

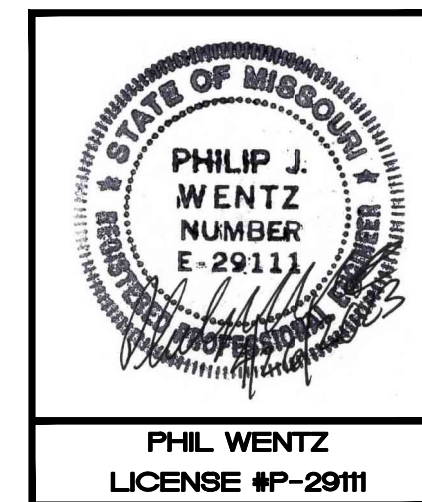
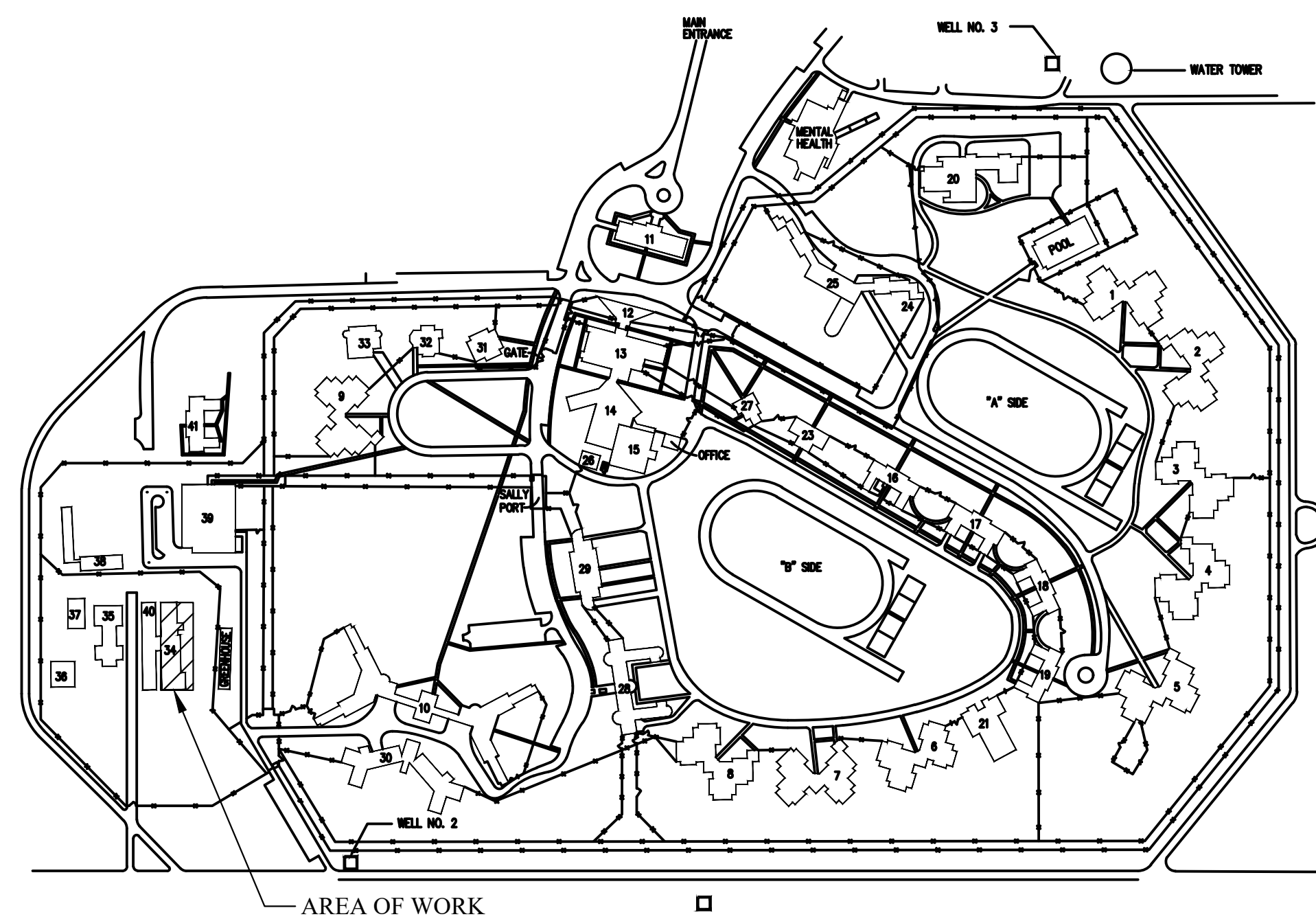
FARMINGTON CORRECTION CENTER

1012 W COLUMBIA STREET

FARMINGTON, MO 63640

BOILER SYSTEM UPGRADE

SITE LOCATION MAP



McCLURE ENGINEERING

1000 Clark Avenue Saint Louis, Missouri 63102
 T 314-645-6232 F 314-645-4128 www.McClureeng.com
 Missouri State Certificate of Authority #000087

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PIPING TRENCH AND PLAN PROFILE

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MAIN LEVEL - CENTRAL ELECTRICAL - DEMOLITION WORK

ED3.2

MAIN LEVEL - SOUTH ELECTRICAL - DEMOLITION WORK

E3.0

MAIN LEVEL - NORTH ELECTRICAL - NEW WORK

E3.1

MAIN LEVEL - CENTRAL ELECTRICAL - NEW WORK

E3.2

MAIN LEVEL - SOUTH ELECTRICAL - NEW WORK

E6.0

ELECTRICAL ONE-LINE DIAGRAMS, DETAILS, AND SCHEDULES

OWNER: STATE OF MISSOURI
 MICHAEL L. PARSON, GOVERNOR
 DEPARTMENT OF PUBLIC SAFETY
 MISSOURI STATE HIGHWAY PATROL

PROJECT MANAGEMENT: OFFICE OF ADMINISTRATION
 DIVISION OF FACILITIES MANAGEMENT,
 DESIGN AND CONSTRUCTION

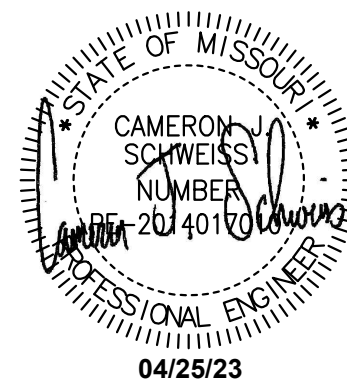
DESIGNER: MCCLURE ENGINEERING
 PROJECT NUMBER: C2006-01
 SITE NUMBER: 7008
 FACILITY NUMBER: 9327008094

ISSUED FOR BID DRAWINGS: APRIL 26, 2023

SHEET NUMBER:

CS-1

1 OF 31 SHEETS
 04-26-2023



CAMERON J SCHWEISS
MO Engineering Registration No. 2014017010

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CIVIL: CM Archer Group, P.C. dba:



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DRAWN BY: JSM
CHECKED BY: CJS
DESIGNED BY: CJS

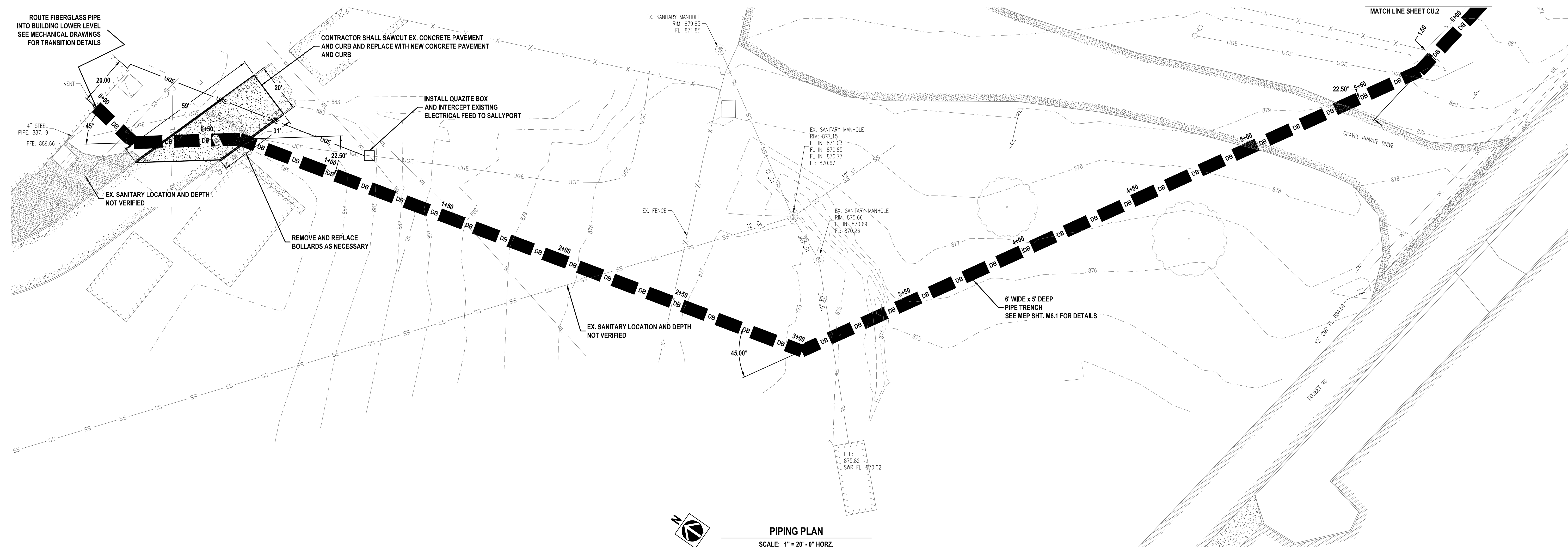
SHEET TITLE:

PIPING TRENCH
PLAN & PROFILE

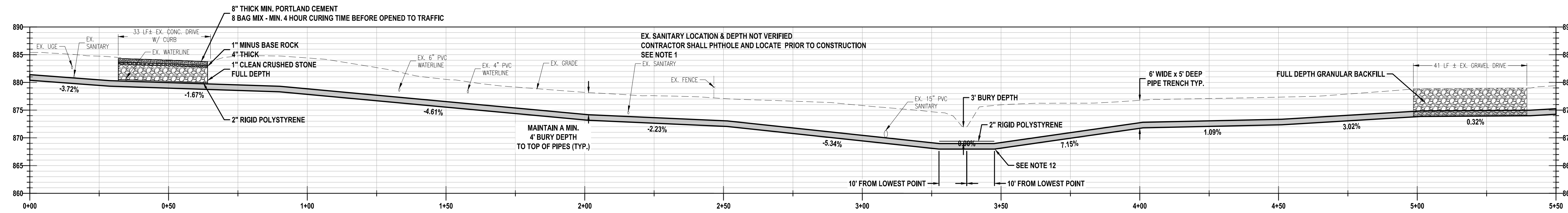
SHEET NUMBER:

CU.1

2 OF 31 SHEETS
04/26/2023



PIPING PLAN
SCALE: 1" = 20'-0" HORZ.



PIPING PROFILE
SCALE: 1" = 20'-0" HORZ.
1" = 5'-0" VERT.

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EXISTING STANDARD LEGEND

○	POWER POLE & GUY WIRE	---	EX 1' CONTOUR
○	LIGHT POLE	---	EX 5' CONTOUR
○	AREA LIGHT	---	EX RIGHT-OF-WAY
○	FLOOD LIGHT	---	EX PROPERTY LINE (APPROXIMATE)
○	TELEPHONE MANHOLE	---	EX OVERHEAD ELECTRIC
○	TELEPHONE PEDESTAL	---	EX UNDERGROUND ELECTRIC
○	CABLE MARKER	---	EX UNDERGROUND TELEPHONE
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○	ELECTRIC METER	---	EX SANITARY SEWER
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○	CLEANOUT	---	ABANDONED UNDERGROUND UTILITY
○	SANITARY SEWER MANHOLE	---	EX CONCRETE PAVING
○	SIGN	---	EX ASPHALT PAVING
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○	GAS METER		
○	GAS VALVE		
○	MAILBOX		
○	BOLLARD		
○	PARKING METER		



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CHECKED BY: CJS
DESIGNED BY: CJS

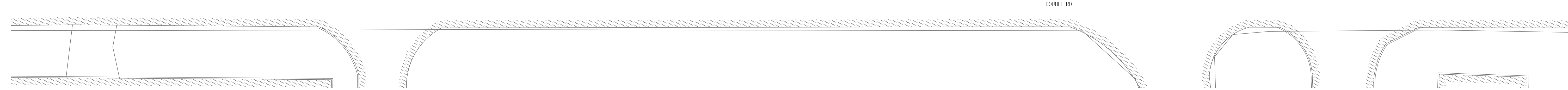
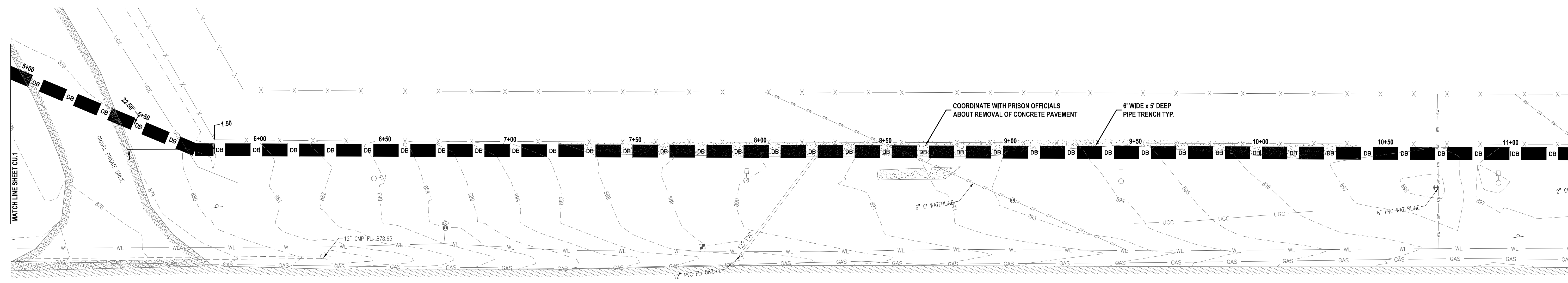
SHEET TITLE:

PIPING TRENCH
PLAN & PROFILE

SHEET NUMBER:

CU.2

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04/26/2023



PIPING PLAN

SCALE: 1" = 20' - 0" HORZ.

PIPING PROFILE

SCALE: 1" = 20' - 0" HORZ.
1" = 5' - 0" VERT.

GENERAL NOTES:

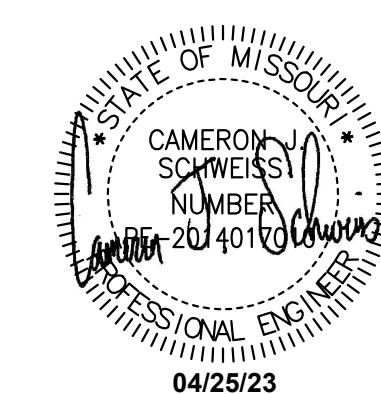
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EXISTING STANDARD LEGEND

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□	LIGHT POLE	---	EX 5' CONTOUR
○	AREA LIGHT	---	EX RIGHT-OF-WAY
○	FLOOD LIGHT	---	EX PROPERTY LINE (APPROXIMATE)
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○	GAS DRIP	---	EX GRANULAR PAVING
○	GAS METER	---	
○	GAS VALVE	---	
○	MAILBOX	---	
○	BOLLARD	---	
○	PARKING METER	---	



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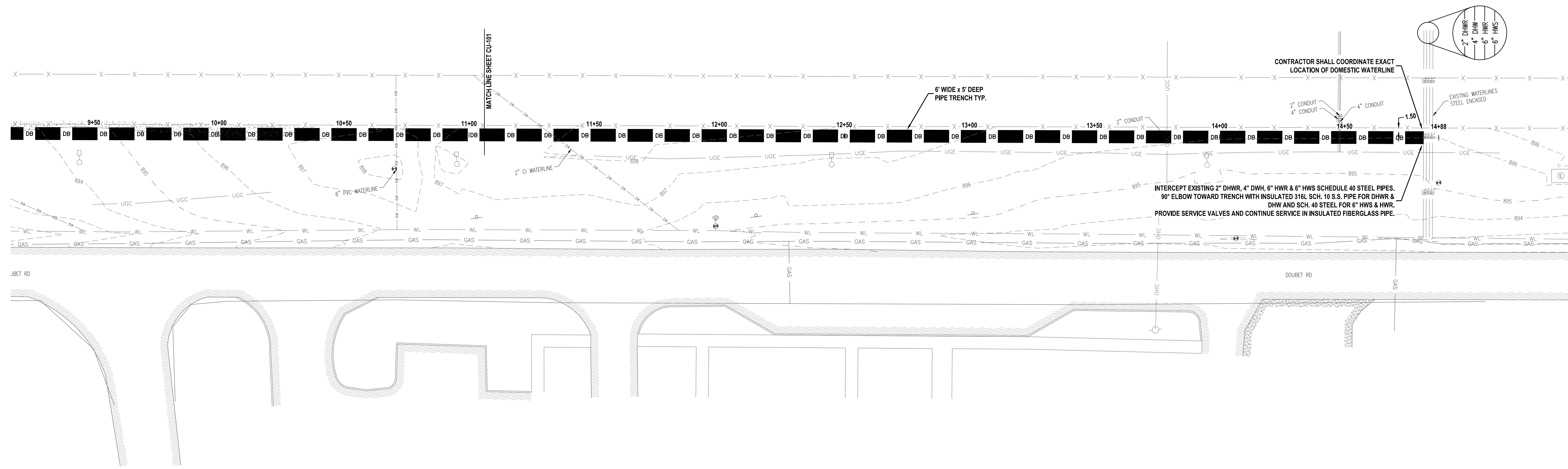
DRAWN BY: JSM
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SHEET TITLE:
**PIPING TRENCH
PLAN & PROFILE**

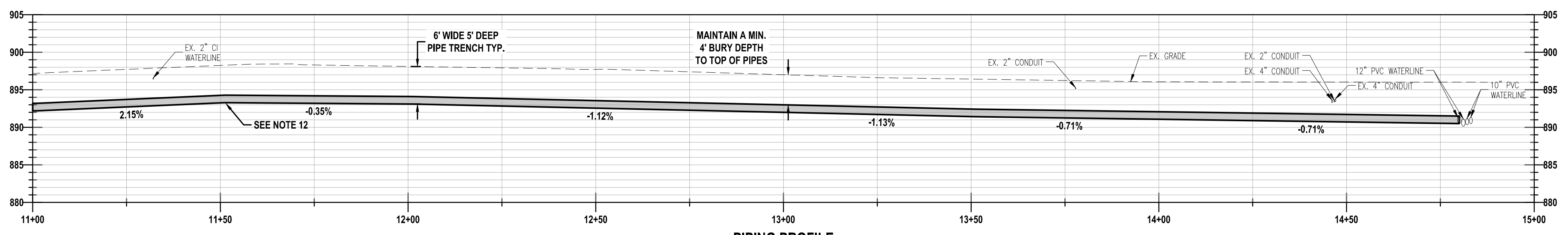
SHEET NUMBER:

CU.3

4 OF 31 SHEETS
04/26/2023



PIPING PLAN
SCALE: 1" = 20' - 0" HORZ.



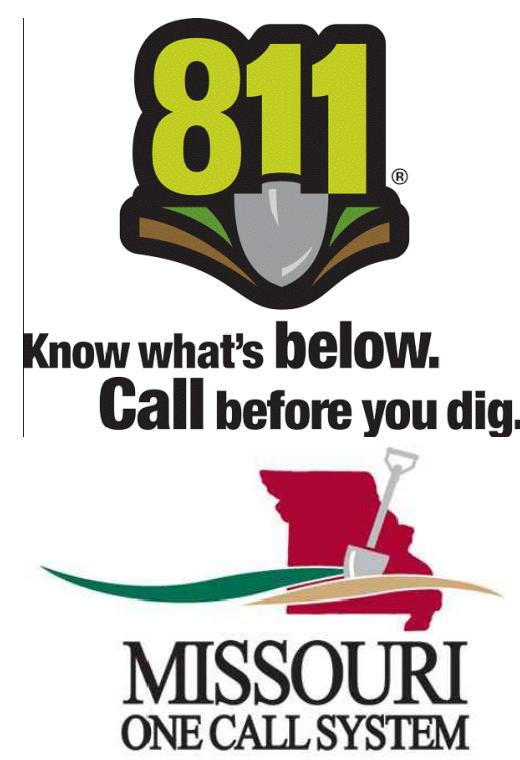
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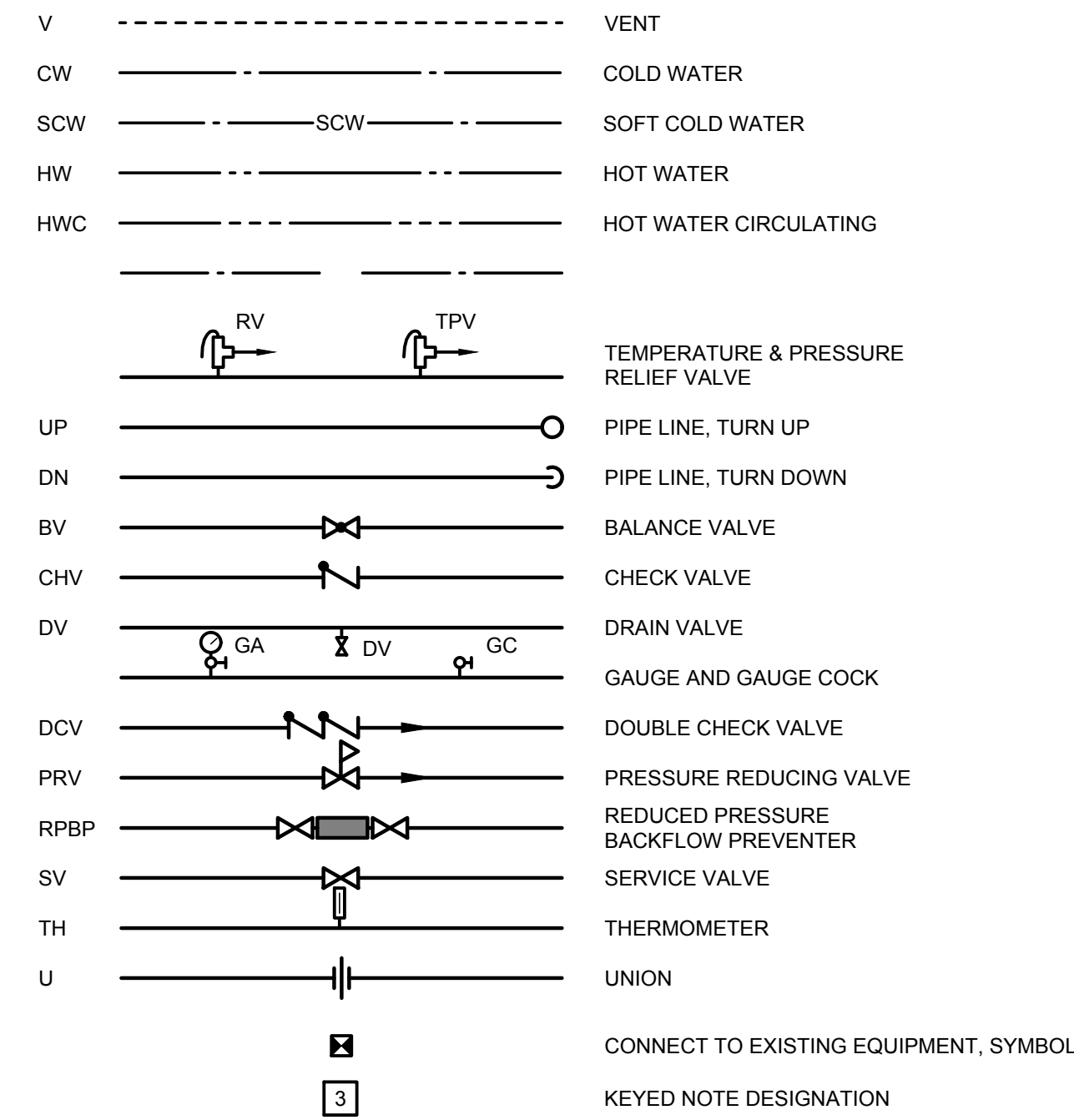
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○	GAS VALVE		
○	MAILBOX		
○	BOLLARD		
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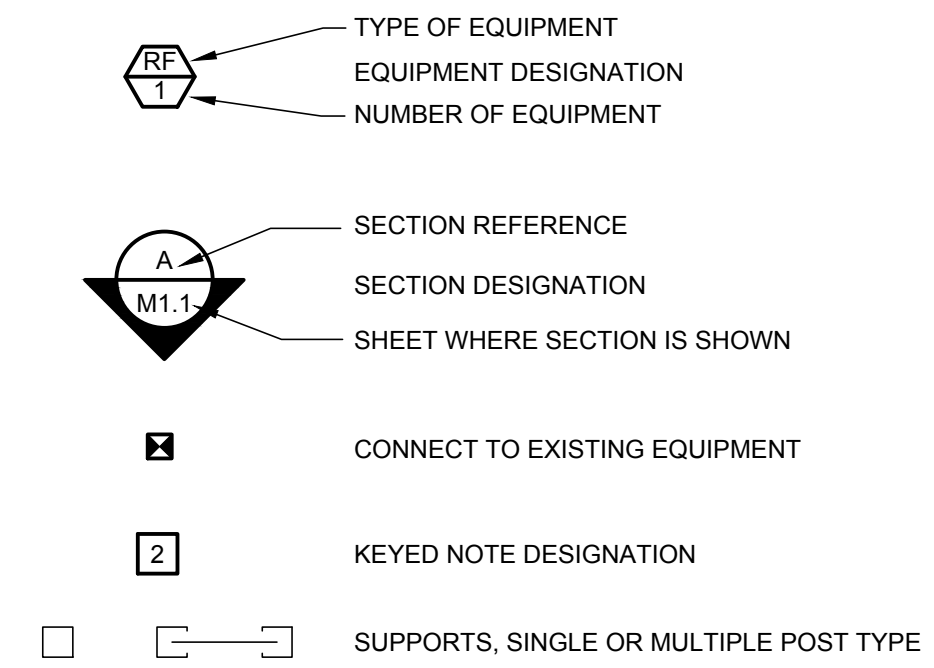
PLUMBING

BV	BALANCE VALVE	V	VENT
CHV	CHECK VALVE	VTR	VENT THROUGH ROOF
CW	COLD WATER	W	WASTE
DCV	DOUBLE CHECK VALVE	WC	WATER CLOSET
DN	DOWN	WCO	WALL CLEANOUT
DV	DRAIN VALVE	WF	WASH FOUNTAIN
ET	EXPANSION TANK	WH	WALL HYDRANT
EW	EYE WASH SYSTEM	WM	WATER MAIN
EX	EXISTING PIPING OR EQUIPMENT	YCO	YARD CLEANOUT
F	FLANGE CONNECTION	YD	YARD DRAIN
FS	FLOOR SINK		
GA	GAUGE		
GC	GAUGE COCK		
HB	HOSE BIBB		
HW	HOT WATER		
HWC	HOT WATER CIRCULATING		
IDW	INDIRECT WASTE		
INV	INVERT		
PRV	PRESSURE REDUCING VALVE		
RPBP	REDUCE PRESSURE BACKFLOW PREVENTER		
SCW	SOFT COLD WATER		
SV	SERVICE VALVE		
TD	TRENCH DRAIN		
TH	THERMOMETER		
TT	TEST TEE		
U	UNION		

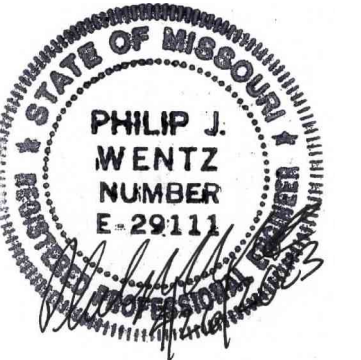


MECHANICAL

AV	AIR VENT	CA	COMPRESSED AIR
BV	BALANCE VALVE	DR	DRAIN LINE
CA	COMPRESSED AIR	FOS	FUEL OIL SUPPLY
CHV	CHECK VALVE	FOR	FUEL OIL RETURN
CY	CONTROL VALVE	G	GAS
DN	DOWN	HPS	HIGH PRESSURE STEAM
DR	DRAIN LINE	HPC	HIGH PRESSURE CONDENSATE
DV	DRAIN VALVE	HWS	HEATING WATER SUPPLY
ET	EXPANSION TANK	HWR	HEATING WATER RETURN
EX	EXISTING	LPS	LOW PRESSURE STEAM
F	FLANGE CONNECTION	LPC	LOW PRESSURE CONDENSATE
FC	FLEXIBLE CONNECTION	PC	PUMPED CONDENSATE
G	GAS	XXX	VARIOUS SYSTEM TYPE, IF NOT SHOWN
GA	GAUGE	UP	PIPE LINE, TURNED UP
GC	GAUGE COCK	DN	PIPE LINE, TURNED DOWN
HPS	HIGH PRESSURE STEAM	BV	BALANCE VALVE
HPC	HIGH PRESSURE CONDENSATE	CV	2 WAY CONTROL VALVE
HWS	HEATING WATER SUPPLY	CHV	CHECK VALVE
HWR	HEATING WATER RETURN	DV	DRAIN VALVE
LPS	LOW PRESSURE STEAM	F	FLANGE CONNECTION
LPC	LOW PRESSURE CONDENSATE	GA GC	GAUGE AND GAUGE COCK
PC	PUMPED CONDENSATE	MC	MECHANICAL COUPLING
XXX	VARIOUS SYSTEM TYPE, IF NOT SHOWN	P	PETE'S PLUG
UP	PIPE LINE, TURNED UP	PFC	PIPE FLEXIBLE CONNECTOR
DN	PIPE LINE, TURNED DOWN	PRV	PRESSURE REDUCING VALVE
BV	BALANCE VALVE	RV	RELIEF VALVE
CV	2 WAY CONTROL VALVE	SV	SERVICE VALVE
CHV	CHECK VALVE	STR	STRAINER
DV	DRAIN VALVE	T	STEAM TRAP
F	FLANGE CONNECTION	TH	THERMOMETER
GA GC	GAUGE AND GAUGE COCK	TW	THERMOMETER WELL
MC	MECHANICAL COUPLING	U	UNION
P	PETE'S PLUG	M	METER
PFC	PIPE FLEXIBLE CONNECTOR	CAP	CAP
PRV	PRESSURE REDUCING VALVE	CONCENTRIC REDUCER	CONCENTRIC REDUCER
RV	RELIEF VALVE	ECCENTRIC REDUCER (BOTTOM & TOP LEVEL)	ECCENTRIC REDUCER (BOTTOM & TOP LEVEL)
SV	SERVICE VALVE	PIPE ANCHOR	PIPE ANCHOR
STR	STRAINER	PIPE GUIDE	PIPE GUIDE
T	STEAM TRAP		
TH	THERMOMETER		
TW	THERMOMETER WELL		
U	UNION		
M	METER		
CAP	CAP		
CONCENTRIC REDUCER	CONCENTRIC REDUCER		
ECCENTRIC REDUCER (BOTTOM & TOP LEVEL)	ECCENTRIC REDUCER (BOTTOM & TOP LEVEL)		
PIPE ANCHOR	PIPE ANCHOR		
PIPE GUIDE	PIPE GUIDE		



STATE OF MISSOURI
 MICHAEL L. PARSON,
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DEPARTMENT OF
 CORRECTIONS

BOILER UPGRADES

FARMINGTON CORRECTIONAL
 CENTER
 1012 WEST COLUMBIA STREET
 FARMINGTON, MO 63640

PROJECT # C2006-01
 SITE# 7008
 FACILITY# 9327008094

REVISION: _____
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 DATE: _____
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 DATE: _____

ISSUE DATE: 04/26/2023

DRAWN BY: RCB
 CHECKED BY: EMP
 DESIGNED BY: EMP

SHEET TITLE:
**MECHANICAL
 SYMBOLS AND
 ABBREVIATIONS**

SHEET NUMBER:

M0.0

5 OF 31 SHEETS
 04/26/2023



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DRAWN BY: RCB
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SHEET TITLE:
**LOWER LEVEL
SOUTH MECHANICAL
DEMOLITION PLAN**

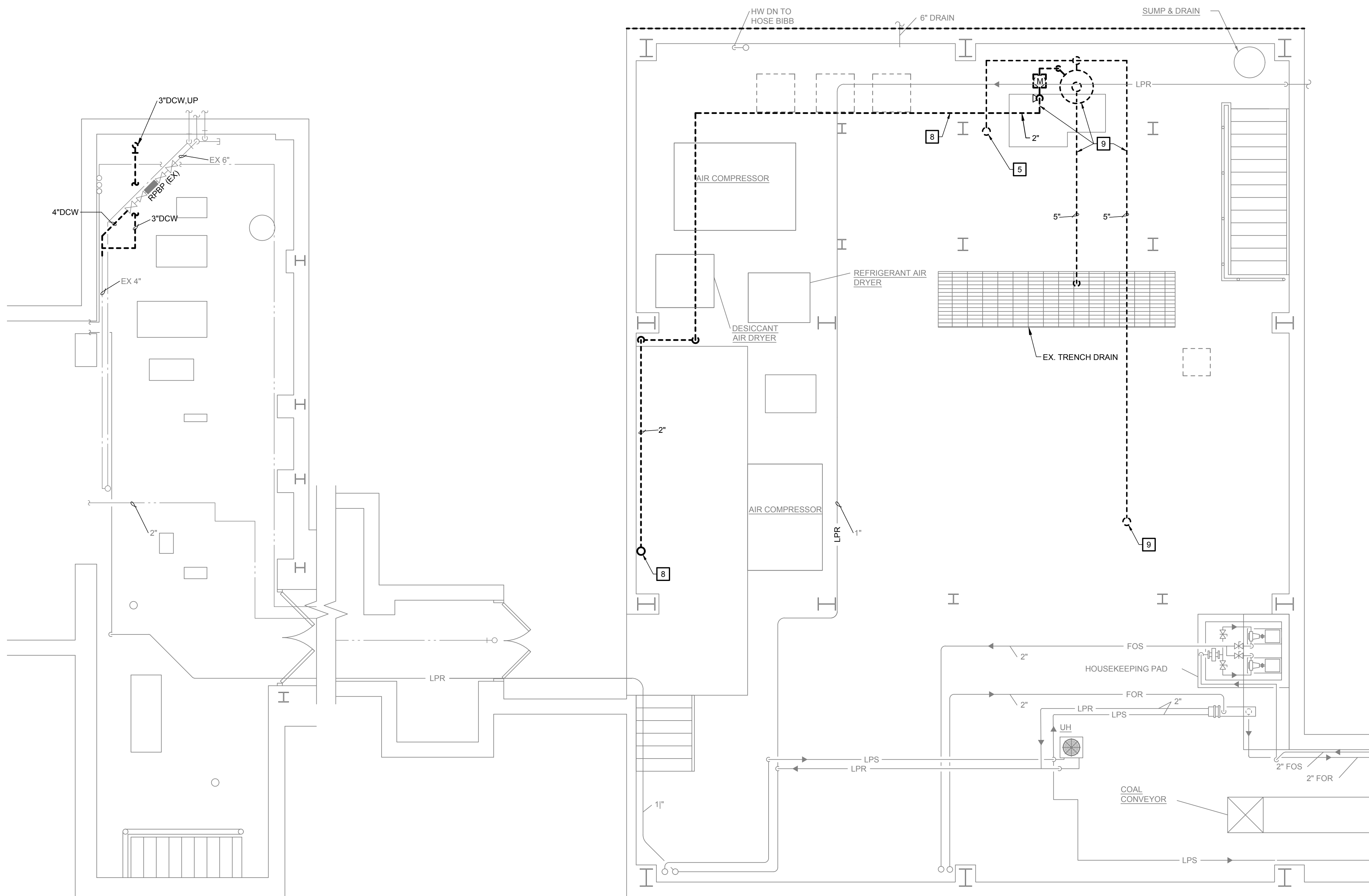
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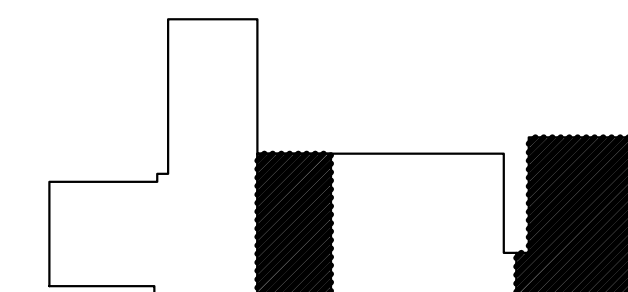
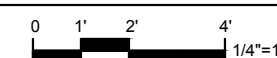
6 OF 31 SHEETS
04/26/2023

