

NORTH CAROLINA TURNPIKE AUTHORITY

ITS STANDARD DETAILS

List of Sheets

V-1 CCTV Block Diagram
 V-2 CCTV Steel Pole
 V-3 CCTV Pole Grounding
 V-4 CCTV Pole-Mounted Cabinet
 V-5 Camera Lowering Device
 V-6 CCTV Cabinet Layout
 D-1 DMS Block Diagram
 D-2A DMS-Typical Mounting AET Gantry Structure
 D-2B DMS-Typical Mounting On-Site DMS Not at Toll Zone
 D-2C DMS-Typical Mounting Off-Site DMS
 D-3 Electrical Junction Box Details
 D-4 Communications Junction Box Details
 D-5 DMS Pole-Mounted Cabinet
 M-1 Microwave Detection Block Diagram
 M-2 Microwave Detection Elevation with CCTV Equipment View
 M-3A Microwave Detection Cabinet Layout
 M-3B Microwave Detection Cabinet Layout
 M-4 Microwave Detection Grounding
 M-5A Microwave Detection Pole Placement
 M-5B Microwave Detection Pole Placement With CCTV Equipment
 M-6 Microwave Detection Sensor Mounting
 M-7 Microwave Detection Placement Schematic

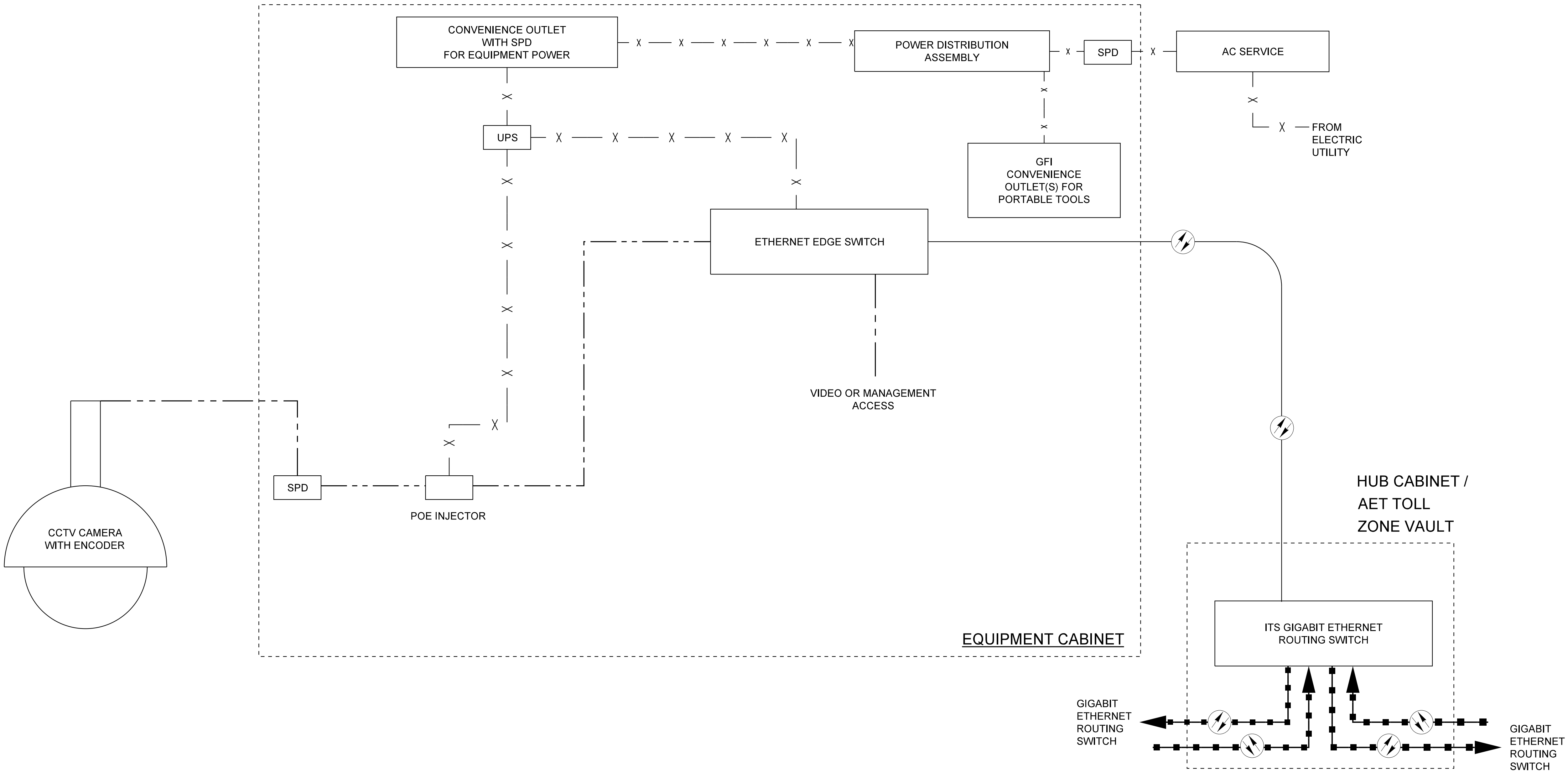
P-1 Power Service Detail Ground Mounted Cabinet
 P-2 Power Service Detail Pole-Mounted Cabinet
 P-3 Power Service Detail-Pedestal Transformer
 P-4 Power Service Detail-Ground Mounted Transformer
 W-1 Wrong-Way Driver Detection Block Diagram
 W-2 Wrong-Way Driver Detection Mainline Sign Infrastructure
 W-3A Wrong-Way Driver Detection Power Service from Outside of Ramp
 W-3B Wrong-Way Driver Detection Power Service from Inside of Ramp
 F-1 Electrical Junction Box Details
 F-2 Communications Junction Box Details

Abbreviations

AET - All-Electronic Tolling
 CCTV- losed-Circuit Television
 C/L - Centerline
 DMS - Dynamic Message Sign
 EOP - Edge of Pavement
 EQ - Equal Distance
 FON - Fiber Optic Network
 (includes conduit, fiber, boxes, etc.)
 GFI - Ground Fault Interrupter
 ITS - Intelligent Transportation Systems
 LPS - Lightning Protection System
 MVD - Microware Vehicle Detector
 NEC - National Electrical Code
 NEMA - National Electrical Manufacturers
 Association
 RFP - Request for Proposals
 R/W - Right-of-Way
 RWIS - Roadside Weather Information
 System
 SOW - Scope of Work
 SPD - Surge Protection Device
 TYP - Typical
 UL - Underwriters Laboratories
 UPS - Uninterruptable Power Supply

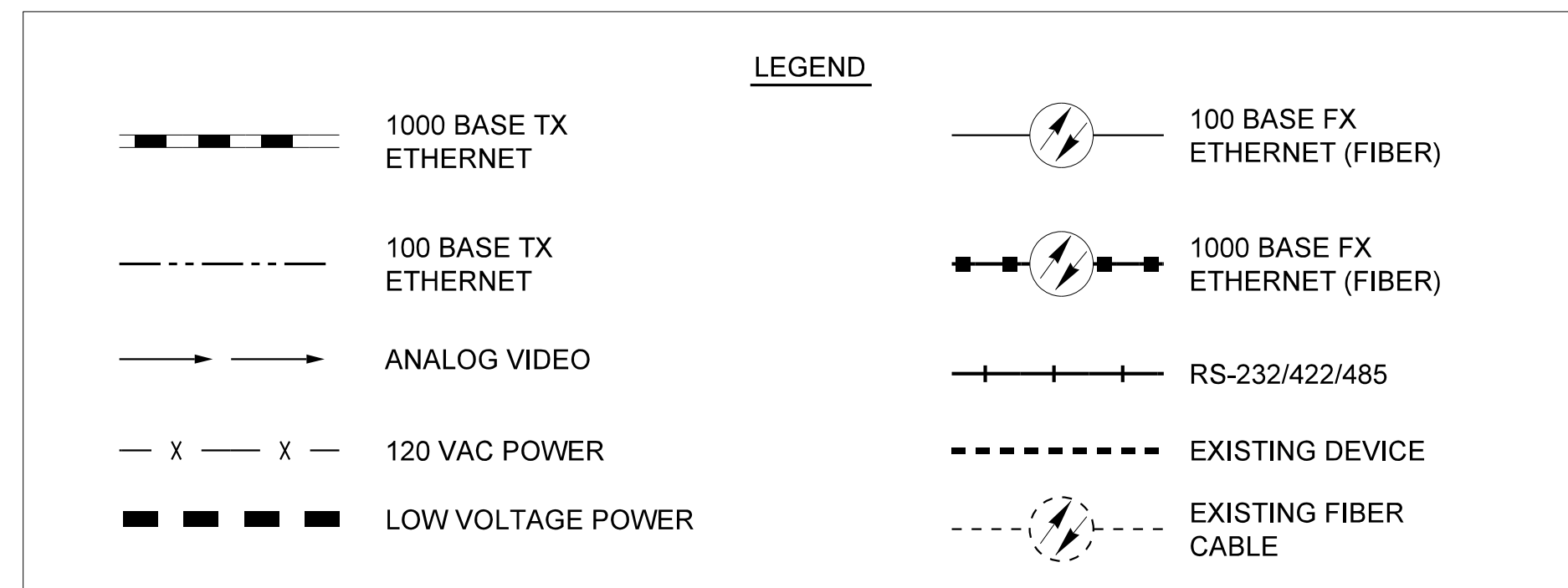
X-XX

ROADWAY DETAIL DRAWING FOR
CCTV BLOCK DIAGRAM



NOTES:

1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
2. IF MULTIPLE CCTV CAMERAS ARE INTEGRATED WITH EQUIPMENT CABINET, EACH CAMERA SHALL HAVE A DEDICATED SPD AND POE INJECTOR BETWEEN THE CAMERA AND SHARED ETHERNET EDGE SWITCH.

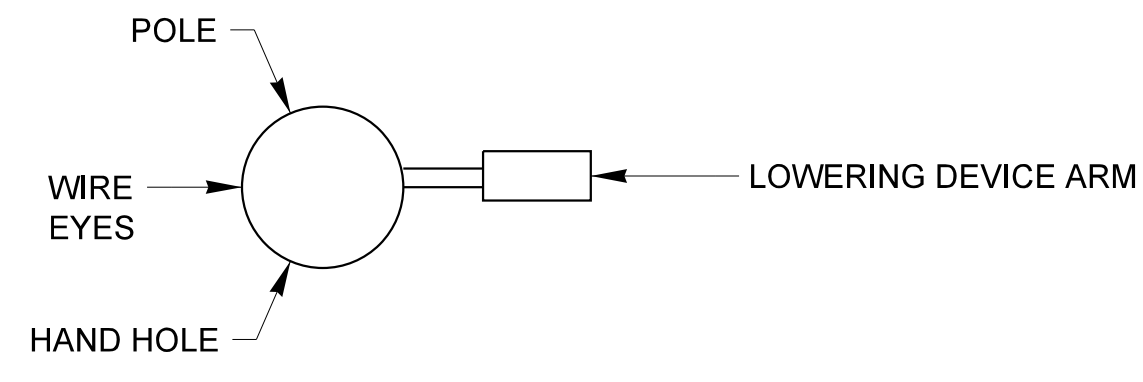


REV. NO.	BY	DATE	DESCRIPTION

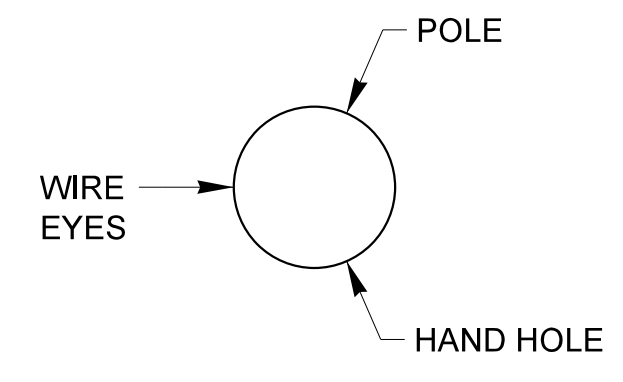
SCALE: N.T.S.
March 2022

X-XX

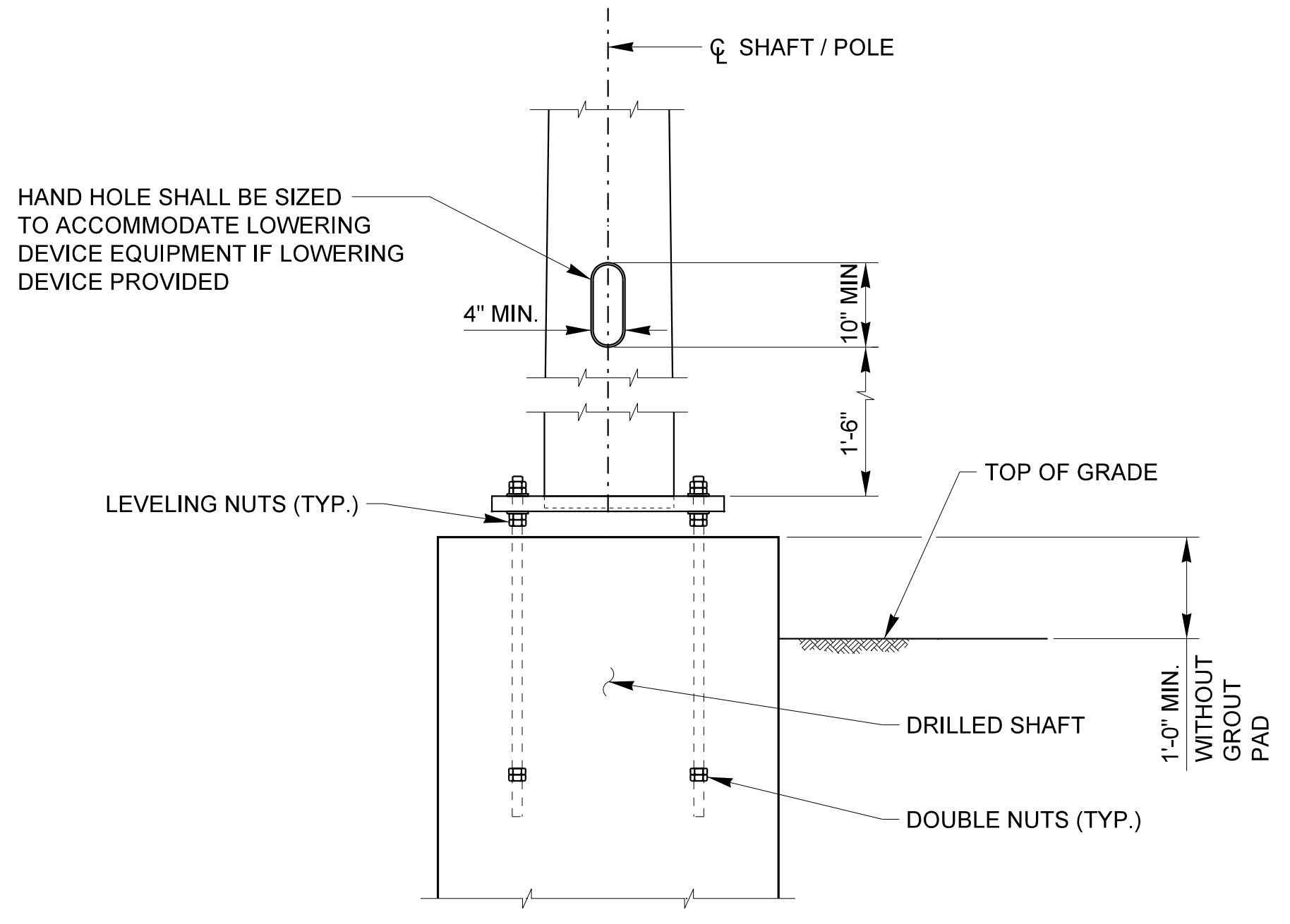
ROADWAY DETAIL DRAWING FOR
CCTV STEEL POLE



ORIENTATION VIEW



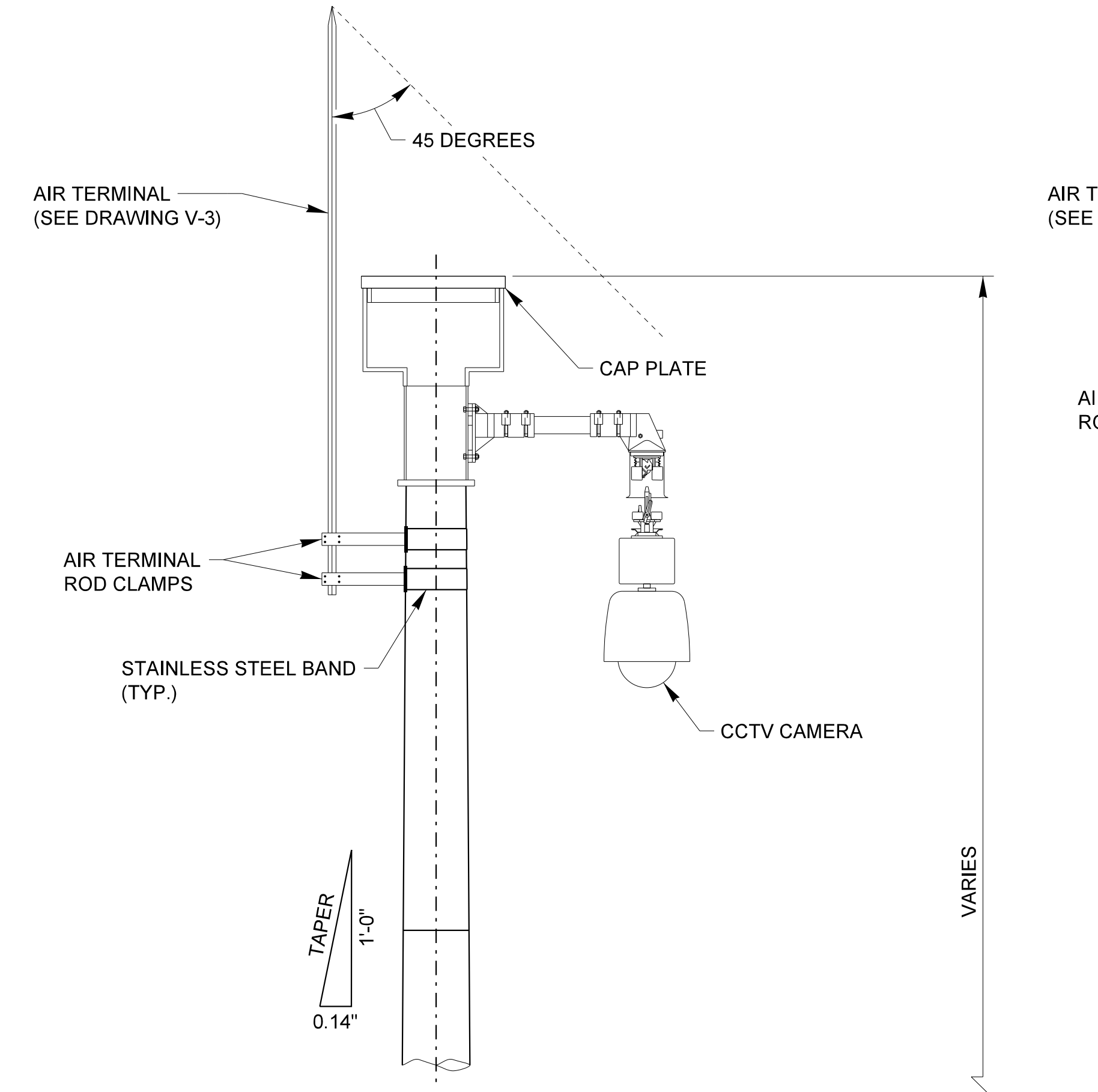
ORIENTATION VIEW



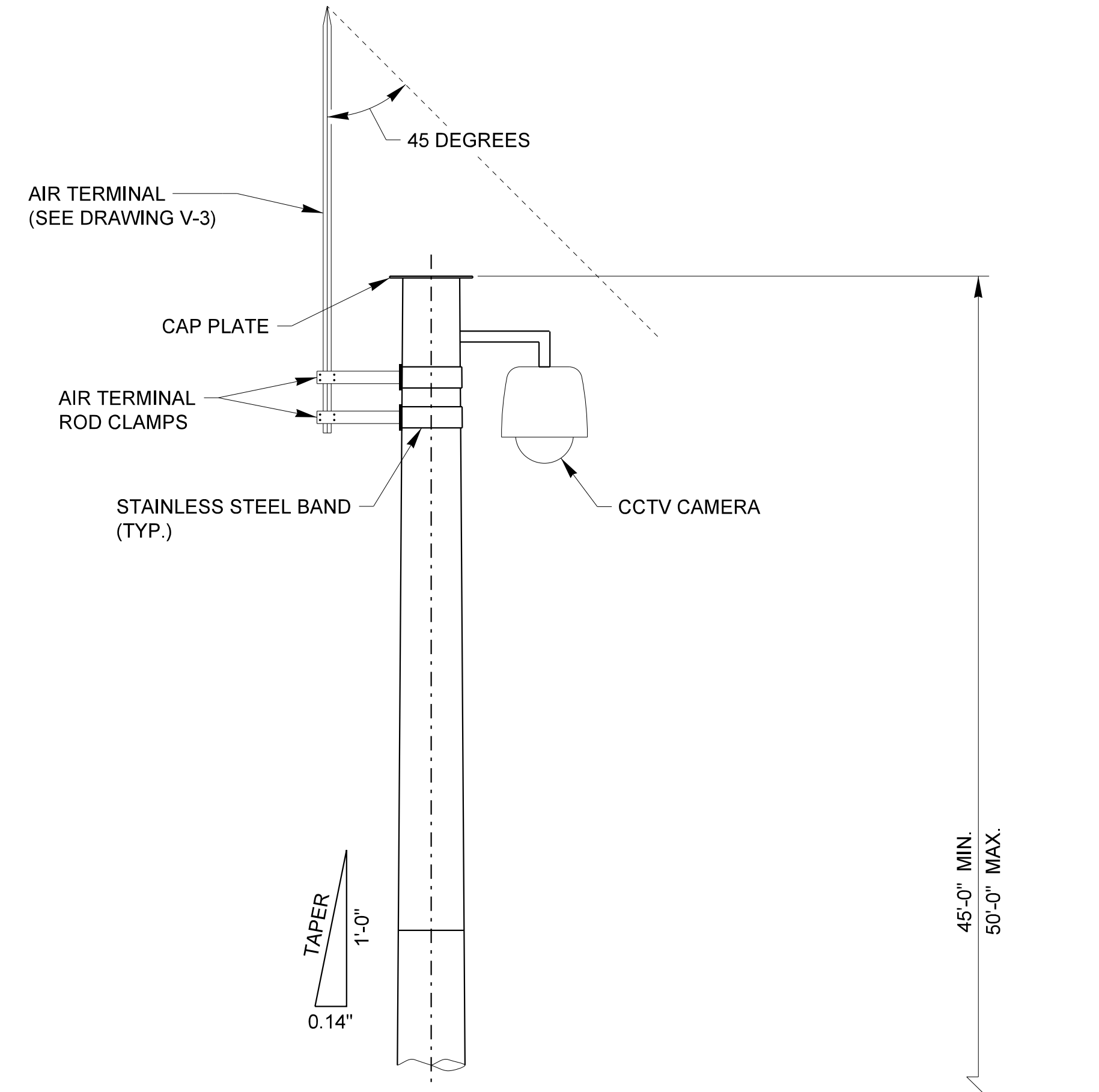
DETAIL 1
Scale: 3/4" = 1'-0"

NOTES:

1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
2. BANDING TO ATTACH CABINET AND ANY CONDUITS SHALL NOT INTERFERE WITH THE HAND HOLE.
3. ORIENT POLE COMPONENTS SUCH THAT THE POLE HANGER IS CLOSEST TO THE TRAVEL LANES AND THE HAND HOLE IS FARTHEST FROM THE TRAVEL LANES.



WITH LOWERING DEVICE
ELEVATION
Scale: 3/23" = 1'-0"



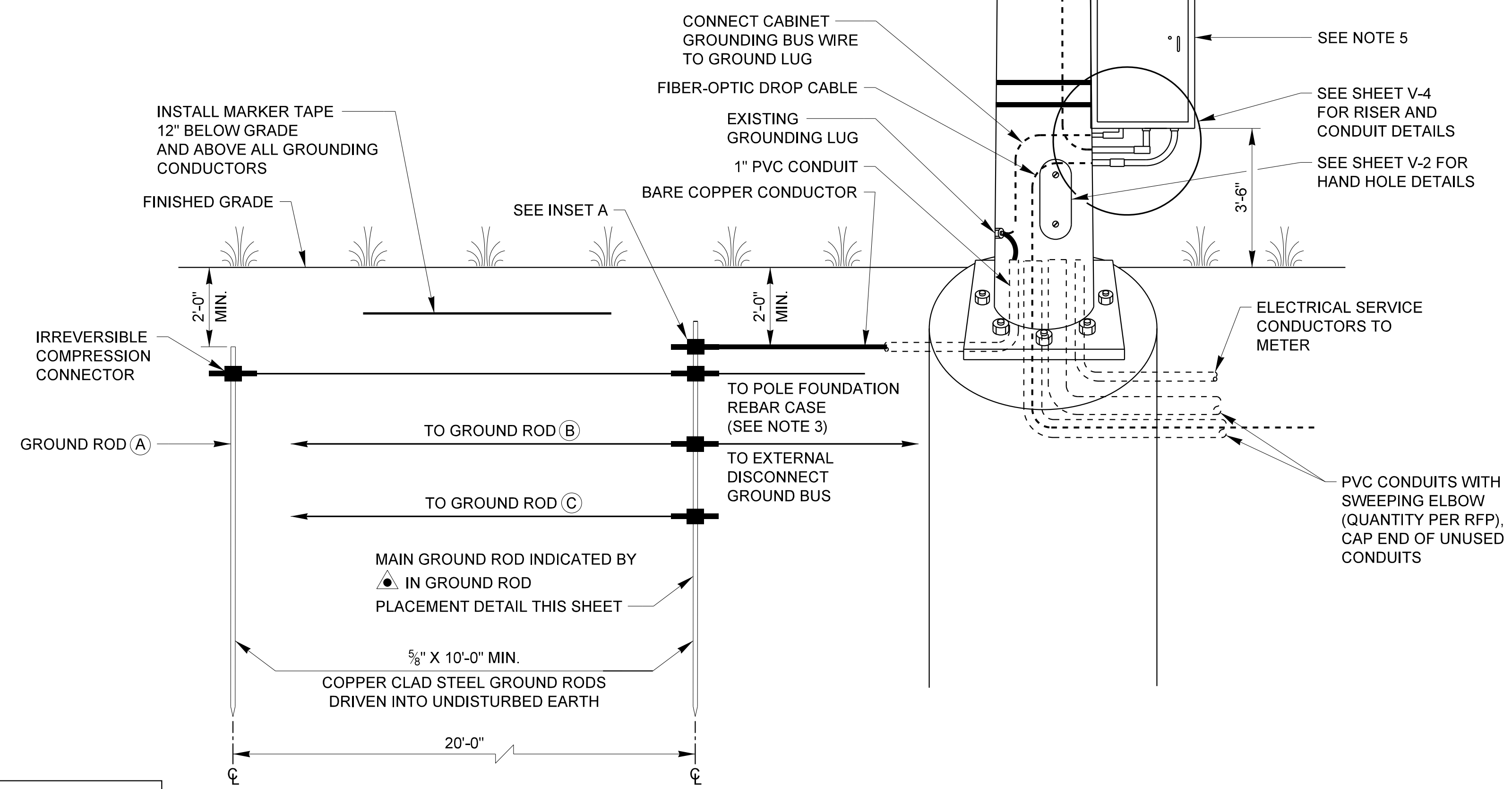
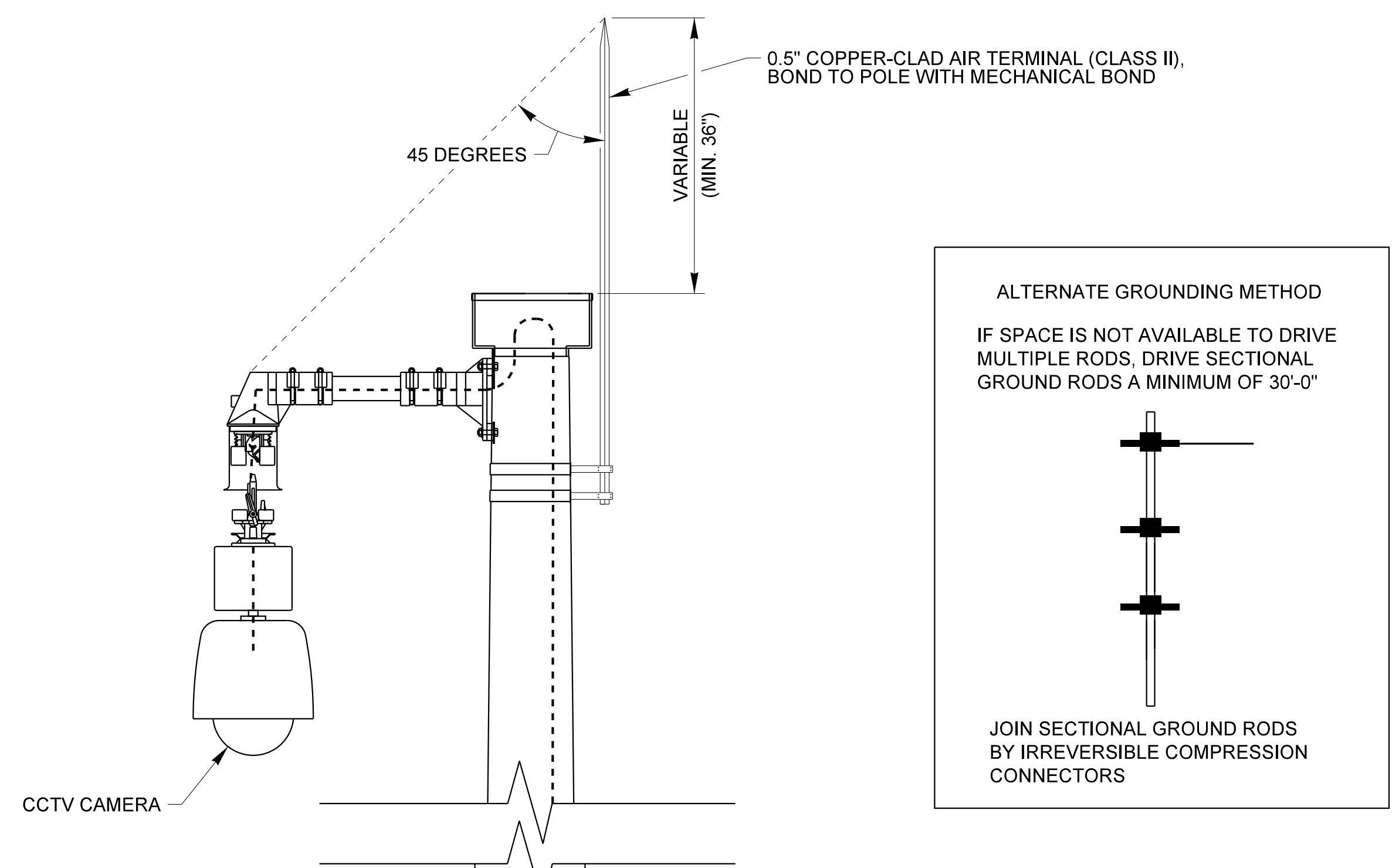
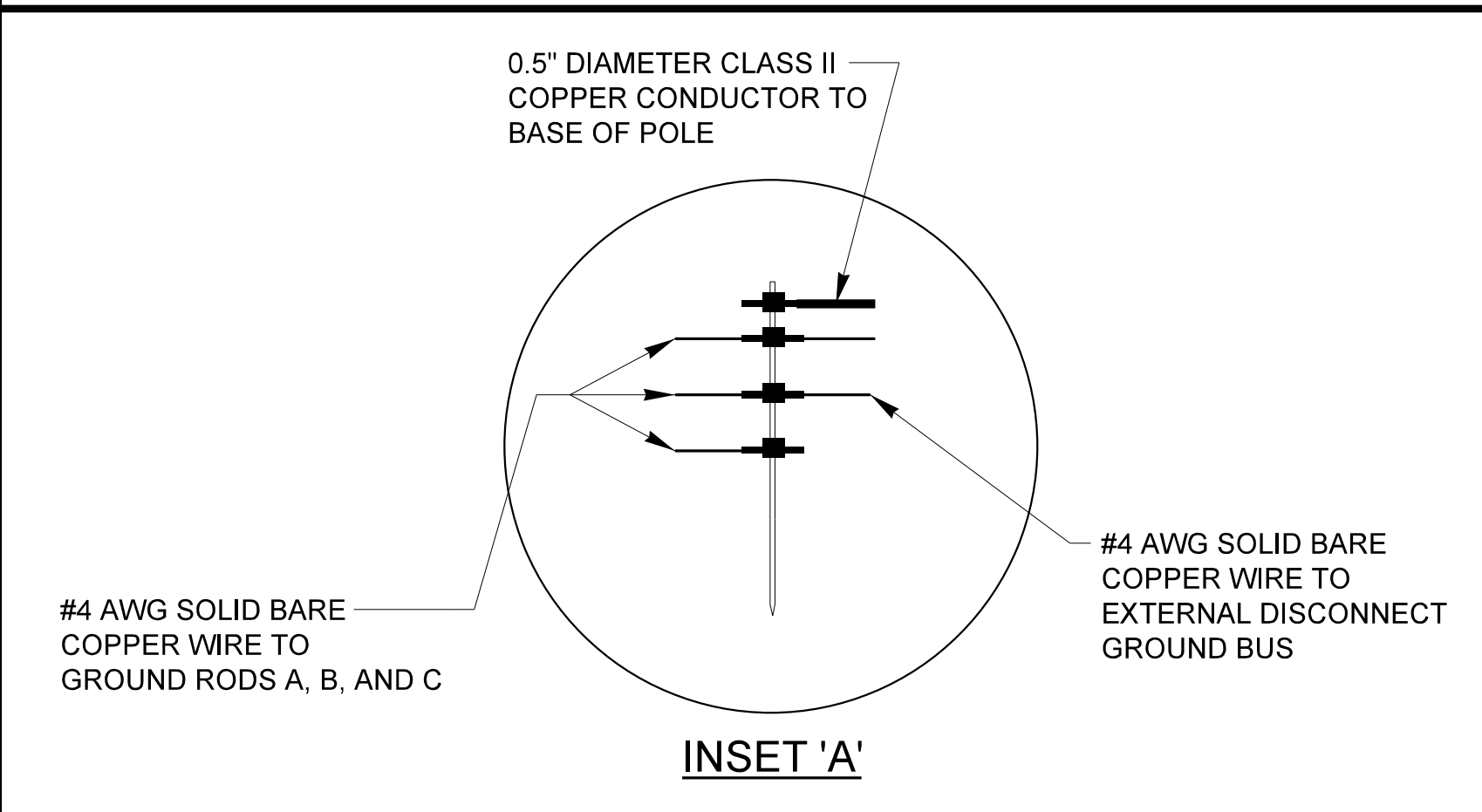
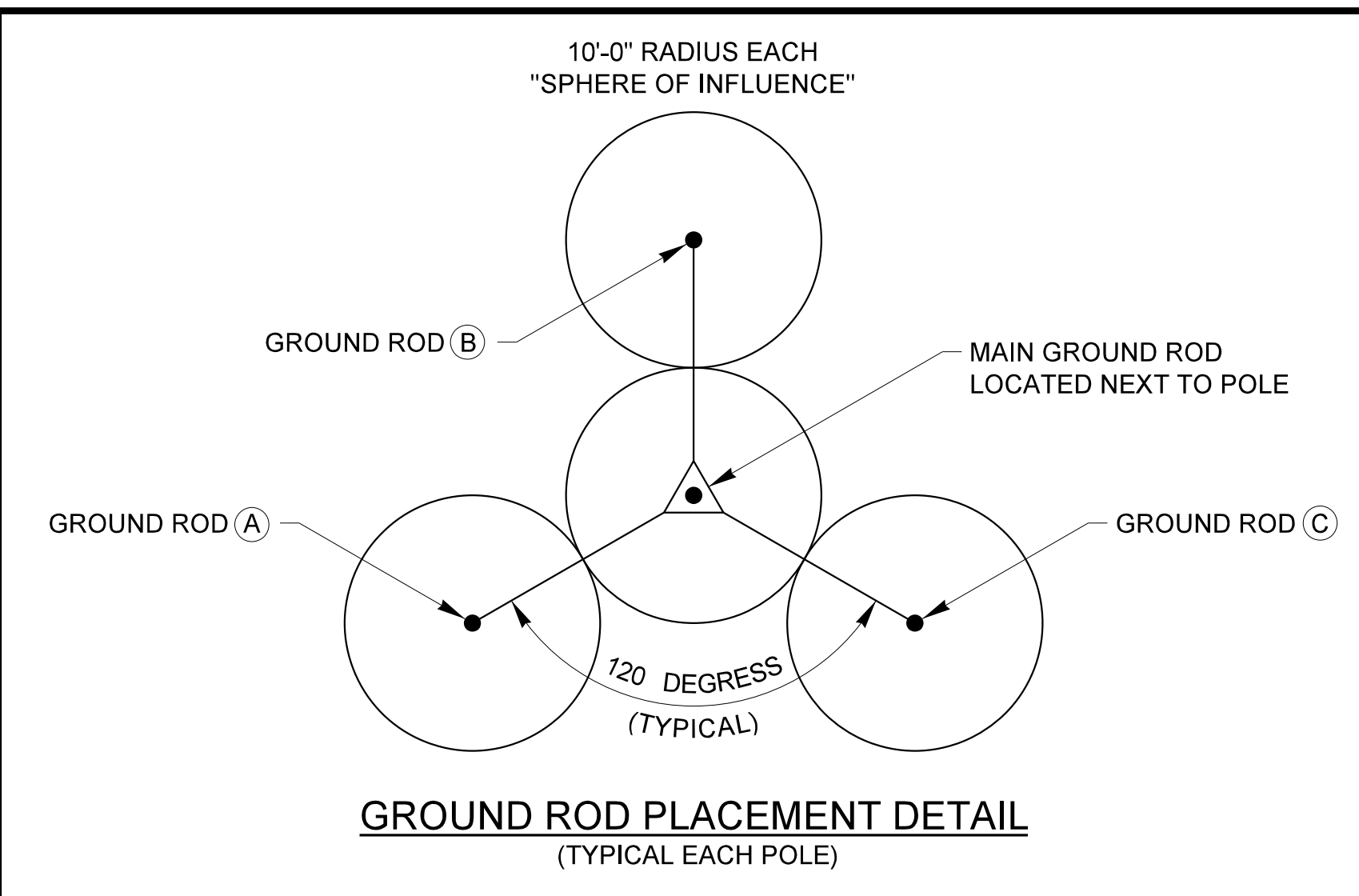
WITHOUT LOWERING DEVICE
ELEVATION
Scale: 3/23" = 1'-0"

SCALE: As Shown
March 2022

REV. NO.	BY	DATE	DESCRIPTION

X-XX

ROADWAY DETAIL DRAWING FOR
CCTV POLE GROUNDING



NOTES:

1. BOND 0.5" DIAMETER, 28 STRAND (MINIMUM) CLASS II COPPER CONDUCTOR TO THE MAIN GROUND ROD BY AN IRREVERSIBLE COMPRESSION CONNECTOR.
2. USE IRREVERSIBLE COMPRESSION CONNECTORS FOR ALL CONNECTIONS TO GROUND RODS.
3. BOND #4 AWG SOLID BARE COPPER WIRE TO REBAR CAGE AND THE MAIN GROUND ROD WITH AN IRREVERSIBLE COMPRESSION CONNECTOR.
4. ENSURE CAMERA HOUSING, CAMERA, AND PAN-TILT UNIT ARE BONDED TO POLE.
5. REMOVE BONDING JUMPER BETWEEN EQUIPMENT CABINET GROUND BUS AND NEUTRAL BUS.
6. THE CONTRACTOR MAY, UPON APPROVAL OF THE ENGINEER, INSTALL A 30-FOOT SECTIONAL GROUND ROD WHEN CONDITIONS WILL NOT ALLOW FOR THE INSTALLATION OF THE 3 - RADIAL GROUND RODS.
7. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12".
8. AIR TERMINAL LENGTH DEPENDS ON LENGTH OF LOWERING DEVICE ARM.
9. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.

