

**CENTRAL  
FLORIDA  
EXPRESSWAY  
AUTHORITY**

**CFX ITS Design  
Standards**



**Version 6  
April 2017**



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April 2017

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Standards



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Standards



Version 6  
April 2017

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CENTRAL  
FLORIDA  
EXPRESSWAY  
AUTHORITY

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*ITS DESIGN STANDARDS*

*FOR DESIGN, CONSTRUCTION, MAINTENANCE AND UTILITY  
OPERATIONS ON THE STATE HIGHWAY SYSTEM*

*VERSION 6  
APRIL 2017*

CENTRAL FLORIDA EXPRESSWAY AUTHORITY  
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GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE CENTRAL FLORIDA EXPRESSWAY AUTHORITY (CFX) 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
2. THESE PLANS REFLECT CONDITIONS KNOWN DURING PLAN DEVELOPMENT. IN THE EVENT ACTUAL PHYSICAL CONDITIONS PREVENT THE APPLICATION OR THE PROGRESSION OF ANY WORK SPECIFIED IN THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY AND PRIOR TO ANY FURTHER WORK ACTIVITY.
3. IN ORDER TO MINIMIZE IMPACT TO LANDSCAPING MATERIAL, THE CONTRACTOR SHALL EXERCISE CAUTION THROUGH LANDSCAPING LIMITS DURING ALL PHASES OF CONSTRUCTION ACTIVITY. ANY LANDSCAPE MATERIAL DAMAGED DURING THE CONSTRUCTION PROCESS SHALL BE REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL AVOID AND/OR PROTECT ALL TREES AND ROOTS BY HAND DIGGING AS NECESSARY. ANY TREES, SHRUBS OR VEGETATION DAMAGED BY THE CONTRACTOR SHALL BE REPLACED IN KIND AT NO COST TO CFX.
4. CONTRACTOR SHALL COORDINATE HIS ACTIVITIES WITH ALL OTHER CONTRACTORS OPERATING WITHIN THE PROJECT AREA.
5. THE CONTRACTOR SHALL EXERCISE ALL APPROPRIATE SAFETY MEASURES WHEN WORKING IN OR AROUND AREAS OF OVERHEAD ELECTRICAL/TRANSMISSION LINES OR UNDERGROUND UTILITIES. HAND DIGGING SHALL BE USED AROUND ALL KNOWN AND LOCATED UTILITIES.
6. FLORIDA STATUTE 556 REQUIRES CONTRACTORS TO CALL SUNSHINE STATE ONE-CALL OF FLORIDA, INC., AT 1-800-432-4770, NO LESS THAN 2 OR MORE THAN 5 BUSINESS DAYS BEFORE BEGINNING ANY EXCAVATION OR DEMOLITION. NOT ALL UTILITY AGENCIES/OWNERS ARE MEMBERS OF SUNSHINE STATE ONE-CALL OF FLORIDA, INC.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH THE CITY OF ORLANDO NOISE ORDINANCE CHAPTER 42.
8. THE CONTRACTOR IS RESPONSIBLE FOR PAYING ALL TOLLS INCURRED FROM USING CFX'S SYSTEM IN TRANSPORTING WORKERS, EQUIPMENT OR MATERIALS TO AND FROM THE SITE OF WORK AT NO ADDITIONAL COST TO CFX. CONTRACTOR SHALL ACCESS THE PROJECT BY EXISTING RAMPS. NO ACCESS WILL BE ALLOWED THROUGH THE RIGHT-OF-WAY FENCE UNLESS APPROVED BY CFX. NO U-TURNS SHALL BE PERMITTED IN THE MEDIAN. VIOLATORS WILL FACE IMMEDIATE TERMINATION OF CONTRACT.
9. VIBRATORY ROLLERS SHALL NOT BE ALLOWED FOR COMPACTION OPERATIONS OF PAVEMENT, SOILS, ETC. ABOVE FIBER OPTIC CABLES (AT&T, MCI WORLD COM, CFX FIBER OPTIC, ETC). THE LOCATION OF ALL PROPOSED EQUIPMENT TO BE INSTALLED SHALL BE CONSIDERED TO BE APPROXIMATE.
10. CAMERA POLE LOCATIONS SHOWN ON PLANS WHICH ARE IN CONFLICT WITH LIGHTING, UTILITIES, DRIVEWAYS, WHEELCHAIR RAMP, ETC. MAY BE ADJUSTED SLIGHTLY(+/- 5') AS DIRECTED BY THE CONSTRUCTION ENGINEER. THE ENGINEER OF RECORD MUST APPROVE EXTREME LOCATION CHANGES.
11. THE WORK CORRIDOR SHALL BE RESTORED TO PRE-WORK CONDITIONS.
12. ALL CONCRETE GUTTERS SHALL BE MAINTAINED OR RESTORED TO PRE-WORK CONDITIONS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATIONS OF EXISTING ROADWAY LIGHTING CONDUIT PRIOR TO INSTALLATION OF POLE FOUNDATIONS.
14. FOR ALL OVERHEAD SIGN STRUCTURES, THE CONTRACTOR SHALL EXERCISE ALL APPROPRIATE SAFETY MEASURES WHEN WORKING IN OR AROUND THESE AREAS. CAUTION SHALL BE TAKEN IN RESPECT TO MAINTAINING THE POWER FEED AND GROUNDING CIRCUITRY. ALL FEATURES SHALL BE RESTORED TO ORIGINAL PRE-WORK CONDITIONS.
15. THE CONTRACTOR SHALL HAND DIG THE FIRST 4' AT EACH POLE INSTALLATION LOCATION. BACKFILLING AROUND POLE SHALL CONFORM TO SECTION 125 OF THE LATEST FDOT STANDARD SPECIFICATIONS.
16. CONTRACTOR SHALL MAKE SURE THAT ALL NECESSARY PROTECTIVE MEASURES ARE TAKEN TO SAFEGUARD EXISTING UTILITIES DURING FIBER/EQUIPMENT INSTALLATIONS.
17. ALL ELECTRICAL WORK SHALL MEET ALL REQUIREMENTS OF THE LATEST EDITIONS OF THE NATIONAL ELECTRICAL CODE, NATIONAL ELECTRIC SAFETY CODE, AND THE STATE OF FLORIDA D.O.T. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ALL COMPONENTS SHALL BE PROPERLY GROUNDED AND BONDED PER N.E.C. REQUIREMENTS. IN ADDITION ALL ELECTRICAL CONDUCTOR MATERIALS SHALL MEET CFX SPECIFICATION 639A.
18. ALL APPLICABLE PROVISIONS OF EXISTING UTILITY EASEMENTS WILL BE ADHERED TO BY THE CONTRACTOR.
19. PULLING INSTRUCTIONS FOR POWER CONDUCTORS: CONNECT PULLING DEVICES TO COPPER WIRE AND NOT TO JACKET AND MEET MANUFACTURERS REQUIREMENTS. USE PULLING COMPOUND PER MANUFACTURES REQUIREMENTS. ALL BENDS SHALL NOT BE LESS THAN RECOMMENDED BY N.E.C. OR N.E.S.C. FOR CABLE USED.
20. ALL MISCELLANEOUS WORK NECESSARY IN THE SHOULDER AREA TO CONSTRUCT ITS POLES, PULL BOXES, ETC. (I.E. GRADING, SODDING, CLEARING AND GRUBBING, GUARDRAIL OR FENCE RESETTING) IS CONSIDERED INCIDENTAL, AND IS TO BE INCLUDED IN THE COST OF CAMERA POLE ASSEMBLY, PULL BOX, ETC. ALL DISTURBED AREAS SHALL BE SODDED. THE CONTRACTOR SHALL HAUL ALL EXCESS EXCAVATION AND WASTE MATERIALS OFF-SITE. REMOVAL OF THESE MATERIALS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE ITS POLE ASSEMBLY, PULL BOX, ETC.
21. THE CONTRACTOR SHALL ESTABLISH, STAKE AND PAINT CAMERA POLE LOCATIONS WITH THE USE OF A FLORIDA REGISTERED LAND SURVEYOR. IF, DURING THE CONSTRUCTION PROCESS, THE STAKES AND/OR PAINTED MARKS ARE OBLITERATED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE THE CAMERA POLE LOCATIONS RE-ESTABLISHED BY A FLORIDA REGISTERED LAND SURVEYOR. NO ADDITIONAL PAYMENT WILL BE ALLOWED.
22. VEGETATION SHALL BE REMOVED OR CUT BACK AS DIRECTED BY THE CONSTRUCTION ENGINEER TO PROVIDE ADEQUATE SIGHT DISTANCE FOR ALL CAMERA LOCATIONS. VEGETATION REMOVAL AND TRIMMING SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE OF THE CAMERA POLE.
23. A GROUNDING ELECTRODE IS REQUIRED PER EACH CAMERA POLE, DMS SIGN STRUCTURE, DMS BOX, AND DMS CABINET. INSTALLATION SHALL BE IN ACCORDANCE WITH CFX SPECIFICATION 620A, WITH A MINIMUM LENGTH OF 20 LINEAR FEET AND A MEASURED RESISTANCE 5 OHMS OR LESS. ALL CONNECTIONS SHALL BE EXOTHERMICALLY WELDED. IF 5 OHMS IS NOT OBTAINED WITH THE INITIAL 20 LINEAR FEET OF GROUNDING ELECTRODE, THEN ADDITIONAL GROUND ELECTRODE OR A GROUND ARRAY SHALL BE INSTALLED UNTIL MEASURED RESISTANCE OF 5 OHMS OR LESS IS ACHIEVED AT NO ADDITIONAL COST TO CFX. ALL DEVICES WITHIN THE HUBS PARAMETER OF INFLUENCE SHALL BE PART OF A SINGLE POINT GROUNDING SYSTEM. CABINET AND POWER SERVICES RECEIVE 40 LINEAR FEET OF GROUNDING ELECTRODES PER CFX SPECIFICATION 620A.
24. THE CONTRACTOR SHALL MAINTAIN THE EXISTING FIBER OPTIC NETWORK WITHIN THE LIMITS OF CONSTRUCTION. AT NO TIME SHALL THERE BE ANY LOSS OF COMMUNICATIONS OR DATA ALONG THE CFX FIBER OPTIC NETWORK. ANY CONSTRUCTION ACTIVITIES WITHIN TEN FEET OF THE FIBER OPTIC NETWORK SHALL BE PERFORMED ON ONE SIDE OF THE ROAD AT A TIME. THE CONTRACTOR SHALL REVIEW CFX SPECIFICATION 631 FOR OTHER FON PRESERVATION DETAILS.
25. ALL OF THE GENERAL NOTES FOR THE CONTRACT CONSTRUCTION DOCUMENT SET WILL APPLY TO THIS PLAN SET.
26. UPON FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL FORWARD A COMPLETE SET OF AS-BUILT PLANS WITH ALL CHANGES MARKED IN RED TO THE ENGINEER. THE AS-BUILTS SHALL CONTAIN ACCURATELY DIMENSIONED LOCATIONS FOR FIBER OPTIC CABLE, PULL BOXES, POWER SERVICES, CONDUITS, STRUCTURES, AND FIELD COMPONENTS. THE AS-BUILT PLANS SHALL INCLUDE A RECORD OF THE COLOR DESIGNATIONS OF ALL HDPE CONDUIT USED, AS WELL AS FIBER SPLICING AND PORT ASSIGNMENTS. THIS SUBMITTAL SHALL BE IN BOTH ELECTRONIC AND PAPER FORMAT.
27. ALL ELECTRICAL EQUIPMENT SHALL BE WEATHERPROOF. ANY OPENINGS WHICH MAY ALLOW WATER TO ENTER, SHALL BE SEALED INSIDE AND OUT WITH SILICONE. PLACE SILICONE SEALANT AROUND THE OUTSIDE EDGE OF THE DISCONNECT WHERE THE ENCLOSURE COMES INTO CONTACT WITH THE CONCRETE PEDESTAL. SEAL AROUND THE TOP AND SIDES OF THE DISCONNECT AND LEAVE THE BOTTOM EDGE UNSEALED. SILICONE SEAL-INSIDE AND OUT- ANY SMALL HOLES (LESS THAN 1/10TH OF INCH) TO INHIBIT WATER AND PEST INTRUSION.
28. THE MIXING OF LINE (SUPPLY SIDE) AND LOAD (EQUIPMENT SIDE) SHALL NOT OCCUR IN EITHER THE CONDUITS OR PULL BOXES.
29. THE LOCATION OF THE CONDUCTORS, CONDUITS, JUNCTION BOXES, SERVICE POINTS, AND CONTROLLER BOXES ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE LOCAL CONDITIONS AND EXISTING UTILITY LOCATIONS. CONDUIT SHALL BE PLACED WITHIN EXISTING RIGHT-OF-WAY.
30. ALL SYMBOLS FOR ROADWAY LIGHTING ARE SHOWN FOR REFERENCE ONLY.
31. THE CONTRACTOR SHALL REFERENCE SIGNING & MARKING PLANS AND COORDINATE WITH S&PM CONTRACTOR REGARDING LOCATIONS OF PULL BOXES. THE CONTRACTOR SHALL ALSO COORDINATE WITH FIBER OPTIC CONTRACTOR FOR LOCATION OF MANHOLE TIE-INS.
32. AERIAL PHOTOGRAPHY IN THESE PLANS MAY NOT REPRESENT CURRENT SITE CONDITIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE PROJECT SITE PRIOR TO BIDDING.
33. THE CONTRACTOR SHALL ACQUIRE ALL PERMITS BY OTHER AGENCIES FOR INSTALLATION OF INFRASTRUCTURE NOT ON CFX FACILITIES. NO ADDITIONAL TIME OR MONEY WILL BE ALLOTTED.
34. MAINTENANCE OF TRAFFIC:
  - A. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO CFX FOR APPROVAL WHICH CONSISTS OF UNMODIFIED FDOT DESIGN STANDARDS (600 SERIES); OTHERWISE THE CONTRACTOR MUST PROVIDE A TRAFFIC CONTROL PLAN WHICH IS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF FLORIDA. ONCE APPROVED BY CFX, THE TRAFFIC CONTROL PLAN MUST BE IN PLACE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES. ALL COSTS ASSOCIATED WITH THE MAINTENANCE OF TRAFFIC SHALL BE INCLUDED IN PAY ITEM 102-1 MAINTENANCE OF TRAFFIC (LUMP SUM).
  - B. TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH FDOT DESIGN STANDARDS, INDEX 600 SERIES.
  - C. LANE WIDTH SHALL NOT BE LESS THAN 11 FEET. LANES SHALL BE PROPERLY DELINEATED DURING ALL PHASES OF CONSTRUCTION.
  - D. THE FOLLOWING REGULATORY SPEED LIMITS SHALL BE MAINTAINED DURING CONSTRUCTION:  
 SR 408 (EAST-WEST EXPRESSWAY) 55 MPH TO 65 MPH  
 SR 528 (MARTIN ANDERSEN BEACHLINE EXPRESSWAY) 55 MPH TO 70 MPH  
 SR 417 (CENTRAL FLORIDA GREENEWAY) 70 MPH  
 SR 429 (DANIEL WEBSTER WESTERN BELTWAY) 70 MPH  
 SR 429 (WEKIVA PARKWAY) 70 MPH  
 SR 451 (WESTERN EXPRESSWAY EXTENSION) 45 MPH TO 65 MPH  
 SR 414 (MAITLAND BOULEVARD EXTENSION) 65 MPH
  - E. FOR ADDITIONAL SIGN INFORMATION, INCLUDING SIZES, REFER TO STANDARD HIGHWAY SIGNS MANUAL SPECIFIED IN THE MUTCD
  - F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A LAW ENFORCEMENT OFFICER DURING ALL LANE CLOSURE OPERATIONS AND DURING ALL NIGHT OPERATIONS.
  - G. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REMOVE ALL UNUSED BARRICADES, SIGNS, AND/OR WARNING DEVICES TO THE APPROPRIATE STORAGE FACILITY UPON COMPLETION OF THEIR USE FOR THE DESIGNED TRAFFIC CONTROL OPERATION. DURING RESTRICTED HOURS OF OPERATION, UNUSED MOT SIGNS MAY REMAIN IN PLACE, BUT SHALL NOT FACE TRAFFIC AND SHALL BE COMPLETELY COVERED SO AS NOT TO BE READABLE.
  - H. THE CONTRACTOR IS ADVISED THAT LANE CLOSURES ARE NOT PERMITTED FROM 6:00 A.M. TO 9:00 P.M. (MONDAY THRU SUNDAY) ON THE S.R. 408 (EAST-WEST EXPRESSWAY), S.R.528 (MARTIN ANDERSEN BEACHLINE EXPRESSWAY), S.R. 429 (DANIEL WEBSTER WESTERN BELTWAY / WEKIVA PARKWAY), S.R. 451 (WESTERN EXPRESSWAY EXTENSION), AND SR 417 (CENTRAL FLORIDA GREENEWAY) S.R. 414 (MAITLAND BOULEVARD EXTENSION) MAINLINES AND FROM 5:00 A.M. TO 11:00 P.M. ON THE RAMPS. IF THE DIRECTOR OF CONSTRUCTION OR HIS DESIGNEE DETERMINES ANY LANE CLOSURE IS CAUSING EXTENDED TRAFFIC CONGESTION, THE DIRECTOR OF CONSTRUCTION OR HIS DESIGNEE MAY DIRECT THE CONTRACTOR TO OPEN THE LANE CLOSURE UNTIL TRAFFIC RETURNS TO AN ACCEPTABLE FLOW. EITHER THE DIRECTOR OF CONSTRUCTION OR HIS DESIGNEE WILL DETERMINE WHEN THE FLOW OF TRAFFIC IS ACCEPTABLE.
  - I. DELAY COSTS TO THE CONTRACTOR WILL RESULT IF ALL TRAVEL LANES AND RAMPS ARE NOT OPEN TO TRAFFIC DURING THE TIMES OUTSIDE OF THE PERMITTED LANE CLOSURE HOURS. THE CONTRACTOR SHALL PLAN OPERATIONS SUCH THAT ALL EQUIPMENT AND MATERIALS INSTALLED BY THE CONTRACTOR FOR LANE CLOSURES ARE REMOVED FROM THE CLEAR ZONE AND TRAVEL LANES ARE REOPENED TO TRAFFIC. FOR MAINLINE AND RAMP CLOSURES THAT OCCUR OUTSIDE THE PERMITTED LANE CLOSURE HOURS, A LANE RENTAL FEE WILL BE ASSESSED TO THE CONTRACTOR IN THE AMOUNT OF \$1,000 PER LANE/RAMP FOR EACH MINUTE THAT ANY LANE/RAMP IS NOT OPEN TO TRAFFIC.

REVISIONS

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FOR INFORMATIONAL PURPOSES ONLY

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GENERAL NOTES (1 OF 4)

SHEET NO. A-1

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GENERAL NOTES (CONTINUED):

- J. LANE RENTAL FEES WILL BE ASSESSED AND WILL CONTINUE TO ACCRUE UNTIL SUBJECT LANE/RAMP IS OPEN TO A TRAFFIC FLOW AS RECORDED BY CFX. CFX SHALL HAVE THE RIGHT TO APPLY AS PAYMENT ON SUCH FEES ANY MONEY THAT IS DUE TO THE CONTRACTOR BY CFX. AT THE DISCRETION OF THE DIRECTOR OF CONSTRUCTION AND/OR HIS DESIGNEE, LANE RENTAL FEES WILL NOT BE CHARGED FOR FAILURE TO OPEN TRAFFIC LANES/RAMPS IF SUCH CAUSE IS BEYOND THE CONTROL OF THE CONTRACTOR, I.E. CATASTROPHIC EVENTS, AND ACCIDENTS NOT RELATED OR CAUSED BY THE CONTRACTOR'S OPERATIONS.
  - K. CONTRACTOR SHALL COORDINATE WITH TOLL PLAZA MANAGERS 72 HOURS PRIOR TO PERFORMING ANY WORK WITHIN 2,000 FEET OF A TOLL PLAZA.
  - L. CFX PROPERTY AFFECTED BY THE CONSTRUCTION WORK SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN EXISTING PRE-CONSTRUCTION CONDITION UNLESS SPECIFICALLY EXEMPT IN THE PLANS. ALL COST SHALL BE INCIDENTAL TO EXISTING PAY ITEMS.
35. FON UTILITY WORK PROCEDURE:  
AN ANS TICKET MUST BE OPENED WITH CAROUSEL INDUSTRIES FOR ALL WORK PERFORMED IN ANY MANHOLE LOCATED ON THE FIBER OPTIC NETWORK (FON)-NO EXCEPTIONS.
- A. CALL CAROUSEL INDUSTRIES ANS TO OPEN A NEW TICKET. THE PHONE NUMBER IS 855-303-9119, THEN OPTION 1, THEN OPTION 1.
  - B. IDENTIFY YOURSELF AS A CONTRACTOR WORKING FOR THE "CENTRAL FLORIDA EXPRESSWAY AUTHORITY" (CFX).
  - C. PROVIDE YOUR NAME AND CONTACT INFORMATION (INCLUDING PHONE NUMBER).
  - D. IDENTIFY THE AREA IN WHICH YOU ARE GOING TO BE WORKING AND WHICH SITES YOU ANTICIPATE AN ALARM FOR (IDENTIFY BY THE NEAREST MAINLINE PLAZA OR ON/OFF RAMP OR HEADQUARTERS).
  - E. ADVISE THE CAROUSEL INDUSTRIES TECHNICIAN OF THE ESTIMATED TIME FRAME OF THE BEGINNING AND ENDING OF YOUR WORK.
  - F. ASK THE CAROUSEL INDUSTRIES TECHNICIAN FOR A REMEDY TROUBLE TICKET NUMBER.
  - G. ONCE WORK IS COMPLETE, CALL BACK IN AND REFERENCE THE REMEDY TROUBLE TICKET NUMBER RECEIVED EARLIER AND ADVISE THE CAROUSEL INDUSTRIES TECHNICIAN THAT WORK HAS BEEN COMPLETED. BE SURE TO ASK THE TECHNICIAN IF ALL ALARMS ASSOCIATED WITH THE TICKET ARE CLEAR. IF ALL ALARMS ARE CLEAR, ADVISE THE TECHNICIAN IT IS OK TO CLEAR THE TROUBLE TICKET. IF ALARMS REMAIN, ADVISE CEI IMMEDIATELY AND WORK TO RESOLVE THE ISSUE.
36. FON UTILITY WORK GUIDELINES:
- A. NO CONTRACTOR SHALL BE PERMITTED TO ENTER THE MAINLINE OR RAMP PLAZAS WITHOUT PRIOR APPROVAL FROM CFX.
  - B. NO CONTRACTOR SHALL BE PERMITTED TO MOVE ANY PATCH PANEL CONNECTIONS UNLESS INDICATED ON THE PLANS AND WITHOUT PRIOR APPROVAL. ANY PATCH PANEL CHANGES SHALL BE DOCUMENTED IN WRITING.
  - C. FOR ALL WORK INVOLVING THE DISRUPTION OF LIVE NETWORK TRAFFIC, THE CONTRACTOR SHALL PROVIDE A HIGH LEVEL OF METHOD OF PROCEDURE (MOP) AT LEAST ONE (1) WEEK IN ADVANCE OF THE PRE-SPLICING MEETING. THIS MOP MUST BE REVIEWED AND APPROVED PRIOR TO BEGINNING WORK. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO FIBER OPTIC SPLICING PAY ITEMS.
  - D. A PRE-SPLICE MEETING SHALL BE HELD AT LEAST ONE (1) WEEK IN ADVANCE OF THE PROPOSED SPLICING DATE.
  - E. A PRIMARY AND BACKUP EMERGENCY CONTACT SHALL BE PROVIDED AS WELL AS AN ESCALATION CONTACT BEFORE BEGINNING WORK.
  - F. THE CONTRACTOR SHALL VERIFY WITH THE CEI THAT THEY ARE IN POSSESSION OF THE MOST RECENT PLAN UPDATES BEFORE BEGINNING ANY WORK. ALL REQUESTS SHALL BE MADE THROUGH THE CEI TO THE GEC.
  - G. A CFX REPRESENTATIVE SHALL BE PRESENT ON-SITE WHEN SPLICING LIVE FIBER, OR "HOT CUTS", ARE TAKING PLACE.

- H. THE CONTRACTOR SHALL OPEN A TICKET WITH CAROUSEL INDUSTRIES PRIOR TO BEGINNING ANY WORK, AND CONTACT CAROUSEL INDUSTRIES TO CLOSE TICKET AFTER THE WORK IS COMPLETE, AS CURRENTLY INSTRUCTED IN THE FON UTILITY WORK PROCEDURE. IN ADDITION TO THIS PROCEDURE, CAROUSEL INDUSTRIES SHALL VERIFY THAT ALL ROUTER ALARMS HAVE CLEARED.
  - I. ALL WORK INVOLVING THE SPLICING OR TESTING OF LIVE FIBERS IS TO BE PERFORMED OUTSIDE OF NORMAL BUSINESS HOURS (7AM-6PM MONDAY-FRIDAY) UNLESS APPROVED BY CFX.
37. CABINET EQUIPMENT IS NOT TO BE STACKED. THE WIRING DIAGRAMS SHOW BLOCKS ON TOP OF ONE ANOTHER FOR CLARITY ONLY.
38. FIBER OPTIC MANHOLE SPACING:  
THE SPACING BETWEEN FIBER OPTIC MANHOLES (FOMH) INSTALLED IN A PAVED SHOULDER SHALL NOT EXCEED 1500'. SPACING BETWEEN FOMH INSTALLED IN AN UNPAVED SHOULDER SHALL NOT EXCEED 4000'.

CONDUIT:

1. THE BACKBONE FIBER OPTIC CONDUIT NETWORK SHALL BE MAINTAINED AT A CONSTANT HORIZONTAL AND VERTICAL LOCATION AS SHOWN IN THE ROADWAY CROSS SECTIONS OF THE ROADWAY PLANS, DRAINAGE PLANS, STRUCTURE PLANS AND OTHER PLAN COMPONENTS OF THIS PROJECT.
2. FIBER OPTIC ROUTE MARKERS ARE NOT REQUIRED WHEN CONDUIT IS PLACED WITHIN A PAVED SHOULDER. ALL FIBER OPTIC CONDUIT SHALL HAVE AN "CFX FIBER OPTIC CABLE BURIED BELOW" WARNING TAPE CONTINUOUSLY RUN IN THE TRENCH 18" BELOW GRADE. IN ADDITION, RAISED MARKERS INDICATING F.O. CABLE BURIED BELOW SHALL BE INSTALLED AT EACH MANHOLE ALONG THE FIBER ROUTE AND AT ANY TURNS IN THE CONDUIT RUN.
3. CONDUIT RUN SHALL NOT EXCEED 270° OF BENDS BETWEEN MANHOLES OR JUNCTION BOXES.
4. THE BLUE HDPE CONDUIT ENTERING A PROPOSED FIBER OPTIC MANHOLE (FOMH) SHOULD CONNECT TO THE BLUE 1" CONDUITS LOCATED INSIDE THE 4" STUBOUT. A 4" DUCT ORGANIZER IS REQUIRED FOR CONDUIT ENTRY INTO THE MANHOLES. LEAVE MINIMUM OF 100 FEET OF CABLE SLACK INSIDE FOMH BEFORE ENTERING THE EXISTING FIBER OPTIC BACKBONE.
5. ALL HDPE CONDUIT CONNECTIONS SHALL BE JOINED WITH ELECTROFUSION COUPLERS OR CFX APPROVED COUPLERS.
6. ALL EMPTY POWER CONDUITS SHALL BE DUCT SEALANT AND FURNISHED WITH A PULL STRING FOR FUTURE USE. THE YELLOW AND WHITE COMMUNICATIONS CONDUIT SHALL BE FURNISHED WITH A PULL STRING FOR FUTURE USE.
7. MINIMUM REQUIRED CONDUIT BURY DEPTHS SHALL BE MAINTAINED WHERE CONFLICTS OCCUR WITH DRAINAGE OR OTHER UTILITIES PER THESE PLANS.
8. IN ACCORDANCE WITH N.E.C. IDENTIFY ALL CIRCUITS AND EQUIPMENT WITH "LAMICOID TAGS".
9. THE TONE WIRE FOR THE CCTV, DCS AND DMS FIBER OPTIC CONDUIT RUNS SHALL BE CONNECTED TO THE GROUNDING SYSTEM IN THE FIBER OPTIC MANHOLE AND 10 FEET OF TONE WIRE SHALL BE COILED IN THE FIBER OPTIC PULL BOX AT THE DEVICE LOCATION. THE TONE WIRE FOR THE 9-1" BACKBONE FON CONDUIT SHALL BE SPLICED CONTINUOUS IN THE FIBER OPTIC MANHOLES. SPLICING THE TONE WIRE FOR THE CCTV, DCS OR DMS TO THE BACKBONE TONE WIRE WILL NOT BE PERMITTED. THE TONE WIRE SHALL NEVER BE STORED INSIDE THE DEVICE CABINET.
10. ALL NEW UNDERGROUND HDPE CONDUIT SHALL BE PROPERLY SEALED AT BOTH ENDS WITH CFX APPROVED DUCT PLUGS TO PREVENT THE ENTRY OF DUST, DIRT OR MOISTURE.
11. ALL CONDUIT TRENCHES SHALL BE BACKFILLED COMPLETELY TO PROVIDE SAFE CROSSING BY THE END OF EACH WORKING DAY OR WHENEVER THE WORK ZONE BECOMES INACTIVE. THE CONTRACTOR SHALL NOT OPEN ANY AREA THAT CANNOT BE BACKFILLED IN THE SAME DAY/NIGHT OPERATION.

12. IT SHOULD BE NOTED THAT NO TEST BORINGS WERE MADE WHERE CONDUIT RUNS ARE TO BE INSTALLED BY JACKING OR TRENCHING. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE JOB SITE CONDITIONS BEFORE SUBMITTING BID PROPOSALS IN ACCORDANCE WITH SECTION 2-4 OF THE FDOT SPECIFICATIONS. THE CONTRACTOR SHALL HAND DIG THE FIRST 4' TO VERIFY POSSIBLE UTILITY CONFLICT AT UTILITY CROSSINGS.
13. WHERE THE PLANS INDICATE DIRECTIONAL BORING OR JACK AND BORING IS REQUIRED, THE CONTRACTOR WILL BE PAID FOR THE FIRST CONDUIT UNDER THAT PAY ITEM. ALL ADDITIONAL CONDUITS WILL BE PAID FOR AS UNDERGROUND TRENCH OR PLOW.
14. ALL HARDWARE AND BRACKETS ASSOCIATED WITH BRIDGE-MOUNTED BRFG SHALL BE INCIDENTAL TO THE COST OF BRFG.
15. ALL UNDERGROUND HDPE CONDUIT SHALL BE SMOOTH WALL AND HAVE A RATING OF SDR-11 OR THICKER. ALL PVC CONDUIT SHALL BE RATED SCHEDULE 40 OR THICKER. ABOVE GROUND PVC IS REQUIRED TO BE SCHEDULE 80. ALL RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE HOT DIPPED GALVANIZED OR PAINTED PER CFX COLOR REQUIREMENTS AND THE PROCESS SPECIFIED IN THE FDOT SPEC. SECTION 649. BULLET RESISTANT CONDUIT SHALL BE PLACED IN BRIDGE CROSS LINE AND WHEN HUNG FROM HANGER SYSTEMS UNDER BRIDGES OR OVERPASSES. PER CFX SPECIFICATION 638. BRFG SHALL BE SIZED AND PAINTED PER CFX COLOR REQUIREMENTS AND THE PLANS.

PULL BOX:

1. EACH FIBER OPTIC PULL BOX SHALL INCLUDE A MINIMUM OF 20 LINEAR FEET OF GROUNDING ELECTRODE IF APPLICABLE IN ACCORDANCE WITH CFX SPECIFICATIONS SECTION 620A/635 AND SHALL MEET A MEASURED RESISTANCE OF 25 OHMS OR LESS. IF 25 OHMS OR LESS IS NOT OBTAINED WITH THE INITIAL 20 LINEAR FEET OF GROUNDING ELECTRODE, THEN ADDITIONAL GROUNDING ELECTRODE OR A GROUNDING ARRAY SHALL BE INSTALLED UNTIL MEASURED RESISTANCE OF 25 OHMS OR LESS IS ACHIEVED.
2. ALL FIBER OPTIC PULL BOXES SHALL HAVE "CFX FIBER" STAMPED ON THE COVER, ALL POWER PULL BOXES SHALL HAVE "CFX POWER" STAMPED ON THE COVER AND ALL GROUNDING PULL BOXES SHALL HAVE "CFX GROUNDING" ON THE COVER.
3. MAXIMUM PULL BOX SPACING FOR POWER SERVICE ELECTRICAL WIRE SHALL BE 500'.

DMS:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATIONS OF EXISTING ROADWAY LIGHTING AND OTHER CFX CONDUIT PRIOR TO INSTALLATION OF DMS STRUCTURE FOUNDATIONS.
2. IN AREAS WHERE DIMENSIONS ARE NOT PROVIDED ON THE PLANS OR WHERE THE EXISTING MONUMENTS HAVE BEEN OBLITERATED THE CONTRACTOR SHALL ESTABLISH, STAKE AND PAINT DMS LOCATIONS WITH THE USE OF A FLORIDA REGISTERED LAND SURVEYOR. IF, DURING THE CONSTRUCTION PROCESS, THE STAKES AND/OR PAINTED MARKS ARE OBLITERATED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE THE DMS LOCATIONS RE-ESTABLISHED BY A FLORIDA REGISTERED LAND SURVEYOR. NO ADDITIONAL PAYMENT WILL BE ALLOWED.
3. DCS EQUIPMENT IS NOT TO UTILIZE THE GFCI RECEPTACLE FOR POWERING EQUIPMENT. THE CONTRACTOR SHALL POWER THE DCS EQUIPMENT FROM A CONTRACTOR FURNISHED UPS CONNECTED TO THE EXISTING "AUX" CIRCUIT OUTLET AS SHOWN IN THE BLOCK DIAGRAMS.
4. THE FIBER OPTIC LOCATE WIRE IS NOT TO BE RUN INTO THE CABINET OR DMS HOUSING.
5. CONTRACTOR TO COORDINATE WITH LIGHTING AND SIGNING CONTRACTOR REGARDING FINAL LOCATION OF DMS EQUIPMENT.
6. THE GALVANIZED RIGID STEEL CONDUITS TO BE LOCATED ON EACH OF THE OVERHEAD SIGN SHALL BE 2" FOR THE COMMUNICATIONS CABLE.

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**FIBER OPTIC CABLE:**

1. THE FIBER OPTIC CABLE INSTALLATION TECHNIQUES AND PROCEDURES SHALL BE AS SPECIFIED BY THE CABLE MANUFACTURER AND SHALL BE SUCH THAT THE OPTICAL AND MECHANICAL CHARACTERISTICS OF THE CABLES ARE NOT DEGRADED AT THE TIME OF INSTALLATION. THE CENTRAL STRENGTH MEMBER AND ARAMID YARN SHALL BE ATTACHED DIRECTLY TO THE PULLING EYE DURING CABLE PULLING. "BASKET GRIP" OR "CHINESE FINGER" TYPE ATTACHMENTS TO THE CABLE SHALL NOT EXCEED THE CABLES OUTSIDE TENSILE RATING ON ALL PULLS.
2. ALL FIBER OPTIC CABLE INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY STANDARDS.
3. CONTRACTOR SHALL COORDINATE WITH CFX REPRESENTATIVE PRIOR TO DISCONNECTING ANY FIBERS AND ALL FIBER SPLICING.
4. UNDER NO CIRCUMSTANCES SHALL ENERGIZED CABLE BE PLACED IN THE SAME CONDUIT OR PULL BOX AS FIBER OPTIC CABLE.

**FIBER CABLE AND CONNECTION DISTRIBUTION:**

**BACKBONE CABLE:**

EXISTING 8-1" HDPE CONDUITS WITH 72 SM FOC IN ORANGE CONDUIT FOR BACKBONE TRUNK CABLE AND 72 SM FOC IN BLUE CONDUIT FOR FEEDER TRUNK CABLE. 1-1" CONDUIT WITH TONE WIRE INSTALLED WITHIN SHALL BE HOUSED WITHIN A YELLOW CONDUIT.

PROPOSED 9-1" HDPE CONDUITS WITH 72 SM FOC IN ORANGE CONDUIT FOR BACKBONE TRUNK CABLE AND 72 SM FOC IN BLUE CONDUIT FOR FEEDER TRUNK CABLE. 1-1" CONDUIT WITH TONE WIRE INSTALLED WITHIN SHALL BE HOUSED WITHIN A BLACK W/RED STRIPE CONDUIT.

**FEEDER DROP CABLE:**

2-1" BLUE AND ORANGE HDPE CONDUITS W/ 1-12 SM FOC IN BLUE CONDUIT FOR FEEDER CABLE.

**TMS:**

1. EACH TMS SENSOR SHALL READ ONE DIRECTION OF TRAVEL AS INDICATED IN THE PLANS. THIS SHALL INCLUDE ALL LANES IN THE DIRECTION, THROUGH LANES AND RAMP LANES (IF APPLICABLE).
2. WHEN MOUNTING MORE THAN ONE SENSOR PER LOCATION, ENSURE THAT THEY ARE ON DIFFERENT CHANNELS TO AVOID INTERFERENCE.
3. USE TMS MANUFACTURER CABLE AS REQUIRED FROM SENSOR TO CONTROLLER CABINET.

**POWER CONNECTIONS:**

1. POWER SUPPLY LOCATIONS HAVE BEEN COORDINATED WITH DUKE ENERGY AND ORLANDO UTILITIES COMMISSION. IT IS RECOMMENDED THAT THE CONTRACTOR CONTACT EACH RESPECTIVE POWER COMPANY CONTACT PERSON AS SOON AS POSSIBLE TO ENSURE ALL POWER SOURCES CAN BE INSTALLED AS SHOWN IN THE PLANS OR IN THE EVENT A PROPOSED POWER SOURCE IS NOT READILY AVAILABLE.
  - a. OUC SERVICE: CONTRACTOR TO RUN UNDERGROUND CONDUIT TO THE BASE OF OUC POWER POLE AND SET A PULL BOX WITH APPROX. 30' OF ELECTRICAL SERVICE WIRE COILED INSIDE. THEN INSTALL RIGID CONDUIT UP THE OUC POLE TO A HEIGHT OF 25' WITH A WEATHER HEAD. CONTRACTOR TO PULL SERVICE WIRE THROUGH CONDUIT AND COIL EXCESS AROUND WEATHER HEAD. CONTACT OUC CUSTOMER SERVICE AT 407-423-9018 TO REQUEST FINAL CONNECTION.
  - b. DUKE ENERGY SERVICE: CONTRACTOR TO RUN UNDERGROUND CONDUIT TO THE BASE OF PEDESTAL THAT EXISTS OR CONTRACTOR INSTALLS AND SET A PULL BOX WITH APPROX. 10' OF ELECTRICAL SERVICE WIRE COILED INSIDE. CONTACT DUKE ENERGY NEW CONSTRUCTION AT 800-700-8744 FOR FINAL CONNECTION BY DUKE ENERGY PERSONNEL.
2. CONNECTIONS TO EXISTING POWER METERS TO BE ACCOMPLISHED PER STATE AND LOCAL CODES. EACH POWER SERVICE METER ENCLOSURE SHALL BE CORRECTLY IDENTIFIED ON THE OUTSIDE FRONT BY A NON-FERROUS METAL OR PLASTIC PLATE PER DUKE ENERGY OR OUC STANDARDS. THE PLATE SHALL BE RIVETED TO THE METER ENCLOSURE. CONTRACTOR'S ELECTRICIAN TO PRE-EXAMINE EACH SITE TO DETERMINE THE FEASIBILITY OF CONNECTING TO THE PROPOSED POWER SOURCE. CONNECTIONS MUST BE MADE THROUGH AN EXISTING OR NEW BREAKER PANEL WITH THE APPROPRIATE CIRCUIT BREAKER. ALL MATERIALS, EQUIPMENT AND LABOR TO BE SUPPLIED FOR A COMPLETE CONNECTION AND IS TO BE PAID UNDER PAY ITEM NUMBER 639-1-11 AND 639-1-12.

**UTILITIES:**

1. THE CONTRACTOR SHALL NOTIFY THE POWER COMPANY AT LEAST 48 HOURS PRIOR TO ANY INSTALLATION THAT IS WITHIN 10 FEET OF ENERGIZED ELECTRICAL CONDUCTORS. THE POWER COMPANY, AT ITS OPTION, SHALL ASSIST THE CFX CONTRACTOR. COVER UP ENERGIZED CONDUCTORS AT THE INSTALLATION SITE, OR TAKE OTHER SAFETY PRECAUTIONS AS NECESSARY. EXTREME CAUTION SHALL BE EXERCISED AT ALL TIMES IN PERFORMANCE OF WORK AROUND THE PRIMARY HIGH VOLTAGE COMPONENTS. CONTRACTOR SHALL OBSERVE OSHA CLEARANCE REGULATIONS WHEN WORKING IN CLOSE PROXIMITY TO OVERHEAD POWER LINES.
2. THE LOCATION OF EXISTING UTILITIES, AS SHOWN ON THESE PLANS, ARE APPROXIMATE AND BASED ON THE INFORMATION FURNISHED TO THE ENGINEER BY THE UTILITY OWNER(S) AND ARE SHOWN AS NOTICE TO THE CONTRACTOR THAT UNDERGROUND UTILITIES EXIST. BEFORE EXCAVATING THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANY OWNER(S) AND REQUEST THEM TO LOCATE AND STAKE THEIR UNDERGROUND FACILITIES. UTILITIES ARE TO BE ADJUSTED BY OTHERS AS DIRECTED BY THE ENGINEER.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING UNDERGROUND UTILITIES VERTICALLY AND HORIZONTALLY (VVH) FOR ALL CONDUIT INSTALLATIONS. THE COST FOR THE VVH'S SHALL BE INCLUDED IN THE COST OF THE CONDUIT. WHEN BORING UNDER PAVEMENT, THE CONTRACTOR SHALL VERIFY DEPTH BY POT HOLING PRIOR TO SHOOTING THE BORE. ANY OTHER METHOD MUST BE APPROVED BY THE ENGINEER.
4. CONTRACTOR SHALL STAKE ALL POLE LOCATIONS AND REQUEST UTILITY COMPANIES TO LOCATE AND STAKE UNDERGROUND UTILITIES PRIOR TO EXCAVATING.
5. CONTRACTOR SHALL LOCATE AND PROTECT EXISTING CFX OWNER FIBER OPTIC CABLES AND BURIED ELECTRICAL LINES DURING THE INSTALLATION OF NEW CONDUIT AND PULL BOXES.

**PAY ITEM NOTES:**

NOTE TO EOR:  
 PAY ITEMS THAT DEVIATE FROM THE TSP'S AND SUMMARY OF PAY ITEMS AS STATED IN SECTION A OF THESE ITS DESIGN STANDARDS SHALL BE PROVIDED HERE AS A PAY ITEM NOTE. ALL PAY ITEM NOTES SHALL INCLUDE ALL WORK THE CONTRACTOR SHALL PERFORM, INCLUDING INCIDENTALS SO THAT NO ADDITIONAL COMPENSATION OR TIME CAN BE REQUESTED BY THE CONTRACTOR.

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MAINTENANCE OF EXISTING FIBER OPTIC NETWORK:

1. THE CONSTRUCTION CONFLICTS SHOWN IN THE PLANS SHALL BE CONSIDERED THE MINIMUM NUMBER OF CONFLICTS WHICH CAN BE EXPECTED WITH THE EXISTING FON. THE CONTRACTOR SHALL DEVELOP A PLAN TO AVOID SUCH CONFLICTS AND MAINTAIN COMMUNICATIONS AT ALL TIMES. THIS PLAN SHALL BE SUBMITTED TO CFX FOR APPROVAL. THE PLAN SHALL INCLUDE SPECIFIC MEANS, METHODS AND QUANTITIES FOR ALL CONFLICT LOCATIONS.

SPECIAL NOTES:

1. SECTION 631 OF THE TECHNICAL SPECIAL PROVISIONS ESTABLISHES THE GENERAL REQUIREMENTS FOR THE PROTECTION AND LOCATION OF THE EXISTING CFX FIBER OPTIC NETWORK (FON) SYSTEM.
2. THE CONTRACTOR SHALL PROCURE THE NECESSARY EQUIPMENT FOR LOCATING THE EXISTING FON. THIS EQUIPMENT SHALL BE COMPATIBLE WITH THE EXISTING RADIO DETECTION LINE MANAGEMENT SYSTEM (LMS). THE CONTRACTOR SHALL SUBMIT THE NAME, MAKE AND MANUFACTURER FOR THE PROPOSED EQUIPMENT FOR APPROVAL. PAYMENT FOR THIS EQUIPMENT SHALL BE CONSIDERED INCIDENTAL TO ITEM NO. 102-1, MAINTENANCE OF TRAFFIC. THE EQUIPMENT SHALL BE TURNED OVER TO CFX AFTER CONDITIONAL ACCEPTANCE OF THE PROJECT.
3. THE CONTRACTOR SHALL IDENTIFY AN INDIVIDUAL FROM THE CONTRACTOR'S STAFF OR SUBCONTRACTOR'S STAFF TO BE RESPONSIBLE FOR THE PROTECTION AND LOCATING OF THE EXISTING FON DURING THIS CONSTRUCTION PROJECT. QUALIFICATIONS OF THIS INDIVIDUAL SHALL BE SUBMITTED FOR CFX APPROVAL.
4. CONTINUOUS OPERATION OF EXISTING ITS DEVICES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION, EXCEPT DURING RELOCATION OF DEVICE, AS GOVERNED BY SECTION 603A.
5. SECTION 600 OF THE TECHNICAL SPECIFICATIONS ESTABLISHES THE MINIMUM TECHNICAL QUALIFICATIONS AND CERTIFICATIONS REQUIRED TO WORK ON CFX'S FIBER OPTIC NETWORK.

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# TABULATION OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	SHEET NUMBERS												TOTAL THIS SHEET		GRAND TOTAL		REF. SHEET	
			PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL		
101-1	MOBILIZATION	LS																		
102-1	MAINTENANCE OF TRAFFIC	LS																		
600-100	INSPECTOR TRAINING FOR TRAFFIC MONITORING STATION	EA																		
600-101	INSPECTOR TRAINING FOR DATA COLLECTION SENSORS	EA																		
600-102	INSPECTOR TRAINING FOR CCTV SYSTEM AND CAMERA LOWERING DEVICE	EA																		
600-103	INSPECTOR TRAINING FOR DYNAMIC MESSAGE SIGNS	EA																		
600-104	INSPECTOR TRAINING FOR FIBER OPTIC NETWORK	EA																		
600-105	INSPECTOR TRAINING FOR SYSTEM AUXILIARIES	EA																		
603A-100	CONTINUOUS OPERATION OF EXISTING ITS DEVICES	LS																		
612-100	GEOLOCATION OF ITS EQUIPMENT AND INFRASTRUCTURE	LS																		
631-100	FIBER OPTIC CABLE INVENTORY	EA																		
631-101	FIBER OPTIC SPLICE HOUSING INVENTORY	EA																		
631-102	RADIODETECTION LOCATION DEVICE	EA																		
631-103	RADIODETECTION TRANSMITTER UNIT	EA																		
633-121-2	FIBER OPTIC CABLE (12 SM FIBER) (F&I)	LF																		
633-121-3	FIBER OPTIC CABLE (24 SM FIBER) (F&I)	LF																		
633-121-4	FIBER OPTIC CABLE (72 SM FIBER) (F&I)	LF																		
633-121-5	FIBER OPTIC CABLE (144 SM FIBER) (F&I)	LF																		
633-121-6	FIBER OPTIC CABLE (EXISTING-WITHDRAW & RELOCATE)	LF																		
633-141-4	FIBER OPTIC SPLICE ENCLOSURE (72 SPLICE) (F&I)	EA																		
633-141-5	FIBER OPTIC SPLICE ENCLOSURE (144 SPLICE) (F&I)	EA																		
633-141-6	FIBER OPTIC SPLICE ENCLOSURE (288 SPLICE) (F&I)	EA																		
633-141-7	FIBER OPTIC FUSION SPLICE	EA																		
633-141-8	EXISTING FIBER OPTIC SPLICE ENCLOSURE RE-ENTRY	EA																		
635-1-11	PULL BOX (F&I)	EA																		
635-1-12	SMALL FIBER OPTIC PULL BOX, 24" DIA, (F&I)	EA																		
635-1-13	LARGE FIBER OPTIC PULL BOX, 36" DIA, (F&I)	EA																		
635-1-14	JUNCTION BOX (SURFACE MOUNTED) (F&I)	EA																		
635-1-30	PULL BOX (ADJUST-ALL TYPES)	EA																		
635-1-60	PULL BOX (REMOVE-ALL TYPES)	EA																		
636-11	CONCRETE MANHOLE 4 X 4 X 4 (F&I)	EA																		
636-12	CONCRETE MANHOLE 4 X 6.5 X 6.5 (F&I)	EA																		
636-13	CONCRETE MANHOLE 4 X 6.5 X 6.5 (DOGHOUSE) (F&I)	EA																		
636-40	CONCRETE MANHOLE (ADJUST)	EA																		
636-60	CONCRETE MANHOLE (REMOVE)	EA																		
638-0001-0111	FO CONDUIT, 1-1" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-0001-0211	FO CONDUIT, 2-1" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-0001-0411	FO CONDUIT, 4-1" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-0001-0811	FO CONDUIT, 8-1" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-0001-0812	FO CONDUIT, 8-1" HDPE SDR 11 (TRENCH IN ASPHALT) (F&I)	LF																		
638-0001-0911	FO CONDUIT, 9-1" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-0002-0111	FO CONDUIT, 1-2" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-0002-0211	FO CONDUIT, 2-2" HDPE SDR 11 (TRENCH OR PLOW)	LF																		
638-0002-0213	FO CONDUIT, 2-2" HDPE SDR 11 (DIRECTIONAL BORE)	LF																		
638-0003-0911	FO CONDUIT, 8-1" & 1-2" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-0006-0116	CONDUIT (UNDERGROUND) (1" SCH 40 PVC) (F&I)	LF																		
638-0007-0116	CONDUIT (UNDERGROUND) (2" SCH 40 PVC) (F&I)	LF																		
638-0008-0116	CONDUIT (UNDERGROUND) (3" SCH 40 PVC) (F&I)	LF																		
638-0009-0117	CONDUIT (ABOVEGROUND) (1/2" RGS) (F&I)	LF																		
638-0010-0117	CONDUIT (ABOVEGROUND) (1" RGS) (F&I)	LF																		
638-0011-0117	CONDUIT (ABOVEGROUND) (2" RGS) (F&I)	LF																		
638-1400-0011	FO CONDUIT, 4" HDPE SDR 11 SLEEVE (TRENCH OR PLOW) (F&I)	LF																		
638-1401-0213	FO CONDUIT, 4" HDPE SDR 11 OUTER DUCT W/ 2-1" HDPE SDR 11 (DIRECTIONAL BORE) (F&I)	LF																		
638-1402-0113	FO CONDUIT, 4" HDPE SDR 11 OUTER DUCT W/ 1-2" HDPE SDR 11 (DIRECTIONAL BORE) (F&I)	LF																		
638-1403-0213	FO CONDUIT, 4" HDPE SDR 11 OUTER DUCT W/ 1-1" & 1-2" HDPE SDR 11 (DIRECTIONAL BORE) (F&I)	LF																		
638-1600-0011	FO CONDUIT, 6" HDPE SDR 11 SLEEVE (EMPTY CONDUIT) (TRENCH OR PLOW) (F&I)	LF																		
638-1601-0413	FO CONDUIT, 6" HDPE SDR 11 OUTER DUCT W/ 4-1" HDPE SDR 11 (DIRECTIONAL BORE) (F&I)	LF																		
638-1601-0811	FO CONDUIT, 6" HDPE SDR 11 OUTER DUCT W/8-1" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-1601-0813	FO CONDUIT, 6" HDPE SDR 11 OUTER DUCT W/8-1" HDPE SDR 11 (DIRECTIONAL BORE) (F&I)	LF																		
638-1603-0911	FO CONDUIT, 6" HDPE SDR 11 OUTER DUCT W/8-1" AND 1-2" HDPE SDR 11 (TRENCH OR PLOW) (F&I)	LF																		
638-( )-( )	SEE SPEC 638 FOR MORE PAY ITEMS	-																		
638-1A	TUBULAR ROUTE MARKER (FIBER)	EA																		
638-1B	TUBULAR ROUTE MARKER (POWER)	EA																		
638-2A	RADIODETECTION SIDE LEG TERMINATOR (SLT) PN 10/444150322	EA																		
638-200	tone wire (UNDERGROUND) (IN CONDUIT) (F&I)	LF																		
639-1-11	ELECTRICAL POWER SERVICE ASSEMBLY (UNDERGROUND) (F&I)	AS																		
639-1-12	ELECTRICAL POWER SERVICE ASSEMBLY (OVERHEAD) (F&I)	AS																		

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# TABULATION OF QUANTITIES


PAY ITEM NO.	DESCRIPTION	UNIT	SHEET NUMBERS														TOTAL THIS SHEET		GRAND TOTAL		REF. SHEET
			1		2		3		4		5		6		7		PLAN	FINAL	PLAN	FINAL	
			PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL					
639-1-13	ELECTRICAL POWER SERVICE ASSEMBLY (ADJUST) (F&I)	AS																			
639-1-14	ELECTRICAL POWER SERVICE ASSEMBLY (REMOVE)	AS																			
639-2-11	ELECTRICAL SERVICE DISCONNECT (POLE) (F&I)	EA																			
639-2-12	ELECTRICAL SERVICE DISCONNECT (ADJUST)	EA																			
639-2-13	ELECTRICAL SERVICE DISCONNECT (REMOVE)	EA																			
639-2-14	ELECTRICAL POWER TRANSFORMER (F&I)	EA																			
639-2-15	ELECTRICAL POWER TRANSFORMER (REMOVE)	EA																			
639-3-01	ELECTRICAL CONDUCTORS (INSULATED) (NO.1) (F&I)	LF																			
639-3-02	ELECTRICAL CONDUCTORS (INSULATED) (NO.2) (F&I)	LF																			
639-3-04	ELECTRICAL CONDUCTORS (INSULATED) (NO.4) (F&I)	LF																			
639-3-06	ELECTRICAL CONDUCTORS (INSULATED) (NO.6) (F&I)	LF																			
639-3-08	ELECTRICAL CONDUCTORS (INSULATED) (NO.8) (F&I)	LF																			
639-3-10	ELECTRICAL CONDUCTORS (INSULATED) (NO.10) (F&I)	LF																			
639-3-12	ELECTRICAL CONDUCTORS (INSULATED) (NO.12) (F&I)	LF																			
639-3-100	ELECTRICAL CONDUCTORS (INSULATED) (NO.1/0) (F&I)	LF																			
639-3-200	ELECTRICAL CONDUCTORS (INSULATED) (NO.2/0) (F&I)	LF																			
639-3-300	ELECTRICAL CONDUCTORS (INSULATED) (NO.3/0) (F&I)	LF																			
663-74-141	DCS FIELD EQUIPMENT, 1 LANE (F&I)	EA																			
663-74-142	DCS FIELD EQUIPMENT, 2 LANES (F&I)	EA																			
663-74-143	DCS FIELD EQUIPMENT, 3 LANES (F&I)	EA																			
663-74-144	DCS FIELD EQUIPMENT, 4 LANES (F&I)	EA																			
663-74-145	DCS FIELD EQUIPMENT, 5 LANES (F&I)	EA																			
663-74-146	DCS FIELD EQUIPMENT, 6 LANES (F&I)	EA																			
663-74-147	DCS FIELD EQUIPMENT, 7 LANES (F&I)	EA																			
663-74-241	DCS FIELD EQUIPMENT, UPTO 3 ADDITIONAL LANES OF COVERAGE (F&I)	EA																			
663-74-440	DCS FIELD EQUIPMENT (RELOCATE)	EA																			
663-74-640	DCS FIELD EQUIPMENT (REMOVE)	EA																			
663-74-SP	DCS FIELD EQUIPMENT, SPARE PARTS KIT (FURNISH ONLY)	EA																			
664-1-40	TMS, POLE MOUNTED (F&I)	EA																			
664-1-41	TMS, TRUSS MOUNTED (F&I)	EA																			
664-2-42	TMS, 30' POLE (F&I)	EA																			
664-2-43	TMS, 40' POLE (F&I)	EA																			
664-3-144	TMS, COMPOSITE CABLE (FURNISH)	LF																			
664-4-145	TMS, POLE REMOVAL SHALLOW	EA																			
664-4-146	TMS, POLE REMOVAL DEEP	EA																			
664-4-147	TMS, ASSEMBLY (ADJUST)	EA																			
664-1-SP	TRAFFIC MONITORING STATION, SPARE PARTS KIT (FURNISH ONLY)	EA																			
668-11	ITS DEVICE CABINET (POLE MOUNTED) (HEAT SHIELD) (F&I)	EA																			
668-12	ITS DEVICE CABINET (BASE MOUNTED) (HEAT SHIELD) (F&I)	EA																			
668-13	ITS NEMA 3R INTERMEDIATE CABINET (POLE MOUNTED) (F&I)	EA																			
668-14	FULLY OPERABLE CYBERLOCK ASSY. (PER CABINET DOOR) (FURNISH ONLY)	EA																			
668-21	ITS NEMA 3R INTERMEDIATE CABINET (POLE MOUNTED) (INSTALL)	EA																			
668-22	CORBIN LOCK (PER CABINET) (REMOVE)	EA																			
668-40	ITS DEVICE CABINET (RELOCATE-ALL TYPES)	EA																			
668-60	ITS DEVICE CABINET (REMOVE-ALL TYPES)	EA																			
683-101	GIGABIT ETHERNET FIELD SWITCH (F&I)	EA																			
683-101SP	GIGABIT ETHERNET FIELD SWITCH (FURNISH ONLY)	EA																			
683-102	HARDENED TERMINAL SERVER (F&I)	EA																			
683-102SP	HARDENED TERMINAL SERVER (FURNISH ONLY)	EA																			
683-103	ETHERNET MEDIA CONVERTER (F&I)	EA																			
683-103SP	ETHERNET MEDIA CONVERTER (FURNISH ONLY)	EA																			
683-104	FIBER OPTIC PATCH PANEL, 12 PORT (F&I)	EA																			
683-105	FIBER OPTIC PATCH PANEL, 72 PORT (F&I)	EA																			
683-106	CUT-TO-LENGTH FIBER OPTIC JUMPER (F&I)	EA																			
683-201	UNINTERRUPTIBLE POWER SUPPLY (F&I)	EA																			
683-201SP	UNINTERRUPTIBLE POWER SUPPLY WITH TWO (2) BATTERIES (FURNISH ONLY)	EA																			
683-202	REMOTE POWER MANAGER/ENVIRONMENTAL SENSOR (F&I)	EA																			
683-202SP	REMOTE POWER MANAGER/ENVIRO. SENSOR ITS COMMANDER PART NO. 1RU8126MS-001 (FURNISH ONLY)	EA																			
683-203	COMMUNICATION RACK INSTALLATION (F&I)	EA																			
686-101	CCTV FIELD ASSEMBLY, (F&I)	EA																			
686-102	CCTV FIELD ASSEMBLY (FURNISH)	EA																			
686-103	CCTV FIELD ASSEMBLY (RELOCATE)	EA																			
686-104	CCTV FIELD ASSEMBLY (REMOVE)	EA																			
686-1-SP	CCTV SPARE PARTS KIT (FURNISH ONLY)	EA																			
686-201	CAMERA LOWERING SYSTEM & (25' POLE) (F&I)	EA																			
686-202	CAMERA LOWERING SYSTEM & (40' POLE) (F&I)	EA																			
686-203	CAMERA LOWERING SYSTEM (50' POLE) (F&I)	EA																			

<b>REVISIONS</b>						<b>FOR INFORMATIONAL PURPOSES ONLY</b>	<b>CENTRAL FLORIDA EXPRESSWAY AUTHORITY</b>	<b>CENTRAL FLORIDA EXPRESSWAY AUTHORITY</b>	<b>TABULATION OF QUANTITIES (2 OF 4)</b>	SHEET NO.
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# TABULATION OF QUANTITIES

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			PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL			
686-204	CAMERA LOWERING SYSTEM & (60' POLE) (F&I)	EA																			
686-205	CAMERA LOWERING SYSTEM (80' POLE) (F&I)	EA																			
686-206	CAMERA LOWERING SYSTEM (130' POLE) (F&I)	EA																			
686-207	DUAL CAMERA LOWERING SYSTEM & (XX' POLE PER PLANS)(F&I)	EA																			
686-301	CAMERA LOWERING SYSTEM (25' POLE) (RELOCATE)	EA																			
686-302	CAMERA LOWERING SYSTEM (40' POLE) (RELOCATE)	EA																			
686-303	CAMERA LOWERING SYSTEM (50' POLE) (RELOCATE)	EA																			
686-304	CAMERA LOWERING SYSTEM (60' POLE) (RELOCATE)	EA																			
686-305	CAMERA LOWERING SYSTEM (80' POLE) (RELOCATE)	EA																			
686-306	CAMERA LOWERING SYSTEM (130' POLE) (RELOCATE)	EA																			
686-307	CAMERA LOWERING SYSTEM POLE REMOVAL SHALLOW	EA																			
686-308	CAMERA LOWERING SYSTEM POLE REMOVAL DEEP	EA																			
686-309	DUAL CAMERA LOWERING SYSTEM & (XX' POLE PER PLANS)(RELOCATE)	EA																			
729-11	FULL COLOR DMS (LED) (3 LINE) (WALK-IN) (F&I)	EA																			
729-11SP	FULL COLOR DMS (LED) (3 LINE) (WALK-IN) (SPARE PARTS KIT)	EA																			
729-12	FULL COLOR DMS (LED) (3 LINE) (WALK-IN) (INSTALL ONLY)	EA																			
730-11	FULL COLOR ADMS (LED) (1 LINE) (FRONT ACCESS) (F&I)	EA																			
730-11SP	FULL COLOR ADMS (LED) (1 LINE) (FRONT ACCESS) (SPARE PARTS KIT)	EA																			
730-12	FULL COLOR ADMS (LED) (1 LINE) (FRONT ACCESS) (INSTALL ONLY)	EA																			
731-11	FULL COLOR ADMS (LED) (2 LINE) (FRONT ACCESS) (F&I)	EA																			
731-11SP	FULL COLOR ADMS (LED) (2 LINE) (FRONT ACCESS) (SPARE PARTS KIT)	EA																			
731-12	FULL COLOR ADMS (LED) (2 LINE) (FRONT ACCESS) (INSTALL ONLY)	EA																			
732-11	FULL COLOR DMS (LED) (1 LINE) (FRONT ACCESS) (F&I)	EA																			
732-11SP	FULL COLOR DMS (LED) (1 LINE) (FRONT ACCESS) (SPARE PARTS KIT)	EA																			
732-12	FULL COLOR DMS (LED) (1 LINE) (FRONT ACCESS) (INSTALL ONLY)	EA																			
733-11	FULL COLOR DMS (LED) (2 LINE) (FRONT ACCESS) (F&I)	EA																			
733-11SP	FULL COLOR DMS (LED) (2 LINE) (FRONT ACCESS) (SPARE PARTS KIT)	EA																			
733-12	FULL COLOR DMS (LED) (2 LINE) (FRONT ACCESS) (INSTALL ONLY)	EA																			
734-11	FULL COLOR DMS (LED) (2 LINE) (FRONT ACCESS) (F&I)	EA																			
734-11SP	FULL COLOR DMS (LED) (2 LINE) (FRONT ACCESS) (SPARE PARTS KIT)	EA																			
734-12	FULL COLOR DMS (LED) (2 LINE) (FRONT ACCESS) (INSTALL ONLY)	EA																			
740-89-12A	RRFB WWDS COMPLETE (RADAR) (A/C POWER) (INSTALL)	EA																			
740-89-12B	RRFB WWDS COMPLETE (LASER) (A/C POWER) (INSTALL)	EA																			
740-89-12C	RRFB WWDS COMPLETE (RADAR) (A/C POWER), BLACK POWDER COAT FINISH MODEL NO. 2180-02650 (F&I)	EA																			
740-89-12D	RRFB WWDS COMPLETE (LASER) (A/C POWER), BLACK POWDER COAT FINISH MODEL NO. 2180-02660 (F&I)	EA																			
740-89-12E	RRFB WWDS COMPLETE (RADAR) (A/C POWER), ALUMINUM FINISH MODEL NO. 2180-02600 (F&I)	EA																			
740-89-12F	RRFB WWDS COMPLETE (LASER) (A/C POWER), ALUMINUM FINISH MODEL NO. 2180-02610 (F&I)	EA																			
740-89-12G	RRFB WWDS COMPLETE (RELOCATE)	EA																			
740-89-5P	RRFB WWDS, SPARE PARTS KIT (FURNISH ONLY)	EA																			

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## TABULATION OF QUANTITIES

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			PLAN		FINAL		PLAN		FINAL		PLAN		FINAL		PLAN		FINAL		PLAN	FINAL		PLAN	FINAL
633-121-2T	TEMPORARY FIBER OPTIC CABLE (12 SM FIBER) (F&I)	LF																					
633-121-4T	TEMPORARY FIBER OPTIC CABLE (72 SM FIBER) (F&I)	LF																					
633-121-5T	TEMPORARY FIBER OPTIC CABLE (144 SM FIBER) (F&I)	LF																					
633-141-3T	TEMPORARY FIBER OPTIC SPLICE ENCLOSURE	EA																					
633-141-4T	TEMPORARY FIBER OPTIC SPLICE	EA																					
635-1-15T	TEMPORARY SMALL FIBER OPTIC PULL BOX (F&I)	EA																					
635-1-16T	TEMPORARY LARGE FIBER OPTIC PULL BOX (F&I)	EA																					
638-001-0111T	TEMPORARY FIBER OPTIC CONDUIT (1-1" HDPE SDR 11) (TRENCH OR PLOW)	LF																					
638-001-0812	FIBER OPTIC CONDUIT (8-1" HDPE SDR 11) (IN ASPHALT)	LF																					
638-001-0911	FIBER OPTIC CONDUIT (9-1" HDPE SDR 11) (TRENCH OR PLOW)	LF																					
638-002-0111T	TEMPORARY FIBER OPTIC CONDUIT (1-2" HDPE SDR 11) (TRENCH OR PLOW)	LF																					
638-003-0911	FIBER OPTIC CONDUIT (8-1" HDPE SDR 11 AND 1-2" HDPE SDR 11) (TRENCH OR PLOW)	LF																					
638-140-0011T	TEMPORARY FIBER OPTIC, 4" HDPE SDR 11 SLEEVE (EMPTY CONDUIT) TRENCH OR PLOW	LF																					
638-141-0213T	TEMPORARY FIBER OPTIC CONDUIT, 4" HDPE SDR 11 W/2-1" HDPE SDR 11 DIRECTIONAL BORE	LF																					
638-143-0211T	TEMPORARY FO CONDUIT, 4" HDPE SDR 11 W/ 1-1" AND 1-2" HDPE SDR 11, TRENCH OR PLOW	LF																					
638-143-0213T	TEMPORARY FO CONDUIT, 4" HDPE SDR 11 W/ 1-1" AND 1-2" HDPE SDR 11, DIRECTIONAL BORE	LF																					
638-240-0011T	TEMPORARY FIBER OPTIC, 4" SCHEDULE 40 PVC SPLIT SLEEVE (TRENCH OR PLOW)	LF																					
638-260-0011T	TEMPORARY FIBER OPTIC, 6" SCHEDULE 40 PVC SPLIT SLEEVE (TRENCH OR PLOW)	LF																					
4210-11T	TEMPORARY FIBER OPTIC MANHOLE (4'X4'X4') (F&I)	EA																					
4210-12T	TEMPORARY 4'X6.5'X6.5' CONCRETE MANHOLE (F&I)	EA																					
4210-13T	TEMPORARY DOGHOUSE FIBER OPTIC MANHOLE (4'X6.5'X6.5') (F&I)	EA																					

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**UTILITY CONTACTS**

UTILITY LOCATES PROVIDED BY NO-CUTS: 1-800-432-4770

CFX (FIBER)	WILLIAM COLLINS	407-690-5000
CFX FACILITIES MAINTENANCE	ICA	407-730-8923
CFX ROADWAY MAINTENANCE (SR429,SR414,SR451)	ICA	407-730-8923
CFX ROADWAY MAINTENANCE (SR408,SR417,SR528)	JCS	407-249-9122

ALL OTHER PROJECT SPECIFIC CONTACTS SHALL BE COMPLETED BY THE DESIGNER

DISRUPTION OF COMMUNICATIONS OR ELECTRICAL TO TOLL PLAZA: IN THE EVENT COMMUNICATION OR POWER LOSS TO ANY TOLL PLAZA(S) SYSTEM WIDE, THE CONTRACTOR SHALL CONTACT THE FOLLOWING PERSONNEL.

DAVID WYNNE	David.Wynne@CFXway.com	407-690-5000
RAFAEL MILLAN	Rafael.Millan@CFXway.com	407-690-5000

**OTHER CONTACTS**

CITY OF APOPAKA PUBLIC SERVICES-DESIGN ENGINEERING	407-703-1731
CITY OF OCOFEE PUBLIC WORKS	407-905-3170
CITY OF ORLANDO TRANSPORTATION ENGINEERING	407-246-2281
CITY OF WINTER GARDER PUBLIC SERVICES	407-656-2256
ORANGE COUNTY TRAFFIC ENGINEERING	407-836-7890

**ABBREVIATIONS**

- BRFG = BULLET RESISTIVE FIBERGLASS OUTER DUCT
- BSP = BLACK STEEL PIPE
- DCS = DATA COLLECTION SENSOR
- DMS = DYNAMIC MESSAGE SIGN
- FO = FIBER OPTIC
- FOMH = FIBER OPTIC MANHOLE (SECTION J)
- PVC = POLYVINYL CHLORIDE OUTER DUCT
- E/W = EQUIPPED WITH
- SDR = SIZE DIMENSION RATIO
- COND.1 = CONDITION 1 CROSSING (SEE FIBER OPTIC TRENCHING DETAILS)
- COND.2 = CONDITION 2 CROSSING (SEE FIBER OPTIC TRENCHING DETAILS)
- TMS = TRAFFIC MONITORING STATION

**LEGEND**

	PROPOSED UNDERGROUND POWER 2" SCHEDULE 40 P.V.C UNDERGROUND CONDUIT WITH AWG XHHW STRANDED COPPER CIRCUIT INSULATED CONDUCTORS INSIDE (CONDUCTOR AND GROUND WIRE SIZES SHOWN ON DETAIL SHEETS) AND INSULATED GREEN STRANDED CU BOND WIRE CONNECTING ALL ITEMS.		EXISTING POLE MOUNTED CABINET & CAMERA W/ LOWERING SYSTEM ON STEEL POLE W/ FOUNDATION
	DIRECTIONAL BORE CONDUIT		PROPOSED POLE MOUNTED CABINET & CAMERA W/ LOWERING SYSTEM ON STEEL POLE W/ NEW FOUNDATION
	BRIDGE MOUNT CONDUIT		EXISTING FIBER OPTIC ROUND PULL BOX (OPENING 24" OR 36")
	1-6" BULLET RESISTIVE FIBERGLASS (BRFG) CONDUIT ATTACHED TO BRIDGE E/W HDPE 9-1" CONDUITS		PROPOSED FIBER OPTIC ROUND PULL BOX (OPENING 24" OR 36")
	6" PVC, SCHEDULE 40 E/W 9-1" HDPE		EXISTING ELECTRIC OR GROUNDING PULL BOX (13"x24"x12"D)
	2-1" HDPE CONDUITS (FEEDER)		PROPOSED ELECTRIC OR GROUNDING PULL BOX (13"x24"x12"D)
	9-1" HDPE CONDUITS (BACKBONE)		EXISTING FIBER OPTIC PULL BOX (17"x30"x12"D)
	EXISTING 9-1" HDPE CONDUITS		EXISTING CONCRETE PEDESTAL FOR POWER SERVICE
	PROPOSED BLACK STEEL PIPE (BSP)		PROPOSED CONCRETE PEDESTAL FOR POWER SERVICE
	EXISTING BLACK STEEL PIPE (BSP)		EXISTING FIBER OPTIC MANHOLE
	OVERHEAD SIGN TRUSS AND STATIC SIGN PANELS TO BE INSTALLED BY SIGNING AND MARKING CONTRACTOR AS PART OF THE SIGNING AND PAVEMENT MARKING PLAN SET.		PROPOSED FIBER OPTIC MANHOLE (4'x4'x4')
			PROPOSED FIBER OPTIC MANHOLE (4'x6.5'x6.5')
			PROPOSED FIBER OPTIC MANHOLE WITH STUB-OUT (4'x4'x4')
			PROPOSED FIBER OPTIC MANHOLE WITH STUB-OUT (4'x6.5'x6.5')
			PROPOSED POLE MOUNTED CABINET
			PROPOSED POINT OF ELECTRICAL SERVICE
			PROPOSED DMS ELECTRICAL SERVICE EQUIPMENT ON H-FRAME SUPPORT WITH CONCRETE PAD.
			PROPOSED TMS
			PROPOSED TTS DETECTION ZONES (SYMBOL SHOULD BE PLACED OVER EACH LANE DETECTED)
			DATA COLLECTION SENSOR ANTENNA SITE (# INDICATES NUMBER OF LANES READ, ARROW POINTS IN DIRECTION OF TRAVEL)

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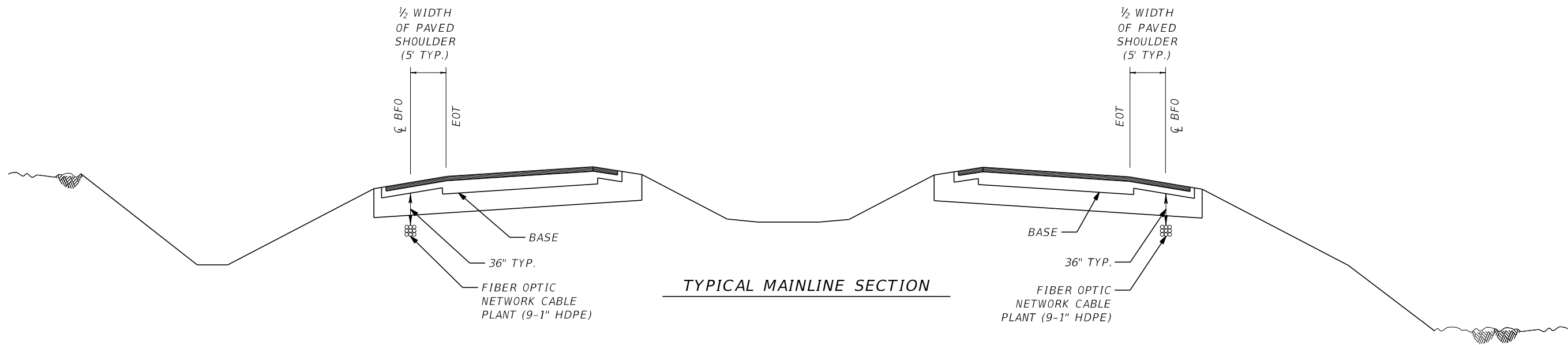


**LEGEND AND UTILITY CONTACTS**

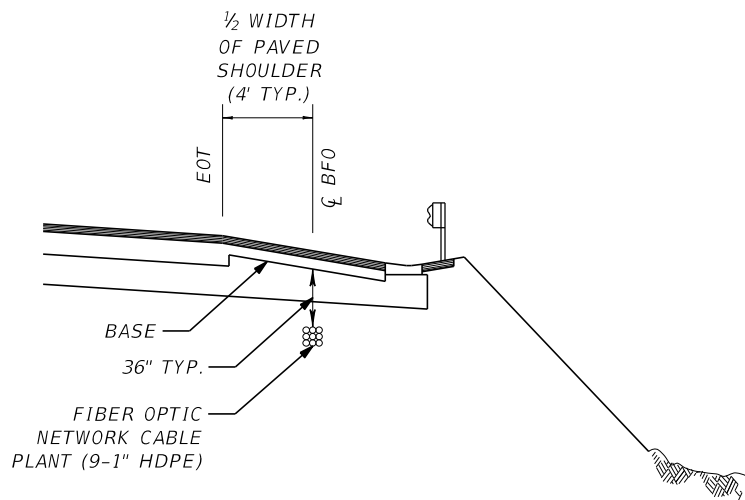
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TYPICAL MAINLINE SECTION



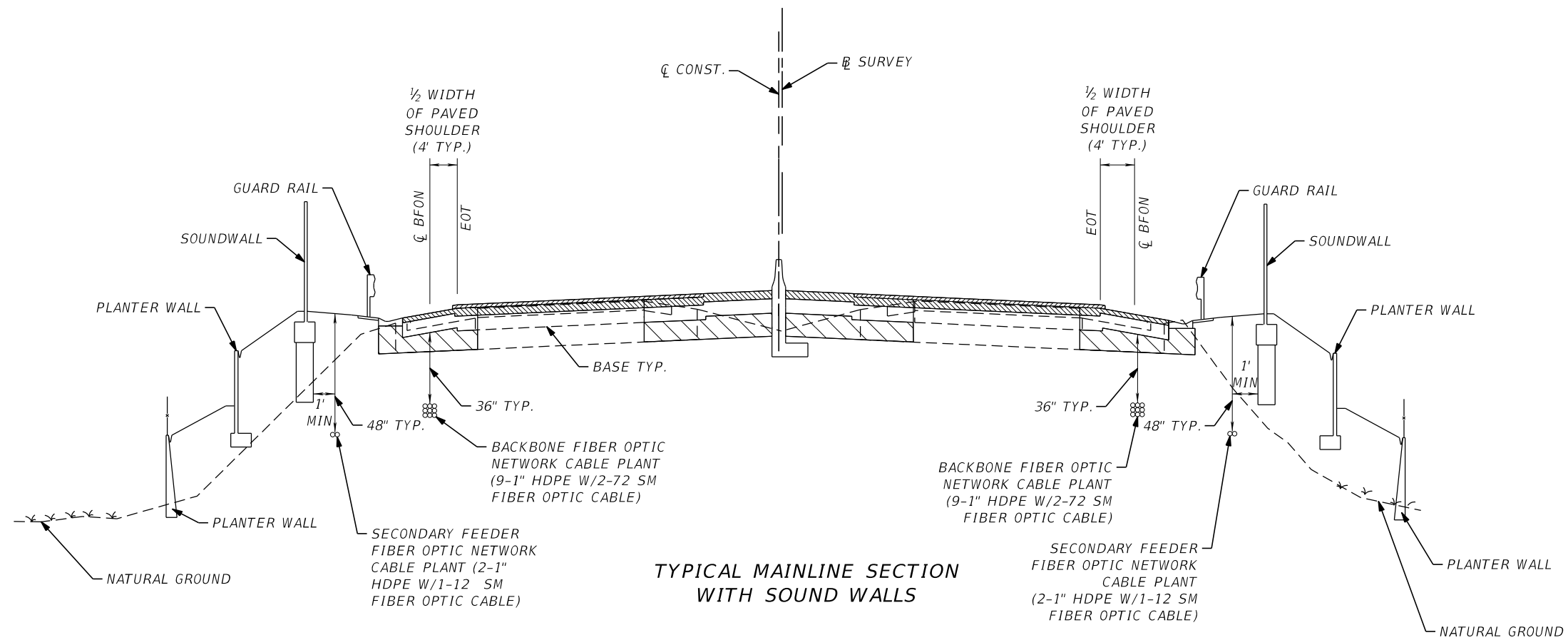
TYPICAL MAINLINE/RAMP SECTION WITH GUARDRAIL

NOTE:

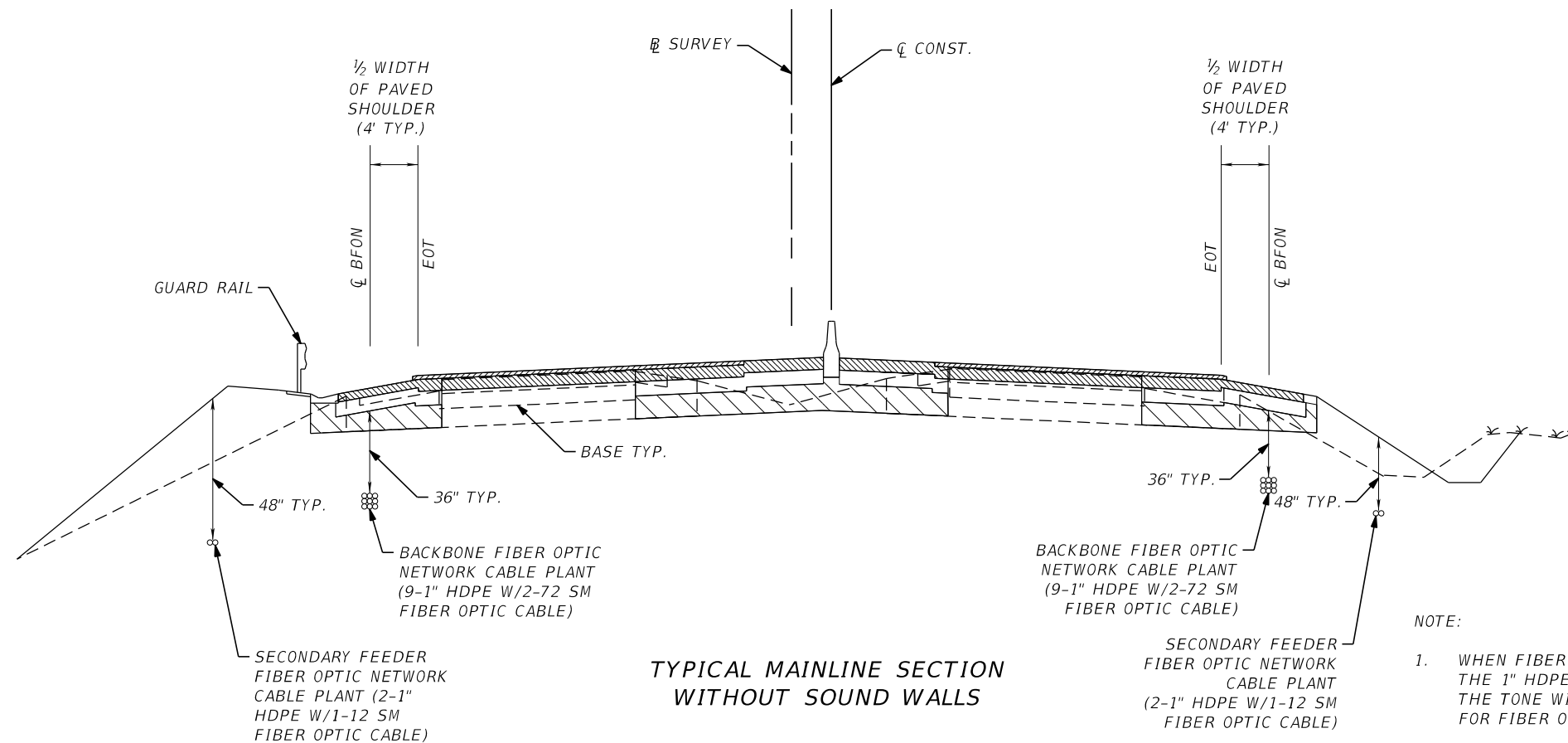
1. WHEN FIBER OPTIC CONDUIT BANK IS INSTALLED, ONE OF THE 1" HDPE CONDUIT SHALL BE INSTALLED TO SLEEVE THE TONE WIRE. 8 HDPE CONDUITS SHALL BE RESERVED FOR FIBER OPTIC CABLE.

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TYPICAL MAINLINE SECTION WITH SOUND WALLS



TYPICAL MAINLINE SECTION WITHOUT SOUND WALLS

NOTE:

1. WHEN FIBER OPTIC CONDUIT BANK IS INSTALLED, ONE OF THE 1" HDPE CONDUIT SHALL BE INSTALLED TO SLEEVE THE TONE WIRE. 8 HDPE CONDUITS SHALL BE RESERVED FOR FIBER OPTIC CABLE.

