TAG (AND LENGTH OR NECK SIZE FOR LINEAR OR SIDEWALL LOUVER DIFFUSERS ONLY); AIR THROW PATTERN WHERE INDICATED (ALL DEVICES ARE 4 -WAY THROW IF NOT INDICATED OTHERWISE); CFM

DIFFUSER, RETURN, & EXHAUST GRILLE TAG

DUCTWORK

	RADIUS ELBOW
	ELBOW WITH TURNING VANES
	RECTANGULAR BRANCH TAKEOFF WITH BALANCING DAMPER
	RECTANGULAR SUPPLY DUCT UP
	RECTANGULAR SUPPLY DUCT DOWN
	RECTANGULAR RETURN OR EXHAUST DUCT UP
	RECTANGULAR RETURN OR EXHAUST DUCT DOWN
	ROUND DUCT, UP
	ROUND DUCT, DOWN
18x12 / 18x12	DUCT SIZE (CLEAR INSIDE DIMENSION) FIRST FIGURE INDICATES PLAN SIZE
18 ⌀ / 18 ⌀	ROUND DUCT DIAMETER SIZE (CLEAR INSIDE DIMENSION)
18/12 / 18/12	OVAL DUCT SIZE
	VOLUME DAMPER
BD	LOCKING QUADRANT BALANCING DAMPER
B	GRAVITY BACK DRAFT DAMPER
M	MOTORIZED DAMPER
F	FIRE DAMPER WITH DUCT ACCESS DOOR
	1A - 1 WAY SUPPLY DIFFUSER
	2A - 2 WAY SUPPLY DIFFUSER
	3A - 3 WAY SUPPLY DIFFUSER
	4A - 4 WAY
	2C - 2 WAY CORNER

MECHANICAL ABBREVIATIONS

ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AHU	AIR HANDLING UNIT
AMPS	AMPERAGE
AS	AIR SEPARATOR
BD	BALANCING DAMPER
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSE POWER
BMS	BUILDING MANAGEMENT SYSTEM
BPD	BYPASS DAMPER
BTU	BRITISH THERMAL UNIT
CC	COOLING COIL
CD	CEILING DIFFUSER
CER	CEILING EXHAUST GRILLE
CER	CEILING RETURN REGISTER
CFM	CUBIC FEET PER MINUTE CFM
CG	CEILING GRILLE
CH	CHILLER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CO	CLEAN OUT
CRA	CONDITIONING RETURN AIR
CSA	CONDITIONING SUPPLY AIR
CTG	CEILING TRANSFER GRILLE
CU	CONDENSING UNIT
DAD	DUCT ACCESS DOOR
DB	DRY BULB
DG	DOOR GRILLE
DH	DEHUMIDIFIER
DIA	DIAMETER
DN	DOWN
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB
EF	EXHAUST FAN
EFF	EFFICIENCY
ET	EXPANSION TANK
ELEC	ELECTRICAL
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB
EWH	ELECTRIC WATER HEATER
EWT	ENTERING WATER TEMPERATURE
°F	DEGREES FAHRENHEIT
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FD	FUSIBLE LINK FIRE DAMPER W/ DAD
FLA	FULL LOAD AMPS
FLR	FLOOR
FT	FEET
GPM	GALLONS PER MINUTE
HC	HEATING COIL
HORIZ	HORIZONTAL
HP	HORSEPOWER
HR	HOUR
HRU	HEAT RECOVERY UNIT
HWR	HEATING WATER RETURN
HWS	HEARING WATER SUPPLY
ID	INSIDE DIMENSION
KW	KILOWATT KW
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LD	LINEAR DIFFUSER
LFD	LOUVER FACE DIFFUSER
LRA	LOCK ROTOR AMPS
LWT	LEAVING WATER TEMPERATURE
M	MOTORIZED DAMPER
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MECH	MECHANICAL
MFG	MANUFACTURER
MFS	MAXIMUM FUSE SIZE
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
MUA	MAKE UP AIR UNIT
NC	NORMALLY CLOSED
NFA	NET FREE AREA
NIC	NOT IN THIS CONTRACT
NR	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE
OA	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIMENSION
P	PUMP
PH OR Ø	PHASE
PD	PRESSURE DROP
PSA	PRIMARY SUPPLY AIR
PSI	POUNDS PER SQUARE INCH (GUAGE)
PRV	PRESSURE REDUCING VALVE
QTY	QUANTITY
RA	RETURN AIR
REFR	REFRIGERANT
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RLA	RUN LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
REQ'D	REQUIRED
SA	SUPPLY AIR
SENS	SENSIBLE
SD	SMOKE DAMPER
SPD	SPLITTER DAMPER
SQFT	SQUARE FEET
SP	STATIC PRESSURE
TA	TRANSFER AIR
TYP	TYPICAL
UC	UNDERCUT DOOR 5/8"
V	VOLTS
VAV	VARIABLE AIR VOLUME
VAVD	VARIABLE AIR VOLUME DAMPER
VEA	VENTILATION EXHAUST AIR
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VD	VOLUME DAMPER
VRF	VARIABLE REFRIGERANT FLOW
W/	WITH
WB	WET BULB
WSR	WALL SUPPLY REGISTER

MECHANICAL GENERAL NOTES

1. EACH CONTRACTOR, SUPPLIER AND/OR MANUFACTURER SHALL REFER TO ALL DOCUMENTS PERTAINING TO THIS PROJECT AND COORDINATE ACCORDINGLY SO AS TO ENSURE ADEQUACY OF FIT, COMPLIANCE WITH SPECIFICATIONS, PROPER ELECTRICAL SERVICE, AND AVOID CONFLICT WITH ANY OTHER BUILDING SYSTEMS. VERIFY SAME WITH SHOP DRAWINGS.
2. ALL OFFSETS, TURNS, FITTINGS, TRIM, DETAIL, ETC., MAY NOT BE INDICATED, BUT SHALL BE PROVIDED AS REQUIRED. ADDITIONAL ALLOWANCES SHALL BE INCLUDED FOR SAME AT EACH PROPOSERS' DISCRETION.
3. OBSERVE ALL APPLICABLE CODES, RULES AND REGULATIONS (CITY, COUNTY, LOCAL, STATE, FEDERAL, MUNICIPALITY, UTILITY COMPANY, OSHA, ETC.).
4. ALL SYSTEMS, EQUIPMENT, AND MATERIALS ARE TO BE INSTALLED IN A NEAT AN WORKMANLIKE MANNER. WORK NOT DONE SO SHALL BE REMOVED AND REINSTALLED SATISFACTORILY.
5. WHERE MOUNTING HEIGHTS ARE NOT INDICATED OR ARE IN CONFLICT WITH ANY OTHER BUILDING SYSTEM, CONTACT THE ENGINEER BEFORE INSTALLATION. REFER ALSO TO ARCHITECTURAL WALL INTERIOR AND EXTERIOR WALL ELEVATIONS, CEILING HEIGHTS AND OTHER DETAILS OF THESE DOCUMENTS. REFERENCE SPECIFICATION 230010 "MECHANICAL GENERAL PROVISIONS" FOR COORDINATION DRAWING REQUIREMENTS.
6. DO NOT SCALE DRAWINGS, PRINTING DISTORTS SCALE. WORK SHALL BE LAID OUT FROM DIMENSIONED DRAWINGS, OR DIMENSIONS SUPPLIED TO THE CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR THEIR WORK. ALL CUTTING AND PATCHING SHALL MATCH ADJACENT SURFACES.
8. TURNING VANES SHALL BE INSTALLED IN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK ELBOWS. TURNING VANES NOT REQUIRED FOR KITCHEN EXHAUST DUCTS.
9. THESE DRAWINGS ARE ACCURATE TO THE BEST OF OUR KNOWLEDGE, HOWEVER LOCATIONS, DEPTHS, ELEVATIONS, AND SIZES WERE TAKEN FROM DIFFERENT SOURCES AND ARE SUBJECT TO DEVIATION. THE CONTRACTOR SHALL ASSUME SOME DEVIATIONS AND INCLUDE OFFSETS, ADDITIONAL PIPING, ETC. AT THE TIME OF BID.
10. WHERE PENETRATING ROOFING MEMBRANE OR OTHER MATERIALS USED FOR WEATHERPROOFING THE BUILDING, MAKE SUCH PENETRATIONS IN A WAY THAT WILL NOT VOID OR DIMINISH THE ROOFING WARRANTY OR INTEGRITY IN ANY WAY. COORDINATE ALL SUCH PENETRATIONS WITH THE GENERAL CONTRACTOR/ROOFER.
11. ADVISE THE ARCHITECT OF ANY CONFLICTS, ERRORS, OMISSIONS, ETC. AT LEAST TEN (10) DAYS PRIOR TO BID DATE, TO ALLOW CLARIFICATION BY WRITTEN ADDENDUM.
12. DEVIATION FROM SPECIFICATIONS OR PLANS REQUIRES PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND MUST BE SUBMITTED IN WRITING NO LATER THAN TEN DAYS PRIOR TO THE BID DATE.
13. COORDINATE THE LOCATION OF DRAINS, ELECTRICAL OUTLETS, ETC. WITH ALL MECHANICAL ROOM EQUIPMENT, ETC. PRIOR TO COMMENCING INSTALLATION. WORK NOT SO COORDINATED SHALL BE REMOVED AND PROPERLY INSTALLED AT THE EXPENSE OF THE RESPONSIBLE CONTRACTOR(S).
14. THE PURPOSE AND INTENT OF THE DOCUMENTS PERTAINING TO THIS PROJECT IS TO PROVIDE A COMPLETE, FUNCTIONAL, AND SAFE FACILITY. ANYTHING LESS SHALL BE UNACCEPTABLE.
15. ALL VIBRATING, OSCILLATING, NOISE PRODUCING OR ROTATING EQUIPMENT SHALL BE ISOLATED FROM SURROUNDING SYSTEMS IN AN APPROVED MANNER. NOISY, VIBRATING, OR STRUCTURALLY DAMAGING INSTALLATIONS SHALL BE SATISFACTORILY REPLACED OR REPAIRED AT THE INSTALLING CONTRACTOR'S EXPENSE. THE FINAL DECISION ON THE SUITABILITY OF A PARTICULAR INSTALLATION SHALL BE THAT OF THE ARCHITECT.
16. INSTALL EQUIPMENT, MATERIALS, ETC. IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND DIRECTIONS. IF IN CONFLICT WITH THE DESIGN INDICATED IN CONTRACT DOCUMENTS, ADVISE THE ARCHITECT PRIOR TO INSTALLATION FOR CLARIFICATION.
17. ALL SUPPORTS FOR EQUIPMENT, DEVICES, OR FIXTURES SHALL BE UNIQUE FROM THE BUILDING STRUCTURE. DO NOT SUPPORT FROM OTHER TRADES, EQUIPMENT OR SUPPORTS WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT AND CONSENT OF THE OTHER TRADE, IN WRITING.
18. DEVIATIONS IN SIZE, CAPACITIES, FIT, FINISH, ETC. FOR EQUIPMENT FROM THAT SPECIFIED SHALL BE THE RESPONSIBILITY OF THE PURCHASER OF THAT EQUIPMENT. ANY PROVISIONS REQUIRED TO ACCOMMODATE A DEVIATION, WHETHER APPROVED BY THE ARCHITECT OR NOT, SHALL BE THE RESPONSIBILITY OF THE PURCHASER.
19. THE GENERAL CONTRACTOR FOR THIS CONSTRUCTION IS RESPONSIBLE FOR THE COORDINATION, APPEARANCE, SCHEDULING, AND TIMELINESS OF THE WORK OF ALL TRADES, CONTRACTORS, SUPPLIERS, INSTALLERS, ETC.
20. VALVES, BALANCING DAMPERS OR ANY MECHANICAL/ELECTRICAL ITEM SHALL NOT BE LOCATED ABOVE A HARD CEILING. IF THIS IS NOT POSSIBLE, THEN AN APPROPRIATELY SIZED ACCESS DOOR SHALL BE PLACED UNDER THE ITEM TO ALLOW EASY MAINTENANCE AND ADJUSTMENT BY THIS CONTRACTOR.
21. THE GENERAL CONTRACTOR, MECHANICAL CONTRACTOR, AND ALL OTHER CONTRACTORS SHALL ENSURE PROPER COORDINATION BETWEEN ALL TRADES SUCH THAT CONDUITS, PIPING, DUCTWORK, ETC. DO NOT BLOCK ACCESS TO VALVES, EQUIPMENT, DUCT ACCESS DOORS, ETC. ITEMS THAT HAVE BEEN INSTALLED WHERE ACCESS IS COMPROMISED SHALL BE RELOCATED AT THE CONTRACTOR'S EXPENSE.
22. THE CONTRACTOR SHALL INCLUDE IN THEIR BID ALL COSTS ASSOCIATED WITH DRAINING AND FILLING PIPING SYSTEMS AS REQUIRED TO INSTALL THEIR NEW WORK.
23. TESTING, ADJUSTING, AND BALANCING AGENCY IS TO PROVIDE SIZING OF FAN AND MOTOR SHEAVES REQUIRED FOR PROPER BALANCE. REPLACE FAN AND MOTOR SHEAVES AND BELTS AS REQUIRED ON EQUIPMENT (AHUs, EFs, ETC.). THE MECHANICAL CONTRACTOR SHALL PURCHASE AND INSTALL ALL SHEAVES AND BELTS AS REQUIRED.
24. PRIOR TO ORDERING ANY MATERIALS OR ROUGH-IN OF ANY KIND, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL COORDINATION OF ALL ELECTRICAL REQUIREMENTS (I.E., VOLTAGE, PHASE, CIRCUIT BREAKER, WIRING SIZE, ETC.) WITH THE ELECTRICAL CONTRACTOR. THERE WILL BE NO CHANGE IN THE CONTRACT AMOUNT FOR ANY DISCREPANCIES. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ALL OTHER CONTRACTORS, VENDORS, AND SUPPLIERS AND SHALL INSURE COMPLETE, 100% FUNCTIONAL, TESTED, INSPECTED, AND APPROVED SYSTEMS. CLAIMS FOR ADDITIONAL COST OR CHANGE ORDERS WILL IMMEDIATELY BE REJECTED.
25. EQUIPMENT BRACING WILL BE INCLUDED FOR ALL OVERHEAD UTILITIES AND OTHER EQUIPMENT WEIGHING 31 POUNDS OR MORE (EXCLUDING DISTRIBUTED SYSTEMS SUCH AS PIPING, ETC.). BRACING SHALL BE ACCOMPLISHED BY EITHER RIGID OR FLEXIBLE SYSTEMS. ALL EQUIPMENT MOUNTINGS SHALL BE DESIGNED TO RESIST FORCES OF 0.5 TIMES THE EQUIPMENT WEIGHT IN ANY DIRECTION AND 1.5 TIMES THE EQUIPMENT WEIGHT IN THE DOWNWARD DIRECTION. ALL BRACING SHALL BE CONTRACTOR DESIGNED.
26. ALL BRANCH DUCTS TO AIR DISTRIBUTION DEVICES (SUPPLY, RETURN, EXHAUST, ETC.) SHALL INCLUDE VOLUME A VOLUME DAMPER PER DRAWINGS AND SPECIFICATIONS.
27. DUCT SIZES INDICATED ARE ACTUAL INSIDE (NET) DIMENSIONS. ALL RECTANGULAR SUPPLY, RETURN, EXHAUST, AND OUTDOOR AIR DUCT SIZES ARE INSIDE CLEAR DIMENSIONS (INSIDE LINER, WHERE APPLICABLE).
28. THE CONTRACTOR SHALL INSTALL CONDENSATE DRAINS, WITH UNION CONNECTIONS, FROM ALL A/C EQUIPMENT. PROVIDE TRAPPED DRAINAGE PIPING WITH VENT RISERS 6" HIGH NEAR EQUIPMENT CONNECTIONS. PROVIDE NEW INSULATED CONDENSATE DRAINS FOR ALL HVAC COOLING COILS AND OVERFLOW PANS AND ROUTE ON SLOPE TO CONNECTION WITH NEARBY PLUMBING VENT STACK, OR FLOOR DRAIN, OR AS INDICATED ON PLANS. PROVIDE CLEANOUTS ON DRAINS, 1" OR LARGER, EVERY 20' O.C., AND AT ENDS AND OFFSETS OF RUNS.