DEMOLITION KEYED NOTES: (MD3.0, MD3.1, MD3.2, MD3.3)

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PARTIAL OPERATING FLOOR DEMOLITION PLAN
SCALE: 1/4" = 1'0"



KEY PLAN



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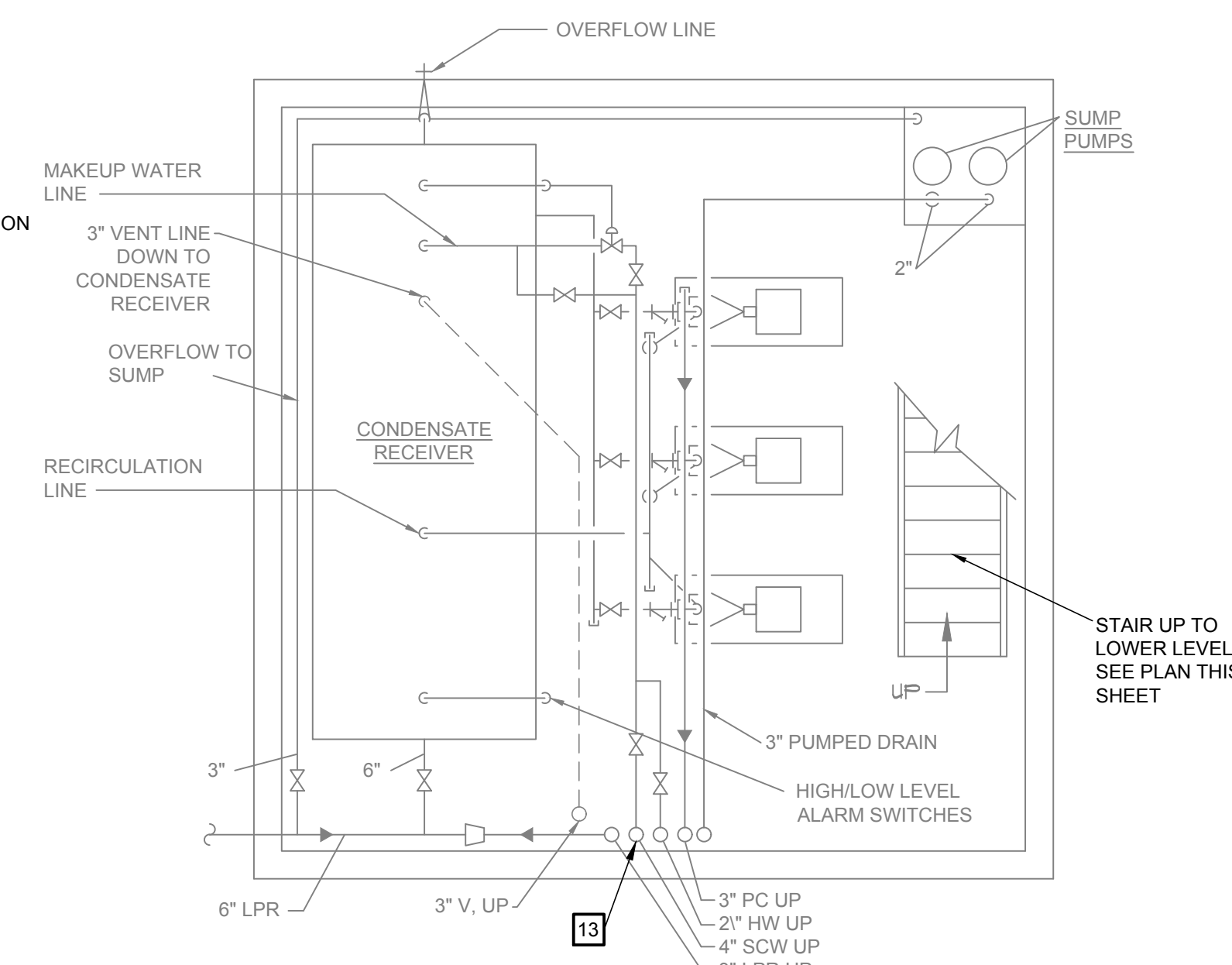
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CHECKED BY: EMP
DESIGNED BY: EMP

SHEET TITLE:
**MAIN LEVEL
NORTH MECHANICAL
DEMOLITION PLAN**

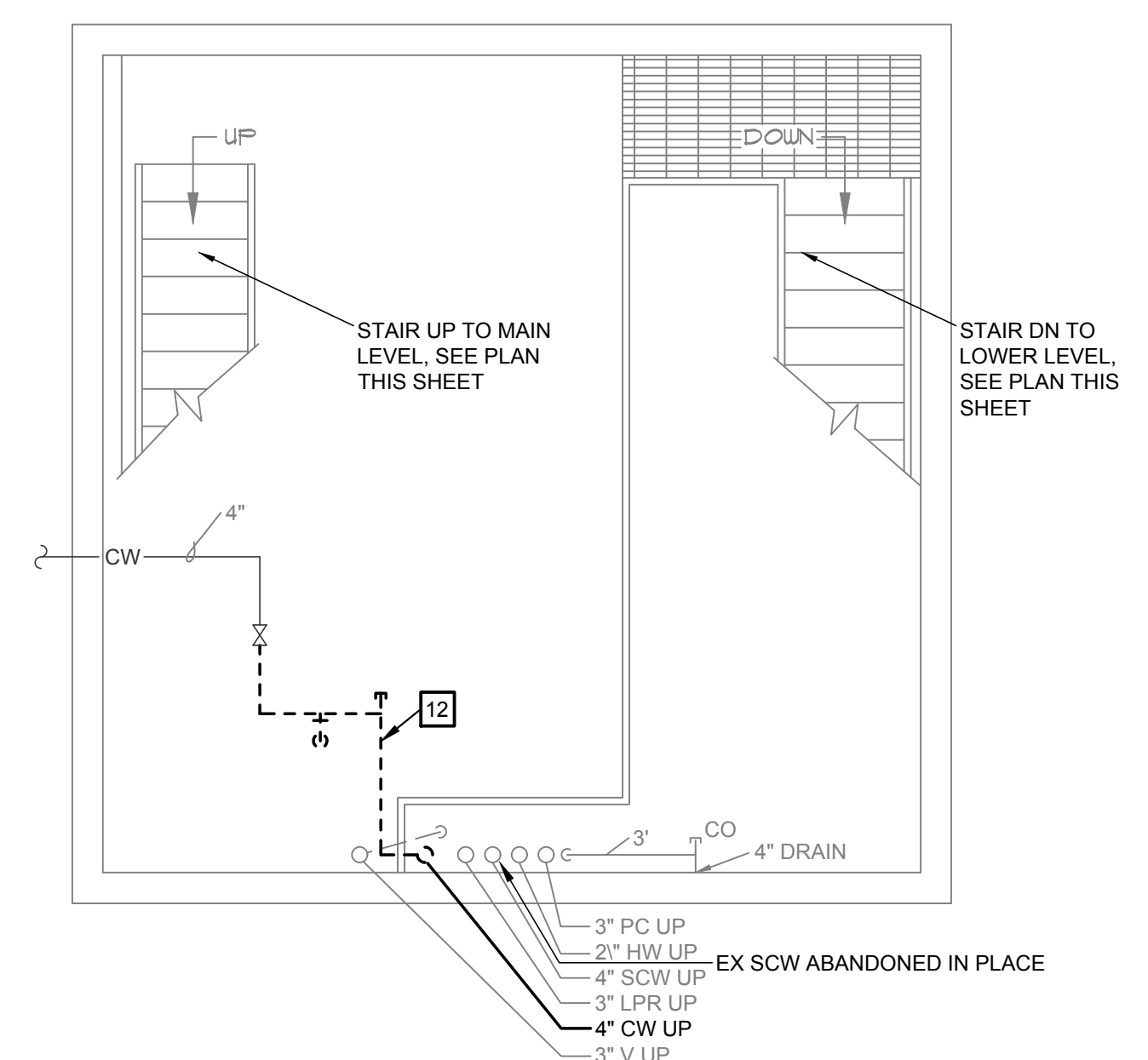
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7 OF 31 SHEETS
04/26/2023

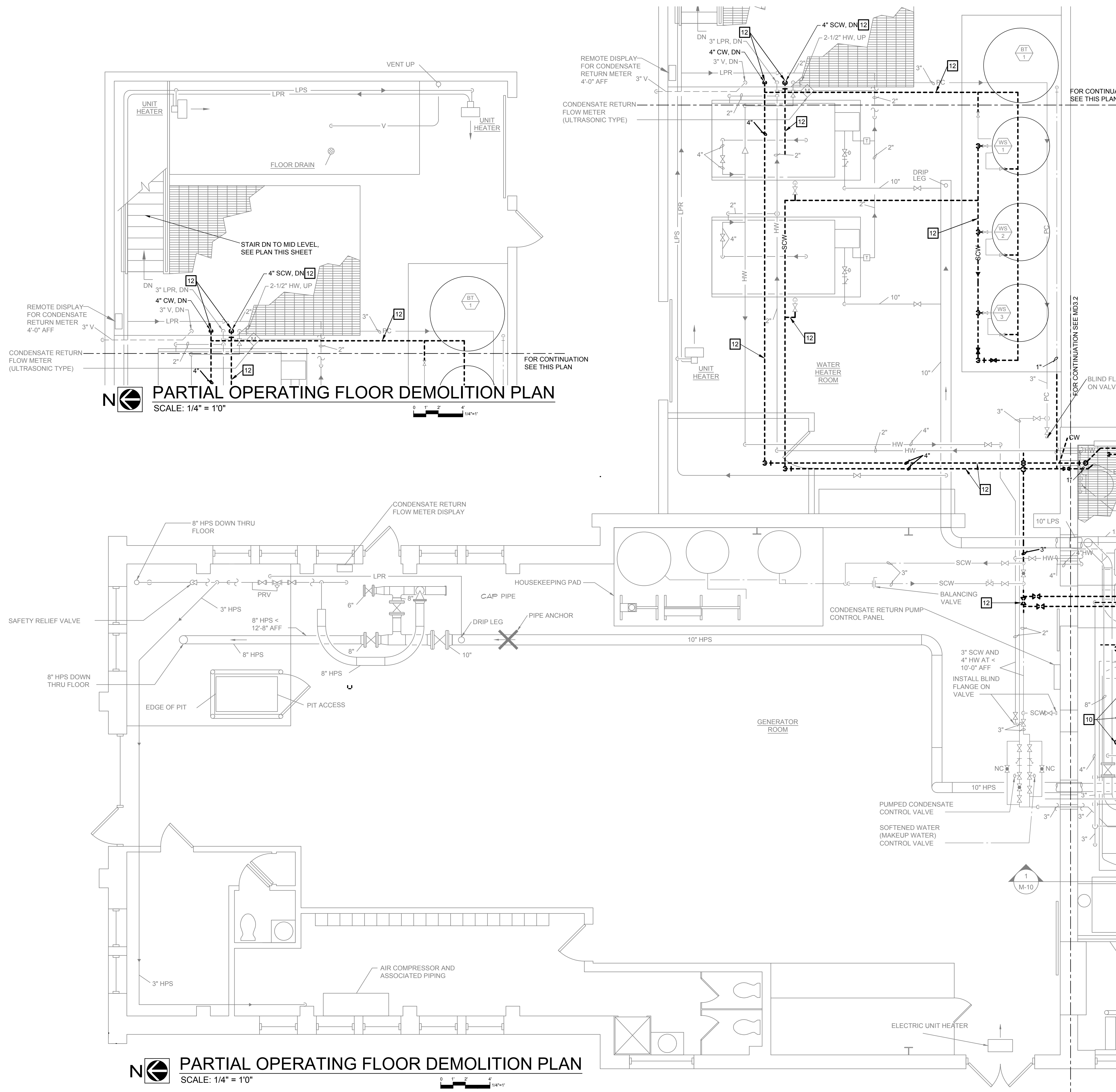
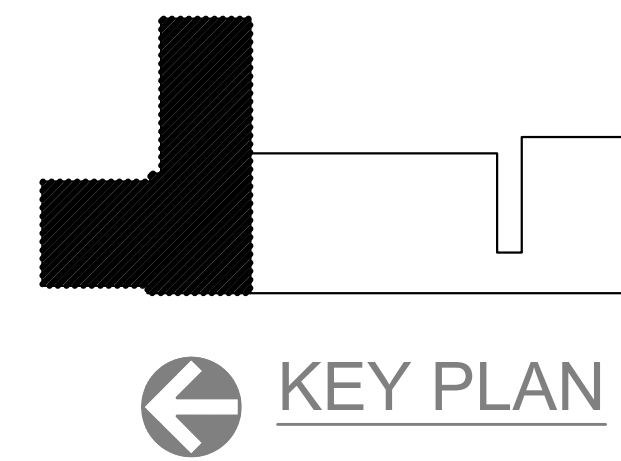


LOWER LEVEL PIT DEMOLITION PLAN
SCALE: 1/4" = 1'0"
0 1' 2' 4' 1/4"=1'



MID LEVEL PIT DEMOLITION PLAN
SCALE: 1/4" = 1'0"
0 1' 2' 4' 1/4"=1'

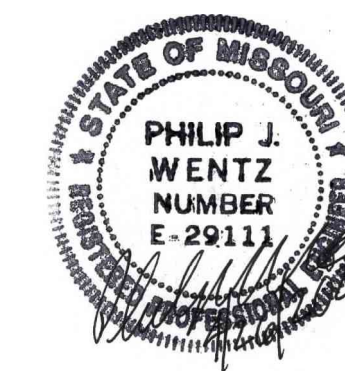
- DEMOLITION KEYED NOTES: (MD3.0, MD3.1, MD3.2, MD3.3)**
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 - DEMOLISH PIPING AS SHOWN.
 - ABANDON SCW IN PLACE.



PARTIAL OPERATING FLOOR DEMOLITION PLAN
SCALE: 1/4" = 1'0"
0 1' 2' 4' 1/4"=1'

PARTIAL OPERATING FLOOR DEMOLITION PLAN
SCALE: 1/4" = 1'0"
0 1' 2' 4' 1/4"=1'

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1012 WEST COLUMBIA STREET
FARMINGTON, MO 63640

PROJECT # C2006-01
SITE# 7008
FACILITY# 9327008094

REVISION: _____
DATE: _____
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DATE: _____
ISSUE DATE: 04/26/2023

DRAWN BY: RCB
CHECKED BY: EMP
DESIGNED BY: EMP

SHEET TITLE:
**MAIN LEVEL
CENTRAL
MECHANICAL
DEMOLITION PLAN**

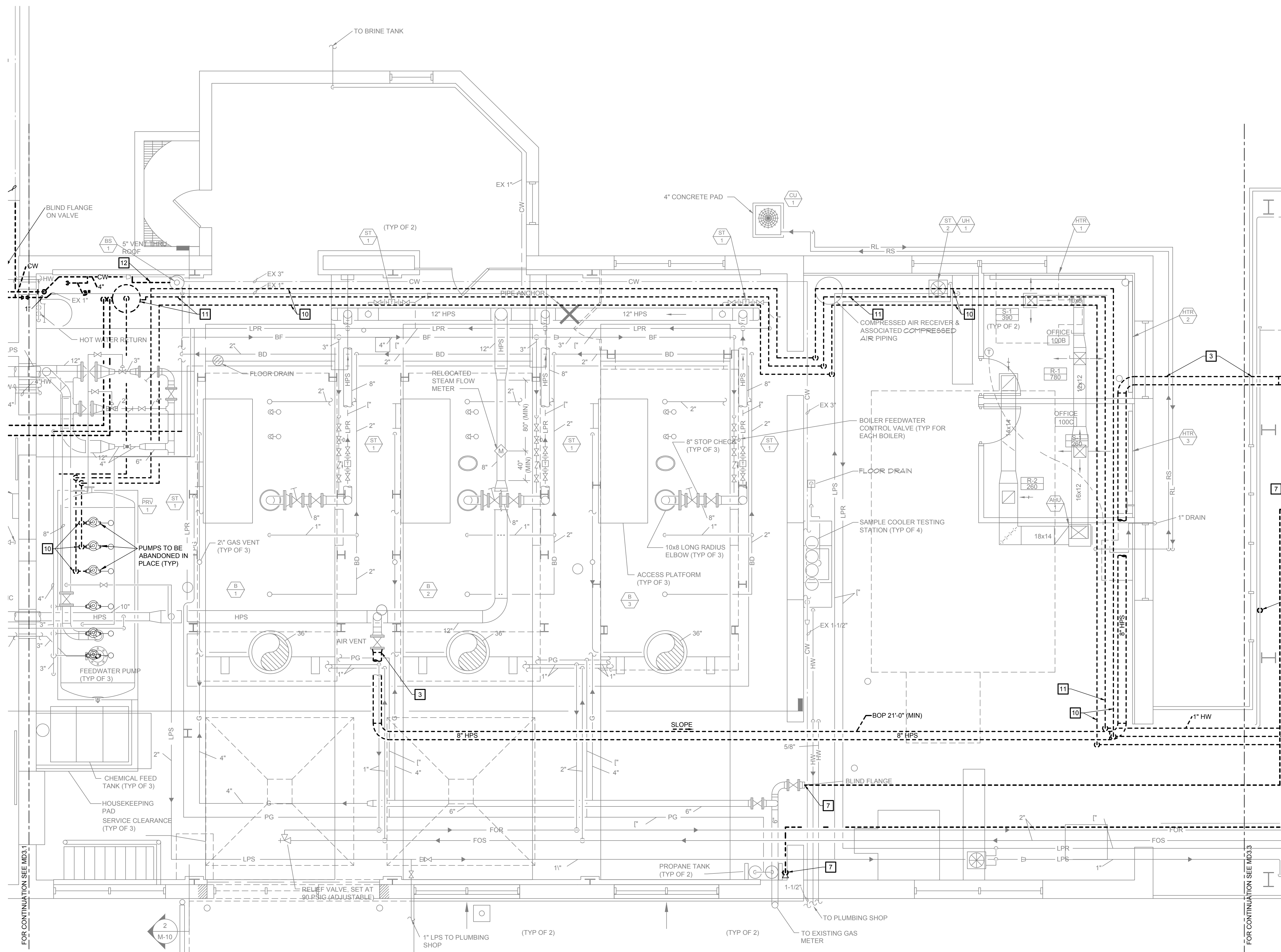
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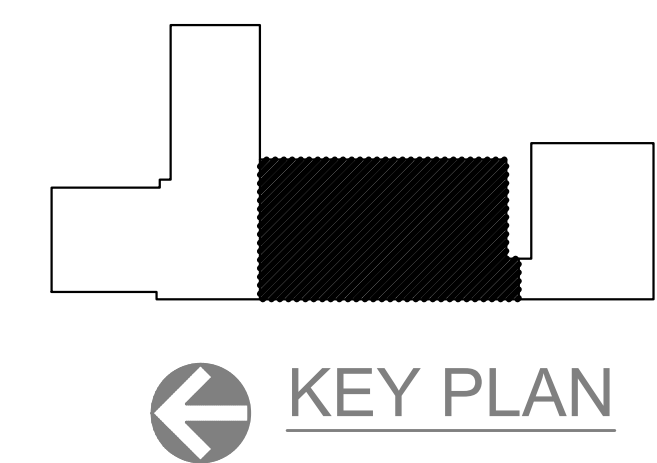
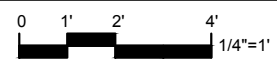
8 OF 31 SHEETS
04/26/2023

DEMOLITION KEYED NOTES:
(MD3.0, MD3.1, MD3.2, MD3.3)

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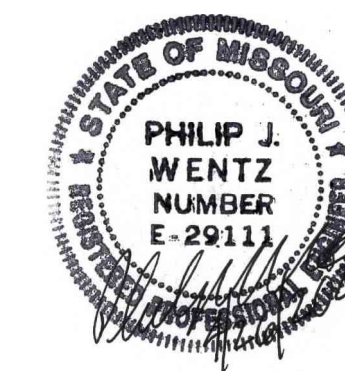


PARTIAL OPERATING FLOOR DEMOLITION PLAN
SCALE: 1/4" = 1'0"



KEY PLAN

S:\075108.000 FARMINGTON CORRECTIONAL CENTER BOILERS\03 MECHANICAL\MD3.1-3-3-075108.000.dwg 2023-4-19 09:20 Cbockenstette



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DEPARTMENT OF
CORRECTIONS

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FARMINGTON CORRECTIONAL
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1012 WEST COLUMBIA STREET
FARMINGTON, MO 63640

PROJECT # C2006-01
SITE# 7008
FACILITY# 9327008094

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DATE: _____
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ISSUE DATE: 04/26/2023

DRAWN BY: RCB
CHECKED BY: EMP
DESIGNED BY: EMP

SHEET TITLE:
**MAIN LEVEL
SOUTH MECHANICAL
DEMOLITION PLAN**

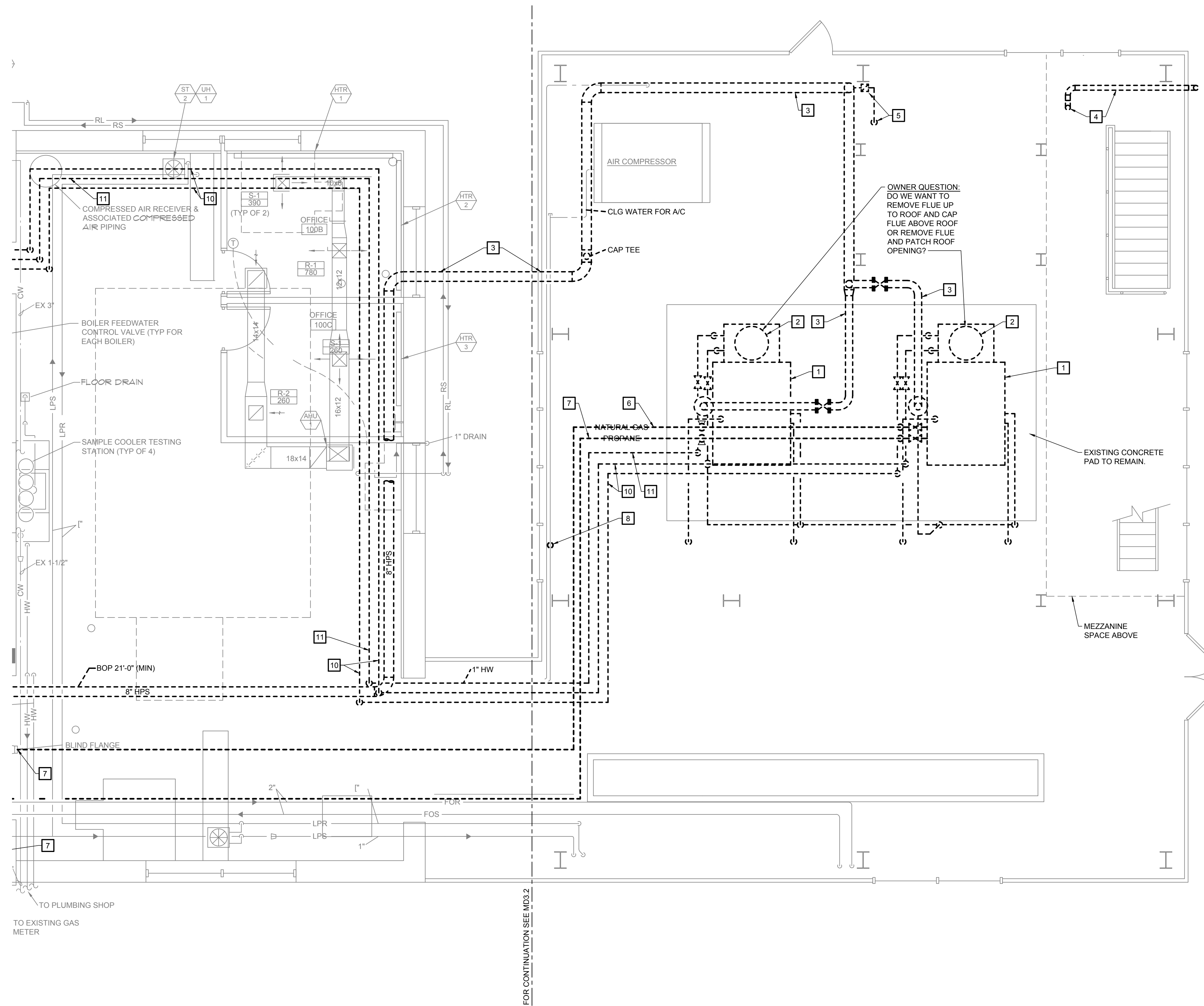
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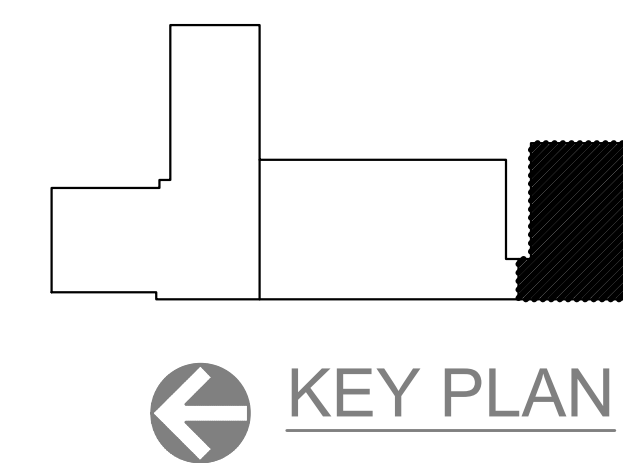
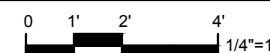
9 OF 31 SHEETS
04/26/2023

DEMOLITION KEYED NOTES:
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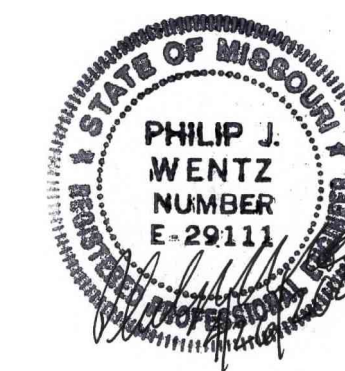


PARTIAL OPERATING FLOOR DEMOLITION PLAN
SCALE: 1/4" = 1'0"



KEY PLAN

S:\075108.000 FARMINGTON CORRECTIONAL CENTER BOILERS\03 MECHANICAL\MD3.1+3-3-075108.000.dwg 2023-4-19 09:20 Cbockenstette



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ISSUE DATE: 04/26/2023

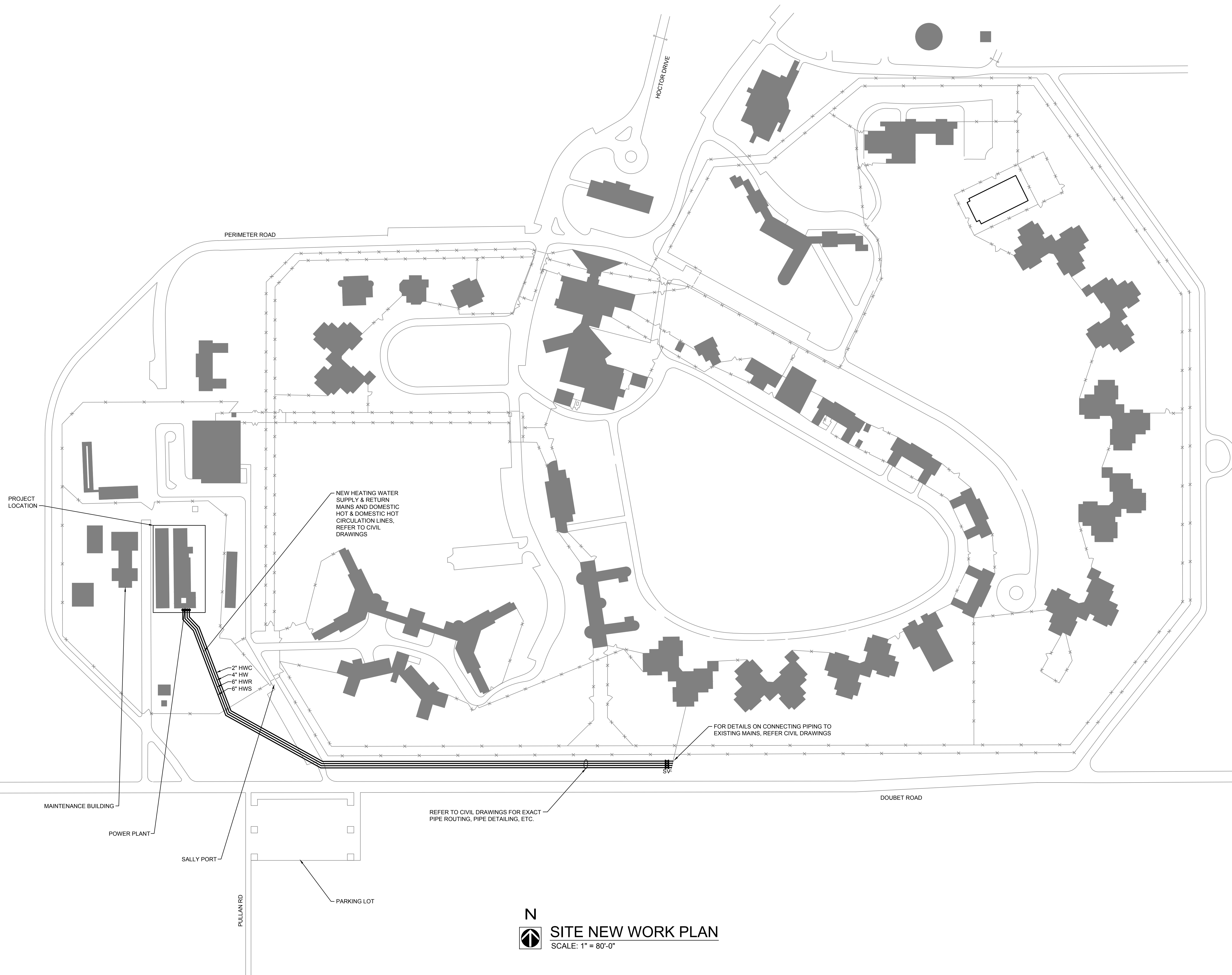
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CHECKED BY: EMP
DESIGNED BY: EMP

SHEET TITLE:
**SITE NEW
WORK PLAN**

SHEET NUMBER:

M1.1

10 OF 31 SHEETS
04/26/2023



N
SITE NEW WORK PLAN
SCALE: 1" = 80'-0"



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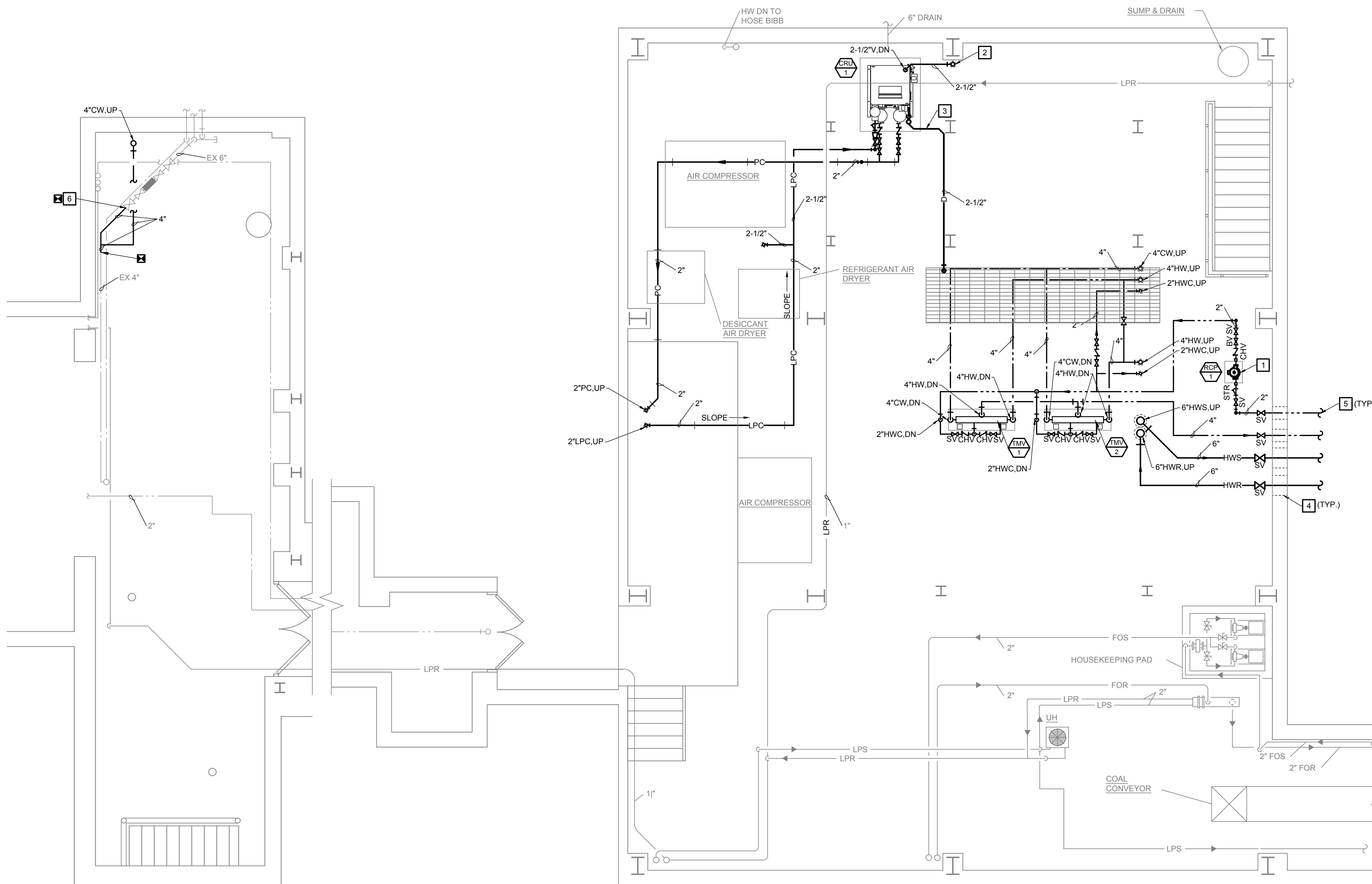
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**LOWER LEVEL
SOUTH MECHANICAL
NEW WORK PLAN**

SHEET NUMBER:

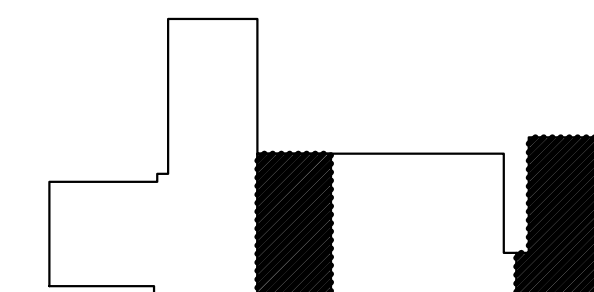
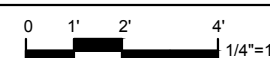
M3.0

11 OF 31 SHEETS
04/26/2023

- KEYED NOTES**
- 1 REFER TO DOMESTIC HOT WATER FLOW DIAGRAM FOR PUMP CONNECTIONS AND APPURTENANCES.
 - 2 2-1/2" VENT UP TO FIRST FLOOR. SEE SHEET M3.3 FOR CONTINUATION.
 - 3 PIPE OVERFLOW TO TRENCH.
 - 4 ROUTE PIPING OUT BASEMENT WALL BELOW EXTERIOR GRADE. SEAL WALL PENETRATIONS WATER TIGHT (TYP)
 - 5 FOR CONTINUATION, SEE SITE PLAN ON M1.1.
 - 6 CONNECT TO EXISTING DOMESTIC WATER PIPING DOWNSTREAM OF BACKFLOW PREVENTER.



