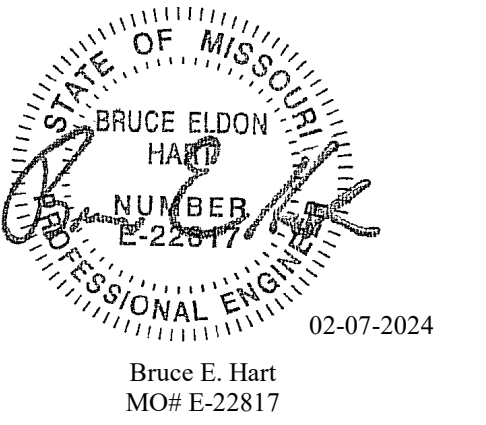


MARYVILLE TREATMENT CENTER

30227 US HWY 136
MARYVILLE, MO 64468

REPLACE STEAM, WATER AND SEWER LINES, BUILDING 3

STATE OF MISSOURI
MIKE PARSON,
GOVERNOR



IMEG
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1600 BALTIMORE
SUITE 300
KANSAS CITY, MO 64108
P: 816.842.8437
PROJECT #23000440.00

Designers

Environmental: Roth Environmental Consultants Inc.

Mechanical, Plumbing, Electrical: IMEG
Certificate of Authority #F001325536

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

SUBMISSION: BID DOCUMENTS - 02/07/2024

GENERAL PROJECT PHASING PLAN

MECHANICAL, ELECTRICAL, AND PLUMBING (MEP) NEW WORK TO INSTALL THE NEW 2-PIPE SYSTEM IN OCCUPIED AREAS OF THE MAIN BLDG MAY BEGIN AS SOON AS POSSIBLE. THIS WORK SHALL BE CONDUCTED IN MULTIPLE PHASES, SO THAT OWNER CAN RELOCATE OCCUPANTS TO OTHER AREAS OF THE MAIN BUILDING WHILE WORK IS ONGOING. OWNER ANTICIPATES APPROXIMATELY EIGHT (8) PHASES WILL BE REQUIRED IN THE OCCUPIED AREAS. REFER TO SPECIFICATION SECTION 011000 "SUMMARY OF WORK" FOR ADDITIONAL DETAILS. FINAL PHASING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. PHASING SHALL BE REVIEWED WITH OWNER AND ENGINEER AND SHALL BE APPROVED BY OWNER. PHASE PROJECT TO MINIMIZE HEATING AND PLUMBING SYSTEM DOWNTIME. COORDINATE ALL HEATING AND PLUMBING SYSTEM DOWNTIME WITH OWNER. PHASES ARE SUBJECT TO OVERLAP WITH EACH OTHER TO MEET THE PROJECT SUBSTANTIAL COMPLETION DEADLINE.

A SUGGESTED SEQUENCE OF WORK FOLLOWS. THIS IS A GENERAL OVERVIEW AND DOES NOT INCLUDE ALL WORK REQUIRED FOR PROJECT COMPLETION. THE FOLLOWING STEPS ARE FOR THE CONVENIENCE OF THE CONTRACTOR AND MAY BE MODIFIED AS REQUIRED:

- SUBMIT PRODUCT DATA FOR NEW BOILERS AND ANY OTHER EQUIPMENT WITH LONG LEAD TIMES, FOR REVIEW AND APPROVAL AS SOON AS POSSIBLE AFTER PROJECT IS AWARDED.
- BEGIN INSTALLATION OF MEP NEW WORK IN OCCUPIED AREAS OF THE MAIN BLDG.
- BEGIN ASBESTOS ABATEMENT IN THE PLUMBING CHASES. TIME THIS WORK SUCH THAT IT WILL BE COMPLETED JUST PRIOR TO BEGINNING THE ABATEMENT WORK IN THE TUNNELS (DESCRIBED BELOW), SO THAT THE ABATEMENT CONTRACTOR MOST ONLY MOBILIZE ONCE.
- WHEN ABATEMENT WORK IN PLUMBING CHASES IS COMPLETE, PLUMBING RISER REPLACEMENT IN CHASES MAY BEGIN.
- PRIOR TO SHUTTING DOWN THE OLD STEAM BOILER PLANT, INSTALL THE NEW DOMESTIC HOT WATER CIRCULATING PUMP AND ANY TEMPORARY PIPING REQUIRED TO SERVE THE MAIN BUILDING (ALONG WITH THE LAUNDRY) USING THE EXISTING GAS-FIRED LAUNDRY WATER HEATERS AND THE SMALL DOMESTIC HOT WATER STORAGE TANK.
- WHEN APPROVED BY THE FACILITY (MIDDLE OF MAY ANTICIPATED), SHUT DOWN THE OLD STEAM BOILERS, TAKING DOWN THE FACILITY HEATING SYSTEM, AS WELL AS THE OLD DOMESTIC WATER HEATING SYSTEM THAT SERVED THE MAIN BUILDING.
- BEGIN MEP DEMOLITION AND NEW WORK IN BOILER BUILDING.
- WHEN THE STEAM PIPING IN THE TUNNELS HAS COOLED OFF, BEGIN ABATEMENT WORK IN THE TUNNELS. OWNER ANTICIPATES THAT CONTRACTOR WILL DIVIDE THIS WORK INTO SEGMENTS. CONTRACTOR SHALL DETERMINE THE LIMITS FOR EACH SEGMENT (I.E. WHERE TO INSTALL TEMPORARY BARRIERS). WHEN A SEGMENT IS COMPLETED AND THAT PORTION OF THE TUNNELS IS CLEARED FOR OCCUPANCY, THEN THE MECHANICAL CONTRACTOR CAN ENTER THAT PORTION AND DEMOLISH THE OLD STEAM PIPING. THIS WOULD MAKE IT EASIER FOR THE ABATEMENT CONTRACTOR TO TRANSPORT HAZARDOUS MATERIALS OUT OF THE NEXT SEGMENT OF THE TUNNELS.
- WHEN ABATEMENT WORK IN TUNNELS IS COMPLETE, PLUMBING WORK IN TUNNELS MAY BEGIN.
- ONCE THE NEW BOILER PLANT AND THE FIRST PACKAGED WATER HEATER IS FULLY OPERATIONAL, DISCONNECT AND REMOVE THE OLD LAUNDRY WATER HEATERS, FREEING UP SPACE IN THE BOILER ROOM, THEN INSTALL AND START UP THE SECOND (REDUNDANT) PACKAGED WATER HEATER.

THE NEW FACILITY HEATING SYSTEM (INCLUDING, BUT NOT LIMITED TO BOILERS, PUMPS, ACCESSORIES, TERMINAL HEAT TRANSFER UNITS, AND CONTROLS) AND ONE OF THE NEW PACKAGED WATER HEATERS SHALL BE INSTALLED AND FULLY OPERATIONAL BY OCTOBER 1. IF THIS IS NOT POSSIBLE, CONTRACTOR SHALL EITHER PROVIDE TEMPORARY HEATING FOR ALL AREAS OF THE MAIN BUILDING UNTIL THE NEW SYSTEM IS OPERATIONAL, OR SHALL COORDINATE WITH THE OWNER TO KEEP THE OLD STEAM BOILERS AND FACILITY HEATING SYSTEM OPERATIONAL UNTIL THE FOLLOWING CALENDAR YEAR. BETWEEN OCTOBER 1 AND MAY 1, IN ALL OCCUPIED AREAS, THE TYPICAL WINTER DESIGN ROOM SETPOINT TEMPERATURE (INDICATED UNDER "MECHANICAL DESIGN CONDITIONS" ON SHEET M000) SHALL BE MAINTAINED.

IF ALTERNATE 1 IS ACCEPTED, THE NEW CHILLER AND ASSOCIATED WORK SHALL BE INSTALLED, STARTED UP, AND TESTED AS SOON AS POSSIBLE. ONCE THE EQUIPMENT IS READY, THE OWNER WILL DECIDE WHEN TO OPERATE THE NEW 2-PIPE SYSTEM IN COOLING MODE. CONTRACTOR SHALL ASSIST THE OWNER WITH SWITCHING THE SYSTEM TO COOLING MODE FOR THE FIRST TIME.



PROJECT LOCATION

NO SCALE

Sheet List	
Number	Name
G001	COVER SHEET
C100	SITE LAYOUT PLAN
ENV100	MAIN BLDG TUNNEL - ABATEMENT
ENV200	MAIN BLD - ENLARGED ABATEMENT PLANS
M000	HVAC COVERSHEET - SYMBOLS AND LEGENDS
M001	HVAC COVERSHEET - ABBREVIATIONS AND GENERAL NOTES
M100	BOILER BLDG - LOWER LEVEL - MECHANICAL DEMOLITION
M101	BOILER BLDG - UPPER LEVEL - MECHANICAL DEMOLITION
M109	MAIN BLDG - TUNNEL LEVEL - MECHANICAL DEMOLITION
M200	BOILER BLDG - LOWER LEVEL - MECHANICAL
M201	BOILER BLDG - UPPER LEVEL - MECHANICAL
M209	MAIN BLDG - TUNNEL LEVEL - MECHANICAL
M210	MAIN BLDG - BASEMENT LEVEL - MECHANICAL
M211	MAIN BLDG - LEVEL 01 - MECHANICAL
M212	MAIN BLDG - LEVEL 02 - MECHANICAL
M213	MAIN BLDG - LEVEL 03 - MECHANICAL
M220	MAIN BLDG - BASEMENT LEVEL - TEMP CONTROLS
M221	MAIN BLDG - LEVEL 01 - TEMPERATURE CONTROLS
M222	MAIN BLDG - LEVEL 02 - TEMPERATURE CONTROLS
M223	MAIN BLDG - LEVEL 03 - TEMPERATURE CONTROLS
M400	MECHANICAL DETAILS
M401	MECHANICAL DETAILS
M500	MECHANICAL DIAGRAMS
M501	MECHANICAL DIAGRAMS
M520	MECHANICAL CONTROL DIAGRAMS
M521	MECHANICAL CONTROL DIAGRAMS
M522	MECHANICAL CONTROL DIAGRAMS
M600	MECHANICAL SCHEDULES
M601	MECHANICAL SCHEDULES
P000	PLUMBING COVERSHEET
P100	BOILER BLDG - LOWER LEVEL - PLUMBING DEMOLITION
P101	BOILER BLDG - UPPER LEVEL - PLUMBING DEMOLITION
P109	MAIN BLDG - TUNNEL LEVEL - PLUMBING DEMOLITION
P200	BOILER BLDG - LOWER LEVEL - PLUMBING
P201	BOILER BLDG - UPPER LEVEL - PLUMBING
P209	MAIN BLDG - TUNNEL LEVEL - PLUMBING
P210	MAIN BLDG - BASEMENT LEVEL - PLUMBING
P211	MAIN BLDG - LEVEL 01 - PLUMBING
P212	MAIN BLDG - LEVEL 02 - PLUMBING
P213	MAIN BLDG - LEVEL 03 - PLUMBING
P311	MAIN BLDG - ENLARGED PLUMBING PLANS
P312	MAIN BLDG - ENLARGED PLUMBING PLANS
P600	PLUMBING SCHEDULES, DETAILS, AND DIAGRAMS
E001	ELECTRICAL COVERSHEET
E100	BOILER BLDG - LOWER LEVEL - ELECTRICAL DEMOLITION
E200	BOILER BLDG - LOWER LEVEL - ELECTRICAL
E201	BOILER BLDG - UPPER LEVEL - ELECTRICAL
E209	MAIN BLDG - TUNNEL LEVEL - ELECTRICAL
E210	MAIN BLDG - BASEMENT LEVEL - ELECTRICAL
E211	MAIN BLDG - LEVEL 01 - ELECTRICAL
E212	MAIN BLDG - LEVEL 02 - ELECTRICAL
E213	MAIN BLDG - LEVEL 03 - ELECTRICAL
E400	ELECTRICAL DETAILS
E500	RISER DIAGRAM
E600	PANEL SCHEDULES
E601	PANEL SCHEDULES
E602	PANEL SCHEDULES

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DESIGN AND
CONSTRUCTION

DEPARTMENT OF
CORRECTIONS

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: G001.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

COVER SHEET

SHEET NUMBER:

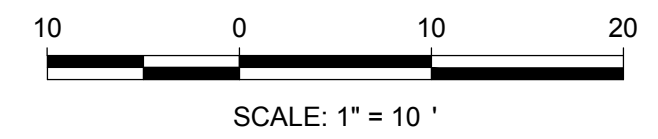
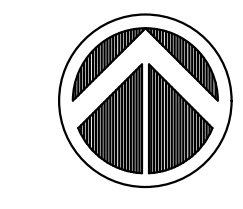
G001

SHEET 1 OF 57

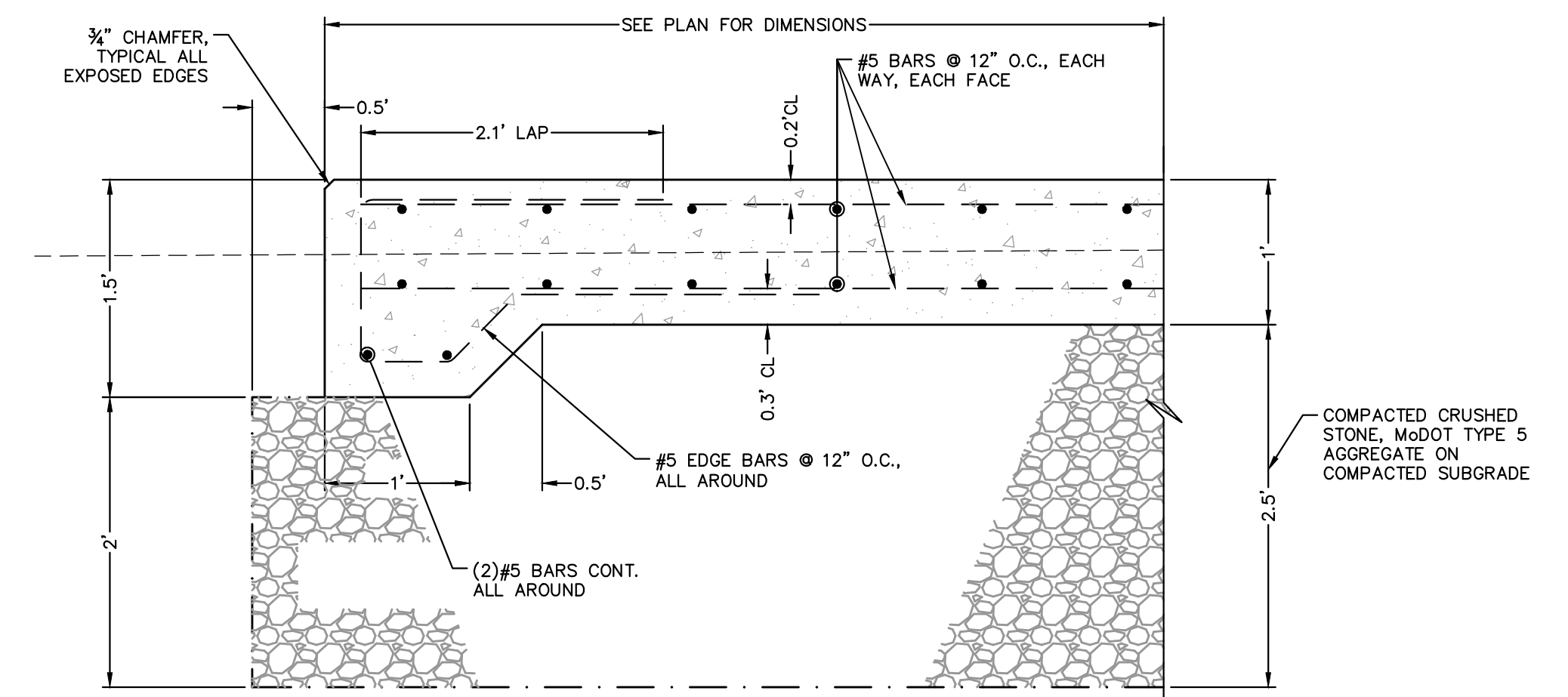
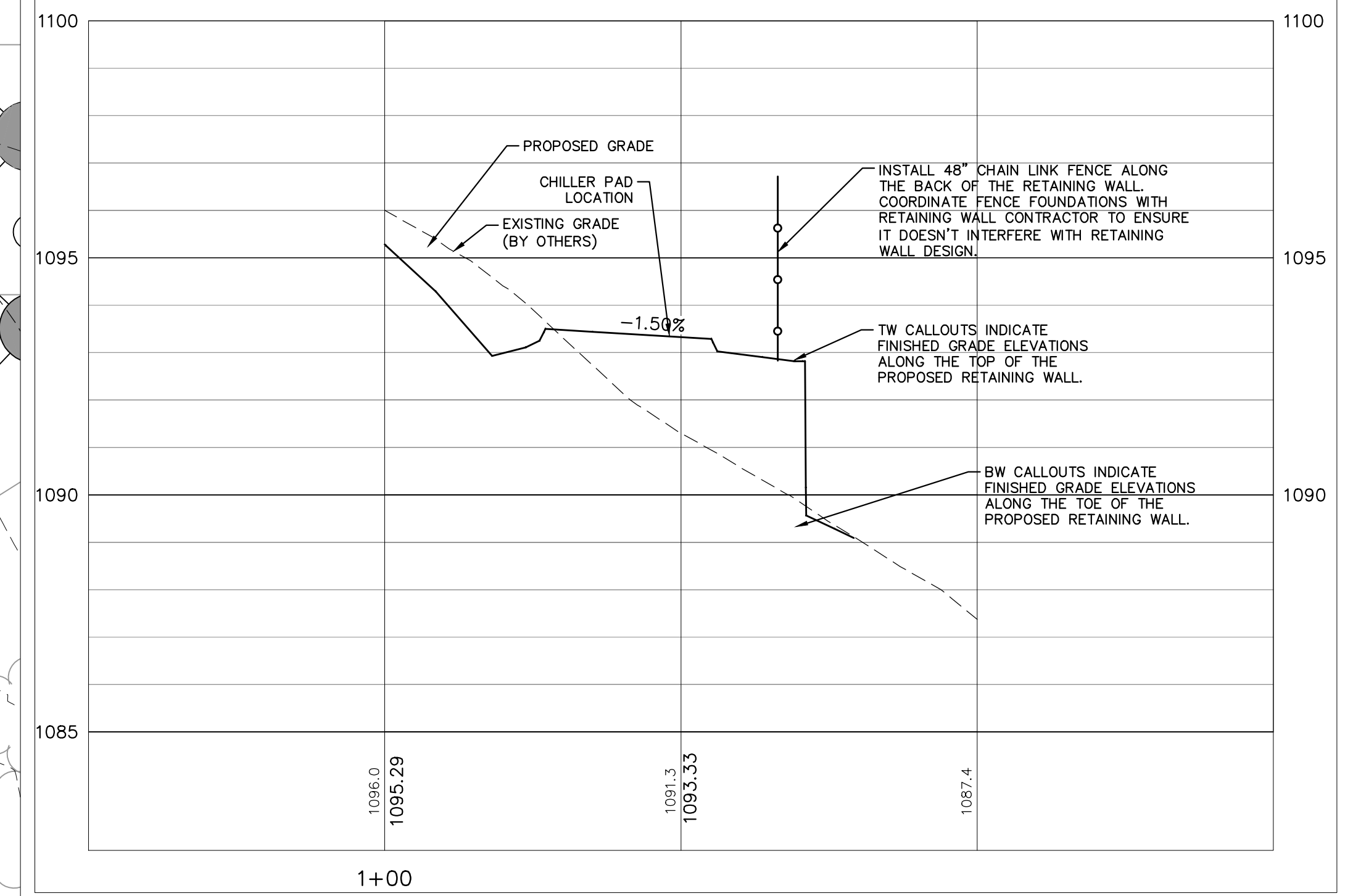
02/07/2024



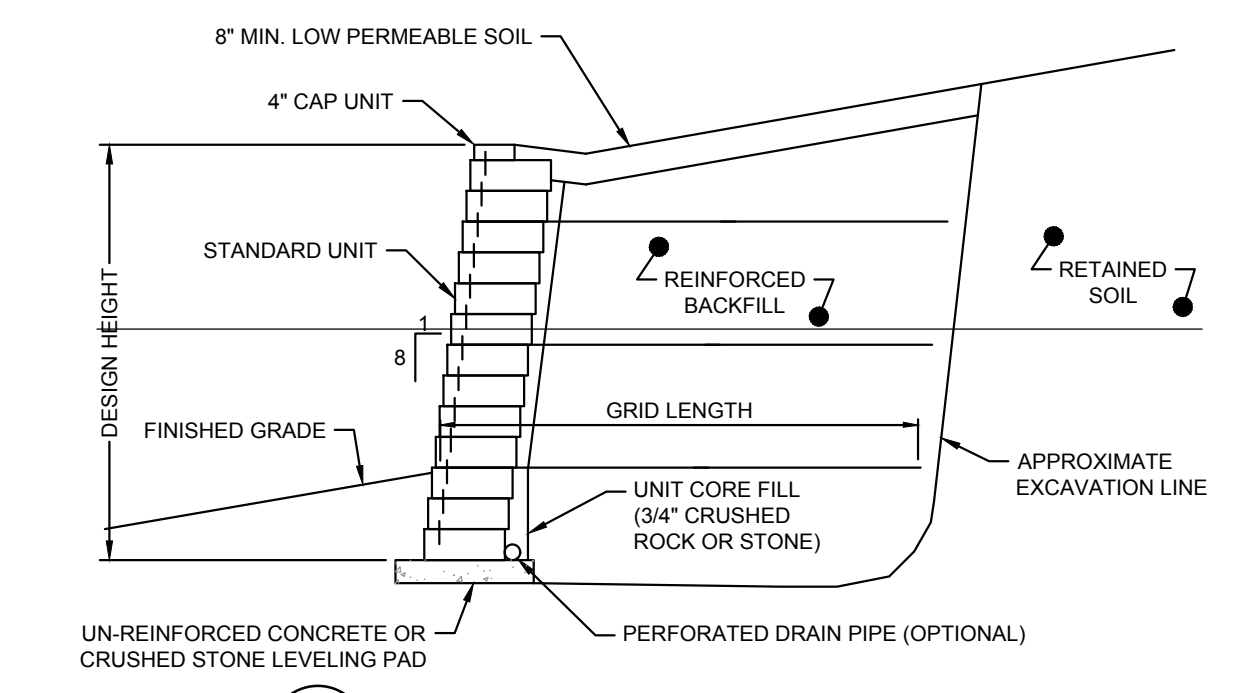
SHEET NOTE:
 1. WORK SHOWN ON THIS SHEET IS ONLY REQUIRED UNDER ALTERNATE #1.



PROFILE VIEW OF 23000440.00-TYPICAL SECTION A-A
 HORIZONTAL SCALE: 1" = 10'
 VERTICAL SCALE: 1" = 2'



1 TYPICAL CONCRETE PAD W/ THICKENED EDGE DETAIL
 C100 N.T.S.



2 TYPICAL RETAINING WALL SECTION
 C100 N.T.S.

*NOTE: CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF RETAINING WALL. RETAINING WALL SHALL BE DESIGNED BY A REGISTERED ENGINEER IN THE STATE OF MISSOURI. RETAINING WALL DESIGN SHALL BE REVIEWED AND APPROVED BY OWNER'S DESIGN REPRESENTATIVE. THE DESIGN REPRESENTATIVE SHALL ALSO REVIEW AND APPROVE RETAINING WALL COLOR.

STATE OF MISSOURI
 MIKE PARSON,
 GOVERNOR



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IMEG, CORP.
 Missouri Certificate of Authority: #F001325536

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DEPARTMENT OF
 CORRECTIONS

REPLACE STEAM, WATER &
 SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
 DATE:
 REVISION:
 DATE:
 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: C100.dwg
 DRAWN BY: AEK
 CHECKED BY: JLH
 DESIGNED BY: AEK

SHEET TITLE:

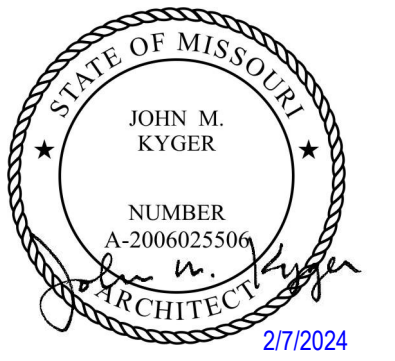
SITE LAYOUT
 PLAN

SHEET NUMBER:

C100

SHEET 2 OF 57

02/07/24



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PROJECT #23000440.00



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MARYVILLE
TREATMENT CENTER

MARYVILLE, MO

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SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: Bid - 02/07/2024

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DRAWN BY: JKy
CHECKED BY: SR
DESIGNED BY: SR

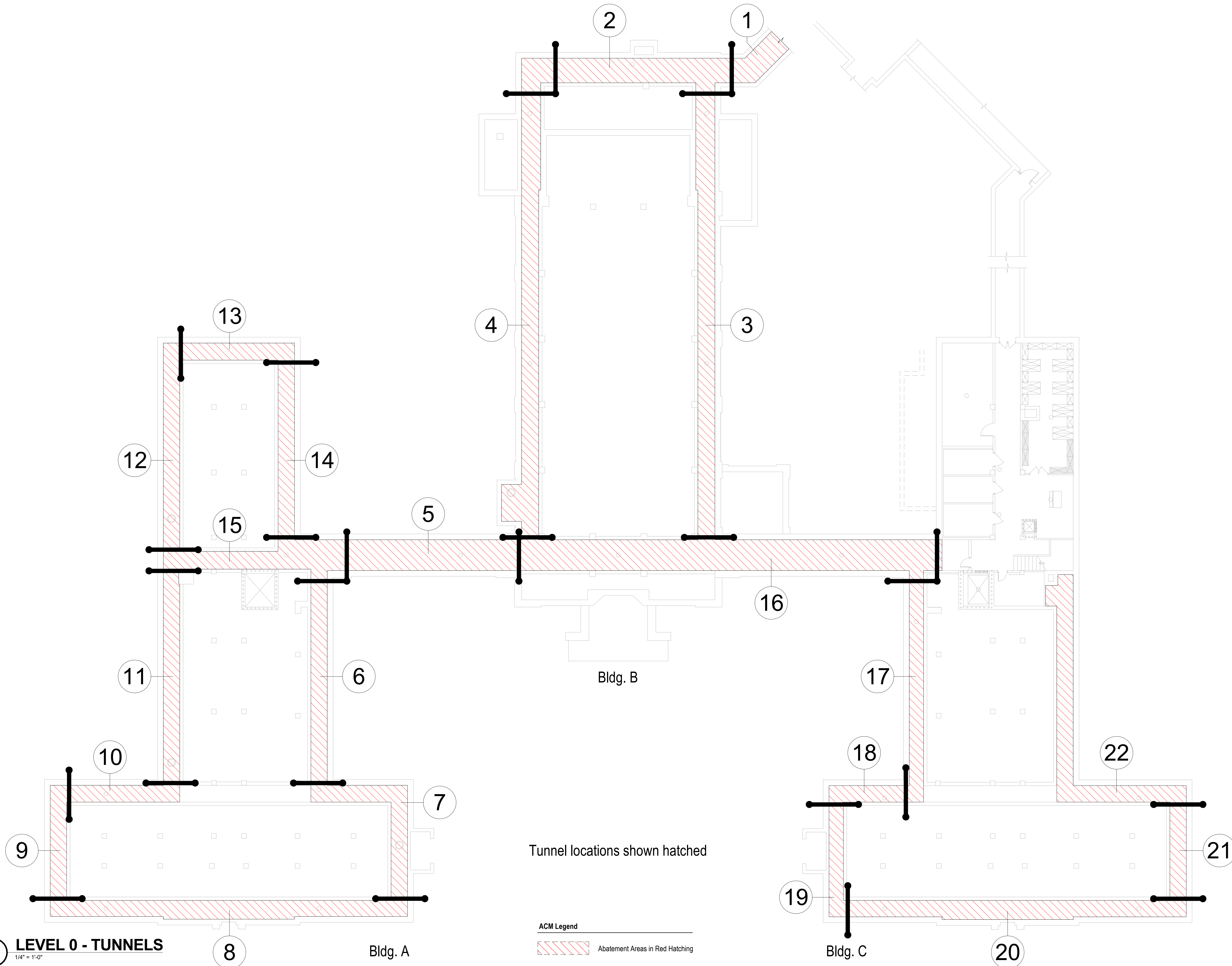
SHEET TITLE:
MAIN BLDG TUNNEL -
ABATEMENT

SHEET NUMBER:

ENV100

SHEET 3 OF 57

02/07/2024



TRUE NORTH
1 LEVEL 0 - TUNNELS
1/4" = 1'-0"

Tunnel locations shown hatched

ACM Legend
Abatement Areas in Red Hatching



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PROJECT #23000440.00



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REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE
TREATMENT CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: Bid - 02/07/2024

CAD DWG FILE: ENV200.dwg
DRAWN BY: JKy
CHECKED BY: SR
DESIGNED BY: SR

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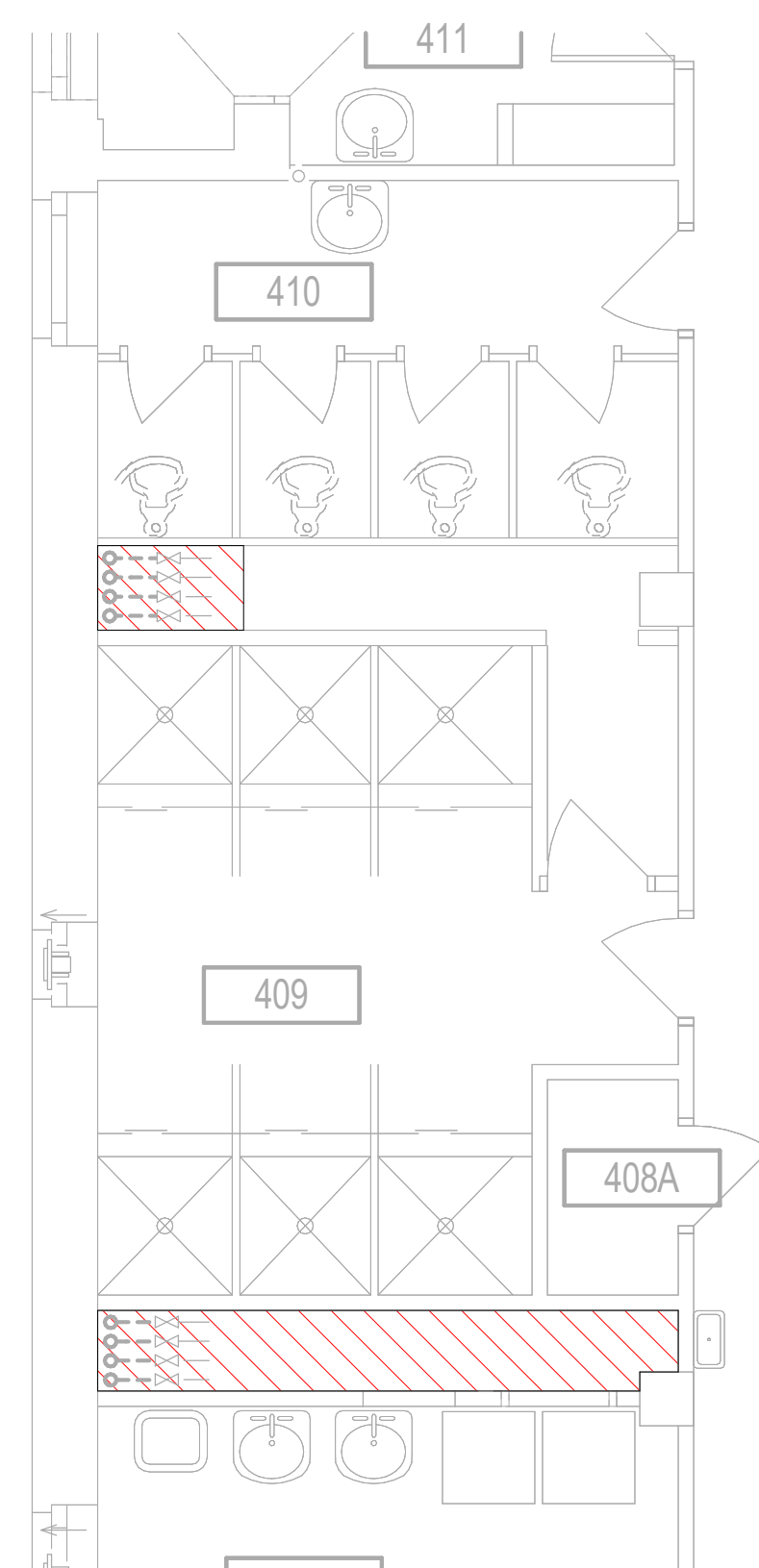
MAIN BLDG -
ENLARGED
ABATEMENT PLANS

SHEET NUMBER:

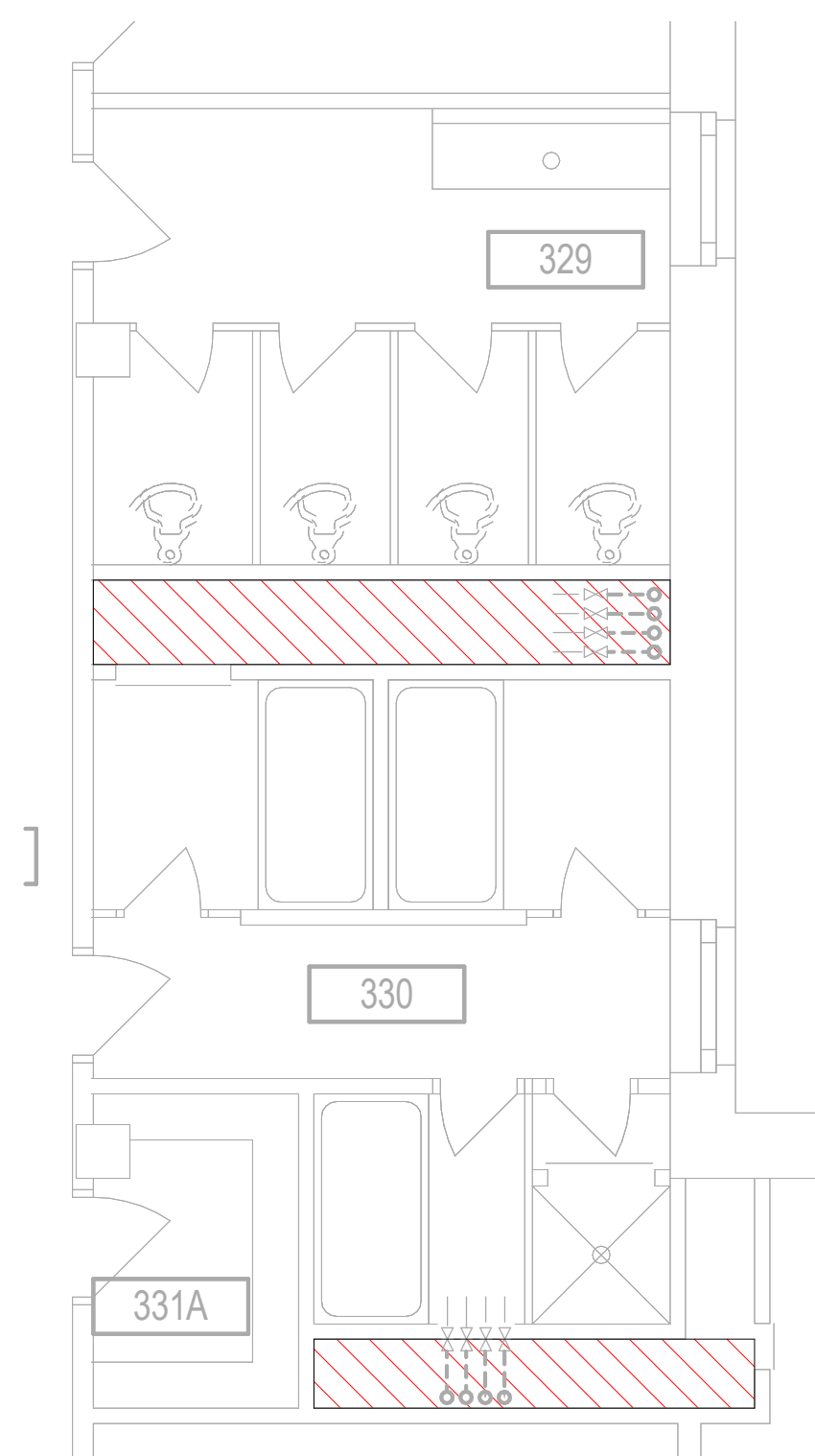
ENV200

SHEET 4 OF 57

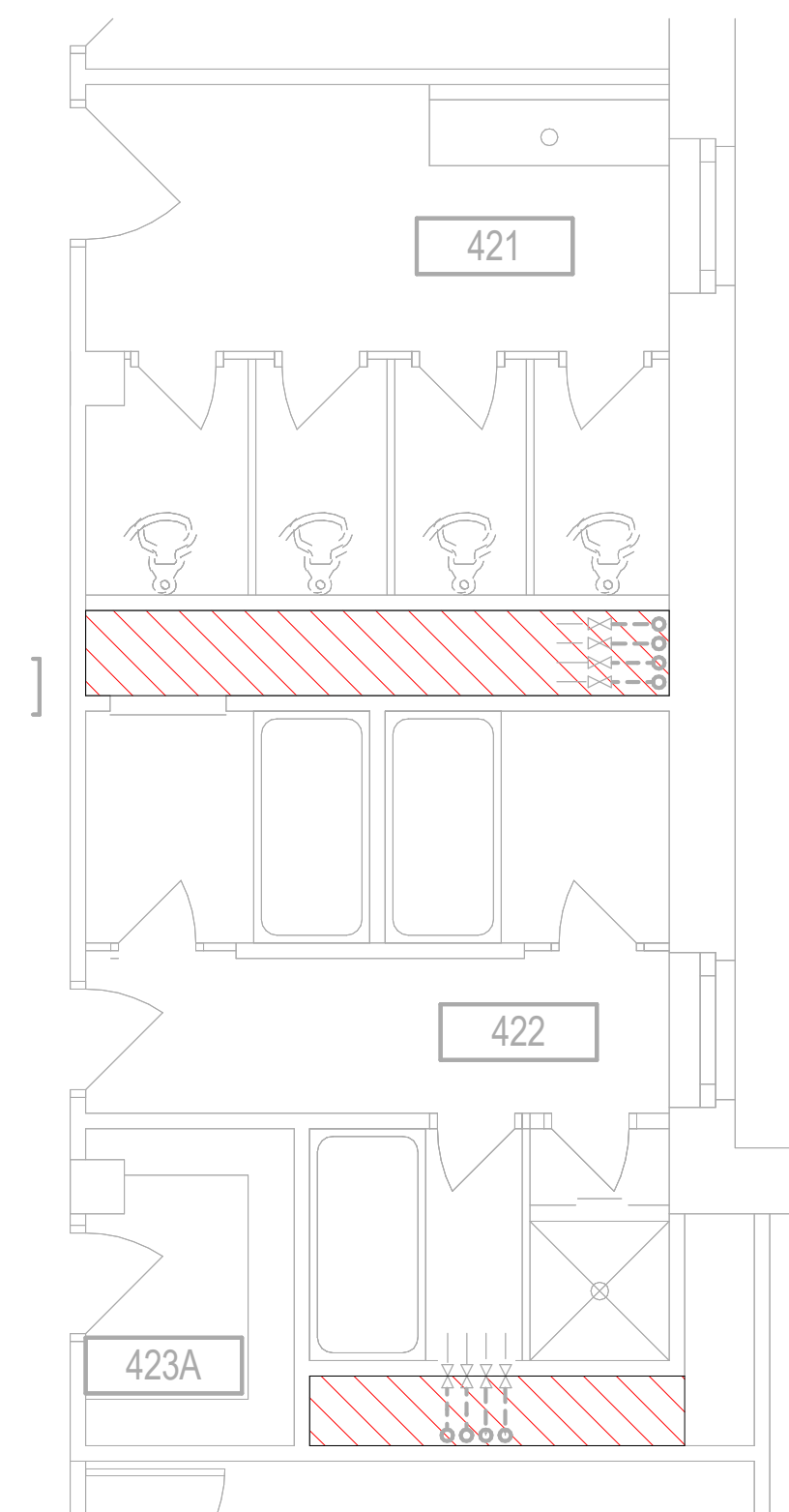
02/07/2024



 **1** ENLARGED PLAN LEVEL -03
WEST ASBESTOS ABATEMENT
1/4" = 1'-0"



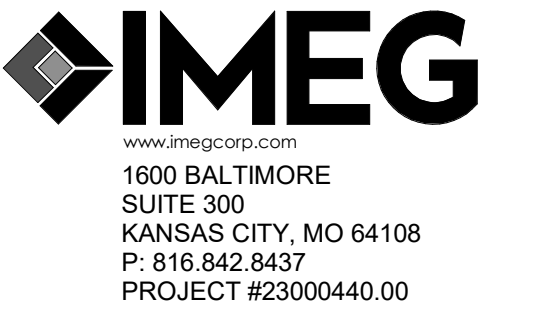
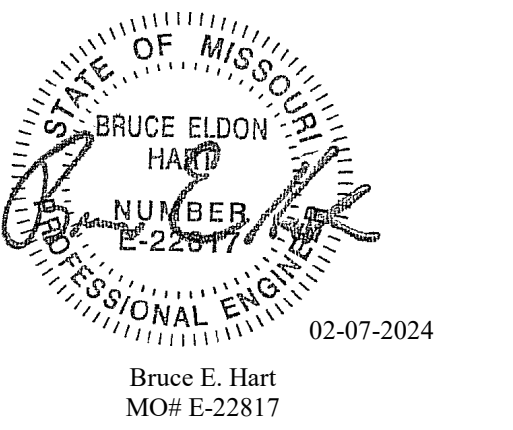
 **2** ENLARGED PLAN LEVEL 02-
EAST ASBESTOS ABATEMENT
1/4" = 1'-0"



 **3** ENLARGED PLAN LEVEL 03-
EAST ASBESTOS ABATEMENT
1/4" = 1'-0"

ACM Legend

 Abatement Areas in Red Hatching



IMEG, CORP.
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MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M000.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

HVAC COVERSHEET-
SYMBOLS AND
LEGENDS

SHEET NUMBER:

M000

SHEET 5 OF 57

02/07/2024

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

INDICATES DIRECTION OF TRUE NORTH
PLAN OR DETAIL NUMBER
PLAN OR DETAIL NAME

VIEW NAME
1/8" = 1'-0"
PLAN OR DETAIL SCALE

INDICATES SIMILAR DETAIL REFERENCED IN MULTIPLE LOCATIONS
DETAIL REFERRED TO BY SECTION CUT
SHEET DETAIL IS LOCATED ON → T101

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 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

HVAC SHEET INDEX

M000	HVAC COVERSHEET- SYMBOLS AND LEGENDS
M001	HVAC COVERSHEET - ABBREVIATIONS AND GENERAL NOTES
M100	BOILER BLDG - LOWER LEVEL - MECHANICAL DEMOLITION
M101	BOILER BLDG - UPPER LEVEL - MECHANICAL DEMOLITION
M109	MAIN BLDG - TUNNEL LEVEL - MECHANICAL DEMOLITION
M200	BOILER BLDG - LOWER LEVEL - MECHANICAL
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M400	MECHANICAL DETAILS
M401	MECHANICAL DETAILS
M500	MECHANICAL DIAGRAMS
M501	MECHANICAL DIAGRAMS
M520	MECHANICAL CONTROL DIAGRAMS
M521	MECHANICAL CONTROL DIAGRAMS
M522	MECHANICAL CONTROL DIAGRAMS
M600	MECHANICAL SCHEDULES
M601	MECHANICAL SCHEDULES
GRAND TOTAL: 25	

MECHANICAL DESIGN CONDITIONS:

DESIGN CONDITIONS: BASED ON WEATHER DATA FOR: KANSAS CITY, MO (ASHRAE 99.6% CONDITIONS)

SUMMER: 96.8°F DRY BULB, 76.4°F WET BULB
WINTER: 0.5°F DRY BULB
WINTER: (AIR SYSTEM'S OUTSIDE AIR STREAM) -10°F DRY BULB

TYPICAL ROOM SETPOINTS:
SUMMER DESIGN: 78°F DRY BULB, 60% RELATIVE HUMIDITY
WINTER DESIGN: 70°F DRY BULB, NO HUMIDITY REQUIREMENT
SUMMER SETBACK: 80°F DRY BULB, 60% RELATIVE HUMIDITY
WINTER SETBACK: 65°F DRY BULB, NO HUMIDITY REQUIREMENT

REFER TO CONTROL DIAGRAMS FOR ROOM SPECIFICS.

HVAC SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
BD	BOILER BLOW DOWN
BF	BOILER FEED WATER
CHR	CHILLED/HEATING WATER RETURN
CHS	CHILLED/HEATING WATER SUPPLY
CR	CONDENSER WATER RETURN
CS	CONDENSER WATER SUPPLY
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DPP	DRAIN
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
G	NATURAL GAS
GV	GAS REGULATOR VENT
GWR	GLYCOL WATER RETURN
GWS	GLYCOL WATER SUPPLY
HCS	HIGH PRESSURE CLEAN STEAM (>125 TO 250 PSIG)
HG	REFRIGERANT HOT GAS
HPC	HIGH PRESSURE CONDENSATE (>125 TO 250 PSIG)
HPS	HIGH PRESSURE STEAM (>125 TO 250 PSIG)
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
LCS	LOW PRESSURE CLEAN STEAM (0 TO 15 PSIG)
LIQ	REFRIGERANT LIQUID
LPC	LOW PRESSURE CONDENSATE (0 TO 15 PSIG)
LPS	LOW PRESSURE STEAM (0 TO 15 PSIG)
LWR	LOOP WATER RETURN
LWS	LOOP WATER SUPPLY
MCS	MEDIUM PRESSURE CLEAN STEAM (>15 TO 125 PSIG)
MPC	MEDIUM PRESSURE CONDENSATE (>15 TO 125 PSIG)
MPS	MEDIUM PRESSURE STEAM (>15 TO 125 PSIG)
NCW	NONPOTABLE COLD WATER
PC	PUMPED CONDENSATE
PD	PUMPED DISCHARGE
SUC	REFRIGERANT SUCTION
SV	SAFETY RELIEF VENT
PIPE CAP	PIPE CAP
PIPE DOWN	PIPE DOWN
PIPE UP OR UP/DOWN	PIPE UP OR UP/DOWN
PITCH PIPE IN DIRECTION	PITCH PIPE IN DIRECTION
DIRECTION OF FLOW IN PIPE	DIRECTION OF FLOW IN PIPE
DIELECTRIC CONNECTION	DIELECTRIC CONNECTION
UNION/FLANGE	UNION/FLANGE
SHUTOFF VALVE NORMALLY OPEN	SHUTOFF VALVE NORMALLY OPEN
SHUTOFF VALVE NORMALLY CLOSED	SHUTOFF VALVE NORMALLY CLOSED
THROTTLING VALVE	THROTTLING VALVE
BALANCING VALVE (NUMBER INDICATES GPM)	BALANCING VALVE (NUMBER INDICATES GPM)
AUTOMATIC BALANCING VALVE	AUTOMATIC BALANCING VALVE
MIXING VALVE	MIXING VALVE
CONTROL VALVE (THREE-WAY)	CONTROL VALVE (THREE-WAY)
CONTROL VALVE (TWO-WAY)	CONTROL VALVE (TWO-WAY)
SOLENOID VALVE	SOLENOID VALVE
CHECK VALVE	CHECK VALVE
BACKFLOW PREVENTER	BACKFLOW PREVENTER
SAFETY/RELIEF VALVE	SAFETY/RELIEF VALVE
PRESSURE REDUCING VALVE (LIQUID/GAS)	PRESSURE REDUCING VALVE (LIQUID/GAS)
PRESSURE REDUCING VALVE (STEAM)	PRESSURE REDUCING VALVE (STEAM)
TRIPLE DUTY VALVE (ANGLE TYPE)	TRIPLE DUTY VALVE (ANGLE TYPE)
TRIPLE DUTY VALVE (IN-LINE TYPE)	TRIPLE DUTY VALVE (IN-LINE TYPE)
PUMP	PUMP
VACUUM BREAKER	VACUUM BREAKER
"WYE" - STRAINER	"WYE" - STRAINER
"WYE" - STRAINER W/SHUTOFF VALVE AND HOSE CONNECTION WITH CAP	"WYE" - STRAINER W/SHUTOFF VALVE AND HOSE CONNECTION WITH CAP
BASKET STRAINER	BASKET STRAINER
FLEXIBLE CONNECTION	FLEXIBLE CONNECTION
PRESSURE/TEMPERATURE TEST PLUG	PRESSURE/TEMPERATURE TEST PLUG
REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB
SUCTION DIFFUSER WITH SUPPORT FOOT	SUCTION DIFFUSER WITH SUPPORT FOOT
AUTOMATIC AIR VENT	AUTOMATIC AIR VENT
MANUAL AIR VENT	MANUAL AIR VENT
DRAIN VALVE WITH HOSE CONNECTION AND CAP	DRAIN VALVE WITH HOSE CONNECTION AND CAP
PRESSURE SENSOR (FURNISHED WITH BALL VALVE)	PRESSURE SENSOR (FURNISHED WITH BALL VALVE)
PRESSURE GAUGE (FURNISHED WITH BALL VALVE)	PRESSURE GAUGE (FURNISHED WITH BALL VALVE)

HVAC SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
SP	STATIC SWITCH
FM	FLOW METER
F	FLOW SWITCH
FS	FLOW SENSOR
T	STEAM TRAP (REFER TO SCHEDULE)
T	F&T STEAM TRAP (REFER TO SCHEDULE)
T	INVERTED BUCKET STEAM TRAP (REFER TO SCHEDULE)
EJ #	EXPANSION JOINT #.# IS THE EXPANSION TRAVEL INCHES
M	METER
→	DIRECTION OF AIR FLOW
	FLEXIBLE DUCT
	MANUAL VOLUME DAMPER
R	RISE IN DIRECTION OF AIR FLOW
D	DROP IN DIRECTION OF AIR FLOW
DUCT CAP	DUCT CAP
DUCT DOWN	DUCT DOWN
DUCT UP	DUCT UP
⊗	SUPPLY/OUTSIDE AIR DUCT SECTION
⊙	RETURN AIR DUCT SECTION
⊗	EXHAUST/RELIEF AIR DUCT SECTION
SD-1 6/115	AIR TERMINAL PROPERTIES SYMBOL NECK SIZE/CFM
	OPPOSED BLADE DAMPER (REFER TO SCHEDULE)
	PARALLEL BLADE DAMPER (REFER TO SCHEDULE)
— —	DIFFERENTIAL PRESSURE SENSOR
H	HUMIDISTAT SENSOR
C	CARBON MONOXIDE SENSOR
C ₂	CARBON DIOXIDE SENSOR
⊙	OCCUPANCY SENSOR
P	PRESSURE SENSOR/MONITOR
P	PRESSURE SENSOR (DUCT MOUNTED)
T	THERMOSTAT/SENSOR
T	TEMPERATURE SENSOR (DUCT MOUNTED)
T	THERMOSTAT/SENSOR WITH HEAVY DUTY ENCLOSURE
T	TEMPERATURE SENSOR WITH WELL
T	THERMOMETER WITH WELL (DIAL TYPE)
T	THERMOMETER WITH WELL (FILLED TYPE)
XX-Y	AIRFLOW MEASUREMENT SYMBOL XX - AHU SYMBOL Y - SEQUENTIAL NUMBER

CONTROLS SYMBOL LIST

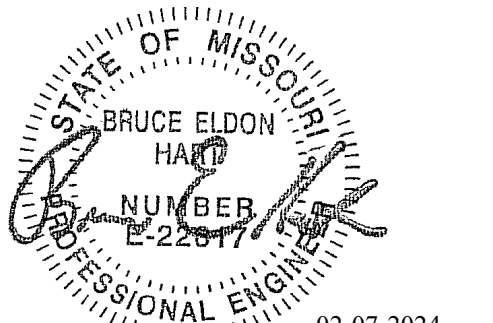
NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
T	AVERAGING TEMPERATURE SENSOR
T	LOW LIMIT TEMPERATURE SWITCH
T	PROBE TEMPERATURE SENSOR
T	PRESSURE SENSOR (DUCT MOUNTED)
SP	STATIC SWITCH
AI	ANALOG INPUT
AO	ANALOG OUTPUT
FM	FLOW METER
F	FLOW SWITCH
FS	FLOW SENSOR
FS	AIR FLOW SWITCH
FM	DUCT FLOW METER
H	HUMIDIFIER
DSD	DUCT SMOKE DETECTOR
HEATING/ COOLING COIL	HEATING/ COOLING COIL
AIR BLENDER	AIR BLENDER
MANUAL MOTOR STARTER W/THERMAL OVERLOAD	MANUAL MOTOR STARTER W/THERMAL OVERLOAD
FAN	FAN
MTR	MOTOR
R	CONTACTOR
PUMP	PUMP
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
H	HUMIDISTAT SENSOR
H	HUMIDISTAT / SENSOR
H	HUMIDITY SENSOR (DUCT MOUNTED)
C	CARBON MONOXIDE SENSOR
C ₂	CARBON DIOXIDE SENSOR
C ₂	CARBON MONOXIDE SENSOR (DUCT MOUNTED)
C ₂	CARBON DIOXIDE SENSOR (DUCT MOUNTED)
⊙	OCCUPANCY SENSOR
⊙	SENSOR
ACT	ACTUATOR
DS	DOOR SWITCH
DP	DIFFERENTIAL PRESSURE SENSOR
CS	CURRENT SWITCH
VS	VIBRATION SWITCH
— —	NORMALLY CLOSED CONTACT
— —	NORMALLY OPEN CONTACT
	OPPOSED BLADE DAMPER
	PARALLEL BLADE DAMPER

FIRE / SMOKE BARRIER DESIGNATIONS

FIRE/SMOKE BARRIERS ARE EXISTING. THE LINE TYPES SHOWN ARE FOR THE CONVENIENCE OF THE CONTRACTOR.

1 HOUR FIRE BARRIER	-----
2 HOUR FIRE BARRIER OR WALL	-----
3 HOUR FIRE BARRIER OR WALL	-----



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**OFFICE OF
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DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND
CONSTRUCTION**

**DEPARTMENT OF
CORRECTIONS**

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M001.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

**HVAC COVERSHEET -
ABBREVIATIONS AND
GENERAL NOTES**

SHEET NUMBER:

M001

SHEET 6 OF 57

02/07/2024

HVAC ABBREVIATION KEY	
ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
C	COMMON
CO	CLEANOUT
CFSD	CONTROL/FIRE/SMOKE DAMPER
DPS	DIFFERENTIAL PRESSURE SWITCH
EA	EXHAUST/RELIEF AIR
ECFSD	EXISTING CONTROL FIRE SMOKE DAMPER
FMCS	FACILITY MANAGEMENT AND CONTROL SYSTEM
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
MA	MIXED AIR
MV	MIXING VALVE
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
SD	SMOKE DAMPER
TD	TRANSFER DUCT
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED

CONTRACTOR ABBREVIATION KEY	
ABBR:	DESCRIPTION:
A.C.	ASBESTOS ABATEMENT CONTRACTOR
C.C.	CIVIL CONTRACTOR
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
S.C.	SECURITY CONTRACTOR
T.C.	TECHNOLOGY CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR

TEMPERATURE CONTROL GENERAL NOTES:

- REFER TO EQUIPMENT SCHEDULES TO CROSS REFERENCE WHICH CONTROL DIAGRAMS APPLY TO WHICH ITEMS OF EQUIPMENT.
- 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.
- ALL WIRING, CONTROL COMPONENTS, DEVICES AND PROGRAMMING SHOWN ON THESE CONTROL DRAWINGS SHALL BE PROVIDED BY THE TCC UNLESS SPECIFICALLY NOTED OTHERWISE.
- 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 16/26 FOR ADDITIONAL DETAILED REQUIREMENTS.
 - CABLE/WIRE JACKET COLOR: GREY
 - CONDUIT BOX COLOR ABOVE FINISHED CEILINGS AND UNFINISHED SPACES WITHOUT CEILINGS: GREY
 - CONDUIT BOX COLOR IN SPACES WITH EXPOSED FINISHED STRUCTURE: GREY
 - CABLE/WIRE INSTALLATION: IN CONDUIT
- 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.
- 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)
- MODULATING SIGNALS SHALL BE DISPLAYED AS % OPEN (SIGNALS DISPLAYED AS % CLOSED ARE NOT ACCEPTABLE).
- 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.
- ALL CONTROL COMPONENTS SUCH AS RELAYS, SWITCHES, DDC CONTROLLERS, ETC. SHALL BE MOUNTED IN STEEL ENCLOSURES WITH STEEL MOUNTING BACKPLATES PER SPECIFICATION.
- 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 FOR ADDITIONAL REQUIREMENTS.
- FAN COIL UNITS SHALL BE PROVIDED WITH 120/24 VOLT TRANSFORMERS TO POWER THE ASSOCIATED DDC CONTROLS. TCC SHALL PROVIDE POWER SUPPLIES FOR ALL OTHER 120VAC POWER REQUIREMENTS SUCH AS DAMPER AND VALVE ACTUATORS, BUILDING PRESSURE SENSORS, AND OTHER CONTROL COMPONENTS AND DEVICES. 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(S) WITH THE ELECTRICAL CONTRACTOR.
- TCC SHALL PROVIDE CONDUIT RUNS AS REQUIRED FOR OUTDOOR EQUIPMENT AND FOR EQUIPMENT INSTALLED REMOTELY FROM THE MAIN BUILDING THAT IS BEING MONITORED OR CONTROLLED BY THE FMCS.
- 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, BOILERS, PUMPS, AND FAN COIL UNITS. 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.
- 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.
- 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.
- 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.

MECHANICAL GENERAL NOTES:

- THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, FIRE PROTECTION, PLUMBING, MEDICAL GAS, VENTILATION, PIPING AND TEMPERATURE CONTROL.
- 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.
 - DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
 - 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 ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
 - REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
 - 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.
 - EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
 - EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS AND FLOORS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATINGS, AND FINISH.
 - SEAL ALL FLOOR AND WALL PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE.
 - 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.
 - 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.
 - 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.
 - DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
 - 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.
 - 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.
 - PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT.
 - DO NOT SUPPORT EQUIPMENT, PIPING, OR DUCTWORK TO NON-STRUCTURAL BUILDING ELEMENTS. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

PIPING GENERAL NOTES:

- THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
- PIPE DRAIN LINES FROM EQUIPMENT TO NEAREST FLOOR DRAIN.

VENTILATION GENERAL NOTES:

- UNLESS NOTED OTHERWISE, THE SIZE OF EACH BRANCH DUCT TO AN AIR TERMINAL SHALL MATCH THE INLET SIZE.
- ALIGN TEMPERATURE SENSORS WITH LIGHT SWITCHES AND WHEN IN CLOSE PROXIMITY TO EACH OTHER.
- PROVIDE ACCESS DOORS AT ALL DUCT MOUNTED EQUIPMENT.

MECHANICAL RENOVATION NOTES:

- THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING, MECHANICAL AND TEMPERATURE CONTROL.
- 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.
 - NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
 - FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
 - 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.
 - THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL AND PATCHING OF WALLS AND FLOORS ASSOCIATED WITH WORK BY ALL CONTRACTORS. CONTRACTORS SHALL NOTIFY THE GC OF AFFECTED AREAS PRIOR TO BIDDING.
 - 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.
 - PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
 - 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.

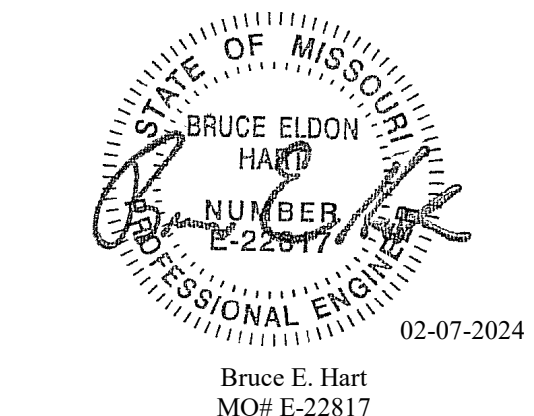
MECHANICAL PHASING NOTES:

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

- REFER TO DRAWINGS FOR GENERAL DESCRIPTION OF PHASES. REFER TO GENERAL CONTRACTOR'S INSTRUCTIONS FOR MORE DETAILS AND PHASING SCHEDULES AND FOR CONCURRENT WORK. MECHANICAL, ELECTRICAL AND TECHNOLOGY DRAWINGS DEPICT THE INTENT OF THE FINAL DESIGN. THE MECHANICAL, ELECTRICAL, AND TECHNOLOGY DRAWINGS DO NOT DEPICT THE MEANS AND METHODS TO MEET THE REQUIREMENTS OF THE PHASING CRITERIA.
- REVIEW PROJECT PHASING PLANS TO COORDINATE DEMOLITION WORK, OUTAGES, ETC. WITH AFFECTED ADJACENT AREAS.
- PROVIDE TEMPORARY DUCTWORK, PIPING, SHUTOFF VALVES, ZONE VALVES, ZONE ALARMS, ETC. AS NEEDED TO MAINTAIN SERVICE TO ALL AREAS DURING ALL PHASES OF PROJECT.
- INSTALL TEMPORARY DUCTWORK, PIPING, SHUTOFF VALVES, ETC. AS NECESSARY TO KEEP ALL OCCUPIED SPACES OPERATIONAL THROUGHOUT ALL PHASES OF THE PROJECT
- PHASE DEMOLITION WORK TO MINIMIZE DOWNTIME.

TAB POST-CONSTRUCTION NOTES:

- TAB CONTRACTOR SHALL COMPILE AND SUBMIT COPIES OF THE FINAL POST-CONSTRUCTION TAB REPORT AS REQUIRED BY SECTION 23 05 93.
- THE FINAL POST CONSTRUCTION REPORT SHALL INCLUDE ALL ITEMS REQUIRED IN THE SPECIFICATIONS.



IMEG, CORP.
Missouri Certificate of Authority: #F001325536

**OFFICE OF
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CONSTRUCTION**

**DEPARTMENT OF
CORRECTIONS**

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M100.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL
SHEET TITLE:

**BOILER BLDG - LOWER
LEVEL - MECHANICAL
DEMOLITION**

SHEET NUMBER:

M100

SHEET 7 OF 57

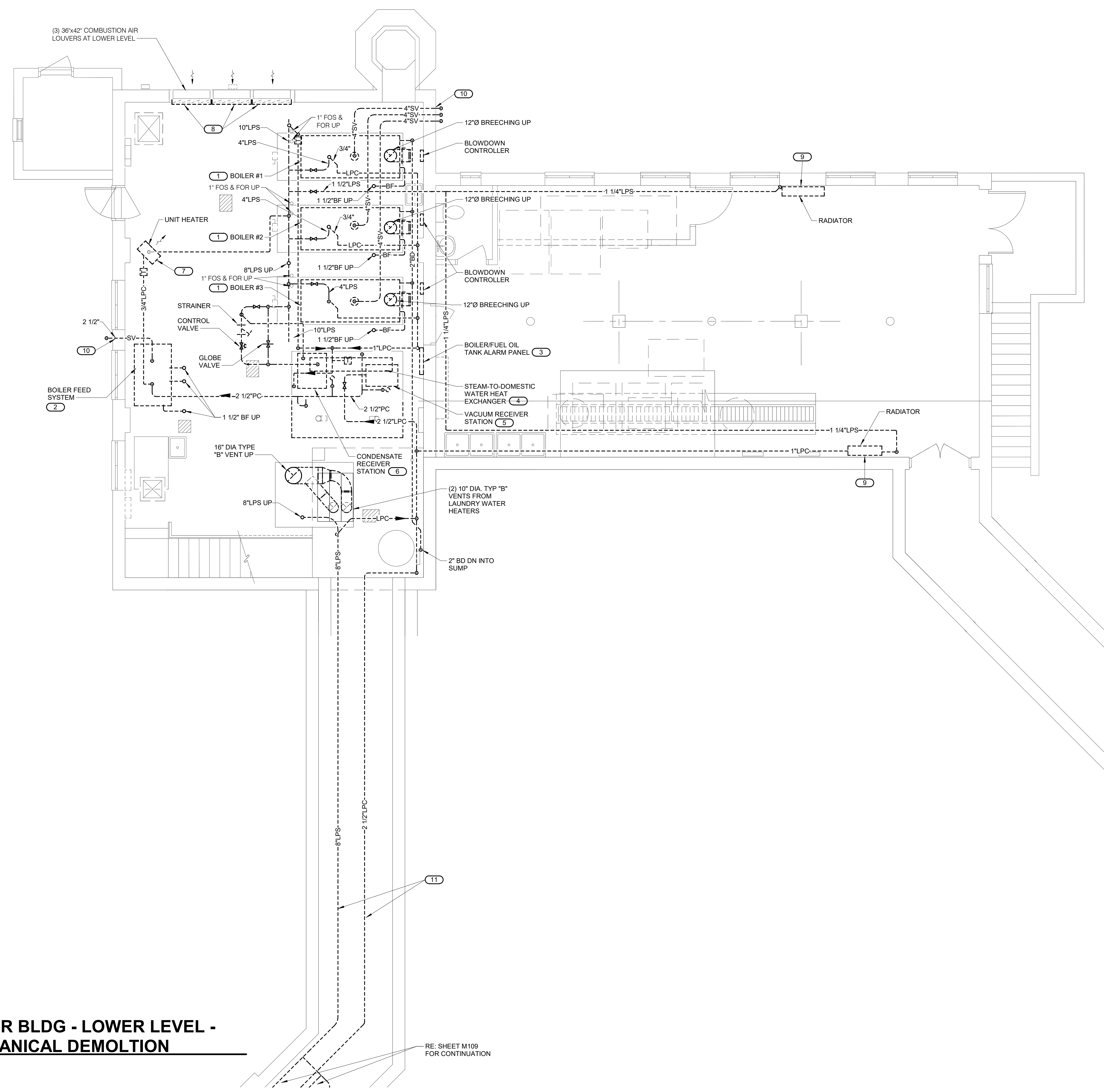
02/07/2024

SHEET NOTES:

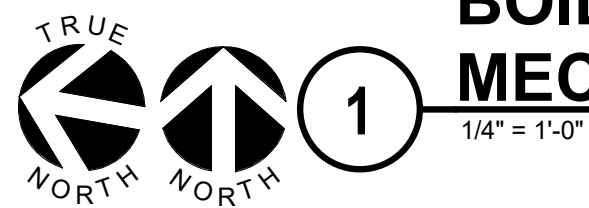
- VENTS SERVING LAUNDRY WATER HEATERS SHALL REMAIN UNTIL THAT EQUIPMENT CAN BE REMOVED. REFER TO SHEET NOTE 1 ON SHEET P100.
- WHERE EQUIPMENT SITTING ON CONCRETE HOUSEKEEPING PADS IS REMOVED, COORDINATE WITH NEW WORK. IF THE PADS WOULD INTERFERE WITH NEW WORK OR PERSONNEL TRAFFIC FLOW AROUND NEW WORK, THEY SHALL BE REMOVED AND THE CONCRETE FLOOR SLAB BELOW THE PADS SHALL BE PATCHED AND SEALED TO MATCH ADJACENT SLAB.

