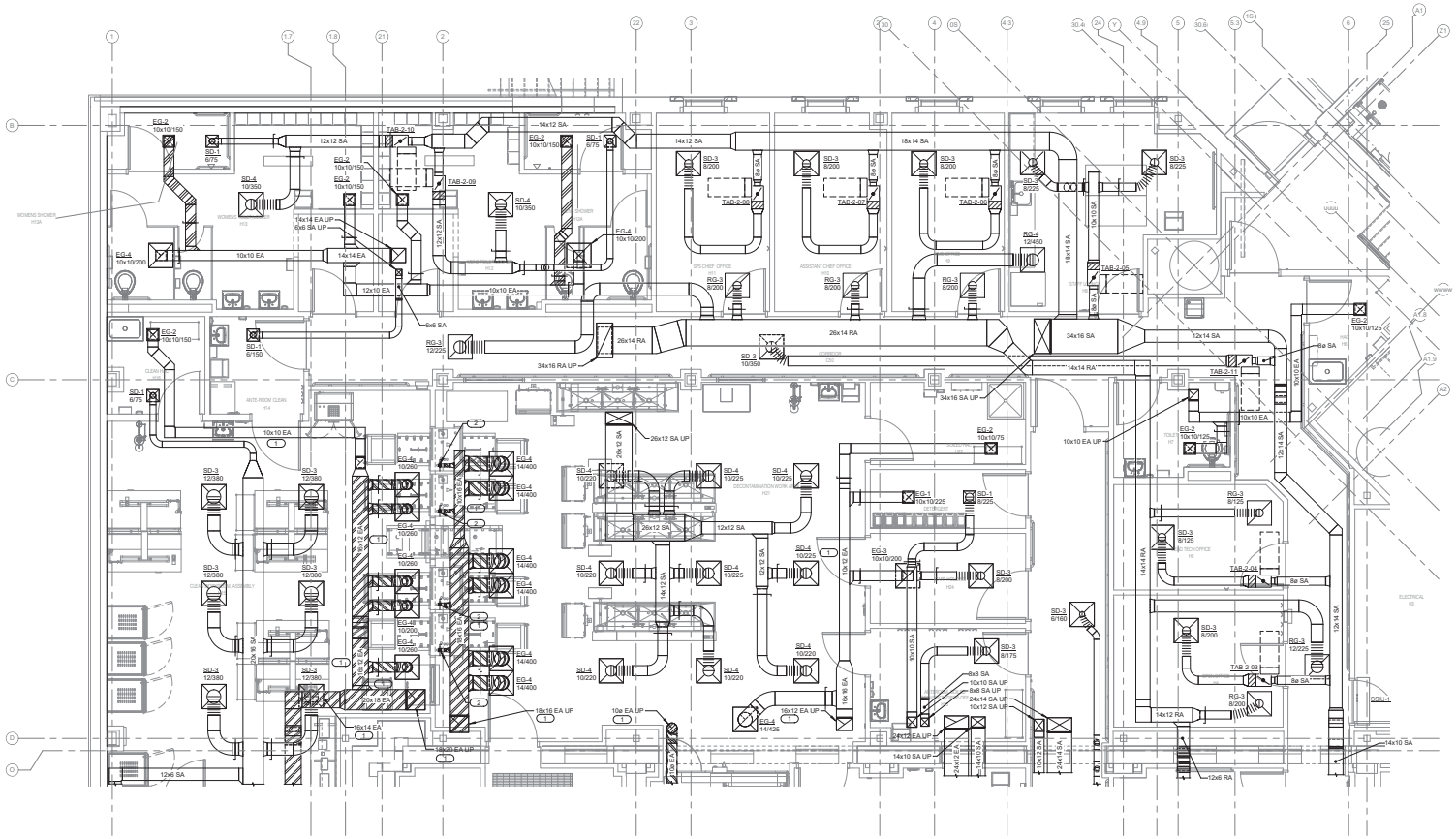

1 ENLARGED GROUND LEVEL FLOOR PLAN - VENTILATION - NORTH

1/4" = 1'-0"

GENERAL VENTILATION NOTES:

1. REFERENCE MV000 – VENTILATION COVERSHEET FOR VENTILATION SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. COORDINATE AND CONFIRM ALL ARCHITECTURALLY EXPOSED DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN OR INSTALLATION.
3. REFERENCE MV600 FOR VENTILATION SCHEDULES.
4. THE SIZE OF BRANCH DUCTS TO TERMINAL AIR BOXES AND AIR OUTLETS SHALL MATCH THEIR INLET SIZE UNLESS OTHERWISE NOTED.
5. ALL BALANCING DAMPERS SHOWN ABOVE HARD LID CEILINGS SHALL BE ELECTRONIC REMOTELY OPERATED TYPE. GENERALLY, ALL GRILLES AND DIFFUSERS SERVED BY AHU-1 OR EF-2A/B HAVE BALANCING DAMPERS LOCATED ABOVE HARD LID CEILINGS. MECHANICAL CONTRACTOR SHALL REVIEW ARCHITECTURAL REFLECTED CEILING PLANS AND VERIFY QUANTITY PRIOR TO BID. PROVIDE EACH DAMPER WITH 9V ELECTRONIC ACTUATOR, MINIMUM 14 FOOT PLENUM RATED CABLE, AND A STAINLESS-STEEL CEILING PLATE WITH ONE RJ11 PORT. PROVIDE ONE HANDHELD REMOTE EQUIPPED WITH 9V POWER SUPPLY AND 5 FOOT CABLE WITH RJ11 PLUG FOR CONNECTION TO ALL DAMPERS.
6. REFERENCE 1/MV400 FOR BRANCH CONNECTIONS DETAIL.
7. REFERENCE 2/MV400 FOR DUCT REINFORCEMENT DETAIL.
8. REFERENCE 3/MV400 FOR ELBOW CONSTRUCTION DETAIL.
9. REFERENCE 4/MV400 FOR LONGITUDINAL SEAMS DETAIL.
10. REFERENCE 5/MV400 FOR TRAPEZE HANGER DUCT WRAP VAPOR SEAL DETAIL.
11. REFERENCE 6/MV400 FOR DIFFUSER CONNECTION DETAIL.
12. REFERENCE 1/MV401 FOR TERMINAL AIR BOX DETAIL.
13. REFERENCE 2/MV401 FOR COIL-IN-DUCT DETAIL.

KEYNOTES: (#)

1. ALL EXHAUST AIR DUCTWORK ASSOCIATED WITH EF-2 AND CART WASHER EXHAUST FROM ROOF PENETRATION TO INDIVIDUAL EXHAUST GRILLES SHALL BE WRAPPED WITH FIRE RATED INSULATION TO CREATE A 2-HR FIRE SEPARATION RATING WITH ZERO CLEARANCE TO COMBUSTIBLE MATERIALS.
2. 3" STAINLESS STEEL EXHAUST DUCT DOWN TO WASHER/DISINFECTOR WITH MANUAL BALANCING DAMPER. BALANCE TO 60 CFM. VERIFY SIZE AND AIRFLOW WITH EQUIPMENT MANUFACTURER.

DUCT MATERIAL KEY:

DUCTWORK SHALL BE OF ALUMINUM CONSTRUCTION.

DUCTWORK SHALL BE OF STAINLESS STEEL CONSTRUCTION.

NOTE: THIS KEY IS INTENDED TO HIGHLIGHT CONDITIONS WHICH VARY FROM THE GENERALLY APPLICABLE DUCTWORK MATERIAL AND INSULATION REQUIREMENTS OF SPECIFICATION SECTION 23 31 00. CONTRACTOR SHALL CONFORM TO SPECIFICATIONS FOR ALL DUCTWORK WHICH IS NOT MODIFIED BY HATCHING ON FLOOR PLANS.

Revisions:	Date:

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PROJECT # 190042404.04

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LICENSED PROFESSIONAL ENGINEER — DELLAN J. LLEWELLYN — 27052 — 21 APR 25 — IOWA

Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: VENTILATION ENLARGED PLANS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460
				Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: MV300
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE

BIM 360://190042404 - VA Vitals DC-VA Sioux Falls New SPS/MEP21 - 190042404_16584_VA Vitals DC-VA Sioux Falls New SPS_Cr.rvt

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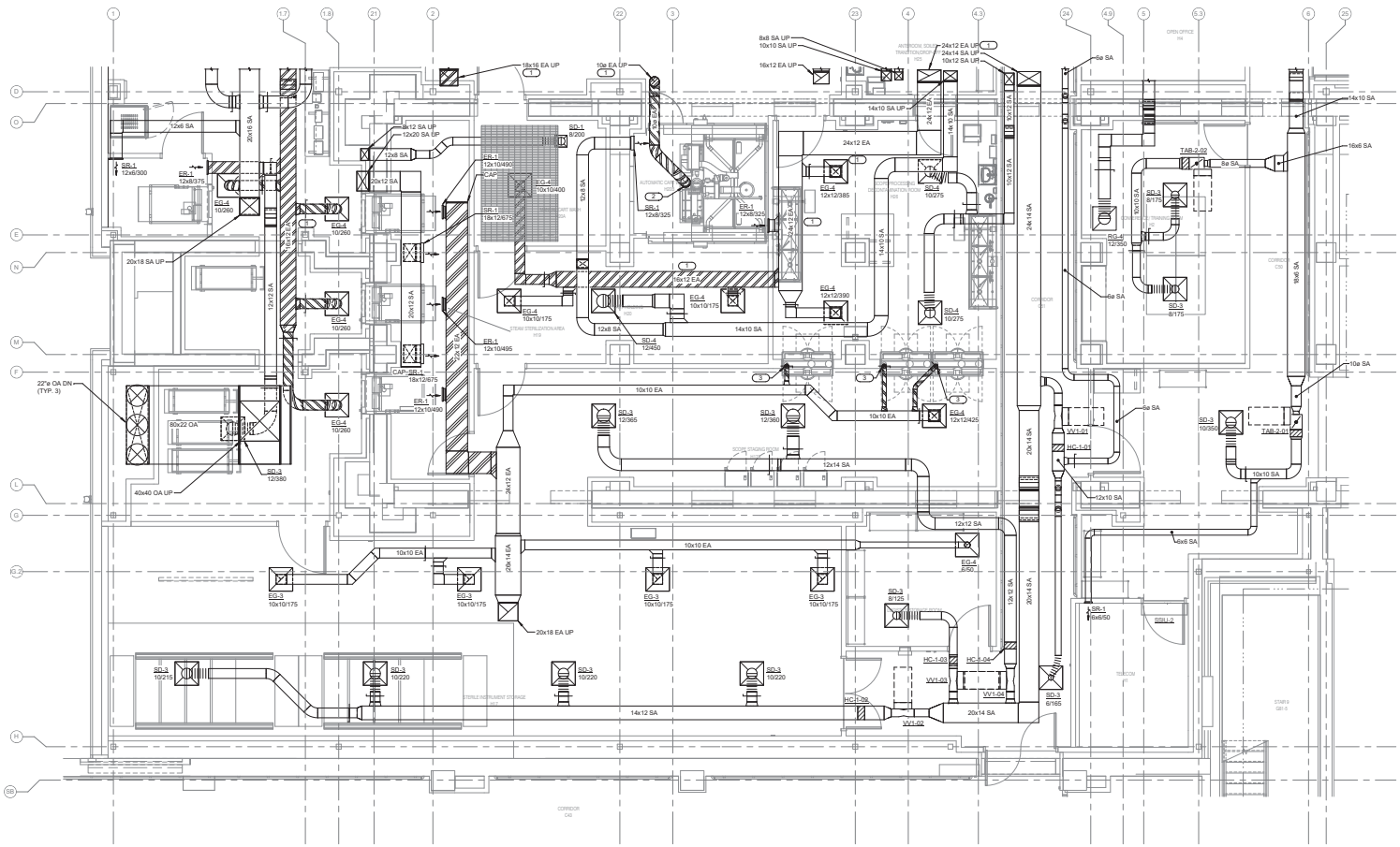

1 ENLARGED GROUND LEVEL FLOOR PLAN - VENTILATION - SOUTH

1/4" = 1'-0"

GENERAL VENTILATION NOTES:

1. REFERENCE MV000 – VENTILATION COVERSHEET FOR VENTILATION SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. COORDINATE AND CONFIRM ALL ARCHITECTURALLY EXPOSED DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN OR INSTALLATION.
3. REFERENCE MV600 FOR VENTILATION SCHEDULES.
4. THE SIZE OF BRANCH DUCTS TO TERMINAL AIR BOXES AND AIR OUTLETS SHALL MATCH THEIR INLET SIZE UNLESS OTHERWISE NOTED.
5. ALL BALANCING DAMPERS SHOWN ABOVE HARD LID CEILINGS SHALL BE ELECTRONIC REMOTELY OPERATED TYPE. GENERALLY, ALL GRILLES AND DIFFUSERS SERVED BY AHU-1 OR EF-2A/B HAVE BALANCING DAMPERS LOCATED ABOVE HARD LID CEILINGS. MECHANICAL CONTRACTOR SHALL REVIEW ARCHITECTURAL REFLECTED CEILING PLANS AND VERIFY QUANTITY PRIOR TO BID. PROVIDE EACH DAMPER WITH 9V ELECTRONIC ACTUATOR, MINIMUM 14 FOOT PLENUM RATED CABLE, AND A STAINLESS-STEEL CEILING PLATE WITH ONE RJ11 PORT. PROVIDE ONE HANDHELD REMOTE EQUIPPED WITH 9V POWER SUPPLY AND 5 FOOT CABLE WITH RJ11 PLUG FOR CONNECTION TO ALL DAMPERS.
6. REFERENCE 1/MV400 FOR BRANCH CONNECTIONS DETAIL.
7. REFERENCE 2/MV400 FOR DUCT REINFORCEMENT DETAIL.
8. REFERENCE 3/MV400 FOR ELBOW CONSTRUCTION DETAIL.
9. REFERENCE 4/MV400 FOR LONGITUDINAL SEAMS DETAIL.
10. REFERENCE 5/MV400 FOR TRAPEZE HANGER DUCT WRAP VAPOR SEAL DETAIL.
11. REFERENCE 6/MV400 FOR DIFFUSER CONNECTION DETAIL.
12. REFERENCE 1/MV401 FOR TERMINAL AIR BOX DETAIL.
13. REFERENCE 2/MV401 FOR COIL-IN-DUCT DETAIL.

KEYNOTES: (#)

1. ALL EXHAUST AIR DUCTWORK ASSOCIATED WITH EF-2 AND CART WASHER EXHAUST FROM ROOF PENETRATION TO INDIVIDUAL EXHAUST GRILLES SHALL BE WRAPPED WITH FIRE RATED INSULATION TO CREATE A 2-HR FIRE SEPARATION RATING WITH ZERO CLEARANCE TO COMBUSTIBLE MATERIALS.
2. CONNECT 10"ø EA TO AUTOMATIC CART WASHER.
3. 4" STAINLESS STEEL EXHAUST DUCT DOWN TO ENDOSCOPE REPROCESSOR WITH MANUAL BALANCING DAMPER. BALANCE TO 50 CFM. VERIFY SIZE AND AIRFLOW WITH EQUIPMENT MANUFACTURER.

DUCT MATERIAL KEY:

DUCTWORK SHALL BE OF ALUMINUM CONSTRUCTION.

DUCTWORK SHALL BE OF STAINLESS STEEL CONSTRUCTION.

NOTE: THIS KEY IS INTENDED TO HIGHLIGHT CONDITIONS WHICH VARY FROM THE GENERALLY APPLICABLE DUCTWORK MATERIAL AND INSULATION REQUIREMENTS OF SPECIFICATION SECTION 23 31 00. CONTRACTOR SHALL CONFORM TO SPECIFICATIONS FOR ALL DUCTWORK WHICH IS NOT MODIFIED BY HATCHING ON FLOOR PLANS.

Revisions:	Date:

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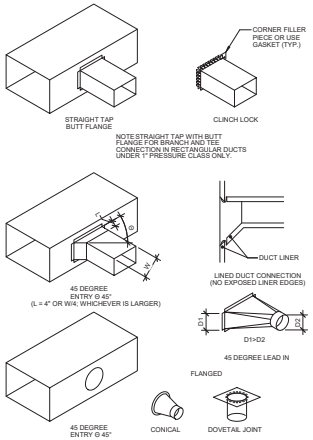
Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: VENTILATION ENLARGED PLANS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Building Number: 5
		Issue Date: 02/14/2025	Checked: DAVING / Drawn: DELLLE	Drawing Number: MV301

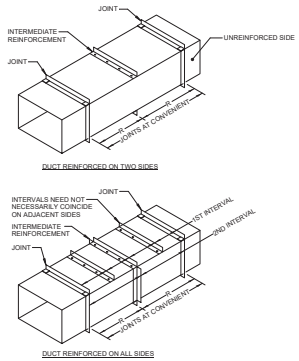


1 BRANCH CONNECTIONS

NO SCALE

NOTES:

1. DO NOT USE CONNECTIONS WITH SCOOPS.
2. FIT ALL CONNECTIONS TO AVOID VISIBLE OPENINGS AND SECURE THEM SUITABLY FOR THE PRESSURE CLASS.
3. ADDITIONAL MECHANICAL FASTENERS ARE REQUIRED FOR 4"W.G. AND OVER.
4. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

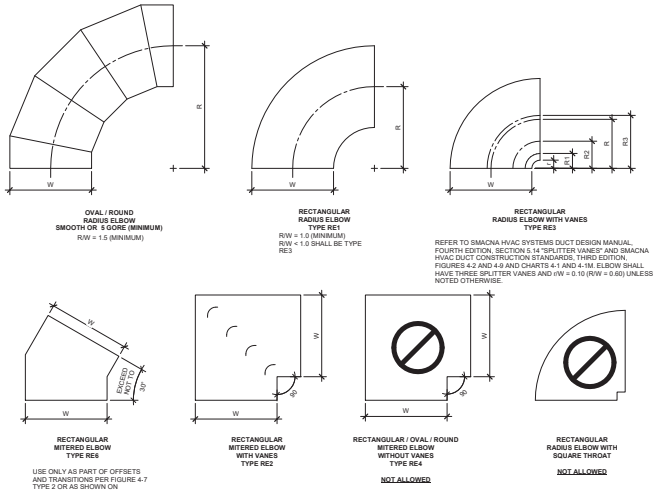


2 DUCT REINFORCEMENT DETAIL

NO SCALE

NOTES:

1. "R" IS AN ALLOWABLE REINFORCEMENT INTERVAL.
2. TOP AND BOTTOM JOINTS MUST QUALIFY AS REINFORCEMENT
3. DUCT SIZES THAT ARE 19 INCHES (483 mm) AND OVER ARE 20 GAGE (1.00 mm) OR LESS, WITH MORE THAN 10 SQUARE FEET (0.93 SQUARE METER) OF UNBRACED PANEL AREA, SHALL BE CROSSBROKEN OR BEADED UNLESS THEY ARE LINED OR EXTERNALLY INSULATED. DUCTS THAT ARE OF HEAVIER GAGE, SMALLER DIMENSIONS, AND SMALLER PANEL AREA AND THOSE THAT ARE LINED OR EXTERNALLY INSULATED ARE NOT REQUIRED TO HAVE CROSSBREAKING OR BEADING.
4. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

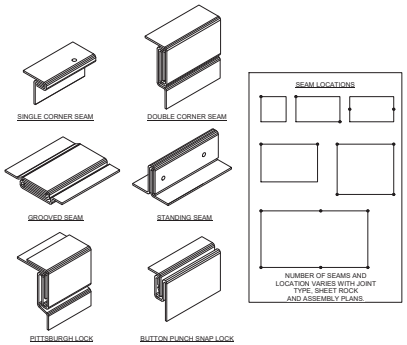


3 ELBOW CONSTRUCTION

NO SCALE

NOTES:

1. BEAD, CROSSBREAK, AND REINFORCE FLAT SURFACES AS IN STRAIGHT DUCT.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. DEFAULT ELBOW SHALL BE TYPE "RE1".
4. ELBOW TYPES SHALL BE INSTALLED AS SHOWN AND NOT BE SUBSTITUTED WITHOUT PERMISSION. EXCEPTION: RE1 OR RE3 MAY BE SUBSTITUTED FOR RE2.

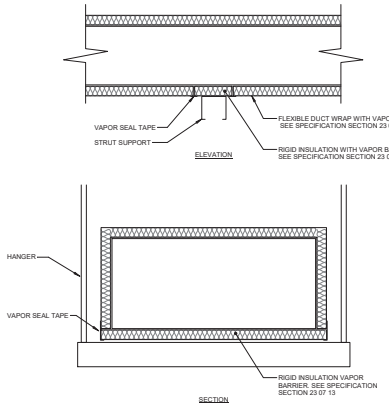


4 LONGITUDINAL SEAMS - RECTANGULAR DUCT

NO SCALE

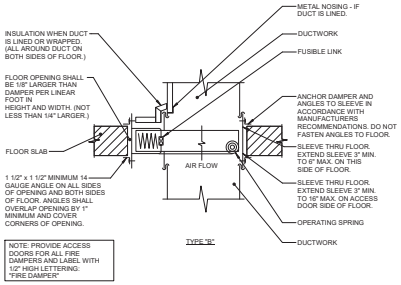
NOTES:

1. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.



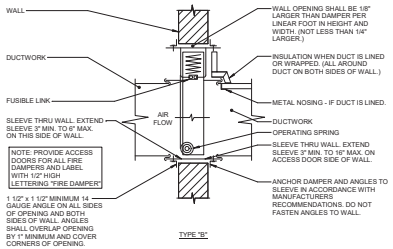
5 TRAPEZE HANGER DUCT WRAP VAPOR SEAL

NO SCALE



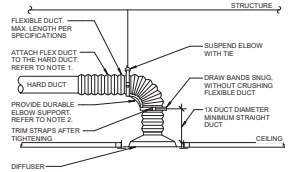
6 FIRE DAMPER THRU FLOOR DETAIL (TYPE B)

NO SCALE



7 FIRE DAMPER THRU WALL DETAIL (TYPE B)

NO SCALE



8 DIFFUSER CONNECTION DETAIL

NO SCALE

NOTES:

1. DETAIL GENERALLY APPLIES TO SUPPLY AIR DIFFUSERS. CONNECTIONS TO CEILING MOUNTED EXHAUST AIR GRILLES SHALL BE MADE WITH CONTINUOUS HARD DUCT.
2. TO ATTACH FLEX DUCT TO THE HARD DUCT, TAPE THE INNER LINER TO THE HARD DUCT THEN ATTACH WITH TWO NYLON TIE WRAPS; ONE FOR THE INNER LINER AND ONE FOR THE OUTER SHELL. FOLD THE OUTER SHELL INSIDE ITSELF SO IT HAS NEAT EDGES PRIOR TO TIE WRAPPING.
3. DURABLE ELBOW SUPPORT ACCEPTABLE MANUFACTURER AND MODEL: HART AND COOLEY - SMARTFLOW, THERMAFLEX - FLEXFLOW, TITUS - FLEXRIGHT, OR APPROVED EQUAL.

Revisions:	Date:

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: VENTILATION DETAILS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460	
				Building Number: 5	
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: MV400	
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE	

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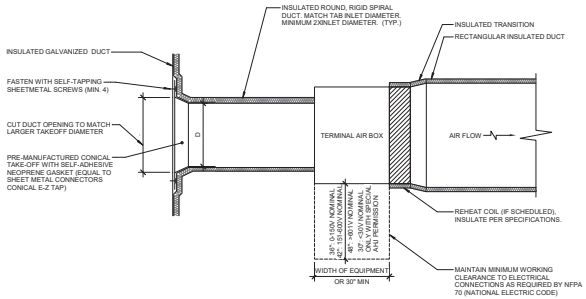
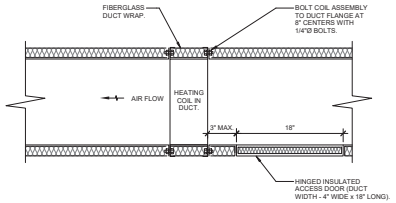


1 TERMINAL AIR BOX - SINGLE DUCT

NO SCALE

NOTES:

1. THIS DETAIL APPLIES ONLY TO TAPS OFF WRAPPED DUCTS.
2. THIS DETAIL APPLIES TO TERMINAL AIR BOXES WITH ROUND INLETS AND RECTANGULAR OUTLETS.
3. DUCT LEADING TO TAB INLET MUST BE STRAIGHT FOR 1.5 DIAMETER UPSTREAM.
4. MAINTAIN VAPOR BARRIER FROM MAIN TO BRANCH DUCT.

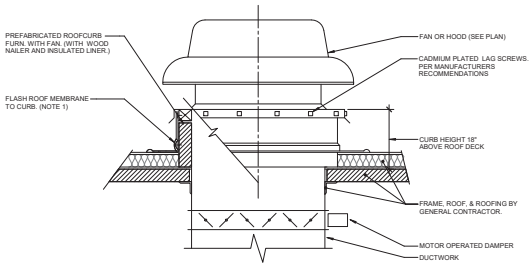


2 COIL - IN DUCT HEATING - WRAPPED

NO SCALE

NOTES:

1. THIS DETAIL APPLIES TO ALL HEATING COILS INSTALLED IN DUCTS. ACCESS DOORS AND FLANGED CONNECTIONS MUST BE PROVIDED AT ALL COILS UNLESS SPECIFICALLY NOTED OTHERWISE.
2. PROVIDE FLANGED CONNECTION ON BOTH SIDES OF COILS. ACCESS DOORS ARE ONLY REQUIRED UPSTREAM OF COILS.
3. PROVIDE 48" STRAIGHT DUCT UPSTREAM AND 24" DOWNSTREAM OF HEATING COIL.

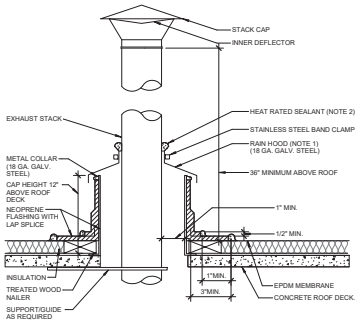


3 FAN/HOOD CURB ROOF SUPPORT DETAIL

NO SCALE

NOTES:

1. ALL ROOF FLASHING SHALL BE PER ROOFING MANUFACTURERS RECOMMENDATIONS.

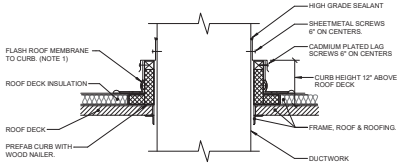


4 EXHAUST STACK THROUGH ROOF

NO SCALE

NOTES:

1. MAINTAIN A MINIMUM 1" CLEARANCE ABOVE FLASHING COLLAR TO ALLOW FOR VENTILATION OF HEAT.
2. SEALANT GOOD TO 250°F, ALL TEMPERATURES HIGHER SHALL BE SOLDER OR BRAZED

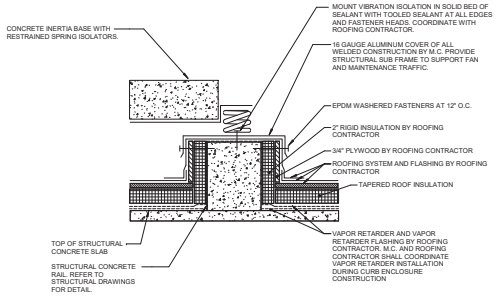


5 DUCT ROOF PENETRATION

NO SCALE

NOTES:

1. ALL ROOF FLASHING SHALL BE PER ROOF MANUFACTURER'S RECOMMENDATIONS.



6 HIGH PLUME EXHAUST FAN ROOF SUPPORT DETAIL

NO SCALE

Revisions:	Date:

CONSULTANT

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: VENTILATION DETAILS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460
				Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: MV401
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE

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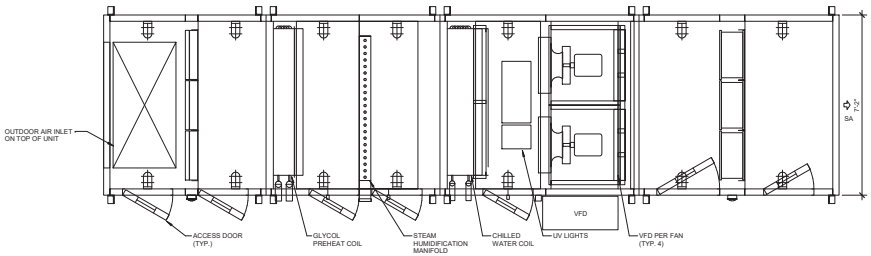
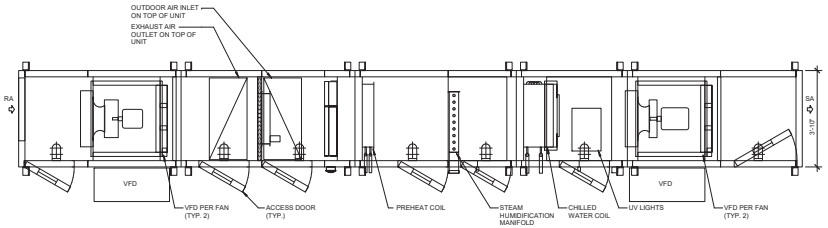
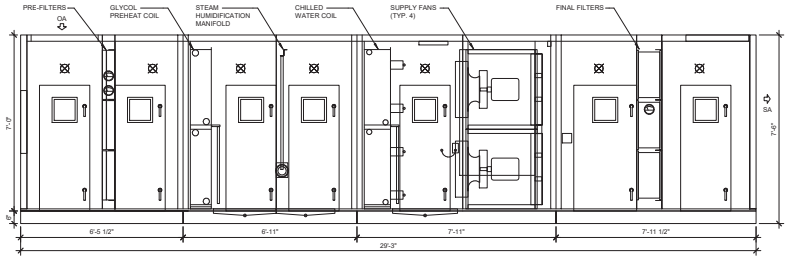


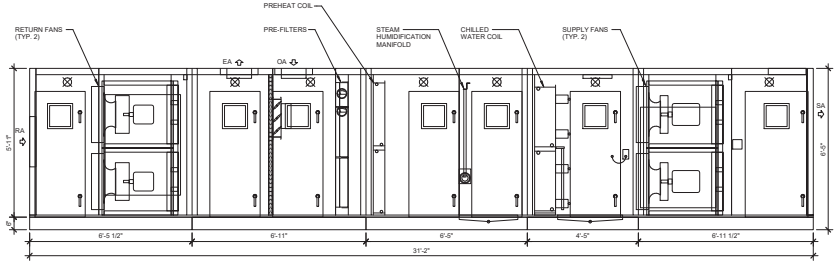
PLAN VIEW



PLAN VIEW



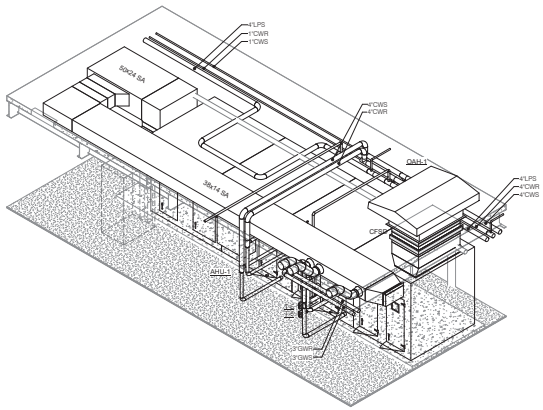
ELEVATION VIEW



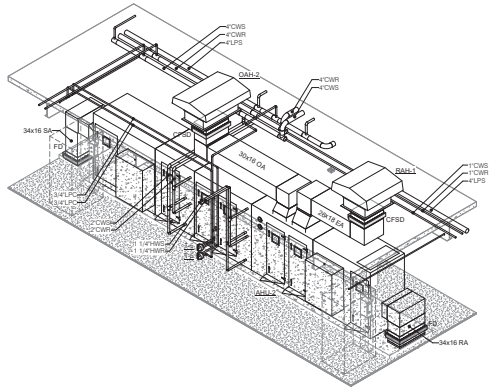
ELEVATION VIEW

1 AHU-1 COMPONENT DETAIL
1/2" = 1'-0"

2 AHU-2 COMPONENT DETAIL
1/2" = 1'-0"



3 AHU-1 ISOMETRIC LOOKING NORTHWEST
NO SCALE



4 AHU-2 ISOMETRIC LOOKING SOUTHEAST
NO SCALE

Revisions:	Date:

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24 APR 25
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Office of Construction and Facilities Management

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Drawing Title	VENTILATION DETAILS
Approved:	
Phase	BID DOCUMENTS
	FULLY SPRINKLERED
Project Title	CONSTRUCT NEW SPS
Location	Sioux Falls, SD.
Issue Date	02/14/2025
Checked	DAVING
Drawn	DELLLE
Project Number	438-460
Building Number	5
Drawing Number	MV402

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AIR HANDLING SCHEDULE - 100% OUTSIDE AIR

NOTES:
1.REFERENCE SPECIFICATION SECTION 23 73 00 INDOOR CENTRAL-STATION AIR-HANDLING UNITS.
2.PROVIDE SHAFT GROUNDING AS REQUIRED IN THE MOTOR SPECIFICATION 23 05 12.
3.ONE FULLY REDUNDANT (N+1) SUPPLY FAN SHALL BE PROVIDED FOR EACH FAN ARRAY. SCHEDULED RPM AND BHP REPRESENT N PERFORMANCE.
4.PROVIDE 1 VFD PER SUPPLY FAN.
5.CHILLED WATER COIL IS SELECTED WITH 100% WATER. GLYCOL HEATING WATER COIL IS SELECTED WITH 30% PROPYLENE GLYCOL.
6.TOTAL EXTERNAL STATIC PRESSURE DOES NOT INCLUDE FILTER LOADING. MANUFACTURER SHALL INCLUDE DIRTY FILTER ALLOWANCE IN TOTAL STATIC PRESSURE CALCULATION.
7.STEAM PRESSURE INDICATED IS THE PRESSURE AVAILABLE DOWNSTREAM OF THE CONTROL VALVE.
8.PROVIDE AHU WITH INTERNAL MOTOR REMOVAL RAILS FOR FAN MOTOR SERVICING.

		SUPPLY FAN (NOTE 2, 3, & 4)									HEATING COIL - GLYCOL HEATING WATER (NOTE 5)							
TAG NAME	SERVICE	NO. OF FANS	CFM TOTAL	MIN. CFM	EXT. S.P.	TYPE	RPM (NOTE D)	BHP EACH (NOTE E)	MHP EACH (NOTE E)	MINIMUM OUTSIDE AIR CFM	EAT °F	LAT °F	EWT °F	LWT °F	GPM	MBH	MAX. A.P.D. IN. W.C.	W.P.D . FEET HEAD
AHU-1	STERILE PROCESSING AREA	4	12000	12000	2.5	PLENUM	3420	6	6.5	12000	-20.0	65.0	175	145	73.4	1329	0.1	4.7

	HUMIDIFIER (NOTE 7)					COOLING COIL - CHILLED WATER (NOTE 5)										ULTRA-VIOLET LIGHT		
TAG NAME	TYPE	CFM	STEAM CAPACITY (LBS/HR)	STEAM PSIG	MANUFACTURER	EAT DB °F	EAT WB °F	LAT DB °F	LAT WB °F	EWT °F	LWT °F	TOTAL MBH	GPM	W.P.D. FEET HEAD	MAX. A.P.D. IN. W.C.	NUMBER OF ROWS	INTENSITY AT COIL SURFACE	TOTAL POWER (WATTS)
AHU-1	DISPERSION TUBE	12,000	341	15	DRI-STEAM	95	78	46.8	46.8	40	52	1165.1	193.2	9.17	0.66	4	31.4 W/ft²	1480

	COMBINATION FILTER (NOTE 6)								FINAL FILTER			
	FIRST STAGE FILTER				SECOND STAGE FILTER						PRESSURE DROP	
			PRESSURE DROP				PRESSURE DROP					
TAG NAME	TYPE	FACE VELOCITY	CLEAN	DIRTY	TYPE	FACE VELOCITY	CLEAN	DIRTY	TYPE	FACE VELOCITY	CLEAN	DIRTY
AHU-1	MERV 8	270	.2	.74	MERV 13	270	.2	1	MERV 14	270	0.2	0.88

	ELECTRICAL									MAXIMUM DIMENSIONS						
				DISCONNECT(S)		CONTROLLER STATER(S)										
TAG NAME	NO. OF POWER CONNECTIONS	VOLTAGE	PHASES	BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	TYPE (NOTE C)	SCCR	NO. OF AUXILIARY CONNECTIONS	LENGTH	WIDTH	HEIGHT	WEIGHT	MANUFACTURER	MODEL	NOTES
AHU-1	1	480	3	EC	F	MFR	VFD	65000	3	351"	86"	90"	15169	TEMTROL	CUSTOM	NOTE 8

AIR HANDLING SCHEDULE - MIXED AIR VAV

NOTES:
1.REFERENCE SPECIFICATION SECTION 23 73 00 INDOOR CENTRAL-STATION AIR-HANDLING UNITS.
2.PROVIDE SHAFT GROUNDING AS REQUIRED IN THE MOTOR SPECIFICATION 23 05 12.
3.ONE FULLY REDUNDANT (N+1) SUPPLY/RETURN FAN SHALL BE PROVIDED FOR EACH FAN ARRAY. SCHEDULED RPM AND BHP REPRESENT N PERFORMANCE.
4.PROVIDE 1 VFD PER SUPPLY/RETURN FAN.
5.CHILLED AND HEATING WATER COILS ARE SELECTED WITH 100% WATER.
6.TOTAL EXTERNAL STATIC PRESSURE DOES NOT INCLUDE FILTER LOADING. MANUFACTURER SHALL INCLUDE DIRTY FILTER ALLOWANCE IN TOTAL STATIC PRESSURE CALCULATION.
7.STEAM PRESSURE INDICATED IS THE PRESSURE AVAILABLE DOWNSTREAM OF THE CONTROL VALVE.
8.PROVIDE AHU WITH INTERNAL MOTOR REMOVAL RAILS FOR FAN MOTOR SERVICING.

		SUPPLY FAN (NOTE 2, 3, & 4)								RETURN FAN (NOTE 2, 3, & 4)								
TAG NAME	SERVICE	NO. OF FANS	CFM TOTAL	MIN. CFM	EXT. S.P.	TYPE	RPM (NOTE D)	BHP EACH (NOTE E)	MHP EACH (NOTE E)	NO. OF FANS	CFM TOTAL	MIN. CFM	EXT. S.P.	TYPE	RPM (NOTE D)	BHP EACH (NOTE E)	MHP EACH (NOTE E)	MINIMUM OUTSIDE AIR CFM
AHU-2	STERILE PROCESSING ADMINISTRATIVE AREA	2	5000	2500	1.8	PLENUM	3443	6.1	7.5	2	5000	2500	1.5	PLENUM	2254	2.7	3	1250

	HEATING COIL - HEATING WATER (NOTE 5)								HUMIDIFIER (NOTE 7)				
TAG NAME	EAT °F	LAT °F	EWT °F	LWT °F	GPM	MBH	MAX. A.P.D. IN. W.C.	W.P.D . FEET HEAD	TYPE	CFM	STEAM CAPACITY (LBS/HR)	STEAM PSIG	MANUFAC TURER
AHU-2	39.3	65.0	180	150	9.8	144	0.1	2.8	DISPERSION TUBE	5,000	142	15	DRI-STEAM

	COOLING COIL - CHILLED WATER (NOTE 5)										ULTRA-VIOLET LIGHT		
TAG NAME	EAT DB °F	EAT WB °F	LAT DB °F	LAT WB °F	EWT °F	LWT °F	TOTAL MBH	GPM	W.P.D. FEET HEAD	MAX. A.P.D. IN. W.C.	NUMBER OF ROWS	INTENSITY AT COIL SURFACE	TOTAL POWER (WATTS)
AHU-2	80.9	69.4	52.3	52	40	52	261.6	43.4	9.94	0.45	4	45.6 W/ft²	248

	ELECTRICAL								
				DISCONNECT(S)		CONTROLLER STATER(S)			
TAG NAME	NO. OF POWER CONNE CTIONS	VOLTAGE	PHASES	BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	TYPE (NOTE C)	SCCR	NO. OF AUXILIARY CONNECTI ONS
AHU-2	2	480	3	EC	F	MFR	VFD	65000	3

	COMBINATION FILTER (NOTE 6)								MAXIMUM DIMENSIONS						
	FIRST STAGE FILTER				SECOND STAGE FILTER										
			PRESSURE DROP				PRESSURE DROP								
TAG NAME	TYPE	FACE VELOCITY	CLEAN	DIRTY	TYPE	FACE VELOCITY	CLEAN	DIRTY	LENGTH	WIDTH	HEIGHT	WEIGHT	MANUFACTURER	MODEL	NOTES
AHU-2	MERV 8	270	.2	.85	MERV 13	270	.2	1	374"	46"	77"	9969	TEMTROL	CUSTOM	NOTE 8

FAN SCHEDULE

NOTES:
1.PROVIDE SHAFT GROUNDING AS REQUIRED IN THE MOTOR SPECIFICATION 23 05 12.
2.PROVIDE FAN WITH SOLID STATE SPEED CONTROL FOR USE BY TAB CONTRACTOR IN INITIAL BALANCING.
3.PROVIDE FAN IN A DUAL FAN CONFIGURATION WITH SHARED INLET PLENUM AND BYPASS AIR DAMPERS. TOTAL AIRFLOW WITH BYPASS AIR SHALL BE APPROXIMATELY 4,200 CFM TO BE ADJUSTED BY THE BALANCING CONTRACTOR.
4.PROVIDE EACH FAN WITH MANUFACTURER'S ISOLATION DAMPERS AND ONE MANUFACTURER'S BYPASS DAMPER. TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE ACTUATORS AND END SWITCHES FOR ALL DAMPERS AND CONFIRM POSITION PRIOR TO START-UP SEQUENCING.
5.PROVIDE FANS WITH FINISH THAT INCLUDES AN EPOXY BASE COAT AND ELECTROSTATIC POWDER COATED HI-PRO POLYESTER TOPCOAT.

											ELECTRICAL (NOTE 1)										VIBRATION ISOLATION				
															DISCONNECT		CONTROLLER/ STARTER								
TAG NAME	SERVICE	CFM	S.P. IN. W.C.	FAN CLASS	WHEEL DIA. INCHES	FAN RPM (NOTE F)	DRIVE TYPE	MAX. AMCA SONES	BACKDRAFT DAMPER TYPE	CURB TYPE (NOTE G)	BHP	MHP	VOLTAGE	PHASES	BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	TYPE (NOTE C)	SCCR	WEIGHT	TYPE	DEFL.	MANUFACTURER	MODEL	NOTES
EF-1	CLEAN WORKROOM INSTRUMENT SET ASSEMBLY	1760	1.75	I	18	1539	DIRECT	15.6	MOD	MFR	1.05	1.5	480	3	EC	NF	MFR	VFD	5000	98	N/A	0.00"	PENN BARRY	DX14B	NOTE 1
EF-2A/B	DECONTAMINATION WORK AREA	5700	3.50	II	25.9	1330	BELT	85	MOD	GC	5.06	7.5	480	3	EC	NF	MFR	VFD	65000	1048	M4	0.75"	MK PLASTICS	AXIJET-F 2017	NOTES 1, 3, 4, & 5
EF-3	GENERAL EXHAUST	1200	1.00	I	20	1455	DIRECT	11.8	MOD	MFR	0.36	0.5	120	1	EC	NF	MFR	FV	5000	66	N/A	0.00"	PENN BARRY	DX16Q1GP	NOTE 2
EF-4	GENERAL EXHAUST	150	0.25	I	16	1215	DIRECT	6.25	MOD	MFR	0.06	0.25	120	1	EC	NF	MFR	FV	5000	51	N/A	0.00"	PENN BARRY	DX13QGP	NOTE 2
SF-1	PIPE BASEMENT VENTILATION	24000	0.50	I	20	515	DIRECT	13.84	MOD	MFR	5.2	6	480	3	EC	NF	MFR	VFD	5000	98	N/A	0.00"	PENN BARRY	LF40BC	NOTE 1

AIR VALVE SCHEDULE

NOTES:
1.NEITHER RADIATED NOR DISCHARGE SOUND LEVELS SHALL EXCEED NC 35 AT 1.5" INLET STATIC PRESSURE WHEN TESTED PER AHRI STANDARD 885-2008 USING 5/8" 20-LB DENSITY MINERAL FIBER CEILING TILE.
2.REFER TO SPECIFICATION SECTION 23 36 00, VENTURI VALVE AIRFLOW CONTROL SYSTEM.
3.PROVIDE ROOM INTEGRATOR TO CONNECT DIRECTLY TO FMCS VIA NETWORK.
4.FAST ACTING VALVE. REFER TO CONTROL DRAWINGS FOR DESCRIPTION OF CONTROL TYPE.
5.SENSOR TYPES: 1 - SENSOR ONLY, 2 - SENSOR WITH ADJUSTMENT, 3 - SENSOR WITH OVERRIDE, 4 - SENSOR WITH ADJUSTMENT AND OVERRIDE.

