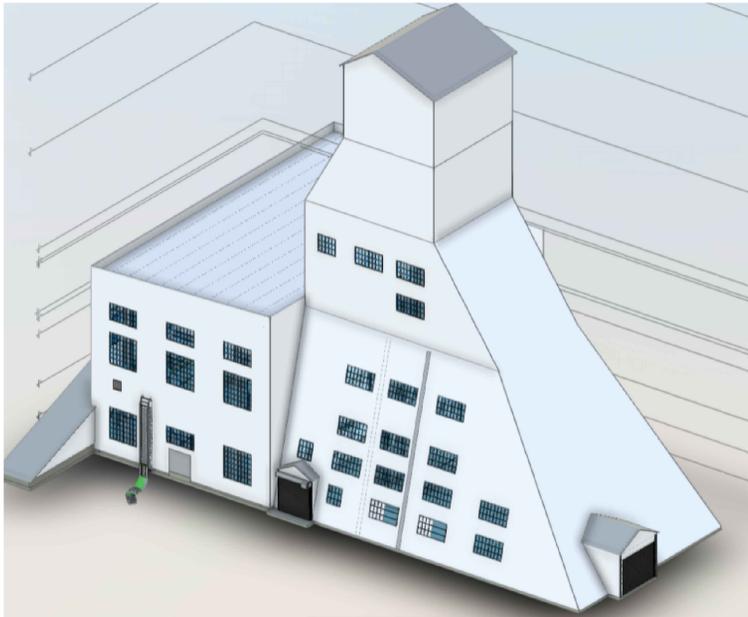


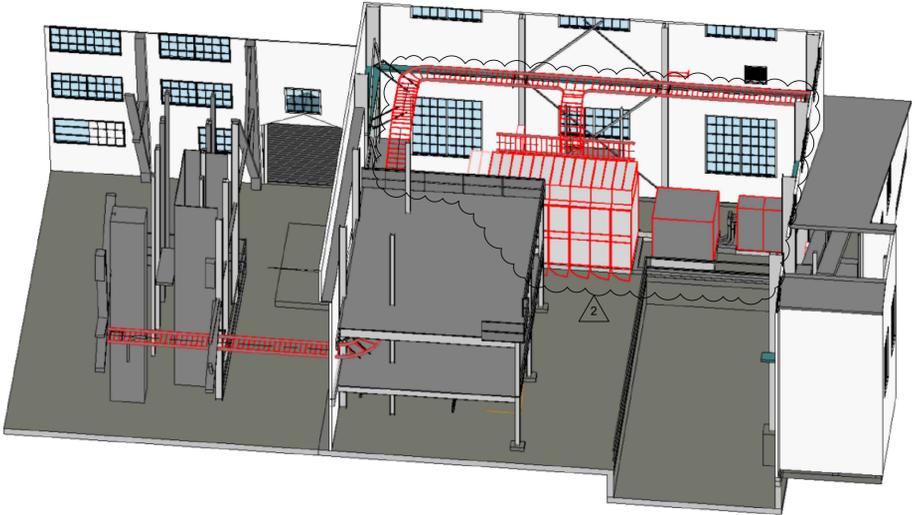
DRAWING INDEX		
SR.NO.	DRAWING NUMBER	DRAWING TITLE
1	24768-E-000	DRAWING INDEX
2	24768-E-001	LEGENDS AND SYMBOLS
3	24768-E-002	ABBREVIATIONS AND GENERAL NOTES
4	24768-E-003	STANDARD DETAILS - I
5	24768-E-004	STANDARD DETAILS - II
6	24768-E-005	STANDARD DETAILS - III
7	24768-E-011	OVERALL SINGLE LINE DIAGRAM
8	24768-E-012	SINGLE LINE DIAGRAM 12.47kV SWGR EQ-YSS04-01 SHEET 1 OF 2
9	24768-E-013	SINGLE LINE DIAGRAM 12.47kV SWGR EQ-YSS04-01 SHEET 2 OF 2
10	24768-E-014	SWITCHBOARD EQ-YSS04-02 SCHEDULE
11	24768-ED100	GENERAL ARRANGEMENT ELECTRICAL DEMOLITION PLAN
12	24768-ED101	GENERAL ARRANGEMENT ELECTRICAL DEMOLITION PLAN WWTP AREA
13	24768-E-100	GENERAL ARRANGEMENT ELECTRICAL SITE PLAN
14	24768-E-101	GENERAL ARRANGEMENT ELECTRICAL SITE PLAN WWTP AREA
15	24768-E-102	GENERAL ARRANGEMENT EAST SWITCHYARD AND FOUNDRY BUILDING AREA ELECTRICAL PLAN
16	24768-E-103	GENERAL ARRANGEMENT HEADFRAME, E&O AND ADMIN BUILDING AREA ELECTRICAL PLAN
17	24768-E-104	GENERAL ARRANGEMENT HOIST BUILDING AREA ELECTRICAL PLAN
18	24768-E-105	GENERAL ARRANGEMENT HEADFRAME/CRUSHER BUILDING ELECTRICAL PLAN
19	24768-E-106	GENERAL ARRANGEMENT HEADFRAME/CRUSHER BUILDING SECTIONS
20	24768-E-107	GENERAL ARRANGEMENT EXISTING DUCT BANK DETAIL
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22	24768-E-500	CONTROL SCHEMATIC MV TRANSFORMER FEEDER BREAKER TYPICAL - SHEET 1 OF 2
23	24768-E-501	CONTROL SCHEMATIC MV TRANSFORMER FEEDER BREAKER TYPICAL - SHEET 2 OF 2
24	24768-E-502	CONTROL SCHEMATIC MV VFD NO DISCONNECT FDR BREAKER TYPICAL - SHEET 1 OF 2
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26	24768-E-504	CONTROL SCHEMATIC MV VFD W/DISCONNECT FDR BREAKER TYPICAL - SHEET 1 OF 2
27	24768-E-505	CONTROL SCHEMATIC MV VFD W/DISCONNECT FDR BREAKER TYPICAL - SHEET 2 OF 2
28	24768-E-506	CONTROL SCHEMATICS MAIN BREAKER 2A SHEET 1 OF 3
29	24768-E-507	CONTROL SCHEMATICS MAIN BREAKER 2A SHEET 2 OF 3
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OVERALL SITE



HEADFRAME/CRUSHER BUILDING



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Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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Title

DRAWING INDEX

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-000 Revision 2

SINGLE LINE DIAGRAM SYMBOLOGY

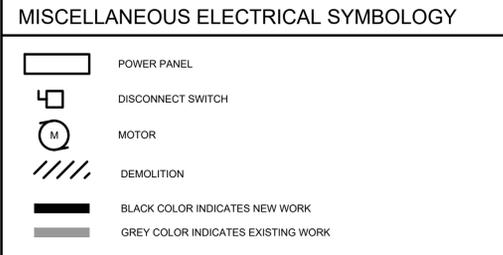
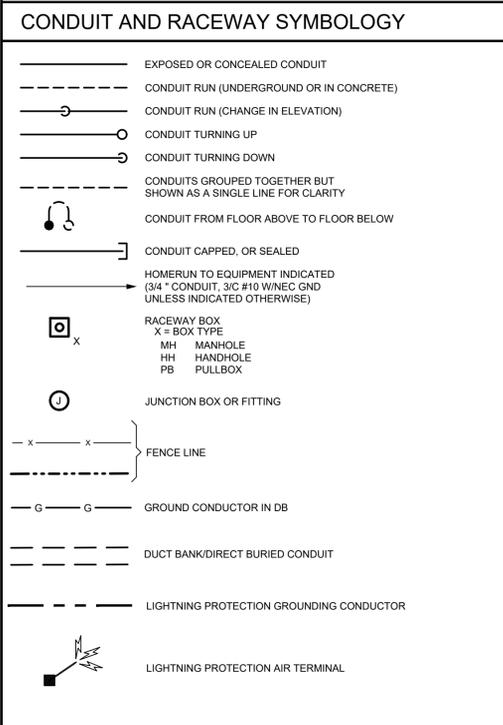
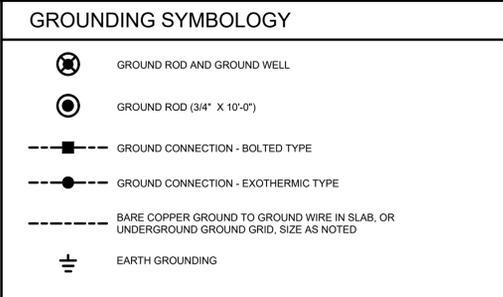
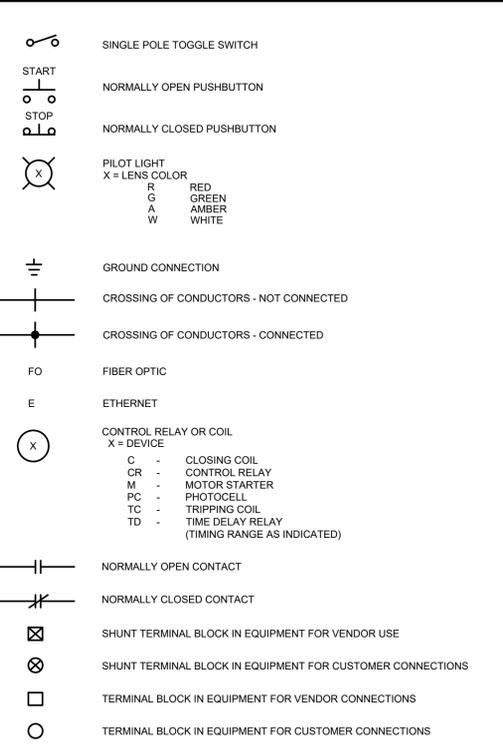
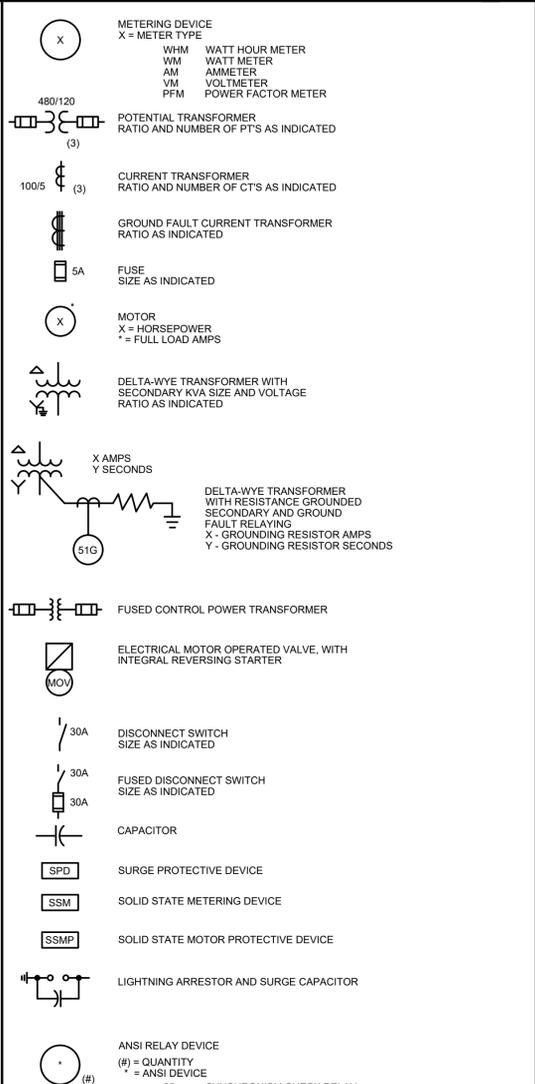
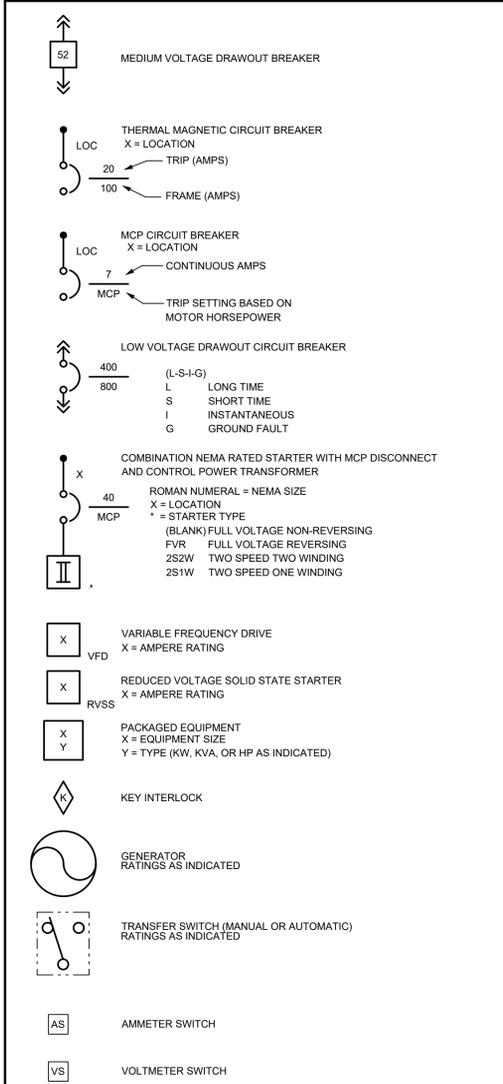
SCHEMATIC DIAGRAM SYMBOLOGY

PLAN SYMBOLOGY

GROUNDING SYMBOLOGY

CONDUIT AND RACEWAY SYMBOLOGY

MISCELLANEOUS ELECTRICAL SYMBOLOGY



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Rev.	Description	Date	By	Chk	Eng.	Appd.
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1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
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Title

LEGENDS AND SYMBOLS

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-001 Revision 2

Dwg Updated: 3/5/2026 6:40:43 PM By: smohie

ELECTRICAL ABBREVIATIONS

A	AMPERE, AUTOMATIC ALTERNATING CURRENT
AC	CIRCUIT BREAKER FRAME SIZE
AFD	ARC FLASH DETECTION
AIP	ABANDONED IN PLACE
AM	AMMETER
ANN	ANNUNCIATOR
AS	ADJUSTABLE SPEED
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
ANOX	ANOXIC BUILDING
ADMN	ADMINISTRATION BUILDING
BATT	BATTERY
BC	BARE COPPER, BLOCK CLOSE
BKR	BREAKER
C	CONDUIT, CLOSED
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLF	CURRENT LIMITING FUSE
COM	COMMON
COMM	COMMUNICATIONS
COMP	COMPARTMENT
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY, CARD READER
CT	CURRENT TRANSFORMER
CONT	CONTROL
DCS	DISTRIBUTED CONTROL SYSTEM
DISC	DISCONNECT
DISTR	DISTRIBUTION
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DIA	DIAMETER
E	EMER.
EMT	ELECTRICAL METALLIC TUBING
EMH	ELECTRICAL MANHOLE
ENCL	ENCLOSURE
ETM	ELAPSED TIME METER
F	FREQUENCY, FUSE, FIXED
FDR	FEEDER
FLA	FULL LOAD AMPS
FLUOR	FLUORESCENT
FM	FREQUENCY METER
FO	FIBER OPTIC
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON-REVERSING
FD	FEED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
H	HAND/HEIGHT
HD	HEAT DETECTOR/HEADWORKS BUILDING
HH	HAND HOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HPS	HIGH PRESSURE SODIUM
HS	HAND SWITCH
HZ	HERTZ
IMC	INTERMEDIATE METALLIC CONDUIT
INCAND	INCANDESCENT
IND	INDICATION
INST	INSTANTANEOUS
I/O	INPUT/OUTPUT
Isc	SHORT CIRCUIT CURRENT, AMPS
ISO	ISOLATION
J, JB	JUNCTION BOX
KA	KILO AMPERES
KAIC	KILO AMP INTERRUPTING CURRENT
KCMIL	KILO CIRCULAR MILS
KVA	KILOVOLT AMPERE
L	LOCAL/LENGTH
LCP	LOCAL CONTROL PANEL
LCS	LOCAL CONTROL STATION
LOC	LOCAL
LOR	LOCAL-OFF-REMOTE
LOS	LOCKOUT STOP PUSHBUTTON
LP	LIGHTING PANEL
LRA	LOCKED ROTOR AMPS
LS	LEVEL SWITCH
LTG	LIGHTING
LTS	LIGHTS
M	MOTOR CONTACTOR COIL
mA	MILLIAMPERE
MCP	MOTOR CIRCUIT PROTECTOR
MLO	MAIN LUGS ONLY
MOV	MOTOR OPERATED VALVE
MS	MANUAL MOTOR STARTER
MTS	MANUAL TRANSFER SWITCH
NEUT	NEUTRAL
NP	NAMEPLATE
O	OPEN, OFF
OL	OVERLOAD

PA	PUBLIC ADDRESS
PB	PUSHBUTTON, PULLBOX
PC	PHOTOCELL
PCM	PROCESS CONTROL MODULE
PF	POWER FACTOR
PFM	POWER FACTOR METER
PH	PHASE
PL	PILOT LIGHT
PNLBD	PANELBOARD
PP	POWER PANELBOARD
POS	POSITION
POT	POTENTIOMETER
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PTZ	PAN-TILT-ZOOM
PWR	POWER
PQR	POWER QUALITY METER
R	REMOTE
RECPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
RMS	ROOT MEAN SQUARE
RTU	REMOTE TERMINAL UNIT
RVSS	REDUCED VOLTAGE SOLID STATE
RTRC	REINFORCED THERMOSETTING RESIN CONDUIT
SEL SW	SELECTOR SWITCH
SEQ	SEQUENCE
SHLD	SHIELDED
SIG	SIGNAL
SP	SPARE
SP HTR	SPACE HEATER
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SSM	SOLID STATE METER
SSMP	SOLID STATE MOTOR PROTECTOR
ST, SH	SHUNT TRIP
STR	STARTER
SSTU	SOLID STATE TRIP UNIT
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SCH	SCHEDULE
TACH	TACHOMETER
TB	TERMINAL BOX
TERM	TERMINAL
TM	REPEAT CYCLE TIMER
TD	TIME DELAY RELAY
TS	TEMPERATURE SWITCH, TEST SWITCH
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VA	VOLT AMPERE
VAR	VOLT AMPERE REACTIVE
VFD	VARIABLE FREQUENCY DRIVE
VM	VOLTMETER
VP	VAPOR PROOF
VCP	VENDOR CONTROL PANEL
W	WATTS, WIRE/WIDTH
WM	WATT METER
WP	WEATHERPROOF
XFMR	TRANSFORMER
XMTR	TRANSMITTER
XP	EXPLOSION PROOF

GENERAL ELECTRICAL NOTES

- ALL RACEWAYS AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, INDUSTRY STANDARD PRACTICE AND MANUFACTURER'S INSTRUCTIONS.
- THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF TERMINAL BOXES AND CONDUIT ENTRANCES FOR ALL EQUIPMENT AGAINST APPROVED SHOP DRAWINGS BEFORE STUBBING UP CONDUITS.
- REFER TO SPECIFICATION SECTION 26 05 33 FOR REQUIREMENTS RELATED TO FLEXIBLE CONDUIT INSTALLATION.
- CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT OR STRUCTURAL CONDITIONS. EXPOSED CONDUIT SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO BEAMS AND WALLS. REFER TO SPECIFICATION SECTION 26 05 33.
- ANY DEVIATION TO THE DESIGN SHALL BE NOTIFIED TO THE SDSTA IN WRITING AND THE SDSTA SHALL APPROVE THE PROPOSED CHANGES BEFORE FIELD MODIFICATION.
- IN THE EVENT OF INTERFERENCE BETWEEN ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND OTHER EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE SDSTA IN WRITING AND THE SDSTA SHALL APPROVE PROPOSED CHANGES BEFORE THEY ARE MADE.
- ALL SURFACE MOUNTED PANELS AND PANELBOARDS ON THE INTERIOR OF EXTERIOR WALLS ABOVE GRADE OR IN OTHER LOCATIONS CONSIDERED DAMP OR WET SHALL BE MOUNTED SO AS TO MAINTAIN A 1/4 INCH (MINIMUM) AIR SPACE BETWEEN THE ENCLOSURE AND THE WALL.
- LOCATION OF PULLBOXES ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION WITH MECHANICAL PIPING AND SHALL BE 12 INCHES (MINIMUM) AWAY FROM MECHANICAL PIPING FLOW LINES.
- ONLY MAJOR PULLBOXES ARE SHOWN. THE CONTRACTOR SHALL PROVIDE ADDITIONAL PULLBOXES WHERE REQUIRED TO MAKE A WORKABLE INSTALLATION.
- ALL CONDUIT RUNS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION OR EXPANSION AND DEFLECTION TYPE FITTINGS.
- ALL PANELBOARDS SHALL BE MOUNTED SO THAT THE DISTANCE FROM THE CENTERLINE OF THE TOP CIRCUIT BREAKER OPERATING HANDLE IN THE UPPERMOST POSITION TO THE FINISHED FLOOR SHALL NOT EXCEED 6'-7".
- THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUIT REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE SDSTA MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
- CONNECTIONS BETWEEN RIGID CONDUIT AND MOTOR TERMINAL BOXES OR SIMILAR EQUIPMENT SUBJECT TO VIBRATION SHALL BE FLEXIBLE LIQUID-TIGHT CONDUIT.
- ALL FREE STANDING PANELS SHALL BE SET ON CONCRETE HOUSEKEEPING PADS WITH LEVELING CHANNELS EMBEDDED IN THE PAD.
- CONCRETE MIX USED FOR ELECTRICAL EQUIPMENTS PAD AND FOR DUCT BANKS SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI.
- EXCAVATION FOR DUCT BANKS / DIRECT BURIED CONDUITS SHALL BE PER INDUSTRY PRACTICE FOR EXCAVATION AROUND UNDERGROUND ELECTRICAL UTILITY.
- ALL CONDUIT CONNECTIONS TO ALL MOTORS, VIBRATING EQUIPMENT, BELT DRIVEN EQUIPMENT, PRESSURE AND LEVEL SWITCHES, THERMOCOUPLES, ETC., TO BE MADE WITH FLEXIBLE CONDUIT.