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MECHANICAL LEGEND, ABBREVIATIONS AND NOTES
PASCAGOULA PUBLIC LIBRARY REPAIRS AND RENOVATIONS
JACKSON COUNTY BOARD OF SUPERVISORS
PASCAGOULA, MS

JOB NUMBER 2020-36
DATE 09/15/23
REVISED ADD - 01.08.24
DRAWN BY M.IMPEY
CHECKED BY R.WILLIAMS

JASON CHRISTOPHER ROUSE
LICENSED PROFESSIONAL ENGINEER
17087
09/15/23
STATE OF MISSISSIPPI

SHEET
M001R

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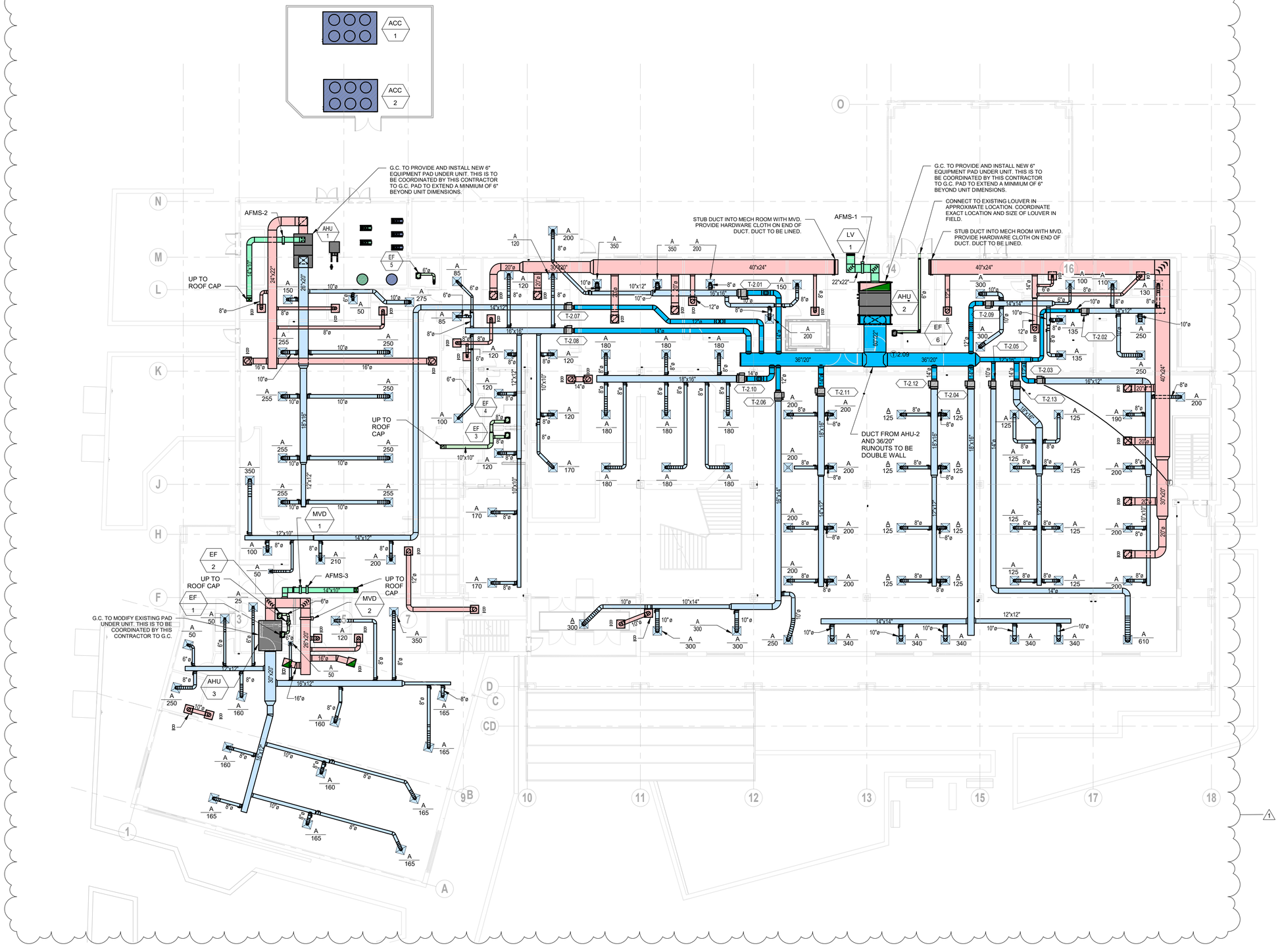

1 M101R **FIRST FLOOR PLAN - NEW MECHANICAL**
3/32" = 1'-0"

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FIRST FLOOR NEW MECHANICAL PLAN

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PASCAGOULA, MS

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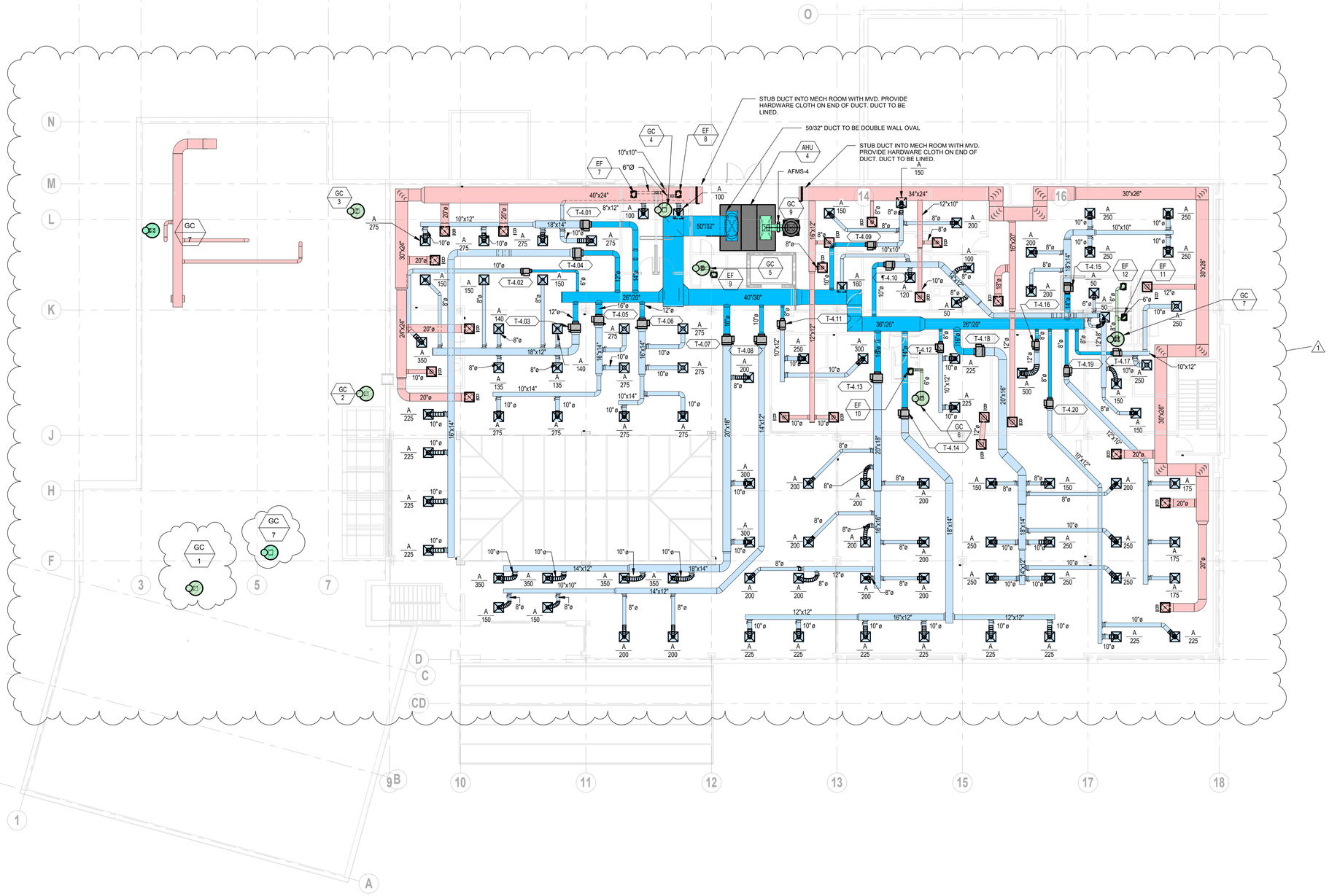

1 SECOND FLOOR PLAN - NEW MECHANICAL
M102R 3/32" = 1'-0"

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SECOND FLOOR NEW MECHANICAL PLAN

