

ITEM NO	TYPE	LOCATION	DESCRIPTION	DURATION	NOTICE REQUIRED	NOTES/RESTRICTIONS
1	POWER OUTAGE	OH to UG Ductbank Transition	Tie-in to Tangent Structure	5 Days	4 Weeks	Must occur from Oct-Mar
2	LINE SECTION OUTAGE	HSBL Circuit (Partial)	Splice HSBL in EMH-320	1 Day	2 Weeks	Seasonal Load Restrictions
3	LINE SECTION OUTAGE	HSBL Circuit (Partial)	Splice HSBL in EMH-319	1 Day	2 Weeks	Seasonal Load Restrictions
4	LINE SECTION OUTAGE	HSBL Circuit (Partial)	Splice HSBL in EMH-313	1 Day	2 Weeks	Seasonal Load Restrictions
5	LINE SECTION OUTAGE	SEBL Circuit	Splice SEBL in EMH-320	1 Day	2 Weeks	Seasonal Load Restrictions
6	LINE SECTION OUTAGE	SEBL Circuit	Splice SEBL in EMH-005	1 Day	2 Weeks	Seasonal Load Restrictions
7	LINE SECTION OUTAGE	RCBL Circuit	Splice RCBL in EMH-313	1 Day	2 Weeks	Seasonal Load Restrictions
8	LINE SECTION OUTAGE	RCBL Circuit	Splice RCBL in EMH-312	1 Day	2 Weeks	Seasonal Load Restrictions
9	LINE SECTION OUTAGE	RCBL Circuit	Splice RCBL in EMH-108	1 Day	2 Weeks	Seasonal Load Restrictions
10	LINE SECTION OUTAGE	CA VA #1 Express Circuit	Splice CA VA #1 Express in EMH-315	1 Day	2 Weeks	Seasonal Load Restrictions
11	LINE SECTION OUTAGE	ECCP1 Circuit	Splice ECCP1 in EMH-315	1 Day	2 Weeks	Seasonal Load Restrictions
12	LINE SECTION OUTAGE	ECCP2 Circuit	Splice ECCP2 in EMH-315	1 Day	2 Weeks	Seasonal Load Restrictions
13	LINE SECTION OUTAGE	GT VA Express Circuit	Splice GT VA Express in EMH-365	1 Day	2 Weeks	Seasonal Load Restrictions
14	LINE SECTION OUTAGE	GT VA Express Circuit	Splice GT VA Express in EMH-312	1 Day	2 Weeks	Seasonal Load Restrictions. Cut into ductbank in EMH-365 following completion of Outage Item No's. 1 through 12. Eposing exist. "old" deenergized ECCP1,CASR1, and ECCP2
15	LINE SECTION OUTAGE	GT VA Express Circuit	Splice GT VA Express in EMH-108 Disconnect from SR-314B	1 Day	2 Weeks	
16	LINE SECTION OUTAGE	PP VA Express Circuit	Splice PP VA Express in EMH-108	1 Day	2 Weeks	Seasonal Load Restrictions
17	LINE SECTION OUTAGE	AGBL CTAP Circuit	Splice AGBL in EMH-103	1 Day	2 Weeks	Seasonal Load Restrictions
18	LINE SECTION OUTAGE	AGBL Circuit (Partial)	Splice AGBL in EMH-316	1 Day	2 Weeks	Seasonal Load Restrictions
19	LINE SECTION OUTAGE	AGBL Circuit (Partial)	Splice AGBL in EMH-282	1 Day	2 Weeks	Seasonal Load Restrictions
20	LINE SECTION OUTAGE	AGBL Circuit (Partial)	Splice AGBL in EMH-103	1 Day	2 Weeks	Seasonal Load Restrictions
21	LINE SECTION OUTAGE	CA VA #2 Express Circuit	Splice CA VA #2 Express in EMH-316	1 Day	2 Weeks	Seasonal Load Restrictions
22	LINE SECTION OUTAGE	CA VA #2 Express Circuit	Splice CA VA #2 Express in EMH-103	1 Day	2 Weeks	Seasonal Load Restrictions
23	LINE SECTION OUTAGE	MW VA Express Circuit	Splice MW VA Express in EMH-365	1 Day	2 Weeks	Seasonal Load Restrictions
24	LINE SECTION OUTAGE	MW VA Express Circuit	Splice MW VA Express in EMH-312	1 Day	2 Weeks	Seasonal Load Restrictions
25	LINE SECTION OUTAGE	MW VA Express Circuit	Splice MW VA Express in EMH-108	1 Day	2 Weeks	Seasonal Load Restrictions
26	LINE SECTION OUTAGE	RC VA Express Circuit	Splice RC VA Express in EMH-365	1 Day	2 Weeks	Seasonal Load Restrictions
27	LINE SECTION OUTAGE	RC VA Express Circuit	Splice RC VA Express in EMH-312	1 Day	2 Weeks	Seasonal Load Restrictions
28	LINE SECTION OUTAGE	RC VA Express Circuit	Splice RC VA Express in EMH-108	1 Day	2 Weeks	Seasonal Load Restrictions
29	TRANSMISSION OUTAGE	69kV Riser	Remove old 69kV riser and associated equipment	2 Day	4 Weeks	Must occur from Oct-Mar

SCHEDULE OF ROADWAY/DRIVE CLOSURES						
ITEM NO	TYPE	LOCATION	DESCRIPTION	DURATION	NOTICE REQUIRED	RESTRICTIONS
1	ROAD CLOSURE	Virginia Avenue - West Leg	Electrical Ductbank J, Storm B1-EX, Sanitary AA1-EX0 Installation	5 WEEKS	30 DAYS	1) Must be concurrent with Item 4 2) Cannot be concurrent with Items 2 and 3 3) Must maintain two-way access to MOI Loading Dock and MOI Circle Drive Entrance 4) Must maintain one-way access out of SE Parking Garage 7 exit.
2	ROAD CLOSURE	Virginia Avenue - North Leg - NB Lane Closure Only	Electrical Ductbank H and I Installation	5 WEEKS	30 DAYS	1) Must be concurrent with Item 3 2) Cannot be concurrent with Item 1 3) Must maintain two lanes of traffic on Virginia Avenue 4) Must maintain two-way access to Parking Lot and NE Parking Garage Driveway
3	ROAD CLOSURE	Virginia Avenue - South of Hospital Drive	Electrical Ductbank H and I Installation	5 WEEKS	30 DAYS	1) Must be concurrent with Item 2 2) Cannot be concurrent with Item 1 3) Must maintain two lanes of traffic along Hospital Drive 4) Must maintain two-way access to Parking Lot and NE Parking Garage Driveway
4	ENTRANCE DRIVE CLOSURE	MOI Parking Lot	Electrical Ductbank E Installation	5 WEEKS	30 DAYS	Must be concurrent with Item 1
5	ACCESS CLOSURE	MU Storage Yards and Storage Sheds	Electrical Ductbank E Installation	5 WEEKS	30 DAYS	

CP231541 ELECTRICAL INTERCONNECT AND SUBSTATION SEQUENCING PLAN			
MILESTONE DESCRIPTION	DURATION	MAJOR SEQUENCING EVENTS	PREREQUISITES & CONSTRAINTS
CONSTRUCT VIRGINIA AVE SUBSTATION	12 Months	1. CONTRACTOR TO ISSUE PO'S FOR ALL EQUIPMENT PURCHASES 2. READY EQUIPMENT YARD FOR EQUIPMENT SETTING 3. RECEIVE AND SET 69kV TRANSFORMERS - Expected early February 2026 4. CONSTRUCT VIRGINIA AVE SUBSTATION BUILDING 5. RECEIVE AND SET SWITCHGEAR LINEUP IN BUILDING	1. RELOCATE EXISTING LIGHTING AND PARKING GATE ELECTRICAL FEEDS
CONSTRUCT UNDERGROUND TRANSMISSION/ DUCTBANK	5 Months	1. CONSTRUCT NEW DUCTBANK IN VIRGINIA AVE 2. CONSTRUCT NEW DUCTBANK STADIUM ROAD SUBSTATION 3. CONSTRUCT NEW DUCTBANK FROM VIRGINIA AVE SUB TO UNIVERSITY SWITCHYARD 4. INSTALL FIBER CABLES VIRGINIA AVE SUB TO UNIVERSITY SWITCHYARD 5. INSTALL 48T FIBER CABLES TO VIRGINIA AVE SUB TO RESEARCH COMMONS THERMAL PLANT	1. COORDINATE WATER/SEWER/STORM UTILITY RELOCATES PRIOR TO DUCTBANK INSTALL 2. CONTRACTOR TO ENSURE PHASE INTEGRITY OF DUCTBANK CONDUCTORS DURING INSTALLATION
ENERGIZE VIRGINIA AVE 13.8kV FROM STADIUM SUB TO...	30 Days	TEMP/PPVA FEEDER.	1. CONSTRUCT VIRGINIA AVE DUCTBANK 2. CONSTRUCT STADIUM DRIVE DUCTBANK 3. INSTALL 13.8kV FEEDER STADIUM DR. SUB TO VIRGINIAL AVE SUB THROUGH EMH-108
INSTALL TEMP OH TRANSMISSION TIE-IN	7 Days	INSTALL TIE-IN OF TRANSMISSION CIRCUIT AT TANGENT STRUCTURE	1. MUST OCCUR BETWEEN OCT-MAR, MAX 5 DAY CLOSURE 2. SEE FIBER INSTALL SEQUENCE, ROUT REF# 16 & 18 DWG E-380. MUST BE COMPLETE TO COMPLETE THIS SEQUENCE MILESTONE. 3. TIE LINE OUTAGE FOR MU TIE-IN. 4. 311L RELAY MUST BE INSTALLED, COMMISSIONED AND OPERATIONAL PRIOR TO TAKING OUTAGE
ENERGIZE VIRGINIA AVE SUBSTATION 69kV	7 Days	ENERGIZE VIRGINIA AVE SUBSTATION @ 69kV	SOAK 69kV TRANSFORMERS FROM 13.8kV PRIOR TO ENERGIZATION AT 69kV 48 HOURS MINIMUM NO LOAD ENERGIZATION
13.8kV LOAD & FIBER TRANSFER	Per Outage Table	TRANSFER ALL UNIVERSITY 13.8kV LOADS FROM STADIUM ROAD SUB TO VIRGINIA AVE SUB	REFER TO MU POWER OUTAGE TABLE FOR CIRCUIT IDENTIFICATIONS AND OUTAGE RESTRICTIONS ALL 48T FIBERS MUST BE INSTALLED AND COMPLETE PRIOR TO TRANSFER OF 138kV...
DE-ENERGIZE STADIUM ROAD SUB	1 Day	SPlice PP VA EXPRESS IN EMH-108	COMPLETE INSTALLATION OF ALL REMAINING FIBER RUNS. MUST REMAIN ENGERGIZED FROM 69kV Bkr 350 UNTILL ALL FIBER IS INSTALLED
FINAL DEMOLITION	60 Days	DEMO EXISTING STADIUM ROAD SUBSTATION AND CABLES	ITEMS TO BE SALVAGED AND RETURNED TO THE UNIVERSITY ARE LISTED ON THE ELECTRICAL DEMOLITION DRAWINGS

ENGINEERED ITEMS DELEGATED FOR CONTRACTOR DESIGN		
ITEM NO	DESCRIPTION	COMMENTS
1.0	Equipment Anchorage	Major equipment will be precured by the construction contractor, so equipment anchoring requirements will not be known until after IFC drawings are issued.
2.0	Precast Concrete Building Panels	This is a specialty fabrication item where design by the fabricator is appropriate
3.0	Hangers and Support Systems	Delegation of design for support systems for suspended piping, cable tray, and ductwork is standard.
4.0	Electrical System Support Structures (Substation)	This is a specialty fabrication item where design by the fabricator is appropriate. Fabricators are able to incorporate cylindrical and elliptical sections which are more economical than designing with standard structural members.
5.0	OH to Underground Tangent Pole	This is a specialty fabrication item where design by the fabricator is appropriate.
6.0	Lightning Protection of Substation Building	It is appropriate to delegate this design to a UL-certified installer in order to satisfy UL Lightning Protection requirements
7.0	Fire Protection for OT Room in Substation Bldg.	This is a specialty self-contained fire control system designated for small areas where delegation of design to the specialty fabricator is...
8.0	Operable Slide Gates	This is a specialty fabrication item where design by the fabricator is appropriate.
9.0	Protective Relay Settings	By Contractor
10.0	Building Fire Detection (Alarms, Beacons, and Emergency Egress Lighting)	Design Provide and Install per NFPA 72 and University Guidelines. Install and connect Owner-provided Fire Control Panel

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4	01/28/25	REVISION	REINER	REINER
5	01/28/25	REVISION	REINER	REINER
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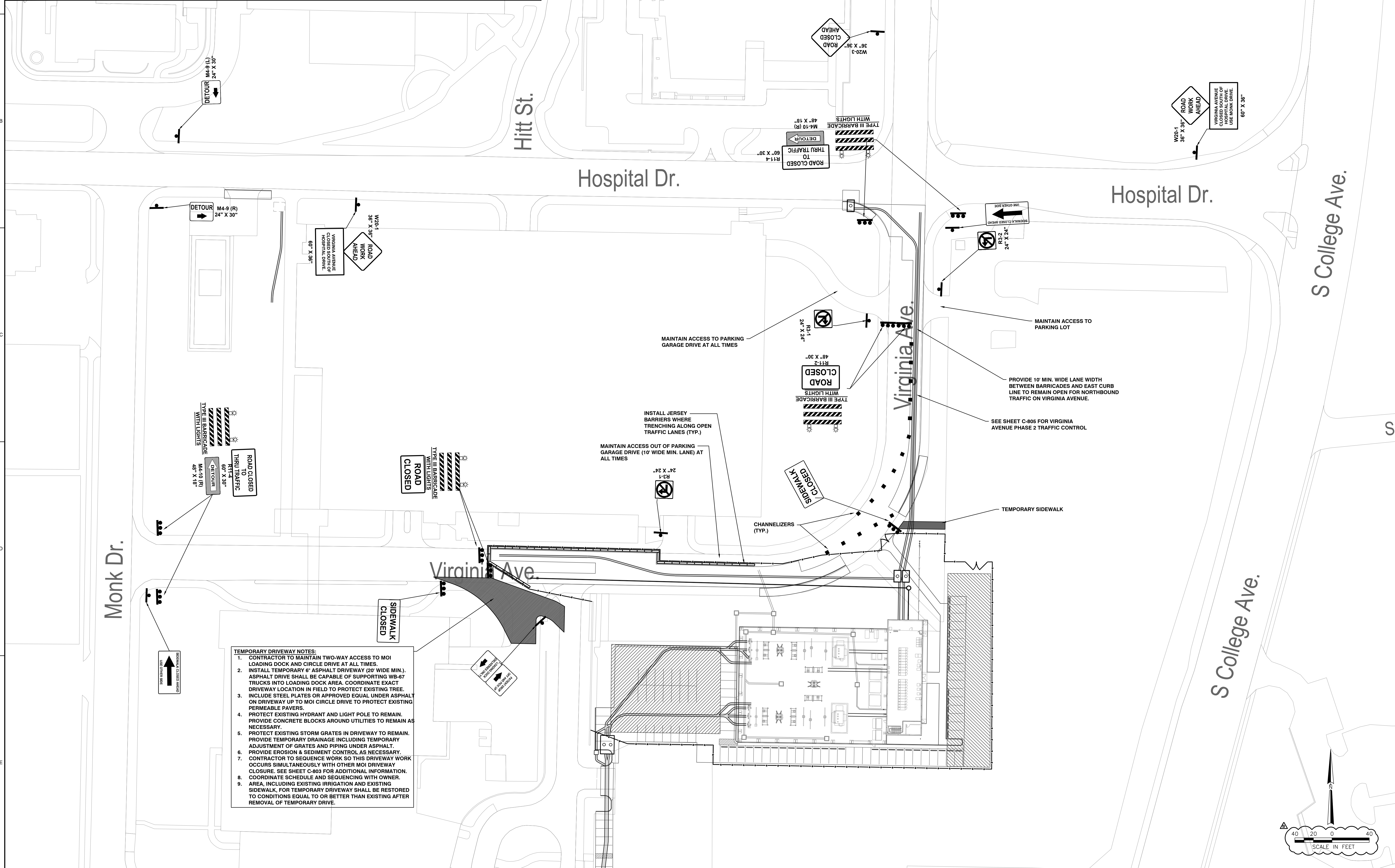
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D3759500

Project Title: GENERAL SITE - VIRGINIA AVENUE SUBSTATION AND UNDERGROUND DUCTBANK
Drawing Title: SEQUENCING, CLOSURE AND OUTAGE TABLES

Date: 01/28/25
Proj. No.: D3750400
Drawing No.:

G-102

SCHEDULE OF ROADWAY/DRIVE CLOSURES						
ITEM NO	TYPE	LOCATION	DESCRIPTION	DURATION	NOTICE REQUIRED	RESTRICTIONS
1	ROAD CLOSURE	Virginia Avenue - West Leg	Electrical Ductbank J, Storm B1-EX, Sanitary AA1-EX0 Installation	5 WEEKS	30 DAYS	1) Must be concurrent with Item 4 2) Cannot be concurrent with Items 2 & 3 3) Must maintain two-way access to MOI Loading Dock and MOI Circle Drive Entrance 4) Must maintain one-way access out of SE Parking Garage 7 exit
2	ROAD CLOSURE	Virginia Avenue - North Leg - NB Lane Closure Only	Electrical Ductbank H and I Installation	5 WEEKS	30 DAYS	1) Must be concurrent with Item 3 2) Cannot be concurrent with Item 1 3) Must maintain two lanes of traffic on Virginia Avenue 4) Must maintain two-way access to Parking Lot and NE Parking Garage Driveway
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4	ENTRANCE DRIVE CLOSURE	MOI Parking Lot	Electrical Ductbank E Installation	3 WEEKS	30 DAYS	Must be concurrent with Item 1
5	ACCESS CLOSURE	MU Storage Yards and Storage Sheds	Electrical Ductbank E Installation	3 WEEKS	30 DAYS	



- TEMPORARY DRIVEWAY NOTES:**
- CONTRACTOR TO MAINTAIN TWO-WAY ACCESS TO MOI LOADING DOCK AND CIRCLE DRIVE AT ALL TIMES.
 - INSTALL TEMPORARY 6" ASPHALT DRIVEWAY (20' WIDE MIN.). ASPHALT DRIVE SHALL BE CAPABLE OF SUPPORTING WB-67 TRUCKS INTO LOADING DOCK AREA. COORDINATE EXACT DRIVEWAY LOCATION IN FIELD TO PROTECT EXISTING TREE.
 - INCLUDE STEEL PLATES OR APPROVED EQUAL UNDER ASPHALT ON DRIVEWAY UP TO MOI CIRCLE DRIVE TO PROTECT EXISTING PERMEABLE PAVERS.
 - PROTECT EXISTING HYDRANT AND LIGHT POLE TO REMAIN. PROVIDE CONCRETE BLOCKS AROUND UTILITIES TO REMAIN AS NECESSARY.
 - PROTECT EXISTING STORM GRATES IN DRIVEWAY TO REMAIN. PROVIDE TEMPORARY DRAINAGE INCLUDING TEMPORARY ADJUSTMENT OF GRATES AND PIPING UNDER ASPHALT.
 - PROVIDE EROSION & SEDIMENT CONTROL AS NECESSARY.
 - CONTRACTOR TO SEQUENCE WORK SO THIS DRIVEWAY WORK OCCURS SIMULTANEOUSLY WITH OTHER MOI DRIVEWAY CLOSURE. SEE SHEET C-803 FOR ADDITIONAL INFORMATION.
 - COORDINATE SCHEDULE AND SEQUENCING WITH OWNER.
 - AREA, INCLUDING EXISTING IRRIGATION AND EXISTING SIDEWALK, FOR TEMPORARY DRIVEWAY SHALL BE RESTORED TO CONDITIONS EQUAL TO OR BETTER THAN EXISTING AFTER REMOVAL OF TEMPORARY DRIVE.

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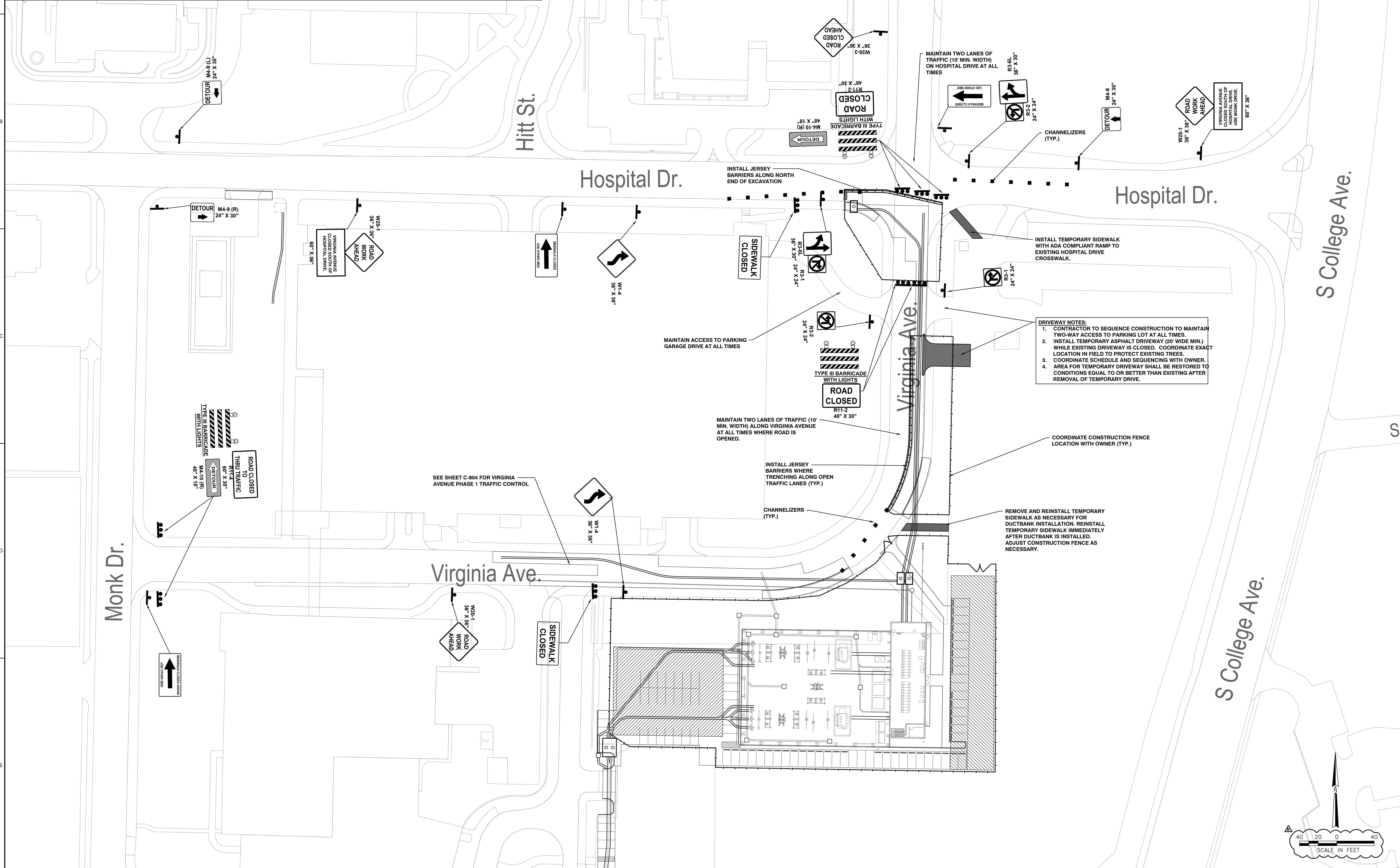
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1	01/20/23	DESIGN	AE	SM	JC
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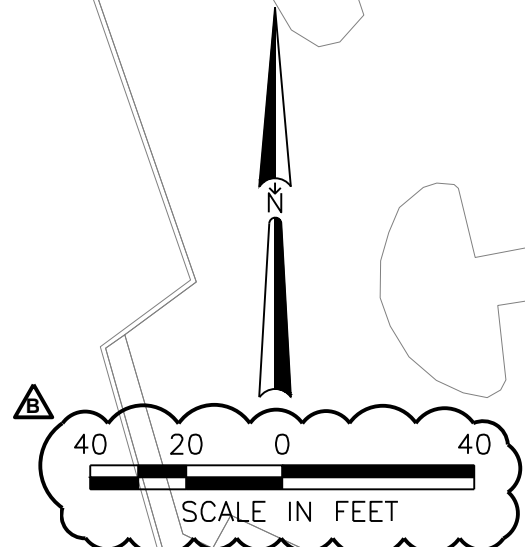
Project Title: GENERAL SITE - VIRGINIA AVENUE SUBSTATION AND UNDERGROUND DUCTBANK
 Drawing Title: TRAFFIC CONTROL - VIRGINIA AVENUE PHASE 1
 Date: 11/13/24
 Proj. No.: D3570400
 Drawing No.: C-804

SCHEDULE OF ROADWAY/DRIVE CLOSURES						
ITEM NO	TYPE	LOCATION	DESCRIPTION	DURATION	NOTICE REQUIRED	RESTRICTIONS
1	ROAD CLOSURE	Virginia Avenue - West Leg	Electrical Ductbank J, Storm B1-EX, Sanitary AA1-EX0 Installation	5 WEEKS	30 DAYS	1) Must be concurrent with Item 4 2) Cannot be concurrent with Items 2 & 3 3) Must maintain two-way access to MOI Loading Dock and MOI Circle Drive Entrance 4) Must maintain one-way access out of SE Parking Garage 7 exit.
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3	ROAD CLOSURE	Virginia Avenue - South of Hospital Drive	Electrical Ductbank H and I Installation	5 WEEKS	30 DAYS	1) Must be concurrent with Item 2 2) Cannot be concurrent with Item 1 3) Must maintain two lanes of traffic along Hospital Drive 4) Must maintain two-way access to Parking Lot and NE Parking Garage Driveway.
4	ENTRANCE DRIVE CLOSURE	MOI Parking Lot	Electrical Ductbank E Installation	3 WEEKS	30 DAYS	Must be concurrent with Item 1
5	ACCESS CLOSURE	MU Storage Yards and Storage Sheds	Electrical Ductbank E Installation	3 WEEKS	30 DAYS	



DRIVEWAY NOTES:

- CONTRACTOR TO SEQUENCE CONSTRUCTION TO MAINTAIN TWO-WAY ACCESS TO PARKING LOT AT ALL TIMES.
- INSTALL TEMPORARY ASPHALT DRIVEWAY (20' WIDE MIN.) WHILE EXISTING DRIVEWAY IS CLOSED. COORDINATE EXACT LOCATION IN FIELD TO PROTECT EXISTING TREES.
- COORDINATE SCHEDULE AND SEQUENCING WITH OWNER.
- AREA FOR TEMPORARY DRIVEWAY SHALL BE RESTORED TO CONDITIONS EQUAL TO OR BETTER THAN EXISTING AFTER REMOVAL OF TEMPORARY DRIVE.



