ABBV.	SYMBOL	DESCRIPTION
G.C.		GENERAL CONTRACTOR
M.C.		MECHANICAL CONTRACTOR
E.C.		ELECTRICAL CONTRACTOR
T.C.C.		TEMPERATURE CONTROL CONTRACTOR
A.F.F.		ABOVE FINISHED FLOOR
A.F.G.		ABOVE FINISHED GRADE
B.F.F.		BELOW FINISHED FLOOR
B.F.G.		BELOW FINISHED GRADE
N.I.C.		NOT IN CONTRACT
N.C. N.O.		NORMALLY CLOSED  NORMALLY OPEN
(N)		NEW NEW
		CONTROL WIRING
AD/AP		ACCESS DOOR/ACCESS PANEL
		DIRECTION OF FLOW IN PIPE
		PITCH PIPE DOWN IN DIRECTION OF ARROW
	E	PIPE CAP
	Υ Ο	GAUGE
-	<del></del>	PRESSURE GAUGE WITH COCK
-	<u> </u>	- FLOW METER FITTING
-		PIPE UNION
-		FLEXIBLE PIPE CONNECTION
-	A <sub>ky</sub>	STRAINER WITH BLOWDOWN VALVE
-	<del>\</del>	STRAINER
		CONCENTRIC PIPE REDUCER  ECCENTRIC PIPE REDUCER
CV -		- CHECK VALVE
BV -	<u>, -</u>	BALANCING VALVE
GV -	—————————————————————————————————————	- GATE VALVE
-		- BALL VALVE
		- GLOBE VALVE
-		- BUTTERFLY VALVE
-		- 3-WAY MANUAL VALVE
-	<u>Ψ</u> Α	MANUAL AIR VENT
-		- AUTOMATIC AIR VENT
	<u> </u>	PRESSURE RELIEF VALVE
P/T -		PRESSURE/TEMPERATURE TEST PLUG
TCV -		(2 OR 3-WAY) TEMPERATURE CONTROL VALVE PIPE ELBOW DOWN
	<del></del>	PIPE ELBOW UP
	181	TEE OFF BOTTOM OF PIPE
	ю	TEE OFF TOP OF PIPE
.	Д	- THERMOMETER
RTU		ROOFTOP UNIT
SF		SUPPLY FAN
EF		EXHAUST FAN
RF		RETURN FAN
		UNIT HEATER
UH		_
CUH		CABINET UNIT HEATER
CUH RH		RADIANT HEATER
CUH RH P		RADIANT HEATER PUMP
CUH RH P B		RADIANT HEATER  PUMP  BOILER
CUH RH P B WF		RADIANT HEATER  PUMP  BOILER  WATER FEEDER
CUH RH P B		RADIANT HEATER  PUMP  BOILER
CUH RH P B WF AS		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR
CUH RH P B WF AS ET		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK
CUH RH P B WF AS ET LVR		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK  LOUVER
CUH RH P B WF AS ET LVR SD		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK  LOUVER  SLOT DIFFUSER
CUH RH P B WF AS ET LVR SD SR		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK  LOUVER  SLOT DIFFUSER  SUPPLY REGISTER
CUH RH P B WF AS ET LVR SD SR SG		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK  LOUVER  SLOT DIFFUSER  SUPPLY REGISTER  SUPPLY GRILLE
CUH RH P B WF AS ET LVR SD SR SG RR		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK  LOUVER  SLOT DIFFUSER  SUPPLY REGISTER  SUPPLY GRILLE  RETURN REGISTER
CUH RH P B WF AS ET LVR SD SR SG RR RG ER EG		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK  LOUVER  SLOT DIFFUSER  SUPPLY REGISTER  SUPPLY GRILLE  RETURN REGISTER  RETURN GRILLE  EXHAUST GRILLE
CUH RH P B WF AS ET LVR SD SR SG RR RG ER EG TG		RADIANT HEATER  PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK  LOUVER  SLOT DIFFUSER  SUPPLY REGISTER  SUPPLY GRILLE  RETURN REGISTER  RETURN GRILLE  EXHAUST REGISTER  EXHAUST GRILLE  TRANSFER GRILLE
CUH RH P B WF AS ET LVR SD SR SG RR RG ER EG TG SA		RADIANT HEATER PUMP BOILER WATER FEEDER AIR SEPARATOR EXPANSION TANK LOUVER SLOT DIFFUSER SUPPLY REGISTER SUPPLY GRILLE RETURN REGISTER RETURN GRILLE EXHAUST REGISTER EXHAUST GRILLE TRANSFER GRILLE SUPPLY AIR
CUH RH P B WF AS ET LVR SD SR SG RR RG ER EG TG SA RA		RADIANT HEATER PUMP  BOILER  WATER FEEDER  AIR SEPARATOR  EXPANSION TANK  LOUVER  SLOT DIFFUSER  SUPPLY REGISTER  SUPPLY GRILLE  RETURN REGISTER  RETURN GRILLE  EXHAUST REGISTER  EXHAUST GRILLE  TRANSFER GRILLE  SUPPLY AIR  RETURN AIR
CUH RH P B WF AS ET LVR SD SR SG RR RG ER EG TG SA		RADIANT HEATER PUMP BOILER WATER FEEDER AIR SEPARATOR EXPANSION TANK LOUVER SLOT DIFFUSER SUPPLY REGISTER SUPPLY GRILLE RETURN REGISTER RETURN GRILLE EXHAUST REGISTER EXHAUST GRILLE TRANSFER GRILLE SUPPLY AIR

MAKE-UP AIR

	HVAC	LEGEND
ABBV.	SYMBOL	DESCRIPTION
HWS		HEATING WATER SUPPLY
HWR	— — — HWR— — — —	HEATING WATER RETURN
RL		REFRIGERANT LIQUID
RS	RS	REFRIGERANT SUCTION
	<u>Ф</u> Г Г	COMPOUND PRESSURE GAUGE
MCD	(M)	MOTORIZED CONTROL DAMPER
	B	BACKDRAFT DAMPER
MVD		MANUAL VOLUME DAMPER
FD		FIRE DAMPER
FSD		COMBINATION MOTORIZED FIRE/SMOKE DAMPER
	\$	WALL SWITCH
	(T) (H)	THERMOSTAT / HUMIDISTAT
	T H 🖂	TEMPERATURE / HUMIDITY / CARBON DIOXIDE SENSOR
		COMBINATION TEMPERATURE SENSORS
	<b>₽</b> PO	EMERGENCY POWER OFF SWITCH
	<b>OS</b>	OCCUPANCY SENSOR
	(S)	SMOKE DETECTOR
	Р	PRESSURE SENSOR
	MS	MOTOR STARTER
	V	VELOCITY SENSOR
	FMD	ANALOG FLOW MEASURING DEVICE
	VFD	VARIABLE FREQUENCY DRIVE
	## (#)	ANALOG OUTPUT
	<del>/// (#</del> )	ANALOG INPUT
	# #	DIGITAL OUTPUT
	<del>//-</del> #	DIGITAL INPUT
	SPT	STATIC PRESSURE TRANSMITTER
	DPT L	DIFFERENTIAL PRESSURE TRANSMITTER
		BIT ENERTIAET NEGOCIAE TO ANOMITTEE
		SUPPLY DUCT UP & DOWN
		RETURN/EXHAUST DUCT UP & DOWN
		ROUND SUPPLY DUCT UP & DOWN
		DUCT ELBOW WITH TURNING VANES
		SQUARE TO ROUND TRANSITION
		OFFSET DUCT UP / DOWN IN DIRECTION OF ARROW
		CONICAL SPIN-IN FITTING WITH MANUAL VOLUME DAMPER
		CONICAL SPIN-IN FITTING WITHOUT MANUAL VOLUME DAMPER
		45° TAKEOFF
		STANDARD RADIUS ELBOW
	10x8 }	NEW RECTANGULAR DUCTWORK - WIDTH x DEPTH
	<u>} 10"ø</u>	NEW ROUND DUCTWORK - DIAMETER
	{ 10x8ø }	NEW OVAL DUCTWORK - WIDTH / DEPTH
CD		CEILING DIFFUSER (FOUR WAY THROW PATTERN)
OD		
CD	EQUALS ← □	CEILING DIFFUSER WITH FLOW PATTERN INDICATION (TWO WAY)
CD	EQUALS —	CEILING DIFFUSER WITH FLOW PATTERN INDICATION (ONE WAY)
CD	EQUALS ← □	CEILING DIFFUSER WITH FLOW PATTERN INDICATION (THREE WAY
CD	₩ EQUALS ₩ →	CEILING DIFFUSER WITH FLOW PATTERN INDICATION (TWO WAY)
SD		SLOT DIFFUSER
RG/EG		
	h	RETURN OR EXHAUST REGISTER OR GRILLE
		RETURN GRILLE WITH SOUND BOOT

VAV TERMINAL UNIT

FLEXIBLE DUCTWORK

AIRFLOW - SUPPLY

SOUND ATTENUATOR

AIRFLOW - RETURN/EXHAUST

VAV

**→**-\/--

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#### **MECHANICAL PIPING NOTES**

- 1. HEATING WATER PIPING AND INSULATION: REFER TO SPECIFICATION SECTIONS 23 20 00 AND 23 07 00 RESPECTIVELY FOR PIPING AND INSULATION REQUIREMENTS.
- GAS PIPING: REFER TO SPECIFICATION SECTION 22 10 00 FOR GAS PIPING REQUIREMENTS.
   REFRIGERANT PIPING AND INSULATION: REFER TO SPECIFICATION SECTIONS 23 20 00 AND 23 07 00
- 3. REFRIGERANT PIPING AND INSULATION: REFER TO SPECIFICATION SECTIONS 23 20 00 AND 23 07 0 RESPECTIVELY FOR PIPING AND INSULATION REQUIREMENTS.
- 4. THE AIR-COOLED CONDENSING UNIT SUPPLIER SHALL SUBMIT A MANUFACTURER APPROVED REFRIGERANT PIPING DIAGRAM SPECIFIC TO THIS PROJECT. CLEARLY IDENTIFY PIPING LENGTHS, DROPS, RISES, SIZES, VALVES, AND SPECIALTIES.
- 5. INSTALL ALL VALVES ABOVE ACCESSIBLE CEILINGS. PROVIDE 12"x12" ACCESS DOORS FOR ALL VALVES ABOVE GYPSUM CEILINGS. ALL FINAL ACCESS DOOR LOCATIONS SHALL BE APPROVED BY THE ARCHITECT DURING COORDINATED SHOP DRAWING REVIEW.
- 6. ALL PIPING SHOWN IS CONCEALED ABOVE CEILINGS UNLESS INDICATED OTHERWISE.
- REFER TO VAV TERMINAL UNIT SCHEDULE FOR COIL DESIGNATIONS REQUIRING 3-WAY VALVES.
- B. PROVIDE PIPING SLEEVES AT ALL WALL PENETRATIONS. REFER TO SPECIFICATION FOR EXACT REQUIREMENTS.
- 9. PROVIDE ISOLATION/SHUT-OFF VALVES AT ALL PIPING BRANCHES THAT HAVE TWO OR MORE HYDRONIC
- 10. PIPING CONTRACTOR SHALL SUBMIT IN ADDITION TO THE COORDINATED SHOP DRAWINGS, AN INDIVIDUAL SHOP DRAWING SHOWING ALL MEANS OF HYDRONIC SYSTEM EXPANSION (HEATING AND CHILLED WATER SYSTEMS). CONTRACTOR CAN USE EXPANSION LOOPS, ANCHORS AND ROLLERS, EXPANSION COMPENSATORS, OR A COMBINATION OF BOTH. HYDRONIC EXPANSION LOCATIONS, METHODS, AND EQUIPMENT SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
- 11. ALL RUN OUT PIPING TO HEATING DEVICES SHALL BE MINIMUM 3/4" UNLESS OTHERWISE NOTED. OR SCHEDULED. ALL RUN OUT PIPING TO HEATING DEVICES SHALL BE A MINIMUM OF 5'-0" IN LENGTH AND SHALL HAVE A MINIMUM OF (5) 90° ELBOWS. WHERE THESE REQUIREMENTS ARE NOT POSSIBLE DUE TO SPACE CONSTRAINTS, FLEXIBLE CONNECTIONS AT THE DEVICE SHALL BE PROVIDED.

### **MECHANICAL HVAC NOTES**

- 1. DUCTWORK DIMENSIONS LISTED ON THE DRAWINGS ARE CLEAR, INSIDE DIMENSIONS.
- FLEXIBLE DUCTWORK SHALL BE INSULATED AND SHALL BE THE SAME SIZE AS THE NECK OF THE AIR DEVICE. FLEXIBLE DUCTWORK SHALL NOT EXCEED 8'-0" IN LENGTH. PROVIDE WRAPPED RIGID ROUND DUCTWORK FOR TAKEOFFS IN EXCESS OF 8'-0".
- 3. UNLESS SHOWN OTHERWISE, THE INLET DUCTWORK TO FAN TERMINAL UNITS AND VARIABLE AIR VOLUME TERMINAL UNITS SHALL BE THE FULL SIZE OF THE UNIT CONNECTION.
- 4. PROVIDE DUCT TRANSITIONS FROM EQUIPMENT CONNECTIONS TO DUCT SIZES AS SHOWN.
- 5. PROVIDE A FLEXIBLE CONNECTION TO THE INTAKE AND DISCHARGE OF ALL MECHANICAL EQUIPMENT HAVING ROTATING PARTS. FLEXIBLE CONNECTION SHALL COMPLY WITH ALL APPLICABLE CODES.
- 6. ALL DUCTWORK SHALL BE A MINIMUM 26 GAUGE SHEETMETAL, OR AS REQUIRED BY ALL APPLICABLE CODES. ALL DUCTWORK CROSSING RATED CORRIDORS SHALL BE A MINIMUM 24 GAUGE SHEETMETAL. MEET OR EXCEED SMACNA STANDARDS.
- 7. ALL SUPPLY, RETURN AND EXHAUST DUCTWORK SHALL BE SEALED AIRTIGHT WITH DUCT SEALANT (SMACNA SEAL CLASS "A") ALONG ALL SEAMS AND JOINTS.
- 8. ALL RECTANGULAR SUPPLY, RETURN AND TRANSFER DUCTWORK SHALL BE SHEETMETAL WITH DUCT LINER. REFER TO SPECIFICATION 233000 FOR REQUIREMENTS.
- 9. ALL EXHAUST DUCTWORK SHALL BE UNLINED SHEETMETAL, UNLESS NOTED OTHERWISE.
- 10. ALL EXPOSED SPIRAL ROUND DUCTWORK SHALL BE SHEETMETAL WITH DUCT LINER. REFER TO
- SPECIFICATION 233000 FOR REQUIREMENTS.

  11. ALL CONCEALED SPIRAL ROUND DUCTWORK SHALL BE SHEETMETAL WITH EXTERNAL DUCT INSULATION.
- 12. ALL UNLINED DUCTWORK THAT IS VISIBLE THROUGH THE AIR DEVICE SHALL BE PAINTED FLAT BLACK.
- 13. MAINTAIN A MINIMUM 10'-0" SEPARATION FROM OUTSIDE AIR INTAKES TO EXHAUST TERMINATIONS AND FLUE OUTLETS.
- 14. MAINTAIN A MINIMUM OF 15'-0" FROM OUTSIDE AIR INTAKES TO PLUMBING VENTS.

REFER TO SPECIFICATION 230700 FOR REQUIREMENTS.

- 15. MAINTAIN A MINIMUM 3'-0" SEPARATION FROM EXHAUST TERMINATIONS TO OPERABLE WINDOWS AND DOORS.
- 16. COORDINATE LOUVER, WALL CAP AND AIR DEVICE PLACEMENT WITH BRICK OR BLOCK COURSING
- 17. COORDINATE THE LOCATION AND ELEVATION OF ALL EXPOSED DUCTWORK WITH THE ARCHITECT AT THE JOB SITE.
- 18. ALL EXPOSED DUCTWORK SHALL BE FREE OF IMPERFECTIONS AND DAMAGE. SEAL EXPOSED DUCTWORK IN A NEAT WORKMANSHIP LIKE MANNER SUITABLE FOR PAINTING.
- 19. THE GENERAL CONTRACTOR SHALL PAINT ALL EXPOSED DUCTWORK, FITTINGS, ETC. IN ACCORDANCE
- WITH THE ARCHITECTURAL SPECIFICATION.
- PRIMER TO PREPARE THE DUCT FOR FIELD PAINTING.

  21. CUT ROOF MOUNTED AIR HANDLING EQUIPMENT DUCT OPENINGS THROUGH THE ROOF 1/2" LARGER

ALL EXPOSED DUCTWORK THAT IS SPECIFIED TO BE PAINTED SHALL BE PROVIDED WITH A PAINT-LOCK

- THAN THE OUTSIDE DIMENSION OF THE SUPPLY AND RETURN DUCTS. SEAL THE OPENINGS AROUND THE DUCTS.
- 22. COMPLETELY FILL ALL ROOF MOUNTED AIR HANDLING EQUIPMENT ROOF CURBS WITH UNFACED BATT INSULATION. LAYER INSULATION IN A NEAT WORKMANSHIP LIKE MANNER.
- 23. SPIN-IN FITTINGS SERVING GRILLES AND DIFFUSERS SHALL BE CONICAL WITH MANUAL VOLUME DAMPERS, UNLESS THE AIR DEVICE IS PROVIDED WITH AN OPPOSED BLADE DAMPER.
- 24. SPIN-IN FITTINGS SERVING VAV TERMINALS SHALL BE CONICAL WITHOUT MANUAL VOLUME DAMPERS.
   25. RECTANGULAR BRANCH DUCT TAKEOFFS SHALL HAVE 45° TAKEOFFS AND ROUND DUCT TAKEOFFS
- 6. ALL ELBOWS, BOTH HORIZONTAL AND VERTICAL, SHALL BE LONG RADIUS ELBOWS WHEREVER POSSIBLE OR SHALL HAVE TURNING VANES UNLESS SHOWN OTHERWISE.
- 27. ALL OUTDOOR AND ROOF MOUNTED DUCTWORK SHALL BE PROVIDED WITH DUCT LINER AND EXTERNAL DUCT INSULATION TO MEET A TOTAL INSULATION VALUE OF R-12, REFER TO SPECIFICATION 230700 FOR REQUIREMENTS. PROVIDE AN ALUMINUM ALL WEATHER JACKETING. SLOPE TOP OF INSULATION TO
- 28. 12"x12" ACCESS DOORS SHALL BE PROVIDED FOR ALL MANUAL VOLUME DAMPERS LOCATED ABOVE GYPSUM BOARD CEILINGS. ALL FINAL ACCESS DOOR LOCATIONS SHALL BE APPROVED BY ARCHITECT

PRIOR TO INSTALLATION.