PARTIAL OPERATING FLOOR NEW WORK PLAN
SCALE: 1/4" = 1'0"



KEY PLAN



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BOILER UPGRADES

FARMINGTON CORRECTIONAL
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FARMINGTON, MO 63640

PROJECT # C2006-01
SITE# 7008
FACILITY# 9327008094

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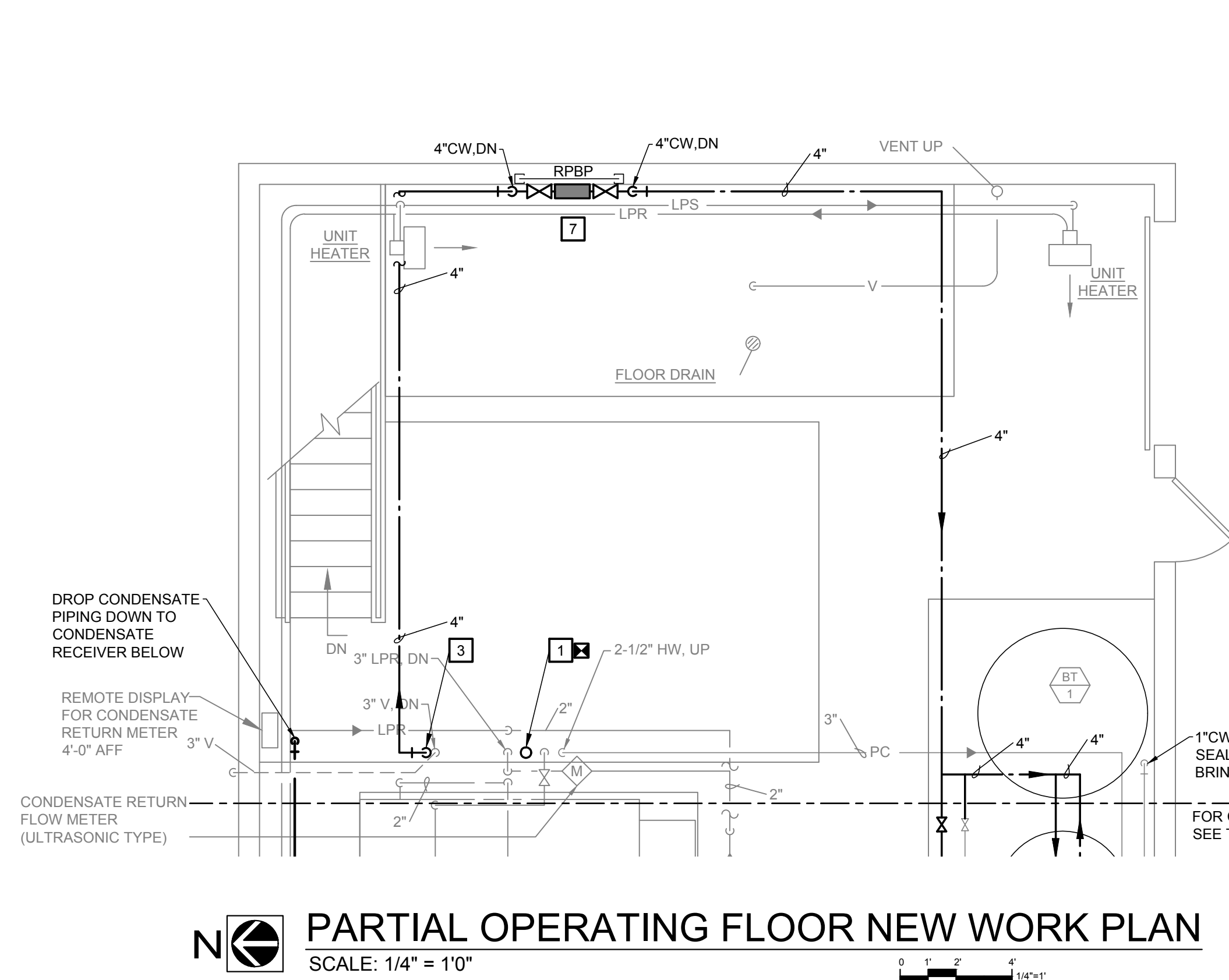
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SHEET TITLE:
**MAIN LEVEL
NORTH MECHANICAL
NEW WORK PLAN**

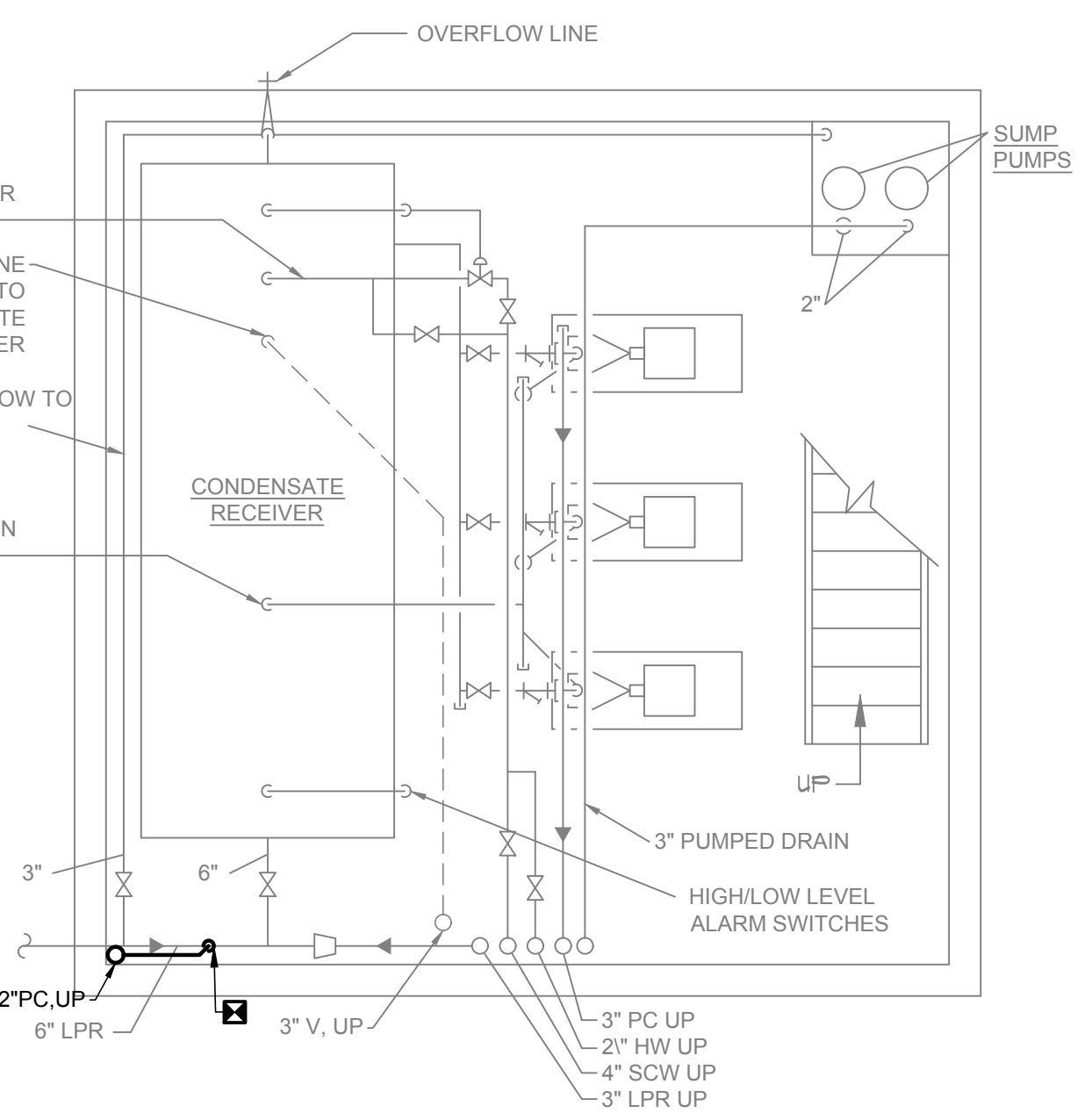
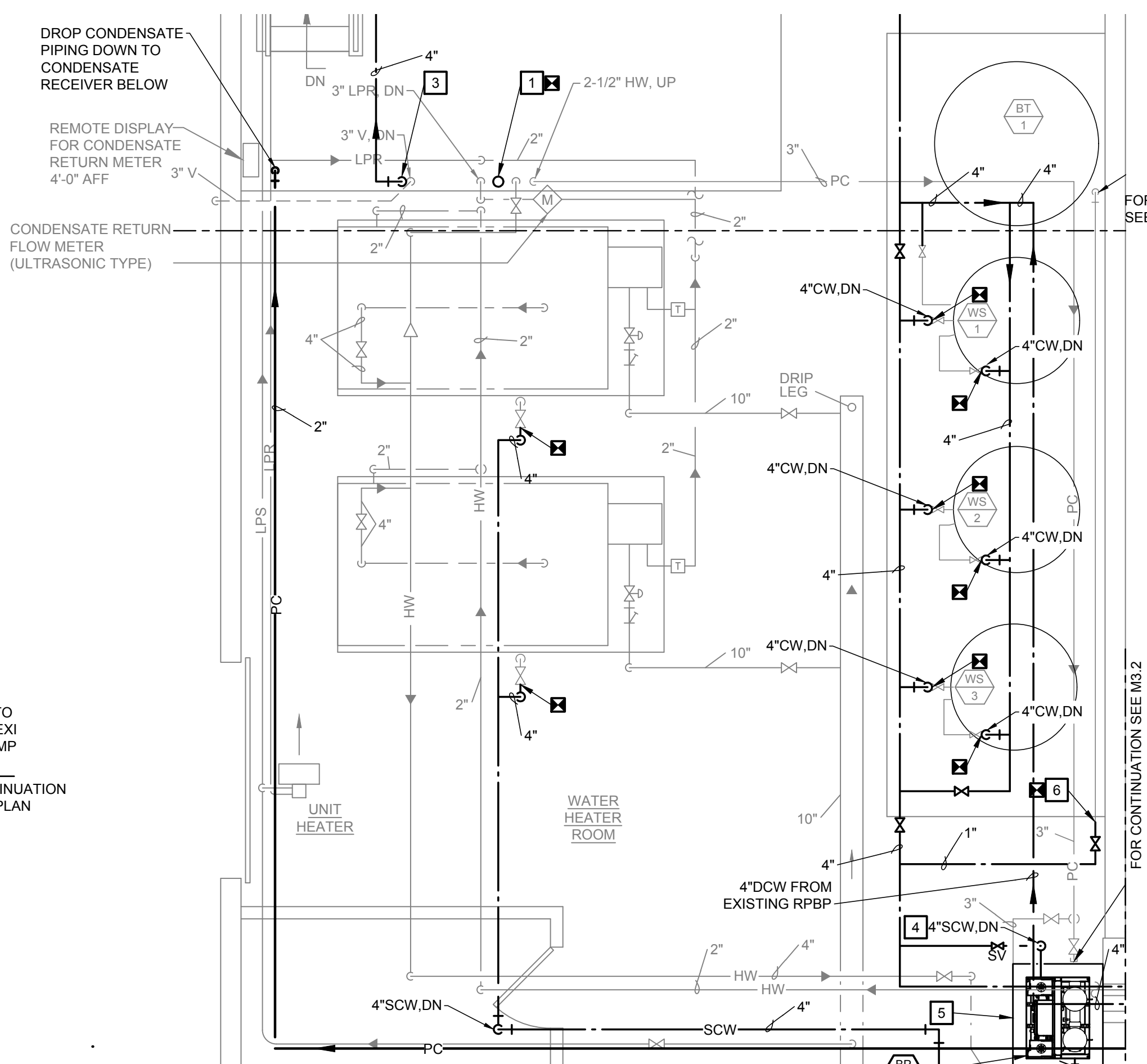
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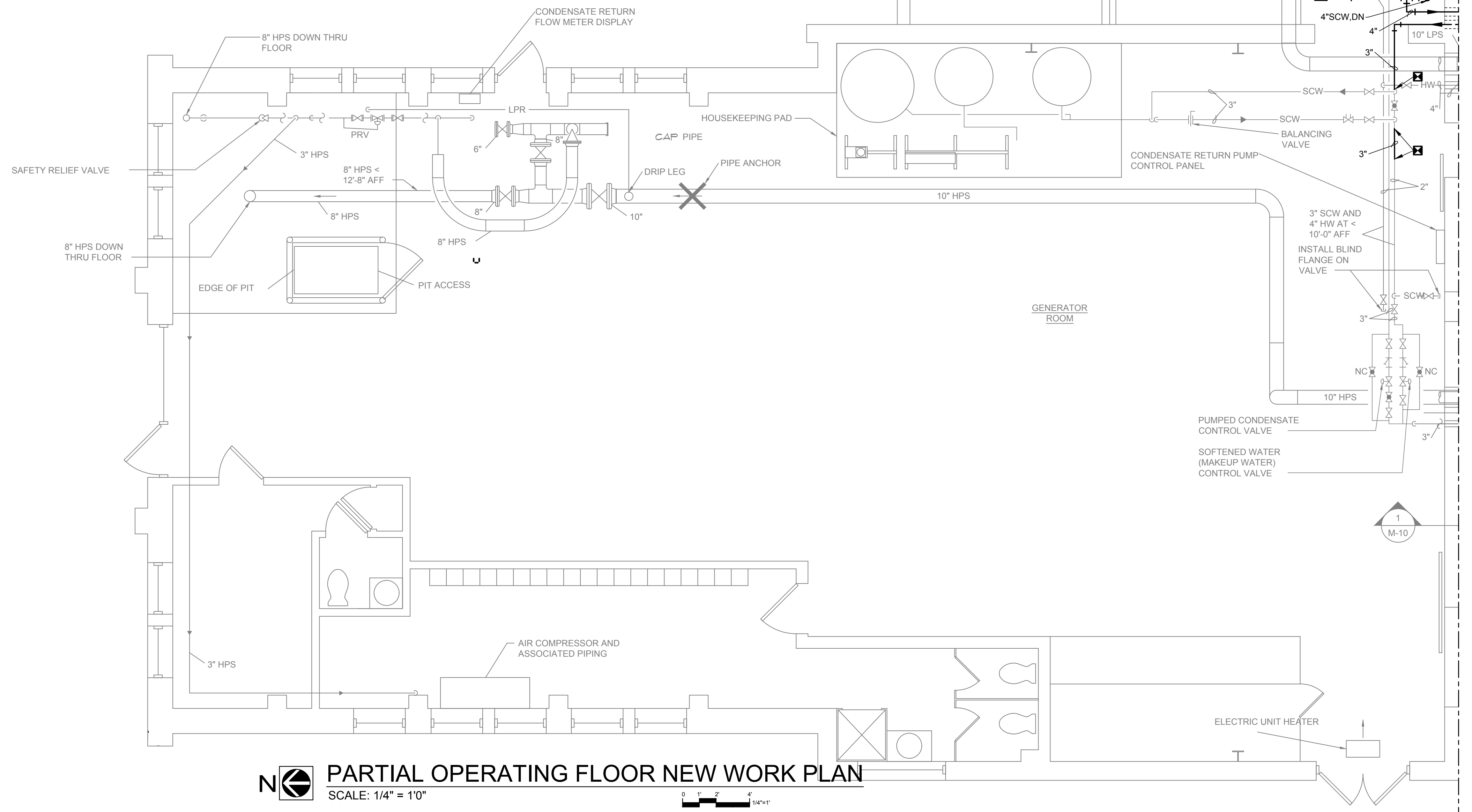
12 OF 31 SHEETS
04/26/2023



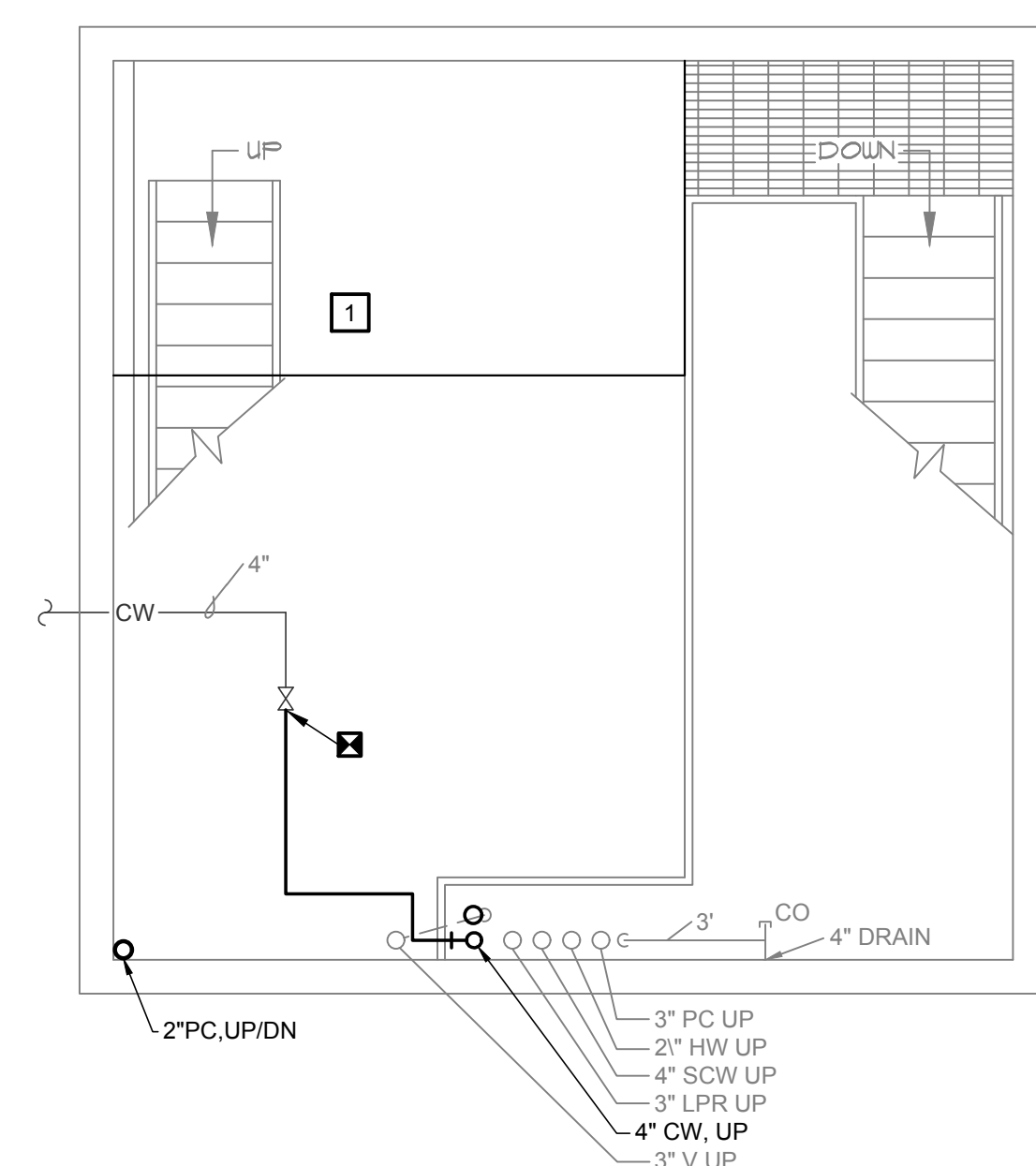
PARTIAL OPERATING FLOOR NEW WORK PLAN
SCALE: 1/4" = 1'0"



LOWER LEVEL PIT PLAN
SCALE: 1/4" = 1'0"



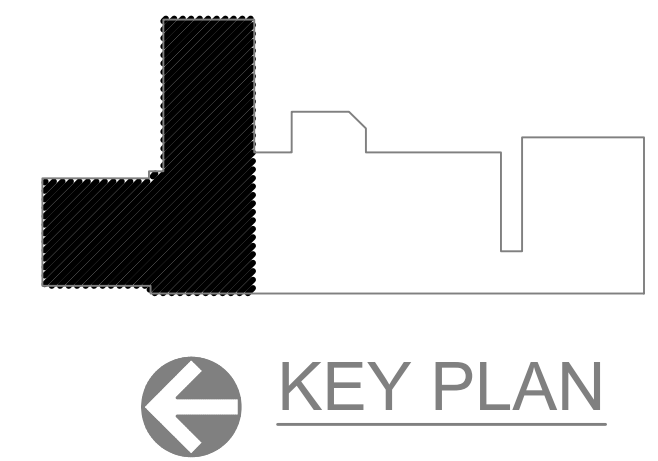
PARTIAL OPERATING FLOOR NEW WORK PLAN
SCALE: 1/4" = 1'0"



MID LEVEL PIT PLAN
SCALE: 1/4" = 1'0"

KEYED NOTES

- 1 CAP ABANDON 4" SCW PIPING AT VALVE.
- 2 CONNECT TO EXISTING PIPING WITH DIELECTRIC UNION.
- 3 4" CW DOWN TO MID LEVEL.
- 4 MOUNT DUPLEX STRAINS IN VERTICAL DROPS. REFER TO DOMESTIC COLD WATER FLOW DIAGRAM.
- 5 NEW 3-1/2" HOUSE KEEPING PAD.
- 6 CONNECT TO EXISTING 1" SERVING WET SEAL ON EXISTING BRINE PUMP.
- 7 4" RPBP MOUNTED ON CONCRETE CURB WITH STANDS. ROUTE DRAIN TO FLOOR DRAIN.



KEY PLAN

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SHEET TITLE:
**MAIN LEVEL
SOUTH MECHANICAL
NEW WORK PLAN**

SHEET NUMBER:

M3.3

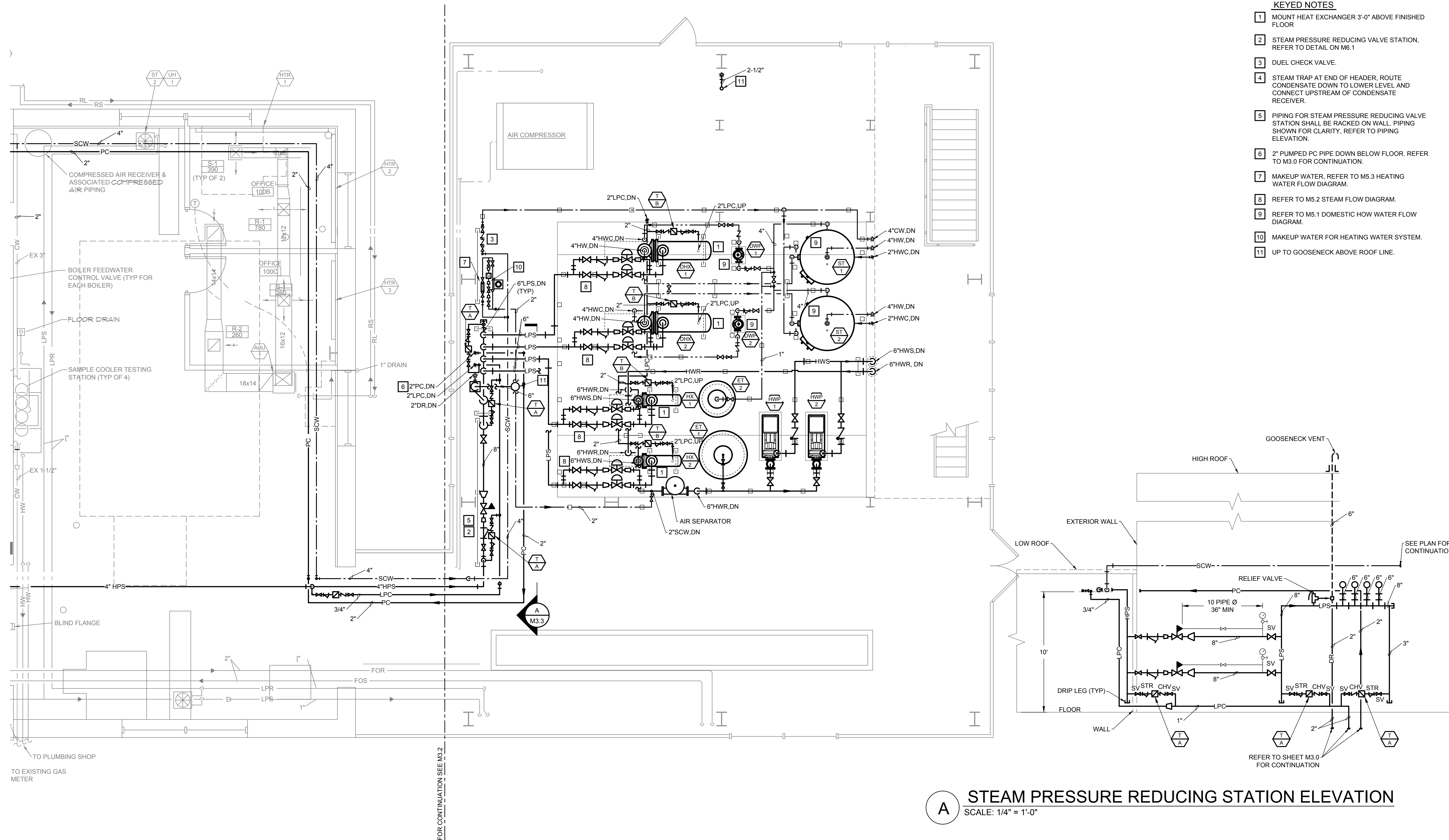
14 OF 31 SHEETS
04/26/2023

GENERAL NOTES

1. PIPING IN THIS AREA TO BE SUPPORTED FROM THE FLOOR. BOTTOM OF PIPING MINIMUM HEIGHT ABOVE FLOOR TO BE 8'-0".
2. PROPOSED PIPE SUPPORT, DELEGATED DESIGN. (TYP.)
3. PROPOSED HEAT EXCHANGER SUPPORT, DELEGATED DESIGN. (TYP.)

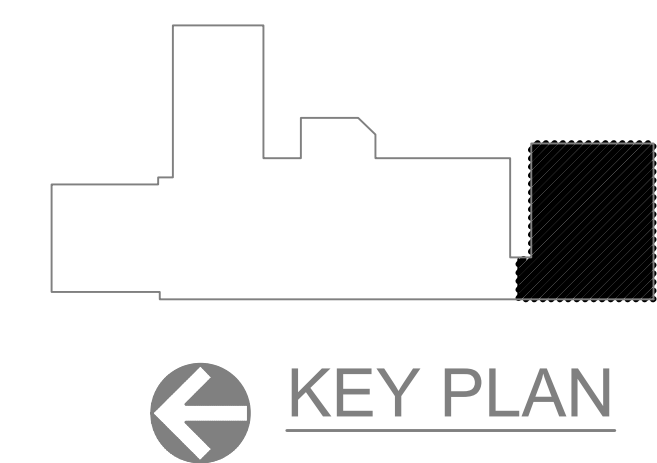
KEYED NOTES

- 1 MOUNT HEAT EXCHANGER 3'-0" ABOVE FINISHED FLOOR
- 2 STEAM PRESSURE REDUCING VALVE STATION. REFER TO DETAIL ON M6.1
- 3 DUEL CHECK VALVE.
- 4 STEAM TRAP AT END OF HEADER, ROUTE CONDENSATE DOWN TO LOWER LEVEL AND CONNECT UPSTREAM OF CONDENSATE RECEIVER.
- 5 PIPING FOR STEAM PRESSURE REDUCING VALVE STATION SHALL BE RACKED ON WALL. PIPING SHOWN FOR CLARITY, REFER TO PIPING ELEVATION.
- 6 2" PUMPED PC PIPE DOWN BELOW FLOOR. REFER TO M3.0 FOR CONTINUATION.
- 7 MAKEUP WATER. REFER TO M5.3 HEATING WATER FLOW DIAGRAM.
- 8 REFER TO M5.2 STEAM FLOW DIAGRAM.
- 9 REFER TO M5.1 DOMESTIC HOW WATER FLOW DIAGRAM.
- 10 MAKEUP WATER FOR HEATING WATER SYSTEM.
- 11 UP TO GOOSENECK ABOVE ROOF LINE.



(A) STEAM PRESSURE REDUCING STATION ELEVATION
SCALE: 1/4" = 1'-0"

PARTIAL OPERATING FLOOR NEW WORK PLAN
SCALE: 1/4" = 1'-0"



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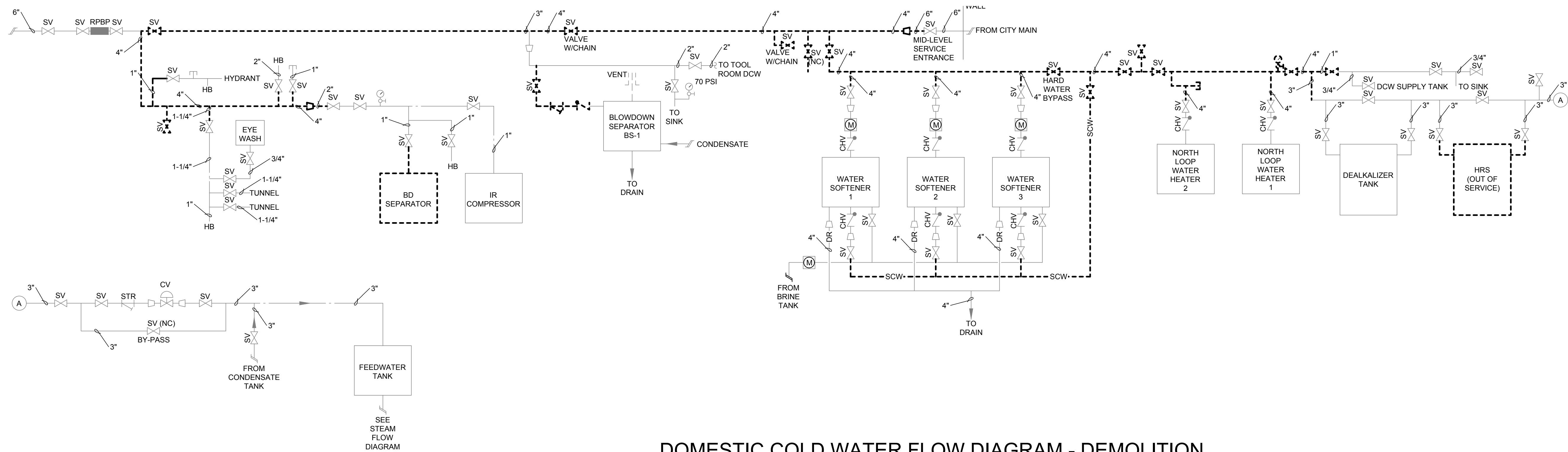
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SHEET TITLE:
**DOMESTIC COLD
WATER FLOW
DIAGRAM**

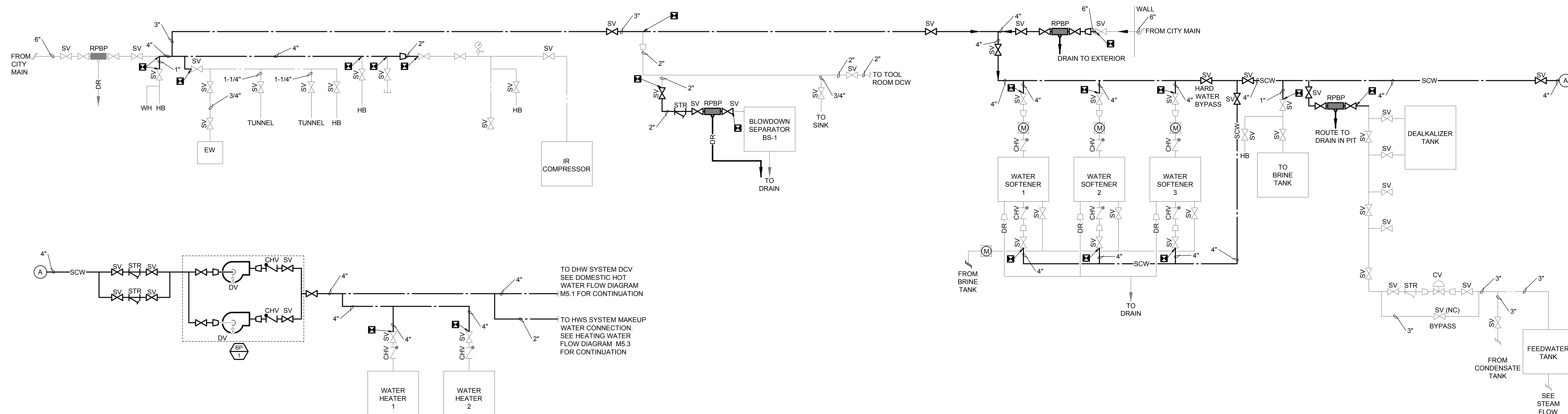
SHEET NUMBER:

M5.0

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04/26/2023



DOMESTIC COLD WATER FLOW DIAGRAM - DEMOLITION
SCALE: NONE



DOMESTIC COLD WATER FLOW DIAGRAM - NEW WORK
SCALE: NONE

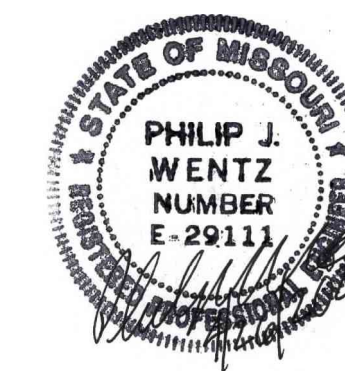
DOMESTIC COLD WATER POINTS LIST									
TYPE	NAME	DESCRIPTION	UNITS	STARTUP TREND		SERVICE TREND		FIELD DEVICE DESCRIPTION	NOTES
				FREQ	ARCHIVE	FREQ	ARCHIVE		
AI	PI-BP	BOOSTER PUMP INLET PRESSURE	PSI.0	1 MIN.	30 MIN	15 MIN.	1 WEEK	NETWORK INTERFACE TO CONTROLLED DEVICE	
AI	PO-BP	BOOSTER PUMP DISCHARGE PRESSURE	PSI.0	1 MIN.	30 MIN	15 MIN.	1 WEEK	NETWORK INTERFACE TO CONTROLLED DEVICE	
BV	AL-BP	BOOSTER PUMP ALARM	NORMAL / ALARM	1 MIN.	30 MIN	15 MIN.	1 WEEK	NETWORK INTERFACE TO CONTROLLED DEVICE	

GENERAL NOTES

- FOR ANALOG POINTS, UNITS COLUMN HAS TWO COMPONENTS: FIRST VALUE INDICATES ENGINEERING UNITS FOR POINT, SECOND VALUE IS NUMBER OF DECIMAL PLACES TO DISPLAY.
- FOR BINARY POINTS, UNITS COLUMN LISTS "OFF" AND "ON" STATE LABELS FOR POINT.