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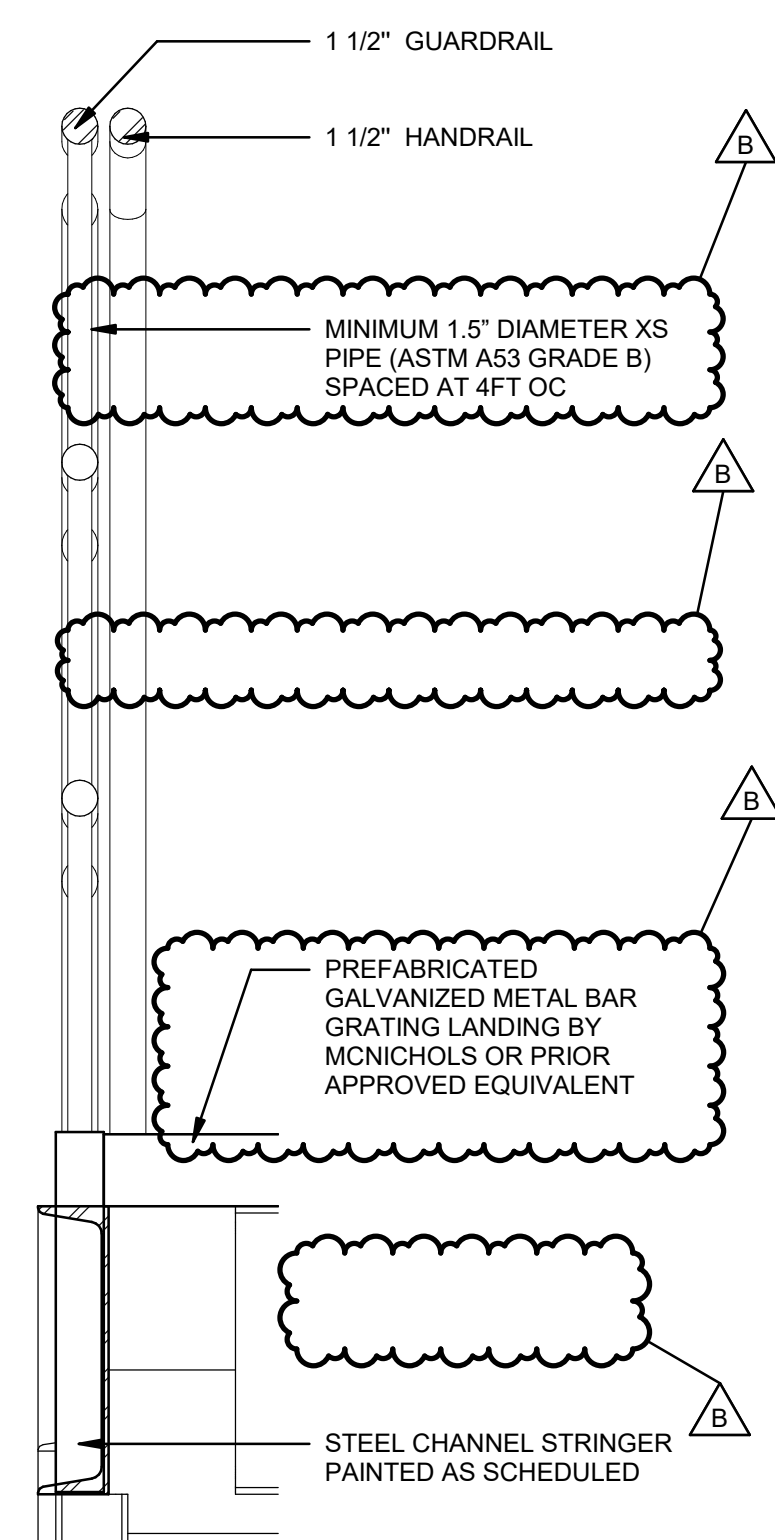


NO.	DATE	REVISION	BY	APPROVED
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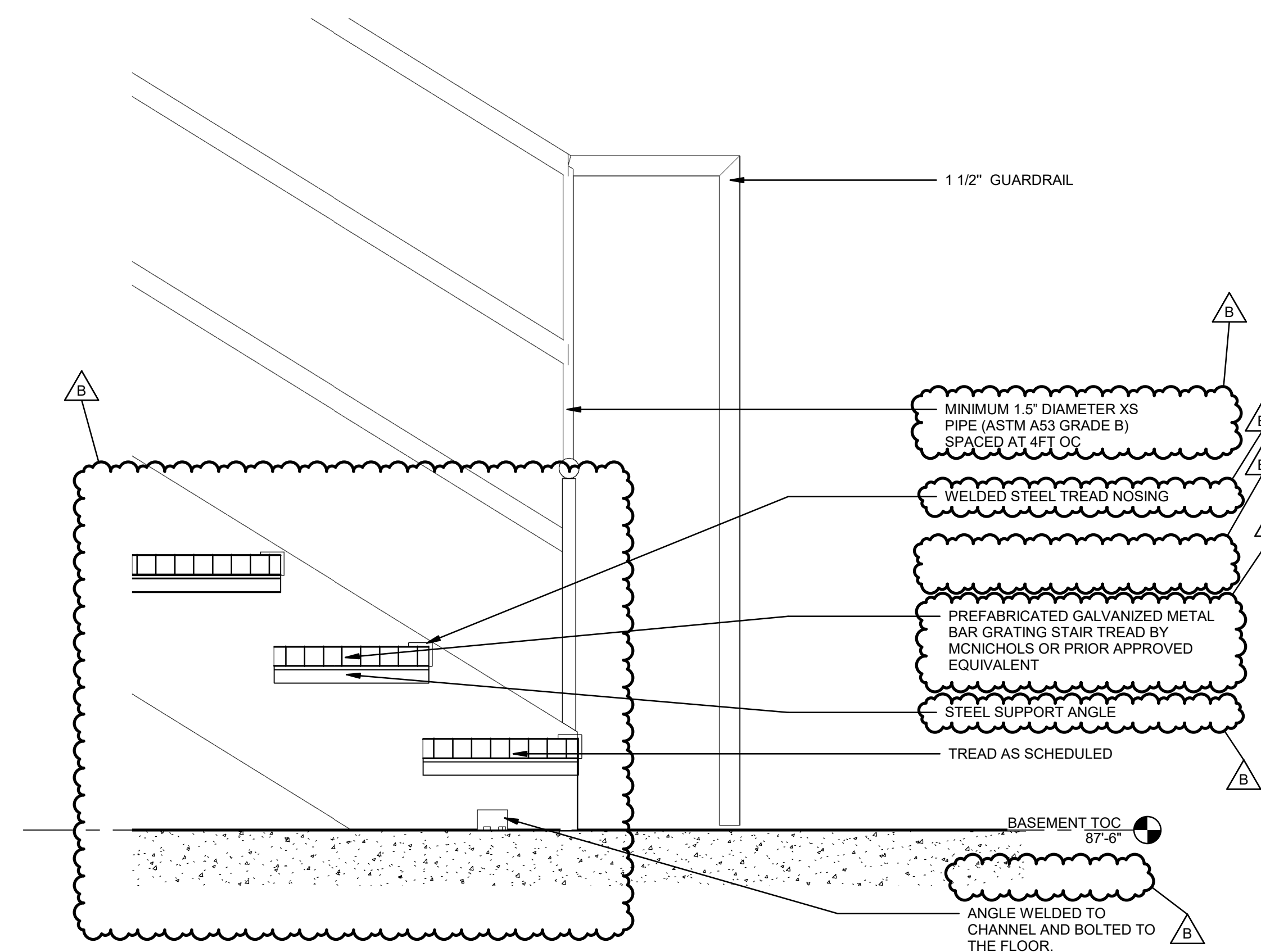
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Project Title: GENERAL SITE - VIRGINIA AVENUE SUBSTATION AND UNDERGROUND DUCTBANK
 Drawing Title: TRAFFIC CONTROL - VIRGINIA AVENUE PHASE 2
 Date: 11/13/24
 Proj. No.: D3570400
 Drawing No.: C-805



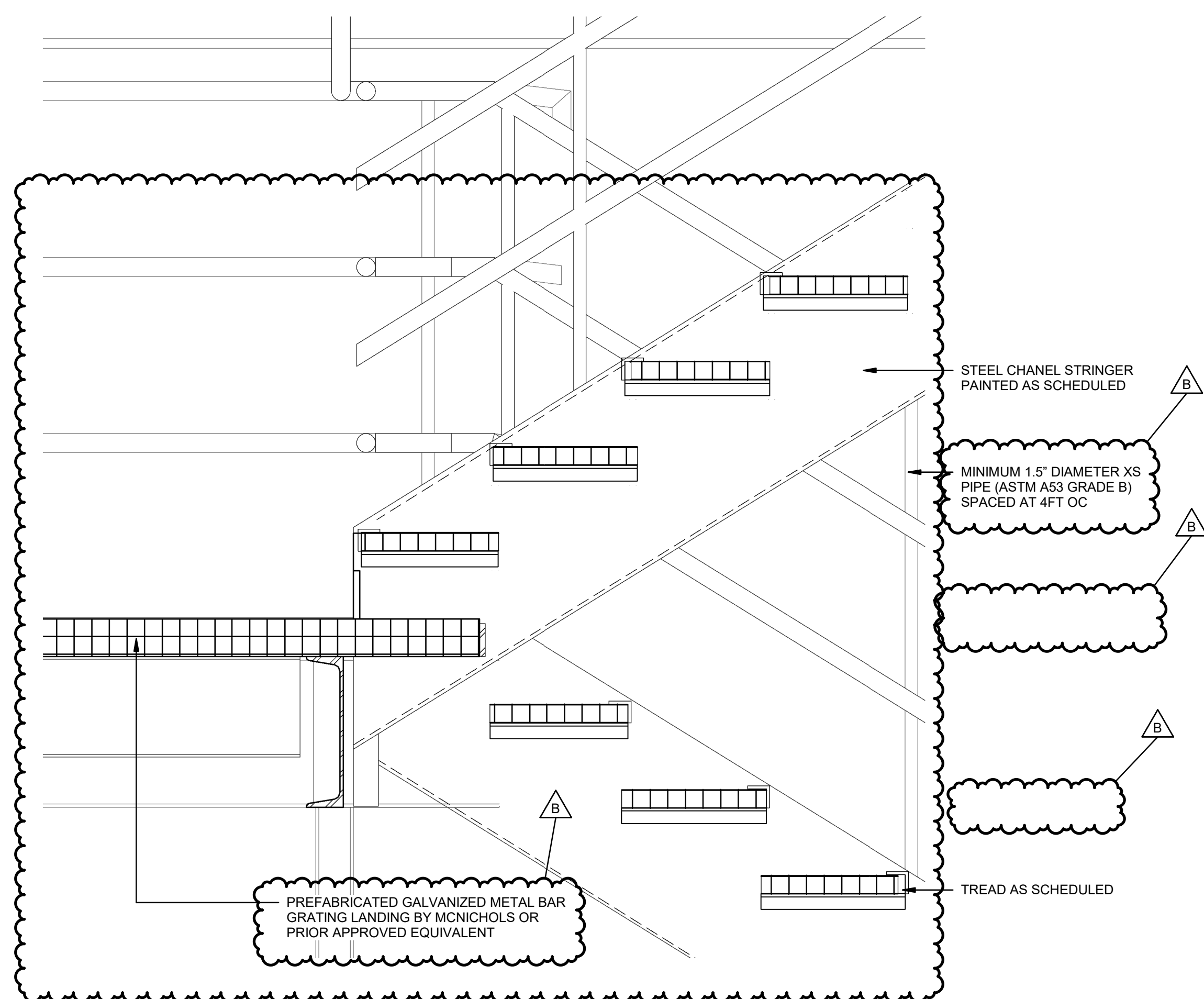
1 SECTION - STAIR - TYP.

A-460 1/12" = 1'-0"



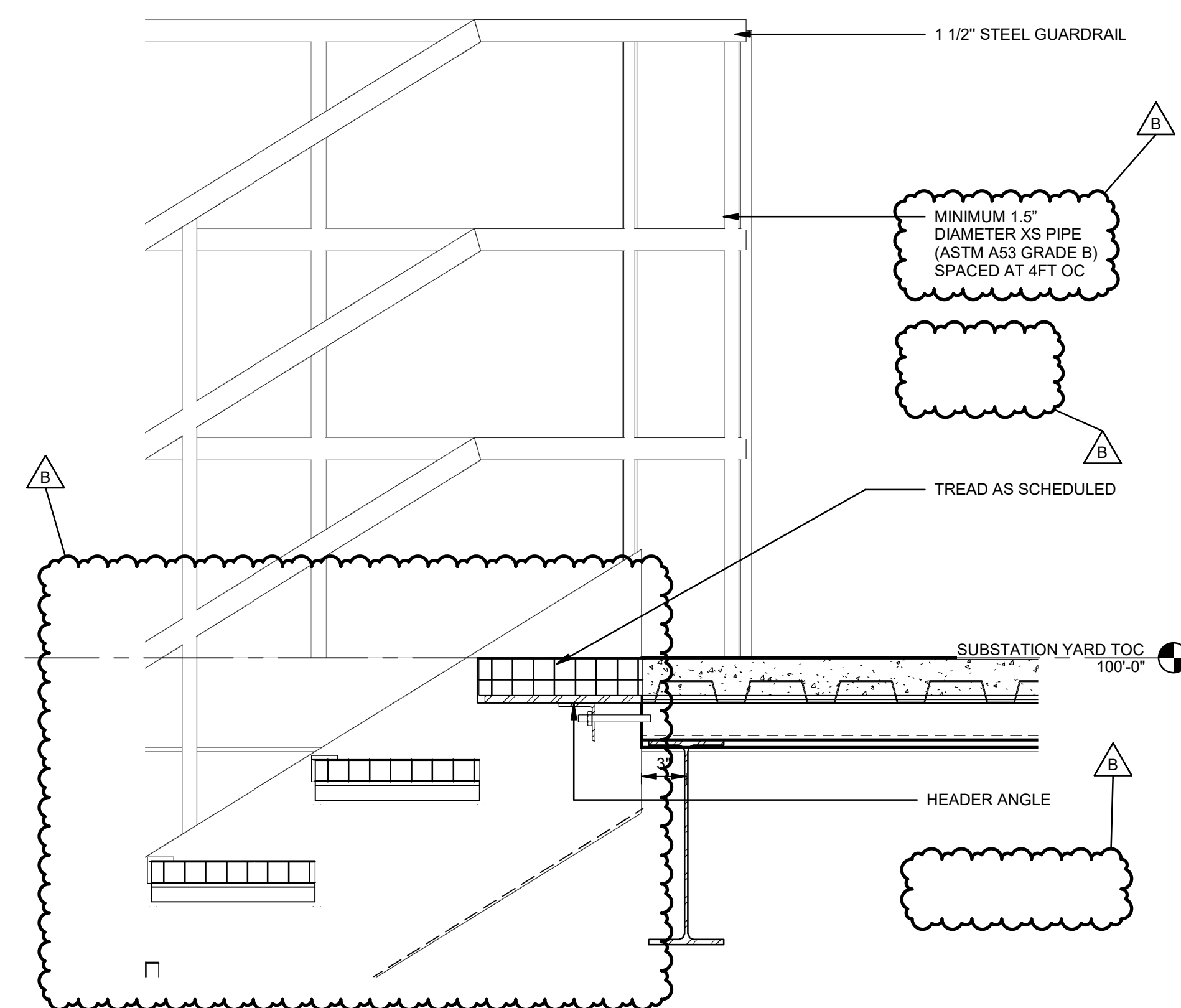
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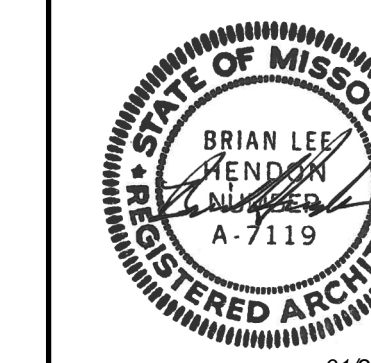
3 SECTION - STAIR - TYP.

A-460 1/12" = 1'-0"



4 SECTION - STAIR - TYP.

A-460 1/12" = 1'-0"



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Project Title: GENERAL SITE - VIRGINIA AVENUE SUBSTATION AND UNDERGROUND DUCTBANK

Drawing Title: STAIR DETAILS

Date: 01/28/25
Proj. No.: D3750400

Drawing No.: A-461

GENERAL NOTES

- A. FOR ABBREVIATIONS, NOTES & SYMBOLS, AND DEVICE NUMBERS SEE DRAWING E-002 & E-003.
- B. SEE SHEET E-807, E-808, E-809, E-810, AND E-811 FOR SUBSTATION CONTROLS AND FIBER CABLE SCHEDULES.

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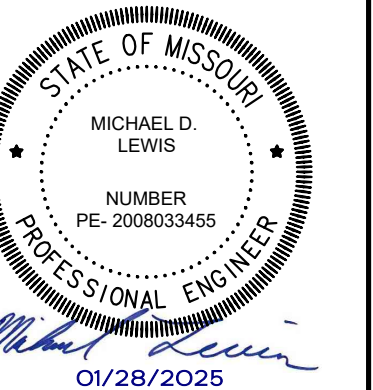
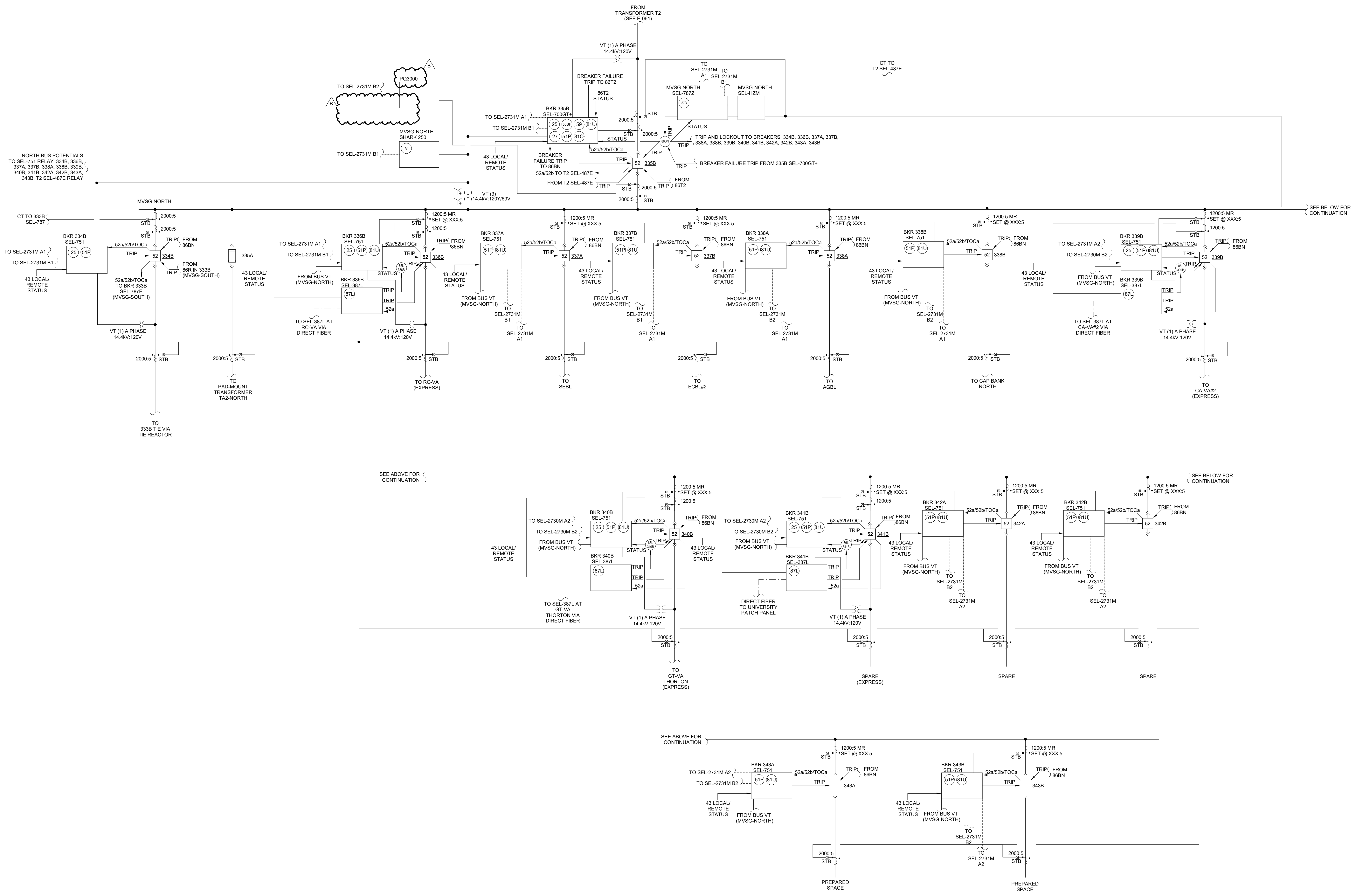
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Project Title: **ELECTRICAL INTERCONNECT AND SUBSTATION**
Drawing Title: **PROTECTION ONE-LINE - VIRGINIA AVE. SUBSTATION**
SHEET 2 OF 3

Date: 1/29/2025
Proj. No.: D3570400
Drawing No.: E-062

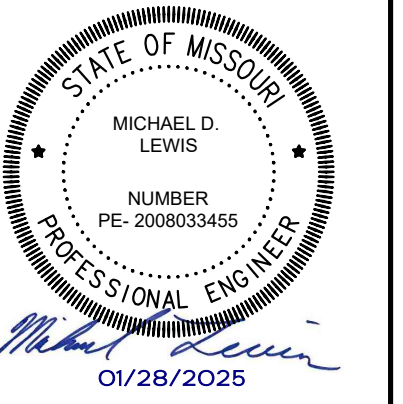
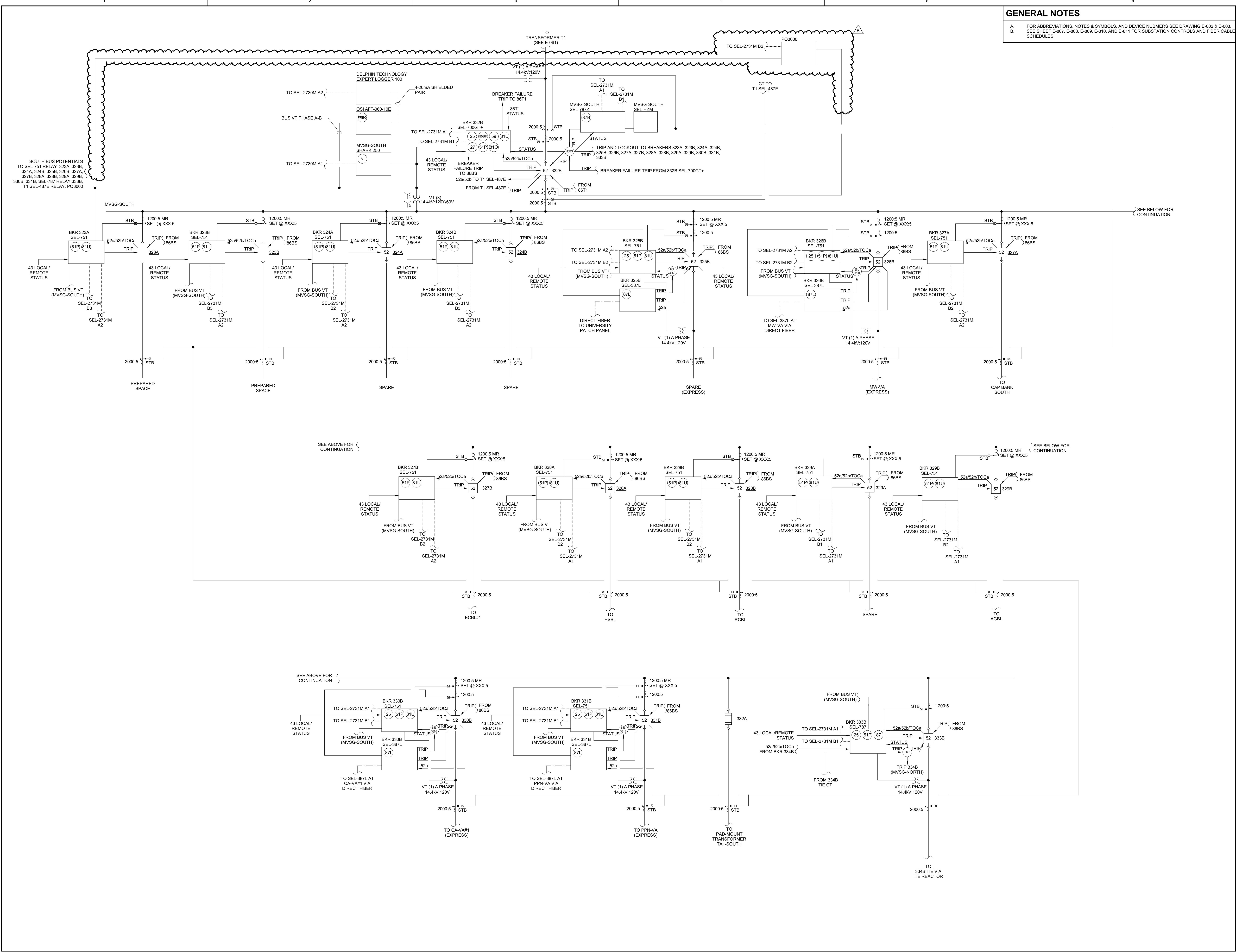
GENERAL NOTES

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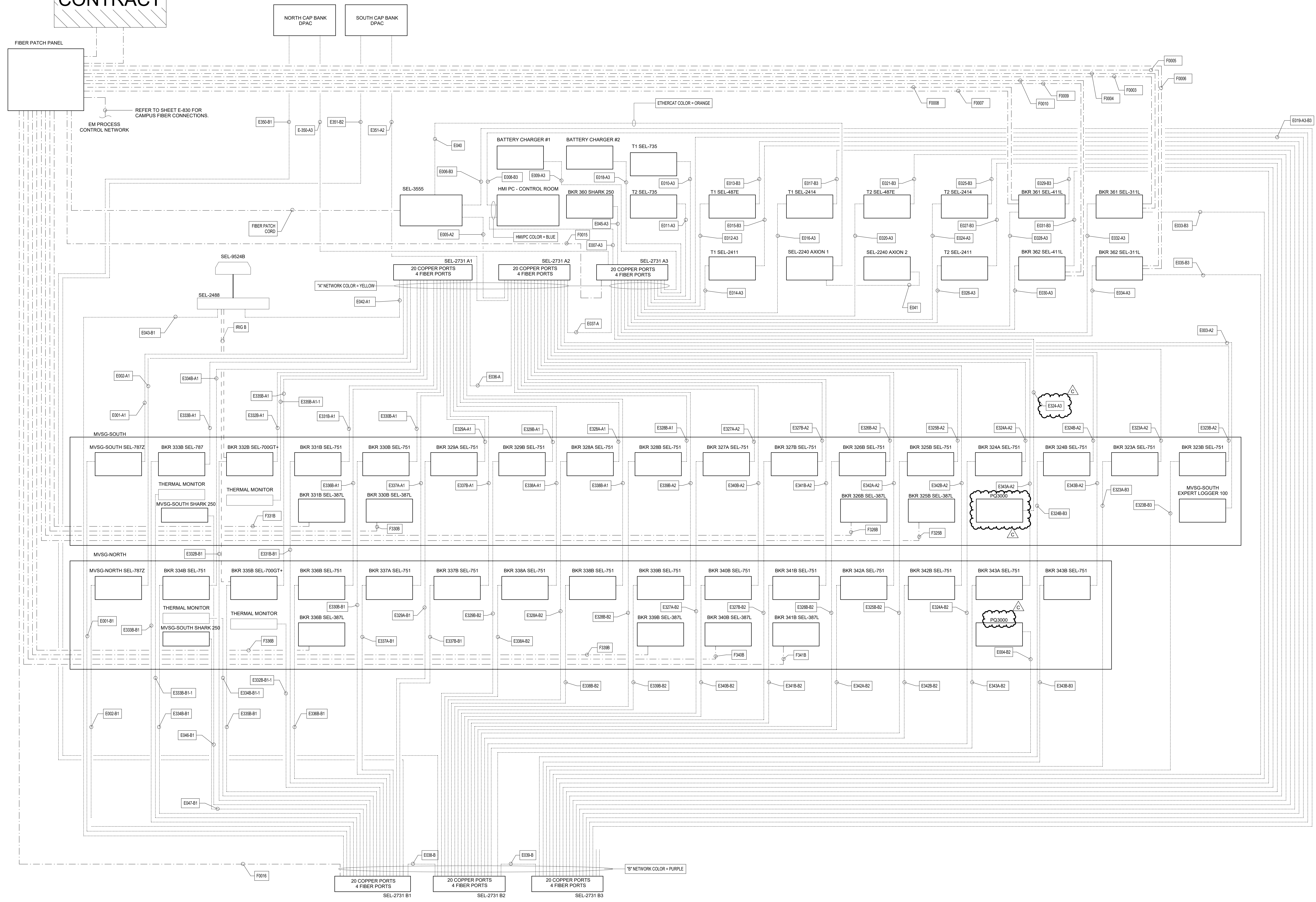
Project Title: **ELECTRICAL INTERCONNECT AND SUBSTATION PROTECTION ONE-LINE - VIRGINIA AVE. SUBSTATION**