- 24"x24" ACCESS DOORS SHALL BE PROVIDED FOR ALL VARIABLE AIR VOLUME TERMINAL UNITS AND HEATING COILS LOCATED ABOVE GYPSUM BOARD CEILINGS. ALL FINAL ACCESS DOOR LOCATIONS SHALL BE APPROVED BY ARCHITECT PRIOR TO INSTALLATION.
- ALL JOB SITE DUCTWORK PRIOR TO INSTALLATION SHALL BE COVERED AND PROTECTED FROM DIRT, DUST, AND DAMAGE PER SMACNA STANDARDS.
- ALL NEW AND REPLACEMENT ROOF MOUNTED EQUIPMENT SHALL BE LOCATED AT LEAST 10'-0" FROM THE EDGE OF THE ROOF. THE GENERAL AND MECHANICAL CONTRACTOR SHALL VERIFY AND CONFIRM THE ACTUAL INSTALLED LOCATIONS OF ALL NEW AND REPLACEMENT ROOF MOUNTED EQUIPMENT. IF THIS EQUIPMENT IS INSTALLED WITHIN 10'-0" OF THE ROOF EDGE, THE GENERAL CONTRACTOR SHALL INSTALL AN OSHA APPROVED GUARD RAIL.
- KITCHEN EXHAUST AIR DUCTWORK SHALL BE CONSTRUCTED OF MATERIALS AS SPECIFIED. THE JOINTS AND SEAMS WILL BE CONTINUOUSLY WELDED OR BRAZED ON THE EXTERNAL SURFACE OF THE DUCTWORK. THE HORIZONTAL DUCTWORK WILL BE SLOPED AT 1/4" PER LINEAL FOOT TOWARD THE KITCHEN HOOD. ANY PORTION OF THE DUCT SYSTEM THAT IS INACCESSIBLE FROM THE DUCT ENTRY OR DISCHAGE SHALL BE PROVIDED WITH CODE APPROVED CLEANOUTS IN THE DUCT AND DUCT ENCLOSURE.
- 3. PROVIDE A BLANKET WRAP INSULATION ON GREASE DUCT IN ACCORDANCE WITH NFPA 96 AND LOCAL CODES
- 34. FLUES FOR BOILERS AND WATER HEATERS SHALL BE ENGINEERED BY THE FLUE MANUFACTURER, BASED ON ACTUAL EQUIPMENT, AND SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- 5. DRYER EXHAUST AIR DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEETMETAL NOT LESS THAN 0.0195 INCHES. INSIDE OF DRYER DUCT SHALL BE SMOOTH WITH NO MECHANICAL FASTENERS PENETRATING THE DUCT. POP RIVETS ARE ACCEPTABLE, VERTICAL RISERS SHALL HAVE AN ACCESSIBLE CLEANOUT. COMPLY WITH MANUFACTURER'S INSTALLATION REQUIREMENTS AND LOCAL CODES.
- 36. DIVISION 26 SHALL PROVIDE ONE DATA CONNECTION AND ONE 120 VOLT, 20 AMP POWER CONNECTION IN THE ROOM HOUSING THE DDC NETWORK CONTROLLER. DIVISION 26 SHALL PROVIDE ONE DATA CONNECTION AND ONE 120 VOLT, 20 AMP POWER CONNECTION IN THE ROOM HOUSING THE DDC COMPUTER AND ASSOCIATED GRAPHICAL USER INTERFACE, CONTROL SERVER SOFTWARE. COORDINATE EXACT LOCATION FOR THE DDC COMPUTER WITH THE OWNER. DIVISION 26 SHALL PROVIDE MULTIPLE 20 AMP CIRCUITS IN THE CEILING SPACE TO SERVE VAV TERMINAL CONTROL TRANSFORMERS. EXACT CIRCUIT LOCATIONS SHALL BE COORDINATED WITH THE TEMPERATURE CONTROLS CONTRACTOR.

# SHEET INDEX

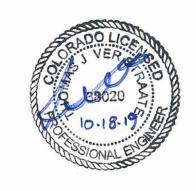
SHEET NUMBER	MECHANICAL, PLUMBING & FIRE PROTECTION SHEET TITLE	SHEET SCALE	SHEET ISSUED
M 000	MEGUANICAL COVER CUEET, LEGEND CENERAL NOTES & CUEET INDEX	NONE	
M 000	MECHANICAL COVER SHEET - LEGEND, GENERAL NOTES & SHEET INDEX	NONE	X
M 111	HVAC FLOOR PLANS	1/8" = 1'-0"	X
M 112	HVAC PIPING FLOOR PLANS	1/8" = 1'-0"	X
M 113	ROOF HVAC PLAN	1/8" = 1'-0"	X
M 411	ENLARGED HVAC MECHANICAL ROOM PLAN	1/4" = 1'-0"	X
M 500	HVAC SECTIONS	1/4" = 1'-0"	X
M 600	HVAC SCHEDULES	NONE	X
M 601	HVAC SCHEDULES	NONE	Х
M 700	HVAC DETAILS	NONE	Х
M 701	HVAC DETAILS	NONE	Х
M 800	HVAC CONTROL DIAGRAMS	NONE	X
M 801	HVAC CONTROL DIAGRAMS	NONE	Х
M 900	HVAC OUTSIDE AIR CALCULATIONS	NONE	X
M 901	HVAC OUTSIDE AIR CALCULATIONS	NONE	X

#### **MECHANICAL GENERAL NOTES**

SUBMITTING BID OR COMMENCING WORK.

- THE MECHANICAL CONTRACTOR SHALL INSPECT SITE TO BECOME FAMILIAR WITH THE SCOPE OF THE WORK. THESE DOCUMENTS DO NOT REFLECT AS-BUILT CONDITIONS. ANY DISCREPANCIES BETWEEN THESE DOCUMENTS AND THE ACTUAL CONDITIONS SHALL BE REPORTED TO THE ARCHITECT/ENGINEER FOR RESOLUTION PRIOR TO BID PRICING. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.
- 2. THE MECHANICAL CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL ABOVE CEILING EQUIPMENT,
  DUCTWORK AND CEILING MOUNTED AIR DEVICES WITH EXISTING ARCHITECTURAL, STRUCTURAL, ELECTRICAL
  AND MECHANICAL CONDITIONS. APPROXIMATE LOCATIONS OF NEW WORK ARE SHOWN AND SHOULD BE
  FOLLOWED AS CLOSELY AS EXISTING CONDITIONS WILL ALLOW.
- 3. MECHANICAL WORK SHALL COMPLY WITH ALL APPLICABLE CODES. VERIFY ALL REQUIREMENTS PRIOR TO
- 4. THE MECHANICAL SYSTEM SHOWN SHALL BE ROUTED AS HIGH AS POSSIBLE. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING REQUIREMENTS WITH ALL TRADES PRIOR TO CONSTRUCTION.
- 5. WHERE CEILING SPACE IS TO BE USED AS A RETURN AIR PLENUM, COMPLY WITH ALL APPLICABLE CODES. ALL MATERIALS WITHIN THE CEILING PLENUM WILL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50.
- WHERE THE CEILING SPACE IS TO BE USED AS A RETURN AIR PLENUM, THE GENERAL AND MECHANICAL CONTRACTORS SHALL VERIFY THAT THE RETURN AIR PATH BACK TO THE UNIT IS OPEN WITH A VELOCITY THROUGH ALL OPENINGS OF 400 FPM OR LESS.
- 7. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL CEILING AIR DEVICES AND ACCESS PANELS. OBTAIN CLARIFICATION FROM THE ARCHITECT, IF EXACT LOCATIONS ARE NOT SHOWN.
  - REFER TO THE ARCHITECTURAL DRAWINGS FOR ROOFING DETAILS SPECIFIC TO THE PROJECT.
- 9. THE MECHANICAL CONTRACTOR SHALL COORDINATE THERMOSTAT, SENSOR, AND SWITCH LOCATIONS WITH ARCHITECT/ENGINEER PRIOR TO INSTALLATION. ALL THERMOSTATS, SENSORS, AND SWITCHES SHALL BE LOCATED 48" A.F.F. UNLESS INDICATED OTHERWISE.
- 10. COORDINATE THERMOSTAT, SENSOR, AND SWITCH LOCATIONS WITH EXISTING CONDITIONS AND THE ARCHITECT/ENGINEER PRIOR TO INSTALLATION. WHERE POSSIBLE MATCH LOCATION OF PREVIOUS CONTROL. PROVIDE WIRE MOLD TO CONCEAL EXPOSED CONTROL WIRING AND TUBING. COLOR TO BE SELECTED BY THE
- 11. BALANCE AIR AND WATER SYSTEMS TO THE QUANTITIES SHOWN AND SUBMIT BALANCE REPORT(S) TO THE ARCHITECT/ENGINEER FOR REVIEW.
- 12. PORTIONS OF THIS BUILDING WILL BE OCCUPIED DURING THIS CONSTRUCTION PROJECT. THE MECHANICAL CONTRACTOR SHALL COORDINATE THE SCHEDULING OF THEIR WORK WITH THE GENERAL CONTRACTOR. CLEAN UP AT THE END OF EACH DAY.
- 13. ACCESS DOORS SHALL BE INSTALLED IN ORDER TO PROVIDE ACCESS TO MECHANICAL SYSTEMS LOCATED ABOVE INACCESSIBLE CEILINGS, WHETHER OR NOT SHOWN ON THE DRAWINGS. ACCESS DOORS SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR. ACCESS DOOR LOCATIONS SHALL BE APPROVED BY THE ARCHITECT PRIOR TO INSTALLATION. PROVIDE 12"x12" ACCESS DOORS FOR HAND ACCESS AND 24"x24" ACCESS DOORS FOR HEAD AND SHOULDER ACCESS.





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SEH Project Checked By Drawn By

Project Status 30% DESIGN 75% DESIGN

100% DESIGN

Revision Issue

MECHANICAL COVER SHEET -LEGEND, GENERAL NOTES & SHEET INDEX

> IVI 000



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CABINET UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL. REFER TO SCHOOL FOR SIZE AND CAPACITY. REFER TO HVAC PIPING FLOOR PLANS FOR PIPING ----CONNECTIONS (18) 5"ø 24 GAUGE SINGLE WALL FLUE PIPE FROM GAS UNIT HEATER UP THROUGH ROOF. CONNECT TO UNIT HEATER PER MANUFACTURER'S RECOMMENDATIONS. REFER TO ROOF HVAC PLAN FOR

CONTINUATION. (19)~ 5"ø 24 GAUGE SINGLE WALL COMBUSTION AIR PIPE FROM GAS UNIT HEATER UP THROUGH ROOF. CONNECT TO UNIT HEATER PER MANUFACTURER'S RECOMMENDATIONS. REFER TO ROOF HVAC

SLOPE BOTTOM OF PLENUM BOX TO CONNECTION AT LOUVER AT 1/4" PER FOOT, PROVIDE NORMALLY CLOSED MOTORIZED DAMPER IN PLENUM BOX. INTERLOCK MOTORIZED DAMPER WITH EXHAUST FAN INDICATED AND HOSE DRYER.

(21) SIDEWALL PROPELLER EXHAUST FAN MOUNTED ON DUCTWORK ATTACHED TO LOUVER. REFER TO SCHEDULE FOR SIZE AND CAPACITY. REFER TO DETAIL. (22) EXHAUST DUCTWORK OF SIZE INDICATED DOWN TO OWNER SUPPLIED HOSE DRYER. CONNECT TO

HOSE DRYER IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. (23) EXHAUST DUCTWORK OF SIZE INDICATED DOWN TO KITCHEN EXHAUST HOOD PROVIDED BY

OTHERS AND UP THROUGH ROOF. CONNECT TO HOOD IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. (24) 4"ø DRYER VENT UP THROUGH ROOF TO MANUFACTURER'S APPROVED ROOF TERMINATION. ALL DRYER EXHAUST DUCTWORK ELBOWS SHALL BE DOUBLE WIDTH RADIUS AND INSTALLED ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFER TO ROOF HVAC PLANS

(25) RESIDENTIAL KITCHEN HOOD. REFER TO ARCHITECTURAL DRAWINGS.

**HVAC FLOOR PLAN KEYNOTES:** 

FLOOR PLAN, THIS SHEET, FOR CONTINUATION.

REFER TO SCHEDULE FOR SIZE AND CAPACITY.

SCHEDULE FOR SIZE AND CAPACITY.

INSTRUCTIONS. OFFSET AS INDICATED.

1 VARIABLE AIR VOLUME TERMINAL UNIT WITH REHEAT COIL AS INDICATED. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

2 HYDRONIC UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY. REFER TO HVAC PIPING FLOOR PLANS FOR PIPING CONNECTIONS.

(3) DUCTWORK OF SIZE AND TYPE INDICATED UP TO ROOF ABOVE. REFER TO ROOF HVAC PLAN FOR

DUCTWORK OF SIZE AND TYPE INDICATED UP TO LEVEL ABOVE. REFER TO LEVEL 2 HVAC FLOOR PLAN, THIS SHEET, FOR CONTINUATION.

6 DUCTLESS SPLIT SYSTEM FAN COIL UNIT MOUNTED ON WALL AS INDICATED. MOUNT UNIT AS HIGH AS POSSIBLE WITHIN THE SPACE. COORDINATE FINAL LOCATION WITH EQUIPMENT IN SPACE.

(5) DUCTWORK OF SIZE AND TYPE INDICATED DOWN TO LEVEL BELOW. REFER TO LEVEL 1 HVAC

(7) OPENING IN TOP OF DUCT OF SIZE INDICATED. PROVIDE OPENING WITH 1/2" BIRD SCREEN.

(9) EXHAUST AIR LOUVER OF SIZE INDICATED. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

OUTSIDE AIR INTAKE LOUVER WITH 32" DEEP OUTSIDE AIR INTAKE SHEETMETAL PLENUM BOX. SLOPE BOTTOM OF PLENUM BOX TO CONNECTION AT LOUVER AT 1/4" PER FOOT. PROVIDE

RADIANT TUBE HEATER HUNG FROM STRUCTURE ABOVE AT 20'-0" A.F.F. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND MAINTAIN ALL REQUIRED CLEARANCES. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

HVLS CEILING FAN MOUNTED FROM STRUCTURE ABOVE AS INDICATED. INSTALL WITH MANUFACTURER'S INSTALLATION KIT AND PROVIDE EXTENSION ARM TO INSTALL FAN BLADES 24'-0"

13 INLINE EXHAUST FAN MOUNTED FROM STRUCTURE ABOVE WITH SPRING VIBRATION ISOLATION AS INDICATED. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

4"ø DRYER VENT DOWN TO CONNECTION AT DRYER. ALL DRYER EXHAUST DUCTWORK ELBOWS SHALL BE DOUBLE WIDTH RADIUS AND INSTALLED ACCORDING TO MANUFACTURER'S INSTALLATION

DRYER VENT AT EXTERIOR WALL TERMINATION SHALL BE INOVATE TECHNOLOGIES - DRYER WALL VENT DWV4. COORDINATE FINAL COLOR SELECTION WITH ARCHITECT.

CEILING MOUNTED EXHAUST FAN IN CEILING AS INDICATED. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

NORMALLY CLOSED MOTORIZED DAMPER IN PLENUM BOX. INTERLOCK MOTORIZED DAMPER WITH

8 EXHAUST AIR LOUVER OF SIZE INDICATED WITH SHEETMETAL PLENUM BOX. SLOPE BOTTOM OF PLENUM BOX TO CONNECTION AT LOUVER AT 1/4" PER FOOT. REFER TO DETAIL. REFER TO

26) ELECTRIC UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

(27) GAS UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

(28) PROVIDE FAN WITH INLET FAN GUARD.

FOR CONTINUATION.

(29) 4"Ø OUTSIDE AIR DUCT ELBOWED DOWN AND PROVIDED WITH BIRD SCREEN TO SERVE AS MAKE UP AIR FOR OWNER PROVIDED SCBA COMPRESSOR. OPEN END INTO ROOM AS INDICATED FOR

OWNER CONNECTION. (30) 4"ø TYPE-B VENT FROM RADIANT HEATER CONNECTION UP THROUGH ROOF. INSTALL PER MANUFACTURER'S RECOMENDATIONS. REFER TO ROOF HAVC PLAN FOR CONTINUATION.

(31) 4"Ø PVC COMBUSTION AIR FROM RADIANT HEATER CONNECTION UP THROUGH ROOF. CONNECT TO RADIANT HEATER WITH A FLEXIBLE CONNECTION AND INSTALL PER MANUFACTURER'S RECCOMENDATIONS. REFER TO ROOF HAVC PLAN FOR CONTINUATION 

ANGLE DN. 30°

) <u>VAV-3-1</u>

16"ø SA (5)

(21) <u>EF-16</u>

(7)40x22



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900 South Broadway

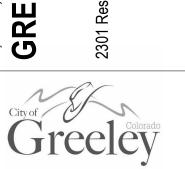
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FIRE



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ADDENDUM 2

**HVAC FLOOR PLANS** 



42x16-RA (7)38x36

REFER TO M.411 FOR ... WORK IN THIS AREA.

