

MISCELLANEOUS			PIPING TYPES			PIPING SYMBOLS			ABBREVIATIONS:		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DOUBLE LINE PIPING (2" AND ABOVE)	SINGLE LINE PIPING (UP TO 2")	PIPE TYPE	SYMBOL	ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
	SECTION NO. SECTION VIEW SHEET NO.		SUPPLY DIFFUSER-4-WAY THROW		CHS	CHILLED WATER SUPPLY					AIR (COMPRESSED)
	DETAIL DESIGNATION		SUPPLY DIFFUSER-3-WAY THROW		CHR	CHILLED WATER RETURN		P&T	PRESSURE/TEMPERATURE PORT TAPS		ABOVE
	POWERED EQUIPMENT DESIGNATION		SUPPLY DIFFUSER-2-WAY THROW		HWS	HEATING WATER SUPPLY		CR	CONCENTRIC REDUCER		ALTERNATING CURRENT
	NON POWERED EQUIPMENT DESIGNATION		SUPPLY DIFFUSER-1-WAY THROW		HWR	HEATING WATER RETURN		ACCH	AIR COMPRESSOR		AIR COOLED CONDENSING UNIT
	BASEBOARD EQUIPMENT DESIGNATION		RETURN DIFFUSER		CWS	CONDENSER WATER SUPPLY		AD	ACCESS DOOR		ADJUSTABLE
	SHEET KEY NOTES		RETURN DIFFUSER		CWR	CONDENSER WATER RETURN		EJ	EXPANSION JOINT		AIR FILTER
	POINT OF DISCONNECTION		HUMIDIFIER		D	CONDENSATE DRAIN		U	UNION		ABOVE FINISHED CEILING
	ARROW INDICATES DIRECTION OF FLOW		FLEXIBLE DUCT CONNECTION		CWR	CONDENSATE RETURN		T	THERMOMETER W/ THERMOWELL		ABOVE FINISHED FLOOR
	EXTERIOR WALL LOUVER (UNDER ARCH. SECTION)		FLEXIBLE DUCT CONNECTION		HPS	HIGH PRESSURE STEAM SUPPLY		FS	FLOW SWITCH		ABOVE FINISHED GRADE
	UNDERCUT DOOR (UNDER ARCH. SECTION)		FLEXIBLE DUCT CONNECTION		MPS	MEDIUM PRESSURE STEAM SUPPLY		PS	PRESSURE SWITCH		ENTERING WET BULB
	DOOR LOUVER (UNDER ARCH. SECTION)		FLEXIBLE DUCT CONNECTION		LPS	LOW PRESSURE STEAM SUPPLY		PG	PRESSURE GAUGE W/ GAUGE COCK		ENTERING WATER
	LOUVER DOOR FULL HEIGHT (UNDER ARCH. SECTION)		FLEXIBLE DUCT CONNECTION		HPR	HIGH PRESSURE CONDENSATE RETURN		FC	FLEXIBLE PIPE CONNECTOR		EXPLOSION PROOF EXISTING
			FLEXIBLE DUCT CONNECTION		MPR	MEDIUM PRESSURE CONDENSATE RETURN		F	DEGREE FAHRENHEIT		FURNISHED BY OTHERS
			FLEXIBLE DUCT CONNECTION		LPR	LOW PRESSURE CONDENSATE RETURN		FCS	FLOOR CONTROL SWITCH		FAN COIL UNIT
			FLEXIBLE DUCT CONNECTION		RS	REFRIGERANT SUCTION		FDS	FIRE DEPARTMENT SIAMESE		FIRE DEPARTMENT VALVE
			FLEXIBLE DUCT CONNECTION		RL	REFRIGERANT LIQUID		FGR	FIRE GROUND		FIRE FAN
			FLEXIBLE DUCT CONNECTION		RHG	REFRIGERANT GAS		FHR	FIRE HOSE CABINET		FIXTURE
			FLEXIBLE DUCT CONNECTION		A	CONTROL AIR (PNEUMATIC)		FLA	FULL LOAD AMPS		FLEXIBLE
			FLEXIBLE DUCT CONNECTION		BD	BOILER BLOW DOWN		FL	FLOOR		FLOOR
			FLEXIBLE DUCT CONNECTION		BF	BOILER FEED		FP	FAN POWERED MIXING BOX		FIRE PUMP
			FLEXIBLE DUCT CONNECTION		BO	BLOW OFF		FPM	FEET PER MINUTE		FRICTION
			FLEXIBLE DUCT CONNECTION		CF	CHEMICAL FEEDER		FS	FEET PER INCH		FIRE HOSE CABINET
			FLEXIBLE DUCT CONNECTION		PCS/R	PROCESS COOLING WATER SUPPLY/RETURN		FV	FEET PER MINUTE		FIRE VALVE
			FLEXIBLE DUCT CONNECTION		HTWS/R	HIGH TEMP. HOT WATER SUPPLY/RETURN		FV	FEET PER MINUTE		FIRE VALVE
			FLEXIBLE DUCT CONNECTION		PHWS/R	PRIMARY OR DISTRICT HEATING WATER SUPPLY/RETURN		FV	FEET PER MINUTE		FIRE VALVE
			FLEXIBLE DUCT CONNECTION		PCHS/R	PRIMARY OR DISTRICT CHILLED WATER SUPPLY/RETURN		FV	FEET PER MINUTE		FIRE VALVE
			FLEXIBLE DUCT CONNECTION		PR	PUMPED CONDENSATE RETURN		FV	FEET PER MINUTE		FIRE VALVE
			FLEXIBLE DUCT CONNECTION		(E)	EXISTING PIPING		FV	FEET PER MINUTE		FIRE VALVE
			FLEXIBLE DUCT CONNECTION		(E)	EXISTING PIPING TO BE REMOVED		FV	FEET PER MINUTE		FIRE VALVE
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GENERAL NOTES:

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2. MAINTAIN CODE REQUIRED AREA OF SEPARATION FROM OUTSIDE AIR INTAKES TO TERMINATIONS OF EXHAUST, COMBUSTION AIR, PLUMBING VENTS, ETC.
3. COORDINATE EQUIPMENT, HOUSEKEEPING PAD DIMENSIONS AND LAYOUT WITH THE GENERAL CONTRACTOR BASED ON FINAL EQUIPMENT SIZES.
4. PROVIDE MANUAL BALANCE DAMPERS IN ALL SUPPLY DUCT BRANCH TAPS DOWNSTREAM OF VAV BOXES.
5. PROVIDE MANUAL BALANCE DAMPERS IN ALL EXHAUST DUCT BRANCH TAPS.
6. COORDINATE SPACE TEMPERATURE SENSORS AND THERMOSTAT LOCATIONS TO ALIGN VERTICALLY WITH LIGHT SWITCHES.
7. TEMPERATURE CONTROLS CONTRACTOR SHALL SUBMIT PLANS INDICATING ALL SPACE TEMPERATURE SENSORS, T-STATS, HUMIDITY SENSORS, ETC. AS PART OF SUBMITTAL PROCESS FOR A/E REVIEW PRIOR TO ROUGH-IN.
8. PROVIDE THROUGH FACE BALANCING FOR ALL DIFFUSERS, REGISTERS, AND GRILLES ABOVE INACCESSIBLE AREAS.
9. PROVIDE TURNING VANES IN ALL 90° DUCT ELBOWS.
10. INSTALL EXPOSED DUCTWORK AS HIGH AS POSSIBLE.
11. ALL DUCT/PIPE PENETRATIONS THROUGH FIRE RATED/SMOKE RATED PARTITIONS SHALL BE CAULKED AND SEALED TO MEET THE RATING REQUIRED. REFER TO LIFE SAFETY DRAWINGS FOR FIRE/SMOKE RATING REQUIREMENTS.
12. PROVIDE ISOLATION VALVES AT EACH BRANCH LINE OFF OF RISER.
13. PROVIDE 3/4" BRANCH PIPING TO ALL TERMINAL UNITS, UNLESS NOTED OTHERWISE.
14. PROVIDE CONDENSATE DRAIN FROM ALL CHILLED WATER COILS AND DX EVAPORATOR COILS TO NEAREST MOP SINK OR MECHANICAL ROOM FLOOR DRAIN. PROVIDE CONDENSATE PUMP FOR WALL MOUNTED UNITS AND CONCEALED UNITS THAT CANNOT BE GRAVITY DRAINED TO TERMINATION LOCATION.

KEYNOTES



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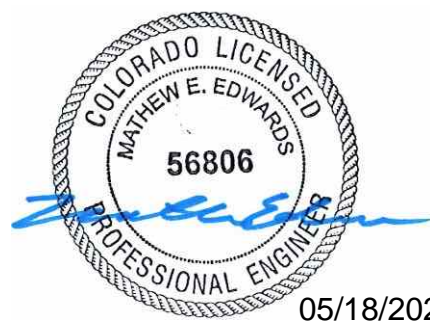
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△ Date	Description
- 2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

Seal / Signature



Project Name  
**SSRC | BASE AREA IMPROVEMENTS**

Project Number  
**003.7835.000**

Description  
**PROMENADE - MECHANICAL SITE PLAN**

Scale  
**1" = 20'-0"**

**1A-M1.100**



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**KEYNOTES**

- M5 ROUTE CONDENSATE DRAIN DOWN IN WALL AND STUB OUT OF WALL TO FLOOR DRAIN.

Date	Description
2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

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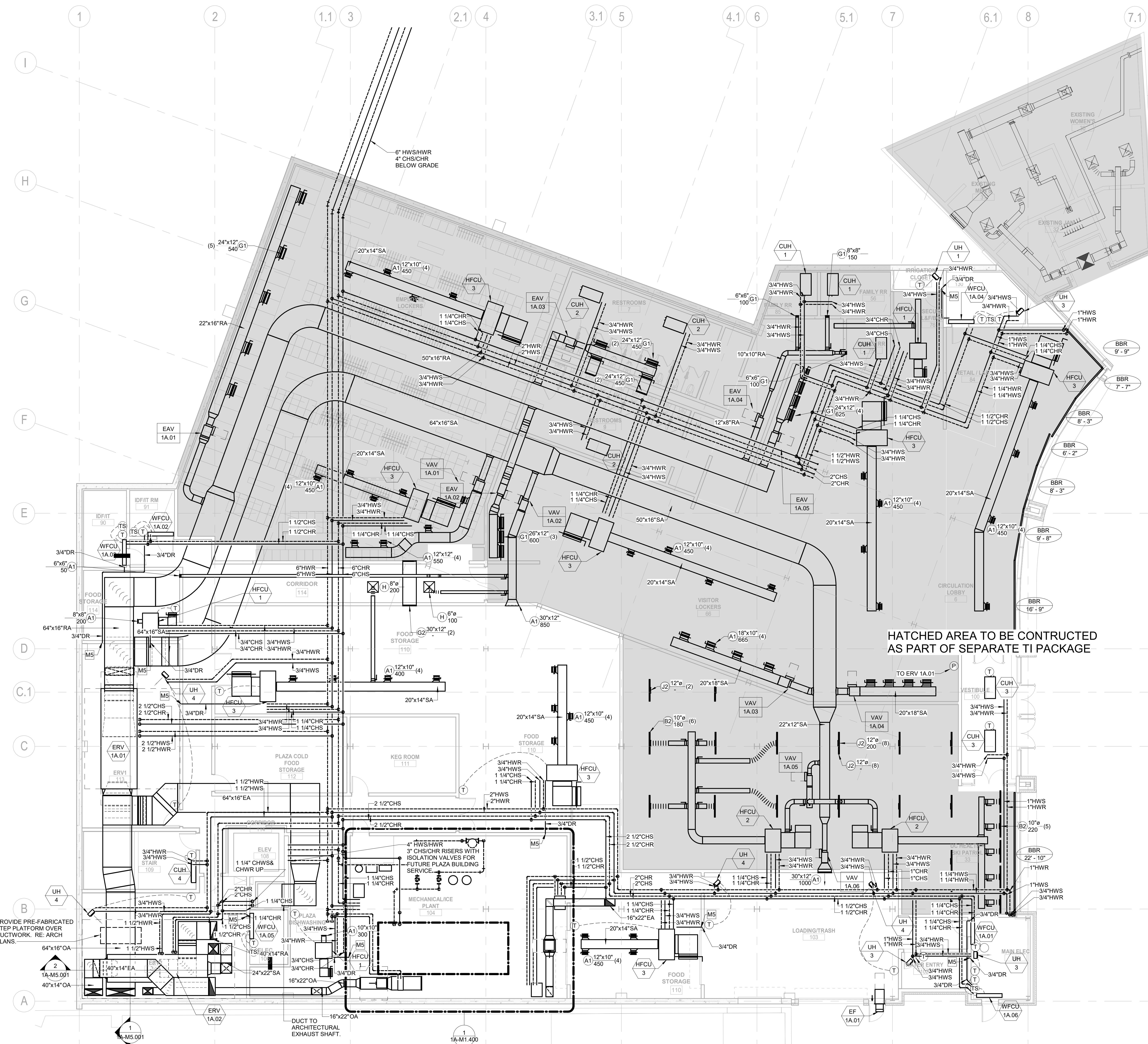
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**SSRC | BASE AREA IMPROVEMENTS**

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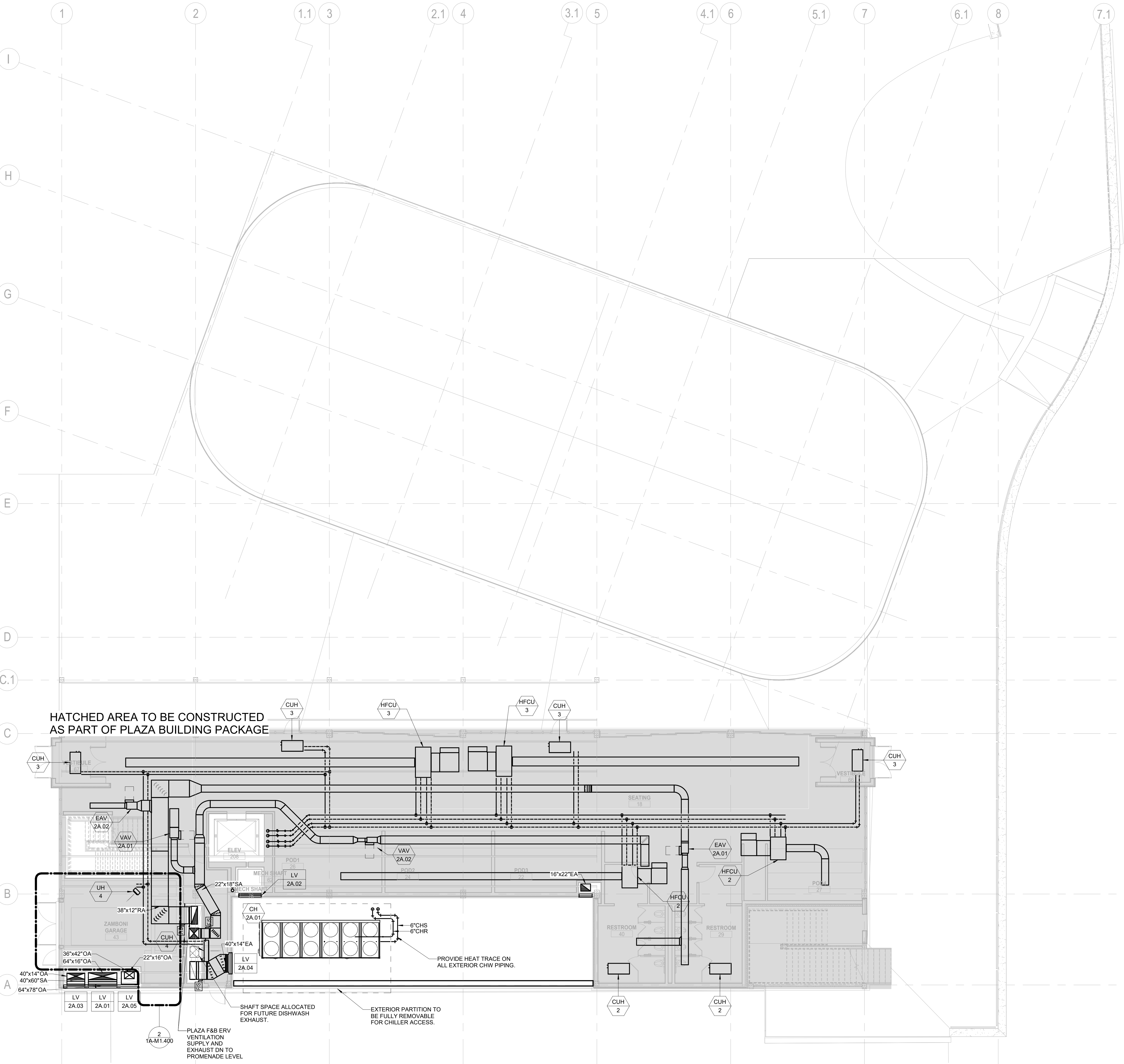
Description  
**PROMENADE - MECHANICAL PLAN - LEVEL 00**

Scale  
**1/8" = 1'-0"**

**1A-M1.200**







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KEYNOTES



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Date	Description
2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

Seal / Signature



05/18/2021

Project Name

SSRC | BASE AREA  
IMPROVEMENTS

Project Number

003.7835.000

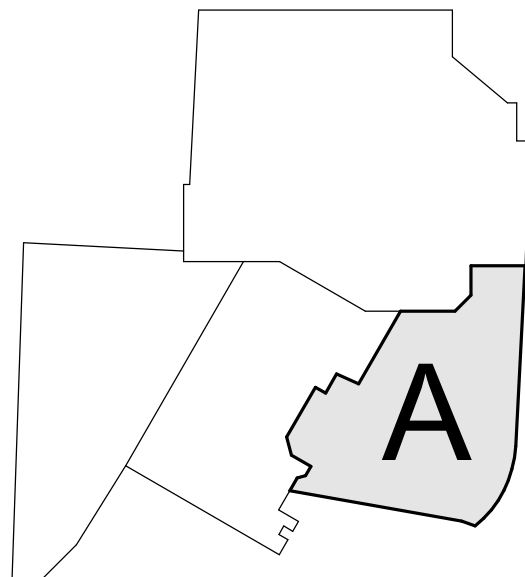
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PROMENADE - MECHANICAL PLAN -  
LEVEL 01

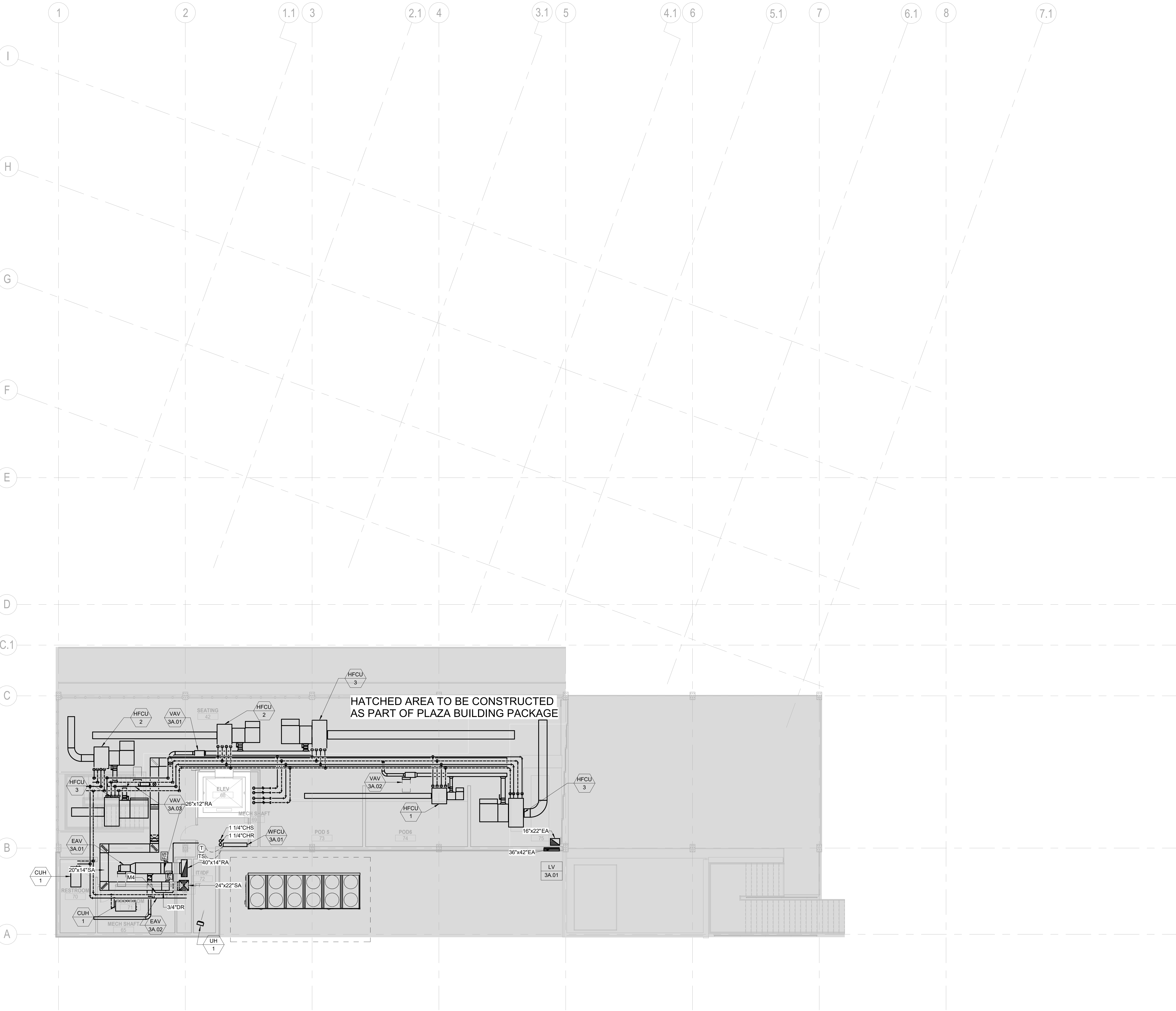
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KEY PLAN







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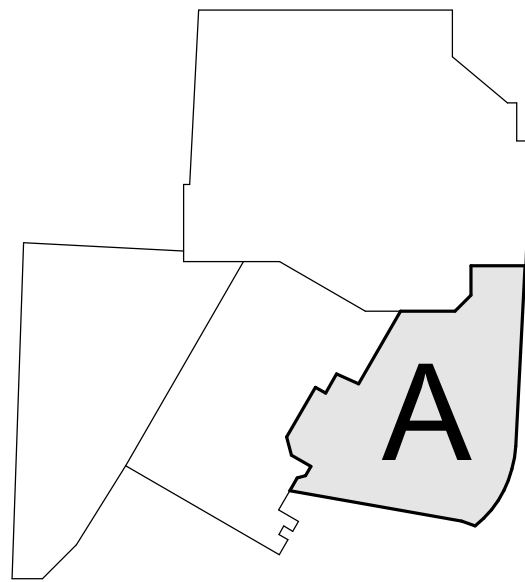
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KEYNOTES

M4

ROUTE CONDENSATE DRAIN DOWN TO APPROVED RECEPTACLE.

KEY PLAN



Steamboat

ALTERRA

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Seal / Signature

56806

05/18/2021

Project Name

SSRC | BASE AREA IMPROVEMENTS

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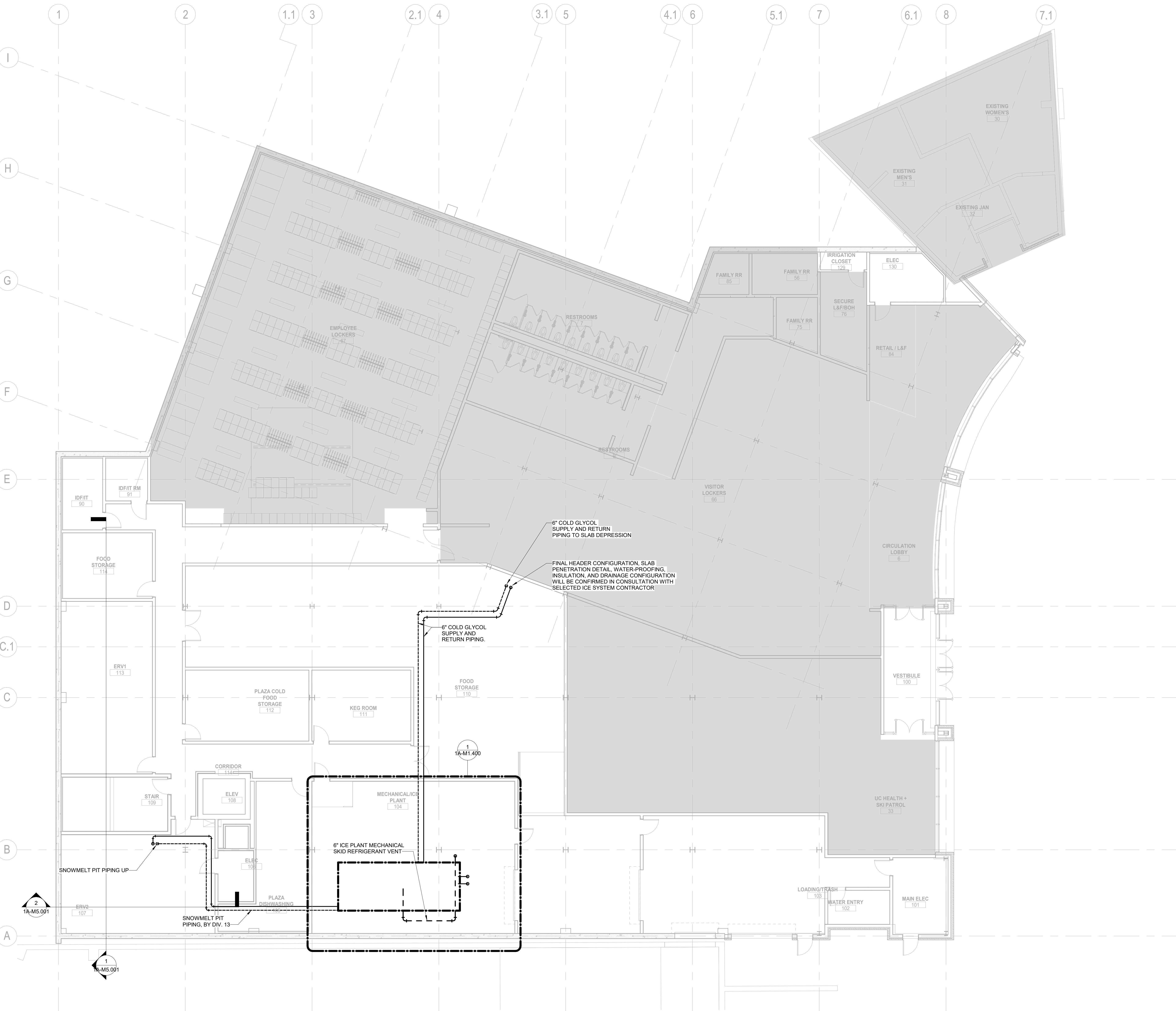
Description

PROMENADE - MECHANICAL PLAN - LEVEL 02

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4. PROVIDE MANUAL BALANCE DAMPERS IN ALL SUPPLY DUCT BRANCH TAPS DOWNSTREAM OF VAV BOXES.
5. PROVIDE MANUAL BALANCE DAMPERS IN ALL EXHAUST DUCT BRANCH TAPS.
6. COORDINATE SPACE TEMPERATURE SENSORS AND THERMOSTAT LOCATIONS TO ALIGN VERTICALLY WITH LIGHT SWITCHES.
7. TEMPERATURE CONTROLS CONTRACTOR SHALL SUBMIT PLANS INDICATING ALL SPACE TEMPERATURE SENSORS, T-STATS, HUMIDITY SENSORS, ETC. AS PART OF SUBMITTAL PROCESS FOR A/E REVIEW PRIOR TO ROUGH-IN.
8. PROVIDE THROUGH FACE BALANCING FOR ALL DIFFUSERS, REGISTERS, AND GRILLES ABOVE INACCESSIBLE AREAS.
9. PROVIDE TURNING VANES IN ALL 90° DUCT ELBOWS.
10. INSTALL EXPOSED DUCTWORK AS HIGH AS POSSIBLE.
11. ALL DUCT/PIPE PENETRATIONS THROUGH FIRE RATED/SMOKE RATED PARTITIONS SHALL BE CAULKED AND SEALED TO MEET THE RATING REQUIRED. REFER TO LIFE SAFETY DRAWINGS FOR FIRE/SMOKE RATING REQUIREMENTS.
12. PROVIDE ISOLATION VALVES AT EACH BRANCH LINE OFF OF RISER.
13. PROVIDE 3/4" BRANCH PIPING TO ALL TERMINAL UNITS, UNLESS NOTED OTHERWISE.
14. PROVIDE CONDENSATE DRAIN FROM ALL CHILLED WATER COILS AND DX EVAPORATOR COILS TO NEAREST MOP SINK OR MECHANICAL ROOM FLOOR DRAIN. PROVIDE CONDENSATE PUMP FOR WALL MOUNTED UNITS AND CONCEALED UNITS THAT CANNOT BE GRAVITY DRAINED TO TERMINATION LOCATION.

KEYNOTES

**Steamboat.**  
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MOUNTAIN COMPANY

2305 Mount Werner Circle  
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Date	Description
2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

Seal / Signature



05/18/2021

Project Name

SSRC | BASE AREA  
IMPROVEMENTS

Project Number

003.7835.000

Description

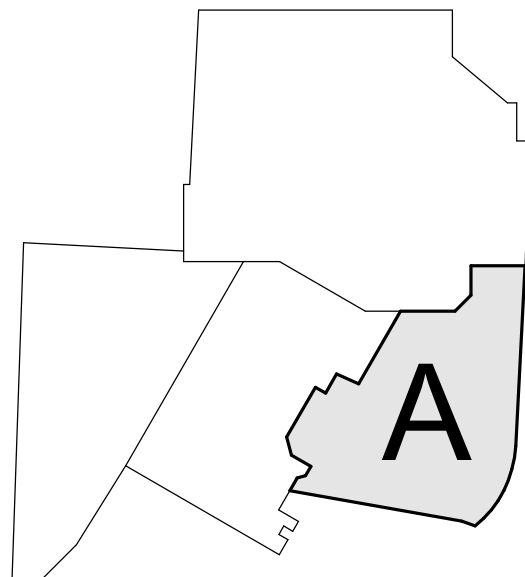
PROMENADE - ICE PLANT PLAN -  
LEVEL 00

Scale

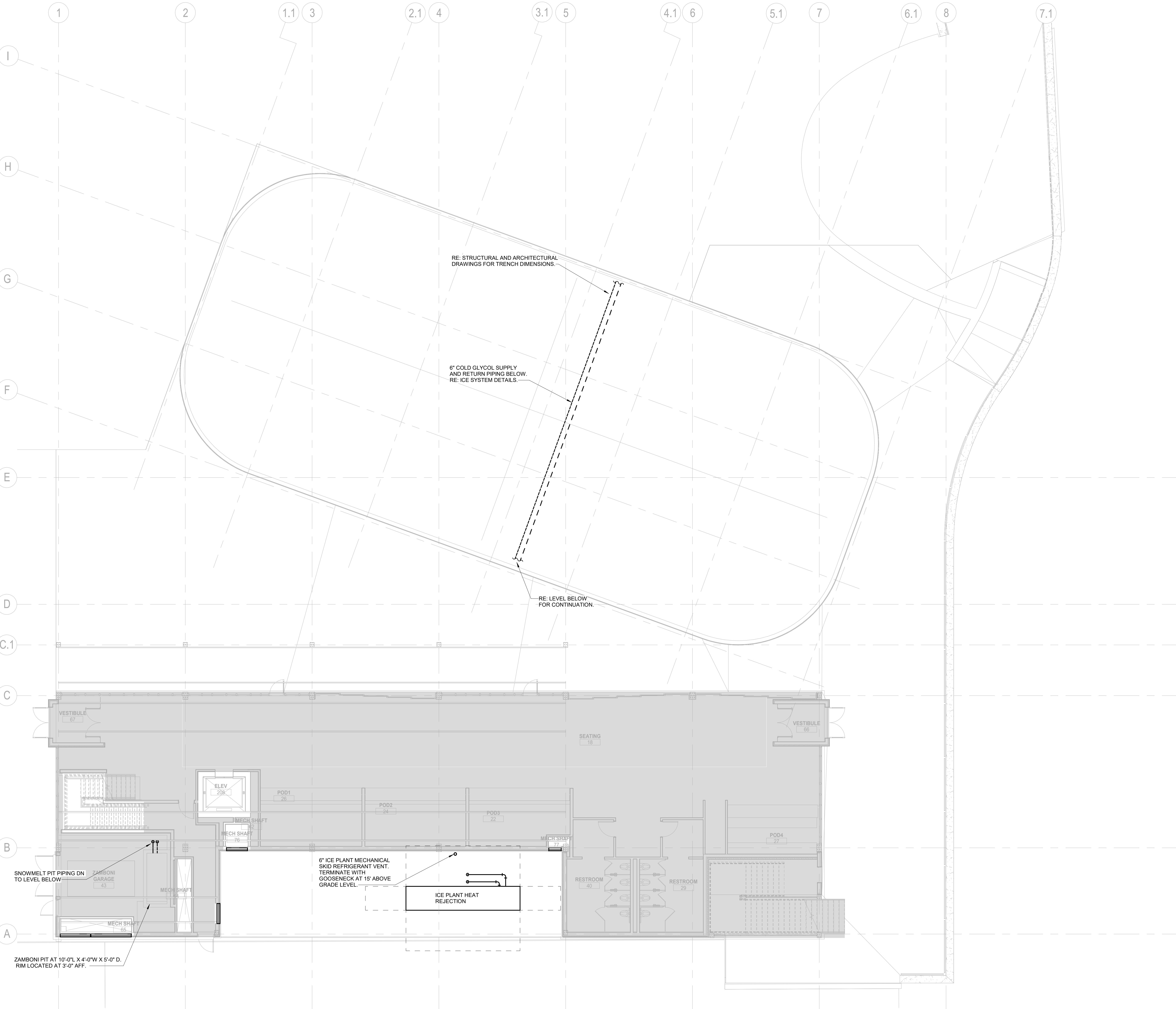
1/8" = 1'-0"

**1A-M1.300**

KEY PLAN







GENERAL NOTES:

1. THE DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE CONTRACTOR IS RESPONSIBLE FOR ALL OFFSETS, TRANSITIONS, ELBOWS, ETC. AS REQUIRED IN DUCTWORK, PIPING, SUPPORTS, ETC. TO COMPLETE THE WORK IN A CLEAN, FUNCTIONAL INSTALLATION THAT IS FULLY COORDINATED WITH ALL OTHER TRADES. ANY PRICING EFFORT SHALL TAKE THESE FACTORS INTO ACCOUNT.
2. MAINTAIN CODE REQUIRED AREA OF SEPARATION FROM OUTSIDE AIR INTAKES TO TERMINATIONS OF EXHAUST, COMBUSTION AIR, PLUMBING VENTS, ETC.
3. COORDINATE EQUIPMENT, HOUSEKEEPING PAD DIMENSIONS AND LAYOUT WITH THE GENERAL CONTRACTOR BASED ON FINAL EQUIPMENT SIZES.
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8. PROVIDE THROUGH FACE BALANCING FOR ALL DIFFUSERS, REGISTERS, AND GRILLES ABOVE INACCESSIBLE AREAS.
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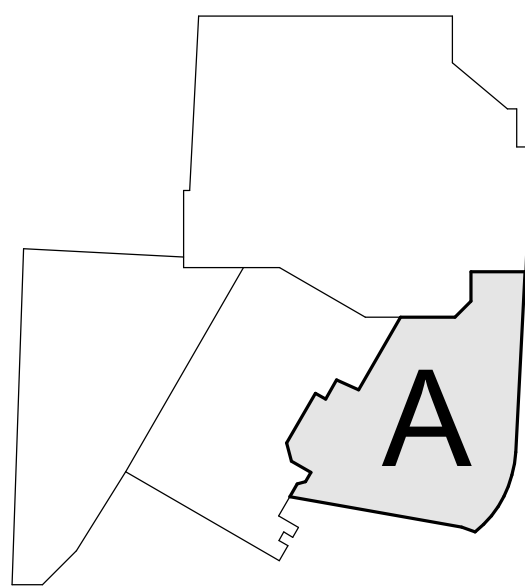
PROMENADE - ICE PLANT PLAN -  
LEVEL 01

Scale

1/8" = 1'-0"