BI BINARY INPUT
BO BINARY OUTPUT
BV BINARY VIRTUAL POINT
AI ANALOG INPUT
AO ANALOG OUTPUT
AV ANALOG VIRTUAL POINT
HW HARD WIRED INTERLOCK/SAFETY
COS CHANGE OF STATE

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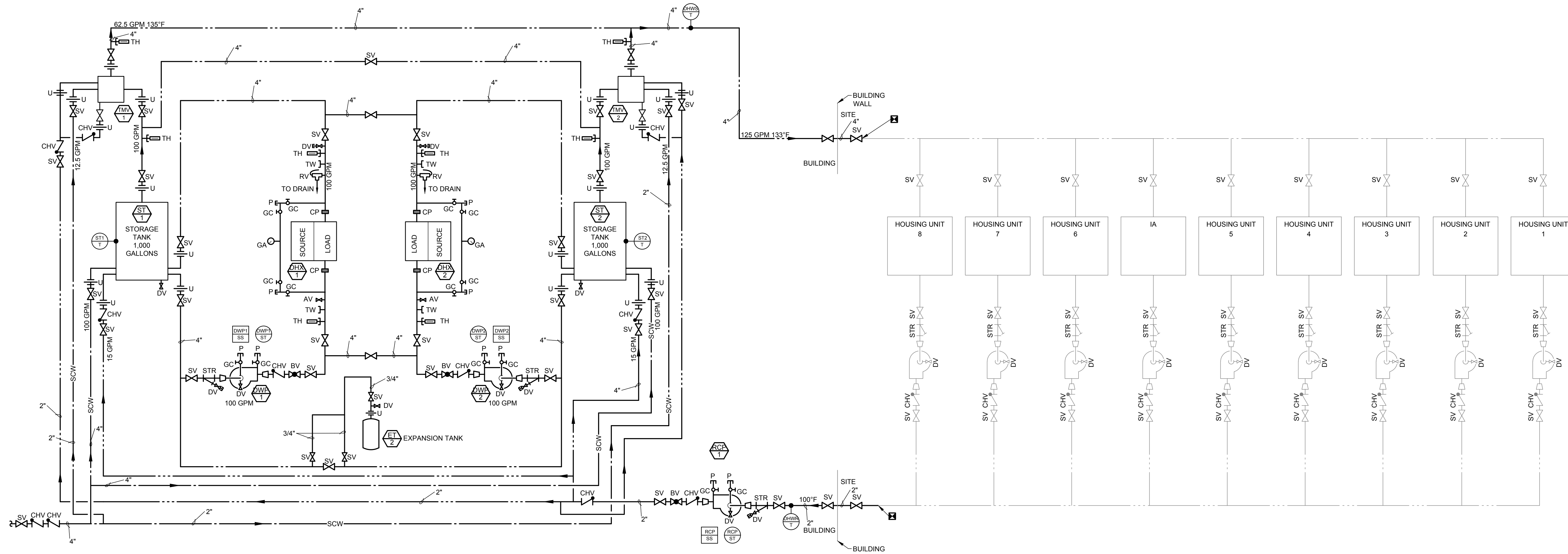
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SHEET TITLE:
**DOMESTIC HOT
WATER FLOW
DIAGRAM**

SHEET NUMBER:

M5.1

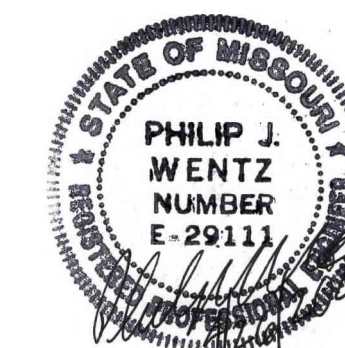
16 OF 31 SHEETS
04/26/2023



DOMESTIC HOT WATER FLOW DIAGRAM
SCALE: NONE

DOMESTIC HOT WATER POINTS LIST										
POINT DESCRIPTION				STARTUP TREND		SERVICE TREND		FIELD DEVICE DESCRIPTION		NOTES
TYPE	NAME	DESCRIPTION	UNITS	FREQ	ARCHIVE	FREQ	ARCHIVE	INSTRUMENT TYPE		
DOMESTIC HOT WATER SYSTEM POINTS										
AI	T-DHWS	DOMESTIC HOT WATER SUPPLY TEMP.	°F,1	1 MIN.	30 MIN	15 MIN.	1 WEEK	INSERTION ELEMENT FLUID TEMPERATURE SENSOR	DOWNSTREAM OF MIXING VALVES	
AI	T-DHWR	DOMESTIC HOT WATER RETURN TEMP.	°F,1	1 MIN.	30 MIN	15 MIN.	1 WEEK	INSERTION ELEMENT FLUID TEMPERATURE SENSOR		
AI	T-ST1	DOMESTIC WATER HEATER TANK TEMP.	°F,1	1 MIN.	30 MIN	15 MIN.	1 WEEK	INSERTION ELEMENT FLUID TEMPERATURE SENSOR		
AI	T-ST2	DOMESTIC WATER HEATER TANK TEMP.	°F,1	1 MIN.	30 MIN	15 MIN.	2 WEEK	INSERTION ELEMENT FLUID TEMPERATURE SENSOR		
DOMESTIC HOT WATER PUMP POINTS										
BO	DWP1-SS	PUMP ENABLE	OFF / ON	1 MIN.	30 MIN	15 MIN.	1 WEEK	DRY CONTACT / RELAY		
BI	DWP1-ST	HOT WATER SUPPLY PUMP STATUS	OFF / ON	1 MIN.	30 MIN	15 MIN.	1 WEEK	FIXED TRIP CURRENT SWITCH		
BO	DWP2-SS	PUMP ENABLE	OFF / ON	1 MIN.	30 MIN	15 MIN.	1 WEEK	DRY CONTACT / RELAY		
BI	DWP2-ST	HOT WATER SUPPLY PUMP STATUS	OFF / ON	1 MIN.	30 MIN	15 MIN.	1 WEEK	FIXED TRIP CURRENT SWITCH		
<p>BI BINARY INPUT BO BINARY OUTPUT BV BINARY VIRTUAL POINT AI ANALOG INPUT AO ANALOG OUTPUT AV ANALOG VIRTUAL POINT HW HARD WIRED INTERLOCK/SAFETY COS CHANGE OF STATE</p> <p>GENERAL NOTES 1. FOR ANALOG POINTS, UNITS COLUMN HAS TWO COMPONENTS: FIRST VALUE INDICATES ENGINEERING UNITS FOR POINT, SECOND VALUE IS NUMBER OF DECIMAL PLACES TO DISPLAY. 2. FOR BINARY POINTS, UNITS COLUMN LISTS "OFF" AND "ON" STATE LABELS FOR POINT.</p>										

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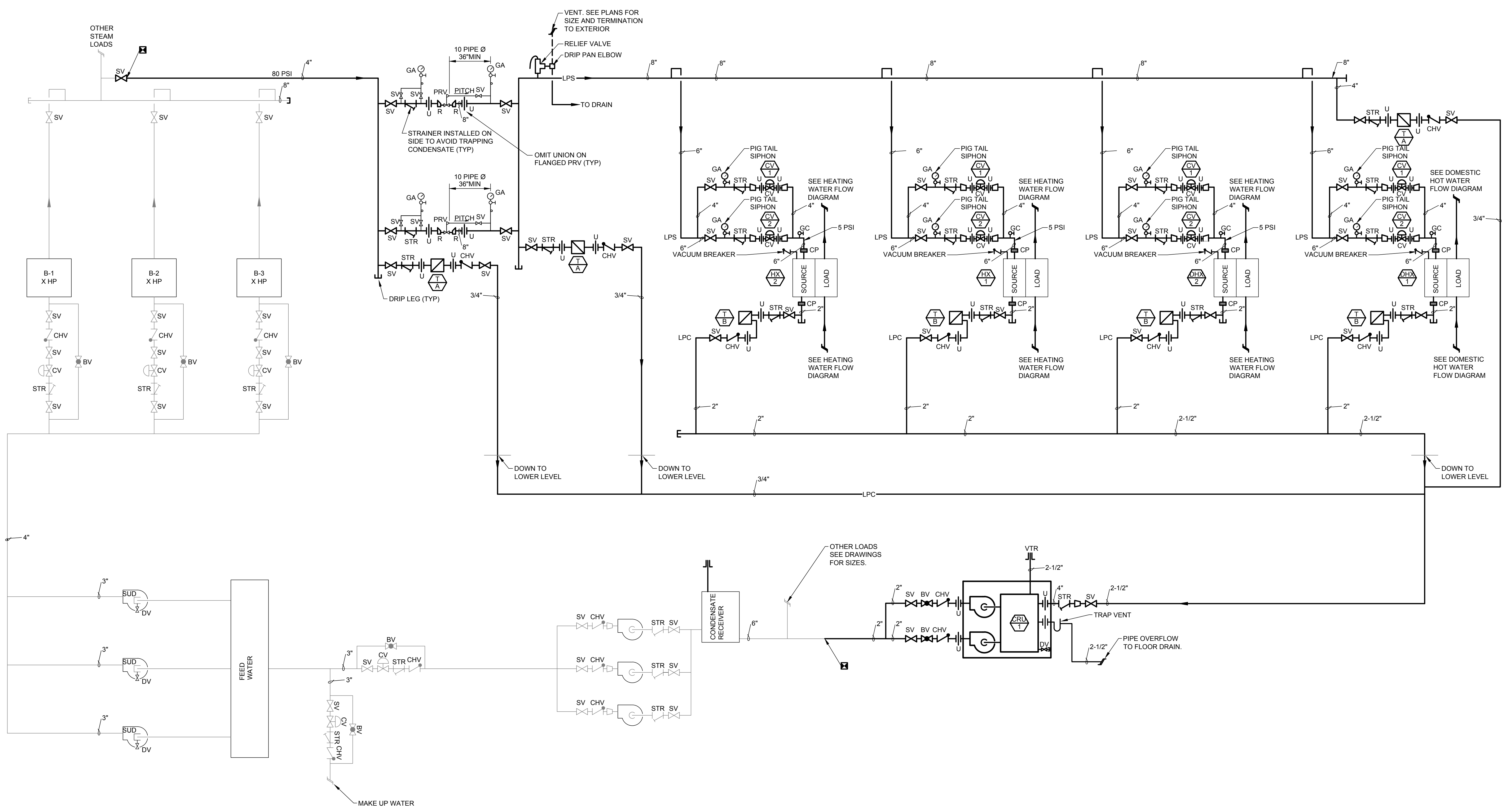
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SHEET TITLE:
**STEAM FLOW
DIAGRAM**

SHEET NUMBER:

M5.2

17 OF 31 SHEETS
04/26/2023



STEAM FLOW DIAGRAM
SCALE: NONE

		POINT DESCRIPTION			STARTUP TREND		SERVICE TREND		FIELD DEVICE DESCRIPTION		NOTES
TYPE	NAME	DESCRIPTION	UNITS	FREQ	ARCHIV E	FREQ	ARCHIV E	INSTRUMENT TYPE			
AO	CV-1	ONE THIRD FLOW STEAM CONTROL VALVE	DEG. 0	1 MIN.	30 MIN	15 MIN.	1 WEEK	SEE CONTROL VALVE SCHEDULE		TYP FOR ALL HEAT EXCHANGERS	
AO	CV-2	TWO THIRDS FLOW STEAM CONTROL VALVE	DEG. 0	1 MIN.	30 MIN	15 MIN.	1 WEEK	SEE CONTROL VALVE SCHEDULE		TYP FOR ALL HEAT EXCHANGERS	
BV	HWL-AL	CONDENSATE RECEIVER HIGH WATER LEVEL ALARM	NORMAL / ALARM	1 MIN.	30 MIN	15 MIN.	1 WEEK	HARDWIRED POINT TO CONTROLLED DEVICE			
BI	BINARY INPUT										
BO	BINARY OUTPUT										
BV	BINARY VIRTUAL POINT										
AI	ANALOG INPUT										
AO	ANALOG OUTPUT										
AV	ANALOG VIRTUAL POINT										
HW	HARD WIRED INTERLOCK/SAFETY										
COS	CHANGE OF STATE										
<p>GENERAL NOTES</p> <p>1. FOR ANALOG POINTS, UNITS COLUMN HAS TWO COMPONENTS: FIRST VALUE INDICATES ENGINEERING UNITS FOR POINT, SECOND VALUE IS NUMBER OF DECIMAL PLACES TO DISPLAY.</p> <p>2. FOR BINARY POINTS, UNITS COLUMN LISTS "OFF" AND "ON" STATE LABELS FOR POINT.</p>											

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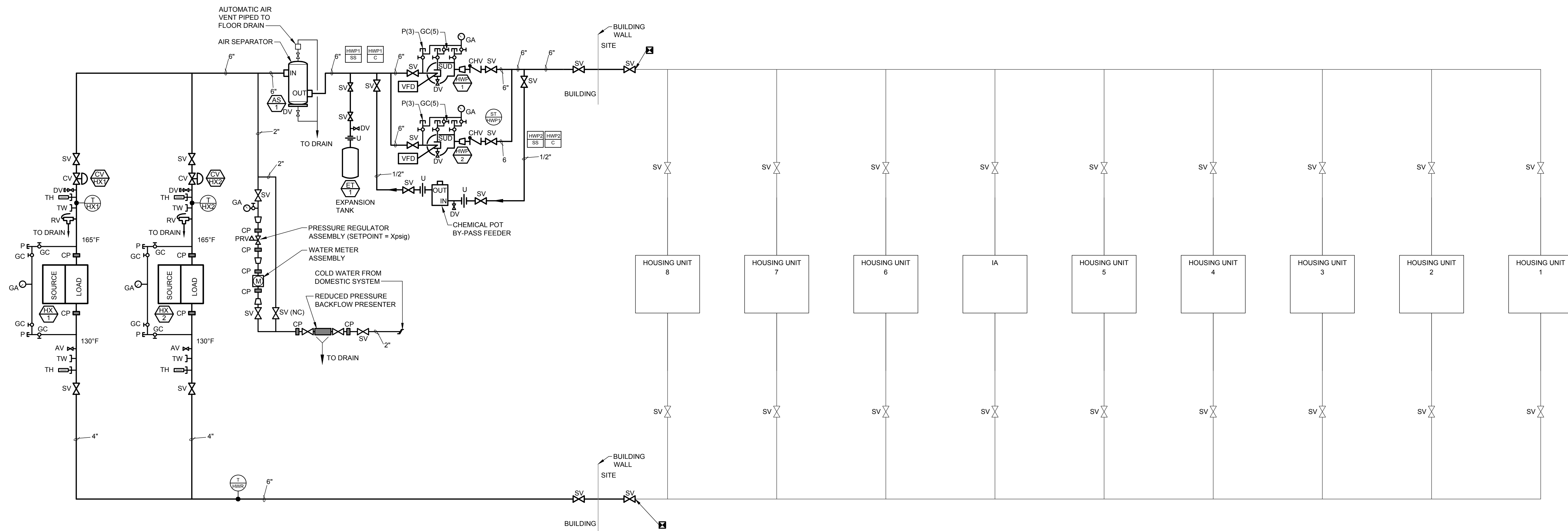
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SHEET TITLE:
**HEATING WATER
FLOW DIAGRAM**

SHEET NUMBER:

M5.3

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04/26/2023



HEATING WATER FLOW DIAGRAM

SCALE: NONE

HEATING HOT WATER POINTS LIST

TYPE	NAME	DESCRIPTION	UNITS	STARTUP TREND			SERVICE TREND			FIELD DEVICE DESCRIPTION	NOTES
				FREQ	ARCHIVE		FREQ	ARCHIVE			
GLOBAL POINTS (TO BE MAPPED TO OTHER CONTROLLERS)											
AI	OA-T	OUTSIDE AIR TEMPERATURE	°F,1	-	-	-	-	-	OUTDOOR AIR TEMPERATURE SENSOR	EXISTING TEMP SENSOR TIED INTO EXISTING BAS	
HEATING WATER HEAT EXCHANGER POINTS											
AI	HX1-T	HX 1 LEAVING WATER TEMPERATURE	°F,1	1 MIN.	30 MIN.	15 MIN.	1 WEEK		INSERTION ELEMENT FLUID TEMPERATURE SENSOR		
AI	HX2-T	HX 2 LEAVING WATER TEMPERATURE	°F,1	1 MIN.	30 MIN.	15 MIN.	1 WEEK		INSERTION ELEMENT FLUID TEMPERATURE SENSOR		
BO	HX1-CV	HX-1 ISOLATION VALVE	CLOSED / OPEN	1 MIN.	30 MIN.	15 MIN.	1 WEEK		CONTROL VALVES		
BO	HX2-CV	HX-2 ISOLATION VALVE	CLOSED / OPEN	1 MIN.	30 MIN.	15 MIN.	1 WEEK		CONTROL VALVES		
HEATING HOT WATER SYSTEM POINTS											
AI	HWR-T	HOT WATER PLANT RETURN TEMP.	°F,1	1 MIN.	30 MIN.	15 MIN.	1 WEEK		INSERTION ELEMENT FLUID TEMPERATURE SENSOR		
AI	HWS-T	HOT WATER PLANT SUPPLY TEMP.	°F,1	1 MIN.	30 MIN.	15 MIN.	1 WEEK		INSERTION ELEMENT FLUID TEMPERATURE SENSOR		
AO	HWP1-C	HOT WATER PUMP 1 SPEED COMMAND	%,0	1 MIN.	30 MIN.	15 MIN.	1 WEEK		HARDWIRED POINT TO CONTROLLED DEVICE	4-10 mA/2-10 VDC, COORD. WITH VFD	
AO	HWP2-C	HOT WATER PUMP 2 SPEED COMMAND	%,0	1 MIN.	30 MIN.	15 MIN.	1 WEEK		HARDWIRED POINT TO CONTROLLED DEVICE	4-10 mA/2-10 VDC, COORD. WITH VFD	
AV	HWP1-HZ	HOT WATER PUMP 1 SPEED FEEDBACK	HZ,0	1 MIN.	30 MIN.	15 MIN.	1 WEEK		NETWORK INTERFACE TO CONTROLLED DEVICE		
AV	HWP2-HZ	HOT WATER PUMP 2 SPEED FEEDBACK	HZ,0	1 MIN.	30 MIN.	15 MIN.	1 WEEK		NETWORK INTERFACE TO CONTROLLED DEVICE		
BI	HWP1-ST	HOT WATER PUMP 1 STATUS	OFF / ON	1 MIN.	30 MIN.	15 MIN.	1 WEEK		FIXED TRIP CURRENT SWITCH		
BI	HWP2-ST	HOT WATER PUMP 2 STATUS	OFF / ON	1 MIN.	30 MIN.	15 MIN.	1 WEEK		FIXED TRIP CURRENT SWITCH		
BO	HWP1-SS	HOT WATER PUMP 1 ENABLE	OFF / ON	1 MIN.	30 MIN.	15 MIN.	1 WEEK		DRY CONTACT / RELAY		
BO	HWP2-SS	HOT WATER PUMP 2 ENABLE	OFF / ON	1 MIN.	30 MIN.	15 MIN.	1 WEEK		DRY CONTACT / RELAY		
<p>GENERAL NOTES</p> <p>1. FOR ANALOG POINTS, UNITS COLUMN HAS TWO COMPONENTS: FIRST VALUE INDICATES ENGINEERING UNITS FOR POINT, SECOND VALUE IS NUMBER OF DECIMAL PLACES TO DISPLAY.</p> <p>2. FOR BINARY POINTS, UNITS COLUMN LISTS "OFF" AND "ON" STATE LABELS FOR POINT.</p>											

BI BINARY INPUT
BO BINARY OUTPUT
BV BINARY VIRTUAL POINT
AI ANALOG INPUT
AO ANALOG OUTPUT
AV ANALOG VIRTUAL POINT
HW HARD WIRED INTERLOCK/SAFETY
COS CHANGE OF STATE



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SHEET TITLE:
**STEAM BOILER
BURNER AND
CONTROLS
SCHEMATIC**

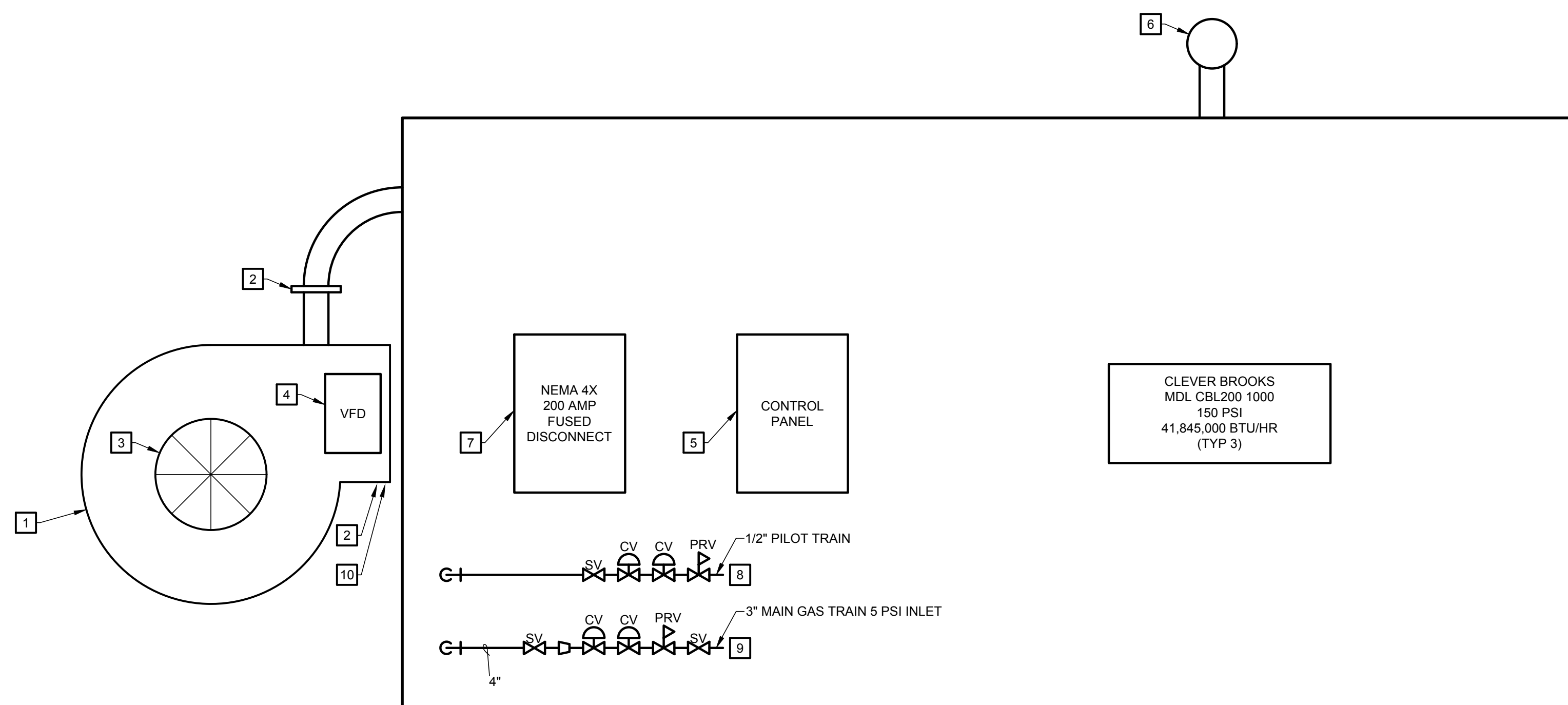
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M5.4

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04/26/2023

KEYED NOTES

- 1 REPLACE EXISTING BURNERS WITH NATURAL GAS/ AIR ATOMIZED #3 OIL BURNER. BOILERS 1 & 3 42,000 MBTU/HR 30 PPM NOX EMISSION LEVEL ON GAS 60 HP BLOWER MOTOR 15 HP COMPRESSOR MOTOR WITH FULL MODULATION OPEN DAMPER PRE-PURGE MODULATION CONTROL AND PARALLEL POSITIONING. BOILER 2 31,500 MBTU/HR 30 PPM NOX EMISSION LEVEL ON GAS 75 HP BLOWER MOTOR 15 HP COMPRESSOR MOTOR WITH FULL MODULATION OPEN DAMPER PRE-PURGE MODULATION CONTROL AND PARALLEL POSITIONING.
- 2 REPLACE COMBUSTION AIR DAMPER, GAS RECIRCULATION DAMPER, FOR METERING VALVE CONTROL PRELIMINARY GAS METERING CONTROL STABILIZER GAS METERING CONTROL OIL METERING CONTROL.
- 3 INSTALL NEW 60 HP BLOWER (BOILERS 1&3) AND 75 HP BLOWER (B2).
- 4 INSTALL NEW 60 HP VFD (BOILERS 1&3) AND 75 HP VFD(B2) VFD BY BURNER MANUFACTURER.
- 5 REPLACE BURNER CONTROLLER AND FLAME DETECTION. PROVIDE 4" HMI COLOR TOUCH SCREEN ON PANEL DOOR.
- 6 REPLACE LOAD CONTROL SENSOR (0-200 PSI) ANALOG OUTPUT.
- 7 PROVIDE SINGLE POINT POWER 200 AMP FUSED DISCONNECT WITH MAIN FUSES AND FEEDER DISTRIBUTION BUS IN-LINE FUSES TO PROTECT ALL MOTORS. PROVIDE 460/3 TO 115/1 LINE VOLTAGE TRANSFORMER.
- 8 REPLACE PILOT GAS TRAIN, DUAL PILOT CONTROL VALVES, AND MANUAL BALL VALVE.
- 9 REPLACE MAIN GAS TRAIN. DUAL MOTORIZED VALVE BODY WITH INTEGRATED REGULATION GAS TRAIN, UPSTREAM AND DOWNSTREAM BALL VALVES, HIGH AND LOW GAS PRESSURE SWITCHES, VENT VALVE, LEAK TEST COCKS AND MANUAL VALVE FOR VENT.
- 10 REPLACE OIL VALVE TRAIN. 1/2" SAFETY SHUT-OFF VALVE, MOTORIZED 3-WAY VALVE, MOTORIZED 2-WAY VALVE LOW LIL PRESSURE SWITCH.



STEAM BOILER BURNER AND CONTROLS SCHEMATIC

SCALE: NONE



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OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF CORRECTIONS

BOILER UPGRADES

FARMINGTON CORRECTIONAL CENTER

1012 WEST COLUMBIA STREET
FARMINGTON, MO 63640

PROJECT # C2006-01

SITE# 7008

FACILITY# 9327008094

REVISION: _____
DATE: _____
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DRAWN BY: RCB _____
CHECKED BY: EMP _____
DESIGNED BY: EMP _____

SHEET TITLE:

INTEGRATED AUTOMATION CONTROL SEQUENCES FOR HVAC

SHEET NUMBER:

M5.5

20 OF 31 SHEETS
04/26/2023

GENERAL

These sequences are intended to be performance based. Implementations that provide the same functional result using different underlying detailed logic will be acceptable.

There is an existing Automated Controls temperature control system in place that serves the campus that was installed in 2018. The intent of this project is to tie into the existing head-end system with the new systems and to update the user graphical interface to bring it up to date. A new controller will need to be provided and installed as the project documents dictate.

The term "proven" (i.e., "proven ON"/"proven OFF") shall mean that the equipment's DI status point (where pro-vided, e.g., current switch, DP switch, or VFD status) matches the state set by the equipment's DO command point.

The term "software point" shall mean an analog variable, and "software switch" shall mean a digital (binary) variable, that are not associated with real I/O points. They shall be read/write capable (e.g., BACnet analog variable and binary variable).

The term "control loop" or "loop" is used generically for all control loops. These will typically be PID loops, but proportional plus integral plus derivative gains are not required on all loops. Unless specifically indicated otherwise, the guidelines in the following subsections shall be followed.

Use proportional only (P-only) loops for limiting loops (such as zone CO2 control loops, etc.).

Do not use the derivative term on any loops unless field tuning is not possible without it.

To avoid abrupt changes in equipment operation, the output of every control loop shall be capable of being limited by a user adjustable maximum rate of change, with a default of 25% per minute.

All set points, timers, deadbands, PID gains, etc. listed in sequences shall be adjustable by the user with appropriate access level whether indicated as adjustable in sequences or not. Software points shall be used for these variables. Fixed scalar numbers shall not be embedded in programs except for physical constants and conversion factors.

Values for all points, including real (hardware) points used in control sequences shall be capable of being overridden by the user with appropriate access level (e.g., for testing and commissioning). If hardware design prevents this for hardware points, they shall be equated to a software point, and the software point shall be used in all sequences. Exceptions shall be made for machine or life safety.

Every sensor input data point shall incorporate input value filtering, a time averaged value is preferable to change of value (COV) techniques. Due to the great variety in filtering requirements based on sensed value stability and process variable use, a prescriptive specification will not be provided in this guideline requirement. Rather, this requirement is to ensure that filtering is present in some form so that it may be adjusted during system tuning and acceptance, if so required, at no additional programming or cost.

Network dependent processes should be avoided. For control processes, particularly control loops, all input sensor readings, output device operations, and logic control algorithms shall reside in a single field controller. For particularly difficult applications, or for less critical applications, network dependent processes should be presented specifically to the Engineer during the Shop Drawing submittal for review and acceptance.

Definitions:

Adjustable (Adj.): Acknowledging that all values within a DDC system are adjustable using appropriate configuration software, the use of the term adjustable or adj. in the following statements has the specific meaning that the term described will be adjustable at the GUI without the need for any software. This adjustment may be password protected to limit access to an appropriate user level, and may use an adjustment mechanism similar to point overrides.

Deadband: The difference between two setpoint or configuration values during which no output function is performed.

Differential: The range or units of measure that separate the enable point from the disable point.

Discharge Temperature: The temperature discharged from a piece of equipment, but not necessarily to an end use consumer.

Hard Wired Control: Control method using relays to enable and interrupt signals without the use of a controller.

Proportional: A set of signals that vary in a continuously linear relationship with each other. They may be direct or reverse acting.

Supply Temperature: The temperature supplied to an occupied zone or terminal equipment point of use.

Temperature: The use of the common term temperature refers specifically to the psychrometric value dry bulb temperature.

Graphics:

All graphics shall display time of day, date, and outdoor air temperature, and a schematic diagram of the system similar to the flow diagrams on the project documents.

Heating Water Plant Graphics:

The diagram of the system shall include return water temperature, leaving water temperatures, flow, pumps' status and speed, control valve positions.

Domestic Hot Water Plant Graphics

The diagram of this system shall include DHX leaving water temperature, storage tank temperature, TMV leaving water temperature, DWP status, and RCP status.

Domestic Cold Water Graphics

The diagram of this system shall include the inlet and outlet pressures at the booster pump skid.

Steam Graphics

The diagram of this system shall include the steam control valve positions.

Alarms

Maintenance Mode:

Operators shall have the ability to put any device (e.g., HX, Pump, etc) in/out of maintenance mode.

All alarms associated with a device in maintenance mode will be suppressed.

If a device is in maintenance mode, issue a daily alarm at a scheduled time indicating that the device is still in maintenance mode.

Entry Delays:

All alarms shall have an adjustable delay time such that the alarm is not triggered unless the alarm condition is TRUE for the delay time. The default entry delay shall be 30 seconds unless otherwise noted.

Exit Hysteresis:

Each alarm shall have an adjustable time-based hysteresis (default: 5 seconds) to exit the alarm. Once set, the alarm does not return to normal until the alarm conditions have ceased for the duration of the hysteresis.

Each analog alarm shall have an adjustable percent-of-limit-based hysteresis (default: 0% of the alarm threshold, i.e., no hysteresis; alarm exits at the same value as the alarm threshold) the alarmed variable required to exit the alarm. Alarm conditions have ceased when the alarmed

variable is below the triggering threshold by the amount of the hysteresis.

Latching:

Any alarm can be configured as latching or non-latching. A latching alarm requires acknowledgement from the operators before it can return to normal, even if the exit deadband has been met. A non-latching alarm does not require acknowledgment. Alarms shall be non-latching unless otherwise noted.

Post-exit Suppression Period:

To limit alarms, any alarm may have an adjustable suppression period such that, if the alarm is triggered, its post-suppression timer is triggered and the alarm may not trigger again until the post-suppression timer has expired. Default suppression periods shall be 24 hours unless otherwise noted.

For both latching and non-latching alarms, the operators may acknowledge the alarm. Acknowledging an alarm clears the alarm, the exit deadband, and suppression period. A device can go right back into alarm as soon as the entry delay elapses.

VFD Speed Points

The speed AO sent to VFDs shall be configured such that 0% speed corresponds to 0 Hz, and 100% speed corresponds to maximum speed configured in the VFD.

Minimum and maximum speeds shall be configured in the VFDs such that the controlled device cannot operate outside of its design range when operating in Auto or Hand.

The controller shall not send an AO signal which is below the minimum allowed % speed of the device.

Equipment Staging and Rotation

Parallel equipment shall be lead/lag or lead/standby rotated to maintain even wear.

Two runtime points shall be defined for each equipment:

Lifetime Runtime: The cumulative runtime of the equipment since equipment start-up. This point shall not be readily resettable by operators.

Staging Runtime: An operator resettable runtime point that stores cumulative runtime since the last operator reset.

Lead/lag equipment: Unless otherwise noted, identical parallel staged equipment shall be lead/lag alternated when more than one is off or more than one is on so that the equipment with the most operating hours as determined by Staging Runtime is made the last stage equipment and the one with the least number of hours is made the lead stage equipment.

Lead/standby equipment:

Unless equipment runs continuously, parallel equipment that are 100% redundant shall be lead/standby alternated when more than one of the equipment is off so that the equipment with the most operating hours as determined by Staging Runtime is made the last stage equipment and the one with the least number of hours is made the earlier stage equipment.

If equipment runs continuously, lead/standby positions shall switch at an adjustable day of the week and time (e.g., every Tuesday at 10:00 am) based on Staging Runtime; standby equipment shall first be started and proven on before former lead equipment is changed to standby and shut off.