KEYNOTES: #

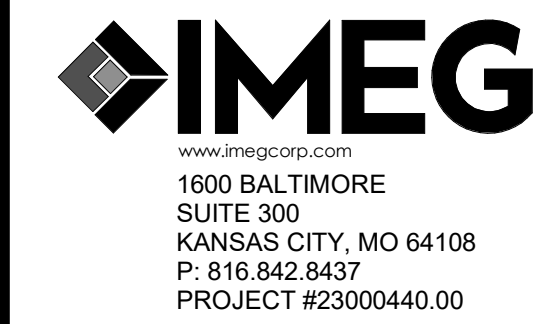
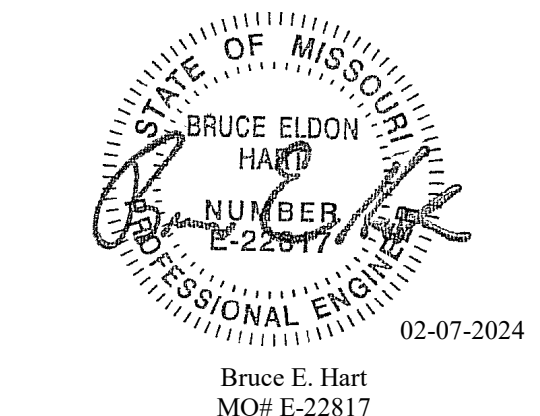
- DISCONNECT AND REMOVE STEAM BOILER, INCLUDING ASSOCIATED BURNER, STEAM PIPING, FEED WATER PIPING, CONDENSATE AND BLOWDOWN PIPING, BLOWDOWN CONTROLLER, ACCESSORIES, AND CONTROLS. REMOVE INDIVIDUAL (ROUND) BOILER BREECHING (INCLUDING ASSOCIATED BAROMETRIC DRAFT DAMPER) BACK TO MAIN (RECTANGULAR) BREECHING. CUT 1" FOS AND 1" FOR LINES ON BOILER SIDE OF SHUTOFF VALVES, AND REMOVE OIL TRIN TO BURNER. INCLUDING ASSOCIATED OIL PUMP (NOT SHOWN) BELOW BURNER.
- DISCONNECT AND REMOVE BOILER FEED SYSTEM, INCLUDING TANK, PUMPS, SUPPORT STEEL, ASSOCIATED PIPING, AND CONTROLS.
- DISCONNECT AND REMOVE ALARM PANEL, INCLUDING ALARM WIRING ASSOCIATED WITH BOILERS. PROTECT ALARM WIRING ASSOCIATED WITH FUEL OIL TANK LOW LEVEL ALARM, TO ALLOW FOR RE-CONNECTION TO NEW FMCS. REFER TO FUEL OIL SYSTEM CONTROLS DIAGRAM ON SEPARATE SHEET.
- DISCONNECT AND REMOVE HEAT EXCHANGER, INCLUDING ASSOCIATED STEAM CONTROL VALVE, PIPING, AND ACCESSORIES.
- DISCONNECT VACUUM RECEIVER/PUMP PACKAGE, INCLUDING ASSOCIATED PIPING AND CONTROLS.
- DISCONNECT EXISTING CONDENSATE RECEIVER/PUMP PACKAGE, INCLUDING ASSOCIATED PIPING AND CONTROLS.
- DISCONNECT AND REMOVE STEAM UNIT HEATER, INCLUDING ASSOCIATED PIPING AND CONTROLS.
- DISCONNECT AND REMOVE THREE (3) 36x42 MANUAL DAMPERS AT LOWER LEVEL. REFER TO SHEET M200 FOR INSTALLATION OF THREE (3) NEW AUTO CONTROL DAMPERS. AT CONTRACTOR'S OPTION, EXISTING DAMPERS MAY REMAIN AND BE RETROFITTED WITH NEW ELECTRIC ACTUATORS.
- REMOVE STEAM RADIATOR, INCLUDING ASSOCIATED PIPING AND CONTROLS.
- REMOVE SAFETY RELIEF VENT PIPING, AND PATCH OPENING(S) IN EXTERIOR WALL TO MAKE WATER-TIGHT.
- STEAM AND CONDENSATE PIPING IN TUNNEL IS INSULATED USING ASBESTOS CONTAINING BUILDING MATERIALS (ACBM) AND SHALL NOT BE REMOVED UNTIL ABATEMENT WORK IS COMPLETE. REFER TO SHEET EMV100 AND SPECIFICATION SECTION 028211.



**BOILER BLDG - LOWER LEVEL -
MECHANICAL DEMOLITION**



RE: SHEET M109
FOR CONTINUATION



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DEPARTMENT OF
 CORRECTIONS

REPLACE STEAM, WATER &
 SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
 DATE:
 REVISION:
 DATE:
 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M101.dwg
 DRAWN BY: MWM
 CHECKED BY: BEH
 DESIGNED BY: MJL
 SHEET TITLE:

BOILER BLDG - UPPER
 LEVEL - MECHANICAL
 DEMOLITION

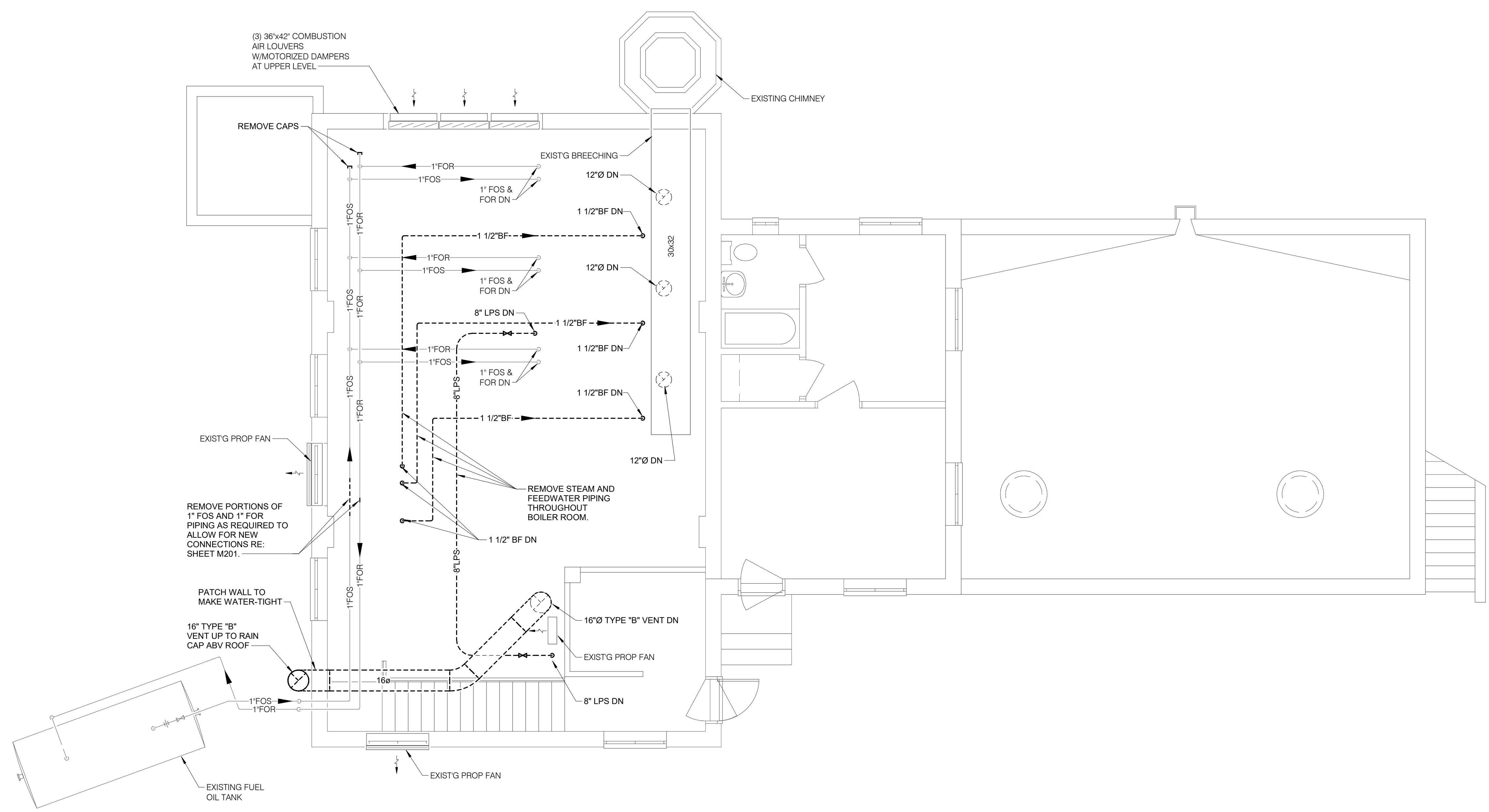
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M101

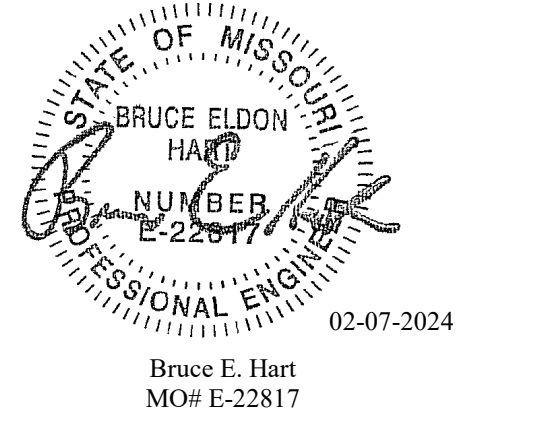
SHEET 8 OF 57

02/07/2024

SHEET NOTES:
 1. VENTS SERVING LAUNDRY WATER HEATERS
 SHALL REMAIN UNTIL THAT EQUIPMENT CAN
 BE REMOVED. REFER TO SHEET NOTE 1 ON
 SHEET P100.



TRUE NORTH NORTH **1** BOILER BLDG - UPPER LEVEL - MECHANICAL DEMOLITION
 1/4" = 1'-0"



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DEPARTMENT OF
CORRECTIONS

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M109.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL
SHEET TITLE:

MAIN BLDG - TUNNEL
LEVEL - MECHANICAL
DEMOLITION

SHEET NUMBER:

M109

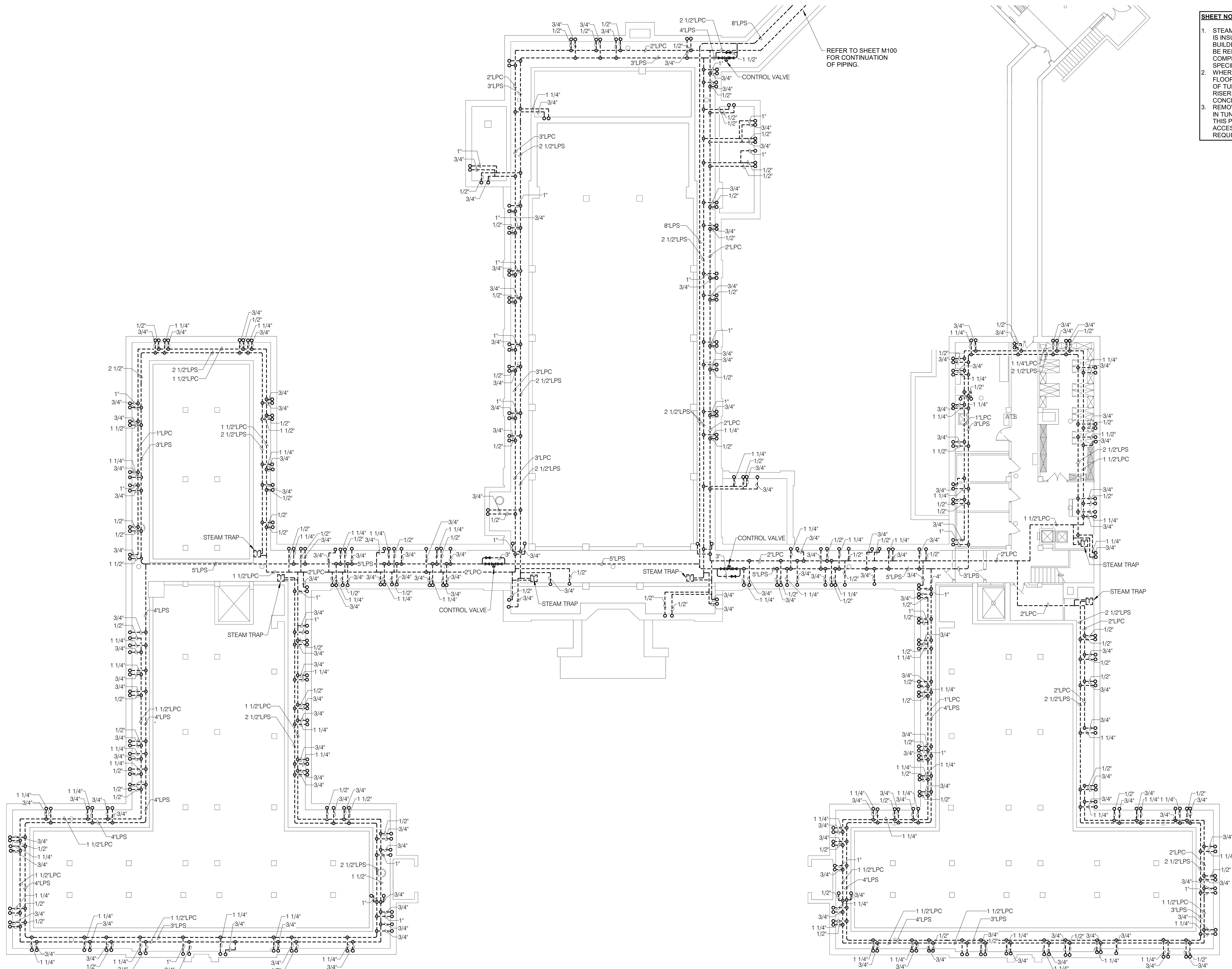
SHEET 9 OF 57

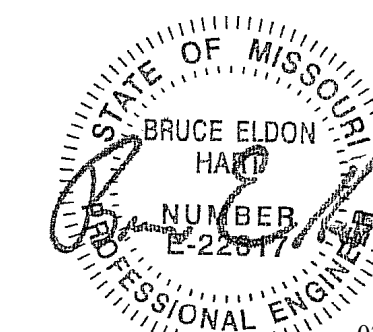
02/07/2024

SHEET NOTES:

1. STEAM AND CONDENSATE PIPING IN TUNNELS IS INSULATED USING ASBESTOS CONTAINING BUILDING MATERIALS (ACBM) AND SHALL NOT BE REMOVED UNTIL ABATEMENT WORK IS COMPLETE. REFER TO SHEET EMV100 AND SPECIFICATION SECTION 028211.
2. WHERE PIPES ARE SHOWN TURNING UP TO FLOOR ABOVE, CUT PIPING JUST BELOW TOP OF TUNNEL AND ABANDON-IN-PLACE THE RISERS AND STEAM RADIATORS THAT ARE CONCEALED IN WALLS ABOVE.
3. REMOVE ALL STEAM AND CONDENSATE PIPING IN TUNNELS AND OTHER ROOMS SHOWN ON THIS PLAN, INCLUDING VALVES, TRAPS, ACCESSORIES, HANGERS AND SUPPORTS NOT REQUIRED TO REMAIN.

REFER TO SHEET M100
FOR CONTINUATION
OF PIPING.





02-07-2024
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SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M200.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

BOILER BLDG - LOWER
LEVEL - MECHANICAL

SHEET NUMBER:

M200

SHEET 10 OF 57

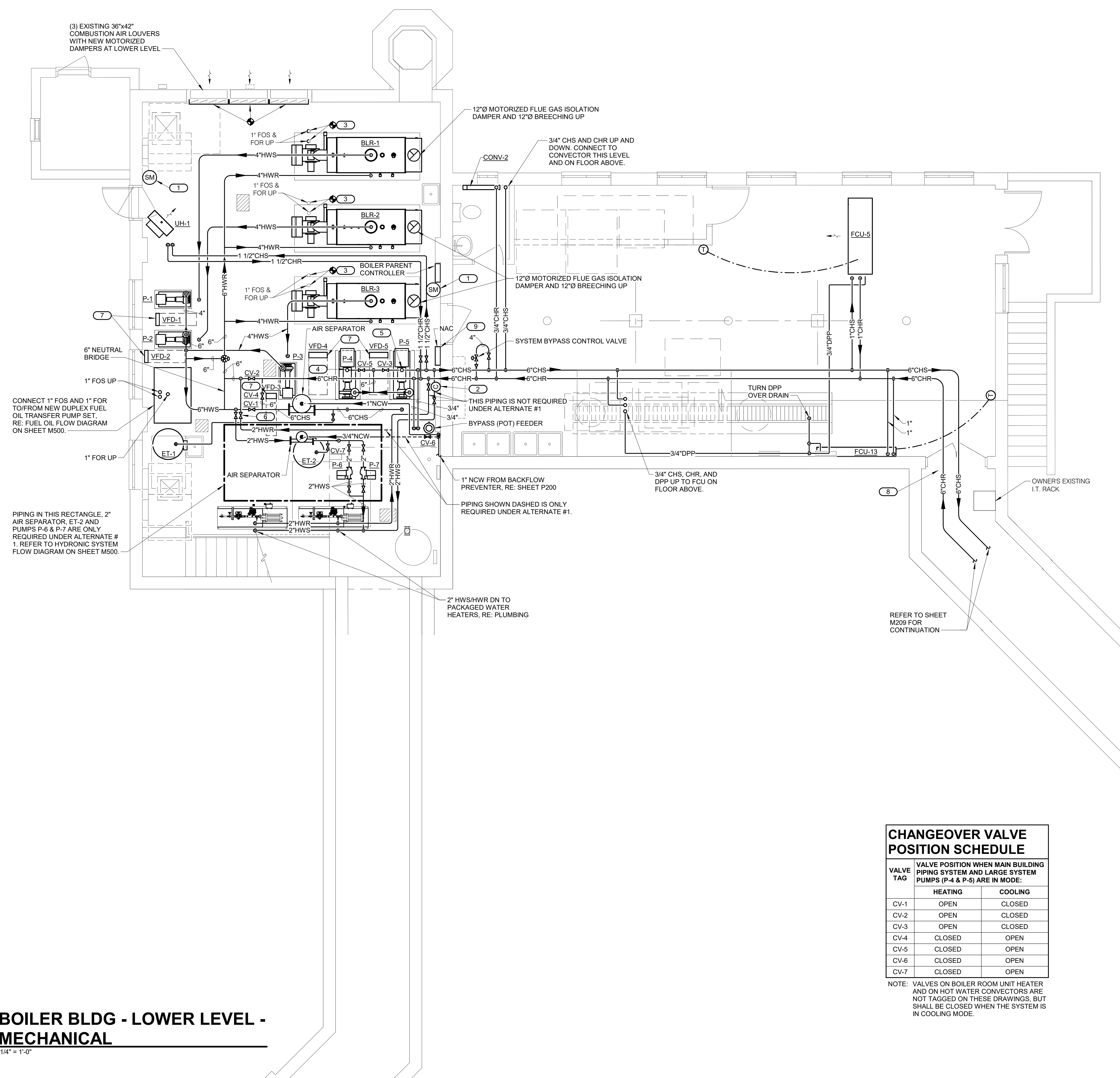
02/07/2024

SHEET NOTES:

- SEE SHEET M000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- IF NECESSARY, CONTRACTOR SHALL DISMANTLE COMBUSTION AIR LOUVERS, ASSOCIATED DAMPERS AND FRAMING AS REQUIRED TO ALLOW NEW EQUIPMENT TO BE MOVED INTO THE BUILDING. IN THAT CASE, CONTRACTOR SHALL RE-INSTALL FRAMING, DAMPERS AND LOUVERS AS REQUIRED TO MAKE BUILDING WATER-TIGHT.

KEYNOTES: #

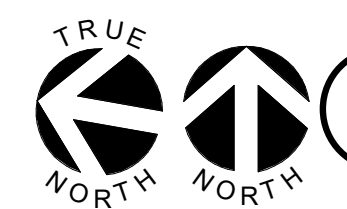
- BOILER ROOM EMERGENCY SHUTDOWN SWITCH, RE: EMERGENCY BOILER SHUTDOWN CONTROL DIAGRAM ON SHEET M520. MOUNT AS CLOSE AS POSSIBLE TO PERSONNEL EXIT DOOR.
- CARBON MONOXIDE SENSOR, RE: EMERGENCY BOILER SHUTDOWN CONTROL DIAGRAM ON SHEET M520.
- EXTEND NEW 1" FUEL OIL PIPING TO NEW BOILER FUEL OIL TRAIN AS REQUIRED.
- 6" CWR PIPING UP. IF ALTERNATE #1 IS NOT ACCEPTED, INSTALL BLIND FLANGE ON OUTLET OF CHANGEOVER VALVE CV-5, FOR FUTURE. UNDER ALTERNATE #1, EXTEND PIPING UP AND ROUTE TO CHILLER AS INDICATED ON SHEET M201.
- 6" CWS PIPING UP. IF ALTERNATE #1 IS NOT ACCEPTED, INSTALL A SHUTOFF WITH BLIND FLANGE IN THE VERTICAL. FOR FUTURE. UNDER ALTERNATE #1, EXTEND PIPING UP AND ROUTE TO CHILLER AS INDICATED ON SHEET M201.
- IF ALTERNATE #1 IS NOT ACCEPTED, PROVIDE THESE TWO (2) VALVES WITH CAPS FOR FUTURE.
- MOUNT VFD ON UNISTRUT STAND (NOT SHOWN) ANCHORED TO FLOOR. INSTALL NEAR PUMP MOTOR WITHOUT BLOCKING ACCESS TO MOTOR. PROVIDE 3" OF CLEAR SPACE IN FRONT OF VFD FOR SERVICE. NEW PIPING SHALL NOT ROUTE OVER TOP OF VFD.
- EXISTING I.T./SECURITY CONDUIT AND WIRING (NOT SHOWN) IN THIS AREA SHALL BE RELOCATED (RE: ELECTRICAL). AFTER IT IS RELOCATED, CORE DRILL THROUGH CONCRETE WALL ABOVE EXISTING DOOR TO INSTALL NEW 6" CHS/CHR PIPING. COORDINATE EXACT LOCATIONS OF PENETRATIONS WITH EXISTING CONDITIONS.
- NEW NETWORK AREA CONTROLLER TO SERVE EQUIPMENT IN BOILER BUILDING. REFER TO FMCS NETWORK REQUIREMENTS CONTROL DIAGRAM ON SHEET M522.

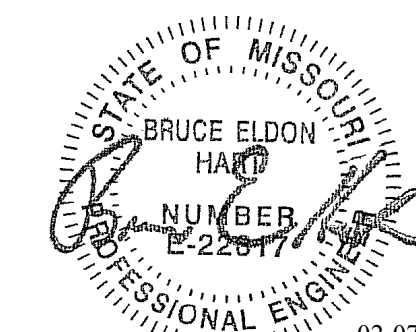


**CHANGEOVER VALVE
POSITION SCHEDULE**

VALVE TAG	VALVE POSITION WHEN MAIN BUILDING PIPING SYSTEM AND LARGE SYSTEM PUMPS (P-4 & P-5) ARE IN MODE:	
	HEATING	COOLING
CV-1	OPEN	CLOSED
CV-2	OPEN	CLOSED
CV-3	OPEN	CLOSED
CV-4	CLOSED	OPEN
CV-5	CLOSED	OPEN
CV-6	CLOSED	OPEN
CV-7	CLOSED	OPEN

NOTE: VALVES ON BOILER ROOM UNIT HEATER AND ON HOT WATER CONNECTORS ARE NOT TAGGED ON THESE DRAWINGS, BUT SHALL BE CLOSED WHEN THE SYSTEM IS IN COOLING MODE.





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REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M201.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

BOILER BLDG - UPPER
LEVEL - MECHANICAL

SHEET NUMBER:

M201

SHEET 11 OF 57

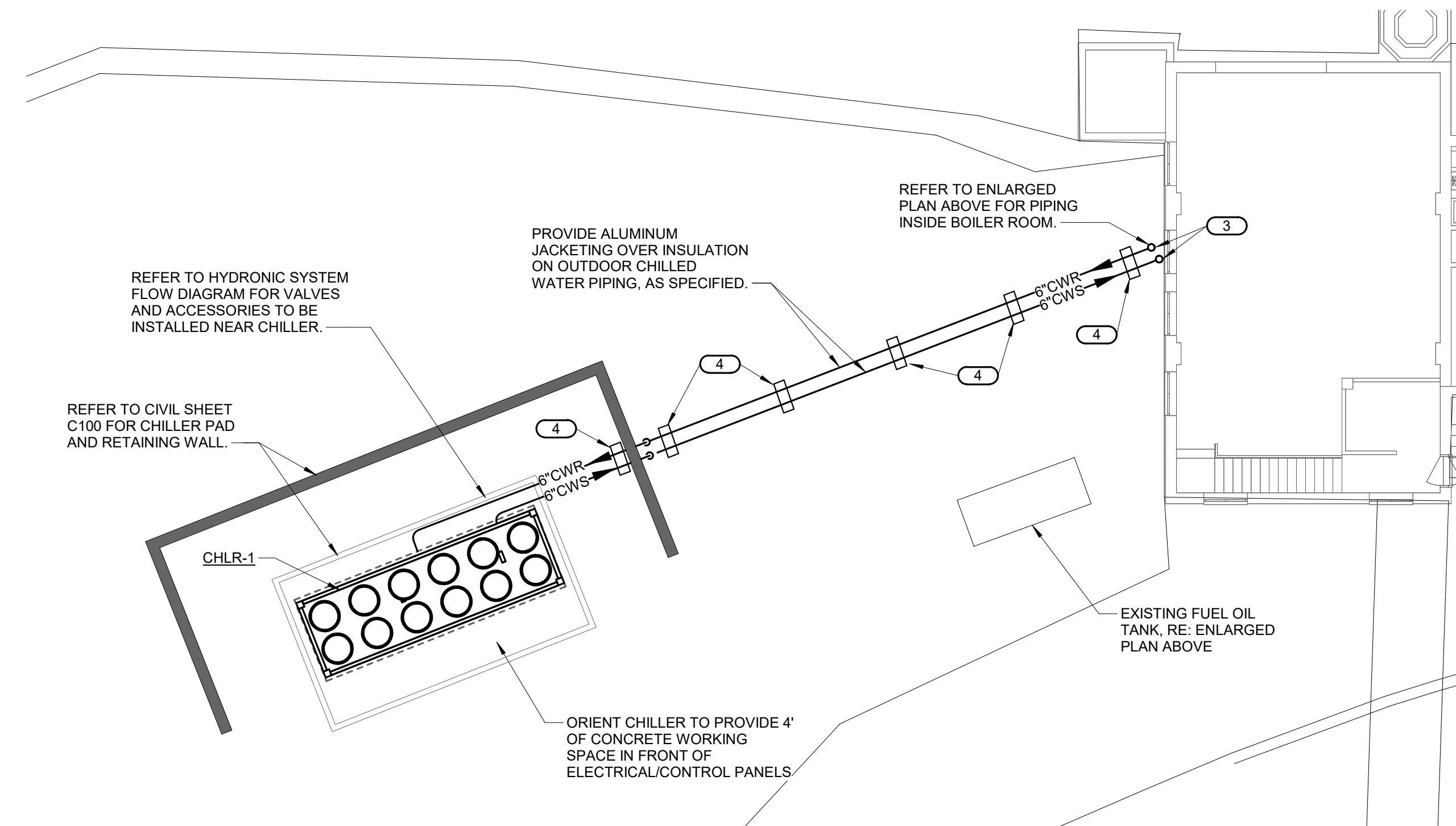
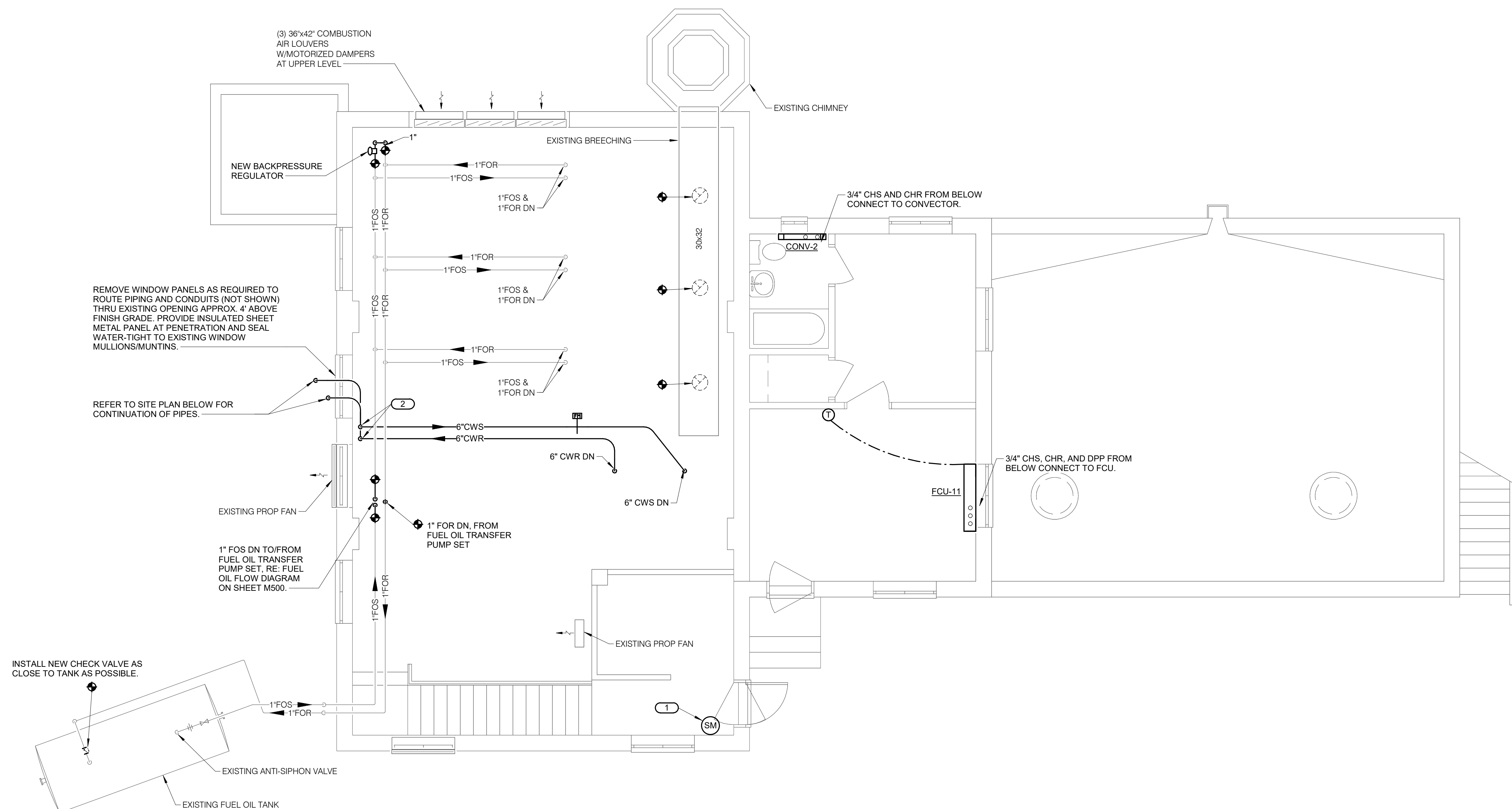
02/07/2024

SHEET NOTES:

- SEE SHEET M000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- CHILLER CHLR-1 AND ASSOCIATED PIPING AND CONDUIT CALLED OUT ON THIS SHEET ARE ONLY REQUIRED UNDER ALTERNATE #1.

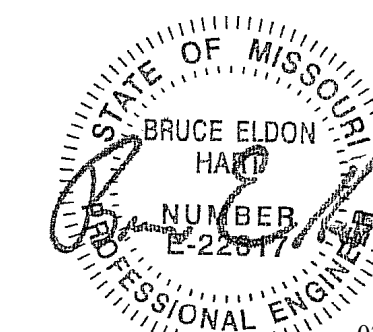
KEYNOTES:

- BOILER ROOM EMERGENCY SHUTDOWN SWITCH, RE: EMERGENCY BOILER SHUTDOWN CONTROL DIAGRAM ON SHEET M520. MOUNT AS CLOSE AS POSSIBLE TO PERSONNEL EXIT DOOR.
- PROVIDE SHUT OFF VALVES (NOT SHOWN) AT BOTTOM OF CWS & CWR RISERS, TO ALLOW OUTDOOR PIPING TO BE ISOLATED.
- PROVIDE DRAIN VALVES AT LOW POINT OF CWS & CWR LINES, TO ALLOW COMPLETE DRAINAGE OF OUTDOOR PIPING IN WINTER.
- INSTALL PIPING ON 1 5/8" STEEL STRUT CHANNEL SUPPORTS WITH STRUT BASE FITTINGS ANCHORED TO CONCRETE BASE. SUPPORTS SHALL HAVE CORROSION-RESISTANT, GREEN PAINTED FINISH, AND FASTENERS SHALL BE HOT-DIPPED GALVANIZED STEEL OR STAINLESS STEEL. MINIMUM THICKNESS OF CONCRETE BASE SHALL BE 4". IN ADDITION TO PIPING SHOWN, SIZE THE SUPPORTS TO ACCOMMODATE TEMPERATURE CONTROL AND POWER CONDUITS BETWEEN THE BOILER ROOM AND THE CHILLER. COORDINATE WITH TEMPERATURE CONTROL SUBCONTRACTOR AND/OR ELECTRICAL CONTRACTOR FOR SIZING AND INSTALLATION OF CONDUITS ON THE MECHANICAL PIPE SUPPORTS.



1 BOILER BLDG - UPPER LEVEL - MECHANICAL
1/4" = 1'-0"

2 SITE - MECHANICAL
1" = 10'-0"



02-07-2024

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MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
 DATE:
 REVISION:
 DATE:
 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M209.dwg
 DRAWN BY: MWM
 CHECKED BY: BEH
 DESIGNED BY: MJL

SHEET TITLE:

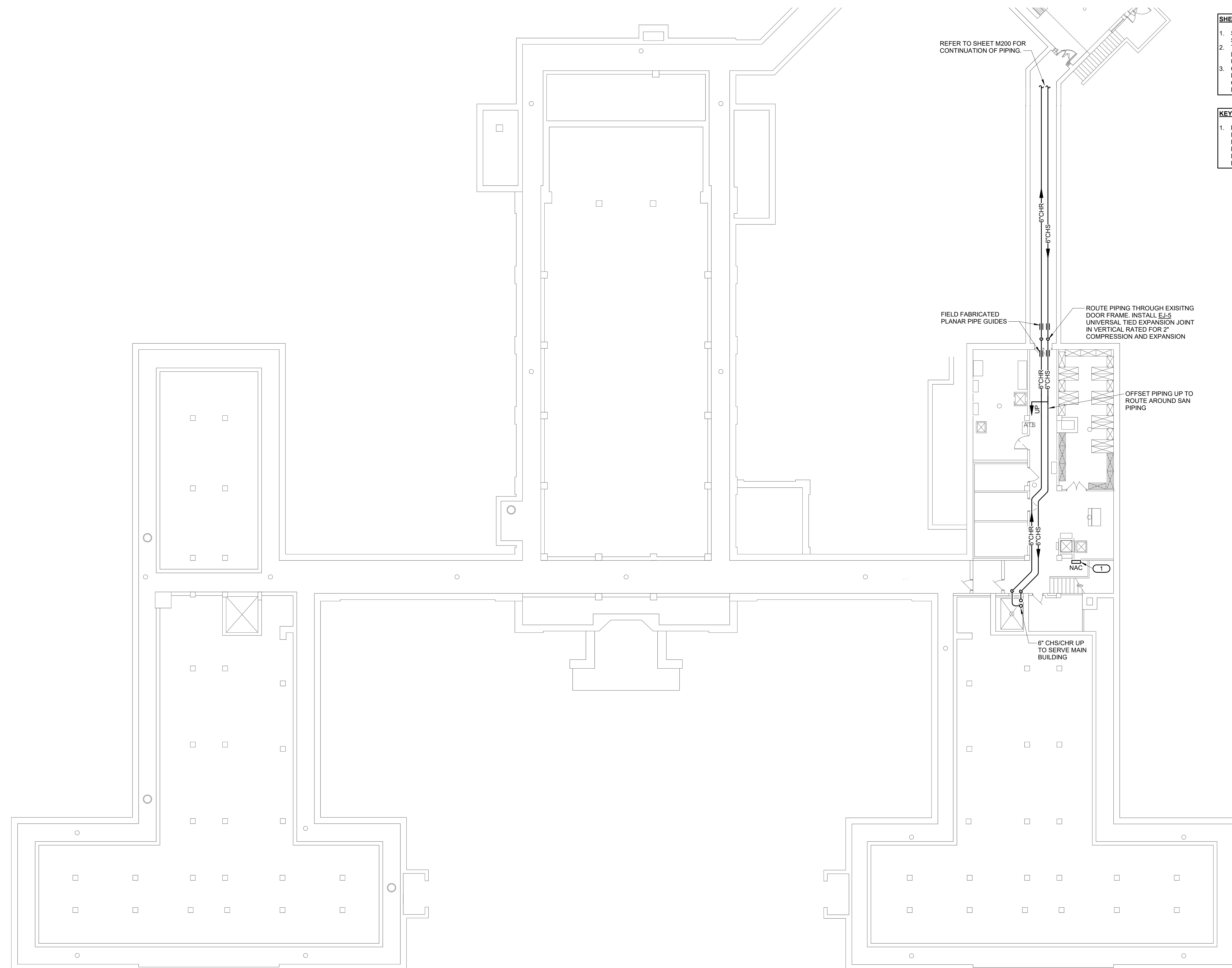
MAIN BLDG - TUNNEL
 LEVEL - MECHANICAL

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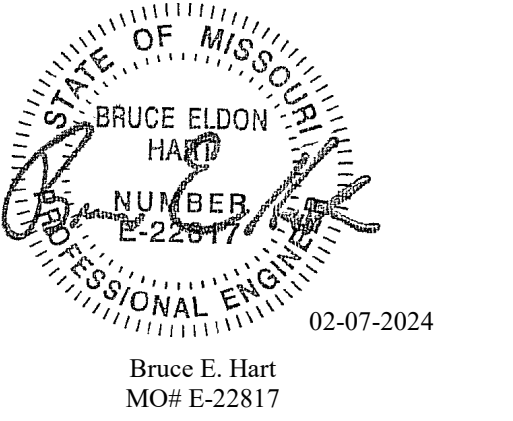
M209

SHEET 12 OF 57

02/07/2024



- SHEET NOTES:**
- SEE SHEET M000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
 - THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
 - CAREFULLY COORDINATE NEW PIPING AND EQUIPMENT LOCATIONS WITH EXISTING CONDITIONS AND WITH OWNER'S REPRESENTATIVE.
- KEYNOTES: (#)**
- NEW NETWORK AREA CONTROLLER TO SERVE FAN COIL UNITS IN MAIN BUILDING. REFER TO FMCS NETWORK REQUIREMENTS CONTROL DIAGRAM ON SHEET M522. COORDINATE EXACT LOCATION OF PANEL WITH OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.

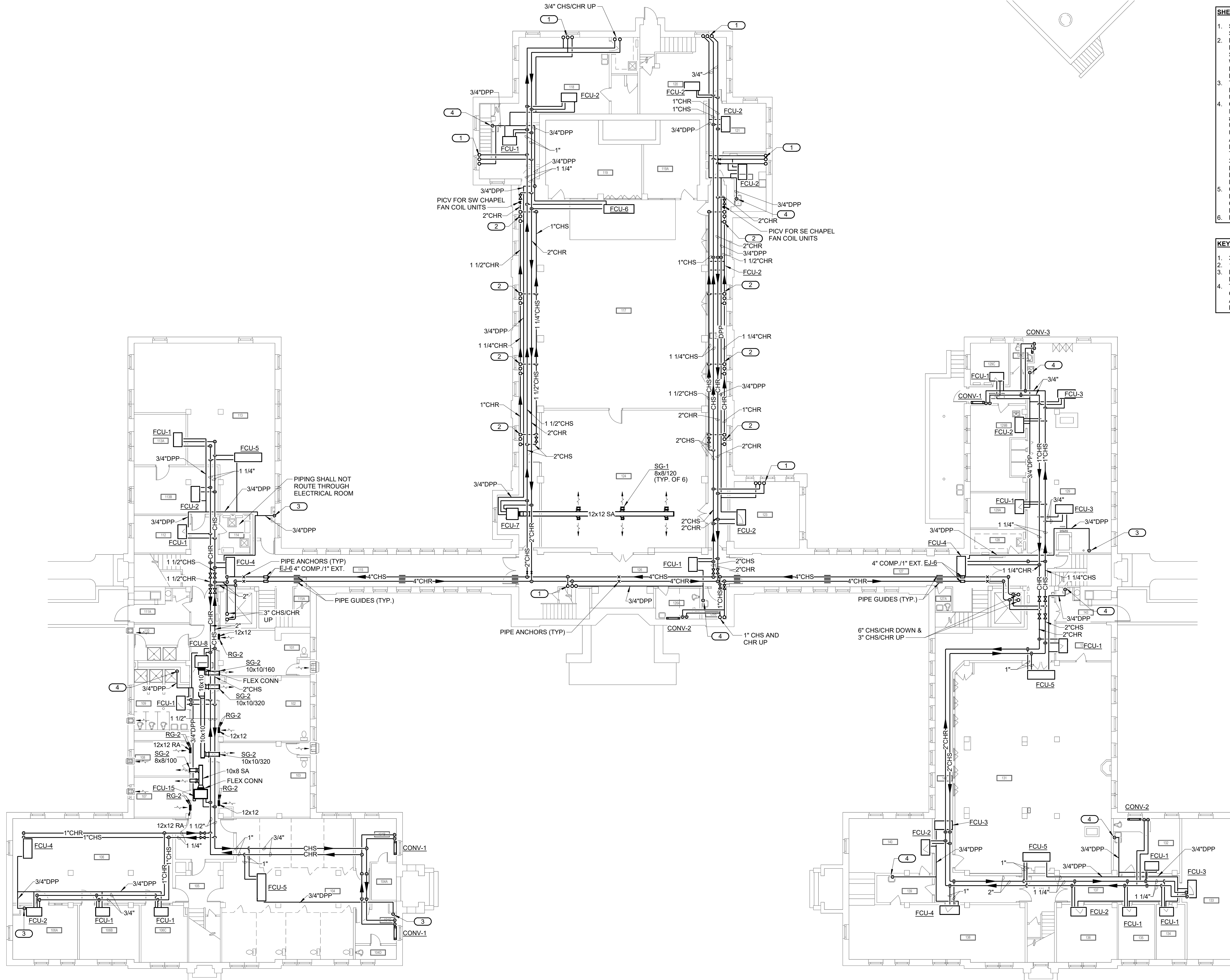


SHEET NOTES:

- SEE SHEET M000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- MAIN PIPE RISERS BETWEEN LEVELS SHALL BE ROUTED IN THE OLD, UNUSED ELEVATOR SHAFTS. COORDINATE EXACT LOCATIONS WITH EXISTING CONDITIONS. WHERE BRANCH MAINS EXIT THE SHAFTS, THEY SHALL NOT ROUTE OVER EXISTING ELECTRICAL PANELS.
- THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
- CONDENSATE DRAIN (DPP) PIPING INDICATED IS REQUIRED UNDER BASE BID. IF ALTERNATE #1 IS NOT ACCEPTED, THE PIPING WILL NOT BE USED INITIALLY, BUT IT SHALL BE INSTALLED UNDER THIS PROJECT. PROVIDE AND INSTALL A CONDENSATE TRAP (NOT SHOWN) AT EACH FAN COIL UNIT; RE: DETAIL ON SHEET M400. THE SIZE OF DPP BRANCH PIPING SHALL BE 3/4" UNLESS NOTED OTHERWISE, AND THE PIPING SHALL BE SLOPED AT 1/8" PER FOOT TO DRAIN. PROVIDE TEE WITH CLEANOUT PLUG AT EACH CHANGE OF DIRECTION.
- CAREFULLY COORDINATE NEW PIPING AND EQUIPMENT LOCATIONS WITH EXISTING CONDITIONS AND WITH OWNER'S REPRESENTATIVE.
- ROUTE PIPING AS HIGH AS POSSIBLE.

KEYNOTES: #

- 3/4" CHS/CHR AND 3/4" DPP UP.
- 1" CHS/CHR AND 3/4" DPP UP.
- EXTEND DRAIN PIPING TO NEW INDIRECT DRAIN; RE: PLUMBING DRAWINGS.
- TURN DRAIN PIPING DOWN AND TERMINATE OVER EXISTING SINK OR FLOOR SINK. PROVIDE A SIGN THAT READS: "CONDENSATE DRAIN PIPING FROM FAN COIL UNITS."



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 CORRECTIONS

REPLACE STEAM, WATER &
 SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
 DATE:
 REVISION:
 DATE:
 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M210.dwg
 DRAWN BY: CSB
 CHECKED BY: BEH
 DESIGNED BY: CSB

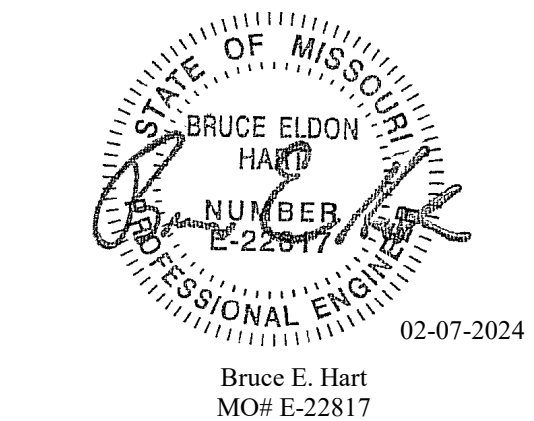
SHEET TITLE:
 MAIN BLDG -
 BASEMENT LEVEL -
 MECHANICAL

SHEET NUMBER:

M210

SHEET 13 OF 57

02/07/2024



- SHEET NOTES:**
- SEE SHEET M000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
 - MAIN PIPE RISERS BETWEEN LEVELS SHALL BE ROUTED IN THE OLD, UNUSED ELEVATOR SHAFTS. COORDINATE EXACT LOCATIONS WITH EXISTING CONDITIONS. WHERE BRANCH MAINS EXIT THE SHAFTS, THEY SHALL NOT ROUTE OVER EXISTING ELECTRICAL PANELS.
 - THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
 - CONDENSATE DRAIN (DPP) PIPING INDICATED IS REQUIRED UNDER BASE BID. IF ALTERNATE #1 IS NOT ACCEPTED, THE PIPING WILL NOT BE USED INITIALLY, BUT IT SHALL BE INSTALLED UNDER THIS PROJECT. PROVIDE AND INSTALL A CONDENSATE TRAP (NOT SHOWN) AT EACH FAN COIL UNIT; RE: DETAIL ON SHEET M400. THE SIZE OF DPP BRANCH PIPING SHALL BE 3/4" UNLESS NOTED OTHERWISE, AND THE PIPING SHALL BE SLOPED AT 1/8" PER FOOT TO DRAIN. PROVIDE TEE WITH CLEANOUT PLUG AT EACH CHANGE OF DIRECTION.
 - CAREFULLY COORDINATE NEW PIPING AND EQUIPMENT LOCATIONS WITH EXISTING CONDITIONS AND WITH OWNER'S REPRESENTATIVE.
 - ROUTE PIPING AS HIGH AS POSSIBLE.

- KEYNOTES: #**
- CORE DRILL SLAB BELOW FCU CASING AND ROUTE 1" CHS/CHR AND 3/4" DPP DOWN THRU SLAB. PIPING ABOVE SLAB SHALL BE CONCEALED WITHIN FCU CASING.
 - EXTEND DRAIN PIPING TO NEW INDIRECT DRAIN; RE: PLUMBING DRAWINGS.
 - TURN DRAIN PIPING DOWN AND TERMINATE OVER EXISTING SINK OR FLOOR SINK. PROVIDE A SIGN THAT READS: "CONDENSATE DRAIN PIPING FROM FAN COIL UNITS."
 - REMOVE EXISTING WINDOW TO ALLOW FOR INSTALLATION OF NEW LOUVER. COORDINATE EXACT WIDTH OF LOUVER TO FILL OPENING. INSTALL LOUVER AS HIGH AS POSSIBLE. BLANK OFF ANY UNUSED PORTION(S) OF REMAINING OPENING USING 2" THICK INSULATED SHEET METAL PANEL AND SEAL WATER-TIGHT. PAINT INSULATED PANEL TO MATCH LOUVER COLOR TO BE SELECTED BY OWNER'S REPRESENTATIVE.
 - DISCONNECT AND REMOVE STEAM RADIATOR (NOT SHOWN) IN THIS LOCATION TO ALLOW FOR INSTALLATION OF NEW CONNECTOR.
 - DISCONNECT AND REMOVE STEAM RADIATOR (NOT SHOWN) IN THIS LOCATION TO ALLOW FOR INSTALLATION OF NEW CONNECTOR. CORE DRILL SLAB BELOW CONVECTOR CASING AS REQUIRED AND ROUTE 3/4" CHS/CHR DOWN THRU SLAB.

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REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M211.dwg
DRAWN BY: CSB
CHECKED BY: BEH
DESIGNED BY: CSB

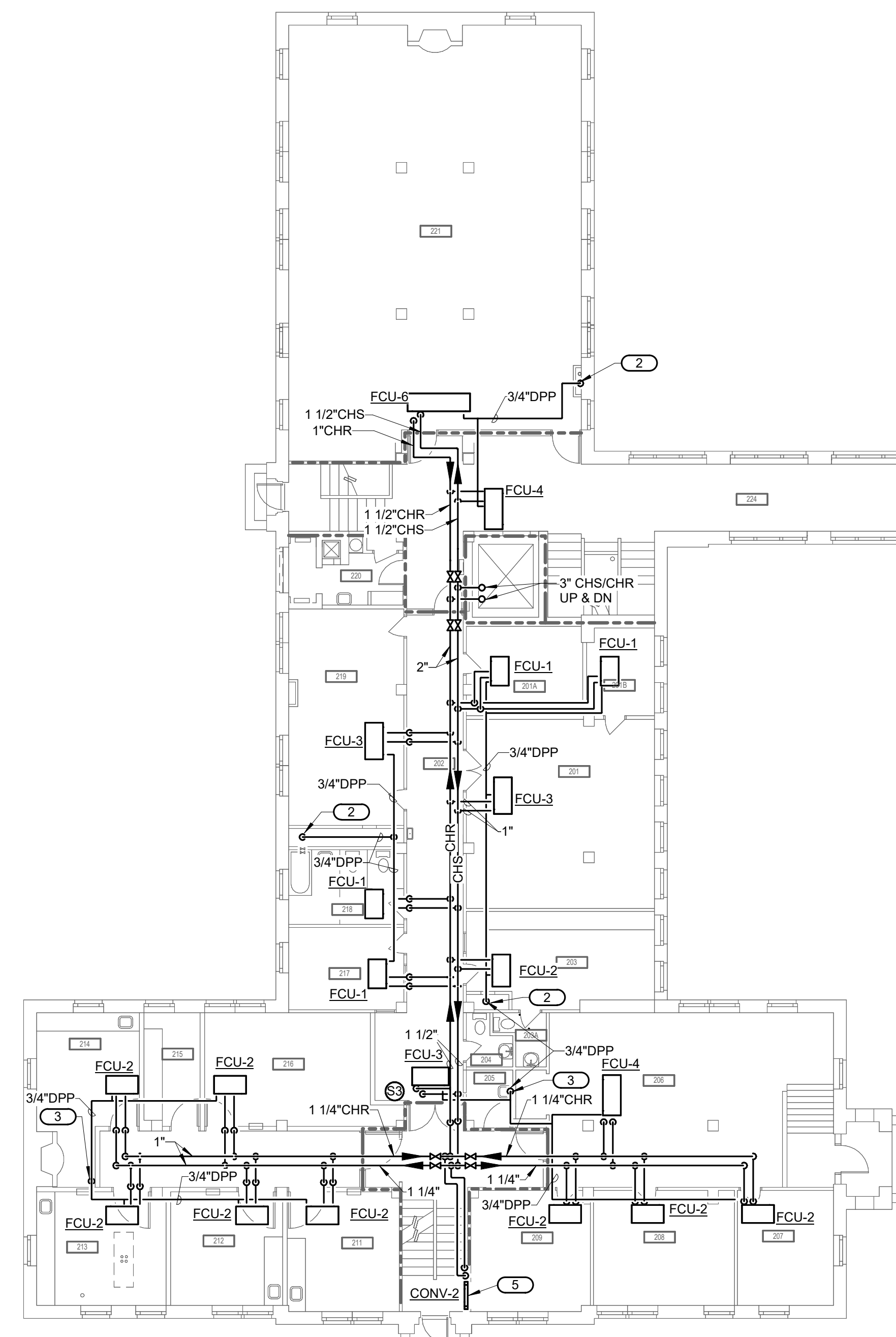
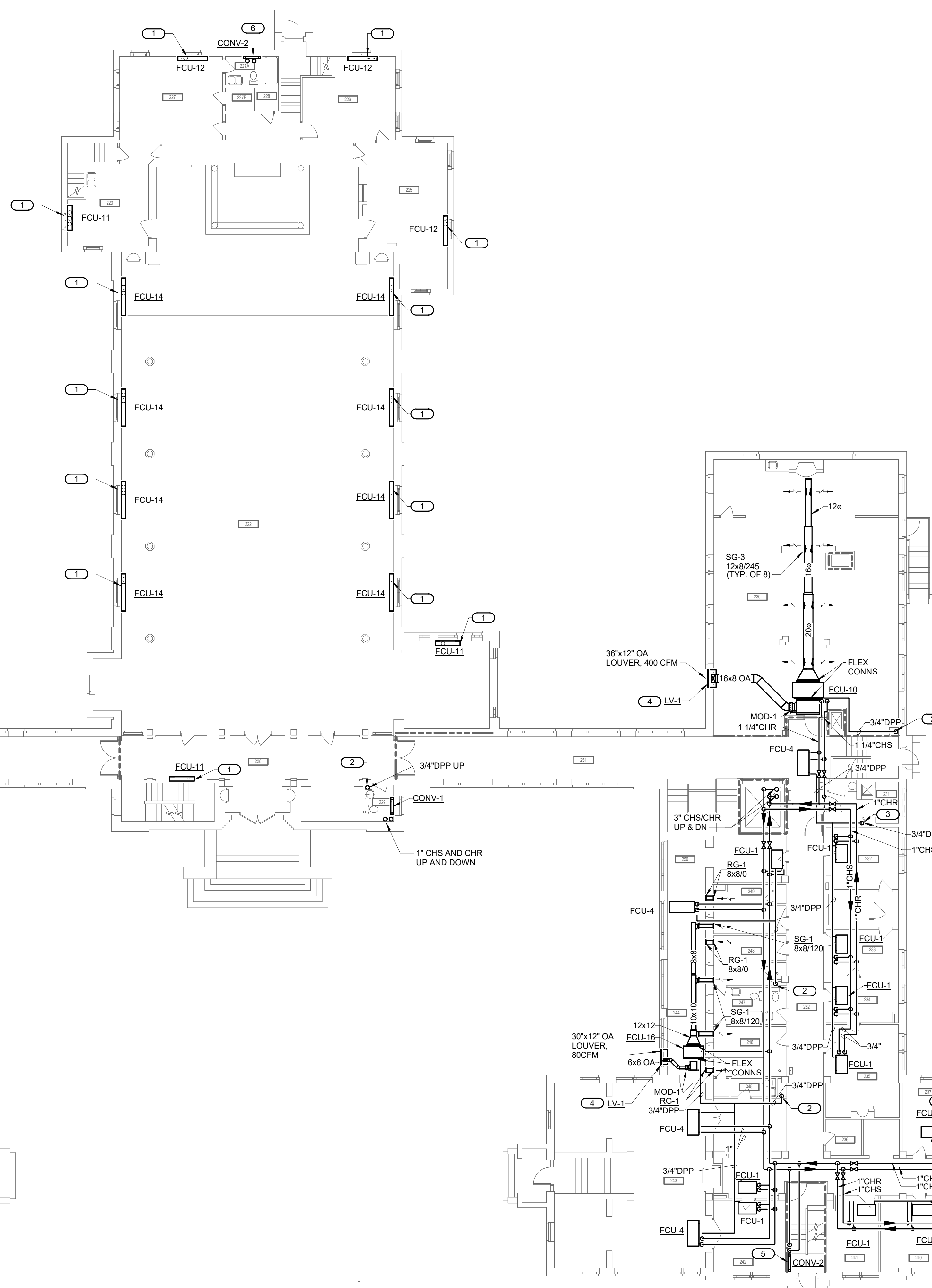
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**MAIN BLDG - LEVEL 01
- MECHANICAL**

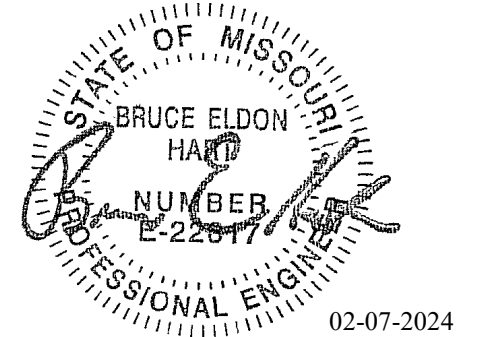
SHEET NUMBER:

M211

SHEET 14 OF 57

02/07/2024





02-07-2024
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MO# E-22817



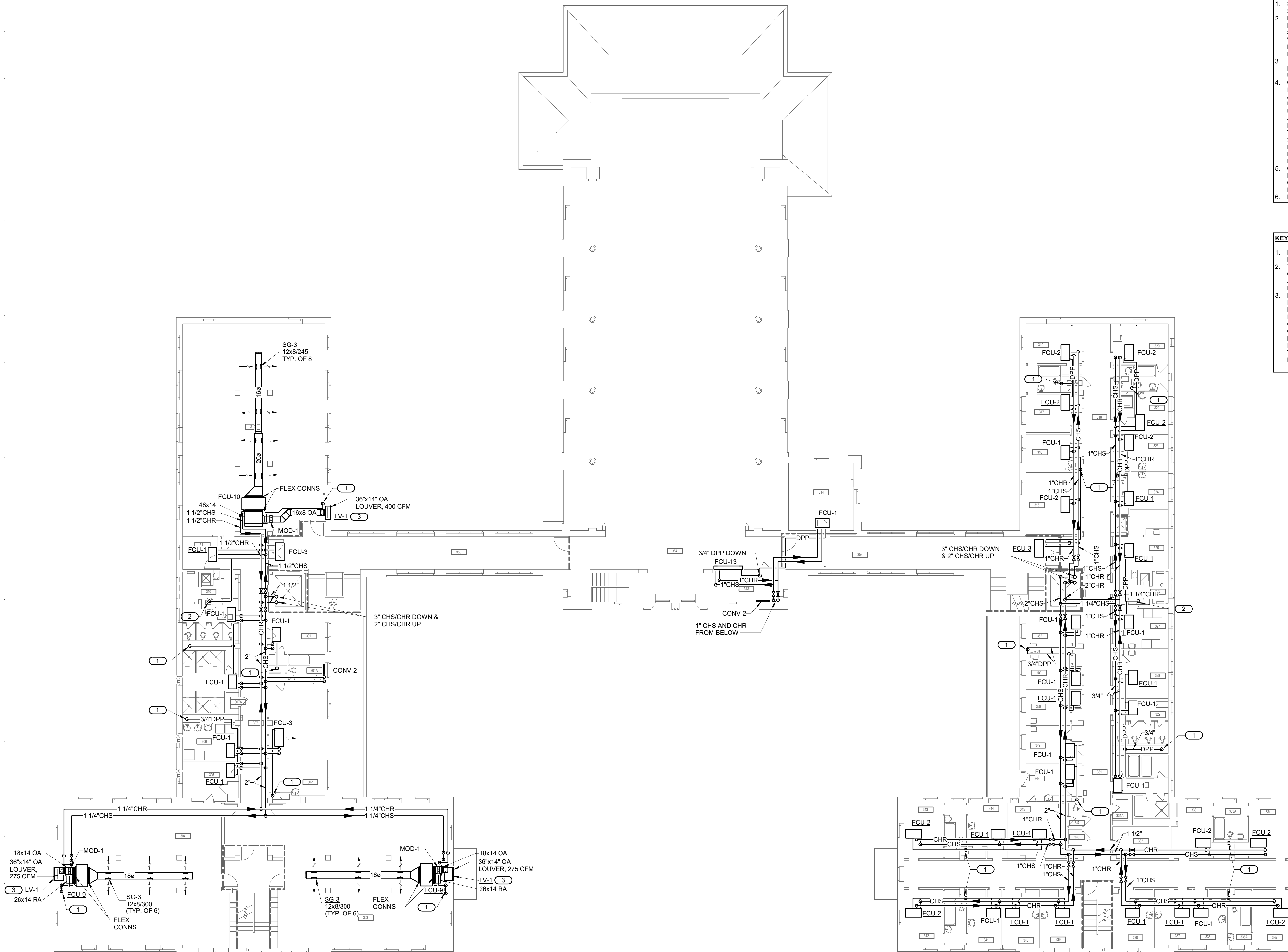
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P: 816.842.8437
PROJECT #23000440.00

SHEET NOTES:

- SEE SHEET M000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- MAIN PIPE RISERS BETWEEN LEVELS SHALL BE ROUTED IN THE OLD, UNUSED ELEVATOR SHAFTS. COORDINATE EXACT LOCATIONS WITH EXISTING CONDITIONS. WHERE BRANCH MAINS EXIT THE SHAFTS, THEY SHALL NOT ROUTE OVER EXISTING ELECTRICAL PANELS.
- THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
- CONDENSATE DRAIN (DPP) PIPING INDICATED IS REQUIRED UNDER BASE BID. IF ALTERNATE #1 IS NOT ACCEPTED, THE PIPING WILL NOT BE USED INITIALLY, BUT IT SHALL BE INSTALLED UNDER THIS PROJECT. PROVIDE AND INSTALL A CONDENSATE TRAP (NOT SHOWN) AT EACH FAN COIL UNIT; RE: DETAIL ON SHEET M400. THE SIZE OF DPP BRANCH PIPING SHALL BE 3/4" UNLESS NOTED OTHERWISE, AND THE PIPING SHALL BE SLOPED AT 1/8" PER FOOT TO DRAIN. PROVIDE TEE WITH CLEANOUT PLUG AT EACH CHANGE OF DIRECTION.
- CAREFULLY COORDINATE NEW PIPING AND EQUIPMENT LOCATIONS WITH EXISTING CONDITIONS AND WITH OWNER'S REPRESENTATIVE.
- ROUTE PIPING AS HIGH AS POSSIBLE.

KEYNOTES: #

- EXTEND DRAIN PIPING TO NEW INDIRECT DRAIN; RE: PLUMBING DRAWINGS.
- TURN DRAIN PIPING DOWN AND TERMINATE OVER EXISTING SINK OR FLOOR SINK. PROVIDE A SIGN THAT READS, "CONDENSATE DRAIN PIPING FROM FAN COIL UNITS."
- REMOVE EXISTING WINDOW TO ALLOW FOR INSTALLATION OF NEW LOUVER. COORDINATE EXACT WIDTH OF LOUVER TO FILL OPENING. INSTALL LOUVER AS HIGH AS POSSIBLE. BLANK OFF ANY UNUSED PORTION(S) OF REMAINING OPENING USING 2" THICK INSULATED SHEET METAL PANEL AND SEAL WATER-TIGHT. PAINT INSULATED PANEL TO MATCH LOUVER (COLOR TO BE SELECTED BY OWNER'S REPRESENTATIVE).