1A-M1.301

KEY PLAN



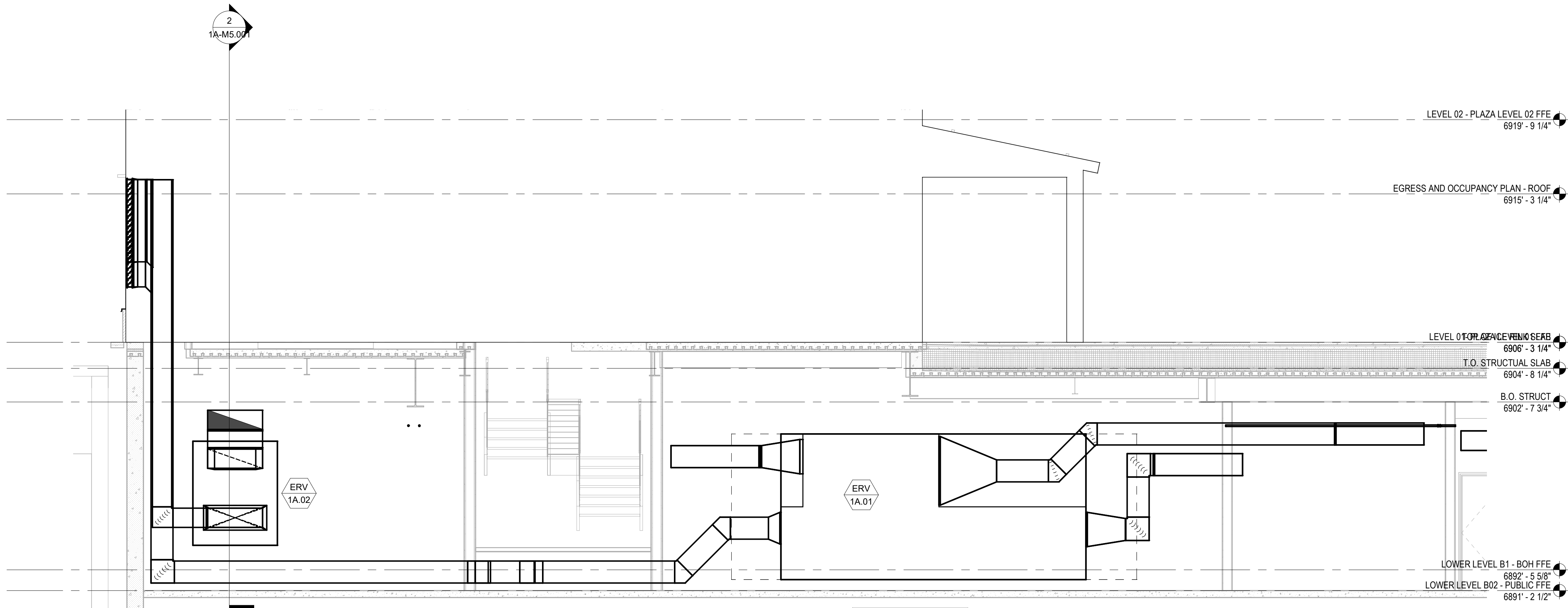
1 ICE PLANT PLAN - LEVEL 01 PLAZA

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

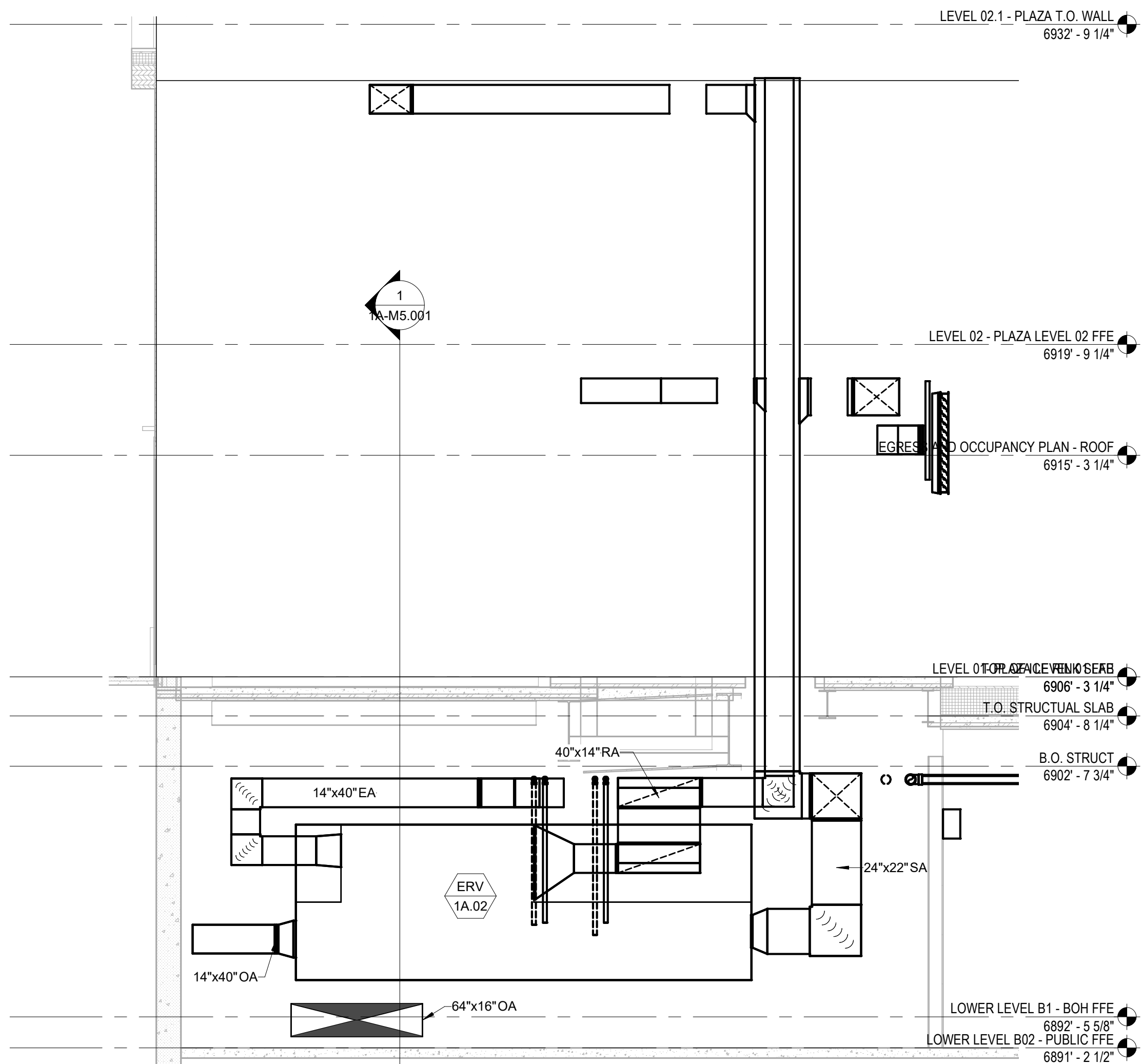








1 PROMENADE MECHANICAL SECTION 1  
SCALE: 1/4" = 1'-0"



2 PROMENADE MECHANICAL SECTION 2  
SCALE: 1/4" = 1'-0"

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2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

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Description

PROMENADE - MECHANICAL  
SECTIONS

Scale

1/4" = 1'-0"

**1A-M5.001**



## CONTROL LEGEND

ABBR DESCRIPTION	ABBR DESCRIPTION	ABBR DESCRIPTION
AI ANALOG INPUT	FR FREEZE/STAT	PHC PREHEAT COIL
AO ANALOG OUTPUT	FRN FURNACE	PT PRESSURE TRANSMITTER
BDD BACKDRAFT DAMPER	FS FLOW SWITCH	PZ PIEZOMETER RING
BTU BTU METER	FSCP FIREFIGHTER SMOKE	RA RETURN AIR
C CONTROLLER	FSPD FAN SPEED	RF RETURN FAN
CC COOLING COIL	FT FLOW TRANSMITTER	S SPACE TEMPERATURE SENSOR
CD CONTROL DAMPER	H HUMIDITY OR HIGH	S/S START/STOP
CFM AIRFLOW MEASURING SENSOR	HC HEATING COIL	SA SUPPLY AIR
CHR CHILLED WATER RETURN	HL HIGH/LOW	SC SPEED CONTROL
CHS CHILLED WATER SUPPLY	HH HIGH LIMIT HUMIDITY SWITCH	SD SMOKE DETECTOR
CO2 CARBON DIOXIDE	HS HUMIDITY SENSOR	SF SUPPLY FAN
COND CONDENSATE OVERFLOW	HT HUMIDITY TRANSMITTER	SPT STATIC PRESSURE TRANSMITTER
COV CHANGE OF VALUE	HWR HOT WATER RETURN	SR SWITCHING RELAY
CSEN CURRENT SENSOR	HWS HOT WATER SUPPLY	T THERMOSTAT
DI DIGITAL INPUT	IR INTERLOCK RELAY	TM THERMAL MASS METER
DO DIGITAL OUTPUT	L LEVEL OR LOW	TO TIMED OVERRIDE SWITCH
DP DIFFERENTIAL PRESSURE	LAN LOCAL AREA NETWORK	TS TEMPERATURE SENSOR
EA EXHAUST AIR	CONNECTION	TT TEMPERATURE TRANSMITTER
ES END SWITCH	M MOTORIZED CONTROL	TTAB TEMPERATURE TRANSMITTER
FACP FILTER ASSEMBLY OR FAIL	MIN MINIMUM	V VALVE
FAS FIRE ALARM SYSTEM	ND NITROGEN DIOXIDE	VFD VARIABLE FREQUENCY DRIVE
FC FAIL CLOSED	OA OUTSIDE AIR	VP VIRTUAL POINT
FCU FAN COIL UNIT	OS OCCUPANCY SENSOR	VS VELOCITY SENSOR
FM FLOW METER	P SPACE STATIC PRESSURE	WBT WET BULB TEMPERATURE
FO FAIL OPEN	P-E PNEUMATIC ELECTRIC SWITCH	TRANSMITTER

### HYDRONIC CABINET UNIT HEATER/ HYDRONIC UNIT HEATER CONTROL

- A. THERMOSTAT SHALL CYCLE FAN & OPEN HEATING WATER VALVE TO MAINTAIN SPACE SETPOINT. HEATING VALVE POSITION TO BE REPORTED TO THE BMS AS PERCENTAGE OPEN.
- B. WHERE REMOTE MOUNTED THERMOSTAT IS INDICATED, PROVIDE CONTROL TRANSFORMER AND LOW VOLTAGE THERMOSTAT BY TEMPERATURE CONTROLS CONTRACTOR.
- C. ALL HEATERS SERVING BUILDING ENTRY VESTIBULES SHALL BE PROVIDED WITH BMS RELAY TO INTERRUPT POWER AND PREVENT UNIT OPERATION WHEN OUTSIDE AIR IS ABOVE 45 DEGREES F. EACH VESTIBULE THERMOSTAT SHALL BE CONFIGURED TO HEAT THE VESTIBULE TO NO HIGHER THAN 60 DEGREES F.

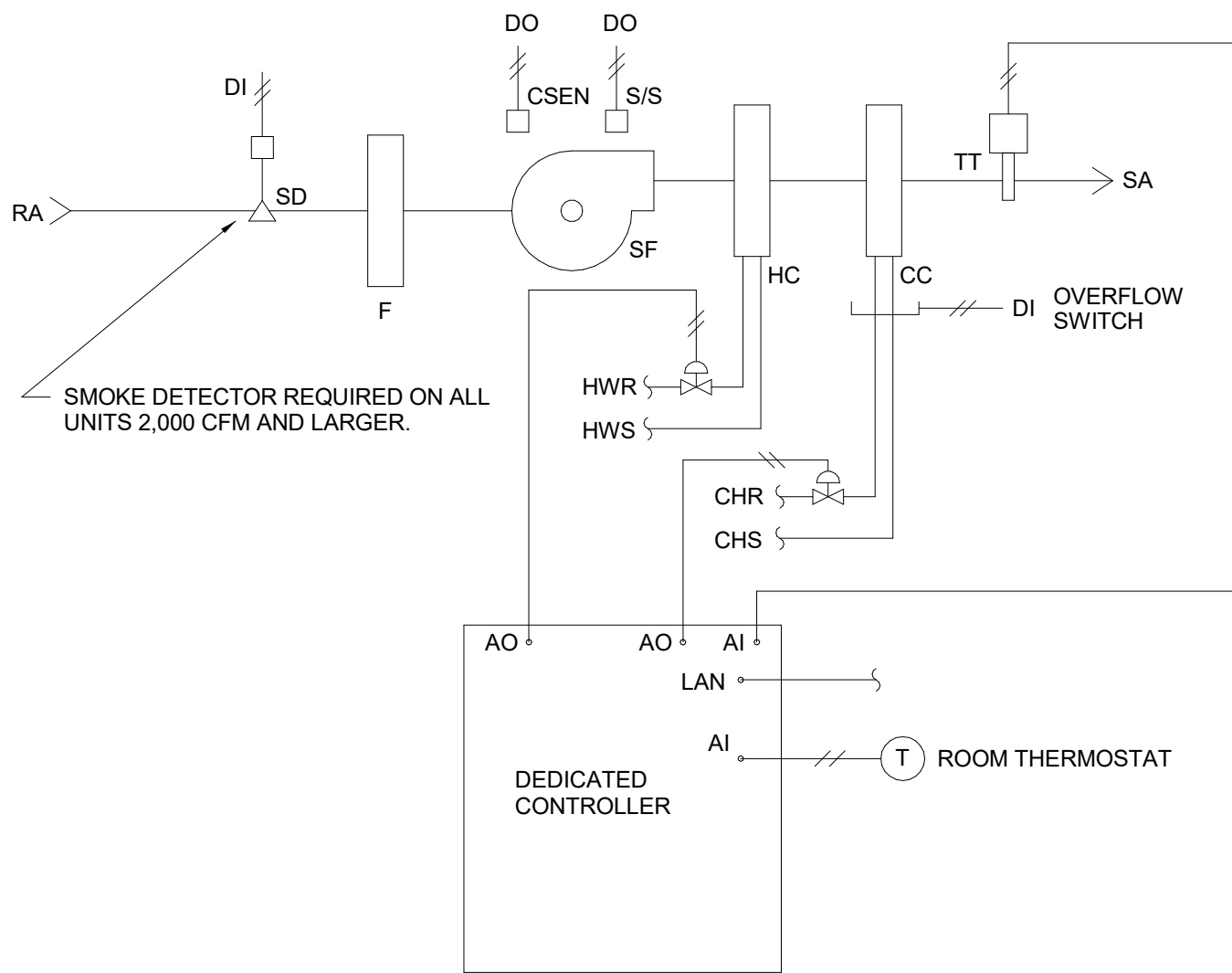
### HYDRONIC FIN TUBE CONTROL

- A. 2-WAY MODULATING CONTROL VALVE SHALL OPEN TO MAINTAIN SPACE TEMPERATURE HEATING SETPOINT. MULTIPLE SECTIONS MAY BE CONTROLLED VIA THE SAME VALVE WITHIN THE SAME TEMPERATURE ZONE (EXPOSURE). UP TO 50 LINEAL FEET OF FIN TUBE MAY BE CONNECTED TO A SINGLE HEATING WATER CONTROL VALVE. HEATING WATER CONTROL VALVES SHALL OPERATE AS THE FIRST STAGE OF HEATING FOR ASSOCIATED ZONE. HEATING VALVE POSITION TO BE REPORTED TO THE BMS AS PERCENTAGE OPEN.

### WALL MOUNTED FAN COIL UNIT CONTROL

#### SEQUENCE OF OPERATION:

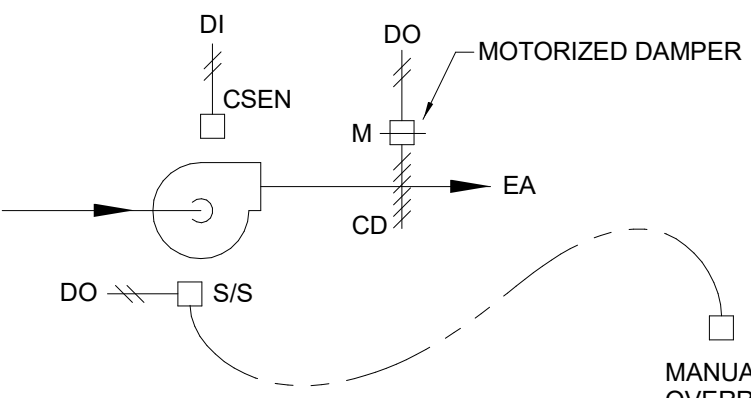
- A. GENERAL:
- THE FOLLOWING SEQUENCE OF OPERATION INCLUDES REQUIRED FUNCTIONALITY OF THE WALL MOUNTED FAN COIL UNIT. POINTS REQUIRED TO EXECUTE THIS SEQUENCE SHALL BE COORDINATED BETWEEN THE EQUIPMENT PROVIDER AND TEMPERATURE CONTROLS CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. SUBMIT LIST OF ITEMS TO BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR IN ORDER TO EXECUTE THIS SEQUENCE.
- B. OCCUPIED MODE:
- WHEN THE UNIT IS IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE INTERMITTENTLY. THE SUPPLY FAN SHALL DELIVER CONSTANT AIRFLOW. COOLING VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE SETPOINT.
- C. UNOCCUPIED MODE:
- WHEN THE FCU ENTERS UNOCCUPIED MODE THE SUPPLY FAN SHALL BE OFF AND THE COOLING CONTROL VALVE SHALL CLOSE.
- D. FAN SAFETY CONTROLS:
- ALARM THE BMS WHEN SPACE TEMPERATURE RISES ABOVE 95F (ADJ.). ALARM THE BMS WITH APPROPRIATE MESSAGE.
- E. COOLING CONTROL:
- THE COOLING CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE COOLING SETPOINT. COOLING CONTROL VALVE SHALL CLOSE IF THE FANS ARE OFF.



### ICE PLANT FAN COIL UNIT CONTROL

#### SEQUENCE OF OPERATION:

- A. GENERAL:
- THE FOLLOWING SEQUENCE OF OPERATION INCLUDES REQUIRED FUNCTIONALITY OF THE FAN COIL UNIT. POINTS REQUIRED TO EXECUTE THIS SEQUENCE SHALL BE COORDINATED BETWEEN THE EQUIPMENT PROVIDER AND TEMPERATURE CONTROLS CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. SUBMIT LIST OF ITEMS TO BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR IN ORDER TO EXECUTE THIS SEQUENCE.
- B. OCCUPIED MODE:
- WHEN THE UNIT IS IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE INTERMITTENTLY. THE SUPPLY FAN SHALL DELIVER CONSTANT AIRFLOW. COOLING VALVE AND HEATING VALVE (WHERE APPLICABLE) SHALL MODULATE IN SEQUENCE TO MAINTAIN SPACE TEMPERATURE SETPOINT.
  - UNITS ARE INTENDED TO REMAIN IN OCCUPIED MODE 24 HOURS PER DAY, 7 DAYS PER WEEK, YEAR-ROUND.
- C. UNOCCUPIED MODE:
- WHEN THE UNIT ENTERS UNOCCUPIED MODE THE SUPPLY FAN SHALL BE OFF, COOLING CONTROL VALVE SHALL CLOSE, AND HEATING CONTROL VALVE SHALL CLOSE.
- D. FAN SAFETY CONTROLS:
- DE-ENERGIZE THE SUPPLY FAN WHENEVER THE OVERFLOW SENSOR HAS TRIPPED OR SUPPLY FAN STATUS INDICATES A FAILURE (AFTER A TWO-MINUTE DELAY). MANUAL RESET REQUIRED FOR ALL FAILURES.
  - ALARM THE BMS WITH THE APPROPRIATE ALARM MESSAGE.
- E. SMOKE DETECTION SHUTDOWN:
- UNITS 2,000 CFM AND LARGER: WHEN SMOKE IS DETECTED AT THE RETURN AIR INLET, THE SUPPLY FAN SHALL BE DE-ENERGIZED, THE COOLING SHALL BE DISABLED, AND HEATING SHALL BE DISABLED.
- F. REFRIGERANT LEAK DETECTION:
- WHEN A REFRIGERANT LEAK IS DETECTED IN THE ROOM, THE UNIT SHALL CONTINUE IN CURRENT OPERATING MODE.
- G. SPACE TEMPERATURE CONTROL:
- PROVIDE A DISCHARGE AIR TEMPERATURE SENSOR FOR EQUIPMENT MONITORING.
  - PROVIDE A DEAD-BAND BETWEEN COOLING AND HEATING WHERE THE COOLING AND HEATING ARE DISABLED AND THE SUPPLY FAN SHALL BE OFF.
- H. HEATING CONTROL:
- THE HEATING CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE HEATING SETPOINT. HEATING CONTROL VALVE SHALL CLOSE IF THE FANS ARE OFF.
- I. COOLING CONTROL:
- THE COOLING CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE COOLING SETPOINT. COOLING CONTROL VALVE SHALL CLOSE IF THE FANS ARE OFF.



### LOADING DOCK EXHAUST FAN CONTROL

- A. FAN SHALL BE INTERLOCKED WITH ENERGY RECOVERY VENTILATOR SERVING SAME AREA. MOTORIZED DAMPER SHALL OPEN AND FAN SHALL BE ENERGIZED WHENEVER ASSOCIATED ENERGY RECOVERY VENTILATOR IS OPERATING.
- B. PROVIDE WALL MOUNTED OVERRIDE SWITCH TO MANUALLY START THE FAN AND OPEN THE MOTORIZED DAMPER. WALL MOUNTED OVERRIDE SWITCH TO BE LOCATED IN LOADING/TRASH AREA NEAR EXTERIOR ENTRY DOOR. SWITCH SHALL BE LABELED WITH TWO POSITIONS: "MANUAL ON" AND "AUTO-BMS CONTROL".

#### MISCELLANEOUS NON-DDC CONTROL:

- A. CHEMICAL TREATMENT: PROVIDE REQUIRED FIELD WIRING INTERLOCKS.
- B. MISCELLANEOUS PUMPS: PUMPS SHALL OPERATE PER SCHEDULE AND DRAWINGS. FOR EXAMPLE, RECIRCULATION PUMPS CYCLE TO MAINTAIN DHW TEMPERATURE.

#### MISCELLANEOUS DDC CONTROL:

- A. AUTOMATED INTERFACE: PROVIDE WEB-BASED INTERFACE FOR REMOTE ACCESS TO THE BMS. INTERFACE SHALL BE PASSWORD PROTECTED AND SHALL ALLOW FOR FULL CONTROL OF ALL BMS FUNCTIONALITY.
- B. FIRE ALARM SYSTEM INTERFACE: PROVIDE CONNECTION TO FIRE ALARM SYSTEM AND REPORT FIRE ALARM CONDITION AT BMS OPERATOR STATION.
- C. PUMPS SHALL OPERATE PER OTHER APPLICABLE CONTROL SECTIONS. BMS SHALL MONITOR ALL PUMPS INCLUDING GLYCOL FEED PUMPS. DOMESTIC HOT WATER RECIRCULATION PUMPS) ARE EXCLUDED.
- D. REFERENCE MECHANICAL EQUIPMENT SCHEDULES (ESPECIALLY "FANS") FOR ADDITIONAL CONTROL SEQUENCES.
- E. FANS:
- UNLESS NOTED OTHERWISE, PROVIDE START, STOP, AND STATUS AT BMS OPERATOR STATION FOR ALL FANS. PROVIDE STATUS ONLY FOR FANS OPERATED VIA LINE VOLTAGE THERMOSTAT, MANUAL SWITCH, OR LOCAL TIMER. FAN STATUS SHALL BE INDICATED VIA CURRENT SENSOR AT FAN ELECTRICAL CONNECTION.
  - RE: MECHANICAL SCHEDULES FOR ADDITIONAL REQUIREMENTS.
- F. ELECTRICAL AND DATA ROOM TEMPERATURE MONITORING:
- PROVIDE SPACE TEMPERATURE SENSOR IN EACH ELECTRICAL ROOM AND DATA ROOM FOR BMS TEMPERATURE MONITORING AND HIGH/LOW ALARMING.
- G. ELECTRIC HEAT TRACE SYSTEMS:
- EACH HEAT TRACE SYSTEM SHALL OPERATE UNDER ITS OWN SELF CONTAINED CONTROLS. ALARM BMS WHEN FAILURE US DETECTED AT EACH HEAT TRACE CONTROLLER. ALARMS SHALL BE ADDRESSABLE TO EACH HEAT TRACE SYSTEM.
  - HEAT TRACE SYSTEMS:
    - PLAZA LEVEL CHILLED WATER SUPPLY/RETURN PIPING TO CHILLER
- H. EXHAUST, RELIEF, AND INTAKE DAMPERS:
- EXHAUST, RELIEF, AND INTAKE LOCATIONS THAT CONTAIN MOTORIZED DAMPERS SHALL INTERLOCK THE POSITION OF THE DAMPER WITH THE OPERATION OF THE ASSOCIATED EQUIPMENT. WHEN THE EQUIPMENT IS ENABLED, THE DAMPER SHALL BE OPEN. WHEN THE EQUIPMENT IS DISABLED, THE DAMPER SHALL BE CLOSED. ALL DAMPERS TO BE FAST-ACTING OR AN EQUIPMENT DELAY SHALL BE PROVIDED TO PREVENT FULL AIRFLOW PRIOR TO DAMPER REACHING FULL OPEN POSITION.
- I. SUMP LEVEL ALARMS:
- PROVIDE LEVEL ALARM AT EACH PLUMBING SUMP. ALARM THE BMS WHEN AN OVERFLOW CONDITION EXISTS. ALARM MAY BE EITHER A DEDICATED LEVEL ALARM OR CONNECTION TO THE ASSOCIATED SUMP PUMP.
  - SUMP LEVEL ALARMS:
    - ELEVATOR SUMPS
    - SUMP PUMPS
    - SEWAGE EJECTORS
- J. ICE SYSTEM:
- PROVIDE THE FOLLOWING POINTS FROM THE ICE SYSTEM CONTROLS AT THE BMS OPERATOR STATION: SLAB TEMPERATURE (2 LOCATIONS), BRINE SUPPLY TEMPERATURE, REFRIGERANT LEAK DETECTION ALARM.

#### CONTROL SYSTEM GENERAL NOTES:

##### DESIGN INTENT:

- A. THE CONTROL DRAWINGS AND SEQUENCES ARE PROVIDED TO COMMUNICATE A DESIGN INTENT FOR CONTROL OF INDICATED SYSTEMS. ALTERNATIVE CONTROL METHODS MAY BE USED WHERE PRACTICAL OR WHERE NECESSARY TO MEET REQUIRED SYSTEM PERFORMANCE. WHERE ALTERNATIVE CONTROL METHODS ARE USED TO MEET THE DESIGN INTENT, THESE METHODS SHALL BE INDICATED IN SUBMITTAL TO ENGINEER FOR EVALUATION. ENGINEER SHALL DETERMINE IF A SUBMITTED ALTERNATIVE CONTROL METHOD MEETS THE DESIGN INTENT.
- B. ALTHOUGH THE MECHANICAL DRAWINGS MAY INDICATE A PRODUCT AS BASIS OF DESIGN, THE CONTROL DRAWINGS AND SEQUENCES ARE PROVIDED TO INDICATE A DESIGN INTENT FOR THE COMPLETE SYSTEM THAT IS APPLICABLE TO MULTIPLE POTENTIAL PRODUCTS OR MANUFACTURERS. CONTROL METHODS SHALL BE DEVELOPED BY THE TEMPERATURE CONTROLS CONTRACTOR AND/OR EQUIPMENT PROVIDER IN ORDER TO ACHIEVE THE REQUIRED SYSTEM PERFORMANCE.

##### REQUIRED COORDINATION:

- A. THE DIVISION 23 CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION BETWEEN EQUIPMENT PROVIDERS AND TEMPERATURE CONTROLS CONTRACTOR IN ORDER TO FULLY SATISFY THE DESIGN INTENT. INTERFACE BETWEEN THE BMS AND CONTROLLED EQUIPMENT, INCLUDING ITEMS PROVIDED BY EACH ENTITY, COMMUNICATION PROTOCOL, SIGNAL TYPE, ETC., SHALL BE COORDINATED PRIOR TO RELEASE OF EQUIPMENT FOR PRODUCTION.
- B. THE TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE SUBMITTAL DRAWINGS AND PRODUCT DATA FOR THE ENTIRE CONTROL SYSTEM TO ENGINEER FOR REVIEW. THE DIVISION 230900 SUBMITTAL SHALL DISTINGUISH WHERE SPECIFIC SEQUENCE ELEMENTS ARE PROVIDED WITHIN THE BUILDING MANAGEMENT SYSTEM OR WITHIN PACKAGED EQUIPMENT CONTROLLERS. RE: SPECIFICATIONS FOR REQUIREMENTS.
- C. REFER TO SPECIFICATION SECTION 23 05 01 MECHANICAL AND ELECTRICAL COORDINATION.

#### SEQUENCE OF OPERATION GENERAL NOTES:

##### GENERAL:

- A. ALTHOUGH EACH SEPARATE CONTROL DIAGRAM MAY INDICATE AN OUTDOOR AIR TEMPERATURE/HUMIDITY SENSOR, OUTDOOR AIR HUMIDITY SENSOR, CARBON DIOXIDE SENSOR, TEMPERATURE CONTROLS CONTRACTOR MAY UTILIZE ONE OF EACH SENSOR AS A COMMON INPUT TO THE SYSTEM FOR USE IN MULTIPLE SEQUENCES. COORDINATE LOCATION WITH ARCHITECT/ENGINEER PRIOR TO INSTALLATION.
- B. PROVIDE INDIVIDUAL INPUTS OR OUTPUTS FOR EACH POINT LISTED IN THE POINTS LISTS OR CONTROL DIAGRAM. PROVIDE ANY ADDITIONAL POINTS NOT LISTED IN THE POINTS LIST OR CONTROL DIAGRAM, BUT REQUIRED TO MEET THE SEQUENCE OF OPERATION, AT NO ADDITIONAL COST TO THE OWNER. ALL ANALOG OUTPUTS SHALL BE 4-20MA, 0-10VDC OR 0-20VDC UNLESS OTHERWISE INDICATED.
- C. ALL SETPOINTS SHALL BE FULLY ADJUSTABLE AT THE OPERATOR WORKSTATION UNLESS NOTED OTHERWISE.
- D. PROVIDE OVERRIDE CONTROL OF ALL POINTS AT THE OPERATOR WORKSTATION UNLESS NOTED OTHERWISE OR WHERE PROHIBITED BY EQUIPMENT PACKAGED CONTROLLERS.
- E. IN THE EVENT OF A POWER OUTAGE OR OTHER MALFUNCTION, THE CURRENTLY ENABLED CONTROLS SEQUENCES SHALL BE MAINTAINED. RE: SPECIFICATIONS. IN ADDITION, CHILLED WATER VALVES SHALL FAIL CLOSED AND HEATING WATER VALVES SHALL FAIL OPEN.

##### OCCUPANCY SCHEDULES:

- A. THE FOLLOWING SPECIAL OCCUPANCY SCHEDULE MODES ARE HEREBY DEFINED:
- OCCUPIED MODE
  - UNOCCUPIED MODE
- B. ANY DEVICE UTILIZING ON/OFF CONTROL OR SCHEDULING VIA BMS SHALL BE CAPABLE OF BEING PROGRAMMED TO CONFORM TO ANY OF THE ABOVE SEQUENCES.
- C. THE BMS SHALL STAGE AIR HANDLERS TO/FROM OCCUPIED MODE TO MINIMIZE SUDDEN CHANGES IN SYSTEM FLOW REQUIREMENTS.

##### INITIAL SPACE THERMOSTAT SETPOINTS

- A. INITIAL SPACE THERMOSTAT SETPOINTS SHALL BE AS FOLLOWS:

- OCCUPIED SPACES:
  - COOLING: 76F
  - HEATING: 70F
- MECHANICAL AND ELECTRICAL ROOMS:
  - COOLING: 80F
  - HEATING: 65F
- BUILDING ENTRY VESTIBULES:
  - HEATING: 60F
- MISCELLANEOUS HEATING-ONLY AREAS:
  - HEATING: 65F

ALL SPACE THERMOSTAT SETPOINTS CORRESPONDING TO EQUIPMENT CONTROLLED BY THE BMS SHALL BE ADJUSTABLE FROM THE BMS OPERATOR STATION.

Seal / Signature



05/18/2021

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IMPROVEMENTS

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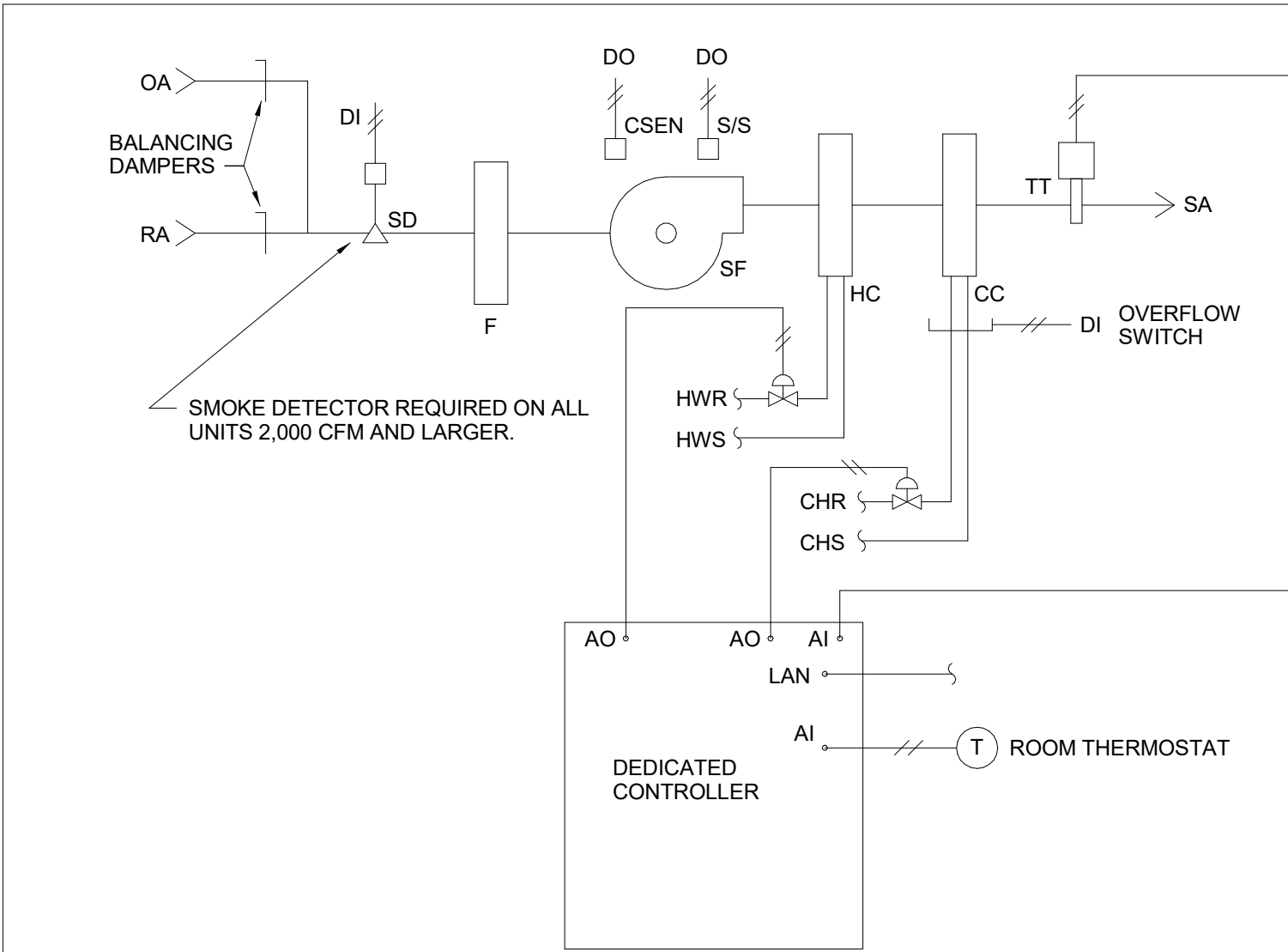
PROMENADE - MECHANICAL  
CONTROLS

Scale

NOT TO SCALE

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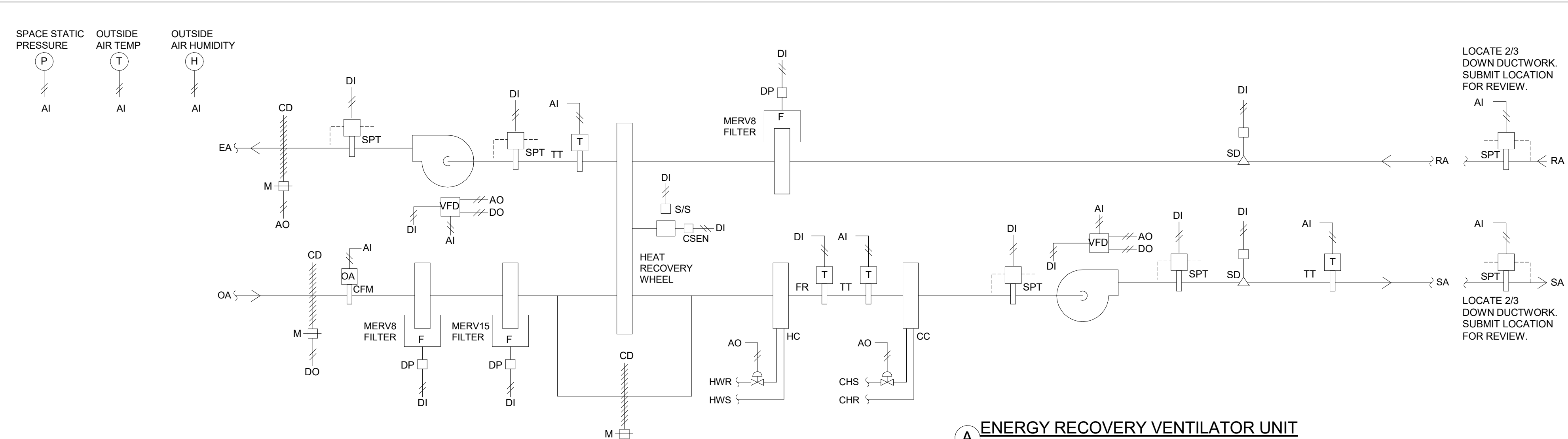




