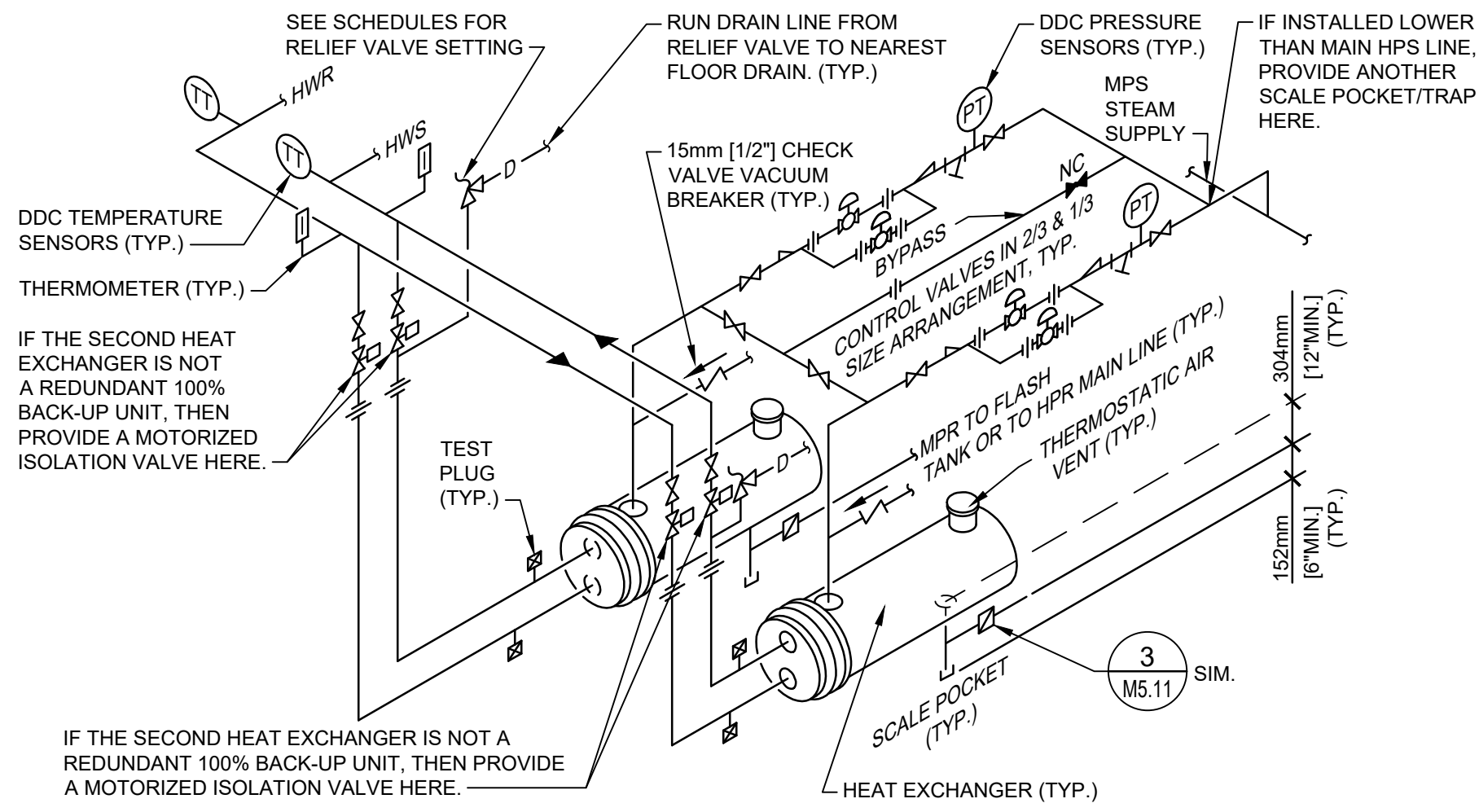
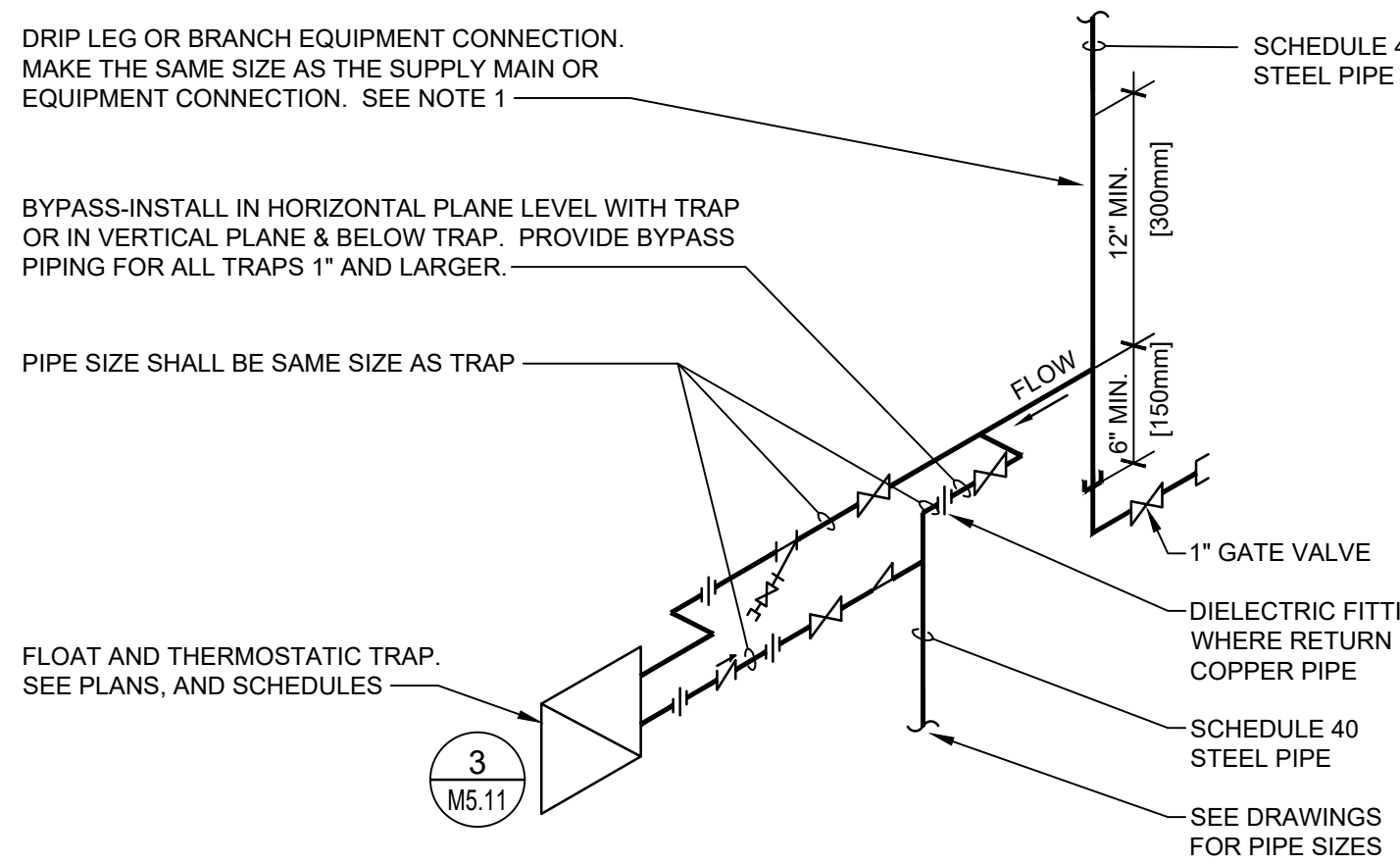
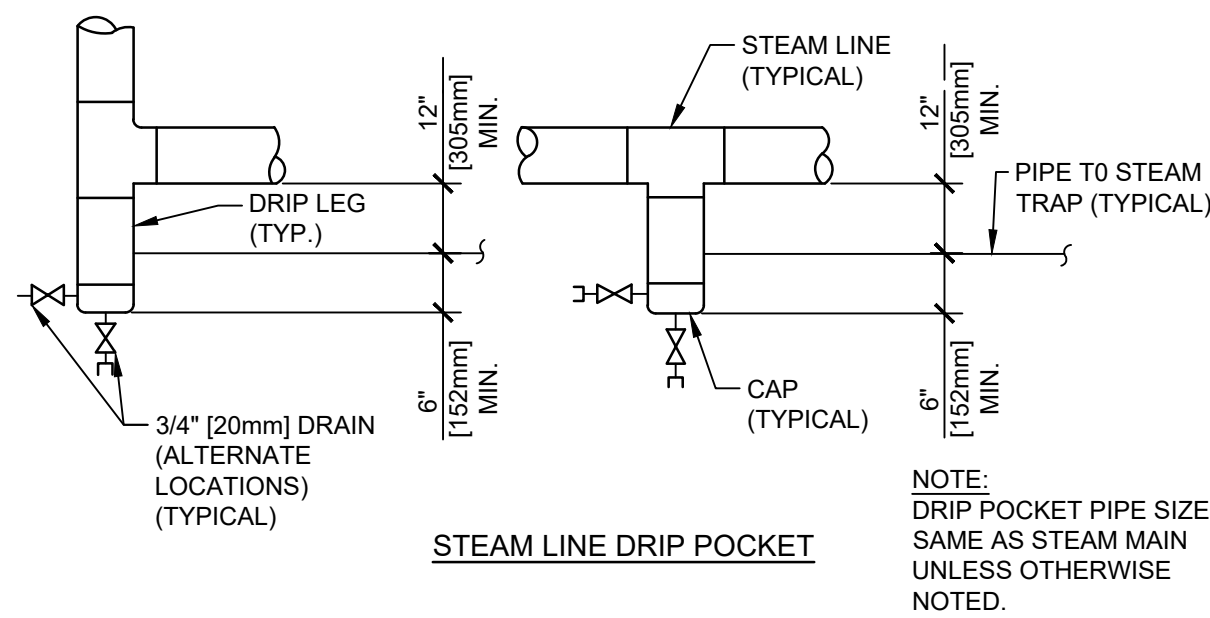




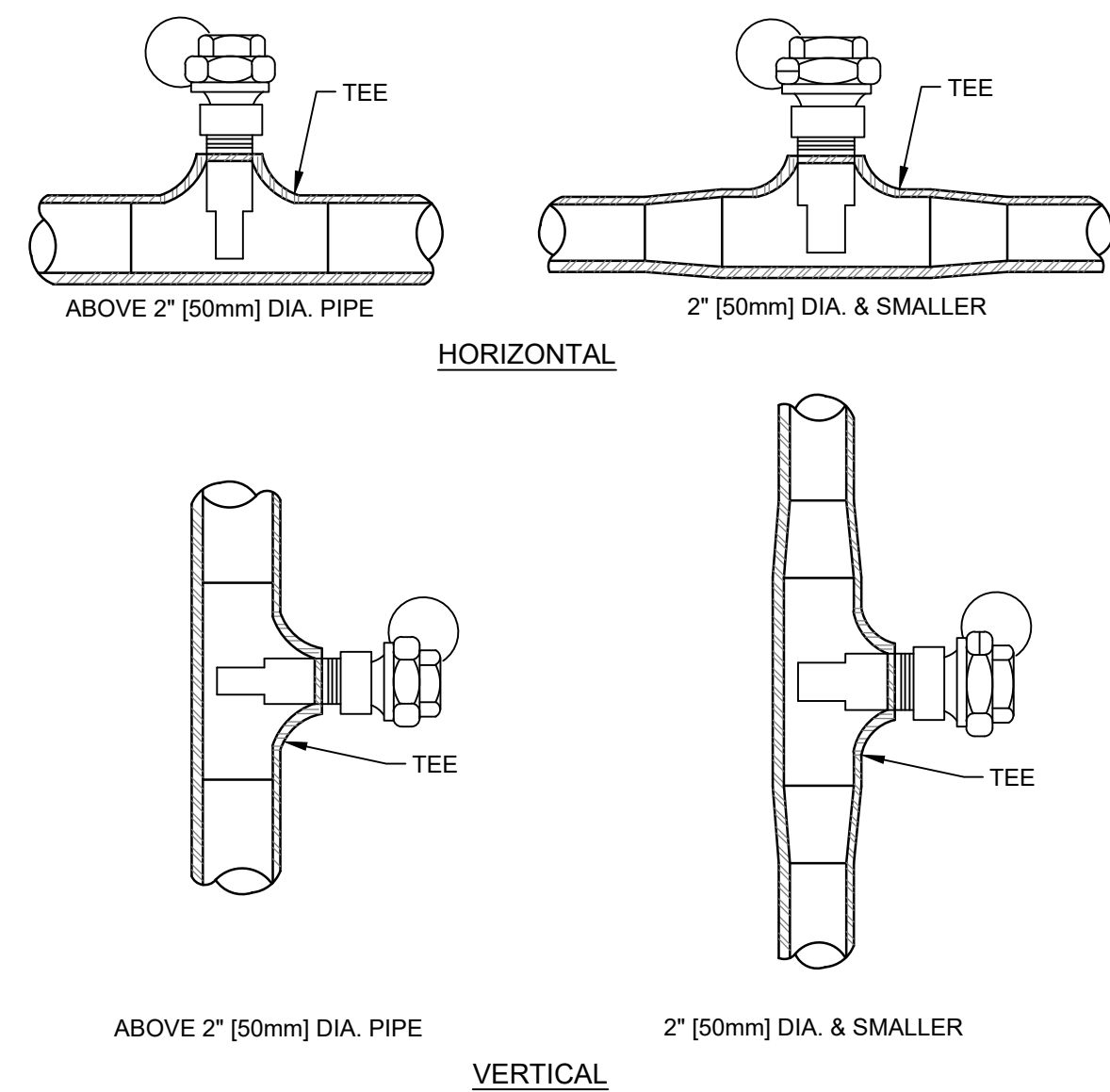
- NOTES:
- THE ABOVE DETAIL SHOWS REQUIRED PIPING FOR TWO HEAT EXCHANGERS IN PARALLEL. INDICATE IF 100% REDUNDANT OR NOT.
 - PROVIDE SADDLE SUPPORTS AND LEGS OR HANGERS FOR HEAT EXCHANGER. MOUNTING HEIGHT SHALL BE ADJUSTED TO FACILITATE GRAVITY RETURN OF STEAM CONDENSATE.
 - MAKE THE BYPASS THE SAME SIZE AS THE CONNECTIONS TO THE CONTROL VALVES.
 - CONTROL VALVES SHALL BE IN A 1/3 AND 2/3 SIZE ARRANGEMENT.

1 HEAT EXCHANGER - STEAM TO HOT WATER
SCALE: N.T.S.

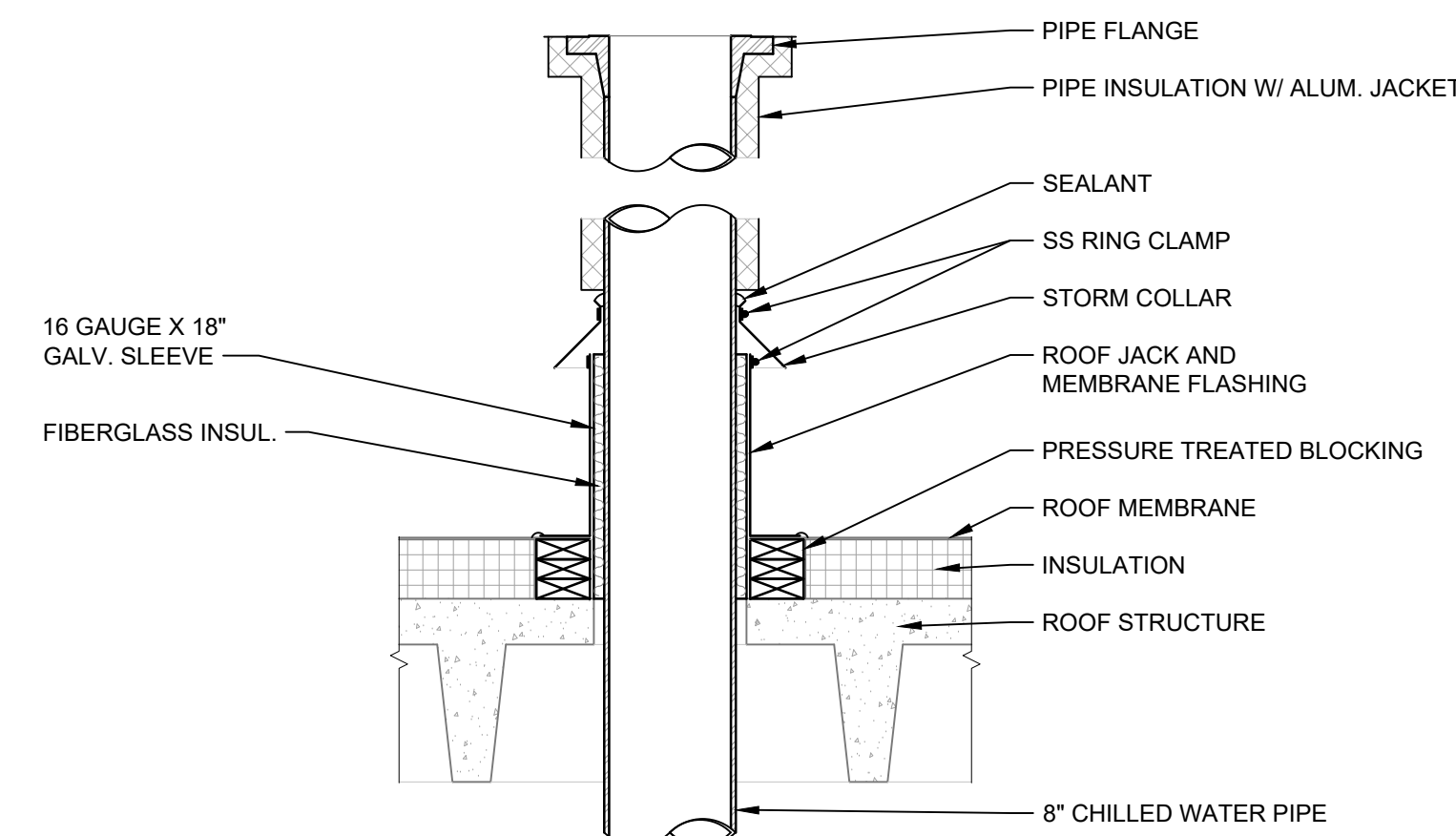


- NOTE:
- ALL DRIP POINTS ON STEAM MAINS SHALL BE PROVIDED WITH A 12" MINIMUM HIGH DRIP LEG FROM BOTTOM OF STEAM MAIN TO TRAP INLET. DRIP LEG SHALL HAVE 6" SCALE POCKET BELOW TRAP INLET.

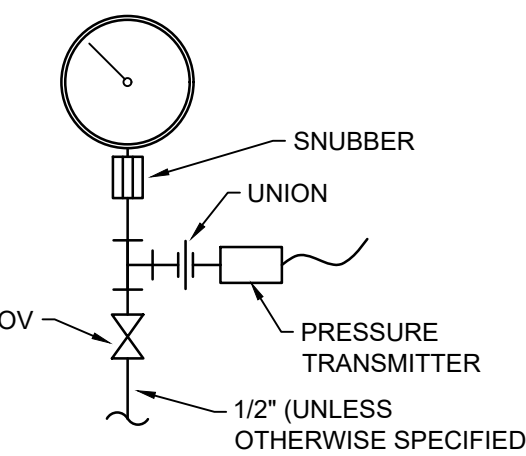
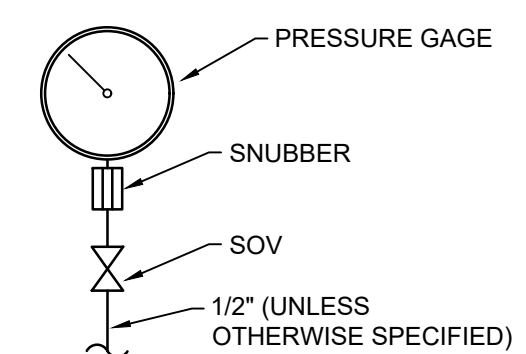
2 END OF MAIN DRIP ASSEMBLY DETAIL
SCALE: N.T.S.



3 F&T TRAP ASSEMBLY DETAIL
SCALE: N.T.S.

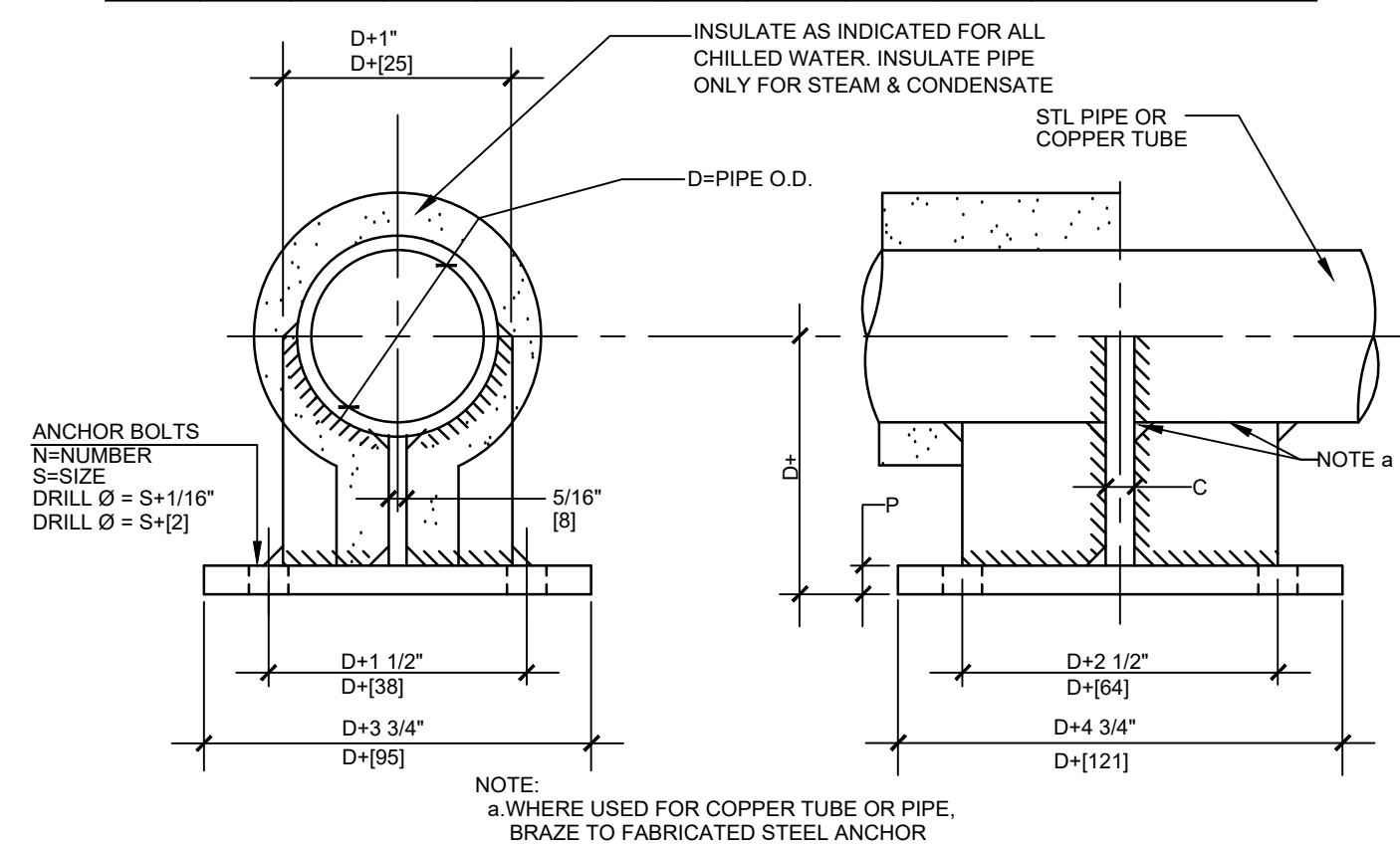


4 STEAM HUMIDIFIER DETAIL
SCALE: N.T.S.

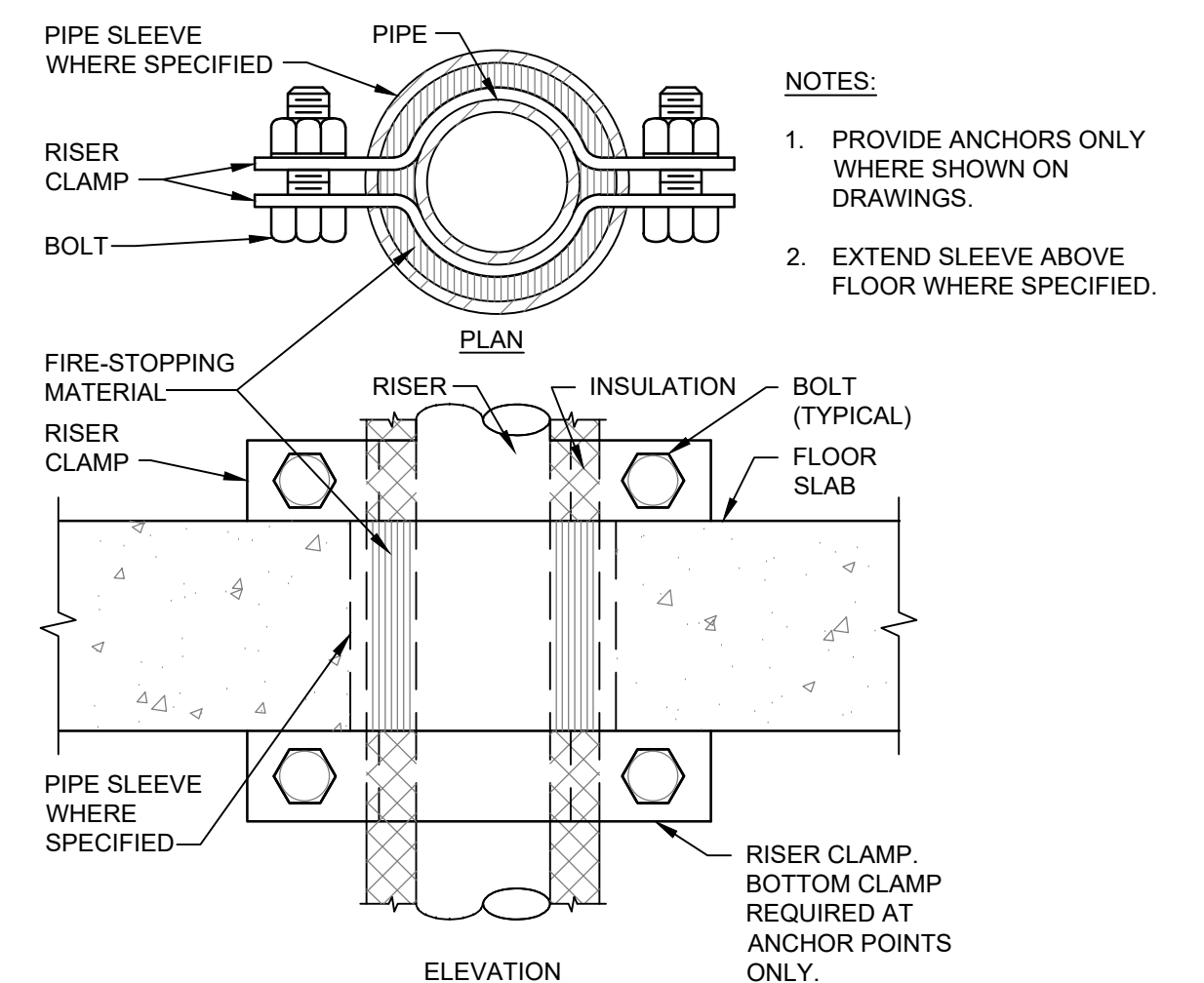


7 ROOF PIPE PENETRATION DETAIL
SCALE: N.T.S.

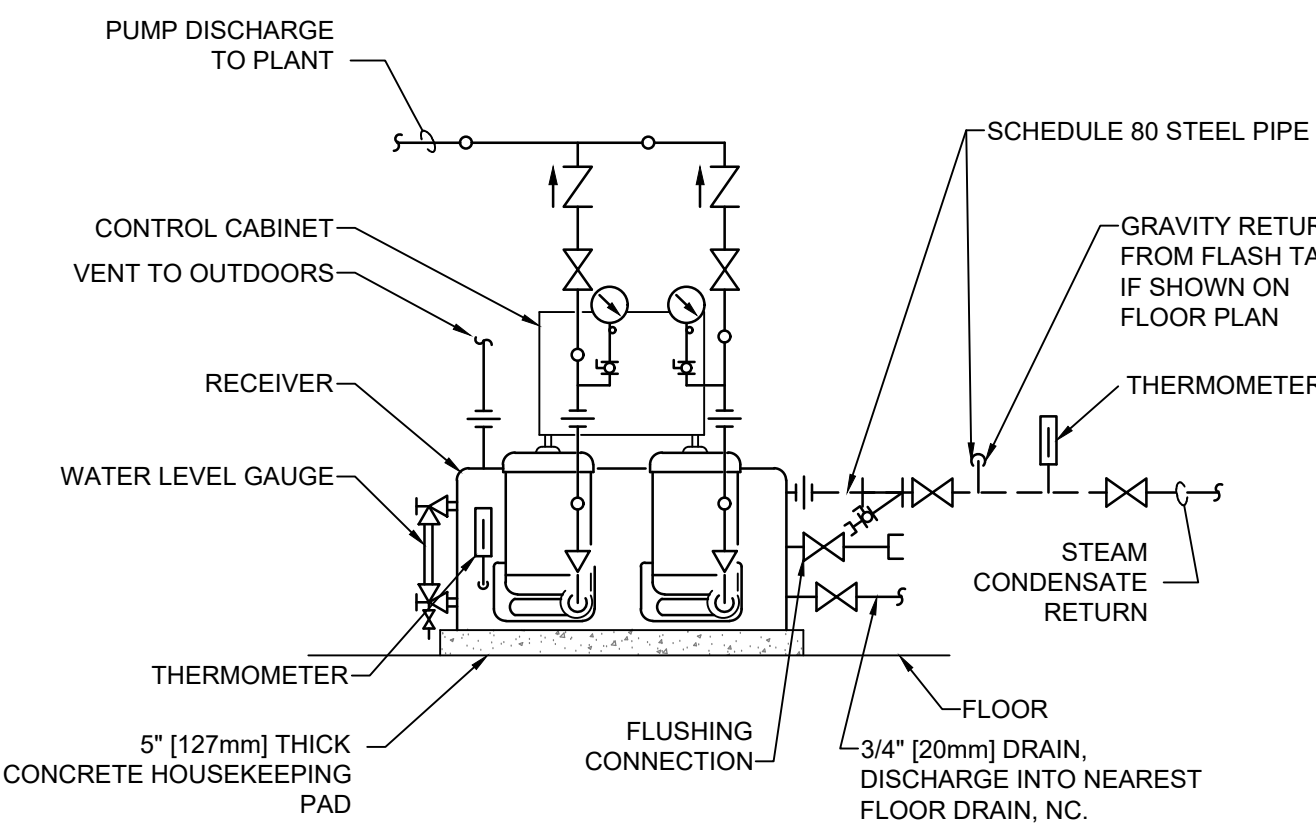
PIPE ANCHOR SCHEDULE										BOLT PATTERN	
D	P	C	N	S							
IN	MM	IN	MM	IN	MM	IN	MM	IN	MM		
4"	102	3/4"	16	3/4"	19	4"	102	3/4"	19		
3"	76	1/2"	13	1/2"	13	4"	102	1/2"	16		
2 1/2"	64	3/8"	10	3/8"	10	4"	102	3/8"	16		
2"	51	3/8"	10	3/8"	10	4"	102	3/8"	16		
1 1/2"	38	3/8"	10	1/2"	6	4"	102	1/2"	13		



8 PRESSURE GAGE DETAIL
SCALE: N.T.S.



5 AIR HANDLING UNIT DRAIN TRAP DETAIL
SCALE: N.T.S.



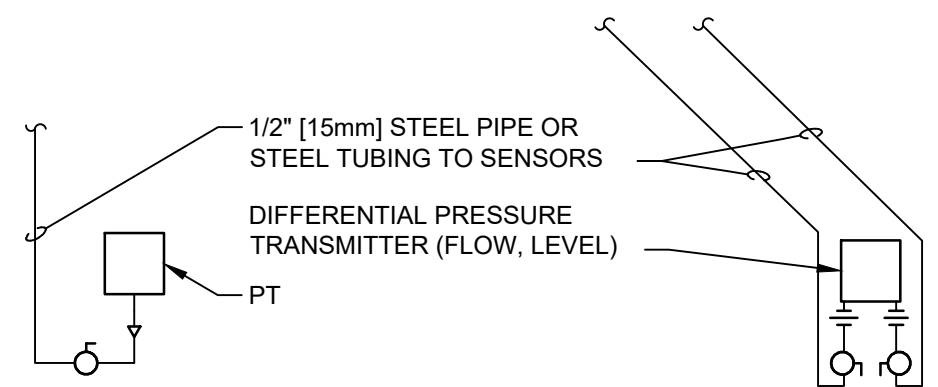
9 CONDENSATE PUMP PIPING CONNECTIONS
SCALE: N.T.S.