		CFM							
TAG NAME	AREA SERVED	COOLING MAX.	MIN.	MIN. INLET SIZE (IN.) DIA.	CONTROL TYPE (NOTE 4)	SENSOR TYPE (NOTE 5)	MANUFACTURER	MODEL	NOTES
VV1-01	C51 CORRIDOR	325	325	8"	TYPE A	TYPE 1	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-02	H17 STERILE INSTRUMENT STORAGE	875	875	8"	TYPE A	TYPE 1	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-03	H18 LOGISTICS STORAGE ROOM	125	125	8"	TYPE A	TYPE 1	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-04	H17A SCOPE STAGING ROOM	725	725	8"	TYPE A	TYPE 2	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-05	H26 SCOPE PROCESSING DECONTAMINATION AREA	550	550	8"	TYPE A	TYPE 2	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-06	H24 CART HOLDING	775	775	8"	TYPE A	TYPE 1	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-07	H20A MANUAL CARTWASH	200	200	8"	TYPE A	TYPE 3	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-08	STEAM STERILIZATION AREA	1350	1350	8"	TYPE A	TYPE 3	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-09	H25 ANTEROOM, SOILED TRANSITION/DROPOFF	175	175	8"	TYPE A	TYPE 1	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-10	H23 DETERGENT	425	425	8"	TYPE A	TYPE 1	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-11	H21 DECONTAMINATION WORK AREA	2000	2000	14"	TYPE A	TYPE 2	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-12	H15 CLEAN WORKROOM/ASSEMBLY	3035	3035	12"	TYPE A	TYPE 2	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3
VV1-13	H14 ANTE-ROOM CLEAN	150	150	8"	TYPE A	TYPE 2	CRITICAL ROOM	CLVI	NOTES 1, 2, & 3

TERMINAL AIR BOX SCHEDULE - SINGLE DUCT

NOTES:
1.NEITHER RADIATED NOR DISCHARGE SOUND LEVELS SHALL EXCEED NC 35 AT 1.5" INLET STATIC PRESSURE WHEN TESTED PER AHRI STANDARD 885-2008 USING 5/8" 20-LB DENSITY MINERAL FIBER CEILING TILE.
2.TOTAL AIR PRESSURE DROP OF TAB AND REHEAT COIL SHALL NOT EXCEED 0.50" WC. PROVIDE REHEAT COILS SEPARATE FROM BOXES IF REQUIRED TO MEET AIR PRESSURE DROP REQUIREMENTS.
3.REFER TO CONTROL DRAWINGS FOR DESCRIPTION OF CONTROL TYPE.
4.SENSOR TYPES: 1 - SENSOR ONLY, 2 - SENSOR WITH ADJUSTMENT, 3 - SENSOR WITH OVERRIDE, 4 - SENSOR WITH ADJUSTMENT AND OVERRIDE.
5.HEATING COIL IS BASED ON HEATING AIR FLOW. WATER PRESSURE DROP OF REHEAT COILS SHALL NOT EXCEED 5'. PROVIDE REHEAT COILS SEPARATE FROM BOXES IF REQUIRED TO MEET WATER PRESSURE DROP REQUIREMENTS.
6.WHEN LAT °F, EWT °F, AND GPM VALUES ARE BLANK, HEATING COIL IS NOT REQUIRED FOR TAB.
7.HEATING COIL SELECTION SHALL BE BASED ON A FIXED LEAVING AIR TEMPERATURE AND VARIABLE FLOW (GPM). PROVIDE FINAL MAXIMUM FLOW RATE (GPM) TO TEST & BALANCE TEMPERATURE CONTROLS CONTRACTORS.

		CFM			HEATING COIL (NOTES 5, 6, & 7)										
TAG NAME	AREA SERVED	COOLING MAX.	HEATING MAX.	MIN.	EAT °F	LAT °F	EWT °F	LWT °F	MAX. GPM	MIN. INLET SIZE (IN.) DIA.	CONTROL TYPE (NOTE 3)	SENSOR TYPE (NOTE 4)	MANUFACTURER	MODEL (NOTES 1, 2)	NOTES
TAB-2-01	C50 CORRIDOR	400	400	400	55.0	85.0	180	150	0.9	6"	TYPE B	TYPE 1	TITUS	DESV	NOTES 1, 2
TAB-2-02	H2 CONFERENCE	350	350	175	55.0	85.0	180	150	0.8	6"	TYPE B	TYPE 3	TITUS	DESV	NOTES 1, 2
TAB-2-03	H4 OFFICE	200	200	80	55.0	85.0	180	150	0.5	6"	TYPE B	TYPE 4	TITUS	DESV	NOTES 1, 2
TAB-2-04	H5 OFFICE	125	125	80	55.0	85.0	180	150	0.5	6"	TYPE B	TYPE 4	TITUS	DESV	NOTES 1, 2
TAB-2-05	H8 STAFF LOUNGE	450	450	150	55.0	85.0	180	150	1.0	8"	TYPE B	TYPE 3	TITUS	DESV	NOTES 1, 2
TAB-2-06	H9 OFFICE	200	200	80	55.0	85.0	180	150	0.5	6"	TYPE B	TYPE 4	TITUS	DESV	NOTES 1, 2
TAB-2-07	H10 OFFICE	200	200	80	55.0	85.0	180	150	0.5	6"	TYPE B	TYPE 4	TITUS	DESV	NOTES 1, 2
TAB-2-08	H11 OFFICE	200	200	80	55.0	85.0	180	150	0.5	6"	TYPE B	TYPE 4	TITUS	DESV	NOTES 1, 2
TAB-2-09	H12 MENS LOCKER	425	425	425	55.0	85.0	180	150	0.9	8"	TYPE B	TYPE 2	TITUS	DESV	NOTES 1, 2
TAB-2-10	H13 WOMENS LOCKER	425	425	425	55.0	85.0	180	150	0.9	8"	TYPE B	TYPE 2	TITUS	DESV	NOTES 1, 2
TAB-2-11	C50 CORRIDOR	350	350	350	55.0	85.0	180	150	0.8	6"	TYPE B	TYPE 1	TITUS	DESV	NOTES 1, 2

COIL SCHEDULE - WATER

NOTES:
1.HEATING COIL SELECTION SHALL BE BASED ON A FIXED LEAVING AIR TEMPERATURE AND VARIABLE FLOW (GPM). PROVIDE FINAL MAXIMUM FLOW RATE (GPM) TO TEST & BALANCE TEMPERATURE CONTROLS CONTRACTORS.

		EAT	LAT									
TAG NAME	CFM	DB °F	DB °F	TOTAL MBH	A.P.D. IN. W.C.	EWT °F	LWT °F	GPM	W.P.D. FT. HEAD	MANUFACTURER	MODEL	NOTES
HC-1-01	325	50.0	85.0	11	0.50	180	150	0.7	5.0	AAON	C5	NOTE 1
HC-1-02	870	50.0	85.0	28	0.50	180	150	1.9	5.0	AAON	C5	NOTE 1
HC-1-03	125	50.0	85.0	4	0.50	180	150	0.5	5.0	AAON	C5	NOTE 1
HC-1-04	725	50.0	85.0	23	0.50	180	150	1.6	5.0	AAON	C5	NOTE 1
HC-1-05	550	50.0	85.0	18	0.50	180	150	1.2	5.0	AAON	C5	NOTE 1
HC-1-06	775	50.0	85.0	25	0.50	180	150	1.7	5.0	AAON	C5	NOTE 1
HC-1-07	200	50.0	85.0	6	0.50	180	150	0.5	5.0	AAON	C5	NOTE 1
HC-1-08	1350	50.0	85.0	44	0.50	180	150	2.9	5.0	AAON	C5	NOTE 1
HC-1-09	175	50.0	85.0	6	0.50	180	150	0.5	5.0	AAON	C5	NOTE 1
HC-1-10	425	50.0	85.0	14	0.50	180	150	0.9	5.0	AAON	C5	NOTE 1
HC-1-11	2000	50.0	85.0	65	0.50	180	150	4.3	5.0	AAON	C5	NOTE 1
HC-1-12	3035	50.0	85.0	98	0.50	180	150	6.6	5.0	AAON	C5	NOTE 1
HC-1-13	150	50.0	85.0	5	0.50	180	150	0.5	5.0	AAON	C5	NOTE 1

HOOD SCHEDULE

NOTES:
1.MOUNT HOOD ON MANUFACTURER'S CURB. TOP OF CURB SHALL BE A MINIMUM OF 18" ABOVE TOP OF ROOF INSULATION.
2.MAXIMUM HEIGHT MEASURED FROM TOP OF CURB TO TOP OF EQUIPMENT.

			THROAT SIZE									MAX. DIMENSIONS						
TAG NAME	SERVICE	CFM	WIDTH	LENGTH	THROAT VELOCITY	STATIC PRESSURE DROP	FREE AREA (FT ²)	CONFIGURATION	MAX. HEIGHT (NOTE 2)	DAMPER TYPE	CURB TYPE	LENGTH	WIDTH	HEIGHT	WEIGHT	MANUFACTURER	MODEL	NOTES
OAH-1	AHU-1	12000	36	54	889	0.08	13.5	GRAVITY HOOD	24	MOD	MFR	92.5	68.5	17	110.6	PENN BARRY	PG3654	NOTE 1
OAH-2	AHU-2	5000	20	42	833	0.07	6	GRAVITY HOOD	20	MOD	MFR	62.5	50.5	13	64.1	PENN BARRY	PG2436	NOTE 1
OAH-3	5-AC10 INTAKE	4750	18	24	950	0.09	5	GRAVITY HOOD	18	MOD	MFR	58.5	42.5	11	53.6	PENN BARRY	PG2036	NOTE 1
RAH-1	AHU-2	4000	24	30	667	0.06	6	GRAVITY HOOD	17	MOD	MFR	56.5	38.5	10	50	PENN BARRY	PG2436	NOTE 1
RAH-2	5-EF12 EXHAUST	625	12	18	625	0.05	1	GRAVITY HOOD	12	MOD	MFR	20.5	20.5	5	18.9	PENN BARRY	PG1212	NOTE 1
RAH-3	5-AC10 RELIEF	4750	18	24	543	0.04	8.75	GRAVITY HOOD	18	MOD	MFR	62.5	44.5	11	63.4	PENN BARRY	PG2036	NOTE 1

AIR TERMINAL SCHEDULE

NOTES:
1.CONTRACTOR SHALL DETERMINE PROPER BORDER TYPE TO MATCH CEILING CONSTRUCTION.
2.REFER TO DRAWINGS FOR NECK SIZE. ALL BRANCH DUCTWORK TO AIR TERMINALS SHALL BE NECK SIZE UNLESS NOTED OTHERWISE.
3.DUCTED RETURN
4.FRONT BLADES VERTICAL UNLESS OTHERWISE NOTED.
5.FLUSH FACE PANEL.
6.ALL BALANCING DAMPERS SHOWN ABOVE HARD LID CEILINGS SHALL BE ELECTRONIC REMOTELY OPERATED TYPE; GENERALLY, ALL GRILLES AND DIFFUSERS SERVED BY AHU-1 OR EF-2A/B HAVE BALANCING DAMPERS LOCATED ABOVE HARD LID CEILINGS. MECHANICAL CONTRACTOR SHALL REVIEW ARCHITECTURAL REFLECTED CEILING PLANS AND VERIFY QUANTITY PRIOR TO BID. REFERENCE SPECIFICATION SECTION 23 31 00 FOR ADDITIONAL INFORMATION.

TAG NAME	FACE SIZE (IN.) (NOTE 2)	TYPE	BORDER	MATERIAL	FINISH	VOLUME DAMPER REQUIRED	MANUFACTURER	MODEL	NOTES
EG-1	12x12	PERFORATED FACE	NOTE 1	STEEL	WHITE	NO	TITUS	PAR	NOTES 3 & 6
EG-2	12x12	PERFORATED FACE	NOTE 1	ALUMINUM	WHITE	NO	TITUS	PAR	NOTES 3 & 6
EG-3	24x24	PERFORATED FACE	NOTE 1	STEEL	WHITE	NO	TITUS	PAR	NOTES 3 & 6
EG-4	24x24	PERFORATED FACE	NOTE 1	ALUMINUM	WHITE	NO	TITUS	PAR	NOTES 3 & 6
ER-1	INLET +2	35 DEGREE DEFLECTION	NOTE 1	ALUMINUM	WHITE	YES	TITUS	350F	NOTE 4 & 6
RG-3	24x24	PERFORATED FACE	NOTE 1	STEEL	WHITE	NO	TITUS	PAR	NOTES 3 & 6
RG-4	24x24	PERFORATED FACE	NOTE 1	ALUMINUM	WHITE	NO	TITUS	PAR	NOTES 3 & 6
SD-1	12x12	PANEL FACE	NOTE 1	STEEL	WHITE	NO	TITUS	OMNI	NOTE 5 & 6
SD-3	24x24	PANEL FACE	NOTE 1	STEEL	WHITE	NO	TITUS	OMNI	NOTE 5 & 6
SD-4	24x24	PANEL FACE	NOTE 1	ALUMINUM	WHITE	NO	TITUS	OMNI	NOTE 5 & 6
SR-1	INLET +2	35 DEGREE DEFLECTION	NOTE 1	STEEL	WHITE	YES	TITUS	350R	NOTE 4 & 6

VENTILATION SCHEDULE GENERAL NOTES

A. DISCONNECT AND CONTROLLER STARTER FURNISHED AND INSTALLED BY:
MFR = MANUFACTURER
EC = ELECTRICAL CONTRACTOR.

B. DISCONNECT TYPE:
F = FUSED
NF = NON-FUSED

C. CONTROLLER STARTER TYPE:
FV = FULL VOLTAGE
VFD = VARIABLE FREQUENCY DRIVE
VFD/B = VARIABLE FREQUENCY DRIVE WITH BYPASS

D. FAN RPM SHALL NOT EXCEED 110% OF SCHEDULED VALUE, WITH THE SCHEDULED WHEEL TYPE. SUBSTITUTION OF BI OR BIA FANS FOR FC IS ACCEPTABLE IF EFFICIENCY IS NOT LOWER.

E. NO EQUIPMENT SHALL BE SELECTED ABOVE 90% OF MOTOR NAME PLATE RATING.

F. MUST BE WITHIN +/- 10% OF SCHEDULED RPM.

G. CURB TYPE:
MFR = STANDARD CURB BY MANUFACTURER
GC = BY GENERAL CONTRACTOR

Revisions: | Date:

CONSULTANT

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REFERENCE SCALE IN INCHES
0 1 2 3

ARCHITECT/ENGINEER OF RECORD

ANDERSON
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STAMP

DELLAN J. LLEWELLYN
27052
2-14-25
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Office of Construction and Facilities Management
VA U.S. Department of Veterans Affairs

Drawing Title: VENTILATION SCHEDULES	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
			Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Drawing Number: MV600
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLLE	

VA FORM 08 - 6231

BIM 360://19004249.04 - VA-Wash DC-VA Sioux Falls New SPS/MEPT21_19004249.04_16584_VA Wash DC-VA Sioux Falls New SPS_C.rvt

2/14/2025 10:30:39 AM

VIEW KEY

NAME — LEVEL NAME; 10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL.

LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
- NEW
- EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
- NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
- EXISTING
- EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
- EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS.

BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
PLUMBING CODE:	IPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 2021 EDITION
ENERGY CONSERVATION CODE:	IECC 2021
HEALTH DEPARTMENT CODE:	CURRENT EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
A.C.	ASBESTOS ABATEMENT CONTRACTOR
C.C.	CIVIL CONTRACTOR
C.O.R.	CONTRACTING OFFICER'S REPRESENTATIVE
E.C.	ELECTRICAL CONTRACTOR
F.P.C.	FIRE PROTECTION CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
T.C.	TECHNOLOGY CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR

CONTACT PERSONS:

DESCRIPTION:	PERSON:
PROJECT MANAGER	ERIC J. HENDERSON, PE
MECHANICAL	DELLAN J. LLEWELLYN, PE
ELECTRICAL	KRISTEN SPINA, PE
TECHNOLOGY	DAMON M. DEEN

PIPING SHEET INDEX

MP000	PIPING COVERSHEET
MPD091	PIPE BASEMENT DEMOLITION PLAN - PIPING
MPD101	GROUND LEVEL FLOOR DEMOLITION PLAN - PIPING
MPD111	FIRST LEVEL DEMOLITION PLAN - PIPING
MPD151	FIFTH LEVEL DEMOLITION PLAN - PIPING
MP091	PIPE BASEMENT FLOOR PLAN - PIPING
MP101	GROUND LEVEL FLOOR PLAN - PIPING
MP111	INTERSTITIAL/FIRST LEVEL FLOOR PLAN - PIPING
MP121	ROOF PLAN - PIPING
MP400	PIPING DETAILS
MP401	PIPING DETAILS
MP500	STEAM FLOW DIAGRAM
MP501	HEATING WATER FLOW DIAGRAM
MP502	CHILLED WATER FLOW DIAGRAM
MP600	PIPING SCHEDULES
GRAND TOTAL: 15	

PIPING SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DPP	DRAIN
GWR	GLYCOL WATER RETURN
GWS	GLYCOL WATER SUPPLY
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
LIQ	REFRIGERANT LIQUID
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
PC	PUMPED CONDENSATE
SUC	REFRIGERANT SUCTION
SV	SAFETY RELIEF VENT
VAC	LAB VACUUM
	PIPE CAP
	PIPE DOWN
	PIPE UP OR UP/DOWN
	PITCH PIPE IN DIRECTION
	DIRECTION OF FLOW IN PIPE
	DIELECTRIC CONNECTION
	UNION/FLANGE
	SHUTOFF VALVE NORMALLY OPEN
	SHUTOFF VALVE NORMALLY CLOSED
	THROTTLING VALVE
	BALANCING VALVE (NUMBER INDICATES GPM)
	AUTOMATIC BALANCING VALVE
	CONTROL VALVE (THREE-WAY)
	CONTROL VALVE (TWO-WAY)
	CHECK VALVE
	BACKFLOW PREVENTER
	SAFETY/RELIEF VALVE
	PRESSURE REDUCING VALVE (LIQUID/GAS)
	PRESSURE REDUCING VALVE (STEAM)
	PUMP
	VACUUM BREAKER
	"WYE" - STRAINER
	"WYE" - STRAINER W/SHUTOFF VALVE AND HOSE CONNECTION WITH CAP
	FLEXIBLE CONNECTION
	PRESSURE/TEMPERATURE TEST PLUG
	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB
	SUCTION DIFFUSER WITH SUPPORT FOOT
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	DRAIN VALVE WITH HOSE CONNECTION AND CAP
P	PRESSURE SENSOR (FURNISHED WITH BALL VALVE)
	PRESSURE GAUGE (FURNISHED WITH BALL VALVE)
FM	FLOW METER
F	FLOW SWITCH
T	TEMPERATURE SENSOR WITH WELL
	THERMOMETER WITH WELL (DIAL TYPE)
	THERMOMETER WITH WELL (FILLED TYPE)
T	STEAM TRAP (REFER TO SCHEDULE)
	F&T STEAM TRAP (REFER TO SCHEDULE)
	INVERTED BUCKET STEAM TRAP (REFER TO SCHEDULE)
	ALIGNMENT GUIDE
	PIPE ANCHOR
M	METER
HTR	TERMINAL AIR BOX w/REHEAT COIL (REFER TO SCHEDULE)
H	HUMIDIFIER

PIPING ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
DPS	DIFFERENTIAL PRESSURE SWITCH
EA	EXHAUST/RELIEF AIR
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
OA	OUTSIDE AIR
PS	PRESSURE SWITCH
RA	RETURN AIR
SA	SUPPLY AIR
SCCR	SHORT CIRCUIT CURRENT RATING
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, FIRE PROTECTION, PLUMBING, VENTILATION, PIPING AND TEMPERATURE CONTROL.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
3. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
4. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
5. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
6. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
8. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
9. IN AREAS WITH DRYWALL CEILINGS COORDINATE LOCATIONS OF ACCESS PANELS WITH THE GC FOR ACCESS TO VALVES, DUCTWORK ACCESSORIES, DAMPERS, ETC. COORDINATE PANEL TYPE AND COLOR WITH ARCHITECT. NOTIFY THE GC OF THE REQUIRED ACCESS PANELS PRIOR TO BIDDING.
10. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH EXTERIOR WALLS AND ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
11. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
12. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
13. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
14. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
15. MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-6" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS.
16. MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6'-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING, DUCTWORK, PIPING, ETC.
17. PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT.
18. DO NOT SUPPORT EQUIPMENT, PIPING, OR DUCTWORK FROM METAL DECKING OR OTHER NON-STRUCTURAL BUILDING ELEMENTS. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, FIRE PROTECTION, PLUMBING, VENTILATION, PIPING AND TEMPERATURE CONTROL.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
2. NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
3. FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. EACH CONTRACTOR SHALL FIELD VERIFY ACCESSIBILITY TO THE AREA OF THEIR WORK AND SHALL NOTIFY THE GENERAL CONTRACTOR PRIOR TO BIDDING IF OTHER UTILITIES ARE REQUIRED TO BE REMOVED OR RELOCATED TO ALLOW ACCESS TO THEIR AREA OF WORK.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL AND PATCHING OF ROOFS, WALLS, AND FLOORS ASSOCIATED WITH WORK BY ALL CONTRACTORS. CONTRACTORS SHALL NOTIFY THE GC OF AFFECTED AREAS PRIOR TO BIDDING.
6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
7. WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
8. PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
9. OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
10. MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
11. DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.

PIPING GENERAL NOTES:

1. THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
2. PIPE DRAIN LINES FROM EQUIPMENT TO NEAREST FLOOR DRAIN.
3. INSTALL ALL REFRIGERANT LIQUID AND SUCTION PIPING SIZED PER EQUIPMENT MANUFACTURER RECOMMENDATIONS.

Revisions:	Date:

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: PIPING COVERSHEET	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Building Number: 5
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLE	Drawing Number: MP000

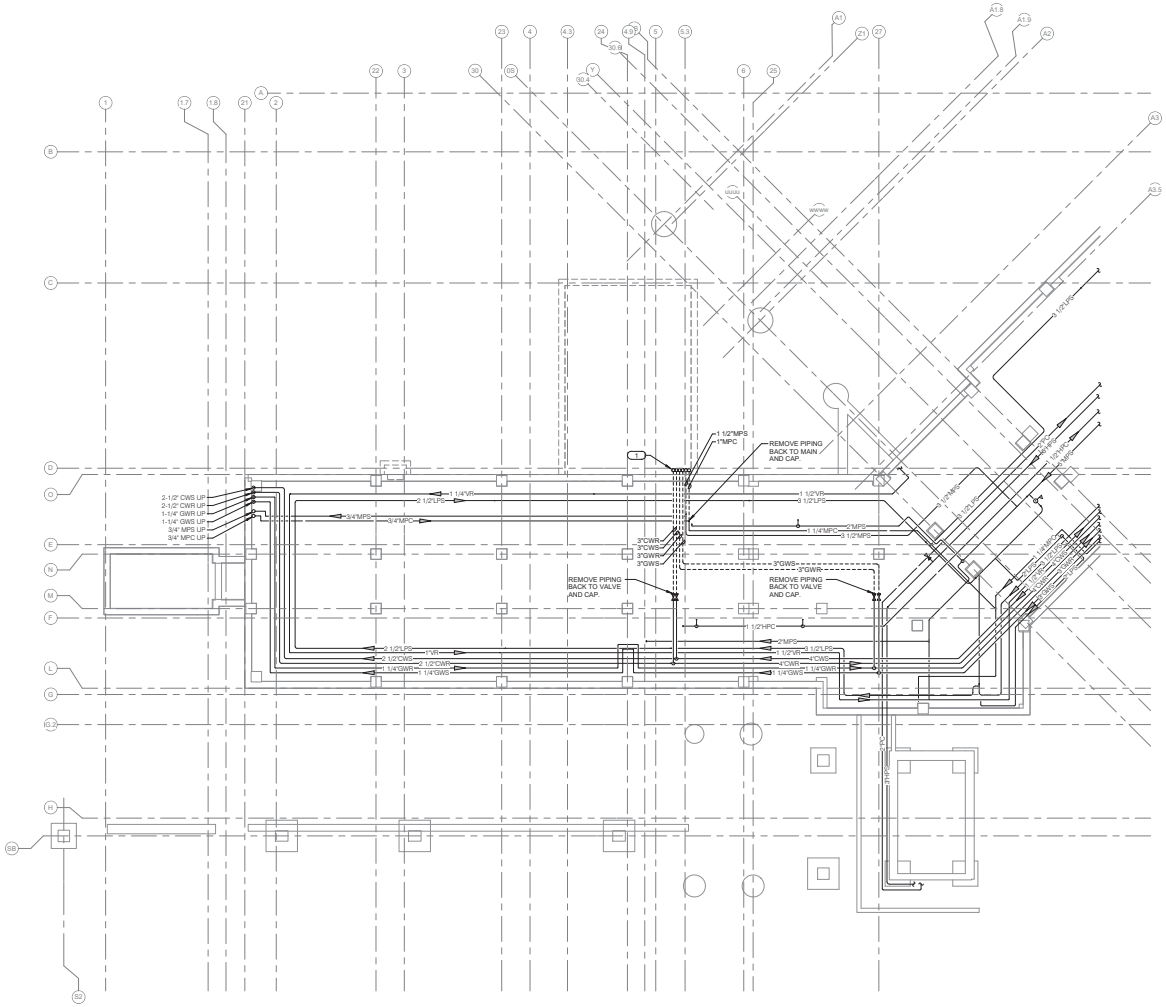
VA FORM 08 - 6231

GENERAL PIPING DEMOLITION NOTES:

1. REFERENCE MP000 - PIPING COVERSHEET FOR PIPING SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
3. COMPLETE LAYOUT DRAWINGS SHALL BE REQUIRED BY SPECIFICATION SECTION 23 05 11. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL SYSTEM LAYOUT DRAWINGS HAVE BEEN APPROVED BY THE C.O.R.
4. CONTRACTOR SHALL MINIMIZE DOWNTIME OF EXISTING SYSTEMS BY INSTALLING NEW SYSTEMS PRIOR TO TYING INTO EXISTING. NOTIFY C.O.R. A MINIMUM OF 24 HOURS PRIOR TO SYSTEM SHUTDOWN.
5. DEMOLISH ALL EXISTING HANGERS, INSULATION, DAMPERS, AND ACCESSORIES ASSOCIATED WITH MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
6. DEMOLISH ALL EXISTING CONTROL DEVICES, WIRING, AND CONDUIT ASSOCIATED WITH MECHANICAL EQUIPMENT SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
7. NOT ALL MECHANICAL DEMOLITION IS EXPLICITLY SHOWN ON THE DRAWING. CONTRACTOR SHALL CONFIRM EXTENT OF DEMOLITION AT THE SITE.

KEYNOTES: (#)

1. REMOVE CHILLED WATER, HEATING WATER, STEAM, AND CONDENSATE UP THROUGH SLAB INTO EXISTING MECHANICAL ROOM.



1 PIPE BASEMENT DEMOLITION PLAN - PIPING

1/8" = 1'-0"

Revisions:	Date:

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title PIPE BASEMENT DEMOLITION PLAN - PIPING	**Phase** BID DOCUMENTS	**Project Title** CONSTRUCT NEW SPS	**Project Number** 438-460
			Building Number 5
Approved:	FULLY SPRINKLERED	**Location** Sioux Falls, SD.	**Drawing Number** MPD091
		Issue Date 02/14/2025	**Checked** DAVING / **Drawn** DELLE

BIM 360://190042403.04 - VA Vitals DC-VA Sioux Falls New SPS/MEP21 - 190042403.04_16584_VA Vitals DC-VA Sioux Falls New SPS_Cr.rvt 2/14/2025 10:27:39 AM

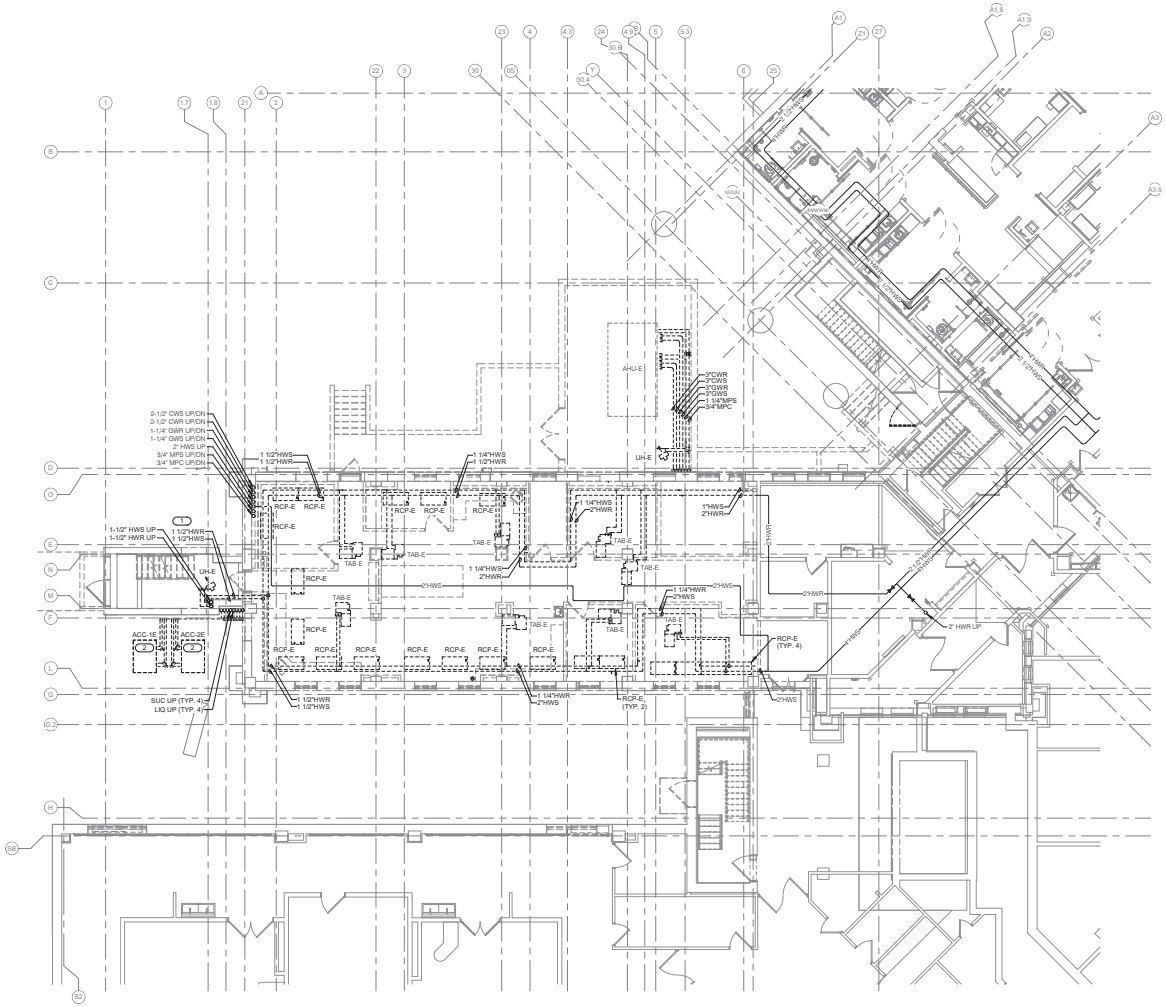
VA FORM 08 - 6231

GENERAL PIPING DEMOLITION NOTES:

1. REFERENCE MP000 - PIPING COVERSHEET FOR PIPING SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
3. COMPLETE LAYOUT DRAWINGS SHALL BE REQUIRED BY SPECIFICATION SECTION 23 05 11. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL SYSTEM LAYOUT DRAWINGS HAVE BEEN APPROVED BY THE C.O.R.
4. CONTRACTOR SHALL MINIMIZE DOWNTIME OF EXISTING SYSTEMS BY INSTALLING NEW SYSTEMS PRIOR TO TYING INTO EXISTING. NOTIFY C.O.R. A MINIMUM OF 24 HOURS PRIOR TO SYSTEM SHUTDOWN.
5. DEMOLISH ALL EXISTING HANGERS, INSULATION, DAMPERS, AND ACCESSORIES ASSOCIATED WITH MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
6. DEMOLISH ALL EXISTING CONTROL DEVICES, WIRING, AND CONDUIT ASSOCIATED WITH MECHANICAL EQUIPMENT SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
7. NOT ALL MECHANICAL DEMOLITION IS EXPLICITLY SHOWN ON THE DRAWING. CONTRACTOR SHALL CONFIRM EXTENT OF DEMOLITION AT THE SITE.

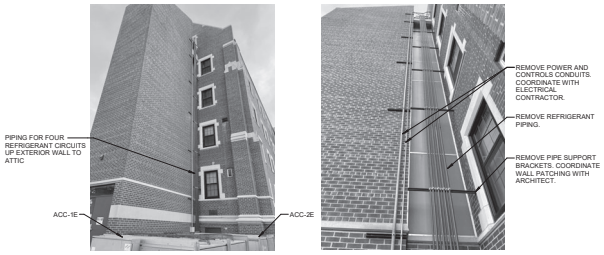
KEYNOTES: (#)

1. EXISTING HEATING WATER PIPING IS ROUTED ON FLOOR IN STAIRWELL PRIOR TO RISING UP STAIR TOWER. REMOVE PIPING ROUTED ON FLOOR AND PREPARE RISERS ABOVE GROUND FLOOR FOR NEW CONNECTION.
2. EXISTING AIR-COOLED CONDENSING UNITS PREVIOUSLY SERVED A MODULAR CHILLER LOCATED IN THE 5TH LEVEL ATTIC SPACE WHICH HAS BEEN TRANSITIONED TO A NEW COOLING TOWER. CHILLERS SHALL BE REMOVED FROM EXISTING LOCATION. COORDINATE REMOVAL OF CHILLERS WITH CONTRACTING OFFICER'S REPRESENTITIVE. PROPERLY RECLAIM AND DISPOSE OF ALL REFRIGERANT.



1 GROUND LEVEL FLOOR DEMOLITION PLAN - PIPING

1/8" = 1'-0"



2 EXISTING REFRIGERANT PIPING DEMOLITION DETAIL

1'2" = 1'-0"

Revisions:	Date:

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: GROUND LEVEL FLOOR DEMOLITION PLAN - PIPING	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
			Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Drawing Number: MPD101
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLLE	

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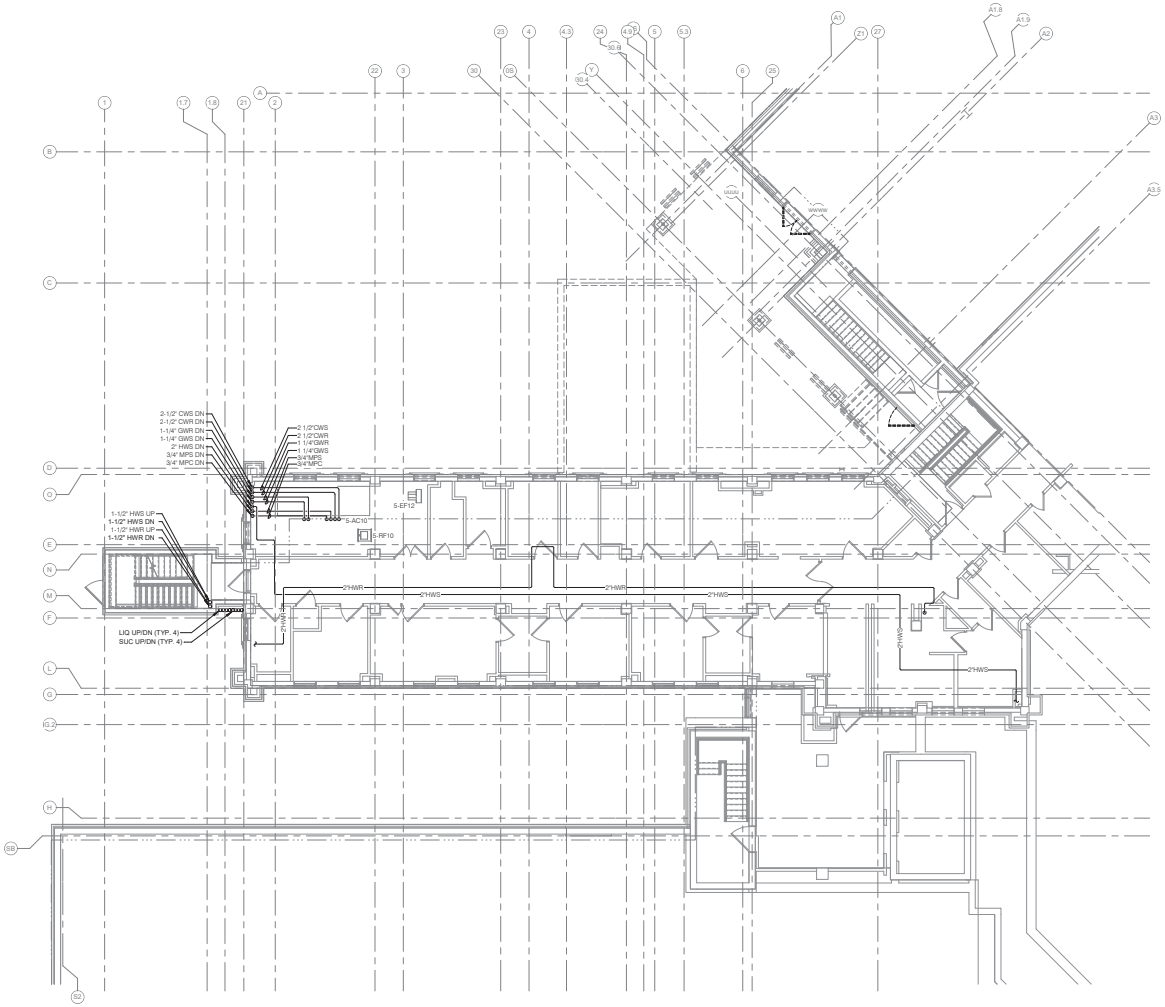
VA FORM 08 - 6231

GENERAL PIPING DEMOLITION NOTES:

1. REFERENCE MP000 - PIPING COVERSHEET FOR PIPING SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
3. COMPLETE LAYOUT DRAWINGS SHALL BE REQUIRED BY SPECIFICATION SECTION 23 05 11. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL SYSTEM LAYOUT DRAWINGS HAVE BEEN APPROVED BY THE C.O.R.
4. CONTRACTOR SHALL MINIMIZE DOWNTIME OF EXISTING SYSTEMS BY INSTALLING NEW SYSTEMS PRIOR TO TYING INTO EXISTING. NOTIFY C.O.R. A MINIMUM OF 24 HOURS PRIOR TO SYSTEM SHUTDOWN.
5. DEMOLISH ALL EXISTING HANGERS, INSULATION, DAMPERS, AND ACCESSORIES ASSOCIATED WITH MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
6. DEMOLISH ALL EXISTING CONTROL DEVICES, WIRING, AND CONDUIT ASSOCIATED WITH MECHANICAL EQUIPMENT SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
7. NOT ALL MECHANICAL DEMOLITION IS EXPLICITLY SHOWN ON THE DRAWING. CONTRACTOR SHALL CONFIRM EXTENT OF DEMOLITION AT THE SITE.



1 FIRST LEVEL DEMOLITION PLAN - PIPING

1/8" = 1'-0"

NORTH

Revisions:	Date:

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: FIRST LEVEL DEMOLITION PLAN - PIPING	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460
				Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: MPD111
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLE

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VA FORM 08 - 6231

GENERAL PIPING DEMOLITION NOTES:

1. REFERENCE MP000 - PIPING COVERSHEET FOR PIPING SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
3. COMPLETE LAYOUT DRAWINGS SHALL BE REQUIRED BY SPECIFICATION SECTION 23 05 11. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL SYSTEM LAYOUT DRAWINGS HAVE BEEN APPROVED BY THE C.O.R.
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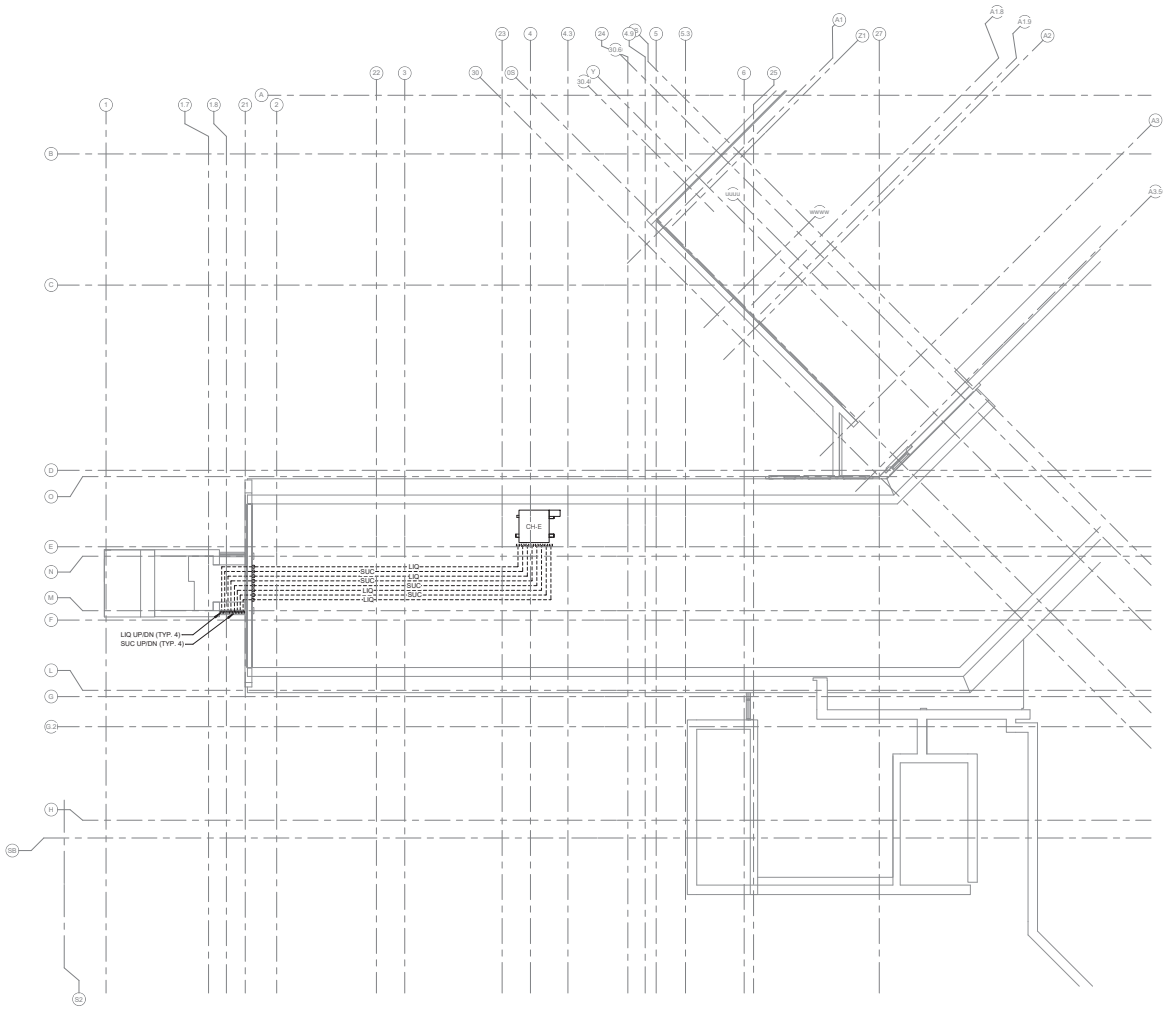
5. DEMOLISH ALL EXISTING HANGERS, INSULATION, DAMPERS, AND ACCESSORIES ASSOCIATED WITH MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
6. DEMOLISH ALL EXISTING CONTROL DEVICES, WIRING, AND CONDUIT ASSOCIATED WITH MECHANICAL EQUIPMENT SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
7. NOT ALL MECHANICAL DEMOLITION IS EXPLICITLY SHOWN ON THE DRAWING. CONTRACTOR SHALL CONFIRM EXTENT OF DEMOLITION AT THE SITE.