**FAN COIL UNIT CONTROL**  
A NONE

**SEQUENCE OF OPERATION:**

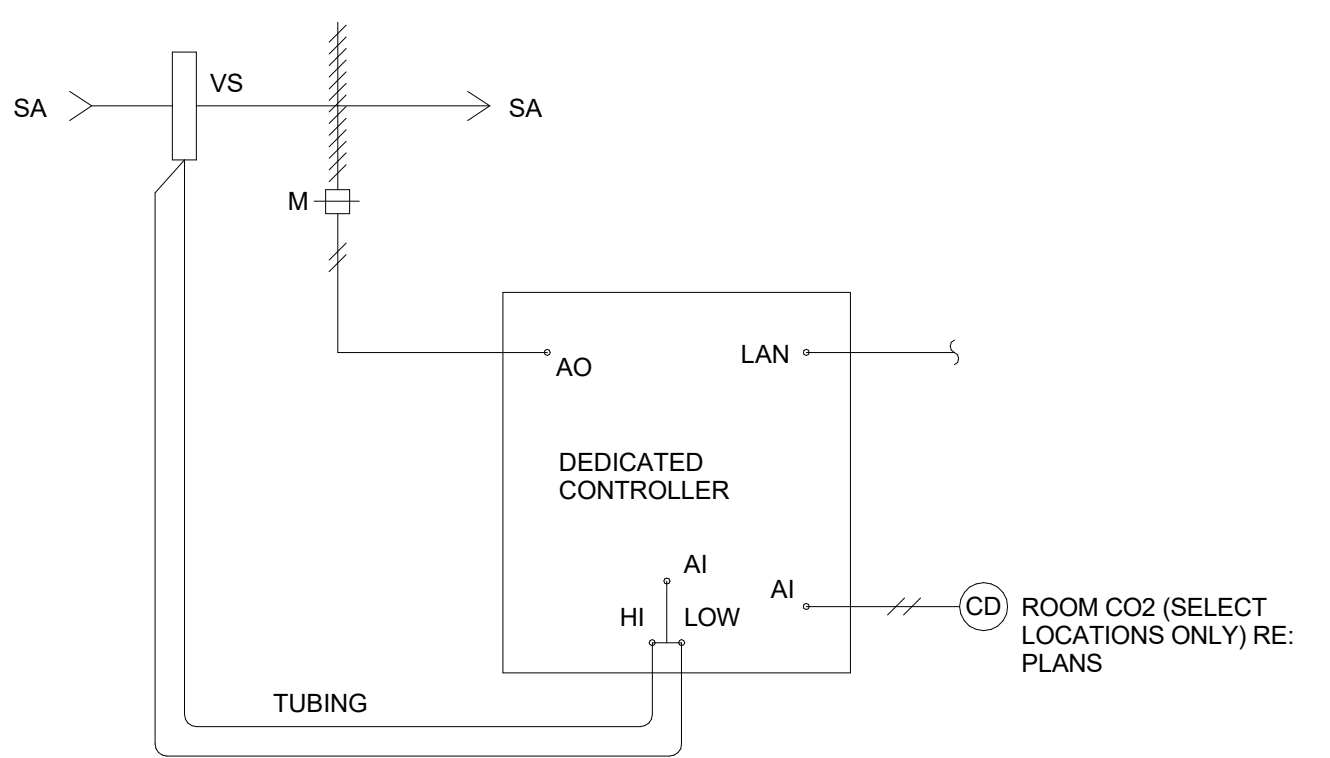
- A. GENERAL:**
1. THE FOLLOWING SEQUENCE OF OPERATION INCLUDES REQUIRED FUNCTIONALITY OF THE FAN COIL UNIT. POINTS REQUIRED TO EXECUTE THIS SEQUENCE SHALL BE COORDINATED BETWEEN THE EQUIPMENT PROVIDER AND TEMPERATURE CONTROLS CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. SUBMIT LIST OF ITEMS TO BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR IN ORDER TO EXECUTE THIS SEQUENCE.
- B. OCCUPIED MODE:**
1. WHEN THE FCU IS IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY. THE SUPPLY FAN SHALL DELIVER CONSTANT AIRFLOW. COOLING VALVE AND HEATING VALVE SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR TEMPERATURE. DISCHARGE AIR TEMPERATURE SHALL BE RESET AS NECESSARY TO MAINTAIN SPACE TEMPERATURE.
- C. UNOCCUPIED MODE:**
1. WHEN THE FCU ENTERS UNOCCUPIED MODE THE SUPPLY FAN SHALL BE OFF, COOLING CONTROL VALVE SHALL CLOSE, AND HEATING CONTROL VALVE SHALL CLOSE.
2. SPACE TEMPERATURE SHALL BE SETBACK AND MAINTAINED BELOW A 5F (ADJ.) OFFSET TO OCCUPIED MODE COOLING SETPOINT AND ABOVE A 10F (ADJ.) OFFSET TO OCCUPIED MODE HEATING SETPOINT.
3. WHEN COOLING IS REQUIRED IN THE SPACE, THE SUPPLY FAN SHALL CYCLE ON AND COOLING SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE.
4. WHEN HEATING IS REQUIRED IN THE SPACE, THE SUPPLY FAN SHALL CYCLE ON AND HEATING SHALL MODULATE TO FULL.
5. UPON SPACE TEMPERATURE REACHING UNOCCUPIED MODE SETPOINT, UNIT SHALL CYCLE OFF.
- D. OPTIMUM START WARM-UP MODE:**
1. PRIOR TO SCHEDULED OCCUPANCY, IF THE SPACE TEMPERATURE IS LESS THAN THE MORNING WARM-UP SETPOINT OF 70F (ADJ.), THE OPTIMUM START WARM-UP SEQUENCE SHALL BE INITIATED.
2. THE CONTROL SYSTEM SHALL CALCULATE THE REQUIRED TIME TO BRING SPACE TEMPERATURE TO OCCUPIED HEATING SETPOINT BASED ON THE CURRENT SPACE TEMPERATURE AND THE CURRENT OUTSIDE AIR TEMPERATURE WHEN THE SEQUENCE IS INITIATED.
3. UPON INITIATING OPTIMUM START WARM-UP MODE, THE SUPPLY FAN AND HEATING SHALL MODULATE AS OUTLINED IN OCCUPIED MODE SEQUENCE TO MAINTAIN SPACE TEMPERATURE SETPOINT.
4. COOLING SHALL BE LOCKED OUT.
5. REVERT TO OCCUPIED MODE WHEN SPACE TEMPERATURE HAS REACHED OCCUPIED HEATING SETPOINT.
- E. OPTIMUM START COOL-DOWN MODE:**
1. PRIOR TO SCHEDULED OCCUPANCY, IF THE SPACE TEMPERATURE IS MORE THAN THE MORNING COOL-DOWN SETPOINT OF 78F (ADJ.), THE OPTIMUM START COOL-DOWN SEQUENCE SHALL BE INITIATED.
2. THE CONTROL SYSTEM SHALL CALCULATE THE REQUIRED TIME TO BRING SPACE TEMPERATURE TO OCCUPIED COOLING SETPOINT BASED ON THE CURRENT SPACE TEMPERATURE AND THE CURRENT OUTSIDE AIR TEMPERATURE WHEN THE SEQUENCE IS INITIATED.
3. UPON INITIATING OPTIMUM START COOL-DOWN MODE, THE SUPPLY FAN AND COOLING SHALL MODULATE AS OUTLINED IN OCCUPIED MODE SEQUENCE TO MAINTAIN SPACE TEMPERATURE SETPOINT.
4. HEATING SHALL BE LOCKED OUT.
5. REVERT TO OCCUPIED MODE WHEN SPACE TEMPERATURE HAS REACHED OCCUPIED COOLING SETPOINT.
- F. FAN SAFETY CONTROLS:**
1. DE-ENERGIZE THE SUPPLY FAN WHENEVER THE OVERFLOW SENSOR HAS TRIPPED OR SUPPLY FAN STATUS INDICATES A FAILURE (AFTER A TWO-MINUTE DELAY). MANUAL RESET REQUIRED FOR ALL FAILURES.
2. ALARM THE BMS WITH THE APPROPRIATE ALARM MESSAGE.
- G. SMOKE DETECTION SHUT-DOWN:**
1. UNITS 2,000 CFM AND LARGER: WHEN SMOKE IS DETECTED AT THE RETURN AIR INLET, THE SUPPLY FAN SHALL BE DE-ENERGIZED, THE COOLING SHALL BE DISABLED, AND HEATING SHALL BE DISABLED.
2. WHEN A FAN COIL UNIT HAS SHUT DOWN DUE TO SMOKE DETECTION, THE ASSOCIATED VENTILATION SYSTEM SERVING THE UNIT SHALL BE SHUT DOWN. PROVIDE ADDRESSABLE ALARM AT THE BMS OPERATOR STATION.
3. WHEN THE VENTILATION SYSTEM SERVING THE UNIT HAS SHUT DOWN DUE TO SMOKE DETECTION, THE FCU SUPPLY FAN SHALL BE DE-ENERGIZED, COOLING SHALL BE DISABLED, AND HEATING SHALL BE DISABLED.
- H. DISCHARGE AIR TEMPERATURE:**
1. PROVIDE A CASCADE RESET (VIA PID LOOP) OF DISCHARGE AIR TEMPERATURE TO MAINTAIN SPACE TEMPERATURE.
2. PROVIDE A DEAD-BAND BETWEEN COOLING AND HEATING WHERE THE COOLING AND HEATING ARE DISABLED AND THE SUPPLY FAN SHALL REMAIN ENERGIZED.
- I. HEATING CONTROL:**
1. THE HEATING CONTROL VALVE SHALL MODULATE TO MAINTAIN THE DAT. HEATING CONTROL VALVE SHALL CLOSE IF THE FANS ARE OFF.
- J. COOLING CONTROL:**
1. THE COOLING CONTROL VALVE SHALL MODULATE TO MAINTAIN THE DAT. COOLING CONTROL VALVE SHALL CLOSE IF THE FANS ARE OFF.



**ENERGY RECOVERY VENTILATOR UNIT**  
A NONE

**SEQUENCE OF OPERATION:**

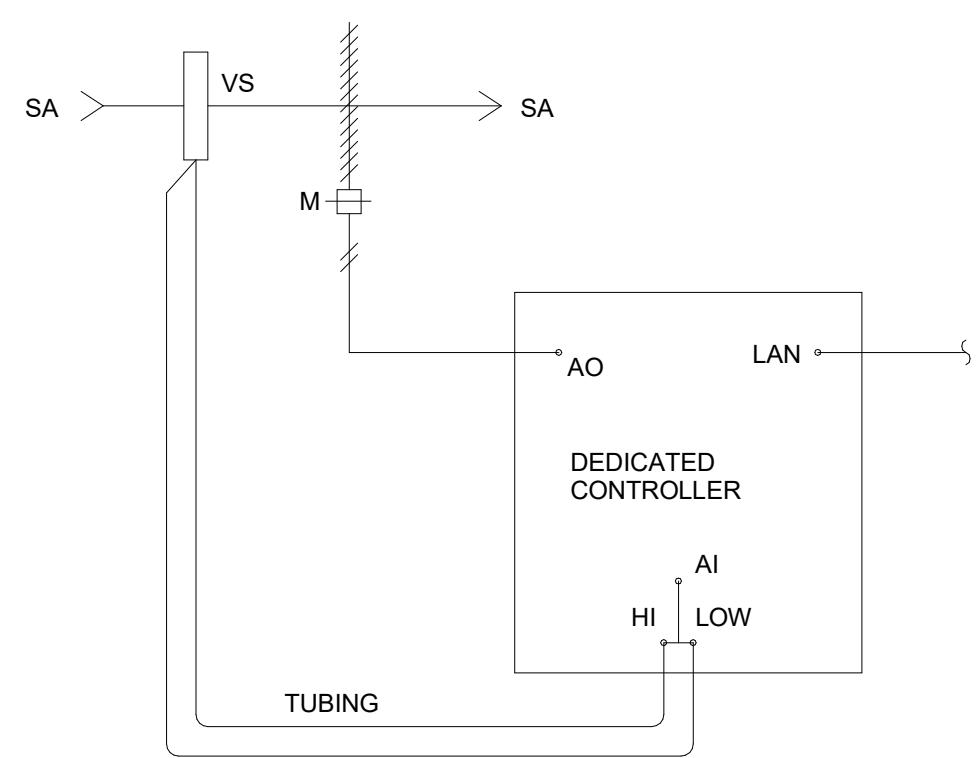
- A. CONFIGURATION, RE: SCHEDULE**
- B. OCCUPIED MODE:**
1. WHEN THE ERV IS IN THE OCCUPIED MODE, THE SUPPLY AND RETURN FANS SHALL OPERATE CONTINUOUSLY. THE SUPPLY FAN VFD SHALL MODULATE TO MAINTAIN THE SUPPLY DUCT STATIC PRESSURE AND THE EXHAUST FAN VFD SHALL MODULATE TO MAINTAIN THE EXHAUST DUCT STATIC PRESSURE. CHILLED WATER CONTROL VALVE, HEATING WATER CONTROL VALVE, AND HEAT RECOVERY WHEEL SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE AIR TEMPERATURE (DAT). THE ERV SHALL ENTER OCCUPIED MODE BASED ON TIME OF DAY SCHEDULE AT BMS OPERATOR STATION.
- C. UNOCCUPIED MODE:**
1. WHEN THE ERV IS IN THE UNOCCUPIED MODE THE SUPPLY AND EXHAUST FANS SHALL BE OFF. THE HEAT WHEEL SHALL STOP. CHILLED WATER CONTROL VALVE SHALL CLOSE, HEATING WATER CONTROL VALVE SHALL CLOSE, THE OUTSIDE AIR DAMPER SHALL CLOSE, AND THE EA DAMPER SHALL CLOSE.
2. WHEN TEMPERATURE DOWNSTREAM OF THE HEATING COIL FALLS TO 45F (ADJ.), HEATING WATER VALVE SHALL MODULATE TO FULL OPEN AND REMAIN OPEN UNTIL TEMPERATURE DOWNSTREAM OF THE HEATING COIL RISES ABOVE SETPOINT.
- D. FAN SAFETY CONTROLS:**
1. DE-ENERGIZE THE SUPPLY AND EXHAUST FANS WHENEVER EITHER SMOKE DETECTOR HAS TRIPPED, HEAT RECOVERY ROTATION DETECTION FAILS, OR A FAN STATUS INDICATES A FAILURE (AFTER A TWO-MINUTE DELAY). SMOKE DETECTORS AND FAN FAILURES REQUIRE A MANUAL RESET.
2. DE-ENERGIZE THE SUPPLY AND EXHAUST FANS WHEN THE SUPPLY FAN DISCHARGE STATIC PRESSURE HIGH-LIMIT REACHES 4.0 INCHES WC (ADJ.).
3. DE-ENERGIZE THE SUPPLY AND EXHAUST FANS WHEN THE EXHAUST FAN DISCHARGE STATIC PRESSURE HIGH-LIMIT REACHES 2.0 INCHES WC (ADJ.).
4. PROVIDE SUCTION STATIC PRESSURE SWITCH AT INLET OF SUPPLY FAN. SWITCH TO BE TIED TO SUPPLY FAN START CIRCUIT. DE-ENERGIZE SUPPLY AND EXHAUST FAN WHEN SUCTION SUPPLY FAN STATIC PRESSURE HIGH-LIMIT REACHES 3.0 INCHES WC (ADJ.).
5. ALARM THE BMS WITH THE APPROPRIATE ALARM MESSAGE.
- E. VFD CONTROL:**
1. WHEN THE SUPPLY AND EXHAUST FANS ARE TURNED ON, EACH VFD SHALL SLOWLY RAMP UP TO SETPOINT AND MODULATE TO MAINTAIN THE CORRESPONDING DUCT STATIC PRESSURE. THE STATIC PRESSURE SENSORS SHALL BE LOCATED BY THIS DIVISION.
2. SUBMIT SENSOR LOCATIONS TO ENGINEER FOR REVIEW.
3. SENSING DEVICE SHALL BE MULTIPLE POINT, NON-PULSATING STATIC SENSING SECTION WITH SELF AVERAGING MANIFOLD.
- F. OUTSIDE AIR MONITORING AND TRENDING:**
1. MEASURE AND TREND THE OUTDOOR AIRFLOW THROUGH THE OUTDOOR AIRFLOW MEASURING STATION LOCATED AT THE INTAKE OF THE UNIT.
- G. BUILDING PRESSURE CONTROL:**
1. ZONE LEVEL EXHAUST AND VENTILATION:
- 1.1. EACH EXHAUSTED AREA IS PROVIDED WITH A CONSTANT VOLUME EAV BOX FOR PRESSURE INDEPENDENT EXHAUST AIRFLOW CONTROL. EACH VENTILATED AREA IS PROVIDED WITH EITHER A CONSTANT VOLUME OR A VARIABLE VOLUME VAV BOX FOR PRESSURE INDEPENDENT VENTILATION AIRFLOW CONTROL AND BUILDING PRESSURE CONTROL.
- 1.2. ALL EXHAUST EAV BOXES SHALL MODULATE TO MAINTAIN FIXED EXHAUST AIRFLOW RATES INDICATED.
- 1.3. SUPPLY VAV BOXES LOCATED IN THE SAME SPACE AS EAV BOXES SHALL BE CONSTANT VOLUME AND SHALL MODULATE TO MAINTAIN FIXED VENTILATION SUPPLY AIRFLOW.
- 1.4. SUPPLY VAV BOXES LOCATED IN AREAS THAT ARE NOT PROVIDED WITH EAV BOXES (HEALTH CLINIC, FOOD STORAGE, ETC.) SHALL MODULATE TOGETHER TO MAINTAIN POSITIVE BUILDING STATIC PRESSURE SETPOINT OF 0.05" W.C. AS MEASURED IN THE HEALTH CLINIC SPACE. SUPPLY VAV BOXES SHALL MODULATE AS A PERCENTAGE OF DESIGN AIRFLOW UP TO A MAXIMUM OF 125% OF DESIGN CFM.
2. SYSTEM STARTUP:
- 2.1. PRIOR TO EQUIPMENT STARTUP, ENSURE VENTILATION SYSTEM HAS ADEQUATE OPENINGS ONTO EACH AREA TO ALLOW FOR VENTILATION SUPPLY AIR FOR TESTING. DO NOT OPERATE THE ERV AT AIRFLOWS HIGHER THAN THE CONNECTED VAV BOXES CAN WITHSTAND.
- H. DISCHARGE AIR CONDITIONS:**
1. COOLING MODE: WHEN OUTSIDE AIR RISES ABOVE 65F (ADJ.), THE UNIT SHALL ENTER COOLING MODE.
- 1.1. DISCHARGE AIR DRY BULB TEMPERATURE SHALL FLOAT FROM A MINIMUM OF 65F (ADJ.) TO A MAXIMUM DISCHARGE AIR DRY BULB TEMPERATURE SETPOINT OF 70F (ADJ.). WHEN DISCHARGE AIR IS BETWEEN MINIMUM AND MAXIMUM, CHILLED WATER CONTROL VALVE SHALL CLOSE, THE HEAT WHEEL SHALL BE DISABLED, AND THE OUTSIDE AIR BYPASS DAMPER SHALL BE OPEN. IF DISCHARGE AIR TEMPERATURE RISES ABOVE SETPOINT, THE COOLING CONTROL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR DRY BULB TEMPERATURE SETPOINT.
- 1.2. CHILLED WATER COOLING AND HEAT WHEEL SHALL BE ENABLED TOGETHER IN STAGES.
2. HEATING MODE: WHEN OUTSIDE AIR FALLS BELOW 65F (ADJ.), THE UNIT SHALL ENTER HEATING MODE.
- 2.1. THE BMS SHALL CONTROL HEATING WATER CONTROL VALVE TO ENSURE UNIT DISCHARGE AIR DRY BULB TEMPERATURE DOES NOT FALL BELOW 65F (ADJ.) MINIMUM.
- 2.2. THE BMS SHALL RESET DISCHARGE AIR DRY BULB TEMPERATURE SETPOINT ACCORDING TO THE FOLLOWING RESET STRATEGY:
- | OUTSIDE AIR DRY BULB TEMPERATURE | DISCHARGE AIR DRY BULB TEMPERATURE |
|----------------------------------|------------------------------------|
| 20 DEGREES F                     | 75 DEGREES F (ADJ.)                |
| 50 DEGREES F                     | 65 DEGREES F (ADJ.)                |
| BETWEEN 20-50 DEGREES F          | RAMP LINEARLY BETWEEN 75-65 F      |
- 2.3. HEATING WATER CONTROL VALVE AND HEAT WHEEL SHALL BE ENABLED TOGETHER IN STAGES.
- 2.4. 3. IF DISCHARGE AIR DRY BULB TEMPERATURE DROPS BELOW 40F (ADJ.), DE-ENERGIZE FANS AND CLOSE OA AND RELIEF AIR DAMPERS. ALARM BMS.



**VENTILATION SUPPLY VARIABLE AIR VOLUME (VAV) BOX**  
A NONE

**SEQUENCE OF OPERATION:**

- A. OCCUPIED MODE:**
1. CONSTANT VOLUME UNITS: WHEN AIR HANDLING SYSTEM IS IN OCCUPIED MODE, UNIT SHALL MODULATE TO MAINTAIN CONSTANT AIRFLOW.
2. UNIT SHALL REPORT CONTROL DAMPER POSITION AND PRIMARY AIRFLOW AS SEPARATE VALUES TO THE BMS. REPORT DAMPER POSITION AS PERCENTAGE OPEN. REPORT PRIMARY AIRFLOW IN CFM.
- B. UNOCCUPIED MODE:**
1. UNIT VOLUME DAMPER SHALL BE FULLY CLOSED.
- C. ALARMS:**
1. ALARM THE TIME, VAV BOX DESIGNATION, AND DURATION OF ALL VAV OVER-RIDES.



**EXHAUST & VENTILATION RELIEF VARIABLE AIR VOLUME (VAV) BOXES**  
A NONE

**SEQUENCE OF OPERATION:**

- A. OCCUPIED MODE:**
1. CONSTANT VOLUME UNITS: WHEN AIR HANDLING SYSTEM IS IN OCCUPIED MODE, UNIT SHALL MODULATE TO MAINTAIN CONSTANT AIRFLOW.
2. UNIT SHALL REPORT CONTROL DAMPER POSITION AND PRIMARY AIRFLOW AS SEPARATE VALUES TO THE BMS. REPORT DAMPER POSITION AS PERCENTAGE OPEN. REPORT PRIMARY AIRFLOW IN CFM.
- B. UNOCCUPIED MODE:**
1. UNIT VOLUME DAMPER SHALL BE FULLY CLOSED.
- C. ALARMS:**
1. ALARM THE TIME, VAV BOX DESIGNATION, AND DURATION OF ALL VAV OVER-RIDES.

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Date	Description
2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

Seal / Signature



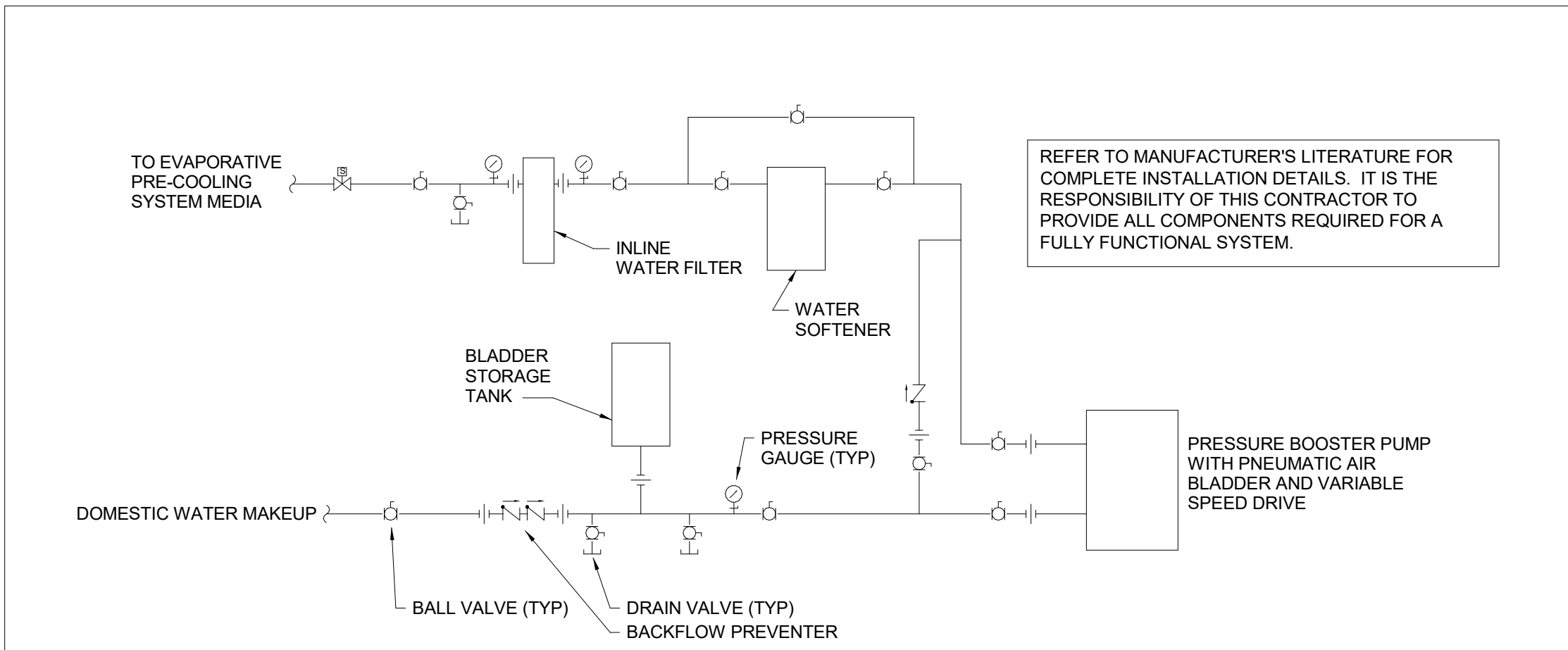
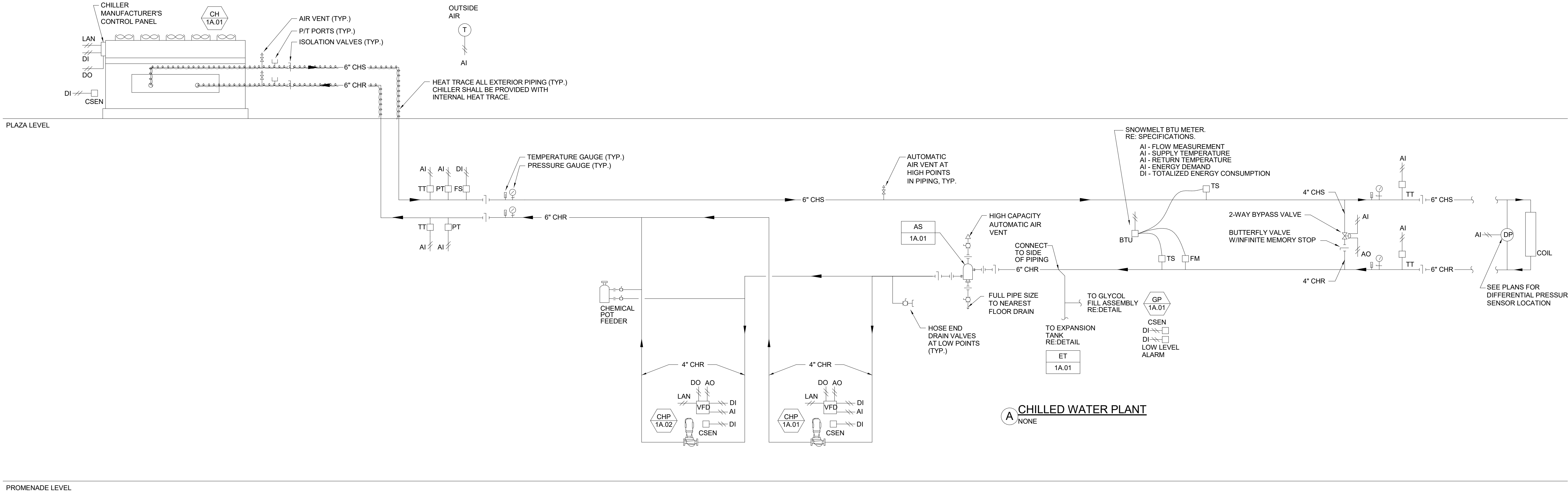
05/18/2021

Project Name	SSRC   BASE AREA IMPROVEMENTS
Project Number	003.7835.000
Description	PROMENADE - MECHANICAL CONTROLS

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**1A-M7.002**





**B** EVAPORATIVE PRE-COOLING SYSTEM CONTROL  
NONE

**SEQUENCE OF OPERATION:**

- A. GENERAL:**
- THE PROJECT INCLUDES ONE EVAPORATIVE PRE-COOLING SYSTEM WHICH SERVES THE PROMENADE BUILDING AIR-COOLED CHILLER.
  - CONTROL FOR THE EVAPORATIVE PRE-COOLING SYSTEM SHALL BE INTERLOCKED WITH CHILLER PACKAGED CONTROLS.
  - PROVIDE SLOW CLOSING SOLENOID VALVE TO MINIMIZE RAPID PRESSURE CHANGE IN THE SYSTEM.
- B. OPERATION:**
- ON A CALL FOR COOLING AT THE CHILLER, THE BOOSTER PUMP SHALL ENERGIZE AND THE SOLENOID VALVE SHALL OPEN TO DELIVER COOLING WATER TO THE EVAPORATIVE PRE-COOLING MEDIA AT THE UNIT CONDENSER. WHEN THE CHILLER NO LONGER HAS A CALL FOR COOLING, THE BOOSTER PUMP SHALL BE DE-ENERGIZED AND THE SOLENOID VALVE SHALL CLOSE.

**CHILLED WATER PLANT SEQUENCE OF OPERATION:**

- A. GENERAL:**
- THE BMS SHALL INDEPENDENTLY MONITOR POINTS INDICATED ON THE CONTROL DIAGRAM AND ALL POINTS REQUIRED TO PERFORM THE FOLLOWING SEQUENCES AND MONITORING FUNCTIONS.
  - THE BMS SHALL ENABLE/DISABLE THE CHILLED WATER SYSTEM BASED UPON:
    - OUTDOOR AIR TEMPERATURE - ENABLE CHILLER SYSTEM WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 50F (ADJ.)
    - SYSTEM LOAD
    - MANUAL OR FORCED
- B. SEQUENCE OF OPERATION:**
- INTENT: THE BMS SHALL CONTROL THE CHILLED WATER SYSTEM INCLUDING PUMPS, VALVES, AND THE PACKAGED CHILLER MICROPROCESSOR. THE BMS SHALL PERFORM ALL START/STOP, TEMPERATURE SETPOINT, AND SCHEDULING FUNCTIONS. THE PACKAGED CHILLER MICROPROCESSOR WILL PERFORM ALL INTERNAL CHILLER TEMPERATURE CONTROL FUNCTIONS, ECONOMIZER FUNCTIONS, AND CHILLER SAFETY FUNCTIONS AND SHALL COMMUNICATE WITH THE BMS VIA A SERIAL COMMUNICATION INTERFACE.
  - START SEQUENCE: UPON SIGNAL TO ENABLE AT THE BMS OPERATOR STATION, THE BMS SHALL:
    - ENABLE THE VARIABLE SPEED DISTRIBUTION PUMPING SYSTEM. BYPASS VALVE POSITION OPEN.
    - START AND PROVE BOTH CHILLED WATER PUMPS.
    - CONTINUALLY MONITOR THE PRESSURE IN THE SUPPLY AND RETURN PIPING MAINS TO THE CHILLER AND DISPLAY BOTH PRESSURE AND PRESSURE DIFFERENTIAL AT THE BMS OPERATOR'S WORKSTATION. CONTINUALLY MONITOR FLOW TO THE CHILLER VIA FLOW METER AND DISPLAY AT THE BMS OPERATOR'S WORKSTATION. DISPLAY BOTH MINIMUM AND OPERATING EVAPORATOR FLOW FOR THE CHILLER AT BMS OPERATOR'S WORKSTATION.
    - MODULATE BYPASS VALVE, AS NECESSARY, TO MAINTAIN PLANT MINIMUM FLOW (ADJ.) AS MEASURED AT THE PLANT BTU METERING STATION. WHEN FLOW IS ABOVE REQUIRED MINIMUM CHILLER FLOW, BYPASS VALVE SHALL MODULATE CLOSED.
    - ENABLE THE CHILLER VIA SIGNAL TO THE PACKAGED CHILLER MICROPROCESSOR ONCE MINIMUM FLOW TO THE CHILLER IS PROVEN.
  - STOP SEQUENCE: UPON SIGNAL TO DISABLE AT THE BMS OPERATOR STATION, THE BMS SHALL:
    - DISABLE THE CHILLERS VIA SIGNAL TO THE PACKAGED CHILLER MICROPROCESSOR.
    - CONFIRM THE CHILLER HAS STOPPED VIA COMMUNICATION INTERFACE WITH THE PACKAGED CHILLER MICROPROCESSOR.
    - DISABLE ALL CHILLED WATER PUMPS.
    - OPEN BYPASS VALVE.
    - CHILLER SHALL NOT BE RESTARTED FOR A FIVE MINUTE DELAY (ADJ.).
  - TEMPERATURE CONTROL: UPON SUCCESSFUL STARTUP, PACKAGED CHILLER MICROPROCESSOR SHALL MAINTAIN CHILLED WATER SUPPLY TEMPERATURE SETPOINT ADJUSTABLE AT THE BMS OPERATOR STATION.
    - INITIAL CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL BE 44 DEGREES F.
    - CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL BE RESET BY THE BMS ACCORDING TO THE FOLLOWING RESET SCHEDULE:

OUTSIDE AIR DRY BULB TEMPERATURE	CHILLED WATER LEAVING TEMPERATURE
80 DEGREES F (ADJ.)	44 DEGREES F (ADJ.)
60 DEGREES F (ADJ.)	50 DEGREES F (ADJ.)
BETWEEN 80-60 DEGREES F	RAMP LINEARLY BETWEEN 44-50F
  - WHEN CHILLED WATER SUPPLY TEMPERATURE IS RESET ABOVE INITIAL SETPOINT AND ANY ZONE SERVED IS ABOVE COOLING SETPOINT FOR MORE THAN 10 CONSECUTIVE MINUTES (ADJ.), CHILLED WATER SETPOINT SHALL BE RETURNED TO INITIAL CHILLED WATER SETPOINT. AFTER DELAY OF 1 HOUR (ADJ.), CHILLED WATER SUPPLY TEMPERATURE RESET SHALL BE ENABLED.
  - CHILLER ECONOMIZER MODE: WHEN OUTSIDE AIR IS 5 DEGREES F (ADJ.) LOWER THAN THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT, THE PACKAGED CHILLER MICROPROCESSOR SHALL ENABLE ECONOMIZER MODE. WHEN ECONOMIZER MODE IS ENABLED, THE PACKAGED CHILLER MICROPROCESSOR SHALL STOP COMPRESSOR COOLING AND DIVERT WATER AS REQUIRED FOR FREE COOLING. ALARM BMS IF ECONOMIZER MODE IS ENABLED AND CHILLED WATER SUPPLY TEMPERATURE IS ABOVE SETPOINT FOR 15 MINUTES (ADJ.).
- PUMP CONTROL: ONCE CHILLER START SEQUENCE IS COMPLETE, THE PUMP VFD'S SHALL MODULATE THEIR RESPECTIVE PUMPS IN PARALLEL TO MAINTAIN SYSTEM DIFFERENTIAL PRESSURE SETPOINT. REQUIRED MINIMUM SYSTEM FLOW SHALL BE 200 GPM (ADJ.) VFD HZ SETPOINTS TO MAINTAIN MINIMUM FLOW SHALL BE DETERMINED DURING TESTING AND BALANCING AND SHALL BE DETERMINED AND PROGRAMMED FOR TWO PUMPS RUNNING IN PARALLEL AND ONLY ONE PUMP RUNNING DURING MINIMUM FLOW CONDITION. THE BMS SHALL BE CAPABLE OF ENABLING AND DISABLING INDIVIDUAL PUMP VFD'S SEPARATELY AT THE BMS OPERATOR STATION. IN RESPONSE TO LOW-LOAD, THE VFD'S SHALL MODULATE THEIR RESPECTIVE PUMPS IN PARALLEL TO MAINTAIN A SYSTEM DIFFERENTIAL PRESSURE SETPOINT.
    - INITIAL DIFFERENTIAL PRESSURE SETPOINT SHALL BE DETERMINED UPON SYSTEM TESTING AND BALANCING.
  - BYPASS VALVE CONTROL: ONCE CHILLED WATER FLOW APPROACHES PLANT MINIMUM FLOW (AS INDICATED VIA DIRECT MEASUREMENT AT CHILLED WATER FLOW METER), THE BYPASS VALVE SHALL MODULATE OPEN TO MAINTAIN MINIMUM SYSTEM FLOW. AS BYPASS VALVE APPROACHES FULL OPEN, PUMP VFD'S SHALL INCREASE, IF NECESSARY, TO ENSURE CHILLED WATER FLOW DOES NOT DECREASE BELOW MINIMUM SYSTEM FLOW.
  - CHILLED WATER PUMP FAILURE: UPON FAILURE OF ONE OF THE CHW PUMPS, RESET SEQUENCE TO UTILIZE REMAINING PUMP AND GENERATE AN APPROPRIATE ALARM AT THE BMS OPERATOR STATION.
  - CHILLER FAILURE: UPON CHILLER FAILURE, THE BMS SHALL ALARM AND SHALL AUTOMATICALLY INITIATE A CHILLED WATER PLANT SHUT DOWN.
  - COMMUNICATION FAILURE: UPON A LOSS OF SIGNAL FROM THE PACKAGED CHILLER MICROPROCESSOR, THE BMS SHALL ALLOW THE SYSTEM TO CONTINUE TO RUN AND SHALL GENERATE AN APPROPRIATE ALARM AT THE BMS OPERATOR STATION.
  - SYSTEM SOFT START: THE CHILLER SEQUENCING SOFTWARE SHALL PROVIDE OPERATOR ADJUSTABLE CHILLED WATER TEMPERATURE RAMP RATES TO ENSURE THAT THE SYSTEM WATER TEMPERATURE DOES NOT APPROACH SETPOINT TOO QUICKLY OR TOO SLOWLY AT SYSTEM START-UP. THIS PREVENTS THE UNNECESSARY OPERATION OF CHILLERS AND LIMITS SYSTEM ELECTRICAL DEMAND DURING DISTRIBUTION LOOP TEMPERATURE PULL DOWN. THE MAXIMUM COOL DOWN RATE IN THE CHILLED WATER LOOP SHALL NOT EXCEED 2F PER MINUTE (ADJ.).
  - CHILLER STATUS DISPLAY: THE BMS SHALL PROVIDE AN OPERATING STATUS REPORT FOR THE CHILLER INCLUDING THE FOLLOWING:
    - CHILLER OPERATING MODE (COOLING MODE, ECONOMIZER MODE, OFF)
    - CHILLER LEAVING WATER TEMPERATURE SETPOINT.
    - CHILLED WATER ENTERING AND LEAVING TEMPERATURES.
    - CHILLED WATER ENTERING AND LEAVING PRESSURES.
    - CHILLER DIFFERENTIAL PRESSURE.
    - CHILLER WATER FLOW.
    - CHILLER LOAD AS MEASURED AT BTU METERING STATION.
    - CHILLER LOAD IN PERCENTAGE OF TOTAL CHILLER CAPACITY.
  - DIAGNOSTIC/PROTECTION: THE BMS SHALL BE ABLE TO ALARM FROM ALL SENSED POINTS AND DIAGNOSTIC ALARMS SENSED BY THE PACKAGED CHILLER MICROPROCESSOR. ALARM LIMITS SHALL BE DESIGNED FOR ALL SENSED ANALOG POINTS.
  - CHILLER PLANT STATUS DISPLAY: THE BMS SHALL PROVIDE A PLANT STATUS REPORT. THE DISPLAY SHALL INCLUDE THE FOLLOWING:
    - ON/OFF STATUS OF CHILLER.
    - ON/OFF STATUS AND SPEED OF EACH PUMP.
    - SYSTEM DIFFERENTIAL PRESSURE AND SETPOINT.
    - CHILLER DIFFERENTIAL PRESSURE AND FLOW.
    - BYPASS VALVE POSITION.
    - PLANT EWT AND LWI.
    - CALCULATED TOTAL PLANT TONNAGE PRODUCTION.
  - SYSTEM DIAGNOSTIC AND ALARM INDICATION: THE PACKAGED CHILLER MICROPROCESSOR SHALL DISPLAY LOCALLY ALL THE ALARM, MONITORING, AND OPERATION CONDITIONS AS DESCRIBED IN SPECIFICATIONS. IT SHALL ALSO SUPPLY TO THE BMS A COMMON BINARY STATUS FOR ANY OF THESE ALARM CONDITIONS.
  - FREEZE PROTECTION: UPON A DROP IN OUTDOOR AIR TEMPERATURE TO 0F, ONE PRIMARY CHILLED WATER PUMP SHALL ENERGIZE, PUMP VARIABLE FREQUENCY DRIVE SHALL MODULATE TO MINIMUM SPEED, AND BYPASS VALVE SHALL OPEN FOR A PERIOD OF 2 MINUTES (ADJ.) EVERY 2 HOURS (ADJ.) FOR SUPPLEMENTARY FREEZE PROTECTION.
  - HEAT TRACE: MONITOR HEAT TRACE ON EXTERIOR PIPING. ALARM BMS UPON FAILURE OF HEAT TRACE SYSTEM.