Sheet: **SHEET 3 OF 3**

Date: 1/29/2025
 Proj. No.: D3570400
 Drawing No.: E-063

TO UNIVERSITY SWITCHYARD
NOT IN CONTRACT

LEGEND
 - - - - - CAT6 COPPER CABLE
 - - - - - FIBER OPTIC
 - - - - - SEL C961 CABLE
 - - - - - SEL962, COAX TO IIRG B



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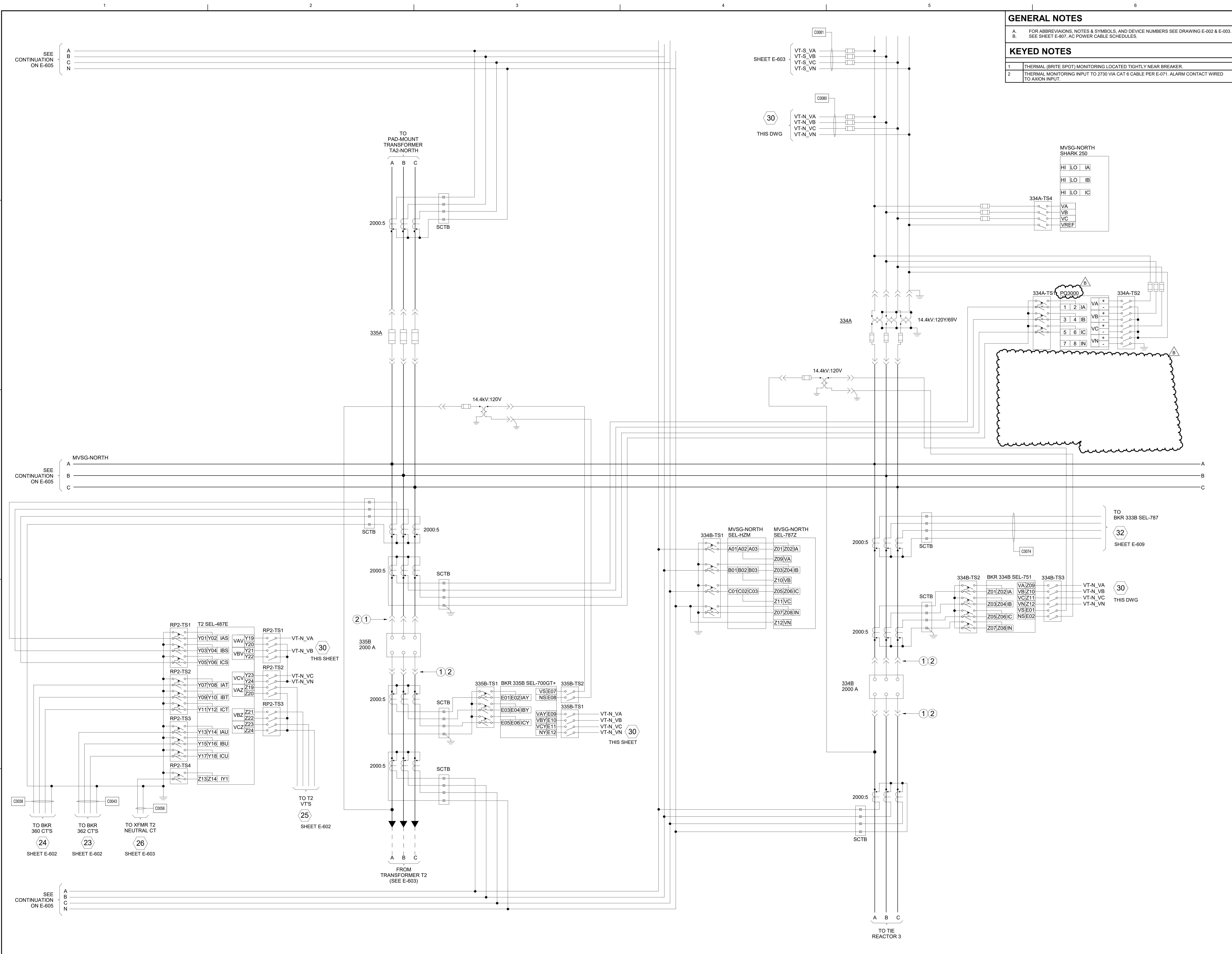
NO.	DATE	REVISION	BY	CHK	APVD	ML
1	1/29/2025	ADDITIONAL 3	FB			
2	1/29/2025	ISSUE FOR BID	FB			



Project Title: **ELECTRICAL INTERCONNECT AND SUBSTATION**
 Drawing Title: **NETWORK ARCHITECTURE RISER SUBSTATION**

Date: 1/29/2025
 Proj. No.: D3570400
 Drawing No.: **E-071**

1 NETWORK ARCHITECTURE RISER SUBSTATION
 NTS



GENERAL NOTES
 A. FOR ABBREVIATIONS, NOTES & SYMBOLS, AND DEVICE NUMBERS SEE DRAWING E-002 & E-003.
 B. SEE SHEET E-807, AC POWER CABLE SCHEDULES.

KEYED NOTES
 1. THERMAL (BRITE SPOT) MONITORING LOCATED TIGHTLY NEAR BREAKER.
 2. THERMAL MONITORING INPUT TO 2730 VIA CAT 6 CABLE PER E-071. ALARM CONTACT WIRED TO AXION INPUT.

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NO.	DATE	REVISION	CHK	APVD
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2	1/29/2025	ISSUED FOR BID		



ELECTRICAL INTERCONNECT AND SUBSTATION
 Drawing Title: **ELECTRICAL THREE LINE - VIRGINIA AVE. SUBSTATION - SHEET 3 OF 13**

Date: 1/29/2025
 Proj. No.: D3570400
 Drawing No.: **E-604**

GENERAL NOTES

A. FOR ABBREVIATIONS, NOTES & SYMBOLS, AND DEVICE NUMBERS SEE DRAWING E-002 & E-003.
 B. SEE SHEET E-807, AC POWER CABLE SCHEDULES.

KEYED NOTES

1. THERMAL (BRITE SPOT) MONITORING LOCATED TIGHTLY NEAR BREAKER.
 2. THERMAL MONITORING INPUT TO 2730 VIA CAT 6 CABLE PER E-071. ALARM CONTACT WIRED TO AXION INPUT.

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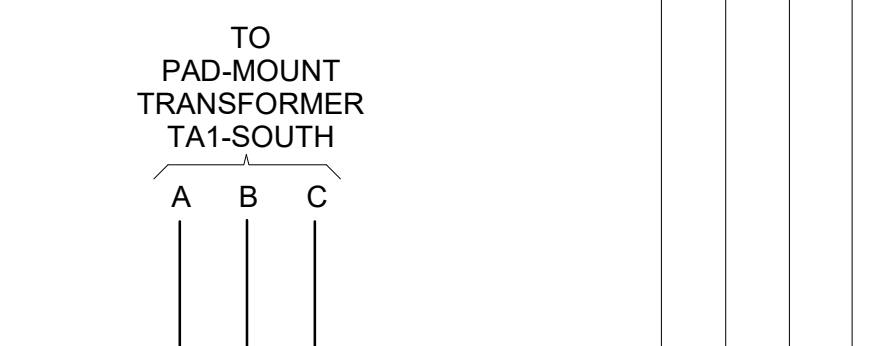
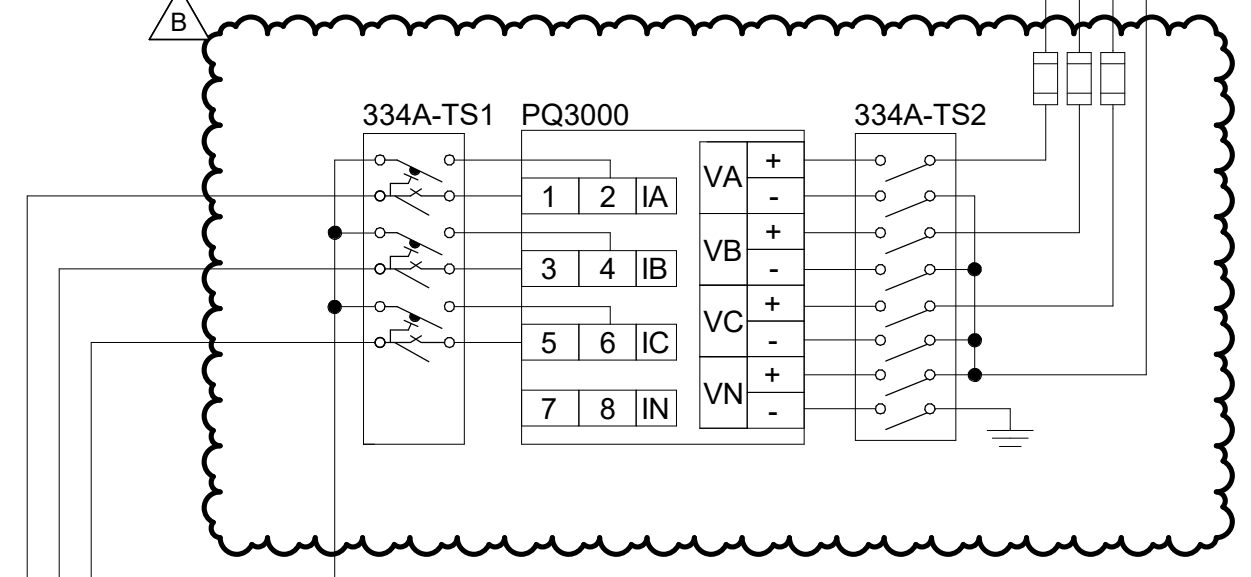
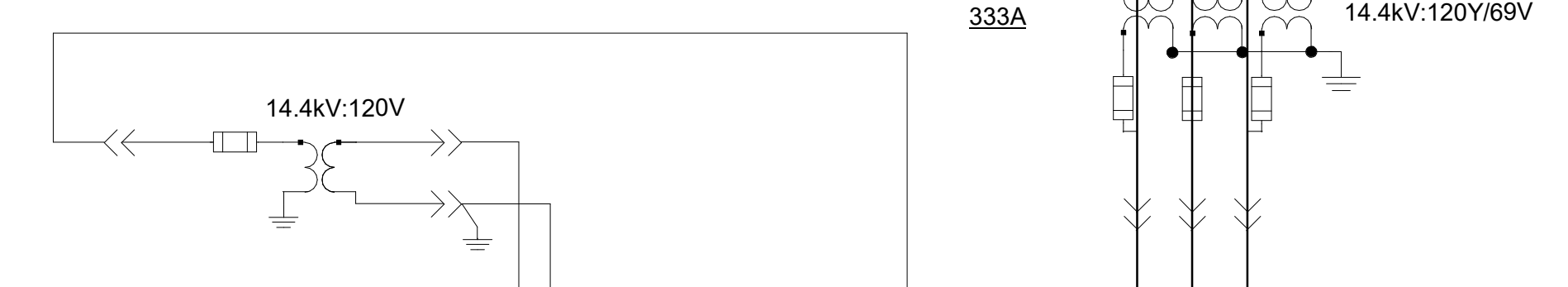
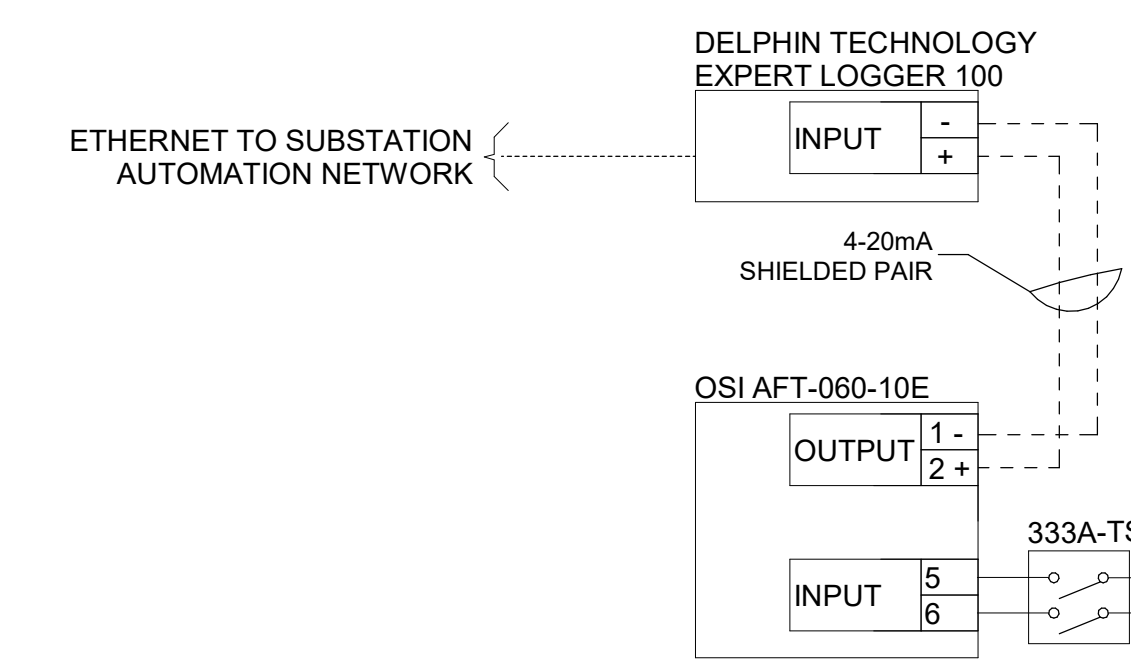
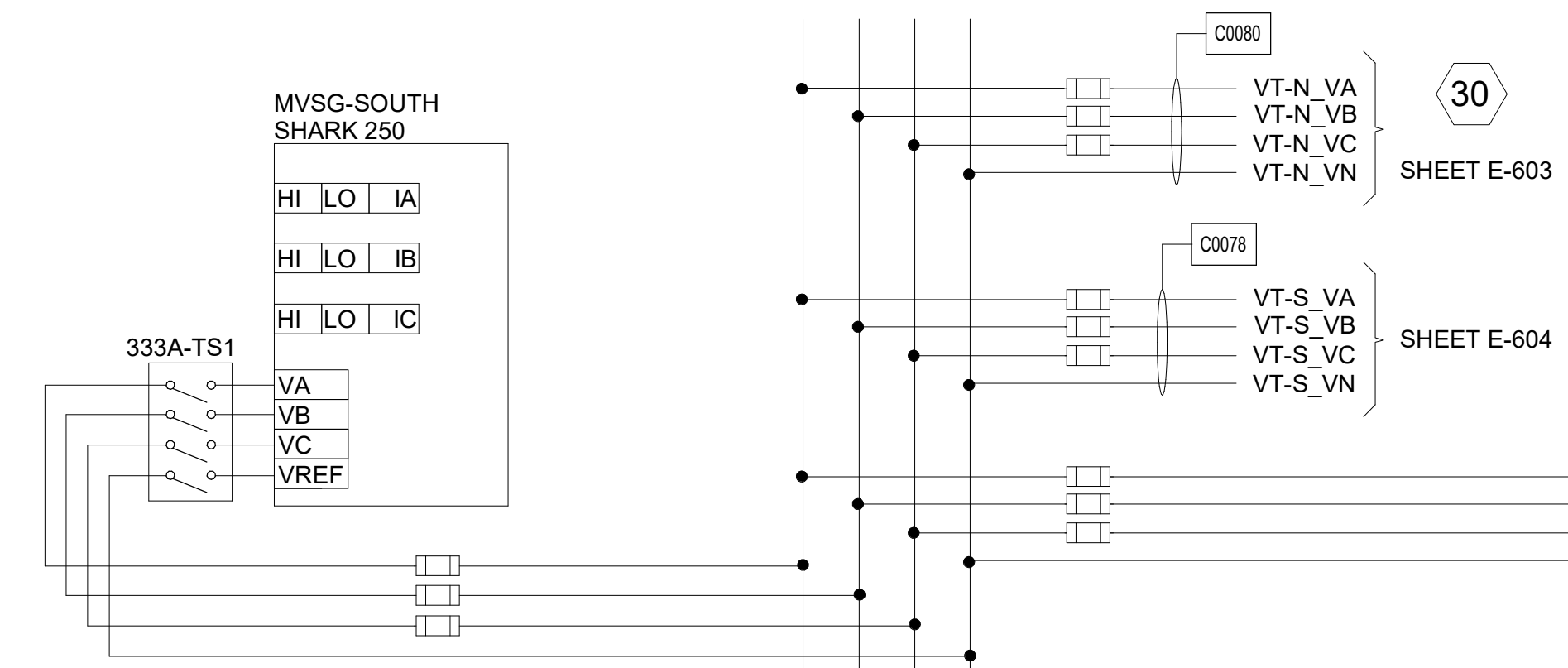


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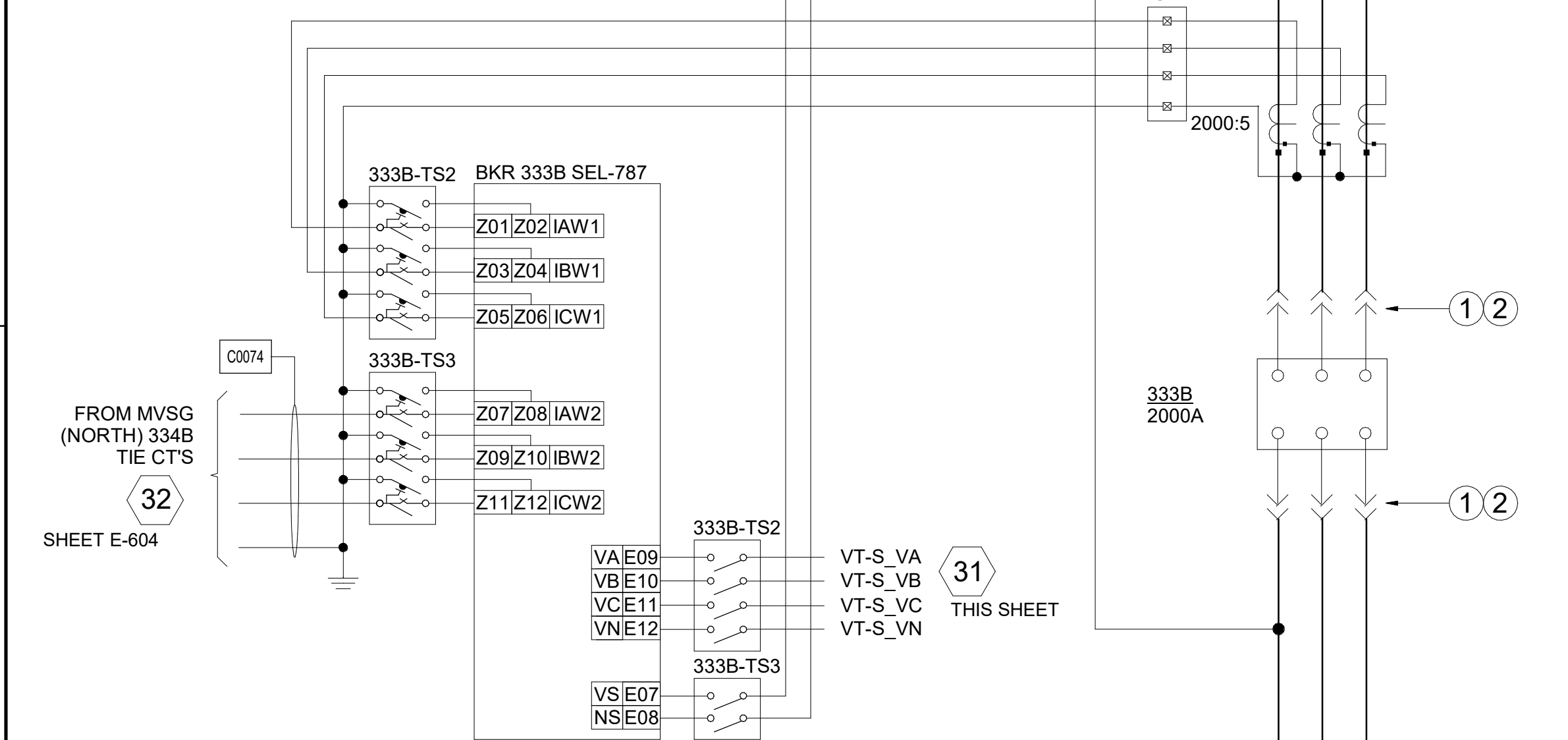
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ELECTRICAL INTERCONNECT AND SUBSTATION
 Drawing Title: **ELECTRICAL THREE LINE - VIRGINIA AVE. SUBSTATION - SHEET 8 OF 13**
 Date: 1/29/2025
 Proj. No.: D3570400
 Drawing No.: **E-609**

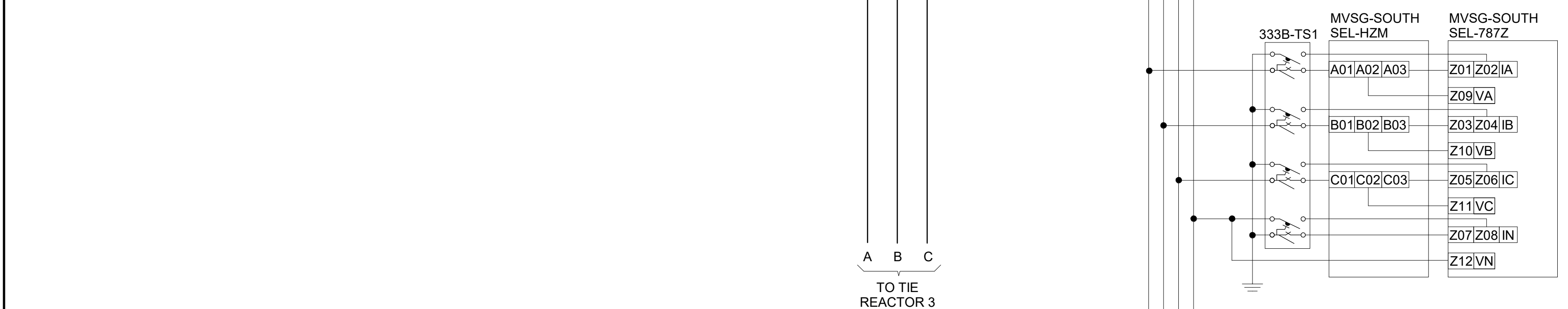
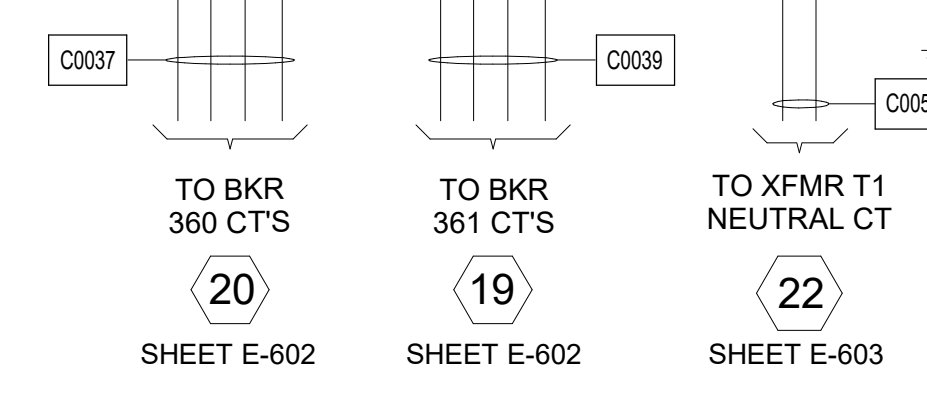
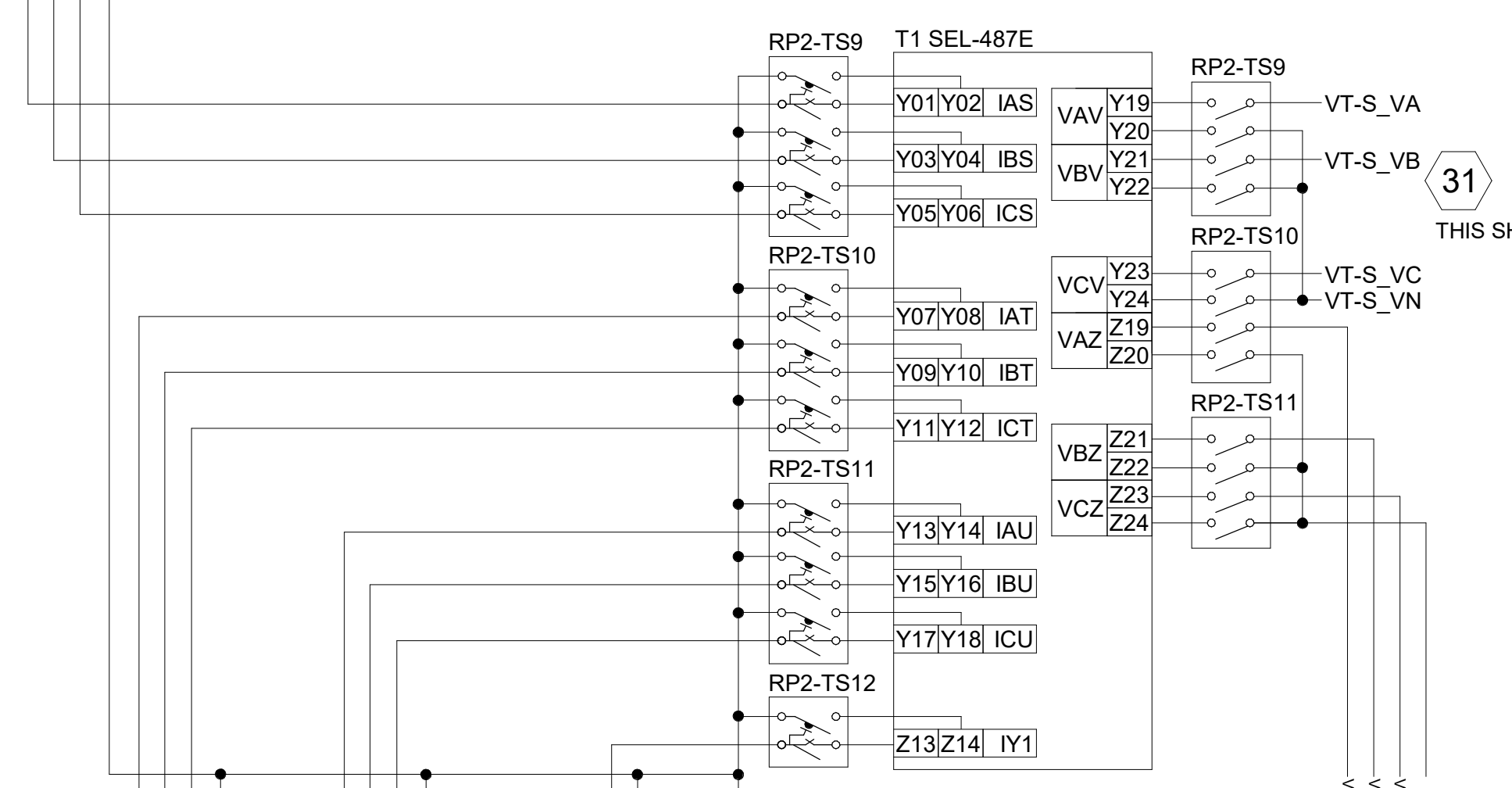
LEGEND
 - - - CAT6 COPPER CABLE SHIELDED PAIR