SAFETIES

The plant is outfitted with mechanical safeties.

HEATING PLANT SYSTEM

Overview:

The heating water plant consists of two variable speed pumps and two steam to hot water heat exchangers in a constant-primary configuration. The pumps and heat exchangers are selected with redundant capacity, only one pump and one heat exchanger are required to run at a time. The system serves hard balanced finned tube heaters and ventilating air handling units in the housing units and indoor athletics facility.

The heating water plant varies supply temperature based on outside air temperature. VFDs are used to balance the system to the desired flows, but the pumps operate at a constant speed.

Safeties:

The loop is fitted with mechanical pressure relief valves.

Startup/Shutdown:

The plant is enabled when outdoor air temperature drops below 68F and disabled when the outdoor air temperature rises above 70F.

Heating Water Temperature Control:

The heating water supply temperature is reset based on outdoor air temperature. The heating water supply temperature setpoint shall be 165F at 0F OAT and linearly reset to 80F at 68F OAT. The enabled heat exchanger modulates its steam valves to maintain HWS-T temperature setpoint.

Steam Control Valve Enable: The heat exchanger with the least number of hours is enabled when the plant is enabled. When the running heat exchanger has accumulated 2 weeks more runtime than the idle heat exchanger, the idle heat exchanger will be enabled and after 90 seconds the running heat exchanger is disabled.

Heating Water Temperature Control:

Hot water temperature is controlled by modulating the two steam valves in sequence. The two steam valves are different in size, the small valve provides 1/3 of the design flow and the larger valve provides 2/3 of the design flow.

Hot Water Temperature PID:

A temperature sensor located in the heating water supply is used as an input. The loop setpoint is reset based on outside air temperature as described above, and the loop output is mapped to control the two steam valves in sequence.

Steam Valve Control:

The 1/3 valve is commanded from 0% to 100% open as the output of the Heating Water Temperature PID goes from 0 to 33.

The 2/3 valve is commanded from 0% to 100% open as the output of the Heating Water Temperature PID goes from 33 to 100.

When a unit is disabled, both control valves are commanded closed.

Duty Cycle: Total runtime for each device is tallied, the heat exchangers are rotated every two weeks hours to render equal runtime. When the units switch operation for duty cycle, the running unit will wait 90 seconds to close its valves in order to allow startup of the idle unit. When the units switch operation for duty loading, both valves control to the same signal.

Heating Water Pump Control:

Pump Enable: The pump with the least number of hours is enabled when the plant is enabled. When the running pump has accumulated 2 weeks more runtime than the idle pump, the idle pump will be enabled, after 90 seconds the running pump is disabled.

Pump Failure: In the event that a pump is commanded on and no status is received for 5 seconds, the idle pump will be enabled and latched until the failed pump is cleared by the operator.

Duty Cycle: Total runtime for each device is tallied, the pumps are rotated every two weeks to render equal runtime.

Alarms:

HX Failure: Plant has been enabled for 30 minutes and loop temperature is 10°F below setpoint for 5 minutes.

Pump Failure: Status differs from the command for a period of 15 seconds.

DOMESTIC HOT WATER SYSTEM

Overview:

The domestic hot water system consists of two constant speed circulating pumps (DWP-1,2), two steam to hot water heat exchangers (DHX-1,2), two 1000-gal storage tanks (ST-1,2) and two hi-low thermostatic mixing valves (TMV-1,2), each with three temperature sensors measuring water heater temperature, return water temperature, and supply water temperature leaving the mixing valve. A single hot water return circulating pump (RCP-1) circulates water throughout the system.

The systems are selected with redundant capacity but shall be operated simultaneously to meet the load.

Safeties:

The loop is fitted with mechanical pressure relief valves.

Startup/Shutdown:

The plant is always enabled.

Domestic Hot Water Temperature Control:

The domestic hot water tank temperature setpoint is set to 150F. The steam valves modulate in sequence to maintain the storage tank temperature.

Steam Control Valve Enable: Both heat exchangers are always enabled.

Domestic Hot Water Temperature Control:

Hot water temperature is controlled by modulating the two steam valves in sequence. The two steam valves are different in size, the small valve provides 1/3 of the design flow and the larger valve provides 2/3 of the design flow.

Hot Water Temperature PID:

A temperature sensor located in the storage tank is used as an input. The tank temperature is mapped to control the two steam valves in sequence.

Steam Valve Control:

The 1/3 valve is commanded from 0% to 100% open as the output of the Heating Water Temperature PID goes from 0 to 33.

The 2/3 valve is commanded from 0% to 100% open as the output of the Heating Water Temperature PID goes from 33 to 100.

When a unit is disabled, both control valves are commanded closed.

Pump Control:

The domestic hot water pumps DWP-1,2 and circulating pump RCP-1 are always enabled.

Alarms:

Tank Temperature: Storage Tank temperature is 10°F below setpoint for 5 minutes.

Pump Failure: Status differs from the command for a period of 5 seconds.

DOMESTIC COLD WATER BOOSTER PUMP

Overview:

The domestic water booster pump control panel monitors water pressure at the pump inlets and supplements city water pressure when available pressure drops below the threshold set by the end user. Control of the pumps is managed by the prewired control panel, but the operation of these pumps shall be compliant with the following sections.

Pump Enable

The pump is enabled when the water pressure measured at the pump inlet drops below 60 psi (user adjustable) for 15 seconds.

Pump Speed Control

The pump control panel automatically modulates the quantity of pumps in operation and their speed to maintain a user-adjustable discharge pressure of 100 psi.

Alarms

A general alarm is sent to the user via a BACnet connection if any of the the following conditions are met:

High Discharge Temperature: If the discharge temperature of the pumps exceeds 125F.

Low Suction Pressure: If the suction pressure drops below 35 psi for 5 seconds.

Pump Failure: If the status and command nature of the pump differ for 5 seconds.

DUPLEX CONDENSATE RECEIVER

Overview:

The duplex condensate receiver has a prewired control panel with two level floats to enable the duplex condensate receiver pumps as needed and a third alarm level float to alarm to the BAS. There is also a mechanical overflow for excess condensate relief.

Alarm

High Water Level: An audible alarm is sounded with a remote silencing relay.



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BOILER UPGRADES

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PROJECT # C2006-01
SITE# 7008
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ISSUE DATE: 04/26/2023

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DESIGNED BY: EMP

SHEET TITLE:
**MECHANICAL
SCHEDULES**

SHEET NUMBER:

M6.0

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04/26/2023

CONTROL VALVE SCHEDULE

UNIT DESIGNATION	LOCATION	SERVICE	STEAM DATA		ΔP (PSI)	PIPE SIZE (IN.)	VALVE						MANUFACTURER MODEL NO.	NOTES
			FLOW (LBS/HR)	ENT. PRESS. (PSIG)			VALVE TYPE	CONTROL SIGNAL	ACTUATOR TYPE	POWER SUPPLY	SIZE (IN.)	Cv		
CV-1	BOILER PLANT SOUTH	HX-1,2	1333	15.0	4.0	4.0	2.5	38.00	GLOBE	MODULATING	NSR	24 VAC	BELIMO 665C-250	1
CV-2	BOILER PLANT SOUTH	HX-1,2	2667	15.0	4.0	6.0	3.0	86.00	GLOBE	MODULATING	NSR	24 VAC	BELIMO 680C-250	1
CV-3	BOILER PLANT SOUTH	DHX-1,2	1667	15.0	4.0	4.0	2.5	48.00	GLOBE	MODULATING	NSR	24 VAC	BELIMO 665C-250	1
CV-4	BOILER PLANT SOUTH	DHX-1,2	3333	15.0	4.0	6.0	3.0	96.00	GLOBE	MODULATING	NSR	24 VAC	BELIMO 680C-250	1

NOTES:
1. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS

ACTUATOR TYPE
NO - SPRING RETURN OPEN
NC - SPRING RETURN CLOSED
NSR - NON SPRING RETURN

BURNER SCHEDULE

UNIT DESIG.	LOCATION	SERVICE	MANUFACTURER & MODEL NO.	BURNER TYPE	FUEL TYPE	FSP (IN WC)	AIR INLET ORIENTATION	INPUT (MBH)	MIN. OUTPUT (MBH)	BLOWER MOTOR HP	COMPRESSOR MOTOR HP	ELECTRICAL DATA		NOTES
												MOP	VOLTS/PH	
BF-1	BOILER ROOM	STEAM BOILER	ICS LNS1LG-420	FD	DF	7.7	RH	42000	33500	60	15	200	480/3	ALL
BF-2	BOILER ROOM	STEAM BOILER	ICS LNDLG-378	FD	DF	7.7	RH	31500	25100	75	15	200	480/3	ALL
BF-3	BOILER ROOM	STEAM BOILER	ICS LNS1LG-420	FD	DF	7.7	RH	42000	33500	60	15	200	480/3	ALL

NOTES:
1. BOILER COMBUSTION AIR WILL BE PULLED DIRECTLY FROM BOILER ROOM.
2. PROVIDE WITH FLUE GAS RECIRCULATION METERING CONTROL VALVE
3. PROVIDE WITH FIREYE PPC4000 AND YB110IR CONTROL SYSTEM FOR PARALLEL POSITIONING MODULATION
4. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS

FUEL TYPE BOILER TYPE BURNER TYPE
DF DUAL FUEL FT FIRE TUBE FD FORCED DRAFT

THERMOSTATIC MIXING VALVE SCHEDULE

PLAN MARK	DESCRIPTION	MANUFACTURER	MODEL	FLOW		LEAVING TEMPERATURE	NOTES
				MINIMUM GPM	GPM @ 10 PSI LOSS		
TMV-1	DOMESTIC THERMOSTATIC MIXING VALVE	LEONARD	TM-1520B-2PS-LF	2	130	135 DEG F	ALL
TMV-2	DOMESTIC THERMOSTATIC MIXING VALVE	LEONARD	TM-1520B-2PS-LF	2	130	135 DEG F	ALL

NOTES:
1. DUPLEX MIXING VALVE SYSTEM
2. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS

PUMP SCHEDULE

UNIT DESIG.	LOCATION	SERVICE	MANUFACTURER & MODEL NO.	TYPE	PUMP DATA			MOTOR DATA				IMPELLER DIA. (IN.)	NOTES
					FLOW (GPM)	HEAD (FT.)	BHP	HP	RPM	VOLTS/PH	UNIT CONTROL		
HWP-1	BOILER PLANT SOUTH	HEATING WATER	B&G E-1510 2EB	END SUCTION	275	100	10.7	15	1800	480/3	VFD (BY DIV 26)	11	6
HWP-2	BOILER PLANT SOUTH	HEATING WATER	B&G E-1510 2EB	END SUCTION	275	100	10.7	15	1800	480/3	VFD (BY DIV 26)	11	6
BP-1	BOILER PLANT NORTH	DOMESTIC WATER BOOSTER SKID	HYFAB MVP-8100	VERTICAL INLINE	275	150	16	2 x 10	3450	480/3	VFD (WITH UNIT)	6 3/4	1,3,4,5,6
DWP-1	BOILER PLANT SOUTH	DOMESTIC HOT WATER	B&G E-90 2AB	VERTICAL INLINE	100	30	1.07	1.5	1725	480/3	STARTR	6	2,6
DWP-2	BOILER PLANT SOUTH	DOMESTIC HOT WATER	B&G E-90 2AB	VERTICAL INLINE	100	30	1.07	1.5	1725	480/3	STARTR	6	2,6
RCP-1	BOILER PLANT SOUTH	DHW RETURN PUMP	B&G E-90 1AAB	VERTICAL INLINE	30	100	1.5	3	1750	480/3	STARTR	5	2,6

NOTES:
1. ALL WETTED SURFACES SHALL BE STAINLESS STEEL, SUITABLE FOR POTABLE WATER APPLICATIONS
2. ALL WETTED SURFACES SHALL BE BRONZE, SUITABLE FOR POTABLE WATER APPLICATIONS
3. PROVIDE WITH HYDRAULIC BYPASS ASSEMBLY WITH RESILIENT SEAT CHECK VALVE
4. PROVIDE THE FOLLOWING OPTIONS: GENERAL ALARM DRY CONTACT RELAY; PIPE BREAK DRY CONTACT, BACNET MONITORS: SENSOR FAIL, LOW SUCTION/LEVEL & HIGH SYSTEM AND VFD FAULTS, VIBRATION
5. DUPLEX PUMPS WITH COMMON HEADER. PROVIDE NECESSARY ACCESSORIES FOR FLANGED PIPING
6. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS

HEAT EXCHANGER SCHEDULE

UNIT DESIG.	LOCATION	SERVICE	MANUFACTURER & MODEL NO.	TYPE	TYPE OF HEAD	SHELL SIDE (SOURCE)		TUBE SIDE (SERVICE)				MAXIMUM LENGTH (INCHES)	MINIMUM HEATING SURFACE AREA (SQ. FT.)	FOULING FACTOR	NOTES
						STEAM SUPPLY (PSIG)	STEAM CAPACITY (LBS/HR)	EWT (°F)	LWT (°F)	FLOW (GPM)	MAX. PD (FT.)				
HX-1	BOILER PLANT	HEATING WATER	B&G QSUS-1030-2	SHELL & U-TUBE	K-STYLE	5	4,000	130	165	275	5.0	48	110	0.0005	1
HX-2	BOILER PLANT	HEATING WATER	B&G QSUS-1030-2	SHELL & U-TUBE	K-STYLE	5	4,000	130	165	275	5.0	48	110	0.0005	1
DHX-1	BOILER PLANT	HOT WATER	B&G QDSU-184-2	SHELL & U-TUBE	K-STYLE	5	5,000	50	150	100	5.0	72	200	0.0005	1,2
DHX-2	BOILER PLANT	HOT WATER	B&G QDSU-184-2	SHELL & U-TUBE	K-STYLE	5	5,000	50	150	100	5.0	72	200	0.0005	1,2

NOTES:
1. EQUIPMENT SUPPORT FIELD FABRICATED BY CONTRACTOR OR PROVIDED WITH EQUIPMENT
2. HEAT EXCHANGER SHALL BE DOUBLE WALL COPPER, RATED FOR POTABLE WATER USE
3. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS

EXPANSION TANK SCHEDULE

UNIT DESIG.	LOCATION	SERVICE	MANUFACTURER & MODEL NO.	MIN. TOTAL VOLUME (GAL)	MIN. ACCEPTANCE VOLUME (GAL)	MAXIMUM PRESSURE (PSI)	PRESSURE CHARGE (PSI)	INSTALLATION TYPE	ESTIMATED SYSTEM VOLUME (GAL)	NOTES
ET-1	BOILER PLANT SOUTH LOWER LEVEL	HEATING WATER	B&G B1600	400	270	125	30	FLOOR MOUNTED	12000	1
ET-2	BOILER PLANT SOUTH LOWER LEVEL	DOMESTIC HOT WATER	B&G PTA-453	250	82	125	80	FLOOR MOUNTED	6000	1

NOTES:
1. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS

STEAM TRAP SCHEDULE

UNIT DESIG.	LOCATION	SERVICE	MANUFACTURER & MODEL NO.	SIZE (IN.)	ORIFICE SIZE	TYPE	CONDENSATE (LBS./HR)	MAX. ALLOWABLE PRESSURE (PSIG)	OPERATING PRESSURE (PSIG)	DIFFERENTIAL PRESSURE (PSIG)	NOTES
T-A	BOILER PLANT SOUTH	HEATING WATER	ARMSTRONG 310	3/4	1/4"	IB	500	175	80	1.5	1
T-B	BOILER PLANT SOUTH	HEATING WATER	ARMSTRONG 15-JD	2	1-1/16"	FT	5000	175	5	0.5	1

TRAP TYPE FT - FLOAT & THERMOSTATIC
IB - INVERTED BUCKET

NOTES:
1. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS

CONDENSATE RECEIVER SCHEDULE

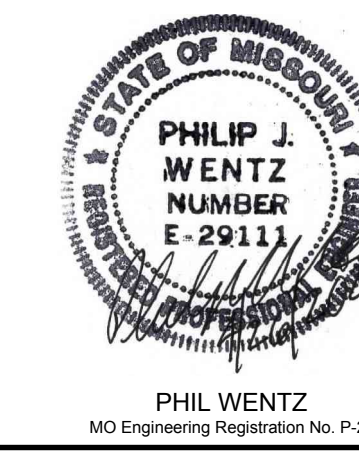
UNIT DESIG.	LOCATION	SERVICE	MANUFACTURER & MODEL NO.	TYPE	RECEIVER VOLUME (GAL)	PUMP				ELECTRICAL			NOTES
						EWT (°F)	FLOW (GPM)	HEAD (FT)	NPSH (FT)	BHP (HP)	HP (TOTAL)	V/PH	
CRU-1	BOILER PLANT SOUTH	STEAM CONDENSATE	BELL & GOSSETT CBE	ELEVATED TANK	75	210	60	70	2	2.0	4	480/3	ALL

NOTES:
1. PROVIDE DUPLEX PUMP SYSTEM
2. PROVIDE CONDENSATE GAUGE GLASS
3. PROVIDE DISCHARGE PRESSURE GAUGE
4. PROVIDE HIGH WATER LEVEL ALARM WITH TERMINAL STRIP FOR CONNECTION TO BAS
5. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS

DOMESTIC HOT WATER STORAGE TANK SCHEDULE

UNIT DESIG.	LOCATION	MANUFACTURER & MODEL NO.	CAPACITY (GAL.)	STORAGE TEMPERATURE (°F)	NOTES
ST-1	BOILER PLANT SOUTH	NILES STEEL TANK-S-54-113	1000	150	ALL
ST-2	BOILER PLANT SOUTH	NILES STEEL TANK-S-54-113	1000	150	ALL

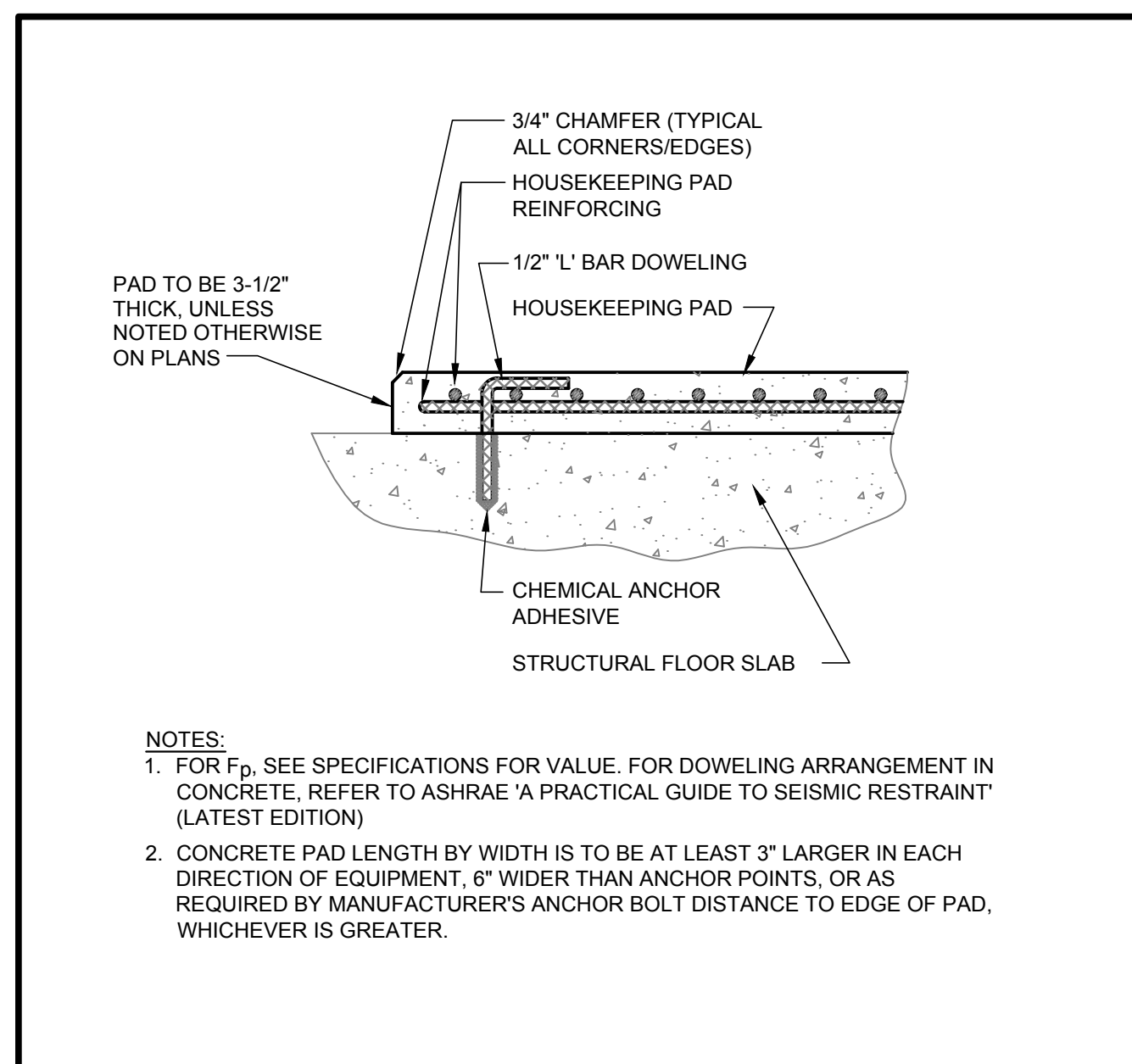
NOTES:
1. PROVIDE INLET, OUTLET, AND RECIRCULATION CONNECTIONS AS INDICATED ON THE FLOW DIAGRAMS AND FLOORPLANS.
2. PROVIDE THERMOMETER WELL AT MID-HEIGHT OF TANK
3. LISTED MANUFACTURER IS FOR BASIS OF DESIGN REFERENCE. SEE SPECIFICATIONS FOR ALTERNATE PREAPPROVED MANUFACTURERS



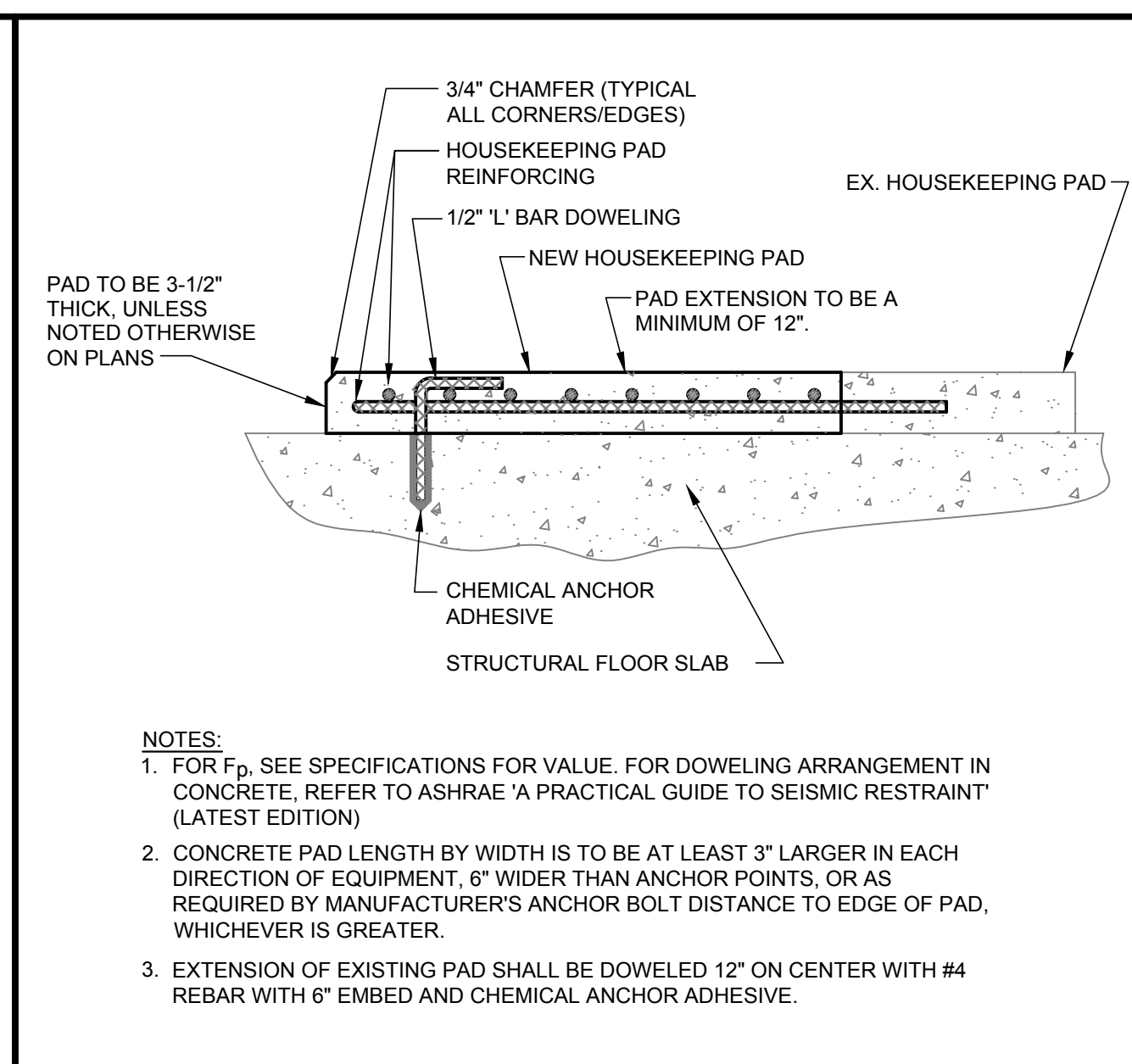
MEP:

McCLURE ENGINEERING

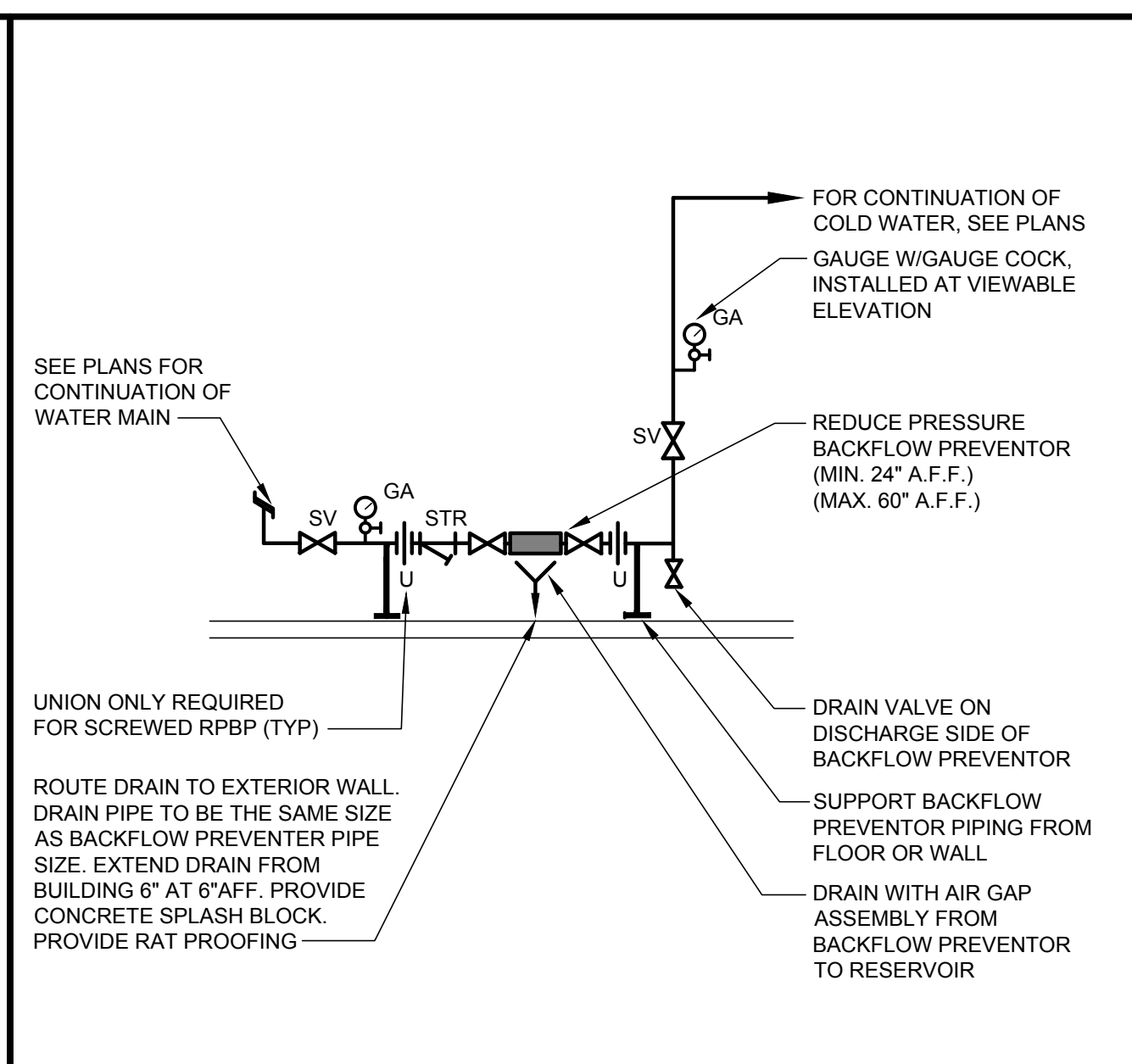
1000 Clark Avenue
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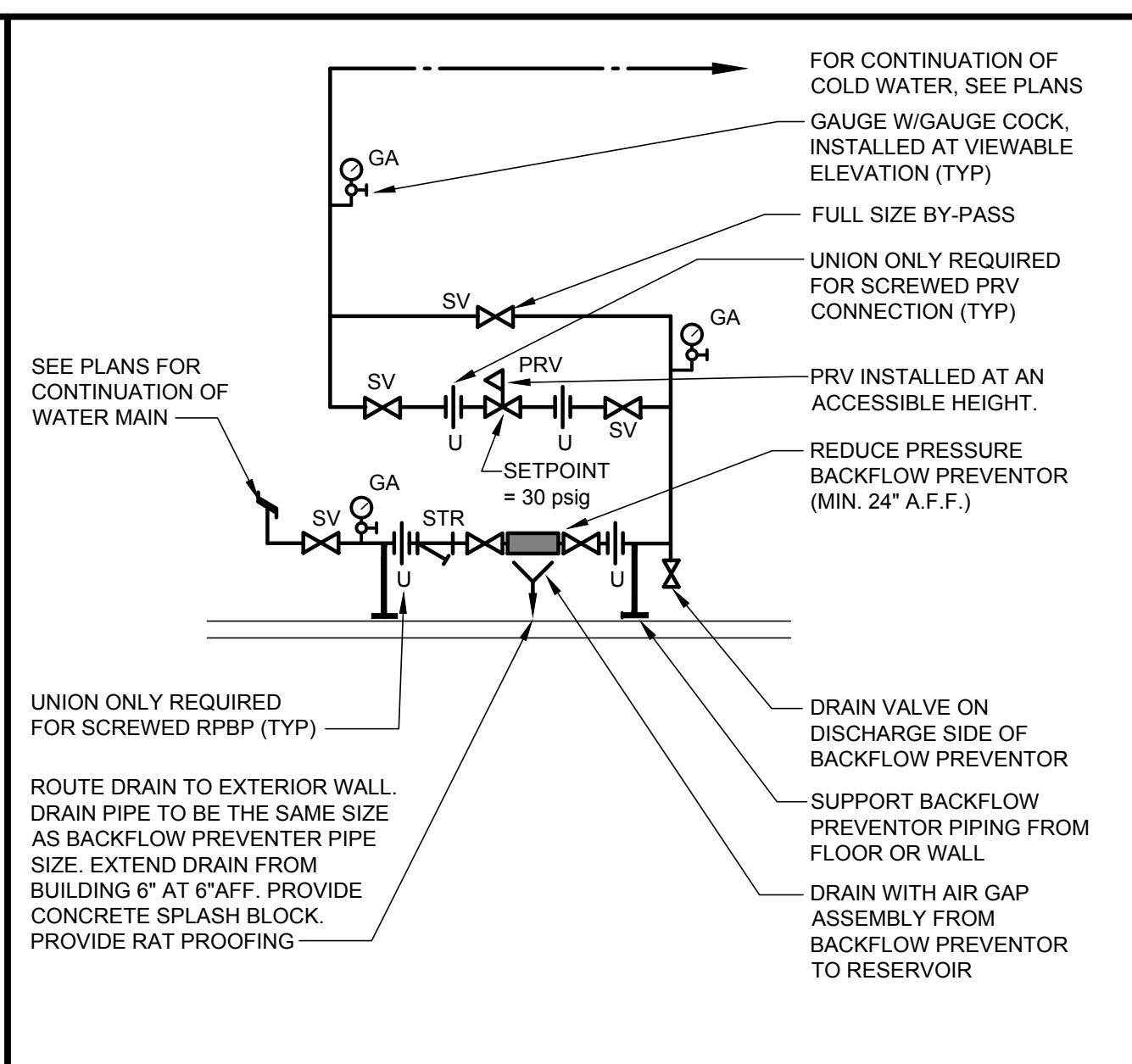
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SCALE: NONE
CONCRETE HOUSEKEEPING PAD



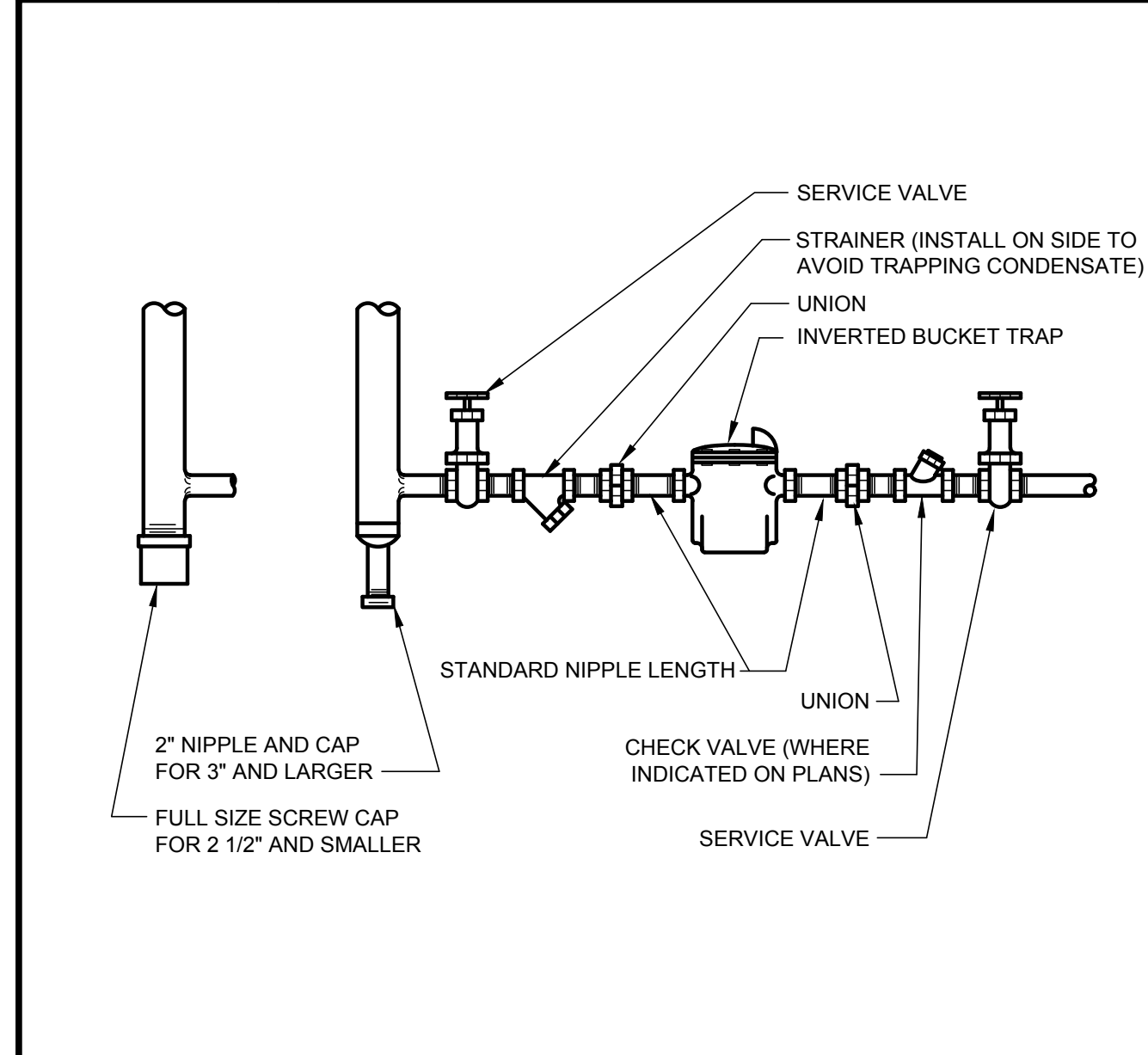
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EXISTING CONCRETE HOUSEKEEPING PAD EXTENSION