1 FIFTH LEVEL DEMOLITION PLAN - PIPING

1/8" = 1'-0"

Revisions:	Date:

CONSULTANT

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PROJECT # 190042409.04

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DELLAN J. LLEWELLYN 27052 LICENSED PROFESSIONAL ENGINEER IOWA

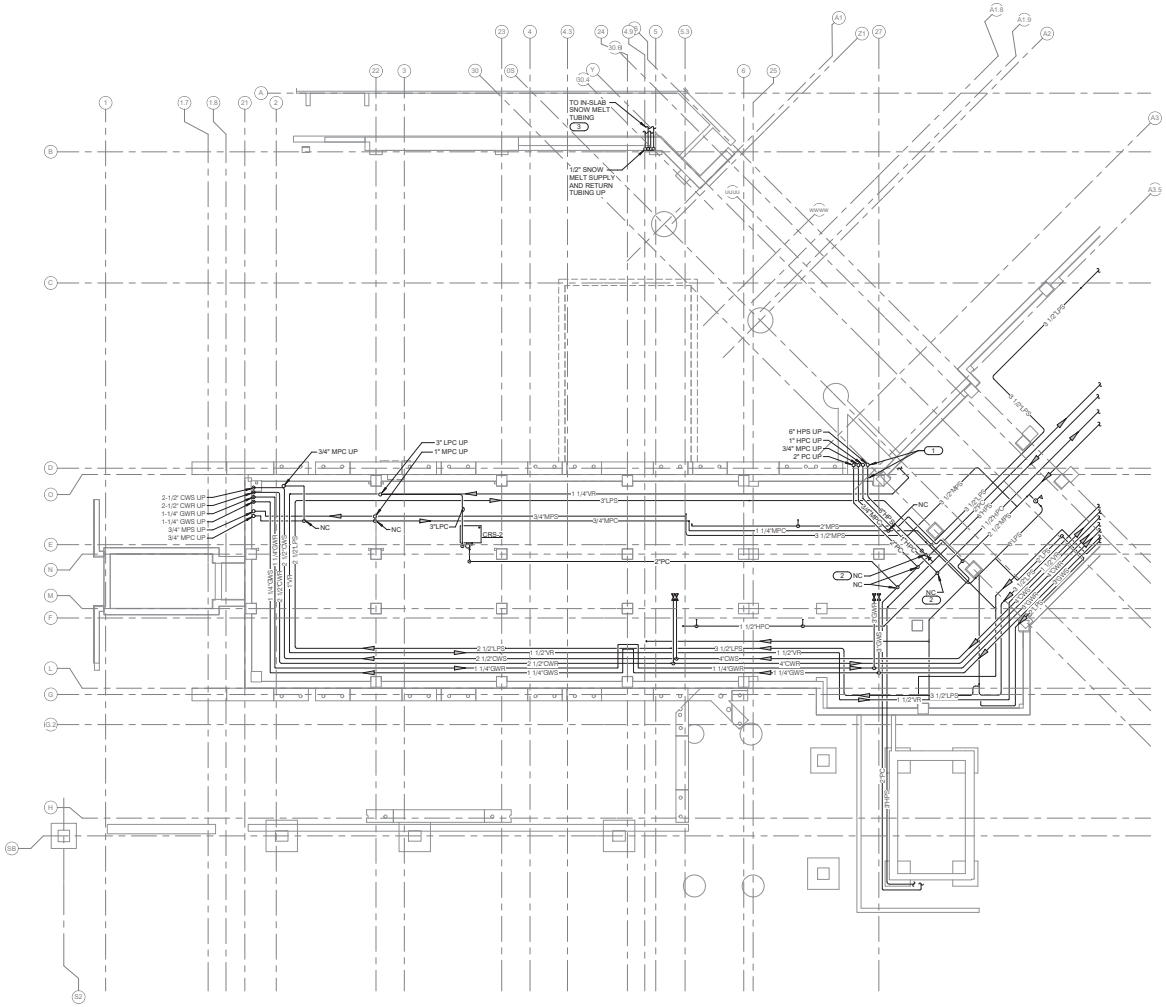
Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: FIFTH LEVEL DEMOLITION PLAN - PIPING	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS			Project Number: 438-460
					Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.			Drawing Number: MPD151
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE	

BIM 360://190042409.04 - VA Vitals DC-VA Sioux Falls New SPS/MEP21 - 190042409.04_18684_VA Vitals DC-VA Sioux Falls New SPS_C1.rvt 2/14/2025 10:27:52 AM

VA FORM 08 - 6231



1 PIPE BASEMENT FLOOR PLAN - PIPING

1/8" = 1'-0"

NORTH

GENERAL MECHANICAL NOTES:

1. REFERENCE MP000 – PIPING COVERSHEET FOR VENTILATION SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. COORDINATE AND CONFIRM ALL ARCHITECTURALLY EXPOSED DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN OR INSTALLATION.
3. REFERENCE MP500 FOR STEAM FLOW DIAGRAM.
4. REFERENCE MP501 FOR HEATING WATER FLOW DIAGRAM.
5. REFERENCE MP502 FOR CHILLED WATER FLOW DIAGRAM.
6. REFERENCE MP600 FOR PIPING SCHEDULES.
7. COMPLETE LAYOUT DRAWINGS SHALL BE REQUIRED BY SPECIFICATION SECTION 23 05 11. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL SYSTEM LAYOUT DRAWINGS HAVE BEEN APPROVED BY THE C.O.R.
8. ALL PIPING, OF ANY KIND, ABOVE SOLID LID CEILINGS SHALL BE CONSTRUCTED OF AS FEW PIECES AS POSSIBLE AND SHALL ONLY UTILIZE WELDED OR SWEATED JOINTS AND CONNECTIONS.
9. REFERENCE 1/MP400 FOR PIPE HANGERS AND SUPPORTS DETAIL.
10. REFERENCE 2/MP400 FOR FIRE RATED FLOOR/WALL PENETRATION DETAIL.
11. REFERENCE 3/MP400 FOR NON-FIRE RATED WALL PENETRATION DETAIL.

KEYNOTES: (#)

1. PROVIDE CORROSION RESISTANT MECHANICAL LINK SEAL DEVICE FOR ALL PIPING PENETRATIONS OF FOUNDATION WALLS AND FLOOR SLABS.
2. PROVIDE HIGH PRESSURE STEAM DRIP TRAP ASSEMBLY IN PIPE BASEMENT DOWNSTREAM OF CONNECTION TO EXISTING ISOLATION VALVE. REFERENCE 1/MP401 FOR HIGH PRESSURE STEAM MAIN DRIP DETAIL.
3. REFERENCE 1/MP401 FOR SNOW MELT TUBING DETAIL.

Revisions:	Date:

CONSULTANT

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: PIPE BASEMENT FLOOR PLAN - PIPING	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS			Project Number: 438-460
					Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.			Drawing Number: MP091
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE	

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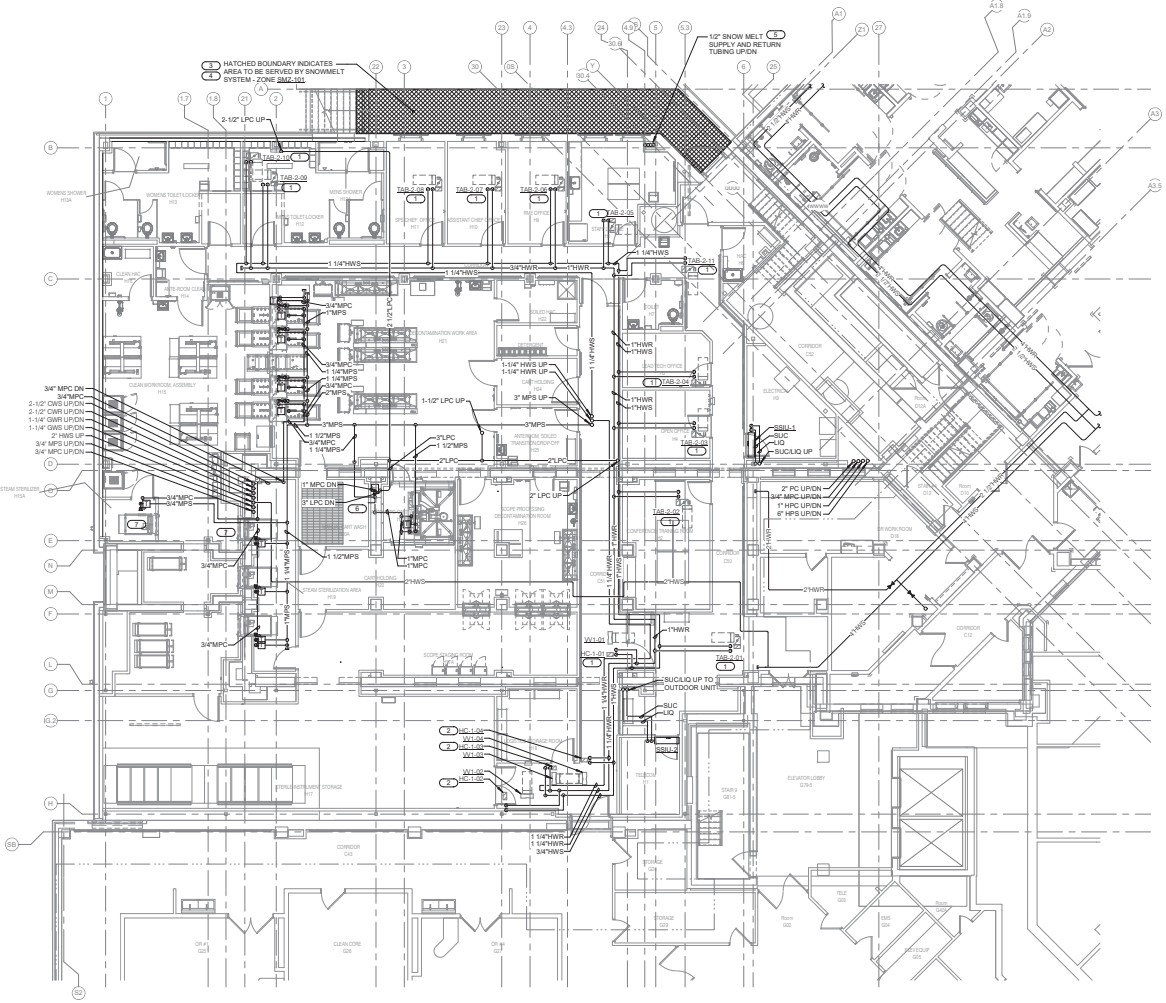
3 HATCHED BOUNDARY INDICATES
4 AREA TO BE SERVED BY SNOWMELT SYSTEM - ZONE SMZ-101
1/2" SNOW MELT SUPPLY AND RETURN TUBING UP/DN
2-1/2" LPC UP
1 1/4"HWS
3/4"HWR
1"HWR
1"HWS
3/4"MPC
1"MPS
1-1/4" HWS UP
1-1/4" HWR UP
3" MPS UP
1-1/2" LPC UP
3"LPC
1 1/2"MPS
2"LPC
2" LPC UP
1" MPC DN
3" LPC DN
3/4" MPC DN
2-1/2" CWS UP/DN
2-1/2" CWR UP/DN
1-1/4" GWR UP/DN
1-1/4" GWS UP/DN
2" HWS UP
3/4" MPS UP/DN
3/4" MPC UP/DN
SBRU-1
SUC
LIQ
SUC/LIQ UP
2" PC UP/DN
3/4" MPC UP/DN
1" HPC UP/DN
6" HPS UP/DN
SUC/LIQ UP TO OUTDOOR UNIT
HC-1-04
WV1-04
1 1/4"HWR
1 1/4"HWS
3/4"HWS
TAB-2-01
TAB-2-02
TAB-2-03
TAB-2-04
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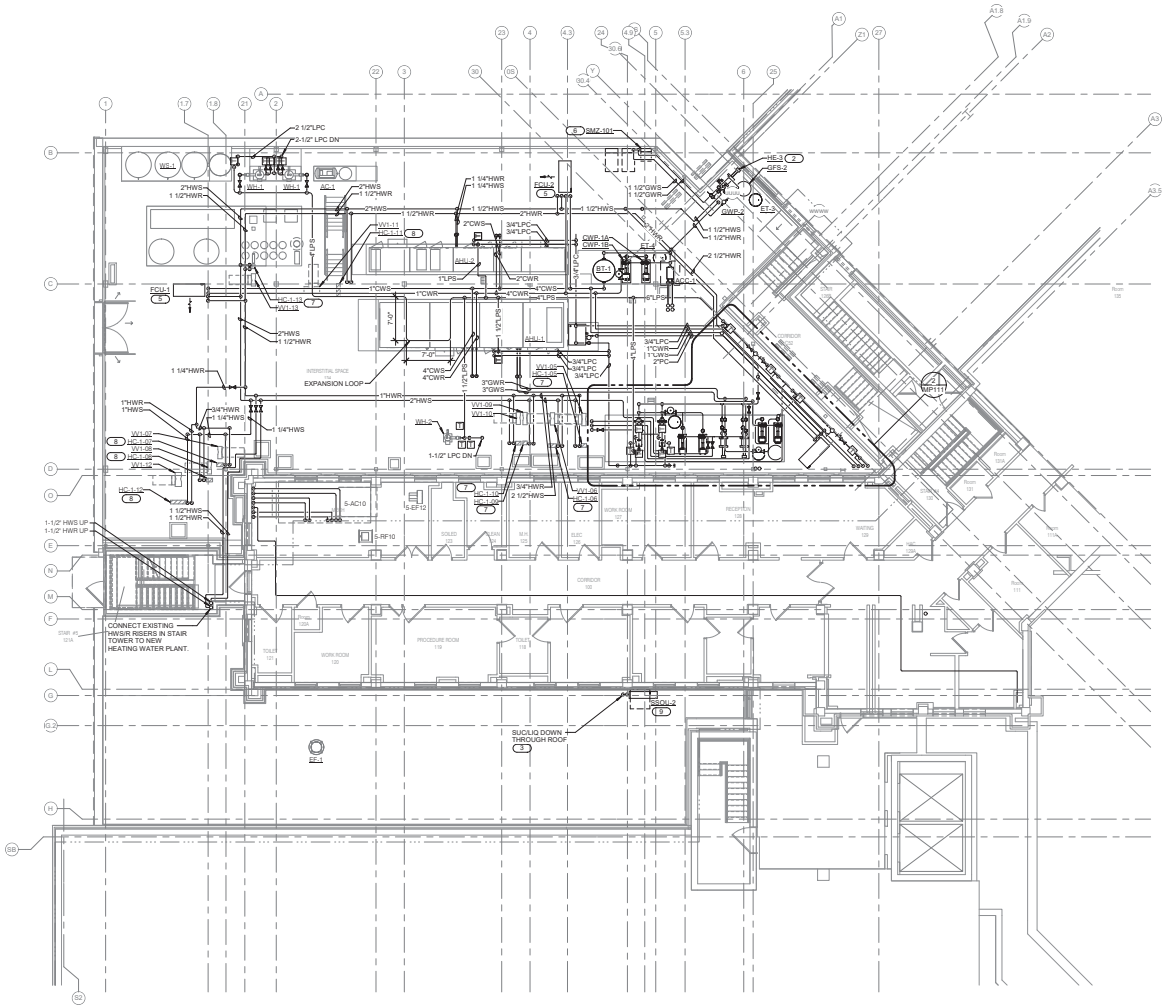
TAB-2-40

GENERAL MECHANICAL NOTES:

1. REFERENCE MP000 – PIPING COVERSHEET FOR VENTILATION SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. COORDINATE AND CONFIRM ALL ARCHITECTURALLY EXPOSED DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN OR INSTALLATION.
3. REFERENCE MP500 FOR STEAM FLOW DIAGRAM.
4. REFERENCE MP501 FOR HEATING WATER FLOW DIAGRAM.
5. REFERENCE MP502 FOR CHILLED WATER FLOW DIAGRAM.
6. REFERENCE MP600 FOR PIPING SCHEDULES.
7. COMPLETE LAYOUT DRAWINGS SHALL BE REQUIRED BY SPECIFICATION SECTION 23 05 11. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL SYSTEM LAYOUT DRAWINGS HAVE BEEN APPROVED BY THE C.O.R.
8. ALL PIPING, OF ANY KIND, ABOVE SOLID LID CEILINGS SHALL BE CONSTRUCTED OF AS FEW PIECES AS POSSIBLE AND SHALL ONLY UTILIZE WELDED OR SWEATED JOINTS AND CONNECTIONS.
9. REFERENCE 1/MP400 FOR PIPE HANGERS AND SUPPORTS DETAIL.
10. REFERENCE 2/MP400 FOR FIRE RATED FLOOR/WALL PENETRATION DETAIL.
11. REFERENCE 3/MP400 FOR NON-FIRE RATED WALL PENETRATION DETAIL.

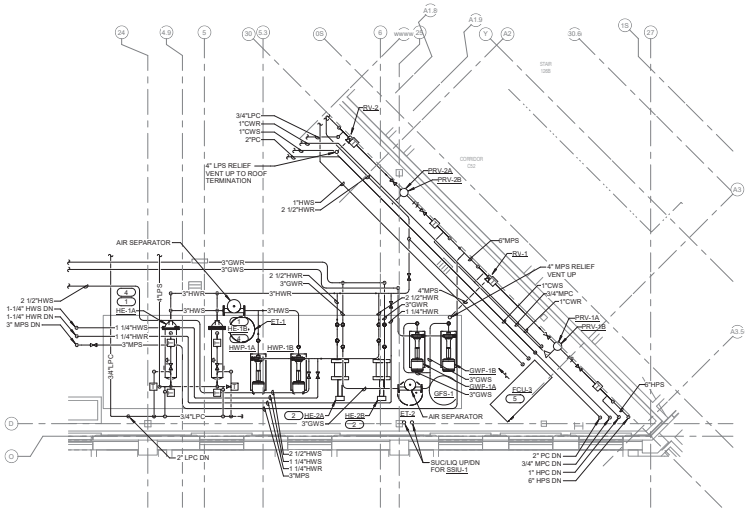
KEYNOTES: (#)

1. REFERENCE 5/MP401 FOR SHELL & TUBE HEAT EXCHANGER PIPING DETAIL.
2. REFERENCE 6/MP401 FOR PLATE & FRAME HEAT EXCHANGER PIPING DETAIL.
3. REFERENCE 5/MP400 FOR INSULATED PIPE HOUSING ROOF PENETRATION DETAIL.
4. REFERENCE 6/MP400 FOR HEAT EXCHANGER SUPPORT DETAIL.
5. REFERENCE 8/MP401 FOR 4-PIPE FAN COIL UNIT PIPING DIAGRAM.
6. REFERENCE 10/MP401 FOR SNOW MELT MANIFOLD PIPING DETAIL.
7. REFERENCE 7/MP401 FOR HEATING WATER COIL PIPING DIAGRAM WITH 3-WAY VALVE.
8. REFERENCE 8/MP401 FOR HEATING WATER COIL PIPING DIAGRAM WITH 3-WAY VALVE.
9. PROVIDE SPLIT SYSTEM OUTDOOR UNIT WITH WALL HANGING MOUNTING BRACKET. MOUNT APPROXIMATELY 24" ABOVE TOP OF ROOF INSULATION.



1 INTERSTITIAL/FIRST LEVEL FLOOR PLAN - PIPING

1/8" = 1'-0"



2 ENLARGED INTERSTITIAL/FIRST LEVEL FLOOR PLAN - PIPING

1/4" = 1'-0"

Revisions:	Date:

CONSULTANT

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LICENSED PROFESSIONAL ENGINEER
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IOWA

Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title INTERSTITIAL/FIRST LEVEL FLOOR PLAN - PIPING	**Phase** BID DOCUMENTS	**Project Title** CONSTRUCT NEW SPS		**Project Number** 438-460
				Building Number 5
Approved:	FULLY SPRINKLERED	**Location** Sioux Falls, SD.		**Drawing Number** MP111
		Issue Date 02/14/2025	**Checked** DAVING / **Drawn** DELLLE	

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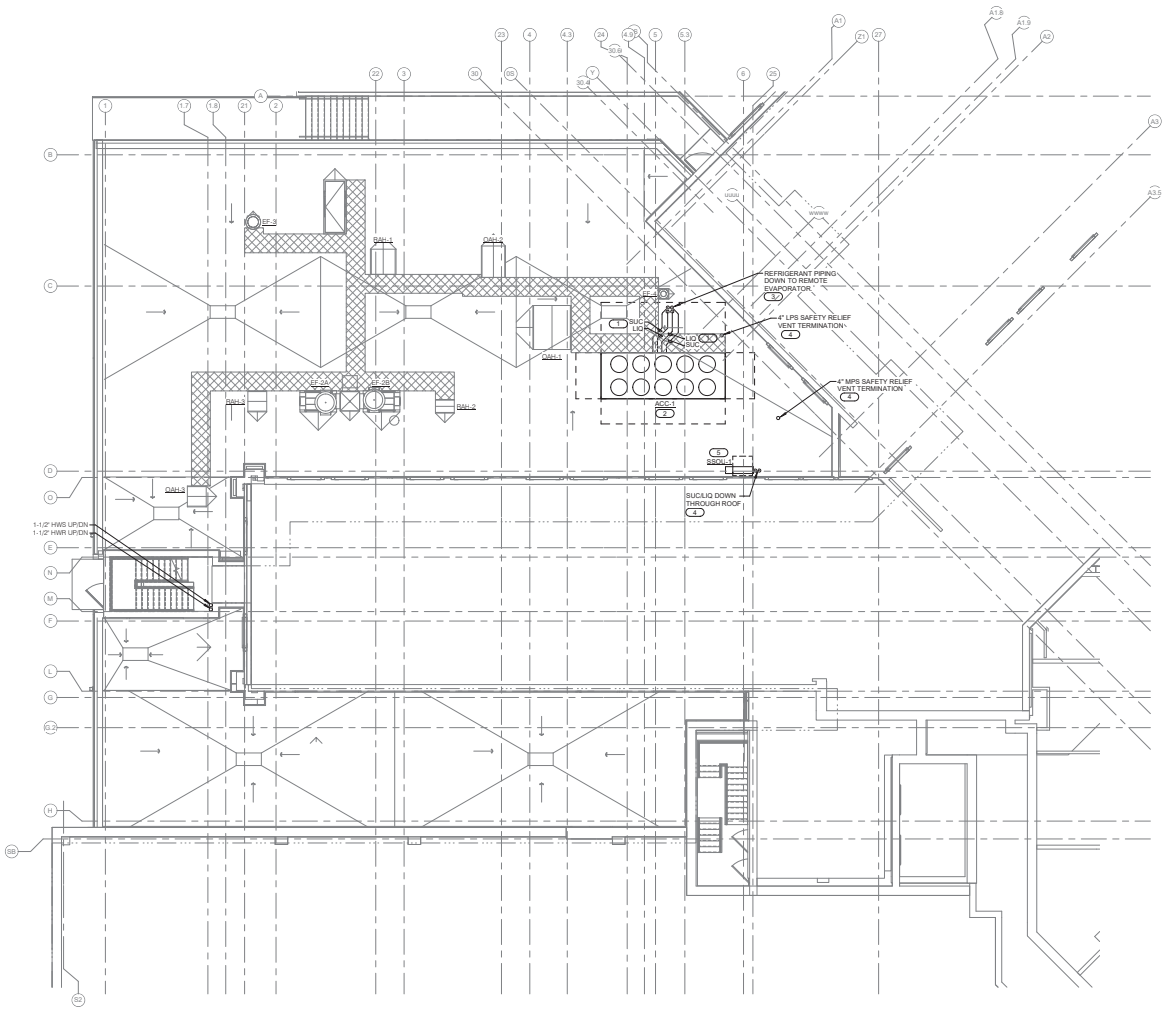

1 ROOF PLAN - PIPING

1/8" = 1'-0"

GENERAL MECHANICAL NOTES:

1. REFERENCE MP000 – PIPING COVERSHEET FOR VENTILATION SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. COORDINATE AND CONFIRM ALL ARCHITECTURALLY EXPOSED DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN OR INSTALLATION.
3. REFERENCE MP500 FOR STEAM FLOW DIAGRAM.
4. REFERENCE MP501 FOR HEATING WATER FLOW DIAGRAM.
5. REFERENCE MP502 FOR CHILLED WATER FLOW DIAGRAM.
6. REFERENCE MP600 FOR PIPING SCHEDULES.
7. COMPLETE LAYOUT DRAWINGS SHALL BE REQUIRED BY SPECIFICATION SECTION 23 05 11. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL SYSTEM LAYOUT DRAWINGS HAVE BEEN APPROVED BY THE C.O.R.
8. ALL PIPING, OF ANY KIND, ABOVE SOLID LID CEILINGS SHALL BE CONSTRUCTED OF AS FEW PIECES AS POSSIBLE AND SHALL ONLY UTILIZE WELDED OR SWEATED JOINTS AND CONNECTIONS.
9. REFERENCE 1/MP400 FOR PIPE HANGERS AND SUPPORTS DETAIL.
10. REFERENCE 2/MP400 FOR FIRE RATED FLOOR/WALL PENETRATION DETAIL.
11. REFERENCE 3/MP400 FOR NON-FIRE RATED WALL PENETRATION DETAIL.

KEYNOTES: (#)

1. ROUTE REFRIGERANT PIPING ACROSS ROOF. FOLLOW CHILLER MANUFACTURER'S REQUIREMENTS FOR REFRIGERANT PIPE ROUTING AND SIZING. EXTERIOR REFRIGERANT PIPING SHALL BE INSULATED AND WRAPPED WITH ALUMINUM JACKETING. REFERENCE 4/MP400 FOR EXTERIOR PIPING ROOF SUPPORT DETAIL.
2. REFERENCE 7/MP400 FOR AIR COOLED CHILLER ROOF SUPPORT DETAIL.
3. REFERENCE 5/MP400 FOR INSULATED PIPE HOUSING ROOF PENETRATION DETAIL.
4. REFERENCE 3/MP401 FOR SAFETY VALVE DISCHARGE PIPING DETAIL.
5. PROVIDE SPLIT SYSTEM OUTDOOR UNIT WITH WALL HANGING MOUNTING BRACKET. MOUNT APPROXIMATELY 24" ABOVE TOP OF ROOF INSULATION.

Revisions:	Date:

CONSULTANT

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Office of Construction and Facilities Management

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Drawing Title	ROOF PLAN - PIPING
Approved:	
Phase	BID DOCUMENTS
	FULLY SPRINKLERED
Project Title	CONSTRUCT NEW SPS
Location	Sioux Falls, SD.
Issue Date	02/14/2025
Checked	DAVING
Drawn	DELLLE
Project Number	438-460
Building Number	5
Drawing Number	MP121

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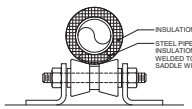
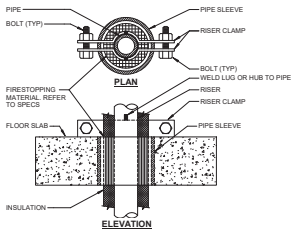
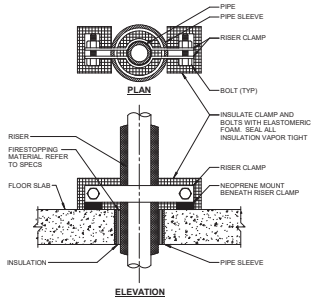


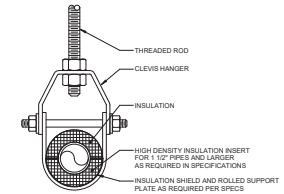
INSULATED HOT PIPE 4" AND LARGER



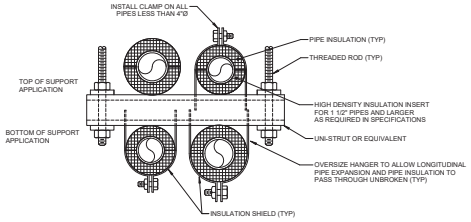
INSULATED HOT PIPE RISER SUPPORT



INSULATED COLD PIPE RISER SUPPORT



INSULATED COLD PIPE HANGER



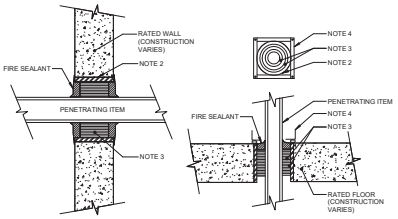
TRAPEZE HANGER

1 PIPE - HANGERS AND SUPPORTS

NO SCALE

NOTES:

1. REFER TO SPECIFICATION SECTION 23 05 29 & SECTION 23 07 19.

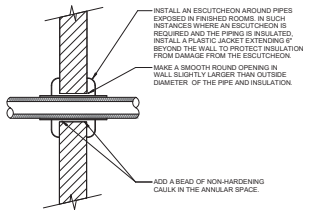


2 FIRE RATED FLOOR/WALL PENETRATION DETAIL

NO SCALE

NOTES:

1. THIS GENERAL DETAIL APPLIES TO ALL ITEMS PENETRATING FIRE RATED WALLS OR FLOORS. THE INTENT IS TO MAINTAIN THE FIRE RATING AND TO ALLOW LONGITUDINAL MOVEMENT. REFER TO SPECIFICATION SECTION 23 05 03 FOR SELECTION OF THROUGH PENETRATION FIRE STOPPING.
2. SCHEDULE 5 PIPE SLEEVE EMBEDDED IN WALL OR FLOOR, OR SMOOTH CORE DRILL. EACH CONTRACTOR FURNISHES SLEEVE TO G.C., COORDINATES SLEEVE LOCATIONS AND DEBURS SLEEVE. G.C. BUILDS SLEEVE INTO WALL OR FLOOR ALLOWING NO GAP AROUND SLEEVE. IF SLEEVE IS NOT PROVIDED WHEN WALL OR FLOOR IS BUILT, CONTRACTOR SHALL INSTALL SLEEVE. SLEEVE SIZE SHALL ALLOW ANNULAR SPACE REQUIRED BY THE SELECTED FIRE STOP SYSTEM.
3. INSTALL BACKING MATERIAL, SUCH AS MINERAL WOOL SAFING, AS REQUIRED FOR FIRE STOP SYSTEM. INSTALL IN ACCORDANCE WITH FIRE STOP SYSTEM APPLICATION LISTING. SECURE TO WALL OR FLOOR TO ALLOW LONGITUDINAL MOVEMENT OF PENETRATING ITEM WITHOUT MOVEMENT OF FIRE BARRIER.
4. WATERTIGHT WELDED 1"x1" 20 GAUGE MINIMUM GALVANIZED SHEET METAL ANGLE FRAME, BY CONTRACTOR IN EQUIPMENT ROOMS FOR WATER STOP. PLACE A BEAD OF WATERPROOF SEALANT BETWEEN FLOOR AND BOTTOM OF ANGLE FRAME. SECURE TO FLOOR WITH MASONRY ANCHORS IN CORNERS AND ON 12" MAXIMUM CENTERS. MULTIPLE PENETRATING ITEMS MAY BE ENCLOSED IN ONE FRAME.

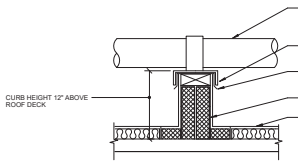


3 NON-FIRE RATED WALL PENETRATION DETAIL

NO SCALE

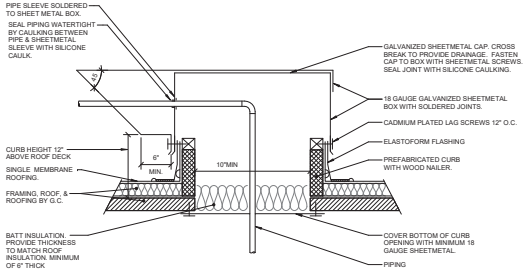
NOTES:

1. THIS DETAIL APPLIES TO ALL PIPES. THE INTENTION IS TO CONTINUE THE INSULATION AND VAPOR BARRIER THROUGH ALL PENETRATIONS. PERMIT THERMAL EXPANSION WITHOUT DAMAGING INSULATION, AND TO SEAL AIRTIGHT AROUND INSULATED AND UNINSULATED PIPES FOR NOISE TRANSMISSION CONTROL.
2. SEE SPECIFICATION SECTION 23 05 29 FOR ADDITIONAL INFORMATION.
3. FLOOR OPENINGS ARE SIMILAR. SEE SPECIFICATION SECTION 23 05 29 FOR DIFFERENCES BETWEEN FLOOR AND WALL PENETRATIONS.



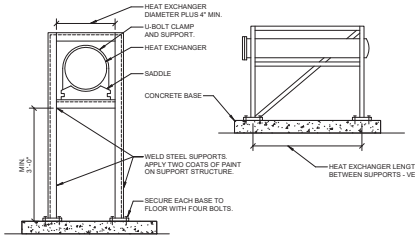
4 EXTERIOR PIPING ROOF SUPPORT DETAIL

NO SCALE



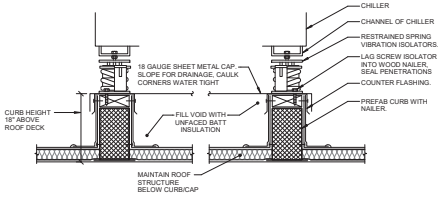
5 INSULATED PIPE HOUSING ROOF PENETRATION DETAIL

NO SCALE



6 HEAT EXCHANGER SUPPORT - FLOOR FRAME

NO SCALE



7 AIR COOLED CHILLER ROOF SUPPORT DETAIL

NO SCALE

NOTES:

1. PROVIDE FULL PERIMETER CURB WITH SHEET METAL CAP AND SEAL WATER-TIGHT.

Revisions:	Date:

CONSULTANT

IMEG

ARCHITECT/ENGINEER OF RECORD

ANDERSON

STAMP

DELLAN J. LLEWELLYN 27052 IOWA

Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: PIPING DETAILS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460
				Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: MP400
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE

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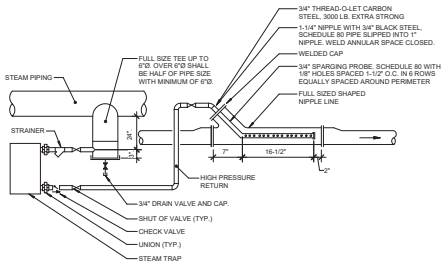
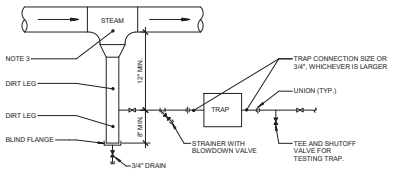
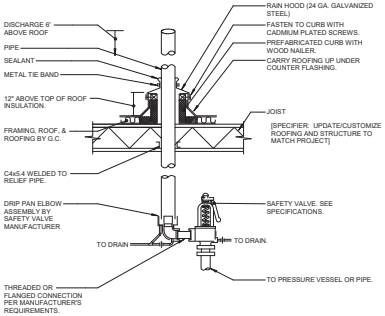


1 HIGH PRESSURE STEAM MAIN DRIP
NO SCALE

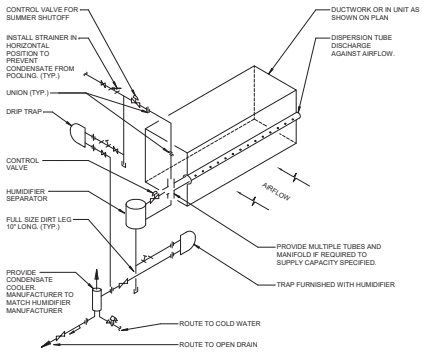


2 STEAM MAIN DRIP CONNECTION
NO SCALE

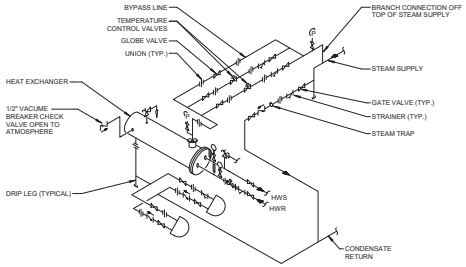
NOTES:
1. DRIP AND DIRT LEGS SHALL BE AT LEAST TWICE THE DIAMETER OF THE TRAP INLET.
2. INSTALL LEGS OF STRAINERS IN HORIZONTAL POSITION TO MINIMIZE CONDENSATE HOLDING.
3. TEE SHALL BE FILL SIZE FOR 4" AND SMALLER MAINS. 4" FOR 5" AND 6" MAINS AND 1/2 OF MAIN DIAMETER FOR LARGER MAINS.
4. LOCATE DRIP TRAPS AT 300 FOOT MAXIMUM INTERVALS AND UPSTREAM OF ALL EXPANSION DEVICES, BRANCH CONNECTIONS OR CONTROL VALVES.



3 SAFETY VALVE DISCHARGE PIPING DETAIL
NO SCALE



4 DIRECT INJECTION HUMIDIFIER PIPING
NO SCALE



SHELL & TUBE HEAT EXCHANGER PIPING DETAIL
5
NO SCALE

NOTES:
1. 1/3- 2/3 VALVES ARE REQUIRED WHEN THE STEAM FLOW IS LARGER THAN THE CAPABILITY OF A 1 1/4" VALVE, AT THE PRESCRIBED PRESSURE DROP.
2. INSTALL A 1" INLET/OUTLET ASME "UV" RELIEF VALVE SET AT 125 PSIG. PIPE TO A FLOOR DRAIN WITH AIR GAP. RELIEF VALVE TO BE ON EXCHANGER SIDE OF SHUT-OFF VALVE.
3. BALL VALVE IN PIPING 2" AND SMALLER. BUTTERFLY VALVE IN PIPING ABOVE 2" (TYPICAL).
4. GLOBE VALVE TO BE ONE HALF THE SIZE OF LARGER TEMPERATURE CONTROL VALVE.
5. LINE SIZE TWO-POSITION MOTORIZED VALVE FOR ISOLATION AND BALANCING.
6. CONTRACTOR MUST VERIFY NUMBER OF HEAT EXCHANGERS AND APPLY THIS DETAIL TO EACH HEAT EXCHANGER.

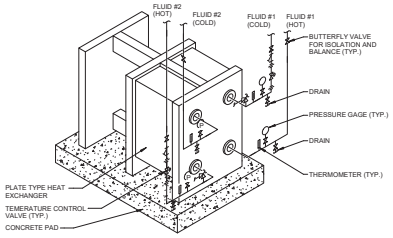
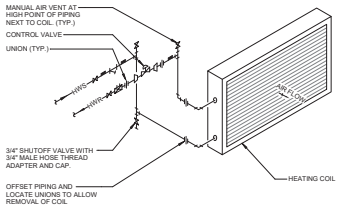


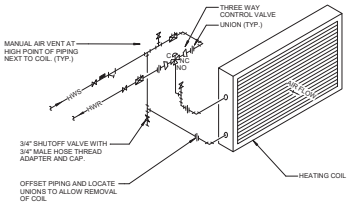
PLATE & FRAME HEAT EXCHANGER PIPING DETAIL
6
NO SCALE

NOTES:
1. COMBINATION DRAIN/BACKWASH VALVE. LINE SIZE-UP TO MAXIMUM OF 2".
2. SEE MANUFACTURERS SHOP DRAWINGS FOR EXACT NOZZEL ORIENTATIONS.
3. INSTALL A 1" INLET/OUTLET ASME "UV" RELIEF VALVE SET AT 125 PSIG. PIPE TO A FLOOR DRAIN WITH AIR GAP. RELIEF VALVE TO BE ON EXCHANGER SIDE OF SHUT-OFF VALVE.



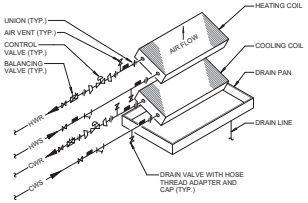
HEATING WATER COIL PIPING DIAGRAM W/2-WAY VALVE
7
NO SCALE

NOTES:
1. SEE SPECIFICATION SECTION 23 21 00 FOR BALANCE VALVE SIZING REQUIREMENTS.

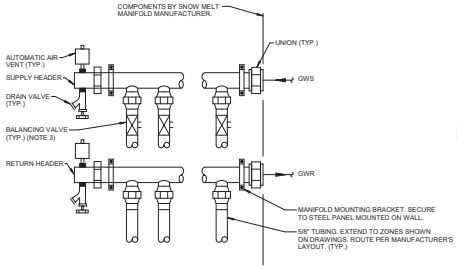


HEATING WATER COIL PIPING DIAGRAM W/3-WAY VALVE
8
NO SCALE

NOTES:
1. SEE SPECIFICATION SECTION 23 21 00 - HYDRONIC PIPING FOR BALANCE VALVE SIZING REQUIREMENTS.

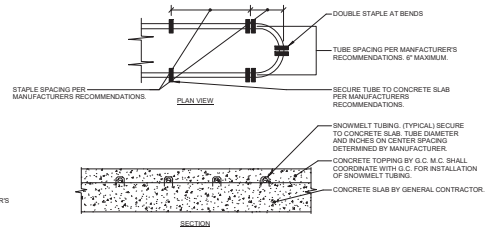


9 FAN COIL UNIT - 4-PIPE PIPING DIAGRAM
NO SCALE

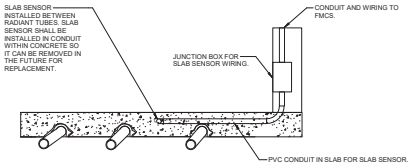


10 SNOW MELT MANIFOLD PIPING DETAIL
NO SCALE

NOTES:
1. VERIFY MANIFOLD PIPING REQUIREMENTS WITH MANUFACTURER.
2. TYPICAL FOR EACH MANIFOLD. VERIFY NUMBER OF MANIFOLDS REQUIRED WITH MANUFACTURER.
3. BALANCING VALVE NOT REQUIRED IF SYSTEM IS SELF BALANCING. FOLLOW MANUFACTURER'S RECOMMENDATIONS.



11 SNOW MELT TUBING DETAIL
NO SCALE



12 RADIANT SLAB SENSOR DETAIL
NO SCALE

NOTES:
1. INSTALLATION SHALL COMPLY WITH RADIANT MANUFACTURER'S INSTALLATION REQUIREMENTS.
2. REFER TO 23 09 00 SPECIFICATIONS FOR CONDUIT TYPE ABOVE SLAB.
3. ONE TEMPERATURE SENSOR REQUIRED PER MANIFOLD/ZONE TO CONTROL TEMPERATURE LIMITS OF CONCRETE. REFER TO CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION (TO BE ISSUED IN T/I PACKAGE).

