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TRANSMITTAL LETTER

PUBLICATION:
Publication 647

DATE:
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SUBJECT:

Civil and Structural Standard Drawings for Intelligent Transportation Systems
Series ITS – 01 to ITS - 90
February 2024 Edition
PUB 647

INFORMATION AND SPECIAL INSTRUCTIONS:

This edition replaces the previous version of Pub 647.

These revised ITS Standards should be adopted on application ITS projects as soon as possible without affecting any letting schedules and in conjunction with current Publication 408 Specifications. Regardless, revised standards under this release must be used on all projects let after June 1, 2024.

Additions, deletions, and revisions specific to each Standard and Sheet are as follows:

STANDARD	SHEET	DESCRIPTION OF CHANGES
ALL	ALL	TITLE BLOCK: • Removed “PENNSYLVANIA TURNPIKE COMMISSION” and added “BUREAU OF OPERATIONS”. • Removed “INTELLIGENT TRANSPORTATION SYSTEMS CIVIL AND STRUCTURAL STANDARD DRAWINGS” SIGNATURE BLOCK: • Revised “BUREAU DIRECTOR, BUREAU OF MAINTENANCE AND OPERATIONS” to “CHIEF, TSMO ARTERIALS AND PLANNING SECTION”. • Revised “CHIEF ENGINEER. PENNSYLVANIA TURNPIKE COMMISSION” to “CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION”. DETAILS: • Removed “NOT TO SCALE” on details. NOTES: • Revised DMS to CMS on all text • Revised steel conduit references to RMC
ITS-00	Title	• Removed PA Turnpike logo and sub-header from sheet.
ITS-00	Index	• Updated index format to match other PennDOT publications • Updated sheet numbering convention and added new sections • Removed PennDOT logo • Removed date and sheet sub-header
ITS-01	NEW: 1 of 1	• New sheet provided to show equipment symbols, abbreviations, and line styles.
ITS-10	NEW: 1 of 3	TITLE BLOCK: • Revised sheet title

	OLD: ITS-1201 1 of 23	GENERAL NOTES: • Revised notes 1 and 5 • Removed note 8 ENCLOSURE NOTES: • Revised note 1 • Added note 7 POLE MOUNTED ITS ENCLOSURE ORIENTATION: • Revised maintainer pad to partially wrap pole foundation STRUCTURE MOUNTED ITS ENCLOSURE (NEW): • Revised detail title • Added enclosure size to be specified at time of design • Removed condulet • Added galvanized rodent screen callout • Callout revisions
ITS-10	NEW: 2 of 3 OLD: ITS-1201 2 of 23	TITLE BLOCK: • Revised sheet title GENERAL NOTES: • Removed note 8 and 10 • Revised note 1 ENCLOSURE NOTES: • Revised note 1 • Added note 7 STRUCTURE MOUNTED ITS ENCLOSURE ORIENTATION: • Revised maintainer pad to partially wrap pole foundation STRUCTURE MOUNTED ITS ENCLOSURE (EXISTING): • Revised detail title • Added enclosure size to be specified at time of design • Added galvanized rodent screen callout • Callout revisions
ITS-10	NEW: 3 of 3 OLD: ITS-1201 3 of 23	GENERAL NOTES: • Removed notes 1, 9, and 10 • Added new note 9 FOUNDATION NOTES: • Revised note 1 ENCLOSURE NOTES: • Added note 1 • Revised note 10 • Revised note 11 GROUND MOUNTED ITS ENCLOSURE ORIENTATION: • Added enclosure to be sized by design • Revised maintainer pad size ITS ENCLOSURE FOUNDATION, IN EARTH IN NEAR-LEVEL GROUND • Revised detail title • Added dimensions • Callout revisions
ITS-11	NEW: 1 of 3 OLD:	TITLE BLOCK: • Revised sheet title

	ITS-1201 5 of 23	GENERAL NOTES: • Removed note 3 TYPICAL HUB ENCLOSURE LAYOUT: • Revised callouts TYPICAL HUB WIRING DIAGRAM: • Updated symbols • Standardized diagram
ITS-12	NEW: 3 of 3 OLD: ITS-1201 6 of 23	TITLE BLOCK: • Revised sheet title GENERAL NOTES: • Added note 7 TYPICAL CMS WIRING DIAGRAM: • Added detail
ITS-20	NEW: 1 of 4 OLD: ITS-1201 8 of 23	TITLE BLOCK: • Revised sheet title GENERAL NOTES: • Removed note 3 ROUND LID/UTILITY HOLE NOTES: • Added applicable notes COMPOSITE JUNCTION BOX NOTES: • Added applicable notes
ITS-20	NEW: 2 of 4 OLD: ITS-1201 9 of 23	TITLE BLOCK: • Revised sheet title DETAILS: • Concrete apron removed • Callout for added for drain hole • Updated to show detectable warning tape • Removed section B-B and D-D views • Standardized details
ITS-20	NEW: 3 of 4	New sheet added to show details for composite ANSI TIER 22 junction box for pull and splice boxes.
ITS-20	NEW: 4 of 4	New sheet added to show round lid/utility hole junction box details.
ITS-21	NEW: 1 of 4 OLD: ITS-1201 10 of 23	TITLE BLOCK: • Revised sheet title GENERAL NOTES: • Revised note 7 BRIDGE APPROACH END CONDUIT DETAIL • Updated to reflect RC-50M
ITS-21	NEW: 2 of 4 OLD:	TITLE BLOCK: • Revised sheet title

	ITS-1201 11 of 23	GENERAL NOTES: • Added note 7 • Revised note 12 CONDUIT INSTALLATION TYPICAL DETAIL: • Moved detail to next sheet METHOD OF OFFSETTING CONDUIT: • New detail • Updated all details to show detectable warning tape
ITS-21	NEW: 3 of 3	New sheet to show trench and boring details for varying applications.
ITS-22	NEW: 1 of 7 OLD: ITS-1201 12 of 23	TITLE BLOCK: • Revised sheet title
ITS-22	NEW: 2 of 7 OLD: ITS-1201 13 of 23	TITLE BLOCK: • Revised sheet title DETAILS: • Standardized details
ITS-22	NEW: 3 of 7 OLD: ITS-1201 14 of 23	TITLE BLOCK: • Revised sheet title DETAILS: • Standardized details • Revised callouts HANGER DETAIL: • Removed conduit ducts
ITS-22	NEW: 4 of 7 OLD: ITS-1201 15 of 23	TITLE BLOCK: • Revised sheet title GENERAL NOTES: • Added general note 1
ITS-22	NEW: 5 of 7 OLD: ITS-1201 16 of 23	TITLE BLOCK: • Revised sheet title DETAILS: • Standardized details HANGER DETAIL: • Removed conduit ducts
ITS-22	NEW: 6 of 7 OLD: ITS-1201 17 of 23	TITLE BLOCK: • Revised sheet title
ITS-22	NEW: 7 of 7	TITLE BLOCK: • Revised sheet title

	OLD: ITS-1201 18 of 23	GENERAL NOTES: • Added general note 1 and 2 DETAILS: • Removed scale bar • Revised to call out RMC conduit • Removed conduit ducts
ITS-23	NEW: 1 of 1	New sheet added to include structure mounted conduit in bridge barrier details
ITS-30	NEW: 1 of 1 OLD: ITS-1201 19 of 23	TITLE BLOCK: • Revised sheet title GENERAL NOTES: • Revised note 5 DETAILS: • Callout revisions
ITS-31	NEW: 1 of 6 OLD: ITS-1201 20 of 23	TITLE BLOCK: • Revised sheet title TYPICAL UTILITY PEDASTAL: • Revised to show electrical panel instead of service disconnect
ITS-31	NEW: 2 of 6 OLD: ITS-1201 21 of 23	GENERAL NOTES: • Revised note 1 • Added note 7 WOODEN UTILITY POLE ELEVATION: • Revised to show electrical panel • Revised callouts • Revised to include communications enclosure WOODEN UTILITY POLE ELEVATION: • Standardized details • Added communication utility enclosure
ITS-31	NEW: 3 of 6 OLD: ITS-1201 22 of 23	TITLE BLOCK: • Revised sheet title DETAILS: • Standardized details • Callout revisions
ITS-31	NEW: 4 of 6 OLD: ITS-1201 23 of 23	TITLE BLOCK: • Revised sheet title GENERAL NOTES: • Revised note 1 • Added note 7 ALL DETAILS: • Revised callouts • Revised to show electrical panel • Revised to include communications enclosure
ITS-31	NEW: 5 of 6	New sheet added to provide aerial fiber details.

ITS-31	NEW: 6 of 6	New sheet added to provide additional aerial fiber details
ITS-32	NEW: 1 of 1	New sheet provided to show typical splice details.
ITS-40	NEW: 1 of 5 OLD: ITS-1210 1 of 6	TITLE BLOCK: • Revised "CLOSED CIRCUIT TELEVISION CAMERA" to "CCTV CAMERA SUPPORT STRUCTURE". • Revised "GENERAL NOTES FOR CCTV CAMERA SUPPORT STRUCTURES" to "GENERAL NOTES". GENERAL NOTES: • Removed Note 1 and renumbered notes. • Revised Note 18 to be Note 11. • Revised Notes 13, 15, and 17 LOWERING DEVICE NOTES: • Note 3: Revised "ENGINEER" to "DEPARTMENT'S REPRESENTATIVE". • Added Note 5: FOR ADDITIONAL DETAILS AND NOTES, REFER TO ITS-41. LEGEND: • Revised "AASHTO 2001 SIGN SPEC" to "AASHTO LRFD SIGN". o Replaced "STANDARD" with "LRFD" o Remove "4th EDITION, 2001, INCLUDING INTERIMS THROUGH 2006". • Revised "AASHTO HIGHWAY BRIDGES" to "AASHTO LRFD BRIDGES". o Revised "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 17TH EDITION" to "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS". • DM-4: o Removed "MAY 2012 EDITION". • ACI: o Removed "METRIC" o Revised "(ACI 318M-99)" to "(ACI 318-11)" • AISC: o Added reference DESIGN CRITERIA FOR CCTV CAMERA SUPPORT STRUCTURES: • Revise Design Criteria to be in accordance with AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st Edition, 2015 with Current Interims; AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; PennDOT Design Manual – Part 4, December 2019 Edition. CCTV POLE ATTACHMENT DESIGN DATA: • Added notes to provide design information for items attached to the CCTV Pole. CONSTRUCTION GENERAL NOTES: • Updated and revised notes. NOTES TO DESIGNER: • Revise Header to "NOTED TO DESIGNER AND FABRICATOR". • Updated and revised notes. • Replaced Note 3 with new Notes 3 – 6.

		• Old Note 4 is now Note 7. • Added new Note 8 to indicate splices are permitted in CCTV Poles with heights greater than 50'. • Old Note 6 is now Note 7. • Old Note 7 is now Note 10. • Remove old Note 8. • Old Note 9 is now Note 11. • Old Note 10 is now Note 12. • Remove old Note 11 • Added Notes 13, 14 and 15. REFERENCE DRAWINGS: • RC-52M: Revised "RC-52M" to" RC-51M" and "TYPE 2" to "TYPE 31". • RC-58M: Removed "PLACEMENT AT MEDIAN PIERS" • Added ITS-10, 11, 12, 21, 30, & 41. • RC-80M: Revised "HIGHWAY LIGHTING FOUNDATIONS HIGH MAST LIGHTING POLE" to "HIGHWAY LIGHTING CONVENTIONAL LIGHTING" • RC-83M: Added	
ITS-40	NEW: 2 of 5 OLD: ITS-1210 2 of 7	TITLE BLOCK: • Revised "CLOSED CIRCUIT TELEVISION CAMERA" to "CCTV CAMERA SUPPORT STRUCTURE". CCTV POLE PLACEMENT – TYPE A: • Added Splice in CCTV Pole. • Revised "MAINTAINER PAD (SEE ITS-1210 SHEET 7)" to "MAINTAINER PAD (SEE ITS-11)" • Fixed "MAINTAINER PAD" to be in accordance with ITS-11. CCTV POLE PLACEMENT – TYPE B: • Added Splice in CCTV Pole. • Revised "MAINTAINER PAD (SEE ITS-1210 SHEET 7)" to "MAINTAINER PAD (SEE ITS-11)" • Fixed "MAINTAINER PAD" to be in accordance with ITS-11. SPLICE DETAIL: • Added splice detail from RC-83M. GENERAL NOTES: • Note 1: Revised "PUB 646, INTELLIGENT TRANSPORTATION SYSTEMS DESIGN GUIDE, CHAPTER 2" to "PENNDOT PUBLICATION 852, TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) GUIDEBOOK PART II: DESIGN, CHAPTER 3". • Note 3: Added "OR PEDESTAL". • Note 5: Added "PER BC-741M, TABLE A". • Note 7: Removed "ITS-1210" • Note 8: o Removed "ITS-1210". o Revised "SHEET 4" to "SHEETS 4 and 5" • Note 9: Revised "FOR DETAILS OF CCTV LOWERING SYSTEM ASSEMBLY, SEE ITS-1210 SHEET 4" to "FOR DETAILS OF CCTV LOWERING SYSTEM (INTERNAL), SEE ITS-41". • Note 10: Added Note. • Note 11 (Old Note 10): Revised "FOR DETAILS OF CCTV ENCLOSURE, SEE ITS-1201 SHEETS 1, 2, 3, OR TC-8802. FOR CCTV ENCLOSURE LAYOUT AND WIRING DIAGRAM SEE ITS-1201 SHEET 4." to "FOR DETAILS OF	

		CCTV ENCLOSURE, SEE ITS-10 OR TC-8802. FOR CCTV ENCLOSURE LAYOUT AND WIRING DIAGRAM SEE ITS-12." • Note 12 (Old Note 11): REFERENCE DRAWINGS: • Removed list of "REFERENCE DRAWINGS" since they are shown on Sheet 1.
ITS-40	NEW: 3 of 5 OLD: ITS-1210 3 of 7	TITLE BLOCK: • Revised "CLOSED CIRCUIT TELEVISION CAMERA" to "CCTV CAMERA SUPPORT STRUCTURE". CCTV CAMERA POLE ELEVATION: • Pole Height callouts: Added PENNDOT STANDARD HEIGHTS = 50'-0" OR 70'-0" • Added Callout for "CAMERA POLE ▲" • Added Callout for "ANCHOR BOLT ASSEMBLY ▲" • Added "▲" to call out for "BASE PLATE" • Revised "WIRE MESH" to "GALVANIZED RODENT SCREEN" • Revised "CAMERA LOWERING DEVICE (SEE ITS-1210 SHEET 6)" TO "CAMERA LOWERING DEVICE (SEE ITS-41)". • Callout for UPPER HAND HOLE: Added "(TO BE CENTERED IN LINE WITH LOWER HANDHOLE, IF REQUIRED)" • Revised "MAINTAINER PAD (SEE ITS-1210 SHEET 7)" to "MAINTAINER PAD (SEE ITS-11)" • Fixed "MAINTAINER PAD" to be in accordance with ITS-11. • * Note: Revised "* SEE ITS-1210 SHEETS 1 AND 2" to "* SEE SHEETS 1 AND 2". • Added "▲ TO BE DESIGNED BY FABRICATOR" CCTV CAMERA POLE PLAN: • Revised "MAINTAINER PAD (SEE ITS-1210 SHEET 7)" to "MAINTAINER PAD (SEE ITS-11)" • Fixed "MAINTAINER PAD" to be in accordance with ITS-11. GENERAL NOTES: • Note 1: Revised "1210.2(g)" to "1210.2(n)"
ITS-40	NEW: 4 of 5	New Sheet provided to show Drilled Caisson details, notes, design criteria and design tables for the 50' and 70' CCTV Poles.
ITS-40	NEW: 5 of 5 OLD: ITS-1210 4 of 6	TITLE BLOCK: • Revised "CLOSED CIRCUIT TELEVISION CAMERA" to "CCTV CAMERA SUPPORT STRUCTURE". • Revised Sheet Title from "POLE FOUNDATION" to "FOUNDATION DETAILS – 2". DRILLED CAISSON DETAILS: • Details removed from sheet and placed on new Sheet 4. SPREAD FOOTING PLAN: • Added "▲▲" to title. • Added "(MAINTAINER PAD NOT SHOWN)" below title. SPREAD FOOTING ELEVATION: • Added "▲▲" to title. • Revised "*" to "▲" to callout for "ANCHOR BOLT ASSEMBLY" • Revised "WIRE MESH" to "GALVANIZED RODENT SCREEN"

		• Revised “SLOPE STABILIZATION, AS REQUIRED” to “EMBANKMENT SLOPE”. • Added call out for stirrups POLE BASE PLATE DETAIL: • Revised “*” to “▲” to callout for “ANCHOR BOLT (TYP)”. • Added "▲” to call out for “BASE PLATE (CVN) (3” MIN)”. • Added “▲” to callout for “POLE”. ANCHOR BOLT: • Revise title from “ANCHOR BOLT” to “ANCHOR BOLT ASSEMBLY ▲”. • Moved location of screen to edge of base plate. • Added callout for “JAM NUT”. LEGEND: • Notes added to sheet to define “▲” and “▲▲”. GENERAL NOTES: • Note 1: Revised “1210.2(h)” to “1210.2(o)” • Note 3: Revised note to agree with the BC Standards but used 3/8” x 3/8” Mesh and 0.045” Diameter Wires. • Note 5: Revised “1210.2(g)” to “1105.02(s)” • Note 8: Note removed and placed on Sheet 4.
ITS-41	NEW: 1 of 1 OLD: ITS-1210 5 of 6	TITLE BLOCK: • Removed “CLOSED CIRCUIT TELEVISION CAMERA”. • Revise from “CAMERA LOWERING SYSTEM ASSEMBLY” to “CCTV CAMERA LOWERING SYSTEM (INTERNAL)”. TYPICAL CAMERA & LOWERING ARM DETAIL: • Added callout for “CL CCTV CAMERA POLE”. • Added callout for “CL CCTV CAMERA”. • Revised “DOME/CAMERA” to “CAMERA” • Revised linework for camera to be square. GENERAL NOTES: • Note 1: o Revised “LOWERING DEVICE TO BE SUPPLIED AS SPECIFIED IN PENNDOT PUB 408 SECTION 1210.2(d)…..” to “PROVIDE LOWERING DEVICE IN ACCORDANCE WITH PUBLICATION 408, SECTION 1210.2(e)…..”. • Added new Notes 2 & 3. • Old Note 2: o Revised to Note 4. o Revised “1210.2(d)3” to “1210.2(e)”. o Removed “SHALL” at the beginning of the second sentence. • Old Note 3: Revised to Note 5. • Old Note 4: Note removed.
ITS-42	NEW: 1 of 1	New sheet to show CCTV camera lowering system details.
ITS-43	NEW: 1 of 1 OLD: ITS-1210 6 of 6	TITLE BLOCK: • Removed “CLOSED CIRCUIT TELEVISION CAMERA”. GENERAL: • Revised linework for camera to be square. (5 places) Note under title “STRUCTURE MOUNTED CCTV CAMERA ASSEMBLY:

		• Revised “ITS 1201 SHEETS 1, 2, 3” to “ITS-10”.
ITS-44	NEW: 1 of 1	New sheet to show wood pole mounted CCTV camera assembly details.
ITS-45	NEW: 1 of 1	New sheet to show CMS structure mounted CCTV camera assembly details.
ITS-50	NEW: 1 of 1 OLD: ITS-1220 1 of 1	TITLE BLOCK: • Revised title DETAILS: • Standardized details
ITS-60, 61 & 62 (OLD: ITS-1230)	All SHEETS	GENERAL REVISIONS: • Revised “DYNAMIC MESSAGE SIGNS” to “CHANGEABLE MESSAGE SIGNS”. • Revised “DMS” to “CMS”
ITS-60	NEW 1 of 3 OLD: ITS-1230 1 of 8	TITLE BLOCK: • Removed “DYNAMIC MESSAGE SIGNS”. CHANGEABLE MESSAGE SIGN (CMS) ELEVATION • Added callouts for “LANE” and “SHOULDER”. • Added “GUIDE RAIL” and callout. • Added “CLEAR ZONE (SEE NOTES 4, 5 AND 7)” • Removed the callout “2’-0” (MIN) (SEE GENERAL NOTE 4)” from the “Edge of Shoulder” to the “Near Edge of CMS”. • Added callout for “2’-0” (MIN) (SEE GENERAL NOTES 6 AND 7)” between the rear face of guide rail post and the near edge of CMS. GENERAL NOTES: • Note 1: Revised “WORKMANSHIP” to “PERFORM WORK” • Note 3: Removed “OR THE PTC”. • Note 4: New Note • Note 5: New Note • Note 6: New Note (Revised old Note 4) • Note 7: New Note (Previously last sentence in old Note 4) • Revised Notes 5 – 12 to Notes 8 – 15: • Note 8 (Old Note 7):Removed “ITS-1210”. • Note 13 (Old Note 10): Revised “ITS-1230 SHEET 8” to “ITS-62”. • Note 14 (Old Note 11): Revised “ITS-1201 SHEET 3” to “ITS-10”. • Note 15 (Old Note 12): o Revised “PENNDOT PUBLICATION 646, INTELLIGENT TRANSPORTATION SYSTEMS DESIGN GUIDE, CHAPTER 2” to “PENNDOT PUBLICATION 852, TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) GUIDEBOOK PART II: DESIGN, CHAPTER 3”. o Removed “AND MAINTENANCE CONSIDERATIONS”. REFERENCE DRAWINGS: • Added ITS-10, ITS-62, BC-741M and TC-8702A,
ITS-60	NEW 2 of 3	TITLE BLOCK: • Removed “DYNAMIC MESSAGE SIGNS”.

	OLD: ITS-1230 2 of 8	CMS POST SELECTION NOTES: • Note 8: Removed “ITS-1230”. LEGEND: • Remove “P2 = W6x12” since it was shown twice.
ITS-60	NEW 3 of 3 OLD ITS-1230 3 of 8	TITLE BLOCK: • Removed “DYNAMIC MESSAGE SIGNS”. CMS POST SELECTION NOTES: • Note 8: Removed “ITS-1230”. LEGEND: • Remove “P2 = W6x12” since it was shown twice.
ITS-61	NEW 1 of 4 OLD ITS-1230 4 of 8	TITLE BLOCK: • Revised “DYNAMIC MESSAGE SIGNS” to “CANTILEVER CMS SUPPORT STRUCTURE”. • Revised “GENERAL NOTES FOR CANTILEVER STRUCTURES” to “GENERAL NOTES”. INFORMATIONAL NOTES: • Switch Notes 4 and 5. GENERAL NOTES: • Removed Note 1 and renumbered notes. • Revised Note 18 to be Note 11. • Revised Notes 12, 13 and 17. • Added Note 18. CONSTRUCTION GENERAL NOTES: • Updated and revised notes to match current BC-741M. NOTES TO DESIGNER: • Updated and revised notes. LEGEND: • AASHTO 2001 SIGN SPEC: o Remove “4th EDITION, 2001, INCLUDING INTERIMS THROUGH 2006”. • AASHTO HIGHWAY BRIDGES: o Removed “17TH EDITION”. • DM-4: o Removed “MAY 2012 EDITION”. • ACI: o Removed “METRIC” REFERENCE DRAWINGS: • Added ITS-62. • RC-52M: Revised “RC-52M” to “RC-51M” and “TYPE 2” to “TYPE 31”. • RC-58M: Removed “PLACEMENT AT MEDIAN PIERS”
ITS-61	NEW 2 of 4 OLD	TITLE BLOCK:

	ITS-1230 5 of 8	• Revised “DYNAMIC MESSAGE SIGNS” to “CANTILEVER CMS SUPPORT STRUCTURE”. • Revised “SAMPLE CONTRACT PLANS FOR CANTILEVER STRUCTURES” to “SAMPLE CONTRACT PLANS”. CANTILEVER CMS SUPPORT STRUCTURE – FRONT ELEVATION: • ENCLOSURE: Revised callout “(SEE ITS-1201, SHEET 1, SHEET 2, OR SHEET 3)” to “(SEE ITS-10)” • MAINTAINER PAD: Revise callout “SEE ITS-1201 SHEET 7” to “(SEE ITS-11)”. • Revised “EL.” To “ELEV” (3 places). CANTILEVER CMS SUPPORT STRUCTURE – SIDE ELEVATION: • Added callout to show Top of Baseplate Elevation. • Added leader line and callout for “COLUMN HEIGHT =” NOTES TO DESIGNER: • Note 1: o Added “SUPPORTING CMS”. o Revised “ITS-1230 SHEET 6 AND SHEET 7” to “SHEETS 3 AND 4”. • Note 4: o Added bullet points to include “VERTICAL BRACE SIZE” and “DIAGONAL BRACE SIZE” o Last Bullet: Revised note to agree with the BC Standards but used 3/8” x 3/8” Mesh and 0.045” Diameter Wires. • Note 8: Revised “ITS-1230 SHEET 4” to “SHEET 1”. • Note 9: Revised “ITS-1230 SHEET 6 AND SHEET 7” to “SHEETS 3 AND 4”. • Note 10: Revised “ITS-1230 SHEET 8” to “ITS-62”. • Note 12: o Revised “PENNDOT PUB 646, INTELLIGENT TRANSPORTATION SYSTEMS DESIGN GUIDE, CHAPTER 2” to “PENNDOT PUBLICATION 852, TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) GUIDEBOOK PART II: DESIGN, CHAPTER 3”. o Removed “AND MAINTENANCE CONSIDERATIONS”. TABLE OF ESTIMATED QUANTITIES: • Remove the symbol “▲” from next to “UNIT” and removed the note below the table.
ITS-61	ITS-61	TITLE BLOCK: • Revised “DYNAMIC MESSAGE SIGNS” to “CANTILEVER CMS SUPPORT STRUCTURE”. • Revised “CANTILEVER STRUCTURES TRUSS AND COLUMN DETAILS” to “TRUSS AND COLUMN DETAILS”. ELEVATION – TYPICAL CANTILEVER SIGN SUPPORT: • Revised “SEE DETAIL 1 (ITS-1230 SHEET 7)” to “SEE DETAIL 1 (SHEET 4)”. • Revised “SEE DETAIL 2 (ITS-1230 SHEET 7)” to “SEE DETAIL 2 (SHEET 4)”. • Add callout for “GALVANIZED RODENT SCREEN”. SECTION A-A: • Revised “(SEE ITS-1230 SHEET 7)” to “(SEE SHEET 4)”. (3 Places)

		SECTION B-B: • Revised “SEE DETAIL B (ITS-1230 SHEET 7)” to “ SEE DETAIL A (SEE SHEET 4)”.
ITS-61	NEW 4 of 4 OLD ITS-1230 7 of 8	TITLE BLOCK: • Revised “DYNAMIC MESSAGE SIGNS” to “CANTILEVER CMS SUPPORT STRUCTURE”. • Revised “CANTILEVER STRUCTURES TRUSS AND COLUMN DETAILS” to “TRUSS AND COLUMN DETAILS”. CHORD SPLICE ASSEMBLY WELD DETAIL: • Added dimensions “1/2” MIN, 1” MAX” for location of “BRACKET PLATE” adjacent to “SPLICE PLATE”. HORIZONTAL STUB STIFFENER PLATE: • Added callout for “R = O.D. POST / 2” DETAIL B: • Revised to “DETAIL A”. • Added weld symbol at top of backing plate and chord to agree with the BC Standards. DETAIL A NOTES: • Note 1: Added “BACKING PLATE MUST BE FABRICATED AS A CONTINUOUS RING”. • Note 2: Added note.
ITS-62	NEW 1 of 1 OLD ITS-1230 8 of 8	TITLE BLOCK: • Removed “DYNAMIC MESSAGE SIGNS”. • Revised “CONNECTION DETAILS” to “CMS CONNECTION DETAILS”. PANEL CONNECTION: • Revised “CENTER-MOUNT” TO “CANTILEVER”. PANEL CONNECTION: • Removed “C-C” section marks. • Revised “B-B” section marks to “D-D” • Revise “A325 BOLTS” to “ASTM F3125, GRADE A325 BOLT”. (2 places) • Revise the callout for the “5/8” DIA U-BOLT”. ALTERNATE PANEL CONNECTION DETAIL: • Added “C-C” section marks. • Revised “D-D” section marks to “B-B” • Revise the callout for the “5/8” DIA U-BOLT”. VIEW C-C: • Revise “A325 BOLT” to “ASTM F3125, GRADE A325 BOLT”. (2 places) NOTES TO DESIGNER: • Note 1: Removed “LARGER SIGN SUPPORTS MAY BE REQUIRED FOR CENTER-MOUNT STRUCTURE TO PROVIDE CLEARANCE BETWEEN HORIZONTAL Z-BRACKETS AN COLUMN”.
ITS-90	NEW:	TITLE BLOCK:

	1 of 1 OLD: ITS-1231 1 of 1	• Revised sheet title GENERAL NOTES: • Added note 10 DETAILS: • Standardized details & callout revisions

CANCEL AND DESTROY THE FOLLOWING: Publication 647 – MARCH 2013 EDITION NOTE: Publication 647 is only available electronically via the PennDOT website	ADDITIONAL COPIES ARE AVAILABLE FROM: ☒ PennDOT website - www.penndot.pa.gov *Click on Forms, Publications & Maps* APPROVED FOR ISSUANCE BY: Daniel Farley Daniel P. Farley, P.E., Director Bureau of Operations

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

CIVIL AND STRUCTURAL STANDARD DRAWINGS
FOR
INTELLIGENT TRANSPORTATION SYSTEMS

BUREAU OF OPERATIONS

FEBRUARY 2024 EDITION

pennsylvania
DEPARTMENT OF TRANSPORTATION
www.penndot.pa.gov

PUB 647 (2-24)

INDEX OF CIVIL AND STRUCTURAL STANDARDS FOR INTELLIGENT TRANSPORTATION SYSTEMS

STANDARD DRAWING NUMBER	DRAWING DATE	DESCRIPTION
ITS-01	FEB. 20, 2024	LEGEND
ENCLOSURES		
ITS-10 (3 Sheets)	FEB. 20, 2024	ENCLOSURES
ITS-11	FEB. 20, 2024	MAINTAINER PADS
ITS-12 (3 Sheets)	FEB. 20, 2024	EQUIPMENT LAYOUT AND WIRING DIAGRAM
CONDUIT AND JUNCTION BOXES		
ITS-20 (4 Sheets)	FEB. 20, 2024	JUNCTION BOXES
ITS-21 (3 Sheets)	FEB. 20, 2024	CONDUIT
ITS-22 (7 Sheets)	FEB. 20, 2024	STRUCTURE MOUNTED CONDUIT (NEW)
ITS-23	FEB. 20, 2024	STRUCTURE MOUNTED CONDUIT (BRIDGE BARRIER)
ELECTRIC AND COMMUNICATION		
ITS-30	FEB. 20, 2024	DEVICE GROUNDING
ITS-31 (6 Sheets)	FEB. 20, 2024	UTILITY SERVICE
ITS-32	FEB. 20, 2024	SPLICE AND TERMINATION
CLOSED CIRCUIT TELEVISION CAMERA		
ITS-40 (5 Sheets)	FEB. 20, 2024	CCTV CAMERA SUPPORT STRUCTURE
ITS-41	FEB. 20, 2024	CCTV CAMERA LOWERING SYSTEM (INTERNAL)
ITS-42	FEB. 20, 2024	CCTV CAMERA LOWERING SYSTEM (EXTERNAL)
ITS-43	FEB. 20, 2024	STRUCTURE MOUNTED CCTV CAMERA ASSEMBLY
ITS-44	FEB. 20, 2024	WOOD POLE MOUNTED CCTV CAMERA ASSEMBLY (TEMPORARY)
ITS-45	FEB. 20, 2024	CCTV MOUNTING DETAILS ON CMS SUPPORT STRUCTURE
HIGHWAY ADVISORY RADIO		
ITS-50	FEB. 20, 2024	ELECTRICAL DETAILS FOR FLASHING BEACONS
CHANGEABLE MESSAGE SIGN		
ITS-60 (3 Sheets)	FEB. 20, 2024	POST MOUNTED CMS, TYPE A
ITS-61 (4 Sheets)	FEB. 20, 2024	CANTILEVER CMS SUPPORT STRUCTURE
ITS-62	FEB. 20, 2024	CMS CONNECTION DETAILS
MISCELLANEOUS		
ITS-90	FEB. 20, 2024	CONCRETE PAD DETAILS

THESE STANDARD DETAILS AND NOTES ARE INTENDED TO BE USED AND/OR REFERENCED FOR THE DESIGN AND CONSTRUCTION OF INTELLIGENT TRANSPORTATION SYSTEMS WITHIN THE COMMONWEALTH OF PENNSYLVANIA.

THE STANDARD DETAILS ARE NOT INTENDED TO REPLACE STANDARD PRACTICE, THE LATEST NTCIP PROTOCOLS AND/OR ENGINEERING JUDGEMENT. REASONABLE MODIFICATION OF THE DETAILS INCLUDED IN THESE STANDARDS MAY BE MADE, WITH COMMONWEALTH APPROVAL, IF CONDITIONS WARRANT.

USE THESE STANDARD DETAILS AND PENNDOT PUB 852 - TSMO GUIDEBOOK, PART II: DESIGN AS A GUIDE IN THE PREPARATION OF INTELLIGENT TRANSPORTATION SYSTEM PLANS.

EQUIPMENT

EXISTING CCTV CAMERA ASSEMBLY	PROPOSED CCTV CAMERA ASSEMBLY
EXISTING UTILITY POLE	PROPOSED UTILITY POLE
EXISTING UTILITY POLE WITH LUMINAIRE	PROPOSED UTILITY POLE WITH LUMINAIRE
EXISTING DISCONNECT AND METER	PROPOSED DISCONNECT AND METER
EXISTING REPEATER ANTENNA POLE	PROPOSED REPEATER ANTENNA POLE
EXISTING CHANGEABLE MESSAGE SIGN	PROPOSED CHANGEABLE MESSAGE SIGN
EXISTING WIRELESS DEVICE	PROPOSED WIRELESS DEVICE
EXISTING ENCLOSURE	PROPOSED ENCLOSURE
EXISTING JUNCTION BOX (POWER)	PROPOSED JUNCTION BOX (POWER)
EXISTING JUNCTION BOX (COMMUNICATIONS)	PROPOSED JUNCTION BOX (COMMUNICATIONS)
EXISTING UTILITY PEDESTAL	PROPOSED UTILITY PEDESTAL
EXISTING LUMINAIRE	PROPOSED LUMINAIRE
EXISTING MAST ARM	PROPOSED MAST ARM
EXISTING POST MOUNTED SIGN	PROPOSED POST MOUNTED SIGN
EXISTING POST MOUNTED SIGN, TYPE A	PROPOSED POST MOUNTED SIGN, TYPE A
EXISTING RADIO COMMUNICATION ANTENNA	PROPOSED RADIO COMMUNICATION ANTENNA
EXISTING STEP-UP/STEP DOWN TRANSFORMER	PROPOSED STEP-UP/STEP DOWN TRANSFORMER
EXISTING STRUCTURE MOUNTED SIGN	PROPOSED STRUCTURE MOUNTED SIGN
EXISTING VEHICLE DETECTOR ZONE	PROPOSED VEHICLE DETECTOR ZONE
EXISTING VEHICLE RADAR DETECTOR	PROPOSED VEHICLE RADAR DETECTOR

OTHER

- CIRCUIT BREAKER
- EARTH GROUND
- FUSE
- SWITCH
- TERMINAL BLOCK

ABBREVIATIONS

ACMS	ARTERIAL CHANGEABLE MESSAGE SIGN
ATMS	ADVANCED TRAFFIC MANAGEMENT SYSTEM
AWG	AMERICAN WIRE GAUGE
CAT-#	CATEGORY - (# INDICATES CATEGORY NUMBER) CONDUCTOR
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CMS	CHANGEABLE MESSAGE SIGN
COMM	COMMUNICATIONS
DIA	DIAMETER
EHS	EXTRA HIGH STRENGTH
F	FUSE
FO	FIBER OPTIC
FRE	FIBERGLASS REINFORCED EPOXY
G	GROUND
GFI	GROUND FAULT INTERRUPT
HAR	HIGHWAY ADVISORY RADIO
HDPE	HIGH DENSITY POLYETHYLENE CONDUIT
HS	HIGH STRENGTH
LAN	LOCAL AREA NETWORK
L1/L2	LINE (HOT)
MDC	MULTI-DUCT CONDUIT
N	NEUTRAL
NTS	NOT TO SCALE
PCCTV	PORTABLE CLOSED CIRCUIT TELEVISION
PCMS	PORTABLE CHANGEABLE MESSAGE SIGN
PTZ	PAN/TILT/ZOOM
PVC	POLY VINYL CHLORIDE
PWR	POWER
REQ'D	REQUIRED
RG-6	COAX CABLE
RGS	RIGID GALVANIZED STEEL
RMC	RIGID METAL CONDUIT
ROW	RIGHT-OF-WAY
RTMC	REGIONAL TRAFFIC MANAGEMENT CENTER
S/A	SURGE ARRESTOR
## SMF	SINGLE MODE FIBER (## INDICATES NUMBER OF STRANDS)
SPD	SURGE PROTECTION DEVICE
STMC	STATEWIDE TRAFFIC MANAGEMENT CENTER
TB	TERMINAL BLOCK
TMC	TRAFFIC MANAGEMENT CENTER
TYP	TYPICAL
UPS	UNINTERRUPTED POWER SUPPLY
UVRF	UV RATED FIBERGLASS CONDUIT
VAC	VOLTS (ALTERNATING CURRENT)
VID	VIDEO

LINE STYLE

—E—	*EXISTING ELECTRIC AERIAL*
—ES—	*EXISTING ELECTRIC ON STRUCTURE*
—EU—	*EXISTING ELECTRIC UNDERGROUND*
-CAT#/A-	*EXISTING ETHERNET AERIAL*
-CAT#/S-	*EXISTING ETHERNET ON STRUCTURE*
-CAT#/U-	*EXISTING ETHERNET UNDERGROUND*
—FO—	*EXISTING FIBER OPTICS AERIAL*
—FOS—	*EXISTING FIBER OPTICS ON STRUCTURE*
—FOU—	*EXISTING FIBER OPTICS UNDERGROUND*
—C/#"—	*EXISTING CONDUIT/SIZE*
—E—	PROPOSED ELECTRIC AERIAL
—ES—	PROPOSED ELECTRIC ON STRUCTURE
—EU—	PROPOSED ELECTRIC UNDERGROUND
-CAT#/A-	PROPOSED ETHERNET AERIAL
-CAT#/S-	PROPOSED ETHERNET ON STRUCTURE
-CAT#/U-	PROPOSED ETHERNET UNDERGROUND
—FO—	PROPOSED FIBER OPTICS AERIAL
—FOS—	PROPOSED FIBER OPTICS ON STRUCTURE
—FOU—	PROPOSED FIBER OPTICS UNDERGROUND
—C/#"—	PROPOSED CONDUIT/SIZE
~~	PROPOSED ELECTRIC (PROVIDED BY OTHERS)
—COMM—	PROPOSED COMMUNICATIONS (PROVIDED BY OTHERS)

GENERAL NOTE:

1. REFER TO DESIGN MANUAL, PART 3: PLANS PRESENTATION FOR CADD SYSTEM PROCEDURES AND CONFIGURATION, ENGINEERING GRAPHIC STANDARDS, AND STANDARD DRAFTING ABBREVIATIONS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

LEGEND

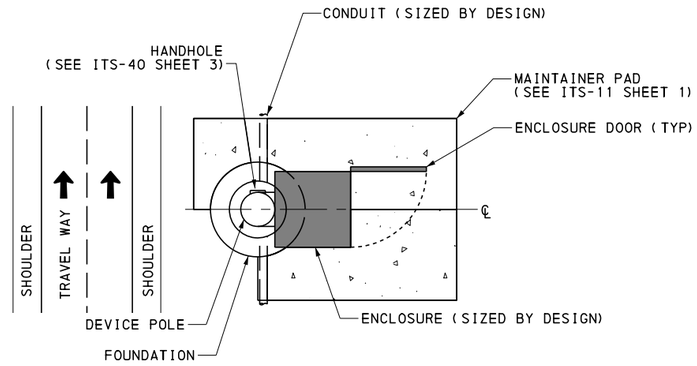
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-01

GENERAL NOTES:

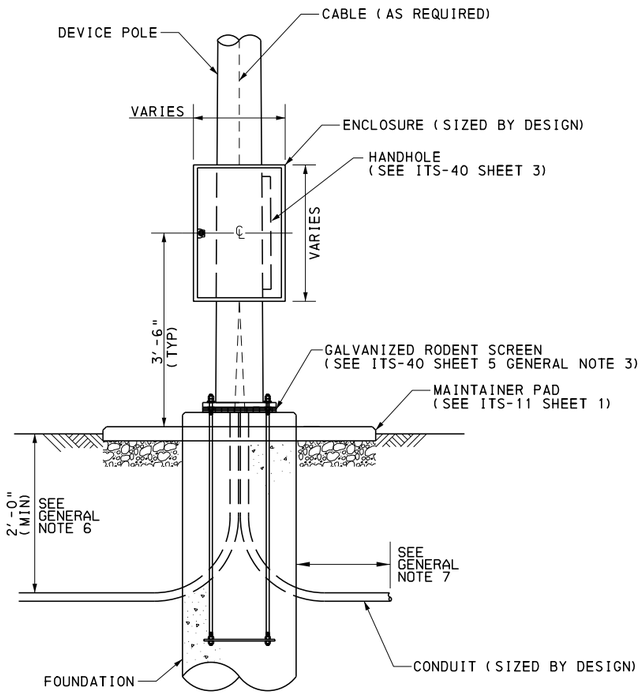
1. MOUNT ENCLOSURE SO THAT MAINTENANCE PERSONNEL FACE THE TRAVEL WAY WHILE MAINTAINING EQUIPMENT. PROVIDE MAINTAINER PAD IN FRONT OF ENCLOSURE. DO NOT PLACE DIRECTLY BENEATH CAMERA.
2. SIZES AND TYPES OF CONDUIT FOR NETWORK COMMUNICATIONS BETWEEN THE COMMUNICATIONS JUNCTION BOX AND THE ENCLOSURE SHALL BE STATED IN THE CONTRACT DOCUMENTS.
3. ALL NETWORK COMMUNICATIONS CONDUITS AND DUCTS SHALL BE SEALED WITH WATERPROOF DUCT PLUGS AND SEALS.
4. LOCATE JUNCTION BOXES FOR POWER CIRCUIT AND NETWORK COMMUNICATIONS WITHIN 5'-0" OF ENCLOSURE, OR AS DIRECTED BY THE REPRESENTATIVE.
5. ENSURE THAT ENCLOSURE AND EQUIPMENT IS BONDED TO DEVICE GROUNDING SYSTEM. SEE ITS-30 SHEET 1 FOR DETAILS.
6. TRANSITION CONDUIT FROM 2'-0" (MIN) DEPTH AT THE FOUNDATION TO 3'-0" (MIN) DEPTH BASED ON THE CABLE BENDING RADIUS FOR ALL CONDUIT RUNS.
7. STUB ALL CONDUITS OUT A MINIMUM OF 1'-0" BEYOND FOUNDATION, AND CAP ENDS WATERTIGHT.
8. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.