TRUE NORTH NORTH
1 MAIN BLDG - LEVEL 02 - MECHANICAL
3/32" = 1'-0"

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REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M212.dwg
DRAWN BY: CSB
CHECKED BY: BEH
DESIGNED BY: CSB
SHEET TITLE:

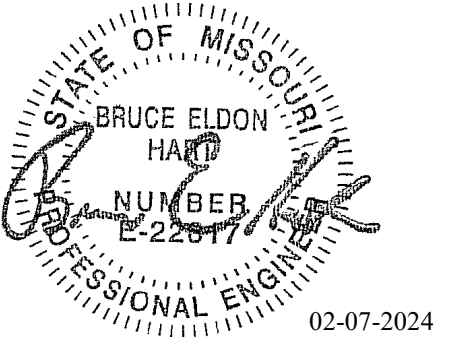
MAIN BLDG - LEVEL 02
- MECHANICAL

SHEET NUMBER:

M212

SHEET 15 OF 57

02/07/2024



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MARYVILLE TREATMENT
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MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
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REVISION:
DATE:
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DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M213.dwg
DRAWN BY: CSB
CHECKED BY: BEH
DESIGNED BY: CSB
SHEET TITLE:

MAIN BLDG - LEVEL 03
- MECHANICAL

SHEET NUMBER:

M213

SHEET 16 OF 57

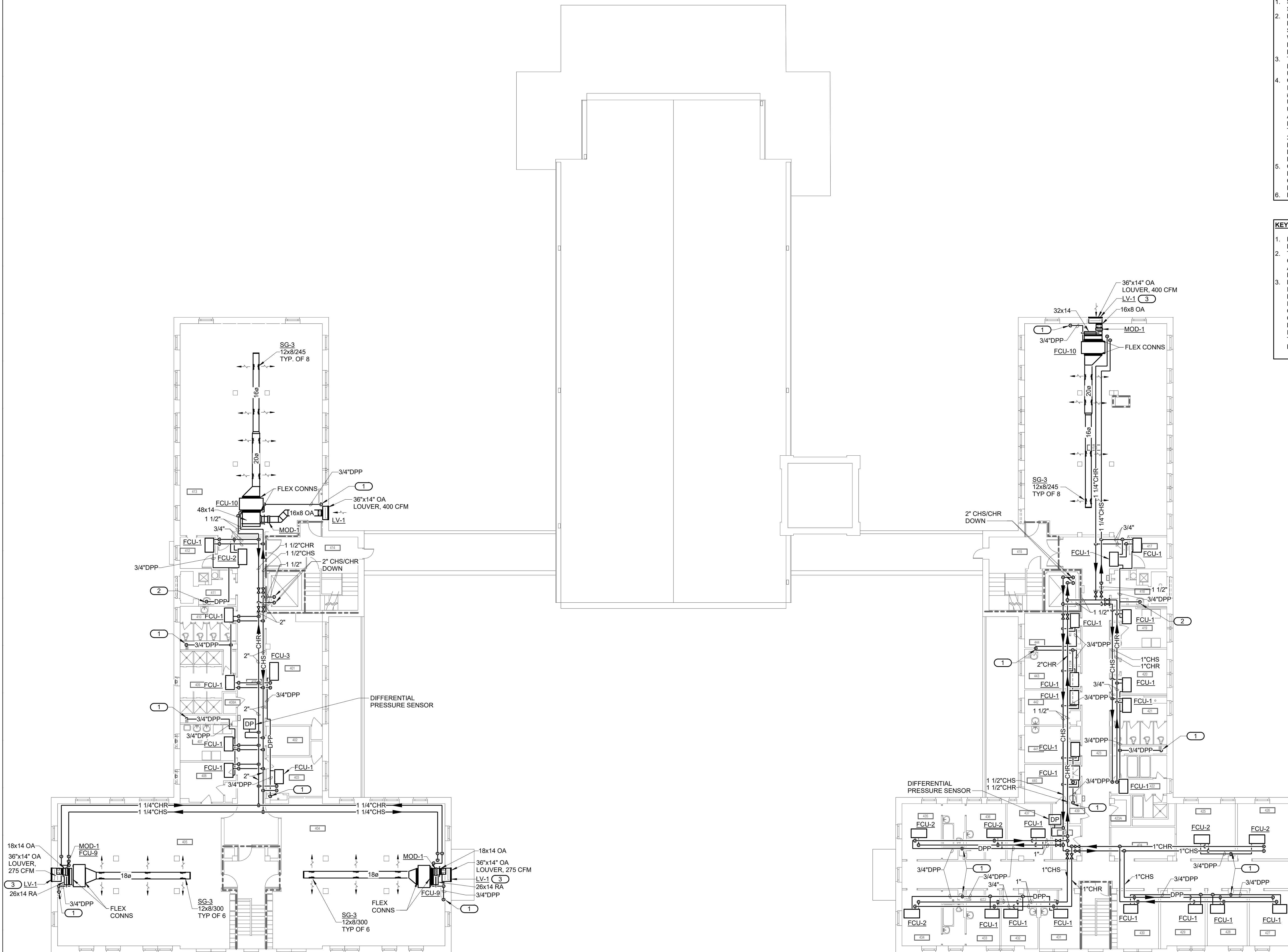
02/07/2024

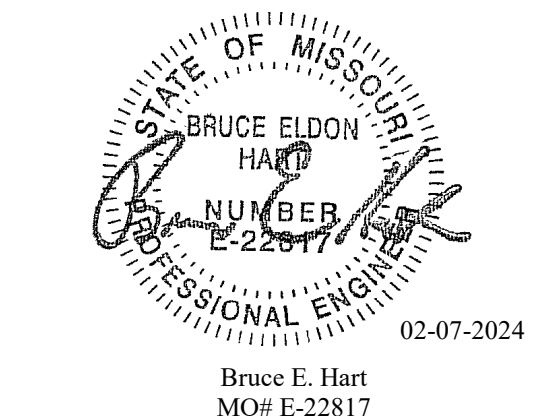
SHEET NOTES:

- SEE SHEET M000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- MAIN PIPE RISERS BETWEEN LEVELS SHALL BE ROUTED IN THE OLD, UNUSED ELEVATOR SHAFTS. COORDINATE EXACT LOCATIONS WITH EXISTING CONDITIONS. WHERE BRANCH MAINS EXIT THE SHAFTS, THEY SHALL NOT ROUTE OVER EXISTING ELECTRICAL PANELS.
- THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
- CONDENSATE DRAIN (DPP) PIPING INDICATED IS REQUIRED UNDER BASE BID. IF ALTERNATE #1 IS NOT ACCEPTED, THE PIPING WILL NOT BE USED INITIALLY, BUT IT SHALL BE INSTALLED UNDER THIS PROJECT. PROVIDE AND INSTALL A CONDENSATE TRAP (NOT SHOWN) AT EACH FAN COIL UNIT; RE: DETAIL ON SHEET M400. THE SIZE OF DPP BRANCH PIPING SHALL BE 3/4" UNLESS NOTED OTHERWISE, AND THE PIPING SHALL BE SLOPED AT 1/8" PER FOOT TO DRAIN. PROVIDE TEE WITH CLEANOUT PLUG AT EACH CHANGE OF DIRECTION.
- CAREFULLY COORDINATE NEW PIPING AND EQUIPMENT LOCATIONS WITH EXISTING CONDITIONS AND WITH OWNER'S REPRESENTATIVE.
- ROUTE PIPING AS HIGH AS POSSIBLE.

KEYNOTES: (#)

- EXTEND DRAIN PIPING TO NEW INDIRECT DRAIN; RE: PLUMBING DRAWINGS.
- TURN DRAIN PIPING DOWN AND TERMINATE OVER EXISTING SINK OR FLOOR SINK. PROVIDE A SIGN THAT READS, "CONDENSATE DRAIN PIPING FROM FAN COIL UNITS."
- REMOVE EXISTING WINDOW TO ALLOW FOR INSTALLATION OF NEW LOUVER. COORDINATE EXACT WIDTH OF LOUVER TO FILL OPENING. INSTALL LOUVER AS HIGH AS POSSIBLE. BLANK OFF ANY UNUSED PORTION(S) OF REMAINING OPENING USING 2" THICK INSULATED SHEET METAL PANEL AND SEAL WATER-TIGHT. PAINT INSULATED PANEL TO MATCH LOUVER (COLOR TO BE SELECTED BY OWNER'S REPRESENTATIVE).





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 DESIGN AND
 CONSTRUCTION

DEPARTMENT OF
 CORRECTIONS

REPLACE STEAM, WATER &
 SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
 DATE:
 REVISION:
 DATE:
 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M210.dwg
 DRAWN BY: CSB
 CHECKED BY: BEH
 DESIGNED BY: CSB

SHEET TITLE:

MAIN BLDG -
 BASEMENT LEVEL -
 TEMP CONTROLS

SHEET NUMBER:

M220

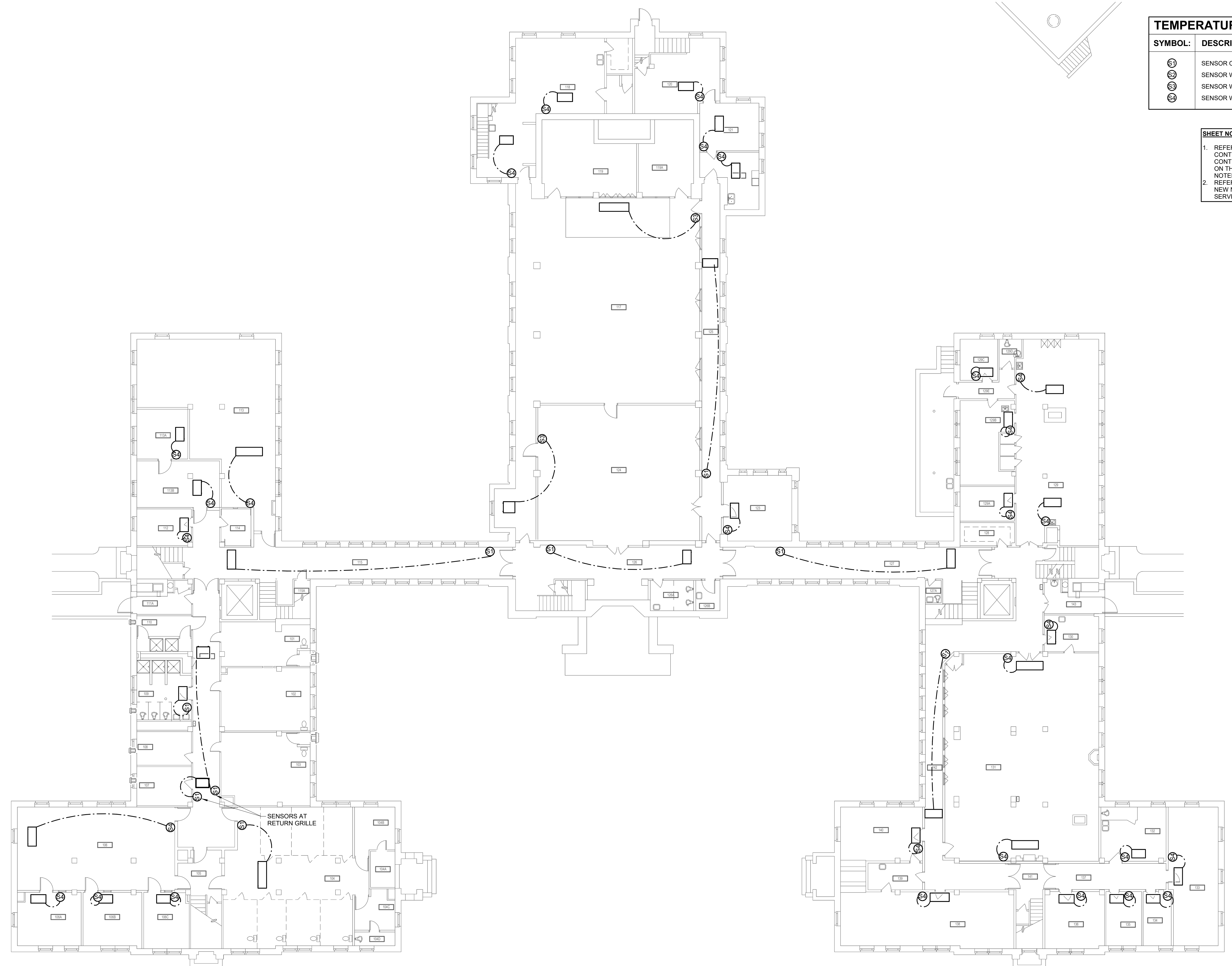
SHEET 17 OF 57
 02/07/2024

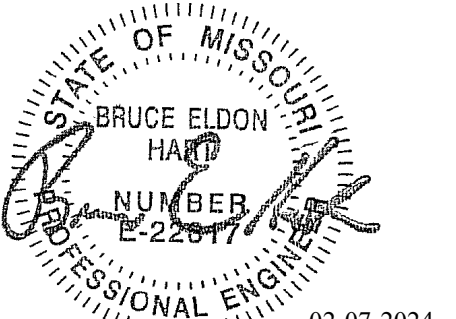
TEMPERATURE SENSOR LEGEND

SYMBOL:	DESCRIPTION:
Ⓢ1	SENSOR ONLY. PROVIDE HEAVY DUTY ENCLOSURE.
Ⓢ2	SENSOR WITH ADJUSTMENT
Ⓢ3	SENSOR WITH OVERRIDE
Ⓢ4	SENSOR WITH ADJUSTMENT & OVERRIDE

SHEET NOTES:

- REFER TO SHEET M522 FOR FAN COIL UNIT CONTROL DIAGRAMS. THE APPLICABLE CONTROL DIAGRAM FOR ALL FAN COIL UNITS ON THIS SHEET SHALL BE FCU-A, UNLESS NOTED OTHERWISE AS FCU-B OR FCU-C.
- REFER TO SHEET M209 FOR LOCATION OF NEW NETWORK AREA CONTROLLER (NAC) TO SERVE FAN COIL UNITS IN MAIN BUILDING.





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MARYVILLE, MO

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REVISION:
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 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M211.dwg
 DRAWN BY: CSB
 CHECKED BY: BEH
 DESIGNED BY: CSB

SHEET TITLE:

MAIN BLDG - LEVEL 01
 - TEMPERATURE
 CONTROLS

SHEET NUMBER:

M221

SHEET 18 OF 57

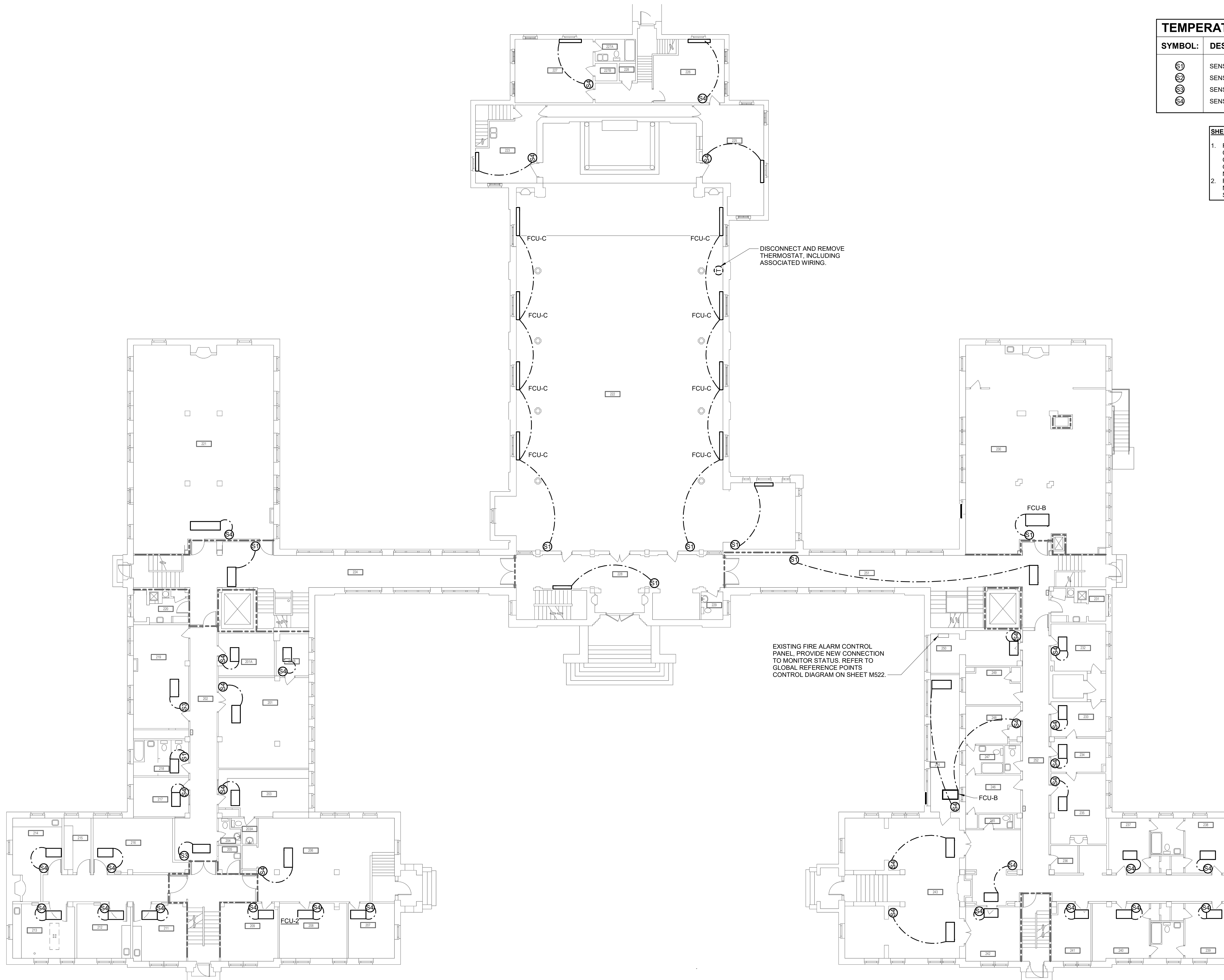
02/07/2024

TEMPERATURE SENSOR LEGEND

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Ⓢ1	SENSOR ONLY. PROVIDE HEAVY DUTY ENCLOSURE.
Ⓢ2	SENSOR WITH ADJUSTMENT
Ⓢ3	SENSOR WITH OVERRIDE
Ⓢ4	SENSOR WITH ADJUSTMENT & OVERRIDE

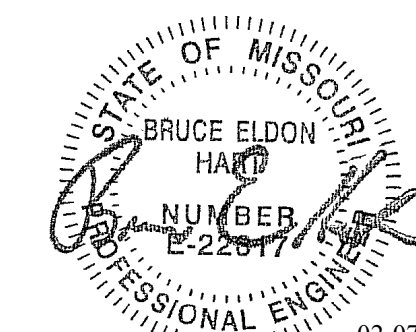
SHEET NOTES:

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1 MAIN BLDG - LEVEL 01 - TEMPERATURE CONTROLS

3/32" = 1'-0"



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MARYVILLE TREATMENT
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MARYVILLE, MO

PROJECT # C1921-01
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REVISION:
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 DATE:
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 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M212.dwg
 DRAWN BY: CSB
 CHECKED BY: BEH
 DESIGNED BY: CSB

SHEET TITLE:

MAIN BLDG - LEVEL 02
 - TEMPERATURE
 CONTROLS

SHEET NUMBER:

M222

SHEET 19 OF 57

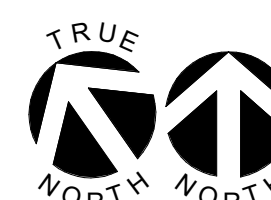
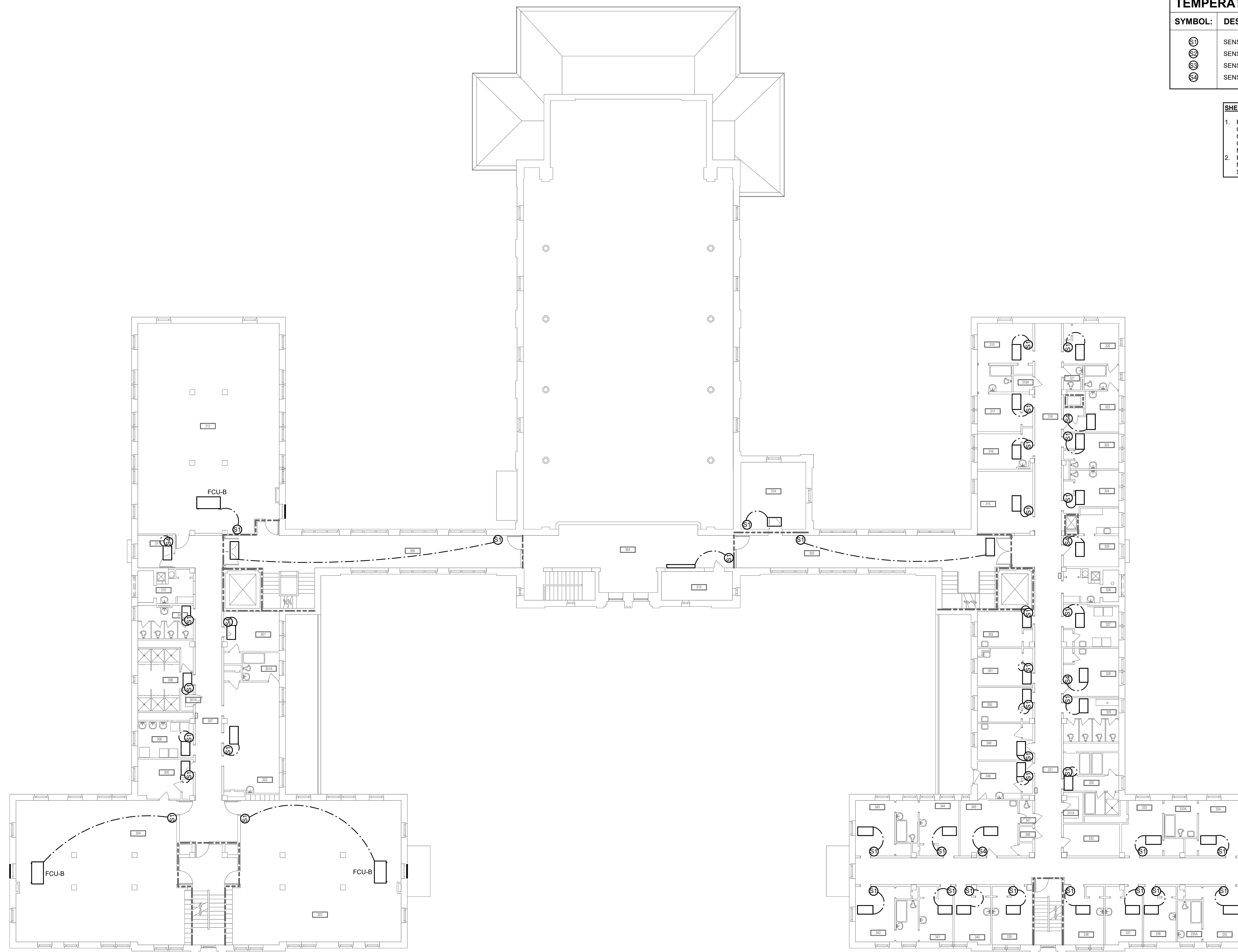
02/07/2024

TEMPERATURE SENSOR LEGEND

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Ⓢ2	SENSOR WITH ADJUSTMENT
Ⓢ3	SENSOR WITH OVERRIDE
Ⓢ4	SENSOR WITH ADJUSTMENT & OVERRIDE

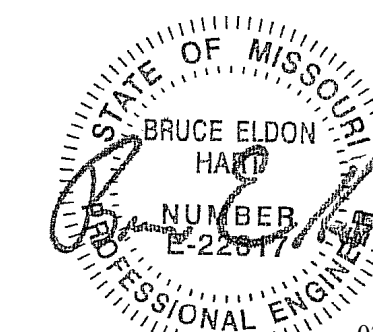
SHEET NOTES:

- REFER TO SHEET M522 FOR FAN COIL UNIT CONTROL DIAGRAMS. THE APPLICABLE CONTROL DIAGRAM FOR ALL FAN COIL UNITS ON THIS SHEET SHALL BE FCU-A, UNLESS NOTED OTHERWISE AS FCU-B OR FCU-C.
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1 MAIN BLDG - LEVEL 02 - TEMPERATURE CONTROLS

3/32" = 1'-0"



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REVISION:
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DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M213.dwg
DRAWN BY: CSB
CHECKED BY: BEH
DESIGNED BY: CSB

SHEET TITLE:

MAIN BLDG - LEVEL 03
- TEMPERATURE
CONTROLS

SHEET NUMBER:

M223

SHEET 20 OF 57

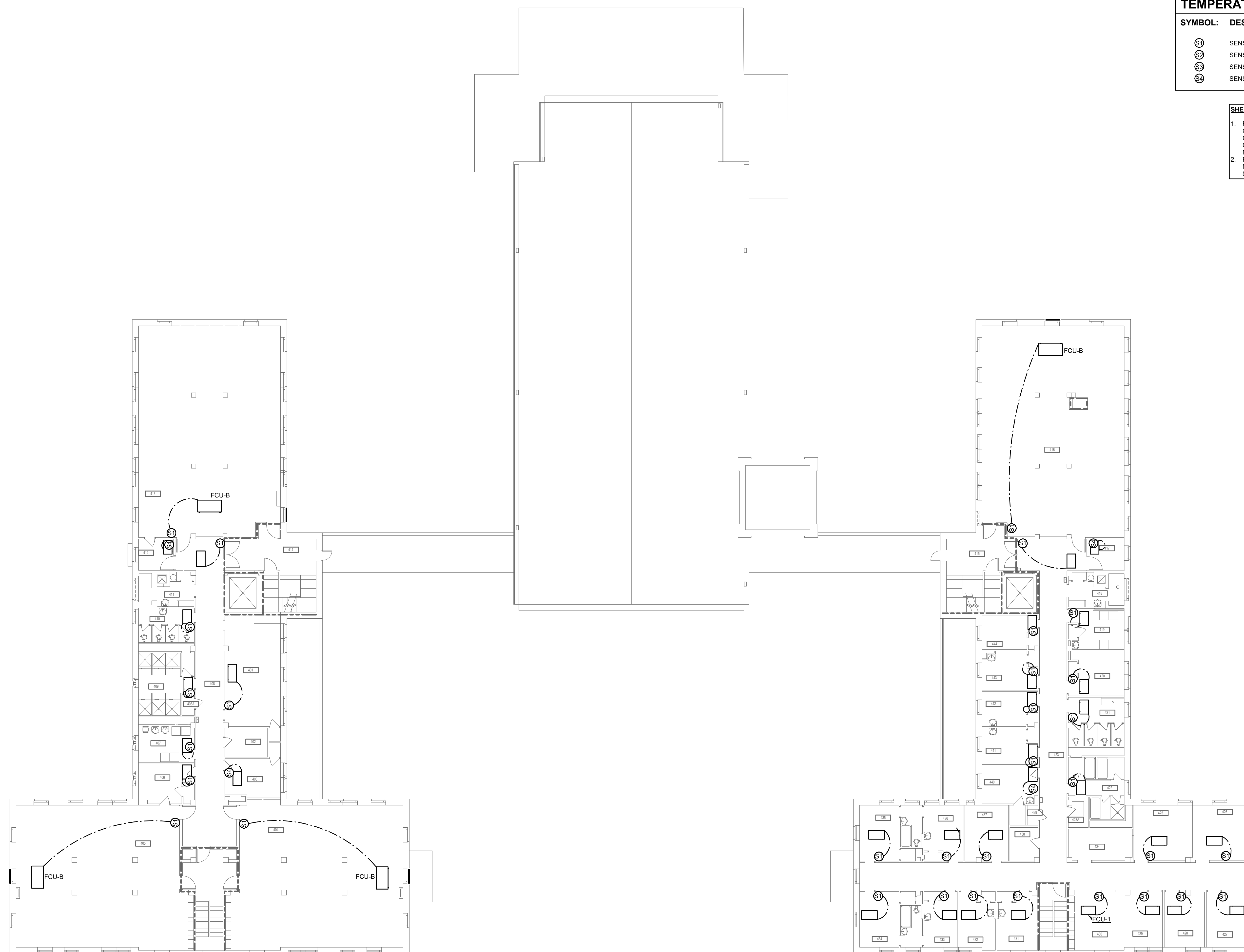
02/07/2024

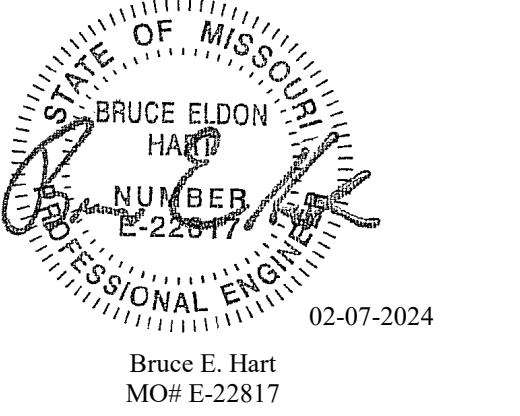
TEMPERATURE SENSOR LEGEND

SYMBOL:	DESCRIPTION:
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ⓈⓂ	SENSOR WITH ADJUSTMENT
ⓈⓄ	SENSOR WITH OVERRIDE
ⓈⓂⓄ	SENSOR WITH ADJUSTMENT & OVERRIDE

SHEET NOTES:

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MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M400.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

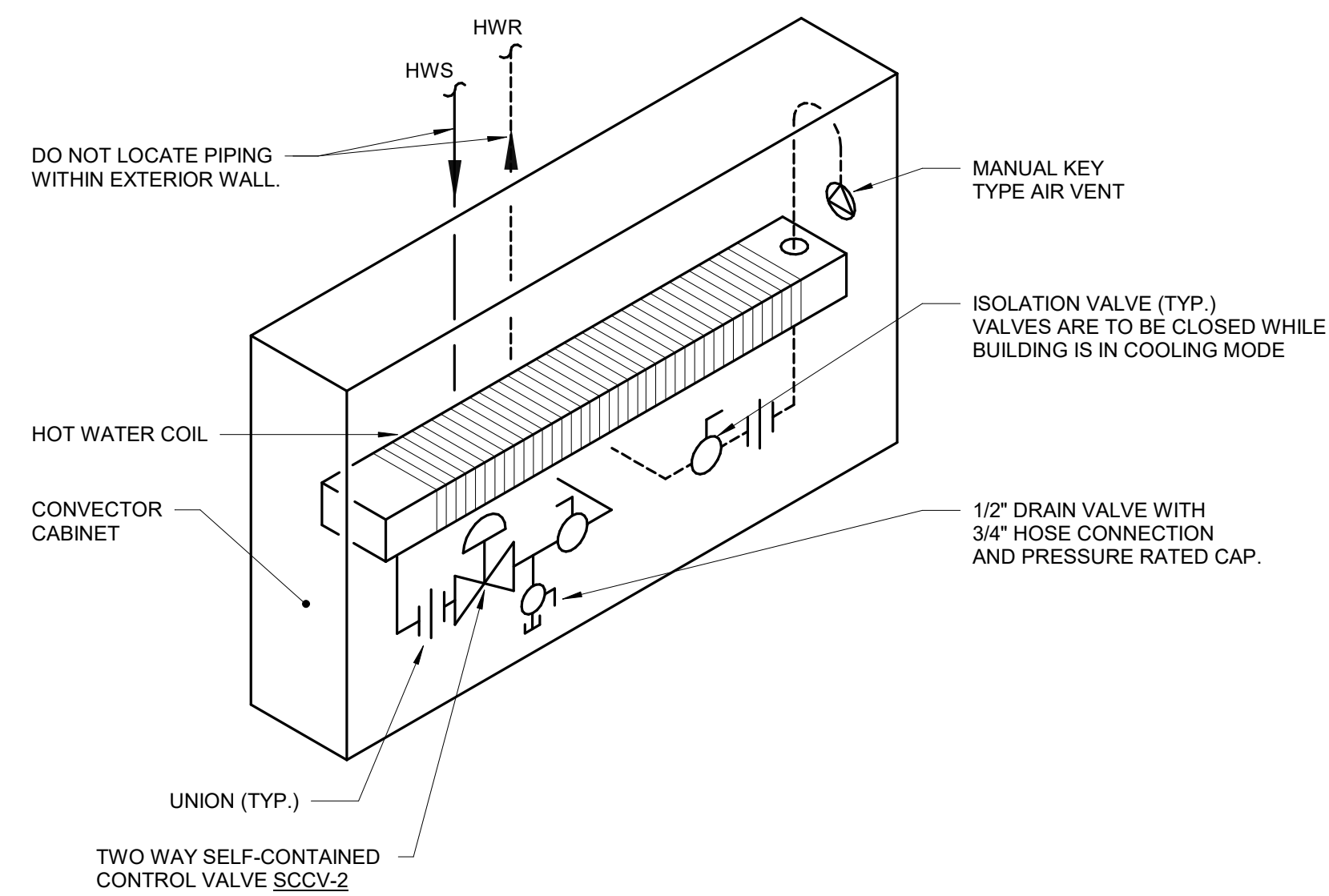
MECHANICAL DETAILS

SHEET NUMBER:

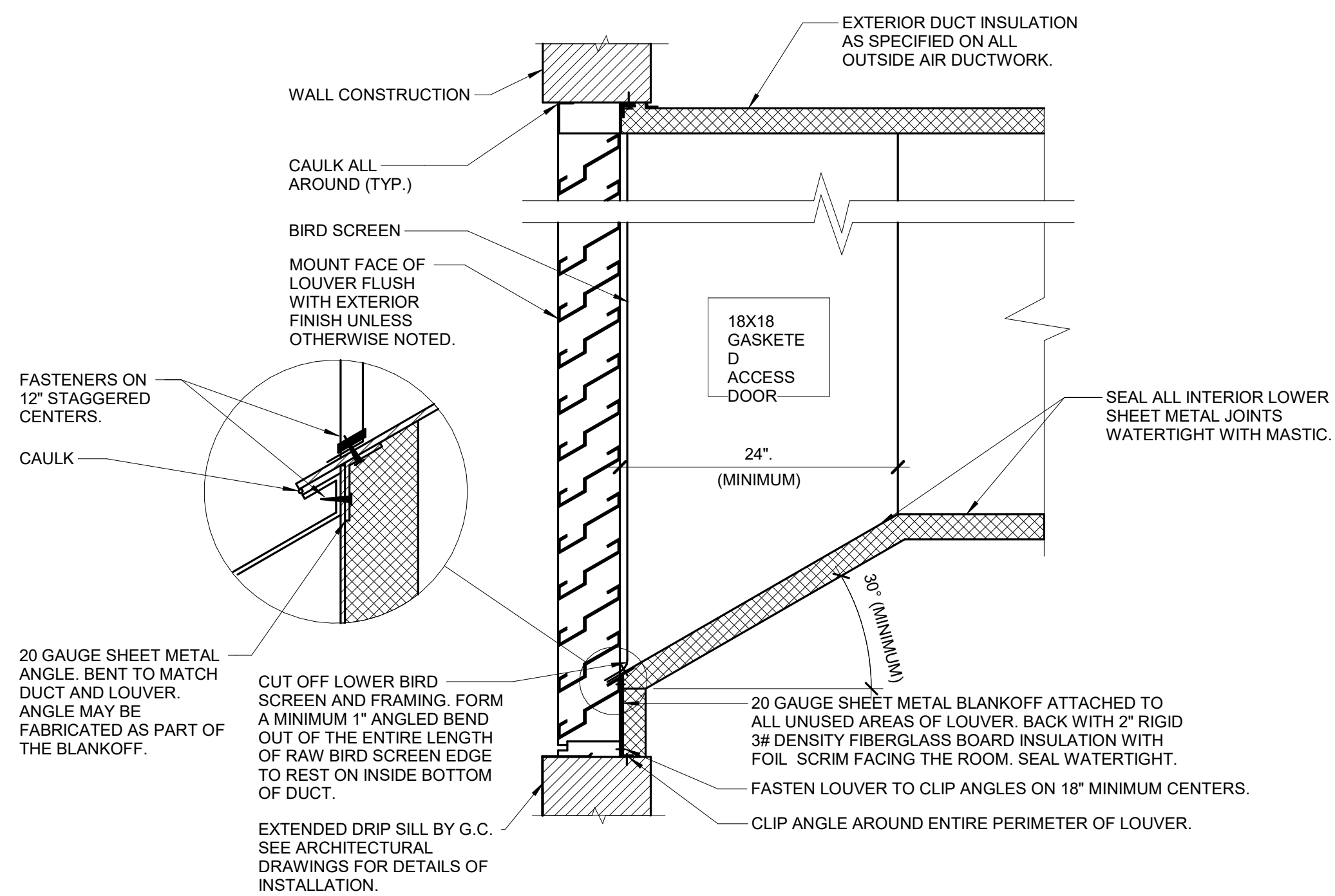
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SHEET 21 OF 57

02/07/2024



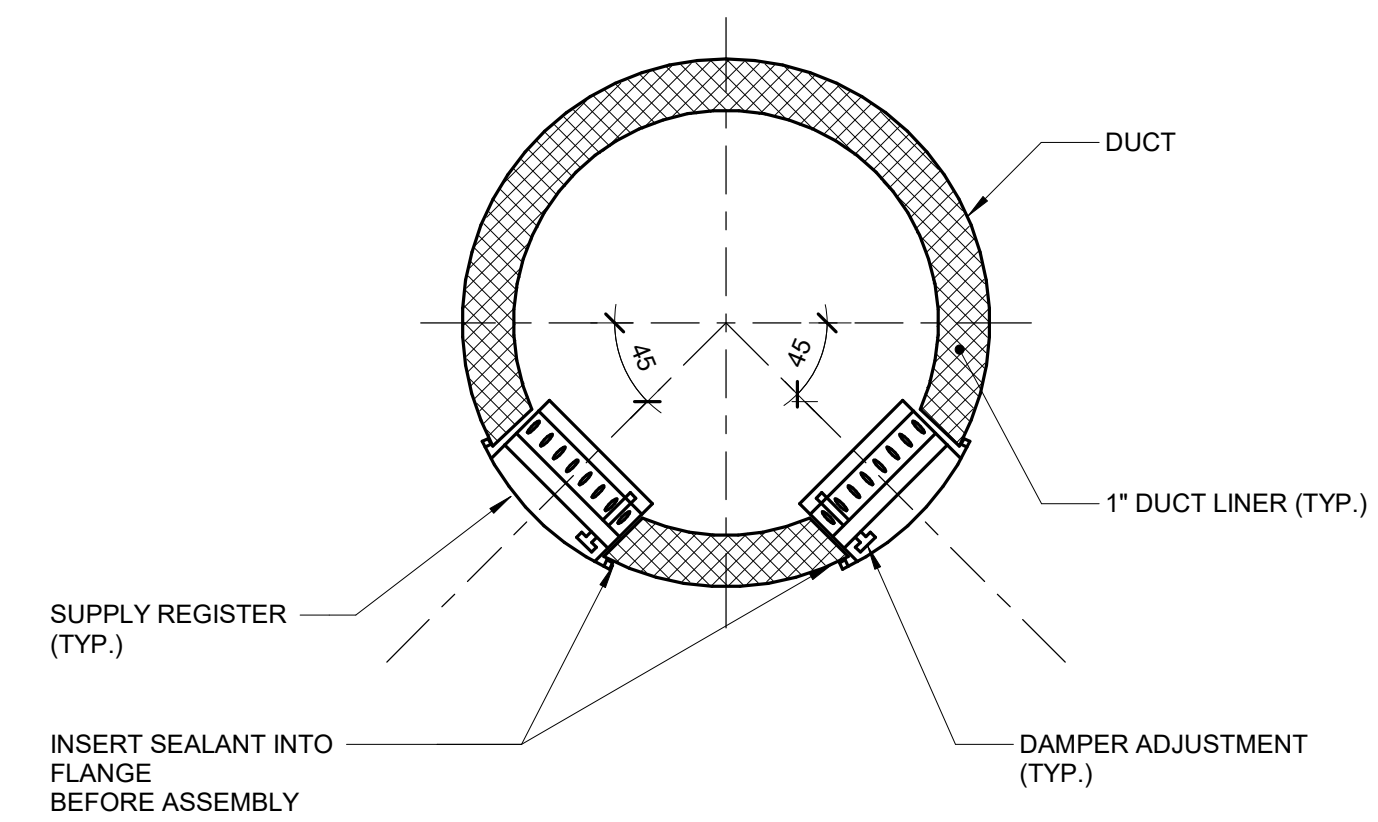
1 DOWNFEED HOT WATER CONVECTOR DETAIL
NO SCALE



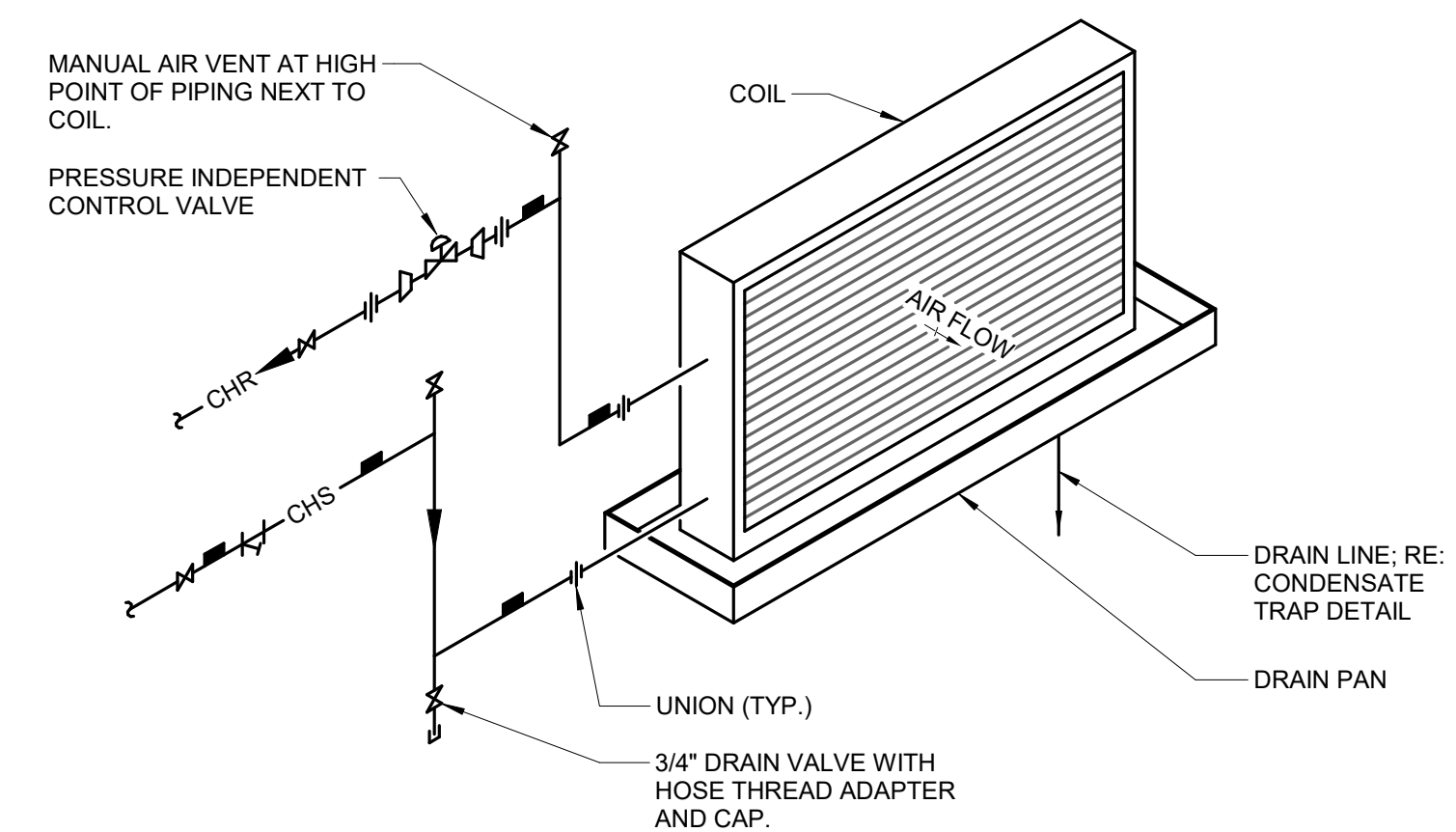
NOTES:

1. SEAL ALL JOING ON BOTTOM INTERIOR SURFACE OF DUCT WITHIN 6'-0" OF THE LOUVER WATER TIGHT.
2. MOUNT BOTTOM OF INTAKE LOUVERS AT LEAST 40" ABOVE GRADE OR ROOF ELEVATION TO MINIMIZE CHANCES OF SNOW DRIFTING INTO THE LOUVER.
3. CAULK SHEETMETAL SCREWS WHERE THE PENETRATE METAL.

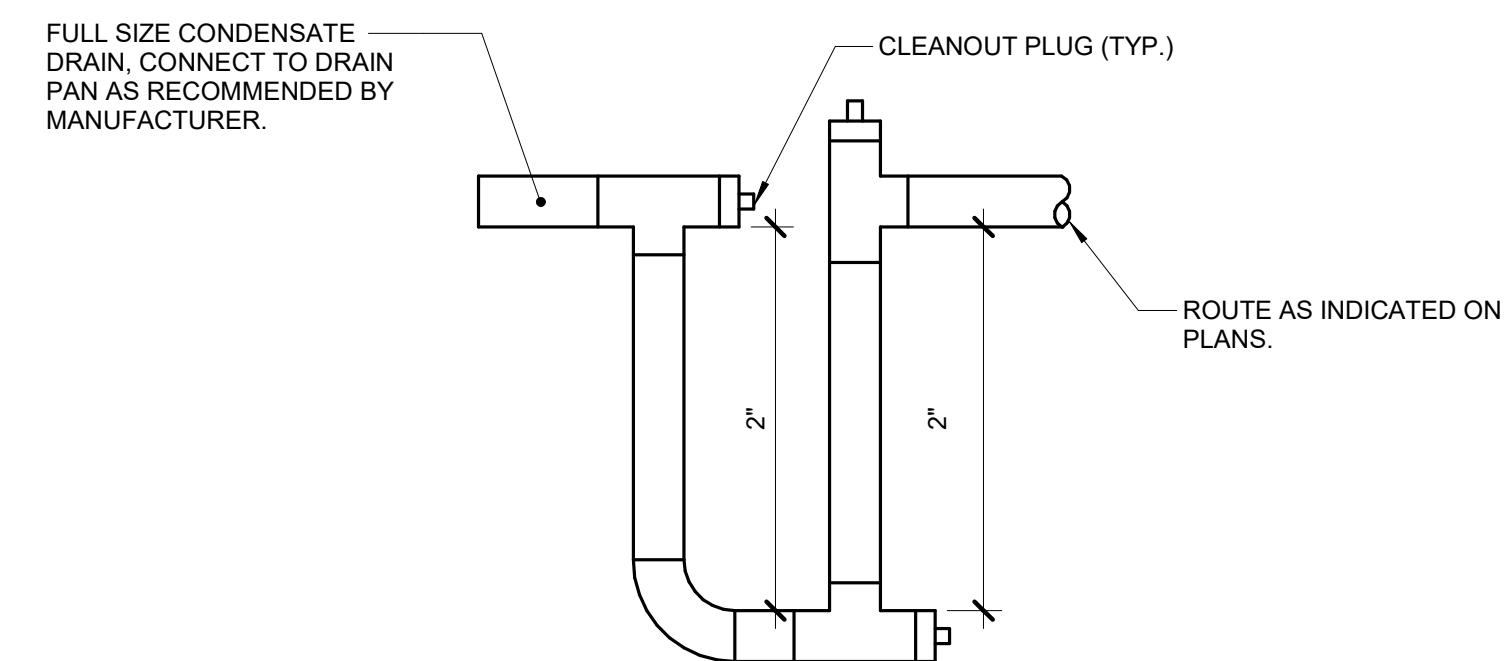
4 LOUVER INSTALLATION
NO SCALE



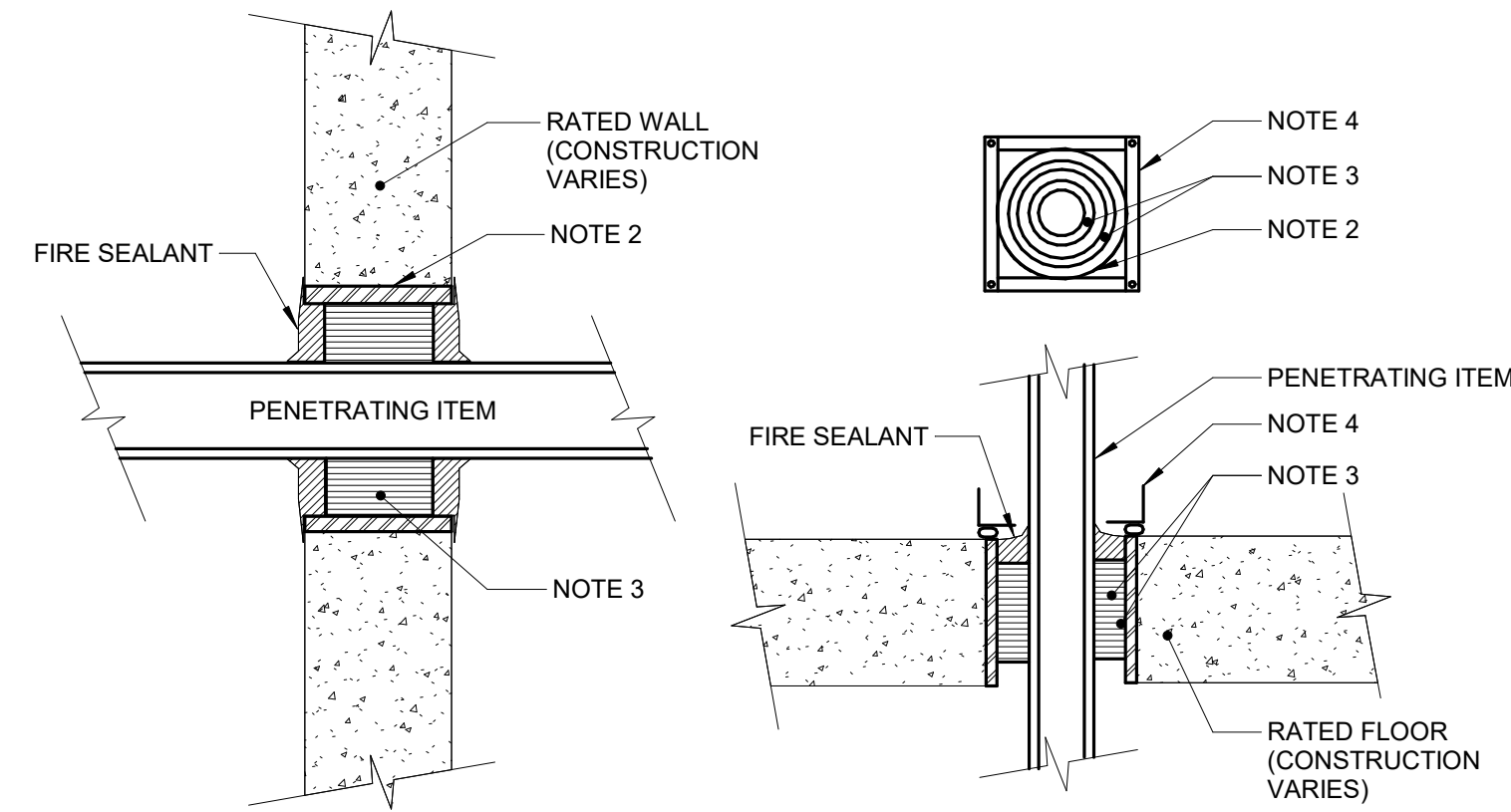
2 AIR TERMINAL - SUPPLY REGISTER ROUND INSET
NO SCALE



3 FAN COIL UNIT - 2-PIPE PIPING DIAGRAM
NO SCALE



5 CONDENSATE TRAP - BLOW THROUGH COIL
NO SCALE

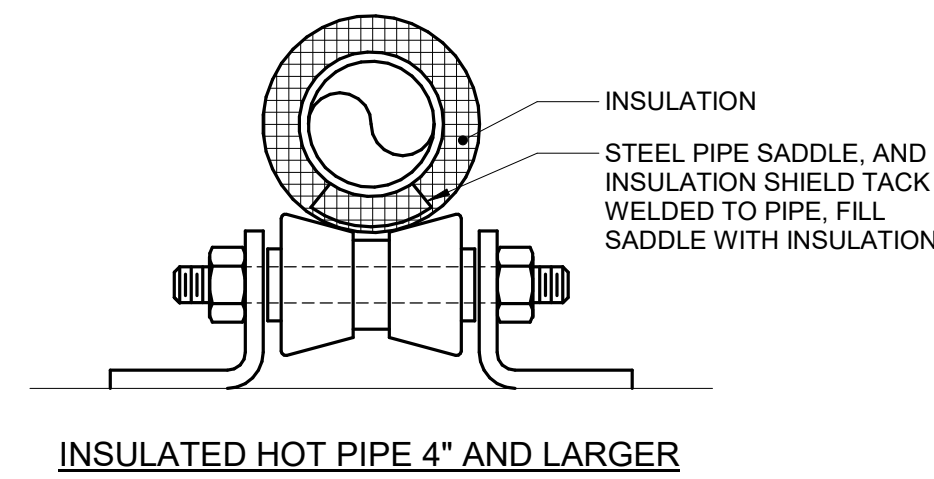


NOTES:

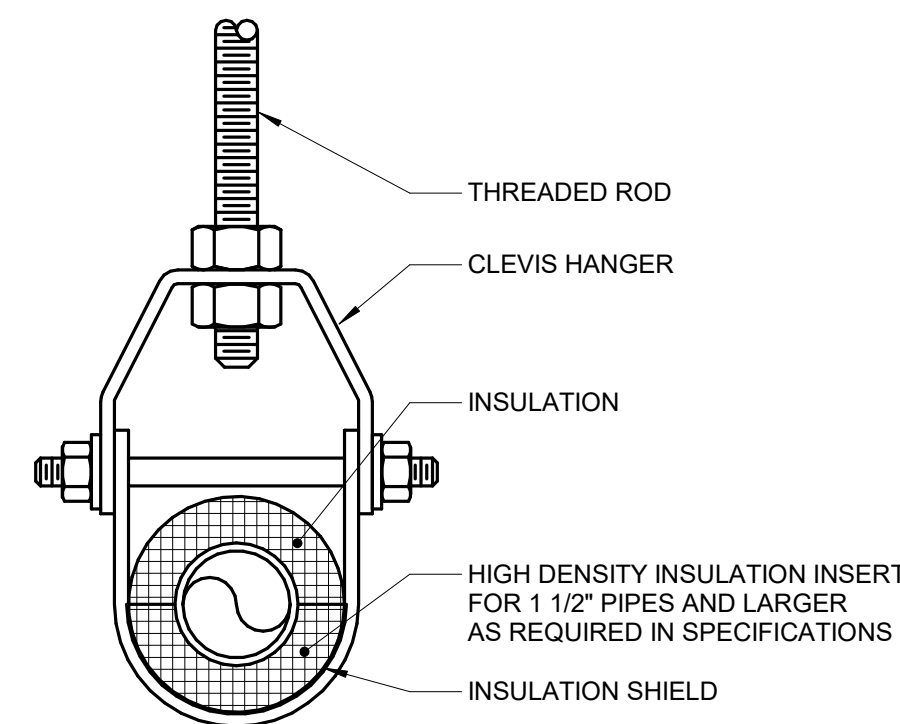
1. THIS GENERAL DETAIL APPLIES TO ALL ITEMS PENETRATING FIRE RATED WALLS OR FLOORS. THE INTENT IS TO MAINTAIN THE FIRE RATING AND TO ALLOW LONGITUDINAL MOVEMENT. REFER TO SPECIFICATION SECTION 07840 (07 84 00) (SECTION 21 05 03 - FIRE PROTECTION, SECTION 22 05 03 - PLUMBING, SECTION 23 05 03 - HVAC) 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.

1 FLOOR/WALL PENETRATION - RATED FIRE BARRIER

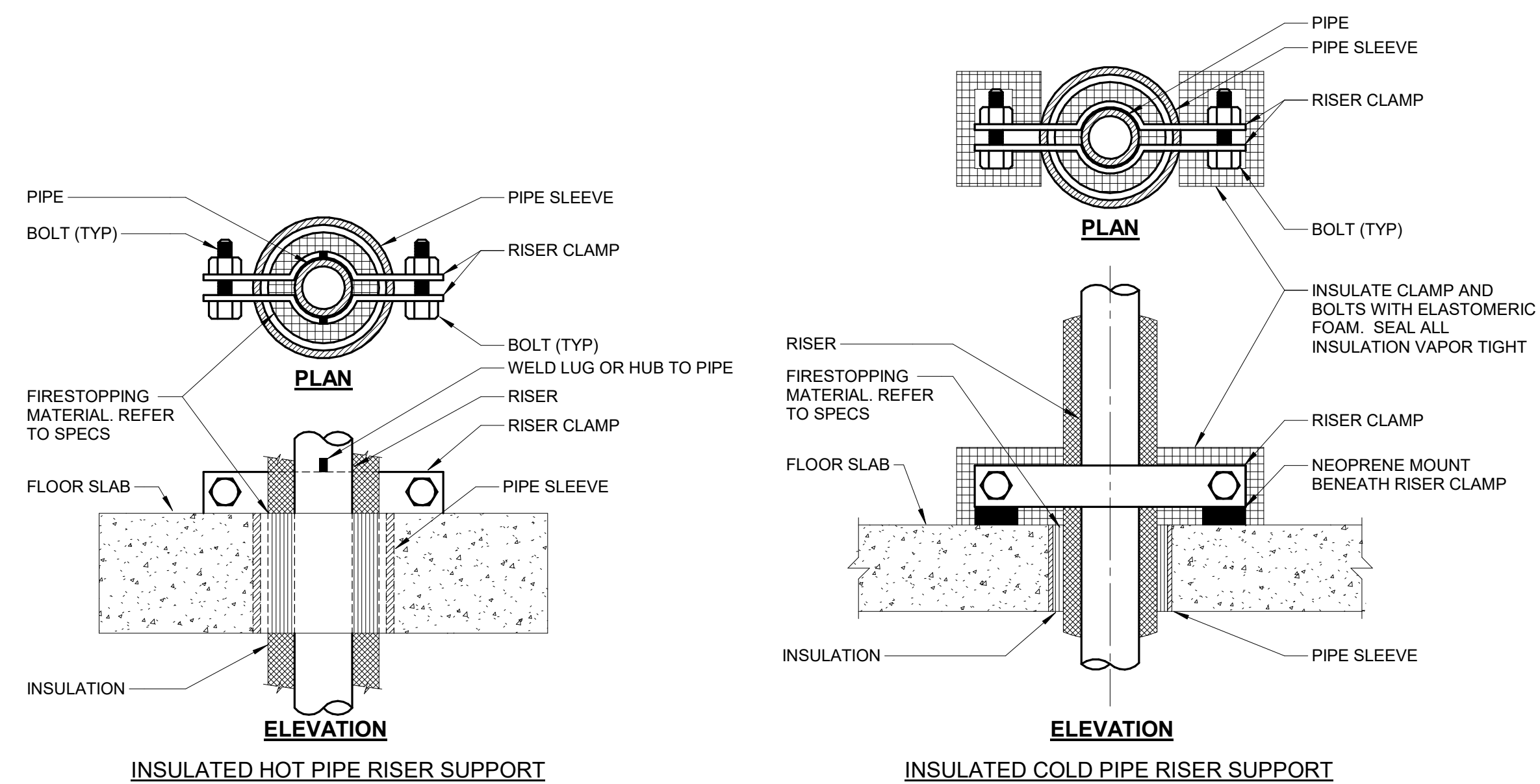
NO SCALE



INSULATED HOT PIPE 4" AND LARGER

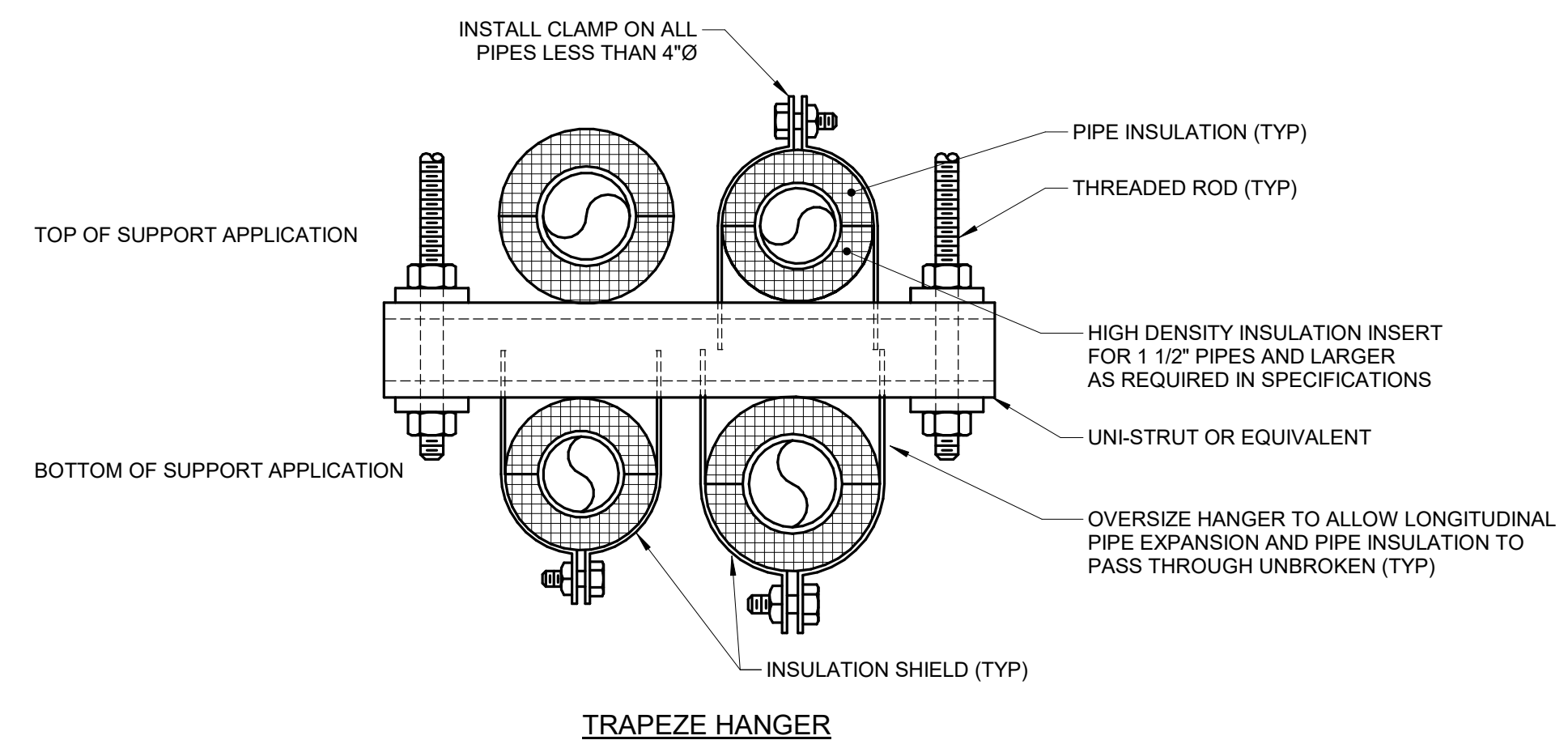


INSULATED COLD PIPE HANGER



INSULATED HOT PIPE RISER SUPPORT

INSULATED COLD PIPE RISER SUPPORT



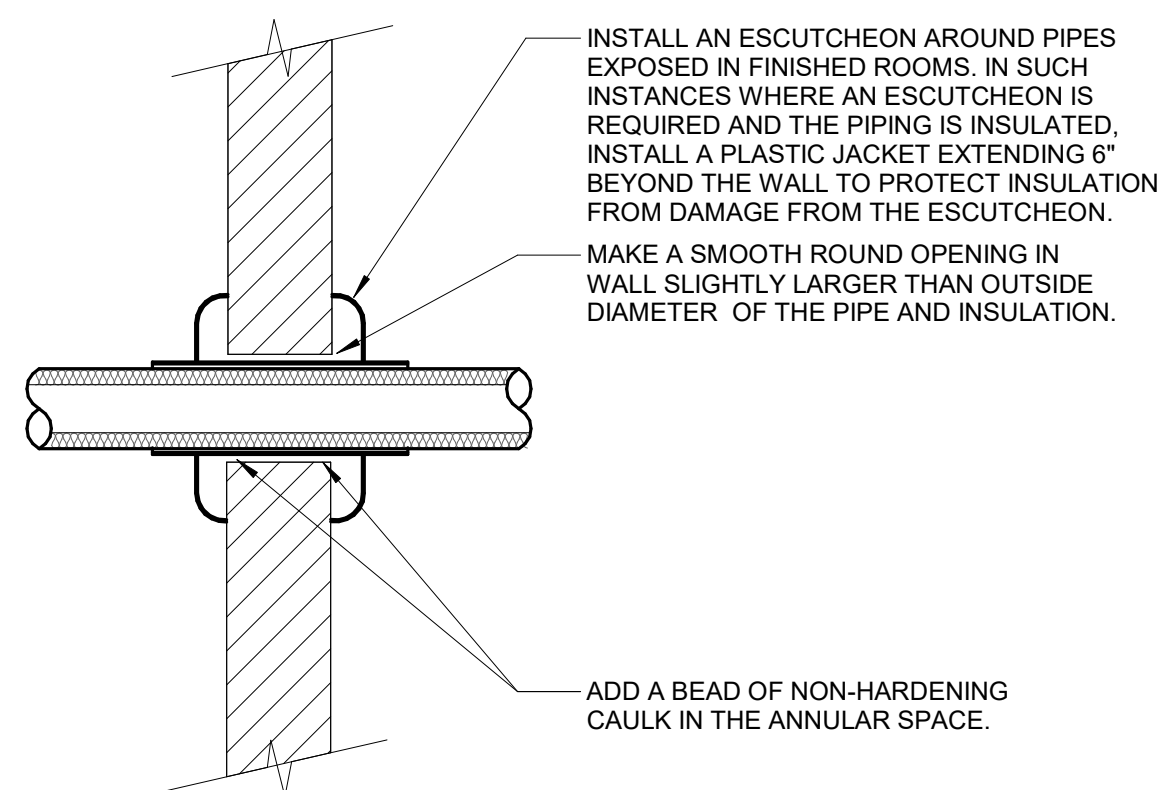
TRAPEZE HANGER

NOTES:

1. REFER TO SPECIFICATION SECTIONS (SECTION 22 05 29- PLUMBING, SECTION 23 05 29-HVAC) & (SECTION 22 07 19- PLUMBING, SECTION 23 07 19-HVAC).