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STATE OF MISSISSIPPI

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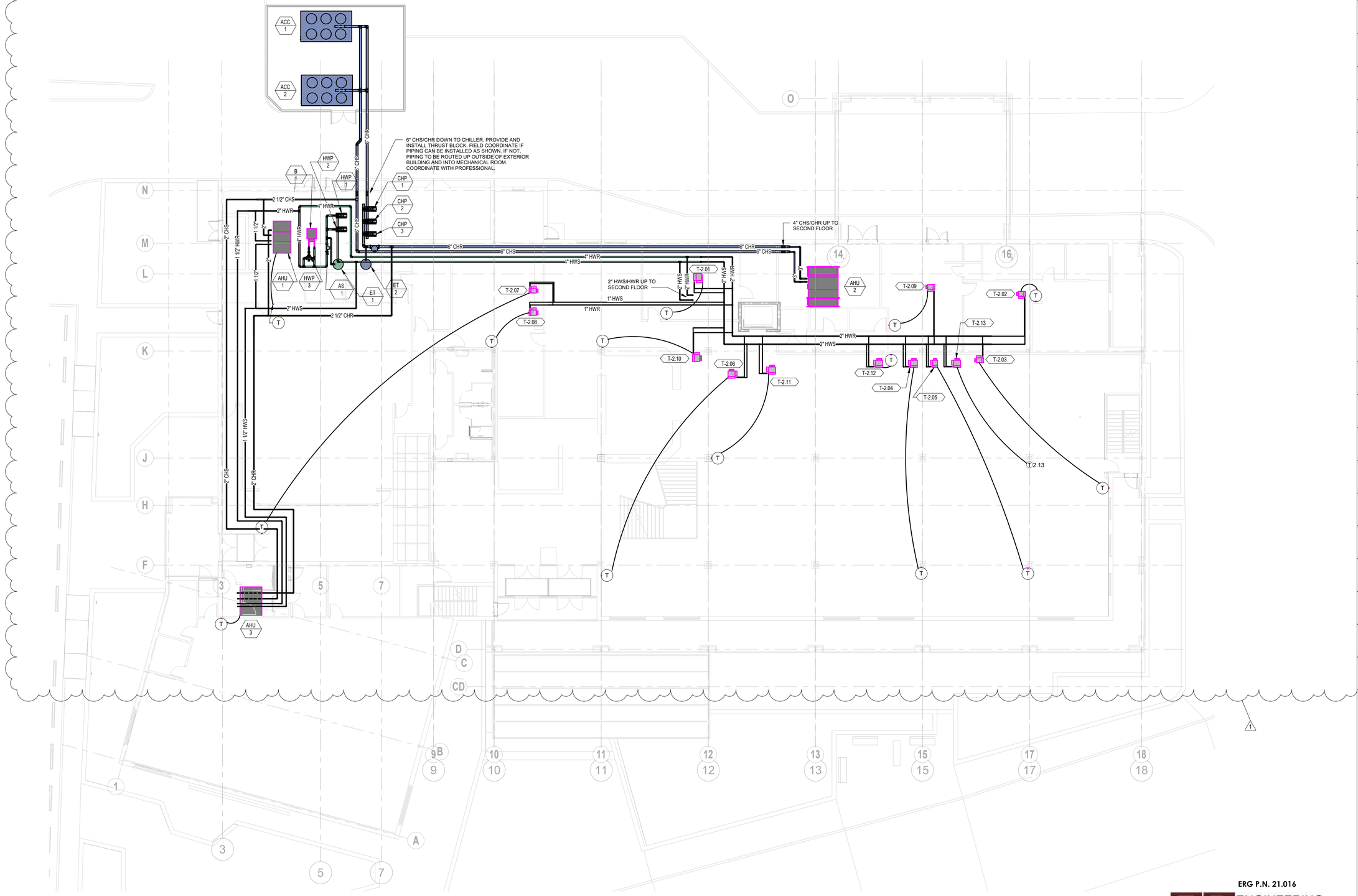
M102R

PIPE RUNOUT SIZE	
GPM	PIPE SIZE
0 - 1.0	1/2"
1.1 - 2.6	3/4"
2.7 - 5.5	1"



1 M103R **FIRST FLOOR PLAN - NEW HVAC PIPING**
3/32" = 1'-0"

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FIRST FLOOR NEW HVAC PIPING PLAN

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PASCAGOULA, MS

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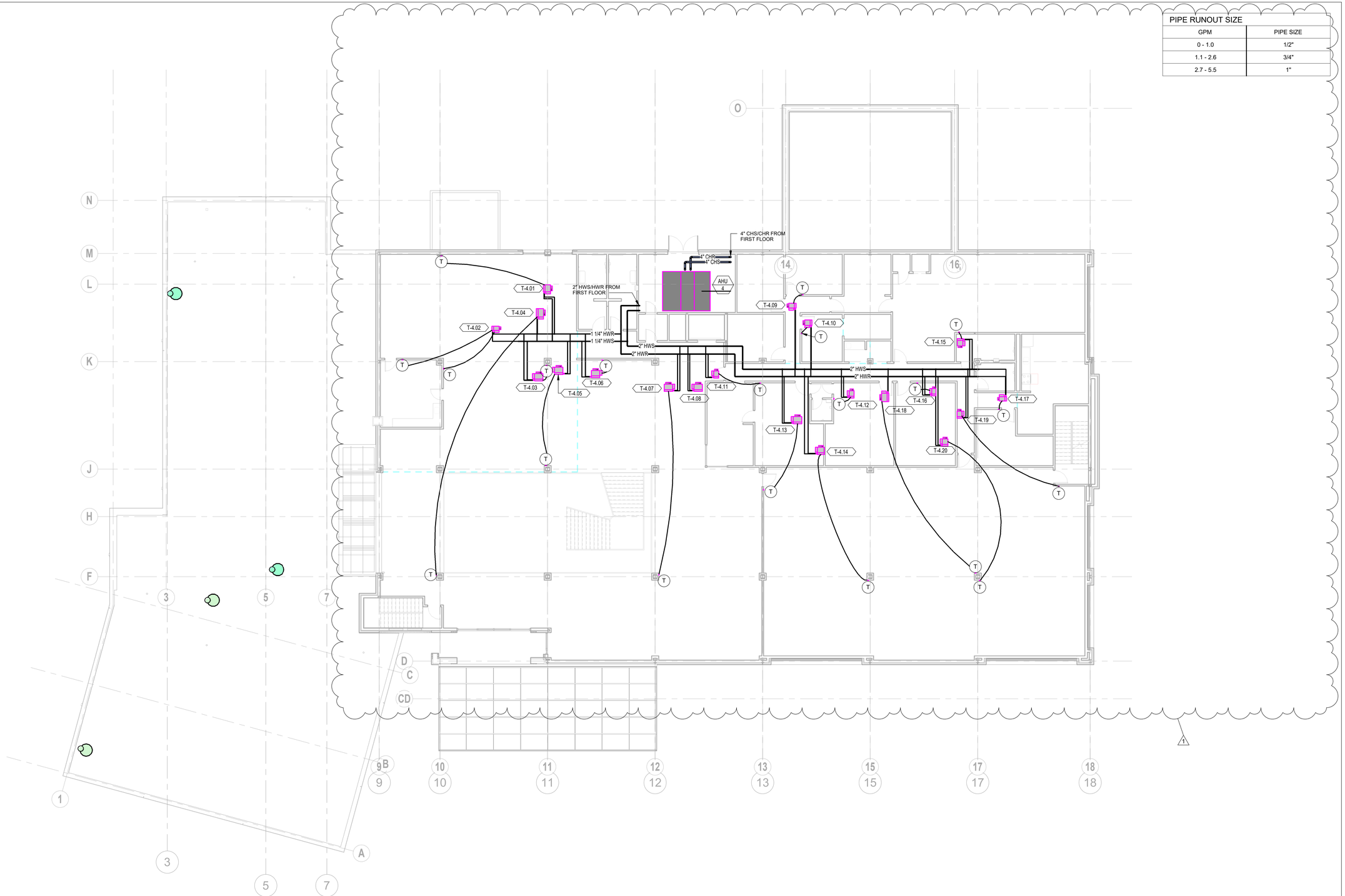
M103R

PIPE RUNOUT SIZE	
GPM	PIPE SIZE
0 - 1.0	1/2"
1.1 - 2.6	3/4"
2.7 - 5.5	1"



1 SECOND FLOOR PLAN - NEW HVAC PIPING
M104R 3/32" = 1'-0"

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SECOND FLOOR NEW HVAC PIPING PLAN

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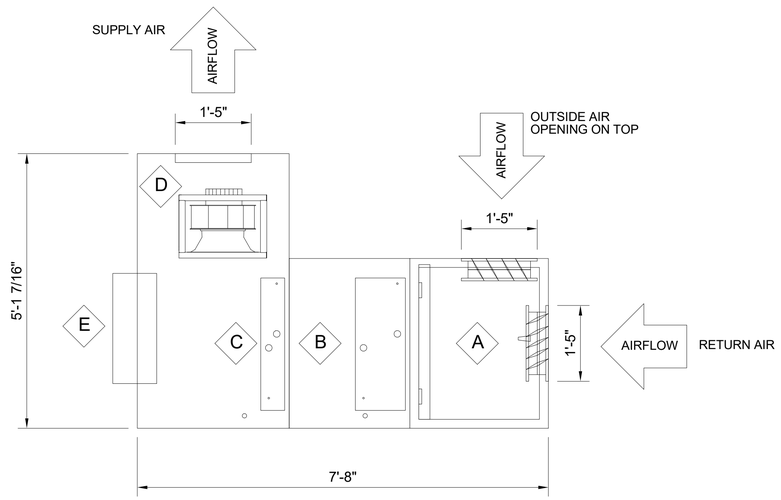
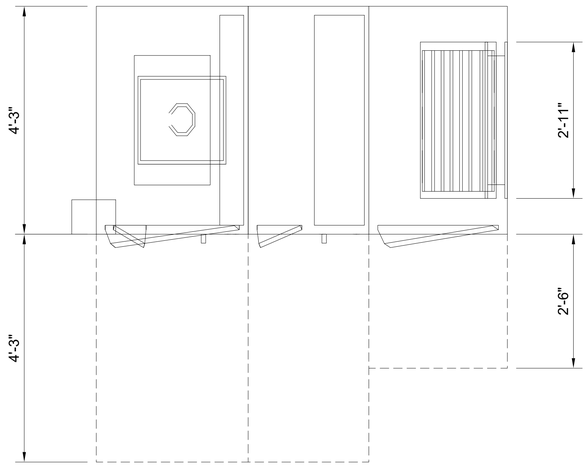
M104R



ELEVATION VIEW



PLAN VIEW

1 M-503 DETAIL OF MODULAR AHU-1

SCALE: 3/4" = 1'-0"

AHU SECTION DESCRIPTION

X

A. FILTER MIXING SECTION. TOP FACTORY MOUNTED RA OPENING WITH DAMPER. BACK FACTORY MOUNTED OA OPENING WITH DAMPER. 2" FLAT FILTER RACK. 2" MERV-13 FILTERS. MIN 20" ACCESS DOOR.

B. CHW COOLING COIL SECTION. STAINLESS STEEL DRAIN PAN, COIL CASING, AND COIL SUPPORTS. MIN 10" ACCESS DOOR

C. REHEAT COOLING COIL SECTION. STAINLESS STEEL COIL CASING. MIN 10" ACCESS DOOR

D. SUPPLY FAN SECTION. MOTORIZED IMPELLER SUPPLY FAN. MOTORIZED IMPELLER CONTROL PANEL (MICP) MOUNTED ON EXTERIOR OF UNIT FACTORY WIRED TO SUPPLY FAN. MICP SHALL PROVIDE SINGLE 460V/3PH POWER LANDING LOCATION FOR DIV 26. START / STOP AND SPEED WIRING FROM MICP TO FAN BY FACTORY. DIV 15C CONTRACTOR TO LAND MI FAN START/STOP AND SPEED SIGNAL ON MICP. MIN 20" ACCESS DOOR. TOP SUPPLY DUCT CONNECTION