ENCLOSURE NOTES:

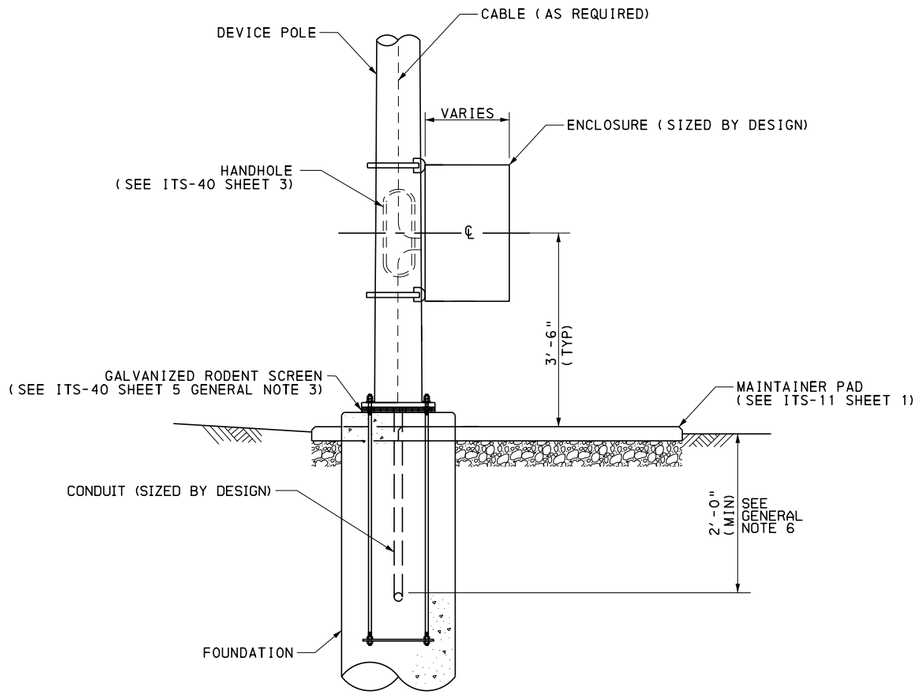
1. PROVIDE ENCLOSURE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.2 (b) AND THE CONTRACT DOCUMENTS. ENCLOSURE SIZE TO BE PROVIDED IN THE CONTRACT DOCUMENTS.
2. FOR ENCLOSURE ATTACHMENT DETAILS SEE BC-741M. STAINLESS STEEL STRAPS ARE ALSO APPROVED FOR ENCLOSURE ATTACHMENT.
3. ALTERNATE ENCLOSURE ATTACHMENT AND POLE PENETRATIONS MAY BE REQUIRED TO MEET CABLE BENDING RADIUS AND PROJECT SPECIFIC REQUIREMENTS. PROVIDE DETAILS ON THE CONTRACT DOCUMENTS IF REQUIRED BY DESIGN.
4. CONTRACTOR TO SUBMIT PROPOSED ENCLOSURE WIRING SCHEMATIC FOR APPROVAL.
5. NO PORTION OF ANY EQUIPMENT, EXCEPT FAN, IS TO BE INSTALLED BETWEEN THE TOP OF DOOR OPENING AND TOP OF ENCLOSURE OR BOTTOM OF DOOR OPENING AND BOTTOM OF ENCLOSURE.
6. PROVIDE DUCT SEALANT AT ALL CONDUIT ENTRIES INTO THE ENCLOSURE TO PREVENT SERPENT/RODENT INTRUSION.
7. ENCLOSURE TO BE CENTERED AT 3'-6" HEIGHT FROM MAINTAINER PAD. IF NECESSARY, ADJUST MOUNTING HEIGHT SO THE TOP OF THE ENCLOSURE IS NO HIGHER THAN 7'-0" ABOVE THE MAINTAINER PAD.



POLE MOUNTED ITS ENCLOSURE ORIENTATION
PLAN VIEW



FRONT ELEVATION



SIDE ELEVATION

STRUCTURE MOUNTED ENCLOSURE (NEW)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

ENCLOSURES
STRUCTURE MOUNTED ENCLOSURES (NEW)

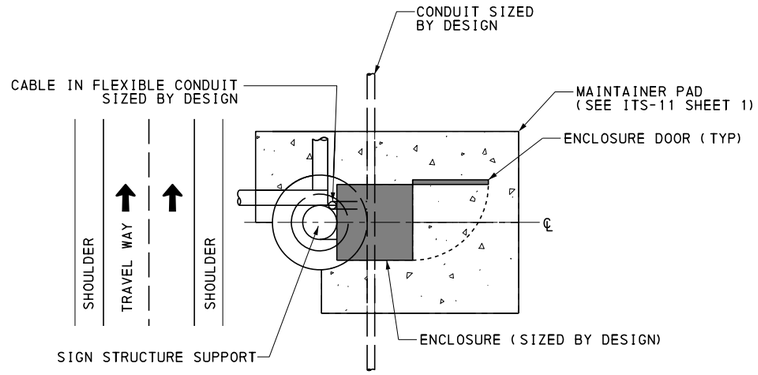
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 3
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-10

GENERAL NOTES:

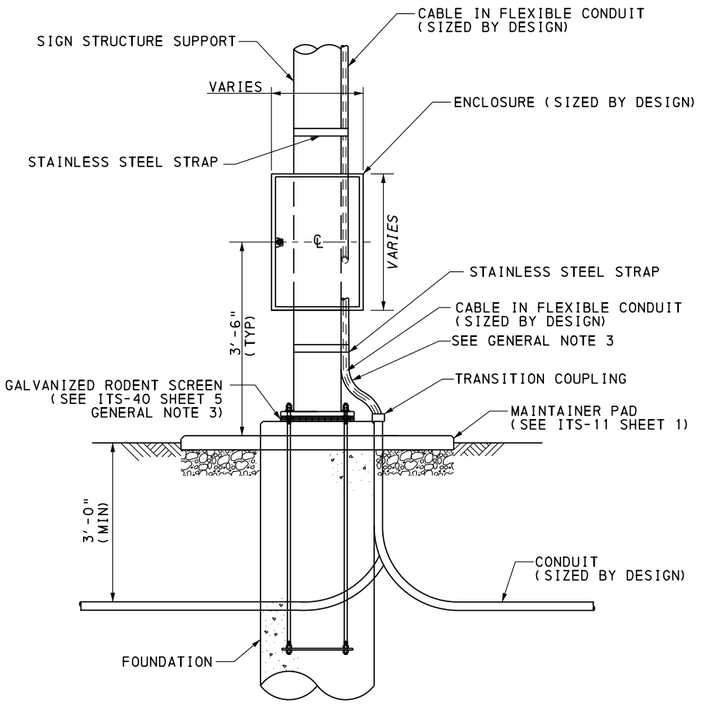
1. MOUNT ENCLOSURE SO THAT MAINTENANCE PERSONNEL FACE THE TRAVEL WAY WHILE MAINTAINING EQUIPMENT. PROVIDE MAINTAINER PAD IN FRONT OF ENCLOSURE. DO NOT PLACE DIRECTLY BENEATH THE CAMERA.
2. PREFERENCE IS TO INSTALL CABLES WITHIN HOLLOW STRUCTURES WHENEVER POSSIBLE. CONFIRM WITH THE REPRESENTATIVE PRIOR TO COMPLETING DESIGN.
3. CONDUIT SHALL BE INSTALLED TIGHT TO STRUCTURE BETWEEN FINISHED GRADE AND THE ENCLOSURE.
4. SIZES AND TYPES OF CONDUIT FOR NETWORK COMMUNICATIONS BETWEEN THE COMMUNICATIONS JUNCTION BOX AND THE ENCLOSURE SHALL BE STATED IN THE CONTRACT DOCUMENTS.
5. ALL NETWORK COMMUNICATIONS CONDUITS AND DUCTS SHALL BE SEALED WITH WATERPROOF DUCT PLUGS AND SEALS.
6. LOCATE JUNCTION BOXES FOR POWER CIRCUIT AND NETWORK COMMUNICATIONS WITHIN 5'-0" OF ENCLOSURE, OR AS DIRECTED BY THE REPRESENTATIVE.
7. ENSURE THAT ENCLOSURE AND EQUIPMENT IS BONDED TO THE SIGN STRUCTURE GROUNDING SYSTEM. SEE ITS-30 SHEET 1 FOR DETAILS.
8. TRANSITION BETWEEN FLEXIBLE CONDUIT AND PVC CONDUIT USING A COUPLING WITHIN 6" OF THE FINISHED GRADE.
9. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.

ENCLOSURE NOTES:

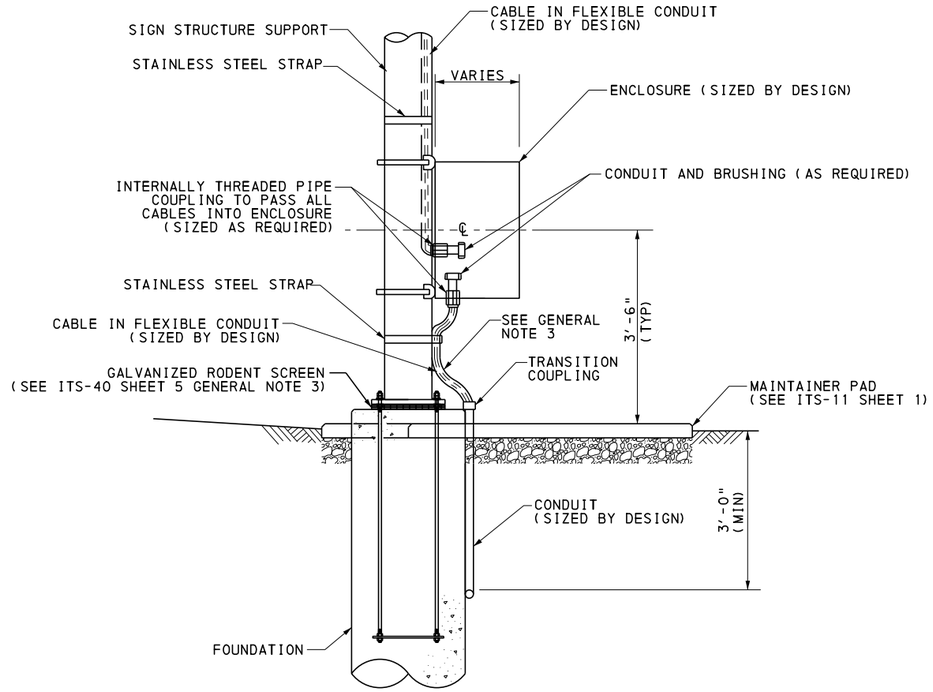
1. PROVIDE ENCLOSURE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.2 (b) AND THE CONTRACT DOCUMENTS. ENCLOSURE SIZE TO BE PROVIDED IN THE CONTRACT DOCUMENTS.
2. FOR ENCLOSURE ATTACHMENT DETAILS SEE BC-741M. STAINLESS STEEL STRAPS ARE ALSO APPROVED FOR ENCLOSURE ATTACHMENT.
3. ALTERNATE ENCLOSURE ATTACHMENT AND POLE PENETRATIONS MAY BE REQUIRED TO MEET CABLE BENDING RADIUS AND PROJECT SPECIFIC REQUIREMENTS. PROVIDE DETAILS ON THE CONTRACT DOCUMENTS IF REQUIRED BY DESIGN.
4. CONTRACTOR TO SUBMIT PROPOSED ENCLOSURE WIRING SCHEMATIC FOR APPROVAL.
5. NO PORTION OF ANY EQUIPMENT, EXCEPT FAN, IS TO BE INSTALLED BETWEEN THE TOP OF DOOR OPENING AND TOP OF ENCLOSURE OR BOTTOM OF DOOR OPENING AND BOTTOM OF ENCLOSURE.
6. PROVIDE DUCT SEALANT AT ALL CONDUIT ENTRIES INTO THE ENCLOSURE TO PREVENT SERPENT/RODENT INTRUSION.
7. ENCLOSURE TO BE CENTERED AT 3'-6" HEIGHT FROM MAINTAINER PAD. IF NECESSARY, ADJUST MOUNTING HEIGHT SO THE TOP OF THE ENCLOSURE IS NO HIGHER THAN 7'-0" ABOVE THE MAINTAINER PAD.



STRUCTURE MOUNTED ITS ENCLOSURE ORIENTATION
PLAN VIEW



FRONT ELEVATION



SIDE ELEVATION

STRUCTURE MOUNTED ENCLOSURE (EXISTING)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

ENCLOSURES
STRUCTURE MOUNTED ENCLOSURES (EXISTING)

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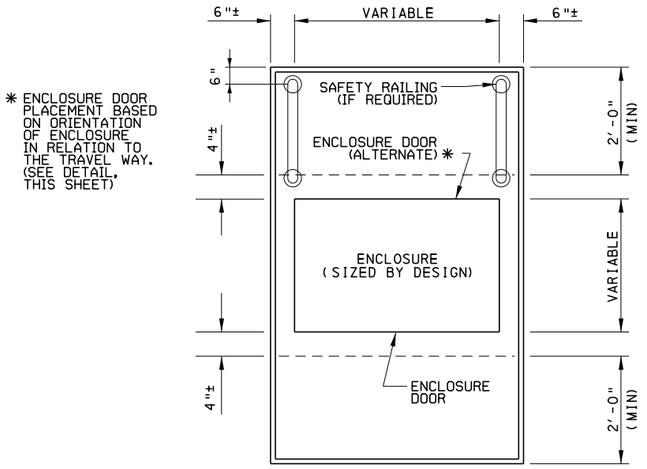
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-10



PLAN VIEW

GENERAL NOTES:

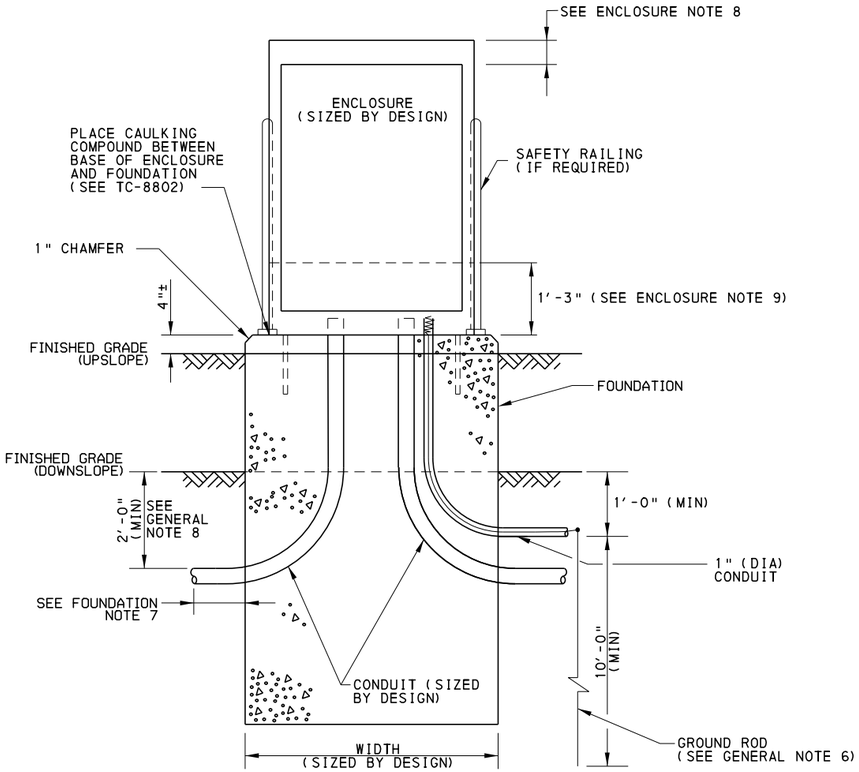
1. CONSTRUCT FOUNDATION AND MOUNT ENCLOSURE SO THAT MAINTENANCE PERSONNEL FACE THE TRAVEL WAY WHILE MAINTAINING EQUIPMENT.
2. SIZES AND TYPES OF CONDUIT FOR NETWORK COMMUNICATIONS BETWEEN THE COMMUNICATIONS JUNCTION BOX AND THE ENCLOSURE SHALL BE STATED ON THE CONTRACT DOCUMENTS.
3. ALL NETWORK COMMUNICATIONS CONDUITS AND DUCTS SHALL BE SEALED WITH WATERPROOF DUCT PLUGS AND SEALS.
4. MINIMUM BEND RADIUS FOR COMMUNICATIONS CONDUITS SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURERS REQUIREMENTS.
5. LOCATE JUNCTION BOXES FOR POWER CIRCUIT AND NETWORK COMMUNICATIONS WITHIN 5'-0" OF ENCLOSURE, OR AS DIRECTED BY THE REPRESENTATIVE.
6. PROVIDE GROUNDING SYSTEM PER PENNDOT PUB 408 SECTION 1201.2 (b) 7. FOR INSTALLATION DETAILS, SEE TC-8804.
7. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.
8. TRANSITION CONDUIT FROM 2'-0" (MIN) DEPTH AT THE FOUNDATION TO 3'-0" (MIN) DEPTH BASED ON THE CABLE BENDING RADIUS FOR ALL CONDUIT RUNS.
9. PROVIDE A CRASHWORTH BARRIER IN ACCORDANCE WITH PENNDOT PUB 13M (DM-2), CHAPTER 12 GUIDERAIL AND/OR CONCRETE BARRIER SHALL MEET APPLICABLE PENNDOT WARRANTS FOR INSTALLATION.

FOUNDATION NOTES:

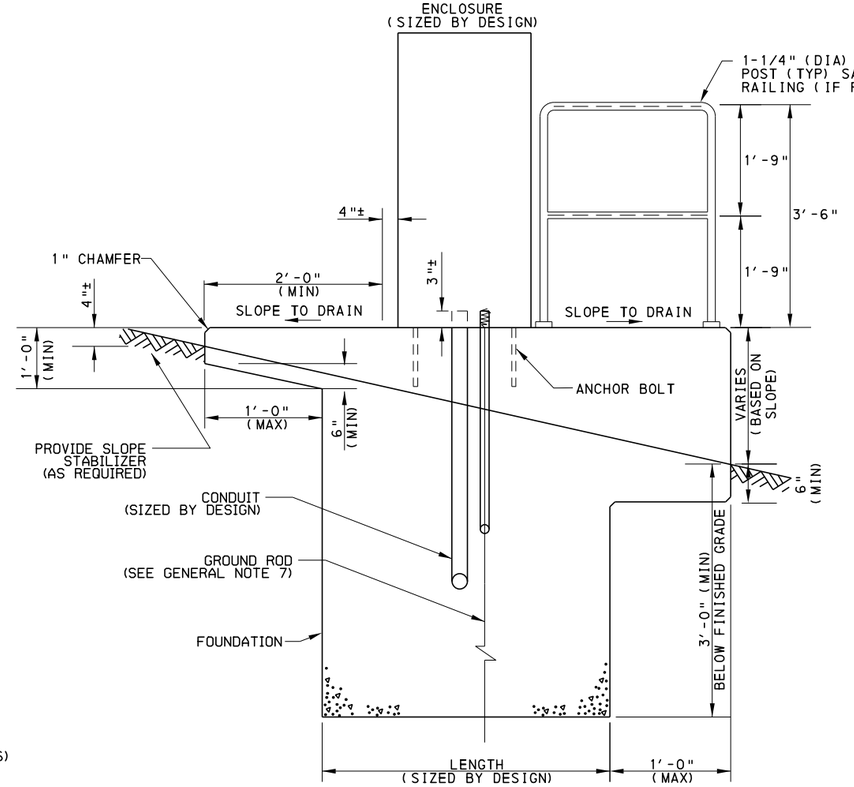
1. CONSTRUCT ENCLOSURE FOUNDATION IN ACCORDANCE WITH THESE NOTES AND TC-8802.
2. PERMANENTLY MARK EACH FOUNDATION TO INDICATE ALL SIDES FROM WHICH CONDUITS PASS. MAKE THIS MARK WITH A TROWEL WHEN FINISHING THE CONCRETE. MAKE MARK 1-¼" DEEP AND 4" TO 6" LONG. PLACE AN ADDITIONAL 2" LONG MARK MADE PERPENDICULAR TO AND CENTERED ON THIS MARKING, AT LOCATIONS OF EMPTY CONDUIT.
3. PROVIDE TWO 1" DIA. SCREENED WEEP HOLES IN THE FOUNDATION AND LOCATE THEM 2" INSIDE THE BACK OR SIDE EDGES OF THE ENCLOSURE. SLOPE WEEP HOLES TO ALLOW OUTLETS TO BE 3" BELOW TOP OF FOUNDATION. SEE TC-8802.
4. AT A MINIMUM PROVIDE REINFORCEMENT FOR TEMPERATURE, SHRINKAGE, SIZE, AND SPACE. NOT SHOWN FOR CLARITY.
5. PROVIDE GRADE 60 REINFORCEMENT STEEL BARS THAT MEET THE REQUIREMENTS OF ASTM A615 FOR CONCRETE REINFORCEMENT. DO NOT WELD REINFORCING STEEL BARS.
6. PROVIDE 3" CONCRETE COVER ON REINFORCEMENT BARS.
7. STUB ALL CONDUITS OUT A MINIMUM OF 1'-0" BEYOND FOUNDATION, AND CAP ENDS WATERTIGHT.
8. ALL CONDUIT, SWEEPS, BENDS, FITTINGS, ETC. ARE INCIDENTAL TO FOUNDATION.

ENCLOSURE NOTES:

1. PROVIDE ENCLOSURE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.2 (b) AND THE CONTRACT DOCUMENTS. ENCLOSURE SIZE TO BE PROVIDED IN THE CONTRACT DOCUMENTS.
2. FURNISH ANCHOR BOLTS AND BOLT CIRCLE TEMPLATE WITH ENCLOSURE. CENTER ENCLOSURE ON FOUNDATION.
3. ANCHOR BOLT, NUT, AND WASHER SHALL BE GALVANIZED.
4. ANCHOR BOLTS SHALL EXTEND ¼" TO ¾" ABOVE THE TOP NUT AFTER INSTALLATION OF NUT, WASHER AND ENCLOSURE.
5. PLACE CAULKING COMPOUND BETWEEN BASE OF ENCLOSURE AND FOUNDATION.
6. INSTALL GROUND BUSHINGS ON EACH END OF METAL CONDUITS. SEAL ALL CONDUITS WITH DUCT SEAL.
7. PROVIDE FLEXIBLE NON-METAL CONDUIT FROM TOP OF ELECTRIC SERVICE CONDUIT IN FOUNDATION TO BREAKER PANEL.
8. NO PORTION OF ANY EQUIPMENT, EXCEPT FAN, IS TO BE INSTALLED BETWEEN THE TOP OF DOOR OPENING AND TOP OF ENCLOSURE.
9. MINIMUM CLEARANCE BETWEEN BOTTOM OF ENCLOSURE AND TERMINALS, EQUIPMENT, OR DEVICES.
10. INSTALL GALVANIZED STEEL SCREEN TO BLOCK SMALL ANIMALS FROM ENTERING ENCLOSURE.
11. CONTRACTOR TO SUBMIT PROPOSED ENCLOSURE WIRING SCHEMATIC FOR APPROVAL.
12. FINAL GROUND MOUNTED ENCLOSURE LOCATION TO BE RECOMMENDED BY CMS MANUFACTURER DURING CONSTRUCTION.



FRONT ELEVATION



SIDE ELEVATION

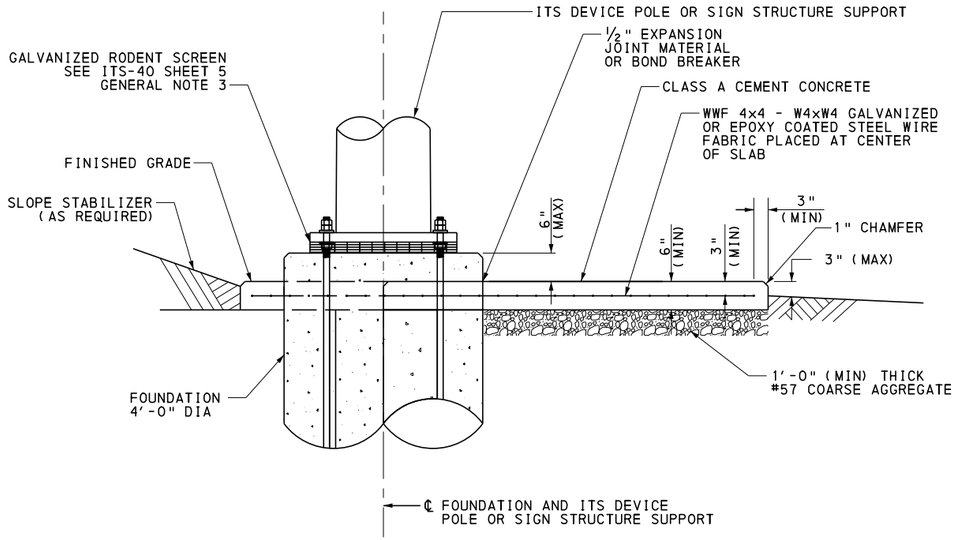
ITS ENCLOSURE FOUNDATION, IN EARTH SLOPE GREATER THAN OR EQUAL TO 2:1

GROUND MOUNTED ITS ENCLOSURE ORIENTATION PLAN VIEW

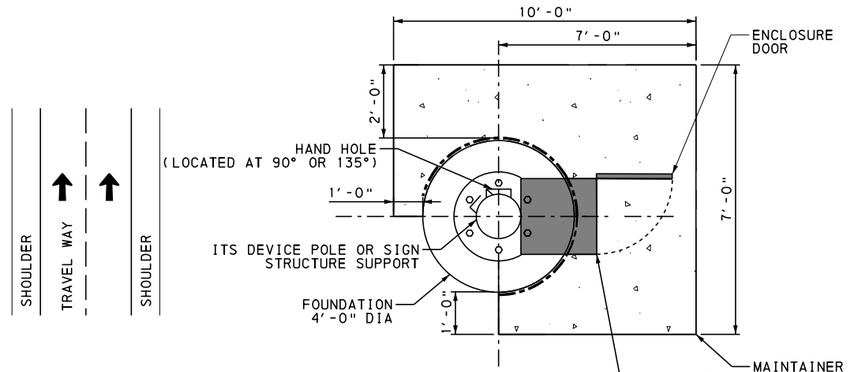
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

ENCLOSURES
GROUND MOUNTED ENCLOSURES

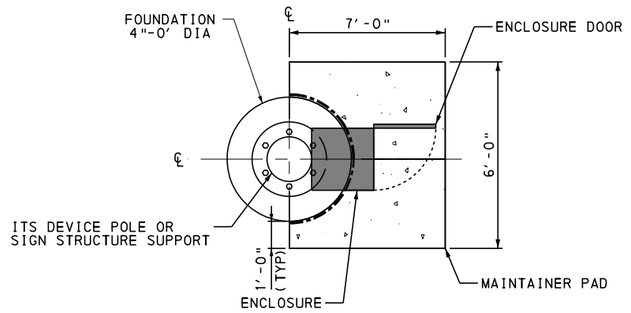
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 3 OF 3
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-10



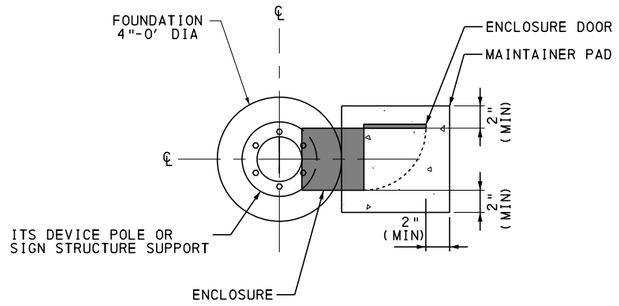
MAINTAINER PAD TYPICAL SECTION



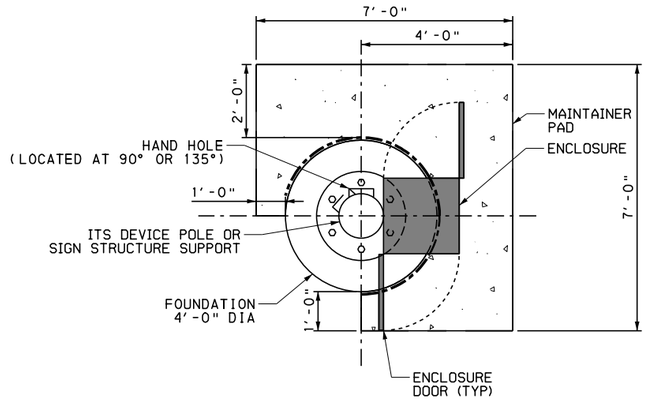
MAINTAINER PAD PLAN VIEW



ALTERNATE MAINTAINER PAD OPTION #1 PLAN VIEW FRONT FACING DOOR(S) NO HANDHOLE OR LOWERING DEVICE



ALTERNATE MAINTAINER PAD OPTION #3 PLAN VIEW- FRONT FACING DOOR NO HANDHOLE OR LOWERING DEVICE



ALTERNATE MAINTAINER PAD OPTION #2 PLAN VIEW- FRONT AND REAR FACING DOORS WITH HANDHOLE OR LOWERING DEVICE

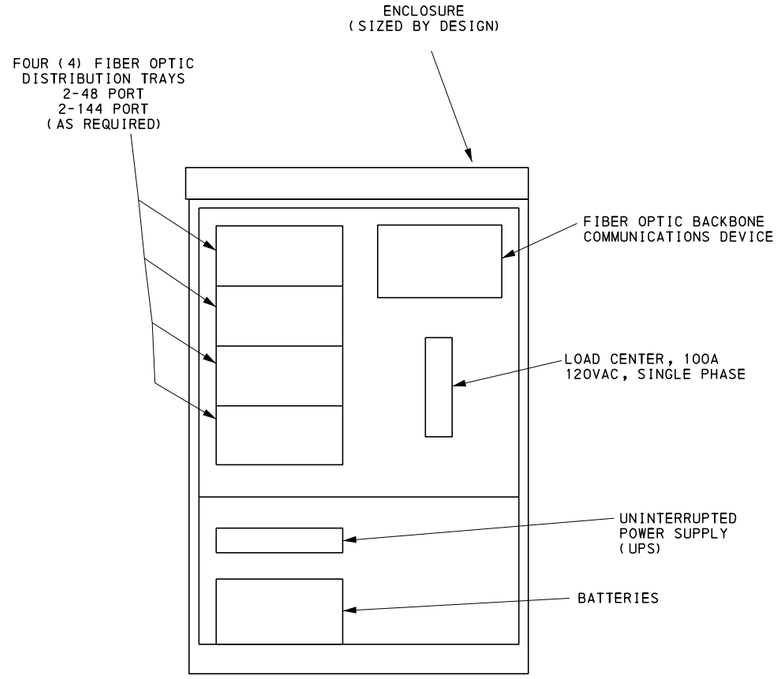
GENERAL NOTES:

1. PROVIDE MAINTAINER PAD FOR POLE/STRUCTURE MOUNTED ENCLOSURE AS SPECIFIED IN PENNDOT PUB 408 SECTION 1201.2(b)9.
2. THE MAINTAINER PAD DIMENSIONS ARE BASED ON A ENCLOSURE WITH THE MAXIMUM ASSUMED PLAN DIMENSIONS OF 1'-9" WIDE BY 1'-4" DEEP AND 4'-0" DIAMETER FOUNDATION. MAINTAINER PAD DIMENSIONS MAY BE MODIFIED BASED ON PROJECT AND SIZE SPECIFIC REQUIREMENTS.
3. MAINTAINER PAD SHOWN IS FOR LEVEL IN EARTH APPLICATIONS. SLOPED AREAS REQUIRE SPECIAL CONSIDERATIONS, INCLUDING RETAINING STRUCTURES, EMBANKMENT, AND HANDRAILS. DESIGNER SHALL CONSIDER THE NEED FOR A MAINTAINER PAD AT THESE LOCATIONS. DESIGNER SHALL ORIENT LOWER HAND HOLE AND ENCLOSURE AS REQUIRED FOR THESE LOCATIONS.
4. IF INDICATED ON THE CONTRACT DOCUMENTS, PROVIDE A 3'-0" WIDE CRUSHED GRAVEL WALKWAY FROM THE SHOULDER OR MAINTENANCE PULL-OFF AREA TO THE MAINTAINER PAD.
5. CLEAR AND GRUB VEGETATION, AS NEEDED WITHIN RIGHT-OF-WAY, TO ENSURE PLANT GROWTH DOES NOT INFRINGE ONTO MAINTAINER PAD.
6. SLOPE MAINTAINER PAD 2% IN THE DIRECTION OF EXISTING DRAINAGE.
7. CONDUIT AND GROUNDING SYSTEM NOT SHOWN FOR CLARITY.
8. MAINTAINER PAD TO BE LARGE ENOUGH TO ENSURE ACCESS TO ALL ENCLOSURE DOOR STYLES, SERVICE ENTRANCES, AND HANDHOLES. PAD SIZE NOT TO EXCEED 75 SQUARE FT CONFIRM USE WITH THE REPRESENTATIVE PRIOR TO CONFIRMING DESIGN.

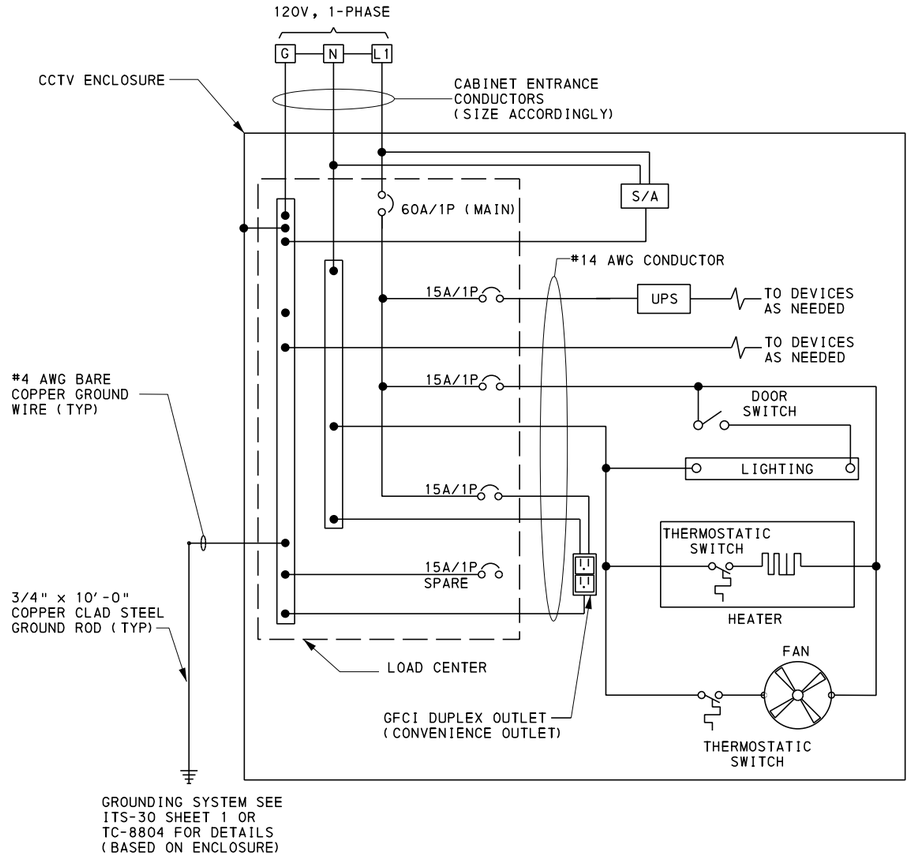
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

MAINTAINER PADS

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-11



TYPICAL HUB ENCLOSURE LAYOUT



TYPICAL HUB WIRING DIAGRAM

GENERAL NOTES:

1. PROVIDE A HUB ENCLOSURE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.2 (b). INSTALL ENCLOSURE AS DETAILED IN TC-8802 OR ITS-10 SHEET 3 AND THE CONTRACT DOCUMENTS.
2. THE ENCLOSURE LAYOUT SHOWN IS FOR DIAGRAMMATIC PURPOSES ONLY AND DEPICT A TYPICAL ENCLOSURE LAYOUT. CONTRACTOR TO SUBMIT PROPOSED ENCLOSURE LAYOUT FOR APPROVAL. SIZE OF PROPOSED ENCLOSURE TO BE SPECIFIED AT THE TIME OF THE DESIGN.
3. ALL ELECTRIC OUTLETS INTENDED FOR CRITICAL SERVICE (I.E. COMMUNICATIONS, ENCODER, ETC.) SHALL NOT BE GFCI DUPLEX OUTLETS.
4. CONTRACTOR TO SUBMIT PROPOSED ENCLOSURE WIRING SCHEMATIC FOR APPROVAL.
5. PROVIDE A MINIMUM OF 60 AMP SERVICE AT THE HUB ENCLOSURE.
6. ENCLOSURE LOCK SHALL BE COMPATIBLE WITH THE REPRESENTATIVES CURRENT KEYING SYSTEM.
7. HUB ENCLOSURE SHALL HAVE A FILTERED AIR VENTILATION SYSTEM.
8. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.

COMMONWEALTH OF PENNSYLVANIA
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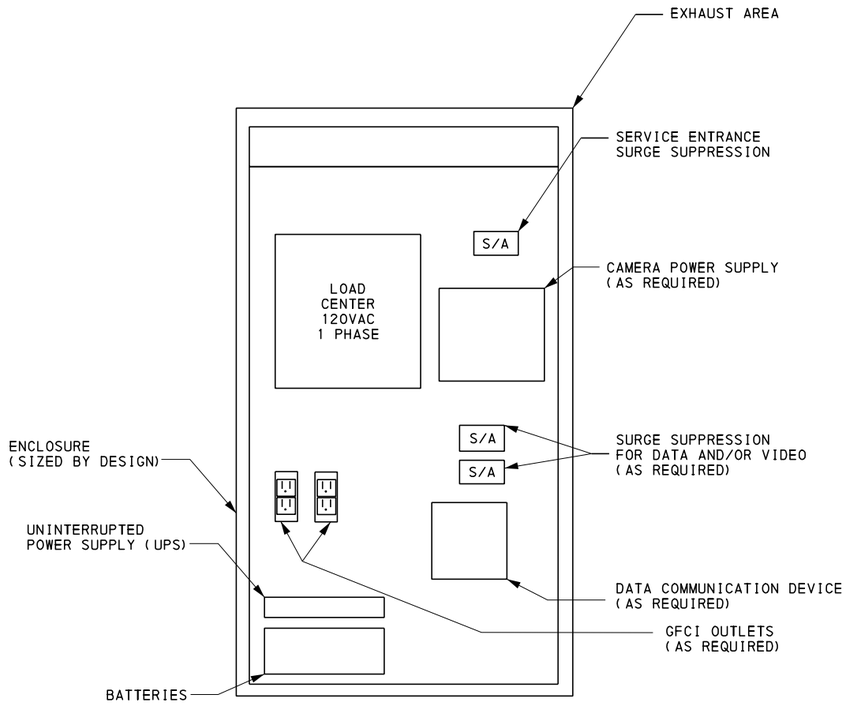
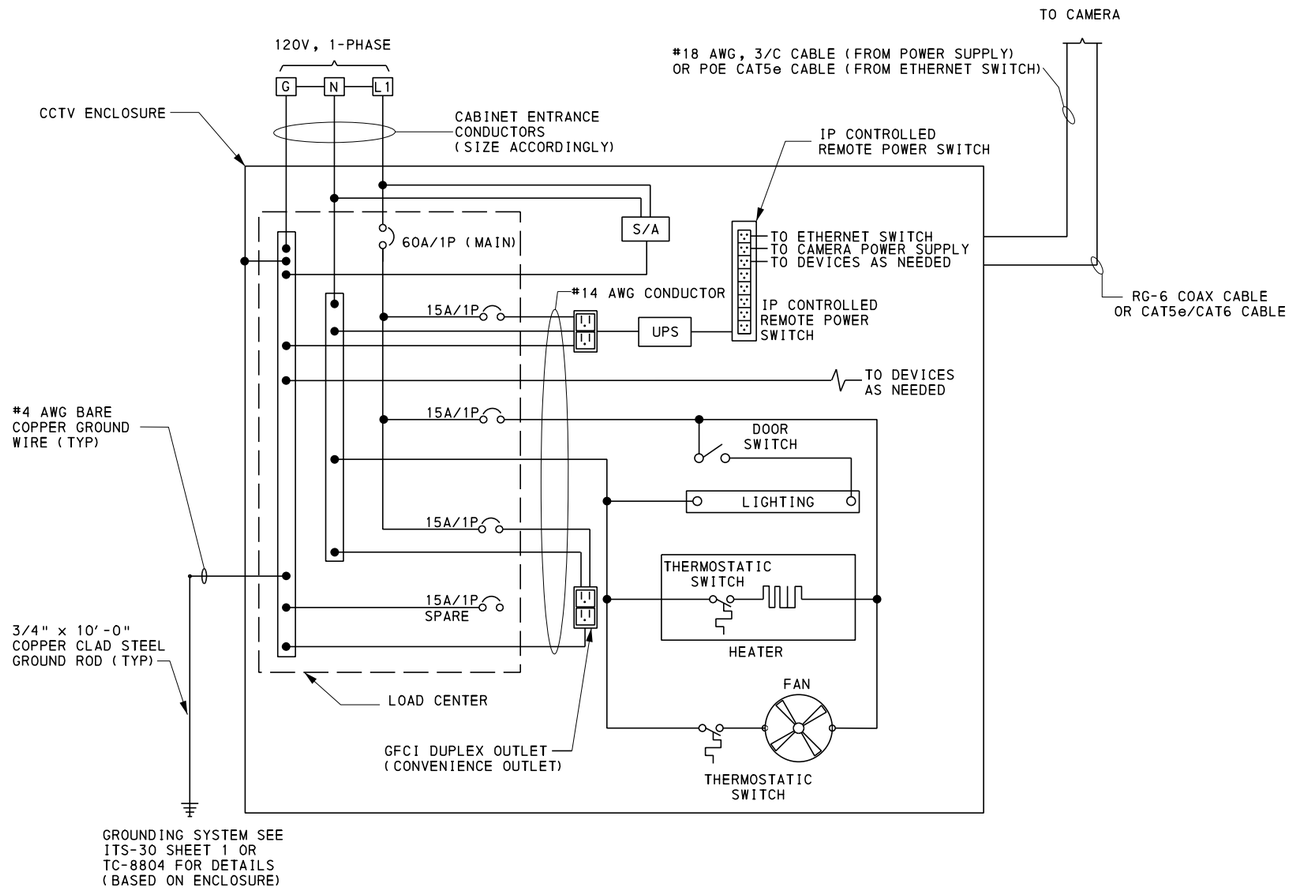
EQUIPMENT LAYOUT AND WIRING DIAGRAM
HUB ENCLOSURE

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 3
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-12



TYPICAL CCTV ENCLOSURE EQUIPMENT LAYOUT



TYPICAL CCTV WIRING DIAGRAM

GENERAL NOTES:

1. PROVIDE A CCTV ENCLOSURE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.2(b). INSTALL ENCLOSURE AS DETAILED IN ITS-10 SHEET 1, 2, 3, OR TC-8802 AND THE CONTRACT DOCUMENTS.
2. THE ENCLOSURE LAYOUT SHOWN IS FOR DIAGRAMMATIC PURPOSES ONLY AND DEPICT A TYPICAL ENCLOSURE LAYOUT. CONTRACTOR TO SUBMIT PROPOSED ENCLOSURE LAYOUT FOR APPROVAL. SIZE OF PROPOSED ENCLOSURE TO BE SPECIFIED AT THE TIME OF THE DESIGN.
3. ALL ELECTRIC OUTLETS INTENDED FOR CRITICAL SERVICE (I.E. COMMUNICATIONS, ENCODER, ETC.) SHALL NOT BE GFCI DUPLEX OUTLETS.
4. CONTRACTOR TO SUBMIT PROPOSED ENCLOSURE WIRING SCHEMATIC FOR APPROVAL.
5. PROVIDE A MINIMUM OF 60 AMP SERVICE AT THE CCTV ENCLOSURE.
6. CCTV ENCLOSURE SHALL HAVE A FILTERED AIR VENTILATION SYSTEM.
7. ENCLOSURE LOCK SHALL BE COMPATIBLE WITH THE REPRESENTATIVES CURRENT KEYING SYSTEM.
8. CONTRACTOR TO PROVIDE A CABINET IDENTIFICATION TAG THAT INCLUDES THE DEVICE NUMBER. DESIGNER TO COORDINATE WITH THE REPRESENTATIVE TO OBTAIN THE DEVICE NUMBER PRIOR TO COMPLETING DESIGN.
9. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.