2 PIPE - HANGERS AND SUPPORTS

NO SCALE

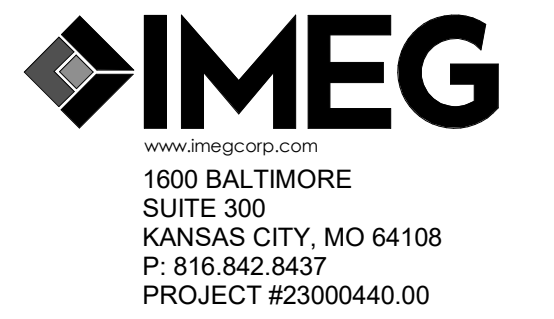
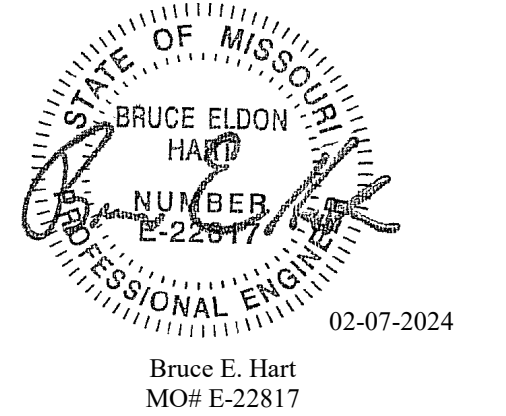


NOTES:

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 SECTIONS (SECTION 22 05 29 - PLUMBING, SECTION 23 05 29 - HVAC) FOR ADDITIONAL INFORMATION.
3. FLOOR OPENINGS ARE SIMILAR. SEE SPECIFICATION SECTION (SECTION 22 05 29 - PLUMBING, SECTION 23 05 29 - HVAC) FOR DIFFERENCES BETWEEN FLOOR AND WALL PENETRATIONS.

3 WALL PENETRATION - NON-FIRE RATED

NO SCALE



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MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M401.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

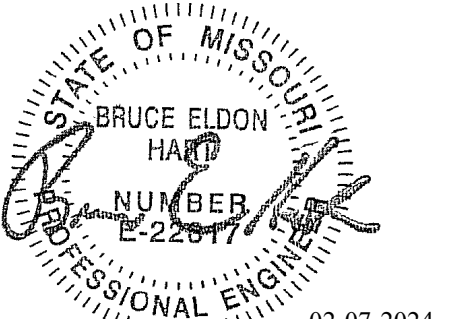
MECHANICAL DETAILS

SHEET NUMBER:

M401

SHEET 22 OF 57

02/07/2024



Bruce E. Hart
MO# E-22817



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ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M500.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

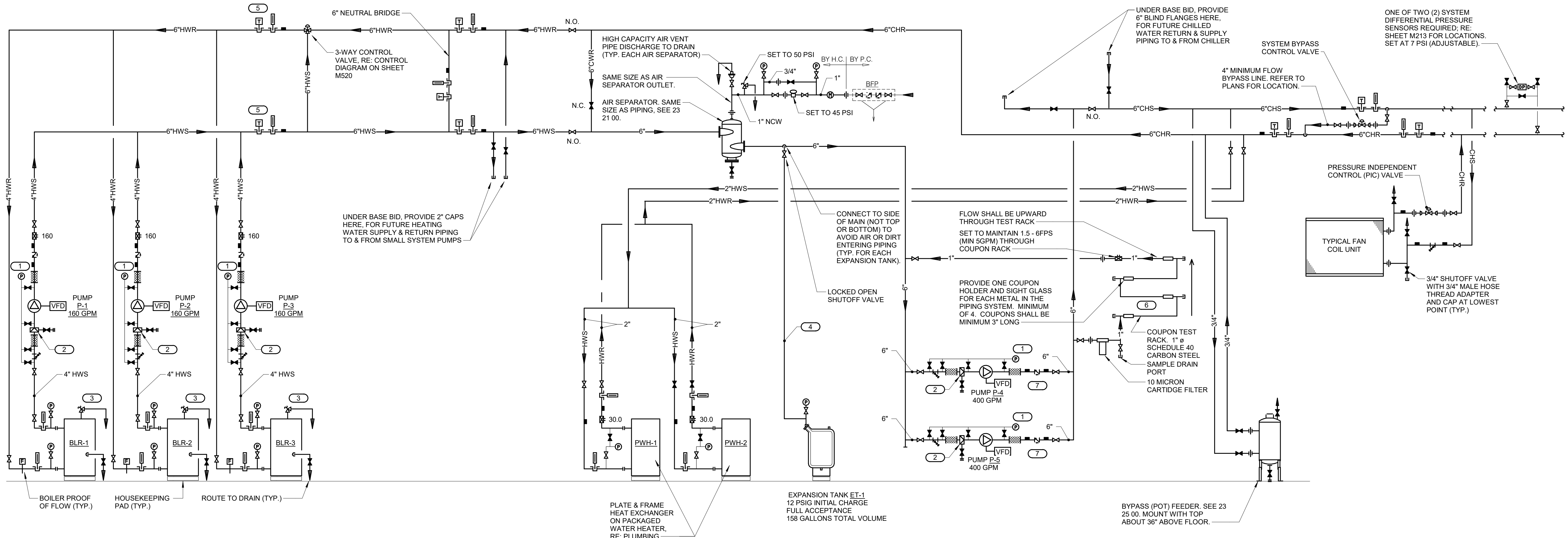
MECHANICAL
DIAGRAMS

SHEET NUMBER:

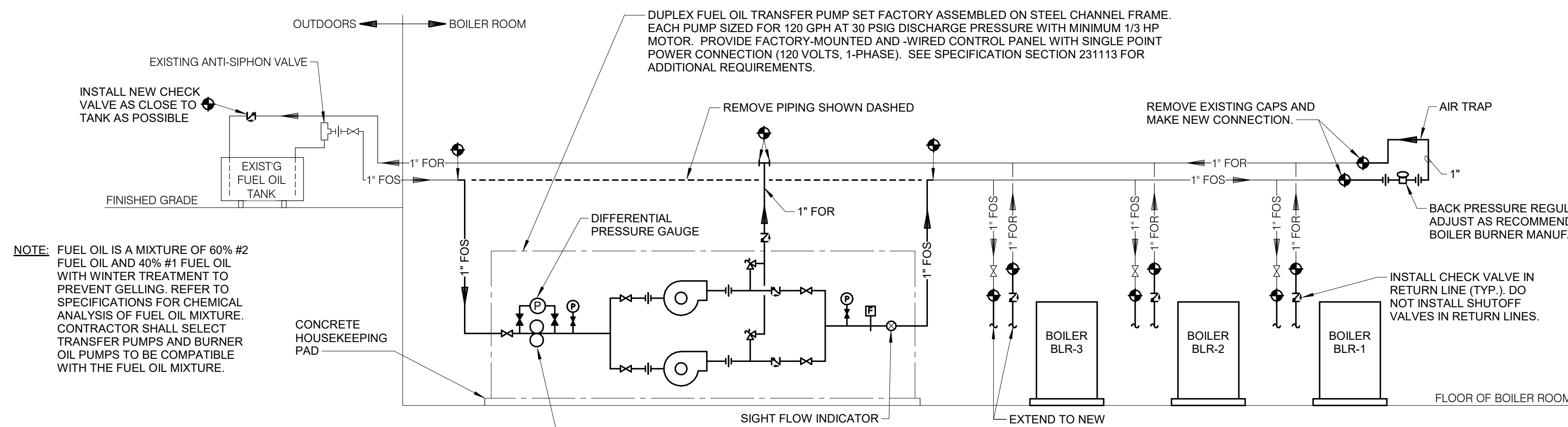
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SHEET 23 OF 57

02/07/2024

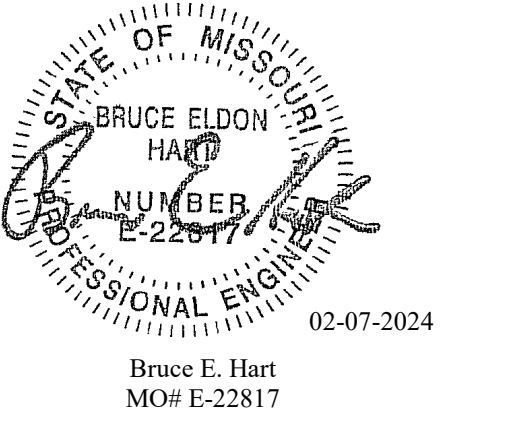


1 HYDRONIC SYSTEM FLOW DIAGRAM - BASE BID
NO SCALE



2 FUEL OIL FLOW DIAGRAM
NO SCALE

- 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. REMOVE & RETAIN TEMPORARY STRAINER FROM SUCTION DIFFUSER AT END OF CONSTRUCTION. PROVIDE SUPPORT LEG AS REQUIRED BY MANUFACTURER.
 3. INSTALL SAFETY RELIEF VALVE PROVIDED BY BOILER MANUFACTURER. PIPE TO DRAIN. SUPPORT SOLIDLY.
 4. SIZE PER BLADDER TANK MANUFACTURER'S RECOMMENDATIONS BUT NOT SMALLER THAN CONNECTION TO TANK.
 5. TEMPERATURE SENSOR PROVIDED BY BOILER MANUFACTURER, WIRED TO BOILER PARENT CONTROLLER.
 6. PROVIDE COUPON TEST RACK AS INDICATED FOR EACH SYSTEM AS SHOWN.
 7. TRIPLE DUTY OR BALANCING VALVES ARE NOT PERMITTED ON VARIABLE VOLUME SYSTEMS.



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DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M500.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

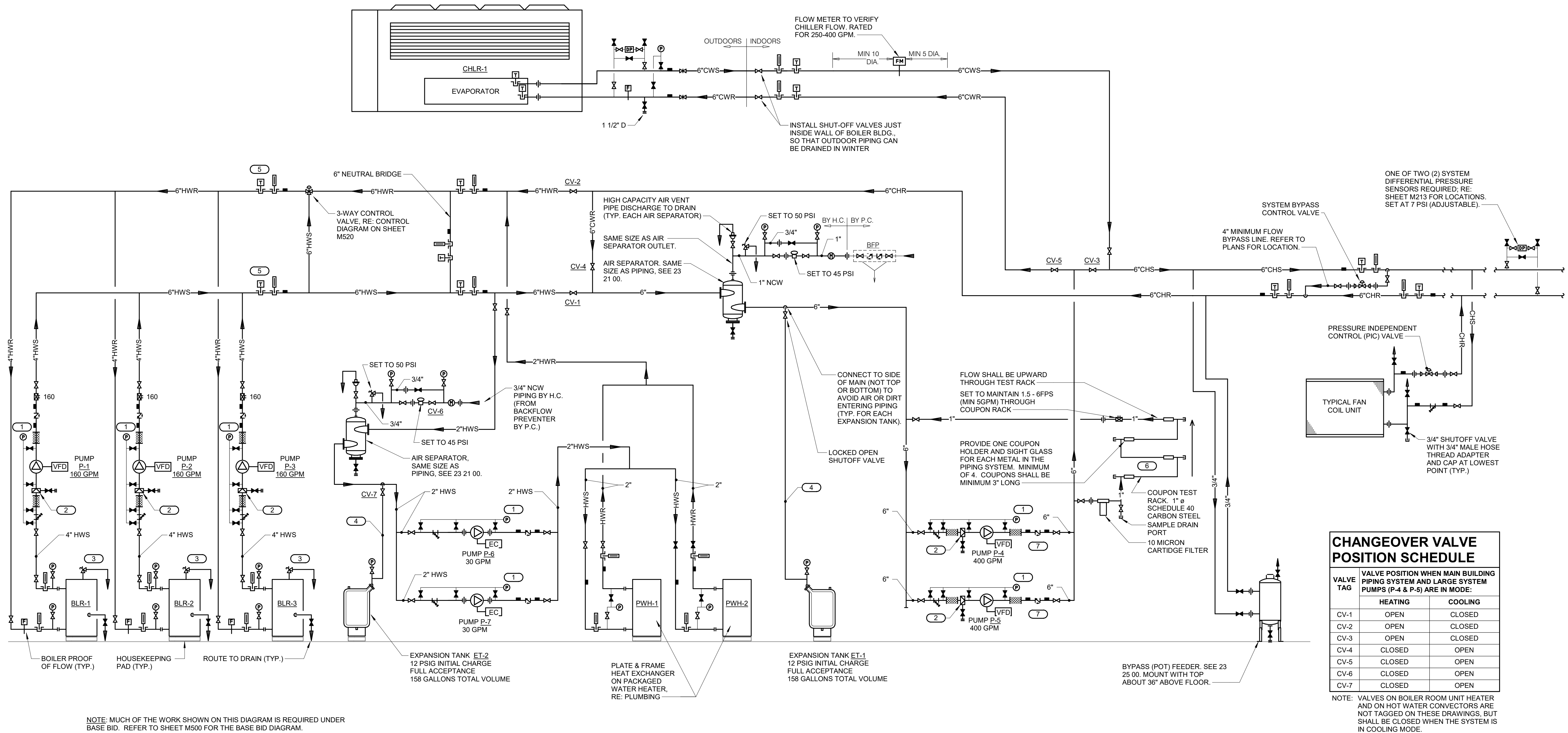
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DIAGRAMS

SHEET NUMBER:

M501

SHEET 24 OF 57

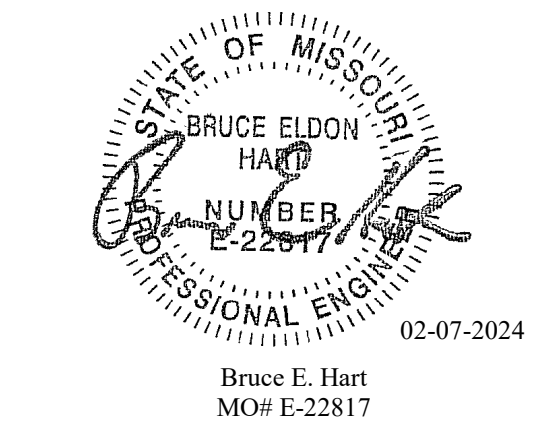
02/07/2024



NOTE: MUCH OF THE WORK SHOWN ON THIS DIAGRAM IS REQUIRED UNDER BASE BID. REFER TO SHEET M500 FOR THE BASE BID DIAGRAM.

1 HYDRONIC SYSTEM FLOW DIAGRAM - ALTERNATE 1
NO SCALE

- KEYNOTES**
- 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.
 - REMOVE & RETAIN TEMPORARY STRAINER FROM SUCTION DIFFUSER AT END OF CONSTRUCTION. PROVIDE SUPPORT LEG AS REQUIRED BY MANUFACTURER.
 - INSTALL SAFETY RELIEF VALVE PROVIDED BY BOILER MANUFACTURER. PIPE TO DRAIN. SUPPORT SOLIDLY.
 - SIZE PER BLADDER TANK MANUFACTURER'S RECOMMENDATIONS BUT NOT SMALLER THAN CONNECTION TO TANK.
 - TEMPERATURE SENSOR PROVIDED BY BOILER MANUFACTURER, WIRED TO BOILER PARENT CONTROLLER.
 - PROVIDE COUPON TEST RACK AS INDICATED FOR EACH SYSTEM AS SHOWN.
 - TRIPLE DUTY OR BALANCING VALVES ARE NOT PERMITTED ON VARIABLE VOLUME SYSTEMS.



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OFFICE OF
ADMINISTRATION
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MANAGEMENT,
DESIGN AND
CONSTRUCTION

DEPARTMENT OF
CORRECTIONS

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M520.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

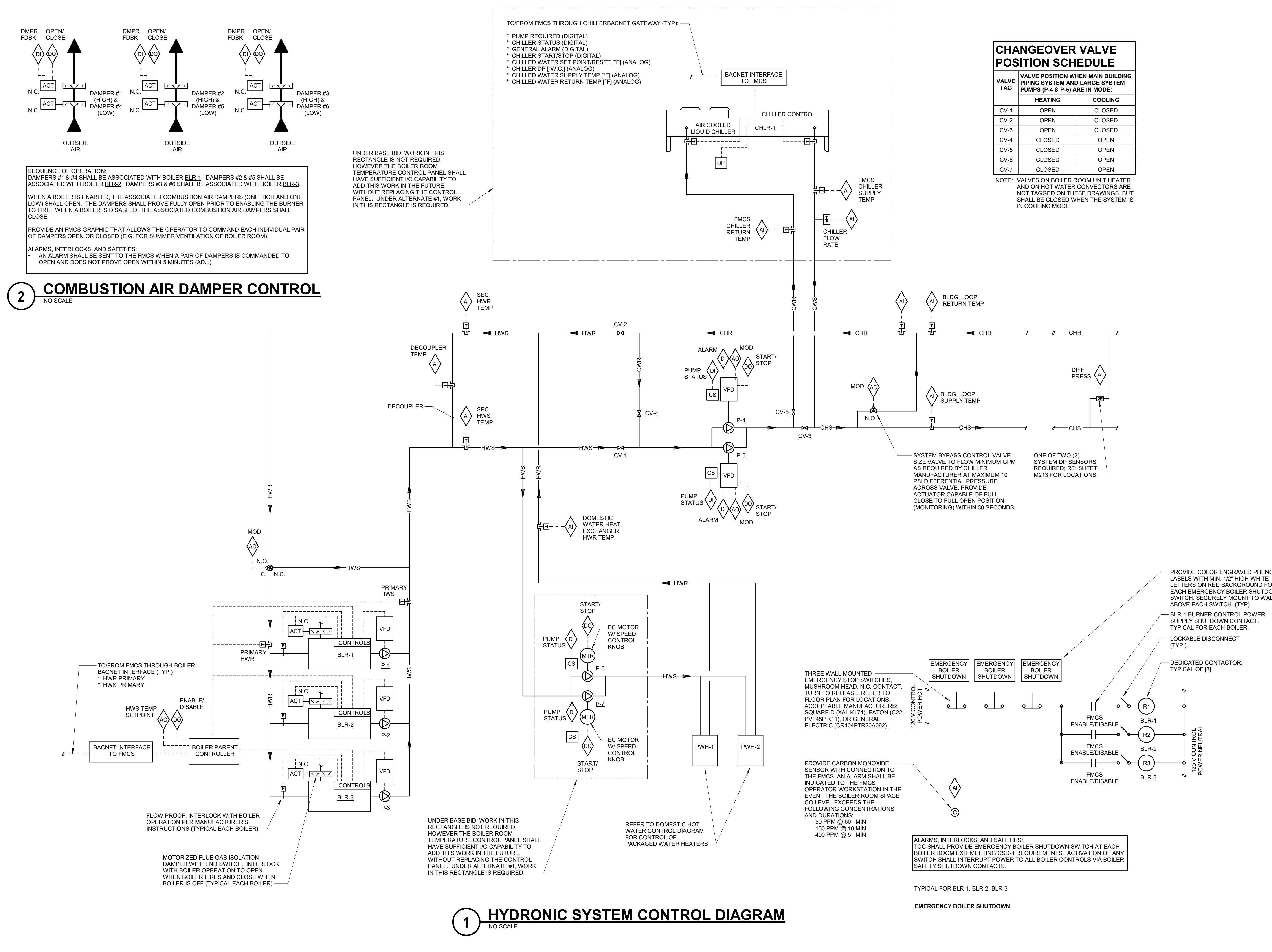
MECHANICAL
CONTROL DIAGRAMS

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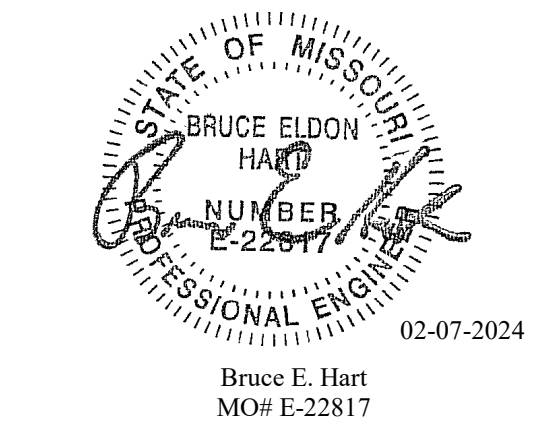
SHEET 25 OF 57

02/07/2024



2 COMBUSTION AIR DAMPER CONTROL
NO SCALE

1 HYDRONIC SYSTEM CONTROL DIAGRAM
NO SCALE



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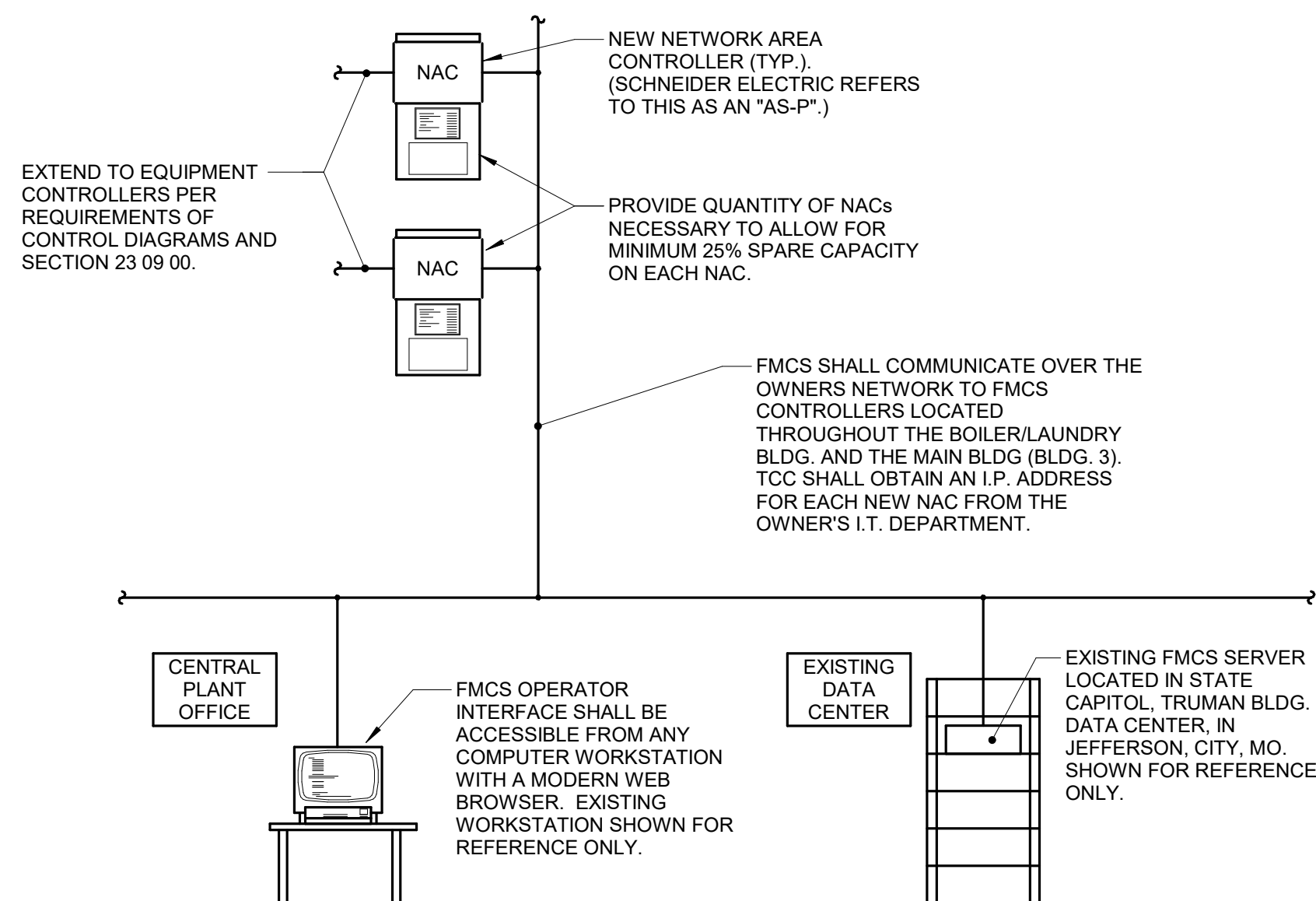
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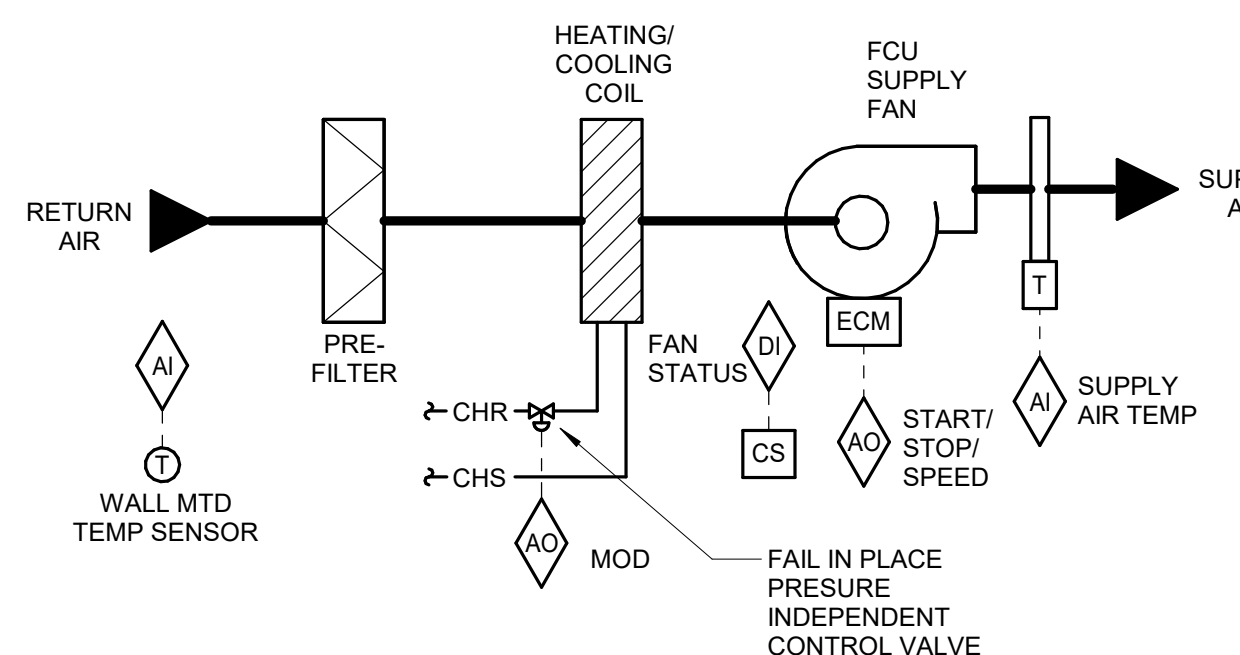
M522

SHEET 27 OF 57

02/07/2024



1 FMCS NETWORK REQUIREMENTS
NO SCALE



SEQUENCE OF OPERATION:

OCCUPIED MODE CONTROL

THE SUPPLY FAN SHALL RUN CONTINUOUSLY. THE FMCS SHALL MODULATE THE SUPPLY FAN AND THE HEATING/CHILLED WATER CONTROL VALVE TO ACHIEVE THE ROOM TEMPERATURE SETPOINT 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 SETPOINT.

WHEN THE 2-PIPE SYSTEM IS IN HEATING MODE:

- WHEN ROOM TEMPERATURE SETPOINT IS MAINTAINED, THE SUPPLY FAN SHALL RUN AT MINIMUM HEATING CFM SPEED AND THE CONTROL VALVE SHALL BE CLOSED.
- ON A REDUCTION IN ROOM TEMPERATURE, THE SUPPLY FAN SHALL REMAIN AT MINIMUM SPEED AND THE CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN ROOM TEMPERATURE SET POINT, HOWEVER THE DISCHARGE AIR TEMPERATURE SHALL NOT BE ALLOWED TO RISE ABOVE 95°F.
- ONCE THE HEATING CONTROL VALVE IS MAINTAINING 95°F DISCHARGE AIR, THE SUPPLY FAN SPEED SHALL RAMP UP TO MAXIMUM HEATING CFM SPEED TO MAINTAIN ROOM TEMPERATURE SET POINT.
- IF THERE IS A CALL FOR COOLING, THE SUPPLY FAN SHALL RAMP DOWN TO MINIMUM HEATING SPEED AND THE CONTROL VALVE SHALL CLOSE.

WHEN THE 2-PIPE SYSTEM IS IN COOLING MODE:

- WHEN ROOM TEMPERATURE SETPOINT IS MAINTAINED, THE SUPPLY FAN SHALL RUN AT MINIMUM COOLING CFM SPEED AND THE CONTROL VALVE SHALL BE CLOSED.
- ON AN INCREASE IN ROOM TEMPERATURE, THE SUPPLY FAN SHALL REMAIN AT MINIMUM SPEED AND THE CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN ROOM TEMPERATURE SET POINT. WHEN THE SUPPLY FAN IS AT MINIMUM SPEED, THE DISCHARGE AIR TEMPERATURE SHALL NOT INFLUENCE THE CONTROL VALVE.
- ON A FURTHER INCREASE IN ROOM TEMPERATURE, THE CONTROL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 55°F (ADJ.) WHILE THE SUPPLY FAN SPEED RAMP UP AS REQUIRED TO MAXIMUM COOLING CFM SPEED TO MAINTAIN THE ROOM TEMPERATURE SETPOINT.
- IF THERE IS A CALL FOR HEATING, THE SUPPLY FAN SHALL RAMP DOWN TO MINIMUM COOLING SPEED AND THE CONTROL VALVE SHALL CLOSE.

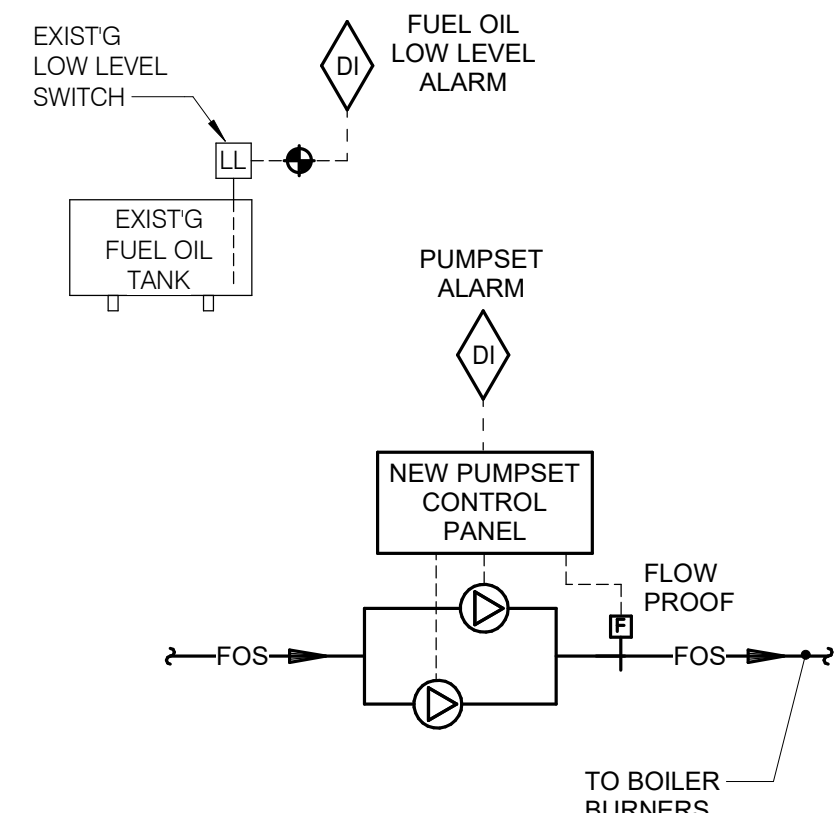
UNOCCUPIED MODE CONTROL

- FOLLOW OCCUPIED MODE CONTROL WITH THE FOLLOWING EXCEPTIONS:
- FMCS SHALL MAINTAIN AN UNOCCUPIED DEADBAND OF 15°F (ADJ.) FROM THE SPACE TEMPERATURE SETPOINT AFTER A 30 MIN. (ADJ.) TIME DELAY AFTER THE SPACE GOES INTO UNOCCUPIED MODE.
 - WHEN THERE IS NO CALL FOR HEATING NOR COOLING, THE SUPPLY FAN SHALL STOP AND THE CONTROL VALVE SHALL CLOSE.
 - IF THE SPACE SENSOR HAS AN OCCUPANCY OVERRIDE BUTTON, WHEN THAT BUTTON IS PRESSED, THE SYSTEM SHALL ENTER THE OCCUPIED MODE CONTROL FOR 2 HOURS (ADJ.)

ALARMS, INTERLOCKS, AND SAFETIES:

- WHEN FIRE ALARM CONTROL PANEL INDICATES AN ALARM CONDITION, UNIT SHALL BE SHUTDOWN.
- IF THE FMCS COMMANDS THE SUPPLY FAN TO OPERATE AND THE FAN CURRENT SWITCH DETECTS INSUFFICIENT CURRENT FLOW, FMCS SHALL INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION.
- THE FOLLOWING CONDITIONS SHALL INDICATE AN ALARM AT THE FMCS OPERATOR WORKSTATION, HOWEVER UNIT SHALL CONTINUE TO OPERATE:
- IF THE ROOM TEMPERATURE IS MORE THAN 10°F (ADJ.) ABOVE OR BELOW SETPOINT.
- WHENEVER THE UNIT IS SHUTDOWN THE FOLLOWING SHALL OCCUR:
- SUPPLY FAN SHALL STOP.
 - HEATING/CHILLED WATER CONTROL VALVE SHALL CLOSE.

2 FAN COIL UNIT CONTROL - FCU-A
NO SCALE



SEQUENCE OF OPERATION:

FUEL OIL STORAGE TANK IS EXISTING TO REMAIN. DUPLEX FUEL OIL TRANSFER PUMP SET SHALL BE NEW AND CONTROLLED BY A FACTORY-MOUNTED PUMPSET CONTROL PANEL.

ONLY ONE FUEL OIL PUMP SHALL RUN AT A TIME. THE OTHER PUMP IS REDUNDANT. SHOULD THE LEAD PUMP FAIL TO OPERATE WHEN COMMANDED TO DO SO, THE FUEL PUMP CONTROLLER SHALL INDICATE AN ALARM CONDITION AND SHALL AUTOMATICALLY START THE BACKUP PUMP.

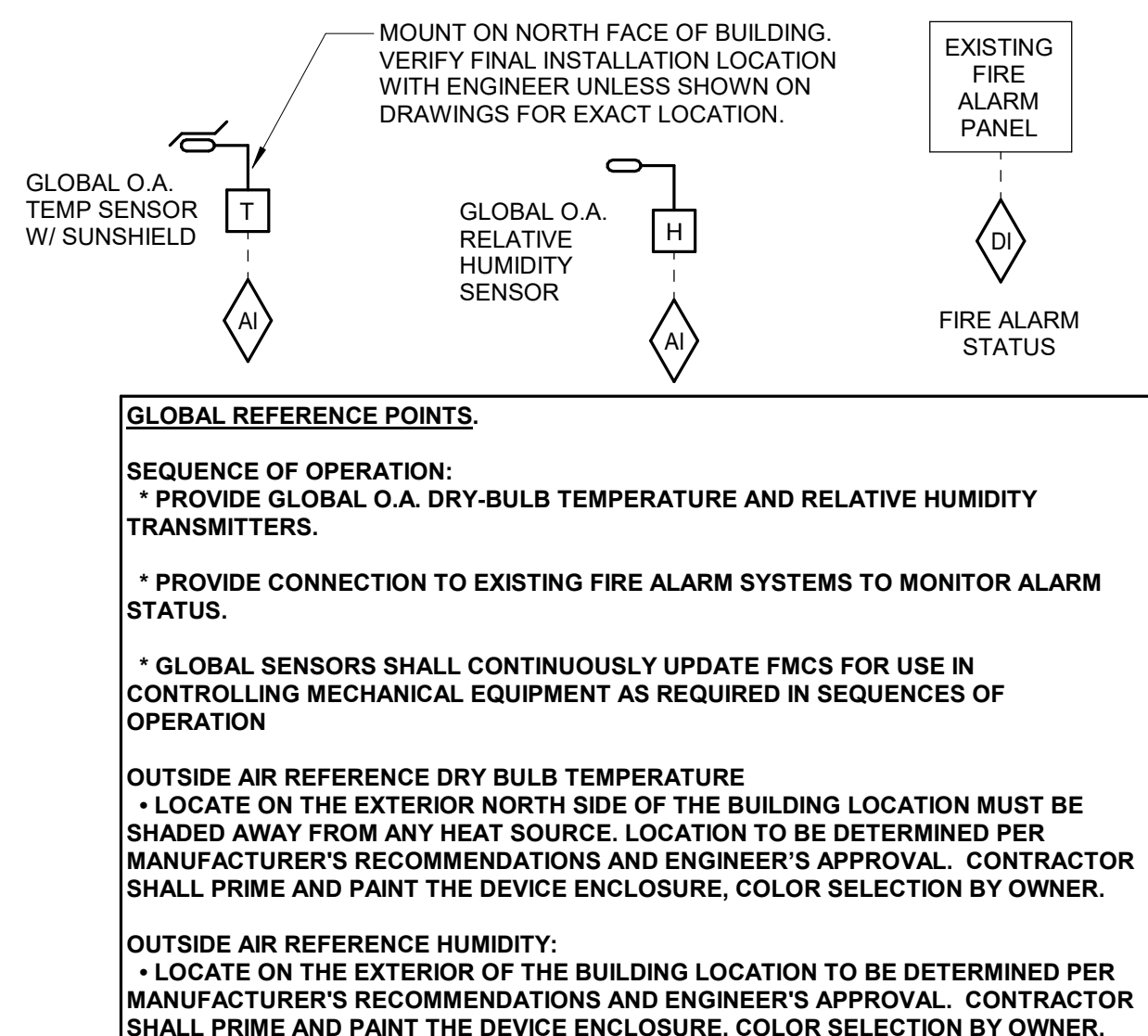
BOILER PLANT OPERATOR SHALL RUN BOILERS FROM THE FUEL OIL SYSTEM AS FOLLOWS:

- MANUALLY TURN FUEL OIL PUMP MOTOR STARTERS TO THE AUTO POSITION. THE PUMPSET CONTROL PANEL SHALL START THE LEAD PUMP.
- MANUALLY TURN BURNER FUEL SELECTION VALVE AT BOILER FROM NATURAL GAS TO FUEL OIL (REFER TO BOILER OPERATING MANUAL FOR ADDITIONAL REQUIREMENTS).
- IN THE EVENT NATURAL GAS SERVICE IS INTERRUPTED, BOILER PLANT OPERATOR SHALL TURN PILOT LIGHT FUEL SELECTION VALVE FROM NATURAL GAS TO THE AUXILIARY FUEL PORT AND SHALL LIGHT PILOT USING PORTABLE PROPANE TANK EQUIPPED WITH HOSE AND QUICK CONNECT COUPLING.

ALARMS, INTERLOCKS & SAFETIES:

- FMCS OPERATOR WORKSTATION SHALL INDICATE AN ALARM IN THE EVENT THE FOLLOWING OCCURS:
- FUEL OIL PUMPSET CONTROL PANEL INDICATES AN ALARM CONDITION
 - FUEL OIL TANK LOW LEVEL SWITCH INDICATES A LOW FUEL LEVEL

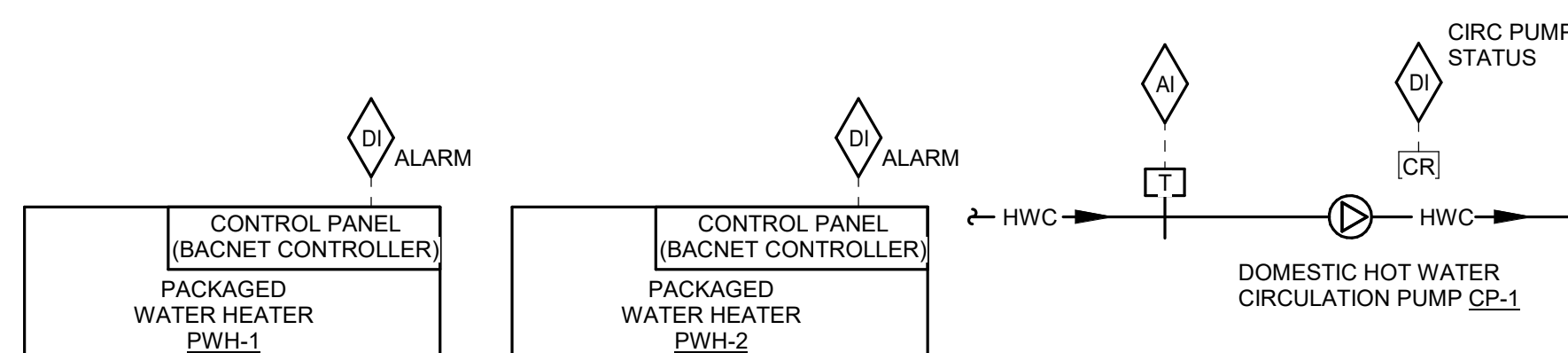
4 FUEL OIL SYSTEM CONTROLS
NO SCALE



GLOBAL REFERENCE POINTS.

- SEQUENCE OF OPERATION:**
- PROVIDE GLOBAL O.A. DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY TRANSMITTERS.
 - PROVIDE CONNECTION TO EXISTING FIRE ALARM SYSTEMS TO MONITOR ALARM STATUS.
 - GLOBAL SENSORS SHALL CONTINUOUSLY UPDATE FMCS FOR USE IN CONTROLLING MECHANICAL EQUIPMENT AS REQUIRED IN SEQUENCES OF OPERATION
- OUTSIDE AIR REFERENCE DRY BULB TEMPERATURE**
- LOCATE ON THE EXTERIOR NORTH SIDE OF THE BUILDING LOCATION MUST BE SHADED AWAY FROM ANY HEAT SOURCE. LOCATION TO BE DETERMINED PER MANUFACTURER'S RECOMMENDATIONS AND ENGINEER'S APPROVAL. CONTRACTOR SHALL PRIME AND PAINT THE DEVICE ENCLOSURE, COLOR SELECTION BY OWNER.
- OUTSIDE AIR REFERENCE HUMIDITY:**
- LOCATE ON THE EXTERIOR OF THE BUILDING LOCATION TO BE DETERMINED PER MANUFACTURER'S RECOMMENDATIONS AND ENGINEER'S APPROVAL. CONTRACTOR SHALL PRIME AND PAINT THE DEVICE ENCLOSURE, COLOR SELECTION BY OWNER.

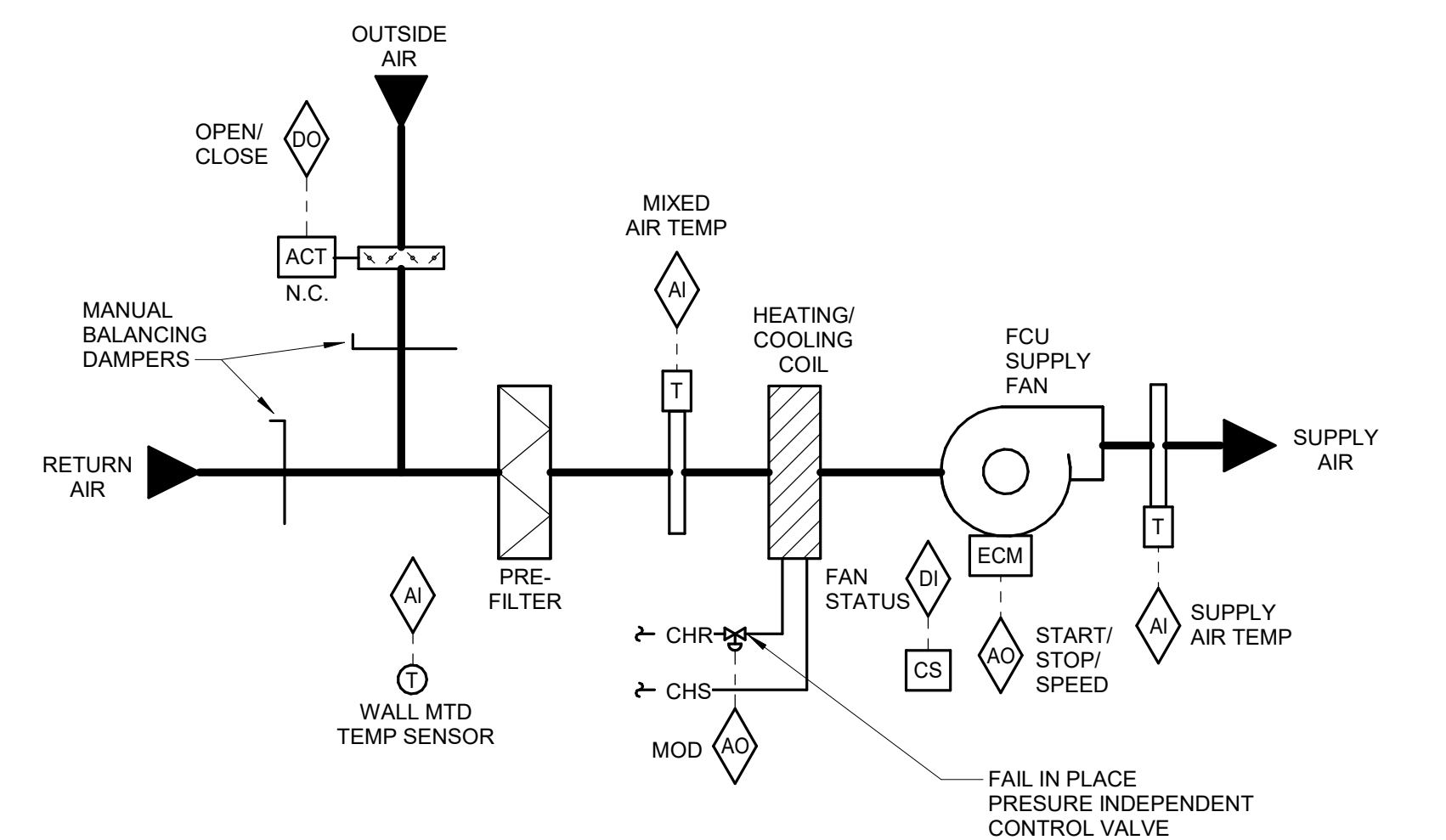
5 GLOBAL REFERENCE POINTS
NO SCALE



SEQUENCE OF OPERATION:

- PACKAGED WATER HEATER CONTROL PANEL (BACNET COMPATIBLE) SHALL CONTROL TO MAINTAIN 115°F (ADJ.) DOMESTIC HOT WATER.
- CIRCULATION PUMP SHALL RUN CONTINUOUSLY.
- FMCS SHALL MONITOR THE TEMPERATURE AT THE CIRCULATION PUMP.
- FMCS SHALL MONITOR THE ALARM RELAY OF EACH PACKAGED WATER HEATER.
- ALARMS, INTERLOCKS & SAFETIES:**
- FMCS SHALL INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION IN THE EVENT THE FOLLOWING OCCUR:
- ANY WATER HEATER INDICATES AN ALARM CONDITION.
 - THE HOT WATER CIRCULATION PUMP INDICATES AN ALARM CONDITION.
 - THE HOT WATER CIRCULATING TEMPERATURE IS BELOW 100°F (ADJ.) FOR MORE THAN 5 MINUTES (ADJ.)

6 DOMESTIC HOT WATER CONTROL
NO SCALE



SEQUENCE OF OPERATION:

OCCUPIED MODE CONTROL

THE OUTSIDE AIR DAMPER SHALL BE OPEN AND THE SUPPLY FAN SHALL RUN CONTINUOUSLY. THE FMCS SHALL MODULATE THE SUPPLY FAN AND THE HEATING/CHILLED WATER CONTROL VALVE TO ACHIEVE THE ROOM TEMPERATURE SETPOINT 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 SETPOINT.

WHEN THE 2-PIPE SYSTEM IS IN HEATING MODE:

- WHEN ROOM TEMPERATURE SETPOINT IS MAINTAINED, THE SUPPLY FAN SHALL RUN AT MINIMUM HEATING CFM SPEED AND THE CONTROL VALVE SHALL BE CLOSED.
- ON A REDUCTION IN ROOM TEMPERATURE, THE SUPPLY FAN SHALL REMAIN AT MINIMUM SPEED AND THE CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN ROOM TEMPERATURE SET POINT, HOWEVER THE DISCHARGE AIR TEMPERATURE SHALL NOT BE ALLOWED TO RISE ABOVE 95°F.
- ONCE THE HEATING CONTROL VALVE IS MAINTAINING 95°F DISCHARGE AIR, THE SUPPLY FAN SPEED SHALL RAMP UP TO MAXIMUM HEATING CFM SPEED TO MAINTAIN ROOM TEMPERATURE SET POINT.
- IF THERE IS A CALL FOR COOLING, THE SUPPLY FAN SHALL RAMP DOWN TO MINIMUM HEATING SPEED AND THE CONTROL VALVE SHALL CLOSE.

WHEN THE 2-PIPE SYSTEM IS IN COOLING MODE:

- WHEN ROOM TEMPERATURE SETPOINT IS MAINTAINED, THE SUPPLY FAN SHALL RUN AT MINIMUM COOLING CFM SPEED AND THE CONTROL VALVE SHALL BE CLOSED.
- ON AN INCREASE IN ROOM TEMPERATURE, THE SUPPLY FAN SHALL REMAIN AT MINIMUM SPEED AND THE CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN ROOM TEMPERATURE SET POINT. WHEN THE SUPPLY FAN IS AT MINIMUM SPEED, THE DISCHARGE AIR TEMPERATURE SHALL NOT INFLUENCE THE CONTROL VALVE.
- ON A FURTHER INCREASE IN ROOM TEMPERATURE, THE CONTROL VALVE SHALL MODULATE TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 55°F (ADJ.) WHILE THE SUPPLY FAN SPEED RAMP UP AS REQUIRED TO MAXIMUM COOLING CFM SPEED TO MAINTAIN THE ROOM TEMPERATURE SETPOINT.
- IF THERE IS A CALL FOR HEATING, THE SUPPLY FAN SHALL RAMP DOWN TO MINIMUM COOLING SPEED AND THE CONTROL VALVE SHALL CLOSE.

UNOCCUPIED MODE CONTROL

- FOLLOW OCCUPIED MODE CONTROL WITH THE FOLLOWING EXCEPTIONS:
- THE OUTSIDE AIR DAMPER SHALL BE CLOSED.
 - FMCS SHALL MAINTAIN AN UNOCCUPIED DEADBAND OF 15°F (ADJ.) FROM THE SPACE TEMPERATURE SETPOINT AFTER A 30 MIN. (ADJ.) TIME DELAY AFTER THE SPACE GOES INTO UNOCCUPIED MODE.
 - WHEN THERE IS NO CALL FOR HEATING NOR COOLING, THE SUPPLY FAN SHALL STOP AND THE CONTROL VALVE SHALL CLOSE.
 - IF THE SPACE SENSOR HAS AN OCCUPANCY OVERRIDE BUTTON, WHEN THAT BUTTON IS PRESSED, THE SYSTEM SHALL ENTER THE OCCUPIED MODE CONTROL FOR 2 HOURS (ADJ.)

ALARMS, INTERLOCKS, AND SAFETIES:

- WHEN FIRE ALARM CONTROL PANEL INDICATES AN ALARM CONDITION, UNIT SHALL BE SHUTDOWN.
- IF THE FMCS COMMANDS THE SUPPLY FAN TO OPERATE AND THE FAN CURRENT SWITCH DETECTS INSUFFICIENT CURRENT FLOW, FMCS SHALL INDICATE AN ALARM TO THE FMCS OPERATOR WORKSTATION.
- THE FOLLOWING CONDITIONS SHALL INDICATE AN ALARM AT THE FMCS OPERATOR WORKSTATION, HOWEVER UNIT SHALL CONTINUE TO OPERATE:
- SHOULD MIXED AIR TEMPERATURE SENSOR SENSE AIR TEMPERATURE <38°F (ADJ.) THE OUTSIDE AIR DAMPER SHALL FULLY CLOSE. ONCE THE GLOBAL OUTSIDE AIR TEMPERATURE RISES ABOVE 40°F (ADJ.), OPERATION OF THE OUTSIDE AIR DAMPER SHALL BE RESTORED. HOWEVER, THE ALARM SHALL CONTINUE UNTIL ACKNOWLEDGED BY THE FMCS OPERATOR.
 - IF THE ROOM TEMPERATURE IS MORE THAN 10°F (ADJ.) ABOVE OR BELOW SETPOINT.
- WHENEVER THE UNIT IS SHUTDOWN THE FOLLOWING SHALL OCCUR:
- SUPPLY FAN SHALL STOP.
 - OUTSIDE AIR DAMPER SHALL CLOSE.
 - HEATING/CHILLED WATER CONTROL VALVE SHALL CLOSE.

3 FAN COIL UNIT CONTROL - FCU-B
NO SCALE

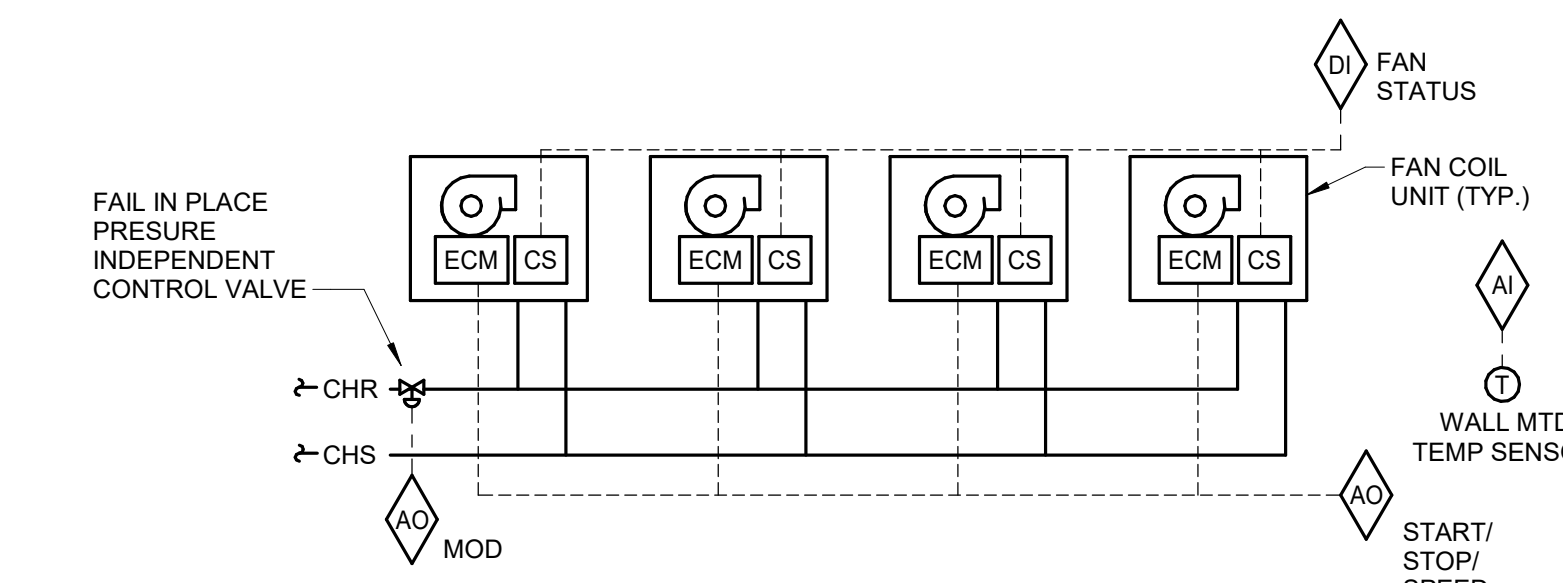
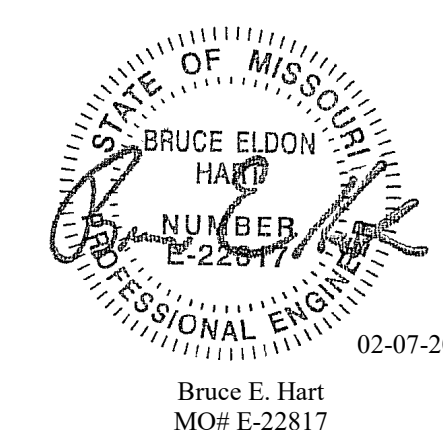


DIAGRAM NOTES:

- MULTIPLE FAN COIL UNITS SHALL BE CONTROLLED TOGETHER AS A SINGLE ZONE, WITH A SINGLE TEMPERATURE SENSOR, A SINGLE CONTROL VALVE, AND SHARED IO POINTS AS INDICATED ABOVE. CURRENT SWITCHES SHALL BE WIRED IN SERIES.
- REFER TO FAN COIL UNIT DIAGRAM FCU-A FOR INTERNAL COMPONENTS OF EACH FCU AND FOR DETAILED SEQUENCE OF OPERATION FOR THE ZONE.
- EACH INDIVIDUAL FCU IN THE ZONE SHALL BE FURNISHED WITH A SUPPLY AIR TEMPERATURE SENSOR (AI POINT) AS INDICATED IN DIAGRAM FCU-A, TO AID IN TROUBLESHOOTING.

7 FAN COIL UNIT CONTROL - FCU-C
NO SCALE



AIR COOLED CHILLER SCHEDULE

- NOTES:
1. MANUFACTURER LISTED IS BASIS OF DESIGN; SEE SPECIFICATIONS FOR OTHER ACCEPTABLE MANUFACTURERS.
2. CHILLER IS ONLY REQUIRED UNDER ALTERNATE #1.
3. PROVIDE UNIT WITH FACTORY-MOUNTED NON-FUSED DISCONNECT SWITCH.
4. PROVIDE UNIT WITH BACNET COMMUNICATIONS INTERFACE.
5. PROVIDE UNIT WITH COMPRESSOR SUCTION SERVICE VALVES AND SUCTION LINE INSULATION.

TAG NAME	AREA SERVED	REFRIGERANT	AMBIENT TEMP °F	MIN. OPERATING AMBIENT TEMP. °F	CAPACITY/PERFORMANCE						EVAPORATOR PERFORMANCE					COMPRESSION TYPE	ELECTRICAL					MAX. DIMENSIONS			WEIGHT		VIBRATION ISOLATION		MANUFACTURER (NOTE 1)	MODEL	NOTES								
					DESIGN TONS	STAGES OF UNLOADING	MIN. EER AT % LOAD (BASED ON AIR AND WATER CONDITIONS AS LISTED.)				EWV °F	LWT °F	MINIMUM	DESIGN	MAX. PRESSURE DROP (FT. W.G.)		FOULING FACTOR	NUMBER OF COMPRESSORS	DISCONNECT	CONTROLLER/ STARTER	SCCR	LENGTH	WIDTH	HEIGHT	DRY	OPERATING	TYPE	DEFL.											
CHLR-1	BLDG. 3	R-410A	100	32	200	8	9.8	12.65	13.81	15.11	13.44	56	44	270	400	8.5	0.0001	9	SCROLL	1	460 V	3	449.6 A	450 A	MFR	NF	MFR	FV	5000	283	89	90	12377	13093	M1	1/4"	CARRIER	30RB225	2-5

BOILER SCHEDULE - HOT WATER

- NOTES:
1. FUEL OIL IS A MIXTURE OF #1 AND #2 FUEL OIL. REFER TO FUEL OIL FLOW DIAGRAM ON SHEET M500 FOR MORE INFORMATION AND REQUIREMENTS.
2. GAS PRESSURE SCHEDULED IS AT INLET TO GAS TRAIN.
3. PROVIDE BOILER WITH A 460/120 VOLT CONTROL CIRCUIT TRANSFORMER FOR 120V CONTROL WIRING.
4. DIMENSIONS SCHEDULED ARE WITH BOILER TRIM. MAX. WIDTH WITHOUT TRIM SHALL BE 34". MAX. HEIGHT WITHOUT TRIM SHALL BE 78".
5. MANUFACTURER LISTED IS BASIS OF DESIGN; SEE SPECIFICATIONS FOR OTHER ACCEPTABLE MANUFACTURERS.
6. PROVIDE BOILER WITH A FLUE GAS ISOLATION DAMPER (MATCHING SIZE OF FLUE CONNECTION) WITH 2-POSITION, ELECTRIC ACTUATOR WITH SPRING RETURN (NORMALLY CLOSED), AND END SWITCH.

TAG NAME	NOMINAL BHP	FUEL (NOTE 1)	INLET GAS PRESSURE PSIG (NOTE 2)	TURNDOWN RATIO	INPUT MBH	OUTPUT MBH	EWV °F	LWT °F	OPERATING PRESSURE PSIG	FLUE CONN. SIZE	ELECTRICAL (NOTE 3)					MAX. DIMENSIONS (NOTE 4)			WEIGHT		MANUFACTURER (NOTE 5)	MODEL	NOTES	
											HP	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	TYPE (NOTE C)	SCCR	LENGTH	WIDTH				HEIGHT
BLR-1	70	NATURAL GAS & FUEL OIL	2	7:1	2820	2345	150	180	45	12"	2.14	460	3	EC	NF	MFR	128	46	86	3925	6280	L.E.S.	HF/HW 70	6
BLR-2	70	NATURAL GAS & FUEL OIL	2	7:1	2820	2345	150	180	45	12"	2.14	460	3	EC	NF	MFR	128	46	86	3925	6280	L.E.S.	HF/HW 70	6
BLR-3	70	NATURAL GAS & FUEL OIL	2	7:1	2820	2345	150	180	45	12"	2.14	460	3	EC	NF	MFR	128	46	86	3925	6280	L.E.S.	HF/HW 70	6

PUMP SCHEDULE

- NOTES:
1. PROVIDE SHAFT GROUNDING AS REQUIRED IN THE MOTOR SPECIFICATION ---23 05 13.
2. MANUFACTURER LISTED IS BASIS OF DESIGN; SEE SPECIFICATIONS FOR OTHER ACCEPTABLE MANUFACTURERS.
3. THIS PUMP WILL SERVE THE MAIN BUILDING (BLDG. 3) AND LAUNDRY AREAS. IF ALTERNATE #1 IS NOT ACCEPTED, IT WILL ALSO SERVE THE PACKAGED WATER HEATERS IN THE BOILER ROOM.
4. THIS PUMP IS ONLY REQUIRED UNDER ALTERNATE #1, AND WOULD FUNCTION AS A SECONDARY HOT WATER PUMP TO SERVE THE PACKAGED WATER HEATERS IN THE BOILER ROOM.

TAG NAME	LOCATION	TYPE	SERVICE	GPM	PUMP FT. HEAD AT DESIGN	MINIMUM PUMP EFFICIENCY	INLET SIZE	IMPELLER SIZE	RPM AT DUTY POINT	BRAKE HP	ELECTRICAL (NOTE 1)					MANUFACTURER (NOTE 2)	MODEL	NOTES			
											MOTOR HP (NOTE E)	MOTOR RPM	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)				TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	TYPE (NOTE C)
P-1	BOILER ROOM	BASE MOUNTED END SUCTION	PRIMARY HOT WATER (BLR-1)	156	30	79.4	2 1/2"	7.0	1590	1.4	2	1800	460	3	EC	NF	MC	VFD	Bell & Gossett	e-1510 2AD-es	
P-2	BOILER ROOM	BASE MOUNTED END SUCTION	PRIMARY HOT WATER (BLR-2)	156	30	79.4	2 1/2"	7.0	1590	1.4	2	1800	460	3	EC	NF	MC	VFD	Bell & Gossett	e-1510 2AD-es	
P-3	BOILER ROOM	BASE MOUNTED END SUCTION	PRIMARY HOT WATER (BLR-3)	156	30	79.4	2 1/2"	7.0	1590	1.4	2	1800	460	3	EC	NF	MC	VFD	Bell & Gossett	e-1510 2AD-es	
P-4	BOILER ROOM	BASE MOUNTED END SUCTION	LARGE SYSTEM PUMP	400	95	79.2	4"	11.0	1625	12.1	20	1800	460	3	EC	NF	MC	VFD	Bell & Gossett	e-1510 3EB	3
P-5	BOILER ROOM	BASE MOUNTED END SUCTION	LARGE SYSTEM PUMP	400	95	79.2	4"	11.0	1625	12.1	20	1800	460	3	EC	NF	MC	VFD	Bell & Gossett	e-1510 3EB	3
P-6	BOILER ROOM	INLINE	SMALL SYSTEM PUMP	30	25	40.5	1 1/2"	0.0	3820	0.4	0.5	4600	208	1	EC	NF	MFR	EC MOTOR	Bell & Gossett	Eccocirc XL 55-45	4
P-7	BOILER ROOM	INLINE	SMALL SYSTEM PUMP	30	25	40.5	1 1/2"	0.0	3820	0.4	0.5	4600	208	1	EC	NF	MFR	EC MOTOR	Bell & Gossett	Eccocirc XL 55-45	4

VARIABLE FREQUENCY DRIVE SCHEDULE

TAG NAME	LINE DISC.	DRIVE BYPASS	CIRCUIT VOLTAGE	POLES	DRIVE			ENCLOSURE	REQUIRED ACCESSORIES & OPTIONS	COMMENTS
					HP RATING	TYPE	TORQUE TYPE			
VFD-1	CB	MANUAL	460	3	2	PWM	VARIABLE	NEMA 1	SA	
VFD-2	CB	MANUAL	460	3	2	PWM	VARIABLE	NEMA 1	SA	
VFD-3	CB	MANUAL	460	3	2	PWM	VARIABLE	NEMA 1	SA	
VFD-4	CB	MANUAL	460	3	20	PWM	VARIABLE	NEMA 1	SA	
VFD-5	CB	MANUAL	460	3	20	PWM	VARIABLE	NEMA 1	SA	

EXPANSION TANK SCHEDULE

- NOTES:
1. MANUFACTURER LISTED IS BASIS OF DESIGN; REFER TO SPECIFICATIONS FOR OTHER ACCEPTABLE MANUFACTURERS.
2. THIS EXPANSION TANK IS ONLY REQUIRED UNDER ALTERNATE #1.