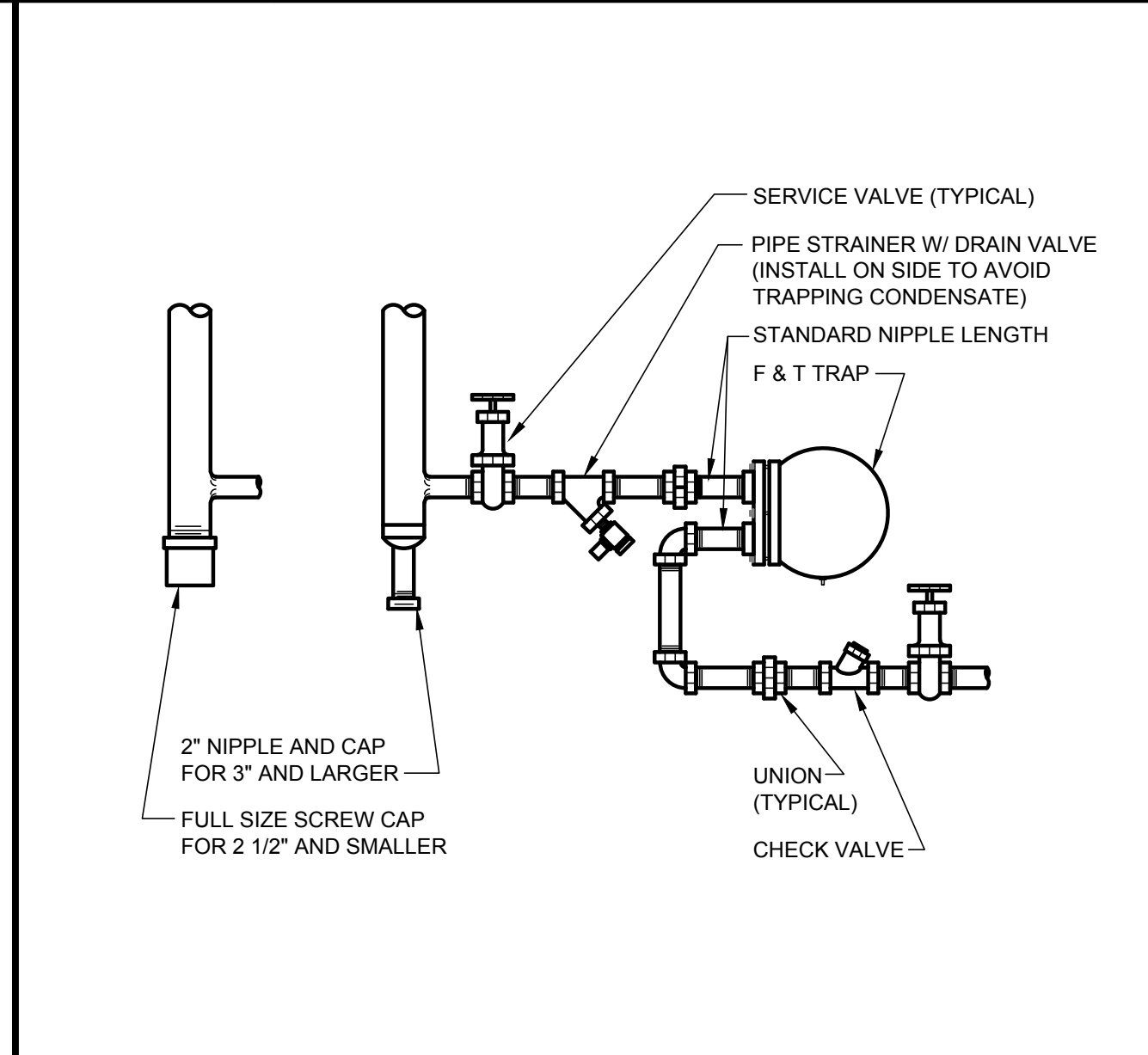
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SCALE: NONE
BUILDING DOMESTIC WATER SERVICE BACKFLOW STATION



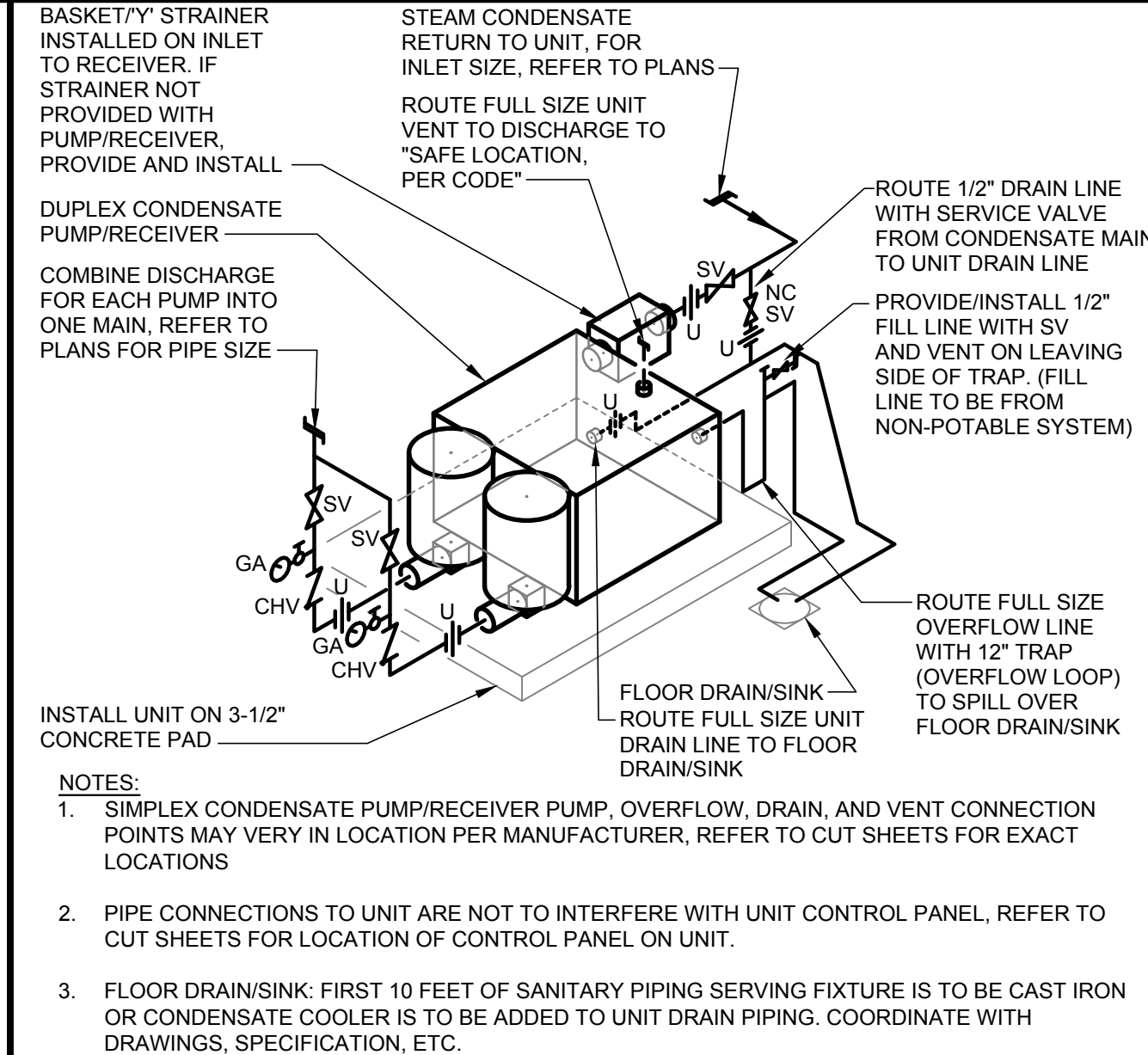
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BUILDING DOMESTIC WATER SERVICE BACKFLOW STATION WITH PRV



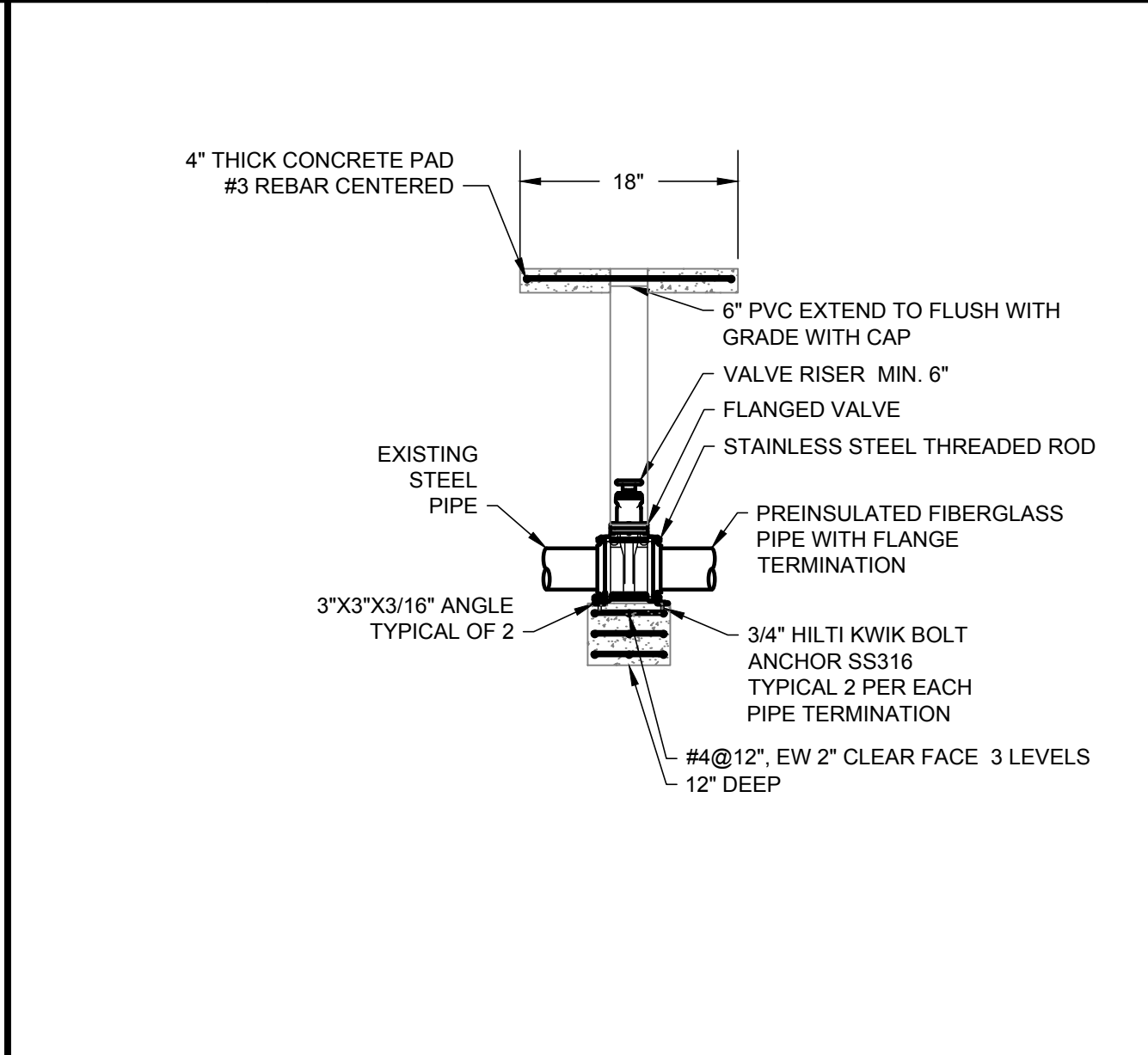
FILE NAME: M-0004
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STEAM DRIP TRAP INVERTED BUCKET



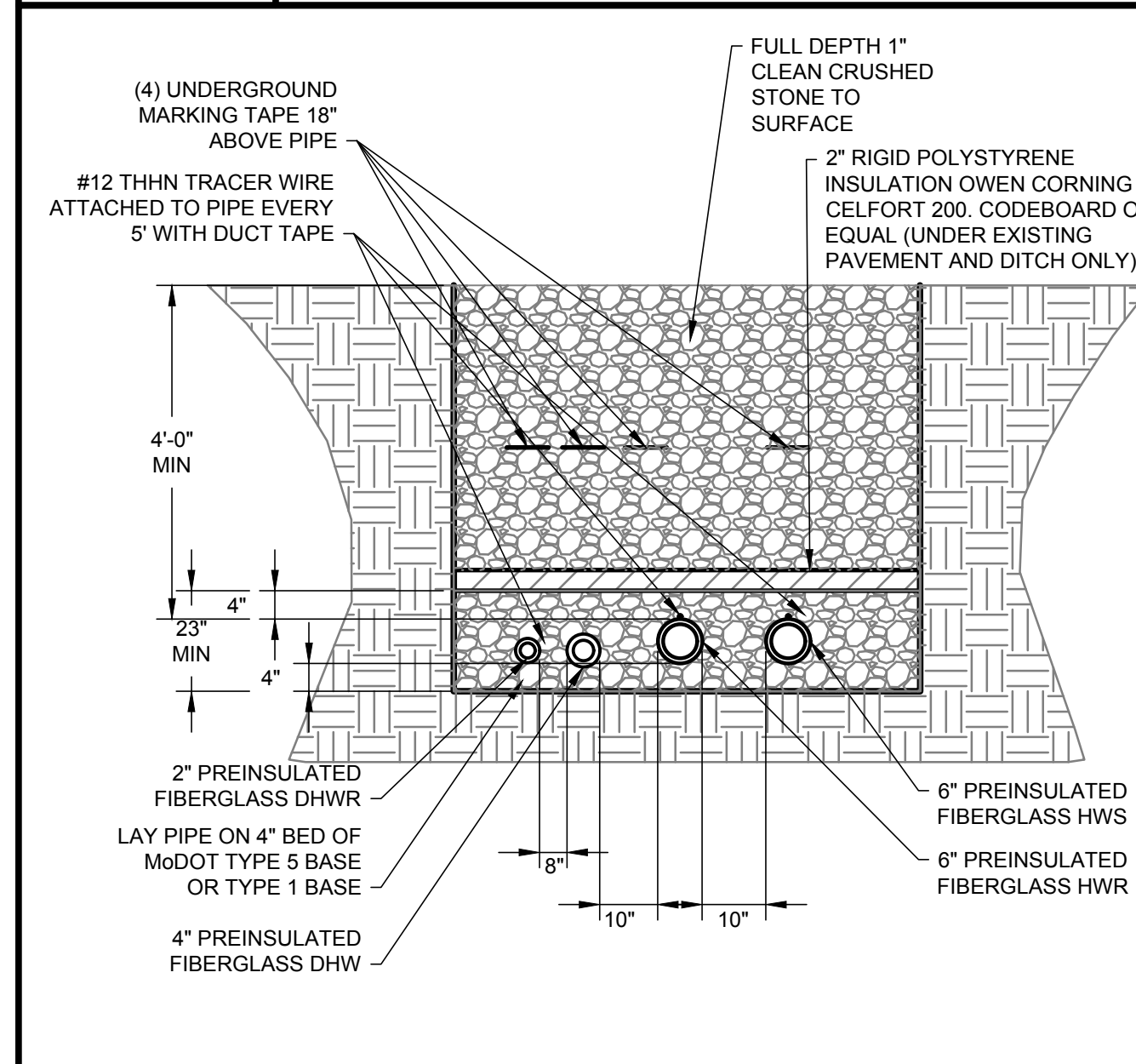
FILE NAME: M-0003A
SCALE: NONE
STEAM DRIP TRAP FLOAT AND THERMOSTATIC



FILE NAME: M-0046B
SCALE: NONE
TYPICAL DUPLEX CONDENSATE PUMP/RECEIVER DETAIL



FILE NAME: M-0054
SCALE: NONE
PIPING TRANSITION UNDERGROUND DETAIL



FILE NAME: M-0055
SCALE: NONE
PIPING BEDDING DETAIL

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BOILER UPGRADES

FARMINGTON CORRECTIONAL
CENTER
1012 WEST COLUMBIA STREET
FARMINGTON, MO 63640

PROJECT # C2006-01
SITE# 7008
FACILITY# 9327008094

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 04/26/2023

DRAWN BY: RCB
CHECKED BY: EMP
DESIGNED BY: EMP

SHEET TITLE:
**MECHANICAL
DETAILS**

SHEET NUMBER:

M6.1

22 OF 31 SHEETS
04/26/2023



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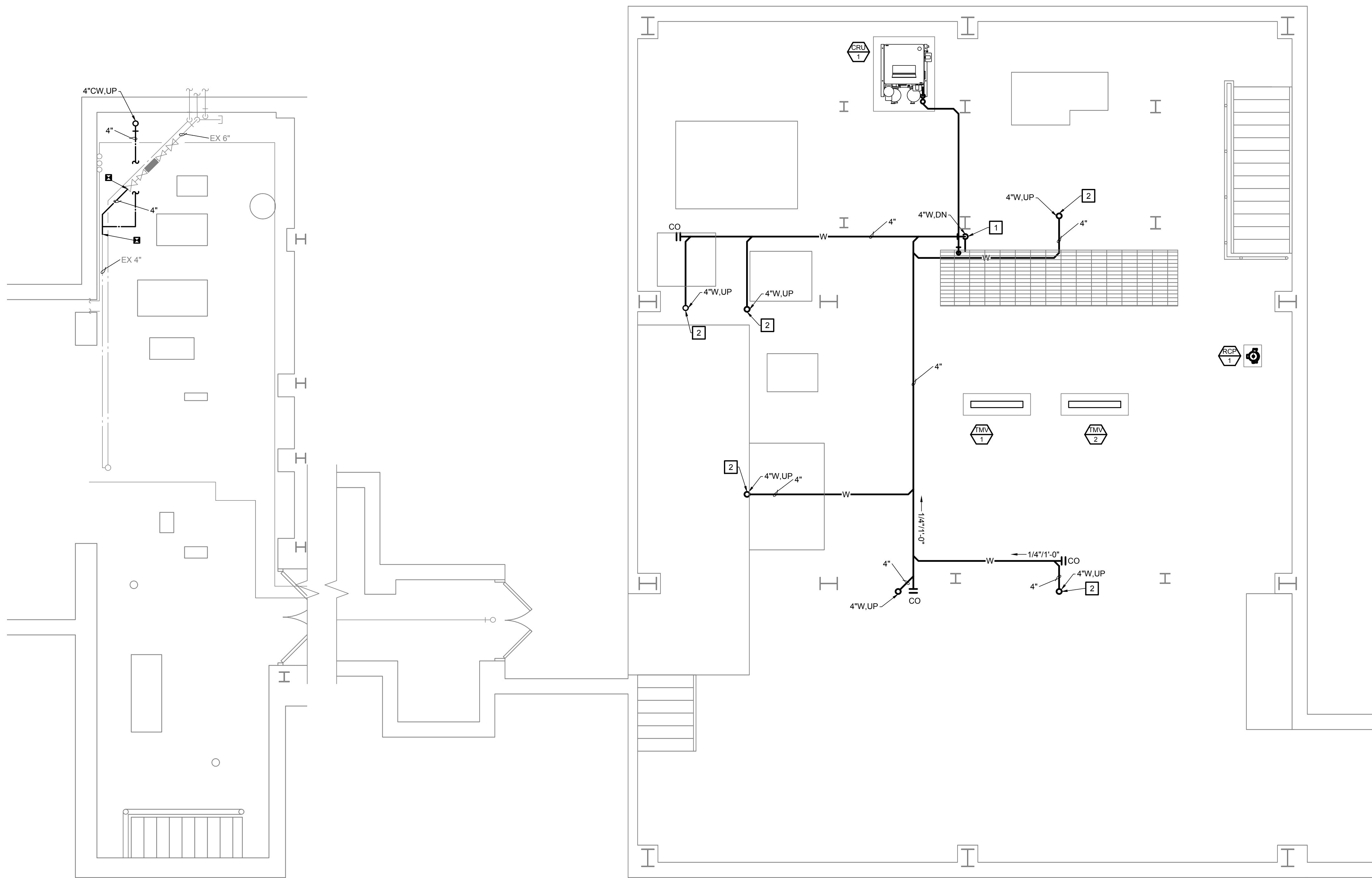
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**LOWER LEVEL
SOUTH PLUMBING
NEW WORK PLAN**

SHEET NUMBER:

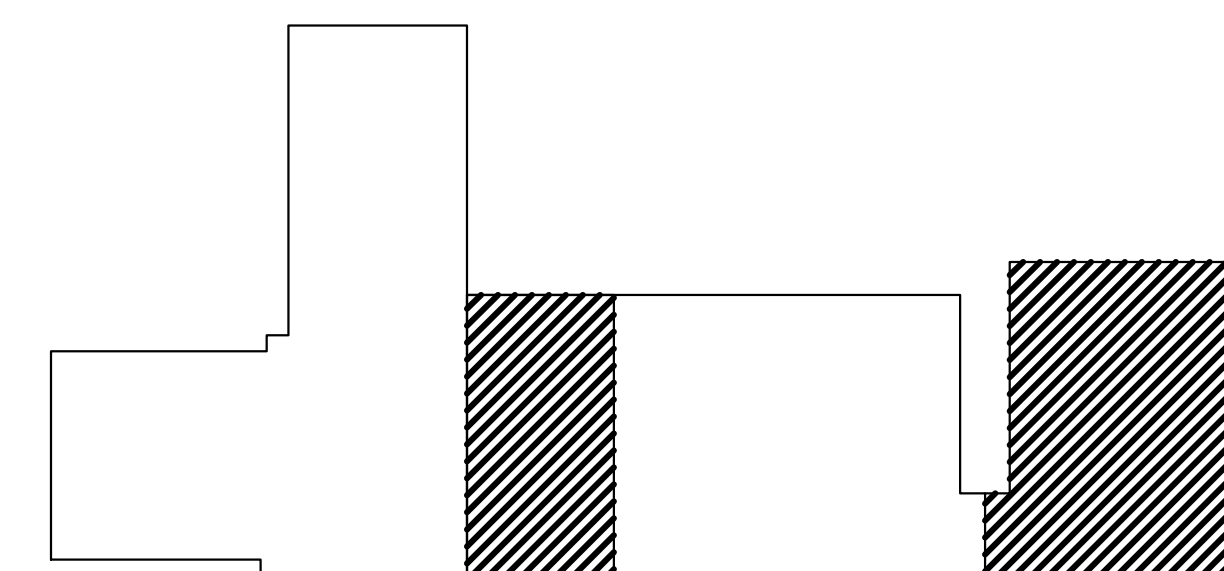
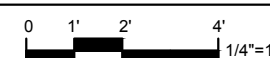
P3.0

23 OF 31 SHEETS
04/26/2023

- KEYED NOTES**
- 1 4" DN FACE OF COLUMN TO FLOOR. ROUTE TO EXISTING TRENCH.
 - 2 4" UP TO FLOOR SINK. SEE P3.1 FOR CONTINUATION.

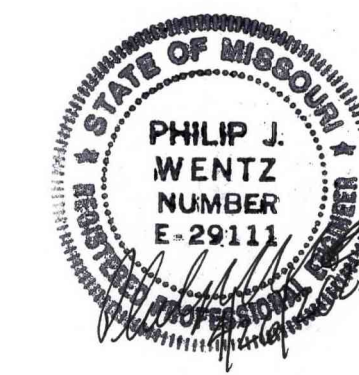


PARTIAL OPERATING FLOOR NEW WORK PLAN
SCALE: 1/4" = 1'0"



KEY PLAN

S:\075108.000 FARMINGTON CORRECTIONAL CENTER BOILERS\03 MECHANICAL\P3.0-075108.000.dwg 2023-5-4 16:08 Cbockenstette



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DRAWN BY: AAC
CHECKED BY: ESW
DESIGNED BY: EMP

SHEET TITLE:
**ELECTRICAL
DETAILS,
SYMBOLS, AND
ABBREVIATIONS**

SHEET NUMBER:

E1.0

25 OF 31 SHEETS
04/26/2023

ELECTRICAL SYMBOLS

SITE EQUIPMENT



ABBREVIATIONS

AFF ABOVE FINISHED FLOOR
AFG ABOVE FINISHED GRADE
AL ALUMINUM
ARC ALUMINUM RIGID CONDUIT
AUX AUXILIARY
BOF BOTTOM OF FIXTURE
C CONDUIT
CB CIRCUIT BREAKER
CKT CIRCUIT
COF CENTER OF FIXTURE
EC ELECTRICAL CONTRACTOR
EMT ELECTRICAL METALLIC TUBING
EWC ELECTRIC WATER COOLER
GRC GALVANIZED RIGID CONDUIT
G GROUND FAULT CIRCUIT INTERRUPTER
GRD GROUND
IMC INTERMEDIATE METAL CONDUIT
MCB MAIN CIRCUIT BREAKER
MLO MAIN LUG ONLY
NC NORMALLY CLOSED
NF NON FUSED
NO NORMALLY OPEN
NTS NOT TO SCALE
PVC PVC CONDUIT
TOF TOP OF FIXTURE
U USB PORT
UCR UNDER CABINET REFRIGERATOR
UNO UNLESS NOTED OTHERWISE
WP WEATHERPROOF COVER
WPI WEATHERPROOF IN-USE COVER

MOUNTING HEIGHTS

ALL MOUNTING HEIGHTS ARE AS GIVEN UNLESS OTHERWISE NOTED ON PLANS
ALL MOUNTING HEIGHTS ARE TO CENTER OF DEVICE/
LIGHT FIXTURE, UNLESS OTHERWISE NOTED

RECEPTACLES

- SINGLE CONVENIENCE OUTLET, RECESSED WALL MOUNTED +18" AFF, 'UNO' ON FLOOR PLANS
- DUPLEX CONVENIENCE OUTLET, RECESSED WALL MOUNTED +18" AFF, 'UNO' ON FLOOR PLANS
- DUPLEX CONVENIENCE OUTLET, RECESSED WALL MOUNTED ABOVE COUNTER +44" AFF 'UNO' ON FLOOR PLANS
- DOUBLE DUPLEX CONVENIENCE OUTLET, RECESSED WALL MOUNTED +18" AFF, 'UNO' ON FLOOR PLANS
- DOUBLE DUPLEX CONVENIENCE OUTLET, RECESSED WALL MOUNTED ABOVE COUNTER +44" AFF, 'UNO' ON FLOOR PLANS
- SPECIAL PURPOSE OUTLET, RECESSED WALL MOUNTED +18", 'UNO' ON FLOOR PLANS
NEMA SEE FLOOR PLANS FOR SIZE
- DEAD FRONT / FACELESS 'GFCI' DEVICE RECESSED WALL MOUNTED +48" AFF WITH ENGRAVED COVERPLATE AS NOTED ON FLOOR PLAN
- 4"x4"x2" JUNCTION BOX WITH FINISHED BLANK COVER RECESSED WALL MOUNTED +18" AFF 'UNO' ON FLOOR PLANS
- 4"x4"x2" JUNCTION BOX WITH FINISHED BLANK COVER MOUNTED ABOVE ACCESSIBLE CEILING UNO
- PULL BOX WITH FINISHED BLANK COVER MOUNTING AND SIZE AS NOTED ON FLOOR PLAN

RECEPTACLE SUB SCRIPT

HG HOSPITAL GRADE
TR TAMPER RESISTANCE
IG ISOLATED GROUND
G GROUND FAULT CIRCUIT INTERRUPTER
WR WEATHER RESISTANCE
WP WEATHERPROOF COVER
WPI WEATHERPROOF IN-USE COVER
U USB PORT

POWER EQUIPMENT

- PANELBOARD
- DISTRIBUTION PANEL
- MOTOR CONTROL CENTER
- SWITCHBOARD
- TRANSFORMER, SEE PLAN FOR TYPE AND SIZE
- AUTOMATIC TRANSFER SWITCH
- FACTORY WIRED CONTROL PANEL
- VARIABLE FREQUENCY DRIVE
- RELAY IN BOX
- DISCONNECT SWITCH
- COMBINATION MAGNETIC STARTER/ DISCONNECT SWITCH 3 PHASE

MOTORS

- 208V, 3 PHASE MOTOR
- 480V, 3 PHASE MOTOR
- 120V, 1 PHASE MOTOR
- 208V, 1 PHASE MOTOR

COMMUNICATION DEVICES

- DATA OUTLET +18" AFF
- DATA OUTLET +44" AFF

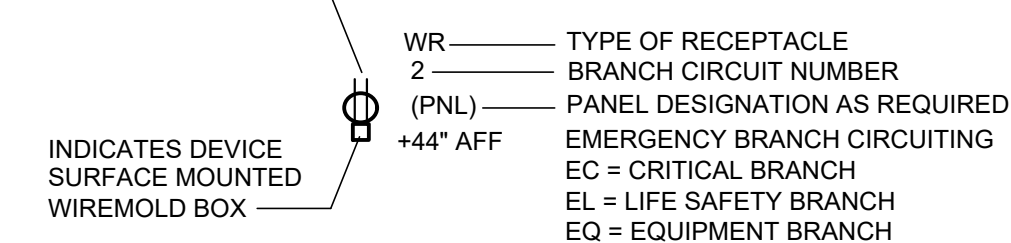
FIRE ALARM

- ALARM HORN WALL MOUNTED +80" AFF TO BOTTOM
- FIRE ALARM HORN CEILING MOUNTED
- COMBINATION ALARM SPEAKER AND VISUAL DEVICE ## INTENSITY OF STROBE (15/75 UNLESS OTHERWISE SPECIFIED) CEILING MOUNTED
- COMBINATION ALARM HORN AND VISUAL DEVICE ## INTENSITY OF STROBE (15/75 UNLESS OTHERWISE SPECIFIED) WALL MOUNTED +80" AFF TO BOTTOM
- SMOKE DETECTOR CEILING MOUNTED
- SMOKE DETECTOR OTHER THAN CEILING MOUNTED
- FIRE ALARM CONTROL PANEL
- FIRE ALARM ANNUNCIATOR

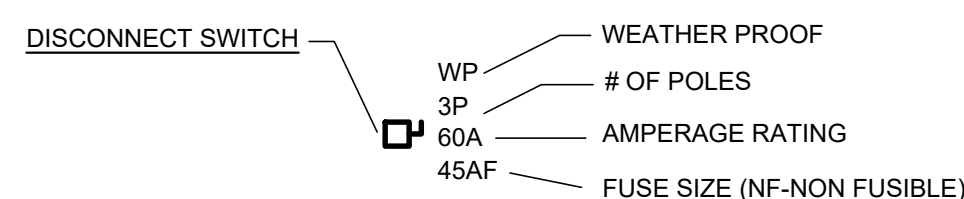
MISCELLANEOUS CONTROL DEVICES

- PUSH-BUTTON/PUSH PAD RECESSED WALL MOUNTED +48" AFF
- MUSHROOM HEAD/EMERGENCY PUSH BUTTON RECESSED WALL MOUNTED +48" AFF

DUPLEX RECEPTACLE



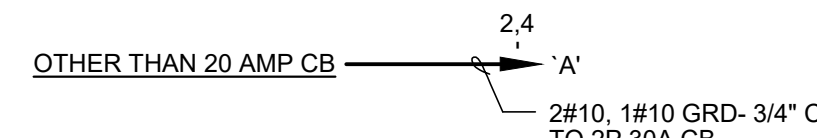
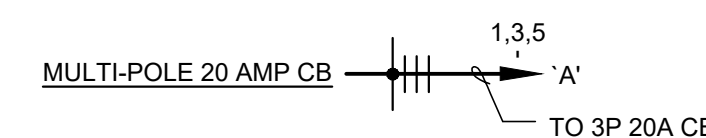
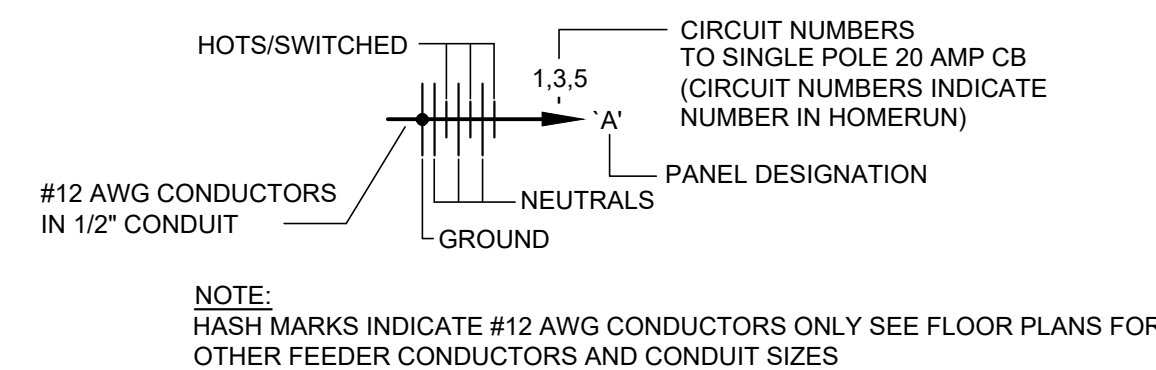
DISCONNECT SWITCH