E. CONTROLS ENCLOSURE

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AHU DETAILS

PASCAGOULA PUBLIC LIBRARY REPAIRS AND RENOVATIONS

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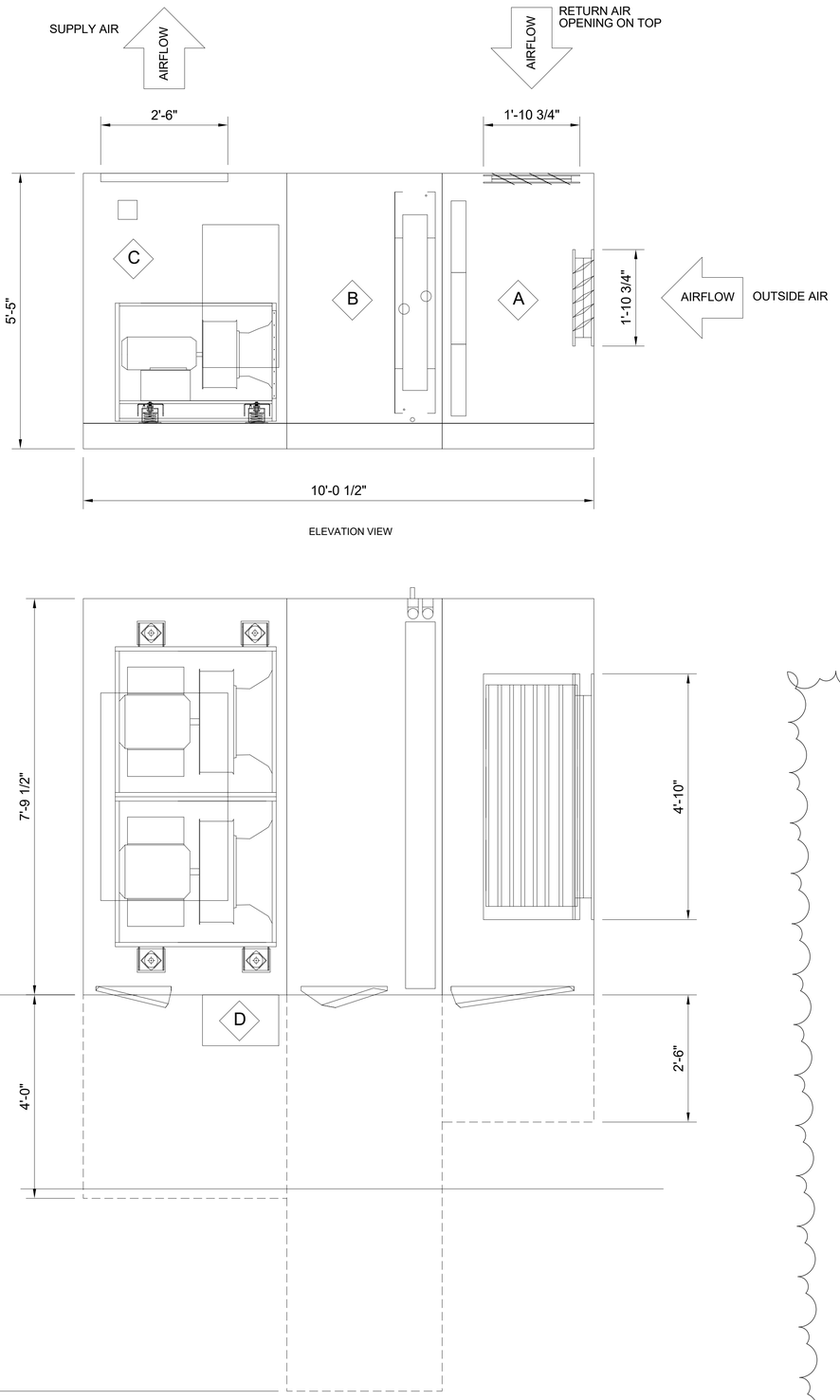

1 M-504 DETAIL OF MODULAR AHU-2

SCALE: 3/4" = 1'-0"

AHU SECTION DESCRIPTION X

A. FILTER MIXING SECTION. TOP FACTORY MOUNTED RA OPENING WITH DAMPER. BACK FACTORY MOUNTED OA OPENING WITH DAMPER. 2" FLAT FILTER RACK. 2" MERV-13 FILTERS. LED MARINE LIGHT. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT

B. CHW COOLING COIL SECTION. COIL REMOVAL PANEL. STAINLESS STEEL DRAIN PAN, COIL CASING, AND COIL SUPPORTS. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT. LED MARINE LIGHT.

C. SUPPLY FAN SECTION. DUAL 10 HP DIRECT DRIVE PLENUM FANS. FACTORY MOUNTED VFD PER FAN BY EQUIPMENT MANUFACTURER (QTY 2) VFDS WIRED TO SINGLE POINT 460V/3PH POWER CONNECTION FOR DIV 26. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT AND 8X8 DUAL PANE THERMAL VIEWING WINDOW.

D. EXTERNAL CONTROLS ENCLOSURE

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AHU DETAILS

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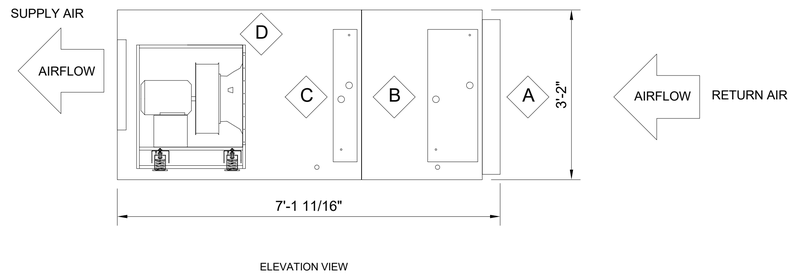
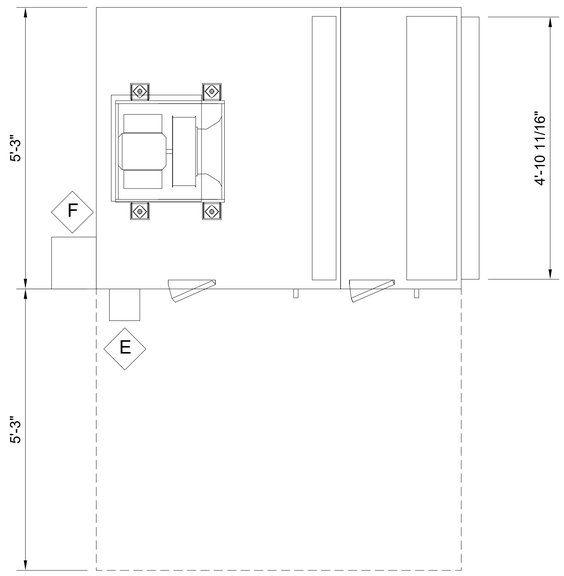


ELEVATION VIEW



PLAN VIEW

1 M-505 DETAIL OF MODULAR AHU-3

SCALE: 3/4" = 1'-0"

AHU SECTION DESCRIPTION X

A. FILTER MIXING SECTION. BACK OPENING. 2" FLAT FILTER RACK. 2" MERV-13 FILTERS. LED MARINE LIGHT. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT.

B. CHW COOLING COIL SECTION. COIL REMOVAL PANEL. STAINLESS STEEL DRAIN PAN, COIL CASING, AND COIL SUPPORTS. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT. LED MARINE LIGHT.

C. SUPPLY FAN SECTION. 5 HP DIRECT DRIVE PLENUM FANS. FACTORY MOUNTED VFD BY EQUIPMENT MANUFACTURER. VFD WIRED TO SINGLE POINT 460V/3PH POWER CONNECTION FOR DIV 26. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT AND 8X8 DUAL PANE THERMAL VIEWING WINDOW

D. EXTERNAL CONTROLS ENCLOSURE

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AHU DETAILS

PASCAGOULA PUBLIC LIBRARY REPAIRS AND RENOVATIONS

JACKSON COUNTY BOARD OF SUPERVISORS

PASCAGOULA, MS

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SHEET

M505

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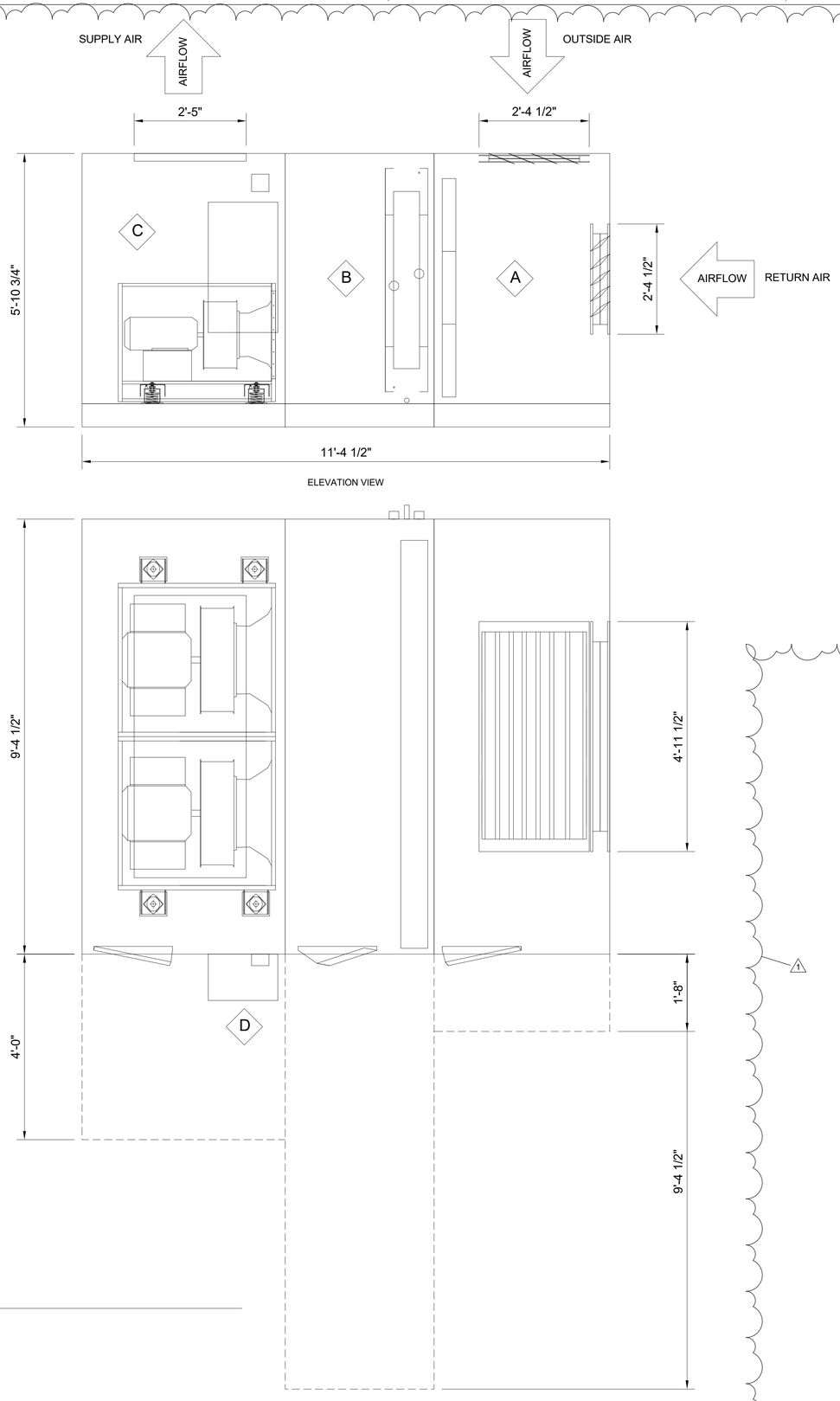

AHU SECTION DESCRIPTION X

A. FILTER MIXING SECTION. TOP FACTORY MOUNTED RA OPENING WITH DAMPER. BACK FACTORY MOUNTED OA OPENING WITH DAMPER. 2" FLAT FILTER RACK. 2" MERV-13 FILTERS. LED MARINE LIGHT. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT.

B. CHW COOLING COIL SECTION. COIL REMOVAL PANEL. STAINLESS STEEL DRAIN PAN, COIL CASING, AND COIL SUPPORTS. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT. LED MARINE LIGHT.

C. SUPPLY FAN SECTION. DUAL 10 HP DIRECT DRIVE PLENUM FANS. FACTORY MOUNTED VFD PER FAN BY EQUIPMENT MANUFACTURER (QTY 2) VFDS WIRED TO SINGLE POINT 460V/3PH POWER CONNECTION FOR DIV 26. MIN 20" ACCESS DOOR WITH RE-SEALABLE 1" TEST PORT AND 8X8 DUAL PANE THERMAL VIEWING WINDOW

D. EXTERNAL CONTROLS ENCLOSURE

1 / M-506 DETAIL OF MODULAR AHU-4

SCALE: 3/4" = 1'-0"

711 Church Street
Ocean Springs, MS 39564
Phone: (228) 762-1975
Email: contact@alliedstolarski.com

allred stolarski architects

AHU DETAILS

PASCAGOULA PUBLIC LIBRARY REPAIRS AND RENOVATIONS

JACKSON COUNTY BOARD OF SUPERVISORS

PASCAGOULA, MS

JOB NUMBER 2020-36
DATE 09/15/23
REVISED ADD - 01.08.24
DRAWN BY Author
CHECKED BY Checker

JASON CHRISTOPHER BROOKS LICENSED PROFESSIONAL ENGINEER 17087 09/15/23 STATE OF MISSISSIPPI

SHEET M506

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MODULAR AIR HANDLING UNIT SCHEDULE