A B C MVSG-SOUTH SEE CONTINUATION ON E-610



FROM MVSG (NORTH) 334B TIE CT'S SHEET E-604



TO TIE REACTOR 3

FROM TRANSFORMER T1 (SEE E-603)

A B C N SEE CONTINUATION ON E-610

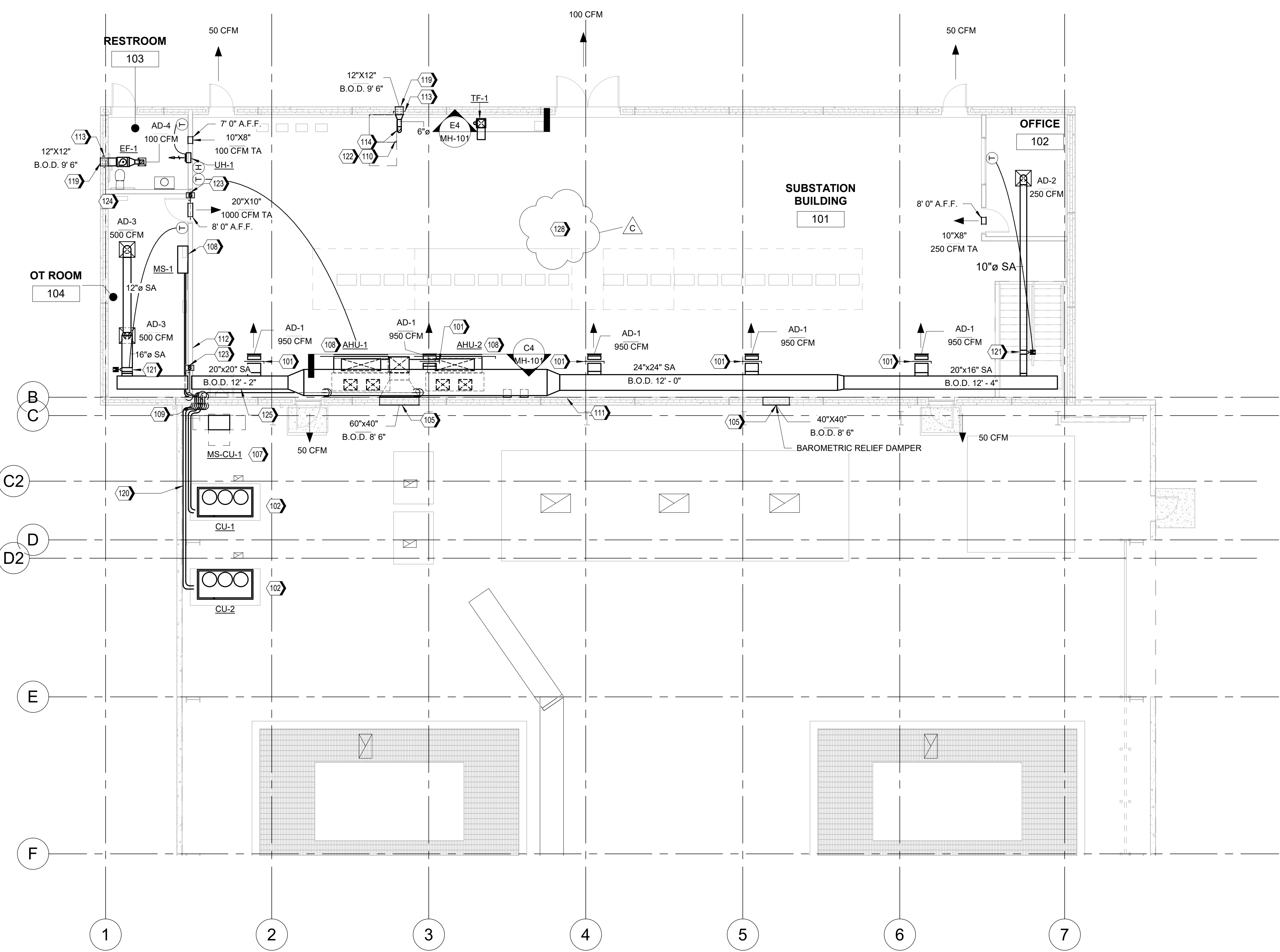
KEYED NOTES

- 101 PROVIDE VOLUME DAMPER.
- 102 PROVIDE 6" HOUSE KEEPING PAD THAT EXTENDS 6" BEYOND ALL SIDES OF THE UNIT.
- 104 PROVIDE STAINLESS STEEL MESH COVER.
- 105 PROVIDE EXTERIOR WALL LOUVER.
- 106 DUCT FROM EF-2 ABOVE TERMINATING IN BIRD MESH.
- 107 CONDENSING UNIT TO BE WALL MOUNTED.
- 108 ROUTE CONDENSATE TO NEAREST FD-1. RE: 1/P-101 FOR FD-1 LOCATIONS.
- 109 PENETRATIONS TO BE GROUPED TO MINIMIZE PENETRATION SIZE. LINES SPACED OUT ON DRAWING FOR CLARITY.
- 110 BATTERY RACK WITH INTEGRAL FAN AND H2 MONITORING.
- 111 INSTALL AHU VFDs ON WALL.
- 112 INSTALL NAE CONTROLLER IN SOUTHWEST CORNER OF SWITCHGEAR ROOM.
- 113 PROVIDE BACKDRAFT DAMPER.
- 114 PROVIDE DUCT CONNECTION FROM BATTERY AND CHARGER ENCLOSURE.
- 115 WATER DETECTION SENSOR INSTALLED AT FLOOR LEVEL. SENSOR TO BE CONNECTED INTO SCADA.
- 116 PROVIDE MESH SCREEN DIRECTLY ON UNIT RETURN.
- 117 APPROXIMATE LOCATION OF VFD FOR AHU-1. MOUNT 48" A.F.F. COORDINATE WITH ELECTRICAL EQUIPMENT.
- 118 APPROXIMATE LOCATION OF VFD FOR AHU-2. MOUNT 48" A.F.F. COORDINATE WITH ELECTRICAL EQUIPMENT.
- 119 PROVIDE EXTERIOR WALL LOUVER WITH BUG SCREEN.
- 120 EACH DUAL CIRCUIT CONDENSING UNIT TO BE PIPED WITH TWO REFRIGERANT LOOP IS ONLY SHOWN FOR CLARITY. ALL EXTERIOR REFRIGERANT PIPING MUST BE INSULATED WITH AN ALUMINUM JACKET. SIZE PIPE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 121 THERMOSTAT TO CONTROL OPERATION OF MOTORIZED DAMPER. REFER TO CONTROL DRAWINGS FOR ADDITIONAL INFORMATION.
- 122 PRE-MANUFACTURED BATTERY ENCLOSURE WITH FAN AND HYDROGEN DETECTOR. COORDINATE VENTILATION REQUIREMENTS WITH MANUFACTURER.
- 123 CONNECT SMOKE DAMPERS TO FIRE ALARM SYSTEM.
- 124 CONTRACTOR TO DESIGN, PROVIDE AND INSTALL NOVEC 1230 FIRE SYSTEM OR APPROVED EQUAL IN OT ROOM.
- 125 MINIMUM 14" CLEARANCE FROM WALL.
- 126 MOTORIZED CONTROL DAMPERS ON RETURN AND OUTSIDE AIR CONNECTION TO ECONOMIZER.
- 127 MOTORIZED CONTROL DAMPERS ON SUPPLY AIR CONNECTION TO ECONOMIZER TO ISOLATE IDLE UNIT.
- 128 DESIGN, PROVIDE AND INSTALL FIRE PROTECTION SYSTEM IN BALANCE OF BUILDING (ALARMS AND BEACONS) PER NFPA 72. CONNECT AND INSTALL OWNER-PROVIDED FIRE ALARM PANEL.

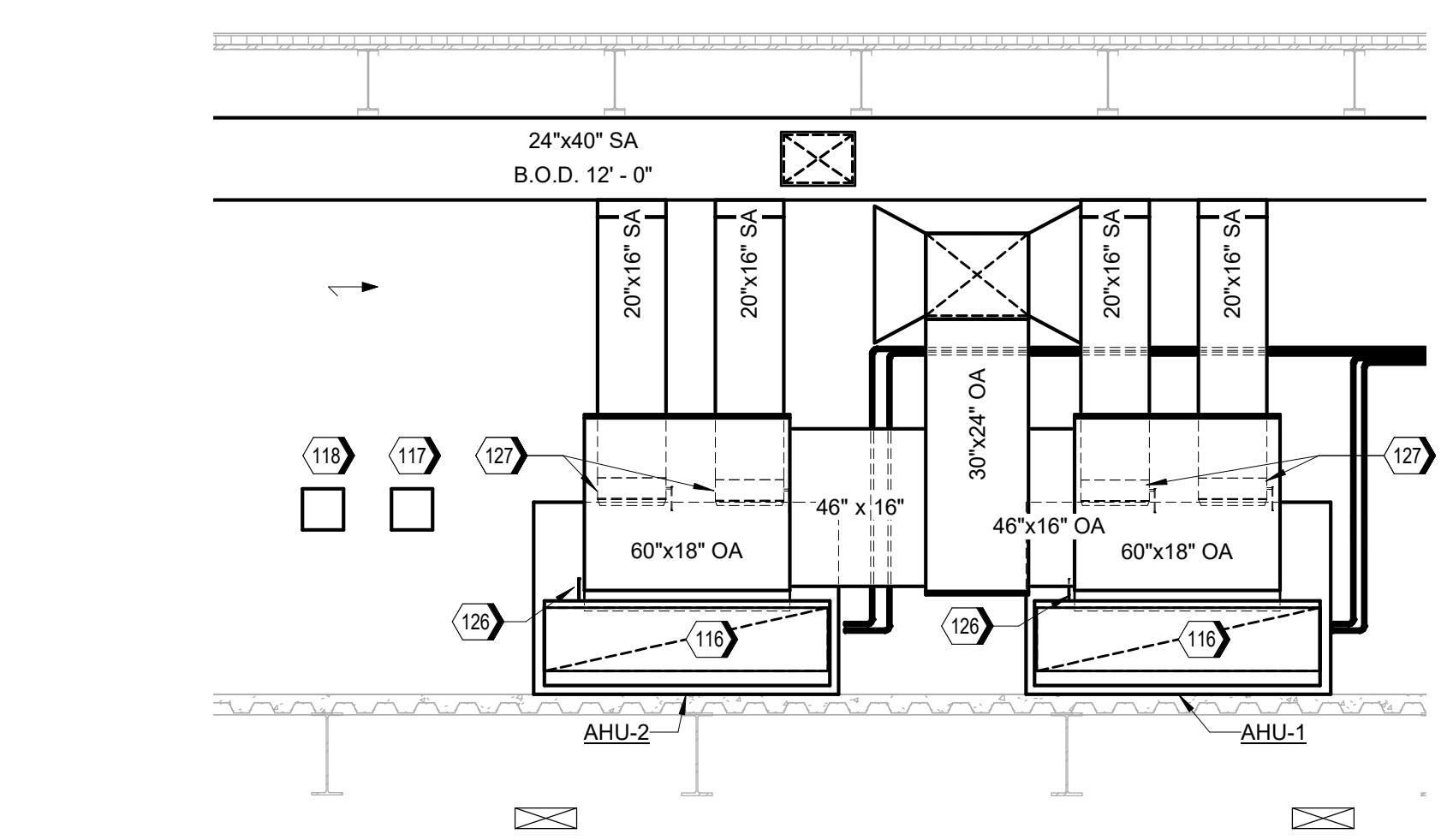
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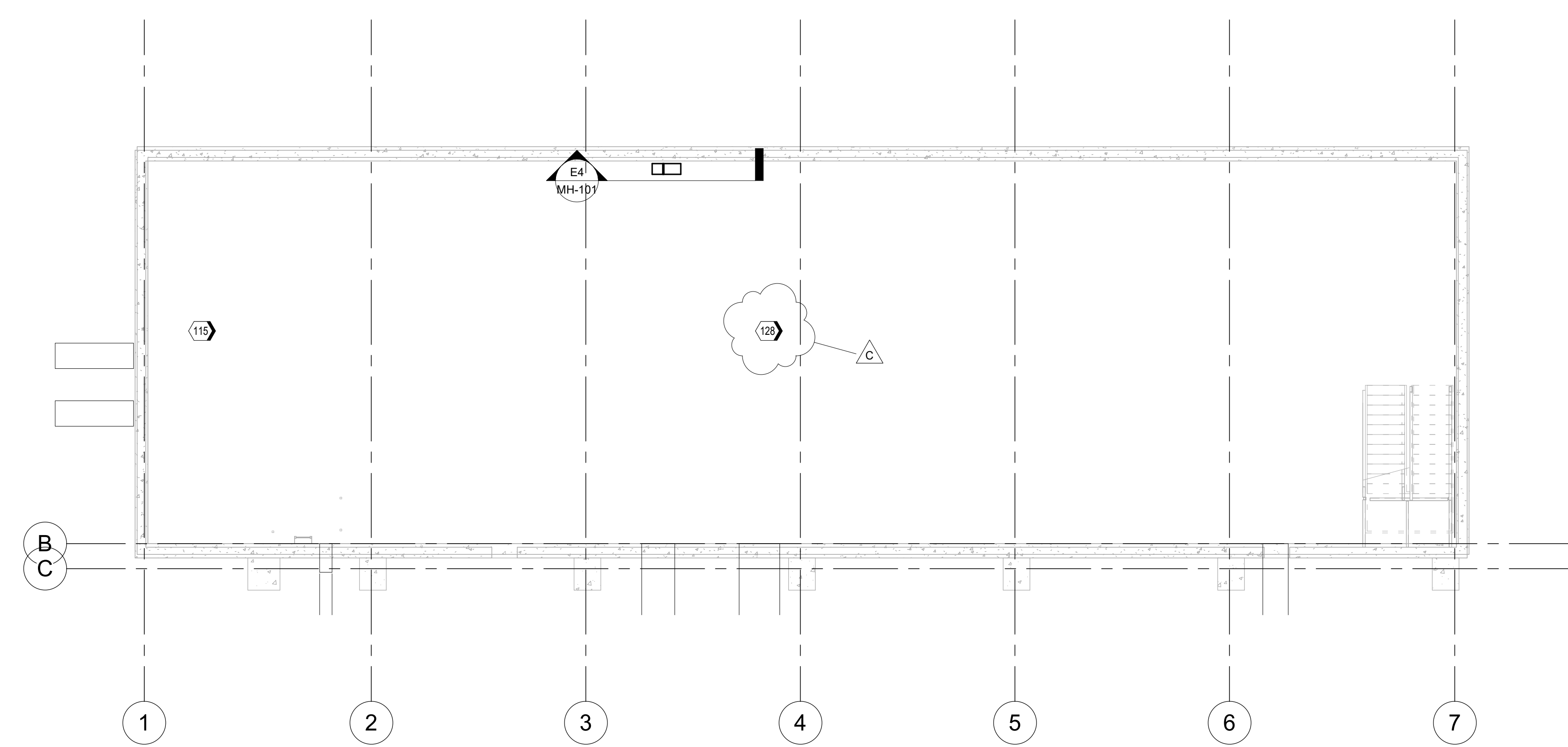
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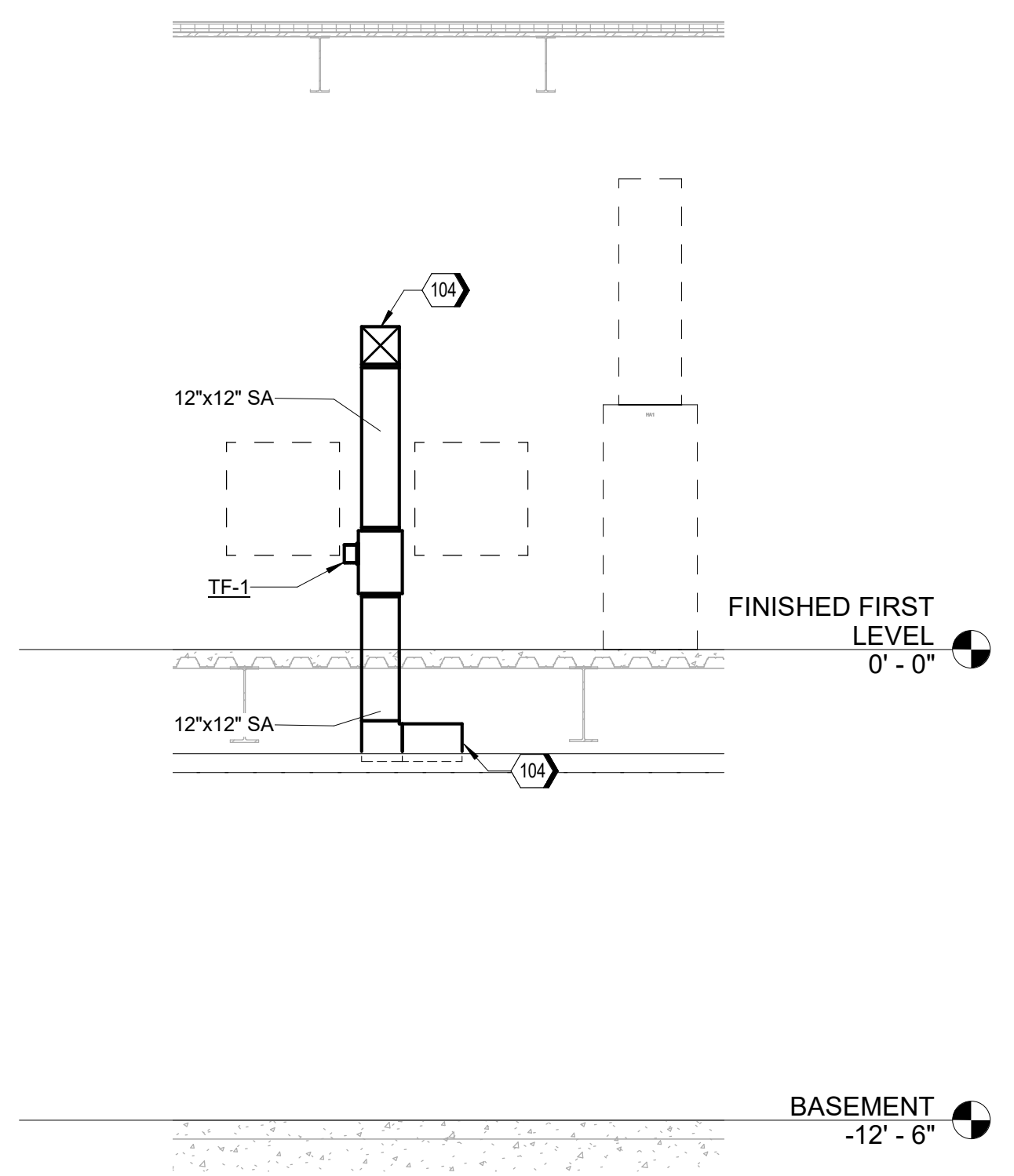
C1 FLOOR PLAN - LEVEL 1
 SCALE 1/8" = 1'-0"



C4 AHU-1 AND AHU-2 SECTION VIEW
 SCALE 1/4" = 1'-0"



E1 FLOOR PLAN - BASEMENT
 SCALE 1/8" = 1'-0"



E4 EF-2 SECTION VIEW
 SCALE 1/4" = 1'-0"



NO.	DATE	REVISION	CHK	APP'D	APPROVAL
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Project Title: **ELECTRICAL INTERCONNECT AND SUBSTATION**
 Drawing Title: **HVAC FLOORPLAN**

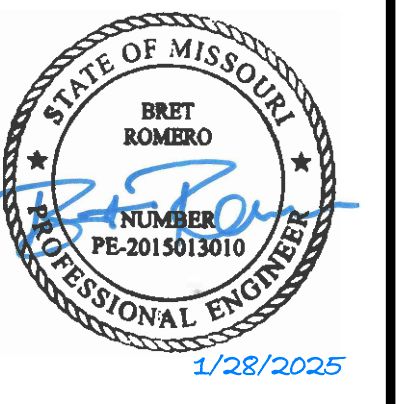
Date: 1/28/25
 Proj. No.: D3750400
 Drawing No.: MH-101

CONTRACTOR TO COORDINATE CONTROL REQUIREMENTS AND RESPONSIBILITIES WITH UNIVERSITY OF MISSOURI PRIOR TO CONSTRUCTION

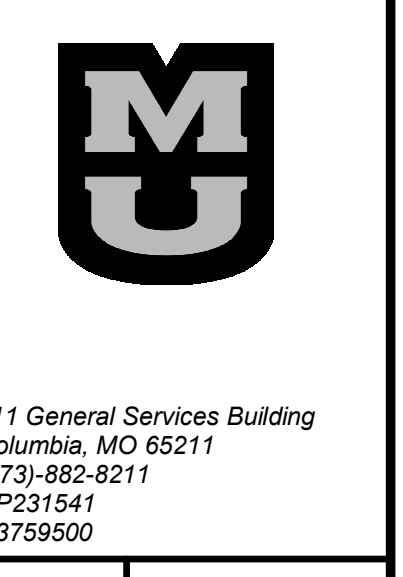
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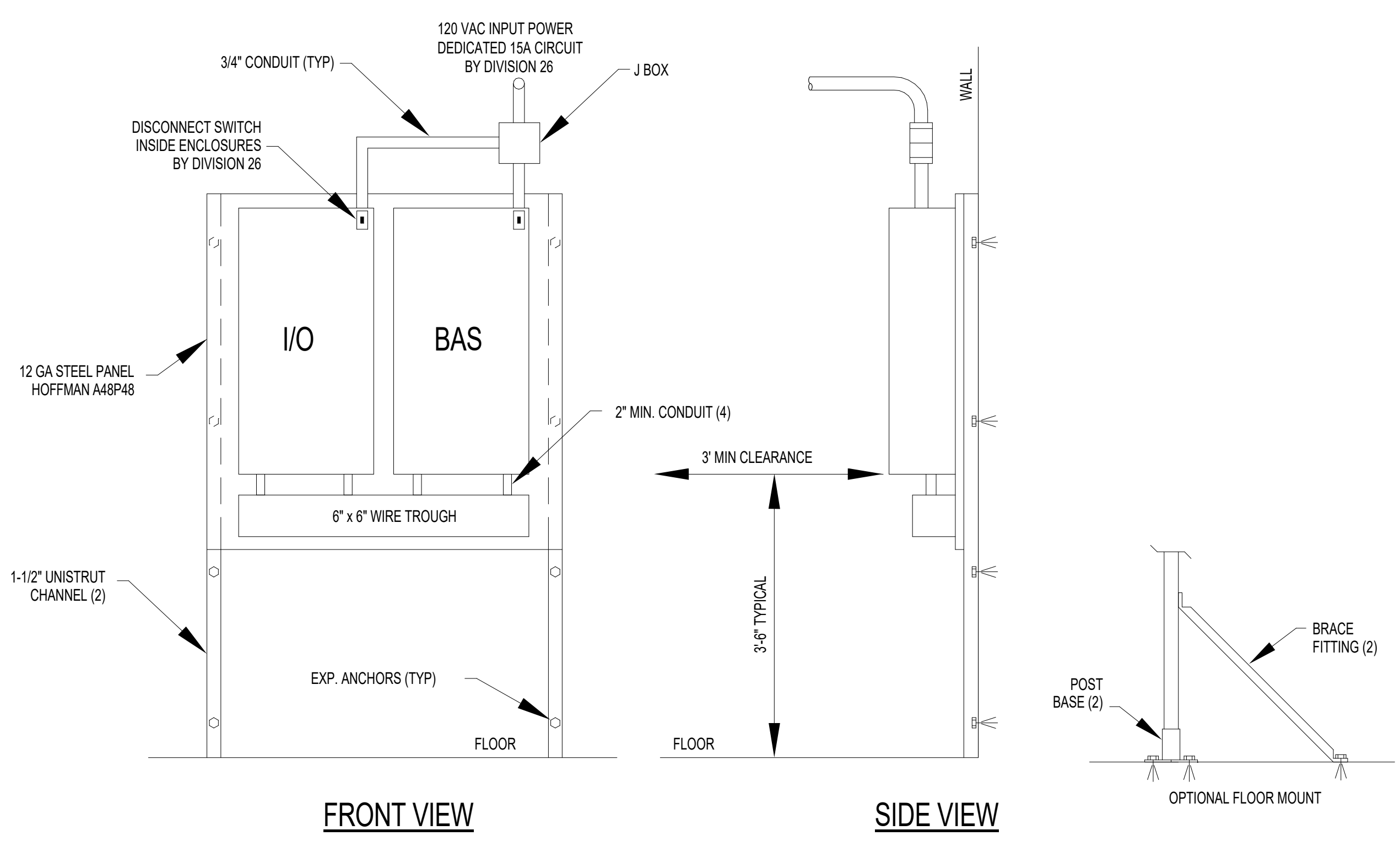
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2	1/28/25					
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4	1/28/25					
5	1/28/25					
6	1/28/25					
7	1/28/25					
8	1/28/25					
9	1/28/25					
10	1/28/25					