Revisions:	Date:

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: PIPING DETAILS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460	
				Building Number: 5	
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: MP401	
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE	

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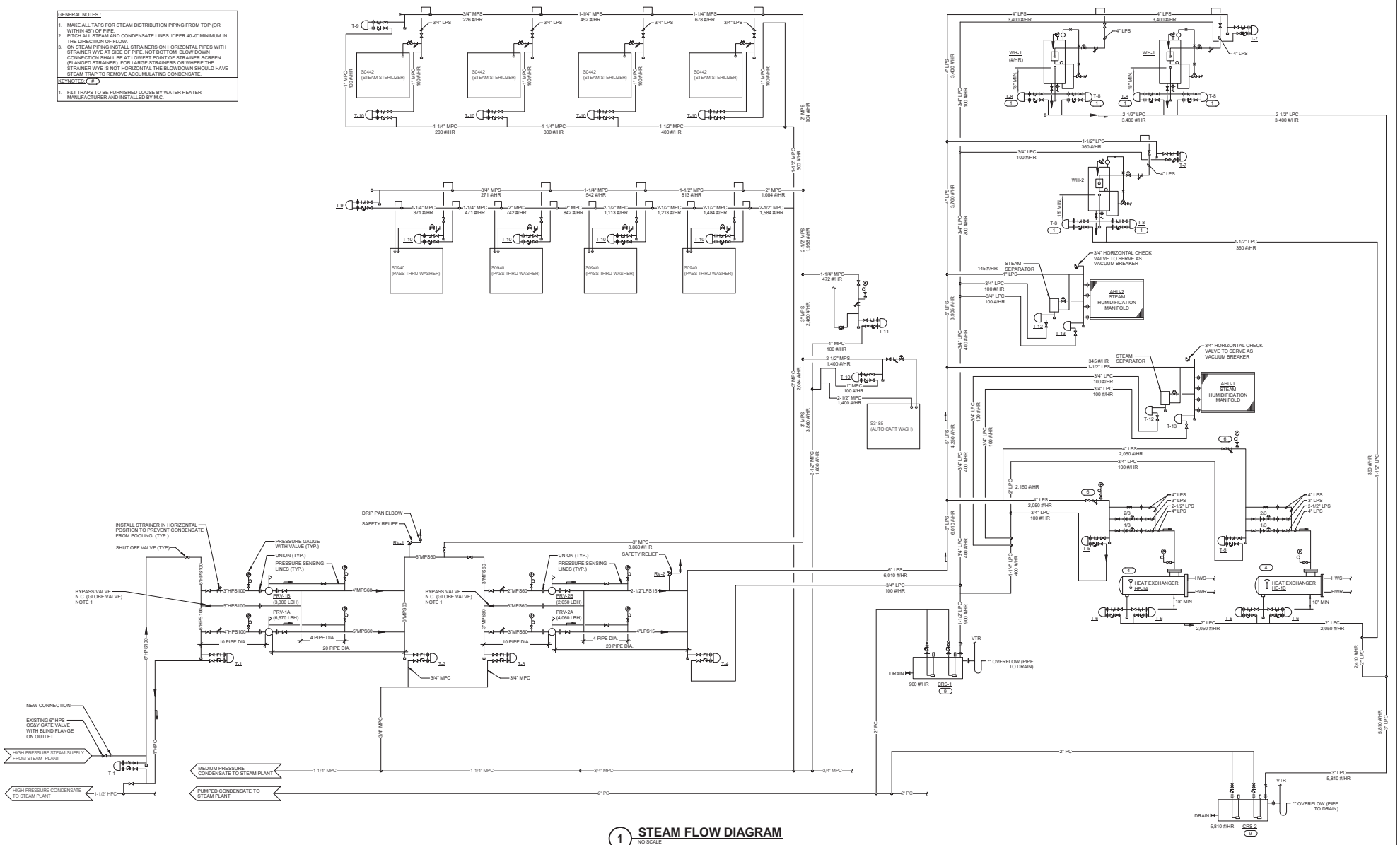
VA FORM 08 - 6231

GENERAL NOTES :

1. MAKE ALL TAPS FOR STEAM DISTRIBUTION PIPING FROM TOP (OR WITHIN 45°) OF PIPE.
2. PITCH ALL STEAM AND CONDENSATE LINES 1" PER 40'-0" MINIMUM IN THE DIRECTION OF FLOW.
3. ON STEAM PIPING INSTALL STRAINERS ON HORIZONTAL PIPES WITH STRAINER WYE AT SIDE OF PIPE, NOT BOTTOM. BLOW DOWN CONNECTION SHALL BE AT LOWEST POINT OF STRAINER SCREEN (FLANGED STRAINER). FOR LARGE STRAINERS OR WHERE THE STRAINER WYE IS NOT HORIZONTAL THE BLOWDOWN SHOULD HAVE STEAM TRAP TO REMOVE ACCUMULATING CONDENSATE.

KEYNOTES: (#)

1. F&T TRAPS TO BE FURNISHED LOOSE BY WATER HEATER MANUFACTURER AND INSTALLED BY M.C.



1 STEAM FLOW DIAGRAM

NO SCALE

NOTES:

1. CV OF BYPASS VALVE SHALL NOT BE GREATER THAN CV OF LARGEST PRV.
2. PRV'S ARE DESIGNED TO REDUCE 1/3 AND 2/3 OF THE TOTAL STEAM LOAD. THE 2/3 PRV SHALL BE SET 2-3 PSI BELOW THE 1/3 CAPACITY PRV.

Revisions:	Date:

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Office of Construction and Facilities Management

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Drawing Title: STEAM FLOW DIAGRAM	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460	
				Building Number: 5	
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: MP500	
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE	

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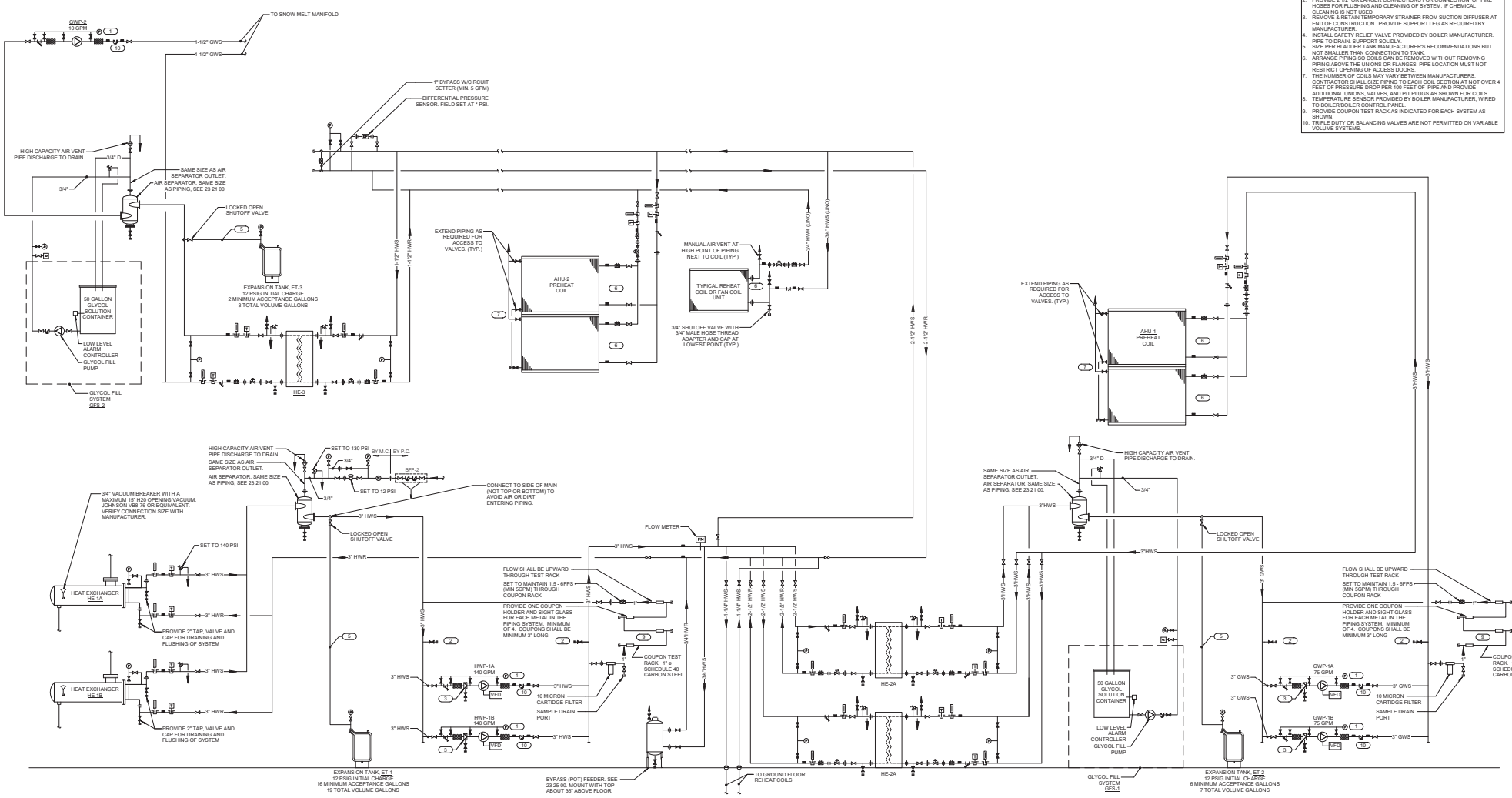

KEYNOTES: (#)

1. PRESSURE GAUGE WITH SNUBBER PER SECTION 23 09 13. INSTALL WITH MOUNTING ON WALL, STAND, OR VIBRATION-FREE PIPE ABOVE PUMP. FLEXIBLE CONNECTOR. INSTALL FLEXIBLE COPPER TUBING TO PIPING CONNECTIONS TO AVOID VIBRATION DAMAGE TO THE GAUGE. PREFERRED CONNECTION LOCATIONS ARE: (a) JUST UPSTREAM OF STRAINER, (b) GAUGE PORT ON SUCTION DIFFUSER OR BETWEEN STRAINER AND PUMP INLET (c) GAUGE TAPPING ON PUMP INLET FLANGE. (d) GAUGE TAPPING ON PUMP OUTLET FLANGE.
2. PROVIDE 2 1/2" OR LARGER CONNECTIONS FOR CONNECTION OF FIRE HOSES FOR FLUSHING AND CLEANING OF SYSTEM, IF CHEMICAL CLEANING IS NOT USED.
3. REMOVE & RETAIN TEMPORARY STRAINER FROM SUCTION DIFFUSER AT END OF CONSTRUCTION. PROVIDE SUPPORT LEG AS REQUIRED BY MANUFACTURER.
4. INSTALL SAFETY RELIEF VALVE PROVIDED BY BOILER MANUFACTURER. PIPE TO DRAIN. SUPPORT SOLELY.
5. SIZE PER BLADDER TANK MANUFACTURER'S RECOMMENDATIONS BUT NOT SMALLER THAN CONNECTION TO TANK.
6. ARRANGE PIPING SO COILS CAN BE REMOVED WITHOUT REMOVING PIPING ABOVE THE UNIONS OR FLANGES. PIPE LOCATION MUST NOT RESTRICT OPENING OF ACCESS DOORS.
7. THE NUMBER OF COILS MAY VARY BETWEEN MANUFACTURERS. CONTRACTOR SHALL SIZE PIPING TO EACH COIL SECTION AT NOT OVER 4 FEET OF PRESSURE DROP PER 100 FEET OF PIPE AND PROVIDE ADDITIONAL UNIONS, VALVES, AND PIT PLUGS AS SHOWN FOR COILS.
8. TEMPERATURE SENSOR PROVIDED BY BOILER MANUFACTURER, WIRED TO BOILER/BOILER CONTROL PANEL.
9. PROVIDE COUPON TEST RACK AS INDICATED FOR EACH SYSTEM AS SHOWN.
10. TRIPLE DUTY OR BALANCING VALVES ARE NOT PERMITTED ON VARIABLE VOLUME SYSTEMS.

1 HEATING WATER FLOW DIAGRAM - HEAT EXCHANGER VARIABLE/PRIMARY

NO SCALE

Revisions:	Date:

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Office of Construction and Facilities Management

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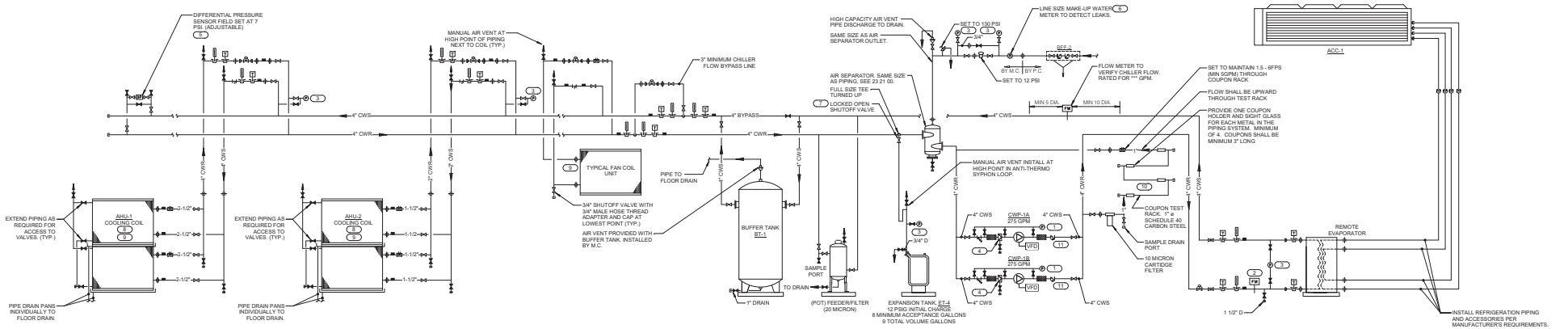
Drawing Title: HEATING WATER FLOW DIAGRAM	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Building Number: 5
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLLE	Drawing Number: MP501

KEYNOTES: (#)

1. PRESSURE GAUGE WITH SNUBBER PER SPECIFICATIONS. MOUNT ON WALL, STAND, OR VIBRATION-FREE PIPE BRACKET ABOVE PUMP. INSTALL FLEXIBLE COPPER TUBING TO PIPING CONNECTIONS TO AVOID VIBRATION DAMAGE TO THE GAUGE. GAUGE SHALL BE GLYCERIN FILLED. PREFERRED CONNECTION LOCATIONS ARE: (a) JUST UPSTREAM OF STRAINER, (b) GAUGE PORT ON SUCTION DIFFUSER OR BETWEEN STRAINER & PUMP INLET, (c) GAUGE TAPPING ON PUMP INLET FLANGE, (d) GAUGE TAPPING ON PUMP OUTLET FLANGE.
2. DIFFERENTIAL PRESSURE FLOW SWITCH FURNISHED BY CHILLER MANUFACTURER. FIELD INSTALLED.
3. PRESSURE GAUGES SHALL BE GLYCERIN FILLED.
4. REMOVE & RETAIN TEMPORARY STRAINER FROM SUCTION DIFFUSER AT END OF CONSTRUCTION. PROVIDE SUPPORT LEG AS REQUIRED BY MANUFACTURER.
5. DIFFERENTIAL PRESSURE SENSOR USED TO CONTROL VFD'S. PIPE PER MANUFACTURER'S RECOMMENDATIONS. VERIFY FINAL LOCATION WITH ENGINEER.
6. CHILLED WATER MAKE-UP WATER METER. MONITORED BY BUILDING AUTOMATION SYSTEM.
7. PROVIDE SIGN "DO NOT SHUT DURING SYSTEM OPERATION".
8. THE NUMBER OF COILS MAY VARY BETWEEN MANUFACTURERS. CONTRACTOR SHALL SIZE PIPING TO EACH COIL SECTION AT NOT OVER 4 FEET OF PRESSURE DROP PER 100 FEET OF PIPE AND PROVIDE ADDITIONAL UNIONS, VALVES, AND P/T PLUGS AS SHOWN FOR COILS.
9. ARRANGE PIPING SO COILS CAN BE REMOVED WITHOUT REMOVING PIPING ABOVE THE UNIONS OR FLANGES. PIPE LOCATION MUST NOT RESTRICT OPENING OF ACCESS DOORS.
10. PROVIDE COUPON TEST RACK AS INDICATED FOR EACH SYSTEM AS SHOWN.
11. TRIPLE DUTY OR BALANCING VALVES ARE NOT PERMITTED ON VARIABLE FLOW SYSTEMS. USE VENTURI FOR PUMP FLOW TESTING.



1 AIR COOLED CHILLER FLOW DIAGRAM - VARIABLE PRIMARY

NO SCALE

Revisions:	Date:

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Office of Construction and Facilities Management

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Drawing Title: CHILLED WATER FLOW DIAGRAM	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Building Number: 5
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLLE	Drawing Number: MP502

VA FORM 08 - 6231

RELIEF VALVE SCHEDULE

NOTES:
1.ASME CODE STAMPED VALVE PROVIDED WITH PRV TO RELIEV MAXIMUM COMBINED CAPACITY OF STATION.
2.PROVIDE WITH DRIP PAN BELOW.

TAG NAME	SERVICE	CAPACITY LB/HR	SET POINT PSIG	INLET SIZE (IN.)	OUTLET SIZE (IN.)	ORIFICE (IN.)	MANUFACTURER	MODEL	NOTES
RV-1	PRV-1A & 1B	9242	70	2 1/2"	4"	4 3/4"	KUNKLE	6252	NOTES 1 & 2
RV-2	PRV-2A & 2B	5860	25	2 1/2"	4"	4 3/4"	KUNKLE	6252	NOTES 1 & 2

PRESSURE REDUCING VALVE SCHEDULE

NOTES:
1.COMPLETE STATION TO INCLUDE SAFETY VALVE, BYPASS, STEAM TRAPS, ETC. REFER TO STEAM AND CONDENSATE FLOW DIAGRAM FOR ADDITIONAL REQUIREMENTS.
2.REFER TO SPECIFICATION SECTION 23 22 13 FOR ADDITIONAL INFORMATION.

TAG NAME	SERVICE	INLET PRESSURE PSI	OUTLET PRESSURE PSI	VALVE SIZE	MANUFACTURER	MODEL	NOTES
PRV-1A	SPS MEDIUM PRESSURE STEAM	6670	100	60	2"	THERMAFLO	JVV	NOTES 1 & 2
PRV-1B	SPS MEDIUM PRESSURE STEAM	3300	100	60	1 1/4"	THERMAFLO	JVV	NOTES 1 & 2
PRV-2A	SPS LOW PRESSURE STEAM	4060	60	15	1 1/2"	THERMAFLO	JVV	NOTES 1 & 2
PRV-2B	SPS MEDIUM PRESSURE STEAM	2050	60	15	1 1/4"	THERMAFLO	JVV	NOTES 1 & 2

HEAT EXCHANGER SCHEDULE - STEAM TO WATER

NOTES:
1.STEAM PRESSURE INDICATED IS THE PRESSURE AVAILABLE DOWNSTREAM OF THE CONTROL VALVE.
2.ONE HEAT EXCHANGER IS 100% REDUNDANT.

		WATER				STEAM (NOTE 1)		HEATING	FOULING	MAX. DIMENSIONS		WEIGHT			
TAG NAME	SERVICE	GPM	W.P.D. FT. HEAD	EWT °F	LWT °F	PSIG	LB/HR	SURFACE FT²	FACTOR	LENGTH	DIAMETER	DRY	MANUFACTURER	MODEL	NOTES
HE-1A	HEATING WATER SYSTEM	140.0	0.7	150	180	15	2050	126.0	0.0003	76"	1'-10"	1396	TACO	E2220BS	NOTE 2
HE-1B	HEATING WATER SYSTEM	140.0	0.7	150	180	15	2050	126.0	0.0003	76"	1'-10"	1396	TACO	E2220BS	NOTE 2

HEAT EXCHANGER SCHEDULE - PLATE AND FRAME

NOTES:
1.COLD SIDE PERFORMANCE BASED ON 30% PROPYLENE GLYCOL.
2.COLD SIDE PERFORMANCE BASED ON 50% PROPYLENE GLYCOL.

		HOT SIDE			COLD SIDE				HEATING	PLATE SIZE						
TAG NAME	SERVICE	GPM	W.P.D. FT. HEAD	EWT °F	GPM	W.P.D. FT. HEAD	EWT °F	LWT °F	SURFACE FT²	HEIGHT	WIDTH	# OF PLATES	MANUFACTURER	MODEL	NOTES
HE-2A	GLYCOL HEATING WATER SYSTEM	75 GPM	18.2	180.0	150.0	75 GPM	20.60	145.0	175.0	33.6	48	24	18	ALFA LAVAL	AQ	NOTE 1
HE-2B	GLYCOL HEATING WATER SYSTEM	75 GPM	18.2	180.0	150.0	75 GPM	20.60	145.0	175.0	33.6	48	24	18	ALFA LAVAL	AQ	NOTE 1
HE-3	SNOW MELT SYSTEM	1 GPM	3.4	180.0	150.0	7.5 GPM	22.60	95.0	115.0	4	30	10	7	ALFA LAVAL	AQ	NOTE 2

CONDENSATE RETURN STATION SCHEDULE

1.LB/HR IS ACTUAL MAXIMUM LOAD OF SYSTEM.
2.PROVIDE WITH GAUGE GLASS, DIAL THERMOMETER, INLET BASKET STRAINER, DISCHARGE PRESSURE GAUGE, LIFTING EYES, NEMA 1 HIGH LEVEL FLOAT SWITCH, AND SUCTION VALVES.
3.PROVIDE HARD WIRED CONNECTION TO BAS FOR PUMP FAILURE ALARM.

									ELECTRICAL								
TAG NAME	SERVICE	CONFIGURATION	LB/HR (NOTE 1)	CONDENSATE TEMPERATURE °F	GPM TOTAL	RECEIVER CAPACITY GALLONS	DISCHARGE PRESSURE (PSI)	NO. OF PUMPS	HP EA.	NO OF POWER CONNECTIONS	VOLTAGE	PHASES	DISCONNECT TYPE (NOTE A)	CONTROLLER/ STARTER BY (NOTE A)	SCCR	MANUFACTURER	MODEL	NOTES
CRS-1	SPS LOW PRESSURE STEAM	DUPLEX	900	210	22	23	40	2	1.5	2	480 V	3	MFR	NF	MFR	5000	DOMESTIC PUMP	120CB	NOTES 1, 2, & 3
CRS-2	SPS LOW PRESSURE STEAM	DUPLEX	5810	210	22	23	40	2	1.5	2	480 V	3	MFR	NF	MFR	5000	DOMESTIC PUMP	120CB	NOTES 1, 2, & 3

AIR COOLED CHILLER SCHEDULE

NOTES:
1.SEE SPECIFICATION SECTION 23 64 30 FOR ADDITIONAL REQUIREMENTS.

			CAPACITY/PERFORMANCE						EVAPORATOR PERFORMANCE						ELECTRICAL									MAX. DIMENSIONS			WEIGHT		VIBRATION ISOLATION				
TAG NAME	SERVICE	REFRIGERANT	DESIGN TONS	STAGES OF UNLOADING	MIN. EER AT % LOAD (BASED ON AIR AND WATER CONDITIONS AS LISTED.) 100	75	50	25	NPLV	EWT °F	LWT °F	GPM	MAX. PRESSURE DROP (FT. W.G.)	FOULING FACTOR	NUMBER OF COMPRESSORS	COMPRESSOR TYPE	NO. OF POWER CONNECTIONS	VOLTAGE	PHASES	MCA	MOCP	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	TYPE (NOTE C)	SCCR	LENGTH	WIDTH	HEIGHT	DRY	OPERATING	TYPE	DEFL.	MANUFACTURER	MODEL	NOTES
ACC-1	STERILE PROCESSING ADDITION	R-32	173.8	6	10.9	14.3	18	19.2	16.5	52	40	346	6.5	0.0001	6	SCROLL	1	480 V	3	390 A	450 A	EC	NF	MFR	FV	65	298"	88"	99"	8678	8678	M4	3/4"	DAIKIN APPLIED	AGZ014F	NOTE 1

GLYCOL FEED SYSTEM

NOTES:
1.PACKAGE SYSTEM COMPLETE WITH STORAGE TANK, PUMP, AND CONTROLS WITH AUDIBLE AND VISUAL ALARM, DESIGNED TO ADD GLYCOL SOLUTION TO A CLOSED LOOP WATER SYSTEM. SYSTEM SHALL AUTOMATICALLY MAINTAIN PRESSURE IN THE PIPING SYSTEM.
2.PROVIDE CUT-OFF AND ALARM TO STOP PUMP IN CASE OF LOW LEVEL OR HIGH PRESSURE. PROVIDE DRY CONTACT FOR ALARM POINT TO DDC.
3.COMPLETE WITH POLYETHYLENE STORAGE TANK AND LID. MOUNT ON FLOOR ABOVE PUMPING ASSEMBLY IN A STEEL FRAME WITH LEGS. LID SHALL BE REMOVABLE FOR FILLING AND PROVIDE MEANS FOR SYSTEM RELIEF VALVE OUTLET TO BE PIPED BACK TO TANK WITHOUT REMOVAL OF PIPING FROM RELIEF VALVE OR AUTOMATIC AIR VENT.
4.PUMPING SYSTEM SHALL CONSIST OF A PUMP, STARTER, PRESSURE TANK WITH CONTROL, PRESSURE REDUCING VALVE, SHUTOFF VALVE, AND PRESSURE GAUGE.

			PUMP HEAD	ELECTRICAL							
TAG NAME	SERVICE	TANK VOLUME	PSI	MHP	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	CONTROLLER/ STARTER BY (NOTE A)	SCCR	MANUFACTURER	MODEL (NOTE 1)	NOTES
GFS-1	AHU-1 PREHEAT COIL	50.0	15	0.33	120	1	MFR	MFR	5000	WESSELS	GMP	NOTES 1, 2, 3, & 4
GFS-2	SNOW MELT SYSTEM	50.0	15	0.33	120	1	MFR	MFR	5000	WESSELS	GMP	NOTES 1, 2, 3, & 4

PUMP SCHEDULE

NOTES:
1.PROVIDE SHAFT GROUNDING AS REQUIRED IN THE MOTOR SPECIFICATION 23 05 13.
2.PUMP SELECTED FOR 30% PROPYLENE GLYCOL.
3.PUMP SELECTED FOR 50% PROPYLENE GLYCOL.

							ELECTRICAL (NOTE 1)								MAX. DIMENSIONS				VIBRATION ISOLATION				
TAG NAME	SERVICE	GPM	PUMP FT. HEAD AT DESIGN	MINIMUM PUMP EFFICIENCY	INLET SIZE	IMPELLER SIZE	BHP (NOTE E)	HP (NOTE E)	RPM	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	CONTROLLER/ STARTER TYPE (NOTE C)	LENGTH	WIDTH	HEIGHT	WEIGHT	TYPE	DEFL.	MANUFACTURER	MODEL	NOTES
CWP-1A	CHILLED WATER SYSTEM	275.0	90.00	73.3	3"	10.625	7.87	10	1680	480	3	EC	F	EC	VFD	42.25"	16"	22"	413	M3	3/4"	B & G	1510 2E	NOTE 1
CWP-1B	CHILLED WATER SYSTEM	275.0	90.00	73.3	3"	10.625	7.87	10	1680	480	3	EC	F	EC	VFD	42.25"	16"	22"	413	M3	3/4"	B & G	1510 2E	NOTE 1
GWP-1A	GLYCOL HEATING WATER SYSTEM	75.0	100.00	46.7	2"	9.500	3.38	7.5	1692	480	3	EC	F	EC	VFD	34.63"	14.63"	17.25"	297	M3	3/4"	B & G	1510 SERIES	NOTES 1 & 2
GWP-1B	GLYCOL HEATING WATER SYSTEM	75.0	100.00	46.7	2"	9.500	3.38	7.5	1692	480	3	EC	F	EC	VFD	34.63"	14.63"	17.25"	297	M3	3/4"	B & G	1510 SERIES	NOTES 1 & 2
GWP-2	SNOW MELT SYSTEM	8.0	60.00	45.3	1"	4.500	1.2	2	3600	480	3	EC	F	EC	VFD	14"	14"	18"	60	H3	3/4"	B & G	1.5A	NOTES 1 & 3
HWP-1A	HEATING WATER SYSTEM	140.0	80.00	61.5	2"	9.500	4.45	7.5	1652	480	3	EC	F	EC	VFD	34.63"	14.63"	17.25"	297	M3	3/4"	B & G	1510 SERIES	NOTE 1
HWP-1B	HEATING WATER SYSTEM	140.0	80.00	61.5	2"	9.500	4.45	7.5	1652	480	3	EC	F	EC	VFD	34.63"	14.63"	17.25"	297	M3	3/4"	B & G	1510 SERIES	NOTE 1

PIPE INSULATION SCHEDULE (HYDRONIC)

GENERAL NOTES:
1. REFER TO THE SPECIFICATIONS FOR TYPE DESCRIPTIONS AND JACKETING REQUIREMENTS. VALUES LISTED BELOW ARE BASED ON ASHRAE / IECC REQUIREMENTS.
2. TYPE A INSULATION IS NOT ALLOWED IN NON-AIR CONDITIONED SPACES (SUCH AS MECHANICAL ROOMS, EXTERIOR, ATTICS, ETC) ON PIPE SYSTEMS WITH FLUID TEMPERATURES BELOW 60 DEG. F.
3. TYPE B INSULATION GREATER THAN 1" THICK SHALL BE INSTALLED USING MULTIPLE LAYERS OF 3/4" OR 1" WITH STAGGERED SEAMS.
4. TYPE E IS NOT ALLOWED IN RETURN AIR PLENUMS, UNLESS LISTED AND LABELED AS 25/50 RATED PER ASTM E84/UL723
5. TYPE G 4" SHALL BE INSTALLED IN TWO (2) 2" LAYERS WITH STAGGERED SEAMS.
6. PROVIDE RIGID INSERT AT HANGERS, EITHER PRE-MANUFACTURED COUPLINGS OR TYPE C, D(HOT PIPE ONLY), E (WHERE ALLOWED BY CODE) OR F INSULATION. SEE SPEC FOR MORE DETAILS.

PIPE SYSTEM	INSULATION TYPE AND THICKNESS PER NOMINAL PIPE OR TUBE SIZE					INSULATION TYPE AND THICKNESS PER NOMINAL PIPE OR TUBE SIZE (DIRECT BURIED)					NOTES
	< 1"	1" TO < 1.5"	1.5" TO < 4"	4" TO < 8"	≥ 8"	< 1"	1" TO < 1.5"	1.5" TO < 4"	4" TO < 8"	≥ 8"	
CWR - CHILLED WATER RETURN	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	
CWS - CHILLED WATER SUPPLY	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	
GWR - GLYCOL WATER RETURN	B 1"	B 1", E 1"	B 1"	B 1"	B 1.5"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	
GWS - GLYCOL WATER SUPPLY	B 1"	B 1"	B 1"	B 1"	B 1.5"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	
HPC - HIGH PRESSURE CONDENSATE	A 4.5"	A 5"	A 5"	A 5"	A 5"	G 4"	G 4"	G 4"	G 5"	G 5"	
HPS - HIGH PRESSURE STEAM	A 4.5"	A 5"	A 5"	A 5"	A 5"	G 4"	G 4"	G 4"	G 5"	G 5"	
HWR - HEATING WATER RETURN	A 1.5"	A 1.5"	A 2"	A 2"	A 2"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	
HWS - HEATING WATER SUPPLY	A 1.5"	A 1.5"	A 2"	A 2"	A 2"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	
LIQ - REFRIGERANT LIQUID	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	
LPC - LOW PRESSURE CONDENSATE	A 2.5"	A 2.5"	A 2.5"	A 3"	A 3"	G 4"	G 4"	G 4"	G 5"	G 5"	
LPS - LOW PRESSURE STEAM	A 2.5"	A 2.5"	A 2.5"	A 3"	A 3"	G 4"	G 4"	G 4"	G 5"	G 5"	
MISC RELIEF VENTS, INTAKES, AND DISCHARGES	A 0.5", B 0.5	A 0.5", B 0.5	A 1", B 1"	A 1", B 1"	A 1", B 1"						
MPC - MEDIUM PRESSURE CONDENSATE	A 4.5"	A 5"	A 5"	A 5"	A 5"	G 4"	G 4"	G 4"	G 5"	G 5"	
MPS - MEDIUM PRESSURE STEAM	A 4.5"	A 5"	A 5"	A 5"	A 5"	G 4"	G 4"	G 4"	G 5"	G 5"	
PC - PUMPED CONDENSATE	A 2.5"	A 2.5"	A 2.5"	A 3"	A 3"	G 4"	G 4"	G 4"	G 5"	G 5"	
SUC - REFRIGERANT SUCTION	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	C 1", E 1"	

FAN COIL UNIT SCHEDULE - HYDRONIC

NOTES:
1.PROVIDE FAN COIL UNIT WITH CONDENSATE PUMP.
2.PROVIDE FAN COIL UNIT WITH WALL MOUNTED THERMOSTAT.
3.FAN COIL UNIT SHALL BE EXPOSED CEILING HUNG TYPE.
4.SCHEDULED LOADS ARE MINIMUM CAPACITIES BASED ON ZONE HEATING AND COOLING DEMANDS. FAN COIL UNIT CAPACITIES MAY BE GREATER.
5.LISTED FLOW RATE IS MAXIMUM FOR BASIS OF DESIGN EQUIPMENT. COORDINATE BALANCE FLOW RATES WITH BALANCING CONTRACTOR BASED ON PERFORMANCE OF FAN COIL UNITS BEING PROVIDED.

				EAT		COOLING COIL					HEATING COIL				ELECTRICAL					MAX. DIMENSIONS				
TAG NAME	AREA SERVED	CFM	EXT. S.P. IN W.C.	DB °F	WB °F	TOTAL MBH	SENSIBLE MBH	GPM	EWT °F	LWT °F	W.P.D. FT. HD	TOTAL MBH	GPM	EWT °F	LWT °F	W.P.D. FT. HD	HP	RPM	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	CONTROLLER/ STARTER TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	SCCR	LENGTH	WIDTH	HEIGHT	MANUFACTURER	MODEL	NOTES
FCU-1	MECHANICAL ROOM	500	0.3	60.0	53.0	19.3	7.85	3.8	40	52	5.00	26.3	1.8	180	150	3.50	0.25	1800	277	1	MFR	NF	FV	5000	20	31	10	IEC	CXB08A6	NOTES 1, 2, 3, 4, & 5
FCU-2	MECHANICAL ROOM	500	0.3	60.0	53.0	19.3	7.85	3.8	40	52	5.00	26.3	1.8	180	150	3.50	0.25	1800	277	1	MFR	NF	FV	5000	20	31	10	IEC	CXB08A6	NOTES 1, 2, 3, 4, & 5
FCU-3	MECHANICAL ROOM	500	0.3	60.0	53.0	19.3	7.85	3.8	40	52	5.00	26.3	1.8	180	150	3.50	0.25	1800	277	1	MFR	NF	FV	5000	20	31	10	IEC	CXB08A6	NOTES 1, 2, 3, 4, & 5

SPLIT SYSTEM UNIT SCHEDULE

NOTES:
1.PROVIDE SPLIT SYSTEM CONDENSING UNIT WITH LOW AMBIENT COOLING KIT.
2.PROVIDE SPLIT SYSTEM EVAPORATOR WITH CONDENSATE PUMP.

		INDOOR UNIT								OUTDOOR UNIT														
					MAX. DIMENSIONS								OUTSIDE UNIT MAX. DIMENSIONS							ELECTRICAL				
TAG NAME	AREA SERVED	CFM	COOLING MBH	HEATING MBH	HEIGHT	LENGTH	WIDTH	WEIGHT	MODEL	SEER	MCA	MOCP	VOLTAGE	PHASES	HEIGHT	LENGTH	WIDTH	WEIGHT	MODEL	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	SCCR	MANUFACTURER	NOTES
SSIU-1	H3 ELECTRICAL ROOM	713	21	27.4	41.5"	8.5"	11.75"	27.6	RNS24	20	20	30	208	1	3'-3 1/4"	3'-1"	1'-1"	150.4	RXS24	MFR	NF	MFR	5000	SAMSUNG	NOTES 1 & 2
SSIU-2	H3 ELECTRICAL ROOM	713	21	27.4				27.6		20	20	30	208	1	3'-3 1/4"	3'-1"	1'-1"	0	RXS24	MFR	NF	MFR	5000		NOTES 1 & 2

RADIATION ZONE SCHEDULE

NOTES:
1. SNOW MELT PERFORMANCE BASED ON 50% PROPELENE GLYCOL.
2. SNOW AND ICE SENSOR PROVIDED BY SNOW MELT MANUFACTURER, INSTALLED BY MECHANICAL CONTRACTOR.
3. SNOW MELT ZONE TO BE CONTROLLED BY ZONE CONTROL VALVE. REFERENCE MC SERIES SHEETS FOR DESCRIPTION OF CONTROL.

TAG NAME	AREA SERVED	AREA	CONSTRUCTION	TUBE TYPE	MAX. TUBE SPACING	MAX. LOOP LENGTH	NUMBER OF LOOPS	TOTAL MBH	LOAD PER SQ. FT.	SURFACE TEMPERATURE	EWT	LWT	GPM	WPD	NOTES
SMZ-101	SPS ENTRANCE SIDEWALK	42S	CONCRETE	PEX 1/2"	6"	240'-0"	3	72.25	170 Btu/(h·ft²)	40	115	95	7.5	12	NOTES 1, 2, & 3

PIPING SCHEDULE GENERAL NOTES

A. DISCONNECT AND CONTROLLER STARTER FURNISHED AND INSTALLED BY:
MFR = MANUFACTURER
EC = ELECTRICAL CONTRACTOR.

B. DISCONNECT TYPE:
F = FUSED
NF = NON-FUSED

C. CONTROLLER STARTER TYPE:
FV = FULL VOLTAGE
WYE = WYE-DELTA
SS = SOLID STATE (SOFT START)
VFD = VARIABLE FREQUENCY DRIVE
VFDB = VARIABLE FREQUENCY DRIVE WITH BYPASS

D. NO EQUIPMENT SHALL BE SELECTED ABOVE 90% OF MOTOR NAME PLATE RATING.

E. MUST BE WITHIN +/- 10% OF SCHEDULED RPM.

Revisions:	Date:

CONSULTANT

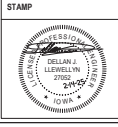
IMEG
8992 185TH STREET
DES MOINES, IA 50322
515.334.8600 FAX: 515.334.8688
www.imeg.com
PROJECT # 190042409.04

REFERENCE SCALE IN INCHES
0 1 2 3

ARCHITECT/ENGINEER OF RECORD

ANDERSON
19605 1st Ave. N. #130 Plymouth, MN 55441
P 763.412.4080 | F 763.412.4090 | ae-mn.com
Anderson Engineering of Minnesota, LLC | Proj# 16584

STAMP



Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: PIPING SCHEDULES
Approved:
Phase: BID DOCUMENTS
FULLY SPRINKLERED
Project Title: CONSTRUCT NEW SPS
Location: Sioux Falls, SD.
Issue Date: 02/14/2025
Checked: DAVING
Drawn: DELLLE
Project Number: 438-460
Building Number: 5
Drawing Number: MP600

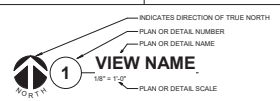
VA FORM 08 - 6231

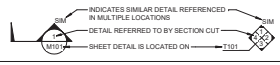
BIM 360://190042409.04 - VA Vitals DC-VA Sioux Falls New SP SMEP721 - 190042409.04_16584_VA Vitals DC-VA Sioux Falls New SPS_Cr.rvt
2/14/2025 10:27:35 AM

VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
NEW
EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
EXISTING
EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS.

BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
PLUMBING CODE:	IPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 2021 EDITION
ENERGY CONSERVATION CODE:	IECC 2021
HEALTH DEPARTMENT CODE:	CURRENT EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
A.C.	ASBESTOS ABATEMENT CONTRACTOR
C.C.	CIVIL CONTRACTOR
C.O.R.	CONTRACTING OFFICER'S REPRESENTATIVE
E.C.	ELECTRICAL CONTRACTOR
F.P.C.	FIRE PROTECTION CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
T.C.	TECHNOLOGY CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR

CONTACT PERSONS:

DESCRIPTION:	PERSON:
PROJECT MANAGER	ERIC J. HENDERSON, PE
MECHANICAL	DELLAN J. LLEWELLYN, PE
ELECTRICAL	KRISTEN SPINA, PE
TECHNOLOGY	DAMON M. DEEN

TEMPERATURE CONTROL SHEET INDEX

MC000	CONTROLS COVERSHEET
MC101	GROUND LEVEL FLOOR PLAN - CONTROLS
MC102	FIRST LEVEL FLOOR PLAN - ROOM PRESSURIZATION PLAN
MC111	INTERSTITIAL/FIRST LEVEL FLOOR PLAN - CONTROLS
MC121	ROOF PLAN - CONTROLS
MC400	CONTROL DIAGRAMS
MC401	CONTROL DIAGRAMS
MC402	CONTROL DIAGRAMS
MC403	CONTROL DIAGRAMS
MC404	CONTROL DIAGRAMS
GRAND TOTAL: 10	

CONTROL SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
CA	COMPRESSED AIR
CW	COLD WATER - POTABLE
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DI	DEIONIZED WATER
GWR	GLYCOL WATER RETURN
GWS	GLYCOL WATER SUPPLY
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HW	HOT WATER - POTABLE
HWC	HOT WATER CIRCULATING - POTABLE
HWC140	HOT WATER CIRC. - POTABLE NUMBER INDICATES TEMP
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
NCW	NON-POTABLE COLD WATER
NHW	NON-POTABLE HOT WATER
O	OXYGEN
PC	PUMPED CONDENSATE
RO	REVERSE OSMOSIS WATER
SCW	SOFT COLD WATER
W	SERVICE WATER - POTABLE
	CONTROL VALVE (THREE-WAY)
	CONTROL VALVE (TWO-WAY)
	SOLENOID VALVE
	CHECK VALVE
T	THERMOSTAT
T	THERMOSTAT/SENSOR WITH HEAVY DUTY ENCLOSURE
T	TEMPERATURE SENSOR (DUCT MOUNTED)
T	TEMPERATURE SENSOR WITH WELL
T	THERMOMETER WITH WELL (DIAL TYPE)
T	THERMOMETER WITH WELL (FILLED TYPE)
T	AVERAGING TEMPERATURE SENSOR
T	LOW LIMIT TEMPERATURE SWITCH
T	PROBE TEMPERATURE SENSOR
P	PRESSURE SENSOR (FURNISHED WITH BALL VALVE)
P	PRESSURE GAUGE (FURNISHED WITH BALL VALVE)
	DIFFERENTIAL PRESSURE SENSOR
P	PRESSURE SENSOR (DUCT MOUNTED)
DP	STATIC SWITCH

CONTROL SYMBOL LIST (CONT.)

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
A	ANALOG INPUT
AV	ANALOG OUTPUT
FM	FLOW METER
F	FLOW SWITCH
FS	AIR FLOW SWITCH
FM	DUCT FLOW METER
H	HUMIDIFIER
DSD	DUCT SMOKE DETECTOR
	HEATING/ COOLING COIL
	AIR BLENDER
	FAN
MTR	MOTOR
R	CONTACTOR
	PUMP
D	DIGITAL INPUT
DO	DIGITAL OUTPUT
H	HUMIDISTAT SENSOR
H	HUMIDISTAT / SENSOR
H	HUMIDITY SENSOR (DUCT MOUNTED)
	FILTER
	TERMINAL AIR BOX
	TERMINAL AIR BOX W/ REHEAT
O	OCCUPANCY SENSOR
S	SENSOR
ACT	ACTUATOR
DS	DOOR SWITCH
DP	DIFFERENTIAL PRESSURE SWITCH
CS	CURRENT SWITCH
VS	VIBRATION SWITCH
	NORMALL CLOSED CONTACT
	NORMALLY OPEN CONTACT
	OPPOSED BLADE DAMPER
	PARALLEL BLADE DAMPER

TEMPERATURE CONTROLS ABBREVIATION KEY

ABBR:	DESCRIPTION:
EA	EXHAUST/RELIEF AIR
MA	MIXED AIR
MV	MIXING VALVE
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NIC	NOT IN CONTRACT
OA	OUTSIDE AIR
TYP	TYPICAL
RA	RETURN AIR
SA	SUPPLY AIR
UON	UNLESS OTHERWISE NOTED

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, FIRE PROTECTION, PLUMBING, VENTILATION, PIPING AND TEMPERATURE CONTROL.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
3. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
4. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
5. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
6. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY DRAWINGS/UAL, AND OTHER MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
8. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
9. IN AREAS WITH DRYWALL CEILINGS COORDINATE LOCATIONS OF ACCESS PANELS WITH THE GC FOR ACCESS TO VALVES, DUCTWORK ACCESSORIES, DAMPERS, ETC. COORDINATE PANEL TYPE AND COLOR WITH ARCHITECT. NOTIFY THE GC OF THE REQUIRED ACCESS PANELS PRIOR TO BIDDING.
10. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS ARTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH EXTERIOR WALLS AND ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
11. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
12. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC. SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
13. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
14. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
15. MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-4" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS.
16. MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6'-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING, DUCTWORK, PIPING, ETC.
17. PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT.
18. DO NOT SUPPORT EQUIPMENT, PIPING, OR DUCTWORK FROM METAL DECKING OR OTHER NON-STRUCTURAL BUILDING ELEMENTS. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, FIRE PROTECTION, PLUMBING, VENTILATION, PIPING AND TEMPERATURE CONTROL.

1. EXISTING CONDITIONS ARE DRAWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
2. NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
3. FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. EACH CONTRACTOR SHALL FIELD VERIFY ACCESSIBILITY TO THE AREA OF THEIR WORK AND SHALL NOTIFY THE GENERAL CONTRACTOR PRIOR TO BIDDING IF OTHER UTILITIES ARE REQUIRED TO BE REMOVED OR RELOCATED TO ALLOW ACCESS TO THEIR AREA OF WORK.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL AND PATCHING OF ROOFS, WALLS, AND FLOORS ASSOCIATED WITH WORK BY ALL CONTRACTORS. CONTRACTORS SHALL NOTIFY THE GC OF AFFECTED AREAS PRIOR TO BIDDING.
6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
7. WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
8. PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
9. OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
10. MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
11. DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.