CONDUIT DUCTBANK NOTES

- DUCT BANKS SHALL MEET THE REQUIREMENT AS SPECIFIED IN NEC ARTICLE 300.5.
- ALL DUCT BANKS CONNECTING TO VAULT SHALL SLOPE 3" PER 100 FEET TOWARDS THE VAULT.
- CONTRACTOR TO BRING CONDUITS 8" ABOVE GRADE AND CAP USING RIGID GALVANIZED STEEL (RGS) CONDUIT. EXCEPT WHERE THERE IS CHEMICAL CONTAINMENT IN THOSE AREAS THE CONTRACTOR TO BRING CONDUIT 8" ABOVE THE CONTAINMENT WALLS/SURFACE AND CAP USING PVC COATED RIGID GALVANIZED STEEL (RGS) CONDUIT OR SCHEDULE 40 PVC.
- CONDUITS IN DUCT BANK SHALL BE SCHEDULE 40 PVC.
- CONTRACTOR TO APPLY SILICONE SEALANT TO CONDUIT BEFORE INSTALLING IT INTO VAULT CONDUIT SLEEVE (TYP. ALL CONDUITS ENTERING VAULT) OR PVC GLUE THAT PROVIDES WATER TIGHT ADHESION LIKE CARLON QUICK-SET CEMENT OR APPROVED EQUAL.
- ALL DUCT BANKS SHALL BE A MINIMUM OF 24" BELOW GRADE. DUCT BANKS MAY BE DEEPER THAN 24".
- A POLYPROPYLENE FILM, LAMINATED, ALUMINUM FOIL CORE, WARNING TAPE "CAUTION BURIED HIGH VOLTAGE LINE BELOW" SHALL BE INSTALLED.
- FOR DUCT BANK USE OF HELIX CONCRETE MIX OR EQUIVALENT WITH MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI IS ACCEPTABLE.
- EACH DUCT BANK SHALL HAVE A #4/0 GROUND CABLE ON TOP OF THE DUCT BANK. THIS CABLE SHALL TERMINATE AT THE VAULT GROUND ROD OR PLANT GROUND GRID.
- ALL CONDUITS ARE SHOWN DIAGRAMMATICALLY. EXCEPT WHERE LOCATED BY DIMENSIONS, THE EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL ALSO DETERMINE THE METHOD OF SUPPORT IN THE ABSENCE OF SPECIFICATIONS AND SDSTA'S INSTRUCTIONS. CONSTRUCTION SHALL PROVIDE ADDITIONAL PULL BOXES OR FITTINGS AS REQUIRED. CONDUIT RUNS BETWEEN BOXES OR PULL POINTS SHALL NOT CONTAIN MORE THAN 360° TOTAL BENDS.
- ALL CONDUIT ENDS SHALL BE CLOSED DURING CONSTRUCTION. ENDS OF SPARE CONDUITS SHALL BE PLUGGED OR CAPPED.
- ALL FIELD BENDS REQUIRED IN PVC CONDUIT SHALL BE UNIFORM LONG RADIUS SWEEPS, BENT ON A SUITABLE POWER BENDER OR WITH OTHER SUITABLE BENDING TOOLS. THE RADIUS OF ANY CONDUIT BENDS, MEASURED FROM THE CENTER OF THE BEND TO THE NEAREST EXTERNAL SURFACE OF THE CONDUIT SHALL, IF POSSIBLE, BE NOT LESS THAN THE BENDING RADIUS LISTED FOR THE PARTICULAR CONDUIT SIZE IN THE FOLLOWING TABLE:

SIZE OF CONDUIT (NOMINAL DIA. INCHES)	MIN. BEND RADIUS (INCHES)
2	24
4	36
5	48
6	60

CABLE TRAY NOTES

- ALL GROUNDING SHALL BE INSTALLED IN ACCORDANCE WITH ALL NATIONAL, STATE & LOCAL CODES.
- THE GROUNDING SYSTEM IS SHOWN DIAGRAMMATICALLY. EXACT LOCATION OF CABLE AND CONNECTIONS SHALL BE DETERMINED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
- CONDUCTORS SHALL BE #4/0 SOFT DRAWN, BARE STRANDED COPPER GROUND WIRES UNLESS OTHERWISE NOTED.
- CONTRACTOR TO EXTEND GROUND CONDUCTOR TO EQUIPMENT FOUNDATION AND COIL AN ADDITIONAL 20'. CABLE TO BE PROTECTED FROM DAMAGE DURING CONSTRUCTION.
- ALL ASSEMBLY HARDWARE, HANGERS ETC. SHALL BE 8-LINE SERIES OR APPROVED EQUAL 2, 3, 4, AND 5 ALUMINUM.
- MEDIUM/LOW VOLTAGE POWER, CONTROL AND INSTRUMENT TRAYS SHALL BE THE WIDTH AS SPECIFIED ON THE DRAWING WITH 6" SIDE RAILS. TRAY WIDTHS SHALL NOT DECREASED WITHOUT THE APPROVAL OF THE SDSTA.
- CABLE TRAY SHALL BE SUPPORTED AT INTERVALS RECOMMENDED BY THE MANUFACTURER OR AS SPECIFIED IN THIS PROJECT'S SPECIFICATIONS.
- ALL DIMENSIONS, ELEVATIONS AND ROUTING LOCATIONS SHOWN ON THE DRAWINGS REFLECT INTENDED DESIGN. INSTALLER SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND ROUTING LOCATIONS IN THE FIELD PRIOR TO INSTALLATION.
- ALL ELEVATIONS SHOWN ARE TO BOTTOM OF TRAY.
- INSTALLER SHALL COORDINATE CABLE TRAY INSTALLATIONS WITH OTHER TRADES TO AVOID CONFLICTS OF SPACE.
- ALL CABLE EXITING CABLE TRAY SHALL BE FIELD RUN IN CONDUIT TO THEIR FINAL DESTINATION.
- ALL CONDUIT INSTALLED OUTDOORS SHALL BE RGS.
- ALL VERTICAL RUNS SHALL BE SUPPORTED EVERY 30 VERTICAL FEET WITH USE OF KELLEM GRIPS, PER APPLICABLE NEC STANDARDS.
- CONTINUOUS GROUNDING OF THE CABLE TRAY SYSTEM SHALL BE MAINTAINED BY INSTALLING #4/0 BARE CONDUCTOR FOR ENTIRE LENGTH OF THE CABLE TRAY.
- CABLE TRAY BLIND ENDS SHALL BE INSTALLED WHERE CABLE TRAY ENDS UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
- CABLE TRAY COVERS SHALL BE INSTALLED ON ALL HORIZONTAL TOP MOST, TRAY INSTALLATIONS. ADDITIONALLY, VERTICAL TRAY SHALL BE COVERED TO AN ELEVATION OF 6'-0" WHERE ACCESSIBLE BY PERSONNEL.
- CABLE TRAY LENGTHS PROVIDED REPRESENT TOTAL CALCULATED LENGTH OF STRAIGHT TRAY, AND DOES NOT ACCOUNT FOR THE NUMBER OF TRAY.
- ALL CABLE TRAYS SUPPORTS SHALL INCORPORATE UNISTRUT AS A BEARING SURFACE FOR THE TRAY.
- CABLE SHALL BE SECURED TO CABLE TRAYS USING UV RESISTANT BLACK NYLON TY-RAPS. ON HORIZONTAL RUNS, CABLES SHALL BE SECURED AT INTERVALS NOT TO EXCEED 5 FEET. ON VERTICAL RUNS, AT INTERVALS NOT TO EXCEED 3 FEET, AND ON INVERTED RUNS, AT EVERY SECOND RUNG.

DIRECT BURIED CONDUIT NOTES

- STANTEC ENGINEERS CANNOT CONFIRM MANY ASPECTS OF CONSTRUCTION INSTALLATION AND RELIES ON THE CONTRACTOR'S JOBSITE VERIFICATION, PROJECT RESEARCH, AND SAFETY PRACTICES TO ENSURE THE APPROPRIATE TIE-IN IS PERFORMED, CONTRACTOR SHALL USE ALL INDUSTRY STANDARD SAFETY PRECAUTIONS AND PRACTICES INCLUDING SDSTA APPROVED JOB SAFETY PLAN, TO VERIFY LINE TIE-IN SUITABLE PRIOR TO COMMENCING CONSTRUCTION.
- DIRECT BURIED CONDUIT SHALL MEET THE REQUIREMENT AS SPECIFIED IN NEC ARTICLE 300.5
- CONTRACTOR SHALL FIELD VERIFY ALL LOCATION AND DIMENSIONS BEFORE COMMENCING WORK.
- ALL WORK SHALL COMPLY WITH PROJECT SPECIFICATION. NEW FACILITIES AND MODIFICATION OF EXISTING FACILITIES SHALL MEET THE SAFETY REQUIREMENTS.
- ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE STATE OF SOUTH DAKOTA ADMINISTRATION CODE, OSHA REGULATIONS & NATIONAL ELECTRICAL CODE.
- ALL CONDUITS CONNECTING TO VAULT SHALL SLOPE 3" PER 100 FEET TOWARDS THE VAULT.
- MINIMUM CONDUIT BURIAL DEPTH SHALL BE 24" BELOW GRADE FOR NEW CONDUIT. CONDUIT BURIAL MAY BE DEEPER THAN 24".
- ALL CONDUITS SHALL HAVE A GROUND WIRE PULLED IN TO PROVIDE A GROUND FAULT RETURN PATH.
- CONTRACTOR TO PLUG ALL UNUSED OPENINGS AND/OR SPARE CONDUITS.
- FOR INSTALLATION, A CABLE MINIMUM BENDING RADIUS AS RECOMMENDED BY MANUFACTURER RECOMMENDATIONS MUST BE MAINTAINED.
- CONTRACTOR TO BRING CONDUITS 8" ABOVE GRADE AND CAP USING RIGID GALVANIZED STEEL (RGS) CONDUIT. EXCEPT WHERE THERE IS CHEMICAL CONTAINMENT IN THOSE AREAS THE CONTRACTOR TO BRING CONDUIT 8" ABOVE THE CONTAINMENT WALLS/SURFACE AND CAP USING PVC COATED RIGID GALVANIZED STEEL (RGS) CONDUIT OR SCHEDULE 40 PVC.
- DRAWINGS INDICATES DIAGRAMMATICALLY DESIRED LOCATIONS OF ELECTRICAL EQUIPMENT AND CONTROL DEVICES. ARRANGEMENT OF SYSTEM CONDUIT/CABLE ROUTING TO BE FOLLOWED AS CLOSELY AS POSSIBLE. PROPER JUDGEMENT MUST BE EXERCISED IN EXECUTION OF WORK TO SECURE THE BEST POSSIBLE INSTALLATION OF ALL DEVICES, EQUIPMENT, AND SYSTEM CONDUIT/CABLE ROUTING. METHOD OF CONDUIT/CABLE ROUTING SHALL BE CAREFULLY EXAMINED, PREPARED AND APPROVED BY THE SDSTA PRIOR TO INSTALLATION
- ALL FIELD BENDS REQUIRED IN PVC CONDUIT SHALL BE UNIFORM LONG RADIUS SWEEPS, BENT ON A SUITABLE POWER BENDER OR WITH OTHER SUITABLE BENDING TOOLS. THE RADIUS OF ANY CONDUIT BENDS, MEASURED FROM THE CENTER OF THE BEND TO THE NEAREST EXTERNAL SURFACE OF THE CONDUIT SHALL, IF POSSIBLE, BE NOT LESS THAN THE BENDING RADIUS LISTED FOR THE PARTICULAR CONDUIT SIZE IN THE FOLLOWING TABLE:

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2	24
4	36
5	48
6	60

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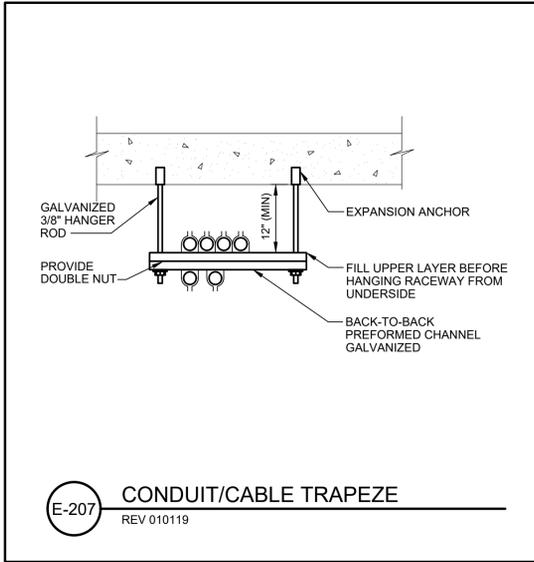
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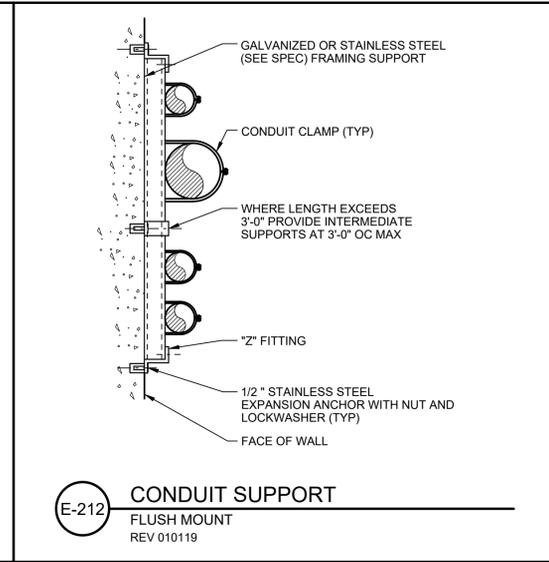
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Dwn.	Chkd.	Dgnt.	YY.MM.DD

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182924768			
Drawing No.	Revision		
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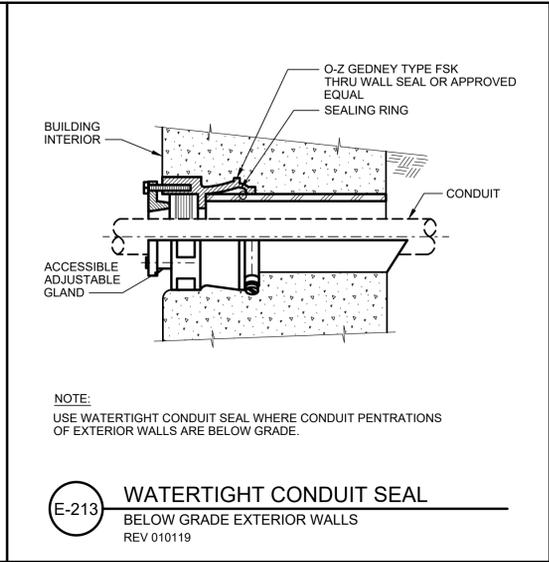
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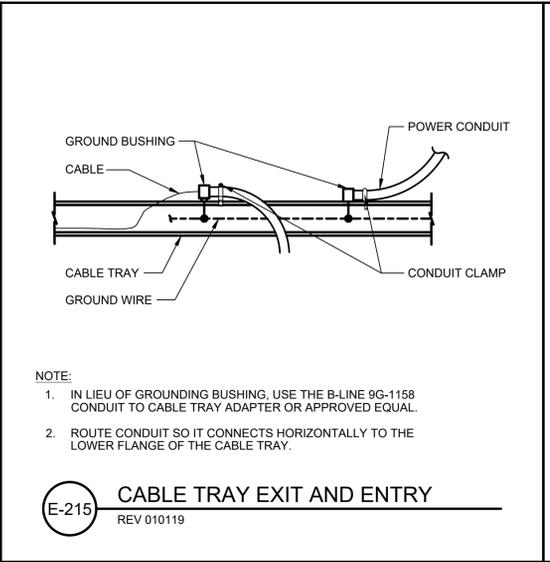
E-207 CONDUIT/CABLE TRAPEZE
REV 010119



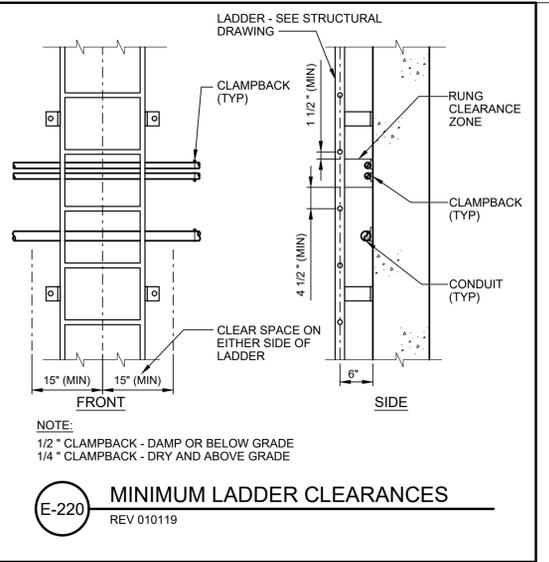
E-212 CONDUIT SUPPORT
FLUSH MOUNT
REV 010119



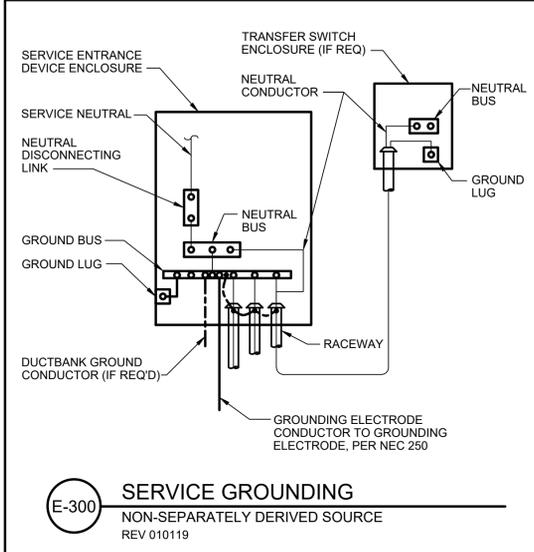
E-213 WATERTIGHT CONDUIT SEAL
BELOW GRADE EXTERIOR WALLS
REV 010119



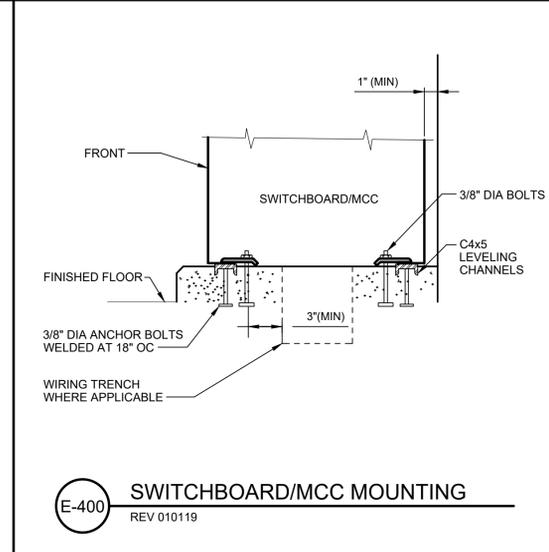
E-215 CABLE TRAY EXIT AND ENTRY
REV 010119



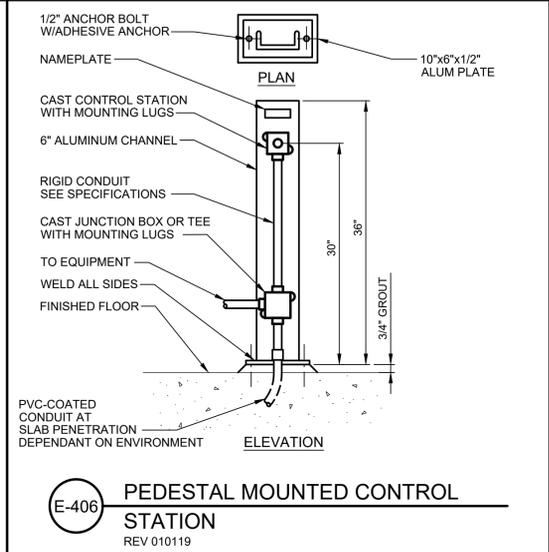
E-220 MINIMUM LADDER CLEARANCES
REV 010119



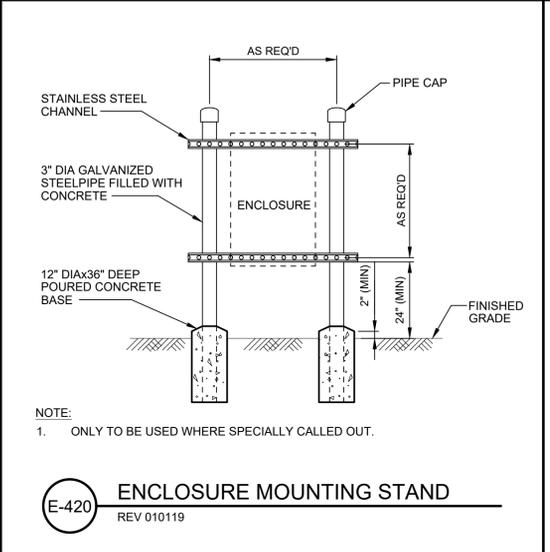
E-300 SERVICE GROUNDING
NON-SEPARATELY DERIVED SOURCE
REV 010119



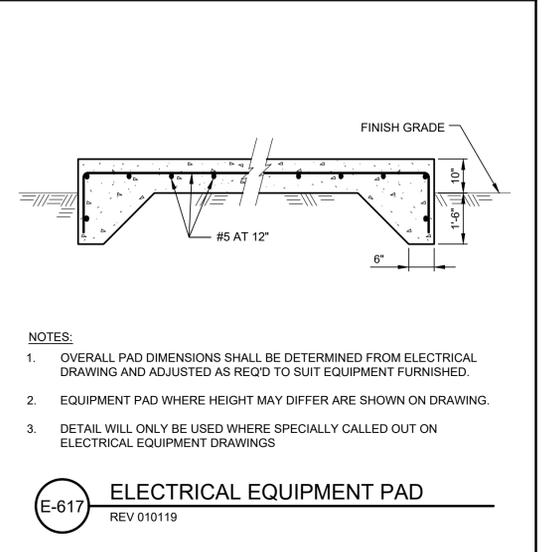
E-400 SWITCHBOARD/MCC MOUNTING
REV 010119