Project Title:
ELECTRICAL INTERCONNECT AND SUBSTATION

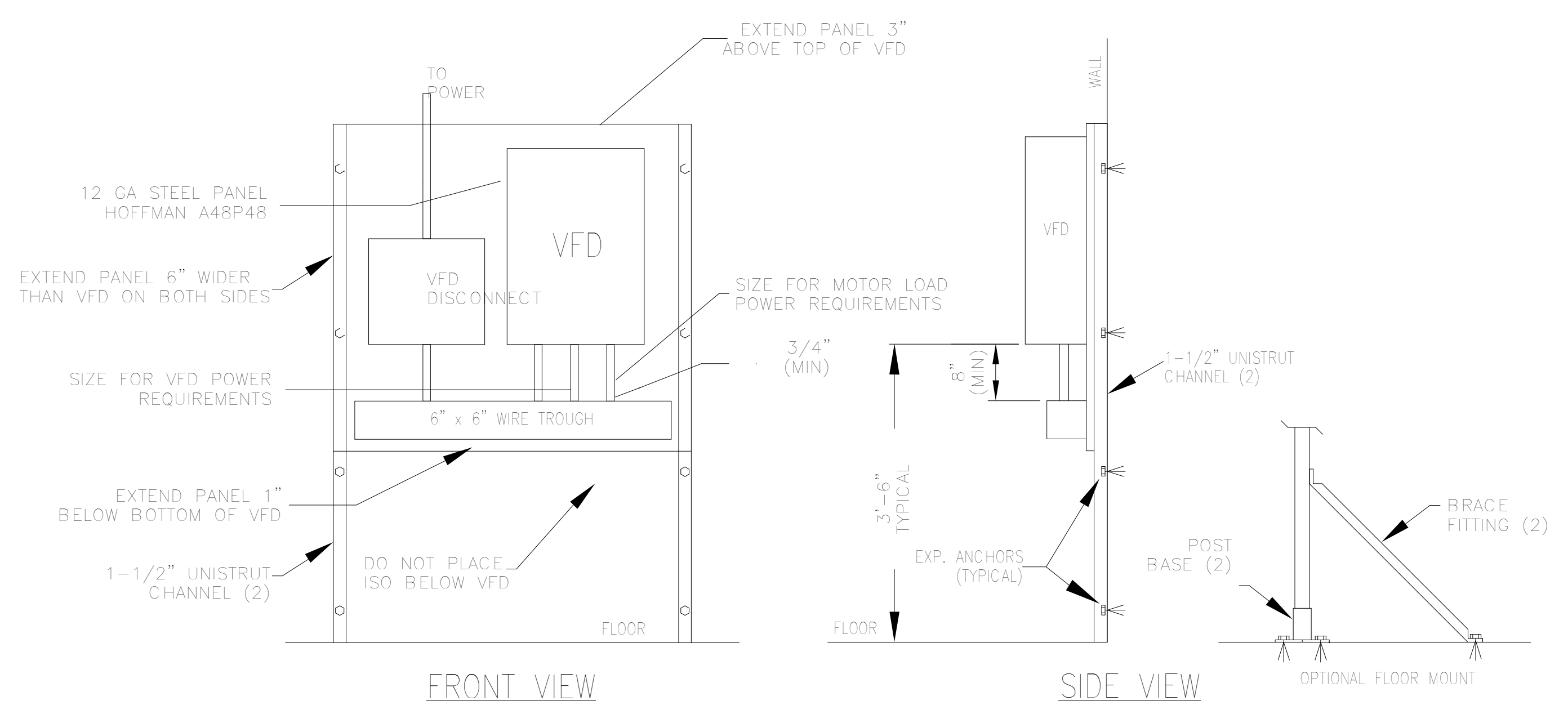
Drawing Title:
HVAC CONTROLS

Date: 1/28/25
 Proj. No.: D3750400
 Drawing No.: MH-103



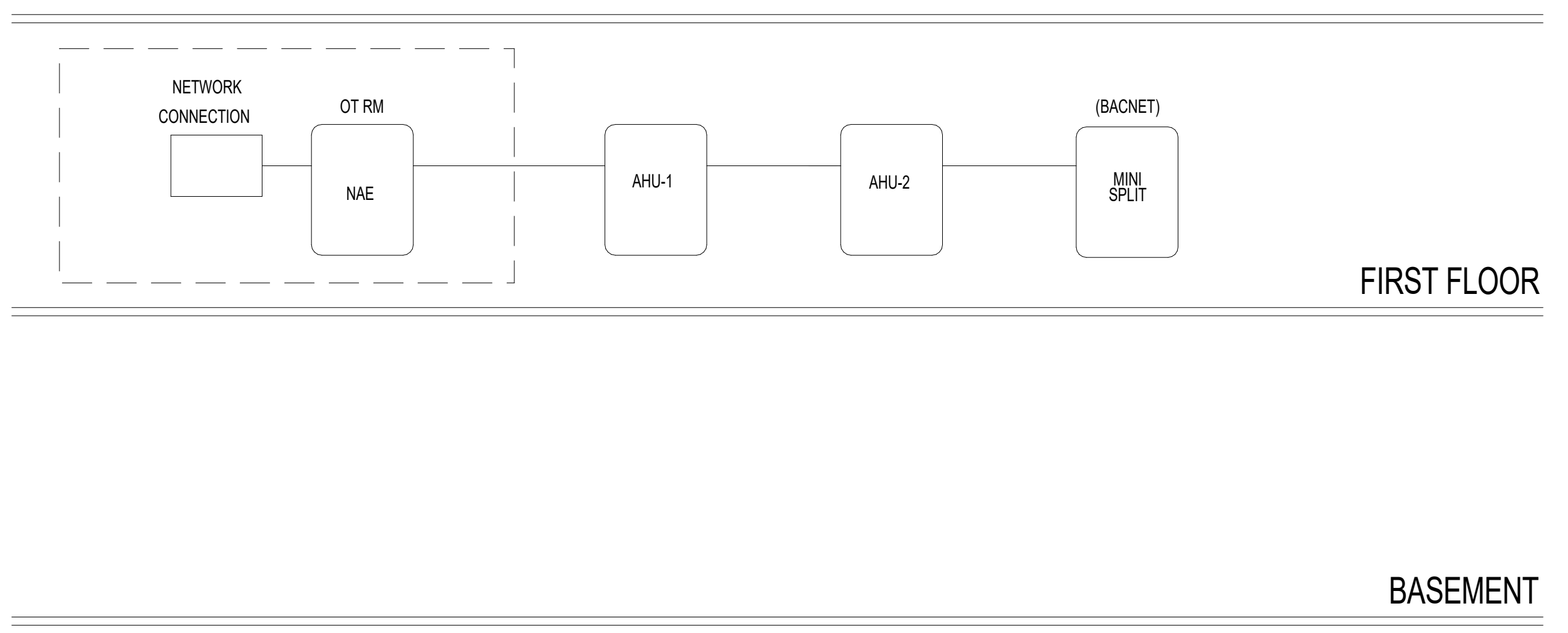
- NOTES:**
- BAS CONTROLLERS AND CABINET ARE SUPPLIED BY OWNER AND MOUNTED BY CONTRACTOR. I/O CABINET AND COMPONENTS PROVIDED BY CONTRACTOR.
 - KEEP ALL LOW VOLTAGE CONTROL WIRING (UNDER 25V) AND LOW VOLTAGE POWER WIRING (OVER 25V) SEPARATED. (RUN IN SEPARATE CONDUIT).
 - PANEL SIZE IS BASED ON THE NUMBER OF CONTROLLERS IN EACH LOCATION. USE MULTIPLE A48P48 PANELS AS REQUIRED. COORDINATE OVERALL SIZE WITH OWNERS REPRESENTATIVE.

C1 ASC PANEL MOUNTING STEEL
 SCALE: NTS



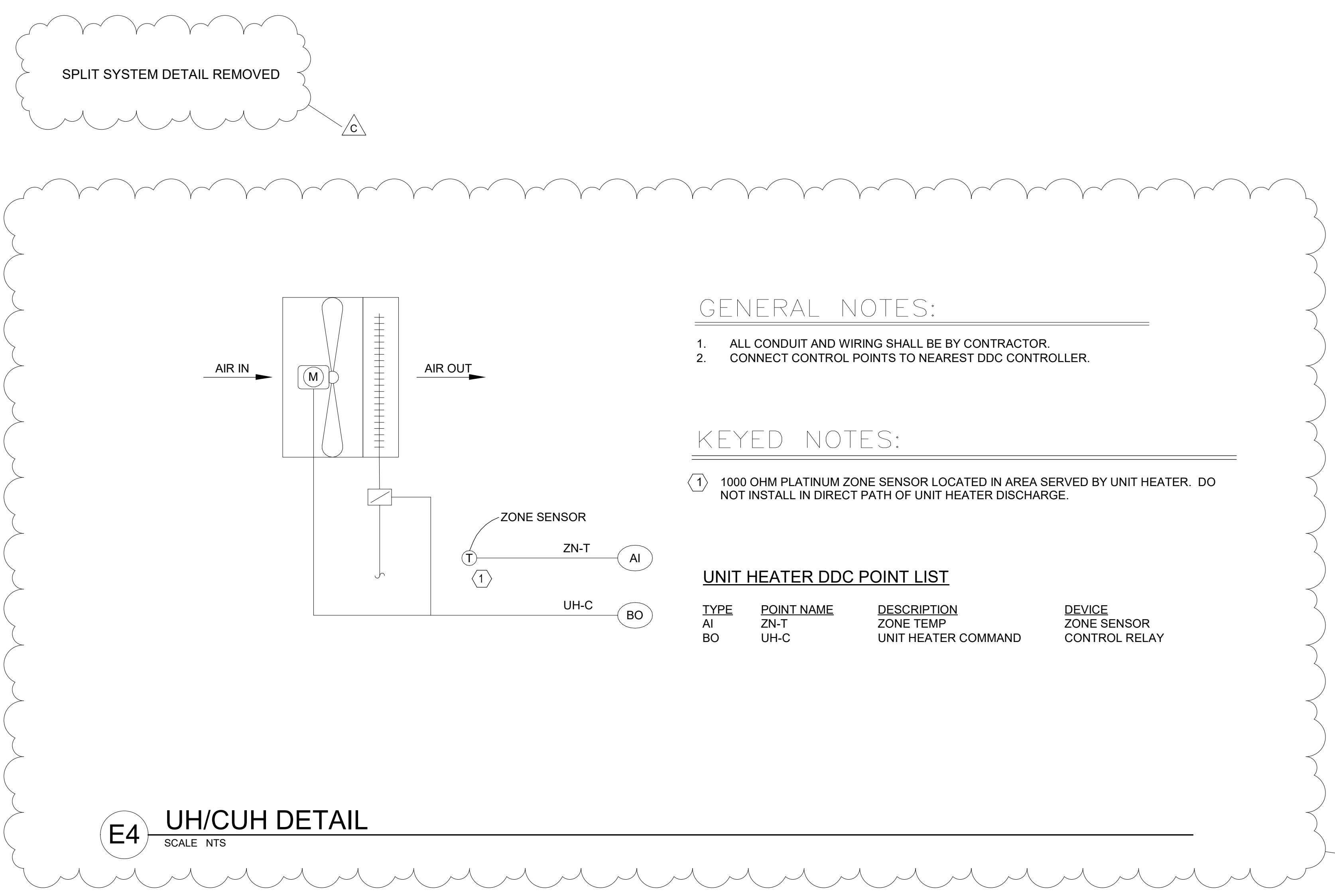
- FRONT VIEW**
- NOTES:**
- VARIABLE FREQUENCY DRIVE (VFD) IS PROVIDED AND INSTALLED BY CONTRACTOR.
 - KEEP ALL LOW VOLTAGE CONTROL WIRING (UNDER 25V) AND HIGH VOLTAGE POWER WIRING (OVER 25V) SEPARATED. (RUN IN SEPARATE CONDUIT).
 - PANEL SIZE IS BASED ON ONE VFD IN EACH LOCATION. FOR MULTIPLE VFD'S, COORDINATE WITH OWNER'S REPRESENTATIVE.
 - POWER TO DRIVE AND LEADS TO MOTOR MUST BE IN SEPARATE CONDUIT.
 - INSTALL ISO TRANSFORMER IF REQUIRED.
 - DO NOT PLACE ISO TRANSFORMER BELOW VFD.
 - IF REMOTE SERVICE DISCONNECT IS REQUIRED IT MUST BE HARDWIRED TO VFD SAFETY CIRCUIT TO SHUT DOWN DRIVE IF DISCONNECT IS OPENED.

C4 VFD MOUNTING DETAIL
 SCALE: NTS



- NOTES:**
- FC BUS TO BE CONTINUOUS DAISY CHAIN WITHOUT SPLICES. CONNECTIONS CAN ONLY BE MADE AT CONTROLLERS. SEE PLANS FOR QUANTITY AND LOCATIONS OF AHU CONTROLLERS. LOCATE PANELS IN SAME ROOM AS EQUIPMENT SERVED.
 - FC COMMUNICATION BUS WIRE SHALL BE 22 AWG, PLENUM RATED, TWISTED SHIELDED, 3 CONDUCTOR, WITH BLUE OUTER CASING, DESCRIBED AS 22-03 OAS STR PLNM NEON BLU JK DISTRIBUTED BY WINDY CITY WIRE. CONSTRUCTED BY CABLE-TEK, OR APPROVED EQUIVALENT.
 - COORDINATE FINAL ROUTING WITH OWNERS REPRESENTATIVE.

E1 FC COMMUNICATIONS
 SCALE: NTS



- GENERAL NOTES:**
- ALL CONDUIT AND WIRING SHALL BE BY CONTRACTOR.
 - CONNECT CONTROL POINTS TO NEAREST DDC CONTROLLER.
- KEYED NOTES:**
- ① 1000 OHM PLATINUM ZONE SENSOR LOCATED IN AREA SERVED BY UNIT HEATER. DO NOT INSTALL IN DIRECT PATH OF UNIT HEATER DISCHARGE.
- UNIT HEATER DDC POINT LIST**
- | TYPE | POINT NAME | DESCRIPTION | DEVICE |
|------|------------|---------------------|---------------|
| AI | ZN-T | ZONE TEMP | ZONE SENSOR |
| BO | UH-C | UNIT HEATER COMMAND | CONTROL RELAY |

E4 UH/CUH DETAIL
 SCALE: NTS



NO.	DATE	DESIGN	DR	AUTHOR	CHECKER	APPROVED
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2	1/21/25	ADVENTURUS				
3	1/13/25	ADVENTURUS				



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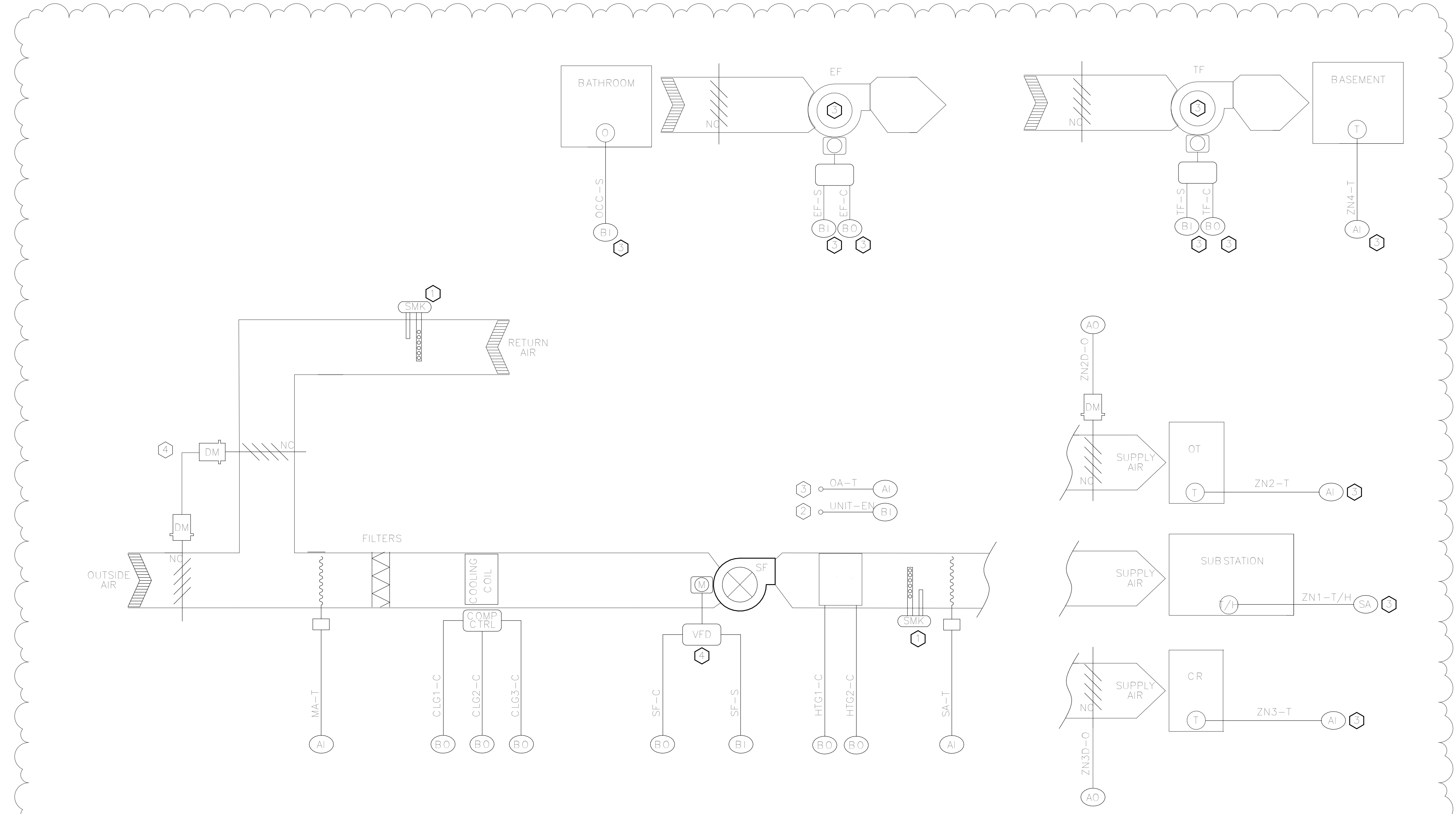
Project Title:
ELECTRICAL INTERCONNECT AND SUBSTATION
Drawing Title:
HVAC CONTROLS

Date: 1/28/25

Proj. No.: D3750400

Drawing No.: MH-104

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AH-1 & AH-2 SYSTEM DDC POINTS LIST
PANEL LOCATION: MECH ROOM

TYPE	POINT NAME	DESCRIPTION	DEVICE	UNIT TAG
AI	OA-T	OUTSIDE AIR TEMP	RTD/DUCT AVERAGING	N/A
AI	MA-T	MIXED AIR TEMP	RTD/DUCT AVERAGING	N/A
AI	SA-T	SUPPLY AIR TEMP	RTD/DUCT AVERAGING	N/A
AI	ZN2-T	OT TEMPERATURE	RTD/DUCT AVERAGING	N/A
AI	ZN3-T	CR TEMPERATURE	RTD/DUCT AVERAGING	N/A
AI	ZN4-T	BASEMENT TEMPERATURE	RTD/DUCT AVERAGING	N/A
SA	ZN1-T/H	SUBSTATION TEMP/HUMIDITY	ZONE TEMP SENSOR	N/A
AO	ZN2D-O	OT ROOM DAMPER OUTPUT	SA BUS STAT	N/A
AO	ZN3D-O	CR ROOM DAMPER OUTPUT	ELECT ACTUATOR W/ SPRING RTN	N/A
BI	SF-S	SUPPLY FAN STATUS	ELECT ACTUATOR W/ SPRING RTN	N/A
BI	TF-S	TRANSFER FAN STATUS	CURRENT SWITCH	N/A
BI	EF-S	EXHAUST FAN STATUS	CURRENT SWITCH	N/A
BI	UNIT-EN	UNIT ENABLE SWITCH	CURRENT SWITCH	N/A
BI	OCC-S	OCCUPANCY STATUS	MANUAL TOGGLE SWITCH	N/A
RO	SF-C	SUPPLY FAN COMMAND	OCCUPANCY SENSOR	N/A
RO	TF-C	TRANSFER FAN COMMAND	UNIT TERMINAL STRIP	G
RO	EF-C	EXHAUST FAN COMMAND	UNIT TERMINAL STRIP	N/A
RO	CLG1-C	COOLING STAGE 1 COMMAND	CONTROL RELAY	N/A
RO	CLG2-C	COOLING STAGE 2 COMMAND	CONTROL RELAY	N/A
RO	CLG3-C	COOLING STAGE 3 COMMAND	UNIT TERMINAL STRIP	Y1
RO	HTG1-C	HEATING STAGE 1 COMMAND	UNIT TERMINAL STRIP	Y2
RO	HTG2-C	HEATING STAGE 2 COMMAND	UNIT TERMINAL STRIP	Y3
RO			UNIT TERMINAL STRIP	W1
RO			UNIT TERMINAL STRIP	W2

KEYED NOTES:

- 1. WIRED TO SHUT DOWN UNIT.
- 2. PROVIDE TOGGLE SWITCH AT AHU CONTROL ENCLOSURE TO ENABLE/DISABLE AHU.
- 3. AHU-1 ONLY.
- 4. TO BE CONTROLLED BY ON BOARD CONTROLLER.

GENERAL NOTES:

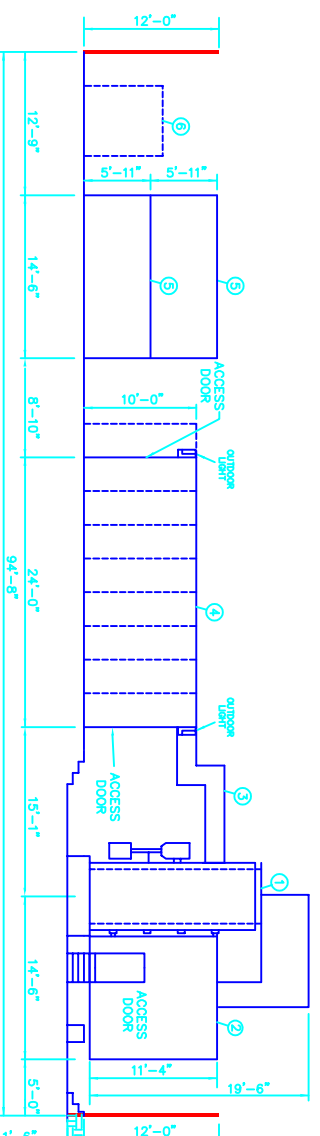
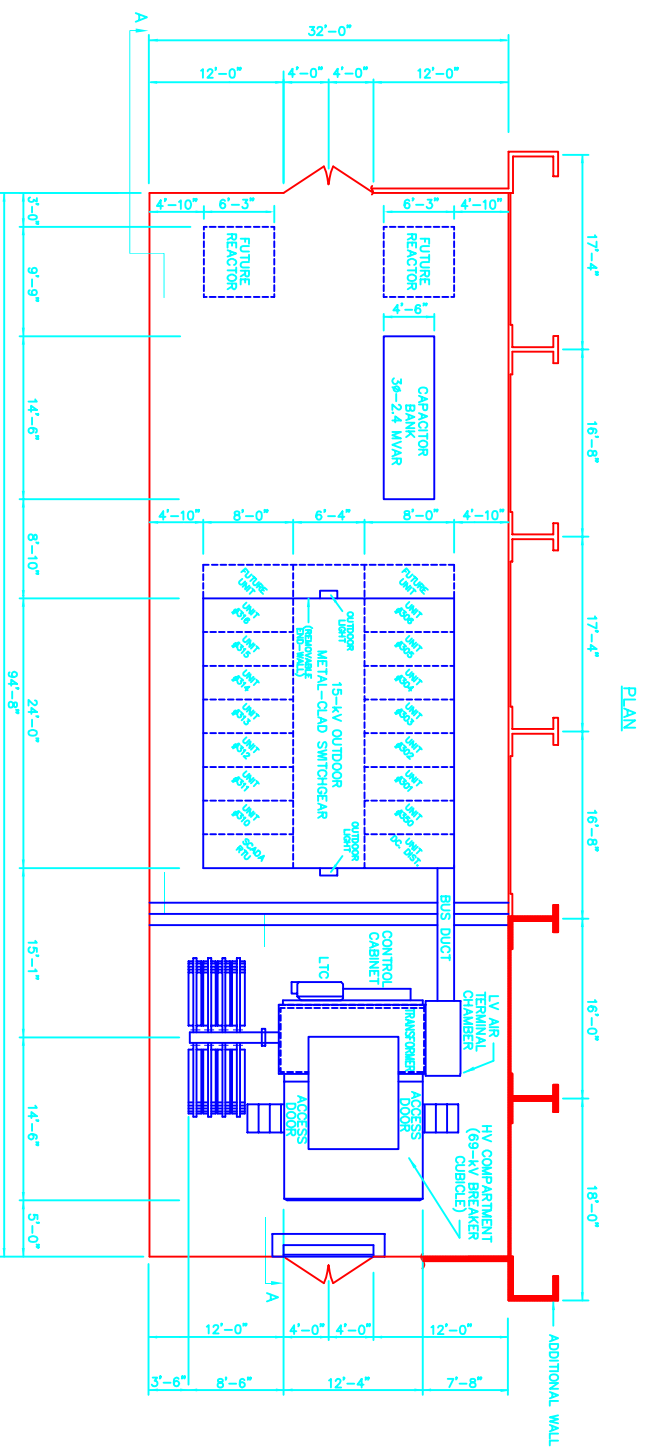
- 1. SEE SPECIFICATIONS FOR DEVICE SPECIFICATIONS.
- 2. ANY DEVICE REQUIRING POWER MUST BE POWERED BY CONTRACTOR.
- 3. POINTS WITH A UNIT TAG TO BE CONNECTED TO ONBOARD CONTROLLER TERMINAL STRIP, NOT DIRECTLY TO DEVICE.

E1 AHU RETURN FAN

SCALE NTS

ITEM NO.	DESCRIPTION
①	89-13.8KV POWER TRANSFORMER - (TO BE FURNISHED BY OTHERS)
②	HV COMPARTMENT (89-KV BREAKER CUBICLE - TO BE FURNISHED BY OTHERS)
③	15-KV BUS DUCT
④	15-KV OUTDOOR METAL-CLAD SWITCHGEAR
⑤	34-24 MWAR CAPACITOR BANK
⑥	FUTURE REACTOR

BILL OF MATERIAL



FOR REFERENCE ONLY



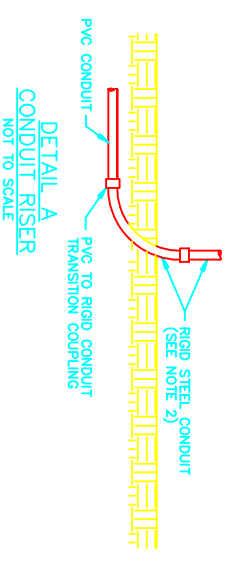
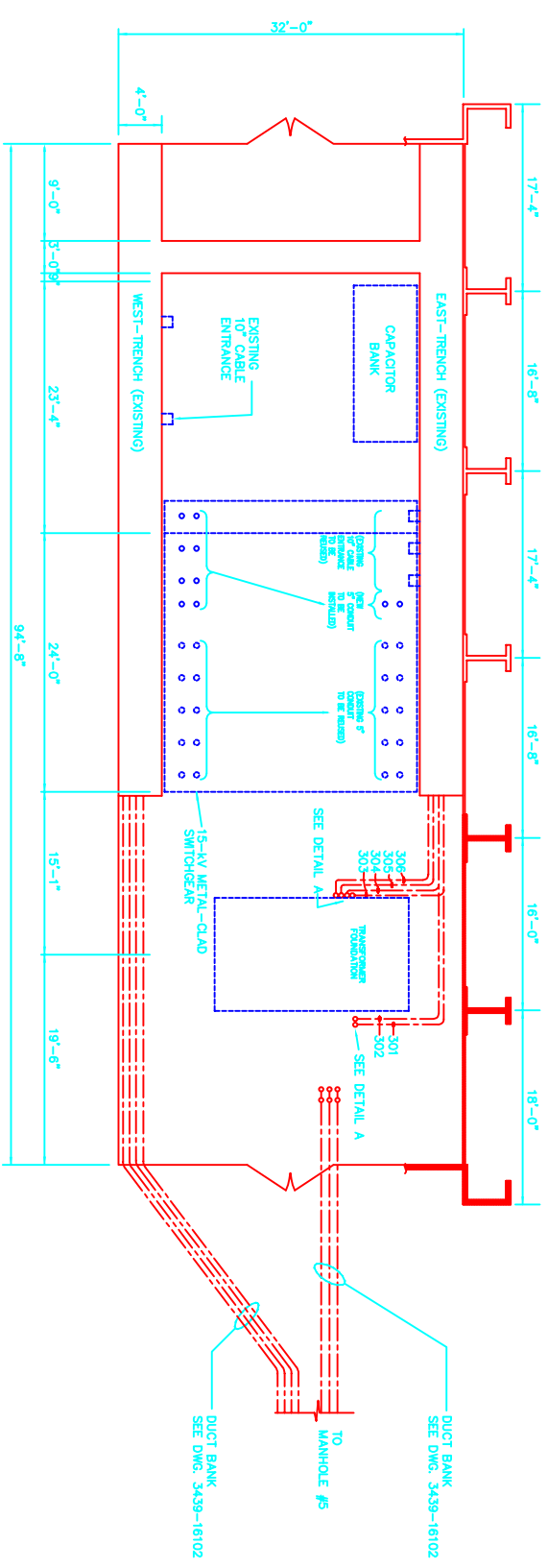
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STATE OF MISSOURI				A 11-07-94			
REV. DATE				DESCRIPTION			
1 04-08-97				RECORD DRAWING			
0 12-05-94				ISSUED FOR CONSTRUCTION			
A 11-07-94				ISSUED FOR APPROVAL			
BY	CHKD.	DATE	REV.	BY	CHKD.	DATE	REV.
		12-05-94				12-05-94	1



GENERAL SITE
69KV INTERTIE TO CITY OF COLUMBIA
69-13.8 KV STADIUM RD. SUBSTATION
PLAN AND ELEVATION

PROJ. NO. 3439/UMC#930146-3
SHEET NO. 1

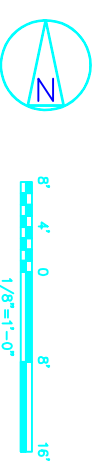


LEGEND:
 - - - - - PVC CONDUIT

- NOTES:**
1. ALL RACEWAY SHALL BE ROUTED AT LEAST 1'-0" BELOW CONCRETE FLOOR.
 2. CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT USING PVC UNLESS NOTED OTHERWISE. ALL RGS ELBOWS AND CONDUIT SHALL BE WRAPPED WITH CORROSION PROTECTIVE TAPE, SCOTCHGARD 51, INSTALLED WITH 1/2 INCH OVERLAP.
 3. ALL SPARE CONDUITS OF DUCT BANK SHALL BE PROPERLY CLEANED AND CAPPED.
 4. THE DIMENSION AND LOCATION OF EXISTING CONDUIT AND EXISTING CABLE ENTRANCE SEE DWG. 3439-4011L.

