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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JACOB R. DEITZ

63619 11.21.2025
LIC. NO. DATE

CDM Smith
652 Bielenberg Drive, Suite 203
Woodbury, MN 55125
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Minneapolis
Water Works

FE10691-001
DRW: ss DATE: 11.21.2025
CHK: TR DATE: 11.21.2025
APP: JRD DATE: 11.21.2025

NORTHEAST HIGH SERVICE PUMP STATION
ELECTRICAL LEGENDS AND ABBREVIATIONS I

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SYMBOL	DESCRIPTION
A	LIGHTING FIXTURE "A" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "b" - CONTROLLED BY SWITCH "b" "3" - CIRCUIT NUMBER
A	LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A	WALL MOUNTED TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A	CROSS HATCH INDICATES LIGHTING FIXTURE THAT IS UNSWITCHED AND SHALL REMAIN ON AT ALL TIMES. NOTATIONS SAME AS ABOVE.
A	SHADED AREA INDICATES LIGHTING FIXTURE THAT IS EQUIPPED WITH EMERGENCY BACKUP POWER SOURCE. NOTATIONS SAME AS ABOVE.
A	POLE MOUNTED AREA TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A	POLE MOUNTED ROADWAY TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
EM	EMERGENCY LIGHTING BATTERY UNIT WITH TWO LAMP HEADS "EM" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "3" - SUPERVISING CIRCUIT * - FIXTURE TAG #
R-2	REMOTE EMERGENCY ADJUSTABLE WALL LIGHTING FIXTURE WITH TWO LAMP HEADS "R-2" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) * - HOME RUN TO BATTERY UNIT INDICATED. CONDUIT SHALL BE 3/4" AND CONTAIN (2) NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND (1) NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE INDICATED.
A	COMBINATION BATTERY UNIT AND EXIT SIGN. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN.
A	CEILING MOUNTED EXIT SIGN, NOTATIONS SAME AS ABOVE. WHEN USED, ARROW INDICATES DIRECTION OF EGRESS. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN. (DOUBLE FACE DOUBLE CHEVRONS SHOWN)
A	WALL MOUNTED EXIT SIGN, NOTATIONS SAME AS ABOVE. WHEN USED, ARROW INDICATES DIRECTION OF EGRESS. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN.
RH-3	REMOTE EMERGENCY CEILING LIGHTING FIXTURE. "RH-3" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "3" - SUPERVISING CIRCUIT * - HOME RUN TO BATTERY UNIT INDICATED. CONDUIT SHALL BE 3/4" AND CONTAIN (2) NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND (1) NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE INDICATED.
	HOME RUN TO DESIGNATED EQUIPMENT. BRANCH CIRCUIT CONDUIT WITH (2) NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND (1) NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE NOTED. NUMBER OF ARROWS INDICATE NUMBER OF CIRCUITS. FOR MINIMUM SIZE CONDUIT PERMITTED REFER TO THE SPECIFICATIONS.
	CONDUIT CONCEALED IN WALL, IN SLAB ABOVE, OR ABOVE CEILING.
	CONDUIT CONCEALED IN OR BELOW FLOOR OR UNDERGROUND.
	CONDUIT RUN EXPOSED. RUN PARALLEL OR PERPENDICULAR TO STRUCTURE OR WALL.
	'X' INDICATES EXPLOSION PROOF CONDUIT SEAL FITTING.
	CONCRETE ENCASED DUCTBANK. WIDTH VARIES. SEE DUCTBANK SECTION/DETAILS FOR REQUIREMENTS AND WIDTH
	CONDUIT STUBBED OUT AND CAPPED
	DENOTES A QUANTITY OF TWO (2) 3-INCH CONDUITS EACH CONTAINING THREE NO. 3/0 AWG CONDUCTORS AND 1 NO. 2 AWG GROUND CONDUCTOR.
2-2/C#16 SH	DENOTES A QUANTITY OF TWO (2) NO. 16 AWG CABLES TWISTED TOGETHER AND COVERED WITH A METALLIC SHIELD AND AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
2-3/C#16 SH	SAME AS ABOVE EXCEPT CABLE TO CONSIST OF THREE NO. 16 AWG CONDUCTORS TWISTED, SHIELDED AND COVERED WITH AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
(3) 4"C.	THREE 4-INCH CONDUITS
	FLEXIBLE METAL CONDUIT "WHIP" (3/4"C., 2#12, 1#12G UNLESS OTHERWISE NOTED) FOR LIQUID TIGHT MOTOR CONNECTIONS
	'X' INDICATES CONDUIT SEAT FITTING IN OTHER THAN CODE REQUIREMENTS LOCATIONS.

SYMBOL	DESCRIPTION
\$ _a	SINGLE POLE SWITCH "a" INDICATES FIXTURES CONTROLLED.
\$ _b	DOUBLE POLE SWITCH "b" INDICATES FIXTURES CONTROLLED.
\$ _c	THREE WAY SWITCH "c" INDICATES FIXTURES CONTROLLED.
\$ _d	FOUR WAY SWITCH "d" INDICATES FIXTURES CONTROLLED.
\$ _e	DIMMER SWITCH "e" INDICATES FIXTURES CONTROLLED
\$OS	SINGLE POLE SWITCH "OS" INDICATES A PASSIVE INFRARED OCCUPANCY SENSOR
\$OS	DOUBLE POLE SWITCH "OS" INDICATES PROGRAMMABLE OCCUPANCY SENSOR CAPABLE OF INBOARD/OUTBOARD SWITCHING
\$DT	SINGLE POLE SWITCH "DT" INDICATES DUAL TECHNOLOGY PROGRAMMABLE OCCUPANCY SENSOR CAPABLE OF SENSING MOTION AND SOUND
C ₃	LIGHTING CONTACTOR WITH NUMBER OF POLES AS INDICATED
TM	TIME SWITCH
□	PUSH BUTTON STATION
TYPE A	INDICATES ALL LIGHTING FIXTURES WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE TYPE "A" UNLESS OTHERWISE NOTED. SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
■	LIGHTING PANELBOARD (LP-#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
■	POWER PANELBOARD (PP-#) OR DISTRIBUTION PANELBOARD (DP-#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
■	LIGHTING CONTACTOR PANELBOARD (LCP-#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
* 4	DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W * GFCI - GROUND FAULT CIRCUIT INTERRUPTER TYPE WP - WEATHERPROOF XP - EXPLOSION PROOF SB - SUBMERSIBLE T - TRANSIENT VOLTAGE SURGE SUPPRESSOR IC - ISOLATED GROUND 4 - CIRCUIT NUMBER
* 4	DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W MOUNTED ABOVE COUNTER-TOP OR 42" AFF * NOTATIONS SAME AS ABOVE
* 60 3 4W	SPECIAL PURPOSE RECEPTACLE * - VOLT RATING "3" - NUMBER OF POLES "60" - AMPERE RATING "4W" - 4 WIRES IN ADDITION TO GROUND
① ①	MULTI-OUTLET ASSEMBLY, SYMBOL DENOTES RECEPTACLE TYPE
①	FLUSH FLOOR OUTLET BOX WITH TYPE OUTLET INDICATED
①	UNDER FLOOR DUCT SYSTEM WITH TYPE OUTLETS INDICATED
③	THREE CELL UNDER FLOOR DUCT SYSTEM JUNCTION BOX
□ OR ①	JUNCTION BOX
□	PULL BOX
TC	TERMINAL CABINET
OS	OCCUPANCY SENSOR
PO	PHOTOCELL
ESA	EMERGENCY EYEWASH/SHOWER ALARM STATION WITH FLOW SWITCH(ES)
	INDICATED EQUIPMENT AND MATERIALS TO BE DEMOLISHED
- - -	GROUND SYSTEM GRID OR LOOP, 36" BELOW FINISHED GRADE UNLESS OTHERWISE NOTED.
	EXOTHERMIC WELD CONNECTION
①	3/4" x 10'-0" GROUND ROD. UNLESS SPECIFIED OTHERWISE.
①	GROUND ROD TEST WELL STATION (SEE DETAIL SHEET FOR REQUIREMENTS)
☒	INDICATES MOTOR STARTER AND/OR MOTOR CONTROL EQUIPMENT WITHIN THE ENCLOSURE.

SYMBOL	DESCRIPTION
▼K	COMMUNICATION SYSTEMS TELEPHONE OUTLET FOR DESK TYPE HANDSET K = KEY SYSTEM
▼K	TELEPHONE OUTLET FOR WALL TYPE HANDSET (MOUNT UP 4'-6") K = KEY SYSTEM
▽	PAGE/PARTY TELEPHONE OUTLET FOR DESK TYPE HANDSET
▽	PAGE/PARTY TELEPHONE OUTLET FOR WALL TYPE HANDSET, MOUNT UP 4'-6"
▷SH _w	PAGING SPEAKER, WALL MOUNTED H = HORN TYPE W = WIDE ANGLE TYPE
▷W	PAGING SPEAKER, WALL MOUNTED, BI-DIRECTIONAL, HORN TYPE W = WIDE ANGLE TYPE
◎	PAGING SPEAKER, FLUSH MOUNTED CEILING TYPE
■	PAGING SPEAKER, SURFACE MOUNTED CEILING TYPE
VC	REMOTE WALL MOUNTED VOLUME CONTROL FOR CEILING SPEAKER, MOUNT UP 5'-0"
▲	PAGING SPEAKER AMPLIFIER ASSEMBLY
TM	TELEPHONE CABINET OR BACKBOARD AS NOTED
P OR C ▼ OR ▲	"C" - DATA INPUT/OUTPUT CABLE OUTLET "P" - PROCESS COMPUTER SYSTEM (CAT6 RJ-45 JACK)
GB	GAS DETECTION/VENTILATION FAILURE WEATHERPROOF DUAL-LITE BEACON MOUNT TOP OF DEVICE UP 6'-8" A.F.F.
15 G	GAS DETECTION/VENTILATION FAILURE HORN/STROBE MOUNT TOP OF DEVICE UP 6'-8" A.F.F.
GB	GAS DETECTION/VENTILATION FAILURE HORN, MOUNT TOP OF DEVICE UP 6'-8" A.F.F.
GB	GAS DETECTION/VENTILATION FAILURE STROBE, MOUNT TOP OF DEVICE UP 6'-8" A.F.F.
SECURITY SYSTEMS	
SACP	SECURITY ALARM CONTROL PANEL
DS	SECURITY ALARM DOOR SWITCH
◇	SECURITY ALARM KEY PAD
CR	SECURITY SYSTEM CARD ACCESS READER
ES	SECURITY SYSTEM ELECTRONIC DOOR STRIKE
◇	SECURITY ALARM MOTION DETECTOR
CCTV	CLOSED CIRCUIT TV CAMERA
PTZ	PAN, TILT, ZOOM CAMERA LENS CONTROLS
REX	SECURITY SYSTEM REQUEST TO EXIT BUTTON
FIRE ALARM SYSTEMS	
H _R 200	FIRE ALARM HEAT DETECTOR 135 FIXED TEMPERATURE UNLESS OTHERWISE NOTED. "200" - 200 FIXED TEMPERATURE "R" - FIXED TEMPERATURE RATE-OF-RISE TYPE
?	FIRE ALARM SMOKE DETECTOR PHOTOELECTRIC TYPE UNLESS OTHERWISE NOTED. "?" - IONIZATION TYPE.
?	FIRE ALARM DUCT SMOKE DETECTOR
FACP	FIRE ALARM CONTROL PANEL
FV	FIRE ALARM VENTILATION PANEL WITH GRAPHIC PANEL
FA	REMOTE FIRE ALARM ANNUNCIATOR PANEL
FM	FIRE ALARM MASTER BOX
F	FIRE ALARM HORN, MOUNT UP 7'-6"
15 F	FIRE ALARM STROBE, MOUNT UP 6'-8" 15 = CANDELA RATING

SYMBOL	DESCRIPTION
15	FIRE ALARM HORN AND STROBE LIGHT COMBINATION, MOUNT UP 6'-8" 15 = CANDELA RATING
F	FIRE ALARM MANUAL PULL STATION, MOUNT UP 4'-0"
VSS	SPRINKLER VALVE SUPERVISORY SWITCH
SFS	SPRINKLER FLOW ALARM SWITCH
FO	FIRE ALARM BELL
FB	WEATHERPROOF HI-INTENSITY FIRE ALARM STROBE LIGHT WITH HORN
PIR	PASSIVE INFRARED DETECTOR
SR	SMOKE BEAM DETECTOR (RECEIVER)
ST	SMOKE BEAM DETECTOR (TRANSMITTER)
■	FIRE ALARM SMOKE DETECTOR REMOTE INDICATOR AND TEST SWITCH

ABBREVIATIONS (CONTINUED)	
ELEV	ELEVATION
EM	EMERGENCY
EMH	ELECTRICAL MANHOLE
ENCL	ENCLOSURE OR ENCLOSED
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EX	EXISTING
FO	FIBER OPTIC
FU	FUSE
GCP	GENERATOR CONTROL PANEL
GEN	GENERATOR
G, GND	GROUND
GFCI	GROUND FAULT CURRENT INTERRUPTER
GRS	GALVANIZED RIGID STEEL
HACR	HEATING & AIR CONDITIONING RATED
HH	HANDLE
HT	HEIGHT
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
HZ	HERTZ
ID	IDENTIFICATION
INSTR	INSTRUMENT
K	KILO (PREFIX)
kcmil	1000 CIRCULAR MILS
KVA	KILOVOLT AMPERES
KW	KILOWATTS
LA	LIGHTING ARRESTER
LCP	LOCAL CONTROL PANEL
LTG	LIGHTING
LP	LOW VOLTAGE
LV	MAXIMUM
MAX	MAIN CIRCUIT BREAKER
MCB	MOTOR CONTROL CENTER
MCC	MOTOR CIRCUIT PROTECTOR
MCP	MAIN DISTRIBUTION PANEL
MDP	MANUFACTURER
MFR	MANHOLE
MH	MINIMUM
MIN	MAIN LUGS ONLY
MTD	MONTE
MTS	MANUAL TRANSFER SWITCH
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN OR NUMBER
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOAD
PB	PULL BOX
POP	PUMP CONTROL PANEL
PH	PHASE
PMH	POWER MANHOLE
PMM	POWER METER MONITOR
PNL	PANEL OR PANELBOARD
PR	PAIR
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
RECP	RECEPTACLE
REQD	REQUIRED
QTY	QUANTITY
SA	SURGE ARRESTER
SEC	SECONDS OR SECONDARY
SH	SHIELDED OR SPACE HEATER
SHH	SIGNAL HANDLINE
SPD	SURGE PROTECTIVE DEVICE
SS	STAINLESS STEEL
SV	SOLENOID VALVE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TC	TIME TO CLOSE OR TRAY CABLE
TEL	TELEPHONE
TO	TIME TO OPEN
TS	TWISTED SHIELDED OR THERMAL SWITCH
TYP	TYPICAL
UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPS
VFD	VARIABLE FREQUENCY DRIVE
WAD	WATTS, WIDTH, WITH, WIRE
WP	WIRELESS ACCESS DEVICE
XP	WEATHERPROOF
XFRM	EXPLOSION PROOF TRANSFORMER

ABBREVIATIONS	

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SCOPE OF WORK:

1. PROJECT PROVIDES A NEW HIGH SERVICE PUMP STATION SOUTH OF THE CITY OF MINNEAPOLIS PUBLIC WORKS PUMP STATION #7. MAJOR IMPROVEMENTS INCLUDE, BUT ARE NOT LIMITED TO A NEW DISTRIBUTION PANEL, AUTOMATIC TRANSFER SWITCH (ATS), OUTDOOR ENCLOSED GENERATOR CONNECTION BOX, VARIABLE FREQUENCY DRIVES (VFD), MEDIUM AND LOW-VOLTAGE TRANSFORMERS, LIGHTING, FIRE ALARMS, AND A SECURITY SYSTEM.
 2. PROVIDE LIGHTNING PROTECTION SYSTEMS IN ACCORDANCE WITH SECTION 26 41 13.
 3. PROVIDE POWER SYSTEM STUDIES IN ACCORDANCE WITH SECTION 26 05 73.

GENERAL NOTES:

1. ELECTRICAL DRAWINGS ARE INTENDED TO SHOW THE GENERAL LAYOUT OF WORK TO BE INSTALLED UNDER THIS CONTRACT WITHOUT ATTEMPTING TO SHOW ALL DETAILS. FURNISH LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS REQUIRED FOR A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE CONTRACT DOCUMENTS.
 2. COORDINATE WORK WITH OTHER TRADES AND THE OWNER.
 3. MAINTAIN EXISTING PROCESS OPERATIONS. POWER INTERRUPTIONS TO ELECTRICAL EQUIPMENT SHALL BE AT OWNER'S CONVENIENCE WITH 72 HOURS MINIMUM NOTICE. EACH INTERRUPTION SHALL HAVE PRIOR WRITTEN APPROVAL.
 4. FIELD VERIFY EXISTING UNDERGROUND ELECTRICAL CONDUIT, CONCRETE DUCT BANKS, MANHOLES, PULL BOXES, ETC. AND MECHANICAL PIPING. CONTRACTOR SHALL INCLUDE IN BID COSTS ASSOCIATED WITH RELOCATION OR REMOVAL OF UNDERGROUND EQUIPMENT AS REQUIRED BY THIS CONTRACT. USE DUE CARE IN CONGESTED AREAS TO AVOID DAMAGE TO EXISTING UNDERGROUND UTILITIES.
 5. CONTRACTOR'S WORK SHALL INCLUDE COMPLETE TESTING OF EQUIPMENT AND WIRING INCLUDING MAKING MINOR CORRECTIONS, CHANGES OR ADJUSTMENTS NECESSARY FOR THE PROPER FUNCTIONING OF THE SYSTEM AND EQUIPMENT. WORKMANSHIP SHALL BE OF THE HIGHEST QUALITY; SUBSTANDARD WORK WILL BE REJECTED.
 6. DO NOT SCALE ELECTRICAL DRAWINGS. REFER TO MECHANICAL, STRUCTURAL DRAWINGS, AND APPROVED MANUFACTURER'S SHOP DRAWINGS FOR EXACT LOCATION OF EQUIPMENT. EXCEPT WHERE DIMENSIONS ARE SHOWN, LOCATIONS OF EQUIPMENT, FIXTURES, OUTLETS, AND SIMILAR DEVICES ARE APPROXIMATE.
 7. WORK SHALL COMPLY WITH NEC AND LOCAL CODES.
 8. DO NOT SPLIC CONDUCTORS EXCEPT AS NOTED.
 9. POWER AND CONTROL CONDUITS SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR WIRE SIZED PER TABLE 250.122 OF THE NEC (UON).
 10. COORDINATE SEQUENCE OF CONSTRUCTION WITH CIVIL, MECHANICAL, AND STRUCTURAL DISCIPLINES. PROVIDE TEMPORARY POWER AND CONTROL CIRCUITS AS REQUIRED TO MAINTAIN FACILITY OPERATION. VERIFY EXISTING UTILITIES IN AREA OF CONSTRUCTION. REFER TO CIVIL DRAWINGS FOR ADDITIONAL UNDERGROUND INFORMATION.
 11. REPAIR, IN ACCORDANCE WITH SPECIFICATIONS, SIDEWALKS, WALLS, ROADWAYS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES WHETHER OR NOT SHOWN FOR REPAIR/REPAVING ON CIVIL DRAWINGS.
 12. CONCEAL CONDUITS TO GREATEST EXTENT PRACTICABLE. CONDUITS RUN AT EXISTING STRUCTURES SHALL BE RUN EXPOSED.
 13. WHERE LOCAL DISCONNECTS AND CONTROL PANELS ARE SHOWN ON PLAN VIEWS, LOCATIONS ARE APPROXIMATE. ADJUST LOCATION AS REQUIRED TO COMPLY WITH NEC ARTICLE 110 FOR WORKING CLEARANCES.
 14. DO NOT INSTALL MAJOR CONDUIT RUNS THROUGH AREAS DESIGNATED FOR FUTURE STRUCTURES.

SUBMITTALS:

1. SUBMIT SHOP DRAWINGS FOR EQUIPMENT, MATERIALS AND OTHER ITEMS FURNISHED UNDER DIVISION 26.
 2. SUBMIT CONDUIT SHOP DRAWINGS FOR YARD ELECTRICAL, WITHIN AND UNDER ROADS, BUILDINGS AND STRUCTURES PRIOR TO COMMENCING WORK. DO NOT POUR CONCRETE UNTIL ENGINEER HAS APPROVED THE ASSOCIATED SHOP DRAWING.
 3. SUBMIT POWER SYSTEM STUDY IN ACCORDANCE WITH SECTION 26 05 73.
 4. SUBMIT OPERATION AND MAINTENANCE MANUALS FOR EQUIPMENT FURNISHED UNDER DIVISION 26.
 5. SUBMIT STARTUP/COMMISSIONING PLANS FOR EQUIPMENT FURNISHED UNDER DIVISION 26.
 6. SUBMIT TESTING AND SERVICE REPORTS FOR EQUIPMENT AND MATERIALS FURNISHED UNDER DIVISION 26.
 7. SUBMIT TRAINING PLANS FOR EQUIPMENT FURNISHED UNDER DIVISION 26.
 8. SUBMIT RECORD DOCUMENTATION TO ACCURATELY SHOW COMPLETED INSTALLATION. INCLUDE MODIFICATIONS TO CONTRACT DOCUMENTS (ONE LINE POWER DIAGRAMS, EQUIPMENT ELEVATIONS, PANEL SCHEDULES, ELEMENTARY CONTROL DIAGRAMS, RISER DIAGRAMS, PLANS, CONDUIT AND DUCTBANK ROUTING, ETC) ALONG WITH ADDITIONAL DRAWINGS OR SKETCHES CREATED TO CONVEY COMPLETED INSTALLATION.

HEAT AND SMOKE DETECTOR

1. HEAT DETECTORS

1. HEAT DETECTORS:
 - 1.1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - 1.1.1. FIRE-LITE ALARMS, INC.; A HONEYWELL INTERNATIONAL COMPANY.
 - 1.1.2. NOTIFIER.
 - 1.1.3. SIEMENS INDUSTRY, INC.; FIRE SAFETY DIVISION.
 - 1.1.4. SIMPLEXGRINNELL LP.
 - 1.2. GENERAL REQUIREMENTS FOR HEAT DETECTORS: COMPLY WITH UL 521.
 - 1.2.1. TEMPERATURE SENSORS SHALL TEST FOR AND COMMUNICATE THE SENSITIVITY RANGE OF THE DEVICE.
 - 1.3. HEAT DETECTOR, COMBINATION TYPE: ACTUATED BY EITHER A FIXED TEMPERATURE OF 135 DEG F OR A RATE OF RISE THAT EXCEEDS 15 DEG F PER MINUTE UNLESS OTHERWISE INDICATED.
 - 1.4. MOUNTING: ADAPTER PLATE FOR OUTLET BOX MOUNTING.
 - 1.5. INTEGRAL ADDRESSABLE MODULE: ARRANGED TO COMMUNICATE DETECTOR STATUS (NORMAL, ALARM, OR TROUBLE) TO PLC.
 2. SMOKE DETECTORS:
 - 2.1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 - 2.1.1. FIRE-LITE ALARMS, INC.; A HONEYWELL INTERNATIONAL COMPANY.
 - 2.1.2. NOTIFIER.
 - 2.1.3. SIEMENS INDUSTRY, INC.; FIRE SAFETY DIVISION.
 - 2.1.4. SIMPLEXGRINNELL LP.
 - 2.2. GENERAL REQUIREMENTS FOR SYSTEM SMOKE DETECTORS:
 - 2.2.1. COMPLY WITH UL 268; OPERATING AT 24-V DC, NOMINAL.
 - 2.2.2. DETECTORS SHALL BE FOUR-WIRE TYPE.
 - 2.2.3. INTEGRAL ADDRESSABLE MODULE: ARRANGED TO COMMUNICATE DETECTOR STATUS (NORMAL, ALARM, OR TROUBLE) TO PLC.
 - 2.2.4. SELF-RESTORING: DETECTORS DO NOT REQUIRE RESETTING OR READJUSTMENT AFTER ACTUATION TO RESTORE THEM TO OPERATION.
 - 2.2.5. INTEGRAL VISUAL-INDICATING LIGHT: LED TYPE, INDICATING DETECTOR HAS OPERATED.
 - 2.2.6. REMOTE CONTROL: UNLESS OTHERWISE INDICATED, DETECTORS SHALL BE DIGITAL-ADDRESSABLE TYPE, INDIVIDUALLY MONITORED BY THE PLC FOR CALIBRATION, SENSITIVITY, AND ALARM CONDITION.
 - 2.2.6.1. RATE-OF-RISE TEMPERATURE CHARACTERISTIC OF COMBINATION SMOKE- AND HEAT-DETECTION UNITS SHALL BE SETTABLE AT THE PLC FOR 15 OR 20 DEG F PER MINUTE.
 - 2.2.6.2. FIXED-TEMPERATURE SENSING CHARACTERISTIC OF COMBINATION SMOKE- AND HEAT-DETECTION UNITS SHALL BE INDEPENDENT OF RATE-OF-RISE SENSING AND SHALL BE SETTABLE AT PLC TO OPERATE 135 OR 155 DEG F.
 - 2.3. PHOTOELECTRIC SMOKE DETECTORS:
 - 2.3.1. DETECTOR ADDRESS SHALL BE ACCESSIBLE FROM PLC AND SHALL BE ABLE TO IDENTIFY THE DETECTOR'S LOCATION WITHIN THE SYSTEM AND ITS SENSITIVITY SETTING.
 - 2.3.2. AN OPERATOR AT THE PLC, HAVING THE DESIGNATED ACCESS LEVEL, SHALL BE ABLE TO MANUALLY ACCESS THE FOLLOWING INFORMATION FOR EACH DETECTOR:
 - 2.3.2.1. PRIMARY STATUS.
 - 2.3.2.2. DEVICE TYPE.
 - 2.3.2.3. PRESENT AVERAGE VALUE.
 - 2.3.2.4. PRESENT SENSITIVITY SELECTED.
 - 2.3.2.5. SENSOR RANGE (NORMAL, DIRTY, ETC.).