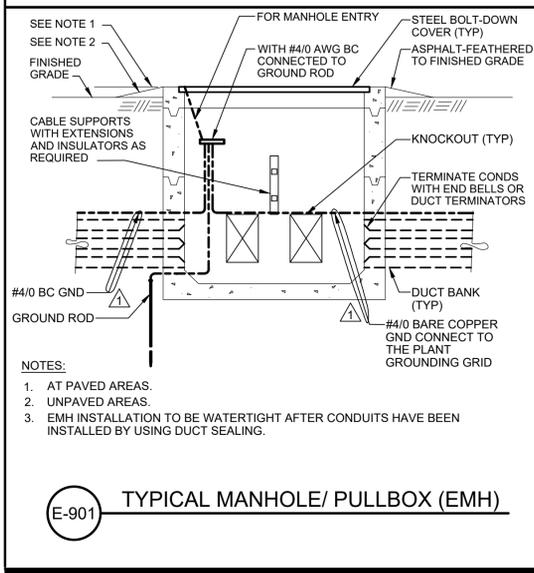
E-406 PEDESTAL MOUNTED CONTROL STATION
REV 010119



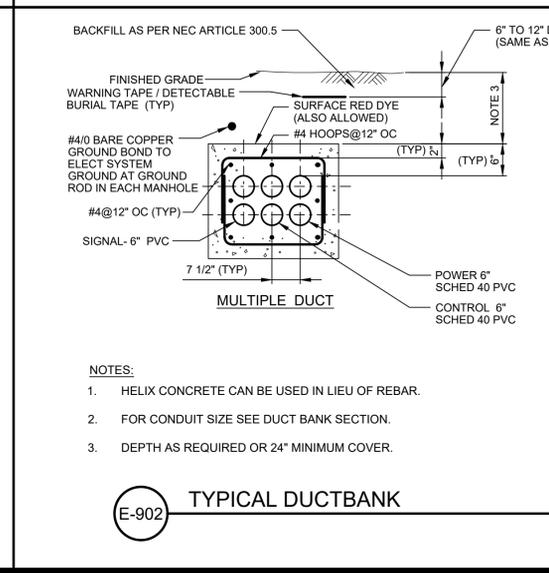
E-420 ENCLOSURE MOUNTING STAND
REV 010119



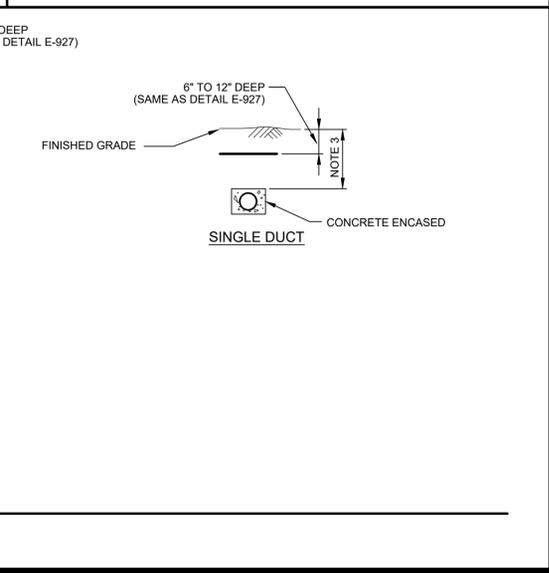
E-617 ELECTRICAL EQUIPMENT PAD
REV 010119



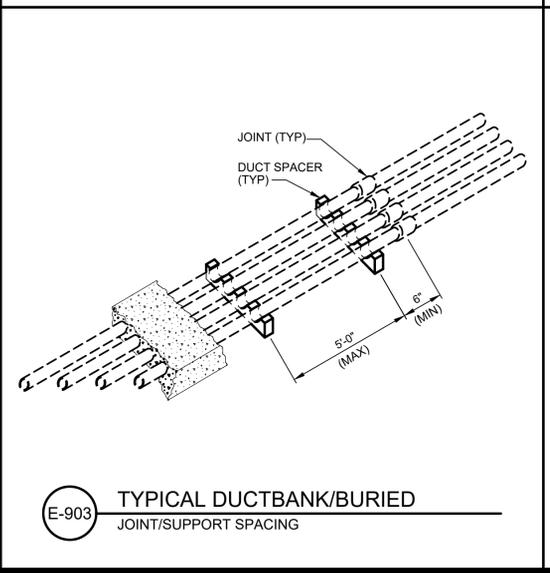
E-901 TYPICAL MANHOLE/ PULLBOX (EMH)



E-902 TYPICAL DUCTBANK



E-903 TYPICAL DUCTBANK/BURIED
JOINT/SUPPORT SPACING



E-904 CONCRETE HOUSEKEEPING CURB
NON-HAZARDOUS LOCATIONS

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Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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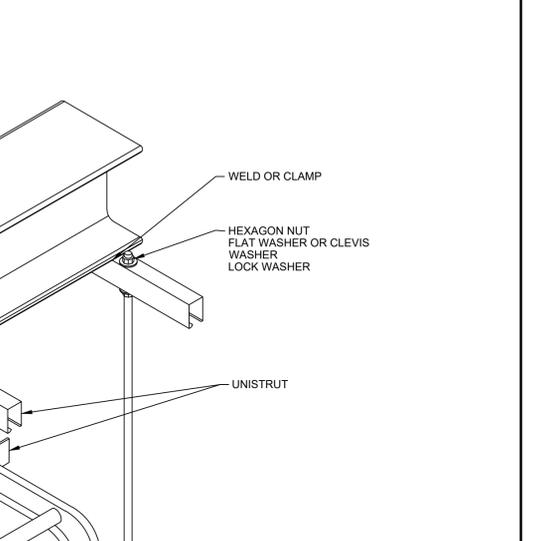
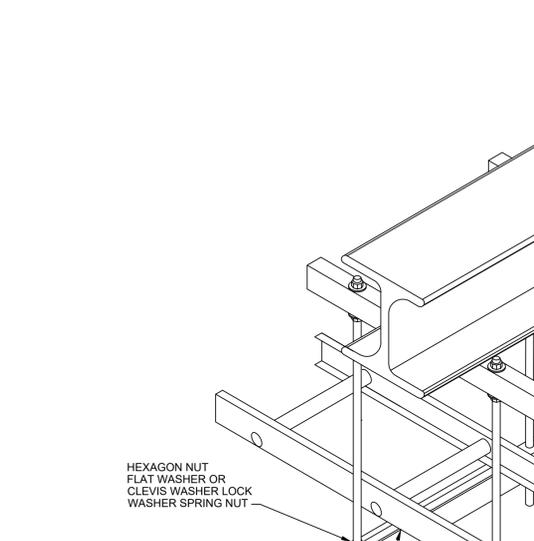
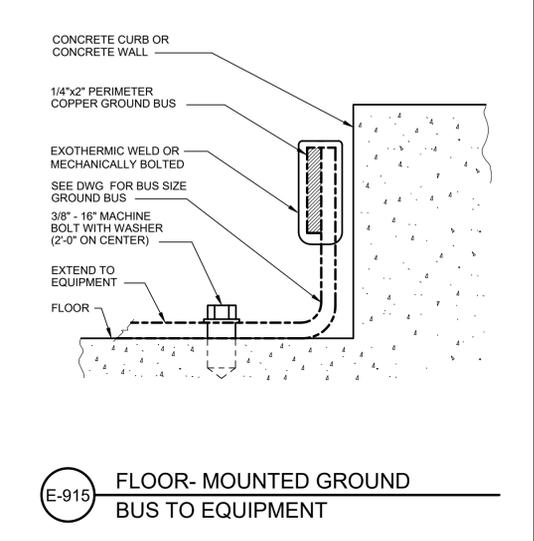
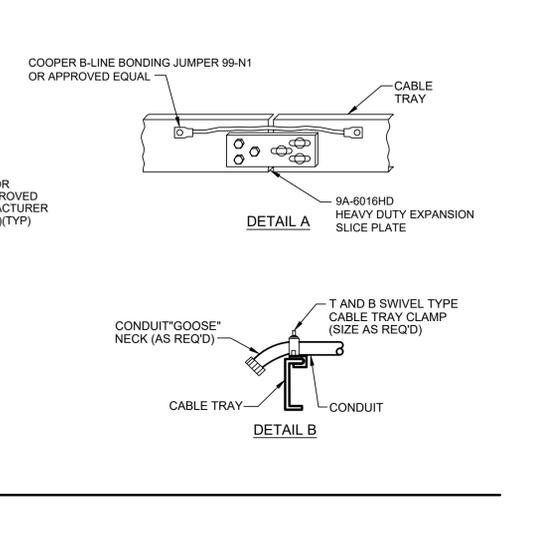
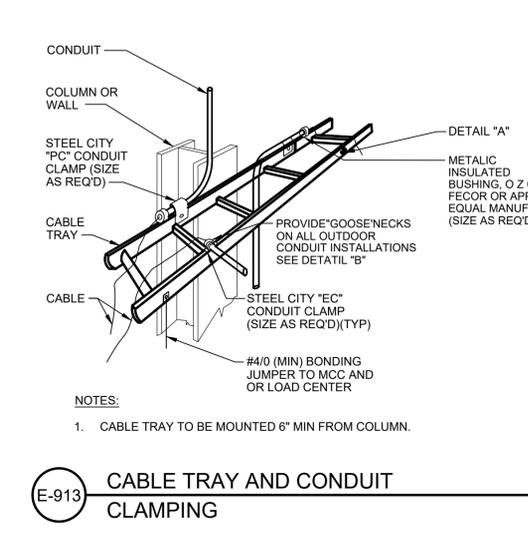
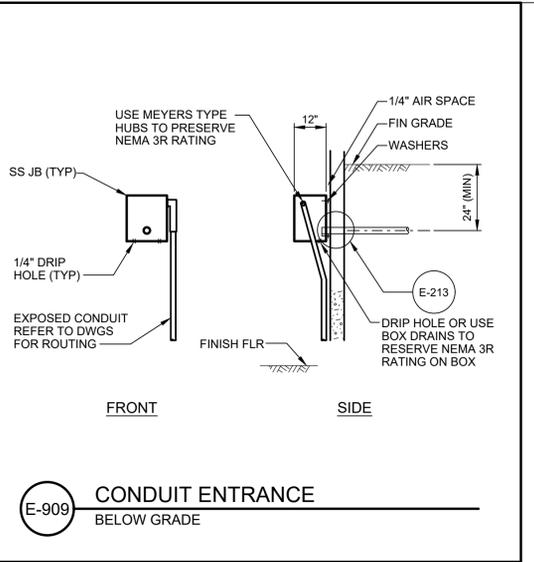
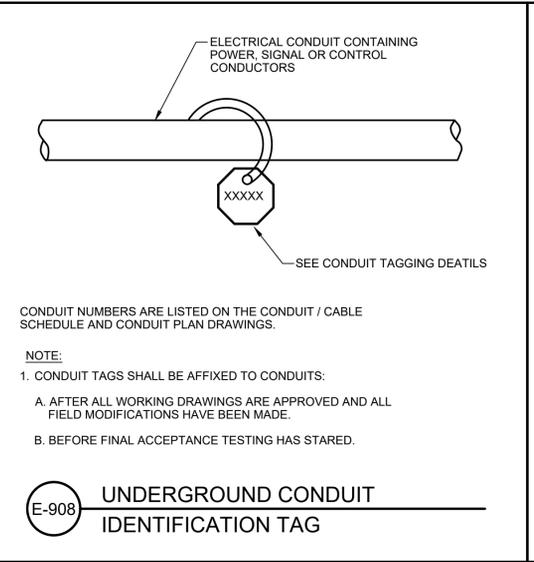
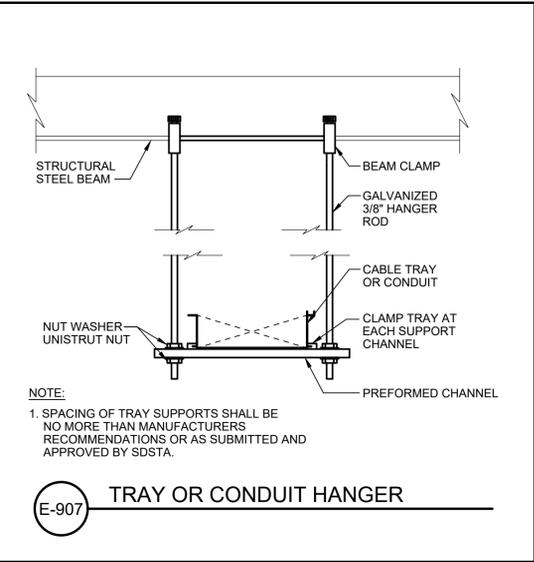
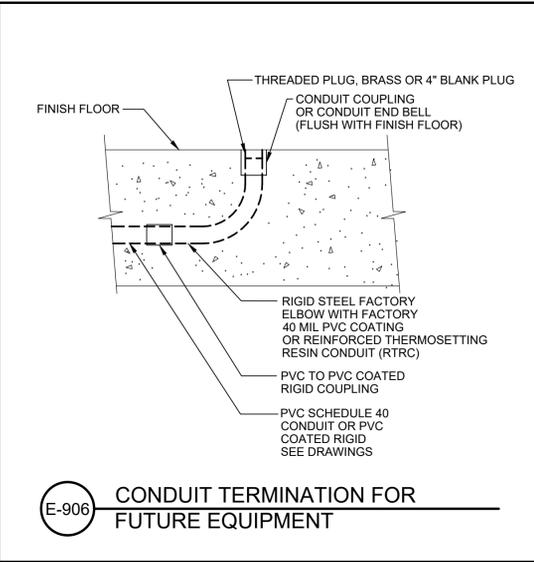
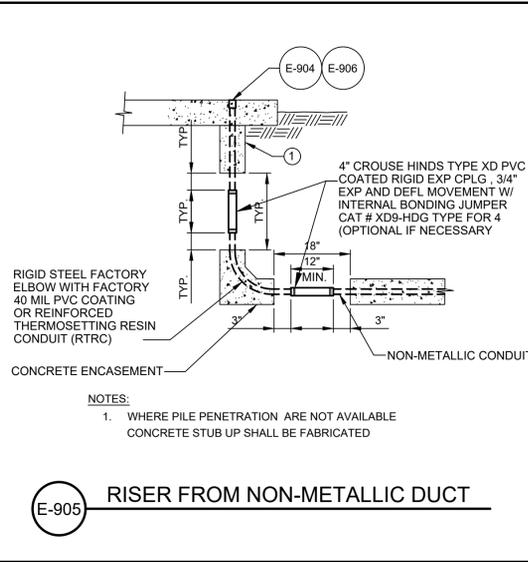
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File Name: 24768-E-003.dwg

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Title		STANDARD DETAILS - I	
Project No.	Scale	NO SCALE	
182924768			
Drawing No.	Revision		
24768-E-003	2		



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1		100%	ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
0		100%	ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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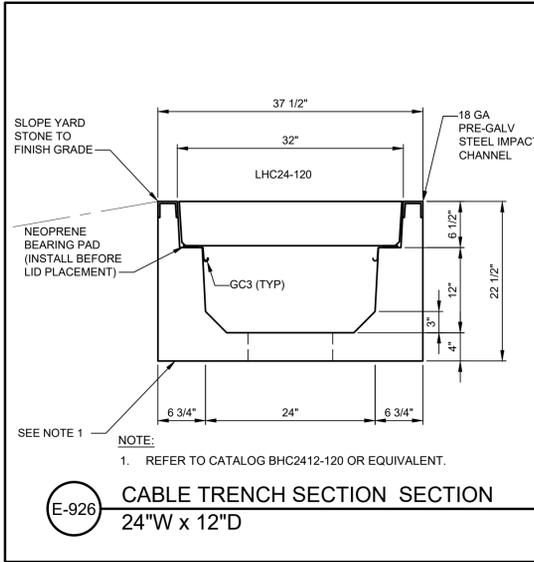
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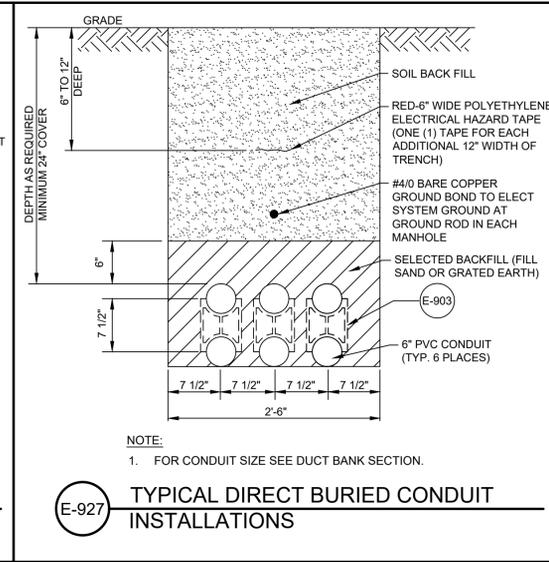
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Project No.	Scale	NO SCALE	
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Drawing No.	Revision		
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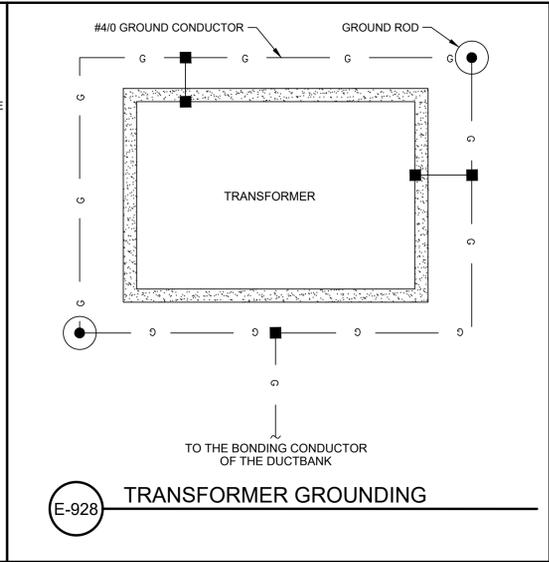
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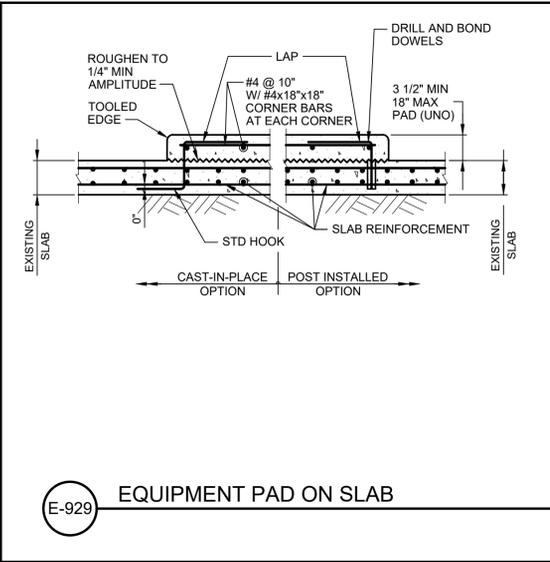
E-926 CABLE TRENCH SECTION
24"W x 12"D



E-927 TYPICAL DIRECT BURIED CONDUIT INSTALLATIONS

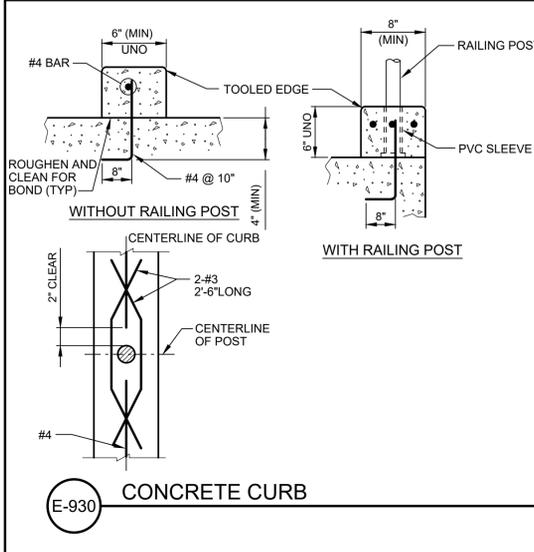


E-928 TRANSFORMER GROUNDING



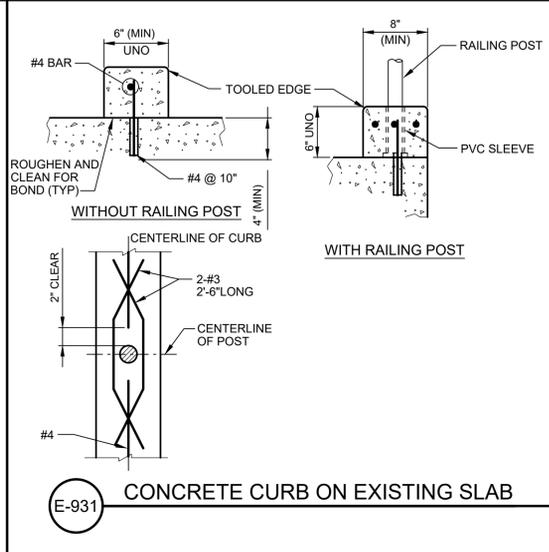
E-929 EQUIPMENT PAD ON SLAB

- NOTES:**
- WHERE SLAB THICKNESS IS LESS THAN REQUIRED FOR POST-INSTALLED ANCHOR EMBEDMENT, USE CAST-IN-PLACE OPTION.
 - LOCATE AND AVOID ALL REINFORCEMENT PRIOR TO DRILLING INTO CONCRETE.
 - THE DETAIL APPLIES WHERE EQUIPMENT PADS OR HOUSEKEEPING PADS ARE INDICATED ON THE CONSTRUCTION DOCUMENTS.
 - CONTRACTOR TO COORDINATE DIMENSIONS RELATED TO MECHANICAL/ELECTRICAL EQUIPMENT BEFORE CONSTRUCTION.
 - CONTRACTOR MUST CONFIRM ALL CONTROLLING FIELD DIMENSIONS AND CONDITIONS PRIOR TO WORK.
 - VERIFY DETAILS BASED ON ACTUAL SITE CONDITIONS AND PROJECT-SPECIFIC LOADS.
 - CONTRACTOR IS FULLY RESPONSIBLE FOR DESIGN ADEQUACY AND ACCURACY.
 - DESIGN ASSUMPTIONS:
 - CONCRETE: 3000 PSI
 - REINFORCEMENT: GRADE 60
 - SOG LOADING: 250 PSF