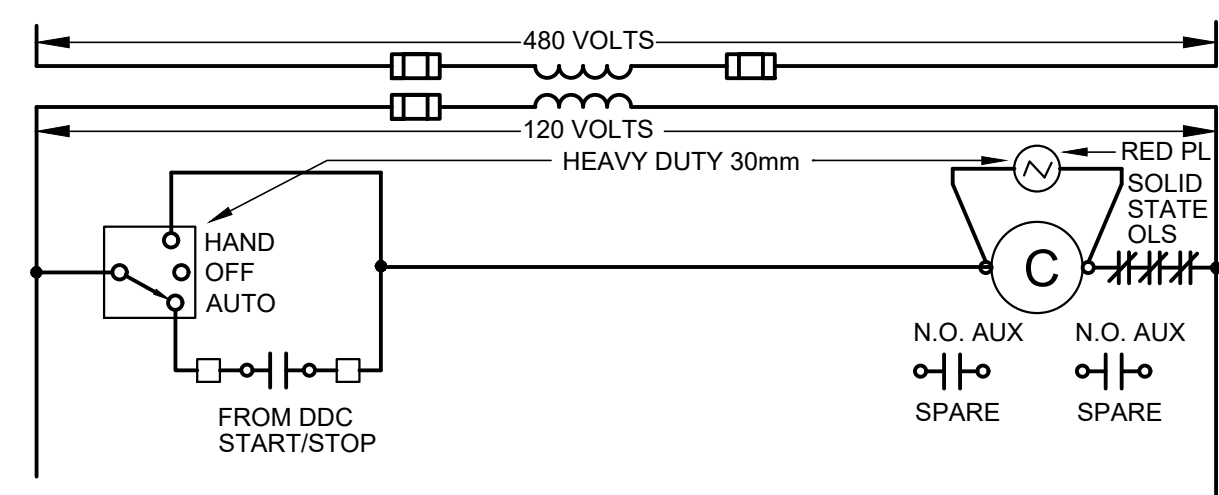
WIRING SYMBOLS

- CONDUIT DOWN
- CONDUIT UP
- CONDUIT CAPPED
- EXISTING
- DEMOLITION WORK
- NEW WORK
- CONDUIT CONCEALED IN SLAB OR IN ACCESSIBLE SPACE BELOW
- CONDUIT EXPOSED
- CONDUIT CONCEALED IN WALL OR ABOVE CEILING
- WIREWAY / WIREMOLD
- VERTICAL WIREWAY
- CABLE TRAY
- CONDUIT SLEEVE (SIZED TO 40% FILL, 2" MINIMUM) UNLESS NOTED OTHERWISE

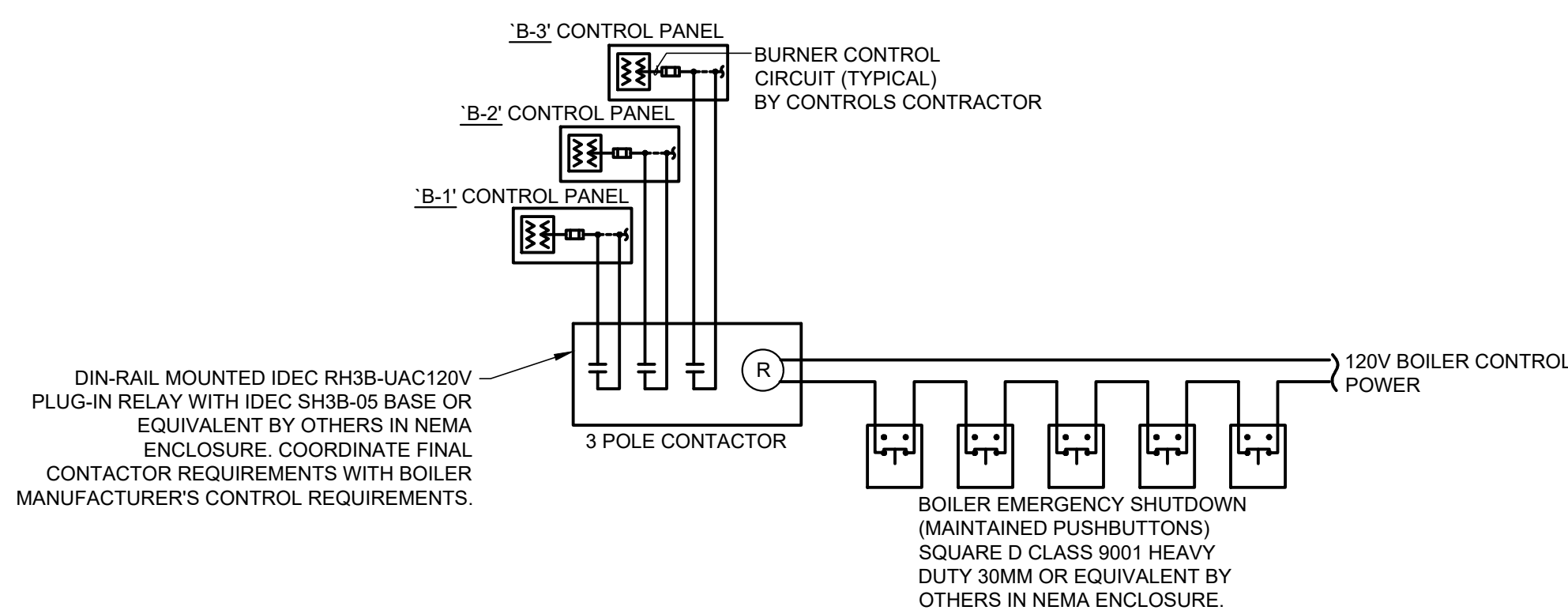
BRANCH CIRCUITING LEGEND



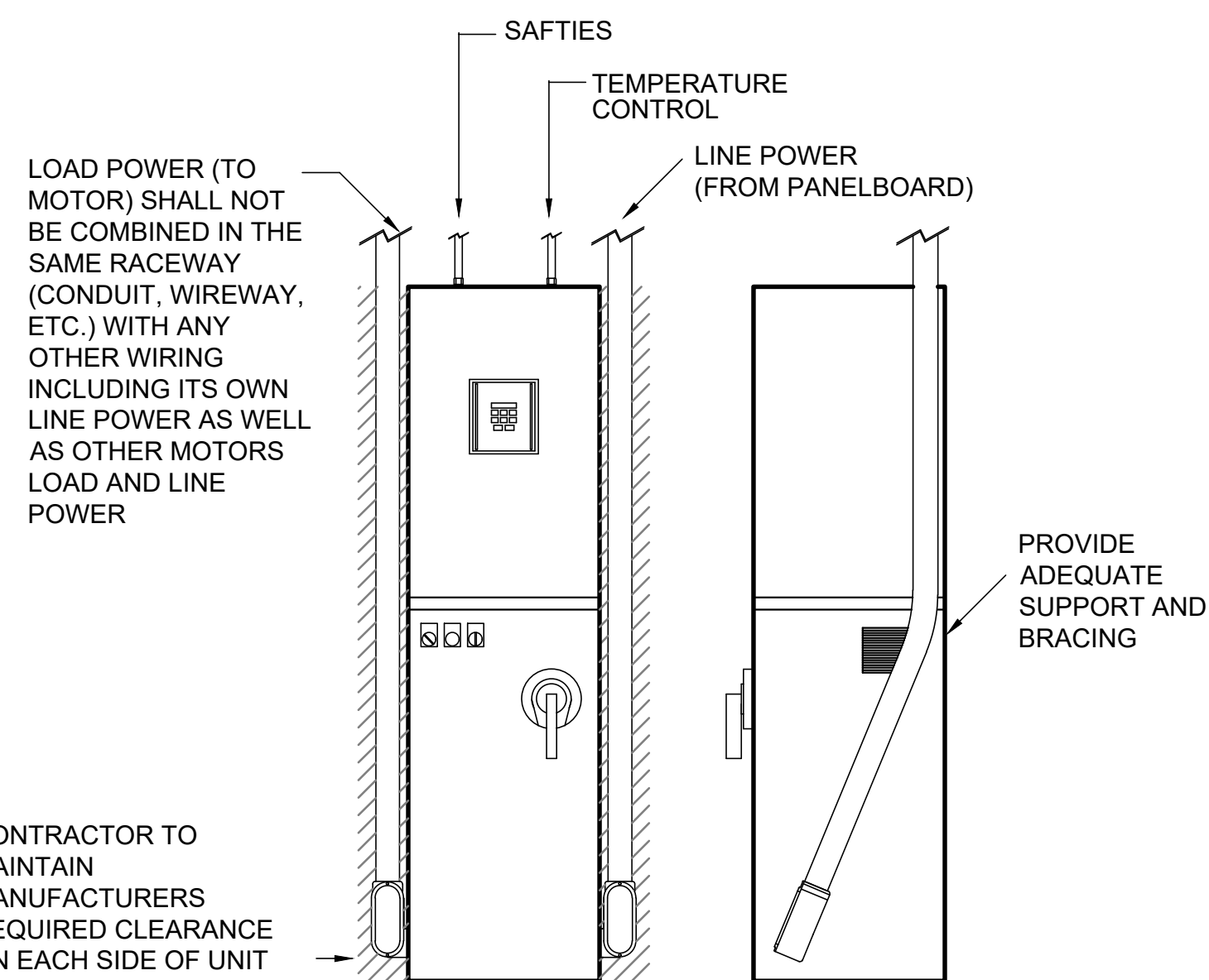
20A BRANCH CIRCUIT HOMERUNS SHALL BE SIZED AS FOLLOWS:
120V: 0-100 FEET SHALL BE #12AWG WIRE MINIMUM
101-200 FEET SHALL BE #10AWG WIRE MINIMUM
IN EXCESS OF 200 FEET SHALL BE #8AWG WIRE MINIMUM
277V: 0-250 FEET SHALL BE #12AWG WIRE MINIMUM
IN EXCESS OF 250 FEET SHALL BE #10AWG WIRE MINIMUM
INDICATES SWITCH IN



TYPICAL COMBINATION STARTER CONNECTION DIAGRAM

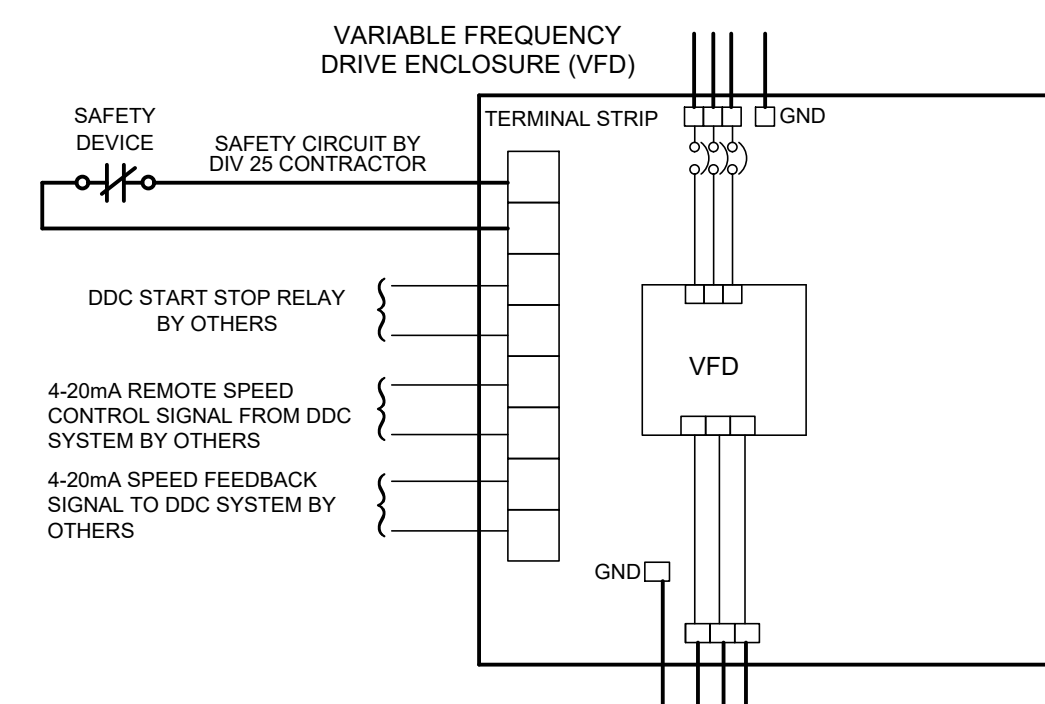


BOILER SHUTDOWN DIAGRAM



TYPICAL VFD CONDUIT DIAGRAM

NOTE:
LINE POWER, TEMPERATURE CONTROL WIRING, AND SAFETY WIRING SHALL NOT BE COMBINED INTO THE SAME RACEWAYS, OR WIREWAYS.



TYPICAL VFD CONNECTION DIAGRAM



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BOILER UPGRADES

FARMINGTON CORRECTIONAL
CENTER
1012 WEST COLUMBIA STREET
FARMINGTON, MO 63640

PROJECT # C2006-01
SITE# 7008
FACILITY# 9327008094

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DATE: _____

ISSUE DATE: 04/26/2023

DRAWN BY: AAC
CHECKED BY: ESW
DESIGNED BY: EMP

SHEET TITLE:
**MAIN LEVEL
CENTRAL ELECTRICAL
DEMOLITION WORK**

SHEET NUMBER:

ED3.1

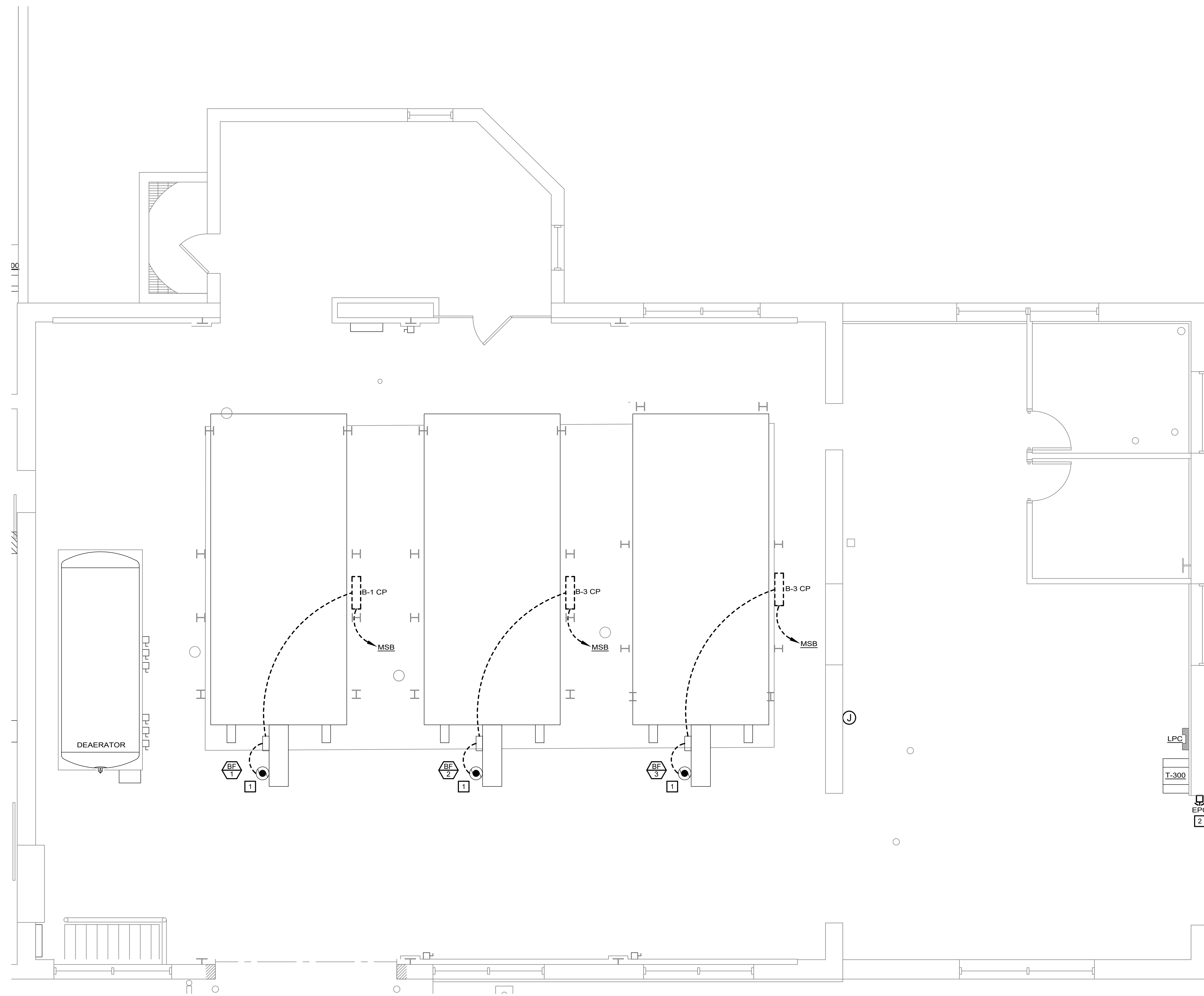
26 OF 31 SHEETS
04/26/2023

GENERAL DEMOLITION NOTES:

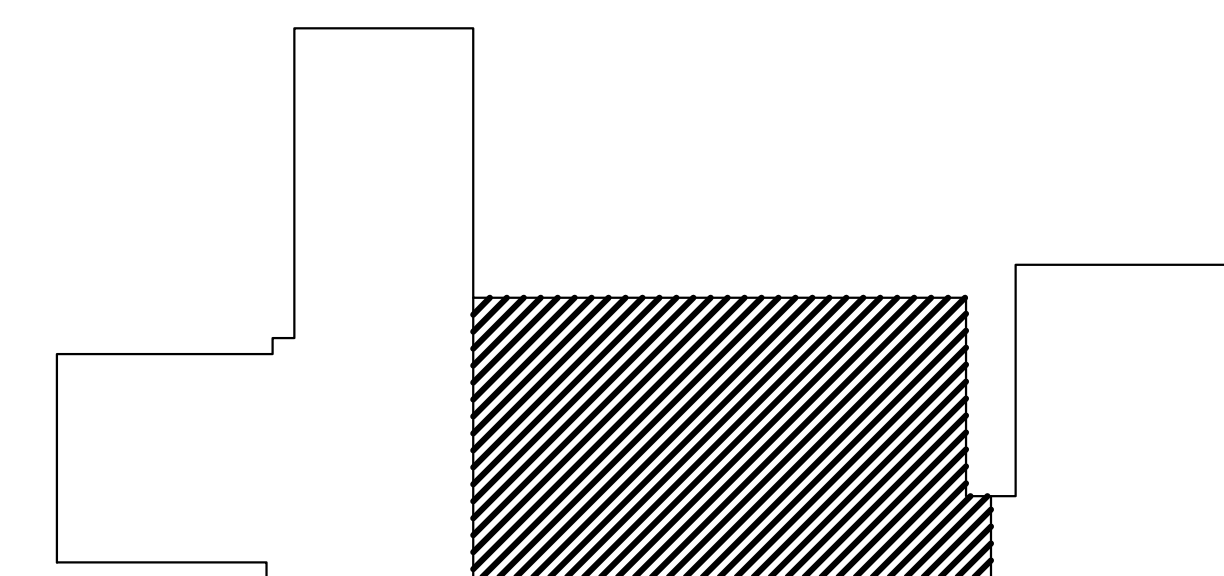
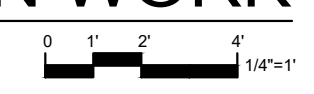
1. ALL SYMBOLS SHOWN DASHED ARE EXISTING ELECTRICAL DEVICES TO BE REMOVED OR AS NOTED. ALL SYMBOLS SHOWN SOLID LIGHT LINE ARE EXISTING ELECTRICAL DEVICES TO REMAIN. EXISTING ELECTRICAL DEVICES WHICH ARE TO REMAIN SHALL BE EXTENDED TO BE FLUSH WITH NEW FINISH ON EXISTING WALLS WHERE REQUIRED.
2. ALL EXISTING ELECTRICAL DEVICES IN A WALL THAT IS TO BE REMOVED; ELECTRICAL CONTRACTOR SHALL DISCONNECT POWER, CUT OFF CONDUCTORS AND CAP CONDUIT IN FLOOR OR CEILING AS REQUIRED. DEVICES ARE TO BE REMOVED ALONG WITH WALL BY GENERAL CONTRACTOR UNLESS OTHERWISE NOTED.
3. ALL EXISTING ELECTRICAL DEVICES TO BE REMOVED FROM WALLS WHICH ARE TO REMAIN; ELECTRICAL CONTRACTOR SHALL DISCONNECT POWER, REMOVE CONDUCTORS, REMOVE DEVICE AND PROVIDE BLANK COVERPLATES AS REQUIRED. UNLESS OTHERWISE NOTED.
4. FOR A PORTION OF A CIRCUIT WHICH IS REMOVED OR ABANDONED, RE-ESTABLISH CIRCUIT CONTINUITY FOR THE PORTION OF THE CIRCUIT WHICH IS TO REMAIN.
5. ALL EXISTING CONDUITS, RACEWAYS AND WIRING ROUTED IN EXISTING WALLS AND CEILING SPACES (WHICH ARE TO BE DEMOLISHED) WHICH SERVE OTHER AREAS SHALL BE REROUTED AS REQUIRED.
6. PROVIDE AND INSTALL SUPPORTS FOR EXISTING CABLES AND CONDUITS ABOVE CEILING THAT ARE CURRENTLY UNSUPPORTED IN ALL AREAS WHERE CEILING IS BEING REMOVED.

KEYED NOTES:

- 1 EXISTING BOILER FAN TO REMAIN, COMPLETELY DEMOLISH ELECTRICAL FEEDER AND CONTROLS BACK TO SOURCE AT MSB.
- 2 DISCONNECT EXISTING BOILER EMERGENCY SHUTOFF AND MAKE SAFE FORE REMOVAL.



N **MAIL LEVEL - CENTRAL ELECTRICAL - DEMOLITION WORK**
1/4" = 1'



KEY PLAN

S:\075105.000 FARMINGTON CORRECTIONAL CENTER BOILERS\03 ELECTRICAL\ED3.0, ED3.1, ED3.2.dwg 2023-5-15 11:43 Acheatham



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DESIGNED BY: EMP

SHEET TITLE:
**MAIN LEVEL
SOUTH ELECTRICAL
DEMOLITION WORK**

SHEET NUMBER:

ED3.2

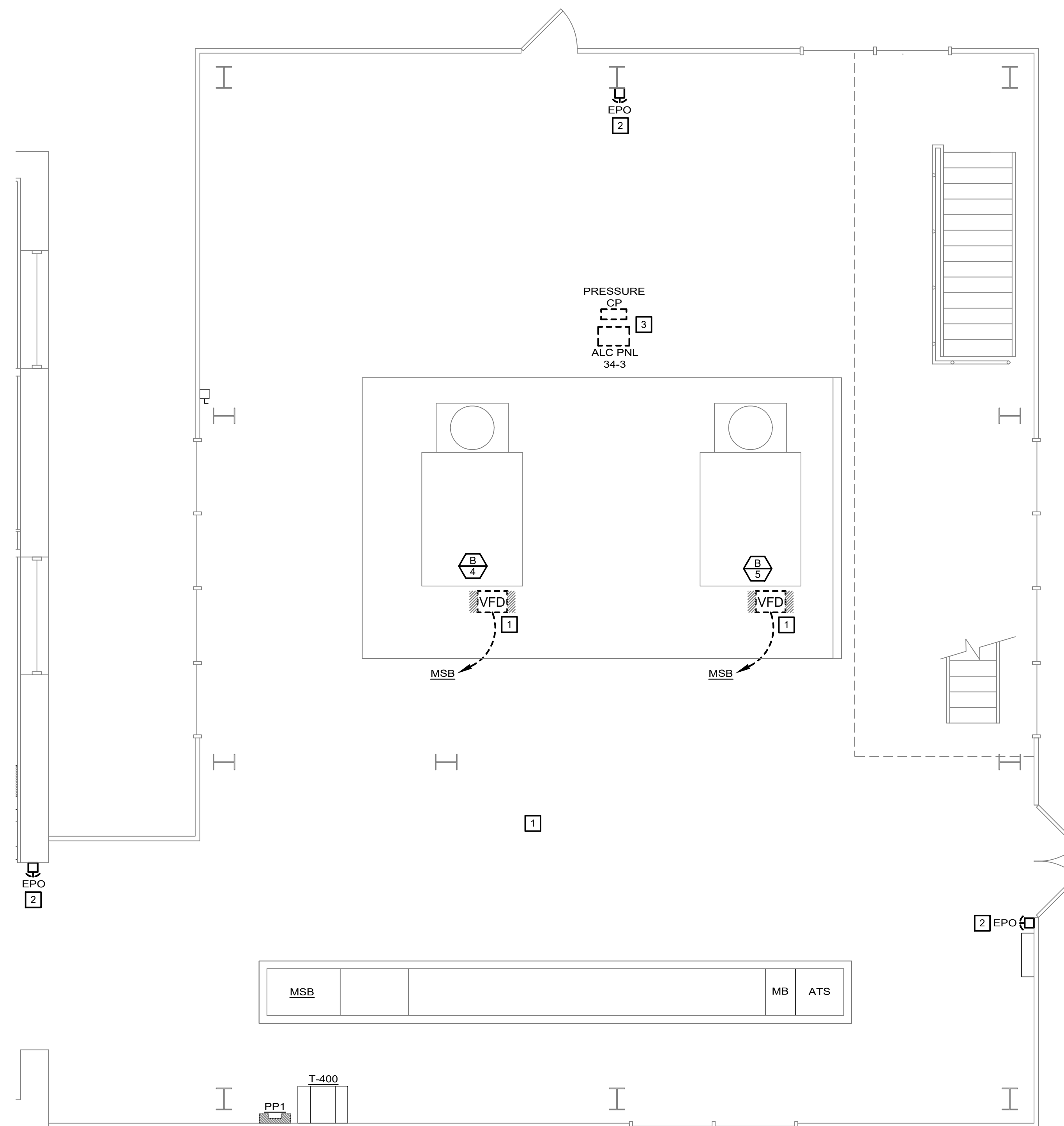
27 OF 31 SHEETS
04/26/2023

GENERAL DEMOLITION NOTES:

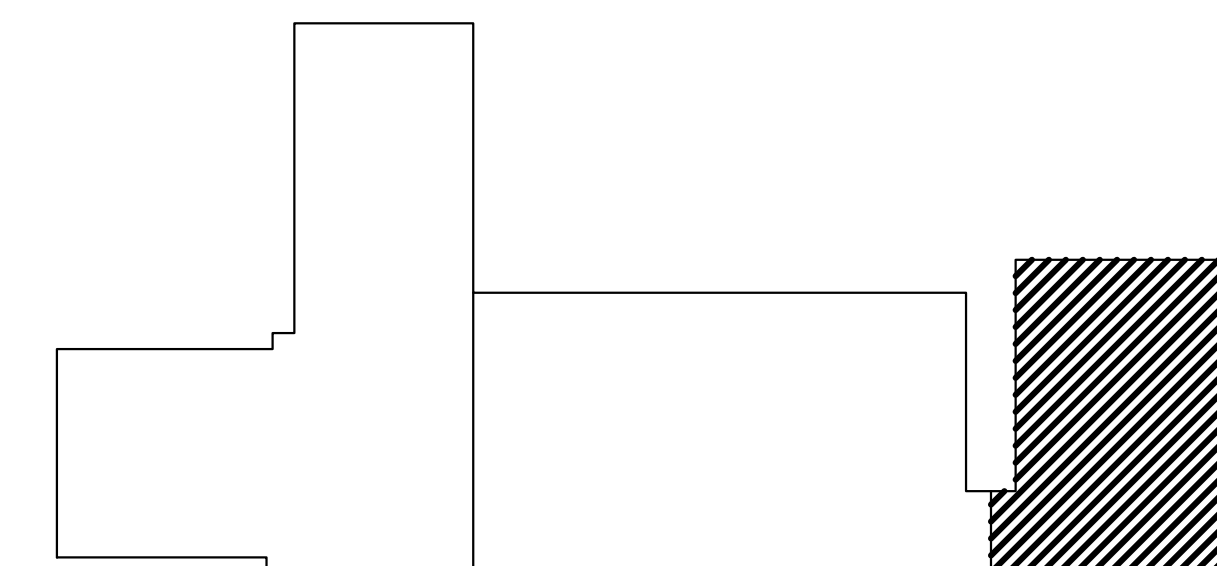
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6. PROVIDE AND INSTALL SUPPORTS FOR EXISTING CABLES AND CONDUITS ABOVE CEILING THAT ARE CURRENTLY UNSUPPORTED IN ALL AREAS WHERE CEILING IS BEING REMOVED.

KEYED NOTES:

- 1 DISCONNECT EXISTING BOILER VFDs AND MAKE SAFE FOR REMOVAL. DEMOLISH EXISTING CONDUIT AND WIRING BACK TO SOURCE MSB.
- 2 DISCONNECT EXISTING BOILER EMERGENCY SHUTOFF AND MAKE SAFE FORE REMOVAL.
- 3 DISCONNECT EXISTING PANELS AND MAKE SAFE FOR REMOVAL.



N **MAIN LEVEL - SOUTH ELECTRICAL - DEMOLITION WORK**
1/4" = 1'



KEY PLAN



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ISSUE DATE: 04/26/2023

DRAWN BY: AAC
CHECKED BY: ESW
DESIGNED BY: EMP

SHEET TITLE:
**MAIN LEVEL
NORTH ELECTRICAL
NEW WORK**

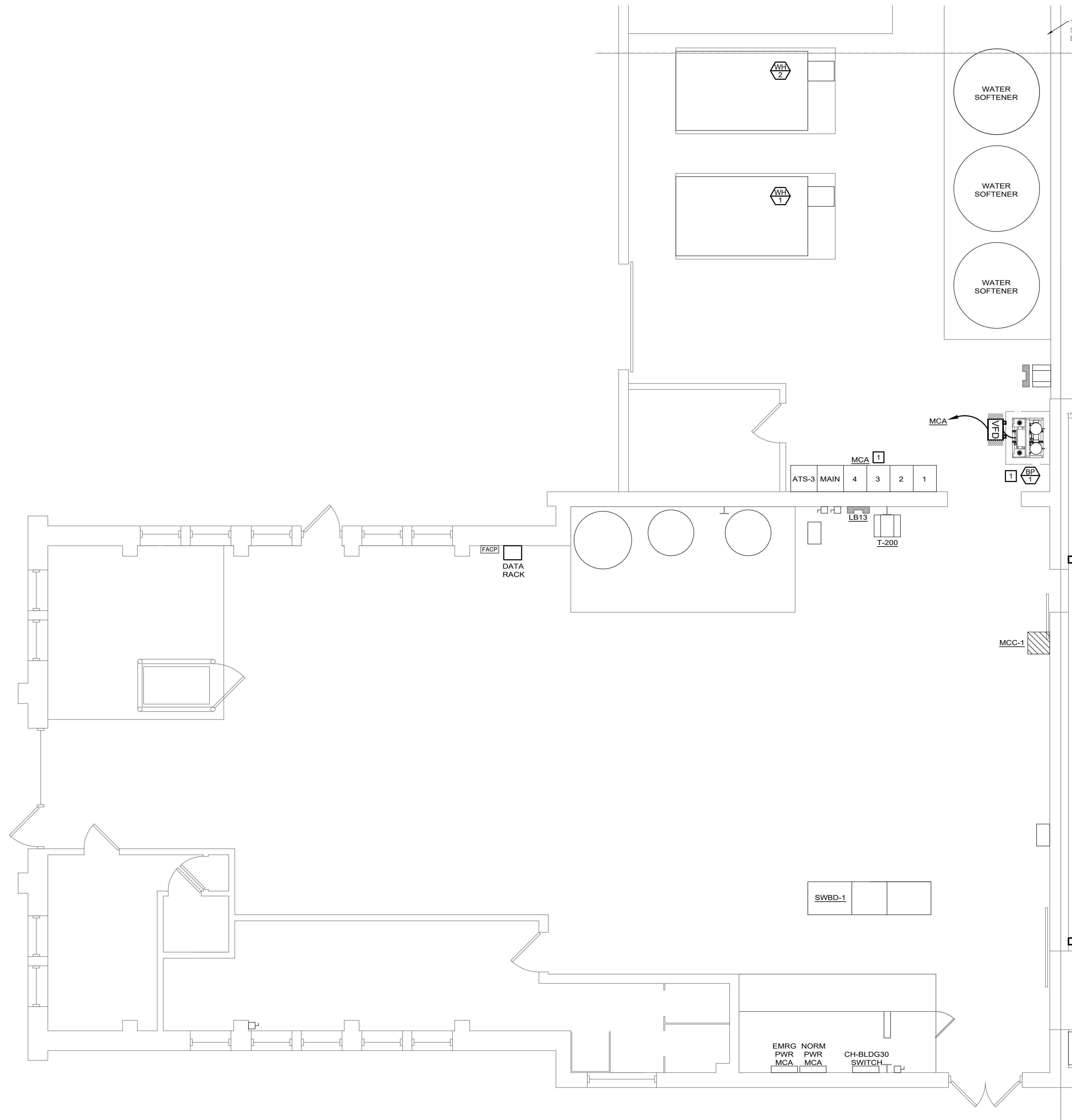
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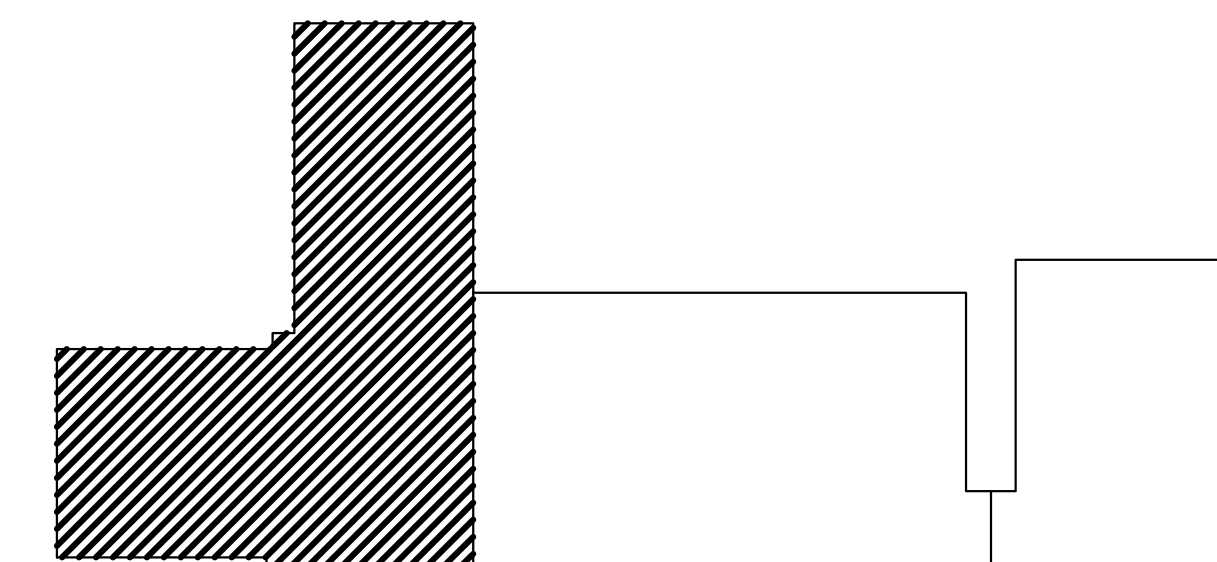
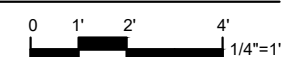
28 OF 31 SHEETS
04/26/2023

KEYED NOTES:

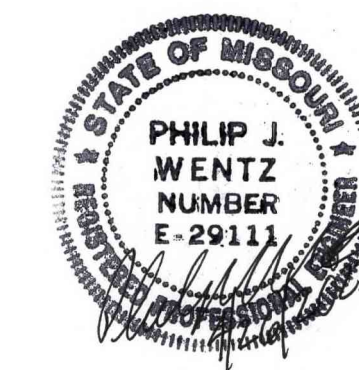
- 1 FEED NEW CIRCUIT FOR BOOSTER PUMP SKID FROM MCA SECTION 4 OF 6. SEE ONE-LINE DIAGRAM AND M.E. INTERFACE ON SHEET E6.0 FOR MORE INFORMATION.