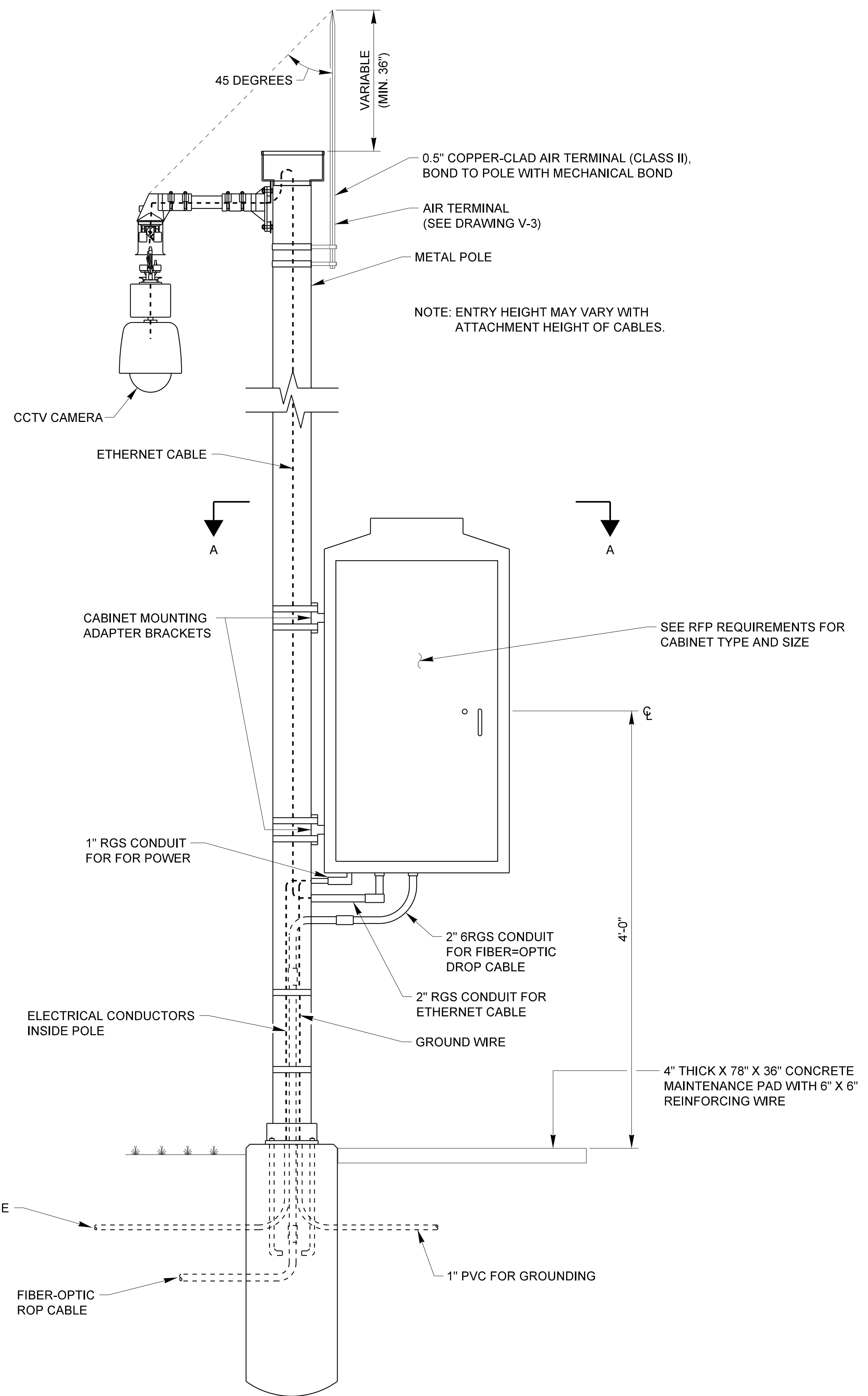
REV. NO.	BY	DATE	DESCRIPTION

SCALE: N.T.S.
March 2022

X-XX

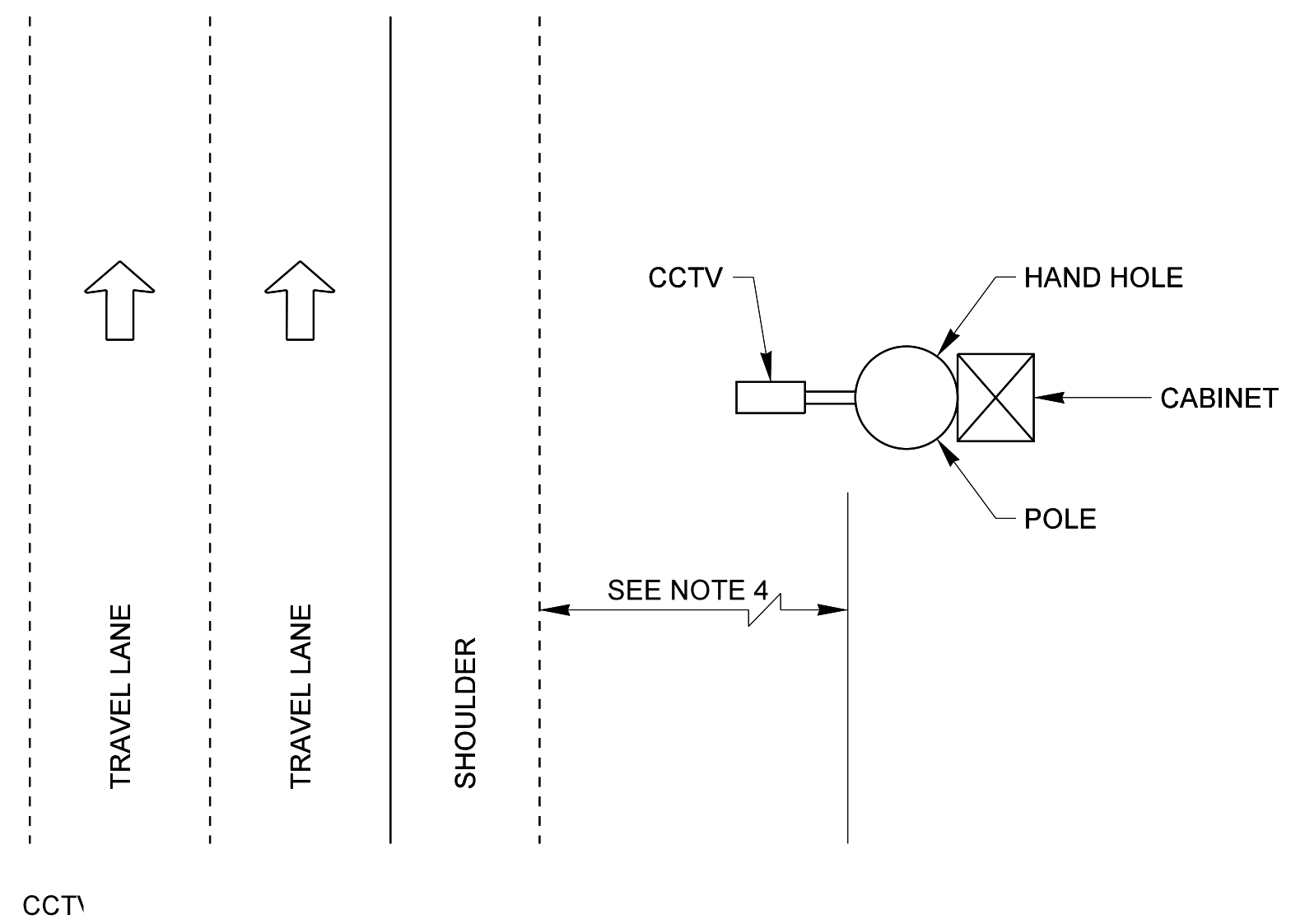
ROADWAY DETAIL DRAWING FOR
CCTV POLE-MOUNTED CABINET

V-4

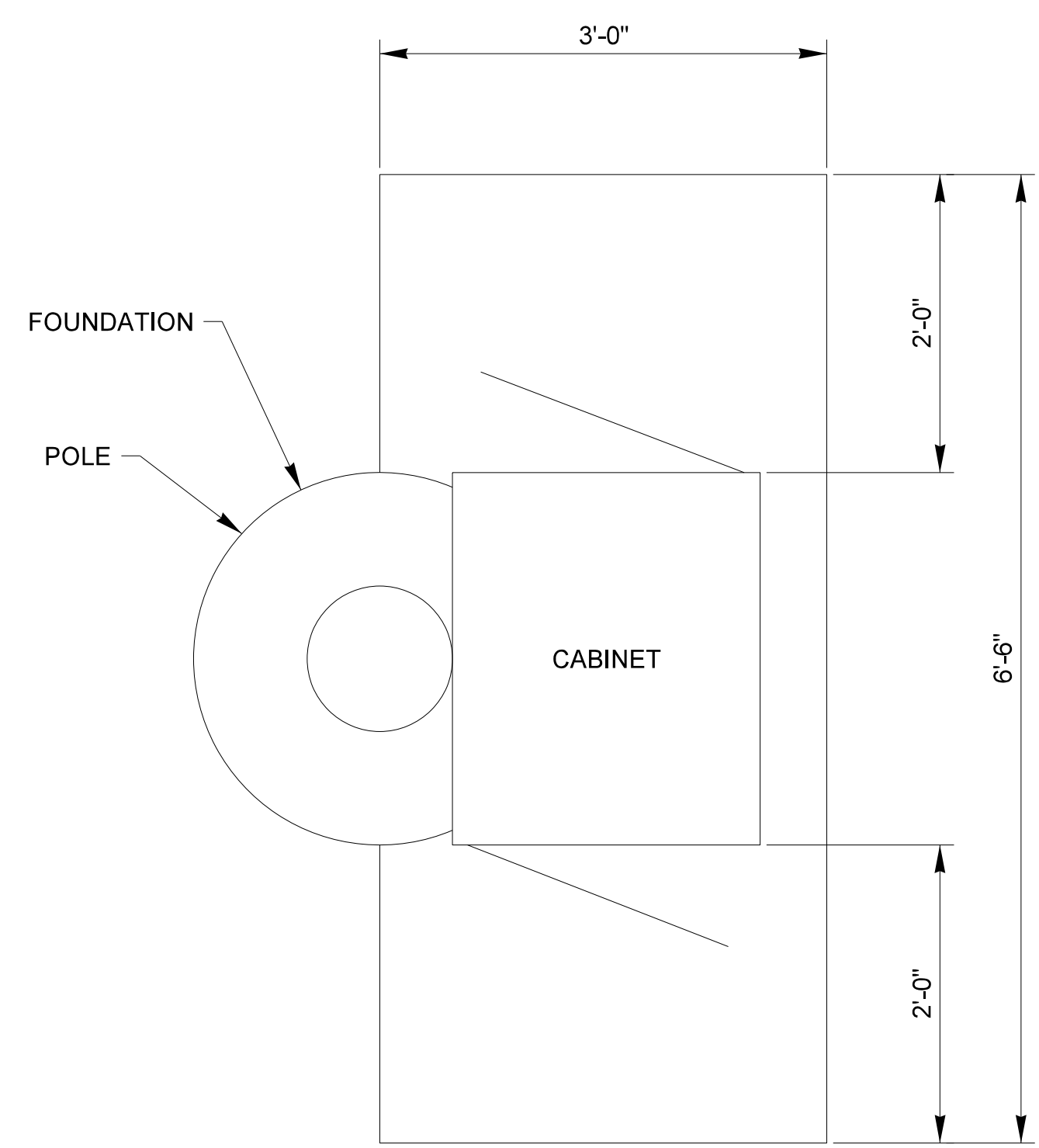


POLE-MOUNTED CCVC CABINET DETAIL
Scale: 1 1/2" = 1'-0"

REV. NO.	BY	DATE	DESCRIPTION



ORIENTATION OF DEVICES ON POLE



SECTION A-A
Scale: 1 1/2" = 1'-0"

NOTES:

1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
2. ALL WIRING / CABLING SHALL BE INTERNAL TO METAL POLE. DO NOT INSTALL CONDUITS / RISERS ON EXTERIOR OF POLE.
3. DO NOT INSTALL MAINTENANCE PAD ON EXCESSIVE SLOPE (GREATER THAN 3:1).
4. LOCATE POLE OUTSIDE OF CLEAR ZONE AS DEFINED BY NCDOT ROADWAY DESIGN MANUAL. IF NOT FEASIBLE, INSTALL GUARDRAIL AS REQUIRED.

SCALE: As Shown
March 2022

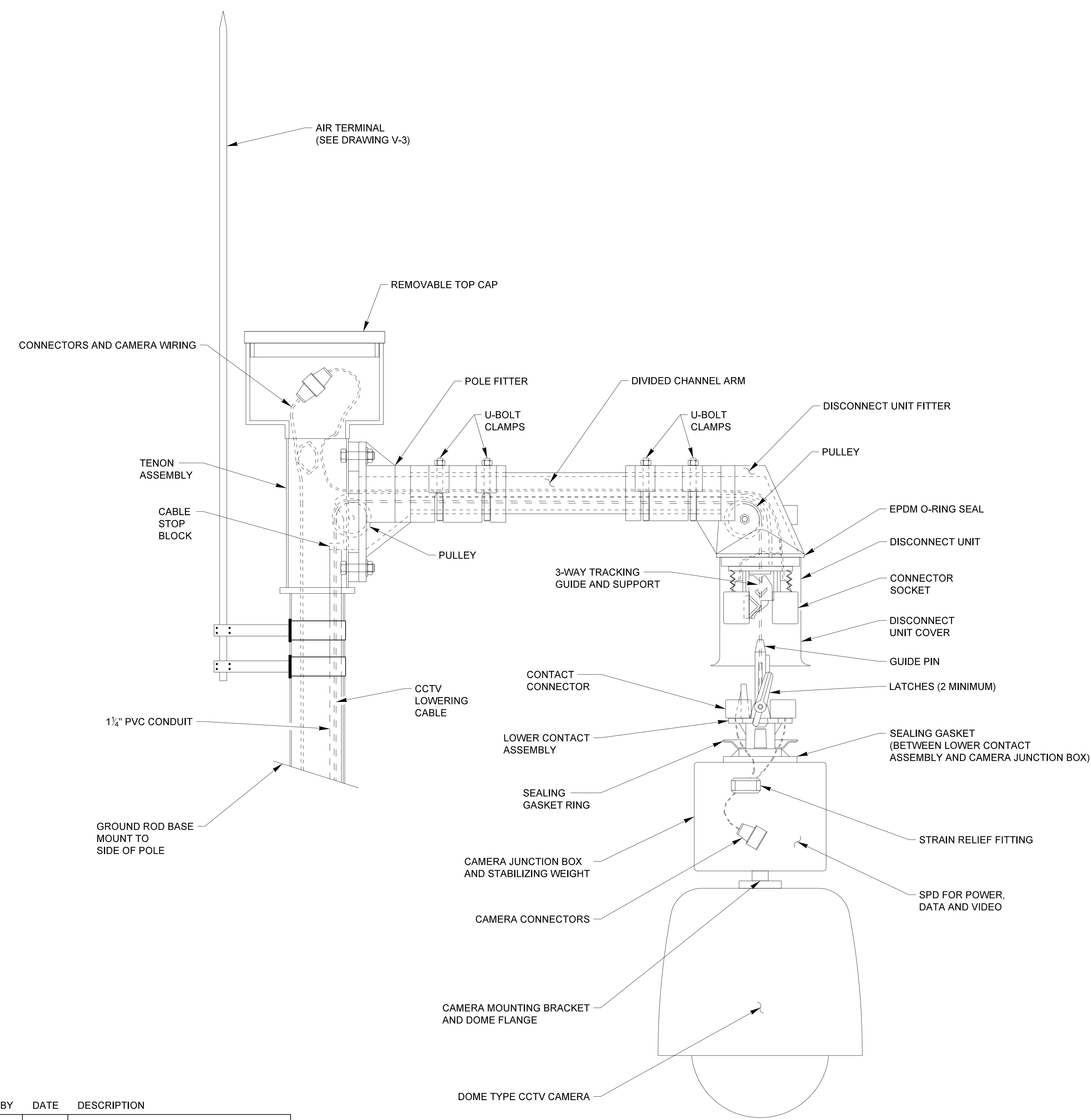
X-XX

ROADWAY DETAIL DRAWING FOR
CAMERA LOWERING DEVICE

V-5

NOTES:

1. LOWERING DEVICE TO BE SHIPPED READY FOR POLE ATTACHMENT TO INCLUDE PREWIRED CASE WITH RJ-45 MALE CONNECTOR PREWIRED TO LOWERING DEVICE AT THE FACTORY. PREWIRED ETHERNET CABLE SHALL BE PROVIDED TO THE POLE TOP JUNCTION BOX OR OF SUFFICIENT LENGTH PER CAMERA LOCATION FOR ONE CONTINUOUS RUN FROM THE CAMERA LOWERING ARM TO THE RESPECTIVE EQUIPMENT CABINET.
2. WHERE FACTORY INSTALLED CABLES TERMINATE IN THE POLE TOP JUNCTION BOX, THE CONTRACTOR SHALL PROVIDE APPROPRIATE LENGTH PER CAMERA LOCATION OF OUTDOOR RATED CAT6 ETHERNET CABLE AND ANY ADDITIONAL POWER/SIGNAL CABLES IN ONE CONTINUOUS RUN FROM THE RESPECTIVE EQUIPMENT CABINET TO THE POLE TOP JUNCTION BOX OF EACH LOWERING DEVICE POLE.
3. THE CONTRACTOR SHALL PROVIDE ANY APPLICABLE POWER/SIGNAL CONNECTORS AND WEATHERPROOF INTERFACE COUPLER FOR ATTACHMENT TO ALL FACTORY INSTALLED CABLES IN THE POLE TOP AND/OR CAMERA JUNCTION BOXES IN A MANNER ACCEPTABLE TO THE PROJECT ENGINEER.
4. THE LOWERING DEVICE MANUFACTURER SHALL SUPPLY BOTH A PORTABLE LOWERING TOOL WITH A MANUAL HAND CRANK AND A PORTABLE ELECTRIC DRILL MOTOR WITH CUSTOM CLUTCH ADAPTER. ONE LOWERING TOOL PER EVERY 10 LOWERING DEVICES IS REQUIRED. THE LOWERING DEVICE MANUFACTURER SHALL PROVIDE AN ON-SITE INSTALLATION INSPECTION AND OPERATOR INSTRUCTION AND CERTIFICATION. THIS ENSURES THE PRODUCT IS ASSEMBLED CORRECTLY AND, MORE IMPORTANTLY, THAT ALL NECESSARY OF THE SYSTEM. BEFORE ERECTING THE FIRST POLE THE CONTRACTOR MUST CONTACT THE LOWERING DEVICE SUPPLIER AND SCHEDULE A FACTORY REPRESENTATIVE TO BE ON-SITE.
5. LOWERING DEVICE CONNECTION TO TOP OF POLE SHALL BE CAPABLE OF SERVICE TENSION AND SHEAR OF 1 KIP MINIMUM. THE CONTRACTOR SHALL PROVIDE PRODUCT CUT SHEET AND CAPACITY DATA FOR THE ENGINEER'S REVIEW AND APPROVAL PRIOR TO INSTALLATION.
6. CAMERA JUNCTION BOX SHALL BE OF TWO PIECE CLAMHELL DESIGN WITH ONE REMOVABLE HINGE SIDE AND ONE LATCH SIDE WITH SINGLE TOGGLE BOLT TO FACILITATE EASY ACCESS. THE GENERAL SHAPE OF THE BOX SHALL BE CYLINDRICAL TO MINIMIZE THE EFFECTIVE PROJECTED AREA. THE CAMERA JUNCTION BOX SHALL BE CAST ALUMINUM WITH STABILIZING WEIGHTS.
7. CAMERA TO BE MOUNTED TO CAMERA JUNCTION BOX VIA 1 1/2" STANDARD NPT PIPE THREAD.
8. USE AIR TERMINAL EXTENSION WHEN THE POLE TOP JUNCTION BOX IS WIDER THAN TOP OF POLE.
9. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.

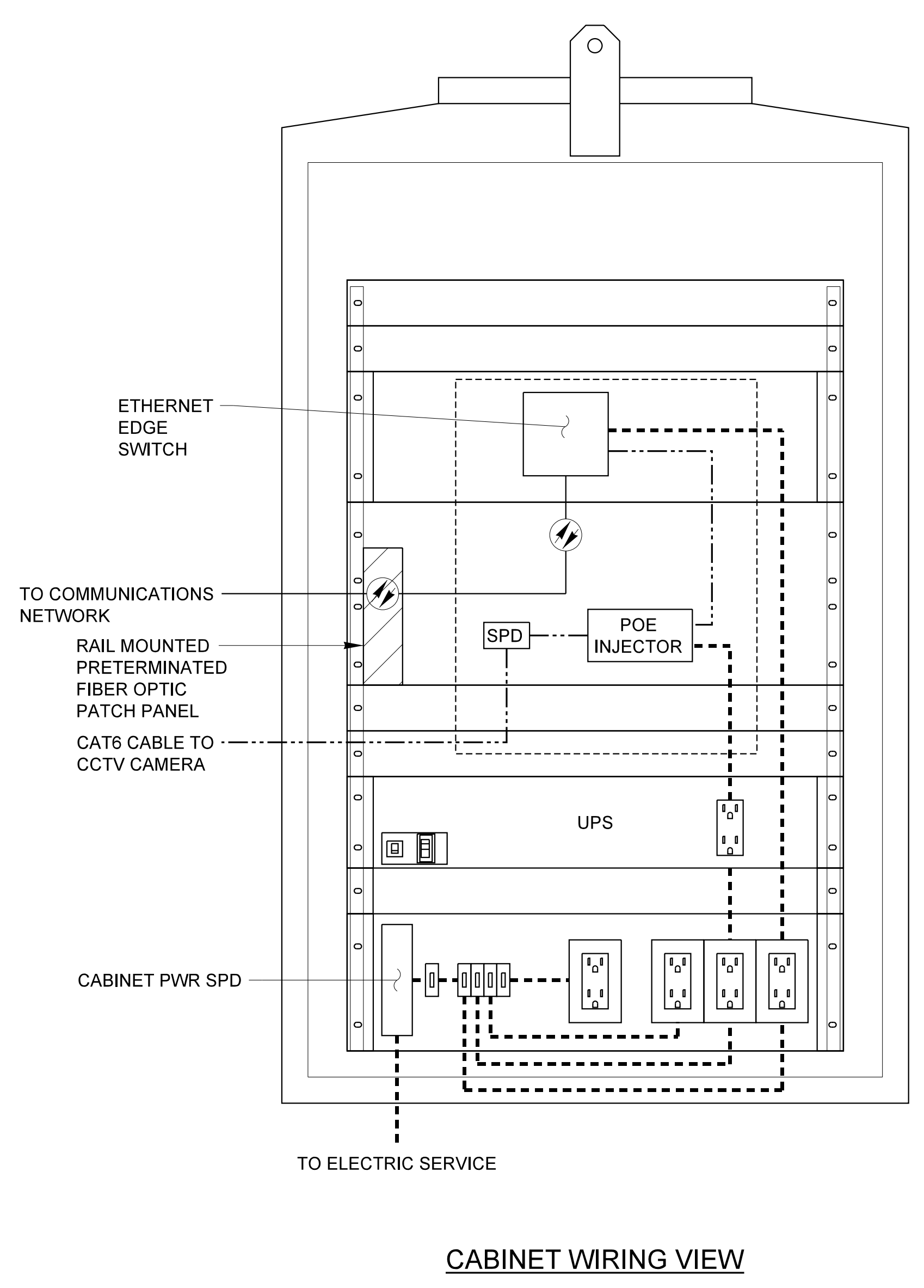
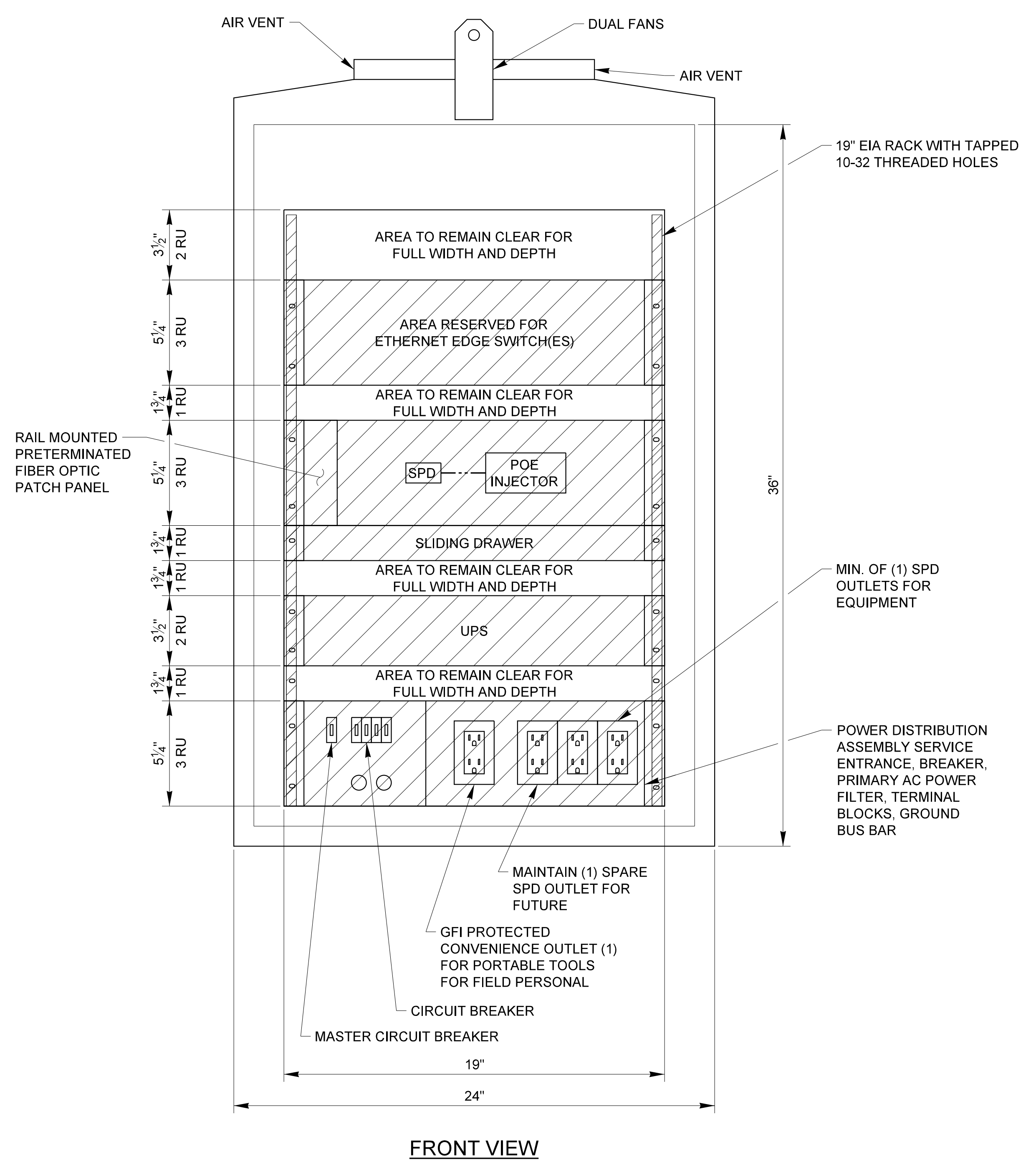


REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3/32" = 1'-0"
 March 2022

X-XX

ROADWAY DETAIL DRAWING FOR
CCTV CABINET LAYOUT

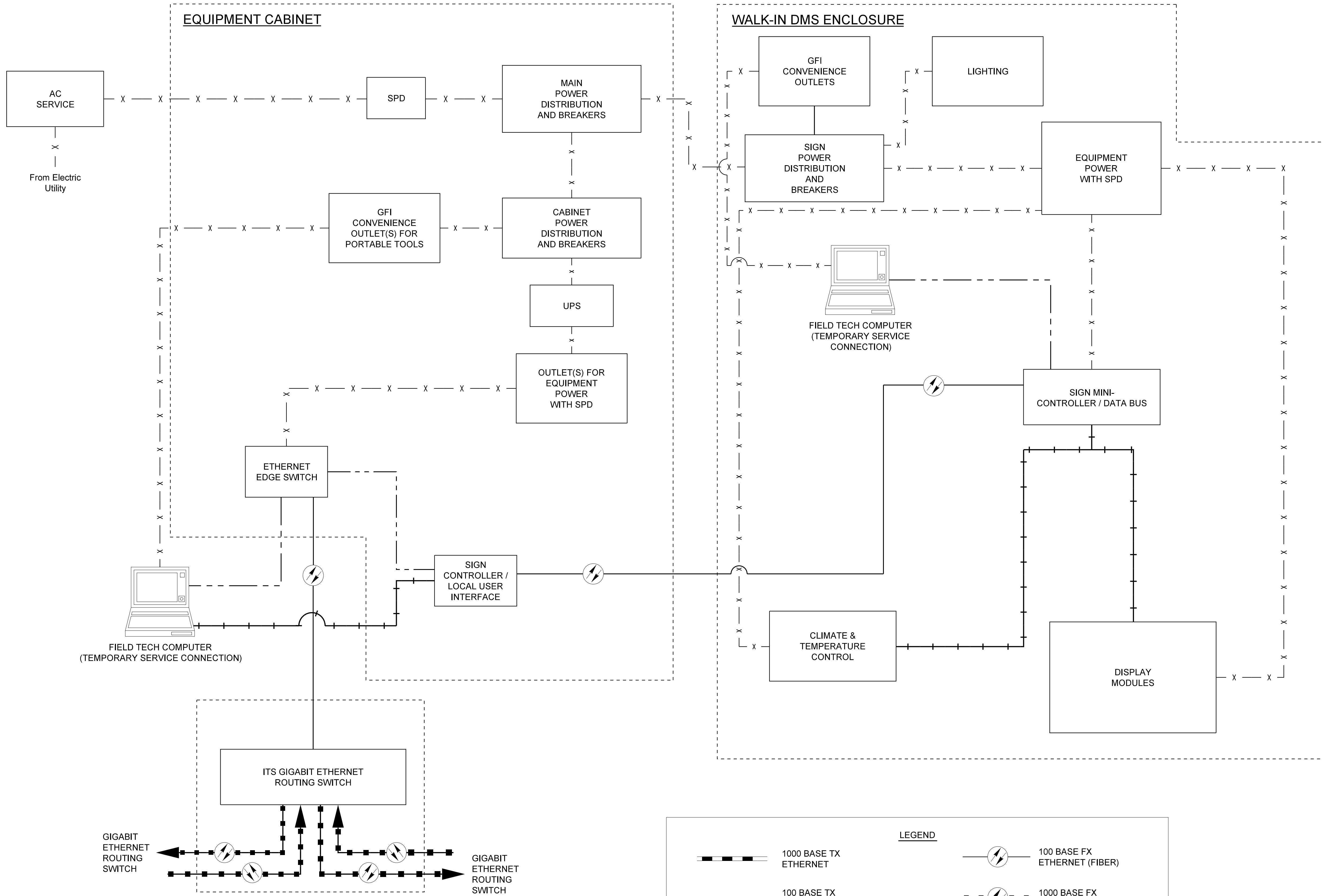


- NOTES:**
1. SEE RFP REQUIREMENTS FOR CABINET TYPE.
 2. ALL DIMENSIONS AND SCALE ARE APPROXIMATE.
 3. THE MINIMUM CCTV CABINET DIMENSIONS SHALL BE 36"H X 24"W X 22"D.
 4. CONDUIT ENTRANCES ARE IN BOTTOM OF CABINET.
 5. MINIMUM NUMBER OF OUTLETS IS THREE: (2) SPD AND (1) GFI PROTECTED.
 6. THERE SHALL BE FRONT AND REAR DOORS. BOTH DOORS SHALL HAVE THE HINGE SIDE NEXT TO THE POLE WHEN POLE MOUNTED.
 7. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.

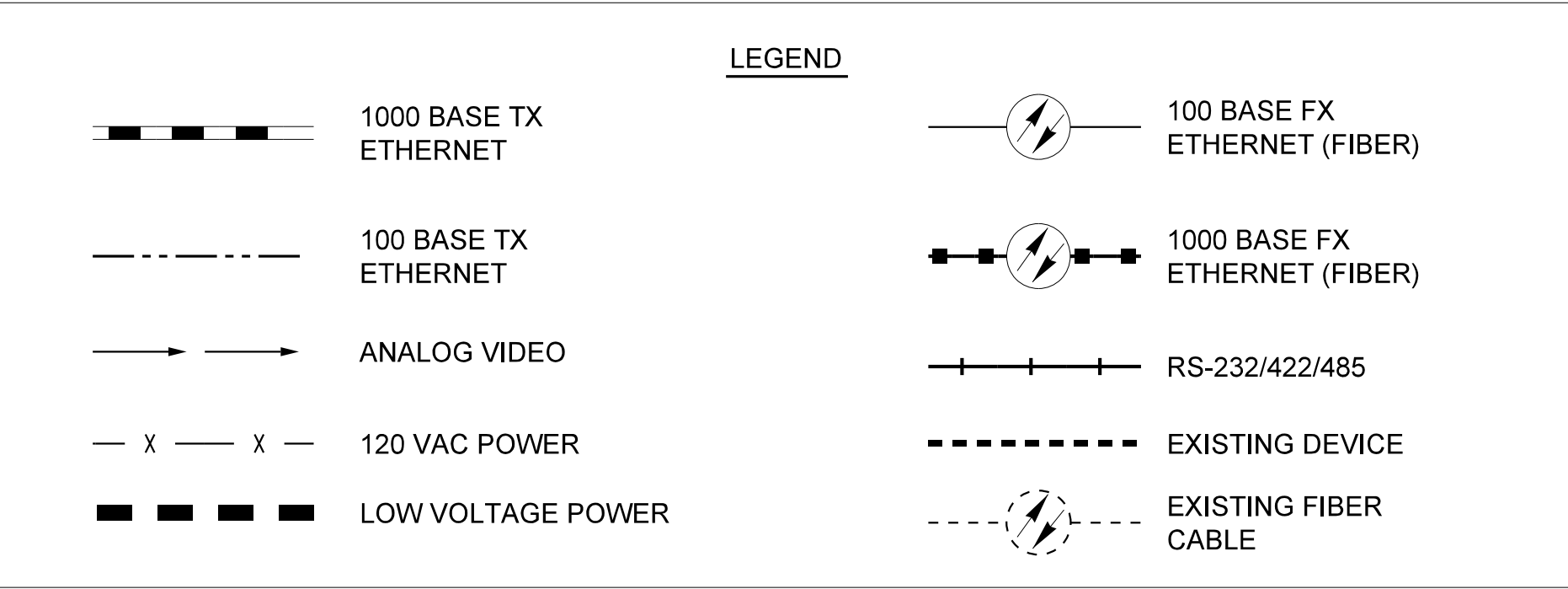
REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3" = 1'-0"
March 2022

X-XX



- NOTES:**
1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN RFP.
 2. AC WIRED CABINET SHALL BE EQUIPPED WITH A SURGE PROTECTOR WITH AN ALARM FEATURE.
 3. SIGNS AT AET VAULT LOCATIONS SHALL USE UPS FOR AET VAULT.



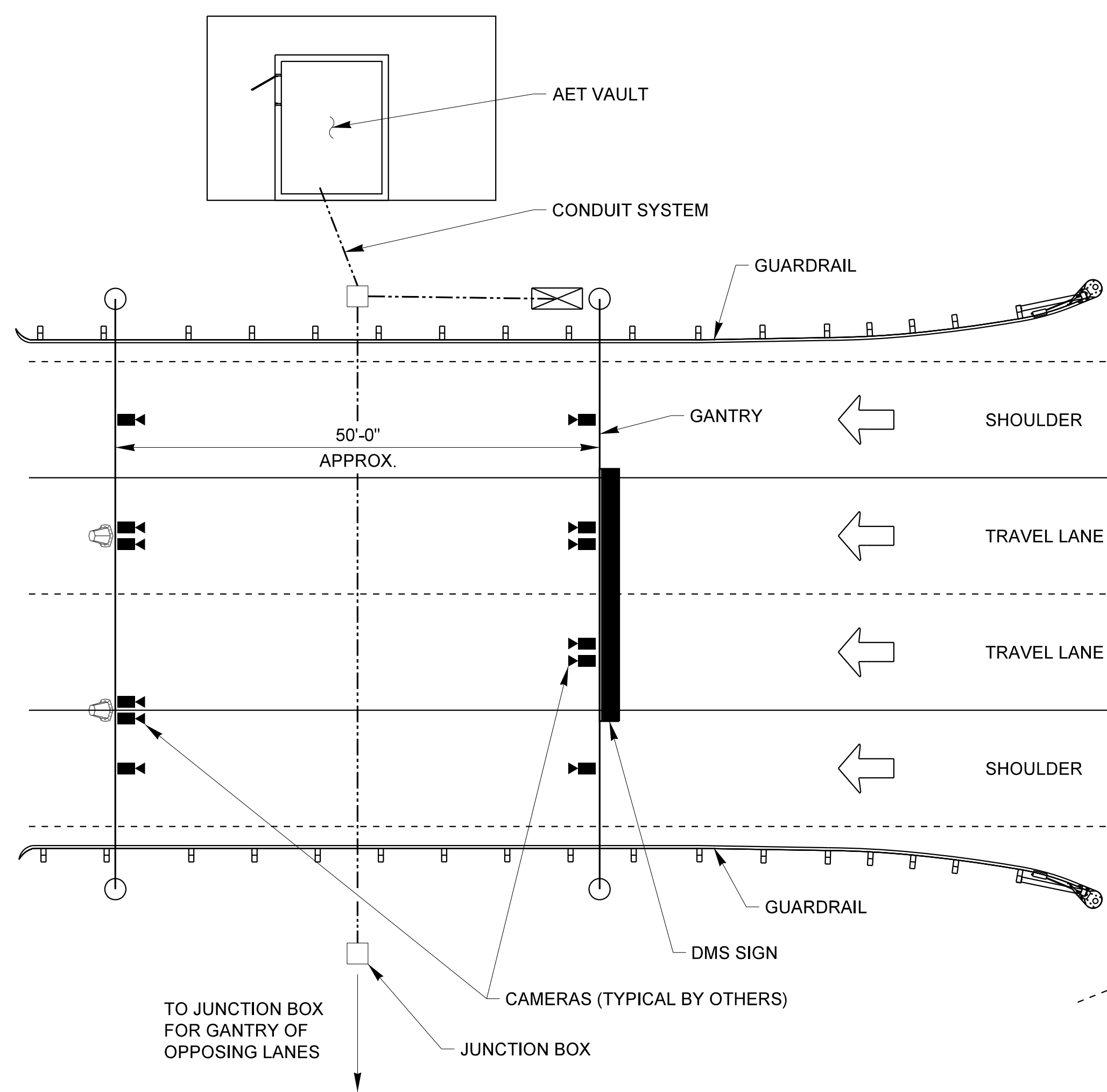
REV. NO.	BY	DATE	DESCRIPTION

SCALE: N.T.S.
March 2022

X-XX

ROADWAY DETAIL DRAWING FOR
**DMS - TYPICAL MOUNTING
AET GANTRY STRUCTURE**

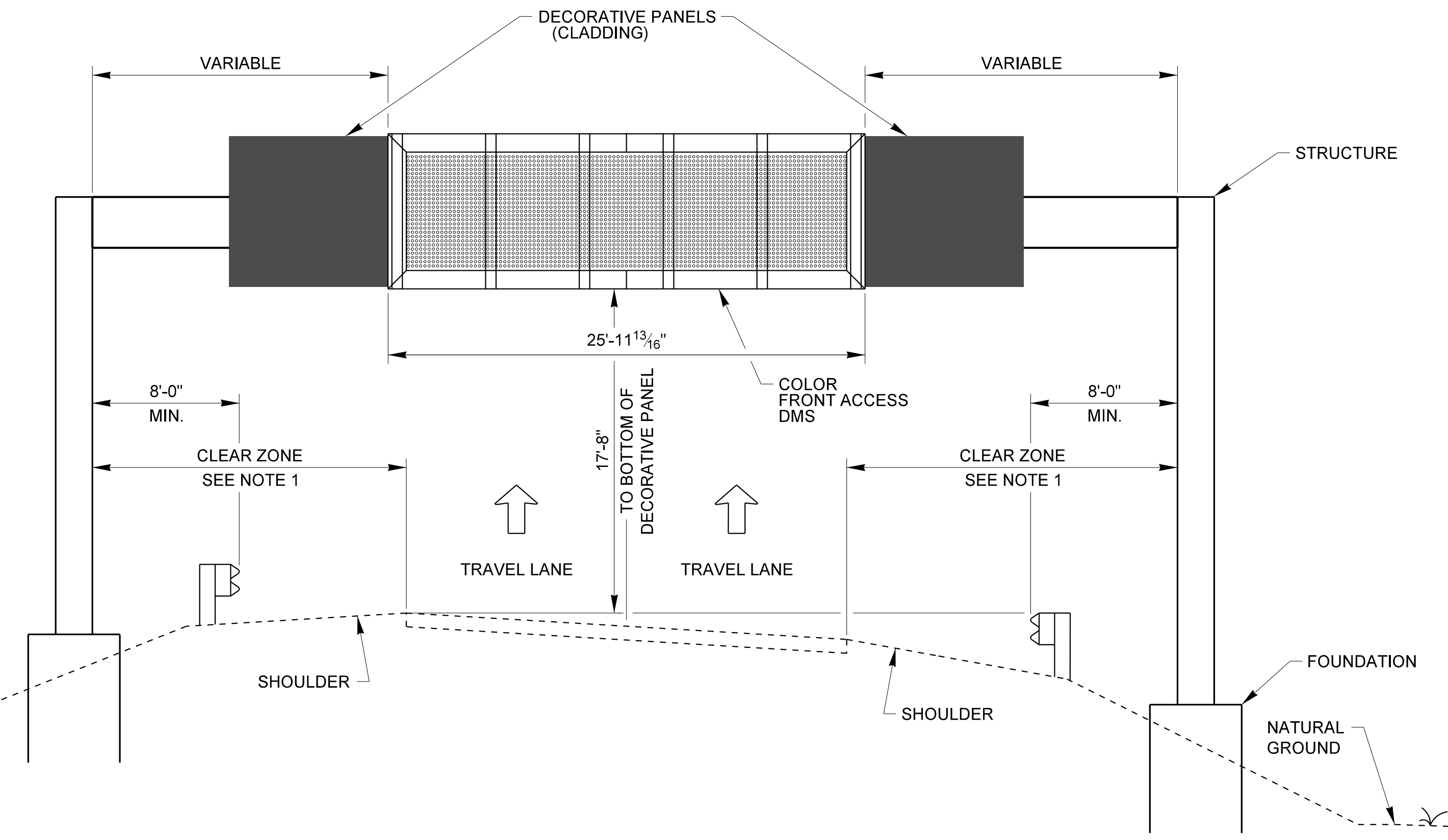
D-2A



**TYPICAL PLAN VIEW
ON-SITE DMS AT AET GANTRY STRUCTURE**
Scale: 3/32" = 1'-0"

NOTES:

- DESIGN COLUMNS IN ACCORDANCE WITH NCTA AESTHETIC DESIGN GUIDELINES AS REQUIRED BY RFP.
- ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
- CONDUCTORS SHALL BE CONNECTED TO STEEL FRAMEWORK THAT HAVE BEEN CLEANED TO BASE METAL, BY USE OF BONDING PLATES HAVING CONTACT AREA OF NOT LESS THAN 8 SQUARE INCHES OR BY WELDING OR BRAZING. DRILLING AND TAPPING THE STEEL STRUCTURE TO ACCEPT A THREADED CONNECTOR IS ALSO AN ACCEPTABLE METHOD.
- IF STEEL FRAMEWORK IS TO BE DRILLED AND TAPPED TO ACCEPT THREADED CONNECTOR, THE THREADED CONNECTOR SHALL HAVE AT LEAST 5 THREADS FULLY ENGAGED AND SECURED WITH A JAM NUT TO THE STEEL FRAMEWORK.
- BENDS IN THE CONDUIT WITH DMS COMMUNICATIONS CABLE (6-COUNT SINGLE MODE FIBER-OPTIC CABLE) SHALL NOT EXCEED THE MANUFACTURER'S MINIMUM RADIUS FOR THE FIBER-OPTIC CABLE.