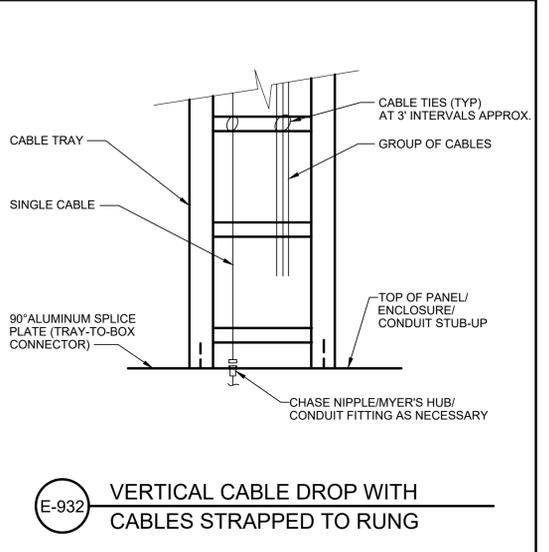
E-930 CONCRETE CURB

- NOTES:**
- CURBS SHALL BE OF EQUAL WIDTH IN THEIR ENTIRE LENGTH.
 - DETAIL ALSO APPLIES TO TOPS OF WALLS REINFORCED WITH ONE CURTAIN OF STEEL.
 - POST INSERTS NOT ALLOWED IN APPLICATIONS SUBJECT TO FREEZING.
 - IN EXISTING SLABS USE #4@10" W/ 4" EMBED, DRILL AND GROUT INTO SLAB.
 - CONTRACTOR TO COORDINATE DIMENSIONS RELATED TO MECHANICAL/ELECTRICAL EQUIPMENT BEFORE CONSTRUCTION.
 - CONTRACTOR MUST CONFIRM ALL CONTROLLING FIELD DIMENSIONS AND CONDITIONS PRIOR TO WORK.
 - VERIFY DETAILS BASED ON ACTUAL SITE CONDITIONS AND PROJECT-SPECIFIC LOADS.
 - CONTRACTOR IS FULLY RESPONSIBLE FOR DESIGN ADEQUACY AND ACCURACY.
 - DESIGN ASSUMPTIONS:
 - CONCRETE: 3000 PSI
 - REINFORCEMENT: GRADE 60
 - SOG LOADING: 250 PSF



E-931 CONCRETE CURB ON EXISTING SLAB

- NOTES:**
- CURBS SHALL BE OF EQUAL WIDTH IN THEIR ENTIRE LENGTH.
 - DETAIL ALSO APPLIES TO TOPS OF WALLS REINFORCED WITH ONE CURTAIN OF STEEL.
 - POST INSERTS NOT ALLOWED IN APPLICATIONS SUBJECT TO FREEZING.
 - IN EXISTING SLABS USE #4@10" W/ 4" EMBED, DRILL AND GROUT INTO SLAB.
 - CONTRACTOR TO COORDINATE DIMENSIONS RELATED TO MECHANICAL/ELECTRICAL EQUIPMENT BEFORE CONSTRUCTION.
 - CONTRACTOR MUST CONFIRM ALL CONTROLLING FIELD DIMENSIONS AND CONDITIONS PRIOR TO WORK.
 - VERIFY DETAILS BASED ON ACTUAL SITE CONDITIONS AND PROJECT-SPECIFIC LOADS.
 - CONTRACTOR IS FULLY RESPONSIBLE FOR DESIGN ADEQUACY AND ACCURACY.
 - DESIGN ASSUMPTIONS:
 - CONCRETE: 3000 PSI
 - REINFORCEMENT: GRADE 60
 - SOG LOADING: 250 PSF



E-932 VERTICAL CABLE DROP WITH CABLES STRAPPED TO RUNG

Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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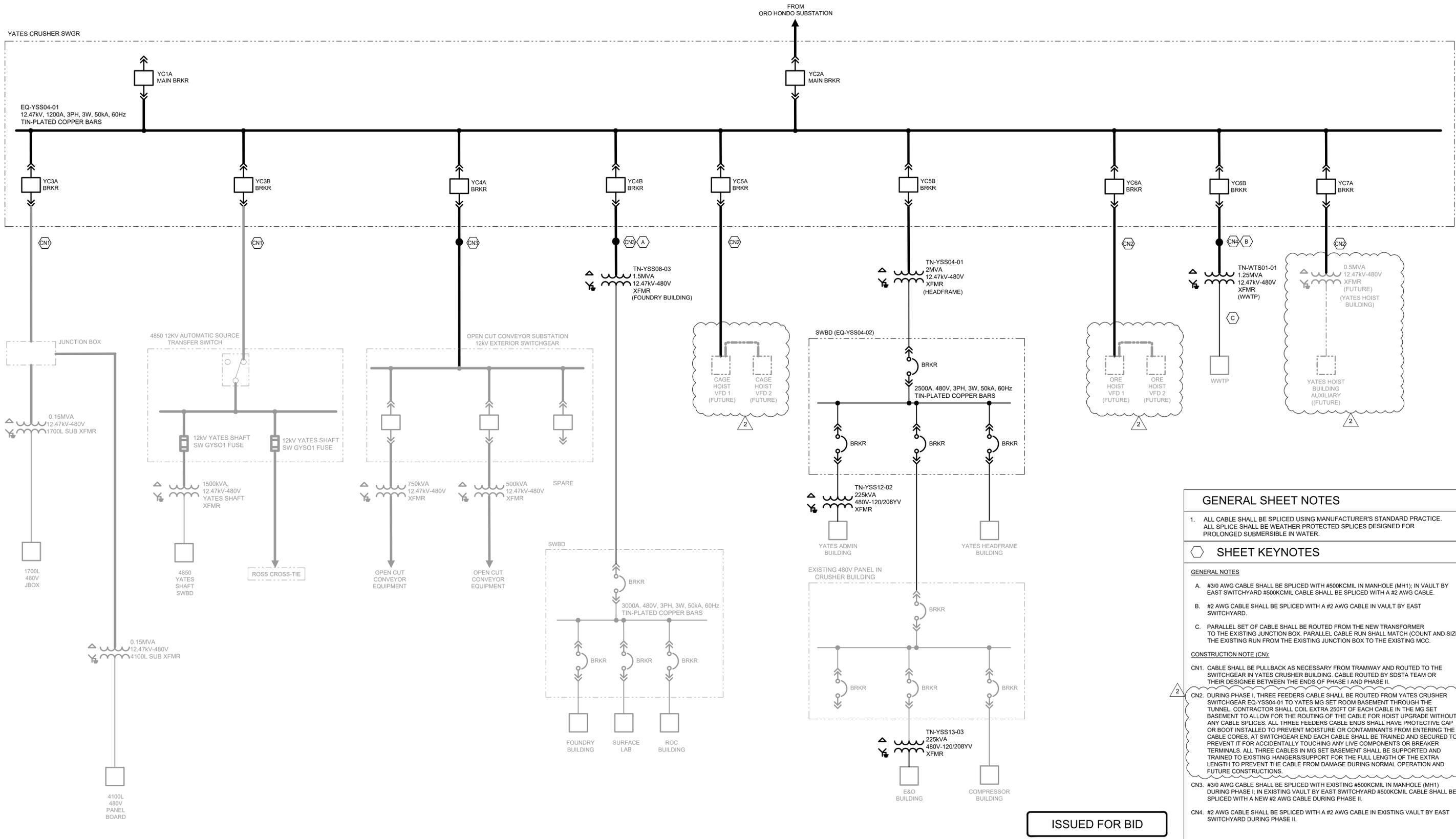
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Title		STANDARD DETAILS - III	
Project No.	Scale	NO SCALE	
182924768			
Drawing No.	Revision		
24768-E-005	2		

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GENERAL SHEET NOTES

- ALL CABLE SHALL BE SPliced USING MANUFACTURER'S STANDARD PRACTICE. ALL SPLICE SHALL BE WEATHER PROTECTED SPLICES DESIGNED FOR PROLONGED SUBMERSIBLE IN WATER.

SHEET KEYNOTES

GENERAL NOTES

- #3/0 AWG CABLE SHALL BE SPliced WITH #500KCMIL IN MANHOLE (MH1); IN VAULT BY EAST SWITCHYARD #500KCMIL CABLE SHALL BE SPliced WITH A #2 AWG CABLE.
- #2 AWG CABLE SHALL BE SPliced WITH A #2 AWG CABLE IN VAULT BY EAST SWITCHYARD.
- PARALLEL SET OF CABLE SHALL BE ROUTED FROM THE NEW TRANSFORMER TO THE EXISTING JUNCTION BOX. PARALLEL CABLE RUN SHALL MATCH (COUNT AND SIZE) THE EXISTING RUN FROM THE EXISTING JUNCTION BOX TO THE EXISTING MCC.

CONSTRUCTION NOTE (CN):

- CABLE SHALL BE PULLBACK AS NECESSARY FROM TRAMWAY AND ROUTED TO THE SWITCHGEAR IN YATES CRUSHER BUILDING. CABLE ROUTED BY SDSTA TEAM OR THEIR DESIGNEE BETWEEN THE ENDS OF PHASE I AND PHASE II.
- DURING PHASE I, THREE FEEDERS CABLE SHALL BE ROUTED FROM YATES CRUSHER SWITCHGEAR EQ-YSS04-01 TO YATES MG SET ROOM BASEMENT THROUGH THE TUNNEL. CONTRACTOR SHALL COIL EXTRA 250FT OF EACH CABLE IN THE MG SET BASEMENT TO ALLOW FOR THE ROUTING OF THE CABLE FOR HOIST UPGRADE WITHOUT ANY CABLE SPLICES. ALL THREE FEEDERS CABLE ENDS SHALL HAVE PROTECTIVE CAP OR BOOT INSTALLED TO PREVENT MOISTURE OR CONTAMINANTS FROM ENTERING THE CABLE CORES. AT SWITCHGEAR END EACH CABLE SHALL BE TRAINED AND SECURED TO PREVENT IT FOR ACCIDENTALLY TOUCHING ANY LIVE COMPONENTS OR BREAKER TERMINALS. ALL THREE CABLES IN MG SET BASEMENT SHALL BE SUPPORTED AND TRAINED TO PREVENT THE CABLE FROM DAMAGE DURING NORMAL OPERATION AND FUTURE CONSTRUCTIONS.
- #3/0 AWG CABLE SHALL BE SPliced WITH EXISTING #500KCMIL IN MANHOLE (MH1) DURING PHASE I; IN EXISTING VAULT BY EAST SWITCHYARD #500KCMIL CABLE SHALL BE SPliced WITH A NEW #2 AWG CABLE DURING PHASE II.
- #2 AWG CABLE SHALL BE SPliced WITH A #2 AWG CABLE IN EXISTING VAULT BY EAST SWITCHYARD DURING PHASE II.

Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
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Title

OVERALL SINGLE LINE DIAGRAM

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-011 Revision 2

File Name: 24768-E-011.dwg

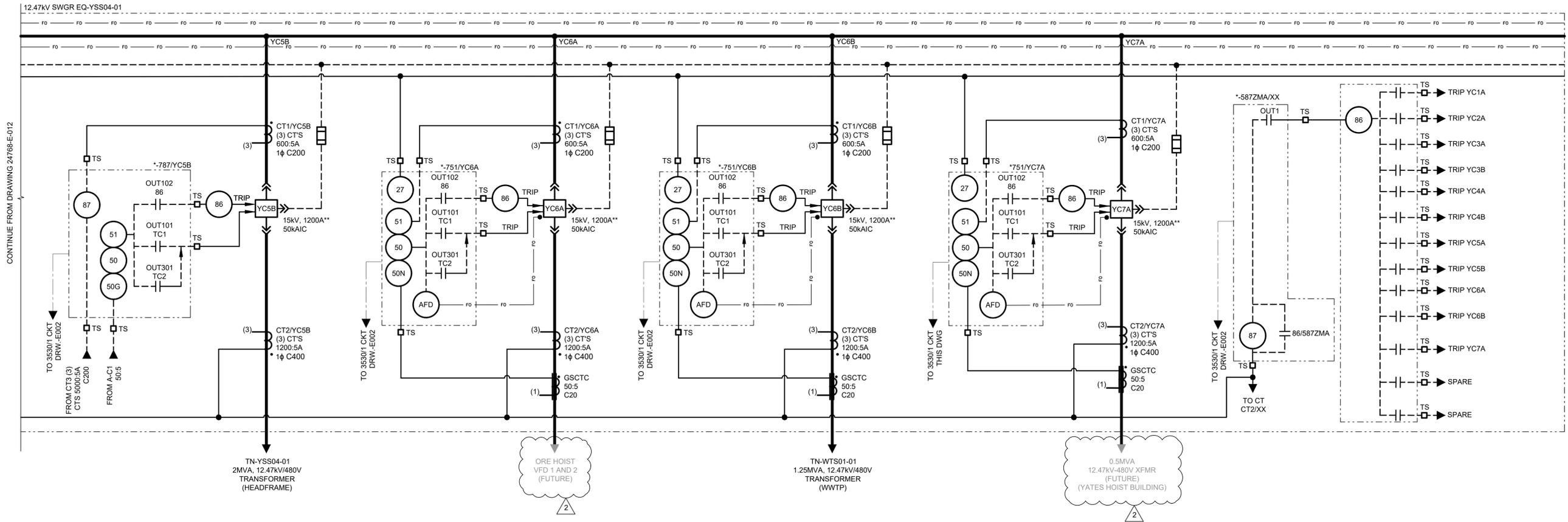
SPM Dwn. VIC Chk. SAD Dgr. 25.11.07 YY.MM.DD

Dwg Updated: 3/5/2026 6:42:39 PM By: smohie

GENERAL SHEET NOTES

CONSTRUCTION NOTE

1. UPDATE RELAY-METERING SINGLE LINE DIAGRAM TO MATCH AS-CONFIRMED OR AS-BUILT SWITCHGEAR VENDOR SUBMITTAL.



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Rev.	Description	Date	By	Chk	Eng.	Appd.
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1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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File Name: 24768-E-013.dwg

SPM	VIC	SAD	25.11.07
Dwn.	Chk.	Dgln.	YY.MM.DD

Title

SINGLE LINE DIAGRAM
12.47kV SWGR EQ-YSS04-01
SHEET 2 OF 2

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-013 Revision 2

SHEET KEYNOTES

CONSTRUCTION NOTES (CN):

CN1. CONTRACTOR TO CONFIRM THE BUS AND MAIN BREAKER RATING OF THE 480V PANEL IN CRUSHER BUILDING; IF THE BUS AND MAIN BREAKER IS LESS THAN 800A AND 600A RESPECTIVELY THEY SHOULD BE REPLACED DURING PHASE I. PANEL SHOULD BE RETAIN TO BE REUSED OR HAND IT OVER TO SDSTA TEAM.

CN2. CONTRACTOR TO CONFIRM THE BUS AND MAIN BREAKER RATING OF THE 480V PANEL IN HEADFRAME BUILDING; UPDATE THE BREAKER AND CABLE DURING PHASE I.

PANELBOARD: EQ-YSS04-02				BUS AMPS: 2500				VOLTS: 480				
LOCATION: CRUSHER BUILDING				MAIN BKR AMPS: 2000				PHASE: 3				
MOUNTING: FLOOR MOUNTED								WIRE: 4				
LOAD DESCRIPTION	KVA			CCT	BKR INT	CCT	KVA			LOAD DESCRIPTION		
	A	B	C				A	B	C			
TN-YSS12-02 ADMIN BUILDING TRANSFORMER	75.0			1	350A/3P	2	166.67			EXISTING 480V PANEL IN CRUSHER BUILDING		
		75.0		3		4		166.67				
			75.0	5		6			166.67			
				7		8	133.33					
		0.0		9		10		133.33				
SPARE		0.0		11	20/3P	12			133.33	HEADFRAME 480V PANEL		
			0.0	13		14	0.0					
				15		16			0.0			
SPARE		0.0		17	20/3P	18				SPARE		
			0.0	19		20	0.0					
				21		22			0.0			
SPARE		0.0		23	20/3P	24				SPARE		
			0.0	25		26	0.0					
				27		28			0.0			
SPACE		0.0		29		30				SPACE		
			0.0	31		32	0.0					
				33		34			0.0			
SPACE		0.0		35		36				SPACE		
			0.0	37		38	0.0					
				39		40			0.0			
SPACE		0.0		41		42				SPACE		
			0.0	43		44			0.0			
				45		46						
TOTAL						300.0	300.0	300.0				
PHASE LOAD				TOTAL LOAD								
375.0	375.0	375.0	1125.0	KVA		1354.8	Amps					

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ISSUED FOR BID

Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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YATES ELECTRICAL REHAB

File Name: 24768-E-014.dwg

SPM	VIC	SAD	25.11.07
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Title		SWITCHBOARD EQ-YSS04-02 SCHEDULE	
Project No.	Scale		
182924768	NO SCALE		
Drawing No.	Revision		
24768-E-014	2		





SHEET KEYNOTES

CONSTRUCTION NOTES (CN):

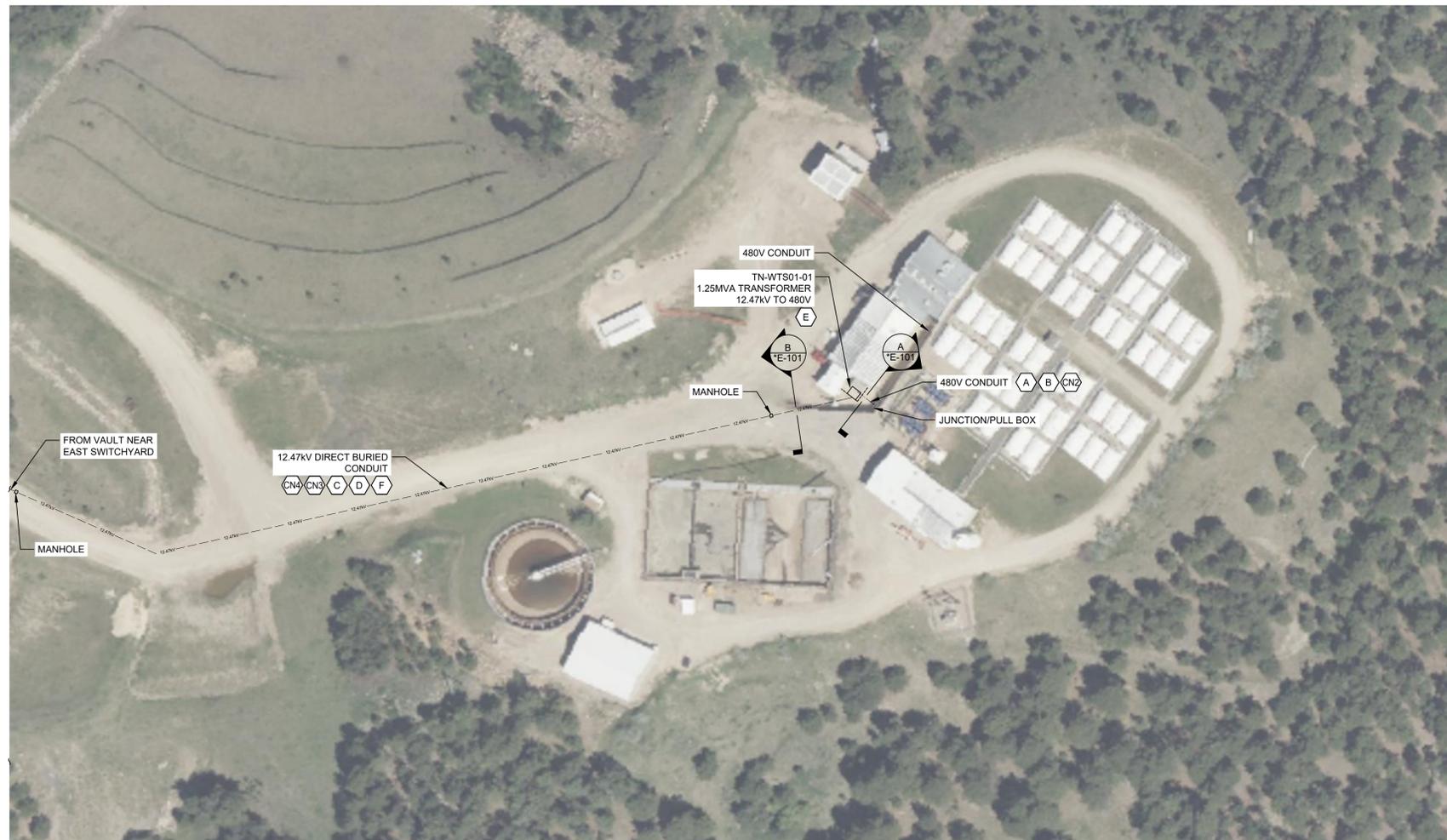
- CN1. PARALLEL SET OF NEW CABLE SHALL BE ROUTED FROM THE NEW TRANSFORMER TO THE EXISTING JUNCTION BOX DURING PHASE III. PARALLEL CABLE RUN SHALL MATCH (COUNT AND SIZE) THE EXISTING RUN FROM THE EXISTING JUNCTION BOX TO THE EXISTING MCC.
- CN2. NEW CABLES FROM THE TRANSFORMER 480V SIDE SHALL BE TERMINATED WITH OR SPLICED TO THE EXISTING CABLE IN THE EXISTING JUNCTION BOX DURING PHASE III.
- CN3. ALL MANHOLES ARE NOT SHOWN FOR THIS RUN. MANHOLE SHALL BE PLACED AT EVERY 500 FEET DURING PHASE III. ALL NEW MANHOLES SHALL BE INSTALLED AS PER DETAIL E-901 ON SHEET 24768-E-003.
- CN4. OVERHEAD LINE AND ASSOCIATED TRANSFORMER TO WWTP WILL REMAIN IN OPERATION TILL THE DIRECT BURIED CONDUIT AND NEW TRANSFORMER FOR THE NEW FEED TO WWTP IS IN PLACE AND READY FOR OPERATION DURING PHASE III.