TAG	MANUFACTURER AND MODEL NO.	SUPPLY FAN										FV	COOLING COIL											HEATING COIL (RE-HEAT)										FILTER			OP WT (LBS.)	REMARKS
		TYPE	SUPPLY AIR (CFM)	OUTDOOR AIR (CFM)	ESP TSP	RPM	ISOLATION TYPE	ISOLATION DEFL	FAN (QTY)	ELEC (PER FAN) BHP	ELEC (PER FAN) HP	ELEC (PER FAN) V/□		EDB EWB	LDB LWB	APD	GPM	EWT	LWT	WPD	CAPACITY (MBH) TOTAL	CAPACITY (MBH) SENS	ROWS FPI	FV	EDB	LDB	APD	GPM	EWT	LWT	WPD	CAPACITY (MBH)	ROWS FPI	TYPE	DEPTH	MERV		
AHU 1	TRANE UCCA08	MOTORIZED IMPELLER	3,900	400	1.0 3.2	1614	INT.	--	1	2.5	--	460/3	511	78 65	52 51	1.1	20	42	56	3	148	112	8 12	511	52	95	0.2	12	160	127	0.4	182	2 12	PLTD	2"	13	1200	6" INTEGRAL BASE FRAME, 120V/1PH CONNECTION FOR MARINE LIGHTS, 120V/1PH FOR CONVENIENCE OUTLET. IG-1
AHU 2	TRANE CSAA030	DIRECT-DRIVE PLENUM FAN	16,000	1,500	2.0 3.9	1788	SPRING	2	2	18	10 EA	460/3	540	77 65	52 51	1.0	88	42	56	6	618	455	8 8	---	---	---	---	---	---	---	---	---	--- ---	PLTD	2"	13	3500	6" INTEGRAL BASE FRAME, VFD(S) FACTORY MTD/WIRED TO SINGLE POINT POWER (MCA/MOP 35/60), 120V/1PH CONNECTION FOR MARINE LIGHTS, 120V/1PH FOR CONVENIENCE OUTLET. IG-1
AHU 3	TRANE UCCA10	DIRECT-DRIVE PLENUM FAN	4,300	400	1.0 2.8	1177	SPRING	2	1	3.4	5	460/3	433	78 65	52 51	0.85	20	42	58	2.6	165	123	8 12	433	52	95	0.2	10	160	118	0.4	200	2 12	PLTD	2"	13	1200	6" INTEGRAL BASE FRAME, VFD(S) FACTORY MTD/WIRED TO SINGLE POINT POWER (MCA/MOP 10.5/15), 120V/1PH CONNECTION FOR MARINE LIGHTS, 120V/1PH FOR CONVENIENCE OUTLET. IG-1
AHU 4	TRANE CSAA040	DIRECT-DRIVE PLENUM FAN	19,000	1,500	2.0 3.6	1856	SPRING	2	2	16.9	10 EA	460/3	476	77 65	51 50	0.76	106	42	56	9	742	535	8 12	---	---	---	---	---	---	---	---	---	--- ---	PLTD	2"	13	4500	6" INTEGRAL BASE FRAME, VFD(S) FACTORY MTD/WIRED TO SINGLE POINT POWER (MCA/MOP 35/60), 120V/1PH CONNECTION FOR MARINE LIGHTS, 120V/1PH FOR CONVENIENCE OUTLET. IG-1

1

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE

TAG	MANUFACTURER AND MODEL NO	INLET SIZE	DESIGN CFM COOL	DESIGN CFM MIN	DESIGN CFM HEAT	TOTAL △P	NC	HEATING COIL ROWS	HEATING COIL CFM	HEATING COIL EAT	HEATING COIL LAT	HEATING COIL GPM	HEATING COIL EWT	HEATING COIL LWT	HEATING COIL MBH	VOLT-Ø	REMARKS
T-2.01	TRANE VCWF	14	1450	320	870	0.23	19	2	870	55.0	95.0	1.8	160	118	37.7	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.02	TRANE VCWF	10	740	170	450	0.25	18	2	450	55.0	95.0	0.9	160	115	19.5	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.03	TRANE VCWF	12	990	240	600	0.23	15	2	600	55.0	95.0	1.3	160	120	26.0	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.04	TRANE VCWF	14	1700	320	1020	0.30	20	2	1020	55.0	95.0	2.2	160	120	44.3	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.05	TRANE VCWF	10	610	170	370	0.10	16	2	370	55.0	95.0	0.7	160	113	16.1	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.06	TRANE VCWF	12	1150	240	690	0.29	15	2	690	55.0	95.0	1.6	160	122	29.9	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.07	TRANE VCWF	12	960	240	580	0.11	15	2	580	55.0	95.0	1.3	160	120	25.2	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.08	TRANE VCWF	14	1450	320	870	0.23	19	2	870	55.0	95.0	1.8	160	118	37.7	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.09	TRANE VCWF	12	970	240	590	0.22	15	2	590	55.0	95.0	1.3	160	120	25.6	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.10	TRANE VCWF	14	1620	320	980	0.28	20	2	980	55.0	95.0	2.1	160	119	42.5	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.11	TRANE VCWF	14	1600	320	960	0.27	19	2	960	55.0	95.0	2.0	160	119	41.6	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.12	TRANE VCWF	14	1600	320	960	0.27	19	2	960	55.0	95.0	2.0	160	119	41.6	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-2.13	TRANE VCWF	14	1600	320	960	0.27	19	2	960	55.0	95.0	2.0	160	119	41.6	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.01	TRANE VCWF	14	1300	320	780	0.20	19	2	780	55.0	95.0	1.6	160	117	34.8	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.02	TRANE VCWF	6	350	60	210	0.34	15	2	210	55.0	95.0	0.5	160	115	9.1	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.03	TRANE VCWF	12	1000	240	600	0.23	15	2	600	55.0	95.0	1.3	160	120	26.0	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.04	TRANE VCWF	12	900	240	540	0.20	15	2	540	55.0	95.0	1.2	160	120	23.4	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.05	TRANE VCWF	12	1100	240	660	0.27	15	2	660	55.0	95.0	1.5	160	121	28.6	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.06	TRANE VCWF	12	1100	240	660	0.27	15	2	660	55.0	95.0	1.5	160	121	28.6	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.07	TRANE VCWF	16	2200	420	1320	0.34	17	2	1320	55.0	95.0	2.6	160	117	57.3	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.08	TRANE VCWF	10	700	170	420	0.23	18	2	420	55.0	95.0	0.8	160	115	18.2	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.09	TRANE VCWF	8	500	110	300	0.28	15	2	300	55.0	95.0	0.9	160	129	13.0	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.10	TRANE VCWF	10	830	170	500	0.30	18	2	500	55.0	95.0	1.0	160	117	21.7	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.11	TRANE VCWF	8	600	110	360	0.38	15	2	360	55.0	95.0	1.1	160	131	15.6	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.12	TRANE VCWF	8	450	110	270	0.24	15	2	270	55.0	95.0	0.8	160	129	11.7	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.13	TRANE VCWF	16	2000	420	1200	0.29	17	2	1200	55.0	95.0	2.3	160	115	52.1	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.14	TRANE VCWF	14	1350	320	810	0.21	19	2	810	55.0	95.0	1.7	160	118	35.1	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.15	TRANE VCWF	14	1400	320	840	0.22	19	2	840	55.0	95.0	1.7	160	118	36.4	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.16	TRANE VCWF	8	500	110	300	0.28	15	2	300	55.0	95.0	0.9	160	129	13.0	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.17	TRANE VCWF	8	500	110	300	0.28	15	2	300	55.0	95.0	0.9	160	129	13.0	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.18	TRANE VCWF	16	2000	420	1200	0.29	17	2	1200	55.0	95.0	2.3	160	115	52.1	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.19	TRANE VCWF	8	525	110	320	0.31	15	2	320	55.0	95.0	0.9	160	130	13.9	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.
T-4.20	TRANE VCWF	8	450	110	270	0.24	15	2	270	55.0	95.0	0.8	160	129	11.7	120-1	SINGLE DUCT WITH HEATING COIL, FLOW RING, 24 VAC CONTROL TRANSFORMER, BOTTOM ACCESS DOOR.

ION GENERATORS

TAG	MANUFACTURER & MODEL NO.	DEVICES REQUIRED	DEVICE MOUNTING LOCATION	MIN ION OUTPUT PER DEVICE	POWER	REMARKS
IG-1	GLOBAL PLASMA GPS-FC48-AC	1	IN UNIT DOWNSTREAM OF FILTERS	> 400 MILLION +/- IONS/CC	24 VAC TO 240 VAC	TRANSFORMER, UL-2998 NO OZONE CERTIFIED
IG-2	GLOBAL PLASMA GPS-IMOD	SEE REMARKS	IN UNIT DOWNSTREAM OF FILTERS FULL LENGTH OF COIL	> 140 MILLION +/- IONS/CC PER INCH OF BAR	24 VAC TO 240 VAC	TRANSFORMER, UL-2998 NO OZONE CERTIFIED, QUANTITY TO BE FIELD VERIFIED BASED ON COIL HEIGHT PER MANUFACTURE'S RECOMMENDATIONS

PUMPS

TAG	MANUFACTURER AND MODEL NO.	SERVING	TYPE	GPM	HEAD	RPM	PUMP EFF (%)	MAX NPSHR	ELECTRICAL BHP	ELECTRICAL HP	ELECTRICAL V/Ø	OP WT (LBS)	REMARKS
CHP 1	B&G e-1531 2BD	CHILLED WATER	CLOSE COUPLED END SUCTION	165	65	1800	74.0	4.7	3.66	5	460/3	250	PREMIUM EFFICIENCY INVERTER DUTY MOTORS, GAUGE TAPS, HOUSING DRAINS
CHP 2	B&G e-1531 2BD	CHILLED WATER	CLOSE COUPLED END SUCTION	165	65	1800	74.0	4.7	3.66	5	460/3	250	PREMIUM EFFICIENCY INVERTER DUTY MOTORS, GAUGE TAPS, HOUSING DRAINS
CHP 3	B&G e-1531 2BD	CHILLED WATER	CLOSE COUPLED END SUCTION	165	65	1800	74.0	4.7	3.66	5	460/3	250	PREMIUM EFFICIENCY INVERTER DUTY MOTORS, GAUGE TAPS, HOUSING DRAINS
HWP 1	B&G e-1531 1.25BC	HEATING WATER	CLOSE COUPLED END SUCTION	75	70	1800	56.5	7.6	2.28	3	460/3	210	PREMIUM EFFICIENCY INVERTER DUTY MOTORS, GAUGE TAPS, HOUSING DRAINS
HWP 2	B&G e-1531 1.25BC	HEATING WATER	CLOSE COUPLED END SUCTION	75	70	1800	56.5	7.6	2.28	3	460/3	210	PREMIUM EFFICIENCY INVERTER DUTY MOTORS, GAUGE TAPS, HOUSING DRAINS
HWP 3	B&G e-60 ECM 3x3x5.25	BOILER RECIRC.	FLEX COUPLED IN-LINE	60	20	1632	61.6	4.3	0.48	1	208/1	69	PREMIUM EFFICIENCY INVERTER DUTY MOTORS, GAUGE TAPS, HOUSING DRAINS

AIR FLOW MEASURING STATION SCHEDULE (PROVIDED BY DIV 23C)

1

TAG	MANUFACTURER	UNIT SERVES	POWER REQUIREMENTS	REMARKS
AFMS 1	EBTRON GOLD	AHU 1	24V	MOUNTING BRACKETS TO BE 304 SS
AFMS 2	EBTRON GOLD	AHU 2	24V	MOUNTING BRACKETS TO BE 304 SS
AFMS 3	EBTRON GOLD	AHU 3	24V	MOUNTING BRACKETS TO BE 304 SS
AFMS 4	EBTRON GOLD	AHU 3	24V	MOUNTING BRACKETS TO BE 304 SS

1

VARIABLE FREQUENCY DRIVES (PROVIDED AND INSTALLED BY DIVISION 23C)

TAG	SERVES	MANUFACTURER AND MODEL NO.	ELECTRICAL HP	ELECTRICAL VOLT/Ø	REMARKS
VFD-1	CHP-1	YASKAWA HV600	5	208/3	NEMA 1 ENCLOSURE, WITH BYPASS, BACnet INTERFACE
VFD-2	CHP-2	YASKAWA HV600	5	208/3	NEMA 1 ENCLOSURE, WITH BYPASS, BACnet INTERFACE
VFD-3	CHP-3	YASKAWA HV600	5	208/3	NEMA 1 ENCLOSURE, WITH BYPASS, BACnet INTERFACE
VFD-4	HWP-1	YASKAWA HV600	3	208/3	NEMA 1 ENCLOSURE, WITH BYPASS, BACnet INTERFACE
VFD-5	HWP-2	YASKAWA HV600	3	208/3	NEMA 1 ENCLOSURE, WITH BYPASS, BACnet INTERFACE

AIR COOLED CHILLER

TAG	MANUFACTURER AND MODEL NO.	COMP. TYPE	CAP. (TONS)	REFER TYPE	AMB. TEMP.	FULL LOAD EER	ARI IPLV	EVAPORATOR DESIGN GPM	EVAPORATOR MIN FLOW GPM	EVAPORATOR FLUID	EVAPORATOR EWT	EVAPORATOR LWT	EVAPORATOR PD(FT.)	EVAPORATOR F.F.	ELECTRICAL VOLT/Ø	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL KW	OPER. WT. (LBS)	REMARKS
ACC 1	TRANE CGAM100F2	SCROLL	97.8	R-454B	95	10.45	15.9	180	150	WATER	56	42	9	0.0001	460/3	207	250	112.2	7000	4 COMPRESSORS MINIMUM, WIDE AMBIENT CONTROLS W/VFD'S, SINGLE POINT DISCONNECT SWITCH & CIRCUIT PROTECTION, FACTORY INSTALLED STRAINER & THERMAL DISPERSION FLOW SWITCH, FULL ARCH. LOUVERS SEACOAST COATING
ACC 2	TRANE CGAM100F2	SCROLL	97.8	R-454B	95	10.45	15.9	180	150	WATER	56	42	9	0.0001	460/3	207	250	112.2	7000	4 COMPRESSORS MINIMUM, WIDE AMBIENT CONTROLS W/VFD'S, SINGLE POINT DISCONNECT SWITCH & CIRCUIT PROTECTION, FACTORY INSTALLED STRAINER & THERMAL DISPERSION FLOW SWITCH, FULL ARCH. LOUVERS SEACOAST COATING