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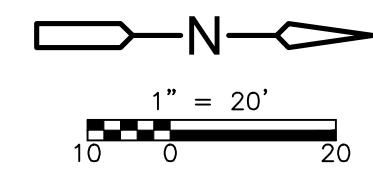
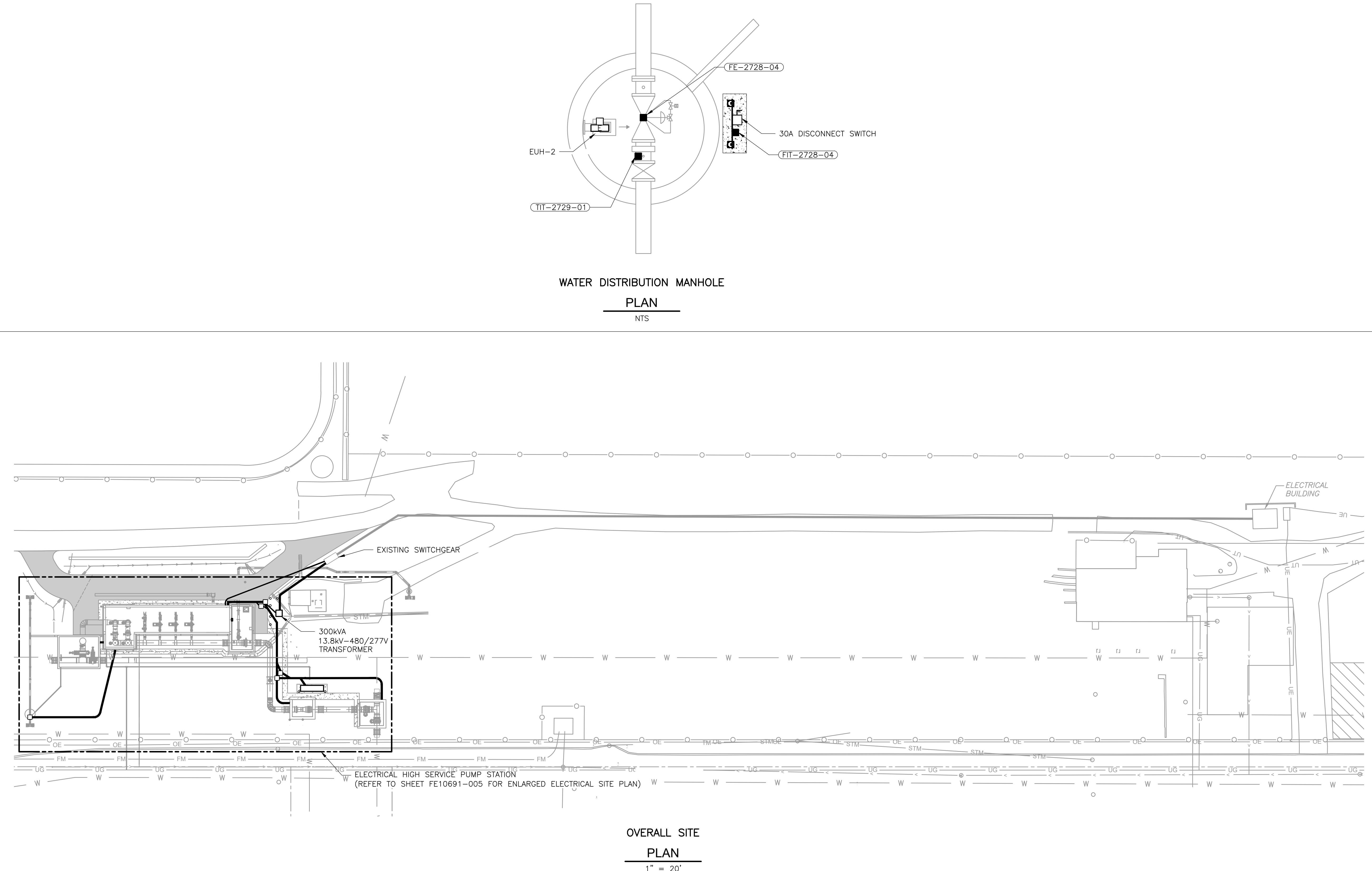
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JACOB R. DEITZ *Jacob Deitz* 63619 11.21.2025

LIC. NO. DATE

FE10691-003		NORTHEAST HIGH SERVICE PUMP STATION
		CDM Smith 652 Bielenberg Drive, Suite 203 Woodbury, MN 55125 Tel: (651) 252-3800
		Minneapolis Water Works
		ELECTRICAL GENERAL NOTES
		APP: JRD DATE: 11.21.2025

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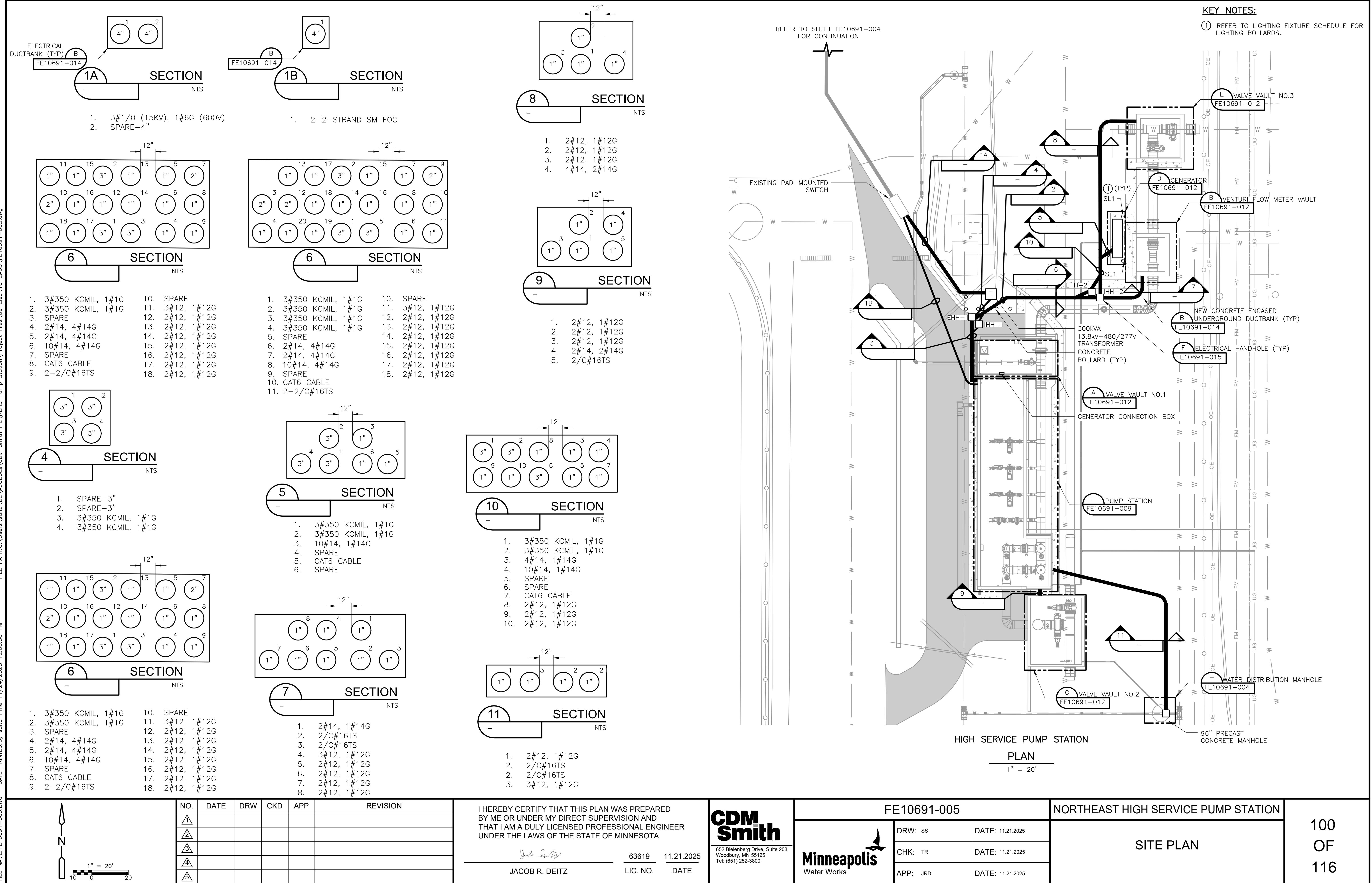
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NORTHEAST HIGH SERVICE PUMP STATION

OVERALL SITE PLAN

99
OF
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KEY NOTES:

① REFER TO LIGHTING FIXTURE SCHEDULE FOR LIGHTING BOLLARDS.

REFER TO SHEET FE10691-004
FOR CONTINUATION

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THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER
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 _____ 63619 11.21.2025
JACOB R. DEITZ LIC. NO. DATE

**CDM
Smith**

652 Bielenberg Drive, Suite 203
Woodbury, MN 55125
Tel: (651) 252-3800

FE10691-005

DRW: ss

CHK: TR

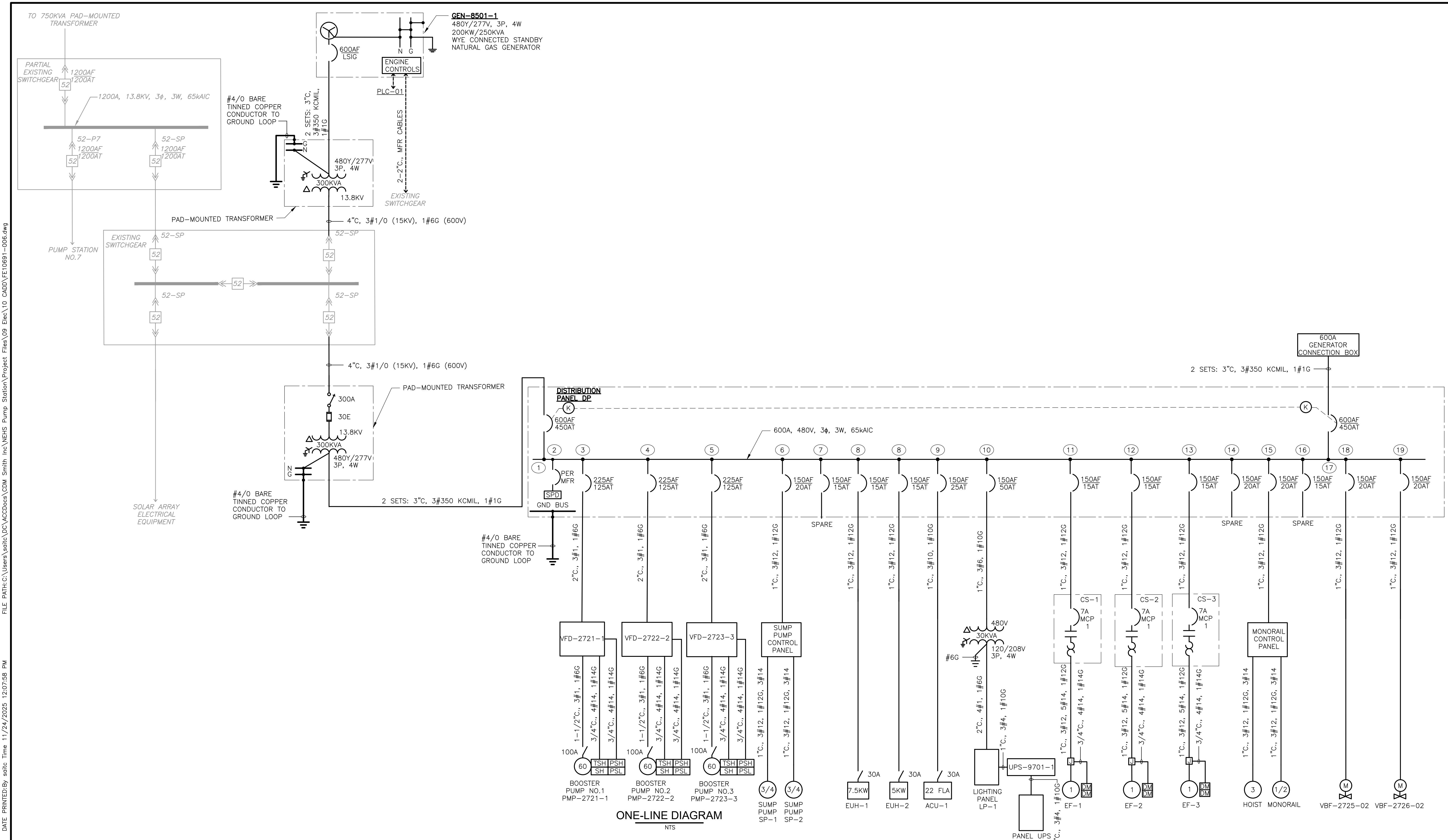
APP: JRD

NORTHEAST HIGH SERVICE PUMP STATION

SITE PLAN

100
OF
116

ISSUED FOR BID



NO.	DATE	DRW	CKD	APP
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JACOB R. DEITZ 63619 11.21.20
JACOB R. DEITZ LIC. NO. DATE

**CDM
Smith**

25
652 Bielenberg Drive, Suite
Woodbury, MN 55125
Tel: (651) 252-3800

FE10691-00

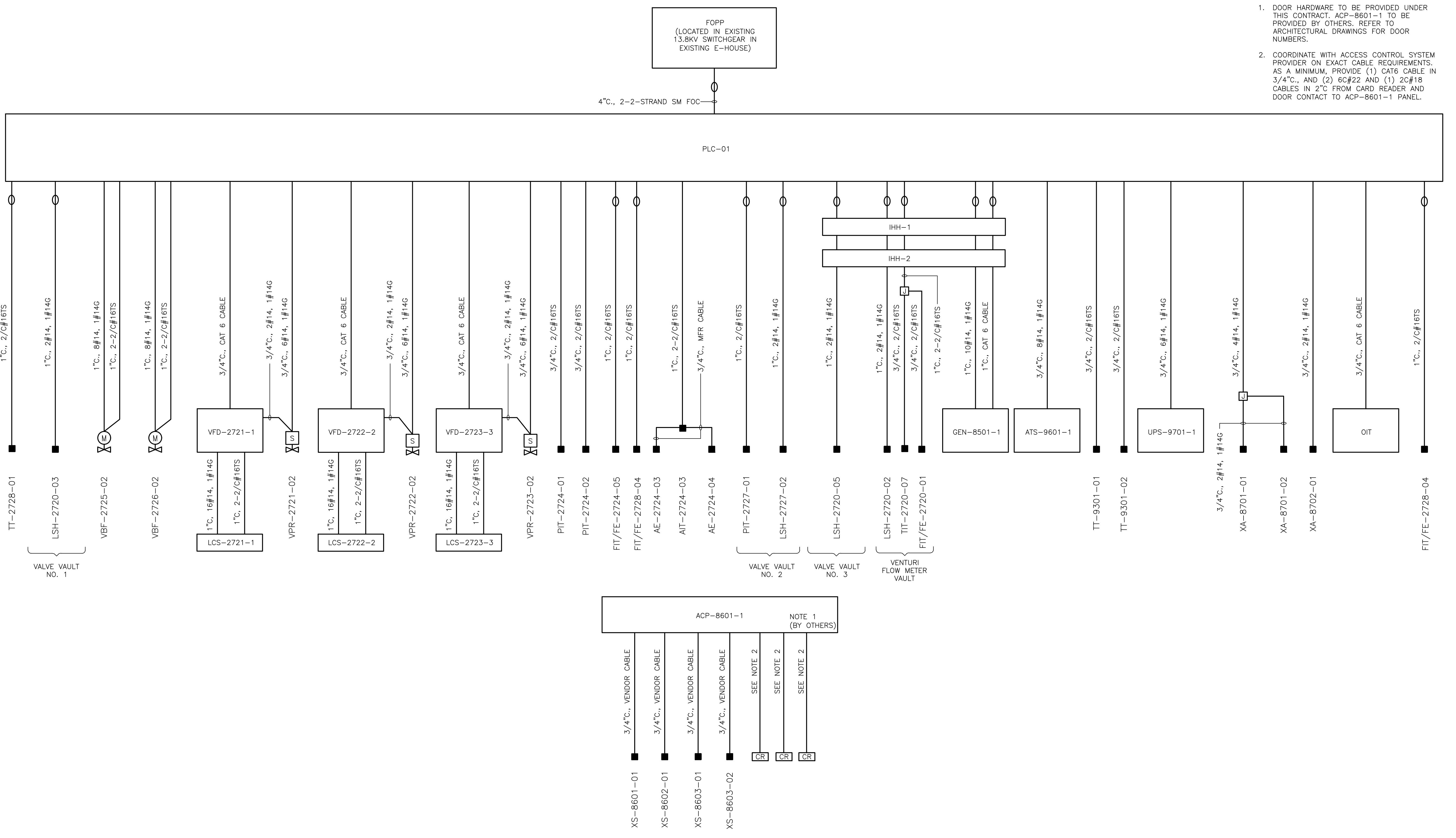
DRW: ss
CHK: TR
APP: APP

NORTHEAST HIGH SERVICE PUMP STATION

ONE-LINE DIAGRAM

101
OF
116

ISSUED FOR BID



NO.	DATE	DRW	CKD	APP	REVISION
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Water Works