GENERAL SHEET NOTES

- 1. "" DENOTES '24768-'

SHEET KEYNOTES

- A. IF DIRECT BURIED CONDUIT AS SHOWN IN DETAIL A IS NOT FEASIBLE, IT IS ACCEPTABLE TO INSTALL TRENCH PER DETAIL E-928 WITH VENTILATED STEEL COVER OR HS20 DEPENDING ON TRAFFIC MOVEMENT IN THE AREA.
- B. NEW CABLES FROM THE TRANSFORMER 480V SIDE SHALL BE TERMINATED WITH OR SPLICED TO THE EXISTING CABLE IN THE EXISTING JUNCTION BOX DURING PHASE III.
- C. ALL MANHOLES ARE NOT SHOWN FOR THIS RUN. MANHOLE SHALL BE PLACED AT EVERY 500 FEET DURING PHASE III. ALL NEW MANHOLES SHALL BE INSTALLED AS PER DETAIL E-901 ON SHEET 24768-E-003.
- D. OVERHEAD LINE AND ASSOCIATED TRANSFORMER TO WWTP WILL REMAIN IN OPERATION TILL THE DIRECT BURIED CONDUIT AND NEW TRANSFORMER FOR THE NEW FEED TO WWTP IS IN PLACE AND READY FOR OPERATION DURING PHASE III.
- E. REFER DETAIL '7' ON SHEET 24768-E-108 FOR WWTP TRANSFORMER.
- F. REFER DETAIL E-927 ON SHEET 24768-E-005 FOR TYPICAL DIRECT BURIED CONDUIT INSTALLATIONS.



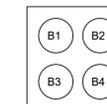
ELECTRICAL SITE PLAN WWTP AREA



CONDUIT ID	CONDUIT SIZE	CABLE TAG	CABLE SIZE (CN)	TO EQUIPMENT	FROM EQUIPMENT	LENGTH (FEET)
A1	5P/I	TNWT0101-LV1	3-1/C #500KCML W/ #2 GND, 600V XLPE XHHW-2 PVC TYPE TC-ER	TN-WTS01-01	JUNCTION BOX	20
A2	5P/I	TNWT0101-LV2	3-1/C #500KCML W/ #2 GND, 600V XLPE XHHW-2 PVC TYPE TC-ER	TN-WTS01-01	JUNCTION BOX	20
A3	5P/I	TNWT0101-LV3	3-1/C #500KCML W/ #2 GND, 600V XLPE XHHW-2 PVC TYPE TC-ER	TN-WTS01-01	JUNCTION BOX	20
A4	5P/I	TNWT0101-LV4	3-1/C #500KCML W/ #2 GND, 600V XLPE XHHW-2 PVC TYPE TC-ER	TN-WTS01-01	JUNCTION BOX	20
A5	5P/I	TNWT0101-LV5	3-1/C #500KCML W/ #2 GND, 600V XLPE XHHW-2 PVC TYPE TC-ER	TN-WTS01-01	JUNCTION BOX	20
A6	5P/I	TNWT0101-LV6	3-1/C #500KCML W/ #2 GND, 600V XLPE XHHW-2 PVC TYPE TC-ER	TN-WTS01-01	JUNCTION BOX	20
A7	5P	SPARE		TN-WTS01-01	JUNCTION BOX	20
A8	5P	SPARE		TN-WTS01-01	JUNCTION BOX	20

WHERE:
 P - PVC CONDUIT
 I - RGS RISER

A
 SECTION - A
 E-101



CONDUIT ID	CONDUIT SIZE	CABLE TAG	CABLE SIZE	TO EQUIPMENT	FROM EQUIPMENT	LENGTH (FEET)
B1	4P	TNWT0101-MV1	3/C #2AWG W/ #6 GND, 15KV MV-105, 133% NL-EPR, PVC	VAULT (NEAR EAST SWITCHYARD)	TN-WTS01-01	2024
B2	4P	POWER SPARE		VAULT (NEAR EAST SWITCHYARD)	TN-WTS01-01	2024
B3	4P	SPARE		VAULT (NEAR EAST SWITCHYARD)	TN-WTS01-01	2024
B4	4P	FIBER SPARE		VAULT (NEAR EAST SWITCHYARD)	TN-WTS01-01	2024

WHERE:
 P - PVC CONDUIT
 I - RGS RISER

B
 SECTION - B
 E-101



ISSUED FOR BID

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Rev.	Description	Date	By	Chk	Eng.	Appd.
2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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Client/Project



SDSTA
 YATES ELECTRICAL REHAB

File Name: 24768-E-101.dwg SPM VIC SAD 25.11.07
 Dwn. Chkd. Dgrr. YY.MM.DD

Title

GENERAL ARRANGEMENT
 ELECTRICAL SITE PLAN WWTP AREA

Project No. 182924768 Scale AS SHOWN

Drawing No. 24768-E-101 Revision 2



CONTINUED TO SHEET 24768-E-102



GENERAL SHEET NOTES

- 1. "" DENOTES '24768-'
SHEET KEYNOTES
A. SEE HDR AS-BUILT DRAWINGS FROM 'REPLACE POWER CABLE TO EAST SWITCHYARD PROJECT' FOR POLE LOCATION.
CONSTRUCTION NOTES (CN):
CN1. EXISTING CABLE SECURED AT THE ADMIN BUILDING SHALL BE REROUTED TO THE NEW TRANSFORMER DURING PHASE I; THEREFORE INSTALL THE TRANSFORMER SUCH THAT CABLES CAN REACH THE TRANSFORMER WITHOUT ANY SPLICE.
CN2. DURING PHASE I, PULL BACK 480V METAL CLAD CABLE BACK FROM THE E&O SUBSTATION AND RE-ROUTE IT TO THE NEW 225KVA - 480 - 120/208Y DRY TYPE TRANSFORMER LOCATED OUTSIDE E&O BUILDING. IF CABLE IS NOT LONG ENOUGH IT IS ACCEPTABLE TO PERFORM IN-LINE SPLICE OR A USING TERMINATION BOX FOR EXTENDING THE CABLE AS NECESSARY. LOCATE THE TRANSFORMER, WHERE FEASIBLE. THE TRANSFORMER SHOULD BE LOCATED IN E&O SUBSTATION AFTER DEMOLITION OR TO BE LOCATED AT PAD AS TRANSFORMER.
CN3. DURING PHASE I, THREE FEEDERS CABLE SHALL BE ROUTED FROM YATES CRUSHER SWITCHGEAR EQ-YSS04-01 TO YATES MG SET ROOM BASEMENT THROUGH THE TUNNEL. CONTRACTOR SHALL COIL EXTRA 250FT OF EACH CABLE IN THE MG SET BASEMENT TO ALLOW FOR THE ROUTING OF THE CABLE FOR HOIST UPGRADE WITHOUT ANY CABLE SPLICES. ALL THREE FEEDERS CABLE ENDS SHALL HAVE PROTECTIVE CAP OR BOOT INSTALLED TO PREVENT MOISTURE OR CONTAMINANTS FROM ENTERING THE CABLE CORES. AT SWITCHGEAR END EACH CABLE SHALL BE TRAINED AND SECURED TO PREVENT IT FROM ACCIDENTALLY TOUCHING ANY LIVE COMPONENTS OR BREAKER TERMINALS. ALL THREE CABLES IN MG SET BASEMENT SHALL BE SUPPORTED AND TRAINED TO EXISTING HANGERS/SUPPORT FOR THE FULL LENGTH OF THE EXTRA LENGTH TO PREVENT THE CABLE FROM DAMAGE DURING NORMAL OPERATION AND FUTURE CONSTRUCTIONS.
CN4. ALL CABLES STUBBING UP OUTSIDE THE CRUSHER BUILDING SHALL BE ROUTED TO THE NEW SWITCHGEAR AS NECESSARY DURING PHASE I AND PHASE II.

Table with 7 columns: CONDUIT ID, CONDUIT SIZE, CABLE TAG, CABLE SIZE, TO EQUIPMENT, FROM EQUIPMENT, LENGTH (FEET). Rows for E1 and E2.

WHERE:
P - PVC CONDUIT
I - RGS RISER



Table with 7 columns: CONDUIT ID, CONDUIT SIZE, CABLE TAG, CABLE SIZE, TO EQUIPMENT, FROM EQUIPMENT, LENGTH (FEET). Row for F1.

WHERE:
P - PVC CONDUIT
I - RGS RISER



Table with 7 columns: CONDUIT ID, CONDUIT SIZE, CABLE TAG, CABLE SIZE, TO EQUIPMENT, FROM EQUIPMENT, LENGTH (FEET). Rows for G1 through G8.

WHERE:
P - PVC CONDUIT
I - RGS RISER

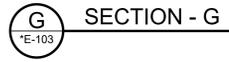


Table with 7 columns: CONDUIT ID, CONDUIT SIZE, CABLE TAG, CABLE SIZE, TO EQUIPMENT, FROM EQUIPMENT, LENGTH (FEET). Rows for H1 through H8.

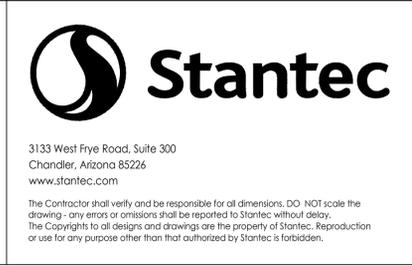
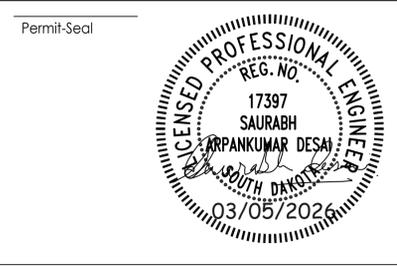
WHERE:
P - PVC CONDUIT
I - RGS RISER



HEADFRAME, E&O AND ADMIN BUILDING AREA ELECTRICAL PLAN

ISSUED FOR BID

Table with 5 columns: Rev., Description, Date, By, Chk, Eng., Appd. containing revision history for the drawing.



Client/Project: SDSTA YATES ELECTRICAL REHAB. Sanford Underground Research Facility logo.

Table with 2 columns: Title, Project No., Scale, Drawing No., Revision. Title: GENERAL ARRANGEMENT HEADFRAME, E&O AND ADMIN BUILDING AREA ELECTRICAL PLAN.

C:\USERS\SMOHIE\DCVACCDOCS\STANTEC CONSULTING\182924768-YATES\ELECTRICAL\PROJECT FILES\01_WIP\13_ELECTRICAL\PROJECT FILES\LAYOUT\24768-E-103.DWG 3/5/2026 6:47 PM



CONTINUED TO SHEET 24768-E-102 AND 24768-E-103

HOIST BUILDING AREA ELECTRICAL PLAN

GENERAL SHEET NOTES

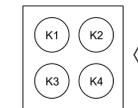
1. "" DENOTES '24768-'.

SHEET KEYNOTES

- A. WORK TO BE PERFORMED AND COMPLETED BY YATES HOIST UPGRADE PROJECT.
- B. REFER DETAIL 'A' FOR EXISTING DUCT BANK ON DRAWING 24768-E-107.
- C. REFER DETAIL E-927 ON SHEET 24768-E-005 FOR TYPICAL DIRECT BURIED CONDUIT INSTALLATIONS.

CONSTRUCTION NOTE (CN):

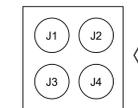
CN1. DURING PHASE I, THREE FEEDERS CABLE SHALL BE ROUTED FROM YATES CRUSHER SWITCHGEAR EQ-YSS04-01 TO YATES MG SET ROOM BASEMENT THROUGH THE TUNNEL. CONTRACTOR SHALL COIL EXTRA 250FT OF EACH CABLE IN THE MG SET BASEMENT TO ALLOW FOR THE ROUTING OF THE CABLE FOR HOIST UPGRADE WITHOUT ANY CABLE SPLICES. ALL THREE FEEDERS CABLE ENDS SHALL HAVE PROTECTIVE CAP OR BOOT INSTALLED TO PREVENT MOISTURE OR CONTAMINANTS FROM ENTERING THE CABLE CORES. AT SWITCHGEAR END EACH CABLE SHALL BE TRAINED AND SECURED TO PREVENT IT FOR ACCIDENTALLY TOUCHING ANY LIVE COMPONENTS OR BREAKER TERMINALS. ALL THREE CABLES IN MG SET BASEMENT SHALL BE SUPPORTED AND TRAINED TO EXISTING HANGERS/SUPPORT FOR THE FULL LENGTH OF THE EXTRA LENGTH TO PREVENT THE CABLE FROM DAMAGE DURING NORMAL OPERATION AND FUTURE CONSTRUCTIONS.



CONDUIT ID	CONDUIT SIZE	CABLE TAG	CABLE SIZE	TO EQUIPMENT	FROM EQUIPMENT	LENGTH (FEET)
K1	6P	TNWT0101-MV1	3/C #2AWG W/ #6 GND, 15KV MV-105, 133% NL-EPR, PVC	MANHOLE MH1	MANHOLE MH2	381
K2	6P	SPARE		MANHOLE MH1	MANHOLE MH2	381
K3	6P	TNYSS0803-MV1	3/C #500KCMIL W/ #2 GND, 15KV MV-105, 133% NL-EPR, PVC (EXISTING)	MANHOLE MH1	MANHOLE MH2	381
K4	6P	TNCNVYOR-MV2	3/C #500KCMIL W/ #2 GND, 15KV MV-105, 133% NL-EPR, PVC (EXISTING)	MANHOLE MH1	MANHOLE MH2	381

WHERE:
P - PVC CONDUIT
I - RGS RISER

K SECTION - K
"E-104



CONDUIT ID	CONDUIT SIZE	CABLE TAG	CABLE SIZE	TO EQUIPMENT	FROM EQUIPMENT	LENGTH (FEET)
J1	6P	TNWT0101-MV1	3/C #2AWG W/ #6 GND, 15KV MV-105, 133% NL-EPR, PVC	MANHOLE MH2	EAST SWITCHYARD VAULT	226
J2	6P	SPARE		MANHOLE MH2	EAST SWITCHYARD VAULT	226
J3	6P	TNYSS0803-MV1	3/C #500KCMIL W/ #2 GND, 15KV MV-105, 133% NL-EPR, PVC (EXISTING)	MANHOLE MH2	EAST SWITCHYARD VAULT	226
J4	6P	TNCNVYOR-MV2	3/C #500KCMIL W/ #2 GND, 15KV MV-105, 133% NL-EPR, PVC (EXISTING)	MANHOLE MH2	EAST SWITCHYARD VAULT	226

WHERE:
P - PVC CONDUIT
I - RGS RISER

J SECTION - J
"E-104



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Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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SDSTA
YATES ELECTRICAL REHAB

File Name: 24768-E-104.dwg
SPM Dwn. VIC Chkd. SAD Dsgn. 25.11.07 YY.MM.DD

Title

GENERAL ARRANGEMENT
HOIST BUILDING AREA ELECTRICAL PLAN

Project No. 182924768 Scale AS SHOWN

Drawing No. 24768-E-104 Revision 2



SHEET KEYNOTE

CONSTRUCTION NOTES (CN):

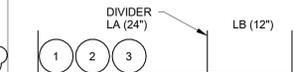
- CN1. DURING PHASE I, CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING THE SECONDARY CONTAINMENT BASED ON INDUSTRY STANDARD PRACTICE FOR THE LIQUID VOLUME IN THE TRANSFORMER. DESIGN DETAIL SHALL BE PROVIDED TO SDSTA TEAM FOR APPROVAL PRIOR TO INSTALLATION.
- CN2. DURING PHASE I, THREE FEEDERS CABLE SHALL BE ROUTED FROM YATES CRUSHER SWITCHGEAR EQ-YSS04-01 TO YATES MG SET ROOM BASEMENT THROUGH THE TUNNEL. CONTRACTOR SHALL COIL EXTRA 250FT OF EACH CABLE IN THE MG SET BASEMENT TO ALLOW FOR THE ROUTING OF THE CABLE FOR HOIST UPGRADE WITHOUT ANY CABLE SPLICES. ALL THREE FEEDERS CABLE ENDS SHALL HAVE PROTECTIVE CAP OR BOOT INSTALLED TO PREVENT MOISTURE OR CONTAMINANTS FROM ENTERING THE CABLE CORES. AT SWITCHGEAR END EACH CABLE SHALL BE TRAINED AND SECURED TO PREVENT IT FOR ACCIDENTALLY TOUCHING ANY LIVE COMPONENTS OR BREAKER TERMINALS. ALL THREE CABLES IN MG SET BASEMENT SHALL BE SUPPORTED AND TRAINED TO EXISTING HANGERS/SUPPORT FOR THE FULL LENGTH OF THE EXTRA LENGTH TO PREVENT THE CABLE FROM DAMAGE DURING NORMAL OPERATION AND FUTURE CONSTRUCTIONS.

SHEET KEYNOTE

- A. FIELD ROUTE RGS CONDUIT FROM THE CABLE TRAY TO THE CONDUIT STUB-UP LOCATED OUTSIDE THE BUILDING. CONDUIT SHALL BE SIZE EITHER TO MATCH THE CONDUIT STUB UP OR TO MEET NEC CONDUIT FILL REQUIREMENT. IT IS ACCEPTABLE TO USE LB FITTING AND REDUCERS AS NECESSARY.
- B. FIELD ROUTE RGS CONDUIT FROM THE CABLE TRAY TO YATES CRUSHER TRANSFORMER.
- C. REFER DETAIL E-931 ON SHEET 24768-E-005 FOR CONCRETE CURB ON EXISTING SLAB.
- D. FIELD TO ROUTE RGS CONDUIT FROM CABLE TRAY TO CRUSHER BUILDING POWER PANEL AND HEADFRAME BUILDING POWER PANEL RESPECTIVELY.
- E. CABLE SHALL BE ROUTED IN TRIPLEX CONFIGURATION.
- F. TRAY IN THE CLOUDED AREA IS SHOWN DIAGRAMMATICALLY ONLY. CONTRACTOR TO ADJUST CABLE TRAY TO AVOID INTERFERENCES IN CRUSHER BUILDING.
- G. IT IS ACCEPTABLE TO POUR THE PAD AT A LATER DATE, TO BE COORDINATED WITH SDSTA.

GENERAL SHEET NOTE

- 1. "" DENOTES '24768'.
 - 2. DENOTES FRONT OF THE EQUIPMENT.
- CABLE NOTES:**
- 3. SEE TRAY SECTION DETAIL L FOR CABLE LENGTH.
 - 4. SINGLE LAYER CABLE TO BE ROUTED IN A TRIPLEX CONFIGURATION FOR THE CABLE TRAY. SEE NEC ARTICLE 392.
 - 5. CABLE ROUTED IN RANDOM FILL CONFIGURATION FOR THE CABLE TRAY. SEE NEC ARTICLE 392.



TRAY SECTION	NO.	CABLE ID	CABLE DESCRIPTION	FROM EQUIPMENT	TO EQUIPMENT	LENGTH (FEET)
LA	1	EQYSS0402-LV1	3-1/C #350KCMIL W/ #2 GND, 600V XHHW-2, XLPE	EQ-YSS04-02	STUB UP OUTSIDE BLDG	50
LA	2	EQYSS0402PPL-LV1	3-1/C #350KCMIL W/ #2AWG GND, 600V XHHW-2, XLPE	EQ-YSS04-02	CRUSHER BLDG POWER PANEL	32
LA	3	EQYSS0402PPL-LV2	3-1/C #350KCMIL W/ #2AWG GND, 600V XHHW-2, XLPE	EQ-YSS04-02	HEADFRAME BLDG POWER PANEL	145
LB			NO CABLE			

DETAIL L



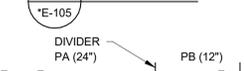
TRAY SECTION	NO.	CABLE ID	CABLE DESCRIPTION	FROM EQUIPMENT	TO EQUIPMENT	LENGTH (FEET)
MA			NO CABLE			
MB	1	EQYSS04HDFRM-LV1	3/C #4/0AWG W/ #2 GND, 600V XHHW-2, XLPE	HEADFRAME TRANSFORMER	EQ-YSS04-02	20

DETAIL M



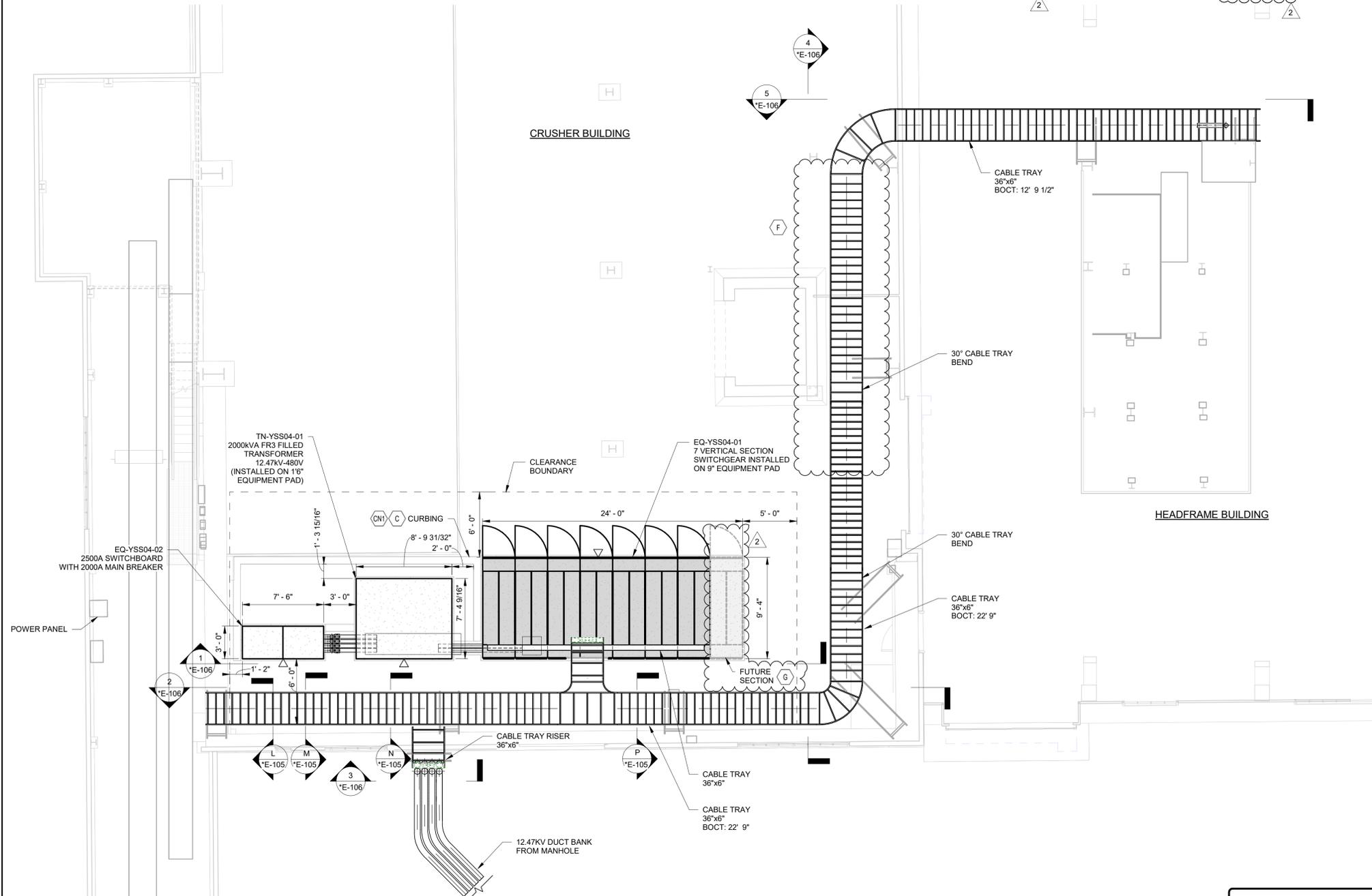
TRAY SECTION	NO.	CABLE ID	CABLE DESCRIPTION	FROM EQUIPMENT	TO EQUIPMENT	LENGTH (FEET)
NA	1	EQYSS0401-MV1	(3) 1/C #500KCMIL W/ #2 GND, 15KV MV-105, 133% NL-EPR, PVC (NOTE 4)	EQ-YSS04-01	CRUSHER BLDG EXT. STUB UP	75
NA	2	EQYSS0401-MV2	(3) 1/C #500KCMIL W/ #2 GND, 15KV MV-105, 133% NL-EPR, PVC (NOTE 4)	EQ-YSS04-01	CRUSHER BLDG EXT. STUB UP	75
NA	3	TNWT50101-MV	3/C #2AWG W/ #6 GND, 15KV MV-105, 133% NL-EPR, PVC (NOTE 5)	EQ-YSS04-01	CRUSHER BLDG EXT. STUB UP	75
NA	4	TNYSS0803-MV	3/C #3/0AWG W/ #4 GND, 15KV MV-105, 133% NL-EPR, PVC (NOTE 5)	EQ-YSS04-01	CRUSHER BLDG EXT. STUB UP	75
NA	5	TNCNVYOR-MV	3/C #3/0AWG W/ #4 GND, 15KV MV-105, 133% NL-EPR, PVC (NOTE 5)	EQ-YSS04-01	CRUSHER BLDG EXT. STUB UP	75
NB	1	EQYSS04HDFRM-LV	3-1/C #350KCMIL W/ #2AWG GND, 600V XHHW-2, XLPE	EQ-YSS04-02	HEADFRAME BLDG POWER PANEL	NOTE 3