TEMPERATURE CONTROL GENERAL NOTES:

1. REFER TO EQUIPMENT SCHEDULES TO CROSS REFERENCE WHICH CONTROL DIAGRAMS APPLY TO WHICH ITEMS OF EQUIPMENT. REFER TO TERMINAL AIR BOX (TAB) SCHEDULES FOR TEMP SENSOR REQUIREMENTS FOR EACH TAB.
2. EACH D.I., D.O., A.I. AND A.O. POINT SHOWN FOR ALL CONTROL DIAGRAMS SHALL BE DISCRETE FROM ALL OTHER POINTS EXCEPT AS SPECIFICALLY NOTED.
3. ALL WIRING, CONTROL COMPONENTS, DEVICES AND PROGRAMMING SHOWN ON THESE CONTROL DRAWINGS SHALL BE PROVIDED BY THE TCC UNLESS SPECIFICALLY NOTED OTHERWISE.
4. TEMPERATURE CONTROL CABLING, CONDUIT, BOXES, IDENTIFICATION: REFER TO THE SPECIFICATIONS FOR A COMPLETE LIST OF REQUIREMENTS. THE FOLLOWING SCHEDULE IS PROVIDED AS A CONVENIENCE. REFER TO SECTION 23 09 00 AND DIV 26 FOR ADDITIONAL DETAILED REQUIREMENTS.
   A. CABLE/WIRE JACKET COLOR: GREY
   B. CONDUIT BOX COLOR ABOVE FINISHED CEILINGS AND UNFINISHED SPACES WITHOUT CEILINGS: GREY
   C. CONDUIT BOX COLOR IN SPACES WITH EXPOSED FINISHED STRUCTURE: GREY
   D. CABLE/WIRE INSTALLATION: IN CONDUIT
5. ALL ACTUATORS SHALL BE OF THE ELECTRICAL TYPE FOR THIS PROJECT UNLESS AN ACTUATOR IS SPECIFICALLY INDICATED ON THE DRAWINGS OR SPECIFICATIONS TO BE PNEUMATIC.
6. ALL MODULATING DAMPER AND VALVE ACTUATORS SHOWN WITH POSITION FEEDBACK SHALL HAVE THE VALVE POSITION DISPLAYED ON GRAPHICAL SCREEN ADJACENT TO THE DAMPER/VALVE COMMAND SIGNAL. DISPLAYED VALVE POSITION SHALL BE FROM THE FEEDBACK DEVICE/CIRCUIT (OUTPUT SIGNAL FROM THE FMCS TO THE ACTUATOR IS NOT ACCEPTABLE)
7. MODULATING SIGNALS SHALL BE DISPLAYED AS % OPEN (SIGNALS DISPLAYED AS % CLOSED ARE NOT ACCEPTABLE).
8. PRESSURE TRANSMITTERS WHOSE SIGNAL IS UTILIZED FOR MAINTAINING DUCT STATIC PRESSURE SHALL BE WIRED DIRECTLY TO THE CONTROLLER THAT MODULATES FAN SPEED. SIGNAL SHALL BE COMPLETELY INDEPENDENT OF THE FMCS NETWORK.
9. PRESSURE TRANSMITTERS WHOSE SIGNAL IS UTILIZED FOR MAINTAINING DIFFERENTIAL PRESSURE OF ANY PUMPED WATER SYSTEM (E.G. HEATING HOT WATER, CHILLED WATER AND THE LIKE) SHALL BE WIRED DIRECTLY TO THE CONTROLLER THAT MODULATES PUMP SPEED. SIGNAL SHALL BE COMPLETELY INDEPENDENT OF THE FMCS NETWORK.
10. ALL CONTROL COMPONENTS SUCH AS RELAYS, SWITCHES, DDC CONTROLLERS, ETC. SHALL BE MOUNTED IN STEEL ENCLOSURES WITH STEEL MOUNTING BACKPLATES PER SPECIFICATION 23 09 00.
11. EACH CONTROL PANEL SHALL HAVE A LAMINATED COPY OF THE APPLICABLE SEQUENCE OF OPERATION AND CONTROL DIAGRAM INDICATING THE POINTS, COMPONENTS AND OPERATION OF EQUIPMENT ASSOCIATED WITH EACH PANEL. REFER TO SECTION 23 09 00 FOR ADDITIONAL REQUIREMENTS.
12. TCC SHALL WIRE THE CONTROL SIGNAL FROM THE ASSOCIATED AIR HANDLING UNIT RTU CONTROL PANEL TO CONTROL THE OPERATION OF SMOKE DAMPERS IN ACCORDANCE WITH SEQUENCE OF OPERATION. TCC SHALL PROVIDE ALL WIRING, CONDUIT, TRANSFORMERS, FUSING AND ALL OTHER ELECTRICAL COMPONENTS REQUIRED FOR COMPLETE INSTALLATION.
13. TCC SHALL EXTEND CONTROL SIGNAL FROM ADDRESSABLE RELAY DEVICE SERVING EACH AIR HANDLING UNIT. REFER TO ELECTRICAL DRAWINGS FOR LOCATIONS. TCC SHALL EXTEND AND TERMINATE WIRING AS REQUIRED FOR EQUIPMENT SHUTDOWN.
14. TCC SHALL PROVIDE POWER SUPPLIES FOR ALL 24VAC POWER REQUIREMENTS TO INCLUDE, BUT NOT LIMITED TO, APPLICATION SPECIFIC CONTROLLERS, DAMPER AND VALVE ACTUATORS, BUILDING PRESSURE SENSORS, AND OTHER CONTROL COMPONENTS AND DEVICES. REFER TO CONTROLS SPECIFICATIONS FOR POWER SUPPLY REQUIREMENTS. REFER TO [TEMPERATURE CONTROL] HEATING] FLOOR PLANS FOR POWER SUPPLY LOCATIONS. PROVIDE LOW VOLTAGE WIRING FROM POWER SUPPLIES TO ALL CONTROLLERS, MONITORS, COMPONENTS AND DEVICES REQUIRING 24 VAC POWER. ADDITIONAL POWER SUPPLIES NOT SHOWN AND REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM SHALL BE PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR. THE TEMPERATURE CONTROL CONTRACTOR SHALL PROVIDE FINANCIAL PROVISIONS WITHIN THEIR BID FOR THE ELECTRICAL CONTRACTOR TO PROVIDE BRANCH POWER TO THE ADDITIONAL POWER SUPPLIES. COORDINATE THE LOCATION OF ADDITIONAL POWER SUPPLY CABINET WITH THE ELECTRICAL CONTRACTOR.
15. TCC SHALL PROVIDE POWER SUPPLIES FOR ALL 120VAC POWER REQUIREMENTS TO INCLUDE, BUT NOT LIMITED TO, APPLICATION SPECIFIC CONTROLLERS, DAMPER AND VALVE ACTUATORS, BUILDING PRESSURE SENSORS, AND OTHER CONTROL COMPONENTS AND DEVICES. REFER TO [TEMPERATURE CONTROL] [HEATING] FLOOR PLANS FOR POWER SUPPLY LOCATIONS. ADDITIONAL CIRCUITS NOT SHOWN AND REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM SHALL BE PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR. THE TEMPERATURE CONTROL CONTRACTOR SHALL PROVIDE FINANCIAL PROVISIONS WITHIN THEIR BID FOR THE ELECTRICAL CONTRACTOR TO PROVIDE BRANCH POWER TO THE ADDITIONAL POWER SUPPLIES. COORDINATE THE LOCATION OF ADDITIONAL POWER SUPPLY CABINET WITH THE ELECTRICAL CONTRACTOR.
16. ELEMENT LENGTHS FOR BOTH MIXED AIR TEMP SENSORS AND LOW LIMIT TEMP SWITCHES SHALL BE MINIMUM 1 LINEAR FOOT PER SQUARE FOOT OF COIL SURFACE AREA. PROVIDE MULTIPLE SENSORS AND SWITCHES AS NEEDED TO ACHIEVE REQUIRED ELEMENT LENGTHS. LOCATE RESET SWITCHES MAX. 6'-6" ABOVE ADJACENT STANDING SURFACE (E.G. ROOF, PLATFORM OR FLOOR) SO THE RESET SWITCH CAN BE CYCLED WITHOUT THE NEED FOR A LADDER.
17. TO PREVENT GENERATOR OVERLOADING, TCC SHALL PROGRAM A STAGGERED START TIME FOR ALL MECHANICAL EQUIPMENT THAT IS CONTROLLED BY FMCS TO INCLUDE, BUT NOT LIMITED TO, AIR HANDLERS, PUMPS, EXHAUST FANS, AND CHILLERS. THE FIRST EQUIPMENT SHALL START 2 MINUTES (ADJ.) FROM THE TIME THE FMCS RECEIVES THE SIGNAL THAT THE TRANSFER SWITCH CHANGED TO EMERGENCY POWER SOURCE WITH ALL EQUIPMENT BEING ENERGIZED WITHIN A 20 MINUTE (ADJ.) TIME SPAN. COORDINATE ORDER OF EQUIPMENT STAGING WITH OWNER'S REPRESENTATIVE.
18. CONTROL DIAGRAMS ARE SCHEMATIC IN NATURE AND DO NOT SHOW ALL REQUIRED CONTROL DEVICES AND COMPONENTS. REFER TO FLOOR PLANS, FLOW DIAGRAMS AND DETAILS FOR ADDITIONAL CONTROL DEVICES, COMPONENTS AND REQUIREMENTS NOT SHOWN ON THESE CONTROL DRAWINGS.
19. TCC SHALL PROVIDE ALL CONTROL COMPONENTS AND ACCESSORIES AS REQUIRED FOR EQUIPMENT TO BE CONTROLLED AS DESCRIBED IN THE SEQUENCE OF OPERATION REGARDLESS OF WHETHER ALL CONTROL COMPONENTS OR POINTS ARE SHOWN IN THE ASSOCIATED CONTROL DIAGRAM.
20. COORDINATE DDC CONTROL PANEL EMERGENCY POWER SUPPLY REQUIREMENT WITH ELECTRICAL CONTRACTOR. ALL CONTROLS ASSOCIATED WITH MECHANICAL SYSTEM REQUIRING EMERGENCY POWER SHALL BE CONNECTED TO THE EMERGENCY POWER SYSTEM.

Revisions:	Date:

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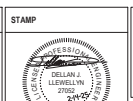

Office of Construction and Facilities Management

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Drawing Title: CONTROLS COVERSHEET	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Building Number: 5
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLE	Drawing Number: MC000

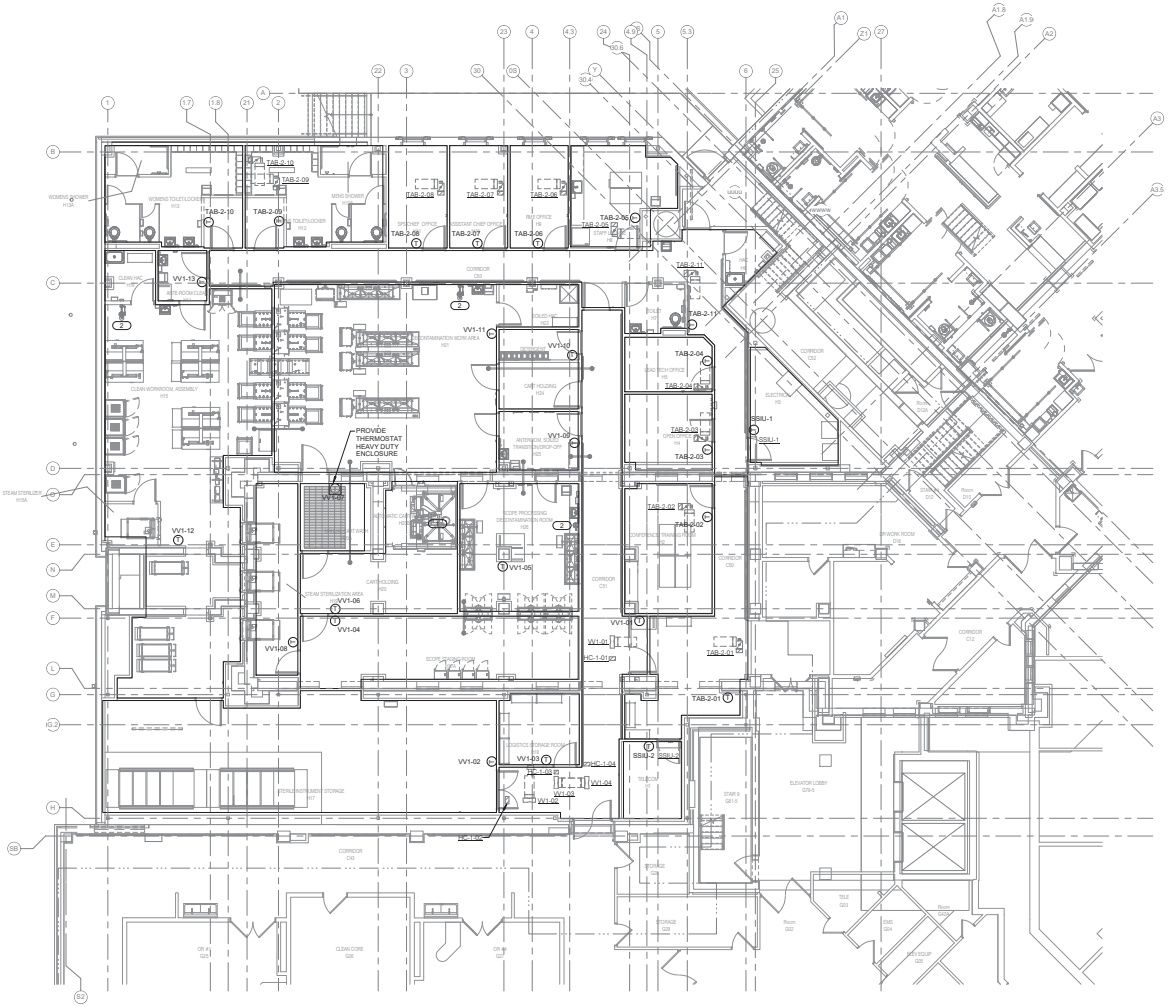
VA FORM 08 - 6231

GENERAL MECHANICAL NOTES:

1. REFERENCE MC000 – MECHANICAL CONTROLS COVERSHEET FOR CONTROLS SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. COORDINATE AND CONFIRM ALL ARCHITECTURALLY EXPOSED DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN OR INSTALLATION.
3. REFERENCE MV600 FOR VENTILATION EQUIPMENT SCHEDULES.
4. REFERENCE MP600 FOR PIPING EQUIPMENT SCHEDULES.
5. REFERENCE 7/MC400 FOR VARIABLE FREQUENCY DRIVE CONTROL DIAGRAM.
6. REFERENCE 5/MC403 FOR TAB NIGHT SETBACK CONTROL SEQUENCE.
7. REFERENCE 6/MC403 FOR TERMINAL AIR BOX REPORT GENERATION SEQUENCE.

KEYNOTES: (#)

1. REFERENCE 1/MC403 FOR CART WASHER FAN CONTROL DIAGRAM.
2. REFERENCE 12/MC403 FOR EMERGENCY SHOWER/EYEWASH MONITORING CONTROL DIAGRAM.



1 GROUND LEVEL FLOOR PLAN - CONTROLS

1/8" = 1'-0"

Revisions:	Date:

CONSULTANT

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Drawing Title: GROUND LEVEL FLOOR PLAN - CONTROLS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS			Project Number: 438-460
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.			Building Number: 5
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE	Drawing Number: MC101

VA FORM 08 - 6231

GENERAL MECHANICAL NOTES:

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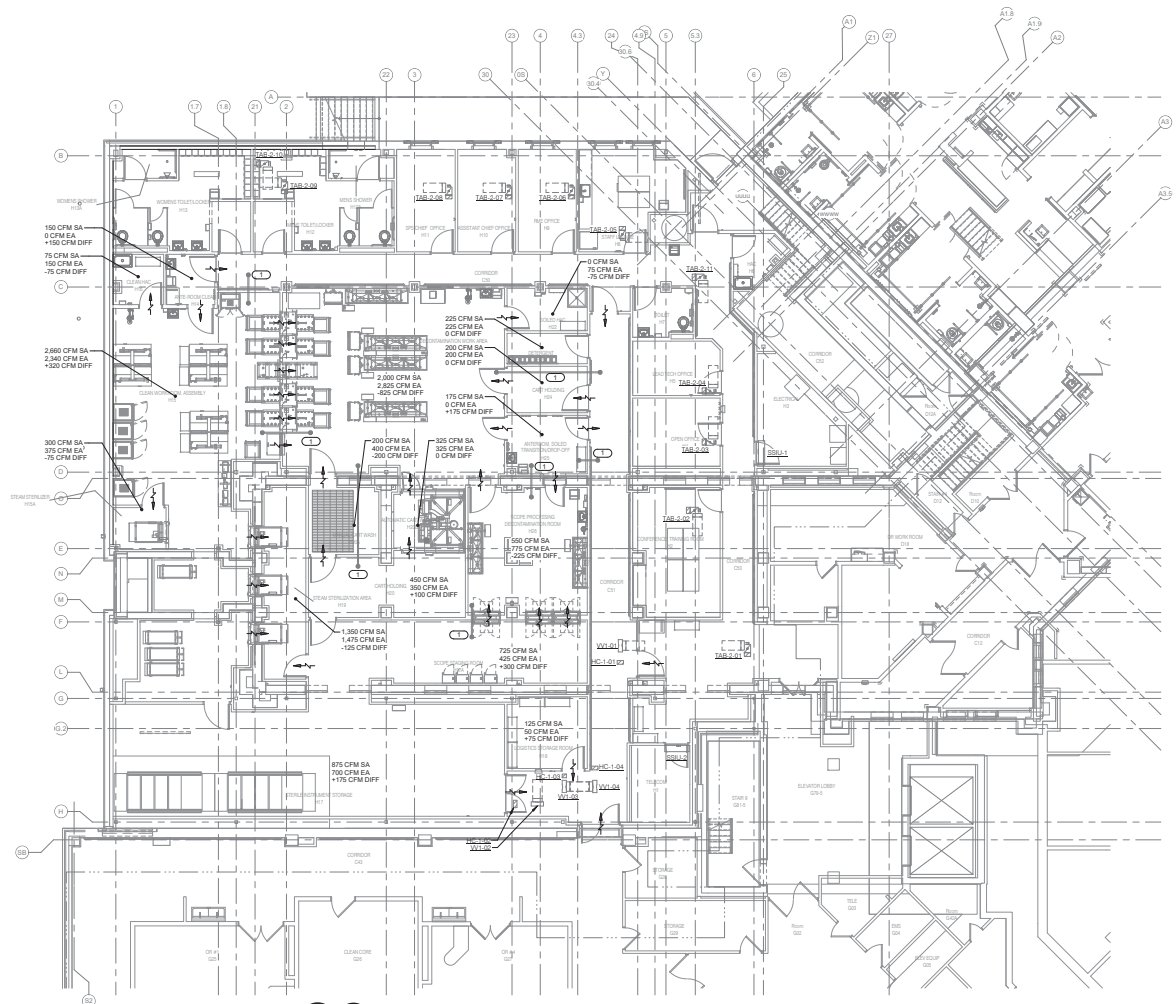
3. REFERENCE MV600 FOR VENTILATION EQUIPMENT SCHEDULES.
4. REFERENCE MP600 FOR PIPING EQUIPMENT SCHEDULES.
5. REFERENCE 7/MC400 FOR VARIABLE FREQUENCY DRIVE CONTROL DIAGRAM.
6. REFERENCE 5/MC403 FOR TAB NIGHT SETBACK CONTROL SEQUENCE.
7. REFERENCE 6/MC403 FOR TERMINAL AIR BOX REPORT GENERATION SEQUENCE.

KEYNOTES: (#)

1. PROVIDE DIFFERENTIAL PRESSURE SENSORS AT LOCATIONS INDICATED ON DRAWINGS. DIFFERENTIAL PRESSURE SENSORS ARE INTENDED FOR MONITORING USE ONLY, THEY SHOULD NOT BE USED TO CONTROL EQUIPMENT. A TYPICAL RANGE OF +/- 0.5" W.C., OR SIMILAR, SHOULD BE PROVIDED.


150 CFM SA
0 CFM EA
+150 CFM DIFF
75 CFM SA
150 CFM EA
-75 CFM DIFF
2,660 CFM SA
2,340 CFM EA
+320 CFM DIFF
300 CFM SA
375 CFM EA
-75 CFM DIFF
2,000 CFM SA
2,825 CFM EA
-825 CFM DIFF
200 CFM SA
400 CFM EA
-200 CFM DIFF
450 CFM SA
350 CFM EA
+100 CFM DIFF
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1,475 CFM EA
-125 CFM DIFF
875 CFM SA
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+175 CFM DIFF
225 CFM SA
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CORRIDOR C02
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CLEAN CORE C05
CLEAN CORE C06
STORAGE C09
STORAGE C29
ELEVATOR LOBBY C04-0
STAIR 5 C01-5
STAIR 6 C01-6
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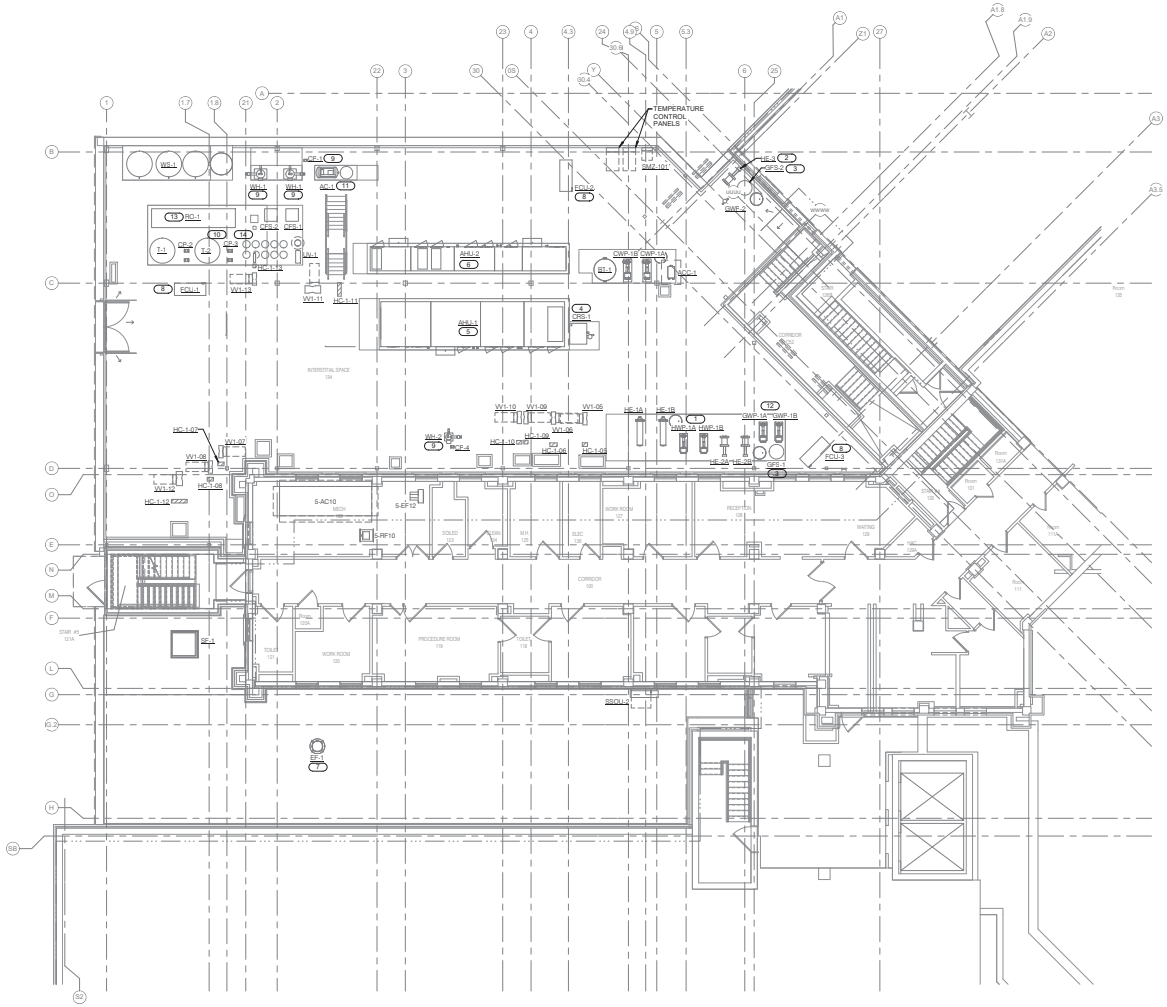
Room C60
Room

GENERAL MECHANICAL NOTES:

1. REFERENCE MC000 – MECHANICAL CONTROLS COVERSHEET FOR CONTROLS SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. COORDINATE AND CONFIRM ALL ARCHITECTURALLY EXPOSED DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN OR INSTALLATION.
3. REFERENCE MV600 FOR VENTILATION EQUIPMENT SCHEDULES.
4. REFERENCE MP600 FOR PIPING EQUIPMENT SCHEDULES.
5. REFERENCE 7/MC400 FOR VARIABLE FREQUENCY DRIVE CONTROL DIAGRAM.
6. REFERENCE 5/MC403 FOR TAB NIGHT SETBACK CONTROL SEQUENCE.
7. REFERENCE 6/MC403 FOR TERMINAL AIR BOX REPORT GENERATION SEQUENCE.

KEYNOTES: (#)

1. REFERENCE 2/MC400 FOR HEATING WATER CONTROL DIAGRAM.
2. REFERENCE 4/MC400 FOR SNOW MELT SYSTEM CONTROL DIAGRAM.
3. REFERENCE 5/MC400 FOR GLYCOL FEED STATION CONTROL DIAGRAM.
4. REFERENCE 6/MC400 FOR CONDENSATE RETURN PUMP MONITORING CONTROL DIAGRAM.
5. REFERENCE 1/MC401 FOR AHU-1 AIR HANDLING UNIT CONTROL DIAGRAM.
6. REFERENCE 1/MC401 FOR AHU-2 AIR HANDLING UNIT CONTROL DIAGRAM.
7. REFERENCE 2/MC403 FOR EXHAUST FAN AHU INTERLOCK CONTROL DIAGRAM.
8. REFERENCE 8/MC403 FOR FAN COIL UNIT CONTROL DIAGRAM.
9. REFERENCE 9/MC403 FOR DOMESTIC HOT WATER CONTROL DIAGRAM.
10. REFERENCE 10/MC403 FOR WATER TREATMENT METERING CONTROL DIAGRAM.
11. REFERENCE 11/MC403 FOR AIR COMPRESSOR CONTROL DIAGRAM.
12. REFERENCE 3/MC400 FOR GLYCOL PREHEAT LOOP CONTROL DIAGRAM.
13. REFERENCE 1/MC404 FOR REVERSE OSMOSIS SYSTEM CONTROL DIAGRAM.
14. REFERENCE 2/MC404 FOR DEIONIZED WATER SYSTEM CONTROL DIAGRAM.



NORTH

1 INTERSTITIAL/FIRST FLOOR PLAN - CONTROLS

1/8" = 1'-0"

Revisions:	Date:

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Drawing Title: INTERSTITIAL/FIRST LEVEL FLOOR PLAN - CONTROLS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
			Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Drawing Number: MC111
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLLE	

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GENERAL MECHANICAL NOTES:

1. REFERENCE MC000 – MECHANICAL CONTROLS COVERSHEET FOR CONTROLS SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. COORDINATE AND CONFIRM ALL ARCHITECTURALLY EXPOSED DEVICE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN OR INSTALLATION.
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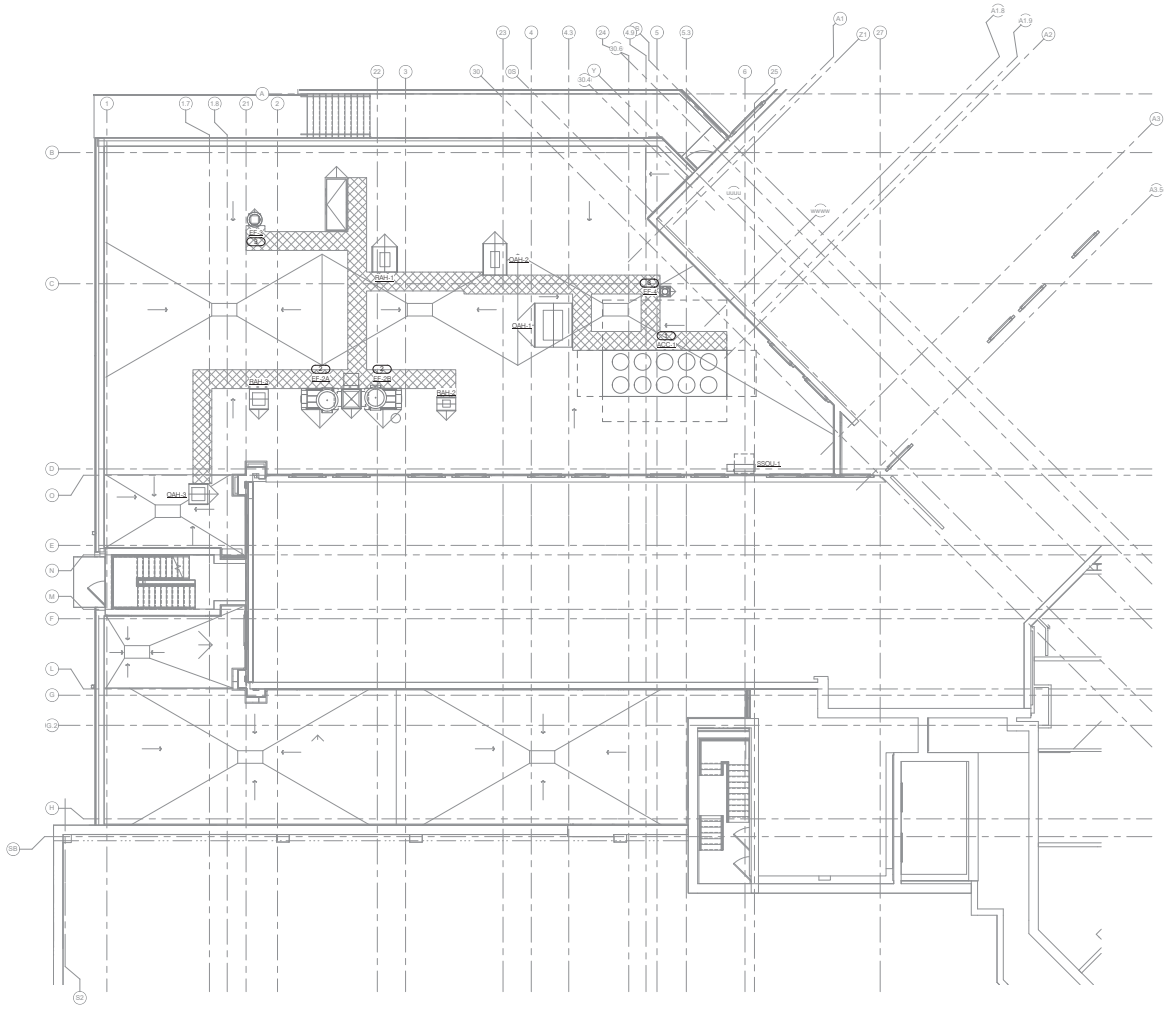
4. REFERENCE MP600 FOR PIPING EQUIPMENT SCHEDULES.
5. REFERENCE 6/MC400 FOR VARIABLE FREQUENCY DRIVE CONTROL DIAGRAM.
6. REFERENCE 5/MC403 FOR TAB NIGHT SETBACK CONTROL SEQUENCE.
7. REFERENCE 6/MC403 FOR TERMINAL AIR BOX REPORT GENERATION SEQUENCE.

KEYNOTES: (#)

1. REFERENCE 1/MC400 FOR AIR COOLED CHILLER CONTROL DIAGRAM.
2. REFERENCE 2/MC403 FOR EXHAUST FAN AHU INTERLOCK CONTROL DIAGRAM.
3. REFERENCE 3/MC403 FOR CONTINUOUS EXHAUST FAN OPERATION CONTROL DIAGRAM.



1 **ROOF PLAN - CONTROLS**
1/8" = 1'-0"

NORTH

Revisions:	Date:

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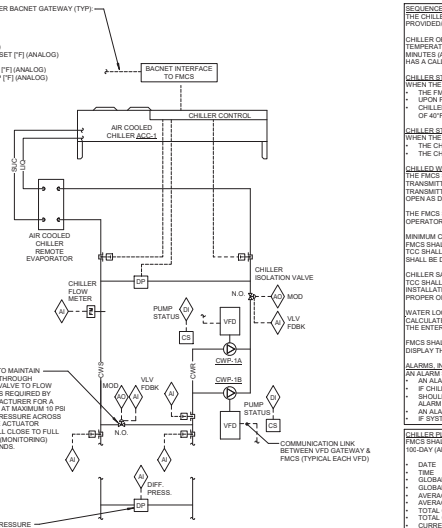
Drawing Title ROOF PLAN - CONTROLS	**Phase** BID DOCUMENTS	**Project Title** CONSTRUCT NEW SPS	**Project Number** 438-460
Approved:	FULLY SPRINKLERED	**Location** Sioux Falls, SD.	**Building Number** 5
		Issue Date 02/14/2025 / **Checked** DAVING / **Drawn** DELLLE	**Drawing Number** MC121



1 AIR COOLED CHILLER CONTROLS - VARIABLE PRIMARY

NO SCALE

SEQUENCE OF OPERATION

THE CHILLER MANUFACTURER SHALL PROVIDE A FACTORY MOUNTED CHILLER CONTROL PANEL. ALL AVAILABLE DATA PROVIDED/MONITORED BY THE CHILLER CONTROL PANEL SHALL BE AVAILABLE TO AND MONITORED BY THE FMCS SYSTEM.

CHILLER OPERATION SHALL BE CONTROLLED BY THE CHILLER CONTROL PANEL AND SHALL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE RISES ABOVE 50°F (ADJ.) FOR 15 MINUTES (ADJ.). WHEN OUTSIDE AIR TEMPERATURE DROPS BELOW 48°F (ADJ.) FOR 15 MINUTES (ADJ.) CHILLER OPERATION SHALL BE DISABLED. CHILLER SHALL NOT OPERATE UNTIL A CHILLED WATER VALVE IN THE SYSTEM HAS A CALL FOR COOLING AND BEGINS TO OPEN. ONCE VALVE STARTS TO OPEN THE FMCS SHALL ENERGIZE THE LEAD PUMP.

CHILLER STARTING:
WHEN THE FMCS INDEXES A CHILLER TO RUN THE FOLLOWING SHALL OCCUR:
- THE FMCS SHALL TURN ON THE CHILLED WATER PUMP
- UPON PROOF OF FLOW IN THE EVAPORATOR BARREL THE CHILLER CONTROL PANEL SHALL INDEX CHILLER TO START.
- CHILLER SHALL START AFTER ALL INTERNAL SAFETIES ARE SATISFIED AND SHALL MAINTAIN CHILLED WATER SUPPLY TEMPERATURE OF 40°F (ADJ.) VIA INTERNAL CONTROLS.

CHILLER STOPPING:
WHEN THE FMCS INDEXES THE CHILLER TO STOP THE FOLLOWING SHALL OCCUR:
- THE CHILLER CONTROL PANEL SHALL INDEX CHILLER TO STOP.
- THE CHILLER CONTROL PANEL SHALL SEND A SIGNAL TO THE FMCS TO SHUTDOWN THE CHILLED WATER PUMP.

CHILLED WATER PUMP CONTROL:
THE FMCS SHALL MODULATE OUTPUT TO THE PUMP VFD AS REQUIRED TO MAINTAIN DP SETPOINT AT THE LOCATION OF THE DP TRANSMITTER. DP TRANSMITTER SIGNAL SHALL BE WIRED DIRECTLY TO THE CONTROLLER SERVING PUMP VFD (SIGNAL SHALL NOT BE TRANSMITTED ACROSS THE FMCS NETWORK). FMCS SHALL RESET THE DP SETPOINT UNTIL ONE MODULATING CONTROL VALVE IS 95% OPEN AS DETERMINED BY THE VALVE FEEDBACK. IN NO CASE SHALL DP SETPOINT EXCEED 10 PSID (ADJ.) OR DROP BELOW 2 PSID (ADJ.)

THE FMCS SHALL ALTERNATE THE LEAD PUMP BASED ON RUN TIME. SWITCH EVERY 400 HOURS (ADJ.). INCLUDE GRAPHIC TOGGLE ON OPERATOR WORKSTATION GRAPHICAL SCREEN TO ALLOW OPERATOR TO MANUALLY SELECT WHICH PUMP IS LEAD AND WHICH IS LAG.

MINIMUM CHILLED WATER FLOW CONTROL:
FMCS SHALL MODULATE THE CHILLED WATER BYPASS CONTROL VALVE AS REQUIRED TO MAINTAIN MINIMUM FLOW THROUGH CHILLER. TCC SHALL VERIFY THE MINIMUM FLOW LIMIT OF CHILLER WITH EQUIPMENT MANUFACTURER. ADEQUATE FLOW THROUGH EACH CHILLER SHALL BE DETERMINED BY THE FLOW METER. IF MINIMUM FLOW RATE IS MET THE CONTROL VALVE SHALL BE CLOSED.

CHILLER SAFETIES:
TCC SHALL COORDINATE ALL SAFETY AND INTERLOCK REQUIREMENTS WITH CHILLER MANUFACTURER. TCC SHALL PROVIDE THE INSTALLATION AND WIRING OF CHILLED WATER FLOW SWITCHES, AND OTHER COMPONENTS PROVIDED WITH CHILLER AS REQUIRED FOR PROPER OPERATION.

WATER LOOP LOAD CALCULATION & DISPLAY:
CALCULATE AND DISPLAY THE CHILLED WATER LOOP TONNAGE ON THE FMCS COMPUTER CHILLER PLANT GRAPHICAL SCREEN USING THE ENTERING AND LEAVING CHILLED WATER TEMPERATURES AND THE FLOW RATE AS DETERMINED BY THE FLOW METER.

FMCS SHALL TOTAL THE KW USED BY THE CHILLER AND CHILLED WATER PUMPS AND DIVIDE BY THE PLANT'S TOTAL TONNAGE AND DISPLAY THE PLANTS KW/TON ON THE SCREEN.

ALARMS, INTERLOCKS AND SAFETIES:
AN ALARM SHALL BE INDICATED AT THE FMCS WHEN THE FOLLOWING OCCUR:
- AN ALARM IS INDICATED AT THE CHILLER CONTROL PANEL.
- IF CHILLED WATER SUPPLY TEMPERATURE IS MORE THAN 5°F (ADJ.) ABOVE OR BELOW SETPOINT FOR MORE THAN 10 MINUTES (ADJ.).
- SHOULD THE FMCS COMMAND THE PUMP TO OPERATE AND THE PUMP FAILS TO DO SO AS DETERMINED BY THE VFD STATUS, AN ALARM SHALL BE INDICATED AT THE FMCS OPERATOR WORKSTATION AND THE FMCS SHALL START THE LAG PUMP.
- AN ALARM CONDITION OCCURS AT ANY VFD.
- IF SYSTEM DIFFERENTIAL PRESSURE IS NOT MAINTAINED FOR MORE THAN 15 MINUTES (ADJ.).

CHILLER PLANT REPORT GENERATION:
FMCS SHALL MONITOR THE FOLLOWING POINTS ON 10 MINUTE (ADJ.) INTERVALS WITHIN A SINGLE TREND. THE TREND SHALL RUN FOR A 100-DAY (ADJ.) DURATION AT WHICH POINT THE NEWEST VALUES SHALL OVERWRITE THE OLDEST VALUES:
- DATE
- TIME
- GLOBAL OUTSIDE AIR TEMPERATURE [°F]
- GLOBAL OUTSIDE AIR DEWPOINT [°F]
- AVERAGE CHILLED WATER SUPPLY TEMPERATURE [°F]
- AVERAGE CHILLED WATER RETURN TEMPERATURE [°F]
- TOTAL CHILLED WATER FLOWRATE [GPM]
- TOTAL CHILLED WATER SYSTEM LOAD [TONS]
- CURRENT DRAW FROM CHILLER [AMPS]

THIS INFORMATION SHALL BE ACCESSIBLE TO VIEW IN EITHER TABULAR OR GRAPHICAL FORM ON THE FMCS OPERATOR WORKSTATION.

ONCE PER MONTH, THE FMCS SHALL RECORD THE LARGEST CHILLED WATER SYSTEM LOAD (IN TONS) WHICH OCCURRED DURING THAT MONTH. THE DATE, TIME, OUTSIDE AIR TEMPERATURE, OUTSIDE AIR DEWPOINT, CHILLED WATER SUPPLY & RETURN TEMPERATURE AND CHILLED WATER FLOWRATE THAT COINCIDED WITH THAT EVENT SHALL ALSO BE RECORDED. THIS INFORMATION SHALL BE STORED TO A MEMORY LOCATION ON THE FMCS OPERATOR WORKSTATION THAT IS MAINTAINED (NOT AUTOMATICALLY OVERWRITTEN).

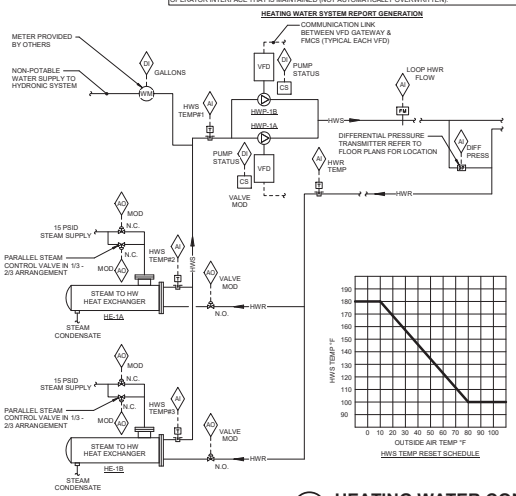
CHILLER PLANT REPORT GENERATION

HEATING SYSTEM REPORT GENERATION

FMCS SHALL MONITOR THE FOLLOWING POINTS ON 5 MINUTE (ADJ.) INTERVALS WITHIN A SINGLE TREND. THE TREND SHALL RUN FOR A 14-DAY (ADJ.) DURATION AT WHICH POINT THE NEWEST VALUES SHALL OVERWRITE THE OLDEST VALUES:
- DATE
- TIME
- GLOBAL OUTSIDE AIR TEMP. (°F)
- HEATING WATER SUPPLY TEMP. (°F)
- HEATING WATER RETURN TEMP. (°F)
- HEATING WATER FLOWRATE (GPM)
- HEATING SYSTEM LOAD (BTU/HR.)
- OPERATIONAL STATUS OF EACH HEAT EXCHANGER AND PUMP.

THIS INFORMATION SHALL BE ACCESSIBLE TO VIEW IN EITHER TABULAR OR GRAPHICAL FORM ON THE FMCS OPERATOR INTERFACE.

ONCE PER MONTH, THE FMCS SHALL RECORD THE LARGEST HEATING SYSTEM LOAD (IN BTU/HR.) WHICH OCCURRED DURING THAT MONTH. THE DATE, TIME, OUTSIDE AIR TEMPERATURE, SECONDARY HEATING WATER SUPPLY AND RETURN TEMPERATURES AND FLOW RATE THAT COINCIDED WITH THAT EVENT SHALL ALSO BE RECORDED. THIS INFORMATION SHALL BE STORED TO A MEMORY LOCATION ON THE FMCS OPERATOR INTERFACE THAT IS MAINTAINED (NOT AUTOMATICALLY OVERWRITTEN).



2 HEATING WATER CONTROL DIAGRAM

NO SCALE

GENERAL:
TWO 100% CAPACITY HEAT EXCHANGERS AND TWO 100% CAPACITY HEATING WATER PUMPS ARE PROVIDED IN THE SYSTEM. (ONE HEAT EXCHANGER AND ONE PUMP ARE REDUNDANT).