32x30 TA

22"ø SA

(30) 4"ø FLUE

20"ø EA

20"ø EA

√(30) 4"ø FLUE

APPARATUS BAY

(LADDER) 134

`10"ø EA

www

(19) 5"ø CA

(8) <u>36x24 LVR-2</u> (13) <u>EF-2</u> 4 2 CA (31)

(SQUAD VEHICLE)

TYP. (8)

20x14 SA BUNK 110 EF-14 14

27 <u>GUH-1</u> 18 5"ø FLUE

 $\sim\sim\sim\sim$ 

(30) 4"ø FLUE

APPARATUS BAY

ELEC 136

ANGLE DN. 30°

ANGLE DN. 30°

ANGLE DN. 30°

150 CFM(28)

WATER ENTRY

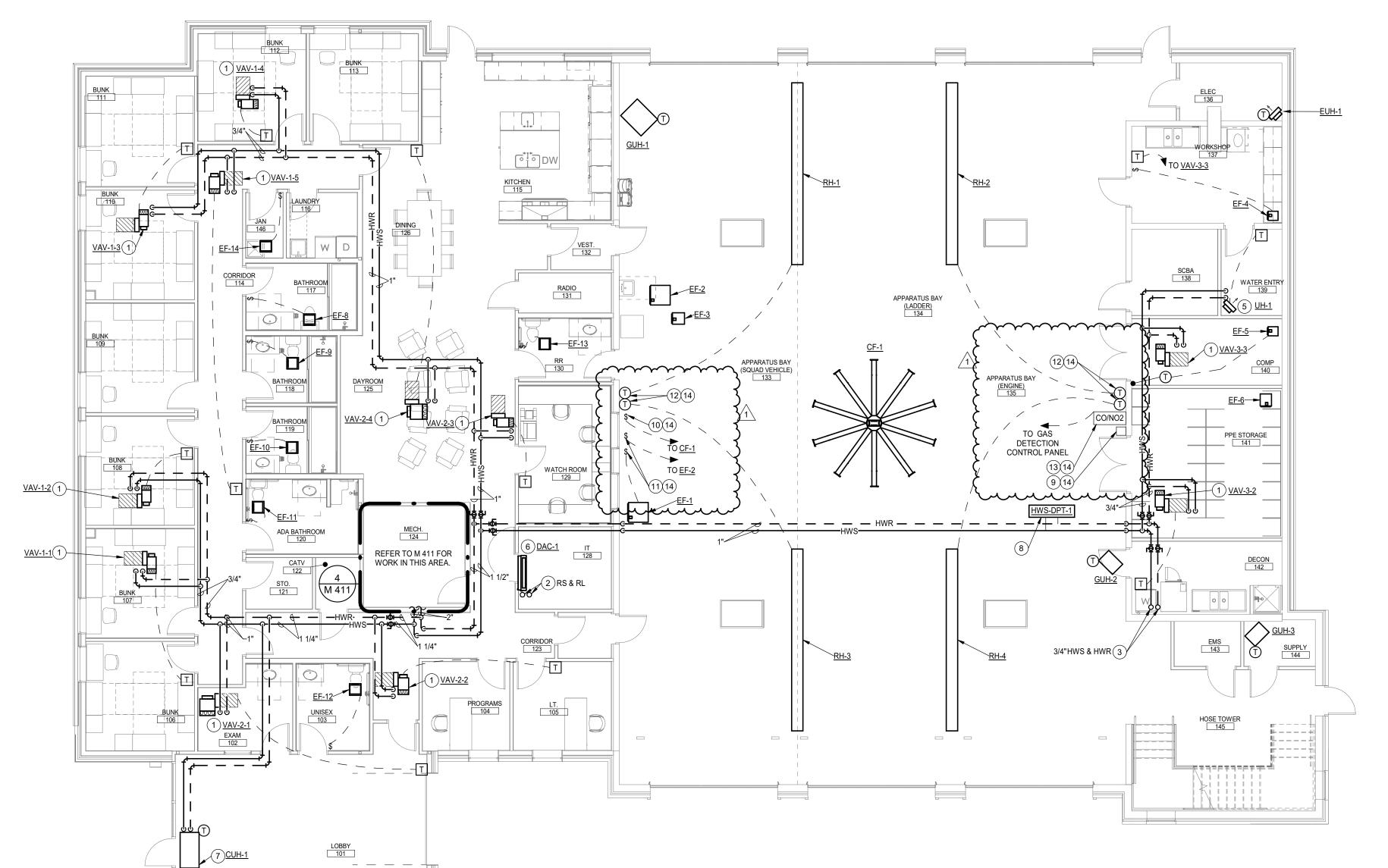
26 <u>EUH-1</u>

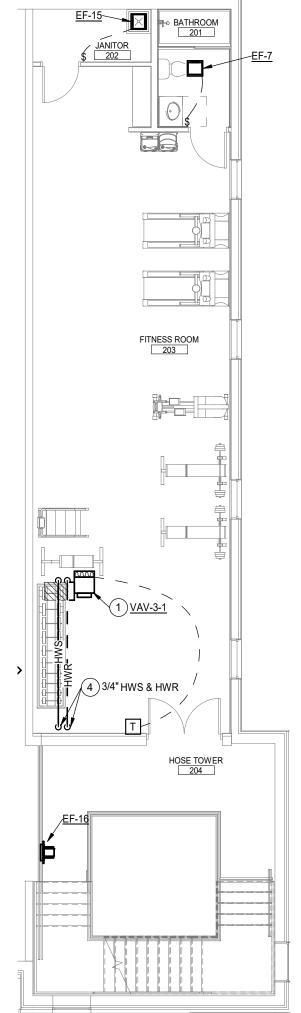
9 16x12 LVR-4

**□** (29) 4"ø OA

LEVEL 2 HVAC FLOOR PLAN

SCALE: 1/8" = 1'-0"

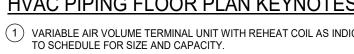


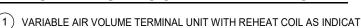


## **HVAC PIPING FLOOR PLAN KEYNOTES:**

- 1 VARIABLE AIR VOLUME TERMINAL UNIT WITH REHEAT COIL AS INDICATED. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- 2 REFRIGERANT LIQUID AND REFRIGERANT SUCTION LINESET UP TO ROOF ABOVE. REFER TO ROOF HVAC PLAN FOR CONTINUATION.
- 3 PIPING OF SIZE AND TYPE INDICATED UP TO LEVEL ABOVE. REFER TO LEVEL 2 HVAC PIPING FLOOR PLAN, THIS SHEET, FOR CONTINUATION.
- PIPING OF SIZE AND TYPE INDICATED DOWN TO LEVEL BELOW. REFER TO LEVEL 1 HVAC PIPING FLOOR PLAN, THIS SHEET, FOR CONTINUATION.
- 5 UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

- (10) CEILING FAN WALL ON/OFF SWITCH AND SPEED CONTROLLER. PROVIDE 120V POWER TO
- (11) ADJUSTABLE SPIN TIMER MOUNTED ON WALL WIRED TO GENERAL EXHAUST FAN INDICATED. FAN SHALL BE OVERRIDDEN BY GAS DETECTION SYSTEM CONTROL PANEL.
- (14) PROVIDE NEMA WATERPROOF ENCLOSURE FOR SWITCH INDICATED.
- (15) ADJUSTABLE SPIN TIMER MOUNTED ON WALL WIRED TO GENERAL EXHAUST FAN INDICATED.





- DUCTLESS SPLIT SYSTEM FAN COIL UNIT MOUNTED ON WALL AS INDICATED. MOUNT UNIT AS HIGH AS POSSIBLE WITHIN THE SPACE. COORDINATE FINAL LOCATION WITH EQUIPMENT IN SPACE. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- 7 CABINET UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- 8 HEATING WATER SYSTEM DIFFERENTIAL PRESSURE TRANSMITTER HWS-DPT-1 AS INDICATED.
  REFER TO CONTROL DRAWINGS FOR REQUIREMENTS.

  9 GAS MONITORING CONTROL PANEL AS INDICATED MOUNTED ON WALL. PROVIDE ARMSTRONG AMC-1AD OR EQUIVALENT. PROVIDE 120V POWER AND FIRE ALARM CONNECTIONS TO PANEL.
  REFER TO ELECTRICAL DRAWINGS FOR REQUIREMENTS. PANEL SHALL RECEIVE INPUTS FROM COMOS SENSOD AND OVERPIDE (2) GENERAL EXHAUST FANS TO FILL AIRFLOW IN PURGE MODE CO/NO2 SENSOR AND OVERRIDE (2) GENERAL EXHAUST FANS TO FULL AIRFLOW IN PURGE MODE.
- (12) MANUFACTURER PROVIDED THERMOSTAT FOR RADIANT HEATER INDICATED.
- (13) COMBINATION CO AND NO2 GAS SENSOR MODULES MOUNTED ON WALL AS INDICATED. PROVIDE ARMSTRONG AMC-1222 OR EQUIVALENT. MOUNT SENSORS AT ELEVATION IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR THE SPECIFIC GAS DETECTED AND APPLICATION. INTERLOCK TO FIRE PANEL.

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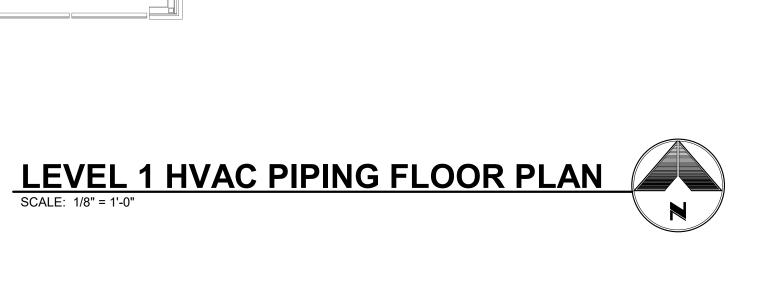
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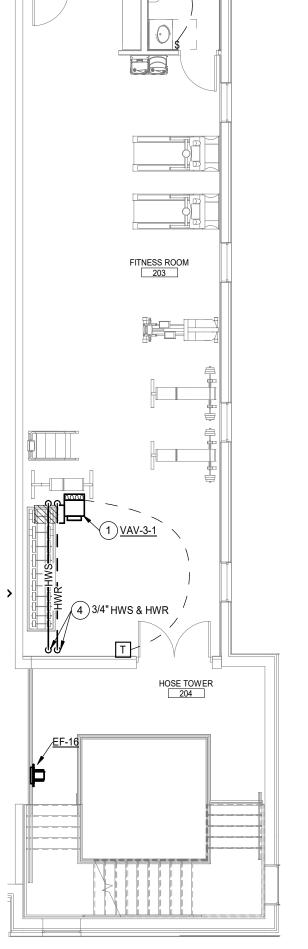
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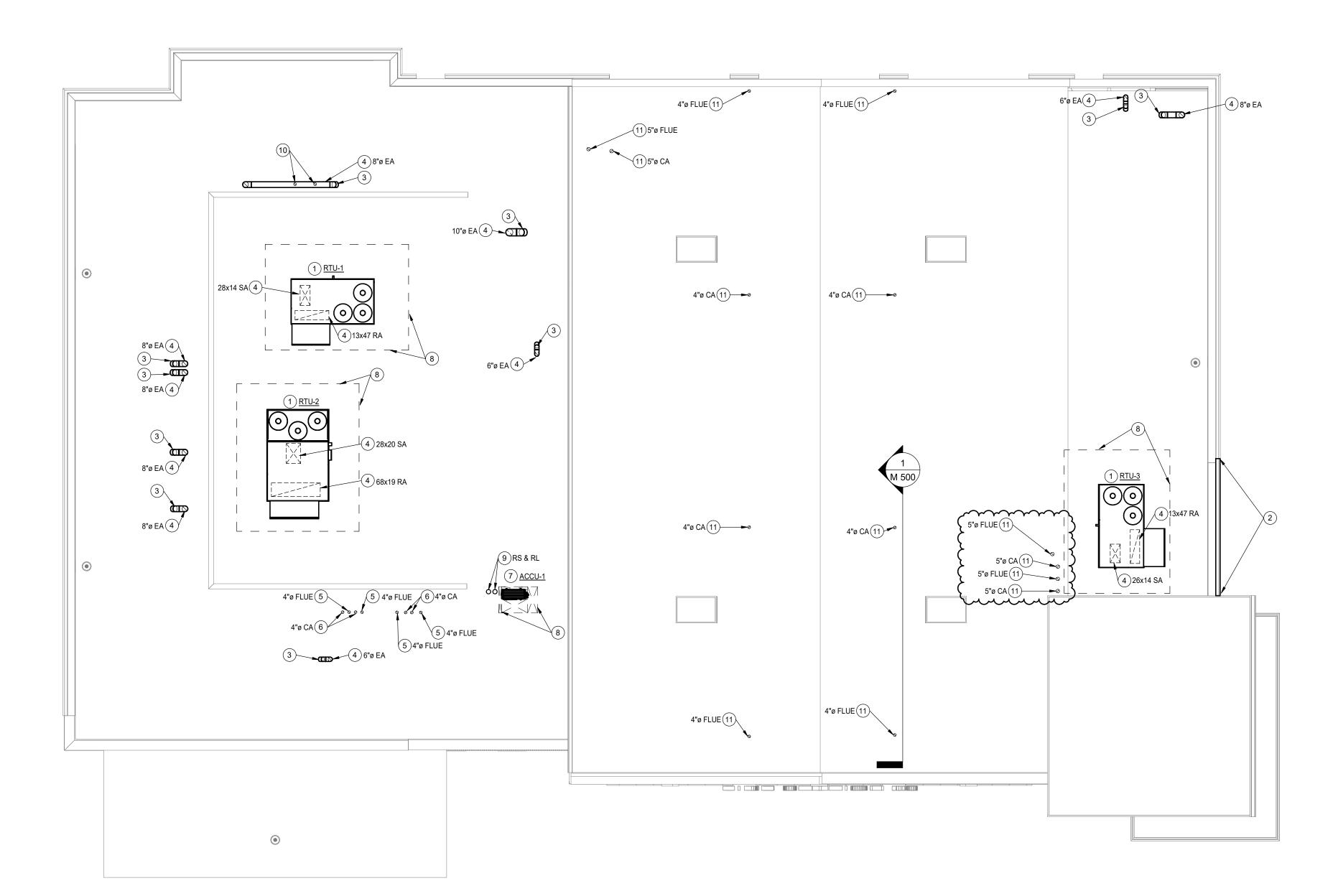
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ADDENDUM 2

HVAC PIPING FLOOR PLANS









### **ROOF HVAC KEYNOTES:**

- ROOFTOP UNIT MOUNTED ON 14" ROOF CUR AND 6" CONCRETE HOUSEKEEPING PAD. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- 2 42" TALL PARAPET WALL OR OSHA APPROVED GUARD RAIL IN THIS LOCATION. EXTEND WALL A MINIMUM OF 3'-0" PAST THE EDGE OF THE ROOFTOP UNIT.
- (3) TERMINATE DUCTWORK WITH GOOSENECK A MINIMUM OF 24" ABOVE ROOF LINE.
- ductwork of size and type indicated down through roof. Refer to hvac floor plans for continuation.
- 5 CPVC FLUE OF SIZE INDICATED DOWN THROUGH ROOF. REFER TO ENLARGED MECHANICAL ROOM PLAN FOR CONTINUATION. TERMINATE A MINIMUM OF 3'-0" ABOVE COMBUSTION AIR TERMINATION IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFER TO DETAIL.
- 6 CPVC COMBUSTION AIR OF SIZE INDICATED DOWN THROUGH ROOF. REFER TO ENLARGED MECHANICAL ROOM PLAN FOR CONTINUATION. TERMINATE A MINIMUM OF 3'-0" ABOVE ROOF IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFER TO DETAIL.
- 7 DUCTLESS SPLIT SYSTEM CONDENSING UNIT MOUNTED ON ROOF CURB AS INDICATED. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- (8) EQUIPMENT SERVICE ACCESS AND CLEARANCE, TYPICAL.
- 9 REFRIGERANT LIQUID AND REFRIGERANT SUCTION LINESET DOWN THROUGH ROOF TO LEVEL BELOW. REFER TO HVAC PIPING FLOOR PLANS FOR CONTINUATION. PROVIDE ALUMINUM JACKETING ON ALL EXTERIOR REFRIGERANT PIPING INSULATION. REFER TO SPECIFICATION 230700 FOR REQUIREMENTS.
- 4"ø DRYER EXHAUST DOWN THROUGH ROOF. TERMINATE WITH MANUFACTURER'S APPROVED ROOF VENT CAP.
- PIPING OF SIZE ANY TYPE INDICATED DOWN THROUGH ROOF TO EQUIPMENT BELOW. TERMINATE A MINIMUM OF 24" ABOVE ROOFLINE WITH MANUFACTURER'S APPROVED TERMINATION CAP. REFER TO HVAC FLOOR PLANS FOR CONTINUATION.