DETAIL N



TRAY SECTION	NO.	CABLE ID	CABLE DESCRIPTION	FROM EQUIPMENT	TO EQUIPMENT	LENGTH (FEET)
PA	1	EQYSS04EL1700-MV	3/C 250 MCM HI-TENSILE VERLOK (NOTE 5)	EQ-YSS04-01	EL1700 JUNCTION BOX	145
PA	2	EQYSS04EL4850-MV	3/C 250 MCM HI-TENSILE VERLOK (NOTE 5)	EQ-YSS04-01	EL 4850 ATS	145
PA	3	HOISTAUX-MV	3/C #2AWG W/ #4 GND, 15KV MV-105, 133% NL-EPR, PVC (NOTE 4)	EQ-YSS04-01	MG SET BASEMENT	145
PA	4	CAGEHOIST-MV	3/C #2/0AWG W/ #4 GND, 15KV MV-105, 133% NL-EPR, PVC (NOTE 4)	EQ-YSS04-01	MG SET BASEMENT	145
PA	5	OREHOIST-MV	3/C #2/0AWG W/ #4 GND, 15KV MV-105, 133% NL-EPR, PVC (NOTE 4)	EQ-YSS04-01	MG SET BASEMENT	145
PB	1	EQYSS04HDFRM-LV	3-1/C #350KCMIL W/ #2AWG GND, 600V XHHW-2, XLPE	EQ-YSS04-02	HEADFRAME BLDG POWER PANEL	NOTE 3

DETAIL P



HEADFRAME/CRUSHER BUILDING ELECTRICAL PLAN

SCALE: 3/16" = 1'-0"

ISSUED FOR BID

Rev.	Description	Date	By	Chk	Eng	Appd.
2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATIONS	26-03-05	SPM	VIC	SAD	
1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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Client/Project

SDSTA
YATES ELECTRICAL REHAB



Title

GENERAL ARRANGEMENT
HEADFRAME/CRUSHER BUILDING
ELECTRICAL PLAN

Project No. 182924768 Scale 3/16" = 1'-0"

Drawing No. 24768-E-105 Revision 2

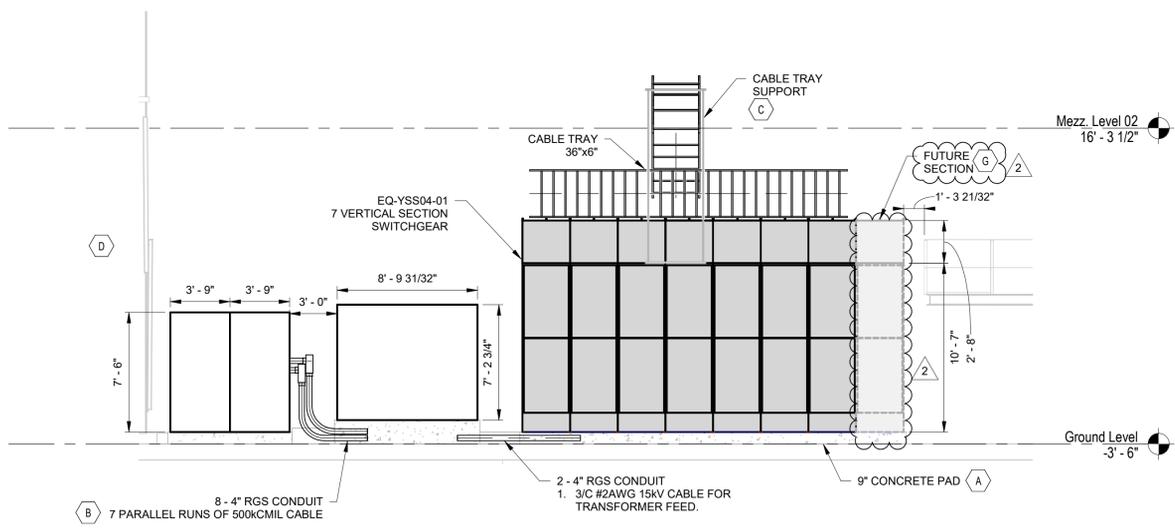
File Name: stn_182924768-mid.v1 SPM Dwn. VIC Chkd. SAD Dgrr. 25.11.07 YY.MM.DD

SHEET KEYNOTE

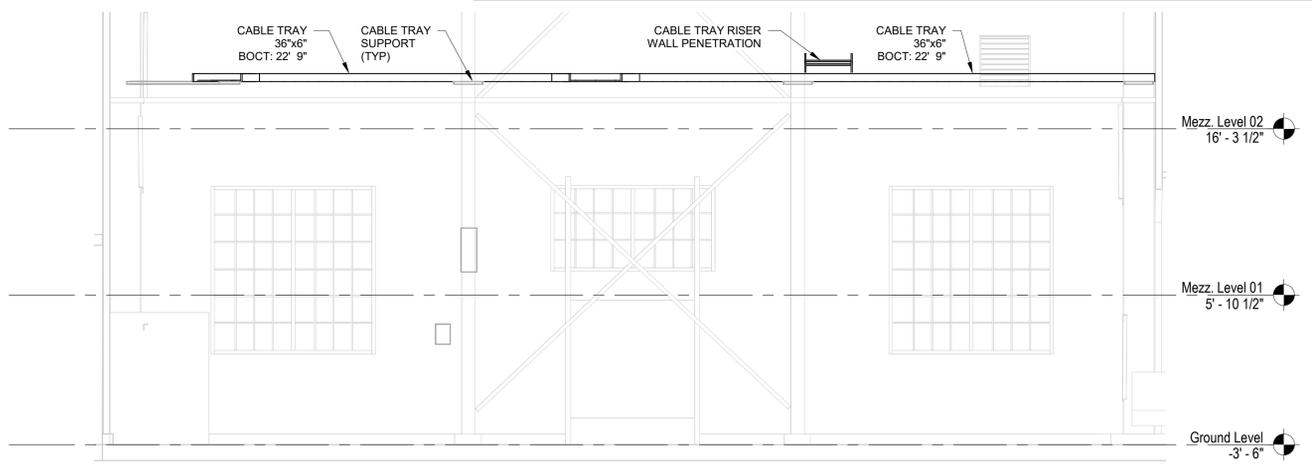
- E. REFER TO NOTES ON SHEET 24768-E-105.
 - F. REFER TO DETAIL E-932 ON SHEET 24768-E-005 FOR TRAINING FOR CABLE ON VERTICAL RISER.
 - G. IT IS ACCEPTABLE TO POUR THE PAD AT A LATER DATE, TO BE COORDINATED WITH SDSTA.
- CONSTRUCTION NOTES (CN):
- CN1. DURING PHASE I, FIELD ROUTE CONDUIT AS NECESSARY TO SUPPORT THE OUTGOING FEEDS FROM THE SWITCHBOARD. IN LIEU OF USING TRAY AS SHOWN ON SHEET 24768-E-105 DETAIL 'L', IT IS ACCEPTABLE TO ROUTE RGS CONDUIT FROM THE SWITCHBOARD TO THE LOADS IN CRUSHER BUILDING.
 - CN2. DURING PHASE I, FIELD ROUTE CONDUIT TO THE 480V DISTRIBUTION FOR THE HEADFRAME BUILDING AS NECESSARY.
 - CN3. DURING PHASE I, CONTRACTOR TO DESIGN THE VERTICAL RISER SUPPORT. SUPPORT SHALL BE DESIGN CONSIDERING FUTURE CAPACITY IN MIND.

GENERAL SHEET NOTE

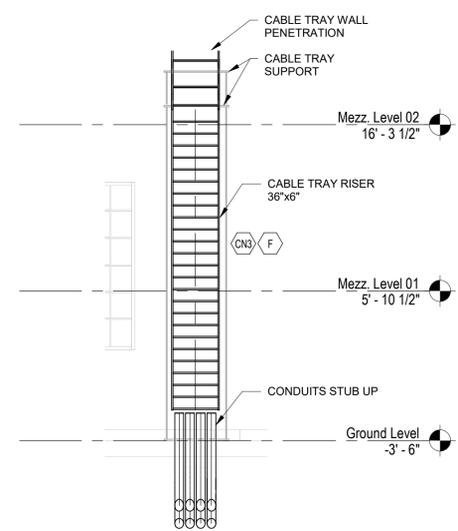
- 1. "" DENOTES '24768'.
- SHEET KEYNOTE**
- A. REFER DETAIL E-929 ON SHEET 24768-E-005 FOR EQUIPMENT PAD ON SLAB.
 - B. IN LIEU OF VERTICAL CONDUIT RISER, VENTILATED WIREWAY CAN BE USE TO ROUTE CABLE TO THE SWITCHBOARD. CONDUIT AND WIREWAY SHALL BE PROPERLY SUPPORTED.
 - C. CABLE TRAY SHALL BE SUPPORTED FROM THE SWITCHGEAR STRUCTURE. SWITCHGEAR MANUFACTURER SHALL BE CONSULTED PRIOR TO ATTACHING CABLE TRAY SUPPORT STRUCTURE ON THE SWITCHGEAR STRUCTURE.
 - D. FIELD ROUTE CONDUIT AS NECESSARY TO SUPPORT THE OUTGOING FEEDS FROM THE SWITCHBOARD. IN LIEU OF USING TRAY AS SHOWN ON SHEET 24768-E-105 DETAIL 'L', IT IS ACCEPTABLE TO ROUTE RGS CONDUIT FROM THE SWITCHBOARD TO THE LOADS IN CRUSHER BUILDING.



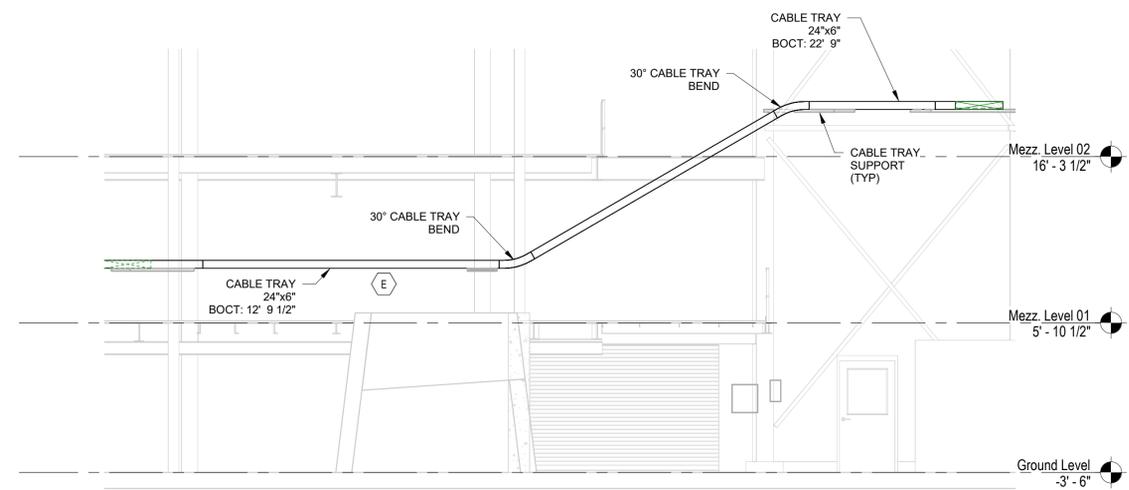
1 SECTION - 1
SCALE: 3/16" = 1'-0"



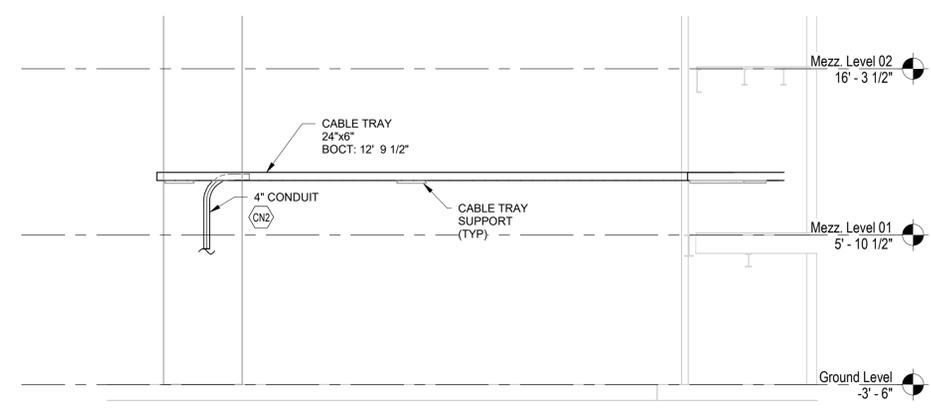
2 SECTION - 2
SCALE: 3/16" = 1'-0"



3 SECTION - 3
SCALE: 3/16" = 1'-0"



4 SECTION - 4
SCALE: 3/16" = 1'-0"



5 SECTION - 5
SCALE: 3/16" = 1'-0"

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Rev.	Description	Date	By	Chk	Eng	Appd.
2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATIONS	26-03-05	SPM	VIC	SAD	
1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
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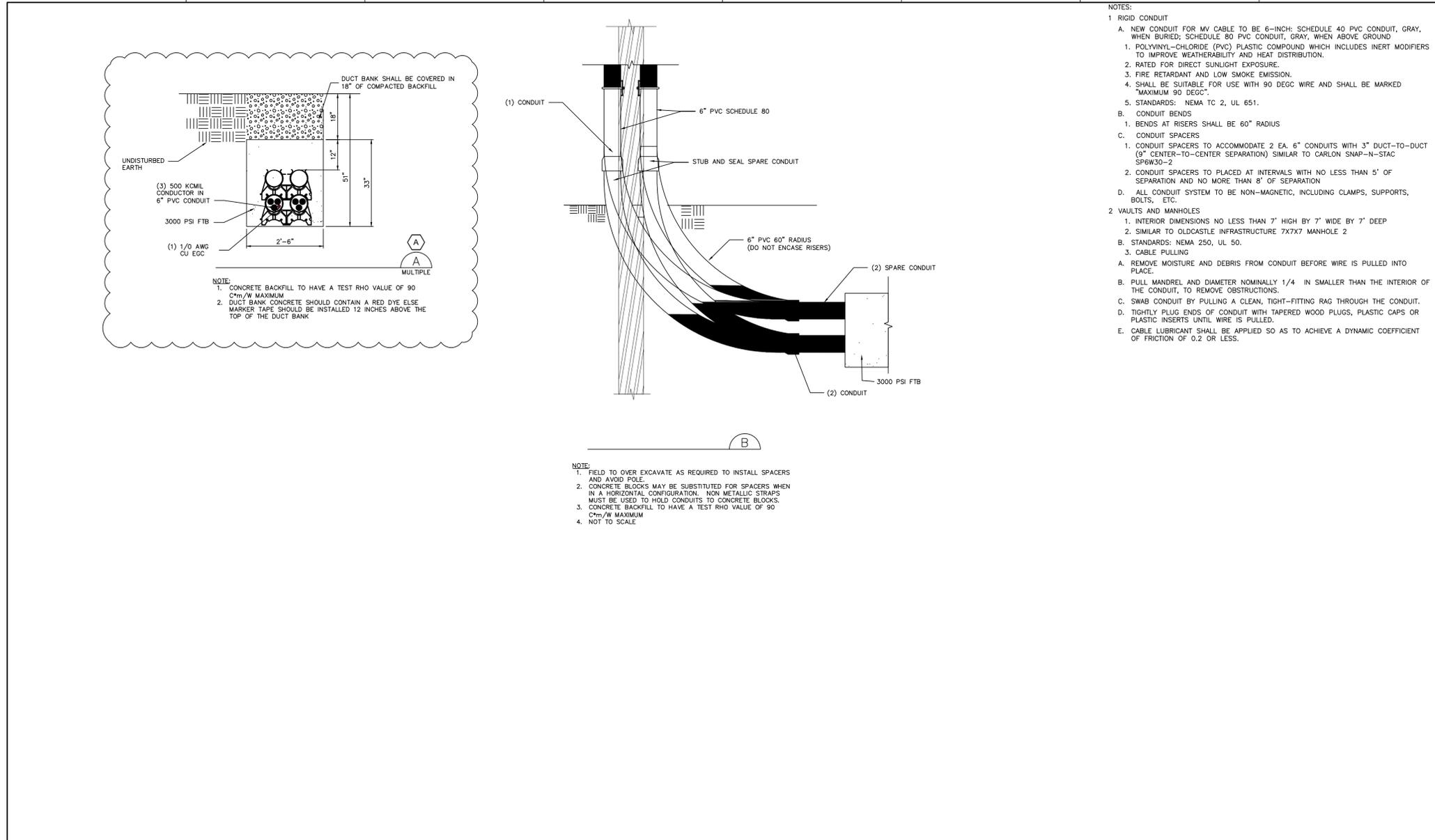
Client/Project: **SDSTA YATES ELECTRICAL REHAB**

SANFORD UNDERGROUND RESEARCH FACILITY
SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

File Name: stn_182924768-rnd.v1

SPM	VIC	SAD	25.11.07
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Title: GENERAL ARRANGEMENT HEADFRAME/CRUSHER BUILDING SECTIONS	
Project No. 182924768	Scale 3/16" = 1'-0"
Drawing No. 24768-E-106	Revision 2



ISSUE	DATE	DESCRIPTION	PROJECT NUMBER
2	2/23/24	AS_BUILT	10333743
1	6/30/22	TRANSITION DETAIL	
0	6/8/22	ISSUE FOR CONSTRUCTION	
0			

PROJECT MANAGER	Trevor Hauck
PROJECT NUMBER	10333743

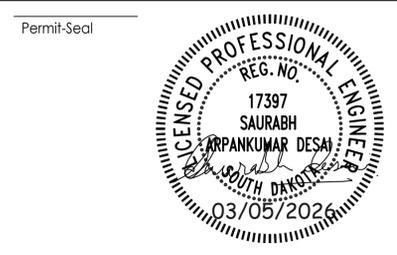
EAST SUBSTATION CABLE REPLACEMENT
 DUCT DETAILS

FILENAME	SURF_E108	SHEET	E108
SCALE	SCALE		

ISSUED FOR BID

C:\USERS\SMOHIE\DCVACCDOCS\STANTEC CONSULTING\182924768-YATESELECTREHAB\PROJECT FILES\01_WIP\13_ELECTRICAL\Sheet FILES\LAYOUT\24768-E-107.DWG 3/5/2026 6:50 PM

Rev.	Description	Date	By	Chk	Eng.	Appd.
2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	



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SDSTA
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SANFORD UNDERGROUND RESEARCH FACILITY
 SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

File Name:	24768-E-107.dwg	SPM	VIC	SAD	25.11.07
		Dwn.	Chkd.	Dsgn.	YY.MM.DD

Title	
GENERAL ARRANGEMENT EXISTING DUCT BANK DETAIL	
Project No.	Scale
182924768	NO SCALE
Drawing No.	Revision
24768-E-107	2

GENERAL SHEET NOTE

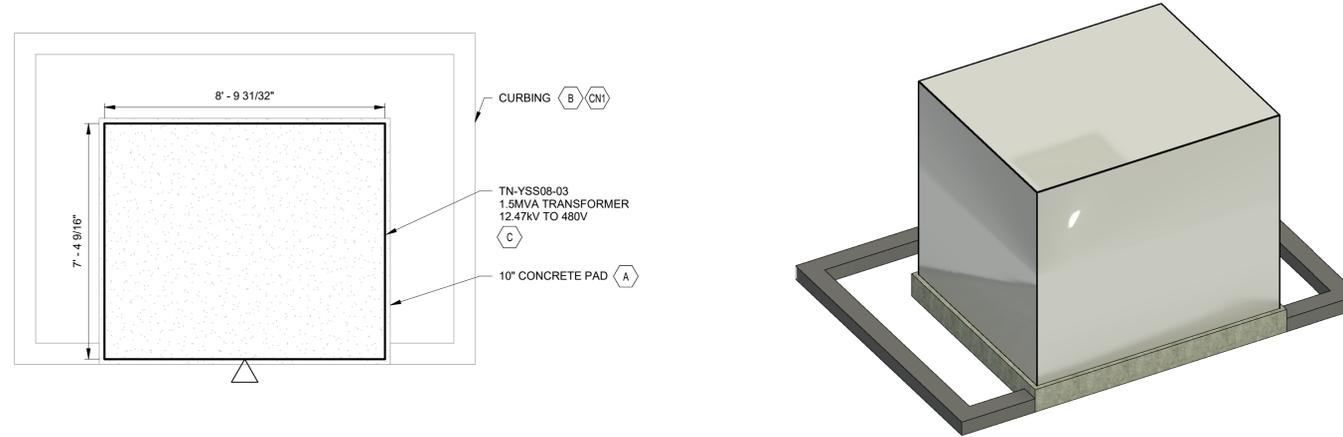
1. "" DENOTES '24768'.
2. △ DENOTES FRONT OF THE EQUIPMENT.