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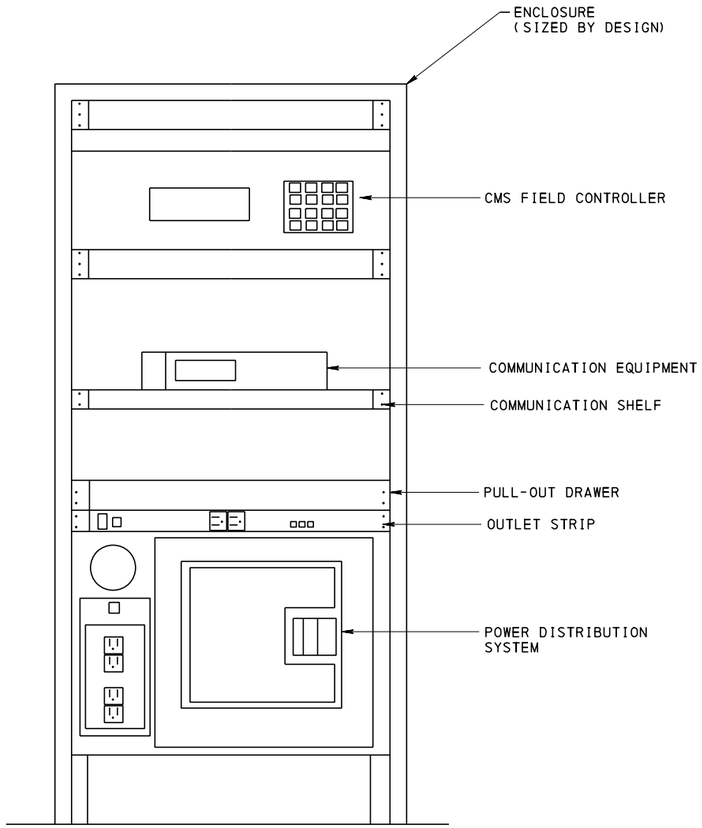
EQUIPMENT LAYOUT AND WIRING DIAGRAM
CCTV ENCLOSURE

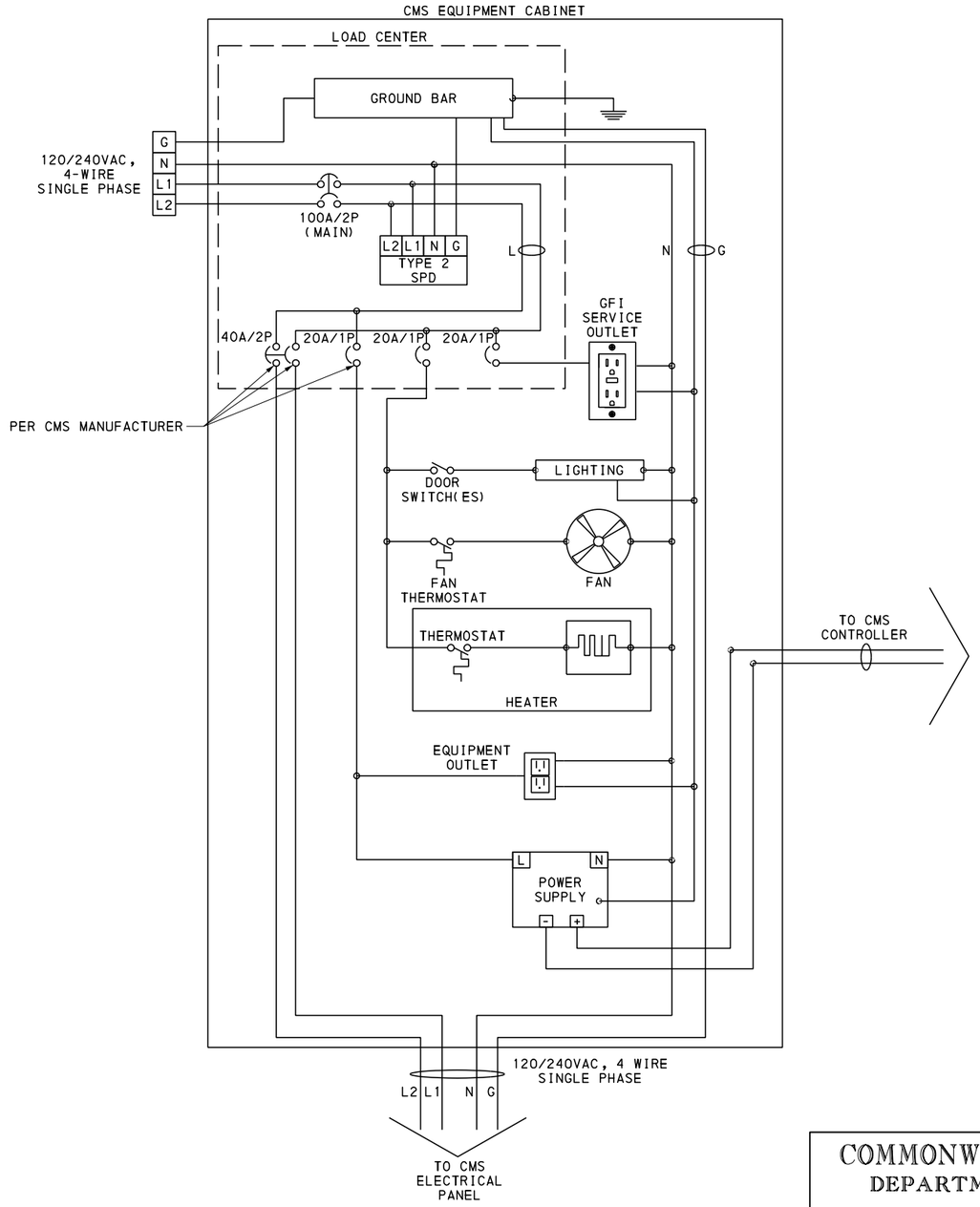
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 2 OF 3
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-12

GENERAL NOTES:

1. PROVIDE A CMS ENCLOSURE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1230.2 (h). INSTALL ENCLOSURE AS DETAILED IN ITS-10 SHEET 1, 2, 3, OR TC-8802.
2. THE ENCLOSURE LAYOUT SHOWN IS FOR DIAGRAMMATIC PURPOSES ONLY AND DEPICT A TYPICAL ENCLOSURE LAYOUT. CONTRACTOR TO SUBMIT PROPOSED ENCLOSURE LAYOUT FOR APPROVAL. SIZE OF PROPOSED ENCLOSURE TO BE SPECIFED AT THE TIME OF THE DESIGN.
3. ALL EQUIPMENT SHALL BE MOUNTED ON A STANDARD EIA/TIA 19 INCH RACK.
4. CONTRACTOR TO SUBMIT CMS MANUFACTURERS PROPOSED ENCLOSURE WIRING SCHEMATIC FOR APPROVAL.
5. ALL ELECTRICAL OUTLETS INTENDED FOR CRITICAL SERVICE (I.E. COMMUNICATION, ENCODER, ETC.) SHALL NOT BE GFCI DUPLEX OUTLETS.
6. PROVIDE A MINIMUM OF 60 AMP SERVICE AT THE CMS ENCLOSURE.
7. CMS ENCLOSURE SHALL HAVE A FILTERED AIR VENTILATION SYSTEM.
8. CABINET LOCK SHALL BE COMPATIBLE WITH THE REPRESENTATIVES CURRENT KEYING SYSTEM.
9. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.



TYPICAL CMS ENCLOSURE LAYOUT



TYPICAL CMS WIRING DIAGRAM

COMMONWEALTH OF PENNSYLVANIA
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EQUIPMENT LAYOUT AND WIRING DIAGRAM
CHANGEABLE MESSAGE SIGN ENCLOSURE

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 3 OF 3
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-12

GENERAL NOTES:

1. PROVIDE JUNCTION BOX IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.2(h)3. REFER TO STANDARD DRAWINGS RC-81M AND RC-82M FOR CAST-IN-PLACE AND PRECAST JUNCTION BOXES AND ITS-20 SHEET 3 FOR COMPOSITE JUNCTION BOXES. REFER TO STANDARD DRAWING BC-721M FOR JUNCTION BOX JB-25 DETAILS.
2. JUNCTION BOX SHOULD BE CHOSEN BASED ON APPLICATION AND THE CABLE BENDING RADIUS AS SPECIFIED BY THE CABLE MANUFACTURER. COMPOSITE JUNCTION BOX TO BE USED FOR COMMUNICATIONS BACKBONE.
3. JUNCTION BOXES SHALL NOT BE INSTALLED IN ROADWAYS OR DRIVEWAYS. JUNCTION BOXES MAY BE INSTALLED IN THE SHOULDER BASED ON FIELD CONDITIONS AND AS INDICATED IN THE CONTRACT DOCUMENTS.
4. THE LEGEND "PENNDOT COMMUNICATION CABLE" SHALL BE IMPRINTED ON ALL COMMUNICATION JUNCTION BOX COVERS.
5. THE LEGEND "PENNDOT ELECTRIC CABLE" SHALL BE IMPRINTED ON ALL POWER JUNCTION BOX COVERS.
6. JUNCTION BOXES SHALL BE INSTALLED FLUSH WITH THE FINISHED GRADE SURFACE.
7. JUNCTION BOX LENGTH (LONG SIDE) SHALL BE PARALLEL TO THE ROADWAY.
8. A PULL WIRE SHALL BE INSTALLED IN THE EMPTY CONDUITS FOR FUTURE USE.
9. LOCATE JUNCTION BOXES FOR POWER CIRCUIT AND COMMUNICATIONS WITHIN 5'-0" OF ENCLOSURE OR BASED ON FIELD CONDITIONS.
10. COMMUNICATION BOXES SHALL NOT CONTAIN ELECTRICAL CONDUIT OR CONDUCTORS. ELECTRICAL CONDUIT AND CONDUCTORS SHALL BE INSTALLED IN SEPARATE BOXES.
11. THE SIZE AND TYPE OF CONDUIT SHALL BE SHOWN ON PLANS.
12. PROVIDE GALVANIZED RODENT SCREEN ON OPEN BOTTOM BOXES AND PENETRATIONS TO BLOCK SMALL ANIMALS.
13. TRANSITION FROM 3'-0" (MIN) DEPTH TO CENTER LINE OF JUNCTION BOX KNOCKOUTS BASED ON CABLE BENDING RADIUS.
14. 50' OF SLACK SHALL BE LEFT IN INTERMEDIATE PULL BOXES AND 100' SHALL BE LEFT AT DEVICE LOCATIONS.
15. PROVIDE GROUNDING AS SPECIFIED IN PENNDOT PUB 408 SECTION 1201.3(e)6.
16. INSTALL DETECTABLE WARNING TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS. REFER TO PENNDOT PUB 408 SECTION 1201.3(e).
17. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.

ROUND LID/UTILITY HOLE NOTES:

1. REINFORCEMENT AND DETAILS FOR THE PRECAST CONCRETE JUNCTION BOX AND TOP SLAB TO CONFORM TO RC-46M.
2. REINFORCEMENT AND THICKNESS FOR THE PRECAST CONCRETE JUNCTION BOX TO CONFORM TO A INLET BOX TYPE-5, BASE SECTION.
3. REINFORCEMENT AND THICKNESS FOR THE PRECAST CONCRETE TOP SLAB TO CONFORM TO A TOP SLAB FOR A INLET BOX TYPE-5.
4. MANHOLE COVER AND FRAME TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF RC-39M AND VERTICAL DEPTH IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. ATTACH THE MANHOLE COVER TO THE FRAME USING COUNTERSUNK STAINLESS STEEL HEX BOLTS.
6. PROVIDE PRECAST CONCRETE ADJUSTMENT RING OR STRUCTURAL STEEL GRADE ADJUSTMENT RISERS PER RC-39M IF REQUIRED.
7. MANHOLE STEPS ARE NOT REQUIRED.
8. 4" DIAMETER CONDUIT SLEEVES CAN BE SUBSTITUTED FOR 6" KNOCKOUTS.
9. INSIDE CORE MAY BE TAPERED TO ALLOW FORM STRIPPING.
10. REFER TO CONTRACT DOCUMENTS FOR ADDITIONAL REQUIREMENTS.

DELINEATOR NOTES:

1. INSTALL A RED FLEXIBLE POST DELINEATOR WITH A LABEL ADJACENT TO EACH POWER JUNCTION BOX ON THE SIDE FURTHEST FROM THE TRAVEL WAY. LABEL TO READ "PENNDOT ELECTRIC CABLE <DISTRICT RTMC PHONE NUMBER>". PHONE NUMBER TO BE APPROVED BY THE REPRESENTATIVE PRIOR TO COMPLETING DESIGN. PROVIDE DELINEATOR PER PENNDOT PUB 408 SECTION 937.
2. INSTALL A ORANGE FLEXIBLE POST DELINEATOR WITH A LABEL ADJACENT TO EACH COMMUNICATION JUNCTION BOX ON THE SIDE FURTHEST FROM THE TRAVEL WAY. LABEL TO READ "PENNDOT COMMUNICATION CABLE <DISTRICT RTMC PHONE NUMBER>". PHONE NUMBER TO BE APPROVED BY THE REPRESENTATIVE PRIOR TO COMPLETING DESIGN. PROVIDE DELINEATOR PER PENNDOT PUB 408 SECTION 937.

COMPOSITE JUNCTION BOX NOTES:

1. JUNCTION BOX SHOULD BE 30"X48"X36" ANSI TIER 22 LOAD RATED WITH OPEN BOTTOM DESIGN.
2. JUNCTION BOX SHOULD BE USED IN OFF-ROADWAY APPLICATIONS SUBJECT TO OCCASIONAL NONDELIBERATE HEAVY TRAFFIC MEETING OR EXCEEDING THE FOLLOWING:
   -VERTICAL DESIGN LOAD OF 22,500 LBS AND TEST LOAD OF 33,750 LBS
   -LATERAL DESIGN LOAD OF 800 LBS/SQFT AND TEST LOAD OF 1,200 LBS/SQFT
3. JUNCTION BOX LID SHOULD BE ONE PIECE, WITH TWO BOLTS, POLYMER CONCRETE FOR OFF-ROADWAY APPLICATION SUBJECT TO OCCASIONAL NONDELIBERATE HEAVY TRAFFIC MEETING OR EXCEEDING THE FOLLOWING:
   -WEIGHT LOAD RATING DESIGN LOAD OF 22,500 LBS AND TEST LOAD OF 33,750 LBS

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JUNCTION BOXES GENERAL NOTES

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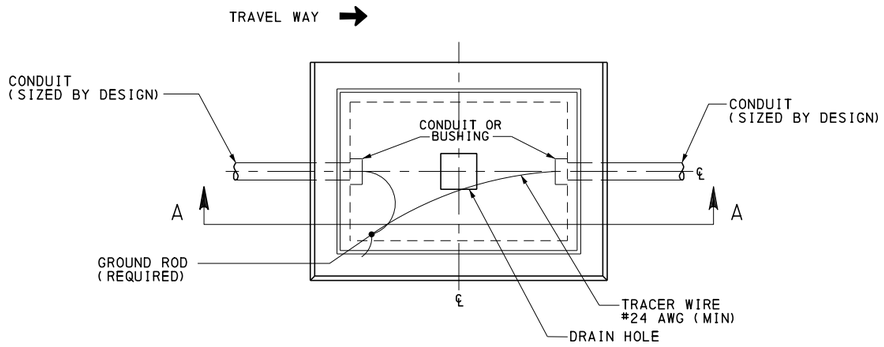
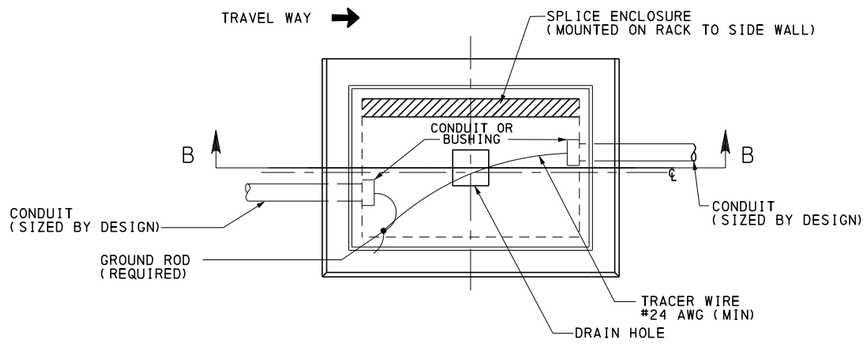
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-20



PLAN VIEW

PULL BOX (COMMUNICATIONS JUNCTION BOX)

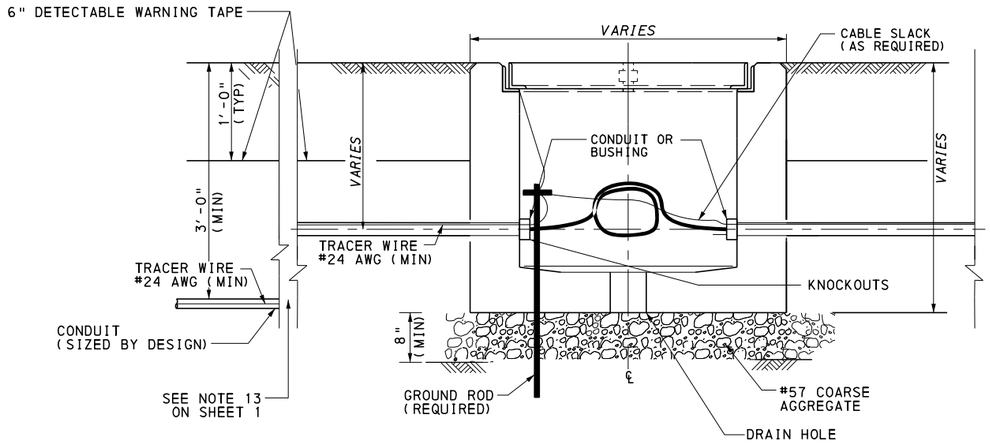
(NOTE JB-12 DEPICTED FOR GRAPHICAL PURPOSES ONLY)



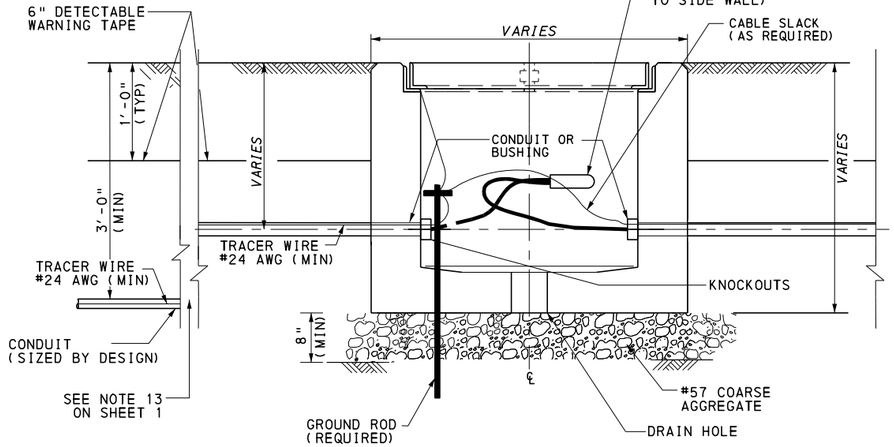
PLAN VIEW

SPLICE BOX (COMMUNICATIONS JUNCTION BOX)

(NOTE JB-12 DEPICTED FOR GRAPHICAL PURPOSES ONLY)



SECTION A-A

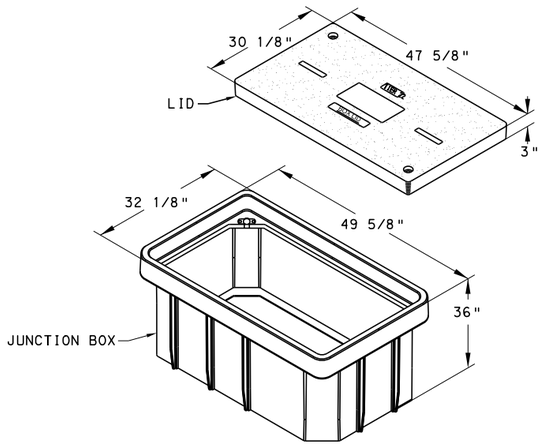


SECTION B-B

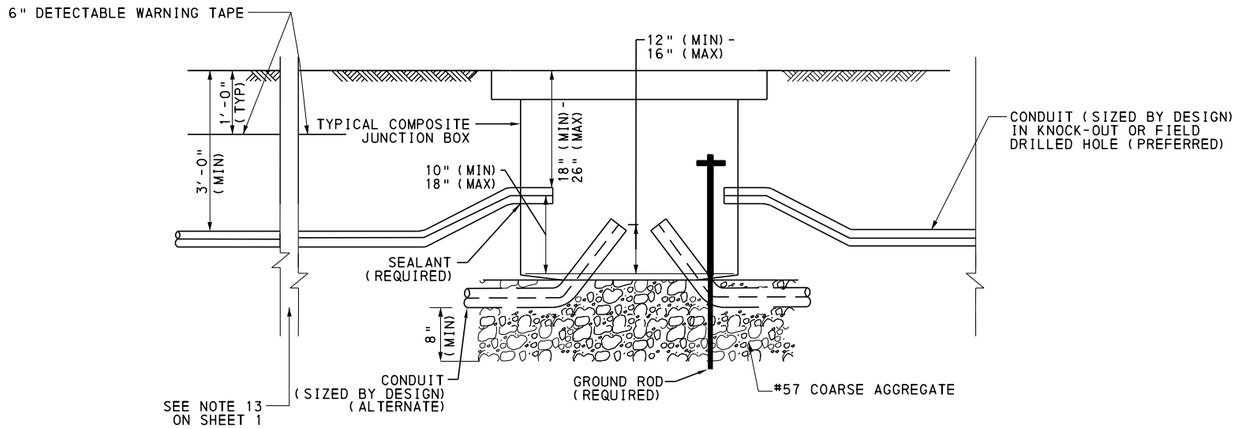
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

JUNCTION BOXES
CAST-IN-PLACE OR PRECAST

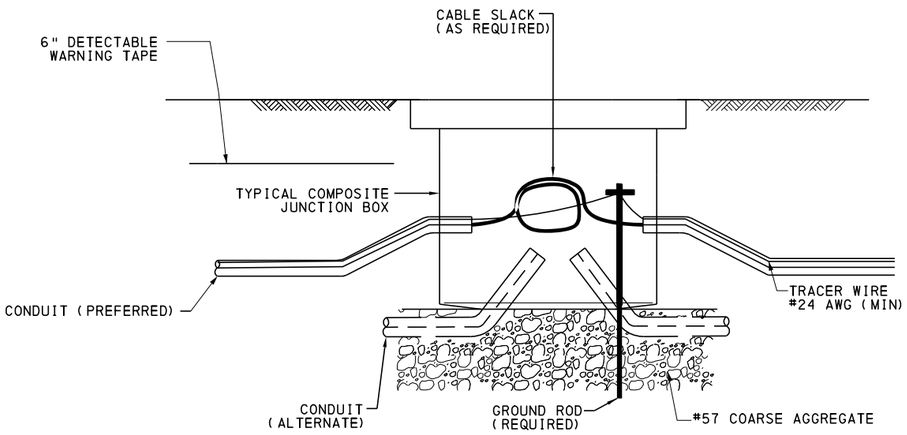
RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 2 OF 4 ITS-20



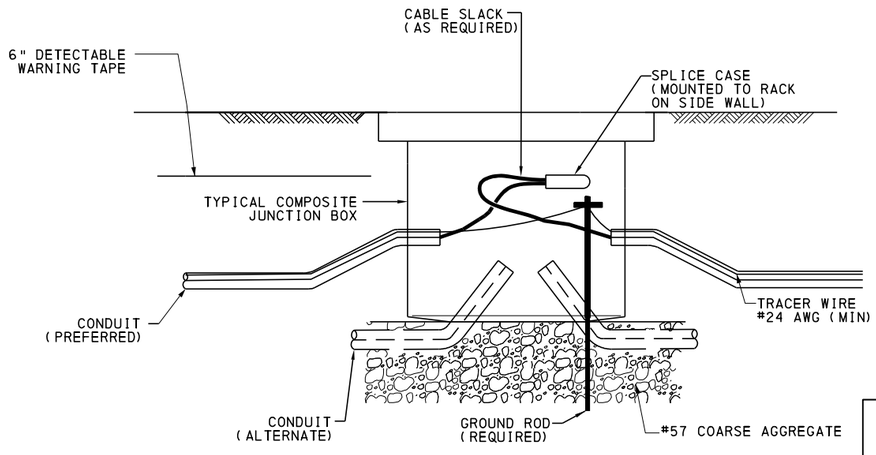
TYPICAL COMPOSITE (ANSI TIER 22)
JUNCTION BOX
CAVALIER PROJECTION



INSTALLATION DETAIL



PULL BOX
(COMMUNICATIONS JUNCTION BOX)



SPLICE BOX
(COMMUNICATIONS JUNCTION BOX)

COMMONWEALTH OF PENNSYLVANIA
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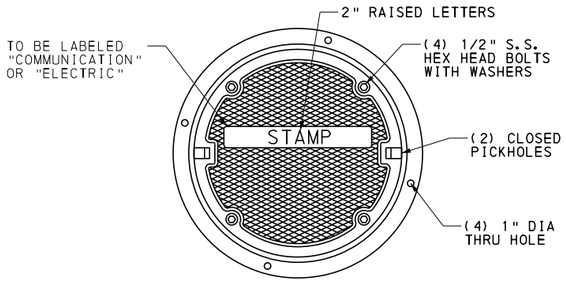
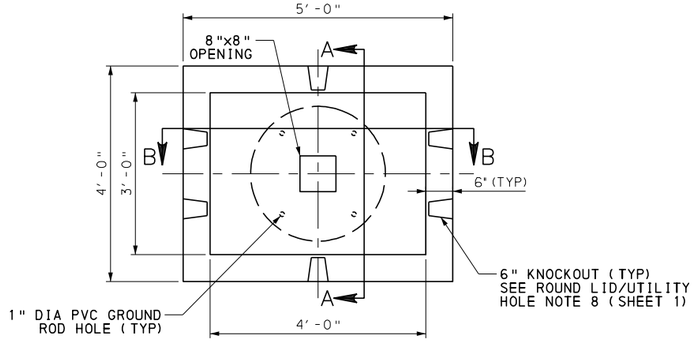
BUREAU OF OPERATIONS

JUNCTION BOXES
COMPOSITE (ANSI TIER 22)

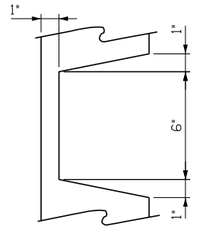
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 3 OF 4
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-20



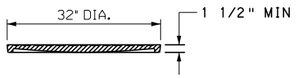
PLAN



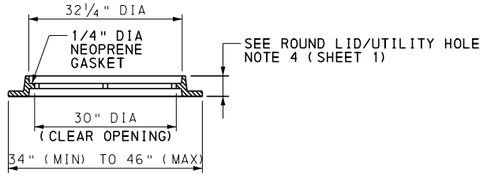
PLAN



KNOCKOUT DETAIL

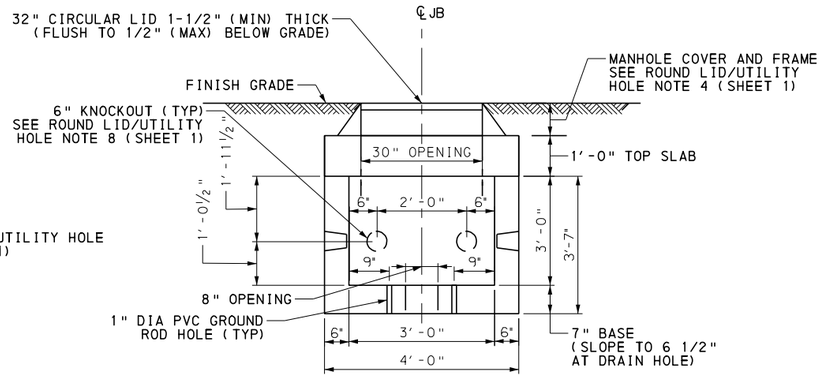


COVER SECTION



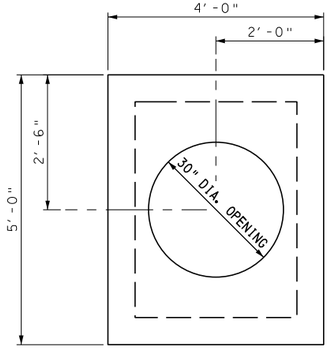
FRAME SECTION

MANHOLE COVER AND FRAME

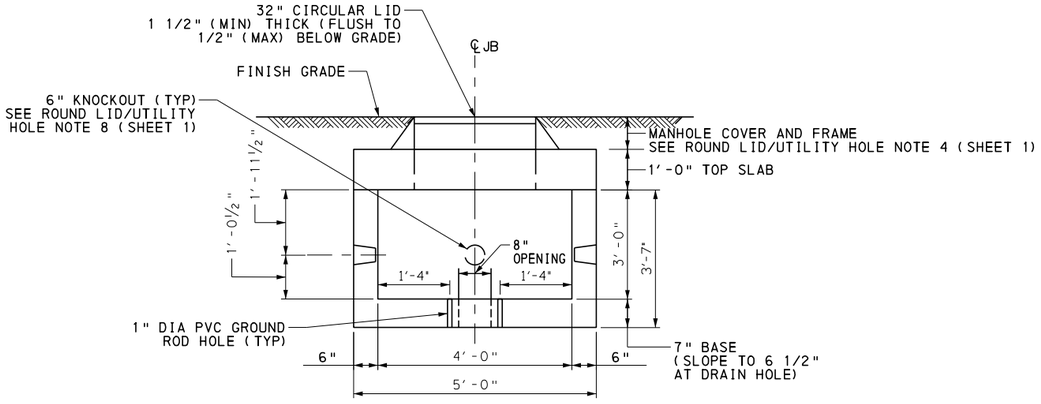


SECTION A-A

ROUND LID JUNCTION BOX DETAILS



TOP SLAB

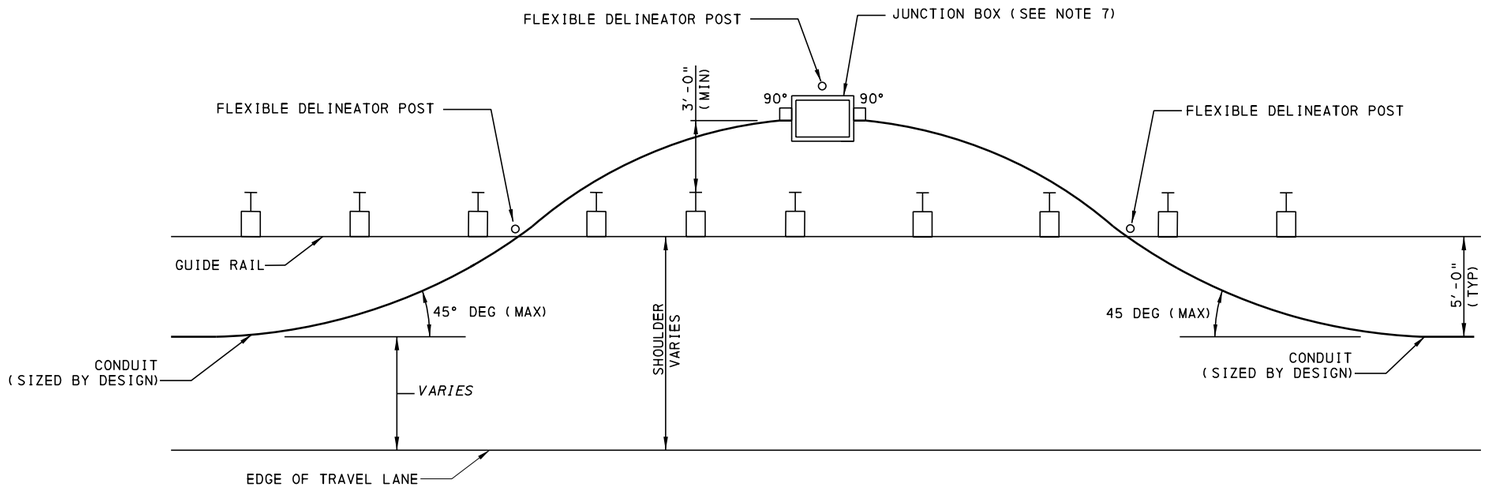


SECTION B-B

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

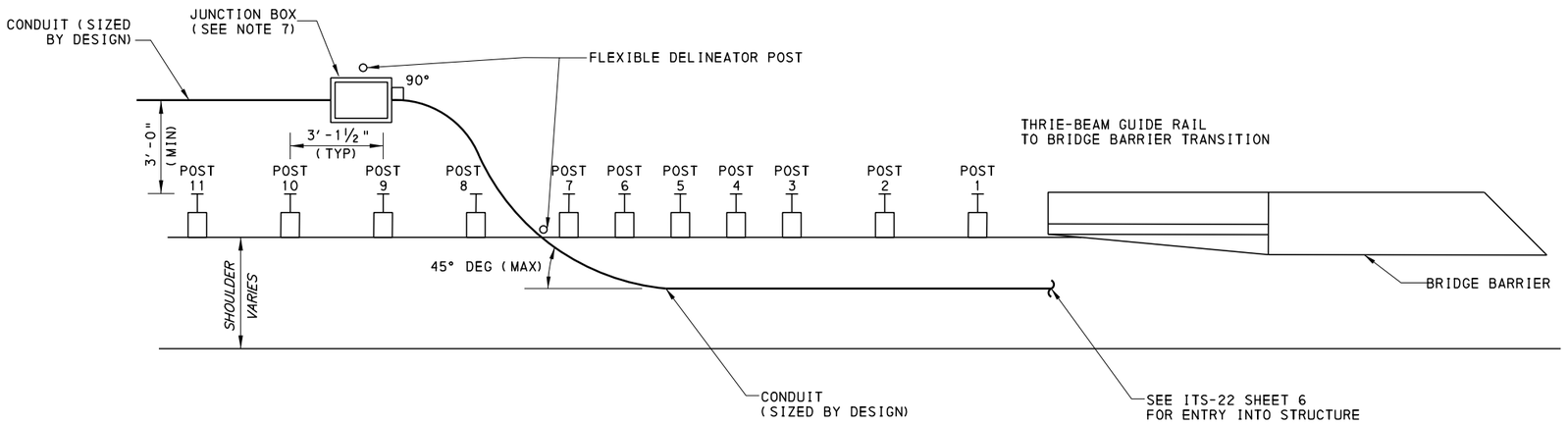
JUNCTION BOXES
ROUND LID/UTILITY HOLE

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 4 OF 4
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-20



ITS JUNCTION BOX (PLAN VIEW)

TYPICAL FOR RECONSTRUCTION OR NEW CONSTRUCTION



BRIDGE APPROACH END CONDUIT DETAIL (PLAN VIEW)

TYPICAL FOR RECONSTRUCTION OR NEW CONSTRUCTION

GENERAL NOTES:

1. THE DETAILS DEPICTED ARE FOR RECONSTRUCTION OR NEW CONSTRUCTION PROJECTS. CONTACT THE REPRESENTATIVE PRIOR TO DESIGN FOR INSTALLATIONS AT EXISTING INFRASTRUCTURE.
2. KEEP JUNCTION BOX SUFFICIENTLY CLEAR OF GUIDE RAIL OR OTHER OBSTRUCTIONS TO MAINTAIN CLEAR ACCESS.
3. INSTALL CONDUIT INTO JUNCTION BOX AT 90 DEGREE ANGLE.
4. INSTALL CONDUIT SWEEP AT AN ANGLE THAT ACCOMMODATES THE CABLE BEND RADIUS. DO NOT EXCEED 45 DEGREES TO THE SHOULDER CENTER LINE.
5. INSTALL FLEXIBLE DELINEATOR POST AT THE LOCATION WHERE THE CONDUIT PASSES UNDER THE EDGE OF SHOULDER. PROVIDE DELINEATION DEVICES PER PENNDOT PUB 408 SECTION 937. PROVIDE LABEL AS INDICATED ON ITS-20 SHEET 1 DELINEATOR NOTES.
6. PROVIDE SPACING BETWEEN COMMUNICATION JUNCTION BOXES BASED ON CABLE SIZE, TYPE AND COMPLEXITY OF RUN. DO NOT EXCEED MANUFACTURERS RECOMMENDED PULL LENGTHS.
7. PROVIDE JUNCTION BOX IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.2(h)3 AND AS APPROPRIATE FOR THE JUNCTION BOX LOCATION. LOCATE JUNCTION BOX AT BRIDGE APPROACHES BEYOND THE THRIE-BEAM GUIDE RAIL TO BRIDGE BARRIER TRANSITION AND IF POSSIBLE, BEYOND THE GUIDE RAIL.
8. TRANSITION CONDUIT FROM BEHIND THE GUIDE RAIL TO THE SHOULDER IN THE TYPE 31 GUIDE RAIL SECTION.
9. AVOID INSTALLATION OF JUNCTION BOXES WITHIN PAVED SHOULDER AREA.
10. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.

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CONDUIT
JUNCTION BOX AND BRIDGE APPROACH PLAN VIEW

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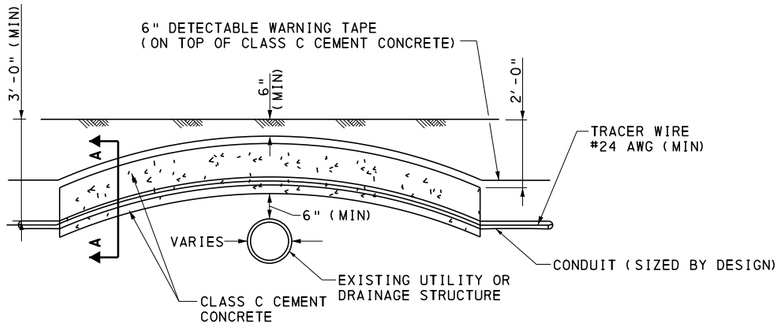
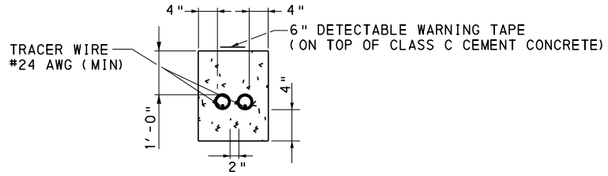
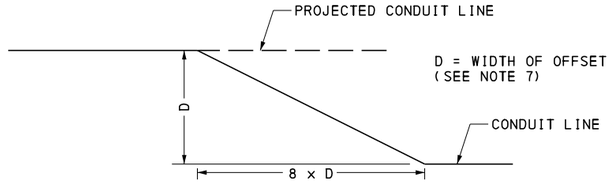
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-21



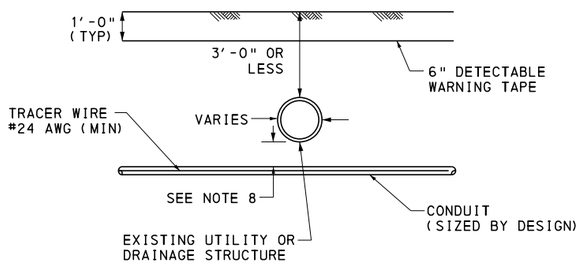


SECTION A-A

CONDUIT INSTALLATION DETAIL ABOVE EXISTING DRAIN PIPES OR UTILITIES



METHOD OF OFFSETTING CONDUIT



CONDUIT INSTALLATION DETAIL BELOW EXISTING DRAIN PIPES OR UTILITIES

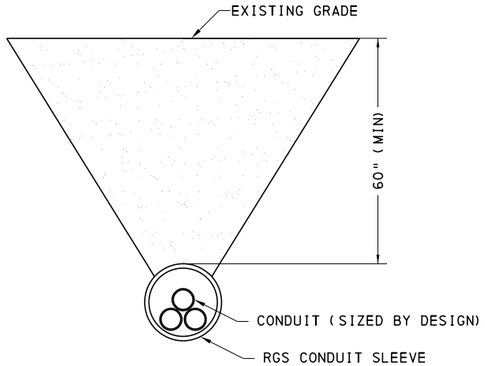
GENERAL NOTES:

1. THE CONTRACTOR, WITH APPROVAL FROM THE REPRESENTATIVE, MAY ADJUST THE FINAL BURIAL DEPTH OF THE CONDUIT(S) IN ORDER TO TRAVERSE NONMOVABLE OBJECT CONFLICTS.
2. BACKFILL IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.3(e).
3. WHERE CONDUITS ARE TO BE INSTALLED OVER EXISTING UNDERGROUND INFRASTRUCTURE (I.E., EXISTING UTILITY OR DRAINAGE STRUCTURE) WHICH ARE LESS THAN 3'-0" DEEP, THE CONTRACTOR SHALL ENCASE THE CONDUIT IN CLASS C CEMENT CONCRETE FOR THE ENTIRE LENGTH OF THE CONDUIT THAT IS INSTALLED AT A DEPTH OF LESS THAN 3'-0".
4. IF THE AMOUNT OF COVER OVER THE ENCASEMENT IS LESS THAN 6", THE CONTRACTOR SHALL INSTALL THE CONDUIT TO PASS BELOW THE UNDERGROUND INFRASTRUCTURE.
5. SIZE AND TYPE OF CONDUITS SHALL BE SHOWN ON THE CONTRACT DRAWINGS.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO ANY UNDERGROUND INFRASTRUCTURE DURING CONSTRUCTION. UTILITY LOCATIONS WILL BE VERIFIED AT LEAST 100' IN ADVANCE OF TRENCHES, PLOWING OR BORING, SO THAT CHANGES IN CONDUIT PLACEMENT CAN BE MADE IN THE EVENT OF CONFLICT.
7. OFFSETTING OF CONDUIT MAY BE USED FOR TYING INTO EXISTING CONDUIT SYSTEMS OR BYPASSING OBSTRUCTIONS AS DIRECTED BY THE REPRESENTATIVE.
8. IF PROPOSED CONDUIT IS CROSSING OR IN CLOSE PROXIMITY TO AN EXISTING UNDERGROUND UTILITY, A MINIMUM CLEARANCE OF 1'-0" VERTICAL AND 1'-6" HORIZONTAL OR A CLEARANCE DICTATED BY MUNICIPAL CODE AND OR UTILITY OWNER SHALL BE MAINTAINED.
9. INSTALL DETECTABLE WARNING TAPE DIRECTLY ABOVE ALL CONDUITS. PLACE DETECTABLE WARNING TAPE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.3(e)1.
10. COMMUNICATIONS AND ELECTRIC CABLES SHALL NOT BE INSTALLED IN THE SAME CONDUIT. COMMUNICATION AND ELECTRIC CONDUITS MAY BE INSTALLED WITHIN THE SAME TRENCH. SEPARATE CONDUITS BASED ON NFPA 70, NATIONAL ELECTRIC CODE. DO NOT STACK CONDUITS VERTICALLY.
11. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.
12. TRANSITION CONDUIT FROM UNDERGROUND WITH A COUPLING TO RGS CONDUIT OR OTHER AS REQUIRED BY DESIGN THAT IS APPROVED FOR ABOVE GORUND APPLICATIONS.

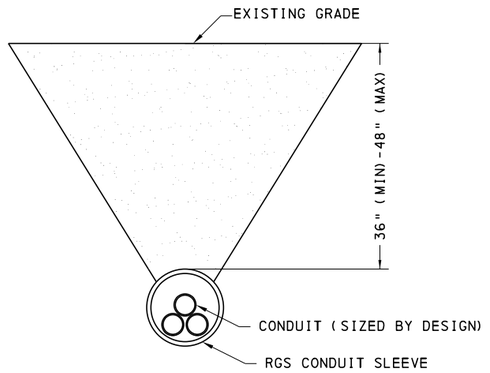
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CONDUIT UTILITY CONFLICTS

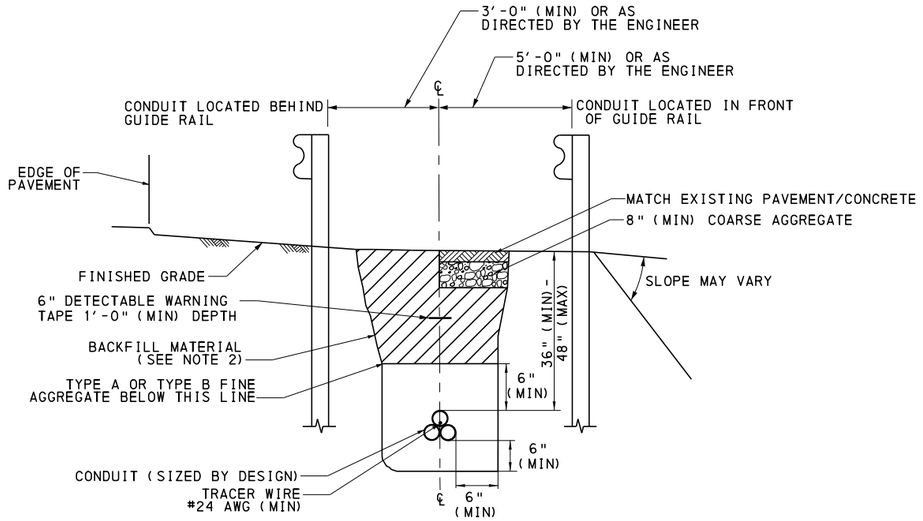
RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 2 OF 3 ITS-21



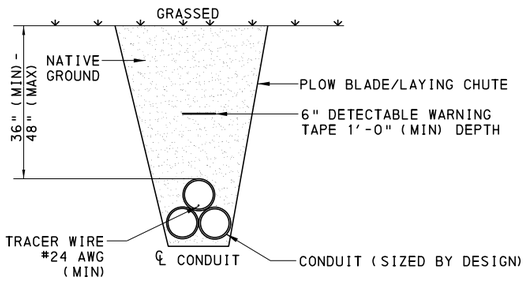
TYPICAL DIRECTIONAL BORE
(HIGHWAYS AND COMMERCIAL DRIVEWAYS)



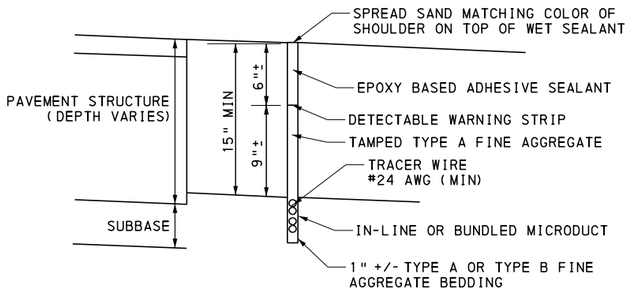
TYPICAL DIRECTIONAL BORE
(RESIDENTIAL DRIVEWAYS)



CONDUIT INSTALLATION TYPICAL DETAIL



TYPICAL PLOW DETAIL



MICRO-TRENCH DETAIL FOR
ROADWAY PAVEMENT AND PAVED SHOULDERS

GENERAL NOTES:

1. THE CONTRACTOR, WITH APPROVAL FROM THE REPRESENTATIVE, MAY ADJUST THE FINAL BURIAL DEPTH OF THE CONDUIT(S) IN ORDER TO TRAVERSE NONMOVABLE OBJECT CONFLICTS.
2. BACKFILL IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.3(e).
3. WHERE CONDUITS ARE TO BE INSTALLED OVER EXISTING UNDERGROUND INFRASTRUCTURE (I.E., EXISTING UTILITY OR DRAINAGE STRUCTURE) WHICH ARE LESS THAN 3'-0" DEEP, THE CONTRACTOR SHALL ENCASE THE CONDUIT IN CLASS C CEMENT CONCRETE FOR THE ENTIRE LENGTH OF THE CONDUIT THAT IS INSTALLED AT A DEPTH OF LESS THAN 3'-0".
4. IF THE AMOUNT OF COVER OVER THE ENCASEMENT IS LESS THAN 6", THE CONTRACTOR SHALL INSTALL THE CONDUIT TO PASS BELOW THE UNDERGROUND INFRASTRUCTURE.
5. SIZE AND TYPE OF CONDUITS SHALL BE SHOWN ON THE CONTRACT DRAWINGS.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO ANY UNDERGROUND INFRASTRUCTURE DURING CONSTRUCTION. UTILITY LOCATIONS WILL BE VERIFIED AT LEAST 100' IN ADVANCE OF TRENCHES, PLOWING OR BORING, SO THAT CHANGES IN CONDUIT PLACEMENT CAN BE MADE IN THE EVENT OF CONFLICT.
7. OFFSETTING OF CONDUIT MAY BE USED FOR TYING INTO EXISTING CONDUIT SYSTEMS OR BYPASSING OBSTRUCTIONS AS DIRECTED BY THE REPRESENTATIVE. SEE METHOD OF OFFSETTING CONDUIT DETAIL ON ITS-21 SHEET 2.
8. IF PROPOSED CONDUIT IS CROSSING OR IN CLOSE PROXIMITY TO AN EXISTING UNDERGROUND UTILITY, A MINIMUM CLEARANCE OF 1'-0" VERTICAL AND 1'-6" HORIZONTAL OR A CLEARANCE DICTATED BY MUNICIPAL CODE AND OR UTILITY OWNER SHALL BE MAINTAINED.
9. INSTALL DETECTABLE WARNING TAPE DIRECTLY ABOVE ALL CONDUITS. PLACE DETECTABLE WARNING TAPE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1201.3(e)1.
10. COMMUNICATIONS AND ELECTRIC CABLES SHALL NOT BE INSTALLED IN THE SAME CONDUIT. COMMUNICATION AND ELECTRIC CONDUITS MAY BE INSTALLED WITHIN THE SAME TRENCH. SEPARATE CONDUITS BASED ON NFPA 70, NATIONAL ELECTRIC CODE. DO NOT STACK CONDUITS VERTICALLY.
11. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.
12. TRANSITION CONDUIT FROM UNDERGROUND WITH A COUPLING TO RGS CONDUIT OR OTHER AS REQUIRED BY DESIGN THAT IS APPROVED FOR ABOVE GROUND APPLICATIONS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CONDUIT
TRENCH AND BORING

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 3 OF 3
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-21

GENERAL NOTES:

1. THE DETAILS DEPICTED ON ITS-22 SHEET 2 THROUGH SHEET 7 AND ITS-23 SHEET 1 ARE FOR RECONSTRUCTION OR NEW CONSTRUCTION PROJECTS. CONTACT THE REPRESENTATIVE PRIOR TO DESIGN FOR INSTALLATIONS AT EXISTING INFRASTRUCTURE.