10 PIPE HANGERS DETAIL
SCALE: N.T.S.

11 SMALL PIPE ANCHOR DETAIL (1-1/2" TO 4")
SCALE: N.T.S.

12 SUPPORT/ANCHOR FOR PIPE RISERS DETAIL
SCALE: N.T.S.

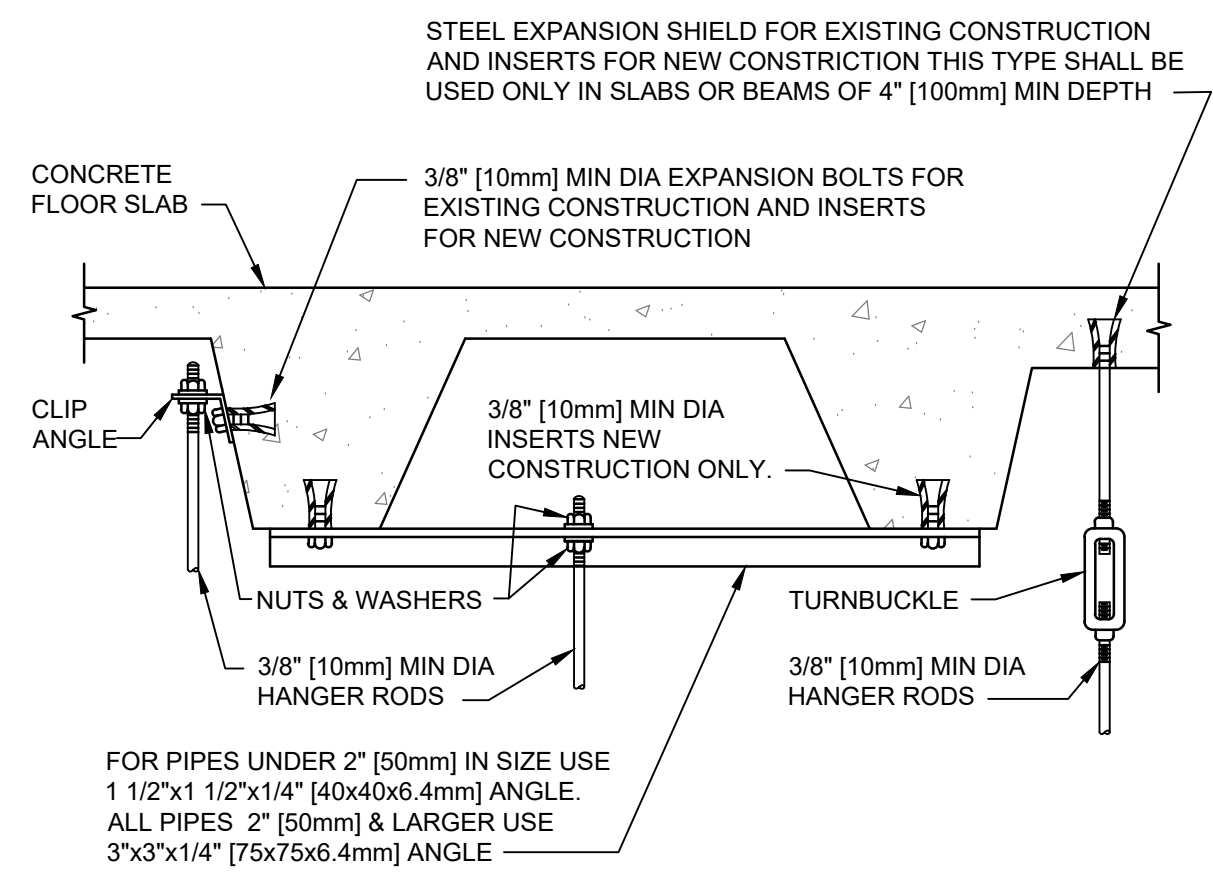
COMPLIANCE REVIEW INCLUDED Revisions: 2/23/2024		CONSULTANTS: TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736 ALBERTSON ENGINEERING, INC. 315 NORTH MAIN AVENUE, SUITE 200 SIOUX FALLS, SOUTH DAKOTA 57104 605.274.0880 FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900		ARCHITECT/ENGINEERS: FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM		Drawing Title Mechanical Details Building 5 - Wet Side 2 Approved: Project Director Omaha VA Medical Center 16.2330.A08		Project Title Design/Construct Sterile Processing Service- Omaha VA Medical Center Location 4101 Woolworth Ave #4109 Omaha, NE 68105 Date 11/23/2020 Checked MK Drawn JB		Project Number 16.2330.A08 Building Number 25 Drawing Number M 5.11 Dwg. 90 of 143		Office of Construction and Facilities Management Department of Veterans Affairs	
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- NOTES:
1. INSTALLATION OF SENSORS AND TRANSMITTERS SHALL CONFORM TO RECOMMENDATIONS OF MANUFACTURERS OF TRANSMITTERS.
 2. SEE GAGE DETAIL 8/0-M5.11.

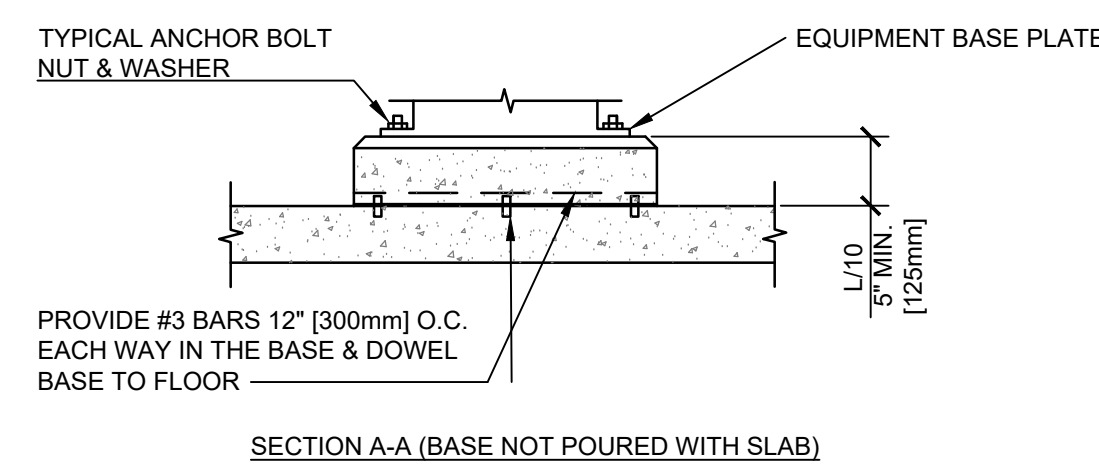
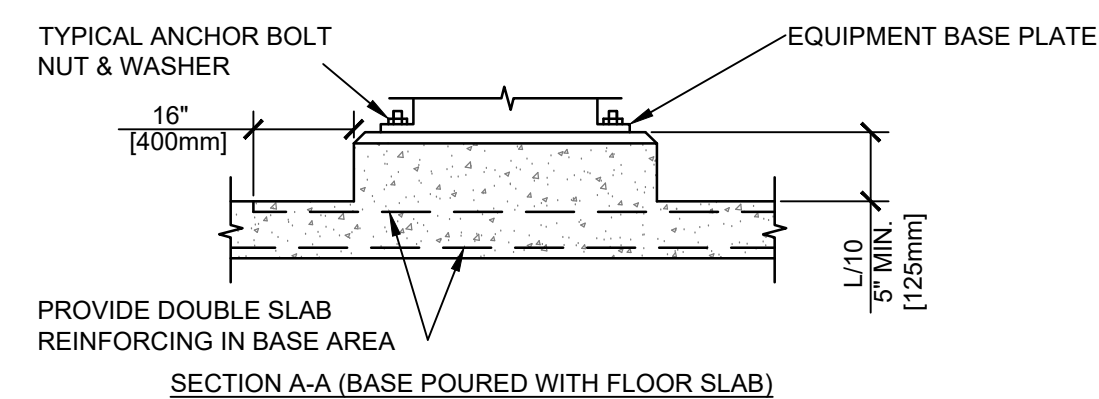
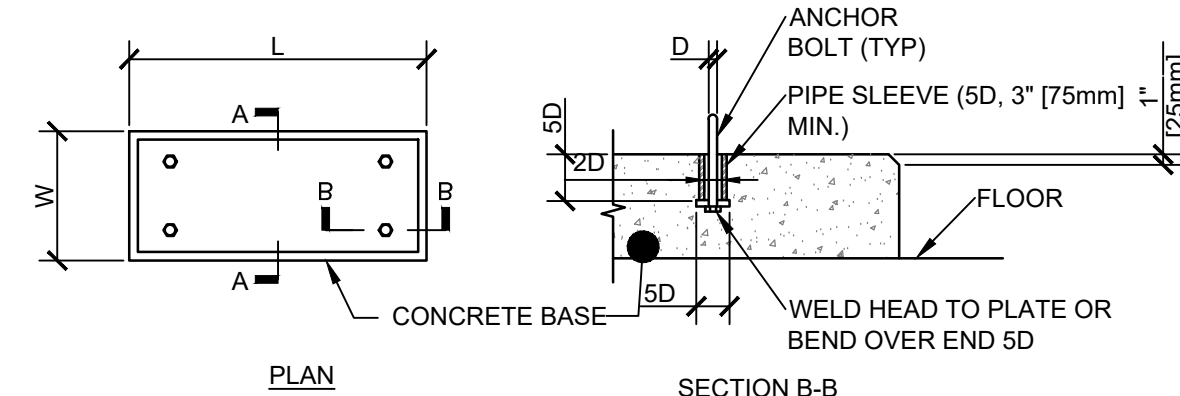
1 PRESSURE TRANSMITTER INSTALLATION

SCALE: N.T.S.



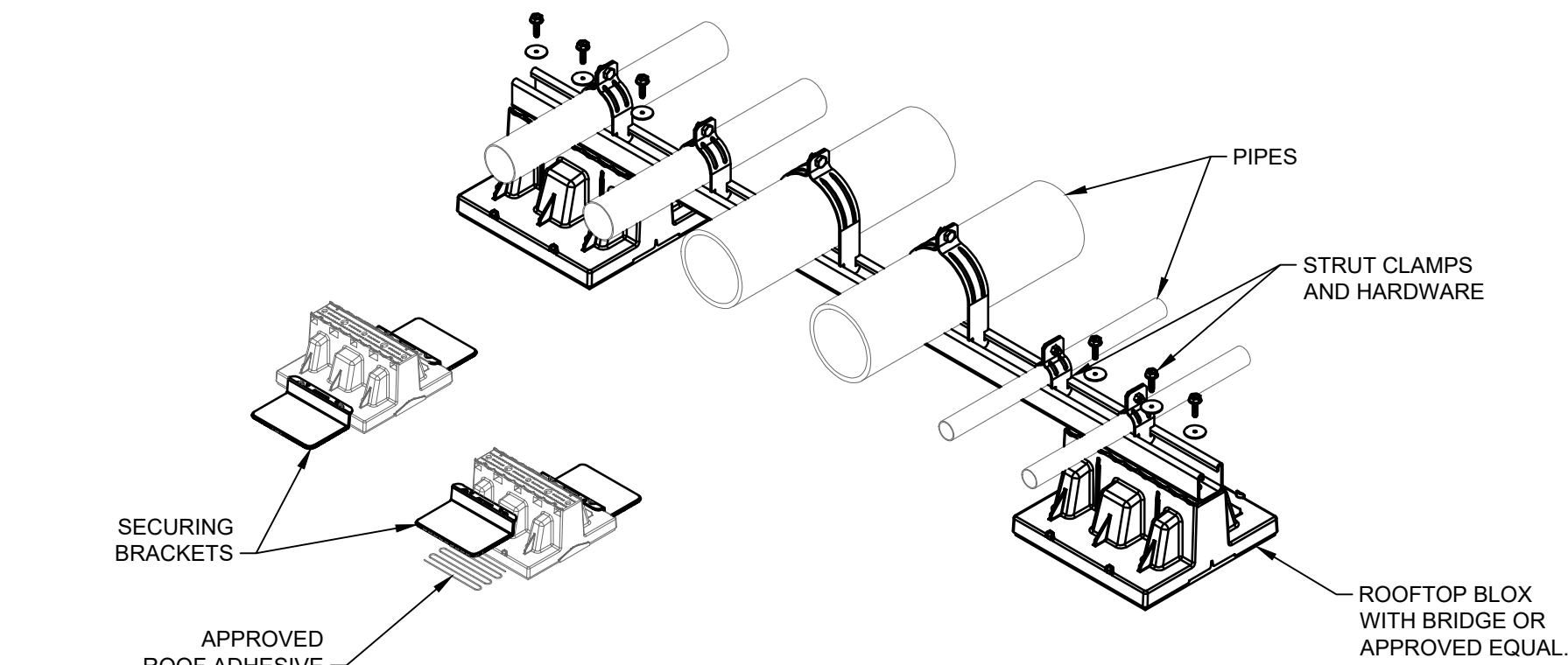
2 SECURING HANGER RODS IN CONCRETE

SCALE: N.T.S.



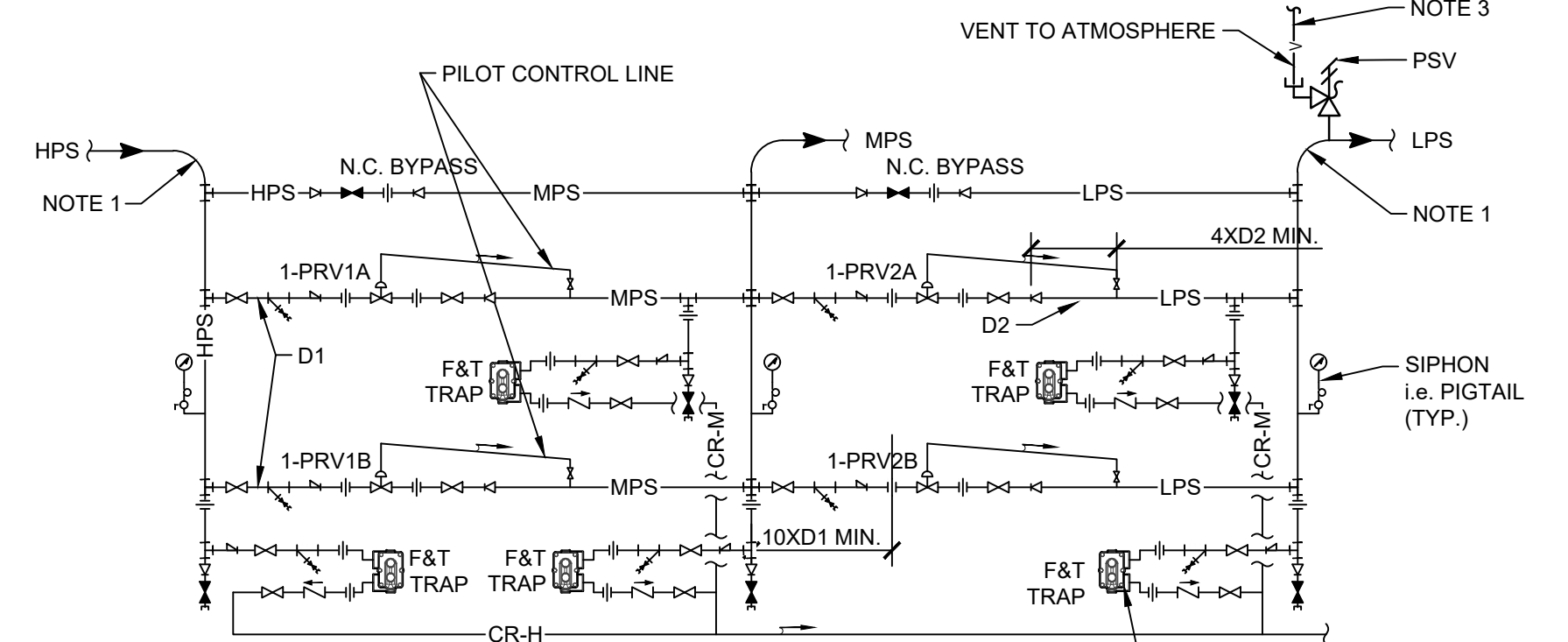
3 CONCRETE EQUIPMENT BASE DETAIL

SCALE: N.T.S.



4 ROOF-TOP PIPE SUPPORT ASSEMBLY

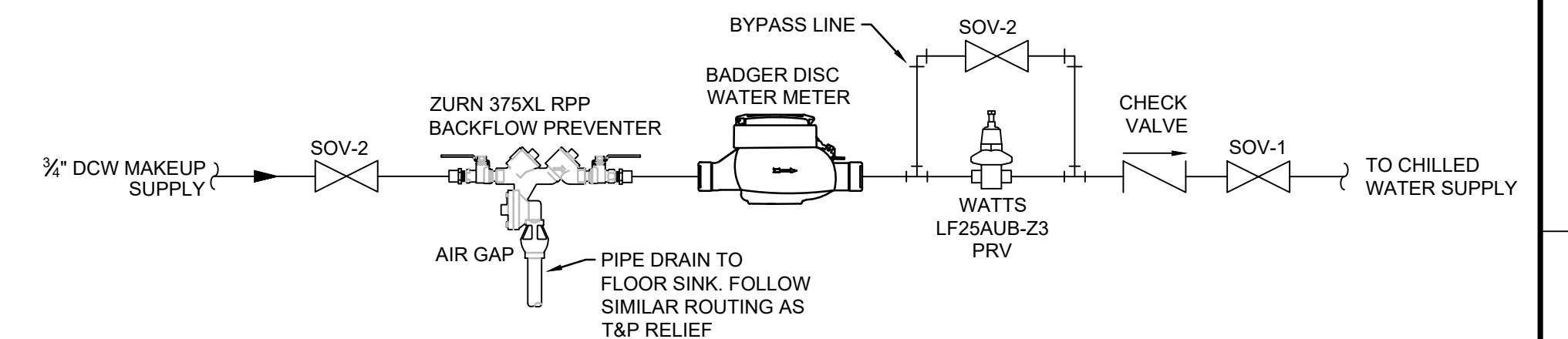
SCALE: N.T.S.



- NOTE:
- R = 1/2 X PIPE OR PIPE INSUL. O.D.

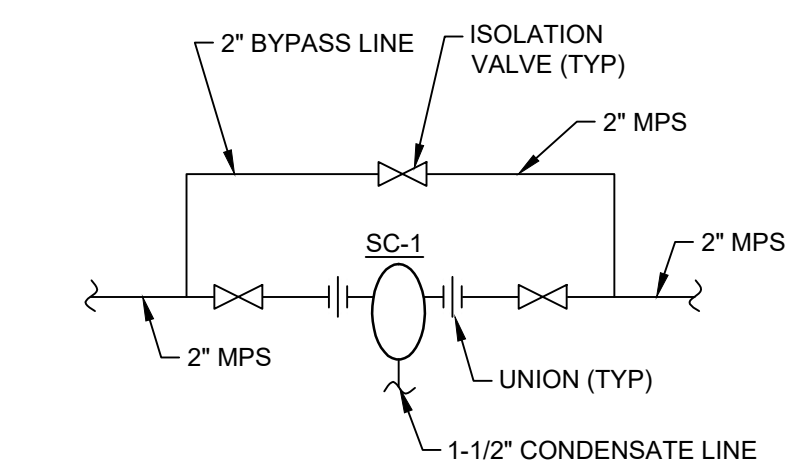
5 STEAM PRESSURE REDUCING STATION DOUBLE VALVE (1/3 AND 2/3)

SCALE: N.T.S.



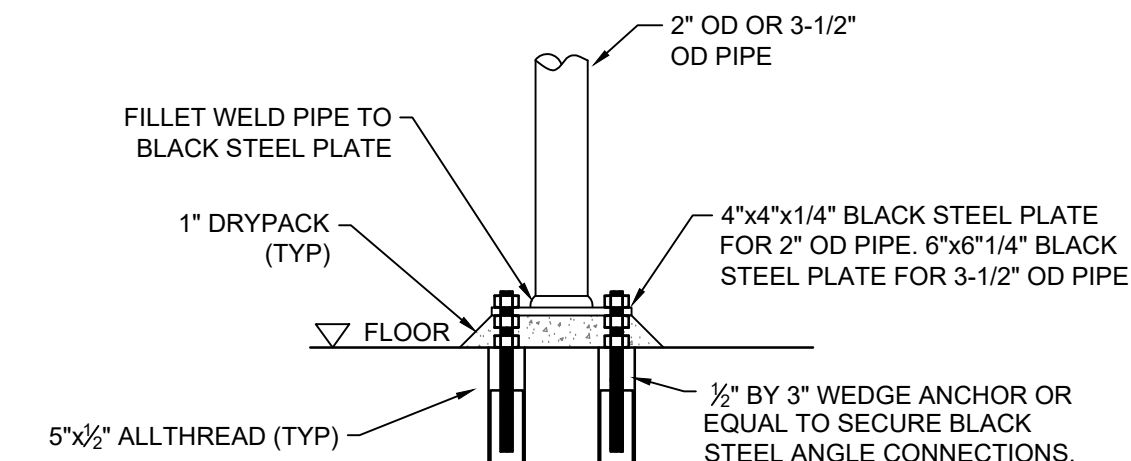
12 HYDRONIC WATER MAKE-UP FROM DCW LINE

SCALE: N.T.S.



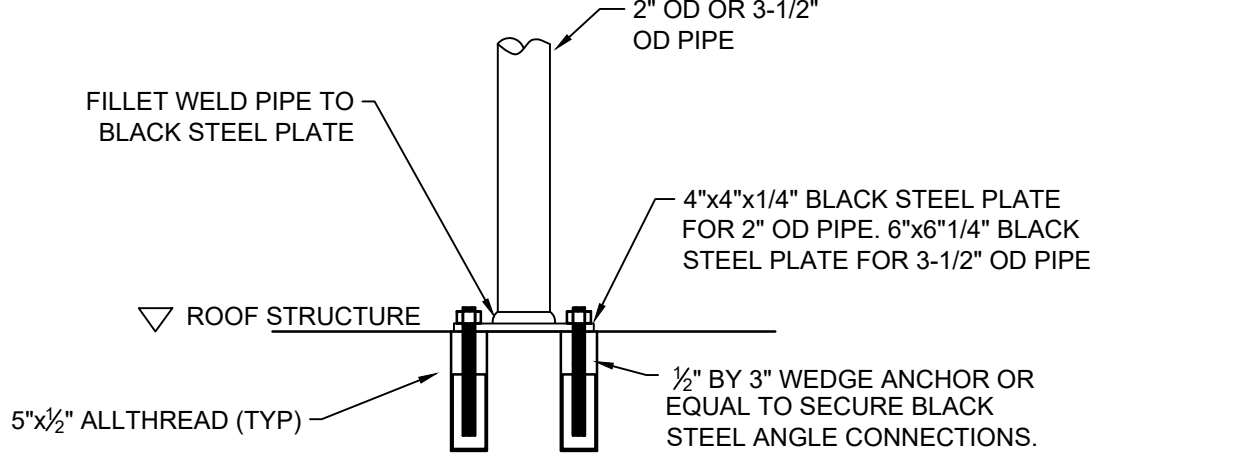
13 STEAM CYCLONE PIPING DETAIL

SCALE: N.T.S.



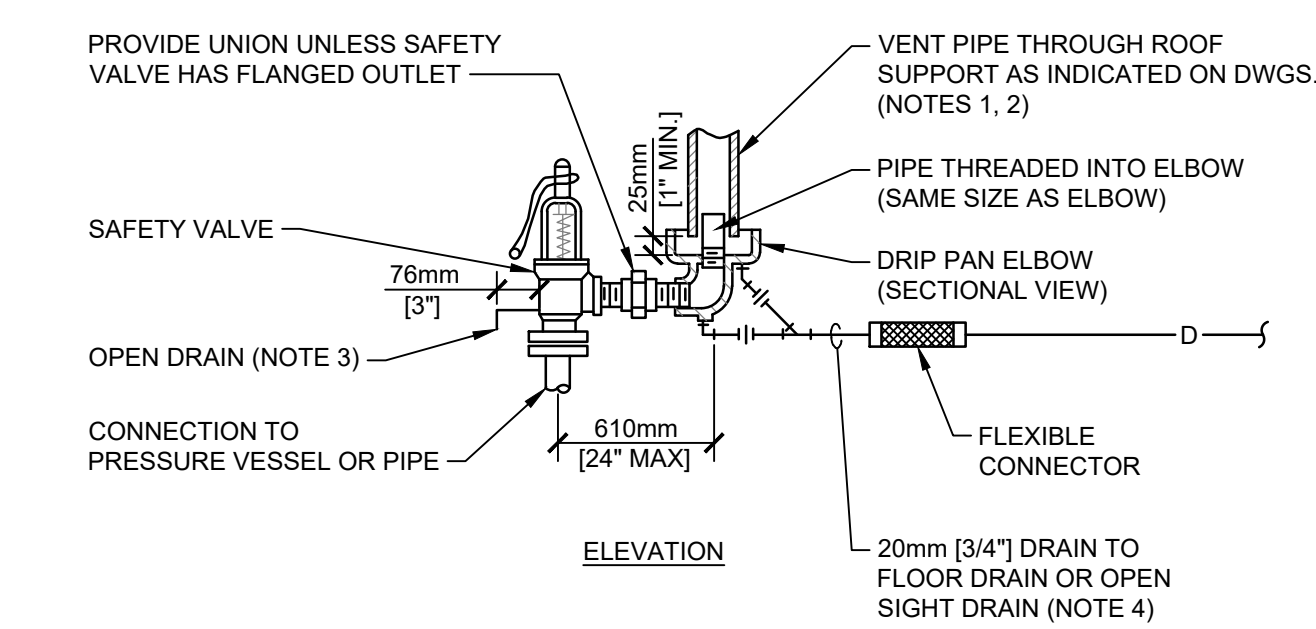
6 DRY PACK AT WELDED PIPE STAND BASE FOR INTERIOR USE DETAIL

SCALE: N.T.S.



7 WELDED PIPE STAND BASE FOR ROOF DETAIL

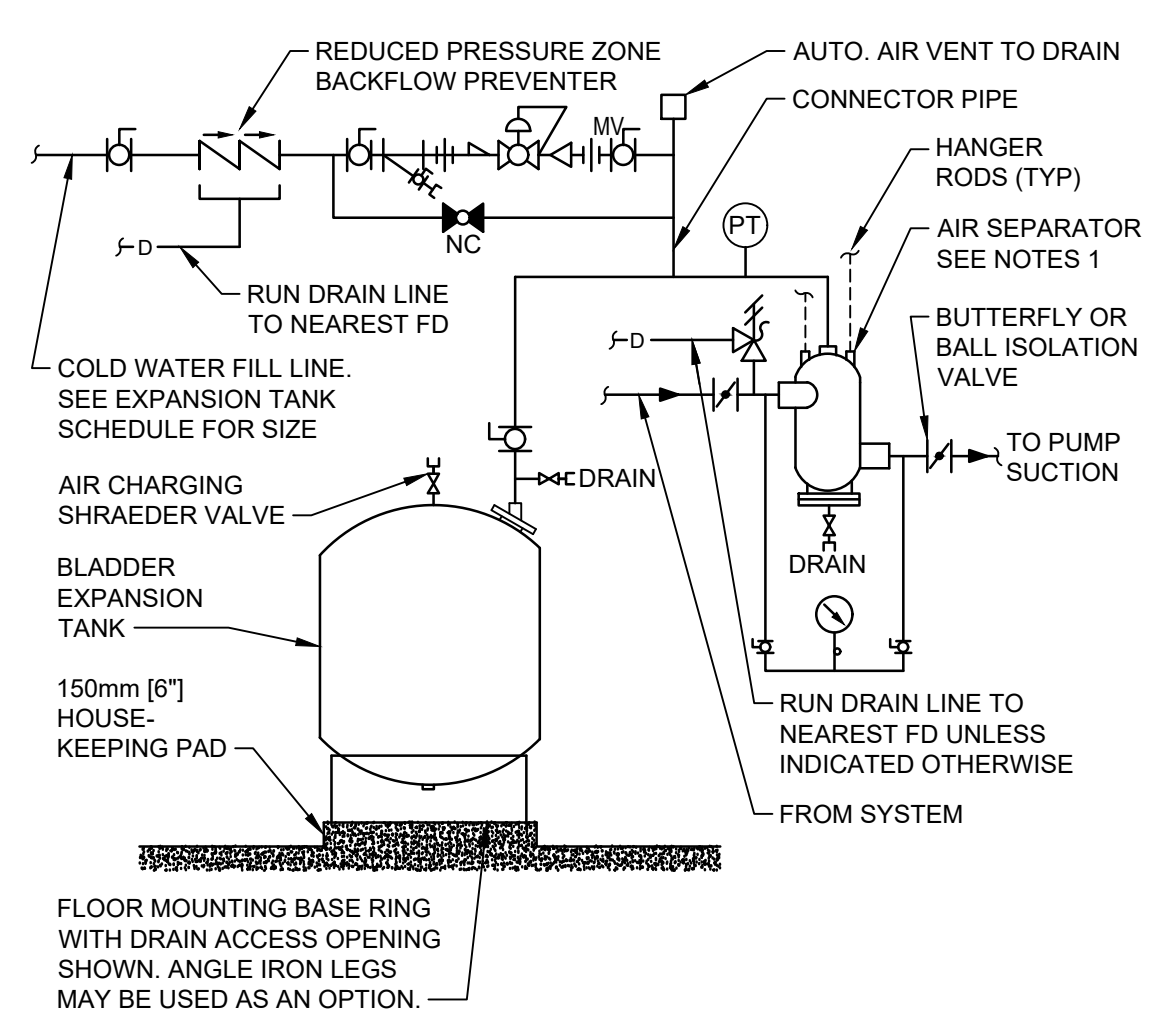
SCALE: N.T.S.



- NOTES:
1. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, SIZE THE VENT PIPE SO THAT STEAM IS NOT BLOWN OUT AT THE VENT PIPE ENTRANCE. UTILIZE THE CALCULATION METHOD CONTAINED IN ANSI B31.1, POWER PIPING CODE, APPENDIX II. THE VENT PIPE SHOULD GO VERTICAL THRU THE ROOF WITH NO TURNS OR ANGLES. WHERE REQUIRED THERE SHALL BE NO MORE THAN A TOTAL OF 180 DEGREES IN DIRECTIONAL CHANGES MADE WITH 45 DEG. ELBOWS.
 2. VENT PIPE SHALL TERMINATE 1820mm (6') MIN. ABOVE FINISHED ROOF.
 3. DISCHARGE OF DRAIN SHALL BE DIRECTED AWAY FROM PLATFORMS OR OTHER AREAS WHERE PERSONNEL MAY OCCUPY.
 4. DO NOT CONNECT ANY OTHER DRAIN TO THE DRIP PAN ELBOW DRAIN PIPE.
 5. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

9 STEAM SAFETY VALVE

SCALE: N.T.S.

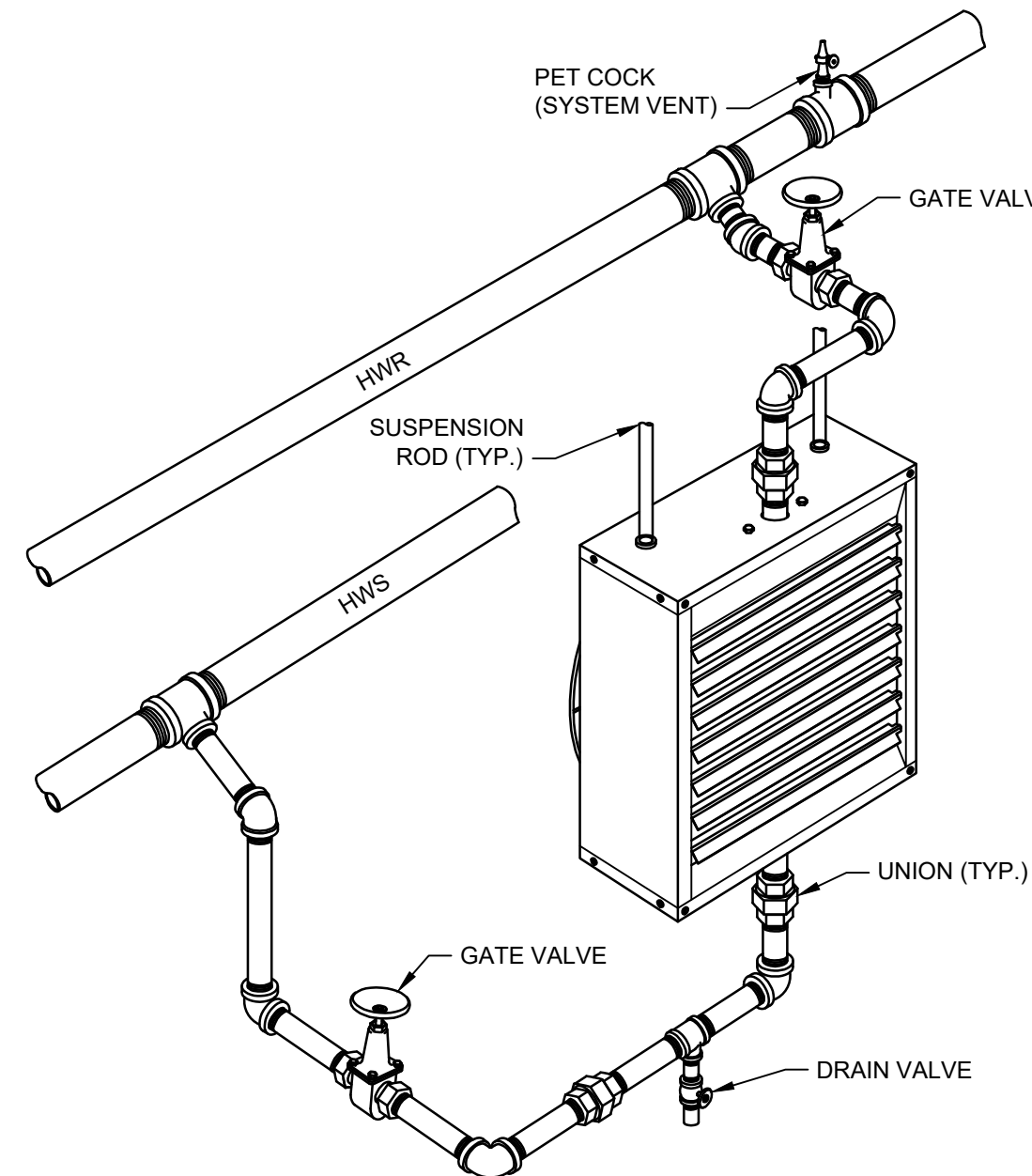


10 FLOOR MOUNTED EXPANSION TANK - PIPING CONNECTIONS

SCALE: N.T.S.

7 WELDED PIPE STAND SADDLE DETAIL

SCALE: N.T.S.



11 SUSPENDED HOT WATER UNIT HEATER DETAIL

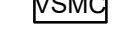
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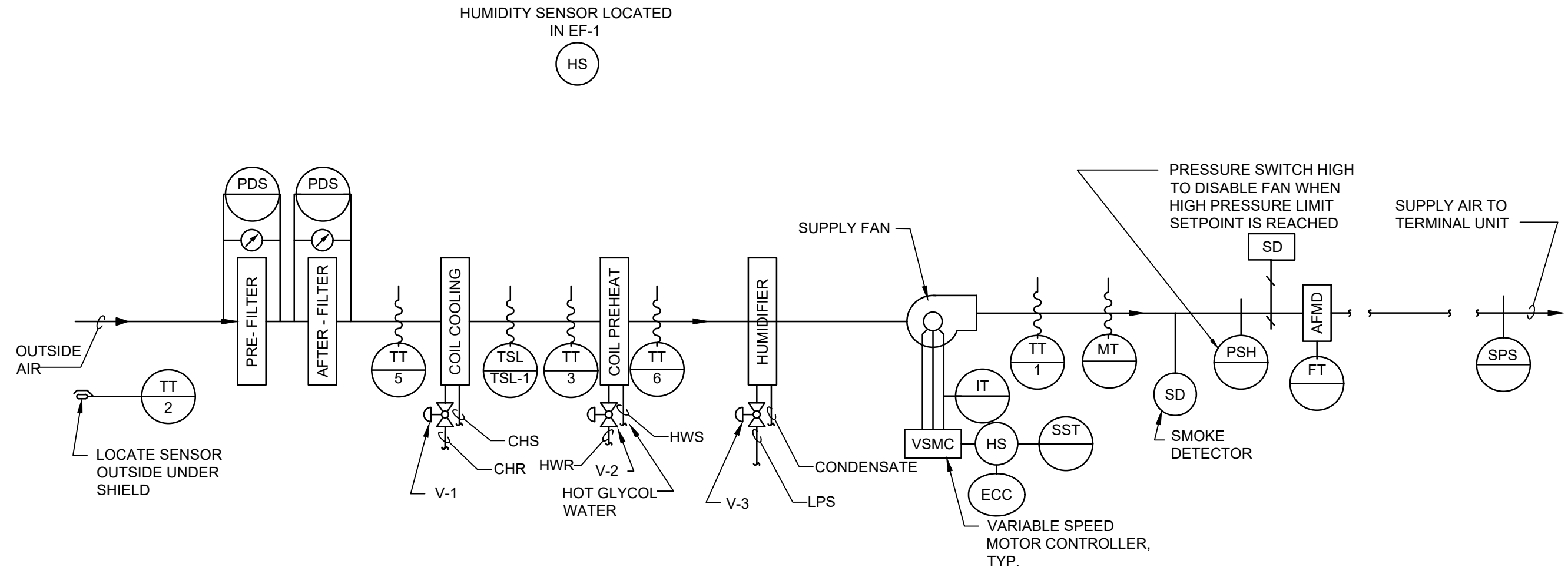
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one eighth inch = one foot
 0 4 8 16
 one quarter inch = one foot
 0 4 8
 three eighths inch = one foot
 0 4
 one half inch = one foot
 0 4
 three quarters inch = one foot
 0 2 4
 one inch = one foot
 0 6
 one and one half inches = one foot
 0 6
 6"

A vertical scale with six horizontal tick marks. The labels A, B, C, D, E, and F are positioned to the right of the scale, aligned with each tick mark from top to bottom.

one eighth inch = one foot
 0 4 8 16
 one quarter inch = one foot
 0 4 8
 three eighths inch = one foot
 0 4
 one half inch = one foot
 0 4
 three quarters inch = one foot
 0 2 4
 one inch = one foot
 0 6
 one and one half inches = one foot
 0 6
 6"

CONTROLS SYMBOLS					
	ROOM THERMOSTAT/TRANSMITTER - WALL MOUNT		HAND SWITCH (HAND-OFF-AUTO SWITCH)	 	OCCUPANCY SENSOR
	ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER - WALL MOUNT		VALVE OR DAMPER POSITION CONTROLLER		LOCAL TEMPERATURE CONTROL PANEL
	TEMPERATURE TRANSMITTER		LOCAL RECORDING TIME CLOCK (RUNTIME)		HVAC CONTROL PANEL
 	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT		TEMPERATURE SWITCH, LOW (FREEZE/STAT)		VARIABLE SPEED MOTOR CONTROLLER
	MOISTURE (HUMIDITY) TRANSMITTER		TEMPERATURE SWITCH, HIGH (TEMP. CUTOUT)		TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION
	PRESSURE TRANSMITTER		LEVEL CONTROLLER		PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION
	STATIC PRESSURE SENSOR		LEVEL TRANSMITTER		SPEED CONTROLLER. SEE SEQUENCE OF OPERATION
	FLOW TRANSMITTER		PRESSURE SWITCH HIGH		SMOKE DETECTOR
	CURRENT TRANSMITTER		PRESSURE SWITCH LOW		FLOW CONTROLLER. SEE SEQUENCE OF OPERATION
	CONDUCTIVITY TRANSMITTER		ELECTRONIC TO PNEUMATIC TRANSDUCER		FLOW SWITCH HIGH
	PRESSURE DIFFERENTIAL TRANSMITTER	 	CARBON DIOXIDE TRANSMITTER		FLOW SWITCH LOW
	PRESSURE DIFFERENTIAL SENSOR	 	CARBON MONOXIDE TRANSMITTER		TIME CLOCK CONTROLLING EQUIPMENT ON A SCHEDULE
	FROST SENSOR		START/STOP		AIR FLOW MEASURING DEVICE
	HIGH HUMIDITY LIMIT SENSOR		RETURN AIR HUMIDITY TRANSMITTER		DIRECT DIGITAL CONTROLLER
	MIXED AIR TEMPERATURE TRANSMITTER		AIR FLOW SWITCH		SMOKE DAMPER
	ENERGY CONTROL CENTER (INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION)		BUILDING AUTOMATION SYSTEM		



1. GENERAL

- 1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF".