Date	Description
2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

Seal / Signature



05/18/2021

Project Name

SSRC | BASE AREA  
IMPROVEMENTS

Project Number

003.7835.000

Description

PROMENADE - MECHANICAL  
CONTROLS

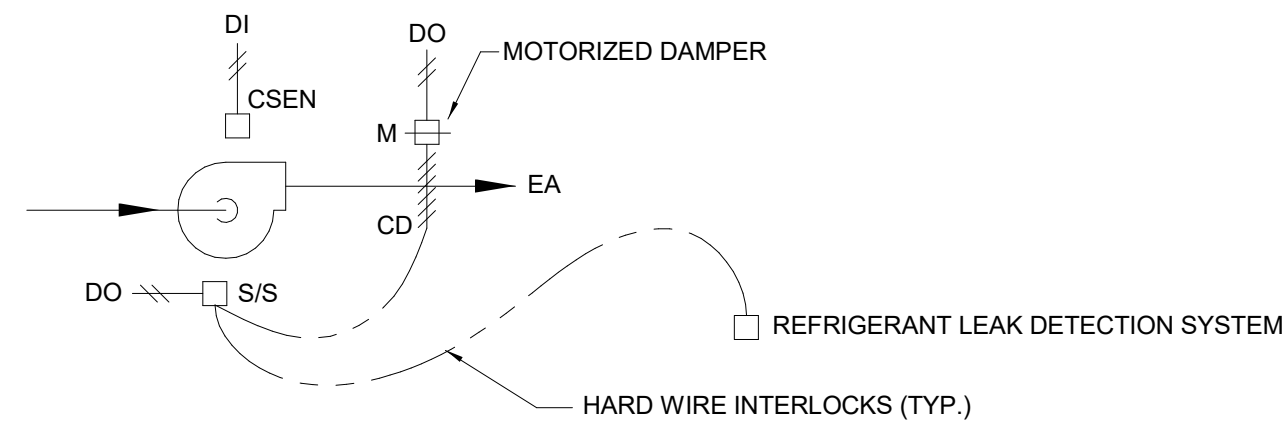
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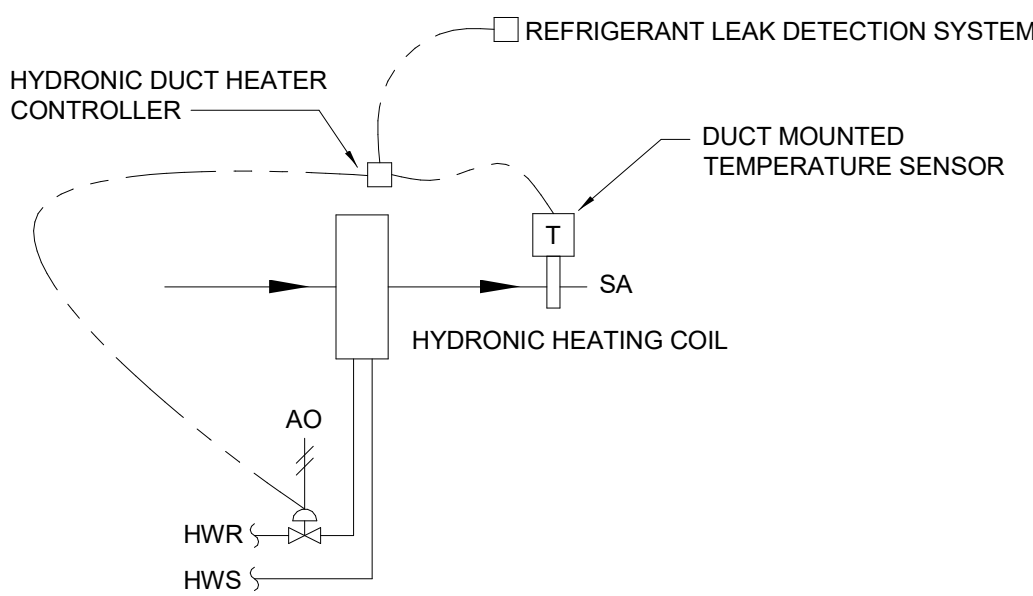


ENERGY METER SCHEDULE/POINTS LIST														
SYSTEM: ENERGY METERING SYSTEM														
POINT DESCRIPTION	F	TYPE	LOAD CATEGORY	ENERGY DEMAND					ENERGY CONSUMPTION				REMARKS	
				UNIT	HOURLY PEAK	DAILY PEAK	MONTHLY PEAK	ANNUAL PEAK	UNIT	HOURLY TOTAL	DAILY TOTAL	MONTHLY TOTAL		ANNUAL TOTAL
BUILDING MAIN ELECTRICAL SERVICE METER			MAIN	kW	X	X	X	X	kWh	X	X	X		
PANEL L1N2 - LIGHTING	E		LTG	kW	X	X	X	X	kWh	X	X	X		
PLAZA BUILDING KITCHEN PODS - POD-1	E		PLUG	kW	X	X	X	X	kWh	X	X	X	DATA FOR EACH KITCHEN POD DERIVED VIA SINGLE CONNECTION TO KITCHEN POD METERING SYSTEM.	
PLAZA BUILDING KITCHEN PODS - POD-2	E		PLUG	kW	X	X	X	X	kWh	X	X	X	DATA FOR EACH KITCHEN POD DERIVED VIA SINGLE CONNECTION TO KITCHEN POD METERING SYSTEM.	
PLAZA BUILDING KITCHEN PODS - POD-3	E		PLUG	kW	X	X	X	X	kWh	X	X	X	DATA FOR EACH KITCHEN POD DERIVED VIA SINGLE CONNECTION TO KITCHEN POD METERING SYSTEM.	
PLAZA BUILDING KITCHEN PODS - POD-4	E		PLUG	kW	X	X	X	X	kWh	X	X	X	DATA FOR EACH KITCHEN POD DERIVED VIA SINGLE CONNECTION TO KITCHEN POD METERING SYSTEM.	
PLAZA BUILDING KITCHEN PODS - POD-5	E		PLUG	kW	X	X	X	X	kWh	X	X	X	DATA FOR EACH KITCHEN POD DERIVED VIA SINGLE CONNECTION TO KITCHEN POD METERING SYSTEM.	
PLAZA BUILDING KITCHEN PODS - POD-6	E		PLUG	kW	X	X	X	X	kWh	X	X	X	DATA FOR EACH KITCHEN POD DERIVED VIA SINGLE CONNECTION TO KITCHEN POD METERING SYSTEM.	
PANEL L1N1 - LIGHTING	E		LTG	kW	X	X	X	X	kWh	X	X	X	OBTAIN PANEL LOAD BY DEDUCTING PANEL R3N1 METERED USAGE FROM PANEL L1N1 METERED USAGE.	
PANEL R3N1 - PLUG LOADS	E		PLUG	kW	X	X	X	X	kWh	X	X	X		
CHILLER ELECTRICITY METER	E		MECH	kW	X	X	X	X	kWh	X	X	X		
PANEL R1N1 - PLUG LOADS	E		PLUG	kW	X	X	X	X	kWh	X	X	X		
PANEL R1N3 - PLUG LOADS	E		PLUG	kW	X	X	X	X	kWh	X	X	X		
PANEL M1N3 - MECHANICAL LOADS	E		MECH	kW	X	X	X	X	kWh	X	X	X	OBTAIN PANEL LOAD BY DEDUCTING ZAMBONI ROOM METERED USAGE FROM PANEL M1N3 METERED USAGE.	
ZAMBONI ROOM - MECHANICAL LOADS	E		MECH	kW	X	X	X	X	kWh	X	X	X		
PANEL M1N2 - MECHANICAL LOADS	E		MECH	kW	X	X	X	X	kWh	X	X	X	OBTAIN PANEL LOAD BY DEDUCTING PANEL R1N4 METERED USAGE FROM PANEL M1N2 METERED USAGE.	
PANEL R1N4 - PLUG LOADS	E		PLUG	kW	X	X	X	X	kWh	X	X	X		
PANEL M1N1 - MECHANICAL LOADS	E		MECH	kW	X	X	X	X	kWh	X	X	X		
ICE PLANT ELECTRICITY METER	E		MECH	kW	X	X	X	X	kWh	X	X	X		
BUILDING LIGHTING	VIR			kW	X	X	X	X	kWh	X	X	X	OBTAIN BY ADDING ALL BUILDING LTG METERS.	
BUILDING HVAC/PLUMBING	VIR			kW	X	X	X	X	kWh	X	X	X	OBTAIN BY ADDING ALL BUILDING MECH METERS. DO NOT DOUBLE COUNT SUB-METERS.	
BUILDING PLUG LOAD	VIR			kW	X	X	X	X	kWh	X	X	X	OBTAIN BY ADDING ALL BUILDING PLUG LOAD METERS. DO NOT DOUBLE COUNT SUB-METERS.	
CHILLER PLANT BTU METER		BTU	MECH	TONS	X	X	X	X	TON-HRS	X	X	X		
CHILLER PLANT EFFICIENCY			VIR	KW/TON									SEE NOTE 10 BELOW.	
PROMENADE BUILDING MAIN NATURAL GAS SERVICE METER	NG		MAIN	TH/H	X	X	X	X	THERMS	X	X	X		
NATURAL GAS SERVICE TO PLAZA BUILDING KITCHENS	NG		MECH	TH/H	X	X	X	X	THERMS	X	X	X		
NATURAL GAS SERVICE TO PLAZA FIRE PITS	NG		MECH	TH/H	X	X	X	X	THERMS	X	X	X		
MAIN DOMESTIC WATER SERVICE	DW		MAIN	GAL/H	X	X	X	X	GAL	X	X	X		
ICE PLANT PROCESS WATER	DW		PLB	GAL/H	X	X	X	X	GAL	X	X	X		
IRRIGATION WATER	DW		PLB	GAL/H	X	X	X	X	GAL	X	X	X		
GENERAL NOTES:														
1. TYPE CODES:														
E: ELECTRICITY														
NG: NATURAL GAS														
DW: DOMESTIC WATER														
BTU: BTU METER														
VIR: VIRTUAL METER OBTAINED VIA ADDITION OR SUBTRACTION														
2. LOAD CATEGORIES:														
MAIN: MAIN BUILDING METER														
MECH: MECHANICAL														
LTG: LIGHTING														
PLB: PLUMBING														
PLUG: PLUG LOAD														
PROC: PROCESS														
3. ALL METERS SHALL RECORD AT INTERVALS OF ONE HOUR OR LESS.														
4. ALL METERS SHALL REPORT BOTH DEMAND (kW OR BTU/h) AND CONSUMPTION (kWh OR THERMS) UNLESS OTHERWISE NOTED.														
5. MAIN ELECTRICAL SERVICE ENTRANCE METERS SHALL RECORD POWER FACTOR AND REPORT HOURLY. RECORD HOURLY VALUES FOR A MINIMUM OF THREE YEARS.														
6. ALL METERS INDICATED SHALL HAVE DIRECT CONNECTION TO THE BMS VIA SERIAL COMMUNICATION UNLESS OTHERWISE NOTED.														
7. RECORDED DATA FOR EACH METER SHALL INCLUDE HOURLY, DAILY, MONTHLY, AND ANNUAL PEAK DEMAND AND TOTAL CONSUMPTION. INFORMATION FOR EACH METER POINT INDICATED SHALL BE REPORTED AT THE BMS OPERATOR STATION IN CALENDAR FORMAT. DATA SHALL BE STORED FOR A MINIMUM OF THREE YEARS.														
8. METERED DATA SHALL BE REMOTELY ACCESSIBLE THROUGH THE BMS.														
9. METERING SYSTEM SHALL BE EXPANDABLE TO INCLUDE ADDITIONAL METERS FOR SHELL AREAS INDICATED ON ARCHITECTURAL DRAWINGS.														
10. REPORT HOURLY CHILLER PLANT kW/TON USING 1 HOUR MEASUREMENT OF TOTAL ELECTRICITY CONSUMED (kWh) DIVIDED BY SAME 1 HOUR MEASUREMENT OF TOTAL COOLING ENERGY PRODUCED (TON-HRS). REPORT MONTHLY MAXIMUM AND MINIMUM CHILLER kW/TON. DATA SHALL BE STORED FOR A MINIMUM OF THREE YEARS.														
11. WHERE METERED CATEGORY VIRTUAL POINTS ARE INDICATED, DO NOT DOUBLE COUNT SUB-METERS. FOR METERS IN SERIES, COUNT ONLY THE UPSTREAM METER IN THE CATEGORY TOTAL.														



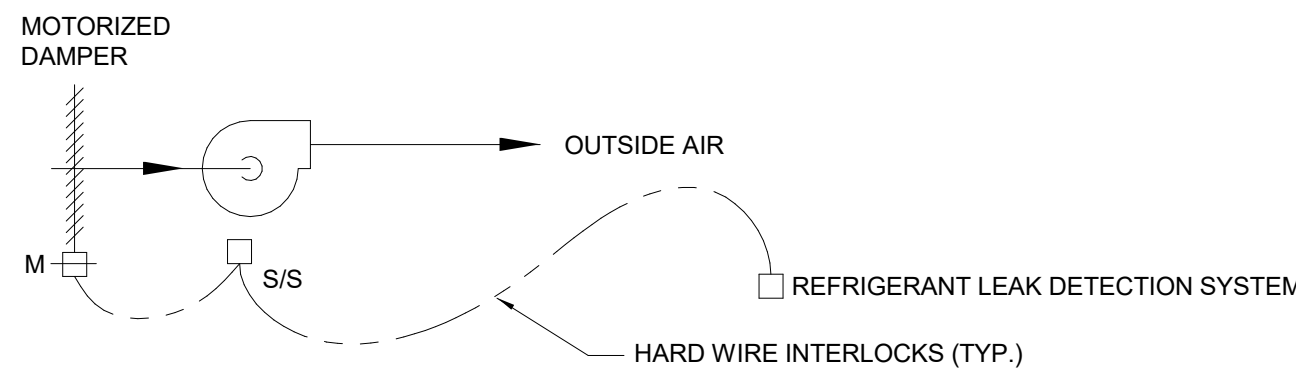
**A** ICE PLANT EXHAUST FAN CONTROL  
NONE

A. FAN SHALL BE INTERLOCKED WITH SUPPLY FAN SERVING SAME AREA. FAN TO RUN CONTINUOUSLY AT A LOW SPEED OF 700CFM. UPON REFRIGERANT LEAK DETECTION SYSTEM ACTIVATION, MODULATE FAN TO HIGH SPEED OF 2500CFM.



**B** HYDRONIC REHEAT COIL CONTROL  
NONE

A. INTERLOCK HYDRONIC DUCT HEATER WITH VENTILATION SUPPLY FAN SERVING SAME AREA. MODULATE CONTROL VALVE TO MAINTAIN VENTILATION SUPPLY AIR TEMPERATURE OF 65F (ADJ.) CONTINUOUSLY.



**C** ICE PLANT SUPPLY FAN VENTILATION CONTROL  
NONE

A. FAN SHALL BE INTERLOCKED WITH EXHAUST FAN SERVING SAME AREA. FAN TO RUN CONTINUOUSLY AT A LOW SPEED OF 700CFM. UPON REFRIGERANT LEAK DETECTION SYSTEM ACTIVATION, MODULATE FAN TO HIGH SPEED OF 2500CFM.

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Description

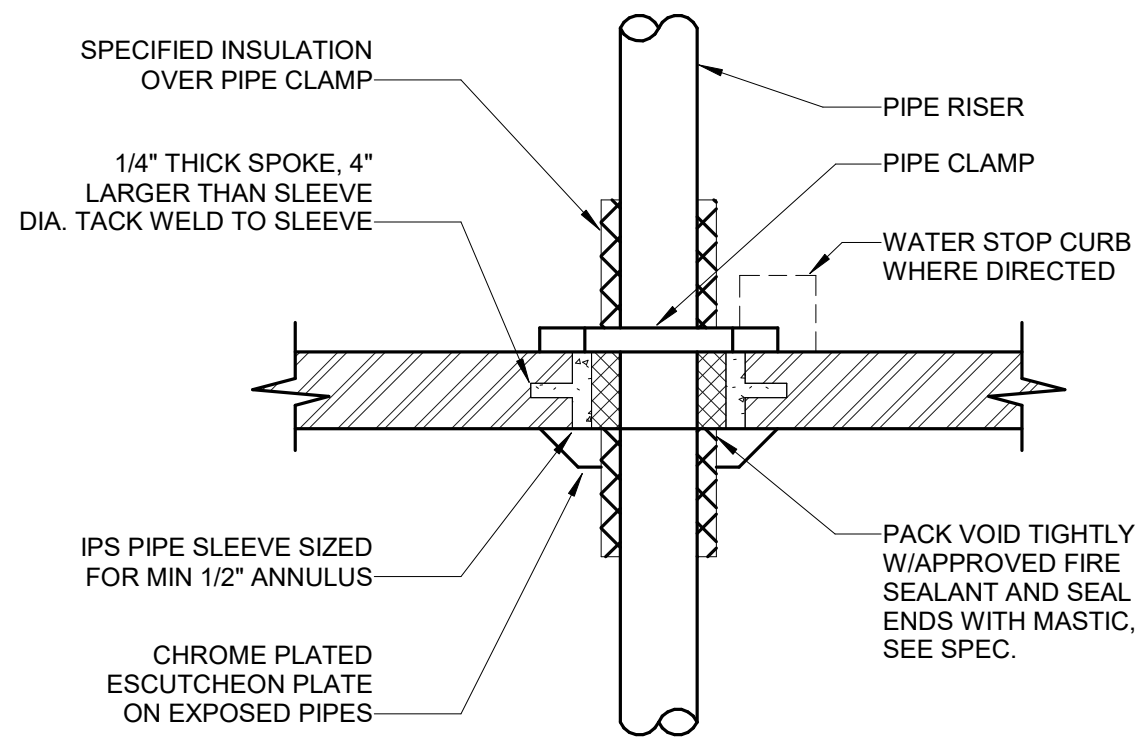
PROMENADE - MECHANICAL  
CONTROLS

Scale

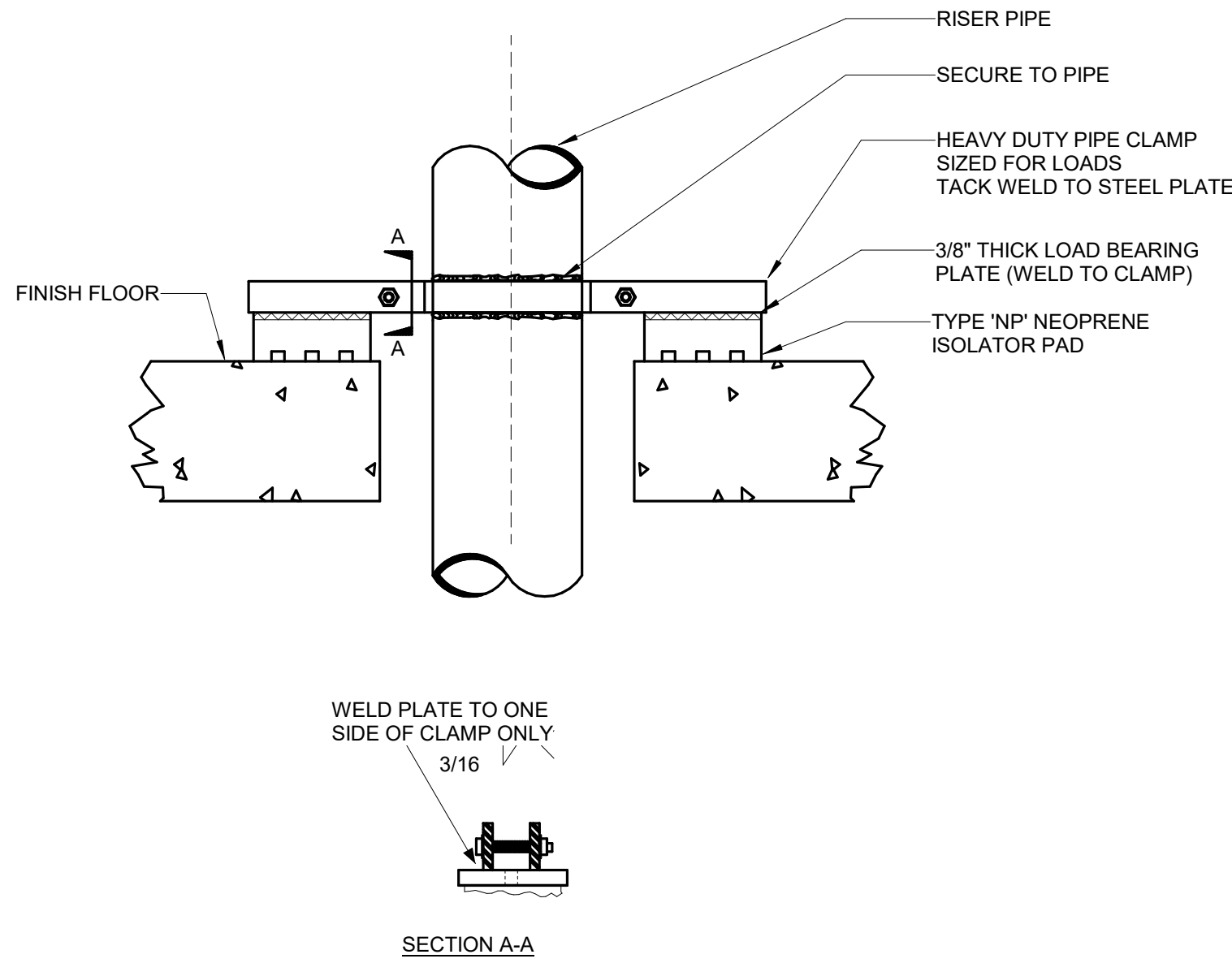
NOT TO SCALE

**1A-M7.004**

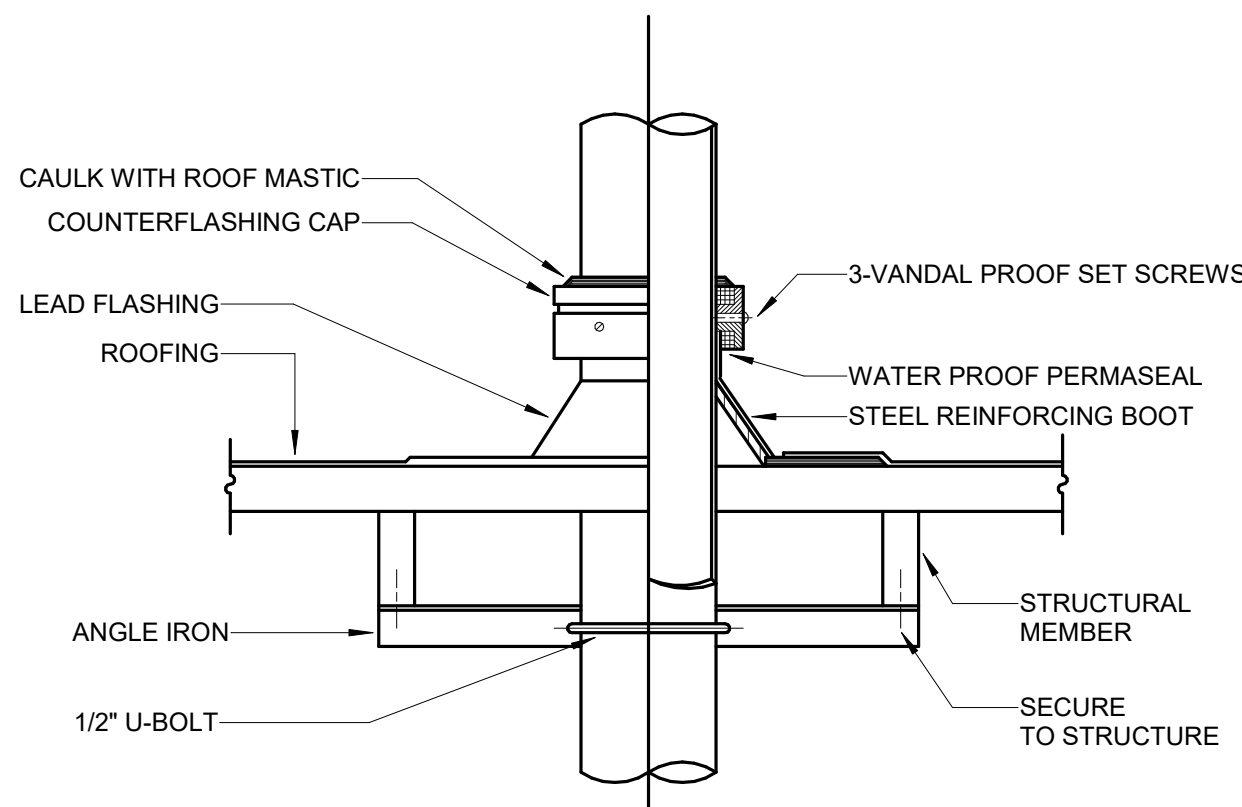




8 PIPE THROUGH FLOOR SLAB DETAIL  
NO SCALE

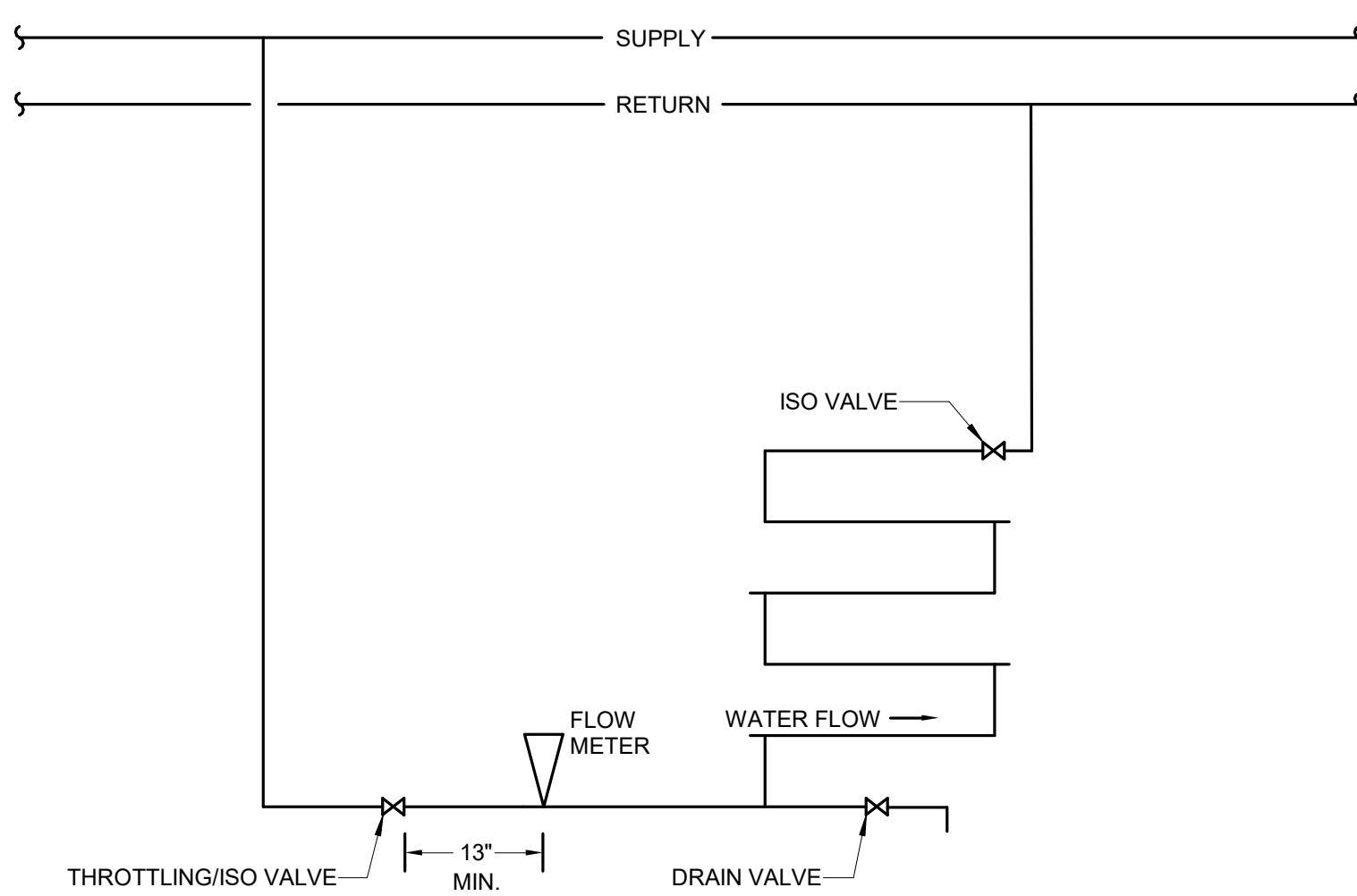


9 RISER ISOLATION SUPPORT  
NO SCALE

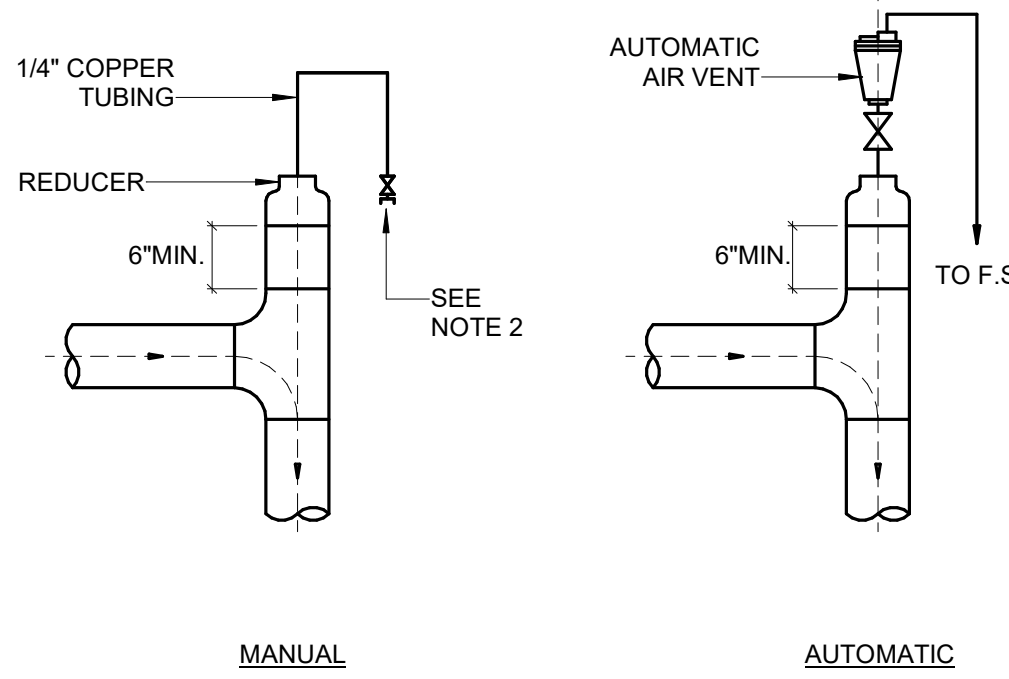


NOTES:  
1. OMIT ANGLE IRON AND 1/2\"/>

10 PIPE THROUGH ROOF  
NO SCALE



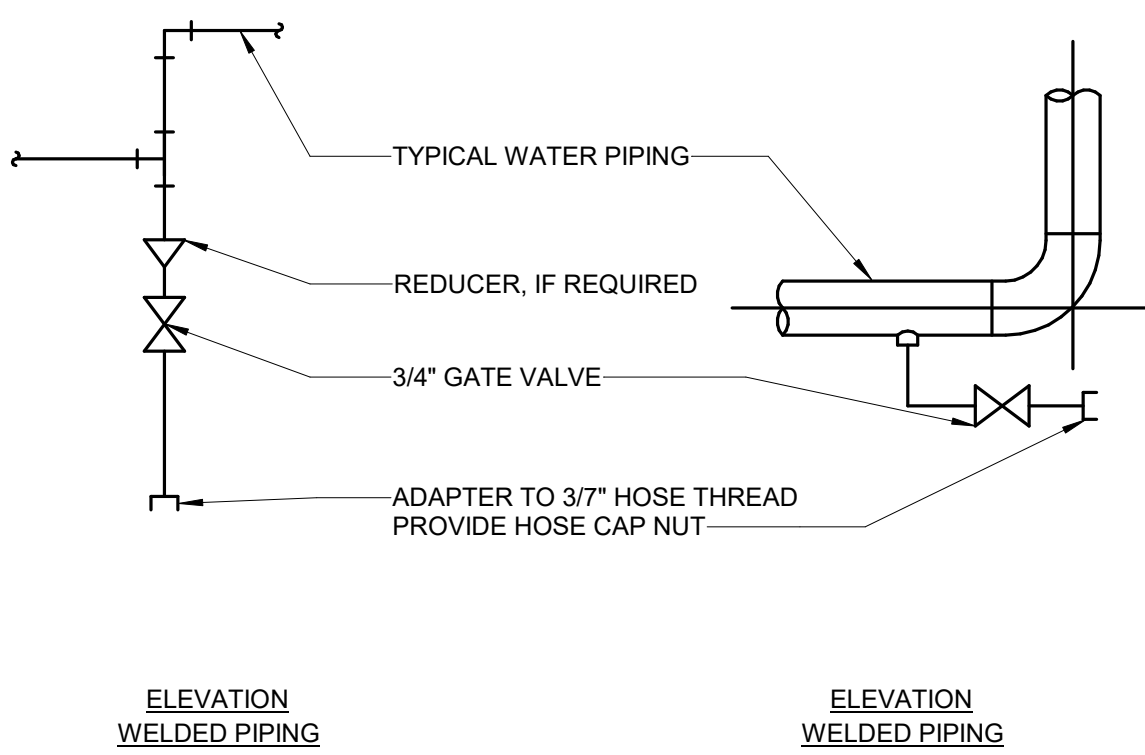
11 CORROSION COUPON RACK  
NO SCALE



NOTE:

1. INSTALL MANUAL AIR VENT AT HIGH POINTS WHERE FLOW CHANGES DIRECTION. INSTALL AUTOMATIC AIR VENT TO PIPING WHICH IS INSTALLED IN EXPOSED AREA INCLUDING FAN ROOM AND MECHANICAL ROOM.
2. INSTALL HOSE VALVE ABOVE CEILING IN AN ACCESSIBLE LOCATION.
3. WELDED PIPE FITTING SHOWN. SCREWED FITTING SIMILAR.