FE10691-007

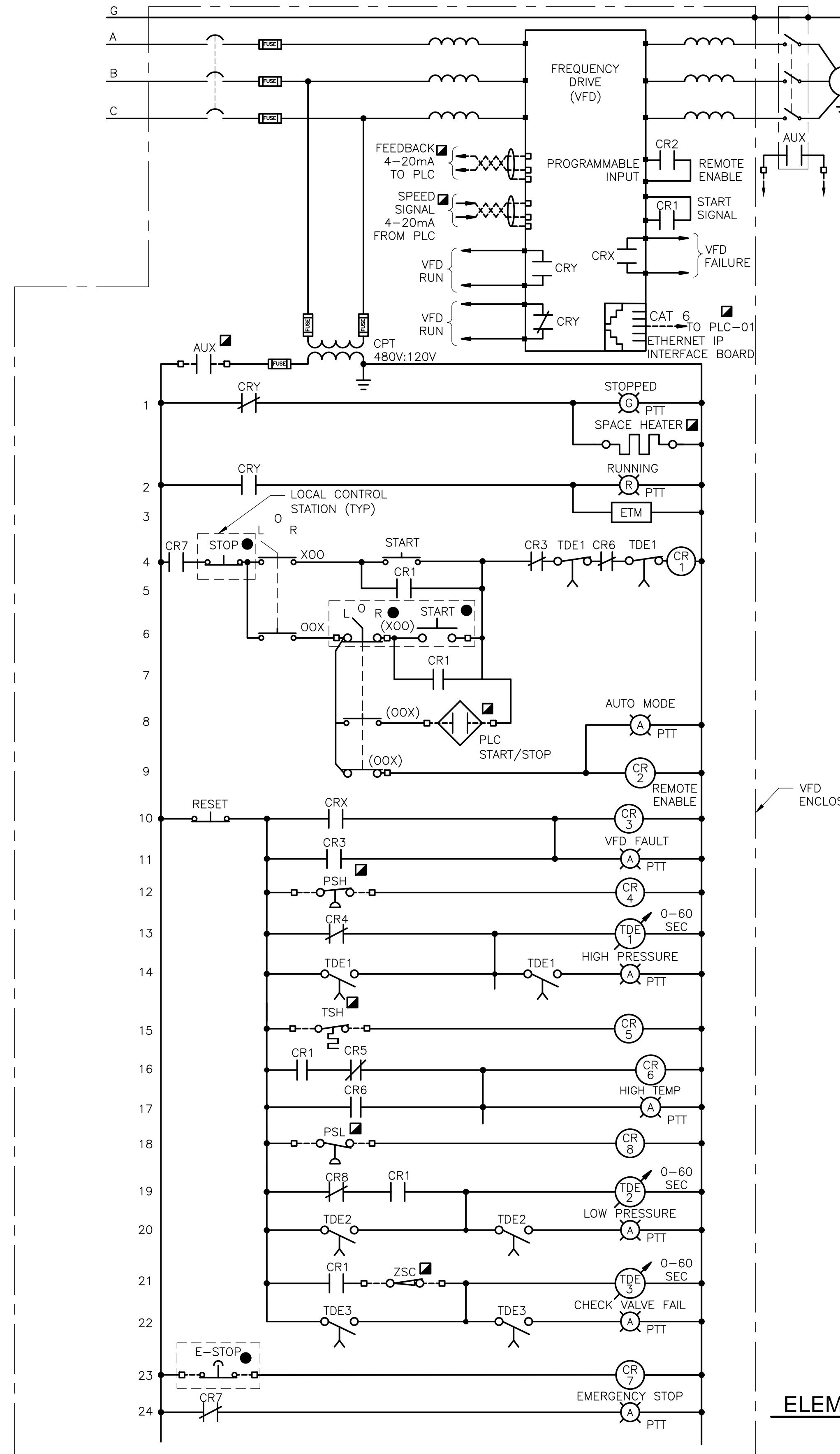


Water Works

NORTHEAST HIGH SERVICE PUMP STATION
CONTROL AND INSTRUMENTATION
RISER DIAGRAM

102
OF
116

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**BOOSTER PUMP VFD
ELEMENTARY CONTROL DIAGRAM**

JACOB R. DEITZ

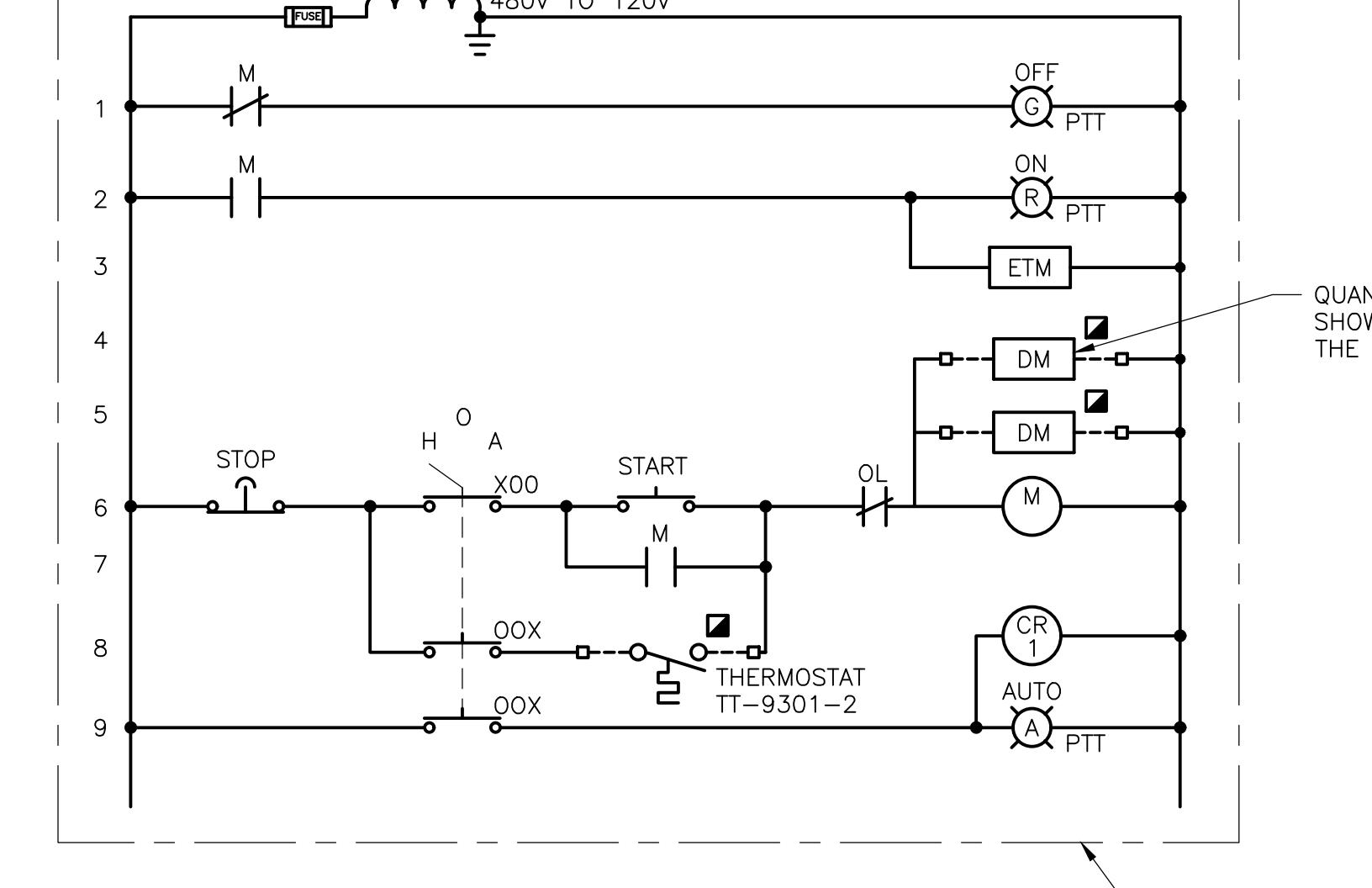
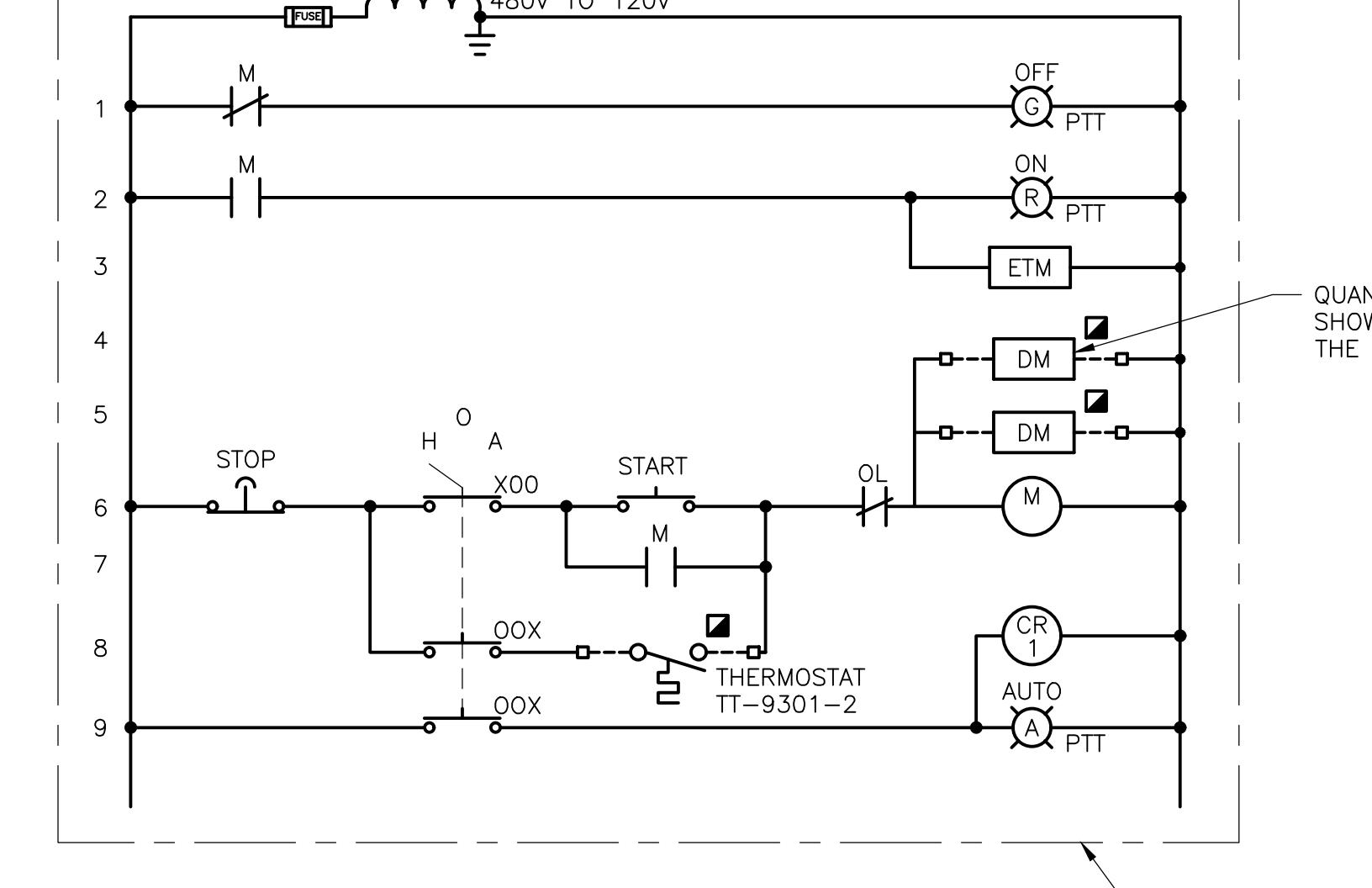
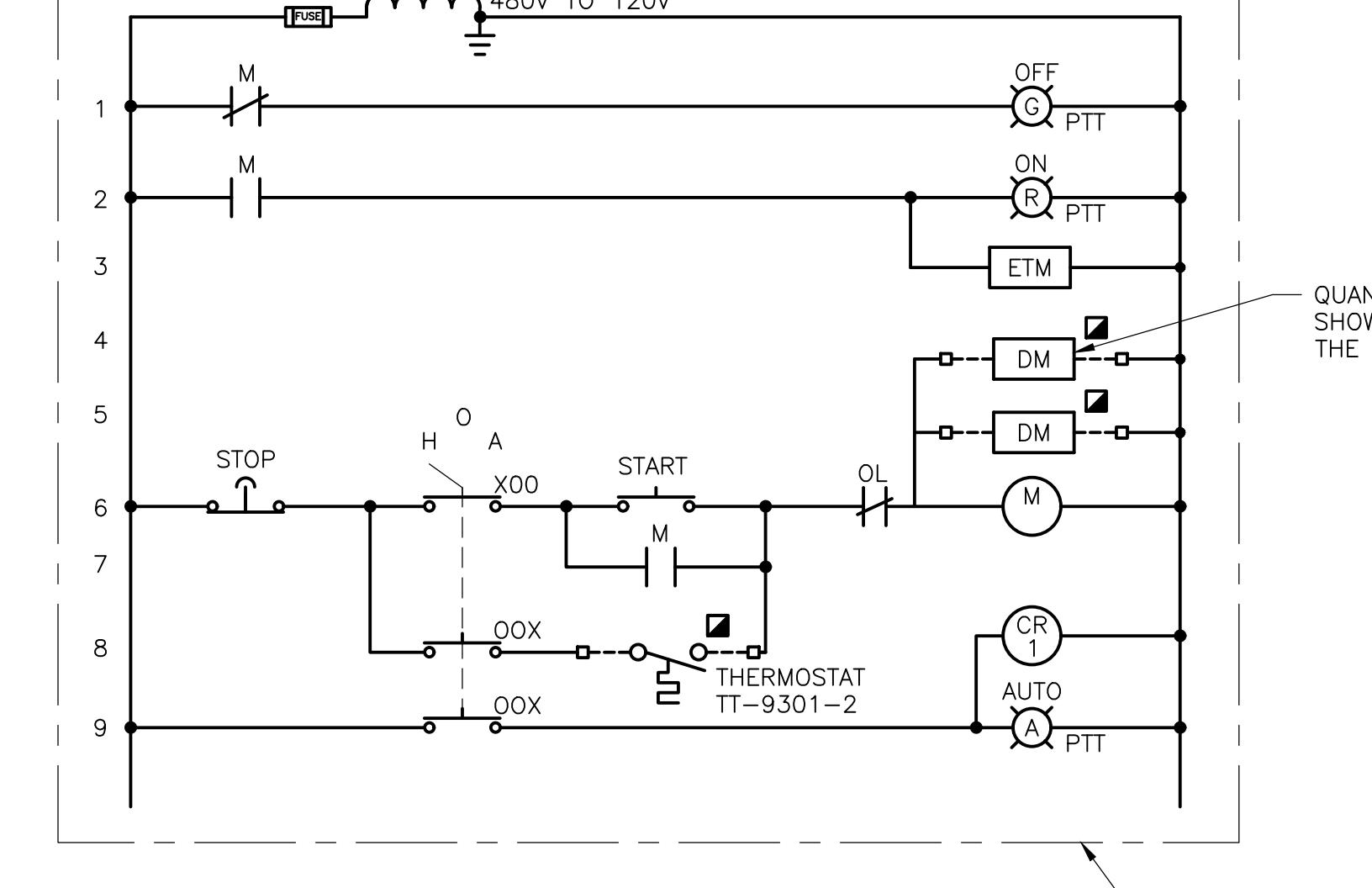
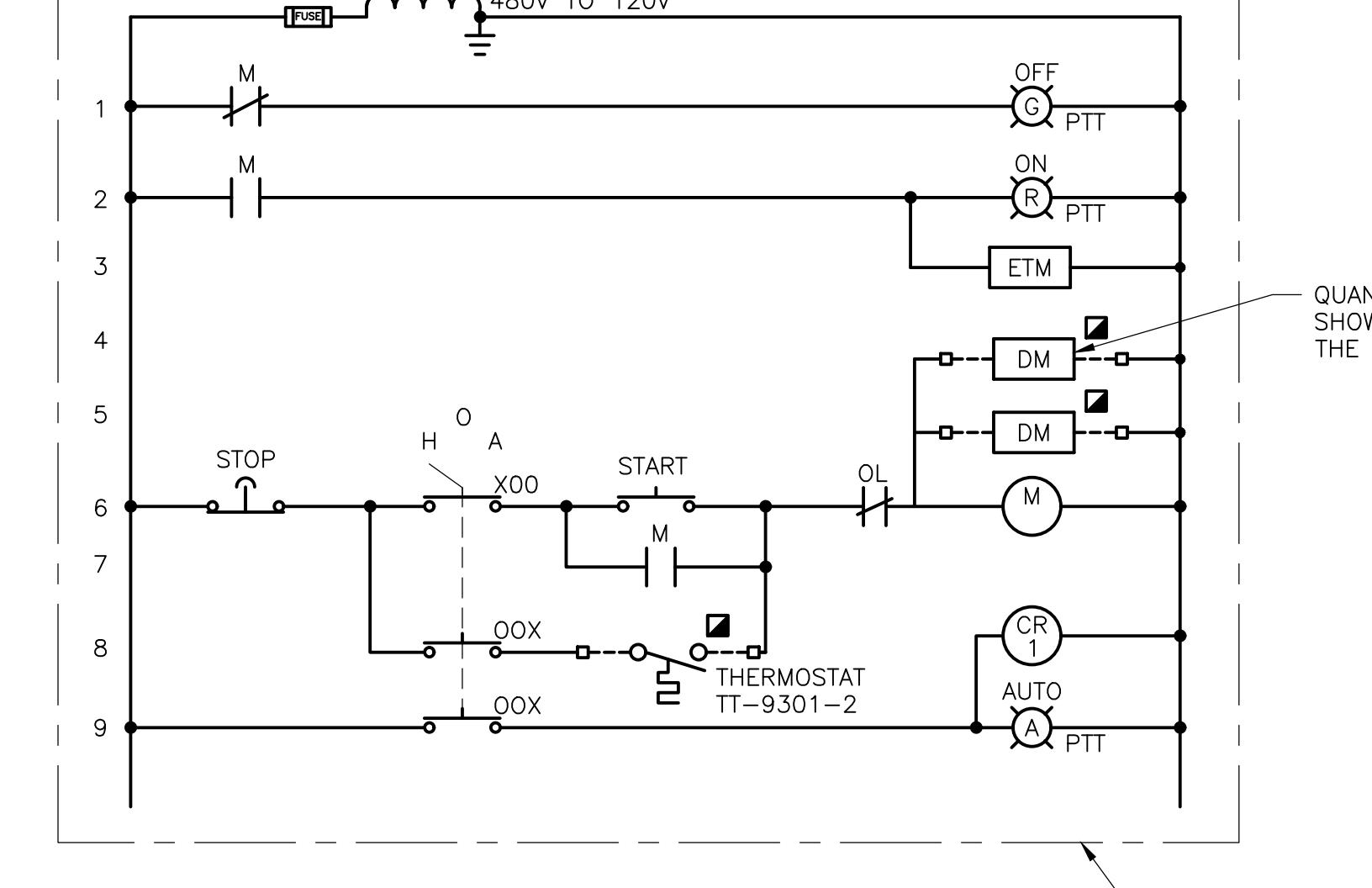
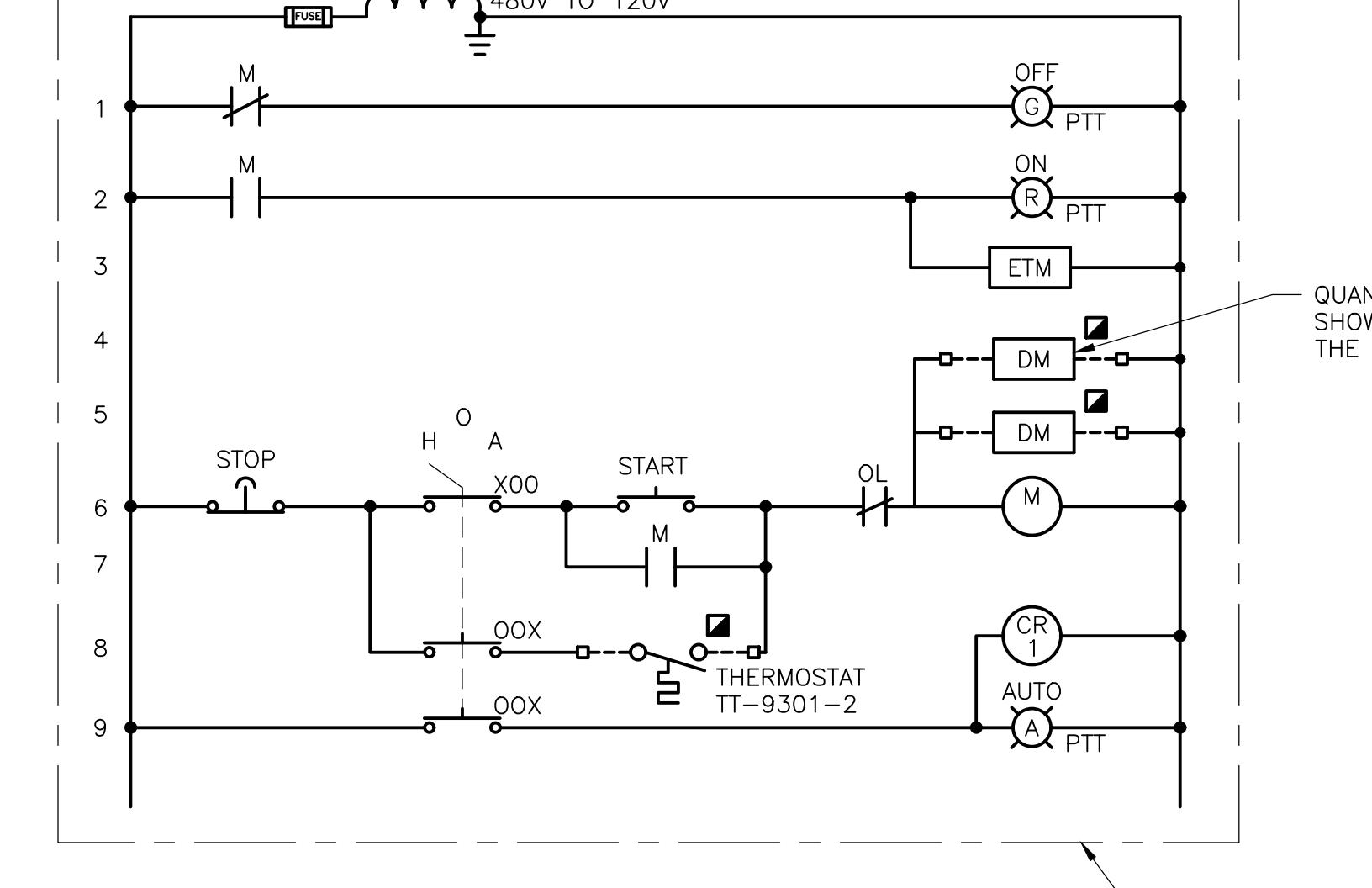
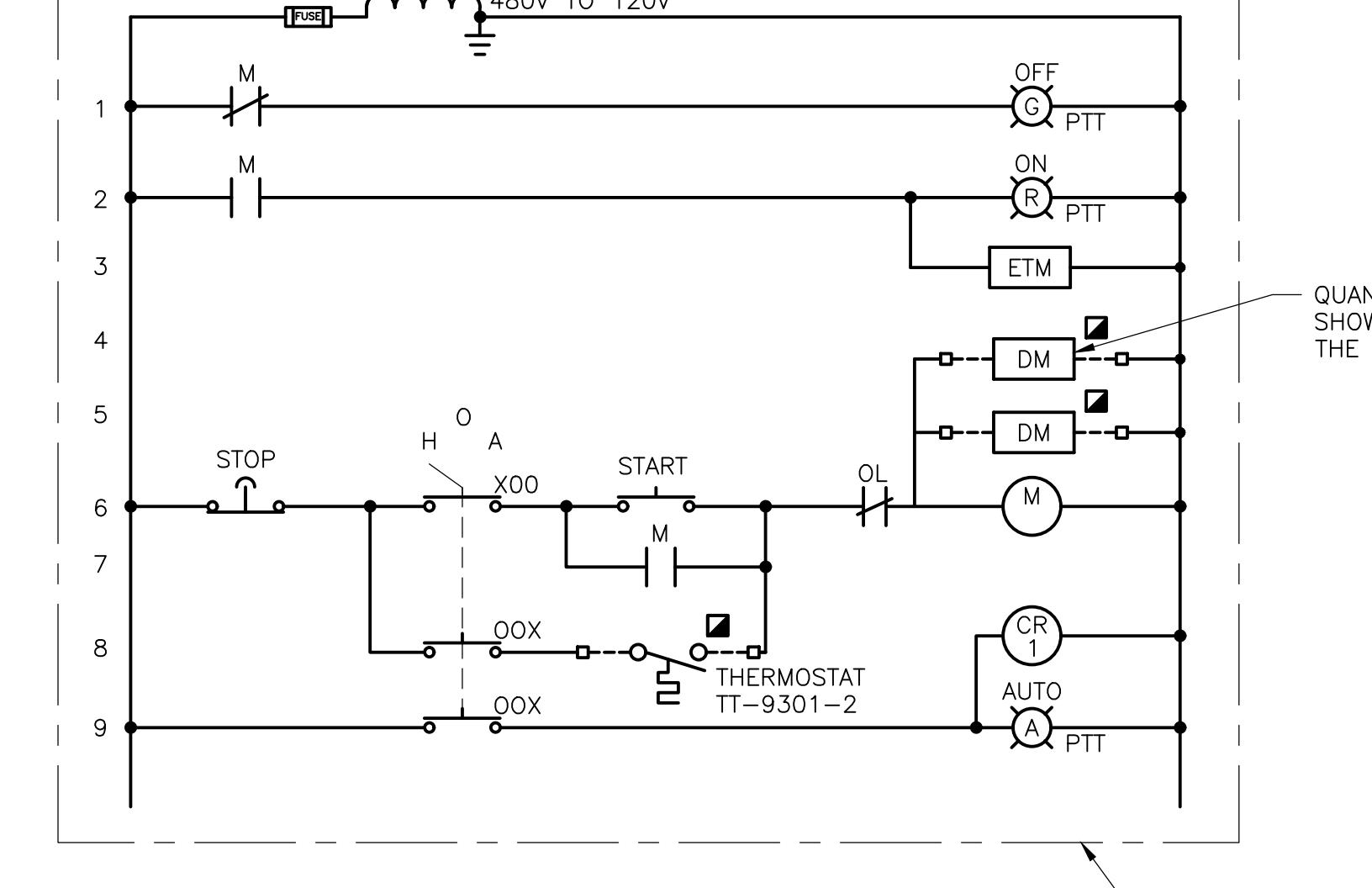
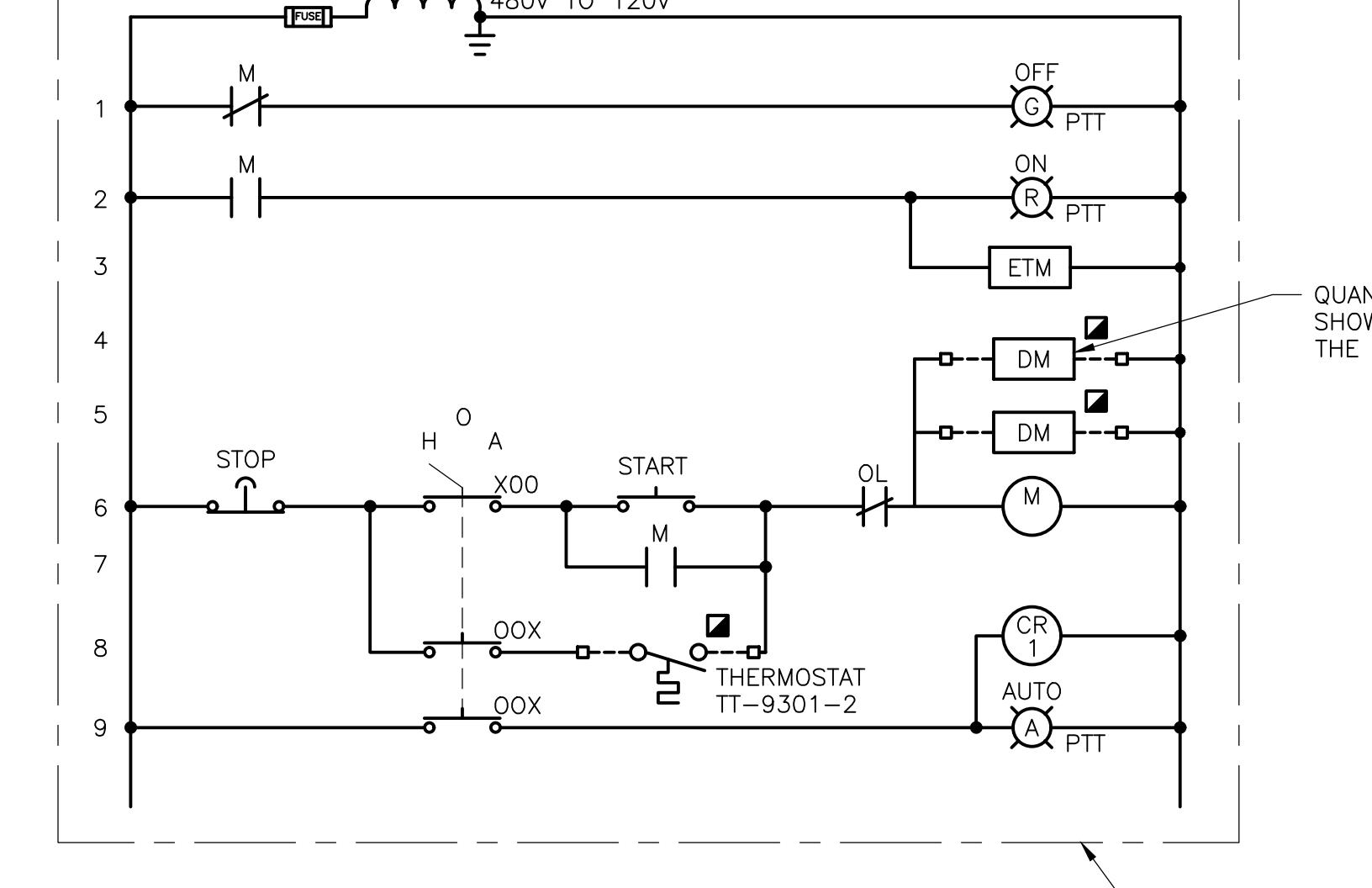
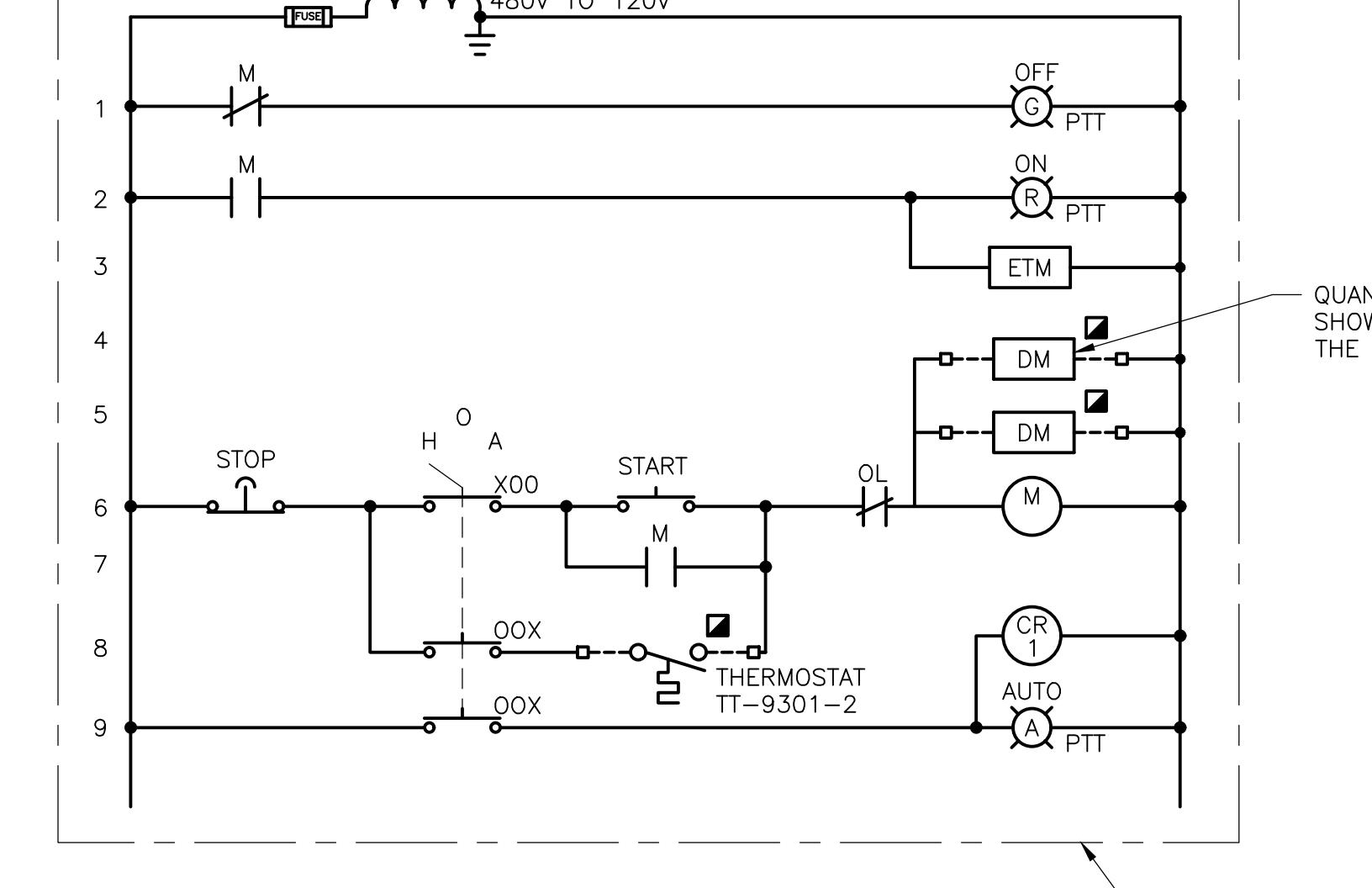
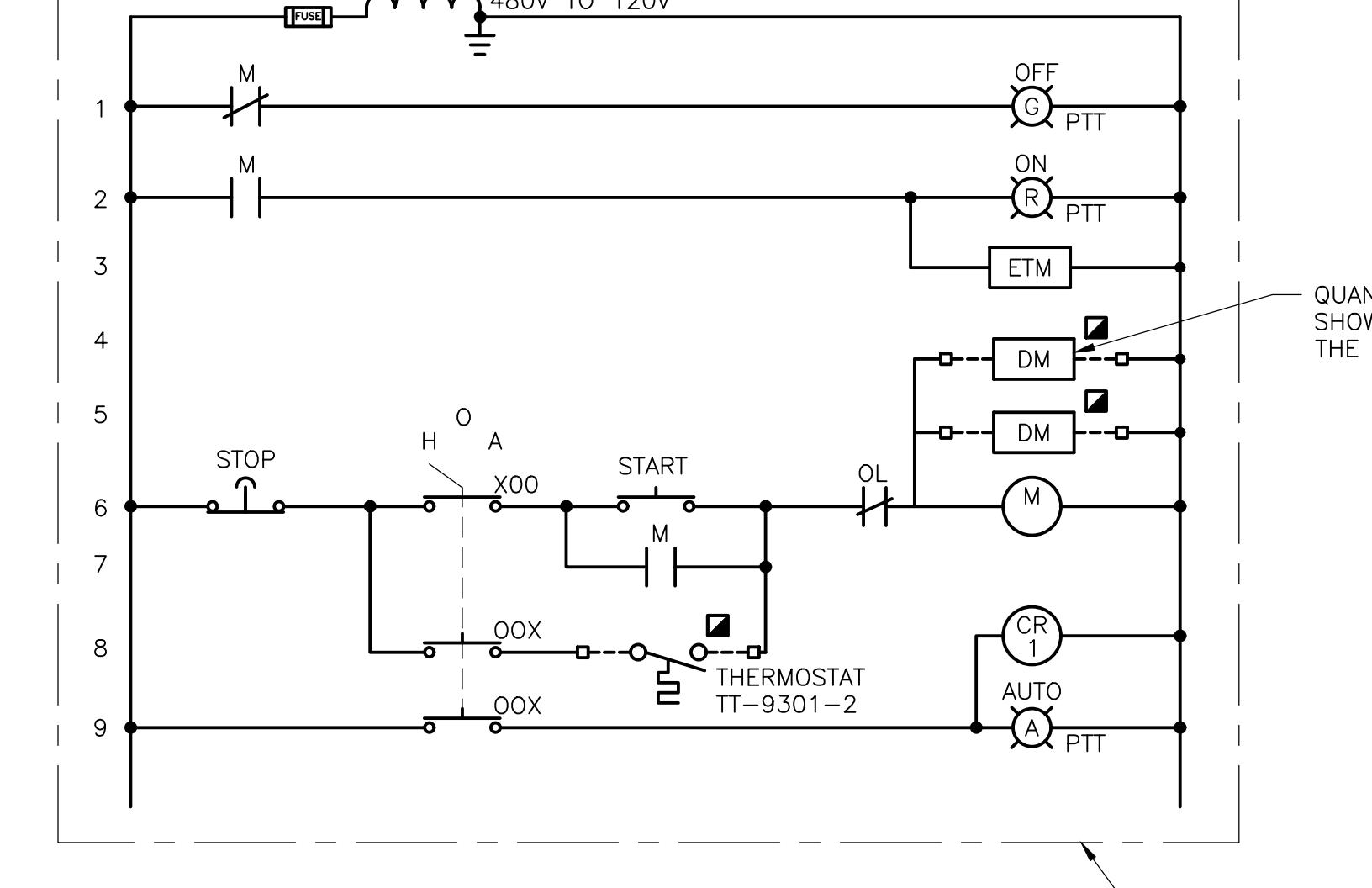
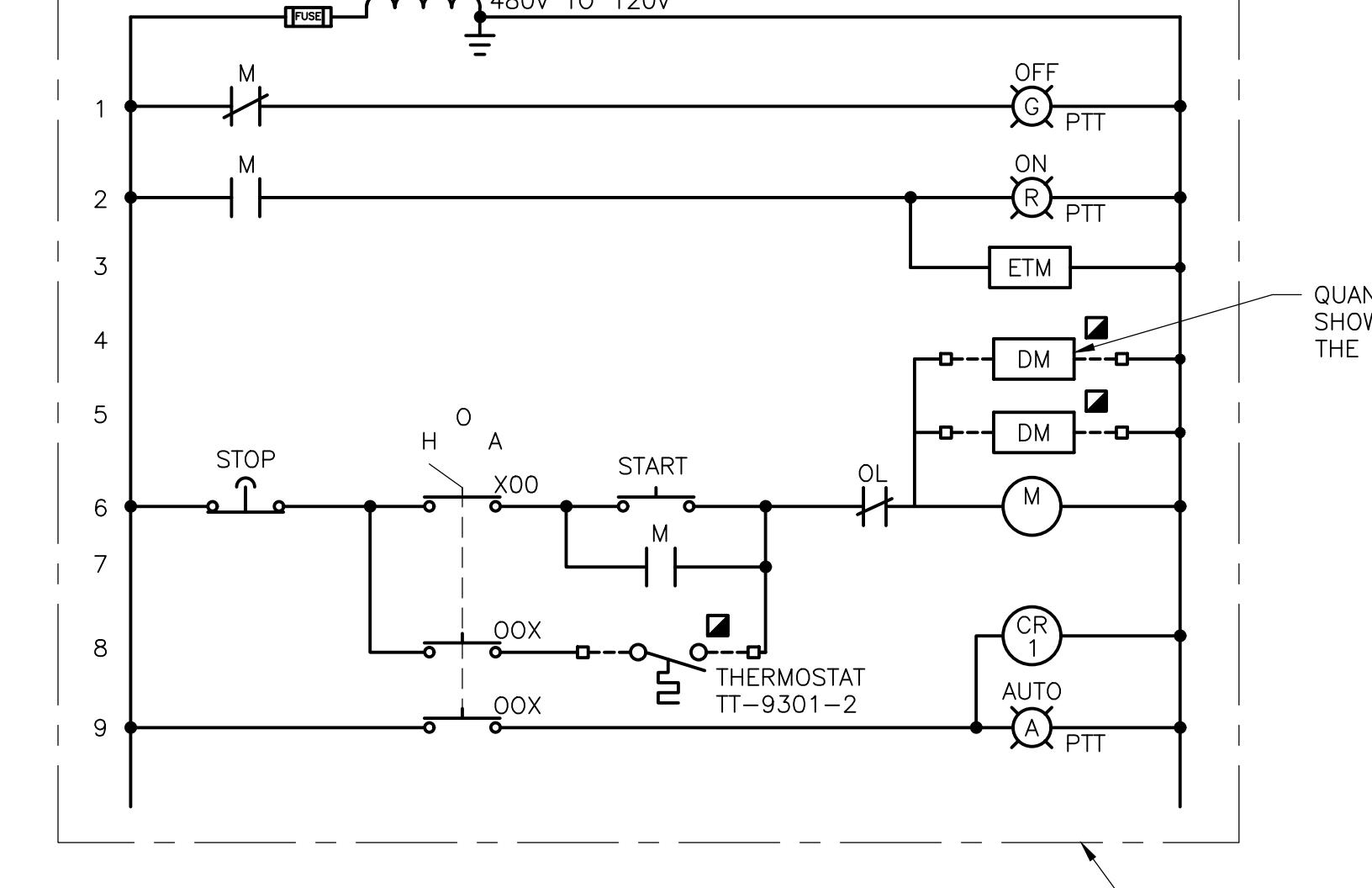