TAG NAME	SYSTEM TYPE	TANK TYPE	TANK VOLUME	TANK DIA	TANK HEIGHT	MANUFACTURER (NOTE 1)	MODEL	NOTES
ET-1	CHILLED/HEATING WATER	FULL ACCEPTANCE BLADDER	158	30	66	AMTROL	600-L	
ET-2	HEATING WATER	FULL ACCEPTANCE BLADDER	158	30	66	AMTROL	600-L	2

PIPE INSULATION SCHEDULE (HVAC)

- 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 BOILER ROOM, EXTERIOR, TUNNELS, 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 INSERT AND/OR SHIELD AT HANGERS. SEE SPEC. FOR MORE DETAILS.

PIPE SYSTEM	INSULATION TYPE	INSULATION THICKNESS PER NOMINAL PIPE OR TUBE SIZE						NOTES
		< 1"	1" TO < 1.5"	1.5" TO < 4"	4" TO < 8"	≥ 8"		
23 PIPING - COOLING								
CWR - CHILLED WATER RETURN	B (Elasto)	0.5"	0.5"	1"	1.5"	1.5"		
CWS - CHILLED WATER SUPPLY	B (Elasto)	0.5"	0.5"	1"	1.5"	1.5"		
DPP - DRAIN - PIPING	B (Elasto)	0.5"	0.5"	1"	1"	1"	APPLY INSULATION ONLY TO LOW TEMP DRAINS (55 DEG AND LOWER IE: COOLING COIL CONDENSATE)	
23 PIPING - HEATING								
CHR - CHILLED/HEATING WATER RETURN	B (Elasto)	1.5"	1.5"	2"	2"	2"		
CHS - CHILLED/HEATING WATER SUPPLY	B (Elasto)	1.5"	1.5"	2"	2"	2"		
HWR - HEATING WATER RETURN	A (GlsFbr), B (Elasto)	1.5"	1.5"	2"	2"	2"		
HWS - HEATING WATER SUPPLY	A (GlsFbr), B (Elasto)	1.5"	1.5"	2"	2"	2"		
23 PIPING - OTHER								
MISC RELIEF VENTS, INTAKES, AND DISCHARGES	A (GlsFbr), B (Elasto)	0.5"	0.5"	1"	1"	1"	APPLY INSULATION ONLY WITHIN 10' OF EXTERIOR PENETRATION ON COMPRESSOR INTAKES, VACUUM DISCHARGES, VENT/RELIEF LINES, ETC.	

SCHEDULE GENERAL NOTES:

- A. DISCONNECT AND CONTROLLER STARTER FURNISHED AND INSTALLED BY:
MFR = MANUFACTURER
EC = ELECTRICAL CONTRACTOR
MC = FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR
MFR/EC = FURNISHED LOOSE BY MANUFACTURER INSTALLED BY 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)
MS = MANUAL STARTER
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
SAC = SOUND ATTENUATOR CURB

Key Name

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REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M600.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

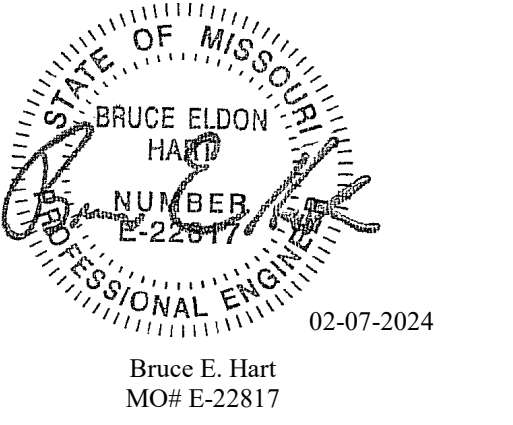
MECHANICAL
SCHEDULES

SHEET NUMBER:

M600

SHEET 28 OF 57

02/07/2024



FAN COIL UNIT SCHEDULE - HYDRONIC

TAG NAME	CONFIGURATION	CFM	MINIMUM OUTSIDE AIR CFM	EXT. S.P. IN W.C.	COIL (COOLING MODE) (NOTE 1)									COIL (HEATING MODE) (NOTE 1)									ELECTRICAL (NOTE 2)					MAX. DIMENSIONS			APPLICABLE CONTROL DIAGRAM	MANUFACTURER (NOTE 3)	MODEL	NOTES	
					EAT DB	EAT WB	LAT DB	LAT WB	TOTAL MBH	SENSIBLE MBH	GPM	EWT °F	LWT °F	W.P.D. FT. HD	HEATING COIL EAT	HEATING COIL LAT	TOTAL MBH	GPM	EWT °F	LWT °F	NO. OF MOTOR	HP (NOTE E)	RPM	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/STARTER TYPE	LENGTH	WIDTH					HEIGHT
FCU-1	HORIZONTAL CABINET	200		0.0	75	64	55	54	6	4.4	1.0	42	54	0.00	70	110	8.6	0.6	180	150	1	0.14	1200	115	1	MFR	NF	EC MOTOR	38"	23.5"	11"	FCU-A	Carrier	42CG02B6	
FCU-2	HORIZONTAL CABINET	300		0.0	75	64	55	54	9	6.3	1.5	42	54	0.00	70	110	13	0.9	180	150	1	0.14	1200	115	1	MFR	NF	EC MOTOR	42"	23.5"	11"	FCU-A	Carrier	42CG03B6	
FCU-3	HORIZONTAL CABINET	400		0.0	75	64	55	54	12.1	8.8	2.0	42	54	0.00	70	110	17.3	1.2	180	150	1	0.17	1200	115	1	MFR	NF	EC MOTOR	48"	23.5"	11"	FCU-A	Carrier	42CG04B6	
FCU-4	HORIZONTAL CABINET	600		0.0	75	64	55	54	17.3	13	2.9	42	54	0.00	70	110	26	1.8	180	150	1	0.17	1200	115	1	MFR	NF	EC MOTOR	53"	23.5"	12"	FCU-A	Carrier	42CG06B6	
FCU-5	HORIZONTAL CABINET	1000		0.0	75	64	55	54	27.5	21	4.6	42	54	0.00	70	110	43.2	2.9	180	150	2	0.17	1200	115	1	MFR	NF	EC MOTOR	74"	23.5"	12"	FCU-A	Carrier	42CG10B6	
FCU-6	HORIZONTAL CABINET	1200		0.0	75	64	55	54	32.8	25	5.5	42	54	0.00	70	110	51.8	3.5	180	150	2	0.17	1200	115	1	MFR	NF	EC MOTOR	82"	23.5"	12"	FCU-A	Carrier	42CG12B6	
FCU-7	DUCTED HORIZONTAL CABINET	600	0	0.0	75	64	55	54	18.1	13.7	3.0	42	54	0.00	70	110	26	1.8	180	150	1	0.5	1200	115	1	MFR	NF	EC MOTOR	31"	34"	18"	FCU-A	Carrier	42DE06B6	
FCU-8	DUCTED HORIZONTAL CABINET	800	0	0.0	75	64	55	54	24.6	17.3	4.1	42	54	0.00	70	110	34.6	2.3	180	150	1	0.5	1200	115	1	MFR	NF	EC MOTOR	36"	34"	18"	FCU-A	Carrier	42DE08B6	
FCU-9	DUCTED HORIZONTAL CABINET	1800	360	0.1	82	66.4	55	54	63.5	52.5	10.6	42	54	0.00	56	110	105	7.0	180	150	2	0.5	1200	115	1	MFR	NF	EC MOTOR	60"	34"	18"	FCU-B	Carrier	42DE18B6	
FCU-10	DUCTED HORIZONTAL CABINET	1950	400	0.2	82	66.4	55	54	70.6	58.3	11.8	42	54	0.00	56	110	113.7	7.6	180	150	2	0.5	1200	115	1	MFR	NF	EC MOTOR	64"	34"	18"	FCU-B	Carrier	42DE20B6	
FCU-11	VERTICAL FREESTANDING CABINET	400		0.0	75	64	55	54	11.6	8.8	1.9	42	54	0.00	70	110	17.3	1.2	180	150	1	0.17	1200	115	1	MFR	NF	EC MOTOR	51"	9"	25"	FCU-A	Carrier	42VB04A6	
FCU-12	VERTICAL FREESTANDING CABINET	600		0.0	75	64	55	54	18.7	13.4	3.1	42	54	0.00	70	110	26	1.8	180	150	1	0.17	1200	115	1	MFR	NF	EC MOTOR	61"	9"	25"	FCU-A	Carrier	42VB06A6	
FCU-13	VERTICAL FREESTANDING CABINET	1000		0.0	75	64	55	54	31.7	21.1	5.3	42	54	0.00	70	110	43.2	2.9	180	150	2	0.17	1200	115	1	MFR	NF	EC MOTOR	77"	9"	25"	FCU-A	Carrier	42VB10A6	
FCU-14	VERTICAL FREESTANDING CABINET	1000		0.0	75	64	55	54	31.7	21.1	5.3	42	54	0.00	70	110	43.2	2.9	180	150	2	0.17	1200	115	1	MFR	NF	EC MOTOR	77"	9"	25"	FCU-C	Carrier	42VB10A6	
FCU-15	DUCTED HORIZONTAL CABINET	200		0.0	75	64	55	54	6	4.4	1.0	42	54	0.00	70	110	8.6	0.6	180	150	1	0.14	1200	115	1	MFR	NF	EC MOTOR	35"	26"	12"	FCU-A	Carrier	42CK02B6	
FCU-16	DUCTED HORIZONTAL CABINET	400	80	0.0	75	64	55	54	12.1	8.8	1.5	42	54	0.00	70	110	17.3	1.2	180	150	2	0.17	1200	115	1	MFR	NF	EC MOTOR	41"	26"	12"	FCU-B	Carrier	42CK04B6	

MOTOR OPERATED DAMPER SCHEDULE

TAG NAME	SIZE		CFM		BLADE CONFIGURATION	BLADE ORIENTATION	ACTUATOR TYPE (NOTE 1)	ACTUATOR STYLE	POWER FAILURE POSITION	POSITIVE POSITION FEEDBACK REQUIRED	NOTES
	WIDTH	HEIGHT	MAX.	MIN.							
MOD-1	SEE PLANS	SEE PLANS	SEE FCU SCHEDULE	0	PARALLEL	VERTICAL	ELECTRIC	TWO POSITION	NORMALLY CLOSED (NC)	No	

LOUVER SCHEDULE

TAG NAME	MAX. FREE AREA VELOCITY FPM	MAX. S.P. IN. W.C.	FINISH (NOTE 1)	MANUFACTURER (NOTE 2)	MODEL	NOTES
LV-1	500	0.10	TYPE 3	RUSKIN	ELF375DX	3, 4

AIR TERMINAL SCHEDULE

TAG NAME	FACE SIZE (IN.) (NOTE 1)	TYPE	BORDER (NOTE 2)	MATERIAL	FINISH	VOLUME DAMPER REQUIRED	MANUFACTURER (NOTE 3)	MODEL	NOTES
SG-1	INLET +2	DOUBLE DEFLECTION	1 1/4"	STEEL	WHITE	NO	TITUS	300R	FRONT BLADES VERTICAL UNLESS NOTED OTHERWISE
SG-2	INLET +2	PERFORATED FACE LIGATURE RESISTANT SECURITY GRILLE	1"	STEEL	WHITE	NO	TITUS	SG-SD	PROVIDE WITH ANCHOR FRAME MOUNTING OPTION
SG-3	DUCT MINUS 1/4"	SPIRAL DUCT GRILLE	1-1/2"	ALUMINUM	WHITE	YES	Titus HVAC	S300FS	ORIENT DOWNWARDS AT 45 DEGREES FROM HORIZONTAL
RG-1	INLET +2	35 DEGREE DEFLECTION	1 1/4"	STEEL	WHITE	NO	TITUS	350R	
RG-2	INLET +2	PERFORATED FACE LIGATURE RESISTANT SECURITY GRILLE	1"	STEEL	WHITE	NO	TITUS	SG-SD	PROVIDE WITH TAMPER RESISTANT SCREWS FOR MOUNTING

CONVECTOR SCHEDULE

TAG NAME	CONFIGURATION	MBH	GPM	EWT °F	LWT °F	MAX. W.P.D. FT. HEAD (NOT TO EXCEED 2 FEET.)	BRANCH PIPE SIZE	CABINET			MANUFACTURER (NOTE 1)	MODEL	NOTES
								H	W	D			
CONV-1	SLOPE TOP FREESTANDING	5.2	0.35	180	150	0.07	3/4"	32"	28"	6"	STERLING	SF-A-632-28	2
CONV-2	SLOPE TOP FREESTANDING	3.2	0.21	180	150	0.04	3/4"	32"	28"	4"	STERLING	SF-A-432-28	2
CONV-3	SLOPE TOP FREESTANDING	1.8	0.12	180	150	0.04	3/4"	18"	20"	4"	STERLING	SF-A-418-20	2

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MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: M601.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

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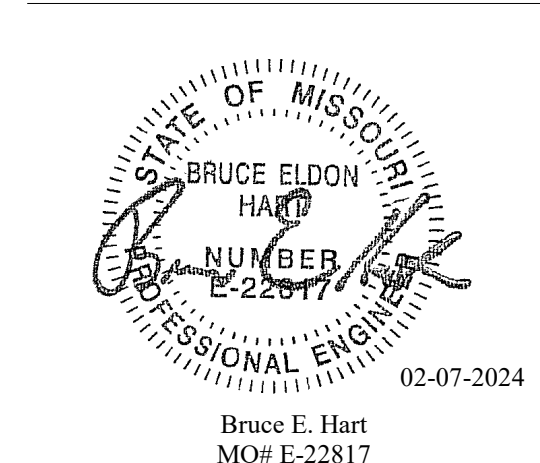
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SHEET NUMBER:

M601

SHEET 29 OF 57

02/07/2024



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REPLACE STEAM, WATER &
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MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: P100.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL
SHEET TITLE:

BOILER BLDG - LOWER
LEVEL - PLUMBING
DEMOLITION

SHEET NUMBER:

P100

SHEET 31 OF 57

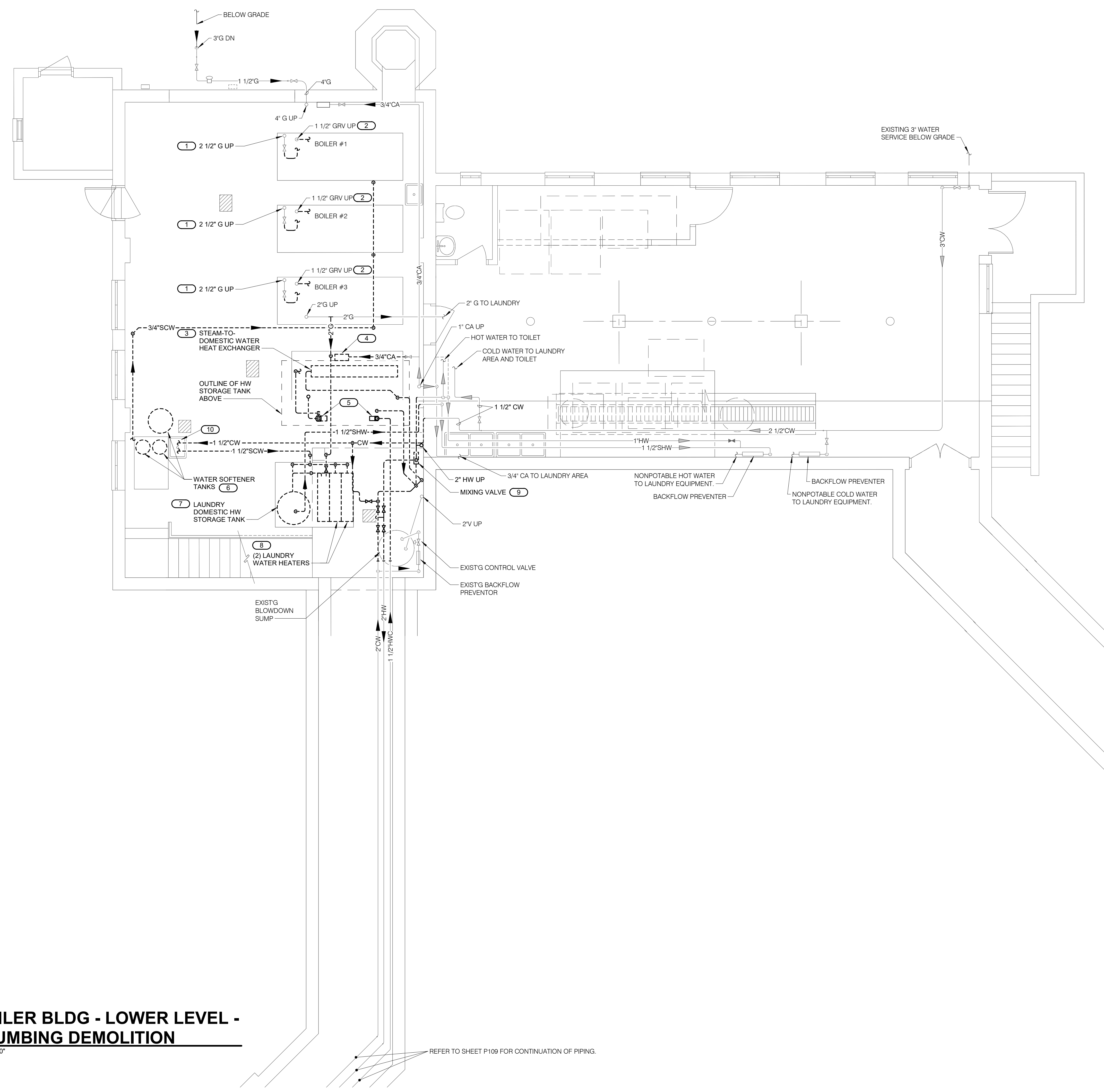
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SHEET NOTES:

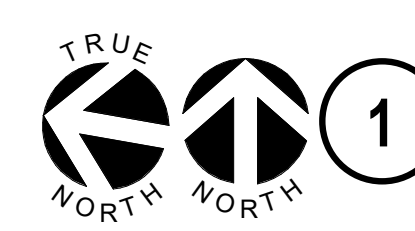
- SEE SHEET P000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- LAUNDRY DOMESTIC HOT WATER EQUIPMENT (INCLUDING, BUT NOT LIMITED TO LAUNDRY WATER HEATERS, LAUNDRY STORAGE TANK, ASSOCIATED PIPING, CONTROLS AND VENTS) SHALL REMAIN IN OPERATION AND SHALL BE USED TO SERVE BOTH MAIN BUILDING AND BOILER/LAUNDRY BUILDING UNTIL ONE OF THE NEW PACKAGED WATER HEATERS IS INSTALLED AND FULLY OPERATIONAL. EXCEPT FOR BRIEF SHUTDOWNS/CUTOVERS SCHEDULED IN ADVANCE WITH THE OWNER, AT NO TIME SHALL EITHER THE MAIN BUILDING OR THE BOILER/LAUNDRY BUILDING BE WITHOUT A SOURCE OF DOMESTIC HOT WATER. CONTRACTOR SHALL PROVIDE AND INSTALL TEMPORARY PIPING, VALVES AND CONTROLS AS REQUIRED. ALSO DURING THIS TIME, HOT WATER SHALL BE CIRCULATED THROUGH THE MAIN BUILDING, USING THE NEW PUMP SHOWN ON SHEET P200.

KEYNOTES:

- CUT GAS PIPING ON DOWNSTREAM SIDE OF SHUTOFF VALVE AND REMOVE GAS TRIN TO BOILER.
- CUT GAS REGULATOR VENT PIPING IN VERTICAL AND REMOVE PIPING AT BOILER. PROTECT RISER FOR NEW CONNECTION, RE: SHEET P200.
- DISCONNECT AND REMOVE HEAT EXCHANGER, INCLUDING ASSOCIATED PIPING.
- DISCONNECT AND REMOVE PNEUMATIC CONTROLS FOR DOMESTIC WATER HEATING SYSTEM, INCLUDING ASSOCIATED COMPRESSED AIR PIPING, REGULATOR AND PNEUMATIC TUBING TO STEAM CONTROL VALVE NOT SHOWN.
- DISCONNECT AND REMOVE TWO (2) DOMESTIC HOT WATER CIRCULATING PUMPS, INCLUDING ASSOCIATED PIPING AND CONTROLS.
- DISCONNECT AND REMOVE WATER SOFTENER SYSTEM, INCLUDING ASSOCIATED TANKS, VALVES, PIPING AND CONTROLS. ALSO REMOVE SOFT COLD WATER PIPING TO BOILER FEED SYSTEM AND BOILERS.
- DISCONNECT AND REMOVE LAUNDRY STORAGE TANK, INCLUDING ASSOCIATED PIPING.
- DISCONNECT AND REMOVE TWO (2) GAS-FIRED WATER HEATERS, INCLUDING ASSOCIATED DOMESTIC WATER AND GAS PIPING, CONTROLS AND STEEL SUPPORT STAND, RE: SHEET M100 FOR DEMOLITION OF ASSOCIATED VENTS.
- DISCONNECT AND REMOVE DOMESTIC WATER MIXING VALVE, INCLUDING ASSOCIATED PIPING.
- CUT COLD WATER PIPING SERVING EXISTING HAND SINK WITH EYEWASH. PROTECT FIXTURE FOR NEW CONNECTION, RE: SHEET P200.

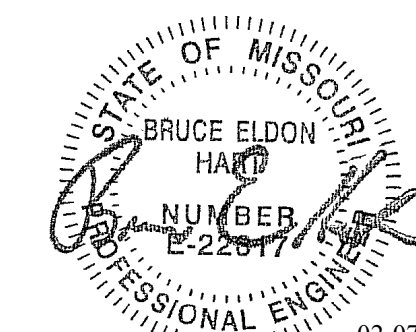


**BOILER BLDG - LOWER LEVEL -
PLUMBING DEMOLITION**



1/4" = 1'-0"

REFER TO SHEET P109 FOR CONTINUATION OF PIPING.



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REPLACE STEAM, WATER &
 SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
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 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: P101.dwg
 DRAWN BY: BWC
 CHECKED BY: BEH
 DESIGNED BY: MJL

SHEET TITLE:

BOILER BLDG - UPPER
 LEVEL - PLUMBING
 DEMOLITION

SHEET NUMBER:

P101

SHEET 32 OF 57

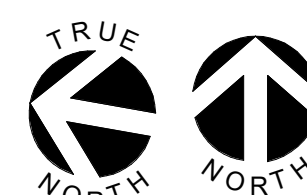
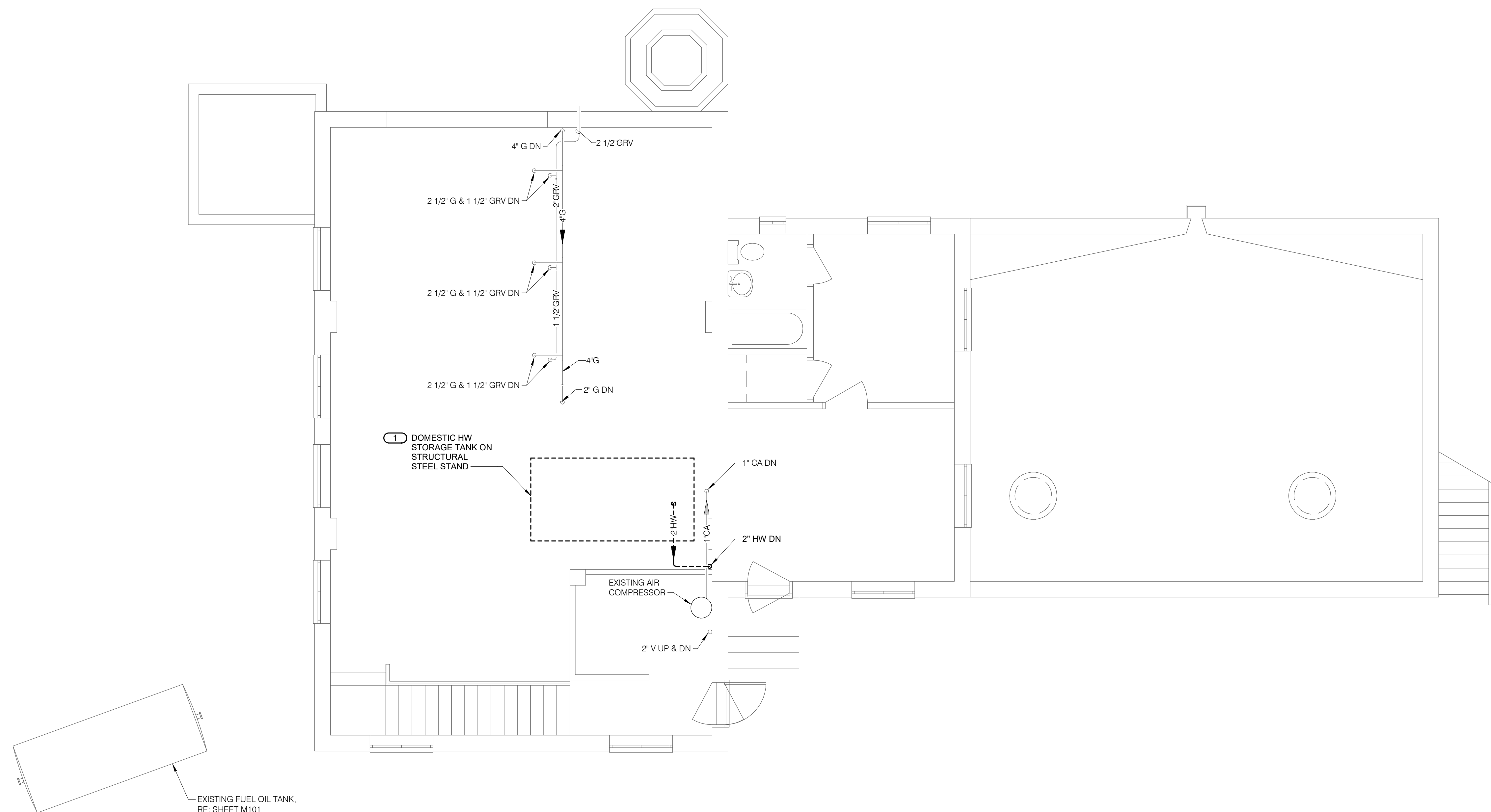
02/07/2024

SHEET NOTES:

1. SEE SHEET P000 FOR SYMBOLS,
 ABBREVIATIONS AND GENERAL NOTES.

KEYNOTES: #

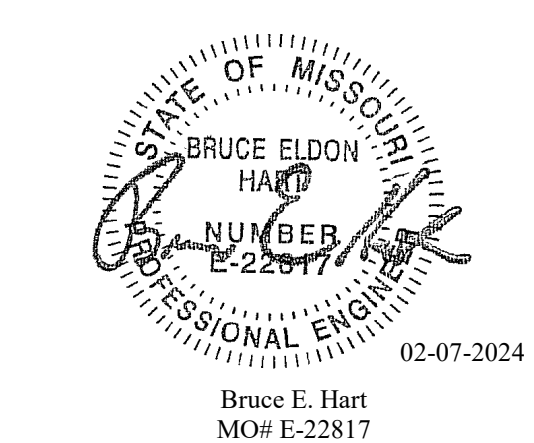
1. DISCONNECT AND REMOVE STORAGE TANK,
 INCLUDING ASSOCIATED PIPING, CONTROLS
 AND STEEL SUPPORT STAND.



1

BOILER BLDG - UPPER LEVEL - PLUMBING DEMOLITION

1/4" = 1'-0"

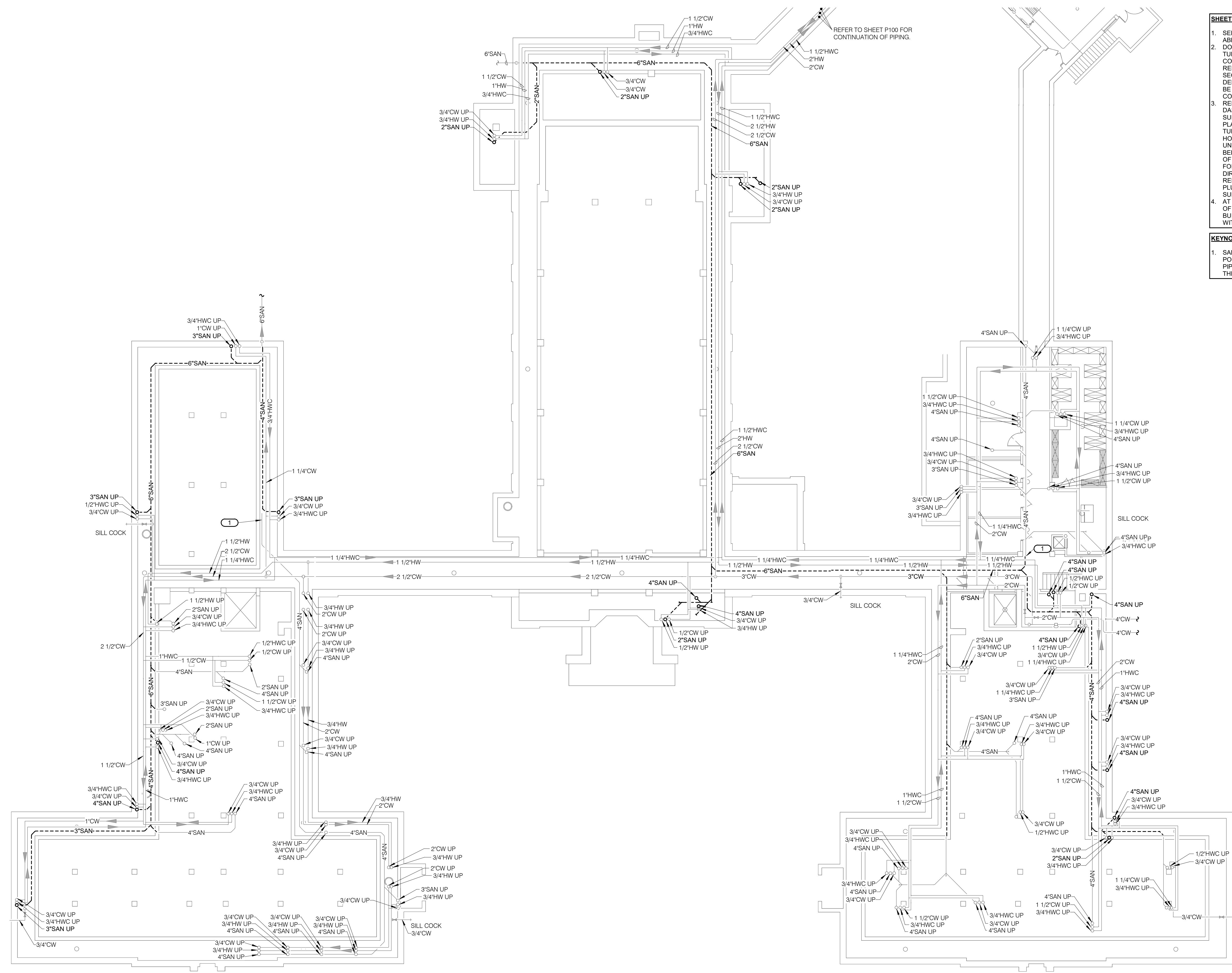


SHEET NOTES:

- SEE SHEET P000 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
- DOMESTIC CW, HW AND HWC PIPING IN TUNNELS IS INSULATED USING ASBESTOS CONTAINING BUILDING MATERIALS (ACBM). REFER TO SHEET EMV100 AND SPECIFICATION SECTION 028211 FOR ABATEMENT WORK. DEMOLITION WORK ON THIS SHEET SHALL NOT BE PERFORMED UNTIL ABATEMENT WORK IS COMPLETE.
- REMOVE ALL SAN PIPING SHOWN DARK AND DASHED, INCLUDING HANGERS AND SUPPORTS THAT CANNOT BE RE-USED IN PLACE. WHERE SAN PIPES ARE SHOWN TURNING UP TO FLOOR ABOVE OR HORIZONTALLY THRU TUNNEL WALL TO UNEXCAVATED AREAS, CUT PIPING JUST BELOW TOP OF TUNNEL OR JUST INSIDE WALL OF TUNNEL, AND PROTECT REMAINING PIPING FOR NEW CONNECTION. THE RISERS AND THE DIRECT-BURIED PIPING ARE NOT BEING REPLACED (EXCEPT THE RISERS IN THE MAIN PLUMBING CHASES, AS SHOWN ON SUBSEQUENT SHEETS).
- AT THE CONCLUSION OF THIS PROJECT, NONE OF THE OLD SAN PIPING FROM THE ORIGINAL BUILDING CONSTRUCTION SHALL REMAIN, WITHIN THE TUNNELS.

KEYNOTES: #

- SAN PIPING ON THIS LEVEL UPSTREAM OF THIS POINT IS PVC PIPING OR NEWER CASTIRON PIPING AND DEMOLITION/REPLACEMENT OF THE NEWER PIPING IS NOT REQUIRED.



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MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
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 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: P109.dwg
 DRAWN BY: MWM
 CHECKED BY: BEH
 DESIGNED BY: MJL

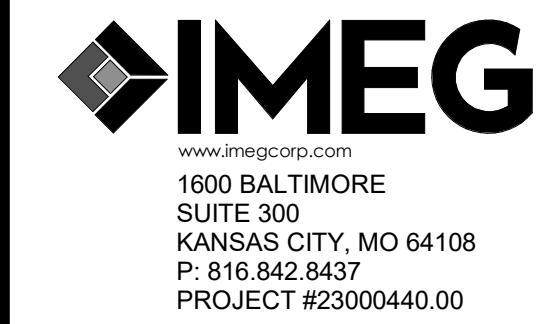
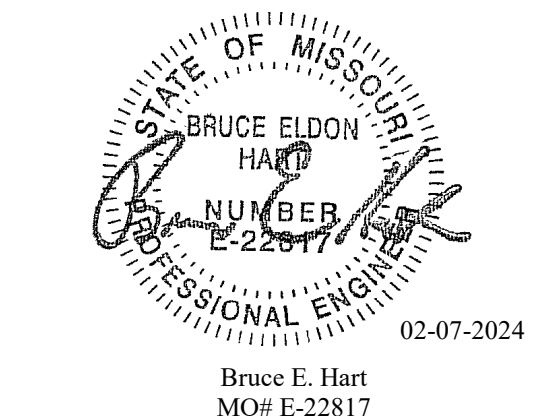
SHEET TITLE:
 MAIN BLDG - TUNNEL
 LEVEL - PLUMBING
 DEMOLITION

SHEET NUMBER:

P109

SHEET 33 OF 57

02/07/2024



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MARYVILLE, MO

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 DRAWN BY: BWC
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 DESIGNED BY: MJL
 SHEET TITLE:

BOILER BLDG - LOWER
 LEVEL - PLUMBING

SHEET NUMBER:

P200

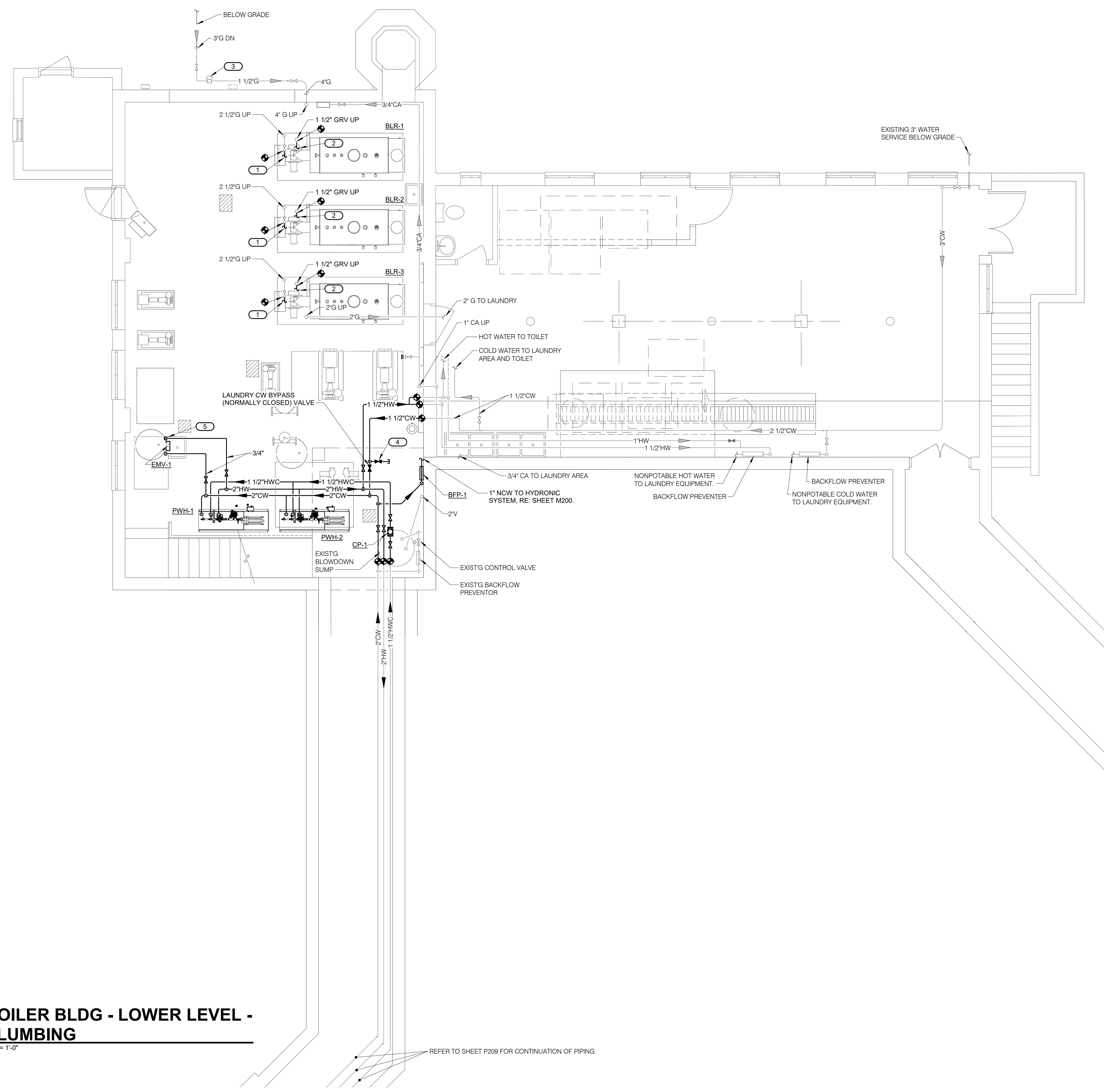
SHEET 34 OF 57
 02/07/2024

SHEET NOTES:

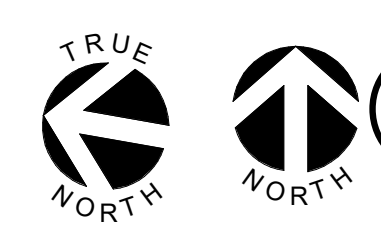
- SEE SHEET P000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.

KEYNOTES: #

- EXTEND NEW GAS PIPING TO NEW BOILER GAS TRAIN AS REQUIRED.
- EXTEND NEW GAS REGULATOR VENT PIPING TO NEW BOILER GAS TRAIN AS REQUIRED.
- ADJUST EXISTING REGULATOR TO PROVIDE DOWNSTREAM GAS PRESSURE OF 2 PSIG TO INLET OF NEW GAS TRAIN ON EACH NEW BOILER.
- PROVIDE DRAIN VALVE WITH GARDEN HOSE THREADS ON OUTLET AND CAP. PROVIDE A SIGN THAT READS: ATTACH A HOSE AND OPEN DRAIN VALVE REGULARLY. TO FLUSH WATER THROUGH "DEAD LEG" IN BYPASS PIPING.
- ROUTE 3/4" CW AND 3/4" HW DOWN TO SERVE EXISTING HAND SINK WITH EMERGENCY EYEWASH. INSTALL NEW EMERGENCY MIXING VALVE IN ACCESSIBLE LOCATION BELOW SINK, WHICH IS ANCHORED TO FLOOR USING STEEL ANGLES. MAKE NEW CONNECTIONS TO EXISTING FAUCET AND SWIVEL EYEWASH AS REQUIRED.



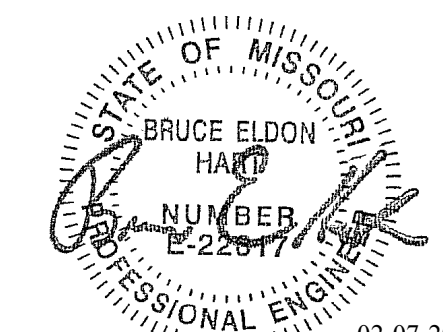
REFER TO SHEET P209 FOR CONTINUATION OF PIPING.



**BOILER BLDG - LOWER LEVEL -
 PLUMBING**

1/4" = 1'-0"

1



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REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: P201.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

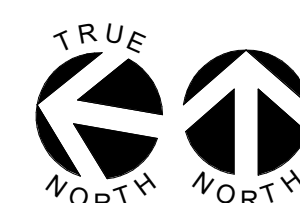
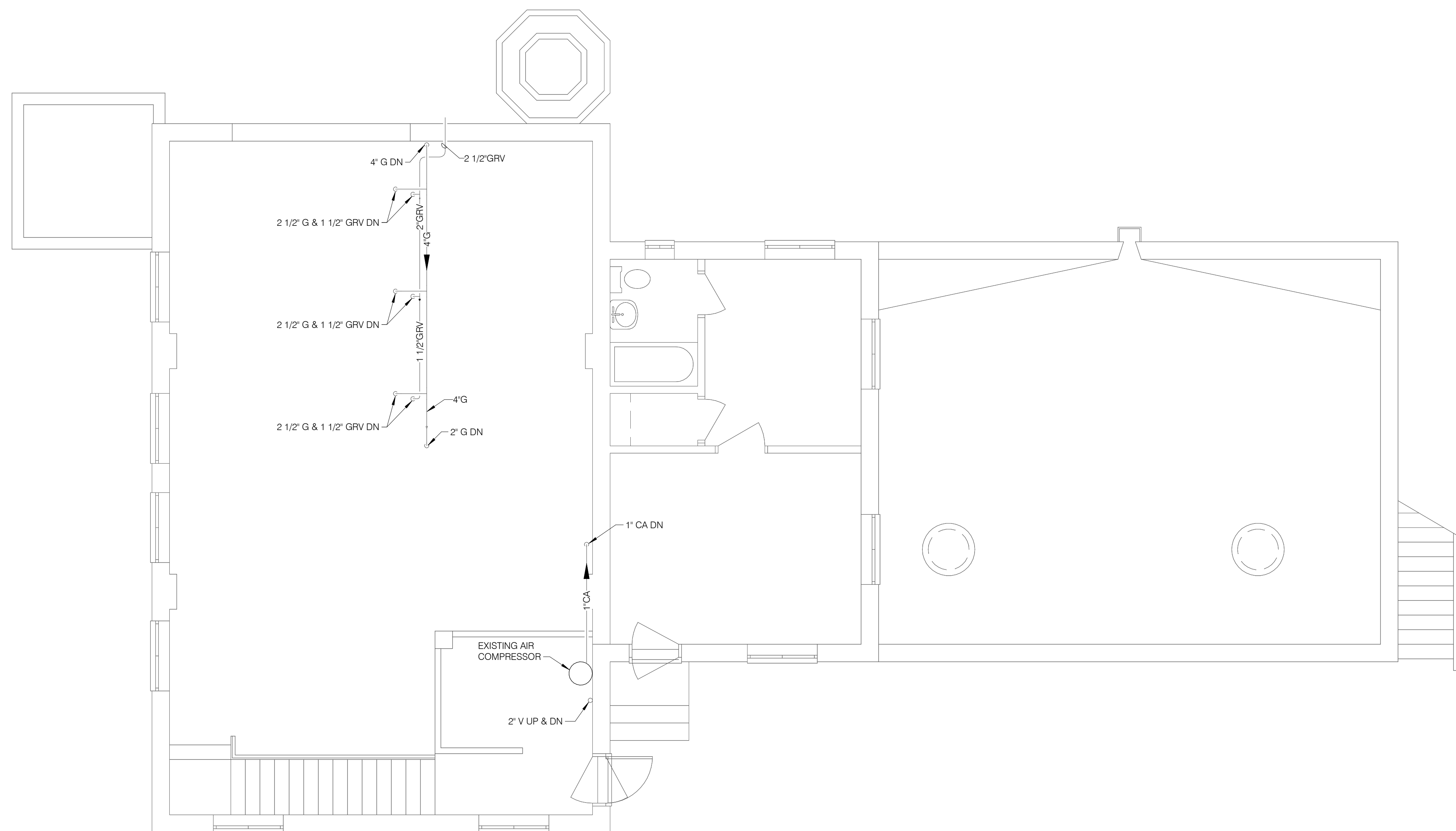
BOILER BLDG - UPPER
LEVEL - PLUMBING

SHEET NUMBER:

P201

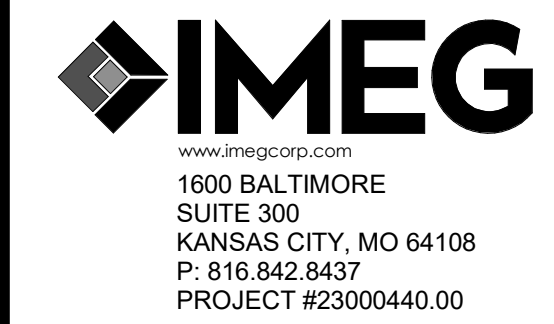
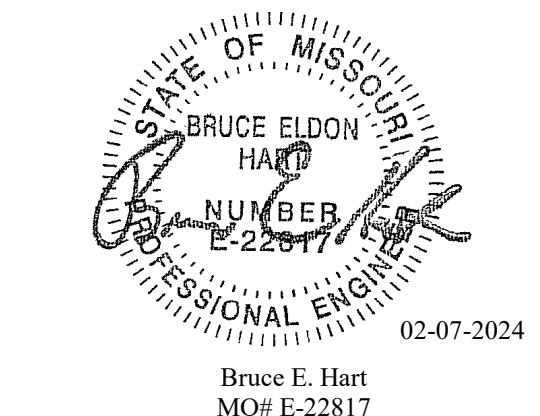
SHEET 35 OF 57

02/07/2024

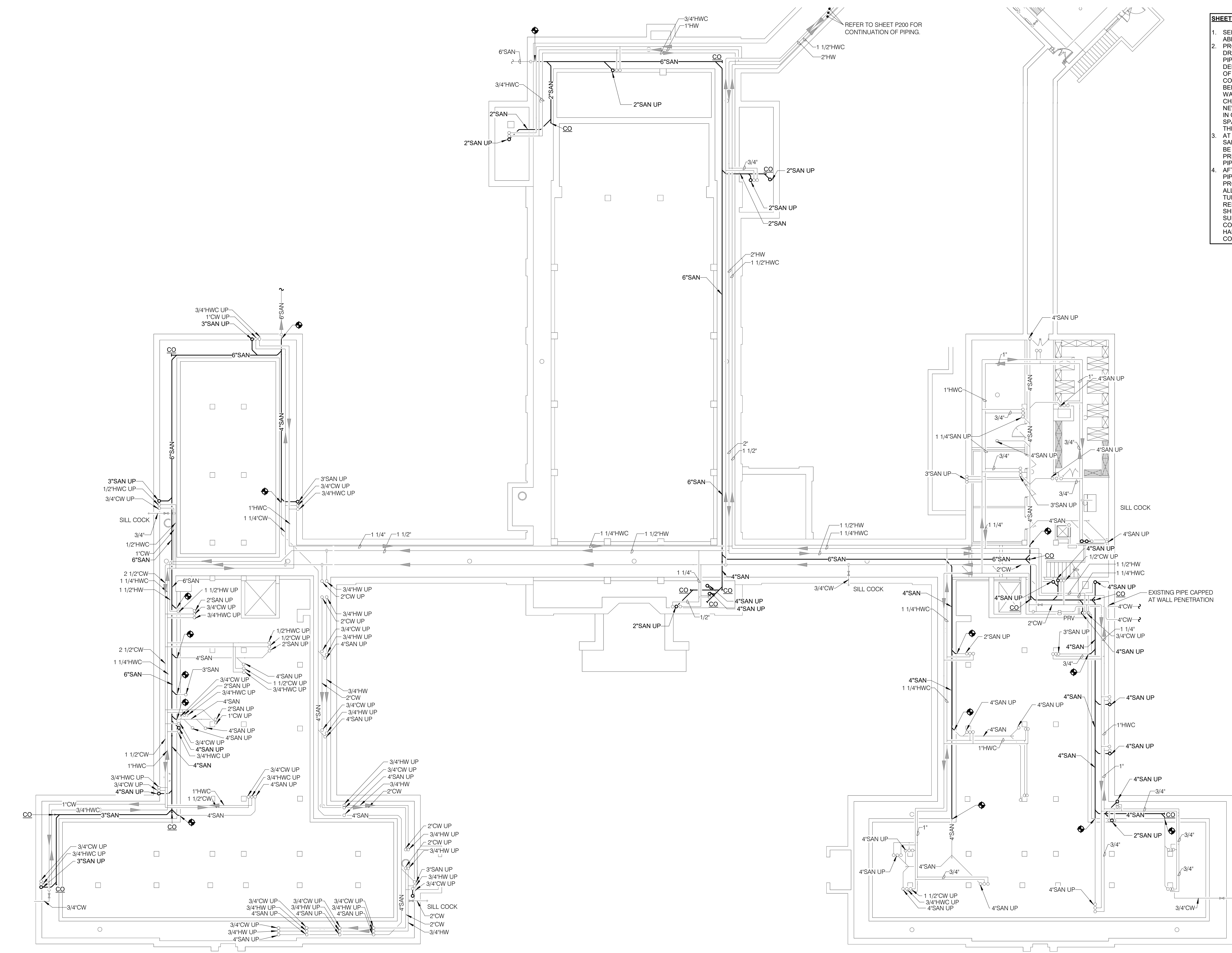


1 BOILER BLDG - UPPER LEVEL - PLUMBING

1/4" = 1'-0"



- SHEET NOTES:**
- SEE SHEET P000 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
 - PROVIDE AND INSTALL NEW SANITARY DRAINAGE PIPING TO REPLACE ALL SANITARY PIPING THAT WAS REMOVED DURING DEMOLITION. NEW PIPING SHALL MATCH SIZES OF OLD PIPING THAT WAS REMOVED. MAKE CONNECTIONS TO EXISTING PIPING JUST BELOW TOP OF TUNNEL OR JUST INSIDE WALLS OF TUNNEL AS REQUIRED. THE CHANGE IN PIPING MATERIAL WILL REQUIRE NEW HANGERS AND SUPPORTS TO BE ADDED, IN ORDER TO MEET SPECIFIED HANGER SPACING REQUIREMENTS, EVEN IF SOME OF THE OLD HANGERS ARE RE-USED.
 - AT THE CONCLUSION OF THIS PROJECT, ALL SANITARY PIPING WITHIN THE TUNNELS SHALL BE PVC-DWV OR ABS-DWV PIPING (EITHER PREVIOUSLY INSTALLED PVC-DWV, OR NEW PIPING INSTALLED UNDER THIS PROJECT).
 - AFTER ABATEMENT WORK AND SANITARY PIPING REPLACEMENT WORK IS COMPLETE, PROVIDE AND INSTALL NEW INSULATION ON ALL DOMESTIC CW, HW AND HWC PIPING IN TUNNELS, AS SPECIFIED FOR NEW PIPING. REFER TO PIPE INSULATION SCHEDULE ON SHEET P600. WHERE EXISTING HANGERS AND SUPPORTS WOULD INTERFERE WITH CONTINUOUS INSULATION, PROVIDE NEW HANGERS AND SUPPORTS TO ALLOW FOR CONTINUOUS INSULATION AS SPECIFIED.



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MARYVILLE TREATMENT
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 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: P209.dwg
 DRAWN BY: MJL
 CHECKED BY: BEH
 DESIGNED BY: MJL
 SHEET TITLE:

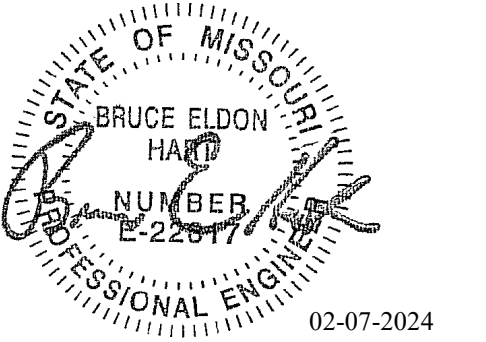
MAIN BLDG - TUNNEL
 LEVEL - PLUMBING

SHEET NUMBER:

P209

SHEET 36 OF 57

02/07/2024



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CAD DWG FILE: P210.dwg
 DRAWN BY: BWC
 CHECKED BY: BEH
 DESIGNED BY: MJL

SHEET TITLE:

MAIN BLDG -
 BASEMENT LEVEL -
 PLUMBING

SHEET NUMBER:

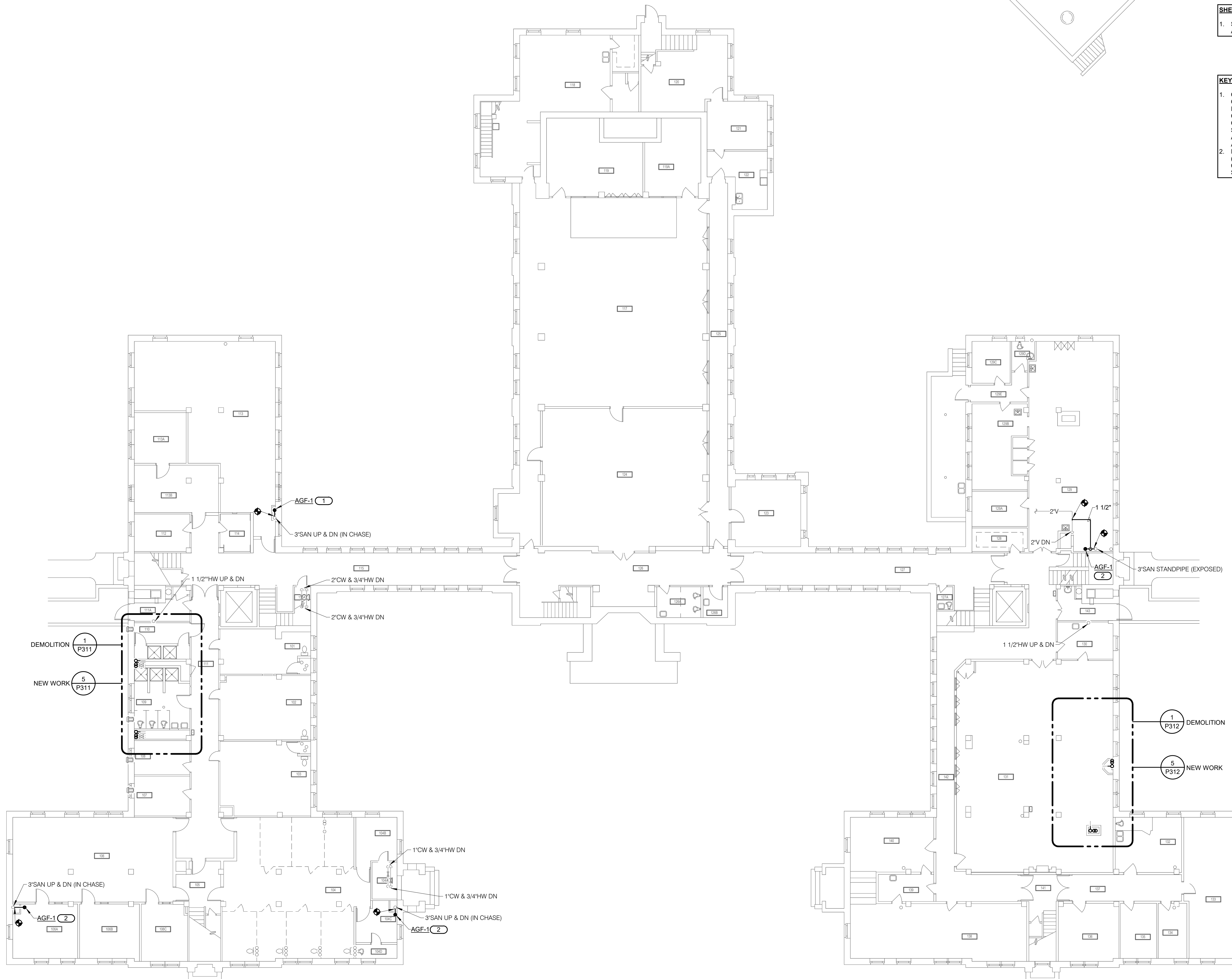
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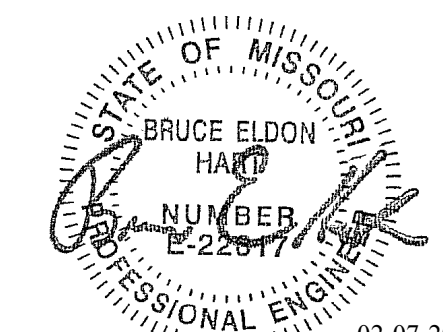
SHEET 37 OF 57

02/07/2024

SHEET NOTES:
 1. SEE SHEET P000 FOR SYMBOLS,
 ABBREVIATIONS AND GENERAL NOTES.

KEYNOTES: #
 1. CUT A HOLE IN WALL OF EXISTING PLUMBING
 CHASE AS REQUIRED AND INSTALL NEW 2"
 INDIRECT DRAIN WITH P-TRAP (TO ACCEPT
 COOLING CONDENSATE) INSIDE CHASE AND
 CONNECT TO EXISTING SANITARY RISER AS
 SHOWN. PATCH HOLE IN CHASE TO MATCH
 ADJACENT AND INSTALL A NEW LOCKING
 ACCESS DOOR. REFER TO DETAIL 1/P400.
 2. INSTALL NEW 2" INDIRECT DRAIN WITH P-TRAP
 (TO ACCEPT COOLING CONDENSATE) AND
 CONNECT TO EXISTING SANITARY RISER AS
 SHOWN.





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CAD DWG FILE: P211.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

MAIN BLDG - LEVEL 01
- PLUMBING

SHEET NUMBER:

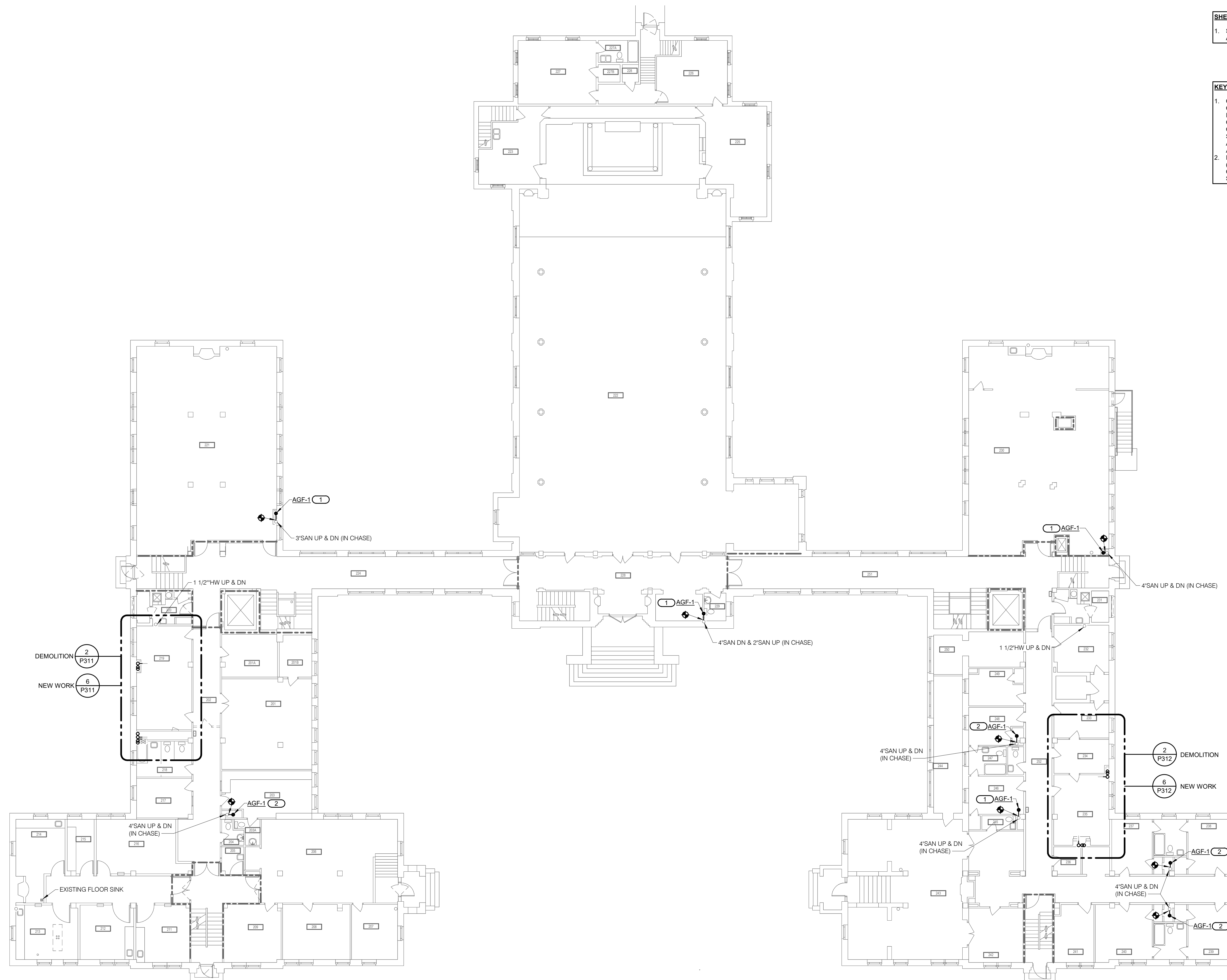
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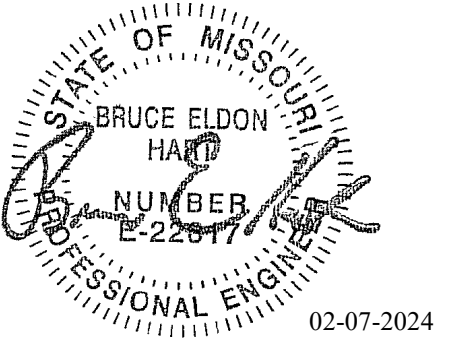
SHEET 38 OF 57

02/07/2024

SHEET NOTES:
1. SEE SHEET P000 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.

KEYNOTES: #
1. CUT A HOLE IN WALL OF EXISTING PLUMBING CHASE AS REQUIRED AND INSTALL NEW 2" INDIRECT DRAIN WITH P-TRAP (TO ACCEPT COOLING CONDENSATE) INSIDE CHASE AND CONNECT TO EXISTING SANITARY RISER AS SHOWN. PATCH HOLE IN CHASE TO MATCH ADJACENT AND INSTALL A NEW LOCKING ACCESS DOOR. REFER TO DETAIL 1/P400.
2. INSTALL NEW 2" INDIRECT DRAIN WITH P-TRAP (TO ACCEPT COOLING CONDENSATE) AND CONNECT TO EXISTING SANITARY RISER AS SHOWN.