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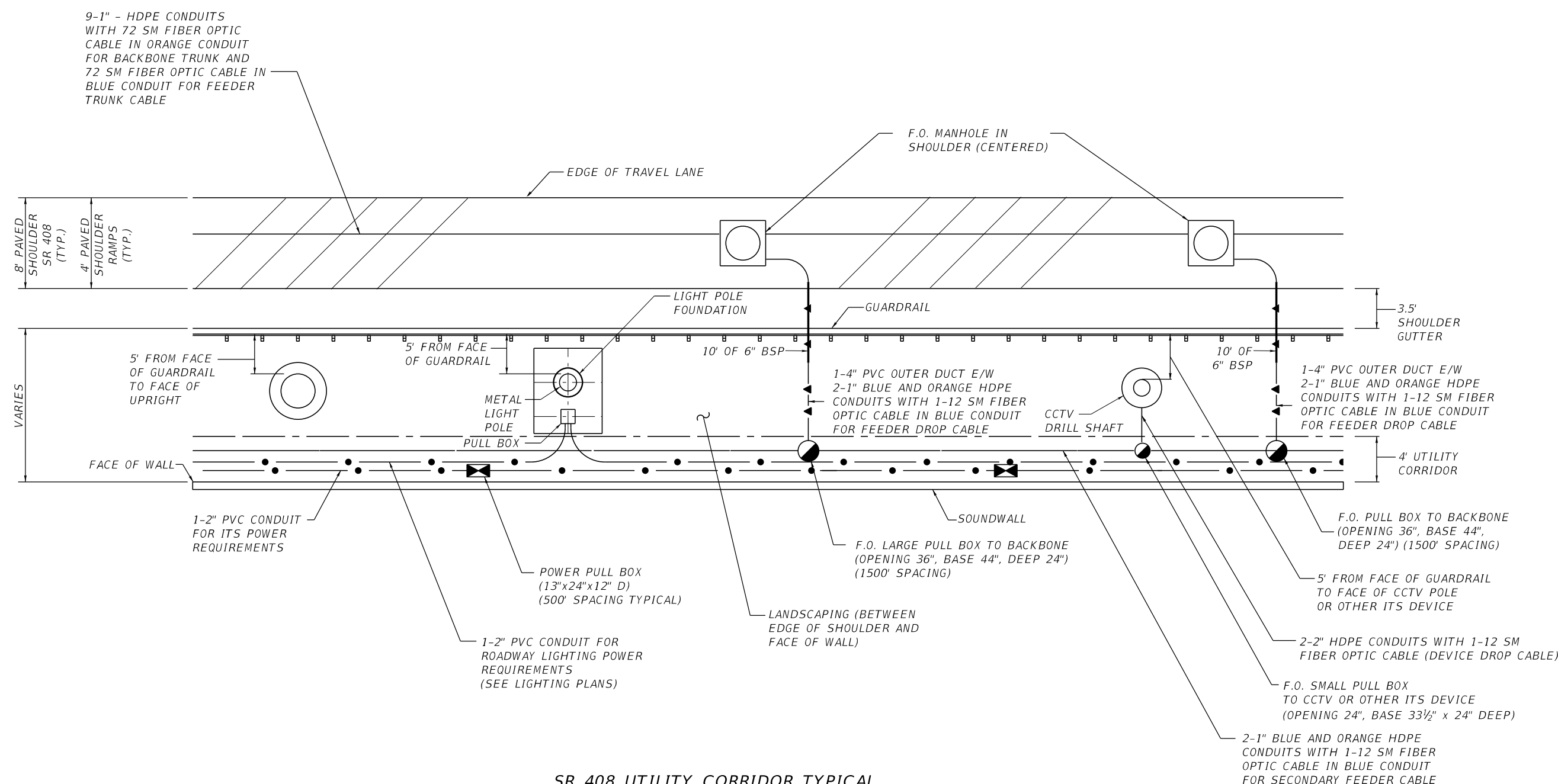
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

FIBER OPTIC NETWORK  
TYPICAL MAINLINE SECTION  
WITH SECONDARY FEEDER

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**SR 408 UTILITY CORRIDOR TYPICAL**

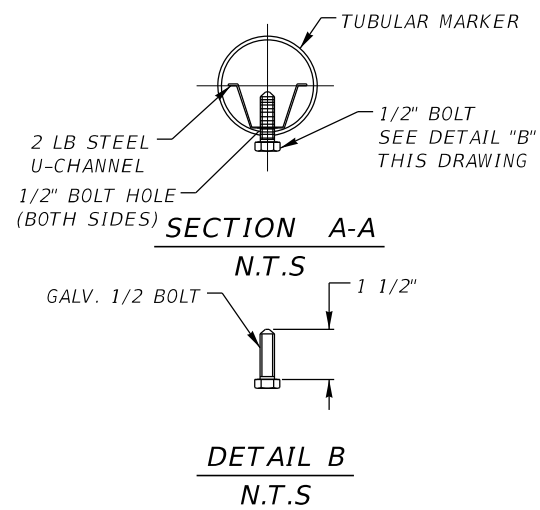
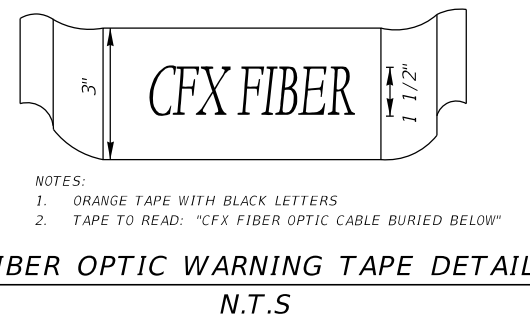
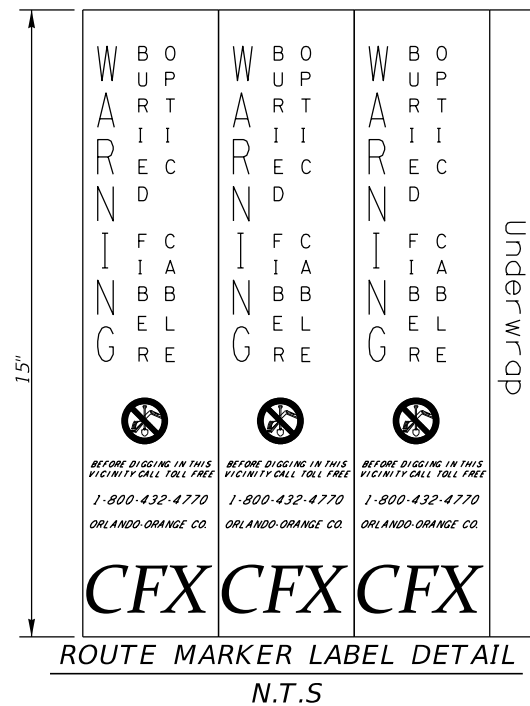
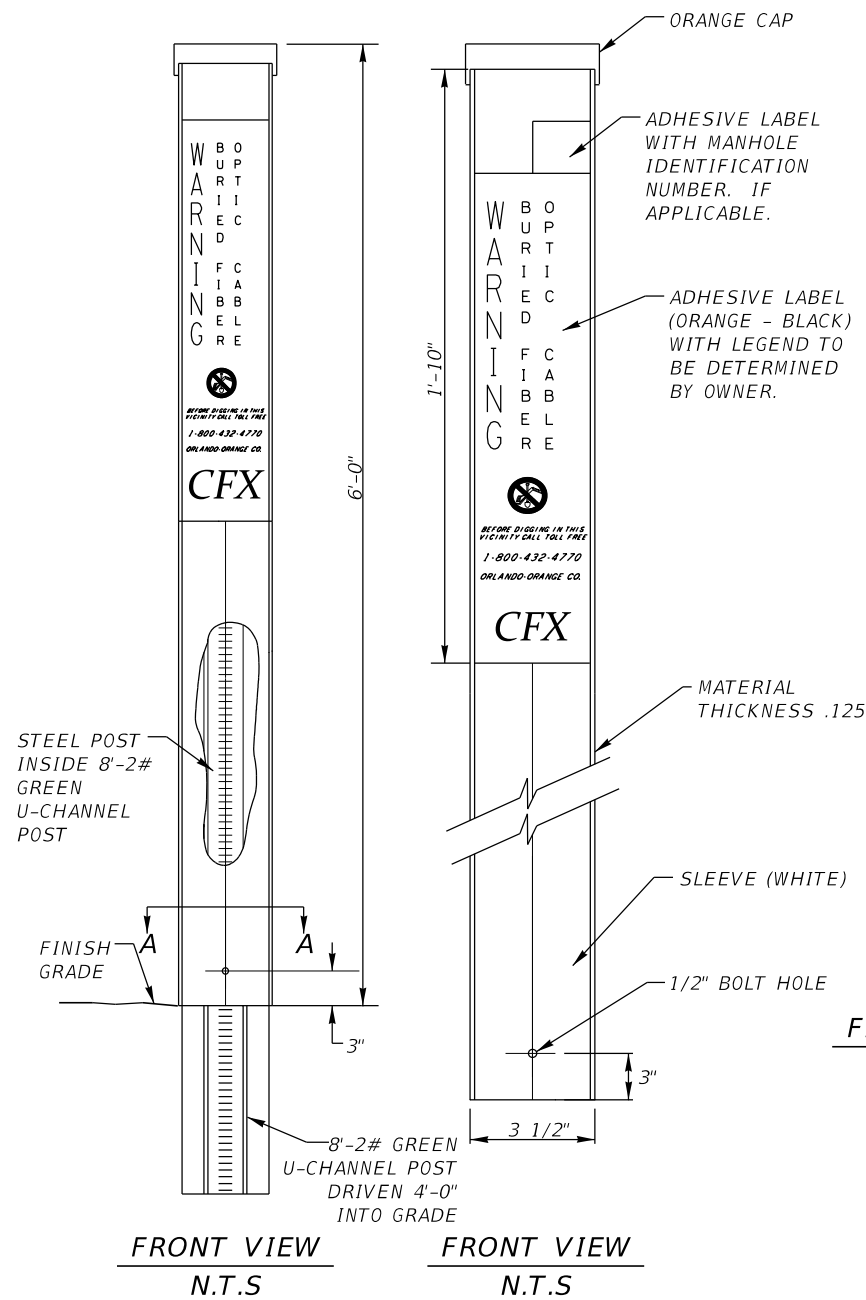


- NOTES:
1. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT THE BACKBONE AND FEEDER FON ARE AT THE PROPER DEPTHS AS SPECIFIED IN THIS TYPICAL DETAIL. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO INSTALL THE BACKBONE AND SECONDARY FEEDER IN CONFLICT AREAS (DRAINAGE, ETC) PER UTILITY CROSSING DETAIL SHEETS.

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	TYPICAL SR 408 UTILITY CORRIDOR	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					A-12

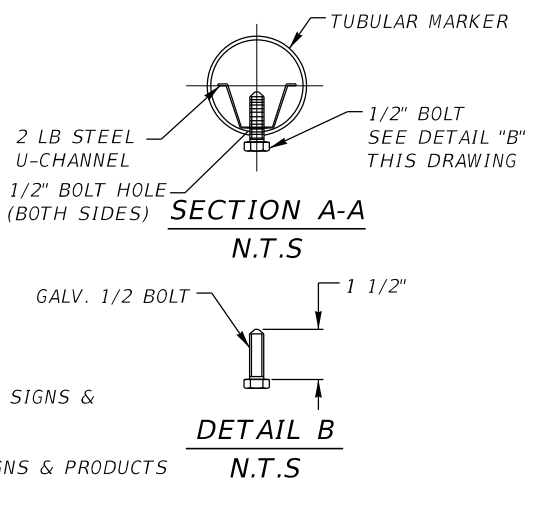
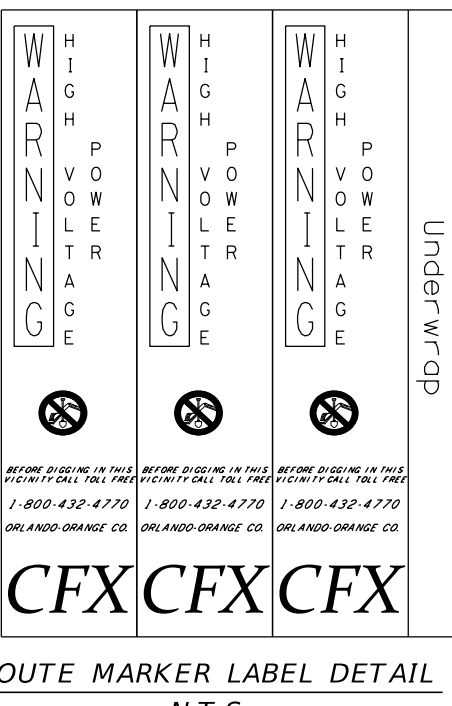
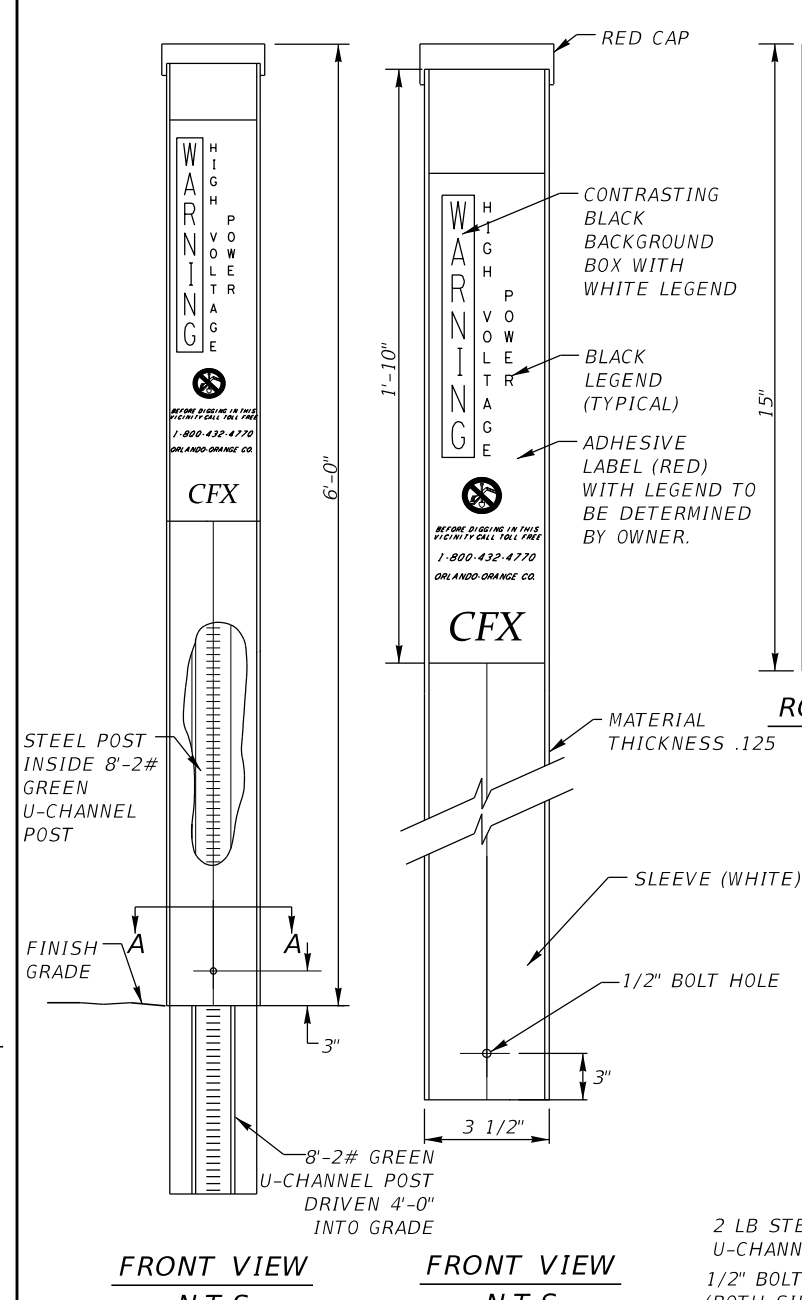
VERSION 6

**FIBER OPTIC ROUTE MARKER**



- NOTES:
- 8'-2#/FT. GREEN STEEL U-CHANNEL POST VULCAN UTILITY SIGNS & PRODUCTS PN 0550145 OR CFX APPROVED EQUAL.
  - 72" H-41-RF TUBULAR ROUTE MARKER VULCAN UTILITY SIGNS & PRODUCTS PN 0300876 OR CFX APPROVED EQUAL.
  - ROUTE MARKER WRAP DECAL, BLACK TEXT ON ORANGE BACKGROUND, VULCAN UTILITY SIGNS & PRODUCTS PN 0900466 OR CFX APPROVED EQUAL.

**POWER ROUTE MARKER**

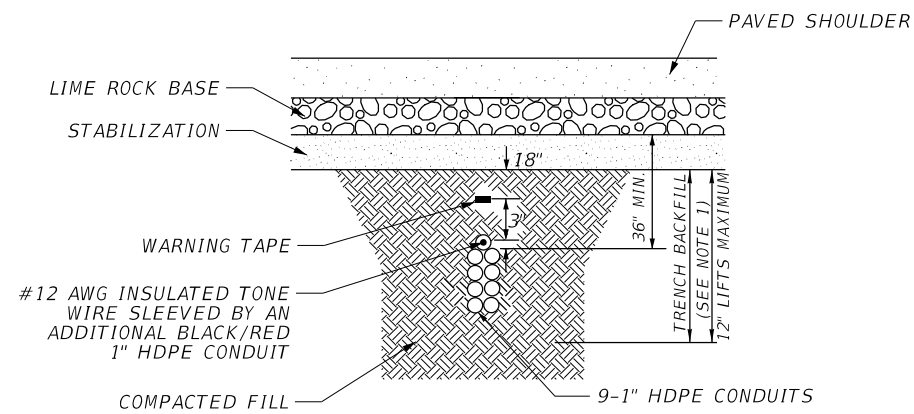


- NOTES:
- 8'-2#/FT. GREEN STEEL U-CHANNEL POST VULCAN UTILITY SIGNS & PRODUCTS PN 0550145 OR CFX APPROVED EQUAL.
  - 72" H-41-RF TUBULAR ROUTE MARKER VULCAN UTILITY SIGNS & PRODUCTS PN 0300876 OR CFX APPROVED EQUAL.
  - ROUTE MARKER WRAP DECAL, BLACK TEXT ON RED BACKGROUND, VULCAN UTILITY SIGNS & PRODUCTS PN 0900466 OR CFX APPROVED EQUAL.

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	FIBER OPTIC / POWER CABLE ROUTE MARKER DETAIL	SHEET NO. A-13
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					

VERSION 6

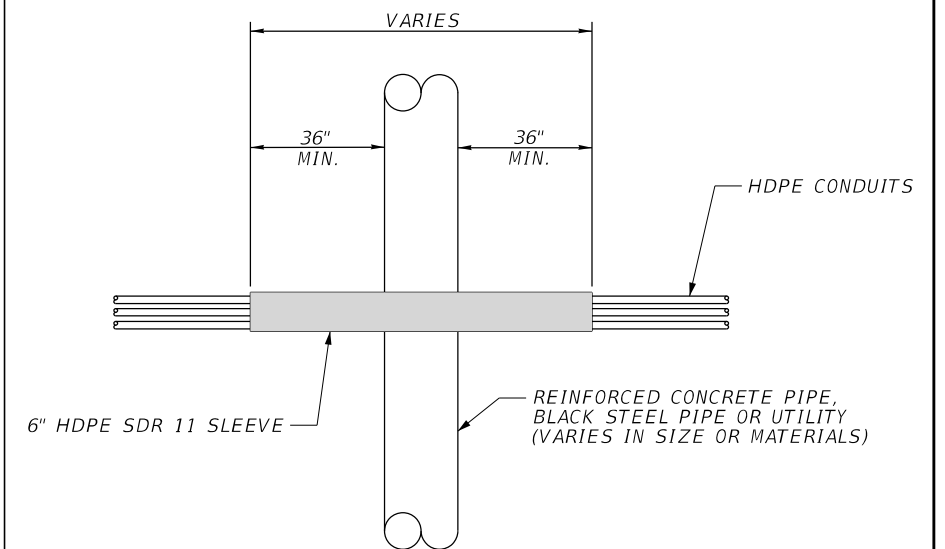




**DETAIL "A"**  
**TYPICAL BEDDING AND TRENCHING DETAIL**

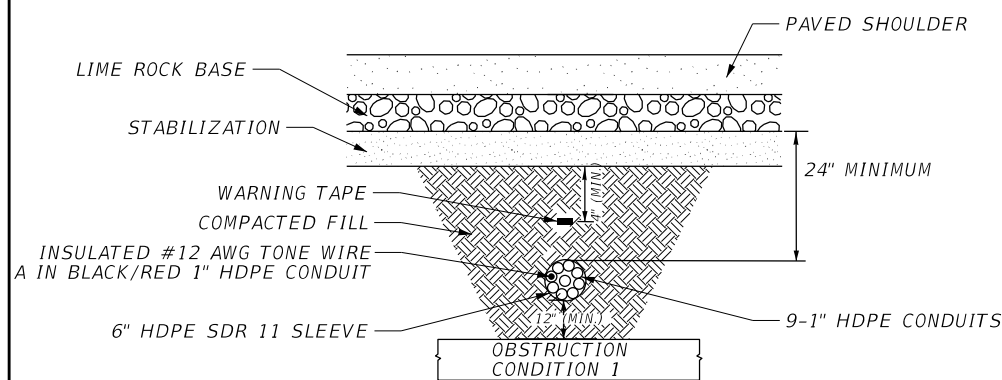
**NOTES:**

1. THE F.O. CONDUIT SHALL BE INSTALLED SUCH THAT IT MAINTAINS A SUBSTANTIALLY UNIFORM ALIGNMENT ( +/- 4 INCHES) BOTH HORIZONTALLY AND VERTICALLY RELATIVE TO THE PAVED SHOULDER AS DETAILED IN THE TYPICAL MAINLINE SECTION.

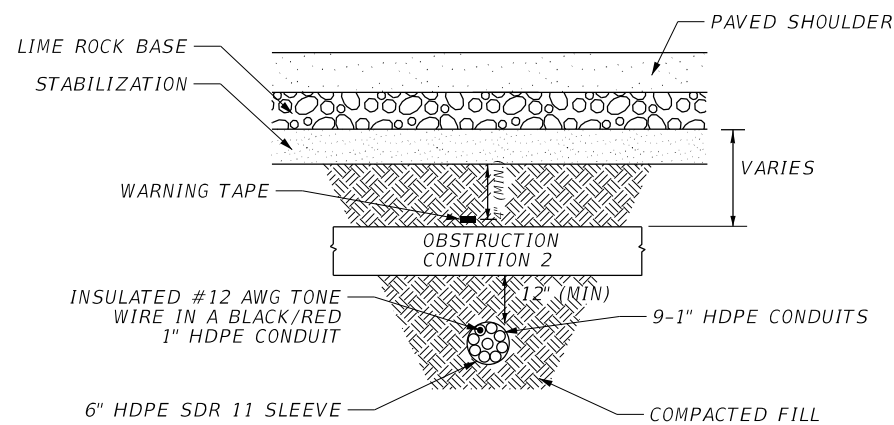


APPLIES FOR ABOVE AND BELOW OBSTRUCTION DETAILS

**DETAIL "D"**  
**SPLIT SLEEVE PLAN DETAIL AT STORM DRAIN PIPE OR UTILITY CROSSINGS**



**DETAIL "B"**  
**TYPICAL STEEL SLEEVE TRENCH DETAIL TO ABOVE CROSS OBSTRUCTION**



**DETAIL "C"**  
**TYPICAL STEEL SLEEVE TRENCH DETAIL TO BELOW CROSS OBSTRUCTION**

**NOTES:**

1. HDPE SDR 11 SLEEVE TO EXTEND A MIN. OF 3' PAST ENDS OF OBSTRUCTION.
2. 6" HDPE SDR 11 SLEEVE SHALL BE SEALED AT BOTH ENDS WITH A NON SHRINK GORUT AND WITH THE F.O. CONDUITS TO PREVENT THE INFILTRATION OF SURROUNDING FILL. METHOD AND MATERIALS TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
3. F.O. CONDUITS MAY ALSO BE ROUTED UNDER OBSTRUCTIONS AS SHOWN IN CONDITION 2, IF MINIMUM COVERS SHOWN IN CONDITION 1 CAN NOT BE MET.
4. PROPOSED OBSTRUCTION CROSSING PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
5. OBSTRUCTION CROSSINGS ARE LABELED ON THE PLAN SHEETS AS COND. 1 FOR A CONDITION 1 CROSSING & COND. 2 FOR A CONDITION 2 CROSSING.
6. DURING ALL HDPE INTERDUCT INSTALLATION INSIDE PVC, HDPE SDR 11, BRFG CONDUIT THE CONTRACTOR SHALL USE POLYWATER FRONT END PACKS, PART NUMBERS J-27 OR J-55, AS APPROPRIATE, OR APPROVED EQUIVALENT AS PULLING LUBRICANT.
7. A MINIMUM HORIZONTAL CLEARANCE OF 12" SHALL BE MAINTAINED FROM ANY OBSTRUCTION.

**ABBREVIATIONS**

- BRFG= BULLET RESISTIVE FIBERGLASS OUTER DUCT
- BSP= BLACK STEEL PIPE
- HDPE= HIGH DENSITY POLYETHYLENE CONDUIT
- FO= FIBER OPTIC
- FOMH= FIBER OPTIC MANHOLE
- PVC= POLYVINYL CHLORIDE OUTER DUCT
- E/W= EQUIPPED WITH
- SDR= SIZE DIMENSION RATIO
- COND.1= CONDITION 1 CROSSING (SEE DETAIL 'B')
- COND.2= CONDITION 2 CROSSING (SEE DETAIL 'B')
- COND.3= CONDITION 3 CROSSING (SEE DETAIL 'B')

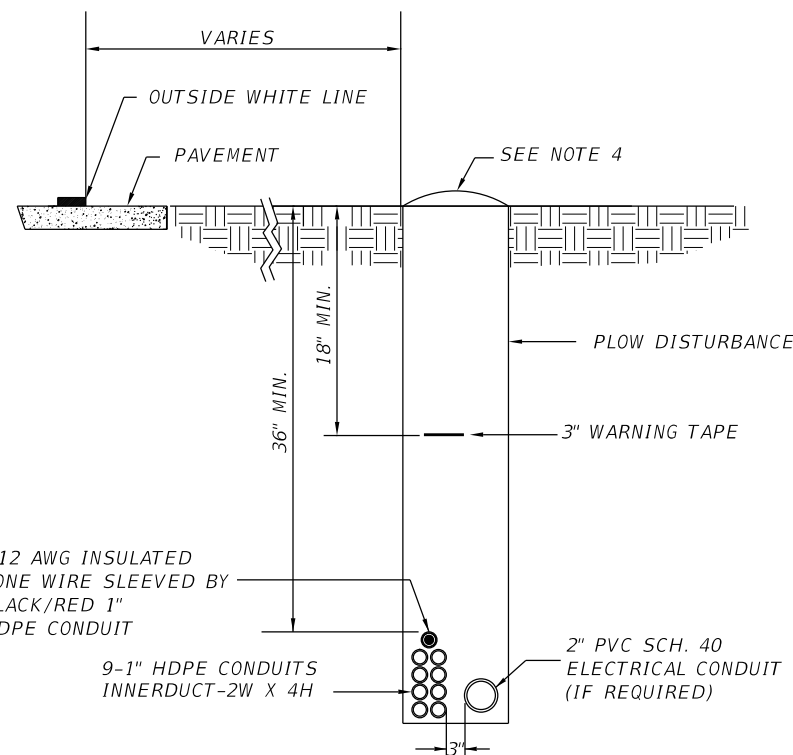
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REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	TRENCHING AND UTILITY CROSSING DETAIL	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					B-1

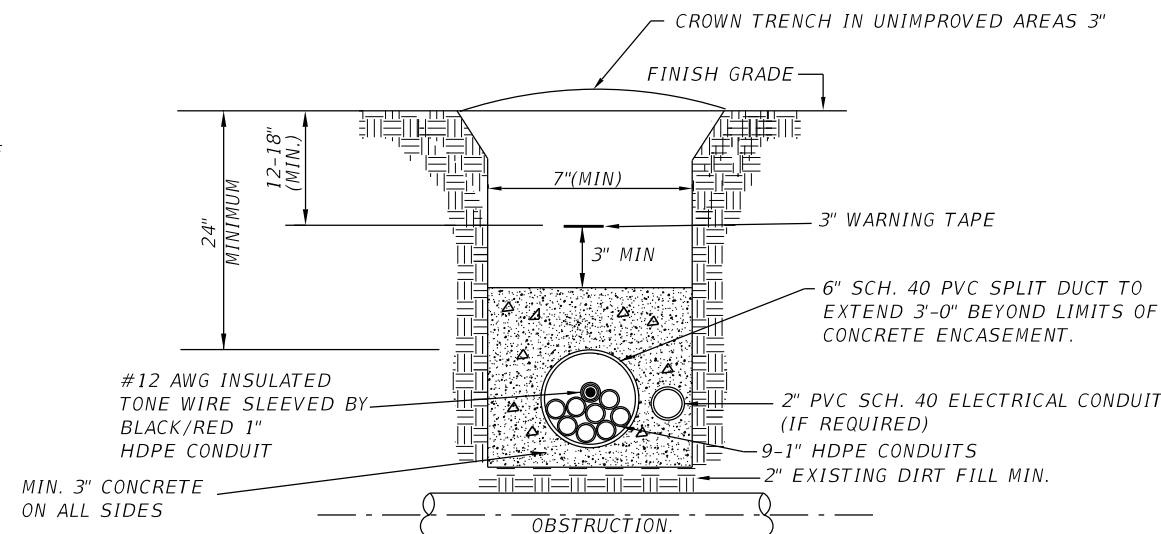
VERSION 6

NOTES:

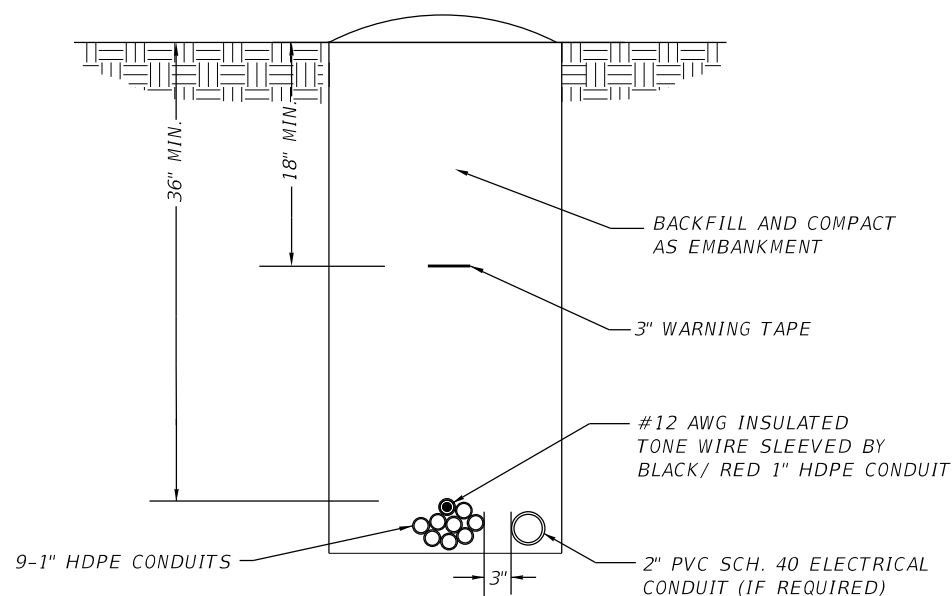
1. TRAFFIC CONTROL FOR LONGITUDINAL INSTALLATION SHALL BE IN ACCORDANCE WITH FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) STANDARD INDEX SERIES 600.
2. A MINIMUM OF 2'- 0" SHALL BE MAINTAINED FROM EXISTING LANDSCAPE FEATURES. LANDSCAPE REPLACEMENT SHALL BE IN KIND AND SUBJECT TO THE APPROVAL OF CFX.
3. REPLACEMENT OF FILL, BASE, SURFACE (ASPHALT), CURB AND DRAINAGE STRUCTURES WILL BE IN ACCORDANCE WITH APPLICABLE COUNTY AND CITY UTILITY AND PUBLIC WORKS STANDARDS FOR COUNTY ROADS AND THE LATEST FDOT UTILITY ACCOMMODATION MANUAL.
4. CONSTRUCTION CORRIDOR SHALL BE RESTORED TO ORIGINAL OR IMPROVED CONDITION AND VERIFIED BY CFX OR THEIR APPROVED AGENTS.
5. ALL TRENCH WIDTHS SHALL BE WIDE ENOUGH TO ACCOMMODATE MECHANICAL COMPACTION EQUIPMENT FOR PROPER COMPACTION IN ACCORDANCE WITH FDOT STANDARD SPECS.
6. ALL TRENCHES SHALL BE BACKFILLED & COMPACTED BY THE END OF EACH WORK DAY.
7. CFX APPROVED JOINT COUPLINGS SHALL BE USED.
8. CONDUIT PATH WILL BE ROUTED TO AVOID ANY OBSTRUCTIONS SHOULD OBSTRUCTIONS BE ENCOUNTERED, THE FOLLOWING HIERARCHY WILL BE STRICTLY ADHERED TO:
  - A. ROUTE CONDUIT AROUND OBSTRUCTION USING SWEEPING BENDS. IF THIS CANNOT BE ACCOMPLISHED, CONDUIT ROUTING WILL BE MADE UNDER THE OBSTRUCTION.
  - B. IF THE ABOVE CANNOT BE ACCOMPLISHED, THEN USE OF ONE OF THE OBSTRUCTION DETAILS WILL BE ALLOWED. PRIOR TO COMMENCING DETAIL A OR B, OWNERS APPROVAL MUST BE OBTAINED. DETAIL A IS THE PREFERRED METHOD.
9. ALL CONCRETE SHALL BE IN ACCORDANCE WITH FDOT SPECIFICATION 347.



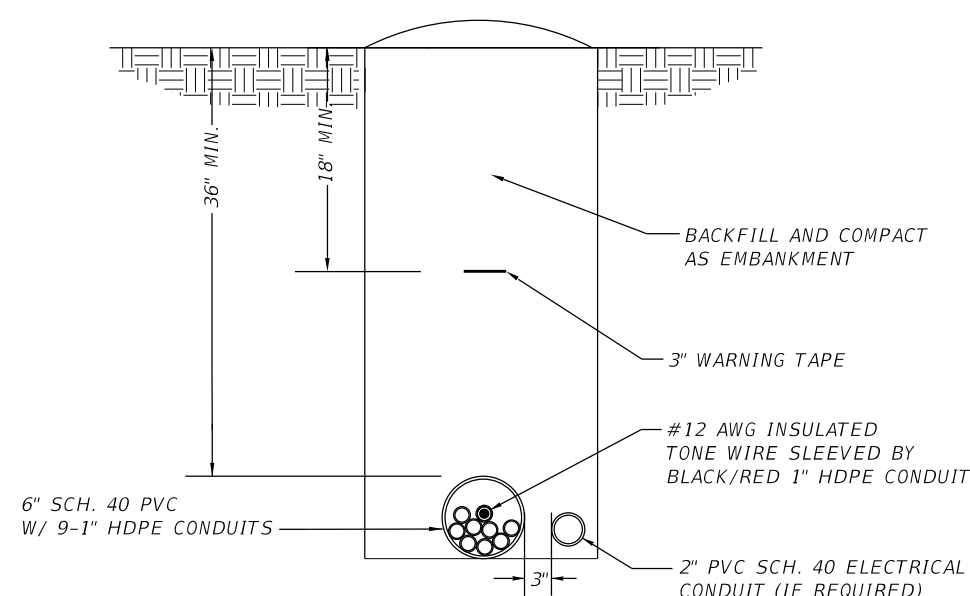
STANDARD CROSS SECTION OF PLOWED CONDUIT



TYPICAL CROSSING WHERE OBSTRUCTION IS 35" TO 44" IN DEPTH.



STANDARD CROSS SECTION OF OPEN TRENCH CONDUIT (NOT IN CASING)



STANDARD CROSS SECTION OF OPEN TRENCH CONDUIT (IN CASING)

VERSION 6

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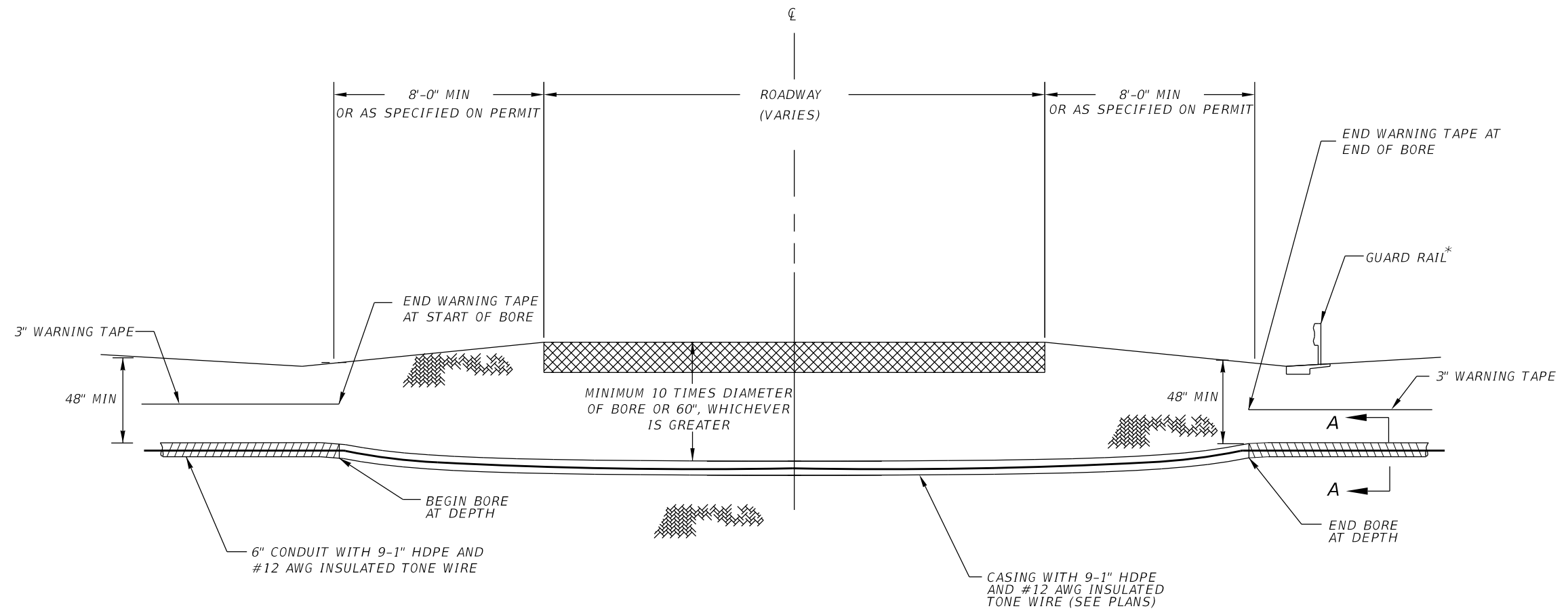
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

TRENCHING AND PLOWING  
DETAILS SINGLE  
CONDUIT BANK

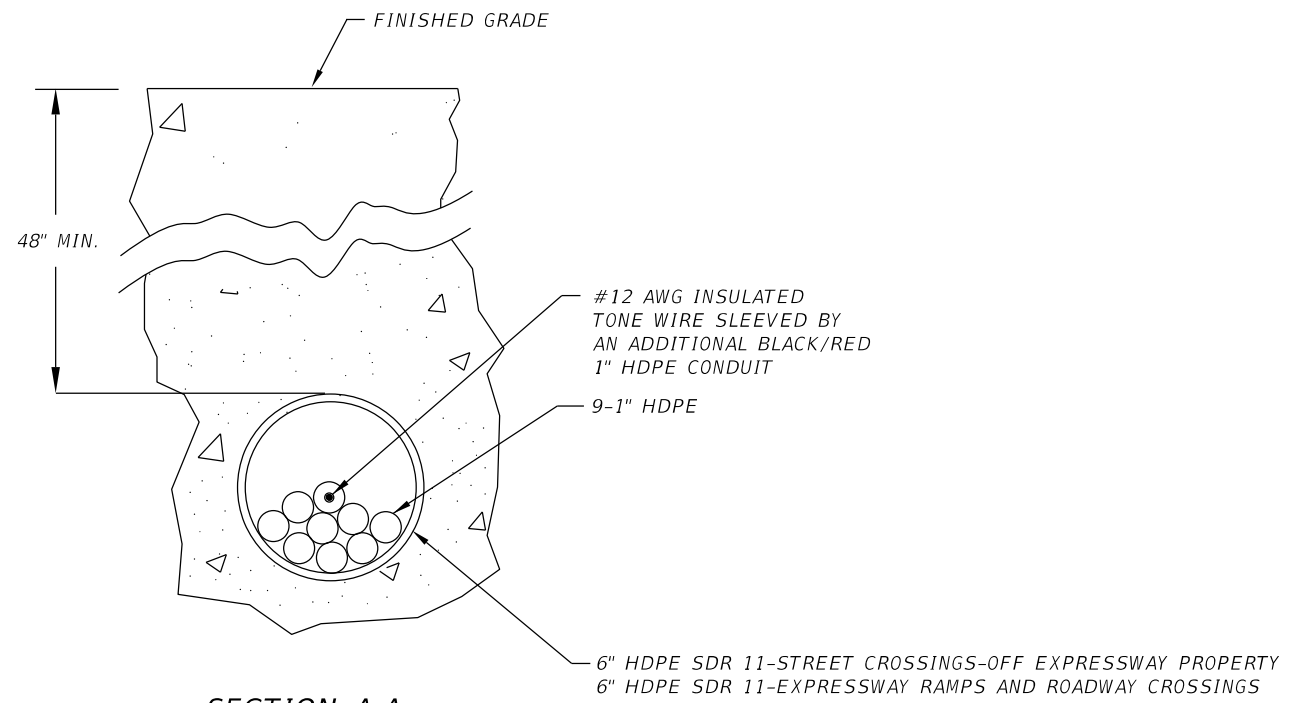
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SHEET NO.

B-2



TYPICAL DIRECTIONAL BORE



SECTION A-A

NOTES:

1. UTILITY IN THE PATH OF THE BORE SHALL BE LOCATED AND THE DEPTH OF THE BORE CROSSING SHALL BE DELINEATED TO CROSS UNDER OR OVER UTILITY WITH 12" MINIMUM SEPARATION.
2. ALL ENDS OF BORES SHALL BE SEALED WITH NON-SHRINK GROUT.
3. \* IN CASES OF NEW OR EXISTING GUARD RAILS, SEE SHEET A-12.

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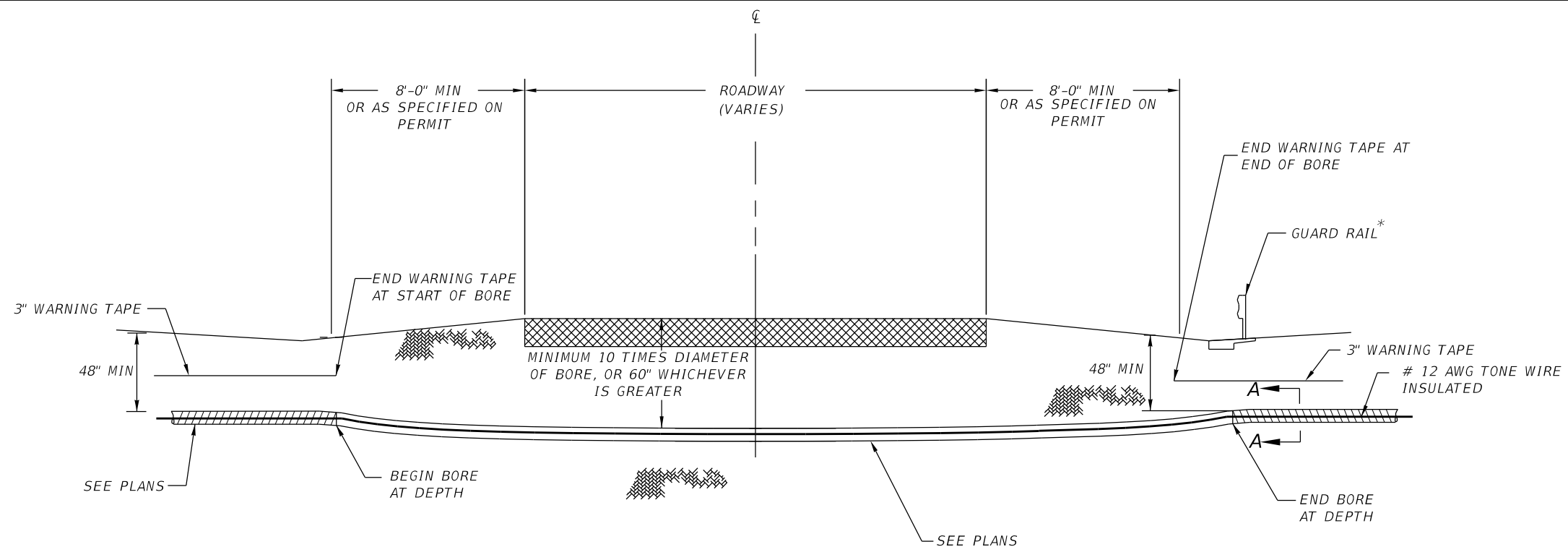
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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

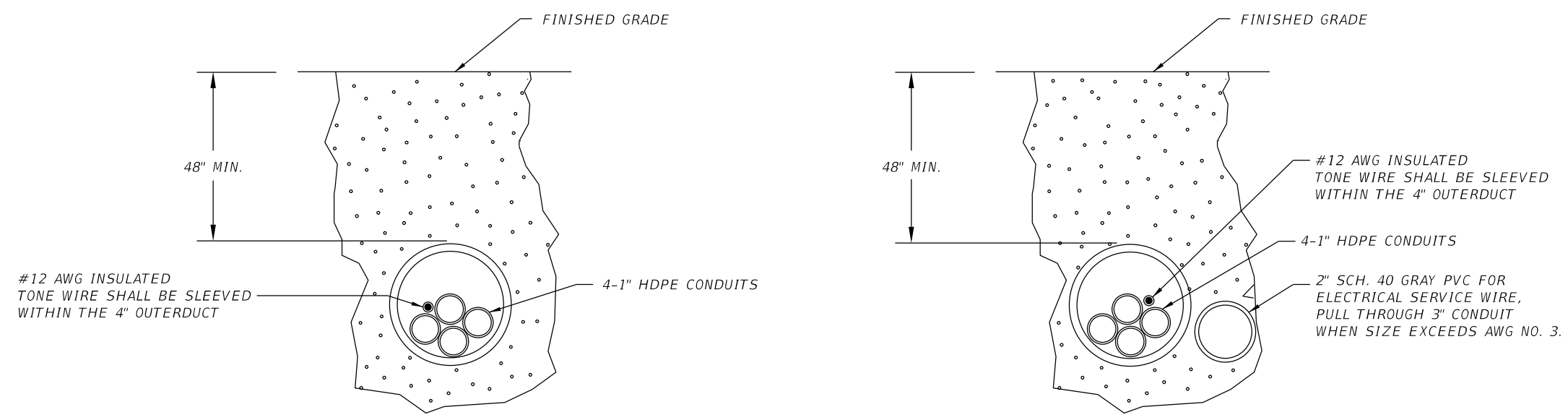
**DIRECTIONAL BORE DETAIL**  
**FIBER OPTIC**  
**BACKBONE CONDUIT**

SHEET NO.  
 B-3

VERSION 6



**TYPICAL DIRECTIONAL BORE**  
N.T.S.



**SECTION A-A**

**NOTES:**

1. UTILITY IN THE PATH OF THE BORE SHALL BE LOCATED AND THE DEPTH OF THE BORE CROSSING SHALL BE DELINEATED TO CROSS UNDER OR OVER UTILITY WITH 12" MINIMUM SEPARATION.
2. ALL ENDS OF BORES SHALL BE SEALED WITH NON-SHRINK GROUT.
3. \* IN CASES OF NEW OR EXISTING GUARD RAILS, SEE SHEET A-12.

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REVISIONS					
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**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**



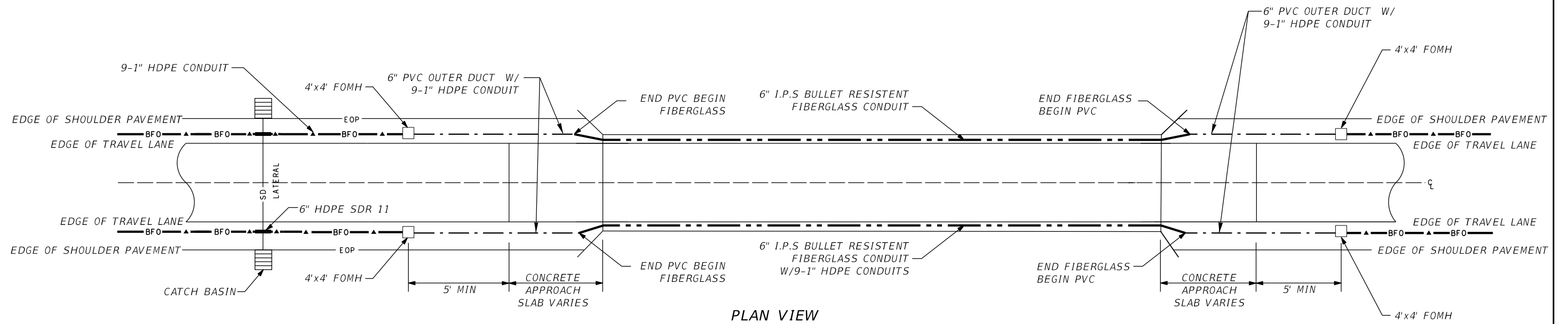
**DIRECTIONAL BORE DETAIL**  
**ITS DEVICE DROP**

SHEET NO.  
B-4

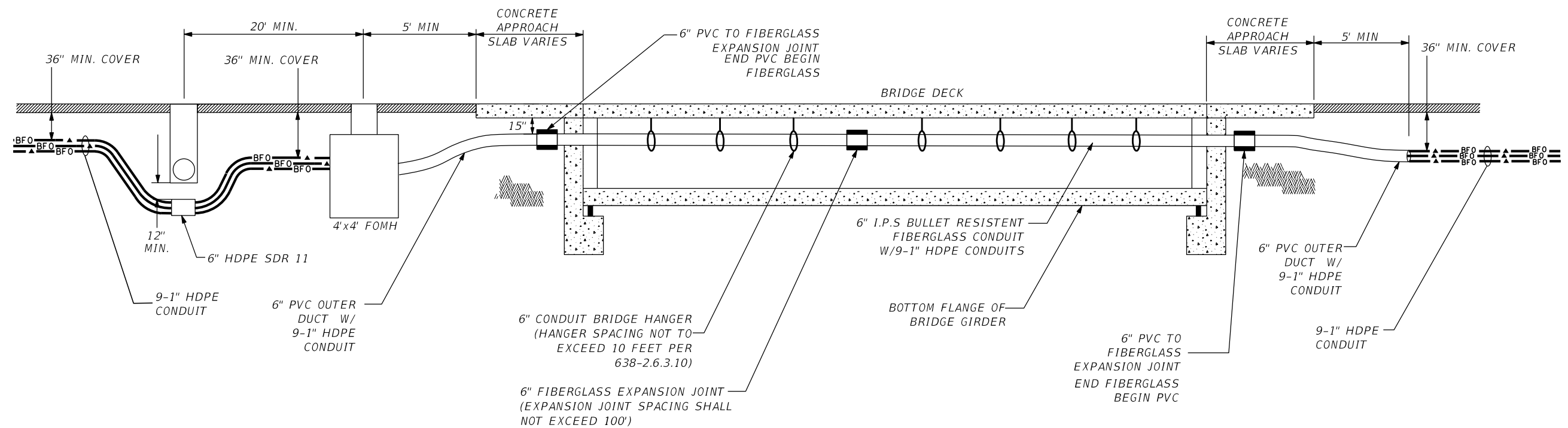
VERSION 6



TYPICAL BRIDGE APPROACH ATTACHMENT DETAIL



PLAN VIEW



PROFILE

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**CENTRAL FLORIDA  
EXPRESSWAY AUTHORITY**

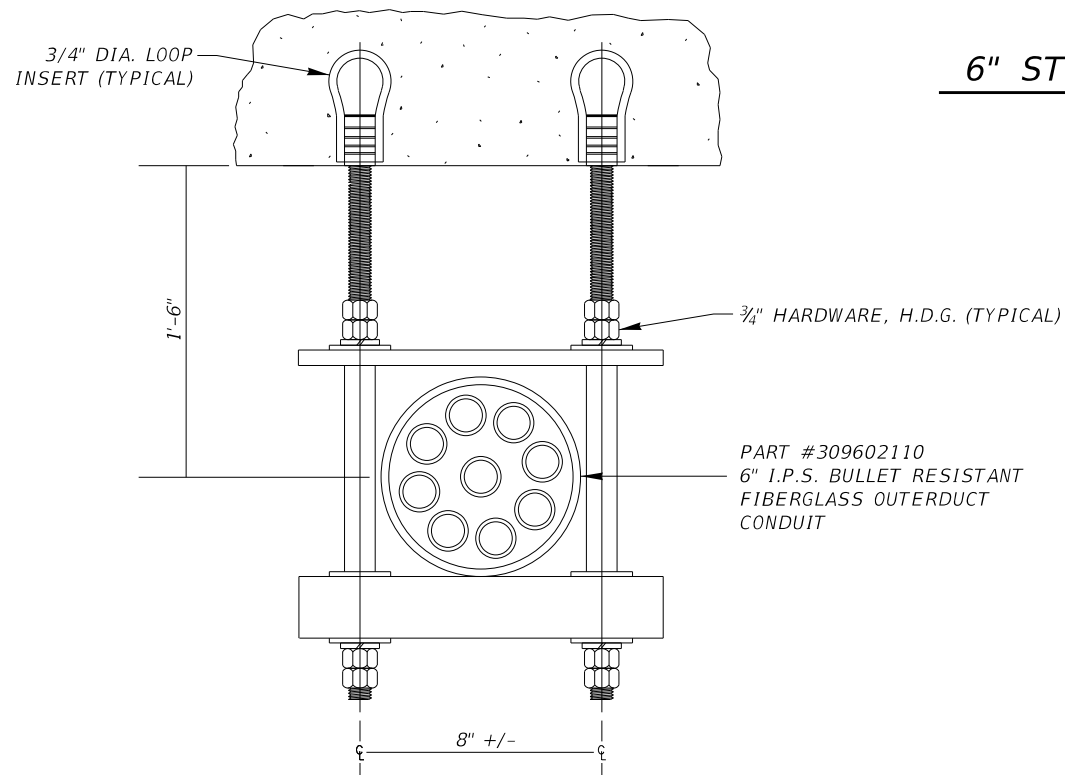
**CENTRAL  
FLORIDA  
EXPRESSWAY  
AUTHORITY**

**TYPICAL BRIDGE  
APPROACH DETAIL**

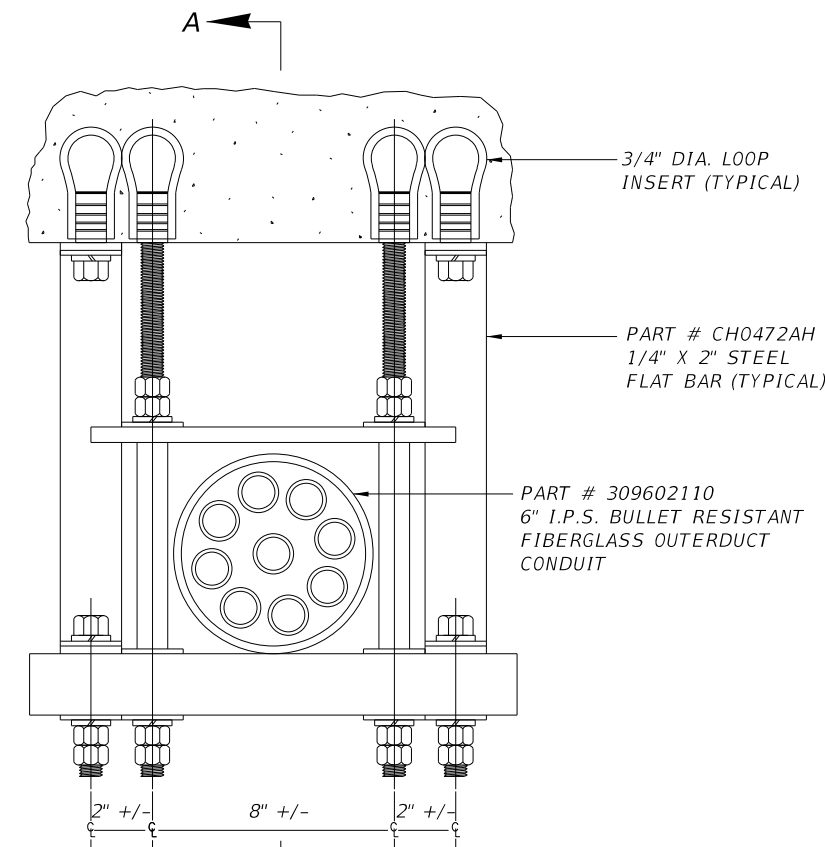
SHEET  
NO.  
C-1

VERSION 6

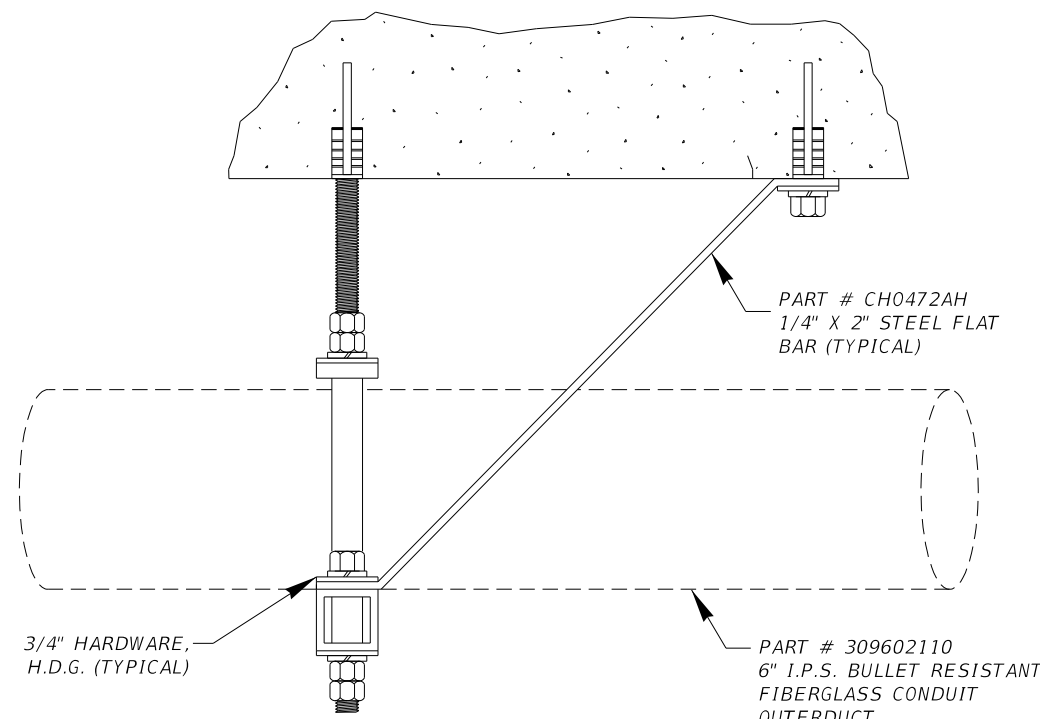
# 6" STAINLESS STEEL UNISTRUT BRIDGE HANGERS



**INTERMEDIATE SUPPORT HANGER**  
**PART #CHO472AG**



**ANCHOR POINT SUPPORT HANGER**  
**PART #CHO472AH**  
**FRONT VIEW**



**SECTION A-A**

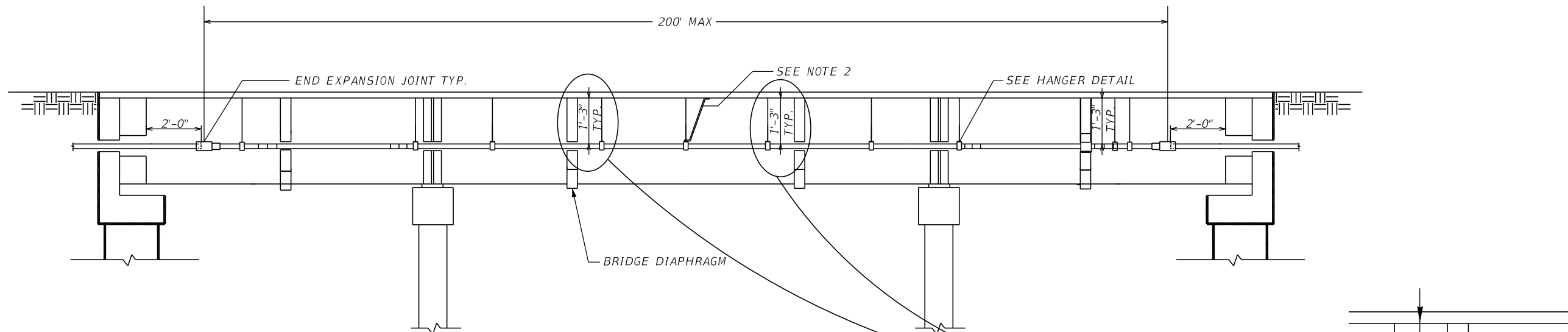
**NOTES:**

1. THE FIBER OPTIC CABLE (FOC) SHALL BE CONTAINED WITHIN A 6" DIAMETER I.P.S. BULLET RESISTANT FIBERGLASS OUTERDUCT CONDUIT AS MANUFACTURED BY OPTI-COM MANUFACTURING NETWORK, INC. (OMNI), PART #309602110 OR APPROVED EQUAL.
2. THE HANGER SUPPORT ASSEMBLIES SHALL BE OMNI PART #CHO472AG. THE HANGER ANCHOR ASSEMBLY SHALL BE OMNI PART #CHO472AH OR APPROVED EQUAL.
3. THE MAXIMUM ANCHORING HANGER SPACING SHALL NOT EXCEED 10 FEET AND THE EXPANSION JOINT SHALL BE PLACED AT EVERY 100 FEET MAXIMUM, OR WITHIN 5 FEET OF A PIER OR ABUTMENT PER SPECIFICATION 638-2.6.3.10.
4. HANGER INSERTS SHALL BE 3/4" HOT DIP GALVANIZED LOOP INSERTS, HAVING A SAFE WORKING LOAD OF 1.5 KIP TENSION AND 2.7 KIP SHEAR MINIMUM. AT CONTRACTORS OPTION, OTHER METHODS OF SECURING HANGERS TO DECK UNDERSIDE MAY BE ACCEPTABLE PROVIDED THAT:
  - A. CALCULATIONS FOR THE HANGER SYSTEM ARE INCLUDED.
  - B. SHOP DRAWINGS ARE SIGNED AND SEALED BY A FLORIDA PROFESSIONAL ENGINEER AND ARE SUBMITTED FOR APPROVAL BY THE ENGINEER OF RECORD.
5. THE INSTALLATION OF HANGER INSERTS SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
6. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE FOLLOWING ITEMS:
  - A. INSERT AND HANGER LAYOUT
  - B. CATALOG CUTS FOR HANGER AND ANCHOR ASSEMBLIES.
7. INSERTS AND THREADED RODS ARE INCLUDED IN BRIDGE CONSTRUCTION. PAYMENT SHALL BE INCLUDED IN THE PRICE BID FOR SUPERSTRUCTURE CONCRETE FOR THE INDIVIDUAL BRIDGES. LOCATION OF INSERTS TO BE DETERMINED BY CONTRACTOR.

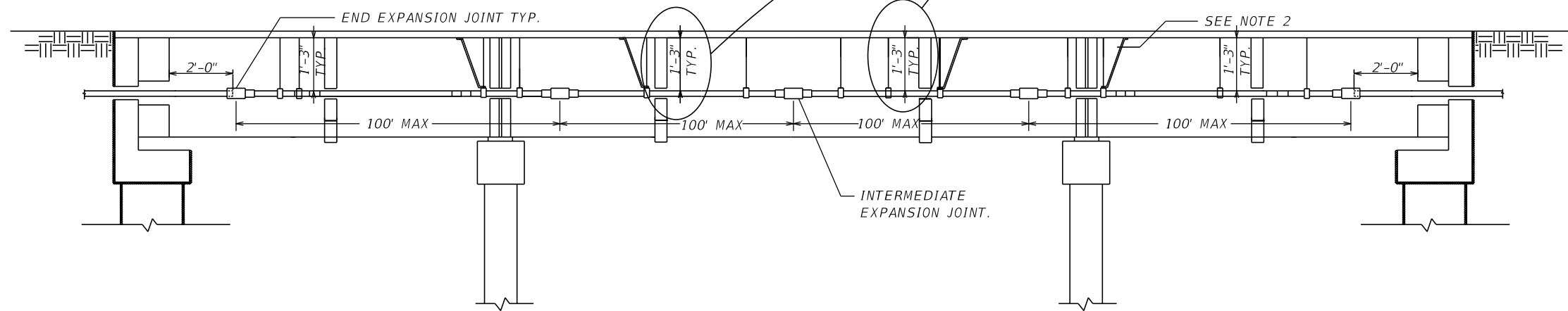
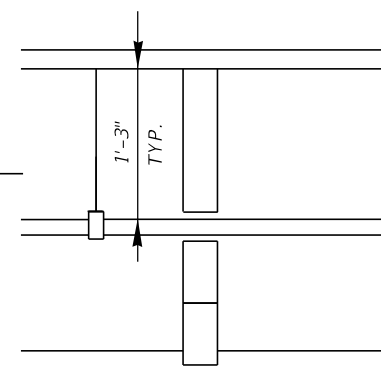
NTS

VERSION 6

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	BRIDGE HANGER DETAIL	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					C-2



TYPICAL BRIDGE SECTION FOR BRIDGES 120' OR SHORTER



TYPICAL BRIDGE SECTION FOR BRIDGES 200' OR LONGER

NOTES:

1. SEE BRIDGE HANGER DETAIL SHEET FOR ANCHORING HANGER AND EXPANSION JOINT SPACING.
2. LATERAL MOVEMENT IS FIXED AT MID SPAN BETWEEN EXPANSION JOINT BY USE OF HANGER BRACE.

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VERSION 6

REVISIONS					
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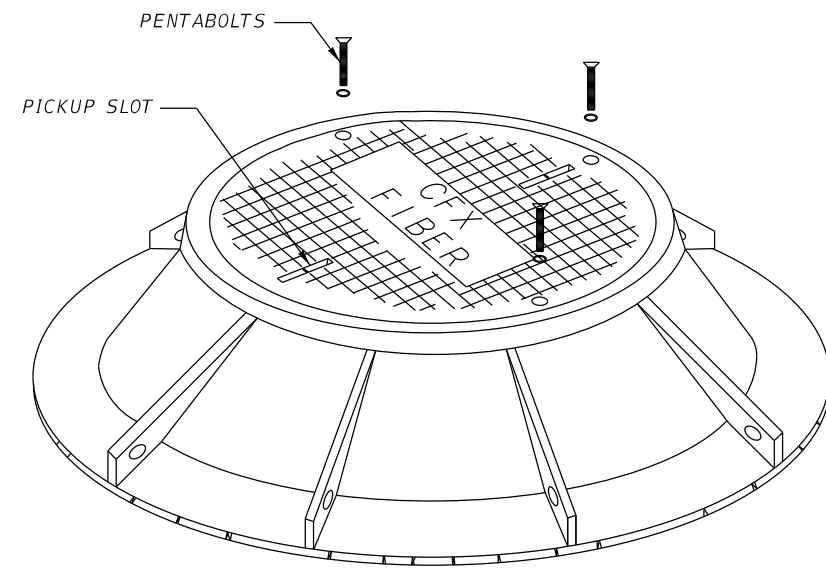
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

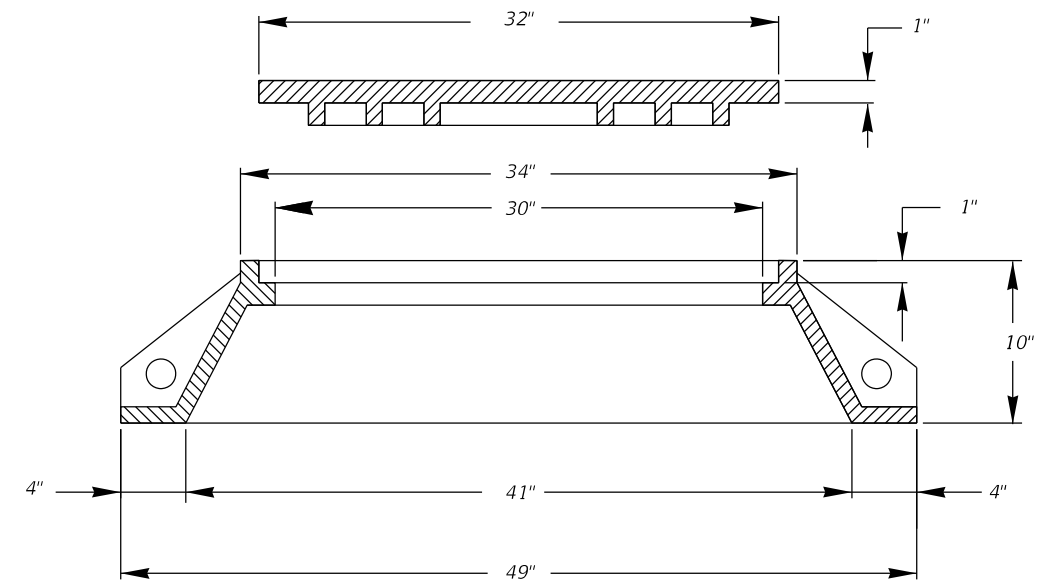
**FIBERGLASS EXPANSION JOINT DETAIL**

SHEET NO.

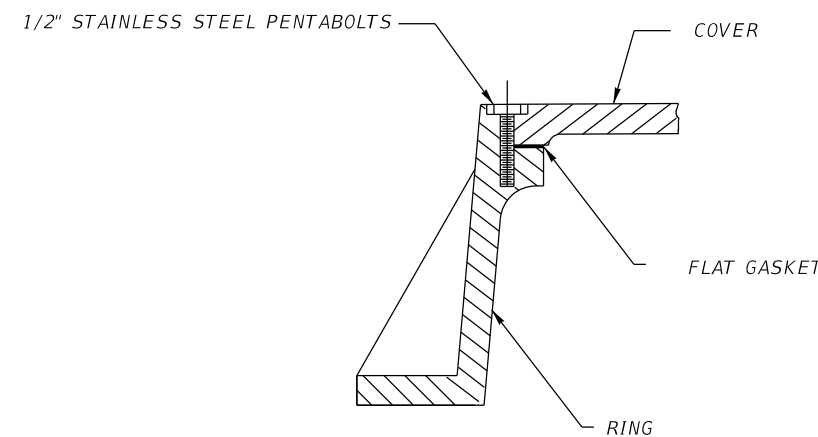
C-3



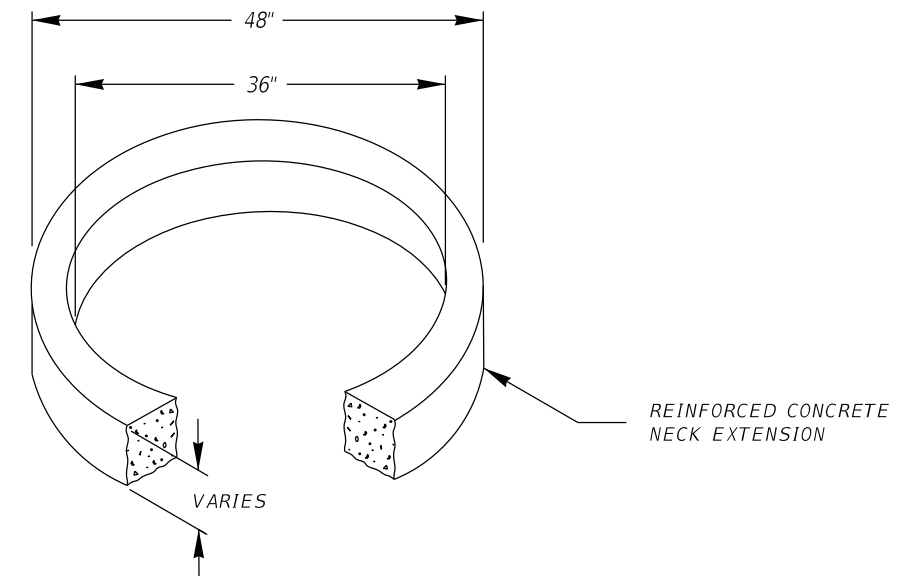
MANHOLE RING AND COVER



RING AND COVER DETAIL



BOLTED WATERTIGHT DETAIL



TYPICAL NECK EXTENSION DETAIL

NOTES:

1. EACH COVER TO HAVE (2) PICKUP SLOTS FOR REMOVING.
2. THE LETTERS "CFX FIBER" SHALL BE STAMPED ON COVER.
3. ACCESS HOLE: 30".
4. MANHOLE RING AND COVER SHALL CONFORM TO HS-20-44 TRAFFIC RATED-HEAVY DUTY LOAD RATING.
5. ANCHOR RING TO MANHOLE TOP SHALL BE SECURED BY 1/2" GALVANIZED BOLTS.
6. MANHOLE RING AND COVER TO BE WATERTIGHT AND GROUNDED TO COMMON GROUND.
7. ALL MATERIAL SHALL CONFORM TO ASTM-A48 CLASS 35B GRAY IRON.

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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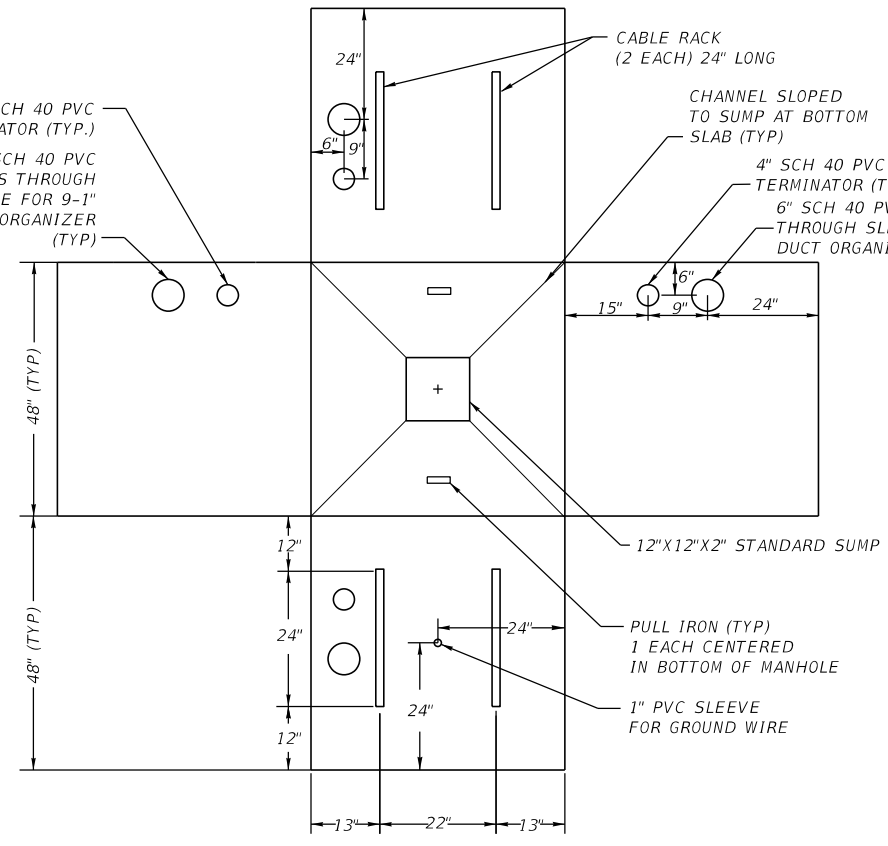
FIBER OPTIC MANHOLE COVER DETAILS

SHEET NO.

D-1



4" SCH 40 PVC TERMINATOR (TYP.)  
6" SCH 40 PVC PASS THROUGH SLEEVE FOR 9-1" DUCT ORGANIZER (TYP.)



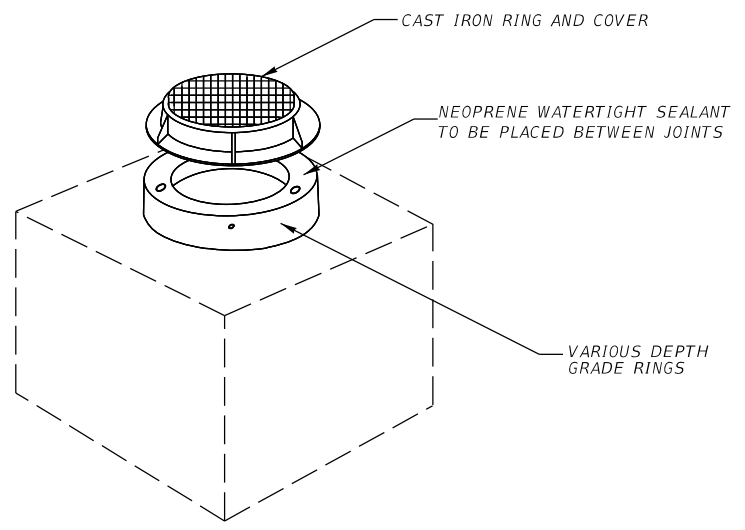
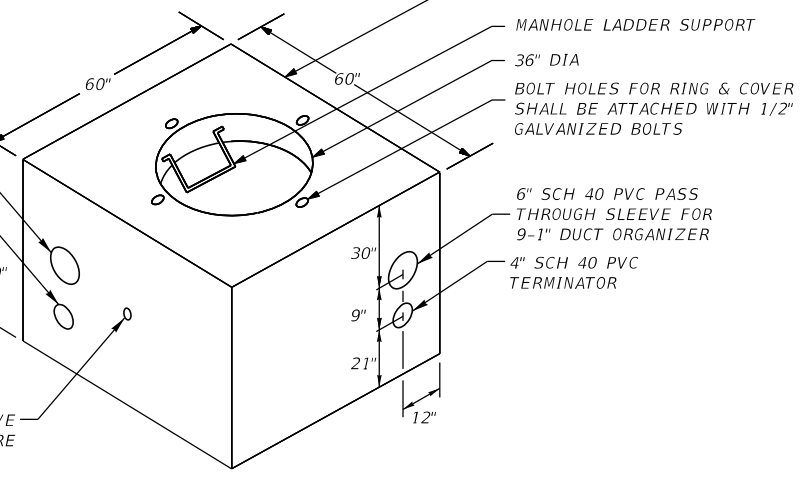
**4'X4'X4' MANHOLE**  
6" WALLS, TOP AND FLOOR  
48" HEADROOM  
DIMENSIONS SHOWN ARE INNER DIMENSIONS

NOTES:

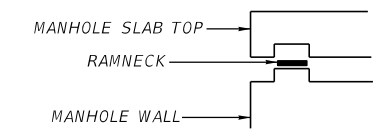
- CONTRACTOR SHALL SUBMIT PRECAST CONCRETE MANHOLE AND RING WEIR CUT SHEETS AND CAPACITIES VERIFICATIONS FOR ENGINEER'S REVIEW AND APPROVAL.
- MANHOLE SHALL CONFORM TO HL93 FULL VEHICULAR LOADING.
- ALL MANHOLES SHALL BE PROVIDED WITH AN INWESCO SERIES I-3600 OR EQUIVALENT LADDER THAT EXTENDS TO THE FLOOR.
- ALL UNUSED ACCESS POINT SHALL BE EQUIPPED WITH COMPRESSION TYPE SNUG PLUGS OR PRECAST TERMINATORS.
- ALL MANHOLES SHALL BE PLACED WITH COVER FLUSH WITH FINISHED GRADE ON PAVED SHOULDER. MANHOLE COVERS SHALL BE BOLTED IN PLACE WITH STAINLESS STEEL TAMPER-RESISTANT PENTABOLTS.
- GROUND RODS SHALL BE INSTALLED OUTSIDE OF MANHOLE AND #6 BARE WIRE SHALL BE BROUGHT INTO MANHOLE THROUGH THE 1" PVC SLEEVE ON SIDE OF MANHOLE.
- ALL MANHOLES SHALL HAVE 12" OF 1/2" CRUSHED ROCK PLACED UNDER MANHOLES.
- ALL MANHOLE PENETRATIONS SHALL BE SEALED TO PREVENT WATER INGRESS TO THE SATISFACTION OF THE ENGINEER.
- MANHOLE WALL THICKNESS SHALL BE A MINIMUM OF 6".
- RAMNECK SHALL BE USED TO SEAL ALL MANHOLE JOINTS.
- CABLE RACKS SHALL BE INSTALLED USING 1/2" x 2 1/2" GALVANIZED MACHINE BOLTS AND GALVANIZED ANCHORS CAST INTO THE WALLS.
- 1" HDPE ENTERS MANHOLE THROUGH 1 1/2" DIAMETER HOLE ONCE INSTALLED GROUT IS APPLIED.