2. EXTEND NO CONDUIT BELOW THE BOTTOM OF THE BEAMS (EXCEPTIONS AT END SPANS SUBJECT TO APPROVAL).

3. DO NOT ATTACH CONDUIT UNDER THE OVERHANGS UNLESS ABSOLUTELY NECESSARY. IF NECESSARY, CHIEF BRIDGE ENGINEER'S APPROVAL IS REQUIRED.

4. DRILLING IN P/S BEAMS OR FIELD WELDING OF STEEL BEAMS MUST BE EVALUATED ON A CASE BY CASE BASIS AND APPROVED BY THE CHIEF BRIDGE ENGINEER.

5. ANY ACCESSORIES, EXCEPT STRUCTURAL STEEL (SUPPLIED BY CONTRACTOR), REQUIRED FOR THE ACCOMMODATION OF CONDUIT IS TO BE FURNISHED AND DELIVERED BY THE CONDUIT COMPANY TO THE P/S BEAM FABRICATOR AND/OR BRIDGE CONTRACTOR AS THE CASE MAY BE.

6. ALL HANGER, SUPPORTS AND THEIR ASSOCIATED HARDWARE TO BE EITHER GALVANIZED OR ZINC RICH PRIMER AND APPLY FINISH COAT TO MATCH STEEL BEAM COLOR.

7. ROD ALL DUCTS WITH A MANDREL 10% SMALLER IN DIAMETER THAN THE INTERNAL DIAMETER OF THE INNER DUCTS. REPLACE DAMAGED CONDUIT SECTION AT NO EXPENSE TO THE DEPARTMENT AND RETEST.

8. REFER TO BC-794M FOR UTILITY ATTACHMENT AND SUPPORT DETAILS FOR PRESTRESSED CONCRETE BRIDGES.

LOCATION OF CONDUITS CARRYING ELECTRICAL POWER:

NOT ACCEPTABLE:

1. EMBEDMENT OF SUCH PIPES IN P/S CONCRETE ADJACENT BOX BEAMS.

2. EMBEDMENT OF SUCH PIPES IN CURBS & BRIDGE BARRIERS UNLESS SPECIAL PROVISIONS (TO BE APPROVED BY THE CHIEF BRIDGE ENGINEER) ARE MADE TO PERMIT DISSIPATION OF THE DEVELOPING HEAT.

ACCEPTABLE:

1. BETWEEN BEAMS ON SPREAD BEAM BRIDGES (I OR BOX). UNDER DIVISOR, IF IN EXISTENCE.

2. UNDER OVERHANG, IF ABSOLUTELY NECESSARY, SUBJECT TO THE CHIEF BRIDGE ENGINEER'S AND/OR, THE DEPARTMENT REPRESENTATIVE'S APPROVAL.

3. ON COMPOSITE P/S CONCRETE ADJACENT BOX BEAMS WHEN SPREAD UP TO 1'-6". IN THIS CASE CORNERS OF BEAMS CHAMFERED UP TO 4" AND SLAB THICKNESS BETWEEN BEAMS INCREASED UP TO 4" IN ADDITION TO THE ORIGINAL 5" COMPOSITE SLAB.

DESIGN NOTES:

1. FURNISH COMPUTATIONS FOR P/S CONCRETE ADJACENT BOX BEAMS WHEN CONDUIT LOAD IS LOCATED BETWEEN BEAMS AND IS MORE THAN 5 LBS. PER FT.

2. FURNISH COMPUTATIONS IN ANY CASE FOR P/S CONCRETE ADJACENT BOX BEAMS WHEN CONDUIT IS SUSPENDED FROM OVERHANGING SLAB OR DIVISOR (INCLUDE HORIZONTAL ACCIDENTAL IMPACT ON RAILING AND BRIDGE BARRIER).

3. STRUCTURES WITH CATHODIC PROTECTION REQUIRE SPECIAL DETAILS.

4. CONDUIT TO INCORPORATE INNER DUCTS AS REQUIRED BY DESIGN.

5. EACH INNER-DUCT SHALL HAVE A PULL WIRE FOR INSTALLATION OF FUTURE CABLES.

6. ALTERNATE INTERMEDIATE DIAPHRAGMS AND AUXILIARY CONDUIT SUPPORTS AT A MAXIMUM 12'-6" SPACING.

7. DOUBLE NUT AT ALL LOCATIONS THAT NUTS ARE SHOWN.

8. EXPANSION COUPLING, 8" TOTAL STROKE MUST BE INSTALLED SUCH THAT A T=68 DEG F THE FEMALE CONDUIT IS AT THE ZERO POINT. 8" TOTAL STROKE IS AVAILABLE, 4" FOR EXPANSION AND 4" FOR CONTRACTION.

9. EXPANSION COUPLING SHALL NOT BE POSITIONED AT OR WITHIN 1'-8" OF ANY CROSS-FRAME OR AUXILIARY CONDUIT SUPPORT LOCATION. UNEQUAL SPACING OF THE EXPANSION COUPLING IS PERMITTED TO MEET THIS CRITERIA.

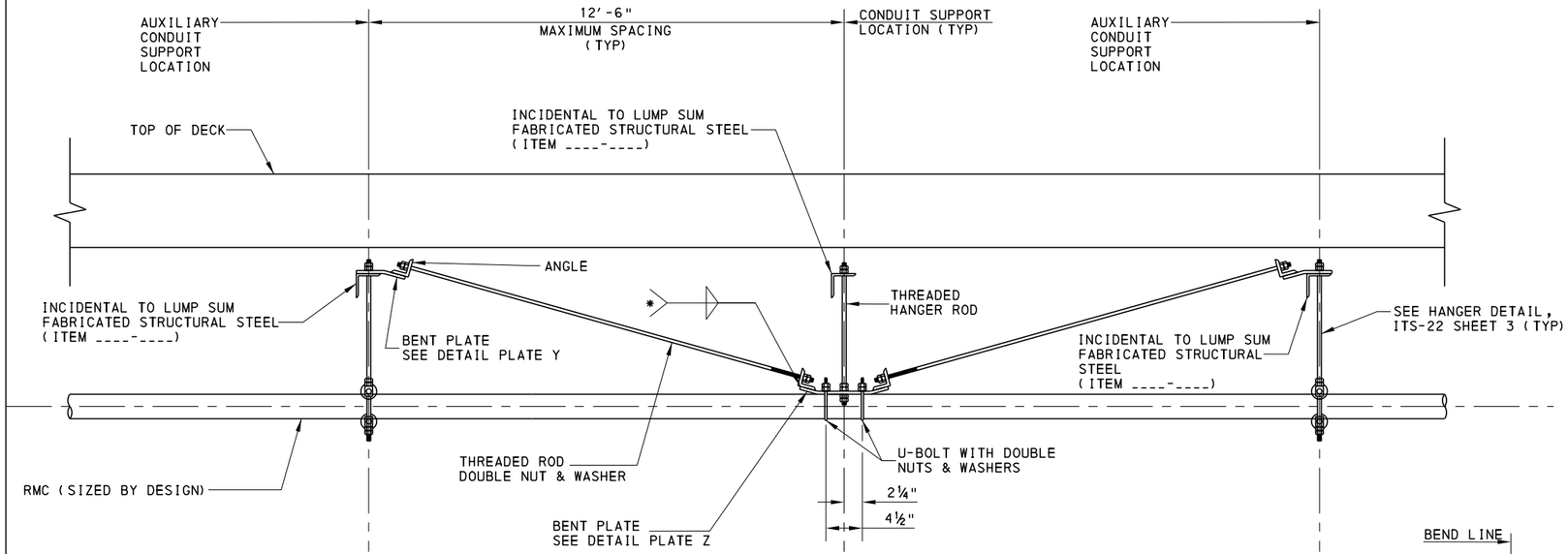
10. CONDUIT ACCESS BOX SHALL BE LOCATED 1'-8" MIN. CLEAR FROM ANY CONDUIT SUPPORT LOCATION.

11. PROVIDE A GALVANIZED CONDUIT ACCESS BOX WITH A REMOVABLE COVER PLATE LOCATED OUTSIDE THE ABUTMENTS FOR BRIDGES < 800'. FOR BRIDGES > 800', JUNCTION BOX SHOULD BE LOCATED NEAR THE MID-SPAN/PIER.

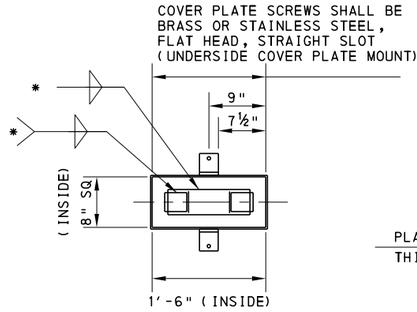
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

STRUCTURE MOUNTED CONDUIT (NEW) GENERAL NOTES

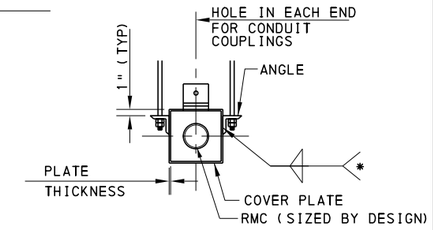
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 7
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-22



DETAIL A
PIER CONDUIT SUPPORT DETAIL WITHOUT EXPANSION JOINTS

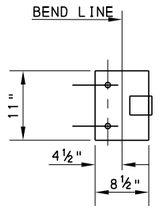


PLAN

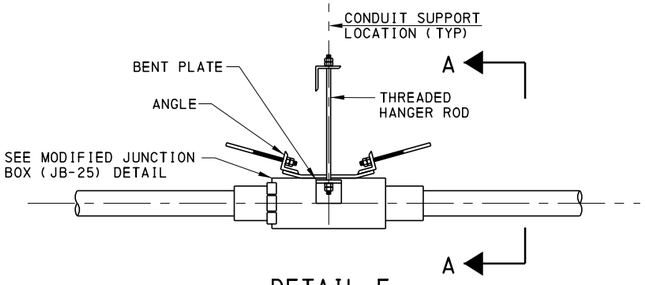


END VIEW (SEE SECTION A-A)

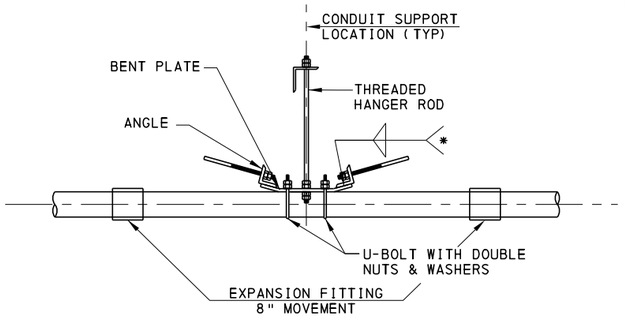
MODIFIED JUNCTION BOX (JB-25) DETAIL



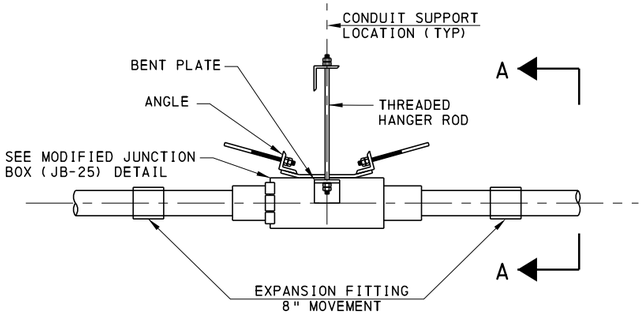
DETAIL PLATE Y
(DEVELOPED)



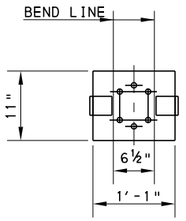
DETAIL E
PIER CONDUIT SUPPORT DETAIL WITHOUT EXPANSION JOINTS



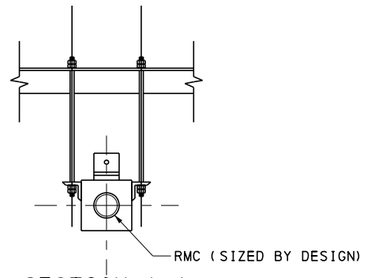
DETAIL B
PIER CONDUIT SUPPORT DETAIL WITH BACK-TO-BACK EXPANSION JOINTS



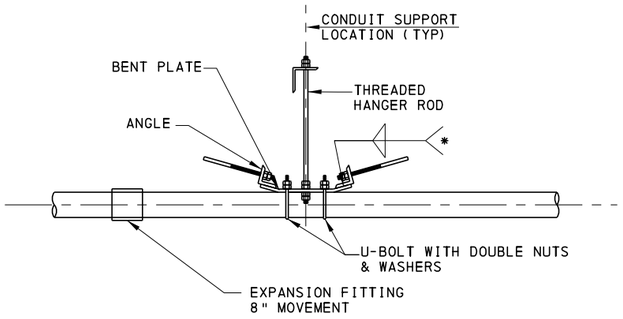
DETAIL D
PIER CONDUIT SUPPORT DETAIL WITH BACK-TO-BACK EXPANSION JOINTS AND MODIFIED JUNCTION BOX



DETAIL PLATE Z
(DEVELOPED)



SECTION A-A



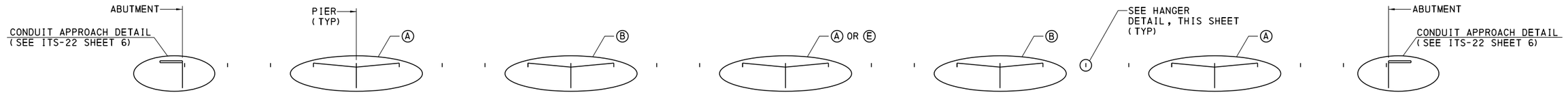
DETAIL C
PIER CONDUIT SUPPORT DETAIL WITH ONE EXPANSION JOINT

* AS REQUIRED BY DESIGN

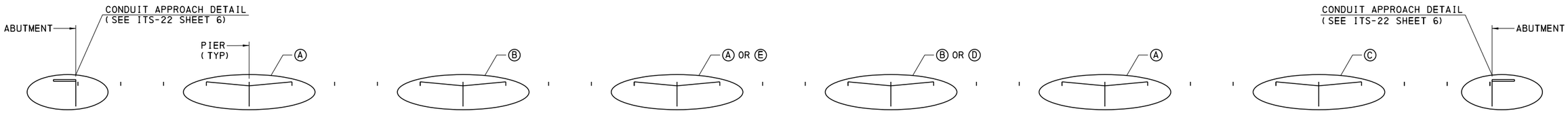
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

STRUCTURE MOUNTED CONDUIT (NEW) STEEL BEAMS

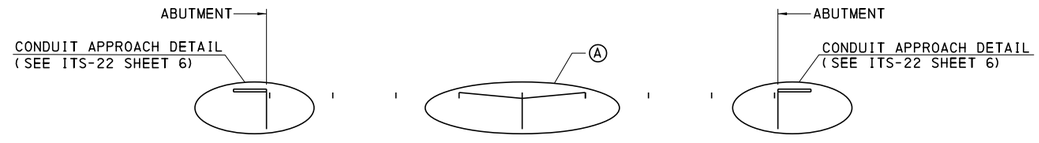
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 2 OF 7
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-22



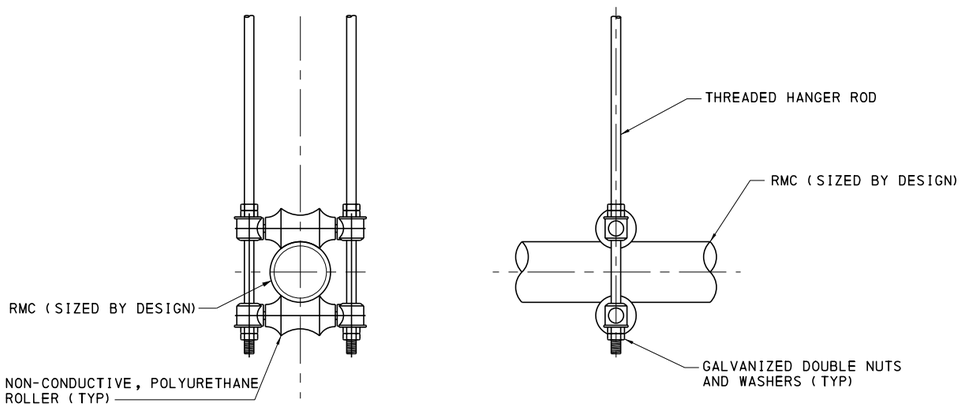
CONDUIT SUPPORT CONFIGURATION:
MULTI-SPAN BRIDGE WITH EVEN NUMBER OF SPANS



CONDUIT SUPPORT CONFIGURATION:
MULTI-SPAN BRIDGE WITH ODD NUMBER OF SPANS



CONDUIT SUPPORT CONFIGURATION: SINGLE SPAN BRIDGE



HANGER DETAIL
NOT TO SCALE

CONDUIT SUPPORT CONFIGURATION LEGEND

Ⓐ USE DETAIL A ON ITS-22 SHEET 2 UNLESS Ⓔ APPLIES.

Ⓑ USE DETAIL B ON ITS-22 SHEET 2 UNLESS Ⓓ APPLIES.

Ⓒ USE DETAIL C ON ITS-22 SHEET 2 AT PIER ADJACENT TO ABUTMENT 2 ON MULTI-SPAN BRIDGES WITH EVEN NUMBER OF SPANS ONLY.

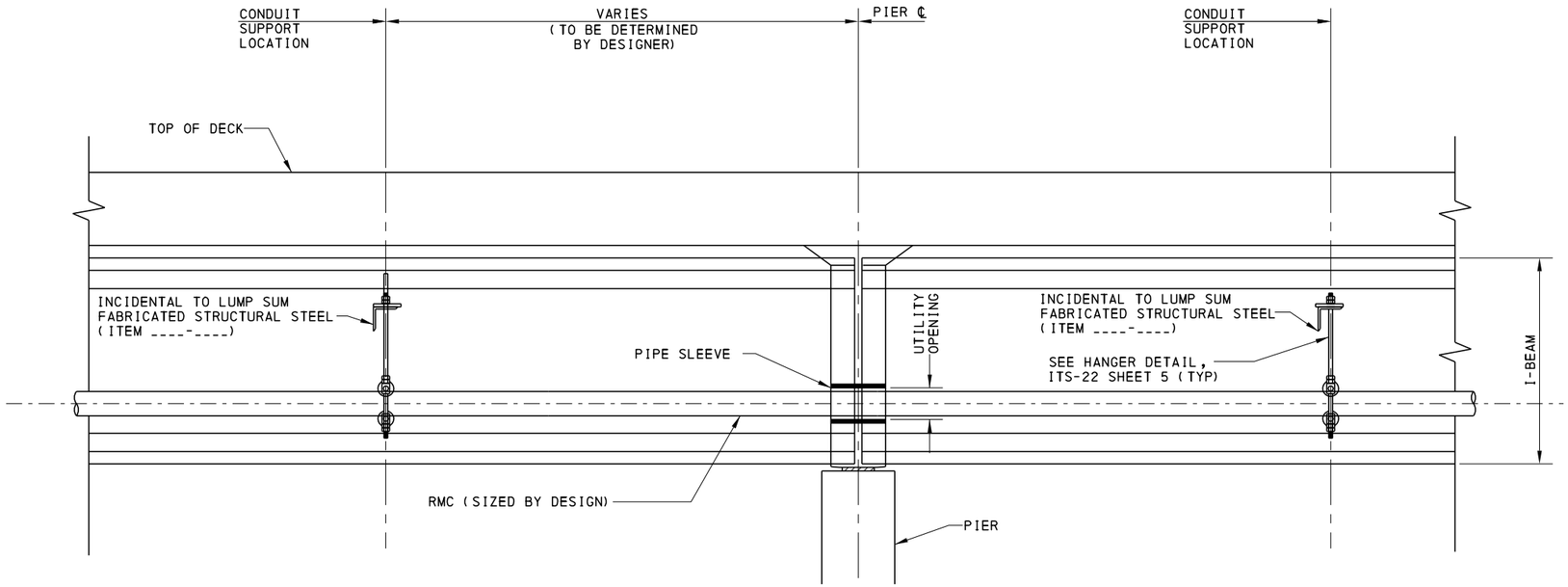
Ⓓ USE DETAIL D ON ITS-22 SHEET 2 IF THE BRIDGE LENGTH IS GREATER THAN 600' AND THIS PIER IS CLOSEST TO THE MIDDLE OF THE BRIDGE.

Ⓔ USE DETAIL E ON ITS-22 SHEET 2 IF THE BRIDGE LENGTH IS GREATER THAN 600' AND THIS PIER IS CLOSEST TO THE MIDDLE OF THE BRIDGE.

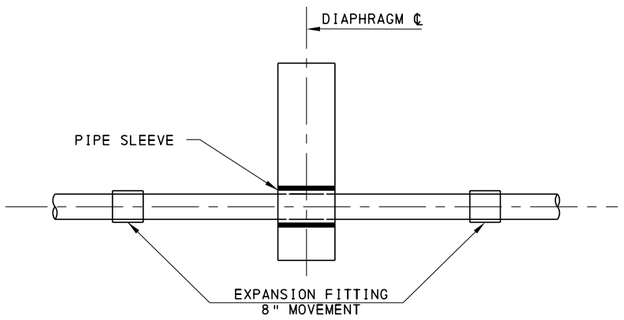
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

STRUCTURE MOUNTED CONDUIT (NEW)
SUPPORT CONFIGURATION FOR STEEL BEAMS

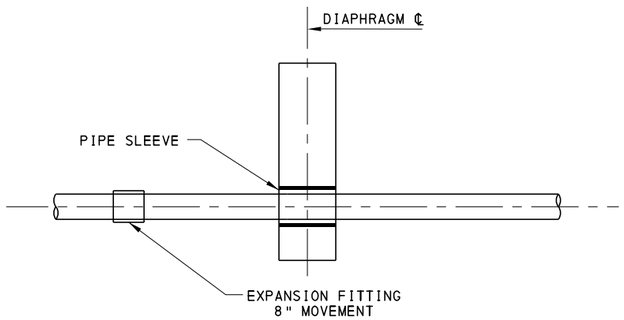
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 3 OF 7
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-22



DETAIL A
PIER CONDUIT SUPPORT DETAIL WITHOUT EXPANSION JOINTS



DETAIL B
PIER CONDUIT SUPPORT DETAIL WITH BACK-TO-BACK EXPANSION JOINTS



DETAIL C
PIER CONDUIT SUPPORT DETAIL WITH ONE EXPANSION JOINT

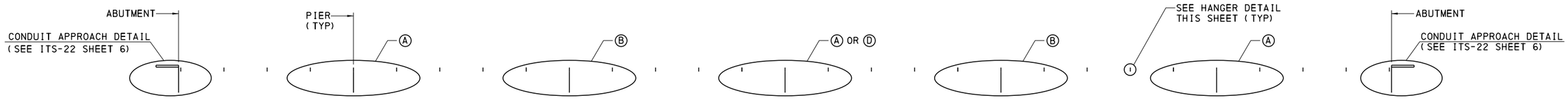
GENERAL NOTE:

1. REFER TO THE CONTRACT DOCUMENTS AND BC-794M FOR UTILITY ATTACHMENT AND SUPPORT DETAILS FOR PRESTRESSED BRIDGES.

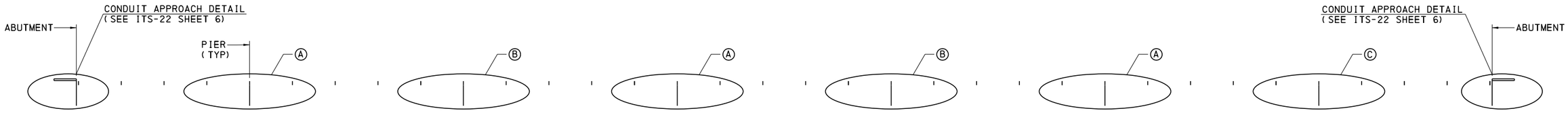
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

STRUCTURE MOUNTED CONDUIT (NEW)
CONCRETE BEAMS

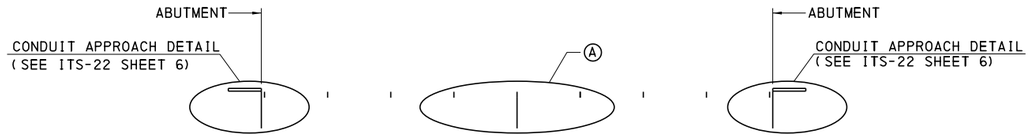
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 4 OF 7
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-22



CONDUIT SUPPORT CONFIGURATION:
MULTI-SPAN BRIDGE WITH EVEN NUMBER OF SPANS



CONDUIT SUPPORT CONFIGURATION:
MULTI-SPAN BRIDGE WITH ODD NUMBER OF SPANS



CONDUIT SUPPORT CONFIGURATION: SINGLE SPAN BRIDGE

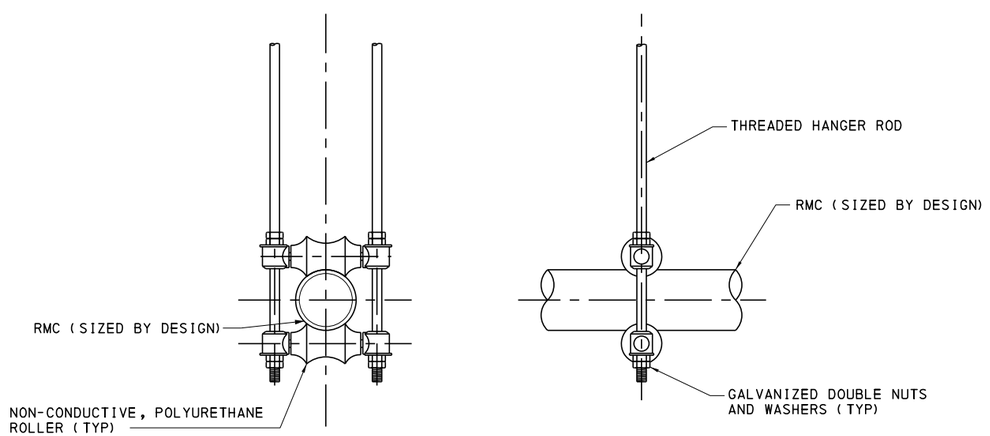
CONDUIT SUPPORT CONFIGURATION LEGEND

(A) USE DETAIL A ON ITS-22 SHEET 4 UNLESS (D) APPLIES.

(B) USE DETAIL B ON ITS-22 SHEET 4 UNLESS (D) APPLIES.

(C) USE DETAIL C ON ITS-22 SHEET 4 AT PIER ADJACENT TO ABUTMENT 2 ON MULTI-SPAN BRIDGES WITH EVEN NUMBER OF SPANS ONLY.

(D) USE DETAIL E ON ITS-22 SHEET 2 IF THE BRIDGE LENGTH IS GREATER THAN 600' AND THIS PIER IS CLOSEST TO THE MIDDLE OF THE BRIDGE.



HANGER DETAIL

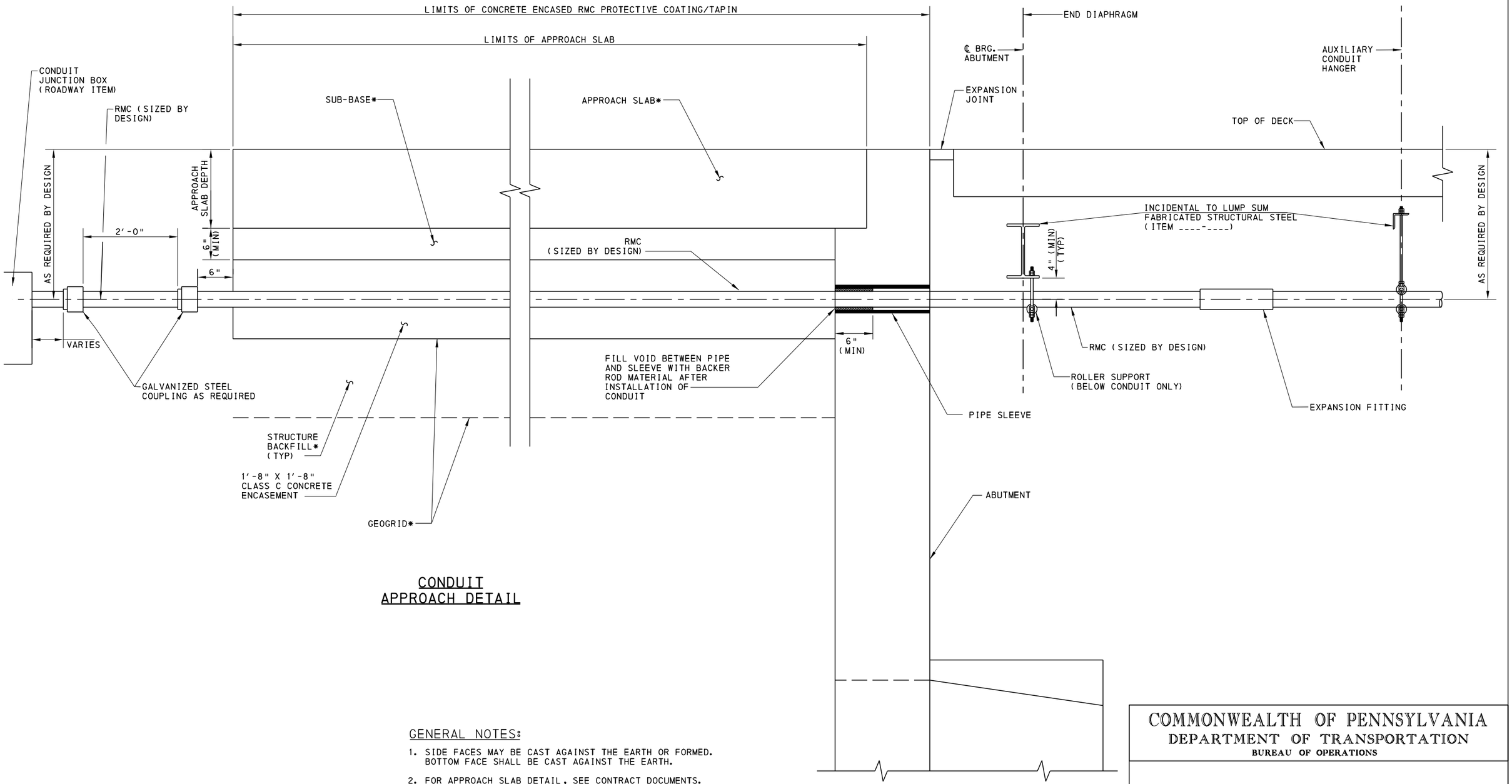
TABLE OF BRIDGE EXPANSION	
BRIDGE LENGTH ℄ BRG. TO ℄ BRG. AT ABUTMENTS	MOVEMENT CLASSIFICATION AT ABUTMENTS
< 200'	4"
200' TO 500'	6"
501' TO 700'	8"
701' TO 1000'	10"
1001' TO 1200'	14"
1201' TO 1400'	16"
1401' TO 1600'	20"

NOTE: STRUCTURE LENGTH OVER 1600' WILL REQUIRE DESIGN COMPUTATIONS FOR MOVEMENT CLASSIFICATION.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

STRUCTURE MOUNTED CONDUIT (NEW)
SUPPORT CONFIGURATIONS FOR CONCRETE BEAMS

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 5 OF 7
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-22



CONDUIT APPROACH DETAIL

GENERAL NOTES:

1. SIDE FACES MAY BE CAST AGAINST THE EARTH OR FORMED. BOTTOM FACE SHALL BE CAST AGAINST THE EARTH.
2. FOR APPROACH SLAB DETAIL, SEE CONTRACT DOCUMENTS.

* INCIDENTAL TO APPROPRIATE PAY ITEM.

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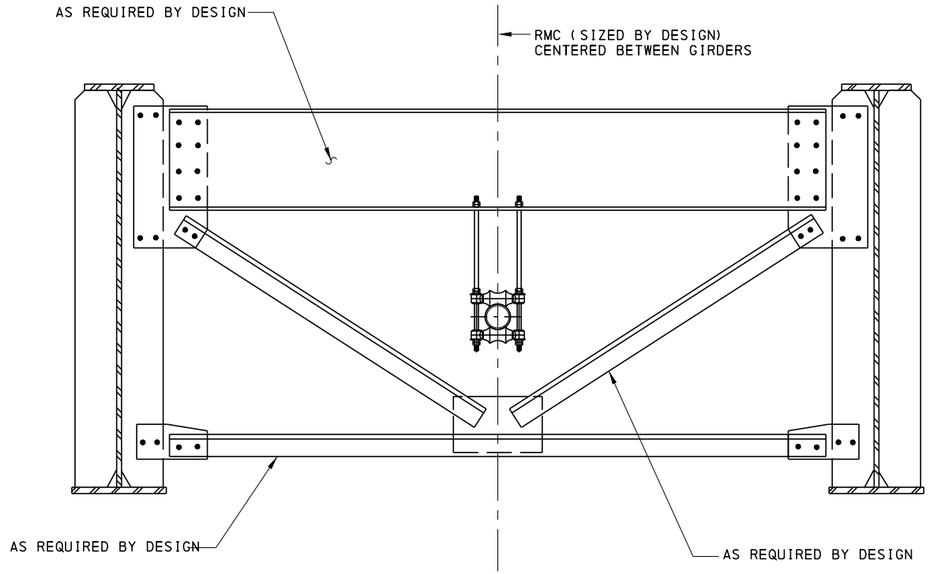
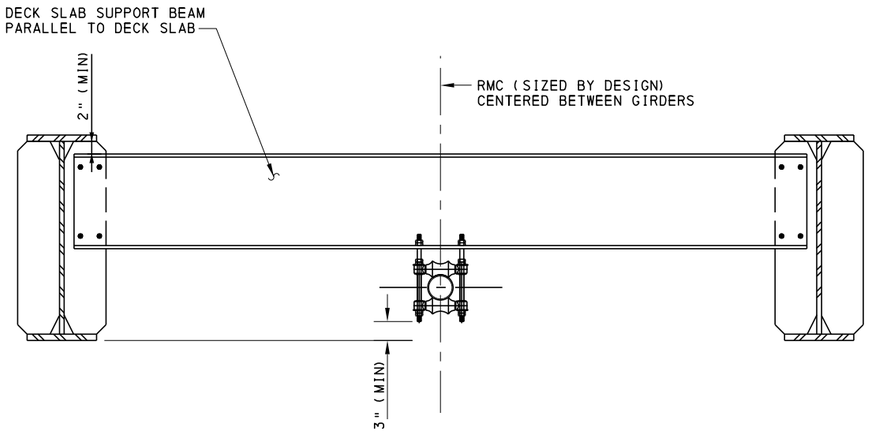
STRUCTURE MOUNTED CONDUIT (NEW) APPROACH DETAIL

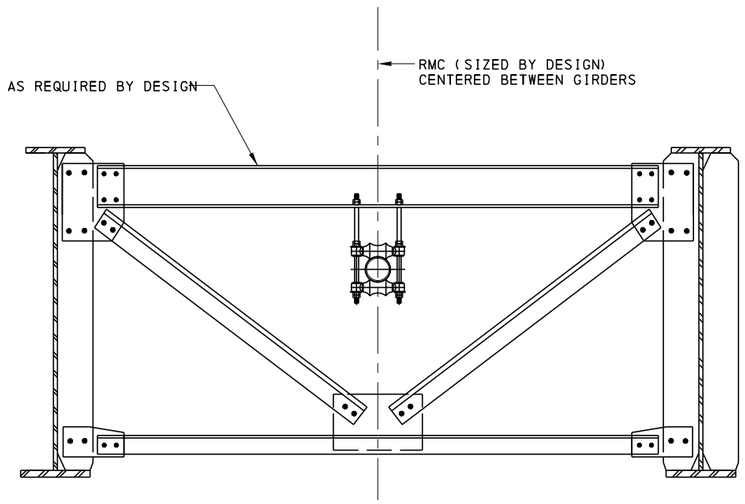
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 6 OF 7
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-22



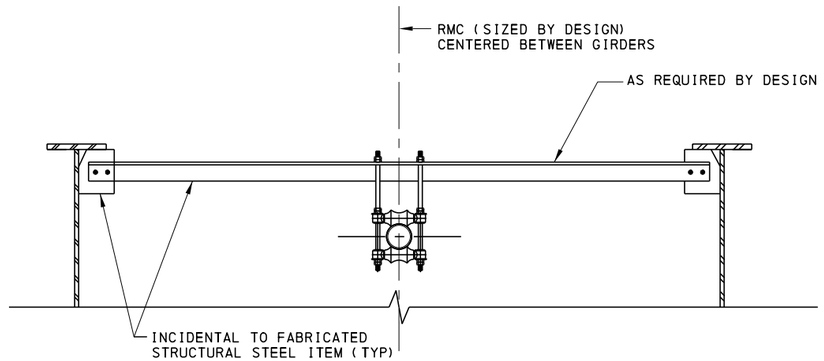
TYPICAL END DIAPHRAGM CONDUIT SUPPORT DETAIL



END DIAPHRAGM



TYPICAL INTERMEDIATE DIAPHRAGM CONDUIT SUPPORT DETAIL



TYPICAL AUXILIARY CONDUIT SUPPORT

GENERAL NOTES:

1. REFER TO THE CONTRACT DOCUMENTS AND BC-754M FOR DIAPHRAGM DETAILS.
2. REFER TO THE CONTRACT DOCUMENTS AND BC-794M FOR UTILITY ATTACHMENT AND SUPPORT DETAILS FOR PRESTRESSED BRIDGES WITH STEEL MID-SPAN DIAPHRAGMS.

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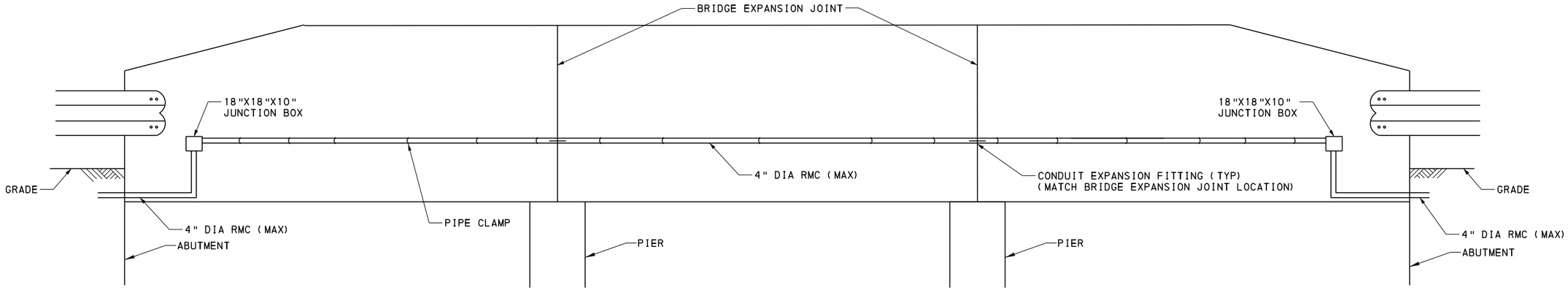
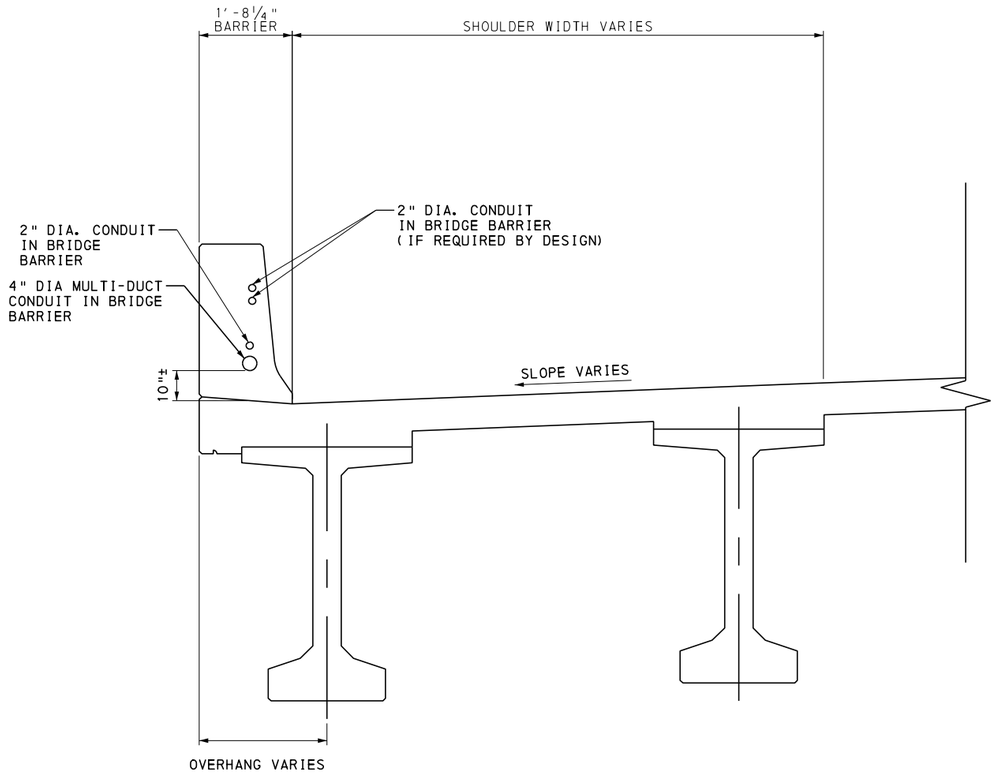
STRUCTURE MOUNTED CONDUIT (NEW)
STEEL BEAM SUPPORT

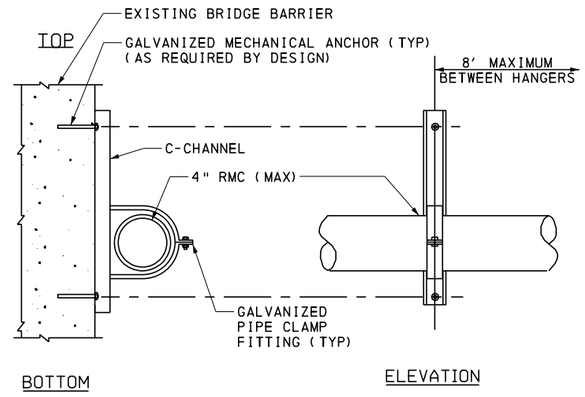
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 7 OF 7
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-22



BRIDGE ATTACHMENT DETAIL (EXISTING STRUCTURE)



CONDUIT IN BRIDGE BARRIER DETAIL (NEW STRUCTURE)



CONDUIT ATTACHED TO STRUCTURE (EXISTING STRUCTURE)

GENERAL NOTES:

1. 4" DIAMETER CONDUIT (MAX) IN BRIDGE BARRIER IS ONLY TO BE USED ON STRUCTURES THAT DO NOT REQUIRE CONDUIT EXPANSION AND DEFLECTION JOINT FITTINGS PER BC-721M SHEET 1.
2. INSTALL 4" DIAMETER CONDUIT BENEATH THE STRUCTURE FOR ALL STRUCTURES THAT WOULD REQUIRE CONDUIT EXPANSION AND DEFLECTION JOINT FITTINGS. SEE ITS-22.
3. GALVANIZE ALL HARDWARE, ANCHOR BOLTS, AND NUTS.
4. SIZE GALVANIZED PIPE CLAMP FITTING ONE SIZE LARGER THAN CONDUIT TO PERMIT TEMPERATURE EXPANSION OF CONDUIT.