REFERENCE:

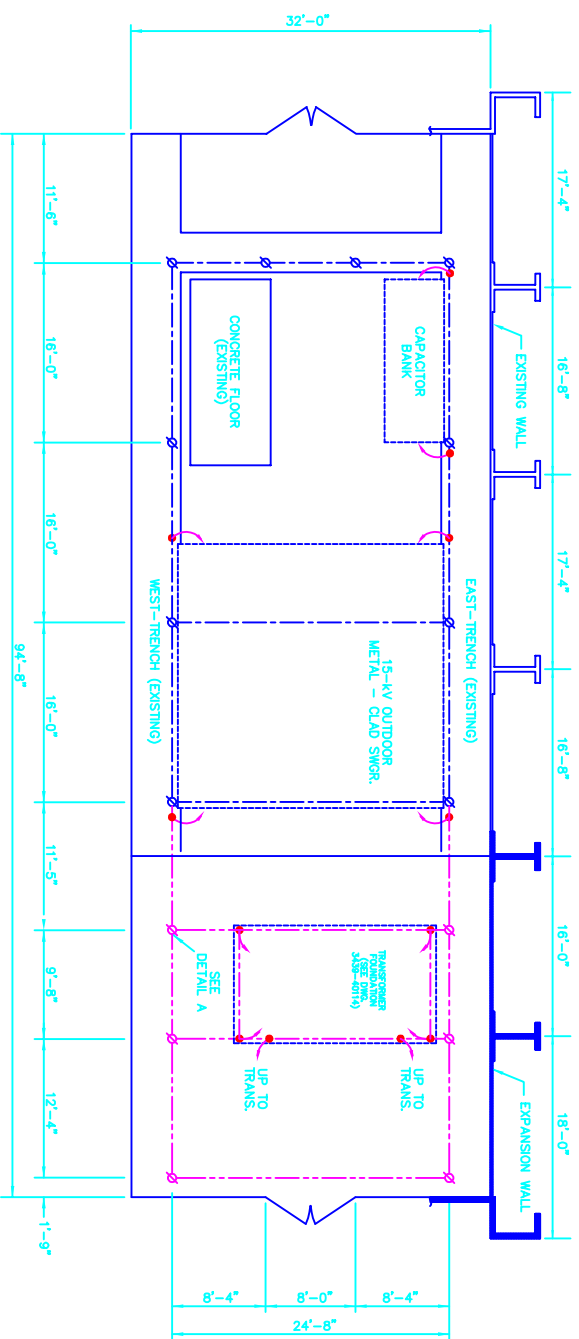
- 324SI-6 UNDERGROUND WIRING FACILITY (STADIUM RD.)
- 3439-4010I (EXISTING RACEWAY PLAN) - BY UMC
- 3439-4011I PLAN AND ELEVATIONS
- 3439-4011I FOUNDATION EXPANSION
- 3439-1610Z PLAN AND PROFILE



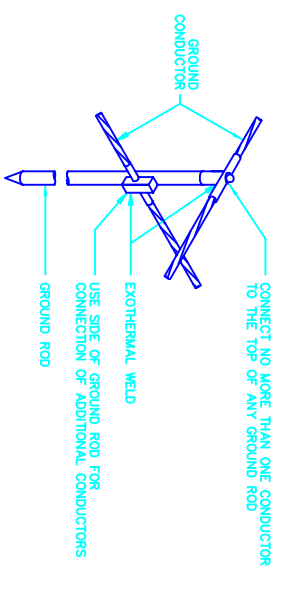
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REV.	DATE	DESCRIPTION	BY	CHKD.	
DESIGN: MCF		CHKD: DC		DATE: 12-05-94	
APPD: RCM		DATE: 12-05-94			
69kV INTERTIE TO CITY OF COLUMBIA GENERAL SITE 69-13.8 KV STADIUM RD. SUBSTATION UNDERGROUND RACEWAY PLAN AND DETAIL					
PROJ. NO.	3439/UMC#980146-3	DWG. NO.	3439-4010Z	REV.	1

FOR REFERENCE ONLY



GROUNDING PLOT PLAN



DETAIL A
GROUND GRID TO GROUND ROD
EXOTHERMAL CONNECTION
NOT TO SCALE

LEGEND:

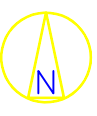
- 4/0 AWG GROUND CONDUCTOR
- Ø 5/8" x 8' GROUND ROD
- 4/0 AWG BARE COPPER STRANDED CONDUCTOR
- Ø 5/8" x 8' COPPER GROUND ROD WITH EXOTHERMAL WELD CONNECTION TO GROUND BUS
- NEW GROUND TO EQUIPMENT OR SUBSTATION STEEL 4/0 AWG BARE COPPER WITH BOLTED CONNECTION
- NEW EXOTHERMAL WELD CONNECTION

NOTES:

1. FOR DETAILS OF TRANSFORMER GROUNDING SEE TRANSFORMER FOUNDATION DWG. - 3439-40114

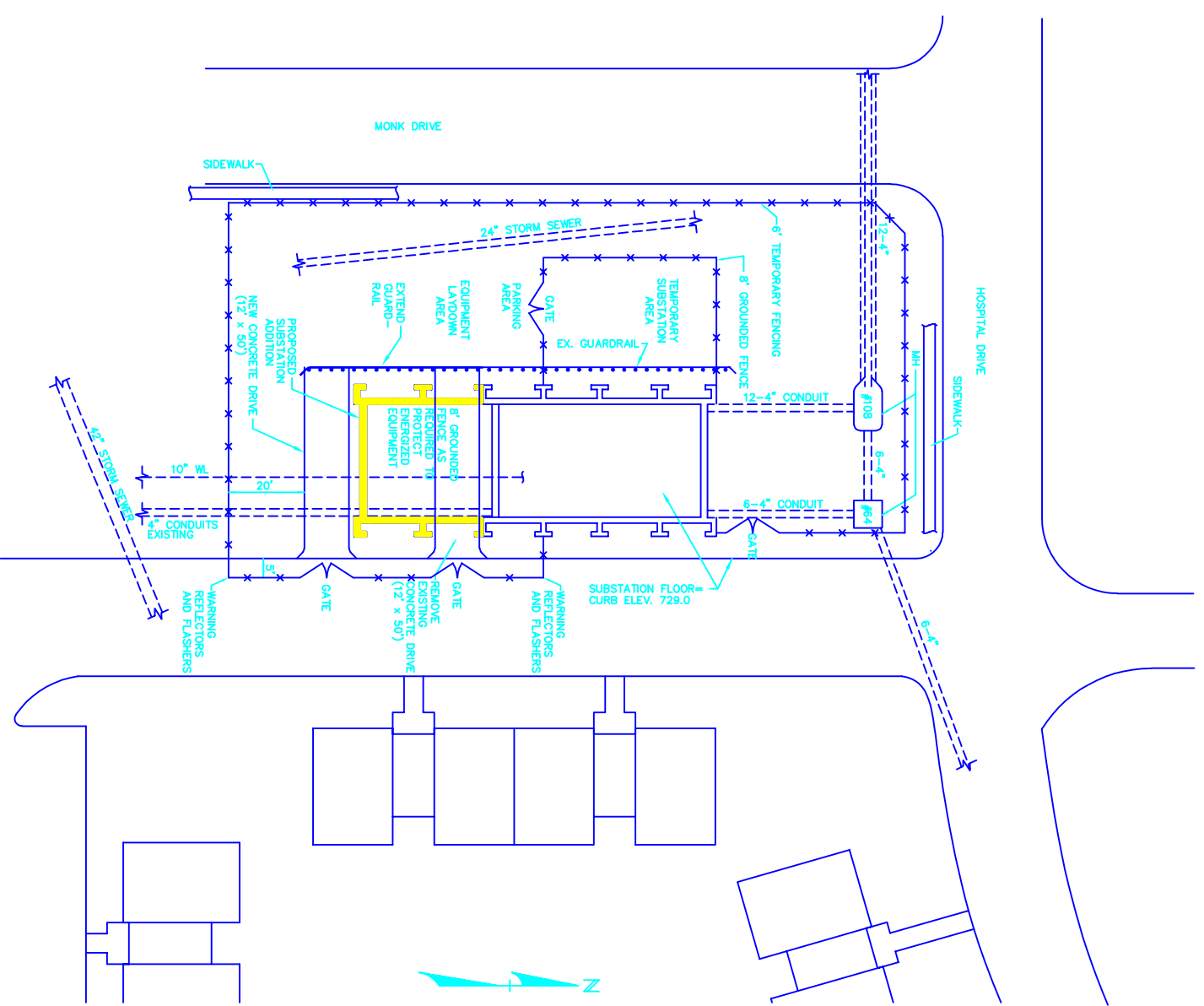
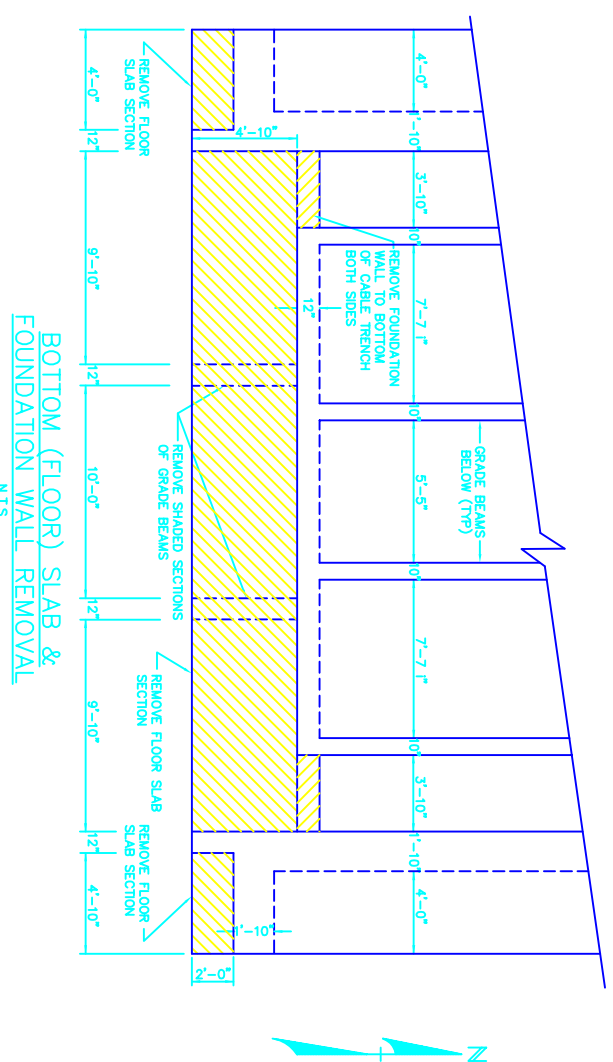
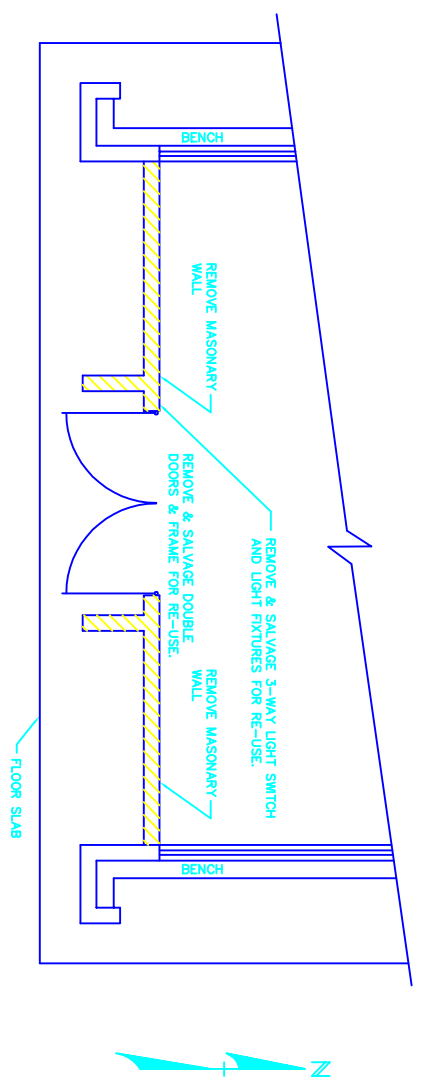
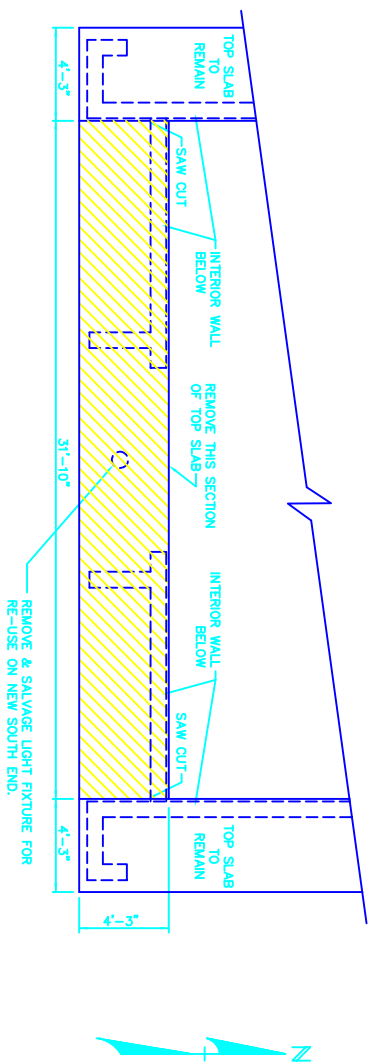
REFERENCES:

- 32451-6 UNDERGROUND WIRING FACILITY (STADIUM RD.) (EXISTING GROUNDING PLAN)
- 3439-40101 PLAN AND ELEVATIONS



FOR REFERENCE ONLY

1. Under the State Seal, the Engineer shall be responsible for the design and construction of the work shown on this drawing. The Engineer shall not be responsible for the design and construction of the work shown on this drawing if the work is not shown on this drawing.						
REV. 0 SEALED BY	RICHARD C. MILES					
NAME	RICHARD C. MILES					
NUMBER	E-18749					
STATE OF MISSOURI						
REV.	DATE	BY	CHKD.	APP'D.	DATE	DESCRIPTION
1	04-08-97					RECORD DRAWING
0	12-03-94	VA	VA			ISSUED FOR CONSTRUCTION
A	11-07-94	VA	VA			ISSUED FOR APPROVAL
GENERAL SITE 69kV INTERTIE TO CITY OF COLUMBIA 69-13.8 KV STADIUM RD. SUBSTATION GROUNDING PLAN & DETAIL						
PROJ. NO.	3439/VUC#980146-3	DWG. NO.	3439-40103	REV.	1	



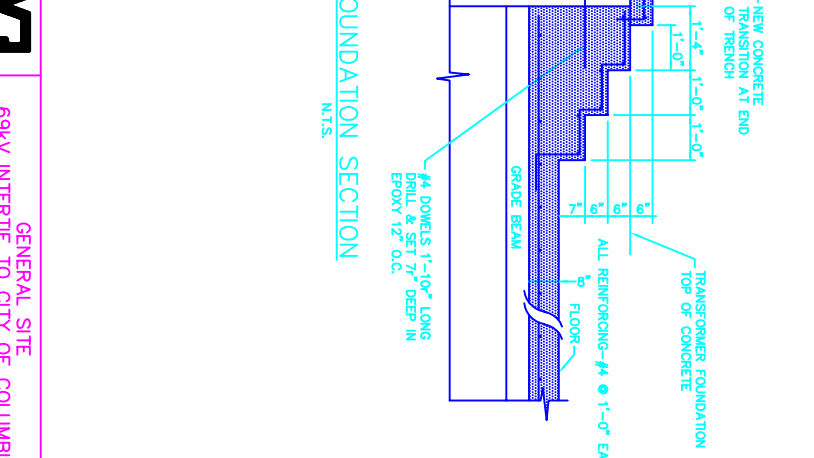
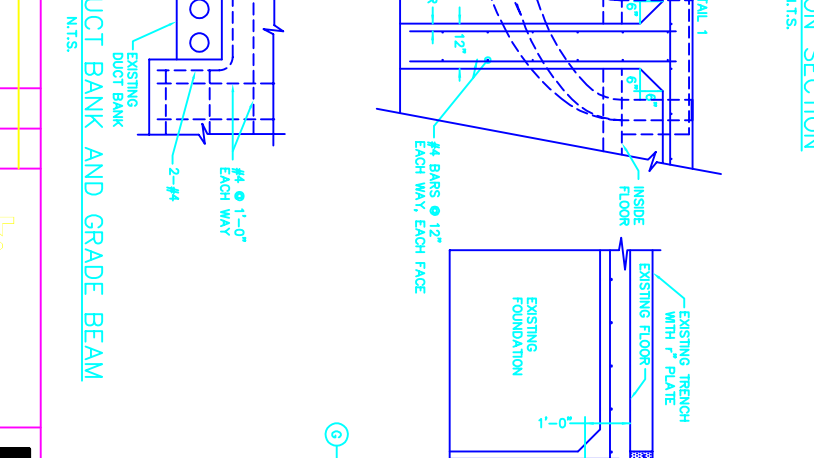
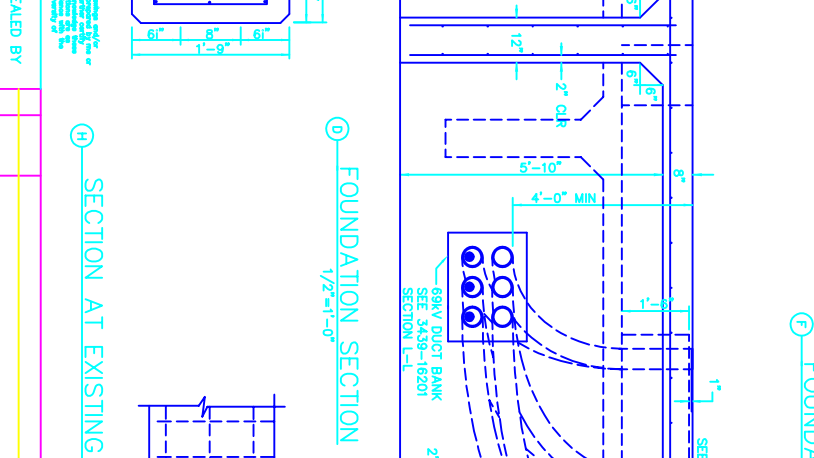
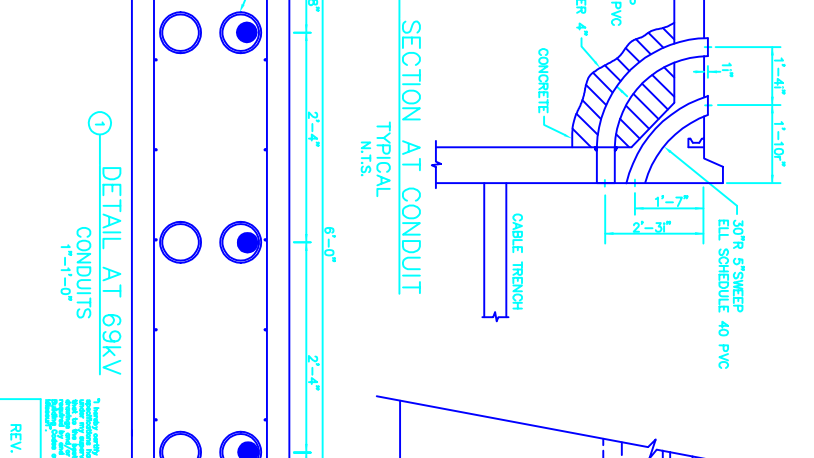
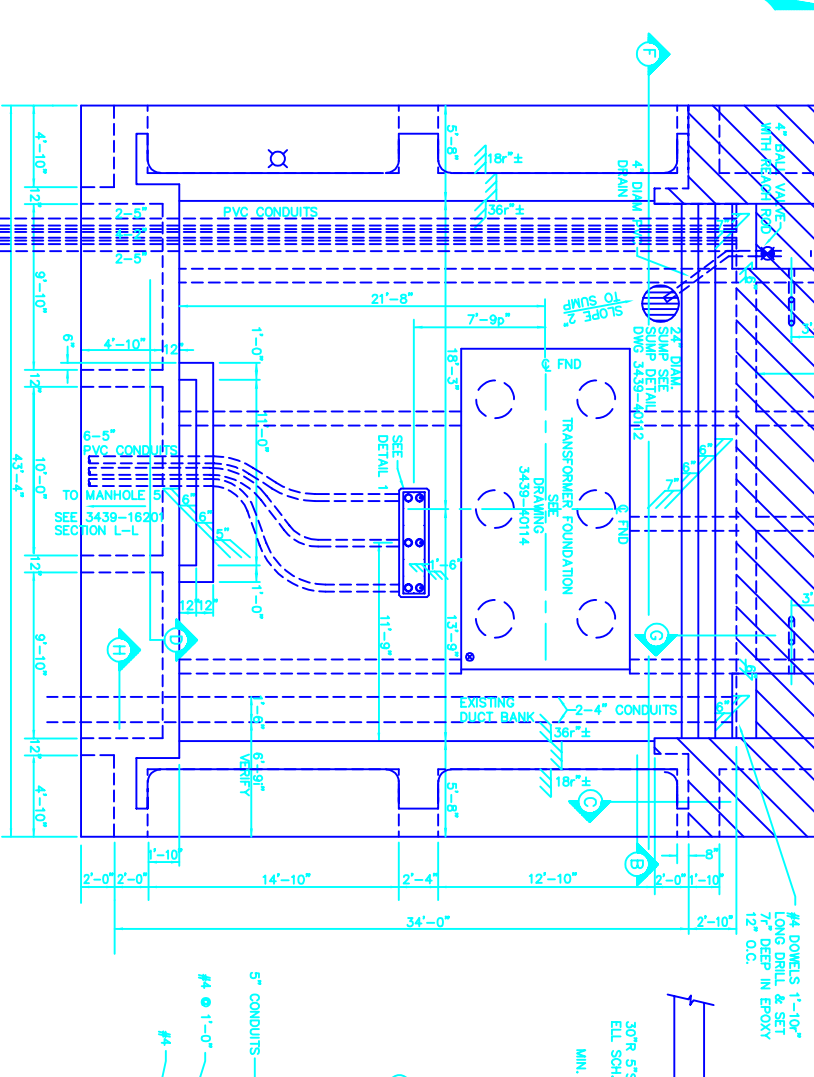
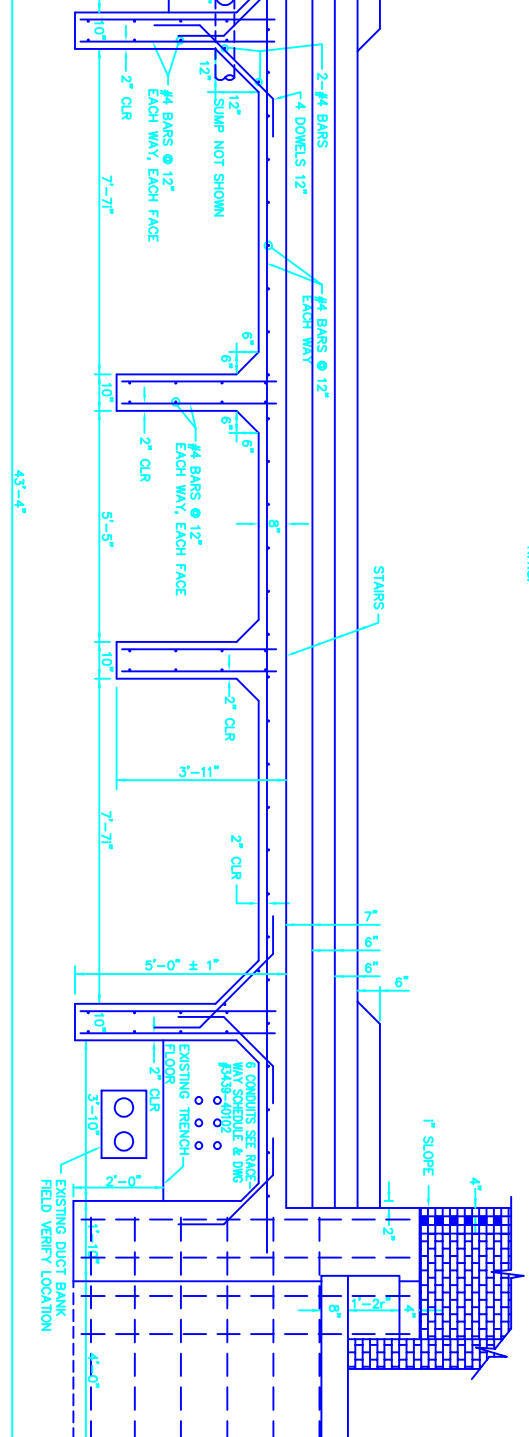
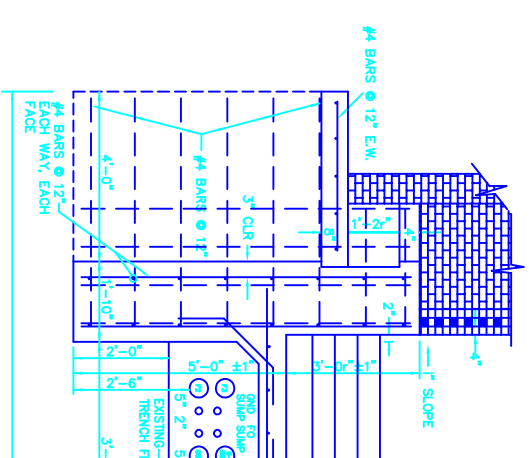
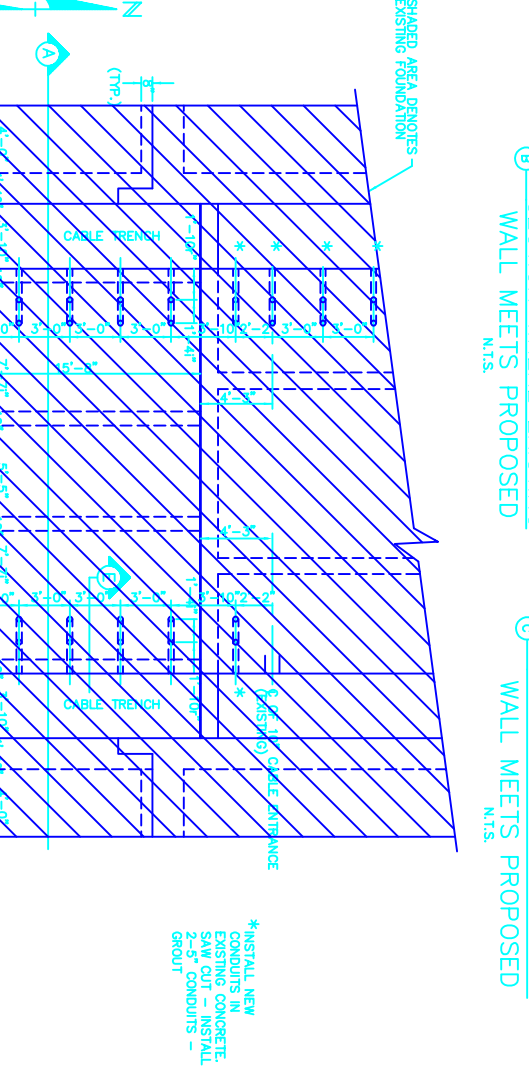
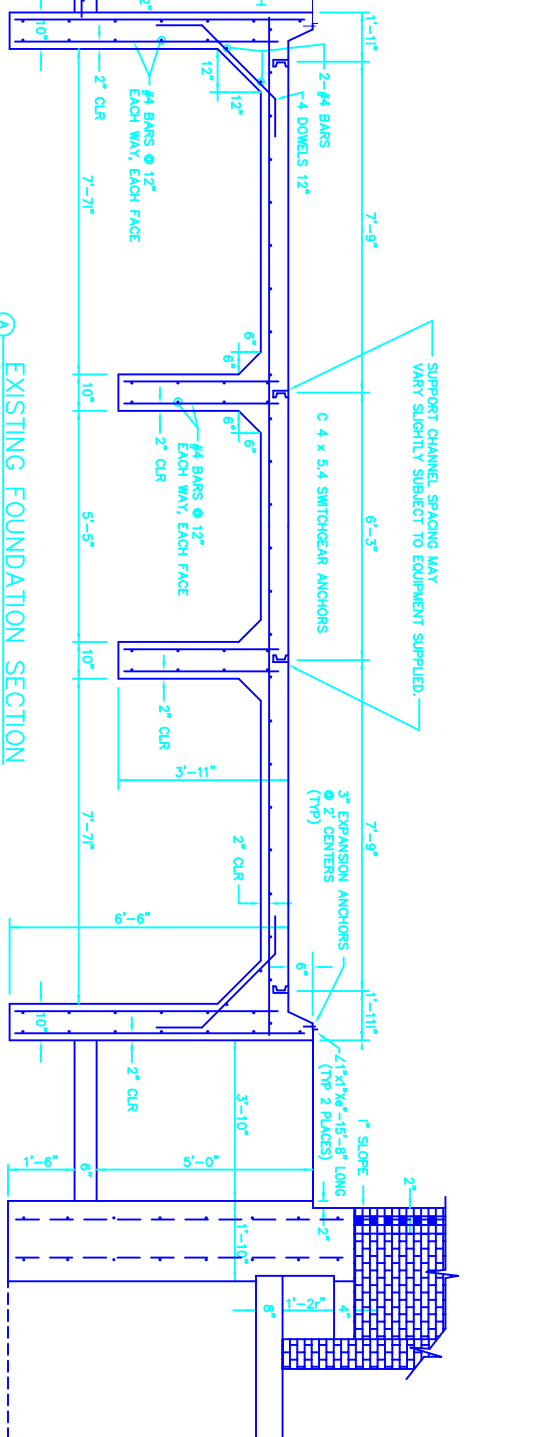
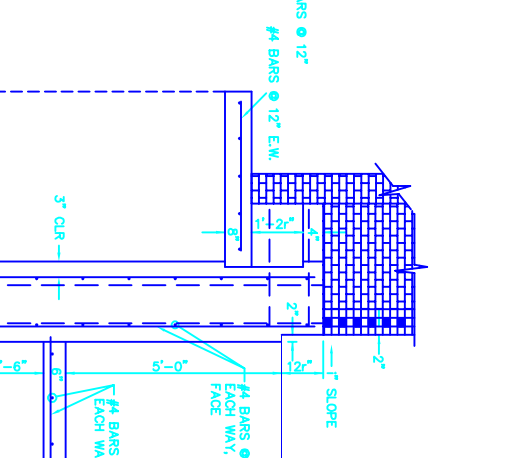
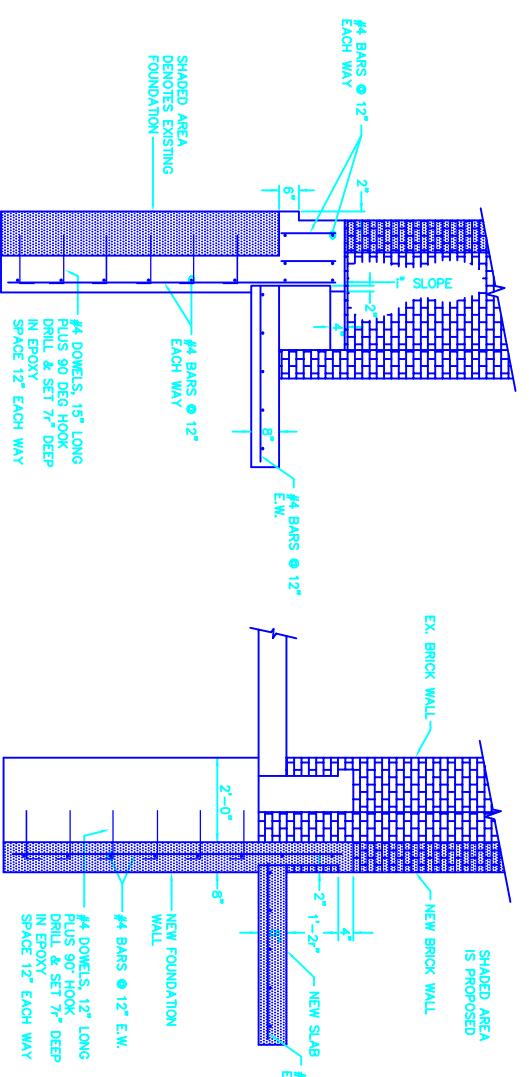
FOR REFERENCE ONLY