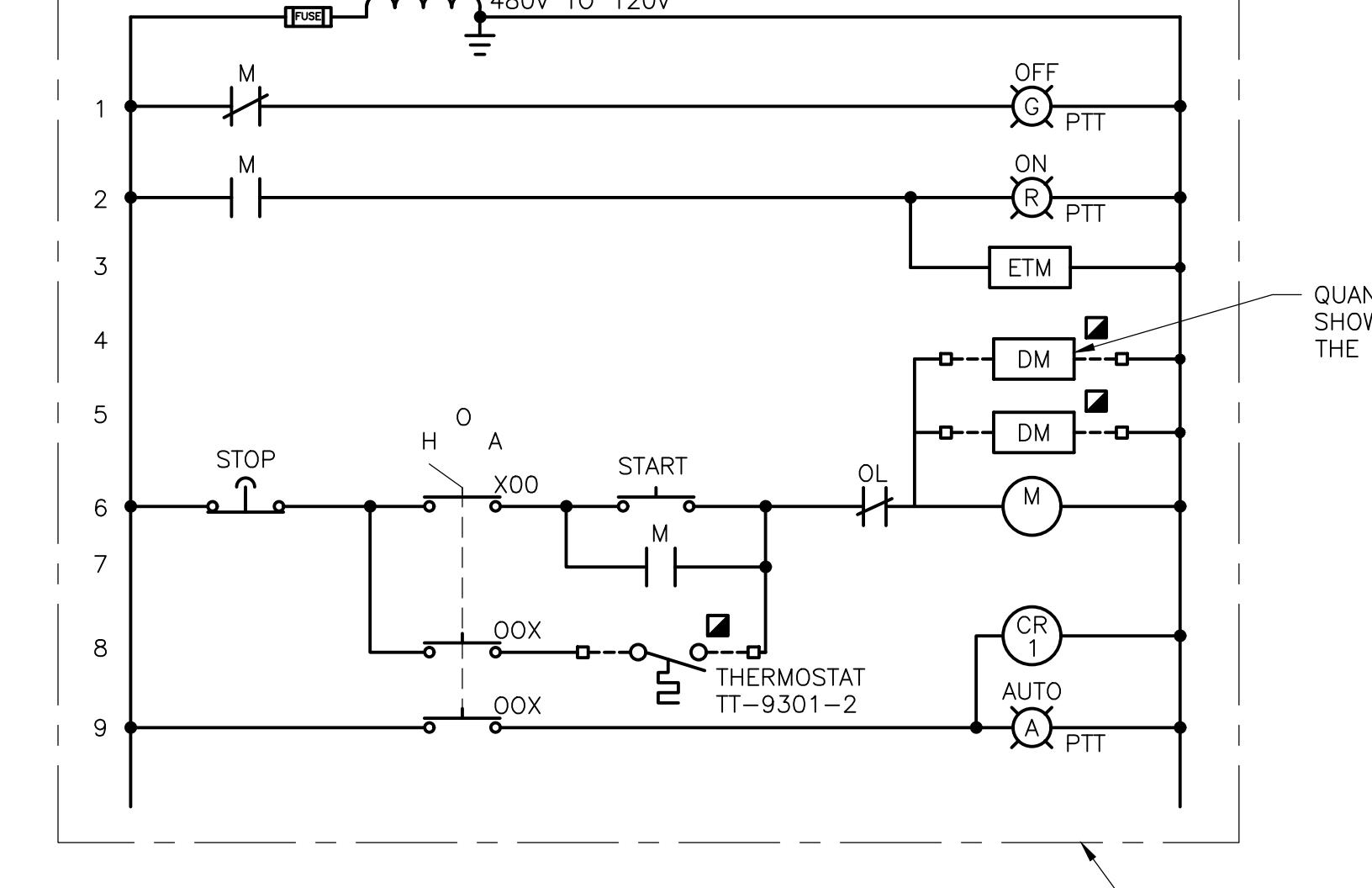
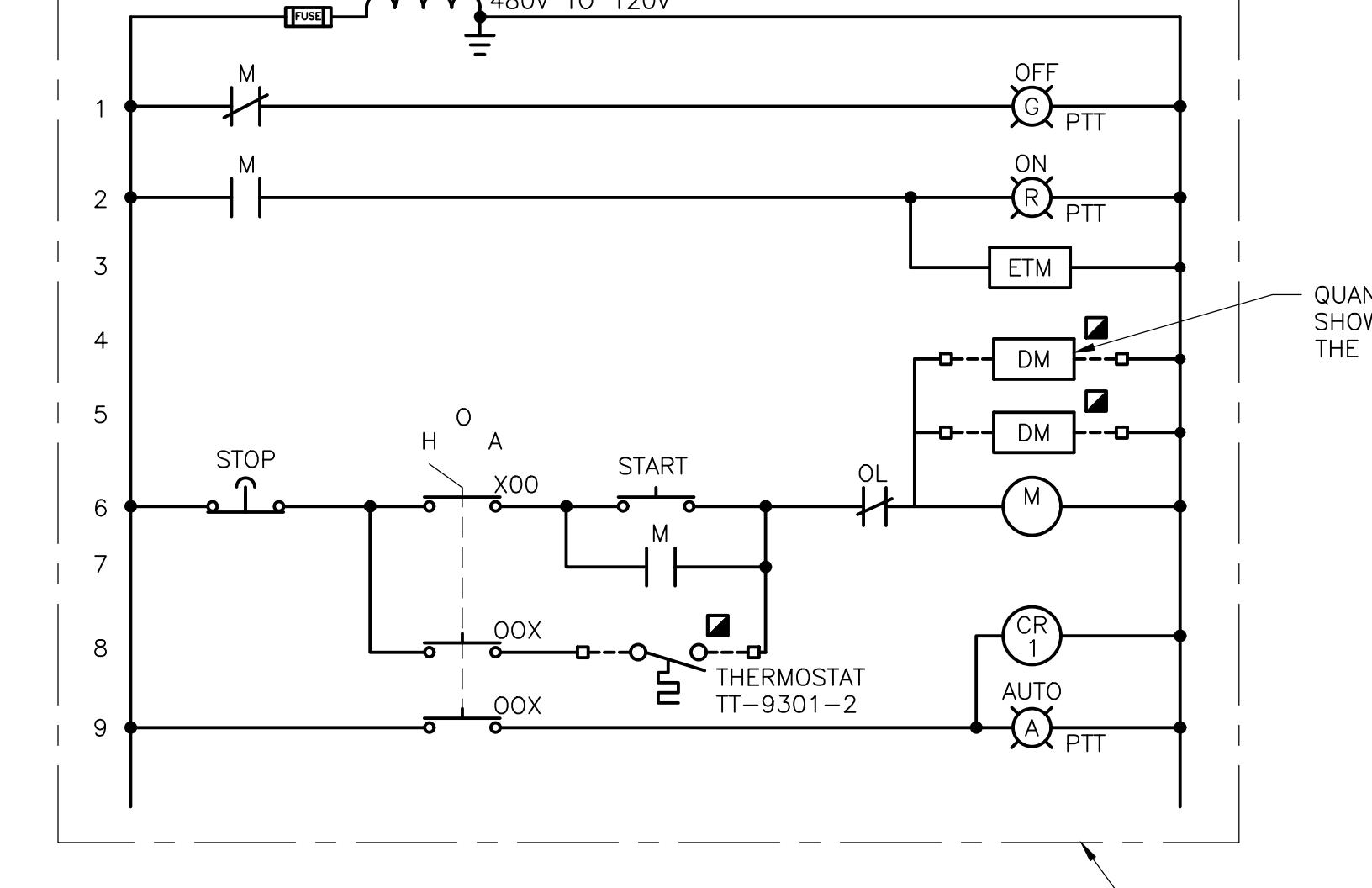
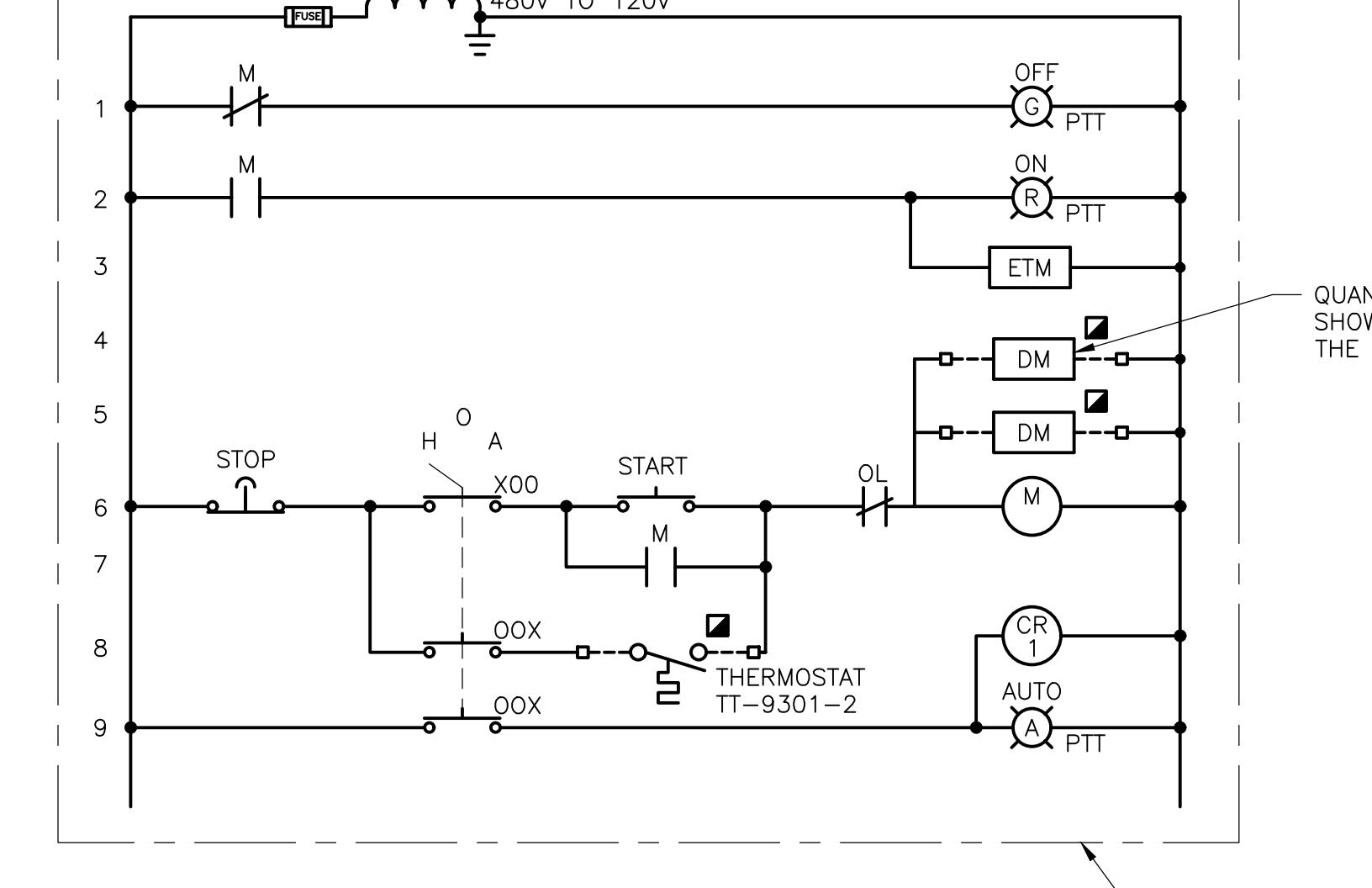
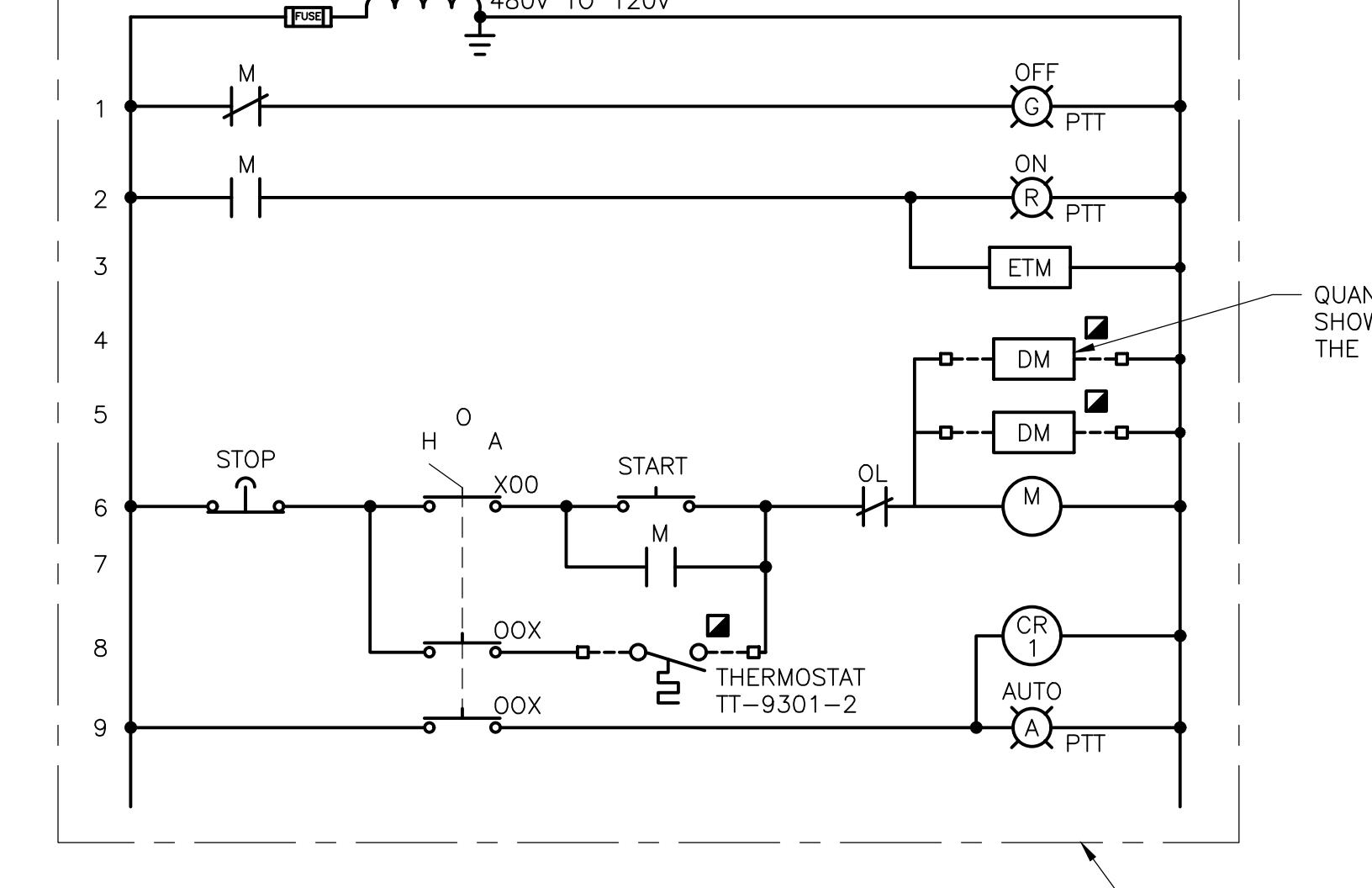
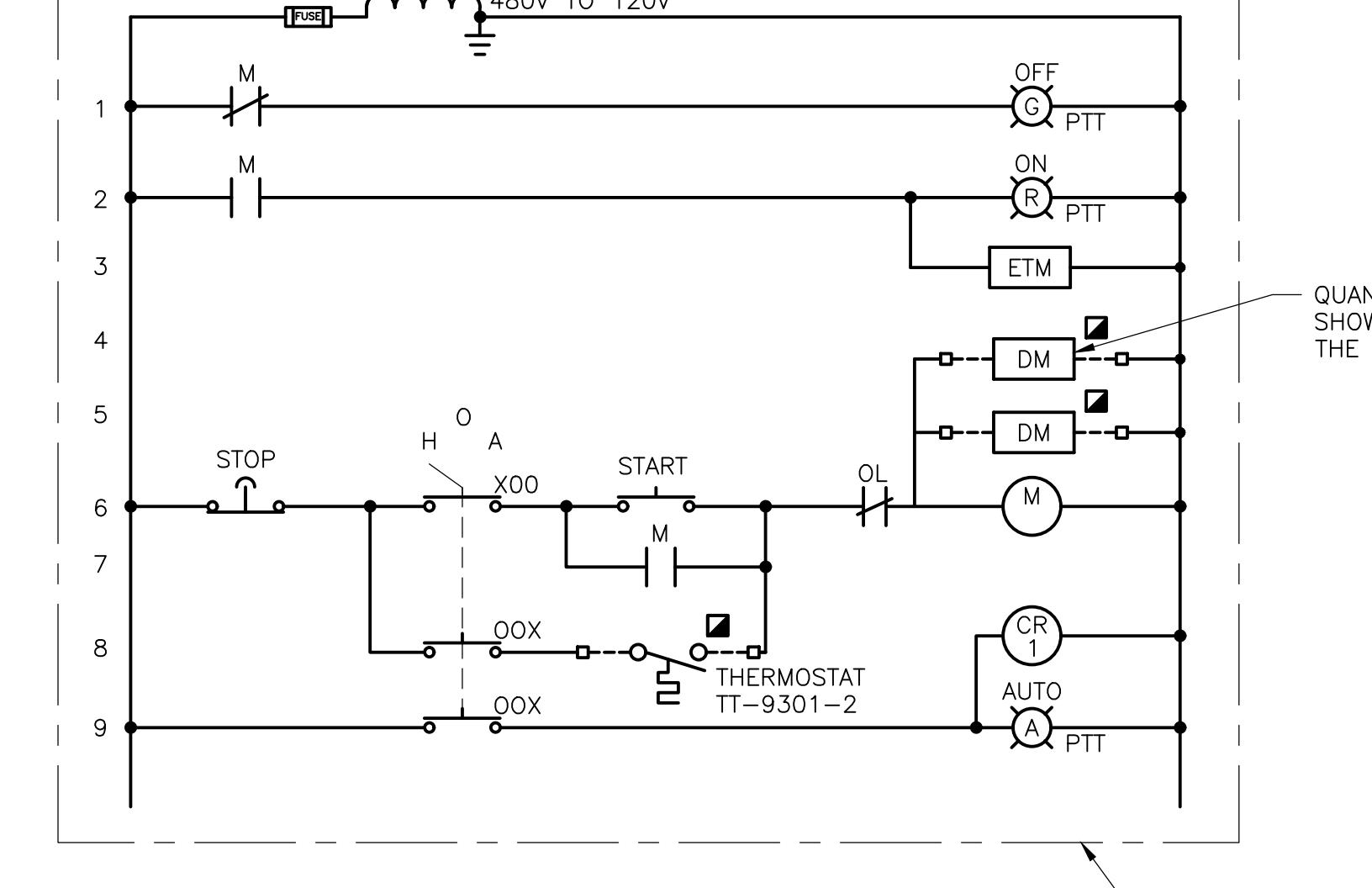
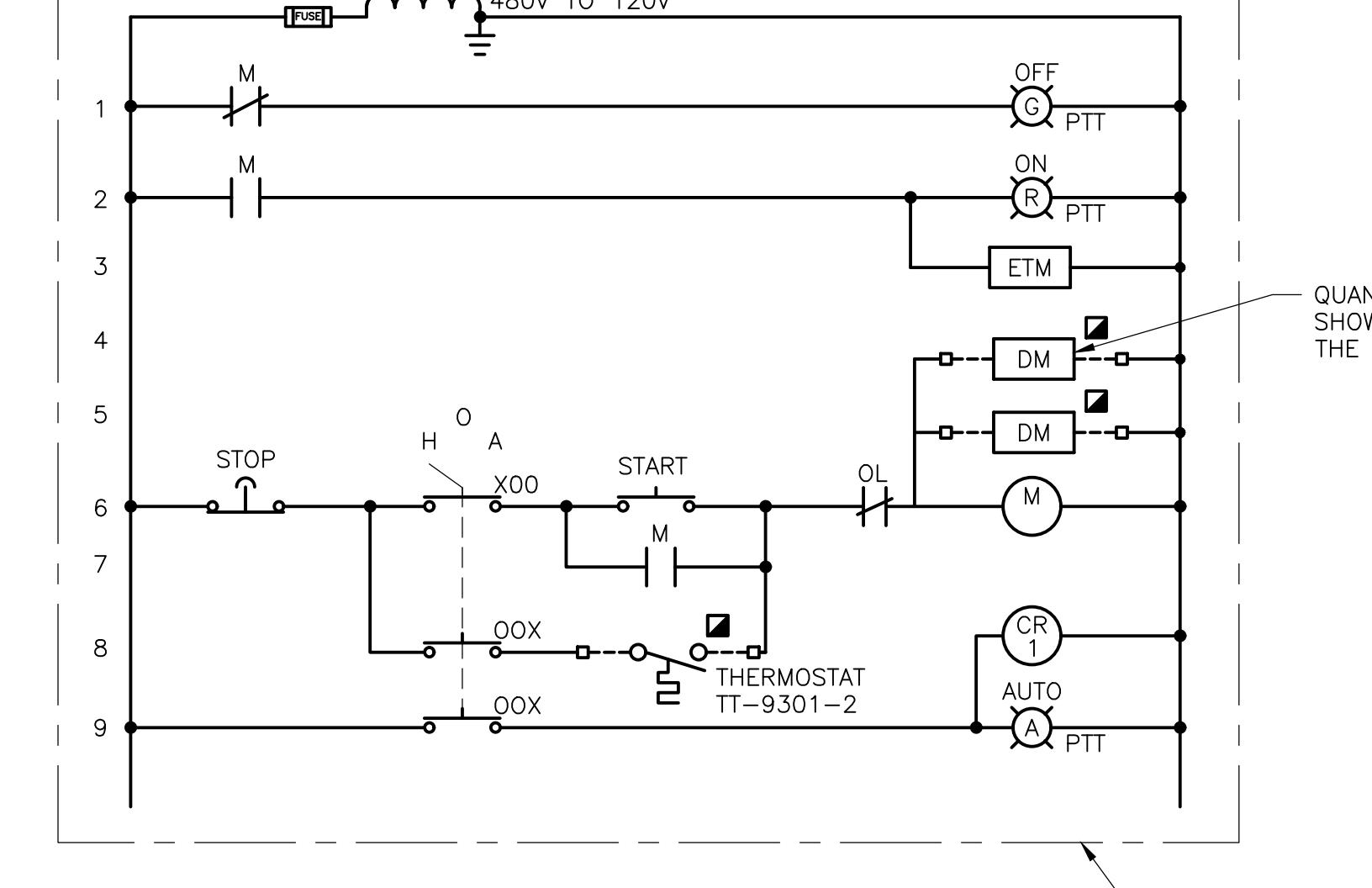
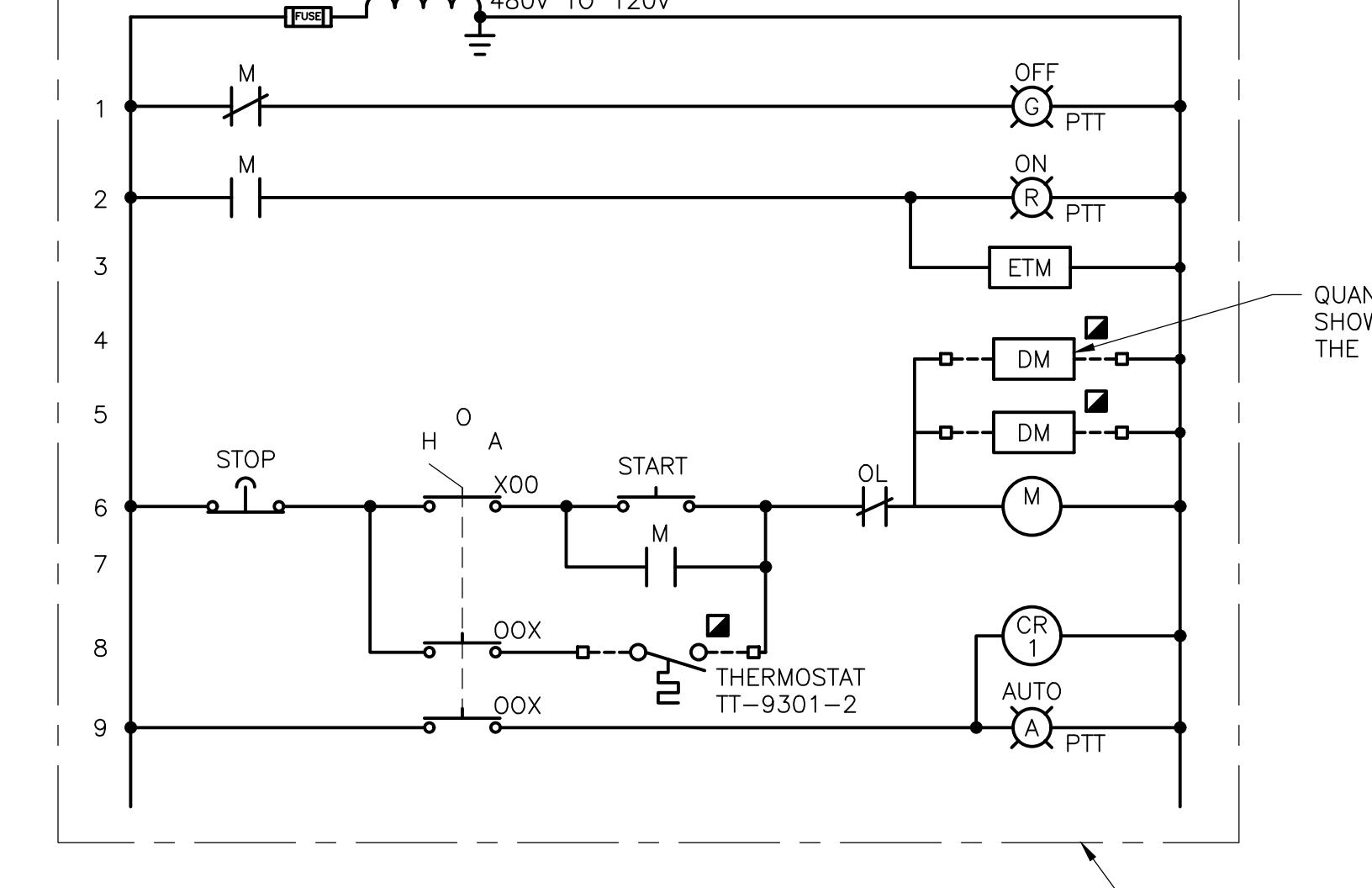
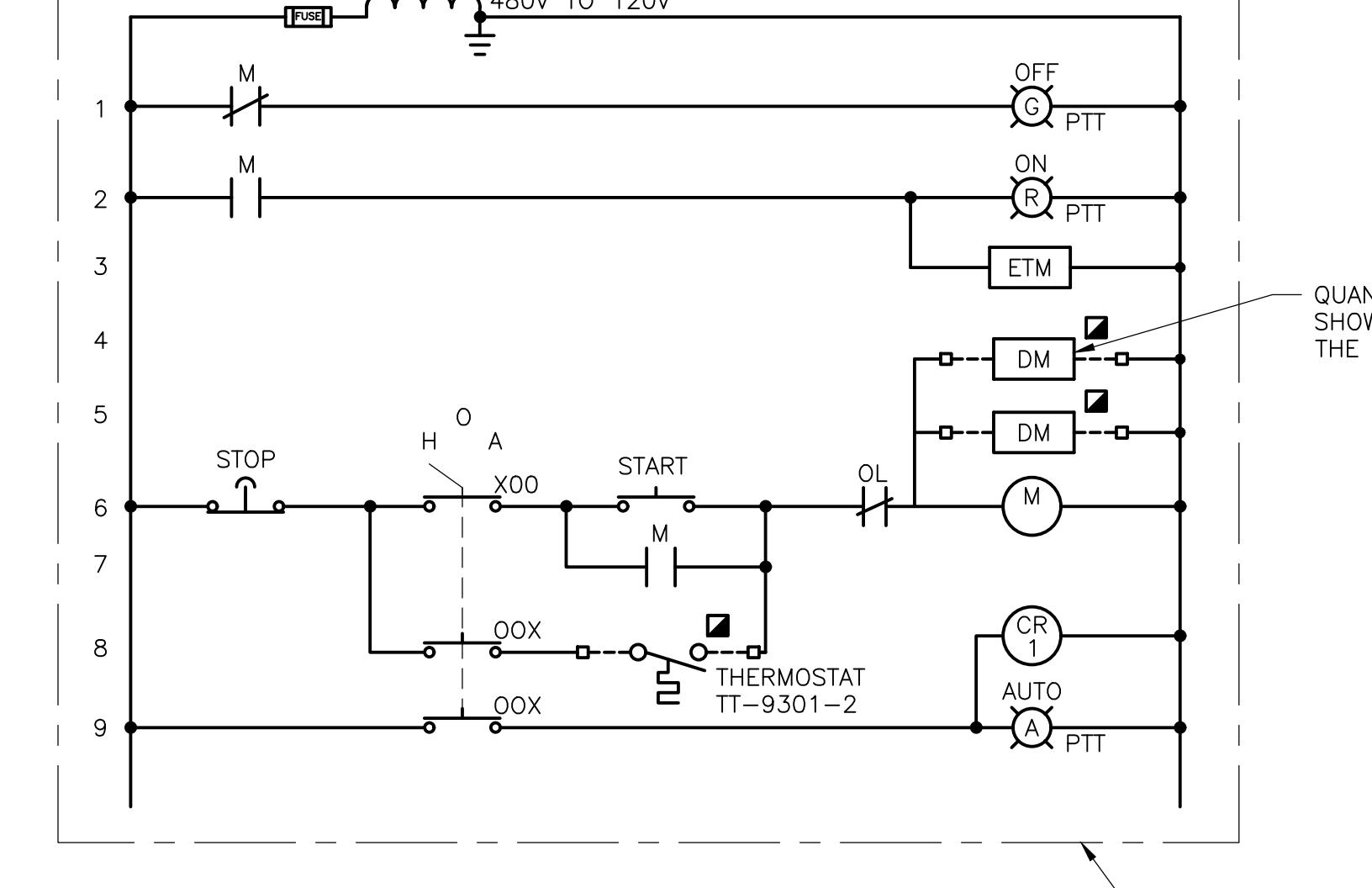
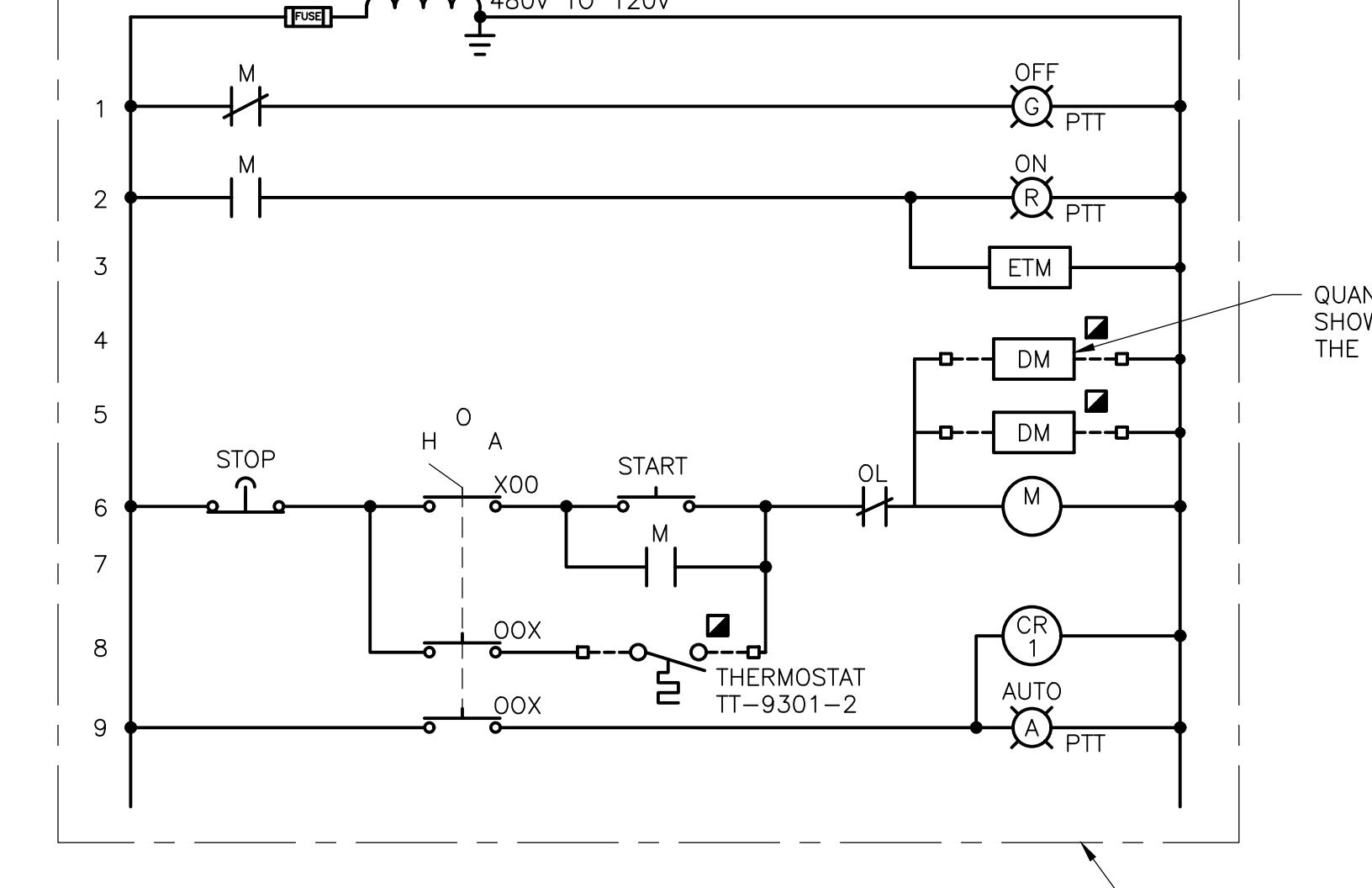
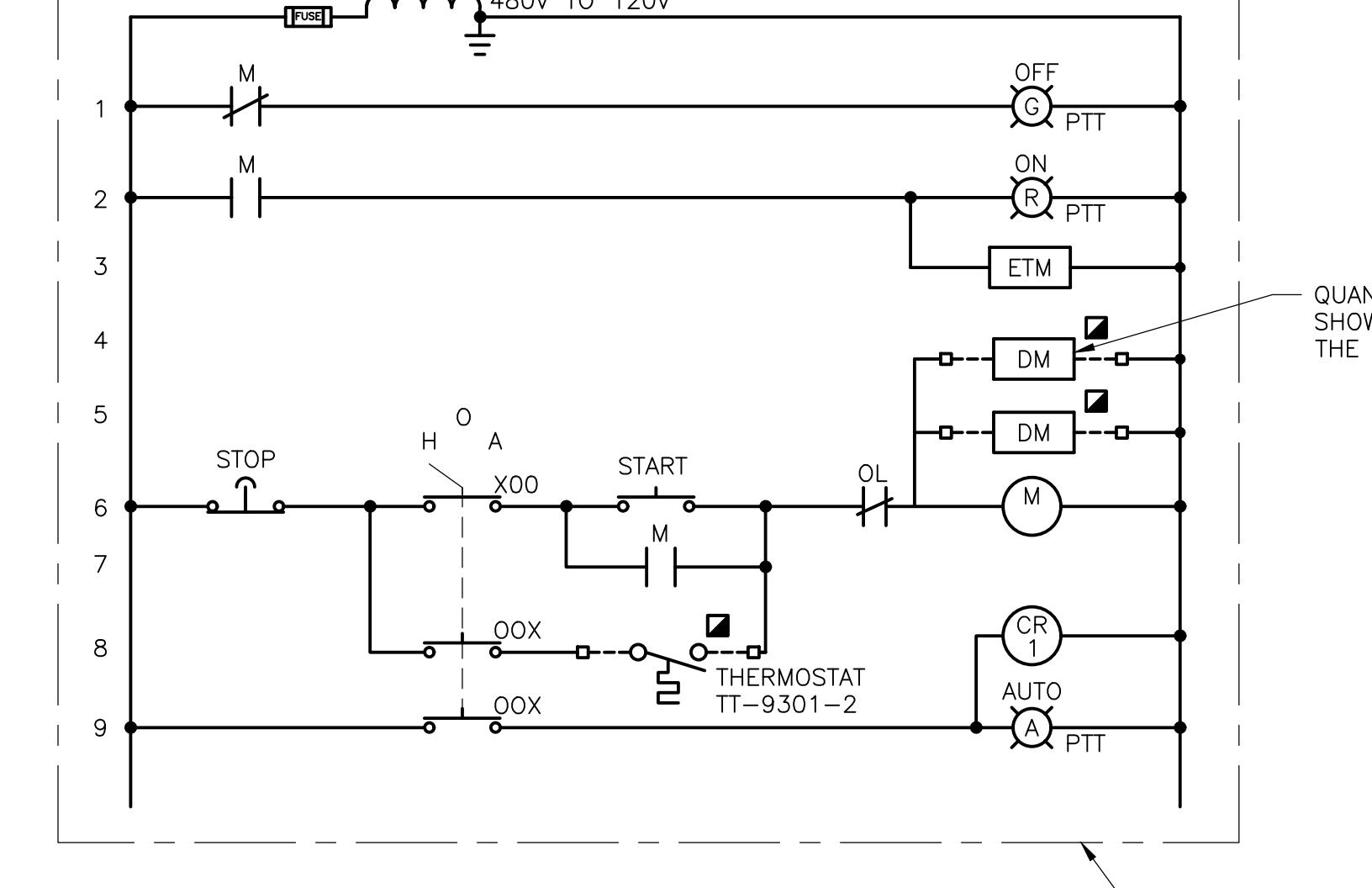
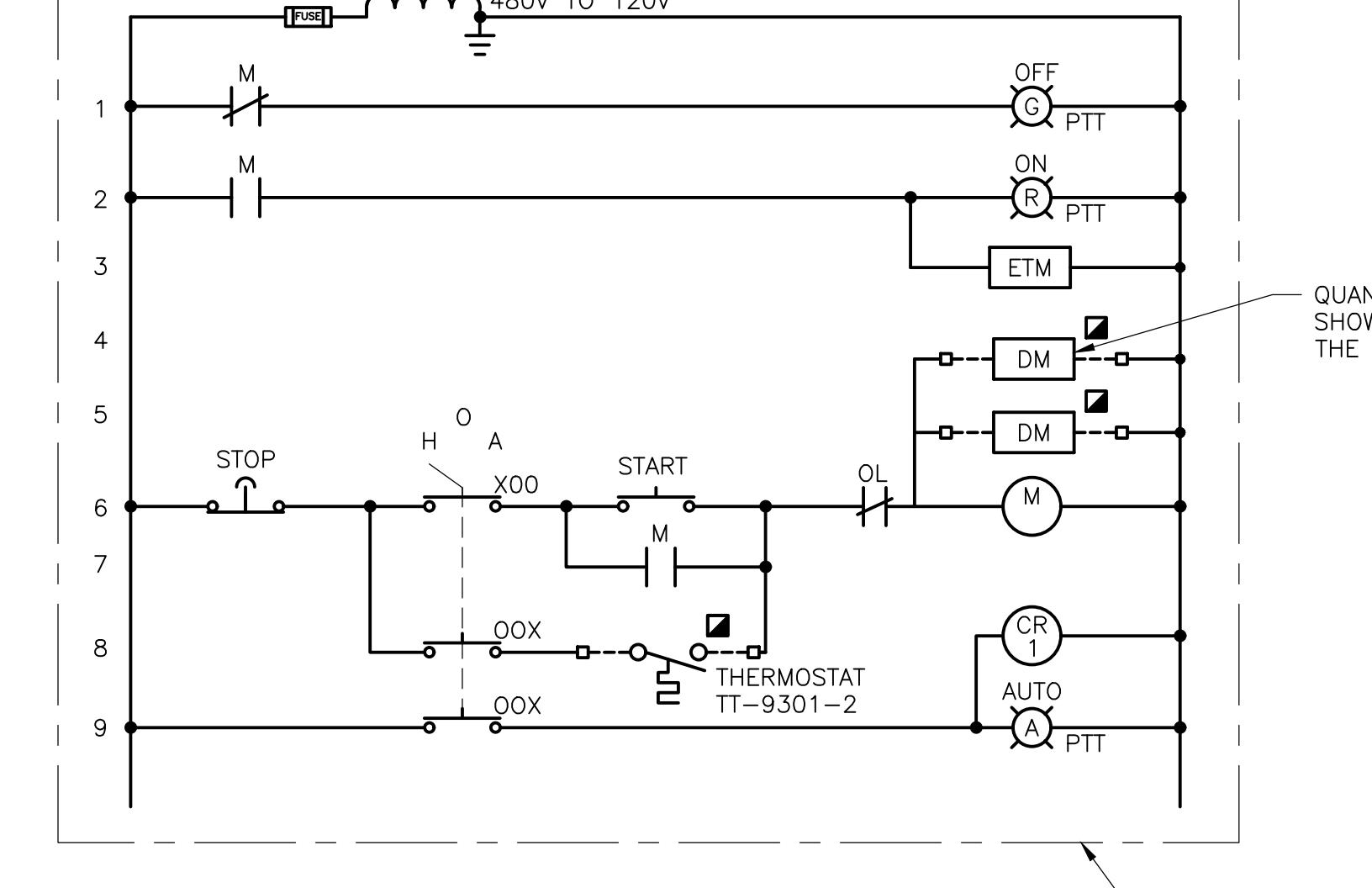
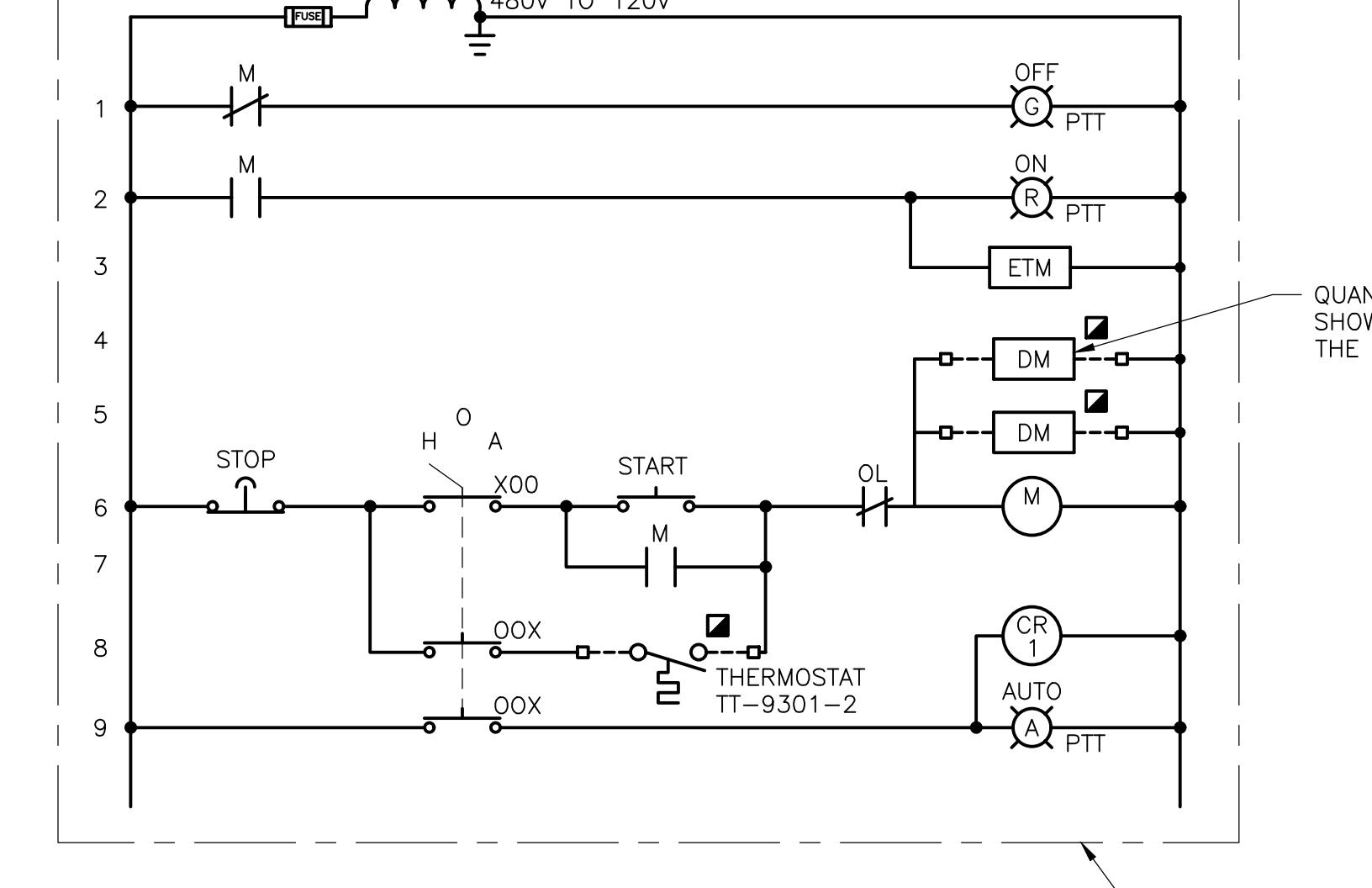
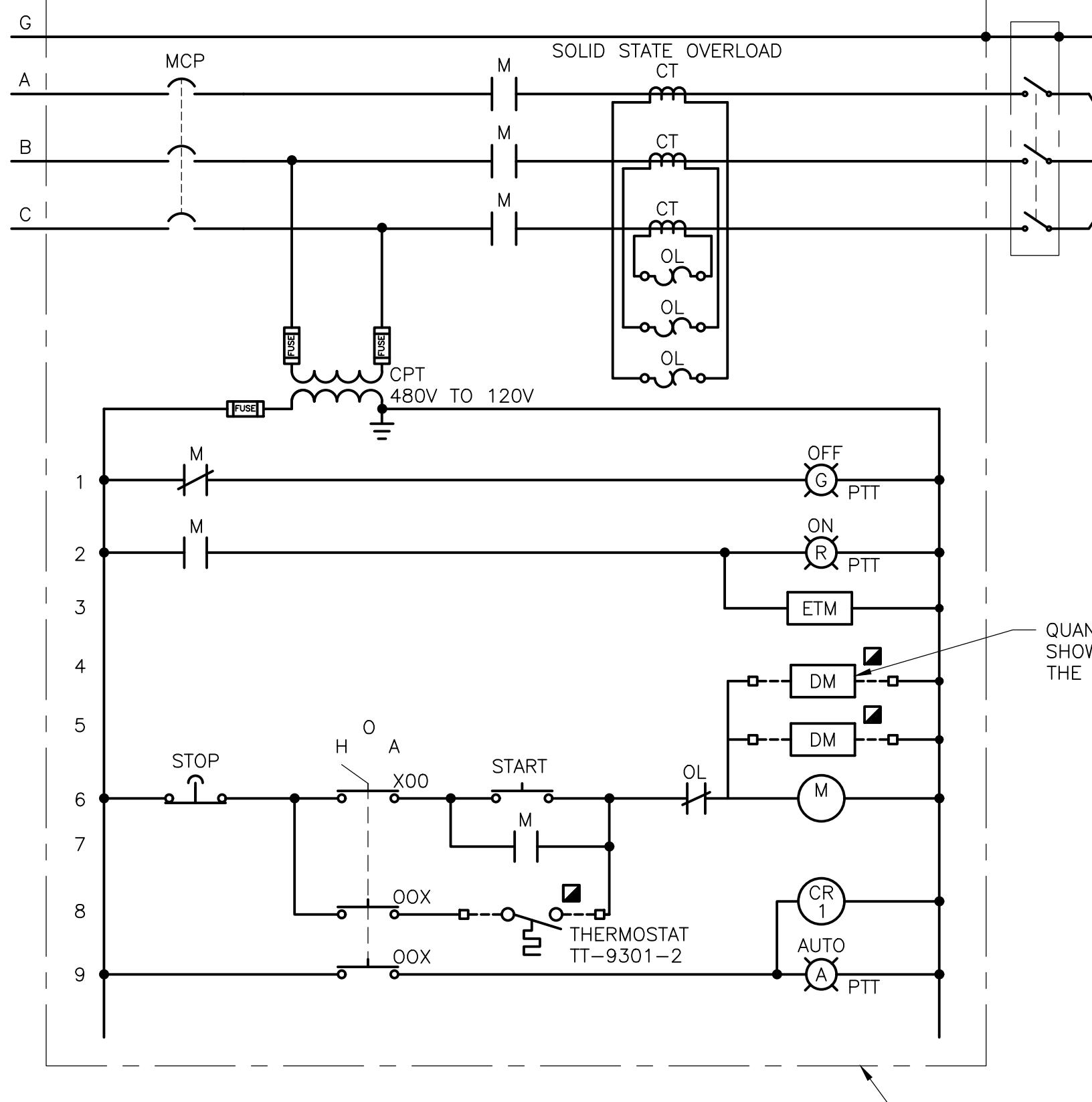
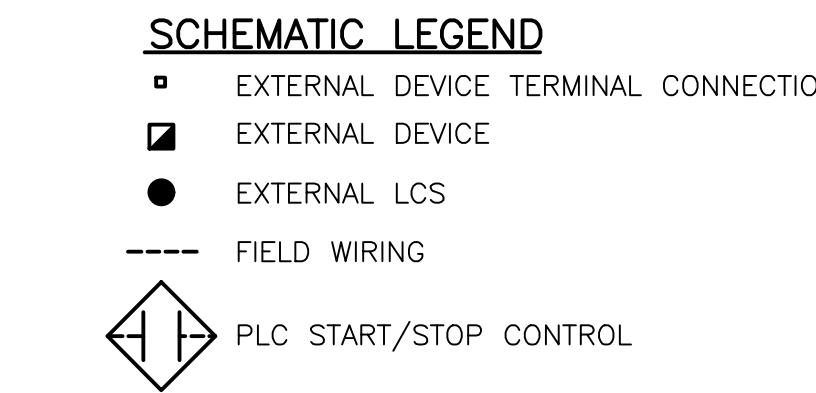
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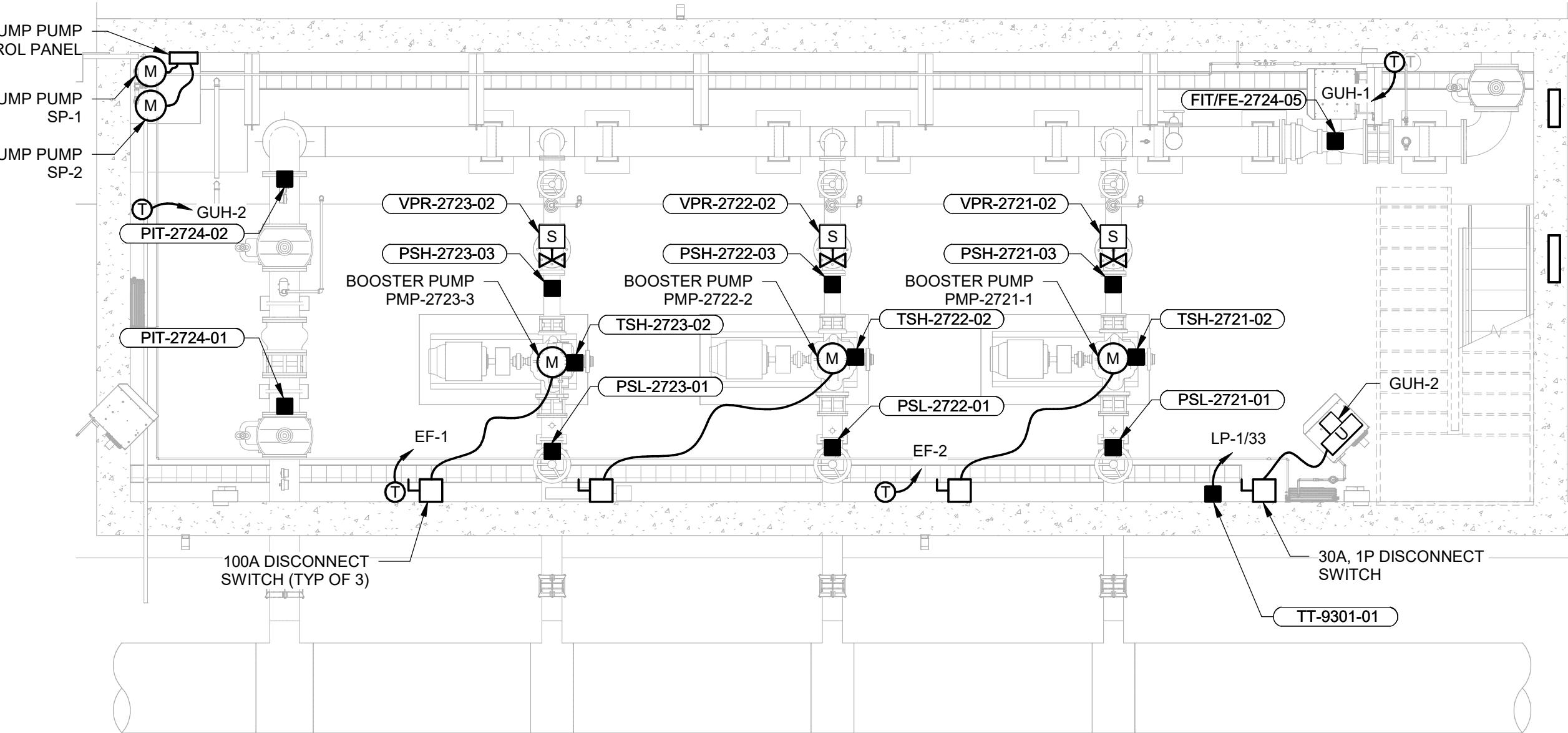
JACOB R. DEITZ