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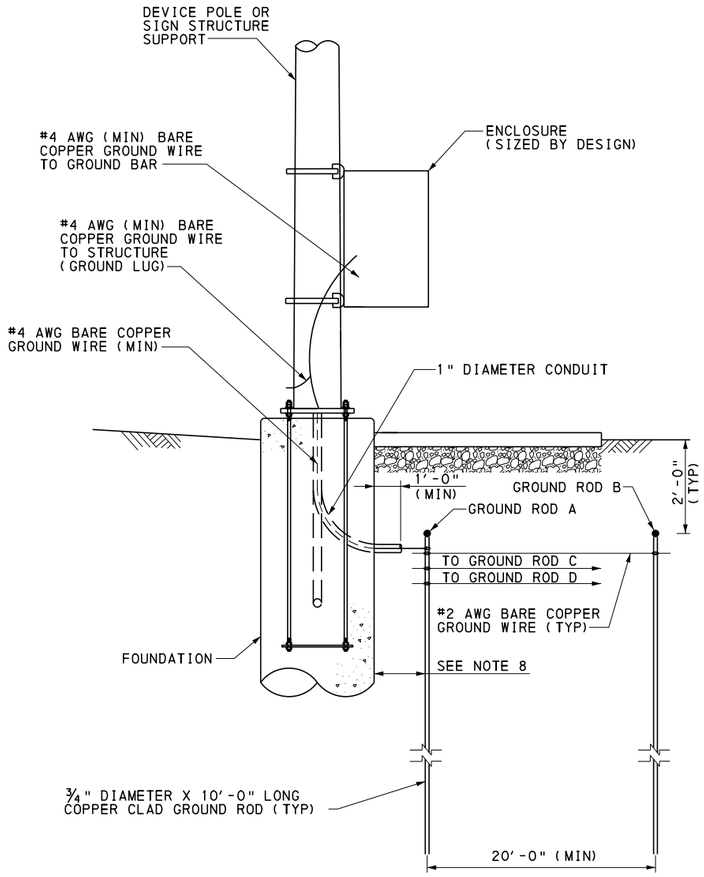
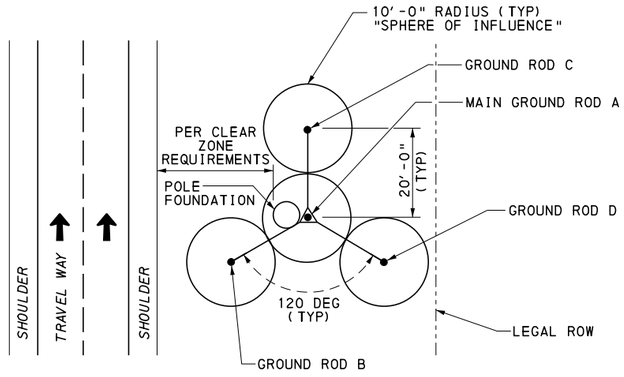
STRUCTURE MOUNTED CONDUIT (BRIDGE BARRIER)

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-23

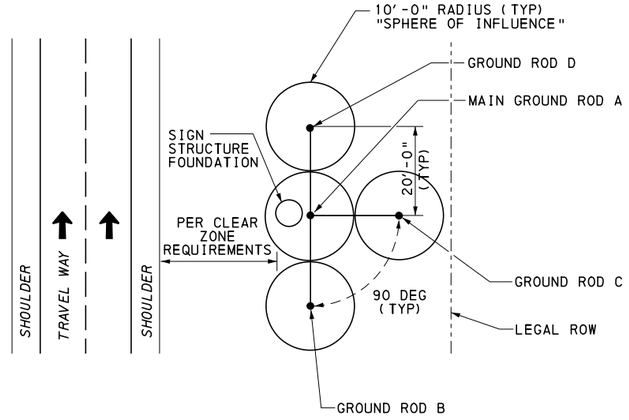


GROUNDING DETAIL FOR POLE AND STRUCTURE MOUNTED ITS ENCLOSURE

(SEE RC-80M FOR GROUNDING REQUIREMENTS)



GROUND ROD PLACEMENT DETAIL (TYPICAL EACH POLE)



GROUND ROD PLACEMENT DETAIL (TYPICAL EACH SIGN STRUCTURE SUPPORT)

GENERAL NOTES:

1. ALL CONNECTIONS SHALL BE EXOTHERMICALLY WELDED TO GROUND RODS OR BRASS LUGS.
2. THE CONTRACTOR MAY, UPON APPROVAL OF THE REPRESENTATIVE, INSTALL A 30' SECTIONAL GROUND ROD FOR INSTANCES WHEN CONDITIONS WILL NOT ALLOW FOR THE INSTALLATION OF THE THREE AUXILIARY GROUND RODS.
3. GROUND ROD A IS REQUIRED, GROUND RODS B, C, AND D WILL BE REQUIRED AS NECESSARY TO MEET THE GROUND RESISTANCE REQUIREMENTS IN THE CONTRACT DOCUMENTS. AN AWG #2 BARE TINNED COPPER CONDUCTOR SHALL BE USED TO INTER-CONNECT GROUND RODS.
4. COPPER FLAT SURFACES SHALL BE BOLTED, WELDED, OR BRAZED SECURELY TO FRAMEWORK TO MAINTAIN ELECTRICAL CONTINUITY.
5. INSTALL DETECTIVE WARNING TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 6".
6. GROUNDING SYSTEM SHALL BE PLACED WITHIN THE LEGAL RIGHT-OF-WAY.
7. CONTRACTOR SHALL TEST THE GROUND ROD BY PERFORMING A SOIL RESISTIVITY TEST. IF TEST RESULTS ARE HIGHER THAN 25 OHMS THEN ADDITIONAL GROUND RODS SHALL BE PLACED UNTIL 25 OHMS OR LESS IS ACHIEVED; REFER TO GROUND ROD PLACEMENT DETAILS. GROUND TESTING SHALL COMPLY WITH PENNDOT PUB 408 SECTION 1201.3(b)8 REPORTING REQUIREMENTS.
8. MAIN GROUND ROD (A) TO BE PLACED ADJACENT TO THE POLE OR SIGN STRUCTURE SUPPORT AND SHALL NOT BE PLACED UNDER THE MAINTAINER PAD.
9. ALL GROUND CONDUCTORS SHALL BE SIZED ACCORDING TO THE NATIONAL ELECTRIC CODE LATEST EDITION.
10. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.

COMMONWEALTH OF PENNSYLVANIA
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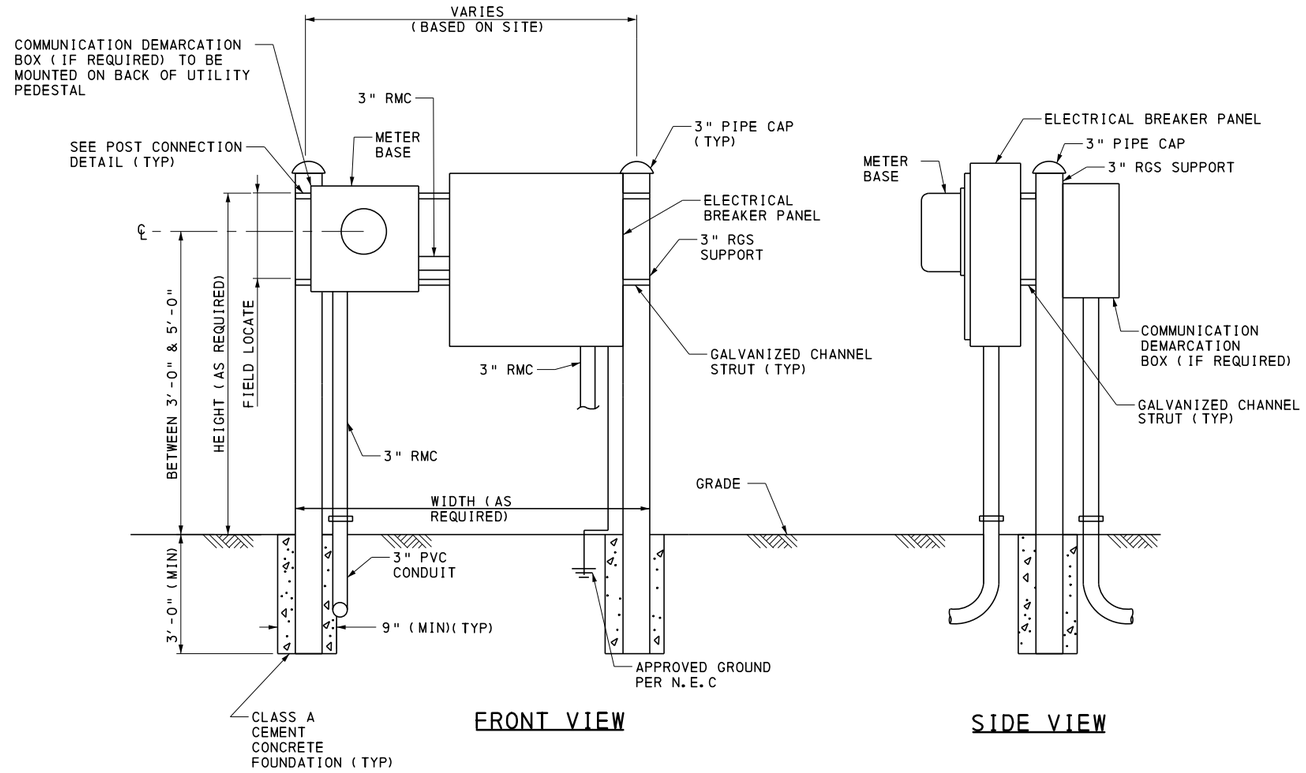
DEVICE GROUNDING

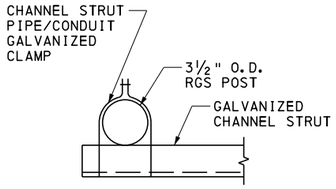
RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 1 OF 1 ITS-30



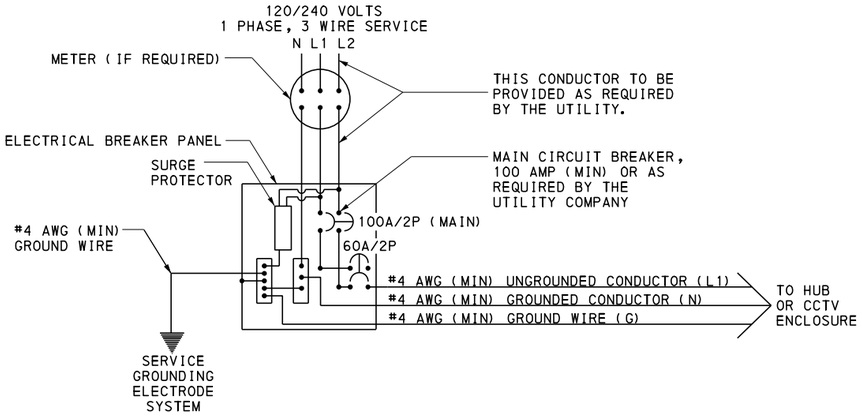
TYPICAL UTILITY PEDESTAL

GENERAL NOTES:

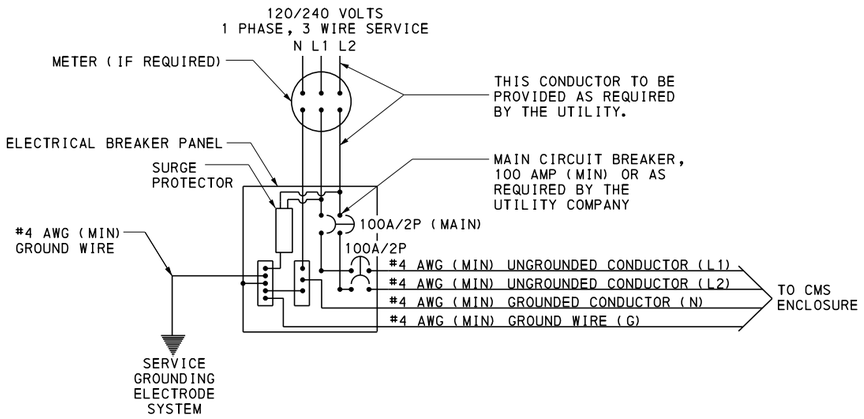
1. REFER TO PENNDOT PUB 852 - TSMO GUIDEBOOK, PART II: DESIGN, CHAPTER 3, DEVICE AND INFRASTRUCTURE DESIGN FOR POWER CONSIDERATIONS, POWER CONDITIONING, SOLAR POWER, OPTIONAL, AND UTILITY BILLING REQUIREMENTS.
2. USE RMC CONDUIT FROM BREAKER PANEL TO WITHIN 6" OF THE GROUND ON SERVICE POLE AND TRANSITION WITH A COUPLING TO PVC CONDUIT TO FIRST JUNCTION BOX.
3. METER BASE TO BE INSTALLED ON CHANNEL STRUT MOUNTED BETWEEN TWO 3" STEEL PIPES ENCASED IN CONCRETE AWAY FROM VEHICLE AND PEDESTRIAN TRAFFIC. THERE MUST BE 3' OF CLEAR WORKING SPACE IN FRONT OF THE METER.
4. THIS DRAWING DEPICTS A TYPICAL REMOTE-PEDESTAL MOUNT METER AND BREAKER PANEL. LOCAL UTILITY APPROVAL MUST BE OBTAINED.
5. PROVIDE LOCKING MECHANISM FOR THE ELECTRICAL BREAKER PANEL. COORDINATE WITH THE REPRESENTATIVE.
6. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.



POST CONNECTION DETAIL



DETAIL A

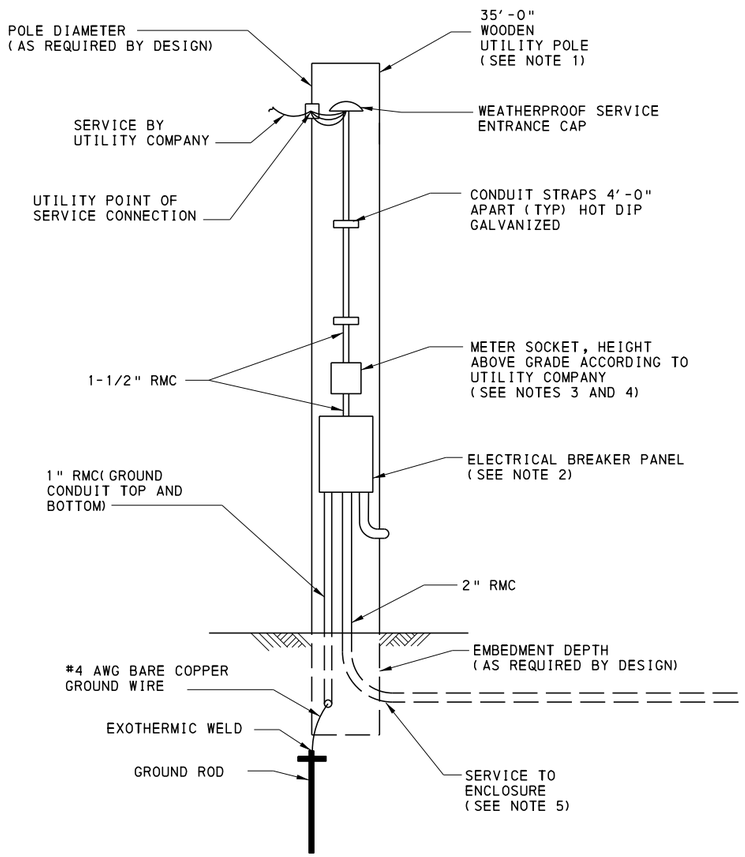


DETAIL B

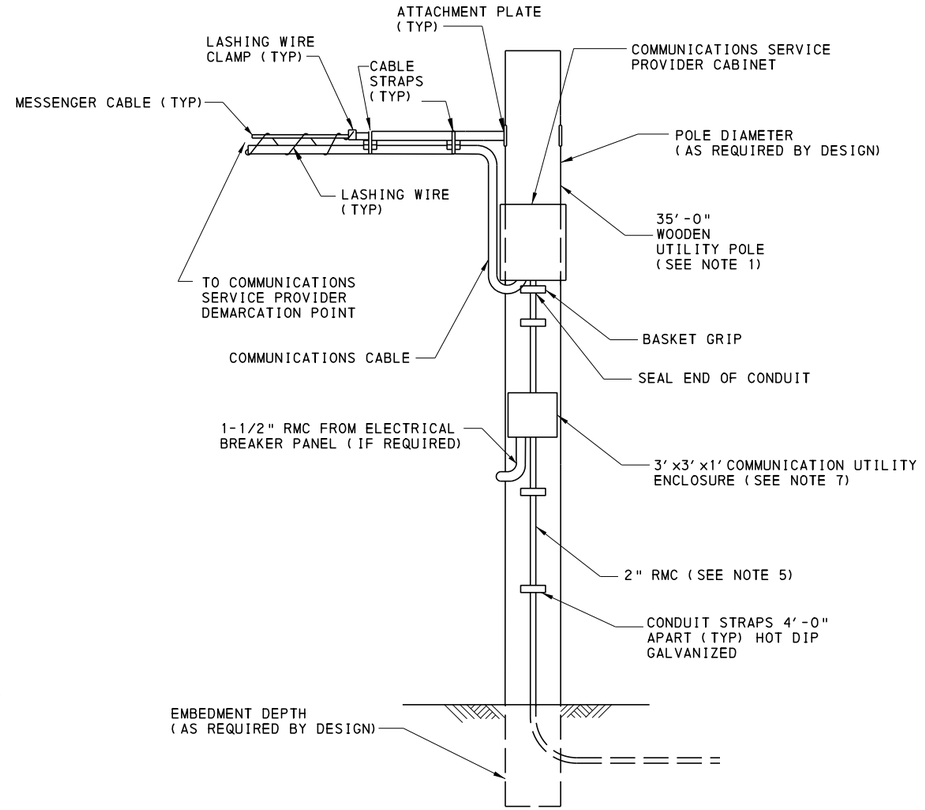
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

UTILITY SERVICE PEDESTAL

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 6
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-31



WOODEN UTILITY POLE ELEVATION
(FRONT VIEW)



WOODEN UTILITY POLE ELEVATION
(BACK VIEW)

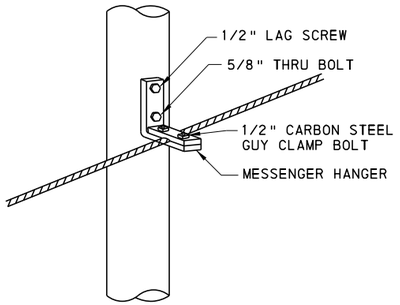
GENERAL NOTES:

1. USE A SINGLE WOODEN UTILITY POLE FOR BOTH ELECTRICAL AND COMMUNICATIONS SERVICE PROVIDERS.
2. ASSEMBLE IN A WAY TO BE SERVICE ENTRANCE RATED AND LABELED "BREAKER PANEL". PROVIDE LOCKING MECHANISM FOR ELECTRICAL BREAKER PANEL COORDINATE WITH THE REPRESENTATIVE.
3. INSTALL SO THAT METER PANEL FACES RIGHT OF WAY FENCE OR DIRECTION FROM WHICH THE UTILITY WILL APPROACH THE SERVICE.
4. INSTALLATION REQUIREMENTS MAY VARY BY UTILITY COMPANY. COORDINATE WITH UTILITY FOR INSTALLATION REQUIREMENTS.
5. TRANSITION FROM RMC TO PVC CONDUIT WITHIN 6" OF THE GROUND ON SERVICE POLE.
6. UTILITY POLE SHALL BE PLACED AS FAR FROM THE TRAVEL WAY AS PRACTICAL.
7. IF REQUIRED BY DESIGN, INSTALL COMMUNICATION UTILITY ENCLOSURE AFTER THE DEMARCATION POINT WITH POWER FOR TELECOMMUNICATIONS EQUIPMENT ON THE UTILITY POLE.

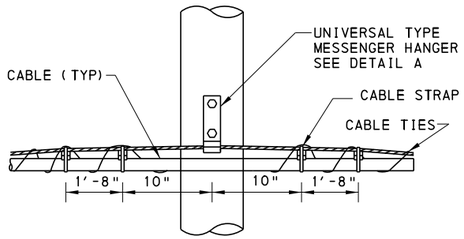
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

UTILITY SERVICE
WOODEN UTILITY POLE

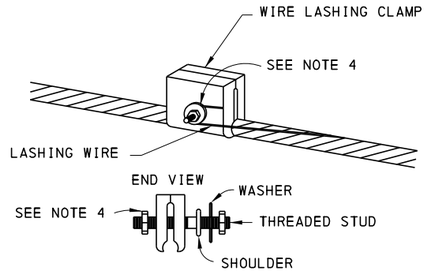
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 2 OF 6
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-31



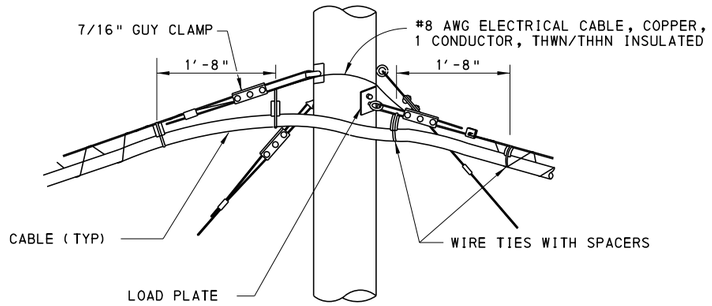
DETAIL A
TYPICAL POLE-SUPPORTED
MESSENGER INSTALLATION



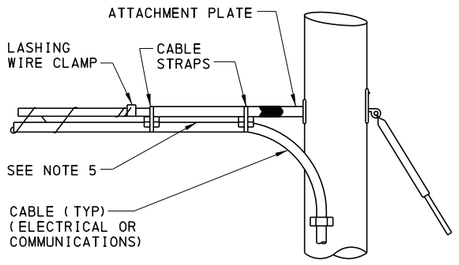
DETAIL B
TYPICAL SUPPORT AND
CABLE SPACERS



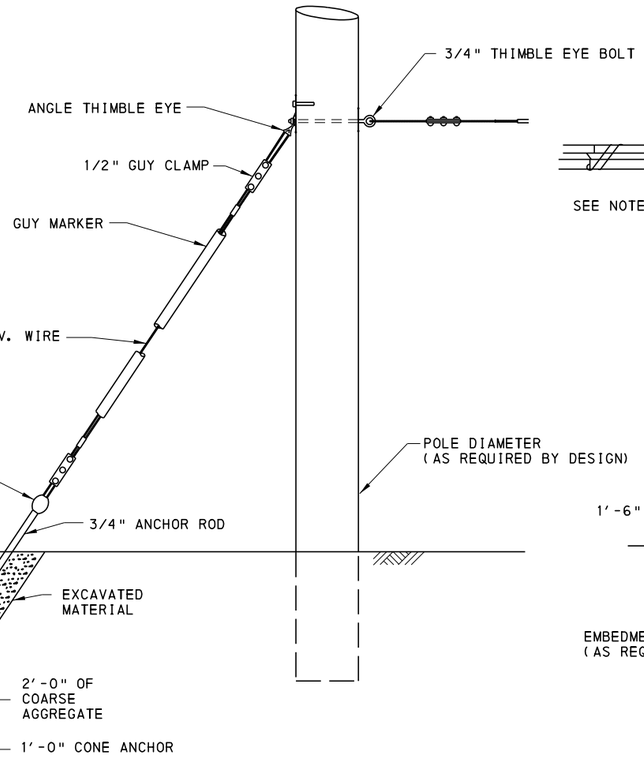
DETAIL C
LASHING WIRE TERMINATION



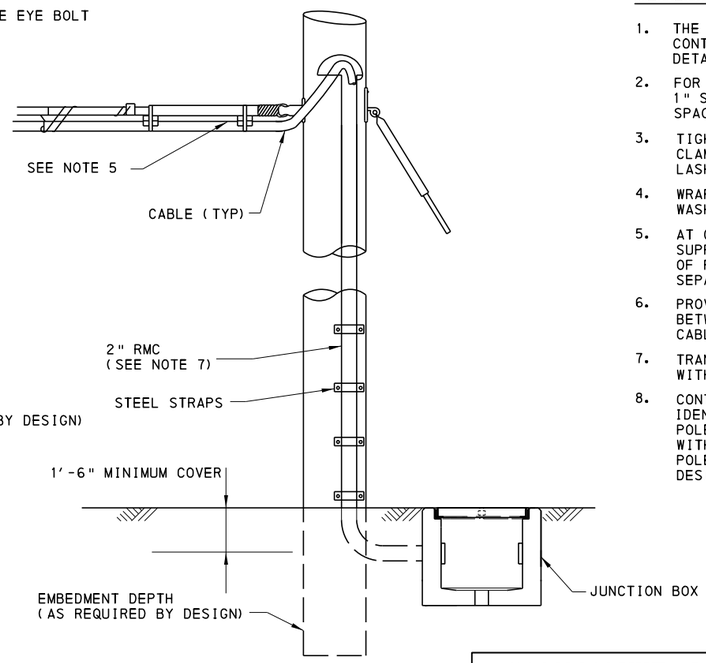
DETAIL D
LASHED CABLE SUPPORTS AND CABLE
SPACERS AT INSIDE CORNERS



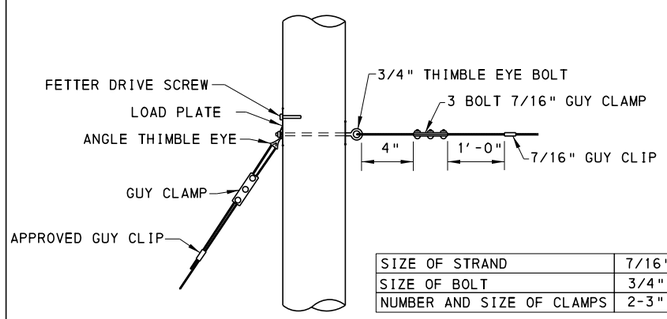
DETAIL E
TYPICAL LASHED CABLE AND
CABLE SPACERS AT END POLE



DETAIL G
DEAD-END POLE WITH ANCHORED GUY



DETAIL H
TRANSITION BETWEEN AERIAL
AND UNDERGROUND UTILITY RUNS



SIZE OF STRAND	7/16"
SIZE OF BOLT	3/4"
NUMBER AND SIZE OF CLAMPS	2-3" BOLT, HEAVY

DETAIL F
SUSPENSION STRAND DEAD-ENDING

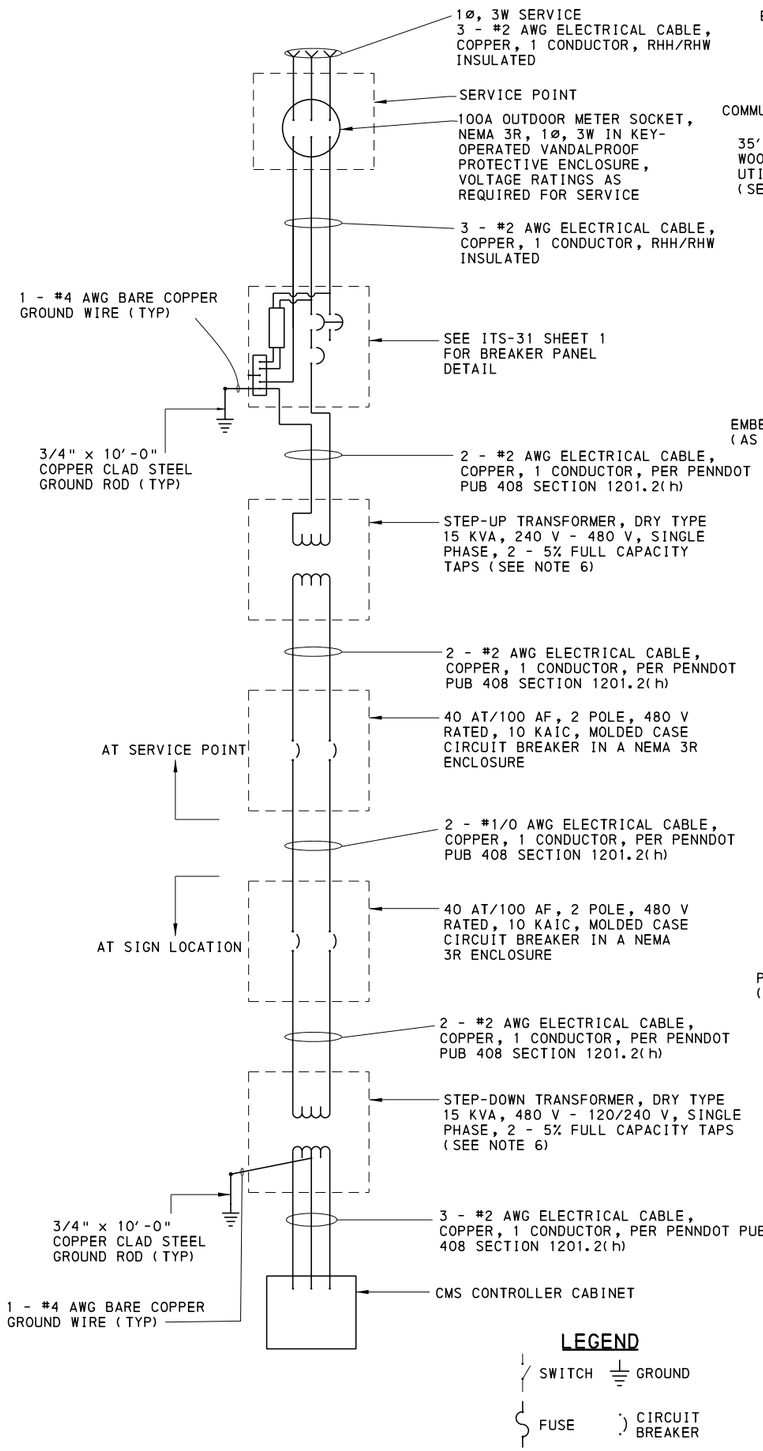
GENERAL NOTES:

1. THE REPRESENTATIVE WILL DIRECT THE CONTRACTOR REGARDING THE USE OF THESE DETAILS AT SPECIFIC LOCATIONS.
2. FOR SEPARATION OF CABLE AND STRAND USE 1" SPACERS 10" FROM CLAMP AND 1/2" SPACERS 2'-6" OUT FROM CLAMP.
3. TIGHTEN THIS NUT FIRST, SECURING THE CLAMP TO THE STRAND THEN CONNECT THE LASHING WIRE.
4. WRAP THE LASHING WIRE BETWEEN THE WASHER AND THE SHOULDER CLOCKWISE.
5. AT CABLE END POLES ARRANGE THE SUPPORTS AS SHOWN USING CABLE SPACER OF PROPER SIZE TO OBTAIN 1/2" SEPARATION FROM THE CABLE.
6. PROVIDE MINIMUM 2'-0" SEPARATION BETWEEN ELECTRICAL AND COMMUNICATIONS CABLES.
7. TRANSITION FROM RMC TO PVC CONDUIT WITHIN 6" OF GROUND ON SERVICE POLE.
8. CONTRACTOR TO PROVIDE A POLE IDENTIFICATION TAG THAT INCLUDES THE POLE NUMBER. DESIGNER TO COORDINATE WITH THE REPRESENTATIVE TO OBTAIN THE POLE NUMBER PRIOR TO COMPLETING DESIGN.

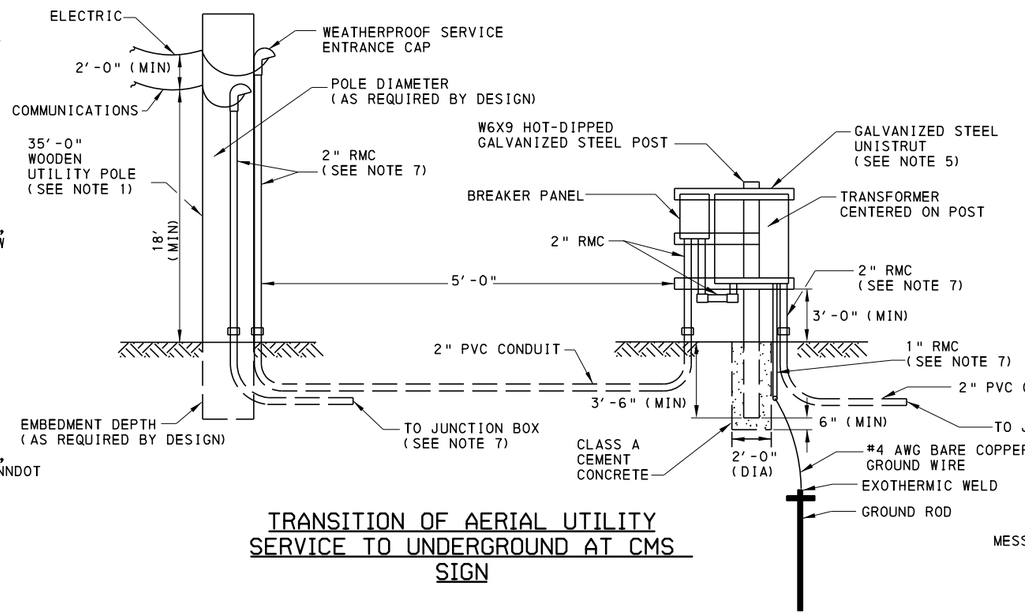
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

UTILITY SERVICE
ELECTRICAL
ATTACHMENTS AND SUPPORTS

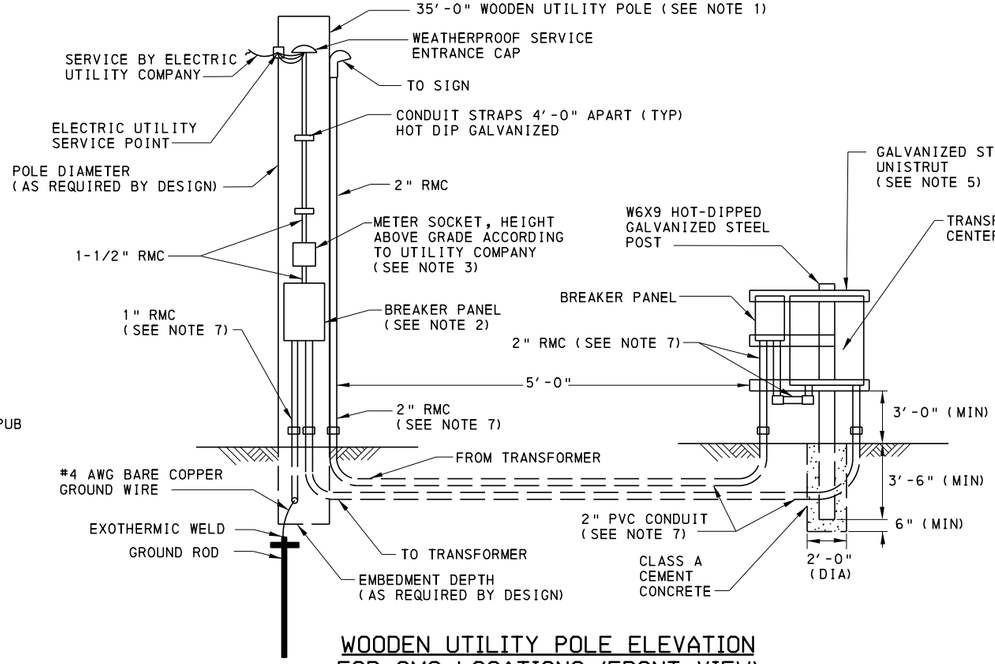
RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 3 OF 6 ITS-31



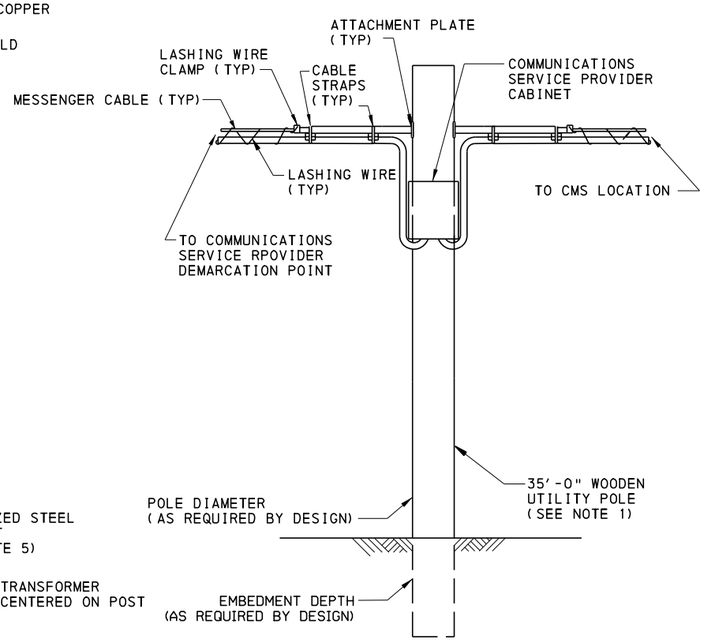
ELECTRICAL SERVICE SCHEMATIC FOR CMS LOCATIONS



TRANSITION OF AERIAL UTILITY SERVICE TO UNDERGROUND AT CMS SIGN



WOODEN UTILITY POLE ELEVATION FOR CMS LOCATIONS (FRONT VIEW)



WOODEN UTILITY POLE ELEVATION FOR CMS LOCATIONS (BACK VIEW)

GENERAL NOTES:

1. WHEN POSSIBLE USE A SINGLE WOODEN UTILITY POLE FOR BOTH ELECTRICAL AND COMMUNICATIONS SERVICE PROVIDERS.
2. ASSEMBLE IN A WAY TO BE SERVICE ENTRANCE RATED AND LABELED "BREAKER PANEL". PROVIDE LOCKING MECHANISM FOR ELECTRICAL BREAKER PANEL. COORDINATE WITH THE REPRESENTATIVE.
3. INSTALL SO THAT METER PANEL FACES RIGHT OF WAY FENCE.
4. ALL CABINET MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
5. BOLT UNISTRUT TO POST WITH 1/2" STAINLESS STEEL HARDWARE.
6. PROVIDE TRANSFORMERS AS NEEDED TO PROVIDE REQUIRED VOLTAGE. ADJUST TAPS ON TRANSFORMERS TO PROVIDE LESS THAN 3% VOLTAGE DROP AT SIGN CONTROL CABINET.
7. TRANSITION FROM RMC TO PVC CONDUIT WITHIN 6" OF THE GROUND ON SERVICE POLE.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
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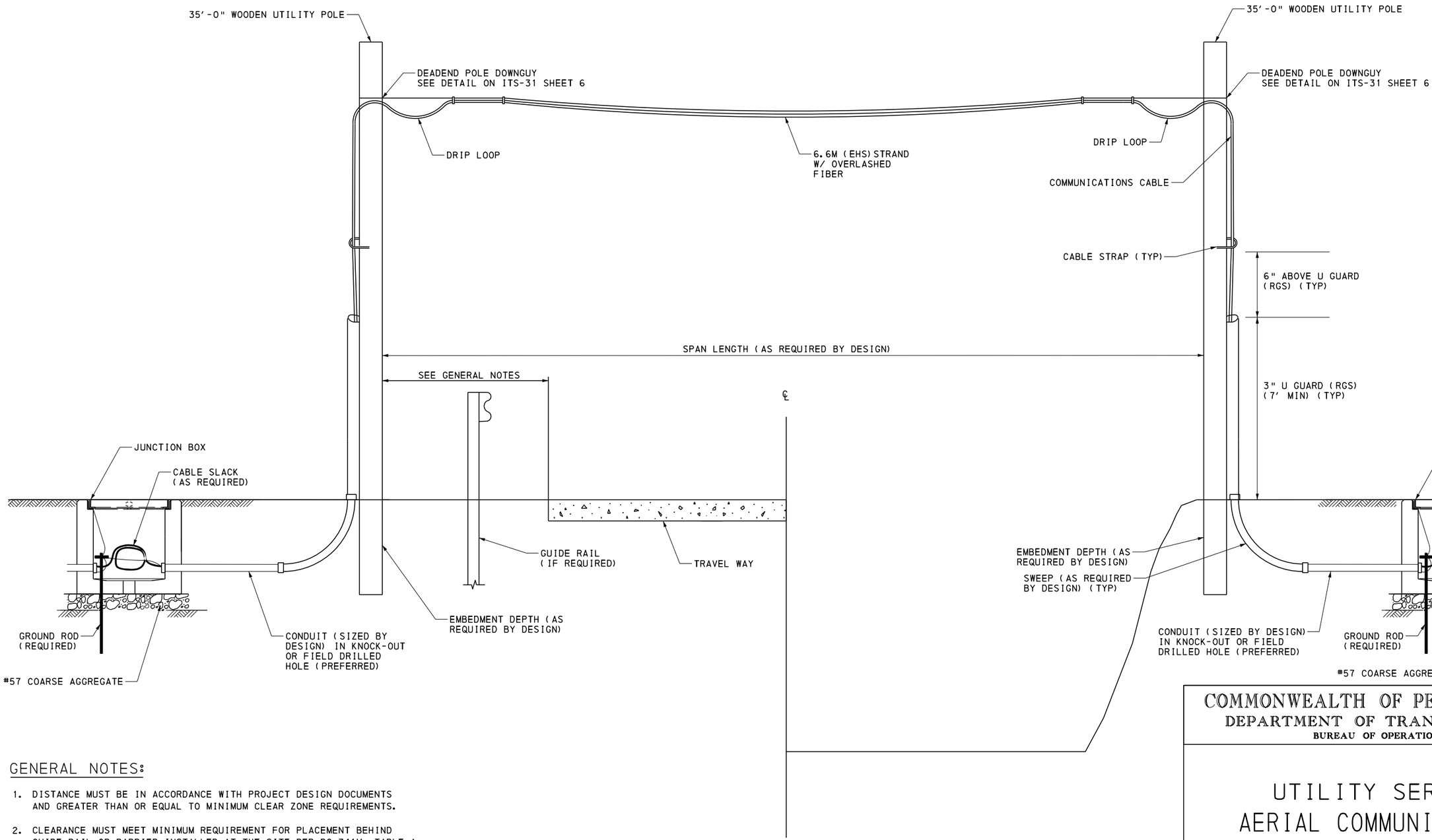
UTILITY SERVICE CMS LOCATIONS

RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 4 OF 6 ITS-31



GENERAL NOTES:

1. DISTANCE MUST BE IN ACCORDANCE WITH PROJECT DESIGN DOCUMENTS AND GREATER THAN OR EQUAL TO MINIMUM CLEAR ZONE REQUIREMENTS.
2. CLEARANCE MUST MEET MINIMUM REQUIREMENT FOR PLACEMENT BEHIND GUIDE RAIL OR BARRIER INSTALLED AT THE SITE PER BC-741M, TABLE A.
3. PLACE POLE BEHIND EXISTING BARRIER WHENEVER POSSIBLE.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
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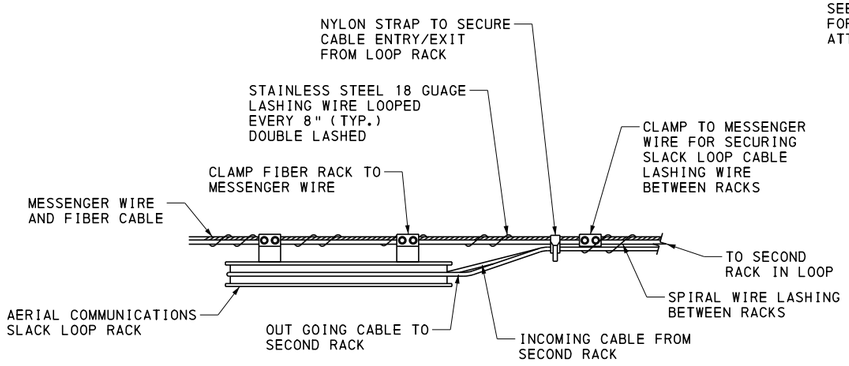
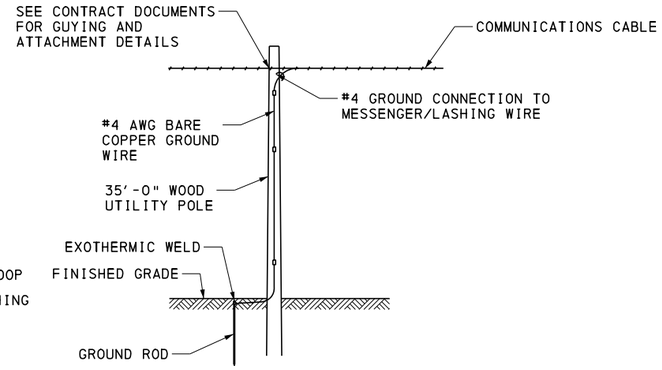
UTILITY SERVICE
AERIAL COMMUNICATIONS

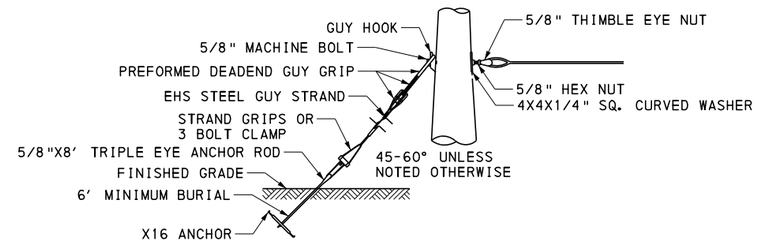
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 5 OF 6
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-31



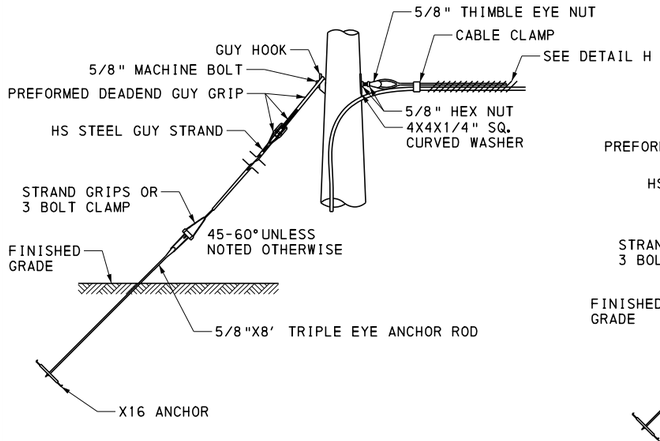
DETAIL A
COMMUNICATIONS SLACK LOOP



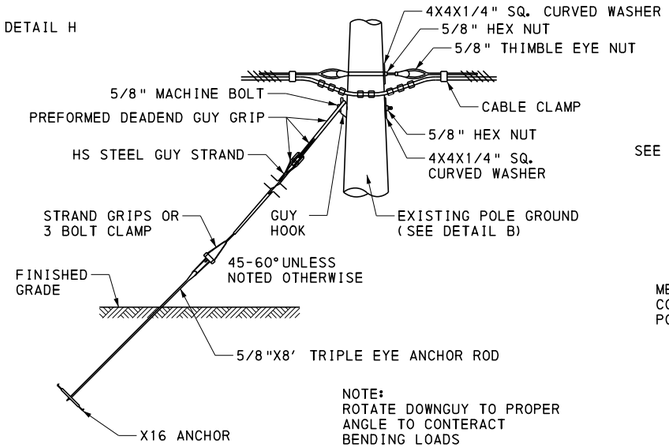
DETAIL B
POLE GROUNDING



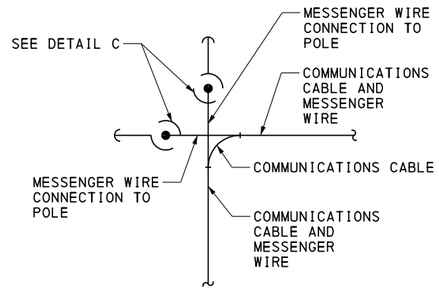
DETAIL C
DEAD END POLE - WITH MESSENGER ONLY



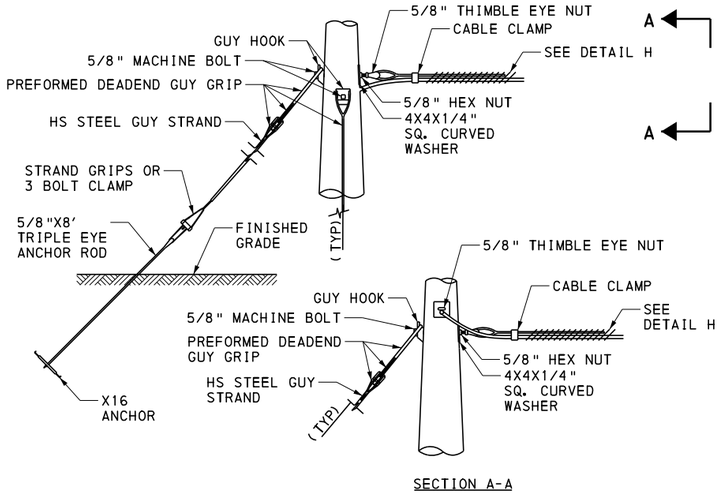
DETAIL D
DEADEND POLE DOWNGUY WITH COMMUNICATIONS



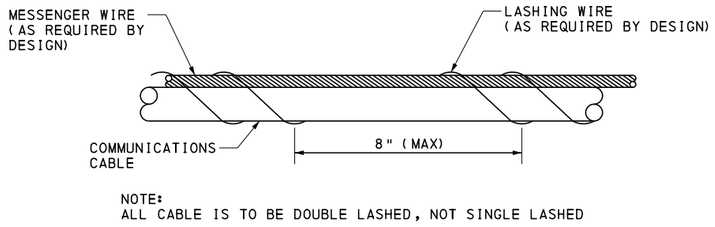
DETAIL E
FALSE DEADEND POLE DOWNGUY WITH COMMUNICATIONS



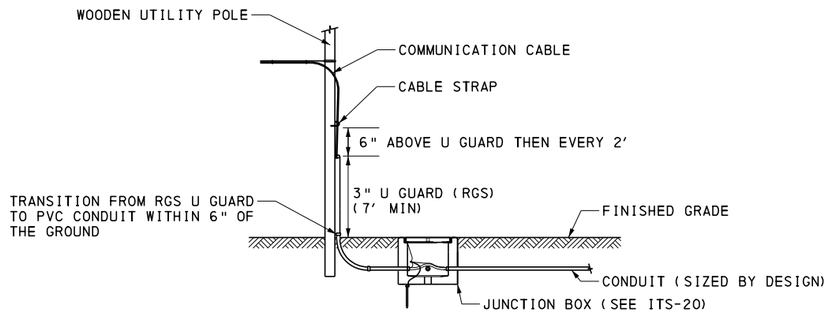
DETAIL F
CORNER/DEAD END POLE - DOWNGUY



DETAIL G
COMMON CORNER-DOWNGUY



DETAIL H
TYPICAL LASHING



DETAIL I
TYPICAL AERIAL/UNDERGROUND TRANSITION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

UTILITY SERVICE COMMUNICATIONS ATTACHMENTS AND SUPPORTS

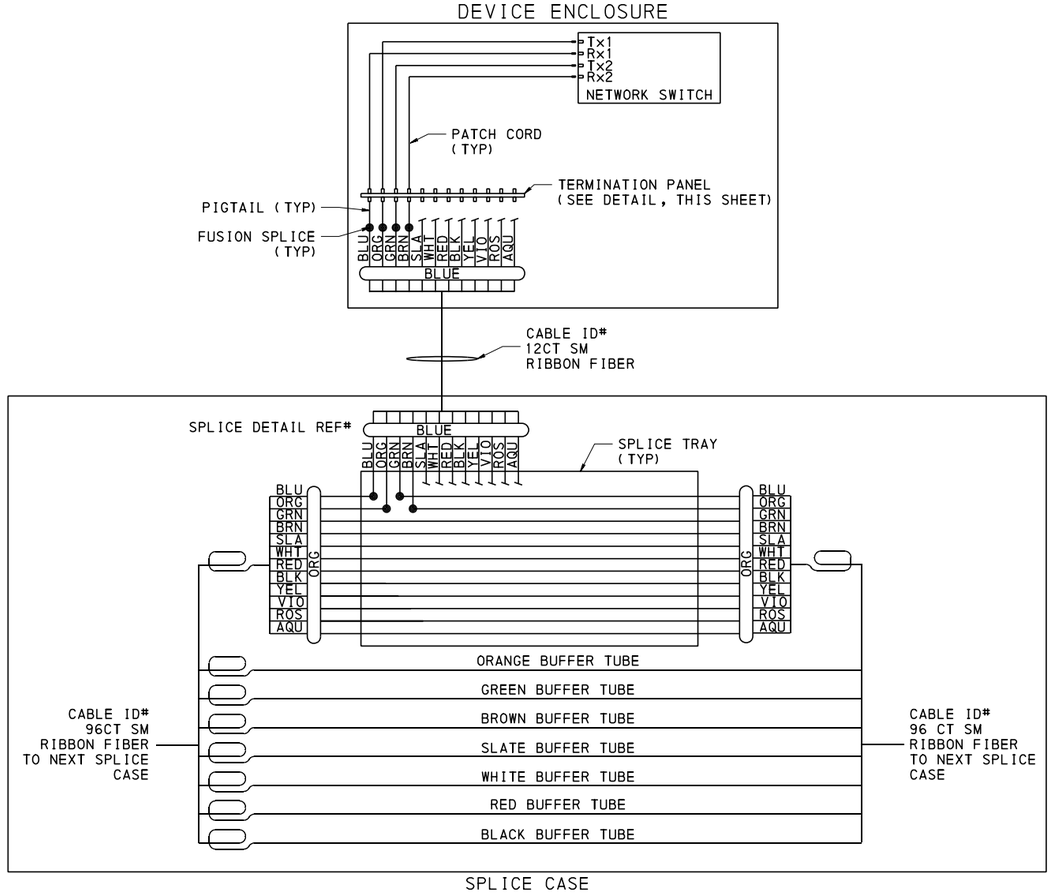
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 6 OF 6
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-31

NOTES:

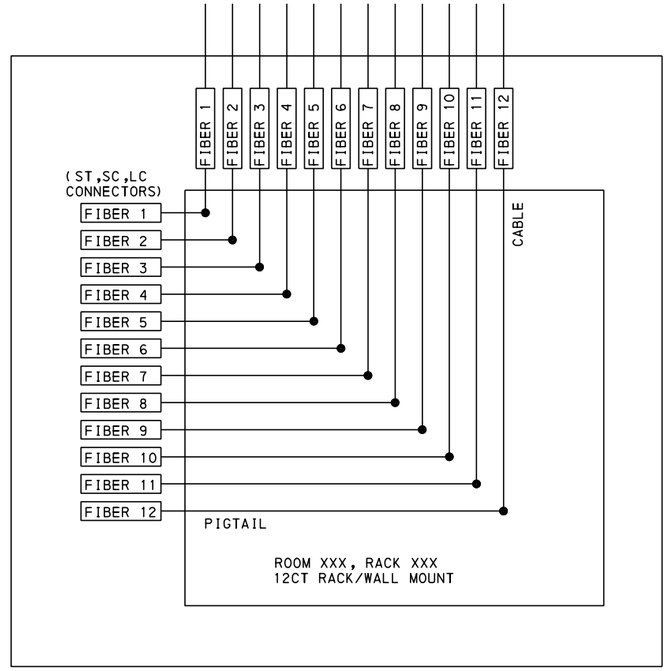
1. LEAVE 6-FOOT CABLE SLACK AT EACH CABLE SEGEMENT PROTRUDING OUTSIDE THE SPLICE ENCLOSURE (OR CROSSPATCH PANEL, AS APPLICABLE), AND COIL CABLE SLACK(S) NEATLY AROUND A TAKE-UP REEL/MECHANISM. FOR INSTALLATION INUNDERGROUND JUNCTION BOXES, THE LENGTH OF SLACK SHALL BE 100 FEET WITH 50 FEET AT EITHER SIDE OF THE SPLICE CASE.

2. LEAVE ALL BUFFER TUBES NOT BEING TERMINATED UNCUT; MAINTAIN CONTINUITY. ONLY PEEL BUFFER TUBES IN WHICH FIBERS ARE BEING TERMINATED. NEATLY COIL AND TIE THE BUFFER TUBE SLACKS WITH NYLON TIES, STORE IN SPLICE CASE.

3. LEAVE ALL FIBERS NOT BEING TERMINATED UNCUT; MAINTAIN CONTINUITY. NEATLY COIL AND TIE THE FIBER SLACKS WITH NYLON TIES, STORE IN SPLICE CASE. PROVIDE A MINIMUM OF 50 FEET OF SLACK FOR CABLEST THAT ARE NOT TERMINATED.



SAMPLE SPLICE DETAIL



TERMINATION PANEL DETAIL REF#

SAMPLE TERMINATION PANEL

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

SPLICE AND TERMINATION

RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 1 OF 1 ITS-32

INFORMATIONAL NOTES:

1. READ THESE NOTES BEFORE USING THESE STANDARDS.
2. USE THESE STANDARDS AS A BASIS FOR THE PREPARATION OF STRUCTURE LAYOUTS AND CONTRACT DRAWINGS.
3. ALL CCTV SUPPORTS LOCATED WITHIN THE CLEAR ZONE MUST BE SHIELDED WITH A CRASHWORTHY BARRIER, SEE TABLE A, BC-741M SHEET 2.
4. PROVIDE CRASHWORTHY BARRIER IN ACCORDANCE WITH PENNDOT PUBLICATION 13M (DM-2), CHAPTER 12 GUIDE RAIL, MEDIAN BARRIER AND ROADSIDE SAFETY DEVICES. USE OF GUIDE RAIL AND/OR CONCRETE BARRIER SHALL MEET APPLICABLE PENNDOT WARRANTS FOR INSTALLATION.

GENERAL NOTES:

1. PROVIDE 3-INCH CONCRETE COVER ON REINFORCEMENT BARS, EXCEPT AS NOTED.
2. USE CLASS A CEMENT CONCRETE f'c = 3000 PSI IN PEDESTALS, FOOTINGS AND CAISSONS.
3. PROVIDE GRADE 60 REINFORCING STEEL BARS THAT MEET THE REQUIREMENTS OF ASTM A615 FOR CONCRETE REINFORCEMENT. DO NOT WELD REINFORCING STEEL BARS.
4. RAKE-FINISH ALL HORIZONTAL CONSTRUCTION JOINTS, EXCEPT AS INDICATED.
5. VERIFY ALL DIMENSIONS AND GEOMETRY OF THE EXISTING STRUCTURES IN THE FIELD AS NECESSARY FOR PROPER FIT OF THE PROPOSED CONSTRUCTION.
6. CHAMFER EXPOSED CONCRETE EDGES 1 INCH BY 1 INCH.
7. ALL DIMENSIONS SHOWN ARE HORIZONTAL, EXCEPT AS NOTED.
8. DIMENSIONS ARE BASED ON A NORMAL TEMPERATURE OF 68 DEGREES F.
9. SPREAD FOOTINGS OR CAISSONS MAY BE ORDERED BY THE ENGINEER TO BE AT ANY ELEVATION OR OF ANY DIMENSIONS NECESSARY TO PROVIDE A PROPER FOUNDATION.
10. GALVANIZE ALL STRUCTURAL STEEL, BOLTS, NUTS, & WASHERS IN ACCORDANCE WITH PENNDOT PUBLICATION 408 UNLESS STAINLESS STEEL IS SPECIFIED OR OTHERWISE INDICATED.
11. PIPE DIAMETER UP TO AND INCLUDING 12 INCHES ARE NOMINAL DIAMETER. PIPE DIAMETER FROM 14 INCHES AND UP ARE ACTUAL DIAMETERS.
12. ALL BOLT HOLES SHALL BE DRILLED.
13. USE STANDARD SIZE HOLE. THE STANDARD HOLE DIAMETER FOR BOLTS SMALLER THEN 1" DIAMETER SHALL BE THE NOMINAL DIAMETER OF THE BOLTS PLUS 1/16". FOR BOLTS 1" DIAMETER AND LARGER, THE DIAMETER OF EACH STANDARD HOLE SHALL BE THE NOMINAL DIAMETER OF THE BOLTS PLUS 1/8".
14. PROVIDE ANCHOR BOLT HOLES 1/4" LARGER THAN BOLT DIAMETER.
15. DESIGN AND DETAIL ANCHOR BOLTS IN ACCORDANCE WITH ACI 318-11 AND AISC DESIGN GUIDE 1, 2ND EDITION. A MINIMUM EMBEDMENT LENGTH OF 20 ANCHOR BOLT DIAMETERS MUST BE PROVIDED.
16. PROVIDE 4 HEX NUTS, 2 WASHERS, AND 1 JAM NUT FOR EACH ANCHOR BOLT.
17. STEEL MEMBER COMPONENTS WITH THICKNESS GREATER THAN 1/2" REQUIRE CHARPY V-NOTCH TESTING AND ARE DESIGNATED ON THE PLANS BY (CVN). PROVIDE STEEL CONFORMING TO THE CVN REQUIREMENTS FOR ZONE 2, NON-FRACTURE CRITICAL AS GIVEN IN THE AASHTO MATERIAL SPECIFICATIONS.

LOWERING DEVICE NOTES:

1. POLE TOP TENON: A TENON SHALL BE BOLTED TO THE POLE TOP WITH MOUNTING HOLES AND SLOT AS REQUIRED FOR THE MOUNTING OF THE LOWERING DEVICE. THE TENON SHALL BE OF DIMENSIONS NECESSARY TO FACILITATE LOWERING DEVICE COMPONENT INSTALLATION.
2. PLACE THE LOWERING CABLE THAT MOVES WITHIN THE POLE IN AN INTERIOR CONDUIT TO PREVENT IT FROM INTERFERING WITH ANY ELECTRICAL WIRE THAT IS WITHIN THE POLE. ENSURE THAT ANY ELECTRICAL WIRE WITHIN THE POLE IS ROUTED SECURELY AND FREE FROM SLACK.
3. LOWERING ARM SHALL BE MOUNTED PERPENDICULAR TO THE ROADWAY OR AS DIRECTED BY THE DEPARTMENT'S REPRESENTATIVE. THE CCTV POLE SHALL BE POSITIONED SO THAT THE CAMERA CAN BE SAFELY LOWERED WITHOUT REQUIRING LANE CLOSURES.
4. POLE SHALL INCLUDE LOWERING DEVICE WHICH IS COMPRISED OF TOP JUNCTION BOX, MOUNTING HARDWARE, LOWERING CABLE, CONTACT BLOCK, WATERPROOF ELECTRICAL CONNECTORS, CAMERA J-BOX, HOUSING AND STEEL POLE.
5. FOR ADDITIONAL DETAILS AND NOTES, REFER TO ITS-41.

* LEGEND:

- AASHTO LRFD SIGN: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS"
- AASHTO LRFD BRIDGES: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
- DM4: PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, DESIGN MANUAL PART 4, STRUCTURES
- U.N.O.: UNLESS NOTED OTHERWISE
- ACI: AMERICAN CONCRETE INSTITUTE - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE WITH COMMENTARY (ACI 318-11)
- CVN: CHARPY V-NOTCH
- AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION - DESIGN GUIDE 1, BASE PLATE AND ANCHOR ROD DESIGN, 2ND EDITION
- CCTV: CLOSED CIRCUIT TELEVISION

DESIGN CRITERIA FOR CCTV CAMERA SUPPORT STRUCTURES:*

- EXTERNAL LOADS — AASHTO LRFD SIGN

BASIC WIND SPEED	STR/EXT 120 MPH (1700 YR MRI)
SERVICE WIND SPEED	SER 76 MPH (10 YR MRI)
MEAN WIND SPEED	FAT 11.2 MPH

- LOAD COMBINATIONS — AASHTO LRFD SIGN 3.4
- STEEL CRITERIA — AASHTO LRFD SIGN

SECTION PROPERTIES FOR TUBULAR SHAPES	APPENDIX B, TABLE B.2-1
COMBINED FORCE INTERACTIONS	5.12
FATIGUE REQUIREMENTS (FATIGUE CATEGORY II)	SECTION 11
ALLOWABLE DEFLECTION	10.4
PERMANENT CAMBER	10.5
STRUCTURAL STEEL DESIGN	SECTION 5

- BOLT CRITERIA — AASHTO LRFD BRIDGES (U.N.O.)

SLIP-CRITICAL BOLT	6.13.2.8
BOLT PRYING ACTION	6.13.2.10.4
COMBINED BOLT SHEAR AND TENSION	6.13.2.11
ANCHOR BOLT DESIGN	SEE NOTE 15

- CONCRETE CRITERIA — AASHTO LRFD BRIDGES & ACI 318-11

BEARING RESISTANCE	5.6.5
SHEAR RESISTANCE OF FOOTINGS	5.7.1.4
SHEAR RESISTANCE OF CONCRETE	5.7.1
SLENDERNESS OF COLUMNS	5.6.4.3
MINIMUM REINF. OF FLEXURAL MEMBERS	5.6.3.3
SPACING LIMITS FOR REINFORCEMENT	5.10.3
MINIMUM CONCRETE COVER	DM-4 D5.10.1
TORSION	5.7.2.1
COLUMN DESIGN (PEDESTALS)	5.6.4

- SPREAD FOOTINGS

MAXIMUM FACTORED BEARING RESISTANCE**	3 TONS PER SQUARE FOOT
MINIMUM AREA IN BEARING	95%
UNIT WEIGHT OF SOIL	100 POUNDS PER CUBIC FOOT
PRESSURES FOR ECCENTRICALLY LOADED FOOTINGS	DM-4 D10.6.1.4

** USE WHEN SITE SPECIFIC SOIL PARAMETERS ARE NOT AVAILABLE.

- DRILLED CAISSONS — DM4, SECTION 10.8

MAXIMUM DESIGN LATERAL DISPLACEMENT	0.5"
ANALYSES	PENNDOT COM624 OR L-PILE

- SEISMIC DESIGN CRITERIA

THE DESIGNER MUST CHECK THE ADEQUACY OF THE STRUCTURE WHEN SEISMIC LOADS ARE TO BE CONSIDERED.

CCTV POLE ATTACHMENT DESIGN DATA:

DESIGN THE POLE AND FOUNDATION FOR THE FOLLOWING ATTACHMENTS:

1. CAMERA SYSTEM (INCLUDES CAMERA AND INTERNAL CAMERA LOWERING DEVICE):
   - WEIGHT: 150 LBS
   - EPA: 3.25 FT²
   - OFFSET: 1.19 FT
2. TENON FOR LOWERING DEVICE (INCLUDES TENON AND ATTACHMENT PLATES):
   - WEIGHT: 110 LBS
   - EPA: 0.50 FT²
   - OFFSET: N/A
3. ENCLOSURE (54" HIGH X 30" WIDE X 18" DEEP):
   - WEIGHT: 350 LBS
   - EPA: 16.30 FT²
   - OFFSET: 140 FT
4. EPA = EFFECTIVE PROJECT AREA
   OFFSET = DISTANCE FROM CENTERLINE OF POLE

CONSTRUCTION GENERAL NOTES:

1. MATERIALS AND WORK:

   PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH CURRENT VERSIONS OF PENNDOT PUBLICATION 408, AASHTO/AWS D1.5, CONTRACT SPECIAL PROVISIONS AND AASHTO "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS". USE AASHTO/AWS D1.1 FOR WELDING NOT COVERED IN AASHTO/AWS D1.5.

2. PROVIDE STRUCTURAL STEEL CONFORMING TO THE FOLLOWING:

   PIPE COLUMNS: SEE PUBLICATION 408, SECTION 1210.2(n)

   ANGLES, SHAPES AND PLATES: AASHTO M270, GRADE 36 OR 50 / ASTM A709, GRADE 36 OR 50

3. ALTERNATE PRESS-BREAK MEMBERS:

   ALTERNATE PRESS-BREAK MEMBERS MUST HAVE THE EQUIVALENT STRENGTH OF THE MEMBER THEY ARE REPLACING. EQUIVALENT RADIUS FOR PRESS-BREAK MEMBERS IS MEASURED FROM THE CENTER OF THE MEMBER TO THE MID-POINT OF ANY CHORD OF THE MEMBER. MINIMUM THICKNESS OF PRESS-BREAK MEMBERS TO BE 5/16".

4. PROVIDE BOLTS CONFORMING TO THE FOLLOWING:

   ANCHOR BOLTS: ASTM F1554 GRADE 55 PER PUBLICATION 408, SECTION 1105.02(c)3

   BOLTS: ASTM F3125 GRADE A325 H.S. BOLTS, EXCEPT AS NOTED

5. DESIGN SPECIFICATIONS:

   AASHTO "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", 1ST EDITION, 2015 WITH CURRENT INTERIMS (UNLESS NOTED OTHERWISE); AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, 2017; PENNDOT DESIGN MANUAL - PART 4, DECEMBER 2019 EDITION.

6. ALL FILLET WELDS SHOWN ARE MINIMUM SIZE UNLESS NOTED OTHERWISE.

NOTES TO DESIGNER AND FABRICATOR:

1. PLACE THE FOLLOWING NOTE ON THE CONTRACT DRAWINGS - PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH SPECIFICATIONS, PUBLICATION 408 (INDICATE YEAR AND CHANGE NUMBER), AASHTO/AWS D1.5, AND CONTRACT SPECIAL PROVISIONS. USE AASHTO/AWS D1.1 FOR WELDING NOT COVERED IN AASHTO/AWS D1.5.
2. DESIGN CCTV POLE SUPPORT POLES AND FOUNDATIONS IN ACCORDANCE WITH PENNDOT PUBLICATION 408, SECTION 1210.2(n) AND AS SPECIFIED HEREIN.
3. PROVIDE BASE PLATES WITH A MINIMUM THICKNESS OF 3".
4. PROVIDE BOTTOM SHAFT SECTIONS WITH A 0.3125" MINIMUM THICKNESS.
5. PROVIDE BOTTOM SHAFT SECTIONS WITH A 11.25" MINIMUM DIAMETER.
6. PROVIDE A COMPLETE JOINT PENETRATION WELD FOR THE CONNECTION OF THE SHAFT TO THE BASE PLATE AS SPECIFIED IN THE AASHTO LRFD SIGN SPECIFICATIONS, TABLE 11.9.3.1-1, DETAIL 4.5.
7. ALUMINUM CCTV CAMERA SUPPORT POLES ARE NOT ALLOWED.
8. TELESCOPING (SLIP-FIT) FIELD SPLICES FOR CCTV CAMERA SUPPORT STRUCTURES ARE NOT PERMITTED FOR POLE HEIGHTS 50' OR LESS.
9. DESIGN THE CCTV CAMERA POLE SO THE POLE TIP DEFLECTION DOES NOT EXCEED 1-INCH IN A 30 MPH NON-GUST WIND.
10. AT A MINIMUM HANDHOLES SHALL BE DETAILED IN ACCORDANCE WITH BC-741M. LOWER HAND HANDHOLES MAY BE SIZED TO ACCOMMODATE CAMERA LOWERING DEVICE, AS PROVIDED HEREIN. PROVIDE CALCULATIONS FOR ALTERNATE SIZE OPENINGS.
11. STANDARD WEATHERPROOF ENTRANCE CAP SHALL BE IN ACCORDANCE WITH BC-741M FABRICATION DETAILS.
12. CCTV POLES TO BE SIZED AS REQUIRED BY DESIGN. STANDARD PENNDOT CCTV POLE HEIGHTS ARE 50 FEET AND 70 FEET. DETERMINE IF STANDARD HEIGHTS ARE APPLICABLE TO THE PROJECT PRIOR TO POLE SIZING THROUGH DESIGN.
13. STANDARD DRILLED CAISSON FOUNDATION DETAILS ARE PROVIDED HEREIN FOR 50 FEET AND 70 FEET CCTV POLE HEIGHTS USING THE DESIGN CRITERIA INDICATED.
14. THE DESIGNER IS PERMITTED TO PROVIDE ALTERNATE FOUNDATION DESIGN DETAILS FOR SITE SPECIFIC SOIL PARAMETERS.
15. FABRICATOR IS RESPONSIBLE FOR THE DESIGN OF THE POLE, BASE PLATE, AND ANCHOR BOLTS (INCLUDNG EMBEDMENT LENGTH).

REFERENCE DRAWINGS	
BC-736M	REINFORCEMENT BAR FABRICATION DETAILS
BC-741M	OVERHEAD SIGN STRUCTURES
ITS-10	ENCLOSURES
ITS-11	MAINTAINER PADS
ITS-12	EQUIPMENT LAYOUT AND WIRING DIAGRAM
ITS-21	CONDUIT
ITS-30	DEVICE GROUNDING
ITS-41	CCTV CAMERA LOWERING SYSTEM (INTERNAL)
RC-11M	CLASSIFICATION OF EARTHWORK FOR STRUCTURES
RC-51M	TYPE 31 STRONG POST GUIDE RAIL
RC-53M	TYPE 2 WEAK POST GUIDE RAIL
RC-54M	BARRIER PLACEMENT AT OBSTRUCTIONS
RC-58M	SINGLE FACE CONCRETE BARRIER
RC-80M	HIGHWAY LIGHTING CONVENTIONAL LIGHTING
RC-83M	HIGHWAY LIGHTING HIGH MAST LIGHTING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CCTV CAMERA SUPPORT STRUCTURE

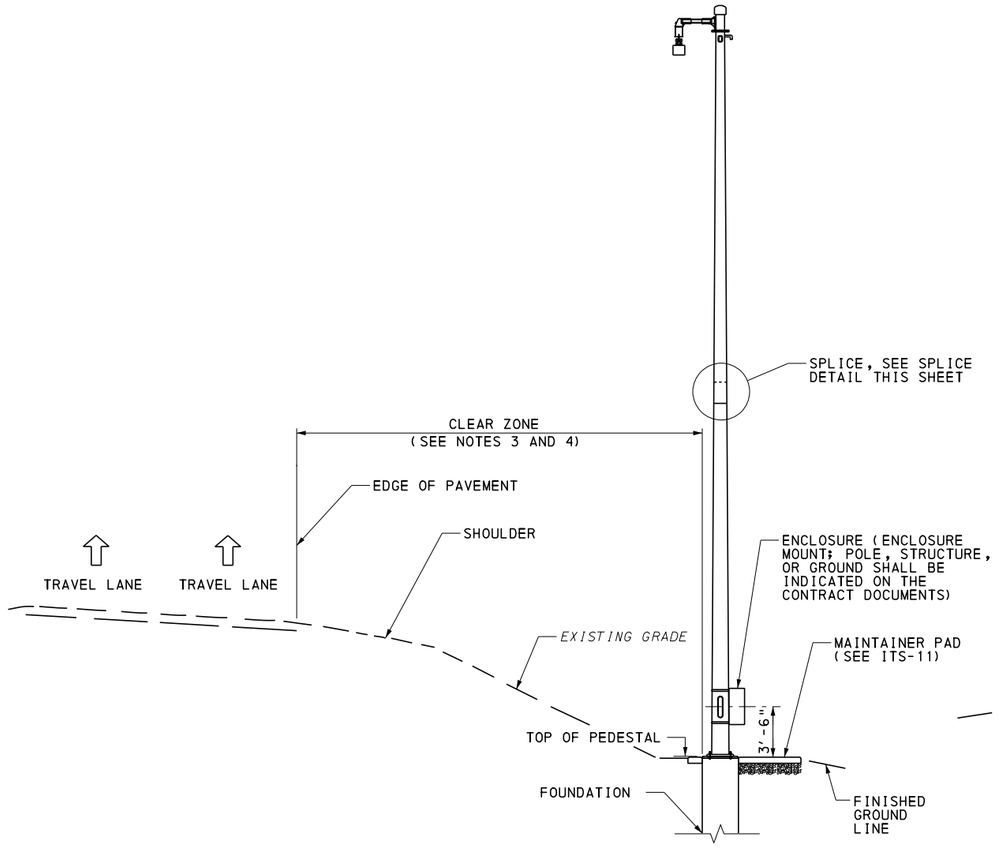
GENERAL NOTES

RECOMMENDED FEB. 20, 2024
CHIEF, TSMO ARTERIALS AND PLANNING SECTION

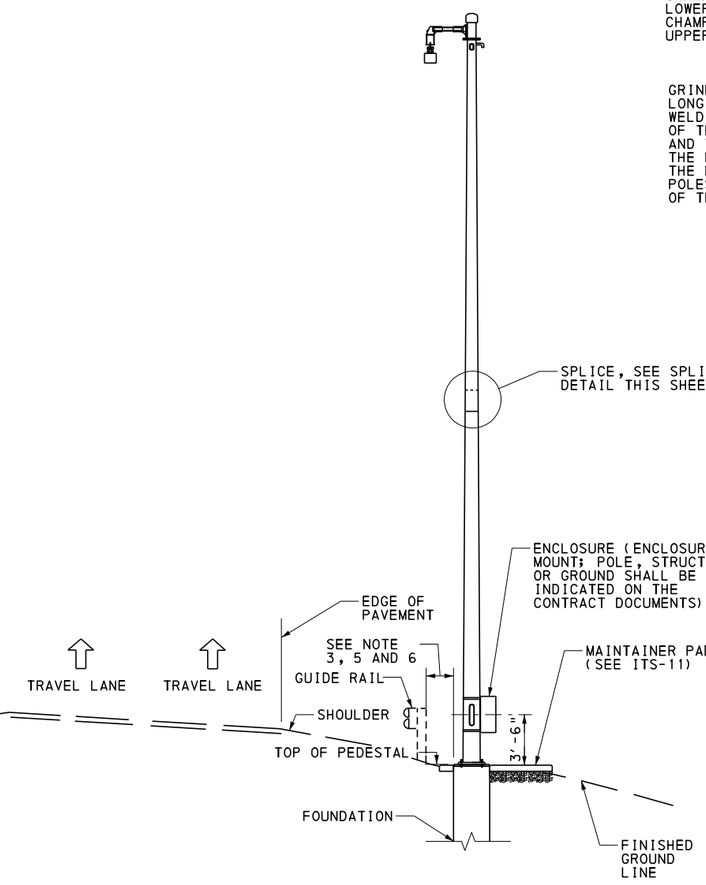
RECOMMENDED FEB. 20, 2024
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

GENERAL NOTES:

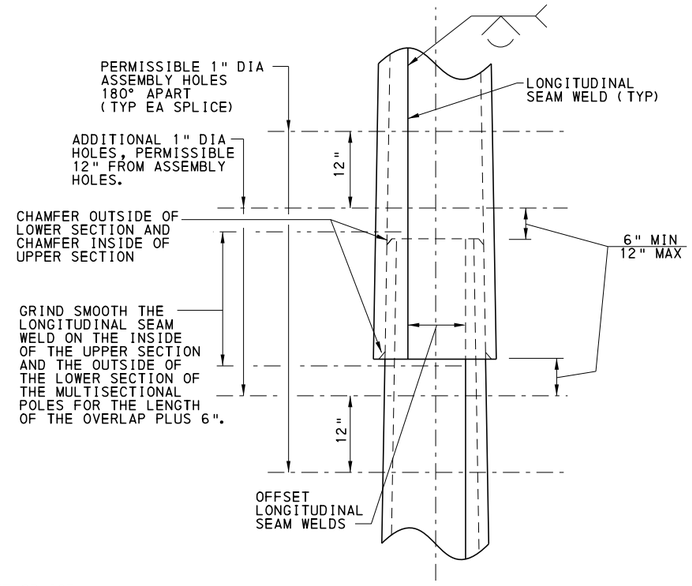
1. REFER TO PENNDOT PUBLICATION 852, TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) GUIDE BOOK PART II: DESIGN, CHAPTER 3 FOR DESIGN CONSIDERATIONS, LOCATION AND PLACEMENT GUIDELINES FOR CCTV SUBSYSTEM.
2. PROVIDE A CCTV SUBSYSTEM IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 1210.2.
3. CLEAR ZONE SHALL BE MEASURED TO THE EDGE OF THE FOUNDATION OR PEDESTAL.
4. DISTANCE MUST BE IN ACCORDANCE WITH PROJECT DESIGN DOCUMENTS AND GREATER THAN OR EQUAL TO MINIMUM CLEAR ZONE REQUIREMENTS.
5. CLEARANCE MUST MEET MINIMUM REQUIREMENT FOR PLACEMENT BEHIND GUIDE RAIL OR BARRIER INSTALLED AT THE SITE PER BC-741M, TABLE A.
6. PLACE CCTV POLE BEHIND EXISTING BARRIER WHENEVER POSSIBLE.
7. FOR DETAILS OF CCTV POLE ASSEMBLY, SEE SHEET 3.
8. FOR DETAILS OF CCTV POLE FOUNDATION, SEE SHEETS 4 AND 5.
9. FOR DETAILS OF CCTV LOWERING SYSTEM (INTERNAL), SEE ITS-41.
10. FOR DETAILS OF CCTV LOWERING SYSTEM (EXTERNAL), SEE ITS-42.
11. FOR DETAILS OF CCTV ENCLOSURE, SEE ITS-10 OR TC-8802. FOR CCTV ENCLOSURE LAYOUT AND WIRING DIAGRAM SEE ITS-12.
12. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF NFPA 70, NATIONAL ELECTRIC CODE AND ALL APPLICABLE CODES.



CCTV POLE PLACEMENT - TYPE A



CCTV POLE PLACEMENT - TYPE B



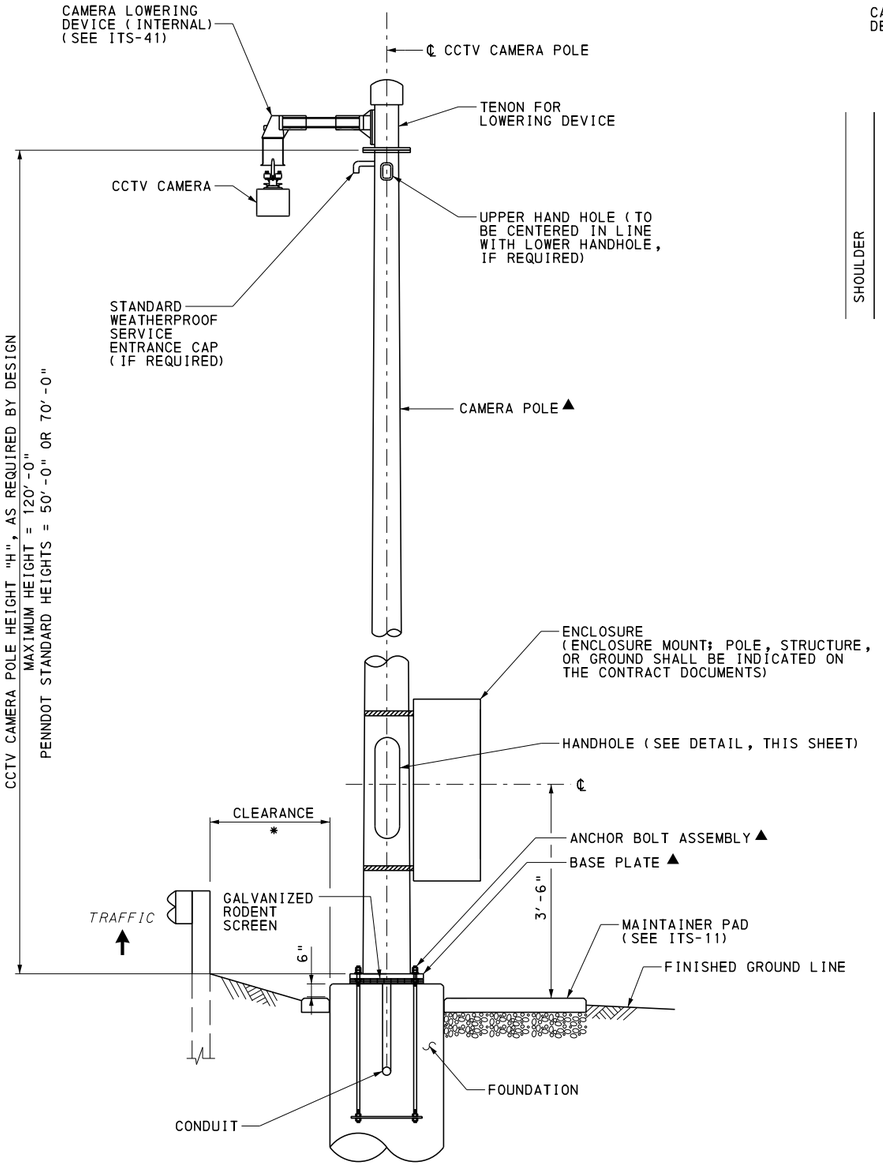
SPLICE DETAIL

(FOR POLES GREATER THAN 50'-0")

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CCTV CAMERA SUPPORT STRUCTURE
TYPICAL SITE LAYOUT AND PLACEMENT

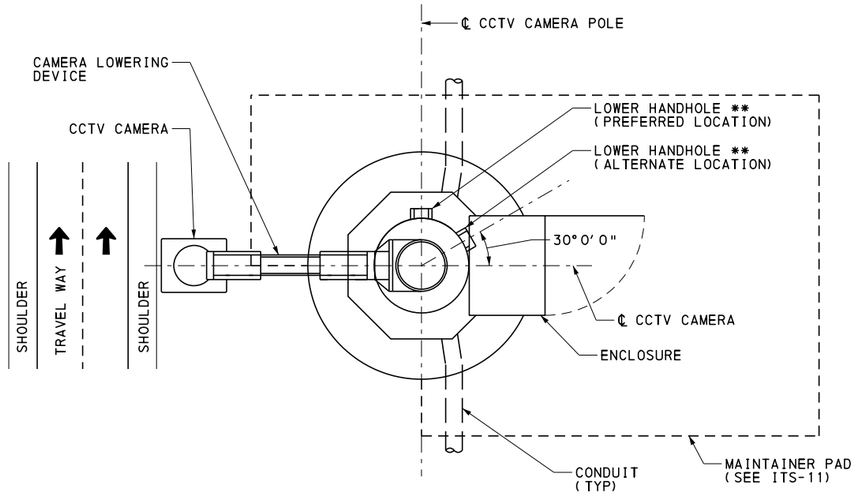
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 2 OF 5
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-40



CCTV CAMERA POLE ELEVATION

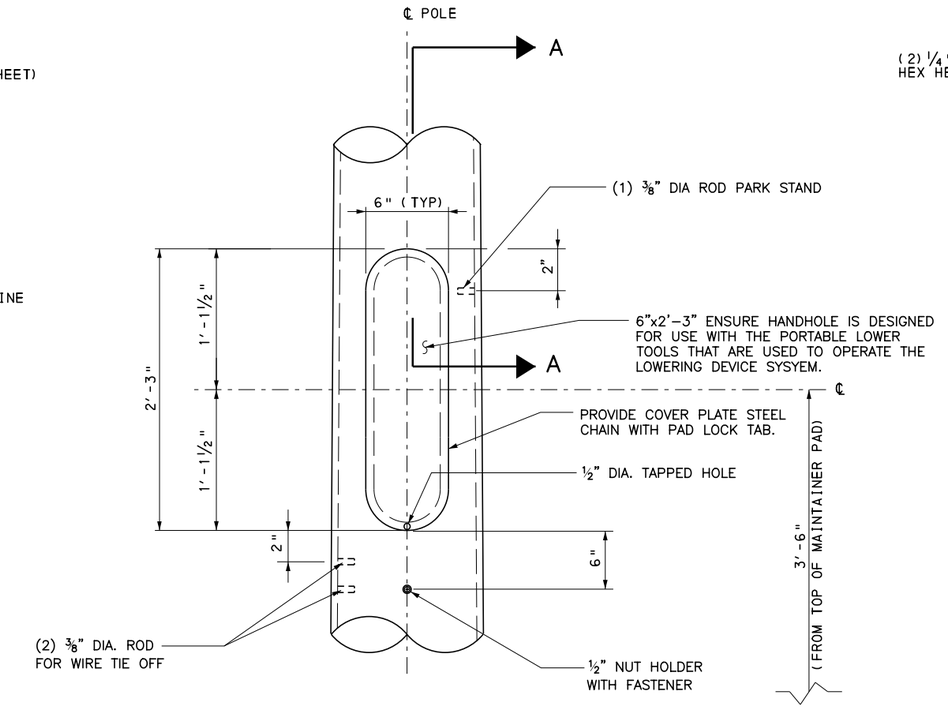
* SEE SHEETS 1 AND 2

▲ TO BE DESIGNED BY FABRICATOR

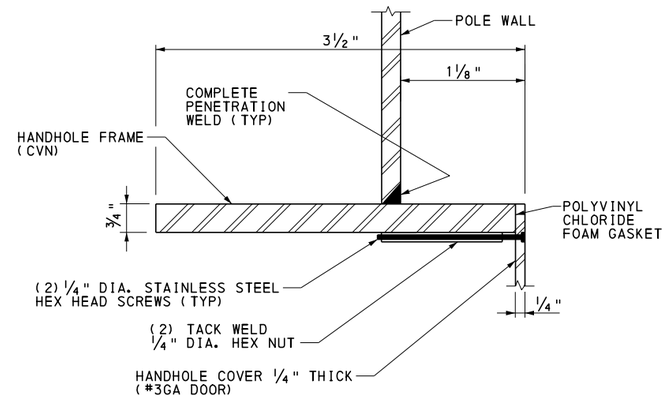


CCTV CAMERA POLE PLAN

** ENSURE LOWER HANDHOLE DOES NOT CONFLICT WITH ENCLOSURE OR ENCLOSURE ATTACHMENTS.



HANDHOLE DETAIL



SECTION A-A

GENERAL NOTES:

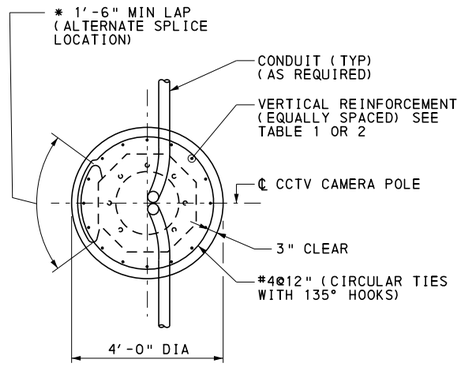
1. PROVIDE CCTV SUPPORT (POLE) IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 1210.2(n).
2. PRIOR TO INSTALLING THE CCTV MOUNTING BRACKET, OBTAIN APPROVAL FROM THE REPRESENTATIVE SO THE CCTV CAMERA FIELD OF VISION CAN BE VERIFIED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CCTV CAMERA SUPPORT STRUCTURE

POLE ASSEMBLY

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 3 OF 5
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-40



DRILLED CAISSON PLAN

TABLE 1
DRILLED CAISSON DESIGN DATA
CAISSON ON LEVEL GROUND

POLE HEIGHT	SHAFT DIAMETER	SHAFT LENGTH	VERTICAL REINFORCEMENT	
FT	FT	FT	QUANTITY	SIZE
50	4	14	16	8
70	4	17	16	8

TABLE 2
DRILLED CAISSON DESIGN DATA
CAISSON ON 2:1 MAX SLOPE

POLE HEIGHT	SHAFT DIAMETER	SHAFT LENGTH	VERTICAL REINFORCEMENT	
FT	FT	FT	QUANTITY	SIZE
50	4	17	16	8
70	4	21	16	8

DRILLED CAISSON NOTES:

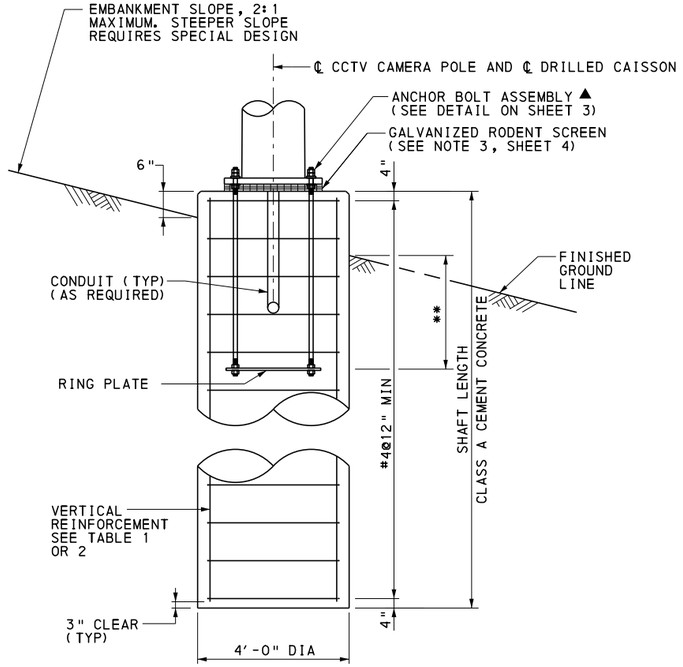
1. CONTACT THE STRUCTURE CONTROL ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:
   A) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
   B) THE SITE WILL NOT SUPPORT THE WEIGHT OF THE DRILLING RIG.
   C) FIRM BEDROCK IS ENCOUNTERED.
2. CONSTRUCT DRILLED CAISSONS AS SPECIFIED IN PUBLICATION 408, SECTION 1006.3.
3. IF THE MINIMUM DRILLED CAISSON FOUNDATION OF 4'-0" CANNOT BE OBTAINED, AN ALTERNATE DESIGN MAY BE SUBMITTED TO THE REPRESENTATIVE FOR APPROVAL.
4. FOR ADDITIONAL NOTES, SEE SHEET 5.