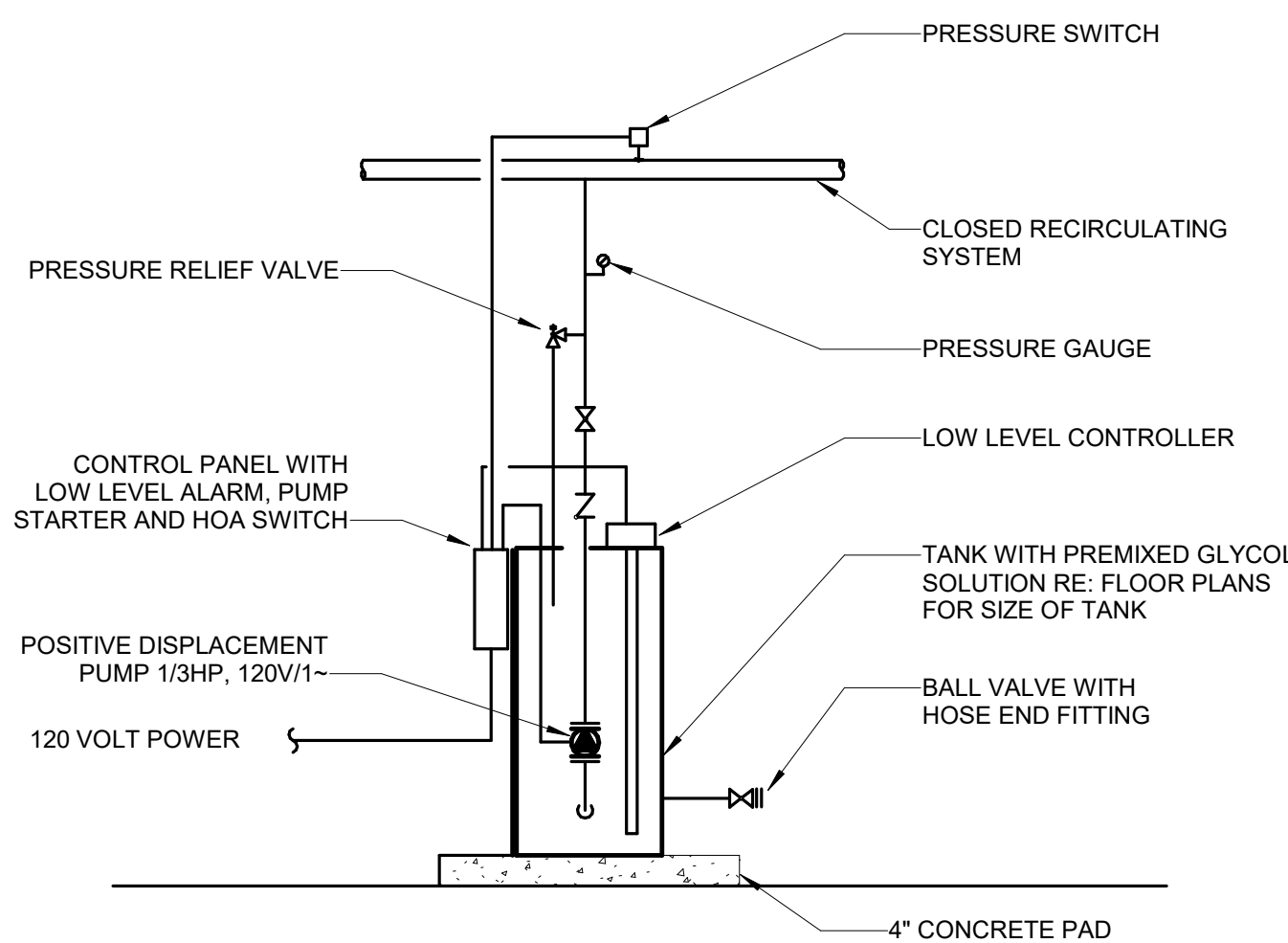
4 AIR VENT DETAIL  
NO SCALE



NOTES:

1. PROVIDE DRAIN VALVES AT LOW POINTS OF WATER SYSTEM.
2. WHERE SCALE POCKETS ARE SHOWN ON PIPE RISER DIAGRAMS AND/OR PLANS LOCATE DRAIN AT BOTTOM OF SCALE POCKET.

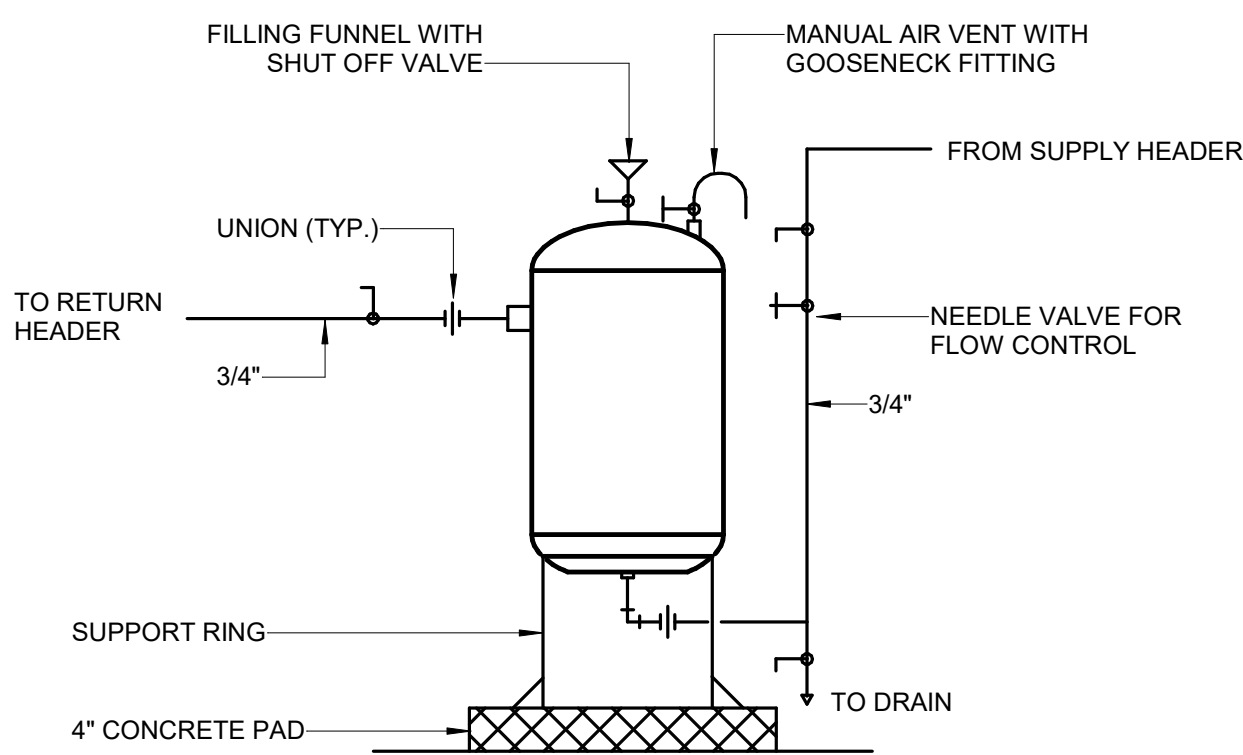
5 DRAIN VALVE CONNECTION DETAIL  
NO SCALE



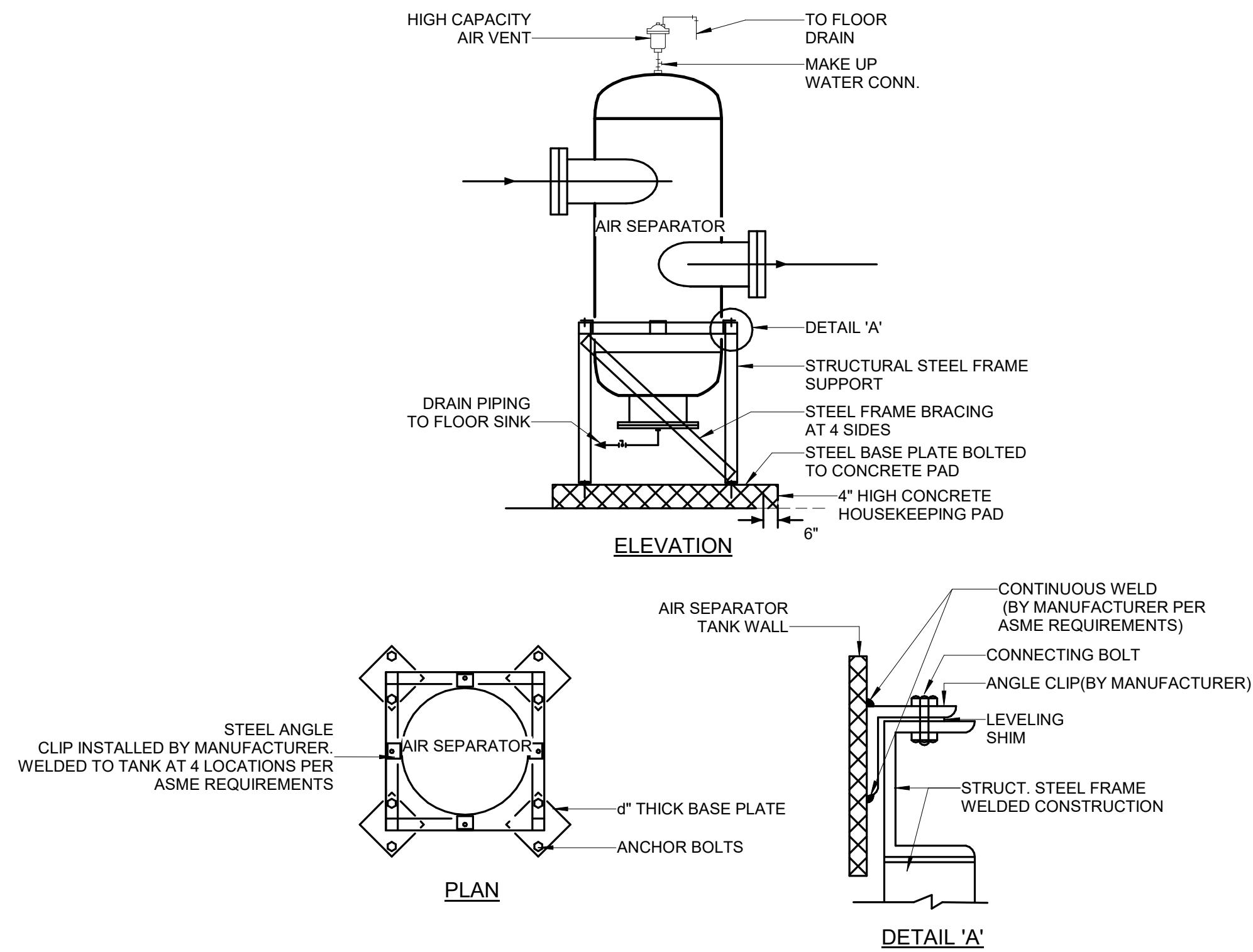
NOTE:

1. GLYCOL FEEDER SHALL BE A PACKAGED SYSTEM PROVIDED BY THE WATER TREATMENT SUPPLIER, H.O.H OR EQUIVALENT.

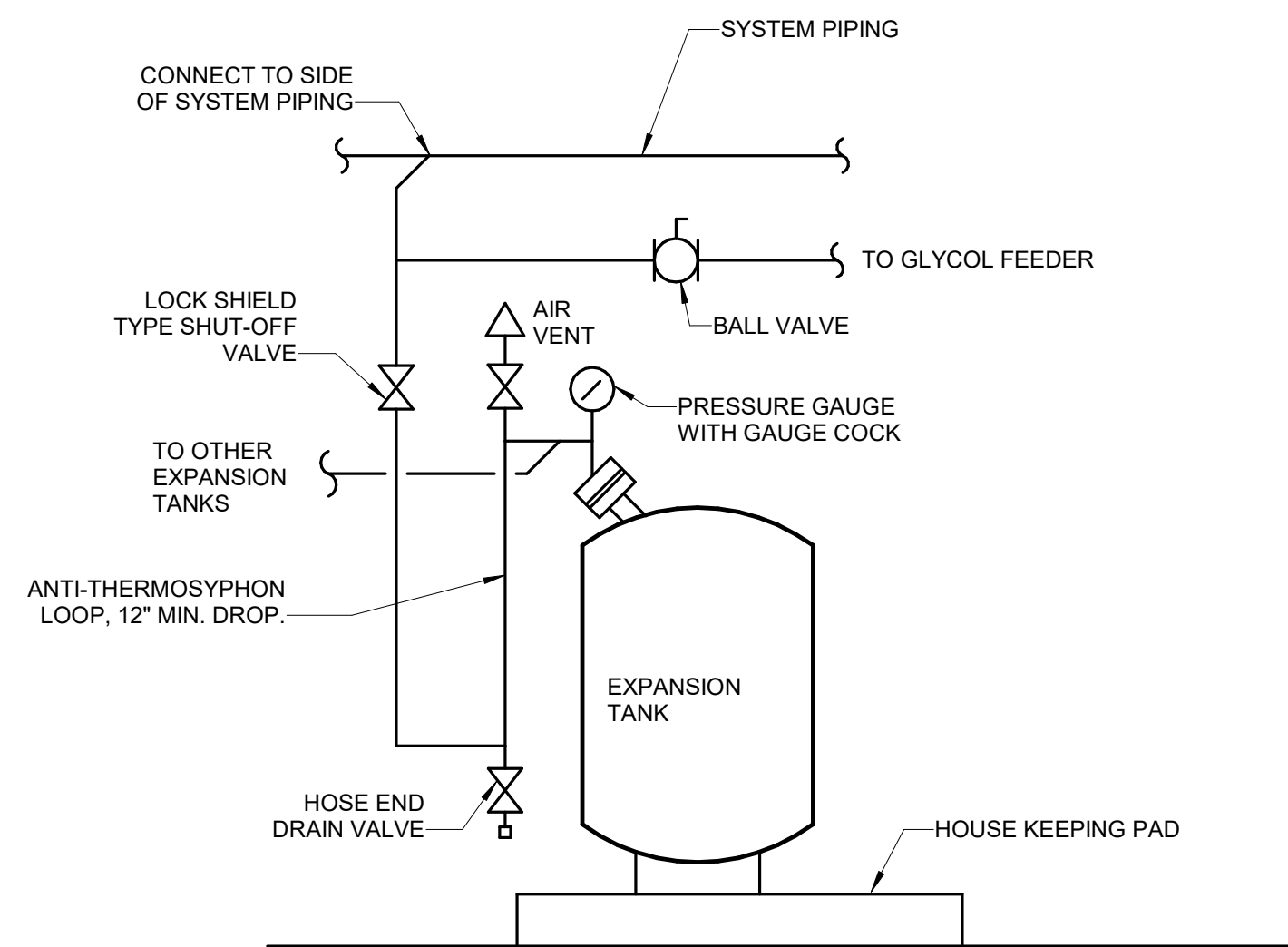
6 GLYCOL FEED ASSEMBLY DETAIL  
NO SCALE



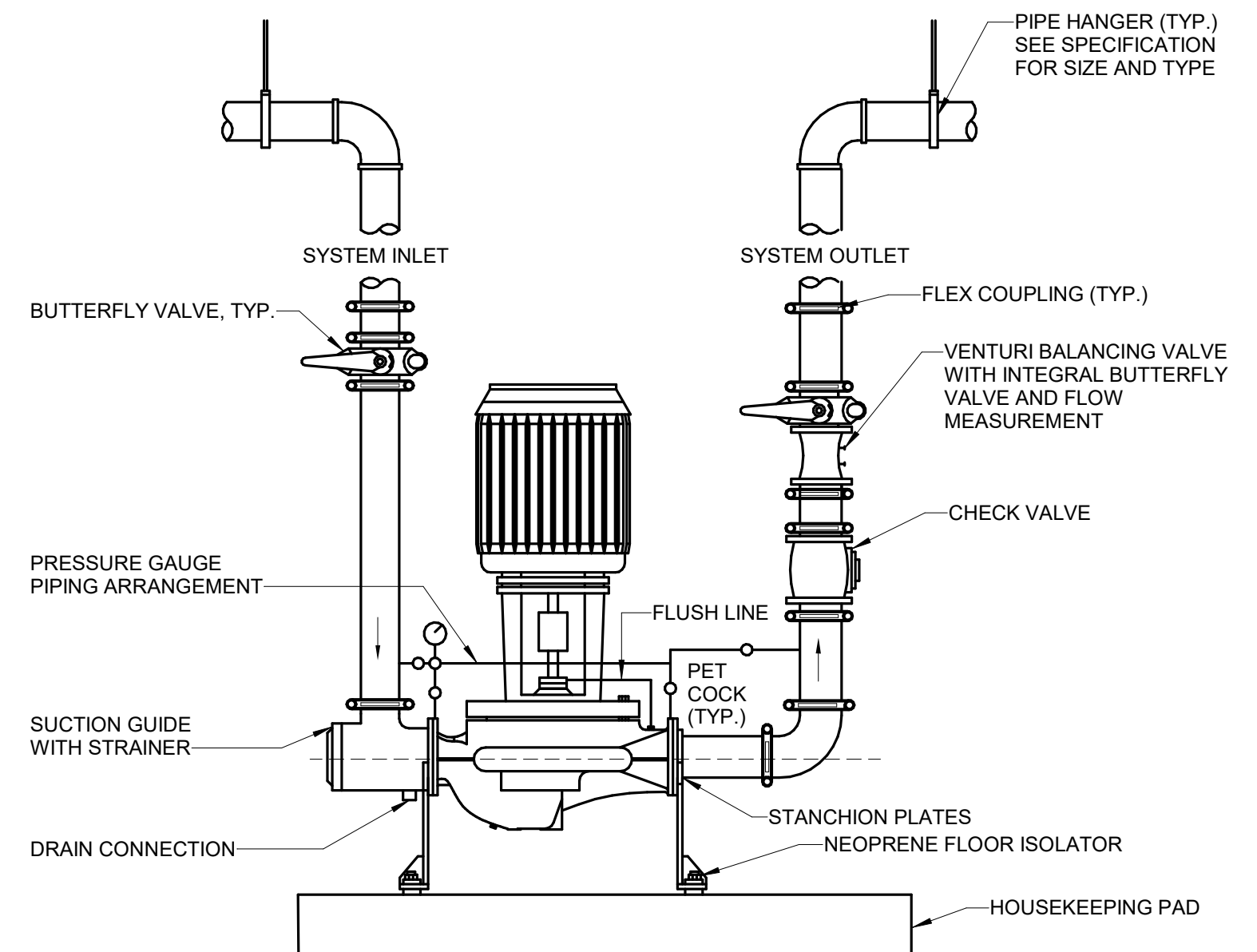
7 CHEMICAL POT FEEDER  
NO SCALE



1 AIR SEPARATOR MOUNTING  
NO SCALE



2 EXPANSION TANK DETAIL  
NO SCALE



3 INLINE PUMP DETAIL - 5HP AND LARGER  
NO SCALE

**Steamboat**

ALTERRA east west partners  
MOUNTAIN COMPANY

2305 Mount Werner Circle  
Steamboat Springs, CO 80487

**Gensler**

1225 17th Street  
Suite 150  
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CONSULTING, INC.

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Tel 970.871.9494

DESIGNWORKSHOP

1390 Lawrence Street  
Suite 100  
Denver, CO 80204  
Tel 303.623.5186

**MARTIN/MARTIN**  
CONSULTING ENGINEERS

12499 West Colfax Ave.  
Lakewood, CO 80215  
United States  
Tel 303.431.6100

**me**  
engineers

14143 Denver West Pkwy  
Suite 300  
Golden, CO  
United States  
Tel 303.421.6655

Date	Description
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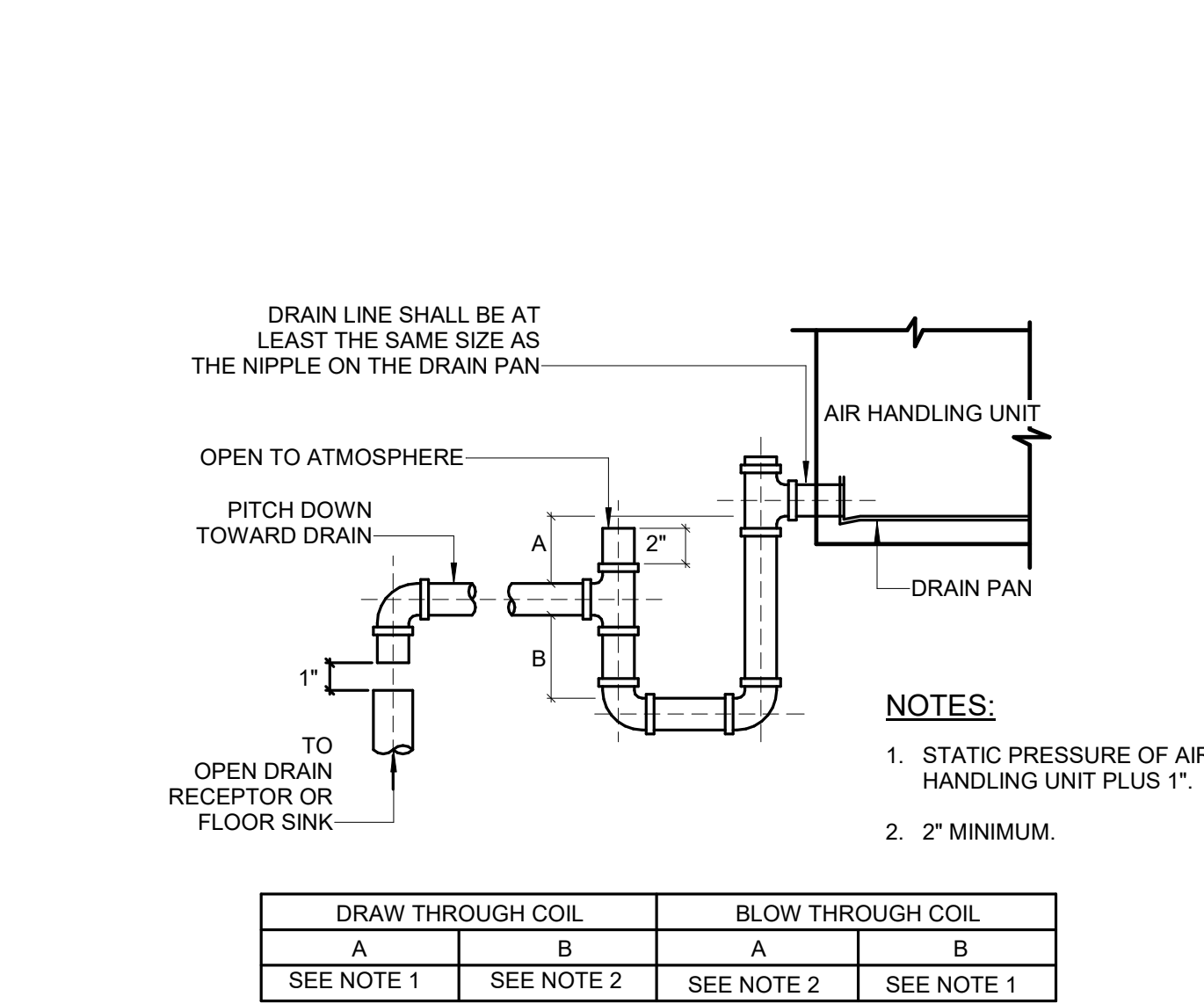
PROMENADE - MECHANICAL DETAILS

Scale

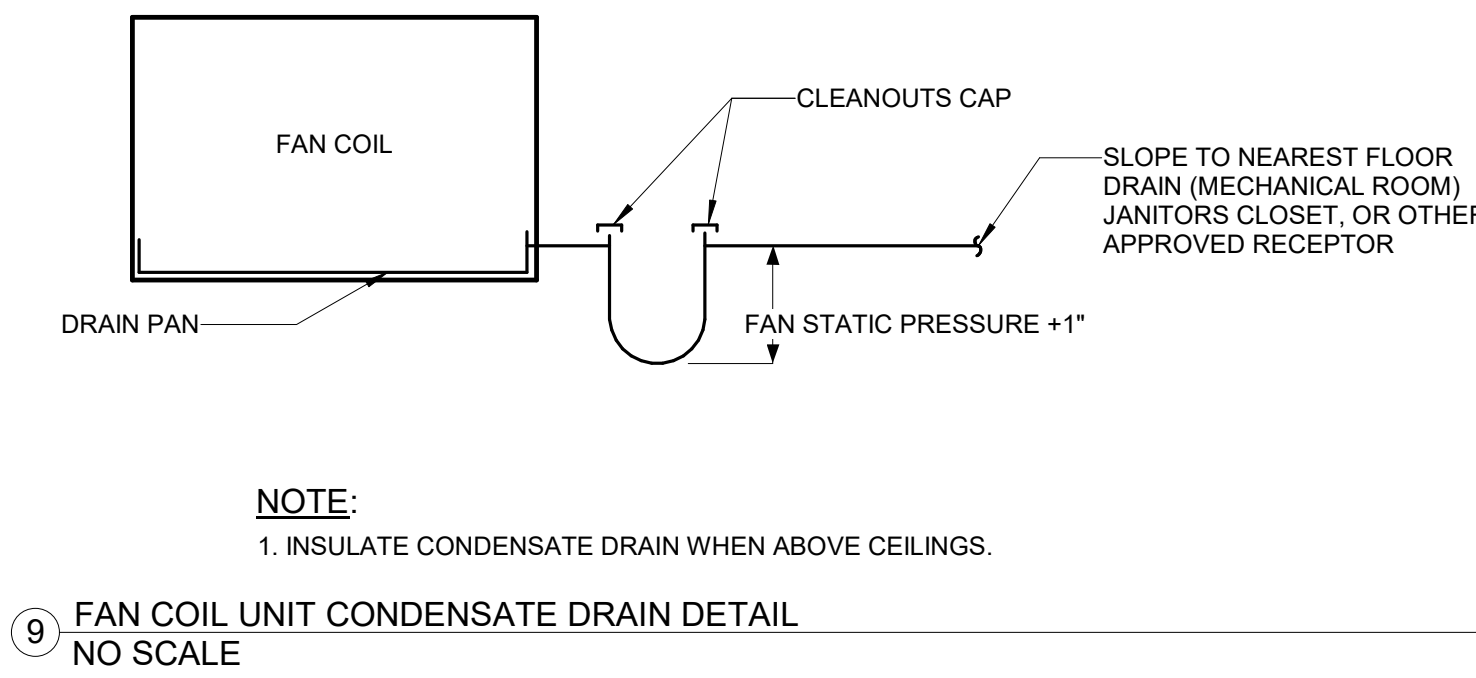
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**1A-M8.000**