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CAD DWG FILE: P212.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

MAIN BLDG - LEVEL 02
- PLUMBING

SHEET NUMBER:

P212

SHEET 39 OF 57

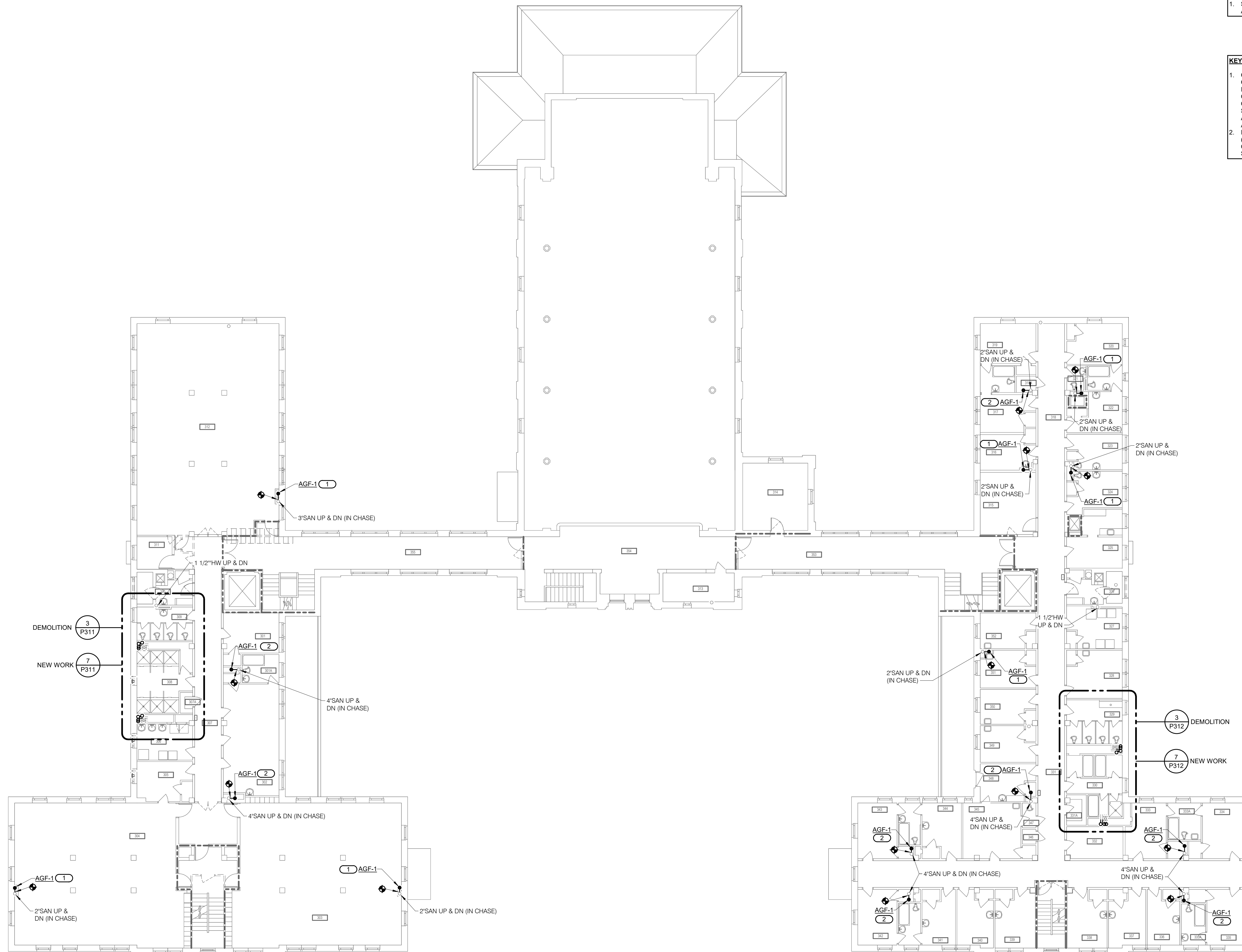
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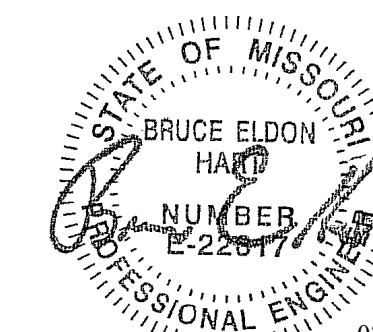
SHEET NOTES:

- SEE SHEET P000 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.

KEYNOTES: #

- CUT A HOLE IN WALL OF EXISTING PLUMBING CHASE AS REQUIRED AND INSTALL NEW 2" INDIRECT DRAIN WITH P-TRAP (TO ACCEPT COOLING CONDENSATE) INSIDE CHASE AND CONNECT TO EXISTING SANITARY RISER AS SHOWN. PATCH HOLE IN CHASE TO MATCH ADJACENT AND INSTALL A NEW LOCKING ACCESS DOOR. REFER TO DETAIL 1/P400.
- INSTALL NEW 2" INDIRECT DRAIN WITH P-TRAP (TO ACCEPT COOLING CONDENSATE) AND CONNECT TO EXISTING SANITARY RISER AS SHOWN.





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CAD DWG FILE: P213.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL

SHEET TITLE:

MAIN BLDG - LEVEL 03
- PLUMBING

SHEET NUMBER:

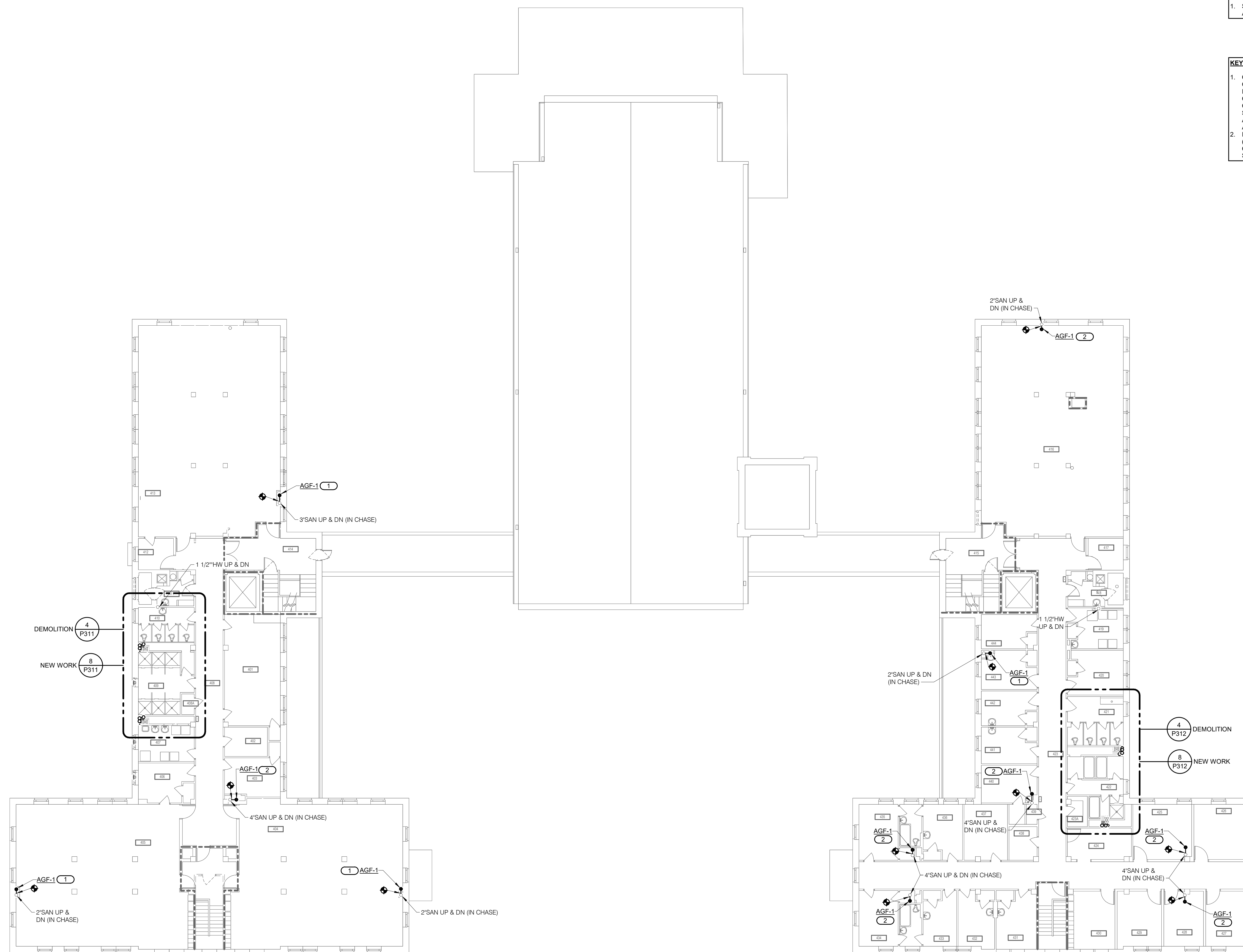
P213

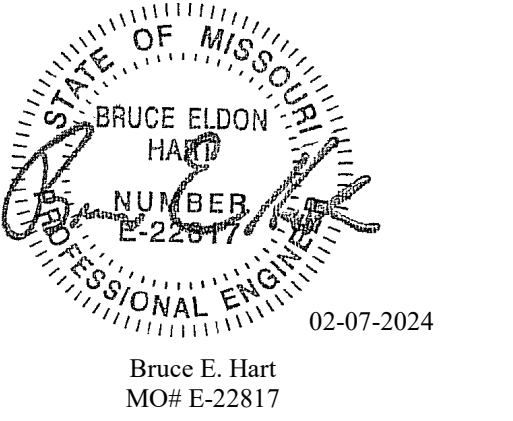
SHEET 40 OF 57

02/07/2024

SHEET NOTES:
1. SEE SHEET P000 FOR SYMBOLS,
ABBREVIATIONS AND GENERAL NOTES.

KEYNOTES: #
1. CUT A HOLE IN WALL OF EXISTING PLUMBING
CHASE AS REQUIRED AND INSTALL NEW 2"
INDIRECT DRAIN WITH P-TRAP (TO ACCEPT
COOLING CONDENSATE) INSIDE CHASE AND
CONNECT TO EXISTING SANITARY RISER AS
SHOWN. PATCH HOLE IN CHASE TO MATCH
ADJACENT AND INSTALL A NEW LOCKING
ACCESS DOOR. REFER TO DETAIL 1/P400.
2. INSTALL NEW 2" INDIRECT DRAIN WITH P-TRAP
(TO ACCEPT COOLING CONDENSATE) AND
CONNECT TO EXISTING SANITARY RISER AS
SHOWN.





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MARYVILLE TREATMENT
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MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
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ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: P311.dwg
DRAWN BY: BWC
CHECKED BY: BEH
DESIGNED BY: MJL
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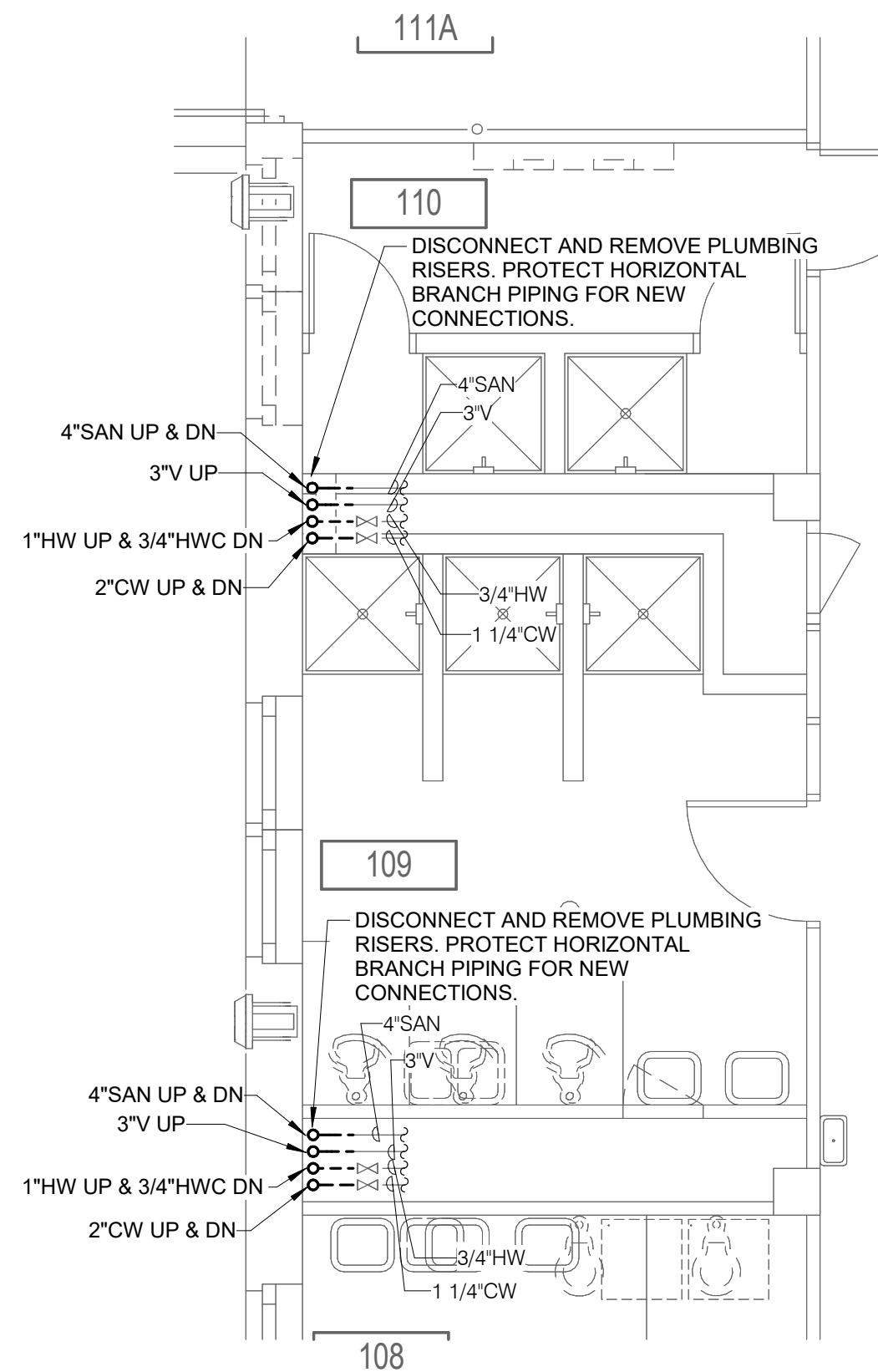
MAIN BLDG -
ENLARGED PLUMBING
PLANS

SHEET NUMBER:

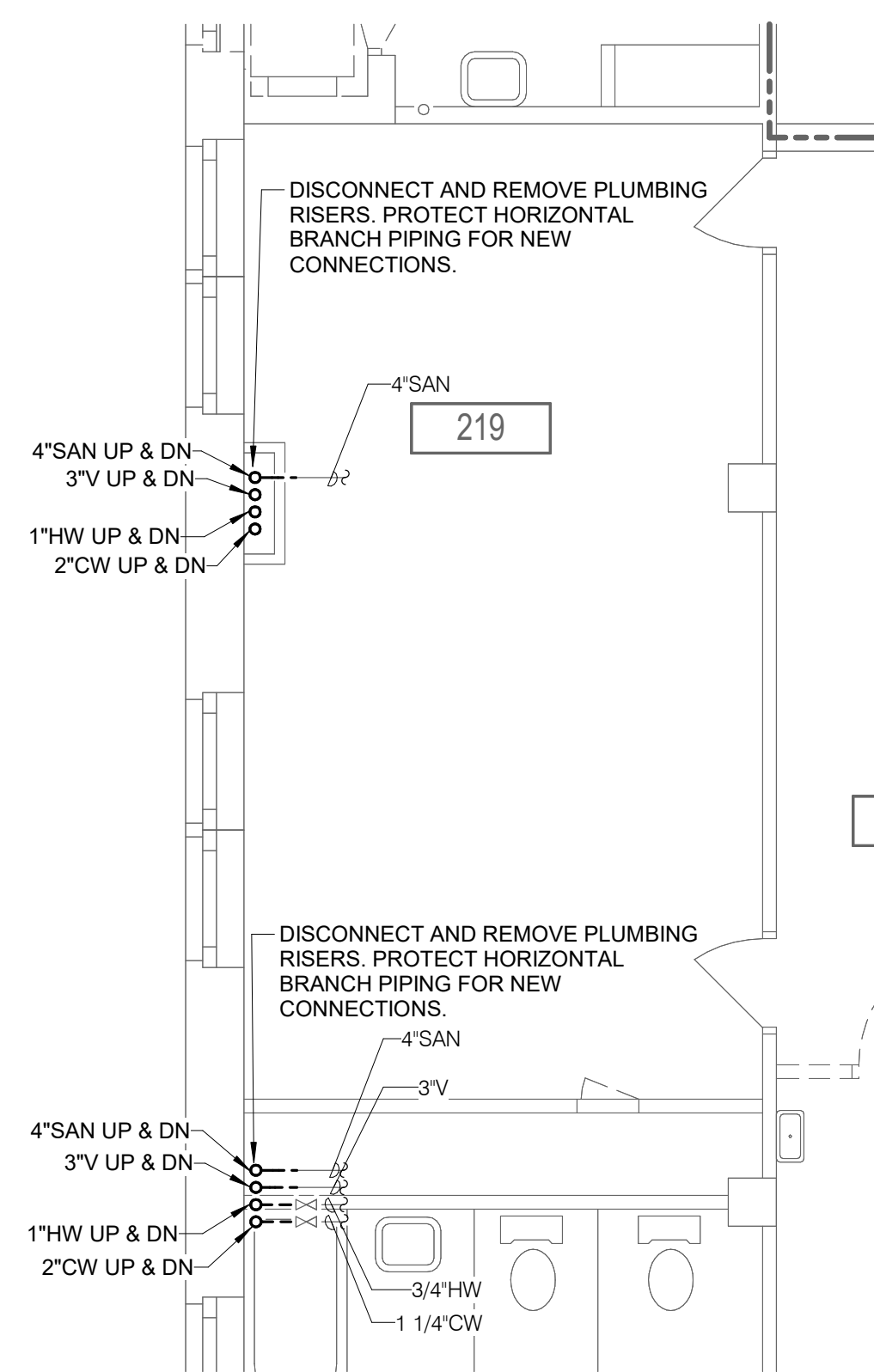
P311

SHEET 41 OF 57

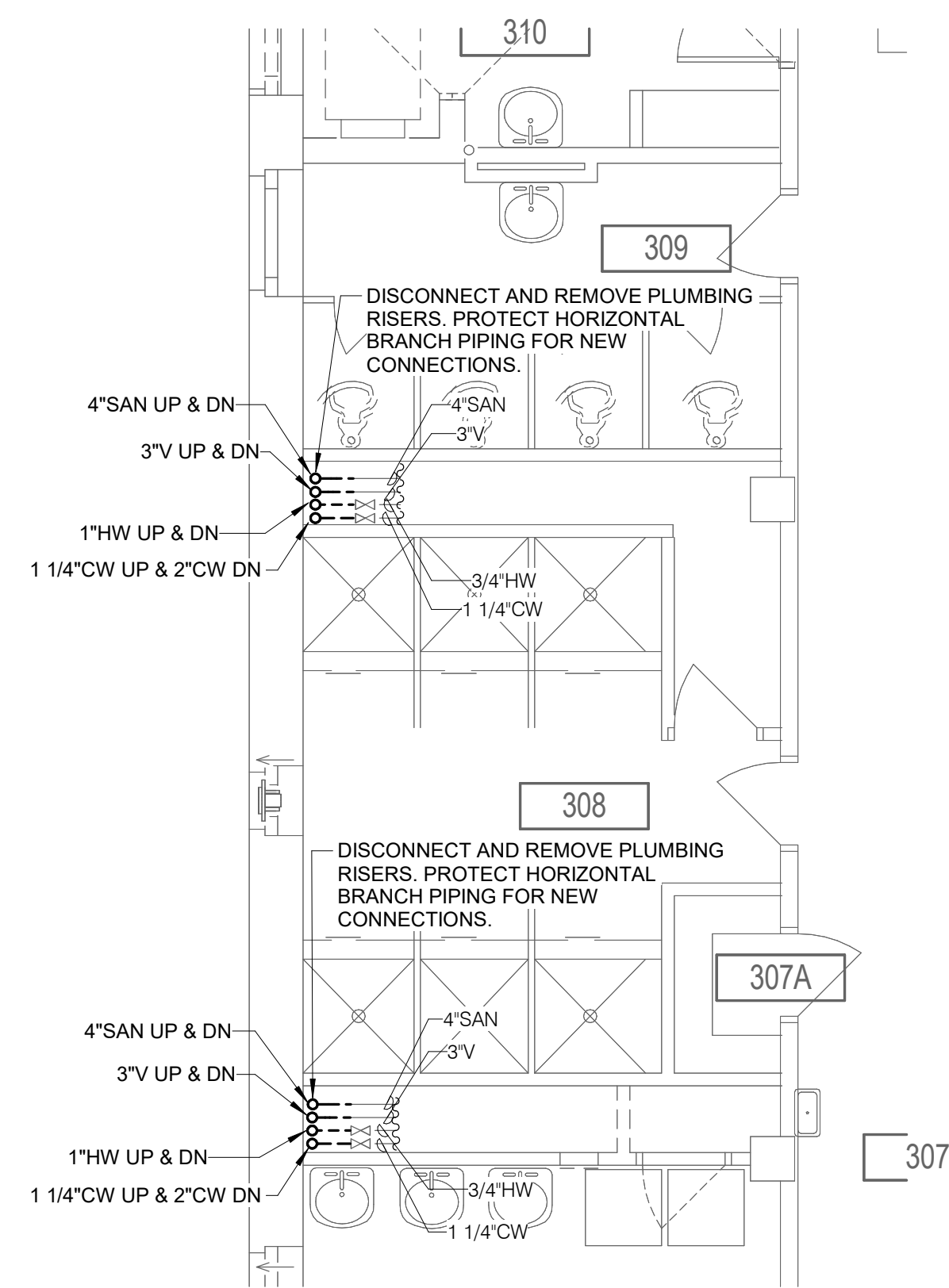
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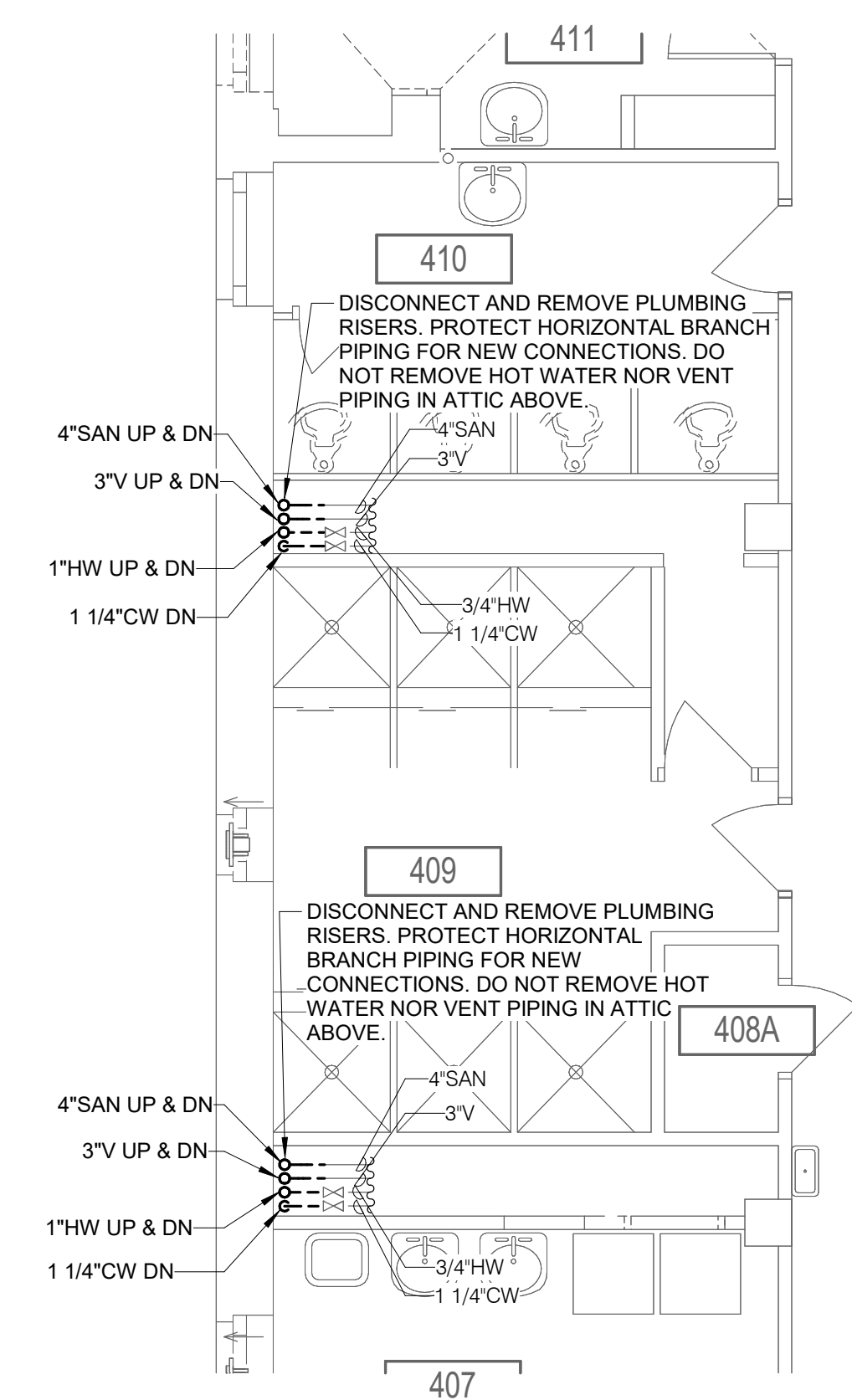
1 ENLARGED PLAN BASEMENT
LEVEL WEST PLUMBING
DEMOLITION
1/4" = 1'-0"



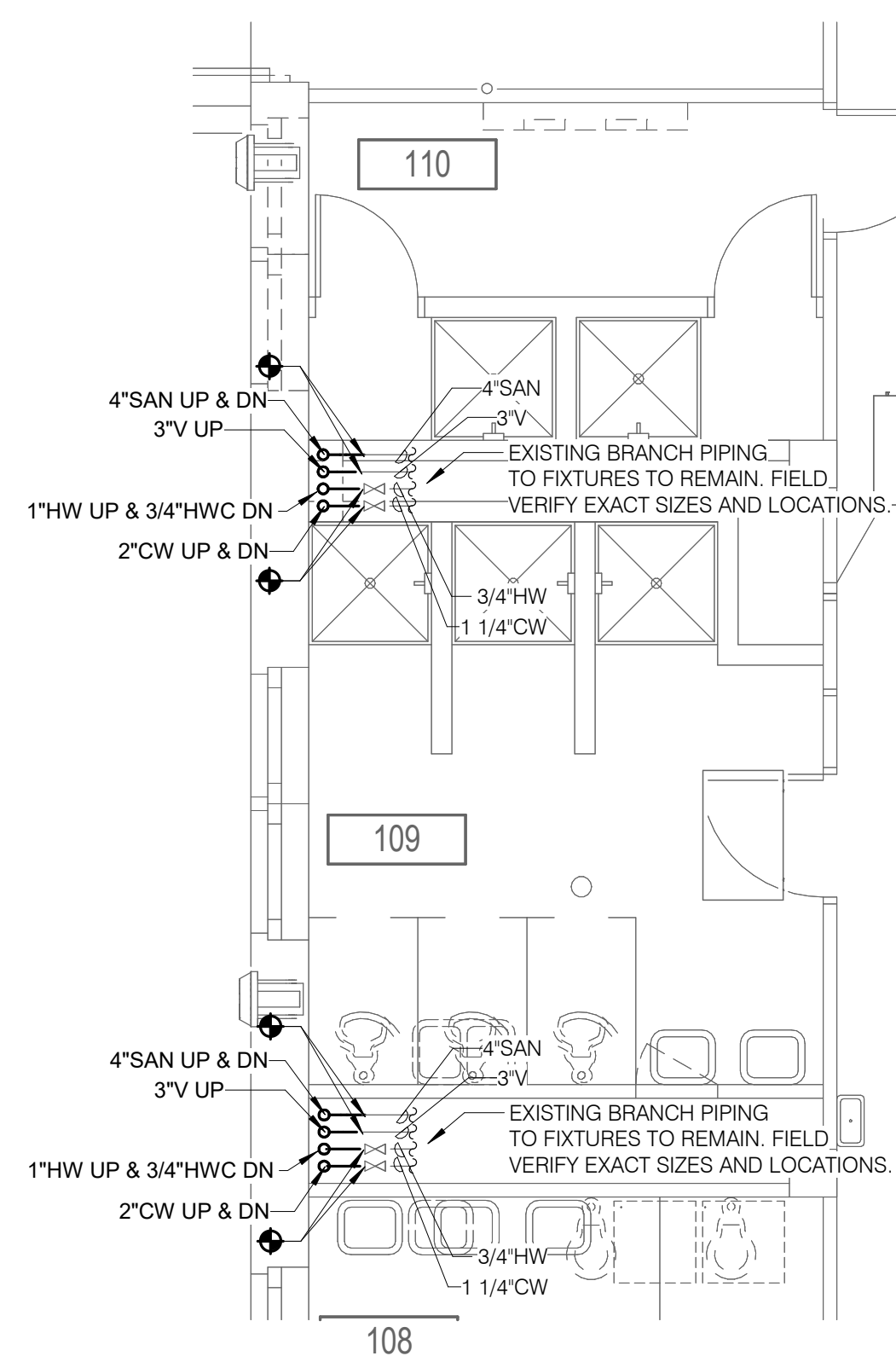
2 ENLARGED PLAN LEVEL 01
WEST PLUMBING DEMOLITION
1/4" = 1'-0"



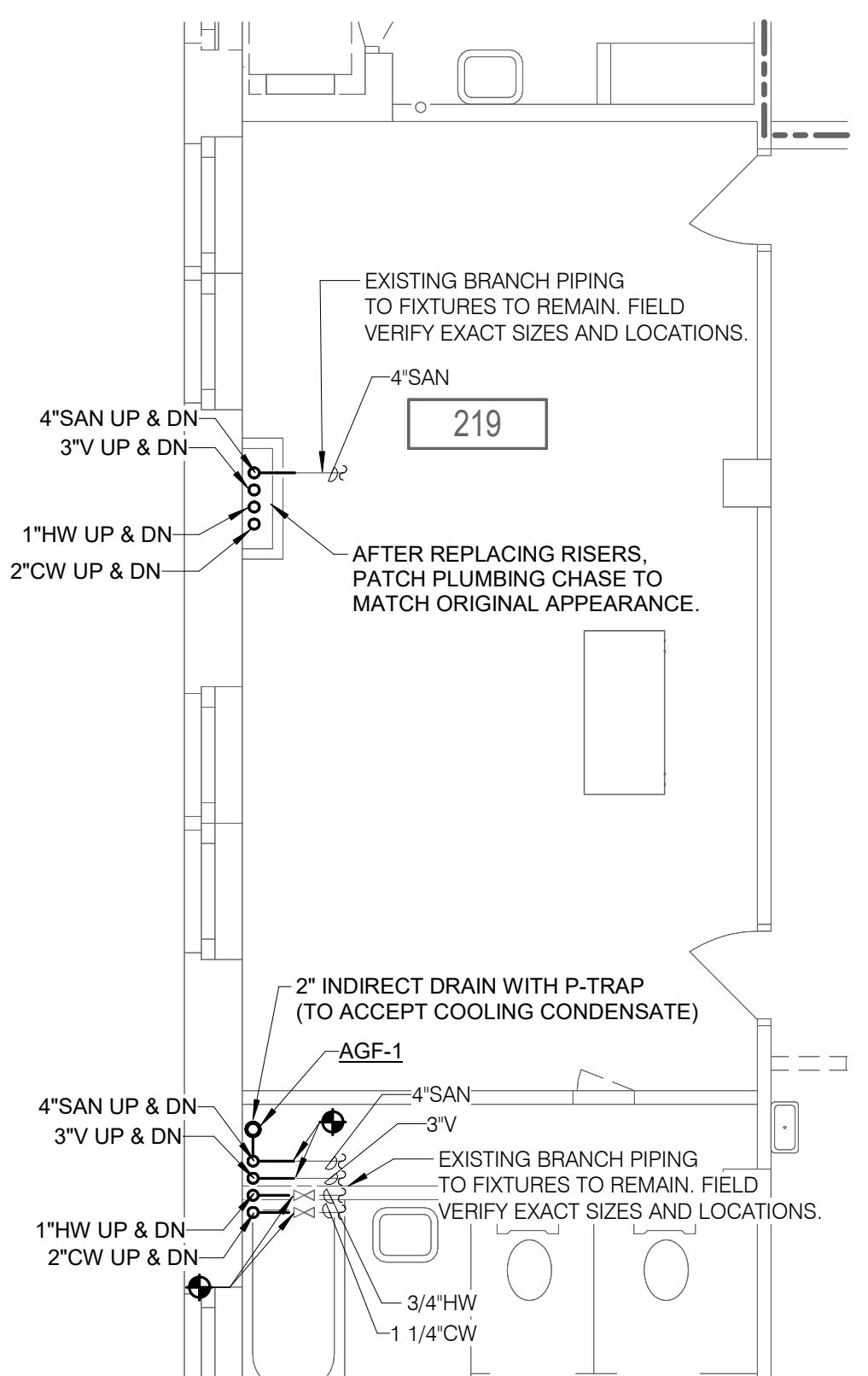
3 ENLARGED PLAN LEVEL 02
WEST PLUMBING DEMOLITION
1/4" = 1'-0"



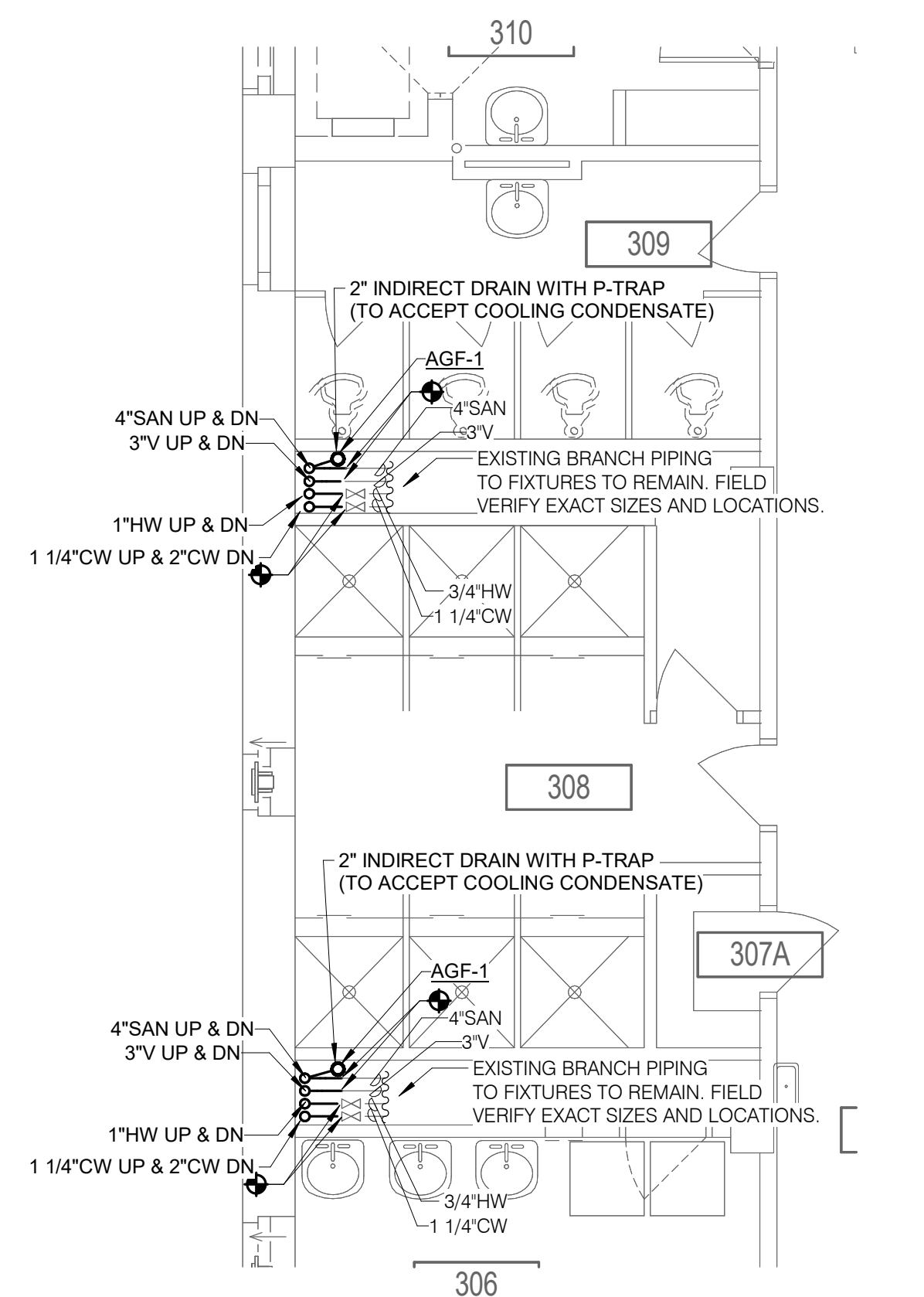
4 ENLARGED PLAN LEVEL 03
WEST PLUMBING DEMOLITION
1/4" = 1'-0"



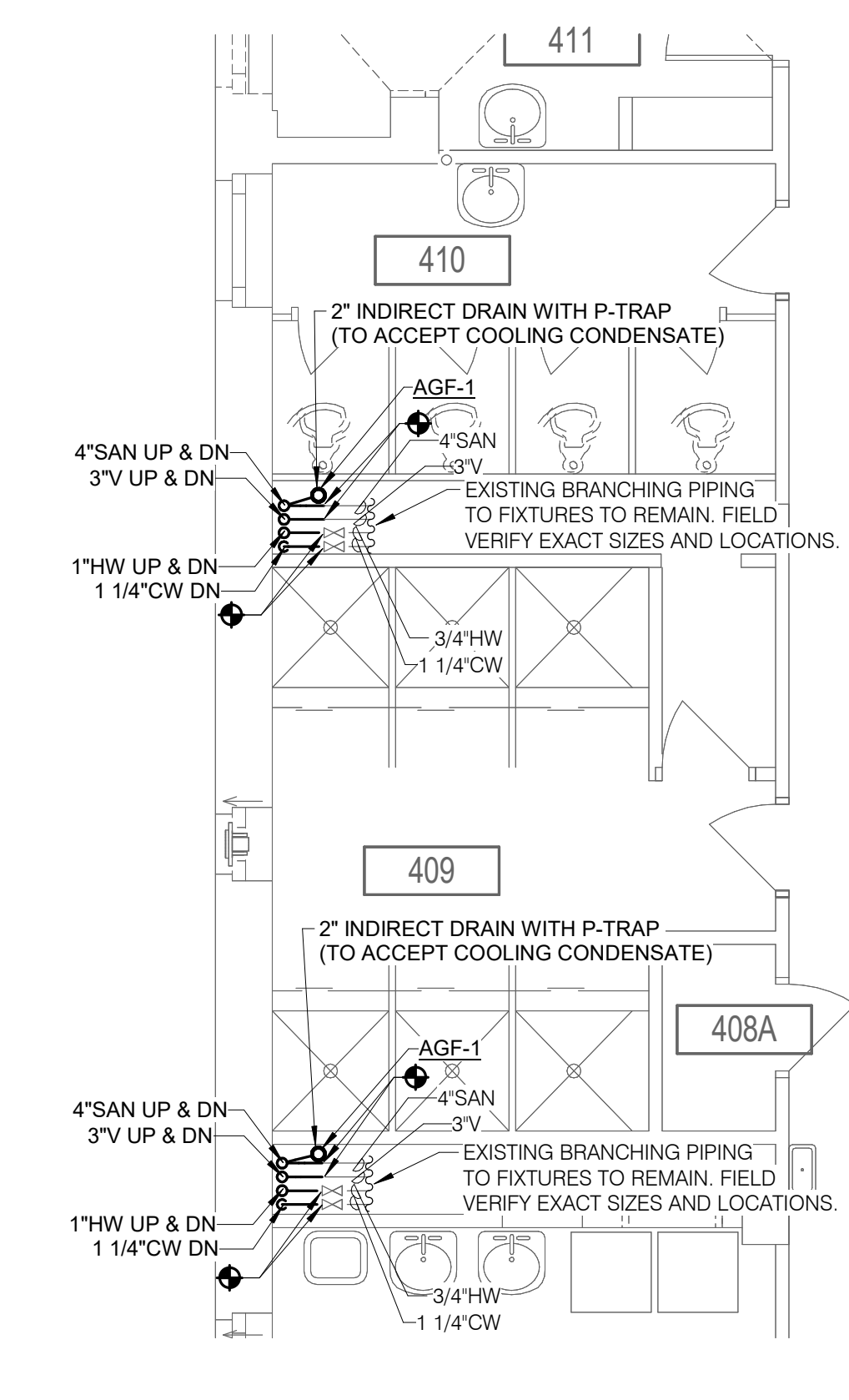
5 ENLARGED PLAN BASEMENT
LEVEL WEST PLUMBING
1/4" = 1'-0"



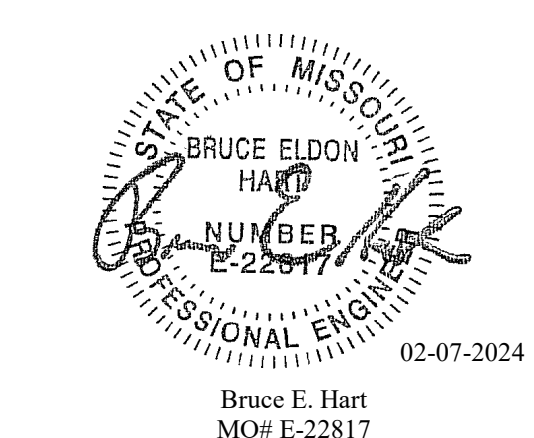
6 ENLARGED PLAN LEVEL 01
WEST PLUMBING
1/4" = 1'-0"



7 ENLARGED PLAN LEVEL 02
WEST PLUMBING
1/4" = 1'-0"



8 ENLARGED PLAN LEVEL 03
WEST PLUMBING
1/4" = 1'-0"



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MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
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ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: P312.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL
SHEET TITLE:

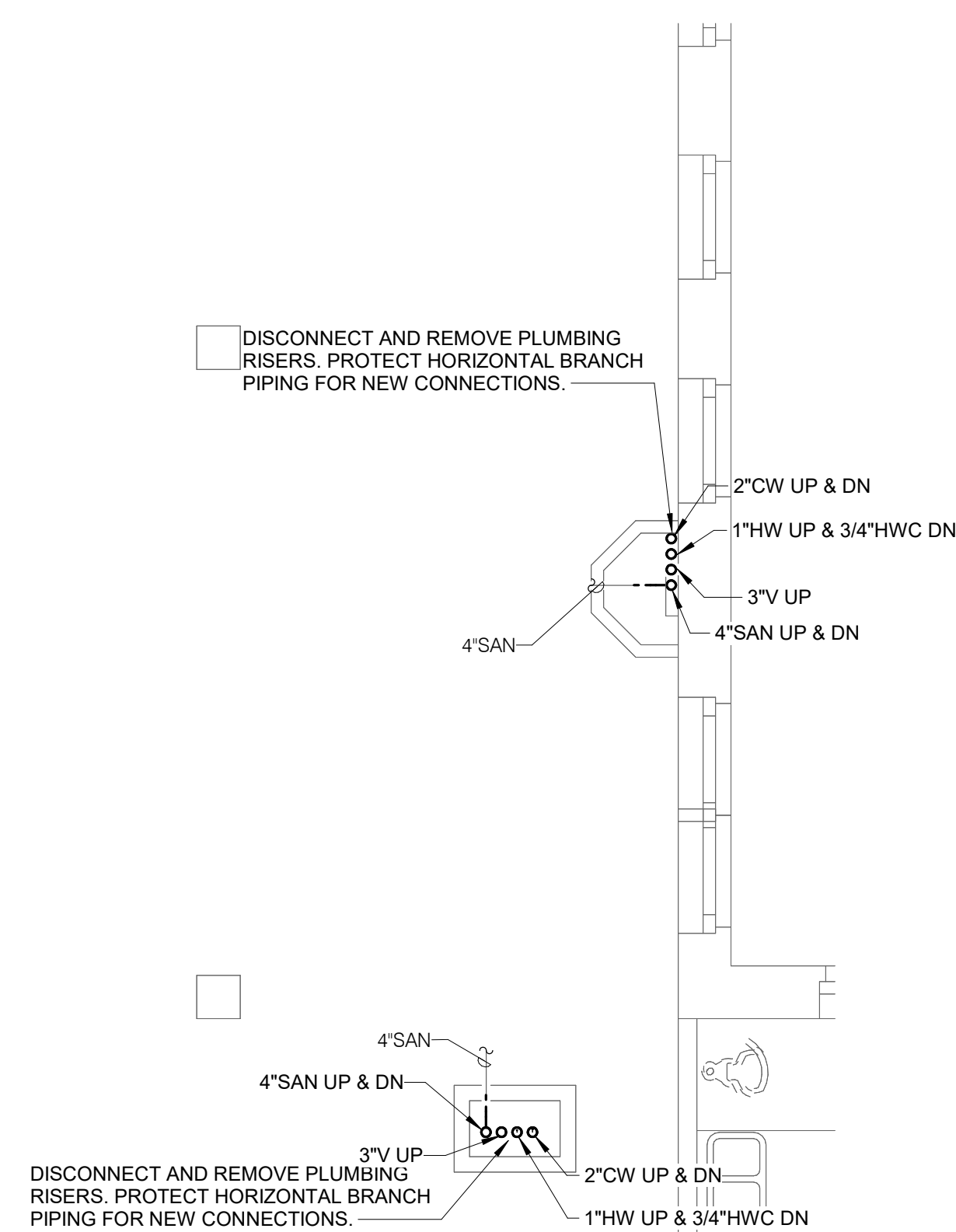
MAIN BLDG -
ENLARGED PLUMBING
PLANS

SHEET NUMBER:

P312

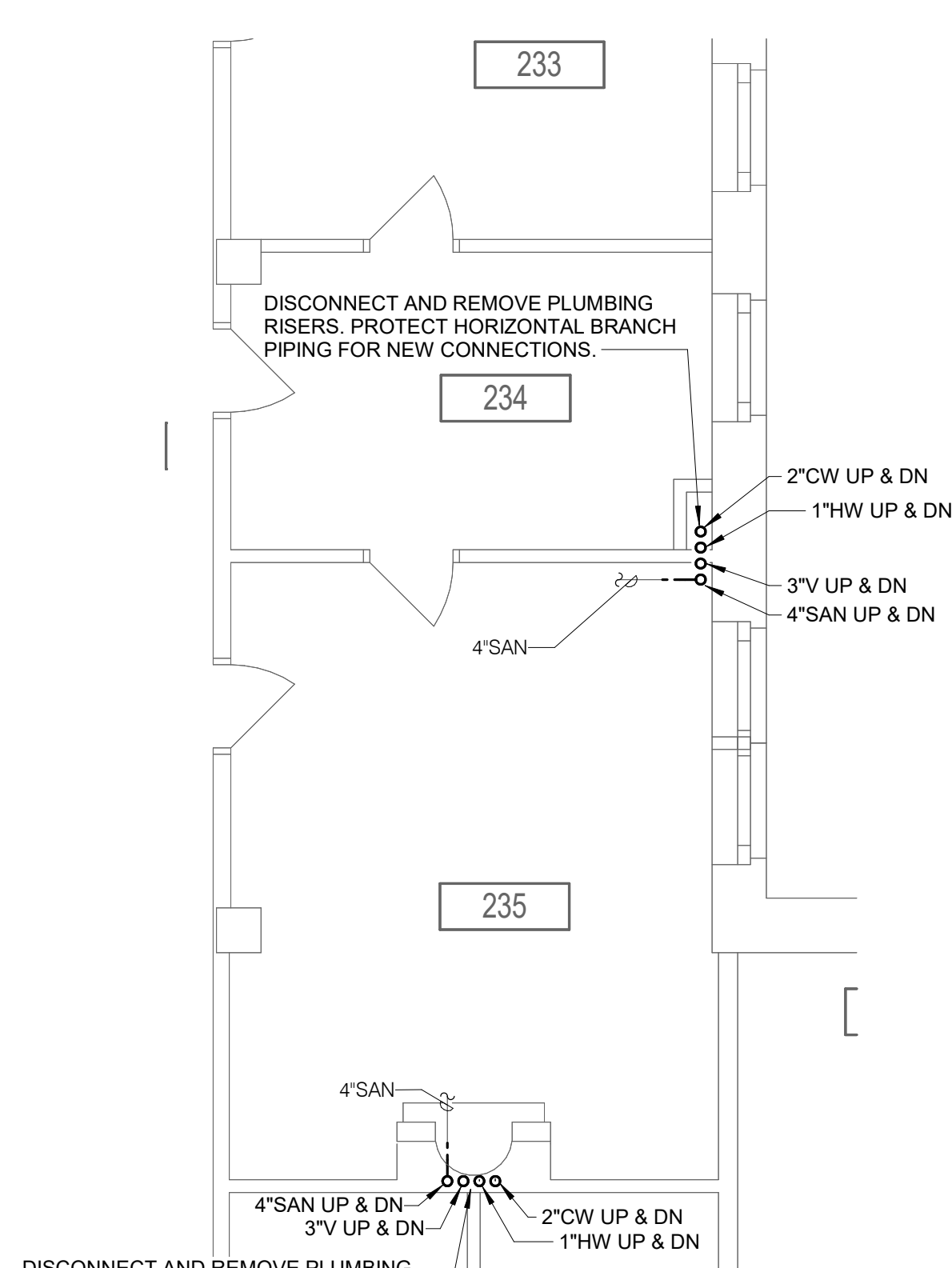
SHEET 42 OF 57

02/07/2024



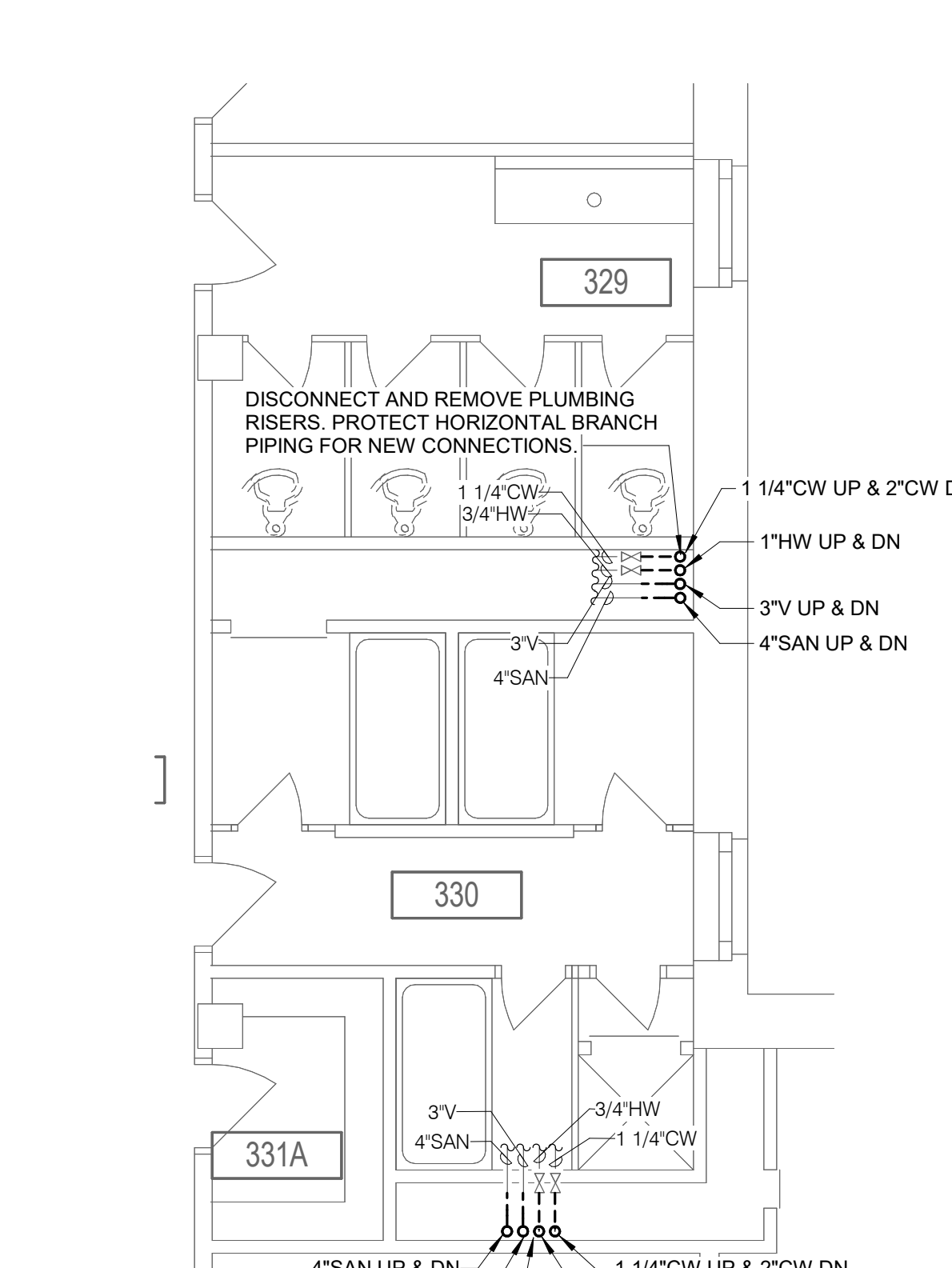
**ENLARGED PLAN BASEMENT
LEVEL EAST PLUMBING
DEMOLITION**

1
1/4" = 1'-0"



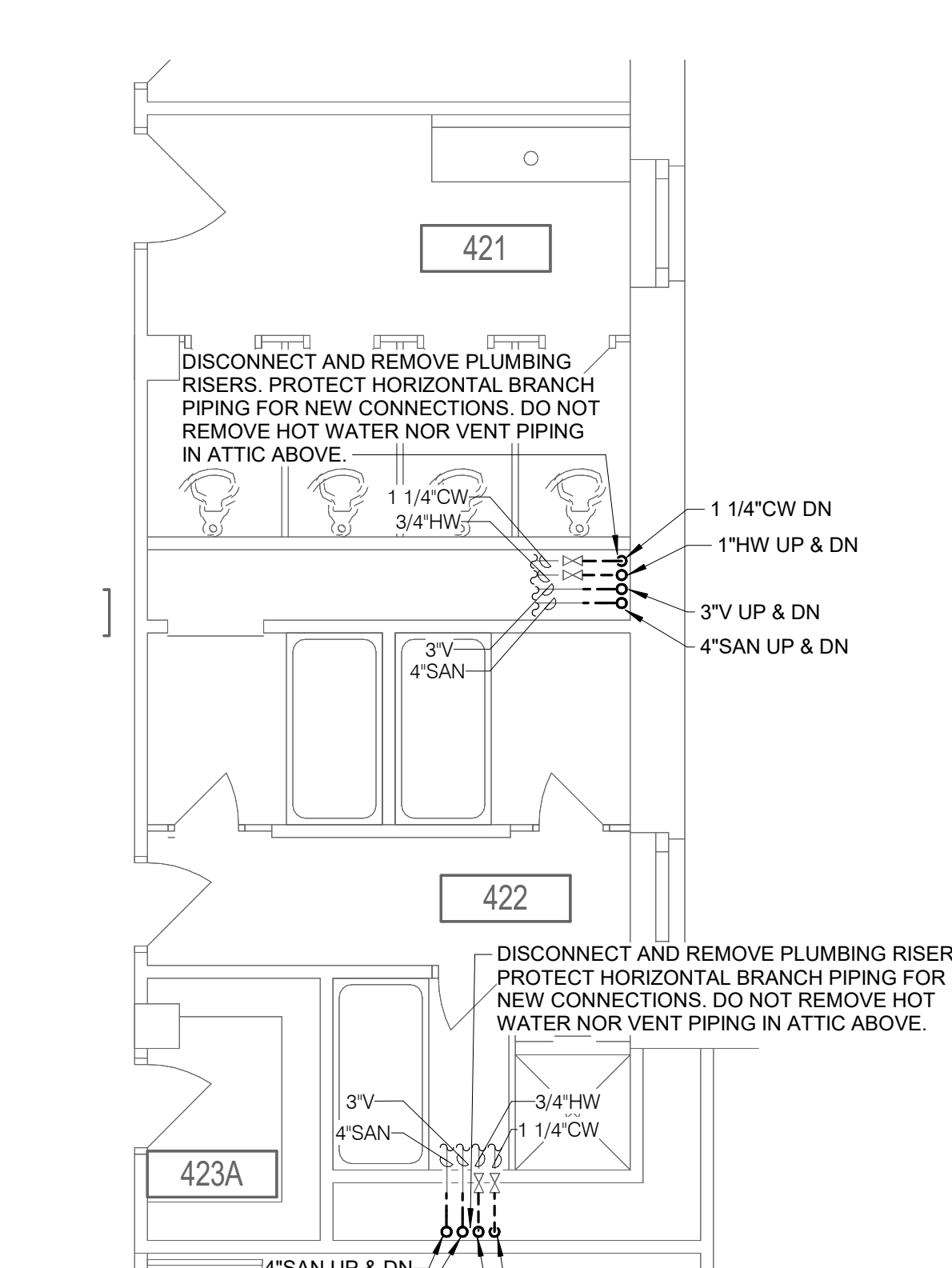
**ENLARGED PLAN LEVEL 01
EAST PLUMBING DEMOLITION**

2
1/4" = 1'-0"



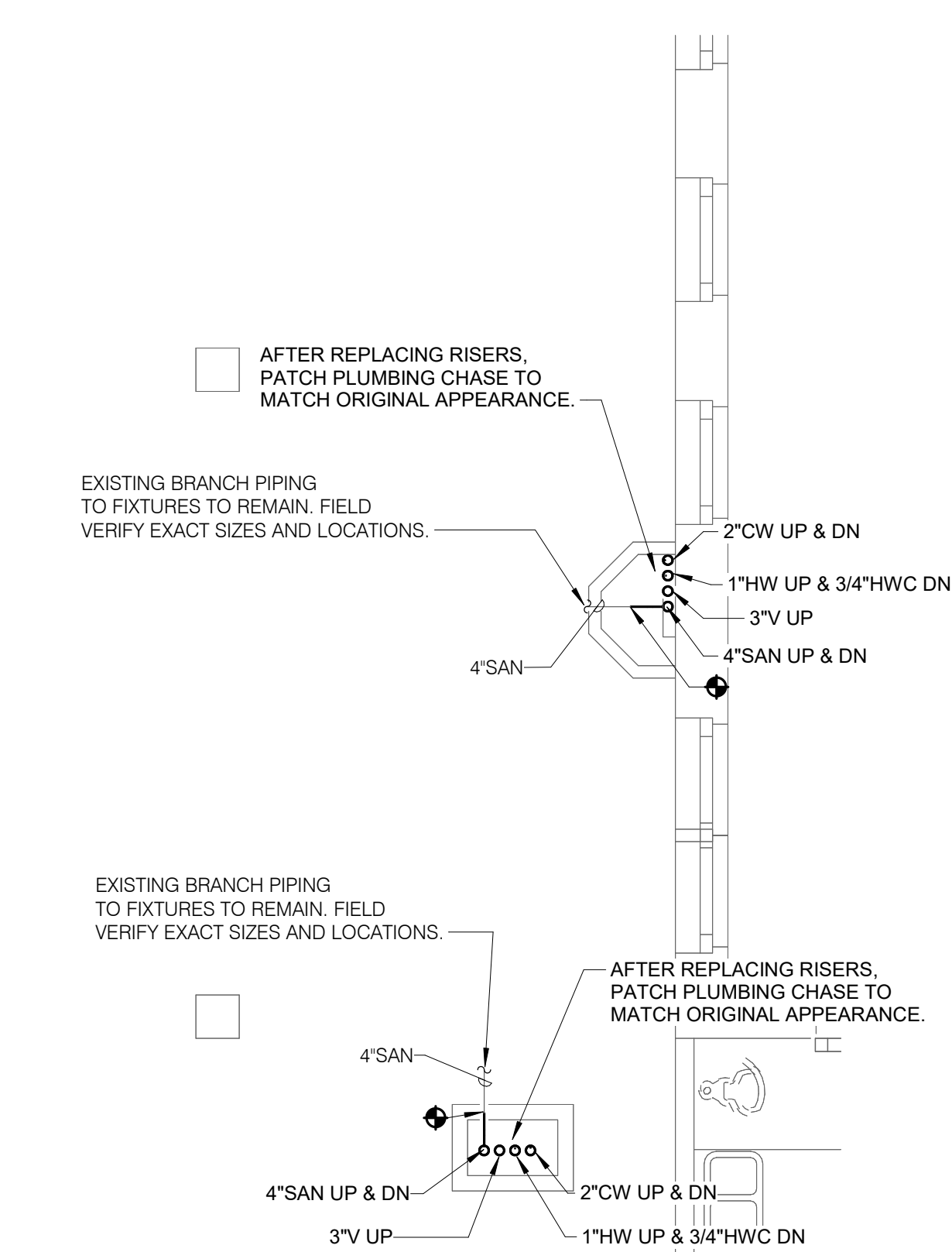
**ENLARGED PLAN LEVEL 02
EAST PLUMBING DEMOLITION**

3
1/4" = 1'-0"



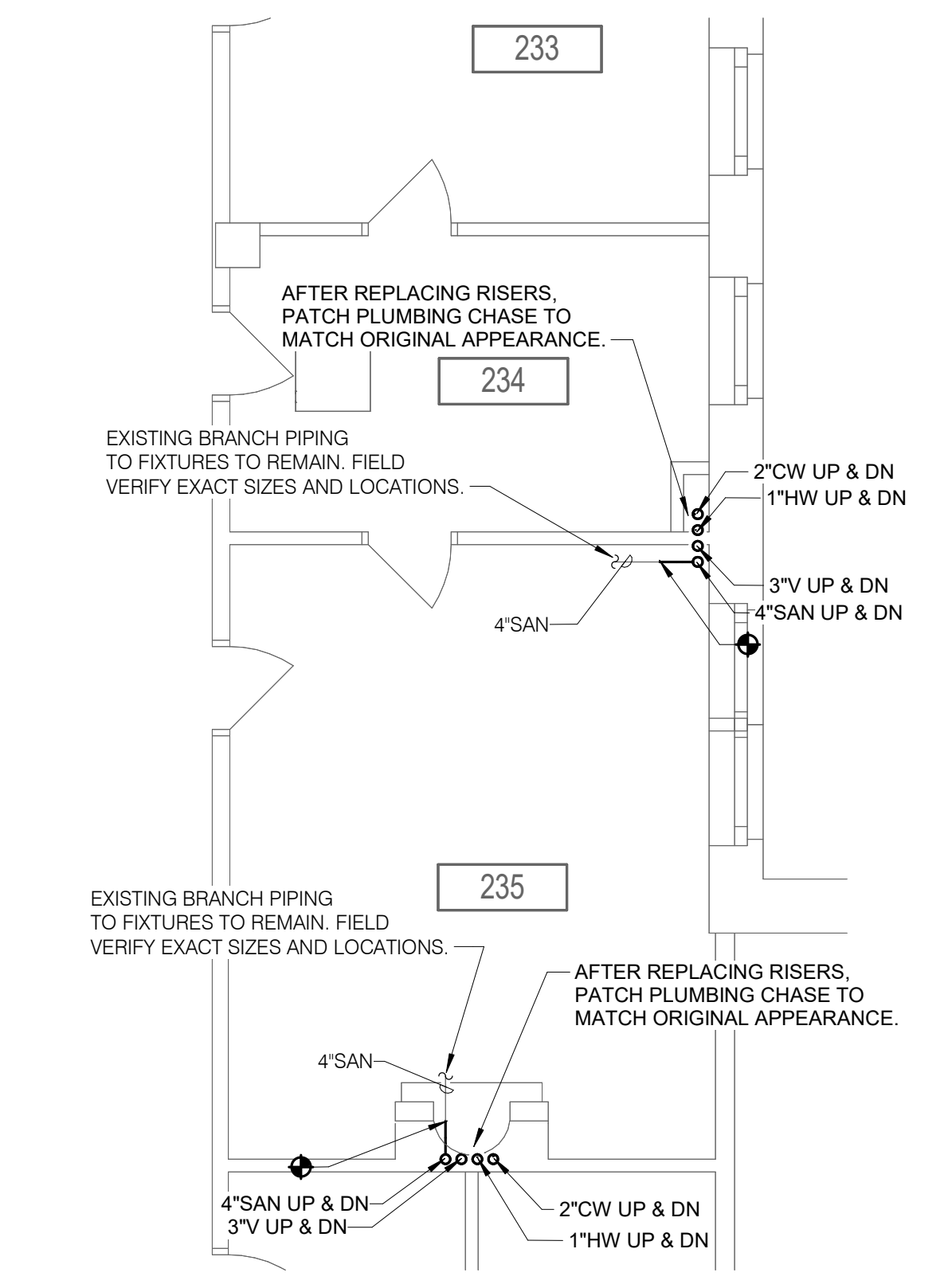
**ENLARGED PLAN LEVEL 03
EAST PLUMBING DEMOLITION**

4
1/4" = 1'-0"