DESIGN CRITERIA FOR DRILLED CAISSONS:

THE FOUNDATION DESIGN IS BASED ON THE FOLLOWING SOIL PARAMETERS:

MAXIMUM FACTORED BEARING RESISTANCE	3 TONS PER SQUARE FOOT
UNIT WEIGHT OF SOIL	70 POUNDS PER CUBIC FOOT
ANGLE OF INTERNAL FRICTION	25 DEGREES
COHESION	0 KIPS PER SQUARE FOOT
MAXIMUM DESIGN LATERAL DISPLACEMENT	0.5 INCHES
MODULUS OF SUBGRADE REACTION, K	25 LB/IN³

AN ANALYSIS IS REQUIRED IF ENCOUNTERED SOIL CONDITIONS ARE DIFFERENT.



DRILLED CAISSON ELEVATION

(MAINTANER PAD NOT SHOWN)

LEGEND:

* TIE HOOKS TO ENGAGE VERTICAL REINFORCEMENT

** FORM 3'-0" BELOW GROUND LINE. BELOW THIS POINT, PLACE CONCRETE AGAINST NATURAL GROUND.

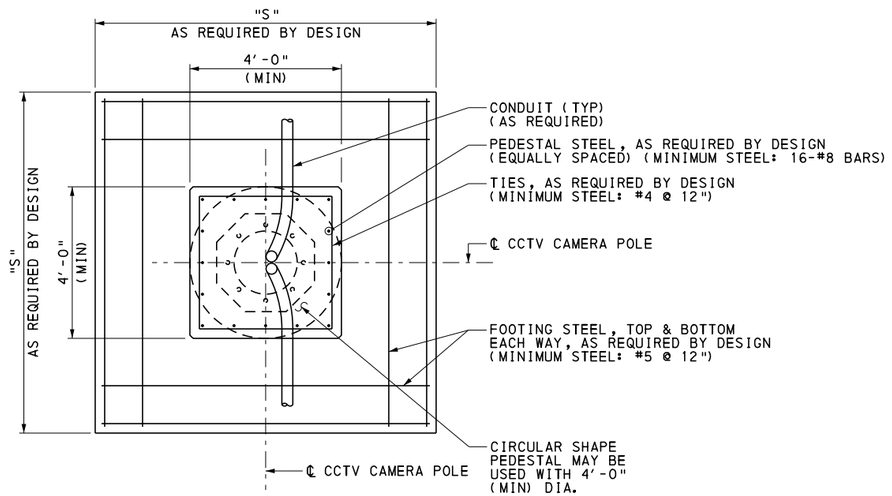
▲ TO BE DESIGNED BY FABRICATOR

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

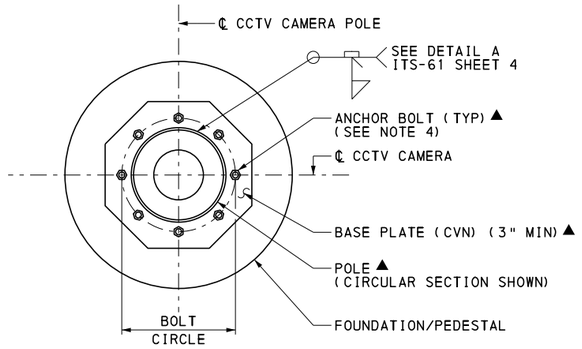
CCTV CAMERA SUPPORT STRUCTURE

FOUNDATION DETAILS - 1

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 4 OF 5
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-40



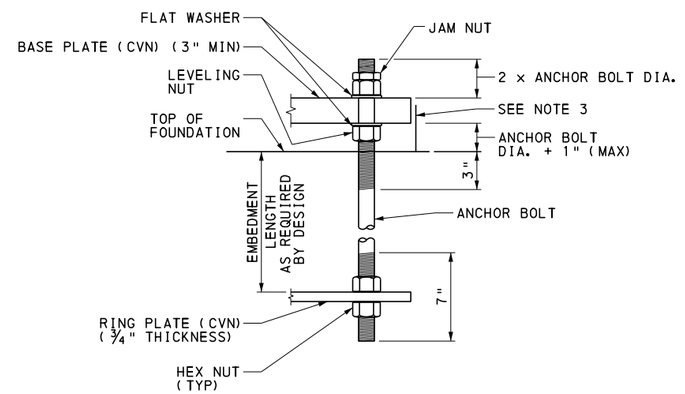
SPREAD FOOTING PLAN ▲▲



POLE BASE PLATE DETAIL

SPREAD FOOTING ELEVATION ▲▲

(MAINTANER PAD NOT SHOWN)



ANCHOR BOLT ASSEMBLY ▲

GENERAL NOTES:

1. PROVIDE CCTV SUPPORT FOUNDATION IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION, 1210.2(o).
2. FOR GROUNDING DETAILS, SEE ITS-30.
3. SEAL BASE PLATE TO FOUNDATION GAP WITH GALVANIZED STEEL SCREEN, ⅜" BY ⅜" MESH AND 0.045" DIAMETER WIRES. SCREEN IS TO PREVENT ENTRY OF RODENTS WHILE PERMITTING DRAINAGE. SCREEN IS TO BE REMOVABLE AND ATTACHED TO BASE PLATE WITH STAINLESS STEEL HARDWARE.
4. AN EIGHT ANCHOR BOLT CONFIGURATION IS PREFERRED FOR SYMMETRY FOR POLE HEIGHTS GREATER THAN 50'-0". HOWEVER, A MINIMUM OF SIX ANCHOR BOLTS IS REQUIRED FOR POLE HEIGHTS LESS THAN 50'-0". IF A SIX BOLT CONFIGURATION IS PROVIDED, THE ANCHOR BOLT PATTERN SHALL BE ORIENTED TO MEET THE POLE ORIENTATION REQUIREMENTS SPECIFIED HEREIN.
5. GALVANIZE ANCHOR BOLTS IN ACCORDANCE WITH PENNDOT PUBLICATION 408, SECTION 1105.02(s).
6. TIE TOP AND BOTTOM MATS OF REINFORCING STEEL WITH #4 BARS AT A MAXIMUM SPACING OF 4'-0" IN BOTH DIRECTIONS. PROVIDE TIE BARS WITH 90 DEGREE HOOK AT ONE END AND 135 DEGREE HOOK AT THE OTHER END. ALTERNATE 90 DEGREE AND 135 DEGREE HOOKS AT TOP IN ALTERNATE TIES.
7. REGRADE/STABILIZE THE CCTV SITE TO PROVIDE FINISHED GROUND LINE THAT WILL ALLOW FOR NO SOIL INTRUSION INTO THE POLE BASE.

LEGEND:

▲ TO BE DESIGNED BY FABRICATOR

▲▲ ALTERNATE FOUNDATION TYPE TO BE DESIGNED AND DETAILED ON THE CONTRACT DRAWINGS (IF REQUIRED)

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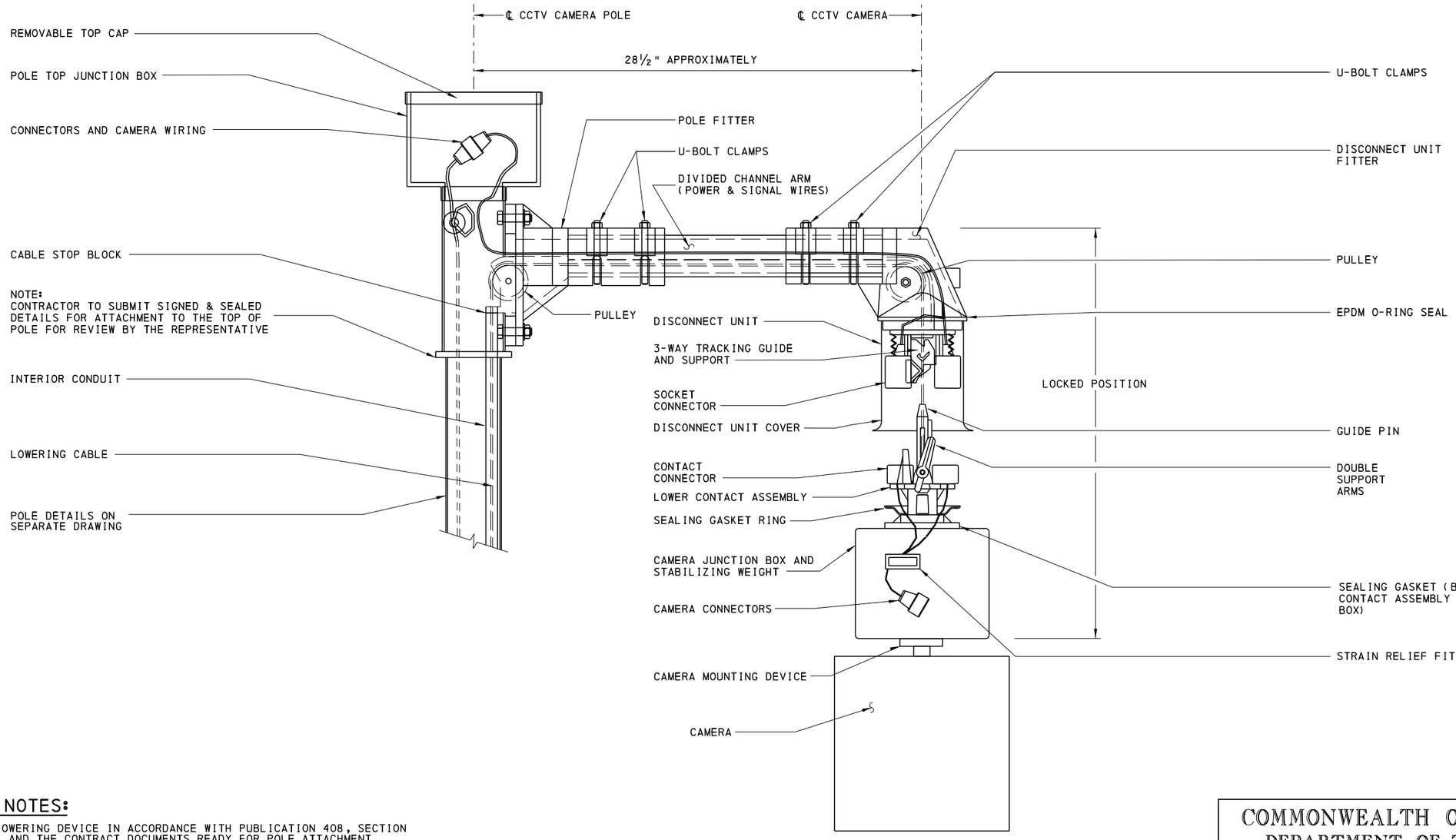
CCTV CAMERA SUPPORT STRUCTURE

FOUNDATION DETAILS - 2

RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 5 OF 5 ITS-40



GENERAL NOTES:

1. PROVIDE LOWERING DEVICE IN ACCORDANCE WITH PUBLICATION 408, SECTION 1210.2(e) AND THE CONTRACT DOCUMENTS READY FOR POLE ATTACHMENT. INCLUDE 100' OF COMPOSITE POWER AND SIGNAL CABLE PREWIRED TO LOWERING DEVICE AT THE FACTORY.
2. LOWERING DEVICE TO BE INSTALLED ON ALL POLES GREATER THAN OR EQUAL TO 50 FEET. A LOWERING DEVICE IS NOT REQUIRED FOR POLES LESS THAN 50 FEET UNLESS OTHERWISE SPECIFIED.
3. LOWERING DEVICE TO BE 15 FEET LONGER THAN THE DESIGNED HEIGHT OF THE POLE TO ALLOW CAMERA MAINTENANCE AT THE ENCLOSURE. LOWERING DEVICE CABLE LENGTH TO BE REVIEWED DURING DESIGN.
4. PROVIDE LOWERING TOOL IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 1210.2(e). ALSO PROVIDE A PORTABLE LOWERING TOOL WITH A MANUAL HAND CRANK.
5. THE LOWERING DEVICE MANUFACTURER SHALL PROVIDE TESTING AND INSTRUCTION AS SPECIFIED IN PENNDOT PUBLICATION 408 SECTION 1201.3(b)9.

TYPICAL CAMERA & LOWERING ARM DETAIL

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
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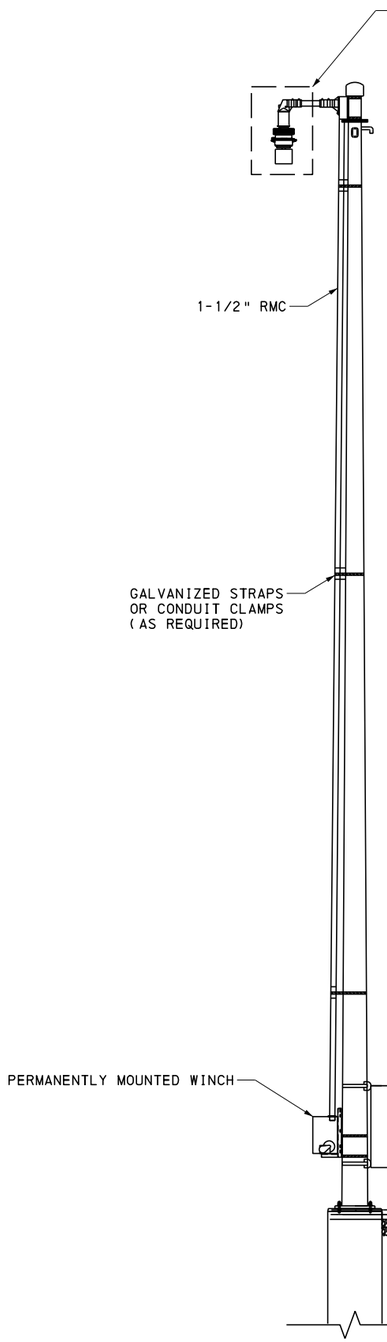
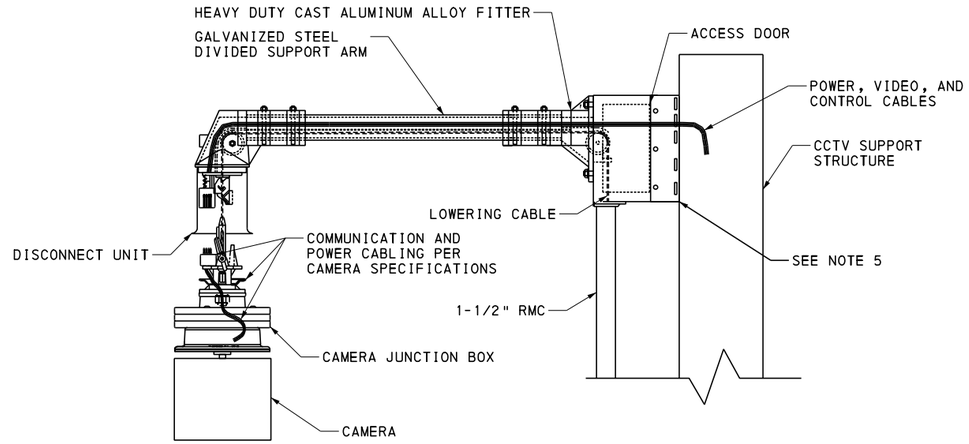
CCTV CAMERA LOWERING SYSTEM (INTERNAL)

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-41



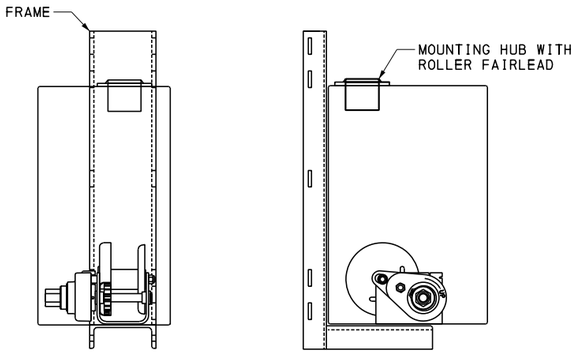
EXTERNAL MOUNT CAMERA
LOWERING DEVICE



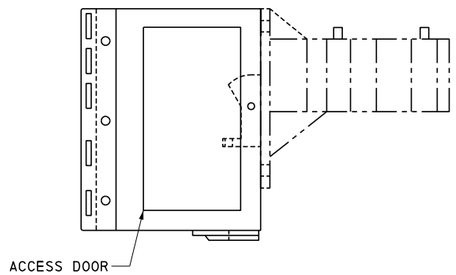
EXTERNAL MOUNT CAMERA
LOWERING DEVICE

LOWERING DEVICE NOTES:

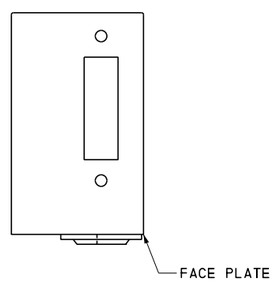
1. METAL COMPONENTS OF EXTERNAL LOWERING DEVICE TO BE POWDER COATED GALVANIZED STEEL.
2. ALL EQUIPMENT TO BE WEATHER PROOFED.
3. CONDUIT AND CABLING TO BE SIZED BASED ON CAMERA MANUFACTURERS SPECIFICATIONS.
4. CONTRACTOR TO PROVIDE APPLICABLE BOX MOUNTED HARDWARE AND ADAPTERS FOR MOUNTING BOX AND WINCH TO STRUCTURE.
5. CONTRACTOR TO SUBMIT SIGNED AND SEALED DETAILS FOR ATTACHMENT OF EXTERNAL LOWERING DEVICE TO THE SUPPORT STRUCTURE FOR REVIEW BY THE REPRESENTATIVE.



EXTERNAL MOUNT CAMERA
PERMANENT WINCH BOX



SIDE VIEW



FRONT VIEW

EXTERNAL MOUNT CAMERA
UNIVERSAL STRAP MOUNT

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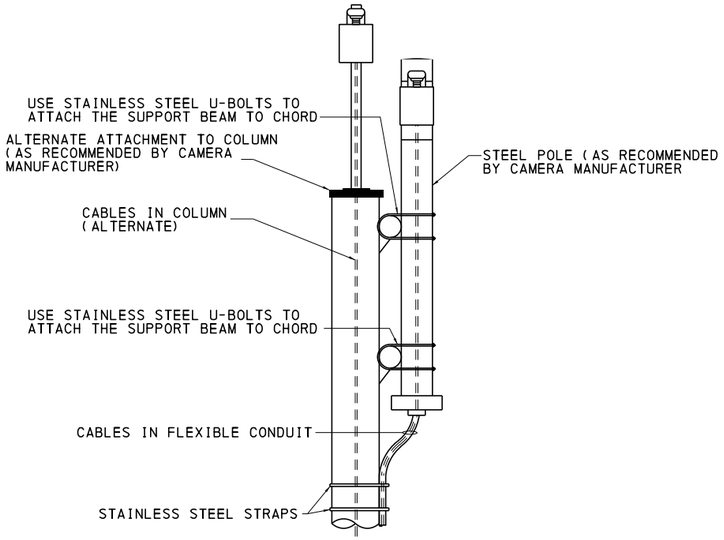
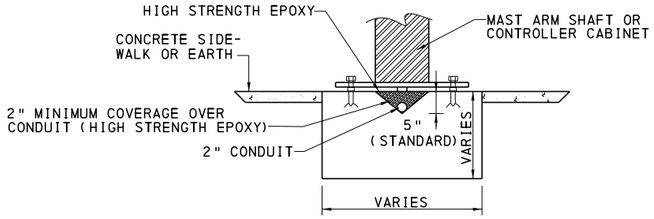
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CCTV CAMERA LOWERING SYSTEM (EXTERNAL)

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-42



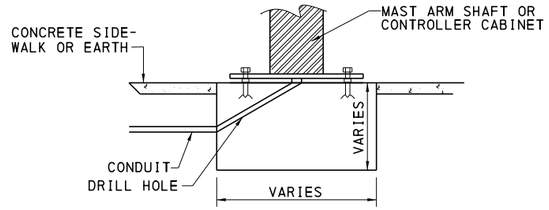
FRONT ELEVATION



V-NOTCH

NOTE:

LIFT POLE OR CABINET TO SAWCUT V-NOTCH



ROTO DRILL

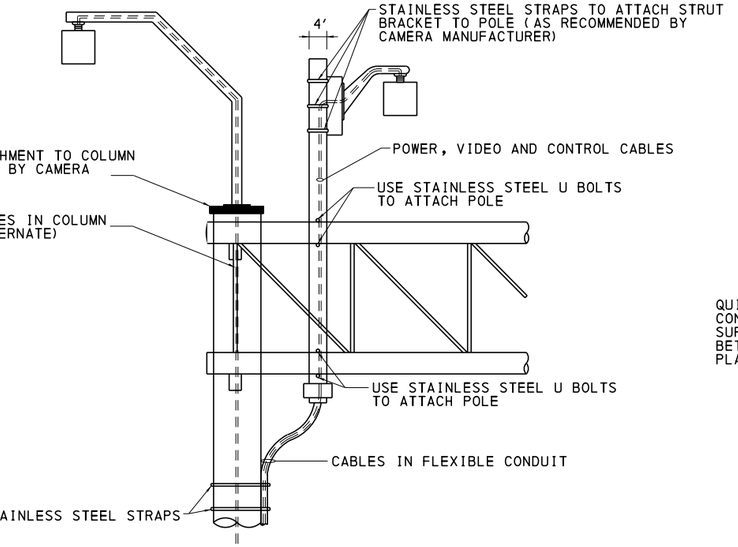
NOTE:

LIFT POLE OR CABINET TO ROTO DRILL

CONDUIT CONNECTION TO EXISTING SIGNAL FOUNDATION

GENERAL NOTES:

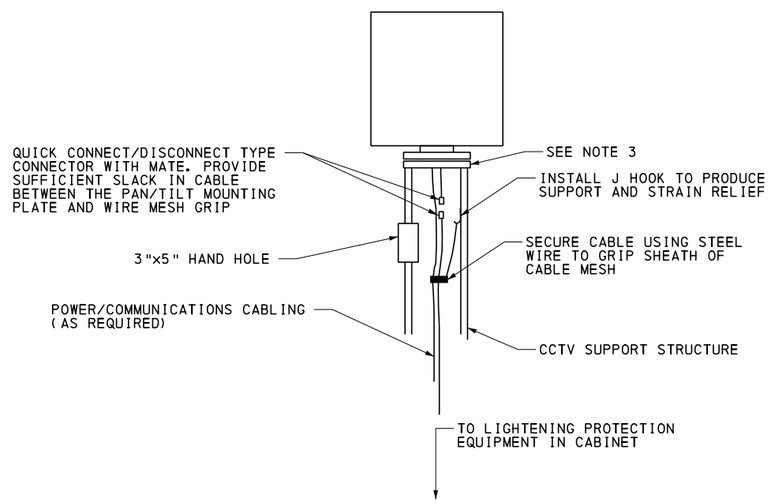
1. IF REQUIRED IN THE CONTRACT DOCUMENTS, PROVIDE A LOWERING DEVICE THAT IS ORIENTED IN A MANNER THAT THE MAINTAINER WILL FACE TRAFFIC WHEN LOWERING THE CCTV CAMERA.
2. BOND THE CCTV CAMERA SUBSYSTEM TO THE STRUCTURES GROUNDING SYSTEM WHENEVER POSSIBLE. TEST AND INSPECT THE STRUCTURES GROUNDING SYSTEM TO ENSURE IT IS INTACT AND FUNCTIONING PROPERLY.
3. CONTRACTOR TO SUBMIT SIGNED AND SEALED DETAILS FOR ATTACHMENT OF TOP MOUNT CCTV CAMERA TO THE SUPPORT STRUCTURE FOR REVIEW BY THE REPRESENTATIVE.



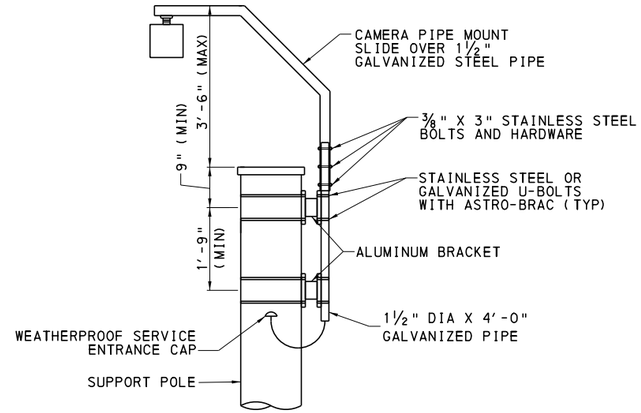
SIDE ELEVATION

STRUCTURE MOUNTED CCTV CAMERA ASSEMBLY

(NOTE: FOR ENCLOSURE DETAILS SEE ITS-10 OR TC-8802)



CCTV CAMERA (TOP MOUNT)



CCTV CAMERA ATTACHMENT TO EXISTING TRAFFIC SIGNAL STRUCTURE

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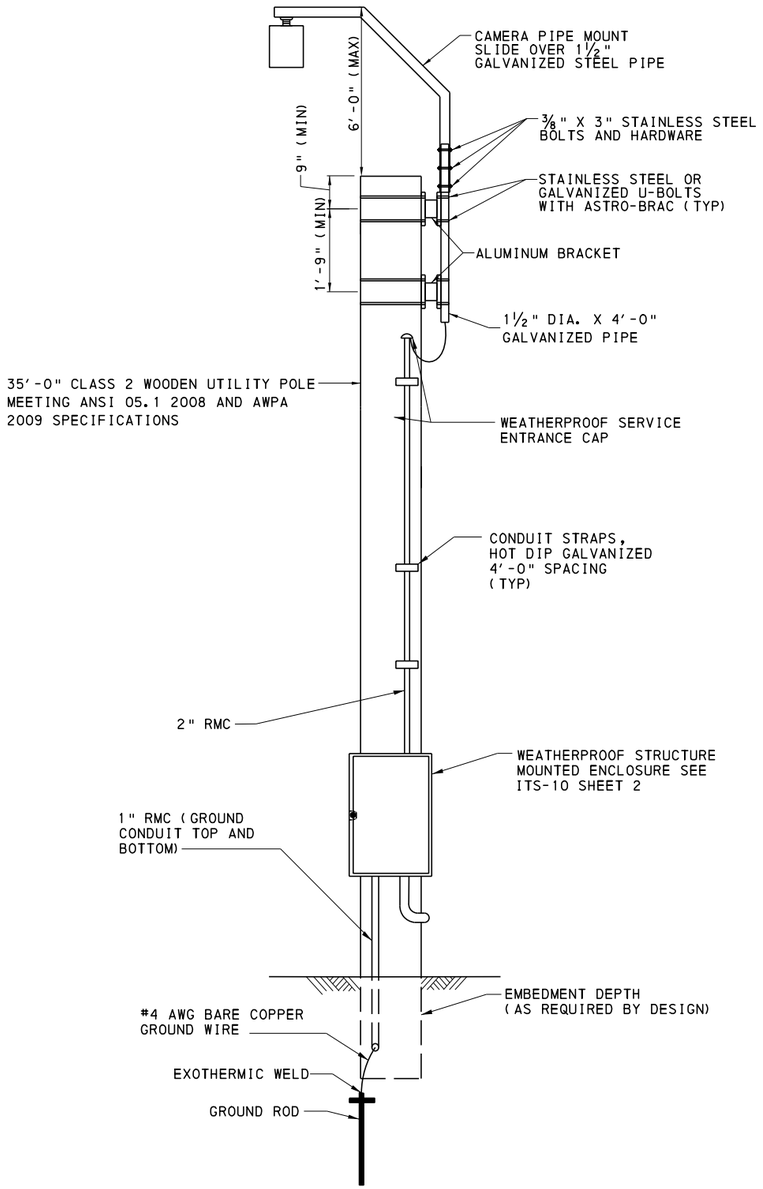
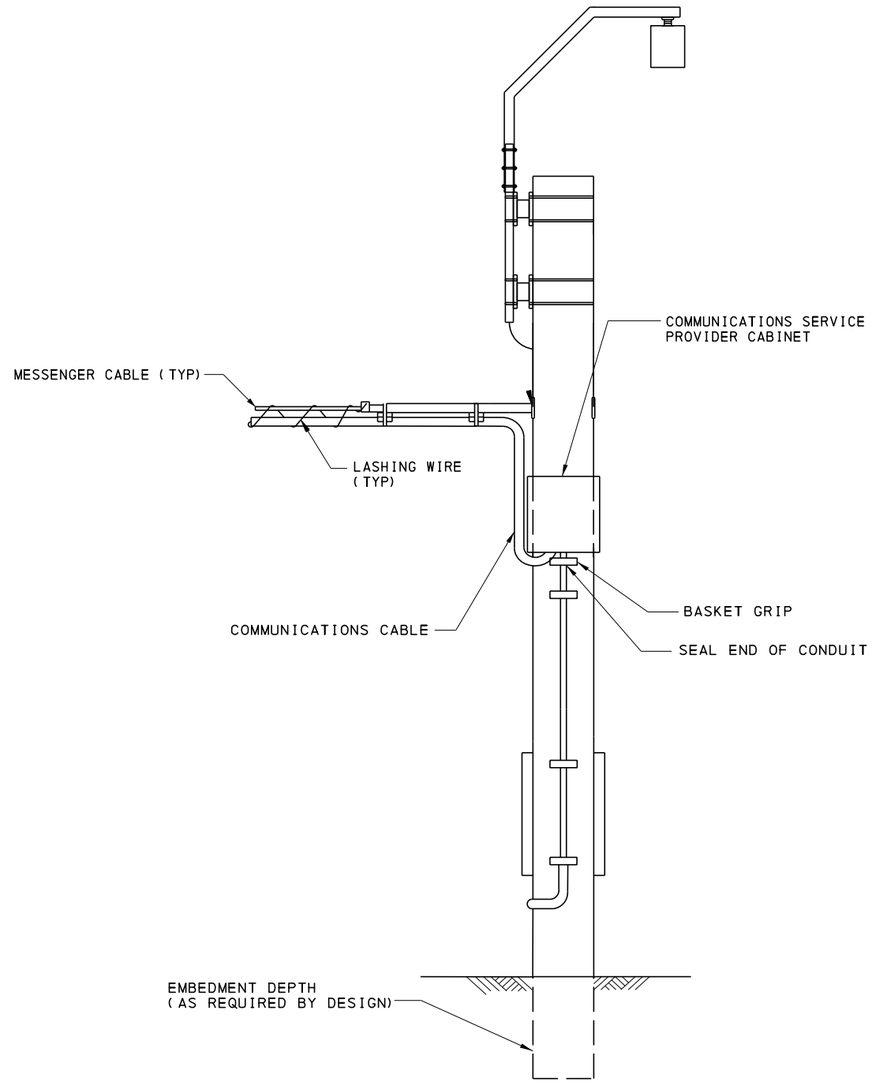
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

STRUCTURE MOUNTED CCTV CAMERA ASSEMBLY

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-43



CCTV CAMERA TEMPORARY INSTALLATION
(FRONT VIEW)

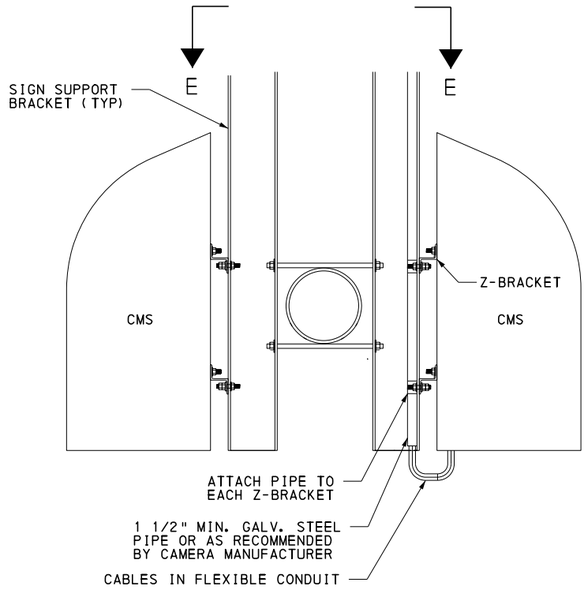


CCTV CAMERA TEMPORARY INSTALLATION
(BACK VIEW)

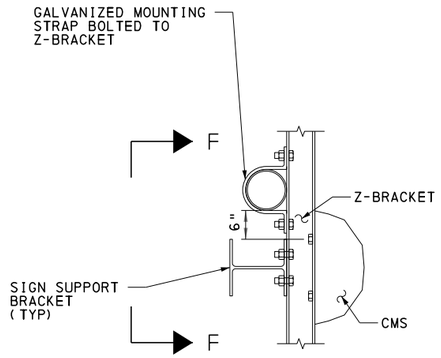
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

WOOD POLE MOUNTED CCTV CAMERA ASSEMBLY (TEMPORARY)

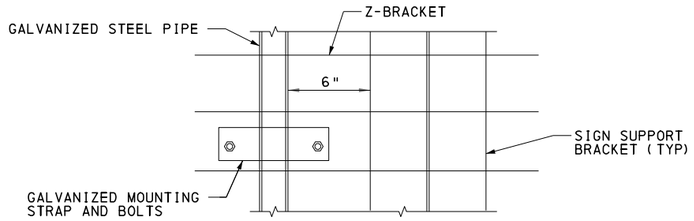
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-44



PIPE CONNECTION DETAIL

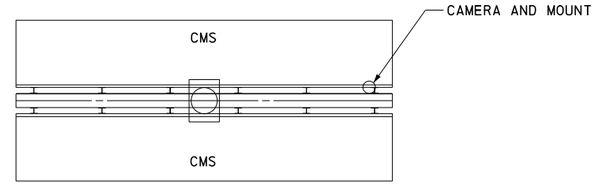


SECTION E-E

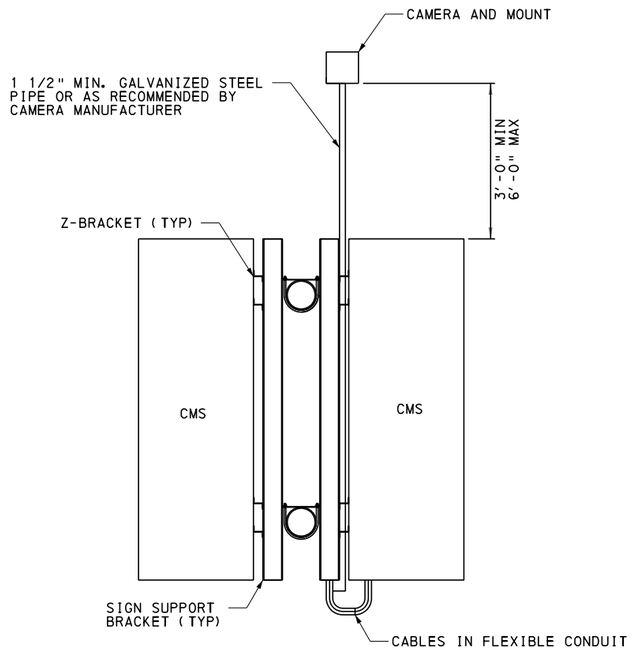


SECTION F-F

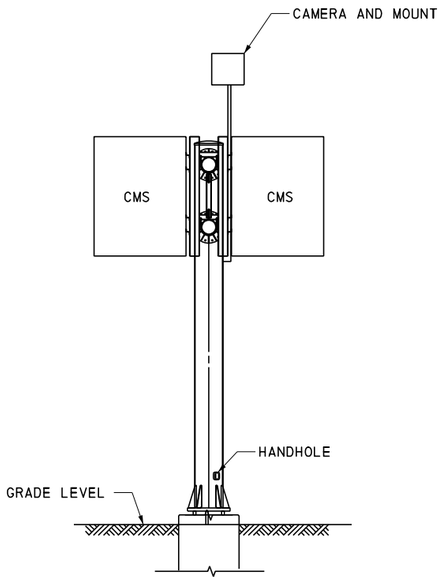
CCTV CAMERA AND TILT/PAN UNIT MOUNTING



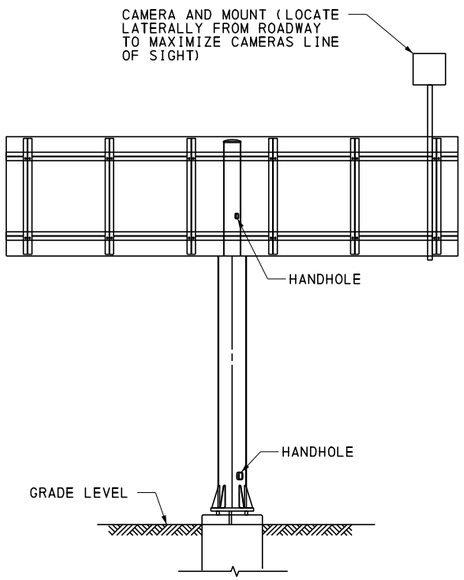
PLAN VIEW



CCTV DETAIL



SIDE ELEVATION



FRONT ELEVATION

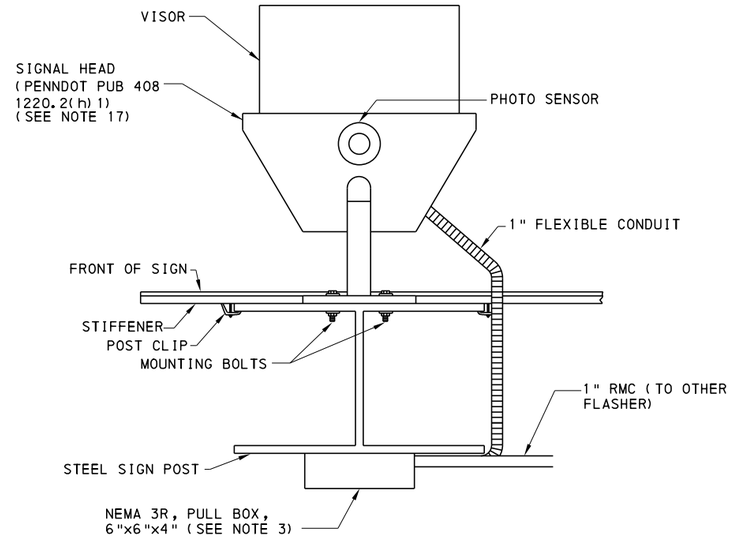
GENERAL NOTE:

1. ALTERNATE MOUNTING LOCATIONS ARE ACCEPTABLE PER APPROVAL OF THE REPRESENTATIVE.

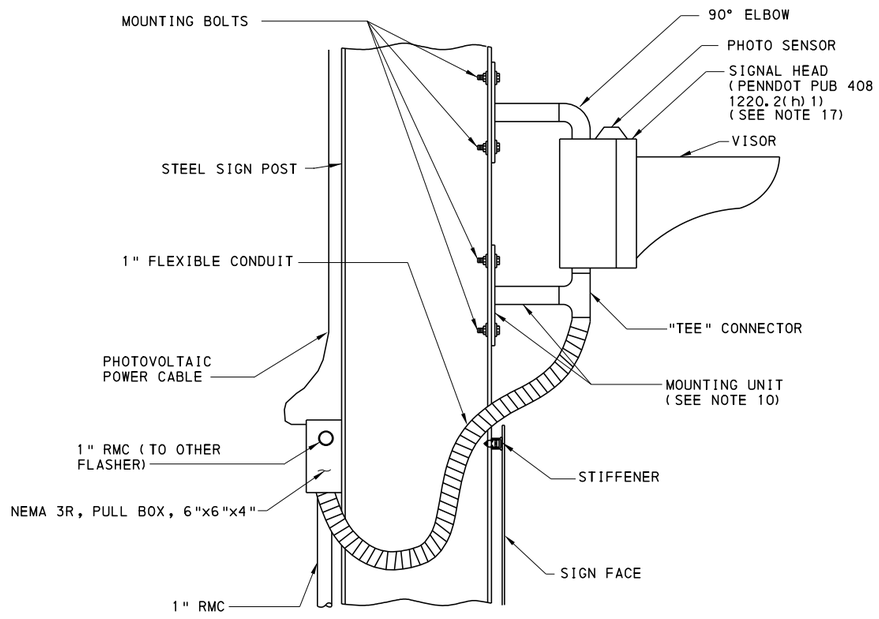
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CCTV MOUNTING DETAILS ON CMS SUPPORT STRUCTURE

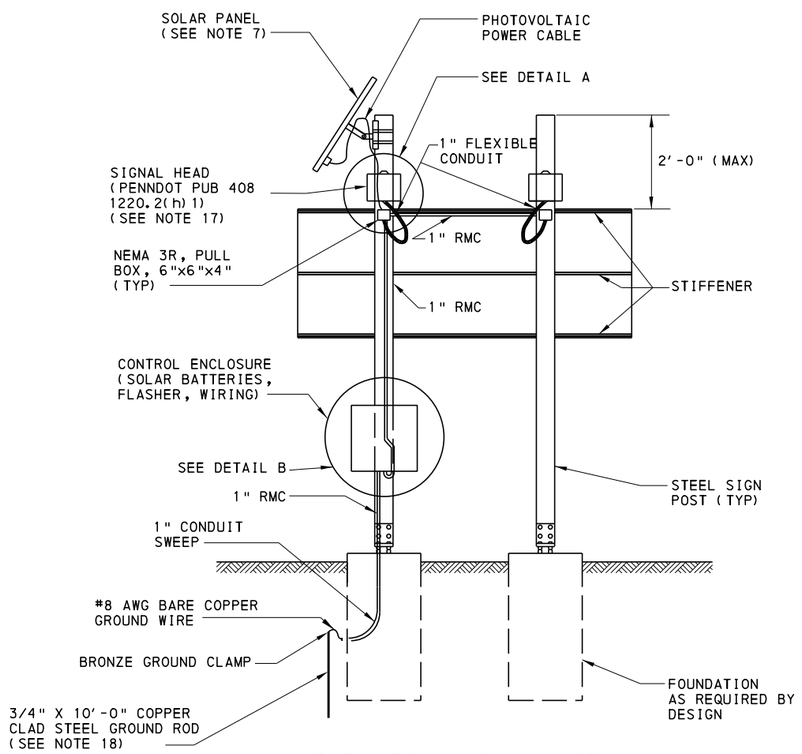
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-45



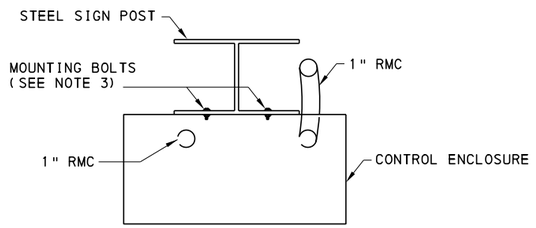
DETAIL A (TOP VIEW)



DETAIL A (SIDE VIEW)



ELEVATION (BACK VIEW)



DETAIL B (TOP VIEW)

GENERAL NOTES:

1. REFER TO PENNDOT PUB 852 - TSMO GUIDEBOOK, PART II: DESIGN, CHAPTER 3, DEVICE AND INFRASTRUCTURE DESIGN FOR DESIGN CONSIDERATIONS AND LOCATION AND PLACEMENT GUIDELINES.
2. THESE DETAILS ARE PROVIDED FOR SOLAR PANEL, CONTROL ENCLOSURE, SIGNAL HEADS, JUNCTION BOXES, CONDUIT, WIRING, GROUND ROD, AND ASSOCIATED HARDWARE ONLY.
3. ALL MOUNTING HARDWARE, INCLUDING MOUNTING BOLTS, WASHERS, LOCK WASHERS, AND NUTS, SHALL BE STAINLESS STEEL.
4. ISOLATE DISSIMILAR METALS USING PROPER SEPARATION TECHNIQUES.
5. PROVIDE SLACK FOR THE FLASHER CABLE IN THE PULL BOX.
6. SUBMIT INSTALLATION DETAIL DRAWINGS TO THE REPRESENTATIVE FOR APPROVAL PRIOR TO FABRICATION.
7. INSTALL SOLAR PANELS AT 180 DEG, SOUTH OR IN ACCORDANCE WITH RECOMMENDATION OF SOLAR PANEL MANUFACTURER. INSTALL THE PANELS ON POST FURTHEST AWAY FROM THE ROADWAY. SUBMIT PLANS AND DETAILS FOR SOLAR PANEL INSTALLATION TO THE REPRESENTATIVE FOR APPROVAL PRIOR TO CONSTRUCTION. PLACE SOLAR PANEL AND SIGN TO PROVIDE 8 CONSECUTIVE HOURS (MINIMUM) WITHOUT SOLAR ARRAY EXPOSURE.
8. LOCATION OF SIGNS WILL BE FINALIZED AFTER THE TRANSMITTER LOCATION IS BROADCASTING.
9. INSTALL CONTROL ENCLOSURE ON THE POST LOCATED FURTHEST AWAY FROM THE ROAD.
10. INSTALL SIGNAL HEADS CAPABLE OF ADJUSTING FOR PAN AND TILT.
11. INSTALL CONDUIT SUPPORTS PER NEC 347-8 AND TABLE 347-8.
12. PROVIDE BREAKAWAY CABLE AND CONDUIT CONNECTORS AT THE BREAKAWAY BASE ASSEMBLY.
13. PROVIDE TYPE A AND TYPE E ADVISORY SIGNS IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1220.2(h). FOR INSTALLATION DETAILS REFER TO TC-8702A AND TC-8702E.
14. PROVIDE SIGN LEGEND IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1220.2(h)4.
15. PROVIDE ENCLOSURE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1220.2(i).
16. PROVIDE TRANSMITTER POLE IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1220.2(g).
17. PROVIDE A 1'-0" (MIN) AMBER LED SINGLE SECTION HEAD. IF INDICATED IN THE CONTRACT DRAWINGS, PROVIDE AN 8" (MIN) AMBER LED SINGLE SECTION HEAD.
18. REFER TO PENNDOT PUB 408 SECTION 1220.2(f) AND ITS-30 SHEET 1 FOR GROUNDING DETAILS.