2. TEMPERATURE CONTROL

- 2.1 SUPPLY AIR TEMPERATURE, SENSED BY TT-1, SHALL BE MAINTAINED AT SETPOINT OF 68 DEGREES F (ADJ) VIA DIGITAL CONTROL PANEL BY MODULATING V-1 OR V-2 IN SEQUENCE.

3. AIR FLOW CONTROL

- 3.1 THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 3.0" [25mm] OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE), SENSED BY SPS-1. RESET STATIC PRESSURE BASED ON ACTUAL BUILDING LOAD BY POLLING ALL ATU
- 3.2 THE DIGITAL CONTROL PANEL, USING TOTAL SUPPLY AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN VSMC TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR.
- 3.3 USING HIGH PRESSURE SENSOR SPS-2 LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 4" [75mm] OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-2 DOES EXCEED 4" [75mm] THE SUPPLY AIR FAN SHALL STOP. SPS-2 SHALL BE HARDWIRED TO THE SUPPLY FAN VSMC AND UNIT SHALL BE SHUTDOWN IN HAND/AUTO OR BYPASS MODE. SPS-2 WILL REQUIRE MANUAL RESET AT THE DEVICE.

4. HUMIDITY CONTROL

- 4.1 WHEN THE DIGITAL CONTROL PANEL IS NOT CALLING FOR HUMIDITY, SENSED BY EXHAUST AIR HUMIDITY H-1, 2-WAY MODULATING CONTROL VALVE V-3 SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, V-3 SHALL REMAIN OPEN.
- 4.2 RETURN AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 35% RH (ADJ) VIA DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE V-3 TO MAINTAIN THE DESIRED HUMIDITY. THE DCP SHALL OVERRIDE THIS CONTROL TO MAINTAIN HUMIDITY OF 80% AS SENSED BY H-2. DCP SHALL CLOSE VALVE V-3 WHENEVER THE SUPPLY FAN IS OFF. VALVE V-3 SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE.

5. FREEZE PROTECTION

- 5.1 IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45°F [7°C], AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F [4.4°C], AS SENSED BY THE TSL, THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN UFD AND UNIT SHALL BE SHUTDOWN IN HAND/AUTO OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.

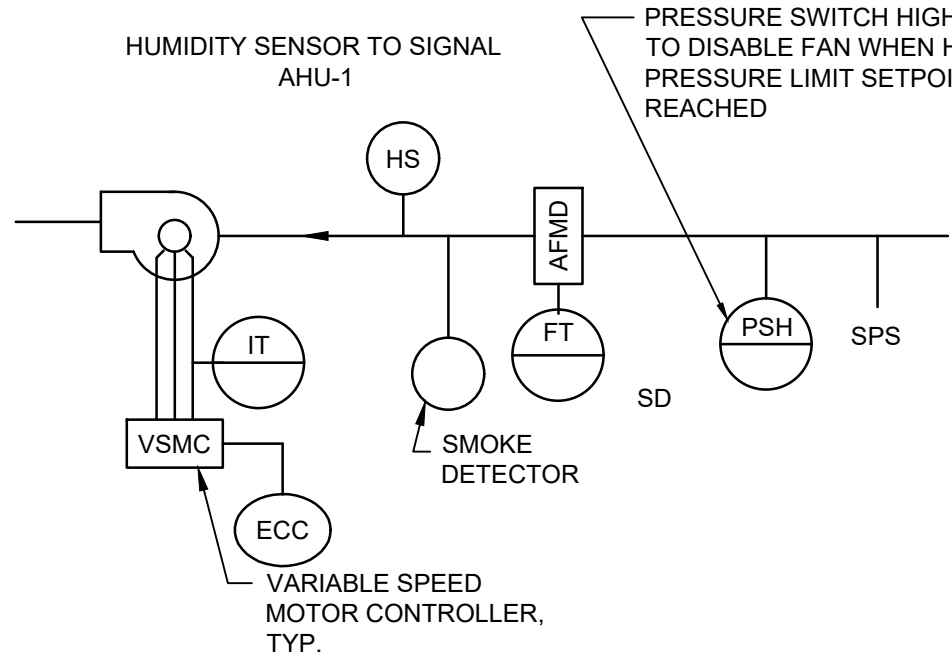
6. AUTOMATIC SHUTDOWN/RESTART

- 6.1 WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, SD, THE SUPPLY AND RETURN FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. ALL SMOKE DAMPERS IN THE SUPPLY AND RETURN DUCTS SHALL CLOSE.
- 6.2 EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART AND SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET.

7. EMERGENCY CONSTANT SPEED OPERATION

- 7.1 UPON FAILURE OF THE VSMC, THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.

		POINT LEGEND	SYSTEM OUTPUTS		SYSTEM INPUTS		SYSTEM SOFTWARE/CONTROL		PAGE:
			BINARY	ANALOG	BINARY	ANALOG	ALARM PROCESSING	APPLICATION/FUNCTION	
SYSTEM:									
AHU-1									



1. GENERAL

- 1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF".

2. AIR FLOW CONTROL

- 2.1 THE EXHAUST AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE EXHAUST FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 3.0" [25mm] OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE), SENSED BY SPS-1.
- 2.2 THE DIGITAL CONTROL PANEL, USING TOTAL EXHAUST AIR FLOW SIGNALS,
- 2.3 USING HIGH PRESSURE SENSOR SPS-2 LOCATED AT THE EXHAUST FAN INTAKE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 4" [75mm] OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-2 DOES EXCEED 4" [75mm] THE SUPPLY AIR FAN SHALL STOP. SPS-2 SHALL BE HARDWIRED TO THE SUPPLY FAN VSMC AND UNIT SHALL BE SHUTDOWN IN HAND/AUTO OR BYPASS MODE. SPS-2 WILL REQUIRE MANUAL RESET AT THE DEVICE.

			POINT LEGEND	SYSTEM OUTPUTS		SYSTEM INPUTS		SYSTEM SOFTWARE/CONTROL				PAGE:																																																																																																																																																																																																																																																																																																																																																											
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			EXHAUST AIR HUMIDITY	EXHAUST AIR FLOW (CFM)	EXHAUST FAN STATUS	STATIC PRESSURE HIGH LIMIT	SUPPLY FAN VSMC ALARM	SUPPLY FAN VSMC	EXHAUST FAN START/STOP	EXHAUST FAN STOP	EXHAUST FAN OVERHEAT	EXHAUST FAN OVERTEMPERATURE	EXHAUST FAN OVERPRESSURE	EXHAUST FAN OVERVIBRATION	EXHAUST FAN OVERSPEED	EXHAUST FAN OVERCURRENT	EXHAUST FAN OVERVOLTAGE	EXHAUST FAN OVERTEMPERATURE	EXHAUST FAN OVERPRESSURE	EXHAUST FAN OVERVIBRATION	EXHAUST FAN OVERSPEED	EXHAUST FAN OVERCURRENT	EXHAUST FAN OVERVOLTAGE	EXHAUST FAN OVERTEMPERATURE	EXHAUST FAN OVERPRESSURE	EXHAUST FAN OVERVIBRATION	EXHAUST FAN OVERSPEED	EXHAUST FAN OVERCURRENT	EXHAUST FAN OVERVOLTAGE	EXHAUST FAN OVERTEMPERATURE	EXHAUST FAN OVERPRESSURE	EXHAUST FAN OVERVIBRATION	EXHAUST FAN OVERSPEED	EXHAUST FAN OVERCURRENT	EXHAUST FAN OVERVOLTAGE	EXHAUST FAN OVERTEMPERATURE	EXHAUST FAN OVERPRESSURE	EXHAUST FAN OVERVIBRATION	EXHAUST FAN OVERSPEED	EXHAUST FAN OVERCURRENT	EXHAUST FAN OVERVOLTAGE	EXHAUST FAN OVERTEMPERATURE	EXHAUST FAN OVERPRESSURE	EXHAUST 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COMPLIANCE REVIEW INCLUDED	2/23/2024
Revisions:	Date

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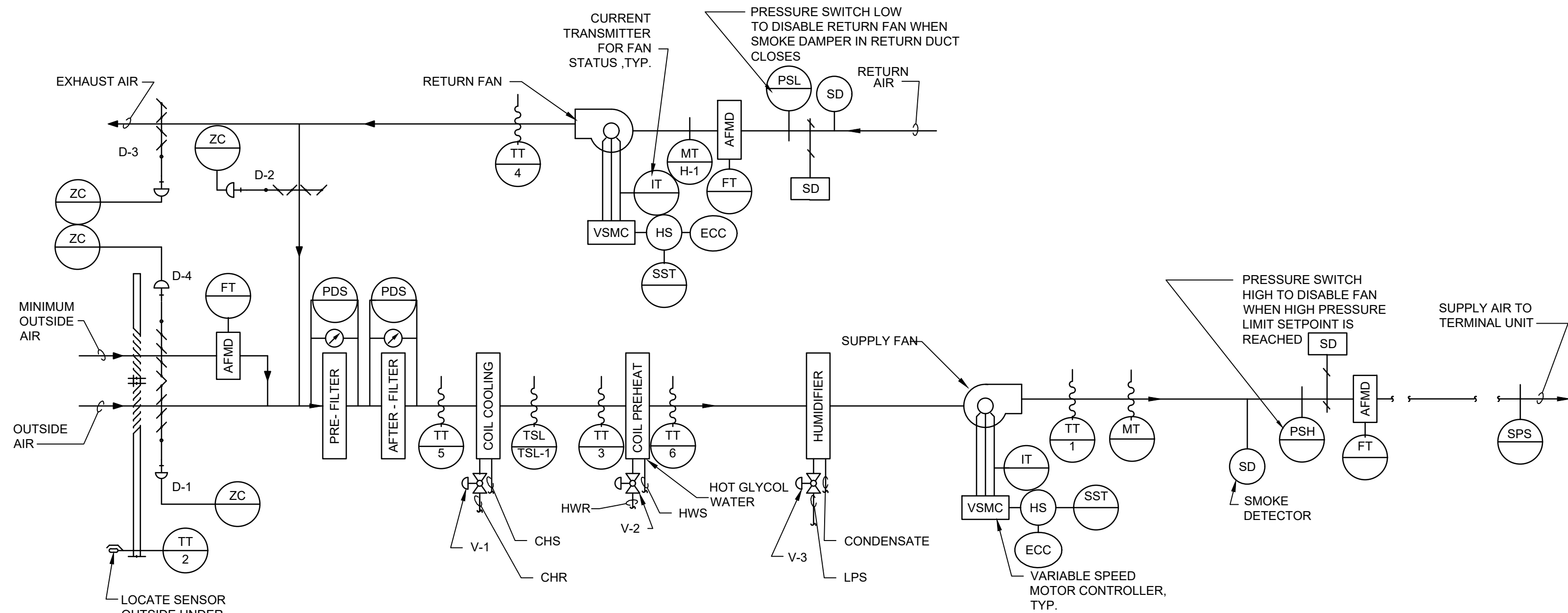
ARCHITECT/ENGINEERS:	
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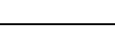
Drawing Title Control Diagrams AHU-1 and EF-1	Approved: Project Director Omaha VA Medical Center
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Project Title Design/Construct Sterile Processing Service- Omaha VA Medical Center	Location 4101 Woolworth Ave #4109 Omaha, NE 68105
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Project Number 16.2330.A08	Building Number 25
Drawing Number M 6.04	Dwg. 96 of 143

Office of Construction and Facilities Management	Department of Veterans Affairs
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CONTROLS SYMBOLS					
	ROOM THERMOSTAT/TRANSMITTER - WALL MOUNT		HAND SWITCH (HAND-OFF-AUTO SWITCH)	 _{OC}	OCCUPANCY SENSOR
	ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER - WALL MOUNT		VALVE OR DAMPER POSITION CONTROLLER		LOCAL TEMPERATURE CONTROL PANEL
	TEMPERATURE TRANSMITTER		LOCAL RECORDING TIME CLOCK (RUNTIME)		HVAC CONTROL PANEL
	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT		TEMPERATURE SWITCH, LOW (FREEZESTAT)		VARIABLE SPEED MOTOR CONTROLLER
	MOISTURE (HUMIDITY) TRANSMITTER		TEMPERATURE SWITCH, HIGH (TEMP. CUTOUT)		TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION
	PRESSURE TRANSMITTER		LEVEL CONTROLLER		PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION
	STATIC PRESSURE SENSOR		LEVEL TRANSMITTER		SPEED CONTROLLER. SEE SEQUENCE OF OPERATION
	FLOW TRANSMITTER		PRESSURE SWITCH HIGH		SMOKE DETECTOR
	CURRENT TRANSMITTER		PRESSURE SWITCH LOW		FLOW CONTROLLER. SEE SEQUENCE OF OPERATION
	CONDUCTIVITY TRANSMITTER		ELECTRONIC TO PNEUMATIC TRANSDUCER		FLOW SWITCH HIGH
	PRESSURE DIFFERENTIAL TRANSMITTER	 _{CO2}	CARBON DIOXIDE TRANSMITTER		FLOW SWITCH LOW
	PRESSURE DIFFERENTIAL SENSOR	 _{CO}	CARBON MONOXIDE TRANSMITTER		TIME CLOCK CONTROLLING EQUIPMENT ON A SCHEDULE
	FROST SENSOR		START/STOP		AIR FLOW MEASURING DEVICE
	HIGH HUMIDITY LIMIT SENSOR		RETURN AIR HUMIDITY TRANSMITTER		DIRECT DIGITAL CONTROLLER
	MIXED AIR TEMPERATURE TRANSMITTER		AIR FLOW SWITCH		SMOKE DAMPER
	ENERGY CONTROL CENTER (INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION)		BUILDING AUTOMATION SYSTEM		

1. GENERAL

- 1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1, D-3, SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-1, SD-1 AND SD-2 SHALL BE FULLY OPEN. D-2 AND D-3 SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

2. TEMPERATURE CONTROL

- 2.1 SUPPLY AIR TEMPERATURE, SENSED BY TT-1, SHALL BE MAINTAINED AT SETPOINT VIA DIGITAL CONTROL PANEL BY MODULATING V-1 OR D-2 AND D-3 OR V-2 IN SEQUENCE.
- 2.2 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS ABOVE 75°F (ADJ) (23.8°C), THE DIGITAL CONTROL PANEL SHALL PREVENT THE MODULATION OF D-2 AND D-3 AND SHALL ASSUME THE MINIMUM OUTSIDE AIR POSITION (D-2 FULLY OPENED AND D-3 FULLY CLOSED). THE DIGITAL CONTROL PANEL SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.
- 2.3 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS BETWEEN 65°F (18.3°C) AND THE SUPPLY AIR TEMPERATURE SENSED BY TT-1, DAMPER D-2 SHALL FULLY CLOSE AND D1 AND D3 SHALL BE FULLY OPEN (MAXIMUM OUTSIDE AIR POSITION). THE DIGITAL CONTROL PANEL SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.
- 2.4 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS BELOW THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1, DAMPERS D1, D-2 AND D-3 SHALL MODULATE TO MAINTAIN THE SCHEDULED SUPPLY AIR TEMPERATURE. IF D-2 IS OPEN AND D-3 IS CLOSED TO MINIMUM OUTSIDE AIR, V-2 SHALL MODULATE OPEN TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.

3. AIR FLOW CONTROL

- 3.1 THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 3.0" (25mm) OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE), SENSED BY SPS-1. RESET STATIC PRESSURE BASED ON ACTUAL BUILDING LOAD BY POLLING ALL ATU.
- 3.2 THE DIGITAL CONTROL PANEL, USING TOTAL SUPPLY AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN VSMC TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR.
- 3.3 USING HIGH PRESSURE SENSOR SPS-2 LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 4" (75mm) OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-2 DOES EXCEED 4" (75mm) THE SUPPLY AIR FAN SHALL STOP. SPS-2 SHALL BE HARDWIRED TO THE SUPPLY FAN VSMC AND UNIT SHALL BE SHUTDOWN IN HAND/AUTO OR BYPASS MODE. SPS-2 WILL REQUIRE MANUAL RESET AT THE DEVICE.

4. HUMIDITY CONTROL

- 4.1 WHEN THE DIGITAL CONTROL PANEL IS NOT CALLING FOR HUMIDITY, SENSED BY RETURN AIR HUMIDITY H-1, 2-WAY "ON-OFF" CONTROL VALVE V-3 SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, V-3 SHALL REMAIN OPEN.
- 4.2 RETURN AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 35% RH (ADJ) VIA DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE V-3 TO MAINTAIN THE DESIRED HUMIDITY. THE DCP SHALL OVERRIDE THIS CONTROL TO MAINTAIN HUMIDITY OF 80% AS SENSED BY H-2. DCP SHALL CLOSE VALVE V-3 WHENEVER THE SUPPLY FAN IS OFF. VALVE V-3 SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE.

5. FREEZE PROTECTION

- 5.1 IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45°F (7°C), AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F (4.4°C), AS SENSED BY THE TSL, THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN FUD AND UNIT SHALL BE SHUTDOWN IN HAND/AUTO OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.

6. AUTOMATIC SHUTDOWN/RESTART

- 6.1 WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, SD, THE SUPPLY AND RETURN FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. ALL SMOKE DAMPERS IN THE SUPPLY AND RETURN DUCTS SHALL CLOSE.
- 6.2 EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART AND SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET.

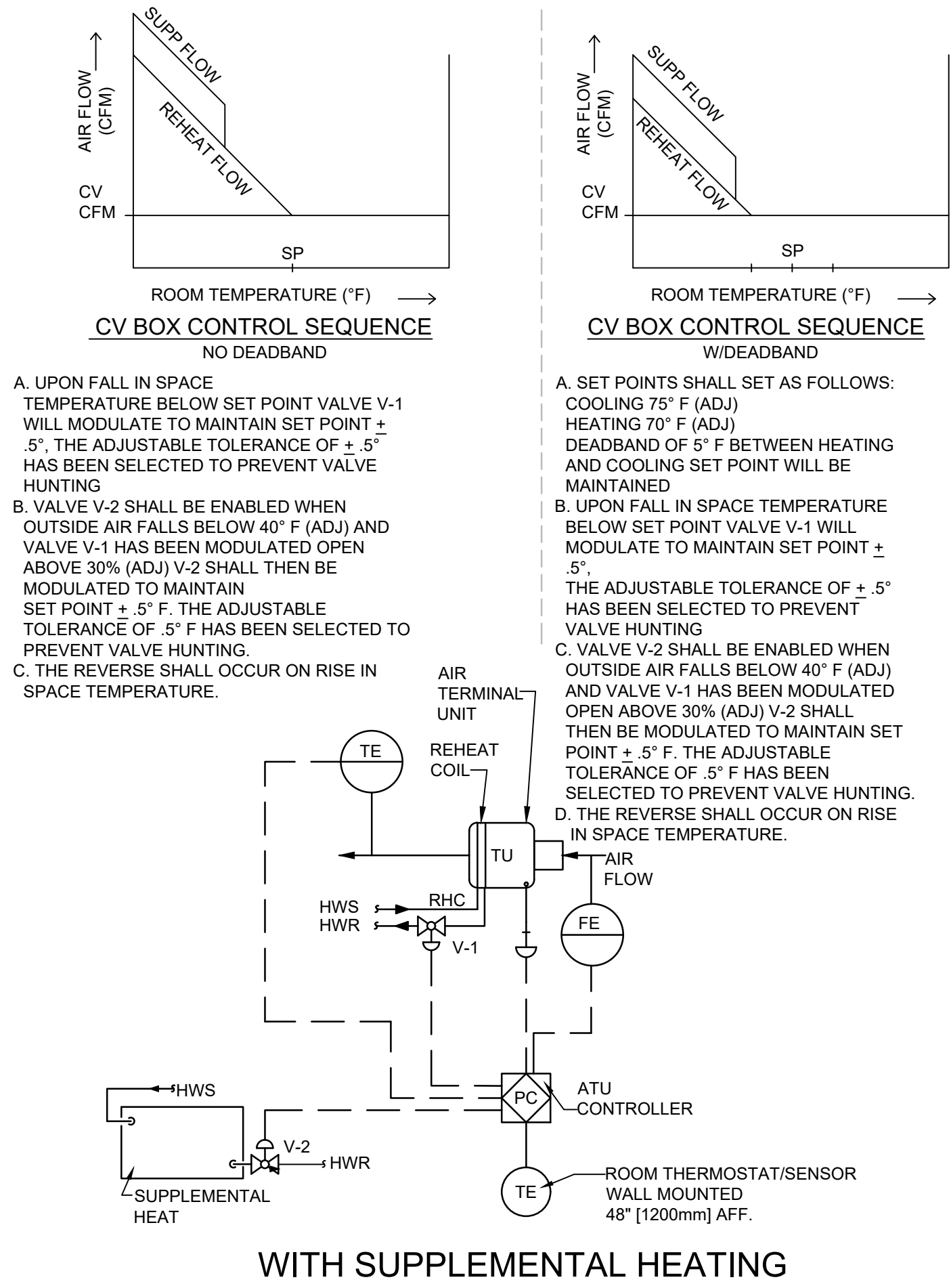
7. EMERGENCY CONSTANT SPEED OPERATION

- 7.1 UPON FAILURE OF THE VSMC, THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.

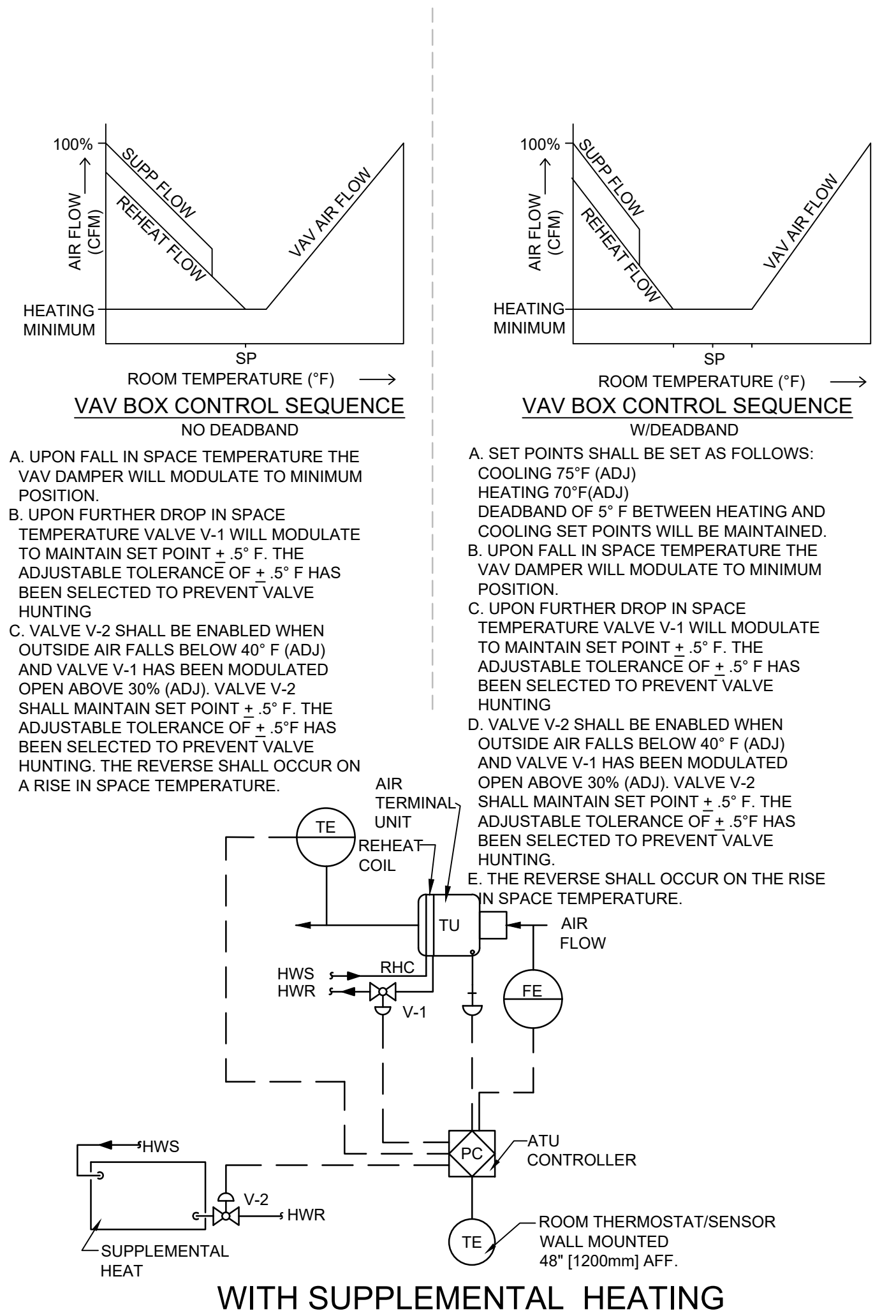
		POINT LEGEND	SYSTEM OUTPUTS	SYSTEM INPUTS		SYSTEM SOFTWARE/CONTROL		PAGE:
			BINARY	ANALOG	BINARY	ANALOG	APPLICATION/FUNCTION	
SYSTEM:								
AHU-2								
SYSTEM COMPONENT:		POINT ID	ASSIGNMENT	TEMPERATURE	PRESSURE	FLOW	STATUS	REMARKS
RETURN AIR TEMPERATURE	AI-1	RAT						
RETURN AIR HUMIDITY	AI-2	RAH						
RETURN AIR FLOW (CFM)	AI-3	RAF						
MIXED AIR TEMPERATURE	AI-4	MAT						
PRE-HEAT TEMPERATURE	AI-5	PHI						
COILING COIL TEMPERATURE	AI-6	CCT						
DISCHARGE AIR TEMPERATURE	AI-7	DAT						
DISCHARGE STATIC PRESSURE	AI-8	DASP						
DISCHARGE AIR HUMIDITY	AI-9	DAH						
SUPPLY AIR FLOW (CFM)	AI-10	SAF						
OUTSIDE AIR TEMPERATURE	AI-11	OAT						
RETURN LOW PRESSURE	BI-1	RLP						
RETURN FAN STATUS	BI-2	RF-SIS						
SUPPLY FAN STATUS	BI-3	SF-SIS						
MIXED AIR LOW LIMIT	BI-4	TSL-1						
STATIC PRESSURE HIGH LIMIT	BI-5	SPS-2						
HUMIDITY HIGH LIMIT	BI-6	HHL						
SUPPLY FAN VSMC ALARM	BI-7	SF-ALA						
RETURN FAN VSMC ALARM	BI-8	RF-ALA						
RETURN FAN VSMC	AO-1	RF-SPD						FULL COMMUNICATION
SUPPLY FAN VSMC	AO-2	SF-SPD						FULL COMMUNICATION
OUTSIDE AIR DAMPER	AO-3	OAD						
RETURN AIR DAMPER	AO-4	RAD						
EXHAUST AIR DAMPER	AO-5	EAD						
MINIMUM OUTSIDE AIR DAMPER	AO-7	MIN-OAD						
PRE-HEAT VALVE V-2	AO-8	PHT-V1						
COILING VALVE V-1	AO-9	CLG-V1						
RETURN FAN START/STOP	BO-1	RF-SST						
SUPPLY FAN START/STOP	BO-2	SF-SST						
STEAM VALVE V-3	BO-3	HUM-ISO-V3						

CONSTRUCTION DOCUMENTS

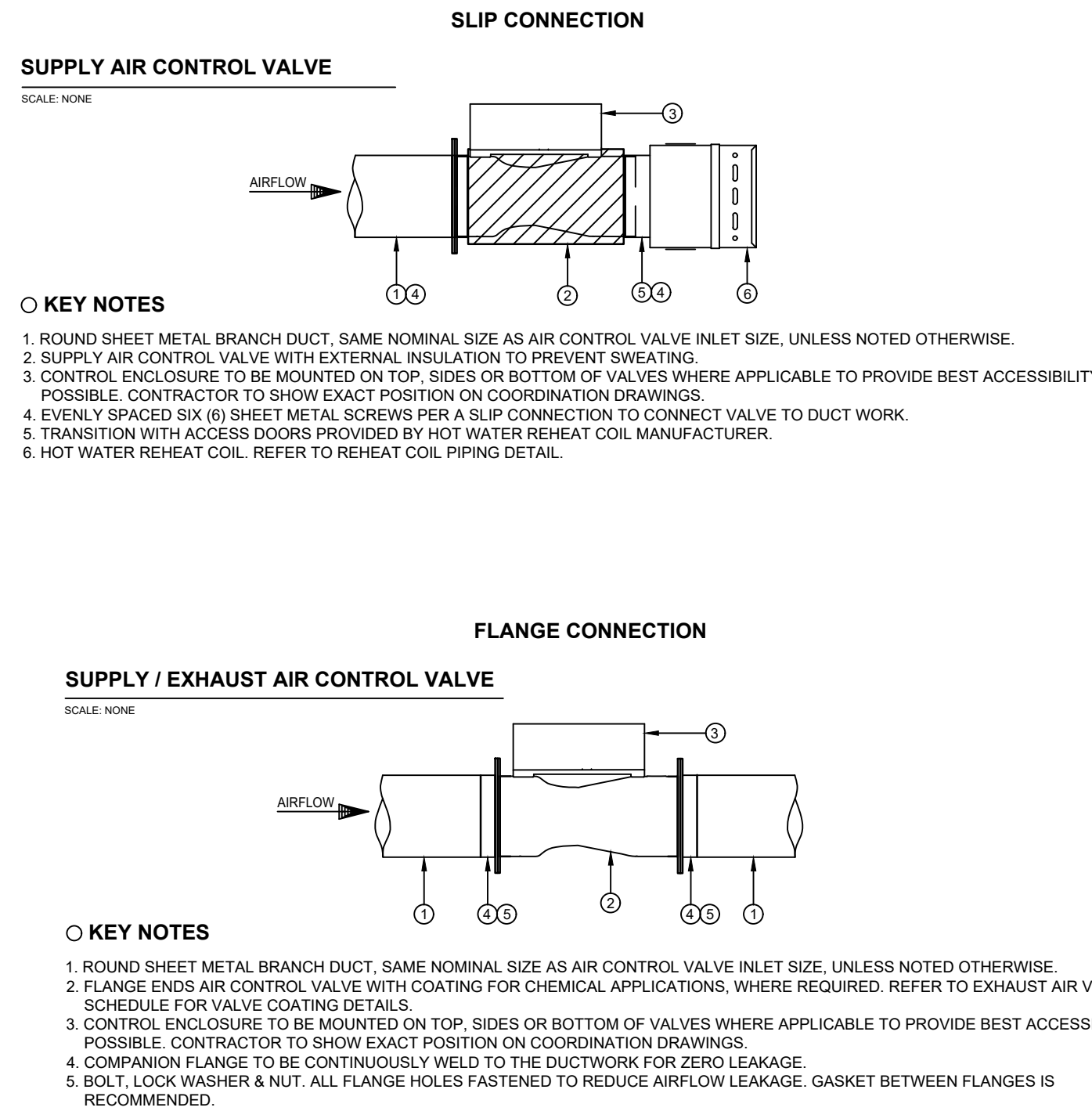
CONSULTANTS:		ARCHITECT/ENGINEERS:		Drawing Title		Project Title		Project Number		Office of Construction and Facilities Management	
 TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736		 ALBERTSON ENGINEERING, INC. 315 NORTH MAIN AVENUE, SUITE 200 SIOUX FALLS, SOUTH DAKOTA 57104 605.274.0880		Control Diagrams AHU-2		Design/Construct Sterile Processing Service- Omaha VA Medical Center		16.2330.A08		Office of Construction and Facilities Management	
 FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900		 FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM		Approved: Project Director Omaha VA Medical Center		Location 4101 Woolworth Ave #4109 Omaha, NE 68105		Building Number 25		Department of Veterans Affairs	
COMPLIANCE REVIEW INCLUDED Revisions: 2/23/2024		16.2330.A08		Date 11/23/2020		Checked MK		Drawn JB		M 6.05 Dwg. 97 of 143	



1 CONSTANT VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM
NTS

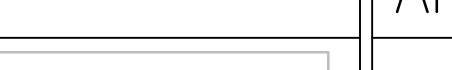


2 VARIABLE VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM
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3 VENTURI VALVE CONTROL DIAGRAM
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CONSTRUCTION DOCUMENTS