**TYPICAL PLAN VIEW
ON-SITE DMS AT AET GANTRY STRUCTURE**
Scale: 3/16" = 1'-0"

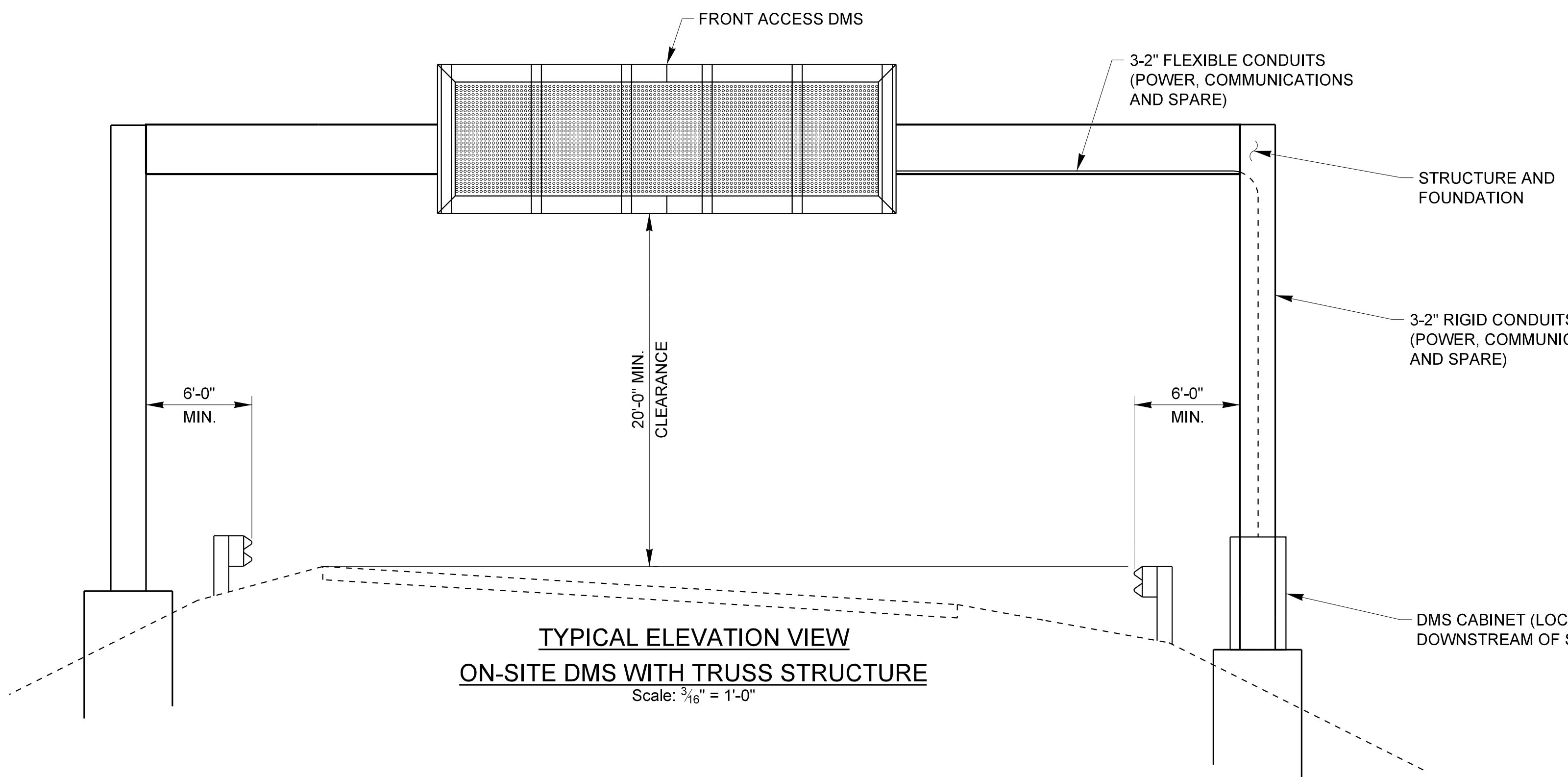
- CONDUITS ON STRUCTURE OR COLUMNS SHALL BE HIDDEN FROM VIEW OF APPROACHING TRAFFIC BY PLACING THEM WITHIN STRUCTURAL MEMBERS OR COLUMNS.
- ALL DATA AND POWER CABLES FOR THE DMS SHALL BE COMPLETELY CONCEALED FROM ONCOMING TRAFFIC.

REV. NO.	BY	DATE	DESCRIPTION

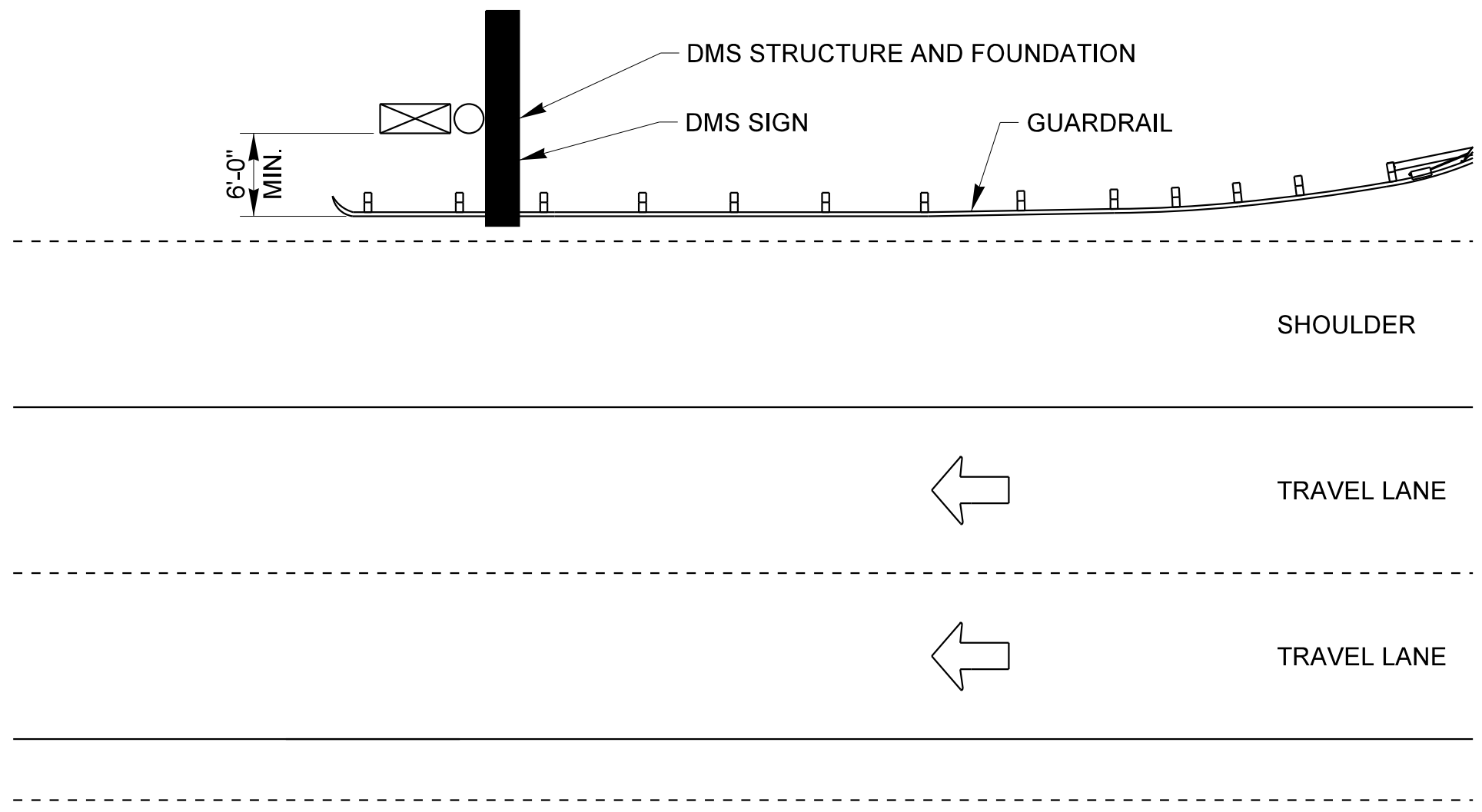
SCALE: As Shown
March 2022

X-XX

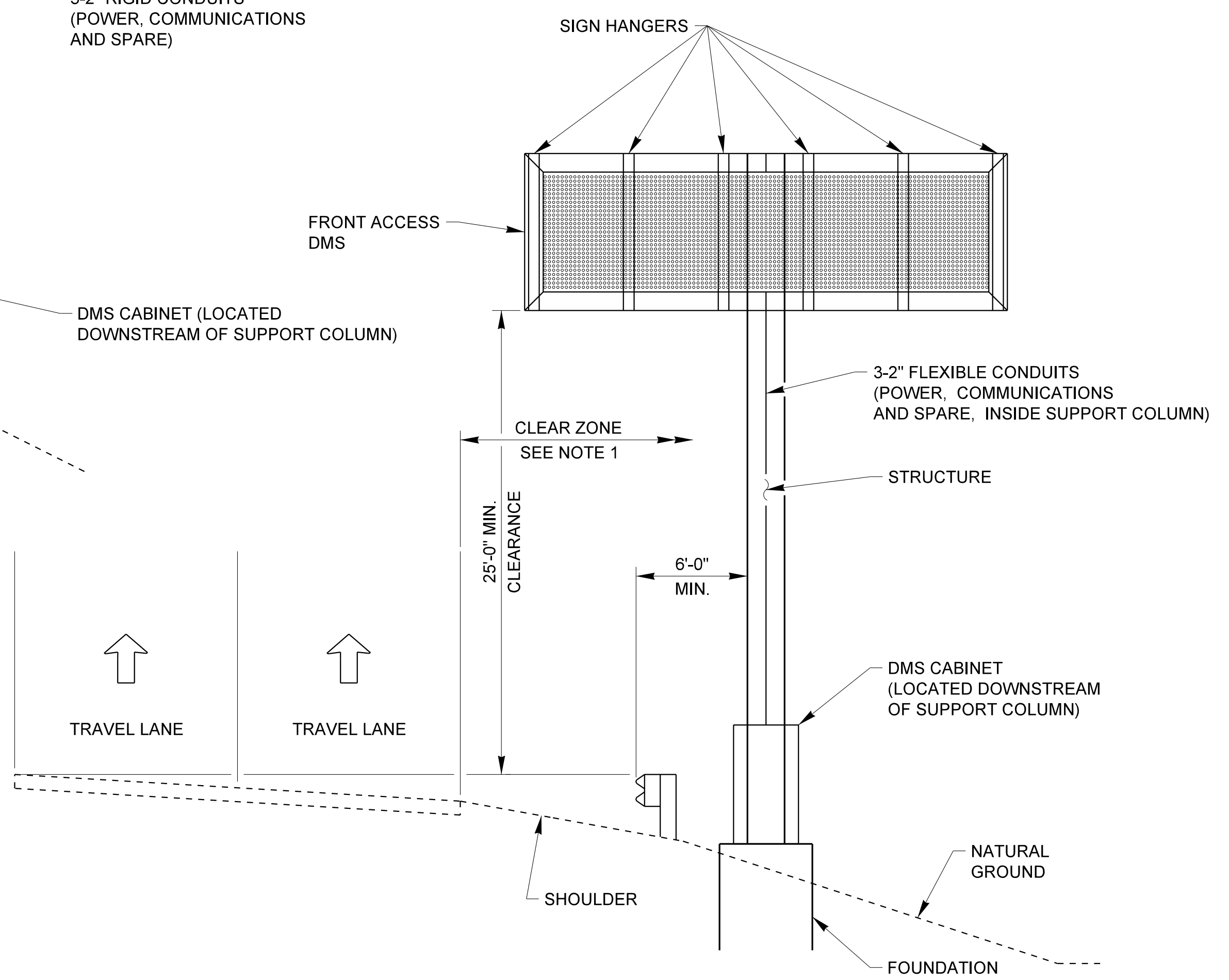
ROADWAY DETAIL DRAWING FOR
**DMS - TYPICAL MOUNTING
AET GANTRY STRUCTURE**



**TYPICAL ELEVATION VIEW
ON-SITE DMS WITH TRUSS STRUCTURE**
Scale: 3/16" = 1'-0"



**TYPICAL PLAN VIEW
ON-SITE DMS CANTILEVER STRUCTURE**
Scale: 3/32" = 1'-0"



**TYPICAL ELEVATION VIEW
ON-SITE DMS WITH PEDESTAL STRUCTURE**
Scale: 3/16" = 1'-0"

NOTES:

1. CONDUCTORS SHALL BE CONNECTED TO STEEL FRAMEWORK THAT HAVE BEEN CLEANED TO BASE METAL, BY USE OF BONDING PLATES HAVING CONTACT AREA OF NOT LESS THAN 8 SQUARE INCHES OR BY WELDING OR BRAZING. DRILLING AND TAPPING THE STEEL STRUCTURE TO ACCEPT A THREADED CONNECTOR IS ALSO AN ACCEPTABLE METHOD.
2. IF STEEL FRAMEWORK IS TO BE DRILLED AND TAPPED TO ACCEPT THREADED CONNECTOR, THE THREADED CONNECTOR SHALL HAVE AT LEAST 5 THREADS FULLY ENGAGED AND SECURED WITH A JAM NUT TO THE STEEL FRAMEWORK.
3. BENDS IN THE CONDUIT WITH DMS COMMUNICATIONS CABLE (6-COUNT SINGLE MODE FIBER-OPTIC CABLE) SHALL NOT EXCEED THE MANUFACTURER'S MINIMUM RADIUS FOR THE FIBER-OPTIC CABLE.
4. CONDUITS ON STRUCTURE OR COLUMNS SHALL BE HIDDEN FROM VIEW OF APPROACHING TRAFFIC BY PLACING THEM WITHIN STRUCTURAL MEMBERS OR COLUMNS.
5. ALL DATA AND POWER CABLES FOR THE DMS SHALL BE COMPLETELY CONCEALED.
6. DMS CABINETS SHALL BE GROUND MOUNTED OR MOUNTED ON STRUCTURE, AS DIRECTED BY THE ENGINEER.
7. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
8. TRUSS DETAIL ONLY APPLIES IF TRUSS IS NOT AT AN AET TOLL ZONE. FOR CONDUIT DETAILS FOR TRUSSES AT AET TOLL ZONES, SEE AET STANDARD DRAWINGS.
9. IF NO GUARDRAIL OR BARRIER WALL EXISTS, STRUCTURE SHALL BE OUTSIDE CLEAR ZONE. CLEAR ZONE SHALL BE MEASURED TO EDGE OF DRILLED SHAFT IF DRILLED SHAFT IS MORE THAN 4" ABOVE ADJACENT GRADE.
10. DESIGN COLUMNS IN ACCORDANCE WITH NCTA AESTHETIC DESIGN GUIDELINES AS REQUIRED BY RFP.

DMS - TYPICAL MOUNTING
ON-SITE DMS NOT AT TOLL ZONE

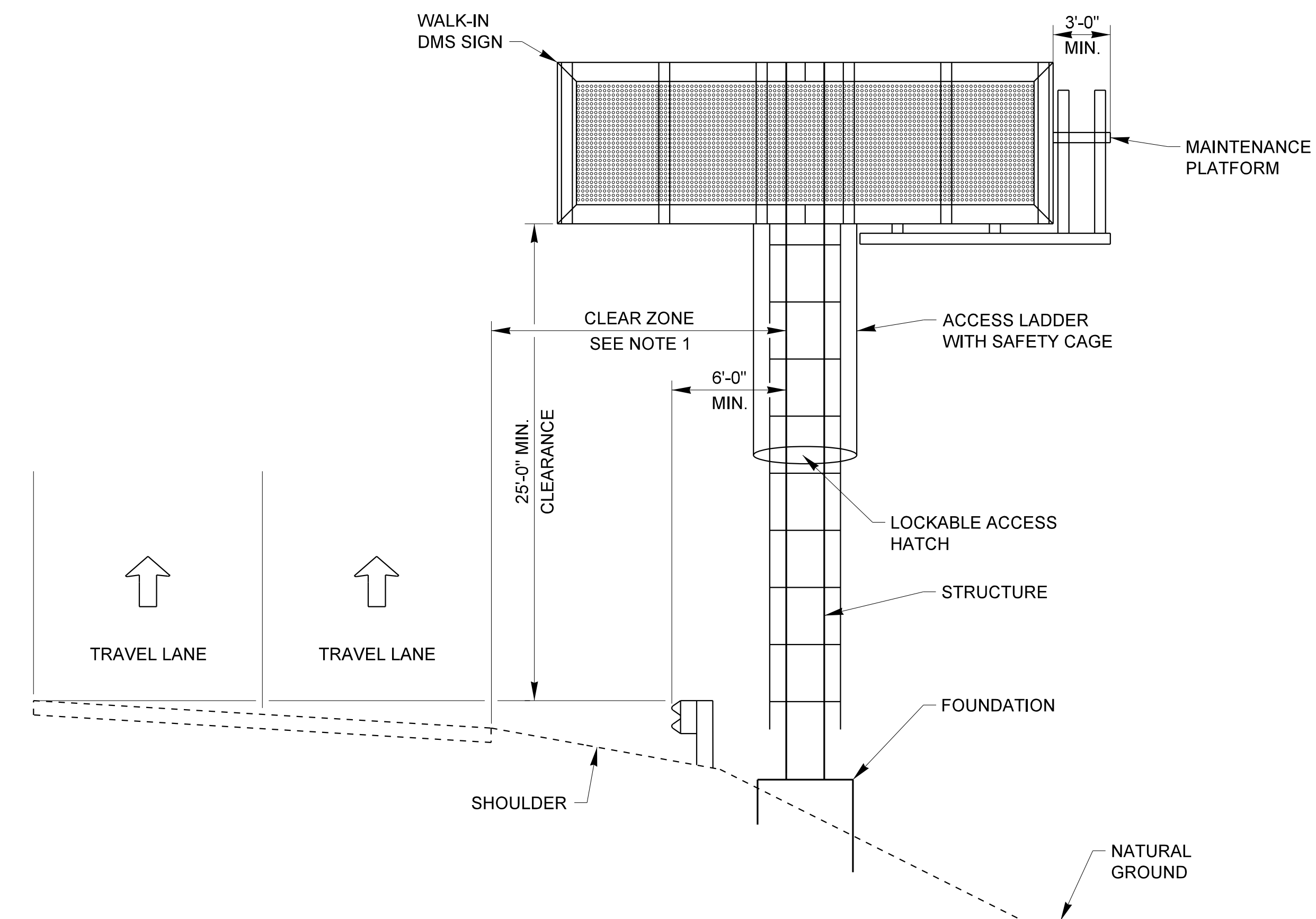
REV. NO.	BY	DATE	DESCRIPTION

SCALE: As Shown
March 2022

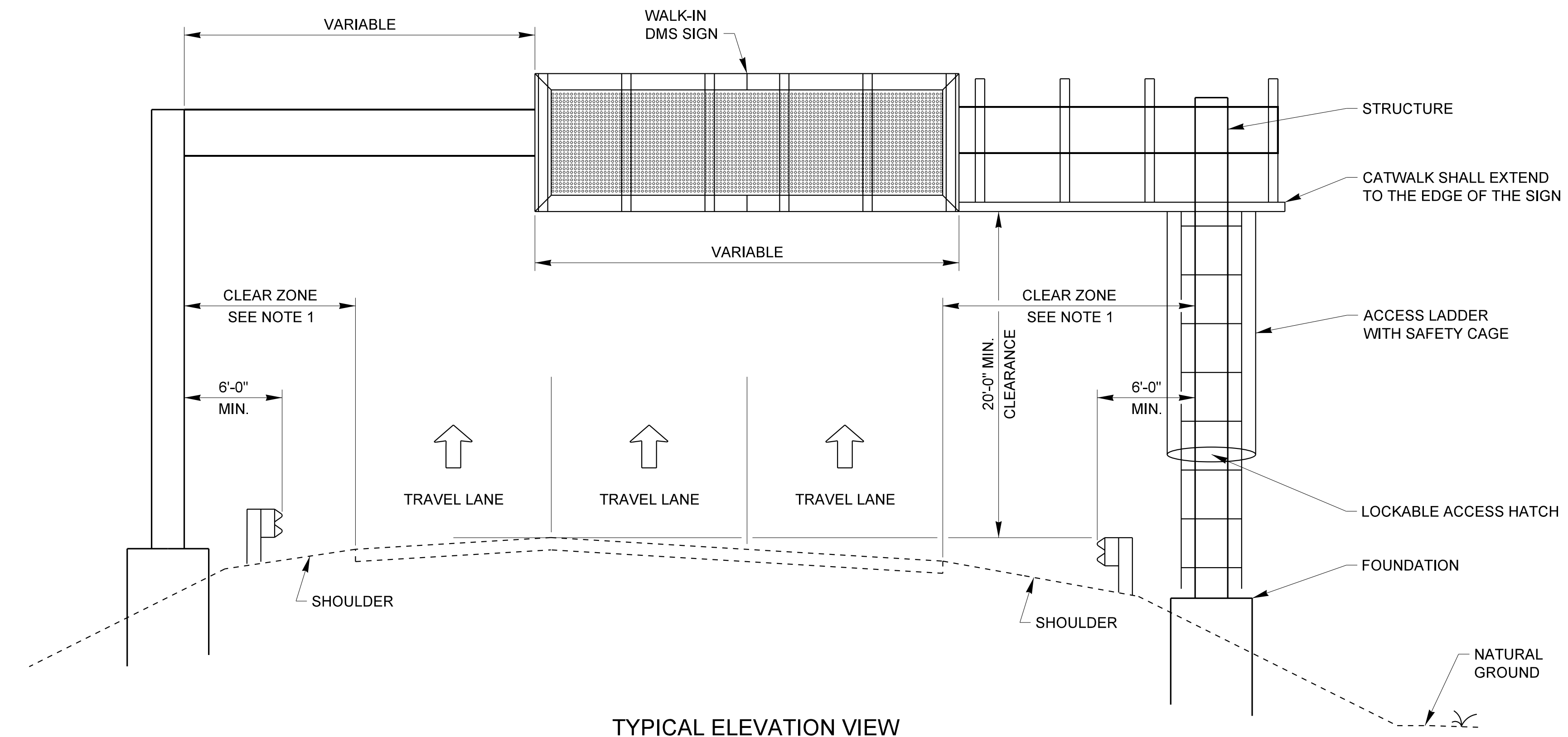
X-XX

ROADWAY DETAIL DRAWING FOR
**DMS - TYPICAL MOUNTING
OFF-SITE DMS**

D-2C



**TYPICAL ELEVATION VIEW
OFF-SITE DMS WITH PEDESTAL STRUCTURE**
Scale: 3/16" = 1'-0"



**TYPICAL ELEVATION VIEW
OFF-SITE DMS WITH TRUSS STRUCTURE**
Scale: 3/16" = 1'-0"

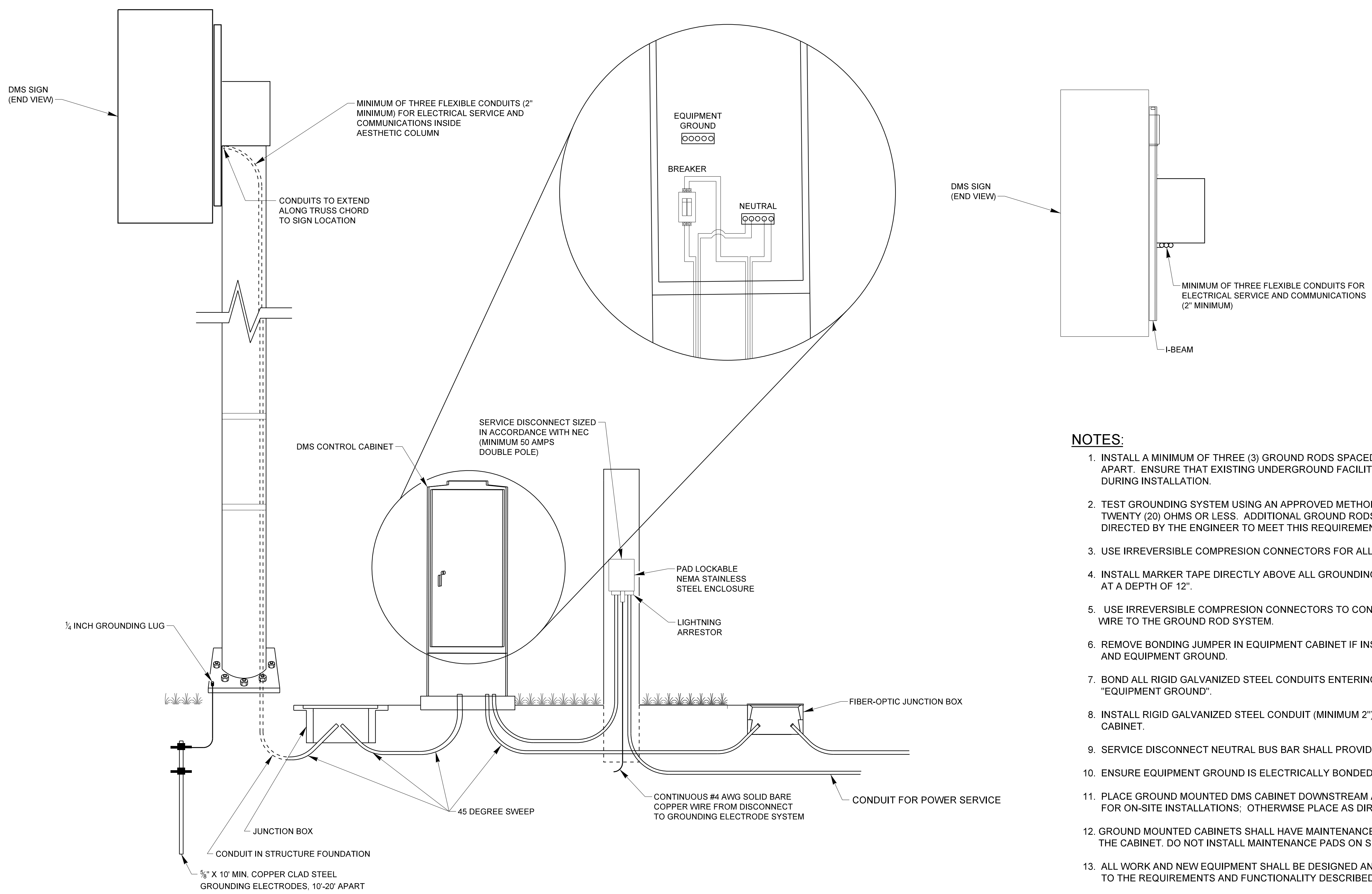
NOTES:

1. IF NO GUARDRAIL OR BARRIER WALL EXISTS, STRUCTURE SHALL BE OUTSIDE CLEAR ZONE. CLEAR ZONE SHALL BE MEASURED TO EDGE OF DRILLED SHAFT IF DRILLED SHAFT IS MORE THAN 4" ABOVE GRADE.
2. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
3. CONTRACTOR IS RESPONSIBLE FOR FURNISHING DMS ELEVATIONS FOR ENGINEER'S APPROVAL.
4. USE THE ACTUAL DIMENSIONS AND WEIGHT OF THE DMS PROVIDED BY THE DMS FABRICATOR TO COMPLETE THE DESIGN OF THE DMS STRUCTURE.
5. FIELD VERIFY ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTINGS USING THE LATEST NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
6. ENSURE THAT THE TOP OF THE FOOTING EXTENDS AT LEAST 6 INCHES AND NOT MORE THAN 24 INCHES ABOVE THE HIGHEST POINT OF THE GROUND SURFACE AT THE FOOTING.
7. DESIGN AND CONSTRUCT THE PEDESTAL STRUCTURE AND DMS ENCLOSURE TO WITHSTAND WIND VELOCITIES OF 90 MPH.
8. VERIFY ALL UNDERGROUND UTILITY LOCATIONS BEFORE BEGINNING ANY UNDERGROUND WORK. DO NOT DAMAGE ANY EXISTING UTILITIES OR NCDOT COMMUNICATIONS CABLE DURING CONSTRUCTION.
9. PROVIDE A FIXED LADDER LEADING TO THE ACCESS PLATFORM. EQUIP THE LADDER WITH A SECURITY COVER (LADDER GUARD). START THE FIRST LADDER RUNG NO MORE THAN 8 INCHES ABOVE A CONCRETE LANDING PAD. DESIGN RUNGS ON 12 INCH CENTER-TO-CENTER TYPICAL SPACING.
10. INSTALL A CONCRETE LANDING PAD MEASURING A MINIMUM 4 INCHES DEEP, 24 INCHES WIDE, AND 36 INCHES LONG DIRECTLY BENEATH THE LADDER.
11. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.
12. BENDS IN THE CONDUIT WITH DMS COMMUNICATIONS CABLE (6-COUNT SINGLE MODE FIBER-OPTIC CABLE) SHALL NOT EXCEED THE MANUFACTURER'S MINIMUM RADIUS FOR THE FIBER-OPTIC CABLE.
13. DMS CABINETS SHALL BE EITHER BE GROUND-MOUNTED OR MOUNTED ON STRUCTURE, AS DIRECTED BY THE ENGINEER.

REV. NO.	BY	DATE	DESCRIPTION

SCALE: As Shown
March 2022

ROADWAY DETAIL DRAWING FOR
**ELECTRICAL SERVICE AND
GROUNDING**



NOTES:

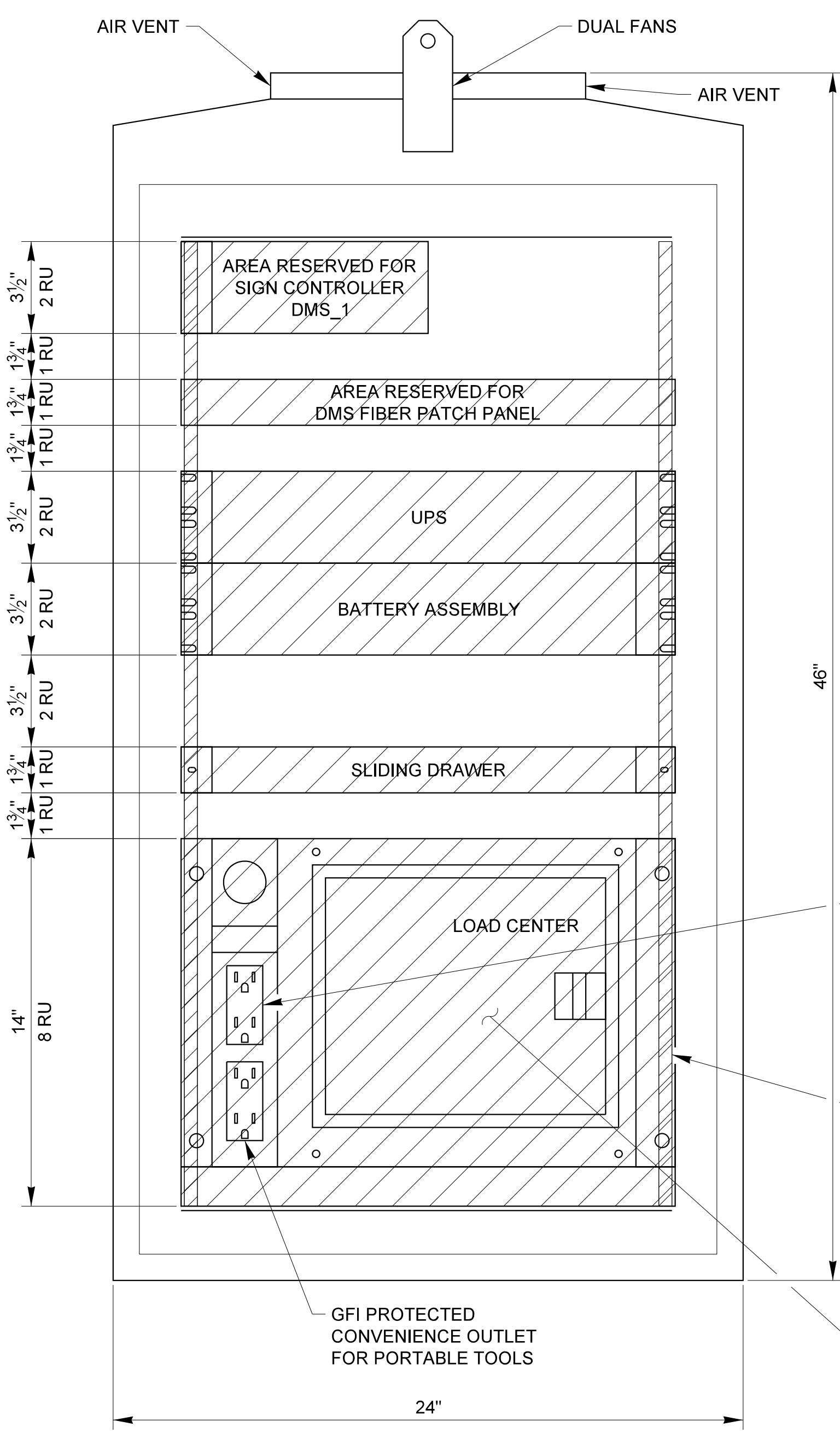
1. INSTALL A MINIMUM OF THREE (3) GROUND RODS SPACED A MINIMUM OF 10 FEET APART. ENSURE THAT EXISTING UNDERGROUND FACILITIES ARE NOT DAMAGED DURING INSTALLATION.
2. TEST GROUNDING SYSTEM USING AN APPROVED METHOD. SYSTEM SHALL MEASURE TWENTY (20) OHMS OR LESS. ADDITIONAL GROUND RODS SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER TO MEET THIS REQUIREMENT.
3. USE IRREVERSIBLE COMPRESSION CONNECTORS FOR ALL CONNECTIONS TO GROUND RODS.
4. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12".
5. USE IRREVERSIBLE COMPRESSION CONNECTORS TO CONNECT THE SERVICE POLE GROUND WIRE TO THE GROUND ROD SYSTEM.
6. REMOVE BONDING JUMPER IN EQUIPMENT CABINET IF INSTALLED BETWEEN AC NEUTRAL AND EQUIPMENT GROUND.
7. BOND ALL RIGID GALVANIZED STEEL CONDUITS ENTERING THE CABINET TO "EQUIPMENT GROUND".
8. INSTALL RIGID GALVANIZED STEEL CONDUIT (MINIMUM 2") BETWEEN DISCONNECT AND CABINET.
9. SERVICE DISCONNECT NEUTRAL BUS BAR SHALL PROVIDE FOR 2 #4 AWG CONNECTIONS.
10. ENSURE EQUIPMENT GROUND IS ELECTRICALLY BONDED TO CABINET.
11. PLACE GROUND MOUNTED DMS CABINET DOWNSTREAM AND BEHIND SUPPORT COLUMN FOR ON-SITE INSTALLATIONS; OTHERWISE PLACE AS DIRECTED BY ENGINEER.
12. GROUND MOUNTED CABINETS SHALL HAVE MAINTENANCE PADS AT FRONT AND REAR OF THE CABINET. DO NOT INSTALL MAINTENANCE PADS ON SLOPES GREATER THAN 3:1.
13. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.