**CDM
Smith**
652 Bielenberg Drive, Suite 203
Woodbury, MN 55125
Tel: (651) 252-3800

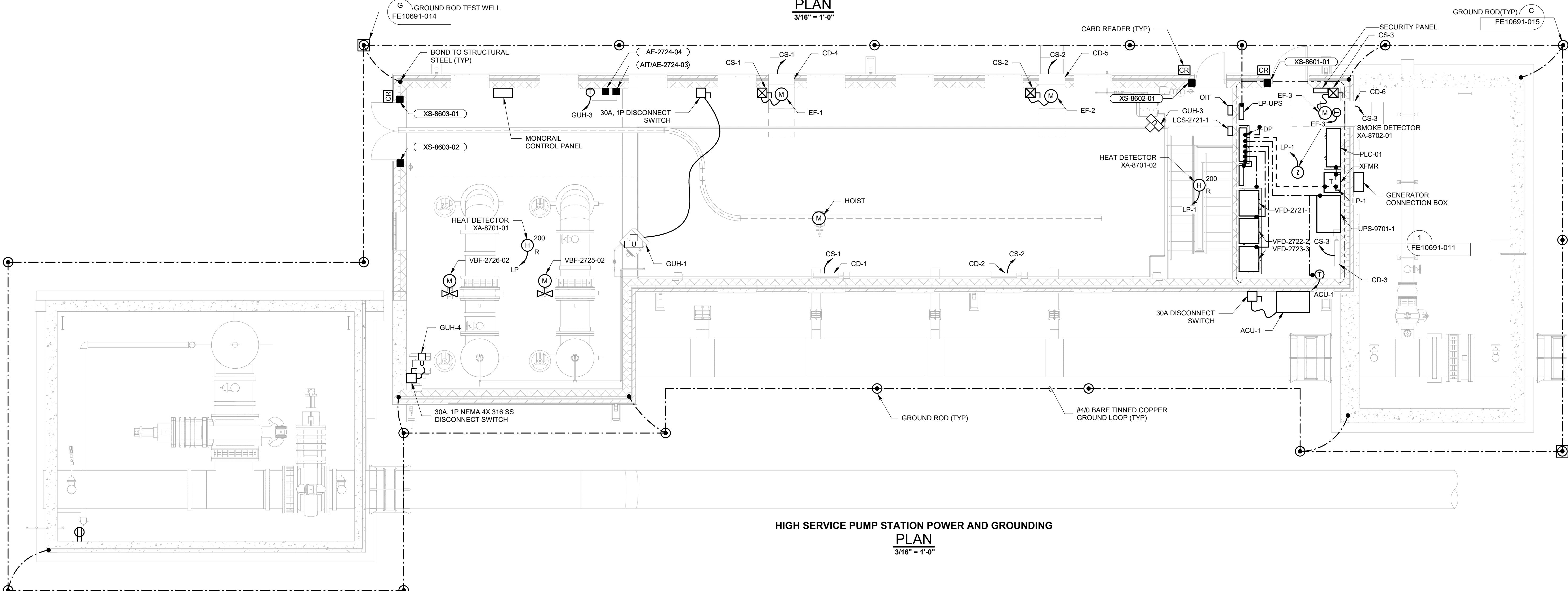
Minneapolis
Water Works



- NOTES:**
- REFER TO SHEET FOR FE10691-005 FOR ONE LINE DIAGRAM.
 - REFER TO SHEET FOR FE-10691-012 FOR PANEL BOARD SCHEDULE AND LIGHTING FIXTURE SCHEDULE.
 - PROVIDE A COMPLETE GROUNDING SYSTEM IN ACCORDANCE WITH NEC ARTICLE 250. ALL EQUIPMENT SHALL BE GROUNDED.
 - REFER TO NFPA 72 REQUIREMENTS FOR SLOPED CEILING FOR INSTALLATION OF HEAT AND SMOKE DETECTORS.