		CONSULTANTS:				ARCHITECT/ENGINEERS:		Drawing Title Control Diagrams VAV's and VV's		Project Title Design/Construct Sterile Processing Service- Omaha VA Medical Center		Project Number 16.2330.A08		Office of Construction and Facilities Management			
		 TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736		 Albertson Engineering Inc.		ALBERTSON ENGINEERING, INC. 315 NORTH MAIN AVENUE, SUITE 200 SIOUX FALLS, SOUTH DAKOTA 57104 605.274.0880				 FOURFRONT DESIGN INC.		FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM					
		 FARRIS ENGINEERING OWAH (BRICK) (BENT) (CROSS) (S) (R) (T) (U) (V) (W) (X) (Y) (Z) (AA) (AB) (AC) (AD) (AE) (AF) (AG) (AH) (AI) (AJ) (AK) (AL) (AM) (AN) (AO) (AP) (AQ) (AR) (AS) (AT) (AU) (AV) (AW) (AX) (AY) (AZ) (BA) (BB) (BC) (BD) (BE) (BF) (BG) (BH) (BI) (BJ) (BK) (BL) (BM) (BN) (BO) (BP) (BQ) (BR) (BS) (BT) (BU) (BV) (BW) (BX) (BY) (BZ) (CA) (CB) (CC) (CD) (CE) (CF) (CG) (CH) (CI) (CJ) (CK) (CL) (CM) (CN) (CO) (CP) (CQ) (CR) (CS) (CT) (CU) (CV) (CW) (CX) (CY) (CZ) (DA) (DB) (DC) (DD) (DE) (DF) (DG) (DH) (DI) (DJ) (DK) (DL) (DM) (DN) (DO) (DP) (DQ) (DR) (DS) (DT) (DU) (DV) (DW) (DX) (DY) (DZ) (EA) (EB) (EC) (ED) (EE) (EF) (EG) (EH) (EI) (EJ) (EK) (EL) (EM) (EN) (EO) (EP) (EQ) (ER) (ES) (ET) (EU) (EV) (EW) (EX) (EY) (EZ) (FA) (FB) (FC) (FD) (FE) (FF) (FG) (FH) (FI) (FJ) (FK) (FL) (FM) (FN) (FO) (FP) (FQ) (FR) (FS) (FT) (FU) (FV) (FW) (FX) (FY) (FZ) (GA) (GB) (GC) (GD) (GE) (GF) (GG) (GH) (GI) (GJ) (GK) (GL) (GM) (GN) (GO) (GP) (GQ) (GR) (GS) (GT) (GU) (GV) (GW) (GX) (GY) (GZ) (HA) (HB) (HC) (HD) (HE) (HF) (HG) (HH) (HI) (HJ) (HK) (HL) (HM) (HN) (HO) (HP) (HQ) (HR) (HS) (HT) (HU) (HV) (HW) (HX) (HY) (HZ) (IA) (IB) (IC) (ID) (IE) (IF) (IG) (IH) (II) (IJ) (IK) (IL) (IM) (IN) (IO) (IP) (IQ) (IR) (IS) (IT) (IU) (IV) (IW) (IX) (IY) (IZ) (JA) (JB) (JC) (JD) (JE) (JF) (JG) (JH) (JI) (JJ) (JK) (JL) (JM) (JN) (JO) (JP) (JQ) (JR) (JS) (JT) (JU) (JV) (JW) (JX) (JY) (JZ) (KA) (KB) (KC) (KD) (KE) (KF) (KG) (KH) (KI) (KJ) (KK) (KL) (KM) (KN) (KO) (KP) (KQ) (KR) (KS) (KT) (KU) (KV) (KW) (KX) (KY) (KZ) (LA) (LB) (LC) (LD) (LE) (LF) (LG) (LH) (LI) (LJ) (LK) (LL) (LM) (LN) (LO) (LP) (LQ) (LR) (LS) (LT) (LU) (LV) (LW) (LX) (LY) (LZ) (MA) (MB) (MC) (MD) (ME) (MF) (MG) (MH) (MI) (MJ) (MK) (ML) (MM) (MN) (MO) (MP) (MQ) (MR) (MS) (MT) (MU) (MV) (MW) (MX) (MY) (MZ) (NA) (NB) (NC) (ND) (NE) (NF) (NG) (NH) (NI) (NJ) (NK) (NL) (NM) (NN) (NO) (NP) (NQ) (NR) (NS) (NT) (NU) (NV) (NW) (NX) (NY) (NZ) (OA) (OB) (OC) (OD) (OE) (OF) (OG) (OH) (OI) (OJ) (OK) (OL) (OM) (ON) (OO) (OP) (OQ) (OR) (OS) (OT) (OU) (OV) (OW) (OX) (OY) (OZ) (PA) (PB) (PC) (PD) (PE) (PF) (PG) (PH) (PI) (PJ) (PK) (PL) (PM) (PN) (PO) (PP) (PQ) (PR) (PS) (PT) (PU) (PV) (PW) (PX) (PY) (PZ) (QA) (QB) (QC) (QD) (QE) (QF) (QG) (QH) (QI) (QJ) (QK) (QL) (QM) (QN) (QO) (QP) (QQ) (QR) (QS) (QT) (QU) (QV) (QW) (QX) (QY) (QZ) (RA) (RB) (RC) (RD) (RE) (RF) (RG) (RH) (RI) (RJ) (RK) (RL) (RM) (RN) (RO) (RP) (RQ) (RR) (RS) (RT) (RU) (RV) (RW) (RX) (RY) (RZ) (SA) (SB) (SC) (SD) (SE) (SF) (SG) (SH) (SI) (SJ) (SK) (SL) (SM) (SN) (SO) (SP) (SQ) (SR) (SS) (ST) (SU) (SV) (SW) (SX) (SY) (SZ) (TA) (TB) (TC) (TD) (TE) (TF) (TG) (TH) (TI) (TJ) (TK) (TL) (TM) (TN) (TO) (TP) (TQ) (TR) (TS) (TT) (TU) (TV) (TW) (TX) (TY) (TZ) (UA) (UB) (UC) (UD) (UE) (UF) (UG) (UH) (UI) (UJ) (UK) (UL) (UM) (UN) (UO) (UP) (UQ) (UR) (US) (UT) (UU) (UV) (UW) (UX) (UY) (UZ) (VA) (VB) (VC) (VD) (VE) (VF) (VG) (VH) (VI) (VJ) (VK) (VL) (VM) (VN) (VO) (VP) (VQ) (VR) (VS) (VT) (VU) (VV) (VW) (VX) (VY) (VZ) (WA) (WB) (WC) (WD) (WE) (WF) (WG) (WH) (WI) (WJ) (WK) (WL) (WM) (WN) (WO) (WP) (WQ) (WR) (WS) (WT) (WU) (WV) (WW) (WX) (WY) (WZ) (XA) (XB) (XC) (XD) (XE) (XF) (XG) (XH) (XI) (XJ) (XK) (XL) (XM) (XN) (XO) (XP) (XQ) (XR) (XS) (XT) (XU) (XV) (XW) (XX) (XY) (XZ) (YA) (YB) (YC) (YD) (YE) (YF) (YG) (YH) (YI) (YJ) (YK) (YL) (YM) (YN) (YO) (YP) (YQ) (YR) (YS) (YT) (YU) (YV) (YW) (YX) (YY) (YZ) (ZA) (ZB) (ZC) (ZD) (ZE) (ZF) (ZG) (ZH) (ZI) (ZJ) (ZK) (ZL) (ZM) (ZN) (ZO) (ZP) (ZQ) (ZR) (ZS) (ZT) (ZU) (ZV) (ZW) (ZX) (ZY) (ZZ)		FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900				16.2330.A08		Approved: Project Director Omaha VA Medical Center		Location 4101 Woolworth Ave #4109 Omaha, NE 68105		Building Number 25		Office of Construction and Facilities Management	
COMPLIANCY REVIEW INCLUDED		2/23/2024								Date 11 / 23 / 2020		Checked MK		Drawn JB			
Revisions:		Date								M 6.06		Dwg. 98 of 143		Department of Veterans Affairs			

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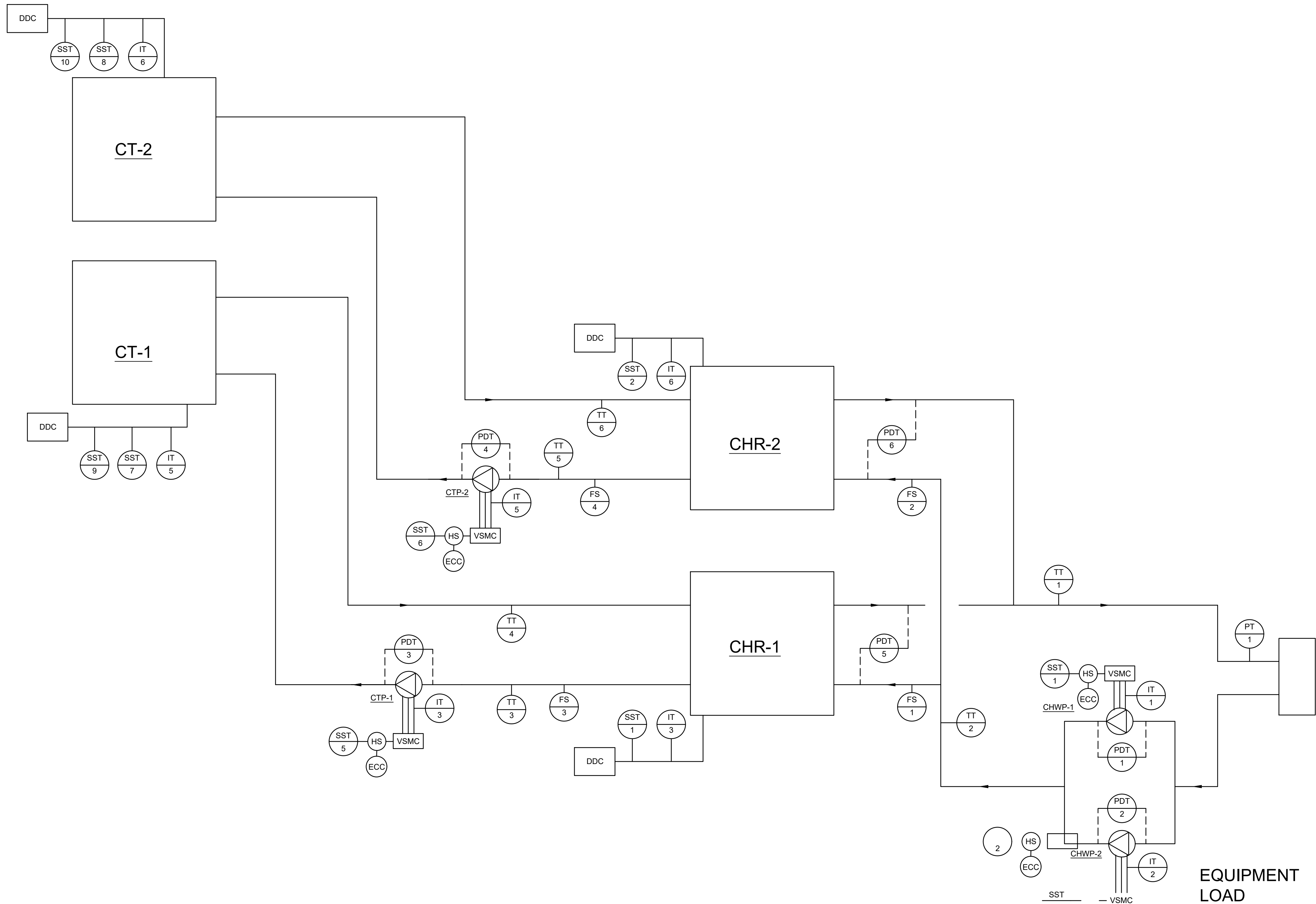
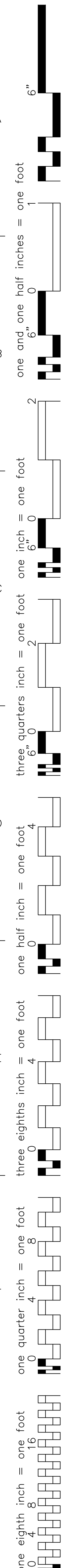
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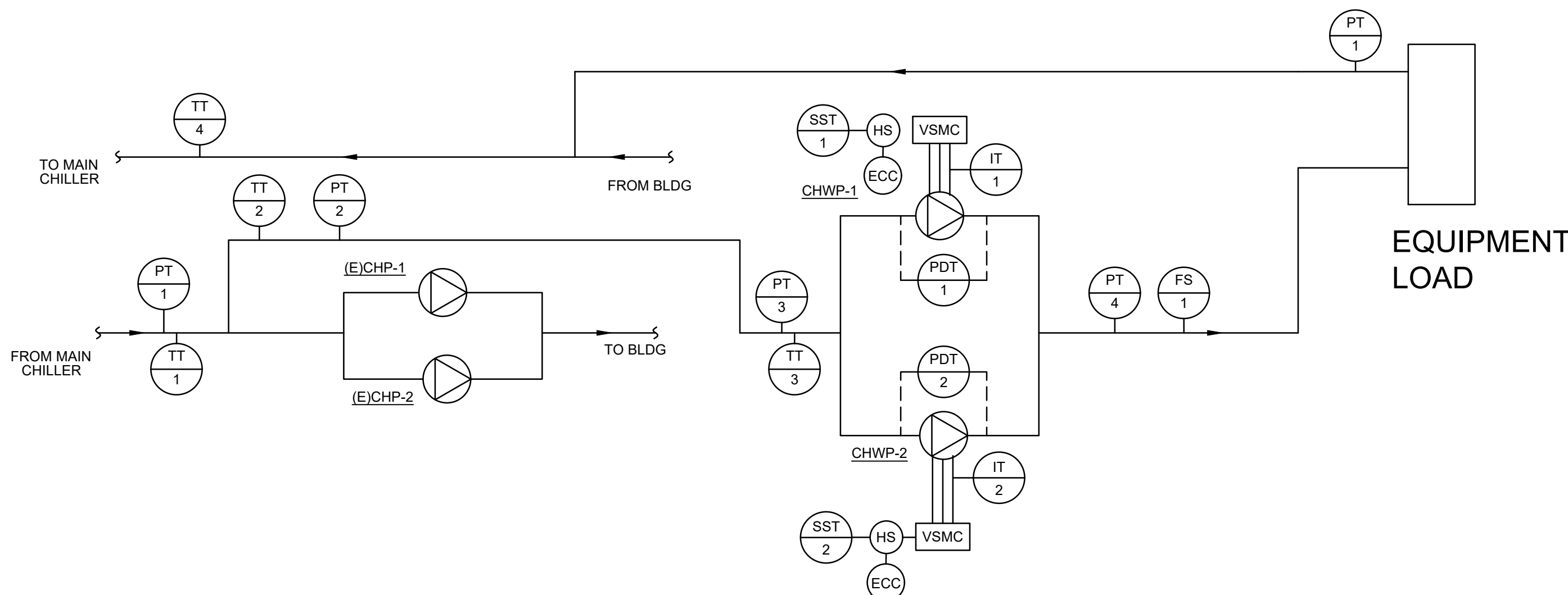
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SYSTEM:	POINT LEGEND	SYSTEM OUTPUTS		SYSTEM INPUTS		SYSTEM SOFTWARE/CONTROL		PAGE:
		BINARY	ANALOG	BINARY	ANALOG	ALARM PROCESSING	APPLICATION/FUNCTION	
CHR-1, CHR-2								
SYSTEM COMPONENT:	POINT ID	ABBREVIATION	PROBABLE ALARM/STATUS	PROBABLE ALARM/STATUS	PROBABLE ALARM/STATUS	PROBABLE ALARM/STATUS	PROBABLE ALARM/STATUS	REMARKS
CHWP-1 VSMC ALARM	BI-1	CHWP-1-ALM						
CHWP-2 VSMC ALARM	BI-2	CHWP-2-ALM						
CHWP-1 VSMC STATUS	BI-3	IT-1						
CHWP-2 VSMC STATUS	BI-4	IT-2						
CHR-1 ALARM	BI-15	CHR-1-ALM						
CHR-1 STATUS	BI-16	IT-3						
CHR-2 ALARM	BI-5	CHR-1-ALM						
CHR-2 STATUS	BI-6	IT-4						
CHWP-1 SPEED	AI-1	CHWP-1-SPD						
CHWP-2 SPEED	AI-2	CHWP-2-SPD						
CHR-1 FLOW	AI-3	FS-1						
CHR-2 FLOW	AI-4	FS-2						
CHILLER SUPPLY PRESSURE	AI-5	PT-1						
CHILLER SUPPLY TEMPERATURE	AI-6	TT-1						
CHILLER RETURN TEMPERATURE	AI-7	TT-2						
CHWP-1 START/STOP	BO-1	SST-1						
CHWP-2 START/STOP	BO-2	SST-2						
CHR-1 ENABLE	BO-5	SST-3						
CHR-2 ENABLE	BO-6	SST-4						
CHWP-1 SPEED CONTROL	AI-8	CHWP-1-S-CM						
CHWP-2 SPEED CONTROL	AI-9	CHWP-2-S-CM						
CTP-1 VSMC ALARM	BI-7	CTP-1-ALM						
CTP-2 VSMC ALARM	BI-8	CTP-2-ALM						
CTP-1 VSMC STATUS	BI-9	CTP-1-STS						
CTP-2 VSMC STATUS	BI-10	CTP-2-STS						
CT-1 ALARM	BI-11	CT-1-ALM						
CT-1 STATUS	BI-12	IT-5						
CT-2 ALARM	BI-13	CT-2-ALM						
CT-2 STATUS	BI-14	IT-6						
CTP-1 SPEED	AI-10	CT-1-SPD						
CTP-2 SPEED	AI-12	CT-2-SPD						
CT-1 FLOW	AI-13	FS-3						
CT-2 FLOW	AI-14	FS-4						
CT-1 SUPPLY TEMPERATURE	AI-15	TT-3						
CT-1 RETURN TEMPERATURE	AI-16	TT-4						
CT-2 SUPPLY TEMPERATURE	AI-17	TT-5						
CT-2 RETURN TEMPERATURE	AI-18	TT-6						
CTP-1 START/STOP	BO-7	SST-5						
CTP-2 START/STOP	BO-8	SST-6						
CT-1 ENABLE	BO-9	SST-7						
CT-2 ENABLE	BO-10	SST-8						
CTP-1 SPEED CONTROL	AI-19	CT-1-S-CM						
CTP-2 SPEED CONTROL	AI-20	CT-2-S-CM						
CTP-1 SPRAY PUMP	BO-7	SST-9						
CTP-2 SPRAY PUMP	BO-8	SST-10						

ALL POINTS TO INTEGRATE BACK TO EXISTING BAS

BASE BID



SYSTEM:	POINT LEGEND	SYSTEM OUTPUTS		SYSTEM INPUTS		SYSTEM SOFTWARE/CONTROL		PAGE:
		BINARY	ANALOG	BINARY	ANALOG	ALARM PROCESSING	APPLICATION/FUNCTION	
CHR-1, CHR-2								
SYSTEM COMPONENT:	POINT ID	ABBREVIATION	PROBABLE ALARM/STATUS	PROBABLE ALARM/STATUS	PROBABLE ALARM/STATUS	PROBABLE ALARM/STATUS	PROBABLE ALARM/STATUS	REMARKS
CHWP-3 VSMC ALARM	BI-1	CHWP-3-ALM						
CHWP-4 VSMC ALARM	BI-2	CHWP-4-ALM						
CHWP-3 VSMC STATUS	BI-3	IT-1						
CHWP-4 VSMC STATUS	BI-4	IT-2						
CHWP-1 SPEED	AI-1	CHWP-1-SPD						
CHWP-2 SPEED	AI-2	CHWP-2-SPD						
WATER FLOW	AI-3	FS-1						
SUPPLY PRESSURE	AI-5	PT-1						
MAIN CHILLER SUPPLY TEMPERATURE	AI-6	TT-1						
NEW CHILLER SUPPLY TEMPERATURE 1	AI-6	TT-2						
NEW CHILLER SUPPLY TEMPERATURE 2	AI-6	TT-3						
CHILLER RETURN TEMPERATURE	AI-6	TT-4						
CHWP-1 START/STOP	BO-1	SST-1						
CHWP-2 START/STOP	BO-2	SST-1						
CHWP-1 SPEED CONTROL	AI-8	CHWP-1-S-CM						
CHWP-2 SPEED CONTROL	AI-9	CHWP-2-S-CM						

BID ALTERNATE #3

CONSTRUCTION DOCUMENTS

COMPLIANCE REVIEW INCLUDED Revisions: 2/23/2024 Date		CONSULTANTS: TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736 Albertson Engineering Inc. FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900		 ARCHITECT/ENGINEERS: FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM		Drawing Title Control Diagrams Chilled Water Systems Approved: Project Director Omaha VA Medical Center		Project Title Design/Construct Sterile Processing Service- Omaha VA Medical Center Location 4101 Woolworth Ave #4109 Omaha, NE 68105 Date 11 / 23 / 2020 Checked MK Drawn JB		Project Number 16.2330.A08 Building Number 25 Drawing Number M 6.07 Dwg. 99 of 143		Office of Construction and Facilities Management Department of Veterans Affairs	
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COOLING OPERATIONAL SEQUENCE (SUMMARY)

BASE BID:

WATER-COOLED CHILLERS: CHILLERS (CHR-1, CHR-2) ARE TO BE OPERATED INDEPENDANTLY AND SEPARATE OF EACH OTHER. DURING OPERATION OF CHR-1, CHR-2 IS DISABLED, AND VICE VERSA. THE WATER COOLED CHILLERS WILL BE AUTOMATICALLY STAGED BY BAS. TARGET DISCHARGE CHILLED WATER TEMPERATURE SETPOINT IS 45 DEGREES F.

THE COOLING TOWERS (TAGGED CT-1 AND CT-2) ARE ALSO TO BE ENABLED BY BAS (COOLING TOWER ENABLE RELAY FROM CHILLER(S)) AUTOMATICALLY, BUT CHR-1 IS PIPED TO CT-1 VIA PUMP CTP-1 AND WILL ONLY WORK WITH THAT EQUIPMENT. AND CHR-2 IS ONLY PIPED TO CT-2 VIA PUMP CTP-2. ANY CHANGEOVER FROM CHR-1 AND CHR-2 MUST INCLUDE CHANGEOVERS WITH THE APPROPRIATE EQUIPMENT. THE CHILLED WATER SYSTEMS ARE 100% REDUNDANT.

LOW AMBIENT TEMPERATURE/LOWER BUILDING LOAD CONDITIONS-CHILLER 5-CC1 TO REMAIN OPERATIONAL UNTIL OUTSIDE AIR TEMPERATURE (OAT) DROPS TO 55 DEGREES F (DRY BULB). WHEN OAT DROPS BELOW 55 DEGREES F, THE STAGED COOLING TOWER SHALL DISABLE SPRAY PUMP AND ALLOW COOLING TOWER FANS TO OPERATE UP TO 90% OF MAXIMUM SPEED FOR COOLING TOWER ECONOMIZER MODE. WHEN OAT MATCHES 39 DEGREES F (ADJUSTABLE) THE BASIN WATER FILL VALVE WILL NOT BE ABLE TO FILL THE BASIN UNTIL OPERATION STAFF ENABLES BASIN FILL VALVE VIA BAS INTERFACE AND THE BASIN ELECTRIC HEATERS SHALL MAINTAIN BASIN WATER TEMPERATURE OF 40 DEGREES F. MINIMUM COOLING TOWER WATER TEMPERATURE ENTERING CHILLERS TO BE 58 DEGREES (55 DEGREES PER MFR REQUIREMENTS).

COOLING SEQUENCE OF OPERATION:

1. THE CHILLED WATER 'SYSTEM' WILL BE INITIATED AS FOLLOWS:
- a. ENABLE PUMP TAGGED CHWP-1 (LEAD). ALLOW VFD TO RAMP SPEED TO FLOW SETPOINT THROUGH 20 SECONDS.
 - i. THE CHILLED WATER LOOP TO BE PROVEN IN MOTION VIA SYSTEM FLOW SWITCH. IF FLOW IS NOT PROVEN WITHIN 60 SECONDS (MANUAL RESET VIA BAS):
 - 1. ALARM BAS AND OPERATION STAFF OF LEAD PUMP FAILURE.
 - 2. SYSTEM TO CHANGE CHILLERS, TOWERS AND PUMPS. RESTART SEQUENCE FOR NEW CHILLER.
 - b. ALLOW PUMP TAGGED CHWP-2 TO REMAIN IDLE (LAG). ALTERNATE LEAD/LAG PUMPS AFTER 240 HOURS OF INDIVIDUAL PUMP OPERATION.
 - c. PUMP ENABLE SHALL BE FROM ANY OF THE FOLLOWING INSTANCES/ACTIONS:
 - i. AIR HANDLING UNIT DEMAND THAT IS NOT IN ECONOMIZER MODE AND REQUIRING COOLING.
 - ii. AIR HANDLING UNIT DEMAND THAT IS IN ECONOMIZER MODE, BUT NOT ABLE TO SATISFY DEMAND.
 - iii. BAS GRAPHIC ENABLE BUTTON OR OVERRIDE FOR OPERATION STAFF USE.
 - iv. OUTDOOR AIR TEMPERATURE THAT IS GREATER THAN 35 DEGREES F DB (ADJUSTABLE).
 - d. PUMPS CHWP-1 AND CHWP-2 SHALL BE SPEED CONTROLLED VIA VFD DEMAND FROM BAS TO MINIMALLY PROVE SYSTEM FLOW SWITCH PLUS 5% HZ ON VFD, AND SPEED/SLOW PUMP TO REDUCE LOOP DELTA T TO MATCH SETPOINT.
2. CHILLER SEQUENCE:
- a. FLOW SWITCH TO PROVE FLOW TO ASSOCIATED WATER-COOLED CHILLER PATHWAY.
 - i. IN THE EVENT THAT FLOW IS NOT PROVEN WITHIN 120 SECONDS, ALARM OPERATIONS STAFF VIA BAS (MANUAL RESET VIA BAS).
 - b. ENABLE WATER-COOLED CHILLER CHR-1 AUTOMATICALLY FROM BAS. OPEN NORMALLY CLOSED CONTROL VALVES.
 - c. ENABLE ASSOCIATED CTP PUMP. PUMP TO ALLOW VFD TO RAMP SPEED TO FLOW SETPOINT THROUGH 20 SECONDS.
 - i. THE CONDENSER WATER LOOP TO BE PROVEN IN MOTION VIA SYSTEM FLOW SWITCH. IF FLOW IS NOT PROVEN WITHIN 60 SECONDS (MANUAL RESET VIA BAS):
 - 1. ALARM BAS AND OPERATION STAFF OF PUMP FAILURE.
 - 2. SYSTEM TO CHANGE CHILLERS, TOWERS AND PUMPS. RESTART SEQUENCE FOR NEW CHILLER.
 - d. BAS TO ENABLE VFD FOR ASSOCIATED COOLING TOWER FAN.
 - e. ALLOW ENABLED COOLING TOWER FAN TO START AT 30% SPEED MINIMUM FOR 2 MINUTES. BAS TO OBSERVE LEAVING TEMPERATURE SENSOR. ALLOW COOLING TOWER FAN TO MODULATE UP TO 80% SPEED (LINEAR FUNCTION) WITHOUT SPRAY PUMP ACTIVATED.
 - TEMPERATURE IS WITHIN SATISFACTORY RANGE (5-10 DEGREES), AND GREATER THAN 58 DEGREES, ALLOW SPRAY PUMP TO NOT OPERATE.
 - i. IF CONDENSER WATER APPROACH TEMPERATURE IS OUT OF RANGE, BAS TO ENABLE SPRAY PUMP FOR ASSOCIATED COOLING TOWER, WHILE MODULATING (LINEAR FUNCTION) FAN OPERATION TO CREATE APPROACH RANGE LISTED ABOVE.
 - ii. IF APPROACH RANGE IS NOT SATISFIED AFTER 10 MINUTES OF OPERATION, ALLOW TOWER FAN TO MODULATE TO 100%, AND ALARM OPERATION PERSONNEL VIA BAS.

ALL TEMPERATURE SETPOINTS AND REFERENCES (EXCEPT FOR APPROACH) FOR PROGRAMMING PURPOSES ARE ADJUSTABLE AND AVAILABLE IN THE GRAPHICS OF THE BAS FOR OPERATIONS STAFF TO OBSERVE AND ADJUST.

ALL POINTS ASSOCIATED WITH THE SEQUENCE REFERENCES, AS WELL AS SHOWN ON THIS PLAN (CONTROL COMPONENTS WITH TAGS), AS WELL AS OTHER COMPONENTS REQUIRED BY SPECIFICATION, ARE TO BE VIEWABLE FOR OPERATION STAFF VIA THE BAS.

TRENDING TO BE SETUP BY THE CONTROL CONTRACTOR TO ALLOW UP TO 12 CONSECUTIVE MONTHS OF HISTORY FOR ALL POINTS REFERENCED IN THE SEQUENCE (BOTH DIGITAL AND ANALOG) FOR HISTORICAL, TROUBLESHOOTING, AND COMMISSIONING PURPOSES.

CONSTRUCTION DOCUMENTS

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one eighth inch = one foot

one quarter inch = one foot

three eighths inch = one foot

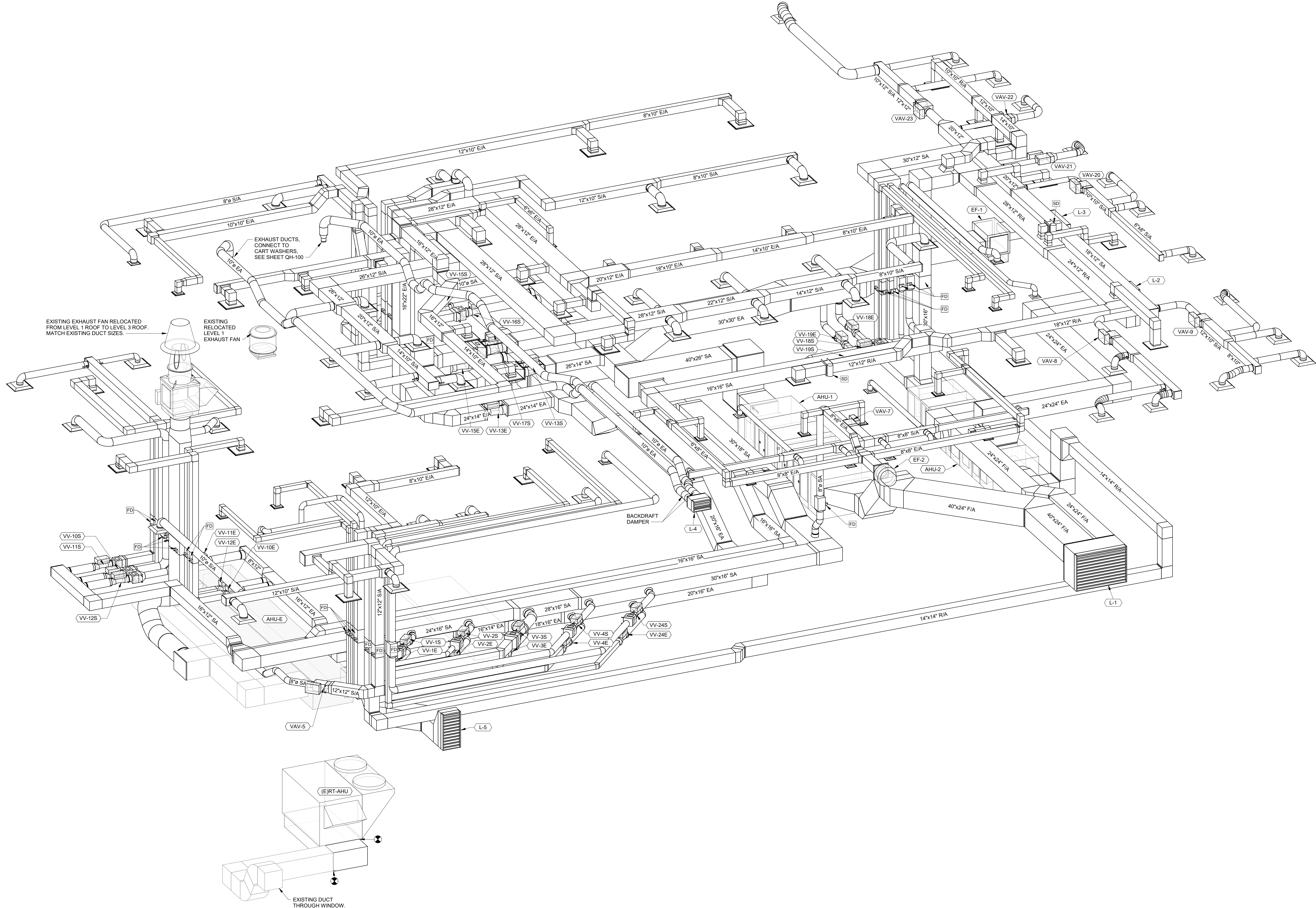
one half inch = one foot

three quarters inch = one foot

one foot one inch = one foot

one and one half inches = one foot

one and three inches = one foot

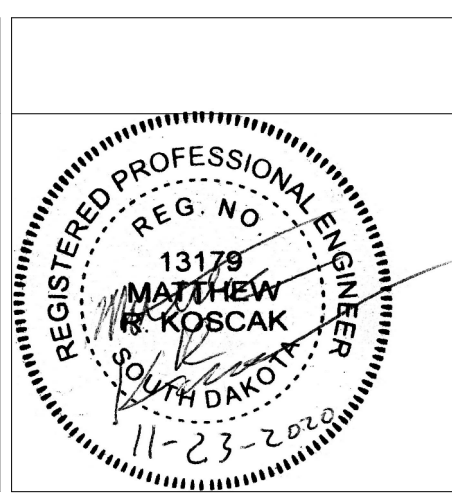


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CONSTRUCTION DOCUMENTS

COMPLIANCE REVIEW INCLUDED	2/23/2024
Revisions:	Date

CONSULTANTS:	
 TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736	 Albertson Engineering Inc.  FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900



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 FOURFRONT DESIGN INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM	16.2330.A08

Drawing Title
DUCTWORK ISOMETRIC VIEWS
Approved: Project Director
Omaha VA Medical Center

Project Title		Project Number
VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service		16.2330.A08
Location		Building Number
4101 Woolworth Ave #4199 Omaha, Ne 68105		25
Date	Checked	Drawn
11 / 23 / 2020	RD	JB
Dwg. 101 of 143		M 7.01

Office of Construction and Facilities Management	
	Department of Veterans Affairs

SPS MEDICAL EQUIPMENT LEGEND						
TAG	JSN	NAME	QTY	ROOM NO.	BASIS OF DESIGN UTILITY REQUESTS	
1915 DECON						
01	A1195	COUNTER, CLEANUP, WITH 3 SINKS.	4	1915, 1905	STERIS	120V, 15A, LIFT SYSTEM - 120VAC, 3A, HW, CW, PW, D, A
02	S0940	WASHER, DISSINFECTOR, STM, 1DO, RSCD1WLL, 26X24X24 SHAM	3	1915	STERIS	480V, 30A, 3-PH, 60HZ, S, CR, HW, CW, PW, D, A
03	-	INNOWAVE PCF SONIC IRRIGATOR	2	1915	STERIS	208V, 30A, 3-PH, 60HZ, HW, CW, PW, D
04	F2410	TRITEC T2	3	1915	STERIS	208V, 20A, 1-PH, 60HZ, HW, CW, D
04A	-	RACK RETURN	1	1915	STERIS	120V, 15A, 1-PH, 60HZ, A
05	-	SCS LOAD-UNLOAD	1	1915	STERIS	120V, 15A, 1-PH, 60HZ, D, A
1917 - AUTOMATIC CARTWASH AREA (CWSH2)				1917		
05	S3185	WASHER, CART & UTENSIL, 2 DO, PIT MNTD, RSCD 2 WLL	2	1917	STERIS	480V, 50/60HZ, PW, HW, CW, S, A, D
1905 - SCOPE PROCESSING				1905		
06	F0540	CART, SCOPE, TRANSPORT	1	1905		
07	S2827	WASHER, FIBER SCOPE, PASS-THROUGH	3	1905	MEDIVATOR	120V, 60HZ, D, A, HW, CW
08	S1905	40" AUTOMATED PASS-THROUGH WINDOW	2	1915, 1905	STERIS	230V, 60Hz, 1-Ph, 15A, 208V, 60Hz, 3-Ph, 15A
1906 - SCOPE STAGING ROOM (CSST1)				1906		
09	M3160	CABINET, STORAGE, HANGING SCOPES	4	1906	MEDIVATOR	100-240VAC, 50/60HZ, 15A, A
1923 - PREP ASSEMBLY				1923		
10	S0047	SCS LOAD-UNLOAD	6	1923	STERIS	120V, 15A, 1-PH, 60HZ, D, A
11	S0048	CART, WASHER TRANSFER	3	1923		
12	-	LOW TEMPERATURE STERILIZER	3	1923	AMSCO	200-208V, 50-60HZ
13	S9610	ADJUSTABLE DELUXE WORKSTATION	8	1915, 1923		
14	-	AMSCO 400 SERIES SMALL STEAM STERILIZER	1	1923	STERIS	480V, 60HZ, 3-PH, 4A, 120V, 60HZ, 1-PH, 15A, S, CW, D
1920 - STERILIZATION				1920		
15	-	AMSCO 600 MEDIUM STEAM STERILIZER	3	1920	STERIS	480V, 60HZ, 3-PH, 20A, S, CW, D, A
16	S0495	LOADING CAR & TRANSFER CARRIAGE, 26.5"x26.5"x63" CHAMBER	6	1920	STERIS	
1912 - H2O				1912		
17	K2020	DISPENSER, DETERGENT, AUTOMATIC	1	1912	STERIS	
18	M4871	SYSTEM, REVERSE OSMOSIS, WATER	1	1912	CULLIGAN	
19	-	TRACK MOUNTED - SUSPENDED SHELVING	2	1921	LEVpro	
NOTE: SEE SHEET QH-101 FOR MORE SPS MEDICAL EQUIPMENT DETAILS.						