6" SCH 40 PVC PASS THROUGH SLEEVE FOR 9-1" DUCT ORGANIZER  
4" SCH 40 PVC TERMINATOR

1" PVC SLEEVE FOR GROUND WIRE

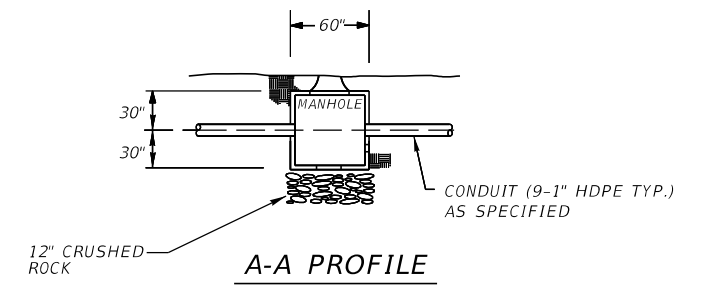
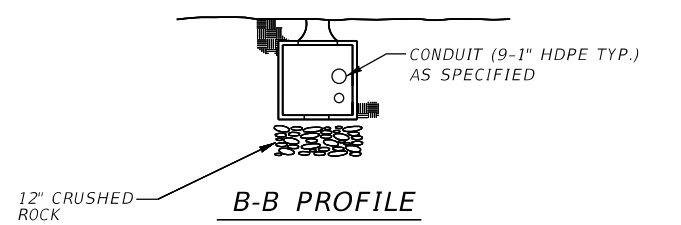
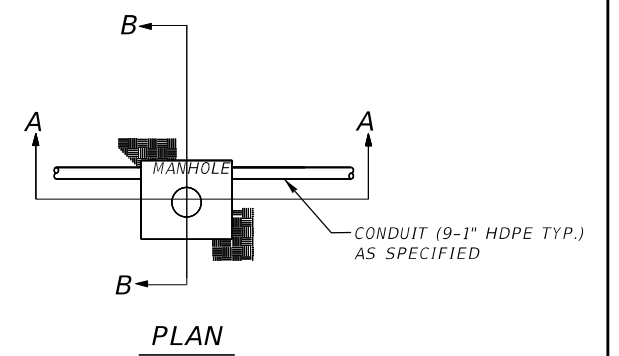


**60" OD SQUARE MANHOLE**  
DIMENSIONS SHOWN ARE OUTER DIMENSIONS



RING & COVER GENERAL NOTES - SEE SHEET D-1

**MANHOLE JOINT CONFIGURATION**



NTS

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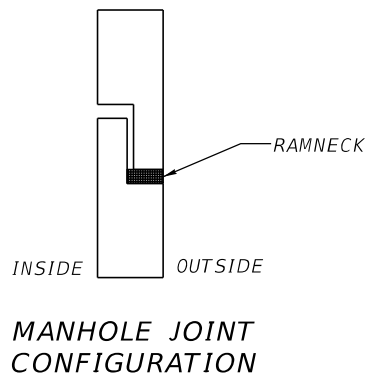
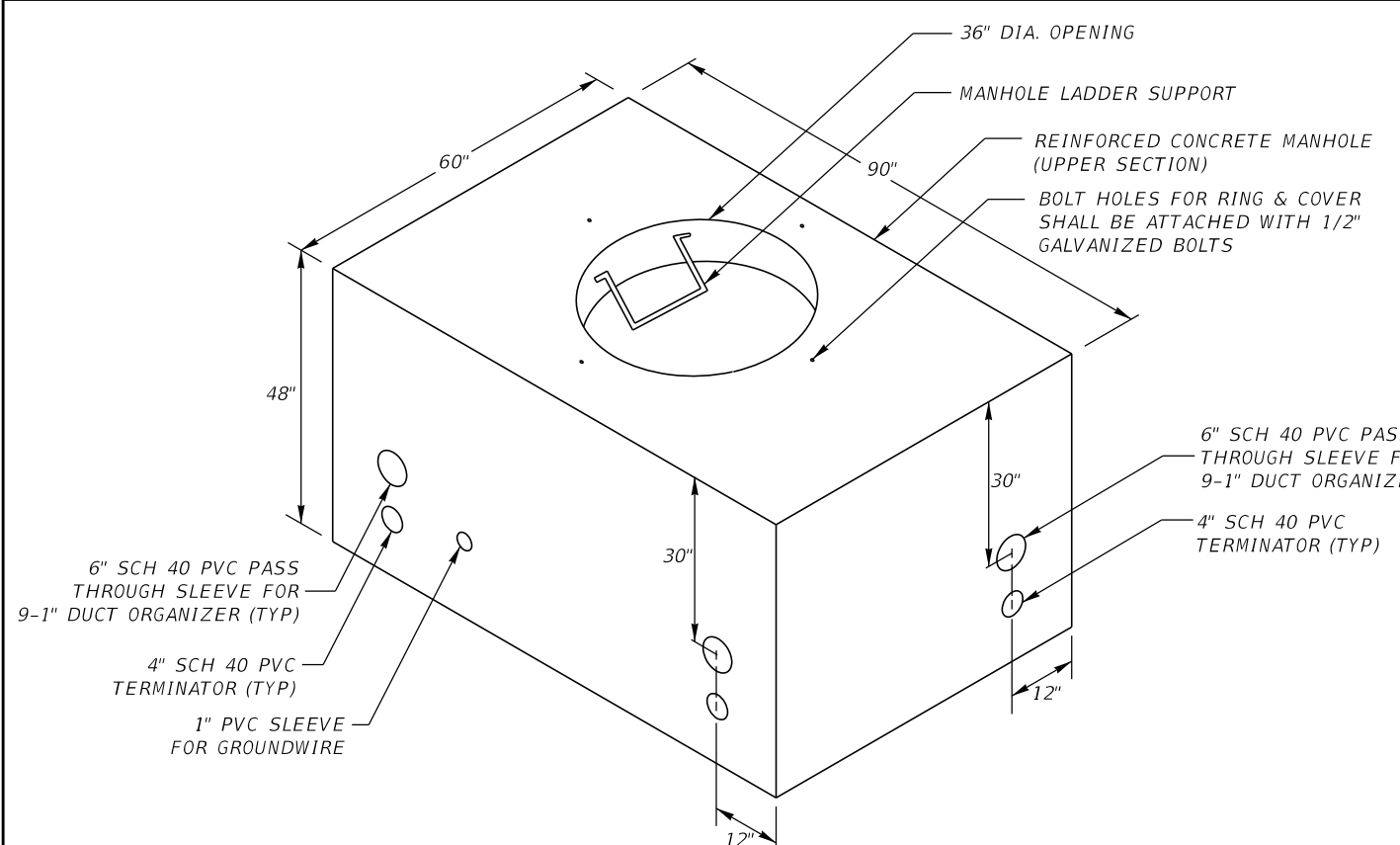
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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

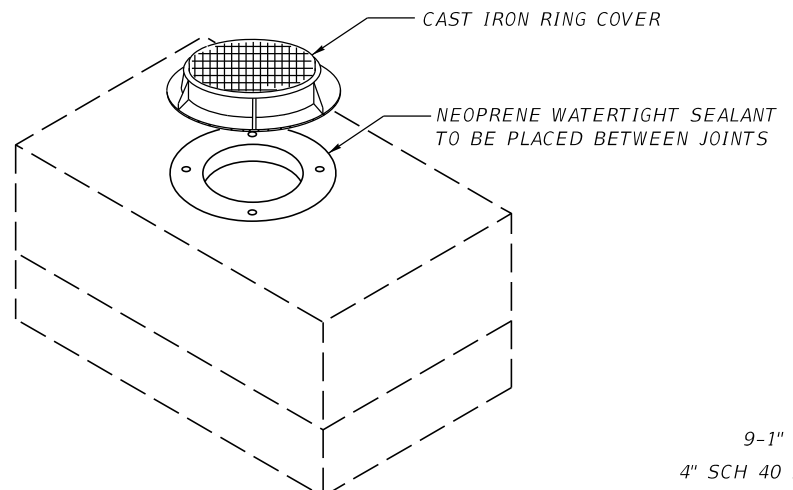
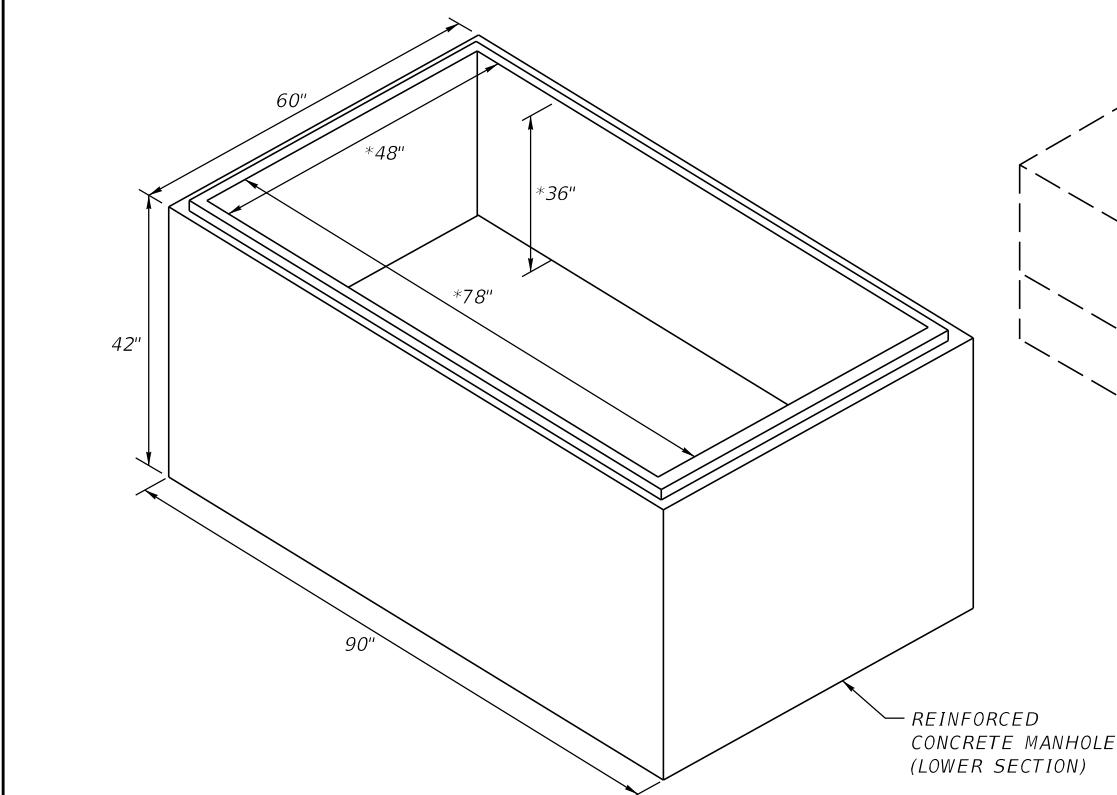
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

**FIBER OPTIC MANHOLE**  
**DETAIL 4' X 4' X 4'**

SHEET NO.  
D-2

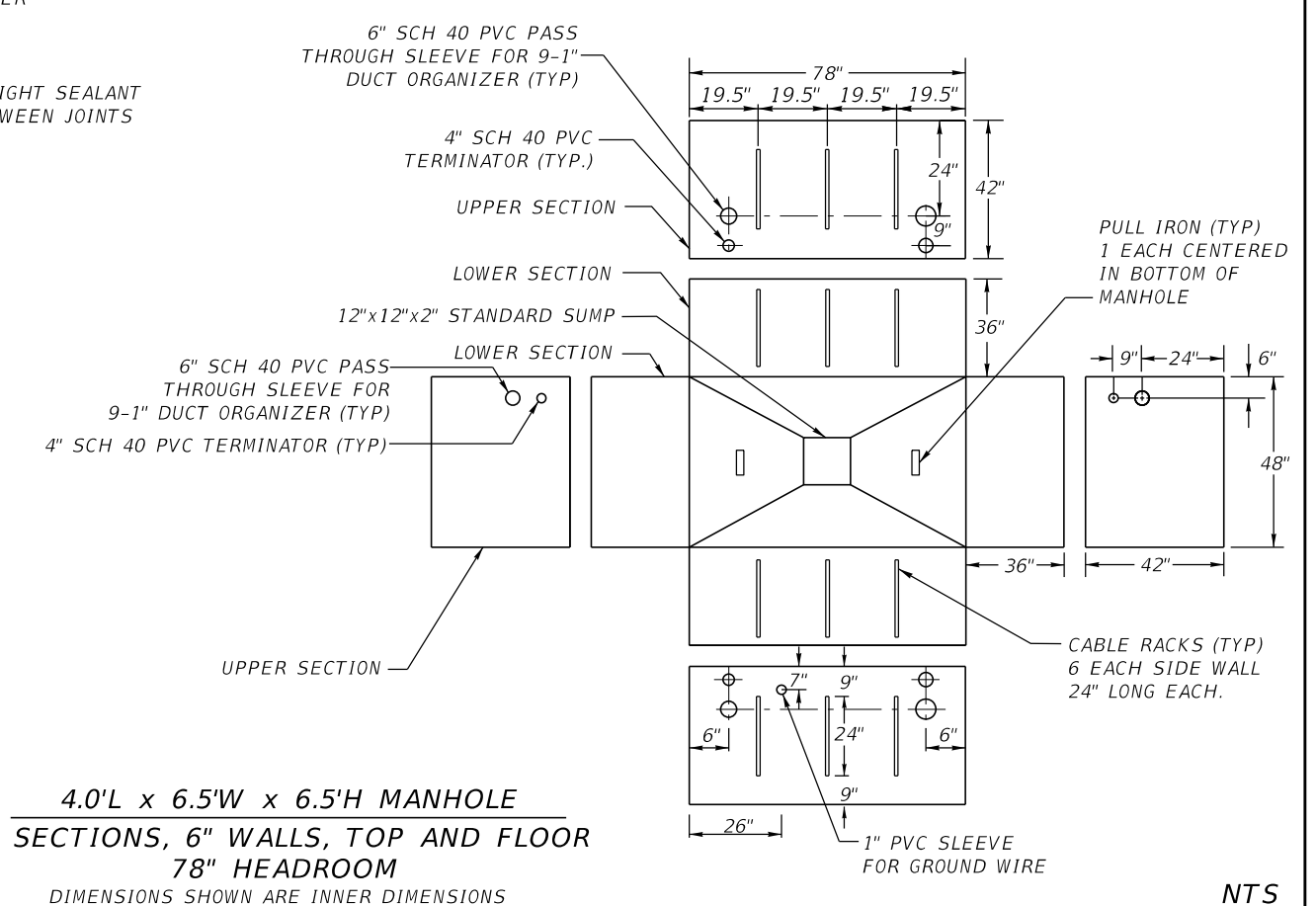


NOTES:  
ADD NOTES FROM SHEET D-2



**60"L X 90"W X 90"H OD RECTANGUALR MANHOLE**  
**42"H LOWER & 48"H UPPER SECTION**

DIMENSIONS SHOWN ARE OUTER DIMENSIONS  
(\*) INNER DIMENSIONS



**4.0'L x 6.5'W x 6.5'H MANHOLE**  
**2 SECTIONS, 6" WALLS, TOP AND FLOOR**  
**78" HEADROOM**

DIMENSIONS SHOWN ARE INNER DIMENSIONS

NTS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

**FOR INFORMATIONAL PURPOSES ONLY**

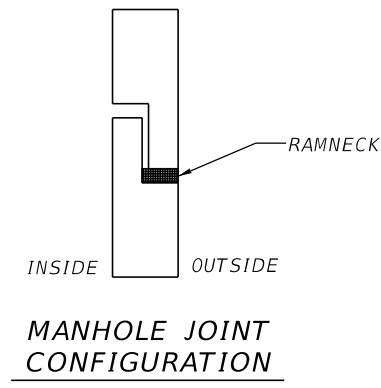
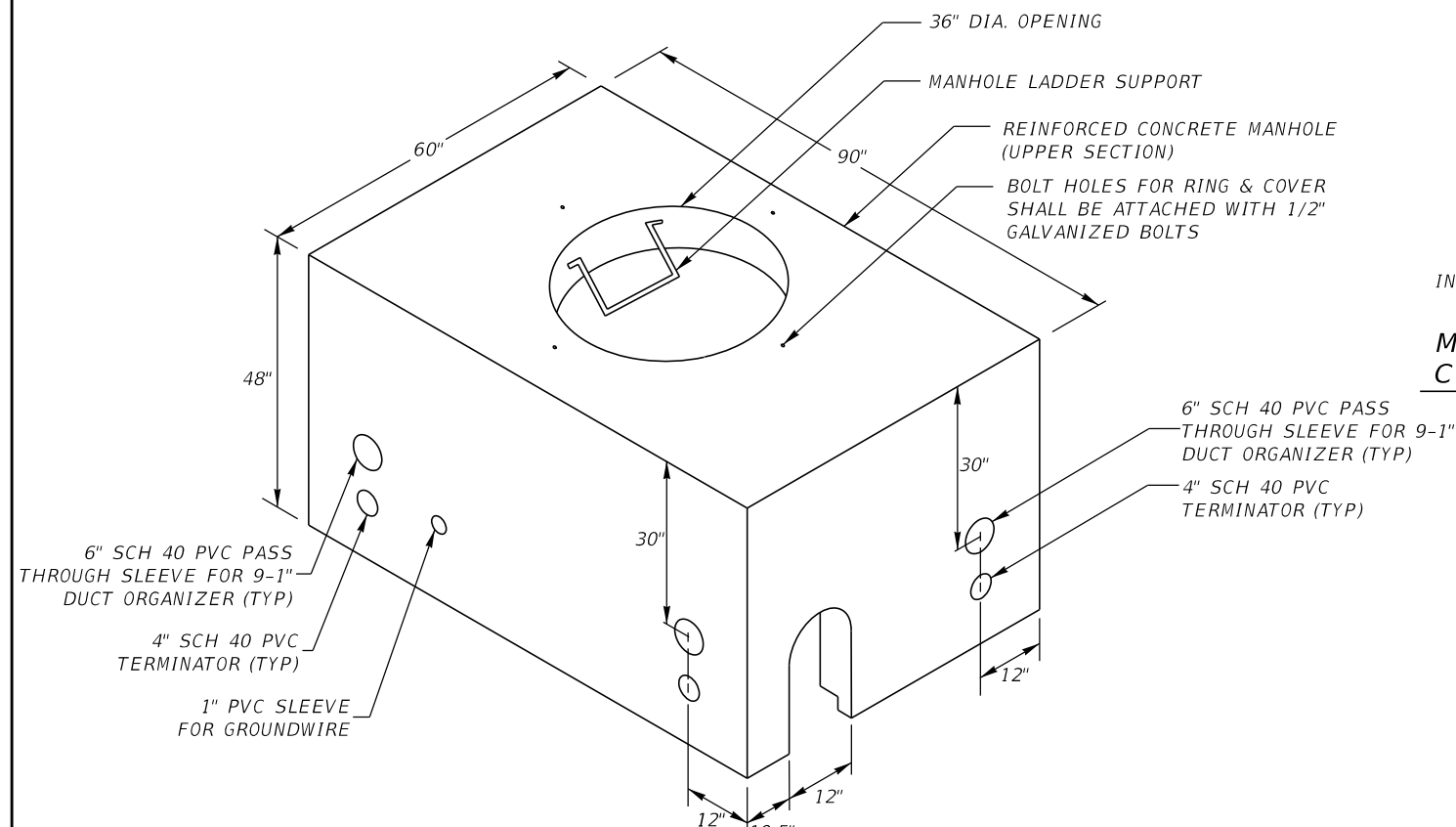
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

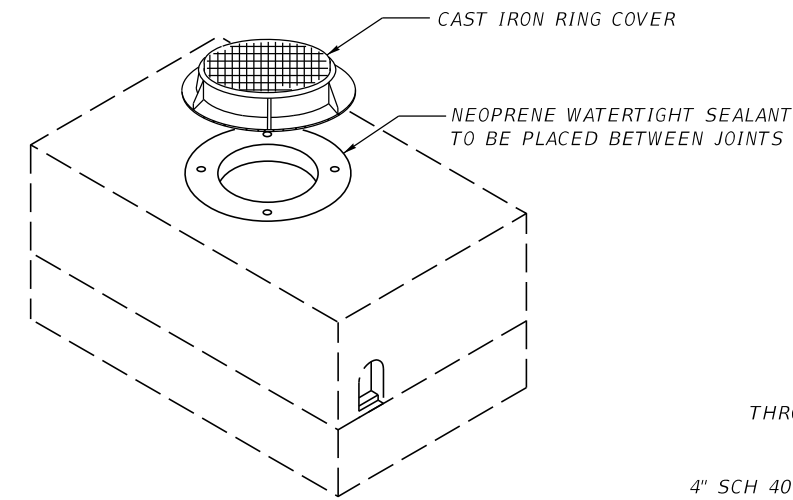
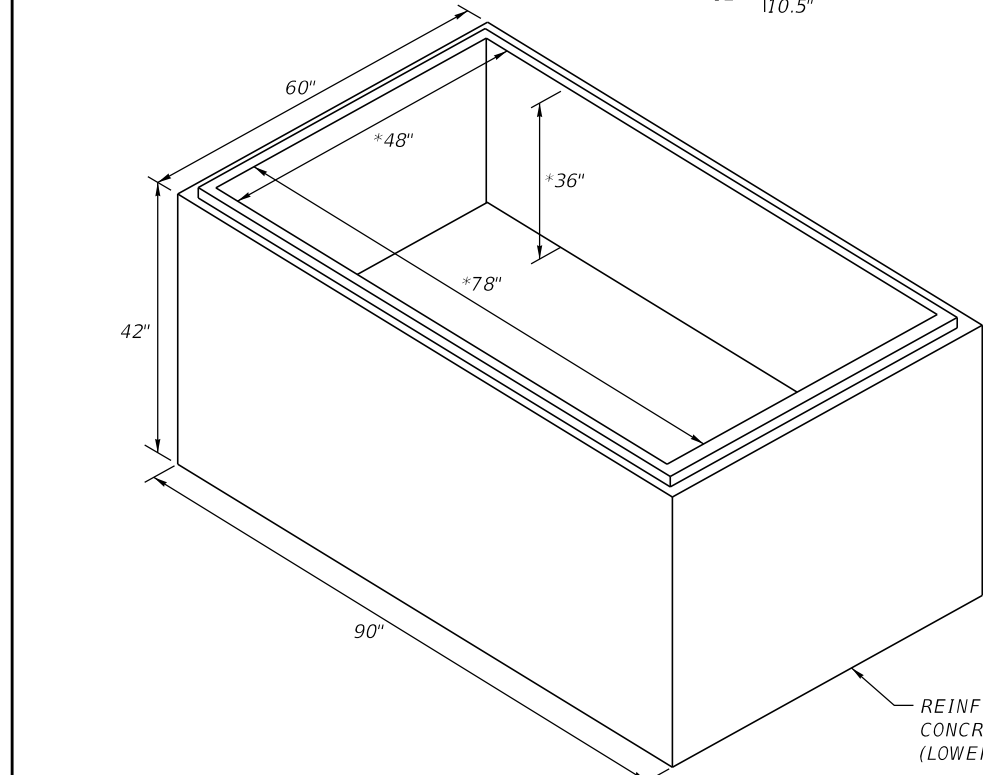
**FIBER OPTIC MANHOLE**  
**DETAIL 4.0' X 6.5' X 6.5'**

SHEET NO.  
D-3

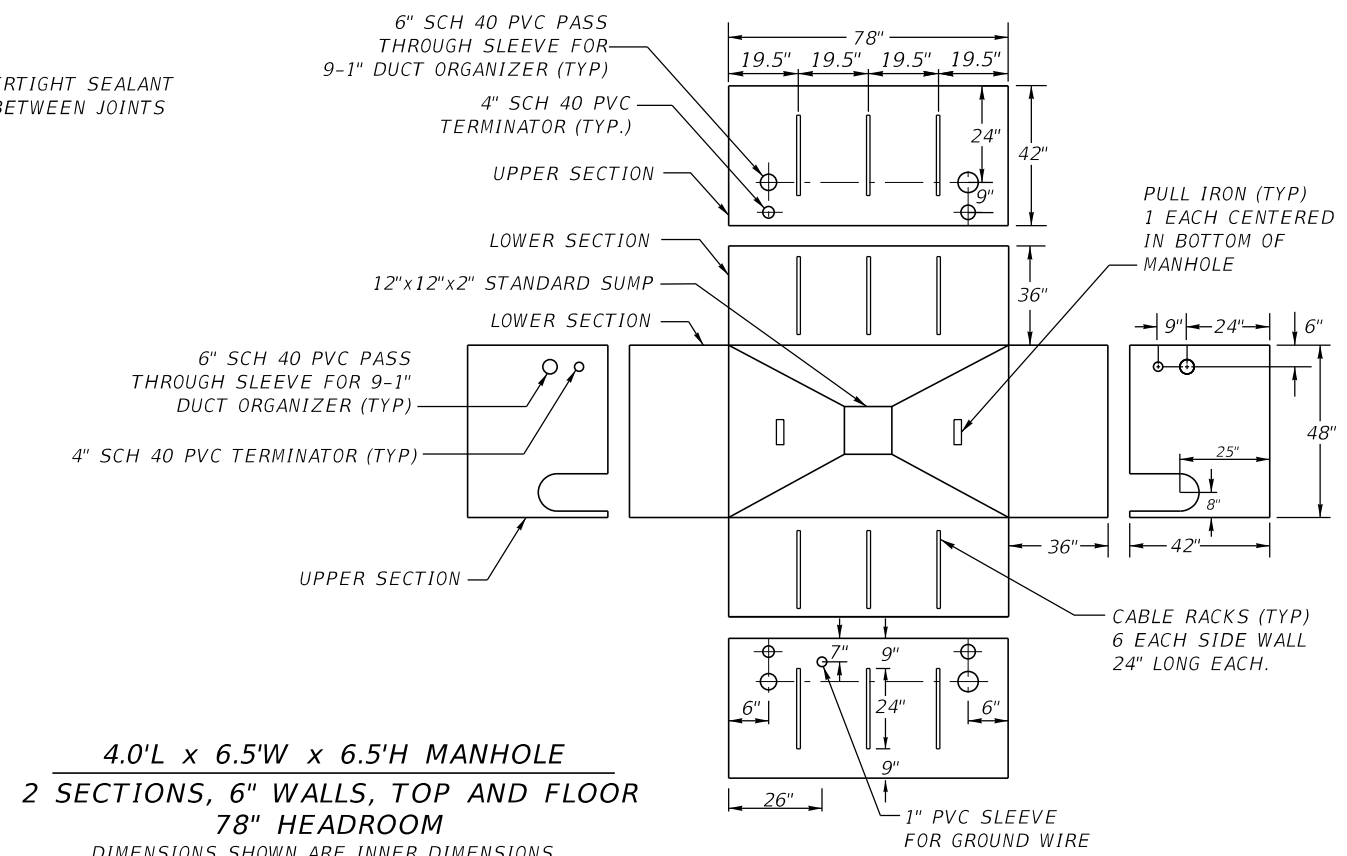
VERSION 6



NOTES:  
 ADD NOTES 1 THRU 11 FROM SHEET D-2  
 12. THE CONTRACTOR SHALL INSTALL THE TONE WIRE AND COIL 20' OF SLACK IN THE MANHOLE. THE CONTRACTOR SHALL ENSURE THAT NO DAMAGE OCCURS TO THE TONE WIRE DURING THE INSTALLATION PROCESS.  
 13. ALL CONDUITS TO EXTEND A MINIMUM OF 12" FROM THE INNERDUCT ORGANIZER.



**60"L X 90"W X 90"H OD RECTANGULAR MANHOLE**  
**42"H LOWER & 48"H UPPER SECTION**  
 DIMENSIONS SHOWN ARE OUTER DIMENSIONS  
 (\*) INNER DIMENSIONS



**4.0'L x 6.5'W x 6.5'H MANHOLE**  
**2 SECTIONS, 6" WALLS, TOP AND FLOOR**  
**78" HEADROOM**  
 DIMENSIONS SHOWN ARE INNER DIMENSIONS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

**FOR INFORMATIONAL PURPOSES ONLY**

**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

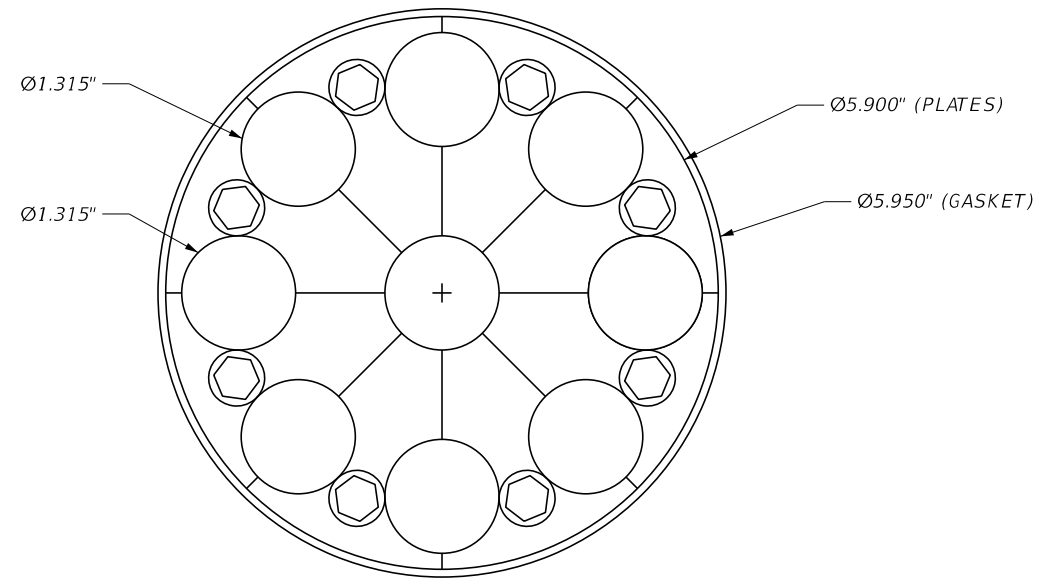
**FIBER OPTIC MANHOLE**  
**DETAIL 4.0' X 6.5' X 6.5'**  
**(DOGHOUSE)**

SHEET NO.  
D-4

NTS

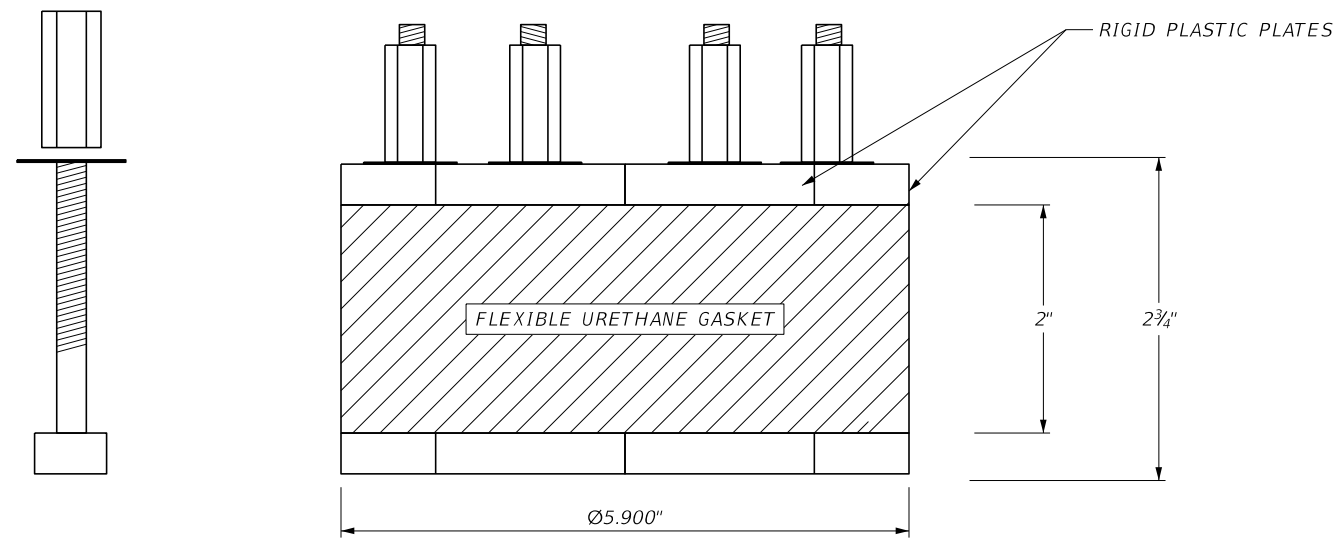
VERSION 6

# TOP VIEW



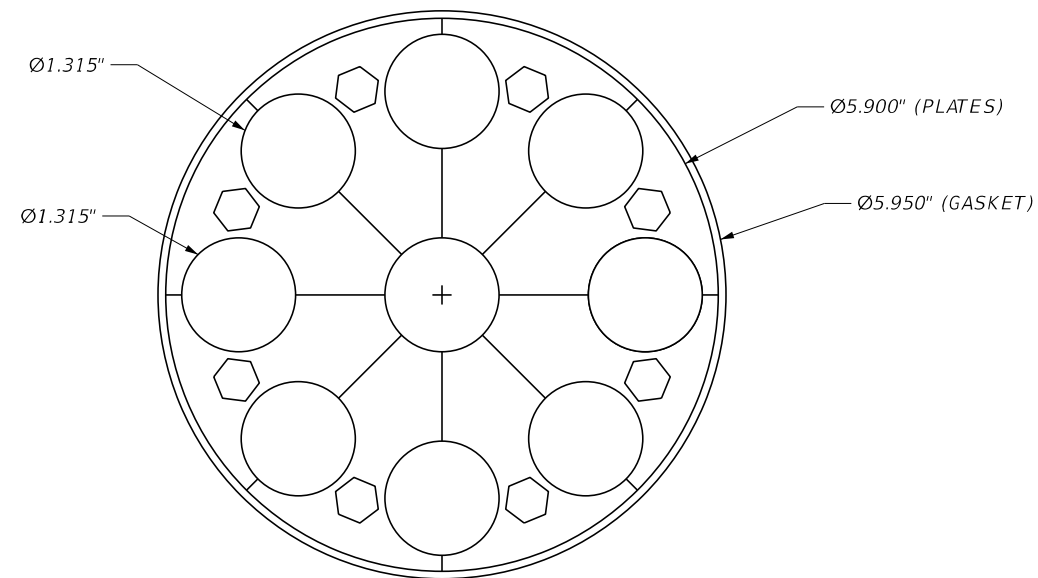
PLUG USES 8-3/4" X 1/4" STAINLESS STEEL BOLTS WITH COUPLER NUTS TO BOTH HOLD THE PIECE TOGETHER AND PROVIDE COMPRESSION WHEN INSTALLED.

# SIDE VIEW



GASKET IS SLIT AND PLATES ARE IN SECTIONS TO ALLOW UNFOLDING OF THE ENTIRE PLUG AND WRAPPING AROUND THE INNER CONDUITS.

# BOTTOM VIEW



NINE HOLES THROUGH THE GASKET CAN BE FORMED TO ANY SIZE UP TO 1.315" DIAMETER.

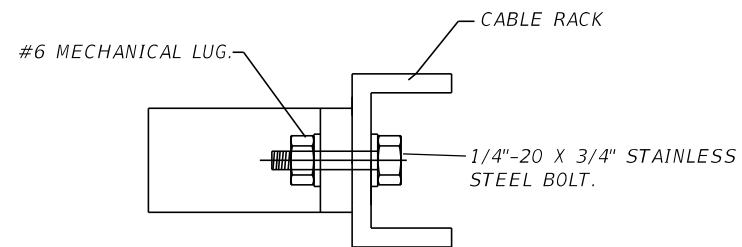
NTS

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	FIBER OPTIC MANHOLE INNERDUCT ORGANIZER	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					D-5

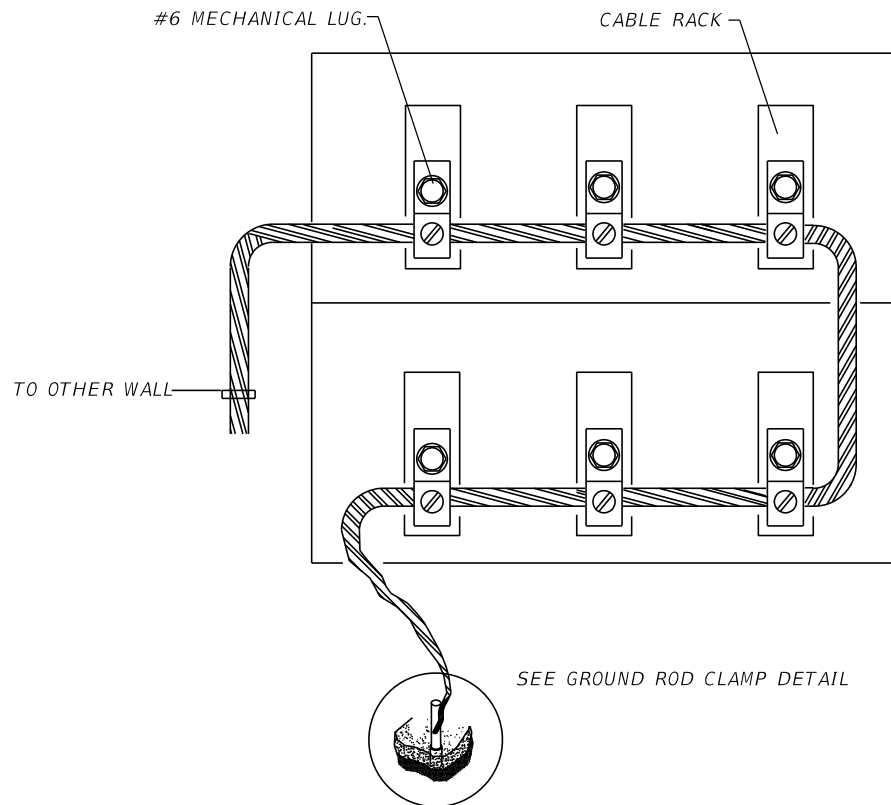
VERSION 6



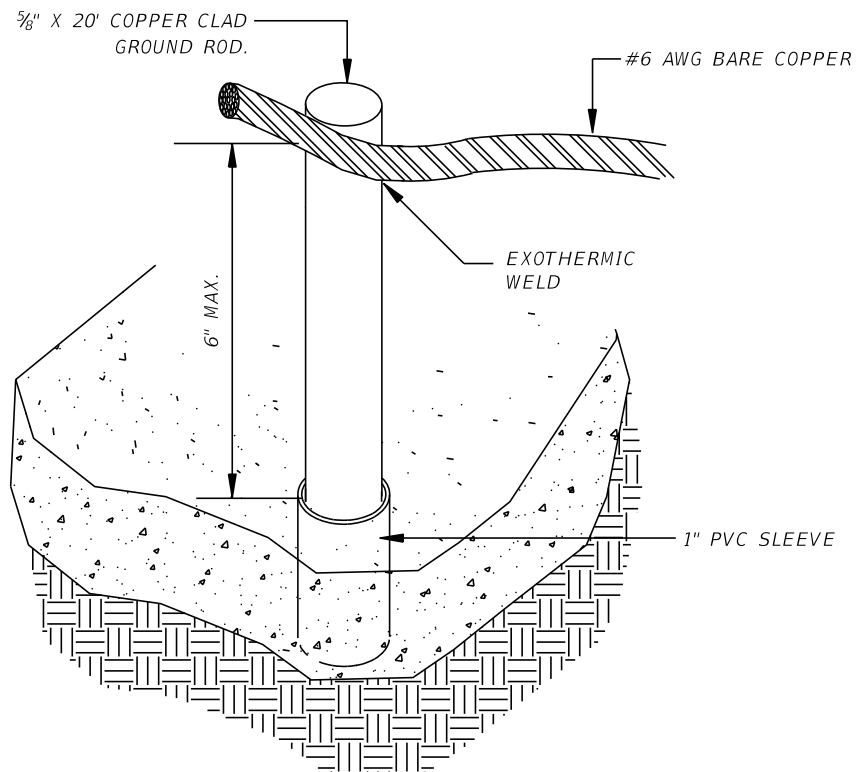
BONDING & GROUNDING DETAIL



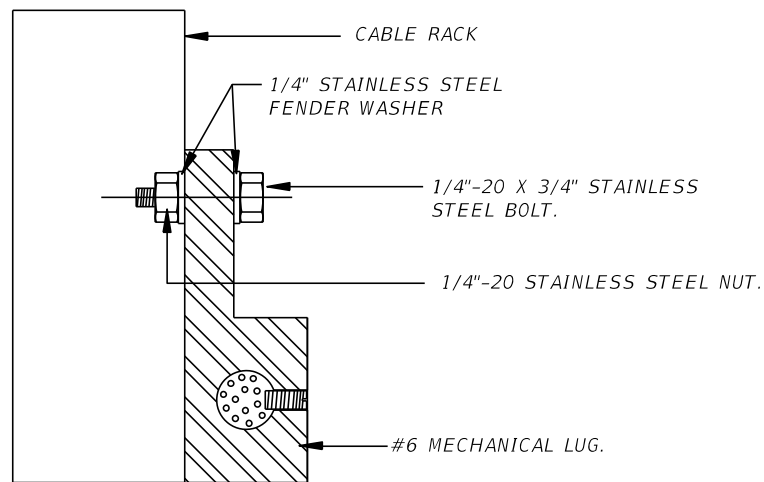
MECHANICAL LUG  
PLAN VIEW



MANHOLE GROUNDING  
TYPICAL WALL



GROUND ROD CLAMP



MECHANICAL LUG  
PROFILE VIEW

ROADWAY AND TRAFFIC DESIGN CALL FOR THE FOLLOWING GENERAL NOTES:

1. GROUND RODS SHALL HAVE A RESISTANCE TO GROUND NOT TO EXCEED 25 OHM. WHERE THE RESISTANCE IS NOT AS LOW AS 25 OHMS, TWO OR MORE ROUND RODS CONNECTED IN PARALLEL SHALL BE USED. CONTRACTOR SHALL HAVE NECESSARY TEST EQUIPMENT (CURRENT CALIBRATION CERTIFICATE REQUIRED) AT FINAL INSPECTION TO INSURE ACCEPTABILITY OF GROUNDING SYSTEM. TOTAL GROUNDING SYSTEM NOT TO EXCEED 10 OHMS.
2. ALL CONNECTIONS BETWEEN BARE COPPER GROUNDING WIRE AND GROUND ROD SHALL BE EXOTHERMIC WELD PER MANUFACTURER STANDARDS.
3. 20' COPPER CLAD GROUND ROD SHALL BE ACHIEVED BY GROUND ROD THREADED COUPLINGS OF THE SAME MATERIAL USED AND ALLOWED PER THE SPECIFICATIONS.

NTS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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CENTRAL FLORIDA  
EXPRESSWAY AUTHORITY

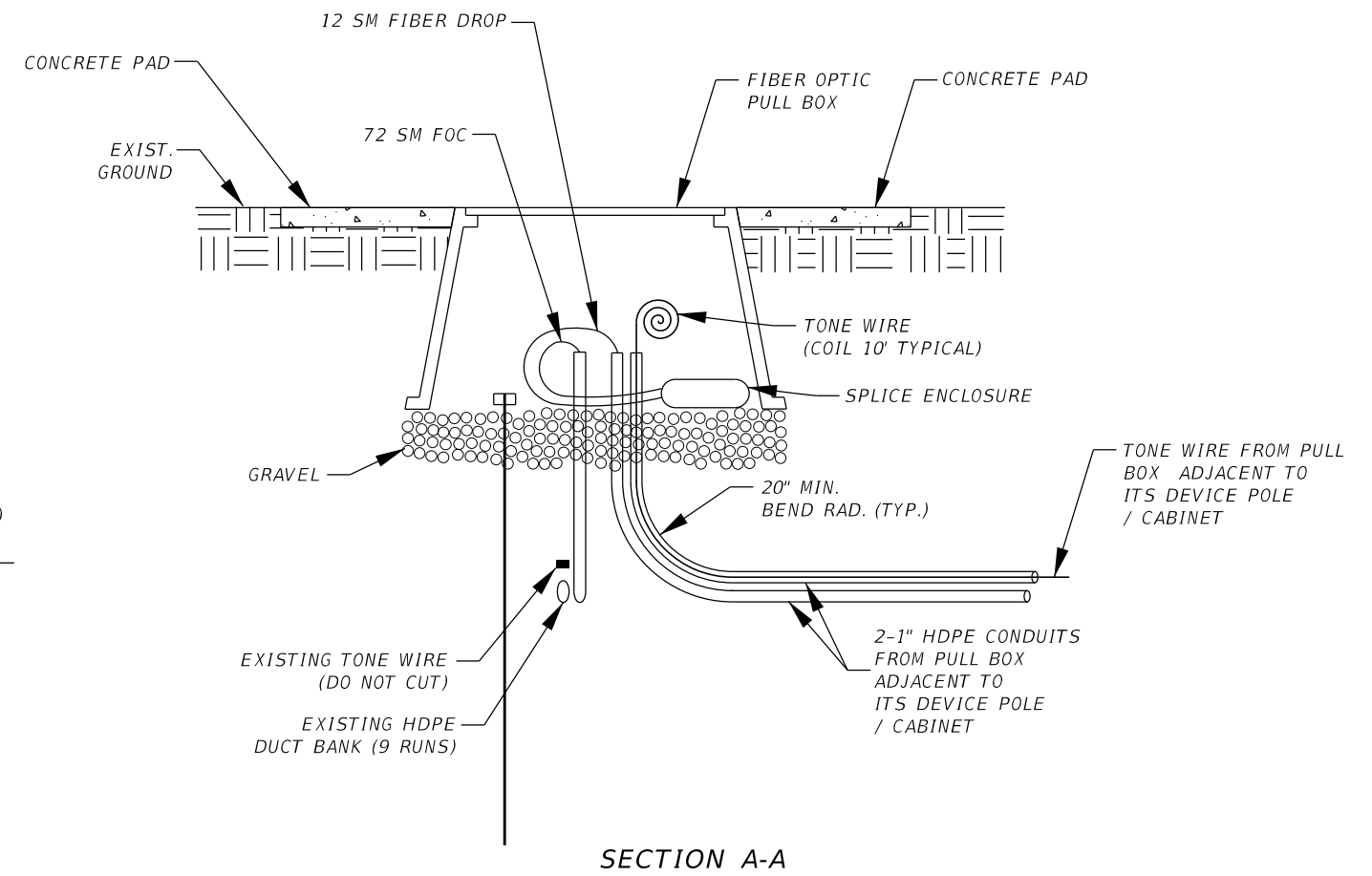
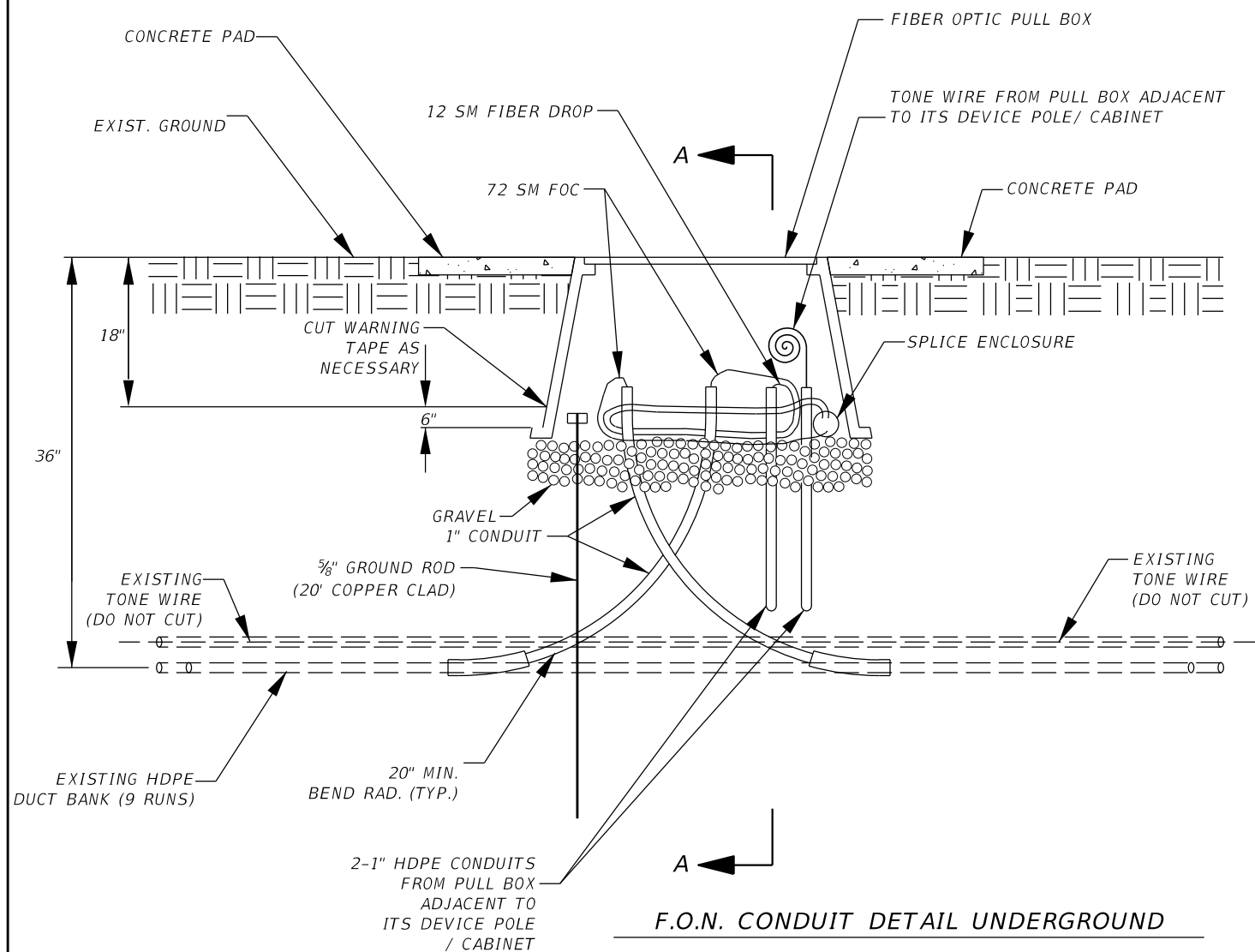
CENTRAL  
FLORIDA  
EXPRESSWAY  
AUTHORITY

**FIBER OPTIC MANHOLE  
GROUNDING DETAILS**

SHEET NO.

D-6

VERSION 6



F.O.N. CONDUIT DETAIL UNDERGROUND

SECTION A-A

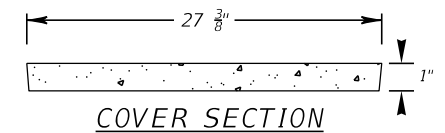
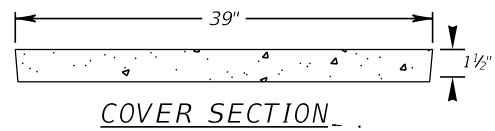
NOTES:

1. CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE EXISTING CONDUIT OR F.O.N. CABLE AND TONE WIRE. ANY DAMAGE SHALL BE REPLACED IN KIND AT THE CONTRACTORS EXPENSE.
2. EXTEND THE FEEDER BLUE CONDUIT INTO THE PULL BOX FOR THE 72 SM FIBER OPTIC CABLE.
3. INSTALLATION OF PULL BOX, ASSOCIATED EQUIPMENT AND MATERIALS SHALL BE PAID UNDER THE PULL BOX PAY ITEM.
4. EXTEND AND COIL TONE WIRE INTO PULL BOX. DO NOT SPLICE INTO EXISTING TONE WIRE.
5. FIBER GLASS LIDS SHALL BE 20,000 LB RATED.
6. TONE WIRE SHALL BE CONTINUOUS RUN FROM PULL BOX TO PULL BOX ADJACENT TO ITS DEVICE POLE/CABINET.
7. ALL FIBER OPTIC CABLE PULL BOXES ADJACENT TO THE ITS DEVICE POLES AND CABINETS NOT TIED TO THE LINE MANAGEMENT SYSTEM (LMS) SHALL HAVE 20 FEET OF GROUND ROD INSTALLED IN ORDER TO GROUND THE TONE GENERATOR.
8. THE TONE WIRE SHALL NOT ENTER INTO THE ITS CABINET BUT TERMINATE IN THE PULL BOX ADJACENT TO THE ITS DEVICE CABINET WITH A COIL OF 10 FEET.

NTS

VERSION 6

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	FIBER OPTIC PULL BOX DETAIL TO DEVICE PULL BOX	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					E-1



3#8 STAINLESS STEEL PENTABOLT W/ WASHER (3)

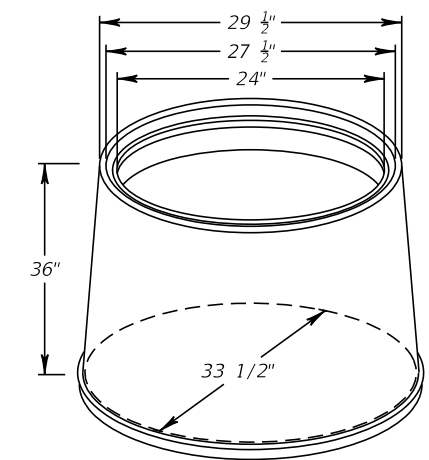
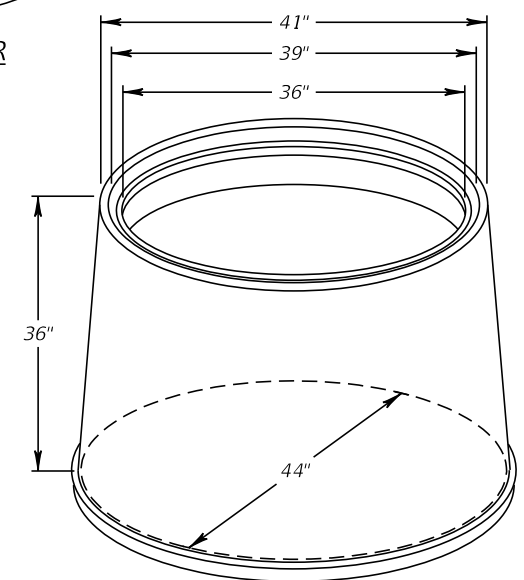
3#8 STAINLESS STEEL PENTABOLT W/ WASHER (3)

1/2" X 4" PULL SLOT  
"CFX FIBER" STAMP  
0.5 COF SKID RESISTANT SURFACE

1/2" X 4" PULL SLOT  
"CFX FIBER" STAMP  
0.5 COF SKID RESISTANT SURFACE

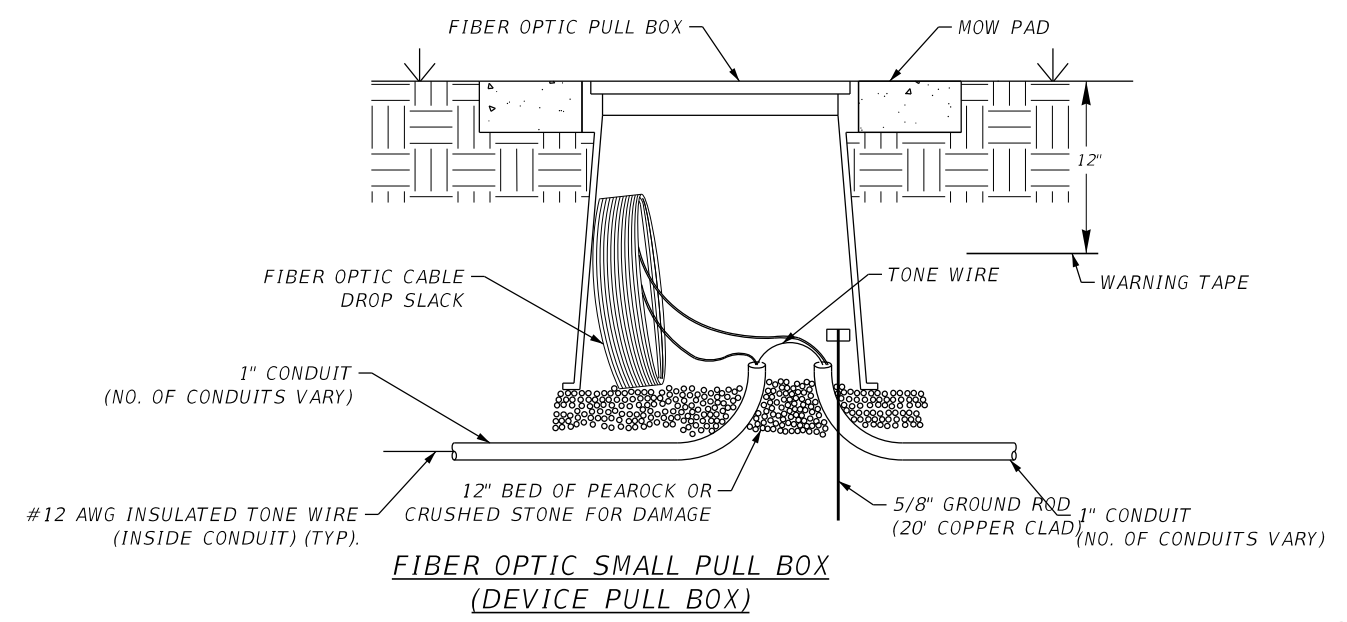
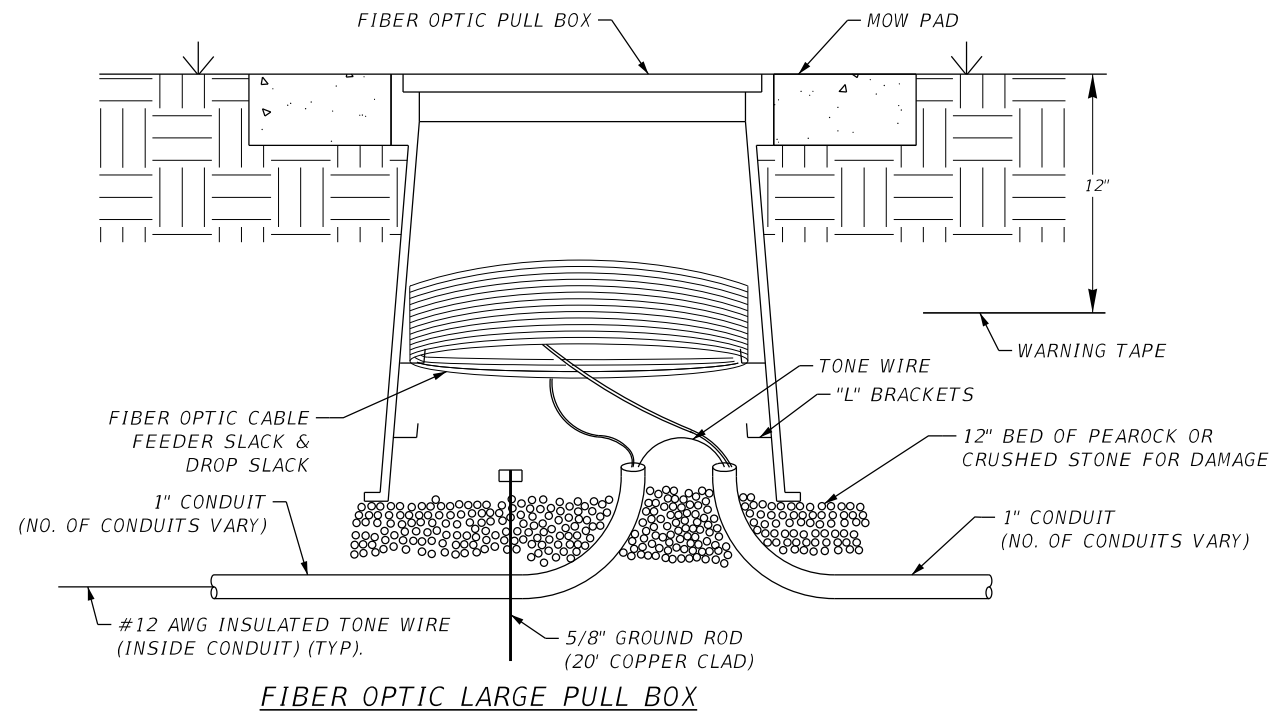
**LARGE COVER**

**SMALL COVER**



**FIBER OPTIC PULL BOX NOTES:**

1. SPARE FIBER OPTIC CABLE IS TO BE WOUND NEATLY AND CAREFULLY, AS NOT TO EXCEED THE MAXIMUM BENDING RADIUS OF THE FIBER OPTIC CABLE.



**FIBER OPTIC LARGE PULL BOX**

**FIBER OPTIC SMALL PULL BOX (DEVICE PULL BOX)**

NTS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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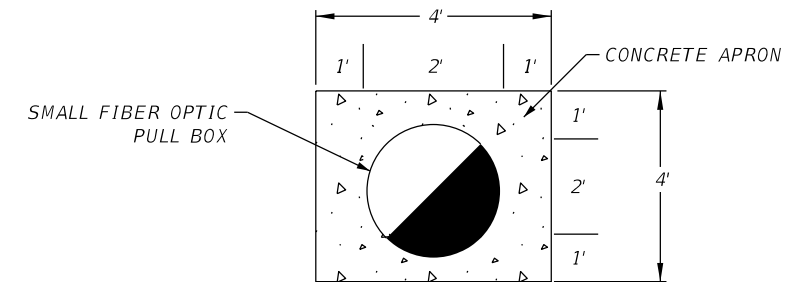
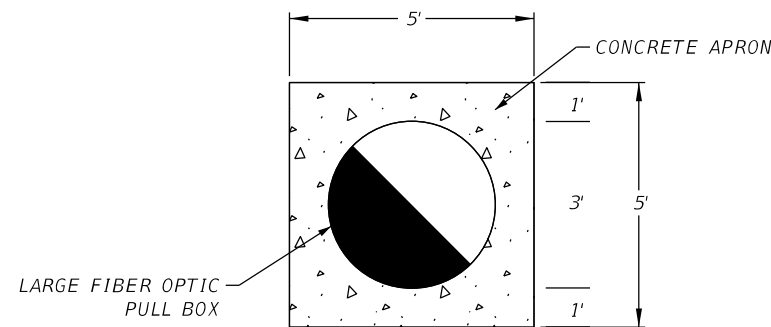
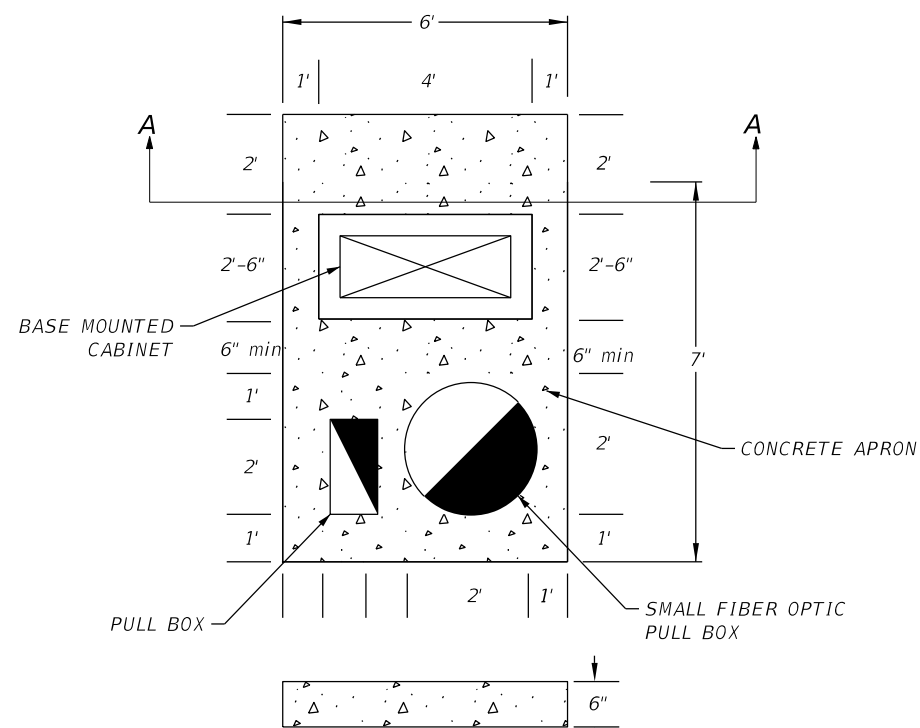
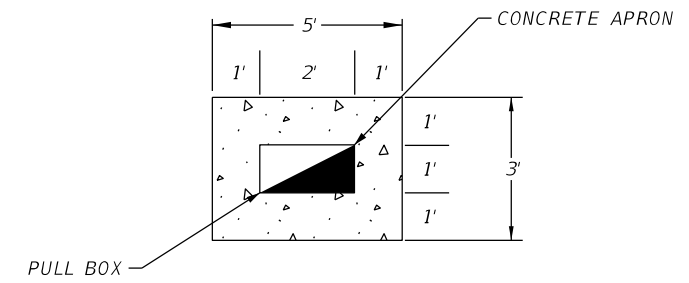
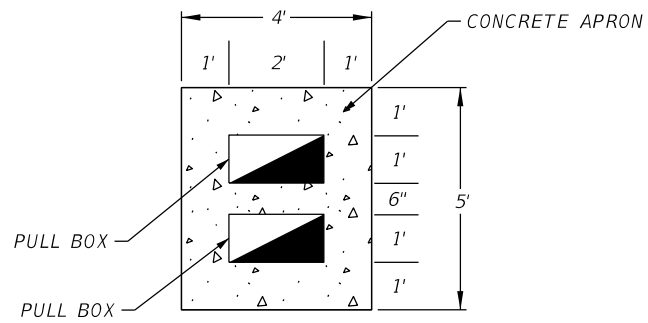
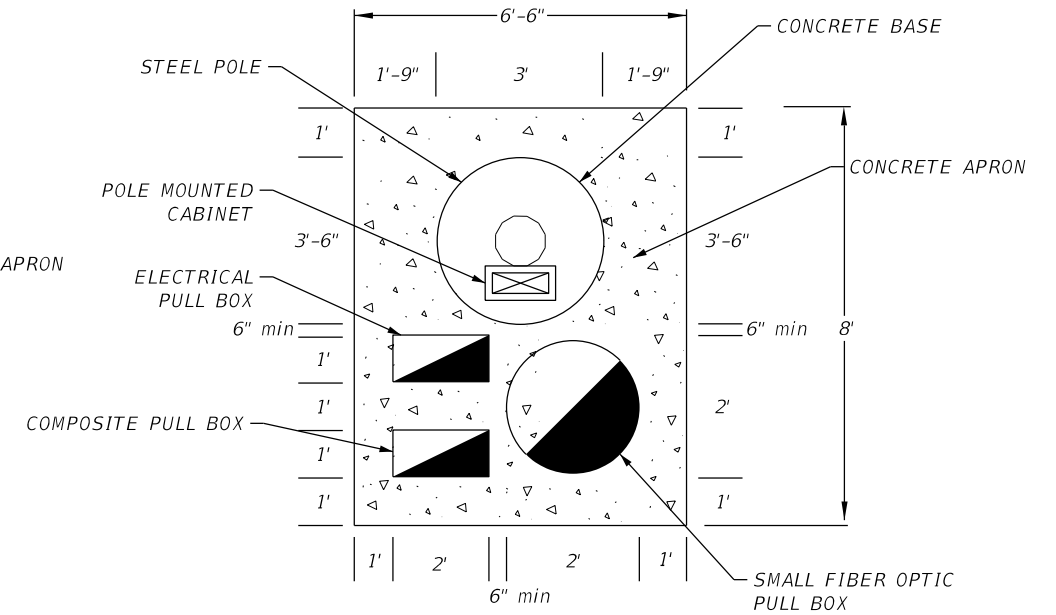
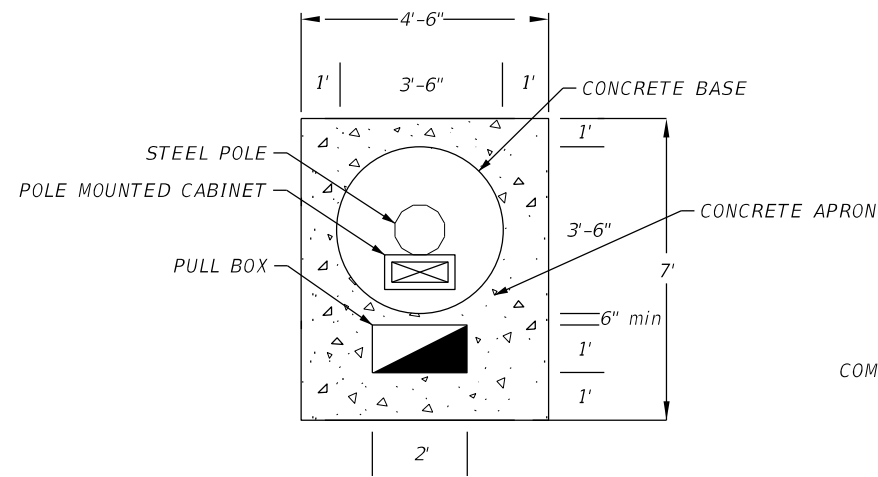
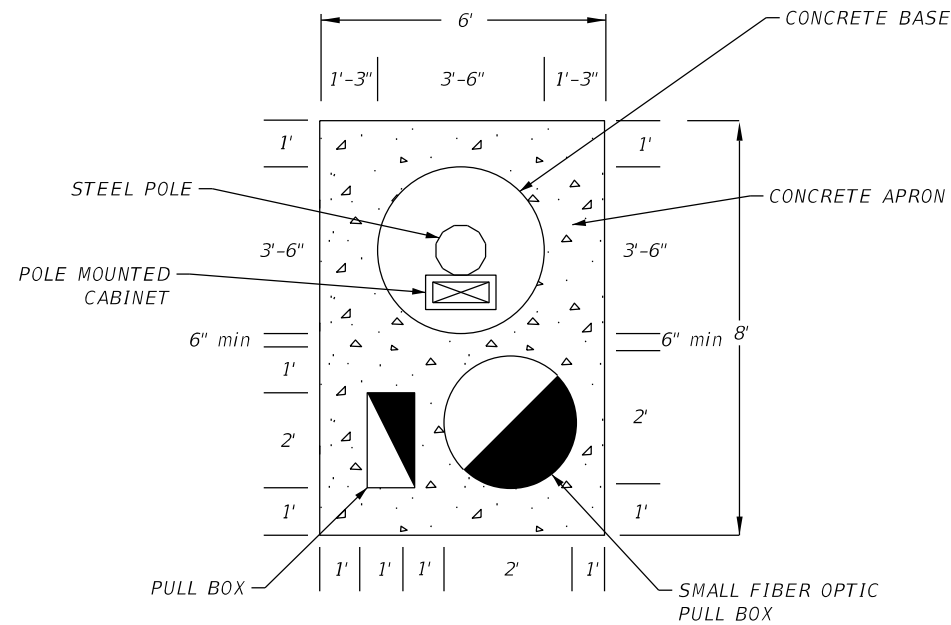
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**FIBER OPTIC PULL BOX DETAILS**

SHEET NO.  
E-2

VERSION 6

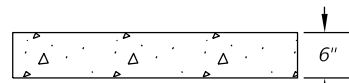
**CONCRETE MOW PAD DETAILS**



**NOTES:**

1. ALL CONCRETE MOW PADS SHALL BE 6" THICK.

**CROSS SECTION A-A**



NTS

REVISIONS					
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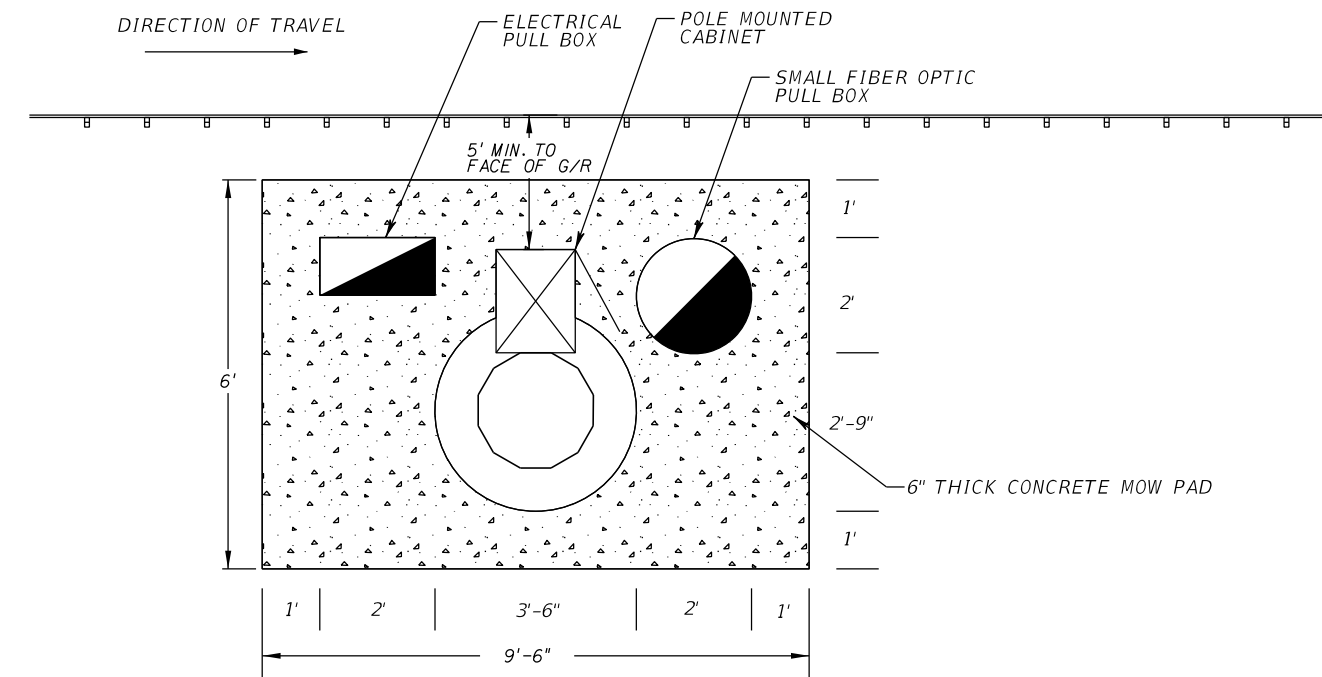
**TYPICAL CONCRETE PULL BOX MOW PAD DETAILS**

SHEET NO.

E-3

VERSION 6

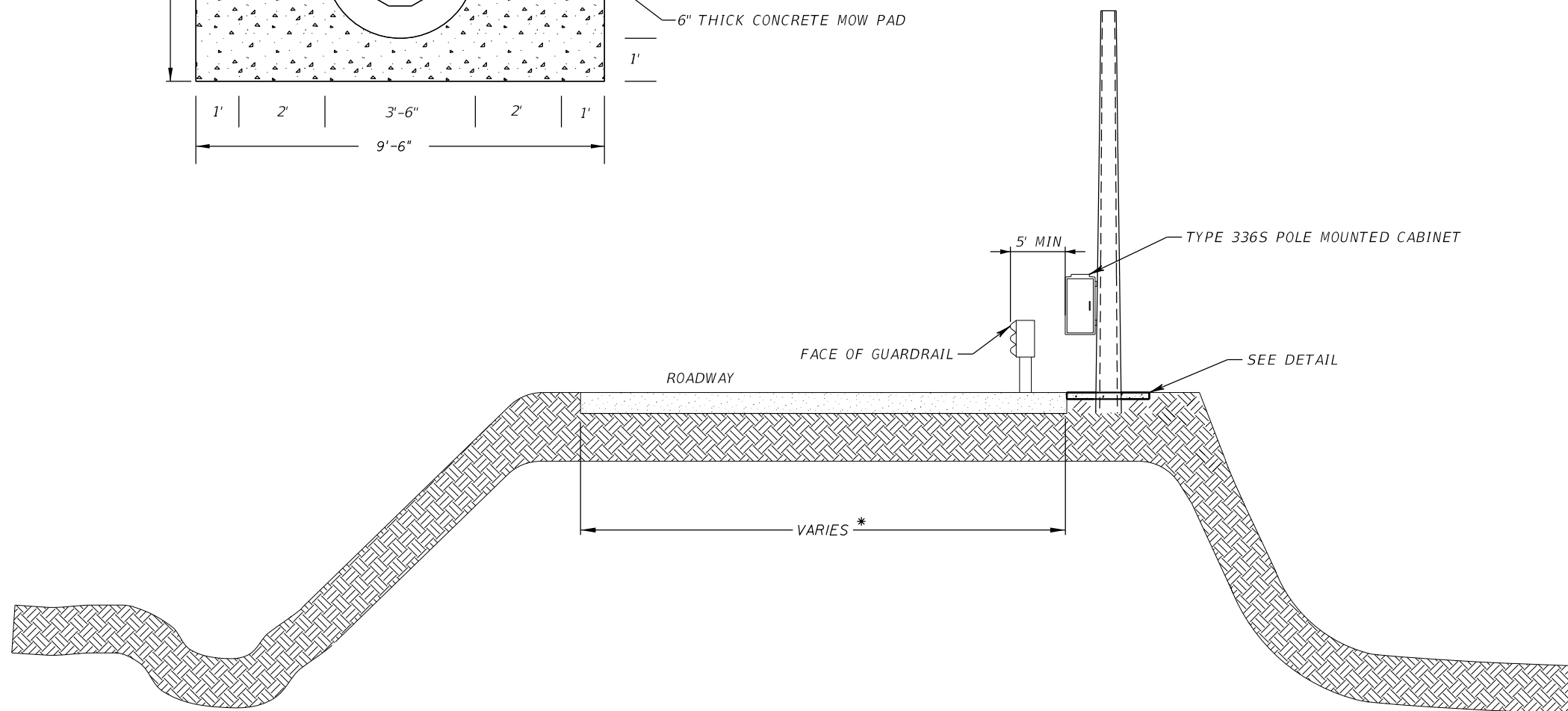
TYPICAL CONCRETE PAD DETAIL ON SLOPES  
N.T.S.



NOTES:

1. NUMBER OF PULL BOXES AND CONFIGURATION TO BE PER PLANS. MINIMUM SPACING IS TO BE MAINTAINED AS SHOWN.
2. PULL BOX ON SLOPE MAY BE MOVED TO FLAT GRADE, BUT SLOPE PROTECTION IS TO REMAIN FOR EROSION CONTROL.

\*VARIES: TO TIE INTO MISC. ASPHALT



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AUTHORITY

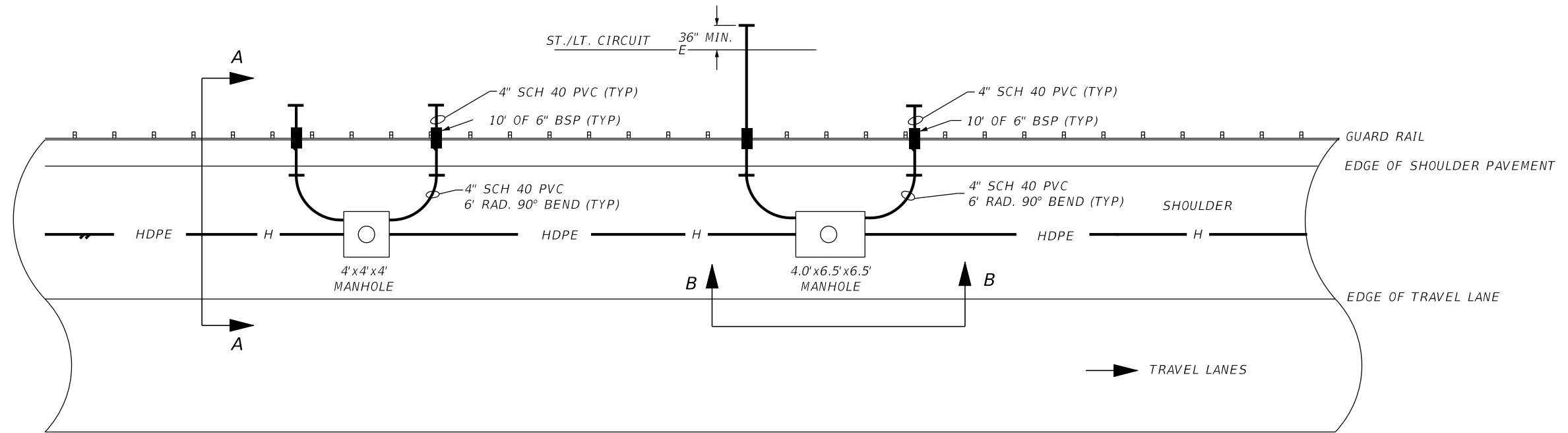
**TYPICAL CONCRETE MOW PAD  
DETAIL FOR SLOPES**

SHEET NO.

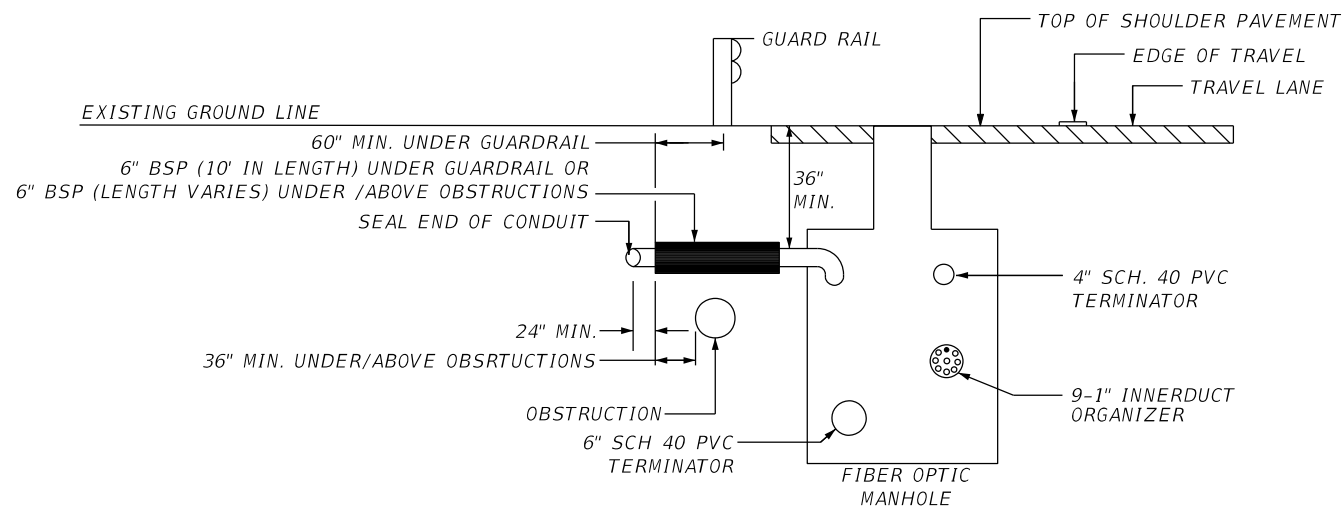
E-4

VERSION 6

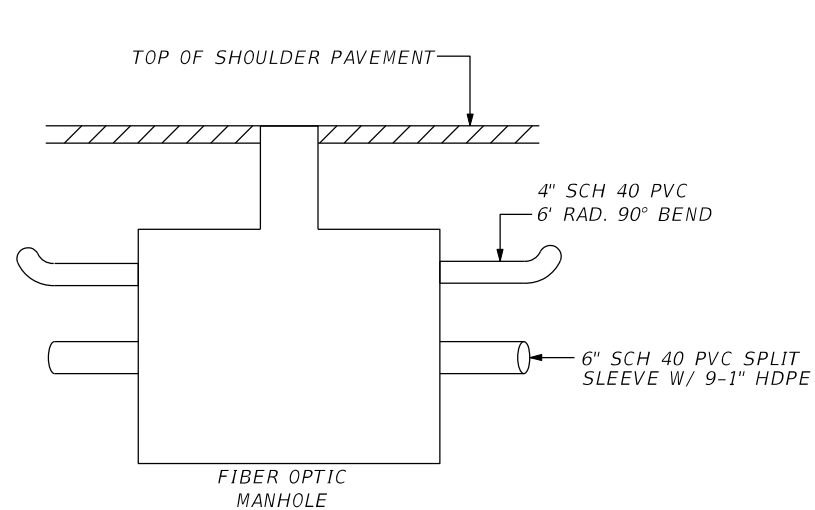
LATERAL CONDUIT FROM MANHOLE DETAIL



PLAN VIEW



SECTION A-A



SECTION B-B

NOTES:

1. ALL MANHOLES INSTALLED UNDER THE PAVED SHOULDER REQUIRE 4" LATERAL CONDUIT AS SHOWN IN DETAILS ABOVE.
2. THE 4" LATERAL CONDUIT SHALL BE EQUIPPED WITH 2-1" HDPE AND SHALL EXTEND A MINIMUM OF 24" BEYOND BSP.
3. LATERAL CONDUITS SHALL BE SEALED IN MANHOLE AND AT END OF CONDUIT.
4. PAYMENT FOR THE 4" SCH. 40 PVC 90° SWEEP LATERAL CONDUIT & 6" BSP SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE MANHOLE AND SHALL BE INCLUDED IN THE COST OF THE MANHOLES.

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REVISIONS

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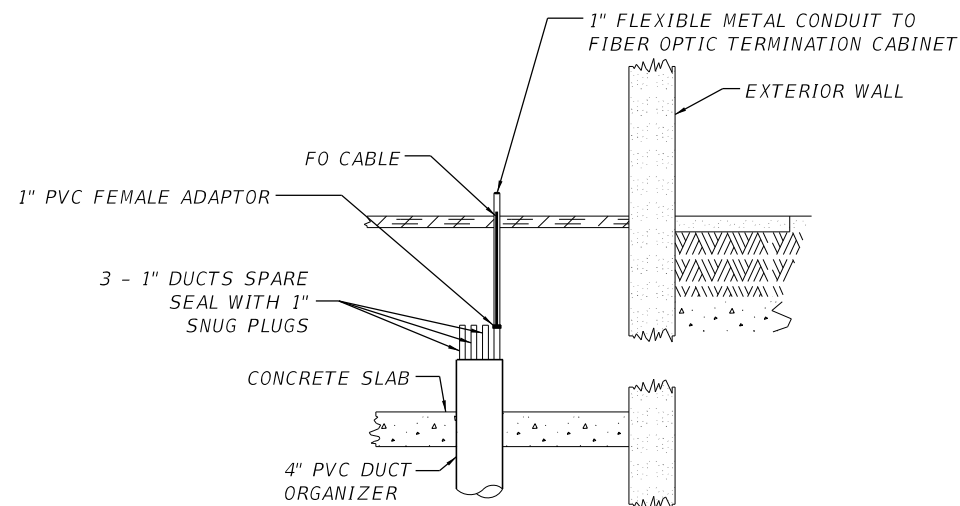
FIBER OPTIC MANHOLE STUBOUT DETAIL

SHEET NO.

E-5

VERSION 6

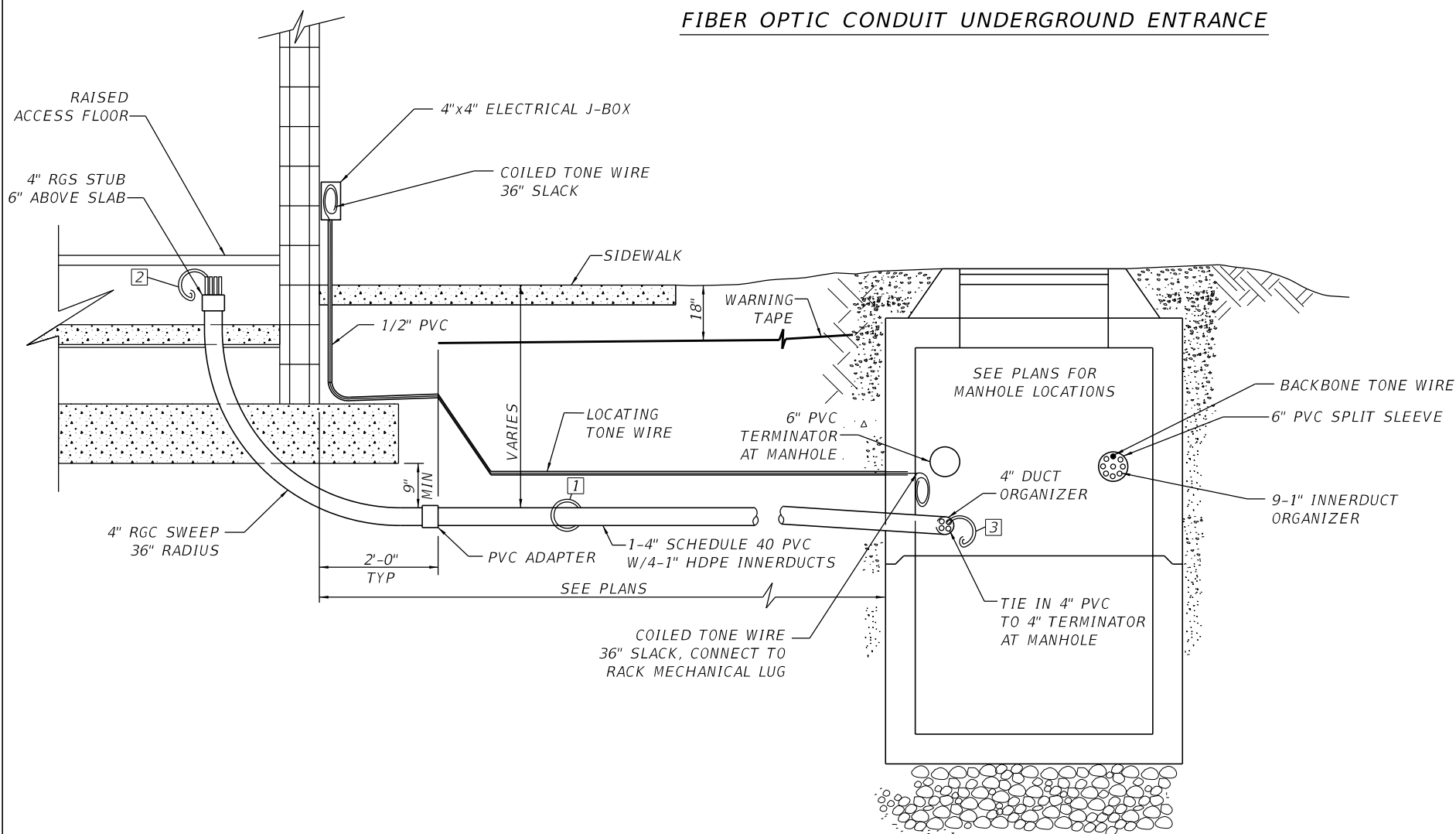




**FIBER OPTIC CONDUIT UNDERGROUND ENTRANCE**

**NOTES:**

1. HAND DIG AS NEEDED TO EXPOSE ANY EXISTING UTILITIES.
2. ALL CONDUITS TO EXTEND A MINIMUM OF 12" FROM THE INNERDUCT ORGANIZER.
3. IF CONDUIT TO BE INSTALLED IS LESS THAN 36" DEEP:
  - A. USE RGC OR
  - B. CONCRETE ENCASED WITH 3" OF 3000 PSI CONCRETE
4. ALL CONCRETE PENETRATIONS AROUND CONDUITS SHALL BE WATERPROOF.
5. PAYMENT FOR THE 9-1" INNERDUCT ORGANIZER SHALL BE CONSIDERED INCIDENTAL TO THE COST OF FON SYSTEM INSTALLATION.
6. LATERAL TONE WIRE SHALL BE LOCATED IN THE 4" CONDUIT BETWEEN THE MANHOLE AND THE FIBER OPTIC PULL BOX. SEE DETAIL. LATERAL TONE WIRE SHALL BE PULLED WITH THE INTERDUCT AND SHALL BE SPLICED TO THE BACKBONE TONE WIRE.



**FIBER OPTIC CONDUIT JUNCTION BOX ENTRANCE AT TOLL PLAZA**

**REFERENCE NOTES:**

1. INSTALL FIBER OPTIC CABLE 72 SINGLE MODE.
2. LEAVE 100' OF SLACK FIBER OPTIC CABLE COILED UNDER RAISED FLOOR.
3. LEAVE 100' OF SLACK FIBER OPTIC CABLE COILED IN UTILITY VAULT.

NTS

VERSION 6

REVISIONS					
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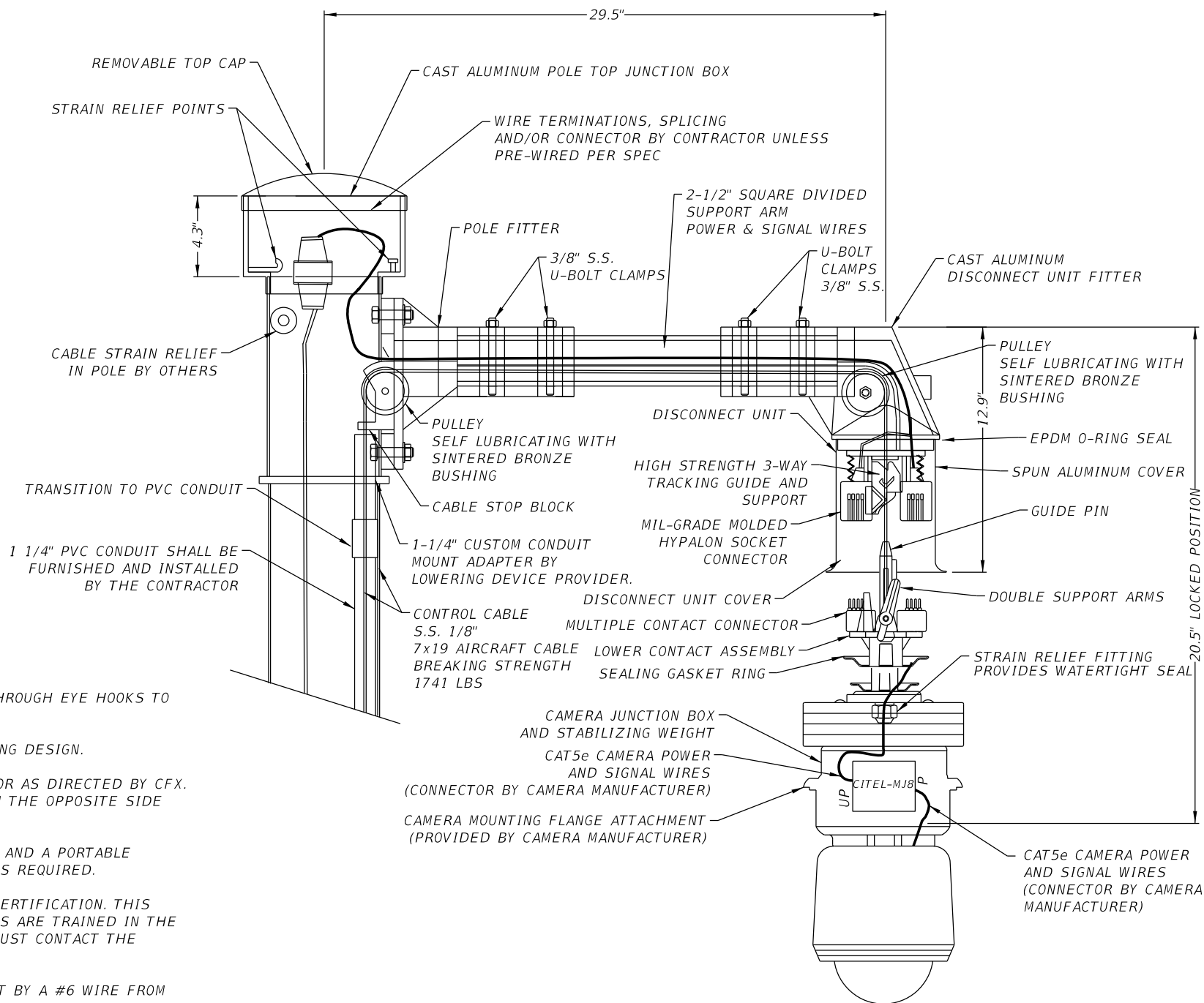
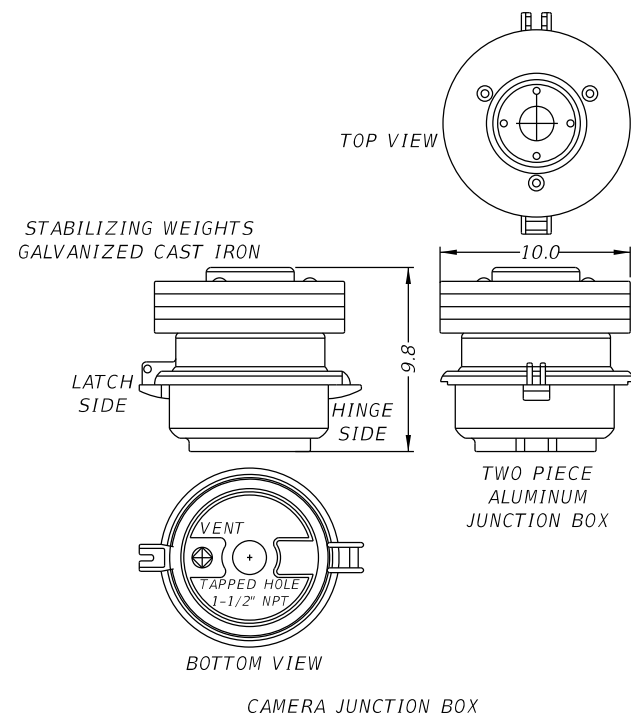
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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FIBER OPTIC NETWORK  
TOLL PLAZA ENTRANCE DETAIL

SHEET NO.