HIGH SERVICE PUMP STATION LOWER LEVEL POWER PLAN
PLAN
 $3/16'' = 1'-0''$

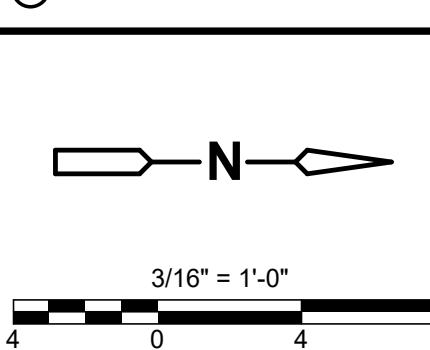


HIGH SERVICE PUMP STATION POWER AND GROUNDING
PLAN
 $3/16'' = 1'-0''$

Autodesk Docs:NEHS Pump Station(EW2001PS.rvt)
Time: 11/24/2025 8:25:15 PM FILE PATH

DATE PRINTED: By SS

FILE NAME:



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Jacob R. Deitz

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JACOB R. DEITZ LIC. NO. DATE

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Woodbury, MN 55125
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Minneapolis
Water Works

FE10691-009

DRW: ss	DATE: 11.21.2025
CHK: TR	DATE: 11.21.2025
APP: JRD	DATE: 11.21.2025

NORTHEAST HIGH SERVICE PUMP STATION

POWER AND GROUNDING PLAN

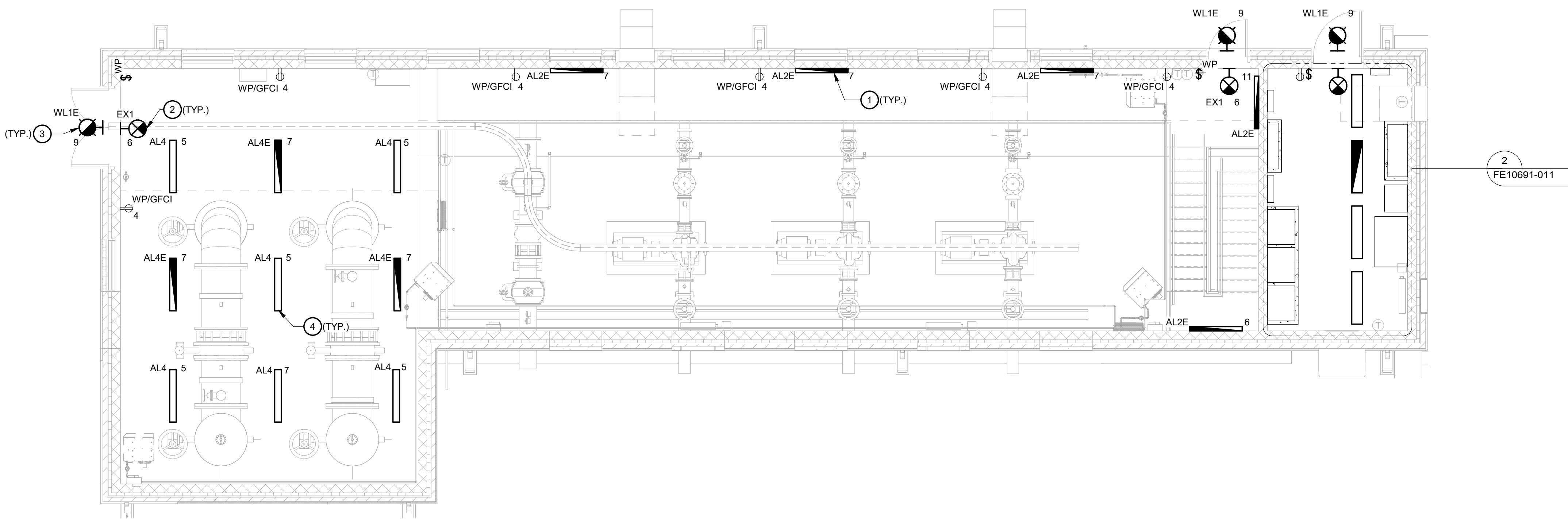
104
OF
116

ISSUED FOR BID

- NOTES:**
- REFER TO SHEET FOR FE10691-005 FOR ONE LINE DIAGRAM.
 - REFER TO SHEET FOR FE-10691-012 FOR PANEL BOARD SCHEDULE AND LIGHTING FIXTURE SCHEDULE.
 - ALL LIGHTING FIXTURES AND RECEPTACLES SHALL BE WIRED BACK TO PANELBOARD LP-1 UNLESS OTHERWISE NOTED.

KEY NOTES:

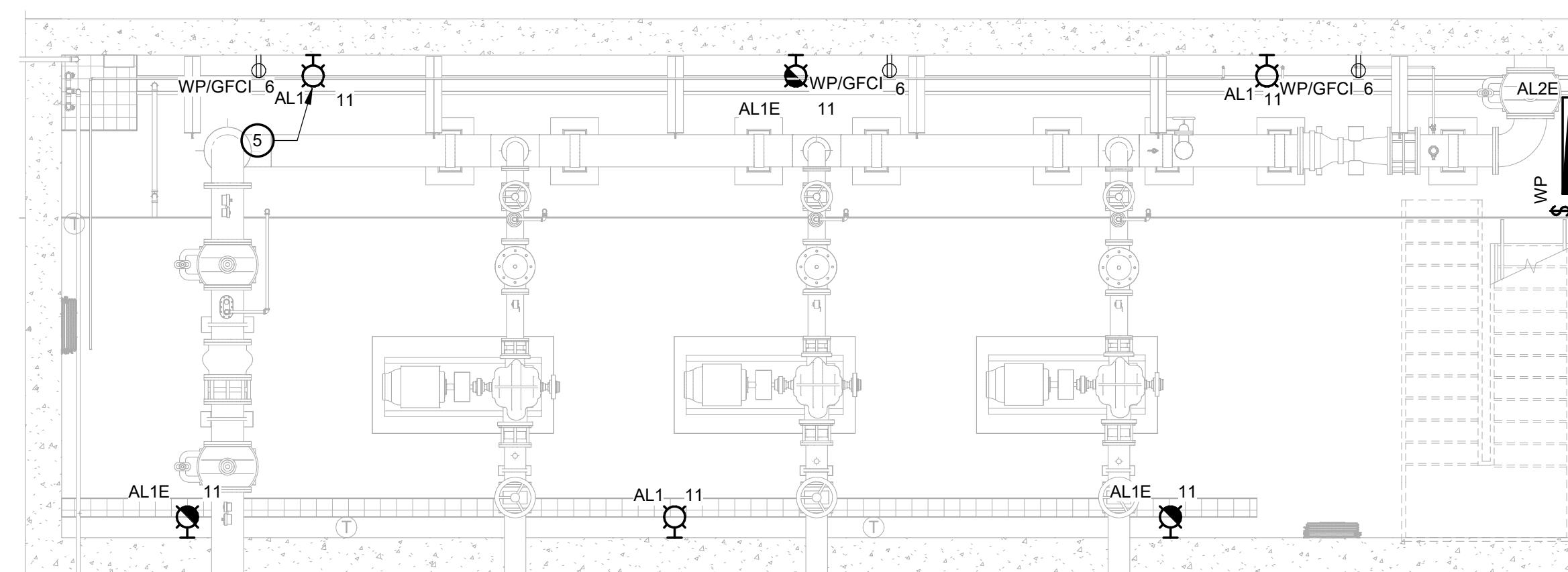
- WALL MOUNT TYPES 'AL2' & 'AL2E' LIGHTING FIXTURE AT 10'-0" AFF UNLESS NOTED OTHERWISE.
- WALL MOUNT EXIT LIGHT FIXTURE TYPE 'EX1' AT 0'-6" ABOVE THE DOOR UNLESS OTHERWISE NOTED.
- WALL MOUNT LIGHT FIXTURE TYPE 'WL1E' AT 0'-6" ABOVE THE DOOR UNLESS OTHERWISE NOTED.
- PENDANT MOUNT TYPE 'AL4' LIGHTING FIXTURE AT 9'-9" AFF UNLESS NOTED OTHERWISE.
- WALL MOUNT LIGHT FIXTURE TYPE 'AL1' AND 'AL1E' AT 10'-0" AFF UNLESS OTHERWISE NOTED.



HIGH SERVICE PUMP STATION UPPER LEVEL LIGHTING

PLAN

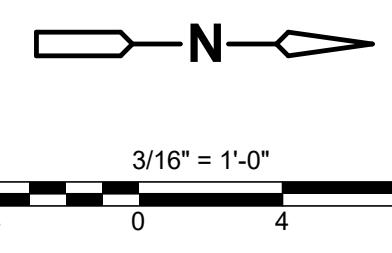
3/16" = 1'-0"



HIGH SERVICE PUMP STATION LOWER LEVEL LIGHTING

PLAN

3/16" = 1'-0"



NO.	DATE	DRW	CKD	APP	REVISION
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4					
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JACOB R. DEITZ

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652 Bielenberg Drive, Suite 203
Woodbury, MN 55125
Tel: (651) 252-3800

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FE10691-010

DRW: ss	DATE: 11.21.2025
CHK: TR	DATE: 11.21.2025
APP: JRD	DATE: 11.21.2025

NORTHEAST HIGH SERVICE PUMP STATION

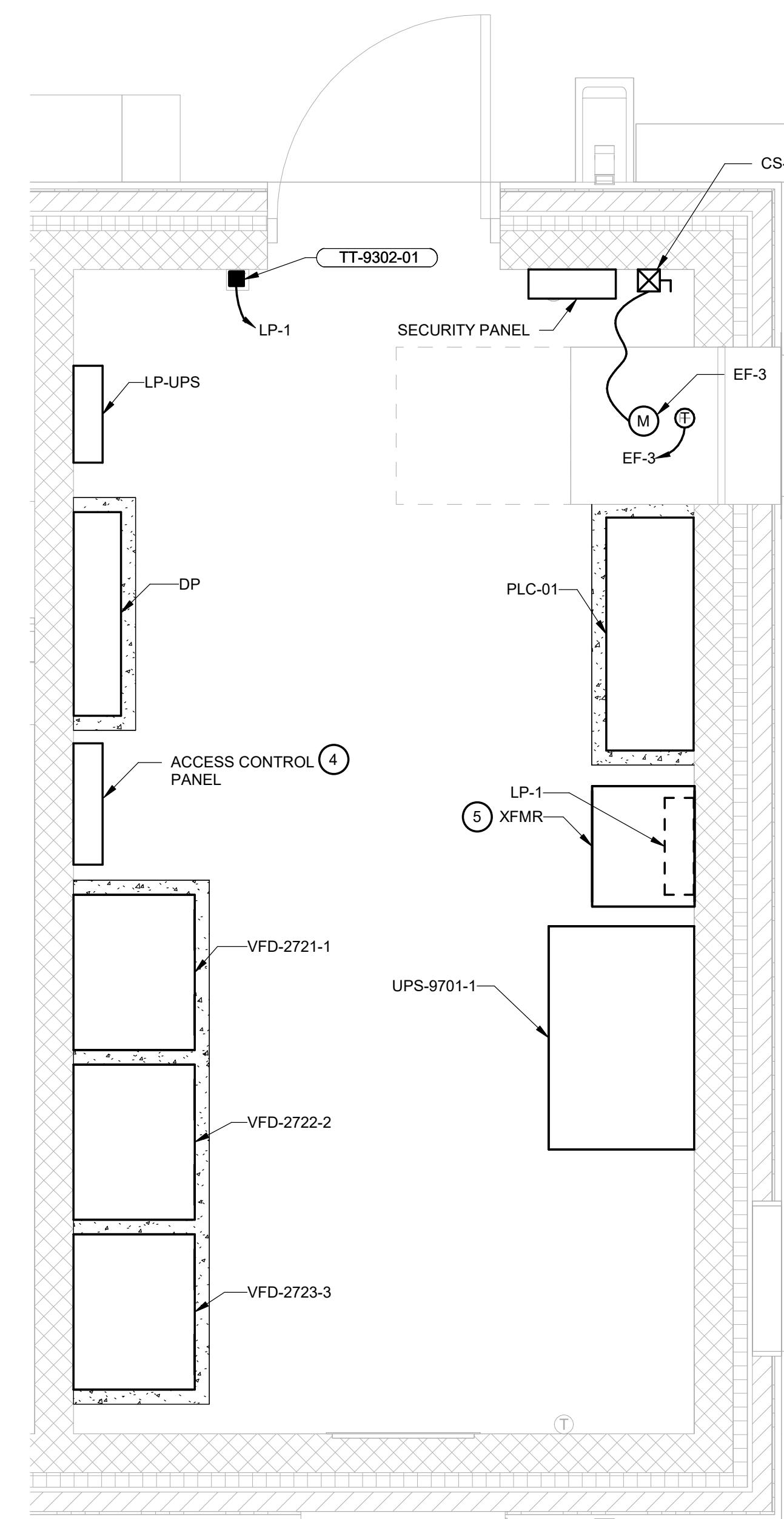
LIGHTING PLAN

105
OF
116

- NOTES:**
- REFER TO SHEET FOR FE10691-005 FOR ONE LINE DIAGRAM.
 - REFER TO SHEET FOR FE-10691-012 FOR PANEL BOARD SCHEDULE AND LIGHTING FIXTURE SCHEDULE.
 - ALL LIGHTING FIXTURES AND RECEPTACLES SHALL BE WIRED BACK TO PANELBOARD LP-1 UNLESS OTHERWISE NOTED.

KEY NOTES:

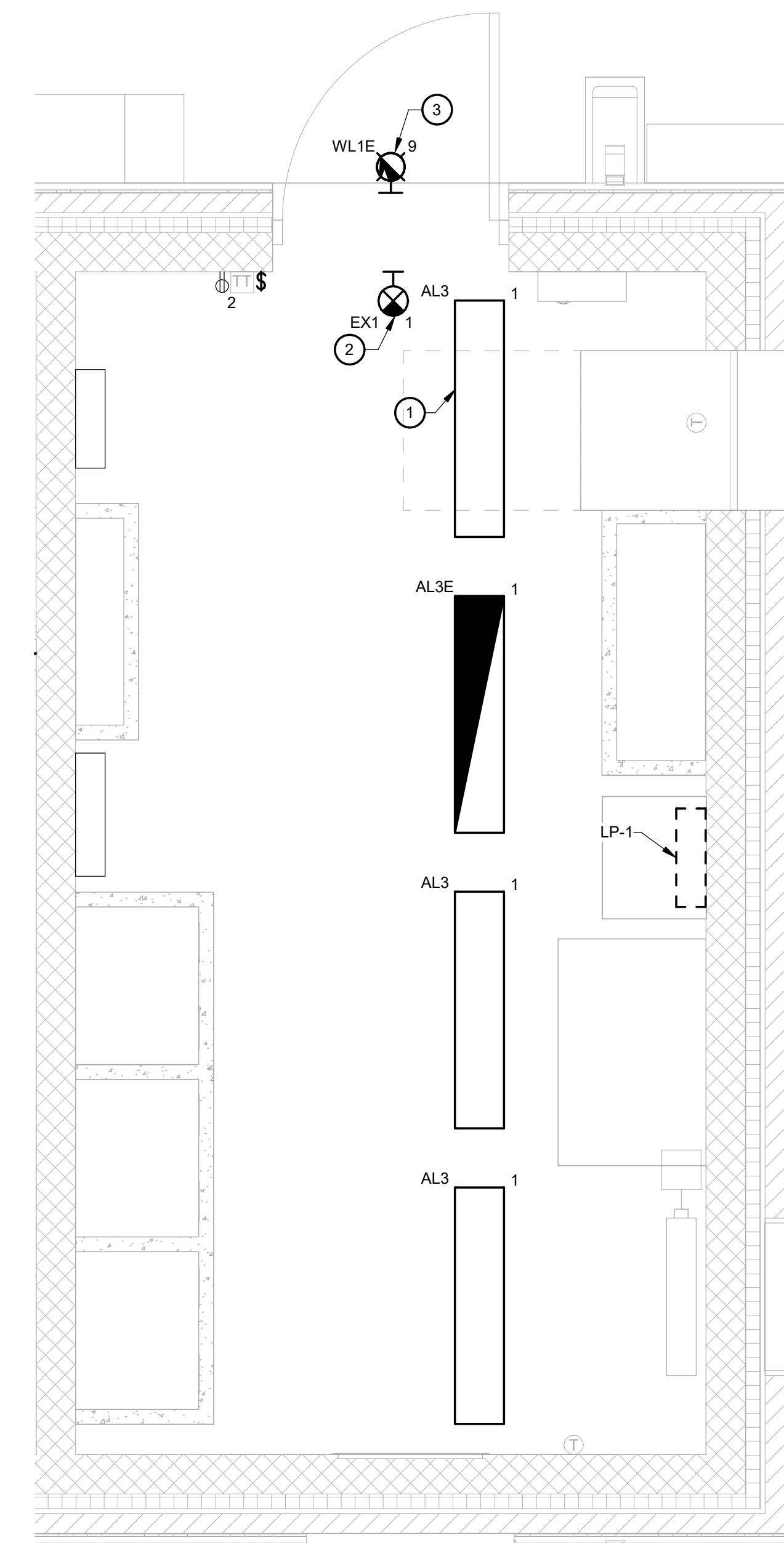
- PENDANT MOUNT TYPES 'AL3' & 'AL3E' LIGHTING FIXTURE AT 9'-6" AFF UNLESS NOTED OTHERWISE.
- WALL MOUNT EXIT LIGHT FIXTURE TYPE 'EX1' AT 0'-6" ABOVE THE DOOR UNLESS OTHERWISE NOTED.
- WALL MOUNT TYPE 'WL1' LIGHT FIXTURE AT 1'-0" ABOVE THE DOOR UNLESS OTHERWISE NOTED.
- ACCESS CONTROL PANEL IS FURNISHED BY OTHERS. CONTRACTOR TO INSTALL PANEL.
- XFMR WALL-MOUNTED ABOVE LP-1.



ELECTRICAL ROOM POWER

PLAN

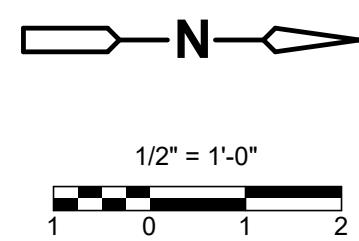
1/2" = 1'-0"



ELECTRICAL ROOM LIGHTING

PLAN

1/2" = 1'-0"



NO.	DATE	DRW	CKD	APP	REVISION
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2					
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4					
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JACOB R. DEITZ

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Minneapolis
Water Works

FE10691-011

NORTHEAST HIGH SERVICE PUMP STATION

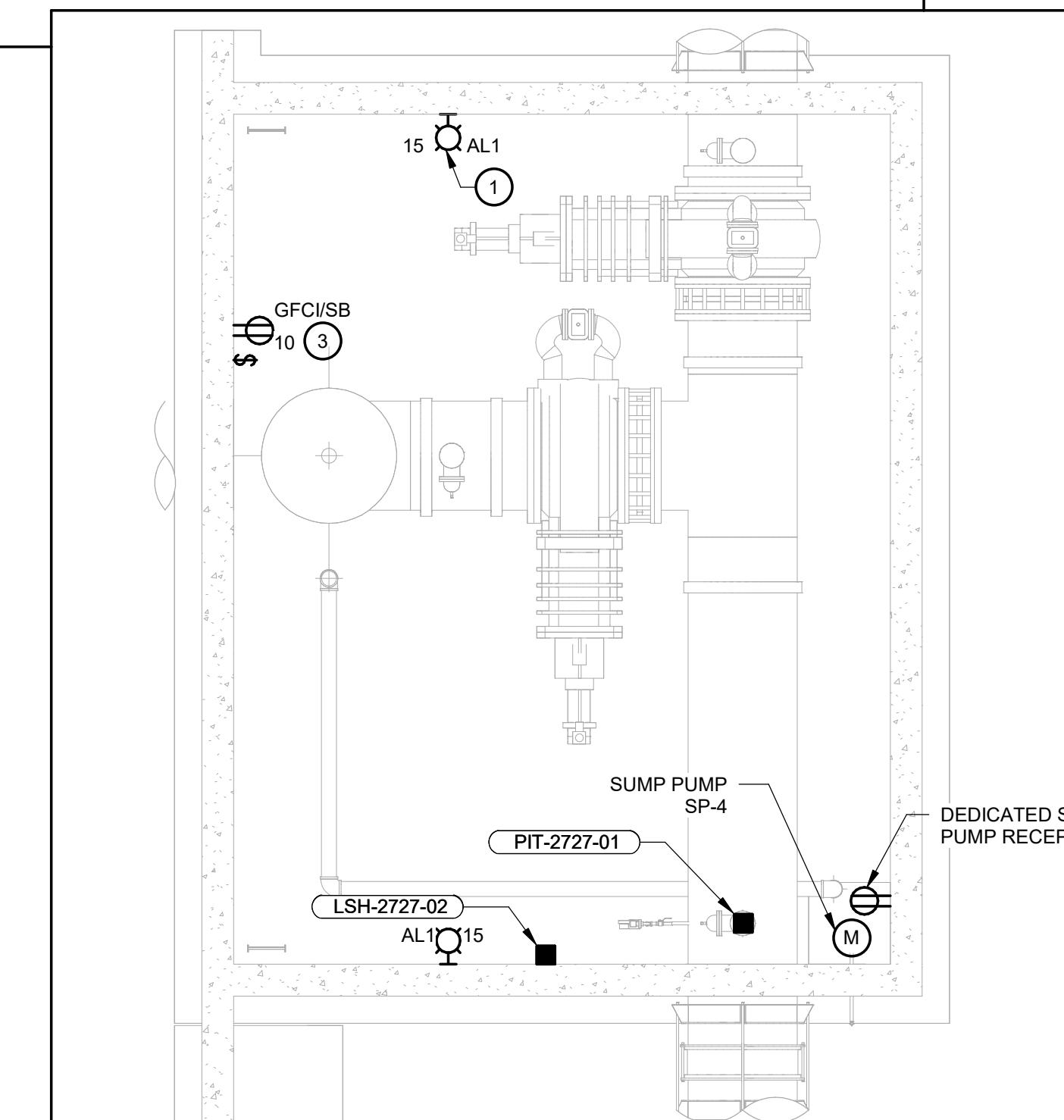
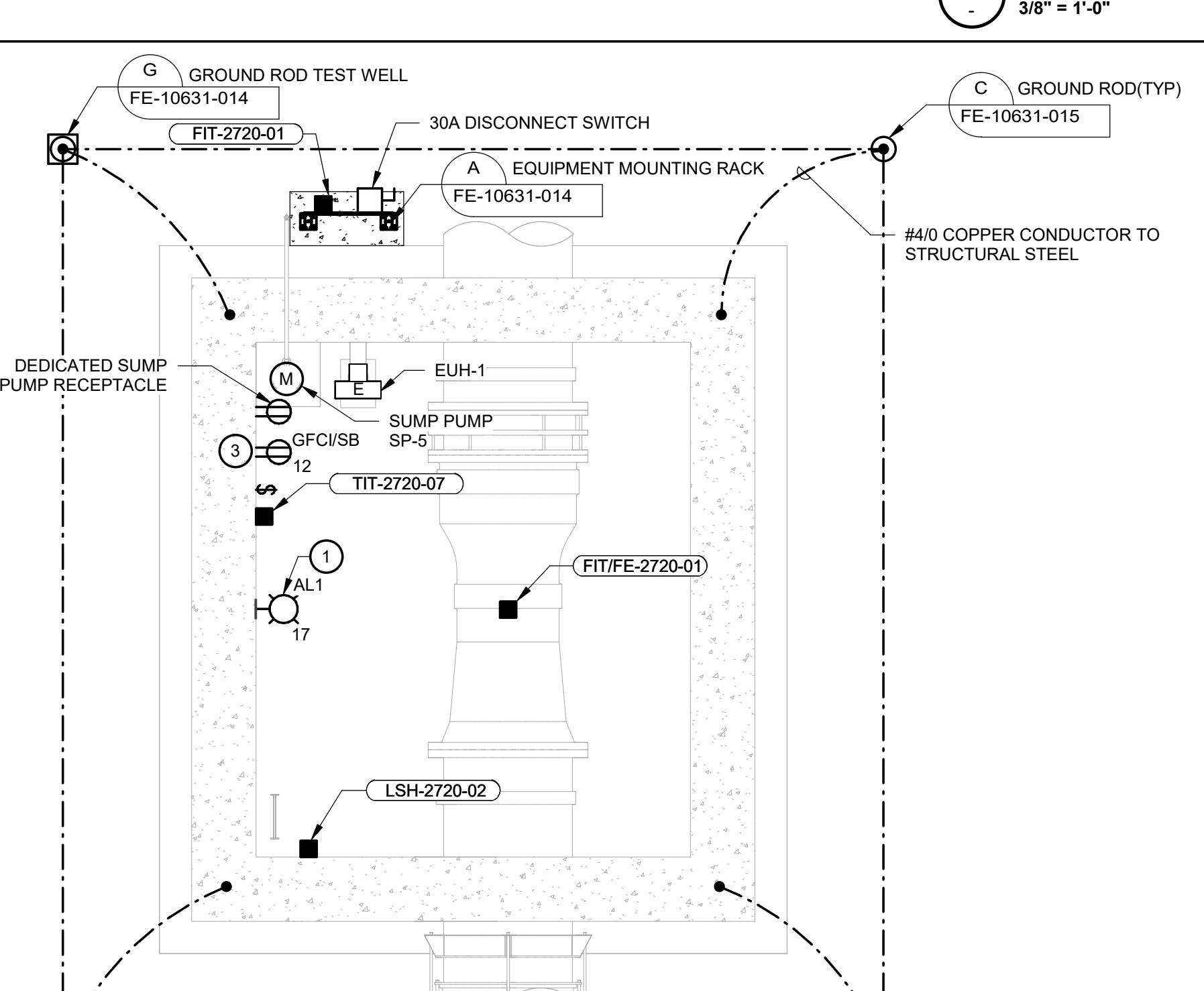
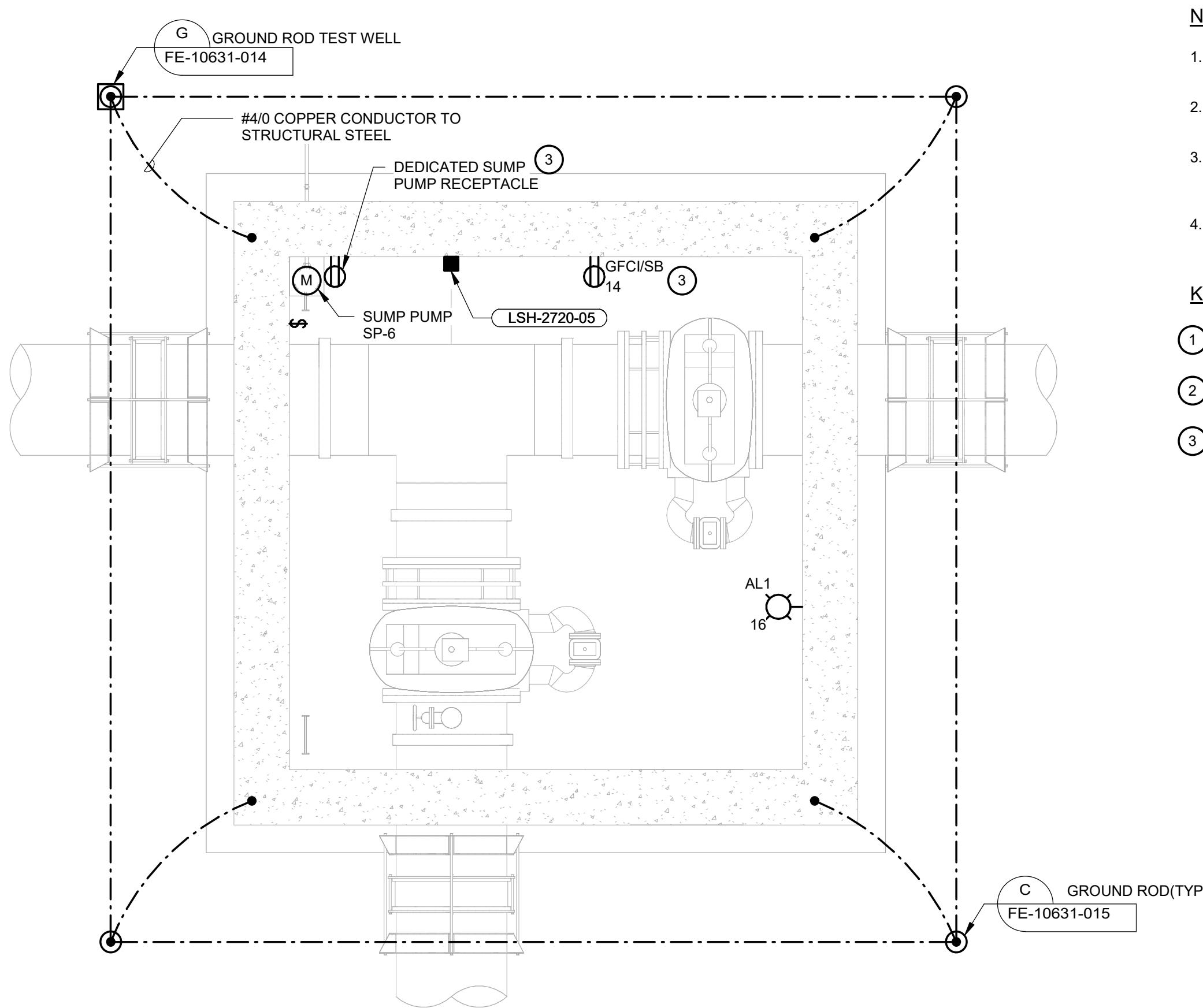
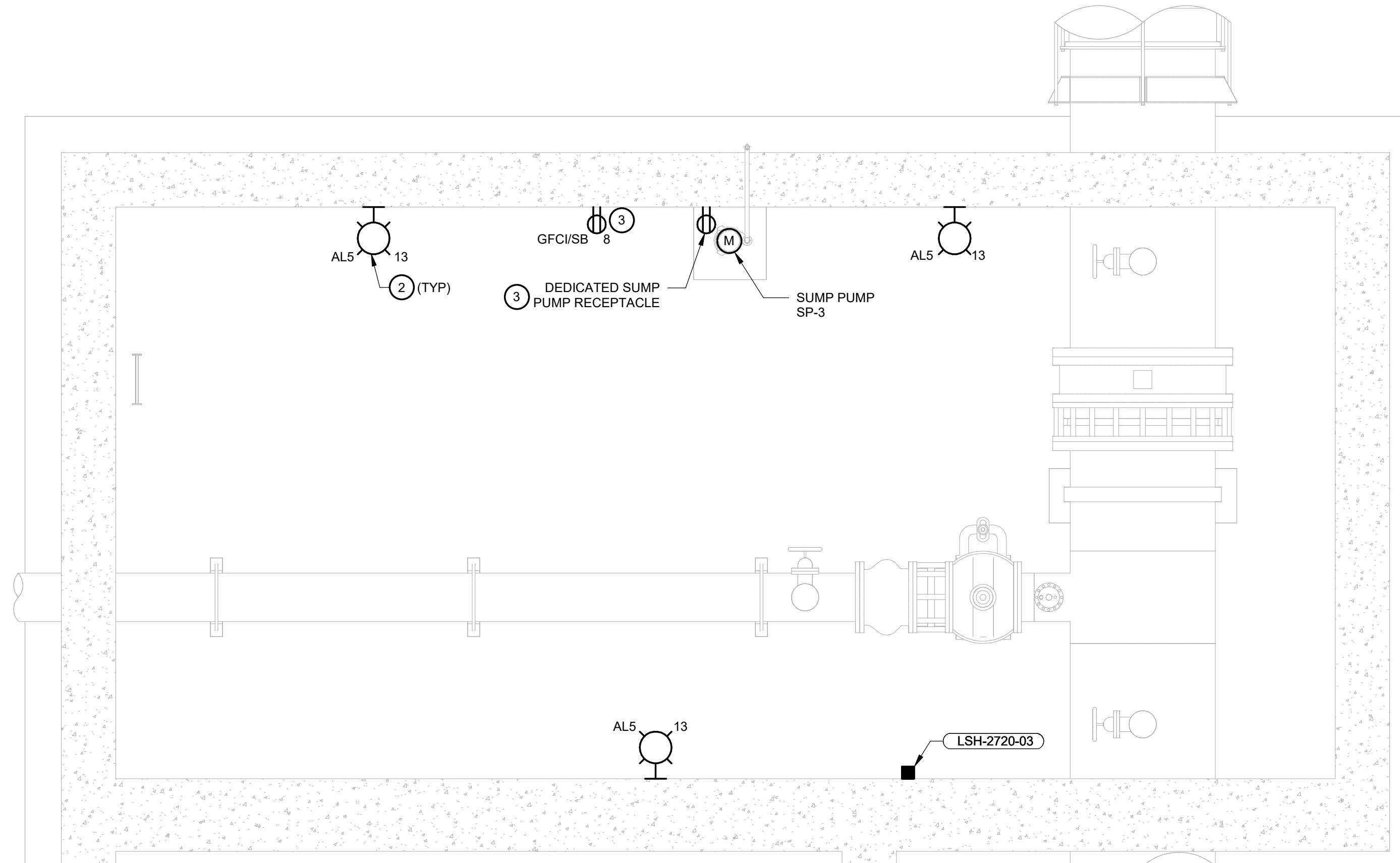
ELECTRICAL ROOM ENLARGED PLAN

106
OF
116

- NOTES:**
- REFER TO SHEET FOR FE10691-005 FOR ONE LINE DIAGRAM.
 - REFER TO SHEET FOR FE-10691-012 FOR PANEL BOARD SCHEDULE AND LIGHTING FIXTURE SCHEDULE.
 - PROVIDE A COMPLETE GROUNDING SYSTEM IN ACCORDANCE WITH NEC ARTICLE 250. ALL EQUIPMENT SHALL BE GROUNDED.
 - ALL LIGHTING FIXTURES AND RECEPTACLES SHALL BE WIRED BACK TO PANELBOARD LP-1 UNLESS OTHERWISE NOTED.