SEQUENCE OF OPERATION:
FMCS SHALL OPEN THE HEATING WATER ISOLATION CONTROL VALVE TO ASSOCIATED HEAT EXCHANGER. THE STEAM CONTROL VALVES SHALL MODULATE TO THE LEAD HEAT EXCHANGER AS REQUIRED TO MAINTAIN SYSTEM SUPPLY TEMP HWSP1 AS FOLLOWS:
- THE 1/3 CAPACITY STEAM CONTROL VALVE SHALL BE MODULATED IN ORDER TO MAINTAIN THE HEATING WATER SUPPLY TEMPERATURE.
- IF THE 1/3 CAPACITY CONTROL VALVE IS 100% OPEN AND THE HEAT EXCHANGER IS UNABLE TO MAINTAIN SETPOINT, THE 1/3 CAPACITY CONTROL VALVE SHALL CLOSE AND THE 2/3 CAPACITY STEAM CONTROL VALVE SHALL MODULATE TO MAINTAIN SETPOINT.
- IF THE 2/3 CAPACITY CONTROL VALVE IS 100% OPEN AND IS UNABLE TO MAINTAIN SETPOINT, THE 2/3 CAPACITY CONTROL VALVE SHALL REMAIN OPEN AND THE 1/3 CAPACITY CONTROL VALVE SHALL ALSO MODULATE OPEN TO MAINTAIN SETPOINT.
- ON A DECREASE IN LOAD, THE 2/3 CAPACITY STEAM CONTROL VALVE SHALL REMAIN OPEN AND THE 1/3 CAPACITY STEAM CONTROL VALVE SHALL MODULATE CLOSED UNTIL SETPOINT IS ACHIEVED.
- ON A FURTHER DECREASE IN LOAD, THE 1/3 CAPACITY STEAM CONTROL VALVE SHALL REMAIN SHUT AND THE 2/3 CAPACITY STEAM CONTROL VALVE SHALL MODULATE CLOSED UNTIL SETPOINT IS ACHIEVED OR UNTIL IT REACHES 40% (ADJ.) OPEN.
- IF THE 2/3 CAPACITY STEAM CONTROL VALVE REACHES 40% (ADJ.) OPEN AND SETPOINT IS STILL NOT ACHIEVED, THE 2/3 CAPACITY STEAM CONTROL VALVE SHALL CLOSE AND THE 1/3 CAPACITY STEAM CONTROL VALVE SHALL MODULATE OPEN UNTIL SETPOINT IS ACHIEVED.

FMCS SHALL LIMIT THE HWS TEMP#2 AND TEMP#3 TO MAX. 180°F (ADJ.).

STEAM CONTROL VALVE OPERATION SHALL NOT BE ENABLED UNLESS ONE PUMP IS RUNNING AS PROVEN BY VFD STATUS AND THE ASSOCIATED HEATING WATER CONTROL VALVE IS OPEN.

UPON DISABLING THE STEAM CONTROL VALVE THE HEATING WATER CONTROL VALVE SHALL BE CLOSED AFTER A 3 MINUTE (ADJ.) TIME DELAY.

THE FMCS SHALL ALTERNATE THE LEAD/STANDBY HEAT EXCHANGERS ON A WEEKLY BASIS.

INCLUDE GRAPHIC TOGGLE ON OPERATOR WORKSTATION GRAPHICAL SCREEN TO ALLOW OPERATOR TO MANUALLY SELECT WHICH HEAT EXCHANGER IS LEAD AND WHICH IS STANDBY.

HWS TEMP SETPOINT:
FMCS SHALL RESET THE HWS TEMP IN ACCORDANCE WITH HWS RESET SCHEDULE.

HEATING WATER PUMP CONTROL:

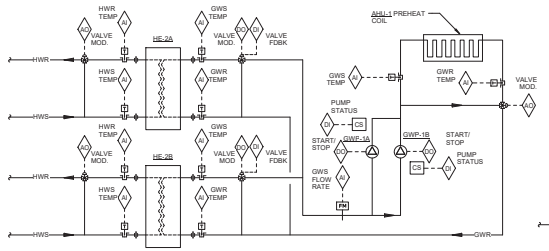
START/STOP: THE FMCS SHALL START THE LEAD PUMP VIA THE VFD AND SHALL RUN CONTINUOUSLY. HEATING WATER PUMPS SHALL BE STARTED AND STOPPED THROUGH A HAND-OFF-AUTO SWITCH ON THE FACE OF THE VFD. WHEN PLACED IN THE HAND POSITION, PUMP MOTOR SHALL RUN CONTINUOUSLY. WHEN PLACED IN THE AUTO POSITION, THE FMCS SHALL CONTROL PUMP OPERATION. WHEN PLACED IN THE OFF POSITION, THE PUMP MOTOR SHALL BE DE-ENERGIZED.

THE FMCS SHALL MODULATE OUTPUT TO THE VFD AS REQUIRED TO MAINTAIN DP SETPOINT AT THE LOCATION OF THE DP TRANSMITTER. DP TRANSMITTER SIGNAL SHALL BE WIRED DIRECTLY TO THE CONTROLLER SERVING PUMP VFD (SIGNAL SHALL NOT BE TRANSMITTED ACROSS THE FMCS NETWORK.) FMCS SHALL RESET THE DP SETPOINT UNTIL ONE SYSTEM COIL MODULATING CONTROL VALVE IS 95% OPEN. IN NO CASE SHALL DP SETPOINT EXCEED 10 PSID (ADJ.) OR DROP BELOW 2 PSID.

THE FMCS SHALL ALTERNATE THE LEAD/STANDBY PUMPS ON A WEEKLY BASIS.

INCLUDE GRAPHIC TOGGLE ON OPERATOR WORKSTATION GRAPHICAL SCREEN TO ALLOW OPERATOR TO MANUALLY SELECT WHICH PUMP IS LEAD AND WHICH IS STANDBY.

ALARMS, INTERLOCKS & SAFETIES:
FMCS SHALL INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION IN THE EVENT THE FOLLOWING OCCUR:
- SHOULD THE FMCS COMMAND THE LEAD HW PUMP TO OPERATE AND THE PUMP FAILS TO DO SO AS DETERMINED BY THE VFD STATUS, AN ALARM SHALL BE INDICATED AT THE FMCS OPERATOR WORKSTATION AND THE STANDBY HW PUMP SHALL AUTOMATICALLY START.
- AN ALARM CONDITION OCCURS AT ANY VFD.
- WHEN 2 GALLONS (ADJ.) OF HYDRONIC SYSTEM MAKE-UP WATER FLOW THROUGH METER AFTER THE LAST ACKNOWLEDGEMENT. WHEN ALARM IS MANUALLY ACKNOWLEDGED, THE FMCS SHALL RE-ZERO THE COUNTER.
- IF HEATING WATER SUPPLY TEMPERATURE IS MORE THAN 5°F (ADJ.) ABOVE OR BELOW SETPOINT FOR MORE THAN 10 MINUTES (ADJ.).
- IF SYSTEM DIFFERENTIAL PRESSURE IS NOT MAINTAINED FOR MORE THAN 15 MINUTES (ADJ.).



GENERAL:
TWO 100% CAPACITY HEAT EXCHANGERS AND TWO 100% CAPACITY GLYCOL WATER PUMPS ARE PROVIDED IN THE SYSTEM (ONE HEAT EXCHANGER AND ONE PUMP ARE REDUNDANT). GLYCOL PREHEAT LOOP SHALL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW 45°F (ADJ.) FOR 15 MINUTES (ADJ.). WHEN OUTSIDE AIR TEMPERATURE RISES ABOVE 49°F (ADJ.) FOR 15 MINUTES (ADJ.).

PUMP CONTROL
WHEN OUTSIDE AIR TEMPERATURE RISES ABOVE 38°F. (ADJ.) FOR 10 MINUTES (ADJ.). GLYCOL WATER PUMP SHALL OPERATE ONLY WHEN HEATING IS CALLD FOR (PREHEAT COIL CONTROL VALVE IS COMMANDED TO OPEN). WHEN OUTSIDE AIR TEMPERATURE DROPS BELOW 38°F (ADJ.) GLYCOL WATER PUMP SHALL OPERATE CONTINUOUSLY. ONCE ENERGIZED, GLYCOL WATER PUMP SHALL REMAIN IN OPERATION FOR A MINIMUM OF 5 MINUTES (ADJ.) TO PREVENT SHORT CYCLING.

THE FMCS SHALL ALTERNATE THE LEAD PUMP BASED ON RUN TIME: SWITCH EVERY 400 HOURS (ADJ.). INCLUDE GRAPHIC TOGGLE ON OPERATOR WORK STATION GRAPHICAL SCREEN TO ALLOW OPERATOR TO MANUALLY SELECT WHICH PUMP IS LEAD AND WHICH IS LAG.

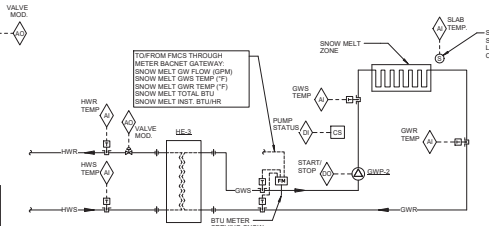
HEAT EXCHANGER CONTROL
UPON A CALL FOR HEATING BY AHU-1, THE LEAD HEAT EXCHANGER GLYCOL WATER CONTROL VALVE SHALL FULLY OPEN. THE LEAD HEAT EXCHANGER HEATING WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN A GLYCOL WATER SUPPLY TEMPERATURE OF 175°F (ADJ.). FMCS SHALL RESET THE GLYCOL WATER SUPPLY TEMPERATURE IN ACCORDANCE WITH THE HEATING WATER SUPPLY RESET SCHEDULE.

THE FMCS SHALL ALTERNATE THE LEAD HEAT EXCHANGER BASED ON RUN TIME: SWITCH EVERY 400 HOURS (ADJ.). INCLUDE GRAPHIC TOGGLE ON OPERATOR WORK STATION GRAPHICAL SCREEN TO ALLOW OPERATOR TO MANUALLY SELECT WHICH HEAT EXCHANGER IS LEAD AND WHICH IS LAG.

ALARMS, INTERLOCKS & SAFETIES:
AN ALARM SHALL BE INDICATED AT THE FMCS WHEN THE FOLLOWING OCCUR:
- IF THE GWS TEMPERATURE IS MORE THAN 5°F (ADJ.) ABOVE OR BELOW SETPOINT FOR MORE THAN 10 MINUTES (ADJ.).
- SHOULD THE FMCS COMMAND THE LEAD PUMP TO OPERATE AND THE PUMP FAILS TO DO SO AS DETERMINED BY THE VFD STATUS, ALARM SHALL BE INDICATED AT THE FMCS OPERATOR WORK STATION AND THE LAG PUMP SHALL AUTOMATICALLY START.
- SHOULD THE FMCS COMMAND THE LEAD HEAT EXCHANGER TO OPERATE AND GLYCOL WATER ISOLATION VALVE FAILS TO OPEN AS DETERMINED BY THE VALVE FEEDBACK, ALARM SHALL BE INDICATED AT THE FMCS OPERATOR WORK STATION AND THE LAG HEAT EXCHANGER SHALL AUTOMATICALLY BE INDEXED TO OPERATE.
- AN ALARM CONDITION OCCUR AT ANY PUMP OR VFD.

3 GLYCOL PREHEAT LOOP CONTROL

NO SCALE



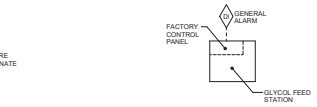
GENERAL
SNOW MELT SYSTEM SHALL BE CONTROLLED VIA THE FMCS. THE FMCS SHALL ENABLE POINT THROUGH THE FMCS WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 40°F (ADJ.). THE SYSTEM SHALL BE DISABLED WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 42°F (ADJ.)

SEQUENCE OF OPERATION:
THE SYSTEM SHALL OPERATE AS FOLLOWS TO MAINTAIN A SNOW MELT GLYCOL HEATING WATER TEMPERATURE OF 115°F (ADJ.):
- THE LEAD CIRCULATION PUMP SHALL START. IF THE LEAD PUMP IS COMMANDED TO START BUT FAILS TO START BASED ON A CURRENT STATUS SWITCH, THE LAG PUMP SHALL BE COMMANDED TO START.
- ONCE THE CIRCULATION PUMP HAS PROVEN OPERATIONAL BY THE CURRENT STATUS SWITCH, THE HEAT EXCHANGER SHALL BE ALLOWED TO ENERGIZE.
- THE HEATING WATER CONTROL VALVE SHALL BE MODULATED IN ORDER TO MAINTAIN THE GLYCOL WATER SUPPLY TEMPERATURE OF 115°F (ADJ.).
- THE SYSTEM SHALL BE STOPPED MANUALLY THROUGH THE FMCS OPERATOR WORK STATION.

ALARMS, INTERLOCKS & SAFETIES:
AN ALARM SHALL BE INDICATED AT THE FMCS WHEN THE FOLLOWING OCCUR:
- GLYCOL HEATING SUPPLY TEMPERATURE GREATER THAN 130°F (ADJ.).
- SHOULD THE FMCS COMMAND THE LEAD PUMP TO OPERATE AND THE PUMP FAILS TO DO SO AS DETERMINED BY THE VFD STATUS, ALARM SHALL BE INDICATED AT THE FMCS OPERATOR WORK STATION AND THE LAG PUMP SHALL AUTOMATICALLY START.
- AN ALARM CONDITION OCCUR AT ANY PUMP OR VFD.

4 SNOW MELT SYSTEM CONTROL

NO SCALE



SEQUENCE OF OPERATION:

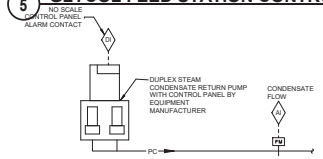
THE GLYCOL FEED SYSTEM CONTROLLER SHALL OPERATE THE SYSTEM TO MAINTAIN THE SPECIFIED PRESSURE IN THE WATER SYSTEM.

ALARMS, INTERLOCKS, AND SAFETIES:

AN ALARM SHALL BE GENERATED AT THE FMCS OPERATOR INTERFACE IF THE GLYCOL CONTROLLER INDICATES AN ALARM.

5 GLYCOL FEED STATION CONTROL DIAGRAM

NO SCALE

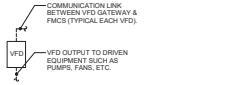


SEQUENCE OF OPERATION:
OPERATION OF CONDENSATE RETURN PUMPS SHALL BE CONTROLLED BY MANUFACTURER'S SUPPLIED CONTROL PANEL (REFER TO SECTION 23 FOR ADDITIONAL INFORMATION).

ALARMS, INTERLOCKS & SAFETIES:
FMCS SHALL MONITOR THE ALARM CONTACT PROVIDED WITH EACH CONTROL. AN ALARM AT ANY CONTROL PANEL SHALL ALSO BE INDICATED AT THE OPERATOR WORKSTATION. FMCS SHALL MONITOR FLOW FROM THE CONDENSATE METER.

6 CONDENSATE RETURN PUMP MONITORING CONTROL

NO SCALE



SEQUENCE OF OPERATION:
FMCS SHALL CONTROL EACH VFD AS DESCRIBED IN THE SEQUENCE OF OPERATION OF THE EQUIPMENT. DRIVE SHALL BE EQUIPPED BY THE VFD MANUFACTURER WITH A CONTROLLER CARD THAT IS COMPATIBLE WITH THE FMCS CONTROL SYSTEM. TCC SHALL PROVIDE COMMUNICATIONS WIRING AND PROGRAMMING AS REQUIRED FOR THE FMCS TO COMMUNICATE WITH EACH VFD AS DESCRIBED BELOW.

THE FOLLOWING VFD CONTROL PANEL POINTS (TO INCLUDE BUT NOT BE LIMITED TO) SHALL BE CONTROLLED BY THE FMCS AND DISPLAYED ON THE OPERATOR WORKSTATION (OWS) GRAPHICAL SCREEN:
- SYSTEM STATUS: [ENABLE/DISABLE]
- SPEED SET ADJUSTMENT: [%]
- CURRENT LIMIT: [AMPS]

THE FOLLOWING VFD CONTROL PANEL POINTS (TO INCLUDE BUT NOT BE LIMITED TO) SHALL BE MONITORED BY THE FMCS AND DISPLAYED ON THE OPERATOR WORKSTATION (OWS) GRAPHICAL SCREEN:
- SYSTEM STATUS: [DISABLED/MANUAL OPERATION/REMOTE OPERATION/AUTO/FAULT]
- INPUT SPEED: [0 - 100%]
- OUTPUT SPEED: [0 - 100%]
- CURRENT: [AMPS]
- POWER: [kW]
- DRIVE TEMPERATURE: [°F]
- RUN HOURS: [NUMERICAL]
- DIAGNOSTIC AND FAULT CODES: [NUMERICAL]
- BYPASS OPERATION: [ENABLED/DISABLED]

TCC SHALL PROVIDE A CURRENT SENSING RELAY ON ANY VFD EQUIPPED WITH A BYPASS WHERE THE VFD STATUS OUTPUT DOES INDICATE THE MOTOR IS RUNNING WHEN THE VFD IS OPERATING IN BYPASS MODE.

ALARMS, INTERLOCKS & SAFETIES:
AN ALARM SHALL BE INDICATED TO THE FMCS OPERATOR WORKSTATION IN THE EVENT A FAULT OR ERROR CONDITION OCCURS AT ANY VFD.

TCC SHALL PROGRAM VFD TO ENSURE MOTOR RPM DOES NOT DROP BELOW MINIMUM REQUIRED BY MOTOR MANUFACTURER.

7 VARIABLE FREQUENCY DRIVE CONTROL

NO SCALE

Revisions:	Date:

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			Drawing Number: MC400

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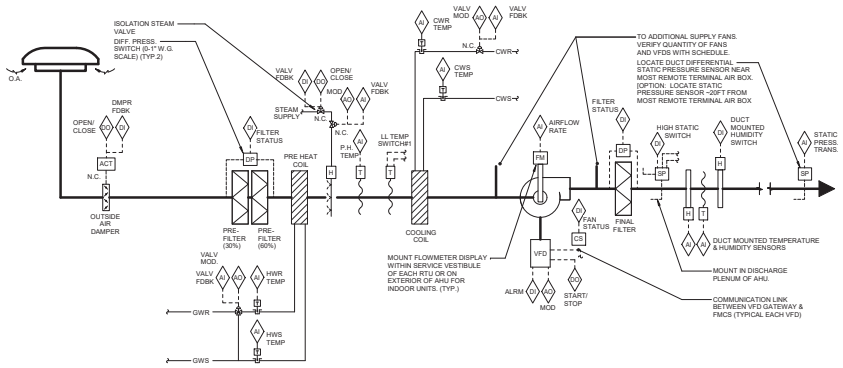


SEQUENCE OF OPERATION:

WHEN AHU IS INDEXED TO RUN, THE FOLLOWING SHALL OCCUR:
- SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS SHALL OPEN.
- AFTER A 30 SECOND DELAY (ADJ.) TO ALLOW FOR OPENING OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS, SUPPLY FAN SHALL BE ENABLED TO RUN.
- WHEN THE SUPPLY FAN HAS STARTED THE INTERLOCKED EXHAUST FANS SHALL START AS SHOWN IN THE FAN INTERLOCK SCHEDULE.

SUPPLY FAN OPERATION:
FMCS SHALL MODULATE SIGNAL TO SUPPLY FAN VFD TO MAINTAIN DUCT STATIC PRESSURE AS MEASURED BY STATIC PRESSURE TRANSMITTER NEAR THE END OF THE CRITICAL DUCT BRANCH.

STATIC PRESSURE RESET:
FMCS SHALL RESET SUPPLY DUCT STATIC PRESSURE SETPOINT BELOW THE MAXIMUM SETPOINT AS REQUIRED TO MAINTAIN AT LEAST ONE SUPPLY TAB DAMPER 90% (ADJ.) OPEN. FMCS SHALL MONITOR ALL SUPPLY TERMINAL AIR BOX POSITIONS TO RESET THE SUPPLY DUCT DIFFERENTIAL STATIC PRESSURE.

DISCHARGE AIR TEMPERATURE SET POINT:
DISCHARGE AIR SET POINT SHALL BE 50°F (ADJ.).

DISCHARGE AIR TEMPERATURE RESET:
RESET DISCHARGE AIR TEMPERATURE BASED ON THE ZONE WITH THE GREATEST CALL FOR COOLING. RESET THE TEMPERATURE AS FOLLOWS:
- WHEN WORST CASE TAB IS LESS THAN 90% (ADJ.) OPEN FOR TEN MINUTES (ADJ.) THEN THE DISCHARGE AIR TEMPERATURE SHALL INCREASE BY 1°F (ADJ.). THIS SHALL CONTINUE UNTIL AHU MAXIMUM DISCHARGE AIR TEMPERATURE OF 60°F (ADJ.) IS ACHIEVED.
- WHEN WORST CASE TAB IS MORE THAN 90% OPEN FOR TEN MINUTES (ADJ.) THEN THE DISCHARGE AIR TEMPERATURE SHALL DROP BY 1°F (ADJ.). THIS SHALL CONTINUE UNTIL AHU MINIMUM DISCHARGE AIR TEMPERATURE OF 50°F (ADJ.) IS ACHIEVED.
- THE MAXIMUM ALLOWABLE SUPPLY AIR DEWPOINT SETPOINT SHALL BE 46.2°F (ADJ.). IF RETURN AIR HUMIDITY IS GREATER THAN SETPOINT, RESET DISCHARGE AIR TEMPERATURE TO 35°F UNTIL SUPPLY AIR DEWPOINT IS 5% LESS THAN MAXIMUM SETPOINT FOR 10 MINUTES (ADJ.).

STATIC PRESSURE AND DISCHARGE AIR TEMPERATURE RESET PRIORITY:
RESET THE DISCHARGE AIR TEMPERATURE PRIOR TO RESETTING THE DUCTWORK STATIC PRESSURE SETPOINT. ONCE THE MAXIMUM SUPPLY TEMPERATURE IS REACHED THEN THE SYSTEM SHALL ENABLE THE STATIC PRESSURE RESET.

VENTILATION AIR CONTROL:
WHENEVER THE AIR HANDLING UNIT IS IN OCCUPIED MODE, THE OUTSIDE AIR DAMPER SHALL BE FULLY OPEN.

COOLING COIL OPERATION:
FMCS SHALL MODULATE CHILLED WATER CONTROL VALVE AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT.

PREHEAT COIL OPERATION:
PREHEAT COIL CONTROLS SHALL BE ENABLED WHEN OUTSIDE AIR TEMP DROPS BELOW 45°F (ADJ.). PREHEAT COIL CONTROLS SHALL BE DISABLED WHEN OUTSIDE AIR TEMP RISES ABOVE 49°F (ADJ.).

FMCS SHALL MODULATE HEATING WATER CONTROL VALVE AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT.

HUMIDIFIER CONTROLS:
HUMIDIFIER CONTROLS AND ALARMS SHALL BE ENABLED WHEN OUTSIDE AIR TEMPERATURE DROPS BELOW 48°F (ADJ.) AT WHICH POINT THE ISOLATION STEAM VALVE SHALL FULLY OPEN. HUMIDIFIER CONTROLS AND ALARMS SHALL BE DISABLED WHEN OUTSIDE AIR TEMPERATURE RISES ABOVE 48°F (ADJ.) FOR 10 MINUTES (ADJ.) AT WHICH POINT THE ISOLATION STEAM VALVE SHALL FULLY CLOSE.

WHEN HUMIDIFIER CONTROLS ARE ENABLED, FMCS CONTROLLER SHALL MODULATE STEAM VALVE AS REQUIRED TO MAINTAIN 43°F DEWPOINT (ADJ.) IN THE SUPPLY AIR DUCT. DUCT MOUNTED HUMIDITY TRANSMITTER AT FAN DISCHARGE SHALL PREVENT SUPPLY AIR RELATIVE HUMIDITY FROM EXCEEDING 80% (ADJ.).

ALARMS, INTERLOCKS, AND SAFETIES:
WHEN FIRE ALARM CONTROL PANEL INDICATES AN ALARM CONDITION, AHU SHALL BE SHUTDOWN.

THE FOLLOWING CONDITIONS SHALL SHUTDOWN THE AHU AND SHALL INDICATE AN ALARM CONDITION AT THE FMCS WORKSTATION:
- HIGH STATIC PRESSURE SWITCH INDICATES SUPPLY DUCT STATIC PRESSURE GREATER THAN THE SPECIFIED DUCT PRESSURE CLASS.
- SHOULD ANY ONE FOOT SECTION OF THE MANUAL RESET LOW LIMIT TEMPERATURE SWITCH #1 SENSE AIR TEMP <34°F (ADJ.). IF MULTIPLE FREEZE STATS ARE REQUIRED, WIRE ALL TO A COMMON RESET SWITCH.

THE FOLLOWING CONDITIONS SHALL INDICATE AN ALARM AT THE FMCS, HOWEVER AHU SHALL CONTINUE TO OPERATE:
- HEATING COIL CIRCULATION PUMP IS COMMANDED TO RUN AND CURRENT RELAY INDICATES INSUFFICIENT CURRENT FLOW.
- AN ALARM IS INDICATED AT ANY SUPPLY FAN VFD.
- DIFFERENTIAL PRESSURE SWITCH ACROSS PRE-FILTER BANK EXCEEDS 0.8 INCHES W.G. (ADJ.)
- DIFFERENTIAL PRESSURE SWITCH ACROSS FINAL FILTER BANK EXCEEDS 1.0 INCHES W.G. (ADJ.)
- THE TOTAL DIFFERENTIAL PRESSURE ACROSS ALL FILTER BANKS EXCEEDS 2.0 INCHES W.G. (ADJ.).
- RELATIVE HUMIDITY OF SUPPLY AIR EXCEEDS 80% RH (ADJ.) AS MEASURED BY AUTOMATIC RESET HUMIDITY SWITCH. WHEN HUMIDITY SWITCH TRIPS, STEAM CONTROL VALVE SHALL FULLY CLOSE UNTIL ALARM IS RESET AT FMCS WORKSTATION. AN ALARM SHALL NOT INDICATE AT THE FMCS WORKSTATION UNLESS HUMIDIFIER CONTROLS ARE ENABLED.
- WHEN DUCTWORK SUPPLY AIR HUMIDITY EXCEEDS 90% RH A SEPARATE DUCT MOUNTED HUMIDITY SWITCH (MANUAL RESET) SHALL DISABLE HUMIDIFIER CONTROLS AND SHALL FULLY CLOSE STEAM ISOLATION VALVE. AN IDENTIFIABLE ALARM CONDITION SHALL BE DISPLAYED AT THE OPERATOR WORKSTATION.
- SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE DISCHARGE AIR TEMPERATURE IS MORE THAN 5°F (ADJ.) ABOVE OR BELOW SETPOINT.

IN THE EVENT SUPPLY FAN IS NOT RUNNING (AS INDICATED BY THE CURRENT SENSING RELAYS) RETURN AIR FAN SHALL BE DE-ENERGIZED.

WHENEVER AHU IS SHUTDOWN THE FOLLOWING SHALL OCCUR:
- THE OUTSIDE AIR DAMPER EXHAUST AIR DAMPER SHALL FULLY CLOSE.
- RETURN AIR DAMPER SHALL FULLY OPEN.
- PREHEAT COIL HEATING WATER CIRCULATION PUMP AND HEATING WATER CONTROL VALVE SHALL REMAIN UNDER CONTROL OF ITS INPUT SENSOR.
- ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS SHALL FULLY CLOSE.
- CHILLED WATER CONTROL VALVE SHALL FULLY CLOSE.
- ISOLATION STEAM VALVE SHALL FULLY CLOSE.
- SUPPLY FAN AND EXHAUST FAN VFDS SHALL BE DE-ENERGIZED.
- INTERLOCKED EXHAUST FANS SHALL BE DE-ENERGIZED.

GRAPHICAL DISPLAY:
DISPLAY THE GLOBAL OUTSIDE AIR TEMPERATURE AND HUMIDITY ON AHU GRAPHIC PAGE.

AHU REPORT GENERATION:
DDC FMCS SHALL MONITOR THE FOLLOWING POINTS ON 10 MINUTE (ADJ.) INTERVALS WITHIN A SINGLE TREND. THE TREND SHALL RUN FOR A 100-DAY (ADJ.) DURATION AT WHICH POINT THE NEWEST VALUES SHALL AUTOMATICALLY OVERWRITE THE OLDEST VALUES:

- DATE
- TIME
- GLOBAL OUTSIDE AIR TEMP [°F]
- GLOBAL OUTSIDE AIR DEWPOINT [°F]
- GLOBAL OUTSIDE AIR HUMIDITY [%RH]
- SUPPLY AIRFLOW [CFM]
- SUPPLY AIR TEMP (SAT) [°F]
- SUPPLY AIR TEMP SETPOINT [°F]
- SUPPLY AIR RELATIVE HUMIDITY [%]
- SUPPLY AIR DEWPOINT [°F]
- SUPPLY AIR DEWPOINT SETPOINT [°F]
- OUTSIDE AIRFLOW [CFM]
- PREHEAT COIL DISCHARGE AIR TEMP [°F]
- PREHEAT COIL DISCHARGE AIR TEMP [°F]
- PRE-FILTER ALARM [STATUS]
- FINAL FILTER ALARM [STATUS]
- GLYCOL HEATING WATER VALVE POSITION [% OPEN]
- GLYCOL HEATING WATER PUMPS [ON/OFF]
- CHILLED WATER VALVE POSITION [% OPEN]
- HUMIDIFIER VALVE POSITION [% OPEN]
- HUMIDIFIER ISOLATION VALVE [OPEN/CLOSED]
- SUPPLY DUCT STATIC PRESSURE SETPOINT [INCHES W.G.]
- SUPPLY DUCT STATIC PRESSURE [INCHES W.G.]
- SUPPLY FAN VFD OUTPUT [% FULL SPEED]
- OUTSIDE AIR DAMPER POSITION [OPEN/CLOSED]

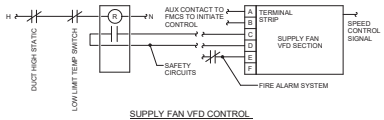
THIS INFORMATION SHALL BE ACCESSIBLE TO VIEW IN GRAPHICAL FORM ON THE FMCS OPERATOR WORKSTATION.

ONCE PER MONTH, THE DDC FMCS SHALL RECORD THE LARGEST AHU AIRFLOW WHICH OCCURED DURING THAT MONTH. THE DATE, TIME, OUTSIDE AIR TEMP (AND ALL OTHER VALUES LISTED ABOVE) THAT COINCIDED WITH THAT EVENT SHALL ALSO BE RECORDED. THIS INFORMATION SHALL BE STORED TO A MEMORY LOCATION ON THE FMCS OPERATOR WORKSTATION THAT IS MAINTAINED (NOT AUTOMATICALLY OVERWRITTEN).

AIR HANDLER REPORT GENERATION
TYPICAL FOR AHU-1

FAN INTERLOCK SCHEDULE		
SYSTEM	INTERLOCKED EXHAUST FANS	REMARKS
AHU-1	EF-1, EF-2A/B	NOTE 1

NOTES:
1. **INTERLOCK EXHAUST FAN OPERATION THROUGH THE FMCS WITH RESPECTIVE AHU IN ACCORDANCE WITH AHU SEQUENCE OF OPERATION.**



SUPPLY FAN VFD CONTROL

CONNECT FIRE ALARM TO AHU START/STOP CIRCUIT SO FIRE ALARM CAN SHUT DOWN AND SO AHU CAN AUTOMATICALLY RESTART AFTER A FIRE ALARM TEST

1 AIR HANDLING UNIT CONTROL - AHU-1
NO SCALE

Revisions:	Date:

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Office of Construction and Facilities Management

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Drawing Title: CONTROL DIAGRAMS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
			Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Drawing Number: MC401
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLLE	

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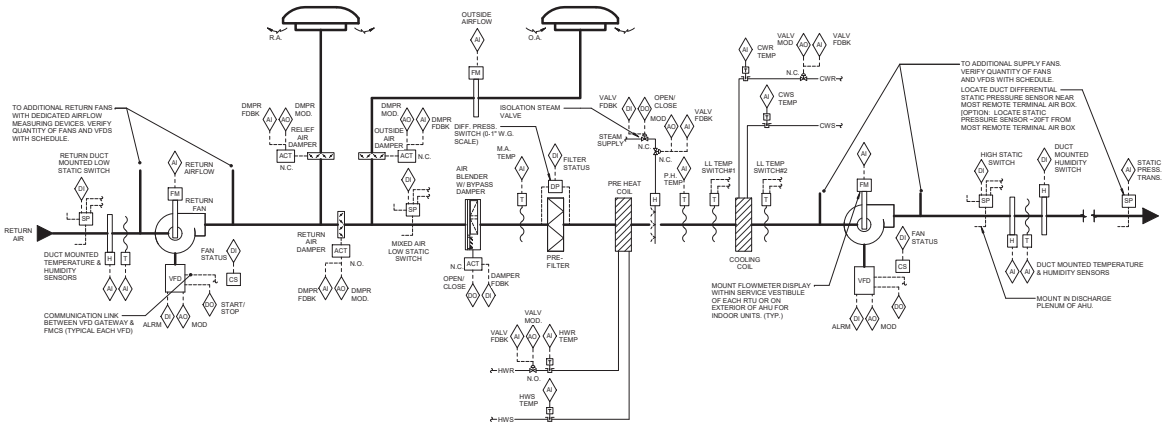
VA FORM 08 - 6231

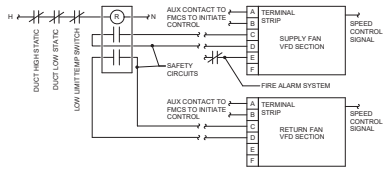
RETURN FAN AIRFLOW SCHEDULE				
SYSTEM	SUPPLY CFM	EXHAUST FANS	PRESSURIZATION CFM	REMARKS
AHU-2	5,000	EF-3 & EF-4	250	NOTES 1,2,3

NOTES:
1. **RETURN FAN AIRFLOW SETPOINT SHALL BE THE SUPPLY FAN AIRFLOW (AS MEASURED BY THE AFMS) MINUS THE SUM OF THE EXHAUST FAN AIRFLOWS MINUS THE PRESSURIZATION CFM.**
2. **FMCS SHALL DETERMINE THE OPERATIONAL STATUS OF EACH EXHAUST FAN VIA THE CURRENT SENSING RELAY TO DETERMINE WHETHER THE CFM ASSOCIATED WITH THAT FAN SHOULD BE INCLUDED IN THE RETURN FAN AIRFLOW CALCULATION.**
3. **EXHAUST FAN AIRFLOWS SHALL NOT BE THE CFM INDICATED ON THE FAN SCHEDULE, BUT SHALL BE THE AIRFLOW INDICATED IN THE FINAL TAB REPORT.**

FAN INTERLOCK SCHEDULE		
SYSTEM	INTERLOCKED EXHAUST FANS	REMARKS
AHU-1	EF-3 & EF-4	NOTE 1

NOTES:
1. **INTERLOCK EXHAUST FAN OPERATION THROUGH THE FMCS WITH RESPECTIVE AHU IN ACCORDANCE WITH AHU SEQUENCE OF OPERATION.**





SUPPLY & RETURN FAN VFD CONTROL

CONNECT FIRE ALARM TO AHU START/STOP CIRCUIT SO FIRE ALARM CAN SHUT DOWN AND SO AHU CAN AUTOMATICALLY RESTART AFTER A FIRE ALARM TEST

SEQUENCE OF OPERATION:

WHEN AHU#/TU IS INDEXED TO RUN, THE FOLLOWING SHALL OCCUR:
- SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS SHALL OPEN.
- AFTER A 30 SECOND DELAY (ADJ.) TO ALLOW FOR OPENING OF SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. SUPPLY FAN SHALL BE ENABLED TO RUN.
- WHEN THE SUPPLY FAN HAS STARTED THE RETURN FAN AND INTERLOCKED EXHAUST FANS SHALL START AS SHOWN IN THE FAN INTERLOCK SCHEDULE.

SUPPLY FAN OPERATION:
FMCS SHALL MODULATE SIGNAL TO SUPPLY FAN VFD TO MAINTAIN DUCT STATIC PRESSURE AS MEASURED BY STATIC PRESSURE TRANSMITTER NEAR THE END OF THE CRITICAL DUCT BRANCH.

RETURN FAN OPERATION:
RETURN FAN SHALL BE INDEXED TO RUN WHENEVER THE SUPPLY FAN IS INDEXED TO RUN. FMCS SHALL MODULATE SIGNAL TO RETURN FAN VFD AS REQUIRED TO MAINTAIN THE AIRFLOW OFFSET AS INDICATED IN THE RETURN FAN AIRFLOW SCHEDULE.

STATIC PRESSURE RESET:
FMCS SHALL RESET SUPPLY DUCT STATIC PRESSURE SETPOINT BELOW THE MAXIMUM SETPOINT AS REQUIRED TO MAINTAIN AT LEAST ONE SUPPLY TAB DAMPER 90% (ADJ.) OPEN. FMCS SHALL MONITOR ALL SUPPLY TERMINAL AIR BOX POSITIONS TO RESET THE SUPPLY DUCT DIFFERENTIAL STATIC PRESSURE.

DISCHARGE AIR TEMPERATURE SET POINT:
DISCHARGE AIR SET POINT SHALL BE 55°F (ADJ.).

DISCHARGE AIR TEMPERATURE RESET:
RESET DISCHARGE AIR TEMPERATURE BASED ON THE ZONE WITH THE GREATEST CALL FOR COOLING. RESET THE TEMPERATURE AS FOLLOWS:
- WHEN WORST CASE TAB IS LESS THAN 90% (ADJ.) OPEN FOR TEN MINUTES (ADJ.) THEN THE DISCHARGE AIR TEMPERATURE SHALL INCREASE BY 1ºF (ADJ.). THIS SHALL CONTINUE UNTIL AHU MAXIMUM DISCHARGE AIR TEMPERATURE OF 60ºF (ADJ.) IS ACHIEVED.
- WHEN WORST CASE TAB IS MORE THAN 90% OPEN FOR TEN MINUTES (ADJ.) THEN THE DISCHARGE AIR TEMPERATURE SHALL DROP BY 1ºF (ADJ.). THIS SHALL CONTINUE UNTIL AHU MINIMUM DISCHARGE AIR TEMPERATURE OF 55ºF (ADJ.) IS ACHIEVED.
- THE MAXIMUM ALLOWABLE RETURN AIR HUMIDITY SETPOINT SHALL BE 60% (ADJ.). IF RETURN AIR HUMIDITY IS GREATER THAN SETPOINT, RESET DISCHARGE AIR TEMPERATURE TO 55°F UNTIL RETURN AIR HUMIDITY IS 5% LESS THAN MAXIMUM SETPOINT FOR 10 MINUTES (ADJ.).

STATIC PRESSURE AND DISCHARGE AIR TEMPERATURE RESET PRIORITY:
RESET THE DISCHARGE AIR TEMPERATURE PRIOR TO RESETTING THE DUCTWORK STATIC PRESSURE SETPOINT. ONCE THE MAXIMUM SUPPLY TEMPERATURE IS REACHED THEN THE SYSTEM SHALL ENABLE THE STATIC PRESSURE RESET.

VENTILATION AIR CONTROL:
WHENEVER THE AIR HANDLING UNIT IS IN OCCUPIED MODE, THE OUTSIDE AIR DAMPER SHALL BE FULLY OPEN. THE RETURN AIR AND RELIEF AIR DAMPER SHALL MODULATE IN OPPOSITION TO MAINTAIN THE MINIMUM OUTSIDE AIR FLOW RATE, OR TO SATISFY THE ECONOMIZER DISCHARGE AIR SEQUENCE.

COOLING COIL OPERATION:
WHEN IN MINIMUM OUTSIDE AIR MODE, FMCS SHALL MODULATE CHILLED WATER CONTROL VALVE AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT.

WHEN IN ECONOMIZER MODE, FMCS SHALL NOT MODULATE COOLING CONTROL VALVE UNLESS RETURN AIR DAMPER IS 5% (ADJ.) OPEN AND RELIEF AIR DAMPER IS 95% (ADJ.) OPEN.

PREHEAT COIL OPERATION:
PREHEAT COIL CONTROLS SHALL BE ENABLED WHEN OUTSIDE AIR TEMP DROPS BELOW 50°F (ADJ.). PREHEAT COIL CONTROLS SHALL BE DISABLED WHEN OUTSIDE AIR TEMP RISES ABOVE 54°F (ADJ.).

FMCS SHALL MODULATE HEATING WATER CONTROL VALVE AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT.

ECONOMIZER OPERATION:
WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LESS THAN THE RETURN AIR DRY BULB TEMPERATURE THE FMCS SHALL ENABLE ECONOMIZER CONTROLS. WHEN OUTSIDE AIR DRY BULB TEMPERATURE IS GREATER THAN THE RETURN AIR DRY BULB TEMPERATURE FOR 10 MINUTES THE FMCS SHALL DISABLE ECONOMIZER CONTROLS AND SHALL RETURN THE UNIT TO MINIMUM OUTSIDE AIR MODE. ONCE ECONOMIZER CONTROLS HAVE BEEN ENABLED OR DISABLED, THE UNIT SHALL CONTINUE TO OPERATE IN THAT MODE FOR A MINIMUM OF 10 MINUTES (ADJ.) BEFORE BEING ALLOWED TO SWITCH BACK (TO PREVENT SHORT CYCLING).

IN ECONOMIZER MODE THE FMCS SHALL MODULATE THE RETURN AND RELIEF DAMPERS AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

HUMIDIFIER CONTROLS:
HUMIDIFIER CONTROLS AND ALARMS SHALL BE ENABLED WHEN OUTSIDE AIR TEMPERATURE DROPS BELOW 48°F (ADJ.) AT WHICH POINT THE ISOLATION STEAM VALVE SHALL FULLY OPEN. HUMIDIFIER CONTROLS AND ALARMS SHALL BE DISABLED WHEN OUTSIDE AIR TEMPERATURE RISES ABOVE 48°F (ADJ.) FOR 10 MINUTES (ADJ.) AT WHICH POINT THE ISOLATION STEAM VALVE SHALL FULLY CLOSE.

WHEN HUMIDIFIER CONTROLS ARE ENABLED, FMCS CONTROLLER SHALL MODULATE STEAM VALVE AS REQUIRED TO MAINTAIN 43°F DEWPOINT (ADJ.) IN THE SUPPLY AIR DUCT. DUCT MOUNTED HUMIDITY TRANSMITTER AT FAN DISCHARGE SHALL PREVENT SUPPLY AIR RELATIVE HUMIDITY FROM EXCEEDING 80% (ADJ.).

SEQUENCE OF OPERATION (CONT.):

ALARMS, INTERLOCKS, AND SAFETIES:
WHEN FIRE ALARM CONTROL PANEL INDICATES AN ALARM CONDITION, AHU SHALL BE SHUTDOWN.

THE FOLLOWING CONDITIONS SHALL SHUTDOWN THE AHU AND SHALL INDICATE AN ALARM CONDITION AT THE FMCS WORKSTATION:
- LOW STATIC PRESSURE SWITCH INDICATES RETURN DUCT PRESSURE LESS THAN THE SPECIFIED DUCT PRESSURE CLASS.
- LOW STATIC PRESSURE SWITCH INDICATES MIXED AIR PRESSURE LESS THAN THE SPECIFIED DUCT PRESSURE CLASS OF THE OUTSIDE AIR DUCTWORK.
- HIGH STATIC PRESSURE SWITCH INDICATES SUPPLY DUCT STATIC PRESSURE GREATER THAN THE SPECIFIED DUCT PRESSURE CLASS.
- SHOULD ANY ONE FOOT SECTION OF THE MANUAL RESET LOW LIMIT TEMPERATURE SWITCH #1 SENSE AIR TEMP <34°F (ADJ.). IF MULTIPLE FREEZE STATS ARE REQUIRED, WIRE ALL TO A COMMON RESET SWITCH.

THE FOLLOWING CONDITIONS SHALL INDICATE AN ALARM AT THE FMCS, HOWEVER AHU SHALL CONTINUE TO OPERATE:
- HEATING COIL CIRCULATION PUMP IS COMMANDED TO RUN AND CURRENT RELAY INDICATES INSUFFICIENT CURRENT FLOW.
- AN ALARM IS INDICATED AT ANY SUPPLY FAN VFD OR RETURN FAN VFD.
- DIFFERENTIAL PRESSURE SWITCH ACROSS PRE-FILTER BANK EXCEEDS 0.8 INCHES W.G. (ADJ.)
- THE TOTAL DIFFERENTIAL PRESSURE ACROSS ALL FILTER BANKS EXCEEDS 2.0 INCHES W.G. (ADJ.)
- RELATIVE HUMIDITY OF SUPPLY AIR EXCEEDS 80% RH (ADJ.) AS MEASURED BY AUTOMATIC RESET HUMIDITY SWITCH. WHEN HUMIDITY SWITCH TRIPS, STEAM CONTROL VALVE SHALL FULLY CLOSE UNTIL ALARM IS RESET AT FMCS WORKSTATION. AN ALARM SHALL NOT INDICATE AT THE FMCS WORKSTATION UNLESS HUMIDIFIER CONTROLS ARE ENABLED.
- WHEN DUCTWORK SUPPLY AIR HUMIDITY EXCEEDS 90% RH A SEPARATE DUCT MOUNTED HUMIDITY SWITCH (MANUAL RESET) SHALL DISABLE HUMIDIFIER CONTROLS AND SHALL FULLY CLOSE STEAM ISOLATION VALVE. AN IDENTIFIABLE ALARM CONDITION SHALL BE DISPLAYED AT THE OPERATOR WORKSTATION.
- SHOULD ANY ONE FOOT SECTION OF THE AUTO RESET LOW LIMIT TEMPERATURE SWITCH #2 SENSE AIR TEMPERATURE <38°F (ADJ.) THE FOLLOWING SHALL OCCUR:
- THE RETURN AIR DAMPER SHALL FULLY OPEN.
- THE OUTSIDE AIR AND RELIEF DAMPERS SHALL FULLY CLOSE.
- THIS ACTION SHALL OCCUR INDEPENDENT OF THE FMCS AHU CONTROLLER. ONCE THE LOW LIMIT TEMPERATURE SWITCH #2 AIR TEMPERATURE RISES ABOVE SET POINT, OPERATION OF THE OUTSIDE AIR, RELIEF AIR, AND RETURN AIR DAMPERS SHALL BE RESTORED. HOWEVER, THE ALARM SHALL CONTINUE UNTIL ACKNOWLEDGED AND MANUALLY RESET BY THE FMCS OPERATOR.
- SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE DISCHARGE AIR TEMPERATURE IS MORE THAN 5°F (ADJ.) ABOVE OR BELOW SETPOINT.