REV. NO.	BY	DATE	DESCRIPTION

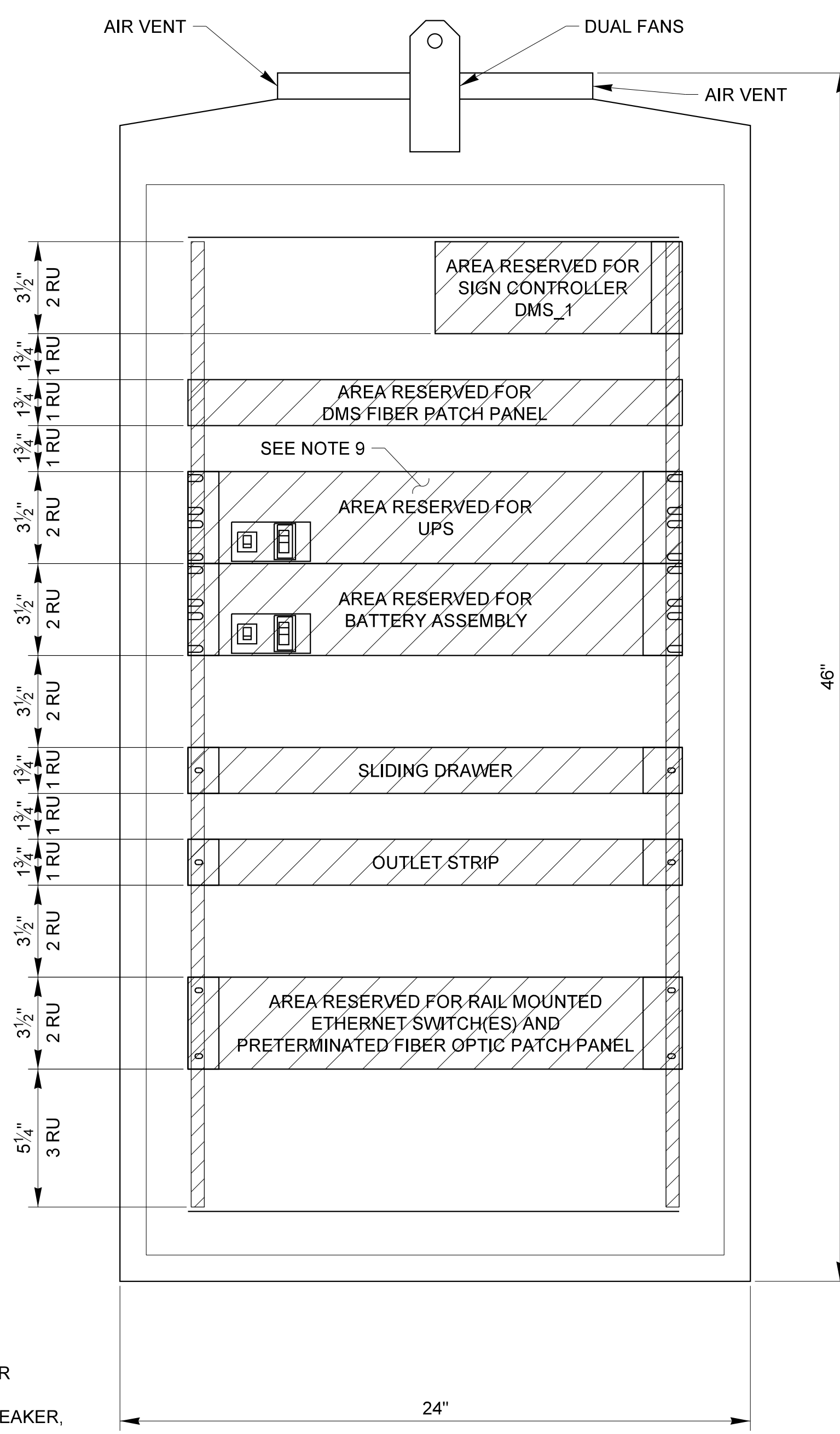
SCALE: 3/8" = 1'-0"
March 2022

X-XX

ROADWAY DETAIL DRAWING FOR
 DMS CABINET LAYOUT



FRONT VIEW



REAR VIEW

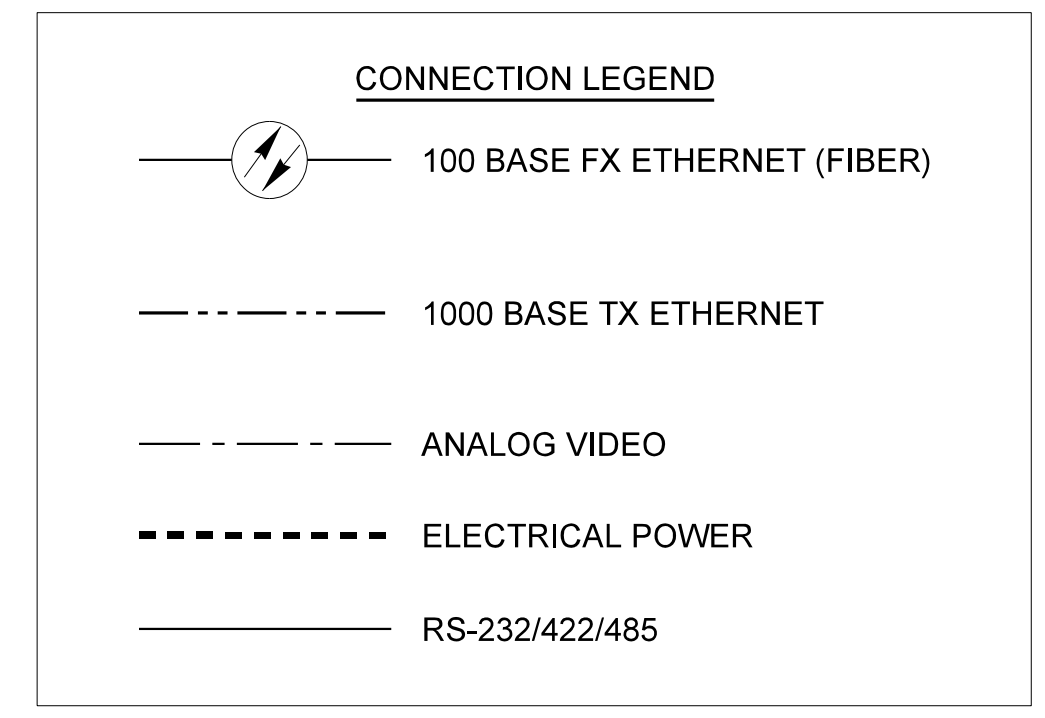
NOTES:

1. CABINET LAYOUT IS FOR BASE-MOUNTED INSTALLATIONS.
2. ALL DIMENSIONS ARE APPROXIMATE.
3. SEE RFP REQUIREMENTS FOR CABINET TYPE AND SIZE.
4. THE MINIMUM DMS CABINET DIMENSIONS SHALL BE 46"H X 24"W X 22"D.
5. CONDUIT ENTRANCES ARE AT BOTTOM OF CABINET.
6. MINIMUM NUMBER OF DUPLEX OUTLETS IS THREE, (2) SPD AND (1) GFI PROTECTED.
7. PROVIDE SIGN CONTROLLER IN GROUND LEVEL CABINET TO PROVIDE FULL ACCESS TO DMS SIGN FOR CONTROL, PROGRAMMING AND TROUBLESHOOTING.
8. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
9. PROVIDE UPS FOR ALL DMS NOT LOCATED AT AET GANTRY STRUCTURES.
10. UTILIZE UPS IN AET VAULT FOR ALL DMS LOCATED AT AET GANTRY STRUCTURE LOCATIONS.

SPD OUTLETS FOR COMMUNICATIONS HARDWARE

19" EIA RACK WITH TAPPED 10-32 THREADED HOLES

LOAD CENTER MUST INCLUDE POWER DISTRIBUTION ASSEMBLY SERVICE ENTRANCE, POWER FILTER, MAIN BREAKER, SEPARATE CIRCUIT BREAKERS FOR EQUIPMENT POWER AND CONVENIENCE OUTLETS, GROUND BLOCKS, GROUND BUS BAR AND TERMINAL BLOCKS FOR DIRECT CONNECTION TO PROTECTED POWER OUTLETS. INCREASE NUMBER OF RACK UNITS AS NECESSARY TO ACCOMMODATE BREAKERS.

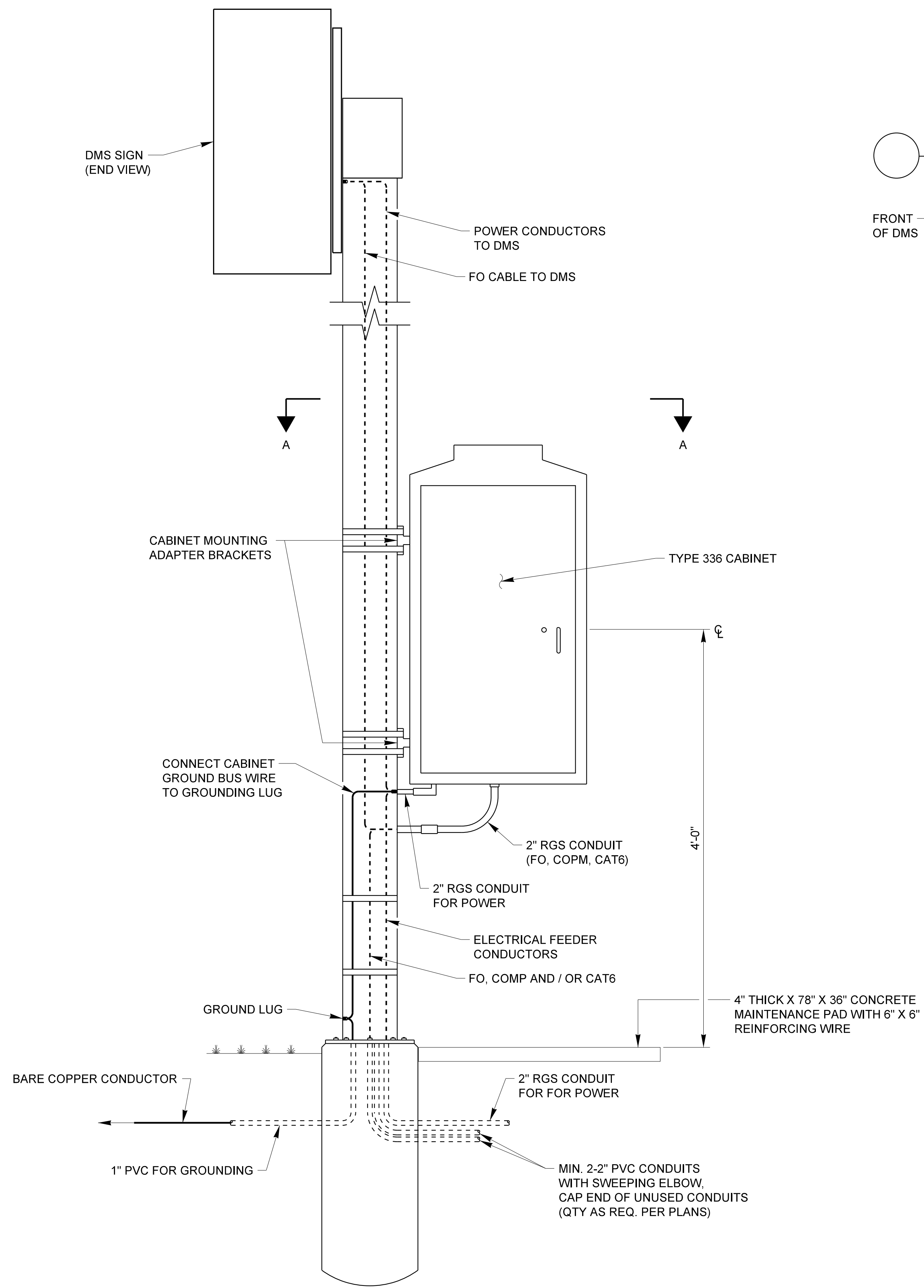


REV. NO.	BY	DATE	DESCRIPTION

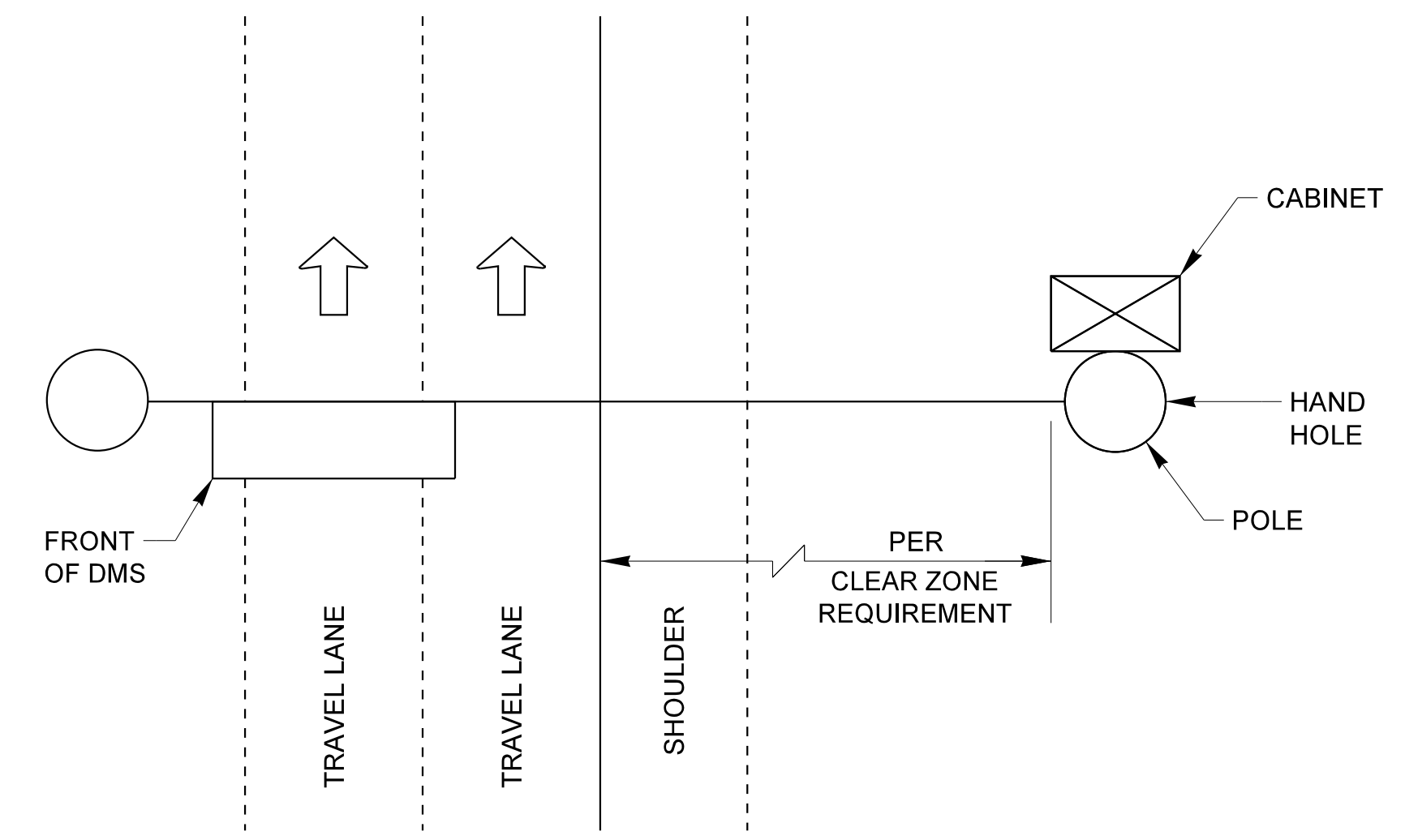
SCALE: 3" = 1'-0"
 March 2022

X-XX

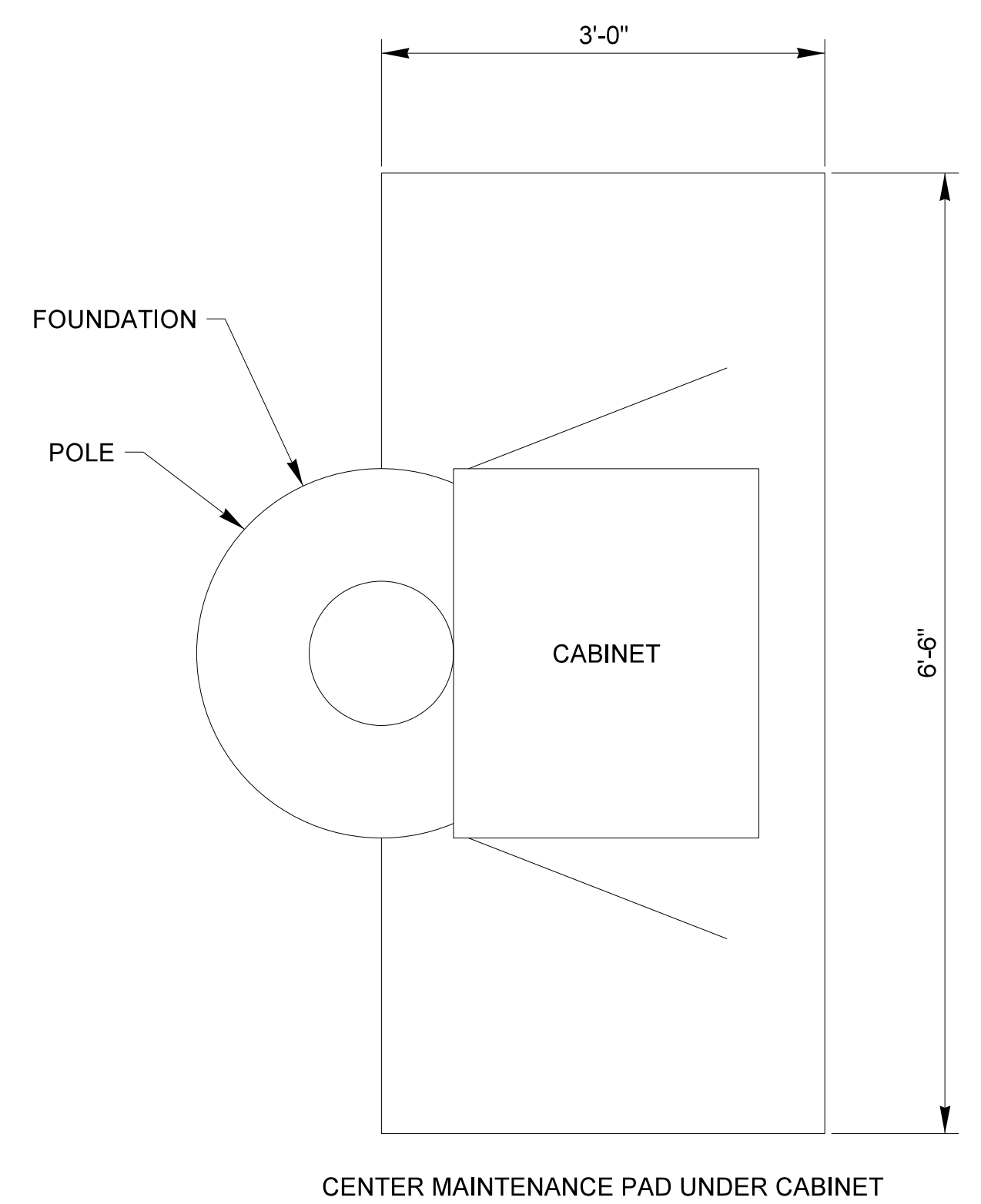
ROADWAY DETAIL DRAWING FOR
DMS POLE-MOUNTED CABINET



POLE-MOUNTED DMS CABINET DETAIL
 Scale: 1 1/2" = 1'-0"



ORIENTATION OF DEVICES ON POLE



SECTION A-A
 Scale: 1 1/2" = 1'-0"

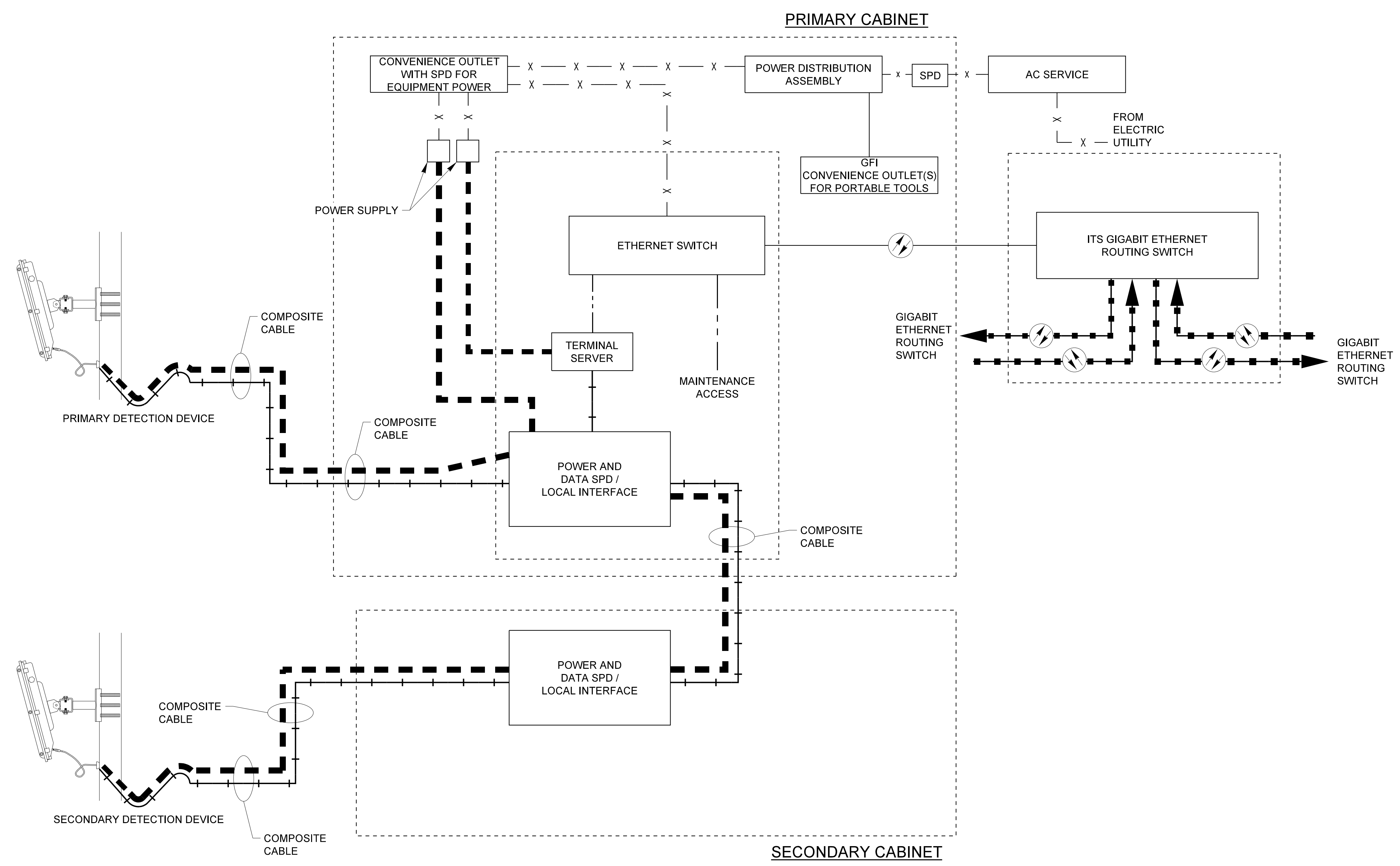
- NOTES:**
1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
 2. ALL WIRING / CABLING TO BE INTERNAL IN METAL POLE UPRIGHT, NOT INSTALL CONDUITS / RISERS ON EXTERIOR OF POLE. CONDUIT SHALL BE CLAMPED OR STRAPPED EXTERNALLY TO TRUSS OVER TO DMS.

REV. NO.	BY	DATE	DESCRIPTION

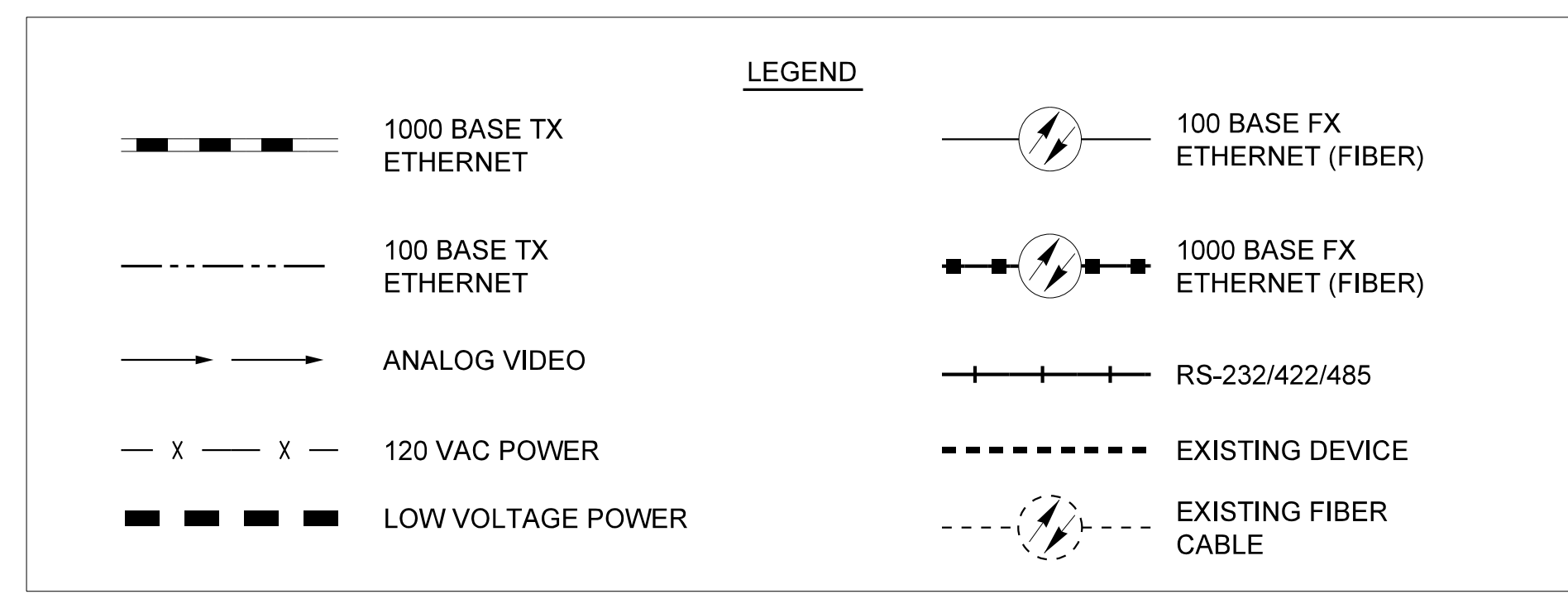
SCALE: As Shown
 March 2022

X-XX

ROADWAY DETAIL DRAWING FOR
MICROWAVE DETECTION
BLOCK DIAGRAM



NOTES:
1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.



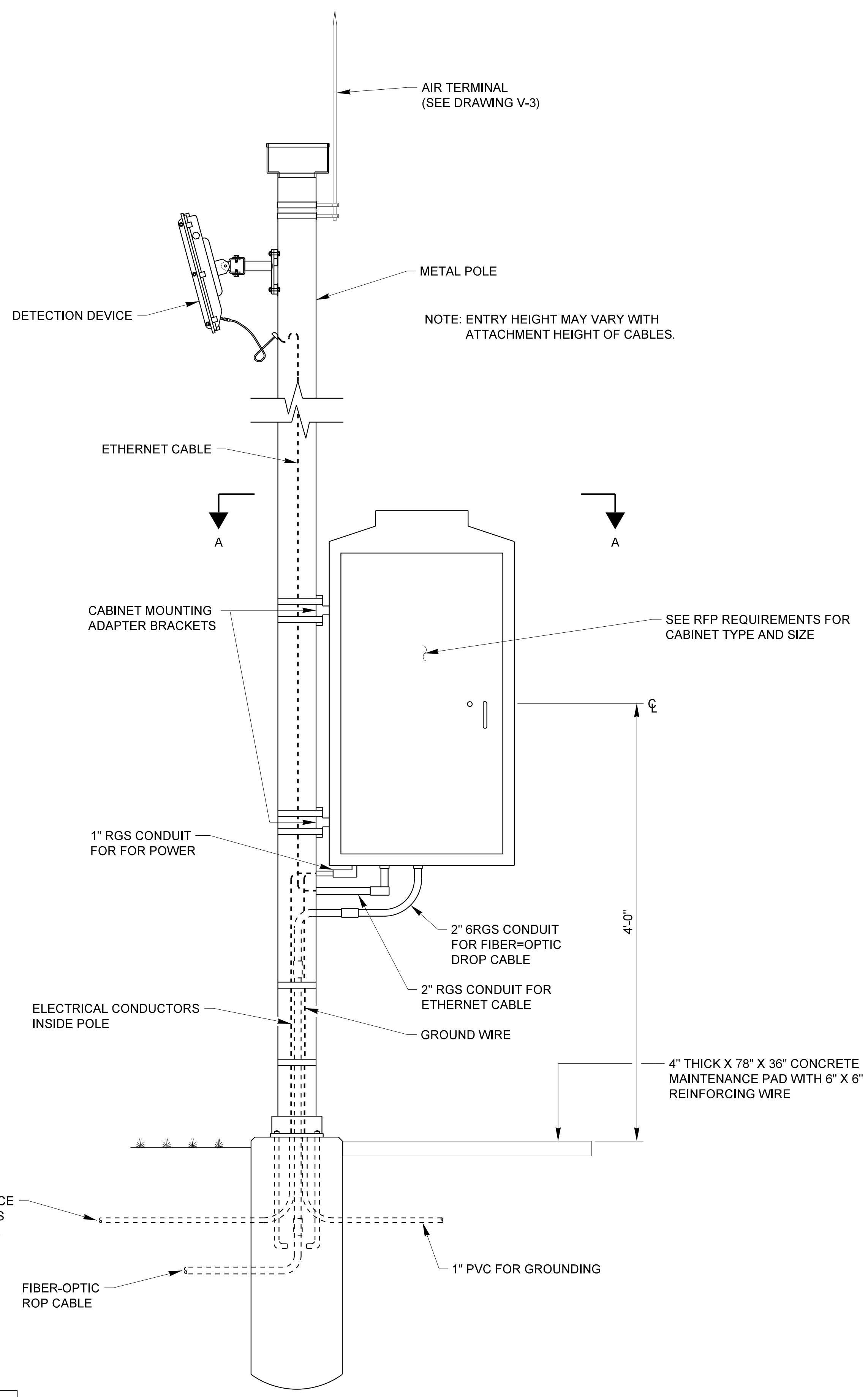
REV. NO.	BY	DATE	DESCRIPTION

SCALE: N.T.S.
March 2022

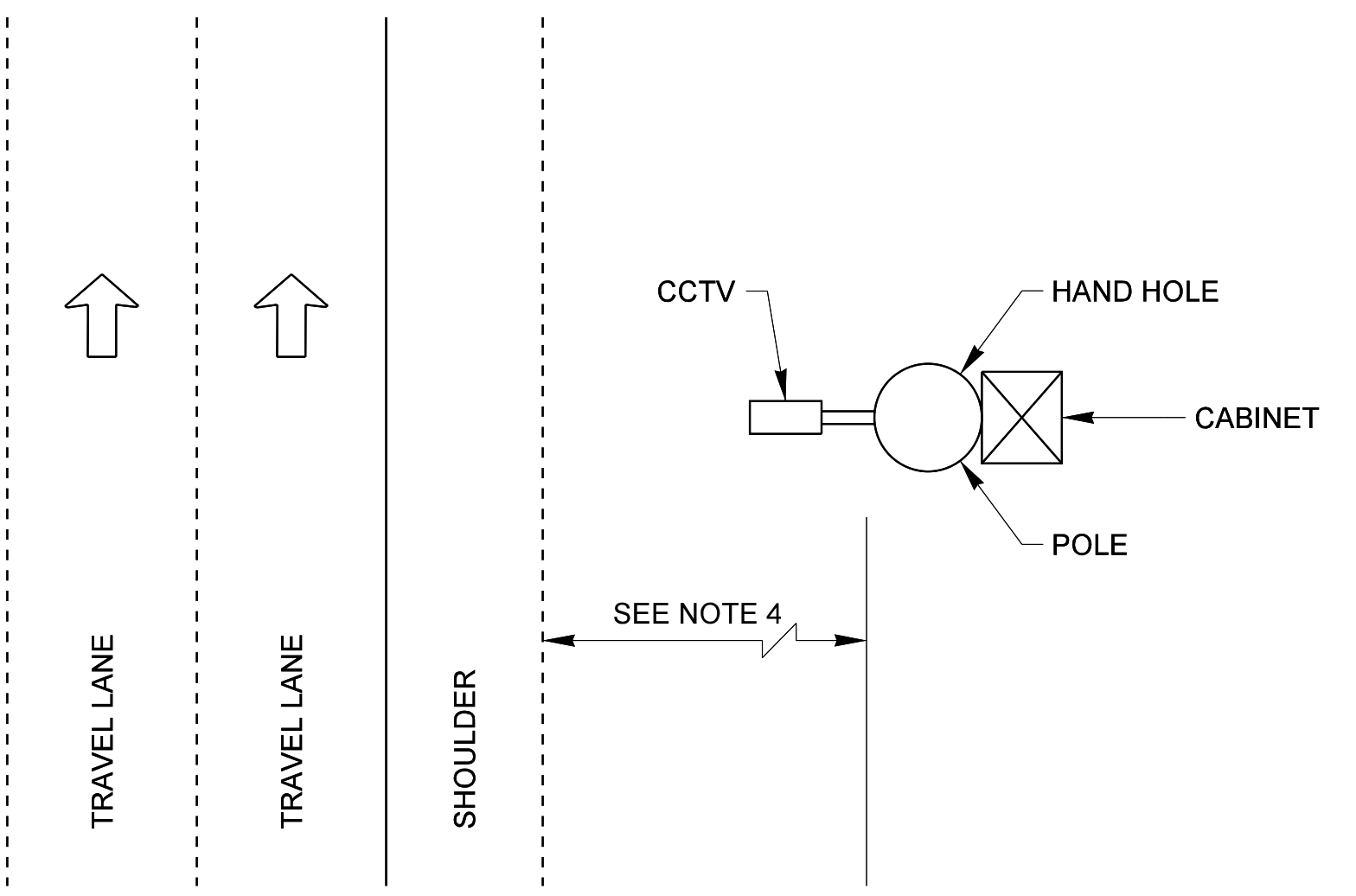
X-XX

ROADWAY DETAIL DRAWING FOR
**MICROWAVE DETECTION ELEVATION
WITH CCTV EQUIPMENT VIEW**

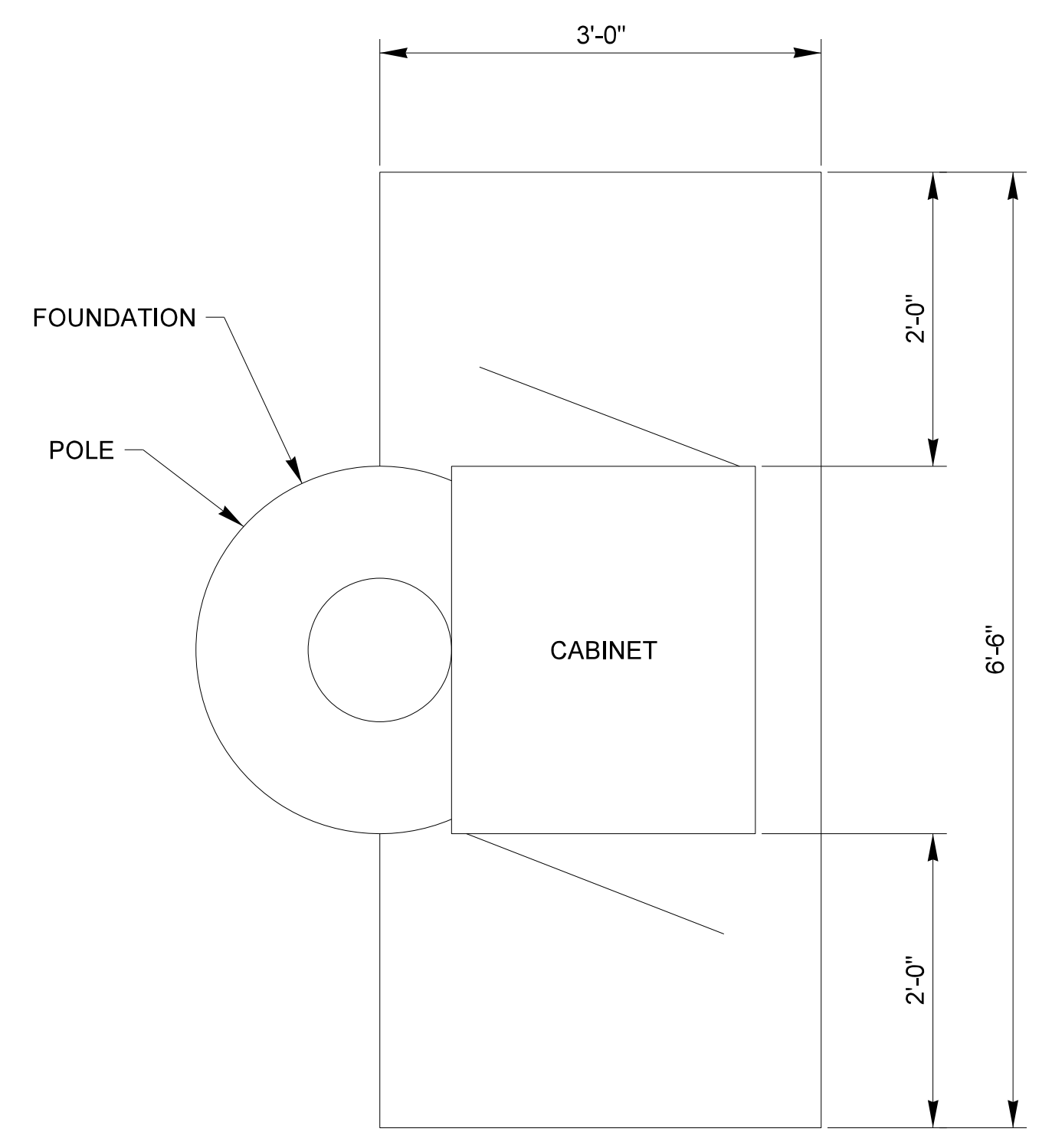
M-2



POLE-MOUNTED MVD CABINET DETAIL
Scale: 1½" = 1'-0"