KEY NOTES:

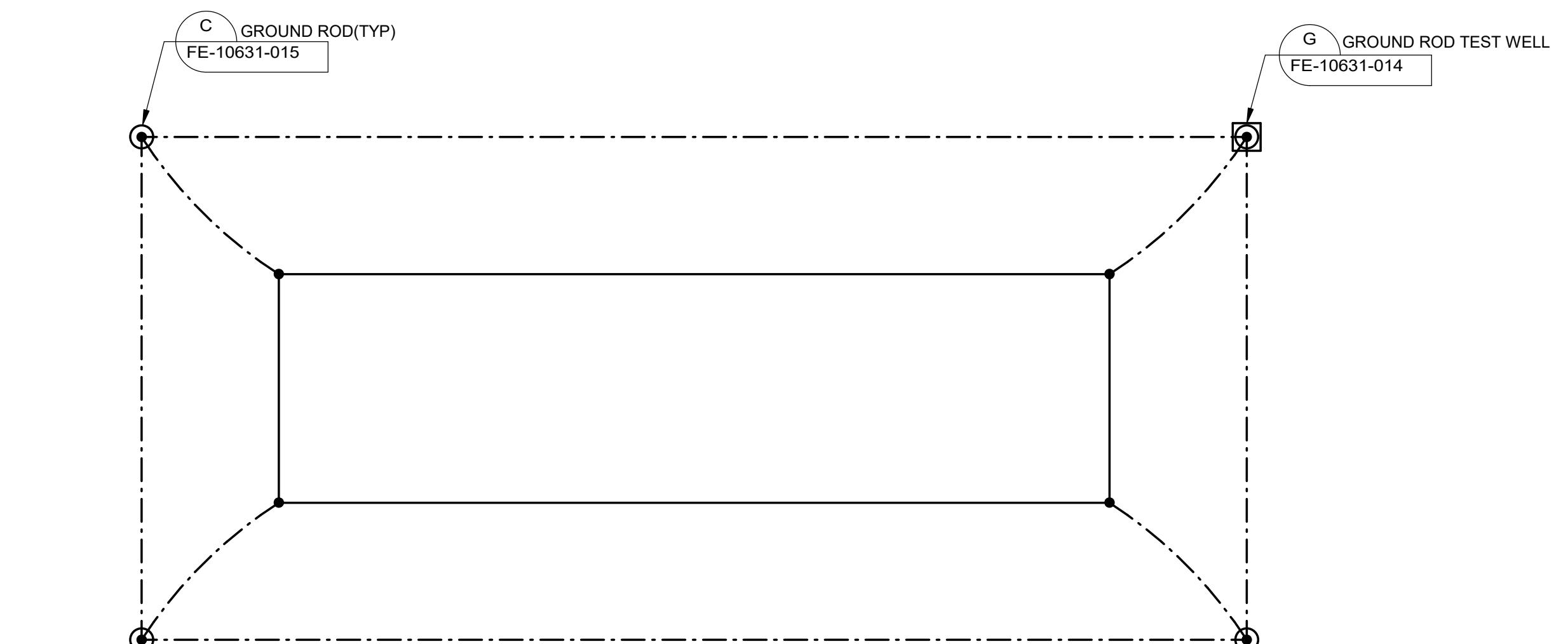
- (1) WALL MOUNT LIGHT FIXTURE TYPE 'AL5' AT 10'-0" AFF UNLESS OTHERWISE NOTED.
- (2) WALL MOUNT LIGHT FIXTURE TYPE 'AL1' AT 15'-0" AFF UNLESS OTHERWISE NOTED.
- (3) MOUNT RECEPTACLE 4'-0" ABOVE THE FINISHED FLOOR.



HIGH SERVICE PUMP STATION VALVE VAULT NO.3 POWER AND GROUNDING

E PLAN

1/4" = 1'-0"



HIGH SERVICE PUMP STATION GENERATOR GROUNDING

D PLAN

3/8" = 1'-0"

NO.	DATE	DRW	CKD	APP	REVISION
1					
2					
3					
4					
5					

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JACOB R. DEITZ 63619 11.21.2025
LIC. NO. DATE

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Tel: (651) 252-3800

Minneapolis
Water Works

FE10691-012

NORTHEAST HIGH SERVICE PUMP STATION

VAULT AND GENERATOR PLAN

107
OF
116

NOTES:	
1.	PROVIDE LOCKING HARDWARE
3.	30 ma GFI CIRCUIT BREAKER FOR E
5.	BRANCH CIRCUIT WIRING: 3/4" C., 3#
7.	BRANCH CIRCUIT WIRING: 3/4" C., 2#

PANELBOARD LP-1

SCHEDULE

1

LIGHT FIXTURE SCHEDULE						
Type	Wattage	Mounting Type	Description	Voltage	Minimum Lumen Output	Manufacturer or Approved Equal
AL1	119W -LED	YOKES	Highbay industrial corrosion resistant luminaire, yoke mounted, 30 degree tilt, NEMA 4X wet location UL listed	MVOLT	18000 lm	Acuity Brands Lighting PXHW 18000LM MDU5 MVOLT 40K 80CRI YK90 DWHXD
AL1E	119W -LED	YOKES	Highbay industrial corrosion resistant luminaire, yoke mounted, 30 degree tilt, NEMA 4X wet location UL listed with emergency option	MVOLT	18000 lm	Acuity Brands Lighting PXHW 18000LM MDU5 MVOLT 40K 80CRI YK90 DWHXD E10WMCP
AL2	49W -LED	WALL	Fully gasketed, polycarbonate NEMA 4X housing, 80CRI, 4000K, 0-10V dimming	120V	6067 lm	Lithonia Lighting CSVT L48 6000LM MVOLT 3500K 80CRI
AL2E	49W -LED	WALL	Fully gasketed, polycarbonate NEMA 4X housing, 80CRI, 4000K, 0-10V dimming integral emergency battery pack	120V	6067 lm	Lithonia Lighting CSVT L48 6000LM MVOLT 3500K 80CRI IE7WCP
AL3	32W -LED	PENDANT	DIE-formed with pre-painted steel, NEMA 4X housing with deep frosted acrylic shielding, 80CRI, 4000K, 0-10V dimming	120V	4000 lm	Acuity Brands Lighting LBL4 4000LM 80CRI 40K MIN1 ZT MVOLT
AL3E	32W -LED	PENDANT	DIE-formed with pre-painted steel, NEMA 4X housing with deep frosted acrylic shielding, 80CRI, 4000K, 0-10V dimming with integral emergency battery pack	120V	4000 lm	Acuity Brands Lighting LBL4 4000LM 80CRI 40K MIN1 ZT MVOLT EL7L
AL4	49W -LED	PENDANT	Fully gasketed, polycarbonate NEMA 4X housing, 80CRI, 4000K, 0-10V dimming	120V	6067 lm	Lithonia Lighting CSVT L48 6000LM MVOLT 3500K 80CRI
AL4E	49W -LED	PENDANT	Fully gasketed, polycarbonate NEMA 4X housing, 80CRI, 4000K, 0-10V dimming integral emergency battery pack	120V	6067 lm	Acuity Brands Lighting CSVT L48 6000LM MVOLT 3500K 80CRI IE7WCP
AL5	14W -LED	WALL	DIE cast aluminum back plate with a thermal shock resistant frosted glass, 4000K, minimum of 70CRI, 120 to 277V, neutral white of NW-G1 generation & suitable for submersible applications	120V	1390 lm	Stonco by Signify VWX-14-NW-G1-8_S
SL1	16W -LED	-	Bollard light, IP66 sealed asymmetric 12C LED light engine high-impact clear acrylic lens with welded top cap, 80CRI, photoelectric option with emergency backup	MVOLT	809 lm	Lithonia Lighting KBR8-12C-350-40K-ASY-MVOLT-PE-ELCW
WL1E	50W-LED	WALL	DIE-CAST ALUMINUM HOUSING WITH TEMPERED GLASS LENS, FULLY GASKETED, TEXTURED DARK BRONZE WALL PACK WITH EMERGENCY BATTERY PACK	MVOLT	6689 lm	Lithonia Lighting WST LED P3 40K VW MVOLT E20WC DDBXD
WL2	34W-LED	WALL	DIE CAST ALUMINUM HOUSING, SILICONE SEALED OPTICAL LED CHAMBER, 0-10V DIMMABLE DRIVER IS STANDARD WITH LEADS EXTERNAL TO THE FIXTURE WITH OPTIONAL INTEGRAL COLD WEATHER BATTERY EMERGENCY EGRESS WITH PHOTOCELL CONTROLLED.	120V	4000 lm	Lithonia Lighting CSVT L48 4000LM MVOLT 3500K 80CRI OR EQUAL
WL2E	34W-LED	WALL	DIE CAST ALUMINUM HOUSING, SILICONE SEALED OPTICAL LED CHAMBER, 0-10V DIMMABLE DRIVER IS STANDARD WITH LEADS EXTERNAL TO THE FIXTURE WITH OPTIONAL INTEGRAL COLD WEATHER BATTERY EMERGENCY EGRESS WITH PHOTOCELL CONTROLLED.	120V	4000 lm	Lithonia Lighting CSVT L48 4000LM MVOLT 3500K 80CRI OR EQUAL
EX1	3.3W-LED	WALL	NEMA 4X wet location UL listed exit sign with die cast aluminum housing, single face self powered, with red letters, white finish, nickel cadmium battery with self diagnostics	120V	-	Lithonia Lighting LV S W 1 R 120/277 EL N

LIGHT FIXTURE SCHEDULE

1

NO.	DATE	DRW	CKD	APP	
1					
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3					
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UNDER THE LAWS OF THE STATE OF MINNESOTA.

 63619 11.21.2025

JACOB R. DEITZ LIC. NO. DATE

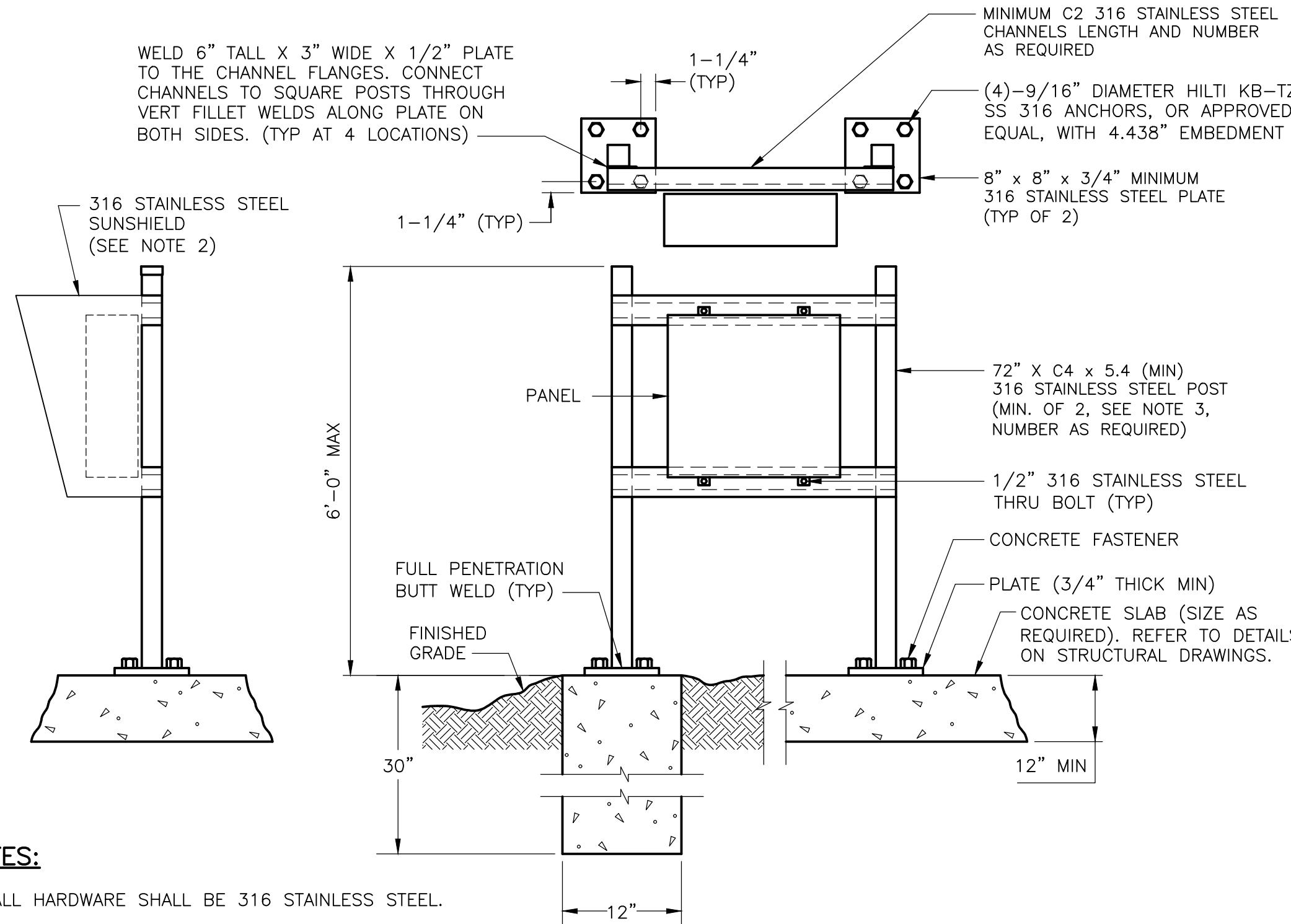


FF10691-013

NORTHEAST HIGH SERVICE PUMP STATION

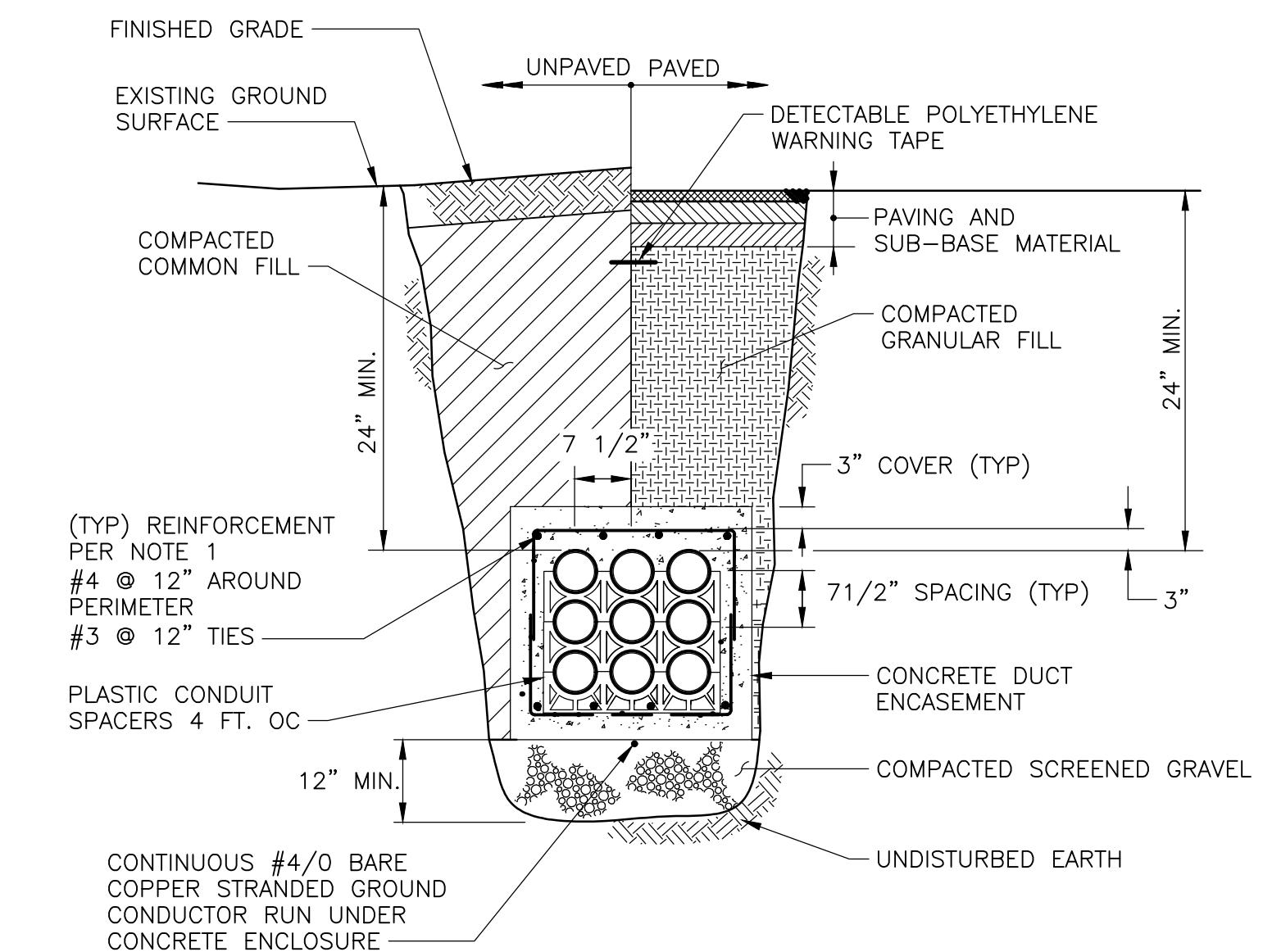
Minneapolis Water Works

PANELBOARD AND LIGHT FIXTURE SCHEDULES



EQUIPMENT MOUNTING RACK
A DETAIL

NTS

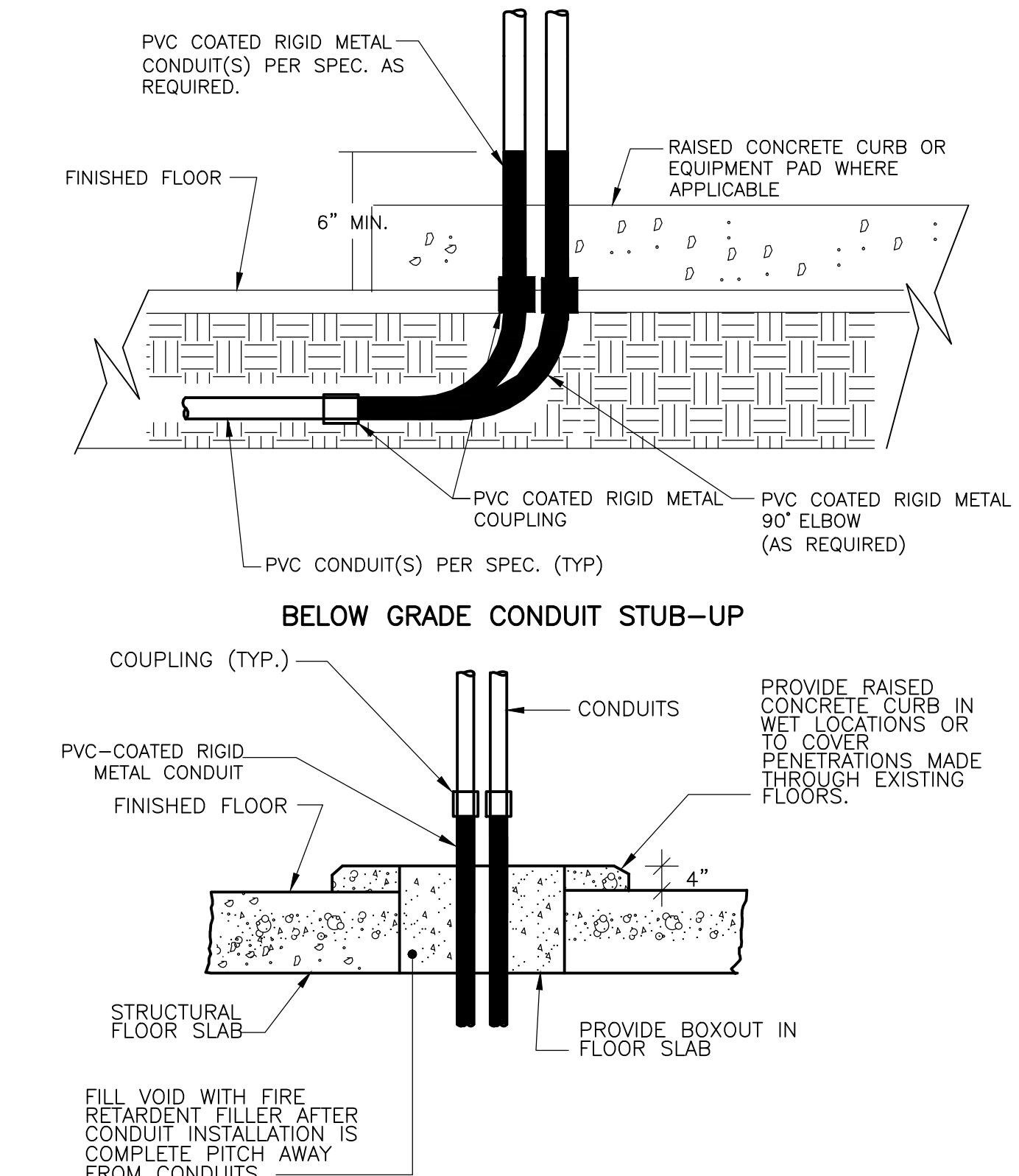


NOTE:

1. DUCT BANKS SHALL BE REINFORCED WHEN INSTALLED OVER NEW PIPELINES OR UNDER ROADWAYS, PARKING LOTS OR ANY AREA SUBJECT TO VEHICULAR TRAFFIC. INSTALL REINFORCING BARS AS SHOWN ON THE DRAWINGS, EXTENDING 5-FT. BEYOND AREA NEEDING PROTECTION.