NOTE: SEE SHEET QH-101 FOR MORE SPS MEDICAL EQUIPMENT DETAILS.

1 M-Pipe Iso

COMPLIANCE REVIEW INCLUDED	2/23/2024
Revisions:	Date

CONSULTANTS:

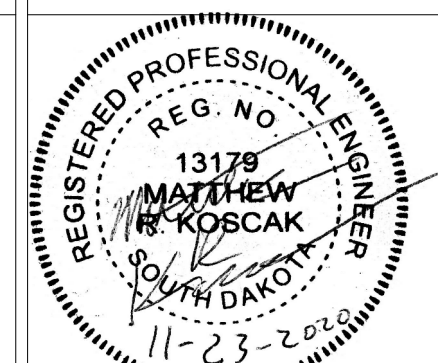
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Drawing Title

MECHANICAL PIPING ISOMETRIC VIEWS

Approved: Project Director
Omaha VA Medical Center

16.2330.A08

Project Title
VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service

Location
4101 Woolworth Ave #4199 Omaha, Ne 68105

Date
11 / 23 / 2020

Checked
RD

Drawn
JB

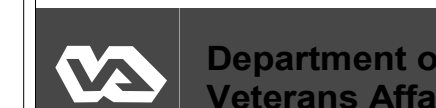
Project Number
16.2330.A08

Building Number
25

Drawing Number
M 7.02

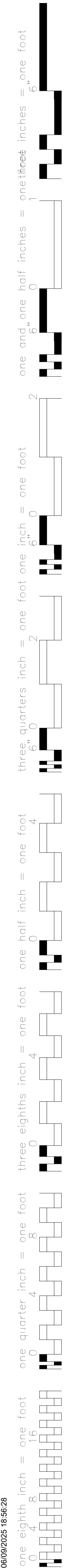
Dwg. 102 of 143

Office of
Construction
and Facilities
Management



CONSTRUCTION DOCUMENTS

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ABBREVIATIONS:

AC	ALTERNATING CURRENT	MD	MOTORIZED DAMPER
ADJ.	ADJUSTABLE	MECH	MECHANICAL
AHJ	AUTHORITY HAVING JURISDICTION	MFG	MANUFACTURER
AHU	AIR HANDLING UNIT	MIN	MINIMUM
AS	AIR SEPARATOR	MIN	MINUTE
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	mm	MILLIMETER
BHP	BRAKE HORSEPOWER	MPS	MEDIUM PRESSURE STEAM
BMS	BUILDING MANAGEMENT SYSTEM	MT	MOISTURE (HUMIDITY) TRANSMITTER
CALC	CALCULATED	MV	MANUAL VENT
CC	CHILLED WATER COOLING COIL - AHU	N.C.	NORMALLY CLOSED
CD	CONDENSATE DRAIN	NC	NOISE CRITERIA LEVEL
CFM	CUBIC FEET PER MINUTE	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
CHWR	CHILLED WATER RETURN	NG	NATURAL GAS
CHWS	CHILLED WATER SUPPLY	N.O.	NORMALLY OPEN
CL	CENTERLINE	NPT	NATIONAL PIPE THREAD
CO	CLEANOUT	OA	OUTSIDE AIR
COEF	COEFFICIENT	OAT	OUTSIDE AIR TEMPERATURE
COMLINK	COMMUNICATION LINK	ORD	OVERFLOW ROOF DRAIN
COND	CONDENSATION	OSA	OUTSIDE AIR
CONFIG	CONFIGURED	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
COR	CONTRACTING OFFICER'S REPRESENTATIVE	Pa	PASCAL
CNTRL.	CONTROL	PC	PUMPED CONDENSATE
CP	CONDENSATE PUMP	PC	PREHEAT STEAM COIL - AHU
CPVC	CHLORINATED POLYVINYL CHLORIDE	PD	PRESSURE DROP
CR	CONDENSATE RETURN	PDS	PRESSURE DIFFERENTIAL SENSOR
CV	CONTROL VALVE	PH	PHASE
CV	FLOW COEFFICIENT	PI	PROPORTIONAL INTEGRAL
DAMP.	DAMPER	PID	PROPORTIONAL INTEGRAL DERIVATIVE
DAT	DISCHARGE AIR TEMPERATURE	PRESS.	PRESSURE
DB	DRY BULB	PSH	HIGH PRESSURE SWITCH
DC	DIRECT CURRENT	PSIG	POUNDS PER SQUARE INCH - GAUGE
DCW	DOMESTIC COLD WATER	PSL	LOW PRESSURE SWITCH
DEG	DEGREES	QUANT.	QUANTITY
DHR	DOMESTIC HOT WATER RETURN	R	RADIUS
DHW	DOMESTIC HOT WATER	R	RETURN
DIFF.	DIFFERENTIAL	RA	RETURN AIR
DIST	DISTRUBUTION	RC	REHEAT STEAM COIL - AHU
DS	DOWNSPOUT	RD	ROOF DRAIN
DSP	DEHUMIDIFICATION SET POINT	RE	RESIDENT ENGINEER
DVV	DRAIN, WASTE AND VENT	REQ'D	REQUIRED
(E)	EXISTING	RH	RELATIVE HUMIDITY
EA	EXHAUST AIR	RPM	REVOLUTIONS PER MINUTE
ECC	ENERGY CONTROL CENTER	S	SUPPLY
ELECT.	ELECTRICAL	SA	SUPPLY AIR
ELEV	ELEVATION	SAN	SANITARY
ENT	ENTERING	SCW	SOFT COLD WATER
ERC	ENERGY RECOVERY COIL - AHU	SD	SMOKE DAMPER
ES	END SWITCH	SF	FAN SECTION - AHU
EWC	ELECTRIC WATER COOLER	SF	SQUARE FEET
F	FAHRENHEIT	SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS ASSOCIATION
FD	FLOOR DRAIN	SP	STATIC PRESSURE
FS	FLOOR SINK	SPEC	SPECIFICATION
FILT.	FILTER	SS	STAINLESS STEEL
FFM	FEET PER MINUTE	SST	START/STOP
FT	FEET	SUH	STEAM UNIT HEATER
GAL	GALLONS	SV	STEAM VALVE
GALV	GALVANIZED	SV	STEAM VENT
G.C.	GENERAL CONTRACTOR	T	THERMOSTAT
GPM	GALLONS PER MINUTE	TEMP.	TEMPERATURE
GT	GLYCOL TANK	TSP	TOTAL STATIC PRESSURE
H	HEIGHT	TT	TEMPERATURE SENSOR/TRANSMITTER
H	HUMIDIFIER - AHU	TYP	TYPICAL
HP	HORSEPOWER	UH	UNIT HEATER
HPS	HIGH PRESSURE STEAM	V	VENT
HR	HOUR	V	VOLTS
HRCR	HEAT RECOVERY RETURN	VAV	VARIABLE AIR VOLUME
HRCs	HEAT RECOVERY SUPPLY	VFD	VARIABLE FREQUENCY DRIVE
HRP	HEAT RECOVERY PUMP	VSMC	VARIABLE SPEED MOTOR CONTROLLER
HSP	HUMIDIFICATION SET POINT	VTR	VENT THROUGH ROOF
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING	W	WIDTH
HX	HEAT EXCHANGER	W/	WITH
HZ	HERTZ	WB	WET BULB
IBC	INTERNATIONAL BUILDING CODE	WG	INCHES OF WATER
IECC	INTERNAIONAL ENERGY CONSERVATION CODE	ZAT	ZONE AIR TEMPERATURE
IFB	INTEGRAL FACE AND BYPASS	ZC	VALVE OR DAMPER CONTROLLER
IMC	INTERNATIONAL MECHANICAL CODE		
IO	INPUT/OUTPUT		
IPC	INTERNATIONAL PLUMBING CODE		
ICVAMC	IOWA CITY VETERANS AFFAIRS MEDICAL CENTER		
K.O.	COMMANDING OFFICER		
L	LENGTH		
LA	LABORATORY EQUIPMENT COMPRESSED AIR		
LBS	POUNDS		
LPS	LOW PRESSURE STEAM		
LWA	SOUND POWER LEVEL		
MAX	MAXIMUM		
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR		
MC	MECHANICAL CONTRACTOR		

PLUMBING SYMBOLS

	3-WAY CONTROL VALVE		BALL VALVE
	2-WAY CONTROL VALVE		PLUG VALVE
	CHECK VALVE		B-VALVE
	FLOW METER		GLOBE VALVE
	AQUASTAT		GLOBE VALVE -MANUAL
	GATE VALVE		GLOBE VALVE - ON/OFF
	GATE VALVE - MANUAL		GLOBE VALVE - MODULATING
	GATE VALVE - ON/OFF		BUTTERFLY VALVE
	GATE VALVE - MODULATING		BUTTERFLY VALVE - MANUAL
	THERMOSTATIC MIXING VALVE		BUTTERFLY VALVE - ON/OFF
	BALANCING VALVE		BUTTERFLY VALVE - MODULATING
	FLOW CONTROL VALVE		VERTICAL HEAT EXCHANGER
	PRESSURE REDUCING VALVE		TEMPERATURE SENSOR
	REDUCED PRESSURE ZONE VALVE		DRINKING FOUNTAIN
	PRESSURE RELIEF VALVE		TRIPLE DUTY VALVE
	SOLENOID VALVE		VACUUM BREAKER
	PRESSURE GAUGE		TEST PLUG
	THERMOMETER		FLEXIBLE PIPE CONNECTION
	PUMP		HAMMER ARRESTOR
	STEAM TRAP		PRESSURE REGULATOR
	STRAINER		MANUAL AIR VENT
	CONCENTRIC REDUCER		POINT OF CONNECTION
	PIPE UNION		POINT OF DISCONNECTION
	PIPE ELBOW		TO BE DEMOLISHED
	PIPE DOWN		PLUMBING PLAN NOTE
	PIPE UP		TEE
	PIPE TEE DOWN		

PLUMBING SHEET INDEX

P 0.00	SYMBOLS, LEGENDS AND ABBREVIATIONS
P 1.00	EXISTING ROOF PLUMBING DEMOLITION PLAN
P 1.01	FIRST FLOOR DRAIN, WASTE AND VENT PLAN
P 1.02	INTERSTITIAL SPACE WATER AND COMPRESSED AIR PLAN
P 1.03	INTERSTITIAL SPACE DRAIN, WASTE AND VENT PLAN
P 1.04	LEVEL 3 SPS WATER AND COMPRESSED AIR PLAN
P 1.05	LEVEL 3 DRAIN, WASTE AND VENT PLAN
P 1.06	PLUMBING ROOF PLAN
P 2.01	WATER AND COMPRESSED AIR ISOMETRIC VIEWS
P 2.02	DRAIN, WASTE AND VENT ISOMETRIC VIEWS
P 3.01	PLUMBING SECTIONS
P 5.01	PLUMBING DETAILS
P 5.02	PLUMBING DETAILS
P 6.01	PLUMBING SCHEDULES

GENERAL PLUMBING NOTES:

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL MECHANICAL CODE (IMC), INTERNATIONAL PLUMBING CODE (IPC), INTERNATIONAL FUEL GAS CODE (IFGC), NFPA 101 LIFE SAFETY CODE, AND ANY AUTHORITY HAVING JURISDICTION. THIS IS A FEDERAL PROJECT, AS SUCH ALL CODE REQUIREMENTS ARE REQUIRED.

ALL EQUIPMENT, MATERIALS, AND ARTICLES INCORPORATED IN THE WORK SHALL BE NEW AND OF COMPARABLE QUALITY AS SPECIFIED. ALL WORKMANSHIP SHALL BE FIRST-CLASS AND SHALL BE PERFORMED BY MECHANICS SKILLED AND REGULARLY EMPLOYED IN THEIR RESPECTIVE TRADES.

ALL WORK SHALL BE COORDINATED WITH ALL AFFECTED TRADES PRIOR TO STARTING WORK. REWORK REQUIRED DUE TO COORDINATION ISSUES SHALL BE DONE BY THE INSTALLATION CONTRACTOR WITHOUT INCREASED COST TO THE OWNER.

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE. ALTHOUGH EVERY ATTEMPT HAS BEEN MADE TO INDICATE THE EXACT ROUTING AND LOCATION OF PROPOSED SYSTEMS, NOT ALL OFFSETS, REQUIRED FITTINGS AND/OR CONDITIONS CAN BE SHOWN. THE CONTRACTOR SHALL COORDINATE WORK AND MAKE REQUIRED CHANGES TO THE ROUTING IN ORDER TO AVOID CONFLICTS WITHOUT ANY INCREASED COST TO THE OWNER.

SYSTEMS DESIGNATED TO BE PROVIDED AND INSTALLED WITHIN THESE CONTRACT DOCUMENTS ARE INTENDED TO BE COMPLETE AND OPERATIONAL. PROVIDE EVERYTHING ESSENTIAL FOR THE COMPLETION OF THE WORK TO MAKE THE SYSTEM READY FOR NORMAL AND PROPER OPERATION, INCLUDING ALL WORK OR MATERIALS NOT DIRECTLY SHOWN ON THE DRAWINGS OR IN THE SPECIFICATIONS, BUT NECESSARY FOR THE PROPER OPERATION OF THE SYSTEM.

PLUMBING CONTRACTOR IS RESPONSIBLE FOR ENSURING PROPER MAINTENANCE CLEARANCES ARE MAINTAINED. CLOSE COORDINATION WILL BE REQUIRED WITH THE MECHANICAL PIPING, HVAC, FIRE PROTECTION, AND ELECTRICAL CONTRACTOR.

ALL DOMESTIC WATER PIPING ABOVE GRADE IS INTENDED TO BE INSULATED, TYPE K OR L HARD DRAWN COPPER PIPE AS SPECIFIED. TYPE M COPPER PIPE IS NOT ALLOWED.

ALL WASTE AND VENT PIPING ABOVE GRADE IS INTENDED TO BE CAST IRON OR DUCTILE IRON AS SPECIFIED. PVC IS NOT ALLOWED ABOVE GRADE. ALL WASTE AND VENT PIPING BELOW GRADE IS INTENDED TO BE PVC AS SPECIFIED. CAST IRON OR OTHER METAL PIPING IS NOT ALLOWED UNDER GRADE.

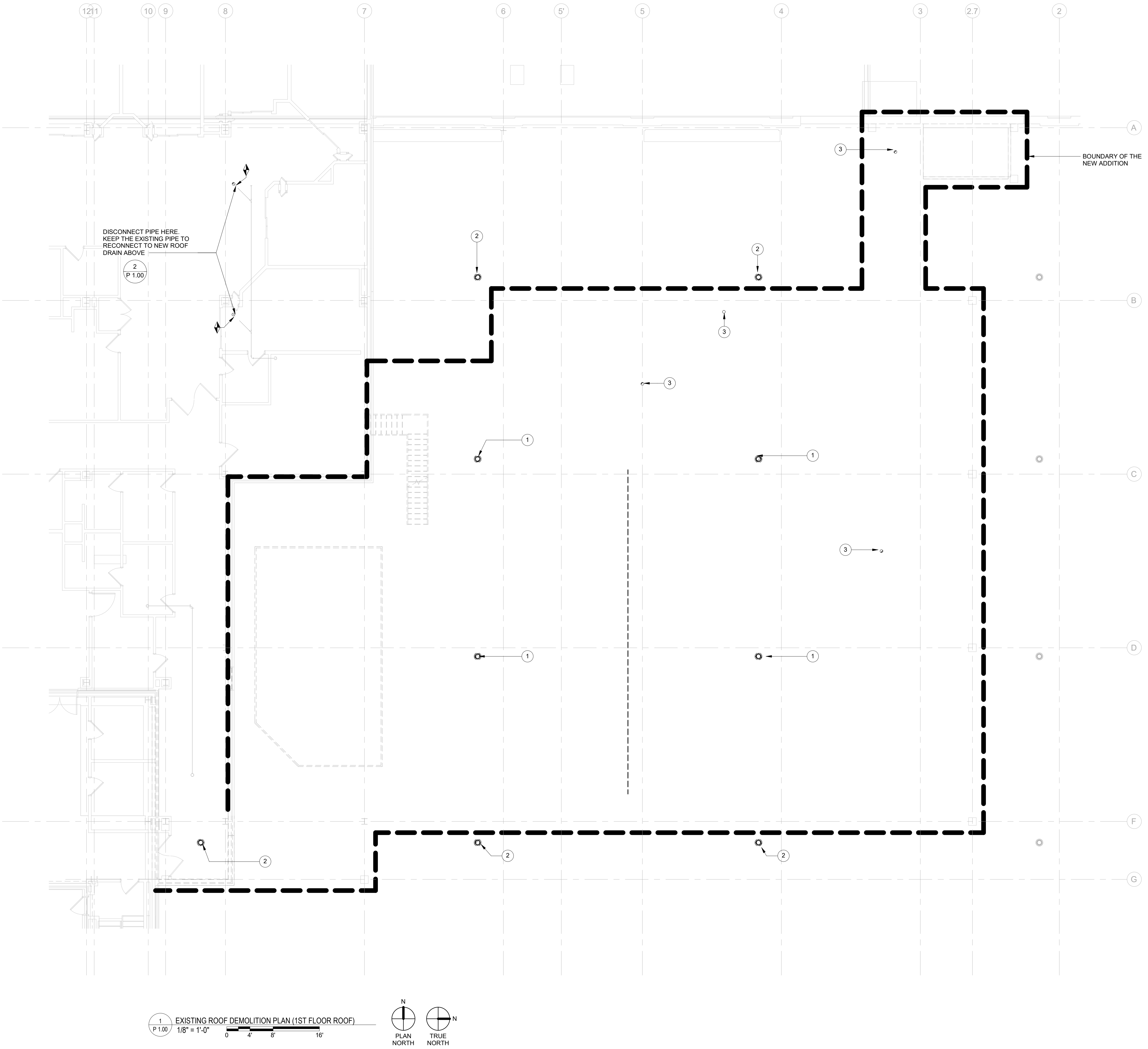
FOR PIPE SIZES NOT SHOWN ON FLOOR PLANS SEE PIPING ISOMETRIC DRAWINGS.

CONSTRUCTION DOCUMENTS

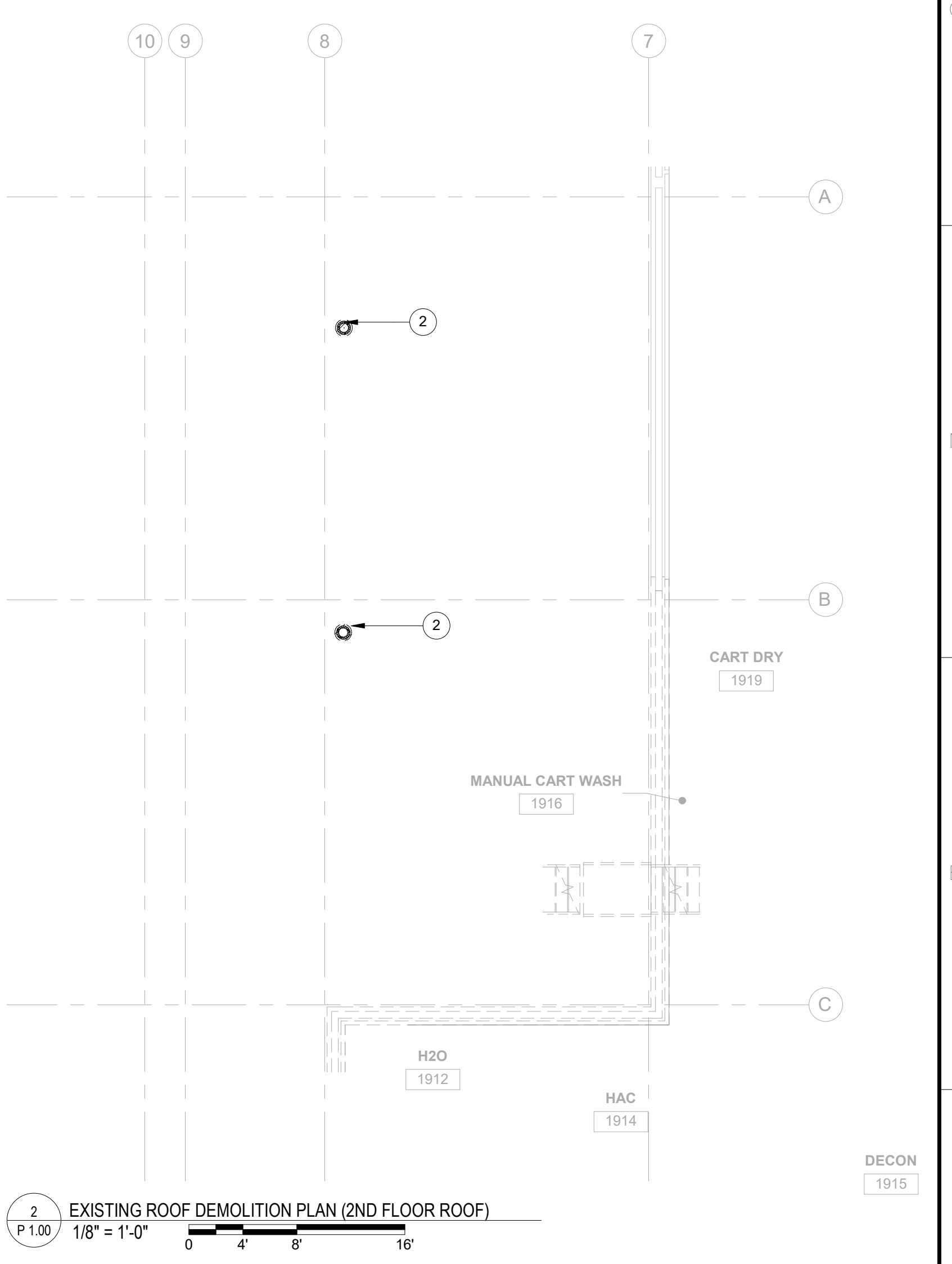
COMPLIANCY REVIEW INCLUDED Revisions:		2/23/2024 Date		CONSULTANTS: TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736 Albertson Engineering Inc. FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900 <td colspan="2"> ARCHITECT FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM </td> <td colspan="2"> Drawing Title SYMBOLS, LEGENDS AND ABBREVIATIONS Approved: Project Director Omaha VA Medical Center 16.2330.A08 </td> <td colspan="2"> Project Title VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service Location 4101 Woolworth Ave #4199 Omaha, Ne 68105 Date 11 / 23 / 2020 Checked RD Drawn BM </td> <td colspan="2"> Project Number 16.2330.A08 Building Number 25 Drawing Number P 0.00 Dwg. 103 of 143 </td> <td colspan="2"> Office of Construction and Facilities Management Department of Veterans Affairs </td>		ARCHITECT FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM		Drawing Title SYMBOLS, LEGENDS AND ABBREVIATIONS Approved: Project Director Omaha VA Medical Center 16.2330.A08		Project Title VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service Location 4101 Woolworth Ave #4199 Omaha, Ne 68105 Date 11 / 23 / 2020 Checked RD Drawn BM		Project Number 16.2330.A08 Building Number 25 Drawing Number P 0.00 Dwg. 103 of 143		Office of Construction and Facilities Management Department of Veterans Affairs	
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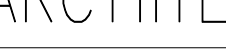
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one eighth inch = one foot
one quarter inch = one foot
three eighths inch = one foot
one half inch = one foot
three quarters inch = one foot
two inches = one foot
one and one half inches = one foot
one and one half inches = one foot
one and one half inches = one foot



- KEY NOTES:**
- ① DEMOLISH ROOF DRAIN AND CAP PIPE UNDERNEATH.
 - ② DEMOLISH THE EXISTING ROOF DRAIN, KEEP PIPE TO CONNECT TO NEW ROOF DRAIN AT A NEW LOCATION AS SHOWN IN P 1.03.
 - ③ DEMOLISH EXISTING VTR AND PATCH HOLES IN EXISTING DECK. SEE P 1.01 AND P 1.03 FOR NEW VTR LOCATION.

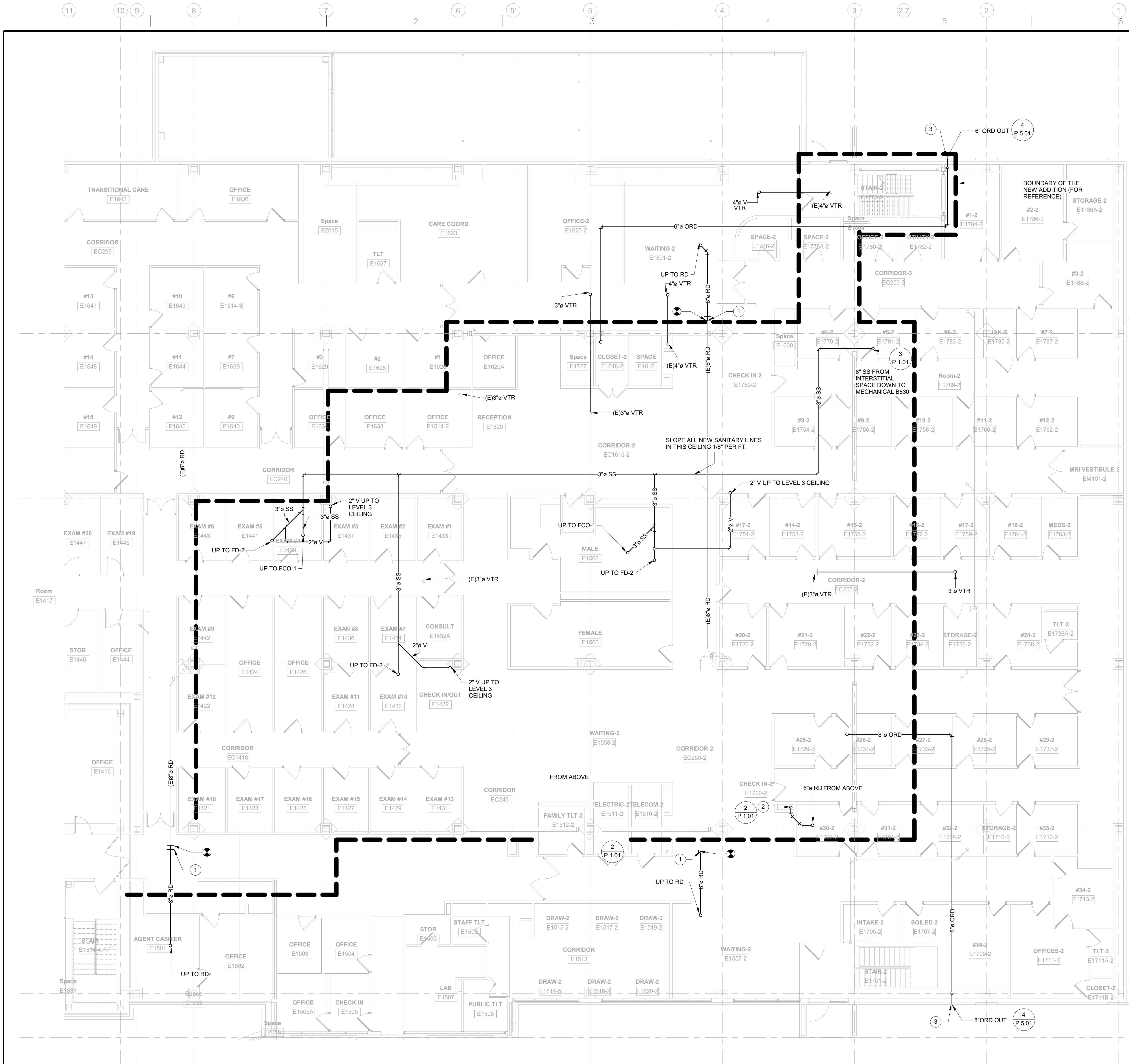


				CONSULTANTS:  Terrasite Design Civil Engineering • Construction Management • Planning  Albertson Engineering Inc.  FARRIS ENGINEERING Design • Construction • General • Construction Management ALBERTSON ENGINEERING, INC. 3202 WEST MAIN STREET, SUITE C RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 343-9606 FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900		ARCHITECT  FOURFRONT DESIGN, INC. FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM		16.2330.A08									
COMPLIANCE REVIEW INCLUDED Revisions:		2/23/2024 Date								Drawing Title EXISTING ROOF PLUMBING DEMOLITION PLAN Approved: Project Director Omaha VA Medical Center		Project Title VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service Location 4101 Woolworth Ave #4199 Omaha, Ne 68105 Date 11 / 23 / 2020 Checked RD Drawn BM		Project Number 16.2330.A08 Building Number 25 Drawing Number P 1.00 Dwg. 104 of 143		Office of Construction and Facilities Management  Department of Veterans Affairs	

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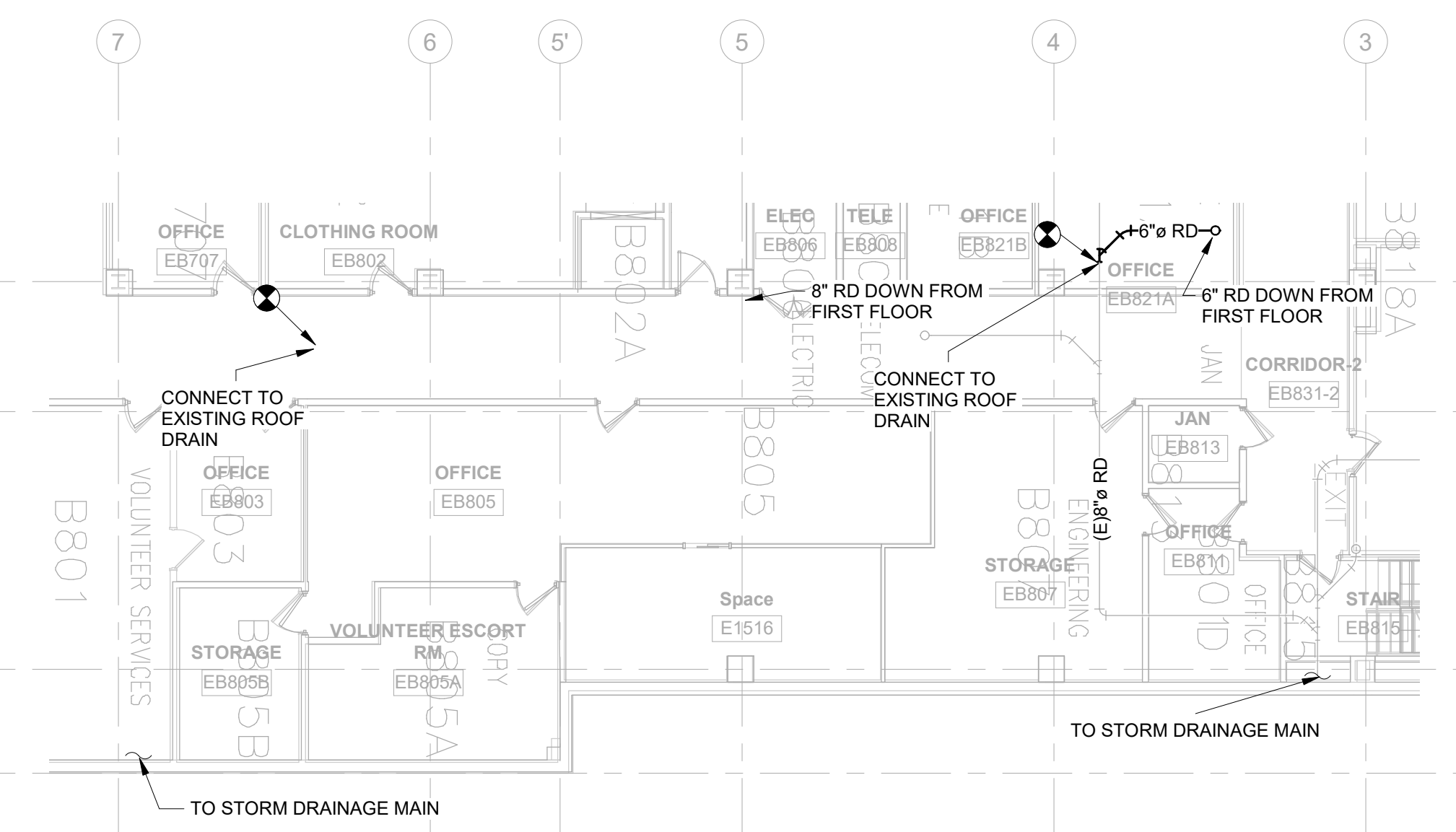


GENERAL NOTES:

- CONTRACTOR WILL BE REQUIRED TO COREDRILL HOLES AND CREATE NEW PENETRATIONS IN EXISTING CONCRETE THROUGHOUT THIS PROJECT. SOME INSTANCES OF COREDRILLING ARE SHOWN ON PLANS, WHILE MOST ARE NOT. CONTRACTOR TO PROVIDE NEW HOLES FOR NEW PLUMBING AND ALSO CREATE RATED FIRE SEALED ASSEMBLY ONCE PIPE IS INSTALLED AT EVERY PENETRATION (WALL OR FLOOR) LOCATION.
- NEW PIPE ROUTING SHOWN IS DIAGRAMMATIC AND HAS NOT BEEN TESTED TO VERIFY THAT NEW PIPING DOES NOT CONFLICT WITH EXISTING CONDITIONS AROUND THE NEW ROUTE SHOWN. CONTRACTOR TO COORDINATE AND PROVIDE OFFSETS TO ALLOW NEW PIPING TO BE INSTALLED IN EXISTING CEILING AS REQUIRED TO COMPLETE THE INTENDED ROUTING. IF CONFLICT ARISES THAT DOES NOT ALLOW FOR OFFSET AND REROUTING, CONTRACTOR TO NOTIFY ENGINEER OF DISCREPANCY.
- NEW PIPING SHOWN IN FOR THIS PROJECT IS SHOWN OVER EXISTING FLOORPLAN (AT THE TIME OF DESIGN). CONTRACTOR TO PROVIDE SERVICES FOR THIS PROJECT AS IF THE EXISTING SPACE SHOWN IS LIVE SPACE AND A COORDINATED AND PHASED REMODEL APPROACH SHALL BE REQUIRED BY THE CONTRACTOR.