1. Under the State Seal, the Engineer shall be responsible for the accuracy of the information furnished to him and for the correctness of the drawings prepared by him or under his supervision.

REV. 0 SEALED BY		NAME		RECORD DRAWING		DESIGN		DRAWN		GENERAL SITE	
DAVID W. WEDELL		DAVID W. WEDELL		ISSUED FOR CONSTRUCTION		M.S. JOHNSON		M.S. JOHNSON		69KV INTERTIE TO CITY OF COLUMBIA	
NUMBER		DATE		DESCRIPTION		DATE		DATE		SITE PLAN & DEMOLITION	
E-18084		11-07-94		ISSUED FOR APPROVAL		12-09-94		12-09-94		69-13.8 KV STADIUM RD. SUBSTATION	
STATE OF MISSOURI		REV. DATE		DESCRIPTION		BY		CHKD. BY		3439/UMC#83046-3	
										3439-40110	
										REV. 1	



69KV INTERTIE TO CITY OF COLUMBIA
69-13.8 KV STADIUM RD. SUBSTATION
SITE PLAN & DEMOLITION



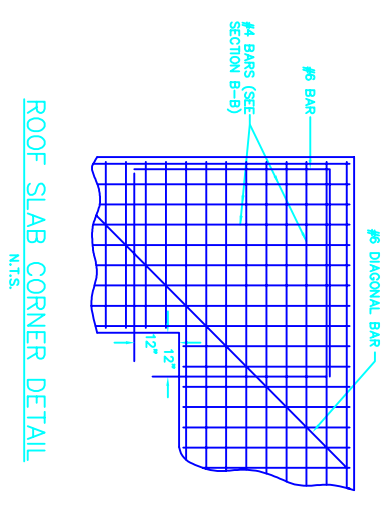
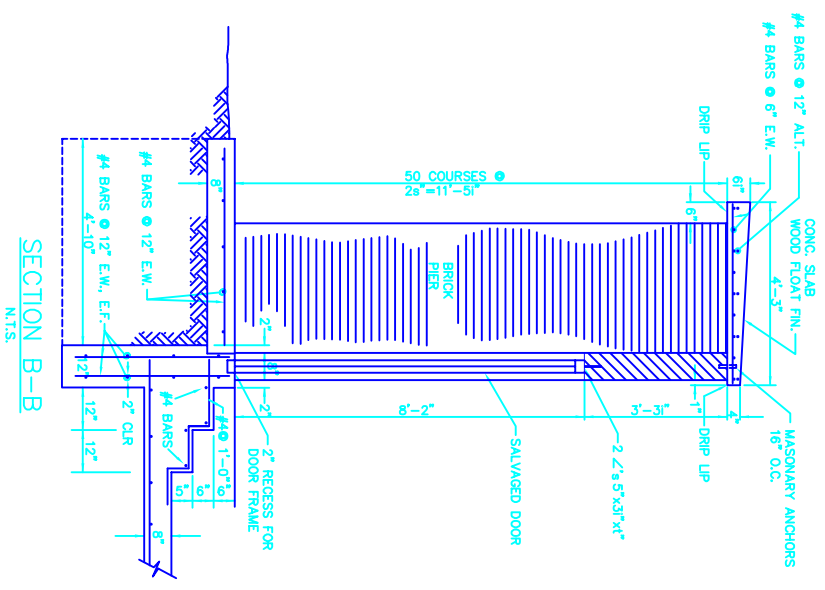
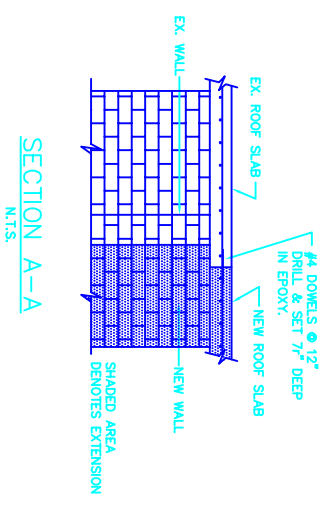
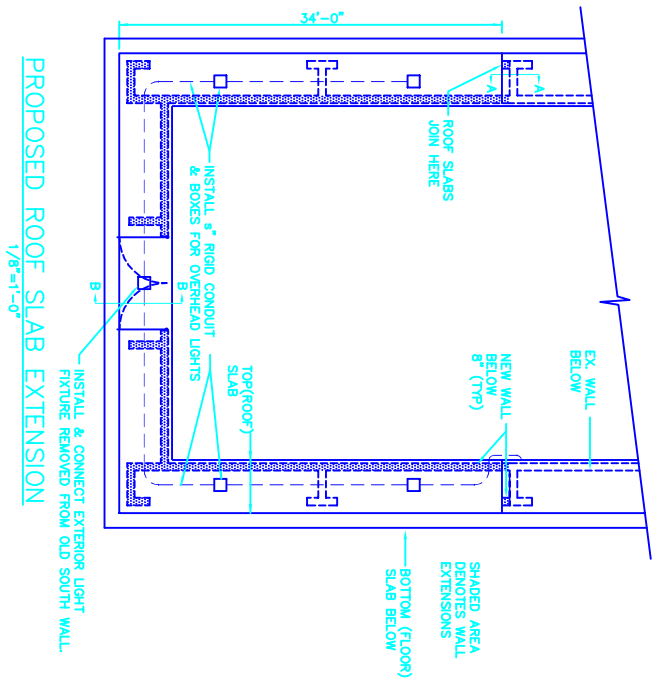
FOR REFERENCE ONLY

REV.	DATE	DESCRIPTION	BY	CHKD.	APP.
1	11-07-94	ISSUED FOR APPROVAL	VA	VA	N.S. JOHNSON
0	12-05-94	ISSUED FOR CONSTRUCTION	VA	VA	N.S. JOHNSON
1	6-30-95	TRANSFORMER FOUNDATION REVISED	VA	VA	N.S. JOHNSON
2	8-18-97	RECORD DRAWING	VA	VA	N.S. JOHNSON

NAME	DAVID W. WEDELL	RECORD DRAWING	DATE	12-05-94
NUMBER	E-18084	ISSUED FOR CONSTRUCTION	DATE	12-05-94
STATE OF MISSOURI		ISSUED FOR APPROVAL	DATE	11-07-94

GENERAL SITE
69-13.8 KV STADIUM RD. SUBSTATION
FOUNDATION EXPANSION

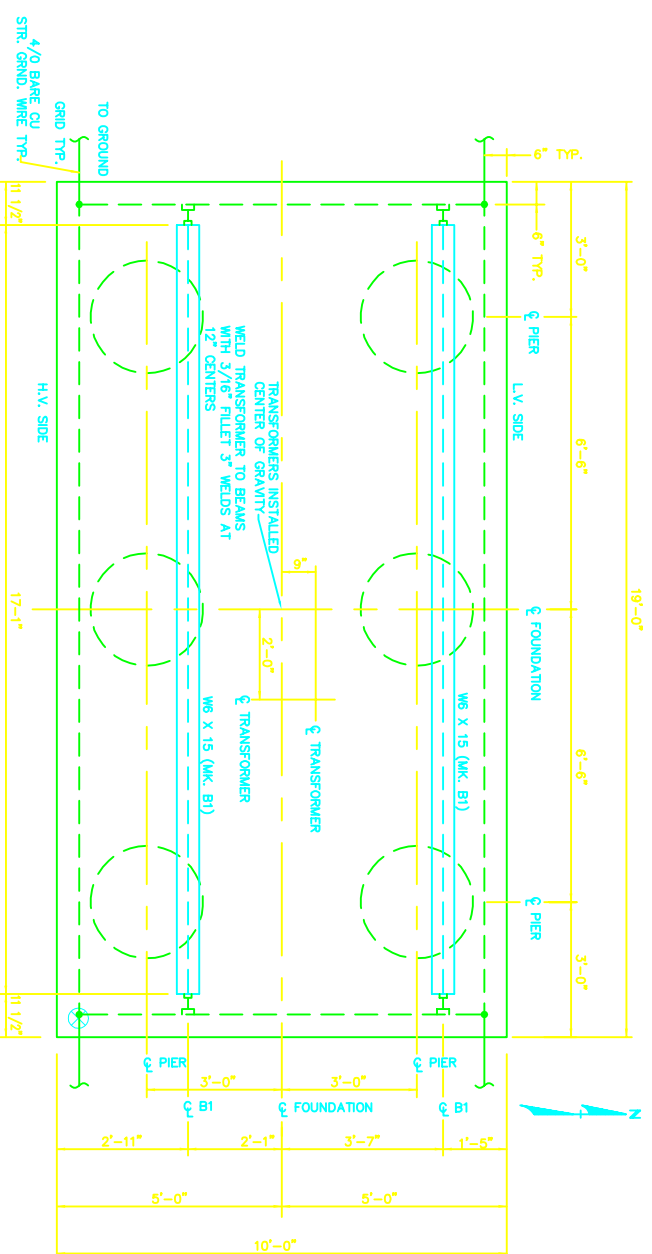
PROJ. NO. 3439/UMC#930146-3
SHEET NO. 2



1. THESE DETAILS HAVE BEEN PREPARED BY THE ARCHITECT AND ARE SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.

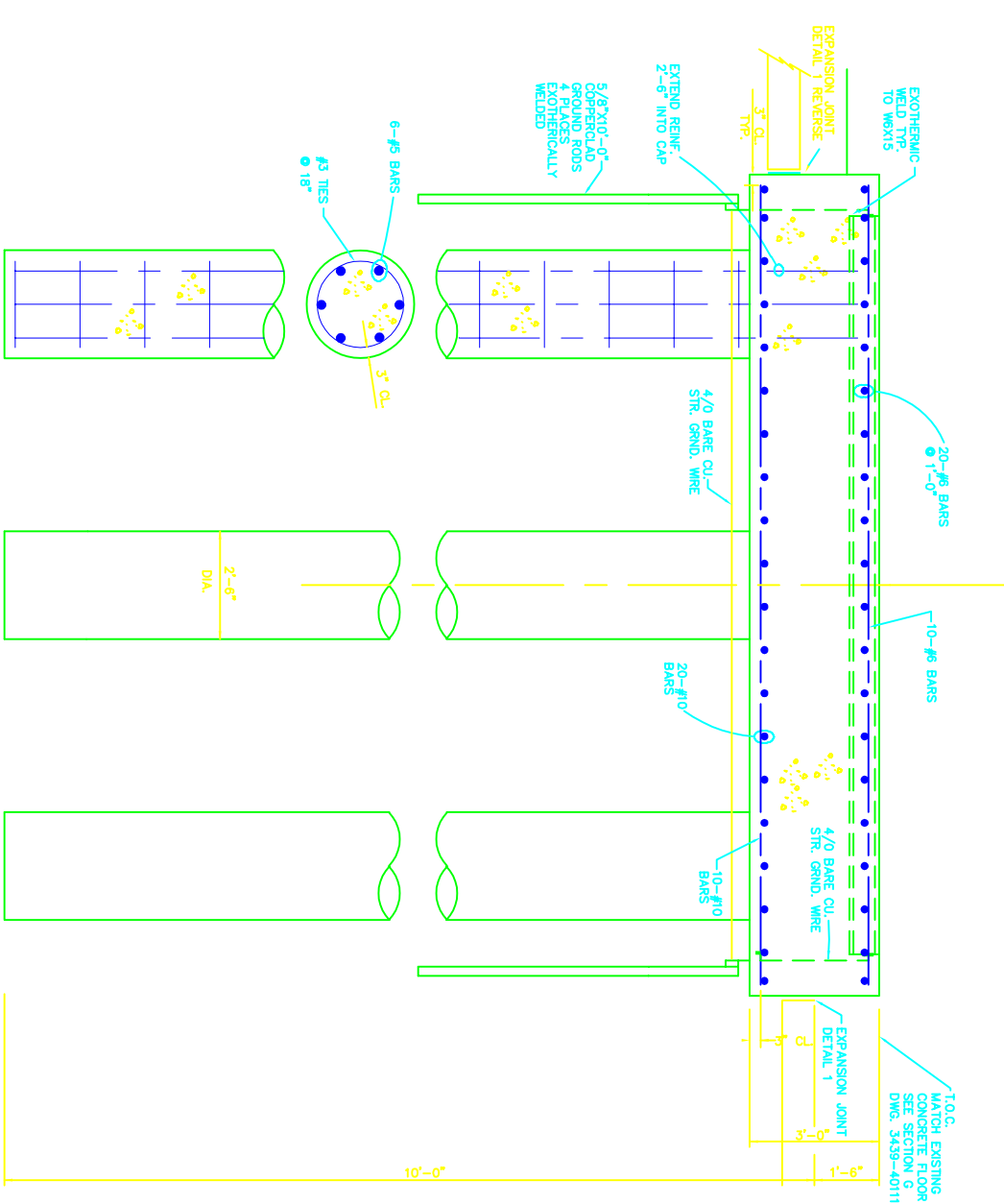
REV. 0 SEALED BY		NAME		DAVID W. WEDELL	
NUMBER		E-19084		STATE OF MISSOURI	
REV.	DATE	DESCRIPTION	BY	CHKD.	DATE
1	04-08-97	RECORD DRAWING	PEJ		
0	12-06-94	ISSUED FOR CONSTRUCTION	KAA		
A	11-02-94	ISSUED FOR APPROVAL	KAA		
GENERAL SITE			DESIGN	DATE	
69KV INTERTIE TO CITY OF COLUMBIA			N.S. JOHNSON	12-09-94	
STADIUM ROAD SUBSTATION EXTENSION			APP'D.	DATE	
ROOF SLAB EXTENSION			N.S. JOHNSON	12-09-94	
PROJ. NO.	3439/UMC#980146-3	DMC. NO.	3439-40113	REV.	1

FOR REFERENCE ONLY



ALIGN TRANSFORMERS INSTALLED CENTER OF GRAVITY WITH THE CENTER OF THE TRANSFORMER FOUNDATION. (SEE MAGNETEK DWG. A2421349094X, SHT. 1, REV. 2, 6/27/95 AND SHT. 2, REV. 2, 6/27/95)

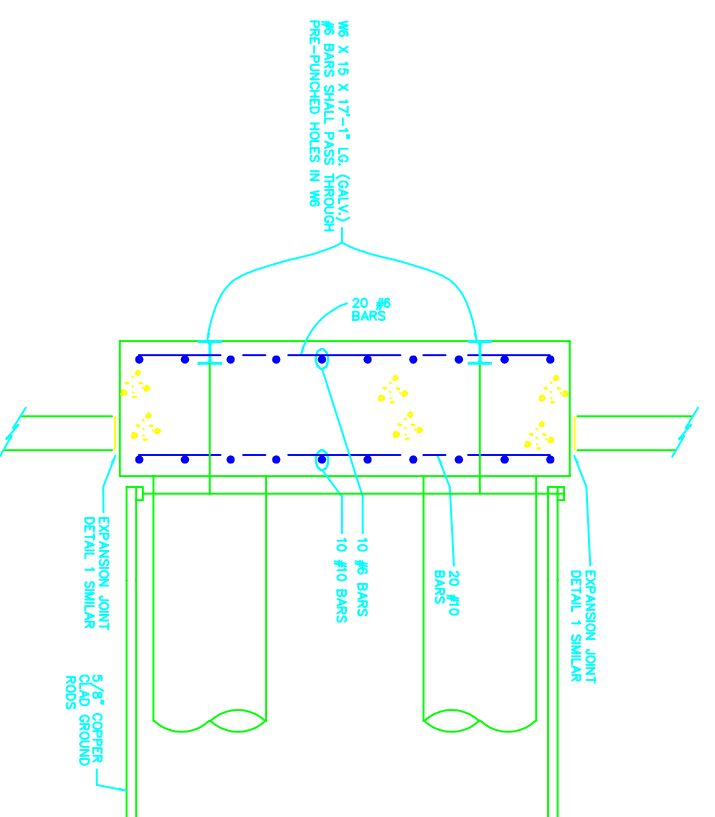
SCALE: 1/2" = 1'-0"



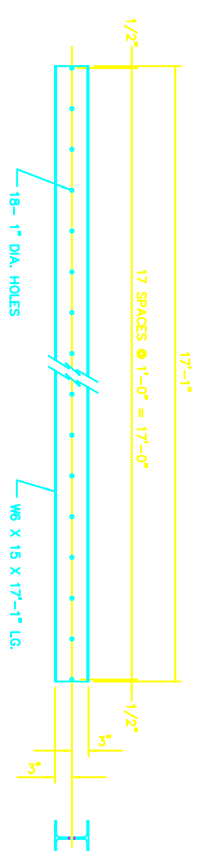
ELEVATION
SCALE: 1/2" = 1'-0"

FOR REFERENCE ONLY

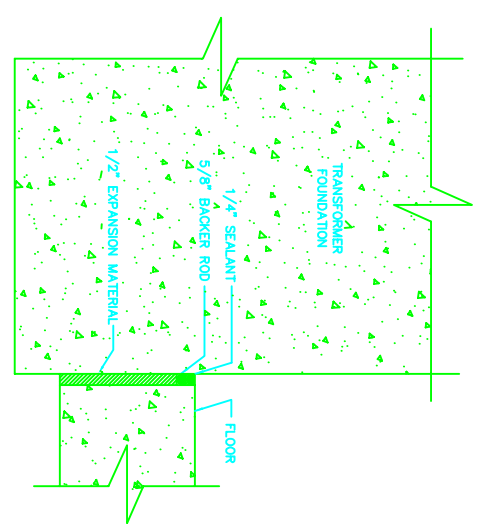
TRANSFORMER FOUNDATION



ELEVATION
SCALE: 1/2" = 1'-0"



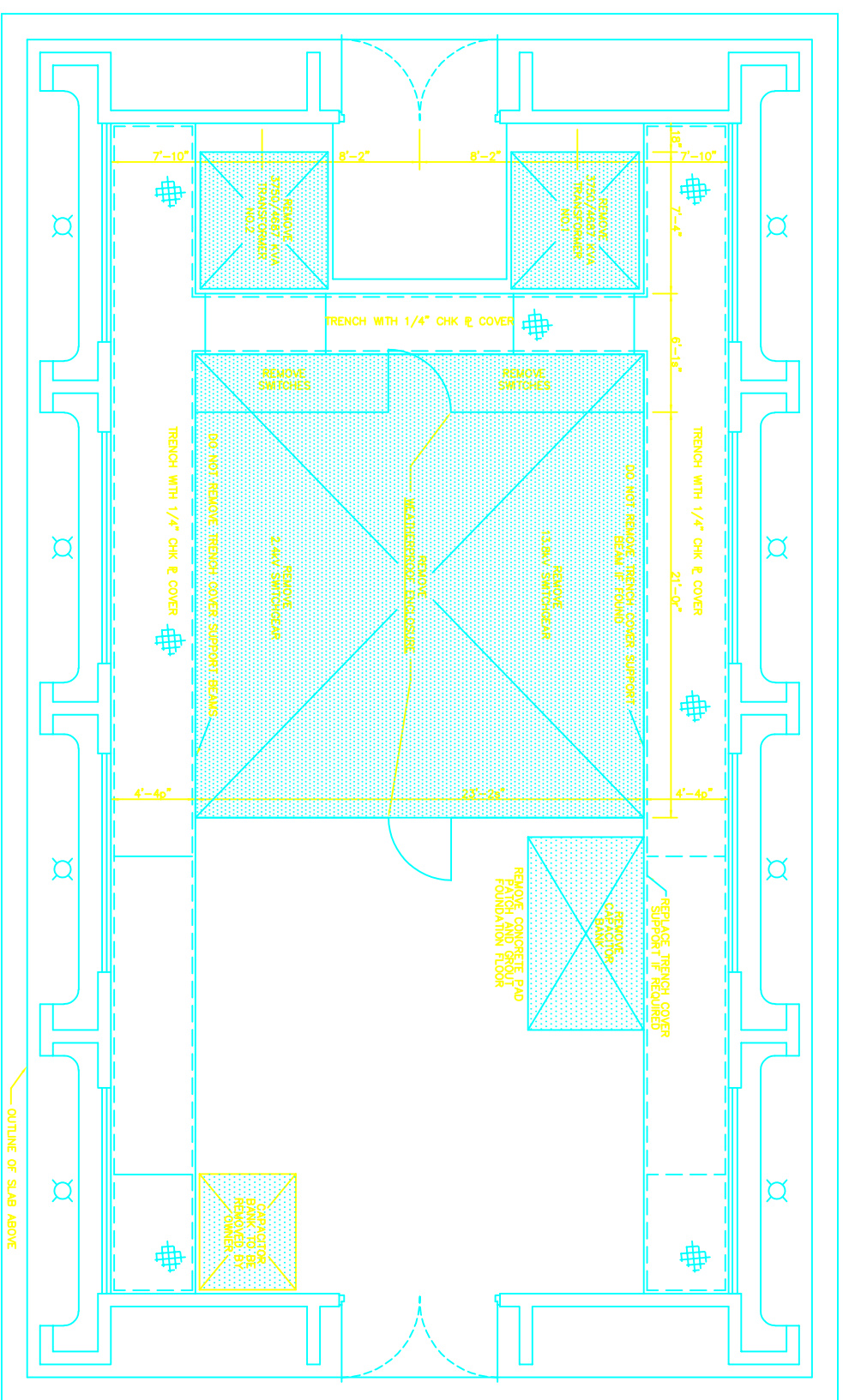
BEAM B1
TWO REQUIRED
NOTE: STEEL TO BE HOT DIP GALVANIZED AFTER FABRICATION



DETAIL 1
EXPANSION JOINT DETAIL
N.T.S.