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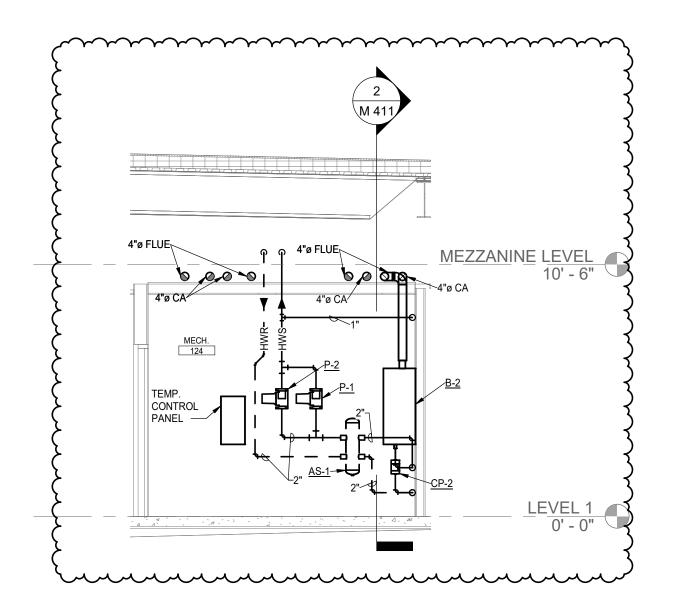
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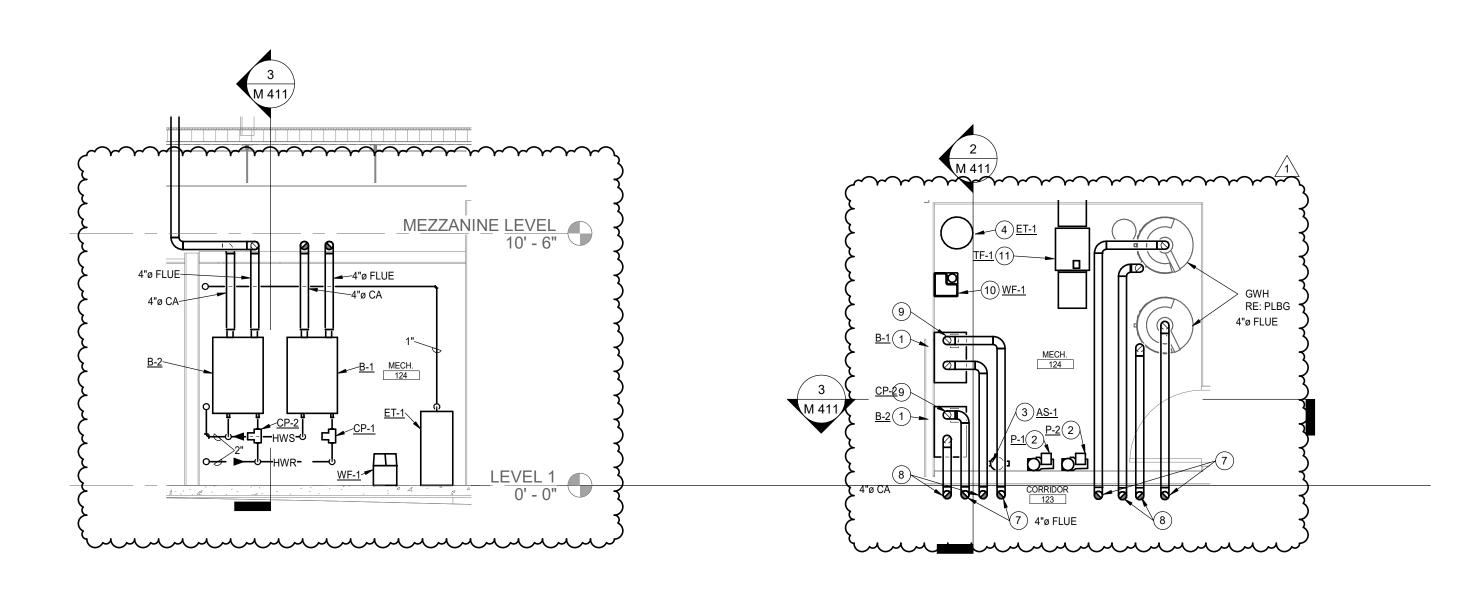
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ADDENDUM 2

**ROOF HVAC PLAN** 







2 ENLARGED BOILER ROOM SECTION 1



4"ø CA

2 M 411 3 4 ET-1 10 WF-1 

ENLARGED HVAC MECHANICAL ROOM PIPING PLAN

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

## **ENLARGED HVAC MECHANICAL ROOM KEYNOTES:**

- 1) CONDENSING BOILER MOUNTED ON WALL AS INDICATED WITH BOILER CIRCULATION PUMP SUPPORTED FROM PIPING BELOW. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- 2) INLINE HEATING WATER CIRCULATION PUMP AS INDICATED MOUNTED ON WALL. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- (3) AIR/DIRT/HYDRAULIC SEPARATOR MOUNTED ON WALL AS INDICATED. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- 4 EXPANSION TANK MOUNTED ON 4" CONCRETE HOUSEKEEPING PAD AS INDICATED. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- 5 BOILER EMERGENCY POWER OFF (EPO) SWITCH. REFER TO CONTROL DRAWINGS FOR REQUIREMENTS.
- 6 PIPING OF SIZE AND TYPE INDICATED OUT OF MECHANICAL ROOM TO MAIN BUILDING. REFER TO HVAC PIPING FLOOR PLANS FOR CONTINUATION.
- 7 CPVC FLUE OF SIZE INDICATED UP THROUGH ROOF. REFER TO ROOF HVAC PLAN FOR CONTINUATION.
- 8 CPVC COMBUSTION AIR OF SIZE INDICATED UP THROUGH ROOF. REFER TO ROOF HVAC PLAN FOR CONTINUATION.
- 9 INLINE BOILER CIRCULATION PUMP BELOW BOILER AS INDICATED. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- (10) WATER FEEDER TO SERVE AS MAKE UP WATER FOR HYDRONIC SYSTEM. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
- INLINE TRANSFER FAN HUNG FROM STRUCTURE ABOVE. REFER TO DETAIL. REFER TO SCHEDULE FOR SIZE AND CAPACITY.
   HEATING WATER SYSTEM DDC TEMPERATURE CONTROL PANEL ON WALL AS INDICATED. REFER TO
- DDC BUILDING NETWORK CONTROLLER (JACE) MOUNTED ON WALL AS INDICATED. COORDINATE FINAL LOCATION WITH EQUIPMENT IN SPACE. REFER TO CONTROL DRAWINGS FOR REQUIREMENTS.

CONTROL DRAWINGS FOR REQUIREMENTS.





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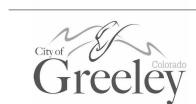
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ELEY FIRE STATION #2

2301 Reservoir



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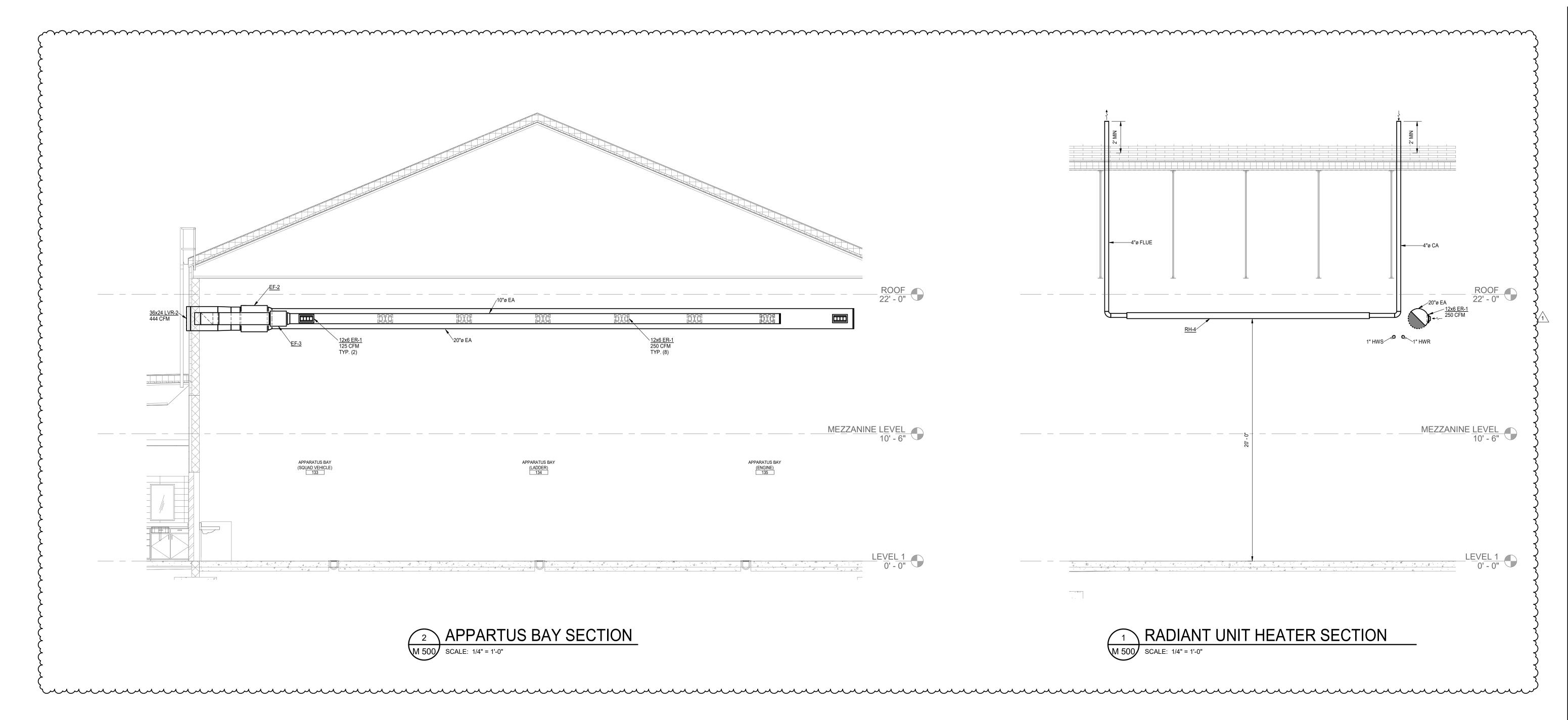
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Rev. # Description

ADDENDUM 2

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ENLARGED HVAC MECHANICAL







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**STATI** FIRE GREEL



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6/26/2019

8/29/2019

10/18/2019

JJG

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Revision Issue

ADDENDUM 2

**HVAC SECTIONS** 

								ROO	FTC	PU	NIT SC	HEDULE	E (G/	4S F	FIRE	D HE	ATIN	1G &	DX	COO	LING	3 - E	XHAUST	FA	N)									
					COOLING	G CAPACITY	(NOTE: 1)				HEAT	ING CAPACITY (NO	TE: 2,5)			S	UPPLY FAI	N			E	EXHAUS1	Γ FAN (NOTE: 13)			FILTER	R DATA		ELECTRIC	CAL	DIME	ENSION	S	
PLAN	MANUFACTURER		NOMINAL	EFFICIENCY	TOTAL	SENS.	AMBIENT	EAT	LAT		MBH INPUT	MBH OUTPUT	EAT	LAT	CFM	MIN. O.A.	CFM	HP	ESP	CFM	ESP	HP	MICROMETL	MCA	MOCP	TYPE	%	V/ø/Hz	SCCR	MCA MOCP	H L	W	WT	REMARKS
CODE	& MODEL NUMBER	AREA SERVED	TONS	EER	MBH	MBH	°F	DB W	B DB	WB	@ S.L.	@ ALT. (5,000')			(CLG)	CFM	(HTG)	(BHP)					MODEL				EFF.		/AIC		(IN) (IN)	(IN)	(LBS)	
				(IEER)				(°F) (°F	) (°F)	(°F)																			RATING					
RTU-1	CARRIER 48LCS008A	DORMS	7.5	12.8 (19.3)	75.5	72.7	95.0	79.4 56.	53.1	46.1	150.0	100.8	51.6	88.2	3,100	650	3,100	5.0 (3.3)	1.6"	2,800	0.5"	1.0	PCD-SRT05CA-D-2M1	7.3	13.1	2" TA	MERV 8	208/3/60		47.0 60.0	79" 116"	64"	2,600	NOTE: 3,4,6,7,8,9,10,11,12
RTU-2	CARRIER 48LCT014A	RESIDENTIAL SIDE	12.5	12.4 (19.1)	121.2	116.9	95.0	80.4 58.	2 53.1	47.8	310.0	208.3	43.6	92.4	4,800	1,500	4,800	5.0 (2.9)	1.6"	4,325	0.5"	2.0"	PCC-MRT69CA-D-2M2	11.4	20.5	2" TA	MERV 8	208/3/60		79.7 100.0	71" 128"	87"	3,300	NOTE: 3,4,6,7,8,9,10,11,12

900

3,000

5.0 (3.2)

2,700

0.5"

1.0

PCD-SRT05CA-D-2M1

13.1

2" TA

FAN SCHEDULE

MERV 8

208/3/60

47.0

60.0

2,600

NOTE: 3,4,6,7,8,9,10,11,12

RTU-3

1. LEAVING AIR TEMPERATURE (LAT) IS TEMPERATURE OFF THE COOLING COIL AND NOT THE SYSTEM SUPPLY AIR TEMPERATURE, SYSTEM SAT = 55°F.

12.8 (19.3)

73.2

70.1

95.0

79.3

61.1

53.1

51.8

150.0

7.5

2. HEATING ENTERING AIR TEMPERATURE IS MIXED AIR TEMPERATURE AT SUPPLY FAN HEATING CFM.

FITNESS/WORK AREAS

3. UNIT HEIGHT INCLUDES 14" ROOF CURB AND 6" CONCRETE PAD.

4. UNIT WEIGHT DOES NOT INCLUDE 6" CONCRETE PAD. 5. UNIT NATURAL GAS PRESSURE SHALL BE 4" TO 13" W.C.

6. MULTI ZONE VARIABLE AIR VOLUME ROOFTOP AIR HANDLING UNIT, PROVIDE VFDS ON SUPPLY AND EXHAUST FANS.

7. PROVIDE UNIT WITH THREE STAGES OF COOLING.

CARRIER 48LCS008A

8. PROVIDE UNIT WITH FULLY MODULATING STAINLESS STEEL GAS BURNER.

82.3

44.6

9. PROVIDE UNIT WITH HIGH ALTITUDE GAS CONVERSION KIT. 10. PROVIDE UNIT WITH OPEN CONTROL BACNET CARD.

100.8

11. PROVIDE UNIT WITH MICROMETL POWER EXHAUST.

12. PROVIDE UNIT WITH FACTORY WIRED CONVENIENCE OUTLET.

13. POWER EXHAUST REQUIRES A SEPARATE ELECTRICAL CONNECTION AND FIELD SUPPLIED DISCONNECT.

3,000

				UNIT	HEA	TER	SCH	HEDUL	_E (	GAS I	FIRED)			
PLAN	MANUFACT	TURER & MODEL I	O. SERVICE	MBH INPUT	CFM	RPM		ELECTF	RICAL		GAS CONN.	FLUE / CA	WEIGHT	REMARKS
CODE				@ S.L.			HP	VOLTS	Ø	FLA	SIZE	SIZE		
GUH-1	7	TRANE GK025	133 APP. BAY	250.0	2,850	1,932	1	115	1	12.0	1/2"	5"ø	275	NOTE: 1,2,3,4,5,6
GUH-2	1	TRANE GK015	135 APP. BAY	150.0	1,975	1,932	3/4	115	1	7.4	1/2"	5"ø	200	NOTE: 1,2,3,4,5,6
GUH-3	7	TRANE GK010	144 SUPPLY	100.0	1,200	1,932	1/3	115	1	5.1	1/2"	5"ø	175	NOTE: 1,2,3,4,5,6

NOTES: PROVIDE SPRING ISOLATORS.

PROVIDE SINGLE STAGE LOW VOLTAGE ROOM THERMOSTAT

PROVIDE FACTORY MOUNTED FAN GUARD.

PROVIDE FACTORY MOUNTED POWER VENT ASSEMBLY. PROVIDE 409 STAINLESS STEEL HEAT EXCHANGER.

NATURAL GAS - 5" TO 14" GAS INLET PRESSURE.

		F	RADIANT H	EATER SC	HEDULE (	GAS FIRED	0)		
					RADIANT I	HEATER			
PLAN	MANUFACTURER. &	SERVICE	MBH INPUT	TUBE LENGTH	REFLECTOR	MOUNTING HEIGHT	ELECTR	ICAL	REMARKS
CODE	MODEL NO.		@ S.L.	(FT)		(FT)	VOLTS/HZ	AMPS	
RH-1	SUPERIOR TA08N	133 APP. BAY	80.0	20	STANDARD	20'-0"	120/60	1.0	NOTES: 1,2,3
RH-2	SUPERIOR TA08N	134 APP. BAY	80.0	20	STANDARD	20'-0"	120/60	1.0	NOTES: 1,2,3
RH-3	SUPERIOR TA08N	133 APP. BAY	80.0	20	STANDARD	20'-0"	120/60	1.0	NOTES: 1,2,3
RH-4	SUPERIOR TA08N	134 APP. BAY	80.0	20	STANDARD	20'-0"	120/60	1.0	NOTES: 1,2,3

NOTES:

TRUE 2-STAGE GAS AND COMBUSTION AIR FAN MODULATION.

PROVIDE WITH GAS FLEX CONNECTOR, CHAIN HANGING KIT AND 2-STAGE WALL THERMOSTAT WITH NIGHT SETBACK.

RADIANT HEATER SHALL OPERATE WITH A NATURAL GAS PRESSURE RANGE OF 5"-14" W.C.

		G	RILLES, F	REGISTER	S & DIFF	USERS SO	CHEDULE		
PLAN	MANUFACTURER	TYPE &	NECK	FACE	VOLUME		MOUNTING		
CODE	& MODEL NO.	SERVICE	SIZE	SIZE	DAMPER	MATERIAL	TYPE	FINISH	REMARKS
					(OBD)				
CD-1	PRICE SMDA	SUPPLY	AS NOTED	24"x24"	NO	STEEL	LAY-IN	WHITE	NOTE: 1
CD-2	PRICE SMDA	SUPPLY	AS NOTED	12"x12"	NO	STEEL	SURFACE	WHITE	NOTE: 2,3
CD-3	PRICE SMDA	SUPPLY	AS NOTED	12"x12"	YES	STEEL	SURFACE	WHITE	NOTE: 2,3
SG-1	PRICE 520	SUPPLY	AS NOTED	NECK+1.75"	NO	STEEL	SURFACE	WHITE	
SR-1	AIR CONCEPTS DL-C	SUPPLY	AS NOTED	NECK+2.5"	YES	ALUMINUM	DUCT	BY ARCH.	NTOE: 6
RG-1	PRICE PDDR	RETURN	AS NOTED	24"x24"	NO	STEEL	LAY-IN	WHITE	NOTE: 5
RG-2	PRICE PDDR	RETURN	AS NOTED	24"x12"	NO	STEEL	LAY-IN	WHITE	NOTE: 5
TG-1	PRICE 530	EXHAUST	AS NOTED	NECK+1.75"	NO	STEEL	SURFACE	WHITE	
ER-1	AIR CONCEPTS DL-C	EXHAUST	AS NOTED	NECK+2.5"	YES	ALUMINUM	DUCT	BY ARCH.	NOTE: 6
EG-1	PRICE 535	EXHAUST	AS NOTED	NECK+1.75"	NO	STEEL	SURFACE	WHITE	

24"x24" MODULE WITH FULL LOUVERED FACE.