KEY NOTES:

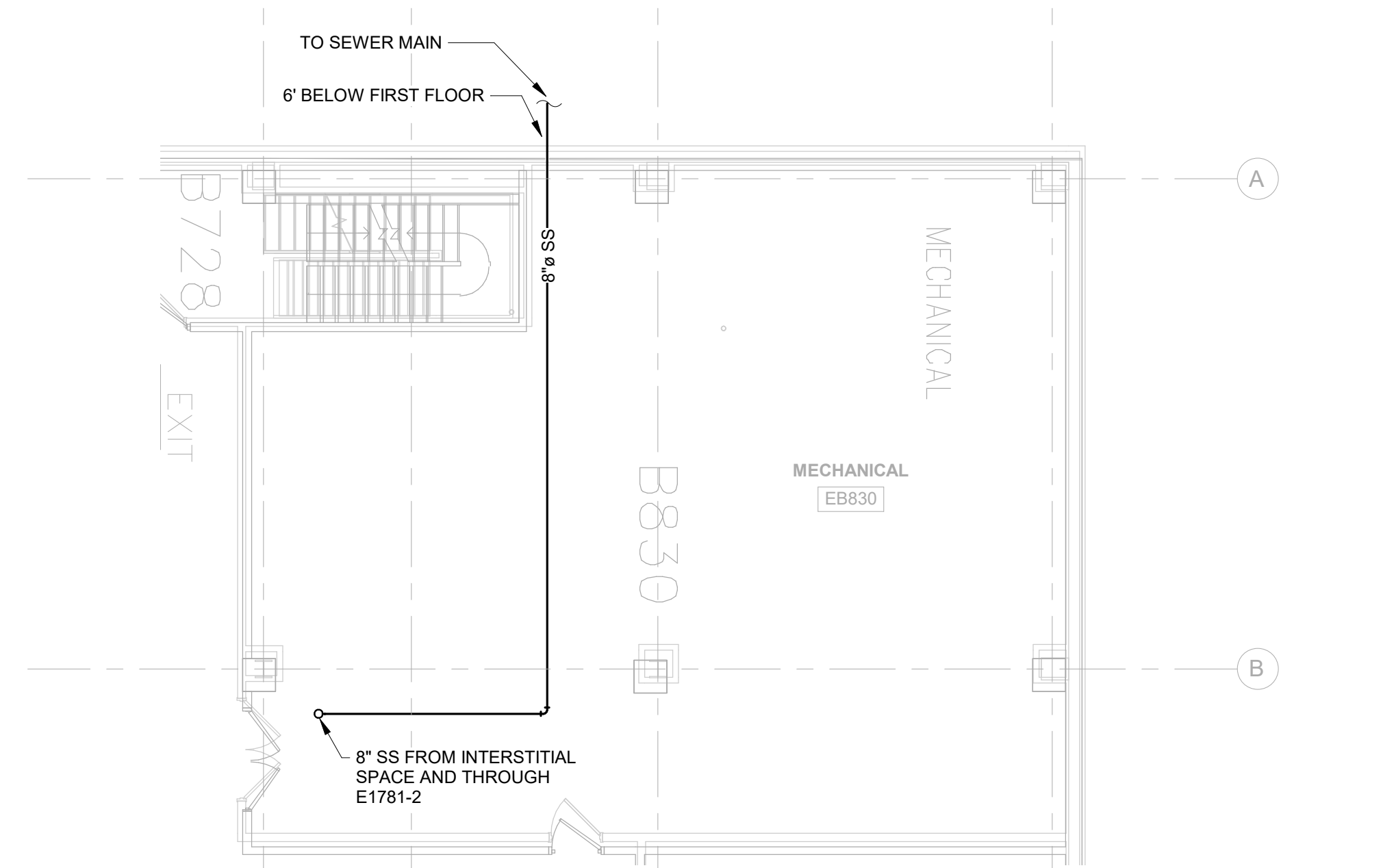
- RECONNECT TO EXISTING STORM DRAIN PIPING AT THIS LOCATION AND EXTEND NEW PIPING TO NEW ROOF DRAIN LOCATION.
- INSTALL NEW STORM DRAIN DOWN EXISTING CHASE. GC TO PROVIDE ACCESS TO CHASE AND PATCH BACK AFTER NEW DRAIN IS INSTALLED.
- ADD HEAT TRACE INSIDE ORD PIPING AT THE TERMINALS.



LEVEL 0 ROOF DRAINAGE

P 1.01 3/32" = 1'-0"

0 4' 8' 16' 24'



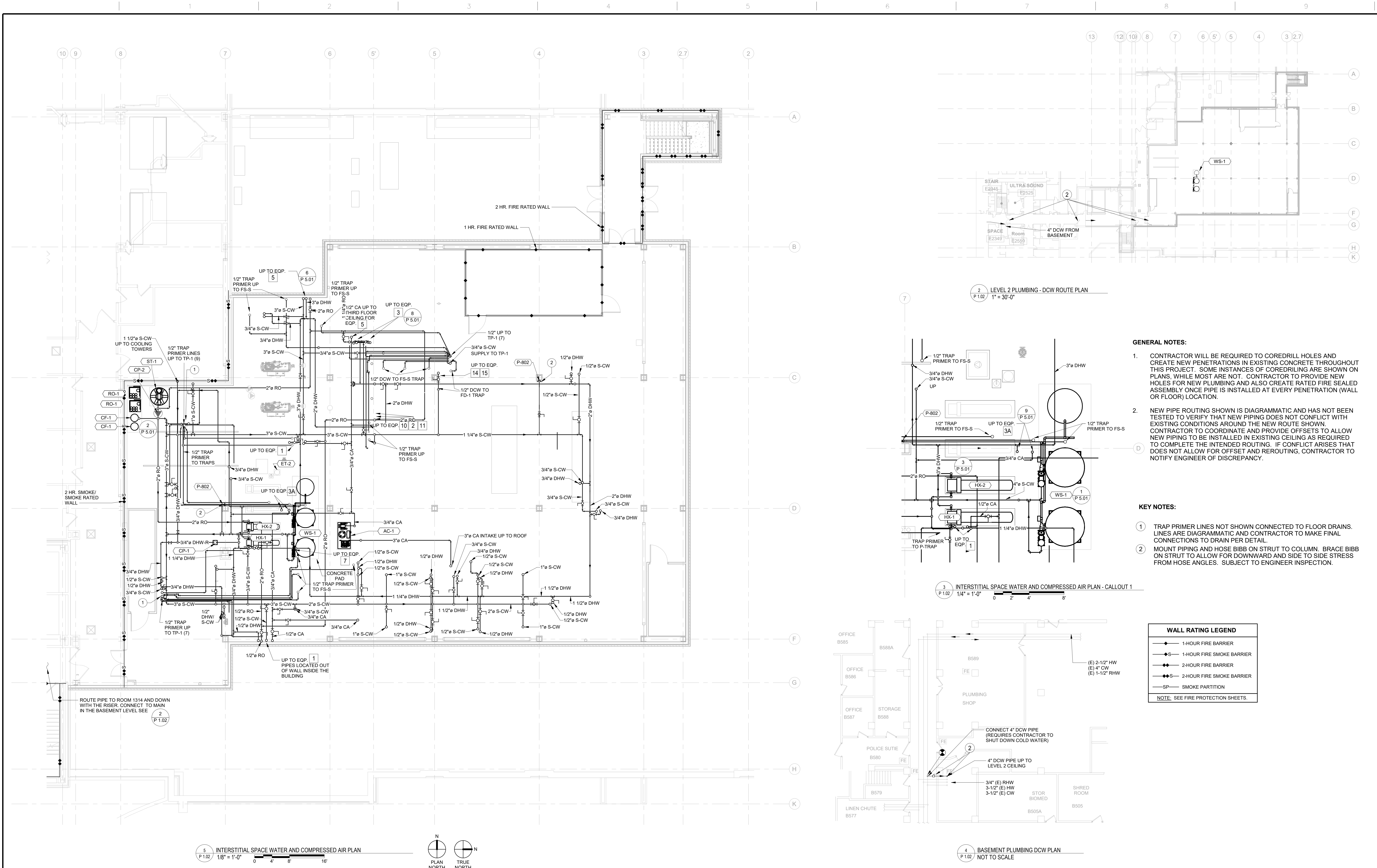
LEVEL 0 SANITARY STUBOUT

P 1.01 1/8" = 1'-0"

0 4' 8' 16'

CONSTRUCTION DOCUMENTS

CONSULTANTS:  TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736  ALBERTSON ENGINEERING, INC. 3202 WEST MAIN STREET, SUITE C RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 343-9606  FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900		ARCHITECT  FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM		Drawing Title FIRST FLOOR DRAIN, WASTE AND VENT PLAN Approved: Project Director Omaha VA Medical Center 16.2330.A08		Project Title VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service Location 4101 Woolworth Ave #4199 Omaha, Ne 68105 Date 11 / 23 / 2020 Checked RD Drawn BM		Project Number 16.2330.A08 Building Number 25 Drawing Number P 1.01 Dwg. 105 of 143		Office of Construction and Facilities Management  Department of Veterans Affairs	
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CONSTRUCTION DOCUMENTS

[illegible]

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SPS EQUIPMENT UTILITY CONNECTION SCHEDULE

MANUFACTURER	MODEL/DESCRIPTION	EQUIPMENT TAG	MECHANICAL PIPE CONNECTIONS (STEAM)				PLUMBING CONNECTIONS					NOTES
			SIZE	PRESSURE	SUPPLY	CONDENSATE RETURN	WASTE	DCW SOFT	DHW	PURE WATER	COMPRESSED AIR	
STERIS	COUNTER, CLEANUP, WITH 3 SINKS	1	1-1/2"	-	-	-	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1/4"	1
STERIS	WASHER, DISINFECTOR, STM, 1DO, RSCD1WLL, 26X24X24 SHAM	2	3" OD	30-80 PSIG MAX 90	1/2"	1/2"	4" FS	1/2"	1/2"	1/2"	1/8"	1
STERIS	INNOVAVE PCF SONIC IRRIGATOR	3	-	-	-	-	3/4"	3/4"	3/4"	3/4"	-	2
STERIS	INNOVAVE UNITY ULTRASONIC IRRIGATOR	3A	-	-	-	-	3/4"	3/4"	3/4"	3/4"	-	2
STERIS	RACK RETURN, LOAD/UNLOAD	4	-	-	-	-	1-1/2"	-	-	-	1/4"	-
STERIS	WASHER, CART & UTENSIL, 2 DO, PIT MNTD, RSCD 2 WLL	5	6" OD	30-80 PSIG	1-1/2"	1"	4"	1"	1"	3/4"	1/2"	1
STERIS	CART, SCOPE, TRANSPORT	6	-	-	-	-	-	-	-	-	-	-
CANTEL	WASHER, FIBER SCOPE, PASS-THROUGH	7	4"	-	-	-	4" FD	1/2"	1/2"	-	1/4"	3
STERIS	40" AUTOMATED PASS-THROUGH WINDOW	8	-	-	-	-	-	-	-	-	-	-
CANTEL	CABINET, STORAGE, HANGING SCOPES	9	-	-	-	-	-	-	-	-	1/4"	-
STERIS	RACK, STERILE WRAP	4A, 10	-	-	-	-	1-1/2"	-	-	-	1/4"	5
STERIS	CART, WASHER TRANSFER	11	-	-	-	-	-	-	-	-	-	-
STERIS	LOW TEMPERATURE STERILIZER	12	-	-	-	-	-	-	-	-	-	-
STERIS	ADJUSTABLE DELUXE WORKSTATION	13	-	-	-	-	-	-	-	-	-	-
STERIS	AMSCO 400 SERIES SMALL STEAM STERILIZER	14	-	-	1/2"	-	1-1/2"	1"	-	-	-	4
STERIS	AMSCO 600 MEDIUM STEAM STERILIZER	15	-	-	1/2"	-	-	-	-	-	1/2"	4
STERIS	LOADING CAR & TRANSFER CARRIAGE, 26.5"x26.5"x63" CHAMBER	16	-	-	-	-	-	-	-	-	-	-
STERIS	DISPENSER, DETERGENT, AUTOMATIC	17	-	-	-	-	-	-	-	-	-	-

GENERAL NOTE: ALL MEDICAL EQUIPMENT TO BE PROVIDED UNDER THIS CONTRACT BY THE GENERAL CONTRACTOR. PLUMBING AND MECHANICAL CONTRACTORS TO PROVIDE ALL PROPER UTILITY CONNECTIONS AND ACCESSORIES PER THIS SCHEDULE AND EQUIPMENT MANUFACTURER WRITTEN INSTRUCTIONS.

NOTES:

- PROVIDE WATER LINES WITH ISOLATION VALVES, UNIONS, WATER HAMMER ARRESTORS AND VACUUM BREAKERS.
- EQUIPMENT HAS INTEGRAL AIR GAP AND OVERFLOW IN WATER SUPPLY.
- EQUIPMENT WITH THERMOSTATIC MIXING VALVE, ISOLATION VALVES, PRESSURE REGULATORS, PRESSURE GAUGES, TEMPERATURE GAUGES AND BYPASS TO FLOOR DRAIN.
- PROVIDE WITH ISOLATION VALVES, UNION, TEST PORT CONNECTION, AND VACUUM BREAKER FOR WATER SUPPLY.
- PIPE DRAIN TO SAME FLOOR SINK FOR EQUIPMENT 2.

WALL RATING LEGEND

- 1-HOUR FIRE BARRIER
 - 1-HOUR FIRE SMOKE BARRIER
 - 2-HOUR FIRE BARRIER
 - 2-HOUR FIRE SMOKE BARRIER
 - S - SMOKE PARTITION
- NOTE: SEE FIRE PROTECTION SHEETS.

SPS MEDICAL EQUIPMENT LEGEND

TAG	JSN	NAME	QTY	ROOM NO.	BASIS OF DESIGN UTILITY REQUESTS
1915 DECON					
01	A1195	COUNTER, CLEANUP, WITH 3 SINKS	4	1915, 1905	STERIS 120V, 15A, LIFT SYSTEM - 120VAC, 3A, HW, CW, PW, D, A
02	S0940	WASHER, DISINFECTOR, STM, 1DO, RSCD1WLL, 26X24X24 SHAM	3	1915	STERIS 480V, 30A, 3-PH, 60HZ, S, CR, HW, CW, PW, D, A
03	-	INNOVAVE PCF SONIC IRRIGATOR	2	1915	STERIS 208V, 30A, 3-PH, 60HZ, HW, CW, PW, D
04	TRITEC 72		3	1915	STERIS 208V, 20A, 1-PH, 60HZ, HW, CW, D
05	F2410	RACK RETURN	1	1915	STERIS 120V, 15A, 1-PH, 60HZ, A
06	-	SCS LOAD-UNLOAD	1	1915	STERIS 120V, 15A, 1-PH, 60HZ, D, A
1917 - AUTOMATIC CARTWASH AREA (CWASH2)					
07	S3185	WASHER, CART & UTENSIL, 2 DO, PIT MNTD, RSCD 2 WLL	2	1917	STERIS 480V, 50/60HZ, PW, HW, CW, S, A, D
1905 - SCOPE PROCESSING					
08	F0540	CART, SCOPE, TRANSPORT	1	1905	
09	S2627	WASHER, FIBER SCOPE, PASS-THROUGH	3	1905	MEDVATOR 120V, 60HZ, D, A, HW, CW
10	S1905	40" AUTOMATED PASS-THROUGH WINDOW	2	1915, 1905	STERIS 230V, 60Hz, 1-PH, 15A, 208V, 60Hz, 3-PH, 15A
1906 - SCOPE STAGING ROOM (CSST1)					
11	M3160	CABINET, STORAGE, HANGING SCOPES	4	1906	MEDVATOR 100-240VAC, 50/60HZ, 15A, A
1923 - PREP ASSEMBLY					
12	S0047	SCS LOAD-UNLOAD	6	1923	STERIS 120V, 15A, 1-PH, 60HZ, D, A
13	S0048	CART, WASHER TRANSFER	3	1923	
14	-	LOW TEMPERATURE STERILIZER	3	1923	AMSCO 200-208V, 50-60HZ
15	S9610	ADJUSTABLE DELUXE WORKSTATION	8	1915, 1923	
16	-	AMSCO 400 SERIES SMALL STEAM STERILIZER	1	1923	STERIS 480V, 60HZ, 3-PH, 4A, 120V, 60HZ, 1-PH, 15A, S, CW, D, A
1920 - STERILIZATION					
17	-	AMSCO 600 MEDIUM STEAM STERILIZER	3	1920	STERIS 480V, 60HZ, 3-PH, 20A, S, CW, D, A
18	S0495	LOADING CAR & TRANSFER CARRIAGE, 26.5"x26.5"x63" CHAMBER	6	1920	STERIS
1912 - H2O					
19	K2020	DISPENSER, DETERGENT, AUTOMATIC	1	1912	STERIS
20	M4871	SYSTEM, REVERSE OSMOSIS, WATER	1	1912	CULLIGAN
21	-	TRACK MOUNTED - SUSPENDED SHELVING	2	1921	LEVpro

NOTE: SEE SHEET QH-101 FOR MORE SPS MEDICAL EQUIPMENT DETAILS.

CONSTRUCTION DOCUMENTS

CONSULTANTS:



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Drawing Title

LEVEL 3 SPS WATER AND COMPRESSED AIR PLAN

Approved: Project Director

Omaha VA Medical Center

16.2330.A08

Project Title

VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service

Location

4101 Woolworth Ave #4199 Omaha, Ne 68105

Date

11 / 23 / 2020

Checked

RD

Drawn

BM

Project Number

16.2330.A08

Building Number

25

Drawing Number

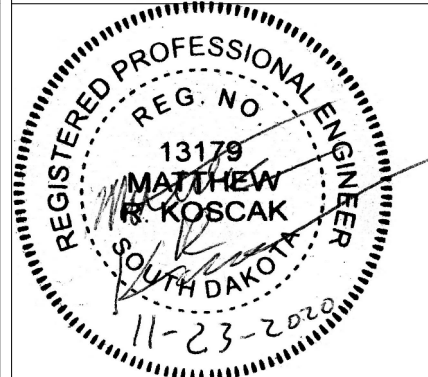
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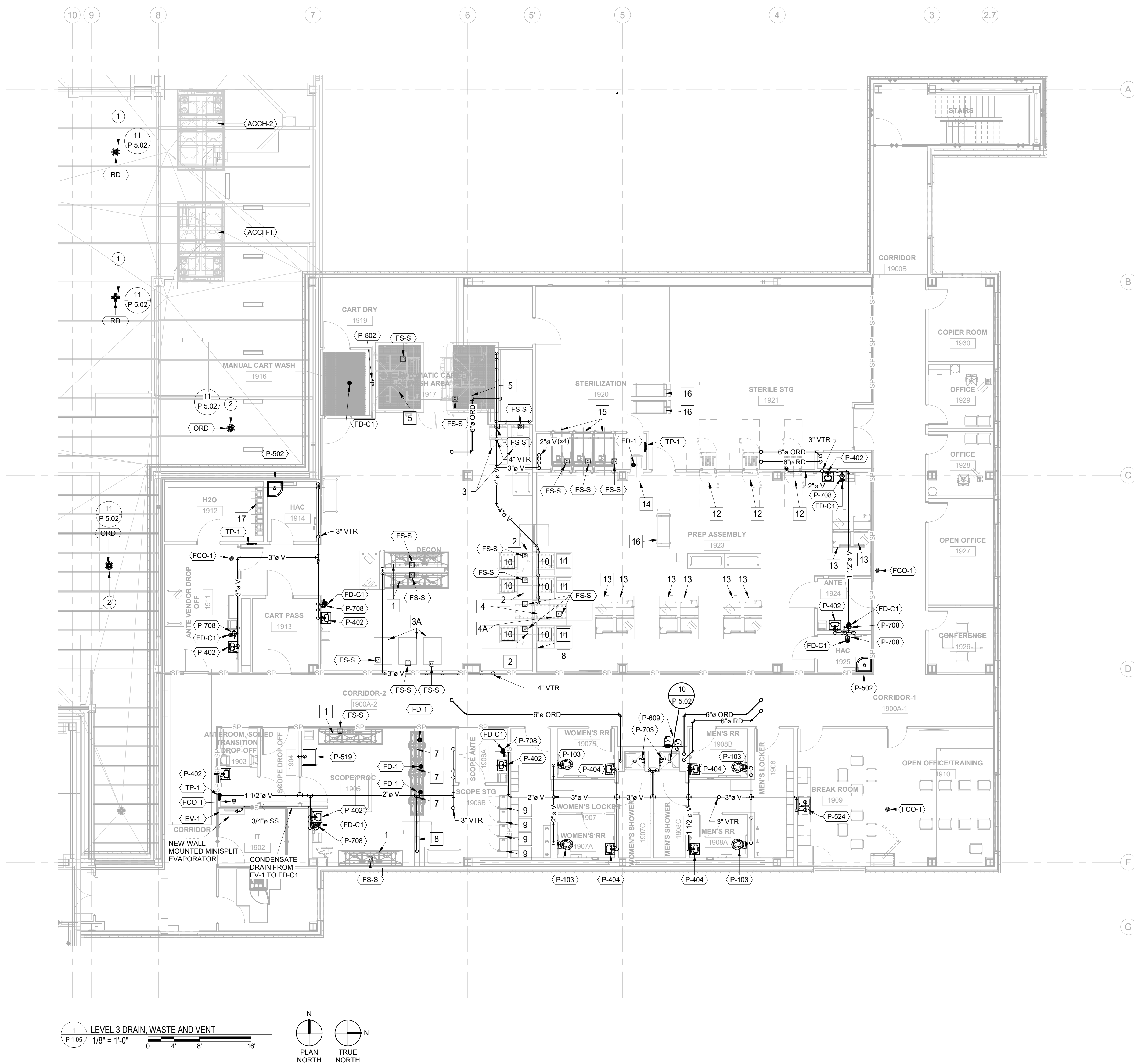
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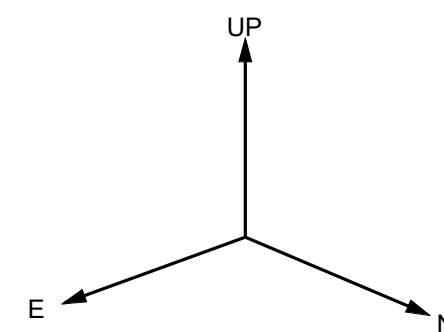
Office of Construction and Facilities Management

 Department of Veterans Affairs

VA FORM 08-6231

CONSULTANTS:		ARCHITECT		Drawing Title		Project Title		Project Number		Office of Construction and Facilities Management	
 TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736  ALBERTSON ENGINEERING, INC. 3202 WEST MAIN STREET, SUITE C RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 343-9606  FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900		 FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM 		LEVEL 3 DRAIN, WASTE AND VENT PLAN		VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service		16.2330.A08			
Approved: Project Director Omaha VA Medical Center		Location 4101 Woolworth Ave #4199 Omaha, Ne 68105		Building Number 25		Drawing Number P 1.05		Dwg. 109 of 143			
Date 11 / 23 / 2020		Checked RD		Drawn BM							

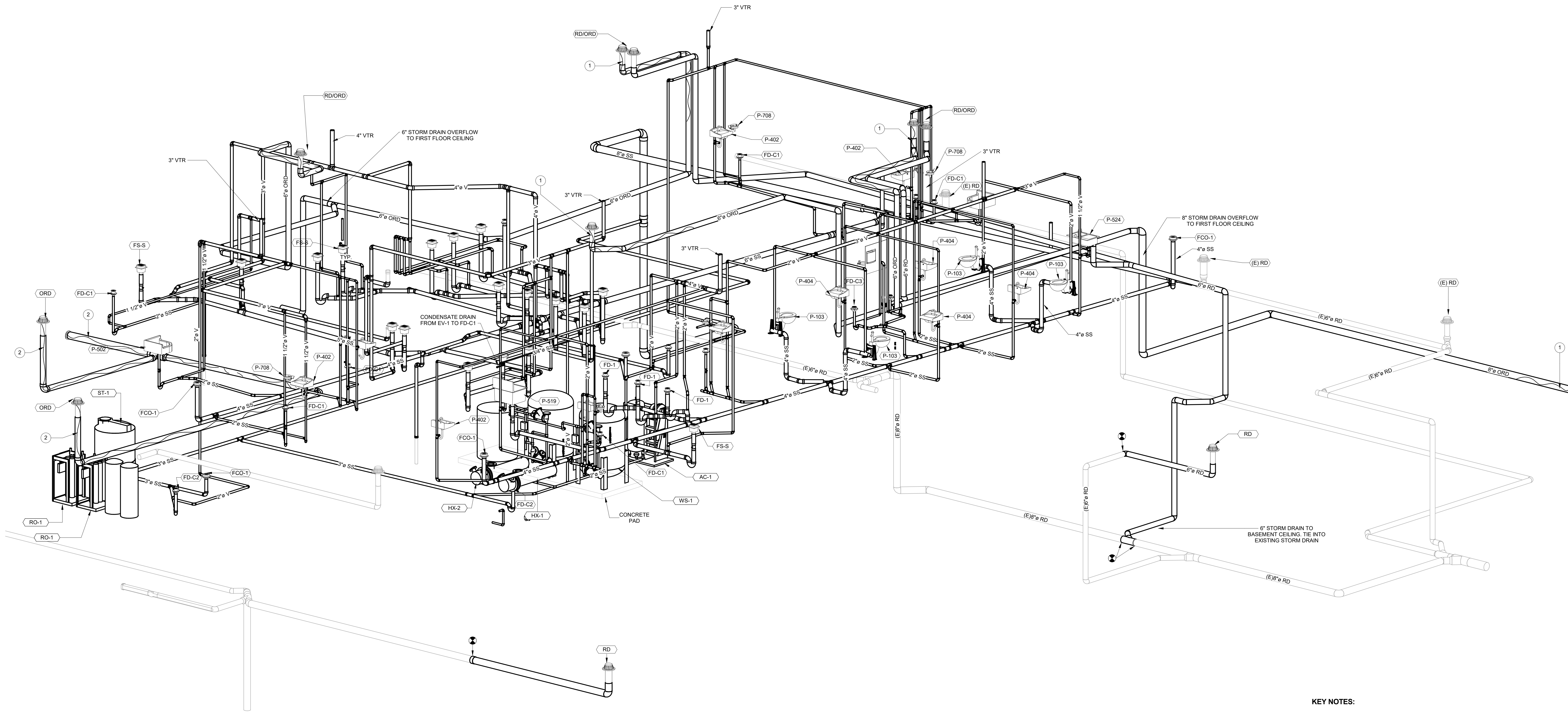




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one quarter inch = one foot
three eighths inch = one foot
one half inch = one foot
three quarters inch = one foot
one inch = one foot
one and one half inches = one foot
two inches = one foot
three inches = one foot
four inches = one foot
six inches = one foot
one foot = one foot



- KEY NOTES:
- 1 ADD HEAT TRACE INSIDE ORD PIPING AT THE TERMINALS.
 - 2 ADD HEAT TRACE INSIDE ORD PIPING THROUGH THE DRAIN ALL THE WAY DOWN TO THE DOWNSPOUT.

COMPLIANCE REVIEW INCLUDED	2/23/2024
Revisions:	Date

CONSULTANTS:

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PH: (605) 791-1736

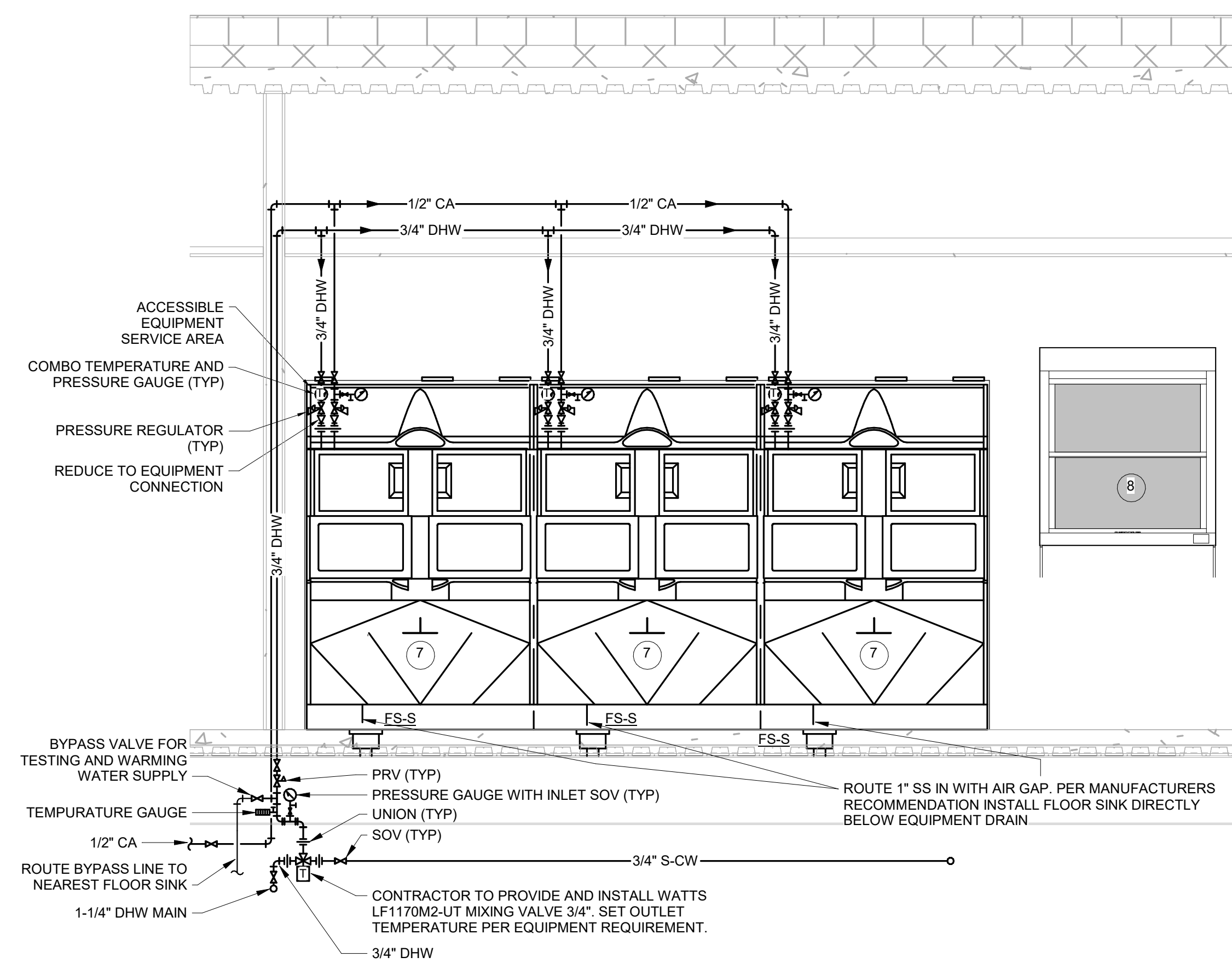
ALBERTSON ENGINEERING, INC.
3202 WEST MAIN STREET, SUITE C
RAPID CITY, SOUTH DAKOTA 57702
PH: (605) 343-9606

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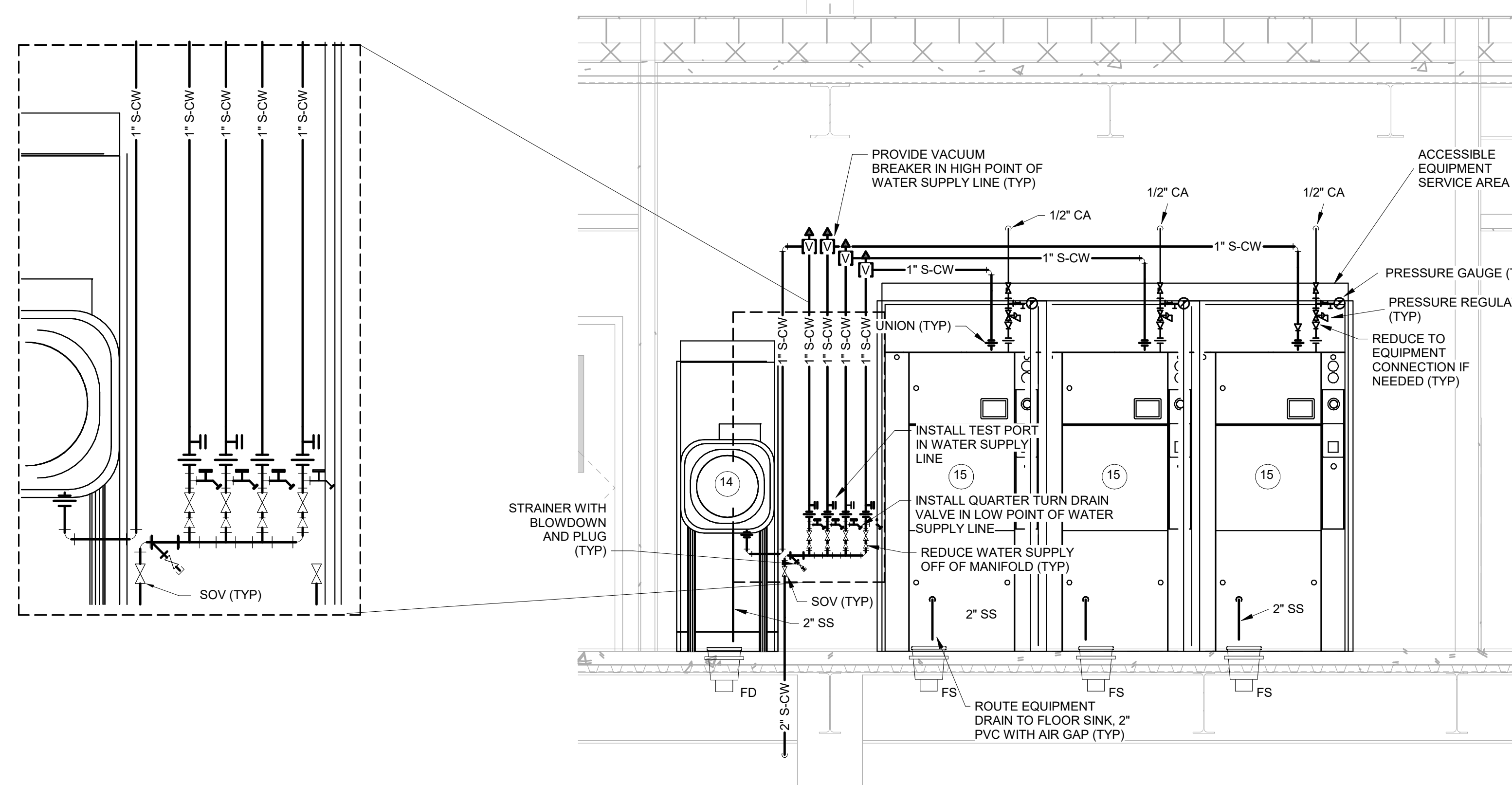
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Drawing Title DRAIN, WASTE AND VENT ISOMETRIC VIEWS	Project Title VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service	Project Number 16.2330.A08	Office of Construction and Facilities Management
Approved: Project Director Omaha VA Medical Center	Location 4101 Woolworth Ave #4199 Omaha, Ne 68105	Building Number 25	
	Date 11 / 23 / 2020	Checked RD	Drawn BM
			Dwg. 112 of 143