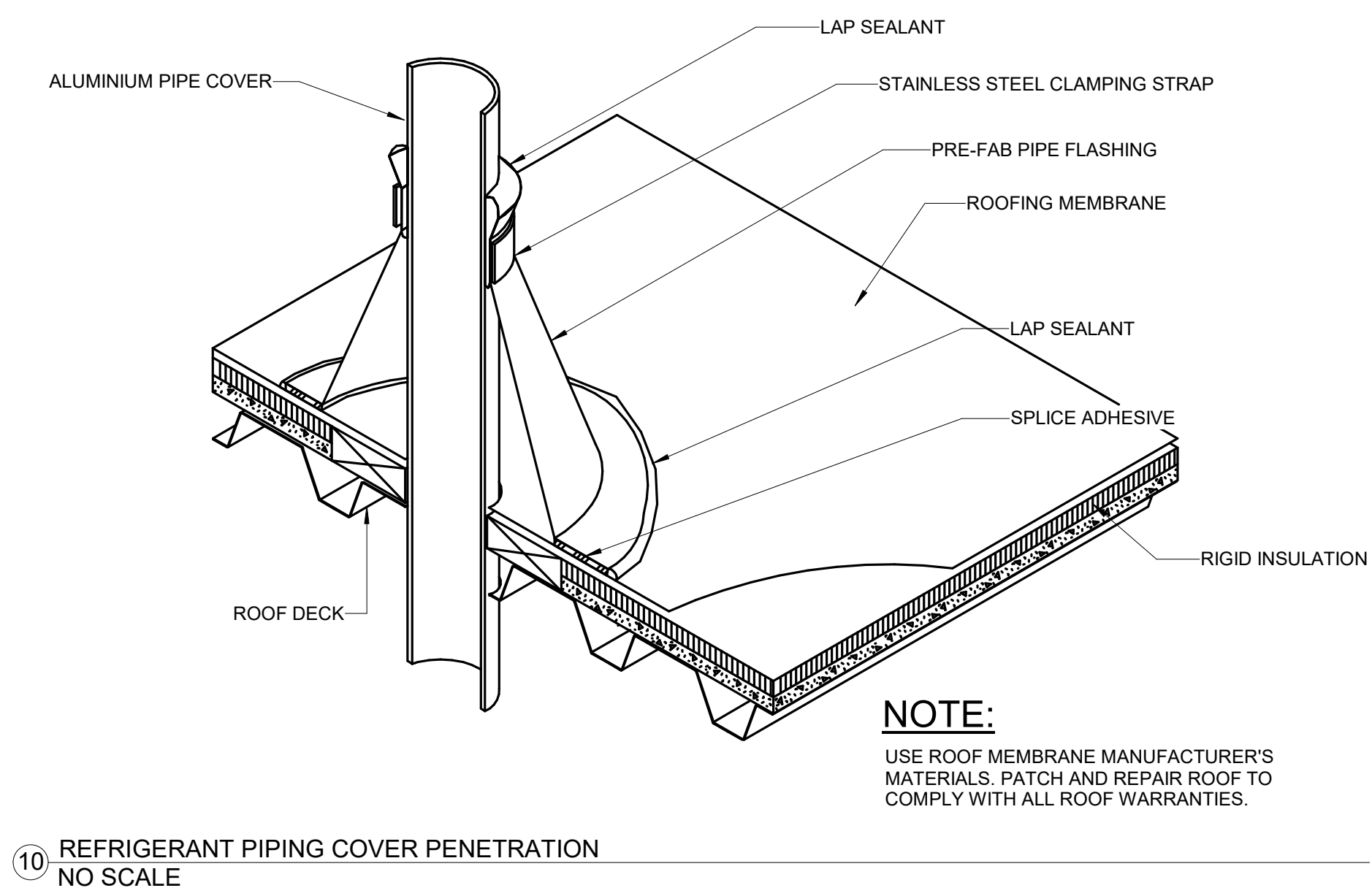




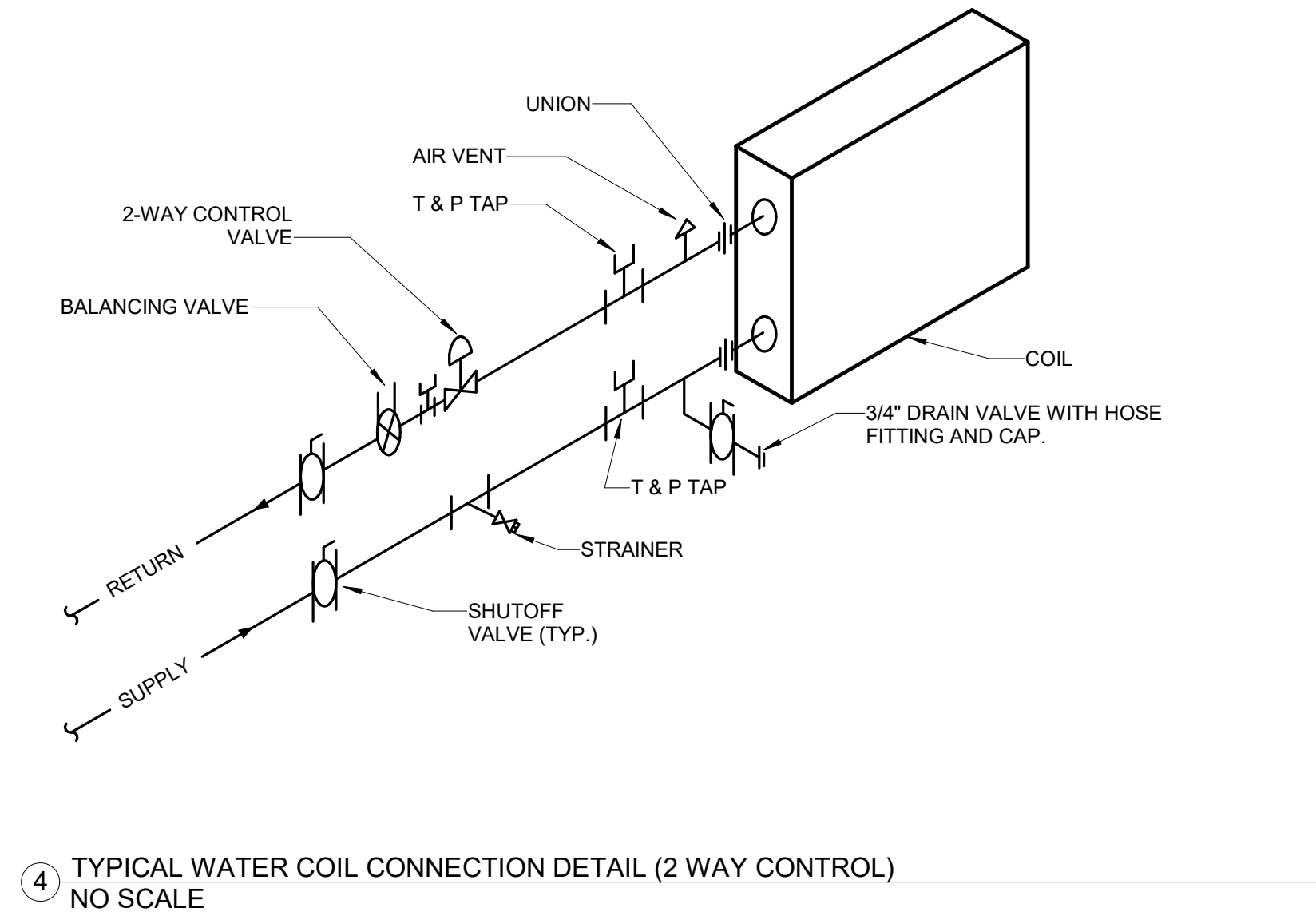
8 DRAIN AND TRAP FROM AIR HANDLING UNIT  
NO SCALE



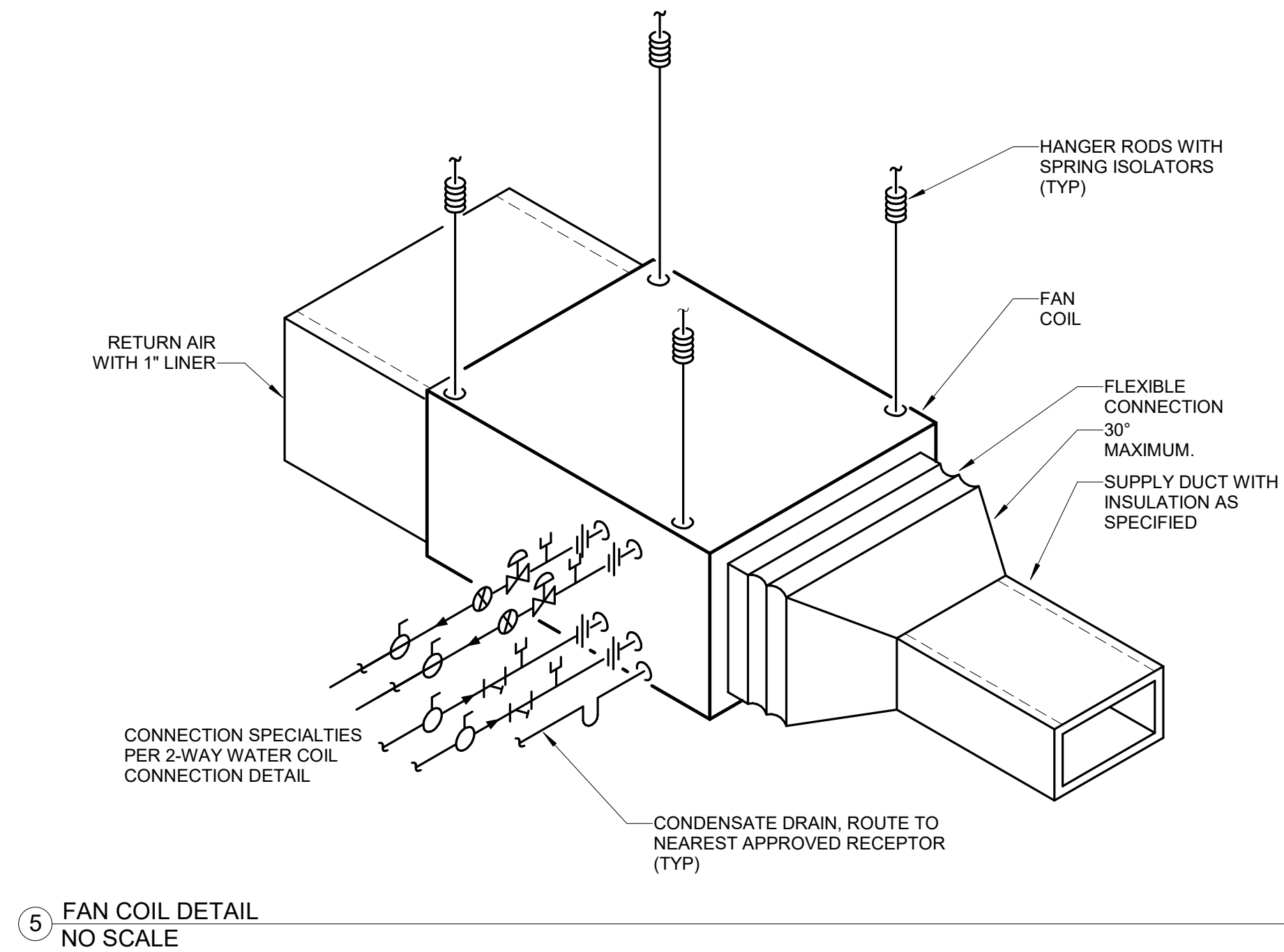
9 FAN COIL UNIT CONDENSATE DRAIN DETAIL  
NO SCALE



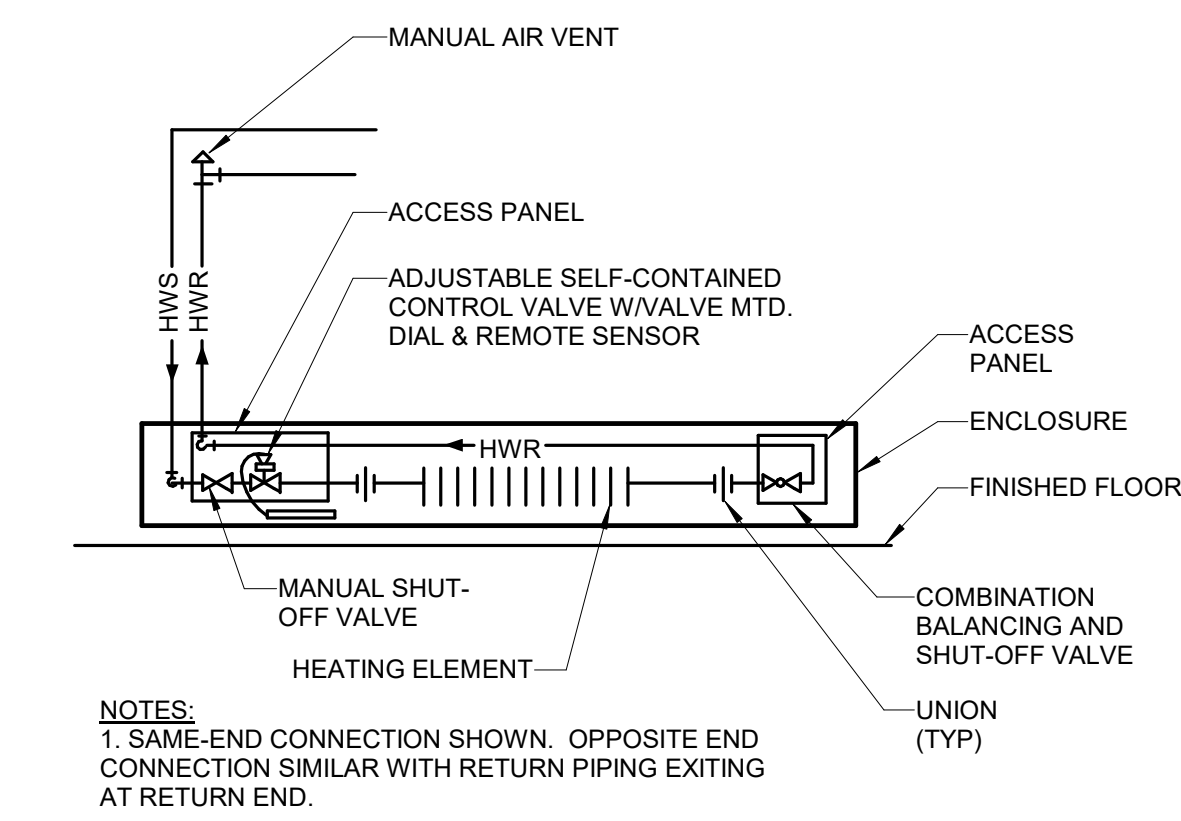
10 REFRIGERANT PIPING COVER PENETRATION  
NO SCALE



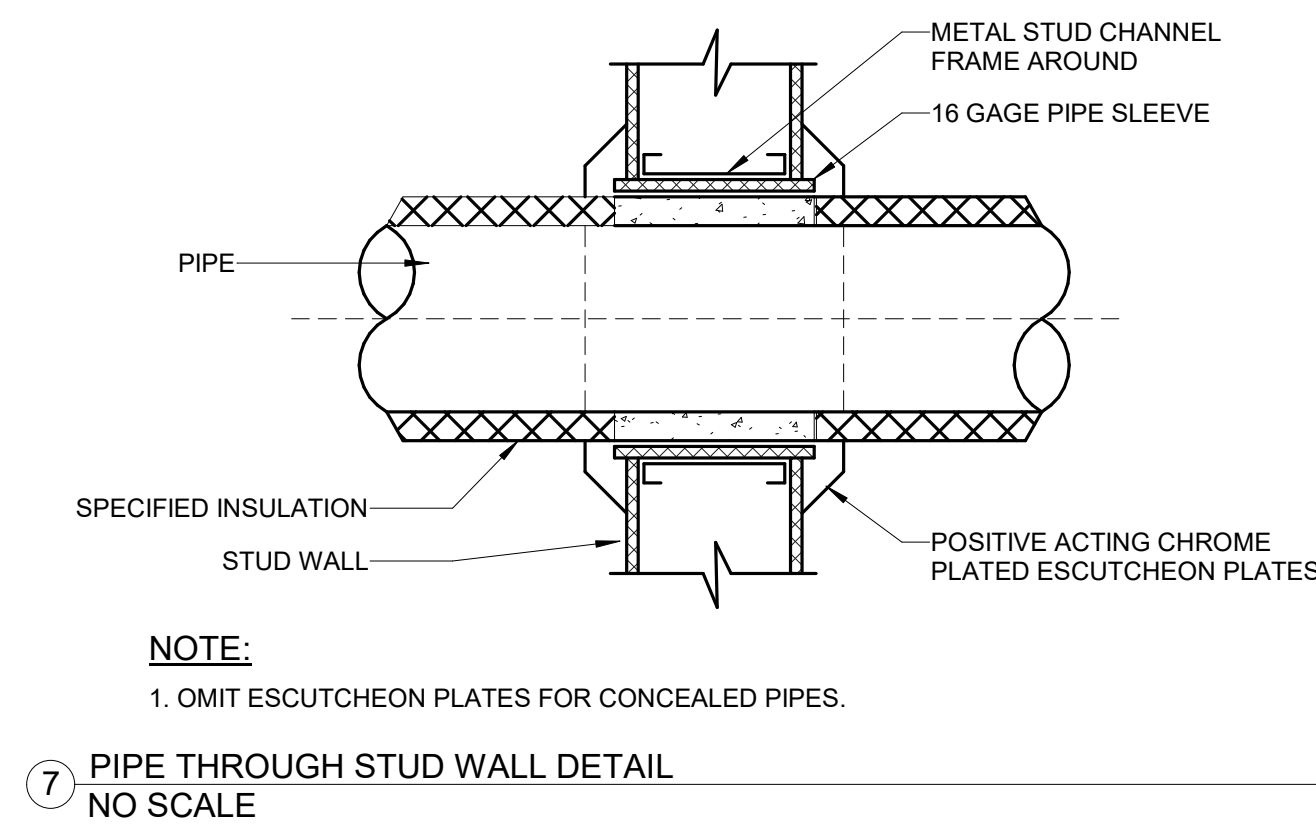
4 TYPICAL WATER COIL CONNECTION DETAIL (2 WAY CONTROL)  
NO SCALE



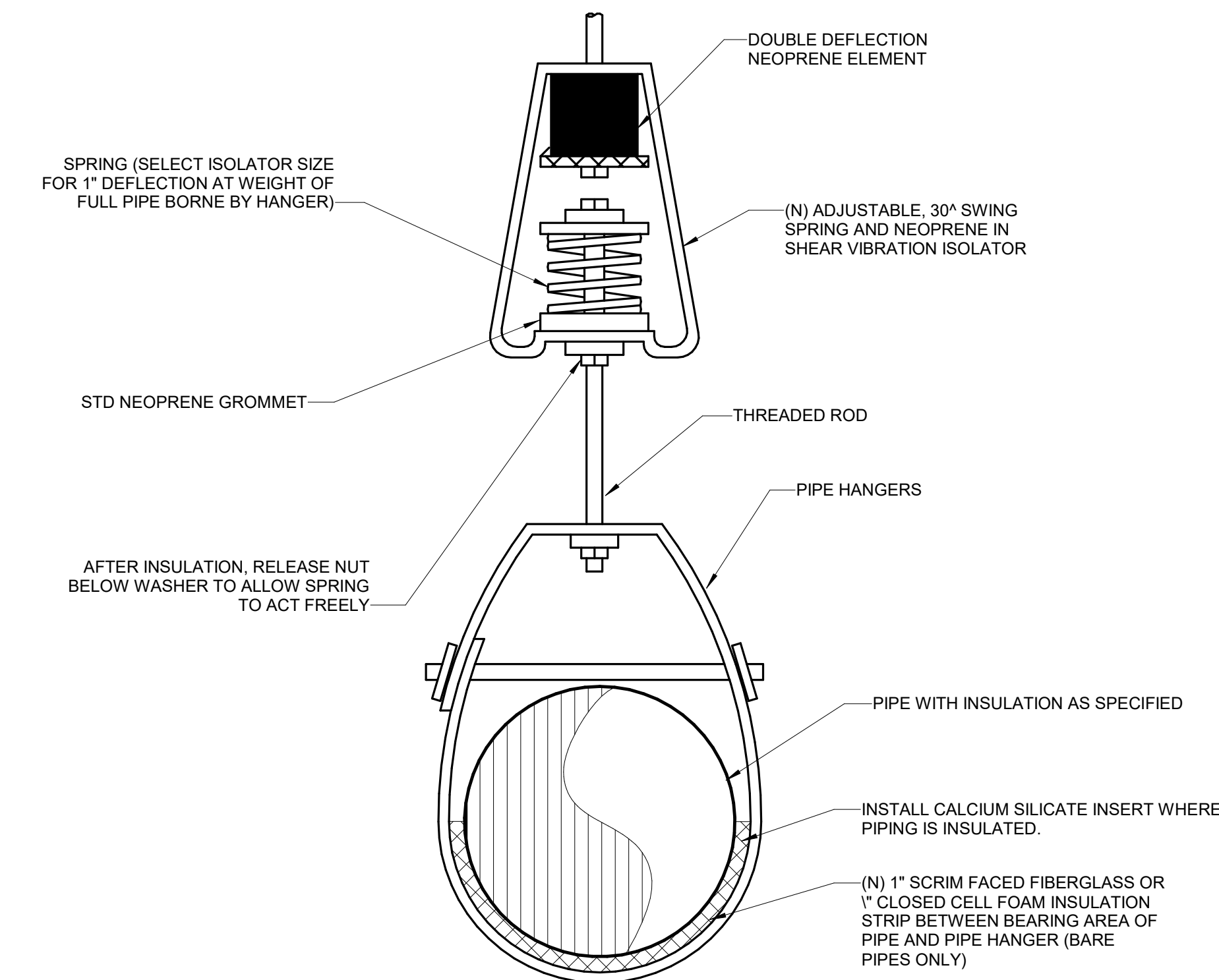
5 FAN COIL DETAIL  
NO SCALE



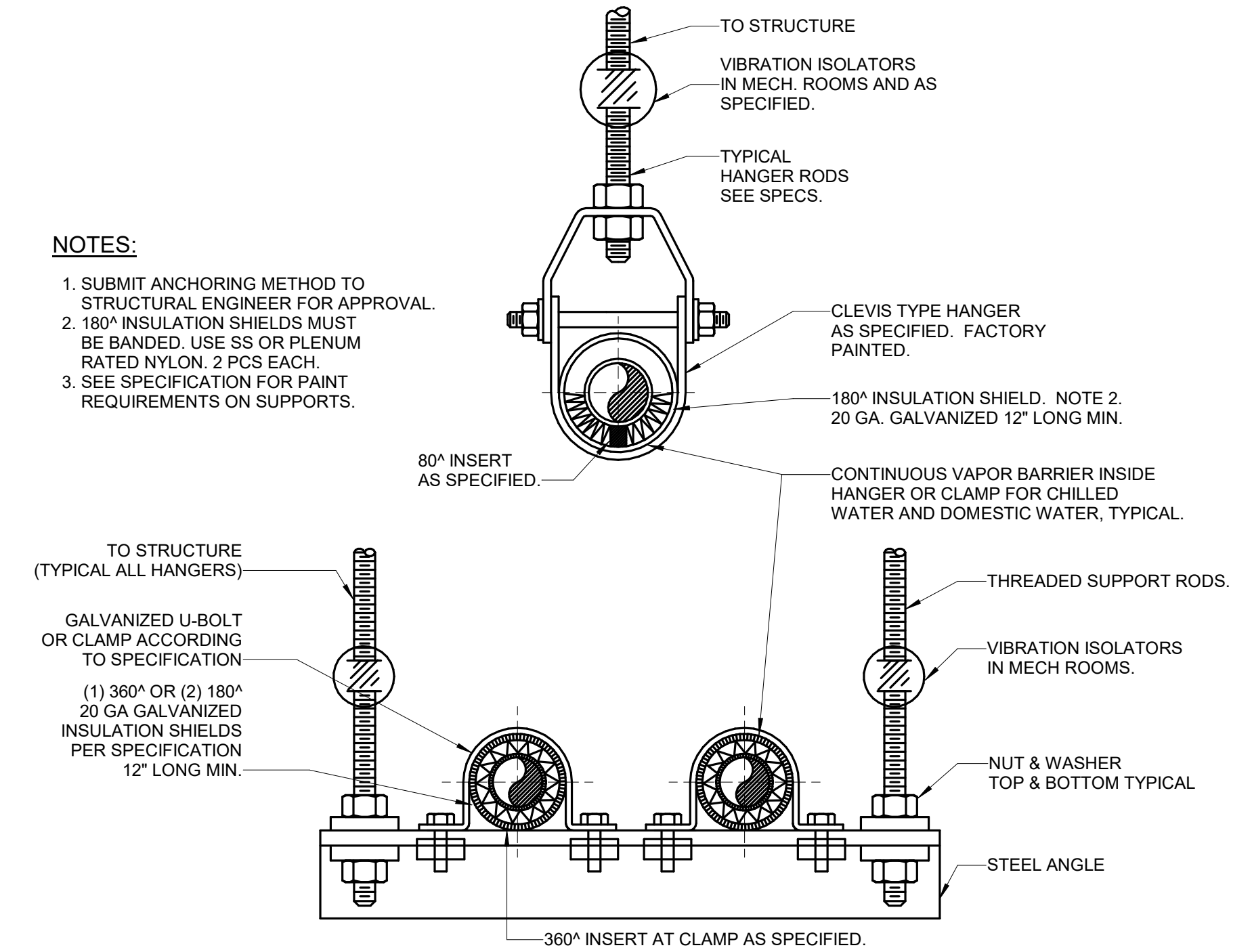
6 HOT WATER BASEBOARD DETAIL  
NO SCALE



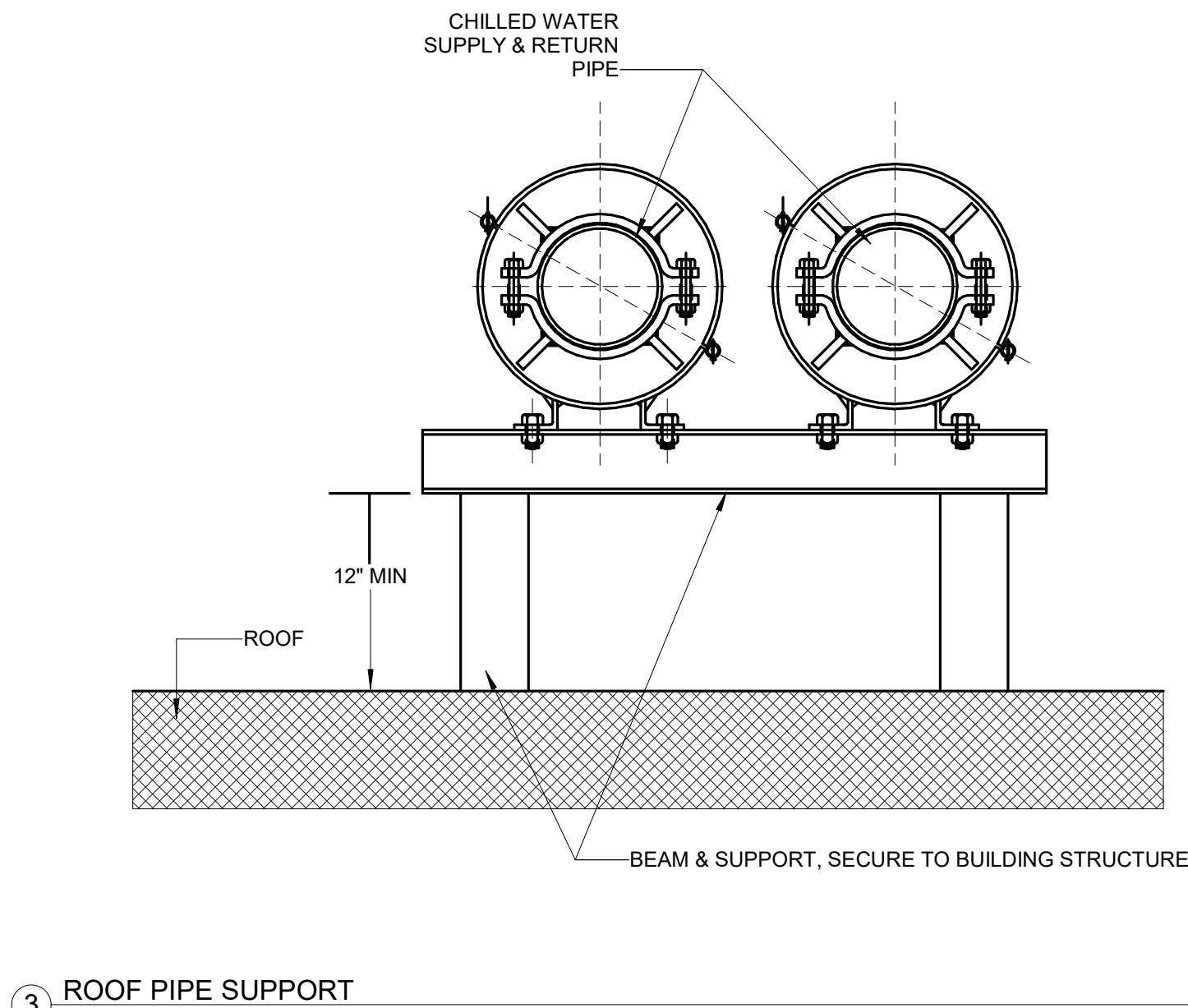
7 PIPE THROUGH STUD WALL DETAIL  
NO SCALE



1 VIBRATION ISOLATION HANGER DETAIL  
NO SCALE



2 TYPICAL PIPE HANGER DETAIL  
NO SCALE



3 ROOF PIPE SUPPORT  
1/8" = 1'-0"

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PROMENADE - MECHANICAL DETAILS

Scale

1/8" = 1'-0"

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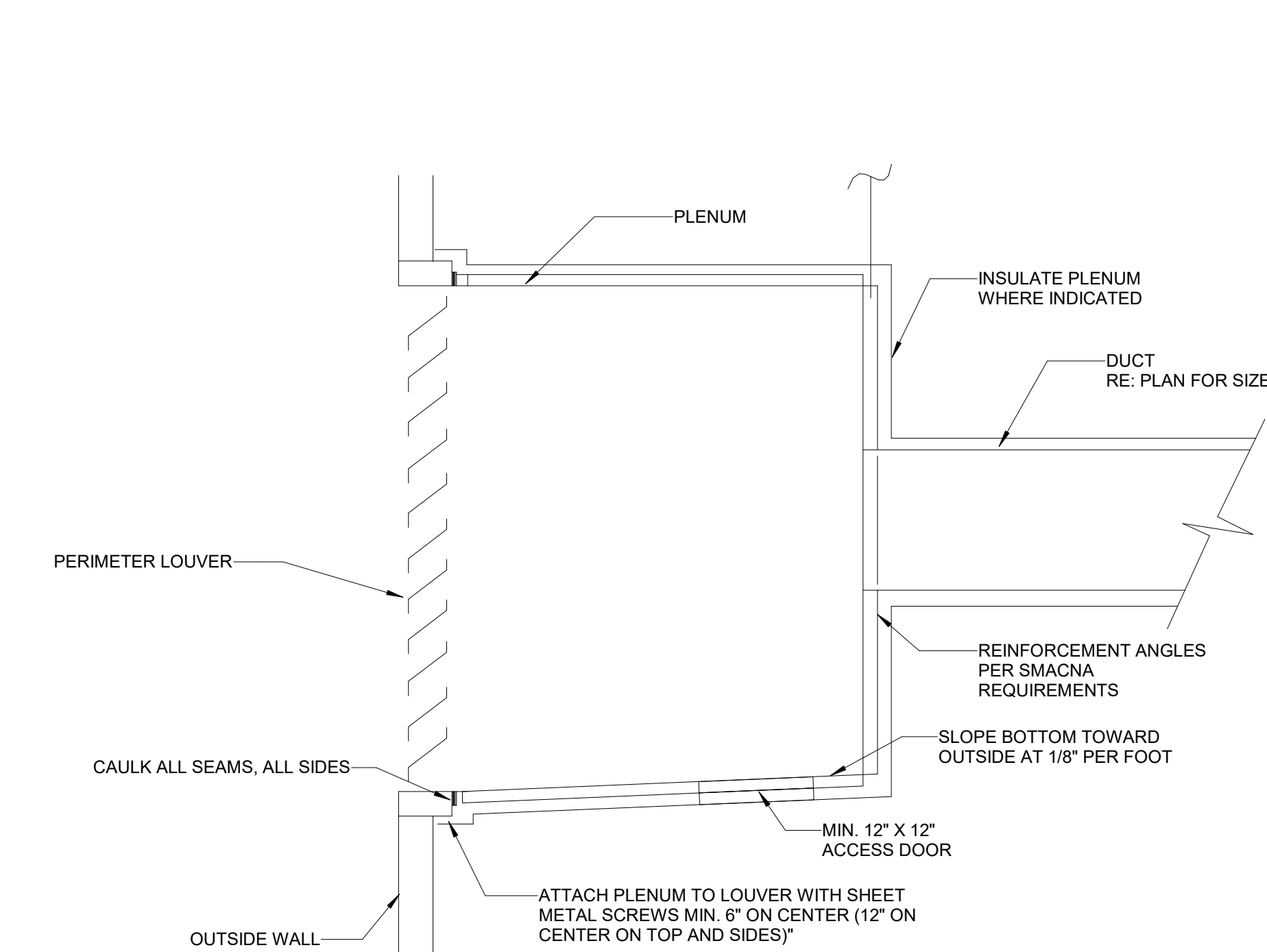
003.7835.000

Description

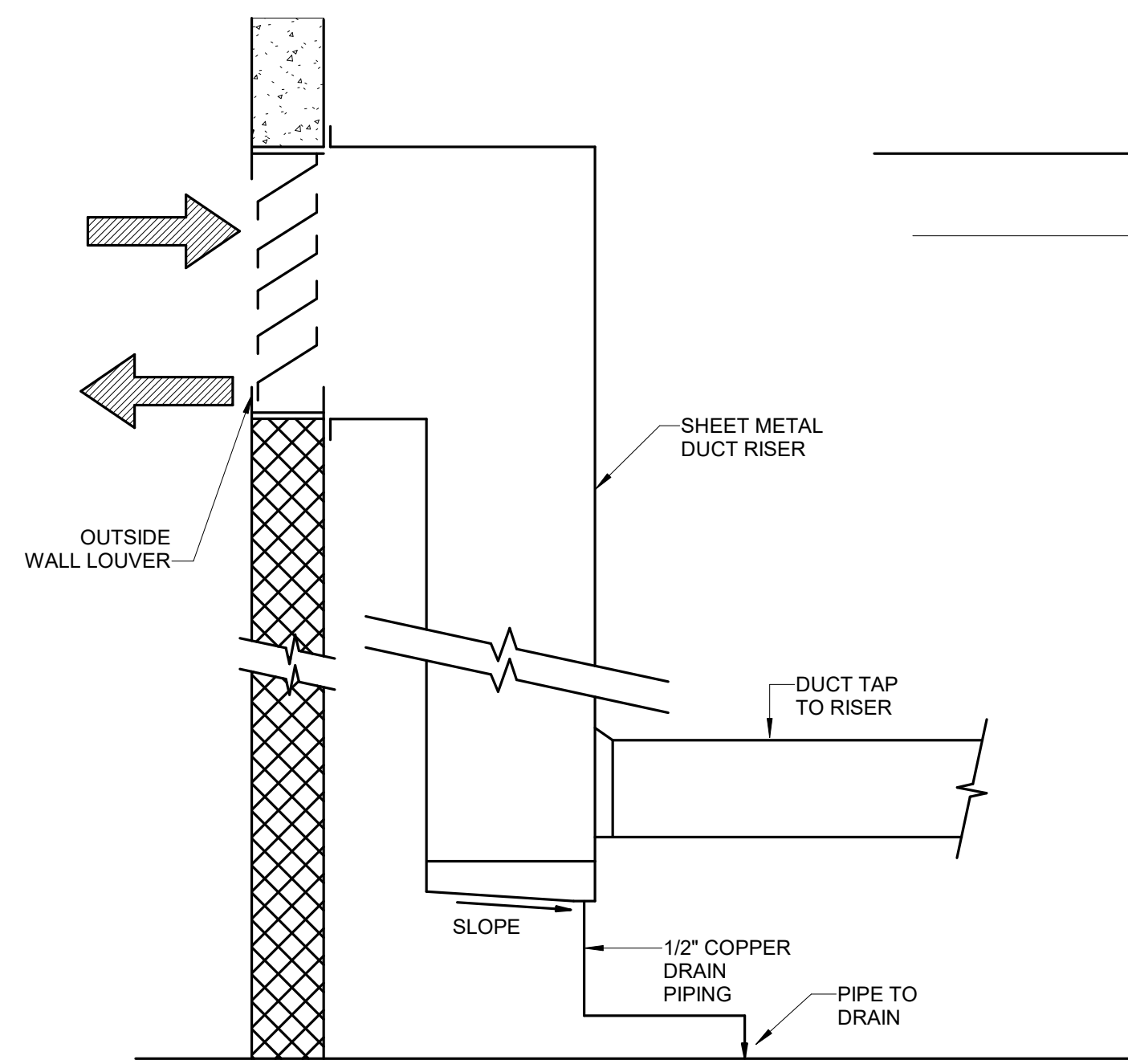
PROMENADE - MECHANICAL DETAILS

Scale

NO SCALE

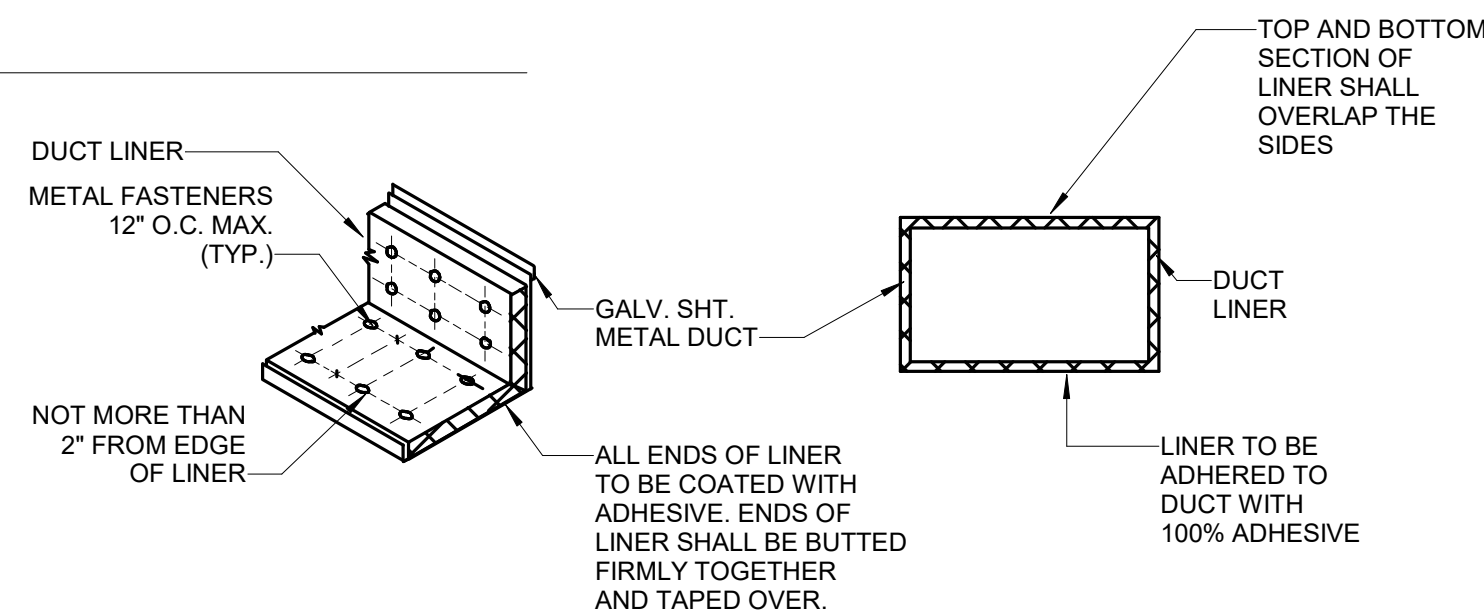


14 EXTERIOR LOUVER PLENUM BOX DETAIL  
NO SCALE

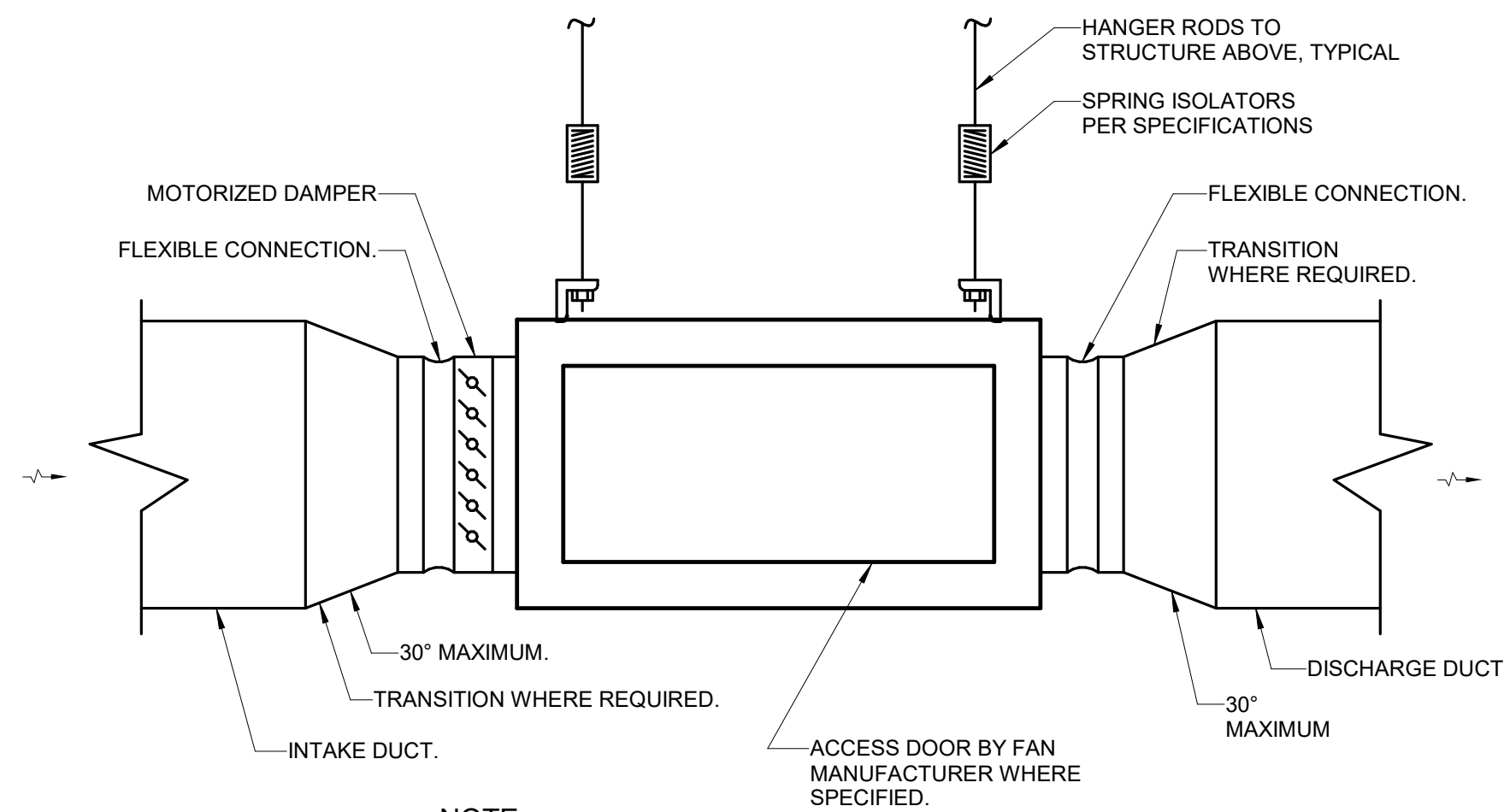


NOTE:  
1. DOUBLE BASE OF PLENUM TO DRAIN INLET.

15 OUTSIDE WALL LOUVER DUCT CONNECTION  
NO SCALE

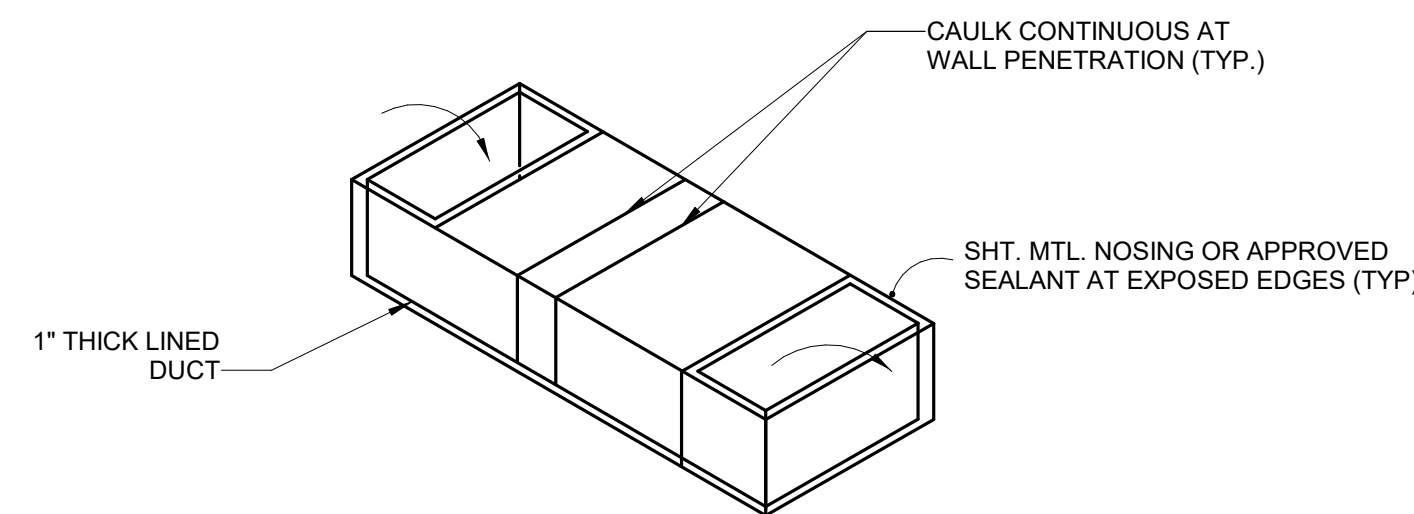


12 DUCT LINER DETAIL  
NO SCALE

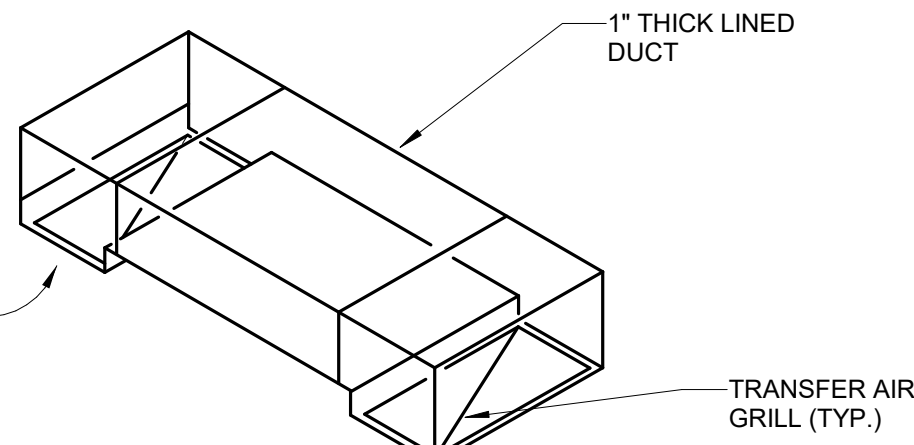


NOTE:  
1. INSTALL FAN WITH PROPER SERVICE CLEARANCE TO MOTOR AND ALL PARTS FOR PROPER AIR MOVEMENT AS RECOMMENDED BY THE MANUFACTURER.