1

GAS FIRED HEATING BOILER SCHEDULE

TAG	MANUFACTURER AND MODEL NO.	FUEL	CAPACITY (MBH) IN	CAPACITY (MBH) OUT	MIN EFFICIENCY (%)	EWT	LWT	MAX FLOW (GPM)	MIN FLOW (GPM)	P.D. (FT)	ELECTRCIAL MCA	ELECTRCIAL V/Ø	OPER. WT. (LBS)	REMARKS
B 1	LOCHINVAR PBN1501	NAT GAS	1,500	1,260	85.0	125	160	90	44	7.7	6.5	120/1	1300	MODULATING BURNER (5:1 TURNDOWN), FACTORY GAS TRAIN, OA SENSOR, BACnet GATEWAY, 10 YEAR PARTS WARRANTY, ALARM ON ANY FAILURE, CATEGORY IV FLUE THRU ROOF WITH NEW ROOF CAP.(EXISTING ROUTING TO BE USED), NEW INTAKE TO BE PROVIDED AND INSTALLED BY THIS CONTRACTOR PER STRICT MANUFACTURER'S RECOMMENDATIONS

711 Church Street
Ocean Springs, MS 39564

Phone: (228) 762-1975
Email: contact@alfredstolarski.com

allred stolarski architects

MECHANICAL SCHEDULES

PASCAGOULA PUBLIC LIBRARY REPAIRS AND RENOVATIONS

JACKSON COUNTY BOARD OF SUPERVISORS

PASCAGOULA, MS

JOB NUMBER 2020-36
DATE 09/15/23
REVISED ADD 1 01.08.24
DRAWN BY M IMPEY
CHECKED BY R WILLIAMS

JASON CHRISTOPHER GRONSKI LICENSED PROFESSIONAL ENGINEER
ENGINEER
17087
09/15/23
STATE OF MISSISSIPPI

ERG P.N. 21.016

ENGINEERING RESOURCE GROUP Inc.
350 EDGEWOOD TERRACE DR. JACKSON, MS 39206 PHONE: (601) 362-3552 FAX: (601) 366-8418
2038 PASS ROAD, SUITE A BILOXI, MS 39531 PHONE: (228) 388-8740 FAX: (228) 388-3275

SHEET

M601

MISCELLANEOUS EQUIPMENT

TAG	MANUFACTURER AND MODEL NO.	SERVING	DESCRIPTION	CAPACITY	DESIGN CONDITIONS	OPER. WT. (LBS)	REMARKS
ET 1	B&G B-85LA	HOT WATER	EXPANSION TANK	23 GAL	12 PSI FILL 35 PSI RELIEF	273	VERTICAL WITH BASE RING, ASME CONSTRUCTION, HEAVY-DUTY REPLACEABLE BLADDER, AUTOMATIC AIR VENT
ET 2	B&G B-35LA	CHILLED WATER	EXPANSION TANK	10 GAL	12 PSI FILL 35 PSI RELIEF	150	VERTICAL WITH BASE RING, ASME CONSTRUCTION, HEAVY-DUTY REPLACEABLE BLADDER, AUTOMATIC AIR VENT
AS 1	B&G RL-3F	HOT WATER	AIR & DIRT SEPARATOR	75 GPM	--	215	FLANGED CONNECTIONS, ASME CERTIFIED, REMOVABLE LOWER HEAD, MANUAL BLOWDOWN VALVE
AS 2	B&G RL-4F	CHILLED WATER	AIR & DIRT SEPARATOR	300 GPM	--	370	FLANGED CONNECTIONS, ASME CERTIFIED, REMOVABLE LOWER HEAD, MANUAL BLOWDOWN VALVE
CPF 1	WINGERT	HOT WATER	CHEMICAL POT FEEDER	5 GAL	--	125	WITH DRAIN PORT
CPF 2	WINGERT	CHILLED WATER	CHEMICAL POT FEEDER	5 GAL	--	125	WITH DRAIN PORT

POWER VENTILATOR SCHEDULE

TAG	MANUFACTURER AND MODEL NO.	TYPE	CFM	ESP	RPM	SOUND (dBA/SONES)	ELECTRICAL			ON/OFF	INTERLOCK	OP WT (LBS)	REMARKS
							BHP	HP	V/Ø				
EF 1	COOK GCVF-100	CEILING MOUNTED	50	0.25	679	0.7	0.125	5W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 2	COOK GCVF-100	CEILING MOUNTED	50	0.25	679	0.7	0.125	5W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 3	COOK GCVF-180	CEILING MOUNTED	140	0.25	1028	3.0	0.013	24W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 4	COOK GCVF-180	CEILING MOUNTED	140	0.25	1028	3.0	0.013	24W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 5	COOK GCVF-100	CEILING MOUNTED	50	0.25	679	0.7	0.125	5W	115/1	WALL SWITCH	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, WALL SWITCH TO BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 6	COOK GCVF-100	CEILING MOUNTED	50	0.25	679	0.7	0.125	5W	115/1	WALL SWITCH	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, WALL SWITCH TO BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 7	COOK GCVF-180	CEILING MOUNTED	100	0.25	825	1.5	0.013	11W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 8	COOK GCVF-180	CEILING MOUNTED	100	0.25	825	1.5	0.013	11W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 9	COOK GCVF-100	CEILING MOUNTED	50	0.25	679	0.7	0.125	5W	115/1	WALL SWITCH	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, WALL SWITCH TO BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 10	COOK GCVF-180	CEILING MOUNTED	70	0.25	825	1.5	0.013	11W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 11	COOK GCVF-180	CEILING MOUNTED	70	0.25	825	1.5	0.013	11W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 12	COOK GCVF-180	CEILING MOUNTED	70	0.25	825	1.5	0.013	11W	115/1	OCCUPANCY SENSOR	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, MOTION SENSOR SHALL BE CEILING MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
EF 13	COOK GCVF-100	CEILING MOUNTED	50	0.25	679	0.7	0.125	5W	115/1	T-STAT	NONE	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, THERMOSTAT SHALL BE WALL MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR
SF 1	COOK 20HEF434D11	ROOF MOUNTED	3000	0.25	1140	17.9	0.34	1/2	115/1	T-STAT	EXIST LOUVERS	-	PRE-WIRED DISCONNECT, ECM MOTOR, BACKDRAFT DAMPER, ISOLATOR KIT, WHITE ALUMINUM GRILLE, THERMOSTAT SHALL BE WALL MOUNTED AND PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR

AIR DISTRIBUTION DEVICE SCHEDULE

TAG	TYPE	MANUFACTURER & MODEL NO.	NECK SIZE	FACE SIZE	REMARKS
A	CEILING MOUNTED SUPPLY AIR DEVICE	TITUS OMNI	SEE PLANS/ SCHEDULE BELOW	SEE PLANS/ SCHEDULE BELOW	24"x24" OR 12"x12" FACE SIZE AS INDICATED ON PLANS. PROVIDE ALL SURFACE MOUNTED GRILLES WITH PLASTER FRAME MOUNT (TITUS TRM). NECK SIZE TO BE AS INDICATED ON PLANS OR CONNECTION SCHEDULE BELOW.
B	CEILING MOUNTED RETURN AIR DEVICE	TITUS 50F	SEE PLANS/ SCHEDULE BELOW	SEE PLANS/ SCHEDULE BELOW	24"x24" OR 24"x12" FACE SIZE AS INDICATED ON PLANS. PROVIDE ALL SURFACE MOUNTED GRILLES WITH SCREW HOLES. NECK SIZE TO BE AS INDICATED ON PLANS OR CONNECTION SCHEDULE BELOW.

NOTES:

1. CEILING DIFFUSERS ARE 4-WAY UNLESS OTHERWISE NOTED BY SHADING ON PLANS.
2. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPE AND CONSTRUCTION DETAILS.
3. AIR DEVICE FRAME AND STYLE SHALL MATCH CEILING TYPE. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLAN.
4. REFER TO ARCHITECT FOR FINISHES AND COLOR OF DEVICES.
5. FACE SIZE TO BE NECK SIZE PLUS 2".

AIR DEVICE CONNECTION SCHEDULE

AIR QUANTITY (CFM)	CEILING MOUNTED NECK SIZE	SIDEWALL MOUNTED NECK SIZE	EXHAUST AIR GRILLE NECK SIZE	BRANCH DUCT SIZE	
				ROUND	ALTERNATE RECTANGULAR DUCT
0-100	6"Ø	8x4"	8x8"	6"Ø	8x4"
101-200	8"Ø	10x6"	8x8"	8"Ø	10x6"
201-350	10"Ø	12x8"	10x10"	10"Ø	12x8"
351-600	12"Ø	14x10"	12x12"	12"Ø	14x10"
601-850	14"Ø	16x12"	14x14"	14"Ø	16x12"
851-1200	16"Ø	18x16"	16x16"	16"Ø	18x16"

MISCELLANEOUS HVAC POWER, CONTROL AND INTERLOCK WIRING CONNECTIONS

TAG	DESCRIPTION	POWER WIRING	CONTROL & INTERLOCK WIRING	ELECTRICAL V/Ø	REMARKS
EMCS	BUILDING AUTOMATION SYSTEM BUILDING CONTROLLER	DIV 23 BAS	DIV 23 BAS	120/1	DIVISION 26 ELECTRICAL SHALL PROVIDE NETWORK IT LAN DROP NEAR BUILDING CONTROLLER
CH	CHILLER FREEZE PROTECTION CIRCUIT	DIV 26 ELECTRICAL	-	120/1	CONNECT TO CHILLER FREEZE PROTECTION

ROOF CAP SCHEDULE

TAG	MANUFACTURER AND MODEL NO.	SERVES	FUNCTION	CAPACITY, CFM	PRESS. DROP, IN WG	THROAT VELOCITY, FPM	THROAT SIZE, INCHES	REMARKS
GC 1	COOK 12 PR SPUN ALUMINUM GRAVITY	MEN 138 WOMEN 139	RELIEF AIR	100	0.004	175	10	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN
GC 2	COOK 12 PR SPUN ALUMINUM GRAVITY	MEN 128 WOMEN 127	RELIEF AIR	280	0.029	491	10	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN
GC 3	COOK 12 PR SPUN ALUMINUM GRAVITY	JAN 131	RELIEF AIR	50	0.001	88	10	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN
GC 4	COOK 12 PR SPUN ALUMINUM GRAVITY	MEN 205 WOMEN 204 JAN 206	RELIEF AIR	250	0.007	246	10	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN
GC 5	COOK 12 PR SPUN ALUMINUM GRAVITY	TLT 210	RELIEF AIR	70	0.002	123	10	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN
GC 6	COOK 12 PR SPUN ALUMINUM GRAVITY	MEN 216 WOMEN 217	RELIEF AIR	140	0.007	246	10	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN
GC 7	COOK 16 PR SPUN ALUMINUM GRAVITY	AHU-3	OUTSIDE AIR	400	0.012	276	16	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN
GC 8	COOK 16 PR SPUN ALUMINUM GRAVITY	AHU-1	OUTSIDE AIR	400	0.012	276	16	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN
GC 9	COOK 24 PR SPUN ALUMINUM GRAVITY	AHU-4	OUTSIDE AIR	1500	0.038	463	24	PROVIDE ROOF CURB TO MATCH ROOF SLOPE, BACKDRAFT DAMPER, BIRDSCREEN

WALL LOUVER SCHEDULE

TAG	MANUFACTURER & MODEL NO.	FUNCTION	CFM	MIN NET FREE AREA (SQFT)	OVERALL SIZE (L X H)	DEPTH	MAX PD (IN.W.G.)	REMARKS
LV 1	COOK ELF6375DX	OUTSIDE AIR AHU-2	1500	1.9	24x24	6	0.1	FLUOROPOLYMER FINISH IN COLOR SELECTED BY ARCHITECT, ALUMINUM BIRDSCREEN

MOTORIZED DAMPER SCHEDULE (PROVIDED AND INSTALLED BY DIVISION 23C CONTRACTOR)

TAG	DAMPER MODEL	ACTUATOR		INTERLOCK	POWER WIRING	CONTROLS & INTERLOCK WIRING	REMARKS
		MODEL	VOLTAGE/PHASE				
MVD 3-1	RUSKIN CD60	BELIMO	24VAC	AHU-3	DIVISION 23C BAS	DIVISION 23C BAS	TAMPERPROOF SUPERVISORY SWITCHES TO MONITOR VALVE STATUS. MODULATING ACTUATOR.
MVD 3-2	RUSKIN CD60	BELIMO	24VAC	AHU-3	DIVISION 23C BAS	DIVISION 23C BAS	TAMPERPROOF SUPERVISORY SWITCHES TO MONITOR VALVE STATUS. MODULATING ACTUATOR.