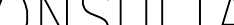


2 EQUIPMENT 7 PIPING DETAIL
P 3.01 NOT TO SCALE



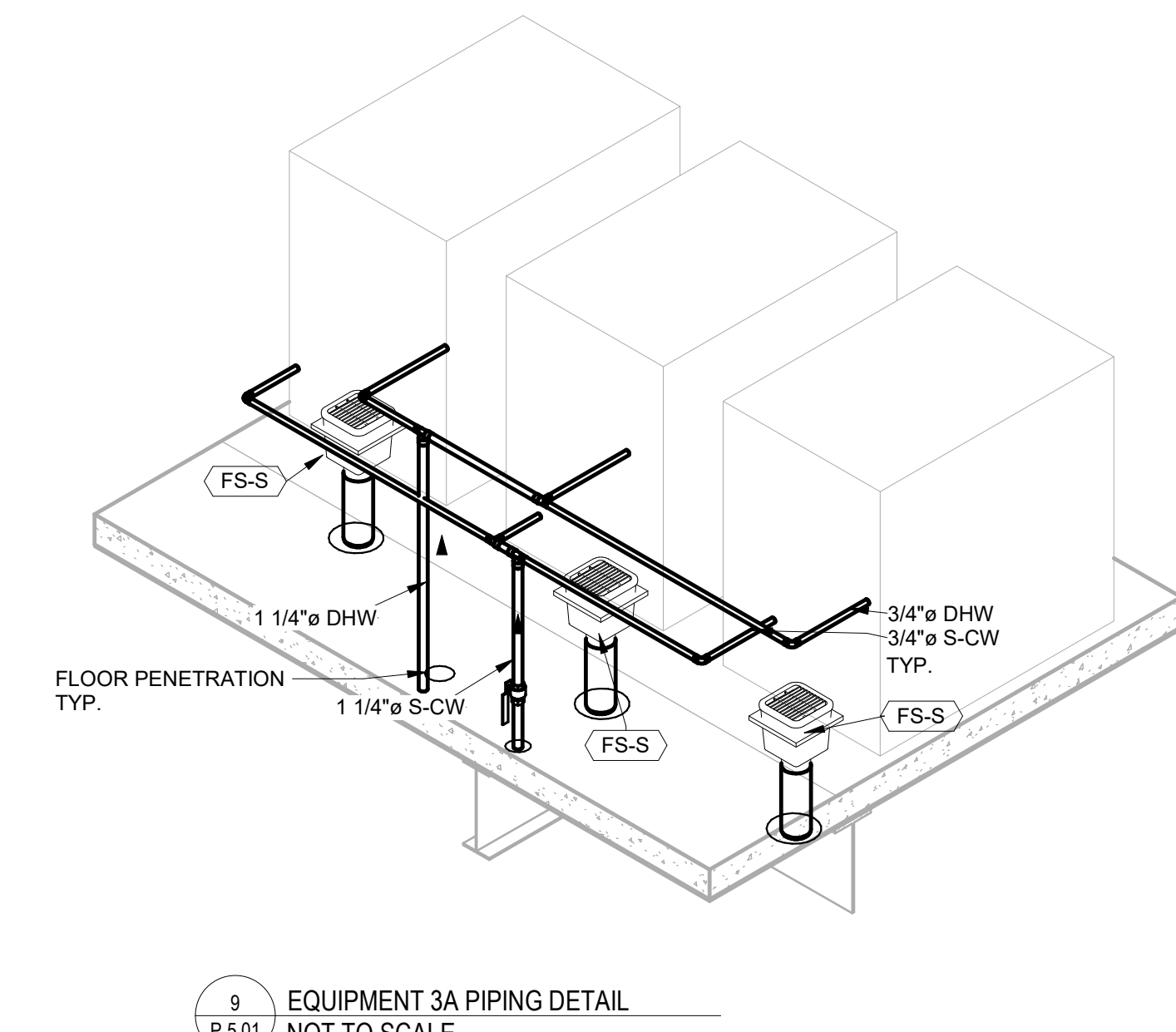
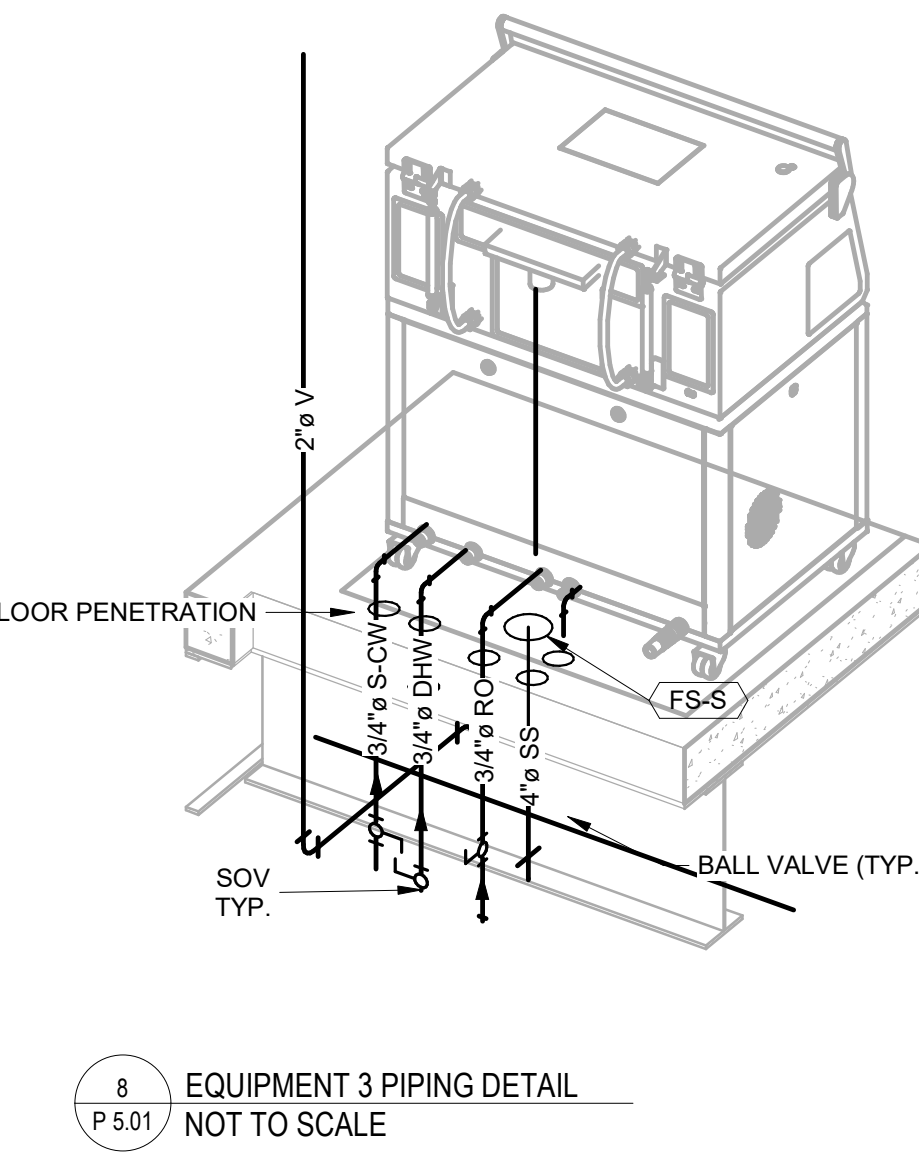
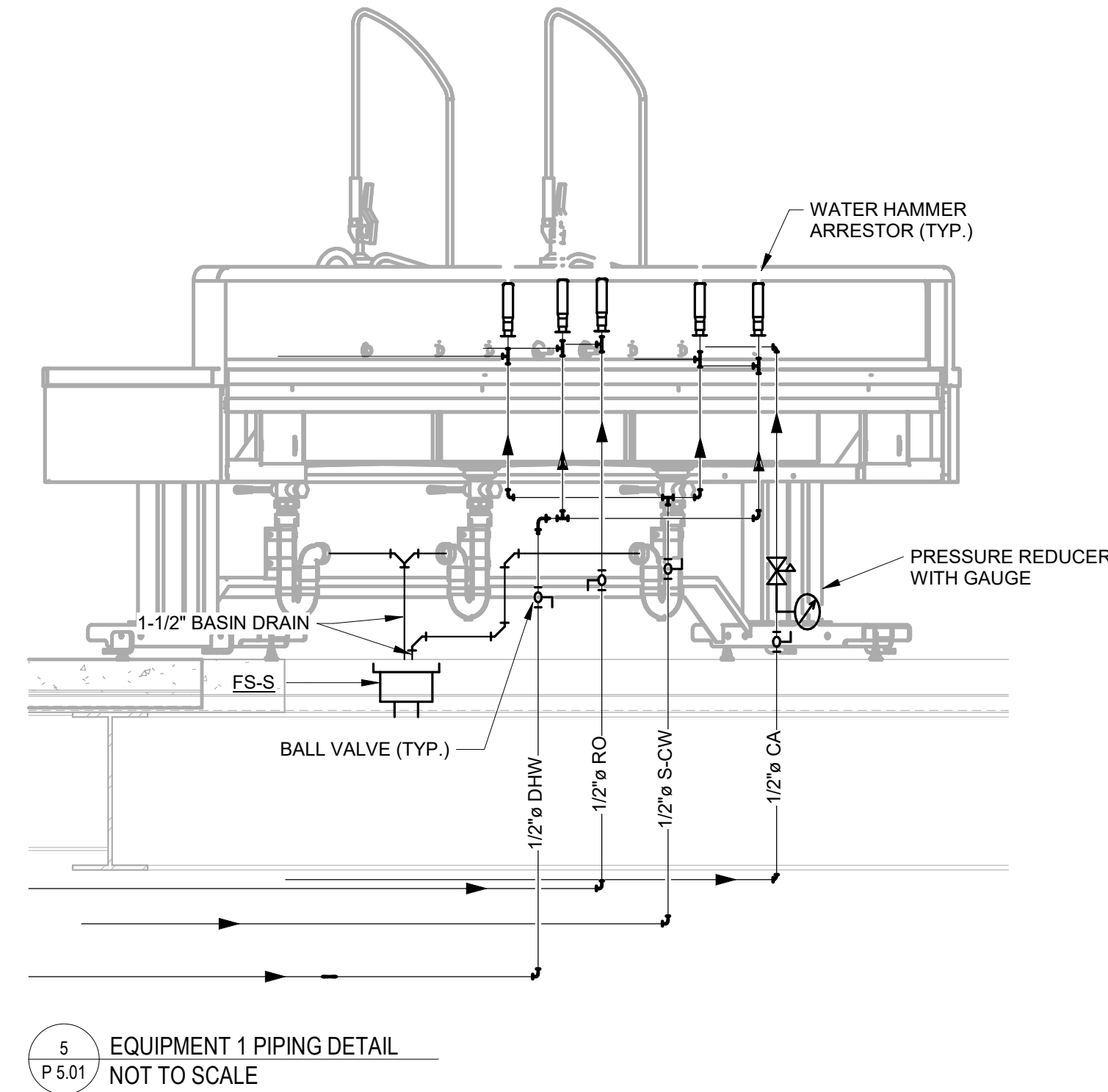
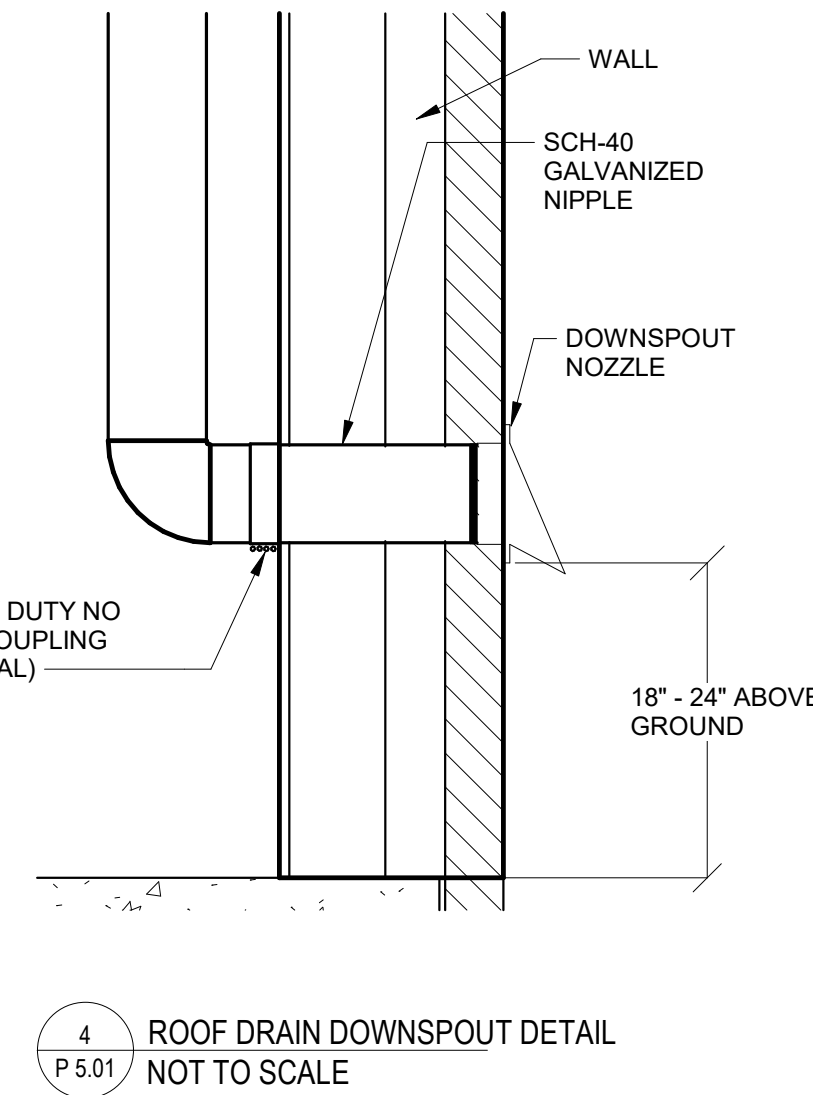
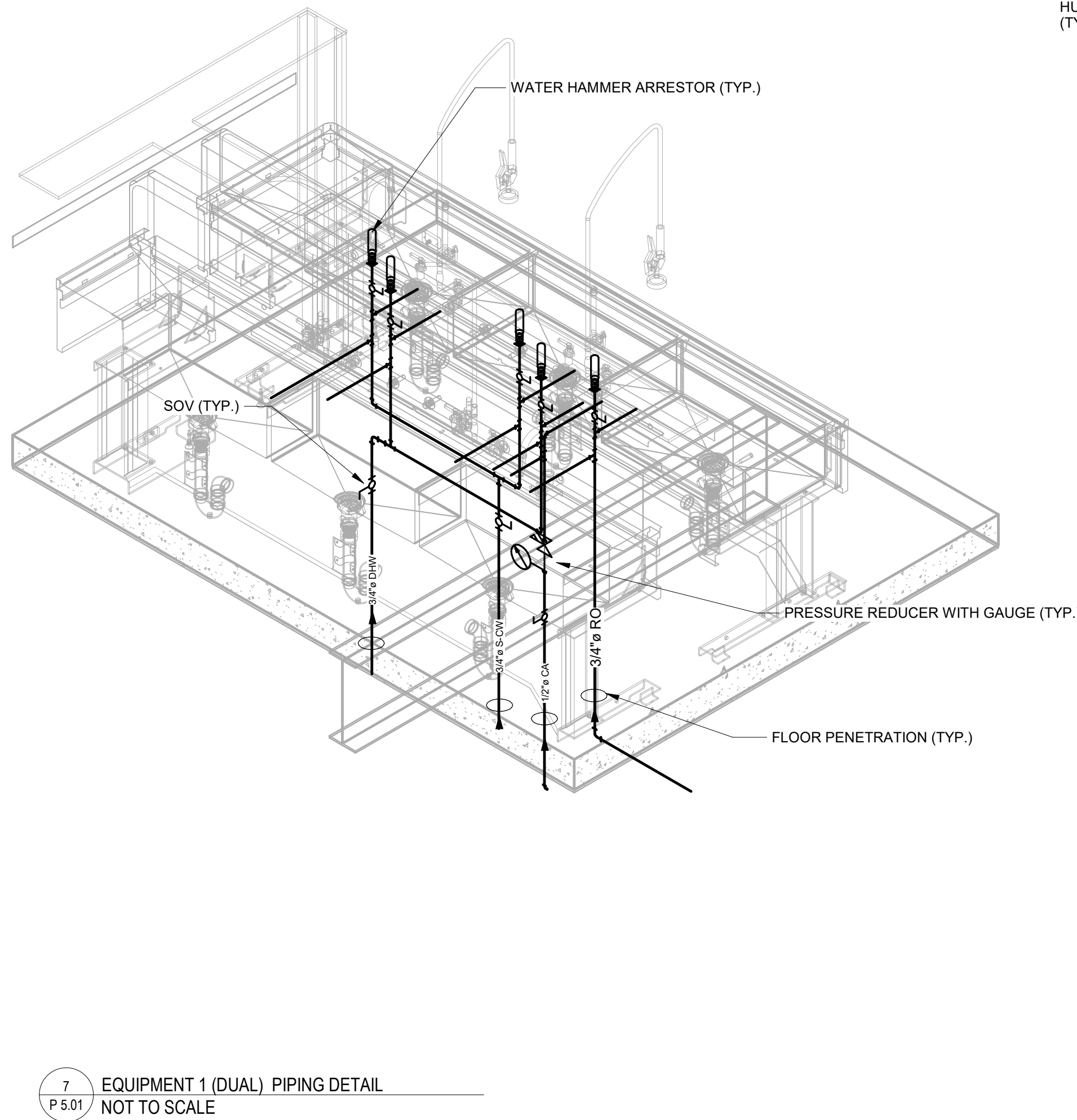
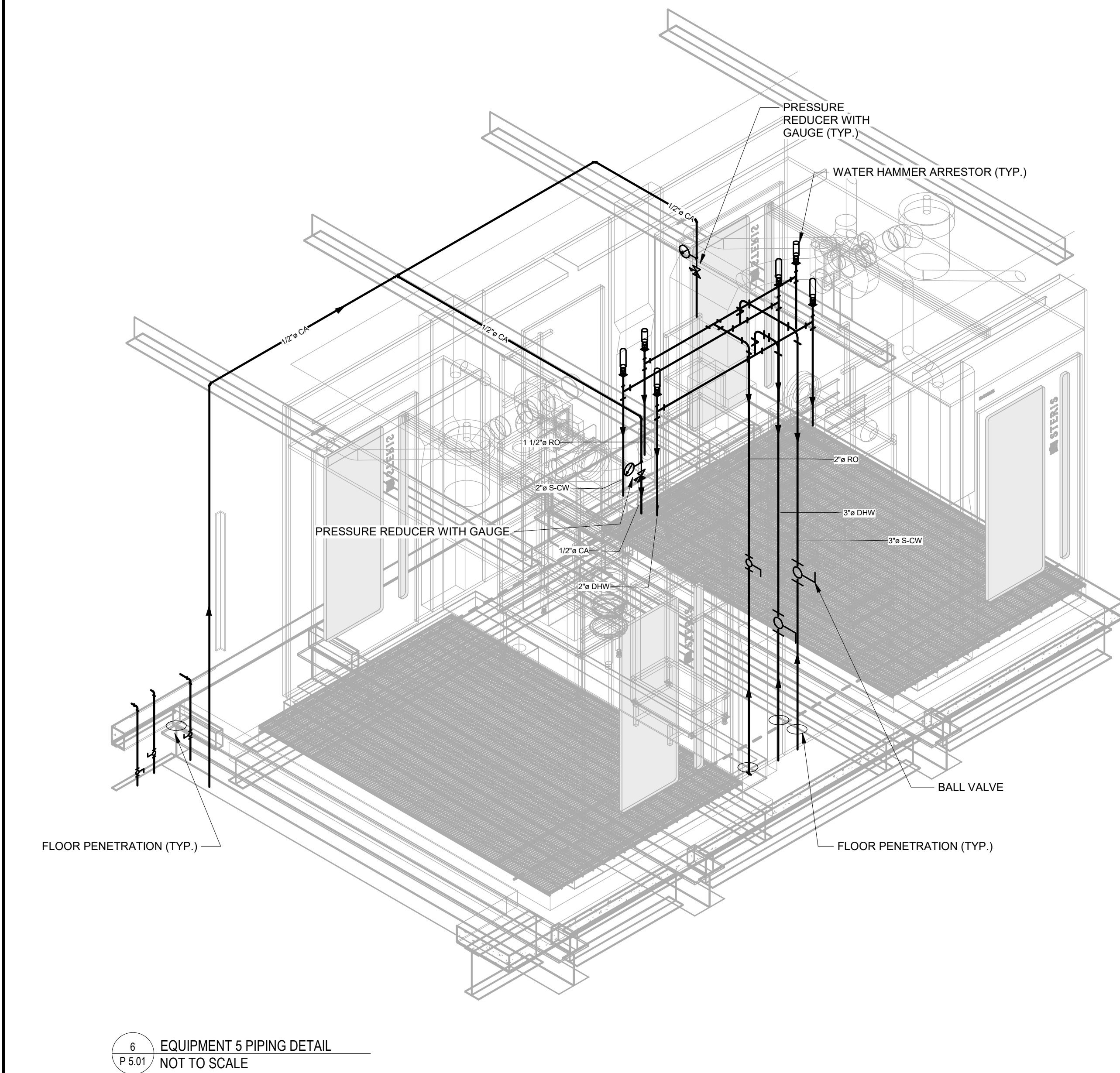
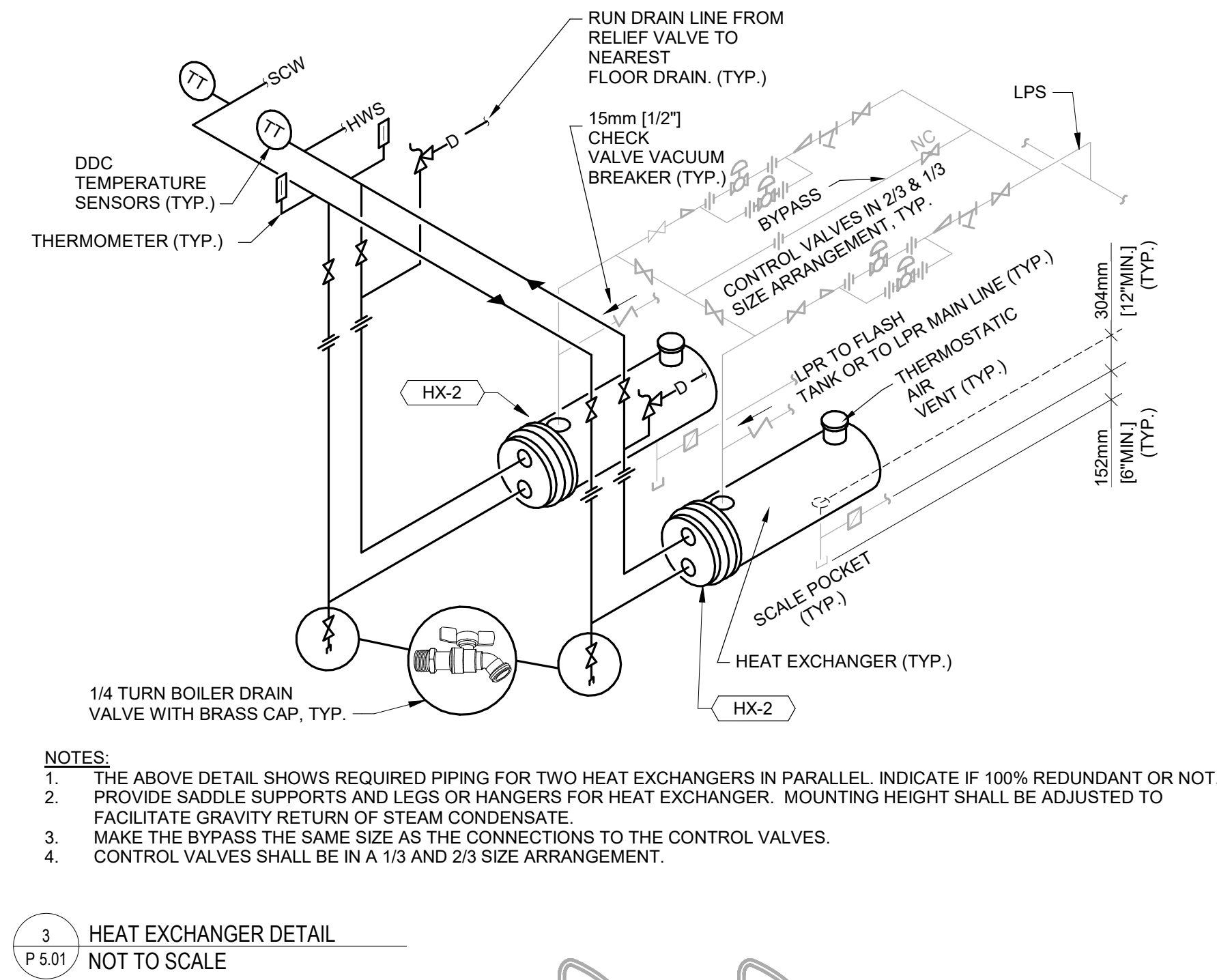
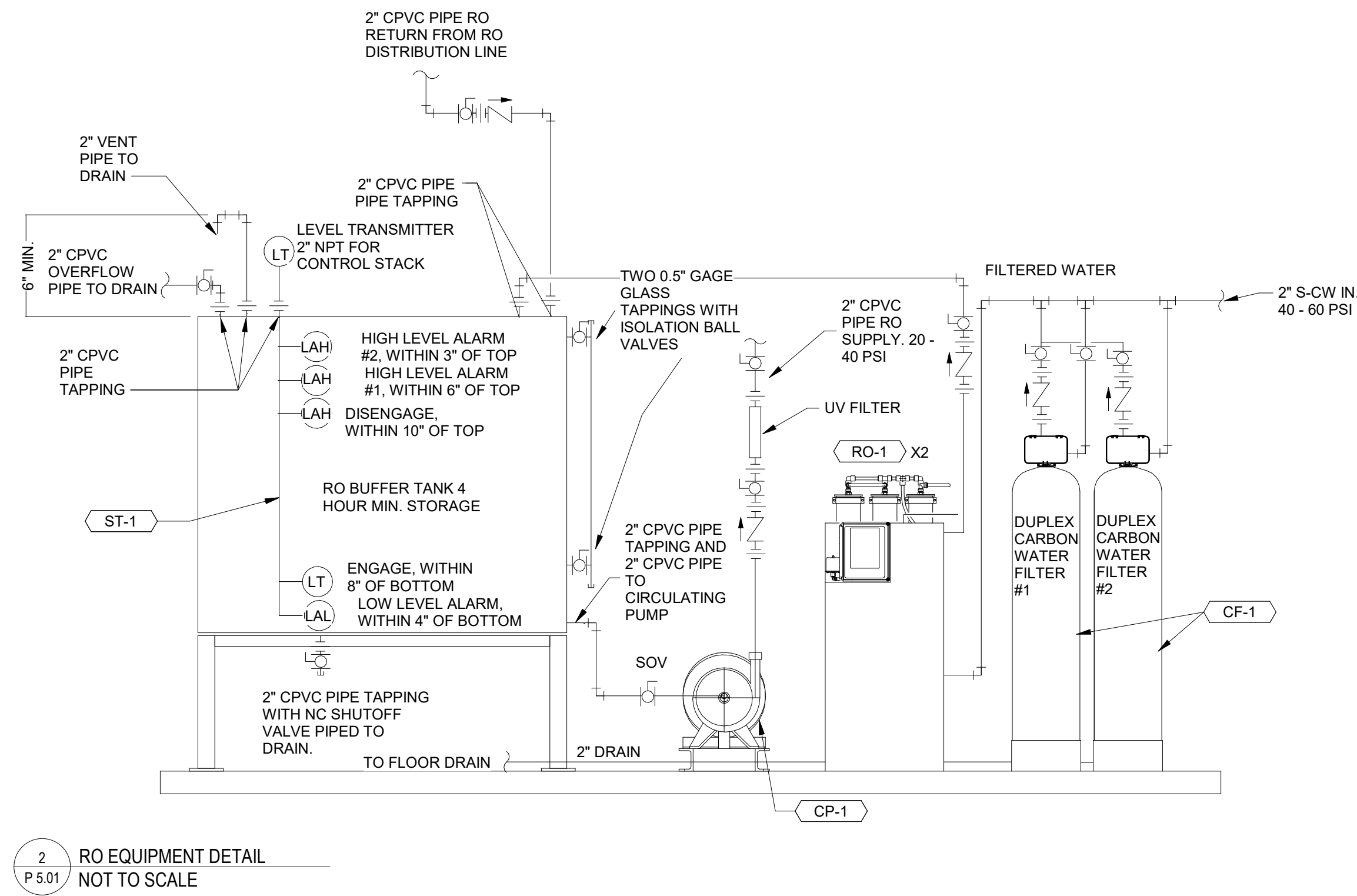
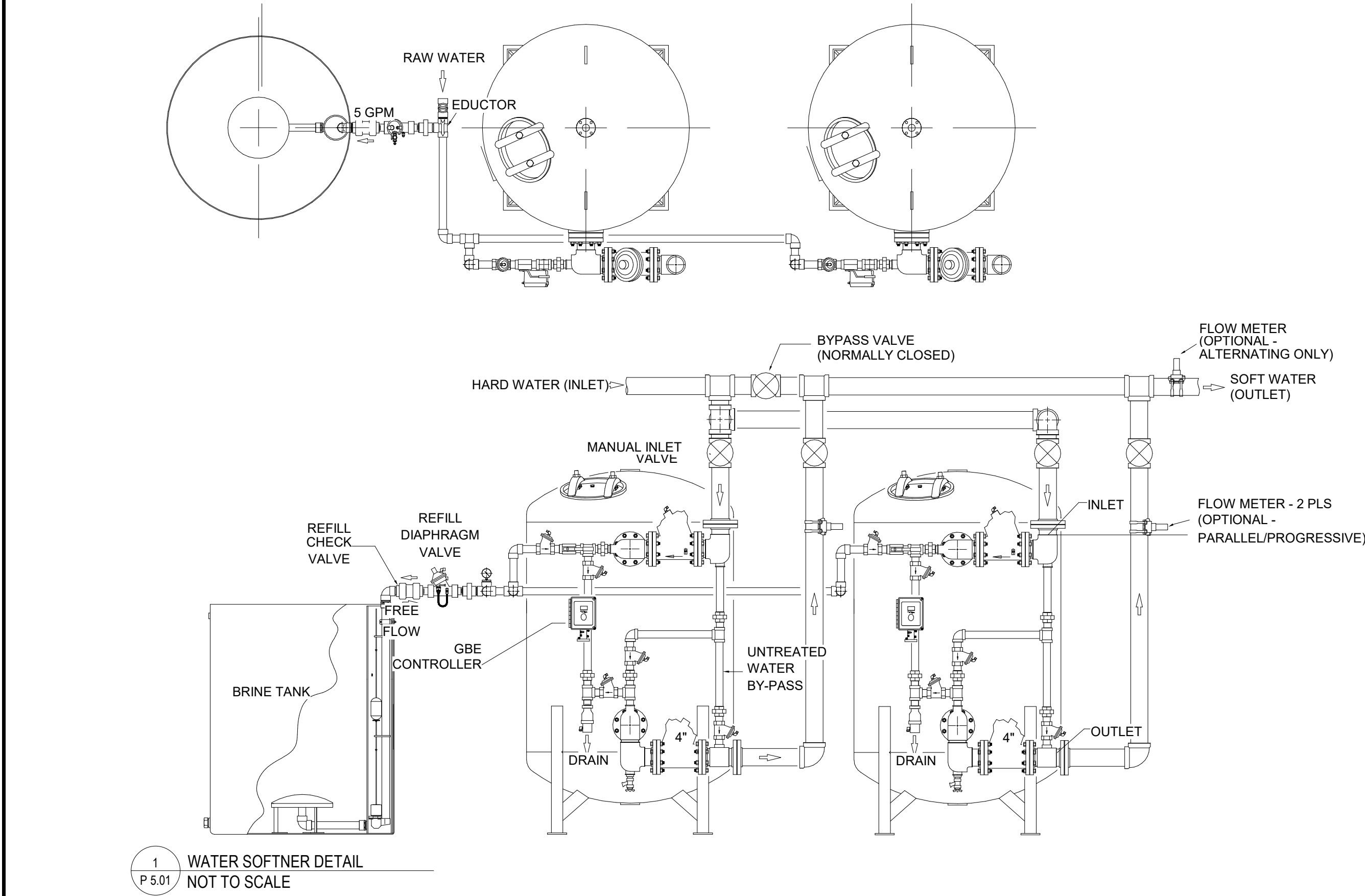
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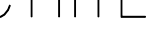
ARCHITECT

		CONSULTANTS:  TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736		 ALBERTSON ENGINEERING, INC. 3202 WEST MAIN STREET, SUITE C RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 343-9606				ARCHITECT  FOURFRONT DESIGN, INC. 917 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM		Project Title PLUMBING SECTIONS Approved: Project Director Omaha VA Medical Center 16.2330.A08		Project Number 16.2330.A08 Building Number 25 Location 4101 Woolworth Ave #4199 Omaha, Ne 68105 Drawing Number P 3.01 Dwg. 113 of 143		Office of Construction and Facilities Management  Department of Veterans Affairs	
COMPLIANCY REVIEW INCLUDED		2/23/2024													
Revisions:		Date													

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ninety six inches = one foot
ninety seven inches = one foot
ninety eight inches = one foot
ninety nine inches = one foot
one hundred inches = one foot



		CONSULTANTS:		ARCHITECT		Drawing Title		Project Title		Project Number		Office of Construction and Facilities Management			
		 TERRASITE DESIGN 1635 DEADWOOD AVENUE RAPID CITY, SOUTH DAKOTA 57702 PH: (605) 791-1736		 Alberston Engineering Inc.		 FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900		 FOURFRONT DESIGN, INC. 517 7TH STREET RAPID CITY, SOUTH DAKOTA 57701 PH: (605) 342-9470 FAX: (605) 342-2377 WWW.FOURFRONTDESIGN.COM		PLUMBING DETAILS				VA NWIHCS OMC CAMPUS - AE Construct Sterile Processing Service	
COMPLIANCE REVIEW INCLUDED		2/23/2024				Approved: Project Director		Location		Drawing Number		Department of Veterans Affairs			
Revisions:		Date				Omaha VA Medical Center		4101 Woolworth Ave #4199 Omaha, Ne 68105		P 5.01 Dwg. 114 of 143					
						16.2330.A08		Date		Checked					
								11 / 23 / 2020		RD					
										BM					

BASIC ELECTRICAL REQUIREMENTS

FURNISH ALL LABOR AND MATERIALS AND PERFORM ALL OPERATIONS NECESSARY FOR THE INSTALLATION OF COMPLETE AND OPERATING ELECTRICAL SYSTEMS SUBJECT TO THE CONDITIONS OF THE CONTRACT. PROVIDE SATISFACTORY OPERATION OF ALL EQUIPMENT AND CONTROLS TO THE ARCHITECT/ENGINEER UPON REQUEST.