SHEET KEYNOTE

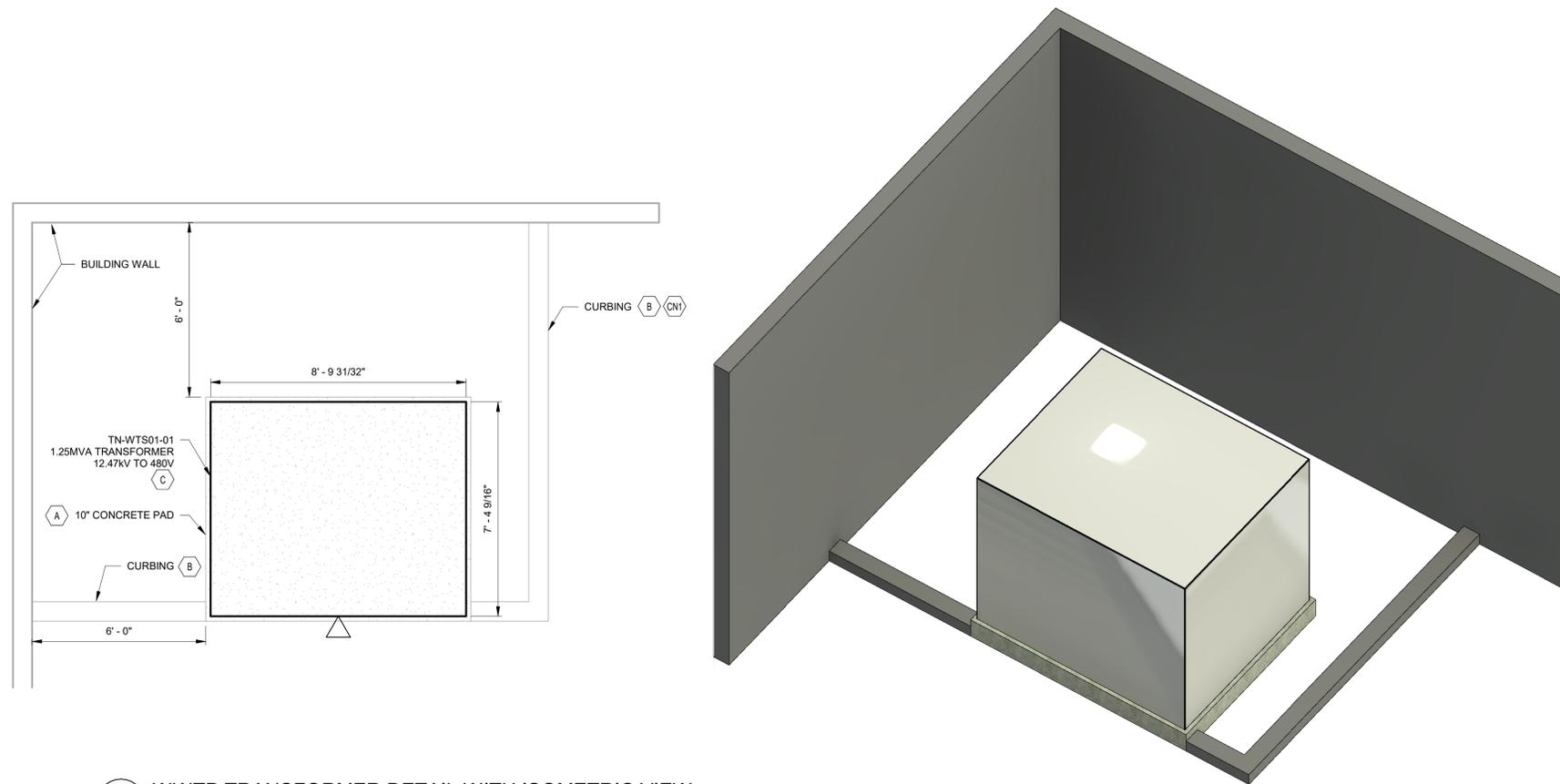
- A. REFER DETAIL E-617 ON SHEET 24768-E-003 FOR ELECTRICAL EQUIPMENT PAD.
- B. REFER DETAIL E-930 ON SHEET 24768-E-005 FOR CONCRETE CURB.
- C. REFER DETAIL E-928 ON SHEET 24768-E-005 FOR TRANSFORMER GROUNDING.

CONSTRUCTION NOTE (CN):

- CN1. DURING PHASE II FOR THE FOUNDRY TRANSFORMER AND DURING PHASE III FOR THE WWTP TRANSFORMER, CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING THE SECONDARY CONTAINMENT BASED INDUSTRY STANDARD PRACTICE FOR THE LIQUID VOLUME IN THE TRANSFORMER. DESIGN DETAIL SHALL BE PROVIDED TO SDSTA TEAM FOR APPROVAL PRIOR TO INSTALLATION.



6 FOUNDRY BUILDING TRANSFORMER DETAIL WITH ISOMETRIC VIEW
 SCALE: 3/8" = 1'-0"



7 WWTP TRANSFORMER DETAIL WITH ISOMETRIC VIEW
 SCALE: 3/8" = 1'-0"

ISSUED FOR BID

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Rev.	Description	Date	By	Chk	Eng	Appd.
2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATIONS	26-03-05	SPM	VIC	SAD	
1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
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SDSTA YATES ELECTRICAL REHAB

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File Name: stn_182924768-mzd.rvt

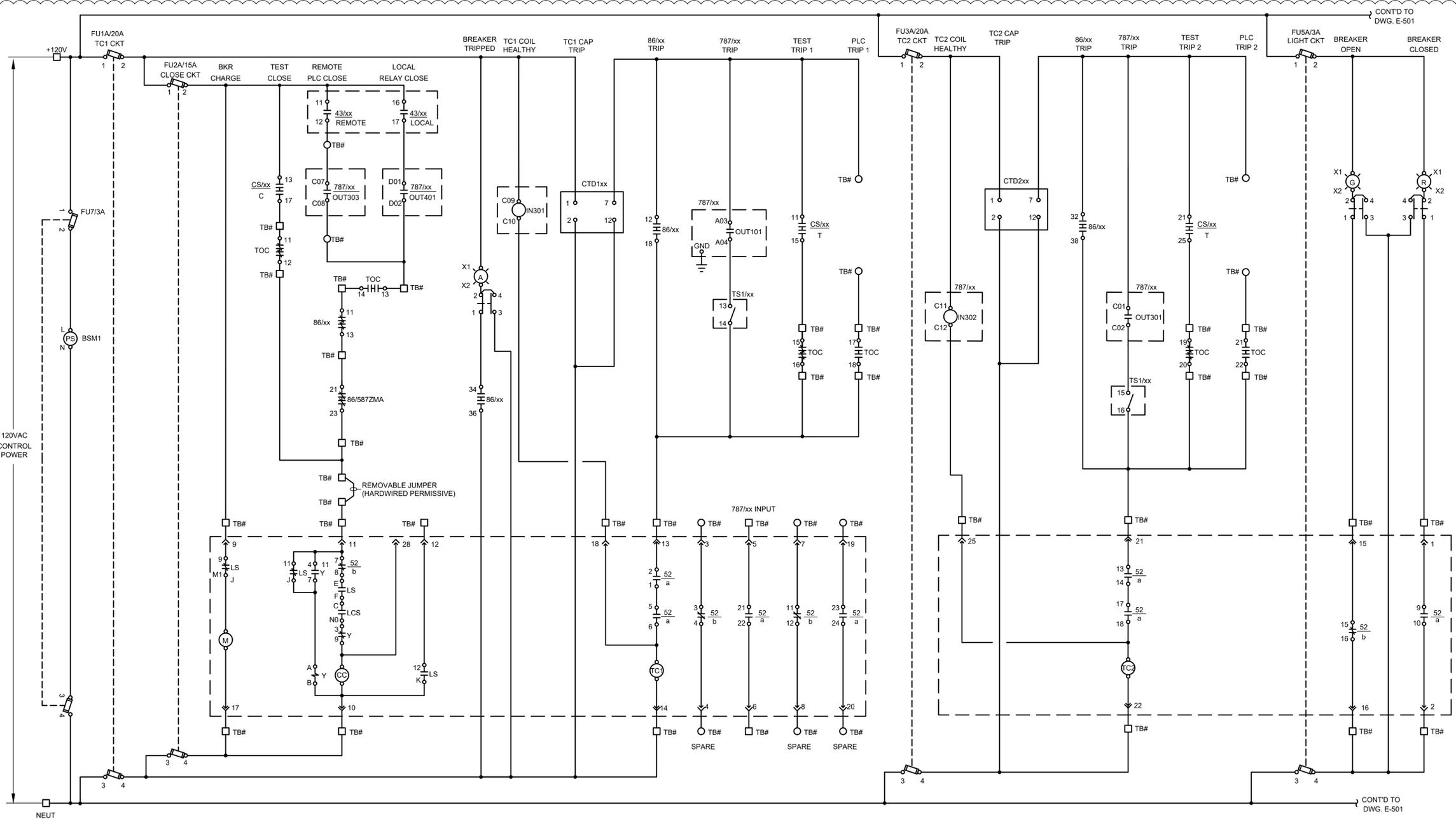
SPM	VIC	SAD	25.11.07
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Title
 GENERAL ARRANGEMENT
 FOUNDRY BUILDING AND WWTP
 TRANSFORMER DETAIL

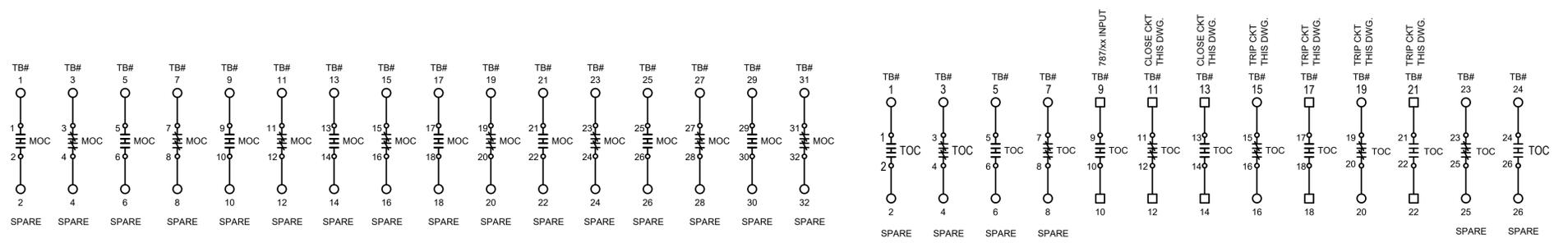
Project No. 182924768 Scale 3/8" = 1'-0"

Drawing No. 24768-E-108 Revision 2

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PRELIMINARY DRAWING. VENDOR SELECTION AND DOCUMENTATION REQUIRED FOR VALIDITY OF THE BREAKER CONTROL SCHEME.



- LEGEND**
- ⊗ SHUNT TERMINAL BLOCK IN EQUIPMENT FOR VENDOR USE
 - ⊙ SHUNT TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS
 - TERMINAL BLOCK IN EQUIPMENT FOR VENDOR CONNECTIONS
 - TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS

ISSUED FOR BID

Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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Dwn.	Chkd.	Dgmn.	YY.MM.DD

Title

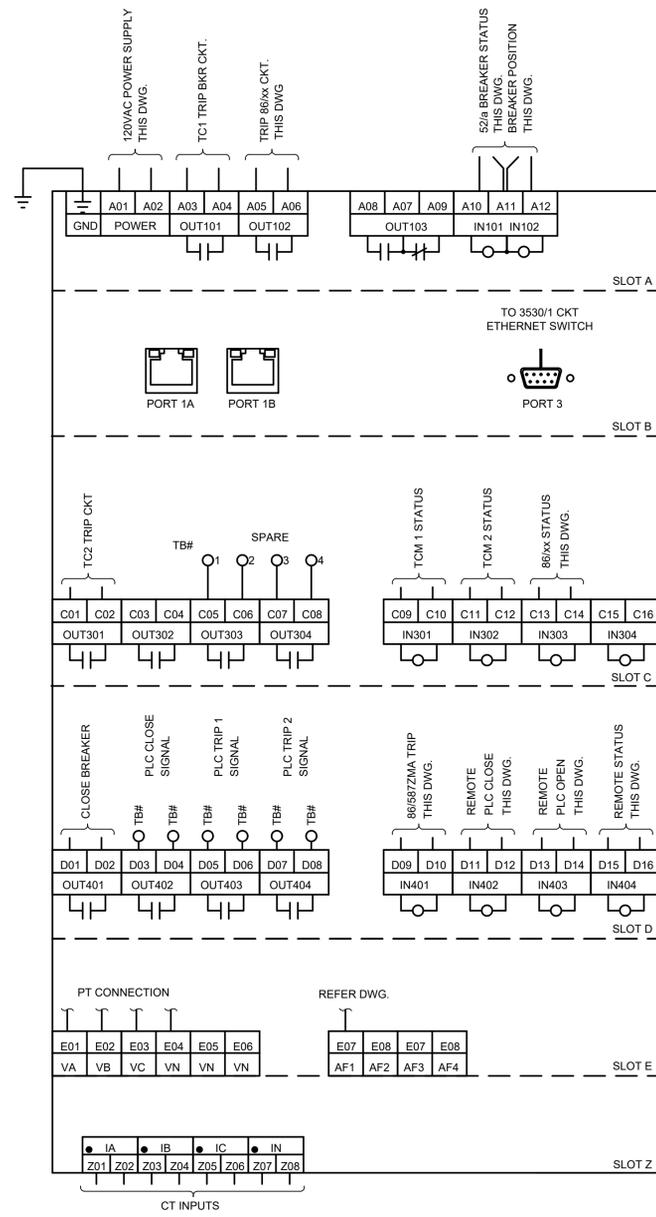
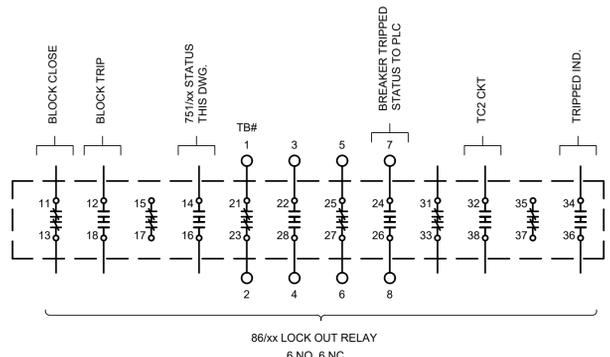
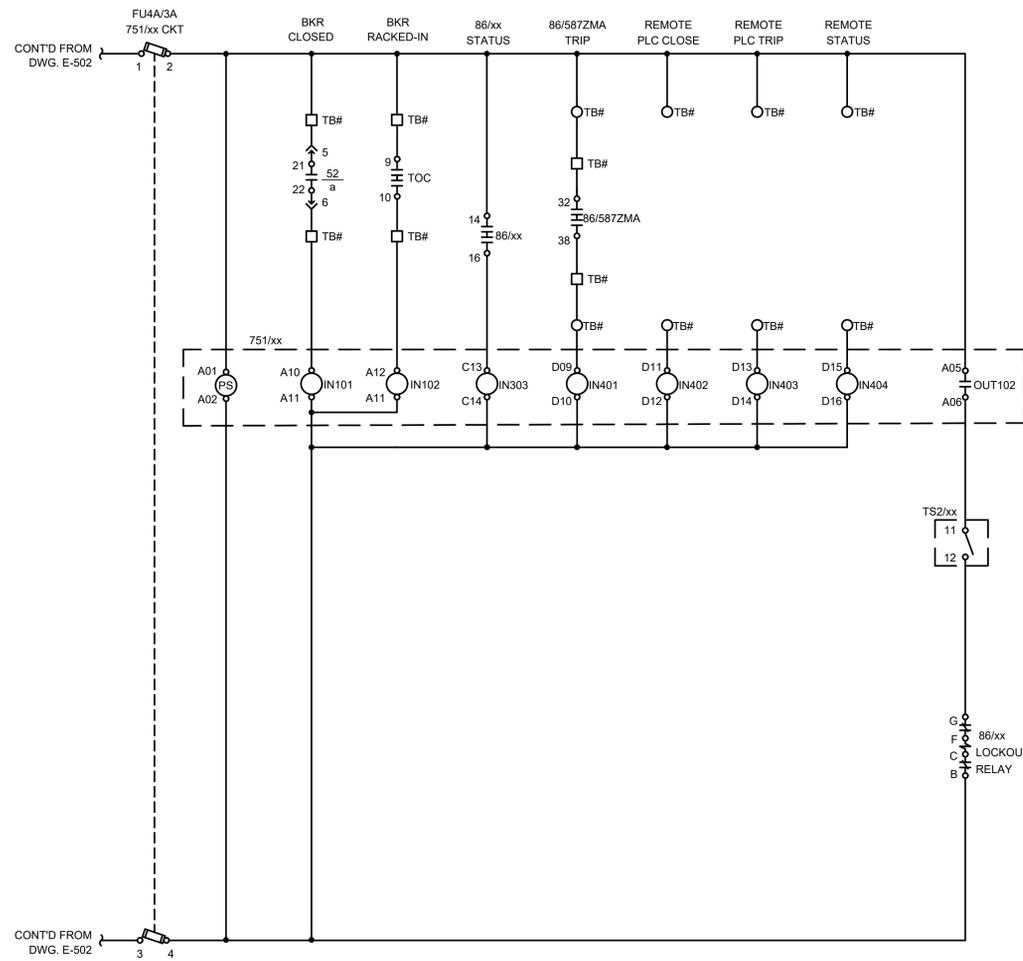
CONTROL SCHEMATIC
MV TRANSFORMER FEEDER BREAKER
TYPICAL - SHEET 1 OF 2

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-500 Revision 2

Dwg Updated: 3/5/2026 6:45:53 PM By: smohie

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CS/xx POSITION

DECK	CONTACTS	TRIP	NORMAL	CLOSE
1	11	15	X	X
	12	16	X	X
	13	17	X	X
2	21	25	X	X
	22	26	X	X
	23	27	X	X

CIRCUIT BREAKER CONTROL SWITCH

43/xx SW. POS.

DECK	CONTACTS	LOCAL	REMOTE
1	11	X	X
	16	X	X
	21	X	X
	26	X	X
2	31	X	X
	36	X	X
	41	X	X
	46	X	X

43LR SELECTOR SWITCH LOCAL/REMOTE STATUS TO PLC

- LEGEND
- ⊗ SHUNT TERMINAL BLOCK IN EQUIPMENT FOR VENDOR USE
 - ⊠ SHUNT TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS
 - ⊡ TERMINAL BLOCK IN EQUIPMENT FOR VENDOR CONNECTIONS
 - TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS

ISSUED FOR BID

Rev.	Description	Date	By	Chk	Eng.	Appd.
2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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File Name: 24768-E-503.dwg

SPM	VIC	SAD	25.11.07
Dwn.	Chkd.	Dgmn.	YY.MM.DD

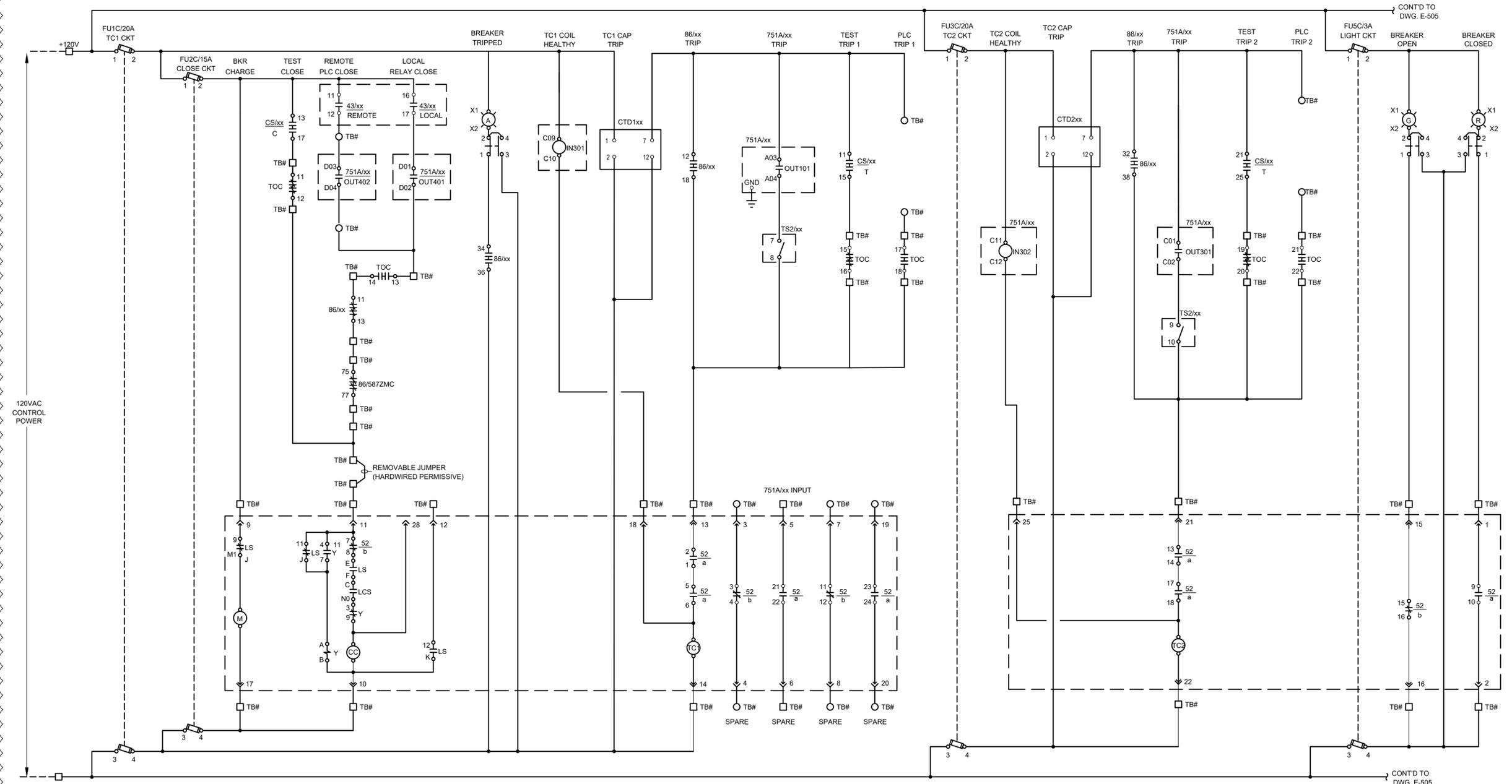
Title

CONTROL SCHEMATIC
MV VFD NO DISCONNECT FDR BREAKER
TYPICAL - SHEET 2 OF 2

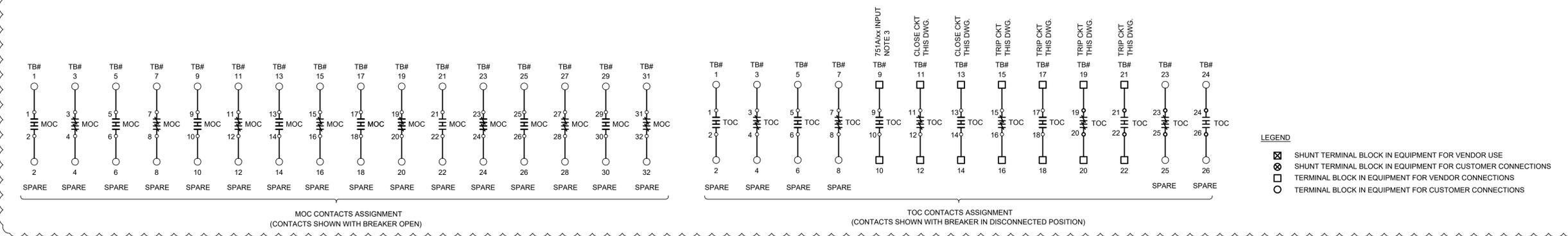
Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-503 Revision 2

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PRELIMINARY DRAWING. VENDOR SELECTION AND DOCUMENTATION REQUIRED FOR VALIDITY OF THE BREAKER CONTROL SCHEME.