ELECTRIC UNIT HEATER SCHEDULE

TAG	MANUFACTURER AND MODEL NO.	TYPE	ELECTRICAL KW - V - Ø	CAPACITY CFM	REMARKS
EUH 1	MARKEL HF2B5107CA1L	3320 SERIES FAN FORCED WALL HEATER	5.6- 208 - 3	700	MOUNT 9' HIGH, PROVIDE WALL MOUNTING BRACKET, IN-BUILT THERMOSTAT AND INTEGRAL DISCONNECT

ERG P.N. 21.016

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MECHANICAL SCHEDULES

PASCAGOULA PUBLIC LIBRARY RENOVATIONS

JACKSON COUNTY BOARD OF SUPERVISORS

PASCAGOULA, MS

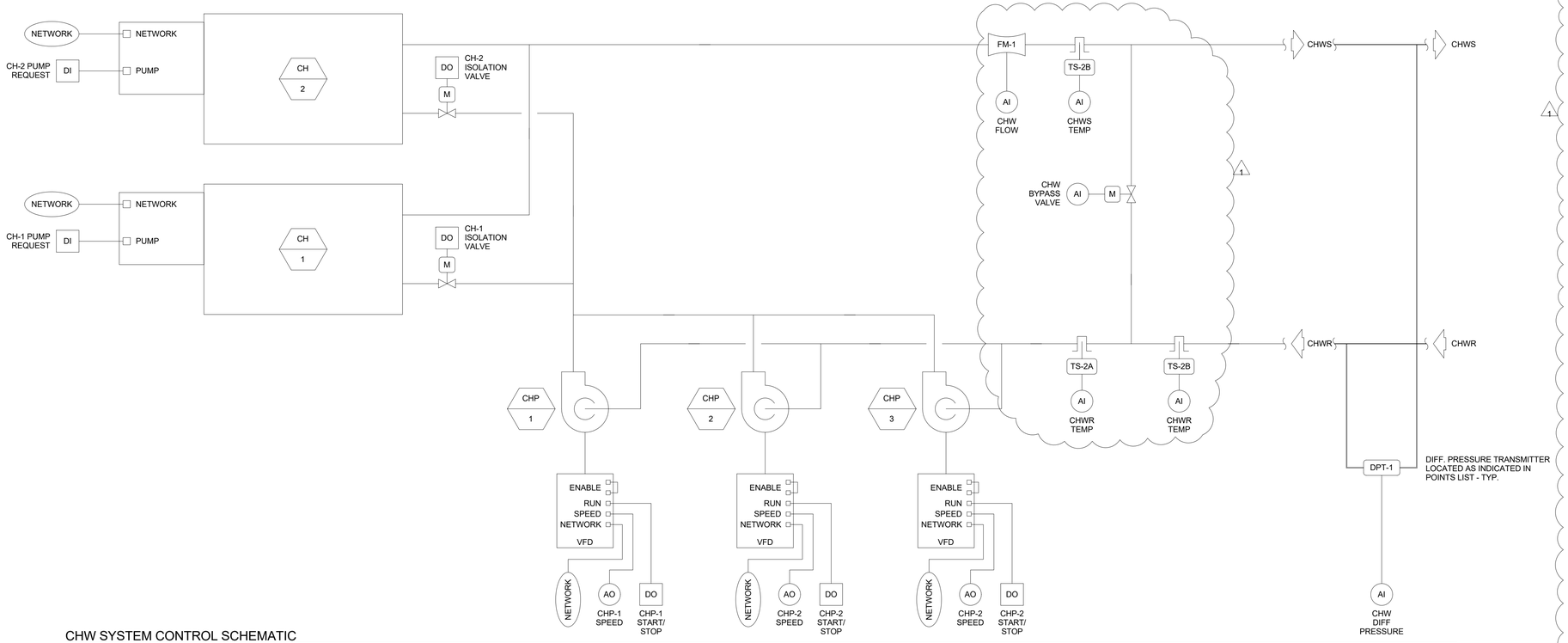
JOB NUMBER 2020-36
DATE 09/15/23
REVISED ADD 1 - 01.08.24
DRAWN BY M IMPEY
CHECKED BY R WILLIAMS

JASON CHRISTOPHER GOSSETT LICENSED PROFESSIONAL ENGINEER 17087 09/15/23 STATE OF MISSISSIPPI

SHEET

M602R

COORDINATE FLOW SWITCH TYPE AND WIRING REQUIREMENTS WITH FINAL EQUIPMENT SUBMITTAL. FLOW SWITCHES REQUIRED TO BE FIELD INSTALLED SPECIFIED UNDER DIV 23 HVAC. FLOW SWITCH WIRING TO CHILLER CONTROL PANEL SPECIFIED UNDER SECTION 230900 BAS (DIV 23C)



CHW SYSTEM CONTROL SCHEMATIC

NO SCALE

CHW SYSTEM SEQUENCE OF OPERATION

General: CHW system with air-cooled chillers and variable primary-only pumping configuration.

The chilled water plant sequence of operation shall be in accordance with ASHRAE Guideline 36-2021. Guideline 36-2021 sequences are not repeated herein for brevity. However, the final as-built sequences of operation shall include all installed sequences from Guideline 36 with any exceptions noted herein.

1. Chillers shall be lead/lag alternated and chilled water pumps shall be lead/lag/standby alternated as described in Sequence of Operations - General.

2. Lead chiller and pump.
   2.1. The lead chilled water system shall be enabled if there are more than 2 (adjustable) Chiller Plant Requests from zones or air handlers for more than 10 minutes (adjustable).
   2.2. The lead chilled water system shall be disabled if it has run at least 10 minutes and there are no Chiller Plant Requests from zones or air handlers for more than 10 minutes (adjustable).

3. When a chilled water system is enabled via the chiller BACnet interface, the BAS shall perform the following:
   3.1. Command open the chiller isolation valve. After 30 seconds, enable the chiller.
   3.2. Upon receiving pump request from chiller control panel, the lead chilled water pump shall be started.
   3.3. Once the chiller has proven flow through the evaporator, the chiller shall begin its startup sequence and operate subject to its own internal controls and safeties.

7. When a chilled water system is disabled, first disable the chiller, then after 3 minutes close the chiller isolation valve.

8. Chiller Staging:
   8.1. Staging shall be executed per the conditions below subject to the following requirements.
      8.1.1. Each stage shall have a minimum runtime of 15 minutes.
      8.1.2. Timers shall reset to zero at the completion of every stage change.
      8.1.3. Any unavailable stage shall be skipped during staging events, but staging conditionals in the current stage shall be evaluated as per usual.
      8.1.4. Chilled water supply and return temperatures used in staging logic shall be those located in common supply and return mains hardwired to plant controllers.
      8.1.5. Stage up if either of the following is true:
         8.1.5.1. Load Condition: Current load is greater than 90% of the current operating chiller'(s) capacity for 15 minutes, or
         8.1.5.2. Failsafe Condition: Any of the following is true:
            8.1.5.2.1. The devices necessary to operate the current stage are unavailable, or
            8.1.5.2.2. CHW DP is 2 psi < set point for 15 minutes; or
            8.1.5.2.3. CHW supply temperature is 2°F > set point for 15 minutes.
      8.1.6. Stage down if both of the following are true:
         8.1.6.1. Load Condition: Current load is less than 40% of the current operating chiller'(s) capacity for 15 minutes; and
         8.1.6.2. The failsafe stage up condition applied to the next lower available stage is not true.
      8.1.7. Whenever there is a stage up command:
         8.1.7.1. Command operating chillers to reduce demand to 75% of their current load. Wait until actual demand <80% of current load up to a maximum of 5 minutes before proceeding.
         8.1.7.2. For any other stage change, reset the minimum flow bypass set point to that appropriate for the new stage (sum of minimum flow through operating chillers). After new set point is achieved, wait 1 minute to allow loop to stabilize.
         8.1.7.3. Slowly open CHW isolation valve of the chiller being enabled. Determine valve timing in the field as that required to prevent nuisance trips.
         8.1.7.4. Start the next stage chiller after the CHW isolation valve is fully open (as determined by end switch status, or nominal valve timing if end switches are not provided).
         8.1.7.5. Release the demand limit.
      8.1.8. Whenever there is a stage down command:
         8.1.8.1. Disable last stage chiller.
         8.1.8.2. When the controller of the chiller being shut off indicates no request for chilled water flow, slowly close the chiller's CHW isolation valve to avoid a sudden change in flow through other operating chillers.
         8.1.8.3. Change the chilled water minimum flow bypass control set point to that appropriate for the new stage (sum of minimum flow through operating chillers).

9. Primary Chilled Water Pump Control:
   9.1. Chilled water pumps shall be lead/lag/standby controlled.
   9.2. Enable lead primary CHW pump when any chiller CHW isolation valve is commanded open. Disable the lead primary CHW pump when all chiller CHW isolation valves are commanded closed.
   9.3. CHW pumps shall be staged as a function of CHWFR, the ratio of current chilled water flow to design primary pump flow, $PCHWF_{design}$, and the number of pumps, N, that operate at design conditions.
   9.4. When any pump is proven on, pump speed will be controlled by a reverse acting PID loop maintaining the differential pressure signal at a setpoint CHW-DPsp determined by the reset scheme described herein. All pumps receive the same speed PID loop output and shall be mapped from minimum pump speed at 0% to maximum pump speed at 100%.
   9.5. Differential pressure setpoint shall be determined within the range of 1 psi to DP-MAX by a slow direct-acting control loop whose control point is the position of the most open valve and whose setpoint is 90% open. In other words, the DP setpoint is reset to maintain the valve requiring the most differential pressure at 90% open. DP-MAX is the design DP setpoint determined in conjunction with Work performed under Section 230593 Testing, Adjusting, and Balancing. All active pumps receive the same speed signal.

10. Chilled Water Minimum Flow Bypass Control:
   10.1. Bypass valve shall modulate to maintain minimum flow as measured by the chilled water flow meter at a set point that provides minimum flow through all operating chillers, determined as follows:
      10.1.1. For the chillers operating in the stage, identify the chiller with the highest ratio, MinFlowRatio, of CHW-MinFlowX to CHW-MaxFlowX.
      10.1.2. Calculate the minimum flow set point as MinFlowRatio multiplied by the sum of CHW-MaxFlowX for the operating chillers.
   10.2. When any CHW pump is proven on, the bypass valve PID loop shall be enabled. The valve shall be opened 100% otherwise. When enabled, the bypass valve loop shall be biased to start with the valve 100% open.

11. Chilled Water Supply Temperature Control:
   11.10. CHWST shall be controlled to its setpoint (ajustable from BACnet interface and locally at chiller control panel). CHWST initial setpoint shall be 42°F (ajustable).
   11.11. Calculate load from flow and temperature difference (CHWS temperature minus CHWR temperature).