ALL MATERIALS SHALL BE NEW. SUBSTITUTIONS SHALL BE APPROVED BY OWNER AND/OR ENGINEER.

VISIT THE PREMISES BEFORE SUBMITTING BID AS NO CHANGE ORDERS WILL BE ALLOWED FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS.

COORDINATE AND ORDER THE PROGRESS OF WORK TO CONFORM TO THE PROJECT SCHEDULE AND THE PROGRESS OF THE WORK OF THE OTHER TRADES.

ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND BECAUSE OF THE SMALL SCALE, IT IS NOT POSSIBLE TO INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. VERIFY ALL SPACE REQUIREMENTS, COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.

PERFORM WORK IN ACCORDANCE WITH GOOD COMMERCIAL PRACTICE. THE GOOD APPEARANCE OF THE FINISHED WORK SHALL BE OF EQUAL IMPORTANCE WITH ITS ELECTRICAL EFFICIENCY AND INTENT. THE OWNER MAY REJECT WORK IF WORKMANSHIP AND APPEARANCE ARE NOT SATISFACTORY.

INSTALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE, OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AND ORDINANCES. COMPLY WITH REQUIREMENTS OF THE UTILITY COMPANIES. IN THE CASE OF DIFFERENCES BETWEEN THESE REQUIREMENTS AND ORDINANCES, THE MOST STRINGENT SHALL GOVERN. CALL FOR INSPECTIONS REQUIRED BY LOCAL BUILDING INSPECTION AUTHORITY.

PLANS AND SPECIFICATIONS GO HAND IN HAND. WHAT IS REQUIRED IN ONE IS REQUIRED IN BOTH. WHERE CONFLICTS BETWEEN SPECIFICATIONS AND PLANS EXIST, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

ELECTRICAL PLANS SUPERSEDE ARCHITECTURAL PLANS. BACKGROUND FLOOR PLANS USED FOR ELECTRICAL DRAWINGS MAY SHOW DIFFERENT THAN THE FINAL ARCHITECTURAL LAYOUT. REFER TO ARCHITECTURAL DRAWINGS FOR ACTUAL DIMENSIONS AND LAYOUT PLACEMENTS FOR SPACE CONDITIONS.

ELECTRICAL DETAILS MAY OR MAY NOT BE DIRECTLY REFERENCED. ALL DETAILS SHOWN ARE TO BE USED FOR BASIS OF INSTALLATION IN ALL CASES, IN COORDINATION WITH MANUFACTURERS' INSTALLATION RECOMMENDATIONS.

ELECTRICAL SHEETS ARE NOT INTENDED TO SPECIFICALLY BE TRADE SPECIFIC TO ELECTRICAL INSTALLATION WORK. ALL MECHANICAL AND ELECTRICAL TRADES ARE RESPONSIBLE FOR FAMILIARIZING THEMSELVES AND INCLUDING A COMPLETE PACKAGE WITHIN THEIR OFFER FOR A COMPLETE SYSTEM.

AT COMPLETION OF WORK, DELIVER COMPLETED PROJECT RECORD DOCUMENTS MARKED WITH FIELD CHANGES TO OWNER.

PROVIDE A WRITTEN WARRANTY TO THE OWNER COVERING THE ENTIRE ELECTRICAL WORK TO BE FREE FROM DEFECTIVE MATERIALS, EQUIPMENT AND WORKMANSHIP FOR A PERIOD OF 1 YEAR AFTER DATE OF ACCEPTANCE.

CLEAN EXPOSED SURFACES OF LIGHT FIXTURES, SWITCHGEAR, AND OTHER EXPOSED ITEMS OF GREASE, DIRT OR OTHER FOREIGN MATERIAL. REMOVE RUBBISH AND DEBRIS RESULTING FROM THE OPERATIONS AND LEAVE EQUIPMENT SPACES CLEAN AND READY FOR USE.

MAINTAIN ALL CEILING, FLOOR AND WALL FIRE AND SMOKE PROTECTION RATINGS. SEAL ALL CONDUIT AND ENCLOSURE PENETRATIONS TO COMPLY WITH UL ASSEMBLY AND BUILDING CODE REQUIREMENTS. ALL SEALANTS AND CONSTRUCTIONS SHALL BE APPROVED BY OWNER PRIOR TO APPLICATION. ALL OPENINGS SHALL BE SEALED DAILY.

CONTRACT DRAWINGS FOR ELECTRICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, CONDUITS, AND APPROXIMATE SIZES AND LOCATIONS OF EQUIPMENT AND OUTLETS. MECHANICAL/ELECTRICAL TRADES SHALL FOLLOW THESE DRAWINGS IN LAYING OUT THEIR WORK, CONSULT GENERAL CONSTRUCTION DRAWINGS TO FAMILIARIZE THEMSELVES WITH ALL CONDITIONS AFFECTING THEIR WORK, AND SHALL VERIFY SPACES IN WHICH THEIR WORK WILL BE INSTALLED. COORDINATE WORK WITH OTHER TRADES AND AS PROJECT CONDITIONS REASONABLY REQUIRE WITHOUT EXTRA COSTS TO OWNER.

ELECTRICAL SPECIFIC: RACEWAYS SHALL BE LEFT WITH 30% FREE SPACE FOR FUTURE NEEDS.

SHARING OF NEUTRALS BETWEEN PHASES SHALL NOT BE ALLOWED.

SEPARATE GROUNDING CONDUCTORS SHALL BE PROVIDED IN ALL RACEWAYS.

CONDUCTORS SHALL BE COPPER. COLOR CODING SHALL BE NEC APPROVED AND AT MINIMUM SHALL BE AS FOLLOWS: 120/208 VOLT-BLACK, RED, BLUE FOR PHASE CONDUCTORS, WHITE FOR NEUTRAL CONDUCTORS, 277/480 VOLT-BROWN, ORANGE, YELLOW FOR PHASE CONDUCTORS, GRAY FOR NEUTRAL CONDUCTORS. GROUNDING CONDUCTORS SHALL BE GREEN.

ELECTRICAL SYSTEMS SHALL COMPLY WITH 2020 NATIONAL ELECTRICAL CODE AND BE INSTALLED BY LICENSED CONTRACTORS. LIGHTING SHALL COMPLY WITH THE 2021 IECC.

UTILITIES: LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE EXACT LOCATIONS IN THE FIELD (NOT ALL UTILITIES ARE SHOWN).

REGULATORY AND CODE REQUIREMENTS: APPLY FOR AND PAY FOR ALL PERMITS, FEES, LICENSES AND INSPECTIONS. ALL WORK IS SUBJECT TO APPROVAL BY THE CODE OFFICIAL AND ENGINEER. ALL CORRECTIONS SHALL BE MADE WITHOUT EXTRA COSTS TO OWNER.

ELECTRICAL LEGEND (FLOORPLAN)

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	MOTOR, SINGLE-PHASE		INSTANTANEOUS OVERCURRENT RELAY		NURSE CALL STATION
	MOTOR, THREE-PHASE		AC-TIME OVERCURRENT RELAY		D = CORRIDOR DOME LIGHT MTD 6" ABOVE DOOR
	TRANSFORMER		AC-DIRECTIONAL OVERCURRENT RELAY		I = AUXILIARY INTERSECTIONAL DOME LIGHT
	WYE CONNECTION		LOCKING OUT RELAY		TELECOMMUNICATIONS TERMINAL CABINET
	DUCT, CELL FLOOR HEADER		DISCONNECT SWITCH, FUSED		TELECOMMUNICATIONS BACKBOARD (WALL MTD)
	DUCT, TROLLEY		DISCONNECT SWITCH, UNFUSED		ELECTRIC POWER HINGE
	DUCT, UNDER-FLOOR JUNCTION BOX		STARTER, COMBINATION WITH DISCONNECT SWITCH		DOOR CONTACT
	EARTH GROUND		STARTER OR MOTOR CONTROLLER		MOTION INTRUSION DETECTOR
	JUNCTION BOX		VARIABLE FREQUENCY DRIVE		SECURITY SURVEILLANCE TELEVISION
	LADDER CABLE TRAY		TIME CLOCK		CAMERA
	BRANCH CIRCUIT HOMERUN. LINES INDICATE NUMBER OF CIRCUITS, NEUTRAL, AND SWITCH LEG CONDUCTORS. ONE SEPARATE GREEN GROUNDING CONDUCTOR SHALL BE PROVIDED FOR EACH HOMERUN, NOT SHOWN		RECTIFIER, CATHODIC PROTECTION SANITARY		360 CAMERA
	PULL BOX		VENTILATOR OR FAN COIL UNIT OUTLET		CARD ACCESS READER; LETTER INDICATES AS FOLLOWS: M-MOUNT D-DESK F-FLUSH H-HIDDEN W-WALL P-PEDESTAL R-RACK S-SURFACE
	WIREWAY		CONDUIT TERMINATED 6" (152mm) AFF IN STANDARD BOX FOR EXTENSION TO EQUIPMENT AS DIRECTED.		B-BARCODE
	RIGID CONDUIT LINE = RC		CONDUIT TERMINATED W/FLUSHING (FLUSH W/FINISHED FLOOR) FOR EXTENSION TO EQUIPMENT AS DIRECTED		M-MAG STRIP
	DIRECT BURIAL CABLE = DB		SWITCH, SPST		F-ELEVATOR FLOOR CALL
	POWER DUCT = P		SWITCH, DPST		H-ELEVATOR HALL CALL
	AUDIO VISUAL LINE = AV		SWITCH, THREE WAY DIMMER		S-SMART CARD
	CABLE TELEVISION LINE = CATV		SWITCH, THREE WAY OCCUPANCY SENSOR		T-TOKEN
	CLOSED CIRCUIT TELEVISION LINE = CCTV		SWITCH, FOUR WAY		ELECTRONIC LOCK; LETTER INDICATES AS FOLLOWS: M-MOUNT D-DESK F-FLUSH H-HIDDEN W-WALL P-PEDESTAL R-RACK S-SURFACE
	FIBER OPTICS LINE = FO		SWITCH, DIMMER		C-CEILING
	COMMUNICATIONS LINE = COM		SWITCH, DOOR JAMB		D-DESK
	INTERCOM LINE = NC		SWITCH, FOUR WAY OCCUPANCY SENSOR		F-FLUSH
	NURSE CALL LINE = NC		SWITCH, DIMMER		H-HIDDEN
	SUBSTATION		SWITCH, FUSED		W-WALL
	HI VOLTAGE SWITCH ON CONCRETE PAD		SWITCH, KEY OPERATED		P-PEDESTAL
	LOW VOLTAGE SWITCH ON CONCRETE PAD		SWITCH, LOW VOLTAGE MASTER		R-RACK
	DUAL POWER AND TELECOMMUNICATIONS MANHOLE		SWITCH, MANUAL, MOTOR STARTING		S-SURFACE
	BUSWAY		SWITCH, MOMENTARY CONTACT		M-MOUNT
	DISTRIBUTION PANEL		SWITCH, MOTOR SNAP WITH PILOT LIGHT (THERMAL TYPE)		C-CEILING
	LIGHTING PANEL		SWITCH, OCCUPANCY SENSOR		D-DESK
	PANELBOARD CABINET, FLUSH MOUNTED		SWITCH, OCCUPANCY SENSOR DIMMER		F-FLUSH
	PANELBOARD CABINET, SURFACE MOUNTED		SWITCH, WITH PILOT LIGHT		H-HIDDEN
	RECEPTACLE, CLOCK HANGER		SWITCH, PHOTOCCELL		W-WALL
	RECEPTACLE, DUPLEX		SWITCH, REMOTE CONTROL		P-PEDESTAL
	RECEPTACLE, GFCI DUPLEX		SWITCH, WEATHER PROOF		R-RACK
	RECEPTACLE, QUADRUPLEX		SWITCH, EXPLOSION PROOF		S-SURFACE
	RECEPTACLE, SPECIAL PURPOSE 120V, 20A, 1 PHASE, 2-POLE, 3W, NEMA 5-20R		COMMUNICATIONS FLOOR RECEPTACLE		M-MOUNT
	RECEPTACLE, SPECIAL PURPOSE 208V, 20A, 1 PHASE, 2-POLE, 3W, NEMA 6-20R		COMMUNICATIONS WALL RECEPTACLE		C = CAMERA (CCTV SYSTEM)
	RECEPTACLE, SPECIAL PURPOSE 120V, 30A, 1 PHASE, 2-POLE, 3W, NEMA 5-30R		COMMUNICATIONS CEILING RECEPTACLE		M = MONITOR (CCTV SYSTEM)
	RECEPTACLE, SPECIAL PURPOSE 208V, 30A, 1 PHASE, 2-POLE, 3W, NEMA 6-30R		TELEVISION FLOOR RECEPTACLE		M = MONITOR (CCTV SYSTEM)
	RECEPTACLE, SPECIAL PURPOSE 208V, 60A, 1 PHASE, 3-POLE, 4W, NEMA 14-60R		TELEVISION CEILING RECEPTACLE		C = CAMERA (CCTV SYSTEM)
	RECEPTACLE, SPECIAL PURPOSE 208V, 30A, 3 PHASE, 3-POLE, 4W, NEMA 15-30R		TELEVISION WALL RECEPTACLE		M = MONITOR (CCTV SYSTEM)
	RECEPTACLE, SPECIAL PURPOSE 208V, 60A, 3 PHASE, 3-POLE, 4W, NEMA 15-60R		TELEVISION WALL RECEPTACLE		C = CAMERA (CCTV SYSTEM)
	RECEPTACLE, SPECIAL PURPOSE 208V, 20A, 3 PHASE, 3-POLE, 4W, NEMA 15-20R		TELEVISION CEILING RECEPTACLE		M = MONITOR (CCTV SYSTEM)
	RECEPTACLE, SWITCHED DUPLEX		TELEVISION WALL RECEPTACLE		C = CAMERA (CCTV SYSTEM)
	DROP CORD, SINGLE CONVENIENCE OUTLET, 3-WIRE, GROUNDING TYPE, 20A, W/12 CONDUCTORS IN FLEXIBLE CORD (CENTER LINE OF OUTLET: 6'-6" (1981mm) AFF. MINIMUM)		TELEVISION CEILING RECEPTACLE		M = MONITOR (CCTV SYSTEM)
	ELECTRICAL STRIP MOLD (OUTLETS ON 2'-0" (610mm) CENTERS OR AS DESIGNATED ON DRAWINGS), MTD 3'-6" (1087mm) AFF. OR AS INDICATED		TELEVISION WALL RECEPTACLE		C = CAMERA (CCTV SYSTEM)

ELECTRICAL LEGEND (DETAILS)

SYMBOL	DESCRIPTION
	DELTA CONNECTION
	MOTOR, SINGLE-PHASE
	MOTOR, THREE-PHASE
	TRANSFORMER
	WYE CONNECTION
	EARTH GROUND
	JUNCTION BOX
	PULL BOX
	PRESSURE SWITCH-CLOSE ON INCREASE
	PRESSURE SWITCH-OPEN ON INCREASE
	SWITCH, MULTIPPOSITION
	SWITCH, NORMALLY CLOSED FLOAT
	SWITCH, NORMALLY CLOSED FOOT OPERATED
	SWITCH, NORMALLY CLOSED LIMIT
	SWITCH, NORMALLY CLOSED TEMPERATURE ACTIVATED
	SWITCH, NORMALLY CLOSED TIME DELAY
	SWITCH, NORMALLY OPEN FLOAT
	SWITCH, NORMALLY OPEN LIMIT
	SWITCH, NORMALLY OPEN TEMPERATURE ACTIVATED
	SWITCH, NORMALLY OPEN TIME DELAY
	SWITCH, SINGLE BREAK
	NORMALLY CLOSED RELAY CONTACT
	NORMALLY OPEN RELAY CONTACT
	FUSE WITH RATING
	MOLDED CASE CIRCUIT BREAKER
	LOW-VOLTAGE DRAWOUT AIR CIRCUIT BREAKER
	HIGH-VOLTAGE OIL CIRCUIT BREAKER
	SWITCH AND FUSE UNIT
	FUSED DRAWOUT POTENTIAL TRANSFORMER
	INSTANTANEOUS OVERCURRENT RELAY
	AC-TIME OVERCURRENT RELAY
	AC-DIRECTIONAL OVERCURRENT RELAY
	LOCKING OUT RELAY
	DISCONNECT SWITCH, FUSED
	DISCONNECT SWITCH, UNFUSED
	FUSIBLE LINK
	STARTER, COMBINATION WITH DISCONNECT SWITCH
	STARTER OR MOTOR CONTROLLER
	TIME CLOCK
	GENERATOR, POWER
	BATTERY
	CAPACITOR
	POTHEAD
	STRESS CONE
	LIGHTNING ARRESTOR
	RECTIFIER, CATHODIC PROTECTION SANITARY
	METER
	AMMETER
	VOLTMETER
	WATTMETER
	WATT-HOUR METER

ELECTRICAL ABBREVIATIONS

1PH	SINGLE-PHASE	ELEC	ELECTRIC OR ELECTRICAL	MW	MEGAWATT MICROWAVE
1P	SINGLE POLE	ELEV	ELEVATOR	NA	NOT APPLICABLE
2/C	TWO-CONDUCTOR	EMCP	EMERGENCY MONITORING CONTROL	NEC	NATIONAL ELECTRICAL CODE
3/C	THREE-CONDUCTOR	EMER	EMERGENCY	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
3PH	THREE-PHASE	EMI	ELECTROMAGNETIC INTERFERENCE	NEUT OR N	NEUTRAL
4/C	FOUR-CONDUCTOR	EMT	ELECTRICAL METALLIC TUBING	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
4W	FOUR-WIRE	ENCL	ENCLOSURE	EPO	NOT IN CONTRACT
AAP	ALARM ANNUNCIATOR PANEL	EPF	EXPLOSION PROOF	ESMT	EASEMENT
ACC	ACCESSIBLE	EW	ELECTRIC WATER COOLER	EW	ELECTRIC WATER HEATER
ADO	AUTOMATIC DOOR OPENER	EXIST	EXISTING	OC	ON CENTER
AFC	ABOVE FINISHED COUNTER, AUTOMATIC FREQUENCY CONTROL, OR AVAILABLE	FA	FIRE ALARM	OD	OUTSIDE DIAMETER
AF	FAULT CURRENT	FAAP	FIRE ALARM ANNUNCIATOR PANEL	OF	OWNER FURNISHED
AFG	ABOVE FINISHED GRADE	FAB	FIRE ALARM BELL	OF/CI	OWNER FURNISHED/CONTRACTOR
AH	AMPERE HOUR	FABX	FIRE ALARM BOX	OF/O	OWNER FURNISHED/OWNER INSTALLED
AHU	AUTHORITY HAVING JURISDICTION	FACP	FIRE ALARM CONTROL PANEL	OL	OVERLOAD
AIC	AMPERE INTERRUPTING CAPACITY	FC	FOOTCANDLE	OS	OCCUPANCY SENSOR
AMP	AMPERE	FIX	FIXTURE	P	POLE
AMP	AMPS SHORT CIRCUIT	FLA	FULL LOAD AMPS	PA	PUBLIC ADDRESS
AT	AMPERE TRIP	FLEX	FLEXIBLE METALLIC CONDUIT	PB	PANELBOARD, PULL BOX, OR PUSHBUTTON
ATS	AUTOMATIC TRANSFER SWITCH	FL	FLOODLIGHT	PBPU	PREFABRICATED BEDSIDE PATIENT UNIT
AUTO	AUTOMATIC	FLUOR	FLUORESCENT	PCB	POLYCHLORINATED BIPHENYL
AV	AUDIO VISUAL	FLUOR FIX	FLUORESCENT FIXTURE	PEC	POLYESTER CELL
BAS	BUILDING AUTOMATION SYSTEM	FP	FIRE PROTECTION	PED	PEDESTAL
BFL	BELOW FINISH FLOOR	FT	FEET OR FOOT	PEND	PENDANT
BLD	BUILDING	FSW	FEEDER SWITCH	PF	POWER FACTOR
BPIP	BOILER PLANT INSTRUMENTATION PANEL	FVNR	FULL VOLTAGE NON-REVERSING	PH	PHASE
BRKR	BREAKER	FVR	FULL VOLTAGE REVERSING	PI	PANEL
BY	BY PASS	G OR GND	GROUND	POD	POWER OPERATED DAMPER
C	CONDUIT	GEN	GENERATOR	PT	POTENTIAL TRANSFORMER
CAB	CABINET	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	PTR	POTENTIAL TRANSFORMER
CALC	CALCULATE	GTB	GROUND TERMINAL BOX	PVC	POLYVINYL CHLORIDE (PLASTIC)
CAP	CAPACITY	H	HEIGHT	PWR	POWER
CAT	CATALOG	HID	HIGH INTENSITY DISCHARGE	RCP	REFLECTED CEILING PLAN
CATV	COMMUNITY ANTENNA TELEVISION	HOA	HAND-OFF-AUTOMATIC	RECPT	RECEPTACLE
CCTV	CLOSED CIRCUIT TELEVISION	HT	HERTZ	RGS	RIGID GALVANIZED STEEL
CAN	CANAL	INC	INCANDESCENT	RM	ROOM
CD	CONSTRUCTION DOCUMENTS	IR	INFRARED	RMS	ROOT MEAN SQUARE
CF	CONTRACTOR FURNISHED	IS	INSTANTANEOUS	REQD	REQUIRED
CF/CI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED	ISNA	ILLUMINATION ENGINEERING SOCIETY OF NORTH AMERICA	SCC	SHORT CIRCUIT CAPACITY
CF/OI	CONTRACTOR FURNISHED/OWNER INSTALLED	IMC	INTERMEDIATE METAL CONDUIT	SES	SERVICE ENTRANCE SECTION
CHW	CHILLED WATER	INCAND	INCANDESCENT	SD	SMOKE DETECTOR
CHWP	CHILLED WATER PUMP	IR	INFRARED	SE	SQUARE FOOT (FEET)
CKT	CIRCUIT	IWH	INSTANTANEOUS WATER HEATER	SHT	SHEET
CKT BRKR	CIRCUIT BREAKER	J-BOX	JUNCTION BOX	SI	INTERNATIONAL SYSTEM OF UNITS
CJF	CURRENT LIMITING FUSE	KV	KILOVOLT	SPEC	SPECIFICATION
CLG	CEILING	KVA	KILOVOLT AMPERE	SPST	SINGLE POLE, SINGLE THROW
CMU	CONCRETE MASONRY UNIT	KWH	KILOWATT HOUR	SPDT	SINGLE POLE, DOUBLE THROW
COAX	COAXIAL CABLE	KWH	KILOWATT HOUR	SURF	SURFACE
COMM	COMMUNICATION	KWH	KILOWATT HOUR	SW	SWITCH
CONC	CONCRETE	LED	LIGHT EMITTING DIODE	SWBD	SWITCHBOARD
CONT	CONTINUE	LF	LINEAR FEET (FOOT)	SWGR	SWITCHGEAR
CONTR	CONTRACTOR	LM	LUMEN	TC	TIME CLOCK
COORD	COORDINATE	LP	LIGHT POLE	TEL	TELEPHONE
CPT	CONTROL POWER TRANSFORMER	LPS	LOW PRESSURE SODIUM	TP	TWISTED PAIR
CRI	COLOR RENDERING INDEX	LRA	LOCKED ROTOR AMPS	TPS	TWISTED PAIR SHIELDED
CT	CURRENT TRANSFORMER	LTCP	LOCAL TEMPERATURE CONTROL PANEL	TTB	TELEPHONE TERMINAL BOARD
CTV	CABLE TELEVISION	LTG	LIGHT	TV	TELEVISION
CU	COPPER	LTG PNL	LIGHTING PANEL	TY	TYPICAL
CU FT	CUBIC FEET	LV	LOW VOLTAGE	UFD	UNDERFLOOR DUCT
CU	CURRENT	LV	LOW VOLTAGE	UGND	UNDERGROUND
DAS	DISTRIBUTED ANTENNA SYSTEM	MC	MAIN CIRCUIT BREAKER	UL	UNDERWRITERS LABORATORY
DB	DECIBEL	MCA	MAIN CIRCUIT BREAKER	UCN	UNLESS OTHERWISE NOTED
DC	DIRECT CURRENT	MCB	MAIN CIRCUIT BREAKER	UPS	UNINTERRUPTIBLE POWER SUPPLY
DCP	DIMMER CONTROL PANEL	MCC	MAIN CIRCUIT BREAKER	UTIL	UTILITY
DEG C	DEGREES CELSIUS	MCD	MAXIMUM OVERCURRENT PROTECTION	V	VOLT
DEG F	DEGREES FAHRENHEIT	MCH	MAIN CIRCUIT BREAKER	V	VOLT
DEMO	DEMOLITION	MCP	MAXIMUM OVERCURRENT PROTECTION	V	VOLT</

one eighth inch = one foot

 one quarter inch = one foot

 one eighth inch = one foot

 three eighths inch = one foot

 one half inch = one foot

 one quarter inch = one foot

 three quarters inch = one foot

 one inch = one foot

 one and one half inches = one foot

 one and three quarters inches = one foot

 two inches = one foot

 two and one half inches = one foot

 three inches = one foot

 three and one half inches = one foot

 four inches = one foot

 four and one half inches = one foot

 five inches = one foot

 five and one half inches = one foot

 six inches = one foot

 six and one half inches = one foot

 seven inches = one foot

 seven and one half inches = one foot

 eight inches = one foot

 eight and one half inches = one foot

 nine inches = one foot

 nine and one half inches = one foot

 ten inches = one foot

 ten and one half inches = one foot

 eleven inches = one foot

 eleven and one half inches = one foot

 twelve inches = one foot


A circular professional engineer seal for the State of Montana. The outer ring contains the text "MONTANA" at the top and "PROFESSIONAL ENGINEER" at the bottom, separated by two stars. The inner circle contains the text "RAYMOND E. JAMES" and "No. 19925PE". A signature is written across the seal.

FOURFRONT

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CONSTRUCTION DOCUMENTS

PANEL LOCATION ROOM:3254						PANEL "DPB2"										BREAKER 400A FED FROM TB2											
MFR MODEL --- AC 65,000						L-L VOLT: 208 L-N VOLT: 120 RATED AMP:		PHASE: 3 WIRES: 4 NEUTRAL 100%		MAIN LUGS NO COND. SIZE (E)		MOUNT SURFACE															
DESCRIPTION	BREAKER TYPE (POLE)	AMP	SIZE	INSULATION	GND	L-LOAD	R-LOAD	O-LOAD	/IS(OH) A/E/H	PHASE	/IS(OH) A/E/H	O-LOAD	R-LOAD	L-LOAD	SIZE	INSULATION	GND	AMP	POLE	TYPE	DESCRIPTION						
PANEL NL-TR-B1-10-1	3	225	(E)	(E)	(E)				1348 S 1 A 2 S 2369 1392 S 3 B 4 S 2281 1484 S 5 C 8 S 2101 5582 7 A 8 4322 9 B 10 T 4322 11 C 12						(E)	(E)	(E)	100	3		PANEL NL-TR-B1-5-						
NEW PANEL TR.B1-3.2	3	60	(4)#	THHN	#6				13 A 14 S 3330 15 B 16 S 2462 17 C 18 S 2462						(E)	(E)	(E)	60	3		SPARE						
SPARE	3	60	(E)	(E)	(E)				1168 S 19 A 20 S 3330 1436 S 21 B 22 S 2462 1168 S 23 C 24 S 2462						(E)	(E)	(E)	100	3		PANEL NL-TR-B1-4-1						
PANEL NL-TR-B1-6-1	3	225	(E)	(E)	(E)				0 M 0 0 A 0 7996 S LOAD E 0 0 H 0 0 T 0 14226 O 0				0 0		(E)	(E)	(E)	100	3		PANEL NL-TR-B1-3-1						
SUMMARY CONNECTED LOADS						0	0														SUMMARY CONNECTED LOADS						
DESCRIPTION	CONN KVA					D.F	DEM KVA		AMPERAGE FED TO PANEL 400 AMP					TOTAL CONNECTED LOAD 125.2 KVA					45.5 KVA					LEGENDKEY			
LIGHTING	0.0					1.0	0.0		TOTAL DEMAND LOAD 108.9 AMP					39.2 KVA							T=TRANSFORMER						
RECEPTACES (FIRST 10KW)	0.0					1.0	0.0		TOTAL DEMAND LOAD 108.9 AMP					39.2 KVA							S=SUBFEED						
RECEPTACES (REMAINDER)	0.0					0.5	0.0		DESIGN (MAX) 400 AMP					144.1 KVA							O=OTHER						
MOTORS	0.0					1.0	0.0		SPARE LOAD 291 AMP					104.9 KVA							M=MINIATOR						
LARGEST MOTOR	0.0					1.25	0.0		CONNECTED LOAD BALANCE SUMMARY												A=APPLANCE						
APPLIANCES	0.0					1.0	0.0		CONNECTED LOAD BALANCE SUMMARY												E=EQUIPMENT						
SUBFEED	31.3					0.8	25.0		PHASE A 142.7 AMP					17.12 KVA							H=HEATING						
EQUIPMENT	0.0					1.0	0.0		PHASE B 119.6 AMP					14.355 KVA							R=RECEPTACLES						
HEATING	0.0					1.0	0.0		PHASE C 116.7 AMP					13.999 KVA							L=LIGHTING						
TRANSFORMER	0.0					1.0	0.0														CONN=CONNECTED						
OTHER	14.2					1.0	14.2		A TO B 16 % B TO C 2 % C TO A 22 %												DEM=DEMAND SPR=SPARE SPC=SPACE						
TOTAL KVA 45.5 KVA						39.2 KVA						NOTE: ALL BRANCH WIRE SIZES BASED ON CIRCUIT SHOWING BEING THE ONLY CIRCUIT WITHIN THE CONDUIT. AT CONTRACTOR OPTION UP TO 3 CIRCUITS MAY BE RUN TOGETHER IN A SINGLE CONDUIT AS LONG AS THEY DO NOT SHARE A NEUTRAL AND CONDUCTORS ARE DERATED BASED ON 2016 NEC TABLE 310.15(B)(3)(a)										D.F = DEMAND FACTOR GF=GROUND FAULT CIRCUIT ST=SHUNT TRIP					
DESIGN (MAX) 400 AMP						108.9 AMP																					
SPARE 400 AMP						291.1 AMP																					

PANEL "DPB2"										PANEL "DPB2"																											
PANEL LOCATION: ROOM 3254						L-L VOLT: 208				PHASE: 3				MAIN LUGS NO				BREAKER 400A																			
MFR MODEL: ...						L-N VOLT: 120				WIRES: 4				WIRE SIZE (E)				FED FROM TB2																			
AC: 65,000						RATED AMP:				NEUTRAL: 100%				COND. SIZE (E)				MOUNT SURFACE																			
DESCRIPTION		BREAKER		BRANCH WIRE		L-LOAD		R-LOAD		O-LOAD		PHASE		L-LOAD		R-LOAD		L-LOAD		R-LOAD		O-LOAD		SIZE		INSULATION		GND		AMP		POLE		TYPE		DESCRIPTION	
PANEL NL-TR-B1-10-1		3 225		(E)	(E)	(E)						1348 S	1 A	2 S	2369			(E)	(E)	(E)	100 3				(E)	(E)	(E)	100 3					PANEL NL-TR-B1-5				
NEW PANEL TR.B1-3.2		3 60		(E) #6	THHN	#6						1392 S	3 B	4 S	2281										(E)	(E)	(E)	60 3					SPARE				
SPARE		3 60		(E)	(E)	(E)						1484 S	5 C	8 S	2101										(E)	(E)	(E)	100 3					PANEL NL-TR-B1-4				
PANEL NL-TR-B1-6-1		3 225		(E)	(E)	(E)						5582 S	7 A	8 S	2329										(E)	(E)	(E)	100 3					PANEL NL-TR-B1-3-1				
SUMMARY CONNECTED LOADS		0 0										4322 S	9 B	10 S	2462																		SUMMARY CONNECTED LOADS				
												11 C	12 S																								
												13 A	14 S	3330																							
												15 B	16 S	2462																							
												17 C	18 S	2462																							
												1168 S	19 A	20 S	3330																						
												1436 S	21 B	22 S	2462																						
												1168 S	23 C	24 S	2462																						
												0 M	0 M	0																							
												0 A	0 A	0																							
												7996 S	0 E	0 S	23259																						
												0 E	0 E	0																							
												0 H	0 H	0																							
												0 T	0 T	0																							
												14226 S	0 O	0																							
DESCRIPTION		CONN KVA						D.F		DEM KVA		AMPERAGE FED TO PANEL		400 AMP		TOTAL CONNECTED LOAD		125.2 KVA		45.5 KVA												LEGEND					
LIGHTING		0.0						1.0		0.0		TOTAL DEMAND LOAD		125.2 KVA		TOTAL CONNECTED LOAD		125.2 KVA		45.5 KVA												S=TRANSFORMER					
RECEPTACLES (FIRST 10KW)		0.0						1.0		0.0		TOTAL DEMAND LOAD		108.9 AMP		39.2 KVA																S=SUBFEED					
RECEPTACLES (REMAINDER)		0.0						0.5		0.0		DESIGN (MAX)		400 AMP		144.1 KVA																O=OTHER					
MOTORS		0.0						1.0		0.0		SPARE LOAD		291 AMP		104.9 KVA																M=MINIATOR					
LARGEST MOTOR		0.0						1.25		0.0		CONNECTED LOAD BALANCE SUMMARY																				A=APPLANCE					
APPLIANCES		0.0						1.0		0.0		CONNECTED LOAD BALANCE SUMMARY																				E=EQUIPMENT					
SUBFEED		31.3						0.8		25.0		PHASE A		142.7 AMP		17.127 KVA																H=HEATING					
EQUIPMENT		0.0						1.0		0.0		PHASE B		119.8 AMP		14.355 KVA																R=RECEPTACLES					
HEATING		0.0						1.0		0.0		PHASE C		116.7 AMP		13.999 KVA																L=LIGHTING					
TRANSFORMER		0.0						1.0		0.0																						CONN=CONNECTED					
OTHER		14.2						1.0		14.2		A TO B		16 %																		DEM=DEMAND					
												B TO C		2 %																		SPR=SPARE					
												C TO A		22 %																		SFC=SPACE					
TOTAL KVA		45.5 KVA						39.2 KVA				NOTE: ALL BRANCH WIRE SIZING IS BASED ON CIRCUIT SHOWING BEING THE ONLY CIRCUIT WITHIN THE CONDUIT. AT CONTRACTOR OPTION UP TO 3 CIRCUITS MAY BE RUN TOGETHER IN A SINGLE CONDUIT AS LONG AS THEY DO NOT SHARE A NEUTRAL AND CONDUCTORS ARE DERATED BASED ON 2016 NEC TABLE 310.15(B)(3)(a)																		D.F = DEMAND FACTOR							
DESIGN (MAX)		126.2 AMP						108.9 AMP																								GFC=GROUND FAULT CIRCUIT					
SPARE								400 AMP																								S-T=SHUNT TRIP					
								291.1 AMP																													

CONSULTANTS:		
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	_____	FARRIS ENGINEERING 12700 WEST DODGE ROAD OMAHA, NEBRASKA 68154 PH: (402) 330-5900

Drawing Title
PANEL SCHEDULES
Approved: Project Director
Omaha VA Medical Center

Office of
Construction
and Facilities
Management