N **MAIN LEVEL - NORTH ELECTRICAL - NEW WORK**
1/4" = 1'



KEY PLAN



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Corporation
Missouri State Certificate of
Authority #000087

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

DEPARTMENT OF
CORRECTIONS

BOILER UPGRADES

FARMINGTON CORRECTIONAL
CENTER
1012 WEST COLUMBIA STREET
FARMINGTON, MO 63640

PROJECT # C2006-01
SITE# 7008
FACILITY# 9327008094

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____

ISSUE DATE: 04/26/2023

DRAWN BY: AAC
CHECKED BY: ESW
DESIGNED BY: EMP

SHEET TITLE:
**MAIN LEVEL
CENTRAL ELECTRICAL
NEW WORK**

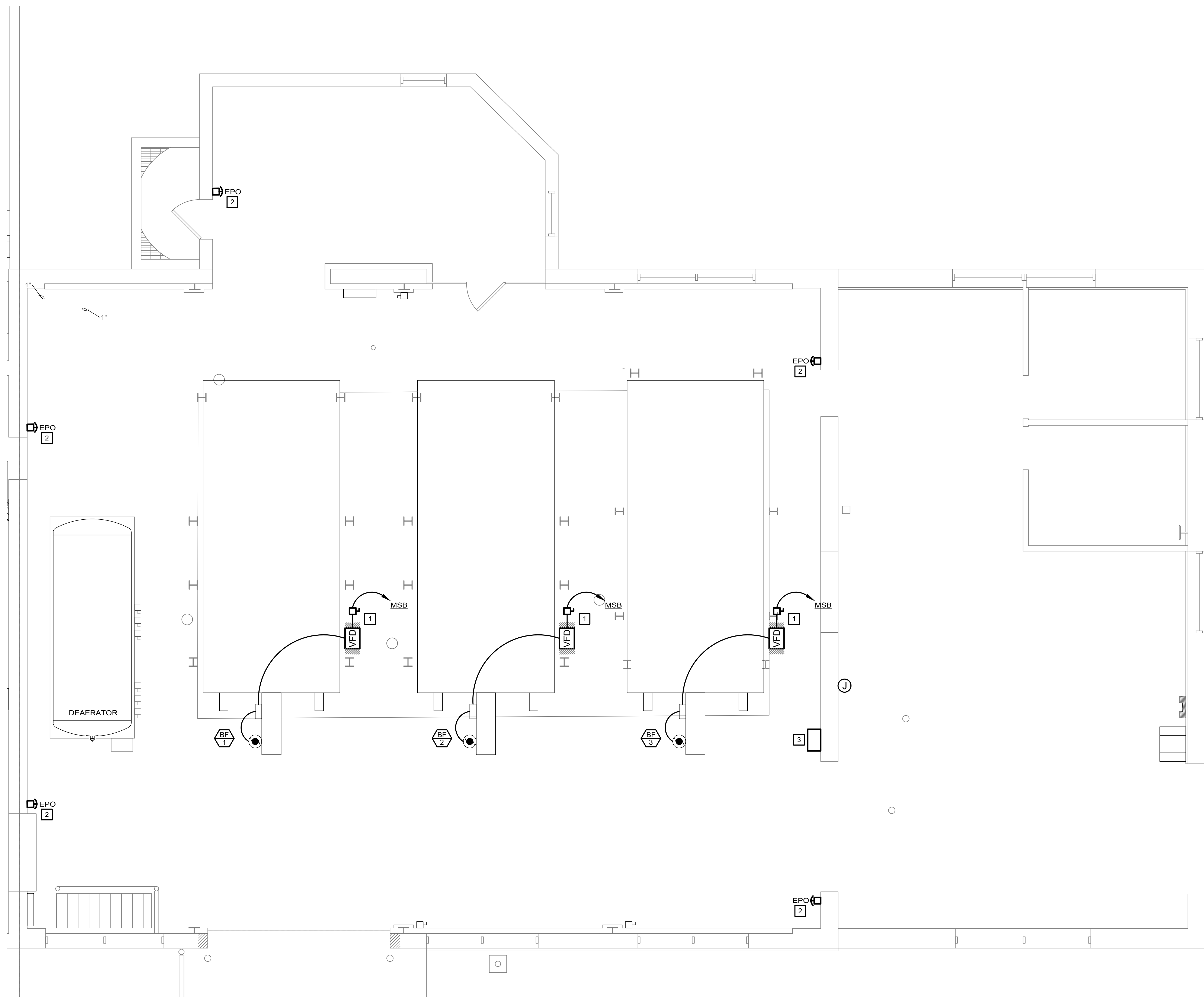
SHEET NUMBER:

E3.1

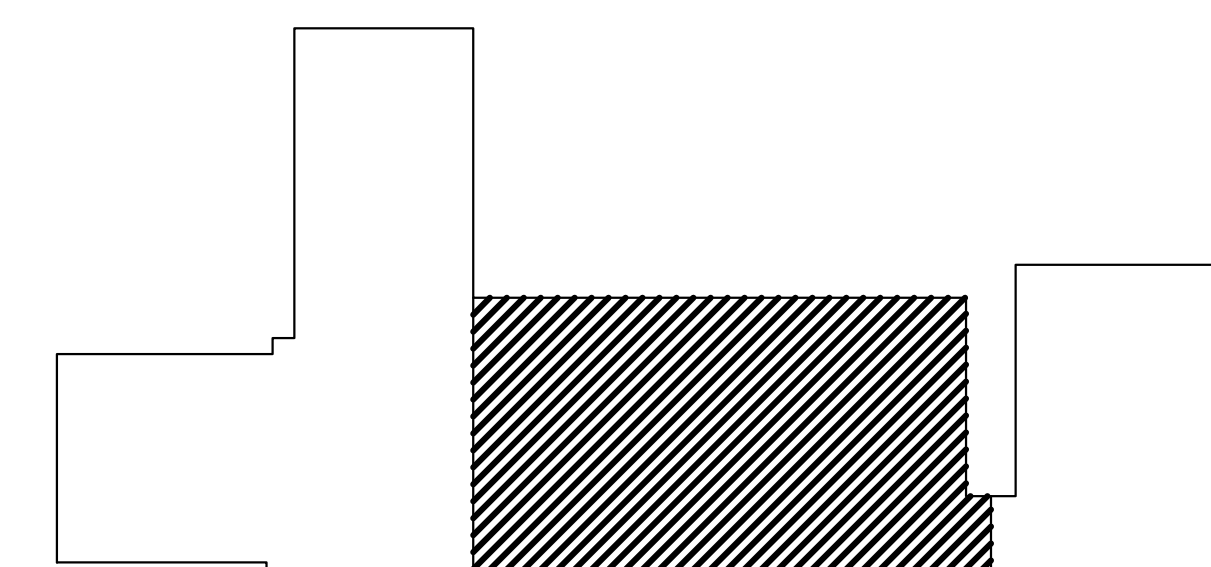
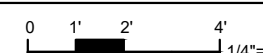
29 OF 31 SHEETS
04/26/2023

KEYED NOTES:

- 1 INSTALL NEW VFD AND DISCONNECT. FEED NEW BURNER FAN CIRCUIT FROM EXISTING SOURCE MSB. SEE ONE-LINE DIAGRAM AND MECHANICAL-ELECTRICAL INTERFACE ON SHEET E6.0 FOR MORE INFORMATION. ALL ELECTRICAL CONNECTIONS TO BURNER FAN AND ASSORTED EQUIPMENT TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR.
- 2 FURNISH AND INSTALL NEW BOILER EMERGENCY POWER-OFF SWITCH IN WEATHERPROOF ENCLOSURE. PROVIDE WITH PROTECTIVE COVER AND MECHANICAL LATCHING MECHANISM. SEE BOILER SHUTDOWN DIAGRAM SHEET E1.0 FOR MORE INFORMATION.
- 3 BOILER SHUTDOWN RELAY CONTACTOR. SEE BOILER SHUTDOWN DIAGRAM SHEET E1.0 FOR MORE INFORMATION.



N **MAIN LEVEL - CENTRAL ELECTRICAL - NEW WORK**
1/4" = 1'



KEY PLAN



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DATE: _____

ISSUE DATE: 04/26/2023

DRAWN BY: AAC
CHECKED BY: ESW
DESIGNED BY: EMP

SHEET TITLE:
**MAIN LEVEL
SOUTH ELECTRICAL
NEW WORK**

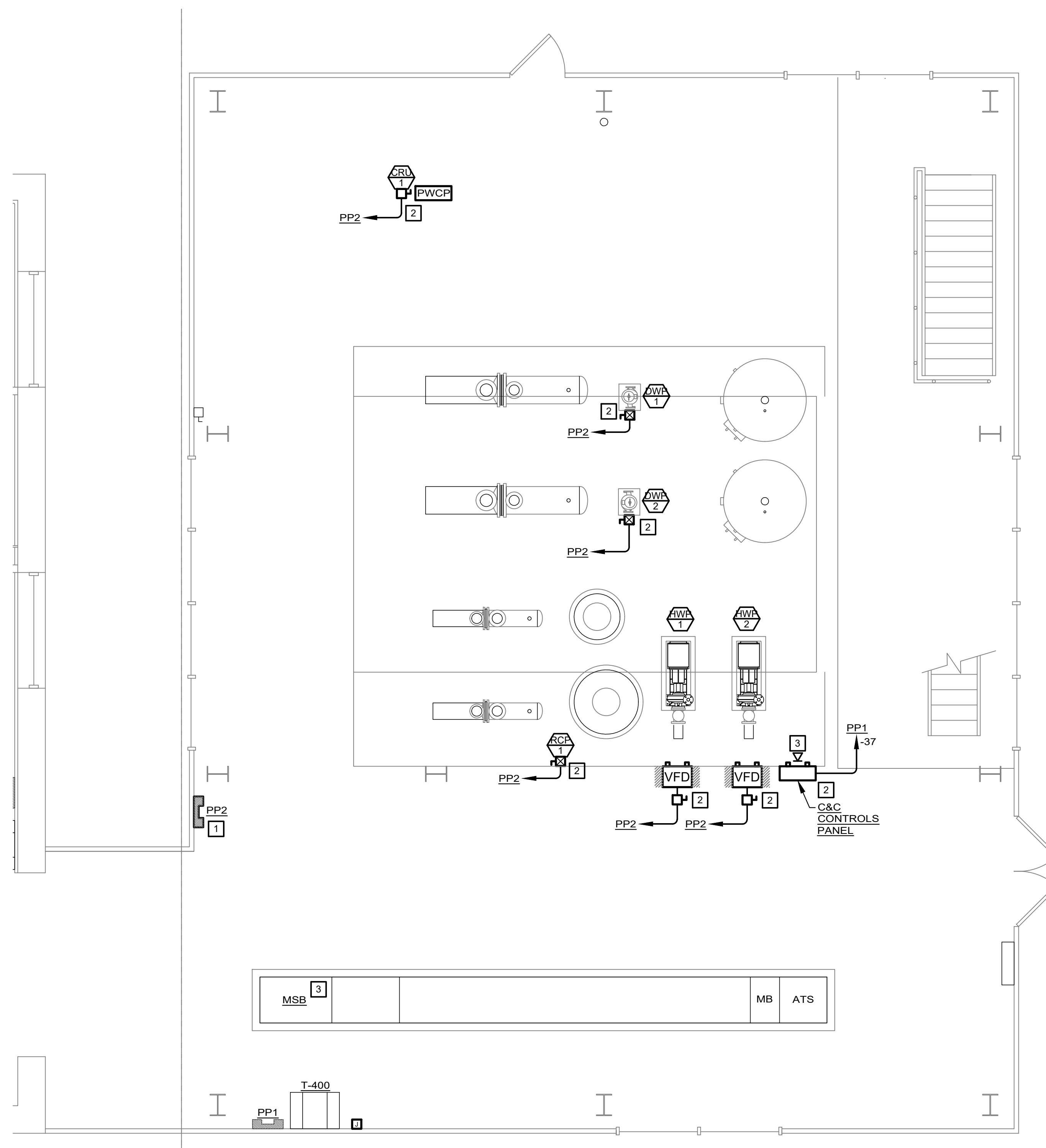
SHEET NUMBER:

E3.2

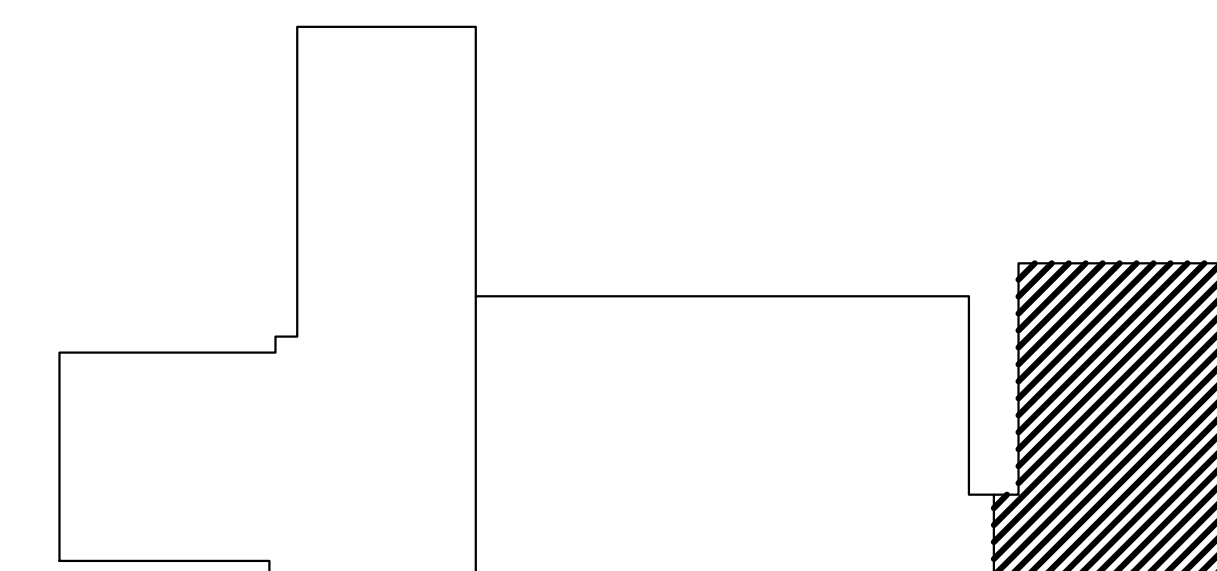
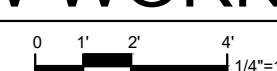
30 OF 31 SHEETS
04/26/2023

KEYED NOTES:

- 1 FURNISH AND INSTALL NEW 277/480V, 125A, 3Ø, 4W PANEL PP2. REFER TO ONE-LINE DIAGRAM ON SHEET E6.0 FOR MORE INFORMATION.
- 2 FURNISH, CONSTRUCT, AND INSTALL UNISTRUT RACK OR MOUNTING EQUIPMENT FOR DISCONNECT AND CONTROLS.
- 3 PROVIDE DATA RECEPTACLE FOR CONNECTION TO NEW CONTROLS PANEL. ROUTE TO DATA RACK LOCATED IN NORTH PLAN. SEE SHEET E3.0 FOR DATA RACK LOCATION.



N **MAIN LEVEL - SOUTH ELECTRICAL - NEW WORK**
1/4" = 1'



KEY PLAN



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MEP:

McCLURE ENGINEERING

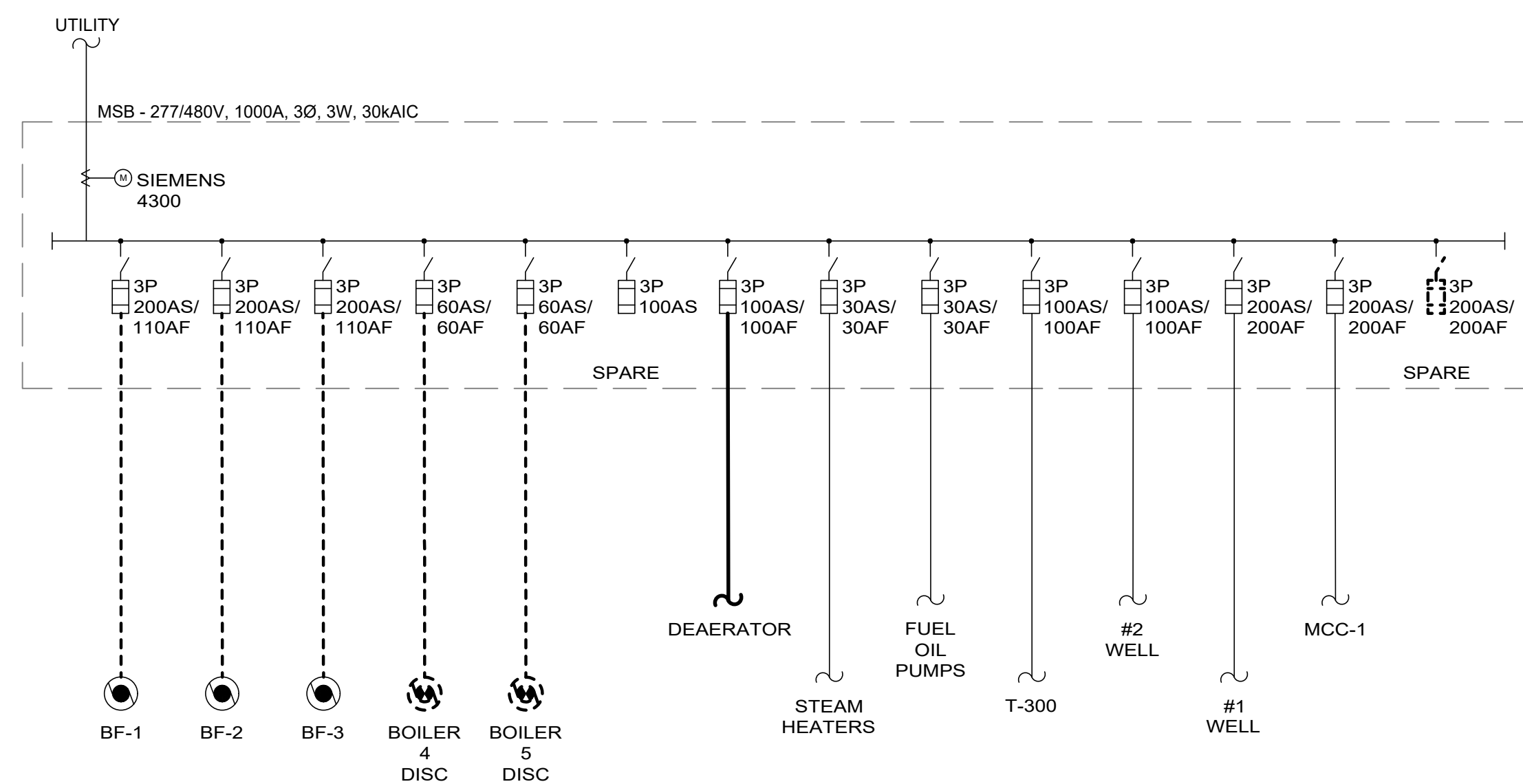
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GENERAL ONE-LINE NOTES:

- ALL EQUIPMENT SHOWN AS THIN CONTINUOUS LIGHT LINE IS EXISTING EQUIPMENT TO REMAIN.
- ALL EQUIPMENT SHOWN AS THICK DASHED HEAVY LINE IS EXISTING EQUIPMENT TO BE REMOVED.
- ALL EQUIPMENT SHOWN AS THICK CONTINUOUS HEAVY LINE IS NEW EQUIPMENT.
- COORDINATE ELECTRICAL SHUT-DOWNS WITH OWNER AND AMEREN.

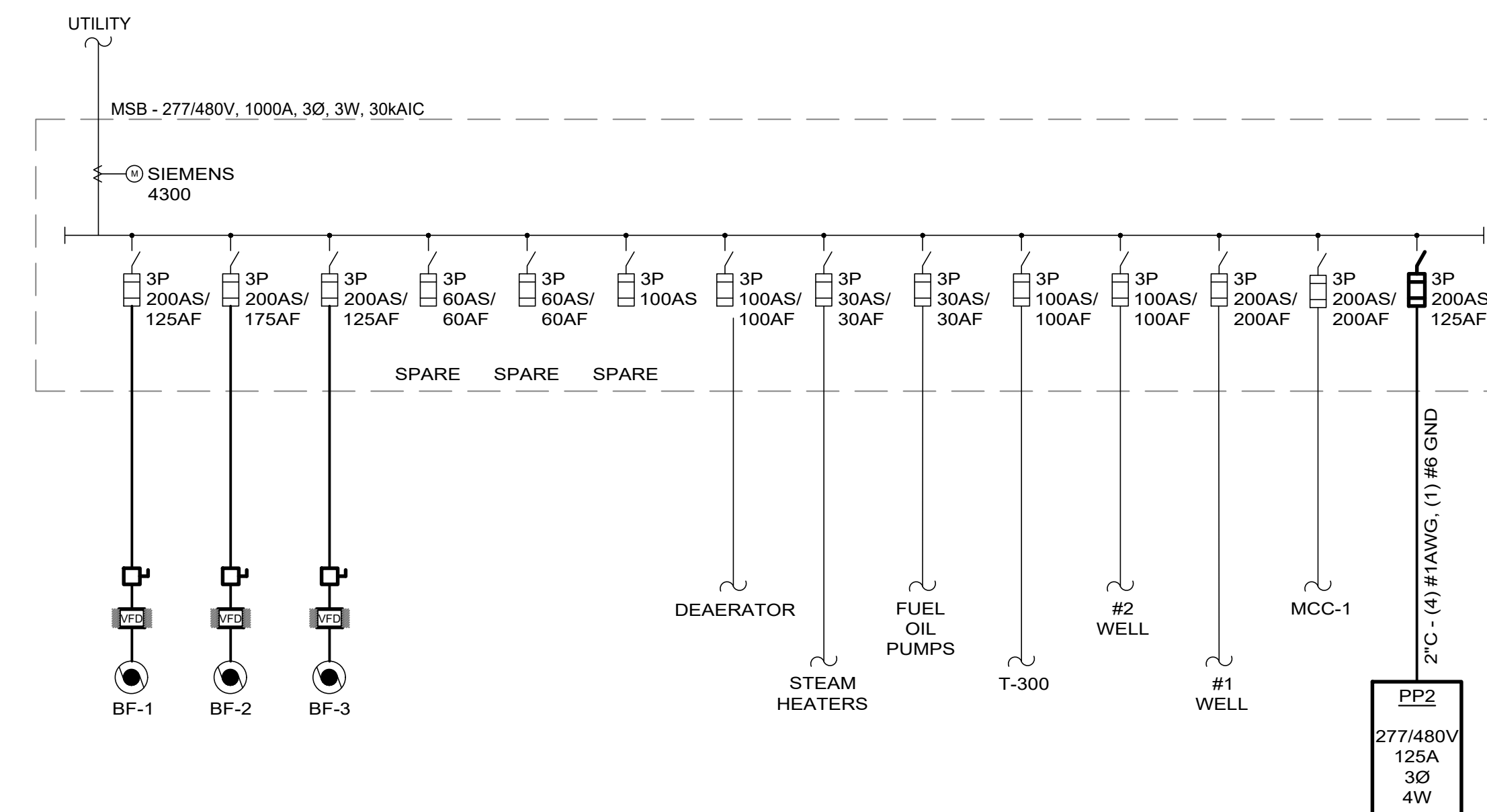
ONE-LINE KEYED NOTES:

- RE-FEED 100A CONNECTION TO SALLY PORT FROM SPARE SWITCH LOCATED IN MSB. SEE PLANS SHEET E3.2 FOR MORE INFORMATION.
- FURNISH AND INSTALL NEW FUSE SWITCH IN EXISTING MCA TO FEED NEW BOOSTER PUMP SKID. SEE PLANS SHEET E3.0 FOR MORE INFORMATION.



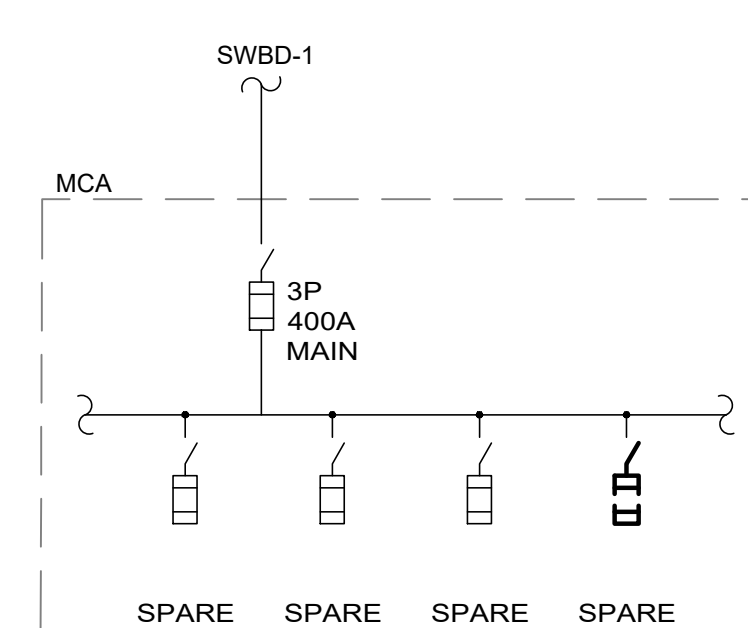
DEMOLITION WORK - ONE-LINE DIAGRAM - MSB

NTS



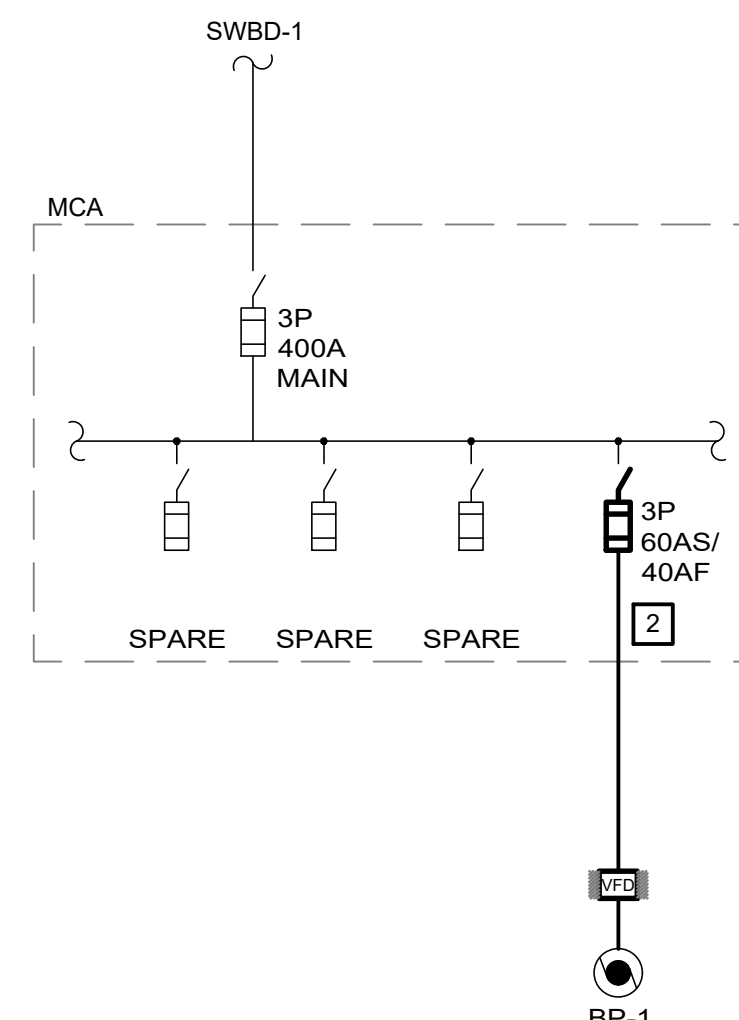
NEW WORK - ONE-LINE DIAGRAM - MSB

NTS



**DEMOLITION WORK
PARTIAL ONE-LINE DIAGRAM - MCA**

NTS



**NEW WORK
PARTIAL ONE-LINE DIAGRAM - MCA**

NTS

PANELBOARD: PP2									
VOLTAGE: 480 Y277V									
PHASE: 3P 4W									
MAIN: 125 A MLO									
SHORT CIRCUIT: 14 K AIC									
LOCATION: BOILER PLANT SOUTH									
LOAD	POLES	CKT BKR	CKT	Ph	CKT	CKT BKR	POLES	LOAD	
HWP-1	3	40	1	A	2	40	3	HWP-2	
			3	B	4				
			5	C	6				
			7	A	8				
			9	B	10				
CRU-1	3	20	11	C	12	20	3	DWP-2	
			13	A	14				
			15	B	16				
			17	C	18				
			19	A	20				
DWP-1	3	20	21	B	22	20	3	RCP-1	
			23	C	24				
			25	A	26				
			27	B	28				
			29	C	30				
SPARE	3	20	31	A	32	20	3	SPARE	
			33	B	34				
			35	C	36				
			37	A	38				
			39	B	40				
SPARE	1	20	31	A	32	20	1	SPARE	
SPARE	1	20	33	B	34	20	1	SPARE	
SPARE	1	20	35	C	36	20	1	SPARE	
SPARE	1	20	37	A	38	20	1	SPARE	
SPARE	1	20	39	B	40	20	1	SPARE	

MECHANICAL-ELECTRICAL INTERFACE																										
EQUIPMENT			MOTOR DATA		BRANCH CIRCUIT DATA		SOURCE DATA				UNIT CONTROLS				ID			EQUIPMENT DISCONNECT				REMARKS				
EQUIP. ID	DESCRIPTION	REF. SHEET	LOCATION	HP / (kW) / (MCA) ¹	VOLTAGE / PHASE	FEEDER SIZE	SOURCE	TYPE ² / POLES	OCB SWITCH/FUSE SIZE or CB TRIP	TYPE ⁴	STARTER SIZE	TYPE ³	SWITCH/FUSE or CB TRIP	NEMA RATING	F	I	C	SWITCH SIZE	POLE	OCB SIZE	NEMA RATING	F	I	C	REMARKS	
HWP-1	HOT WATER PUMP	E3.2	BOILER PLANT SOUTH	15HP	480 / 3	(3) #10, (1) #10 GRD - 3/4"	PP2	CB / 3	40	VFD	NA	NA	NA	1	E	E	E	HWP-1	60A	3	40A	1	E	E	E	VFD PROVIDED BY DIVISION 26
HWP-2	HOT WATER PUMP	E3.2	BOILER PLANT SOUTH	15HP	480 / 3	(3) #10, (1) #10 GRD - 3/4"	PP2	CB / 3	40	VFD	NA	NA	NA	1	E	E	E	HWP-2	60A	3	40A	1	E	E	E	VFD PROVIDED BY DIVISION 26
BP-1	DOMESTIC WATER BOOSTER SKID	E3.0	BOILER PLANT NORTH	20HP	480 / 3	(3)#8, (1)#10 GRD - 3/4"	MCA	FS / 3	60/40	VFD	NA	NA	NA	1	M	M	E	BP-1	NA	NA	NA	NA	N	N	N	FACTORY-MOUNTED VFD
DWP-1	DOMESTIC WATER PUMP	E3.2	BOILER PLANT SOUTH	1.5HP	480 / 3	(3)#12, (1)#12 GRD - 3/4"	PP2	CB / 1	20	COMB	0	FS	15A	1	E	E	E	DWP-1	NA	NA	NA	NA	N	N	N	
DWP-2	DOMESTIC WATER PUMP	E3.2	BOILER PLANT SOUTH	1.5HP	480 / 3	(3)#12, (1)#12 GRD - 3/4"	PP2	CB / 1	20	COMB	0	FS	15A	1	E	E	E	DWP-2	NA	NA	NA	NA	N	N	N	
CRU-1	CONDENSATE RECEIVER	E3.2	BOILER PLANT SOUTH	4HP	480 / 3	(3) #12, (1) #12 GRD - 3/4"	PP2	CB / 3	20	PWCP	NA	NA	NA	1	M	M	E	CRU-1	30A	3	20A	1	E	E	E	
BF-1	BOILER FAN	E3.1	BOILER PLANT CENTRAL	75HP	480 / 3	(3)#1, (1)#6 GRD - 2"	MSB	FS / 3	200/125	VFD	NA	NA	NA	1	M	M	E	BF-1	200A	3	125A	1	E	E	E	VFD PROVIDED BY DIVISION 23
BF-2	BOILER FAN	E3.1	BOILER PLANT CENTRAL	100HP	480 / 3	(3)#20, (1)#6 GRD - 2"	MSB	FS / 3	200/175	VFD	NA	NA	NA	1	M	M	E	BF-2	200A	3	175A	1	E	E	E	VFD PROVIDED BY DIVISION 23
BF-3	BOILER FAN	E3.1	BOILER PLANT CENTRAL	75HP	480 / 3	(3)#1, (1)#6 GRD - 2"	MSB	FS / 3	200/125	VFD	NA	NA	NA	1	M	M	E	BF-3	200A	3	125A	1	E	E	E	VFD PROVIDED BY DIVISION 23
RCP-1	DOMESTIC HOT WATER RETURN PUMP	E3.1	BOILER PLANT SOUTH	3HP	480 / 3	(3)#12, (1)#12 GRD - 3/4"	PP2	CB / 3	20A	COMB	0	FS	15A	1	E	E	E	RCP-1	NA	NA	NA	NA	N	N	N	

¹HP / (kW): HORSEPOWER IS SHOWN UNLESS KILOWATTS (KW) OR MINIMUM CIRCUIT AMPACITY (MCA) IS CALLED OUT

²TYPE: FS FUSED SWITCH CB CIRCUIT BREAKER NA NOT APPLICABLE

³TYPE: COMB Combination Magnetic Starter / Disconnect Switch or Circuit Breaker MAG Magnetic Starter 2S1W 2-speed 1-winding Magnetic Starter 2S2W 2-speed 2-winding Magnetic Starter MAN Manual Motor Starter PWCP Pre-wired Control Panel VFD Variable Frequency Drive TOK Toggle Switch (horsepower rated) TST Thermostat RIB Relay in a Box NA Not Applicable

⁴F I C: (Furnished, Installed, Connected) M Mechanical, Plumbing, Fire Protection Contractor, or Factory E Electrical Contractor N Not Applicable

REVISION: _____
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ISSUE DATE: 04/26/2023

DRAWN BY: AAC
CHECKED BY: ESW
DESIGNED BY: EMP

SHEET TITLE:
**ELECTRICAL
ONE-LINE DIAGRAM
AND SCHEDULES**

SHEET NUMBER:

E6.0

S:\075105.000 FARMINGTON CORRECTIONAL CENTER BOILERS\03 ELECTRICAL\E6.0.dwg 2023-5-1 16:15 Acheatham