13 INLINE FAN DETAIL  
NO SCALE

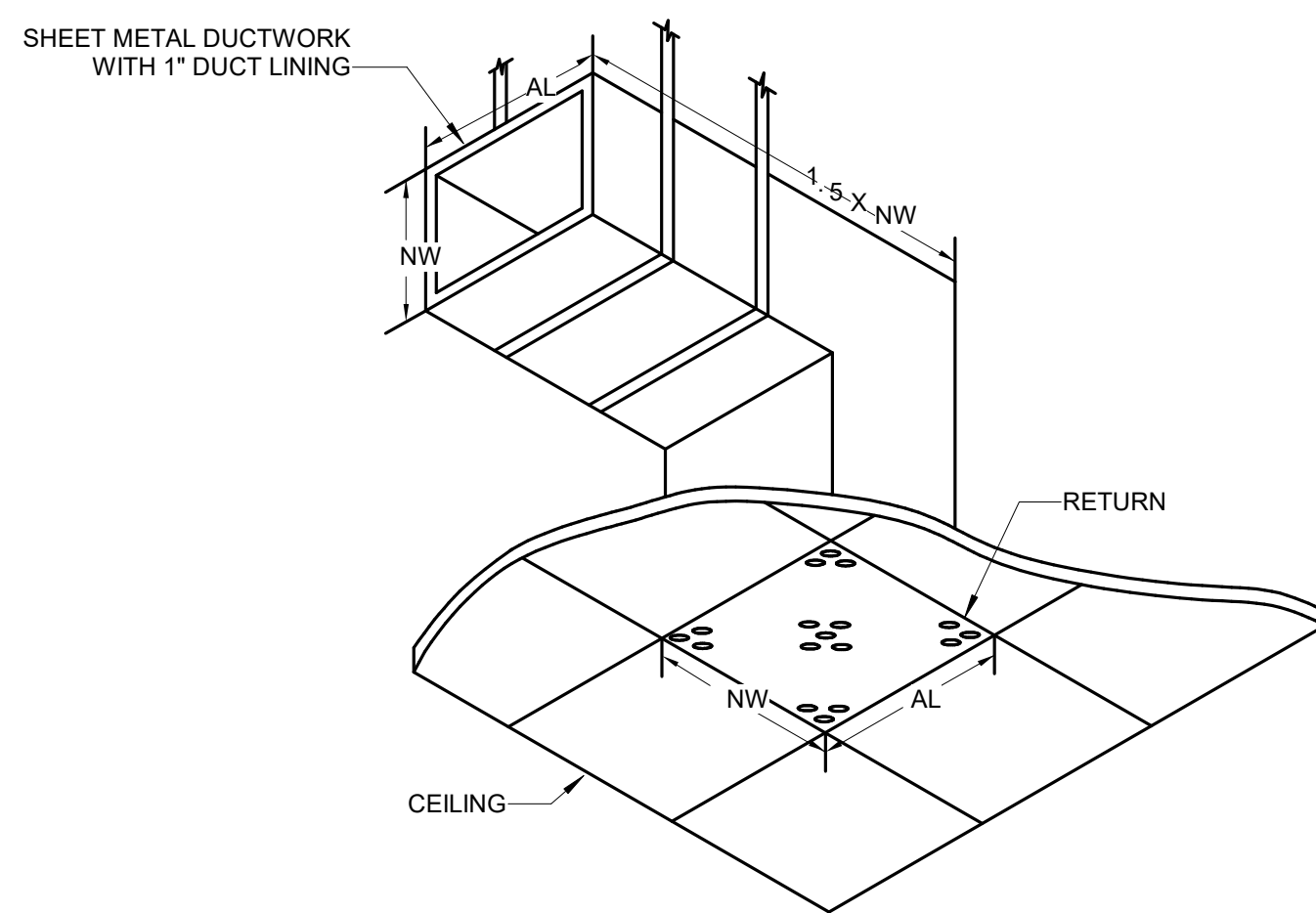


RETURN AIR TRANSFER BOOT

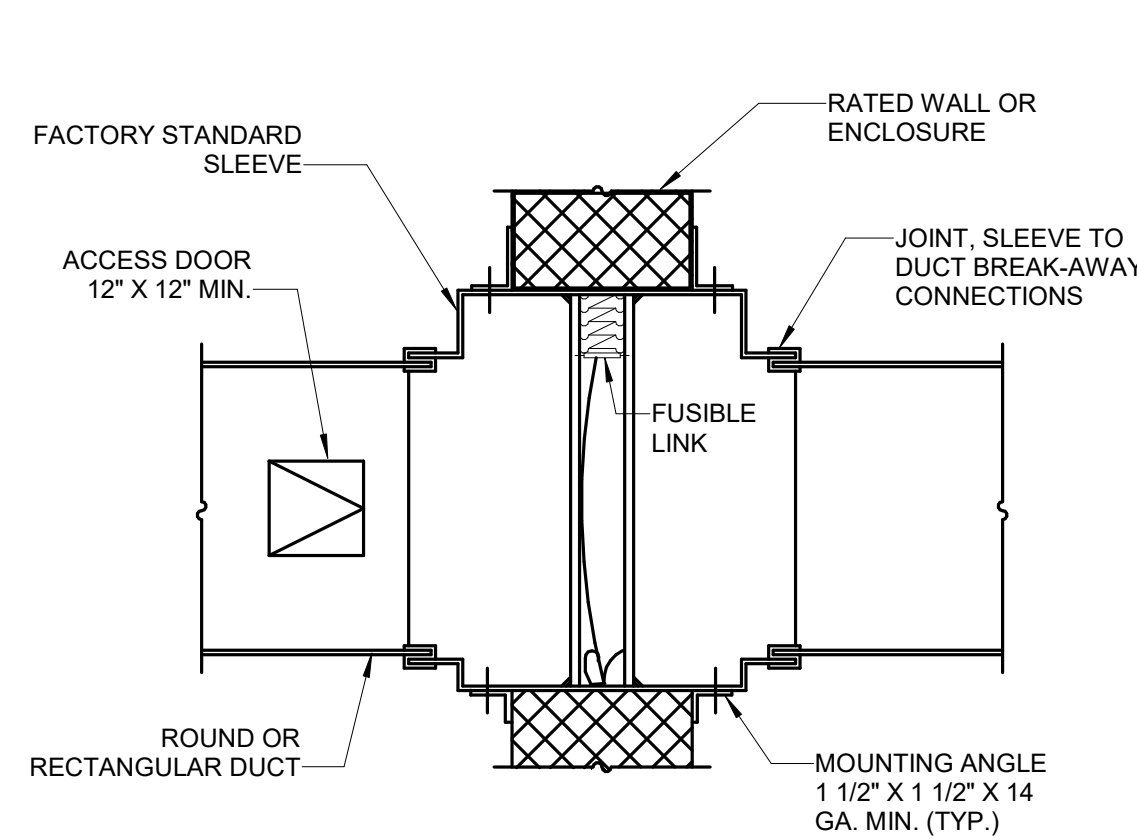


TRANSFER AIR DUCT

10 RETURN AIR TRANSFER BOOT AND AIR DUCT  
NO SCALE



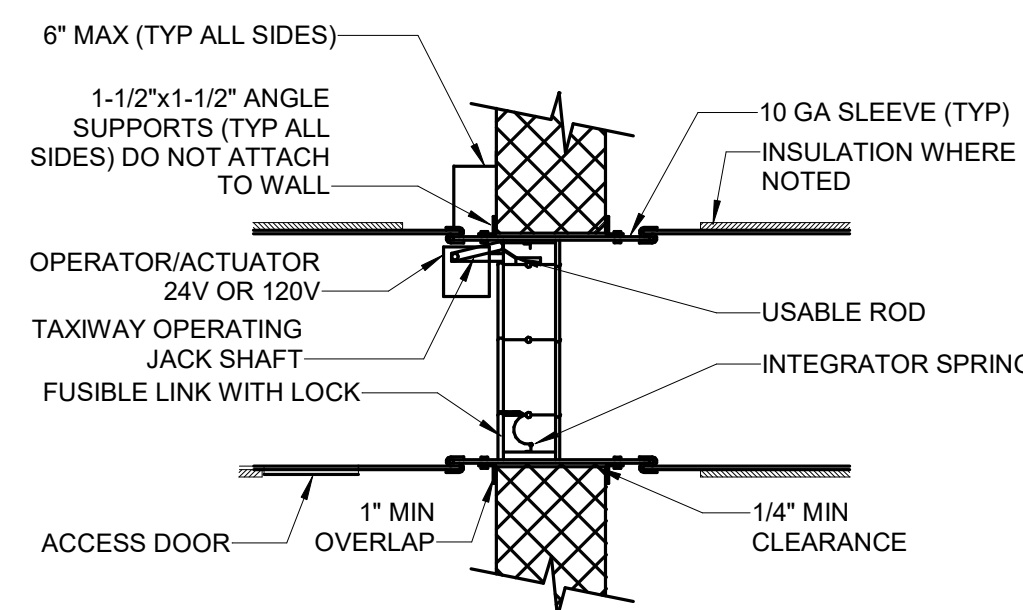
11 RETURN AIR BOOT DETAIL  
NO SCALE



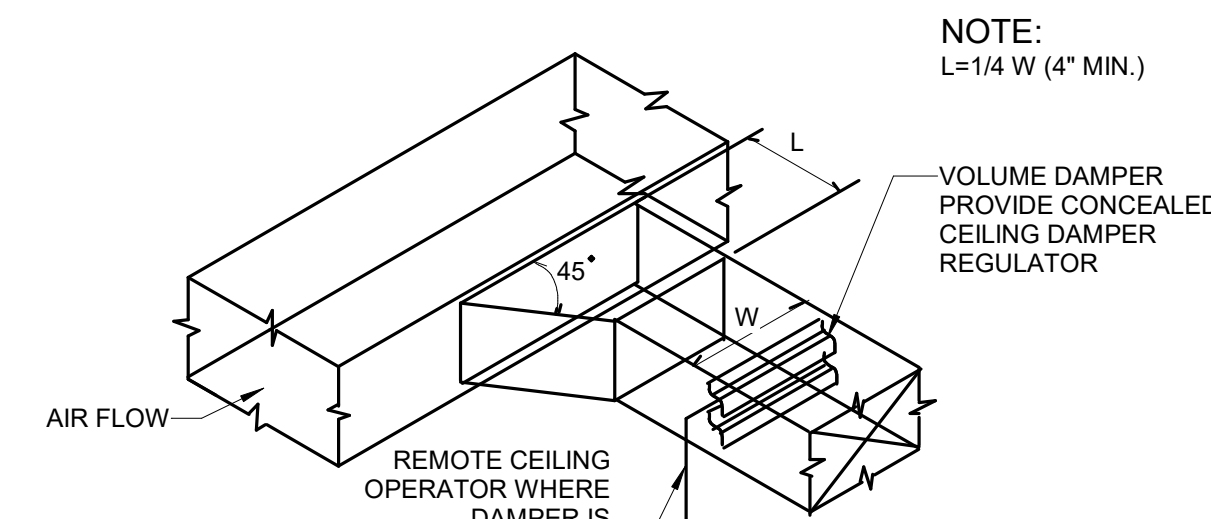
NOTES:

1. DYNAMIC FIRE DAMPER SHALL BE USED.
2. FIRE DAMPERS SHALL BE INSTALLED STRICTLY PER MANUFACTURER'S PRINTED INSTRUCTIONS.
3. FIRE DAMPERS SHALL COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.
4. MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE MADE AVAILABLE TO INSPECTING AUTHORITIES.

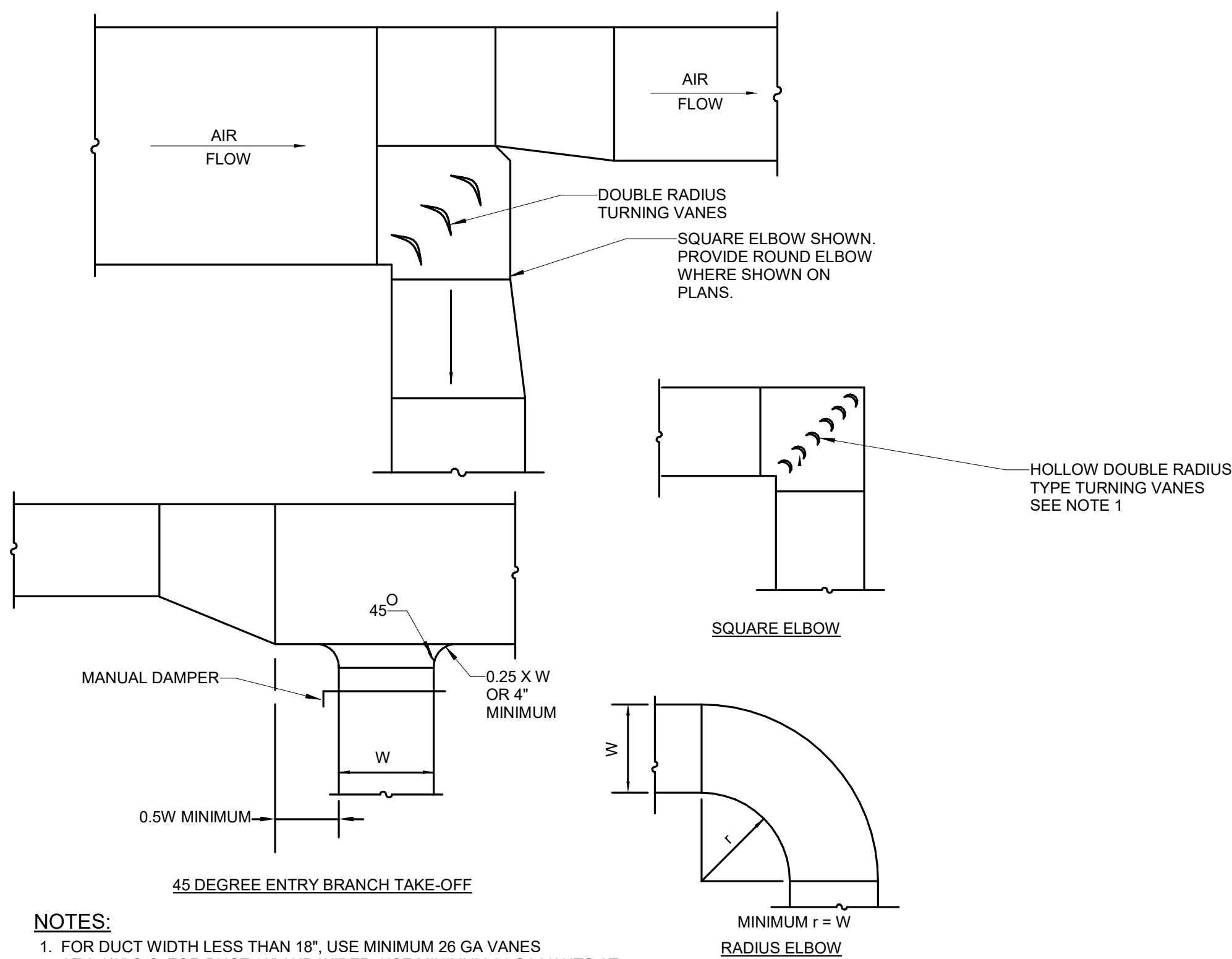
6 FIRE DAMPER  
NO SCALE



7 COMBINATION FIRE SMOKE DAMPER DETAIL  
NO SCALE



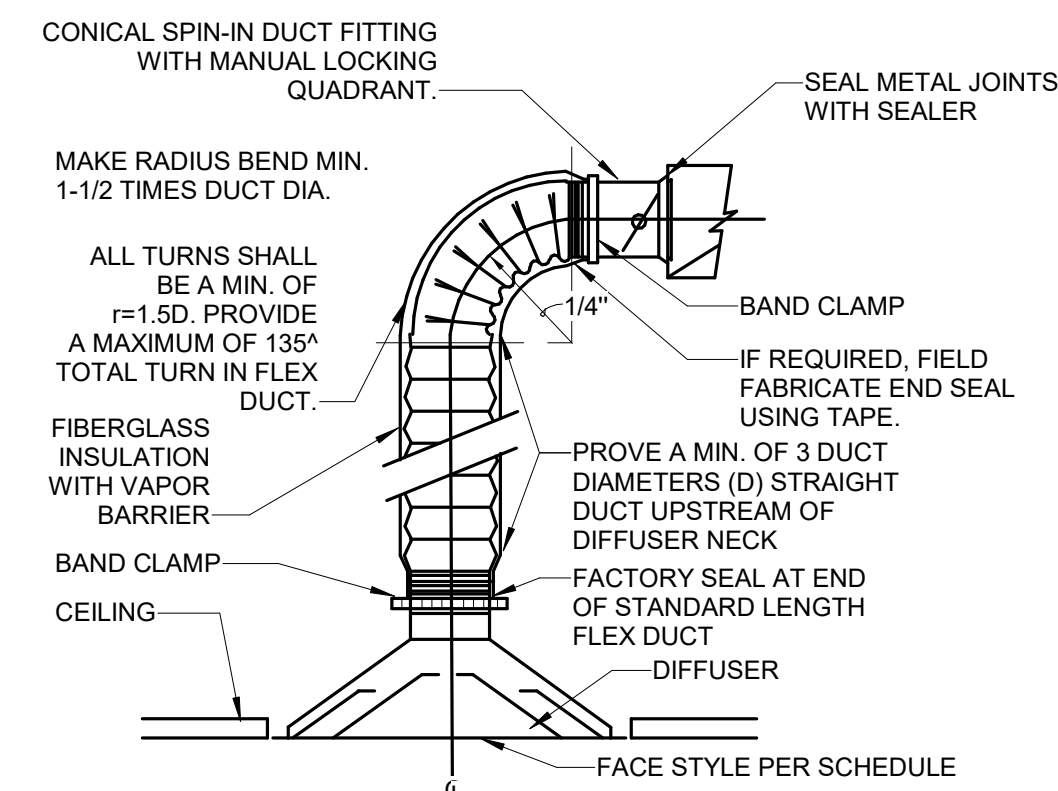
8 BRANCH DUCT TAKE-OFF DETAIL  
NO SCALE



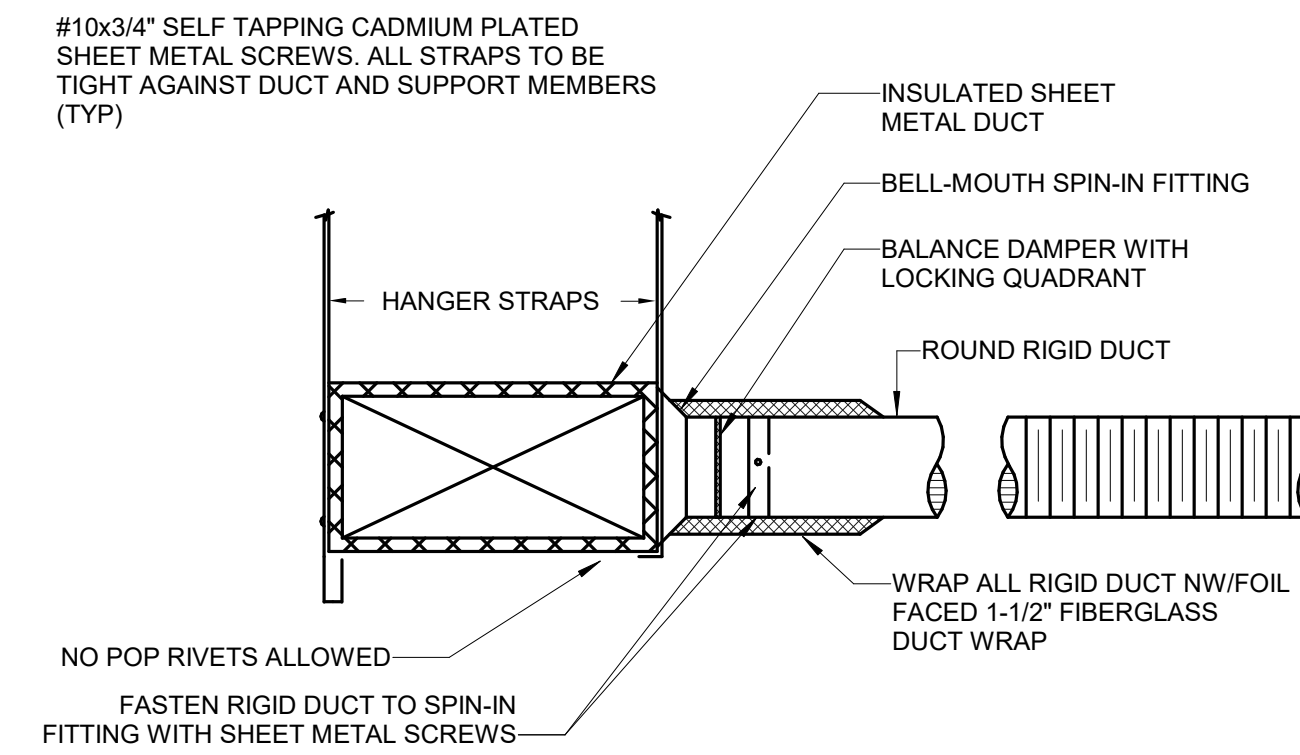
NOTES:

1. FOR DUCT WIDTH LESS THAN 18", USE MINIMUM 26 GA VANES AT 2-1/8" O.C. FOR DUCT 18" AND WIDER, USE MINIMUM 24 GA VANES AT 3-1/4" O.C.
2. FITTINGS TO BE 2 GAGES HEAVIER THAN CONNECTED DUCT.

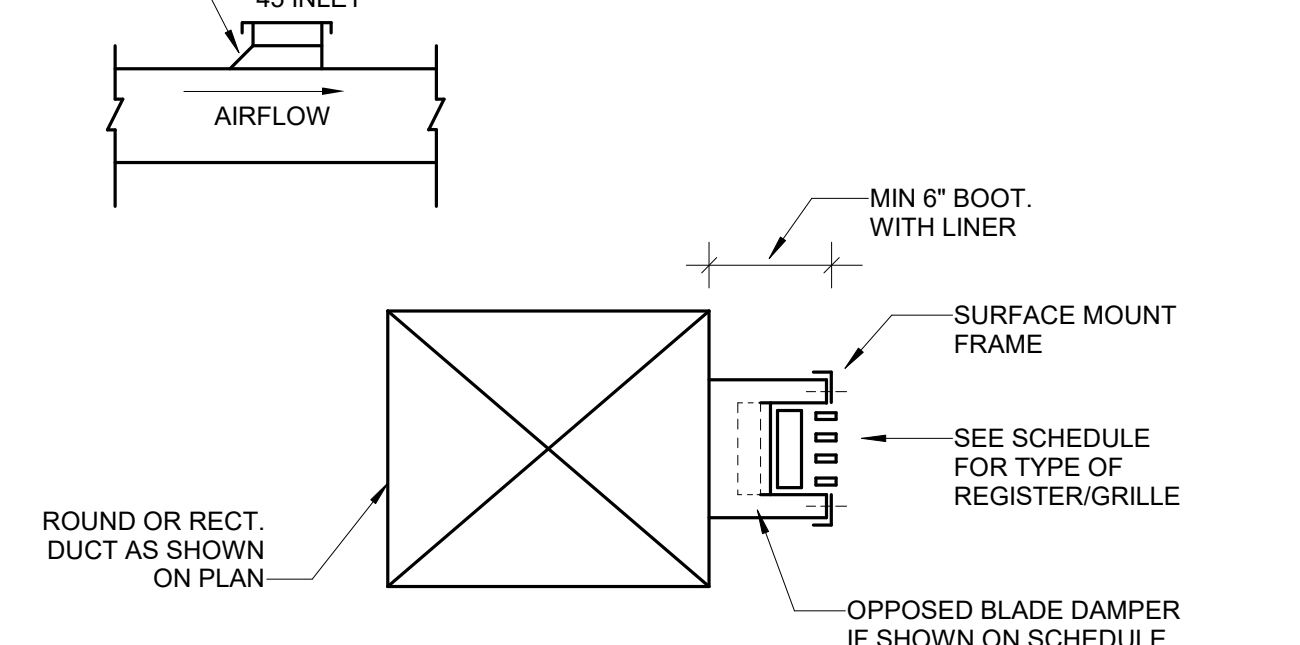
9 RECTANGULAR DUCT FITTINGS AND TAKE-OFF  
NO SCALE



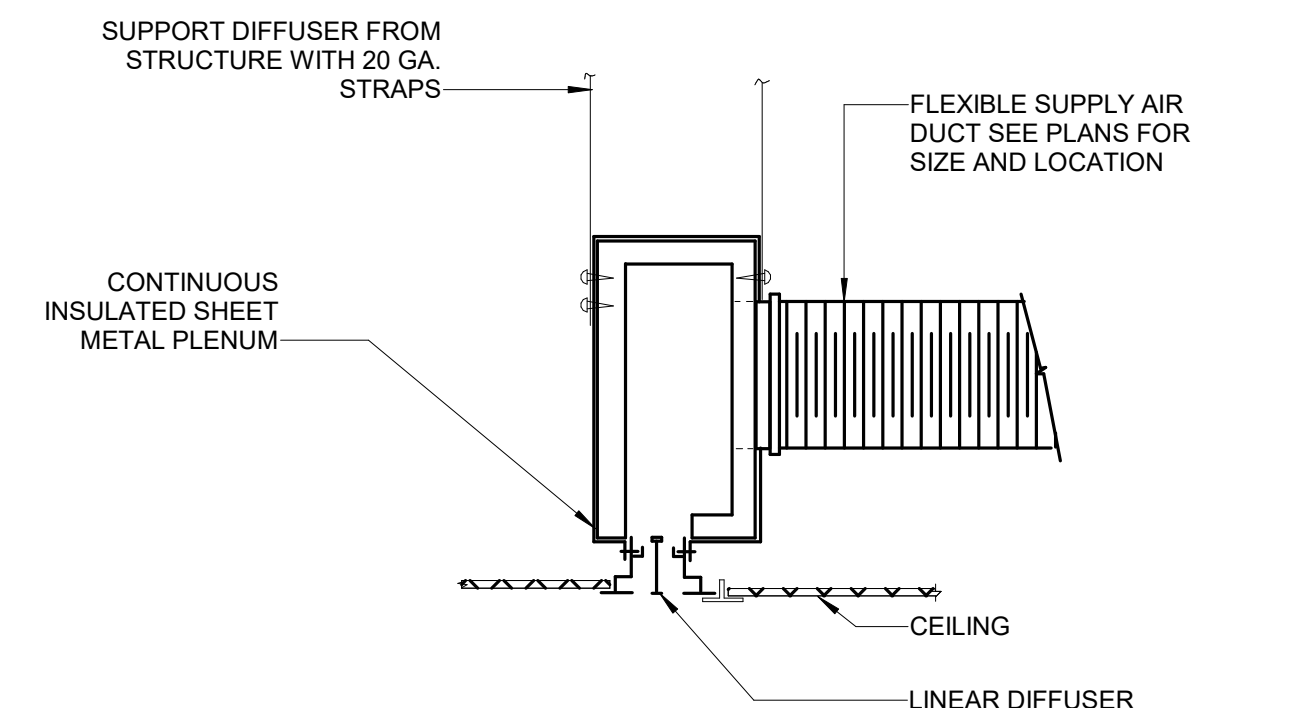
1 CEILING DIFFUSER DETAIL  
NO SCALE



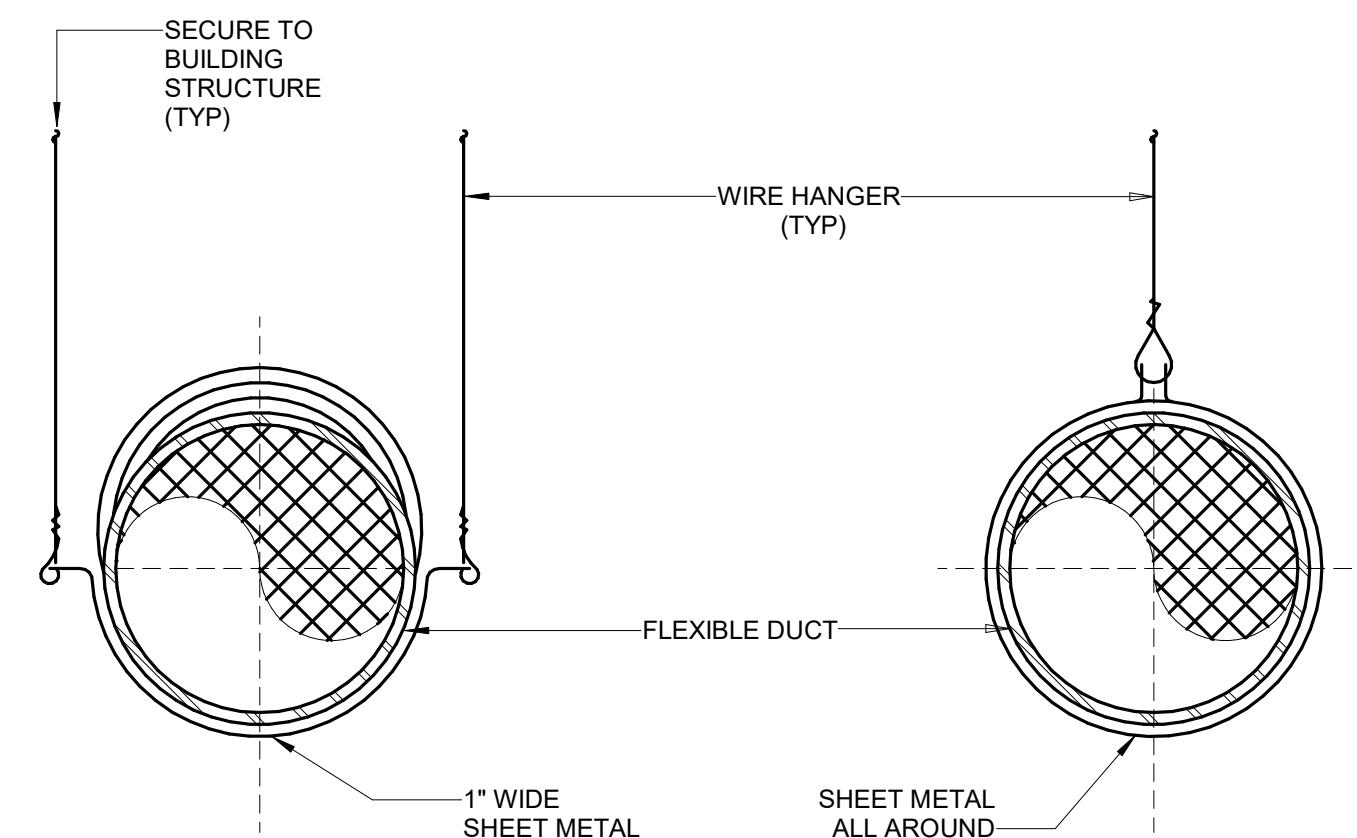
2 FLEX DUCT/ SPIN-IN FITTING DETAIL  
NO SCALE



3 DUCT MOUNTED AIR DEVICE DETAIL  
NO SCALE



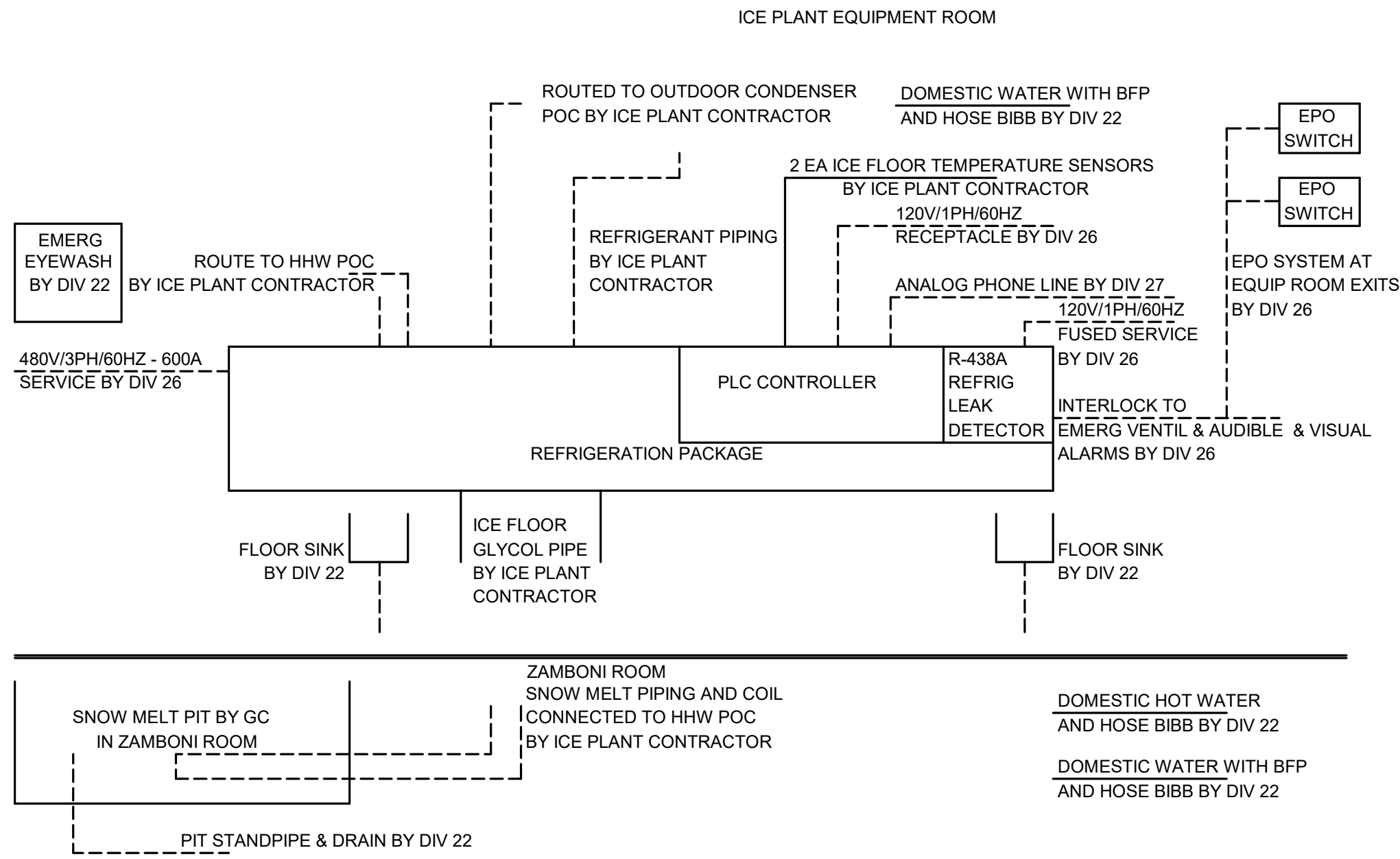
4 LINEAR DIFFUSER AND PLENUM DETAIL  
NO SCALE



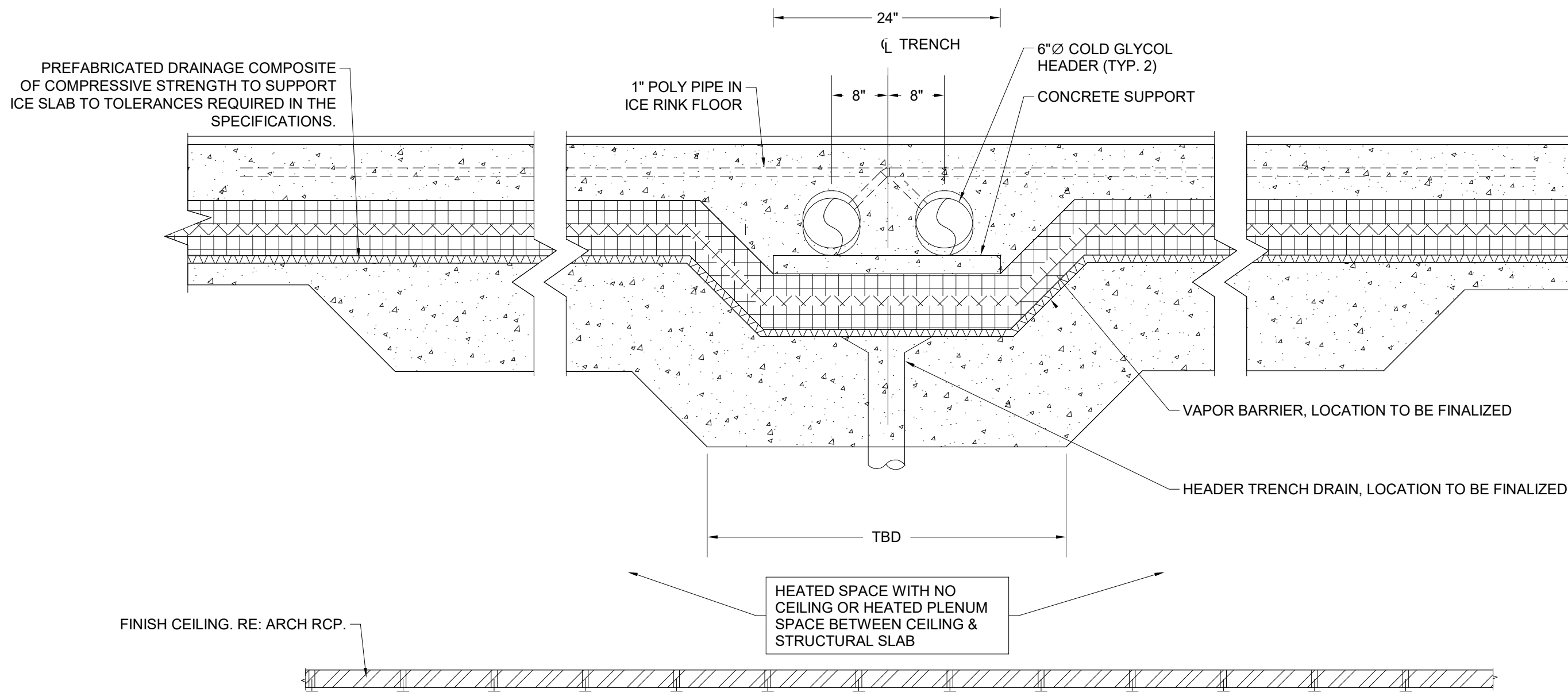
NOTE:  
1. SUPPORT AT 3' MAX.