E-6



NOTES:

- INTERNAL CAMERA SUPPLY CABLES RUN THROUGH THE INSIDE OF THE POLE SHALL BE INSTALLED THROUGH EYE HOOKS TO PREVENT INTERFERENCE WITH LOWERING MECHANISM CABLE, UNLESS OTHERWISE NOTED.
- CAMERA LOWERING DEVICE DETAILS ARE REPRESENTATIVE AND DO NOT REFLECT ACTUAL ENGINEERING DESIGN.
- LOWERING ARM SHALL BE MOUNTED PERPENDICULAR TO THE ROADWAY OR AS SHOWN IN THE PLANS OR AS DIRECTED BY CFX. THE CCTV POLE SHALL BE POSITIONED SO THAT THE DOME ENCLOSURE CAN BE SAFELY LOWERED ON THE OPPOSITE SIDE OF THE HAND CRANK.
- [MG]2 INC. PART NO. LWR5-100 FOR THE PORTABLE LOWERING TOOL WITH BOTH MANUAL HAND CRANK AND A PORTABLE ELECTRIC DRILL MOTOR WITH CUSTOM CLUTCH ADAPTER. ONE LOWERING TOOL PER EVERY 10 POLES IS REQUIRED.
- [MG]2 INC. PART NO. CLDMG2-ON SITE IS FOR ON SITE INSTALLATION/OPERATION INSTRUCTION AND CERTIFICATION. THIS ENSURES THE PRODUCT IS ASSEMBLED CORRECTLY AND MORE IMPORTANTLY ALL NECESSARY PERSONS ARE TRAINED IN THE PROPER SAFE OPERATION OF THE SYSTEM. PRIOR TO ERECTING THE FIRST POLE THE CONTRACTOR MUST CONTACT THE LOWERING DEVICE SUPPLIER AND SCHEDULE FOR A FACTORY REPRESENTATIVE TO BE ON SITE.
- DIN RAIL IN CAMERA JUNCTION BOX SHALL BE ELECTRICALLY GROUNDED TO THE STABILIZING WEIGHT BY A #6 WIRE FROM THE END OF THE DIN RAIL TO A RING TERMINAL TO THE WEIGHT VIA SCREW.
- CAMERA LOWERING SYSTEM, [MG]2 INC. MODEL NOS. (DESIGNER TO ENTER MODEL # BASED OFF CFX SPECIFICATIONS) TO INCLUDE POLE TOP J-BOX, MOUNTING HARDWARE, LOWERING CABLE, MOLDED HYPALON CONTACT BLOCK, CAMERA J-BOX, HOUSING, CUSTOM XX FT AS INDICATED IN THE PLANS.
- CAMERA LOWERING DEVICE TO BE SHIPPED READY FOR POLE ATTACHMENT TO INCLUDE ADEQUATE CAT5e CABLE PRE-WIRED TO LOWERING DEVICE AT THE FACTORY. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ADEQUATE CABLE LENGTH BETWEEN EACH CCTV LOWERING DEVICE ASSEMBLY.
- CAMERA LOWERING DEVICE TO BE POWDER COATED FLAT BLACK BY MANUFACTURER.

NTS

VERSION 6

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

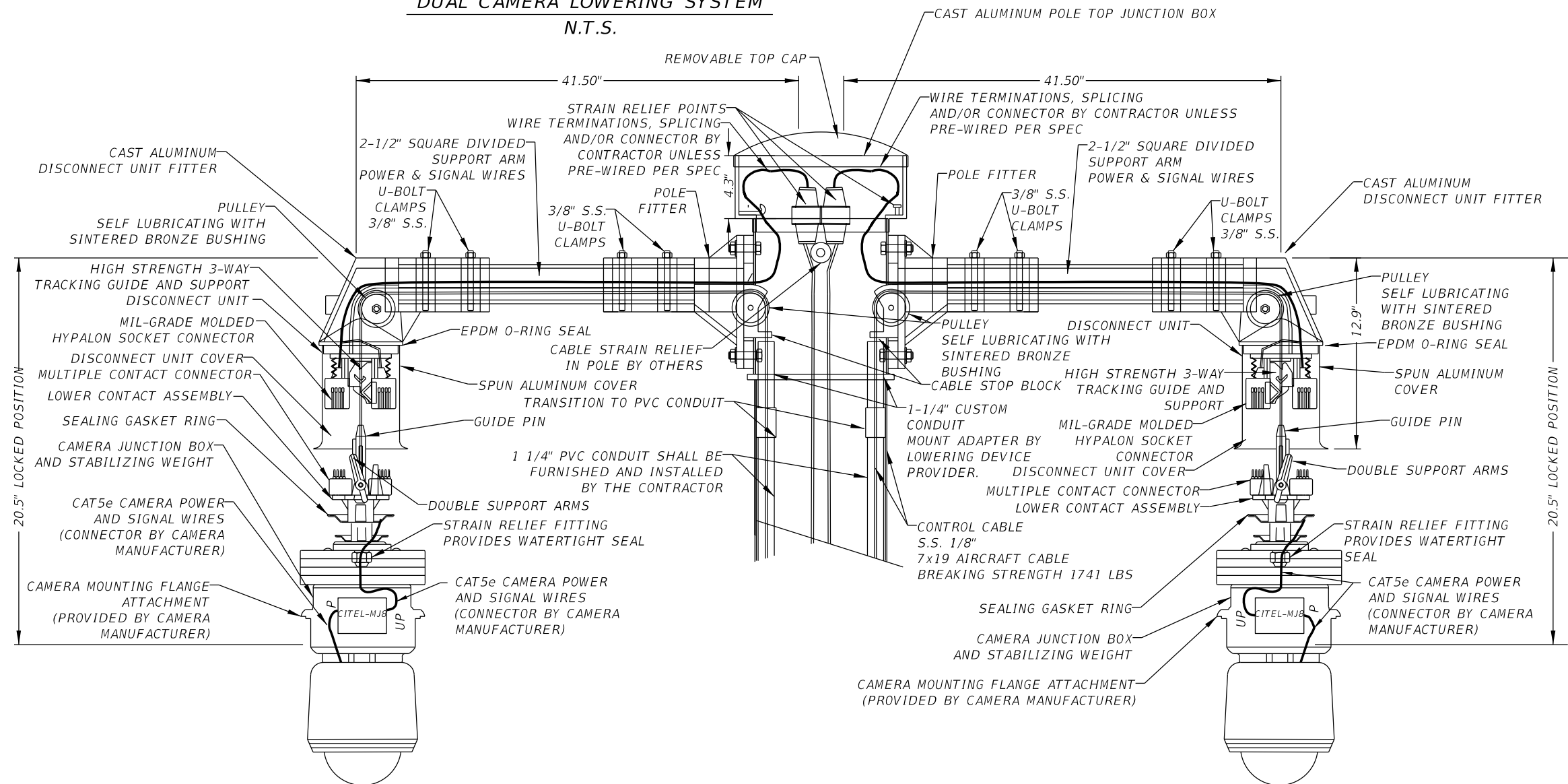
CCTV CAMERA LOWERING DEVICE DETAIL

SHEET NO.

F-1

DUAL CAMERA LOWERING SYSTEM

N.T.S.



NOTES:

1. CAMERA LOWERING SYSTEM, [MG]2 INC. MODEL NOS. TO BE ENTERED BY DESIGNER BASED OFF CFX SPECIFICATIONS (DUAL) TO INCLUDE POLE TOP J-BOX, MOUNTING HARDWARE, LOWERING CABLE, MOLDED HYPALON CONTACT BLOCK, CAMERA J-BOX, HOUSING, CUSTOM XX FT AS INDICATED IN THE PLANS.
2. SEE SHEET F-1 FOR ADDITIONAL NOTES.

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

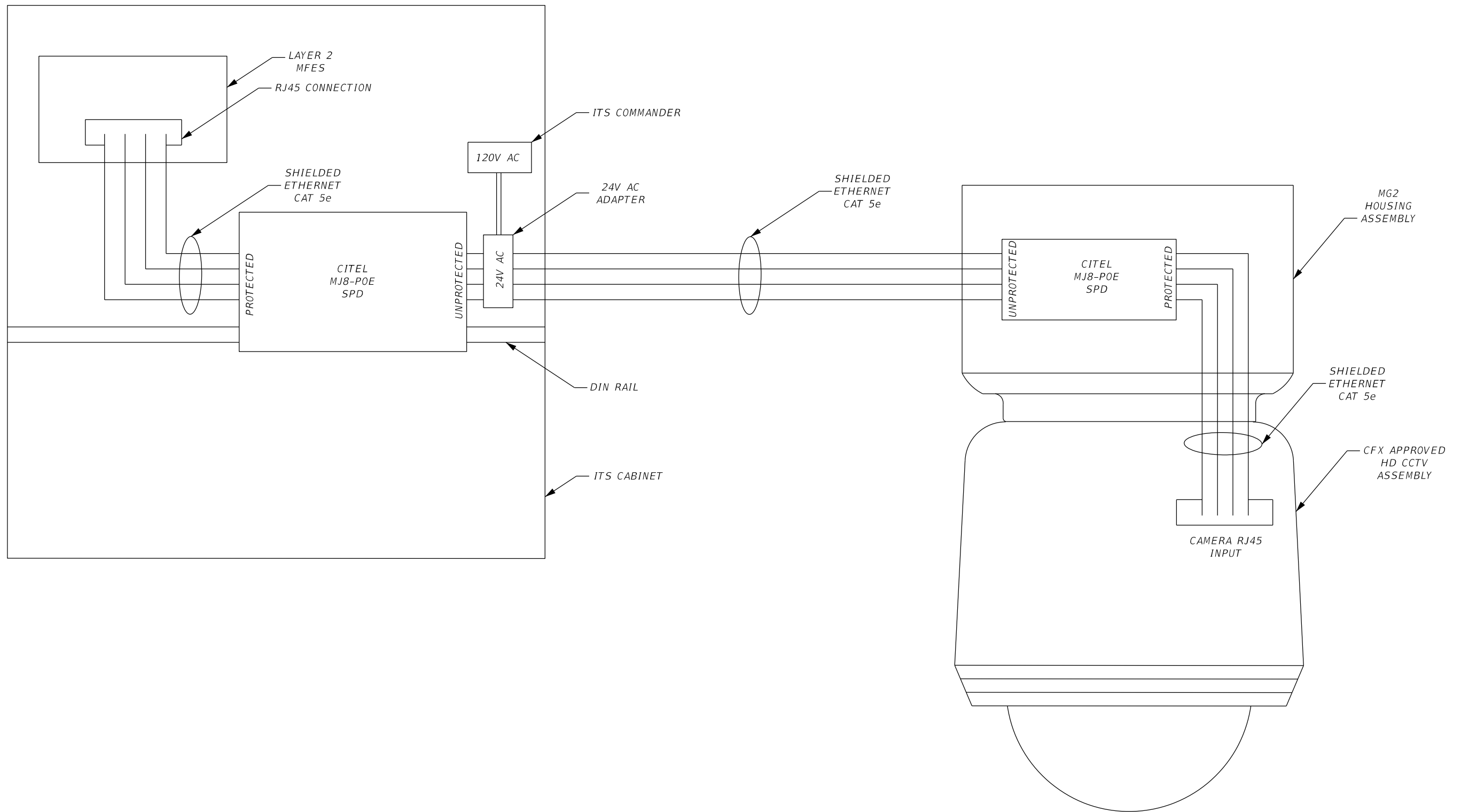
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DUAL CCTV CAMERA LOWERING DEVICE DETAIL

SHEET NO. F-2

VERSION 6

ITS CABINET TO CAMERA JUNCTION BOX WIRING DIAGRAM



NTS

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	ITS CABINET TO CAMERA JUNCTION BOX WIRING DIAGRAM	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					F-3

VERSION 6

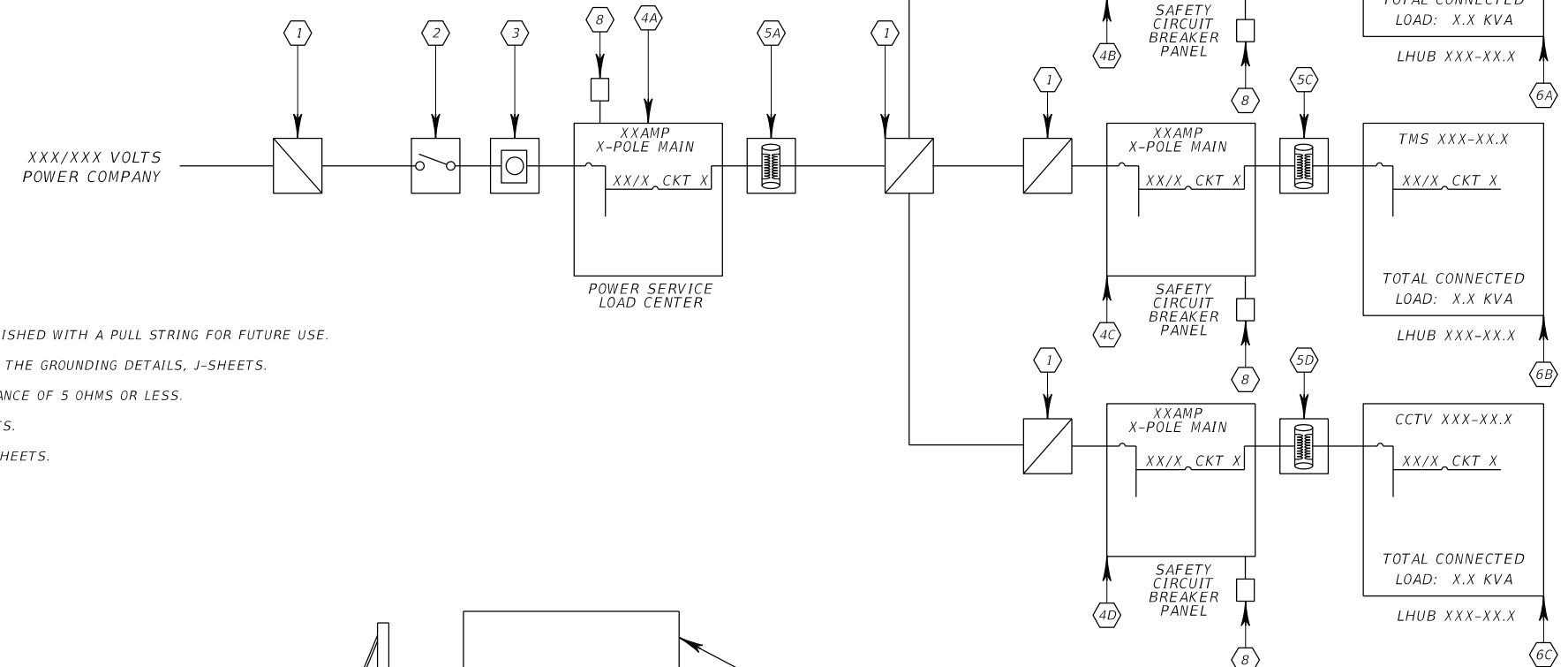
**KEYED NOTES:**

- 1 PULL BOX
- 2 XX AMP, XXX/XXXV NON-FUSED DISCONNECT (IF REQUIRED BY SERVICE PROVIDER).
- 3 METER SOCKET BY CONTRACTOR, METER BY POWER COMPANY (IF REQUIRED)
- 4A XX AMP X-POLE, XXX/XXXV MAIN CIRCUIT BREAKER PANEL (MODEL #XXXXXXX) CONTRACTOR SHALL SUBMIT SQUARE-D MODEL NUMBER TO CFX FOR APPROVAL
- 4B XX AMP X-POLE, XXX/XXXV SAFETY CIRCUIT BREAKER PANEL (MODEL #XXXXXXX) CONTRACTOR SHALL SUBMIT SQUARE-D MODEL NUMBER TO CFX FOR APPROVAL
- 4C XX AMP X-POLE, XXX/XXXV SAFETY CIRCUIT BREAKER PANEL (MODEL #XXXXXXX) CONTRACTOR SHALL SUBMIT SQUARE-D MODEL NUMBER TO CFX FOR APPROVAL
- 4D XX AMP X-POLE, XXX/XXXV SAFETY CIRCUIT BREAKER PANEL (MODEL #XXXXXXX) CONTRACTOR SHALL SUBMIT SQUARE-D MODEL NUMBER TO CFX FOR APPROVAL
- 5A XFMR (X KVA) (XXX/XXXV PRIMARY, XXX/XXXV SECONDARY) (IF REQUIRED)
- 5B XFMR (X KVA) (XXX/XXXV PRIMARY, XXX/XXXV SECONDARY) (IF REQUIRED)
- 5C XFMR (X KVA) (XXX/XXXV PRIMARY, XXX/XXXV SECONDARY) (IF REQUIRED)
- 5D XFMR (X KVA) (XXX/XXXV PRIMARY, XXX/XXXV SECONDARY) (IF REQUIRED)
- 6A TYPE XXXX CABINET W/CIRCUIT BREAKER
- 6B TYPE XXXX CABINET W/CIRCUIT BREAKER
- 6C TYPE XXXX CABINET W/CIRCUIT BREAKER
- 7A X"-X" CONDUIT TYPE XX
- 8 SURGE PROTECTION DEVICE
- 9 GROUND ROD

# SERVICE POINT DETAIL

## ONE LINE DIAGRAM

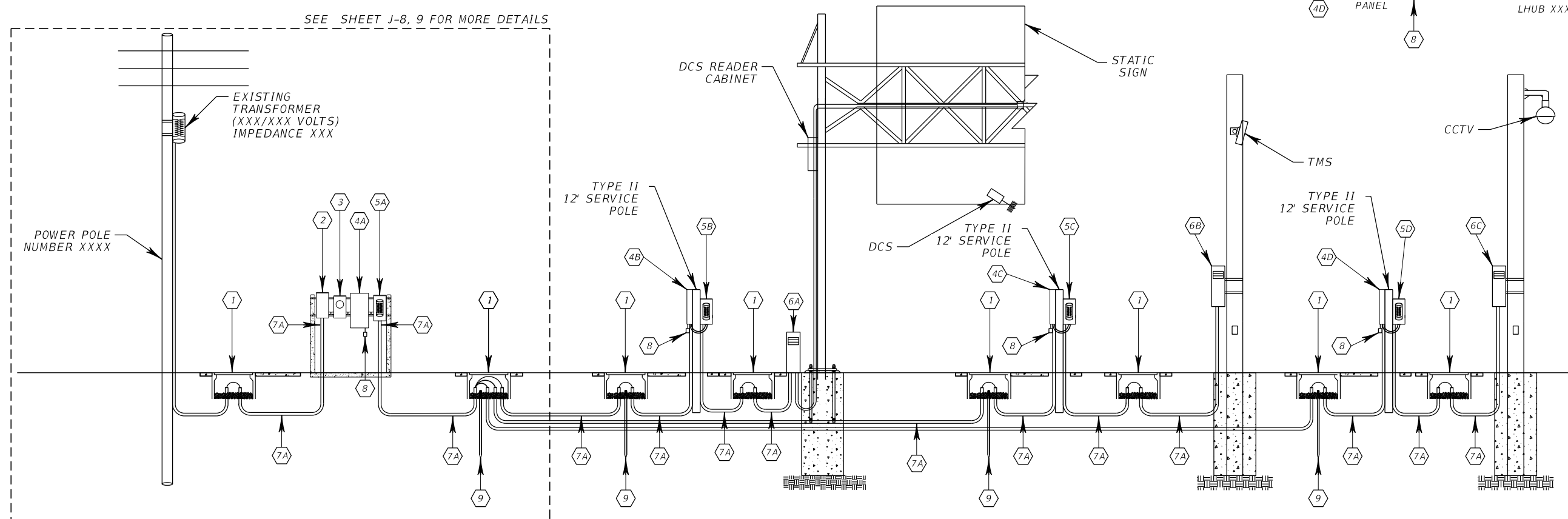
NOTES TO EOR:  
 1. THIS DETAIL IS FOR CADD LOOK AND FEEL REFERENCE ONLY. ALL VOLTAGES, CONDUITS, TRANSFORMERS, BREAKERS AND SPD'S SHALL BE SIZED BY THE EOR.  
 2. MAXIMUM VOLTAGE THROUGHOUT THE POWER ASSEMBLY IS NOT TO EXCEED 480V.



**NOTES:**

1. ALL EMPTY POWER CONDUITS SHALL BE CAPPED AND FURNISHED WITH A PULL STRING FOR FUTURE USE.
2. CONTRACTOR SHALL GROUND THIS SITE AS SHOWN WITHIN THE GROUNDING DETAILS, J-SHEETS.
3. ELECTRICAL GROUNDING SHALL MEET A REQUIRED RESISTANCE OF 5 OHMS OR LESS.
4. CONDUCTOR SIZE AND QUANTITY VARIES. SEE PLAN SHEETS.
5. PULL BOXES LOCATION AND QUANTITY VARIES. SEE PLAN SHEETS.

SEE SHEET J-8, 9 FOR MORE DETAILS



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**REVISIONS**

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FOR INFORMATIONAL PURPOSES ONLY

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

## SERVICE POINT DETAIL

SHEET NO.

G-1

VERSION 6

**KEYED NOTES:**

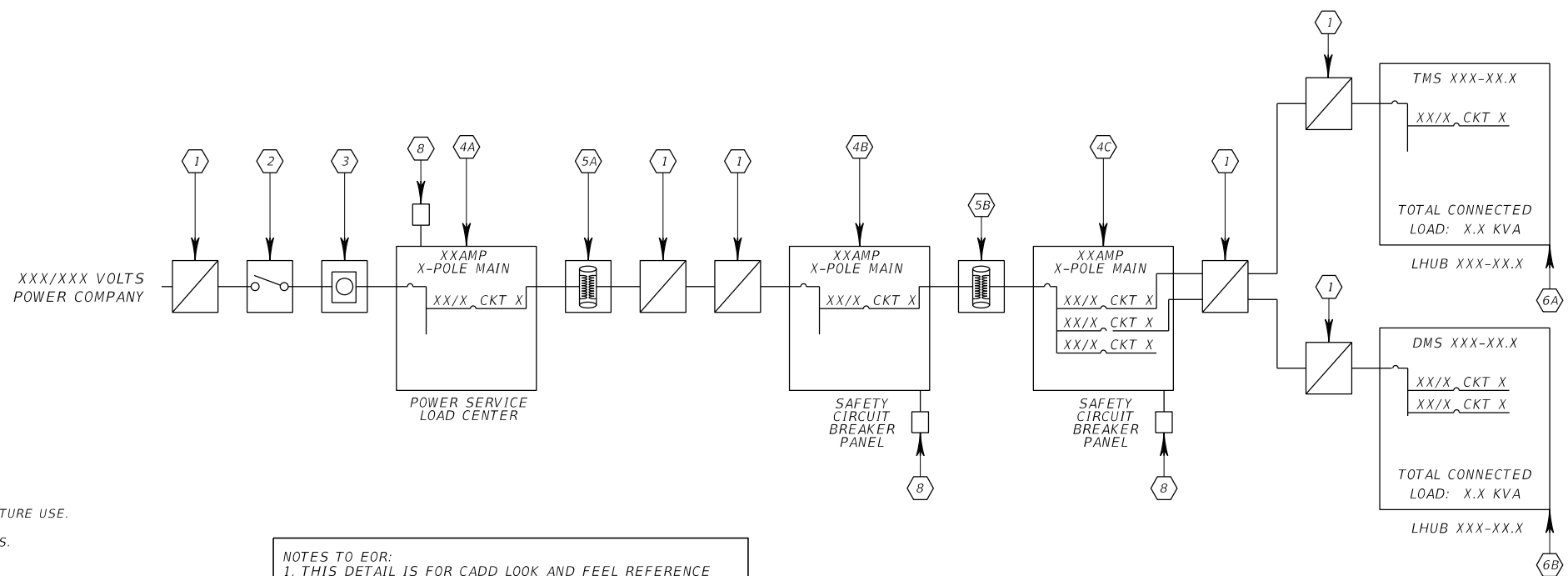
- 1 PULL BOX
- 2 XX AMP, XXX/XXXV NON-FUSED DISCONNECT (IF REQUIRED BY SERVICE PROVIDER).
- 3 METER SOCKET BY CONTRACTOR, METER BY POWER COMPANY (IF REQUIRED)
- 4A XX AMP X-POLE, XXX/XXXV MAIN CIRCUIT BREAKER PANEL (MODEL #XXXXXXX)  
CONTRACTOR SHALL SUBMIT SQUARE-D MODEL NUMBER TO CFX FOR APPROVAL
- 4B XX AMP X-POLE, XXX/XXXV SAFETY CIRCUIT BREAKER PANEL (MODEL #XXXXXXX)  
CONTRACTOR SHALL SUBMIT SQUARE-D MODEL NUMBER TO CFX FOR APPROVAL
- 4C XX AMP X-POLE, XXX/XXXV SAFETY CIRCUIT BREAKER PANEL (MODEL #XXXXXXX)  
CONTRACTOR SHALL SUBMIT SQUARE-D MODEL NUMBER TO CFX FOR APPROVAL
- 4D XX AMP X-POLE, XXX/XXXV SAFETY CIRCUIT BREAKER PANEL (MODEL #XXXXXXX)  
CONTRACTOR SHALL SUBMIT SQUARE-D MODEL NUMBER TO CFX FOR APPROVAL (IF REQUIRED)
- 5A XFMR (X KVA) (XXX/XXXV PRIMARY, XXX/XXXV SECONDARY) (IF REQUIRED)
- 5B XFMR (X KVA) (XXX/XXXV PRIMARY, XXX/XXXV SECONDARY) (IF REQUIRED)
- 6A TYPE XXXX CABINET W/CIRCUIT BREAKER
- 6B TYPE XXXX CABINET W/CIRCUIT BREAKER
- 7A X'-X" CONDUIT TYPE XX
- 8 SURGE PROTECTION DEVICE
- 9 GROUND ROD

**NOTES:**

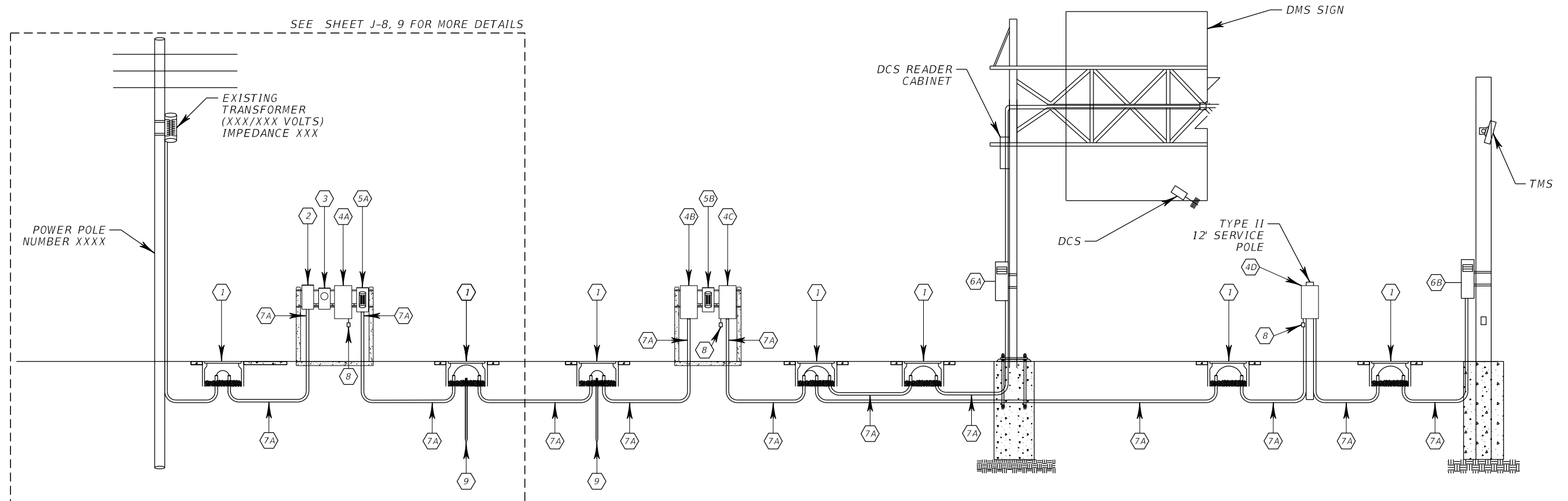
1. ALL EMPTY POWER CONDUITS SHALL BE CAPPED AND FURNISHED WITH A PULL STRING FOR FUTURE USE.
2. CONTRACTOR SHALL GROUND THIS SITE AS SHOWN WITHIN THE GROUNDING DETAILS, J-SHEETS.
3. ELECTRICAL GROUNDING SHALL MEET A REQUIRED RESISTANCE OF 5 OHMS OR LESS.
4. CONDUCTOR SIZE AND QUANTITY VARIES. SEE PLAN SHEETS.
5. PULL BOXES LOCATION AND QUANTITY VARIES. SEE PLAN SHEETS.

# DMS SERVICE POINT DETAIL

## ONE LINE DIAGRAM



**NOTES TO EOR:**  
 1. THIS DETAIL IS FOR CADD LOOK AND FEEL REFERENCE ONLY. ALL VOLTAGES, CONDUITS, TRANSFORMERS, BREAKERS AND SPD'S SHALL BE SIZED BY THE EOR.  
 2. MAXIMUM VOLTAGE THROUGHOUT THE POWER ASSEMBLY IS NOT TO EXCEED 480V.



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REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	DMS SERVICE POINT DETAIL	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					G-2

VERSION 6



**EXISTING ITS DEVICE AND CCTV POLE, LOWERING SYSTEM WITH NEW FOUNDATION GENERAL NOTES**

1. DESIGN CRITERIA: DESIGNED IN ACCORDANCE WITH AASHTO "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" 1ST EDITION, 2015. THE DESIGN WIND SPEED OF 150 MPH IS IN CONFORMANCE WITH THE FDOT "PLANS PREPARATION MANUAL" AND "STRUCTURES MANUAL" (CURRENT EDITION).

THE STRUCTURE SHALL NOT EXCEED 1" DEFLECTION IN 30 MPH (NON-GUST) WIND.

FOUNDATION DESIGN PARAMETERS:  
(DETERMINED BY GEOTECHNICAL ENGINEER BASED ON SITE SPECIFIC BORINGS)

SOIL TYPE: XXXXX  
SOIL LAYER THICKNESS: XX FEET  
SOIL FRICTION ANGLE: XX DEGREES  
SOIL WEIGHT (ASSUME SATURATED): XX.X PCF  
SLOPE (V:H): X:X MAX

2. EXISTING POLE SHAFTS: EXISTING POLE SHAFTS ARE 12 SIDED WITH A MINIMUM CORNER RADIUS OF 3/8" AND A CONSTANT TAPER OF 0.14 IN/FT.

3. ITS DEVICE AND CCTV POLE STRUCTURE MATERIALS SHALL BE AS FOLLOWS:

- STEEL PLATES -> ASTM A709 GRADE 50 OR ASTM A36
- WELD METAL -> E70XX
- ANCHOR BOLTS -> ASTM F1554 GRADE 55
- NUTS FOR ANCHOR BOLTS -> ASTM A563 GRADE A HEAVY HEX
- WASHERS FOR ANCHOR BOLTS -> ASTM F436 TYPE 1
- STAINLESS STEEL SCREWS -> AISI TYPE 316
- NUT COVERS -> ASTM B26 (319-F)

4. ALL STEEL ITEMS SHALL BE GALVANIZED AS FOLLOWS:

- ALL NUTS, BOLTS AND WASHERS -> ASTM F2329
- ALL OTHER STEEL ITEMS -> ASTM A123

5. REINFORCING STEEL SHALL BE ASTM A615, GRADE 60.

6. CONCRETE SHALL BE CLASS IV (DRILLED SHAFT) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4 KSI FOR ALL ENVIRONMENTAL CLASSIFICATIONS.

7. GROUT SHALL HAVE A MINIMUM 3-DAY COMPRESSIVE STRENGTH OF 5 KSI AND SHALL MEET THE REQUIREMENTS OF SECTION 934. GROUT AFTER POLE IS SET AND PROPERLY PLUMBED.

8. ALL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE (STEEL) ANSI/AWS D1.1 (CURRENT EDITION). FOR ADDITIONAL WELDING REQUIREMENTS SEE AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS LUMINAIRES AND TRAFFIC SIGNALS, SECTION 5.15, WELDED CONNECTIONS."

9. THE FOUNDATIONS FOR THE CCTV STRUCTURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 455 OF THE SPECIFICATIONS EXCEPT THAT NO PAYMENT FOR THE FOUNDATION SHALL BE MADE UNDER SECTION 455. THE COST OF PROVIDING THE FOUNDATION SHALL BE INCLUDED IN THE PAY ITEM FOR PROVIDING THE COMPLETE CCTV STRUCTURE. PAYMENT FOR ANY INCIDENTAL ITEMS INCURRED IN FURNISHING AND INSTALLING THIS CCTV STRUCTURE SHALL BE INCLUDED IN THE PAY ITEM FOR PROVIDING THE COMPLETE CCTV STRUCTURE.

10. ANCHOR BOLT HOLE DIAMETERS SHALL NOT EXCEED THE BOLT DIAMETER PLUS 1/2".

11. THE STRUCTURE SHALL BE INSTALLED PLUMB.

12. THE STRUCTURE SHALL NOT BE ERECTED UNTIL THE FOUNDATION CONCRETE HAS ACHIEVED 70% OF THE MINIMUM SPECIFIED 28-DAY COMPRESSIVE STRENGTH.

13. CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE EXISTING CONDUIT OR FIBER OPTIC CABLE AND TONE WIRE. ANY DAMAGE SHALL BE REPLACED IN KIND AT THE CONTRACTORS EXPENSE.

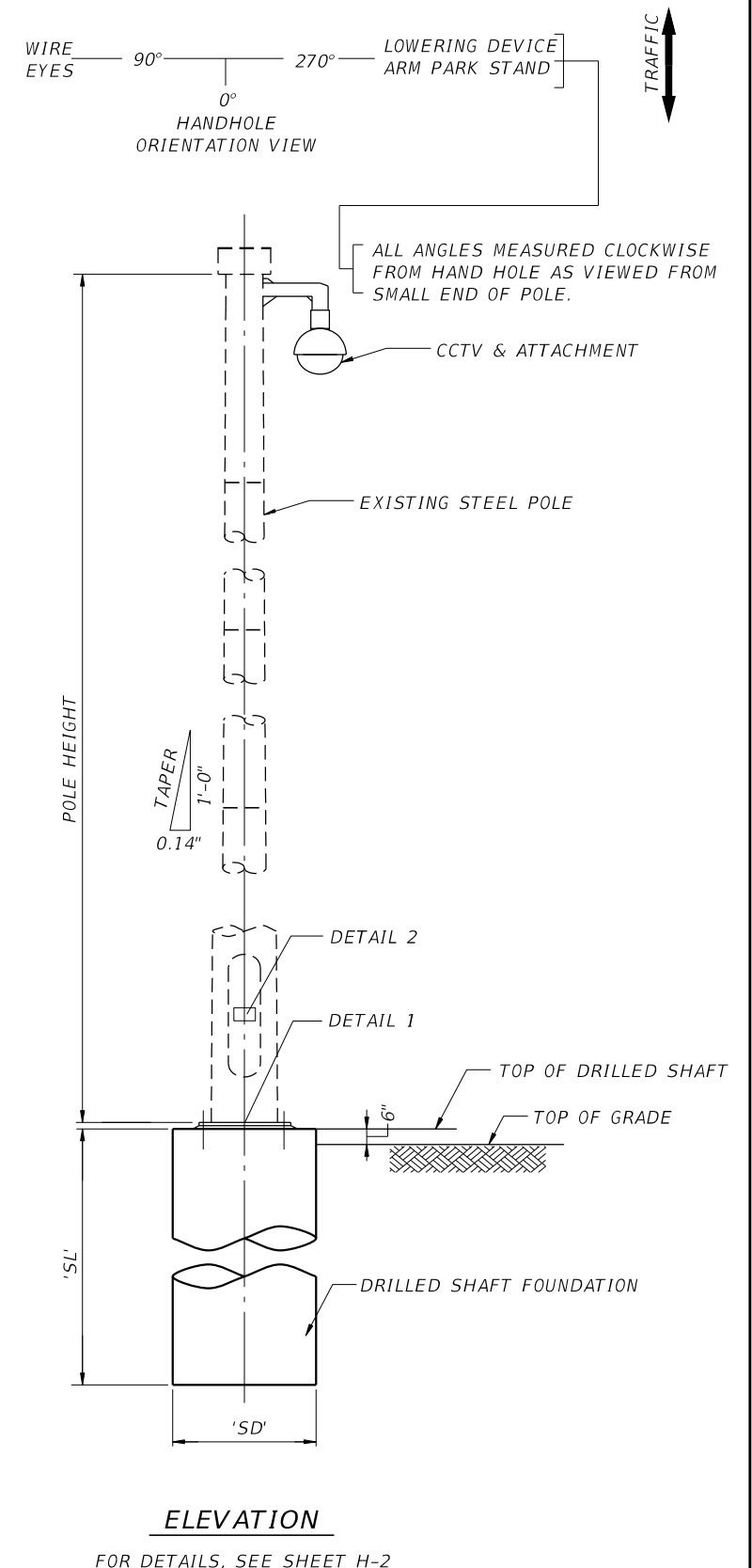
14. NEW BASE PLATE SHALL BE GALVANIZED ACCORDING TO FDOT SPECIFICATION 962 AND POWDER COATED FLAT BLACK OVER GALVANIZATION BY THE MANUFACTURER.

**LOWERING DEVICE:**

1. POLE TOP TENON: A TENON SHALL BE ATTACHED TO THE POLE TOP WITH MOUNTING HOLES AND SLOT AS REQUIRED FOR THE MOUNTING OF THE CAMERA-LOWERING SYSTEM. THE TENON SHALL BE OF DIMENSIONS NECESSARY TO FACILITATE CAMERA LOWERING DEVICE COMPONENT INSTALLATION. EACH SLOT SHALL BE PARALLEL TO THE POLE CENTERLINE FOR MOUNTING THE LOWERING DEVICE.
2. ALL CABLES SHALL BE SECURED IN A MANNER THAT PREVENTS THEM FROM INTERFERING WITH OR BEING DAMAGED BY THE LOWERING CABLE THAT MOVES WITHIN THE POLE.
3. SET ORIENTATION OF POLE SUCH THAT THE CAMERA LOWERING DEVICE ARM IS ORIENTED PERPENDICULAR TO THE ROADWAY OR AS DIRECTED BY THE ENGINEER. THE CCTV POLE SHALL BE POSITIONED SO THAT THE CAMERA CAN BE SAFELY LOWERED WITHOUT REQUIRING LANE CLOSURES

**NOTES TO EOR:**

1. THE FOLLOWING SHEETS (H-1 THROUGH H-5) PROVIDE EXAMPLES OF ITS DEVICE AND CCTV POLE STRUCTURE AND FOUNDATION DETAILS FROM PREVIOUS CFX PROJECTS. THESE SHEETS ARE PROVIDED FOR REFERENCE ONLY. PROJECT SPECIFIC CONDITIONS SHALL BE CONSIDERED IN DESIGN.
2. SHEETS H-1 & H-2 ARE EXAMPLES FOR REUSING EXISTING ITS/CCTV POLES ON NEW DRILLED SHAFT FOUNDATIONS AND NEW BASE PLATES (IF REQUIRED).
3. SHEETS H-3 THROUGH H-5 ARE EXAMPLES FOR NEW INSTALLATION OF ITS/CCTV POLES.
4. BORING DATA SHALL BE PROVIDED WITH THE SUBMITTAL.



**ELEVATION**

FOR DETAILS, SEE SHEET H-2

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

**FOR INFORMATIONAL PURPOSES ONLY**

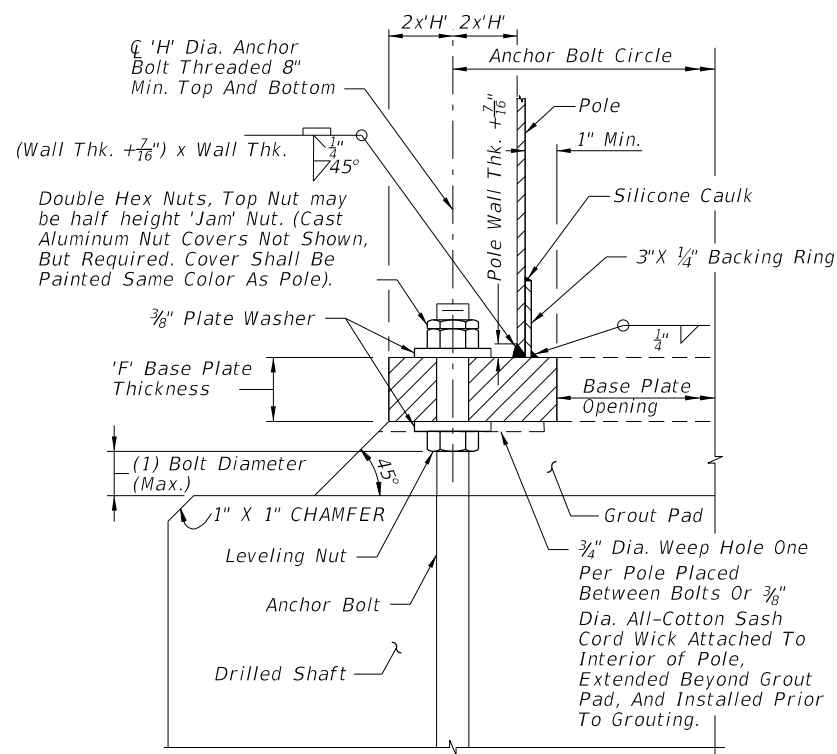
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

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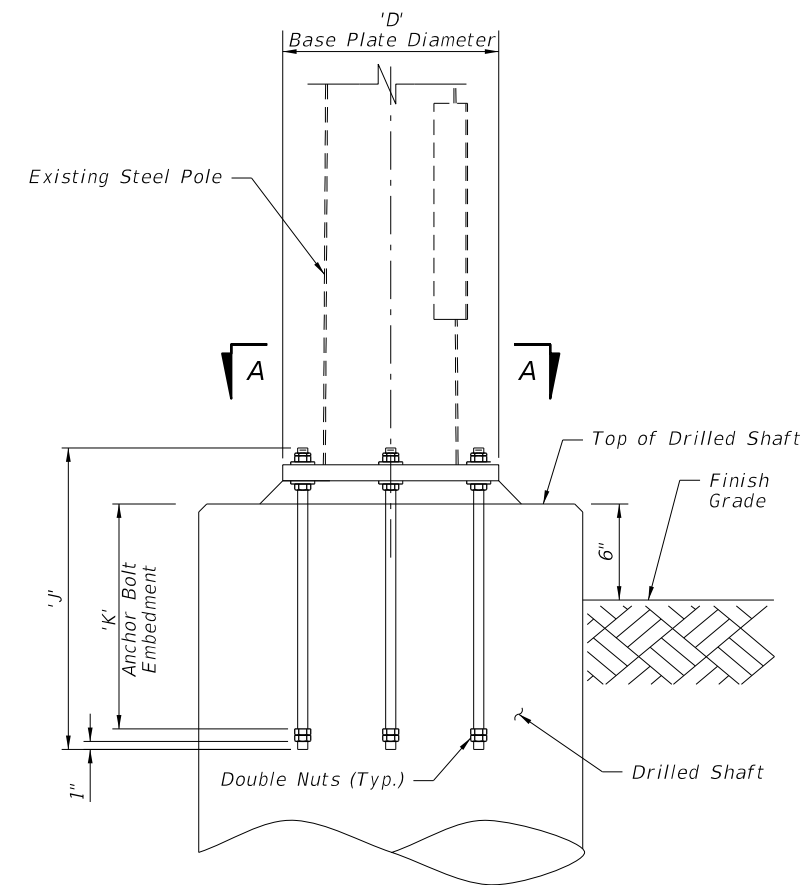
**EXISTING ITS DEVICE & CCTV POLE W/NEW FOUNDATION (SHEET 1 OF 2)**

SHEET NO.  
H-1

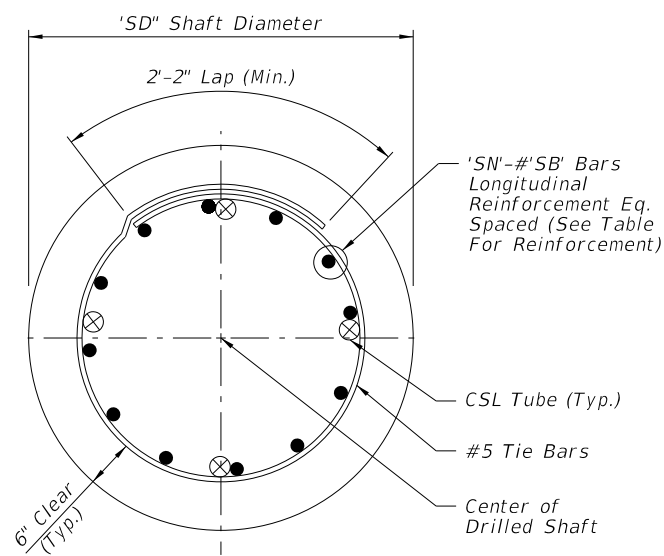
VERSION 6



SECTION C-C

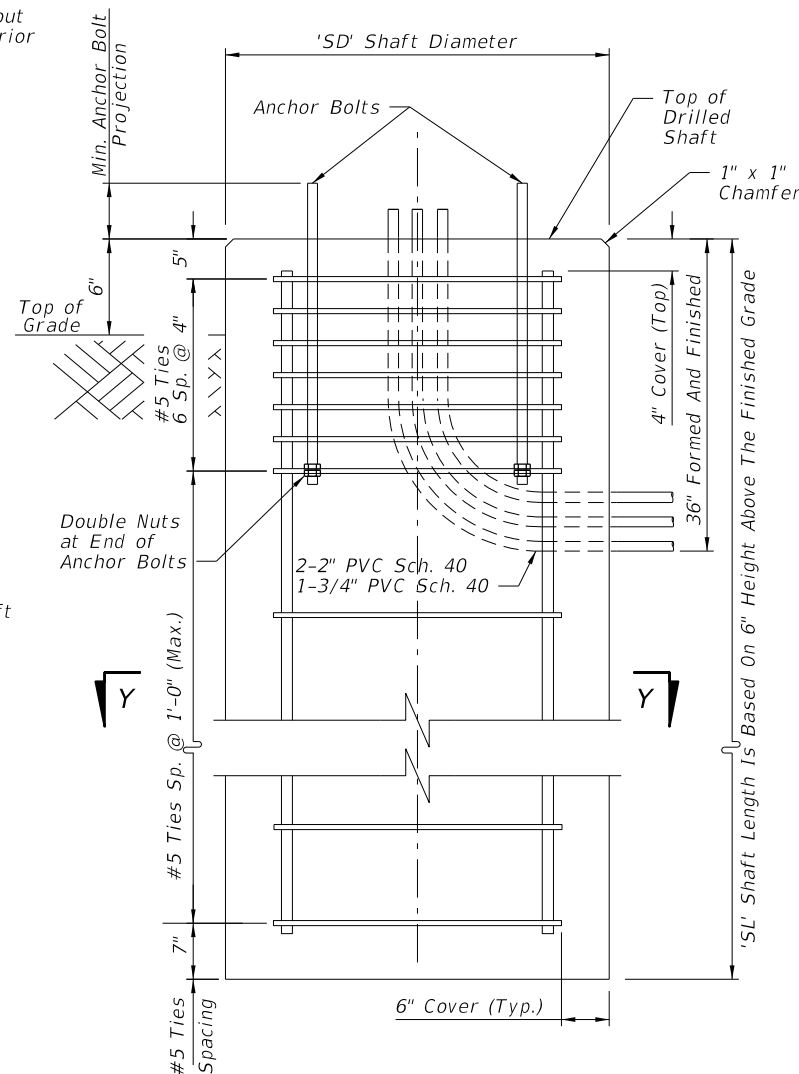


BASE PLATE AND ANCHORAGE ELEVATION  
DETAIL 1  
(Conduits, Reinforcement, and CSL Tubes Not Shown)



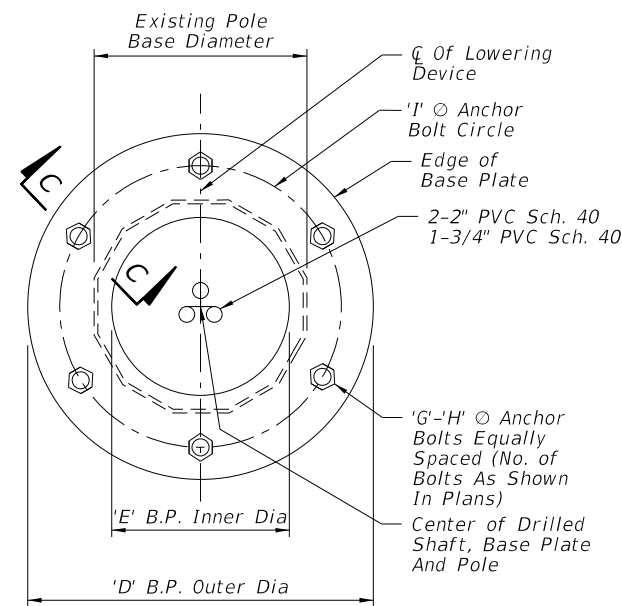
SECTION Y-Y

(Anchor Bolts and Conduits Not Shown)



FOUNDATION ELEVATION

(CSL Tubes Not Shown)



SECTION A-A

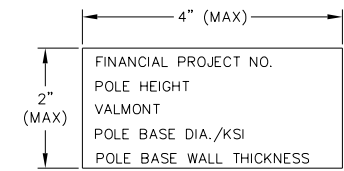
NOTE TO EOR:  
THIS SHEET IS FOR REFERENCE  
ONLY

POLE VARIABLES									
CCTV NO.	STATION	POLE HEIGHT (FT.)	BASE PLATE						
			OUTSIDE DIAMETER (IN.)	INSIDE DIAMETER (IN.)	PLATE THICKNESS (IN.)	NUMBER OF BOLTS	BOLT DIAMETER (IN.)	BOLT CIRCLE DIAMETER (IN.)	BOLT LENGTH (IN.)
XXX-XX	XXX+XX	--	D (IN.)	E (IN.)	F (IN.)	G	H (IN.)	I (IN.)	J (IN.)

DRILLED SHAFT VARIABLES						
CCTV NO.	STATION	SHAFT LENGTH	SHAFT DIAMETER	BAR SIZE	NUMBER OF BARS	BOLT EMBEDMENT
		SL (FT.)	SD (FT.)	SB	SN	K (IN.)
XXX-XX	XXX+XX	--	--	--	--	XX.X

FOUNDATION DESIGN ASSUMPTIONS		
REACTION ON FOUNDATION	POLE HEIGHT	
	XX (FT)	XX (FT)
OVERTURN	XX.XX kip-ft	XX.XX kip-ft
HORIZONTAL LOAD	X.XX kip	X.XX kip
AXIAL LOAD	X.XX kip	X.XX kip

NOTE:  
IN ORDER TO COMPLY WITH CURRENT DESIGN LOAD CRITERIA, EXISTING POLE XXX-XX SHALL BE RETROFITTED WITH NEW BASE AND ANCHORAGE REQUIREMENTS AS INDICATED IN THE TABLE OF VARIABLES ON THIS SHEET. EXISTING BASE PLATES SHALL BE TORCH-CUT FROM EXISTING POLES TO ALLOW FOR ATTACHMENT OF NEW BASE PLATE AS PER DETAIL ON SECTION C-C. ALL POLES SHALL BE MILLED TO BEAR AND PREPPED FOR WELDING. POLES SHALL BE INSPECTED AFTER THE BASE PLATE HAS BEEN REMOVED AND SURFACES PREPARED. GALVANIZED SURFACES DAMAGED DURING THE RETROFIT PROCEDURE SHALL BE REPAIRED IN ACCORDANCE WITH SECTION 562 OF THE SPECIFICATIONS. ENTIRE POLE PLUS NEW GALVANIZED BASE PLATE SHALL BE PAINTED FLAT BLACK. FIELD WELDING WILL NOT BE PERMITTED AND CONTRACTOR SHALL SUBMIT TOCH-CUTTING AND WELDING PROCEDURES FOR EOR REVIEW AND APPROVAL.



Aluminum Identification Tag Secured To Pole Shaft with (2) 0.125" SS Screws. Located on Inside of Pole Visible from Handhole.

IDENTIFICATION TAG  
DETAIL 2

NTS

REVISIONS					
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EXISTING ITS DEVICE & CCTV POLE W/NEW FOUNDATION (SHEET 2 OF 2)

SHEET NO. H-2

VERSION 6

**NEW ITS DEVICE AND CCTV CAMERA POLE, LOWERING SYSTEM & FOUNDATION GENERAL NOTES**

1. DESIGN CRITERIA: DESIGNED IN ACCORDANCE WITH AASHTO "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" 1ST EDITION, 2015. THE DESIGN WIND SPEED OF 150 MPH IS IN CONFORMANCE WITH THE FDOT "PLANS PREPARATION MANUAL" AND "STRUCTURES MANUAL" (CURRENT EDITION).

THE STRUCTURE SHALL NOT EXCEED 1" DEFLECTION IN A 30 MPH (NON-GUST) WIND.

FOUNDATION DESIGN PARAMETERS:  
(DETERMINED BY GEOTECHNICAL ENGINEER BASED ON SITE SPECIFIC BORINGS)

SOIL TYPE:C	XXXXX
SOIL LAYER THICKNESS:	XX FEET
SOIL FRICTION ANGLE:	XX DEGREES
SOIL WEIGHT (ASSUME SATURATED):	XX.X PCF
SLOPE (V:H)	X:X MAX

2. POLE SHAFT: THE POLE SHAFT SHALL BE 12 SIDED WITH A 3.375" CORNER RADIUS, HAVE A CONSTANT LINEAR TAPER OF 0.14 IN/FT, AND CONTAIN ONLY ONE LONGITUDINAL SEAM WELD. CIRCUMFERENTIAL WELDED TUBE BUTT SPLICES AND LAMINATED TUBES ARE NOT PERMITTED. LONGITUDINAL SEAM WELDS WITHIN 6" OF COMPLETE PENETRATION POLE TO BASE PLATE WELDS SHALL BE COMPLETE PENETRATION WELDS.

3. HAND HOLES: SEE DETAILS

4. CABLE SUPPORTS: ELECTRICAL CABLE GUIDES AND PARKING STAND (EYEBOLTS): TOP AND BOTTOM ELECTRICAL CABLE GUIDES SHALL BE LOCATED WITHIN THE POLE ALIGNED WITH EACH OTHER. ONE CABLE GUIDE SHALL BE POSITIONED 2" BELOW THE HANDHOLE AND THE OTHER SHALL BE POSITIONED 1" DIRECTLY BELOW THE TOP OF TENON. PARKING STANDS SHALL BE POSITIONED 2" BELOW THE TOP OF THE HANDHOLE.

5. ITS DEVICE AND CCTV POLE STRUCTURE MATERIALS SHALL BE AS FOLLOWS:

POLES	-> ASTM A1011 GRADE 50, 55, 60 OR 65 (LESS THAN 1/4"), OR ASTM A572 GRADE 50, 55, 60 OR 65 (GREATER THAN OR EQUAL TO 1/4"), OR ASTM A595 GRADE A (55 KSI YIELD) OR GRADE B (60 KSI YIELD)
STEEL PLATES & POLE CAP	-> ASTM A709 GRADE 50 OR ASTM A36
WELD METAL	-> E70XX
ANCHOR BOLTS	-> ASTM F1554 GRADE 55
NUTS FOR ANCHOR BOLTS	-> ASTM A563 GRADE A HEAVY HEX
WASHERS FOR ANCHOR BOLTS	-> ASTM F436 TYPE 1
HANDHOLE FRAME	-> ASTM A709 GRADE 36 OR ASTM A36
HANDHOLE COVER	-> ASTM A1011 GRADE 50, 55, 60 OR 65
STAINLESS STEEL SCREWS	-> AISI TYPE 316
NUT COVERS	-> ASTM B26 (319-F)
BOLTS	-> ASTM F3125, GRADE A325, TYPE 1
NUTS	-> ASTM A563 GRADE DH
WASHERS	-> ASTM F436, TYPE 1

6. ALL STEEL ITEMS SHALL BE HOT DIP GALVANIZED AS FOLLOWS:

ALL NUTS, BOLTS AND WASHERS	-> ASTM F2329
ALL OTHER STEEL ITEMS	-> ASTM A123

7. REINFORCING STEEL SHALL BE ASTM A615, GRADE 60.

8. CONCRETE SHALL BE CLASS IV (DRILLED SHAFT) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4 KSI FOR ALL ENVIRONMENTAL CLASSIFICATIONS.

9. GROUT SHALL HAVE A MINIMUM 3-DAY COMPRESSIVE STRENGTH OF 5 KSI AND SHALL MEET THE REQUIREMENTS OF SECTION 934. GROUT UNDER BASE PLATE AFTER POLE IS SET AND PROPERLY PLUMBED.

10. ALL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE (STEEL) ANSI/AWS D1.1 (CURRENT EDITION). FOR ADDITIONAL WELDING REQUIREMENTS SEE AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS LUMINAIRES AND TRAFFIC SIGNALS, SECTION 5.15, WELDED CONNECTIONS."

11. SHOP DRAWINGS FOR THIS STRUCTURE ARE REQUIRED AND ARE TO INCLUDE POLE AND TENON DESIGN CALCULATIONS AND DETAIL DRAWINGS SIGNED AND SEALED BY A FLORIDA REGISTERED P.E. FABRICATION SHALL NOT BEGIN UNTIL THESE SHOP DRAWINGS ARE APPROVED.

12. THE FOUNDATION FOR THE CCTV STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH FDOT SPECIFICATION SECTION 455 OF THE SPECIFICATIONS EXCEPT THAT NO PAYMENT FOR THE FOUNDATION SHALL BE MADE UNDER FDOT SPECIFICATIONS SECTION 455. (THE COST OF PROVIDING THE FOUNDATION SHALL BE INCLUDED IN THE PAY ITEM 686-XXX ITS POLE (FURNISH & INSTALL XX FT STEEL POLE WITH LOWERING DEVICE) AND 686-XXX ITS POLE FURNISH & INSTALL XX FT STEEL POLE WITH LOWERING DEVICE), THESE PAY ITEMS SHALL ALSO INCLUDE ANY INCIDENTAL ITEMS INCURRED IN FURNISHING AND INSTALLING THIS CCTV STRUCTURE.)

13. EXCEPT FOR ANCHOR BOLTS, ALL BOLT HOLE DIAMETERS SHALL BE EQUAL TO THE BOLT DIAMETER PLUS 1/16", PRIOR TO GALVANIZING. HOLE DIAMETERS FOR ANCHOR BOLTS SHALL NOT EXCEED THE BOLT DIAMETER PLUS 1/2".

14. THE STRUCTURE SHALL BE INSTALLED PLUMB.

15. THE STRUCTURE SHALL NOT BE ERECTED UNTIL THE FOUNDATION CONCRETE HAS ACHIEVED A MINIMUM OF 70% OF THE SPECIFIED 28-DAY COMPRESSIVE STRENGTH.

16. CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE EXISTING CONDUIT OR FIBER OPTIC CABLE AND TONE WIRE. ANY DAMAGE SHALL BE REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.

17. POLE SHALL BE GALVANIZED ACCORDING TO SPECIFICATION 962 AND POWDER COATED FLAT BLACK OVER GALVANIZATION BY THE MANUFACTURER.

18. CONTRACTOR SHALL CONTACT UTILITY COMPANIES PRIOR TO FOUNDATION CONSTRUCTION AND FIELD VERIFY ADJACENT UTILITIES PRIOR TO DRILLING.

19. 100% OF FULL-PENETRATION GROOVE WELDS AND A RANDOM 25% OF PARTIAL PENETRATION GROOVE SHALL BE INSPECTED. FULL PENETRATION GROOVE WELDS SHALL BE PERFORMED BY RADIOGRAPHY OR ULTRASONICS.

**LOWERING DEVICE:**

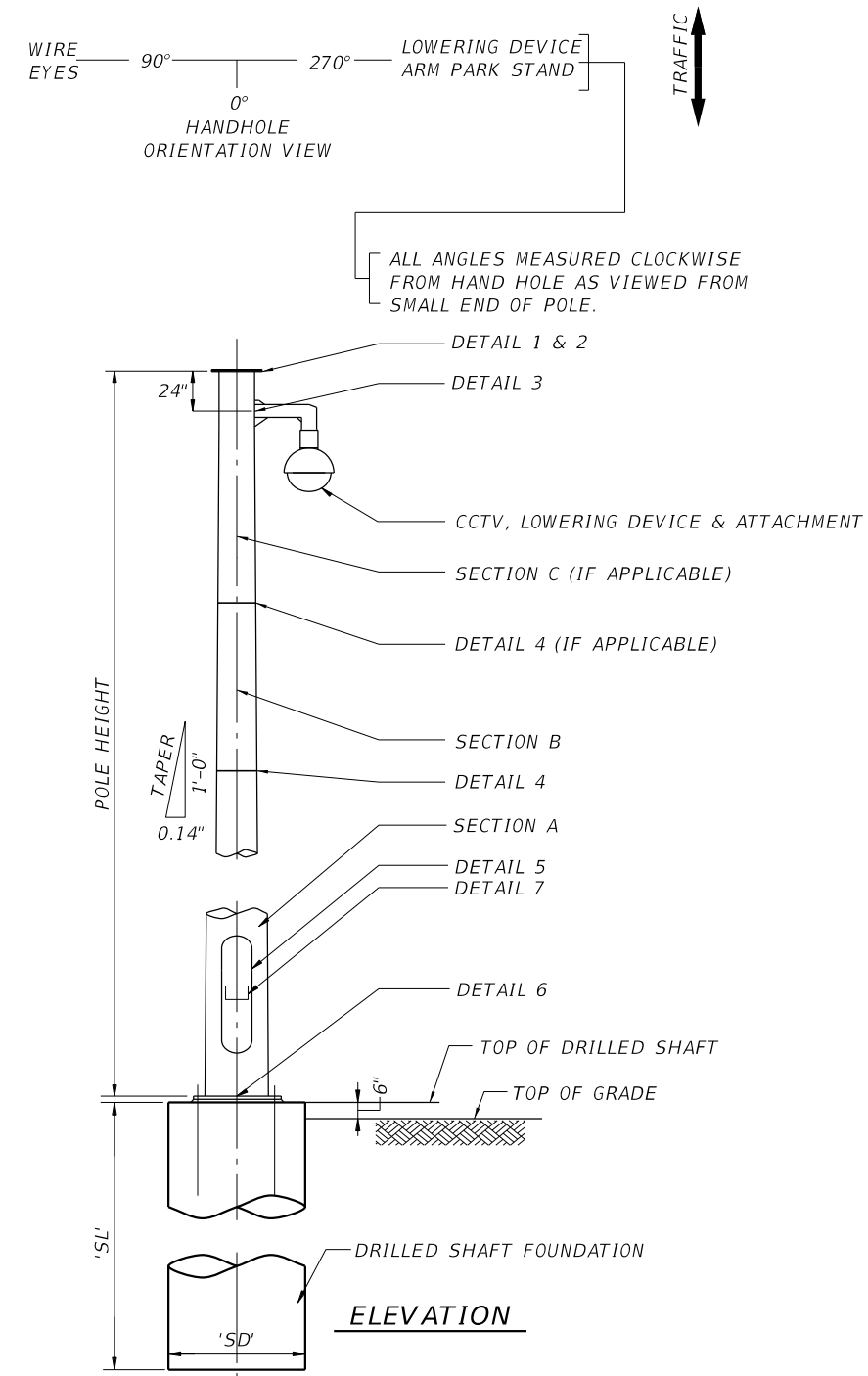
1. POLE TOP TENON: A TENON SHALL BE ATTACHED TO THE POLE TOP WITH MOUNTING HOLES AND SLOT AS REQUIRED FOR THE MOUNTING OF THE CAMERA-LOWERING SYSTEM. THE TENON SHALL BE OF DIMENSIONS NECESSARY TO FACILITATE CAMERA LOWERING DEVICE COMPONENT INSTALLATION. EACH SLOT SHALL BE PARALLEL TO THE POLE CENTERLINE FOR MOUNTING THE LOWERING DEVICE.

2. ALL CABLES SHALL BE SECURED IN A MANNER THAT PREVENTS THEM FROM INTERFERING WITH OR BEING DAMAGED BY THE LOWERING CABLE THAT MOVES WITHIN THE POLE.

3. SET ORIENTATION OF POLE SUCH THAT THE CAMERA LOWERING DEVICE ARM IS ORIENTED PERPENDICULAR TO THE ROADWAY OR AS DIRECTED BY THE ENGINEER. THE CCTV POLE SHALL BE POSITIONED SO THAT THE CAMERA CAN BE SAFELY LOWERED WITHOUT REQUIRING LANE CLOSURES

4. THE STRUCTURE MUST BE ASSEMBLED AFTER GALVANIZING AND PRIOR TO SHIPMENT TO THE SITE TO ASSURE FIT UP. IT MUST BE DISASSEMBLED FOR SHIPPING.

5. POLE SHALL INCLUDE LOWERING DEVICE WHICH INCLUDES TOP J-BOX, MOUNTING HARDWARE, LOWERING CABLE, CONTACT BLOCK, WATERPROOF ELECTRICAL CONNECTORS, CAMERA J-BOX, HOUSING AND STEEL POLE.



**NOTE TO EOR:**

- THE FOLLOWING SHEETS (H-1 THROUGH H-5) PROVIDE EXAMPLES OF ITS DEVICE AND CCTV POLE STRUCTURE AND FOUNDATION DETAILS FROM PREVIOUS CFX PROJECTS. THESE SHEETS ARE PROVIDED FOR REFERENCE ONLY. PROJECT SPECIFIC CONDITIONS SHALL BE CONSIDERED IN DESIGN.
- SHEETS H-1 & H-2 ARE EXAMPLES FOR REUSING EXISTING ITS/CCTV POLES ON NEW DRILLED SHAFT FOUNDATIONS AND NEW BASE PLATES (IF REQUIRED).
- SHEETS H-3 THROUGH H-5 ARE EXAMPLES FOR NEW INSTALLATION OF ITS/CCTV POLES.
- BORING DATA SHALL BE PROVIDED WITH THE SUBMITTAL.

REVISIONS					
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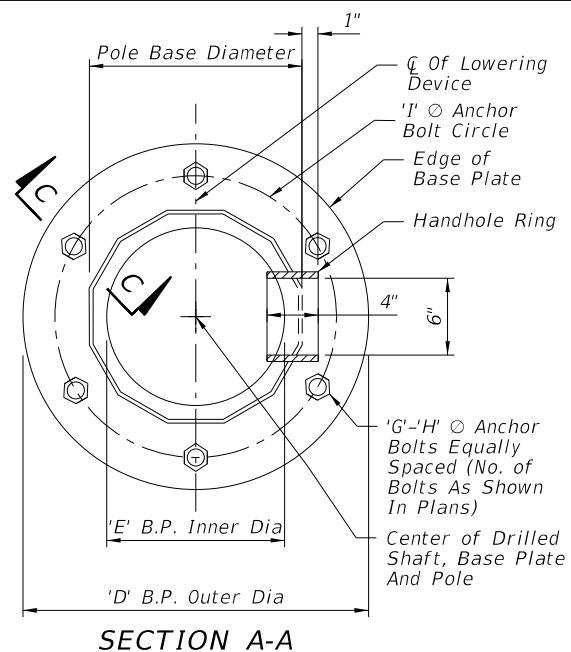
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

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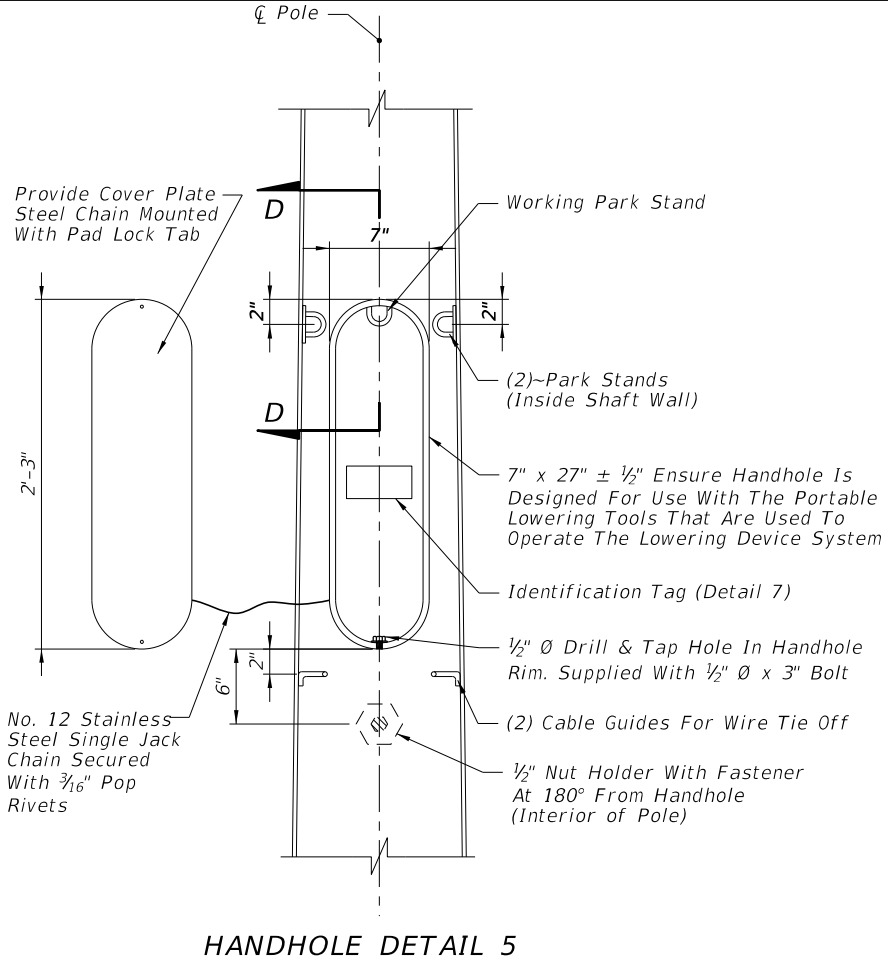
**NEW ITS DEVICE & CCTV POLE STRUCTURE AND FOUNDATION (SHEET 1 OF 3)**

SHEET NO.  
H-3

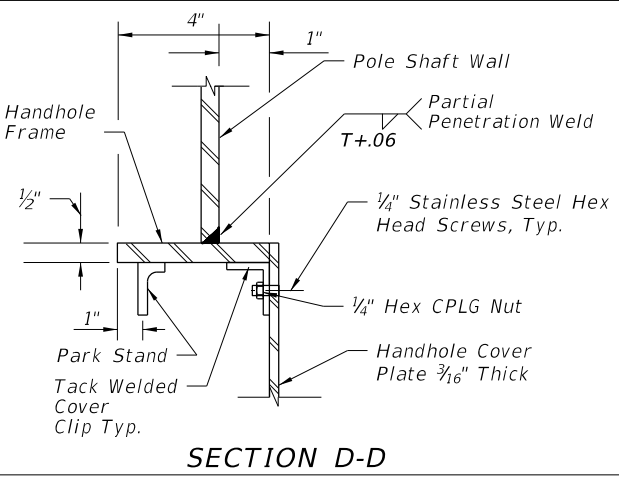
VERSION 6



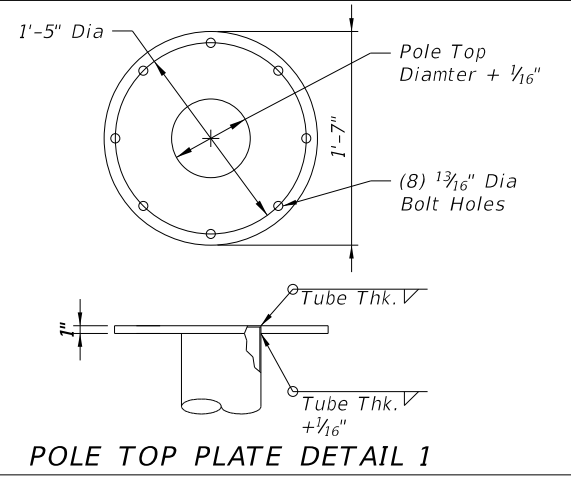
**SECTION A-A**



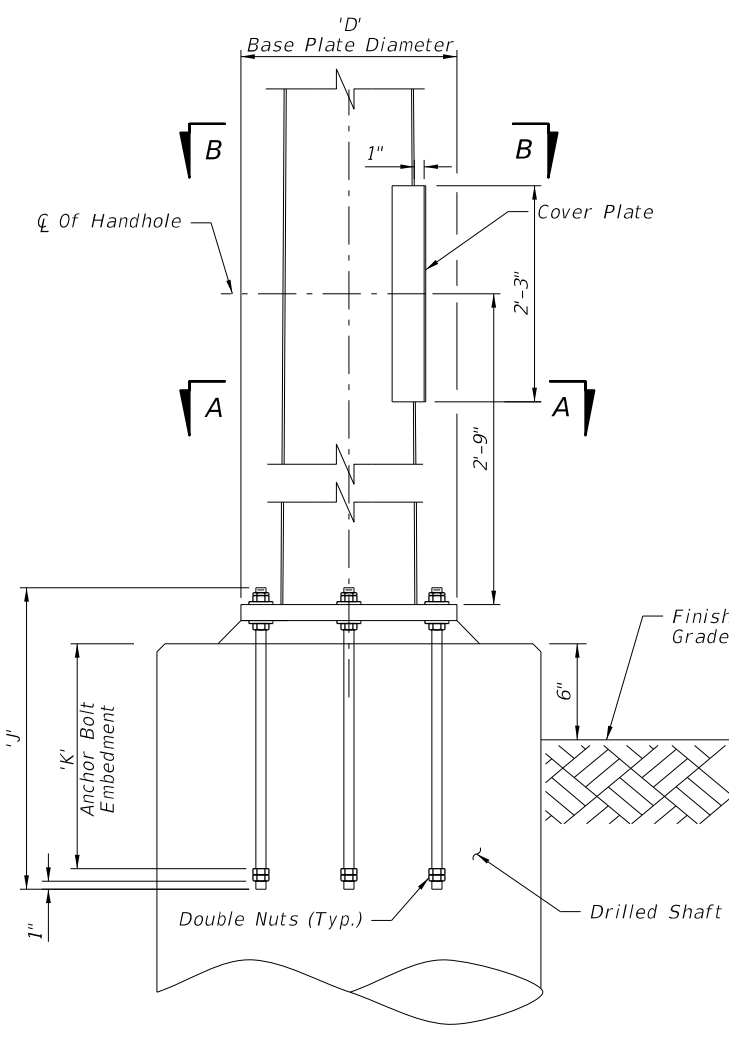
**HANDHOLE DETAIL 5**



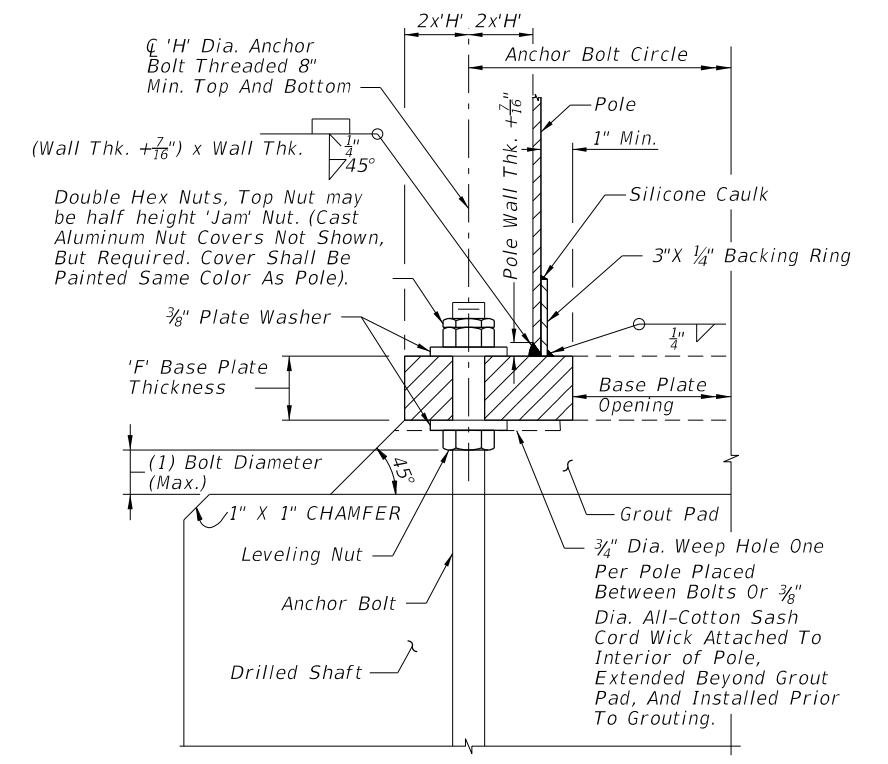
**SECTION D-D**



**POLE TOP PLATE DETAIL 1**

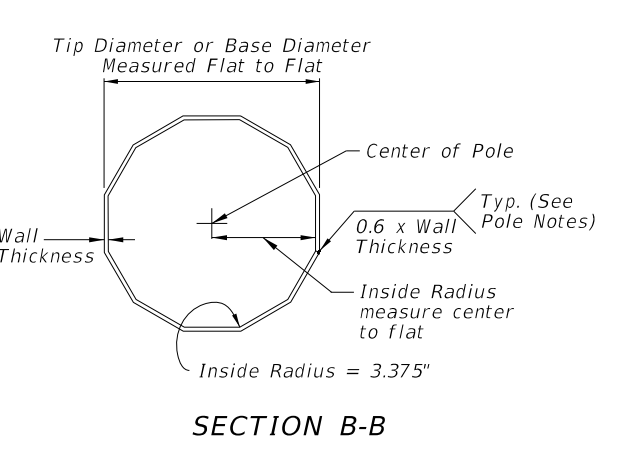


**BASE PLATE AND ANCHORAGE ELEVATION DETAIL 6**  
(Conduits, Reinforcement, and CSL Tubes Not Shown)

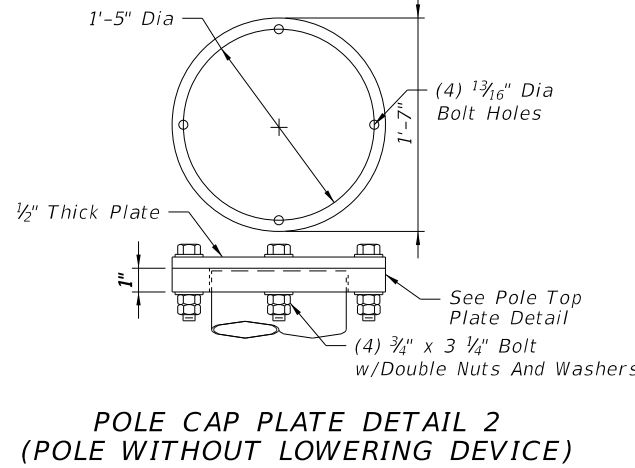


**SECTION C-C**

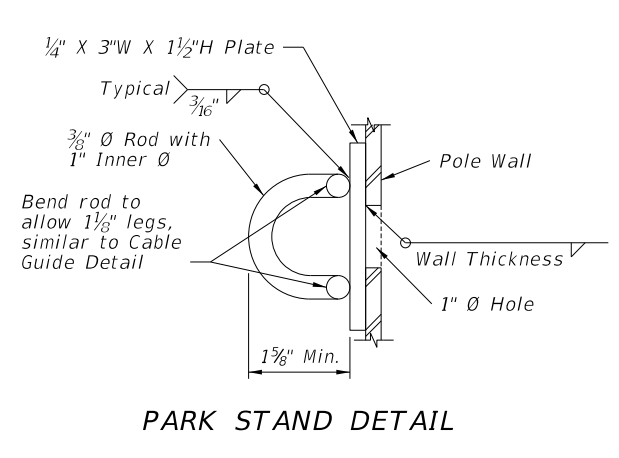
Note: Install all handhole and opening covers prior to shipping. For Poles with Lowering Device, install Pole Cap Plate when Tenon Assembly is not installed.



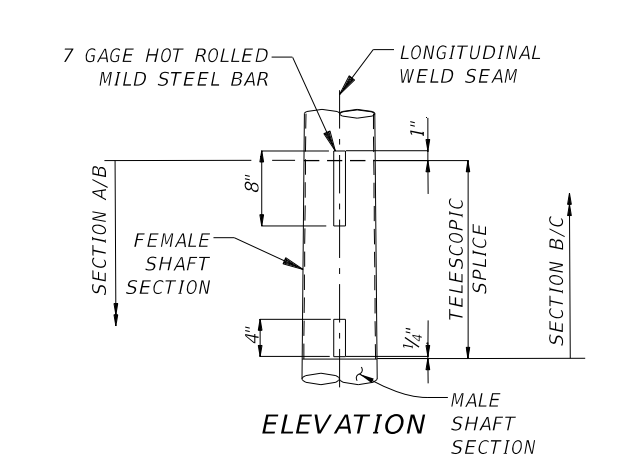
**SECTION B-B**



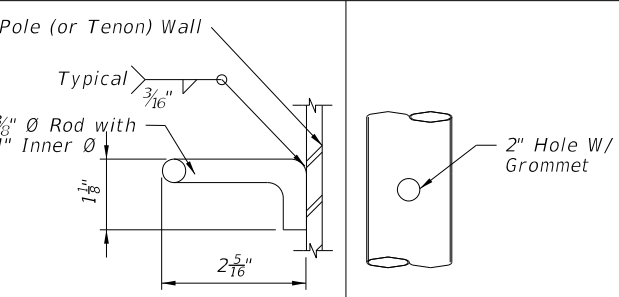
**POLE CAP PLATE DETAIL 2 (POLE WITHOUT LOWERING DEVICE)**



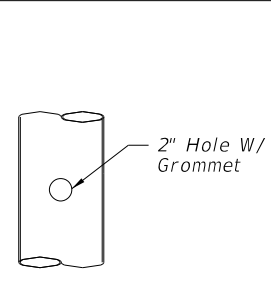
**PARK STAND DETAIL**



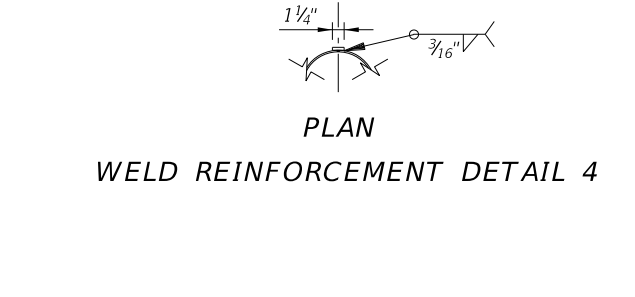
**ELEVATION**



**CABLE GUIDE DETAIL**



**DRILLED HOLE DETAIL 3**



**WELD REINFORCEMENT DETAIL 4**

NOTE TO EOR:  
THIS SHEET IS FOR REFERENCE ONLY

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FOR INFORMATIONAL PURPOSES ONLY

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

**NEW ITS DEVICE & CCTV POLE STRUCTURE AND FOUNDATION (SHEET 2 OF 3)**

SHEET NO. H-4

VERSION 6

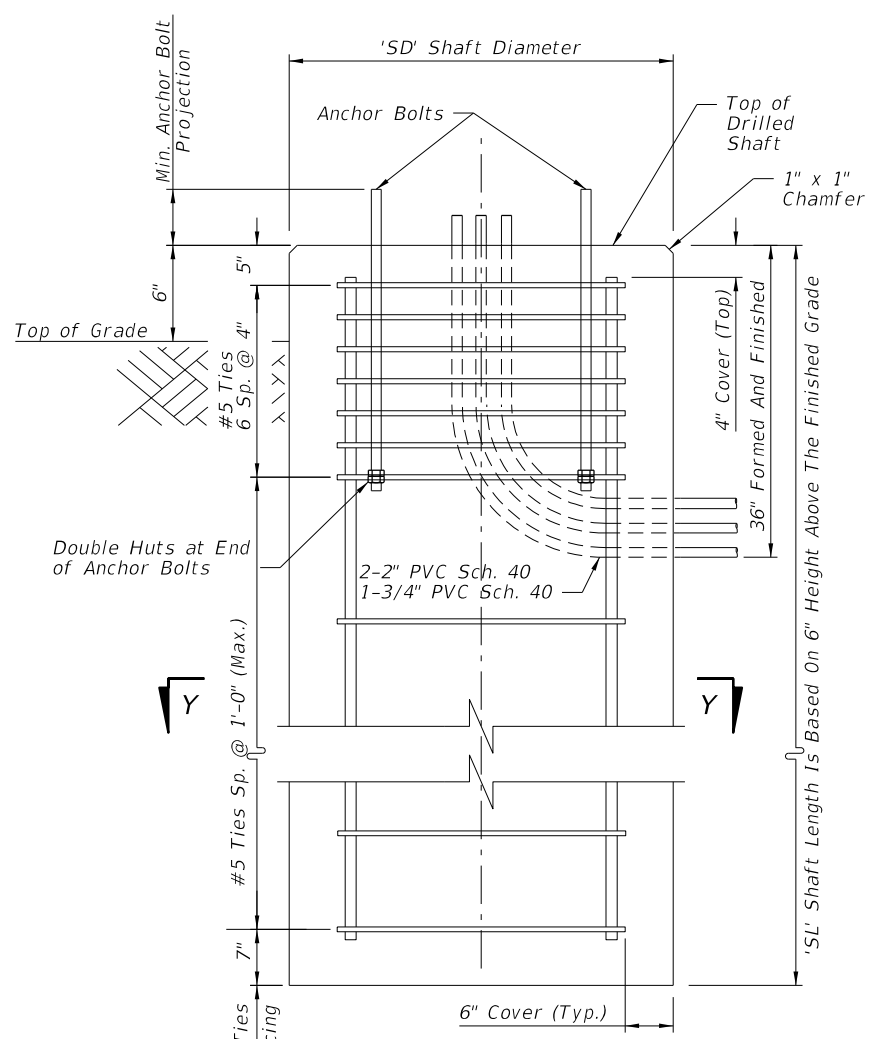
POLE VARIABLES																					
CCTV NO.	STATION	POLE HEIGHT	SECTION A TUBE				SECTION B TUBE				SECTION C TUBE				BASE PLATE						
			LENGTH	BASE DIAMETER	TIP DIAMETER	THICK	LENGTH	BASE DIAMETER	TIP DIAMETER	THICK	LENGTH	BASE DIAMETER	TIP DIAMETER	THICK	OUTSIDE DIAMETER	INSIDE DIAMETER	PLATE THICKNESS	NUMBER OF BOLTS	BOLT DIAMETER	BOLT CIRCLE DIAMETER	BOLT LENGTH
		(FT.)	(FT.)	(IN.)	(IN.)	C (IN.)	(FT.)	(IN.)	(IN.)	C (IN.)	(FT.)	(IN.)	(IN.)	C (IN.)	D (IN.)	E (IN.)	F (IN.)	G	H (IN.)	I (IN.)	J (IN.)
XXX-XX	XXX+XX	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

NOTE TO EOR:  
THIS SHEET IS FOR REFERENCE ONLY

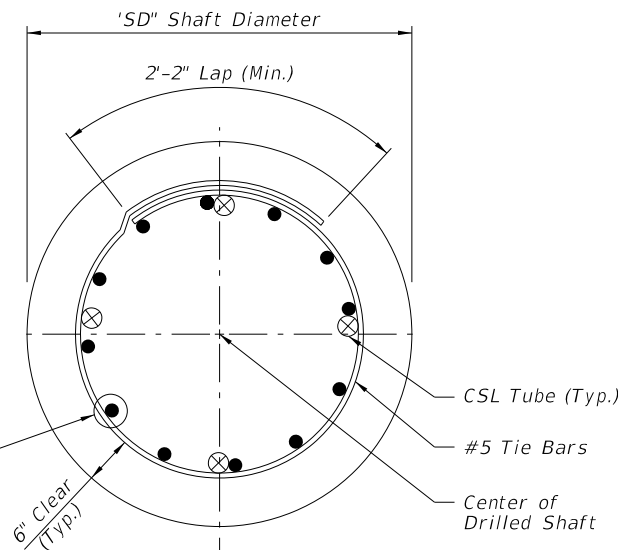
NOTE: POLE SPLICE IS 2'-3" AT SECTION B FOR 80 FT HIGH POLE.