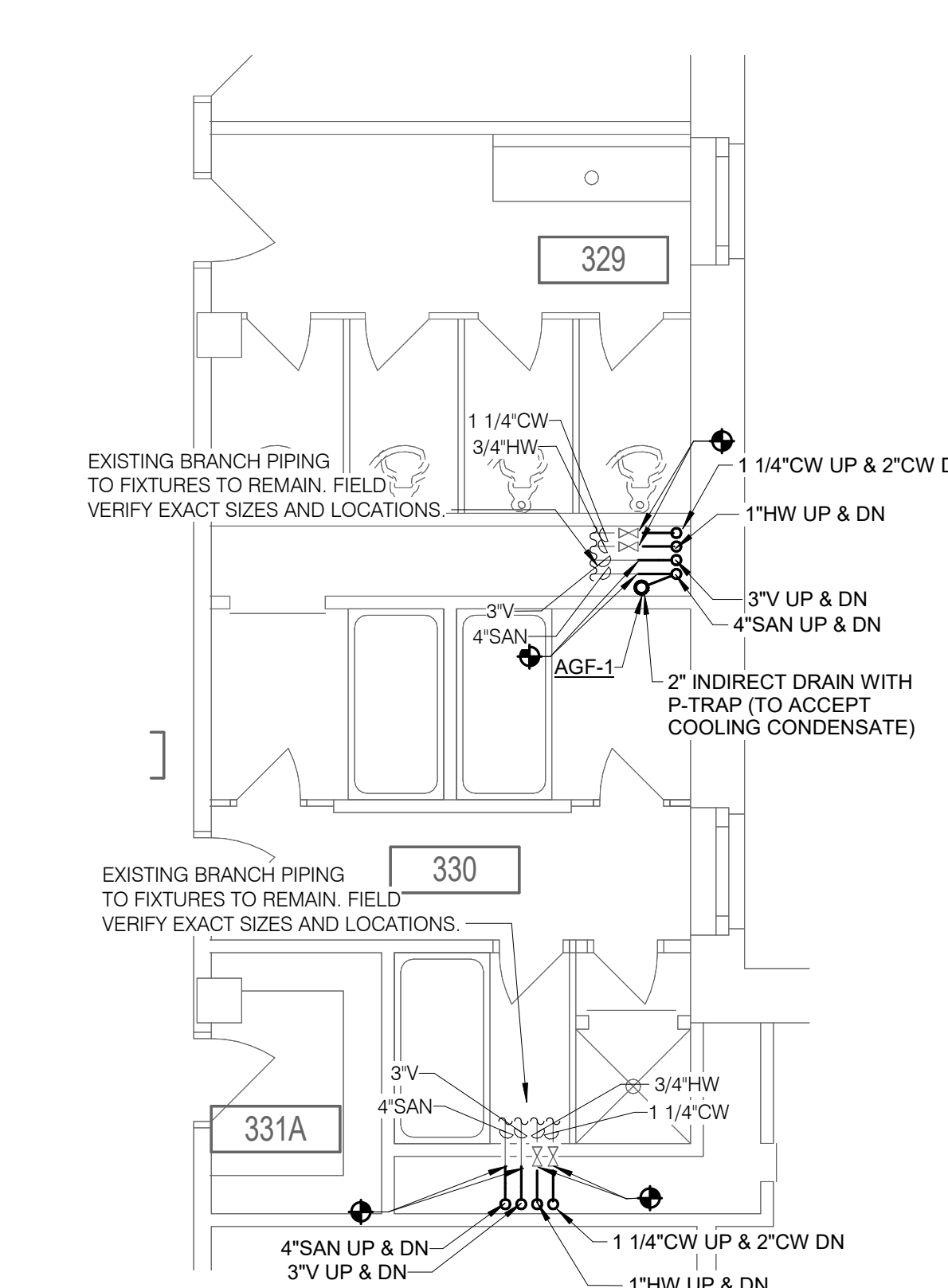
**ENLARGED PLAN BASEMENT
LEVEL EAST PLUMBING**

5
1/4" = 1'-0"



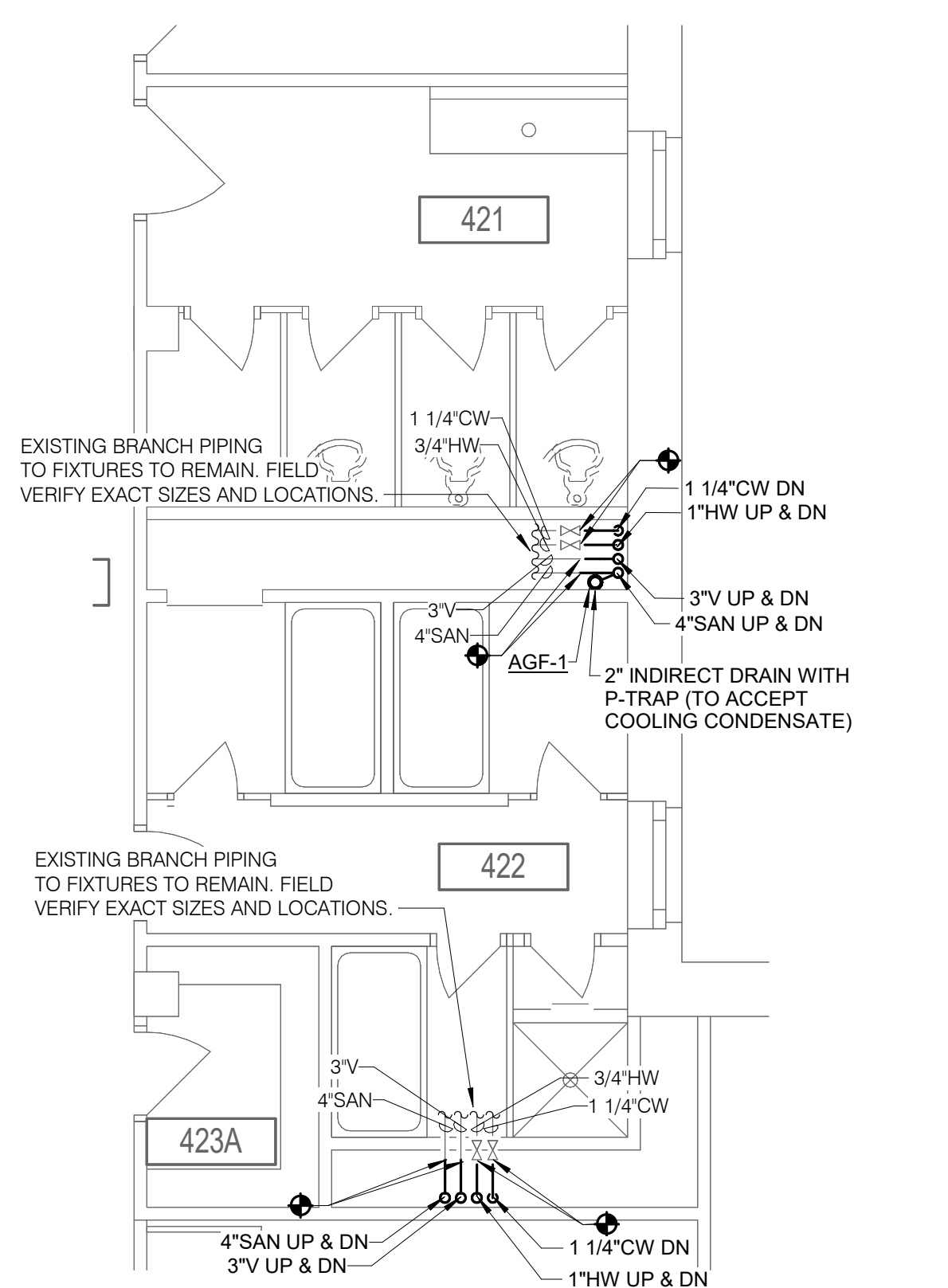
**ENLARGED PLAN LEVEL 01
EAST PLUMBING**

6
1/4" = 1'-0"



**ENLARGED PLAN LEVEL 02
EAST PLUMBING**

7
1/4" = 1'-0"



**ENLARGED PLAN LEVEL 03
EAST PLUMBING**

8
1/4" = 1'-0"

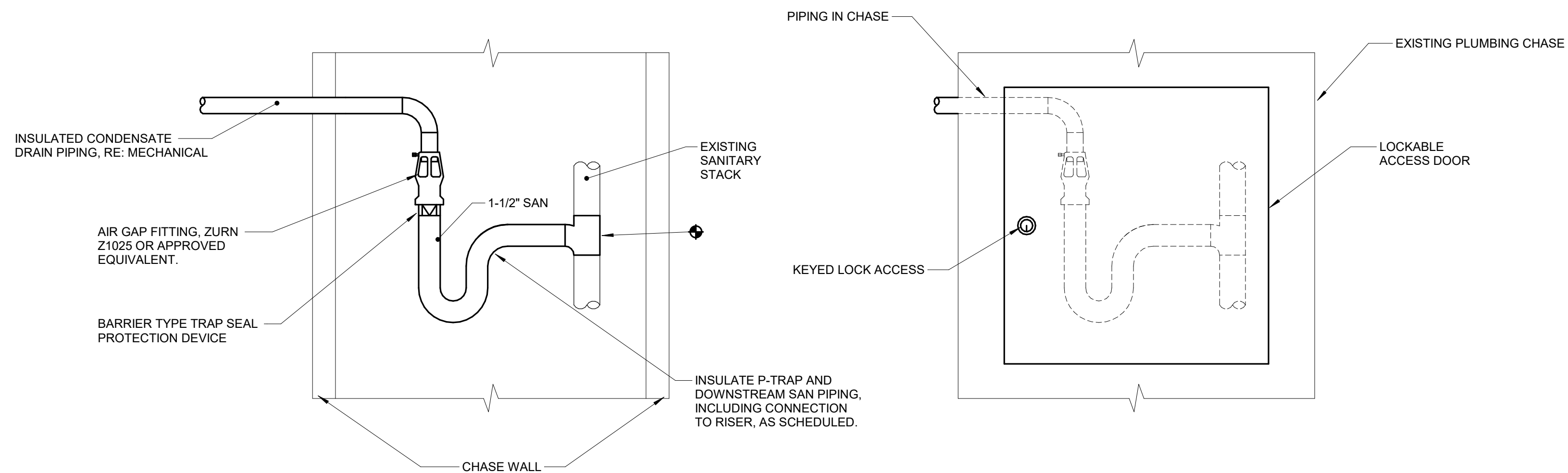
PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
AGF-1	AIR GAP FITTING - CAST IRON CONSTRUCTION, SET SCREW OR THREADED INLET, SELECT SIZE TO MATCH INDIRECT WASTE LINE INLET AND STANDPIPE OUTLET. TRAP SEAL - PLASTIC HOUSING WITH FLEXIBLE DIAPHRAGM, SEALING GASKETS, RECLOSERS AND SEALS WHEN DISCHARGE IS COMPLETED, ASSE 1072.	ZURN (Z1025), JOSAM (88900), SMITH (3955), WADE (W-2490) TRAP SEAL - SURE SEAL (SS), PROVENT (TRAP GUARD), SMITH (QUAD CLOSE)
BFP-1	BACK FLOW PREVENTER - REDUCED PRESSURE ZONE, LEAD FREE BRONZE CONSTRUCTION, SIZE SAME AS PIPE (1/2" TO 2"), NON-CORROSIVE INTERNAL PARTS, STAINLESS STEEL SPRINGS, DIFFERENTIAL PRESSURE RELIEF VALVE BETWEEN SPRING-LOADED CHECK VALVES, BALL STYLE SHUT-OFF VALVES ON INLET AND OUTLET OF UNIT, AIR GAP DRAIN FITTING, TEST PORTS WITH SHUT-OFF VALVES, RATED FOR 175 PSI AT 33°F TO 140°F, 15 PSI (MAXIMUM) PRESSURE DROP AT 10 FPS, FACTORY TESTED, ALL PARTS TO BE SERVICEABLE WITHOUT REMOVING UNIT FROM LINE, APPROVED BY USC FCCC & HR, AWWA C511-92, ASSE 1013, IAPMO AND SBCCI LISTED. MOUNT WITHIN 60" OF FINISHED FLOOR. ROUTE DRAIN PIPE FROM AIR GAP FITTING TO FLOOR DRAIN. PROVIDE AND INSTALL BRONZE OR EPOXY COATED STRAINER UPSTREAM OF EACH UNIT AND ADDITIONAL VALVE UPSTREAM OF EACH STRAINER. FLOW PRESSURE DROP CURVES SHALL BE SUBMITTED.	WATTS (LF919), APOLLO (RPLF4A), WILKINS (975XL2)
CP-1	CIRCULATING PUMP - LEAD FREE BRONZE CONSTRUCTION, PERMANENTLY LUBRICATED SEALED BEARINGS, MECHANICAL SEAL, OIL LUBRICATED, OPEN DRIP-PROOF NON OVERLOADING MOTOR WITH THERMAL OVERLOAD PROTECTION, FLANGED CONNECTIONS, RATED FOR 125 PSIG AT 225°F, UL LISTED. 30 GPM @ 25 FEET OF HEAD. MOTOR SHALL BE 1/6 HP. ELECTRICAL REQUIREMENTS - 120V-1 PHASE (HARD-WIRE)	GRUNDFOS (UP SERIES), B&G (PL SERIES), TACO (OO SERIES)
DMV-1	DIGITAL MIXING VALVE - MASTER MIXING VALVE FOR TEMPERED WATER CONTROL, STAINLESS STEEL OR BRASS VALVE CONSTRUCTION WITH POLYMER ELECTRONICS ENCLOSURE AND INTEGRAL TEMPERATURE SENSORS. ONE MIXING VALVE SHALL BE PROVIDED AS PART OF EACH PACKAGED WATER HEATER, SCHEDULED SEPARATELY. VALVE SHALL HAVE MINIMUM OF 1" INLET/OUTLET CONNECTIONS AND BE RATED FOR A FLOW OF AT LEAST 35 GPM AT 5 PSI PRESSURE LOSS MAXIMUM. OPERATIONAL FEATURES: +/- 2 DEGREE F WATER TEMPERATURE CONTROL AT POINTS OF USE 25 FEET DOWNSTREAM DURING DEMAND AND ALSO AT THE VALVE DURING ZERO SYSTEM DEMAND. AUTOMATIC SHUTOFF OF HOT WATER UPON COLD WATER SUPPLY FAILURE AND ALSO IN THE EVENT OF POWER FAILURE. CONNECTIVITY: SINGLE POLE CHANGEOVER (SPCO) RELAY FUSED AT 2 AMPS. LCD DISPLAY WHICH CAN PROVIDE DELIVERED TEMPERATURE, ERROR CODES, AND ALERT CONDITIONS. COMMUNICATIONS PORT (INCLUDING ACCESSORIES, IF REQUIRED) TO INTERFACE WITH THE FACILITY MANAGEMENT AND CONTROL SYSTEM (FMCS) VIA BACNET. PROGRAMMABLE FEATURES: SET POINT RANGE, THERMAL DISINFECTION MODE, FIRST LEVEL HI/LOW TEMPERATURE ALARM DISPLAY, AND TEMPERATURE ERROR LEVEL FOR SAFETY SHUTDOWN. ELECTRICAL CONNECTIONS - 100-240 VAC, UL LISTED. PROVIDE FIELD ADJUSTMENT BY FACTORY AUTHORIZED REPRESENTATIVE. UNIT SHALL BE ASSE 1017 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874.	ARMSTRONG BRAIN (DMC40), POWERS INTELLISTATION (LFIS100), LEONARD (NUCLEUS NV-150-LF)
EMV-1	EMERGENCY MIXING VALVE - THERMOSTATIC MIXING VALVE FOR EMERGENCY EYEWASH OR COMBINATION EYEWASH/FACEWASH FIXTURE, BRONZE BODY CONSTRUCTION, FAIL TO COLD WATER ONLY, OUTLET THERMOMETER, COMBINATION CHECK STOPS OR SEPARATE SUPPLY CHECK VALVES AND SHUT OFF VALVES, OUTLET ISOLATION VALVE, MOUNTING BRACKET. SUPPLY SHUT OFF VALVES SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED CLOSURE. THERMOSTATIC MIXING AND PRESSURE REGULATING VALVE TO DELIVER 3 GPM OF TEMPERED WATER (60-100 DEGREE F) WITH 10 PSI PRESSURE DIFFERENTIAL. UNIT SHALL BE ASSE 1071 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874.	LEONARD (TA-LF), ACORN CONTROLS (ET71 SERIES), ARMSTRONG (Z358), APOLLO (34ELF), BRADLEY (S19 SERIES), HAWS (TWBS-EWE), LAWLER (811E1F), POWERS (ES), GUARDIAN (G6020)
PWH-1	PACKAGED WATER HEATER - PACKAGE CONSISTING OF WATER TO WATER HEAT EXCHANGER FOR USE WITH BOILER WATER SYSTEMS, DIGITAL MIXING VALVE OR CONTROL VALVE, PIPING & ACCESSORIES, HEAT EXCHANGER CIRCULATION PUMP (IF REQUIRED BY MANUFACTURER), FACTORY PRE-PIPED AND SKID MOUNTED TO A STEEL FRAME, AND FACTORY TESTED PRIOR TO SHIPPING. HEAT EXCHANGER - DOUBLE WALL, GASKETED PLATE & FRAME, WITH REMOVABLE 304 OR 316 STAINLESS STEEL PLATES, DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASME BOILER & PRESSURE VESSEL CODE SECTION VIII. HEAT EXCHANGER SHALL BE DESIGNED FOR THE FOLLOWING: BOILER WATER INLET TEMPERATURE: 180°F BOILER WATER OUTLET TEMPERATURE: CAN VARY (BOILER SYSTEM INCLUDES SEPARATE CONTROLS TO ENSURE WATER RETURNING TO BOILERS IS NEVER BELOW 140°F) BOILER WATER FLOW RATE: 30 GPM BOILER SIDE PRESSURE DROP: MAX. 8 PSI DOMESTIC WATER INLET TEMPERATURE: 40°F DOMESTIC WATER OUTLET TEMPERATURE: MIN. 132°F DOMESTIC WATER FLOW RATE: 25 GPM DOMESTIC WATER PRESSURE DROP: MAX. 5 PSI CONTROL VALVE - PACKAGE SHALL BE DESIGNED TO WORK WITH NO CONTROL VALVE ON BOILER WATER SIDE OF HEAT EXCHANGER. ON DOMESTIC WATER SIDE, IF POSSIBLE, PACKAGE SHALL INCLUDE A DMV-1 DIGITAL MIXING VALVE, AS SCHEDULED SEPARATELY. IF THE PACKAGED WATER HEATER MANUFACTURER CANNOT FURNISH A DIGITAL MIXING VALVE MEETING CONTRACT REQUIREMENTS AS PART OF THE FACTORY PRE-PIPED PACKAGE, THEN THE PACKAGE SHALL INCLUDE AN ELECTRONIC, 3-WAY CONTROL VALVE, STAINLESS STEEL OR BRASS VALVE CONSTRUCTION, WITH FACTORY-MOUNTED TEMPERATURE SENSORS AND PID CONTROLS THAT WILL ACHIEVE TEMPERATURE CONTROL TO WITHIN +/- .4°F. IN THIS CASE, CONTRACTOR SHALL ALSO PROVIDE A DMV-1 DIGITAL MIXING VALVE, AS SCHEDULED SEPARATELY, AND SHALL COORDINATE WITH THE OWNER TO INSTALL THE DMV-1 SEPARATELY, IN AN ACCESSIBLE LOCATION APPROVED BY OWNER, IN ACCORDANCE WITH DMV-1 MANUFACTURER'S WRITTEN INSTRUCTIONS. IN THAT CASE, CONTRACTOR SHALL PROVIDE ADDITIONAL ISOLATION VALVES, STRAINERS, AND CHECK VALVES (NOT SHOWN ON DRAWINGS) AT THE DMV-1, AS RECOMMENDED BY ITS MANUFACTURER. PIPING & ACCESSORIES - ON THE DOMESTIC WATER SIDE OF THE HEAT EXCHANGER, PACKAGE SHALL HAVE PIPING CONNECTIONS FOR COLD WATER INLET, HOT WATER RETURN FROM SYSTEM INLET, AND HOT WATER SUPPLY OUTLET. ALL PIPING & ACCESSORIES SHALL BE CONSTRUCTED OF STAINLESS STEEL, COPPER, OR COPPER ALLOY. PROVIDE EACH INLET CONNECTION WITH SHUT OFF VALVE, STRAINER, CHECK VALVE, AND THERMOMETER. PROVIDE OUTLET CONNECTION WITH THERMOMETER AND SHUT-OFF VALVE. PROVIDE STRAINER IN HOT PIPING BETWEEN HEAT EXCHANGE AND MIXING/CONTROL VALVE. ALSO PROVIDE UNIONS ON 3 CONNECTIONS TO MIXING/CONTROL VALVE, AND ON INLET & OUTLET CONNECTIONS OF HEAT EXCHANGER. IF REQUIRED BY MANUFACTURER, PROVIDE A 2-WAY ELECTRIC SAFETY SHUT-OFF VALVE IN HOT PIPING BETWEEN HEAT EXCHANGER AND MIXING/CONTROL VALVE, OR PROVIDE AN INTEGRAL CONSTANT SPEED HEAT EXCHANGER CIRCULATION PUMP. OPERATIONAL FEATURES - PACKAGE SHALL PROVIDE AUTOMATIC SHUTOFF OF HOT WATER UPON COLD WATER SUPPLY FAILURE AND ALSO IN THE EVENT OF POWER FAILURE. PROGRAMMABLE FEATURES - SET POINT RANGE, THERMAL DISINFECTION MODE, FIRST LEVEL HI/LOW TEMPERATURE ALARM DISPLAY, AND TEMPERATURE ERROR LEVEL FOR SAFETY SHUTDOWN. CONNECTIVITY - IF PACKAGE INCLUDES A FACTORY-MOUNTED DMV-1 DIGITAL MIXING VALVE, AS SCHEDULED SEPARATELY, AND ALL CONTROLS ARE CONTAINED WITHIN THE DMV-1, THEN NO ADDITIONAL CONNECTIVITY IS REQUIRED. OTHERWISE, PACKAGE SHALL INCLUDE A COMMUNICATIONS PORT (INCLUDING ACCESSORIES, IF REQUIRED) TO INTERFACE WITH THE FACILITY MANAGEMENT AND CONTROL SYSTEM (FMCS) VIA BACNET. ELECTRICAL CONNECTIONS - 120 VAC, HARD WIRED, UL LISTED, SINGLE-POINT POWER CONNECTION. IF PACKAGE DOES NOT INCLUDE A FACTORY-MOUNTED DMV-1 DIGITAL MIXING VALVE, THEN CONTRACTOR SHALL INCLUDE PROVISIONS FOR A SEPARATE POWER CONNECTION TO THE DMV-1. THIS SHALL BE COORDINATED WITH THE EC PRIOR TO BIDDING AND SHALL BE INSTALLED AT NO ADDITIONAL COST TO OWNER. PROVIDE FIELD ADJUSTMENT BY FACTORY AUTHORIZED REPRESENTATIVE.	ARMSTRONG (DF-WDW SERIES), AERCO (SPDW SERIES), PVI (EZ PLATE SERIES), LAARS (LP SERIES)
PWH-2	SAME AS PWH-1	SAME AS PWH-1

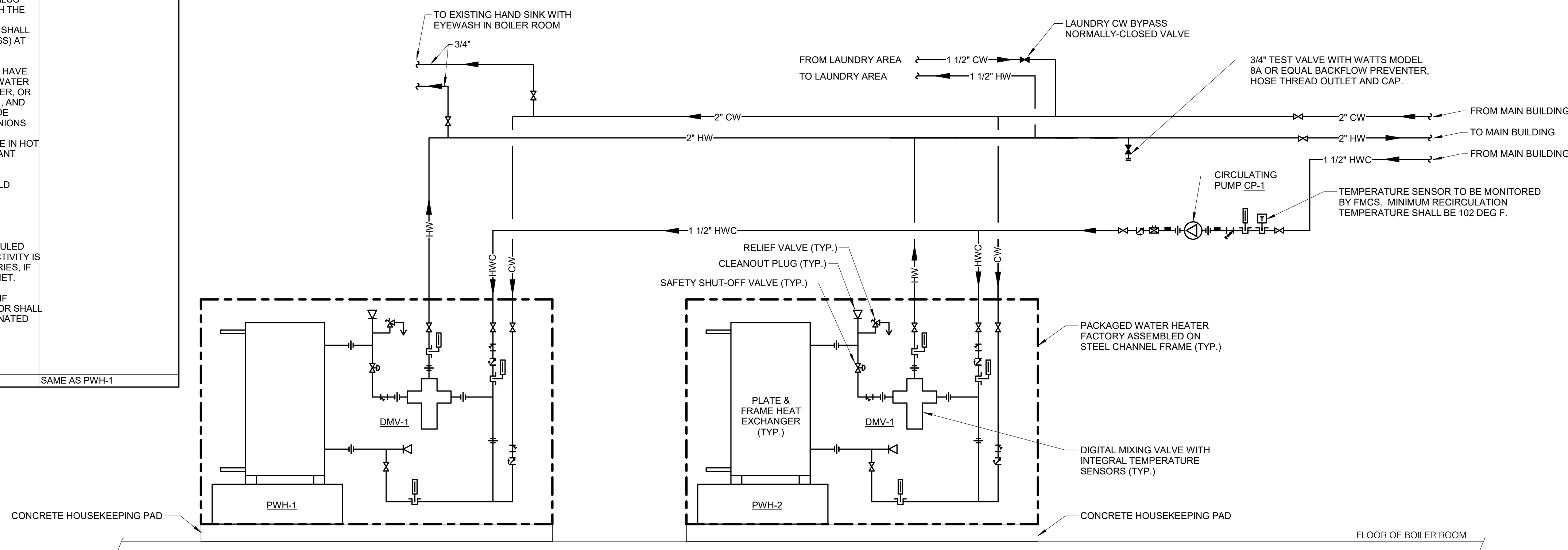
PIPE INSULATION SCHEDULE (PLUMBING)

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 BOILER ROOM, TUNNELS, 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 INSERT AND/OR SHIELD AT HANGERS. SEE SPEC. FOR MORE DETAILS.

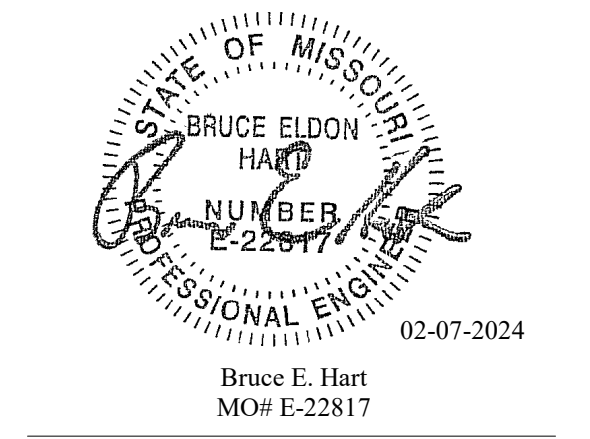
PIPE SYSTEM	INSULATION TYPE	INSULATION THICKNESS PER NOMINAL PIPE OR TUBE SIZE					NOTES
		< 1"	1" TO < 1.5"	1.5" TO < 4"	4" TO < 8"	≥ 8"	
22 PLUMBING - WASTE							
SAN - SANITARY DRAINAGE	B (Elasto)	0.5"	0.5"	1"	1"	1"	APPLY INSULATION ONLY TO FLOOR DRAIN BODY, P-TRAP AND 10' DOWNSTREAM AT LOW TEMP DRAIN DISCHARGE (55 DEG AND LOWER IE: COOLING COIL CONDENSATE, ICE MACHINE DRAINS, ETC.) WHERE LOW TEMP DRAINS CONNECT TO EXISTING VERTICAL SAN PIPING THAT IS CONCEALED IN A WALL, ADDING INSULATION TO THE EXISTING RISER IS NOT REQUIRED, EXCEPT AT THE CONNECTION POINT.
22 PLUMBING - WATER							
CW - COLD WATER - POTABLE	B (Elasto)	0.5"	0.5"	1"	1"	1"	
HW - HOT WATER - POTABLE	A (GlsFbr), B (Elasto)	1"	1"	1"	1"	1"	
HWC - HOT WATER CIRCULATING - POTABLE	A (GlsFbr), B (Elasto)	1"	1"	1"	1"	1"	



2 INDIRECT DRAIN IN CHASE
NO SCALE



1 DOMESTIC WATER FLOW DIAGRAM
NO SCALE



IMEG, CORP.
Missouri Certificate of Authority: #F001325536

OFFICE OF
ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND
CONSTRUCTION

DEPARTMENT OF
CORRECTIONS

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: P600.dwg
DRAWN BY: MWM
CHECKED BY: BEH
DESIGNED BY: MJL
SHEET TITLE:

PLUMBING
SCHEDULES, DETAILS,
AND DIAGRAMS

SHEET NUMBER:

P600

SHEET 43 OF 57
02/07/2024

VIEW KEY

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

INDICATES DIRECTION OF TRUE NORTH
PLAN OR DETAIL NUMBER
PLAN OR DETAIL NAME
1/8" = 1'-0"
PLAN OR DETAIL SCALE

INDICATES SIMILAR DETAIL REFERENCED IN MULTIPLE LOCATIONS
DETAIL REFERRED TO BY SECTION CUT
M101 → SHEET DETAIL IS LOCATED ON T101

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 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 INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 2018 EDITION
FIRE CODE:	IFC 2018 EDITION
PLUMBING CODE:	IPC 2018 EDITION
MECHANICAL CODE:	IMC 2018 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2017 EDITION
LIFE SAFETY CODE:	NFPA 101 2018 EDITION
ENERGY CONSERVATION CODE:	IECC 2018

CONDUIT INSTALLATION SCHEDULE

THE FOLLOWING SCHEDULE SHALL BE ADHERED TO UNLESS THEY CONSTITUTE A VIOLATION OF APPLICABLE CODES OR ARE NOTED OTHERWISE ON THE DRAWINGS. THE INSTALLATION OF RMC CONDUIT WILL BE PERMITTED IN PLACE OF ALL CONDUIT SPECIFIED IN THIS SCHEDULE. REFER TO CONDUIT AND BOXES SPECIFICATION 26 05 33 FOR ADDITIONAL INFORMATION.

INSTALLATION TYPE	RMC	IMC	EMT	PVC COATED RMC	PVC	PVC CONCRETE ENCASED
FEEDERS: SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS, MOTOR CONTROL CENTERS, ETC.		X	X			
BRANCH CIRCUITS: LIGHTING, RECEPTACLES, CONTROLS, ETC.		X	X			
MECHANICAL EQUIPMENT FEEDERS: PUMPS, CHILLERS, AIR HANDLING UNITS, ETC.		X	X			
FLOOR MOUNTED EQUIPMENT FEEDERS: PUMPS, ETC. (INCLUDE NO MORE THAN 6 FEET OF LFMC TO PUMP)		X	X			
CONTROLS (LIGHTING, POWER, BUILDING AUTOMATION, ETC.)		X	X			
FINISHED SPACES / CONCEALED			X			
WET AND DAMP LOCATIONS: (CONDUIT, BOXES, FITTINGS, INSTALLED AND EQUIPPED TO PREVENT WATER ENTRY)	X					
ELEVATED CONCRETE SLABS (ABOVE GRADE)	X				X	
INTERIOR LOCATIONS: CONCEALED			X			
INTERIOR LOCATIONS: EXPOSED		X	X			
INTERIOR LOCATIONS: EXISTING WALLS AND EXPOSED INSTALLATION (FINISHED SPACES)			X			
UNDERGROUND / SLABS ON GRADE (IN OR UNDER SLABS ON GRADE)						
WITHIN 5' FROM THE PERIMETER OF THE BUILDING	X				X	
WITHIN 5' FROM THE PERIMETER OF THE BUILDING WHEN PASSING THROUGH THE PERIMETER OF THE BUILDING FOUNDATION:	X					X
UNDERGROUND SITE CONDUITS:						
WITHIN 5' FROM THE PERIMETER OF A BUILDING FOUNDATION	X					X
5' OR GREATER FROM THE PERIMETER OF A BUILDING FOUNDATION	X				X	
UNDER ROADS, DRIVES, AND VEHICLE TRAVELED WAYS, WHEN HDPE DIRECTIONAL BORING IS ALLOWED: PROVIDE PRESSURIZED GROUT				X	X	

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
	ECONN	26 05 33	ELECTRICAL CONNECTION
	JB	26 05 33	JUNCTION BOX
	PANEL-###	26 24 16	PANELBOARD - RECESS MOUNT
	PANEL-###	26 24 16	PANELBOARD - SURFACE MOUNT
	MX-#MS-# CB-#CS-#	26 24 19	MANUAL SWITCH / STARTER / COMBINATION STARTER/ CIRCUIT BREAKER. REFER TO DISC/STA SCHEDULE
	TR-#DTR-#	26 22 00	TRANSFORMER
	CB-#	26 28 16	CIRCUIT BREAKER - SURFACE MOUNTED
	CB-#	26 28 16	CIRCUIT BREAKER - FLUSH MOUNTED
	DS-#FDS-#/DSS-#	26 28 16	DISCONNECT SWITCH

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
	REC-DUP	26 27 26	DUPLEX RECEPTACLE, 125V
	REC-DUP-GFI	26 27 26	DUPLEX GFI RECEPTACLE, 125V
	REC-QUAD	26 27 26	QUAD RECEPTACLE, 125V
	REC-QUAD-GFI	26 27 26	QUAD GFI RECEPTACLE, 125V

ELECTRICAL EQUIPMENT TAGS

TAG:	DESCRIPTION:	RELATED SPECIFICATION
ATS-#	AUTOMATIC TRANSFER SWITCH	26 36 00
DP-#	DISTRIBUTION PANEL	26 24 16
SB-#	SWITCHBOARD	26 24 13
FDS-#	FUSED DISCONNECT SWITCH	26 28 16
VFD-#	VARIABLE FREQUENCY DRIVE	26 29 23
X-#	TRANSFORMER	26 22 00

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
A.C.	ASBESTOS ABATEMENT CONTRACTOR
C.C.	CIVIL CONTRACTOR
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
S.C.	SECURITY CONTRACTOR
T.C.	TECHNOLOGY CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR

ELECTRICAL ABBREVIATION KEY

ABBR:	DESCRIPTION:
AFF	ABOVE FINISHED FLOOR
C	CONDUIT
GFI	GROUND FAULT INTERRUPTER
NIC	NOT IN CONTRACT
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED

ELECTRICAL SHEET INDEX

E001	ELECTRICAL COVERSHEET
E100	BOILER BLDG - LOWER LEVEL - ELECTRICAL DEMOLITION
E200	BOILER BLDG - LOWER LEVEL - ELECTRICAL
E201	BOILER BLDG - UPPER LEVEL - ELECTRICAL
E209	MAIN BLDG - TUNNEL LEVEL - ELECTRICAL
E210	MAIN BLDG - BASEMENT LEVEL - ELECTRICAL
E211	MAIN BLDG - LEVEL 01 - ELECTRICAL
E212	MAIN BLDG - LEVEL 02 - ELECTRICAL
E213	MAIN BLDG - LEVEL 03 - ELECTRICAL
E400	ELECTRICAL DETAILS
E500	RISER DIAGRAM
E600	PANEL SCHEDULES
E601	PANEL SCHEDULES
E602	PANEL SCHEDULES
GRAND TOTAL: 14	

ELECTRICAL GENERAL NOTES:

- SHADED DEVICE INDICATES DEVICE IS CONNECTED TO AN EMERGENCY CIRCUIT.
- DEVICE KEY:
DEVICE ⊕ A = MOUNTING (IF APPLICABLE)
1 = CIRCUIT NUMBER
- *IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: A / 1
- ELECTRICAL MOUNTING SUBSCRIPT KEY:**
- A MOUNT AT +6" TO CENTERLINE ABOVE COUNTER OR BACKSPLASH
C MOUNT AT CEILING
H MOUNT ORIENTED HORIZONTALLY
L MOUNT IN CASEWORK
M MOUNT IN MODULAR FURNITURE
R MOUNT IN SURFACE RACEWAY

ELECTRICAL INSTALLATION NOTES:

- THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADA STANDARDS FOR ACCESSIBLE DESIGN.
- CIRCUIT NUMBERS ARE SHOWN FOR CIRCUIT IDENTIFICATION. CIRCUITING SHALL AGREE WITH NUMBERING ON THE PANEL PROVIDED. COMMON NEUTRALS MAY NOT BE USED FOR BRANCH CIRCUITS. BALANCE THE LOAD ON PANEL AS EVENLY AS POSSIBLE BETWEEN EACH PHASE.
- EMERGENCY, LEGALLY REQUIRED, OPTIONAL STANDBY BRANCH WIRING FOR FEEDERS AND BRANCH CIRCUITS SHALL BE ROUTED IN SEPARATE RACEWAY, JUNCTION BOXES, PULL BOXES, AND CABINETS. WIRING FOR EACH BRANCH SHALL BE INDEPENDENT FROM OTHER BRANCHES, INCLUDING THE NORMAL BRANCH.
- FLUSH MOUNT ALL DUPLEX RECEPTACLES AND TECHNOLOGY OUTLETS AT +18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED.
- CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINAIRES, SPRINKLER, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN.
- CONTRACTOR SHALL VERIFY ALL FURNITURE, MODULAR FURNITURE, AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS, AND REVIEWED SHOP DRAWINGS. PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION, THIS CONTRACTOR SHALL ADJUST RECEPTACLES, OUTLETS, OR CONNECTION LOCATIONS TO ACCOMMODATE FURNITURE AND/OR EQUIPMENT.
- ELECTRICAL EQUIPMENT SHALL BE MOUNTED TO AVOID IMPEDANCE OF OPERATION OF, AND/OR ACCESS TO ELECTRICAL AND MECHANICAL EQUIPMENT. ALL MOUNTING OF ELECTRICAL EQUIPMENT, ON EQUIPMENT SUPPLIED BY ANOTHER CONTRACTOR, SHALL BE APPROVED IN ADVANCE BY THE OTHER CONTRACTOR.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.
- ALL WELDING SHALL BE ACCORDING TO AMERICAN WELDING SOCIETY STANDARDS. CONTRACTOR SHALL FURNISH TO THE ARCHITECT/ENGINEER CERTIFICATES QUALIFYING EACH WELDER PRIOR TO START OF WORK. THE ARCHITECT/ENGINEER RESERVES THE RIGHT TO REQUIRE QUALIFYING DEMONSTRATION, AT THE CONTRACTOR'S EXPENSE, OF ANY WELDERS ASSIGNED TO THE JOB.
- EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO THE WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLAN AND OTHER ELECTRICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
- ELECTRICAL IDENTIFICATION. REFER TO SPECIFICATION SECTION 26 05 53 FOR COLOR/LABEL REQUIREMENTS FOR CONDUIT, BOX, CABLE/WIRE, AND EQUIPMENT.

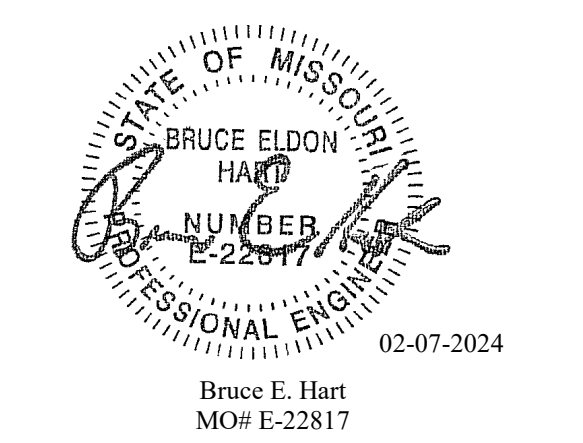
ELECTRICAL RENOVATION NOTES:

- THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES.
- 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.
 - NOT ALL EXISTING EQUIPMENT, LUMINAIRES, AND CONDUIT ARE SHOWN. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS WITH NEW WORK BEFORE STARTING WORK.
 - FIELD VERIFY THE AVAILABLE CLEARANCES FOR CABLE TRAY, BUSWAY AND CONDUITS BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
 - EACH CONTRACTOR SHALL CUT AND PATCH ROOFS, WALLS, AND FLOORS ASSOCIATED WITH THEIR WORK.
 - 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.
 - WHERE EXISTING ELECTRICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, CONDUIT, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING ELECTRICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
 - COORDINATE HOURS OF ACCESS WITH OWNER.

ELECTRICAL PHASING NOTES:

- THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES.
- MECHANICAL, ELECTRICAL AND TECHNOLOGY DRAWINGS DEPICT THE INTENT OF THE FINAL DESIGN. THE MECHANICAL, ELECTRICAL, AND TECHNOLOGY DRAWINGS DO NOT DEPICT THE MEANS AND METHODS TO MEET THE REQUIREMENTS OF THE PHASING CRITERIA.
 - REVIEW PROJECT PHASING PLANS TO COORDINATE DEMOLITION WORK, OUTAGES, ETC. WITH AFFECTED ADJACENT AREAS.
 - PROVIDE TEMPORARY LIGHTING, POWER, SYSTEMS, ETC. AS NEEDED TO MAINTAIN SERVICE TO ALL AREAS DURING ALL PHASES OF PROJECT.
 - PHASE DEMOLITION WORK TO MINIMIZE DOWNTIME.

STATE OF MISSOURI
MIKE PARSON,
GOVERNOR



IMEG, CORP.
Missouri Certificate of Authority: #F001325536

OFFICE OF
ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND
CONSTRUCTION

DEPARTMENT OF
CORRECTIONS

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E001.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB

SHEET TITLE:

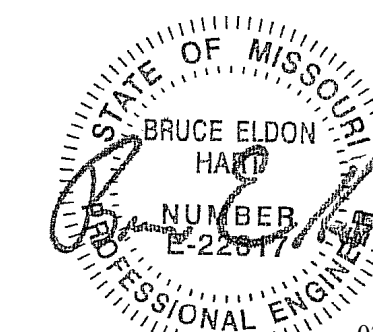
ELECTRICAL
COVERSHEET

SHEET NUMBER:

E001

SHEET 44 OF 57

02/07/2024



Bruce E. Hart
MO# E-22817



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PROJECT #23000440.00

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MARYVILLE TREATMENT
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MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
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CAD DWG FILE: E100.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB

SHEET TITLE:

BOILER BLDG - LOWER
LEVEL - ELECTRICAL
DEMOLITION

SHEET NUMBER:

E100

SHEET 45 OF 57

02/07/2024

SHEET NOTES:

1. REFER TO E001 FOR GENERAL ELECTRICAL NOTES, SYMBOLS, ELECTRICAL INSTALLATION NOTES AND OTHER MISCELLANEOUS INFORMATION. NOT ALL SYMBOLS AND GENERAL NOTES MAY APPLY TO THIS SHEET.
2. REFER TO E400 FOR RELEVANT DETAILS.
3. PROVIDE ALL NEW LABELING AND TYPE-WRITTEN PANEL DIRECTORIES FOR ALL DISTRIBUTION AND BRANCH PANELBOARDS IMPACTED BY THIS SCOPE OF WORK. MATCH LOAD DESCRIPTION WITH ACTUAL FIELD CONDITIONS AND ROOM NUMBERING.

KEYNOTES: #

1. DISCONNECT AND REMOVE EXISTING WIRE AND CONDUIT BACK TO SOURCE FOR THE DEMOLISHED MECHANICAL EQUIPMENT UNLESS WIRE OR CONDUIT CAN BE ADAPTED, MODIFIED, AND REUSED FOR NEW INSTALLATION.
2. DISCONNECT AND REMOVE WIRE AND CONDUIT BACK TO SOURCE. COORDINATE WITH MC FOR REMOVAL OF EQUIPMENT. CIRCUIT BREAKERS SERVING EQUIPMENT SHALL BE TURNED OFF AND LABELED AS SPARE, UON.

DISCONNECT AND MAINTAIN EXISTING LOAD WIRE AND CONDUIT FOR CONNECTION TO NEW PANELS DEH AND DE. REFER TO NEW WORK PLAN AND PANEL SCHEDULES FOR MORE INFORMATION.

DE-E
X-DE-E
DEH-E

DISCONNECT AND REMOVE WIRE AND CONDUIT BACK TO SOURCE. COORDINATE WITH MC FOR REMOVAL OF EQUIPMENT.

DISCONNECT AND REMOVE WIRE AND CONDUIT BACK TO SOURCE. COORDINATE WITH MC FOR REMOVAL OF LAUNDRY CIRCULATING PUMPS.

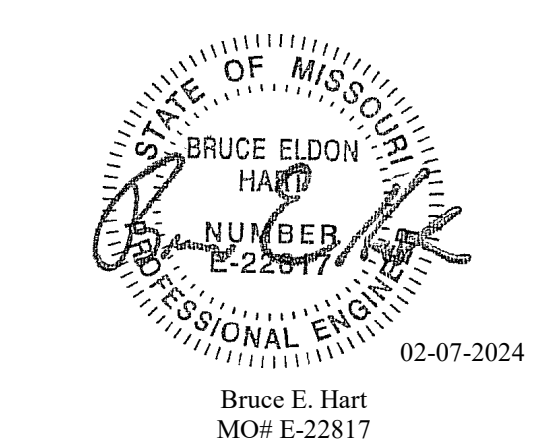
DISCONNECT AND REMOVE WIRE AND CONDUIT BACK TO SOURCE. COORDINATE WITH MC FOR REMOVAL OF LAUNDRY WATER HEATERS. LAUNDRY WATER HEATERS SHALL NOT BE REMOVED UNTIL ONE OF THE NEW PACKAGED WATER HEATERS IS INSTALLED AND FULLY OPERATIONAL.

DISCONNECT AND REMOVE WIRE AND CONDUIT BACK TO SOURCE. COORDINATE WITH MC FOR REMOVAL OF EXISTING EQUIPMENT. CIRCUIT BREAKERS SERVING EQUIPMENT SHALL BE TURNED OFF AND LABELED AS SPARE, UON.



**BOILER BLDG - LOWER LEVEL -
ELECTRICAL DEMOLITION**

1/4" = 1'-0"



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MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
 DATE:
 REVISION:
 DATE:
 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E200.dwg
 DRAWN BY: RAB
 CHECKED BY: PLR
 DESIGNED BY: RAB
 SHEET TITLE:

BOILER BLDG - LOWER
 LEVEL - ELECTRICAL

SHEET NUMBER:

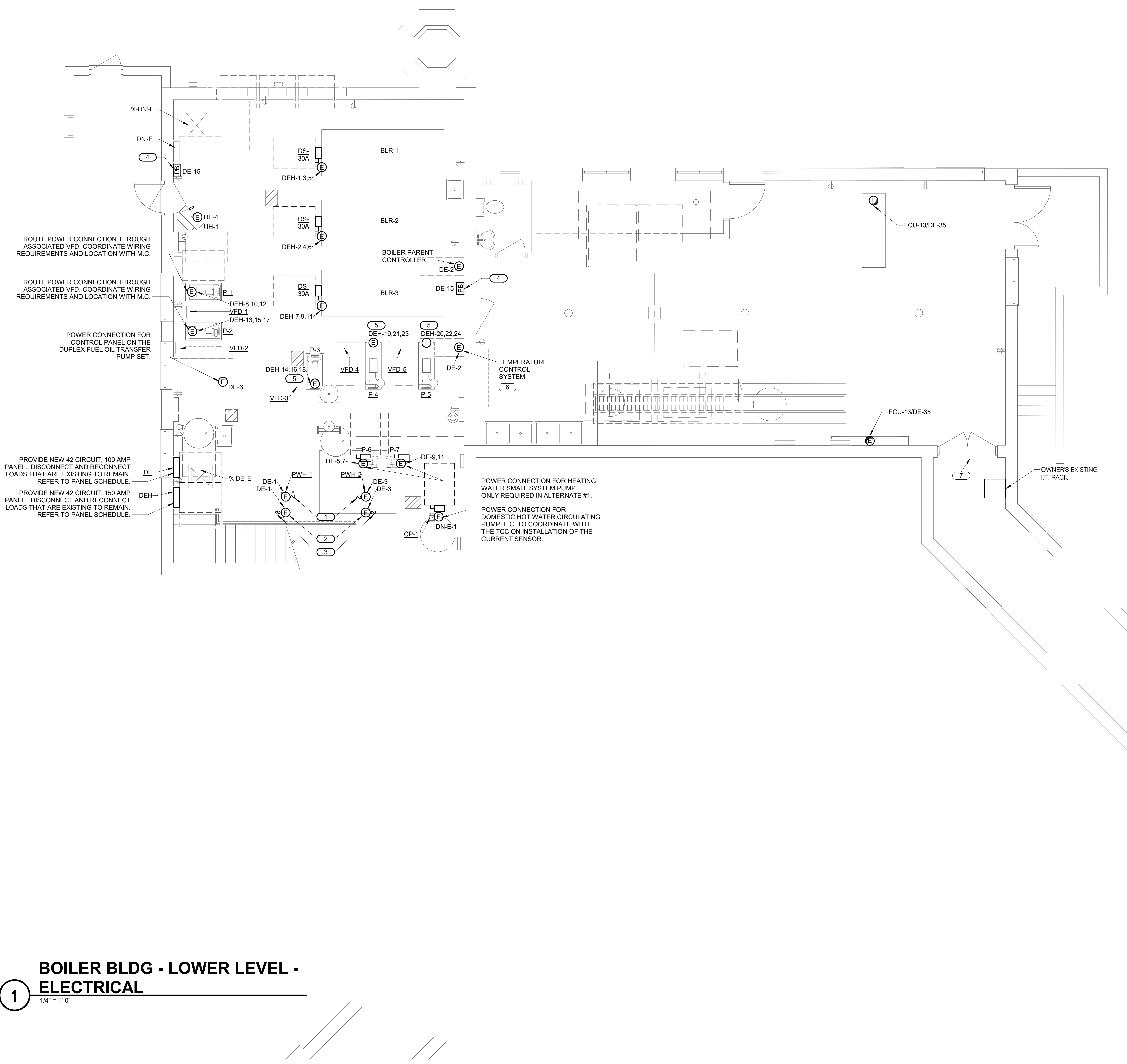
E200

SHEET 46 OF 57

02/07/2024

- SHEET NOTES:**
- REFER TO E001 FOR GENERAL ELECTRICAL NOTES, SYMBOLS, ELECTRICAL INSTALLATION INFORMATION, NOT ALL SYMBOLS AND GENERAL NOTES MAY APPLY TO THIS SHEET.
 - REFER TO E400 FOR RELEVANT DETAILS.
 - PROVIDE ALL NEW LABELING AND TYPE-WRITTEN PANEL DIRECTORIES FOR ALL DISTRIBUTION AND BRANCH PANELBOARDS IMPACTED BY THIS SCOPE OF WORK. MATCH LOAD DESCRIPTION WITH ACTUAL FIELD CONDITIONS AND ROOM NUMBERING.
 - 120 VOLT CONNECTION TO EACH FCU SHALL CONNECT TO INTEGRAL DISCONNECT SWITCH FURNISHED WITH FCU BY OTHERS.

- KEYNOTES: (#)**
- POWER CONNECTION FOR PACKAGED WATER HEATER. E.C. TO PROVIDE NON-FUSED DISCONNECT.
 - IF PACKAGED WATER HEATERS DO NOT INCLUDE A FACTORY-MOUNTED DIGITAL MIXING VALVE, PROVIDE 120V, HARD WIRED POWER CONNECTION FOR EACH DIGITAL MIXING VALVE ASSOCIATED WITH PACKAGED WATER HEATER.
 - IF THE DIGITAL MIXING VALVES ARE REQUIRED, PROVIDE ONE (1) NON-FUSED DISCONNECT SWITCH AT EACH VALVE.
 - BOILER ROOM EMERGENCY SHUTDOWN SWITCH TO BE FURNISHED AND INSTALLED BY M.C. EC TO PROVIDE 120V POWER BETWEEN SHUTDOWN SWITCHES AND PANEL FOR CONNECTION TO BOILERS BY MC. REFER TO EMERGENCY BOILER SHUTDOWN CONTROL DIAGRAM ON SHEET M520 FOR MORE INFORMATION.
 - ROUTE POWER FOR PUMP THROUGH ASSOCIATED VFD. COORDINATE WIRING REQUIREMENTS AND LOCATION WITH M.C.
 - FURNISH AND INSTALL DATA CONNECTION TO TEMPERATURE CONTROL SYSTEM NETWORK AREA CONTROLLER. PROVIDE (1) CATEGORY DATA CABLE FROM CONTROLLER TO EXISTING IT RACK IN TUNNEL BETWEEN BUILDINGS. COORDINATE EXACT TYPE OF CABLE REQUIRED WITH OWNER'S STANDARDS AND TYPE OF PATCH PANEL IN IT RACK. LEAVE 10'-0" OF SLACK CABLE AT RACK FOR FINAL CONNECTION BY OWNER.
 - RELOCATE 1" CONDUIT WITH (5) LOW-VOLTAGE CABLES EXTENDING TO IT RACK THAT IS EXTENDING THROUGH TUNNEL WALL AT THIS APPROXIMATE LOCATION TO ALLOW FOR INSTALLATION OF NEW MECHANICAL PIPING. COORDINATE RELOCATION OF CONDUIT AND CABLING WITH OWNER.



ROUTE POWER CONNECTION THROUGH ASSOCIATED VFD. COORDINATE WIRING REQUIREMENTS AND LOCATION WITH M.C.

ROUTE POWER CONNECTION THROUGH ASSOCIATED VFD. COORDINATE WIRING REQUIREMENTS AND LOCATION WITH M.C.

POWER CONNECTION FOR CONTROL PANEL ON THE DUPLEX FUEL OIL TRANSFER PUMP SET.

PROVIDE NEW 42 CIRCUIT, 100 AMP PANEL. DISCONNECT AND RECONNECT LOADS THAT ARE EXISTING TO REMAIN. REFER TO PANEL SCHEDULE.

PROVIDE NEW 42 CIRCUIT, 150 AMP PANEL. DISCONNECT AND RECONNECT LOADS THAT ARE EXISTING TO REMAIN. REFER TO PANEL SCHEDULE.

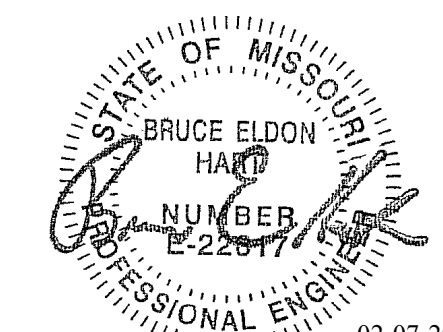
POWER CONNECTION FOR HEATING WATER SMALL SYSTEM PUMP. ONLY REQUIRED IN ALTERNATE #1.

POWER CONNECTION FOR DOMESTIC HOT WATER CIRCULATING PUMP. E.C. TO COORDINATE WITH THE TOC ON INSTALLATION OF THE CURRENT SENSOR.



BOILER BLDG - LOWER LEVEL - ELECTRICAL

1
 1/4" = 1'-0"



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REPLACE STEAM, WATER &
 SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
 DATE:
 REVISION:
 DATE:
 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E201.dwg
 DRAWN BY: RAB
 CHECKED BY: PLR
 DESIGNED BY: RAB

SHEET TITLE:

BOILER BLDG - UPPER
 LEVEL - ELECTRICAL

SHEET NUMBER:

E201

SHEET 47 OF 57

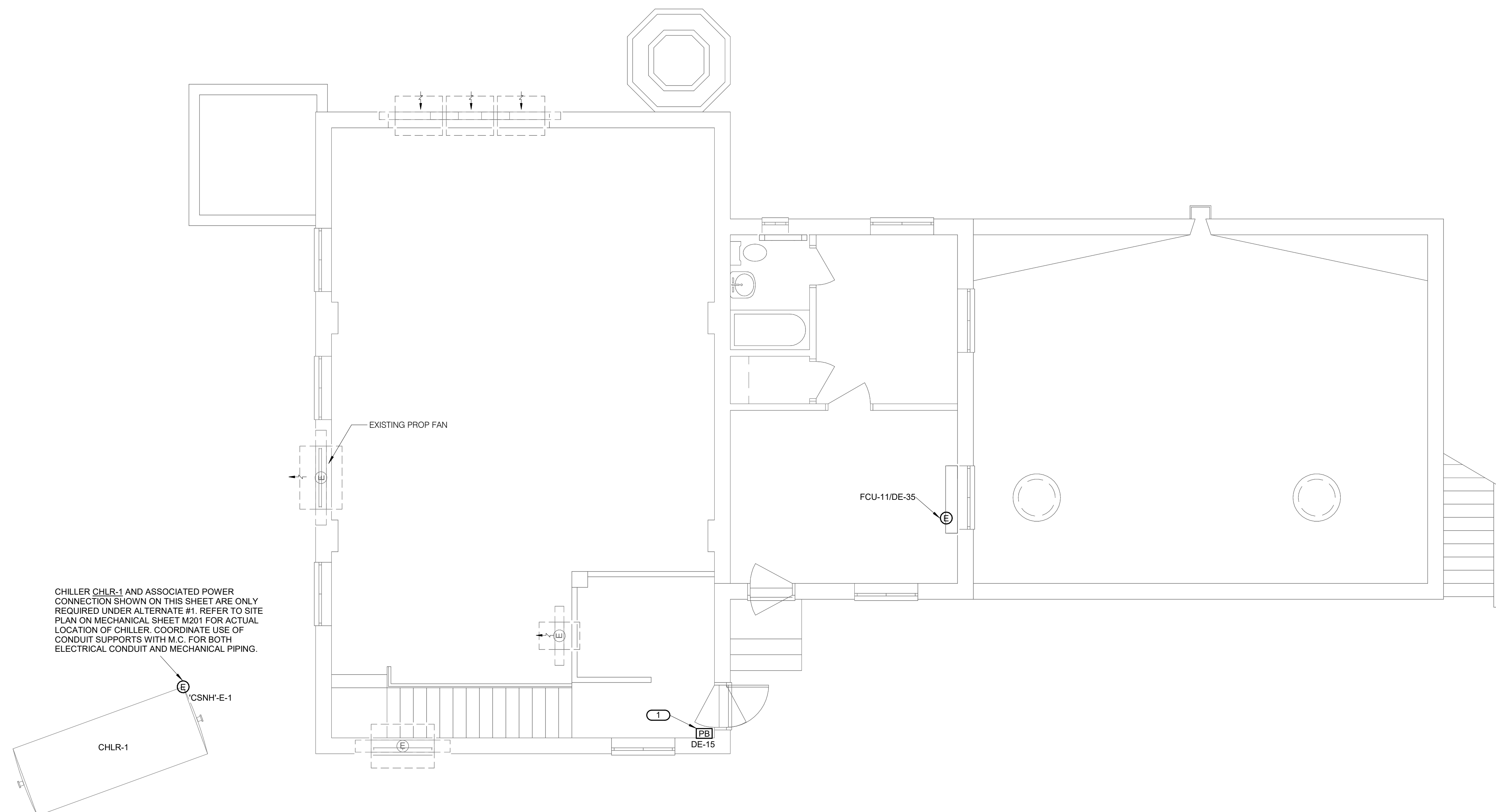
02/07/2024

SHEET NOTES:

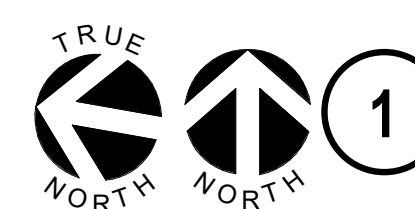
1. REFER TO E001 FOR GENERAL ELECTRICAL NOTES, SYMBOLS, ELECTRICAL INSTALLATION INFORMATION. NOT ALL SYMBOLS AND GENERAL NOTES MAY APPLY TO THIS SHEET.
2. REFER TO E400 FOR RELEVANT DETAILS.
3. PROVIDE ALL NEW LABELING AND TYPE-WRITTEN PANEL DIRECTORIES FOR ALL DISTRIBUTION AND BRANCH PANELBOARDS IMPACTED BY THIS SCOPE OF WORK. MATCH LOAD DESCRIPTION WITH ACTUAL FIELD CONDITIONS AND ROOM NUMBERING.
4. 120 VOLT CONNECTION TO EACH FCU SHALL CONNECT TO INTEGRAL DISCONNECT SWITCH FURNISHED WITH FCU BY OTHERS.

KEYNOTES: #

1. BOILER ROOM EMERGENCY SHUTDOWN SWITCH TO BE FURNISHED AND INSTALLED BY MC. EC TO PROVIDE 120V POWER BETWEEN SHUTDOWN SWITCHES AND PANEL FOR CONNECTION TO BOILERS BY MC. REFER TO EMERGENCY BOILER SHUTDOWN CONTROL DIAGRAM ON SHEET M520 FOR MORE INFORMATION.

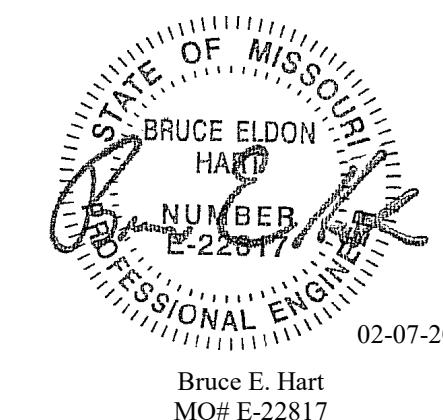


CHILLER CHLR-1 AND ASSOCIATED POWER CONNECTION SHOWN ON THIS SHEET ARE ONLY REQUIRED UNDER ALTERNATE #1. REFER TO SITE PLAN ON MECHANICAL SHEET M201 FOR ACTUAL LOCATION OF CHILLER. COORDINATE USE OF CONDUIT SUPPORTS WITH M.C. FOR BOTH ELECTRICAL CONDUIT AND MECHANICAL PIPING.



1 BOILER BLDG - UPPER LEVEL - ELECTRICAL

1/4" = 1'-0"



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MARYVILLE TREATMENT
 CENTER

MARYVILLE, MO

PROJECT # C1921-01
 SITE # 7014
 ASSET # 9327014013

REVISION:
 DATE:
 REVISION:
 DATE:
 REVISION:
 DATE:
 ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E209.dwg
 DRAWN BY: RAB
 CHECKED BY: PLR
 DESIGNED BY: RAB
 SHEET TITLE:

MAIN BLDG - TUNNEL
 LEVEL - ELECTRICAL

SHEET NUMBER:

E209

SHEET 48 OF 57
 02/07/2024

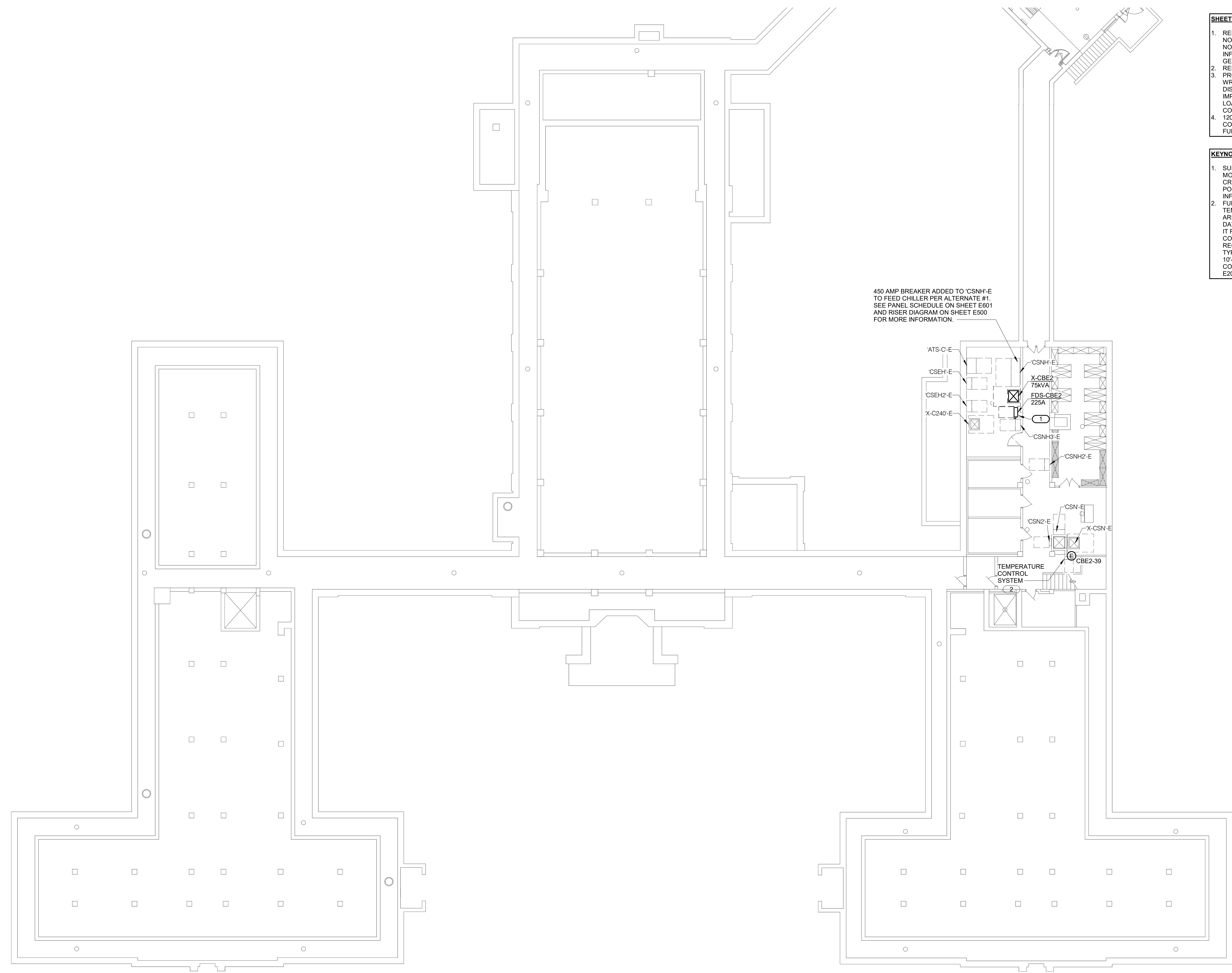
SHEET NOTES:

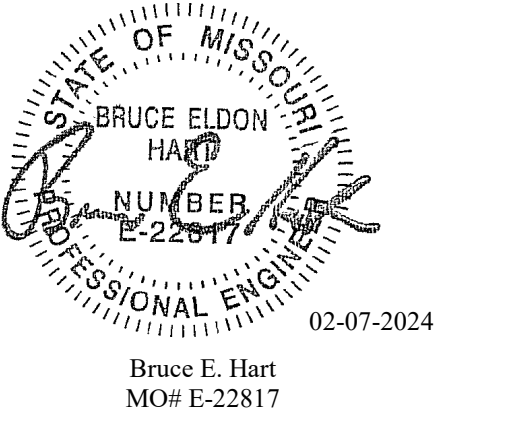
1. REFER TO E001 FOR GENERAL ELECTRICAL NOTES, SYMBOLS, ELECTRICAL INSTALLATION NOTES AND OTHER MISCELLANEOUS INFORMATION. NOT ALL SYMBOLS AND GENERAL NOTES MAY APPLY TO THIS SHEET.
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4. 120 VOLT CONNECTION TO EACH FCU SHALL CONNECT TO INTEGRAL DISCONNECT SWITCH FURNISHED WITH FCU BY OTHERS.