12"x12" MODULE WITH FULL LOUVERED FACE.

PROVIDE HARD LID TRIM KIT.

PROVIDE (4)-1-1/2" SLOTS AND MANUFACTURER'S INSULATED SUPPLY PLENUM.

PROVIDE FIELD FABRICATED SOUND BOOT. REFER TO DETAIL.

			H∨	LS F	AN SCH	HEDULE						
PLAN	MANUFACTURER		RPM		MOTOR	DIMEN	ISIONS		WT	VIB.	DAMPER	
CODE	& MODEL NO.	SERVICE	@ S.L.	MCA	V/ø/HZ	Н	W	L	(LBS)	ISOL.	TYPE	REMARKS
CF-1	BIG ASS FANS ESSENCE	BAYS	56	10.0	120/1/60	NOTE: 7	14'	Ø	100	NONE	NONE	NOTES: 1,2,3,5,6

AIRFOIL, HARDWARE AND COLOR SELECTION BY ARCHITECT. PROVIDE WITH WIRED WALL CONTROLER. INSTALL PER MANUFACTURER'S REQUIRMENTS.

PROVIDE WITH EXTENSION TUBE.

PROVIDE WITH TALL CEILING KIT AND STABILIZER KIT.

COORDINATE MOUNTING TYPE WITH STRUCTURE ABOVE.

PROVIDE AIR DEVICE WITH OPPOSED BALDE MANUAL VOLUME DAMPER.

INTERLOCK FAN WITH FIRE CONTROL PANEL FOR SHUTDOWN DURING ACTIVATION.

REFER TO DRAWINGS FOR INSTALLATION HEIGHT. COORDINATE EXTENSION ARM LENGTH WITH STRUCTURE ABOVE.

PLAN	MANUFACTURER				CFM	T.S.P.	RPM	M	OTOR	WT	VIB.	CONTROL	DAMPER	
CODE	& MODEL NO.	TYPE	SERVICE	SONES				HP	V/Ø/HZ	(LBS)	ISOL.		TYPE	REMARKS
EF-1	GREENHECK SQ-160-VG	INLINE	BAY EXHAUST	8.6	2,000	0.50	995	3/4	208/1/60	175	NOTE: 1	NOTE: 5,8	GRAVITY BDD	NOTE: 2,3
EF-2	GREENHECK SQ-160-VG	INLINE	BAY EXHAUST	8.6	2,000	0.50	995	3/4	208/1/60	175	NOTE: 1	NOTE: 5,8	GRAVITY BDD	NOTE: 2,3
EF-3	GREENHECK SQ-80-VG	INLINE	CONT. BAY EXHAUST	6.1	250	0.25	1,393	1/10	120/1/60	75	NOTE: 1	NOTE: 7	GRAVITY BDD	NOTE: 2,3
EF-4	GREENHECK SQ-70-VG	INLINE	WORKSHOP 137	4.5	150	0.25	1,546	1/15	120/1/60	50	NOTE: 1	NOTE: 5	GRAVITY BDD	NOTE: 2,3,10
EF-5	GREENHECK SQ-70-VG	INLINE	COMP 140 & SCBA 138	4.5	150	0.25	1,546	1/15	120/1/60	50	NOTE: 1	NOTE: 6	GRAVITY BDD	NOTE: 2,3
EF-6	GREENHECK SQ-80-VG	INLINE	DECON 142 & PPE STOR 141	6.9	300	0.25	1,510	1/10	120/1/60	75	NOTE: 1	NOTE: 7	GRAVITY BDD	NOTE: 2,3
EF-7	GREENHECK SP-A200	CEILING	BATHROOM 201	1.5	125	0.25	703	20 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-8	GREENHECK SP-A200	CEILING	BATHROOM 117	1.5	125	0.25	703	20 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-9	GREENHECK SP-A200	CEILING	BATHROOM 118	1.5	125	0.25	703	20 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-10	GREENHECK SP-A200	CEILING	BATHROOM 119	1.5	125	0.25	703	20 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-11	GREENHECK SP-A200	CEILING	ADA BATHROOM 120	1.5	125	0.25	703	20 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-12	GREENHECK SP-A200	CEILING	UNISEX 103	1.4	100	0.25	664	16 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-13	GREENHECK SP-A200	CEILING	RR 130	1.4	100	0.25	664	16 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-14	GREENHECK SP-A200	CEILING	JAN 146	1.4	100	0.25	664	16 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-15	GREENHECK SP-A200	UPBLAST	JANITOR 202	1.4	100	0.25	664	16 W	120/1/60	40	NOTE: 1	NOTE: 4	GRAVITY BDD	NOTE: 3,9
EF-16	GREENHECK AER-E20C-610-VG	SIDEWALL PROP.	HOSE TOWER 204	18.7	2,000	0.50	1,554	1/2	120/1/60	100	NOTE: 1	NOTE: 6	GRAVITY BDD	NOTE: 2,3
TF-1	GREENHECK SQ-100-VG	INLINE	MECH	6.1	750	0.25	1,154	1/4	120/1/60	75	NOTE: 1	NOTE: 6	GRAVITY BDD	NOTE: 2,3

1.	REFER TO SPECIFICATIONS FOR VIBRATION AND SOUND ISOATION REQUIREMENTS.
2.	PROVIDE VARIABLE SPEED ECM MOTOR, CONTROL WITH MOTOR POTENTIOMENTER OR 0-10V SIGNAL.
3.	PROVIDE MANUFACTURER'S INTEGRAL DISCONNECT SWITCH.
4.	FAN CONTROLLED BY WALL SWITCH BY DIVISION 26.

FAN SHALL RUN BASED ON WALL MOUNTED ON/OFF SWITCH WITH ADJUSTABLE SPIN TIMER.

REVERSE ACTING THERMOSTAT SHALL ENERGIZE FAN UPON RISE IN TEMPERATURE ABOVE SETPOINT. FAN SHALL RUN CONTINUOUSLY 24/7/365 TO CONTINOUSLY VENTILATE THE SPACE.

FAN SHALL ENERGIZE VIA DRY CONTACT FROM THE CO/NO2 DETECTION CONTROL PANEL.

				LOU	VER S	CHEDUL	.E					
PLAN	MANUFACTURER	SERVICE	FREE	CFM	VEL.	A.P.D.	MOUNTING	MATERIALS		SIZE		REMARKS
CODE	& MODEL NO.		AREA		(FPM)	(IN. W.C.)	TYPE			(INCHES	)	
			(SQ. FT.)						W	Н	D	
LVR-1	RUSKIN ELF375DX	BAY EXHAUST	2.9	2,000	685	0.10	STANDARD	NOTE: 1	36"	24"	4"	NOTES: 2,3
LVR-2	RUSKIN ELF375DX	BAY EXHAUST	2.9	2,250	771	0.13	STANDARD	NOTE: 1	36"	24"	4"	NOTES: 2,3
LVR-3	RUSKIN ELF375DX	BAY MAKE UP AIR	5.6	4,250	756	0.12	STANDARD	NOTE: 1	48"	32"	4"	NOTES: 2,3
LVR-4	RUSKIN ELF375DX	WORKSHOP EXHAUST	0.5	150	304	0.02	STANDARD	NOTE: 1	16"	12"	4"	NOTES: 2,3
LVR-5	RUSKIN ELF375DX	COMP & SCBA EXHAUST	0.5	150	304	0.02	STANDARD	NOTE: 1	16"	12"	4"	NOTES: 2,3
LVR-6	RUSKIN ELF375DX	DECON & PPE STOR EXHAUST	0.5	300	608	0.08	STANDARD	NOTE: 1	16"	12"	4"	NOTES: 2,3
LVR-7	RUSKIN ELF375DX	HOSE TOWER MAKE UP AIR	3.7	2,900	780	0.13	STANDARD	NOTE: 1	36"	30"	4"	NOTES: 2,3

0.10

STANDARD

STANDARD

9. PROVIDE VARIABLE SPEED ECM MOTOR, CONTROL WITH THREE SPEED SWITCH.

NOTE: 1

NOTE: 1

24"

10. PROVIDE FAN WITH INLET FAN GUARD.

EXTRUDED ALUMINUM.

RUSKIN ELF375DX

RUSKIN ELF375DX

PROVIDE LOUVER WITH 1/2" BIRD SCREEN.

PROVIDE LOUVER WITH ANODIZED FINISH AND COLOR SELECTION BY ARCHITECT.

HOSE TOWER EXHAUST

HOSE DRYER

2.9

1.2

2,000

685

736

			UN	IIT HE	ATER	SCH	IEDL	JLE (	ELE	CTRI	C)					
PLAN			CAP.		ELEMENT						МОТС	R		WEIGHT	CONTROL	
CODE	MANUF. & MODEL NO.	SERVICE	(MBH)	KW	VOLTS	Ø	CFM	EAT	FLA	HP	VOLTS	Ø	RPM	(LBS)		REMARKS
EUH-1	BERKO HUHAA320	136 ELEC ROOM	10.2	3.0	208	1	350	55.0	14.5	1/100	115	1	1,600	30	NOTE: 1	NOTE: 2

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Checked By Drawn By

NOTES: 2,3

NOTES: 2,3

30% DESIGN 75% DESIGN

100% DESIGN

6/26/2019

8/29/2019

ADDENDUM 2

**HVAC SCHEDULES** 

# COOLING ONLY SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

								FAN CO	IL UNIT																	CON	DENSI	NG UNI	IT								
	FAN COIL UNIT		CFM		SUPPLY FAN		(	OOLING C	OIL		TOTAL	SENS.	EA	<u></u> λΤ	LA	AT	DIMENSI	IONS				CAPACIT	Υ					ELE	ECTRICA	L (NOTE: 1	)			DIME	ISIONS	$\overline{}$	
PLAN	MANUF.	SERVICE	@	ESP W	ATTS RPM	REFRIG.	SYSTE	M ROW	S FINS/	SST	CAP.	CAP.	DB	WB	DB	WB	W D	Н	WT.	PLAN	MANUF.	TONS M	BH AMBIENT	SST		COMPRESSO	R		CONI	DENSER		SYSTEM	SYSTEM	WF	I D	WT.	
CODE	& MODEL NO.		ALT.				CHAR	SE	INCH	(°F)	(MBH)	(MBH)	(°F)	(°F)	(°F)	(°F)		(1	LBS)	CODE	& MODEL NO.			(°F)	NO.	RLA V/ø/l	lz RPM	NO.	WATTS	V/ø/Hz	RPM	MCA	MOCP			(LBS)	REMARKS
DAC-1	MITSUBISHI PKA-A24		700	0.0	56.0 1,250	R410A	6 lb 10	oz 2	19.5	45.0	22.9	21.5	85.0	61.0	50.5	48.0	46" 12"	14"	46.0	ACCU-1	MITSUBISHI PUY-A24	2.0 2	4.0 100.0	45.0	1	12.0 208/1/	60 -	1	75.0	208/1/60	750.0	18.0	30.0	37" 37	" 14"	175.0	NOTE: 2,3

1. SYSTEM REQUIRES ONE ELECTRICAL CIRCUIT. POWER IS FED TO THE OUTDOOR CONDENSING UNIT. A BRANCH LINE IS THEN FED FROM THE CONDENSING UNIT TO THE

INDOOR UNIT. REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS FOR DETAILS. 2. PROVIDE UNIT WITH MANUFACTURER SUPPLIED MICROPROCESSOR CONTROLLER AND LOW AMBIENT CONTROL. 3. PROVIDE WITH HARD WIRED ELECTRONIC PROGRAMMABLE WALL THERMOSTAT.

PLAN	MANUF. &	THERMOSTAT	INLET	AIR	QUANT	ITY	INLET	UNIT		C	OIL SE	CTION (N	IOTE:	4)		DIN	IENSIC	NS	MAX.	CONTROL	VAV	REMARKS
CODE	MODEL NO.	LOCATION	SIZE	CLG	CLG	HTG	S.P.	P.D.	MBH	GPM	WPD	COIL	EWT	EAT	LAT	Н	L	W	SOUND		ZONE	
				(MAX)	(MIN)	CFM	(IN WC)	(IN WC)			(FT)	ROWS							(dB)		EXPOSURE	
VAV-1-1	PRICE SDV	BUNK 107	8	650	230	650	1.0"	0.451	23.2	1.5	5.0	2 HC	150.0	55.0	95.0	10"	25"	12"	61	DDC	EXTERIOR	NOTE: 1,2,3
VAV-1-2	PRICE SDV	BUNK 109	8	600	210	600	1.0"	0.384	21.4	1.5	5.0	2 HC	150.0	55.0	95.0	10"	25"	12"	60	DDC	EXTERIOR	NOTE: 1,2,3,5
VAV-1-3	PRICE SDV	BUNK 111	8	600	210	600	1.0"	0.384	21.4	1.5	5.0	2 HC	150.0	55.0	95.0	10"	25"	12"	60	DDC	EXTERIOR	NOTE: 1,2,3,5
VAV-1-4	PRICE SDV	BUNK 114	7	450	160	450	1.0"	0.265	16.0	1.0	5.0	2 HC	150.0	55.0	95.0	10"	25"	12"	60	DDC	EXTERIOR	NOTE: 1,2,3
VAV-1-5	PRICE SDV	CORRIDOR	10	1,000	350	750	1.0"	0.495	20.1	1.5	5.0	2 HC	150.0	55.0	85.0	13"	25"	14"	62	DDC	INTERIOR	NOTE: 1,2,3
VAV-2-1	PRICE SDV	LOBBY 101	16	2,600	910	1,950	1.0"	0.529	69.5	3.5	5.0	2 HC	150.0	55.0	95.0	18"	29"	24"	66	DDC	EXTERIOR	NOTE: 1,2,3
VAV-2-2	PRICE SDV	LT 105	7	550	195	425	1.0"	0.396	15.2	1.0	5.0	2 HC	150.0	55.0	95.0	10"	25"	12"	63	DDC	EXTERIOR	NOTE: 1,2,3
VAV-2-3	PRICE SDV	WATCH ROOM 106	6	250	90	200	1.0"	0.162	7.1	0.5	5.0	2 HC	150.0	55.0	95.0	8"	25"	12"	51	DDC	EXTERIOR	NOTE: 1,2,3
VAV-2-4	PRICE SDV	DAYROOM 124	14	1,900	665	1,425	1.0"	0.439	38.1	2.0	5.0	2 HC	150.0	55.0	85.0	18"	29"	20"	64	DDC	INTERIOR	NOTE: 1,2,3
VAV-3-1	PRICE SDV	FITNESS ROOM 201	14	2,275	800	1,725	1.0"	0.630	61.5	3.5	5.0	2 HC	150.0	55.0	95.0	18"	29"	20"	65	DDC	EXTERIOR	NOTE: 1,2,3,5
VAV-3-2	PRICE SDV	PPE STORAGE 139	8	600	450	450	1.0"	0.384	16.0	1.0	5.0	2 HC	150.0	55.0	95.0	10"	25"	12"	60	DDC	EXTERIOR	NOTE: 1,2,3
VAV-3-3	PRICE SDV	WORKSHOP 136	7	450	450	450	1.0"	0.265	16.0	1.0	5.0	2 HC	150.0	55.0	95.0	10"	25"	12"	60	DDC	EXTERIOR	NOTE: 1,2,3

MAXIMUM SOUND POWER SCHEDULED IS END DISCHARGE SOUND POWER LEVEL BASED ON MAXIMUM SCHEDULED AIRFLOW

AT 1.0 W.G. INLET PRESSURE AT 500 HZ. OCTAVE BAND. REFER TO SPECIFICATION FOR FURTHER SOUND REQUIREMENTS.

HEATING COIL DUTY RATED AT HTG CFM.

MAXIMUM DIFFERENTIAL PRESSURE (P) IS AT MAXIMUM SCHEDULED AIRFLOW WITH REHEAT COIL WHERE INDICATED.

SELECT HEATING COIL ASSUMING 0% P.G. SOLUTION AND AN ELEVATION OF 5000'. PROVIDE TERMINAL UNIT WITH THREE WAY VALVE.

			UN	IT HE	ATER	SCH	IEDL	JLE (	ELE	CTRI	C)					
PLAN			CAP.	ı	ELEMENT						МОТО	)R		WEIGHT	CONTROL	
CODE	MANUF. & MODEL NO.	SERVICE	(MBH)	KW	VOLTS	Ø	CFM	EAT	FLA	HP	VOLTS	Ø	RPM	(LBS)		REMARKS
EUH-1	BERKO HUHAA320	136 ELEC ROOM	10.2	3.0	208	1	350	55.0	14.5	1/100	115	1	1,600	30	NOTE: 1	NOTE: 2

UNIT MOUNTED THERMOSTAT PROVIDED BY UNIT HEATER MANUFACTURER.

FLA (FULL LOAD AMPS) INCLUDES HEATING ELEMENT AND MOTOR CURRENT REQUIREMENTS, SINGLE POINT POWER REQUIRED.