ISSUED FOR BID

Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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File Name: 24768-E-504.dwg

SPM	VIC	SAD	25.11.07
Dwn.	Chk.	Dgr.	YY.MM.DD

Title

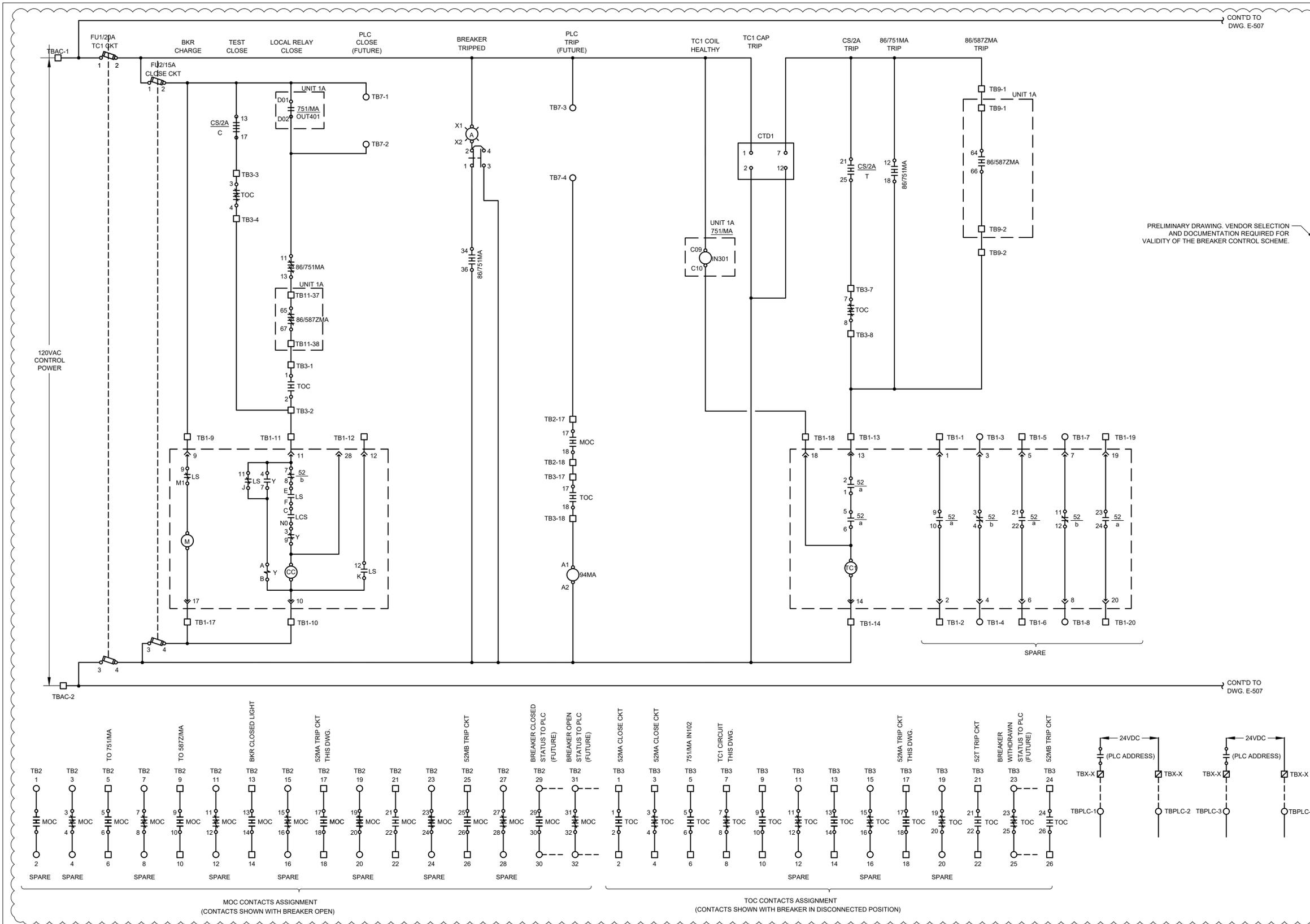
CONTROL SCHEMATIC
MV VFD W/DISCONNECT FDR BREAKER
TYPICAL - SHEET 1 OF 2

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-504 Revision 2

Dwg Updated: 3/5/2026 6:46:24 PM By: smohie

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GENERAL SHEET NOTES

- INTERLOCKING**
- BOTH MAIN BREAKERS 1A AND 2A MAY NOT BE CLOSED SIMULTANEOUSLY TO PREVENT PARALLELING OF SOURCES. THIS IS ACTIVE IN ALL MODES OF OPERATION UNTIL THERE IS A TRANSITION BETWEEN THE MAIN BREAKERS IN THE EVENT OF LOSS OF UTILITY POWER AT EITHER OF THE MAIN BREAKERS.
 - MAIN BREAKERS 1A AND 2A WILL CLOSE SIMULTANEOUSLY FOR A VERY SHORT DURATION WHILE MAKING A TRANSITION BEFORE ONE OF THE BREAKERS OPEN IN THE EVENT OF LOSS OF UTILITY POWER AT EITHER OF THE MAIN BREAKERS.
- LOCK-OUT**
- OVER CURRENT TRIP (OT) ON MAIN BREAKERS ARE INCORPORATED IN THE CONTROL SCHEME SUCH THAT THERE WILL BE NO CLOSURE OF ANY BREAKER TO A FAULT.
- NORMAL CONDITIONS**
- MAIN BREAKER 2A CLOSED.
 - 1A IS OPENED.
 - RED LIGHT TURNS ON.
- SEQUENCE OF AUTOMATIC TRANSFER**
- A. LOSS OF UTILITY POWER AT MAIN BREAKER 2A**
- RELAY 751MA/2A DETECTS LOSS OF NORMAL VOLTAGE.
 - TIME DELAY OF 3 SECONDS.
 - MAIN BREAKER 2A OPENS.
 - FEEDS TO WWTP, FOUNDRY BUILDING, OPEN CONVEYOR BLDG., HOIST VFD OPEN.
 - RELAY 751MA/1A DETECTS OPENING OF MAIN BREAKER 2A.
 - TIME DELAY OF 3 SECONDS.
 - MAIN BREAKER 1A CLOSURES.
- B. LOSS OF UTILITY POWER AT MAIN BREAKER 1A (FUTURE - ROSS SUBSTATION)**
- RELAY 751MA/1A DETECTS LOSS OF NORMAL VOLTAGE.
 - TIME DELAY 3 SECONDS.
 - MAIN BREAKER 1A OPENS.
 - FEEDS TO WWTP, FOUNDRY BUILDING, OPEN CONVEYOR BLDG., HOIST VFD OPEN.
 - RELAY 751MA/2A DETECTS OPENING MAIN BREAKER 1A.
 - TIME DELAY OF 3 SECONDS.
 - MAIN BREAKER 2A CLOSURES.
- C. STAND-BY GENERATOR TURNS ON**
- RELAY 751MA DETECTS NORMAL VOLTAGE.
 - TIME DELAY OF 3 SECONDS.
 - GENERATOR BREAKER CLOSED.
 - TIME DELAY OF 3 SECONDS.
 - RELAY 751MA/2A DETECTS CLOSURE OF GENERATOR BREAKER.
 - RED LIGHT TURNS OFF.
 - GREEN & BLUE LIGHTS TURNS ON.
 - FEEDS TO WWTP, FOUNDRY BUILDING, OPEN CONVEYOR BLDG., HOIST VFD CLOSED (MANUALLY).
- D. LOSS OF UTILITY POWER AT MAIN BREAKERS 1A AND 2A.**
- NO ACTION IS TAKEN.
- E. RETURN OF UTILITY POWER**
- RELAY 751MA/2A DETECTS NORMAL VOLTAGE.
 - TIME DELAY OF 3 SECONDS.
 - GENERATOR TURNS OFF.
 - GENERATOR BREAKER OPENED.
 - RELAY 751MA/2A DETECTS OPENING OF GENERATOR BREAKER.
 - TIME DELAY OF 3 SECONDS.
 - GREEN & BLUE LIGHTS TURNS OFF.
 - MAIN BREAKER 2A CLOSE.
 - TIME DELAY OF 3 SECONDS.
 - RED LIGHT TURNS ON.

LEGEND

	SHUNT TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS.
	TERMINAL BLOCK IN EQUIPMENT FOR POWELL CONNECTIONS.
	TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS
	TERMINAL BLOCK IN PLC

ISSUED FOR BID

Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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YATES ELECTRICAL REHAB

File Name: 24768-E-506.DWG

SPM	VIC	SAD	25.11.07
Dwn.	Chk.	Dgln.	YY.MM.DD

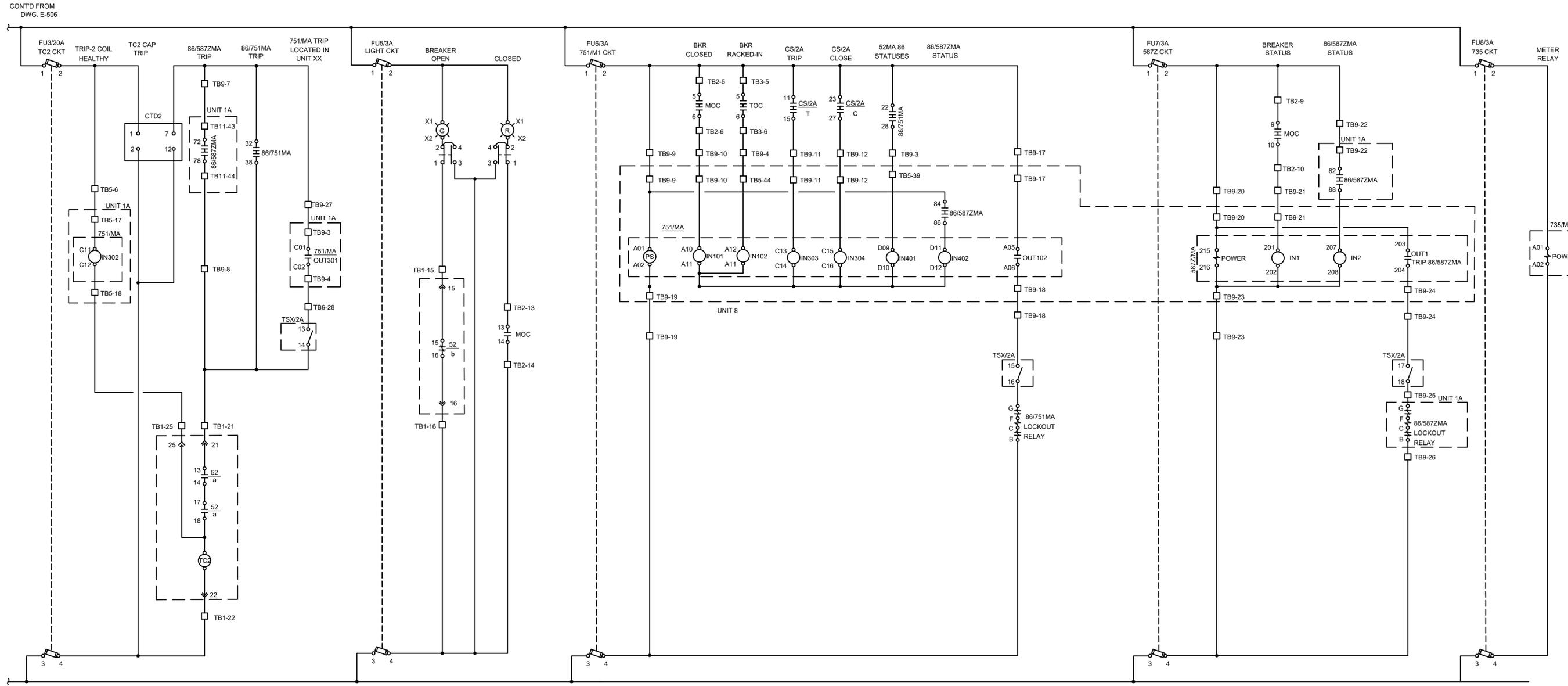
Sanford Underground Research Facility

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-506 Revision 2

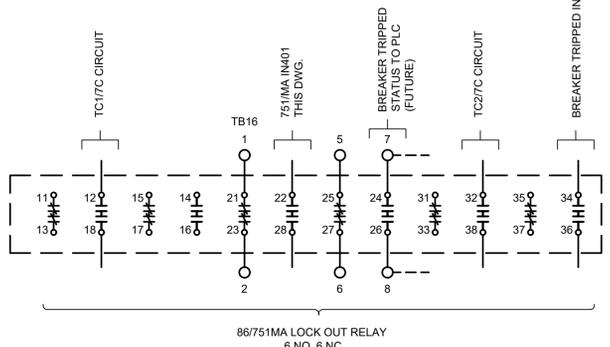
Dwg Updated: 3/5/2026 6:46:41 PM By: smohie

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CONT'D FROM DWG. E-506

CONT'D FROM DWG. E-506



CS/2A

DECK	CONTACTS			POSITION	
	TRIP	NORMAL	CLOSE	TRIP	CLOSE
1	11-O-H-I-O-15	12-O-H-I-O-16	13-O-H-I-O-17	X	X
2	21-O-H-I-O-25	22-O-H-I-O-26	23-O-H-I-O-27	X	X

CIRCUIT BREAKER CONTROL SWITCH

LEGENDS ○ TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS
 ⊗ SHUNT TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS.

PRELIMINARY DRAWING. VENDOR SELECTION AND DOCUMENTATION REQUIRED FOR VALIDITY OF THE BREAKER CONTROL SCHEME.

ISSUED FOR BID

REFERENCE DRAWING
 1. REFER DRAWING E-506 FOR GENERAL SHEET NOTES.

Rev.	Description	Date	By	Chk	Eng.	Appd.
2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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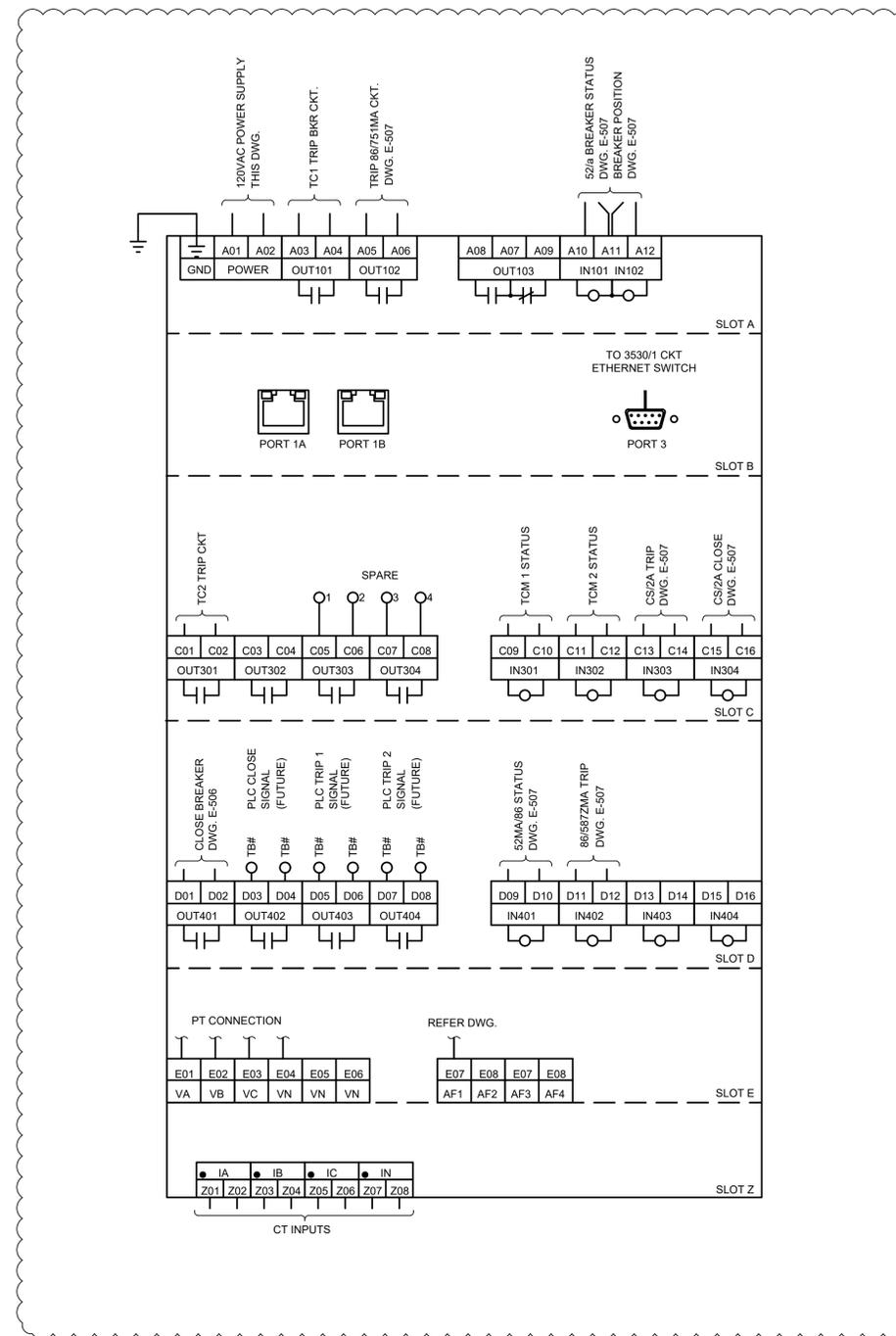
File Name: 24768-E-507.DWG

SPM	VIC	SAD	25.11.07
Dwn.	Chkd.	Dgmn.	YY.MM.DD

Title
**CONTROL SCHEMATICS
 MAIN BREAKER 2A
 SHEET 2 OF 3**

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-507 Revision 2



PRELIMINARY DRAWING. VENDOR SELECTION AND DOCUMENTATION REQUIRED FOR VALIDITY OF THE BREAKER CONTROL SCHEME.

LEGEND

- ☒ SHUNT TERMINAL BLOCK IN EQUIPMENT FOR VENDOR USE
- ☑ SHUNT TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS
- TERMINAL BLOCK IN EQUIPMENT FOR VENDOR CONNECTIONS
- TERMINAL BLOCK IN EQUIPMENT FOR CUSTOMER CONNECTIONS

ISSUED FOR BID

C:\USERS\SMOHIE\DCVACCDOCS\STANTEC CONSULTING\182924768-YATESELECREHAB\PROJECT FILES\01_WIP\13_ELECTRICAL\SHEET FILES\SCHMATIC\24768-E-508.DWG 3/5/2026 6:50 PM

Ref. Dwg. No.	Ref. Dwg. Title	Rev.	Description	Date	By	Chk	Eng.	Appd.
		2	100% ISSUED FOR BID - HOIST UPGRADE MODIFICATION	26-03-05	SPM	VIC	SAD	
		1	100% ISSUED FOR BID - ADMINISTRATIVE REVISION ONLY	25-12-12	SPM	VIC	SAD	
		0	100% ISSUED FOR BID	25-11-07	SPM	VIC	SAD	

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File Name: 24768-E-508.dwg

SPM	VIC	SAD	25.11.07
Dwn.	Chk.	Dsgn.	YY.MM.DD

Title

CONTROL SCHEMATICS
MAIN BREAKER 2A
SHEET 3 OF 3

Project No. 182924768 Scale NO SCALE

Drawing No. 24768-E-508 Revision 2