DRILLED SHAFT VARIABLES						
CCTV NO.	STATION	SHAFT LENGTH	SHAFT DIAMETER	BAR SIZE	NUMBER OF BARS	BOLT EMBEDMENT
		SL (FT.)	SD (FT.)	SB	SN	K (IN.)
XXX-XX	XXX+XX	--	--	--	--	XX.X

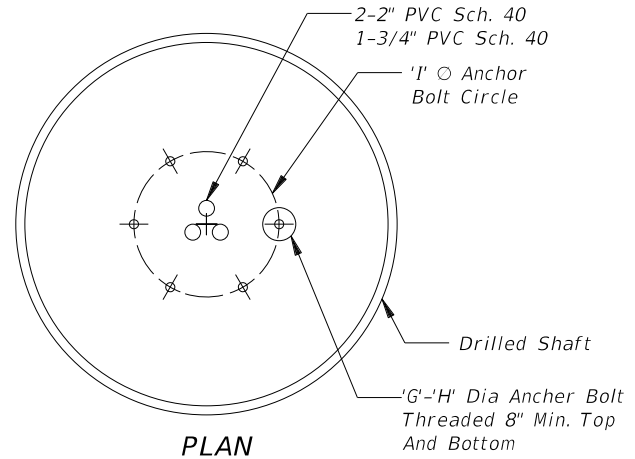
FOUNDATION DESIGN ASSUMPTIONS		
REACTION ON FOUNDATION	POLE HEIGHT	
	XX (FT)	XX (FT)
OVERTURN	XX.XX kip-ft	XX.XX kip-ft
HORIZONTAL LOAD	X.XX kip	X.XX kip
AXIAL LOAD	X.XX kip	X.XX kip



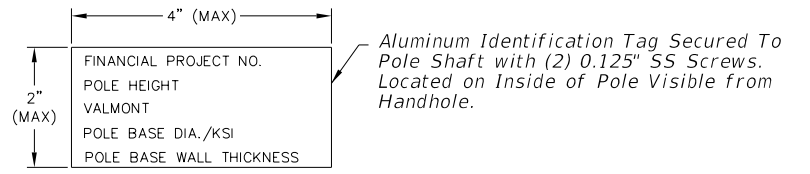
FOUNDATION ELEVATION  
(CSL Tubes Not Shown)



SECTION Y-Y  
(Anchor Bolts and Conduits Not Shown)



PLAN



IDENTIFICATION TAG DETAIL 7

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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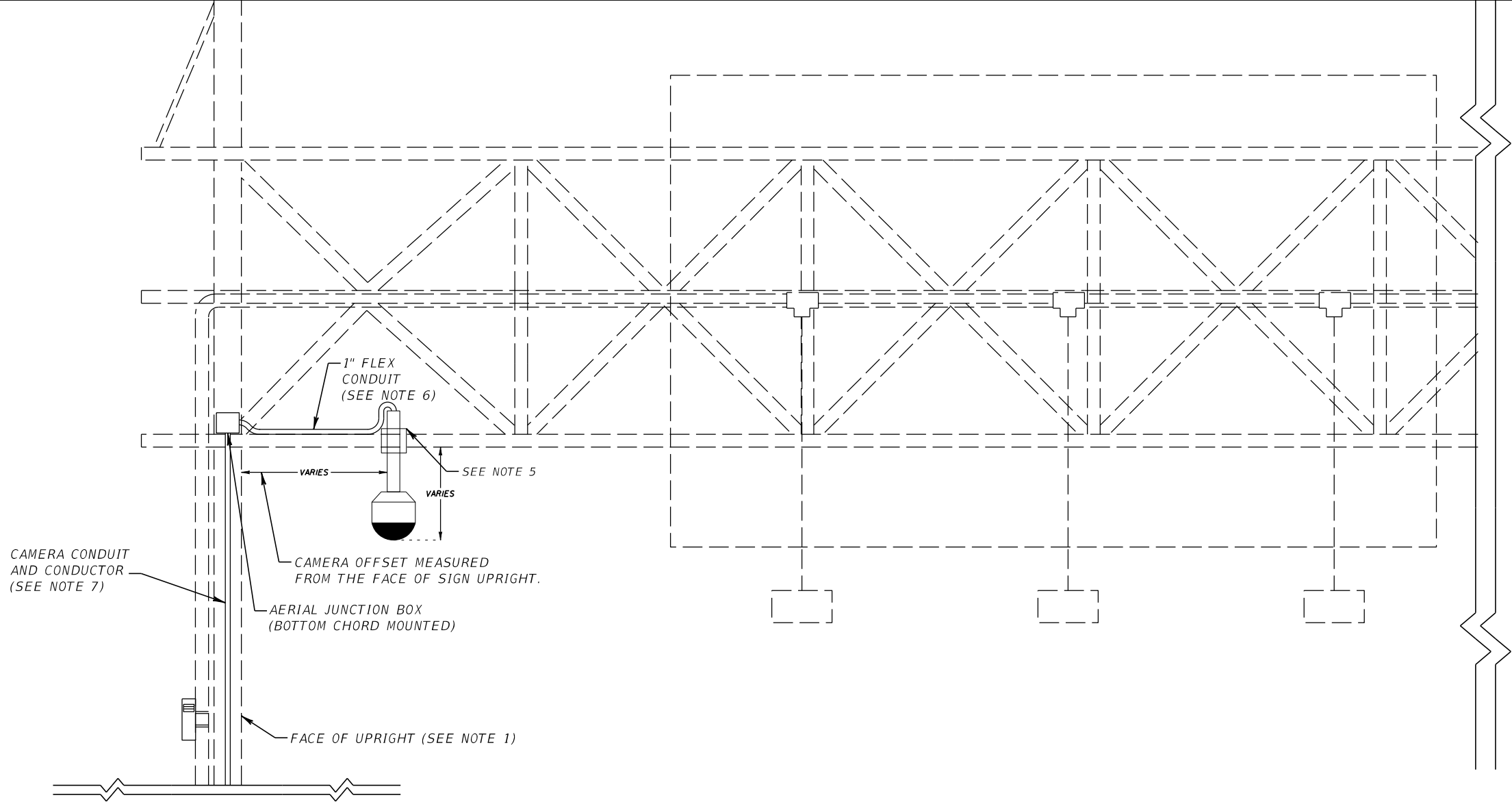
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**NEW ITS DEVICE & CCTV POLE STRUCTURE AND FOUNDATION (SHEET 3 OF 3)**

	SHEET NO. <b>H-5</b>
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NTS

VERSION 6



- NOTES:
1. FOR PURPOSES OF THIS DETAIL, THE FACE OF UPRIGHT SHALL BE CONSIDERED THE SURFACE OF THE UPRIGHT NEAREST THE EDGE OF TRAVEL
  2. AERIAL MOUNTED JUNCTION BOX FOR CAMERA CABLE SHALL BE 8"W X 8"H X 3"D (MIN.). JUNCTION BOX SHALL BE ATTACHED TO SIGN UPRIGHT IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
  3. ENSURE THE BOTTOM OF THE DOME OF THE CAMERA EXTENDS BENEATH THE CHORD TO WHICH IT IS MOUNTED BY A MINIMUM OF 1 FOOT AND NO MORE THAN 3 FEET.
  4. GRAPHICAL REPRESENTATION OF BACK CHORD MOUNTING. FOR REFERENCE ONLY, REFER TO TABLE A (THIS SHEET) FOR CHORD-MOUNTING DESIGNATION.
  5. PTM01: PIPE THREAD ADAPTER-TYPE MOUNTING BRACKET. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
  6. HORIZONTAL FLEXIBLE CONDUIT SHALL BE SECURED TO THE STRUCTURE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.

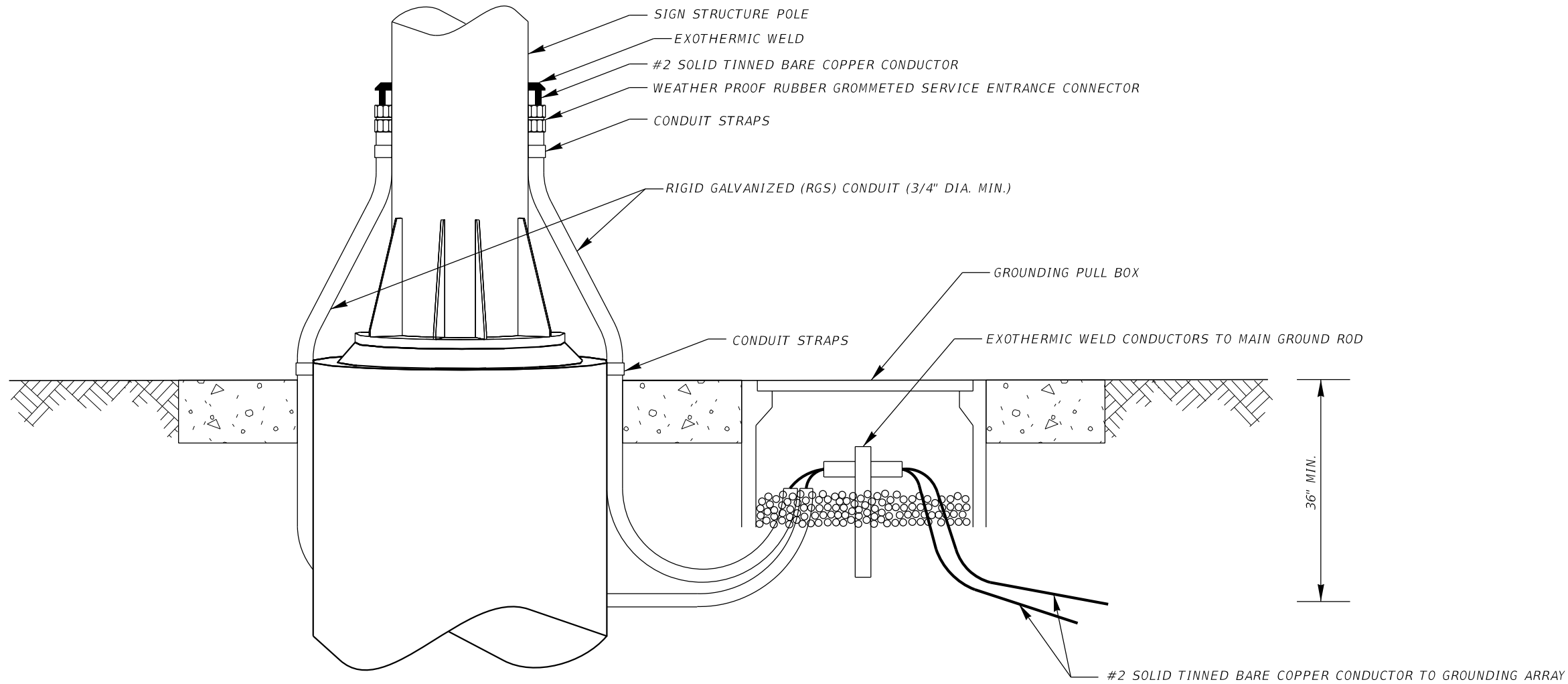
VERSION 6

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	<b>EXISTING SIGN STRUCTURE CAMERA MOUNTING DETAIL</b>	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					H-6



GROUNDING NOTES:

1. ALL GROUNDING CONNECTIONS MADE BETWEEN THE STRUCTURE AND GROUND RODS SHALL BE MADE USING #2 AWG SOLID CONDUCTOR TINNED BARE COPPER WIRE. THE CONNECTING WIRE SHALL BE BURIED PER N.E.C. AND SHALL BE ATTACHED TO GROUND RODS USING EXOTHERMIC WELDS.
2. THE STRUCTURE SHALL BE CONNECTED TO THE GROUNDING ARRAY. BASE-MOUNTED CABINETS WHICH SUPPORT ITS DEVICES ON THE STRUCTURE SHALL ALSO BE GROUNDED TO THE COMMON GROUNDING ARRAY IF THE CABINETS ARE WITHIN 60 FEET OF THE STRUCTURE.
3. THE DMS ENCLOSURE SHALL BE GROUNDED TO THE SIGN STRUCTURE WITH A GROUNDING CONDUCTOR PER MANUFACTURER'S RECOMMENDATIONS.
4. FOR EXISTING STRUCTURES, GROUND WIRE LEADS SHALL BE EXOTHERMICALLY WELDED TO THE STRUCTURAL POLES. WELDS SHALL BE LOCATED ON THE SIDE OF THE STRUCTURAL POLE AT LEAST 1 FOOT ABOVE THE BOLT FLANGE. GRIND THROUGH GALVANIZED COATING TO EXPOSE BARE STEEL. ONCE BARE STEEL IS EXPOSED, WORK CALLED FOR IN THE REMAINDER OF THIS NOTE SHALL BE COMPLETED WITHOUT INTERRUPTION. HEAT BARE STEEL WITH TORCH FOR SEVERAL MINUTES AND MAKE WELD WHILE BARE STEEL IS WARM. AFTER WELD IS COMPLETE, COAT WELD AND ASSOCIATED STEEL WITH COLD GALVANIZING SPRAY WHILE WELD IS STILL WARM.
5. HALF-SPAN OR FULL-SPAN STRUCTURES SHALL BE EQUIPPED WITH COMPLETE GROUNDING ARRAYS ATTACHED TO EACH UPRIGHTS.
6. ALL CONDUIT DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS.



NTS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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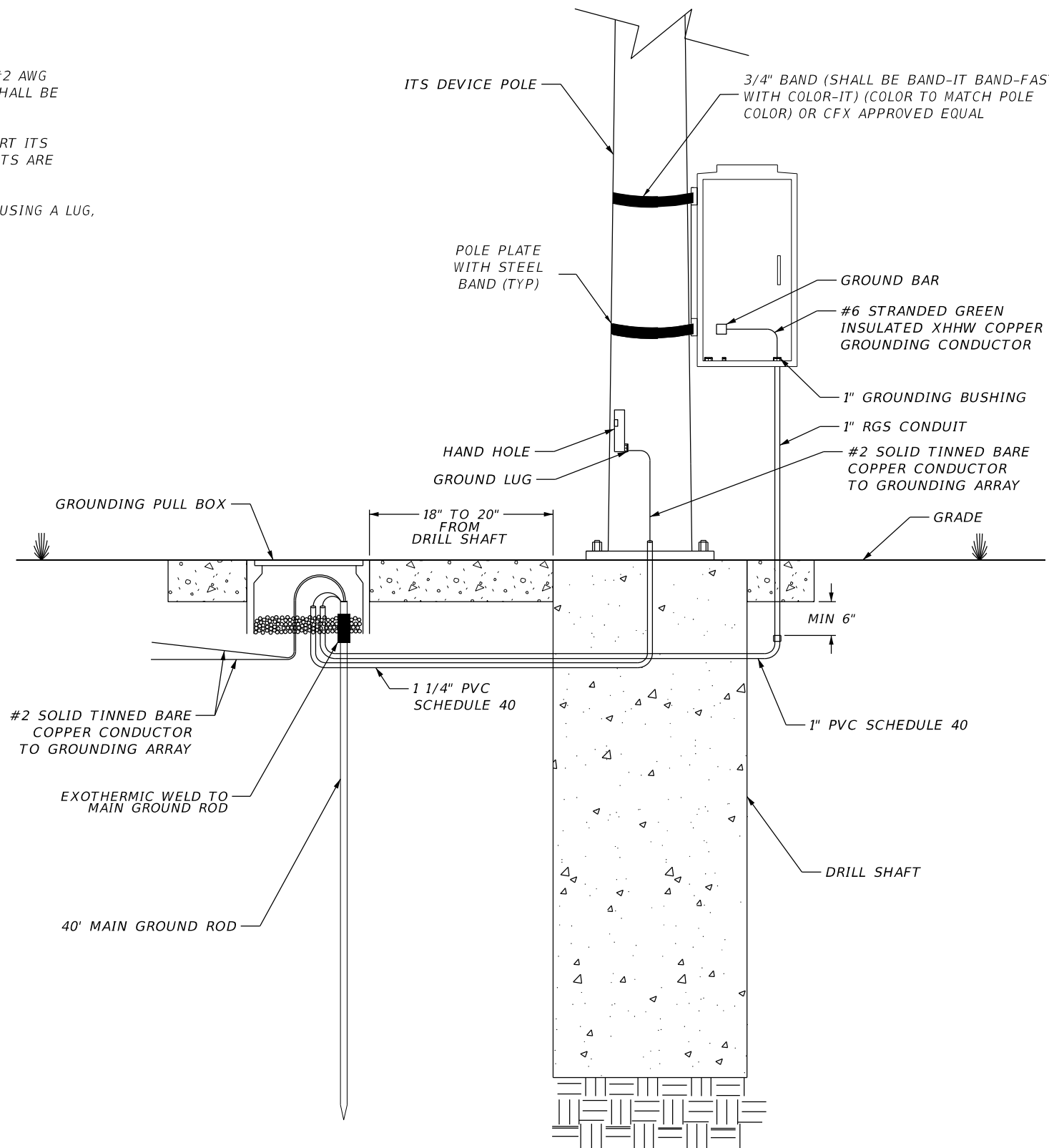
**EXISTING STRUCTURE GROUNDING**

SHEET NO. J-1

VERSION 6

GROUNDING NOTES:

1. ALL GROUNDING CONNECTIONS MADE BETWEEN THE STRUCTURE AND GROUND RODS SHALL BE MADE USING #2 AWG SOLID CONDUCTOR TINNED BARE COPPER WIRE. THE CONNECTING WIRE SHALL BE BURIED PER N.E.C. AND SHALL BE ATTACHED TO GROUND RODS USING EXOTHERMIC WELDS.
2. THE STRUCTURE SHALL BE CONNECTED TO THE GROUNDING ARRAY. BASE-MOUNTED CABINETS WHICH SUPPORT ITS DEVICES ON THE STRUCTURE SHALL ALSO BE GROUNDED TO THE COMMON GROUNDING ARRAY IF THE CABINETS ARE WITHIN 60 FEET OF THE STRUCTURE.
3. FOR ITS DEVICE POLES, THE BOND WIRE SHALL BE AFFIXED TO THE POLE VIA A MECHANICAL CONNECTION USING A LUG, WHICH IS TO BE LOCATED INSIDE THE POLE WITHIN CLOSE PROXIMITY TO THE HAND HOLE.
4. GROUNDING PULL BOXES SHALL BE STAMPED WITH "CFX GROUNDING" ON TOP OF THE LID.
5. ALL CONDUIT DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS.



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**ITS DEVICE POLE & POLE MOUNTED CABINET GROUNDING**

SHEET NO. J-2

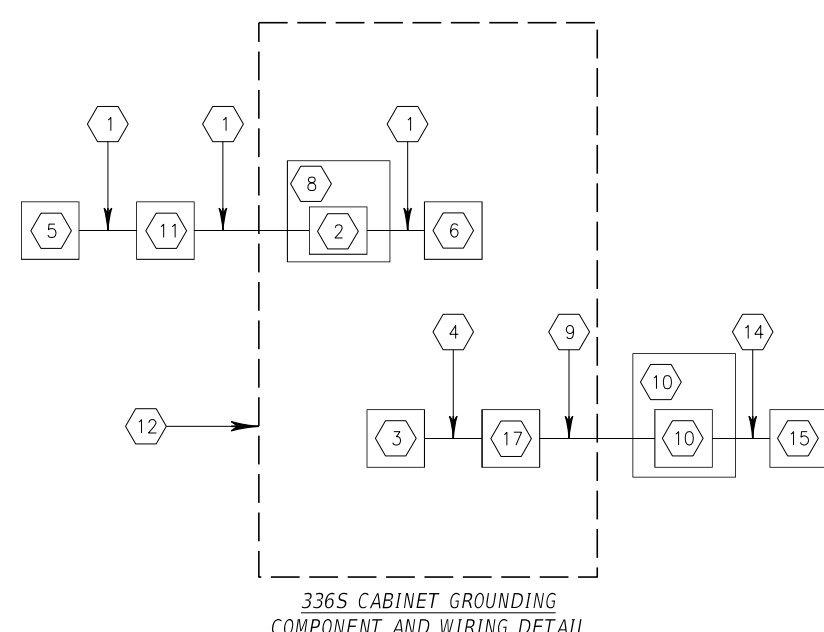
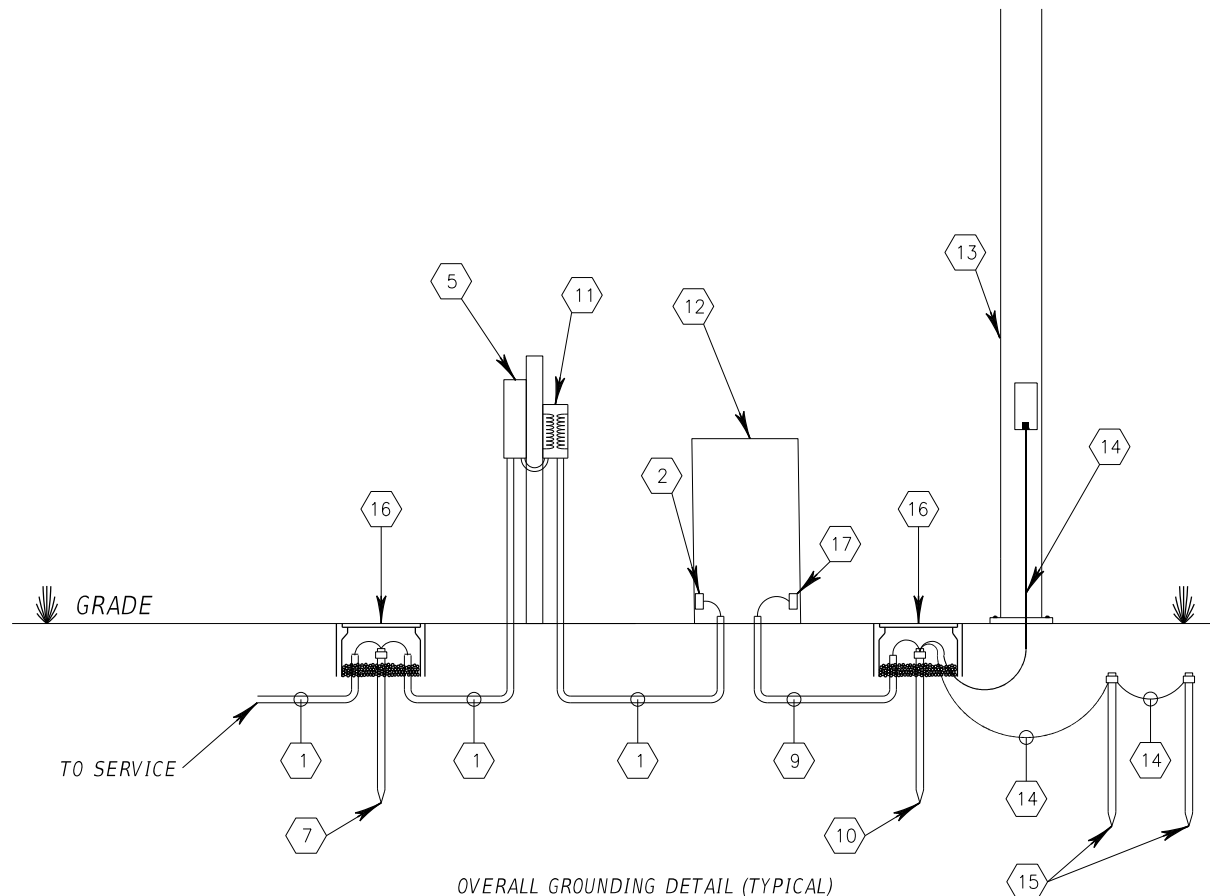
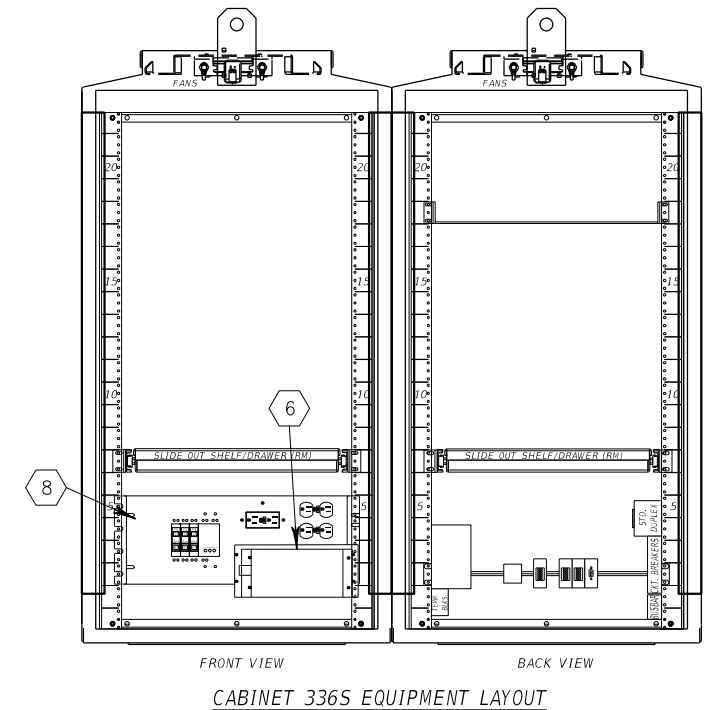
VERSION 6

**GENERAL NOTES**

1. DESIGN INTENT OF THIS DRAWING IS TO PROVIDE AN OVERALL GROUNDING CONCEPT THAT SHOWS ALL GROUNDS FOR CABINETS, POLES, AND SERVICE.
2. THE POWER PANEL GROUND AND CABINET GROUND(EQUIPMENT/LIGHTNING) ARE TO BE ISOLATED FROM EACH OTHER.
3. SYSTEM SHOWN IS TO CLARIFY AND MEET THE INTENT OF NEC ARTICLE 250.
4. REFER TO THE OTHER SECTION-J SHEETS FOR ADDITIONAL GROUNDING DETAILS
5. NUMBER OF GROUND RODS WILL VARY DEPENDING ON SITE CONDITION. CONTRACTOR TO PROVIDE PROPER NUMBER OF GROUND RODS IN ORDER TO OBTAIN THE 5 OHM REQUIREMENT PER SPECIFICATION.
6. ALLOW 2 FEET OF SLACK FOR THE EQUIPMENT AND LIGHTNING GROUND CONDUCTOR, SO A CLAMP ON MEGGER CAN BE ATTACHED BETWEEN THE CABINET GROUND BAR AND MAIN GROUND ROD FOR THE GROUNDING ARRAY.

**KEYED NOTES**

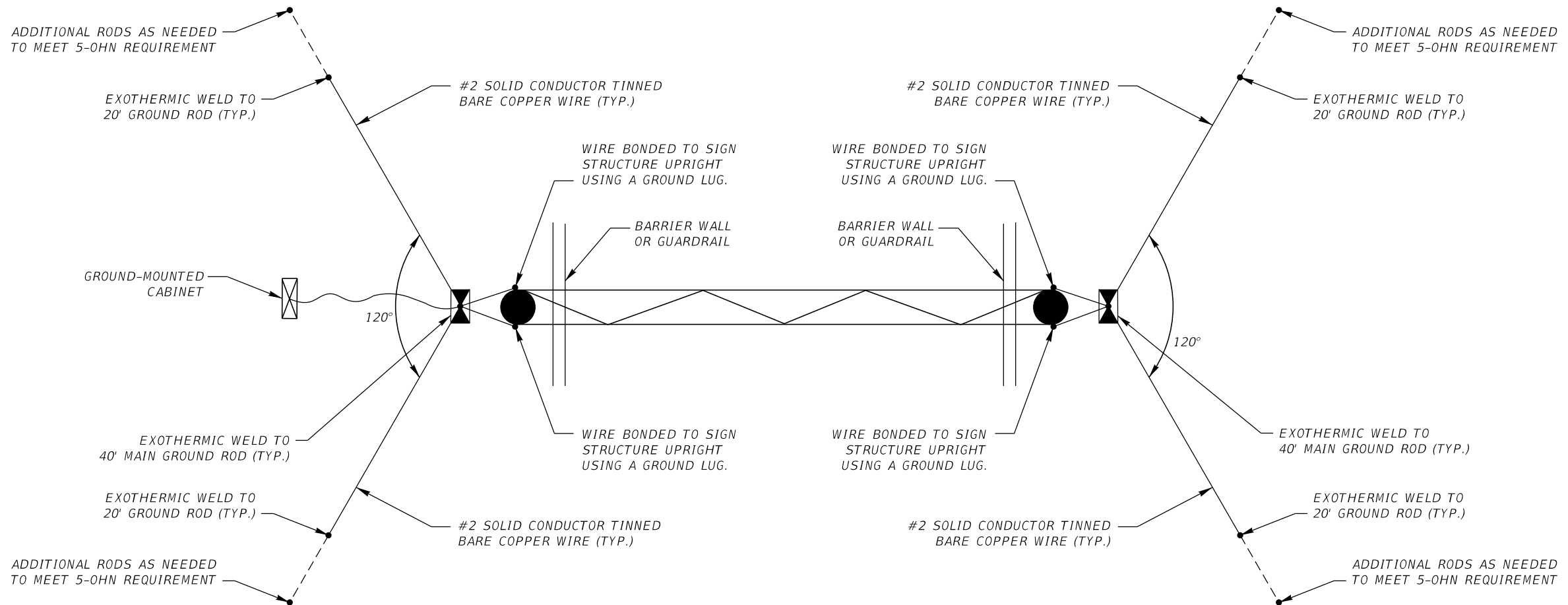
- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1 #6 GREEN INSULATED XHHW COPPER SERVICE GROUND CONDUCTOR.</li> <li>2 POWER PANEL GROUND BAR.</li> <li>3 SURGE PROTECTION DEVICE DIN RAIL MOUNTED INSIDE CABINET.</li> <li>4 #10 GREEN INSULATED XHHW COPPER CONDUCTOR FROM DIN RAIL TO CABINET GROUND BAR.</li> <li>5 SAFETY CIRCUIT BREAKER PANEL FOR AC POWER TO CABINET (IF REQUIRED).</li> <li>6 CABINET MAIN POWER SPD (SURGE SUPPRESSION DEVICE).</li> <li>7 SAFETY CIRCUIT BREAKER PANEL GROUND ROD.</li> <li>8 POWER PANEL FOR ELECTRICAL OUTLETS, FANS, AND LIGHTS.</li> <li>9 #6 GREEN INSULATED XHHW COPPER CABINET GROUND CONDUCTOR (EQUIPMENT/LIGHTNING).</li> <li>10 GROUNDING ARRAY MAIN GROUND ROD.</li> <li>11 STEP UP/STEP DOWN TRANSFORMER ASSEMBLY, GROUND PER NEC (IF REQUIRED). N-G BONDING SHALL OCCUR INSIDE THE TRANSFORMER.</li> </ol> | <ol style="list-style-type: none"> <li>12 ITS CABINET.</li> <li>13 ITS DEVICE POLE.</li> <li>14 #2 SOLID TINNED BARE COPPER GROUND CONDUCTOR.</li> <li>15 GROUND RODS, SEE ITS DEVICE GROUNDING ARRAYS.</li> <li>16 GROUNDING PULL BOX.</li> <li>17 CABINET GROUND BAR (EQUIPMENT/LIGHTNING).</li> </ol> |
|--|--|



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

<p><b>FOR INFORMATIONAL PURPOSES ONLY</b></p>	<p><b>CENTRAL FLORIDA EXPRESSWAY AUTHORITY</b></p>	<p><b>CENTRAL FLORIDA EXPRESSWAY AUTHORITY</b></p>	<p><b>ITS DEVICE GROUNDING ARRAY (1 OF 5)</b></p>	<p>SHEET NO. J-3</p>
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VERSION 6



NOTE:  
 1. MAINTAIN FORTY FEET SPACING BETWEEN ALL GROUNDING RODS WITHIN ARRAY.

EXISTING OR NEW ROADWAY SPAN STRUCTURE WITH SINGLE-POLE UPRIGHTS

NTS

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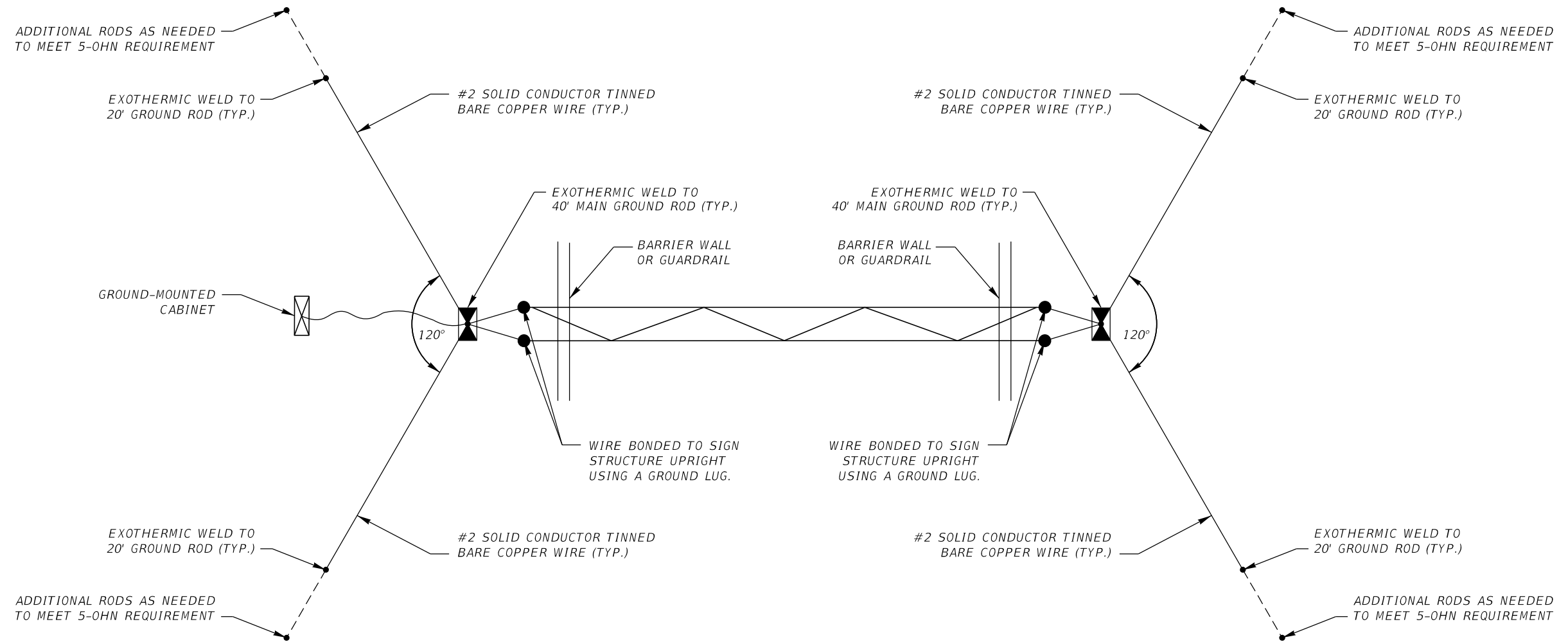
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ITS DEVICE GROUNDING  
 ARRAY (2 OF 5)

SHEET NO.  
 J-4

VERSION 6



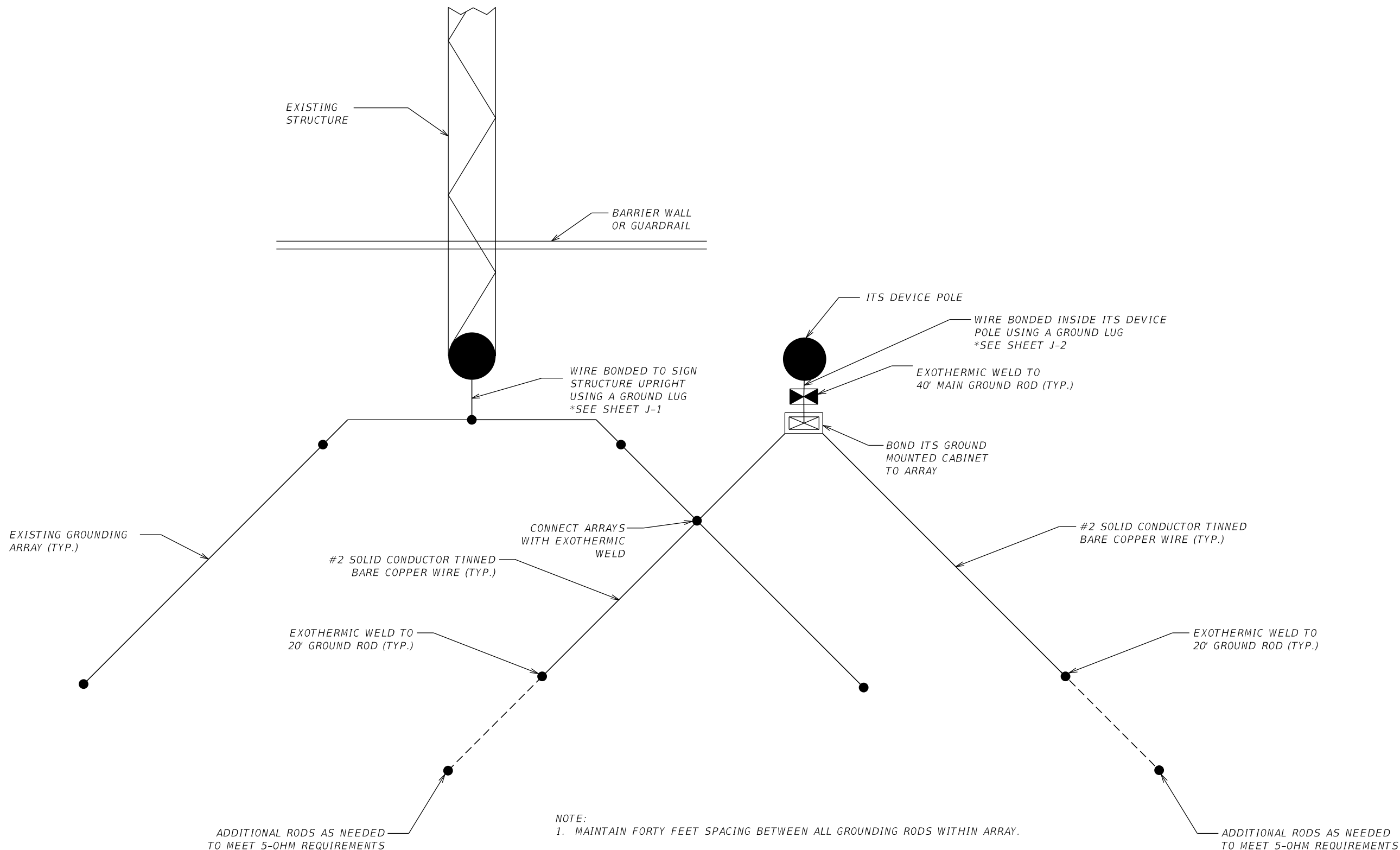
NOTE:  
 1. MAINTAIN FORTY FEET SPACING BETWEEN ALL GROUNDING RODS WITHIN ARRAY.

EXISTING OR NEW ROADWAY SPAN STRUCTURE WITH DUAL-POLE UPRIGHTS

NTS

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	ITS DEVICE GROUNDING ARRAY (3 OF 5)	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					J-5

VERSION 6



NOTE:  
1. MAINTAIN FORTY FEET SPACING BETWEEN ALL GROUNDING RODS WITHIN ARRAY.

**GROUNDING DETAIL IN PROXIMITY  
TO EXISTING ITS SIGN STRUCTURE**

NTS

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	ITS DEVICE GROUNDING ARRAY (4 OF 5)	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					J-6

VERSION 6

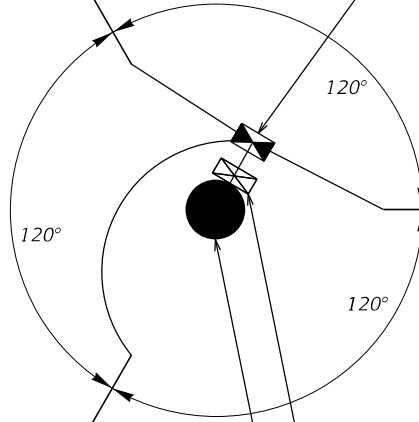


ADDITIONAL RODS  
AS NEEDED TO MEET  
5-OHM REQUIREMENTS

EXOTHERMIC WELD TO  
20' GROUND ROD (TYP.)

#2 SOLID TINNED  
BARE COPPER WIRE

PULL BOX WITH AN  
EXOTHERMIC WELD TO  
40' GROUND ROD (TYP.)



ADDITIONAL RODS  
AS NEEDED TO MEET  
5-OHM REQUIREMENTS

EXOTHERMIC WELD TO  
20' GROUND ROD (TYP.)

#2 SOLID TINNED  
BARE COPPER WIRE

BOND ITS POLE  
MOUNTED  
CABINET TO ARRAY

ITS DEVICE POLE

#2 SOLID TINNED  
BARE COPPER WIRE

EXOTHERMIC WELD TO  
20' GROUND ROD (TYP.)

ADDITIONAL RODS  
AS NEEDED TO MEET  
5-OHM REQUIREMENTS

**STANDARD GROUNDING ARRAY**

EXOTHERMICALLY WELD ALL FENCE POSTS  
WITHIN 6' OF THE GROUNDING ARRAY

R/W FENCE

BOND ITS GROUND  
MOUNTED CABINET  
TO ARRAY

PULL BOX WITH AN  
EXOTHERMIC WELD TO  
40' MAIN GROUND ROD (TYP.)

ITS DEVICE POLE

#2 SOLID TINNED  
BARE COPPER WIRE

#2 SOLID TINNED  
BARE COPPER WIRE

EXOTHERMIC WELD TO  
20' GROUND ROD (TYP.)

EXOTHERMIC WELD TO  
20' GROUND ROD (TYP.)

ADDITIONAL RODS  
AS NEEDED TO MEET  
5-OHM REQUIREMENTS

ADDITIONAL RODS  
AS NEEDED TO MEET  
5-OHM REQUIREMENTS

**GROUNDING ARRAY - LIMITED R/W**

ADDITIONAL RODS  
AS NEEDED TO MEET  
5-OHM REQUIREMENTS

EXOTHERMIC WELD TO  
20' GROUND ROD (TYP.)

#2 SOLID TINNED  
BARE COPPER WIRE

#2 SOLID TINNED  
BARE COPPER WIRE

BOND ITS POLE  
MOUNTED  
CABINET TO ARRAY

BARRIER WALL  
OR GUARDRAIL

180°

#2 SOLID TINNED  
BARE COPPER WIRE

ADDITIONAL RODS  
AS NEEDED TO MEET  
5-OHM REQUIREMENTS

EXOTHERMIC WELD TO  
20' GROUND ROD (TYP.)

ITS DEVICE POLE

PULL BOX WITH AN  
EXOTHERMIC WELD TO  
40' MAIN GROUND ROD (TYP.)

WALL OR OBSTRUCTION

**GROUNDING ARRAY - LIMITED R/W**

NOTE:  
1. MAINTAIN FORTY FEET SPACING BETWEEN ALL GROUNDING RODS WITHIN ARRAY.

NTS

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AUTHORITY

ITS DEVICE GROUNDING  
ARRAY (5 OF 5)

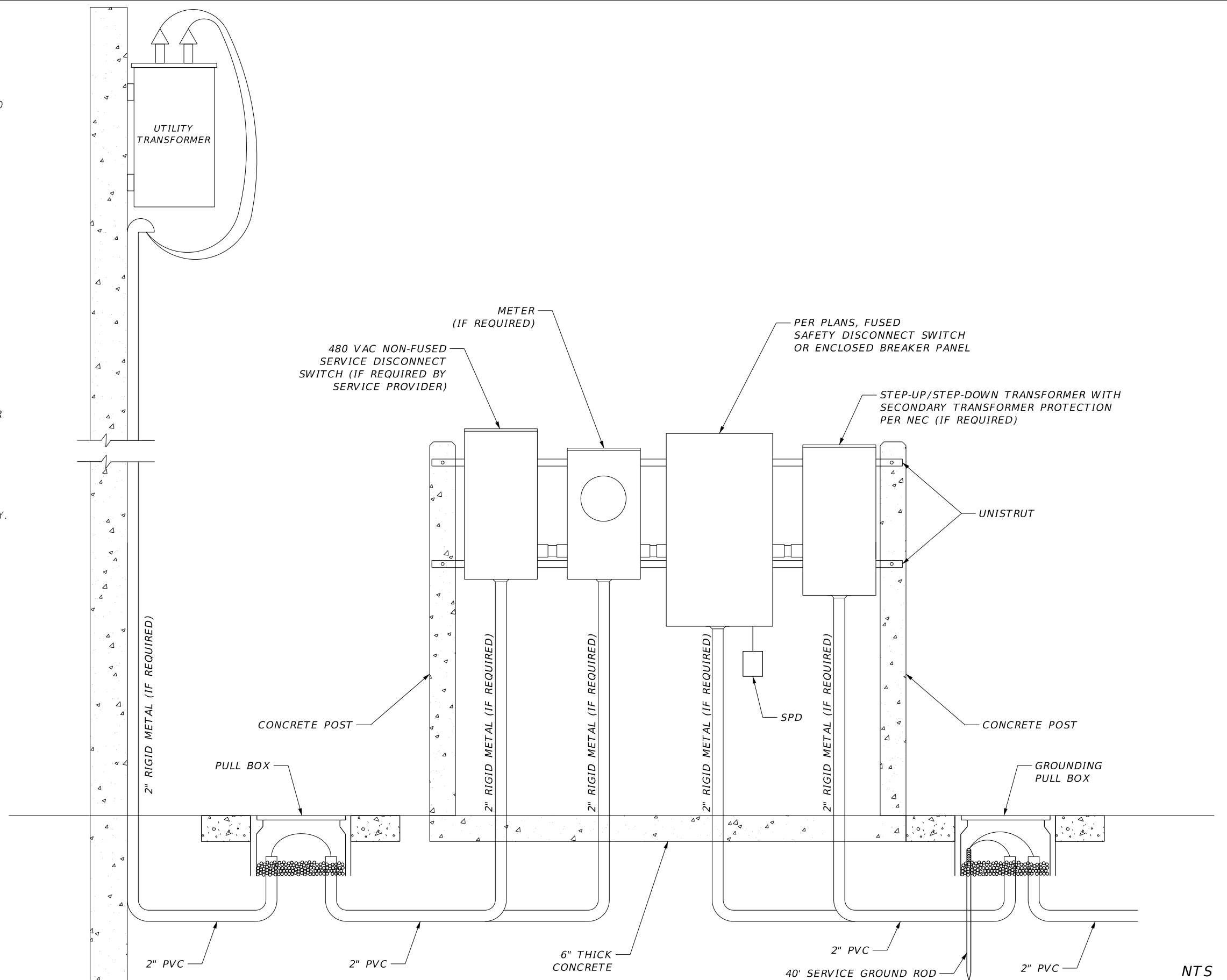
SHEET  
NO.

J-7

VERSION 6

NOTES:

1. THE ENCLOSURE SHALL BE NEMA 3R AND RAIN-TIGHT. THE SIDES AND TOP OF ALL EQUIPMENT MOUNTED TO THE H-FRAME ASSEMBLY SHALL BE SEALED WITH SILICONE. HOLES SMALLER THAN 1/8" SHALL BE SEALED WITH SILICONE SEALANT INSIDE AND OUT. DO NOT PLACE SILICONE AROUND THE BOTTOM OF THE DEVICE.
2. ENCLOSURES ARE TO BE RIGIDLY ATTACHED TO THE H-FRAME ASSEMBLY.
3. A 600 V SPD SHALL BE WIRED INSIDE THE ENCLOSURE MOUNTED ACCORDING TO INDEX 17736. THE SPD SHALL HAVE A LED INDICATOR AND BE LIT TO SHOW PROTECTION.
4. A MAIN BREAKER IS REQUIRED IN ALL SERVICE PANELS WITH TWO OR MORE BRANCH BREAKERS.
5. ALL SERVICE EQUIPMENT SHALL BE U.L. APPROVED.
6. ALL EDGES TO HAVE 1/2" CHAMFER.
7. DO NOT DRILL OR PUNCH HOLES IN METER BASE. USE PROVIDED KNOCKOUTS.
8. MOUNT KINDORF CHANNEL USING 1/2" BOLT THROUGH POST OR LEAD ANCHOR AND BOLT. DO NOT USE POWER GUN TO SHOOT FASTENERS INTO POST. DO NOT USE PLASTIC ANCHORS.
9. KINDORF CHANNEL IS NOT TO EXTEND PAST THE OUTER SIDES OF THE H-FRAME CONCRETE POSTS.
10. HEN MANUFACTURING POST, SECOND MOUNTING HOLE AND KINDORF CHANNEL INFORMATION DOES NOT APPLY.
11. SE 4500 PSI CONCRETE WITH (4) #4 REBARS SPACED IN A 4" X 4" SQUARE CENTERED IN THE POST.
12. PROVIDE OVERCURRENT PROTECTION FOR THE SECONDARY WIRES OF THE TRANSFORMER AS REQUIRED BY N.E.C.



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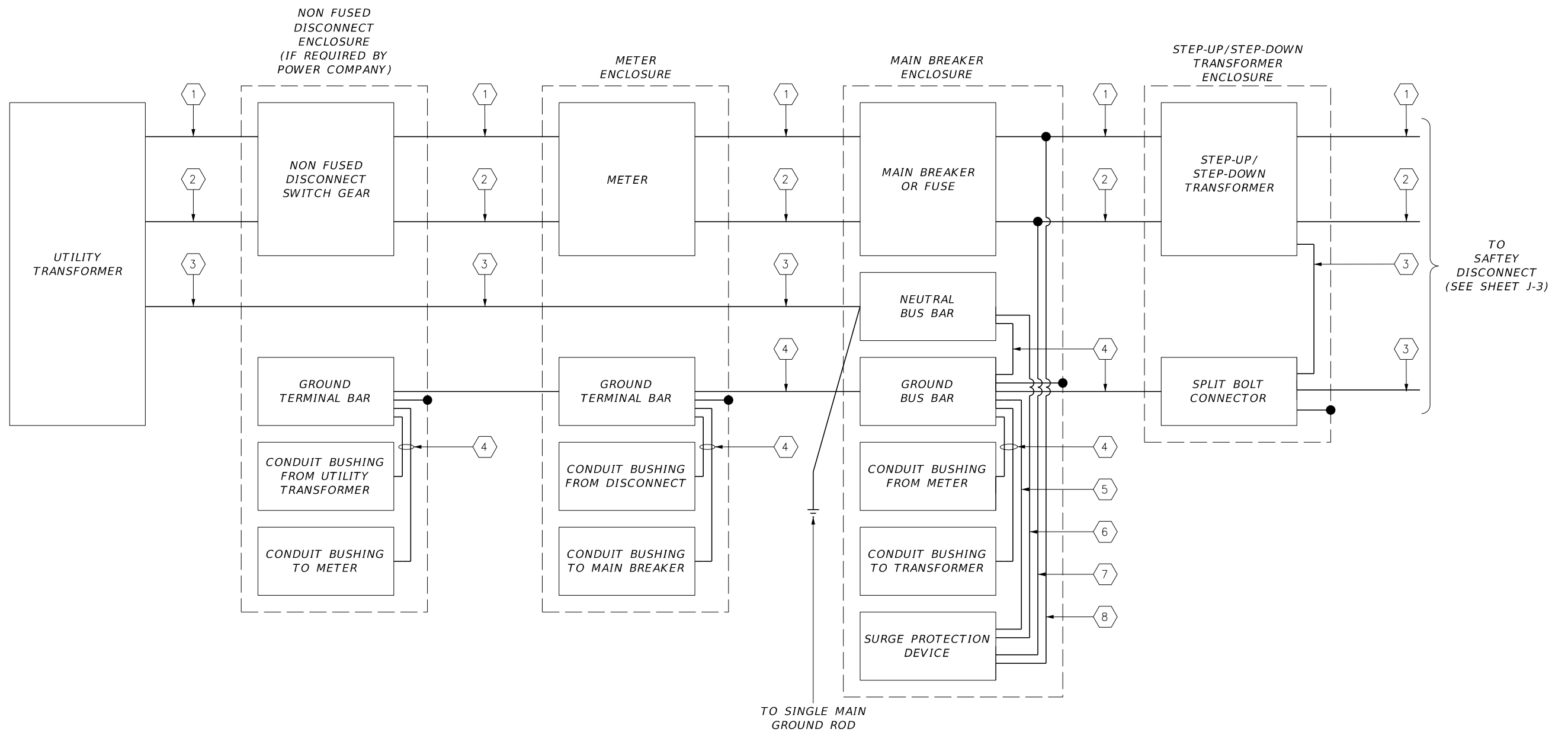
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**ELECTRICAL SERVICE ASSEMBLY**

SHEET NO.

J-8

VERSION 6



NOTES TO EOR:  
 1. CHANGE WIRING AS NEEDED TO MEET PROJECT REQUIREMENTS.  
 2. THIS IS FOR 120/240 AND 240/480 VAC APPLICATIONS.

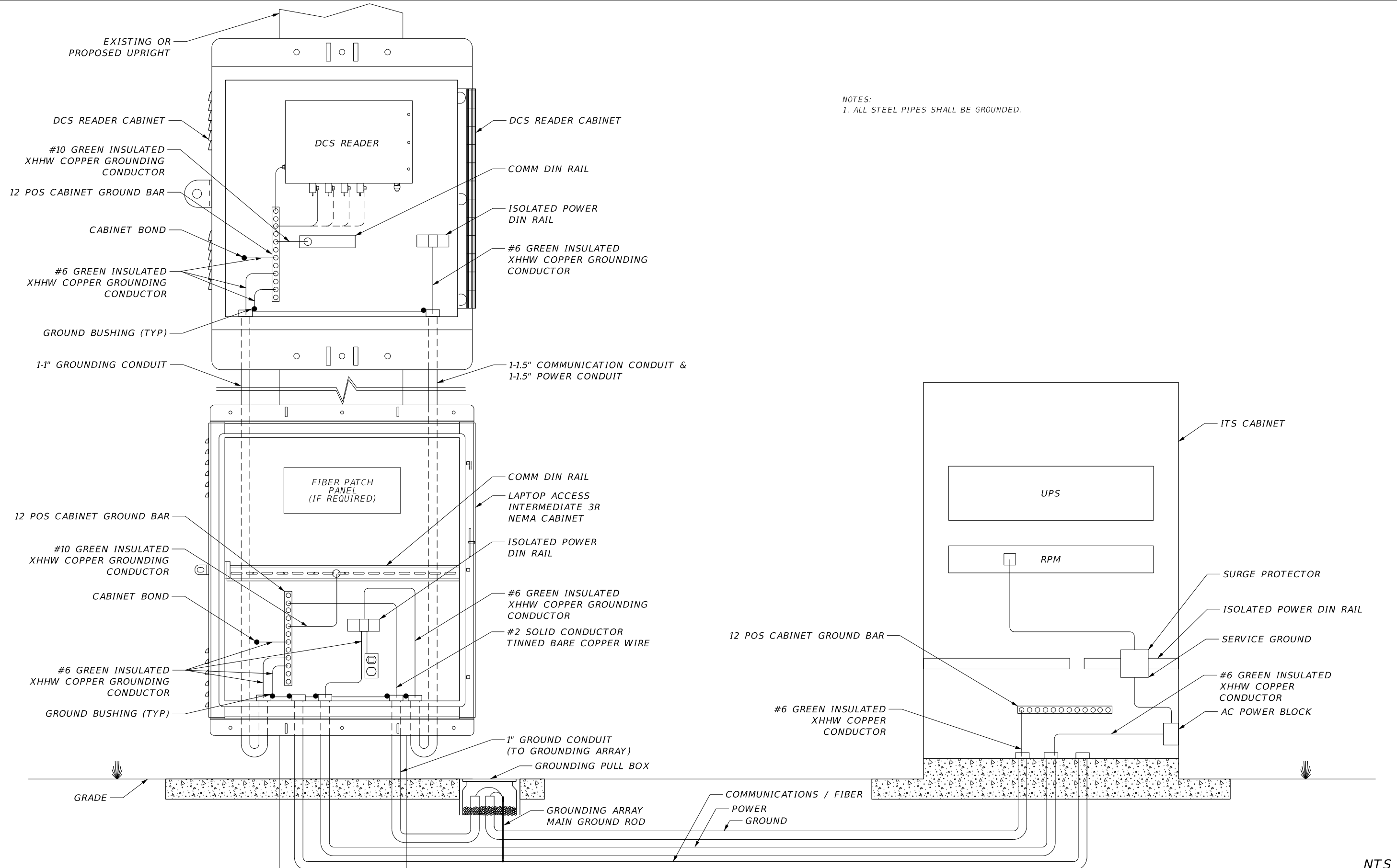
**GENERAL NOTES**

- ALL CONDUCTORS ARE TO BE SIZED AS REQUIRED BY THE N.E.C. THE SMALLEST GROUND CONDUCTOR TO BE USED THROUGHOUT THE SERVICE ASSEMBLY IS #6 AWG COPPER XHHW.

- KEYED NOTES**
- 1 BLACK INSULATED LOAD CONDUCTOR A
  - 2 RED INSULATED LOAD CONDUCTOR B WHEN PROVIDED/REQUIRED
  - 3 WHITE INSULATED NEUTRAL CONDUCTOR
  - 4 GREEN INSULATED GROUND CONDUCTOR
  - 5 SURGE PROTECTION DEVICE GROUND WIRE
  - 6 SURGE PROTECTION DEVICE NEUTRAL WIRE
  - 7 SURGE PROTECTION DEVICE LOAD WIRE B
  - 8 SURGE PROTECTION DEVICE LOAD WIRE A

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	ELECTRICAL SERVICE ASSEMBLY WIRING DIAGRAM	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					J-9

VERSION 6



NOTES:  
1. ALL STEEL PIPES SHALL BE GROUNDED.

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REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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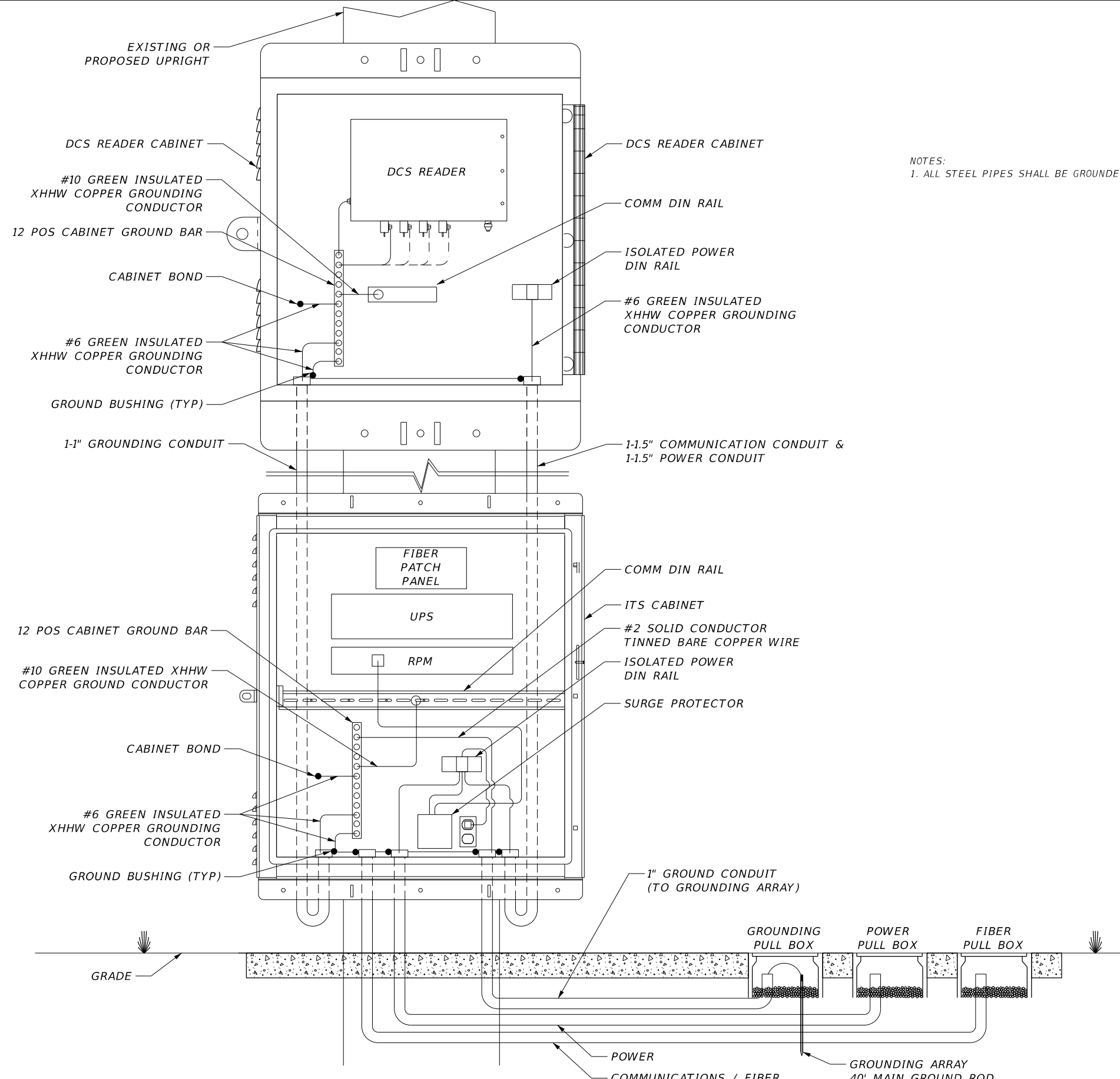
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DCS READER CABINET (1 OF 2)

SHEET NO.  
J-10

VERSION 6



NOTES:  
1. ALL STEEL PIPES SHALL BE GROUNDED.

NTS

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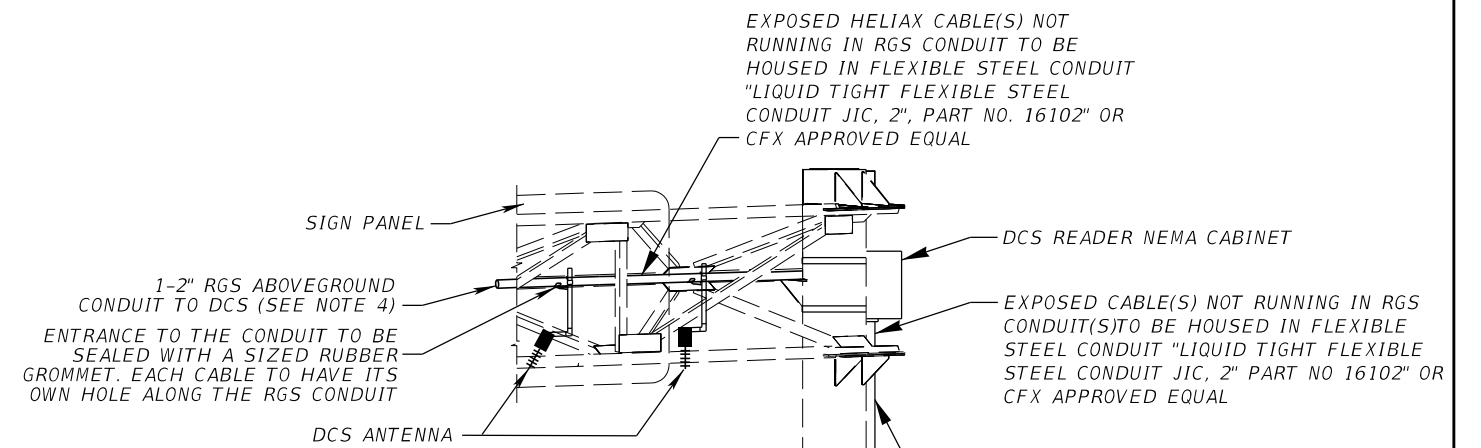
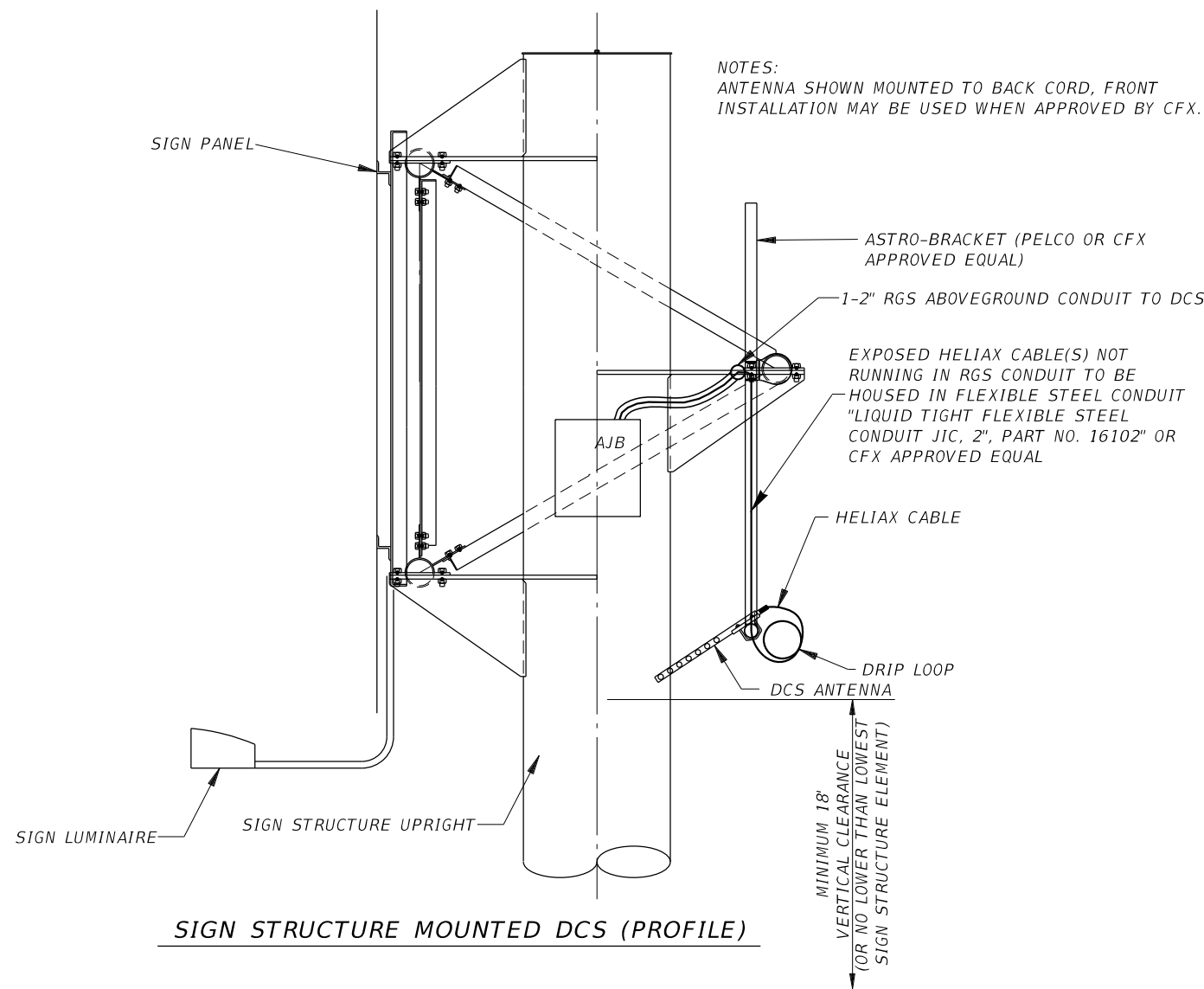
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DCS READER CABINET (2 OF 2)

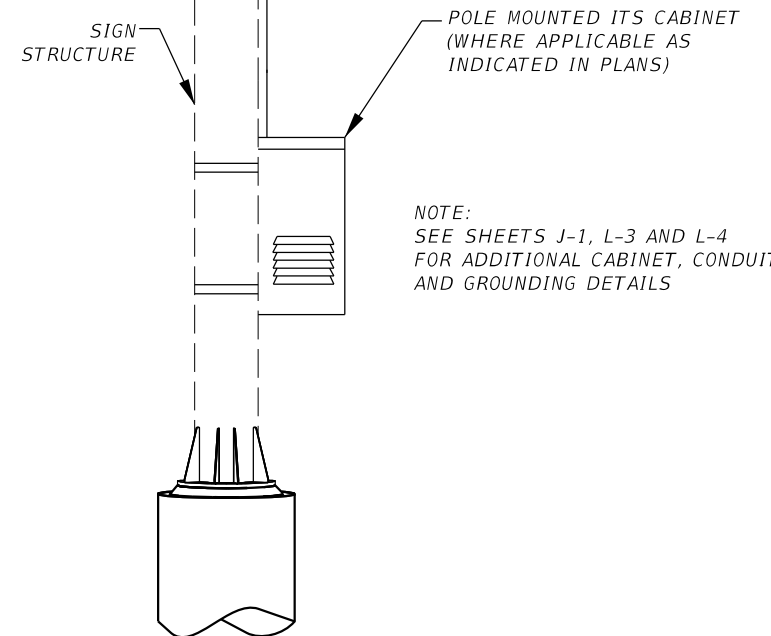
SHEET NO.  
J-11

VERSION 6



NOTES:

- DCS CABINET TO BE MOUNTED TO STRUCTURE UPRIGHT WITH 2 STAINLESS STEEL BANDS.
- BAND ITS CABINET TO UPRIGHT AT BACK OF POLE. RUN FIBER OPTIC CABLE AND POWER SUPPLY TO BOTTOM OF CABINET IN RIGID CONDUIT. CONTINUE SINGLE RUN OF RIGID CONDUIT FROM BASE OF CABINET TO BASE OF CABINET. RUN CABLE INTO BOTTOM OF "J" HOOK AND INTO DCS READER CABINET.
- WHEN INSTALLING DCS EQUIPMENT TO EXISTING STRUCTURE, CARE SHALL BE TAKEN AS TO NOT DAMAGE ANY EXISTING EQUIPMENT ATTACHED TO THE SIGN STRUCTURE. ANY DAMAGED EQUIPMENT SHALL BE REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.
- WHEN INSTALLING ABOVEGROUND CONDUIT ON EXISTING SIGN STRUCTURES, THE CONDUIT SHALL BE ATTACHED TO THE BACK TRUSS CHORD TO MINIMIZE VISUAL IMPACT.
- STAINLESS STEEL BANDS SHALL BE SIZED TO SUPPORT 3 TIMES THE WEIGHT OF THE CABINETS AND ITS CONTENTS.
- SHOP DRAWINGS FOR THE DCS MOUNT WILL BE REQUIRED FOR ENGINEER'S REVIEW AND APPROVAL PRIOR TO FABRICATION. THE MOUNTING HARDWARE OF THE DCS SHALL BE SIZED TO SUPPORT 3 TIMES THE WEIGHT OF THE DCS, AND TO RESIST 3 TIMES THE WIND LOAD ON THE DCS DUE TO DESIGN WIND SPEED OF 130 MPH.
- ANTENNA COLOR SHALL BE SUBMITTED TO CFX FOR APPROVAL.
- CONDUIT SHALL ENTER THE POLE MOUNTED CABINET FROM THE BOTTOM.
- ITS CABINET SHALL BE PLACED AS SHOWN 3' FROM BOTTOM OF CABINET TO GRADE. IF IMPRACTICAL DUE TO SITE GEOMETRICS, AN ALTERNATE LOCATION ADJACENT TO THE STRUCTURE SHALL BE DESIGNED FOR A CABINET PLACEMENT ON A TYPE II POLE WITH THE BOTTOM OF THE CABINET 3' FROM GRADE.
- SLIDE OUT TRAY SHALL BE ORIENTED SUCH THAT THE TECHNICIAN SHALL NEVER HAVE THEIR BACK TO THE DIRECTION OF TRAVEL.
- CABINET SHALL NEVER BE MOUNTED ON THE APPROACHING SIDE OF TRAFFIC.
- IT IS THE INTENT OF THE ENGINEER TO PROVIDE A SAFE WORKING SPACE FOR THE FIELD TECHNICIANS.



**SIGN STRUCTURE MOUNTED DCS**

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VERSION 6

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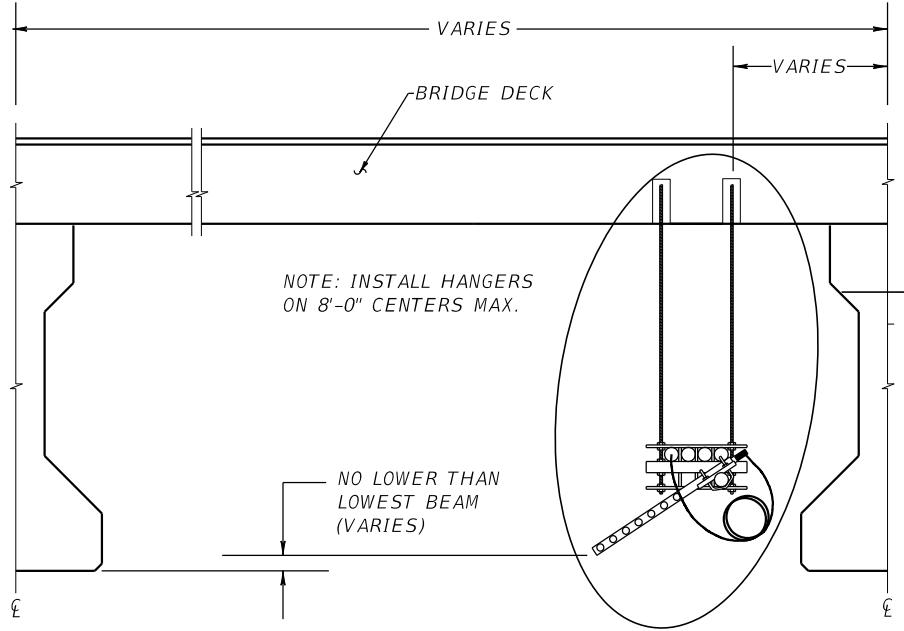
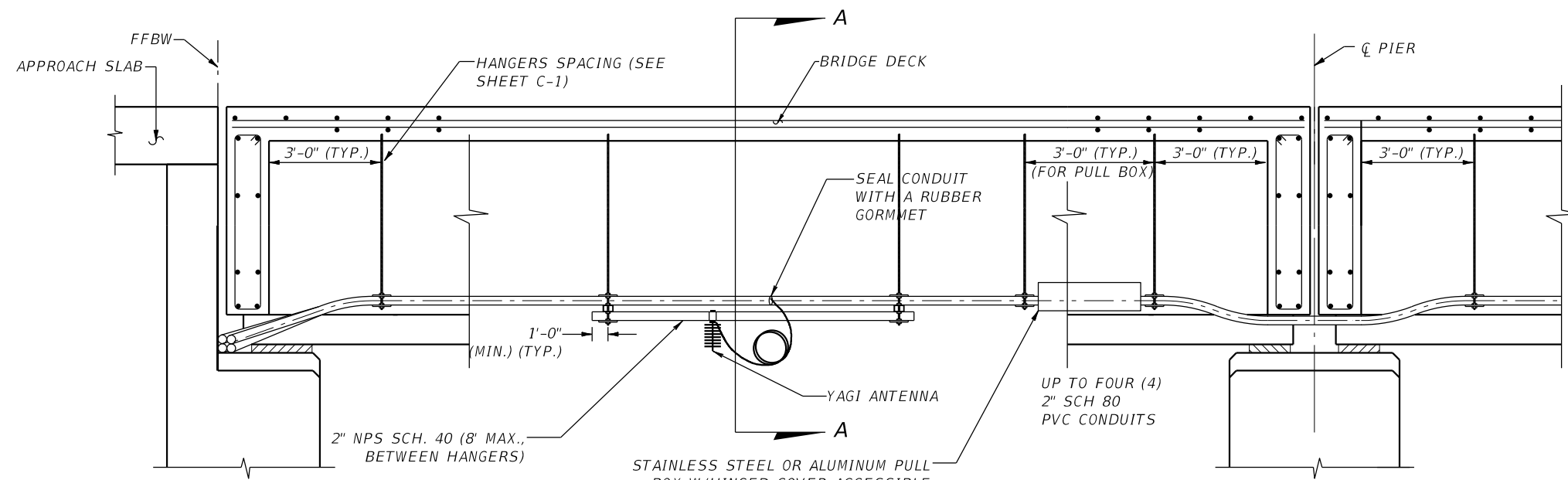
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DCS SIGN STRUCTURE MOUNTING DETAIL

SHEET NO.

K-1



**SECTION (THRU PIERS AND END BENTS)  
WITH ANTENNA HANGER**  
SEE HANGER DETAIL FOR UNDER BRIDGE DECK INSTALLATION

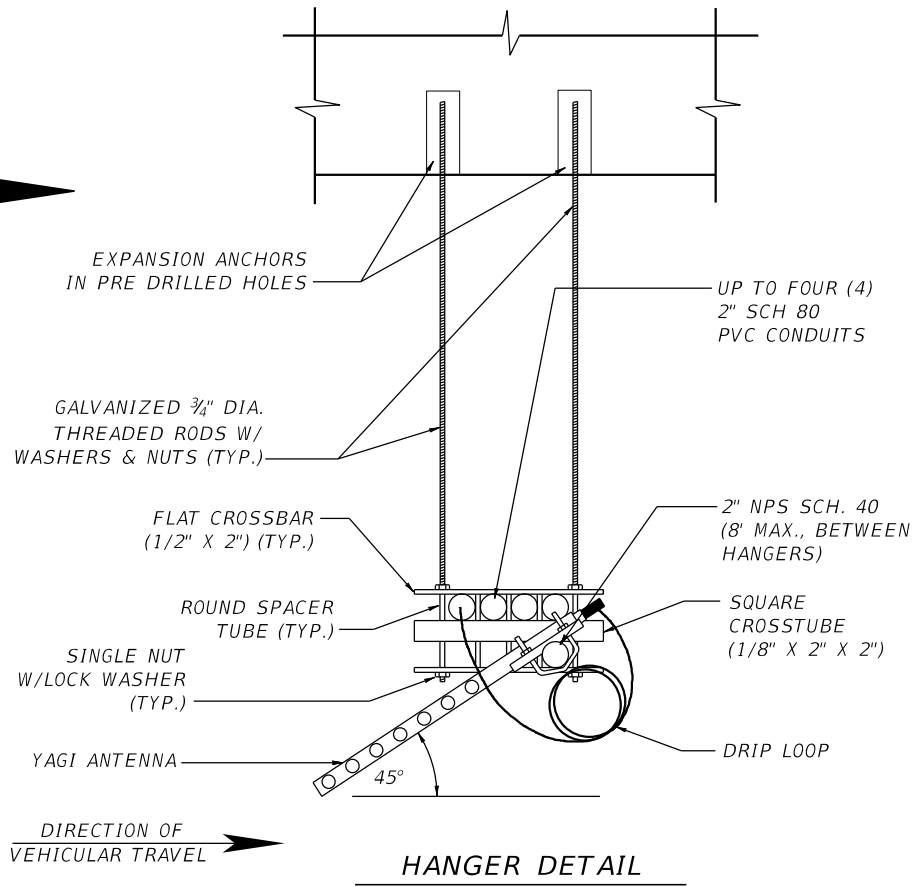
NOTE: INSTALL HANGERS ON 8'-0" CENTERS MAX.

NO LOWER THAN LOWEST BEAM (VARIES)

**SECTION A-A**

**NOTES:**

1. THE MECHANICAL EXPANSION ANCHORS INSTALLED IN PRE-DRILLED HOLES IN THE EXISTING BRIDGE DECK SHALL BE SIZED WITH A MINIMUM FACTOR OF SAFETY OF FOUR.
2. THE EXPANSION ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
3. THE THREADED RODS SHALL BE IN ACCORDANCE WITH ASTM A36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
4. 2" RDS SCH. 40 STRUCTURAL PIPE SHALL BE IN ACCORDANCE WITH ASTM A53 FOR STANDARD WEIGHT PIPE (SCHEDULE 40) AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123. THE PIPE SHALL BE SECURED TO THE HANGERS WITH U-BOLTS TO AVOID MOVEMENT AND ROTATION.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF THE HANGER SYSTEM FOR APPROVAL PRIOR TO FABRICATION. THE SHOP DRAWINGS SHALL INCLUDE, AT A MINIMUM, HANGER LAYOUT AND HANGER DETAILS. LOCATIONS OF EXPANSION JOINTS AND ANCHOR POINTS, MOUNTING DETAILS OF ANTENNA TO PIPE AND ALL OTHER DETAILS REQUIRED FOR INSTALLATION OF ANTENNAS, CONDUITS AND HANGERS.
6. THE FURNISHING AND INSTALLATION OF THE HANGER SYSTEM, CONDUITS, ANTENNAS AND RELATED HARDWARE SHALL BE PAID UNDER PAY ITEM SERIES 663-74-14X.
7. IF OTHER TYPE OF ANTENNA IS TO BE INSTALLED, THE CONTRACTOR SHALL SUBMIT DESIGN, SHOP DRAWINGS, AND DESIGN CALCULATIONS FOR APPROVAL BY CFX.



**HANGER DETAIL**

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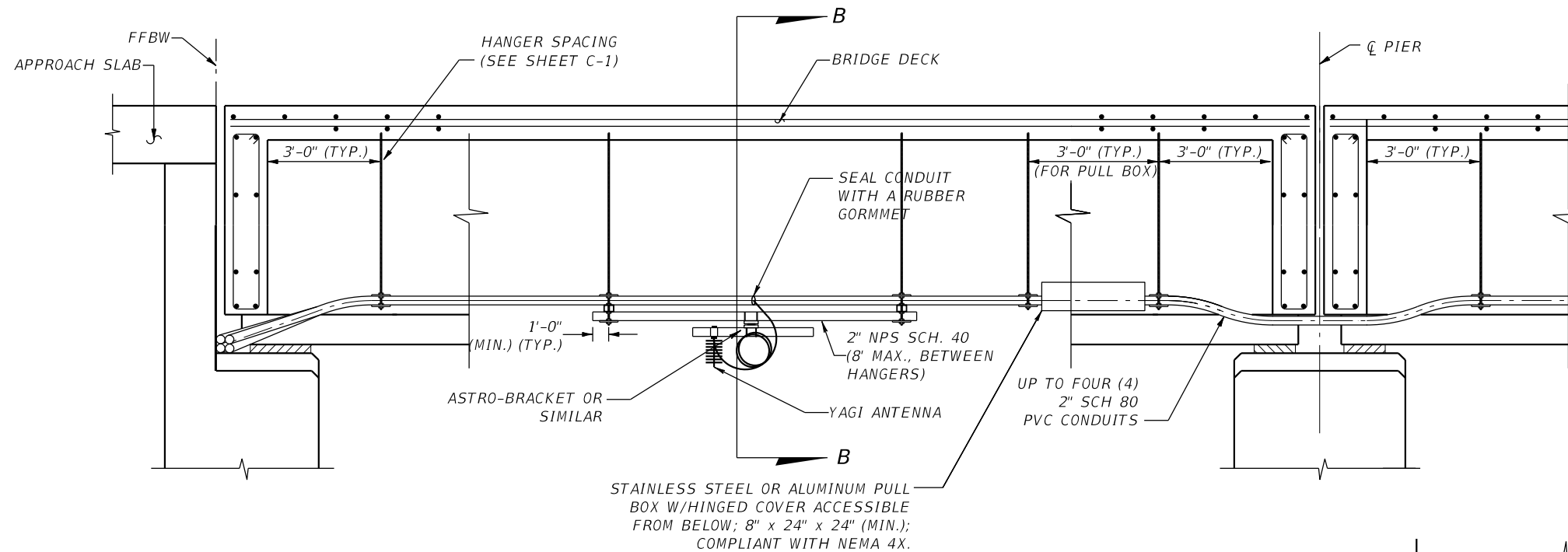
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AUTHORITY**

**DCS BRIDGE MOUNTING  
DETAIL (STRAIGHT BRIDGE)**

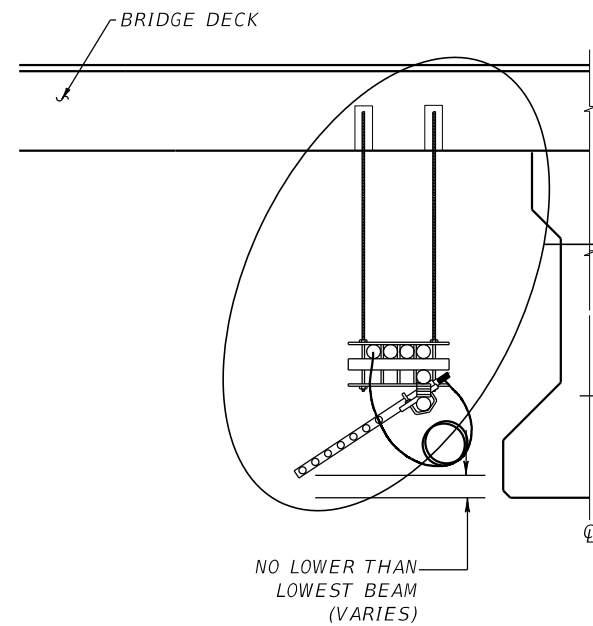
SHEET NO.