		CAI	3IN	ET	UNIT	HEA	ATER	SC	HEI	DULE	E (HC	OT V	۷A	TEF	₹)			
PLAN	MANUF.	LOCATION	MBH	CFM	EAT	EWT	LWT	FLOW	WPD	EL	ECTRICAL	-	DIN	MENSIC	NS	WT.	CONTROL	REMARKS
CODE	& MODEL NO.				°F	°F	°F	(GPM)	(FT)	HP	V/ø/Hz	RPM	D	L	Н	(LBS)		
CUH-1	VULCAN C-1150-04	LOBBY 101	22.2	430	60.0	150.0	110.0	1.5	1.5	1/10	120/1/60	1,050	25"	47"	10"	150	NOTE: 1	NOTE: 2,3,4,5,6,7

1. UNIT MOUNTED THERMOSTAT PROVIDED BY CABINET UNIT HEATER MANUFACTURER. 2. HOT WATER SYSTEM UTILIZES 0% PROPYLENE GLYCOL.

3. CEILING MOUNTED CABINET, HANG EXPOSED FROM STRUCTURE ABOVE. 4. PROVIDE UNIT WITH FACTORY MOUNTED INTEGRAL DISCONNECT SWITCH. 5. PROVIDE WITH HIGH CAPACITY 2 ROW COIL.

6. FRONT RETURN FRONT SUPPLY

7. COLOR SELECTION BY ARCHITECT.

				CONE	DENS	ING \	WATER	ВО	ILEF	R S	CHE	DUL	_E						
			MBH	HEATNG	WATER	ASME	RELIEF VALVE					WATER				SIZE (IN	)	OPER	
LAN	MANUFACTURER	SERVICE	INPUT	OUTPUT	VOLUME	(PSIG)	SETTING	V/ø/Hz	МОР	EWT	LWT	FLOW	%	WPD	L	W	Н	WT.	REMARKS
ODE	& MODEL NO.		S.L.	(5,000')	(GAL)	RATING	PSIG			(°F)	(°F)	(GPM)	P.G.	(FT)				(LBS)	
							·									$\overline{}$		, and the second second	

27.0

NOTES:

B-2

PROVIDE UNIT WITH 30 PSI RELIEF VALVE.

TRIANGLE TUBE 399

FM GAS TRAIN RATED FOR 5" TO 13" GAS INLET PRESSURE.

TRIANGLE TUBE 399 HEATING WATER

PROVIDE WITH MANUFACTURER SUPPLIED CONDENSATE NEUTRALIZATION KIT.

HEATING WATER

399.0

399.0

304.1

304.1

7.4

80.0

150.0 120/1/60 200 NOTE: 1,2,3,4,5 15.0 110.0 15.2

4. PROVIDE UNIT WITH MANUFACTURER APPROVED WALL MOUNTING KIT. 5. PROVIDE EXTERNAL LOW WATER CUTOFF. MCDONNEL & MILLER RB-122E.

			PUMP S	SCH	EDl	JLE						
				IMP.				EL	ECTRICAL			
PLAN	MANUFACTURER	TYPE	SERVICE	DIA.	GPM	TDH	EFF.	HP	VOLT/	RPM	WT.	REMARKS
CODE	& MODEL NO.			(IN)		(FT)	EEI		ø/HZ		(LBS)	
CP-1	GRUNDFOS UP 26-99F	WET ROTOR	B-1 CIRC	-	15.0	20.0	-	1/6	120/1/60	3,500	25	NOTE: 1
CP-2	GRUNDFOS UP 26-99F	WET ROTOR	B-2 CIRC	-	15.0	20.0	-	1/6	120/1/60	3,500	25	NOTE: 1
P-1	GRUNDFOS MAGNA3 40-180F	WET ROTOR	HEATING WATER	-	30.0	50.0	-	607 W	208/1/60	3,500	75	NOTE: 1,2,3
P-2	GRUNDFOS MAGNA3 40-180F	WET ROTOR	HEATING WATER	-	30.0	50.0	-	607 W	208/1/60	3,500	75	NOTE: 1,2,3
NOTEO												

NOTES:

SYSTEM UTILIZES 0% PROPLYENE GLYCOL.

PROVIDE PUMP WITH INTEGRAL VFD AND CONTROLLER.

PROVIDE PUMP WITH INNTEGRAL CONTROLS TO CONTROL PUMP SPEED AND INCLUDE A BACNET MS/TP INTERFACE CARD.

				WA	TER	FEE	DER S	CHEDU	ILE						
			S'	YSTEM PL	JMP	TANK	UNIT "ON"	UNIT "OFF"	SYSTEM	TANK				OPER.	
PLAN	MANUF. &	SERVICE	FLOW	HEAD	MOTOR	SIZE	PRESSURE	PRESSURE	ELECTRICAL	P.G.	U	NIT SIZ	Έ	WT.	
CODE	MODEL NO.		(GPM)	(PSI)	WATTS	(GAL)	(PSI)	(PSI)	REQUIREMENTS	(%)	L	W	Н	(LBS)	REMARKS
WF-1	AXIOM MF-200	BOILER MAKE UP WATER	0.7	25.0	50 W	6.6	10.0	25.0	NOTE: 1	0.0	12"	12"	16"	160	NOTE: 2,3,4,5

PROVIDE A DEDICATED 120/1/60 20 AMP CIRCUIT WITH A GFI RECEPTACLE LOCATED

WITHIN 3 FEET OF AND BEHIND UNIT.

TANK SHALL BE POLYETHYLENE OF SIZE AS INDICATED MOUNTED IN A STEEL FRAME.

SYSTEM PUMP SHALL BE BRONZE ROTARY GEAR TYPE.

PROVIDE FLOAT SWITCH FOR LOW LEVEL PUMP SHUTOFF AND AUDIBLE ALARM.

PROVIDE NEMA 4X UNIT CONTROL PANEL.

AIR SEPARATOR SCHEDULE WPD STRAINER WEIGHT SYSTEM **DIMENSIONS (NOTE: 2)** REMARKS LENGTH CONN. SIZE HEIGHT DIA. HEATING WATER 30.0 1.0 YES 2.0" 150 NOTE: 1,2,3

NOTES:

PLAN

CODE

AS-1

SYSTEM UTILIZES 0% PROPLYENE GLYCOL.

SYSTEMS CONTAINS 0% PROPLYENE GLYCOL.

2. SYSTEM VOLUME IS TOTAL VOLUME.

**MANUFACTURER** 

& MODEL NO.

SPIROTHERM VDX 200

LENGTH DIMENSION IS FLANGE TO FLANGE CONNECTION DISTANCE.

PROVIDE WITH FACTORY INSULATION.

			E	XPAN	ISION '	TAN	IK SCHED	ULE							
PLAN															
CODE	& MODEL NO.		VOLUME	VOLUME	VOLUME	EWT	TEMPERATURE	PRESSURE	PRESSURE	DIA.	HT.	WEIGHT	REMARKS		
ET-1	ARMSTRONG 85-L	HEATING WATER	23.0	23.0	150.0	40.0	150.0	12.0	27.0	16"	37"	200	NOTE: 1,2,3		
NOTES:															

ASME PRESSURE RATING EQUALS 125 PSI.



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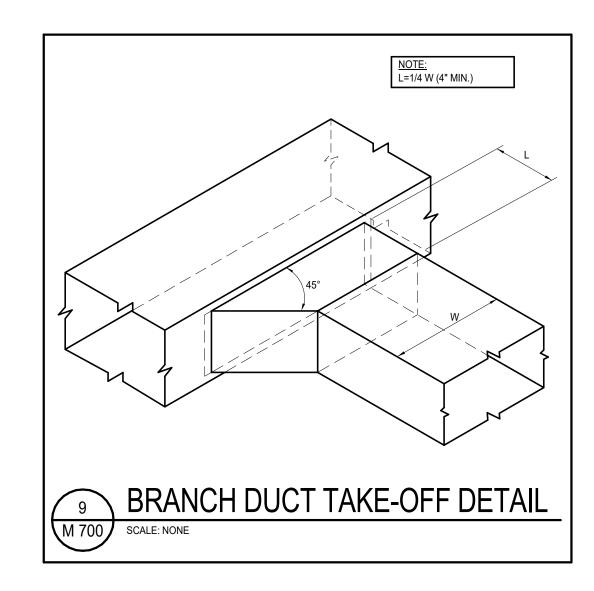
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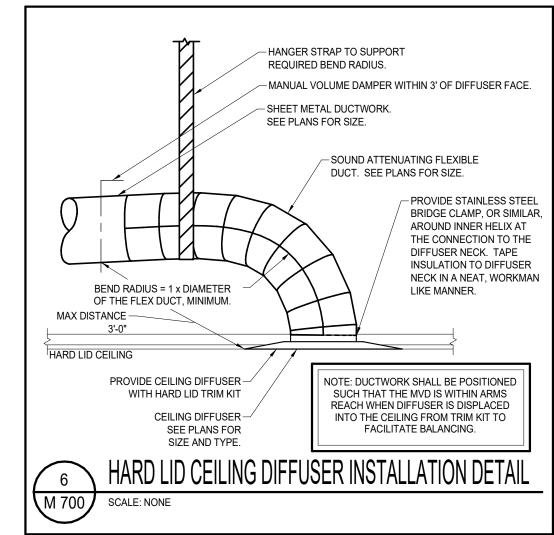
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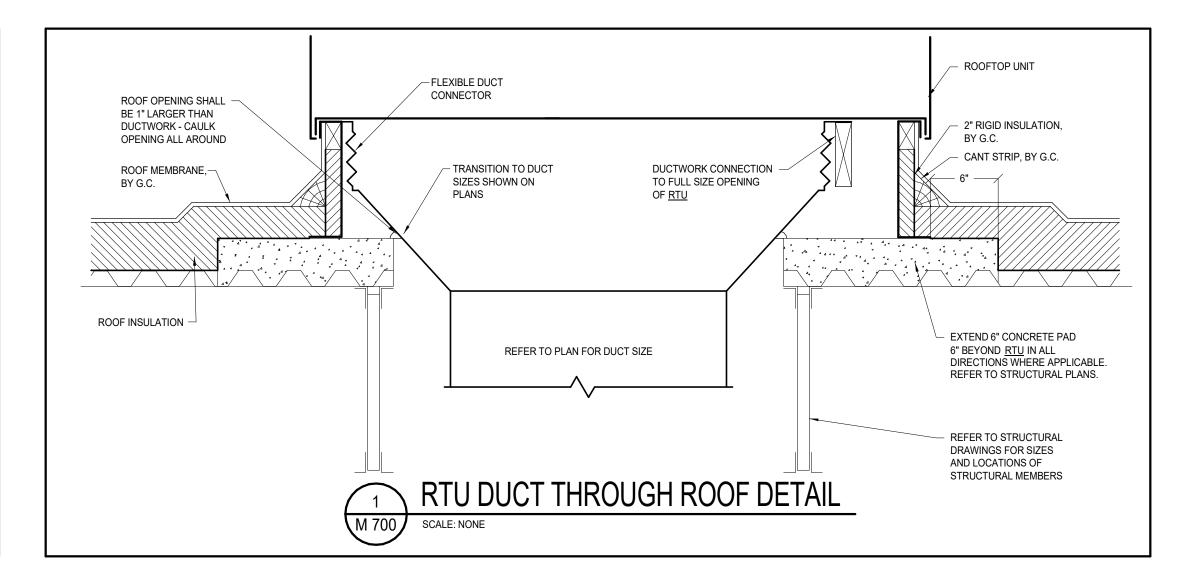
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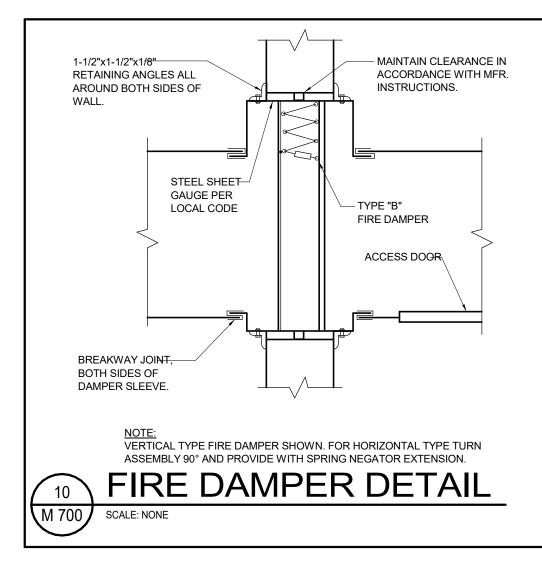
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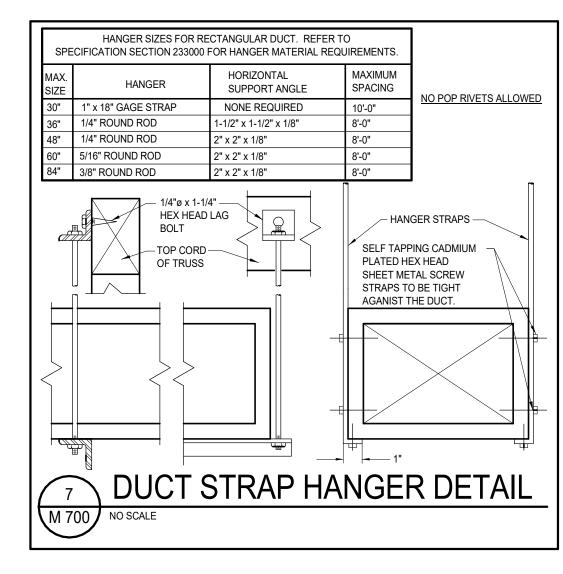
**HVAC SCHEDULES** 