12. Alarms.
   12.1. Maintenance interval alarm when pump has operated for more than 1500 hours: Level 5. Reset interval counter when alarm is acknowledged.
   12.2. Maintenance interval alarm when chiller has operated for more than 2000 hours: Level 5. Reset interval counter when alarm is acknowledged.
   12.3. Chiller alarm: Level 2.
   12.4. High chiller leaving chilled water temperature (more than 5°F above setpoint) for more than 10 minutes when chiller has been enabled for longer than 15 minutes: Level 3.
   12.5. Pump alarm is indicated by the status input being different from the output command after a period of 15 seconds after a change in output status.
      12.5.1. Commanded on, status off: Level 2.
      12.5.2. Commanded off, status on: Level 4.
   12.6. CHW System low differential pressure: Level 2 alarm if CHW system differential pressure falls below 0.75 times t

POINTS MAPPED FROM VFD BACNET CARD

Description	Type	Device	Trend Logging: Comm-issioning	Trend Logging: Contin-uous	Calibra-tion
Fault reset	DO	Through network	COV	COV	–
On/off status	DI	Through network	COV	COV	–
Fault (Critical Alarm)	DI	Through network	COV	COV	–
Minor Alarm	DI	Through network	COV	COV	–
Fault Text	DI	Through network (convert code to plain English text)	COV	COV	–
Alarm Text	DI	Through network (convert code to plain English text)	COV	COV	–
Keypad in hand/auto	DI	Through network	COV	COV	–
Minimum frequency setpoint	AO	Through network	±5%	±5%	–
Maximum frequency setpoint	AO	Through network	±5%	±5%	–
Acceleration rate	AO	Through network	±5%	±5%	–
Deceleration rate	AO	Through network	±5%	±5%	–
Actual frequency	AI	Through network	1 min	15 min	–
AC output voltage	AI	Through network	±10%	±10%	–
Current	AI	Through network	15 min	60 min	–
VFD temperature	AI	Through network	60 min	60 min	–
Power, kW	AI	Through network	1 min	15 min	–
Energy, MWh	AI	Through network	15 min	60 min	–
DC Bus Voltage	AI	Through network	±10%	±10%	–

POINTS MAPPED FROM CHILLER BACNET CARD

Description	Type	Device	Trend Logging: Comm-issioning	Trend Logging: Contin-uous	Calibra-tion
Enable	DO	Through network	COV	COV	–
Alarm Present	DI	Through network	COV	–	–
Chiller Running State	DI	Through network	COV	–	–
Compressor Running	DI	Through network	COV	–	–
Local Setpoint Control	DI	Through network	COV	–	–
Evaporator Flow	DI	Through network	COV	–	–
Current Limit Setpoint	AO	Through network	COV	COV	–
Chilled Water Setpoint	AO	Through network	COV	COV	–
Evaporator EWT	AI	Through network	1 min	60 min	–
Evaporator LWT	AI	Through network	1 min	60 min	–
Active Running Capacity	AI	Through network	1 min	60 min	–
Running Amps	AI	Through network	1 min	60 min	–
Power, kW	AI	Through network	1 min	60 min	–

CHW SYSTEM HARDWIRED POINTS LIST

Description	Type	Device	Trend Logging: Comm-issioning	Trend Logging: Contin-uous	Calibra-tion
Chiller CH-1 pump request	DI	Connect to chiller pump contact	COV	COV	–
Chiller CH-2 pump request	DI	Connect to chiller pump contact	COV	COV	–
CHP-1 start/stop	DO	Connect to VFD Run	COV	COV	–
CHP-2 start/stop	DO	Connect to VFD Run	COV	COV	–
CHP-3 start/stop	DO	Connect to VFD Run	COV	COV	–
CH-1 isolation valve	DO	Two position valve, line size	COV	COV	–
CH-2 isolation valve	DO	Two position valve, line size	COV	COV	–
CHP-1 speed	AO	Connect to VFD Speed	1 min	15 min	–
CHP-2 speed	AO	Connect to VFD Speed	1 min	15 min	–
CHP-3 speed	AO	Connect to VFD Speed	1 min	15 min	–
CHW bypass valve	AO	2-way modulating valve	1 min	15 min	–
CHW flow	AI	FM-1	1 min	15 min	–
CHWS temperature	AI	TS-2B	1 min	15 min	–
CHWR temperature	AI	TS-2B	1 min	15 min	–
CHWR temperature	AI	TS-2A	1 min	15 min	–
CHW differential pressure	AI	DPT-1, 0 to 20 psi	1 min	15 min	–

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MECHANICAL CONTROLS

PASCAGOULA PUBLIC LIBRARY REPAIRS AND RENOVATIONS

JACKSON COUNTY BOARD OF SUPERVISORS

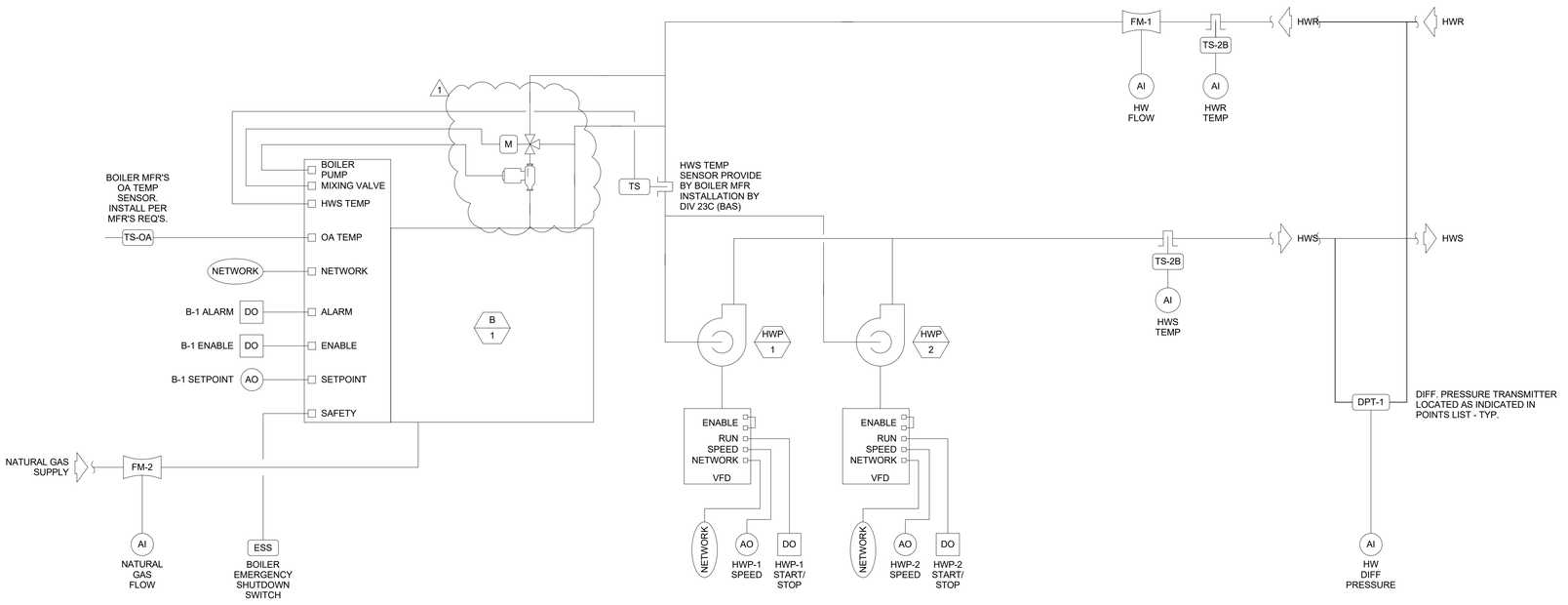
PASCAGOULA, MS

JOB NUMBER 2020-36
DATE 09/15/23
REVISED ADD - 01.08.24
DRAWN BY M IMPEY
CHECKED BY R WILLIAMS

JASON CHRISTOPHER GRISSOM LICENSED PROFESSIONAL ENGINEER 17087 09/15/23 STATE OF MISSISSIPPI

SHEET

M702R



HW SYSTEM CONTROL SCHEMATIC

NO SCALE

HW SYSTEM SEQUENCE OF OPERATION

General: HW system with condensing boiler and variable speed pumps.

1. For boiler, convert firing rate (valve position or other indicator per mfr's recommendations) from boiler controller to % load. Display % load on boiler graphic as well as valve position (or other % load indicator used).

2. Boiler and pump.

   2.1. The system shall be enabled if there are more than 1 (adjustable) Boiler Plant Requests from zone temperature sensors for more than 10 minutes (adjustable).
   2.2. The system shall be disabled if it has run at least 10 minutes and there are no Boiler Plant Requests from zone temperature sensors for more than 10 minutes (adjustable).

3. When the HW system is enabled, first start the lead pump and after 30 seconds, enable the boiler. When the lead system is disabled, first disable the boiler, then after 3 minutes turn off the lead pump.

4. Pumps shall be controlled in a lead/standby sequence as described in Sequences of Operation - General. Pumps speed shall be controlled by a PID loop maintaining the differential pressure signal at a setpoint determined in conjunction with Work performed under Section 230593 Testing, Adjusting, and Balancing. All active pumps receive the same speed signal.

5. Hot Water Supply Temperature Reset:

   5.1. Hot water supply temperature setpoint shall be reset linearly with outdoor air temperature from 160°F at OA temperature of 32°F down to 120°F at 70°F.

6. Boiler efficiency shall be calculated for each boiler from the following:

   6.1. Convert measured gas usage to Btu/h by a user adjustable conversion factor (default value = 1000 Btu/h per cubic feet of gas; acutal value set by user from utility bill).
   6.2. Calculate load from flow and temperature difference (HWS temperature minus HWR temperature).

   QE = 490*GPMs*(HWS temp - HWR temp)

   6.3. Thermal efficiency is equal to measured load divided by measured gas consumption.
   6.4. Calculate predicted thermal efficiency.

   Gpart-load = GD (0.0634 + 0.7856*PLR + 0.1534*PLR^2)

   6.4.1. Where GD is the design gas flow rate and PLR is the measured load divided by the design load. See schedules for design load and gas rate.

   6.5. Summary Data. For each boiler, statistics shall be calculated and displayed on associated graphic for runtime, peak load, energy use, average actual efficiency, average predicted efficiency, and average load (flow rate, MBH, etc.), all summarized on an instantaneous (displaying real-time data), year-to-date, and last year basis.

7. Alarms.

   7.1. Maintenance interval alarm when pump has operated for more than 1500 hours: Level 5. Reset interval counter when alarm is acknowledged.
   7.2. Maintenance interval alarm when boiler has operated for more than 2000 hours: Level 5. Reset interval counter when alarm is acknowledged.
   7.3. Boiler alarm: Level 2.
   7.4. Low boiler leaving hot water temperature (more than 15°F below setpoint) for more than 15 minutes when boiler has been enabled for longer than 15 minutes: Level 3.
   7.5. Pump alarm is indicated by the status input being different from the output command after a period of 15 seconds after a change in output status.

      7.5.1. Commanded on, status off: Level 2.
      7.5.2. Commanded off, status on: Level 4.

   7.6. HW System low differential pressure: Level 2 alarm if HW system differential pressure falls below 0.75 times the differential pressure setpoint for more than 15 minutes.

HW SYSTEM HARDWIRED POINTS LIST

Description	Type	Device	Trend Logging		Calibration
			Commissioning	Continuous	
Boiler B-1 enable	DO	Connect to boiler enable contact	COV	COV	–
HWP-1 start/stop	DO	Connect to VFD Run	COV	COV	–
HWP-2 start/stop	DO	Connect to VFD Run	COV	COV	–
HWP-1 speed	AO	Connect to VFD Speed	1 min	15 min	–
HWP-2 speed	AO	Connect to VFD Speed	1 min	15 min	–
B-1 setpoint	AO	Connect to boiler setpoint input	1 min	15 min	–
Boiler B-1 Alarm	DI	Connect to boiler alarm contact	COV	COV	–
HW differential pressure	AI	DPT-1, 0 to 20 psi	1 min	15 min	–
Natural gas flow	AI	FM-2	1 min	15 min	–

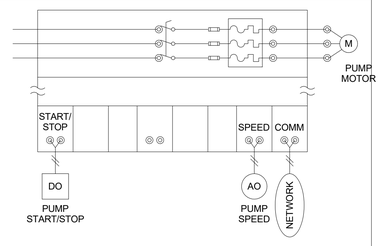
POINTS MAPPED FROM BOILER BACNET CARD

Description	Type	Device	Trend Logging		Calibration
			Commissioning	Continuous	
Status/fault code 1-47	AI	Through network	±1	±1	–
Unit Status code 0-5	AI	Through network	±1	±1	–
HWS temperature	AI	Through network	1 min	1 min	–
HWR temperature	AI	Through network	15 min	15 min	–
Exhaust temperture	AI	Through network	15 min	15 min	–
FFWD temperature	AI	Through network	15 min	15 min	–
Firing rate %	AI	Through network	1 min	15 min	–
O2 level	AI	Through network	15 min	15 min	–
CO level	AI	Through network	15 min	15 min	–
Flame strength %	AI	Through network	15 min	15 min	–
Active HWST setpoint	AI	Through network	1 min	15 min	–
HWST Setpoint command	AO	Through network	±1°F	±1°F	–

POINTS MAPPED FROM VFD BACNET CARD

Description	Type	Device	Trend Logging		Calibration
			Commissioning	Continuous	
Fault reset	DO	Through network	COV	COV	–
On/off status	DI	Through network	COV	COV	–
Fault (Critical Alarm)	DI	Through network	COV	COV	–
Minor Alarm	DI	Through network	COV	COV	–
Fault Text	DI	Through network (convert code to plain English text)	COV	COV	–
Alarm Text	DI	Through network (convert code to plain English text)	COV	COV	–
Keypad in hand/auto	DI	Through network	COV	COV	–
Minimum frequency setpoint	AO	Through network	±5%	±5%	–
Maximum frequency setpoint	AO	Through network	±5%	±5%	–
Acceleration rate	AO	Through network	±5%	±5%	–
Deceleration rate	AO	Through network	±5%	±5%	–
Actual frequency	AI	Through network	1 min	15 min	–
AC output voltage	AI	Through network	±10%	±10%	–
Current	AI	Through network	15 min	60 min	–
VFD temperature	AI	Through network	60 min	60 min	–
Power, kW	AI	Through network	1 min	15 min	–
Energy, MWh	AI	Through network	15 min	60 min	–
DC Bus Voltage	AI	Through network	±10%	±10%	–

PUMP LADDER DIAGRAMS



HW PUMP VFD

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JACKSON COUNTY BOARD OF SUPERVISORS
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CHECKED BY R WILLIAMS

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