ORIENTATION OF DEVICES ON POLE



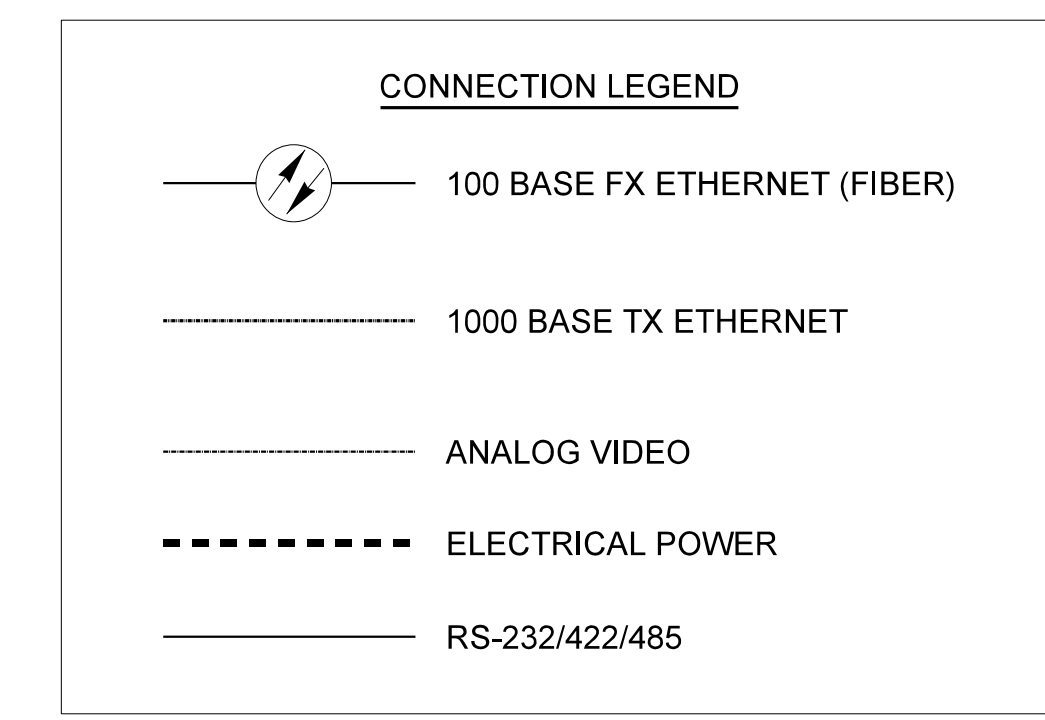
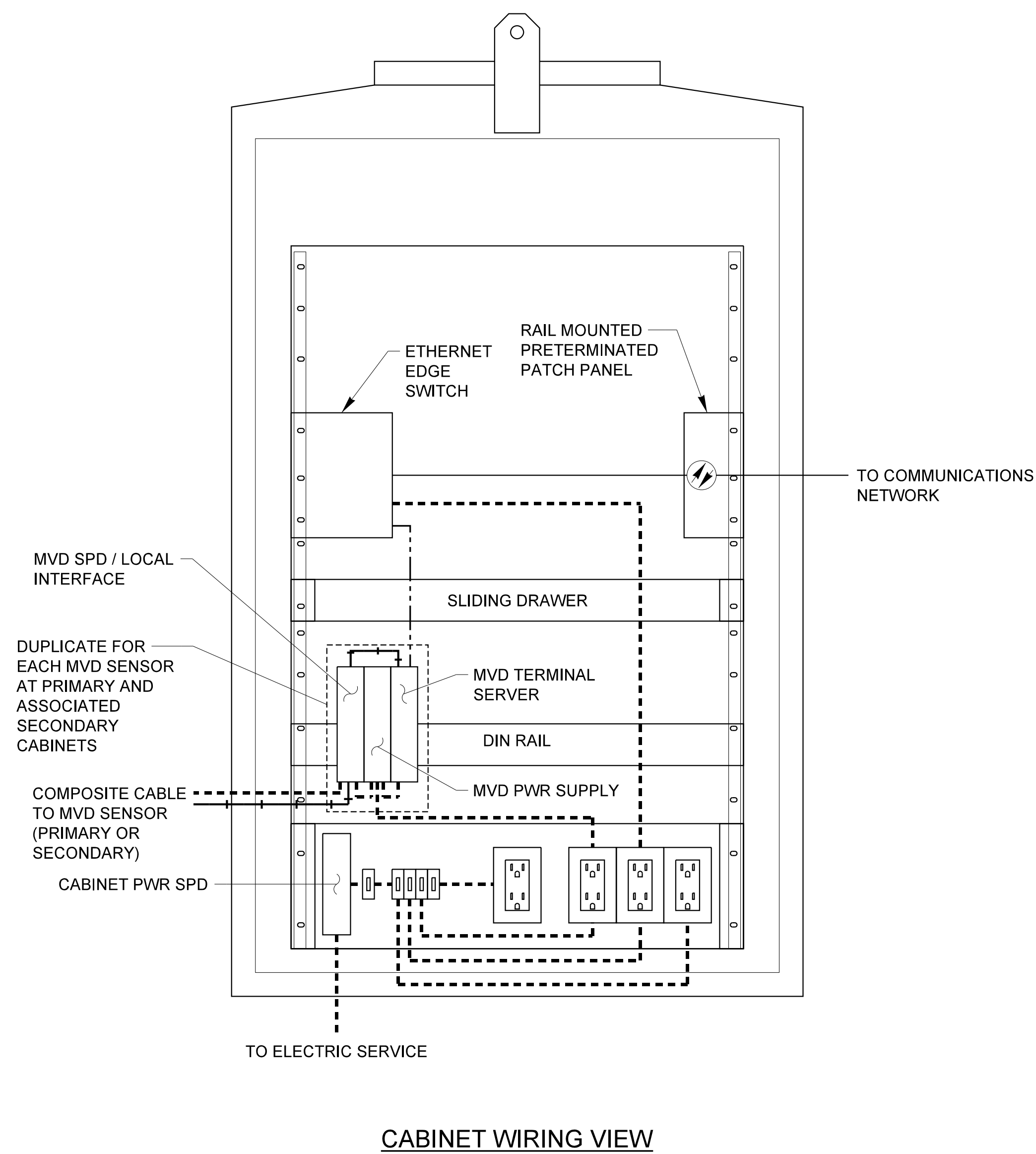
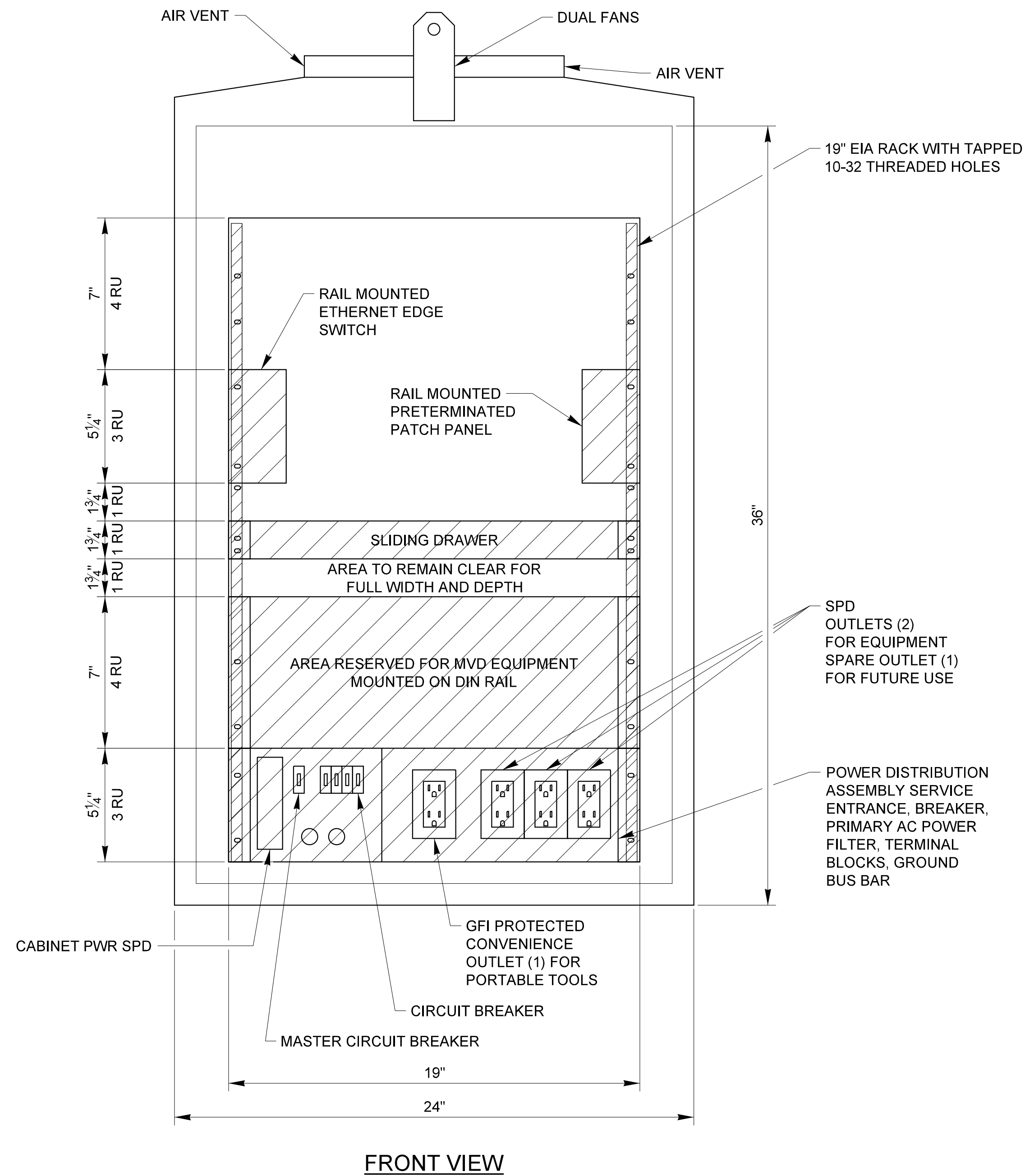
SECTION A-A
Scale: 1½" = 1'-0"

NOTES:

1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
2. ALL WIRING / CABLING SHALL BE INTERNAL TO METAL POLE. DO NOT INSTALL CONDUITS / RISERS ON EXTERIOR OF POLE.
3. DO NOT INSTALL MAINTENANCE PAD ON EXCESSIVE SLOPE (GREATER THAN 3:1).
4. LOCATE POLE OUTSIDE OF CLEAR ZONE AS DEFINED BY NCDOT ROADWAY DESIGN MANUAL. IF NOT FEASIBLE, INSTALL GUARDRAIL AS REQUIRED.

REV. NO.	BY	DATE	DESCRIPTION

SCALE: As Shown
March 2022



NOTES:

1. ALL DIMENSIONS AND SCALE ARE APPROXIMATE.
2. ALL EQUIPMENT RACKS SHALL HAVE A MINIMUM OF ONE RACK UNIT SPACE IN BETWEEN THEM FOR VENTILATION
3. SEE RFP REQUIREMENTS FOR CABINET SIZE AND TYPE.
4. CONDUIT ENTRANCES ARE IN BOTTOM OF CABINET.
5. MINIMUM NUMBER OF OUTLETS IS THREE, (2) SPD AND (1) GFI PROTECTED.
6. SPD SHALL FULLY PROTECT ALL DATA COMMUNICATIONS BETWEEN DETECTOR AND CABINET.
7. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.

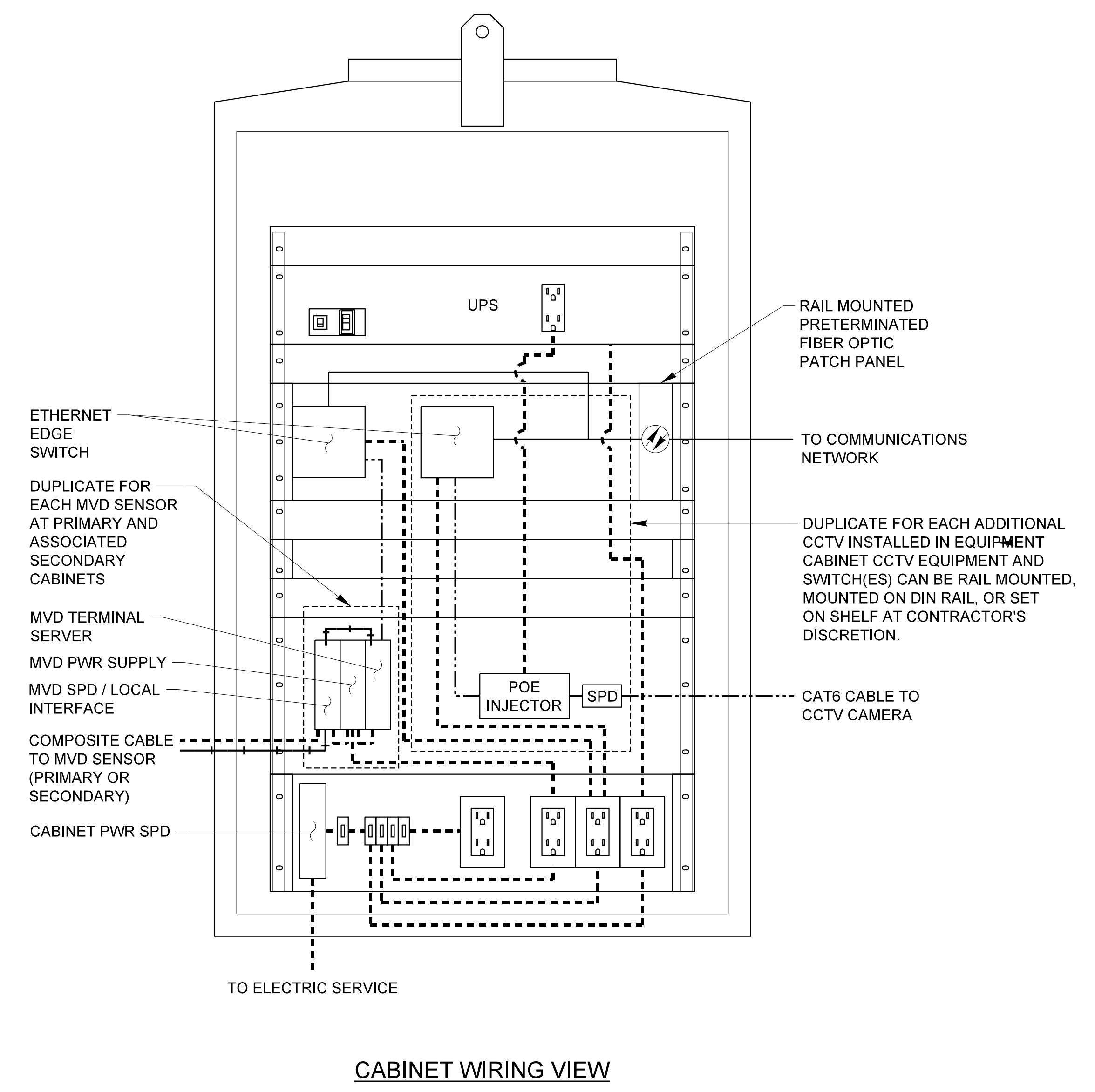
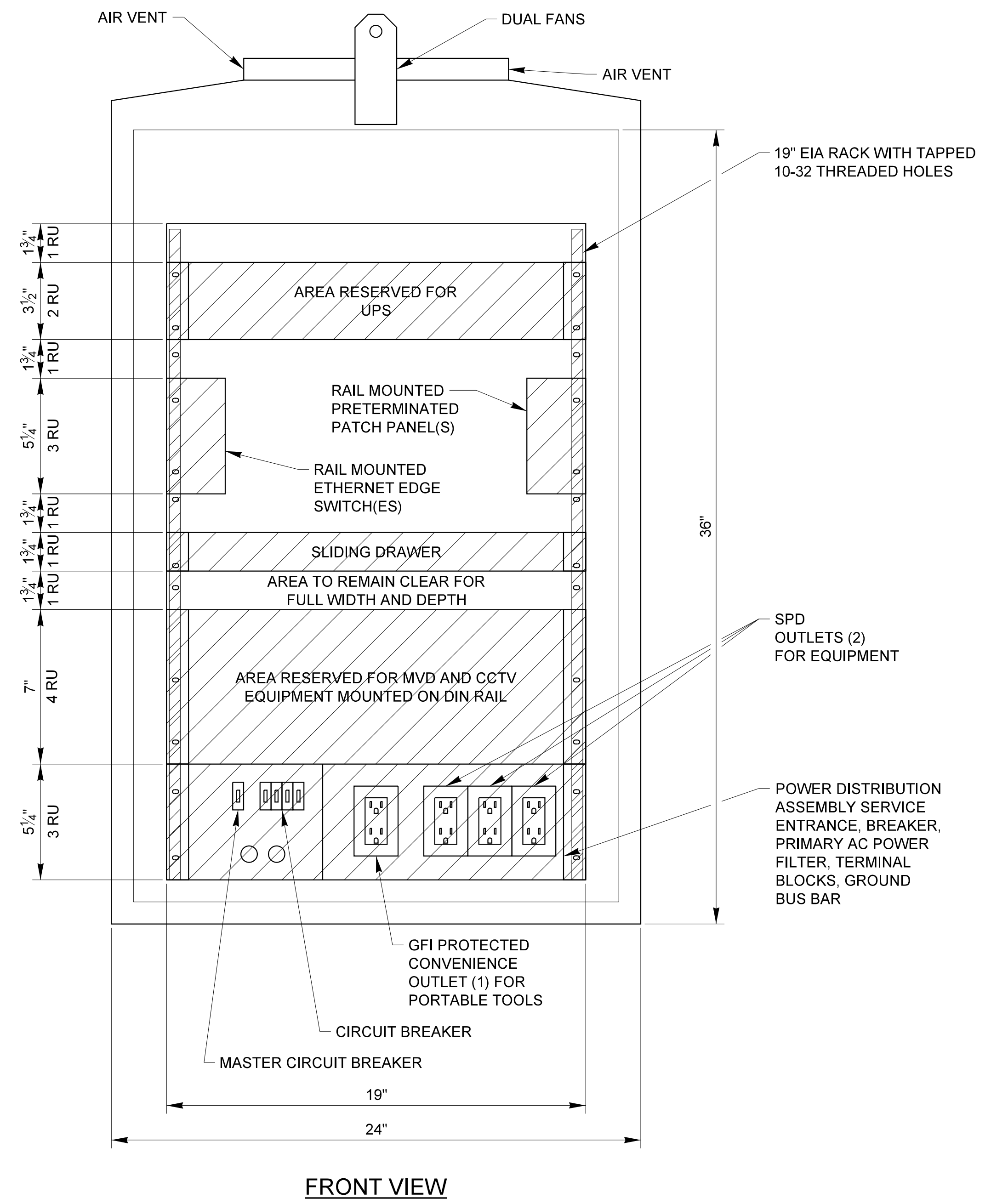
REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3" = 1'-0"
March 2022

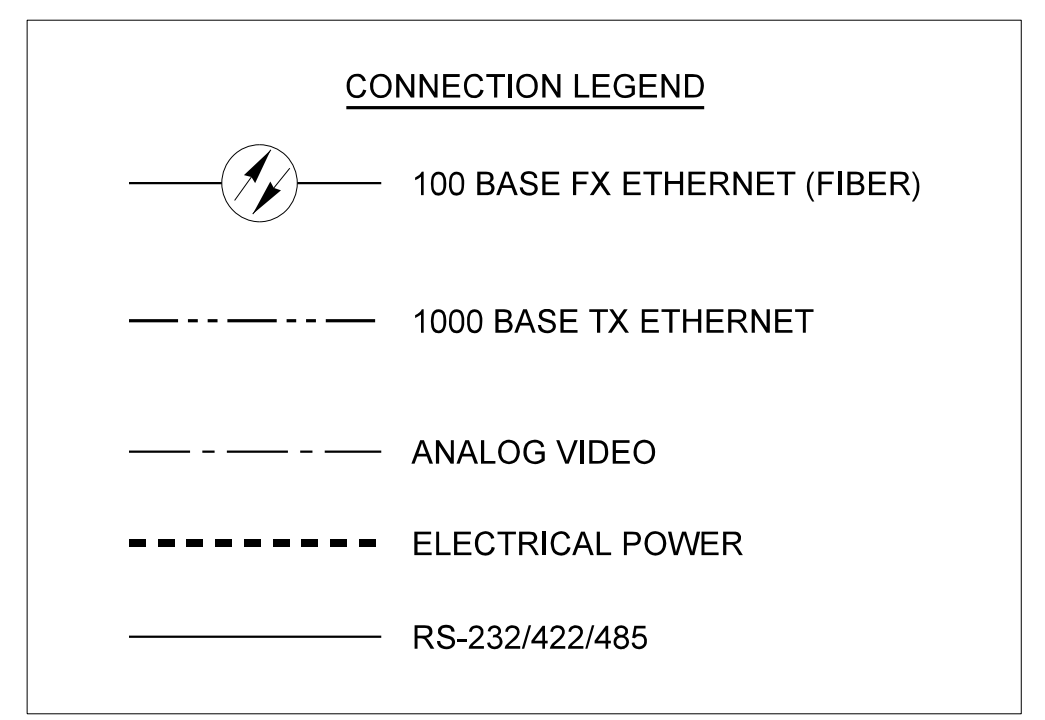
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
MICROWAVE DETECTION
CABINET LAYOUT

X-XX
 M-3A



- NOTES:**
1. ALL DIMENSIONS AND SCALE ARE APPROXIMATE.
 2. ALL EQUIPMENT RACKS SHALL HAVE A MINIMUM OF ONE RACK UNIT SPACE IN BETWEEN THEM FOR VENTILATION
 3. SEE RFP REQUIREMENTS FOR CABINET SIZE AND TYPE.
 4. CONDUIT ENTRANCES ARE IN BOTTOM OF CABINET.
 5. MINIMUM NUMBER OF OUTLETS IS THREE, (2) SPD AND (1) GFI PROTECTED.
 6. SPD SHALL FULLY PROTECT ALL DATA COMMUNICATIONS BETWEEN DETECTOR AND CABINET.
 7. THERE SHALL BE FRONT AND REAR DOORS. BOTH DOORS SHALL HAVE THE HINGE SIDE NEXT TO THE POLE WHEN POLE MOUNTED.
 8. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.



REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3" = 1'-0"
March 2022

STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

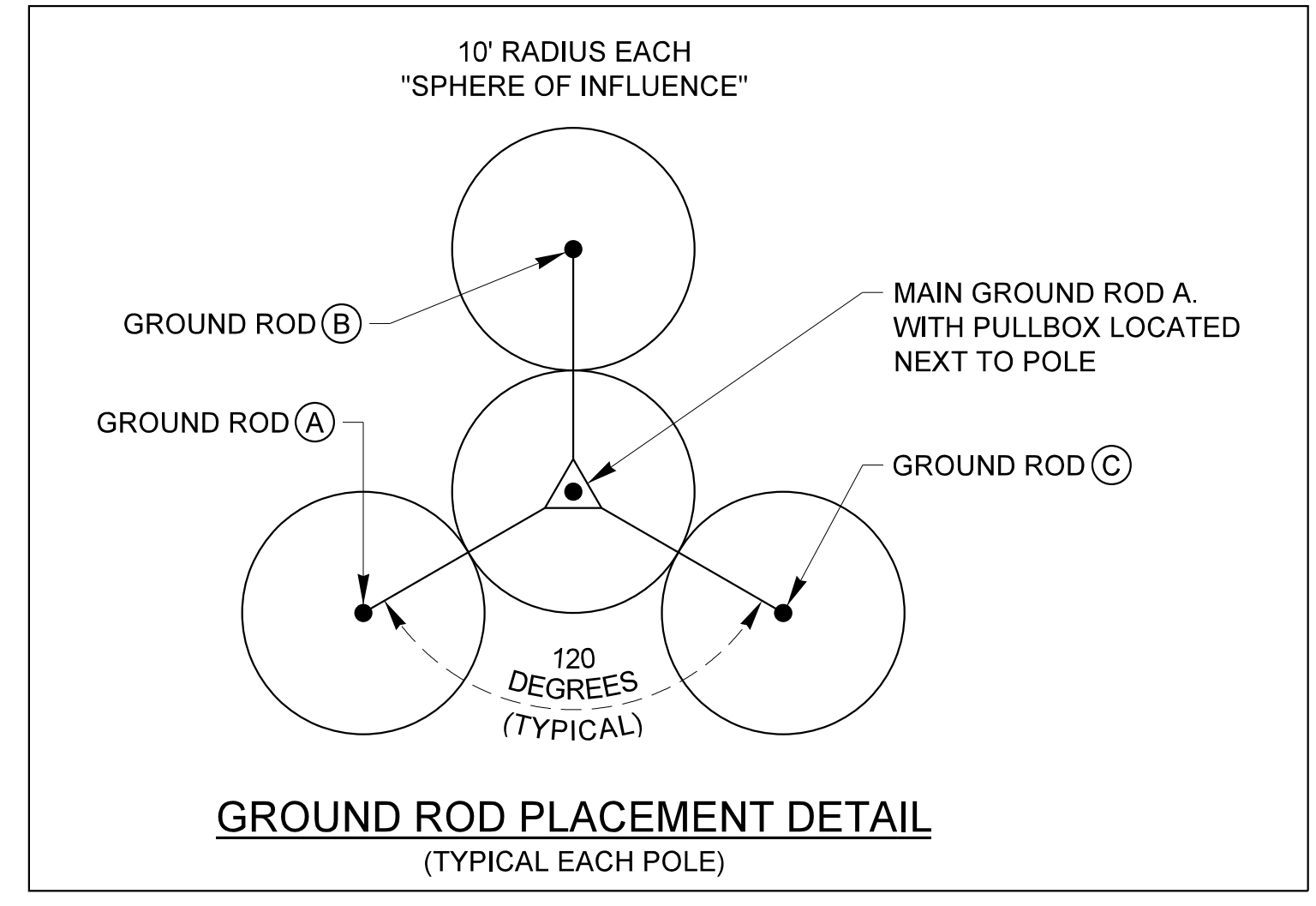
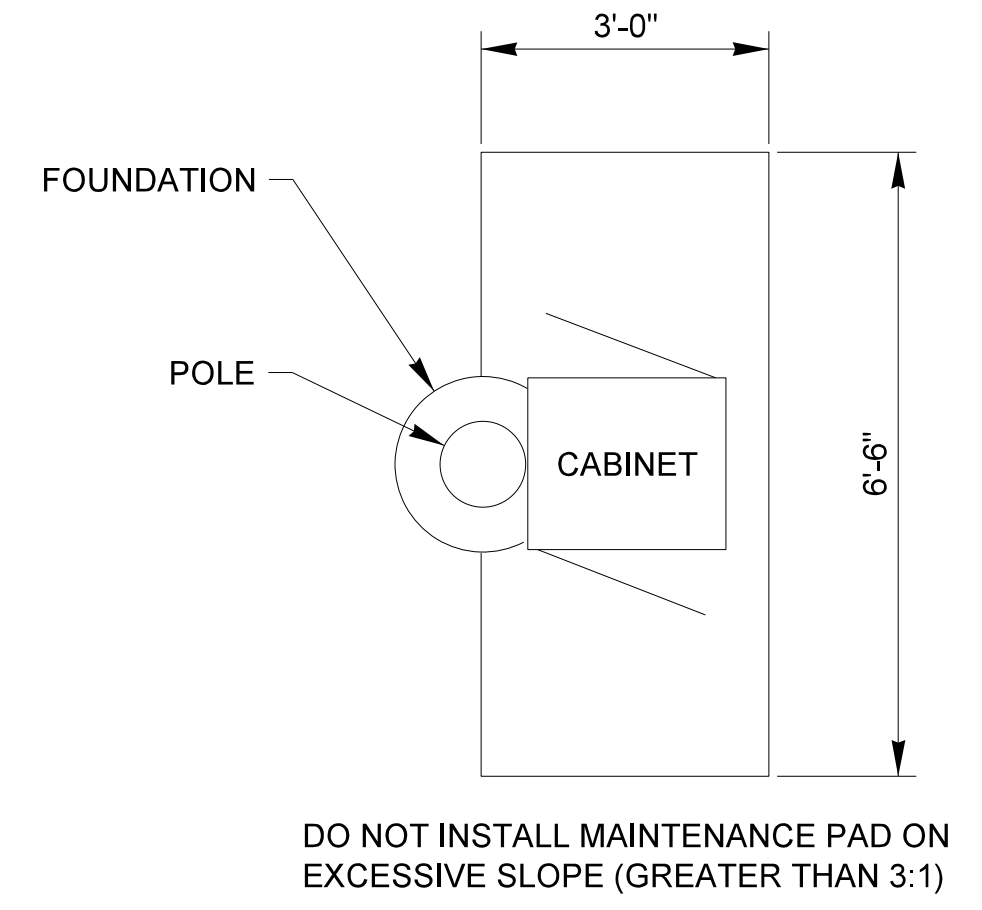
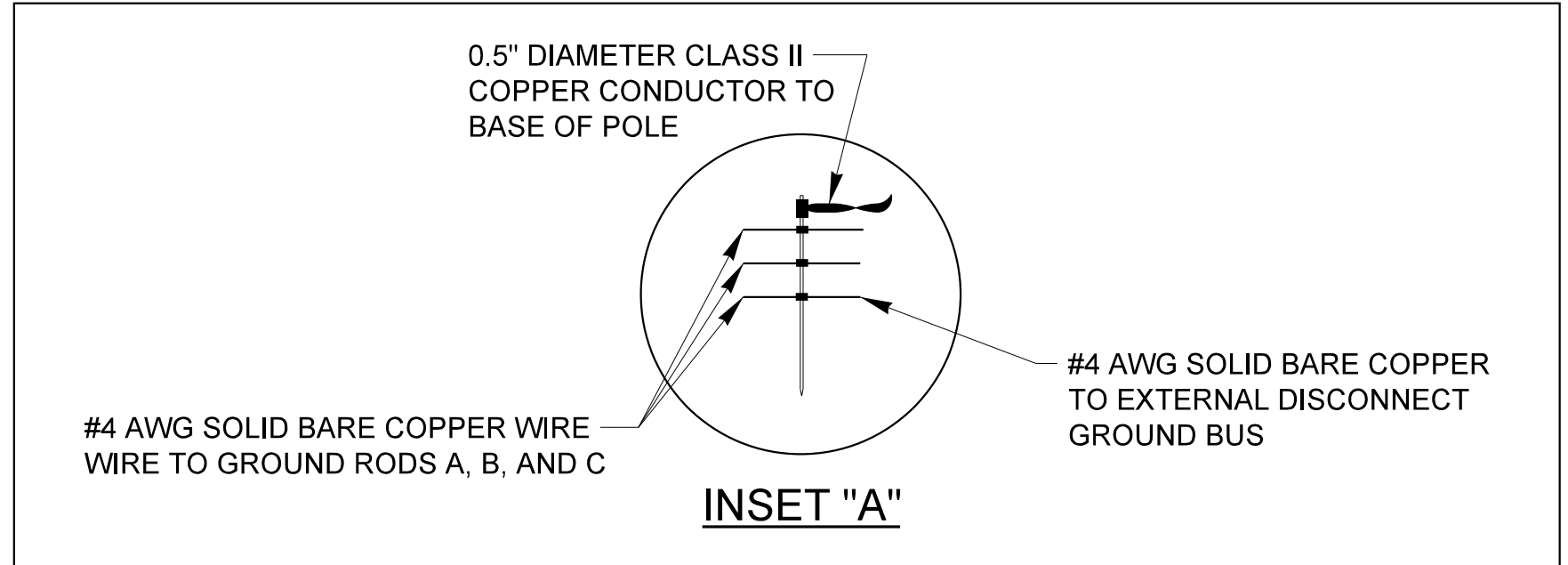
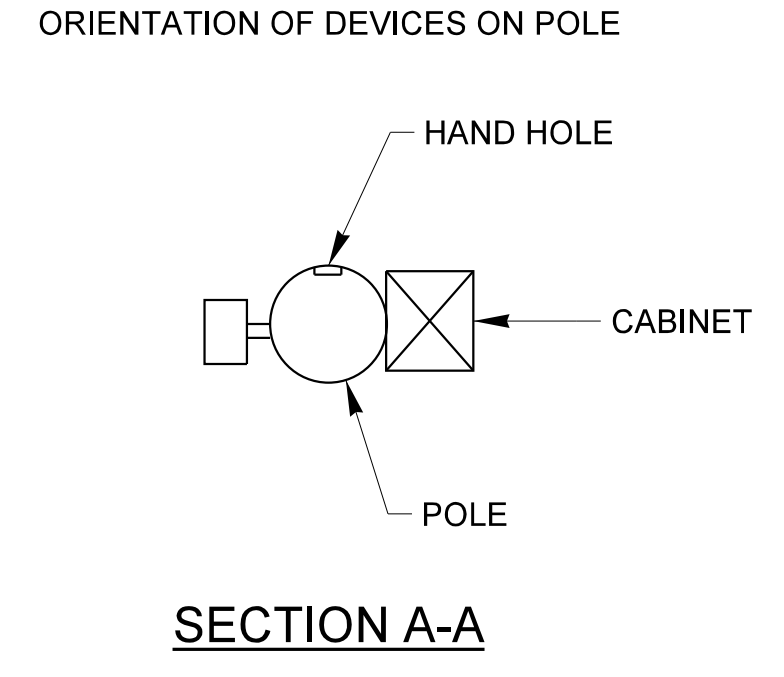
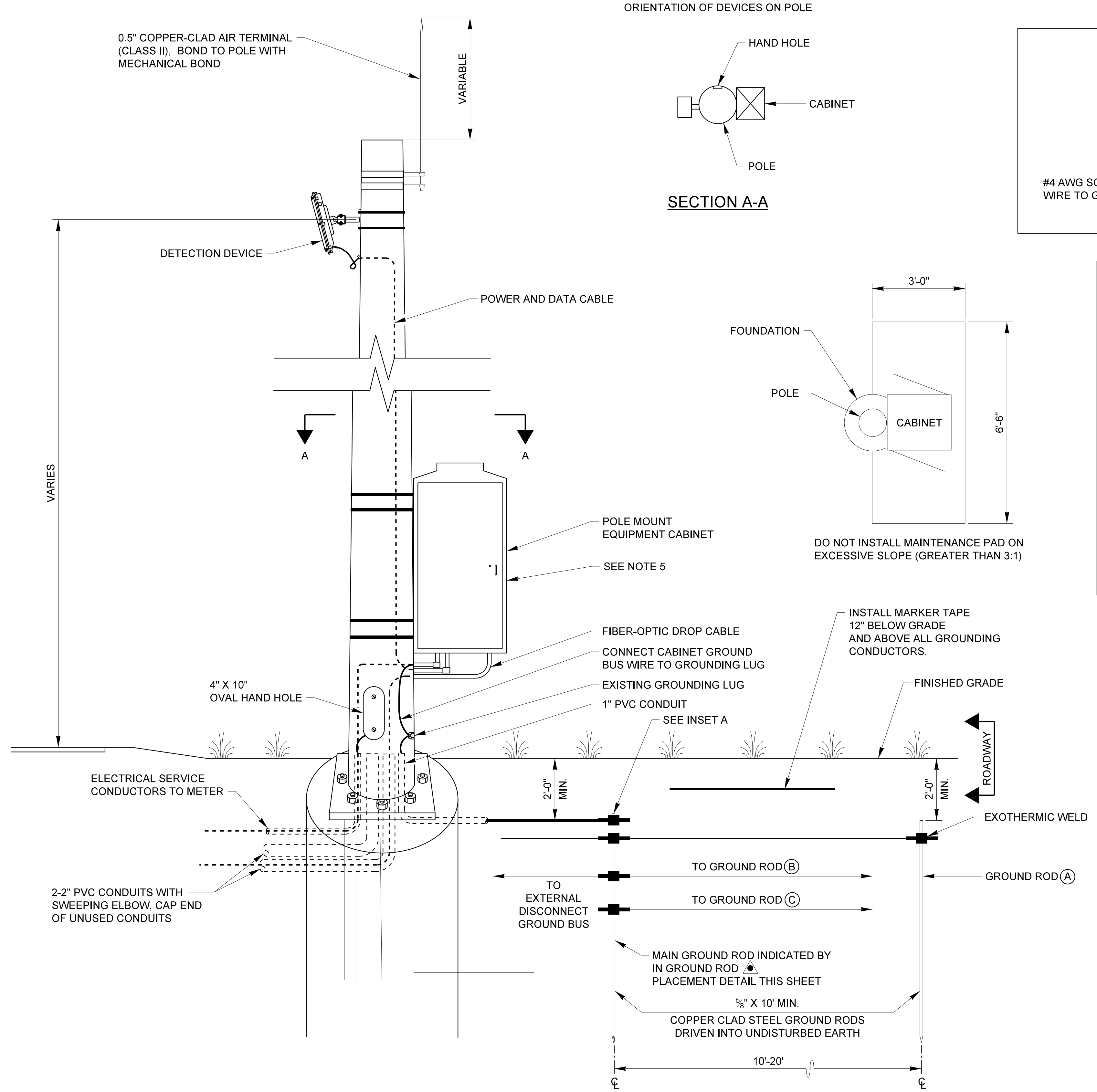
ROADWAY DETAIL DRAWING FOR
MICROWAVE DETECTION
CABINET LAYOUT

M-3B

X-XX

ROADWAY DETAIL DRAWING FOR
**MICROWAVE DETECTION
GROUNDING**

M-4



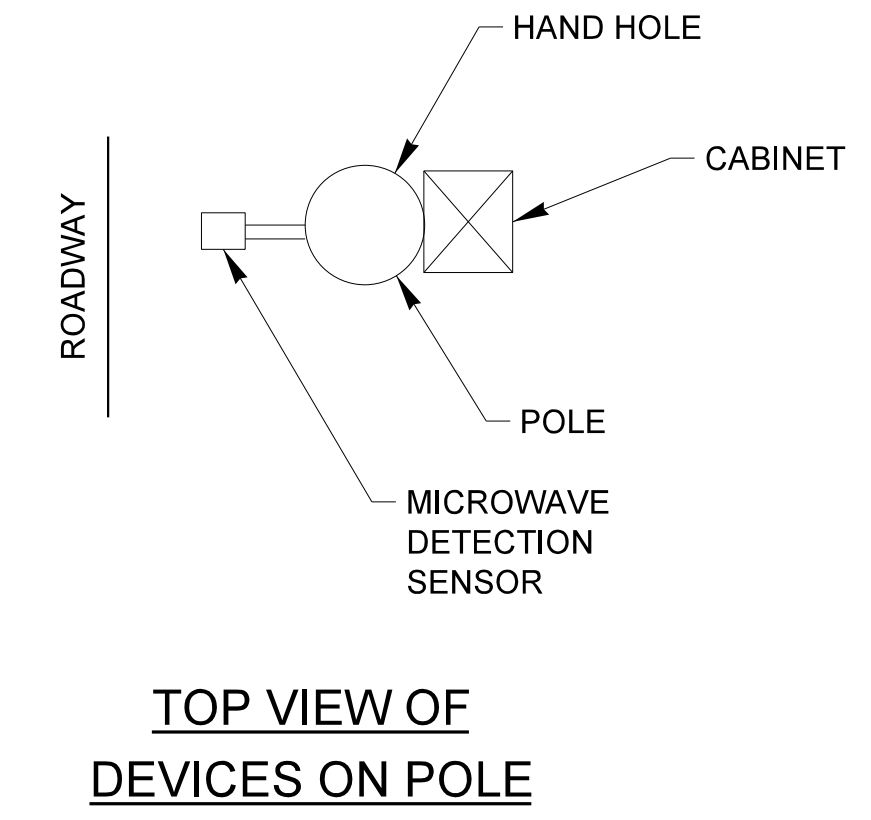
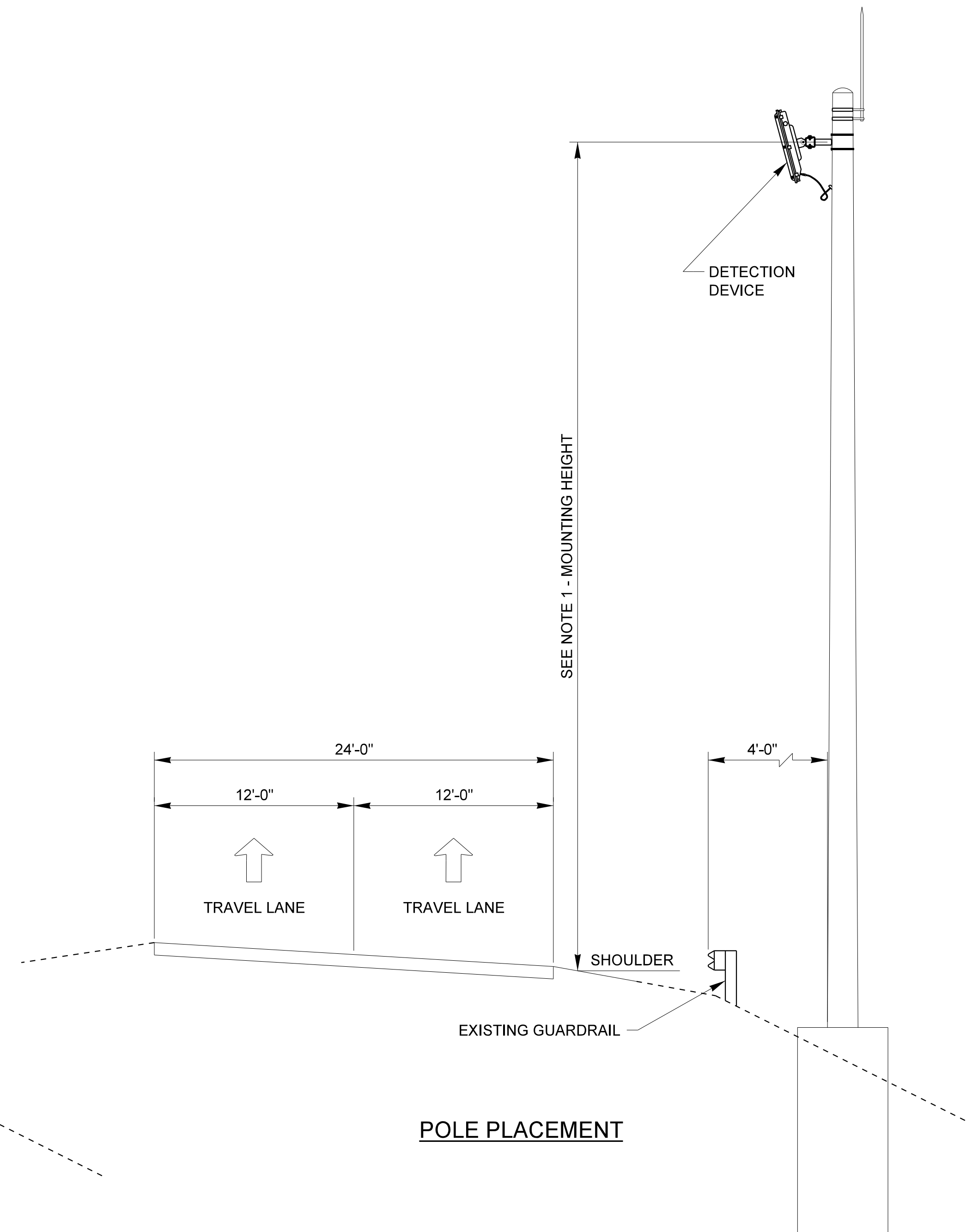
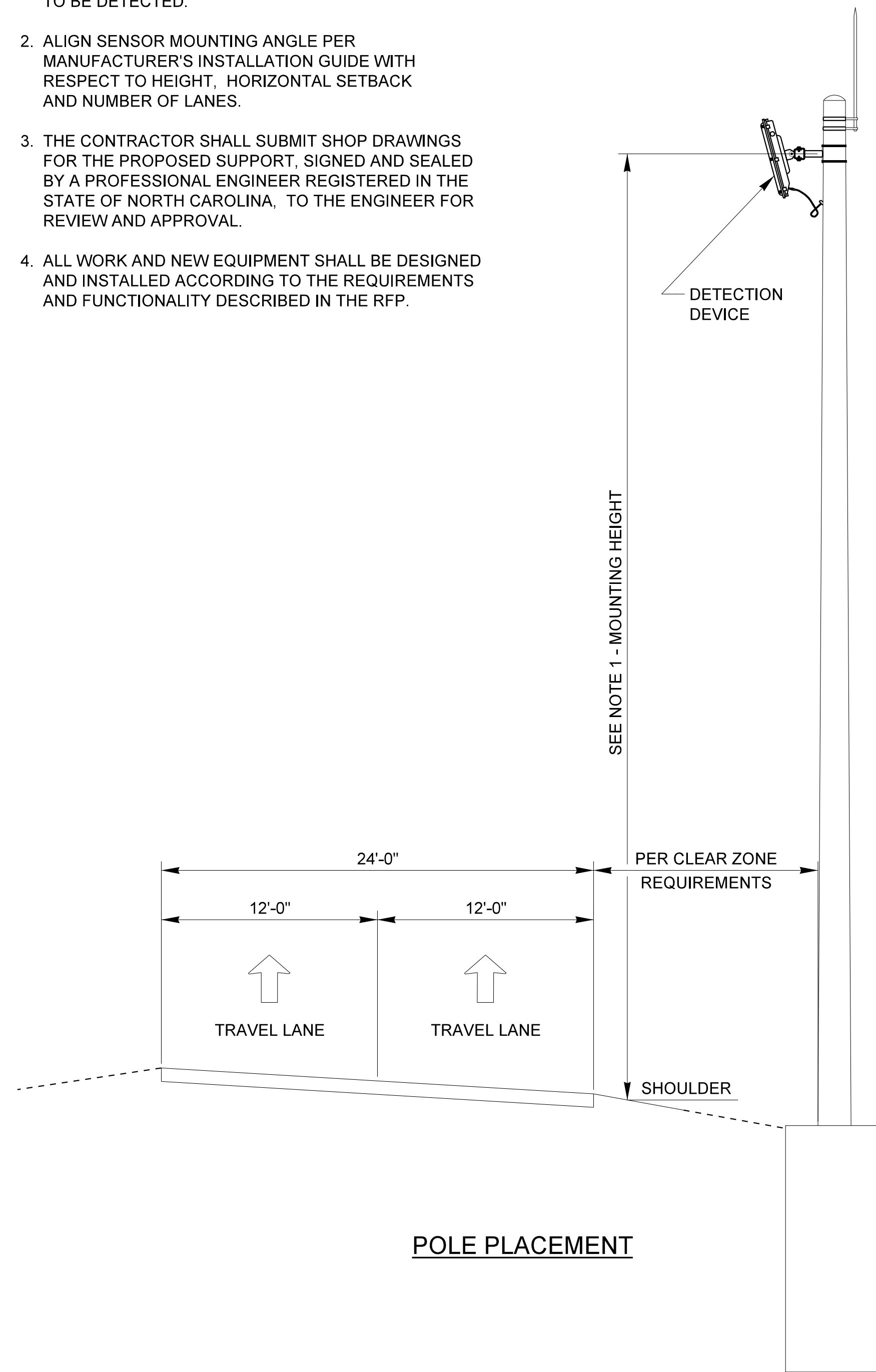
- GROUNDING NOTES:**
1. BOND 0.5" DIAMETER, 28 STRAND (MINIMUM) CLASS II COPPER CONDUCTOR TO THE MAIN GROUND ROD BY AN EXOTHERMIC WELD METHOD.
 2. EXOTHERMICALLY WELD ALL CONNECTORS TO GROUND RODS.
 3. BOND #4 AWG SOLID BARE COPPER WIRE TO THE REBAR CAGE AND THE MAIN GROUND ROD BY AN EXOTHERMIC WELD METHOD.
 4. ENSURE MICROWAVE VEHICLE DETECTOR UNIT IS BONDED TO POLE.
 5. REMOVE BONDING JUMPER BETWEEN EQUIPMENT CABINET GROUND BUS AND NEUTRAL BUS.
 6. THE CONTRACTOR MAY, UPON APPROVAL OF THE ENGINEER, INSTALL A 30-FOOT SECTIONAL GROUND ROD WHEN CONDITIONS WILL NOT ALLOW FOR THE INSTALLATION OF THE 3 - RADIAL GROUND RODS.
 7. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12".
 8. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.