K-2

VERSION 6



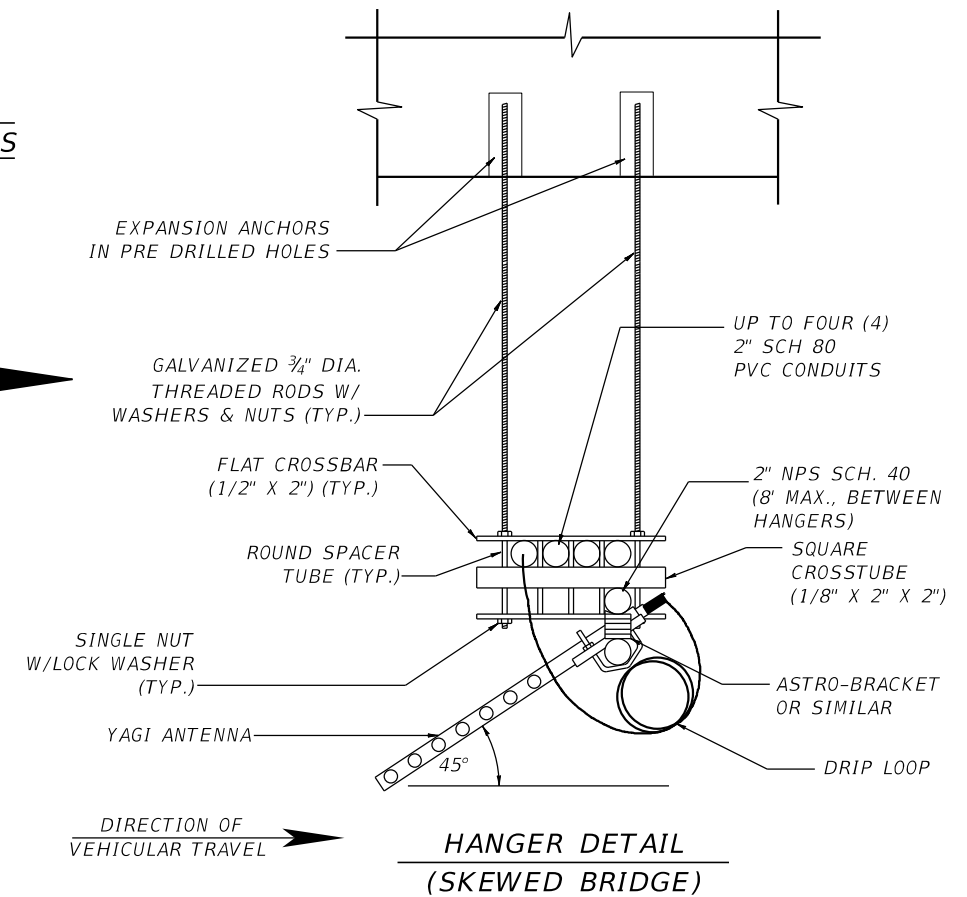
**SECTION (THRU PIERS AND END BENTS)  
WITH ANTENNA HANGER FOR SKEWED BRIDGES**  
SEE HANGER DETAIL FOR UNDER BRIDGE DECK INSTALLATION



**SECTION B-B  
(SKEWED BRIDGE)**

**NOTES:**

1. THE MECHANICAL EXPANSION ANCHORS INSTALLED IN PRE-DRILLED HOLES IN THE EXISTING BRIDGE DECK SHALL BE SIZED WITH A MINIMUM FACTOR OF SAFETY OF FOUR.
2. THE EXPANSION ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
3. THE THREADED RODS SHALL BE IN ACCORDANCE WITH ASTM A36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
4. 2" RDS SCH. 40 STRUCTURAL PIPE SHALL BE IN ACCORDANCE WITH ASTM A53 FOR STANDARD WEIGHT PIPE (SCHEDULE 40) AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123. THE PIPE SHALL BE SECURED TO THE HANGERS WITH U-BOLTS TO AVOID MOVEMENT AND ROTATION.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF THE HANGER SYSTEM FOR APPROVAL PRIOR TO FABRICATION. THE SHOP DRAWINGS SHALL INCLUDE, AT A MINIMUM, HANGER LAYOUT AND HANGER DETAILS. LOCATIONS OF EXPANSION JOINTS AND ANCHOR POINTS, MOUNTING DETAILS OF ANTENNA TO PIPE AND ALL OTHER DETAILS REQUIRED FOR INSTALLATION OF ANTENNAS, CONDUITS AND HANGERS.
6. THE FURNISHING AND INSTALLATION OF THE HANGER SYSTEM, CONDUITS, ANTENNAS AND RELATED HARDWARE SHALL BE PAID UNDER PAY ITEM SERIES 663-74-14X.
7. IF OTHER TYPE OF ANTENNA IS TO BE INSTALLED, THE CONTRACTOR SHALL SUBMIT DESIGN, SHOP DRAWINGS, AND DESIGN CALCULATIONS FOR APPROVAL BY CFX.



**HANGER DETAIL  
(SKEWED BRIDGE)**

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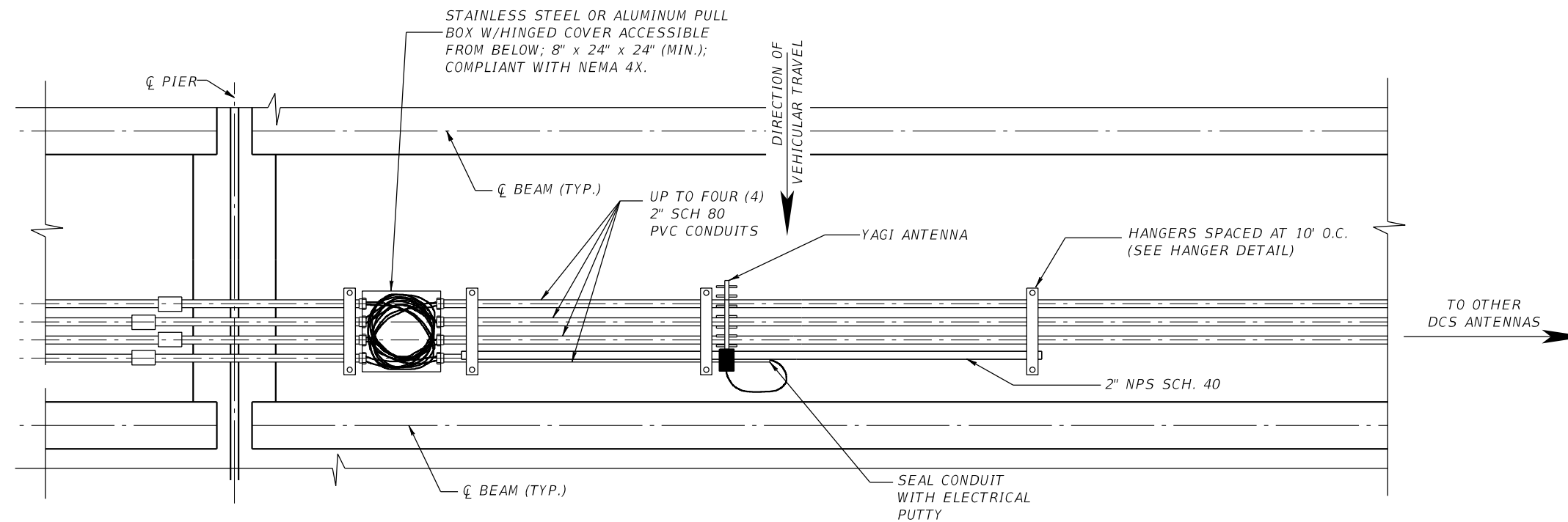
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**DCS BRIDGE MOUNTING  
DETAIL (SKEWED BRIDGE)**

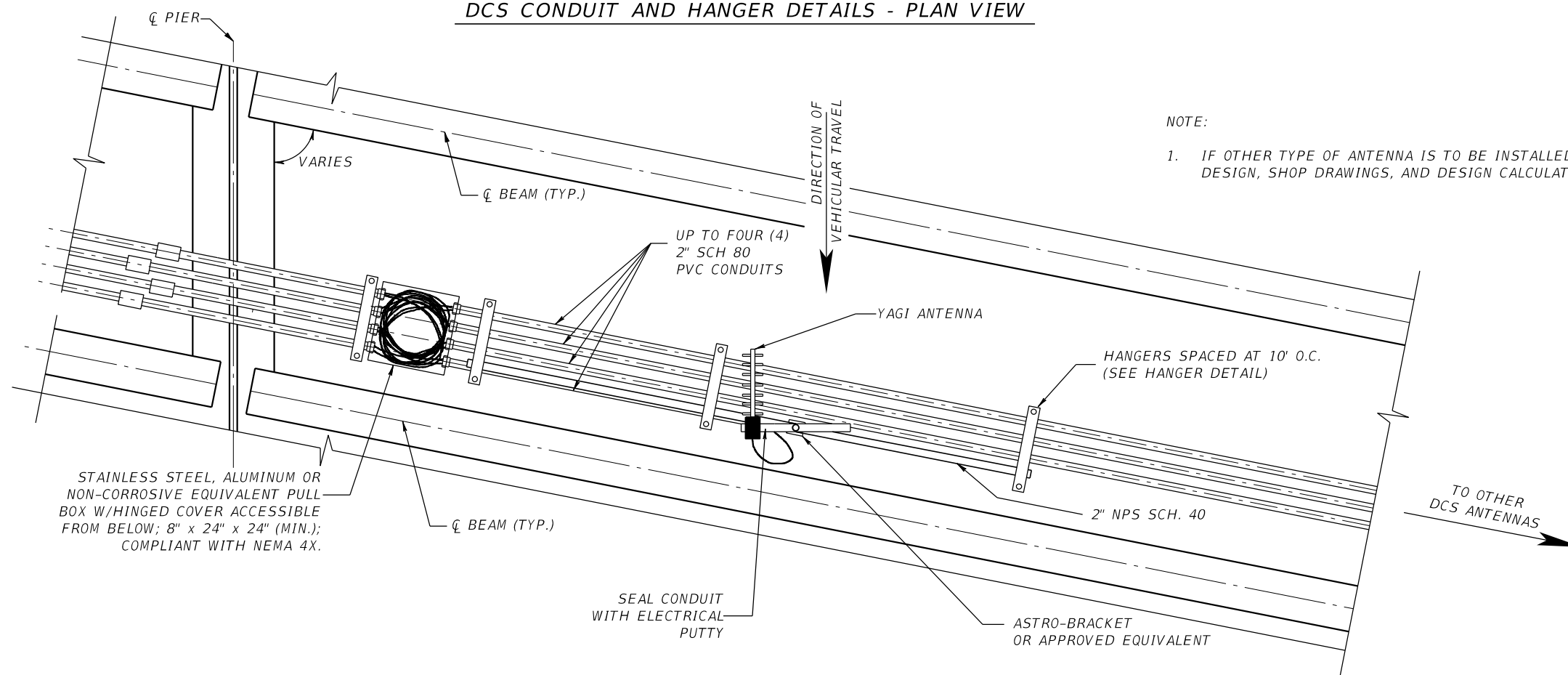
SHEET NO.  
K-3

VERSION 6





**DCS CONDUIT AND HANGER DETAILS - PLAN VIEW**



NOTE:

1. IF OTHER TYPE OF ANTENNA IS TO BE INSTALLED, THE CONTRACTOR SHALL SUBMIT DESIGN, SHOP DRAWINGS, AND DESIGN CALCULATIONS FOR APPROVAL BY CFX.

**DCS CONDUIT AND HANGER DETAILS - PLAN VIEW  
SKEWED BRIDGE**

NTS

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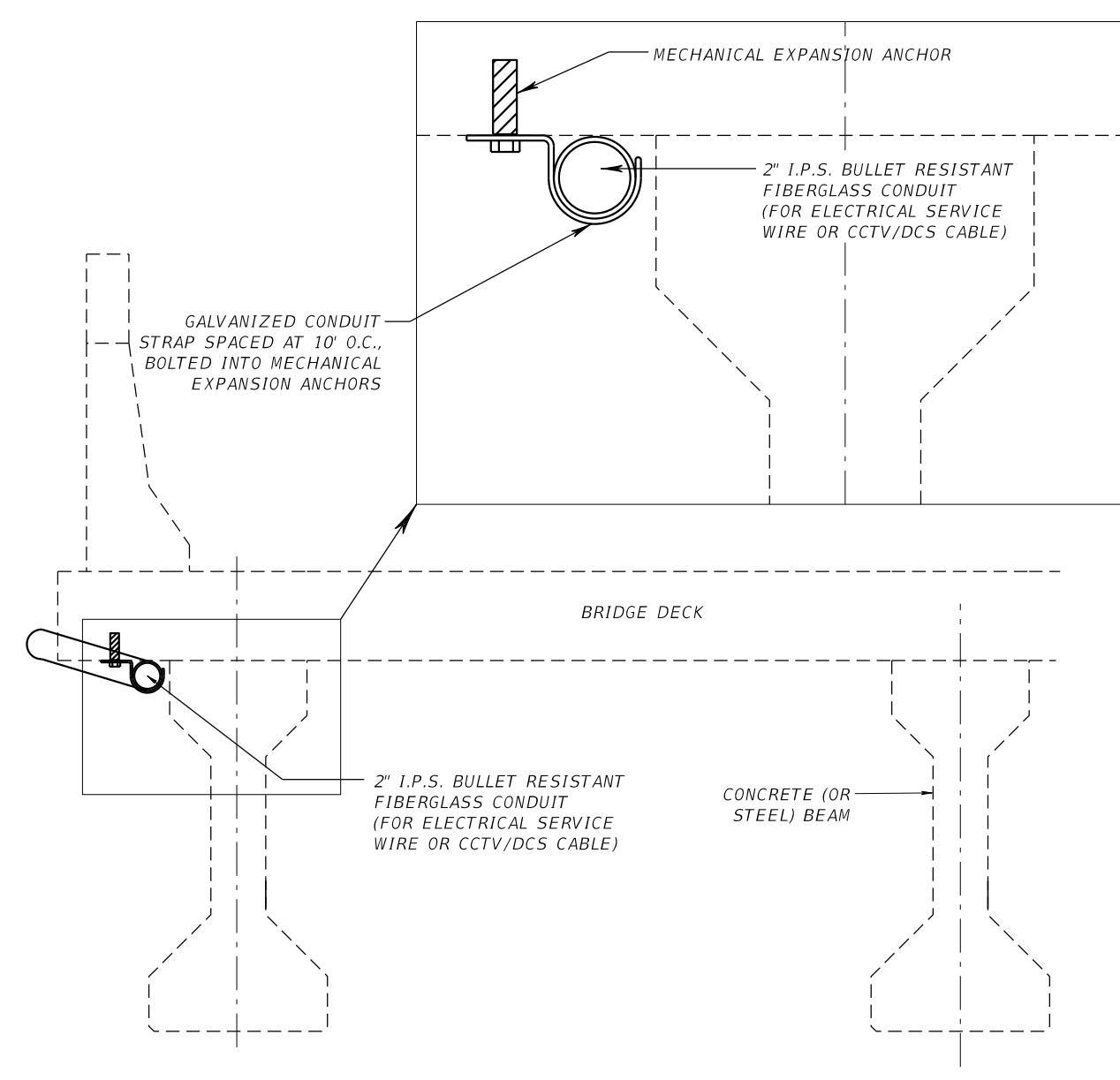
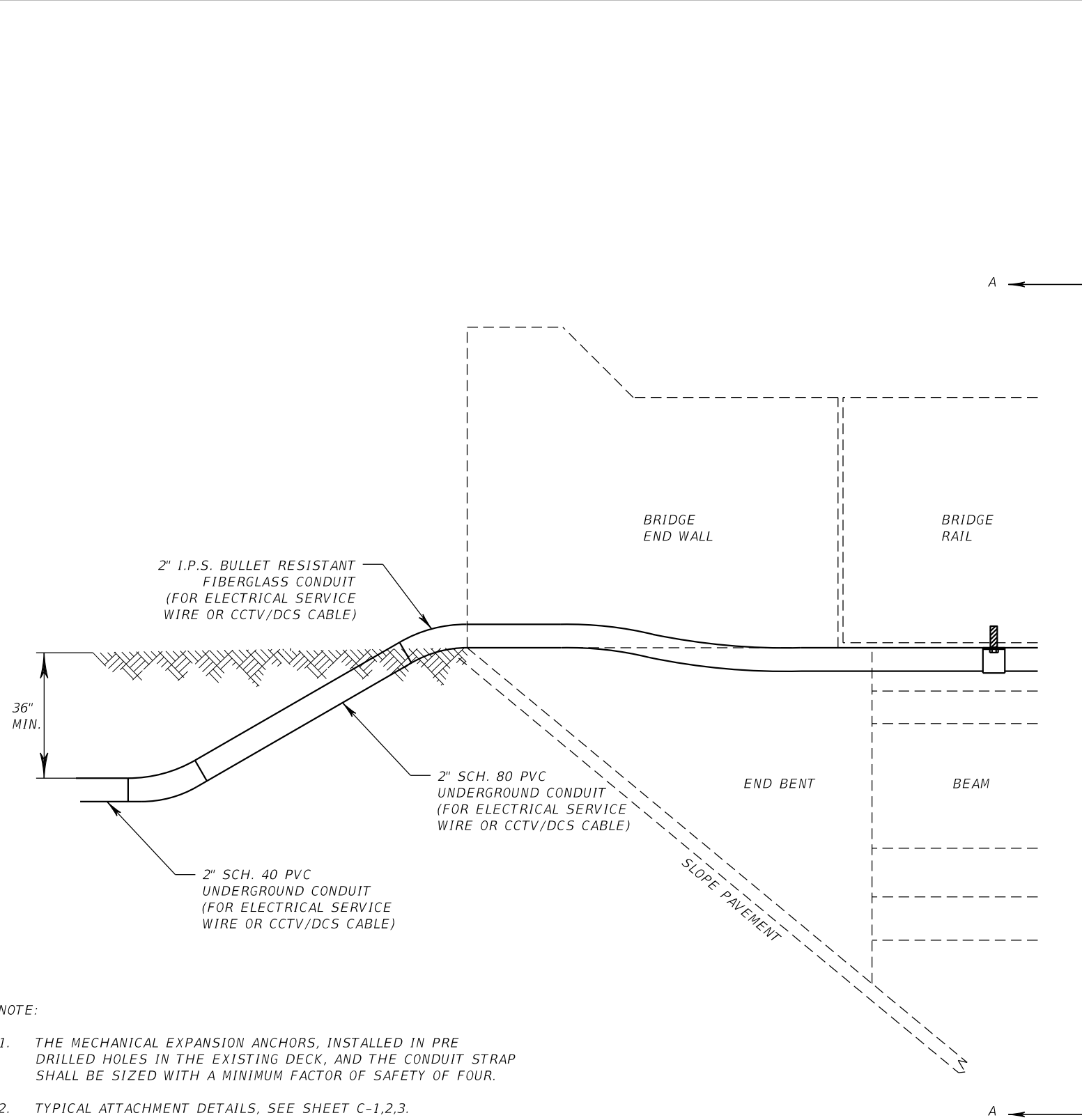
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DCS BRIDGE MOUNTED CONDUIT DETAIL

SHEET NO.

K-4

VERSION 6



- NOTE:
1. THE MECHANICAL EXPANSION ANCHORS, INSTALLED IN PRE DRILLED HOLES IN THE EXISTING DECK, AND THE CONDUIT STRAP SHALL BE SIZED WITH A MINIMUM FACTOR OF SAFETY OF FOUR.
  2. TYPICAL ATTACHMENT DETAILS, SEE SHEET C-1,2,3.

**BRIDGE STRUCTURE MOUNTED CONDUIT FOR ELECTRICAL AND CCTV/DCS CABLES (TYPICAL)**

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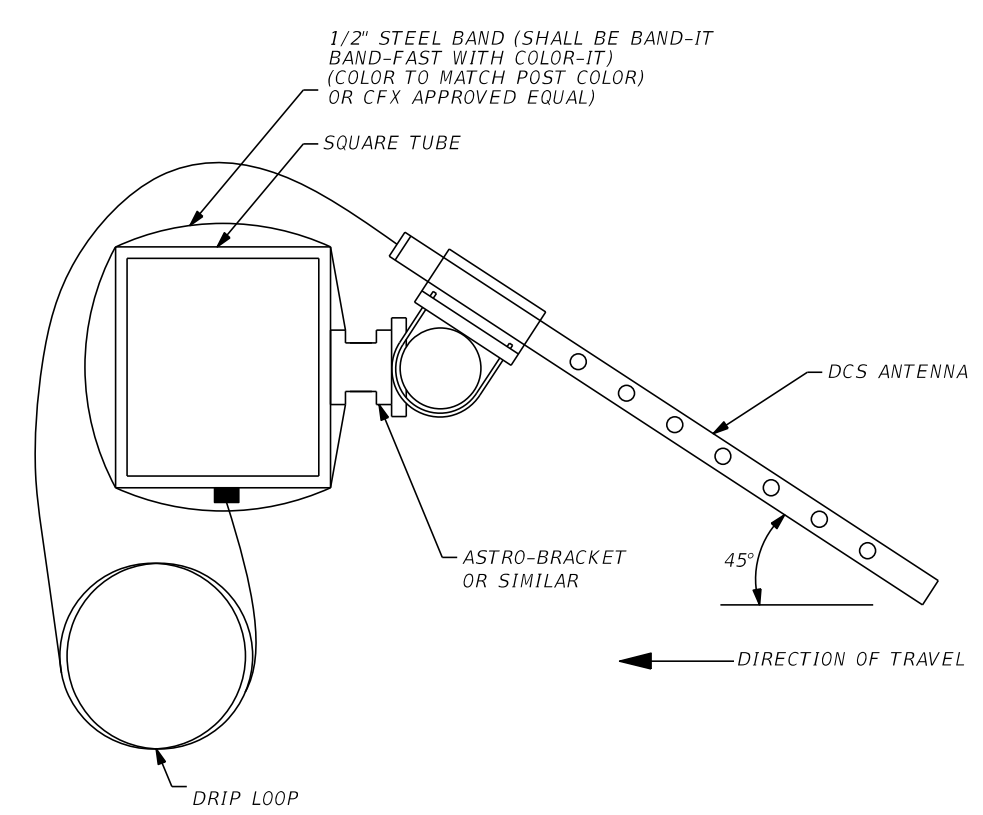
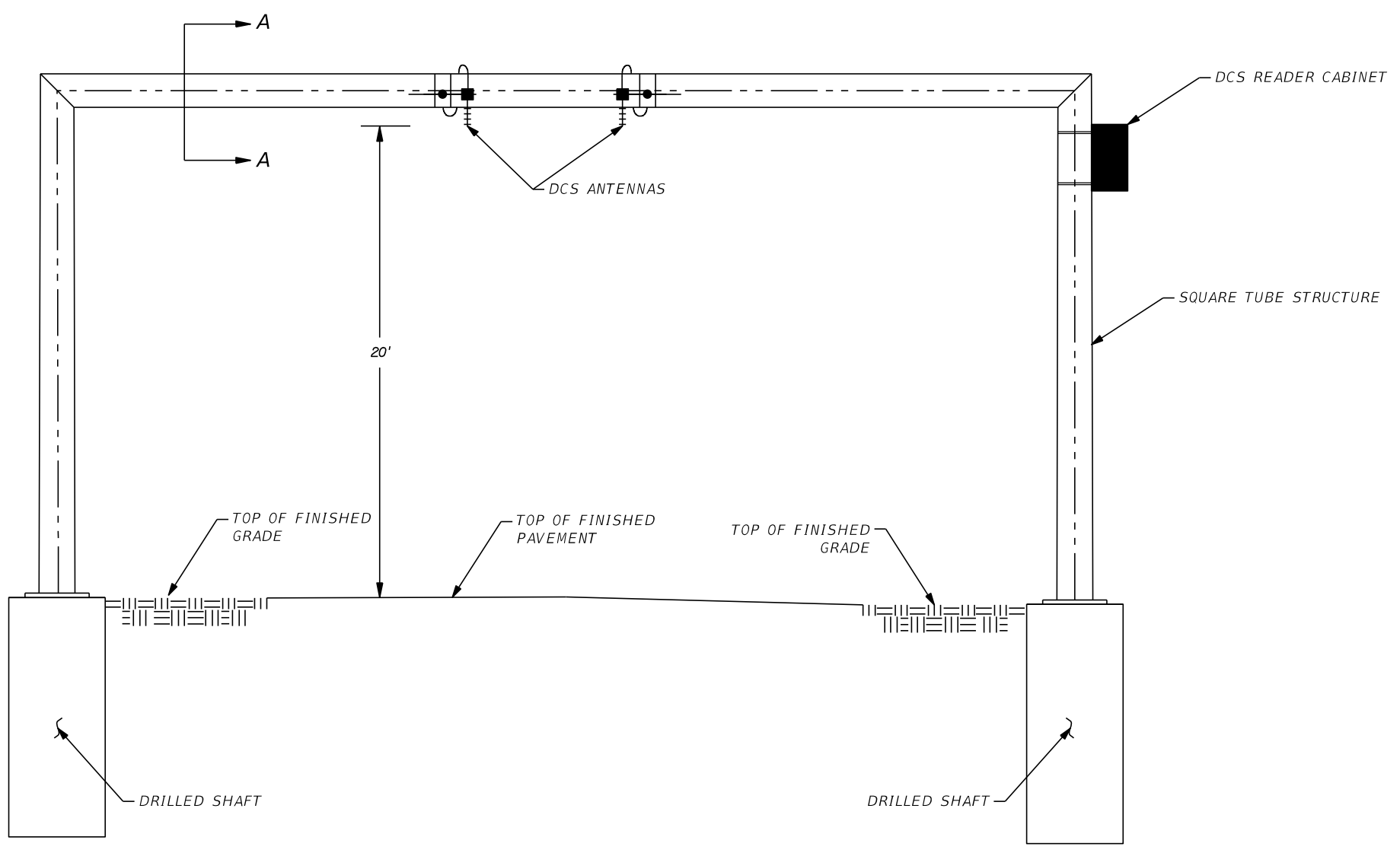
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**DCS BRIDGE MOUNTED CONDUIT TRANSITION DETAIL**

SHEET NO. K-5

VERSION 6



**SECTION A-A**

**DCS ON STEEL TUBE STRUCTURE MOUNTING DETAIL**

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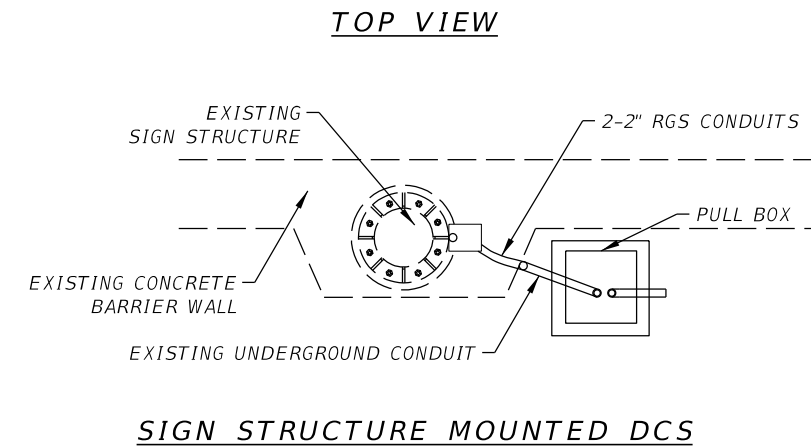
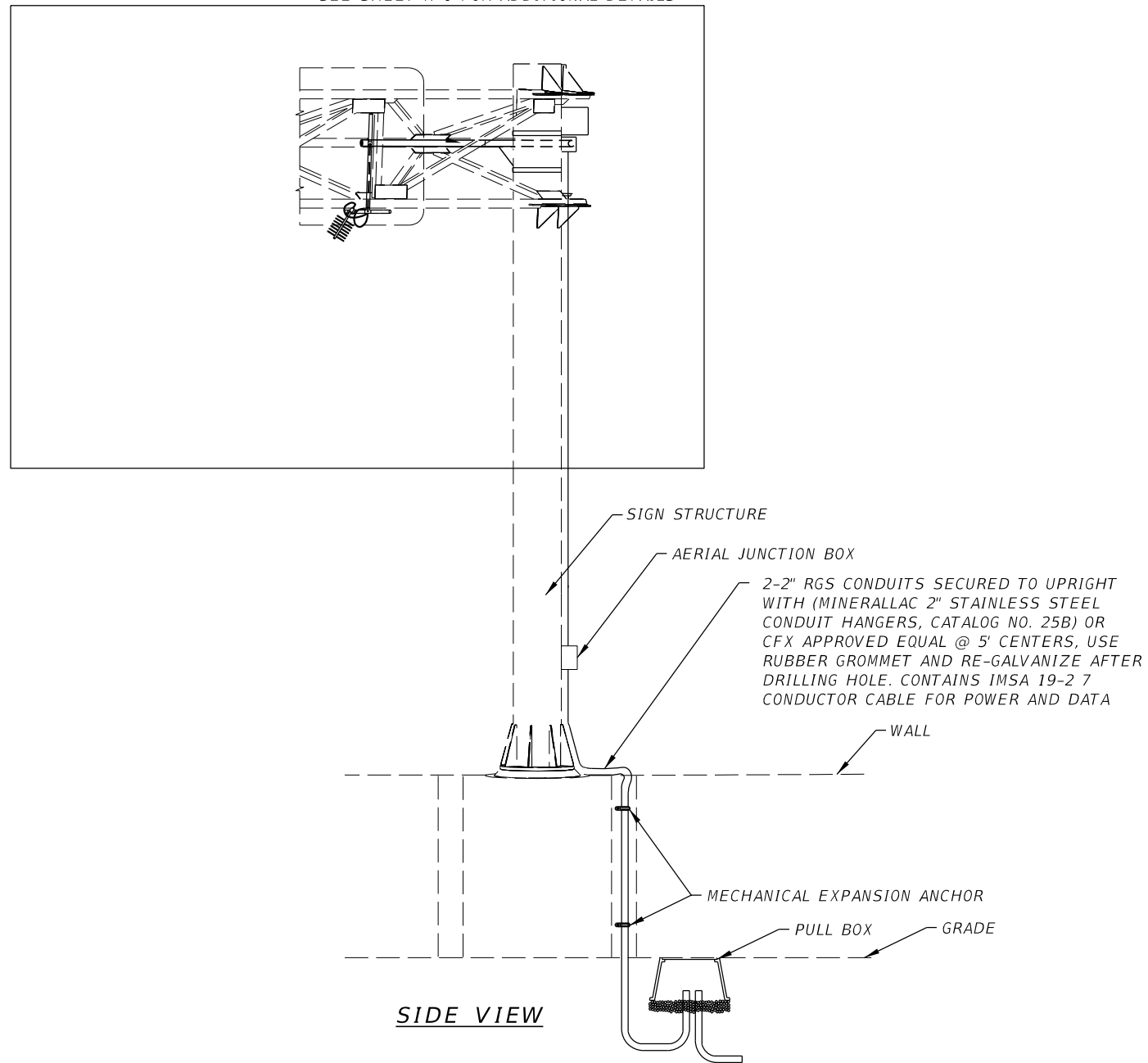
**DCS STEEL TUBE STRUCTURE ANTENNA DETAIL**

SHEET NO. K-6

VERSION 6

DCS MOUNTING DETAIL

SEE SHEET K-1 FOR ADDITIONAL DETAILS



NOTES:

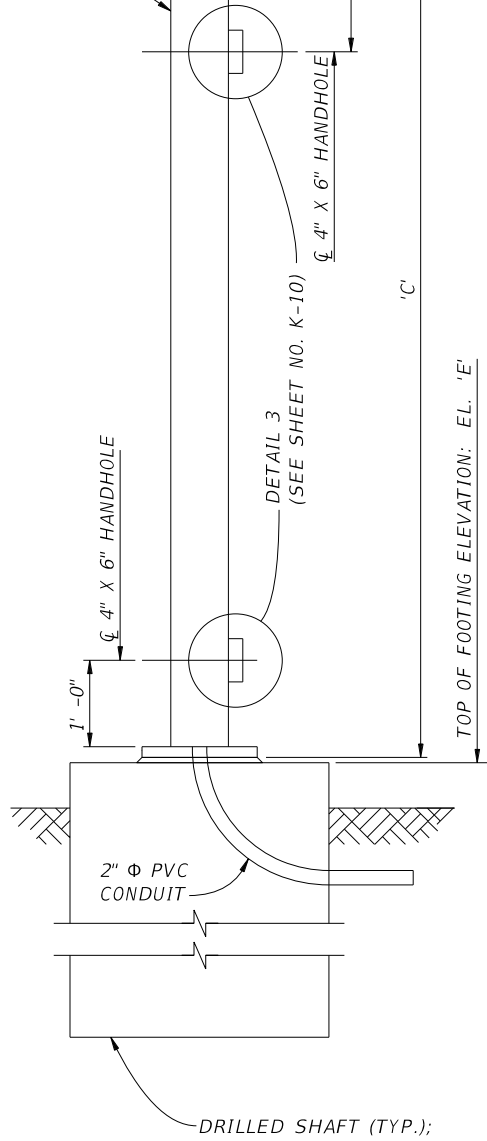
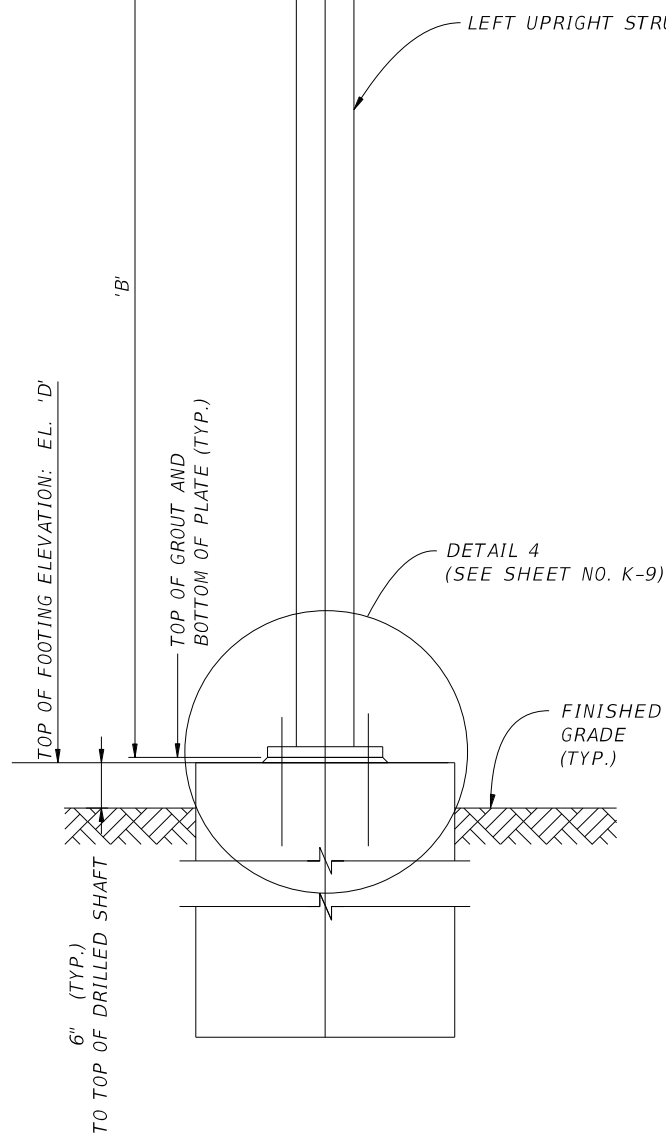
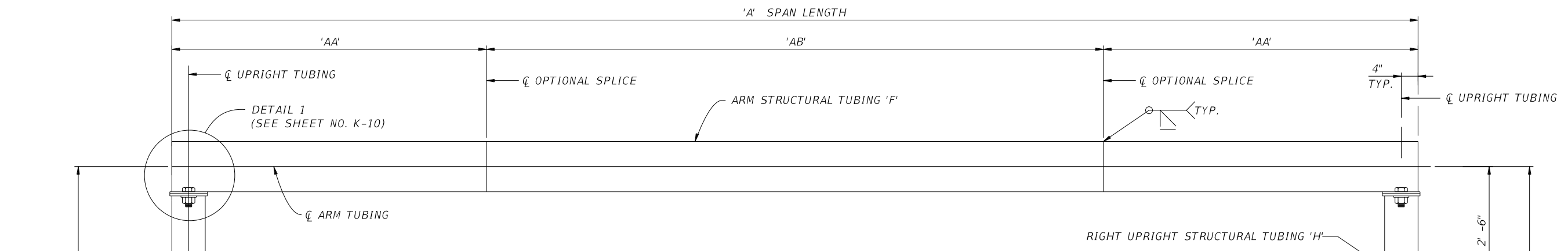
1. WHEN NEW CONDUIT IS INSTALLED ON A PAINTED MECHANICAL STABILIZED EARTH (MSE) WALL OR OTHER PAINTED SURFACE, THE CONDUIT SHALL BE PAINTED TO MATCH THE EXISTING MSE WALL OR SURFACE. PAINT COLORS AND PAINTING PROCEDURES SHALL BE SUBMITTED TO CFX FOR APPROVAL PRIOR TO THE START OF PAINTING WORK.

NTS

VERSION 6

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	MSE WALL DCS MOUNTING DETAIL	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					K-7

NOTE TO EOR:  
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**DCS STEEL TUBE STRUCTURE NOTES**

- GENERAL SPECIFICATIONS: FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (2017 EDITION) AND SUPPLEMENTS THERETO.
- DESIGN SPECIFICATIONS: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS (1st, EDITION, 2015).
- THE DESIGN WIND SPEED IS 150 MPH IN CONFORMANCE WITH THE FDOT STRUCTURES DESIGN GUIDELINES AND PLANS PREPARATION MANUAL, JANUARY 2017 EDITION.
- STRUCTURE MATERIALS SHALL BE AS FOLLOWS:  
STEEL STRUCTURAL TUBING: ASTM A500, GRADE B.  
STEEL PLATES: ASTM A709, GRADE 36  
WELD METAL: E70XX  
BOLTS (EXCEPT ANCHOR BOLTS): ASTM A307  
ANCHOR BOLTS: ASTM F1554, GRADE 55  
NUTS FOR ANCHOR BOLTS: ASTM A563, GRADE A, HEAVY HEX
- REINFORCING STEEL SHALL BE ASTM A615, GRADE 60.
- CONCRETE SHALL BE CLASS IV (DRILLED SHAFT) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4 KSI FOR ALL ENVIRONMENTAL CLASSIFICATIONS.
- GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5 KSI AND SHALL MEET THE REQUIREMENTS OF SECTION 934 OF FDOT SPECIFICATIONS.
- HOLE DIAMETERS FOR ANCHOR BOLTS SHALL NOT EXCEED THE BOLT DIAMETER PLUS 1/2".
- ALL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE (STEEL) ANSI/AWS D1. 1 (CURRENT EDITION). ALL COMPLETE JOINT PENETRATION WELDS SHALL BE RADIOGRAPHICALLY OR ULTRASONICALLY INSPECTED. ALL WELDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.
- BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED PER ASTM F2329.
- PAINT AND COLOR FOR THE STRUCTURE, THE DCS ANTENNA ATTACHMENT HARDWARE AND ALL ATTACHMENTS TO THE STRUCTURE SHALL BE WEATHER PERFECT ACRYLIC, LATEX FLAT, COLOR NO. SW2333-IMPRESSIVE IVORY OR APPROVED EQUAL. FOR PAINTING AND SURFACE PREPARATION, THE CONTRACTOR SHALL FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
- ALTERNATE DESIGNS FOR THIS STRUCTURE ARE NOT ALLOWED.
- SHOP DRAWINGS FOR THIS STRUCTURE ARE REQUIRED AND FABRICATION SHALL NOT BEGIN UNTIL THESE SHOP DRAWINGS ARE APPROVED. SHOP DRAWINGS SHALL INCLUDE THE CONTRACTOR'S FIELD VERIFICATION OF ALL UPRIGHT HEIGHTS AND FOUNDATION ELEVATIONS NECESSARY TO INSURE MINIMUM VERTICAL CLEARANCES AS PER THESE PLANS. SHOP DRAWINGS SHALL ALSO INCLUDE ANCHOR BOLT ORIENTATION WITH RESPECT TO CL TRUSS AND THE DIRECTION OF TRAFFIC.
- ALTERNATE SPLICE DETAILS SHALL REQUIRE SHOP DRAWINGS FROM CONTRACTOR, SIGNED AND SEALED BY A FLORIDA PROFESSIONAL ENGINEER, FOR REVIEW AND APPROVAL.
- THE FOUNDATION FOR THE STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 455 OF THE SPECIFICATIONS EXCEPT THAT NO PAYMENT FOR THE FOUNDATION SHALL BE MADE UNDER SECTION 455. THE COST OF PROVIDING THE FOUNDATION SHALL BE INCLUDED IN THE PAY ITEM FOR PROVIDING THE COMPLETE STRUCTURE. PAYMENT FOR ANY INCIDENTAL ITEMS INCURRED IN FURNISHING AND INSTALLING THIS STRUCTURE SHALL BE INCLUDED IN THE PAY ITEM FOR PROVIDING THE COMPLETE STRUCTURE.
- PROVIDE CAMBER ON THE ARM WITH THE MIDSPAN CAMBER VALUE AS INDICATED ON THE CAMBER DIAGRAM. SHOP DRAWINGS ARE REQUIRED, DETAILING METHOD TO OBTAIN THE ARM CAMBER, FOR REVIEW AND APPROVAL.
- THE STRUCTURE MUST BE ASSEMBLED AFTER FIELD SURVEY OF ANCHOR BOLT LOCATIONS AND PRIOR TO PAINTING AND SHIPMENT TO THE SITE TO VERIFY CORRECT ORIENTATION AND ASSURE FIT UP. IT MAY BE DISASSEMBLED FOR SHIPPING. THE CONTRACTOR SHALL DEMONSTRATE TO THE ENGINEER BY PREASSEMBLY OR OTHER APPROVED METHODS THAT THE SPAN LENGTH OF THE STRUCTURE IN THE NO-LOAD CONDITION MATCHES WITHIN 1/2" OF THE FIELD MEASURED SPAN LENGTH BETWEEN FOUNDATIONS.

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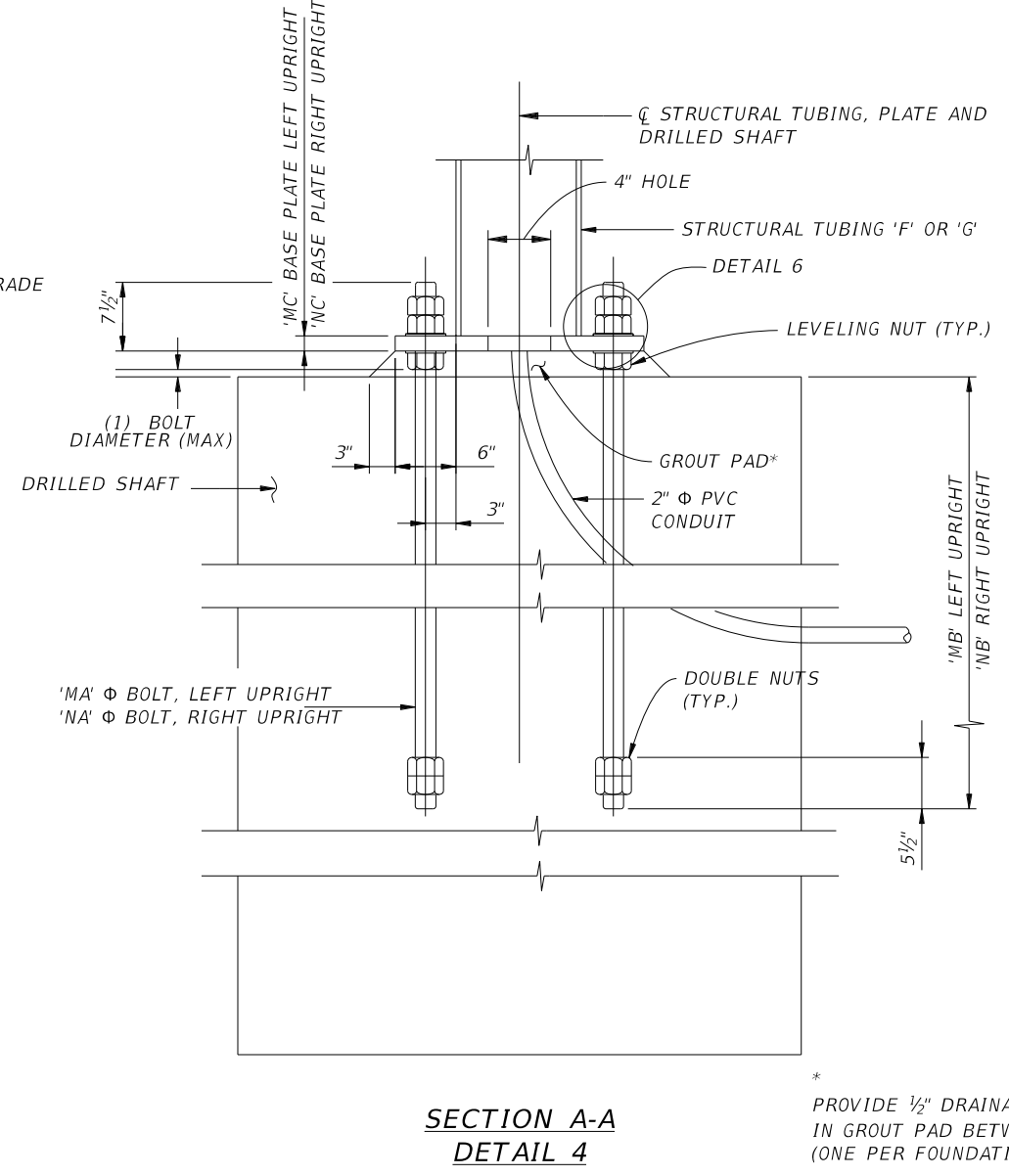
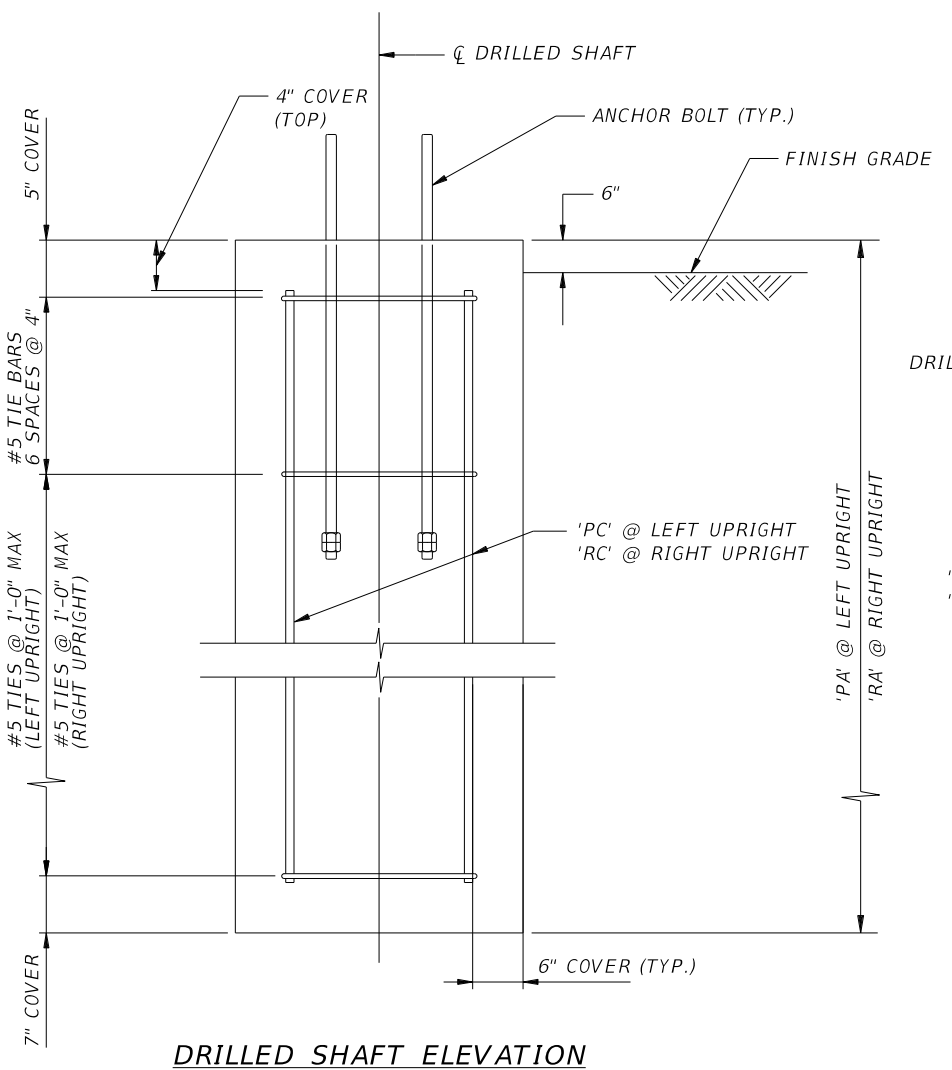
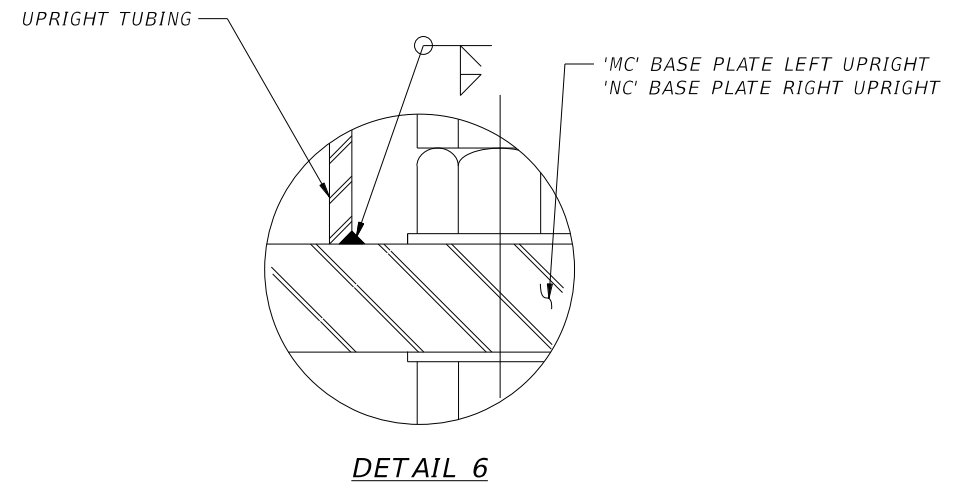
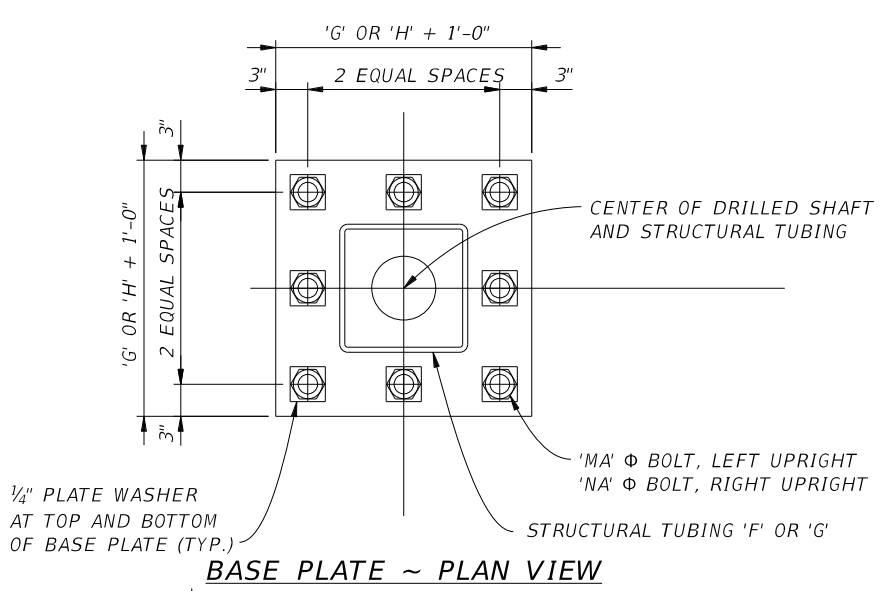
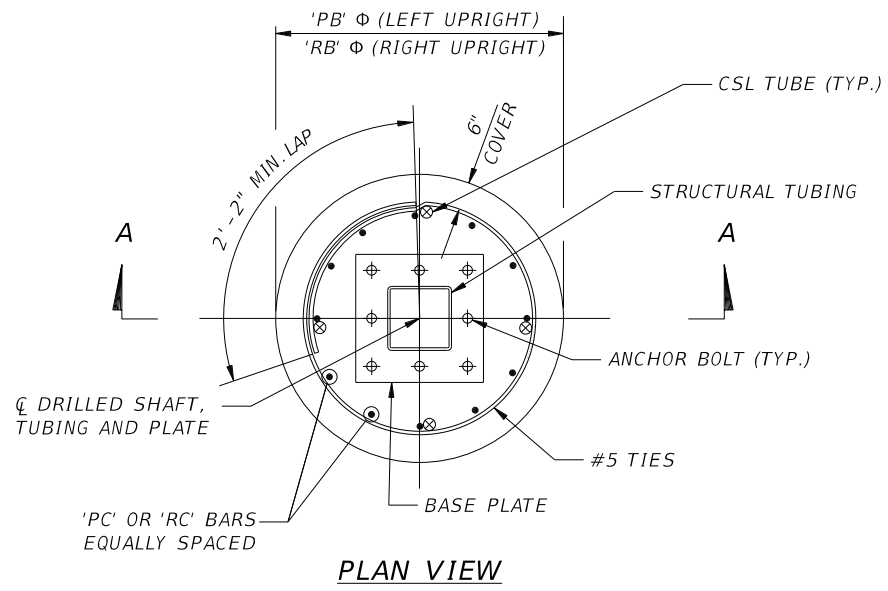
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DCS STEEL TUBE STRUCTURE NOTES AND ELEVATIONS

SHEET NO. K-8

VERSION 6



NOTE TO EOR:  
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\* PROVIDE 1/2" DRAINAGE SLOT  
IN GROUT PAD BETWEEN BOLTS  
(ONE PER FOUNDATION)

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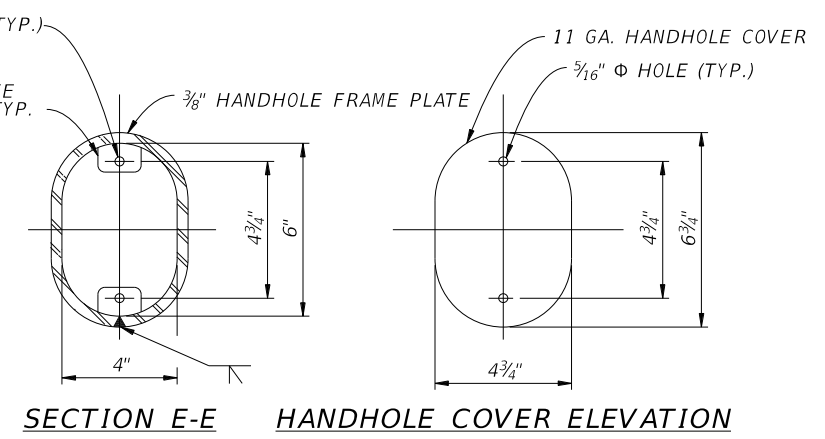
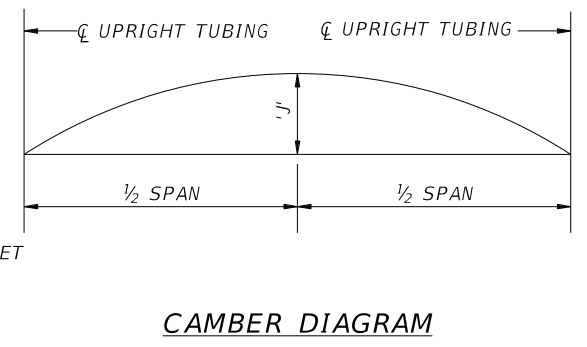
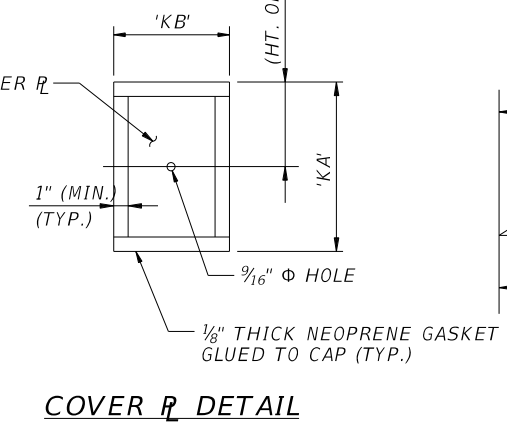
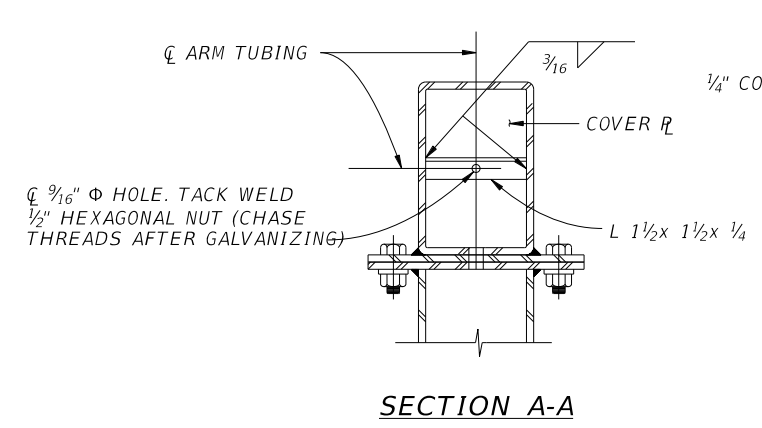
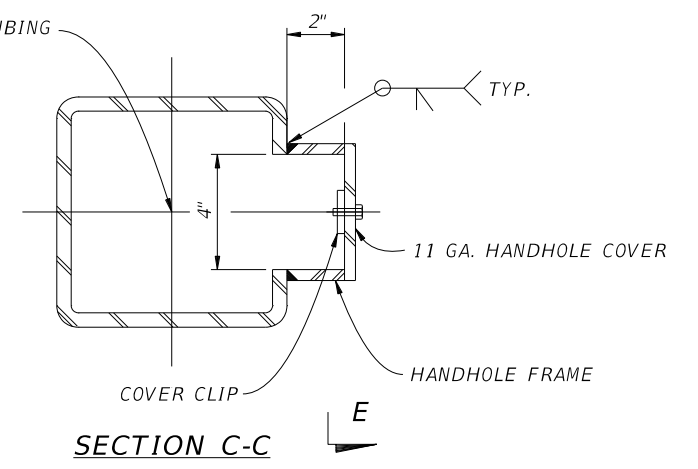
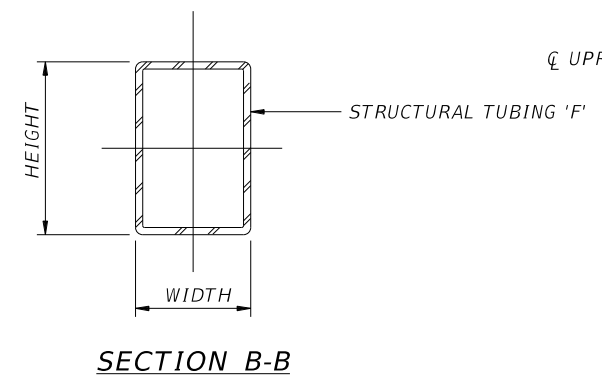
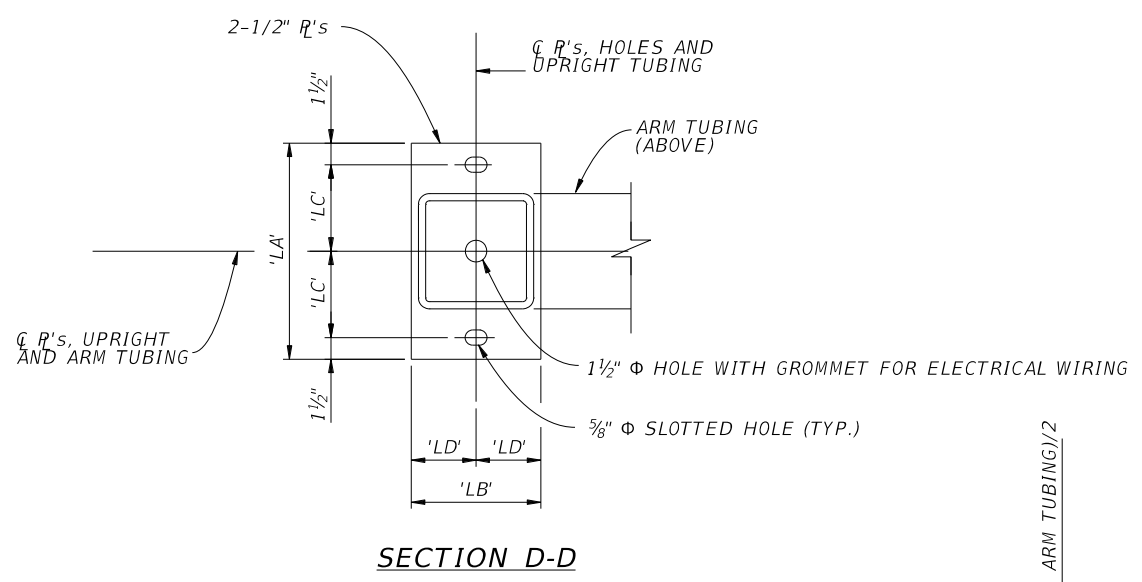
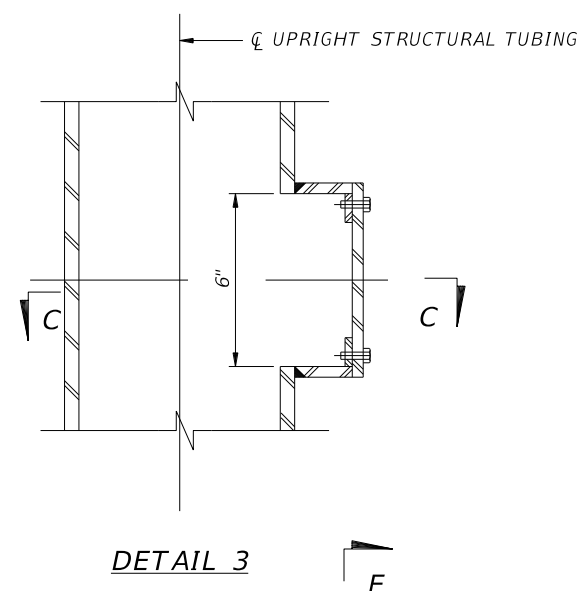
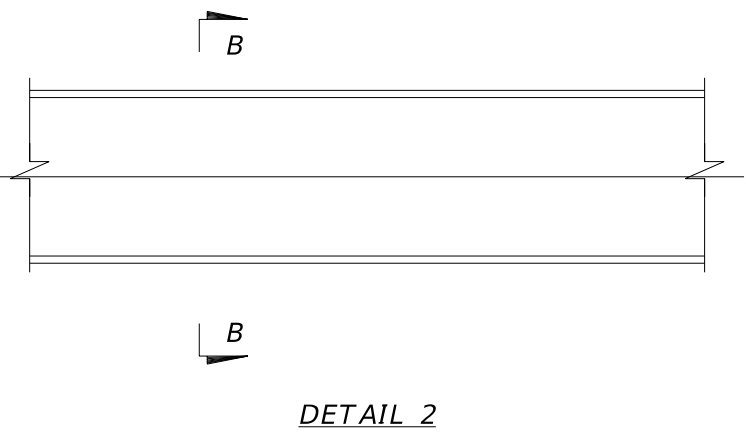
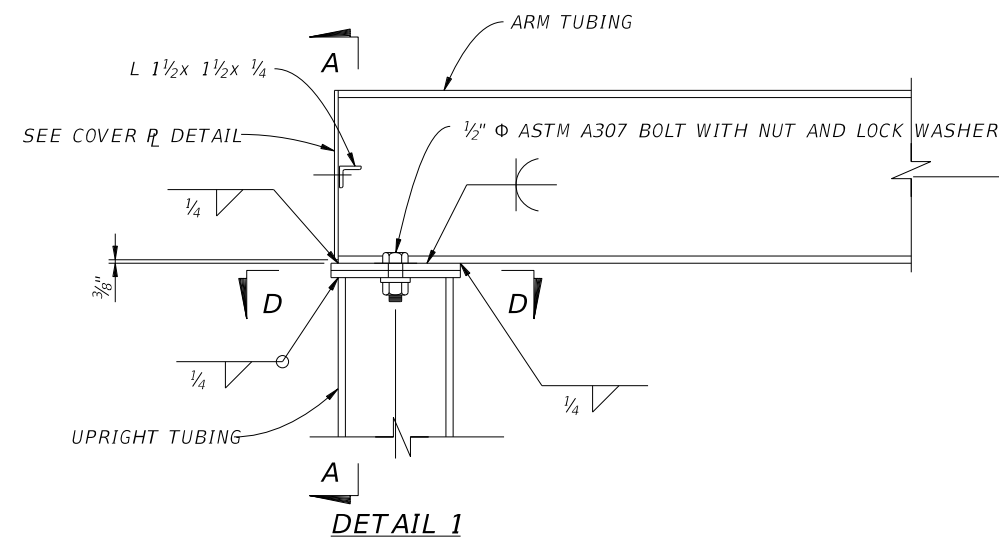
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**DCS STEEL TUBE STRUCTURE FOUNDATION DETAILS**

SHEET NO.  
K-9

VERSION 6

NOTE TO EOR:  
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**HANDHOLE DETAILS**

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**DCS STEEL TUBE STRUCTURE MISCELLANEOUS DETAILS**

SHEET NO.  
K-10

VERSION 6

**FOR REFERENCE ONLY**

TABLE OF DCS STEEL TUBE STRUCTURE VARIABLES

STRUCTURE NUMBER	STATION	DIMENSIONS					ELEVATIONS			MEMBER SIZES		
		A	AA	AB	B	C	D	E	F (ARM)	G (LEFT UPRIGHT)	H (RIGHT UPRIGHT)	J (CAMBER)
										Width x Ht. x Wall Thk.	Width x Ht. x Wall Thk.	
DCS XXX-XX	XXX+XX	--	--	--	--	--	--	--	--X--X--	--X--X--	--X--X--	--

TABLE OF DCS STEEL TUBE STRUCTURE VARIABLES (CONT.)

STRUCTURE NUMBER	COVER PLATE		UPRIGHT CONNECTION				LEFT BASE CONNECTION			RIGHT BASE CONNECTION		
	KA	KB	LA	LB	LC	LD	MA	MB	MC	NA	NB	NC
DCS XXX-XX	--	--	--	--	--	--	--	--	--	--	--	--

TABLE OF DCS STEEL TUBE STRUCTURE VARIABLES (CONT.)

STRUCTURE NUMBER	LEFT DRILLED SHAFT			RIGHT DRILLED SHAFT		
	PA	PB	PC	RA	RB	RC
			# / size			# / size
DCS XXX-XX	--	--	--	--	--	--

NOTES:

- DESIGN WIND SPEED = 150 MPH
- ERECTION IS THE CONTRACTOR'S RESPONSIBILITY.

FOUNDATION NOTES:

- ASSUMPTIONS AND VALUES USED IN DESIGN:
  - SOIL TYPE= COHESIONLESS (SAND)
  - SOIL FRICTION ANGLE = 26 DEGREES
  - EFFECTIVE SOIL WEIGHT = 42.6 PCF
  - DESIGN WATER TABLE IS AT XX FT
- THE ENGINEER SHALL IMMEDIATELY CONTACT THE ENGINEER OF RECORD IF DURING DRILLED SHAFT CONSTRUCTION SOIL CONDITIONS, SUCH AS MUCK OR VERY LOOSE SOIL, ARE ENCOUNTERED.

NOTE TO EOR:  
 1. THIS SHEET IS FOR REFERENCE ONLY.  
 2. BORING DATA SHALL BE PROVIDED WITH THE SUBMITTAL.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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EXPRESSWAY AUTHORITY



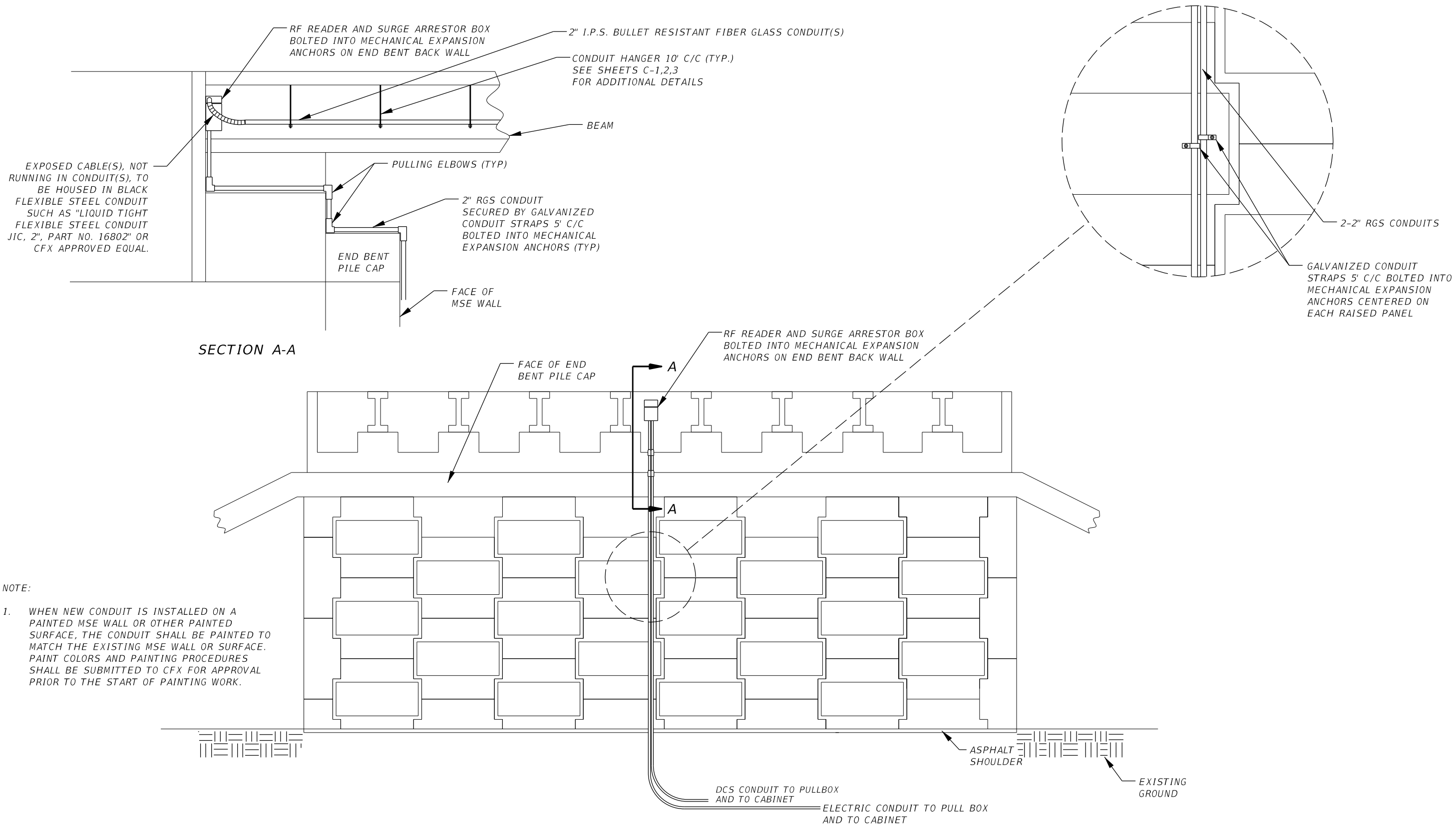
**DCS STEEL TUBE STRUCTURE  
TABLE OF VARIABLES**

SHEET NO.

K-11



**BRIDGE STRUCTURE MOUNTED DCS EQUIPMENT AND CONDUIT FOR ELECTRICAL AND DCS CABLES**



NTS

REVISIONS					
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**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

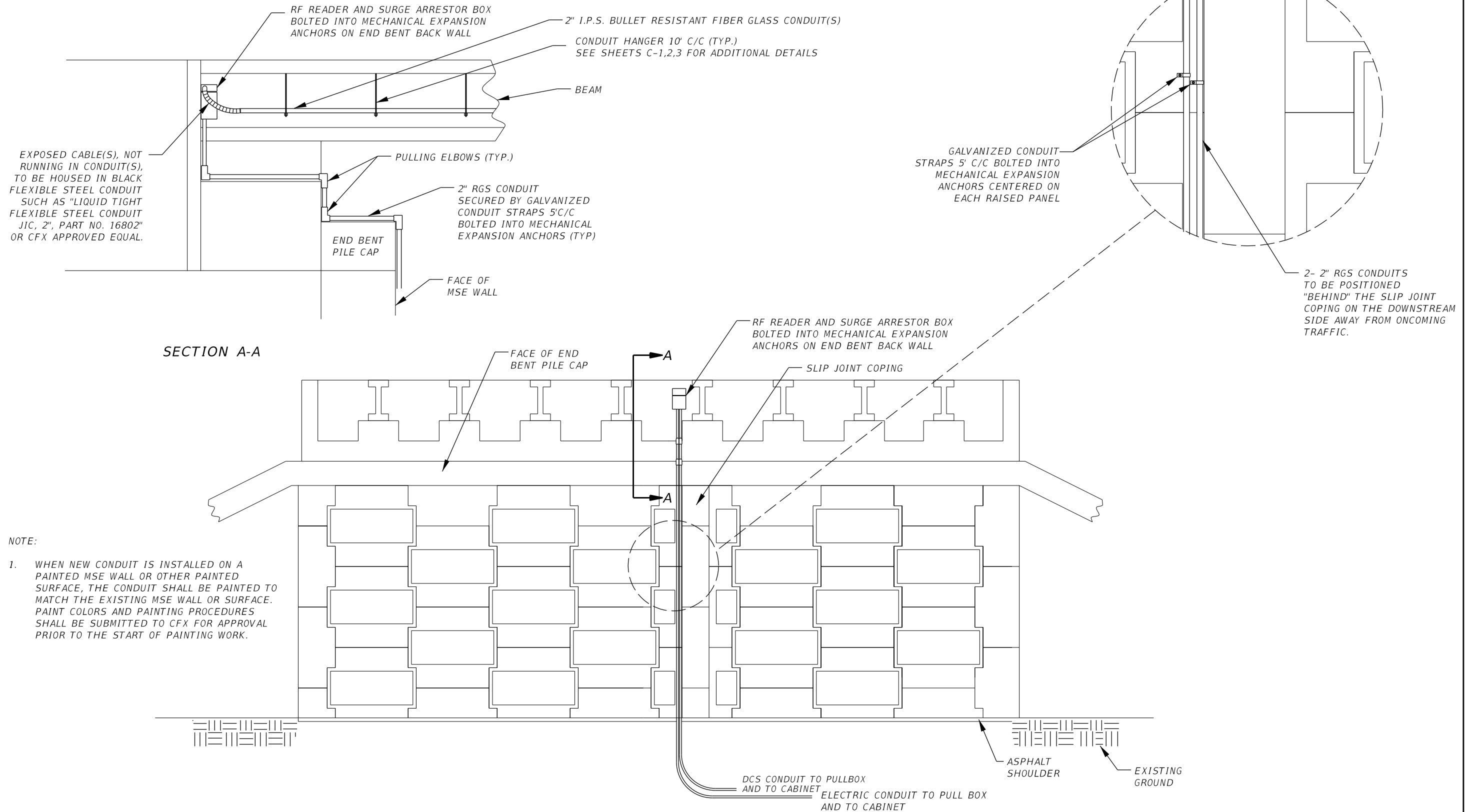
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**DCS DETAILS FOR BRIDGE STRUCTURE MOUNTED EQUIPMENT AND CONDUIT (1 OF 4)**

SHEET NO.  
K-12

VERSION 6

**BRIDGE STRUCTURE MOUNTED EQUIPMENT AND CONDUIT FOR ELECTRICAL AND DCS CABLES**



**NOTE:**

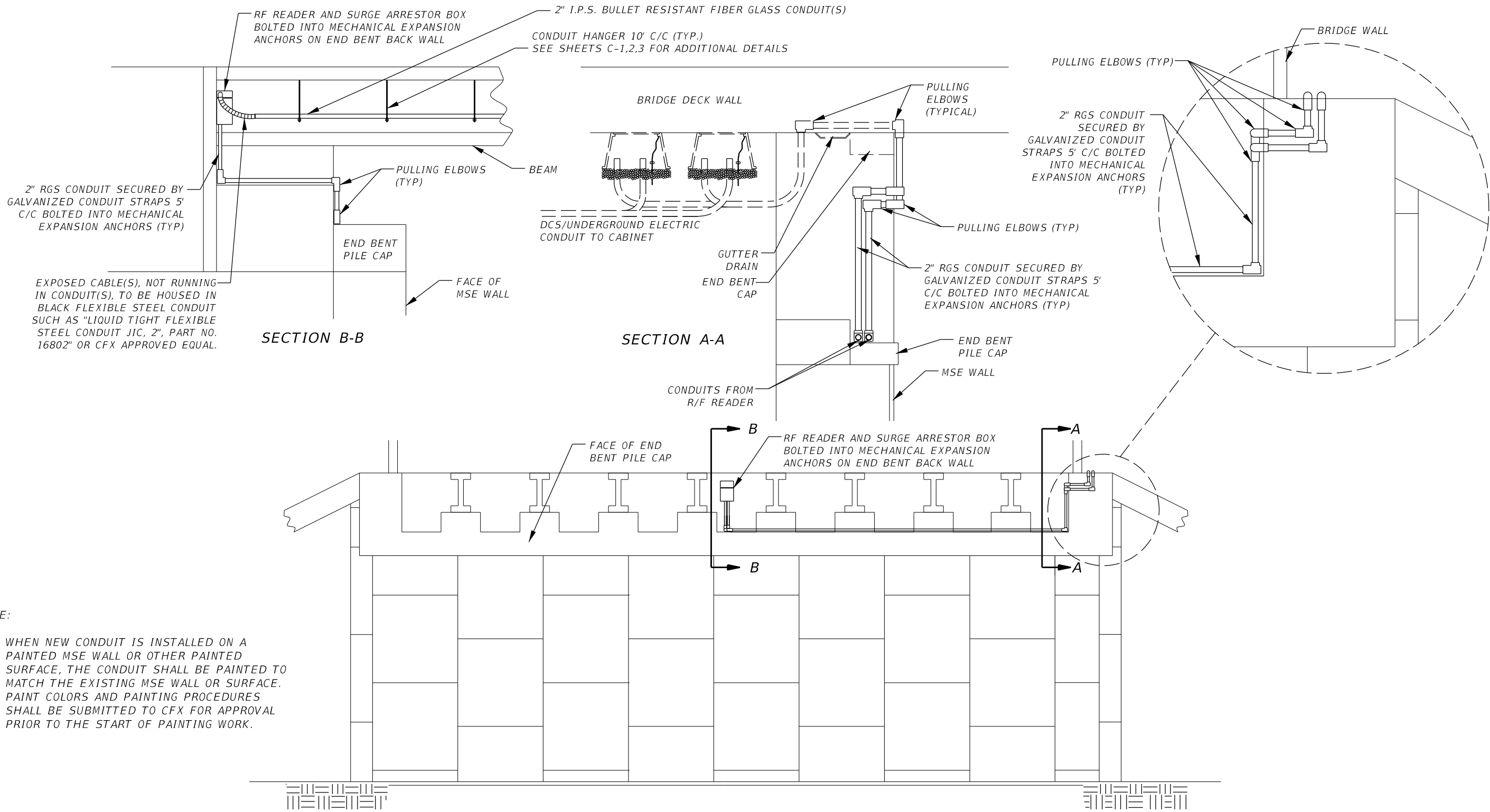
1. WHEN NEW CONDUIT IS INSTALLED ON A PAINTED MSE WALL OR OTHER PAINTED SURFACE, THE CONDUIT SHALL BE PAINTED TO MATCH THE EXISTING MSE WALL OR SURFACE. PAINT COLORS AND PAINTING PROCEDURES SHALL BE SUBMITTED TO CFX FOR APPROVAL PRIOR TO THE START OF PAINTING WORK.

NTS

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	DCS DETAILS FOR BRIDGE STRUCTURE MOUNTED EQUIPMENT AND CONDUIT (2 OF 4)	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					K-13

VERSION 6

**BRIDGE STRUCTURE MOUNTED EQUIPMENT AND CONDUIT FOR ELECTRICAL AND DCS CABLES**



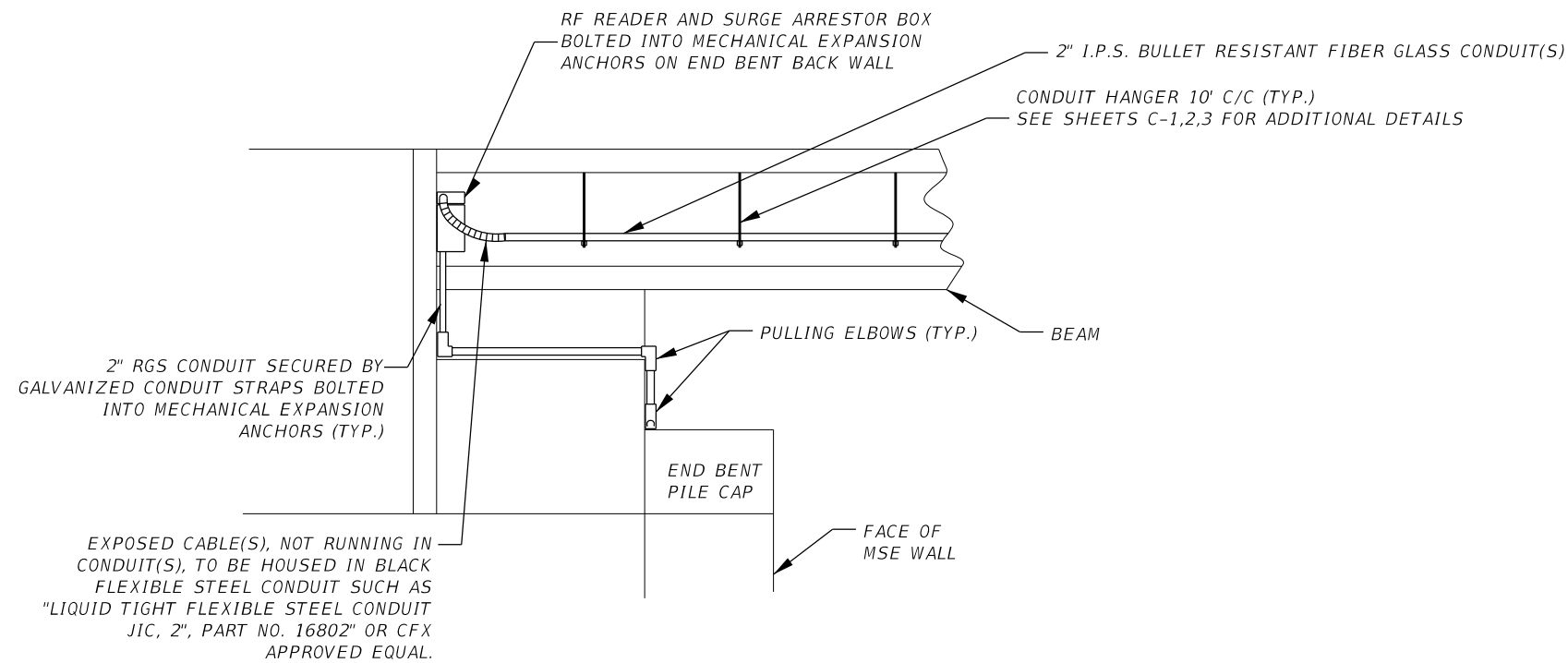
NOTE:  
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NTS

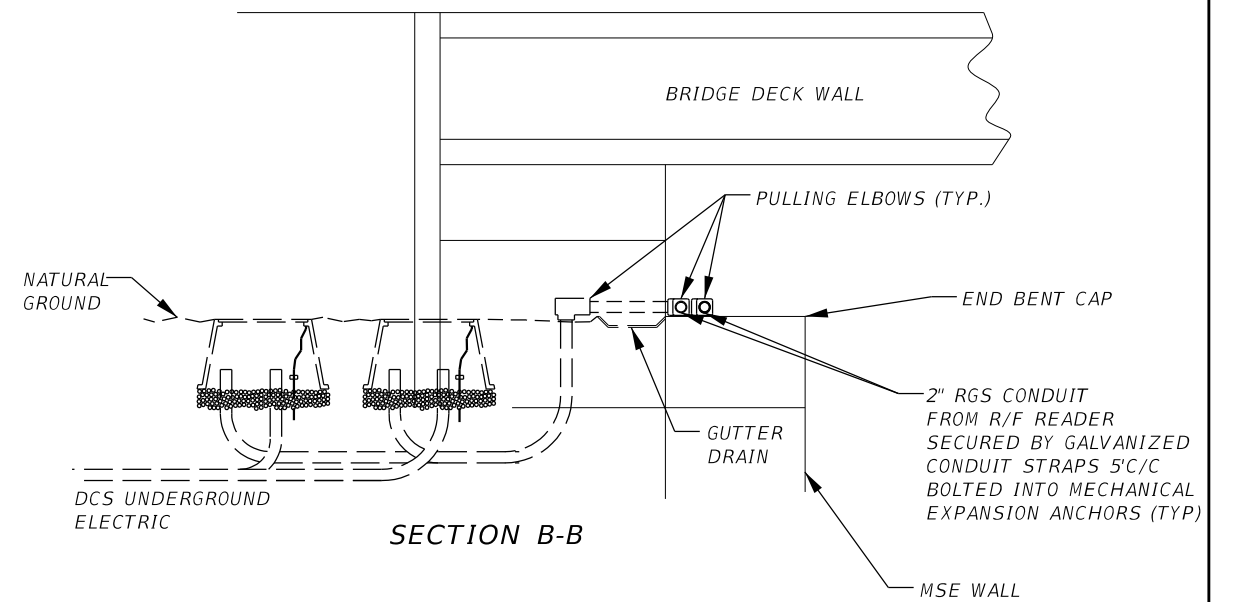
REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	DCS DETAILS FOR BRIDGE STRUCTURE MOUNTED EQUIPMENT AND CONDUIT (3 OF 4)	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					K-14

VERSION 6

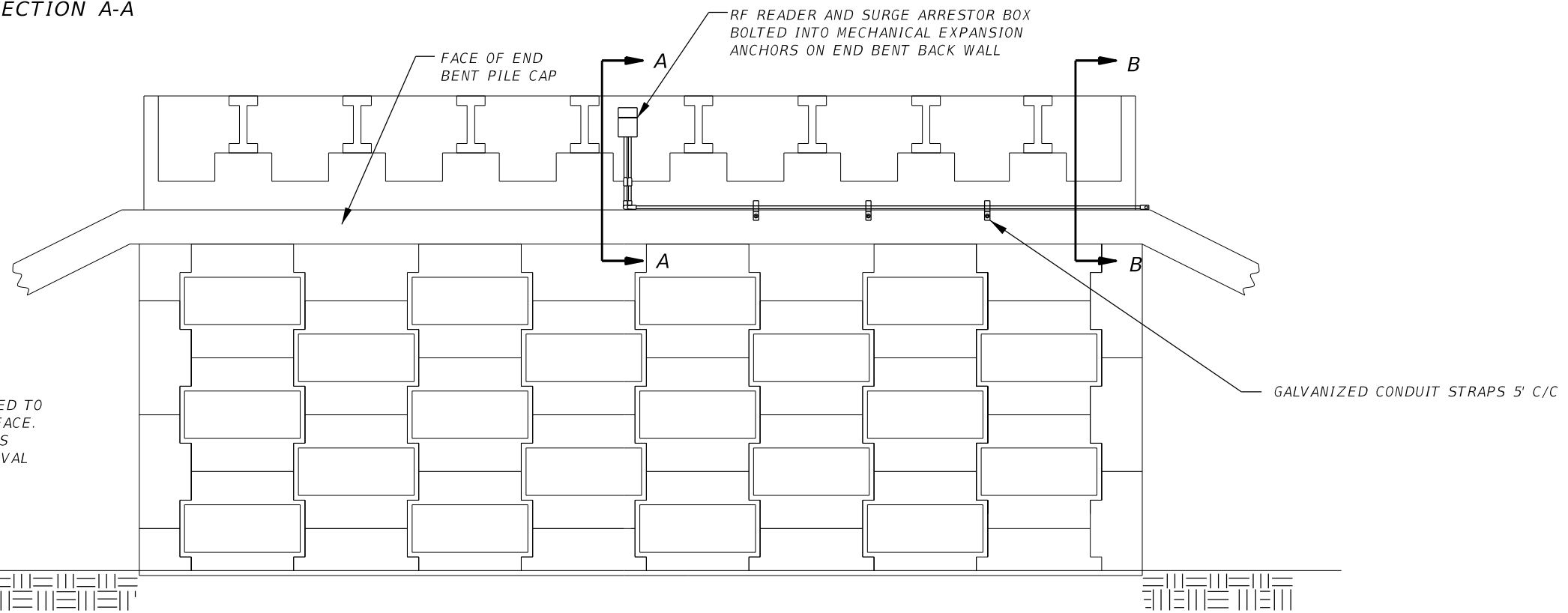
**BRIDGE STRUCTURE MOUNTED DCS EQUIPMENT AND CONDUIT FOR ELECTRICAL AND DCS CABLES**



**SECTION A-A**



**SECTION B-B**



**NOTE:**

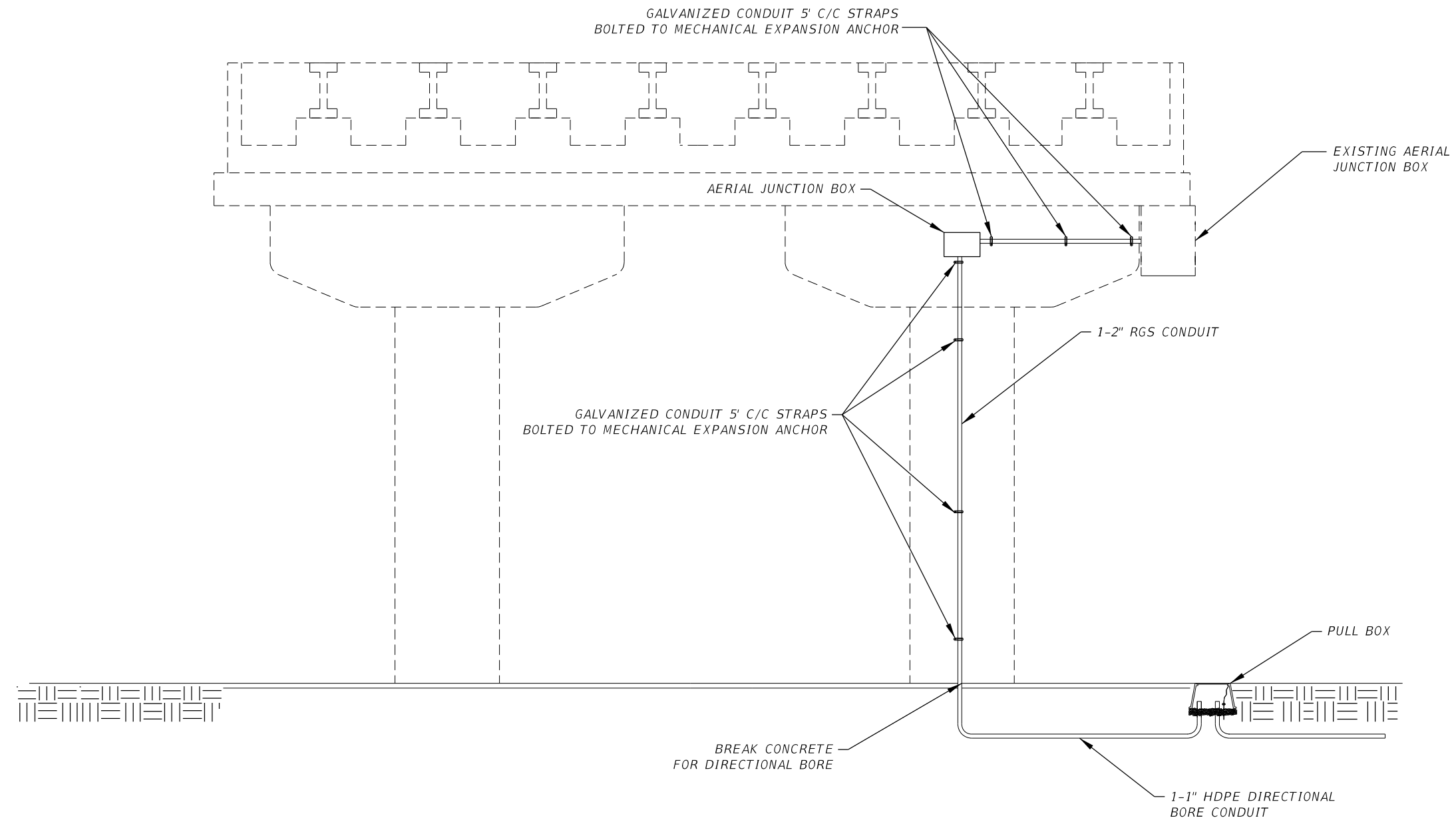
1. WHEN NEW CONDUIT IS INSTALLED ON A PAINTED MSE WALL OR OTHER PAINTED SURFACE, THE CONDUIT SHALL BE PAINTED TO MATCH THE EXISTING MSE WALL OR SURFACE. PAINT COLORS AND PAINTING PROCEDURES SHALL BE SUBMITTED TO CFX FOR APPROVAL PRIOR TO THE START OF PAINTING WORK.