5 FLEXIBLE DUCT SUPPORT  
NO SCALE





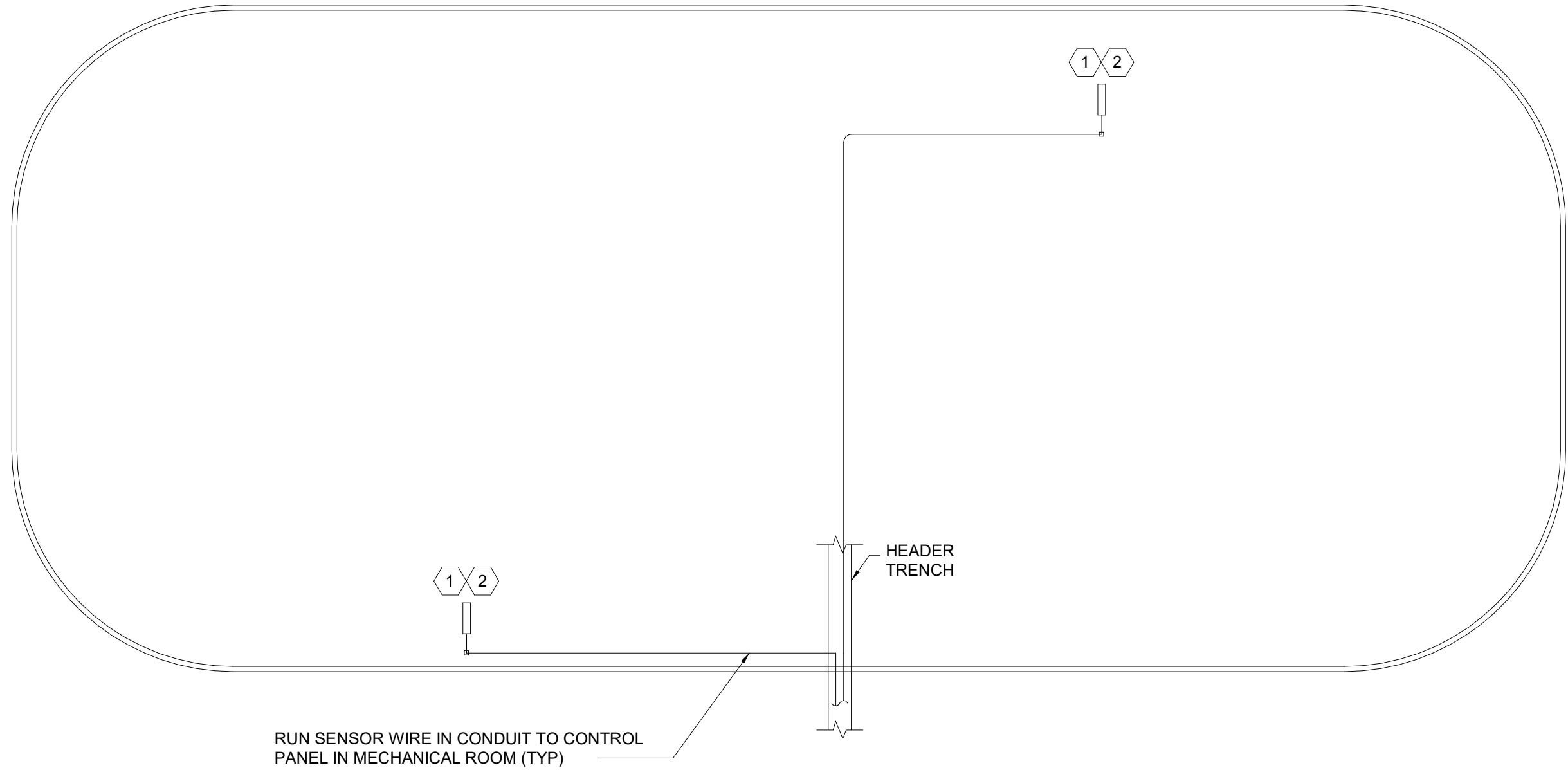
1 ICE SYSTEM COORDINATION  
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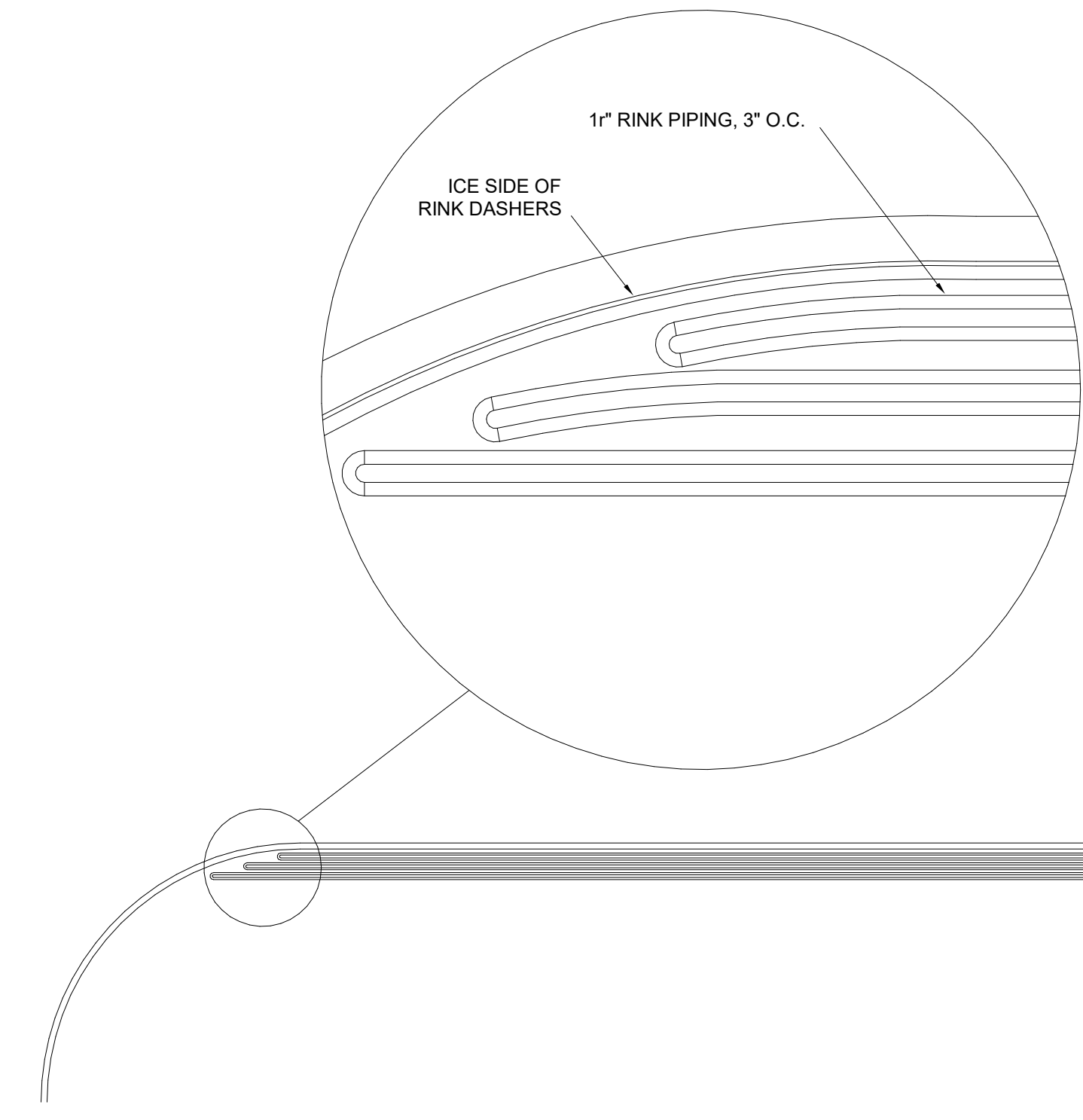
2 SECTION AT HEADER TRENCH  
NO SCALE

NOTES:

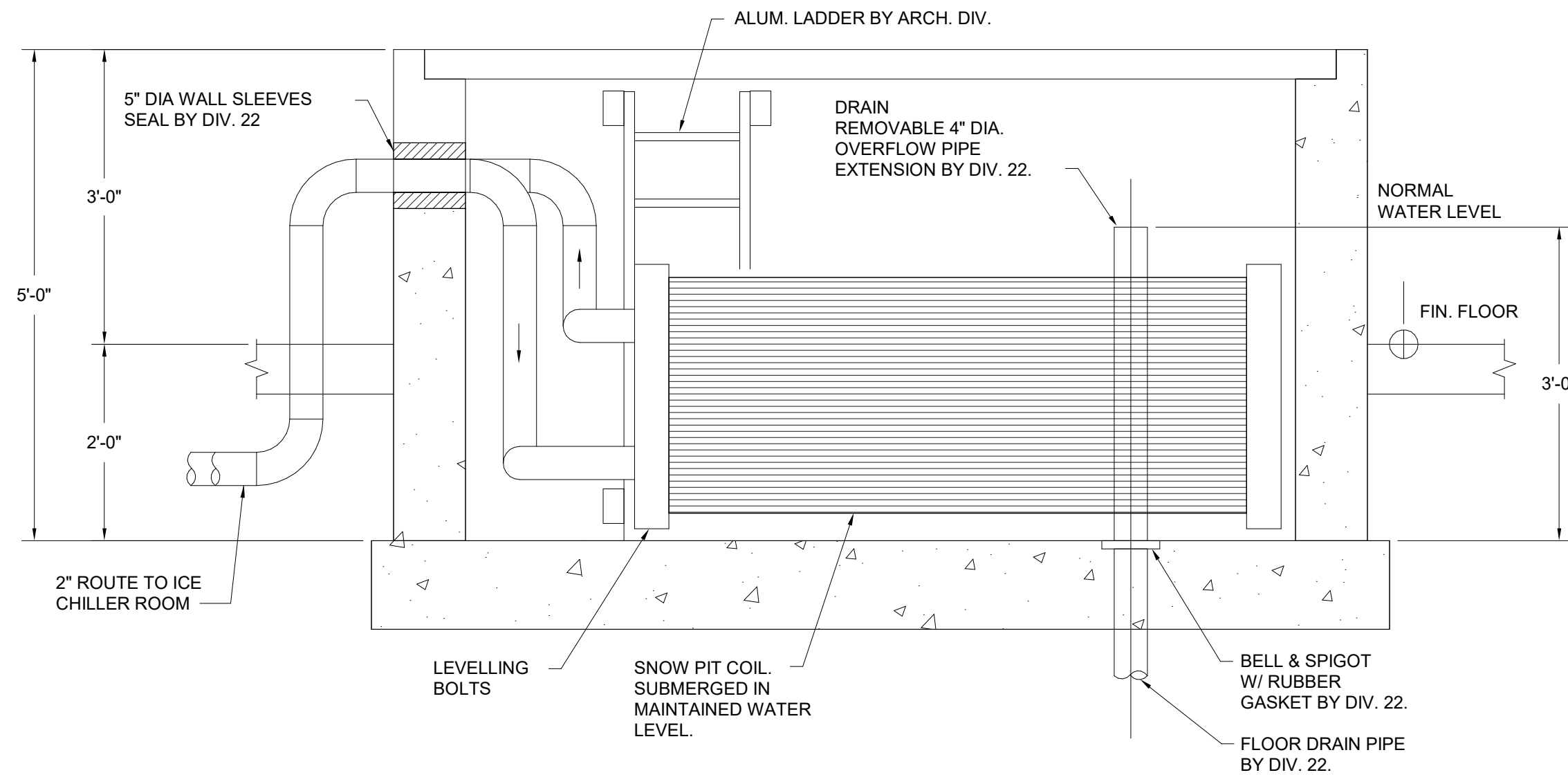
- 1 RINK FLOOR TEMPERATURE RTD.
- 2 RUN RTD IN DEDICATED CONDUIT TO CONTROL PANEL IN REFRIGERATION ROOM.



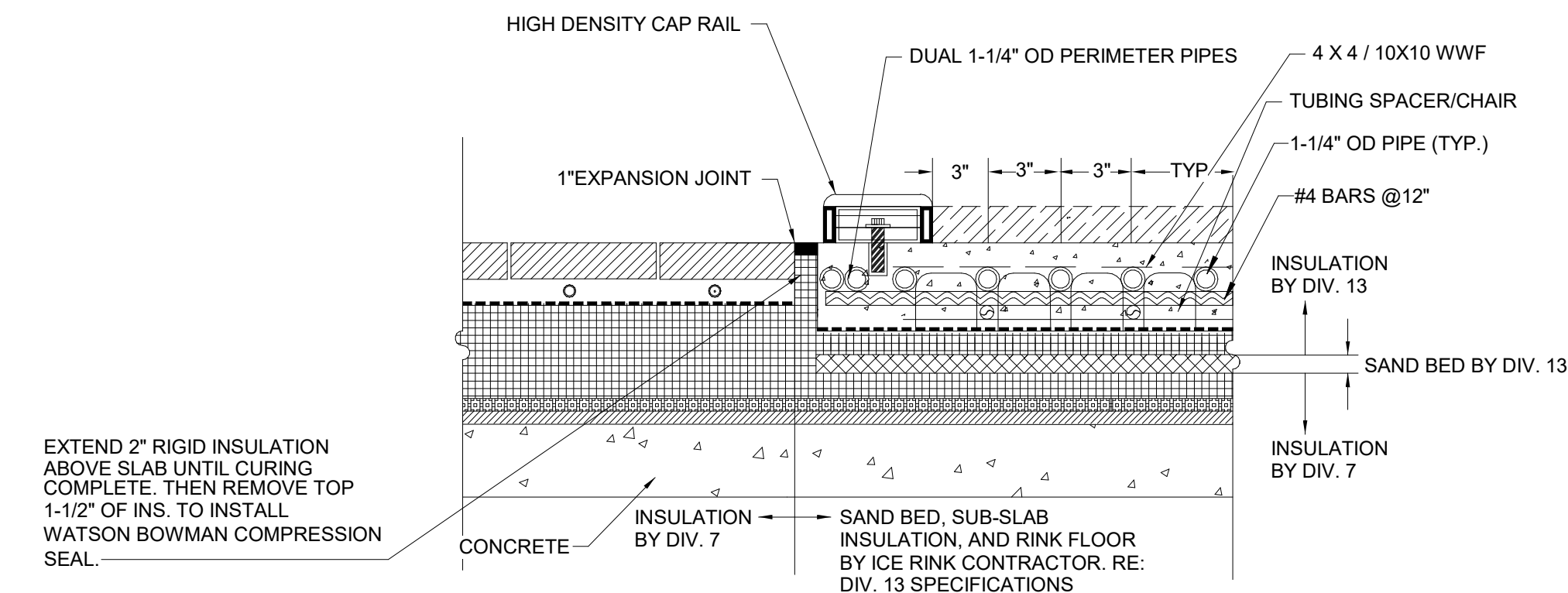
3 RINK TEMPERATURE SENSOR PLAN VIEW  
NO SCALE



4 ENLARGED VIEW OF ICE RINK PIPING AT DASHER BOARD  
NO SCALE



5 SNOW MELT PIT COIL DETAIL  
NO SCALE



6 THRESHOLD AT ICE RINK - OVER STRUCTURE  
NO SCALE

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05/18/2021

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Project Number

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Description

PROMENADE - ICE PLANT DETAILS

Scale

NO SCALE



A

ICE SHEET SYSTEM SCHEMATIC FLOW DIAGRAM – R438A SYSTEM

NO SCALE



ALTERRA east west partners  
MOUNTAIN COMPANY

2305 Mount Werner Circle  
Steamboat Springs, CO 80487

Gensler

1225 17th Street  
Suite 150  
Denver, CO 80202  
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Tel 303.595.8586  
Fax 303.625.6823



141 9th Street  
PO Box 774943  
Steamboat Springs, CO  
80477  
Tel 970.871.9494

DESIGNWORKSHOP

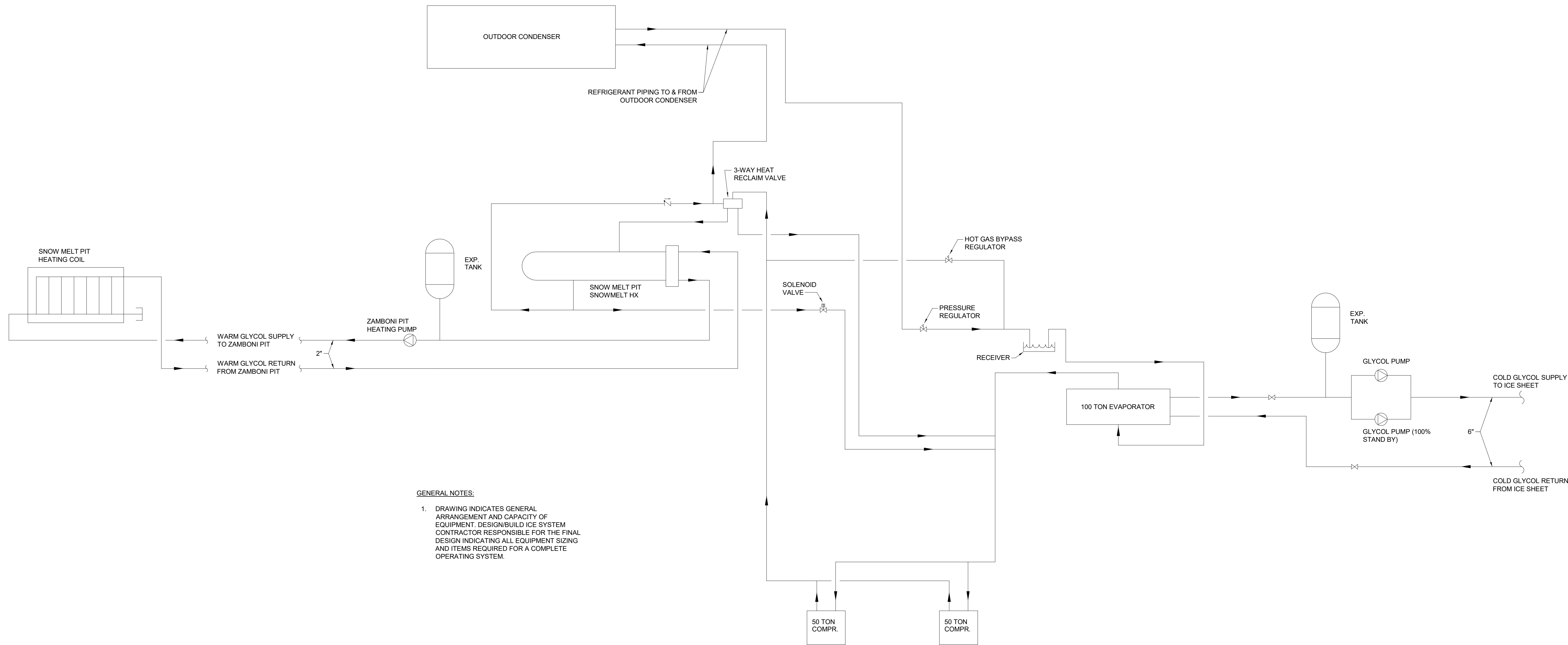
1390 Lawrence Street  
Suite 100  
Denver, CO 80204  
Tel 303.623.5186



12499 West Colfax Ave.  
Lakewood, CO 80215  
United States  
Tel 303.431.6100



14143 Denver West Pkwy  
Suite 300  
Golden, CO  
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Tel 303.421.6655



△ Date	Description
- 2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

Seal / Signature



Project Name

SSRC | BASE AREA IMPROVEMENTS

Project Number

003.7835.000

Description

PROMENADE - ICE PLANT DETAILS

Scale

1/8" = 1'-0"

1A-M9.001



AIR-COOLED CHILLER SCHEDULE																														
CODE (CH)	MANUFACTURER/ MODEL NO.	CAPACITY		CHILLED WATER DATA					ELECTRICAL										NPLV EER	KW/TON AT DESIGN CONDITIONS	HEIGHT (IN)	WIDTH (IN)	LENGTH (IN)	OPERATING WEIGHT (LBS)	REMARKS					
		NOM. (TONS)	ACTUAL (MBH)	EWT (F)	LWT (F)	GPM	WPD (FT)	DESIGN DB (F)	CHILLER					HEAT TRACE																
									SCCR	VOLT	PH	MCA	MOP	FUSE	DISCON.	FEEDER	VOLT	PH								MOP	FUSE	DISCON.	FEEDER	
2A.01	TRANE/RTAF	170	1740	54	44	374	40	88	65	460	3	321	450	RE: ONE-LINES			277	1	20	-	\$ T.O.	(2#12, #12G) 3/4"	9.7	15.3	0.934	98.0	98.0	274.0	12,500	
<div>GENERAL NOTES:</div> <div>1. FLUID CONTAINS 30% PROPYLENE GLYCOL.</div> <div>2. JOB SITE ELEVATION = 6,700 FT.</div> <div>3. PROVIDE FREE COOLING COIL WITH INTERNAL DIVERTING VALVE.</div> <div>4. PROVIDE MANUFACTURER'S STANDARD ROOF CURB, 14" CURB HEIGHT. PROVIDE 2" DEFLECTION SPRING ISOLATORS PER MECHANICAL SPECIFICATIONS.</div> <div>5. PROVIDE 115V CONVENIENCE OUTLET.</div> <div>6. PROVIDE SINGLE POINT POWER CONNECTION FOR CHILLER. PROVIDE CONTROL TRANSFORMER AS REQUIRED. HEAT TRACE CONNECTION SHALL BE VERIFIED BY MANUFACTURER FOR SINGLE POINT OR DEDICATED HEAT TRACE CONNECTION.</div> <div>7. PROVIDE VARIABLE SPEED COMPRESSORS FOR CAPACITY CONTROL.</div> <div>8. PROVIDE EVAPORATIVE PRE-COOLING SYSTEM, EVAPORCOOL OR EQUAL. PROVIDE BOOSTER PUMP, WATER TREATMENT, EXPANSION TANK, MEDIA AT CHILLER AIR INTAKES, AND COMPLETE PIPING SYSTEM TO PROVIDE DOMESTIC WATER TO EVAPORATIVE PRE-COOLING MEDIA. INTERLOCK WITH CHILLER TO OPERATE ON CALL FOR COOLING.</div>																														

PUMP SCHEDULE																
CODE	MANUFACTURER/ MODEL NO.	SERVICE	PUMP TYPE	GPM	HEAD (FT)	NPSHR (FT)	IMPELLER DIA (IN)	BHP	ELECTRICAL							REMARKS
									HP	VOLT	PH	FLA	FUSE	DISCON.	FEEDER	
CWP-1A.01	TACO/SKV 3006D	PRIMARY CHILLED WATER LOOP	INLINE	200	75	12	5.2	5.14	7.5	460	3	11	15A LPS-RK	30A/3P	(3#12, #12G) 3/4"C	A,B,C
CWP-1A.02	TACO/SKV 3006D	PRIMARY CHILLED WATER LOOP	INLINE	200	75	12	5.2	5.14	7.5	460	3	11	15A LPS-RK	30A/3P	(3#12, #12G) 3/4"C	A,B,C
GP-1B.01	NEPTUNE/G-50	GLYCOL FEEDER	POS. DISP.	--	--	--	--	--	0.5	120	1	10	-	CORD & PLUG	(2#12, #12G) 3/4"C	C,D
<div>GENERAL NOTES:</div> <div>1. PROVIDE MAGNETIC STARTER WITH AUXILIARY CONTACTS AND HOA SWITCH ON ALL THREE PHASE MOTORS.</div> <div>2. PROVIDE PREMIUM EFFICIENCY MOTORS FOR MOTORS 1 HP AND OVER PER NEMA STANDARD MG1-2003, TABLES 12-12 AND 12-13.</div> <div>3. FOR PARALLEL PUMP APPLICATIONS MANUFACTURER SHALL REVIEW SINGLE PUMP OPERATION SUCH THAT PUMP CAN OPERATE AND NOT EXCEED THE END OPERATION POINT ON THE PUMP CURVE AND MOTOR HP IS PROPERLY SELECTED TO PREVENT OVERLOADING.</div> <div>4. NPSHR AT SCHEDULED OPERATING POINT SHALL NOT EXCEED 0.8"NPSHA</div> <div>5. REFER TO DRAWINGS TO DETERMINE REQUIRED PUMP ROTATION. COORDINATE WITH MECHANICAL CONTRACTOR PRIOR TO ORDERING.</div> <div>REMARK NOTES:</div> <div>A. PROVIDE WITH VARIABLE FREQUENCY DRIVE WITH INTEGRAL OVER-CURRENT PROTECTION AND GROUND FAULT PROTECTION PER NEC 430.</div> <div>B. 50% CAPACITY (PARALLEL PUMP APPLICATION).</div> <div>C. FLUID CONTAINS 30% PROPYLENE GLYCOL. ALL PUMP COMPONENTS IN CONTACT WITH FLUID SHALL BE COMPATIBLE WITH GLYCOL. ADJUST STANDARD CATALOG PERFORMANCE TO ACCOUNT FOR USE OF GLYCOL.</div> <div>D. ELECTRICAL CONNECTION TO 120V WALL RECEPTACLE.</div>																

EVAPORATIVE PRE-COOLING BOOSTER PUMP SCHEDULE													
CODE (EBP)	MANUFACTURER/ MODEL NO.	SERVICE	CAPACITY		ELECTRICAL							OPERATING WEIGHT (LBS)	REMARKS
			GPM	PSI	HP	VOLT	PH	AMPS	FUSE	DISCON.	FEEDER		
1A.01	TOWLE WHITNEY/TW1000-15W-40	CHILLER EVAPORATIVE PRE-COOLING SYSTEM	15	40	1/2	480	3	3	15A LPS-RK	30A/3P	(3#12, #12G) 3/4"C	100	
GENERAL NOTES: 1. PUMP SHALL BE PROVIDED BY EVAPORATIVE PRE-COOLING SYSTEM MANUFACTURER. REFER TO SPECIFICATIONS. 2. PUMP SHALL BE CENTRIFUGAL TYPE WITH FACTORY WIRED VARIABLE FREQUENCY DRIVE. 3. PROVIDE PUMP WITH INTEGRAL DIAPHRAGM EXPANSION TANK SIZED BY EVAPORATIVE PRE-COOLING SYSTEM MANUFACTURER. 4. PROVIDE THE FOLLOWING PUMP COMPONENTS: RELIEF VALVE, CHECK VALVE, STEEL FRAME, PRESSURE GAUGE, TANK TEE, BRASS NIPPLE, AND COPPER FITTINGS. 5. REFER TO MECHANICAL CONTROLS DRAWINGS FOR REQUIRED EVAPORATIVE PRE-COOLING SYSTEM PIPING AND CONTROL FUNCTIONS.													

EXPANSION TANK													
CODE (ET)	MANUFACTURER/ MODEL NO.	SERVICE	DESIGN PARAMETERS			OPERATING PARAMETERS		CONFIG.	TYPE	MIN. ACCEPT (GAL)	PRECHARGE (PSIG)	REMARKS	
			SYSTEM VOLUME	MIN. TEMPERATURE (F)	MAX. TEMPERATURE (F)	MIN. PRESSURE (PSIG)	MAX. PRESSURE (PSIG)						
1A.01	TACO/CA300-125	CHILLED WATER	3,000	40	90	20	67.5	VERTICAL	B	79.0	20.0		
GENERAL NOTES: 1. TYPE: B=FULL ACCEPTANCE BLADDER. 2. LOCATE GLYCOL FEEDER CONNECTION AT EXPANSION TANK CONNECTION TO HYDRONIC SYSTEM. REFER TO DETAIL. 3. PROVIDE MAKEUP WATER WITH FILL PRESSURE NO HIGER THAN 20 PSI. 4. PROVIDE PRESSURE RELIEF VALVE SET AT 75 PSIG. 5. FLUID CONTAINS 30% PROPYLENE GLYCOL.													

AIR SEPARATOR									
CODE (AS)	SERVICE	DESIGN PARAMETERS			OPERATING PARAMETERS			DIMENSIONS	
		SYSTEM FLOW (GPM)	PIPE SIZE (IN)	MAX PD (FT. HD.)	MANUFACTURER/ MODEL NO.	DIAMETER (IN.)	HEIGHT (IN.)	WEIGHT (LBS)	REMARKS
1A.01	CHILLED WATER	385	6	1	TACO/ACT06F	20	41	800.0	
<div>GENERAL NOTES:</div> <div>1. FLUID CONTAINS 30% PROPYLENE GLYCOL.</div> <div>2. PROVIDE WITH STRAINER.</div> <div>3. PROVIDE FLOOR STAND SUPPORT.</div>									



ALERRA east west partners  
MOUNTAIN COMPANY

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Gensler

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14143 Denver West Pkwy  
Suite 300  
Golden, CO  
United States  
Tel 303.421.6655

Date	Description
2021.05.19	BP3: PROMENADE - ISSUE FOR BID AND PERMIT

Seal / Signature



05/18/2021

Project Name

SSRC | BASE AREA  
IMPROVEMENTS

Project Number

003.7835.000

Description

PROMENADE - MECHANICAL  
SCHEDULES

Scale

1A-MEP0.000



ENERGY RECOVERY VENTILATOR SCHEDULE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
CODE (ERV)	LOCATION	MANUFACTURER/ MODEL NO.	SUPPLY FAN				EXHAUST FAN				COOLING CAPACITY (CHILLED WATER)								HEATING CAPACITY (HEATING HOT WATER)					SENSIBLE WHEEL HEAT RECOVERY																UNIT WEIGHT (LBS)	REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
			MAX CFM	MIN CFM	ESP "W.C. (ALT.)	HP	MAX CFM	MIN CFM	ESP "W.C. (ALT.)	HP	EAT (°F)		UNIT LAT (°F)		TOTAL (MBH)	SENSIBLE (MBH)	GPM	WPD (FT)	EAT (°F)	LAT (°F)	CAP (MBH)	GPM	WPD (FT)	COOLING				HEATING				EXH EAT (F)				EXH LAT (F)						SENSIBLE EFF.		LATENT EFF.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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HORIZONTAL FAN COIL SCHEDULE (HYDRONIC)																									
CODE (HFCU)	MANUFACTURER/ MODEL NO.	AREA SERVED	FAN		COOLING COIL						HEATING COIL						ELECTRICAL								
			SUPPLY CFM	ESP (IN.)	EAT (°F) DB WB	TOTAL MBH	SENS MBH	MAX LAT (F)	GPM	ROW	WPD (FT)	EAT (°F)	MIN LAT (F)	GPM	ROW	WPD (FT)	HP	VOLT	PH	FLA	DISCON.	FEEDER	FUSE	REMARKS	
1	ENGINEERED COMFORT/D35FHZW-08	1 TON	600	0.3	75 62	12.8	10.2	55	2.7	4	1.2	65	11.5	85	1.3	1	4.6	1/8	120	1	3.3	\$ T.O.	(2#12, #12G) 3/4"C	-	
2	ENGINEERED COMFORT/D35FHZW-16	2 TON	1100	0.3	75 62	25.7	19.7	55	5.4	5	2.7	65	19.6	85	2.2	1	2.5	1/4	120	1	7.2	\$ T.O.	(2#12, #12G) 3/4"C	-	
3	ENGINEERED COMFORT/D35FHZW-24	3 TON	1800	0.3	75 62	38.7	31.1	55	8.1	5	3.6	65	31.1	85	3.5	1	6.5	1/2	120	1	11.8	\$ T.O.	(2#12, #12G) 3/4"C	-	
4	ENGINEERED COMFORT/D35FHZW-30	4 TON	2300	0.3	75 62	49.5	39.8	55	10.4	5	2.3	65	40.5	85	4.6	1	3.2	1/2	120	1	12.6	\$ T.O.	(2#12, #12G) 3/4"C	-	A
GENERAL NOTES: 1. CHILLED WATER: EWT = 44 F, LWT = 54 F, 30% PROPYLENE GLYCOL. 2. HEATING WATER: EWT = 150 F, LWT = 130 F, 30% PROPYLENE GLYCOL. 3. PROVIDE 2" MERV 8 THROW AWAY FILTERS. 4. SCHEDULED FAN VALUES (CFM, SP AND HP) ARE ACTUAL AT ALTITUDE. MOTOR HP HAS BEEN ADJUSTED FROM SEA LEVEL CONDITIONS FOR OPERATION AT JOBSITE ELEVATION. JOB SITE ELEVATION = 6700 FT. 5. PROVIDE PREMIUM EFFICIENCY MOTORS FOR MOTORS 1 HP AND OVER PER MENA STANDARD MG1-2003, TABLES 12-12 AND 12-13. 6. PROVIDE CONDENSATE PUMP POWERED FROM EQUIPMENT. PUMP SHALL BE PROVIDED WITH VOLTAGE MATCHING FAN COIL UNIT. IF TRANSFORMER IS PROVIDED FOR CONDENSATE PUMP OPERATION, PROVIDE LINE ITEM COST. GRAVITY DRAINAGE ACCEPTABLE WHERE POSSIBLE. 7. DESIGN OUTSIDE AIR CONDITIONS: COOLING: 88F DB/56.2F WB HEATING: -10F DB																									
REMARK NOTES: A. PROVIDE DUCT SMOKE DETECTORS PER CODE FOR ALL UNITS 2000 CFM OR GREATER.																									

HIGH WALL FAN COIL SCHEDULE (HYDRONIC)																				
CODE (WFCU)	MANUFACTURER/ MODEL NO.	AREA SERVED	FAN		COOLING COIL								ELECTRICAL							REMARKS
			SUPPLY CFM	ESP (IN.)	EAT (°F) DB WB	TOTAL MBH	SENS MBH	MAX LAT(°F)	GPM	ROW	WPD (FT)	HP	VOLT	PH	FLA	DISCON.	FEEDER	FUSE		
1A.01	MULTIAQUA/MHWW-36-H-3	MAIN ELEC	850	0	80 67	36.0	22.0	55	9.5	1	24.5	1/12	120	1	0.9	\$ T.O.	(2#12, #12G) 3/4"	-	A	
1A.02	MULTIAQUA/MHWW-36-H-3	IDF/IT	850	0	80 67	36.0	22.0	55	9.5	1	24.5	1/12	120	1	0.9	\$ T.O.	(2#12, #12G) 3/4"	-	A	
1A.03	MULTIAQUA/MHWW-36-H-3	IDF/IT RM	850	0	80 67	36.0	22.0	55	9.5	1	24.5	1/12	120	1	0.9	\$ T.O.	(2#12, #12G) 3/4"	-	A	
1A.04	MULTIAQUA/MHWW-36-H-3	MAIN ELEC	850	0	80 67	36.0	22.0	55	9.5	1	24.5	1/12	120	1	0.9	\$ T.O.	(2#12, #12G) 3/4"	-	A	
1A.05	MULTIAQUA/MHWW-36-H-3	ELEC	850	0	80 67	36.0	22.0	55	9.5	1	24.5	1/12	120	1	0.9	\$ T.O.	(2#12, #12G) 3/4"	-	A	
1A.06	MULTIAQUA/MHWW-36-H-3	ELEC	850	0	80 67	36.0	22.0	55	9.5	1	24.5	1/12	120	1	0.9	\$ T.O.	(2#12, #12G) 3/4"	-	A	
3A.01	MULTIAQUA/MHWW-36-H-3	ELEC	850	0	80 67	36.0	22.0	55	9.5	1	24.5	1/12	120	1	0.9	\$ T.O.	(2#12, #12G) 3/4"	-	A	
GENERAL NOTES:																				
1. CHILLED WATER: EWT = 44° F, LWT = 54° F, 30% PROPYLENE GLYCOL.																				
2. SCHEDULED FAN VALUES (CFM, SP AND HP) ARE ACTUAL AT ALTITUDE. MOTOR HP HAS BEEN ADJUSTED FROM SEA LEVEL CONDITIONS FOR OPERATION AT JOBSITE ELEVATION. JOB SITE ELEVATION = 6700 FT.																				
3. PROVIDE PREMIUM EFFICIENCY MOTORS FOR MOTORS 1 HP AND OVER PER MENA STANDARD MG1-2003, TABLES 12-12 AND 12-13.																				
4. PROVIDE CONDENSATE PUMP POWERED FROM EQUIPMENT. PUMP SHALL BE PROVIDED WITH VOLTAGE MATCHING FAN COIL UNIT. IF TRANSFORMER IS PROVIDED FOR CONDENSATE PUMP OPERATION, PROVIDE LINE ITEM COST. GRAVITY DRAINAGE ACCEPTABLE WHERE POSSIBLE.																				
5. DESIGN OUTSIDE AIR CONDITIONS:																				
COOLING: 88F db/56.2F wb																				
HEATING: -10F db																				
REMARK NOTES:																				
A. PROVIDE REMOTE THERMOSTAT.																				

CABINET UNIT HEATER SCHEDULE (HYDRONIC)																		
CODE (CUH)	MANUFACTURER/ MODEL NO.	AREA SERVED	CONFIG	CAP. (MBH)	CFM	GPM	ROW	WPD (FT)	WATTS	VOLT	PH	ELECTRICAL				FEEDER	CONN. SIZE	REMARKS
												FLA	DISC	FUSE				
1	TRANE/FORCEFLO-02	SEE PLANS	HORIZONTAL RECESSED	18	315	1.3	2	7.2	84	120	1	3.1	\$ T.O.	-	(2#12, #12G) 3/4"	3/4"	A,C,D	
2	TRANE/FORCEFLO-04	SEE PLANS	HORIZONTAL RECESSED	25	410	1.7	2	2.85	110	120	1	3.1	\$ T.O.	-	(2#12, #12G) 3/4"	3/4"	A,C,D	
3	TRANE/FORCEFLO-06	SEE PLANS	HORIZONTAL RECESSED	41	700	2.8	2	8.6	162	120	1	3.1	\$ T.O.	-	(2#12, #12G) 3/4"	3/4"	A,C,D	
4	TRANE/FORCEFLO-06	SEE PLANS	VERTICAL CABINET	41	700	2.8	2	8.6	162	120	1	3.1	\$ T.O.	-	(2#12, #12G) 3/4"	3/4"	A,B,D	
GENERAL NOTES: 1. EAT = 65° F, LAT = 95° F. 2. HEATING WATER: EWT = 150° F, LWT = 130° F, 30% PROPYLENE GLYCOL. 3. JOB SITE ELEVATION = 6,700 FT.																		
REMARK NOTES: A. PROVIDE UNIT MOUNTED DISCONNECT SWITCH. B. PROVIDE FRONT STAMPED INLET AND FRONT STAMPED OUTLET LOUVERS. C. PROVIDE BOTTOM STAMPED INLET AND BOTTOM STAMPED OUTLET LOUVERS. D. PROVIDE WALL MOUNTED THERMOSTAT.																		

UNIT HEATER SCHEDULE (HYDRONIC)																
CODE (UH)	MANUFACTURER/ MODEL NO.	SERVICE	CAPACITY (MBH)	WATER SIDE		AIR SIDE		ELECTRICAL							REMARKS	
				GPM	WPD (FT)	EAT (F)	LAT (F)	CFM	WATTS	VOLT	PH	FLA	DISC	FUSE		FEEDER
1	TRANE / UHSB08	SEE PLANS	8	0.8	0.8	60	95	250	16	120	1	1	\$ T.O.	-	(2#12, #12G) 3/4" C	A,B
2	TRANE / UHSB18	SEE PLANS	18	1.9	2.2	60	95	500	16	120	1	1	\$ T.O.	-	(2#12, #12G) 3/4" C	A,B
3	TRANE / UHSB25	SEE PLANS	24	2.5	2.2	60	95	580	25	120	1	1	\$ T.O.	-	(2#12, #12G) 3/4" C	A,B
4	TRANE / UHSB36	SEE PLANS	35	3.6	3	60	95	850	1/20 HP	120	1	1	\$ T.O.	-	(2#12, #12G) 3/4" C	A,B
GENERAL NOTES																
1. EWT =150F, LWT = 130F.																
2. WATER CONTAINS 30% PROPYLENE GLYCOL.																
3. JOB SITE ELEVATION = 6700 FT.																
REMARK NOTES																
A. PROVIDE WALL MOUNTED THERMOSTAT.																
B. HORIZONTAL DISCHARGE W/ LOUVER.																