REV. NO.	BY	DATE	DESCRIPTION

SCALE: N.T.S.
March 2022

NOTES:

1. LOCATE DETECTOR MOUNTING HEIGHT PER THE MANUFACTURER'S MOUNTING CHART FOR HORIZONTAL SETBACK AND NUMBER OF LANES TO BE DETECTED.
2. ALIGN SENSOR MOUNTING ANGLE PER MANUFACTURER'S INSTALLATION GUIDE WITH RESPECT TO HEIGHT, HORIZONTAL SETBACK AND NUMBER OF LANES.
3. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE PROPOSED SUPPORT, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA, TO THE ENGINEER FOR REVIEW AND APPROVAL.
4. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.



REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3/16" = 1'-0"
March 2022

STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

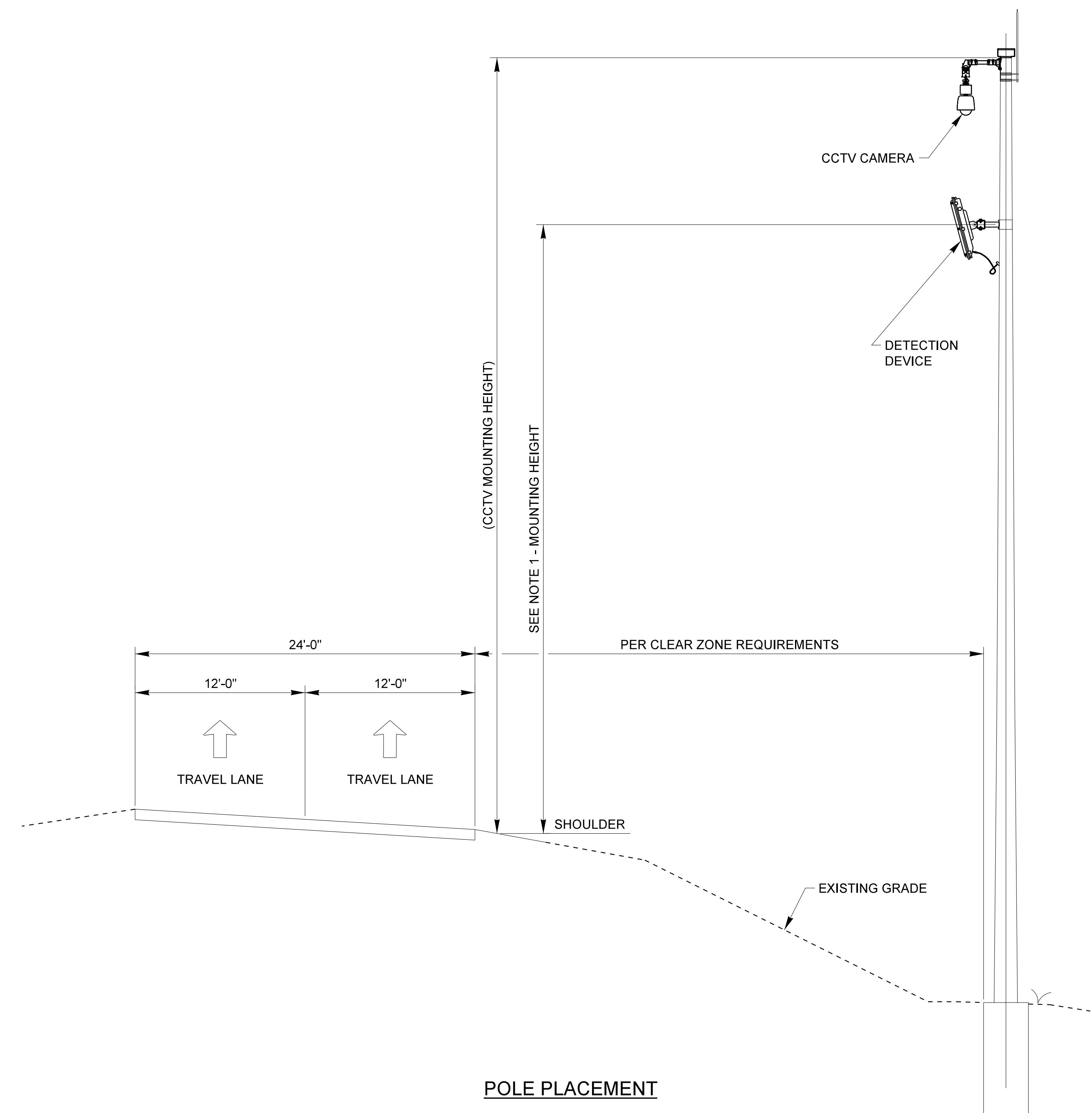
ROADWAY DETAIL DRAWING FOR
**MICROWAVE DETECTION
 POLE PLACEMENT**

M-5A

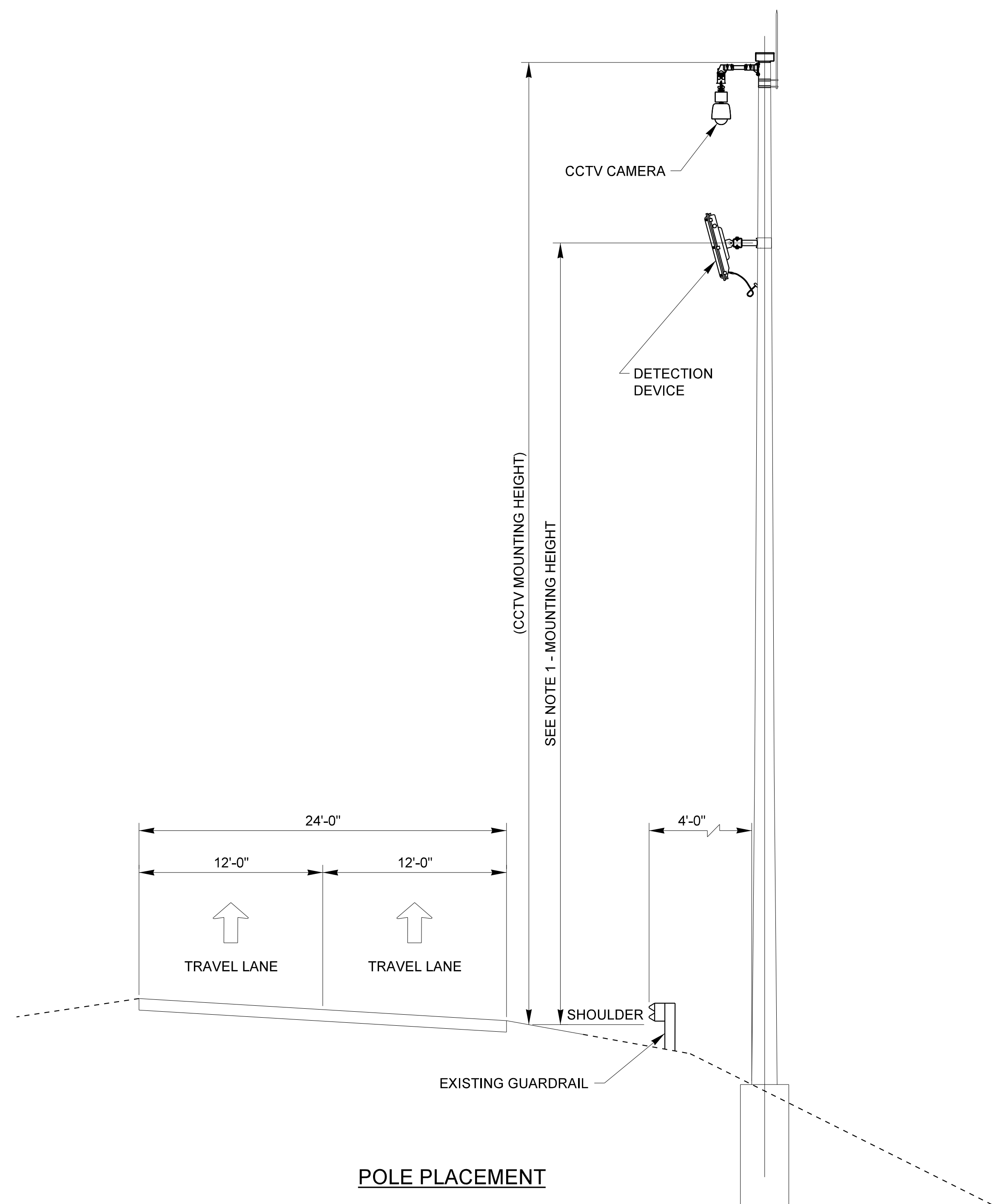
X-XX

ROADWAY DETAIL DRAWING FOR
**MICROWAVE DETECTION
POLE PLACEMENT WITH
CCTV EQUIPMENT**

M-5B



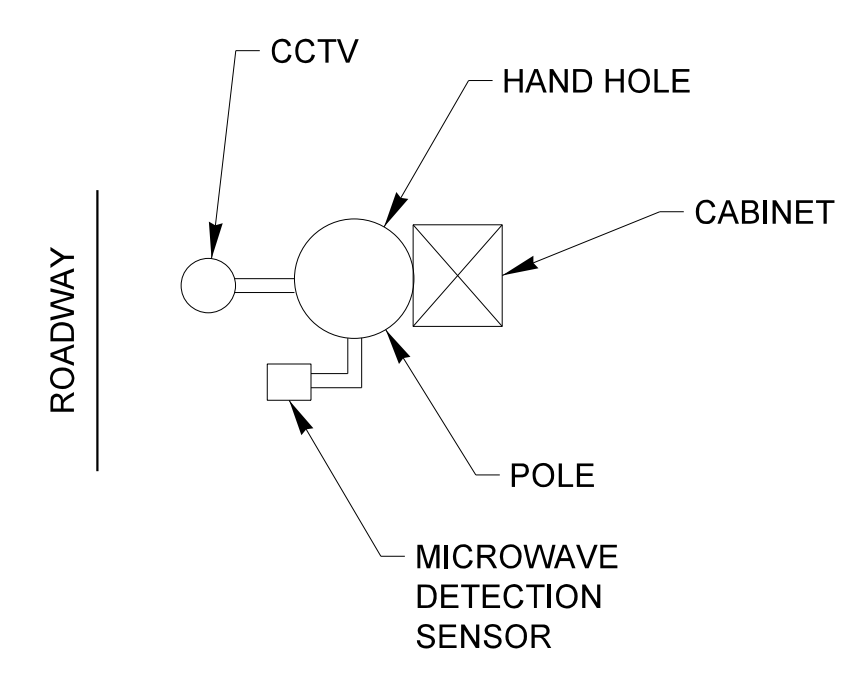
POLE PLACEMENT



POLE PLACEMENT

NOTES:

1. LOCATE DETECTOR MOUNTING HEIGHT PER THE MANUFACTURER'S MOUNTING CHART FOR HORIZONTAL SETBACK AND NUMBER OF LANES TO BE DETECTED.
2. ALIGN SENSOR MOUNTING ANGLE PER MANUFACTURER'S INSTALLATION GUIDE WITH RESPECT TO HEIGHT, HORIZONTAL SETBACK AND NUMBER OF LANES.
3. MOUNT DETECTOR ON SIDE OF POLE. 90 DEGREES TO CAMERA ARM SO THE DETECTOR DOESN'T INTERFERE WITH CAMERA LOWERING DEVICE.
4. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.



TOP VIEW OF
DEVICES ON POLE

SCALE: 3/16" = 1'-0"
March 2022

REV. NO.	BY	DATE	DESCRIPTION

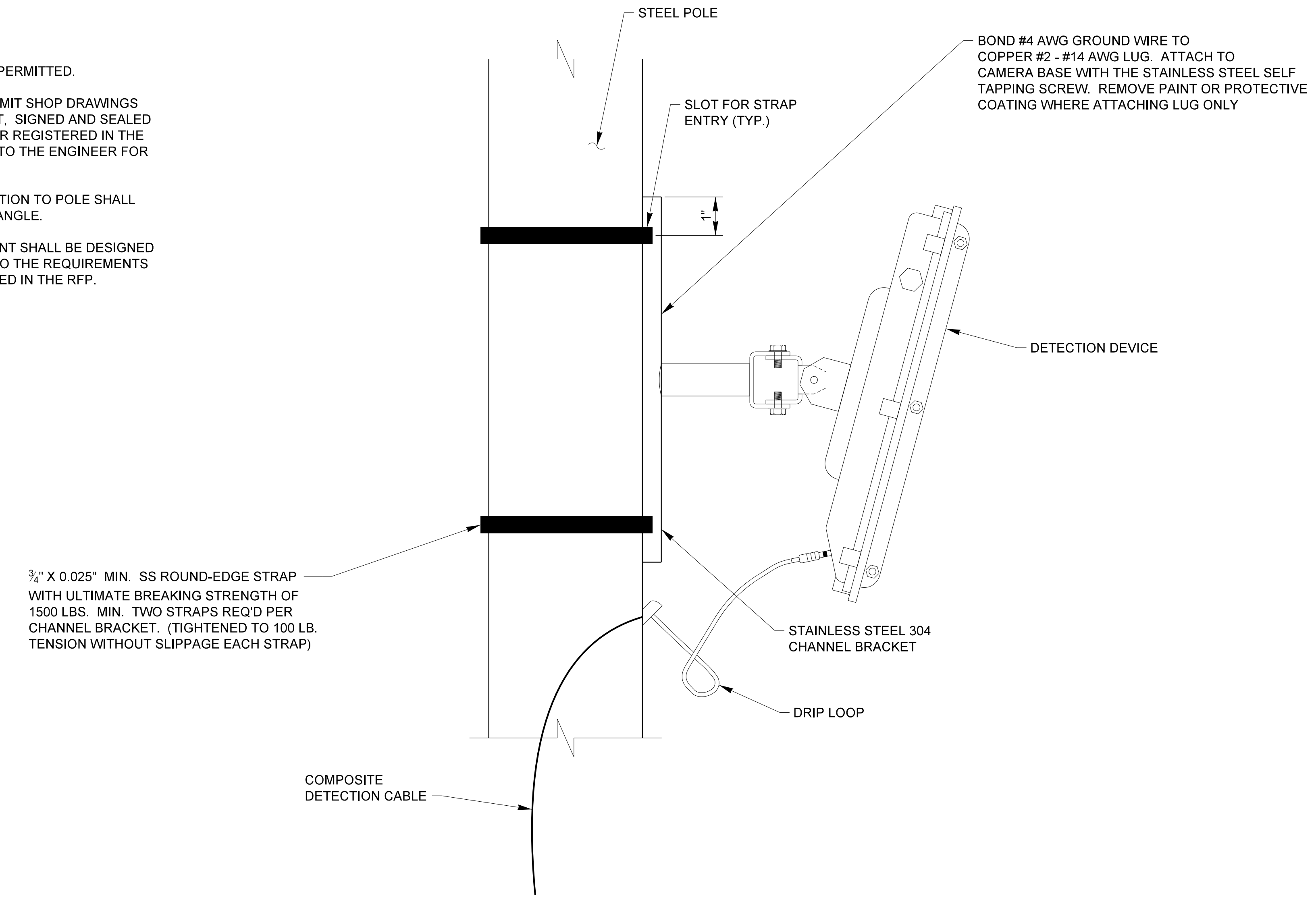
X-XX

ROADWAY DETAIL DRAWING FOR
**MICROWAVE DETECTION
SENSOR MOUNTING**

M-6

NOTES:

1. NO FIELD WELDING SHALL BE PERMITTED.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE PROPOSED SUPPORT, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA, TO THE ENGINEER FOR REVIEW AND APPROVAL.
3. MOUNTING BRACKET CONNECTION TO POLE SHALL ALLOW ADJUSTMENT OF TILT ANGLE.
4. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.



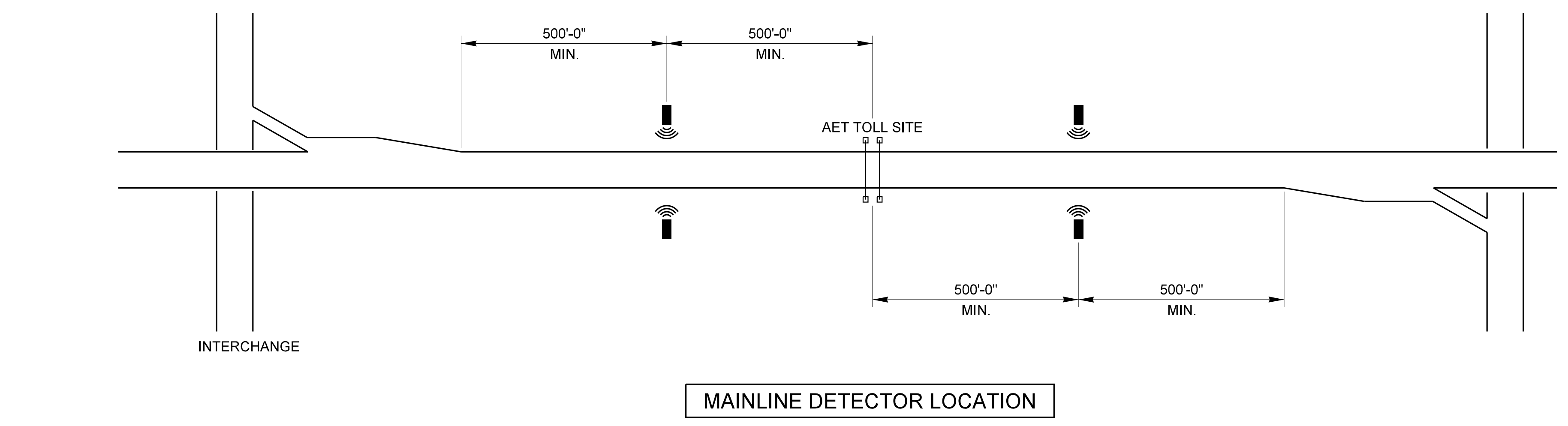
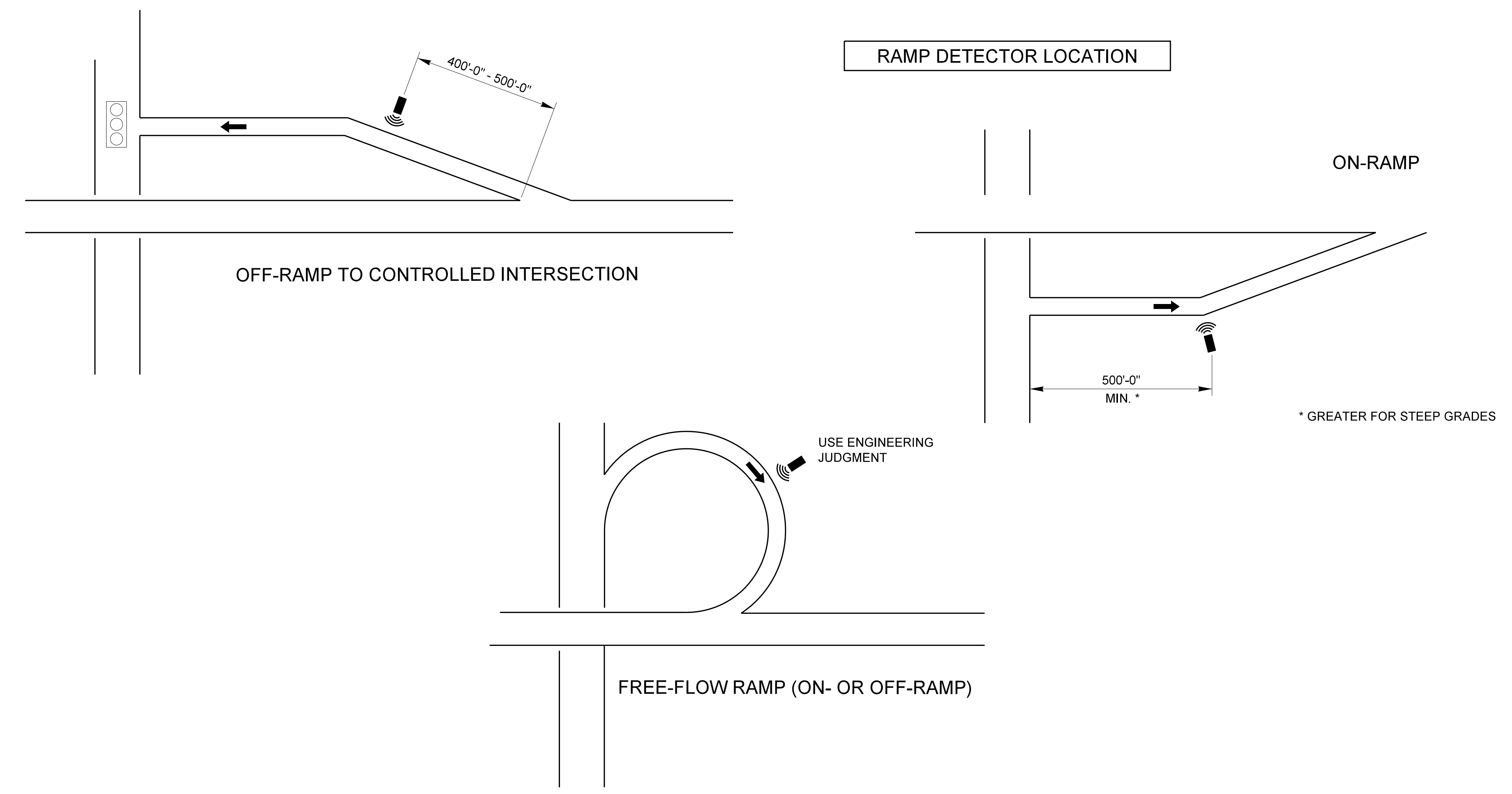
MICROWAVE DETECTION SENSOR ELEVATION VIEW
NOT TO SCALE

REV. NO.	BY	DATE	DESCRIPTION

SCALE: As Shown
March 2022

X-XX

ROADWAY DETAIL DRAWING FOR
**MICROWAVE DETECTION
PLACEMENT SCHEMATIC**



NOTES:

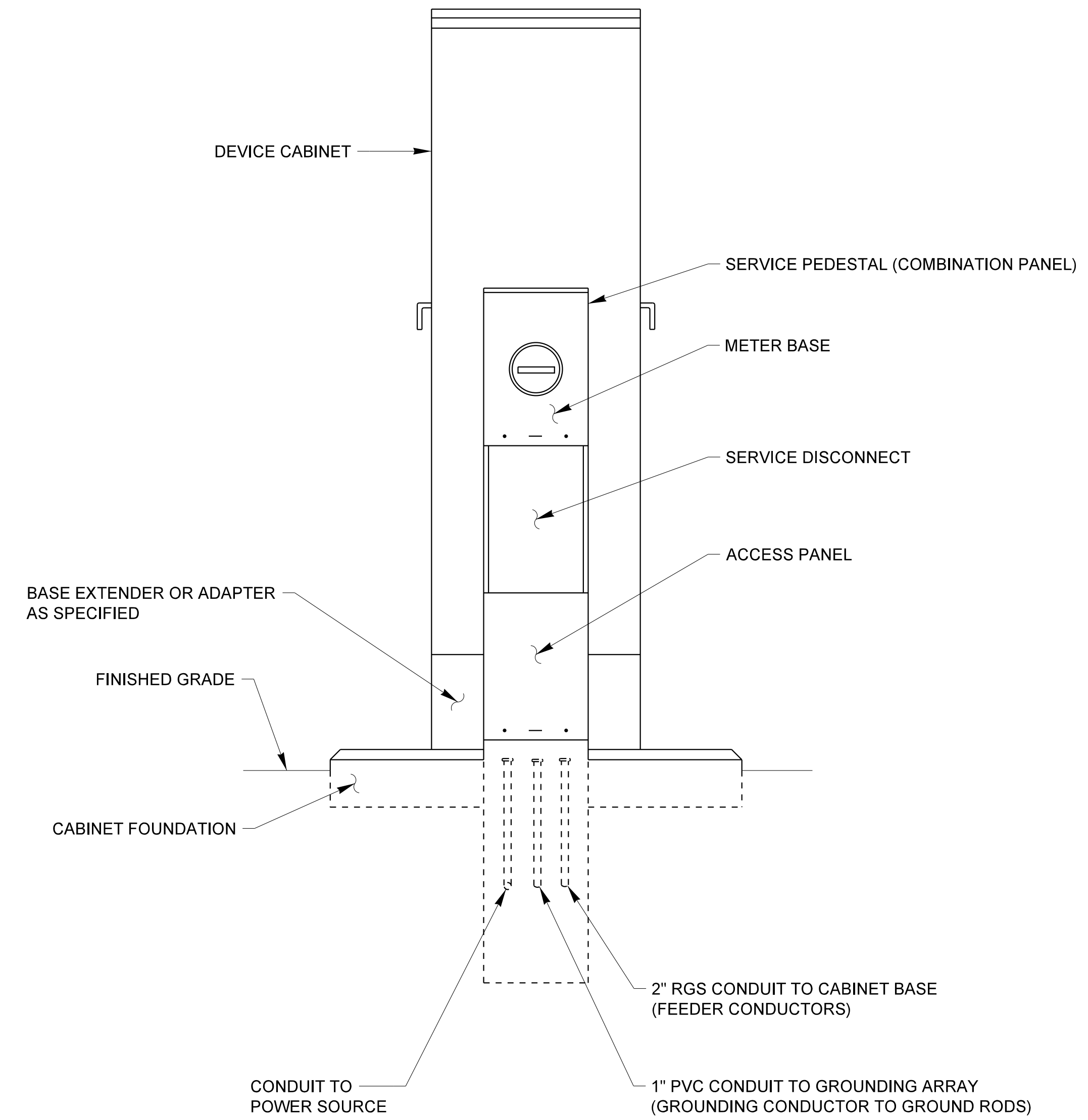
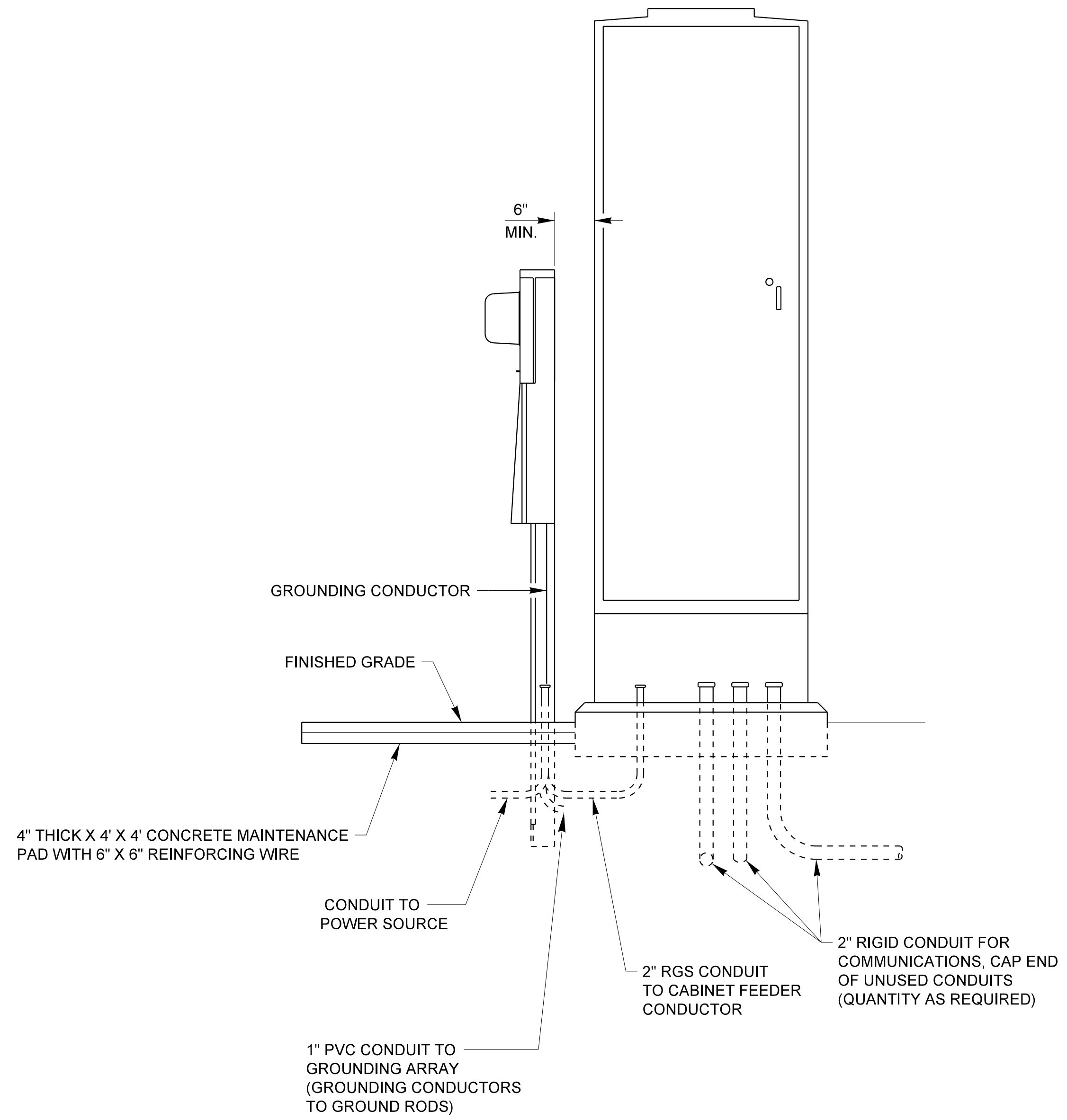
- ONE OR MORE DETECTORS PER SITE MAY BE REQUIRED. SEE SCOPE OF WORK
- LOCATE DETECTOR SITES ROUGHLY HALF WAY BETWEEN TOLL SITE AND ON/OFF RAMP, IF POSSIBLE.

REV. NO.	BY	DATE	DESCRIPTION

SCALE: 1" = 200'-0"
March 2022

X-XX

ROADWAY DETAIL DRAWING FOR
POWER SERVICE DETAIL
GROUND MOUNTED CABINET



NOTES:

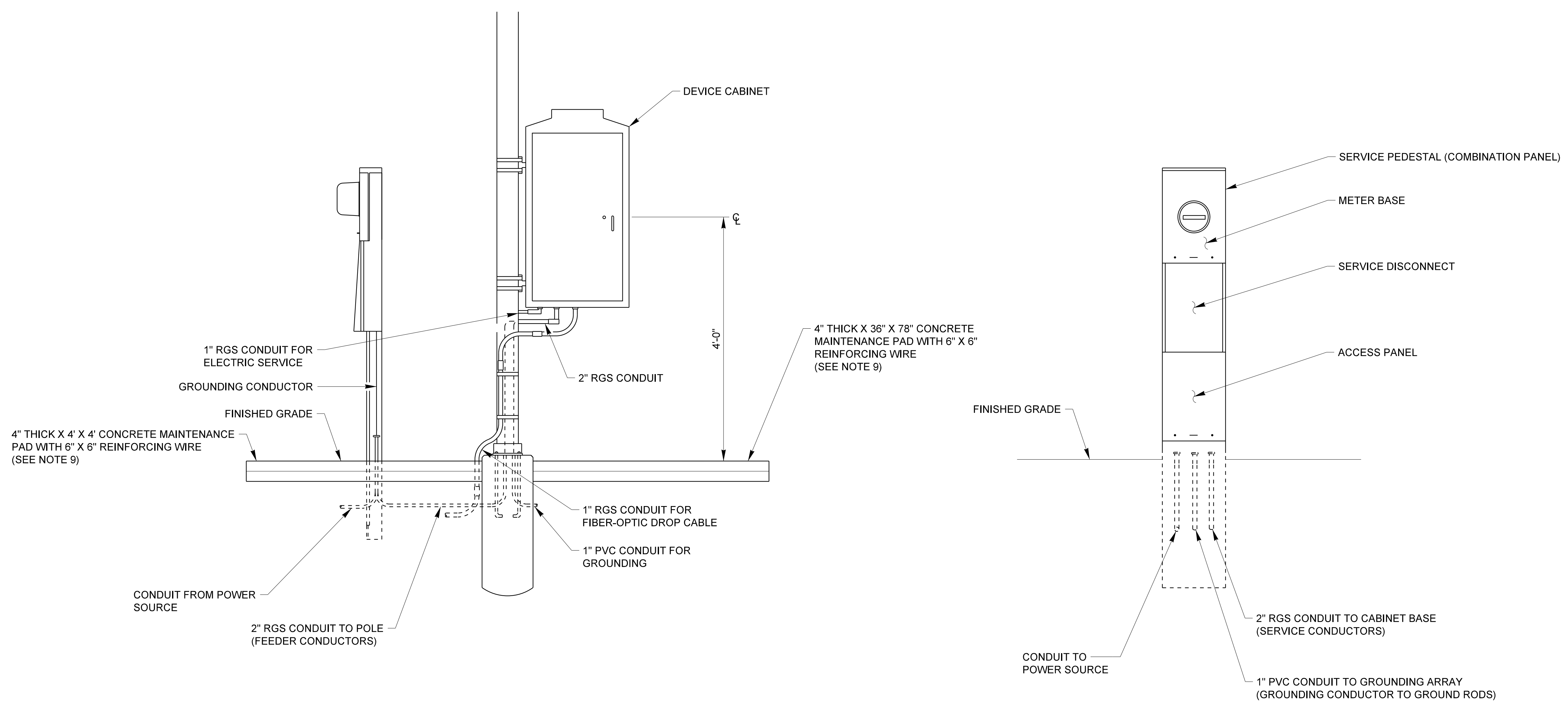
1. TEST GROUNDING SYSTEM USING AN APPROVED METHOD IN ACCORDANCE WITH SPECIAL PROVISIONS. INSTALL GROUND RODS AS DIRECTED BY THE ENGINEER TO MEET THIS REQUIREMENT.
2. REMOVE ANY EXISTING GROUND RODS IN CONCRETE CABINET FOUNDATION BY CUTTING OFF FLUSH WITH FOUNDATION SURFACE.
3. REMOVE BONDING JUMPER IN EQUIPMENT CABINET IF INSTALLED BETWEEN AC NEUTRAL AND EQUIPMENT GROUND.
4. BOND ALL RIGID GALVANIZED STEEL CONDUITS ENTERING THE CABINET TO EQUIPMENT GROUND.
5. INSTALL RIGID GALVANIZED STEEL CONDUIT (MINIMUM 2") BETWEEN DISCONNECT AND CABINET.
6. SERVICE DISCONNECT GROUND BUS BAR SHALL PROVIDE FOR 2 #4 AWG CONNECTIONS.
7. IF CONDITIONS REQUIRE SERVICE PEDESTAL TO BE INSTALLED IN FRONT OR REAR OF CABINET, MAINTAIN SUFFICIENT CLEARANCE FOR DOOR TO FULLY OPEN.
8. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
9. CONCRETE PADS FOR SERVICE PEDESTAL AND CABINET SHALL BE COMBINED INTO A SINGLE PAD IF PEDESTAL IS LOCATED NEXT TO CABINET. DO NOT INSTALL PADS ON SLOPES GREATER THAN 3:1. COMBINATION PANELS NOT ADJACENT TO CABINETS DO NOT REQUIRE MAINTENANCE PADS.