IN THE EVENT SUPPLY FAN IS NOT RUNNING (AS INDICATED BY THE CURRENT SENSING RELAYS) RETURN AIR FAN SHALL BE DE-ENERGIZED.

WHENEVER AHU/RTU IS SHUTDOWN THE FOLLOWING SHALL OCCUR:
- THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL FULLY CLOSE.
- RETURN AIR DAMPER SHALL FULLY OPEN.
- PREHEAT COIL HEATING WATER CIRCULATION PUMP AND HEATING WATER CONTROL VALVE SHALL REMAIN UNDER CONTROL OF ITS INPUT SENSOR.
- ALL SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS SHALL FULLY CLOSE.
- CHILLED WATER CONTROL VALVE SHALL FULLY CLOSE.
- ISOLATION STEAM VALVE SHALL FULLY CLOSE.
- SUPPLY FAN AND RETURN FAN VFDS SHALL BE DE-ENERGIZED.
- INTERLOCKED EXHAUST FANS SHALL BE DE-ENERGIZED.

UNOCCUPIED MODE:
PROVIDE TIME OF DAY SCHEDULE TO ALLOW AHU TO ENTER UNOCCUPIED MODE PER SCHEDULE. COORDINATE SCHEDULE WITH OWNER.

- THE SUPPLY AND RETURN FANS SHALL CONTINUE RUNNING. WHEN USING CONSTANT VOLUME OFFSET FOR RETURN AIR FAN CONTROL, THE OFFSET SHALL GO TO ZERO AND THE SUPPLY FAN SHALL BE LIMITED TO THE MAXIMUM RETURN FAN AIRFLOW.
- THE OUTSIDE AIR AND RELIEF AIR DAMPERS SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN. ECONOMIZER CYCLE SHALL TAKE PRECEDENCE OVER DAMPER POSITION.
- ALL SPACE TEMPERATURES SHALL BE ALLOWED TO VARY +/- 10°F (ADJ.) FROM OCCUPIED SETPOINT.

HEATING OPTIMUM START-UP:
- THIS CYCLE SHALL OVERRIDE THE UNOCCUPIED CYCLE. IF THE SYSTEM WAS OPERATING AS A RESULT OF THE UNOCCUPIED CYCLE, THE SYSTEM SHALL CONTINUE TO OPERATE. THE DDC SYSTEM SHALL DETERMINE THE MINIMUM RUNTIME TO WARM THE SPACES TO THEIR SETPOINT WHEN THE COMPUTED START TIME IS REACHED. THE AIR HANDLING UNIT DISCHARGE AIR TEMPERATURE SHALL BE MAINTAINED AT A SETPOINT OF 85ºF (ADJ.). THE SYSTEM SHALL CONTINUE TO OPERATE IN THIS MODE UNTIL ALL TEMPERATURES EXCEED A SETPOINT OF 68ºF (ADJ.). AT THAT TIME, THE DDC SYSTEM SHALL SWITCH TO OCCUPIED CONTROL.

COOLING OPTIMUM START-UP:
- THIS CYCLE SHALL OVERRIDE THE UNOCCUPIED CYCLE. IF THE SYSTEM WAS OPERATING AS A RESULT OF THE UNOCCUPIED CYCLE, THE SYSTEM SHALL CONTINUE TO OPERATE. THE DDC SYSTEM SHALL DETERMINE THE MINIMUM RUNTIME TO COOL THE SPACES TO THEIR SETPOINT.WHEN THE COMPUTED START TIME IS REACHED. THE AIR HANDLING UNIT DISCHARGE AIR TEMPERATURE SHALL BE MAINTAINED AT A SETPOINT OF 55ºF (ADJ.). THE SYSTEM SHALL CONTINUE TO OPERATE IN THIS MODE UNTIL ALL TEMPERATURES ARE LESS THAN A SETPOINT OF 75ºF (ADJ.). AT THAT TIME, THE DDC SYSTEM SHALL SWITCH TO OCCUPIED CONTROL.

GRAPHICAL DISPLAY:
DISPLAY THE GLOBAL OUTSIDE AIR TEMPERATURE AND HUMIDITY ON AHU GRAPHIC PAGE.

AHU REPORT GENERATION:
DDC FMCS SHALL MONITOR THE FOLLOWING POINTS ON 10 MINUTE (ADJ.) INTERVALS WITHIN A SINGLE TREND. THE TREND SHALL RUN FOR A 100-DAY (ADJ.) DURATION AT WHICH POINT THE NEWEST VALUES SHALL AUTOMATICALLY OVERWRITE THE OLDEST VALUES:

- DATE
- TIME
- GLOBAL OUTSIDE AIR TEMP [°F]
- GLOBAL OUTSIDE AIR DEWPOINT [°F]
- GLOBAL OUTSIDE AIR HUMIDITY [%RH]
- SUPPLY AIRFLOW [CFM]
- SUPPLY AIR TEMP (SAT) [°F]
- SUPPLY AIR TEMP SETPOINT [°F]
- SUPPLY AIR RELATIVE HUMIDITY [%]
- SUPPLY AIR DEWPOINT [°F]
- RETURN AIRFLOW [CFM]
- RETURN AIR TEMP (RAT) [°F]
- RETURN AIR RELATIVE HUMIDITY [%]
- OUTSIDE AIRFLOW [CFM]
- MIXED AIR TEMP [°F]
- PREHEAT COIL DISCHARGE AIR TEMP [°F]
- PRE-FILTER ALARM (STATUS)
- HEATING WATER VALVE POSITION [% OPEN]
- HEATING PUMP (ON/OFF)
- CHILLED WATER VALVE POSITION [% OPEN]
- HUMIDIFIER VALVE POSITION [% OPEN]
- HUMIDIFIER ISOLATION VALVE (OPEN/CLOSED)
- SUPPLY DUCT STATIC PRESSURE SETPOINT [INCHES W.G.]
- SUPPLY DUCT STATIC PRESSURE [INCHES W.G.]
- SUPPLY FAN VFD OUTPUT [% FULL SPEED]
- RETURN FAN VFD OUTPUT [% FULL SPEED]
- OUTSIDE AIR DAMPER POSITION [% OPEN]
- RETURN AIR DAMPER POSITION [% OPEN]
- RELIEF AIR DAMPER POSITION [% OPEN]

THIS INFORMATION SHALL BE ACCESSIBLE TO VIEW IN GRAPHICAL FORM ON THE FMCS OPERATOR WORKSTATION.

ONCE PER MONTH, THE DDC FMCS SHALL RECORD THE LARGEST AHU AIRFLOW WHICH OCCURED DURING THAT MONTH. THE DATE, TIME, OUTSIDE AIR TEMP (AND ALL OTHER VALUES LISTED ABOVE) THAT COINCIDED WITH THAT EVENT SHALL ALSO BE RECORDED. THIS INFORMATION SHALL BE STORED TO A MEMORY LOCATION ON THE FMCS OPERATOR WORKSTATION THAT IS MAINTAINED (NOT AUTOMATICALLY OVERWRITTEN).

AIR HANDLER REPORT GENERATION
TYPICAL FOR AHU-2

1 AIR HANDLING UNIT CONTROL - AHU-2
NO SCALE

Revisions:	Date:

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Office of Construction and Facilities Management

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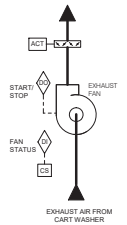
Drawing Title: CONTROL DIAGRAMS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Building Number: 5
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLLE	Drawing Number: MC402

VA FORM 08 - 6231



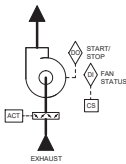
SEQUENCE OF OPERATION:
CART WASHER EXHAUST FAN SHALL BE STARTED AND STOPPED BY CART WASHER'S INTEGRAL CONTROLS.

FMCS SHALL MONITOR CONTACTS THAT ARE PART OF THE CART WASHER CONTROLS TO DETERMINE WHEN THE CART WASHER CONTROLS ARE COMMANDING INTEGRAL EXHAUST FAN TO ACTIVATE.

WHEN FAN IS ENERGIZED TWO-POSITION DAMPER SHALL FULLY OPEN. WHEN FAN IS DE-ENERGIZED TWO-POSITION FAN SHALL FULLY CLOSE.

ALARMS, INTERLOCKS AND SAFETIES:
AN ALARM SHALL BE GENERATED AT THE FMCS OPERATOR WORKSTATION IN THE FOLLOWING EVENTS:
- AN ALARM CONDITION OCCURS AT THE CART WASHER

1 CART WASHER FAN CONTROL
NO SCALE

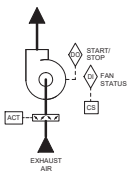


SEQUENCE OF OPERATION:
EXHAUST FAN SHALL BE INTERLOCKED TO RUN CONTINUOUSLY WHEN RESPECTIVE AHU IS OPERATING.

2-POSITION DAMPER SHALL FULLY OPEN WHEN FAN IS ENERGIZED. WHEN FAN IS DE-ENERGIZED, 2-POSITION DAMPER SHALL FULLY CLOSE.

ALARMS, INTERLOCKS AND SAFETIES:
AN ALARM SHALL BE GENERATED AT THE FMCS OPERATOR WORKSTATION IN THE EVENT THE FMCS COMMANDS THE EXHAUST FAN TO OPERATE AND THE CURRENT SENSING RELAY DETECTS INSUFFICIENT CURRENT DRAW.

2 EXHAUST FAN AHU INTERLOCK - EF-1 & EF-2A/B
NO SCALE

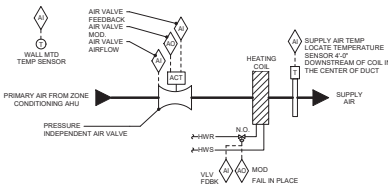


SEQUENCE OF OPERATION:
EXHAUST FAN SHALL BE INTERLOCKED TO RUN CONTINUOUSLY WHEN RESPECTIVE AHU IS OPERATING.

2-POSITION DAMPER SHALL FULLY OPEN WHEN FAN IS ENERGIZED. WHEN FAN IS DE-ENERGIZED, 2-POSITION DAMPER SHALL FULLY CLOSE.

ALARMS, INTERLOCKS AND SAFETIES:
AN ALARM SHALL BE GENERATED AT THE FMCS OPERATOR WORKSTATION IN THE EVENT THE FMCS COMMANDS THE EXHAUST FAN TO OPERATE AND THE CURRENT SENSING RELAY DETECTS INSUFFICIENT CURRENT DRAW.

3 EXHAUST FAN AHU INTERLOCK - EF-3 & EF-4
NO SCALE



SEQUENCE OF OPERATION
- THE FMCS SHALL MODULATE THE SUPPLY AIR VALVE TO MAINTAIN THE VOLUMETRIC OFFSET AS SCHEDULED IN THE DRAWINGS.
- THE FMCS SHALL MODULATE THE HEATING COIL CONTROL VALVE TO MAINTAIN SPACE TEMPERATURE OF 72°F (ADJ.) WITH A 5°F (ADJ.) DEADBAND.
- THE FMCS SHALL UTILIZE FEEDBACK FROM ALL SUPPLY AIR VALVE POSITIONS TO RESET THE SUPPLY DUCT DIFFERENTIAL STATIC PRESSURE.

ALARMS, INTERLOCKS AND SAFETIES:
- SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE SPACE TEMPERATURE IS 10°F (ADJ.) ABOVE OR BELOW SETPOINT.
- SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE SUPPLY AIR FLOW RATE IS 10% (ADJ.) ABOVE OR BELOW SET POINT.

4 TYPE A - SUPPLY AIR VALVE
NO SCALE

SEQUENCE OF OPERATION:
1. ALL TERMINAL AIR BOXES SHALL INCORPORATE A NIGHT SETBACK SEQUENCE.
2. TAB NIGHT SETBACK SHALL BE INITIATED VIA THE FMCS BASED ON THE FOLLOWING TIME SCHEDULE:
   OCCUPIED MODE START: 6:00 AM (ADJ.) UNOCCUPIED MODE START: 9:00 PM (ADJ.)
3. AT THE START OF OCCUPIED MODE, FMCS SHALL ESTABLISH THE MIN. CFM SETPOINTS OF ALL TAB TO BE EQUAL TO THE MIN. CFM VALUE SCHEDULED IN THE TAB SCHEDULE AND SHALL ESTABLISH THE ROOM TEMP SETPOINT IN ACCORDANCE WITH THE TAB SEQUENCES OF OPERATION (THIS SHEET).
4. AT THE START OF UNOCCUPIED MODE, FMCS SHALL ESTABLISH THE MIN. CFM SETPOINT OF ALL TAB TO BE EQUAL TO ZERO (0) CFM AND SHALL ESTABLISH THE ROOM TEMP SETPOINTS OF: COOLING SETPOINT = 85°F (ADJ.) HEATING SETPOINT = 55°F (ADJ.).
5. PROVIDE NIGHT SETBACK OVERRIDE BUTTON WHERE INDICATED ON THE DRAWINGS. WHEN BUTTON IS DEPRESSED, FMCS SHALL SWITCH ALL TAB INTO OCCUPIED MODE FOR A 2 HOUR (ADJ.) TIME PERIOD. AT THE END OF THE TIME PERIOD, FMCS SHALL SWITCH ALL TAB BACK TO UNOCCUPIED MODE.

5 TAB NIGHT SETBACK CONTROL
NO SCALE

TERMINAL AIR BOX REPORT & DUCT MOUNTED HOT WATER REHEAT COIL GENERATION:
DDC FMCS SHALL BE PROGRAMMED TO GENERATE THE FOLLOWING REPORT BASED ON A MANUAL COMMAND FROM THE DDC FMCS WORKSTATION BY CLICKING ON A GRAPHICAL BUTTON. UPON INITIATING COMMAND THE DDC FMCS SHALL COMPILE A REPORT AS FOLLOWS:

TAB/COIL SYMBOL	AIRFLOW(CFM) MAX/ACTUAL	MIN	DMPR POS (% OPEN)	VALVE POS (% OPEN)	SUP AIR TEMP (DEG. F)	ROOM TEMP (DEG. F)	ROOM SETPOINT (DEG. F)
***	****/****	***	85%	10%	65.2	73.6	72.0
***	****/****	***	80%	60%	75.1	71.1	72.0

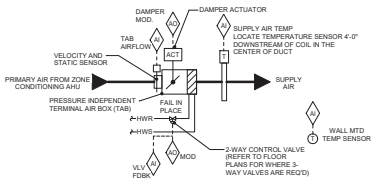
WHEREAS THE SAMPLE REPORT ABOVE SHOWS ONLY A COUPLE TAB/COILS, THE FINAL PROGRAMMED REPORT SHALL LIST ALL TABS/COILS SERVED BY A SINGLE AHU. A SEPARATE REPORT SHALL BE PROGRAMMED FOR EACH AHU AND FOR EACH FLOOR.

AFTER THE REPORT PRINTS OUT ALL TAB/HEATING COIL DATA, THE DDC FMCS SHALL AUTOMATICALLY TOTAL ALL THE INDIVIDUAL TAB AIRFLOW TO A SINGLE VALUE.

AFTER PRINTING THE SUM OF THE TAB/HEATING COIL AIRFLOW CFM, THE DDC FMCS SHALL THEN AUTOMATICALLY PRINT OUT THE AIR HANDLER REPORT FOR THE AHU WHICH SERVES THE TABS/HEATING COILS LISTED IN THE REPORT.

DDC FMCS SHALL ALLOW THE DDC FMCS OPERATOR TO ISSUE A SINGLE COMMAND THAT WILL AUTOMATICALLY CHANGE THE LOCAL SETPOINT FOR EACH TAB SERVED BY A AHU TO A SINGLE VALUE (E.G. A SINGLE COMMAND WILL SET ALL TABS/HEATING COILS SERVED BY AHU-1A TO 80°F). A SEPARATE TAB/HEATING COIL SETPOINT OVERRIDE COMMAND SHALL BE PROGRAMMED IN THE FMCS FOR EACH AHU.

6 TERMINAL AIR BOX REPORT GENERATION
NO SCALE

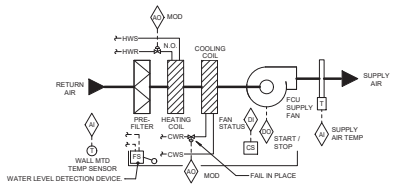


SEQUENCE OF OPERATION:
- FMCS TAB CONTROLLER SHALL MODULATE THE TAB DAMPER AND TAB HW REHEAT COIL CONTROL VALVE TO MAINTAIN SPACE TEMPERATURE OF 72°F (ADJ.) WITH 5°F (ADJ.) DEAD BAND BASED ON A SIGNAL FROM A WALL MOUNTED TEMPERATURE SENSOR. SEE DRAWINGS FOR TEMPERATURE SENSOR REQUIREMENTS. SPACES WITH ADJUSTABLE THERMOSTATS WILL ALLOW A +/- 3°F (ADJ.) OFFSET FROM THE DDC SETPOINT.
- AT FULL COOLING, THE TAB SHALL BE OPEN TO MAXIMUM CFM POSITION. THE REHEAT COIL CONTROL VALVE SHALL BE CLOSED.
- UPON A FALL IN SPACE TEMPERATURE, THE TAB SHALL MODULATE CLOSED UNTIL SPACE SETPOINT IS MAINTAINED, OR UNTIL IT REACHES ITS MINIMUM SCHEDULED CFM POSITION PER THE TAB SCHEDULE. THE REHEAT COIL CONTROL VALVE SHALL BE CLOSED.
- UPON A FURTHER FALL IN SPACE TEMPERATURE, THE REHEAT COIL CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN SPACE SETPOINT UNTIL THE SUPPLY AIR TEMPERATURE IS 20°F ABOVE ROOM TEMPERATURE SETPOINT.
- UPON A FURTHER FALL IN SPACE TEMPERATURE, TAB SHALL OPEN TO MAINTAIN SETPOINT UNTIL TAB AIRFLOW REACHES ITS MAXIMUM HEATING SETTING. THE REHEAT CONTROL VALVE SHALL CONTINUE TO MODULATE OPEN TO MAINTAIN MAXIMUM DELTA T LISTED ABOVE.
- THE FMCS SHALL UTILIZE OUTPUT FROM ALL TERMINAL AIR BOX POSITIONS TO RESET THE SUPPLY DUCT DIFFERENTIAL STATIC PRESSURE.
- WHEN FLOATING CV'S ARE USED, FMCS SHALL PERFORM AN AUTO-ZERO FUNCTION EVERY NIGHT DURING UNOCCUPIED TIMES. THE FMCS SHALL STAGGER AUTO-ZERO SEQUENCES SO THAT ALL VALVES DO NOT SIMULTANEOUSLY CLOSE.

ALARMS, INTERLOCKS & SAFETIES:

SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE SPACE TEMPERATURE IS MORE THAN 10°F (ADJ.) ABOVE OR BELOW SETPOINT.

7 TYPE B - TAB CONTROL W/ HOT WATER REHEAT
NO SCALE



SEQUENCE OF OPERATION:
SUPPLY FAN OPERATION SHALL BE CONTROLLED BY THE FMCS THROUGH A CONTACTOR. THE UNIT SHALL MAINTAIN A ROOM AIR TEMPERATURE SETPOINT.

WHENEVER THE ROOM AIR TEMPERATURE IS 2°F (ADJ.) ABOVE THE SETPOINT, THE FOLLOWING SHALL OCCUR:
- THE HEATING COIL CONTROL VALVE SHALL BE CLOSED.
- THE CHILLED WATER CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN SPACE TEMPERATURE SETPOINT.

WHENEVER THE ROOM AIR TEMPERATURE IS 3°F (ADJ.) BELOW THE SETPOINT, THE FOLLOWING SHALL OCCUR:
- THE CHILLED COIL CONTROL VALVE SHALL BE CLOSED.
- THE HEATING WATER CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN SPACE TEMPERATURE SETPOINT.

IF ROOM AIR TEMPERATURE IS MAINTAINED AND BOTH THE HEATING AND COOLING COIL VALVES ARE CLOSED, THE SUPPLY FAN SHALL BE DE-ENERGIZED. IF EITHER OF THE COIL CONTROL VALVES OPEN, THE SUPPLY FAN SHALL BE ENERGIZED.

WHEN FLOATING CV'S ARE USED, FMCS SHALL PERFORM AN AUTO-ZERO FUNCTION EVERY NIGHT DURING UNOCCUPIED TIMES. THE FMCS SHALL STAGGER AUTO-ZERO SEQUENCES SO THAT ALL VALVES DO NOT SIMULTANEOUSLY CLOSE.

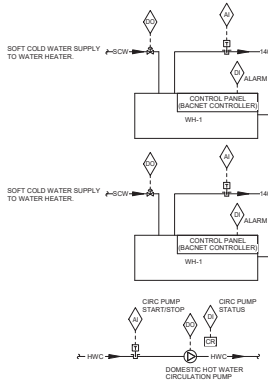
ALARMS, INTERLOCKS & SAFETIES:
WHEN THE FIRE ALARM CONTROL PANEL INDICATES AN ALARM CONDITION, FCU SHALL SHUTDOWN.

A WATER LEVEL DETECTION DEVICE SHALL CLOSE THE CHILLED WATER VALVE AND PREVENT SUPPLY FAN OPERATION UPON DETECTION OF HIGH WATER LEVEL AND SHALL INDICATE AN ALARM TO THE OPERATOR WORKSTATION.

FMCS SHALL INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION IF THE FMCS COMMANDS ANY SUPPLY FAN TO OPERATE AND THE FAN CURRENT RELAY DETECTS INSUFFICIENT CURRENT FLOW.

WHENEVER FCU IS SHUTDOWN THE FOLLOWING SHALL OCCUR:
- HEATING AND CHILLED WATER CONTROL VALVE SHALL CLOSE.
- SUPPLY FAN SHALL BE DE-ENERGIZED.

8 FAN COIL UNIT CONTROL
NO SCALE



SEQUENCE OF OPERATION:
DOMESTIC WATER HEATER CONTROL PANEL (BACNET COMPATIBLE) SHALL MODULATE THE STEAM CONTROL VALVE TO MAINTAIN 140°F (ADJ.) DOMESTIC HOT WATER.

FMCS SHALL OPEN CONTROL VALVE ON COLD WATER WHEN THE WATER HEATER IS ENERGIZED. ONE OF THE TWO CONTROL VALVES SHALL ALWAYS BE OPEN TO ALLOW THE DOMESTIC HOT WATER CIRCULATION PUMP TO OPERATE. WHEN WATER HEATER IS NOT OPERATIONAL CONTROL VALVE SHALL CLOSE.

FMCS SHALL MONITOR THE TEMPERATURE AT THE 140°F CIRCULATION PUMP. THE CIRCULATION PUMP SHALL TURN ON WHEN THE TEMPERATURE FALLS BELOW 132°F (ADJ.) AND SHALL TURN OFF WHEN THE TEMPERATURE RISES ABOVE 139°F (ADJ.)

FMCS SHALL MONITOR THE OUTPUT TEMPERATURE OF THE WATER HEATERS.

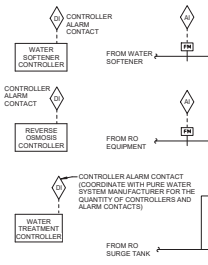
FMCS SHALL MONITOR AND RECORD THE FOLLOWING INFORMATION FROM THE WATER HEATER:
- DISPLAY THE TEMPERATURES ONCE EVERY 5 MINUTE (ADJ.) TIME INTERVAL AND RECORD IN A TREND THAT MAINTAINS DATA FOR A 7 DAY (ADJ.) PERIOD. AT THE END OF THE 7 DAY (ADJ.) PERIOD THE TREND SHALL AUTOMATICALLY OVERWRITE THE EARLIEST RECORDED DATA. TREND DATA SHALL INCLUDE DATE AND TIME STAMPS. THIS INFORMATION SHALL BE ACCESSIBLE TO VIEW IN EITHER TABULAR OR GRAPHICAL FORM ON THE FMCS OPERATOR WORKSTATION.
- ONCE PER MONTH, THE FMCS SHALL RECORD THE FOLLOWING INFORMATION TO A MEMORY LOCATION ON THE FMCS OPERATOR WORKSTATION THAT IS MAINTAINED (NOT AUTOMATICALLY OVERWRITTEN)

FMCS SHALL MONITOR AND RECORD THE FOLLOWING INFORMATION FROM THE CIRCULATION PUMPS:
- TOTAL RUN TIME ON EACH PUMP SHOWN IN THE DIAGRAM. COORDINATE FINAL RECORDING, DISPLAY, AND ARCHIVING REQUIREMENTS WITH THE OWNER.

OPERATOR WORKSTATION SHALL DISPLAY PUMP CURRENT STATUS AND ALLOW OPERATOR TO ENABLE/DISABLE THE CIRCULATION PUMP.

ALARMS, INTERLOCKS & SAFETIES:
FMCS SHALL TIE INTO BACNET CONTROLLER AND INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION IN THE EVENT THE FOLLOWING OCCUR:
- ANY WATER HEATER INDICATES AN ALARM CONDITION.
- ANY HOT WATER CIRCULATION PUMP INDICATES AN ALARM CONDITION.
- THE LEAVING HOT WATER TEMPERATURE IS ABOVE 149°F (ADJ.) OR BELOW 139°F (ADJ.) FOR MORE THAN 5 MINUTES.(ADJ.)

9 DOMESTIC HOT WATER CONTROL
NO SCALE

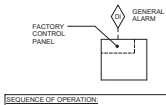


SEQUENCE OF OPERATION:
FMCS SHALL MONITOR THE OUTPUT OF THE WATER SOFTENER, REVERSE OSMOSIS (RO), AND DEIONIZED (DI) EQUIPMENT LOCATED IN THE INTERSTITIAL LEVEL MECHANICAL ROOM. THE PURE WATER SYSTEM CONTROLLER SHALL OPERATE THE SYSTEM AS REQUIRED.

FMCS SHALL MONITOR AND RECORD THE FOLLOWING INFORMATION FROM THE WATER METER:
- CALCULATE FLOW [IN GPM] ONCE EVERY 5 MINUTE (ADJ.) TIME INTERVAL AND RECORD IN A TREND THAT MAINTAINS DATA FOR A 7 DAY (ADJ.) PERIOD. AT THE END OF THE 7 DAY (ADJ.) PERIOD THE TREND SHALL AUTOMATICALLY OVERWRITE THE EARLIEST RECORDED DATA. TREND DATA SHALL INCLUDE DATE AND TIME STAMPS. THIS INFORMATION SHALL BE ACCESSIBLE TO VIEW IN EITHER TABULAR OR GRAPHICAL FORM ON THE FMCS OPERATOR WORKSTATION.
- ONCE PER MONTH, THE FMCS SHALL RECORD THE FOLLOWING INFORMATION TO A MEMORY LOCATION ON THE FMCS OPERATOR WORKSTATION THAT IS MAINTAINED (NOT AUTOMATICALLY OVERWRITTEN):
- DATE, TIME AND HIGHEST RECORDED FLOW RATE [IN GPM] (CALCULATED OVER A 5 MINUTE TIME PERIOD).
- TOTAL VOLUME [IN GALLONS] OF SOFTENED WATER.

ALARMS, INTERLOCKS AND SAFETIES:
- AN ALARM SHALL BE GENERATED AT THE FMCS OPERATOR INTERFACE IF ANY OF THE PURE WATER SYSTEM CONTROLLERS INDICATE AN ALARM.

10 WATER TREATMENT METERING CONTROL
NO SCALE



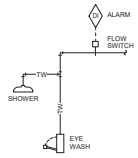
SEQUENCE OF OPERATION:

THE AIR COMPRESSOR CONTROLLER SHALL OPERATE THE SYSTEM TO MAINTAIN THE SPECIFIED PRESSURE.

ALARMS, INTERLOCKS AND SAFETIES:

SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE AIR COMPRESSOR CONTROLLER INDICATES AN ALARM.

11 AIR COMPRESSOR CONTROL DIAGRAM
NO SCALE



ALARMS, INTERLOCKS & SAFETIES:
FMCS SHALL INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION IN THE EVENT THE FLOW SWITCH DETECTS FLOW.

FMCS SHALL MONITOR AND RECORD EACH OPERATION.

12 EMERGENCY SHOWER/EYEWASH MONITORING
NO SCALE

Revisions:	Date:		

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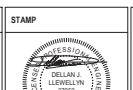
STAMP


Office of Construction and Facilities Management
VA | U.S. Department of Veterans Affairs

Drawing Title: CONTROL DIAGRAMS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
			Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Drawing Number: MC403
		Issue Date: 02/14/2025 / Checked: DAVING / Drawn: DELLLE	

BIM 360://1900420.04 - VA Vitals DC-VA Sioux Falls New SP SUBCP21 - 1900420.04 - 1804_VA Vitals DC-VA Sioux Falls New SP S_C.rvt
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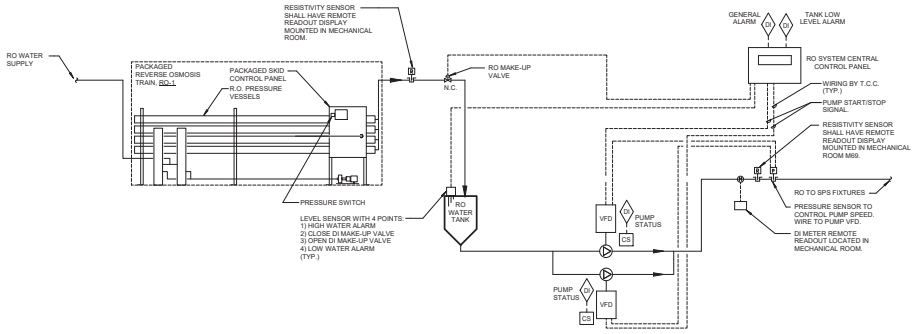
VA FORM 08 - 6231



GENERAL:
THE REVERSE OSMOSIS WATER SYSTEM PUMPS SERVING THE STERILE PROCESSING SERVICE SHALL BE CONTROLLED BY THE RO SYSTEM CENTRAL CONTROL PANEL WHICH IS PROVIDED AS A PART OF THE RO SYSTEM.

PUMP CONTROL:
START/STOP: THE DI SYSTEM CENTRAL CONTROL PANEL SHALL START THE LEAD PUMP VIA THE VFD AND THE PUMP SHALL RUN CONTINUOUSLY.

MODULATE THE OUTPUT TO THE VFD AS REQUIRED TO MAINTAIN SYSTEM PRESSURE SETPOINT AT THE LOCATION OF THE PRESSURE SENSOR. CONFIRM REQUIRED PRESSURE SETPOINT DURING TESTING AND BALANCING.

IF THE LEAD PUMP FAILS TO OPERATE OR CANNOT MAINTAIN THE PRESSURE SETPOINT FOR 10 MINUTES (ADJ.) THE OPERATING PUMP SHALL STOP AND THE STANDBY PUMP SHALL START.

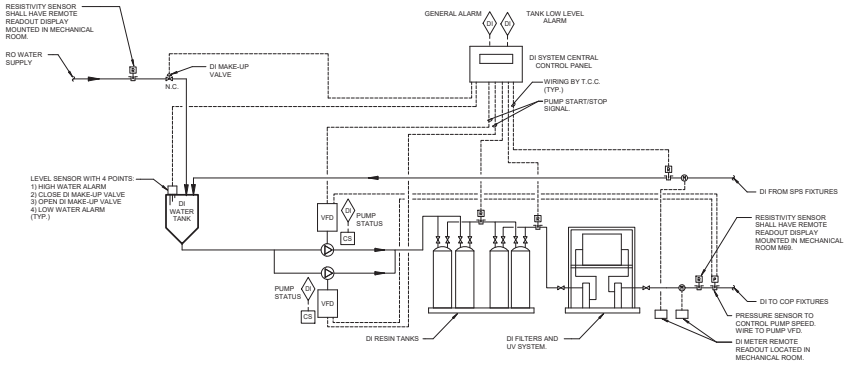
THE RO SYSTEM CENTRAL CONTROL PANEL SHALL ROTATE THE LEAD AND STANDBY PUMPS ON A WEEKLY BASIS. INCLUDE A TOGGLE ON THE RO SYSTEM CENTRAL CONTROL PANEL TO ALLOW OPERATOR TO MANUALLY SELECT WHICH PUMP IS LEAD AND STANDBY.

RO TANK CONTROL:
WHEN THE WATER LEVEL IN THE RO WATER TANK IS AT THE "CLOSE RO MAKE-UP VALVE" LEVEL, THE RO MAKE-UP VALVE SHALL BE COMPLETELY CLOSED. ONCE THE WATER LEVEL IN THE RO WATER TANK WITH THE ACTIVE LEVEL SENSOR DROPS TO THE "OPEN RO MAKE-UP VALVE" LEVEL, THE ACTIVE LEVEL SENSOR SHALL SEND A SIGNAL TO OPEN THE RO MAKE-UP VALVE. THE RO SYSTEM CENTRAL CONTROL PANEL SHALL THEN SEND A SIGNAL TO THE RO MAKE-UP VALVE TO COMPLETELY OPEN TO ALLOW RO WATER TO FILL THE TANKS.

ALARMS, INTERLOCKS, AND SAFETIES:

FMCS SHALL INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION IN THE EVENT THE FOLLOWING OCCUR:
- SHOULD NEITHER THE LEAD OR THE STANDBY PUMPS BE OPERATING AT ANY TIME AS DETERMINED BY THE CURRENT SENSORS.
- AN ALARM CONDITION OCCURS AT THE RO SYSTEM CENTRAL CONTROL PANEL.
- THE RO SYSTEM CENTRAL CONTROL PANEL INDICATES A RO STORAGE TANK LOW LEVEL ALARM.

1 REVERSE OSMOSIS WATER SYSTEM CONTROL
NO SCALE



GENERAL:
THE DEIONIZED WATER SYSTEM LOOP PUMPS SERVING THE STERILE PROCESSING SERVICE SHALL BE CONTROLLED BY THE DI SYSTEM CENTRAL CONTROL PANEL WHICH IS PROVIDED AS A PART OF THE DI SYSTEM. THE SYSTEM SHALL PRODUCE DI WATER WITH A RESISTIVITY BETWEEN 15 AND 17 MEGA-OHMS.

PUMP CONTROL:
START/STOP: THE DI SYSTEM CENTRAL CONTROL PANEL SHALL START THE LEAD PUMP VIA THE VFD AND THE PUMP SHALL RUN CONTINUOUSLY.

MODULATE THE OUTPUT TO THE VFD AS REQUIRED TO MAINTAIN SYSTEM PRESSURE SETPOINT AT THE LOCATION OF THE PRESSURE SENSOR. CONFIRM REQUIRED PRESSURE SETPOINT DURING TESTING AND BALANCING.

IF THE LEAD PUMP FAILS TO OPERATE OR CANNOT MAINTAIN THE PRESSURE SETPOINT FOR 10 MINUTES (ADJ.) THE OPERATING PUMP SHALL STOP AND THE STANDBY PUMP SHALL START.

THE DI SYSTEM CENTRAL CONTROL PANEL SHALL ROTATE THE LEAD AND STANDBY PUMPS ON A WEEKLY BASIS. INCLUDE A TOGGLE ON THE DI SYSTEM CENTRAL CONTROL PANEL TO ALLOW OPERATOR TO MANUALLY SELECT WHICH PUMP IS LEAD AND STANDBY.

DI TANK CONTROL:
WHEN THE WATER LEVEL IN THE DI WATER TANK IS AT THE "CLOSE DI MAKE-UP VALVE" LEVEL, THE DI MAKE-UP VALVE SHALL BE COMPLETELY CLOSED. ONCE THE WATER LEVEL IN THE DI WATER TANK WITH THE ACTIVE LEVEL SENSOR DROPS TO THE "OPEN DI MAKE-UP VALVE" LEVEL, THE ACTIVE LEVEL SENSOR SHALL SEND A SIGNAL TO OPEN THE DI MAKE-UP VALVE. THE DI SYSTEM CENTRAL CONTROL PANEL SHALL THEN SEND A SIGNAL TO THE DI MAKE-UP VALVE TO COMPLETELY OPEN TO ALLOW DI WATER TO FILL THE TANKS.

UV SYSTEM CONTROL:
THE DUAL UV SYSTEM SHALL BE MANUALLY ENABLED/DISABLED VIA A WALL SWITCH. BOTH UV LIGHTS ARE INTENDED TO BE ACTIVE DURING NORMAL OPERATION.

ALARMS, INTERLOCKS, AND SAFETIES:

FMCS SHALL INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION IN THE EVENT THE FOLLOWING OCCUR:
- SHOULD NEITHER THE LEAD OR THE STANDBY PUMPS BE OPERATING AT ANY TIME AS DETERMINED BY THE CURRENT SENSORS.
- AN ALARM CONDITION OCCURS AT THE DI SYSTEM CENTRAL CONTROL PANEL.
- THE DI SYSTEM CENTRAL CONTROL PANEL INDICATES A DI STORAGE TANK LOW LEVEL ALARM.

2 DEIONIZED WATER SYSTEM CONTROL
NO SCALE

Revisions:	Date:

CONSULTANT

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0 1 2 3

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: CONTROL DIAGRAMS	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460	
				Building Number: 5	
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: MC404	
		Issue Date: 02/14/2025	Checked: DAVING	Drawn: DELLLE	

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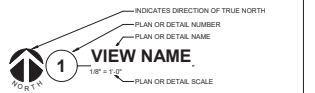
2/14/2025 10:23:11 AM

VA FORM 08 - 6231

VIEW KEY

NAME — LEVEL NAME, 10'-0" HEIGHT ABOVE PROJECT 0'-0"

INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED. SPECIFIC TO THE SHEET AND/OR DETAIL



LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
- NEW
- EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
- NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
- EXISTING
- EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
- EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E	TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING
TAG-1	UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST
	INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
A.C.	ASBESTOS ABATEMENT CONTRACTOR
C.C.	CIVIL CONTRACTOR
C.O.R.	CONTRACTING OFFICER'S REPRESENTATIVE
E.C.	ELECTRICAL CONTRACTOR
F.P.C.	FIRE PROTECTION CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
T.C.	TECHNOLOGY CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS.

BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
PLUMBING CODE:	IPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 2021 EDITION
ENERGY CONSERVATION CODE:	IECC 2021
HEALTH DEPARTMENT CODE:	CURRENT EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTACT PERSONS:

DESCRIPTION:	PERSON:
PROJECT MANAGER	ERIC J. HENDERSON, PE
MECHANICAL	DELLAN J. LLEWELLYN, PE
ELECTRICAL	KRISTEN SPINA, PE
TECHNOLOGY	DAMON M. DEEN

PLUMBING SHEET INDEX

PL000	PLUMBING COVERSHEET
PLD100	PIPE BASEMENT DEMOLITION PLAN - PLUMBING
PLD101	GROUND LEVEL FLOOR DEMOLITION PLAN - PLUMBING
PLD111	FIRST LEVEL DEMOLITION PLAN - PLUMBING
PL100	PIPE BASEMENT AND UNDERFLOOR - PLUMBING
PL101	GROUND LEVEL FLOOR PLAN - PLUMBING
PL111	INTERSTITIAL/FIRST LEVEL FLOOR PLAN - PLUMBING
PL121	ROOF PLAN - PLUMBING
PL300	PLUMBING ENLARGED PLANS
PL400	PLUMBING DETAILS
PL401	PLUMBING DETAILS
PL500	PLUMBING FLOW DIAGRAMS
PL600	PLUMBING MATERIAL LISTS
GRAND TOTAL: 13	

PLUMBING SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
CA	COMPRESSED AIR
CW	COLD WATER - POTABLE
D	DRAIN
DI	DEIONIZED WATER
DT	DRAIN TILE
HW	HOT WATER - POTABLE
HWC	HOT WATER CIRCULATING - POTABLE
HW140	HOT WATER - POTABLE NUMBER INDICATES TEMP
HWC140	HOT WATER CIRC. - POTABLE NUMBER INDICATES TEMP
NCW	NON-POTABLE COLD WATER
NHW	NON-POTABLE HOT WATER
O	OXYGEN
RO	REVERSE OSMOSIS WATER
SAN	SANITARY DRAINAGE
SCW	SOFT COLD WATER
SHW	SOFT HOT WATER
ST(1,000)	STORM DRAINAGE (ROOF SQUARE FOOTAGE)
STS	STORM DRAINAGE (SECONDARY)
STW	SOFT TEMPERED WATER
TW	TEMPERED WATER
V	VENT
W	SERVICE WATER - POTABLE
	PIPE CONTINUATION
	PIPE CAP
	PIPE DOWN
	PIPE UP OR UP/DOWN
FD	PIPE SERVING FIXTURE ON FLOOR ABOVE (EXAMPLE: FD = FLOOR DRAIN)
	PITCH PIPE IN DIRECTION
	DIRECTION OF FLOW IN PIPE
	ROUTE TO DRAIN
RD-1 (6"X1000)	ROOF DRAIN PROPERTIES SYMBOL SIZE (ROOF SQ. FT.)
	DIELECTRIC CONNECTION
	UNION/FLANGE
	SHUTOFF VALVE NORMALLY OPEN
	SHUTOFF VALVE NORMALLY CLOSED
GPM	BALANCING VALVE (NUMBER INDICATES GPM)
	CHECK VALVE
	BACKFLOW PREVENTER
	SOLENOID VALVE
	"WYE" - STRAINER
	"WYE" - STRAINER W/SHUTOFF VALVE AND HOSE CONNECTION WITH CAP
	FLEXIBLE CONNECTION
	MANUAL AIR VENT
	DRAIN VALVE WITH HOSE CONNECTION AND CAP
	SAFETY/RELIEF VALVE
	VACUUM BREAKER
P	PRESSURE GAUGE (FURNISHED WITH BALL VALVE)
P	PRESSURE SENSOR (FURNISHED WITH BALL VALVE)
T	TEMPERATURE SENSOR WITH WELL
T	THERMOMETER WITH WELL (DIAL TYPE)
T	THERMOMETER WITH WELL (FILLED TYPE)
	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB
P	PRESSURE REDUCING VALVE (LIQUID/GAS)
	PUMP
M	METER

PLUMBING ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BFP	BACKFLOW PREVENTER
CI	CAST IRON
CO	CLEANOUT
DI	DUCTILE IRON
E	EXISTING
EE	EMERGENCY EYEWASH
ESE	EMERGENCY SHOWER/EYEWASH
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FM	FLOW METER
FS	FLOOR SINK
HB	HOSE BIBB
I.E.	INVERT ELEVATION (FOR REFERENCE ONLY)
LAV	LAVATORY
MB	MOP BASIN
MV	MIXING VALVE
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
RD	ROOF DRAIN
SCCR	SHORT CIRCUIT CURRENT RATING
SH	SHOWER
SK	SINK
TP	TRAP PRIMER
TYP	TYPICAL
UR	URINAL
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WH	WATER HEATER
WM	WATER METER
WS	WATER SOFTENER
UB	UTILITY BOX
UON	UNLESS OTHERWISE NOTED
YCO	YARD CLEANOUT

PLUMBING ROUGH-IN SCHEDULE

NOTES: (APPLIES TO ALL PLUMBING FIXTURES LISTED BELOW)
1) SIZES SHOWN ARE MINIMUMS. LARGER SIZES SHOWN ON THE DRAWING SHALL DICTATE THE ROUGH-IN SIZE. 2) SANITARY RISERS UP IN WALL TO FIXTURES SHALL BE A MINIMUM OF 2". 3) DOMESTIC WATER BRANCH PIPING OUTSIDE OF THE WALL/CHASE SHALL BE A MINIMUM OF 3/4" UNLESS NOTED OTHERWISE. ONLY THE FINAL RISE-DROP SHALL BE SMALLER. 4) FINAL SANITARY SIZE SHALL MATCH P-TRAP SIZE (REFER TO MATERIAL LIST).