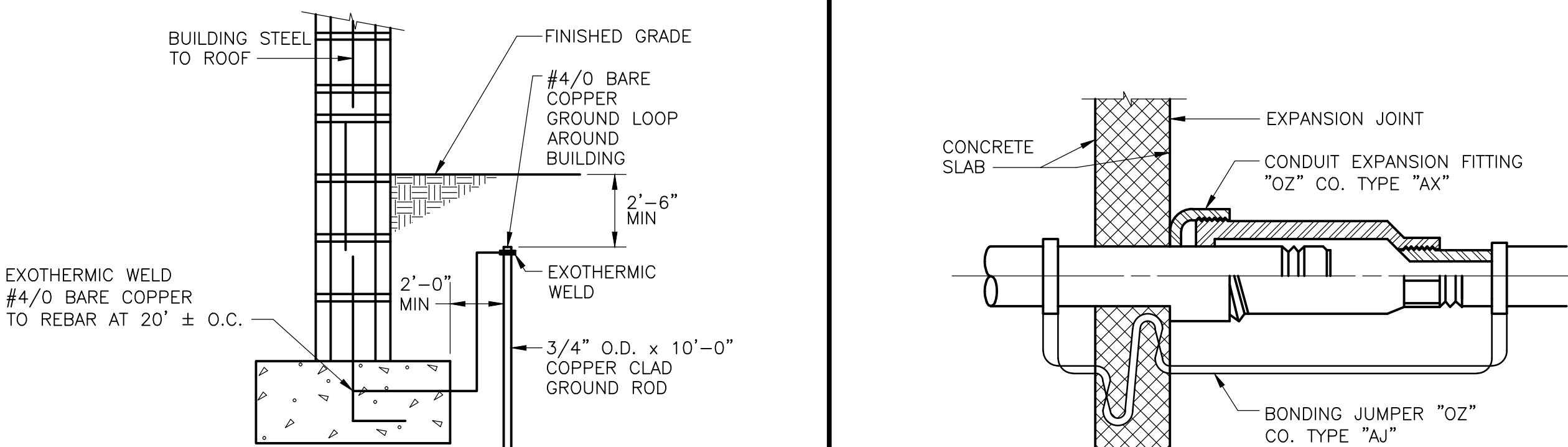
CONCRETE ENCASED ELECTRICAL DUCTBANK
B DETAIL

NTS



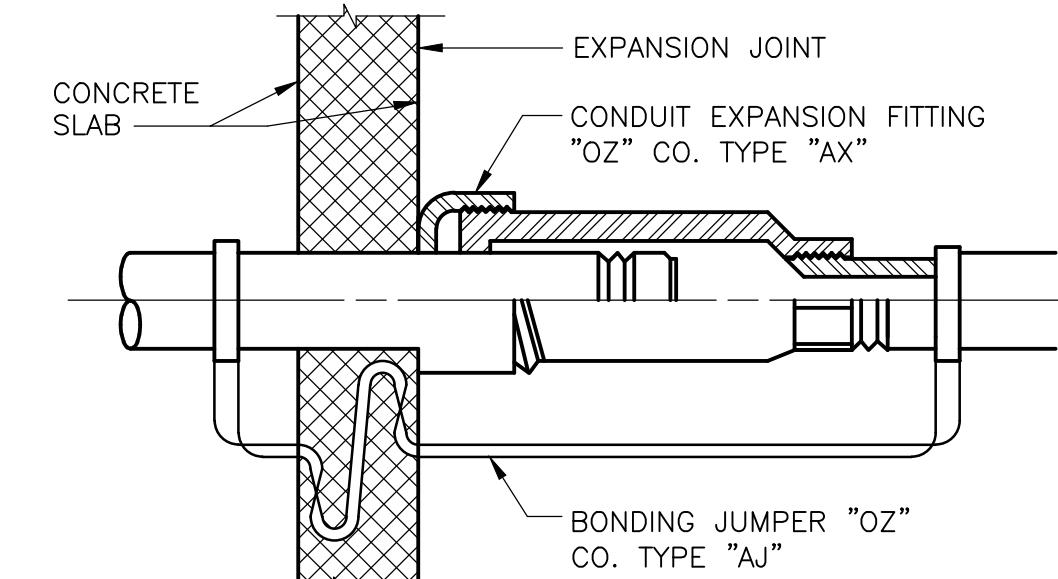
TYPICAL CONDUIT FLOOR PENETRATION
C DETAIL

NTS



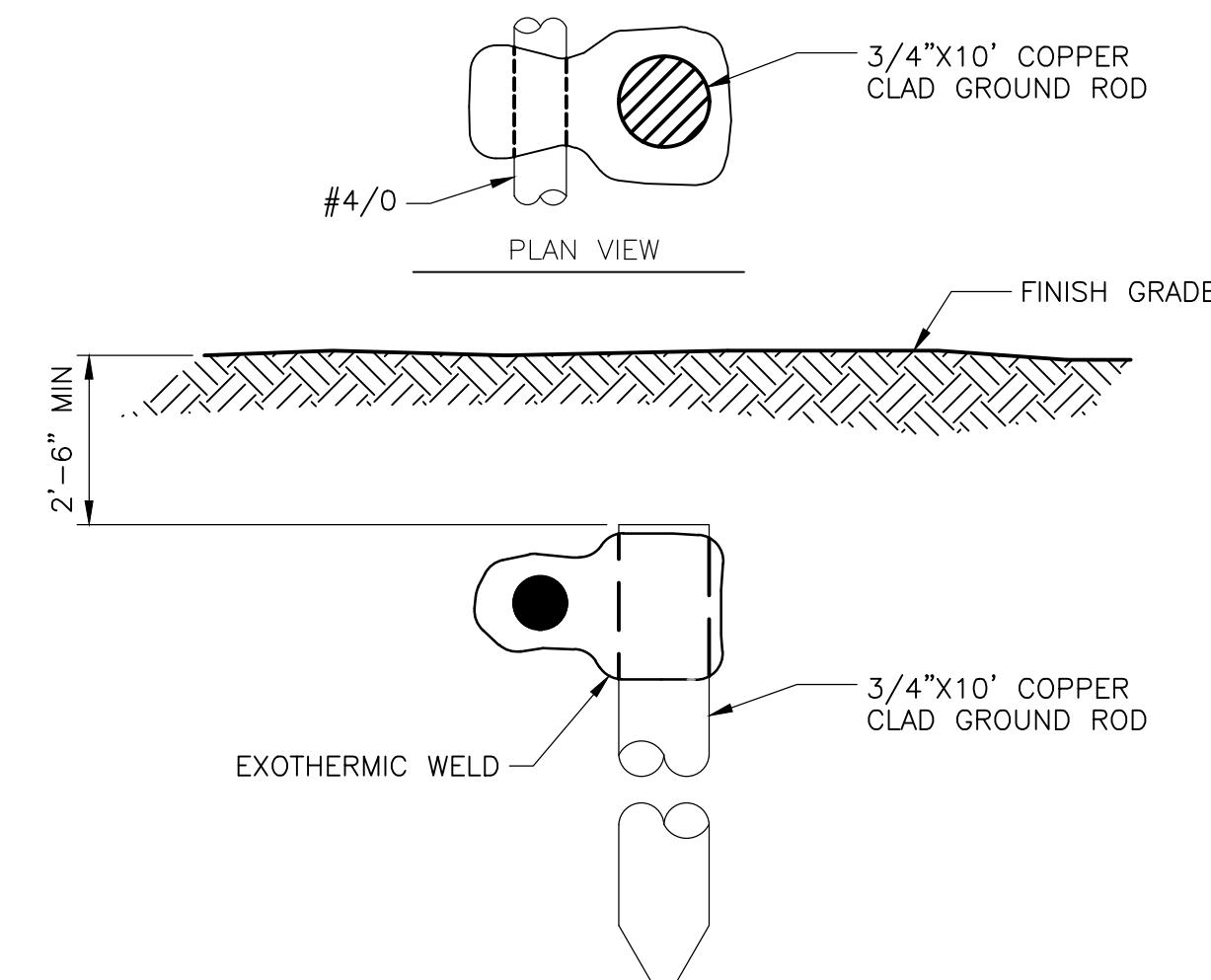
BUILDING STRUCTURE BONDING
D DETAIL

NTS



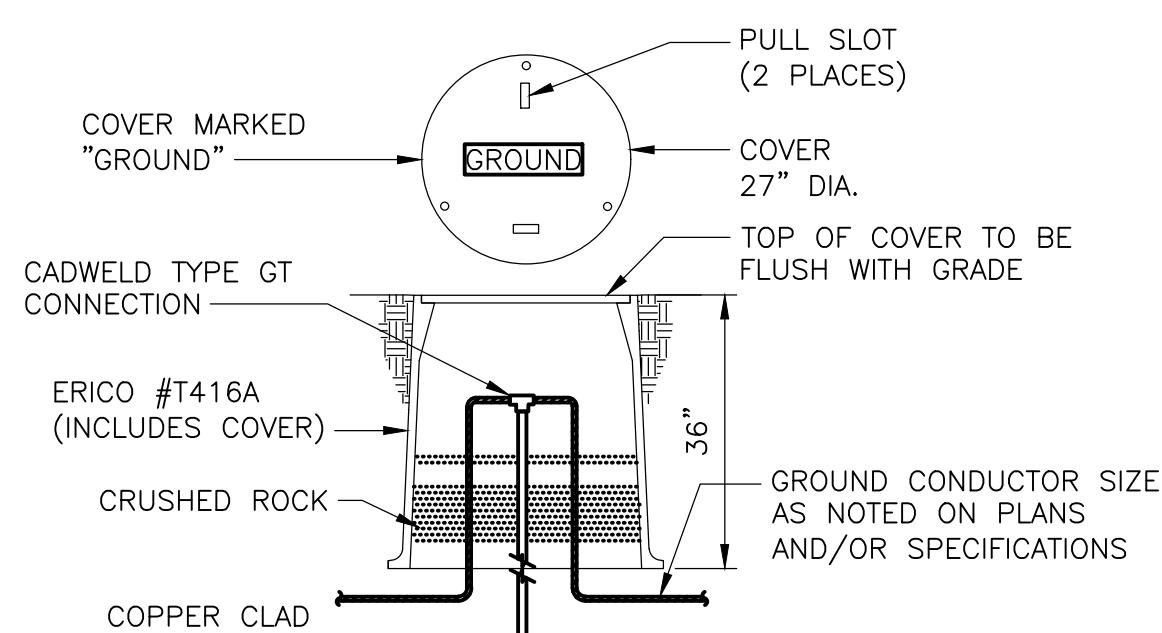
EXPANSION FITTING
E DETAIL

NTS



GROUND GRID CONNECTION TO GROUND ROD
F DETAIL

NTS



NOTE:

1. TO IMPROVE SYSTEM RESISTANCE, ERICO GEM MAY BE USED AS A BACKFILL MATERIAL IN AN AUGERED HOLE.

GROUND ROD TEST WELL
G DETAIL

NTS

NO.	DATE	DRW	CKD	APP	REVISION
▲					
▲					
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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Jacob R. Deitz
63619 11.21.2025
JACOB R. DEITZ
LIC. NO. DATE

CDM
Smith

652 Bielenberg Drive, Suite 203
Woodbury, MN 55125
Tel: (651) 252-3800

Minneapolis
Water Works

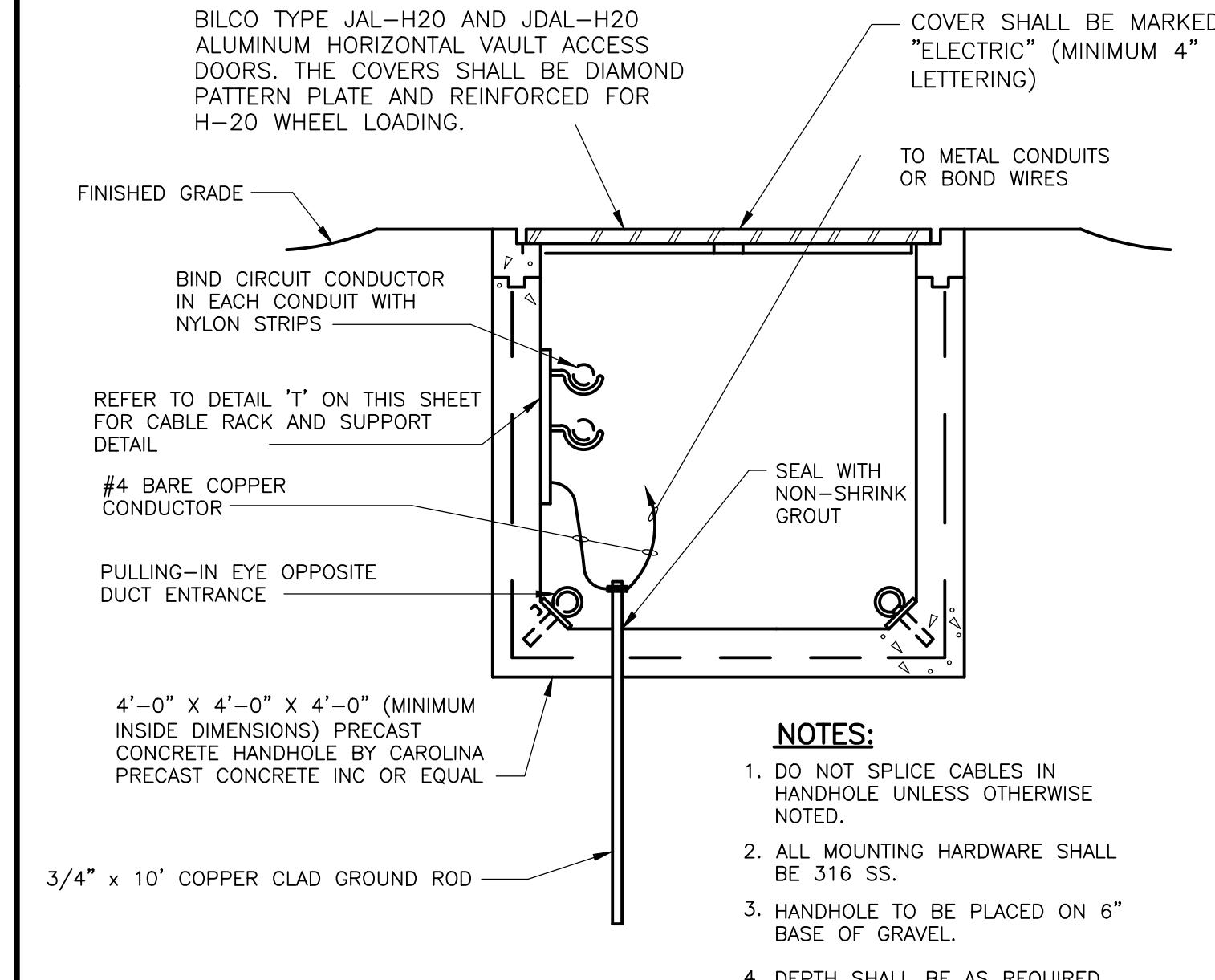
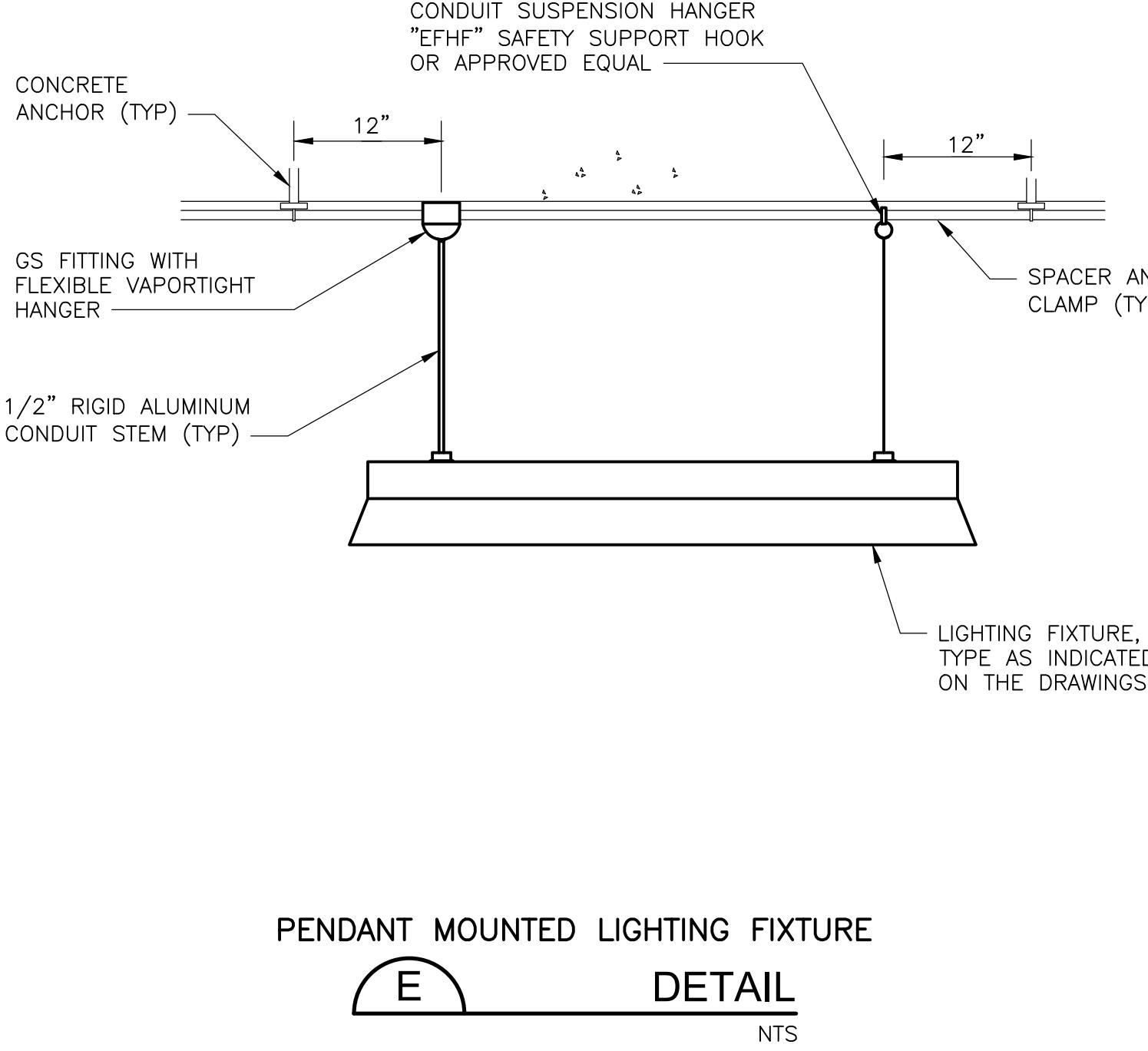
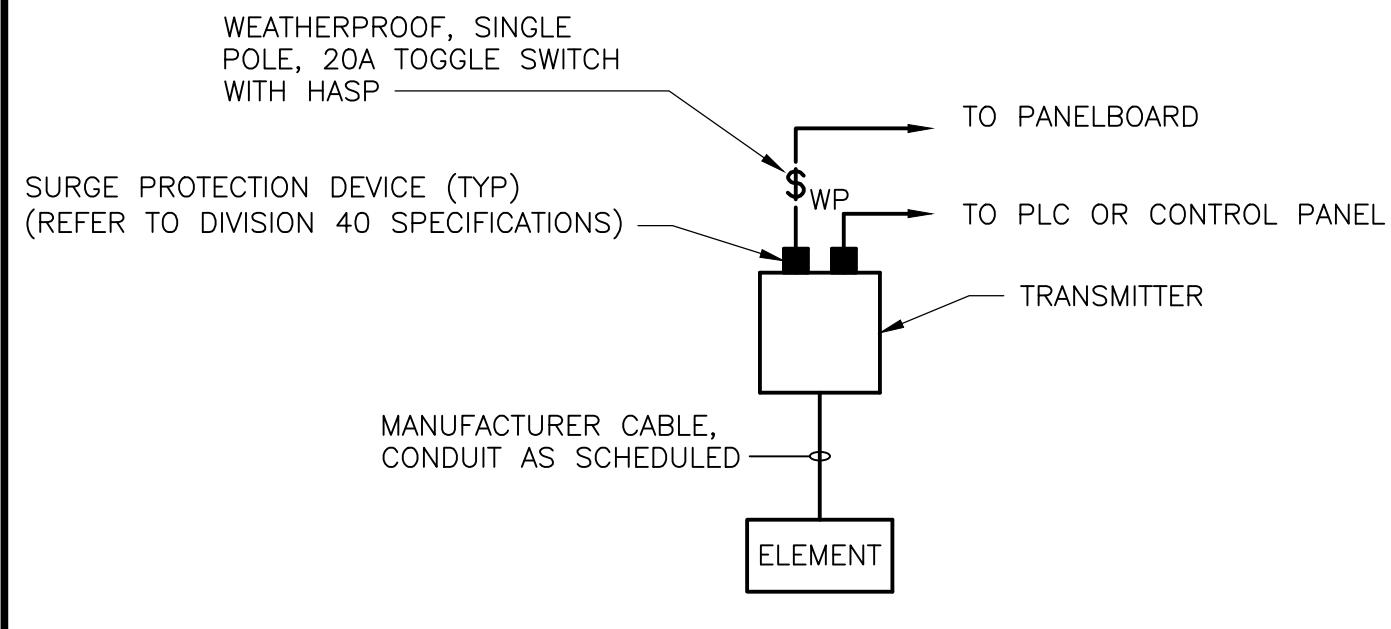
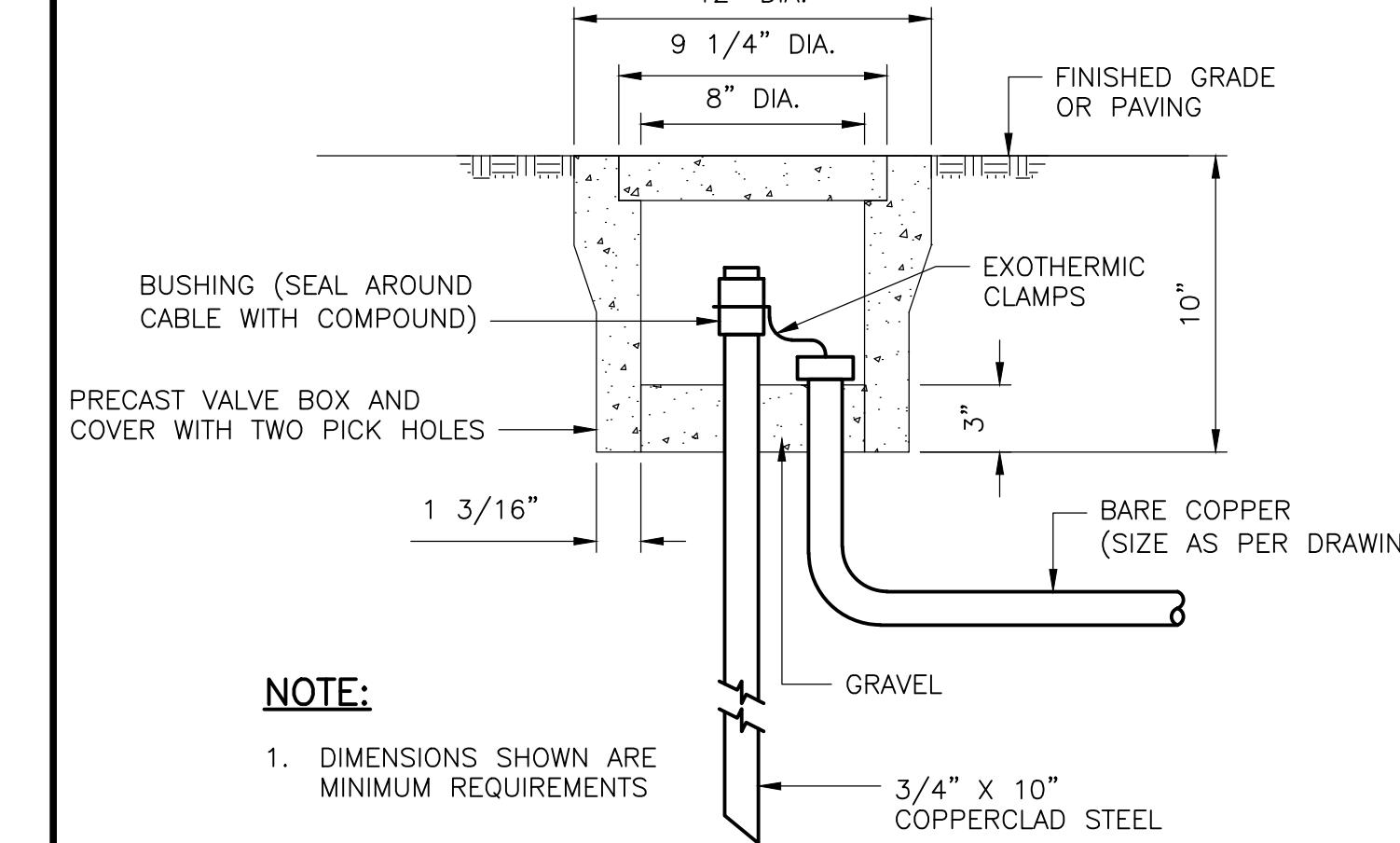
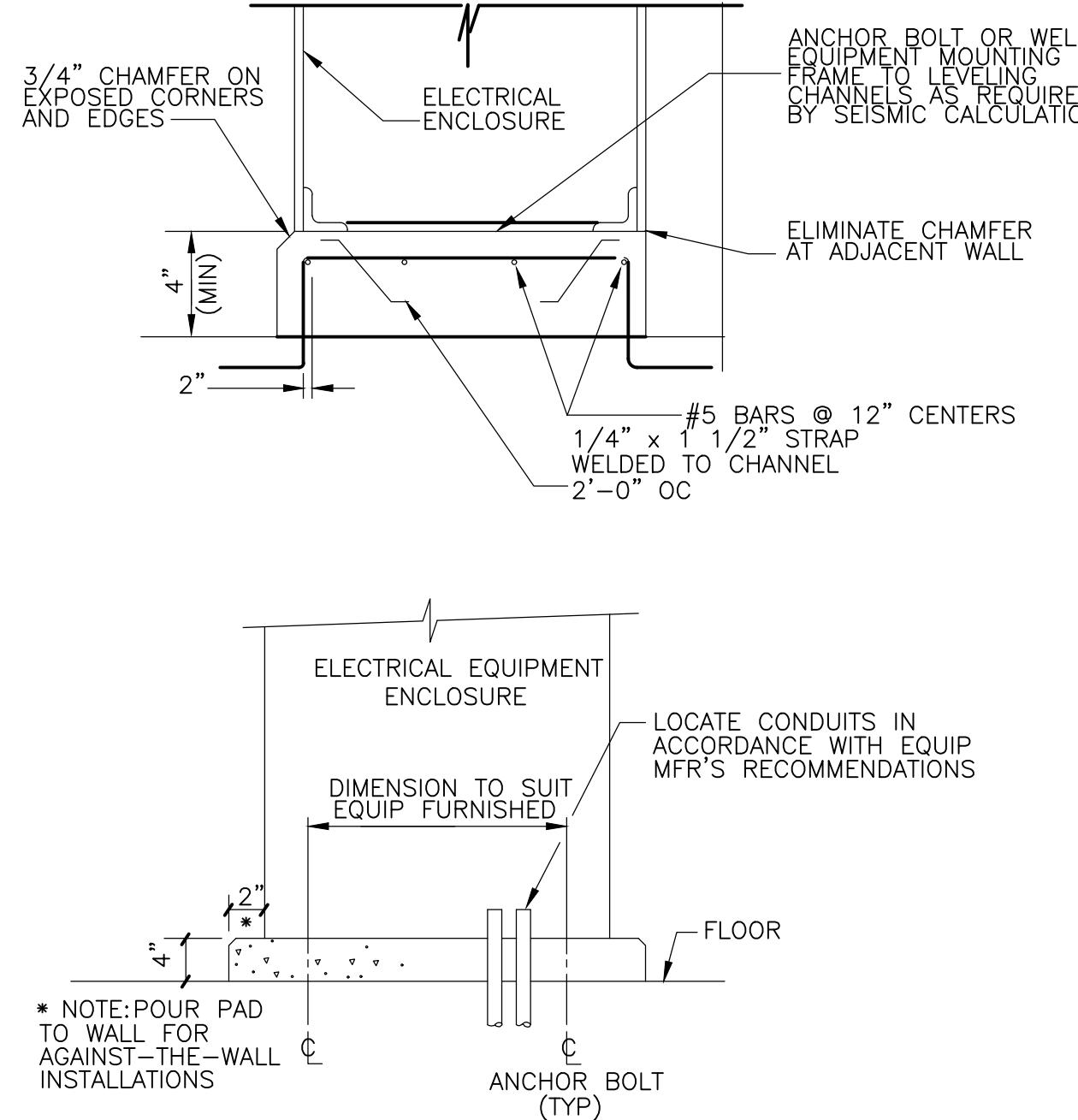
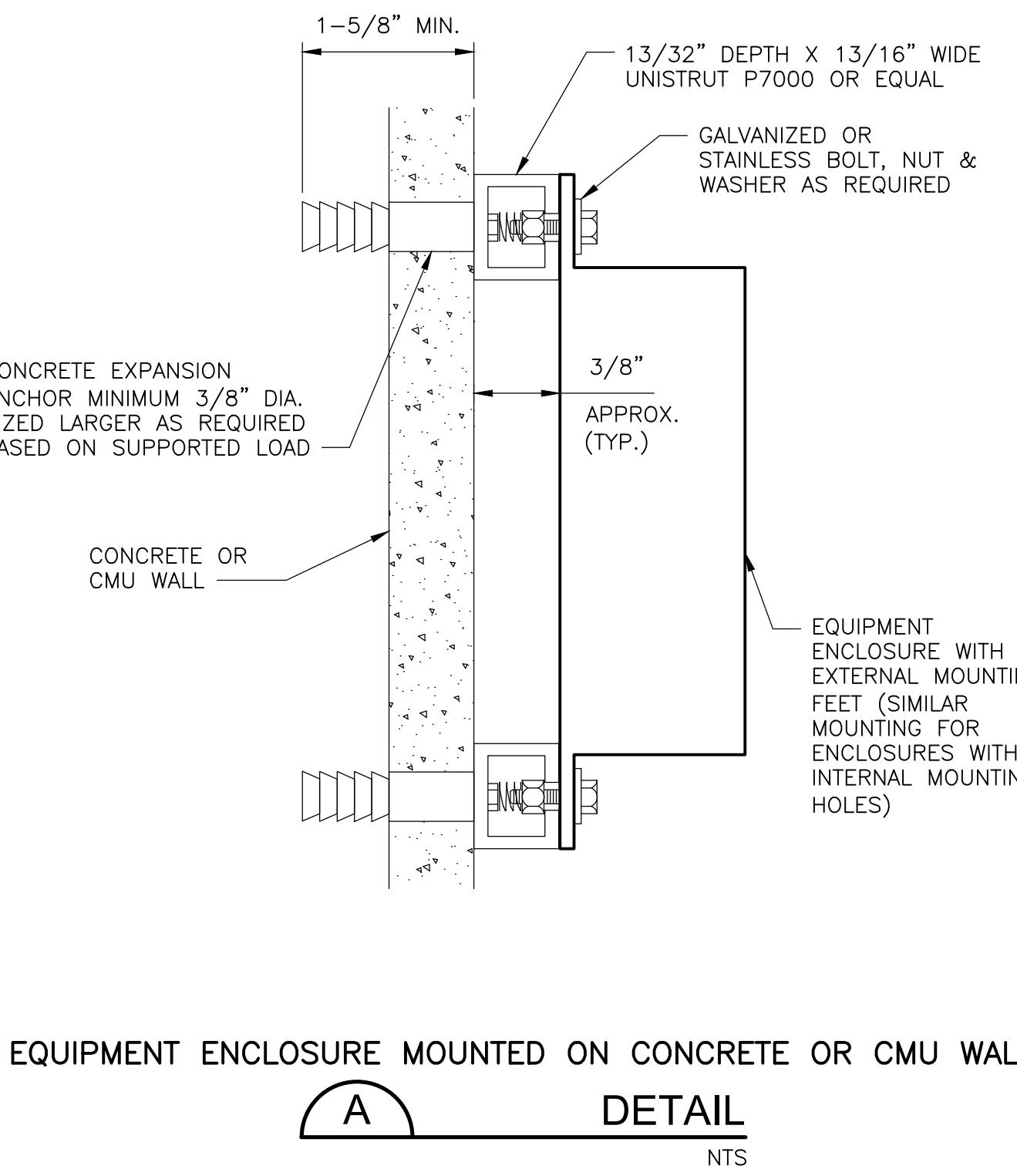
FE10691-014

DRW: ss	DATE: 11.21.2025
CHK: TR	DATE: 11.21.2025
APP: JRD	DATE: 11.21.2025

NORTHEAST HIGH SERVICE PUMP STATION

ELECTRICAL
DETAILS I

109
OF
116



NO.	DATE	DRW	CKD	APP	REVISION
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Minneapolis
Water Works

FE10691-015

NORTHEAST HIGH SERVICE PUMP STATION

ELECTRICAL
DETAILS II

110
OF
116