REV. NO.	BY	DATE	DESCRIPTION

SCALE: 7/8" = 1'-0"
 March 2022

X-XX

ROADWAY DETAIL DRAWING FOR
POWER SERVICE DETAIL
POLE-MOUNTED CABINET

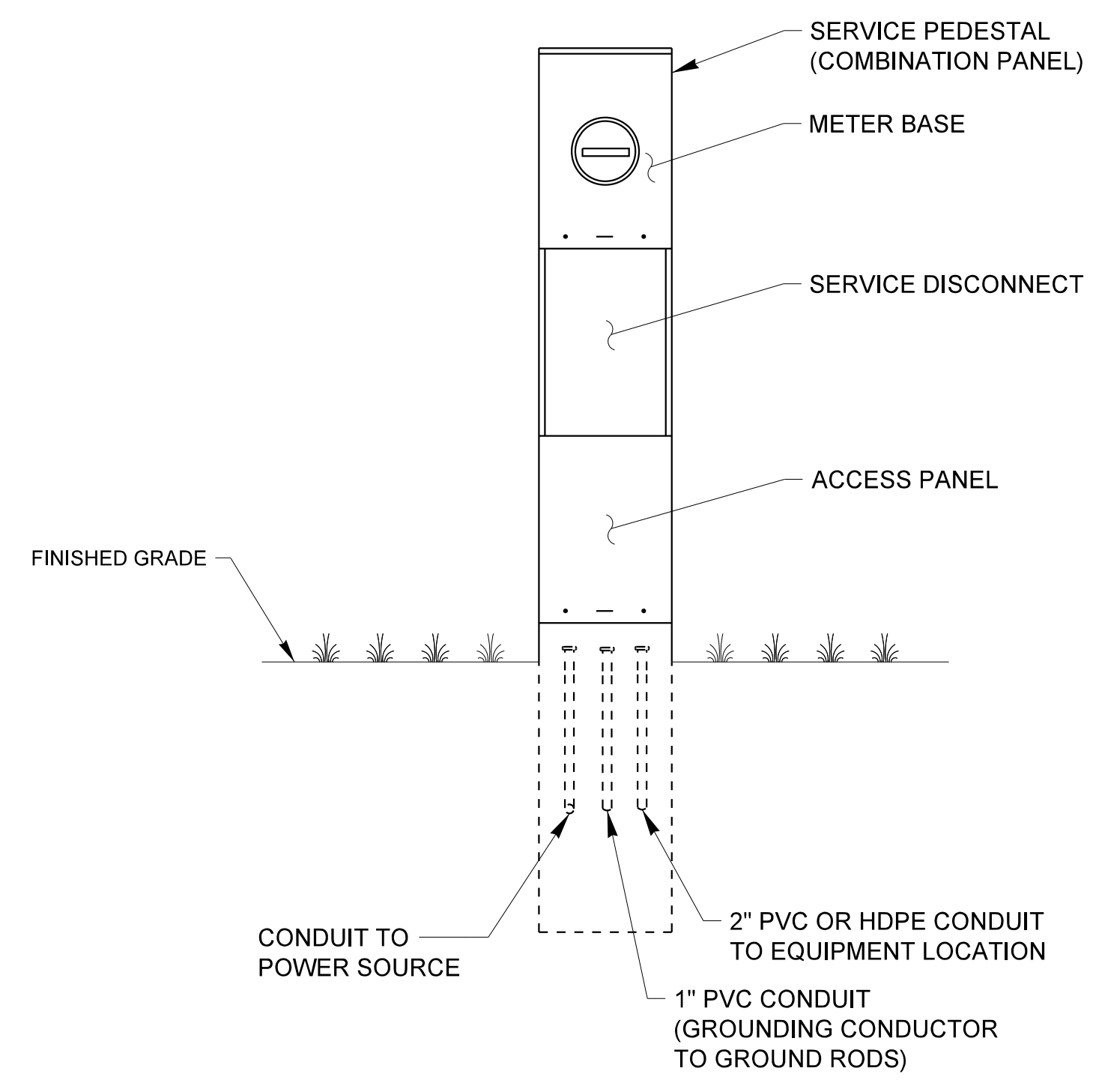


NOTES:

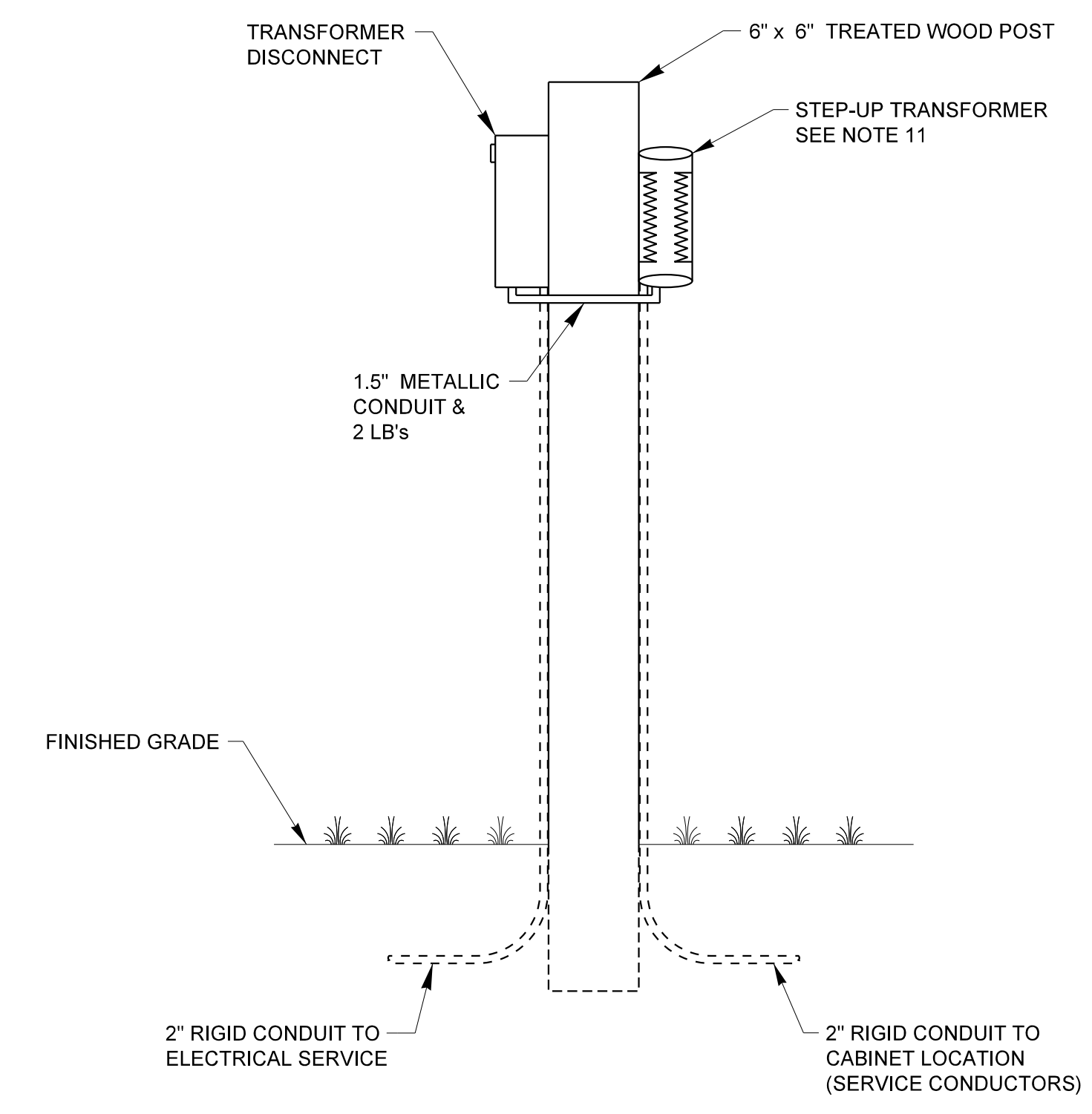
1. TEST GROUNDING SYSTEM USING AN APPROVED METHOD IN ACCORDANCE WITH SPECIAL PROVISIONS. INSTALL GROUND RODS AS DIRECTED BY THE ENGINEER TO MEET THIS REQUIREMENT.
2. REMOVE ANY EXISTING GROUND RODS IN CONCRETE CABINET FOUNDATION BY CUTTING OFF FLUSH WITH FOUNDATION SURFACE.
3. REMOVE BONDING JUMPER IN EQUIPMENT CABINET IF INSTALLED BETWEEN AC NEUTRAL AND EQUIPMENT GROUND.
4. BOND ALL RIGID GALVANIZED STEEL CONDUITS ENTERING THE CABINET TO "EQUIPMENT GROUND".
5. INSTALL RIGID GALVANIZED STEEL CONDUIT (MINIMUM 2") BETWEEN DISCONNECT AND CABINET.
6. SERVICE DISCONNECT GROUND BUS BAR SHALL PROVIDE FOR 2 #4 AWG CONNECTIONS.
7. IF CONDITIONS REQUIRE SERVICE PEDESTAL TO BE INSTALLED IN FRONT OR REAR OF CABINET, MAINTAIN SUFFICIENT CLEARANCE FOR DOOR TO FULLY OPEN.
8. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
9. CONCRETE PADS FOR SERVICE PEDESTAL AND CABINET SHALL BE COMBINED INTO A SINGLE PAD, IF PEDESTAL IS PRESENT NEXT TO POLE. COMBINATION PANELS NOT ADJACENT TO CABINETS DO NOT REQUIRE A MAINTENANCE PAD. DO NOT INSTALL MAINTENANCE PADS ON SLOPES GREATER THAN 3:1.

REV. NO.	BY	DATE	DESCRIPTION

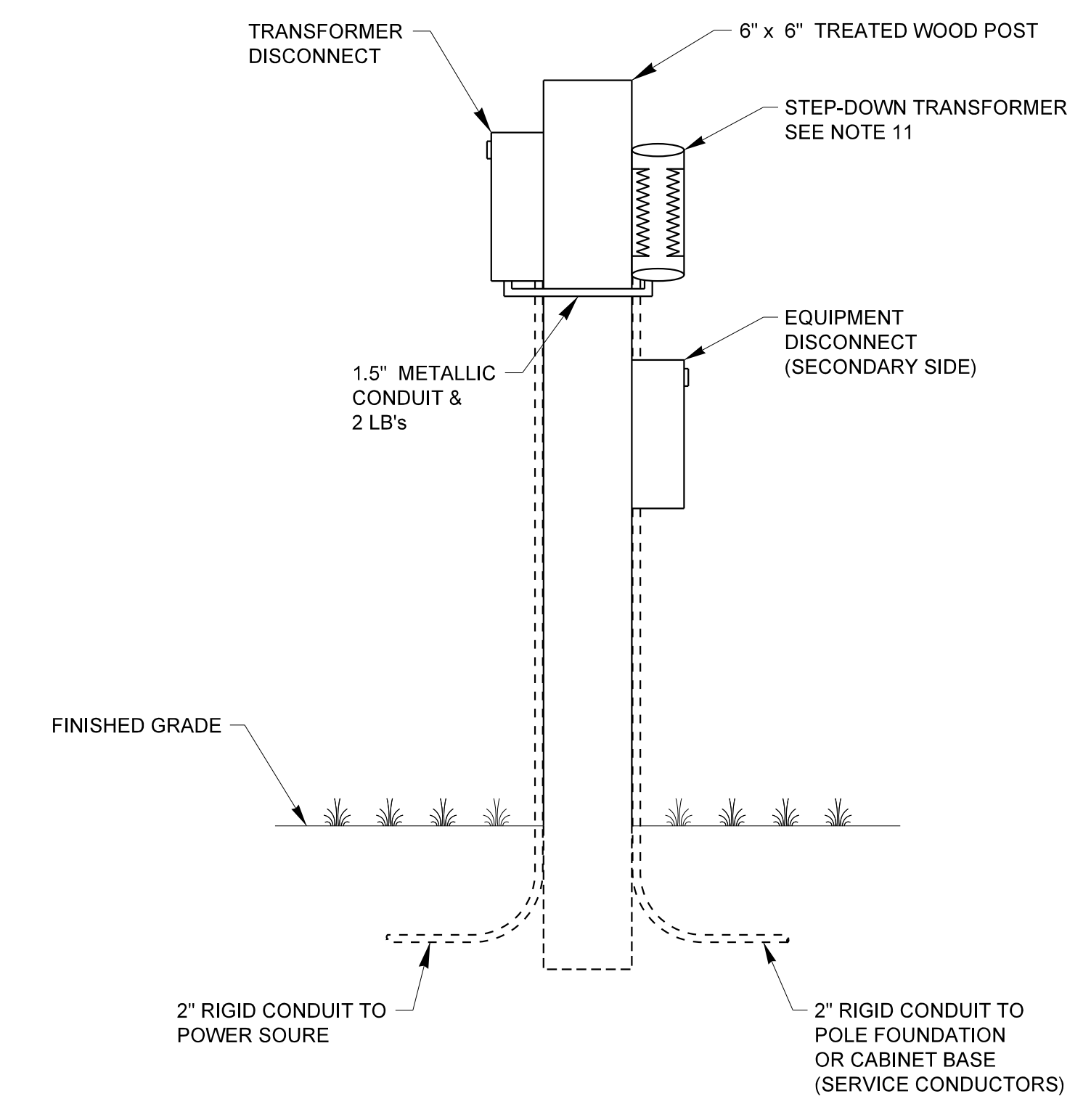
SCALE: 1" = 1'-0"
March 2022



**POWER SERVICE ENTRANCE
COMBINATION PEDESTAL DETAIL**



**STEP-UP TRANSFORMER
DETAIL**



**STEP-DOWN TRANSFORMER
DETAIL**

NOTES:

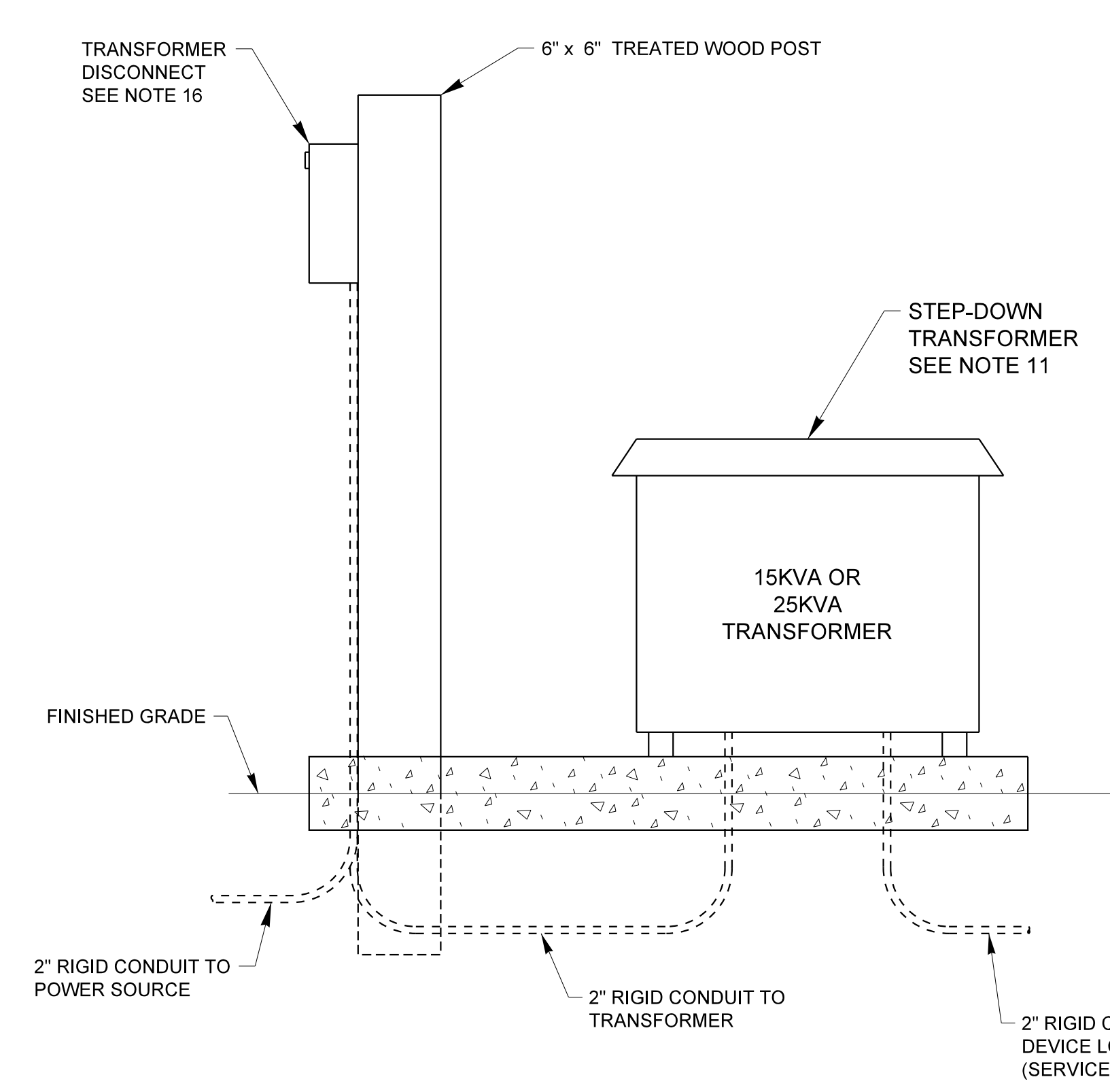
1. TREATED WOOD POSTS SHALL BE INSTALLED A MINIMUM OF THREE (3) FEET INTO THE GROUND.
2. INSTALL ALL PEDESTAL MOUNTED ELECTRICAL SERVICE EQUIPMENT AT A HEIGHT NOT TO EXCEED 5 FEET AS MEASURED FROM THE CENTER OF EQUIPMENT.
3. ELECTRICAL EQUIPMENT SHALL BE GROUNDED. TEST GROUNDING SYSTEM USING AN APPROVED METHOD. SYSTEM SHALL MEASURE TWENTY (20) OHMS OR LESS. ADDITIONAL GROUND RODS SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER TO MEET THIS REQUIREMENT.
4. REMOVE BONDING JUMPER IN EQUIPMENT CABINET IF INSTALLED BETWEEN AC NEUTRAL AND EQUIPMENT GROUND.
5. BOND ALL RIGID GALVANIZED STEEL CONDUITS ENTERING THE CABINET TO "EQUIPMENT GROUND".
6. INSTALL RIGID CALVANIZED STEEL CONDUIT (MINIMUM 1") BETWEEN DISCONNECT AND CABINET.
7. SERVICE DISCONNECT GROUND BUS BAR SHALL PROVIDE FOR 2 #4 AWG CONNECTIONS.
8. IF CONDITIONS REQUIRE SERVICE PEDESTAL TO BE INSTALLED IN FRONT OR REAR OF CABINET, MAINTAIN SUFFICIENT CLEARANCE FOR DOOR TO FULLY OPEN.
9. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
10. CONCRETE PADS FOR SERVICE OR EQUIPMENT DISCONNECT PEDESTALS AND CABINETS SHALL BE COMBINED INTO A SINGLE PAD, IF PEDESTAL IS PRESENT NEXT TO POLE. COMBINATION PANELS NOT ADJACENT TO CABINETS DO NOT REQUIRE A MAINTENANCE PAD.

REV. NO.	BY	DATE	DESCRIPTION

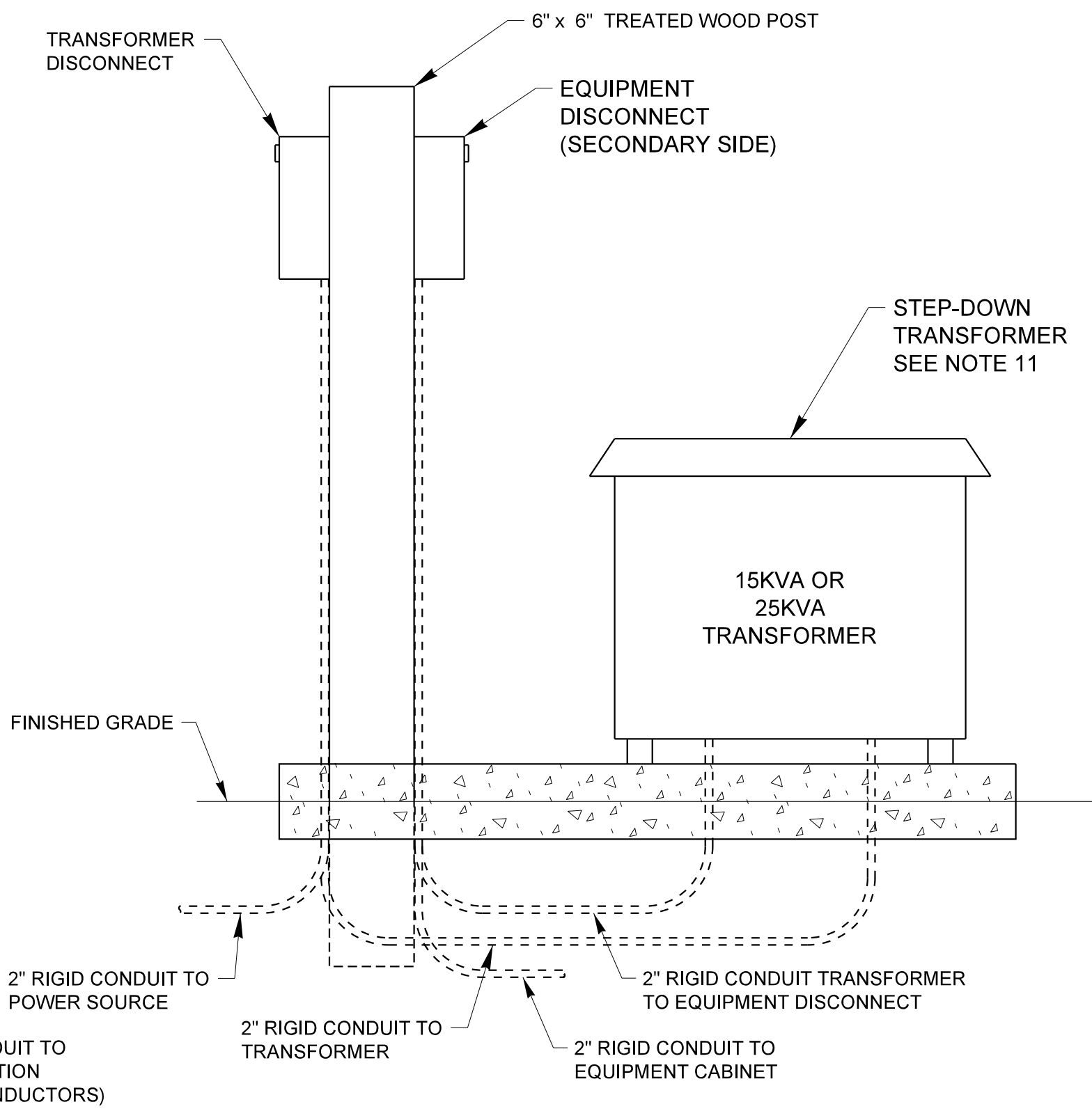
SCALE: N.T.S.
March 2022

X-XX

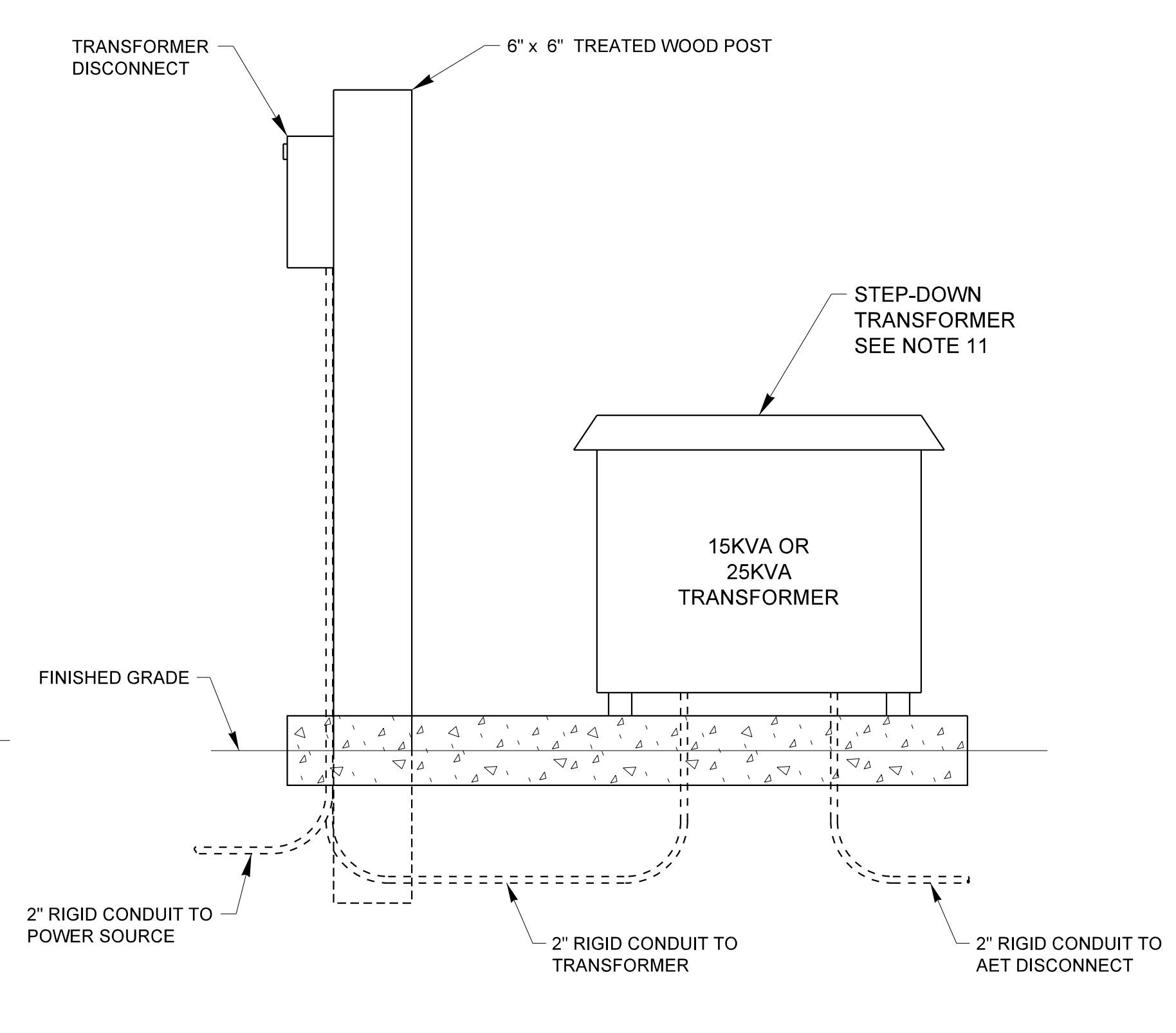
ROADWAY DETAIL DRAWING FOR
**POWER SERVICE DETAIL -
GROUND MOUNTED TRANSFORMER**



GROUND MOUNTED
STEP-UP TRANSFORMER WITH
EQUIPMENT DISCONNECT AT SERVICE
ENTRANCE DETAIL



GROUND MOUNTED
STEP-DOWN TRANSFORMER WITH
EQUIPMENT DISCONNECT DETAIL



GROUND MOUNTED
STEP-UP TRANSFORMER WITH
EQUIPMENT DISCONNECT AT DEVICE OR ON
AET EQUIPMENT PAD DETAIL

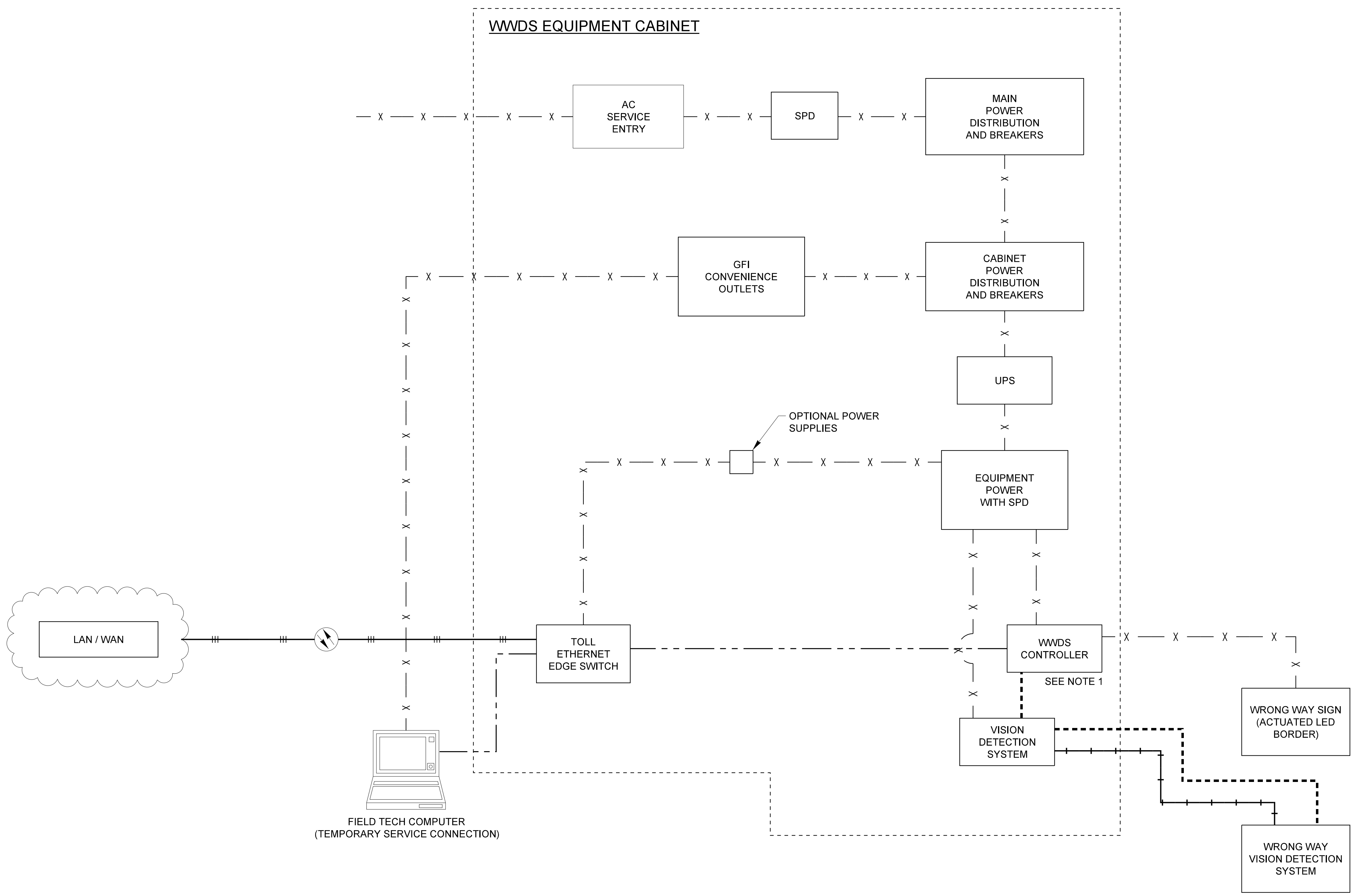
NOTES:

1. TREATED WOOD POSTS SHALL BE INSTALLED A MINIMUM OF THREE (3) FEET INTO THE GROUND.
2. INSTALL ALL PEDESTAL MOUNTED ELECTRICAL SERVICE EQUIPMENT AT A HEIGHT NOT TO EXCEED 5 FEET AS MEASURED FROM THE CENTER OF EQUIPMENT.
3. ELECTRICAL EQUIPMENT SHALL BE GROUNDED. TEST GROUNDING SYSTEM USING AN APPROVED METHOD. SYSTEM SHALL MEASURE TWENTY (20) OHMS OR LESS. ADDITIONAL GROUND RODS SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER TO MEET THIS REQUIREMENT.
4. REMOVE BONDING JUMPER IN EQUIPMENT CABINET IF INSTALLED BETWEEN AC NEUTRAL AND EQUIPMENT GROUND.
5. BOND ALL RIGID GALVANIZED STEEL CONDUITS ENTERING THE CABINET TO "EQUIPMENT GROUND".
6. INSTALL RIGID CALVANIZED STEEL CONDUIT (MINIMUM 1") BETWEEN DISCONNECT AND CABINET.
7. SERVICE DISCONNECT GROUND BUS BAR SHALL PROVIDE FOR 2 #4 AWG CONNECTIONS.
8. IF CONDITIONS REQUIRE SERVICE PEDESTAL TO BE INSTALLED IN FRONT OR REAR OF CABINET, MAINTAIN SUFFICIENT CLEARANCE FOR DOOR TO FULLY OPEN.
9. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
10. CONCRETE PADS FOR SERVICE OR EQUIPMENT DISCONNECT PEDESTALS AND CABINETS SHALL BE COMBINED INTO A SINGLE PAD, IF PEDESTAL IS PRESENT NEXT TO POLE. COMBINATION PANELS NOT ADJACENT TO CABINETS DO NOT REQUIRE A MAINTENANCE PAD.

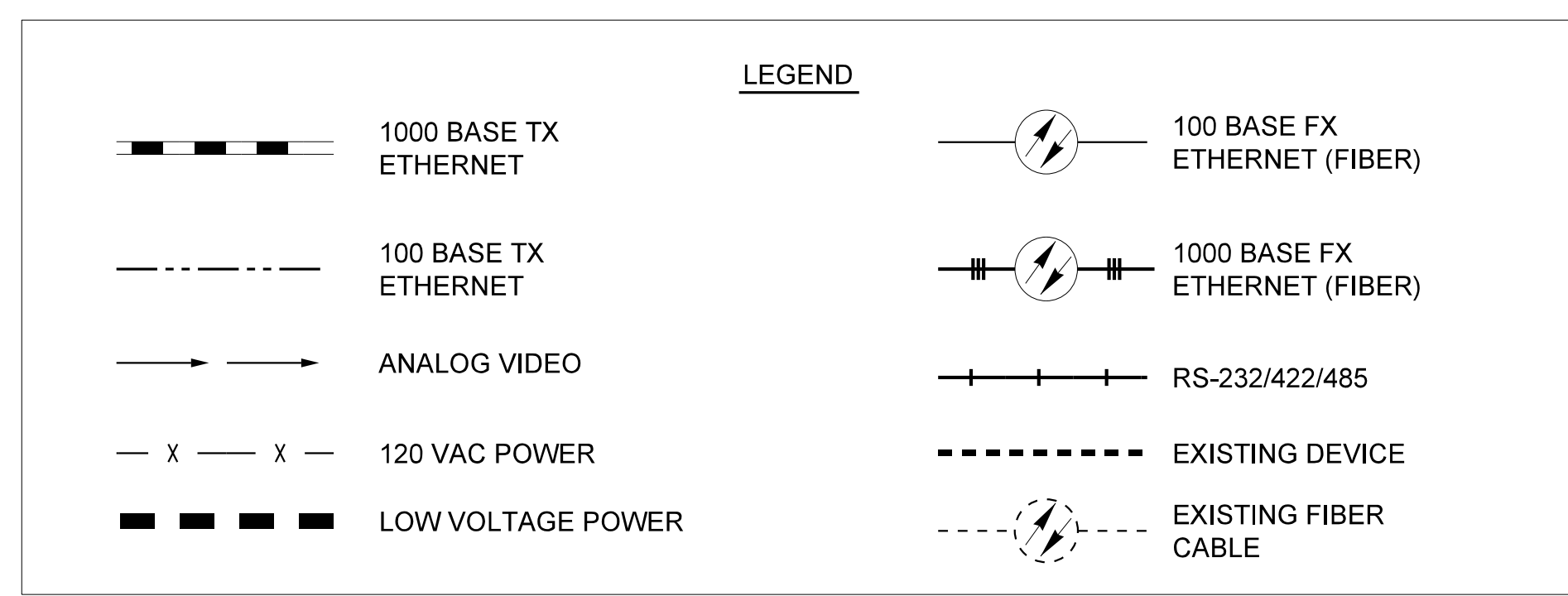
REV. NO.	BY	DATE	DESCRIPTION

SCALE: N.T.S.
March 2022

X-XX
ROADWAY DETAIL DRAWING FOR
WRONG-WAY DRIVER DETECTION
BLOCK DIAGRAM



- NOTES:**
1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN RFP.
 2. AC WIRED CABINET SHALL BE EQUIPPED WITH A SURGE PROTECTOR WITH AN ALARM FEATURE.
 3. SIGNS AT AET VAULT LOCATIONS SHALL USE UPS FOR AET VAULT.

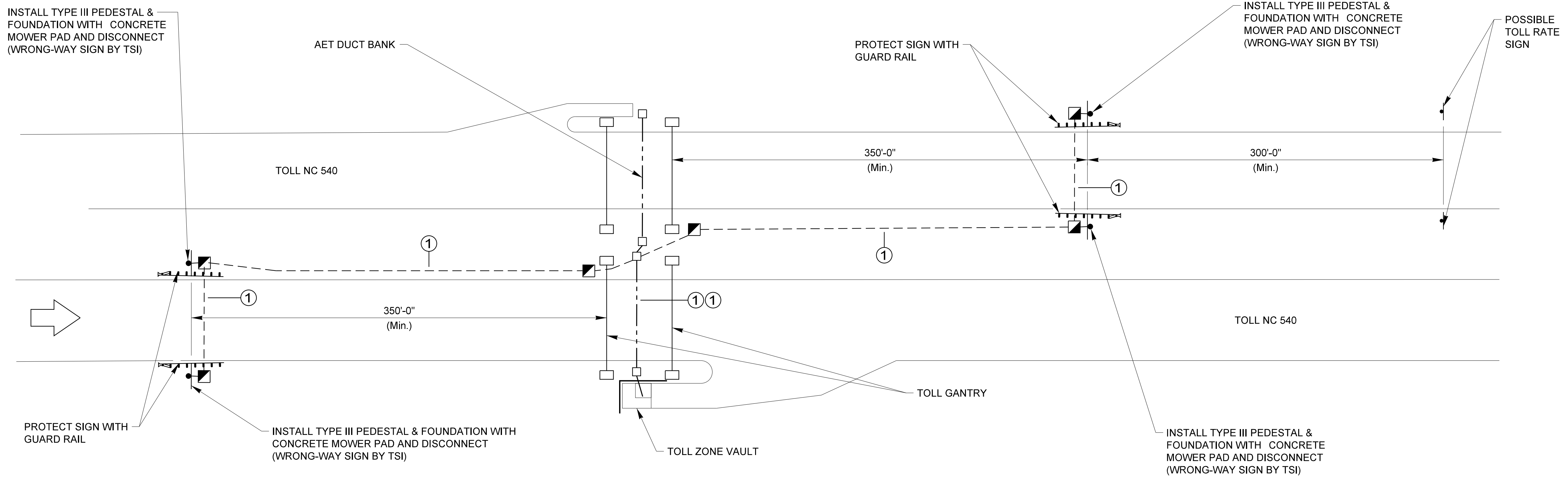


REV. NO.	BY	DATE	DESCRIPTION

SCALE: N.T.S.
March 2022

X-XX

ROADWAY DETAIL DRAWING FOR
**WRONG-WAY DRIVER DETECTION
MAINLINE SIGN INFRASTRUCTURE**



NOTES:

1. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
2. USE SPARE CONDUITS IN AET DUCT BANK.
3. INSTALL 18" (MIN.) CONCRETE MOWER PAD FOR ALL PEDESTALS.
4. INSTALL SIGN PEDESTALS AT LEAST 12' FROM THE EDGE OF TRAVEL.
5. INSTALL 18" (MIN.) CONCRETE MOWER PAD FOR ALL JUNCTION BOXES.
6. CONDUIT ROUTE FROM TOLL ZONE TO SIGNS MAY USE EITHER SHOULDER.
7. CONDUIT ROUTE MAY BE TRENCHED IN TANDEM WITH FIBER TRUNKLINE, BUT MAY NOT USE CONDUIT DEDICATED TO FIBER.
8. RUN A SINGLE 3-WIRE CONDUCTOR FROM SIGNS TO VAULT. STORE CABLE AT JUNCTION BOXES AND VAULT FOR CONNECTION BY TSI.