NTS

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	DCS DETAILS FOR BRIDGE STRUCTURE MOUNTED EQUIPMENT AND CONDUIT (4 OF 4)	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					K-15

VERSION 6

BRIDGE STRUCTURE MOUNTED CONDUIT FOR FIBER OPTIC CABLE



NOTES:

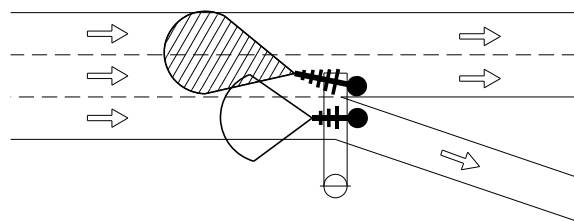
1. WHEN NEW CONDUIT IS INSTALLED ON A PAINTED MSE WALL OR OTHER PAINTED SURFACE, THE CONDUIT SHALL BE PAINTED TO MATCH THE EXISTING MSE WALL OR SURFACE. PAINT COLORS AND PAINTING PROCEDURES SHALL BE SUBMITTED TO CFX FOR APPROVAL PRIOR TO THE START OF PAINTING WORK.

NTS

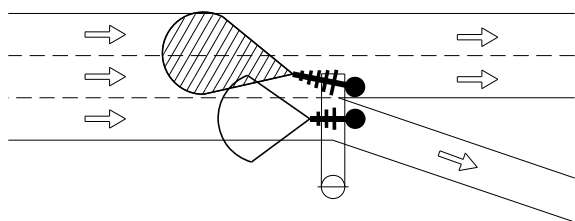
REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	BRIDGE MOUNTED FIBER OPTIC CONDUIT DROP	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					K-16

VERSION 6

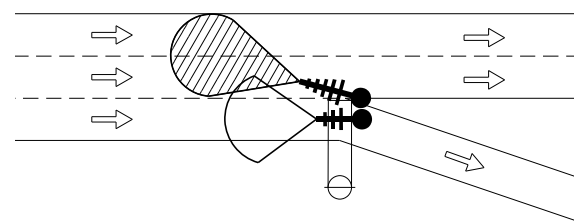
OPTION 1



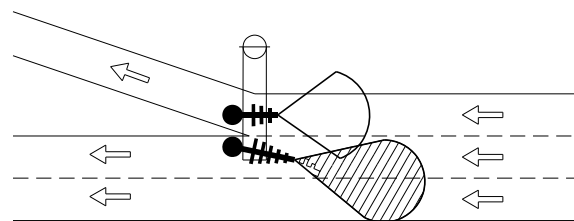
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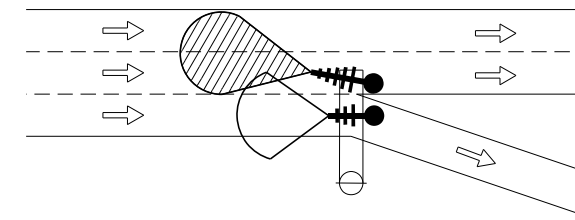
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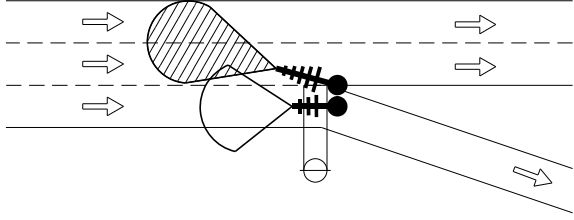
OPTION 4



OPTION 5

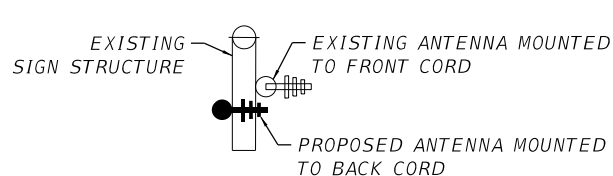


OPTION 6



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

NTS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

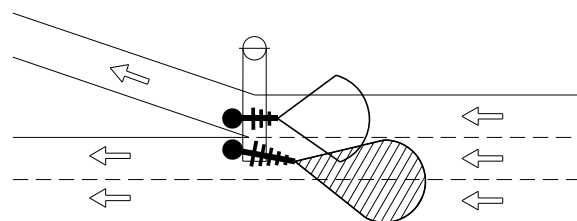
DCS COVERAGE AREA (1 OF 11)

SHEET NO.

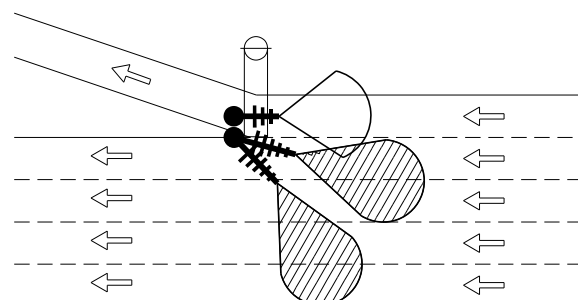
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VERSION 6

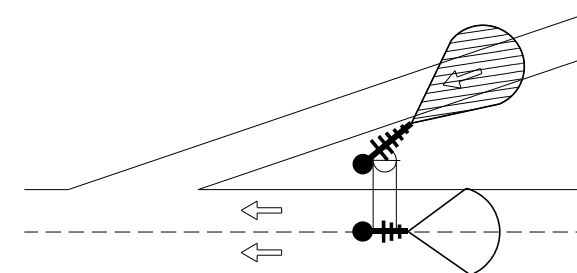
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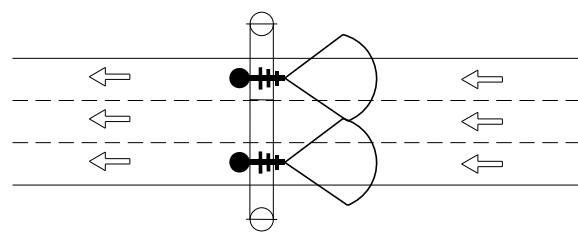
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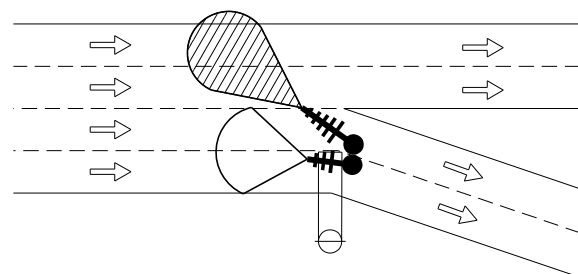
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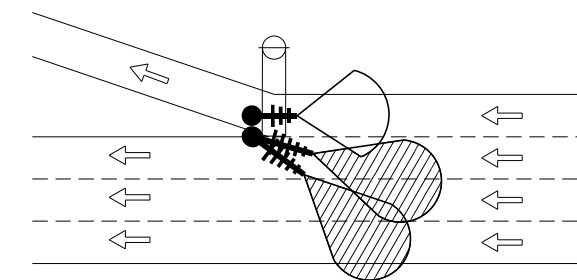
OPTION 10



OPTION 11

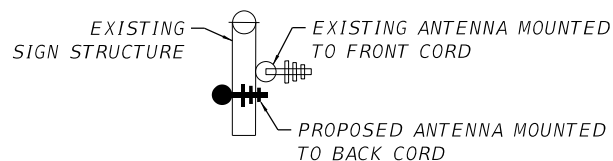


OPTION 12



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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VERSION 6

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

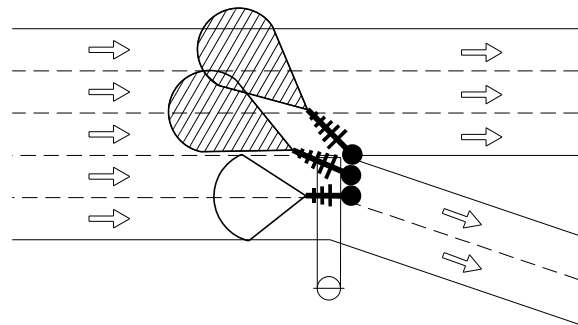
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DCS COVERAGE AREA (2 OF 11)

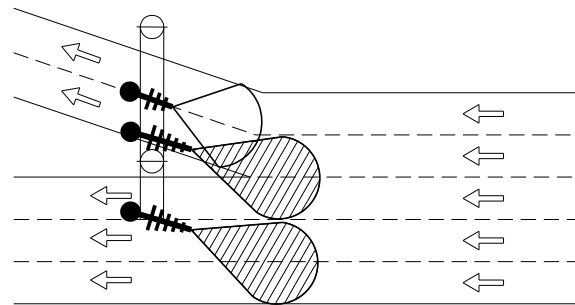
SHEET NO.

K-18

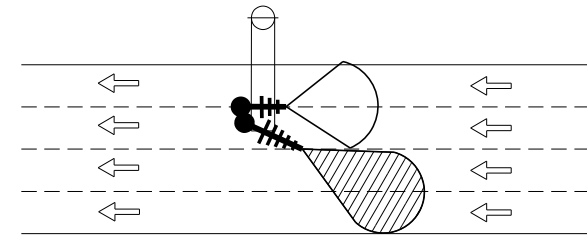
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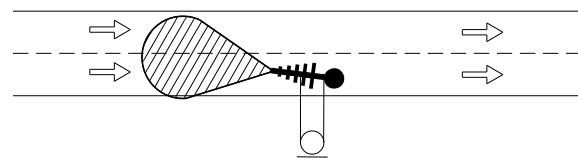
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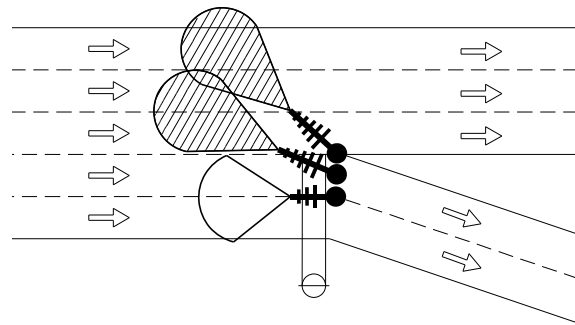
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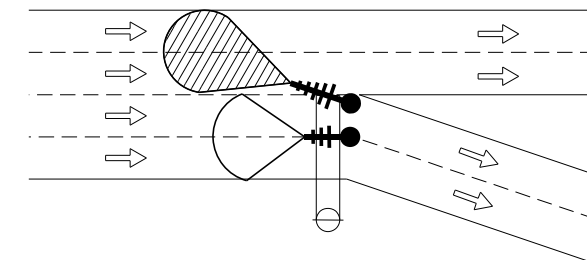
OPTION 16



OPTION 17

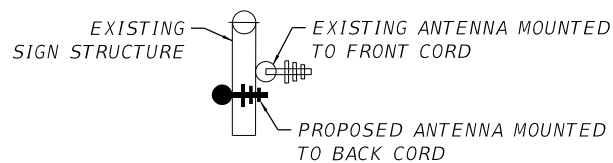


OPTION 18



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DCS COVERAGE AREA (3 OF 11)

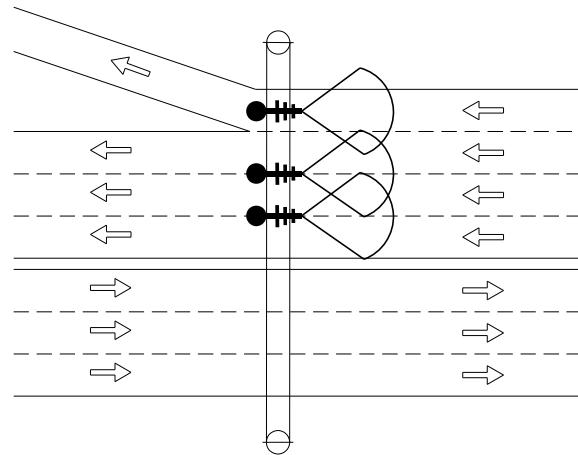
SHEET NO.

K-19

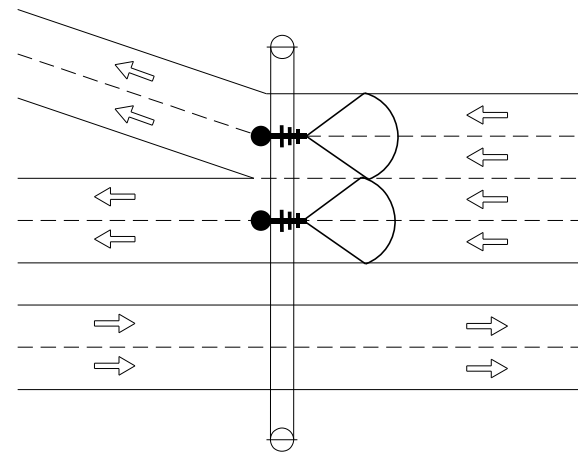
VERSION 6



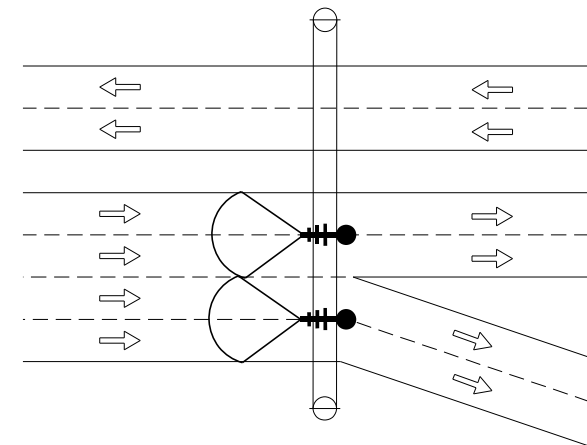
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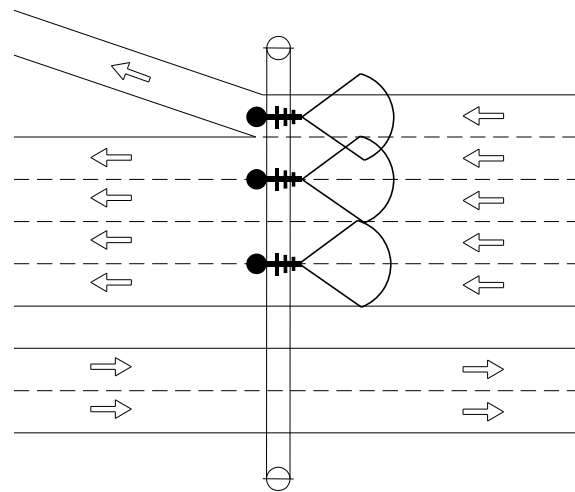
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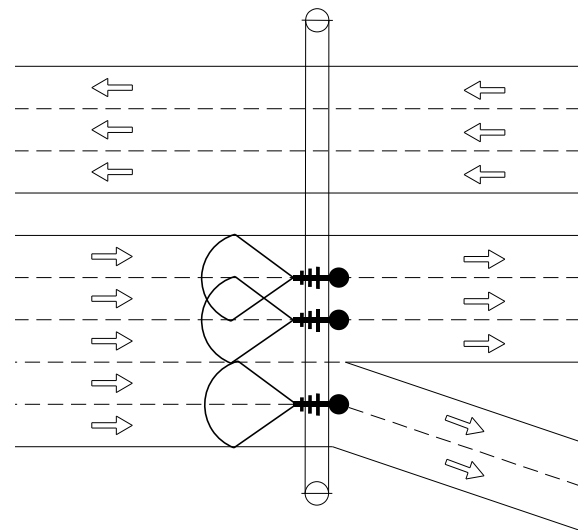
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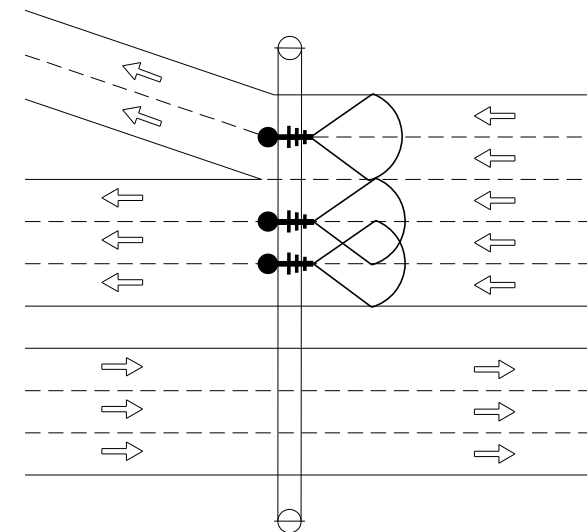
OPTION 22



OPTION 23

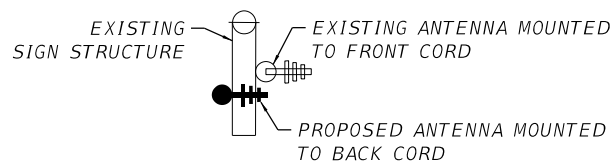


OPTION 24



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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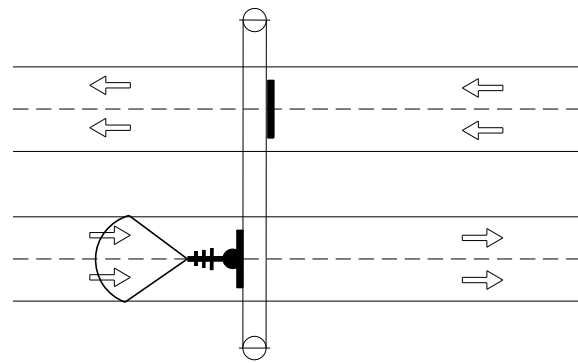
DCS COVERAGE AREA (4 OF 11)

SHEET NO.

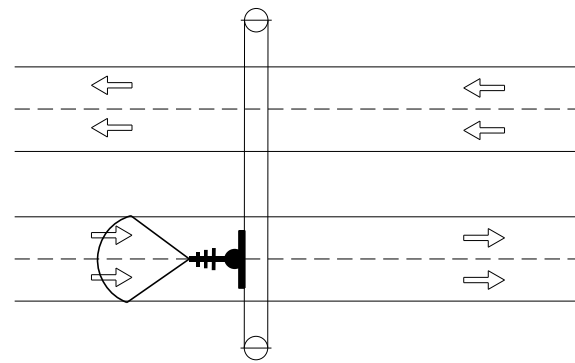
K-20

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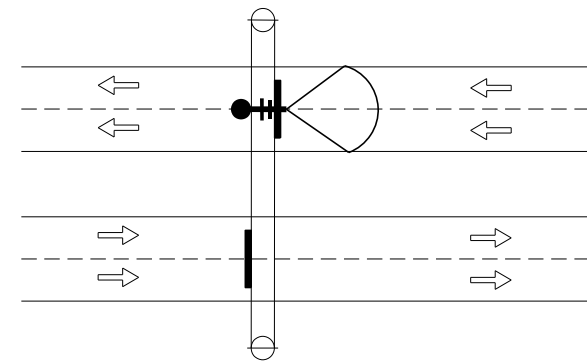
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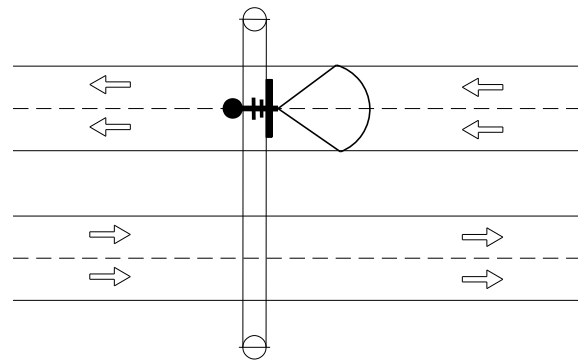
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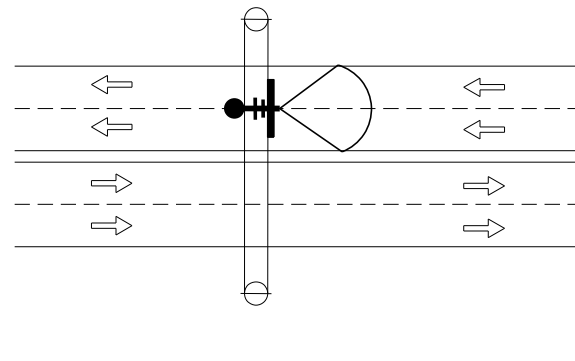
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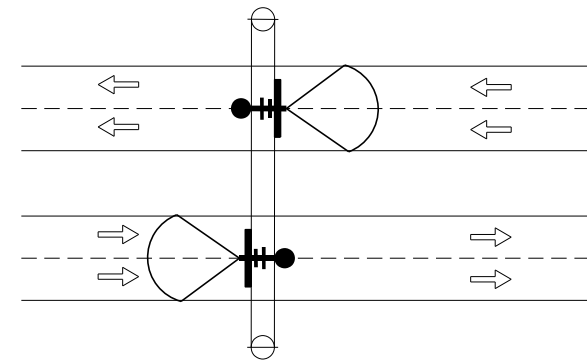
OPTION 28



OPTION 29

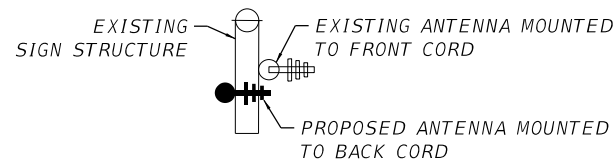


OPTION 30



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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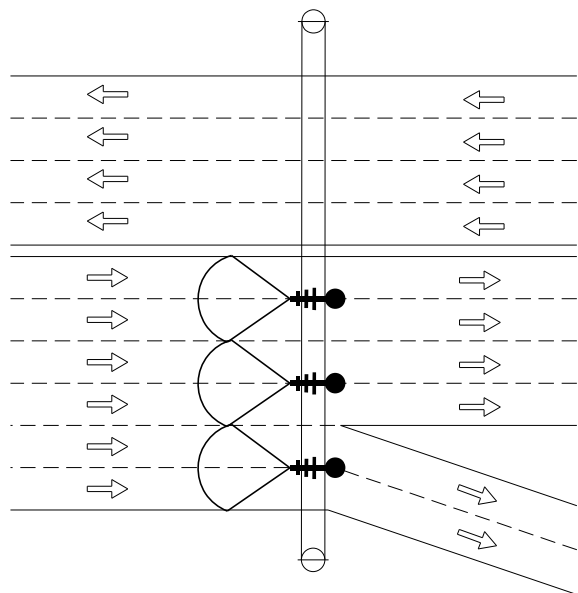
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DCS COVERAGE AREA  
(5 OF 11)

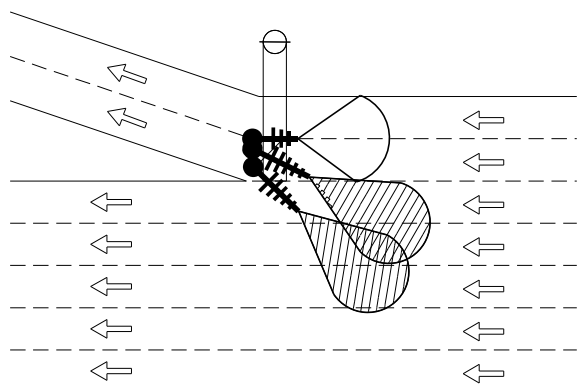
SHEET NO.

K-21

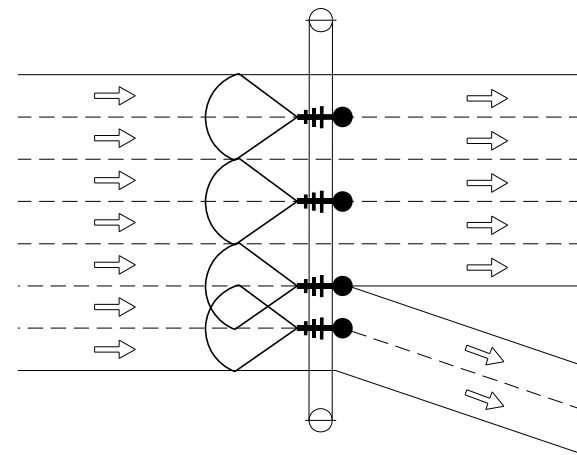
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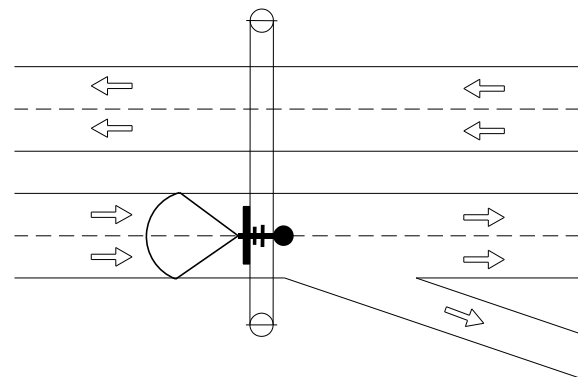
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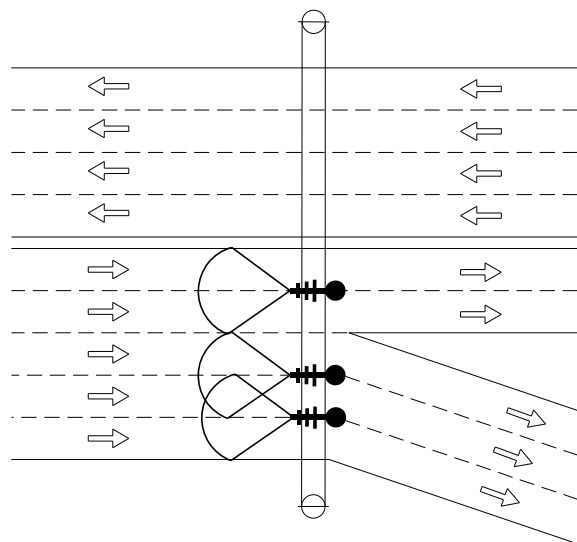
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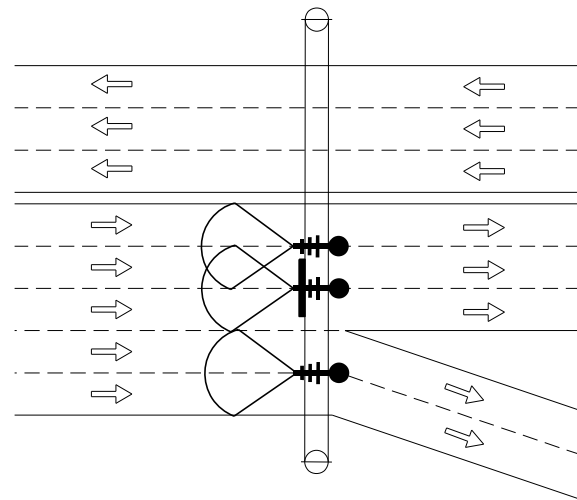
OPTION 34



OPTION 35

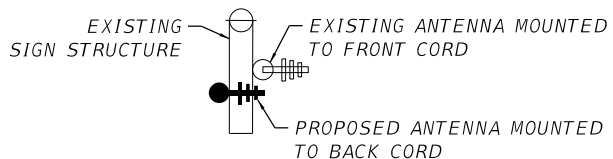


OPTION 36



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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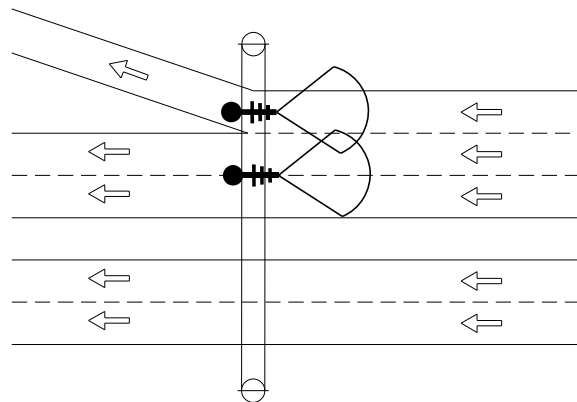
DCS COVERAGE AREA (6 OF 11)

SHEET NO.

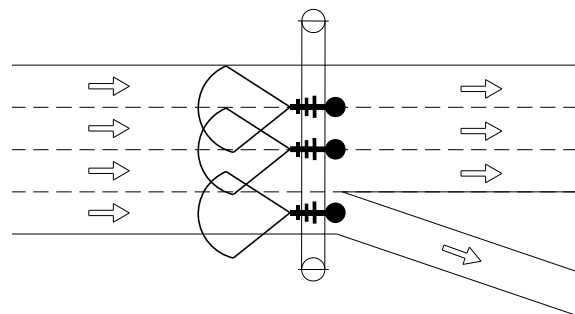
K-22

VERSION 6

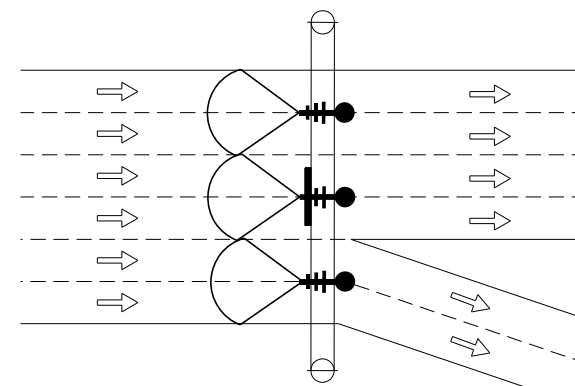
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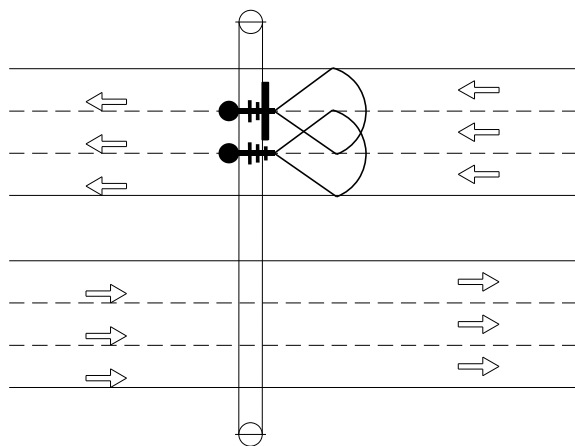
OPTION 38



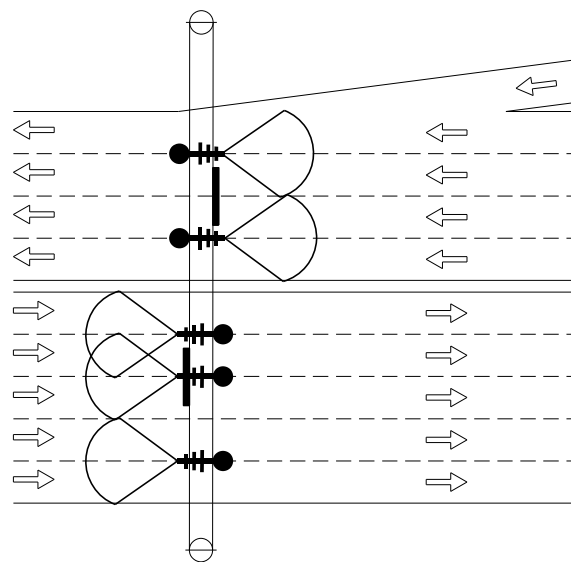
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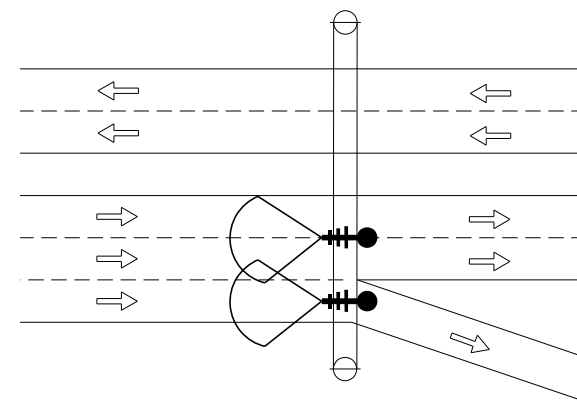
OPTION 40



OPTION 41

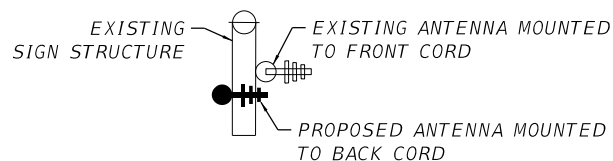


OPTION 42



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

NTS

REVISIONS					
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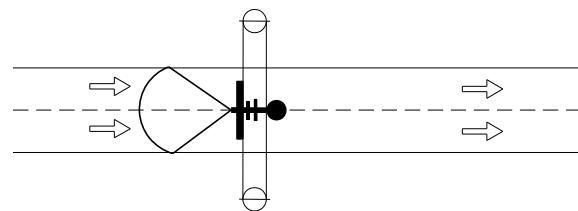
DCS COVERAGE AREA (7 OF 11)

SHEET NO.

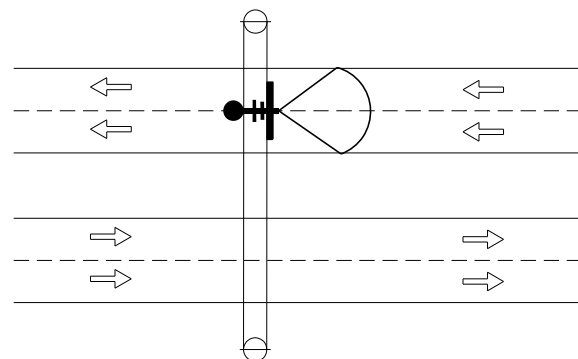
K-23

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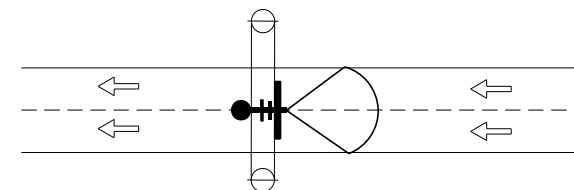
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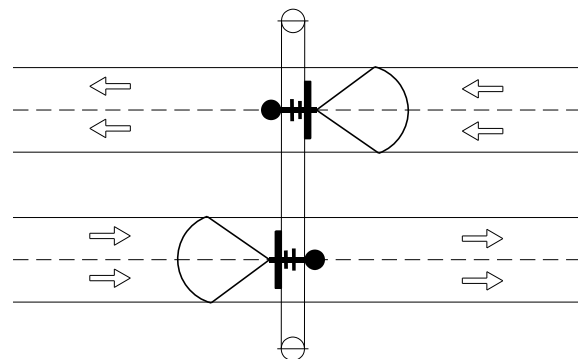
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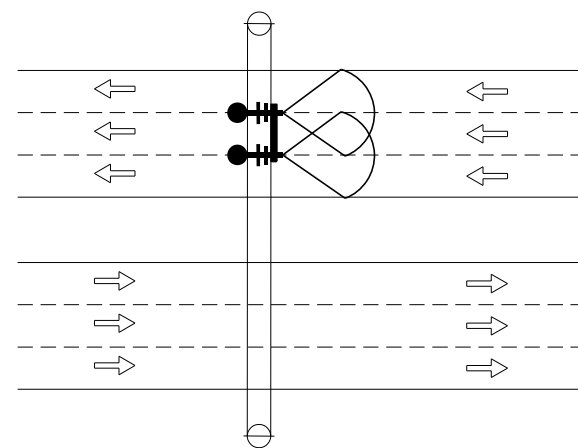
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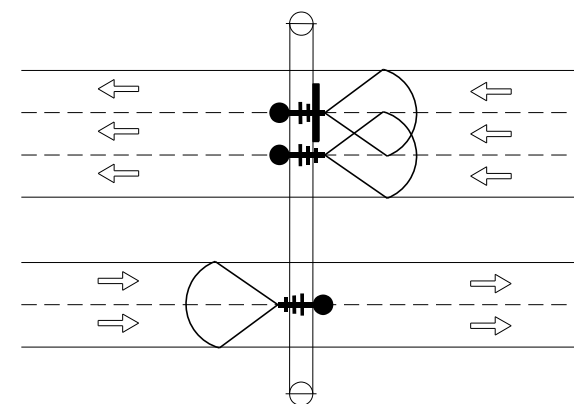
OPTION 46



OPTION 47

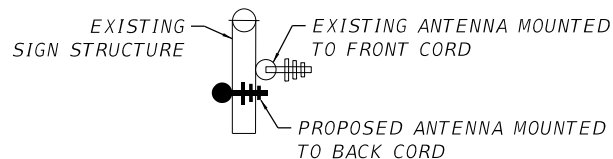


OPTION 48



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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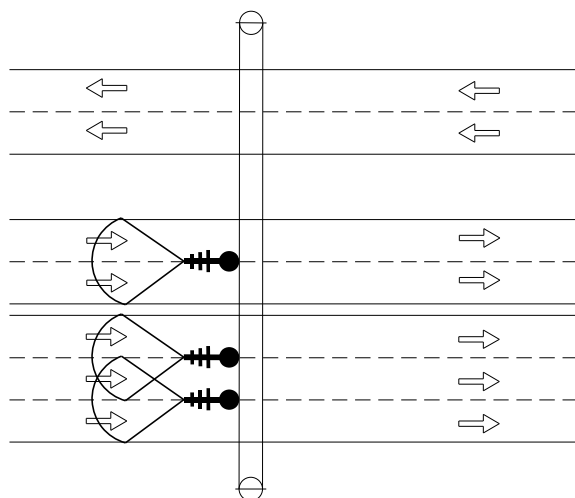
DCS COVERAGE AREA (8 OF 11)

SHEET NO.

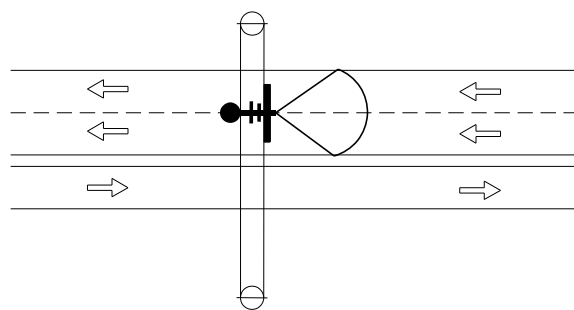
K-24

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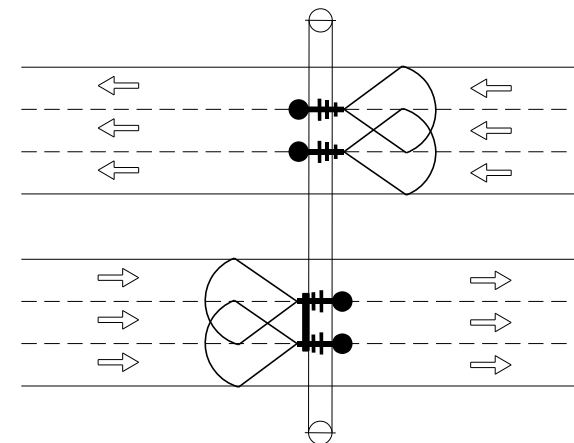
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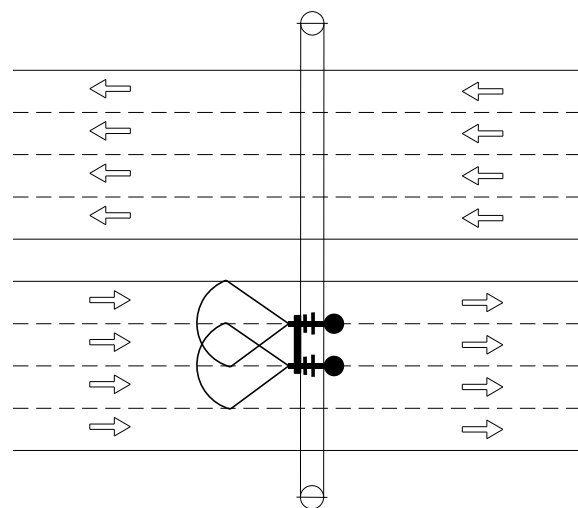
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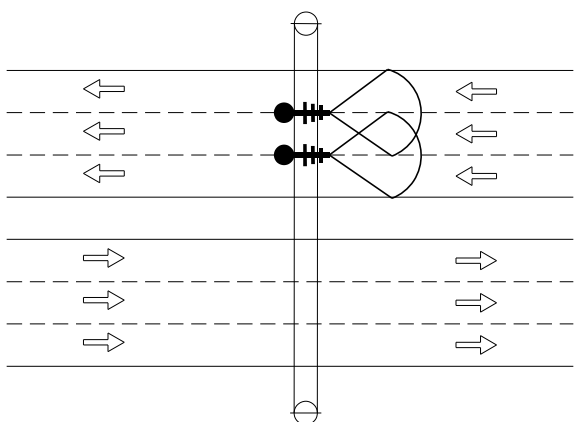
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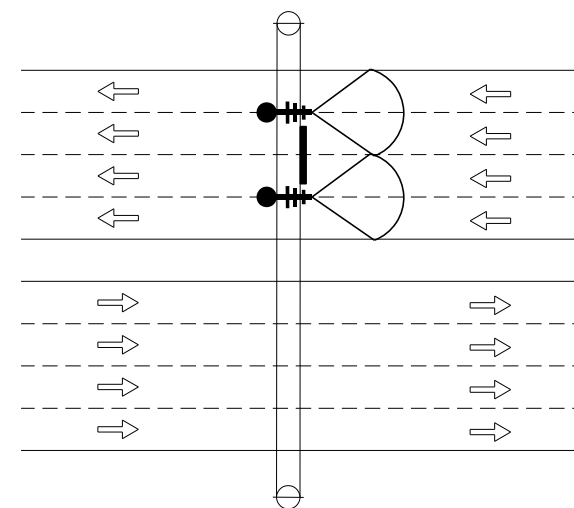
OPTION 52



OPTION 53

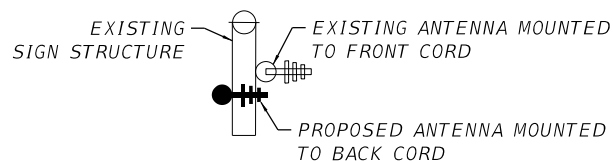


OPTION 54



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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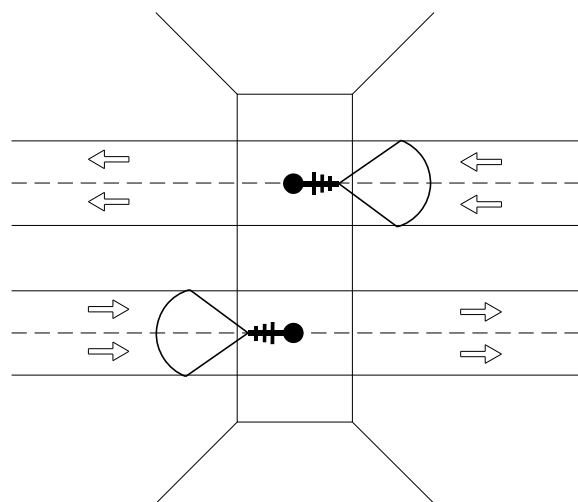
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DCS COVERAGE AREA (9 OF 11)

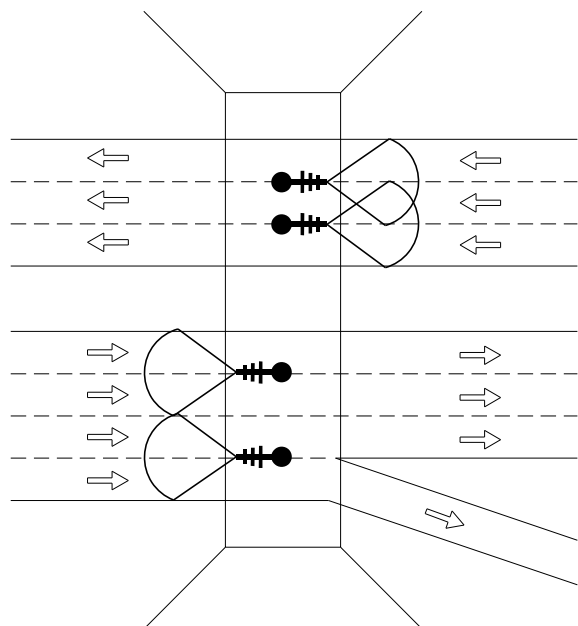
SHEET NO.

K-25

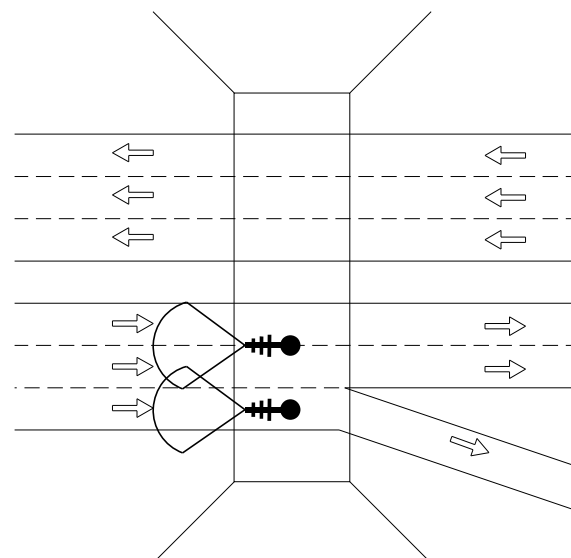
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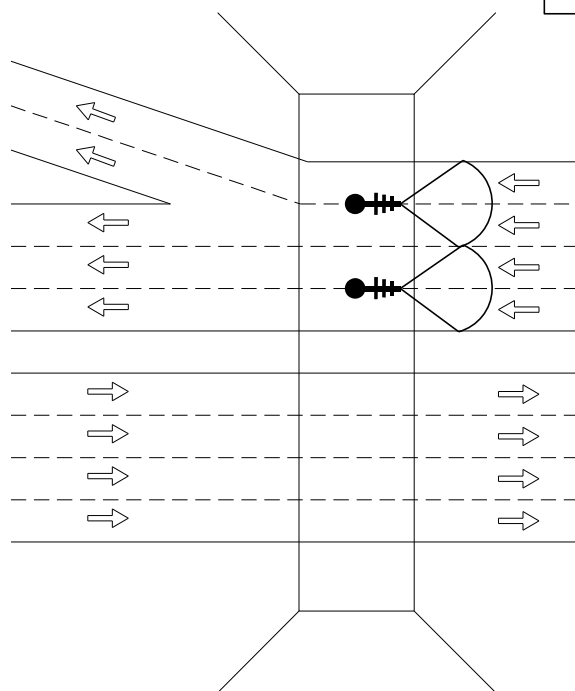
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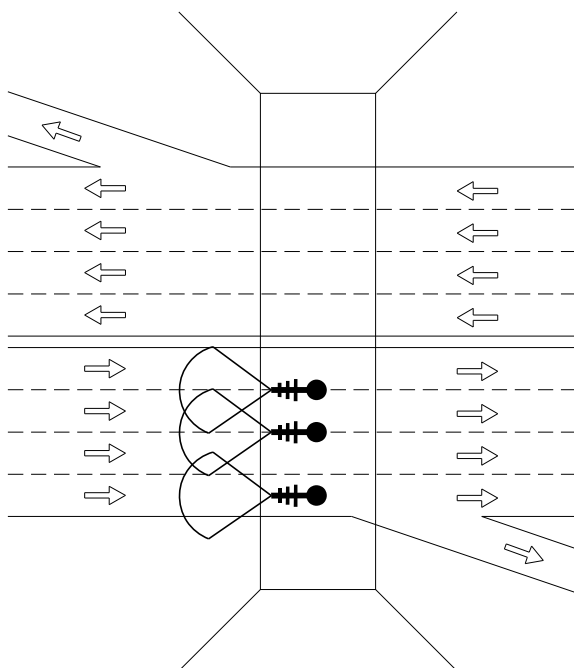
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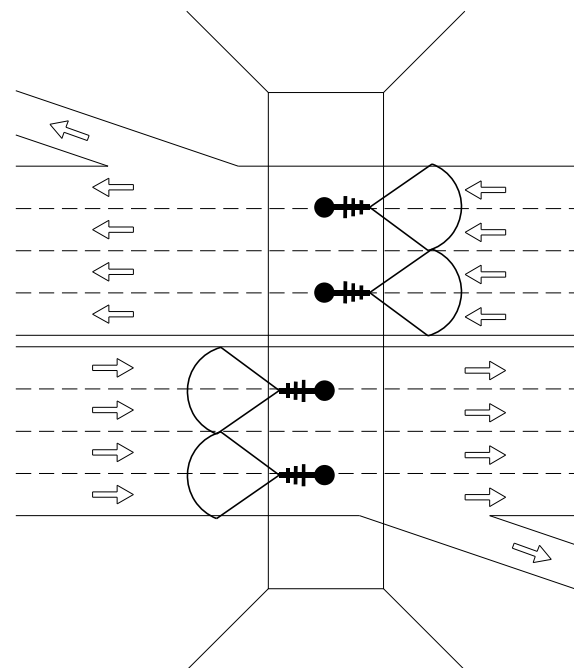
OPTION 58



OPTION 59

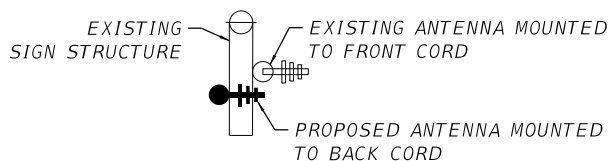


OPTION 60



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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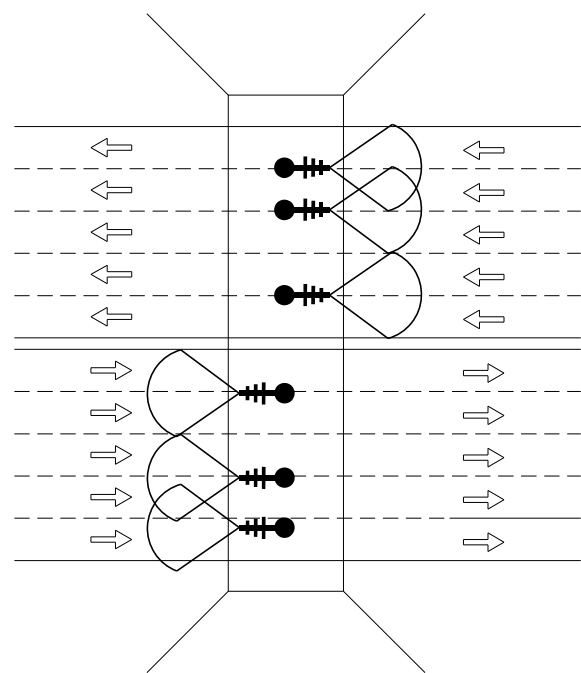
DCS COVERAGE AREA (10 OF 11)

SHEET NO.

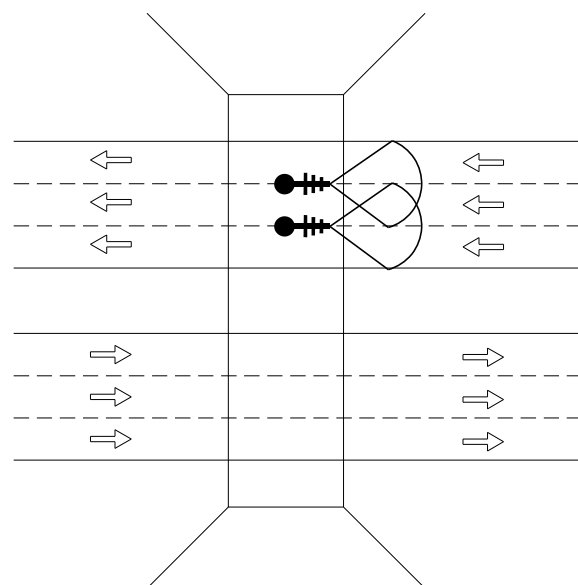
K-26

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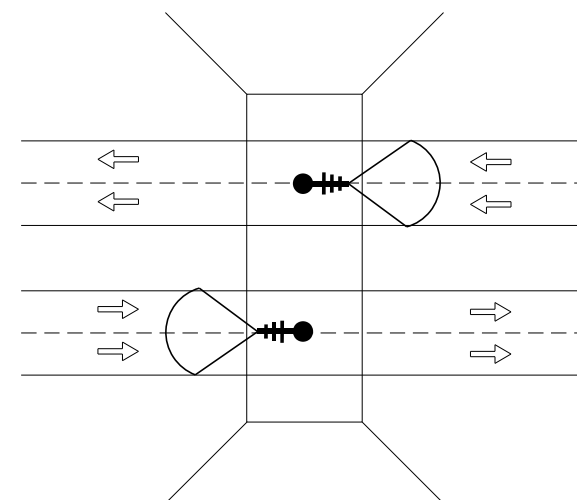
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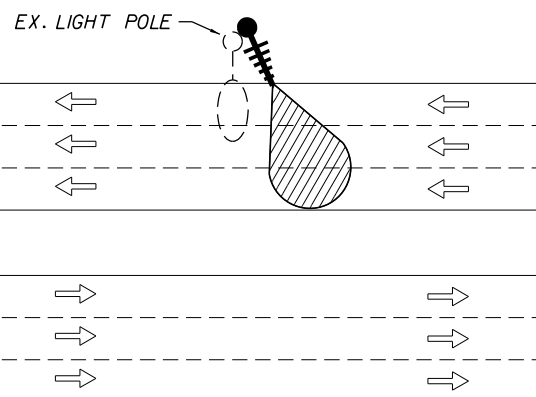
OPTION 62



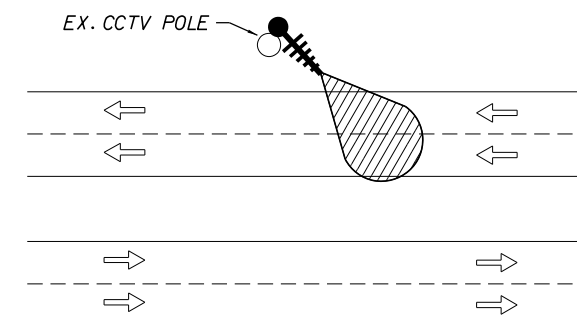
OPTION 63



OPTION 64

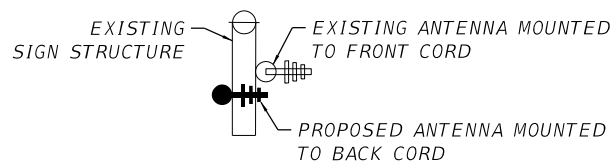


OPTION 65



- LEGEND:**
- EXISTING 10 or 16 dB (TO BE REMOVED)
  - PROPOSED 10 dB
  - PROPOSED 16 dB
  - DMS
  - DIRECTION OF TRAFFIC

- DATA COLLECTION SENSOR - COVERAGE AREA FOR 10db ANTENNA
- DATA COLLECTION SENSOR - COVERAGE AREA FOR 16db ANTENNA



**NOTES:**

1. EXISTING ANTENNA REPLACEMENT MAY VARY. CONTRACTOR TO ENSURE PROPOSED ANTENNA IS INSTALLED ON BACK CORD OF SIGN STRUCTURE POINTING OPPOSITE THE DIRECTION OF TRAFFIC.
2. CONTRACTOR SHALL INSTALL DCS ANTENNAS OVER LANE STRIPE WHERE POSSIBLE. WHEN INSTALLATION OVER TRAVEL LANES IS NOT POSSIBLE DUE TO THE LENGTH OF THE STRUCTURE A HIGH GAIN 16 dB ANTENNA SHALL BE USED, TO MEET LANE ACCURACY REQUIREMENTS DEFINED IN SECTION 663.

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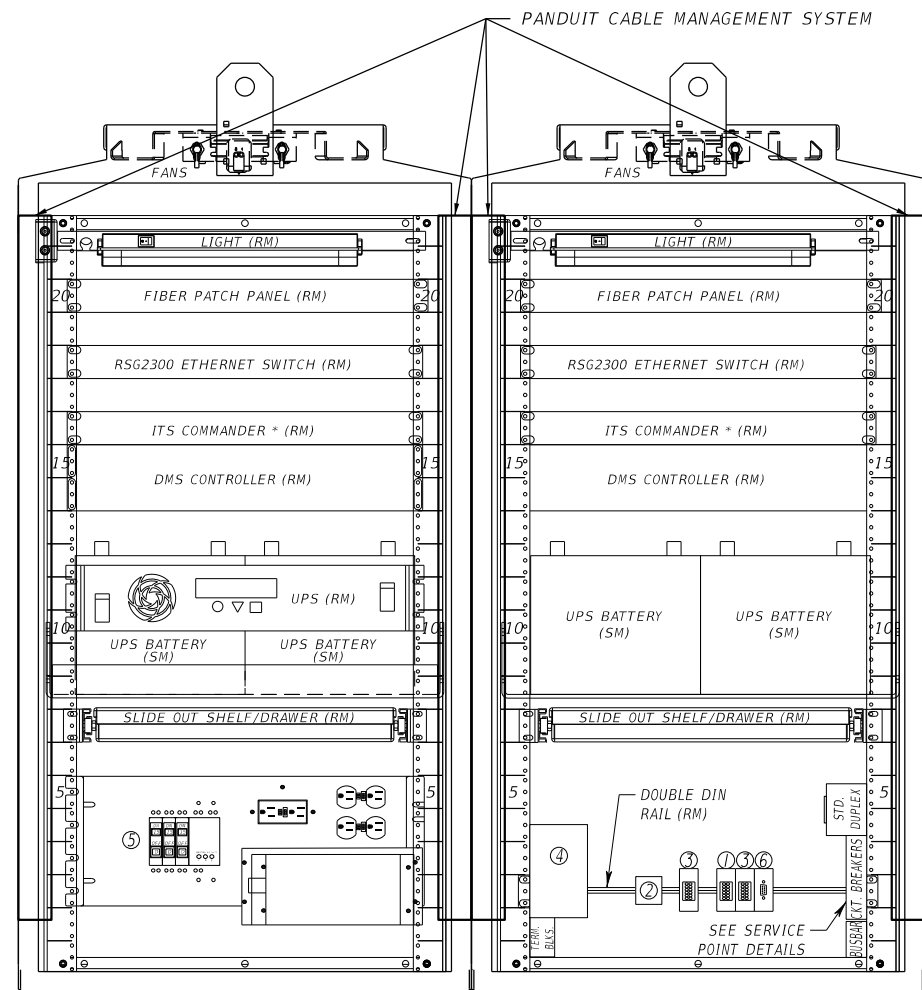
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DCS COVERAGE AREA (11 OF 11)

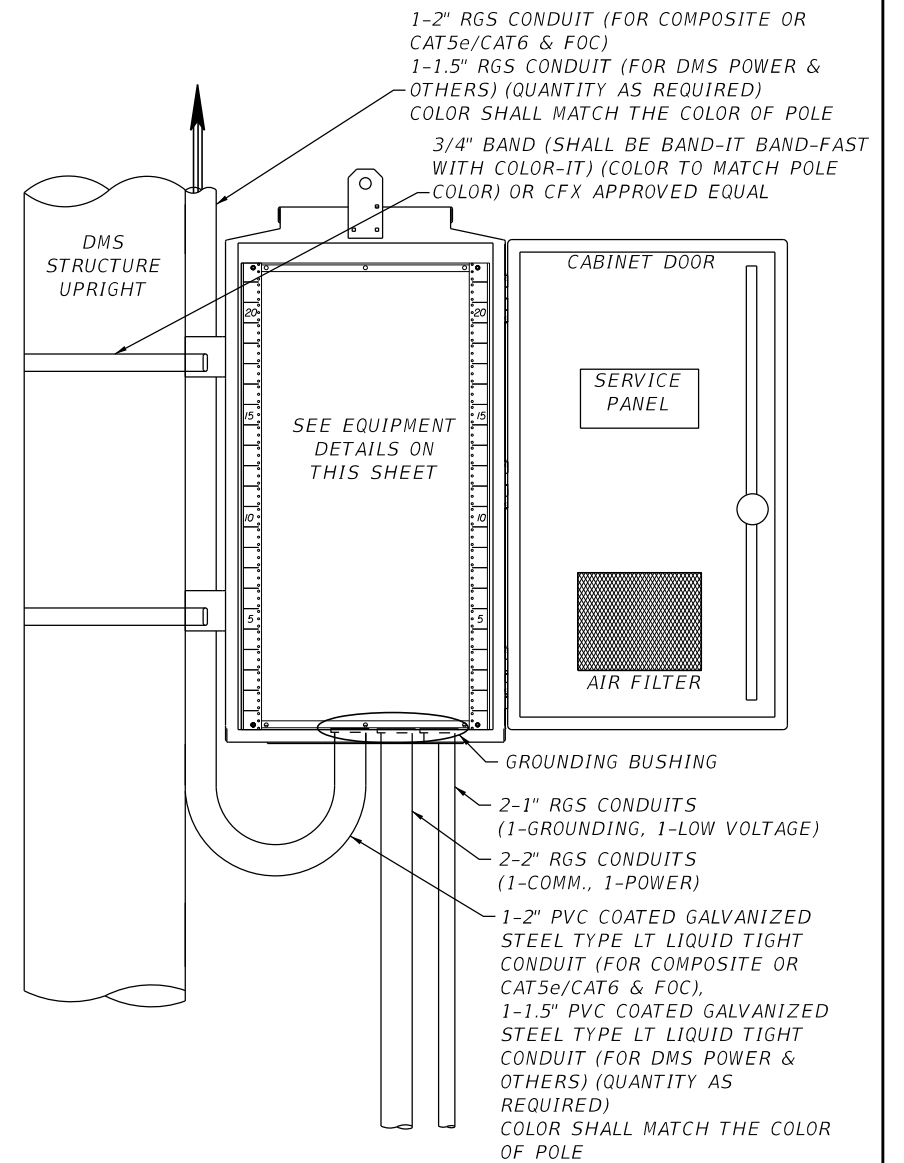
SHEET NO.

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FRONT VIEW BACK VIEW  
 \* = REMOTE POWER MANAGER W/  
 ENVIRONMENTAL MONITOR  
**TYPE 336S DMS CABINET**  
**POLE MOUNTED**



**TYPE 336S DMS**  
**POLE MOUNTED CABINET DETAIL**

NOTES:

- THE CABINET SHALL PROVIDE FOR RACK MOUNTING AND SHELVING OF ALL EQUIPMENT.
- CABINETS SHALL BE TYPE 336S AND FABRICATED IN ACCORDANCE TO SECTION 668 OF CFX SPECIFICATIONS.
- (SM) = SHELF MOUNT, (RM) = RACK MOUNT
- BUS RATING SHALL BE A MINIMUM OF THE FULL ELECTRICAL LOAD WHEN ALL CABINET AND EXTERNAL POLE MOUNTED DEVICES ARE ACTIVE.
- CABINET SPD MODELS SHALL BE AS FOLLOWS:  
 SPD 1 - ADVANCED PROTECTION TECHNOLOGIES (APT) - APT RS232/D1  
 SPD 2 - ADVANCED PROTECTION TECHNOLOGIES (APT) - S50A120V1PND W/SKIT1  
 SPD 3 - ADVANCED PROTECTION TECHNOLOGIES (APT) - APT SCAT5  
 SPD 4 - ADVANCED PROTECTION TECHNOLOGIES (APT) - S50A120V1PND W/SKIT1  
 SPD 5 - ADVANCED PROTECTION TECHNOLOGIES (APT) - APT TE01XCS104XA  
 6 - MAINTENANCE PORT (RS232)
- FLEX CONDUIT RADIUS SHALL BE GREATER THAN FIBER OPTIC CABLE MINIMUM BENDING RADIUS.
- 19" DOUBLE DIN RAIL SHALL BE GROUNDED PER MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL SUBMIT A CABINET LAYOUT/WIRING DIAGRAM FOR CFX APPROVAL.
- FRONT FACE OF EQUIPMENT SHALL BE INSTALLED WITHIN THE CABINET FACING THE OPPOSITE DIRECTIONAL OF TRAVEL.
- THE DIN RAIL MOUNTED RS-232 CONNECTOR SHALL BE CLEARLY LABELED AS "DCS READER MAINTENANCE PORT - RS-232". SUGGESTED VENDOR/PART NUMBER FOR THE RS-232 CONNECTOR: B&B ELECTRONIC DB9 MTB OR CFX APPROVED EQUAL.
- TYPE 336S CABINETS SHALL BE PLACED AS SHOWN 3' FROM BOTTOM OF CABINET TO GRADE. IF IMPRACTICAL DUE TO SITE GEOMETRICS, AN ALTERNATE LOCATION ADJACENT TO THE STRUCTURE SHALL BE DESIGNED FOR A CABINET PLACEMENT ON A TYPE II POLE WITH THE BOTTOM OF THE CABINET 3' FROM GRADE.
- SLIDE OUT TRAY SHALL BE ORIENTED SUCH THAT THE TECHNICIAN SHALL NEVER HAVE THEIR BACK TO THE DIRECTION OF TRAVEL.
- CABINET SHALL NEVER BE MOUNTED ON THE APPROACHING SIDE OF TRAFFIC.
- IT IS THE INTENT OF THE ENGINEER TO PROVIDE A SAFE WORKING SPACE FOR THE FIELD TECHNICIANS.
- PANDUIT DIMENSIONS ARE AS FOLLOWS:  
 A. RIGHT; 1.26" WIDE BY 1.59" DEEP  
 B. RIDE SIDE OF CABINET - (LATCH SIDE); 1.26" WIDE BY 1.12" DEEP
- ALL CONDUIT DIMENSIONS SHOWN ARE MINIMUM.

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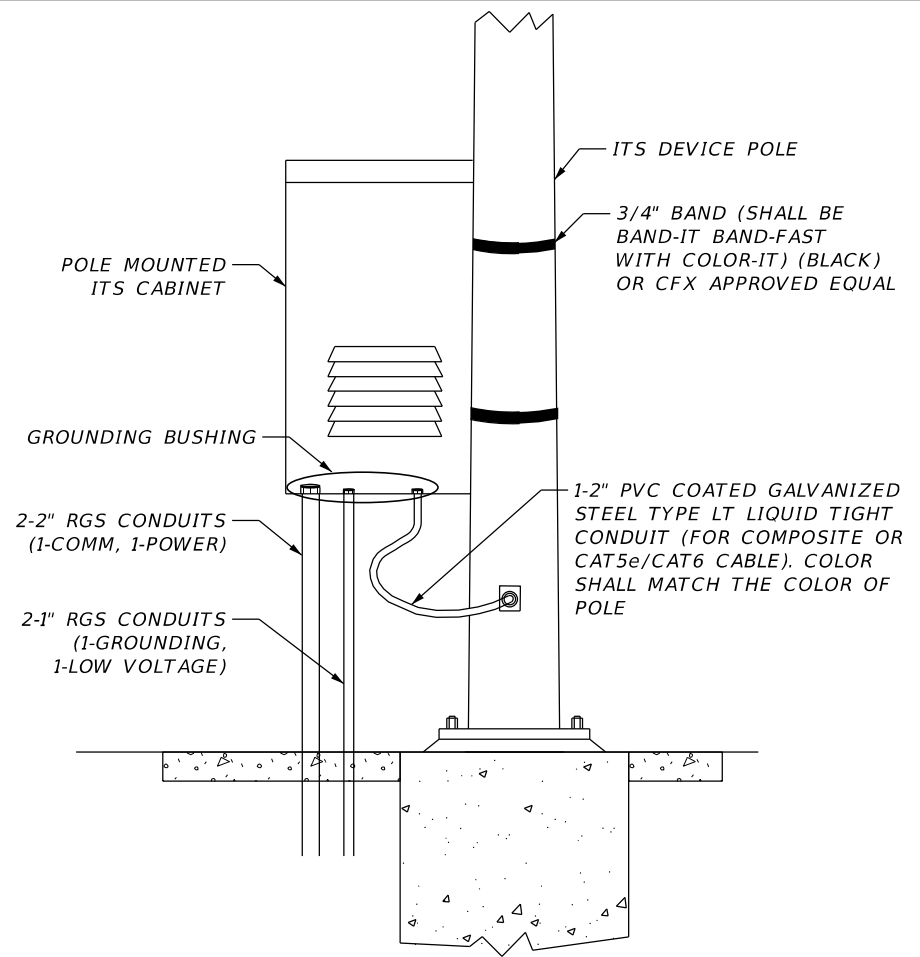
CENTRAL FLORIDA  
 EXPRESSWAY AUTHORITY

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 FLORIDA  
 EXPRESSWAY  
 AUTHORITY

**DMS CABINET LAYOUT DETAIL**

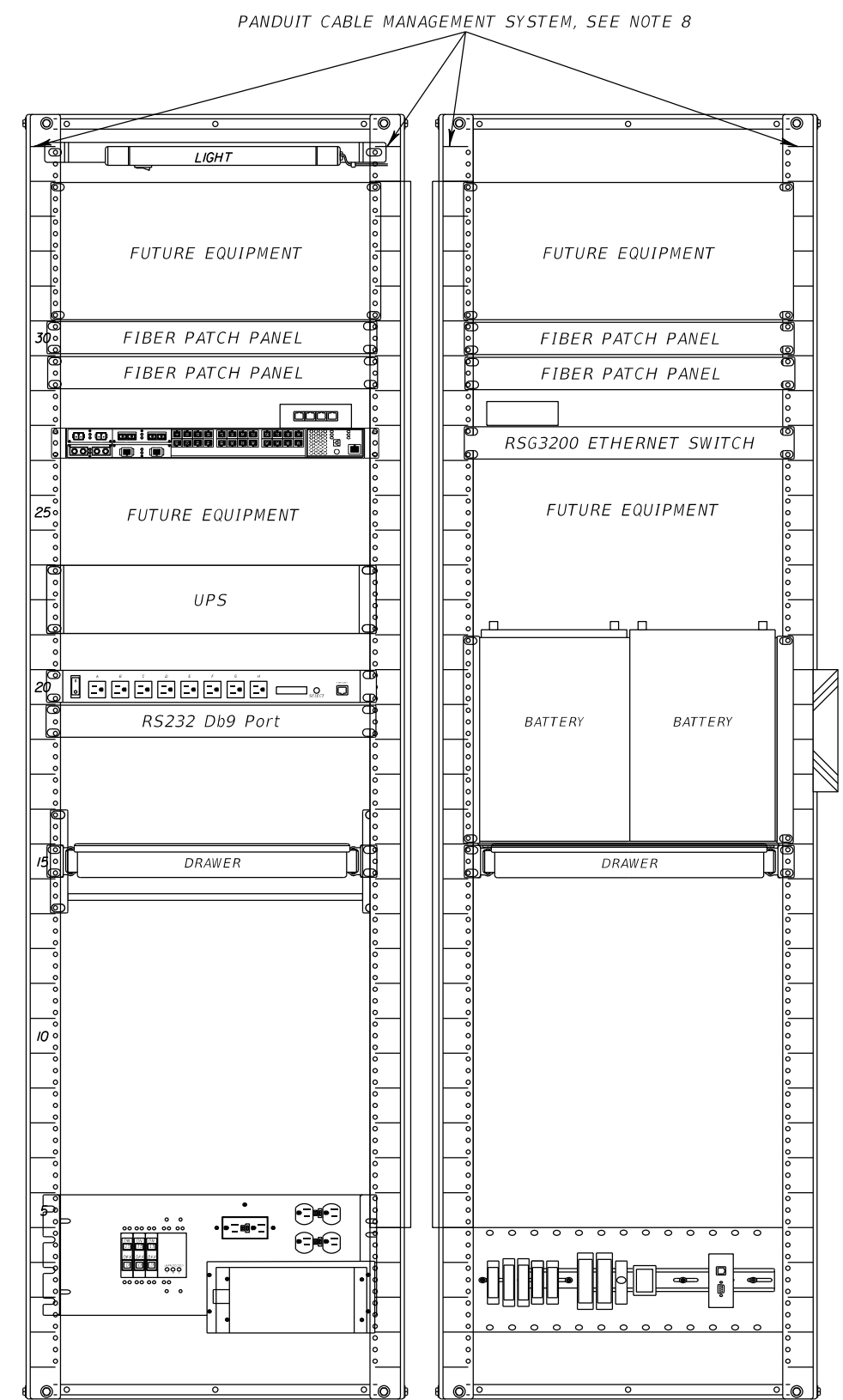
SHEET NO.

L-1



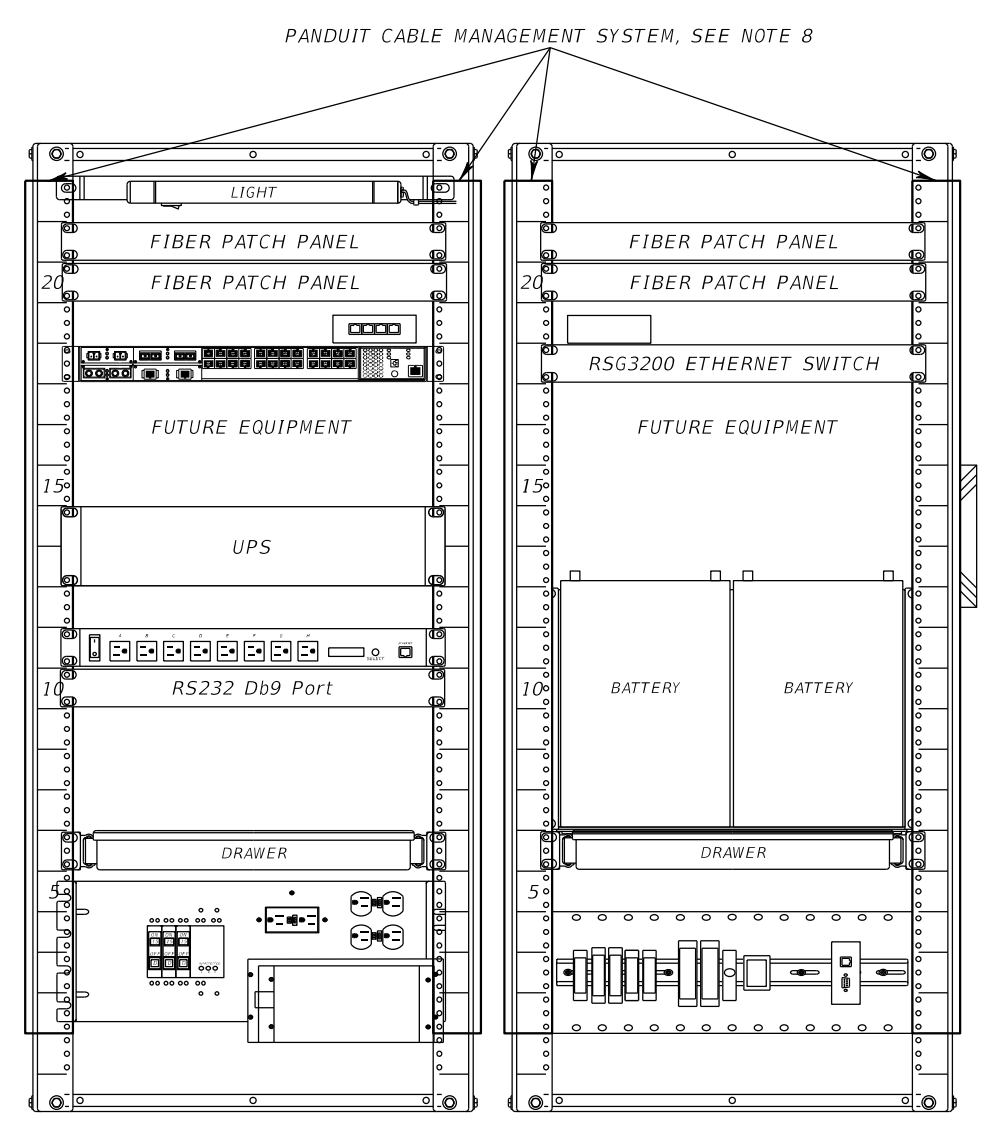
**TYPE MODEL 336S ITS  
POLE MOUNTED CABINET DETAIL**

- NOTES:
- INTERNAL CABINET RACK ASSEMBLY SHALL BE ADJUSTED SO THAT THE PANDUIT CABLE MANAGEMENT SYSTEM IS NOT IN CONFLICT WITH THE CABINET INTERNAL DOOR LOCKING MECHANISM, THIS INCLUDES 334 ITS CABINETS.
  - THE CABINET SHALL PROVIDE FOR RACK MOUNTING AND SHELVING OF ALL EQUIPMENT, THIS INCLUDES 334 ITS CABINETS.
  - ALL ITS CABINETS SHALL MEET CFX SPECIFICATION 668.
  - 336S CABINETS SHALL BE PLACED AS SHOWN 3' FROM BOTTOM OF CABINET TO GRADE. IF IMPRACTICAL DUE TO SITE GEOMETRICS, AN ALTERNATE LOCATION ADJACENT TO THE STRUCTURE SHALL BE DESIGNED FOR A CABINET PLACEMENT ON A TYPE II POLE WITH THE BOTTOM OF THE CABINET 3' FROM GRADE.
  - ALL ITS CABINETS SLIDE OUT TRAYS SHALL BE ORIENTED SUCH THAT THE TECHNICIAN SHALL NEVER HAVE THEIR BACK TO THE DIRECTION OF TRAVEL.
  - ALL ITS CABINETS SHALL NEVER BE MOUNTED ON THE APPROACHING SIDE OF TRAFFIC.
  - IT IS THE INTENT OF THE ENGINEER TO PROVIDE A SAFE WORKING SPACE FOR THE FIELD TECHNICIANS AT ALL ITS CABINET LOCATIONS.
  - PANDUIT DIMENSIONS ARE AS FOLLOWS:  
A. LEFT SIDE OF CABINET; 2" WIDE BY 1.5" DEEP  
B. RIDE SIDE OF CABINET - (LATCH SIDE); 2" WIDE BY 1" DEEP
  - POE SHALL BE GROUNDED TO DIN RAIL.
  - ALL CONDUIT DIMENSIONS SHOWN ARE MINIMUM.