- NOTES:**
1. ⊗ ORIENTATION MARK - SEE DWG. NO. 3439-40111
 2. STEEL BEAMS SHALL BE SET LEVEL AND FLUSH WITH THE TOP OF CONCRETE. CLEAN ALL CONCRETE FROM TOP OF BEAMS.
 3. DRILLED PIERS SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS SECTION 02390 - DRILLED PIER FOUNDATIONS.
 4. REINFORCING SHALL BE IN ACCORDANCE WITH SECTION 03210 - REINFORCING STEEL.
 5. CONCRETE CAP SHALL BE IN ACCORDANCE WITH SECTION 03310 - CONCRETE. CONCRETE SHALL BE CLASS A WITH TYPE 3 SLUMP.

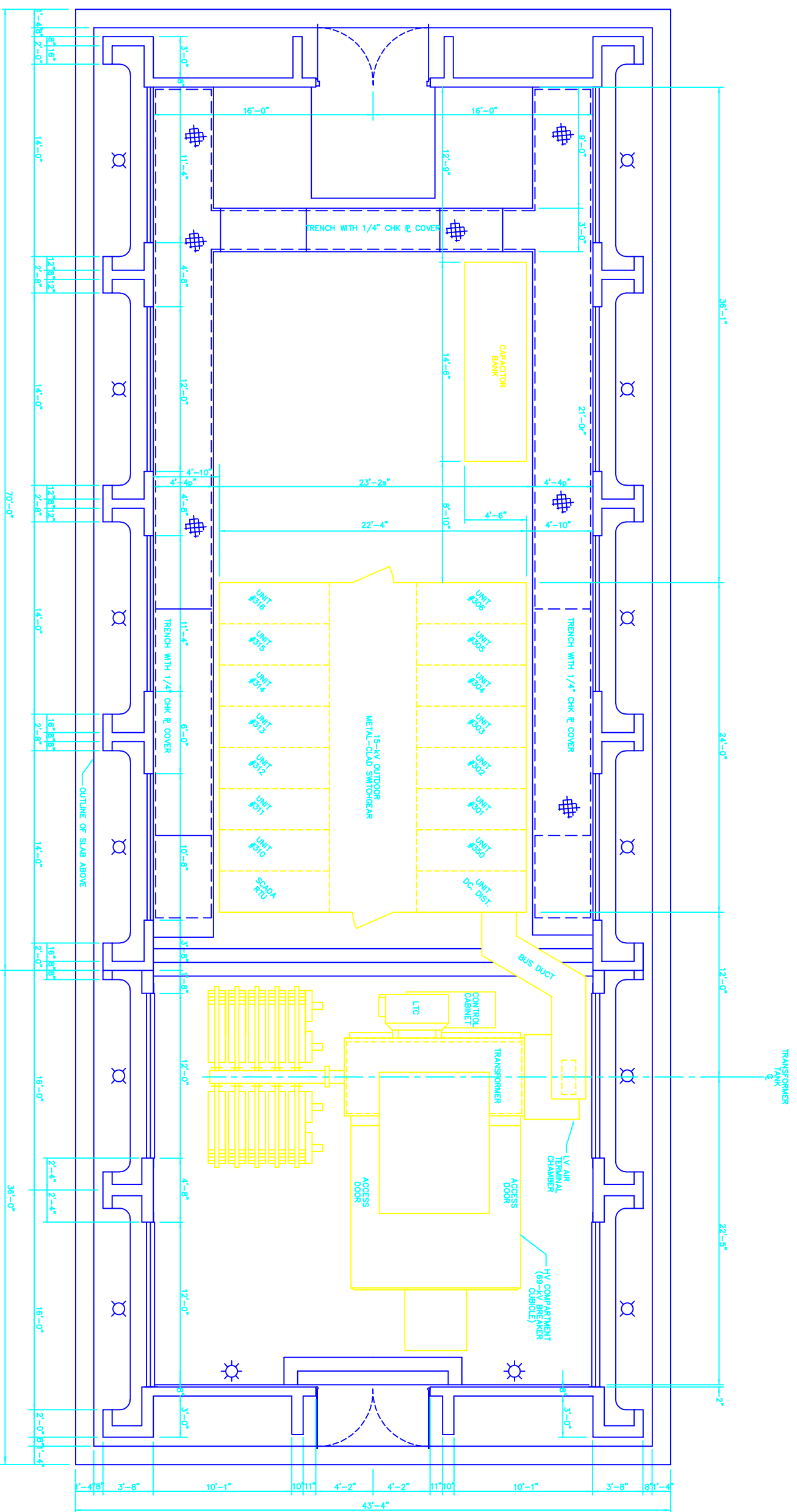
1. This drawing shall be read in conjunction with the drawings and specifications for the project. 2. The contractor shall be responsible for obtaining all necessary permits. 3. The contractor shall be responsible for obtaining all necessary approvals. 4. The contractor shall be responsible for obtaining all necessary clearances. 5. The contractor shall be responsible for obtaining all necessary easements. 6. The contractor shall be responsible for obtaining all necessary rights-of-way. 7. The contractor shall be responsible for obtaining all necessary utility easements. 8. The contractor shall be responsible for obtaining all necessary utility clearances. 9. The contractor shall be responsible for obtaining all necessary utility easements. 10. The contractor shall be responsible for obtaining all necessary utility clearances.						
REV. 1 SEALED BY	DAVID W. WEDELL					
NAME	DAVID W. WEDELL					
NUMBER	E-18084					
STATE OF MISSOURI						
REV.	DATE	DESCRIPTION	BY	CHKD.	DATE	DESCRIPTION
2	6-18-97	RECORD DRAWING	DAW			
1	6-30-98	TRANSFORMER FOUNDATION FINISHED	DAW			
0	12-06-94	ISSUED FOR CONSTRUCTION	DAW			
A	11-07-94	ISSUED FOR APPROVAL	DAW			
GENERAL SITE 69kV INTERTIE TO CITY OF COLUMBIA 69-13 BAY STADIUM RD. SUBSTATION TRANSFORMER FOUNDATION		PROJ. NO. 3439/UMC#980146-3	DWG. NO. 3439-40114	REV. 2		



EXISTING EQUIPMENT REMOVAL PLAN
1/4"=1'-0"

FOR REFERENCE ONLY

1. These drawings were prepared by the author or under his direct supervision and he is a duly Licensed Professional Engineer in the State of Missouri. 2. These drawings were prepared by the author or under his direct supervision and he is a duly Licensed Professional Engineer in the State of Missouri.			REV. 0 SEALED BY DAVID W. WEDELL NAME NUMBER E-18084 STATE OF MISSOURI		
REV.	DATE	DESCRIPTION	BY	CHKD.	DATE
1	04-08-97	RECORD DRAWING	PJ		
0	12-05-94	ISSUED FOR CONSTRUCTION	KA		
A	11-07-94	ISSUED FOR APPROVAL	KA		
			DESIGN: N.S. JOHNSON DATE: 12-05-94		
GENERAL SITE 69KV INTERTIE TO CITY OF COLUMBIA EXISTING EQUIPMENT REMOVAL			PROJ. NO. 3439/UMC#930146-3		
69KV INTERTIE TO CITY OF COLUMBIA EXISTING EQUIPMENT REMOVAL			DWG. NO. 3439-40115		
			REV. 1		



EQUIPMENT LOCATION PLAN
1/4"=1'-0"

- NOTES:**
1. ANCHOR EQUIPMENT TO CONCRETE FOUNDATION TO OBEY THE MANUFACTURER'S REQUIREMENTS AND PROVIDE THE REQUIRED ANCHORING. ANCHOR BOLTS SHALL BE GALVANIZED AND WEDGE ANCHORS OR OTHER SIMILAR ATTACHMENT METHODS.
 2. REVISION 1 APPLIES TO TRANSFORMER LOCATION ONLY. TRANSFORMER FINAL LOCATION PER DRAWING DATA.

1. This drawing shall be sealed and signed by a Professional Engineer in the State of Missouri.

REV. 1 SEALED BY		DAVID W. WEDELL	
NAME		DAVID W. WEDELL	
NUMBER		E-18084	
STATE OF MISSOURI			
REV.	DATE	DESCRIPTION	BY
2	8-18-97	RECORD DRAWING	TD
1	8-30-95	TRANSFORMER LOCATION REVISION	VA
0	12-05-94	ISSUED FOR CONSTRUCTION	VA
A	11-07-94	ISSUED FOR APPROVAL	VA

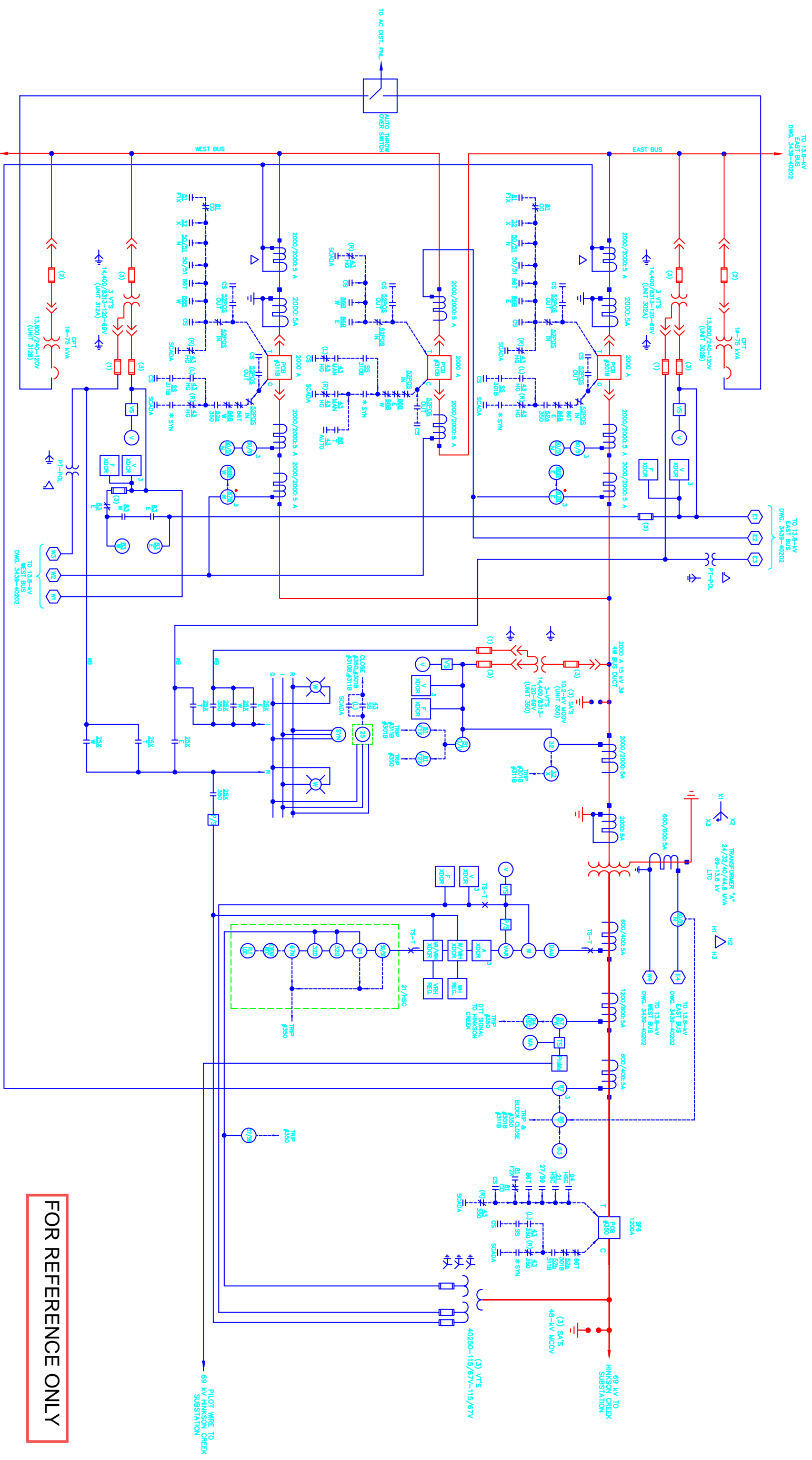
DESIGNER	DATE	DRW. NO.
K.S. JOHNSON	12-05-94	3439

PROJECT NO.	PROJECT NAME
3439/UMC#930146-3	69kV INTERTIE TO CITY OF COLUMBIA

PROJ. NO.	UMC NO.	REV.
3439/UMC#930146-3	3439-40116	2

FOR REFERENCE ONLY

GENERAL SITE
69kV INTERTIE TO CITY OF COLUMBIA
EQUIPMENT LOCATION & ANCHORING



FOR REFERENCE ONLY

- LEGEND**
- E — BUS EAST
 - W — BUS WEST
 - HO — HINDSON'S BREAKER
 - U — UNDER/VOLTAGE RELAY BASLER EL. BE-27/29
 - R — REVERSE POWER RELAY — ABB 328
 - RA — REVERSE POWER AUX. RELAY — GE #FA
 - CO — PHASE OVER CURRENT RELAY — ABB CO
 - CO — GROUND OVER CURRENT RELAY — ABB CO
 - ST — TRANSFORMER SUDON PRESSURE RELAY
 - FR — FREQUENCY RELAY — BASLER EL. BE-31-0/0
 - FR — UNDER FREQUENCY AUX. RELAY — GE #FA
 - FL — VT FLIP FLOP — GE #FA
 - LO — BUS DIFFERENTIAL LOOKOUT RELAY — ELECTROSWITCH LOR
 - LO — TRANSFORMER LOOKOUT RELAY — ELECTROSWITCH LOR
 - LO — BUS DIFFERENTIAL RELAY — GE #FD
 - LO — BUS DIFFERENTIAL RELAY — GE #FD
 - LO — LINE CURRENT DIFFERENTIAL RELAY — ABB HCB-1

- 1 — TRANSFORMER DIFFERENTIAL RELAY — GE #D01
- 2 — AUXILIARY TRIPPING LINE RELAY — ABB AR
- 3 — THERMAL DEMAND AMMETER
- 4 — PILOT WIRE MULL AMMETER
- 5 — SYNCHROSCOPE WITH 2 INDICATING LAMPS
- 6 — VOLTMETER
- 7 — VARMIETER
- 8 — WATT METER
- 9 — AMP TRANSFORMER, R50A/C48
- 10 — VOLT TRANSFORMER, R50A/W48
- 11 — VOLT TRANSFORMER, R50A/W48
- 12 — VOLT TRANSFORMER, R50A/W48
- 13 — WATT TRANSFORMER, R50A/W48
- 14 — WATT TRANSFORMER, R50A/W48
- 15 — WATT TRANSFORMER, R50A/W48
- 16 — WATT TRANSFORMER, R50A/W48
- 17 — WATT TRANSFORMER, R50A/W48
- 18 — WATT TRANSFORMER, R50A/W48
- 19 — WATT TRANSFORMER, R50A/W48
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- 88 — WATT TRANSFORMER, R50A/W48
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- 91 — WATT TRANSFORMER, R50A/W48
- 92 — WATT TRANSFORMER, R50A/W48
- 93 — WATT TRANSFORMER, R50A/W48
- 94 — WATT TRANSFORMER, R50A/W48
- 95 — WATT TRANSFORMER, R50A/W48
- 96 — WATT TRANSFORMER, R50A/W48
- 97 — WATT TRANSFORMER, R50A/W48
- 98 — WATT TRANSFORMER, R50A/W48
- 99 — WATT TRANSFORMER, R50A/W48
- 100 — WATT TRANSFORMER, R50A/W48

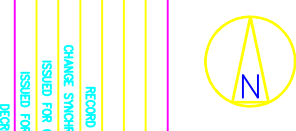
- 1 — FREQUENCY TRANSFORMER — ROCHESTER
- 2 — VAR-VARHOOR TRANSFORMER — ROCHESTER XH430
- 3 — VARHOOR REGISTER — ROCHESTER
- 4 — VARHOOR REGISTER — ROCHESTER
- 5 — FIBER OPTIC INTERFACE — LCOM FPM44
- 6 — PHASE SHIFT
- 7 — SYNCHRONIZING SWITCH
- 8 — PILOT WIRE TEST SWITCH
- 9 — VOLT SWITCH
- 10 — INDICATES AC CIRCUITS
- 11 — 2SX SYNC — CHECK AUXILIARY RELAY — GE #FA
- 12 — 4X SELECTOR SWITCH (LOCAL/REMOTE, AUTO/MAN)
- 13 — 8/O CONTROL POWER TRANSFORMER
- 14 — CS CONTROL SWITCH
- 15 — TEST SWITCH — OPT
- 16 — VOLTAGE TRANSFORMER
- 17 — PT-POL POTENTIAL TRANSFORMER — POLARIZING UNIT
- 18 — PT-POL POTENTIAL TRANSFORMER — POLARIZING UNIT
- 19 — PT-POL POTENTIAL TRANSFORMER — POLARIZING UNIT
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- 25 — PT-POL POTENTIAL TRANSFORMER — POLARIZING UNIT
- 26 — PT-POL POTENTIAL TRANSFORMER — POLARIZING UNIT
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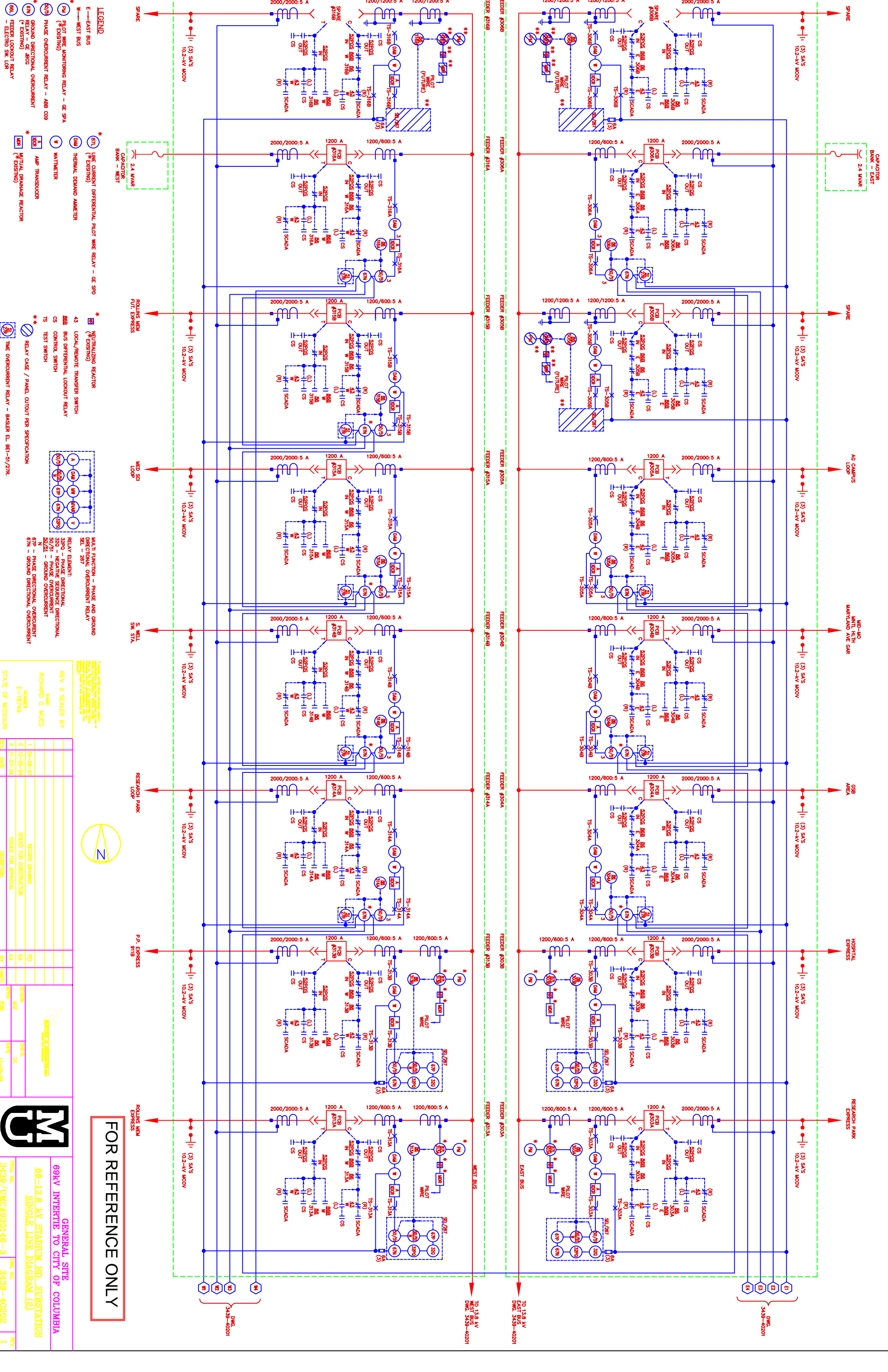
REV.	DATE	DESCRIPTION
1	11-07-94	ISSUED FOR CONSTRUCTION
2	12-21-94	ISSUED FOR APPROVAL
3	08-18-97	CHANGE SYNCHRONIZING SCHEME
4	12-21-94	ISSUED FOR CONSTRUCTION
5	12-05-94	ISSUED FOR APPROVAL

NAME	DATE	BY	CHKD.	REV.
RICHARD C. MILES	11-07-94	KAA	KAA	1
RECORD DRAWING	12-21-94	KAA	KAA	2
CHANGE SYNCHRONIZING SCHEME	08-18-97	KAA	KAA	3
ISSUED FOR CONSTRUCTION	12-21-94	KAA	KAA	4
ISSUED FOR APPROVAL	12-05-94	KAA	KAA	5

GENERAL SITE
69kV INTERTIE TO CITY OF COLUMBIA
69-13.8 kV STADIUM RD. SUBSTATION
SINGLE LINE DIAGRAM (1)
3439/TUC#890146-3
3439-40201
2

NOTE:
* SW - SEE SECTION - CHECK COMPUTING
DEFINED IN SPECIFICATION SECTION 16382





LEGEND

E—EAST BUS
W—WEST BUS

* 67L LINE CURRENT DIFFERENTIAL PILOT WIRE RELAY - GE SPD
67L (EXISTING)

* 67M THERMAL DEMAND AMMETER
67M (EXISTING)

* 67N PILOT WIRE MONITORING RELAY - GE SPA
67N (EXISTING)

* 67P PHASE OVERCURRENT RELAY - ABB O9
67P (EXISTING)

* 67Q GROUND DIRECTIONAL OVERCURRENT RELAY - GE BDC
67Q (EXISTING)

* 67R GROUND DIRECTIONAL OVERCURRENT RELAY - GE BDC
67R (EXISTING)

* 67S FEEDER LOCKOUT RELAY
67S (EXISTING)

* 67T NEUTRALIZING REACTOR
67T (EXISTING)

* 67U LOCAL/REMOTE TRANSFER SWITCH
67U (EXISTING)

* 67V 43 LOCK/REMOTE TRANSFER SWITCH
67V (EXISTING)

* 67W BUS DIFFERENTIAL LOCKOUT RELAY
67W (EXISTING)

* 67X CONTROL SWITCH
67X (EXISTING)

* 67Y TEST SWITCH
67Y (EXISTING)

* 67Z RELAY CASE / PANEL CUTOFF PER SPECIFICATION
67Z (EXISTING)

* 68 TIME OVERCURRENT RELAY - BASSEN EL BEI-51/27R
68 (EXISTING)

* 69 MULTIFUNCTION - PHASE AND GROUND
RECTIONAL OVERCURRENT RELAY
69 (EXISTING)

* 70 RELAY ELEMENT
32P - PHASE DIRECTIONAL
32Q - NEGATIVE SEQUENCE DIRECTIONAL
50/51 - GROUND OVERCURRENT
67N - GROUND DIRECTIONAL OVERCURRENT

* 71 32P - PHASE DIRECTIONAL OVERCURRENT
32Q - NEGATIVE SEQUENCE DIRECTIONAL
50/51 - GROUND OVERCURRENT
67N - GROUND DIRECTIONAL OVERCURRENT

* 72 67P - PHASE OVERCURRENT RELAY
67Q - GROUND DIRECTIONAL OVERCURRENT
67R - GROUND DIRECTIONAL OVERCURRENT

* 73 67L - LINE CURRENT DIFFERENTIAL PILOT WIRE RELAY
67M - THERMAL DEMAND AMMETER
67N - PILOT WIRE MONITORING RELAY
67P - PHASE OVERCURRENT RELAY
67Q - GROUND DIRECTIONAL OVERCURRENT RELAY
67R - GROUND DIRECTIONAL OVERCURRENT RELAY
67S - FEEDER LOCKOUT RELAY
67T - NEUTRALIZING REACTOR
67U - LOCAL/REMOTE TRANSFER SWITCH
67V - 43 LOCK/REMOTE TRANSFER SWITCH
67W - BUS DIFFERENTIAL LOCKOUT RELAY
67X - CONTROL SWITCH
67Y - TEST SWITCH
67Z - RELAY CASE / PANEL CUTOFF PER SPECIFICATION
68 - TIME OVERCURRENT RELAY - BASSEN EL BEI-51/27R
69 - MULTIFUNCTION - PHASE AND GROUND RECTIONAL OVERCURRENT RELAY
70 - RELAY ELEMENT
32P - PHASE DIRECTIONAL
32Q - NEGATIVE SEQUENCE DIRECTIONAL
50/51 - GROUND OVERCURRENT
67N - GROUND DIRECTIONAL OVERCURRENT

REVISED BY: RICHARD C. WILES
DATE: 10-07-94

REV	DATE	DESCRIPTION
1	04-08-97	RECORD DRAWINGS
0	12-05-94	ISSUED FOR CONSTRUCTION
A	11-07-94	ISSUED FOR APPROVAL

FOR REFERENCE ONLY

GENERAL SITE
69kV INTERTIE TO CITY OF COLUMBIA
SINGLE LINE DIAGRAM (2)

PROJECT NO. 3439/UMC#930148-3
DWG. NO. 3439-40202

REV. 1