LEGEND

--- TRENCH OR BORED CONDUIT (2 X 2" HDPE)

□ TOLL SITE ELECTRICAL PULLBOX

▣ ELECTRICAL PULL BOX FOR WRONG-WAY SIGN

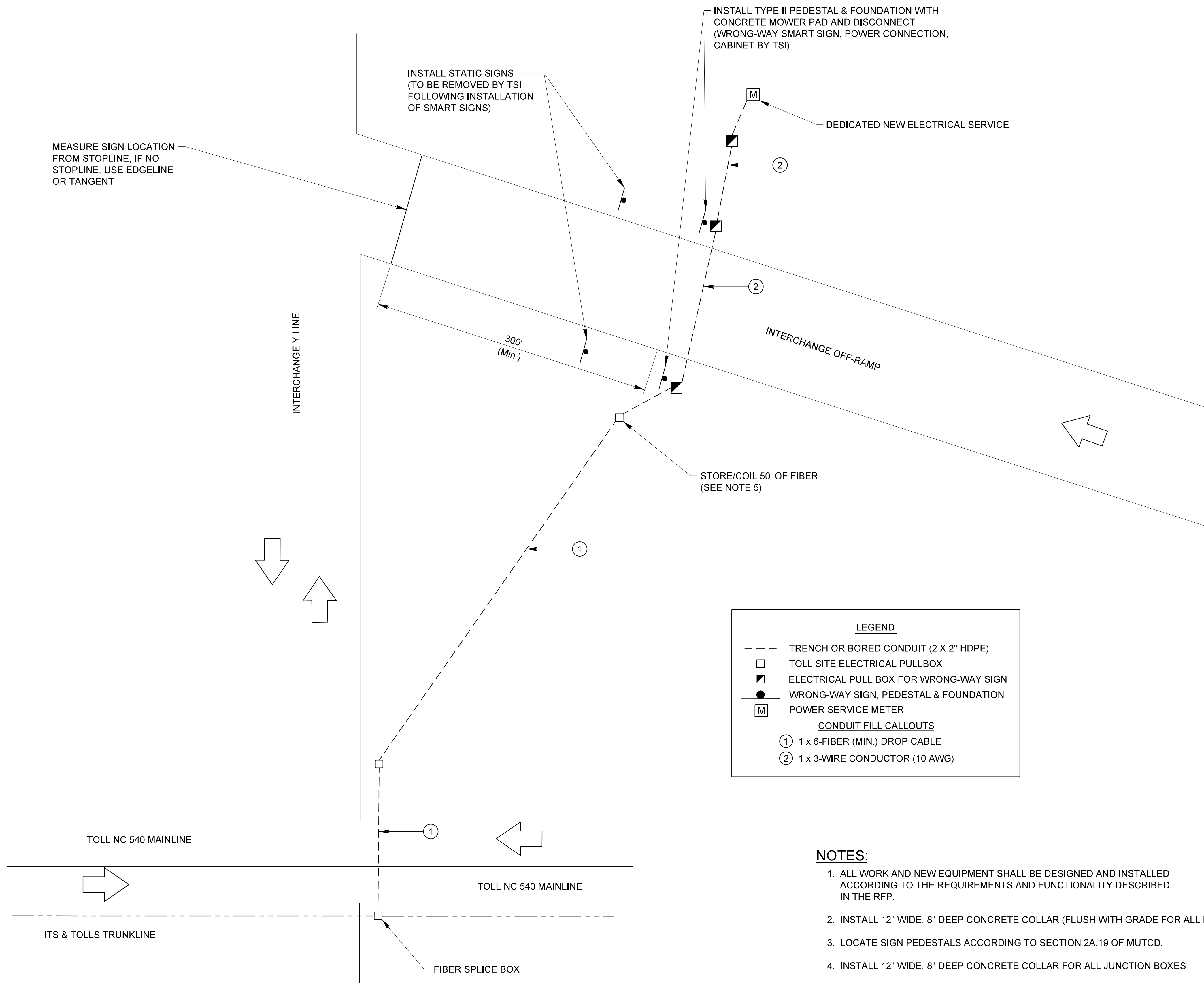
● WRONG-WAY SIGN, PEDESTAL & FOUNDATION

CONDUIT FILL CALLOUTS

① 1 x 3-WIRE CONDUCTOR (10 AWG)

REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3" = 1'-0"
March 2022



MEASURE SIGN LOCATION FROM STOPLINE; IF NO STOPLINE, USE EDGELINE OR TANGENT

INSTALL STATIC SIGNS (TO BE REMOVED BY TSI FOLLOWING INSTALLATION OF SMART SIGNS)

INSTALL TYPE II PEDESTAL & FOUNDATION WITH CONCRETE MOWER PAD AND DISCONNECT (WRONG-WAY SMART SIGN, POWER CONNECTION, CABINET BY TSI)

DEDICATED NEW ELECTRICAL SERVICE

STORE/COIL 50' OF FIBER (SEE NOTE 5)

LEGEND

- TRENCH OR BORED CONDUIT (2 X 2" HDPE)
- TOLL SITE ELECTRICAL PULLBOX
- ELECTRICAL PULL BOX FOR WRONG-WAY SIGN
- WRONG-WAY SIGN, PEDESTAL & FOUNDATION
- M POWER SERVICE METER

CONDUIT FILL CALLOUTS

- ① 1 x 6-FIBER (MIN.) DROP CABLE
- ② 1 x 3-WIRE CONDUCTOR (10 AWG)

- NOTES:**
- ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
 - INSTALL 12" WIDE, 8" DEEP CONCRETE COLLAR (FLUSH WITH GRADE FOR ALL PEDESTALS).
 - LOCATE SIGN PEDESTALS ACCORDING TO SECTION 2A.19 OF MUTCD.
 - INSTALL 12" WIDE, 8" DEEP CONCRETE COLLAR FOR ALL JUNCTION BOXES
 - COIL/STORE FIBER-OPTIC CABLE IN JUNCTION BOX FOR CONNECTION TO TSI.
 - POWER SERVICE CAN BE SHARED WITH MVD OR CCTV BUT NOT A TRAFFIC SIGNAL.
 - SPLICE WWDD FIBER DROP INTO THE TOLLS CABLE AS DIRECTED BY NCTA.
 - FOR OFF-RAMP LOOPS, INSTALL SIGNS 250' FROM STOPLINE, OR USE ENGINEERING JUDGEMENT.
 - RUN A SINGLE 3-WIRE CONDUCTOR FROM METER TO FURTHEST DEVICE BOX. STORE 25' OF WIRE IN EACH JUNCTION BOX, FOR CONNECTION BY TSI. AWG SIZE TO BE CONFIRMED BY TSI/NCTA.

REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3" = 1'-0"
March 2022

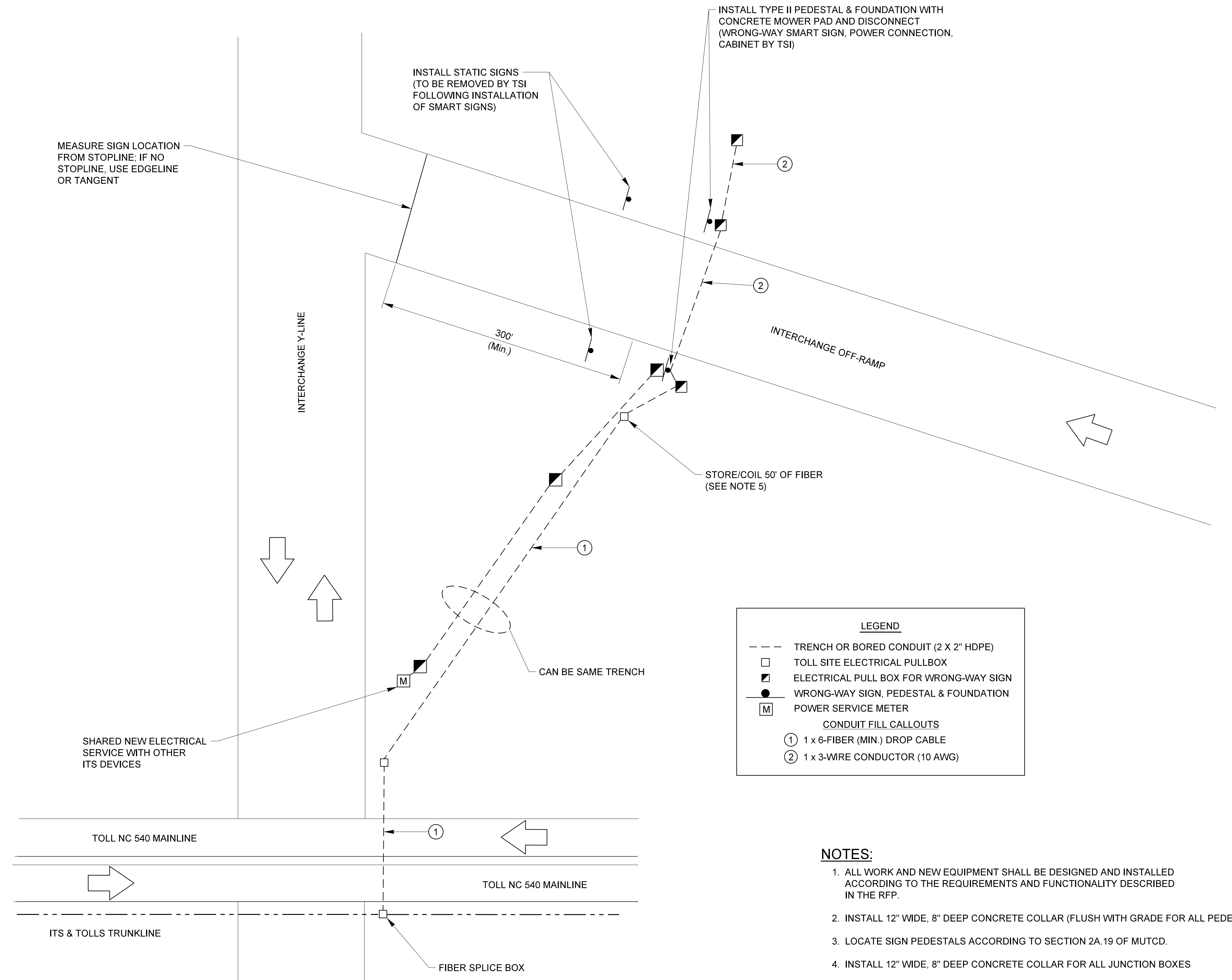
X-XX

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
WRONG-WAY DRIVER DETECTION
POWER SERVICE FROM OUTSIDE
OF RAMP

W-3A

ROADWAY DETAIL DRAWING FOR
**WRONG-WAY DRIVER DETECTION
 POWER SERVICE FROM INSIDE OF
 RAMP**



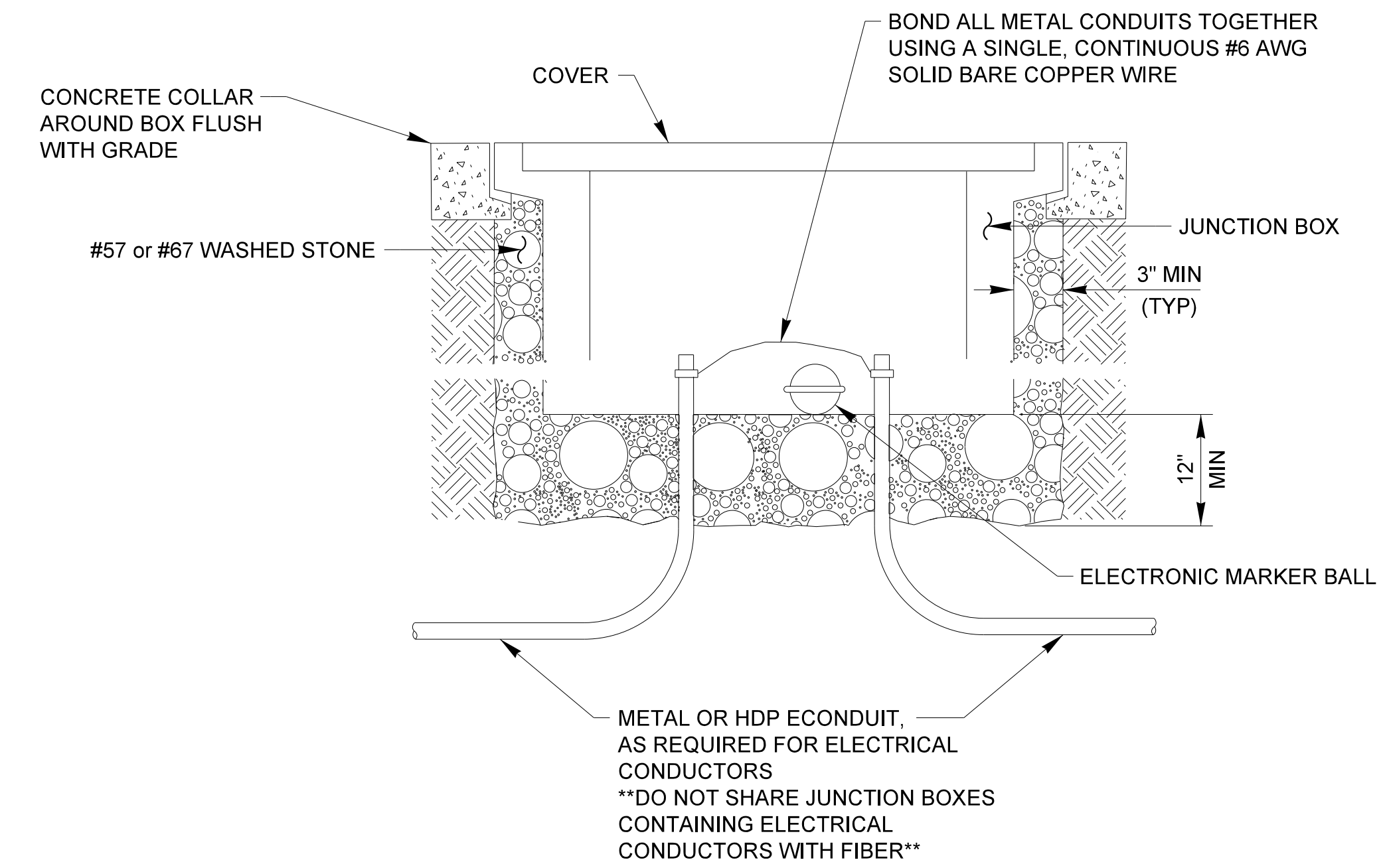
- NOTES:**
- ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.
 - INSTALL 12" WIDE, 8" DEEP CONCRETE COLLAR (FLUSH WITH GRADE FOR ALL PEDESTALS).
 - LOCATE SIGN PEDESTALS ACCORDING TO SECTION 2A.19 OF MUTCD.
 - INSTALL 12" WIDE, 8" DEEP CONCRETE COLLAR FOR ALL JUNCTION BOXES
 - COIL/STORE FIBER-OPTIC CABLE IN JUNCTION BOX FOR CONNECTION TO TSI.
 - POWER SERVICE CAN BE SHARED WITH MVD OR CCTV BUT NOT A TRAFFIC SIGNAL.
 - SPLICE WWDD FIBER DROP INTO THE TOLLS CABLE AS DIRECTED BY NCTA.
 - FOR OFF-RAMP LOOPS, INSTALL SIGNS 250' FROM STOPLINE, OR USE ENGINEERING JUDGEMENT.
 - RUN A SINGLE 3-WIRE CONDUCTOR FROM METER TO FURTHEST DEVICE BOX. STORE 25' OF WIRE IN EACH JUNCTION BOX, FOR CONNECTION BY TSI. AWG SIZE TO BE CONFIRMED BY TSI/NCTA.

SCALE: 3" = 1'-0"
 March 2022

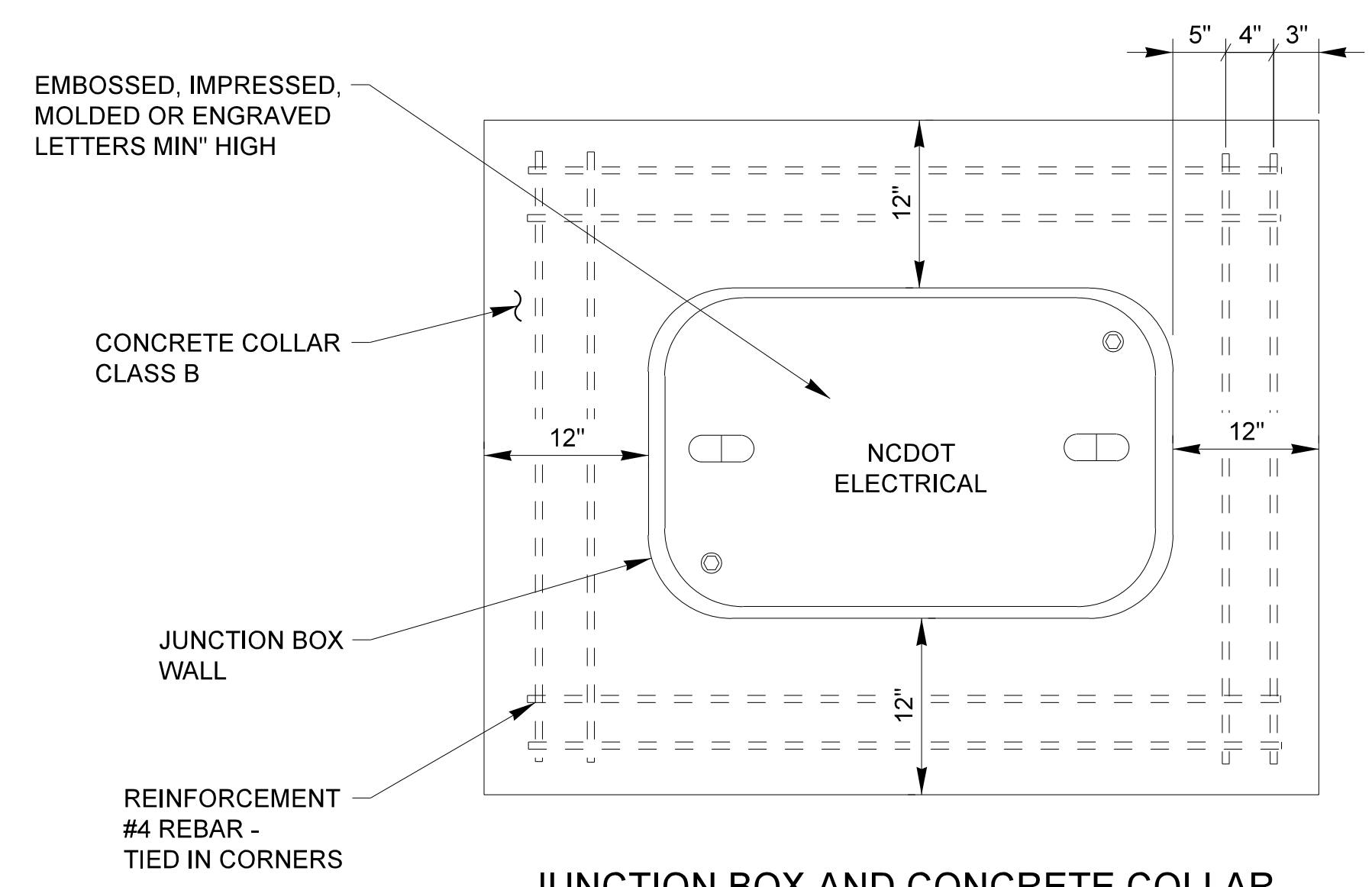
REV. NO.	BY	DATE	DESCRIPTION

ROADWAY DETAIL DRAWING FOR
ELECTRICAL JUNCTION BOX
DETAILS

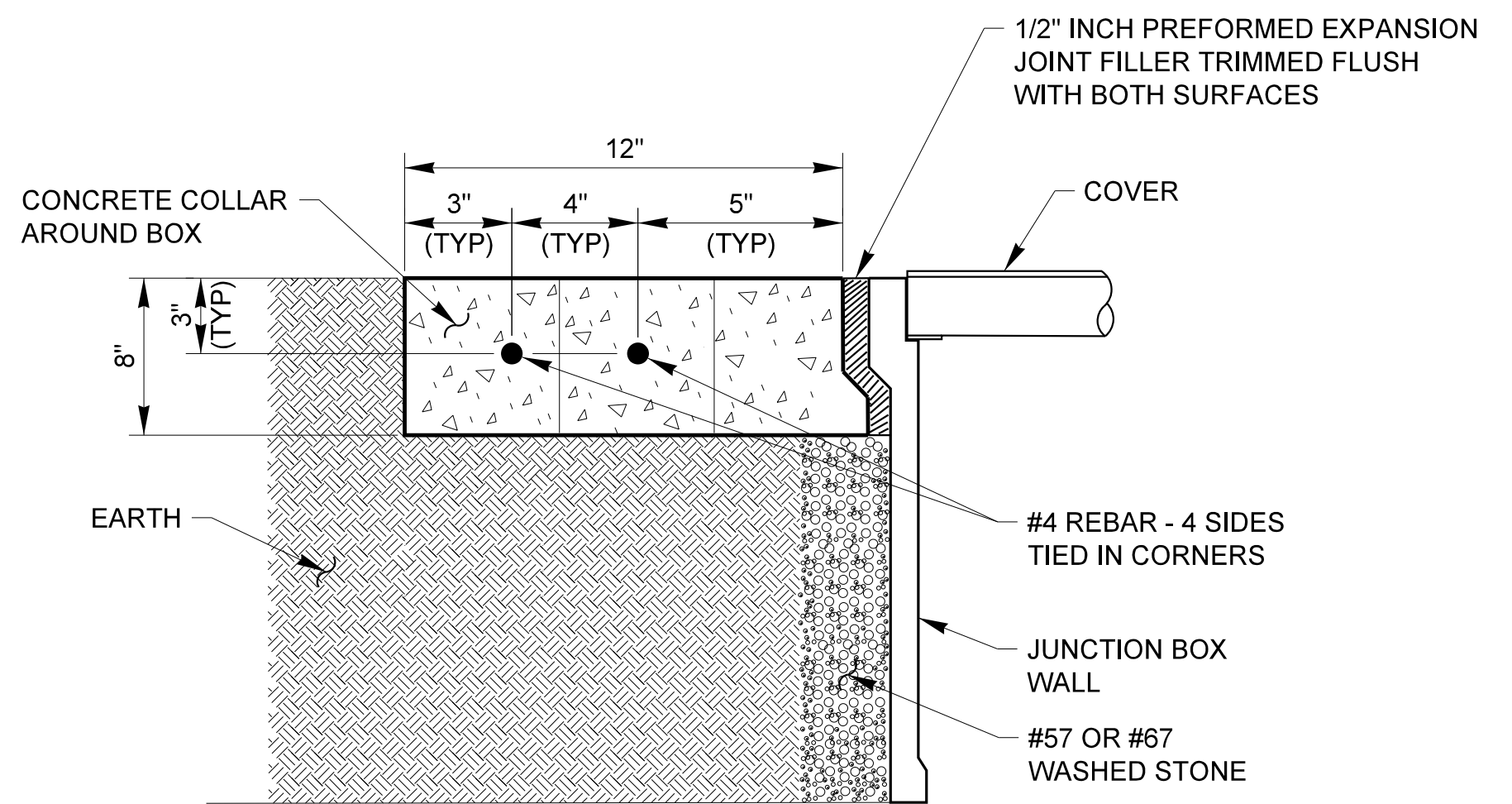
INSTALLATION CROSS-SECTION



ELECTRICAL JUNCTION BOX (AT GRADE)



JUNCTION BOX AND CONCRETE COLLAR



JUNCTION BOX CONCRETE COLLAR DETAIL

NOTES:

1. FURNISH ELECTRICAL JUNCTION BOXES WITH OUTER DIMENSIONS OF 18" (L) X 11" (W) X 12" (D).
2. FURNISH ELECTRONIC MARKER BALLS FOR POWER THAT ARE RED IN COLOR AND PROGRAMMED TO TRANSMIT AT 169.8 KHZ.
3. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.

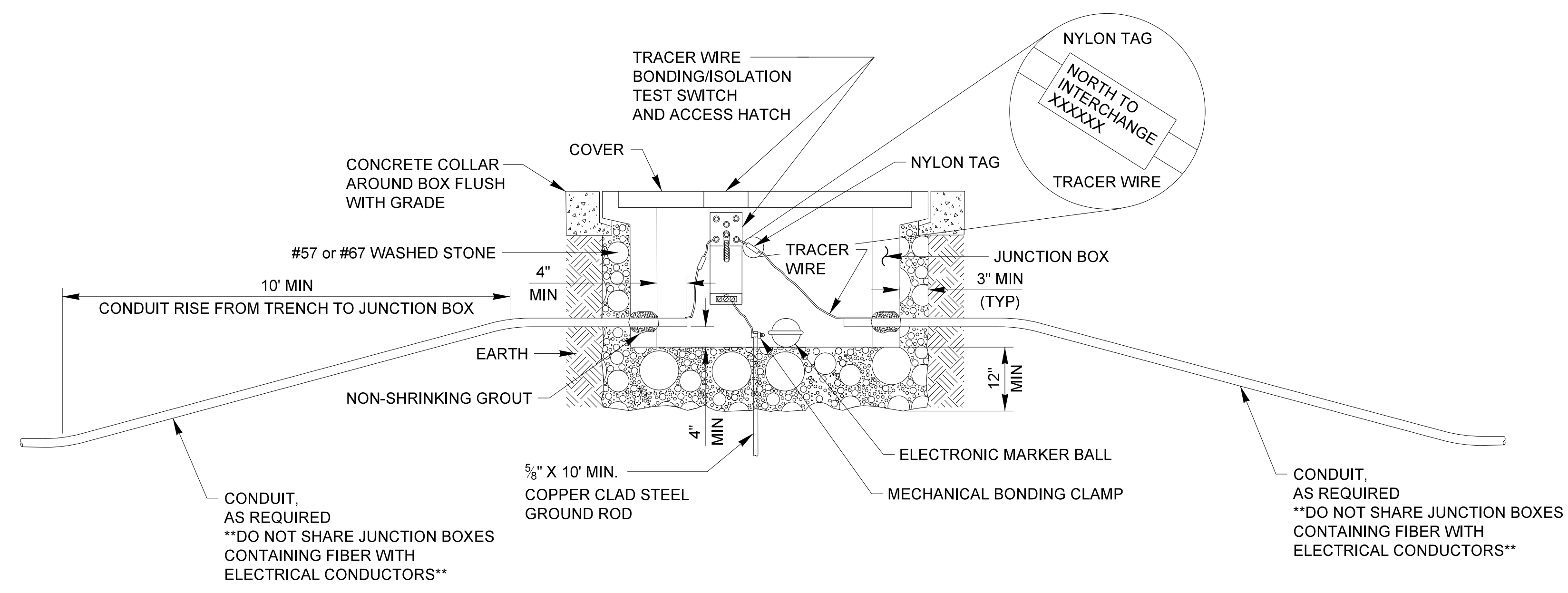
REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3" = 1'-0"
 March 2022

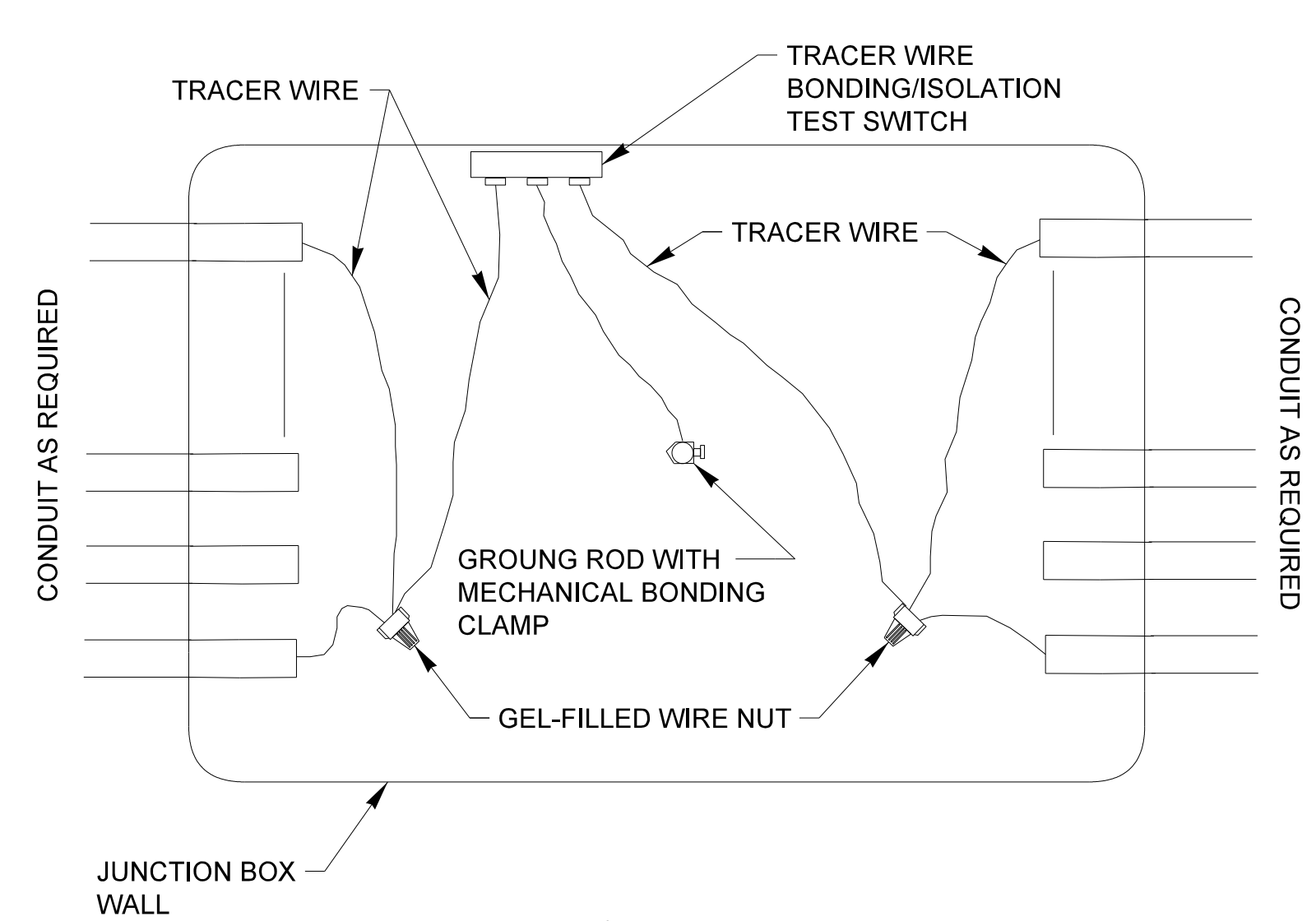
X-XX

ROADWAY DETAIL DRAWING FOR
COMMUNICATIONS JUNCTION BOX
DETAILS

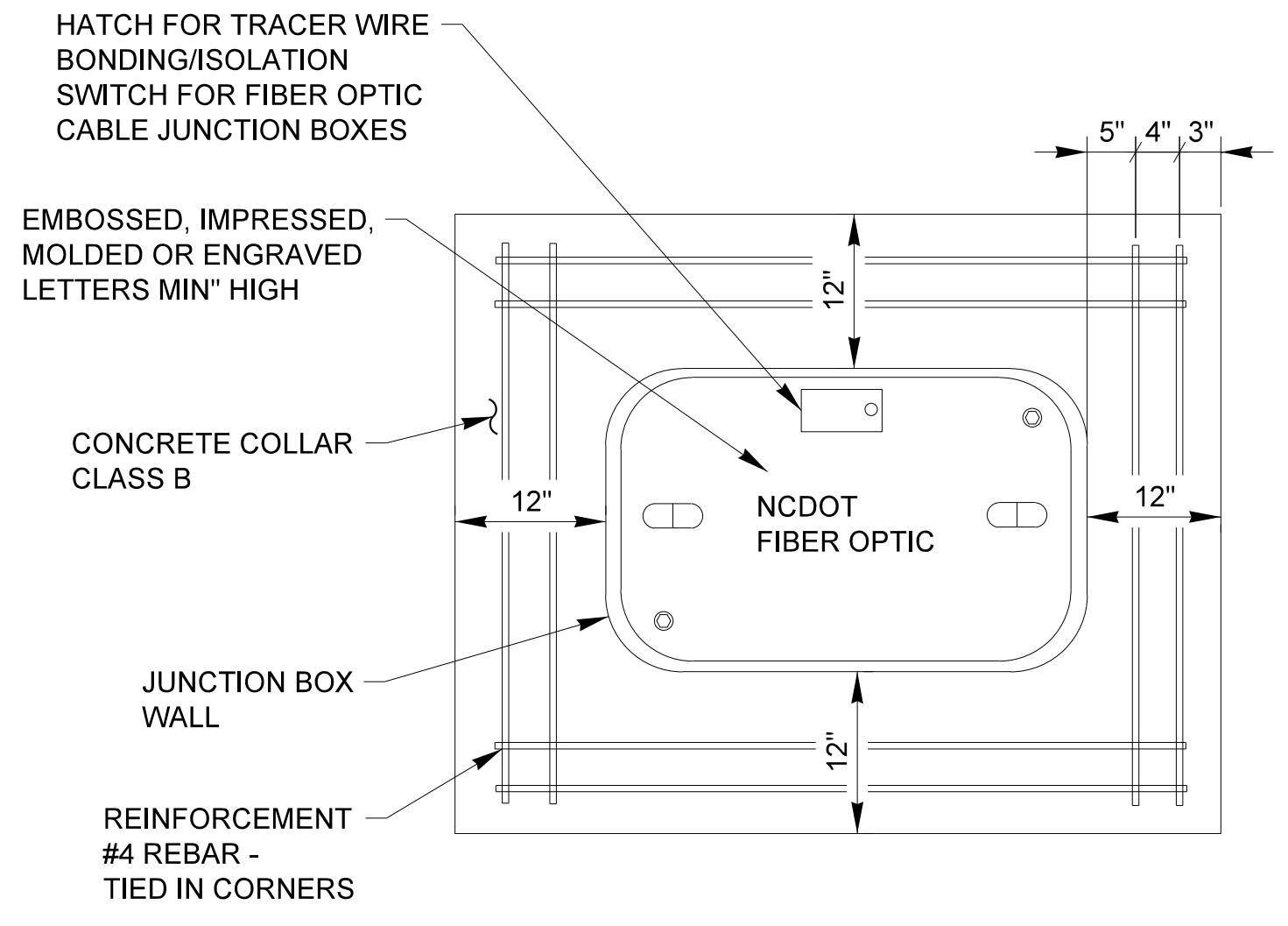
INSTALLATION CROSS-SECTION



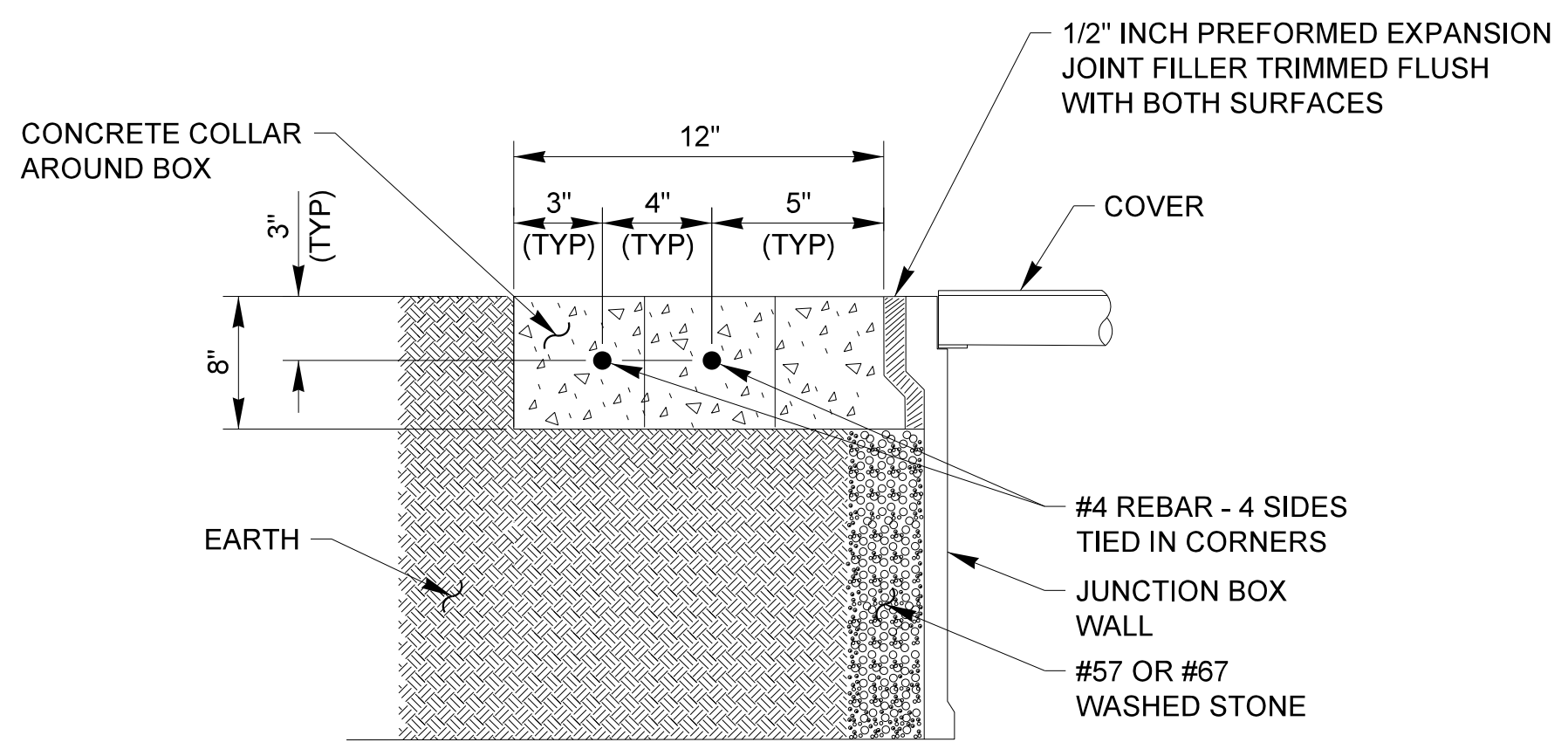
COMMUNICATIONS JUNCTION BOX (AT GRADE)



TOP VIEW
 ENSURE CONDUIT COLORS LINE UP
 ENTERING AND EXITING JUNCTION BOX
 FOR EASE OF JETTING INSTALLATION



JUNCTION BOX AND CONCRETE COLLAR



JUNCTION BOX CONCRETE COLLAR DETAIL

NOTES:

1. FURNISH OVERSIZED COMMUNICATIONS JUNCTION BOXES WITH OUTER DIMENSIONS OF 30" (L) x 17" (W) x 24" (D).
2. FURNISH SPECIAL OVERSIZED COMMUNICATIONS JUNCTION BOXES WITH OUTER DIMENSIONS OF 48" (L) x 30" (W) x 36" (D).
3. FURNISH ELECTRONIC MARKER BALLS FOR POWER THAT ARE ORANGE IN COLOR AND PROGRAMMED TO TRANSMIT AT 101.4 KHZ.
4. ALL WORK AND NEW EQUIPMENT SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE REQUIREMENTS AND FUNCTIONALITY DESCRIBED IN THE RFP.

REV. NO.	BY	DATE	DESCRIPTION

SCALE: 3" = 1'-0"
 March 2022