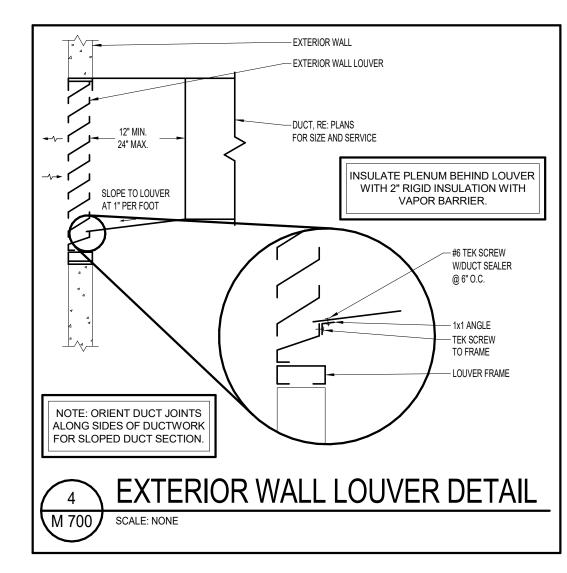


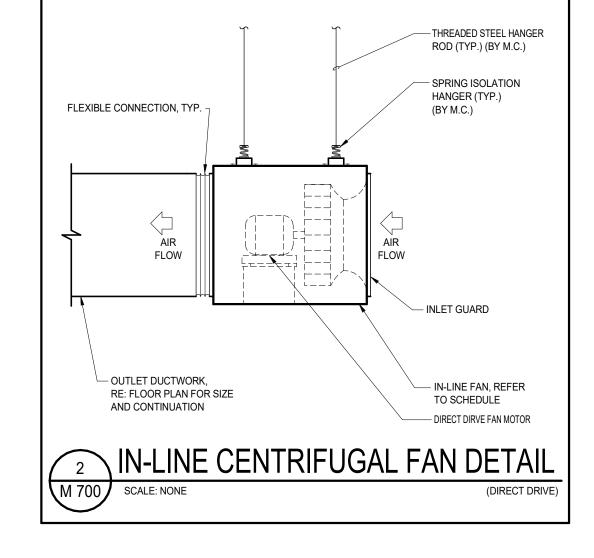


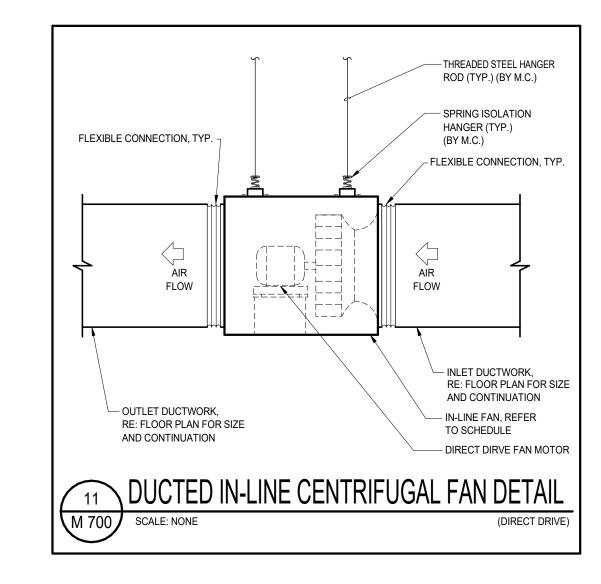


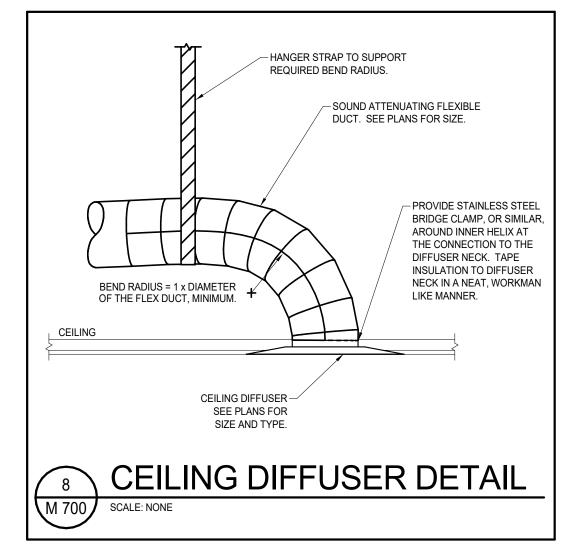


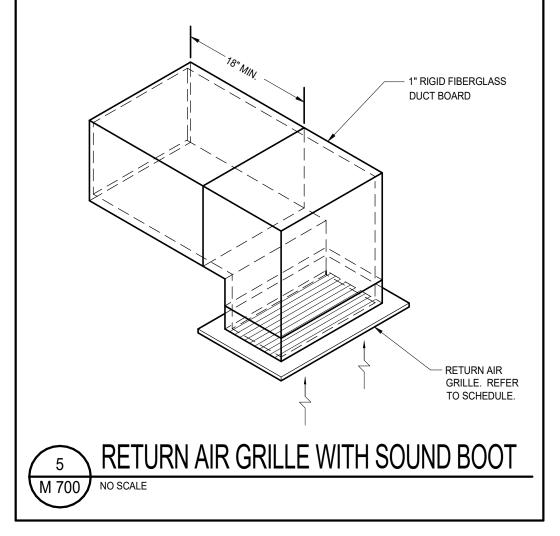


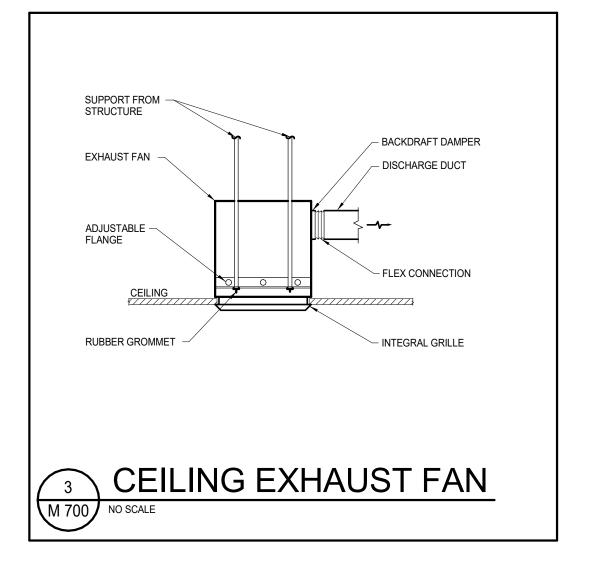
















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City of Greeley

GREELEY FIRE STATION #

City of Selection of Colorado Colorado

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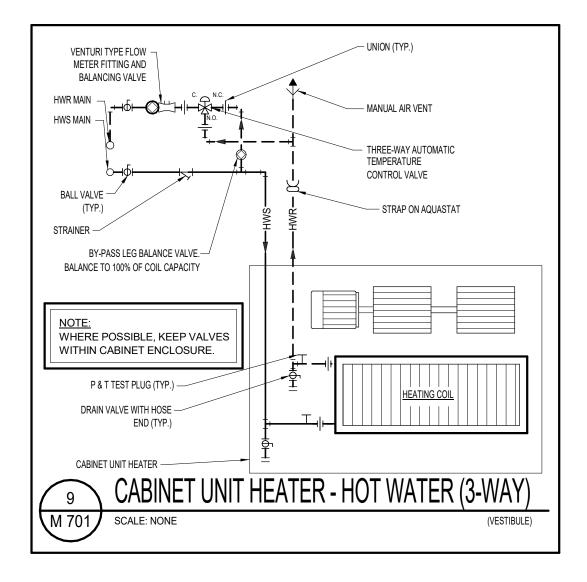
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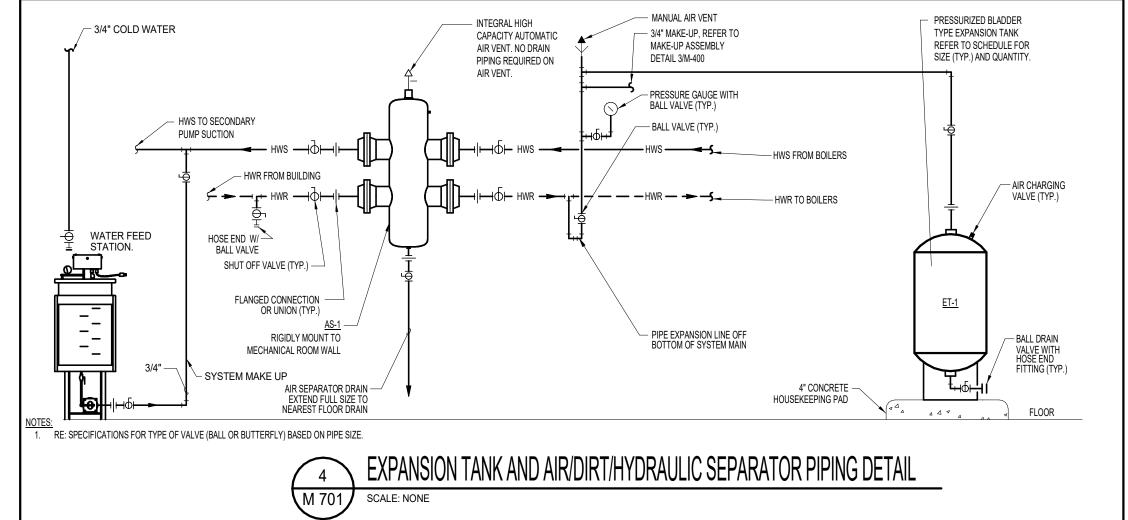
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75% DESIGN

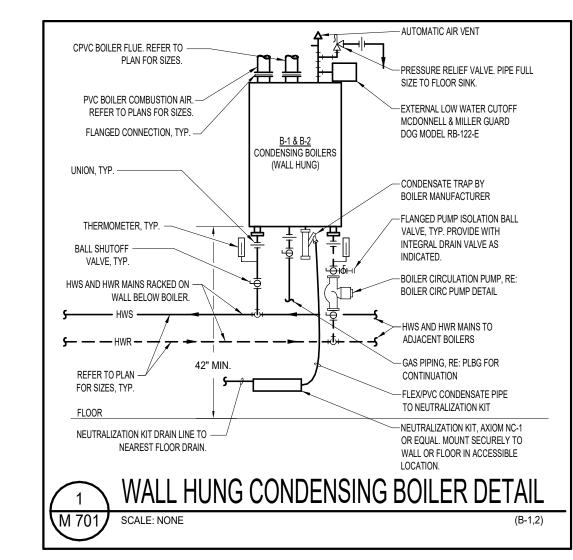
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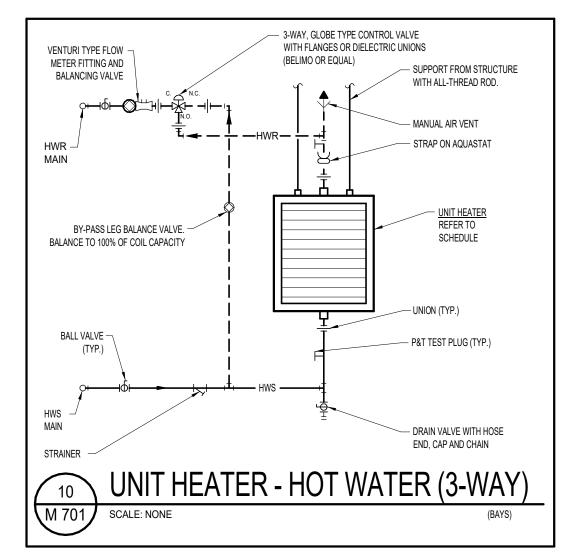
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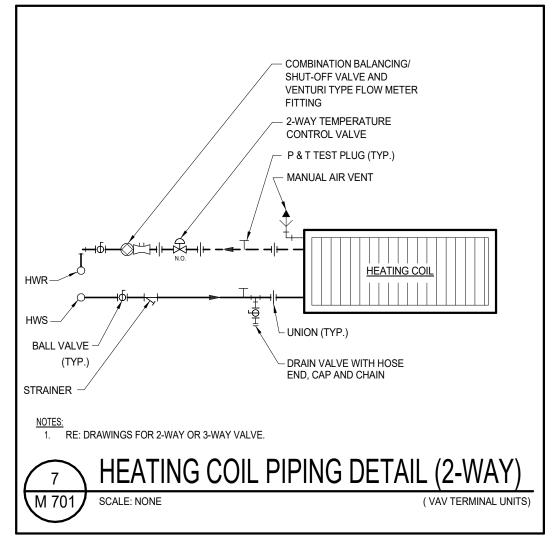
HVAC DETAILS

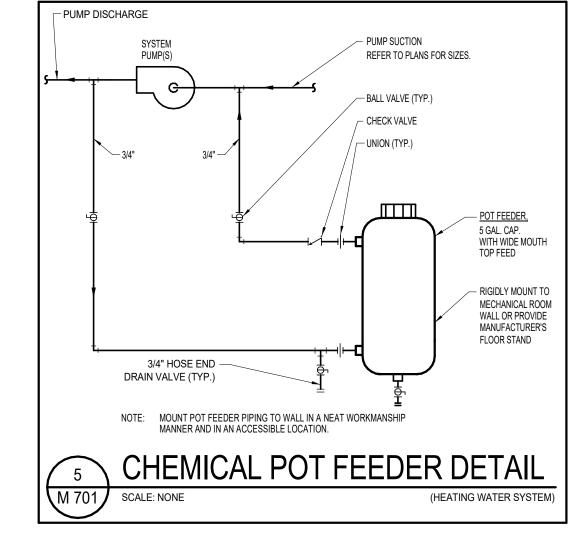


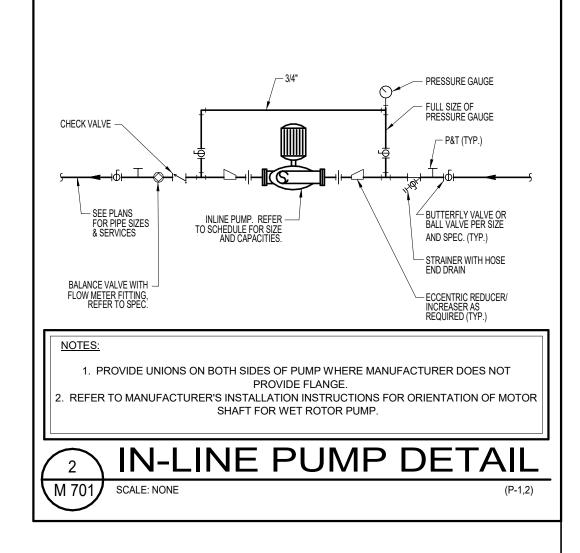


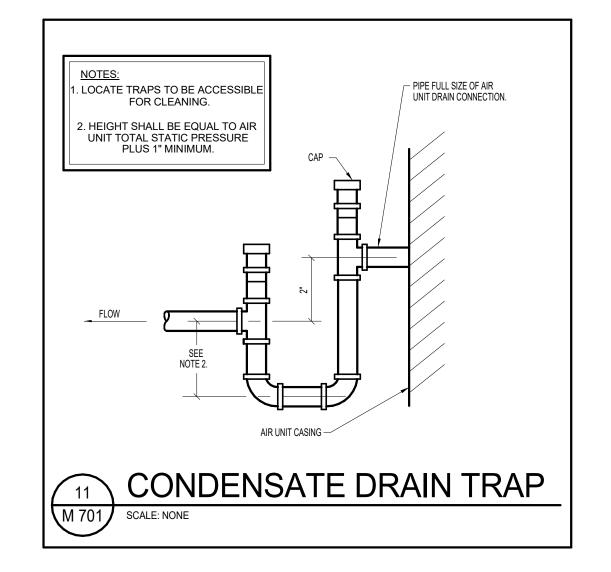


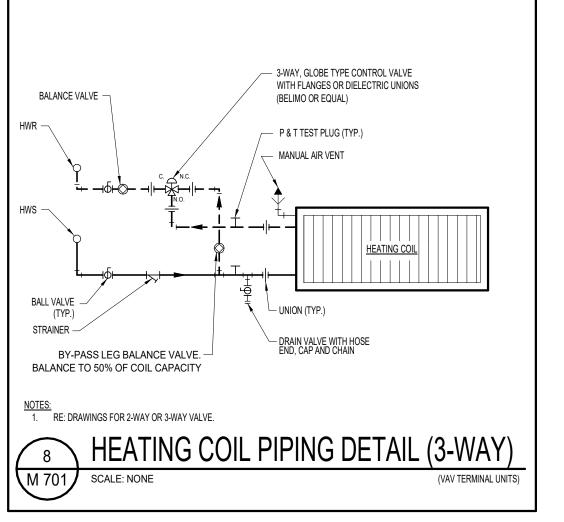


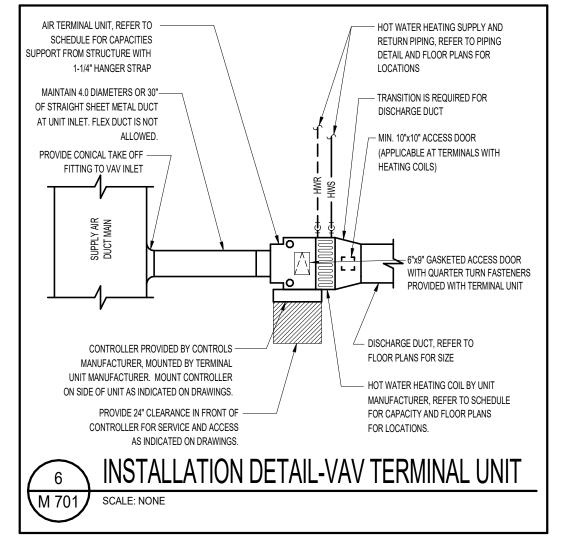


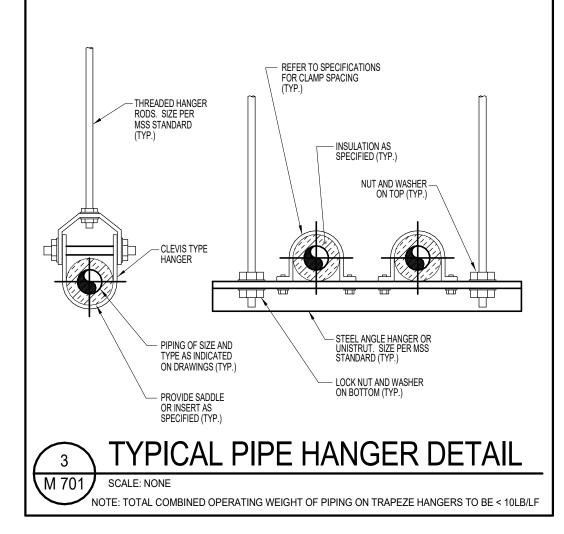
















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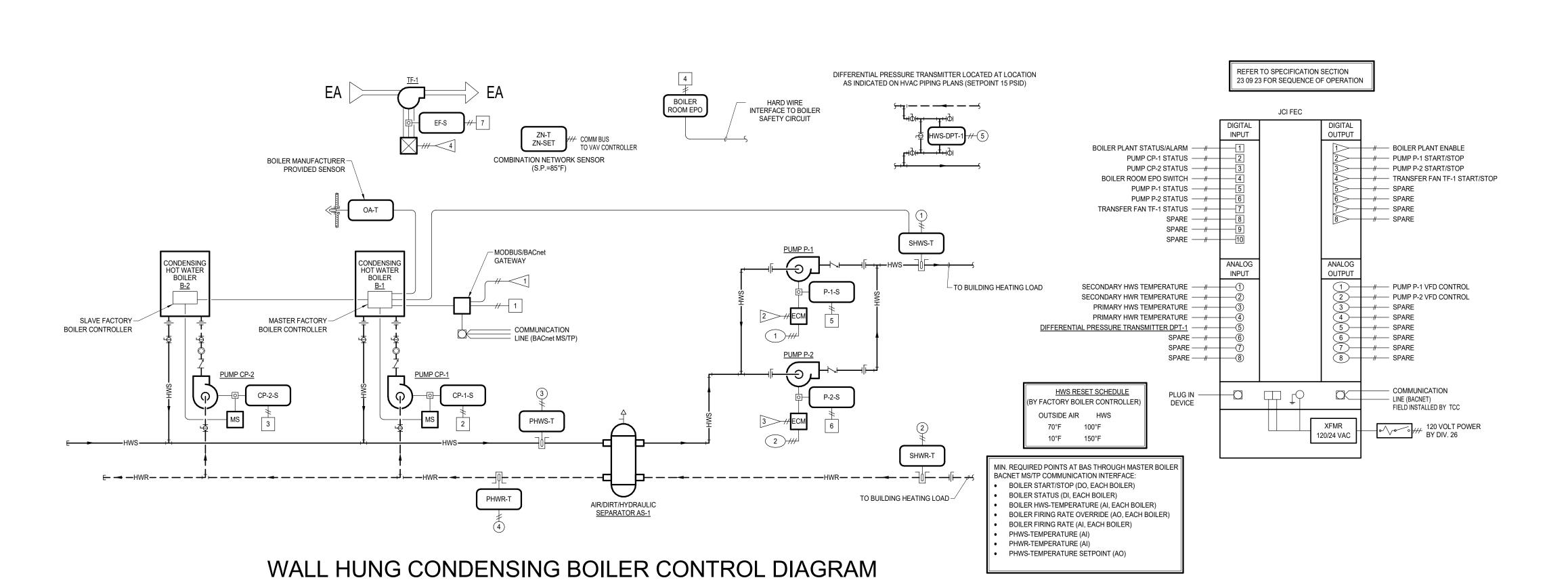
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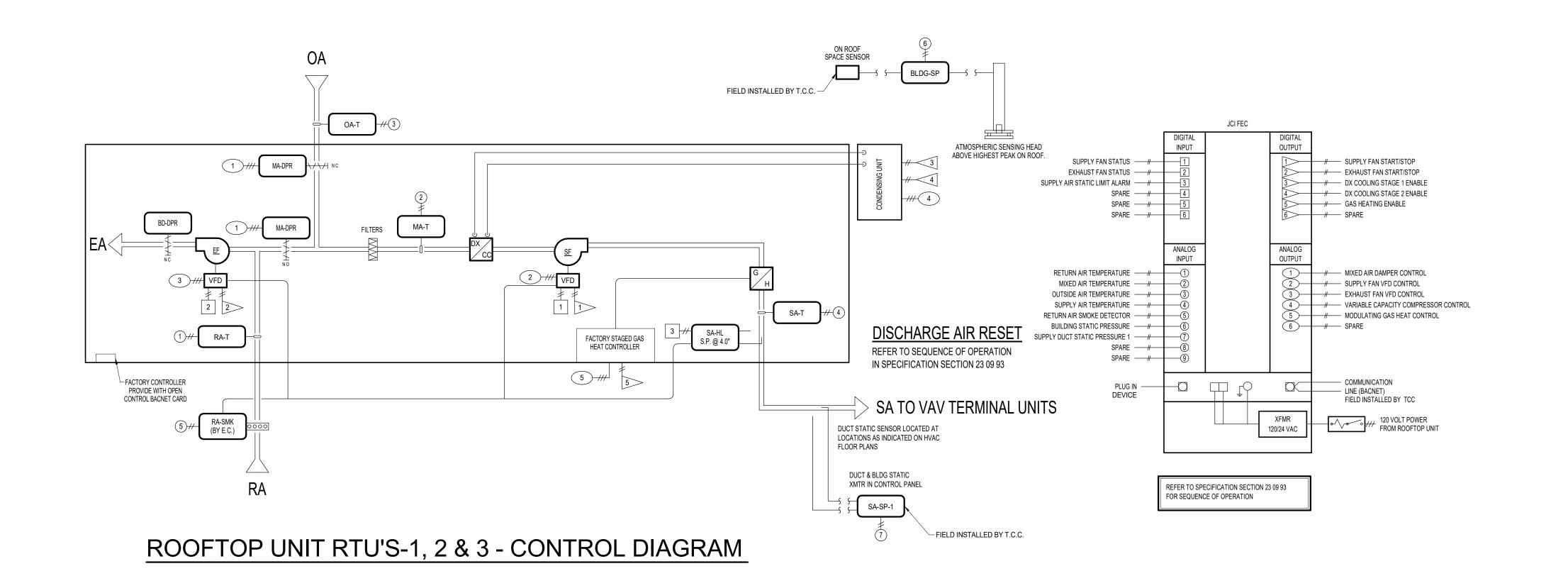
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Revision Issue