KEYNOTES: (#)

1. SURFACE MOUNTED DISCONNECT SWITCH. MOUNTING BRACKETS MAY BE NEEDED TO CREATE FLUSH MOUNTING SURFACE WITH POLE. REFER TO SHEET E500 FOR MORE INFORMATION.
2. FURNISH AND INSTALL DATA CONNECTION TO TEMPERATURE CONTROL SYSTEM NETWORK AREA CONTROLLER. PROVIDE (1) CATEGORY DATA CABLE FROM CONTROLLER TO EXISTING IT RACK IN TUNNEL BETWEEN BUILDINGS. COORDINATE EXACT TYPE OF CABLE REQUIRED WITH OWNER'S STANDARDS AND TYPE OF PATCH PANELS IN IT RACK. LEAVE 10'-0" OF SLACK CABLE AT RACK FOR FINAL CONNECTION BY OWNER. REFER TO SHEET E200 FOR LOCATION OF IT RACK.

450 AMP BREAKER ADDED TO 'CSNH-E TO FEED CHILLER PER ALTERNATE #1. SEE PANEL SCHEDULE ON SHEET E601 AND RISER DIAGRAM ON SHEET E500 FOR MORE INFORMATION.





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MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
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REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E210.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB

SHEET TITLE:

MAIN BLDG -
BASEMENT LEVEL -
ELECTRICAL

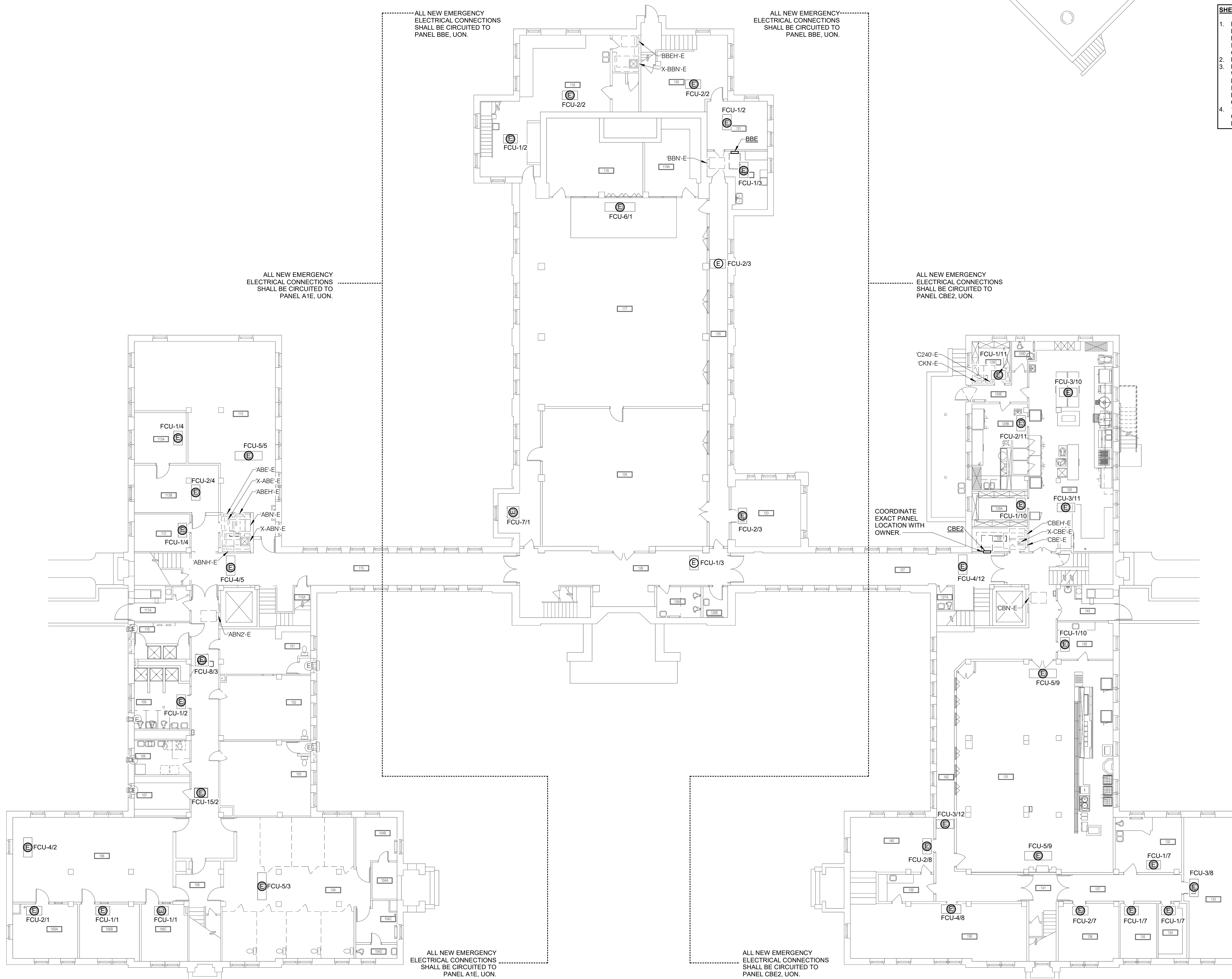
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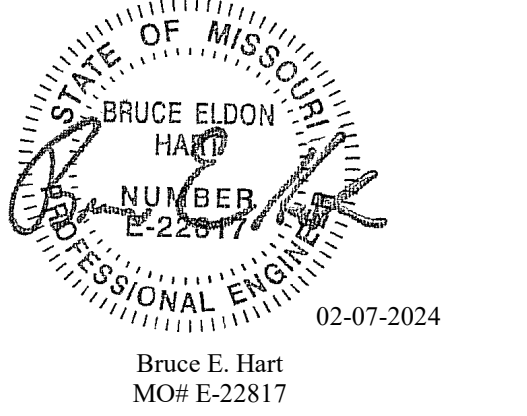
E210

SHEET 49 OF 57

02/07/2024

- SHEET NOTES:**
1. REFER TO E001 FOR GENERAL ELECTRICAL NOTES, SYMBOLS, ELECTRICAL INSTALLATION NOTES AND OTHER MISCELLANEOUS INFORMATION. NOT ALL SYMBOLS AND GENERAL NOTES MAY APPLY TO THIS SHEET.
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 4. 120 VOLT CONNECTION TO EACH FCU SHALL CONNECT TO INTEGRAL DISCONNECT SWITCH FURNISHED WITH FCU BY OTHERS.





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PROJECT # C1921-01
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REVISION:
DATE:
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DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E211.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB
SHEET TITLE:

MAIN BLDG - LEVEL 01
- ELECTRICAL

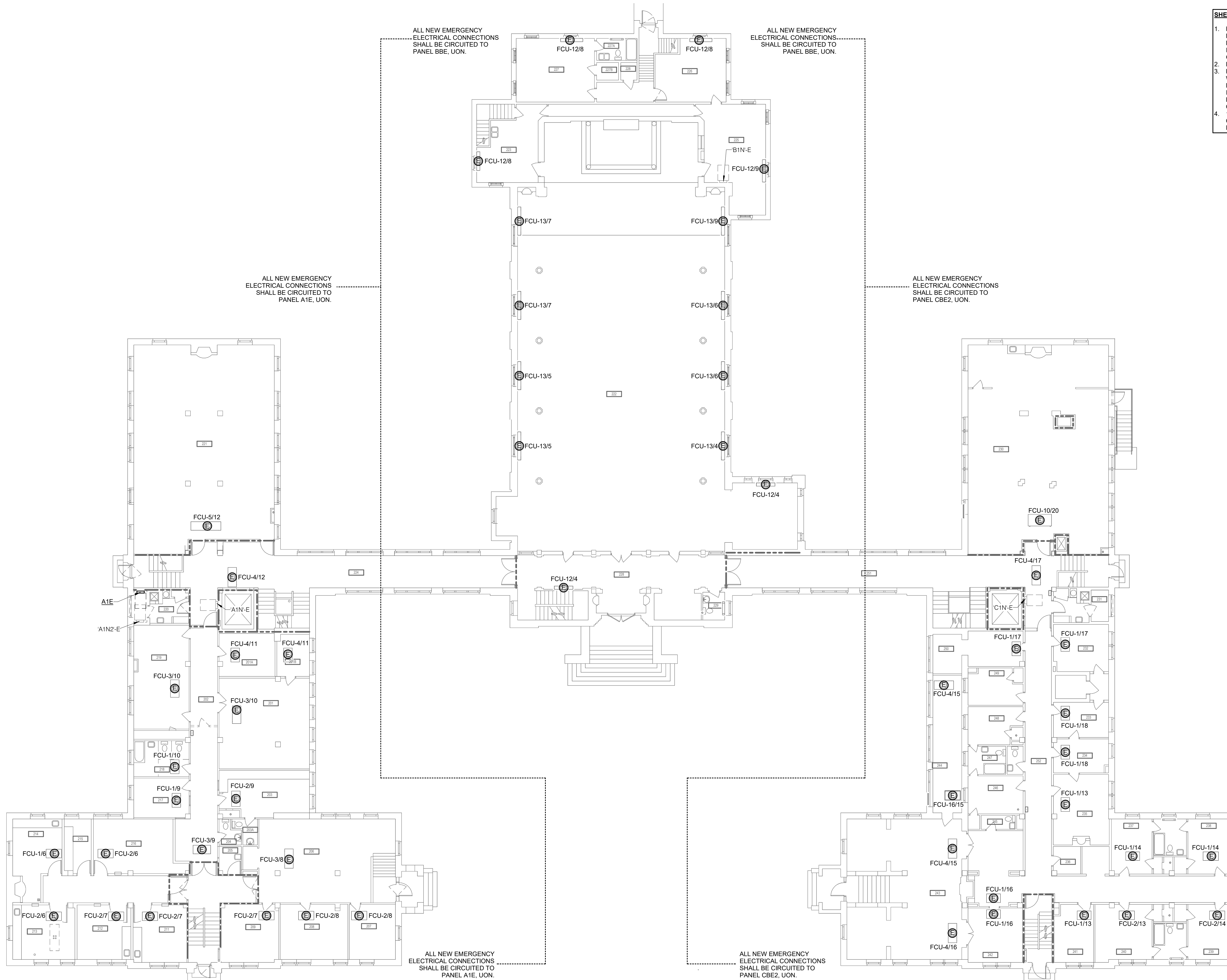
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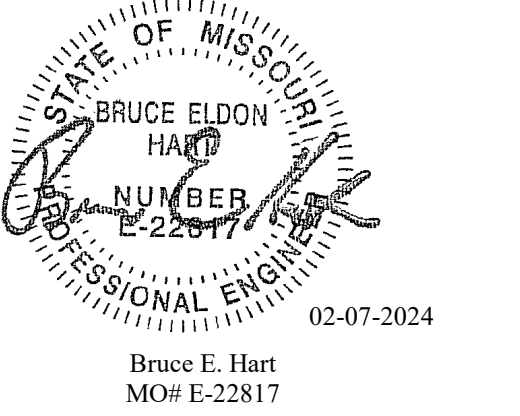
E211

SHEET 50 OF 57

02/07/2024

- SHEET NOTES:**
1. REFER TO E001 FOR GENERAL ELECTRICAL NOTES, SYMBOLS, ELECTRICAL INSTALLATION INFORMATION, NOT ALL SYMBOLS AND GENERAL NOTES MAY APPLY TO THIS SHEET.
 2. REFER TO E400 FOR RELEVANT DETAILS.
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 4. 120 VOLT CONNECTION TO EACH FCU SHALL CONNECT TO INTEGRAL DISCONNECT SWITCH FURNISHED WITH FCU BY OTHERS.





02-07-2024

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ASSET # 9327014013

REVISION:
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REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E212.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB
SHEET TITLE:

MAIN BLDG - LEVEL 02
- ELECTRICAL

SHEET NUMBER:

E212

SHEET 51 OF 57

02/07/2024

SHEET NOTES:
1. REFER TO E001 FOR GENERAL ELECTRICAL NOTES, SYMBOLS, ELECTRICAL INSTALLATION NOTES AND OTHER MISCELLANEOUS INFORMATION. NOT ALL SYMBOLS AND GENERAL NOTES MAY APPLY TO THIS SHEET.
2. REFER TO E400 FOR RELEVANT DETAILS.
3. PROVIDE ALL NEW LABELING AND TYPE-WRITTEN PANEL DIRECTORIES FOR ALL DISTRIBUTION AND BRANCH PANELBOARDS IMPACTED BY THIS SCOPE OF WORK. MATCH LOAD DESCRIPTION WITH ACTUAL FIELD CONDITIONS AND ROOM NUMBERING.
4. 120 VOLT CONNECTION TO EACH FCU SHALL CONNECT TO INTEGRAL DISCONNECT SWITCH FURNISHED WITH FCU BY OTHERS.

ALL NEW EMERGENCY ELECTRICAL CONNECTIONS SHALL BE CIRCUITED TO PANEL BBE, UON.

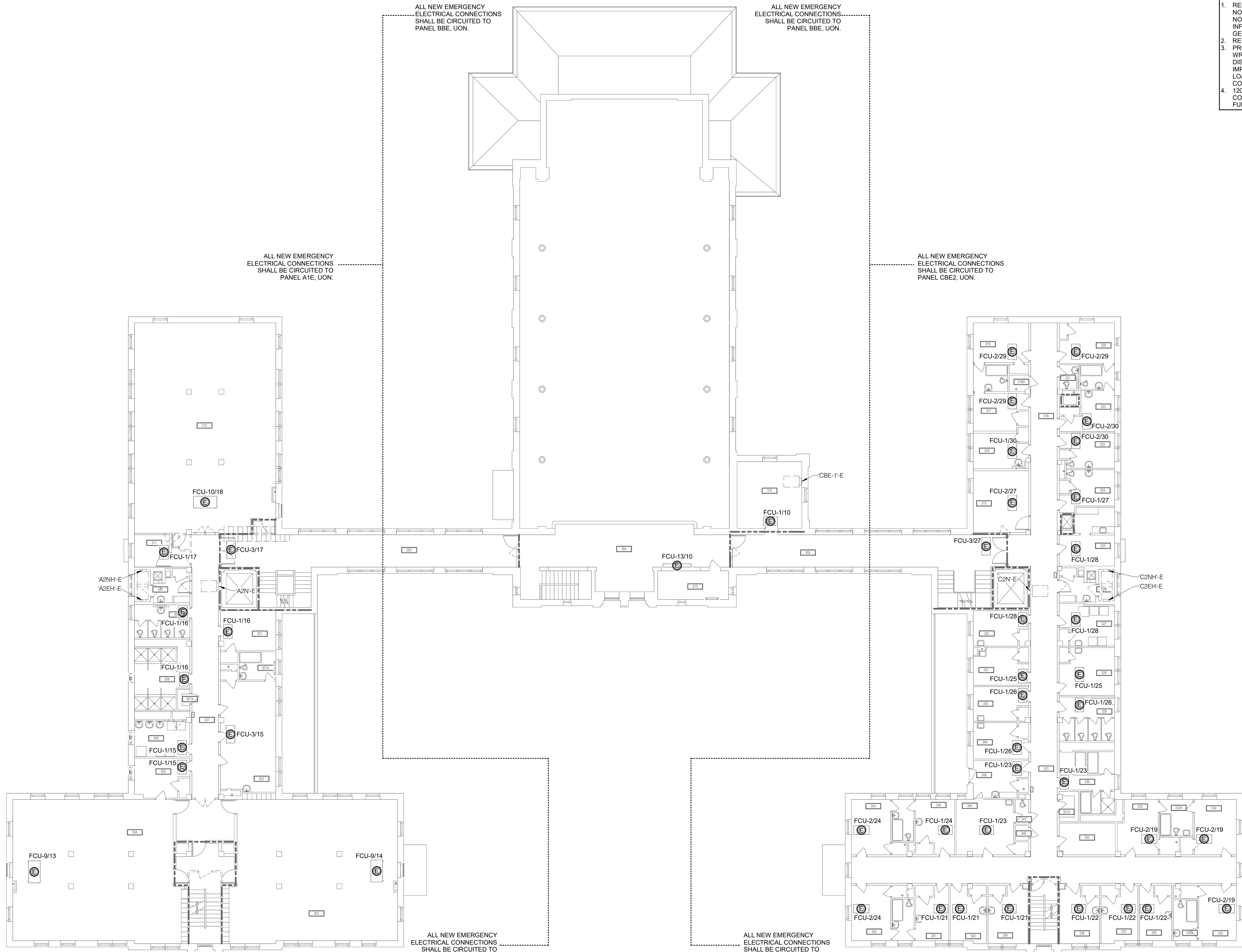
ALL NEW EMERGENCY ELECTRICAL CONNECTIONS SHALL BE CIRCUITED TO PANEL BBE, UON.

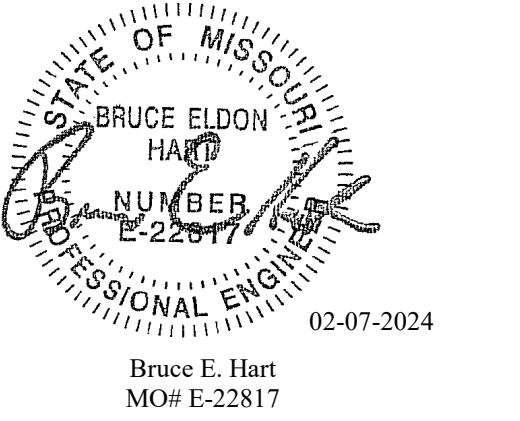
ALL NEW EMERGENCY ELECTRICAL CONNECTIONS SHALL BE CIRCUITED TO PANEL A1E, UON.

ALL NEW EMERGENCY ELECTRICAL CONNECTIONS SHALL BE CIRCUITED TO PANEL CBE2, UON.

ALL NEW EMERGENCY ELECTRICAL CONNECTIONS SHALL BE CIRCUITED TO PANEL A1E, UON.

ALL NEW EMERGENCY ELECTRICAL CONNECTIONS SHALL BE CIRCUITED TO PANEL CBE2, UON.





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REVISION:
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DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E213.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB
SHEET TITLE:

MAIN BLDG - LEVEL 03
- ELECTRICAL

SHEET NUMBER:

E213

SHEET 52 OF 57

02/07/2024

- SHEET NOTES:**
1. REFER TO E001 FOR GENERAL ELECTRICAL NOTES, SYMBOLS, ELECTRICAL INSTALLATION INFORMATION, NOT ALL SYMBOLS AND GENERAL NOTES MAY APPLY TO THIS SHEET.
 2. REFER TO E400 FOR RELEVANT DETAILS.
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 4. 120 VOLT CONNECTION TO EACH FCU SHALL CONNECT TO INTEGRAL DISCONNECT SWITCH FURNISHED WITH FCU BY OTHERS.

ALL NEW EMERGENCY
ELECTRICAL CONNECTIONS
SHALL BE CIRCUITED TO
PANEL BBE, UON.

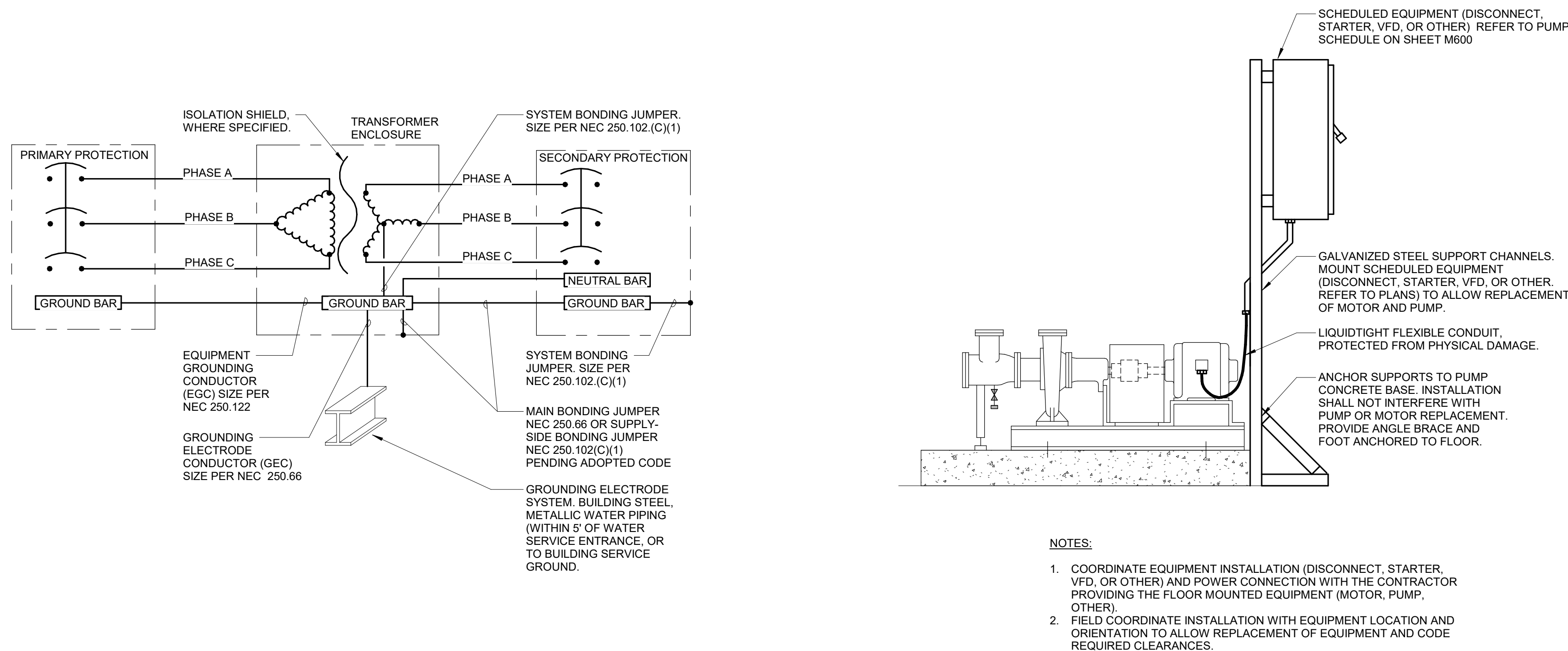
ALL NEW EMERGENCY
ELECTRICAL CONNECTIONS
SHALL BE CIRCUITED TO
PANEL BBE, UON.

ALL NEW EMERGENCY
ELECTRICAL CONNECTIONS
SHALL BE CIRCUITED TO
PANEL A1E, UON.

ALL NEW EMERGENCY
ELECTRICAL CONNECTIONS
SHALL BE CIRCUITED TO
PANEL CBE2, UON.

ALL NEW EMERGENCY
ELECTRICAL CONNECTIONS
SHALL BE CIRCUITED TO
PANEL A1E, UON.

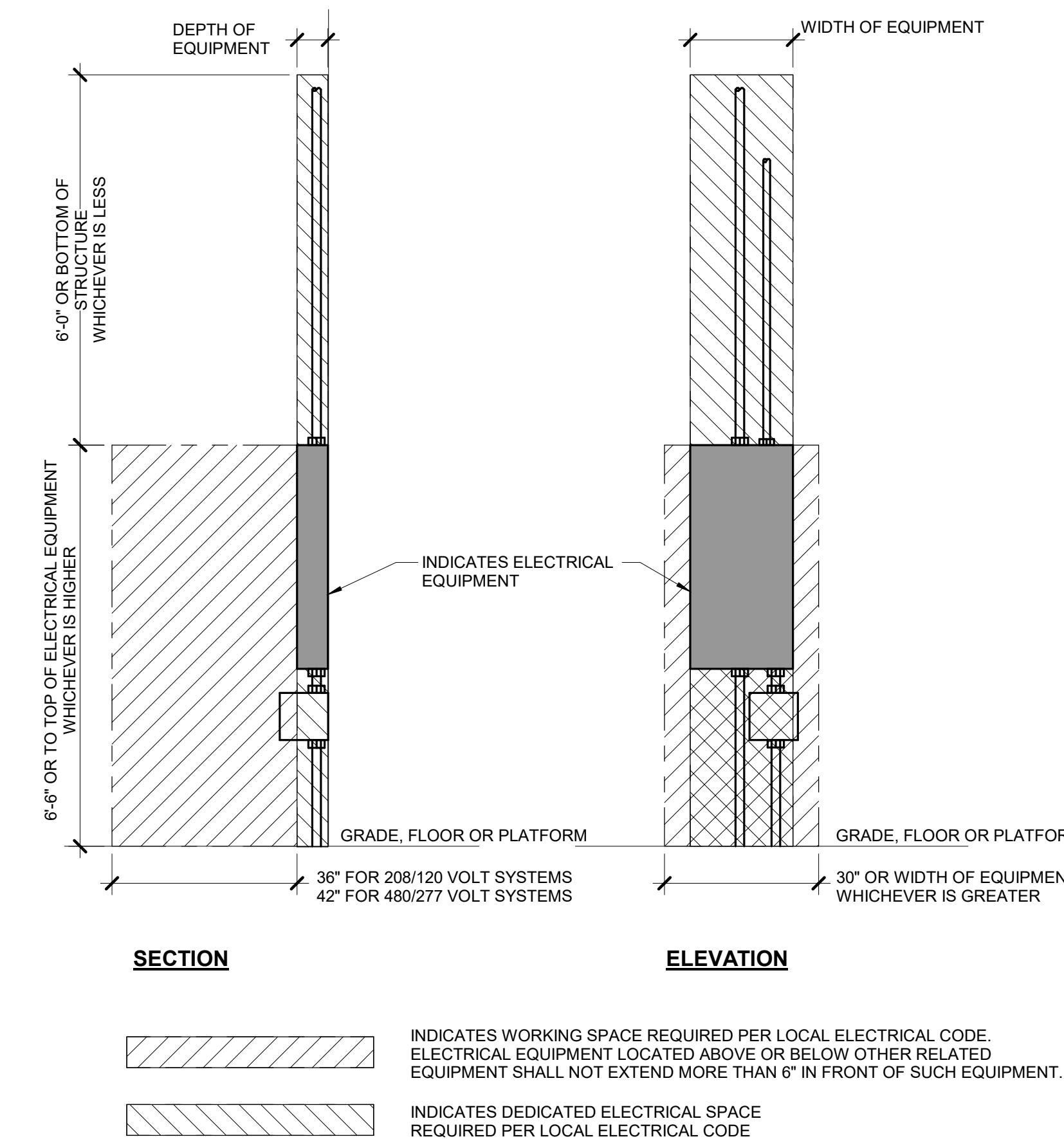
ALL NEW EMERGENCY
ELECTRICAL CONNECTIONS
SHALL BE CIRCUITED TO
PANEL CBE2, UON.



1 TRANSFORMER WIRING DETAIL
12" = 1'-0"

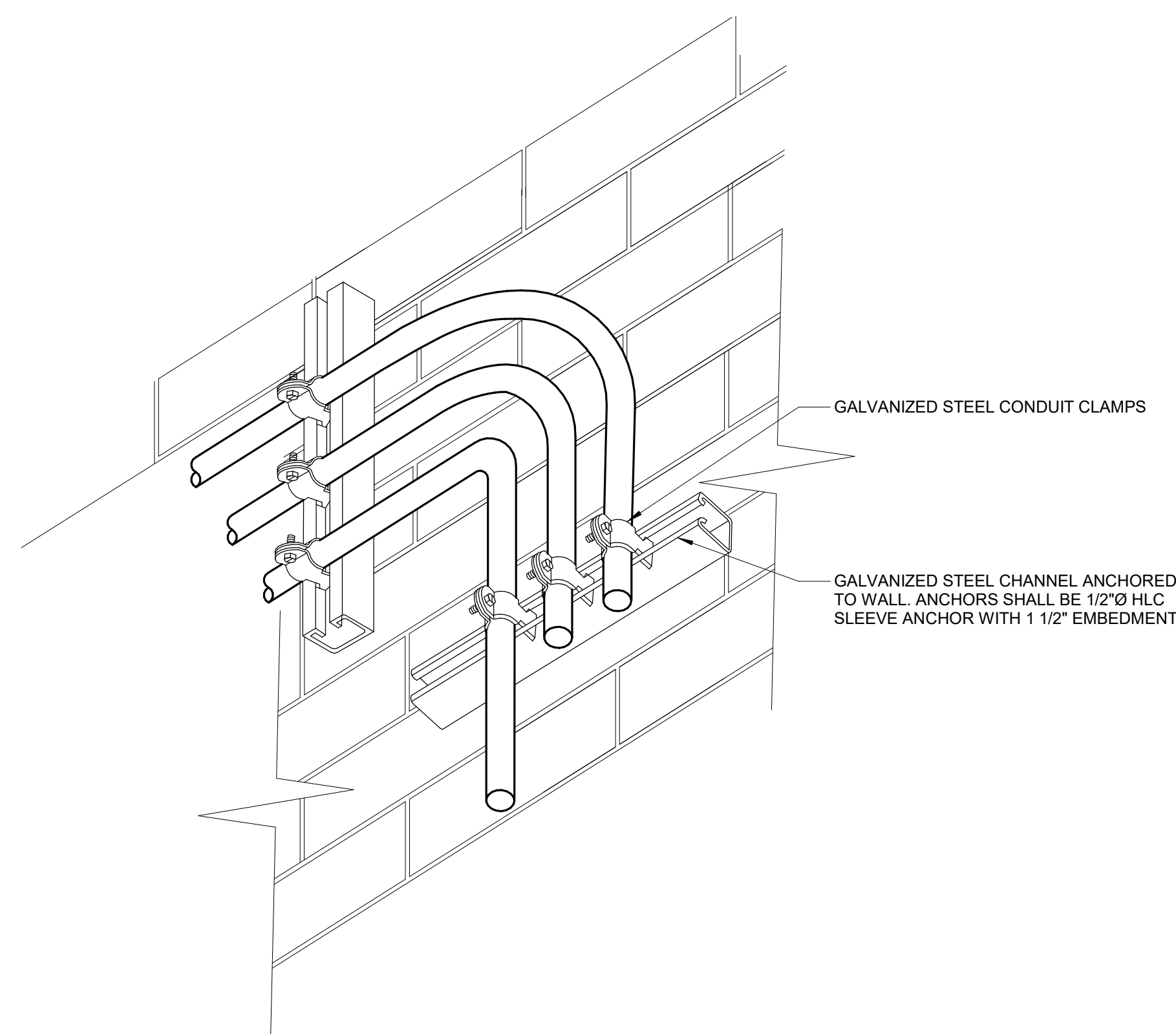
2 PUMP CONNECTION DETAIL
12" = 1'-0"

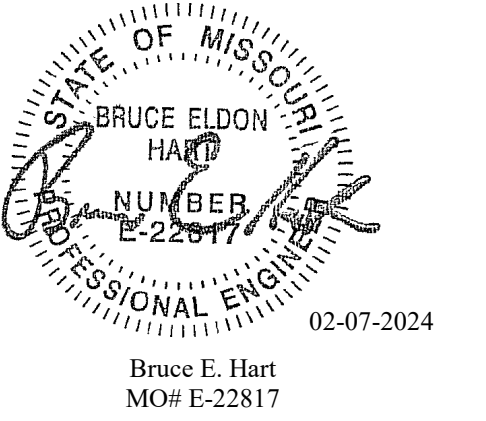
3 CONDUIT WALL PENETRATION
NO SCALE



5 PANELBOARD EQUIPMENT CLEARANCES
12" = 1'-0"

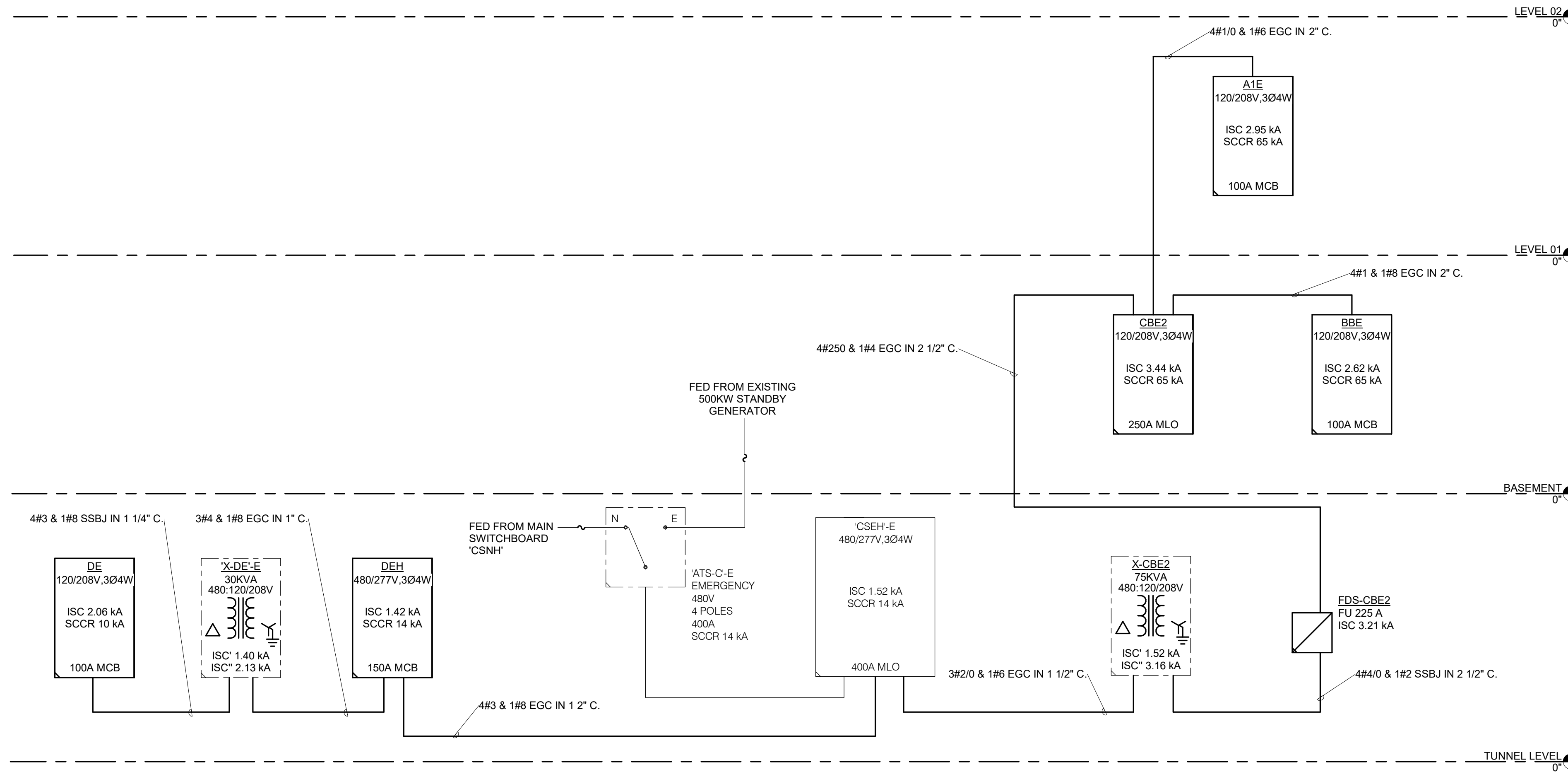
4 CONDUIT WALL SUPPORT
NO SCALE





ELECTRICAL - RISER DIAGRAM NOTES:

- THE RISER DIAGRAM IS INTENDED TO CONVEY THE COMPONENTS OF THE ELECTRICAL DISTRIBUTION SYSTEM. REFER TO ELECTRICAL DRAWINGS, DETAILS, DISTRIBUTION / PANEL / EQUIPMENT / EQUIPMENT CONNECTION SCHEDULES, AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- SHORT CIRCUIT CURRENT RATINGS (SCCR) FOR EQUIPMENT ARE MINIMUM REQUIREMENTS FOR BUS BRACING AND DEVICE RATING. ALL EQUIPMENT SHALL BE FULLY RATED UNLESS SPECIFICALLY NOTED AS SERIES RATED.
- TRANSFER SWITCHES (SCCR) RATINGS ARE INTENDED AS WITHSTAND AND CLOSE RATINGS (WCR).
- THE BASIS OF DESIGN: THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING AND SIZING CONDUCTORS AND CONDUITS TO EQUAL OR EXCEED AMPACITY OF THE BASIS OF DESIGN CIRCUITS WHEN ALTERNATIVE METHODS OR MATERIALS OTHER THAN THE BASIS OF DESIGN ARE APPLIED.
 - RACEWAY: EMT UNLESS OTHERWISE NOTED
 - FEEDER CHARACTERISTICS: ALL CURRENT CARRYING CONDUCTORS SHALL BE COPPER UNLESS NOTED OTHERWISE. CONDUCTOR SIZES ARE BASED ON AMERICAN WIRE GAUGE AWG AND KCML THOUSANDS OF CIRCULAR MIL. REFER TO SPECIFICATION SECTION 25 05 13 WIRE AND CABLE FOR ADDITIONAL INFORMATION
 - GROUNDING AND BONDING CONDUCTORS SHALL BE COPPER.
 - CONDUCTORS (MOTORS): COPPER
 - CONDUCTOR LENGTHS LISTED IN RISER DIAGRAMS AND SCHEDULES ARE FOR ENGINEERING CALCULATIONS AND SHALL NOT BE USED FOR BIDDING PURPOSES.
 - [AL] INDICATES ALUMINUM CONDUCTOR
 - [BLANK] OR [CU] INDICATES COPPER CONDUCTOR
 - [CI] INDICATES CIRCUIT INTEGRITY CIRCUIT. FEEDER ROUTED OUTSIDE BUILDING OR 2 HOUR FIRE RATED.
- PROVIDE GROUNDING ELECTRODE AND BONDING SYSTEM PER CODE REQUIREMENTS. PROVIDE THE FOLLOWING MINIMUM CONNECTIONS AND COMPONENTS. REFER TO SPECIFICATION SECTION 26 05 26 GROUNDING AND BONDING AND DETAILS WHEN APPLICABLE:
 - ELECTRICAL GROUND FIELD
 - CONCRETE-ENCASED GROUNDING ELECTRODE (UFER)
 - METALLIC WATER MAIN
 - BUILDING STEEL, EFFECTIVELY GROUND
 - INTERSYSTEM BONDING TERMINAL [IBT]
 - GROUND RING ENCIRCLING STRUCTURE
- DRY TYPE TRANSFORMER AND SEPARATELY DERIVED SYSTEMS. PROVIDE GROUNDING ELECTRODE CONDUCTOR FOR SEPARATELY DERIVED SYSTEM. ROUTE TO STRUCTURAL BUILDING STEEL WHEN AVAILABLE. OTHERWISE ROUTE TO MAIN GROUNDING ELECTRODE SYSTEM.
- PROVIDE O.Z. GEDNEY OR EQUAL GROUND BUSHING FOR ALL SERVICE AND FEEDER RACEWAYS BONDED TO GROUND BUS WITH CONDUCTOR SIZED TO MAXIMUM FEEDER GROUND CAPACITY.
- CONDUCTORS AND GROUND SIZES ON THE LINE AND LOAD SIDES OF ALL DISCONNECT SWITCHES SHALL BE IDENTICAL UNLESS NOTED OTHERWISE.
- REFER TO COVER SHEET FOR ADDITIONAL EQUIPMENT TAG INFORMATION (SPD-#, M-#, ETC)
- REFER TO GROUNDING ELECTRODE SYSTEM AND BONDING DETAILS
 - EGC - EQUIPMENT GROUNDING CONDUCTOR
 - GEC - GROUNDING ELECTRODE CONDUCTOR
 - SSBJ - SUPPLY SIDE BONDING JUMPER
- CIRCUIT BREAKER CHARACTERISTICS AND ACCESSORIES:
 - [CB] INDICATES CIRCUIT BREAKER
 - [FU] INDICATES FUSED SWITCH
 - [NF] INDICATES NON-FUSED SWITCH
 - [MLO] INDICATES MAIN LUG ONLY
 - [MCB] INDICATES MAIN CIRCUIT BREAKER
 - [MCCB] INDICATES MOLDED CASE CIRCUIT BREAKER
 - [LSIG] INDICATES FEATURES PROVIDED WITH SOLID STATE CIRCUIT BREAKER [LONG TIME (W/DELAY), SHORT TIME (W/DELAY), INSTANTANEOUS, GROUND FAULT]
 - [LSIA] INDICATES FEATURES PROVIDED WITH SOLID STATE CIRCUIT BREAKER [LONG TIME (W/DELAY), SHORT TIME (W/DELAY), INSTANTANEOUS, GROUND FAULT ALARM (NO GROUND FAULT TRIP)]
 - [GFR] INDICATES GROUND FAULT RELAY
 - [AER] INDICATES ARC ENERGY REDUCTION SYSTEM
 - [100% RATED] INDICATES INSULATED CASE BREAKER RATED FOR FULL CONTINUOUS CAPACITY OF CIRCUIT BREAKER NAMEPLATE
 - [DRAW] INDICATES DRAWOUT DEVICES
 - [LOCK] INDICATES PADLOCK HASP
 - [RED] INDICATES RED HANDLE
 - [SHUNT] INDICATES SHUNT TRIP BREAKER
 - [KIRK] CAPTURED KEY INTERLOCK SWITCH



1 RISER DIAGRAM
12" = 1'-0"

OFFICE OF
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DESIGN AND
CONSTRUCTION

DEPARTMENT OF
CORRECTIONS

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E500.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB

SHEET TITLE:

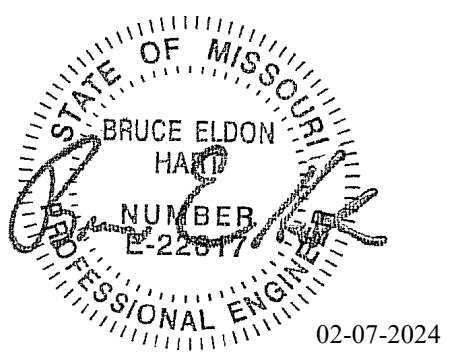
RISER DIAGRAM

SHEET NUMBER:

E500

SHEET 54 OF 57

02/07/2024



Bruce E. Hart
MO# E-22817



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KANSAS CITY, MO 64108
P: 816.842.8437
PROJECT #23000440.00

IMEG, CORP.
Missouri Certificate of Authority: #F001325536

**OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND
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DEPARTMENT OF CORRECTIONS

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

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PROJECT # C1921-01
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REVISION:
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ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E600.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB

SHEET TITLE:

PANEL SCHEDULES

SHEET NUMBER:

E600

SHEET 55 OF 57

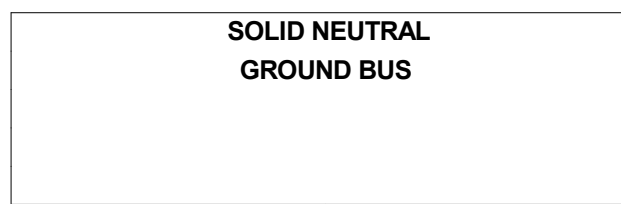
02/07/2024

ELECTRICAL DISTRIBUTION AND PANEL SCHEDULE NOTES:

- BRANCH PANEL KEY:
a. *A = ARC FAULT INTERRUPT
b. *G = GROUND FAULT CIRCUIT INTERRUPT
c. *1 = ISOLATED GROUND
d. *M = BRANCH CIRCUIT MONITOR
e. *P = PADLOCK HASP
f. *R = RED HANDLE
g. *S = SHUNT TRIP
h. *NB = NEW BREAKER
i. *RB = REPLACE EXISTING BREAKER WITH NEW BREAKER
j. *EB = EXISTING BREAKER

PANEL CBE2

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 250 A/3P @ CBE2
LOCATION:



MAIN: 250 A MLO
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC: 3.44 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE	H	N	G	VD %	A	B	C	VD %	WIRE SIZE	G	N	H	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY			
1	PANEL BBE		100 A	3	1	1	8	1.76	3.88	9.53				1.96	6	1/0	1/0	3	100 A	PANEL A1E	2			
--	3	--	--	--	--	--	--	--	--	--				--	--	--	--	--	--	--	4	--		
--	5	--	--	--	--	--	--	--	--	--				--	--	--	--	--	--	--	6	--		
7	FCUs - RM 132, 134, 135, 136		20 A	1	12	12	12	2.01	0.65	0.64				1.94	12	12	12	1	20 A	FCUs - RM 133, 138, 140	8			
9	FCUs - RM 131		20 A	1	12	12	12	1.78						1.34	12	12	12	1	20 A	FCUs - RM 129, 129A, 130	10			
11	FCUs - RM 129, 129B, 129C		20 A	1	12	12	12	1.03						0.88	0.71					20 A	FCUs - RM 127, 142	12		
13	FCUs - RM 235, 240, 241		20 A	1	12	12	12	1.48	0.49	0.49				1.74	12	12	12	1	20 A	FCUs - RM 237, 238, 239	14			
15	FCUs - RM 243, 244		20 A	1	12	12	12	1.49						1.48	12	12	12	1	20 A	FCUs - RM 242, 243, 252	16			
17	FCUs - RM 232, 250, 251		20 A	1	12	12	12	0.7						0.54	0.31					20 A	FCUs - RM 233, 234	18		
19	FCUs - RM 333, 334, 335		20 A	1	12	12	12	2.01	0.52	1.84				1.2	10	10	10	1	30 A	FCU - RM 330	20			
21	FCUs - RM 339, 340, 341		20 A	1	12	12	12	1.57						1.76	12	12	12	1	20 A	FCUs - RM 336, 337, 338	22			
23	FCUs - RM 330, 345, 348		20 A	1	12	12	12	1.33						0.47	0.52	1.7	12	12	12	1	20 A	FCUs - RM 342, 343, 344	24	
25	FCUs - RM 328, 351		20 A	1	12	12	12	0.64	0.31	0.47				1.13	12	12	12	1	20 A	FCUs - RM 329, 349, 350	26			
27	FCUs - RM 315, 324, 353		20 A	1	12	12	12	0.79						0.85	12	12	12	1	20 A	FCUs - RM 325, 327, 352	28			
29	FCUs - RM 317, 319, 320		20 A	1	12	12	12	1.12						0.54	0.52	0.95	12	12	12	1	20 A	FCUs - RM 316, 322, 323	30	
31	FCUs - RM 442, 443, 444		20 A	1	12	12	12	1.02	0.47	0.47				0.98	12	12	12	1	20 A	FCUs - RM 417, 419, 423	32			
33	FCUs - RM 422, 437, 440		20 A	1	12	12	12	1.53						1.39	12	12	12	1	20 A	FCUs - RM 420, 421, 441	34			
35	FCUs - RM 431, 432, 433		20 A	1	12	12	12	1.75						1.97	12	12	12	1	20 A	FCUs - RM 434, 435, 436	36			
37	FCUs - RM 425, 426, 427		20 A	1	12	12	12	2.31	0.54	0.47				1.95	12	12	12	1	20 A	FCUs - RM 428, 429, 430	38			
39	TEMPERATURE CONTROL SYSTEM		20 A	1	--	--	--	--	--	--				1.97	8	8	8	1	30 A	FCU - RM 416	40			
--	41	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	42	--	
--	43	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	44	--	
--	45	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	46	--	
--	47	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	48	--	
--	49	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	50	--	
--	51	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	52	--	
--	53	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	54	--	
--	55	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	56	--	
--	57	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	58	--	
--	59	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	60	--	
--	61	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	62	--	
--	63	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	64	--	
--	65	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	66	--	
--	67	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	68	--	
--	69	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	70	--	
--	71	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	72	--	
--	73	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	74	--	
--	75	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	76	--	
--	77	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	78	--	
--	79	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	80	--	
--	81	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	82	--	
--	83	SPARE	20 A	1	--	--	--	--	--	--				--	--	--	--	--	--	20 A	SPARE	84	--	
										Total Load:		20.75 kVA		17.02 kVA		15.13 kVA								
										Total Amps:		175.32		144.22		126.10								

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*
Power	52.896 kVA	59.45%	31.448 kVA	TOTAL CONNECTED LOAD: 52.90 kVA TOTAL ESTIMATED DEMAND LOAD: 31.448 kVA TOTAL CONNECTED AMPS: 146.82 A TOTAL ESTIMATED DEMAND AMPS: 87.3 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.
CIRCUIT KEY NOTES:

PANEL A1E

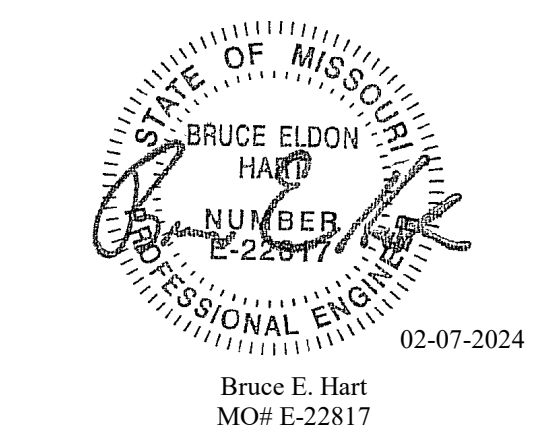
MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 100 A/3P @ CBE2
LOCATION:



MAIN: 100 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC: 2.95 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE	H	N	G	VD %	A	B	C	VD %	WIRE SIZE	G	N	H	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY	
1	FCUs - RM 106A, 106B, 106C		20 A	1	12	12	12	1.25	0.49	0.54				1.16	12	12	12	1	20 A	FCUs - RM 106, 109, 111	2	
3	FCUs - RM 104, 111		20 A	1	12	12	12	1.69			1.22	0.49		0.54	12	12	12	1	20 A	FCUs - RM 112, 113A, 113B	4	
5	FCUs - RM 115, 113		20 A	1	12	12	12	1.01						2.37	12	12	12	1	20 A	FCUs - RM 213, 214, 216	6	
7	FCUs - RM 209, 211, 212		20 A	1	12	12	12	1.38	0.54	0.61				1.81	12	12	12	1	20 A	FCUs - RM 206, 207, 208	8	
9	FCUs - RM 203, 202, 217		20 A	1	12	12	12	1.23			0.59	0.95		1.6	12	12	12	1	20 A	FCUs - RM 201, 218, 219	10	
11	FCUs - RM 201A, 201B		20 A	1	12	12	12	0.58						0.86	12	12	12	1	20 A	FCUs - RM 221, 224	12	
13	FCU - RM 304		30 A	1	8	8	8	2.19	1.84	1.84				2.73	8	8	8	1	30 A	FCU - RM 303	14	
15	FCUs - RM 302, 305, 306		20 A	1	12	12	12	1.2			0.56	0.47		0.69	12	12	12	1	20 A	FCUs - RM 301, 308		



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CORRECTIONS

REPLACE STEAM, WATER &
SEWER LINES, BLDG. 3

MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
SITE # 7014
ASSET # 9327014013

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E601.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB

SHEET TITLE:

PANEL SCHEDULES

SHEET NUMBER:

E601

SHEET 56 OF 57

02/07/2024

SWITCHGEAR 'CSNH'-E

ENCLOSURE: NEMA 1
FED FROM: 20 A/3P @ X-NC
LOCATION:

SOLID NEUTRAL
GROUND BUS

MAIN: LVPCB
VOLTS: 480/277 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC: 2.04 kA

NOTES:

CKT	LOAD DESCRIPTION	Load	POLES	FRAME	TRIP	TYPE	ACC.	WIRE AND RACEWAY	CIRCUIT KEY
1	NEW CHILLER (ALTERNATE #1)	0 kVA	3	600 A	450 A			(2) SETS OF 4#1 & 1#2 EGC EACH IN 1 1/2" C.	NB
2	EXISTING PANEL 'CSNH2-E	0 kVA	3	600 A	500 A				
3	EXISTING PANEL 'ABNH-E	0 kVA	3	600 A	500 A				
4	EXISTING ATS 'ATS-C-E	124.02 kVA	3	400 A	400 A				
5	EXISTING PANEL 'ENH-E	0 kVA	3	100 A	60 A	--	--		--
6	EXISTING XFMR 'X-C240-E	0 kVA	3	100 A	80 A				
7	EXISTING XFMR 'X-DN-E	0 kVA	3	250 A	225 A				
8	EXISTING XFMR 'X-BBN-E	0 kVA	3	250 A	125 A				
9									
10									

LOAD SUMMARY (INCLUDES ALL TUBS IN THIS PANEL)					TOTALS*	
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND			
Other	0 kVA	0.00%	0 kVA			
Power	96.373 kVA	55.19%	53.186 kVA	TOTAL CONNECTED LOAD:	124.02 kVA	
Redundant	27.644 kVA	100.00%	27.644 kVA	TOTAL ESTIMATED DEMAND LOAD:	53.186 kVA	
				TOTAL CONNECTED AMPS:	149.17 A	
				TOTAL ESTIMATED DEMAND AMPS:	64 A	

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.
CIRCUIT KEY NOTES:

PANEL 'CSEH'-E

ENCLOSURE: NEMA 1
FED FROM: 400 A/3P @ 'ATS-C'-E
LOCATION:

SOLID NEUTRAL
GROUND BUS

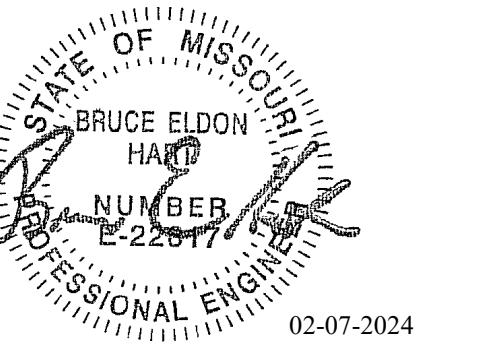
MAIN: 400 A MLO
VOLTS: 480/277 Wye
PHASE: 3
WIRE: 4
SCCR: 14 kA
ISC: 1.52 kA

NOTES:

CKT	LOAD DESCRIPTION	Load	POLES	FRAME	TRIP	TYPE	ACC.	WIRE AND RACEWAY	CIRCUIT KEY
1	EXISTING PANEL 'CSEH2-E	0 kVA	3	150 A	100 A				
2	EXISTING PANEL 'ABEH-E	0 kVA	3	150 A	60 A				
3	EXISTING PANEL 'CBEH-E	0 kVA	3	150 A	100 A				
4	EXISTING PANEL 'EEH-E	0 kVA	3	400 A	60 A	--	--		--
5	NEW PANEL DEH	71.12 kVA	3	100 A	100 A			4#3 & 1#8 EGC IN 1 1/4" C.	RB
6	EXISTING PANEL 'CSNH3-E	0 kVA	3	150 A	100 A				
7	EXISTING -MAIN LUGS	0 kVA	1	400 A	20 A	--	--		--
8	EXISTING -MAIN BREAKER	0 kVA	1	400 A	20 A	--	--		--
9	EXISTING PANEL 'C2EH-E	0 kVA	3	150 A	60 A				
10	EXISTING PANEL 'A2EH-E	0 kVA	3	150 A	100 A				
11	NEW TRANSFORMER X-CBE2	52.9 kVA	3	250 A	175 A			3#2/0 & 1#6 EGC IN 1 1/2" C.	NB
12	SPACE	--	1	--	--	--	--		--

LOAD SUMMARY (INCLUDES ALL TUBS IN THIS PANEL)					TOTALS*	
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND			
Other	0 kVA	0.00%	0 kVA			
Power	96.373 kVA	55.19%	53.186 kVA	TOTAL CONNECTED LOAD:	124.02 kVA	
Redundant	27.644 kVA	100.00%	27.644 kVA	TOTAL ESTIMATED DEMAND LOAD:	53.186 kVA	
				TOTAL CONNECTED AMPS:	149.17 A	
				TOTAL ESTIMATED DEMAND AMPS:	64 A	

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.
CIRCUIT KEY NOTES:



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MO# E-22817



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MARYVILLE TREATMENT
CENTER

MARYVILLE, MO

PROJECT # C1921-01
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ISSUE DATE: BID - 02/07/2024

CAD DWG FILE: E602.dwg
DRAWN BY: RAB
CHECKED BY: PLR
DESIGNED BY: RAB

SHEET TITLE:

PANEL SCHEDULES

SHEET NUMBER:

E602

SHEET 57 OF 57

02/07/2024

ELECTRICAL DISTRIBUTION AND PANEL
SCHEDULE NOTES:

- BRANCH PANEL KEY:
 - *A = ARC FAULT INTERRUPT
 - *G = GROUND FAULT CIRCUIT INTERRUPT
 - *I = ISOLATED GROUND
 - *M = BRANCH CIRCUIT MONITOR
 - *P = PADLOCK HASP
 - *R = RED HANDLE
 - *S = SHUNT TRIP
 - *NB = NEW BREAKER
 - *RB = REPLACE EXISTING BREAKER WITH NEW BREAKER
 - *EB = EXISTING BREAKER

PANEL DEH																		
MOUNTING: SURFACE ENCLOSURE: NEMA 1 FED FROM: 100 A/3P @ 'CSEH'-E LOCATION:				SOLID NEUTRAL GROUND BUS				MAIN: 150 A MCB VOLTS: 480/277 Wye PHASE: 3 WIRE: 4 SCCR: 14 kA ISC: 1.42 kA										
NOTES: NEW PANEL IS A REPLACEMENT FOR AN EXISTING PANEL AND SHALL BE CONNECTED TO EXISTING FEEDER FROM EXISTING DISTRIBUTION PANEL 'CSEH'. BRANCH CIRCUIT BREAKERS INDICATED AS SERVING EXISTING LOADS SHALL HAVE EXISTING BRANCH CIRCUIT CONDUCTORS CONNECTED TO BREAKER.																		
KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H N G	VD %	A	B	C	VD %	WIRE SIZE G N H	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY			
	1	BOILER 1	20 A	3	12	12	0.08	0.86	0.86		0.1	12	12	3	20 A	BOILER 2	2	
	3	EXISTING LOAD	20 A	1	12	12											4	
	5	EXISTING LOAD	20 A	1	12	12											6	
	7	BOILER 2	20 A	3	12	12	0.05	0.86	0.94		0.09	12	12	3	20 A	P-1	8	
	9	EXISTING DRYER	20 A	3	12	12											10	
	11	EXISTING DRYER	20 A	3	12	12											12	
	13	P-2	20 A	3	12	12		0.94			0.07	12	12	3	20 A	P-3	14	
	15	EXISTING WASHING MACHINE	20 A	1	12	12											16	
	17	EXISTING WASHING MACHINE	20 A	1	12	12											18	
	19	P-4	50 A	3	6	10	0.23	9.21	9.21		0.27	10	10	6	3	50 A	P-5	20
	21	EXISTING WASHING MACHINE	20 A	1	12	12											22	
	23	EXISTING WASHING MACHINE	20 A	1	12	12											24	
	25	EXISTING EXIT LIGHTING	20 A	1	12	12		0.36			0.08	8	4	3	70 A	TRANSFORMER X-DE	26	
	27	SPARE	20 A	1	12	12											28	
	29	SPARE	20 A	1	12	12											30	
	31	SPARE	20 A	1	12	12		0.0									32	
	33	SPARE	20 A	1	12	12		0.0									34	
	35	SPARE	20 A	1	12	12		0.0									36	
	37	SPARE	20 A	1	12	12		0.0									38	
	39	SPARE	20 A	1	12	12		0.0									40	
	41	SPARE	20 A	1	12	12		0.0									42	
			Total Load:			23.25 kVA			23.92 kVA			23.95 kVA						
			Total Amps:			83.94			86.74			86.82						
LOAD SUMMARY																		
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*														
Other	0 kVA	0.00%	0 kVA	TOTAL CONNECTED LOAD:	71.12 kVA													
Power	43.477 kVA	61.50%	26.738 kVA	TOTAL ESTIMATED DEMAND LOAD:	26.738 kVA													
Redundant	27.644 kVA	100.00%	27.644 kVA	TOTAL CONNECTED AMPS:	85.54 A													
				TOTAL ESTIMATED DEMAND AMPS:	32.2 A													
*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.																		
CIRCUIT KEY NOTES:																		

PANEL DE																	
MOUNTING: SURFACE ENCLOSURE: NEMA 1 FED FROM: 100 A/3P @ 'X-DE'-E LOCATION:				SOLID NEUTRAL GROUND BUS				MAIN: 100 A MCB VOLTS: 120/208 Wye PHASE: 3 WIRE: 4 SCCR: 10 kA ISC: 2.06 kA									
NOTES: NEW PANEL IS A REPLACEMENT FOR AN EXISTING PANEL AND SHALL BE CONNECTED TO NEW SECONDARY FEEDER FROM EXISTING TRANSFORMER. BRANCH CIRCUIT BREAKERS INDICATED AS SERVING EXISTING LOADS SHALL HAVE EXISTING BRANCH CIRCUIT CONNECTED TO BREAKER.																	
KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H N G	A	B	C	VD %	WIRE SIZE G N H	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY			
	1	PWH-1	20 A	1	12	12	12	0.36	0			12	12	1	20 A	BOILER PARENT AND TEMP. CONTROL SYS.	2
	3	PWH-2	20 A	1	12	12	12	0.36	0.67			12	12	1	15 A	UH-1	4
	5	P-6 (ALTERNATE #1)	20 A	2	12	12						1	20 A	60 A	DUPLEX FUEL OIL TRANSFER PUMP SET	6	
	7	EXISTING OUTLETS	20 A	2	12	12		0.0	0.0			2	60 A	60 A	EXISTING OUTLETS	8	
	9	P-7 (ALTERNATE #1)	20 A	2	12	12		0.0	0.0								10
	11	EXISTING LOAD	20 A	1	12	12											12
	13	EXISTING - TUNNEL LIGHTING	20 A	1	12	12		0.0									14
	15	BOILER ROOM EMERG. STOP BUTTONS	20 A	1	12	12		0.0									16
	17	EXISTING - BOILER RECEPTACLES	20 A	1	12	12											18
	19	EXISTING LOAD	15 A	1	12	12		0.0	0.0								20
	21	EXISTING LOAD	20 A	1	12	12		0.0	0.0								22
	23	EXISTING LOAD	15 A	1	12	12		0.0	0.0								24
	25	EXISTING - GUARD SHACK ZONE 2	30 A	2	12	12		0.0	0.0								26
	27	SPARE	20 A	1	12	12		0.0	0.0								28
	29	EXISTING DRYER	20 A	3	12	12		0.0	0.0								30
	31	EXISTING - OFFICE MICROWAVE	20 A	1	12	12		0.0	0.0								32
	33	EXISTING - OFFICE LIGHTS	20 A	1	12	12		0.0	0.0								34
	35	EXISTING - OFFICE RECEPTACLES	20 A	1	12	12		0.0	0.0								36
	37	NEW - BOILER ROOM FCUS	20 A	1	10	10		1.06	0								38
	39	EXISTING MAIN BREAKER	100 A	3	12	12		0.0	0.0								40
	41	EXISTING - AIR COMPRESSOR	20 A	1	12	12		0.0	0.0								42
			Total Load:			0.36 kVA			1.03 kVA			1.06 kVA					
			Total Amps:			3.00			9.46			9.66					
LOAD SUMMARY																	
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*													
Other	0 kVA	0.00%	0 kVA	TOTAL CONNECTED LOAD:	2.45 kVA												
Power	2.448 kVA	100.00%	2.448 kVA	TOTAL ESTIMATED DEMAND LOAD:	2.448 kVA												
				TOTAL CONNECTED AMPS:	6.79 A												
				TOTAL ESTIMATED DEMAND AMPS:	6.8 A												
*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.																	
CIRCUIT KEY NOTES:																	

PANEL 'DN'-E																	
MOUNTING: SURFACE ENCLOSURE: NEMA 1 FED FROM: 100 A/3P @ LOCATION:				SOLID NEUTRAL GROUND BUS				MAIN: 100 A MCB VOLTS: 120/208 Wye PHASE: 3 WIRE: 4 SCCR: 65 kA ISC UNKNOWN 0.00 kA									
NOTES:																	
KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H N G	VD %	A	B	C	VD %	WIRE SIZE G N H	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY		
	1	DOMESTIC HOT WATER CIRC PUMP	20 A	1	12	12	0	--								2	
	3	EXISTING LOAD	20 A	1	12	12										4	
	5	EXISTING LOAD	20 A	1	12	12										6	
	7	EXISTING DRYER	20 A	3	12	12	0	0								8	
	9	EXISTING WASHING MACHINE	20 A	3	12	12		0	0							10	
	11	EXISTING WASHING MACHINE	20 A	3	12	12		0	0							12	
	13	EXISTING DRYER	20 A	3	12	12		0	0							14	
	15	EXISTING WASHING MACHINE	20 A	3	12	12		0	0							16	
	17	EXISTING WASHING MACHINE	20 A	3	12	12		0	0							18	
	19	EXISTING WASHING MACHINE	20 A	3	12	12		0	0							20	
	21	EXISTING WASHING MACHINE	20 A	3	12	12		0	0							22	
	23	EXISTING WASHING MACHINE	20 A	3	12	12		0	0							24	
	25	EXISTING LOAD	20 A	1	12	12		0	0							26	
	27	EXISTING LOAD	20 A	2	12	12		0	0							28	
	29	EXISTING LOAD	20 A	1	12	12		0	0							30	
	31	EXISTING LOAD	20 A	1	12	12		0	0							32	
	33	EXISTING LOAD	20 A	3	12	12		0	0							34	
	35	EXISTING LOAD	20 A	3	12	12		0	0							36	
	37	EXISTING LOAD	20 A	3	12	12		0	0							38	
	39	EXISTING LOAD	20 A	2	12	12		0	0							40	
	41	EXISTING LOAD	20 A	2	12	12		0	0							42	
			Total Load:			0.00 kVA			0.00 kVA			0.00 kVA					
			Total Amps:			0.00			0.00			0.00					
LOAD SUMMARY																	
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*													
Power	0 kVA	0.00%	0 kVA	TOTAL CONNECTED LOAD:	0.00 kVA												
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA												
				TOTAL CONNECTED AMPS:	0.00 A												
				TOTAL ESTIMATED DEMAND AMPS:	0 A												
*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.																	
CIRCUIT KEY NOTES:																	