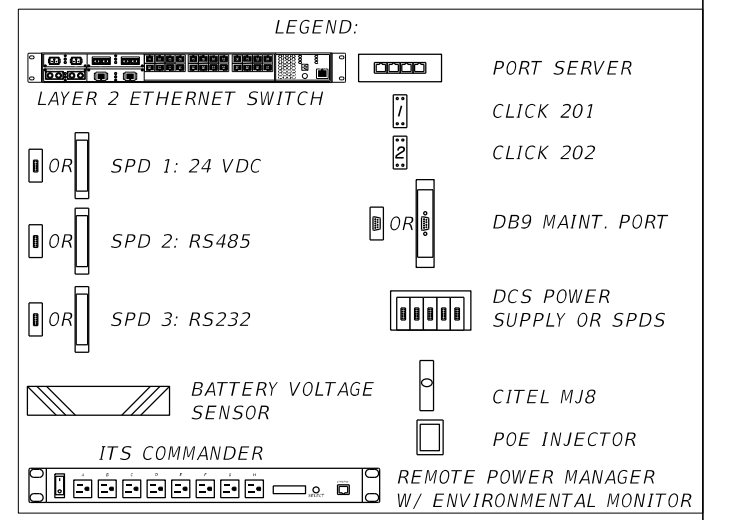
FRONT VIEW BACK VIEW

**TYPE 334 ITS CABINET  
GROUND MOUNTED CABINET**



FRONT VIEW BACK VIEW

**TYPE 336S ITS CABINET  
POLE MOUNTED CABINET**



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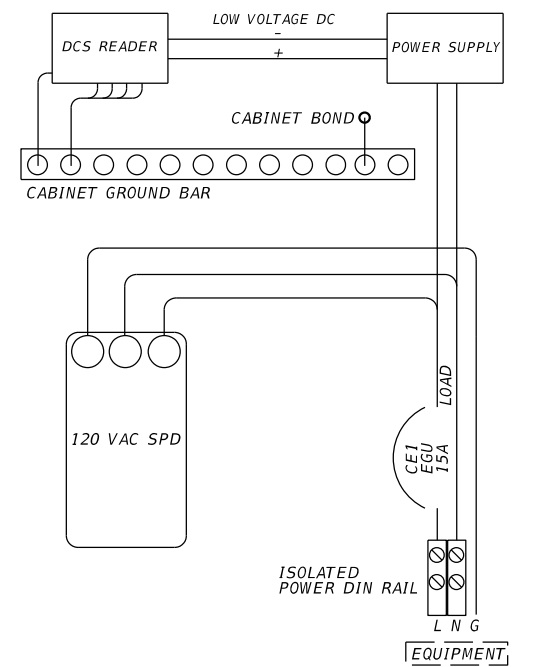
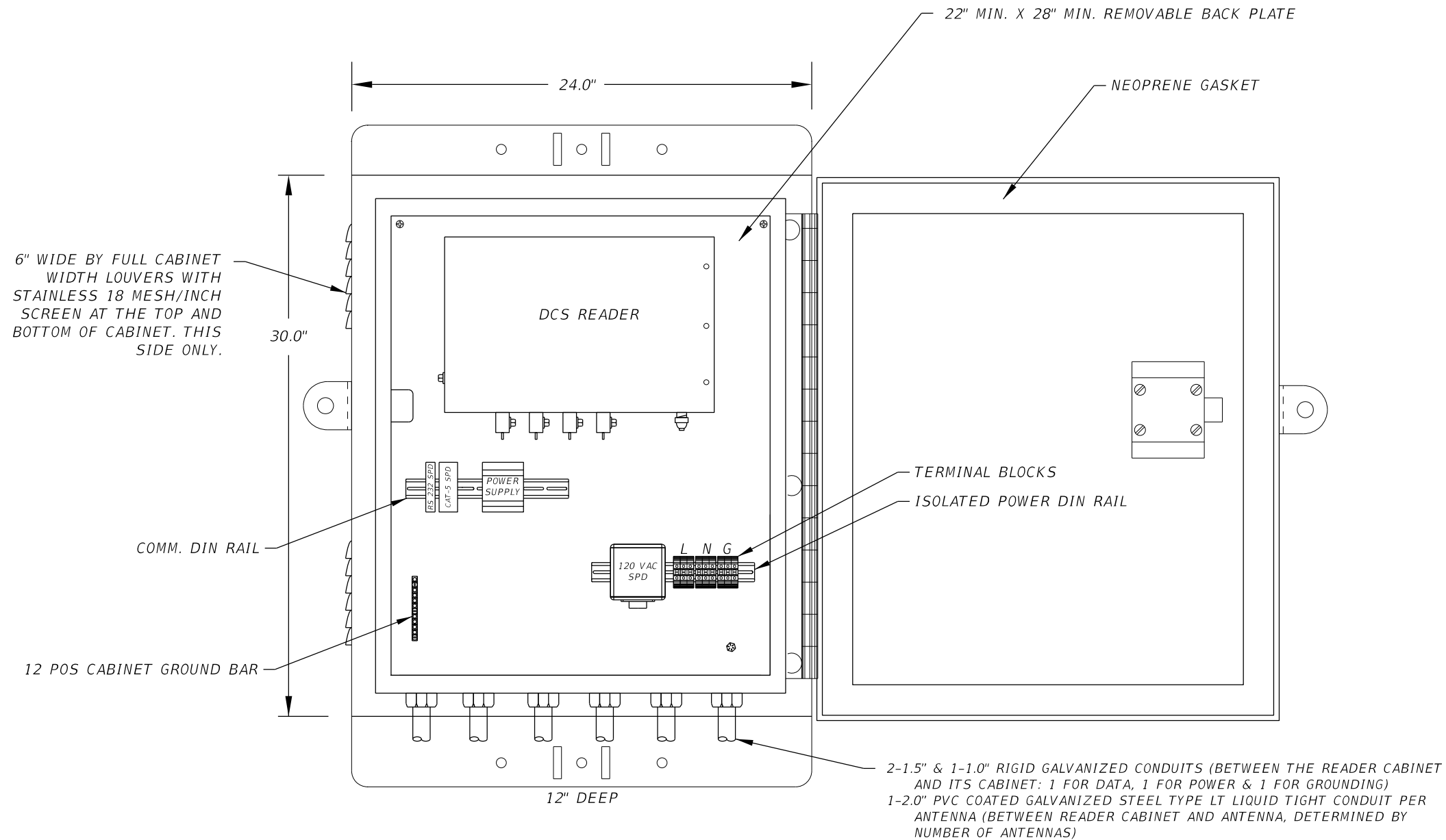
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**ITS CABINET LAYOUT DETAIL**

SHEET NO. L-2

**NTS**

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**POLE / WALL MOUNTED CABINET (RF READER MODULE)**

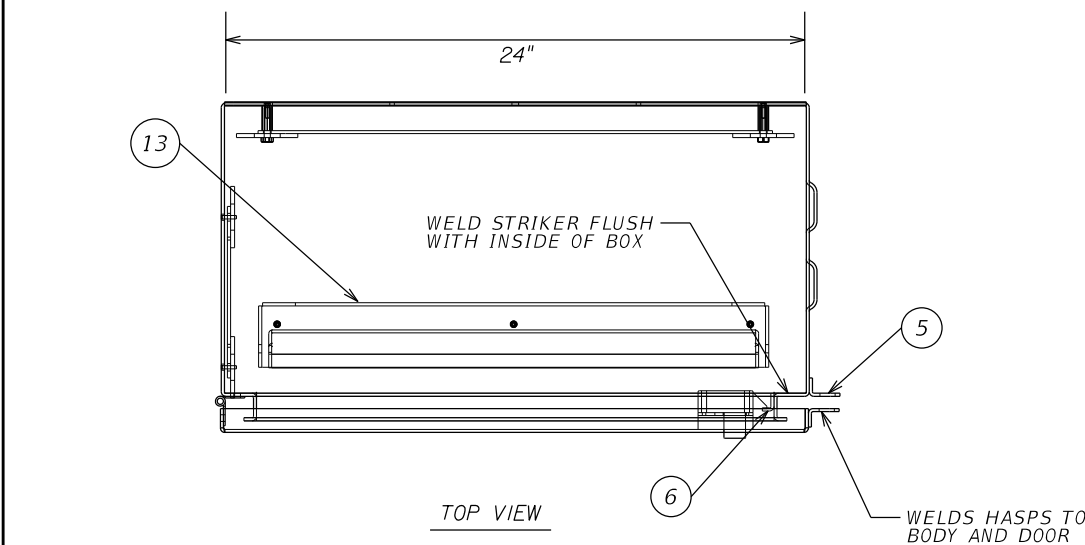
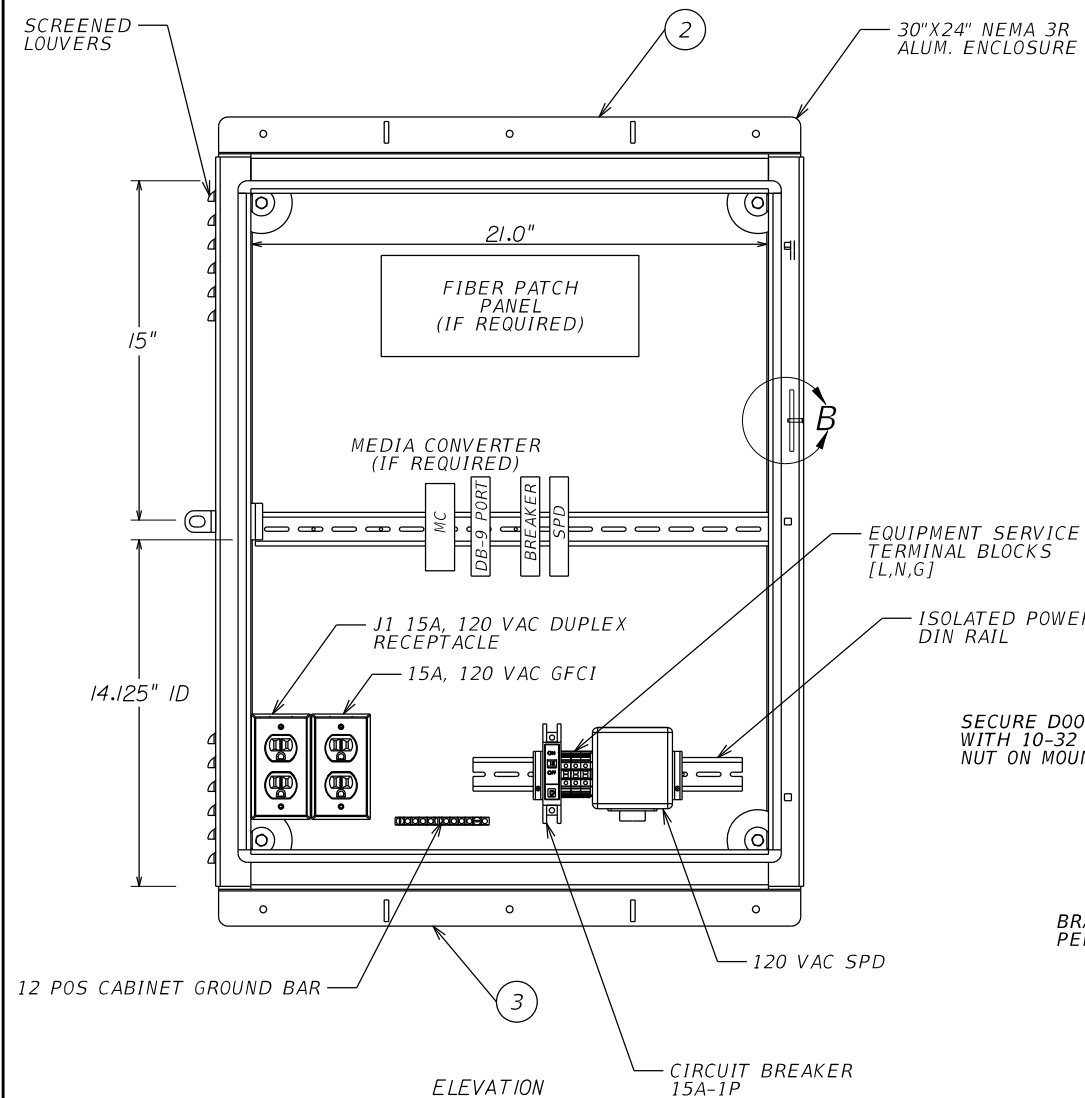
**NOTES:**

1. CONTRACTOR TO SUBMIT A CABINET WIRING AND LAYOUT DIAGRAM FOR CFX APPROVAL PRIOR TO PROCUREMENT.
2. SEE WIRING DIAGRAM FOR EQUIPMENT TO BE INSTALLED IN THE CABINET.
3. DCS READER PORT ASSIGNMENT SHALL CONFIGURE LANE 1 TO PORT 1 FOR RIGHT MOST LANE OF TRAVEL.
4. DCS READER CAN ACCOMMODATE UP TO FOUR ANTENNAS.

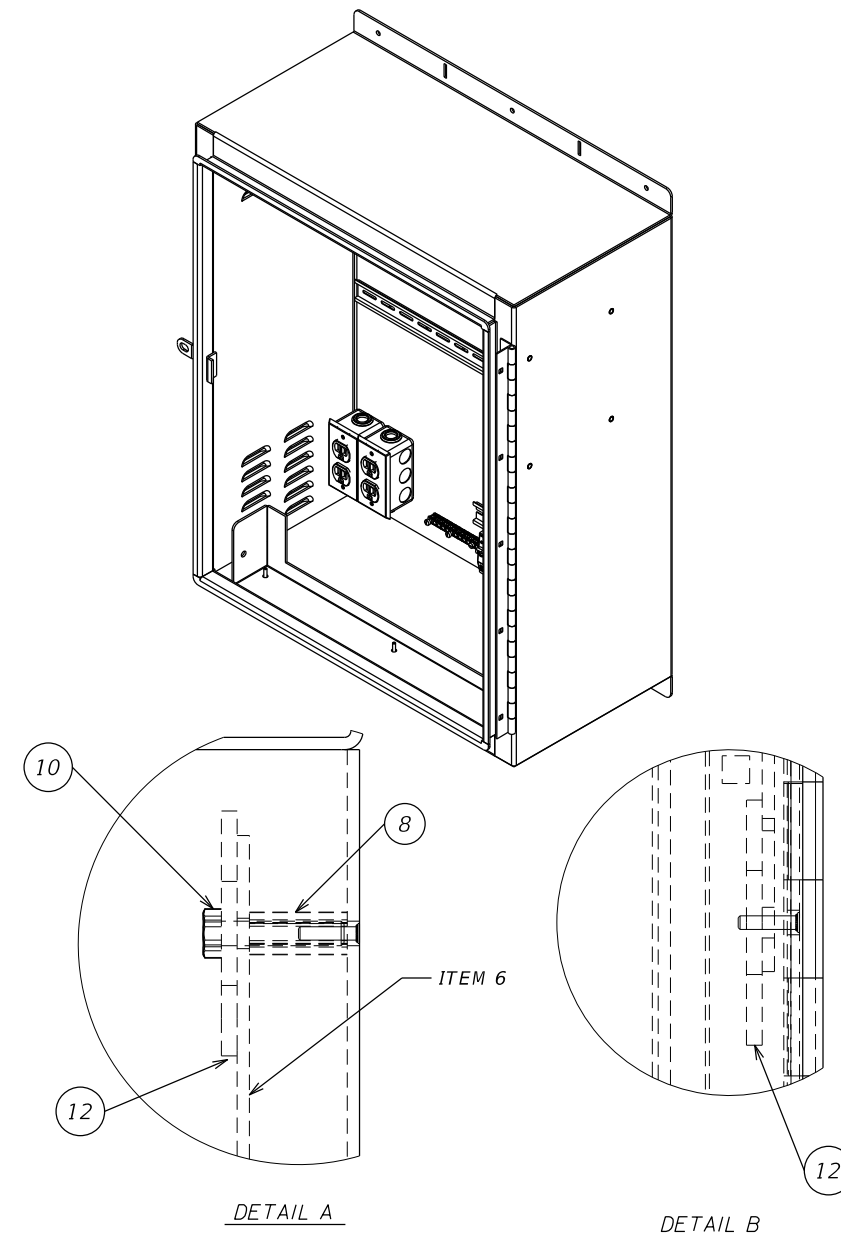
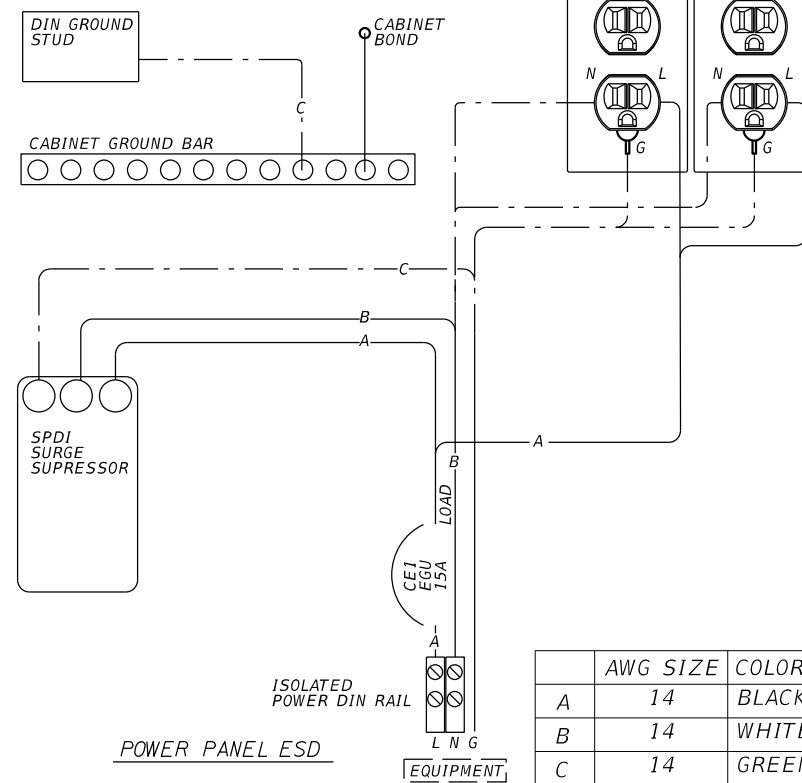
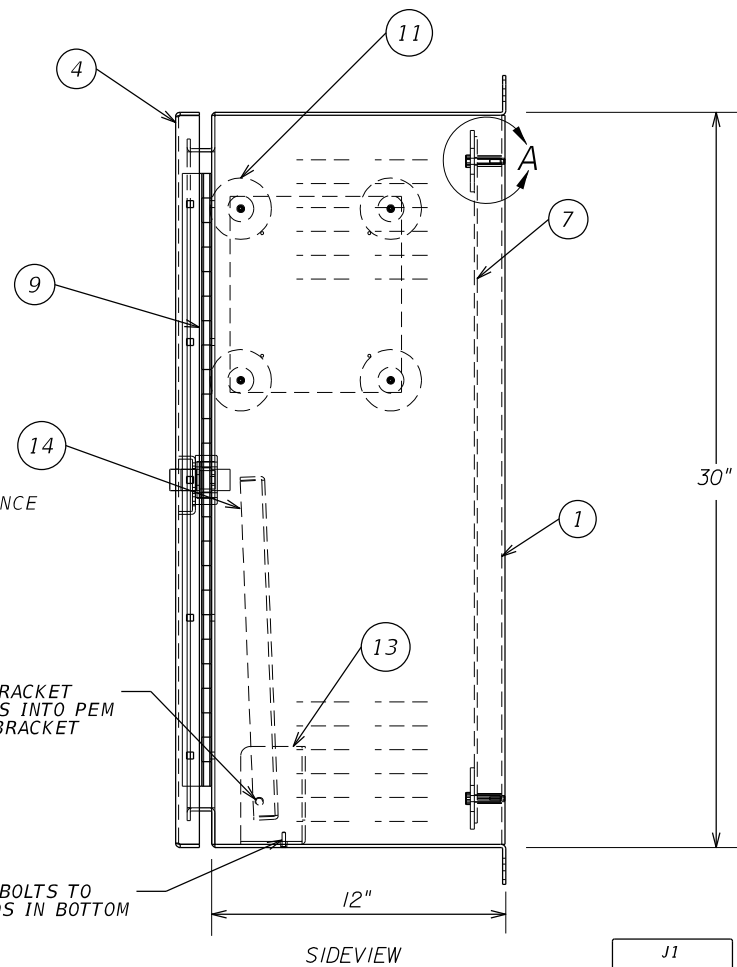
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NOTES:  
 1. ADD TERMINAL BLOCK IF REQUIRED.  
 2. TERMINATE EACH WIRE IN ITS OWN BLOCK.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	CA-30X24X12-BDY-6		1
2	CA-30X24X12-END-CAP-6	END CAP	1
3	CA-30X24X12-BOT-END-CAP-6		1
4	CA-30X24X12-D00R-ASSY-6		1
5	CA-30X24X10-BDY-HASP		1
6	CA-30X24X12-STRIKER-6		1
7	BP-100-FT-28X21-00		1
8	STANDOFF.25X1.00	1/4-20X1" STANDOFF	4
9	2IN-.070-25-5.625-HINGE-ASSY		1
10	HEX BOLT_AI		4
11	7X8-BP-001		1
12	FLAT WASHER TYPE B REGULAR_AI		8
13	FOLD-DN SHELF BKT-.190-CAB	BRACKET	1
14	CA-30X24X12-F-DN-SH	FOLD DOWN SHELF	1

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**INTERMEDIATE NEMA 3R CABINET**

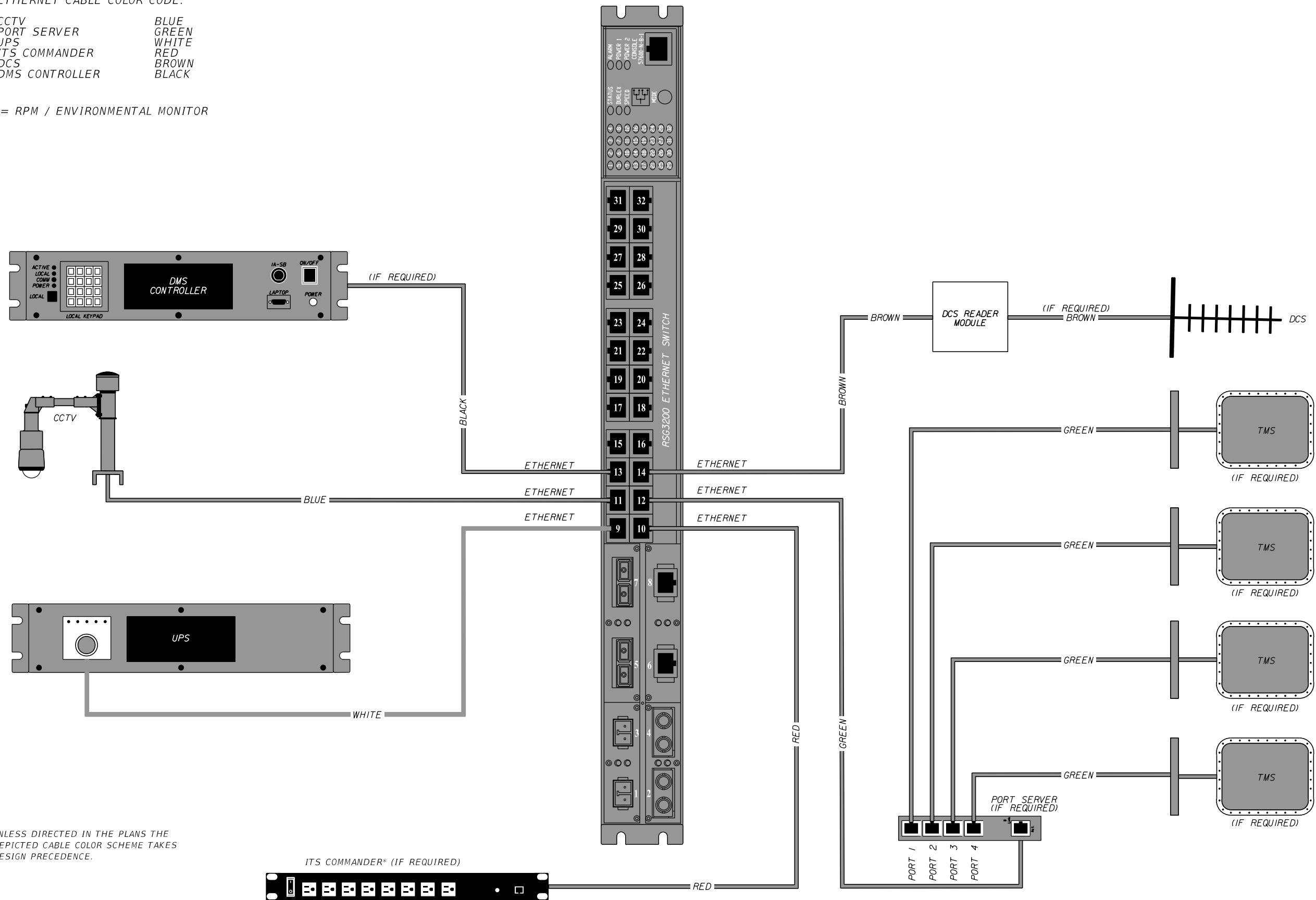
SHEET NO.  
L-4

VERSION 6

ETHERNET CABLE COLOR CODE:

CCTV BLUE  
 PORT SERVER GREEN  
 UPS WHITE  
 ITS COMMANDER RED  
 DCS BROWN  
 DMS CONTROLLER BLACK

\*= RPM / ENVIRONMENTAL MONITOR



UNLESS DIRECTED IN THE PLANS THE DEPICTED CABLE COLOR SCHEME TAKES DESIGN PRECEDENCE.

ITS COMMANDER\* (IF REQUIRED)



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FOR INFORMATIONAL PURPOSES ONLY

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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ETHERNET SWITCH DETAIL

SHEET NO.

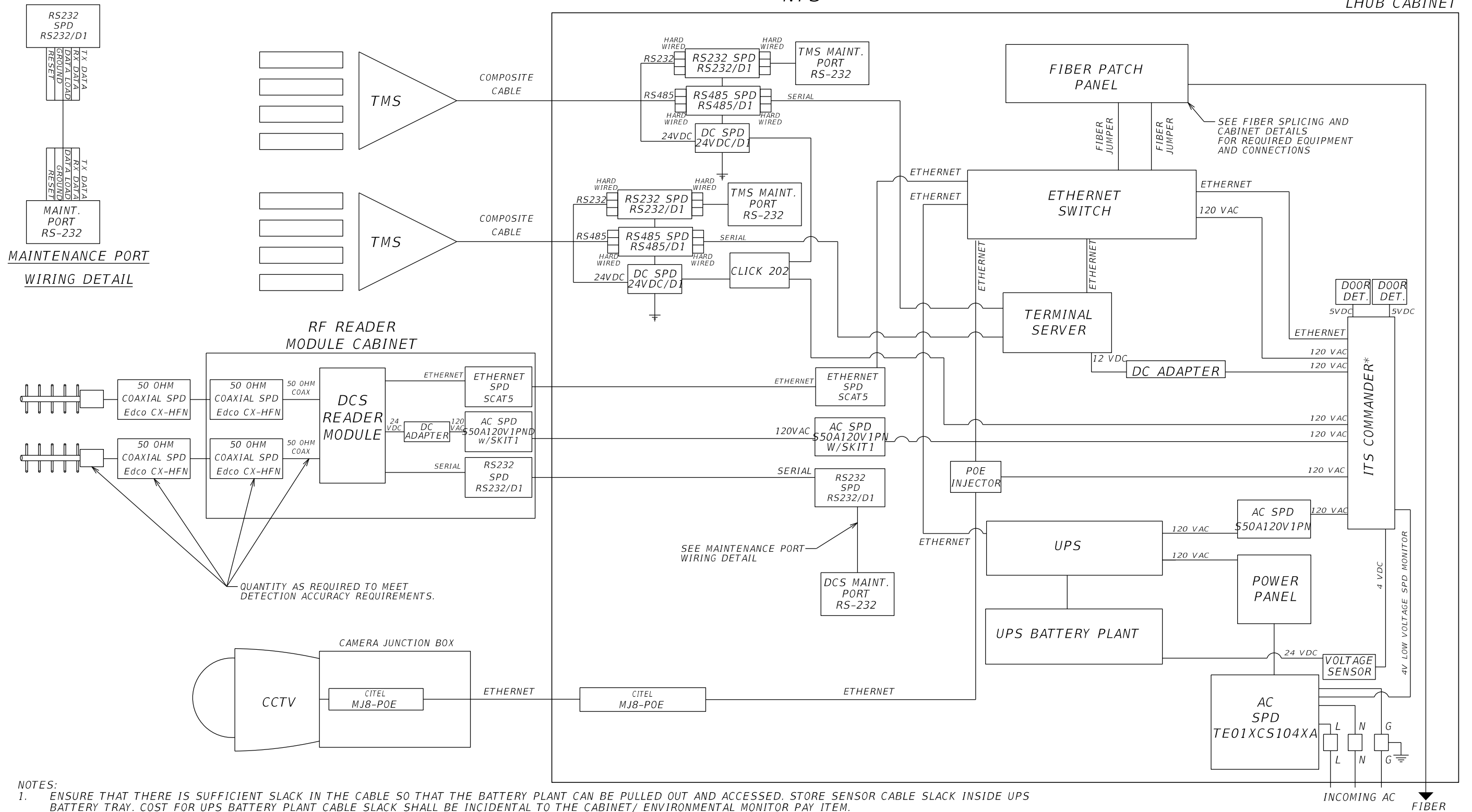
L-5

VERSION 6

PROPOSED CCTV, DCS & 2 TMS CONNECTION DIAGRAM

NTS

LHUB CABINET



NOTES:

1. ENSURE THAT THERE IS SUFFICIENT SLACK IN THE CABLE SO THAT THE BATTERY PLANT CAN BE PULLED OUT AND ACCESSED. STORE SENSOR CABLE SLACK INSIDE UPS BATTERY TRAY. COST FOR UPS BATTERY PLANT CABLE SLACK SHALL BE INCIDENTAL TO THE CABINET/ ENVIRONMENTAL MONITOR PAY ITEM.
2. INSTALL DRY CONTACT AND WIRING CAPABLE OF REMOTE SNMP COMMUNICATIONS AS DIRECTED IN PLANS.
3. FROM HUB TO HEAD, PROTECTED SIDE OF SPD FACES HEAD. FROM HUB TO 3R CABINET, UNPROTECTED SIDE FACES 3R CABINET, PROTECTED SIDE FACES THE HEAD. THE EQUIPMENT SIDE IS ALWAYS PROTECTED.

\* = REMOTE POWER MANAGER W/ ENVIRONMENTAL MONITOR

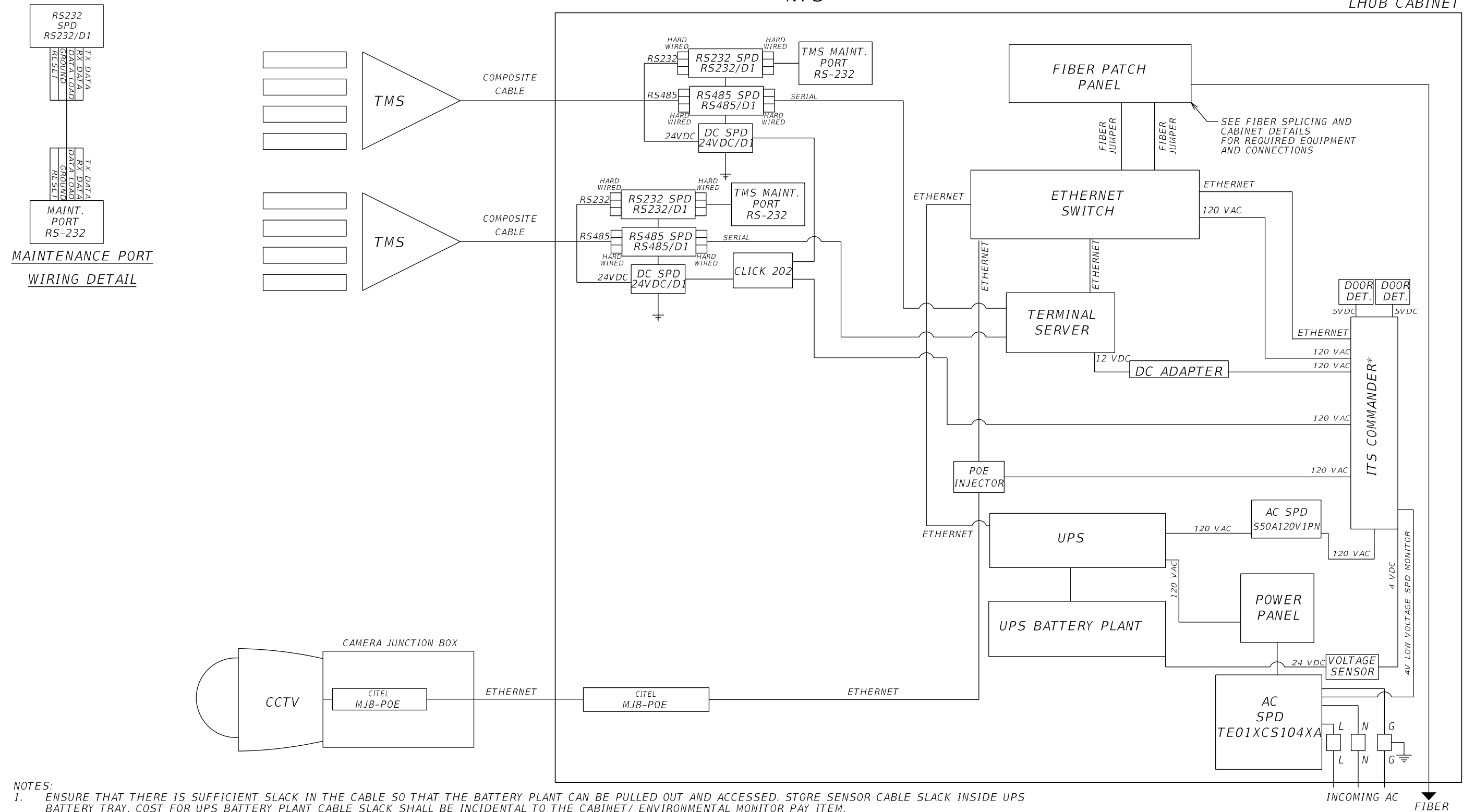
REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	TYPICAL WIRING DIAGRAMS (1 OF 6)	SHEET NO. L-6
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					

VERSION 6

# PROPOSED CCTV & 2 TMS CONNECTION DIAGRAM

NTS

LHUB CABINET



- NOTES:
1. ENSURE THAT THERE IS SUFFICIENT SLACK IN THE CABLE SO THAT THE BATTERY PLANT CAN BE PULLED OUT AND ACCESSED. STORE SENSOR CABLE SLACK INSIDE UPS BATTERY TRAY. COST FOR UPS BATTERY PLANT CABLE SLACK SHALL BE INCIDENTAL TO THE CABINET/ ENVIRONMENTAL MONITOR PAY ITEM.
  2. INSTALL DRY CONTACT AND WIRING CAPABLE OF REMOTE SNMP COMMUNICATIONS AS DIRECTED IN PLANS.
  3. FROM HUB TO HEAD, PROTECTED SIDE OF SPD FACES HEAD. FROM HUB TO 3R CABINET, UNPROTECTED SIDE FACES 3R CABINET, PROTECTED SIDE FACES THE HEAD. THE EQUIPMENT SIDE IS ALWAYS PROTECTED.

\* = REMOTE POWER MANAGER W/ ENVIRONMENTAL MONITOR

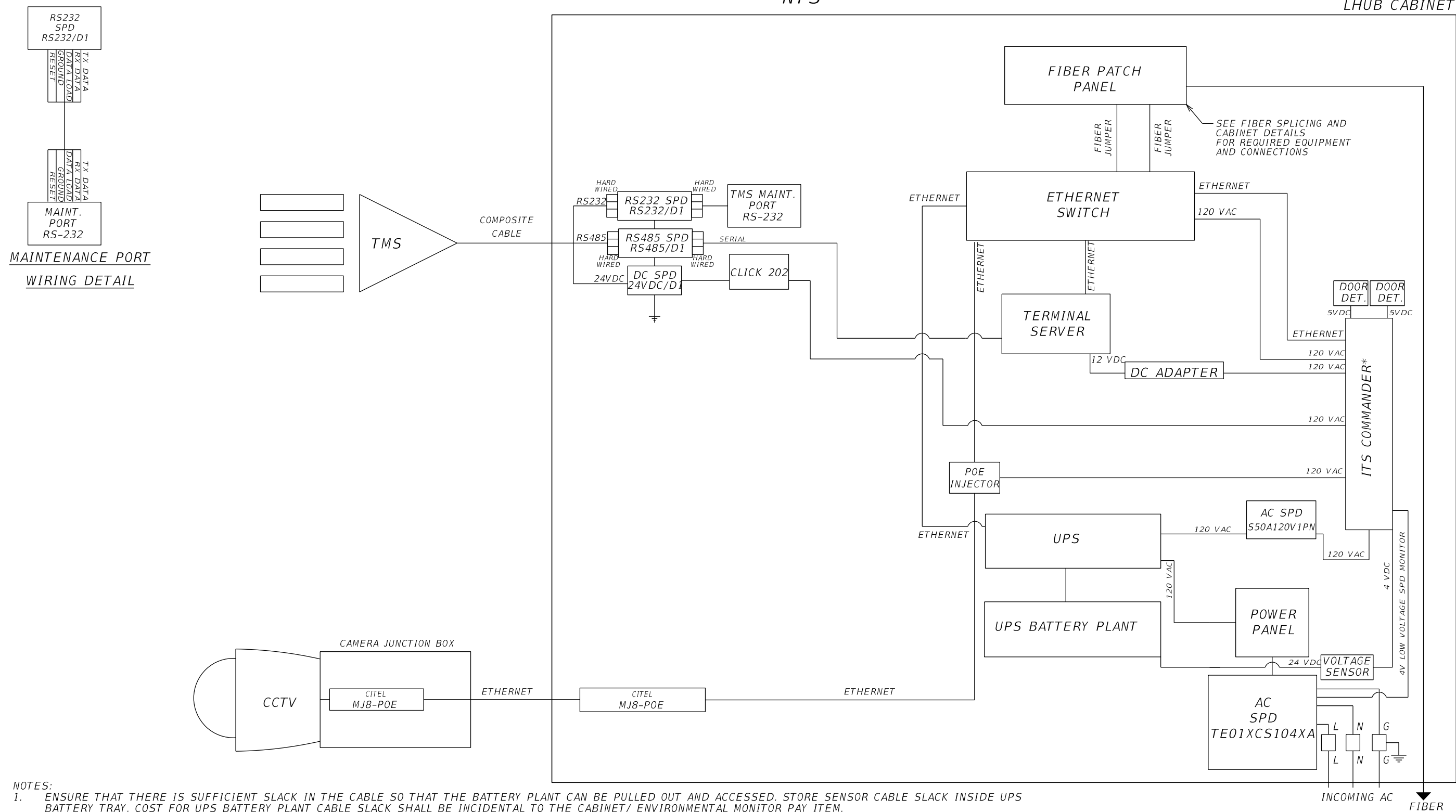
REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	TYPICAL WIRING DIAGRAMS (2 OF 6)	SHEET NO. L-7
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					

VERSION 6

# PROPOSED CCTV & TMS CONNECTION DIAGRAM

NTS

LHUB CABINET



**NOTES:**

1. ENSURE THAT THERE IS SUFFICIENT SLACK IN THE CABLE SO THAT THE BATTERY PLANT CAN BE PULLED OUT AND ACCESSED. STORE SENSOR CABLE SLACK INSIDE UPS BATTERY TRAY. COST FOR UPS BATTERY PLANT CABLE SLACK SHALL BE INCIDENTAL TO THE CABINET/ ENVIRONMENTAL MONITOR PAY ITEM.
2. INSTALL DRY CONTACT AND WIRING CAPABLE OF REMOTE SNMP COMMUNICATIONS AS DIRECTED IN PLANS.
3. FROM HUB TO HEAD, PROTECTED SIDE OF SPD FACES HEAD. FROM HUB TO 3R CABINET, UNPROTECTED SIDE FACES 3R CABINET, PROTECTED SIDE FACES THE HEAD. THE EQUIPMENT SIDE IS ALWAYS PROTECTED.

\* = REMOTE POWER MANAGER W/ ENVIRONMENTAL MONITOR

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FOR INFORMATIONAL PURPOSES ONLY

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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TYPICAL WIRING DIAGRAMS  
(3 OF 6)

SHEET NO.  
L-8

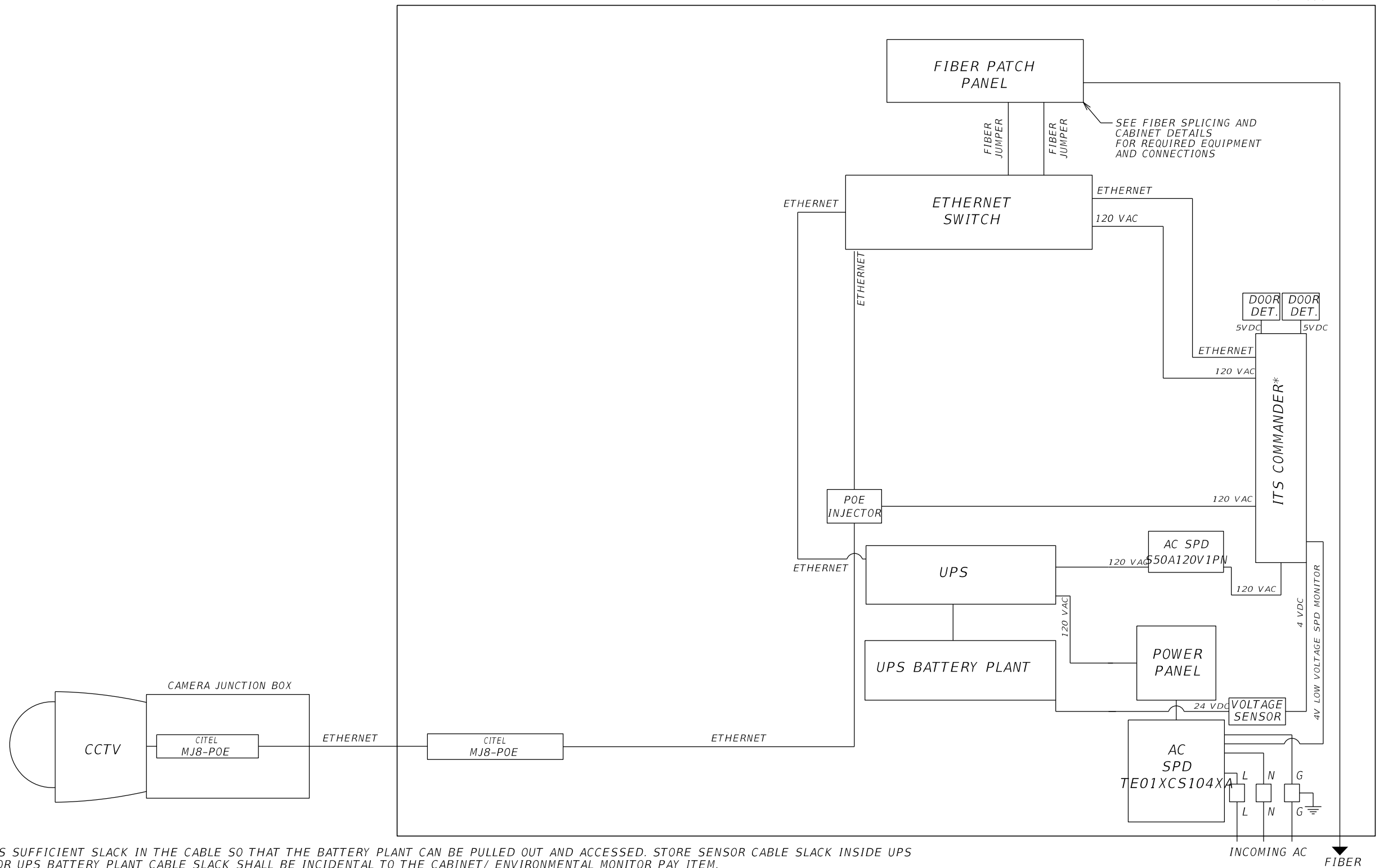
VERSION 6



PROPOSED CCTV CONNECTION DIAGRAM

NTS

LHUB CABINET



NOTES:

1. ENSURE THAT THERE IS SUFFICIENT SLACK IN THE CABLE SO THAT THE BATTERY PLANT CAN BE PULLED OUT AND ACCESSED. STORE SENSOR CABLE SLACK INSIDE UPS BATTERY TRAY. COST FOR UPS BATTERY PLANT CABLE SLACK SHALL BE INCIDENTAL TO THE CABINET/ ENVIRONMENTAL MONITOR PAY ITEM.
2. INSTALL DRY CONTACT AND WIRING CAPABLE OF REMOTE SNMP COMMUNICATIONS AS DIRECTED IN PLANS.
3. FROM HUB TO HEAD, PROTECTED SIDE OF SPD FACES HEAD. FROM HUB TO 3R CABINET, UNPROTECTED SIDE FACES 3R CABINET, PROTECTED SIDE FACES THE HEAD. THE EQUIPMENT SIDE IS ALWAYS PROTECTED.

\* = REMOTE POWER MANAGER W/ ENVIRONMENTAL MONITOR

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

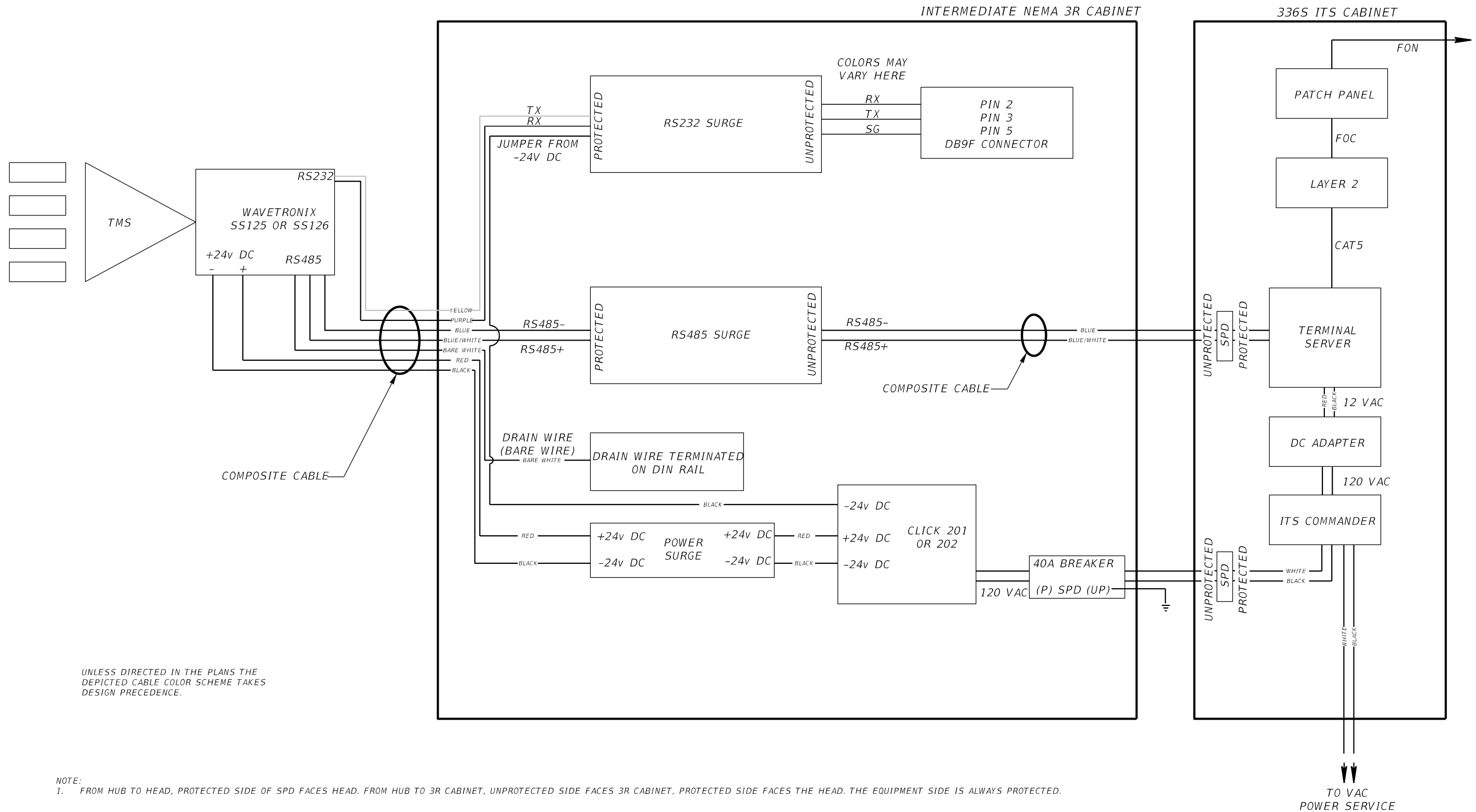
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

TYPICAL WIRING DIAGRAMS  
(4 OF 6)

SHEET NO.  
L-9

VERSION 6

# USING WAVETRONIX CABLE NTS



VERSION 6

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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**CENTRAL FLORIDA  
EXPRESSWAY  
AUTHORITY**

**CENTRAL  
FLORIDA  
EXPRESSWAY  
AUTHORITY**

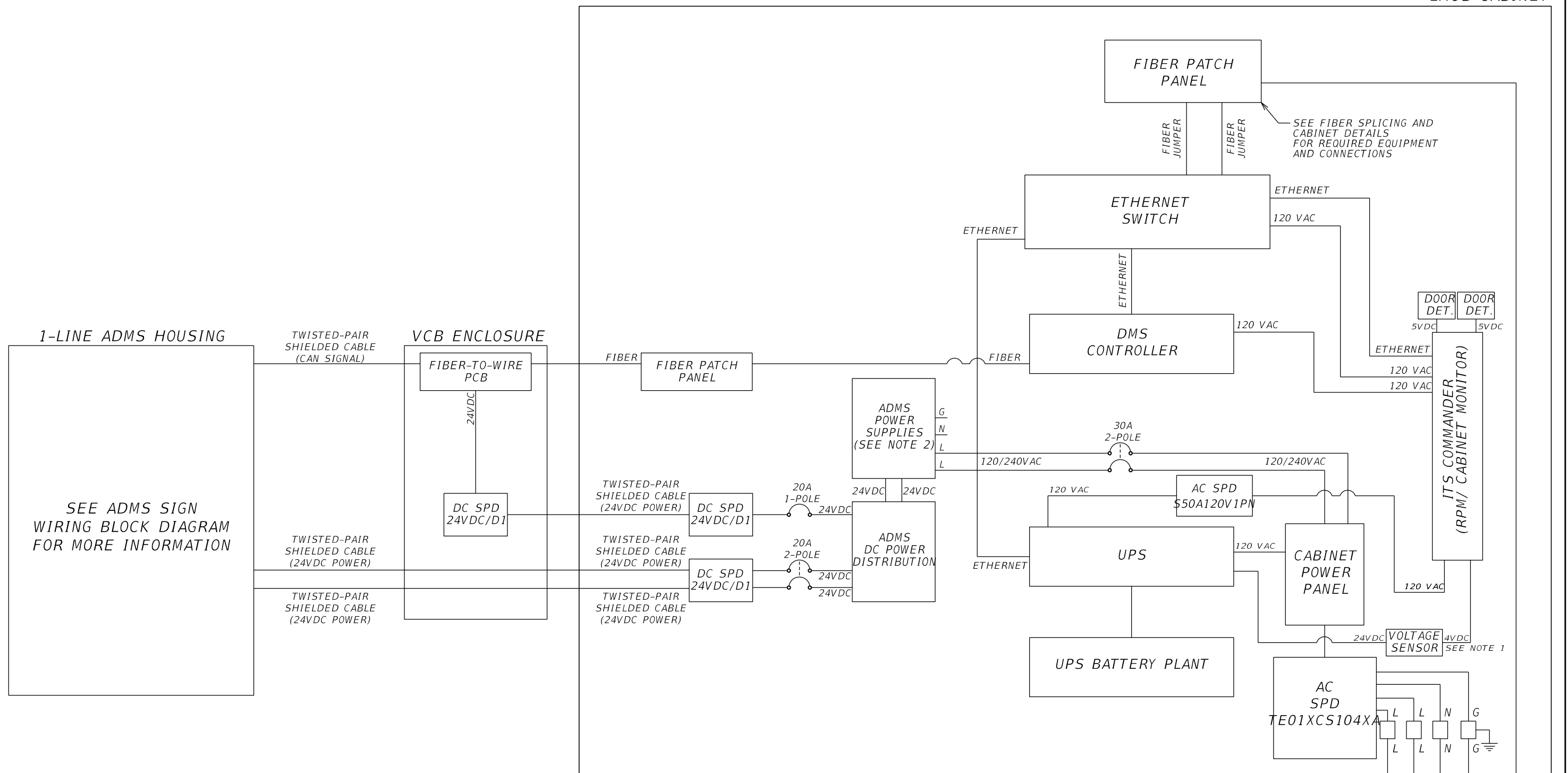
**TYPICAL WIRING DIAGRAM  
WAVETRONIX  
(5 OF 6)**

SHEET  
NO.  
**L-10**

PROPOSED 1-LINE ADMS CONNECTION DIAGRAM

N.T.S.

LHUB CABINET

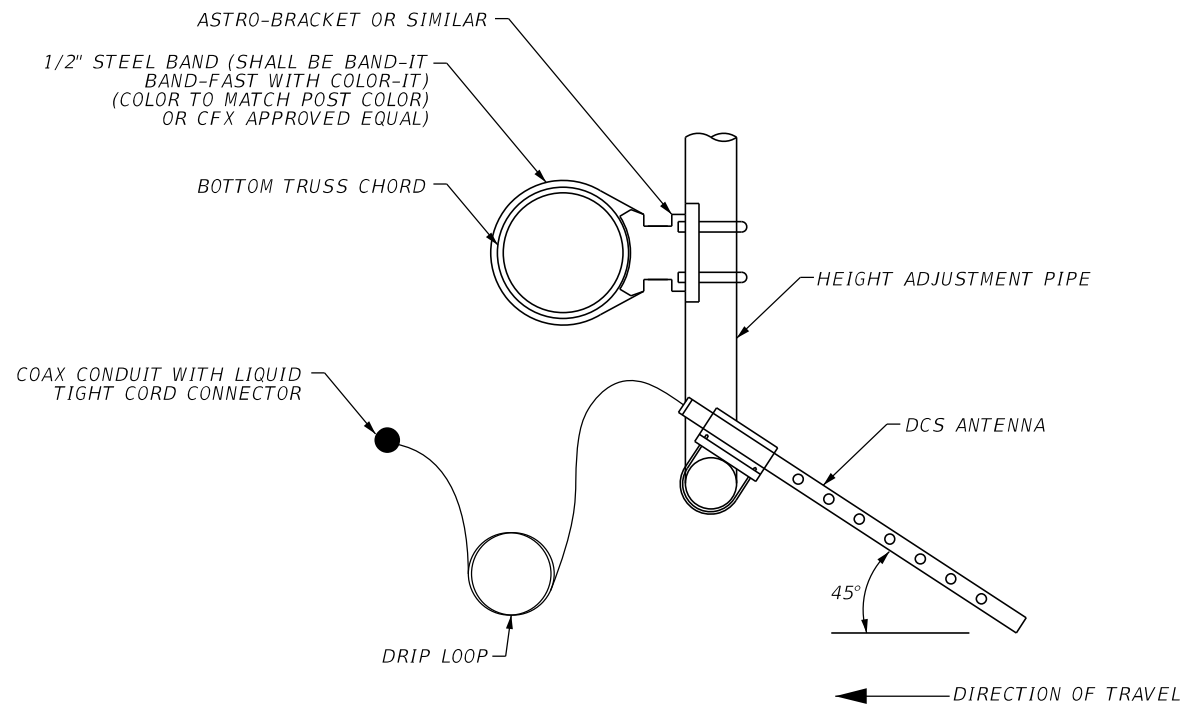
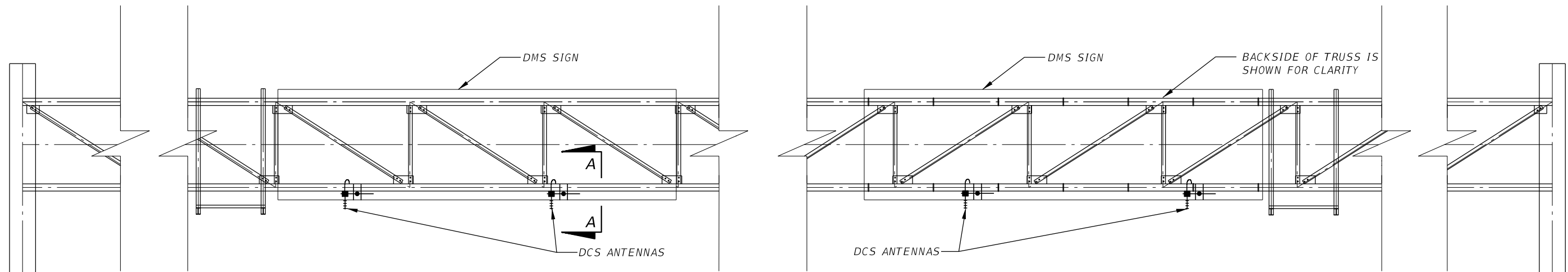


- NOTES:
1. ENSURE THAT THERE IS SUFFICIENT SLACK IN THE CABLE SO THAT THE BATTERY PLANT CAN BE PULLED OUT AND ACCESSED. STORE SENSOR CABLE SLACK INSIDE UPS BATTERY TRAY. UPS BATTERY PLANT CABLE SLACK IS CONSIDERED INCIDENTAL TO THE CABINET/ ENVIRONMENTAL MONITOR PAY ITEM.
  2. FROM HUB TO HEAD, PROTECTED SIDE OF SPD FACES HEAD. FROM HUB TO 3R CABINET, UNPROTECTED SIDE FACES 3R CABINET, PROTECTED SIDE FACES THE HEAD. THE EQUIPMENT SIDE IS ALWAYS PROTECTED.
  3. ADMS POWER SUPPLIES SHALL BE ON SEPARATE AC POWER LEGS FOR REDUNDANCY.
  4. GROUND SHIELDED CABLE PER MANUFACTURER'S REQUIREMENTS.

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	TYPICAL WIRING DIAGRAM 1 - LINE ADMS (6 OF 6)	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					L-11

VERSION 6

FULL SPAN BOX TRUSS DMS SIGN STRUCTURE DETAIL



- NOTES:
1. THE DCS SHALL BE MOUNTED OVER LANE STRIPES PER DCS COVERAGE DETAILS.
  2. CONTRACTOR SHALL ACHIEVE LANE ACCURACY REQUIREMENTS DEFINED IN SPECIFICATION 663.

NTS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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EXPRESSWAY AUTHORITY**

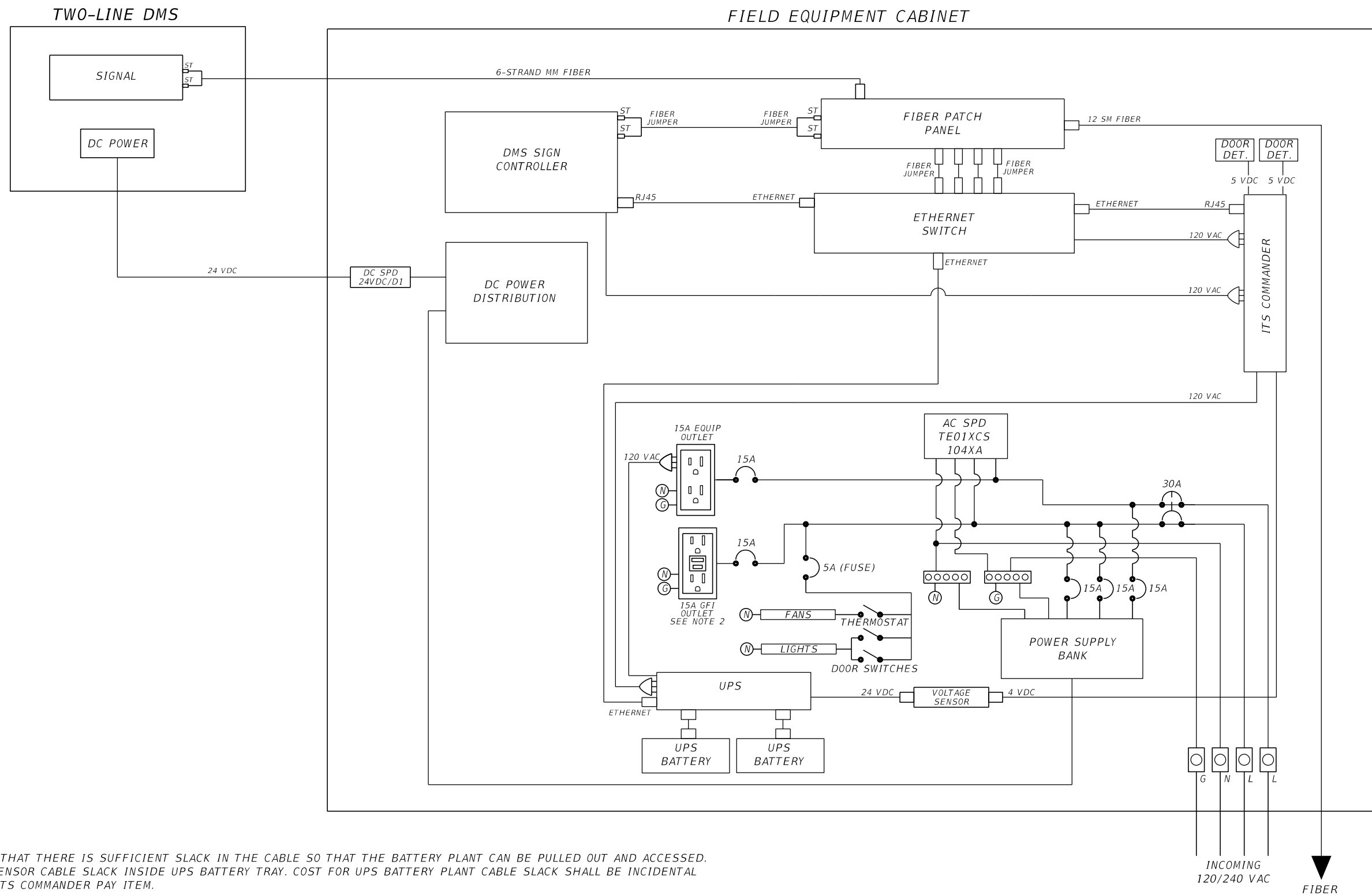
**CENTRAL  
FLORIDA  
EXPRESSWAY  
AUTHORITY**

**DCS ANTENNA ON DMS  
TRUSS DETAIL SHEET**

SHEET  
NO.  
**M-1**

VERSION 6

DUAL LINE DMS BLOCK DIAGRAM



NOTES:

- ENSURE THAT THERE IS SUFFICIENT SLACK IN THE CABLE SO THAT THE BATTERY PLANT CAN BE PULLED OUT AND ACCESSED. STORE SENSOR CABLE SLACK INSIDE UPS BATTERY TRAY. COST FOR UPS BATTERY PLANT CABLE SLACK SHALL BE INCIDENTAL TO THE ITS COMMANDER PAY ITEM.
- ADD 'MAX 1000W' LABEL TO OUTLET.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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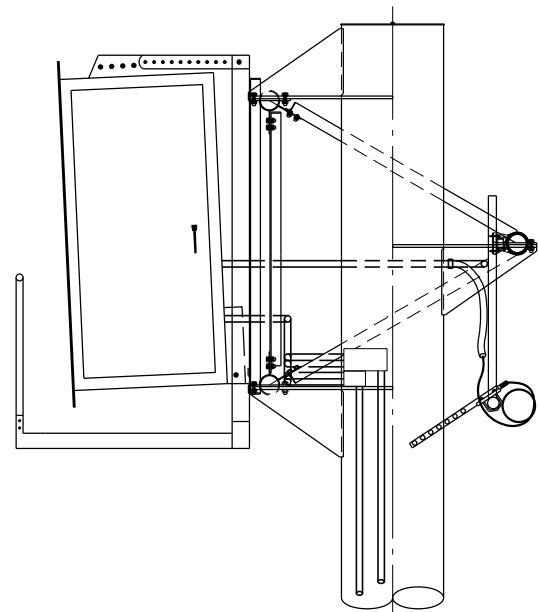
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**DUAL LINE DMS BLOCK DIAGRAM**

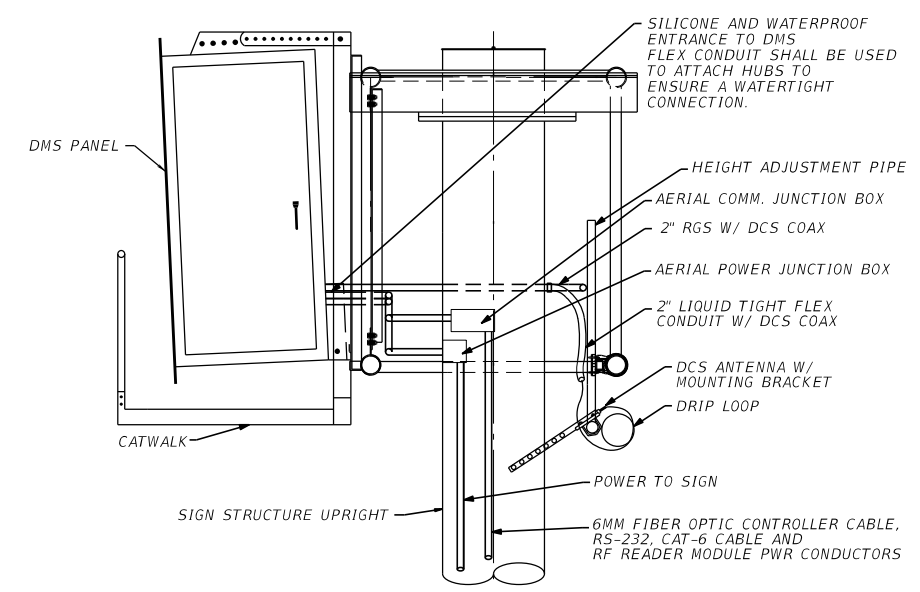
SHEET NO.  
M-2

VERSION 6

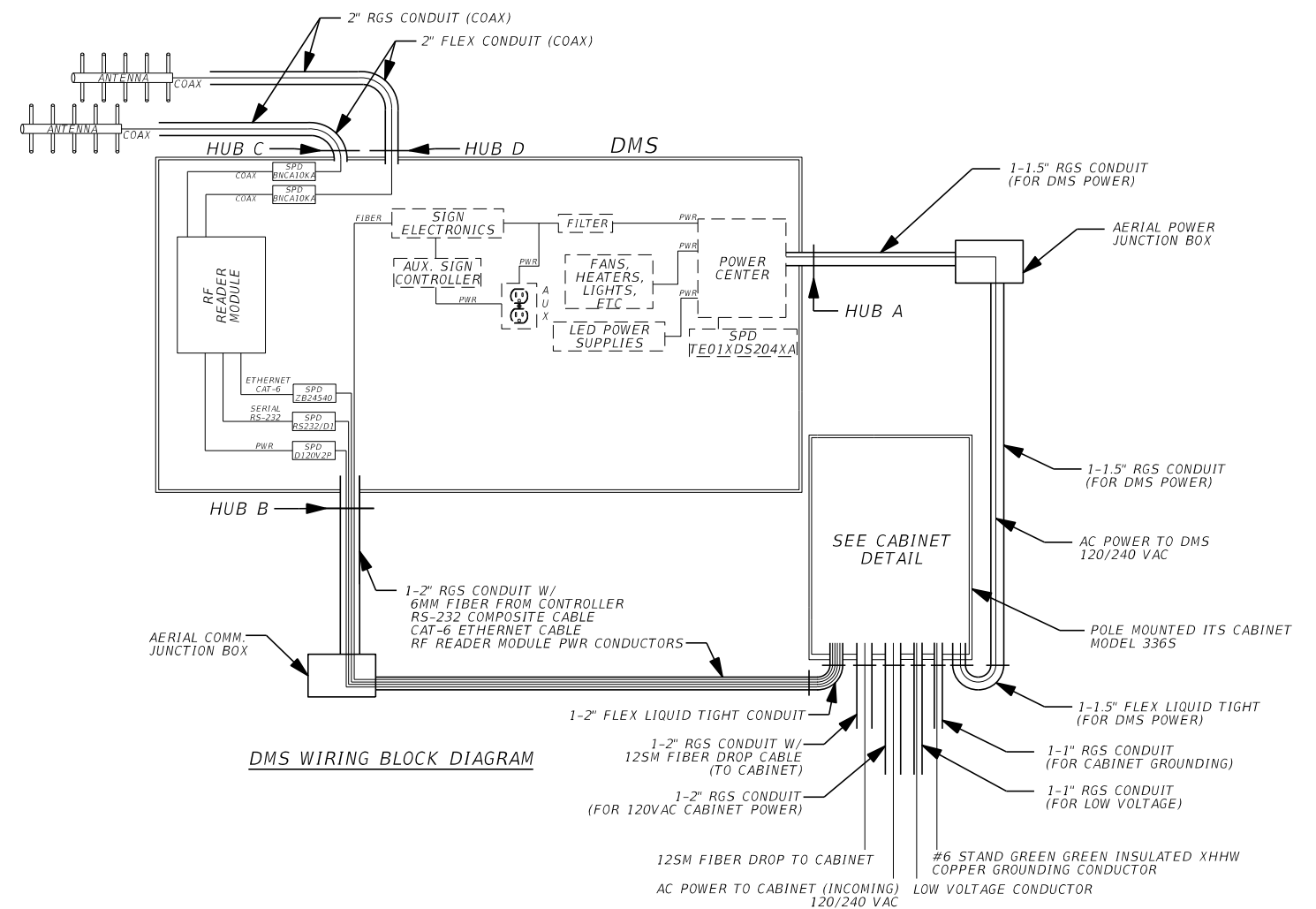
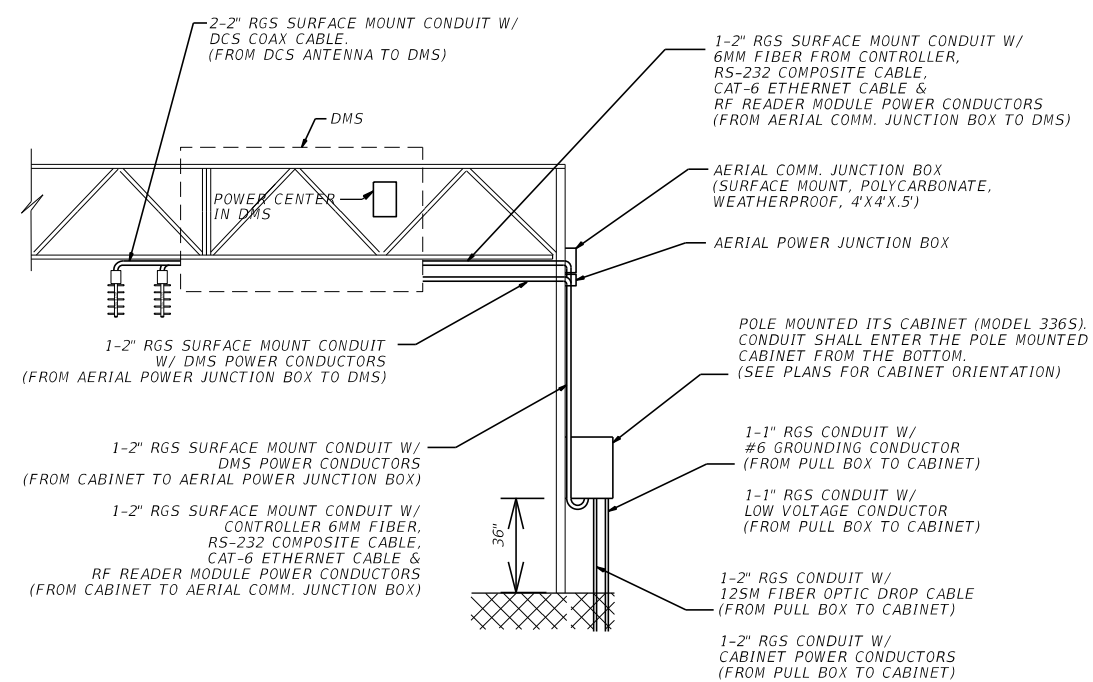


FOR CALLOUTS,  
SEE QUAD-CHORD PROFILE CALLOUTS

STRUCTURE POLE - TRI CHORD MOUNTED DMS (PROFILE)



STRUCTURE POLE - QUAD CHORD MOUNTED DMS (PROFILE)



DMS WIRING BLOCK DIAGRAM

- NOTES:
1. THE SPD MODEL NUMBERS THAT ARE SHOWN ARE APT PRODUCTS.
  2. ALL SPD ARE TO BE MOUNTED ON A DIN RAIL. DIN RAIL SHALL BE GROUNDED PER SPD MANUFACTURER'S RECOMMENDATIONS.
  3. PLAN REQUIREMENTS WILL VARY PER INSTALLATION. THE CONTRACTOR IS TO UTILIZE THIS DETAIL FOR CONSTRUCTION REQUIREMENTS BUT MUST BID EACH INSTALLATION AS REQUIRED BY THE PLAN SHEETS. NO ADDITIONAL COMPENSATION WILL BE GIVEN.
  4. THE CONTRACTOR SHALL SUBMIT A DETAILED WIRE-BY-WIRE DIAGRAM FOR REVIEW AND APPROVAL BY CFX PRIOR TO INSTALLATION.
  5. CONTRACTOR SHALL FURNISH RF READER PER SPECIFICATION 663.
  6. CONTRACTOR TO ATTACH THE RS-232 MAINTENANCE CABLE TO THE DB-9 RS-232 MAINTENANCE PORT ON THE RF READER MODULE.
  7. CONDUIT SHALL BE SECURED TO SIGN STRUCTURE WITH "MINERALLAC CONDUIT CLAMPS AT 5' CENTERS (CATALOG NO. 25B (1"), 45B (2"), 55B (2") OR CFX APPROVED EQUAL). USE SILICONE LOCK TIGHT AFTER DRILLING HOLE.
  8. POLE MOUNTED CABINET GROUNDING SHALL BE PER DCS SIGN STRUCTURE MOUNTING DETAIL AND OTHER APPLICABLE GROUNDING DETAILS.
  9. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL BE USED BETWEEN RGS CONDUIT TO JUNCTION BOX AND RGS CONDUIT TO DMS. ENTRANCE TO CONDUIT TO BE SEALED WITH A SIZED LIQUID TIGHT CORD CONNECTOR.
  10. ANY POLE DRILLING FOR CABLE ENTRY SHALL BE SEALED USING RUBBER GROMMET. RE-GALVANIZE AND PAINT AFTER DRILLING.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

**FOR INFORMATIONAL PURPOSES ONLY**

**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

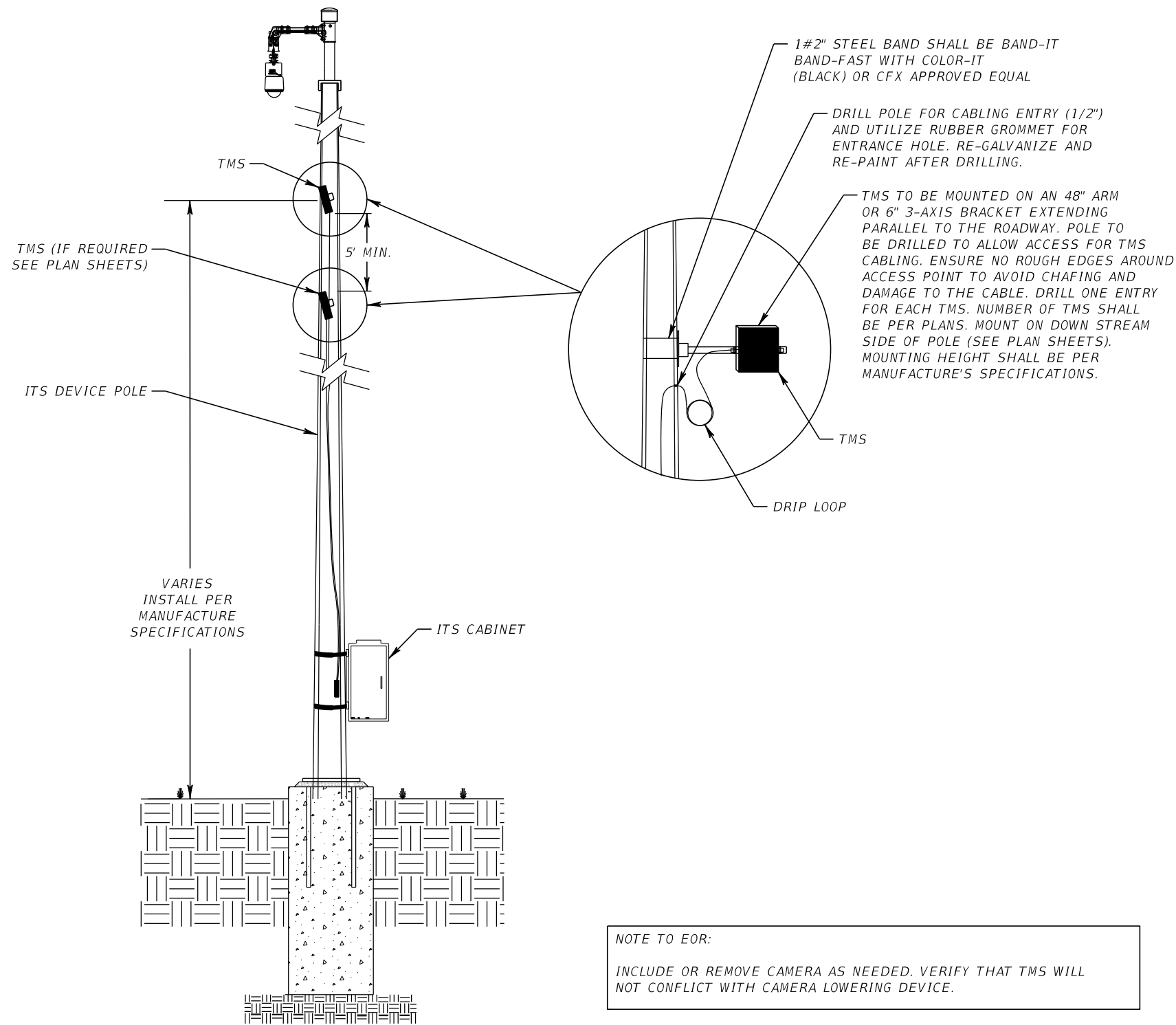
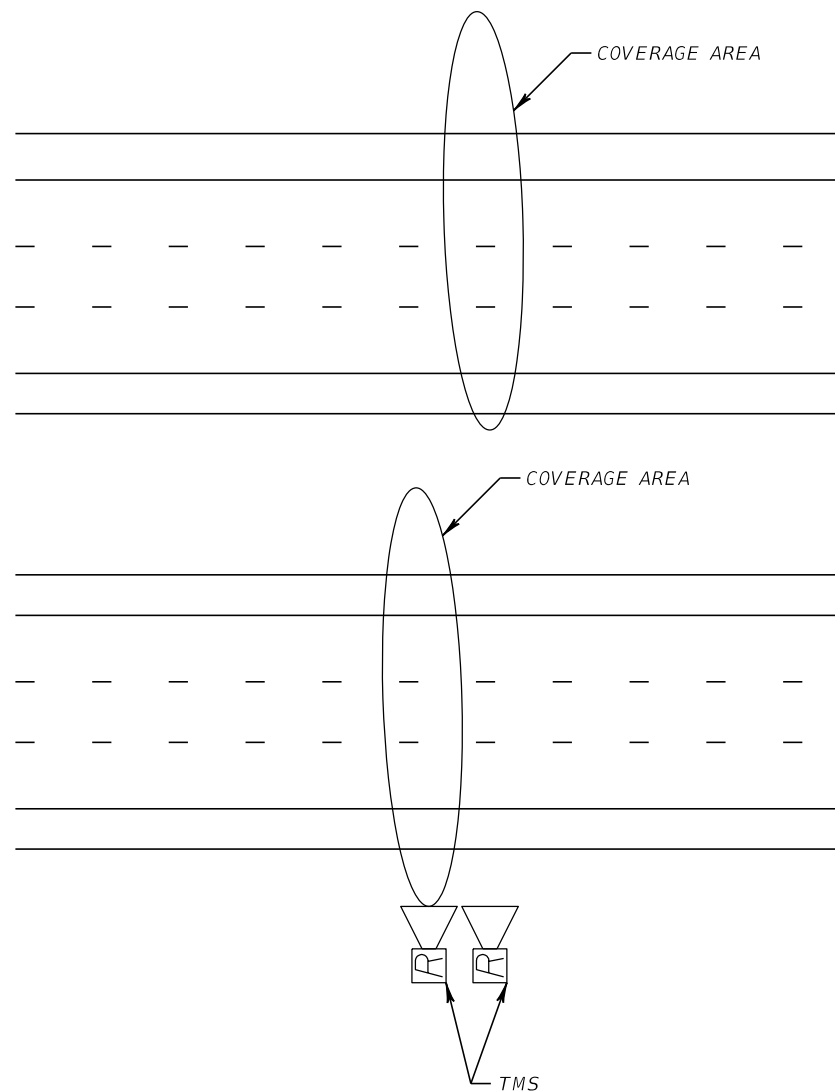
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**DCS AND THREE LINE DMS DEVICE CO-LOCATION DETAIL**

SHEET NO.  
M-3

VERSION 6

TYPICAL 4 & 6 LANE DIVIDED HIGHWAY



NOTE TO EOR:  
INCLUDE OR REMOVE CAMERA AS NEEDED. VERIFY THAT TMS WILL NOT CONFLICT WITH CAMERA LOWERING DEVICE.

- NOTES:
1. ONLY MANUFACTURER CABLE SHALL BE USED FROM TMS DEVICE CABINET TO SURGE PROTECTORS IN CABINET.
  2. POLE MOUNTED CABINET TO BE ORIENTED PER THE PLAN SHEETS.
  3. SEE SHEETS J-2 & L-2 FOR ADDITIONAL CABINET, CONDUITS AND GROUNDING DETAILS

TYPICAL TMS  
INSTALLATION DETAILS  
SIDE VIEW

NTS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

**FOR INFORMATIONAL PURPOSES ONLY**

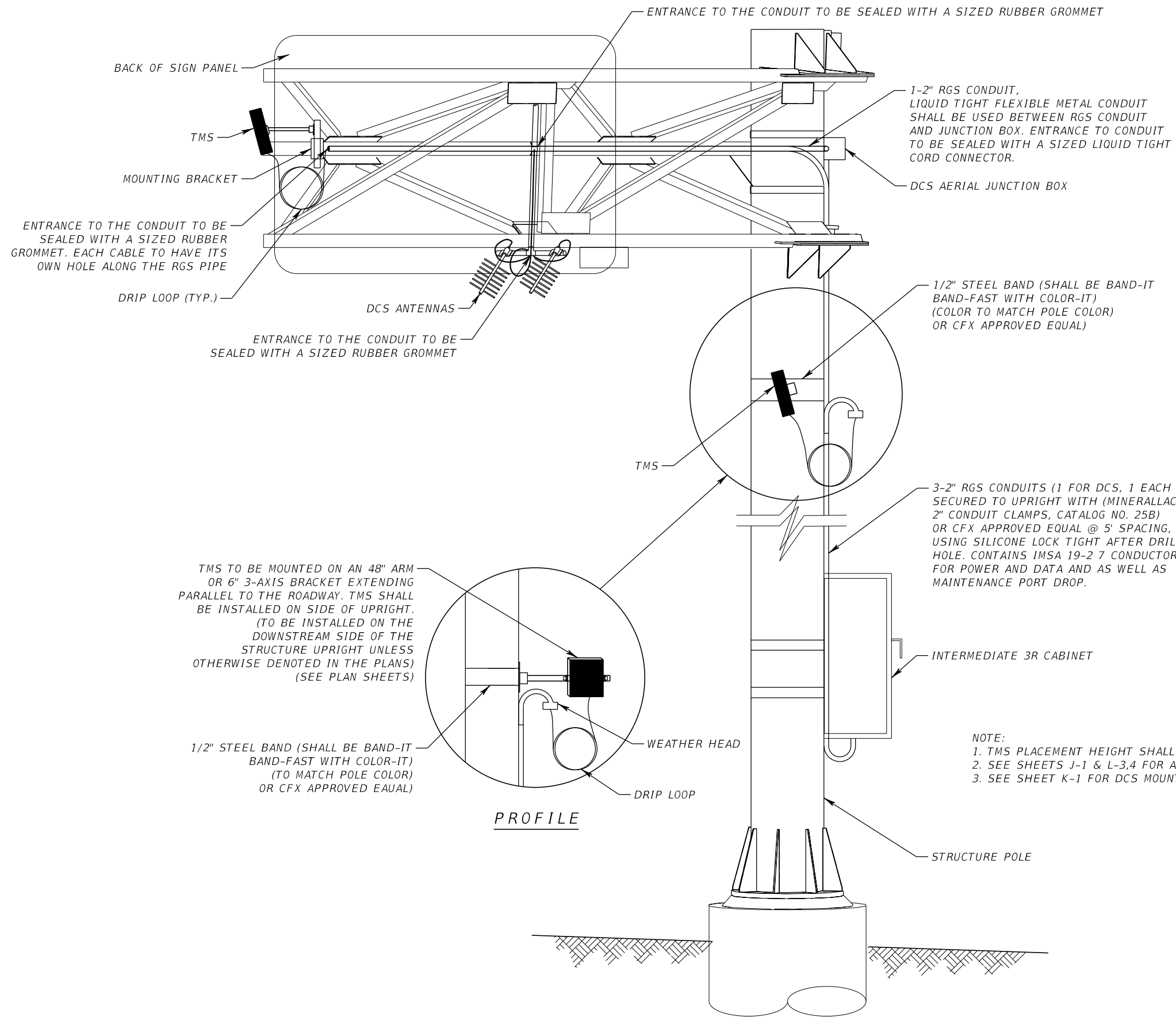
**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**CENTRAL FLORIDA EXPRESSWAY AUTHORITY**

**TRAFFIC MONITORING STATIONS  
INSTALLATION DETAILS**

SHEET NO.  
N-1

VERSION 6



TYPICAL SIGN STRUCTURES WITH TMS & DCS INSTALLATION DETAILS

NTS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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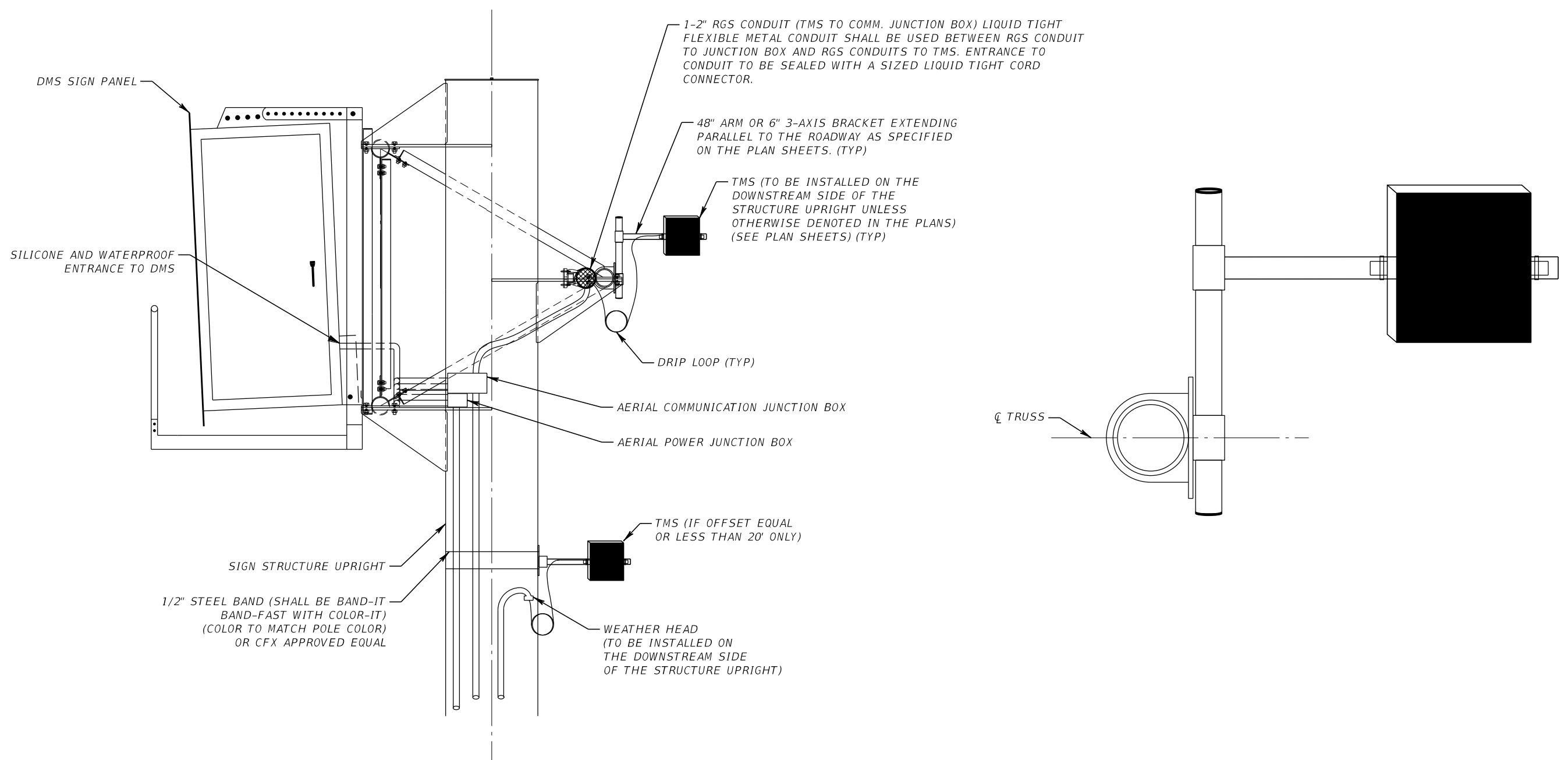
TRAFFIC MONITORING STATIONS, DCS AND SIGN CO-LOCATION DETAILS

SHEET NO.

N-2

VERSION 6





- NOTES:
1. SENSOR SHOWN MOUNTED TO BACK CORD.
  2. SEE SHEET M-2 FOR DMS WIRING DETAIL.

SIGN STRUCTURE MOUNTED TMS (PROFILE)

NTS

REVISIONS						FOR INFORMATIONAL PURPOSES ONLY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	TRAFFIC MONITORING STATIONS SIGN STRUCTURE MOUNTING DETAILS	SHEET NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION					N-3

VERSION 6