HVAC DETAILS





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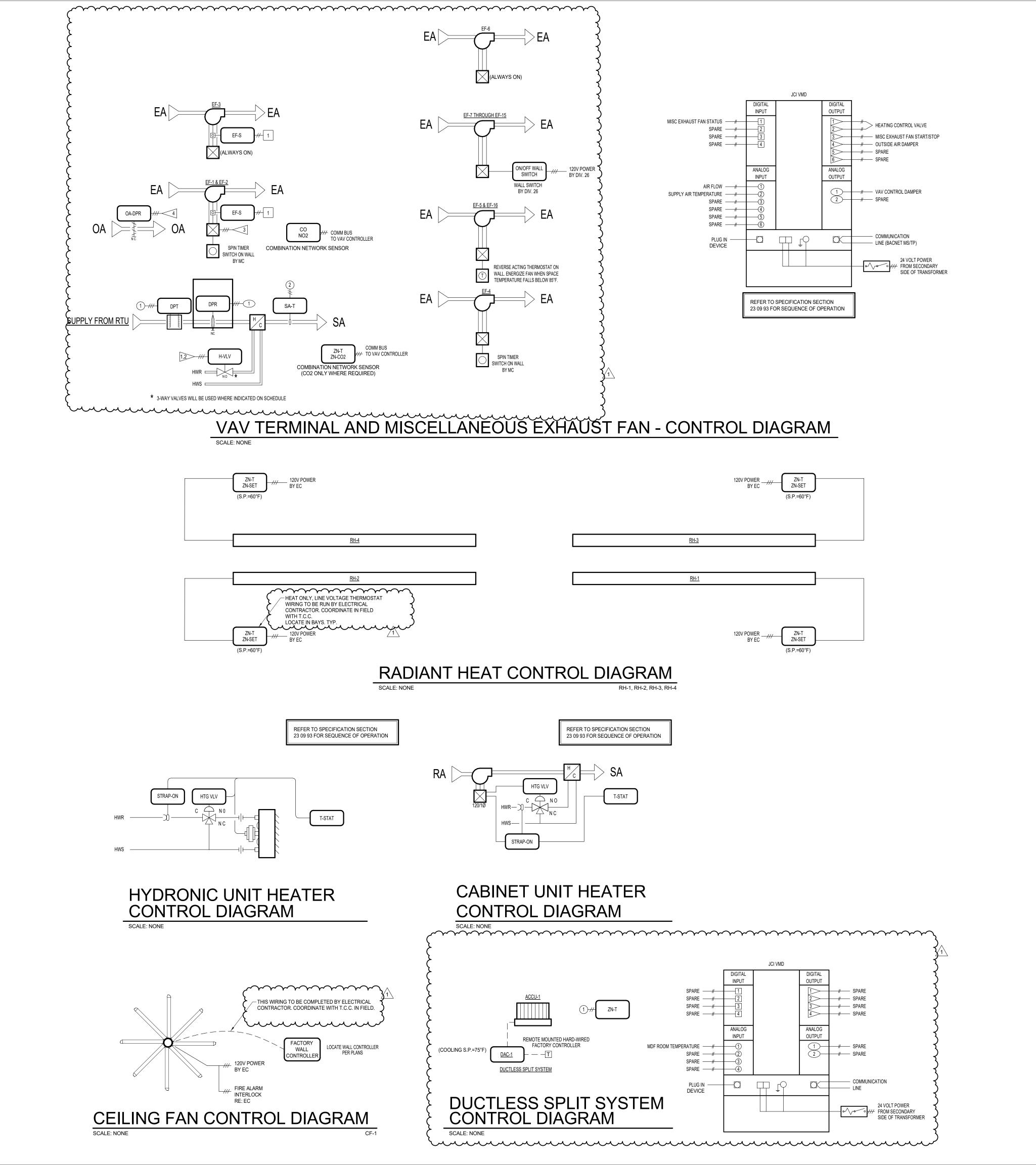
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HVAC CONTROL DIAGRAMS







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LEY FIRE STATION #2

City of Colorado

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Revision Issue

ADDENDUM 2

HVAC CONTROL DIAGRAMS

# 2015 IMC MINIMUM OUTDOOR AIR REQUIREMENTS - MULTIPLE ZONE

Project: GREELY FIRE STATION #2

Project #: 19054

SYSTEM: RTU-2
OPERATING MODE: HEATING

ROOM	ROOM	ZONE	OCCUPANCY	FLOOR	DESIGN	OA/	OA/	AIR	ZONE AIR	REQUIRED	SA	PRIMARY	ZONE
NAME	NO.	TAG	CATEGORY	AREA	POP.	PERSON	SF	DISTRIBUTION	DISTRIBUTION	OA TO ZONE	TO ZONE	OUTDOOR AIR	VENT.
				(SF)				TYPE	EFFECTIVENESS	(CFM)	(CFM)	FRACTION	EFF.
						(Rp)	(Ra)		(Ez)	(Voz)		(Zpz)	(Evz)
LOBBY	101	VAV-2-1	Lobbies	395	59	5.0	0.06	CSCRH	0.8	399.9	1,950	0.21	0.98
EXAM	102	VAV-2-2	Office space	100	1	5.0	0.06	CSCRH	0.8	10.6	150	0.07	1.11
UNISEX	103	VAV-2-2	Corridors	90	0	0.0	0.06	CSCRH	0.8	6.8	50	0.14	1.05
PROGRAMS	104	VAV-2-2	Office space	105	1	5.0	0.06	CSCRH	0.8	11.2	125	0.09	1.09
LT	105	VAV-2-2	Office space	125	1	5.0	0.06	CSCRH	0.8	13.3	125	0.11	1.08
WATCHRM	129	VAV-2-3	Break rooms	185	5	5.0	0.06	CSCRH	0.8	42.8	125	0.34	0.84
RR	130	VAV-2-3	Corridors	85	0	0.0	0.06	CSCRH	0.8	6.4	50	0.13	1.06
DAYROOM	125	VAV-2-4	Dayroom	500	15	5.0	0.06	CSCRH	0.8	131.3	300	0.44	0.75
DINNING	126	VAV-2-4	Restaurant dining rooms	205	14	7.5	0.18	CSCRH	0.8	180.7	450	0.40	0.78
KITCHEN	115	VAV-2-5	Kitchen (cooking)	350	7	7.5	0.12	CSCRH	0.8	118.1	675	0.18	1.01

\*PER IMC 403.3.1.1.2.3.2, SYSTEM VENTILATION EFFICIENCY (Ev)

SYSTEM AVERAGE OUTDOOR AIR FRACTION Xs > 0.15

ASHRAE 62.1, APPENDIX A, PER FOOTNOTE 3 ON ASHRAE 62.1 TABLE 6.2.5.2

AS CALCULATED BY:

FLOOR AREA SERVED BY SYSTEM

POPULATION OF SYSTEM

(Ps)

102

OA REQ'D PER UNIT AREA FOR SYSTEM (AVG)

OA REQ'D PER PERSON FOR SYSTE AREA (AVG)

UNCORRECTED OUTDOOR AIR INTAKE

(Vou)

737

CFM

DESIGN PRIMARY SUPPLY FAN AIRFLOW

(Vps)

4,000

CFM

IMC TABLE 403.3.1.1.2.3.2:

MAX Zp 0.44
SYSTEM VENTILATION EFFICIENCY (Ev) 0.71

(Ev) 0.71

ASHRAE 62.1-2013 NORMATIVE APPENDIX A:

AVERAGE OUTDOOR AIR FRACTION (Xs) 0.18
SYSTEM VENTILATION EFFICIENCY (Ev) 0.75

TOTAL REQUIRED OUTDOOR AIR INTAKE FLOW RATE\* (Vot) 987 CFM

TOTAL OUTDOOR AIR PROVIDED 1,500 CFM

# 2015 IMC MINIMUM OUTDOOR AIR REQUIREMENTS - MULTIPLE ZONE

Project: GREELY FIRE STATION #2

Project #: 19054

SYSTEM: RTU-1
OPERATING MODE: HEATING

ROOM	ROOM	ZONE	OCCUPANCY	FLOOR	DESIGN	OA/	OA/	AIR	ZONE AIR	REQUIRED	SA	PRIMARY	ZONE
NAME	NO.	TAG	CATEGORY	AREA	POP.	PERSON	SF	DISTRIBUTION	DISTRIBUTION	OA TO ZONE	TO ZONE	OUTDOOR AIR	VENT.
				(SF)				TYPE	EFFECTIVENESS	(CFM)	(CFM)	FRACTION	EFF.
						(Rp)	(Ra)		(Ez)	(Voz)		(Zpz)	(Evz)
BUNK	107	VAV-1-1	Bedroom/living room	165	2	5.0	0.06	CSCRH	0.8	22.7	350	0.06	1.00
BUNK	108	VAV-1-2	Bedroom/living room	160	2	5.0	0.06	CSCRH	0.8	22.0	300	0.07	1.00
BUNK	109	VAV-1-3	Bedroom/living room	160	2	5.0	0.06	CSCRH	0.8	22.0	300	0.07	1.00
BUNK	110	VAV-1-4	Bedroom/living room	160	2	5.0	0.06	CSCRH	0.8	22.0	300	0.07	1.00
BUNK	111	VAV-1-5	Bedroom/living room	160	2	5.0	0.06	CSCRH	0.8	22.0	300	0.07	1.00
BUNK	112	VAV-1-6	Bedroom/living room	165	2	5.0	0.06	CSCRH	0.8	22.7	400	0.06	1.01
BUNK	114	VAV-1-7	Bedroom/living room	160	2	5.0	0.06	CSCRH	0.8	22.0	275	0.08	0.99
BUNK	115	VAV-1-8	Bedroom/living room	160	2	5.0	0.06	CSCRH	0.8	22.0	275	0.08	0.99
LAUNDRY	116	VAV-1-9	Laundry rooms, central	100	1	5.0	0.12	CSCRH	0.8	21.3	275	0.08	0.99
BATHROOM	117	VAV-1-9	Corridors	100	0	0.0	0.06	CSCRH	0.8	7.5	50	0.15	0.92
BATHROOM	118	VAV-1-9	Corridors	85	0	0.0	0.06	CSCRH	0.8	6.4	50	0.13	0.94
BATHROOM	119	VAV-1-9	Corridors	85	0	0.0	0.06	CSCRH	0.8	6.4	50	0.13	0.94
ADA BATHROOM	120	VAV-1-9	Corridors	110	0	0.0	0.06	CSCRH	0.8	8.3	50	0.17	0.90
CORRIDOR	129	VAV-1-9	Corridors	390	0	0.0	0.06	CSCRH	0.8	29.3	125	0.23	0.84
CORRIDOR	145	VAV-1-9	Corridors	290	0	0.0	0.06	CSCRH	0.8	21.8	125	0.17	0.90
STORAGE	182	VAV-1-9	Storage rooms	50	0	0.0	0.12	CSCRH	0.8	7.5	50	0.15	0.92

\*PER IMC 403.3.1.1.2.3.2, SYSTEM VENTILATION EFFICIENCY (Ev)

AS CALCULATED BY:

IMC, TABLE 403.3.1.1.2.3.2

FLOOR AREA SERVED BY SYSTEM

(As) 2,500 sf

POPULATION OF SYSTEM

(Ps) 14

OA REQ'D PER UNIT AREA FOR SYSTEM (AVG)

(Ras) 0.06 CFM

OA REQ'D PER PERSON FOR SYSTE AREA (AVG)

UNCORRECTED OUTDOOR AIR INTAKE

(Vou) 229 CFM

DESIGN PRIMARY SUPPLY FAN AIRFLOW

(Vps) 3,275 CFM

IMC TABLE 403.3.1.1.2.3.2:

MAX Zp 0.23
SYSTEM VENTILATION EFFICIENCY (Ev) 0.92

SYSTEM VENTILATION EFFICIENCY (Ev) 0.92

ASHRAE 62.1-2013 NORMATIVE APPENDIX A:

AVERAGE OUTDOOR AIR FRACTION (Xs) 0.07
SYSTEM VENTILATION EFFICIENCY (Ev) 0.84

TOTAL REQUIRED OUTDOOR AIR INTAKE FLOW RATE\* (Vot) 249 CFM

TOTAL OUTDOOR AIR PROVIDED 650 CFM

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GREELEY FIRE STATION #

2301 Reservoir F



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6/26/2019

8/29/2019

JJG

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Project Status 30% DESIGN 75% DESIGN

100% DESIGN

Rev. # Description

HVAC OUTSIDE AIR CALCULATIONS

# 2015 IMC MINIMUM OUTDOOR AIR REQUIREMENTS - MULTIPLE ZONE

Project: GREELY FIRE STATION #2

Project #: 19054

SYSTEM: RTU-3
OPERATING MODE: HEATING

ROOM	ROOM	ZONE	OCCUPANCY	FLOOR	DESIGN	OA/	OA/	AIR	ZONE AIR	REQUIRED	SA	PRIMARY	ZONE
NAME	NO.	TAG	CATEGORY	AREA	POP.	PERSON	SF	DISTRIBUTION	DISTRIBUTION	OA TO ZONE	TO ZONE	OUTDOOR AIR	VENT.
				(SF)				TYPE	EFFECTIVENESS	(CFM)	(CFM)	FRACTION	EFF.
						(Rp)	(Ra)		(Ez)	(Voz)		(Zpz)	(Evz)
FITNESS RM	203	VAV-3-1	Health club/weight rooms	865	9	20.0	0.06	CSCRH	0.8	281.1	1,650	0.17	0.98
BATHROOM	201	VAV-3-1	Corridors	75	0	0.0	0.06	CSCRH	0.8	5.6	50	0.11	1.04
DECON	142	VAV-3-2	Laundry rooms, central	145	1	5.0	0.12	CSCRH	0.8	30.8	200	0.15	1.00
PPE STOR	141	VAV-3-2	Storage rooms	290	0	0.0	0.12	CSCRH	0.8	43.5	275	0.16	1.00
COMP	140	VAV-3-3	Storage rooms	135	0	0.0	0.12	CSCRH	0.8	20.3	75	0.27	0.88
SCBA	138	VAV-3-3	Storage rooms	100	0	0.0	0.12	CSCRH	0.8	15.0	75	0.20	0.95
WORKSHOP	137	VAV-3-3	Wood/metal shop	195	4	10.0	0.18	CSCRH	0.8	92.6	200	0.46	0.69

FLOOR AREA SERVED BY SYSTEM

(As)

1,805

sf

POPULATION OF SYSTEM

(Ps)

14

OA REQ'D PER UNIT AREA FOR SYSTEM (AVG)

(Ras)

0.10

CFM

OA REQ'D PER PERSON FOR SYSTE AREA (AVG)

(Rps)

15.66

CFM

UNCORRECTED OUTDOOR AIR INTAKE

(Vou)

391

CFM

DESIGN PRIMARY SUPPLY FAN AIRFLOW

(Vps)

2,525

CFM

IMC TABLE 403.3.1.1.2.3.2:

MAX Zp 0.46
SYSTEM VENTILATION EFFICIENCY (Ev) 0.69

ASHRAE 62.1-2013 NORMATIVE APPENDIX A:

AVERAGE OUTDOOR AIR FRACTION (Xs) 0.15

SYSTEM VENTILATION EFFICIENCY (Ev) 0.69

TOTAL REQUIRED OUTDOOR AIR INTAKE FLOW RATE\* (Vot) 565 CFM

TOTAL OUTDOOR AIR PROVIDED

900 CFM

\*PER IMC 403.3.1.1.2.3.2, SYSTEM VENTILATION EFFICIENCY (Ev)

AS CALCULATED BY:

ASHRAE 62.1, APPENDIX A, PER FOOTNOTE 3 ON ASHRAE 62.1 TABLE 6.2.5.2

SYSTEM AVERAGE OUTDOOR AIR FRACTION Xs > 0.15

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GREELEY FIRE STATION #

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6/26/2019

8/29/2019

JJG

SEH Project Checked By Drawn By

Project Status 30% DESIGN 75% DESIGN 100% DESIGN

Revision Iss

HVAC OUTSIDE AIR CALCULATIONS