TAG NAME	DESCRIPTION	COLD WATER	HOT WATER	SANITARY	VENT
FD-C1	FLOOR DRAIN	-	-	3"	1 1/2"
FD-C2	FLOOR DRAIN	-	-	4"	2"
FD-S1	FLOOR SINK	-	-	4"	2"
FD-S2	FLOOR DRAIN	-	-	4"	2"
P-103	WATER CLOSET	1 1/2"	-	4"	2"
P-103A	WATER CLOSET (ACCESSIBLE)	1 1/2"	-	4"	2"
P-402	LAVATORY	1/2"	1/2"	1 1/2"	1 1/2"
P-501	MOP BASIN	3/4"	3/4"	3"	1 1/2"
P-502	MOP BASIN	3/4"	3/4"	3"	1 1/2"
P-528	SINK	1/2"	1/2"	1 1/2"	1 1/2"
P-608	ELECTRIC WATER COOLER (ACCESSIBLE)	1/2"	-	1 1/2"	1 1/2"
P-701	SHOWER	1/2"	1/2"	2"	1 1/2"
P-707	EMERGENCY SHOWER EYE/FACE WASH	1 1/2"	-	-	-
P-708	EMERGENCY SHOWER EYE/FACE WASH	1 1/2"	-	-	-

PLUMBING SLOPE REQUIREMENTS:

BASED ON PLUMBING CODE: IPC-2018

INTERIOR:	
SANITARY WASTE:	≤2-1/2" ø=1/4" PER FOOT ≥3"ø = 1/8" PER FOOT ≥8"ø = 1/16" PER FOOT
GREASE WASTE:	1/4" PER FOOT
STORM (GRAVITY):	1/8" PER FOOT
CONDENSATE AND INDIRECT DRAINAGE:	1/8" PER FOOT
SANITARY AND GREASE VENT:	NO SPECIFIC PITCH, PITCH TO FIXTURES
DOMESTIC WATER:	NO SPECIFIC PITCH, PITCH TO FIXTURES

PIPE INSULATION SCHEDULE (PLUMBING)

GENERAL NOTES:
1.REFER TO THE SPECIFICATIONS FOR TYPE DESCRIPTIONS AND JACKETING REQUIREMENTS. VALUES LISTED BELOW ARE BASED ON ASHRAE / IECC REQUIREMENTS.
2.TYPE A INSULATION IS NOT ALLOWED IN NON-AIR CONDITIONED SPACES, SUCH AS MECHANICAL ROOMS, EXTERIOR, ATTICS, ETC.
3.TYPE B INSULATION GREATER THAN 1" THICK SHALL BE INSTALLED USING MULTIPLE LAYERS OF 3/4" OR 1" WITH STAGGERED SEAMS.
4.PROVIDE RIGID INSERTS AT HANGERS, EITHER PRE-MANUFACTURED COUPLINGS (REFER TO PIPE HANGER AND SUPPORTS SPECIFICATIONS). SEE SPEC. FOR MORE DETAILS.
5.APPLY INSULATION ONLY TO LOW TEMP DRAINS (55 DEG AND LOWER IE: COOLING COIL CONDENSATE, ICE MACHINE DRAINS, ETC.)
6.APPLY INSULATION ONLY WITHIN 10' OF EXTERIOR PENETRATION.
7.APPLY INSULATION ONLY TO FLOOR DRAIN BODY, P-TRAP AND 10' DOWNSTREAM AT LOW TEMP DRAIN DISCHARGE (55 DEG AND LOWER IE: COOLING COIL CONDENSATE, ICE MACHINE DRAINS, ETC.)
8.APPLY INSULATION ONLY TO HORIZONTAL PIPES AND DRAIN BODIES.

PIPE SYSTEM	INSULATION TYPE AND THICKNESS PER NOMINAL PIPE OR TUBE SIZE					NOTES
	< 1"	1" TO < 1.5"	1.5" TO < 4"	4" TO < 8"	≥ 8"	
CW - COLD WATER - POTABLE	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	
D - DRAIN - PLUMBING	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	NOTE 5
DI - DEIONIZED WATER	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	
HW140 - HOT WATER 140 - POTABLE	A 1", B 1"	A 1", B 1"	A 1.5"	A 1.5"	A 1.5"	
HWC140 - HOT WATER CIRCULATING 140 - POTABLE	A 1", B 1"	A 1", B 1"	A 1.5"	A 1.5"	A 1.5"	
MISC RELIEF VENTS, INTAKES, AND DISCHARGES	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	NOTE 6
NCW - NON-POTABLE COLD WATER	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	
RO - REVERSE OSMOSIS	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	
SAN - SANITARY DRAINAGE	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	NOTE 7
SCW - SOFT COLD WATER	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	
ST - STORM DRAINAGE	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	NOTE 8
STS - STORM DRAINAGE - SECONDARY	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	NOTE 8
TW - TEMPERED WATER - POTABLE	A 1", B 1"	A 1", B 1"	A 1.5"	A 1.5"	A 1.5"	
V - VENT	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	NOTE 6
W - SERVICE WATER - POTABLE	A 0.5", B 0.5"	A 0.5", B 0.5"	A 1", B 1"	A 1", B 1"	A 1", B 1"	

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, FIRE PROTECTION, PLUMBING, VENTILATION, PIPING AND TEMPERATURE CONTROL.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
2. NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
3. FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. EACH CONTRACTOR SHALL FIELD VERIFY ACCESSIBILITY TO THE AREA OF THEIR WORK AND SHALL NOTIFY THE GENERAL CONTRACTOR PRIOR TO BIDDING IF OTHER UTILITIES ARE REQUIRED TO BE REMOVED OR RELOCATED TO ALLOW ACCESS TO THEIR AREA OF WORK.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL AND PATCHING OF ROOFS, WALLS, AND FLOORS ASSOCIATED WITH WORK BY ALL CONTRACTORS. CONTRACTORS SHALL NOTIFY THE GC OF AFFECTED AREAS PRIOR TO BIDDING.
6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
7. WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
8. PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
9. OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
10. MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
11. DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, FIRE PROTECTION, PLUMBING, VENTILATION, PIPING AND TEMPERATURE CONTROL.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
3. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
4. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
5. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
6. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
8. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSED DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
9. IN AREAS WITH DRYWALL CEILINGS COORDINATE LOCATIONS OF ACCESS PANELS WITH THE GC FOR ACCESS TO VALVES, DUCTWORK ACCESSORIES, DAMPERS, ETC. COORDINATE PANEL TYPE AND COLOR WITH ARCHITECT. NOTIFY THE GC OF THE REQUIRED ACCESS PANELS PRIOR TO BIDDING.
10. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH EXTERIOR WALLS AND ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
11. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
12. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
13. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
14. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
15. MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-6" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS.
16. MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6'-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING: DUCTWORK, PIPING, ETC.
17. PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT.
18. DO NOT SUPPORT EQUIPMENT, PIPING, OR DUCTWORK FROM METAL DECKING OR OTHER NON-STRUCTURAL BUILDING ELEMENTS. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

PLUMBING GENERAL NOTES:

1. THE SYMBOLS AND THE MATERIAL LIST ARE FOR THE CONVENIENCE OF THE CONTRACTOR. CONTRACTOR SHALL VERIFY QUANTITIES AND FURNISH ALL MATERIALS REQUIRED FOR FULLY OPERATIONAL SYSTEMS, WHETHER SPECIFIED OR NOT.
2. CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR A COMPLETE DESCRIPTION OF MATERIAL ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL TAKES PRECEDENCE OVER THE CATALOG NUMBER. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.
3. CONTRACTOR SHALL VERIFY THAT FIXTURES SUPPLIED ARE APPROVED PER ALL APPLICABLE STATE, LOCAL AND GOVERNING AUTHORITIES.
4. ALL FIXTURES SHALL CONFORM TO FEDERAL ACT S.3874
5. INVERT ELEVATIONS ARE FROM EXISTING DRAWINGS AND MAY NOT BE ACCURATE. VERIFY ALL ELEVATIONS BEFORE BEGINNING WORK.
6. VERIFY UNDERGROUND PIPE SIZES, INVERT ELEVATIONS, AND LOCATIONS PRIOR TO BEGINNING ANY WORK.
7. REFER TO THE PLUMBING ROUGH-IN SCHEDULE FOR THE SIZES OF BRANCH PIPES TO PLUMBING FIXTURES.
8. FOR CLARITY, NOT ALL VALVES HAVE BEEN SHOWN. PROVIDE SHUTOFF VALVES IN DOMESTIC WATER PIPING SERVING EACH ROOM WITH FIXTURES. ANGLE STOPS SHALL NOT BE CONSIDERED SHUTOFF VALVES.
9. EXISTING CONDITIONS ON DEMOLITION PLANS ARE PROVIDED TO INDICATE THE GENERAL SCOPE OF ITEMS TO BE REMOVED. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL DEMOLITION INFORMATION.
10. P.C. SHALL CUT AND PATCH EXISTING AS REQUIRED FOR NEW OR DEMOLITION WORK UNLESS NOTED OTHERWISE. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL INFORMATION.

AIR COMPRESSOR SCHEDULE

NOTES:
1.DUPLEX AIR COMPRESSOR TO DELIVER INSTRUMENT QUALITY COMPRESSED AIR AS DESCRIBED BY THE 2018 EDITION OF NFPA 99. COMPLETELY PACKAGED, TANK MOUNTED, EQUIPPED WITH CHECK VALVED, INLET AND OUTLET FLEXIBLE CONNECTOR, SHUTOFF VALVE, SAFETY RELIEF VALVE, AIR BYPASS SOLENOID, PRESSURE GAUGE, INLET MUFFLERS, AND MOTOR COUPLING WITH GUARD.
2.EQUIP UNIT WITH CLEANABLE AIR-COOLED HEAT EXCHANGER.
3.RECEIVER SHALL BE A VERTICAL WELDED STEEL TANK. PRIME COATED WITH EPOXY LINING. INCLUDE PRESSURE GAUGE, SAFETY RELIEF VALVE, AND AUTOMATIC TANK DRAIN.
4.PROVIDE PACKAGED COMPRESSED AIR SYSTEM WITH MANUFACTURER'S CONTROLLER. PRE-WIRED IN NEMA 250 TYPE 12 ENCLOSURE WITH FUSIBLE DISCONNECTS, MAGNETIC MOTOR STARTERS WITH OVERLOAD PROTECTION, CONTROL CIRCUIT TRANSFORMERS, CLOCK TIMER, AUTOMATIC WATER AND AIR BYPASS CIRCUITS, PRESSURE SWITCHES, HAND-OFF-AUTO SELECTOR SWITCHES, SAFETY DISCONNECT DOOR, AND LCD TOUCH SCREEN CONTROL PANEL.

TAG NAME	SERVICE	CONFIGURATION	CAP. SCFM AT 200 PSI	RECEIVER CAPACITY (GAL.)	NUMBER OF PUMPS	ELECTRICAL: HP EACH	NO. OF POWER CONNECTIONS	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	CONTROLLER/ STARTER TYPE (NOTE C)	SCCR	MAX. DIMENSIONS: LENGTH	WIDTH	HEIGHT	VIBRATION ISOLATION: TYPE	DEFL.	MANUFACTURER	MODEL	NOTES
AC-1	COMPRESSED AIR SYSTEM	DUPLEX	19.6	120	2	7.5	2	480	3	MFR	F	MFR	FV	20000	65"	66"	79"	MI	0.75	CHEMTRON	IAD5075-120T	NOTES 1, 2, 3, & 4

Revisions:	**Date:**	

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: PLUMBING COVERSHEET	**Phase:** BID DOCUMENTS	**Project Title:** CONSTRUCT NEW SPS	**Project Number:** 438-460
			Building Number: 5
Approved:	FULLY SPRINKLERED	**Location:** Sioux Falls, SD.	**Drawing Number:** PL000
		Issue Date: 02/14/2025 **Checked:** NATJAC **Drawn:** DELLLE	

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GENERAL PLUMBING NOTES:

1. REFERENCE P000 - PLUMBING COVERSHEET FOR PLUMBING SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
3. G.C. SHALL CUT AND PATCH EXISTING AS REQUIRED FOR NEW WORK. REFERENCE SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL INFORMATION.
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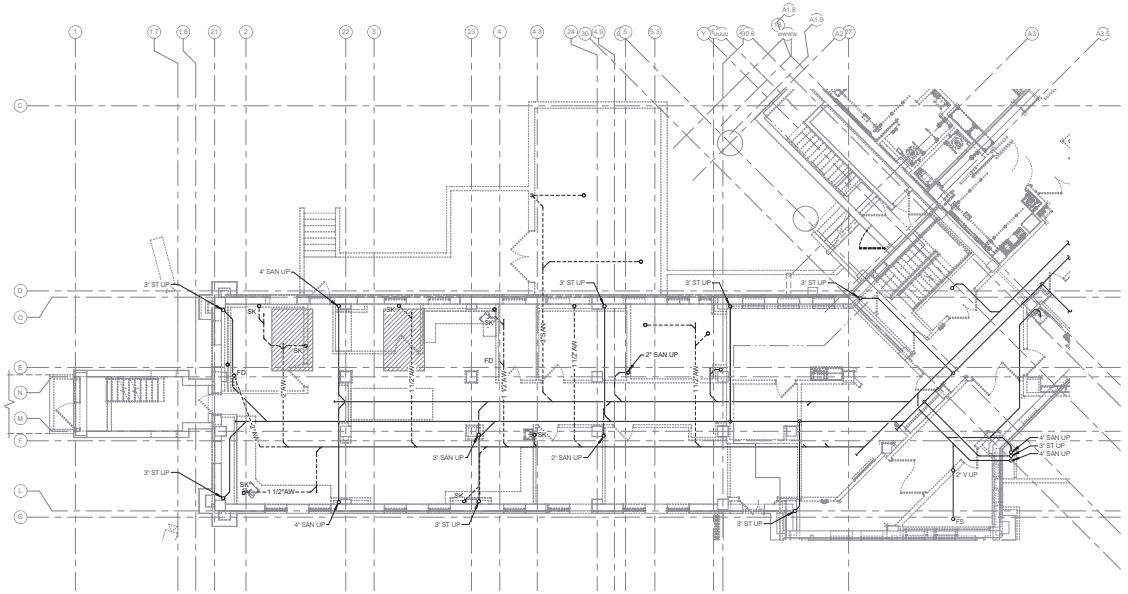
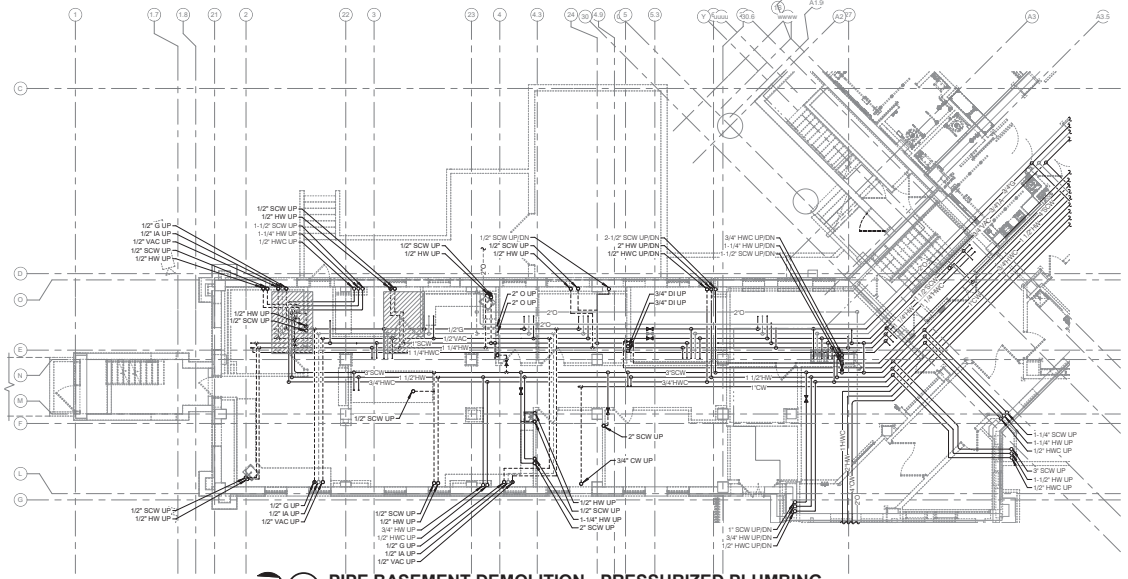
7. DEMOLISH ALL EXISTING CONTROL DEVICES, WIRING, AND CONDUIT ASSOCIATED WITH MECHANICAL EQUIPMENT SHOWN TO BE REMOVED ON THESE PLANS UNLESS OTHERWISE NOTED.
8. NOT ALL MECHANICAL DEMOLITION IS EXPLICITLY SHOWN ON THE DRAWING. CONTRACTOR SHALL CONFIRM EXTENT OF DEMOLITION AT THE SITE.



1 **PIPE BASEMENT DEMOLITION - GRAVITY PLUMBING**
1/8" = 1'-0"



2 **PIPE BASEMENT DEMOLITION - PRESSURIZED PLUMBING**
1/8" = 1'-0"

Revisions:	**Date:**

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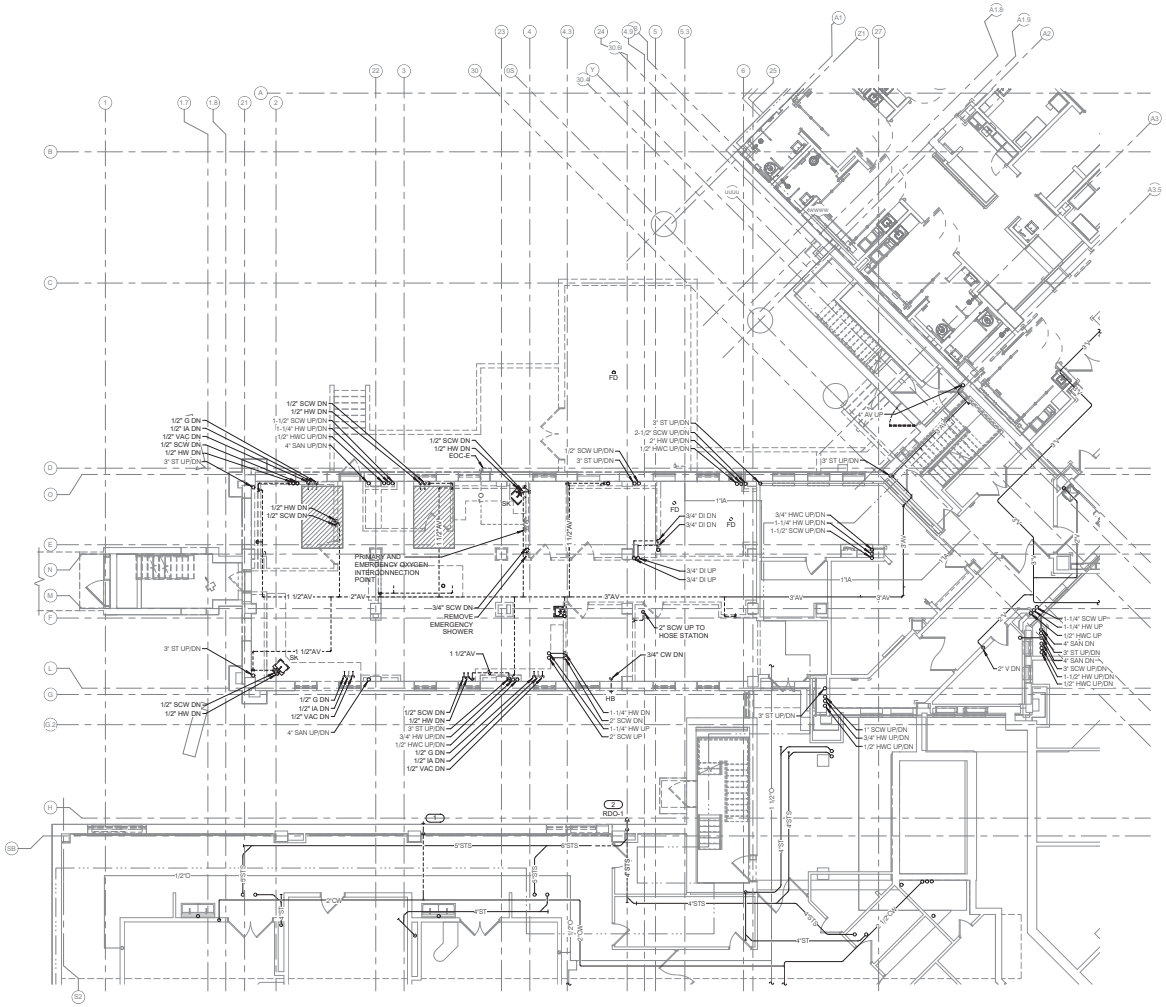
Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: PIPE BASEMENT DEMOLITION PLAN - PLUMBING	**Phase:** BID DOCUMENTS	**Project Title:** CONSTRUCT NEW SPS		**Project Number:** 438-460
				Building Number: 5
Approved:	FULLY SPRINKLERED	**Location:** Sioux Falls, SD.		**Drawing Number:** PLD100
		Issue Date: 02/14/2025	**Checked:** NATJAC	**Drawn:** DELLLE

VA FORM 08 - 6231



1 GROUND LEVEL FLOOR DEMOLITION PLAN - PLUMBING

1/8" = 1'-0"

GENERAL PLUMBING NOTES:

1. REFERENCE P000 - PLUMBING COVERSHEET FOR PLUMBING SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
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KEYNOTES: (#)

1. REMOVE EXISTING EXTERIOR HOSE BIBB. DEMOLISH ASSOCIATED COLD WATER PIPING BACK TO MAIN AND CAP TO PREVENT PRESENCE OF A DEAD LEG IN THE DOMESTIC WATER SYSTEM.
2. REMOVE EXISTING SECONDARY STORM DRAIN OUTLET.

Revisions:	Date:

CONSULTANT

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VA | U.S. Department of Veterans Affairs

Drawing Title: GROUND LEVEL FLOOR DEMOLITION PLAN - PLUMBING	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
			Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Drawing Number: PLD101
		Issue Date: 02/14/2025	Checked: NATJAC
			Drawn: DELLLE

VA FORM 08 - 6231

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GENERAL PLUMBING NOTES:

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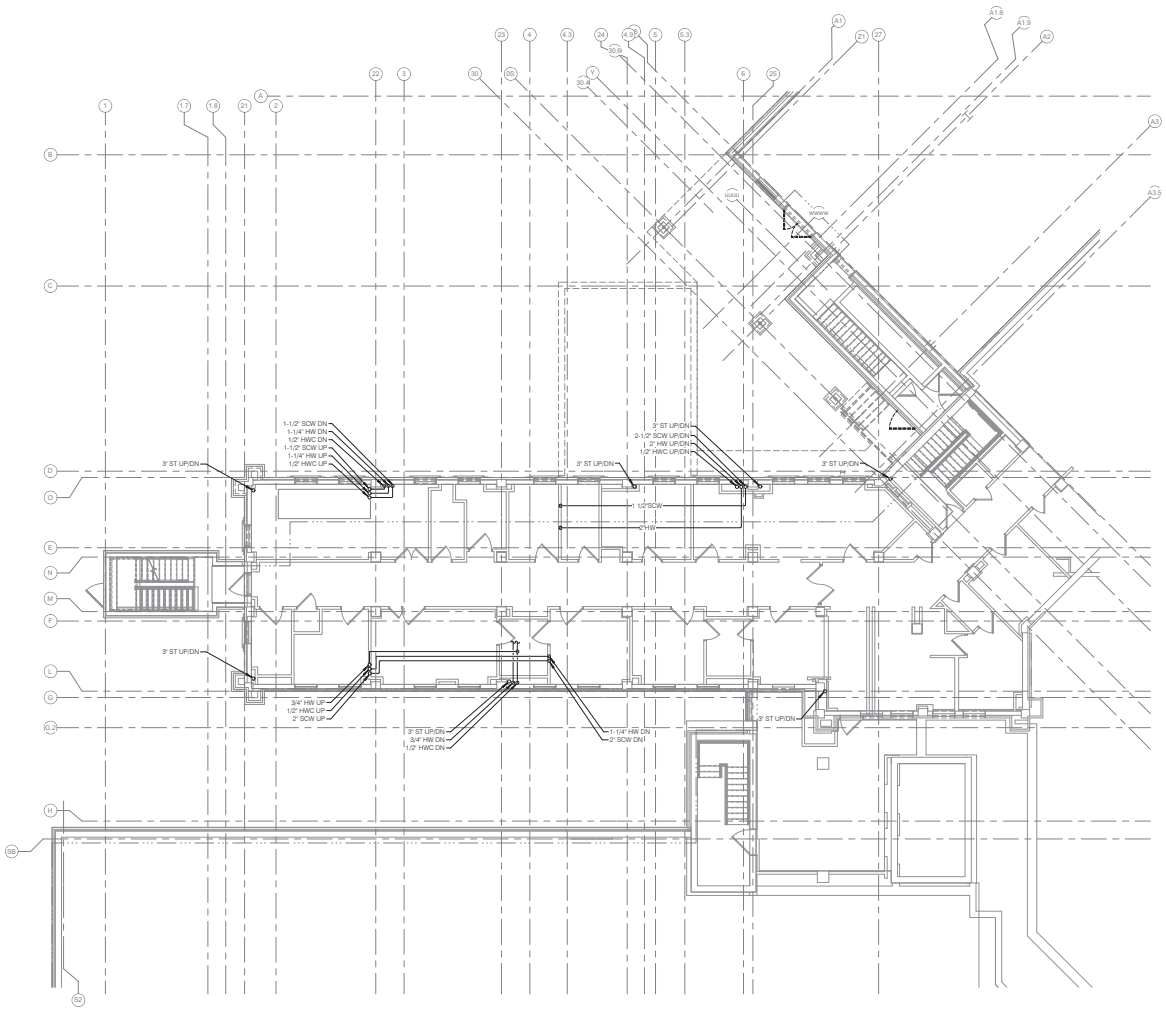

1 FIRST LEVEL DEMOLITION PLAN - PLUMBING

1/8" = 1'-0"

NORTH

Revisions:	Date:

CONSULTANT

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Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: FIRST LEVEL DEMOLITION PLAN - PLUMBING	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS		Project Number: 438-460
				Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.		Drawing Number: PLD111
		Issue Date: 02/14/2025	Checked: NATJAC	Drawn: DELLLE

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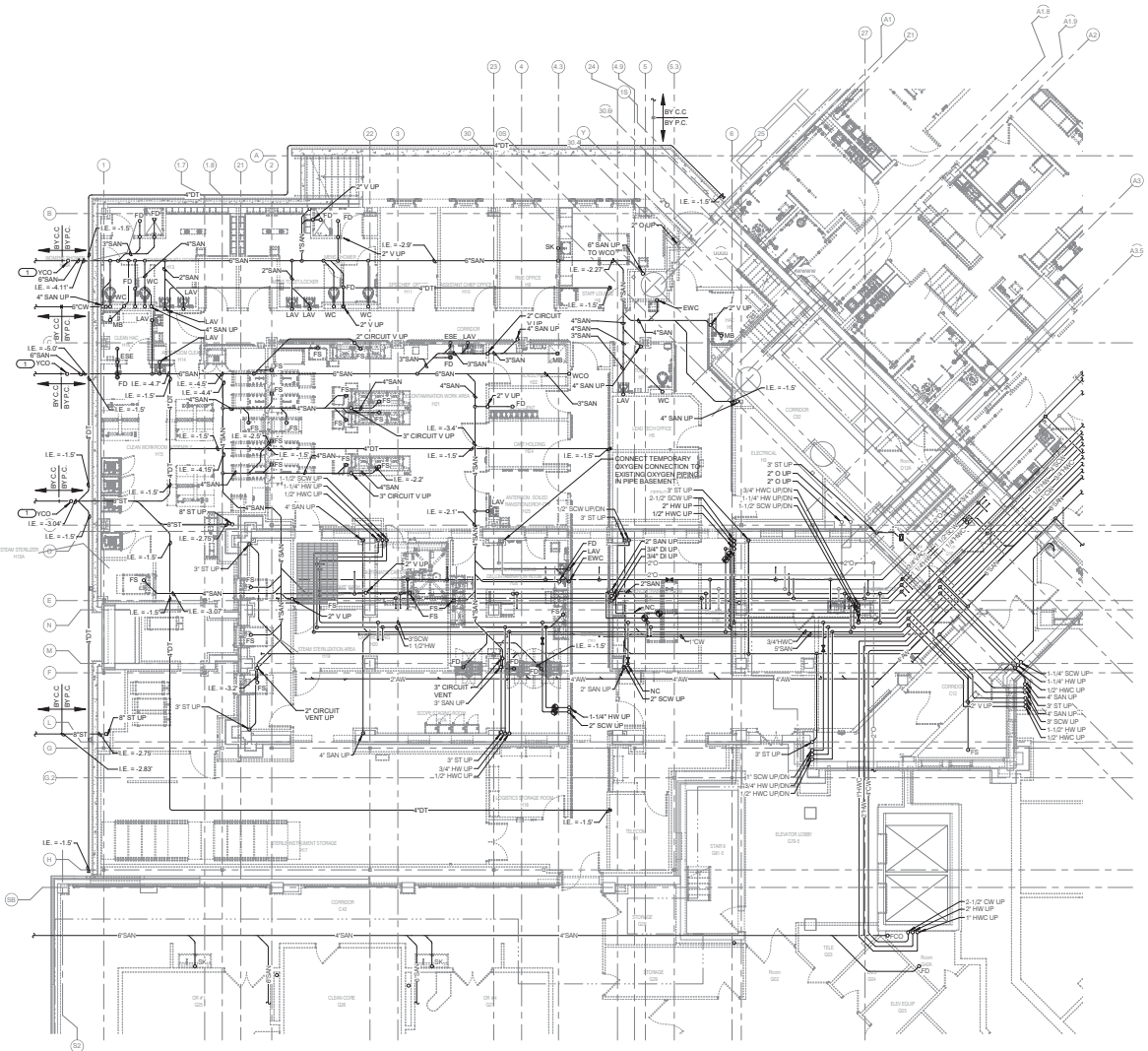

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6. REFERENCE PL500 FOR PLUMBING FLOW DIAGRAM.
7. REFERENCE PL600 FOR PLUMBING MATERIAL LIST.
8. REFERENCE 1/PL400 FOR DRAIN TILE DETAIL.
9. REFERENCE 2/PL400 FOR PIPE FOUNDATION AND SLEEVE DETAIL.
10. REFERENCE 3/PL400 FOR PIPE UNDERFLOOR TRENCH DETAIL.
11. REFERENCE 5/PL400 FOR UNDERGROUND WATER MAIN ANCHORING DETAIL.

KEYNOTES: (#)

1. REFERENCE 4/PL400 FOR YARD CLEANOUT DETAIL.

1 UNDERFLOOR - PLUMBING

1/8" = 1'-0"

NORTH

Revisions:	Date:

CONSULTANT

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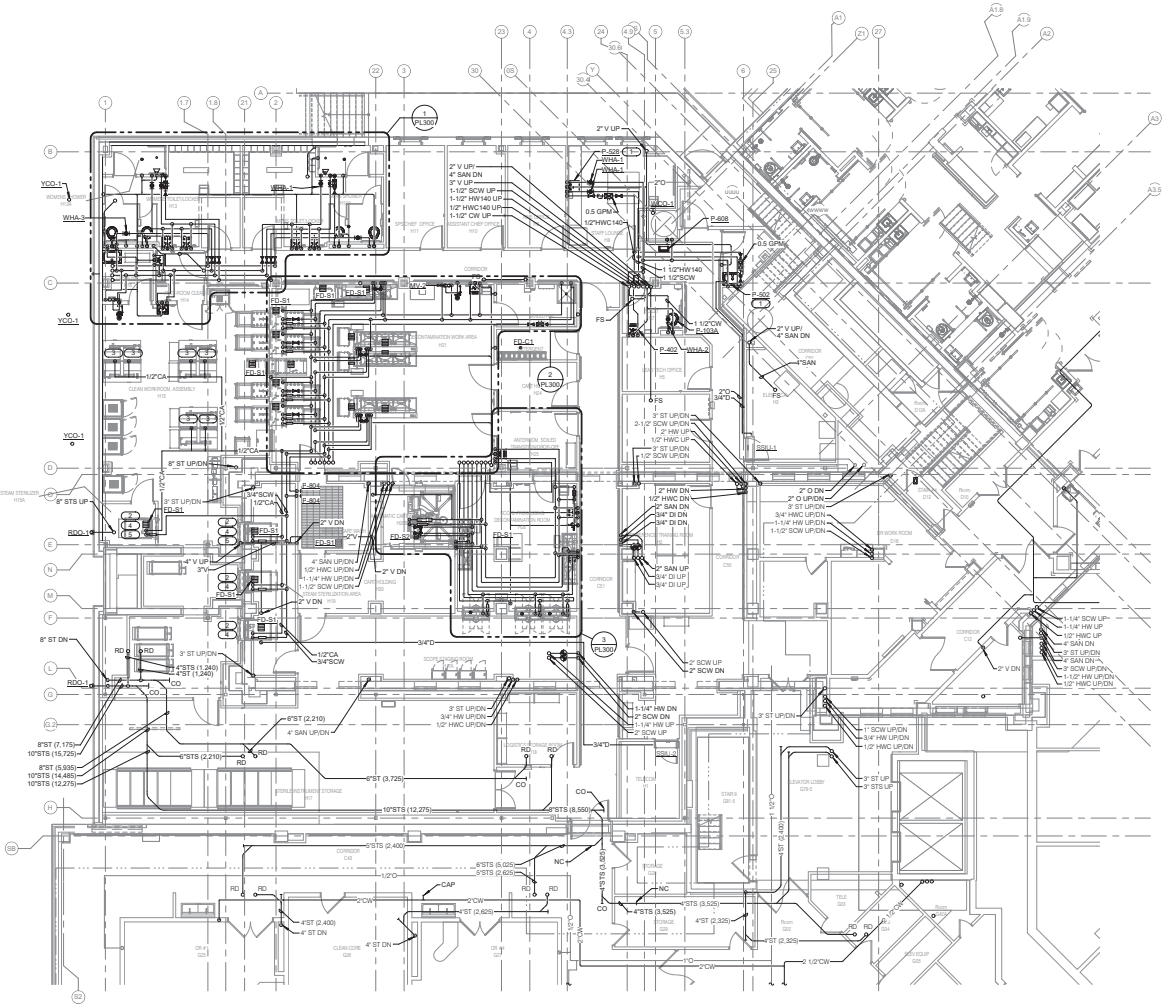
DELLAN J. LLEWELLYN 27054 LICENSED PROFESSIONAL ENGINEER IOWA

Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title	PIPE BASEMENT AND UNDERFLOOR - PLUMBING
Approved:	
Phase	BID DOCUMENTS
	FULLY SPRINKLERED
Project Title	CONSTRUCT NEW SPS
Location	Sioux Falls, SD.
Issue Date	02/14/2025
Checked	NATJAC
Drawn	DELLLE
Project Number	438-460
Building Number	5
Drawing Number	PL100

VA FORM 08 - 6231



1 GROUND LEVEL FLOOR PLAN - PLUMBING
1/8" = 1'-0"

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6. ALL PIPING, OF ANY KIND, ABOVE SOLID LID CEILINGS SHALL BE CONSTRUCTED OF AS FEW PIECES AS POSSIBLE AND SHALL ONLY UTILIZE WELDED OR SWEATED JOINTS AND CONNECTIONS.
7. REFERENCE PL500 FOR PLUMBING FLOW DIAGRAM.
8. REFERENCE PL600 FOR PLUMBING MATERIAL LIST.
9. REFERENCE 9/PL400 FOR FIRE RATED FLOOR/WALL PENETRATION DETAIL.
10. REFERENCE 10/PL400 FOR NON-FIRE RATED WALL PENETRATION DETAIL.

KEYNOTES: (#)

1. REFERENCE 4/PL401 FOR FIXTURE HOT WATER ROUTING DETAIL.
2. REFERENCE 6/PL401 FOR COMPRESSED AIR TERMINAL DETAIL.
3. REFERENCE 7/PL401 FOR COMPRESSED AIR TERMINAL AT CEILING DETAIL.
4. REFERENCE 9/PL401 FOR STERILIZER PIPING DETAIL.
5. STERILIZER WILL BE RELOCATED BY THE EQUIPMENT VENDOR FROM AN EXISTING LOCATION IN THE FACILITY TOWARDS THE END OF THIS PROJECT. ALL PIPING SHALL BE ROUGHED IN PRIOR TO RELOCATION TO MINIMIZE DOWNTIME OF THE EQUIPMENT. COORDINATE WITH C.O.R. FOR RELOCATION EFFORT.

Revisions:	Date:

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DELLAN J. LLEWELLYN 27052 REGISTERED PROFESSIONAL ENGINEER IOWA

Office of Construction and Facilities Management

VA | U.S. Department of Veterans Affairs

Drawing Title: GROUND LEVEL FLOOR PLAN - PLUMBING	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS	Project Number: 438-460
			Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.	Drawing Number: PL101
		Issue Date: 02/14/2025	Checked: NATJAC
			Drawn: DELLLE

VA FORM 08 - 6231

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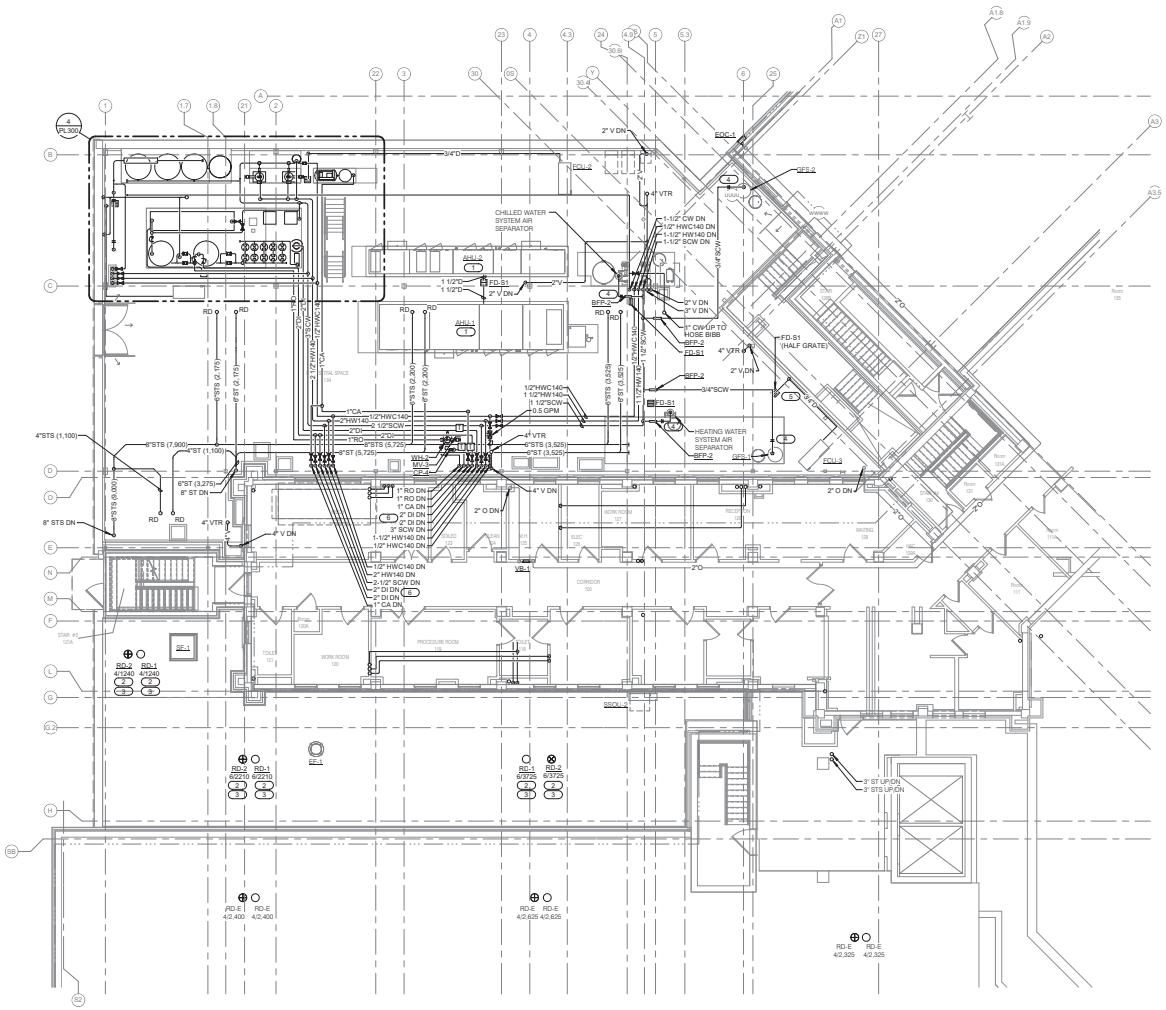

1 INTERSTITIAL/FIRST LEVEL FLOOR PLAN - PLUMBING

1/8" = 1'-0"

GENERAL PLUMBING NOTES:

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7. REFERENCE PL500 FOR PLUMBING FLOW DIAGRAM.
8. REFERENCE PL600 FOR PLUMBING MATERIAL LIST.
9. ALL FLOOR PENETRATIONS THROUGH MECHANICAL ROOM FLOOR SHALL BE MADE WITH A 4" THICK WATER LEAK RESISTANT CONCRETE CURB INSTALLED BY THE GENERAL CONTRACTOR. CURBS DEPICTED ON THESE PLANS ARE GENERIC IN NATURE. MECHANICAL CONTRACTOR SHALL COORDINATE EXACT SIZES AND LOCATIONS OF CURBS WITH GENERAL CONTRACTOR. WHERE FEASIBLE, CONGREGATE FLOOR PENETRATIONS OF DUCTWORK, MECHANICAL PIPING, AND PLUMBING PIPING INTO COMBINED CURB/PENETRATION GROUPS.
10. REFERENCE 9/PL400 FOR FIRE RATED FLOOR/WALL PENETRATION DETAIL.
11. REFERENCE 10/PL400 FOR NON-FIRE RATED WALL PENETRATION DETAIL.

KEYNOTES: (#)

1. PROVIDE COOLING EQUIPMENT WITH CONDENSATE DRAIN TRAP AND ROUTE CONDENSATE TO NEAREST FLOOR DRAIN. REFERENCE 8/PL400 FOR CONDENSATE TRAP DETAIL.
2. REFERENCE 8/PL400 FOR ROOF DRAIN DETAIL.
3. PROVIDE HEAT TRACE AT ROOF DRAINS, ROOF DRAIN BASINS, AND THE FIRST 15' OF BOTH PRIMARY AND SECONDARY STORM PIPING INSIDE BUILDING. COORDINATE EXACT LOCATION WITH ELECTRICAL CONTRACTOR.
4. DELINIATION OF SCOPE BETWEEN PLUMBING CONTRACTOR (DARK) AND MECHANICAL CONTRACTOR (LIGHT). COORDINATE WITH MECHANICAL CONTRACTOR.
5. ROUTE CONDENSATE DRAIN TO FLOOR SINK. DISCHARGE THROUGH 45° ELBOW WITH 1" GAP BETWEEN ELBOW OUTLET AND FLOOR SINK RIM.
6. PROVIDE 3-VALVE ARRANGEMENT AT DI LOOP PRIOR TO PENETRATING INTERSTITIAL LEVEL FLOOR. 3-VALVE ARRANGEMENT SHALL CONSIST OF TWO NORMALLY OPEN VALVES DOWNSTREAM OF A LOOP BYPASS (SIZED SAME AS LOOP PIPING) WITH A NORMALLY CLOSED ISOLATION VALVE.

Revisions:	Date:

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Office of Construction and Facilities Management

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Drawing Title: INTERSTITIAL/FIRST LEVEL FLOOR PLAN - PLUMBING	Phase: BID DOCUMENTS	Project Title: CONSTRUCT NEW SPS			Project Number: 438-460
					Building Number: 5
Approved:	FULLY SPRINKLERED	Location: Sioux Falls, SD.			Drawing Number: PL111
		Issue Date: 02/14/2025	Checked: NATJAC	Drawn: DELLLE	

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