COMMONWEALTH OF PENNSYLVANIA
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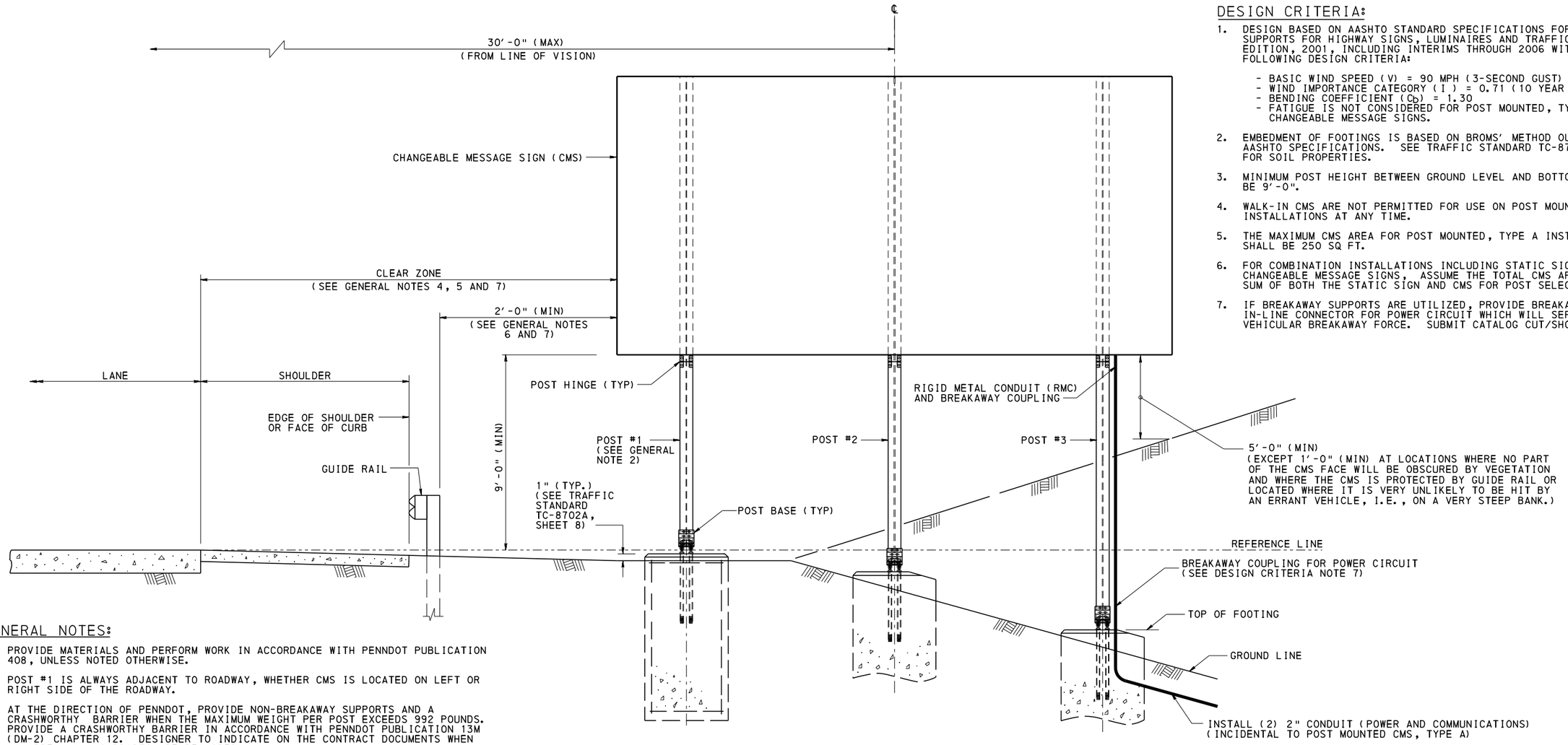
ELECTRICAL DETAILS FOR FLASHING BEACONS

RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 1 OF 1 ITS-50



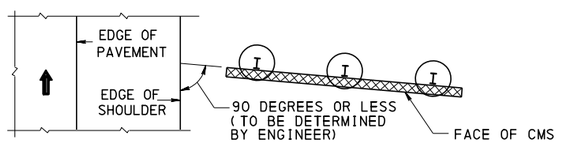
CHANGEABLE MESSAGE SIGN (CMS)
ELEVATION

DESIGN CRITERIA:

1. DESIGN BASED ON AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION, 2001, INCLUDING INTERIMS THROUGH 2006 WITH THE FOLLOWING DESIGN CRITERIA:
   - BASIC WIND SPEED (V) = 90 MPH (3-SECOND GUST)
   - WIND IMPORTANCE CATEGORY (I) = 0.71 (10 YEAR DESIGN LIFE)
   - BENDING COEFFICIENT (C_b) = 1.30
   - FATIGUE IS NOT CONSIDERED FOR POST MOUNTED, TYPE A CHANGEABLE MESSAGE SIGNS.
2. EMBEDMENT OF FOOTINGS IS BASED ON BROMS' METHOD OUTLINED IN THE AASHTO SPECIFICATIONS. SEE TRAFFIC STANDARD TC-8702A, SHEET 8 FOR SOIL PROPERTIES.
3. MINIMUM POST HEIGHT BETWEEN GROUND LEVEL AND BOTTOM OF DMS WILL BE 9'-0".
4. WALK-IN CMS ARE NOT PERMITTED FOR USE ON POST MOUNTED, TYPE A INSTALLATIONS AT ANY TIME.
5. THE MAXIMUM CMS AREA FOR POST MOUNTED, TYPE A INSTALLATIONS SHALL BE 250 SQ FT.
6. FOR COMBINATION INSTALLATIONS INCLUDING STATIC SIGN PANELS AND CHANGEABLE MESSAGE SIGNS, ASSUME THE TOTAL CMS AREA TO BE THE SUM OF BOTH THE STATIC SIGN AND CMS FOR POST SELECTION.
7. IF BREAKAWAY SUPPORTS ARE UTILIZED, PROVIDE BREAKAWAY MECHANICAL IN-LINE CONNECTOR FOR POWER CIRCUIT WHICH WILL SEPARATE UPON VEHICULAR BREAKAWAY FORCE. SUBMIT CATALOG CUT/SHOP DRAWINGS.

GENERAL NOTES:

1. PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH PENNDOT PUBLICATION 408, UNLESS NOTED OTHERWISE.
2. POST #1 IS ALWAYS ADJACENT TO ROADWAY, WHETHER CMS IS LOCATED ON LEFT OR RIGHT SIDE OF THE ROADWAY.
3. AT THE DIRECTION OF PENNDOT, PROVIDE NON-BREAKAWAY SUPPORTS AND A CRASHWORTHY BARRIER WHEN THE MAXIMUM WEIGHT PER POST EXCEEDS 992 POUNDS. PROVIDE A CRASHWORTHY BARRIER IN ACCORDANCE WITH PENNDOT PUBLICATION 13M (DM-2) CHAPTER 12. DESIGNER TO INDICATE ON THE CONTRACT DOCUMENTS WHEN NON-BREAKAWAY SUPPORTS ARE REQUIRED.
4. CLEAR ZONE SHALL BE MEASURED TO THE EDGE OF CMS.
5. DISTANCE MUST BE IN ACCORDANCE WITH PROJECT DESIGN DOCUMENTS AND GREATER THAN OR EQUAL TO MINIMUM CLEAR ZONE REQUIREMENTS.
6. AT LOCATIONS WHERE GUIDE RAIL, BARRIER, OR ROADSIDE SAFETY DEVICES ARE INSTALLED, PLACE THE NEAR EDGE OF THE CMS TO MEET THE MINIMUM CLEARANCE REQUIREMENTS BEHIND THE GUIDE RAIL, BARRIER, OR ROADSIDE SAFETY DEVICE INSTALLED AT THE SITE PER BC-741M, TABLE A.
7. PRIOR TO INSTALLATION, DETERMINE ACTUAL LATERAL PLACEMENT IN THE FIELD WITH THE APPROVAL OF THE REPRESENTATIVE.
8. LOCATE CMS TO AVOID PLACING SUPPORTS IN DRAINAGE DITCHES.
9. MOUNT ENTIRE CMS AND ALL STATIC SIGN PANELS ABOVE POST HINGES.
10. FOR SELECTION OF POSTS, REFER TO POST SELECTION TABLES ON SHEETS 2 AND 3.
11. FOR POST BASE AND HINGE DETAILS, REFER TO TRAFFIC STANDARD TC-8702A, SHEET 5.
12. FOR SELECTION OF FOOTING SIZE AND REINFORCEMENT, REFER TO FOOTING SELECTION TABLE ON TRAFFIC STANDARD TC-8702A, SHEET 8.
13. SEE ITS-62 FOR ATTACHMENT HARDWARE AND CONNECTION DETAILS. USE APPROPRIATE MOUNTING HARDWARE AND FOLLOW INSTALLATION DIRECTIONS OF CMS MANUFACTURER.
14. PROVIDE ENCLOSURE IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 1230.2(g), ITS-10 AND THE CONTRACT DOCUMENTS. STRUCTURE MOUNTED ENCLOSURES WILL NOT BE PERMITTED AT ANY TIME.
15. REFER TO PENNDOT PUBLICATION 852, TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) GUIDEBOOK PART II: DESIGN, CHAPTER 3 FOR DESIGN CONSIDERATIONS, LOCATION AND PLACEMENT GUIDELINES FOR CMS SUBSYSTEM.



PLAN VIEW

ITS-10	ENCLOSURES
ITS-62	CMS CONNECTION DETAILS
BC-741M	OVERHEAD SIGN STRUCTURES
TC-8702A	POST-MOUNTED SIGNS, TYPE A

REFERENCE DRAWINGS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

POST MOUNTED CMS, TYPE A

ERECTION DETAILS

RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 1 OF 3 ITS-60

POST SELECTION TABLE - TWO POSTS

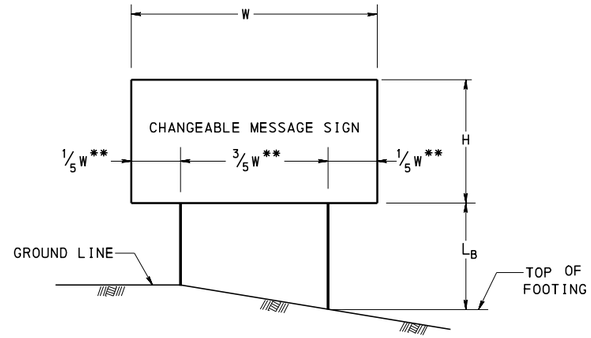
W FT	L_B FT	HEIGHT "H" IN FT						
		4′	5′	6′	7′	8′	9′	10′
6′	9′	P2	P2	P2	P2	P2	P3	P3
	10′	P2	P2	P2	P2	P3	P3	P3
	11′	P2	P2	P2	P2	P3	P3	-
	12′	P2	P2	P2	P3	P3	-	-
	13′	P2	P2	P2	P3	P3	-	-
	14′	P2	P2	P3	P3	-	-	-
	15′	P2	P3	P3	P3	-	-	-
	16′	P2	P3	P3	-	-	-	-
	17′	P3	P3	P3	-	-	-	-
7′	9′	P2	P2	P2	P2	P2	P3	P3
	10′	P2	P2	P2	P2	P3	P3	-
	11′	P2	P2	P2	P3	P3	P3	-
	12′	P2	P2	P2	P3	P3	-	-
	13′	P2	P2	P3	P3	-	-	-
	14′	P2	P3	P3	P3	-	-	-
	15′	P2	P3	P3	-	-	-	-
	16′	P3	P3	-	-	-	-	-
	17′	P3	P3	-	-	-	-	-
8′	9′	P2	P2	P2	P2	P2	P3	P3
	10′	P2	P2	P2	P2	P3	P3	P3
	11′	P2	P2	P2	P3	P3	P3	-
	12′	P2	P2	P3	P3	P3	-	-
	13′	P2	P2	P3	-	-	-	-
	14′	P2	P3	P3	-	-	-	-
	15′	P3	P3	-	-	-	-	-
	16′	P3	P3	-	-	-	-	-
	17′	P3	-	-	-	-	-	-
9′	9′	P2	P2	P2	P3	P3	P3	P4 *
	10′	P2	P2	P2	P3	P3	P4 *	P4 *
	11′	P2	P2	P3	P3	P4 *	P4 *	P4 *
	12′	P2	P2	P3	P3	P4 *	P4 *	P4 *
	13′	P2	P3	P3	P4 *	P4 *	P4 *	P5 *
	14′	P2	P3	P4 *	P4 *	P4 *	P4 *	P5 *
	15′	P3	P3	P4 *	P4 *	P4 *	P5 *	P6 *
	16′	P3	P4 *	P4 *	P4 *	P5 *	P5 *	P6 *
	17′	P3	P4 *	P4 *	P4 *	P5 *	P6 *	P6 *
10′	9′	P2	P2	P2	P2	P3	P4 *	P4 *
	10′	P2	P2	P2	P3	P3	P3	P4 *
	11′	P2	P2	P2	P3	P3	P4 *	P4 *
	12′	P2	P2	P3	P3	P4 *	P4 *	P4 *
	13′	P2	P2	P3	P3	P4 *	P4 *	P5 *
	14′	P2	P3	P3	P4 *	P4 *	P5 *	P5 *
	15′	P3	P3	P4 *	P4 *	P5 *	P5 *	P6 *
	16′	P3	P3	P4 *	P4 *	P4 *	P5 *	P6 *
	17′	P3	P4 *	P4 *	P4 *	P5 *	P6 *	P6 *
11′	9′	P2	P2	P2	P2	P3	P3	P4 *
	10′	P2	P2	P2	P3	P3	P4 *	P4 *
	11′	P2	P2	P3	P3	P3	P4 *	P4 *
	12′	P2	P2	P3	P3	P4 *	P4 *	P5 *
	13′	P2	P2	P3	P3	P4 *	P4 *	P6 *
	14′	P3	P3	P3	P4 *	P4 *	P5 *	P6 *
	15′	P3	P4 *	P4 *	P4 *	P4 *	P5 *	P6 *
	16′	P3	P4 *	P4 *	P5 *	P5 *	P6 *	P6 *
	17′	P4 *	P4 *	P4 *	P5 *	P6 *	P6 *	P8 *
12′	9′	P2	P2	P3	P3	P4	P4	P4
	10′	P2	P2	P3	P3	P4	P4	P4
	11′	P2	P2	P3	P3	P4	P4	P4
	12′	P2	P2	P3	P3	P4	P4	P5
	13′	P2	P3	P3	P4	P4	P4	P5
	14′	P2	P3	P4	P4	P4	P5	P6
	15′	P3	P3	P4	P4	P4	P5	P6
	16′	P3	P4	P4	P4	P5	P6	P6
	17′	P4	P4	P4	P4	P5	P6	P6
13′	9′	P2	P2	P3	P3	P4	P4	P4
	10′	P2	P2	P3	P3	P4	P4	P4
	11′	P2	P2	P3	P3	P4	P4	P4
	12′	P2	P2	P3	P4	P4	P4	P5
	13′	P2	P3	P3	P4	P4	P5	P5
	14′	P2	P3	P4	P4	P4	P5	P6
	15′	P3	P3	P4	P4	P5	P6	P6
	16′	P3	P4	P4	P4	P5	P6	P6
	17′	P4	P4	P4	P5	P6	P6	P8
14′	9′	P2	P2	P3	P3	P4	P4	P4
	10′	P2	P2	P3	P3	P4	P4	P4
	11′	P2	P2	P3	P3	P4	P4	P4
	12′	P2	P3	P3	P4	P4	P4	P5
	13′	P2	P3	P3	P4	P4	P5	P6
	14′	P3	P3	P4	P4	P5	P5	P6
	15′	P3	P3	P4	P4	P5	P6	P6
	16′	P3	P4	P4	P4	P5	P6	P6
	17′	P3	P4	P4	P4	P5	P6	P6

* SEE NOTE 6

POST SELECTION TABLE - TWO POSTS

W FT	L_B FT	HEIGHT "H" IN FT						
		4′	5′	6′	7′	8′	9′	10′
15′	9′	P2	P2	P3	P4	P4	P4	P5
	10′	P2	P3	P3	P4	P4	P4	P5
	11′	P2	P3	P4	P4	P4	P5	P6
	12′	P3	P3	P4	P4	P4	P6	P6
	13′	P3	P4	P4	P4	P5	P6	P6
	14′	P3	P4	P4	P5	P6	P6	P8
	15′	P4	P4	P4	P5	P6	P6	P8
	16′	P4	P4	P5	P6	P6	P8	P8
	17′	P4	P4	P5	P6	P6	P8	P8
16′	9′	P2	P3	P3	P4	P4	P4	P5
	10′	P2	P3	P3	P4	P4	P5	P5
	11′	P3	P3	P4	P4	P4	P5	P6
	12′	P3	P3	P4	P4	P5	P6	P6
	13′	P3	P4	P4	P5	P5	P6	P7
	14′	P3	P4	P4	P5	P6	P6	P8
	15′	P4	P4	P5	P6	P6	P8	P8
	16′	P4	P4	P5	P6	P6	P8	P8
	17′	P4	P5	P6	P6	P8	P8	P9
17′	9′	P2	P3	P3	P4	P4	P4	P5
	10′	P2	P3	P4	P4	P4	P5	P6
	11′	P3	P3	P4	P4	P4	P5	P6
	12′	P3	P4	P4	P4	P5	P6	P6
	13′	P3	P4	P4	P5	P6	P6	P8
	14′	P3	P4	P4	P5	P6	P6	P8
	15′	P4	P4	P5	P6	P6	P8	P8
	16′	P4	P4	P5	P6	P8	P8	P8
	17′	P4	P5	P6	P6	P8	P8	P9
18′	9′	P2	P3	P3	P4	P4	P4	P5
	10′	P2	P3	P4	P4	P4	P5	P6
	11′	P3	P3	P4	P4	P5	P5	P6
	12′	P3	P4	P4	P4	P5	P6	P7
	13′	P3	P4	P4	P5	P6	P6	P8
	14′	P4	P4	P5	P6	P6	P8	P8
	15′	P4	P4	P5	P6	P6	P8	P8
	16′	P4	P5	P6	P6	P8	P8	P9
	17′	P4	P5	P6	P6	P8	P8	-
19′	9′	P2	P3	P3	P4	P4	P5	P5
	10′	P3	P3	P4	P4	P4	P5	P6
	11′	P3	P3	P4	P4	P5	P6	P6
	12′	P3	P4	P4	P5	P5	P6	P8
	13′	P3	P4	P4	P5	P6	P7	P8
	14′	P4	P4	P5	P6	P6	P8	P8
	15′	P4	P4	P5	P6	P6	P8	P8
	16′	P4	P5	P6	P6	P8	P8	P9
	17′	P4	P5	P6	P6	P8	P8	P9
20′	9′	P2	P3	P4	P4	P4	P5	P6
	10′	P3	P3	P4	P4	P5	P5	P6
	11′	P3	P4	P4	P4	P5	P6	P6
	12′	P3	P4	P4	P5	P6	P6	P8
	13′	P4	P4	P4	P6	P6	P8	P8
	14′	P4	P4	P5	P6	P6	P8	P8
	15′	P4	P5	P5	P6	P8	P8	P9
	16′	P4	P5	P6	P6	P8	P8	P9
	17′	P4	P5	P6	P8	P8	P9	-
21′	9′	P2	P3	P4	P4	P4	P5	P6
	10′	P3	P3	P4	P4	P5	P6	P6
	11′	P3	P4	P4	P4	P5	P6	P6
	12′	P3	P4	P4	P5	P6	P6	P8
	13′	P4	P4	P4	P6	P6	P8	P8
	14′	P4	P4	P5	P6	P7	P8	P8
	15′	P4	P5	P6	P6	P8	P8	P9
	16′	P4	P5	P6	P8	P8	P9	-
	17′	P5	P6	P6	P8	P8	P9	-
22′	9′	P3	P3	P4	P4	P4	P5	P6
	10′	P3	P3	P4	P4	P5	P6	P6
	11′	P3	P4	P4	P5	P6	P6	P8
	12′	P3	P4	P4	P5	P6	P8	P8
	13′	P4	P4	P5	P6	P6	P8	P8
	14′	P4	P4	P5	P6	P8	P8	P8
	15′	P4	P5	P6	P6	P8	P8	P9
	16′	P4	P5	P6	P8	P8	P9	-
	17′	P5	P6	P6	P8	P8	-	-

* SEE NOTE 6



** SEE NOTE 6

CMS ON TWO POSTS

SKETCH A

POST SELECTION EXAMPLE

FOR A CMS WHERE

W = 10′
H = 5′
L_B = 12′

TWO P3 = W6 x 15 STEEL POSTS ARE REQUIRED.

CMS POST SELECTION NOTES:

1. DETERMINE VALUES OF "W", "H", AND "L_B" AS INDICATED IN SKETCHES "A" OR "B".
   W = MAXIMUM WIDTH OF CMS.
   H = MAXIMUM HEIGHT OF CMS.
   L_B = MAXIMUM DISTANCE BETWEEN TOP OF A FOOTING AND BOTTOM OF DMS.
2. FOR SELECTION OF POSTS, ENTER TABLES WITH VALUES OF "W", "H" AND "L_B".
3. FOR A CMS SIZE BETWEEN THOSE VALUES OF "W", "H" AND "L_B" IN THE TABLE, USE NEXT HIGHEST FT VALUE.
4. ALL POSTS ARE ASTM A 572, GRADE 50 STEEL.
5. USE THE LONGEST POST TO SELECT ALL POST SIZES.
6. POSTS IN THE SELECTION TABLE WITH AN "*" MUST HAVE A MINIMUM CLEAR SPACING OF 7′ BETWEEN POSTS BY INCREASING THE 3/5 W SPACING. THE REMAINING DMS WIDTH "W" SHOULD BE EQUALLY DISTRIBUTED TO THE OVERHANGS.
7. THERE IS NO NEED TO CHECK THE BELOW WEIGHT CRITERIA FOR POSTS DETERMINED USING THIS POST SELECTION TABLE. NO MORE THAN TWO POSTS MAY BE ERECTED WITHIN A 7′ PATH. A SINGLE POST SPACED WITH A CLEAR DISTANCE OF 7′ OR MORE FROM ANOTHER POST, SHALL HAVE A WEIGHT NO GREATER THAN 44 LB/FT. THE TOTAL WEIGHT BELOW THE HINGE PLATE, BUT ABOVE THE SHEAR PLATE OF THE BREAKAWAY BASE, SHALL NOT EXCEED 600 LB. FOR TWO POSTS SPACED WITH LESS THAN 7′ CLEARANCE, EACH POST SHALL HAVE A WEIGHT LESS THAN 17 LB/FT.
8. SEE SHEET 3 FOR THREE-POST INSTALLATION.

LEGEND:

P2 = W6 x 12
P3 = W6 x 15
P4 = W8 x 18
P5 = W8 x 21
P6 = W10 x 22
P7 = W10 x 26
P8 = W14 x 30
P9 = W18 x 35
P10 = W18 x 40

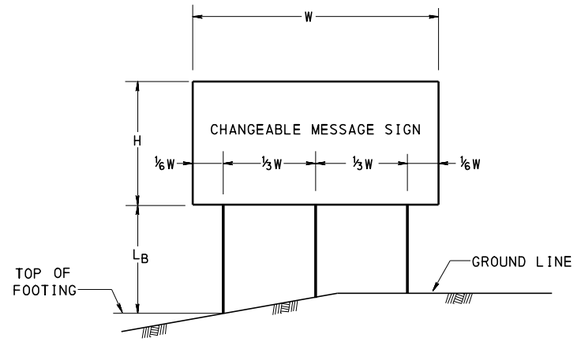
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

POST MOUNTED CMS, TYPE A

POST SELECTION TABLE

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 2 OF 3
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-60

POST SELECTION TABLE - THREE POSTS								
W FT	L_B FT	HEIGHT "H" IN FT						
		4′	5′	6′	7′	8′	9′	10′
22′	9′	P2	P2	P3	P3	P4	P4	P4
	10′	P2	P3	P3	P4	P4	P4	P5
	11′	P2	P3	P4	P4	P4	P5	P5
	12′	P3	P3	P4	P4	P4	P5	P6
	13′	P3	P4	P4	P4	P5	P6	P6
	14′	P3	P4	P4	P5	P6	P6	P8
	15′	P4	P4	P4	P5	P6	P6	P8
	16′	P4	P4	P5	P6	P6	P8	P8
	17′	P4	P4	P5	P6	P6	P8	P8
23′	9′	P2	P3	P3	P4	P4	P4	P5
	10′	P2	P3	P3	P4	P4	P4	P5
	11′	P3	P3	P4	P4	P4	P5	P6
	12′	P3	P3	P4	P4	P5	P6	P6
	13′	P3	P4	P4	P4	P5	P6	P6
	14′	P3	P4	P4	P5	P6	P6	P8
	15′	P4	P4	P5	P5	P6	P7	P8
	16′	P4	P4	P5	P6	P6	P8	P8
	17′	P4	P4	P5	P6	P8	P8	P8
24′	9′	P2	P3	P3	P4	P4	P4	P5
	10′	P2	P3	P3	P4	P4	P5	P5
	11′	P3	P3	P4	P4	P4	P5	P6
	12′	P3	P3	P4	P4	P5	P6	P6
	13′	P3	P4	P4	P5	P6	P6	P7
	14′	P3	P4	P4	P5	P6	P6	P8
	15′	P4	P4	P5	P6	P6	P8	P8
	16′	P4	P4	P5	P6	P6	P8	P8
	17′	P4	P5	P6	P6	P8	P8	P9
25′	9′	P2	P3	P3	P4	P4	P4	P5
	10′	P2	P3	P3	P4	P4	P5	P5
	11′	P3	P3	P4	P4	P4	P5	P6
	12′	P3	P4	P4	P4	P5	P6	P6
	13′	P3	P4	P4	P5	P6	P6	P8
	14′	P3	P4	P4	P5	P6	P6	P8
	15′	P4	P4	P5	P6	P6	P8	P8
	16′	P4	P4	P5	P6	P7	P8	P8
	17′	P4	P5	P6	P6	P8	P8	P9



CMS ON THREE POSTS

SKETCH B

GENERAL NOTE:

1. SEE SHEET 2 FOR CMS POST SELECTION NOTES AND CMS ON TWO POSTS.

LEGEND:

P2 = W6 x 12
P3 = W6 x 15
P4 = W8 x 18
P5 = W8 x 21
P6 = W10 x 22
P7 = W10 x 26
P8 = W14 x 30
P9 = W18 x 35
P10 = W18 x 40

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

POST MOUNTED CMS, TYPE A

POST SELECTION TABLE

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 3 OF 3
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-60

INFORMATIONAL NOTES:

1. READ THESE NOTES BEFORE USING THESE STANDARDS.
2. USE THESE STANDARDS AS A BASIS FOR THE PREPARATION OF STRUCTURE LAYOUTS AND CONTRACT DRAWINGS FOR CMS SUPPORTED CANTILEVER SUPPORT STRUCTURES.
3. ALL CMS SUPPORTS LOCATED WITHIN THE CLEAR ZONE MUST BE SHIELDED WITH A CRASHWORTHY BARRIER, SEE TABLE A, BC-741M SHEET 2.
4. PROVIDE CRASHWORTHY BARRIER IN ACCORDANCE WITH PENNDOT PUBLICATION 13M (DM-2). CHAPTER 12 GUIDE RAIL, MEDIAN BARRIER AND ROADSIDE SAFETY DEVICES. USE OF GUIDE RAIL AND/OR CONCRETE BARRIER SHALL MEET APPLICABLE PENNDOT WARRANTS FOR INSTALLATION.
5. BRIDGE-MOUNTED CMS ARE PROHIBITED.

GENERAL NOTES:

1. PROVIDE 3-INCH CONCRETE COVER ON REINFORCEMENT BARS, EXCEPT AS NOTED.
2. USE CLASS A CEMENT CONCRETE f'c = 3000 PSI IN PEDESTALS, FOOTINGS AND CAISSONS.
3. PROVIDE GRADE 60 REINFORCING STEEL BARS THAT MEET THE REQUIREMENTS OF ASTM A615 FOR CONCRETE REINFORCEMENT. DO NOT WELD REINFORCING STEEL BARS.
4. RAKE-FINISH ALL HORIZONTAL CONSTRUCTION JOINTS, EXCEPT AS INDICATED.
5. VERIFY ALL DIMENSIONS AND GEOMETRY OF THE EXISTING STRUCTURES IN THE FIELD AS NECESSARY FOR PROPER FIT OF THE PROPOSED CONSTRUCTION.
6. CHAMFER EXPOSED CONCRETE EDGES 1 INCH BY 1 INCH.
7. ALL DIMENSIONS SHOWN ARE HORIZONTAL, EXCEPT AS NOTED.
8. DIMENSIONS ARE BASED ON A NORMAL TEMPERATURE OF 68 DEGREES F.
9. SPREAD FOOTINGS OR CAISSONS MAY BE ORDERED BY THE ENGINEER TO BE AT ANY ELEVATION OR OF ANY DIMENSIONS NECESSARY TO PROVIDE A PROPER FOUNDATION.
10. GALVANIZE ALL STRUCTURAL STEEL BOLTS, NUTS & WASHERS IN ACCORDANCE WITH PENNDOT PUBLICATION 408 UNLESS STAINLESS STEEL IS SPECIFIED OR OTHERWISE INDICATED.
11. PIPE DIAMETERS SHOWN UP TO AND INCLUDING 12 INCHES ARE NOMINAL DIAMETERS. PIPE DIAMETERS SHOWN FROM 14 INCHES AND UP ARE ACTUAL DIAMETERS.
12. USE STANDARD SIZE HOLE, THE STANDARD HOLE DIAMETER FOR BOLTS SMALLER THAN 1" DIAMETER SHALL BE THE NOMINAL DIAMETER OF THE BOLT PLUS 1/16". FOR BOLTS 1" DIAMETER AND LARGER, THE DIAMETER OF EACH STANDARD HOLE SHALL BE THE NOMINAL DIAMETER OF THE BOLT PLUS 1/8".
13. CLEAR DISTANCE BETWEEN BOLT HOLES OR BETWEEN THE BOLT HOLE AND THE EDGE OF THE MEMBER IN THE DIRECTION OF THE APPLIED BEARING FORCE SHALL BE AS DETAILED IN BC-741. IF THESE MINIMUMS ARE NOT PROVIDED, BOLT BEARING MUST BE CHECKED.
14. PROVIDE ANCHOR BOLT HOLES 1/4" LARGER THAN BOLT DIAMETER.
15. PROVIDE A MINIMUM ANCHOR BOLT EMBEDMENT LENGTH OF 20 ANCHOR BOLT DIAMETERS.
16. PROVIDE 4 NUTS, 2 WASHERS, AND 1 JAM NUT FOR EACH ANCHOR BOLT.
17. STEEL MEMBER COMPONENTS WITH THICKNESSES GREATER THAN 1/2" REQUIRE CHARPY V-NOTCH TESTING AND ARE DESIGNATED ON THE PLANS BY (CVN). PROVIDE STEEL CONFORMING TO THE CVN REQUIREMENTS FOR ZONE 2, NON FRACTURE CRITICAL AS GIVEN IN THE AASHTO MATERIAL SPECIFICATIONS.
18. PROVIDE ONE TEST BORING AT EACH CMS FOUNDATION LOCATION.

CONSTRUCTION GENERAL NOTES:

1. MATERIALS AND WORK:

   PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH THE CURRENT VERSIONS OF THE PENNDOT PUBLICATION 408, AASHTO/AWS D1.5, CONTRACT SPECIAL PROVISIONS, AND AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS". USE AASHTO/AWS D1.1 FOR WELDING NOT COVERED IN AASHTO/AWS D1.5.

2. PROVIDE STRUCTURAL STEEL CONFORMING TO THE FOLLOWING:

COLUMNS, PIPE CHORDS: & PIPE BRACING	SEE PUBLICATION 408, SECTION 948.2
ANGLES, SHAPES, AND PLATES:	AASHTO M270, GRADE 36 ASTM A709, GRADE 36

3. ALTERNATE PRESS-BREAK MEMBERS:

   ALTERNATE PRESS-BREAK MEMBERS MUST HAVE THE EQUIVALENT STRENGTH OF THE MEMBER THEY ARE REPLACING. EQUIVALENT RADIUS FOR PRESS-BREAK MEMBERS IS MEASURED FROM THE CENTER OF THE MEMBER TO THE MID-POINT OF ANY CHORD OF THE MEMBER. MINIMUM THICKNESS OF PRESS-BREAK MEMBERS TO BE 5/16". PENNDOT'S SIGN STRUCTURE PROGRAM OR AN APPROVED FINITE ELEMENT ANALYSIS COMPUTER PROGRAM MUST BE RUN TO VERIFY THE ADEQUACY OF PRESS-BREAK MEMBERS FOR STRENGTH AND FATIGUE. PRESS-BREAK MEMBERS ARE PERMITTED AS AN ALTERNATE ONLY FOR COLUMNS. PRESS-BREAK MEMBERS ARE NOT PERMITTED FOR CHORDS.

4. PROVIDE BOLTS CONFORMING TO THE FOLLOWING:

ANCHOR BOLTS:	ASTM F1554 GRADE 55 PER PUBLICATION 408, SECTION 1105.02(c)3
BOLTS:	ASTM F3125 GRADE A325 H.S. BOLTS, EXCEPT AS NOTED

5. DESIGN SPECIFICATIONS:

   AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", 4TH EDITION, 2001 WITH CURRENT INTERIMS (UNLESS NOTED OTHERWISE)": AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", 1996 WITH INTERIMS THROUGH AND INCLUDING 2000: PENNDOT DESIGN MANUAL - PART 4, AUGUST 1993 EDITION (INCLUDING AUGUST 1995 REVISIONS).

6. ALL FILLET WELDS SHOWN ARE MINIMUM SIZE UNLESS NOTED OTHERWISE.

DESIGN CRITERIA FOR PENNDOT CMS STRUCTURES:*

1.	LOADING	AASHTO 2001 SIGN SPECS.(U.N.O.)
	DEAD LOAD	3.5
	LIVE LOAD (CATWALKS)	3.6
	ICE LOAD	3.7
	WIND LOAD	APPENDIX C, SECTION C.3, EQ. C-1, WITH 80 MPH WIND AND 30% GUST FACTOR
	CMS SIZE AND DEAD LOAD PER SUPPLIER	
	WIND DRAG COEFFICIENT C_d = 1.7 FOR DMS (STRENGTH DESIGN AND FATIGUE DESIGN)	
2.	GROUP LOADS	AASHTO 2001 SIGN SPECS. 3.4
3.	STEEL CRITERIA	AASHTO 2001 SIGN SPECS. (U.N.O.)
	STRENGTH CRITERIA	
	SECTION PROPERTIES FOR TUBULAR SHAPES	APPENDIX B, TABLE B-1
	MAXIMUM STRESSES IN TUBULAR SHAPES	APPENDIX B, TABLE B-2
	ALLOWABLE STRESSES FOR TUBULAR SHAPES	5.6 (TABLE 5-3) & 5.11
	ALLOWABLE STRESSES FOR CMS SUPPORTS	5.12
	ALLOWABLE STRESSES FOR BASE PLATES	5.8
	ALLOWABLE STRESSES FOR COMBINED STEEL STRESS	5.12
	ALLOWABLE STRESSES FOR STRUCTURAL STEEL	SECTION 5
	FATIGUE CRITERIA	
	FATIGUE REQUIREMENTS	SECTION 11
	FATIGUE IMPORTANCE CATEGORY (I_F = I)**	11.6
	GALLOPING	11.7.1
	NATURAL WIND GUST	11.7.3
	TRUCK-INDUCED GUST	11.7.4
	ALL CMS SUPPORT STRUCTURES SHALL BE DESIGNED FOR NATURAL WIND GUSTS AND TRUCK-INDUCED GUSTS. CENTER-MOUNT AND CANTILEVER STRUCTURES SHALL ALSO BE DESIGNED FOR GALLOPING.	
	** A FATIGUE IMPORTANCE CATEGORY OF II MAY BE USED FOR NON-CANTILEVERED CMS SUPPORT STRUCTURES LOCATED ON MINOR ARTERIALS, COLLECTORS, OR LOCAL ROADS.	
	SERVICEABILITY CRITERIA	
	ALLOWABLE DEFLECTION	10.4
	PERMANENT CAMBER	10.5
4.	BOLT CRITERIA	AASHTO HIGHWAY BRIDGES (U.N.O.)
	ALLOWABLE BOLT STRESSES	TABLE 10.32.3B
	SLIP-CRITICAL BOLT ALLOWABLE	10.32.3.2.1
	BOLT PRYING ACTION	10.32.3.3.2
	COMBINED BOLT SHEAR AND TENSION	10.32.3.3.3
	BOLT DESIGN CRITERIA	AASHTO 2001 SIGN SPECS. 5.16
	ALLOWABLE ANCHOR BOLT STRESSES	AASHTO 2001 SIGN SPECS. 5.17
5.	CONCRETE CRITERIA	AASHTO HIGHWAY BRIDGES (U.N.O.)
	ALLOWABLE BEARING STRESS	8.15.2.1.3
	REINFORCEMENT TENSILE STRESS	8.15.2.2
	SHEAR CAPACITY OF FOOTINGS	8.15.5.6.1
	SHEAR STRESS IN FOOTINGS	8.15.5.6.2
	ALLOWABLE SHEAR STRESS	8.15.5.6.4
	SLENDERNESS OF COLUMNS	8.16.5.2
	MINIMUM REINF. OF FLEXURAL MEMBERS	8.17.1
	SPACING LIMITS FOR REINFORCEMENT	8.21
	MINIMUM CONCRETE COVER	DM4 8.22.1*
	PRESSURES FOR ECCENTRICALLY LOADED FOOTINGS	FIG. 4.4.7.1.1.1C
	DISTRIBUTION OF REINFORCEMENT	4.4.11.2.2
	FOOTING STABILITY REQUIREMENTS	DM4 D5.5.5
	TORSION	ACI SECTION A.7.3*
	COLUMN DESIGN (PEDESTALS)	8.15.4
6.	FOUNDATION NOTES	

ONE TEST BORING SHALL BE PROVIDED AT EACH CMS FOUNDATION LOCATION

SPREAD FOOTINGS:

MINIMUM AREA IN BEARING 95%

DRILLED SHAFTS (CAISSONS): DM4 SEC.10.8, PENNDOT COM624 OR L-PILE

MAXIMUM DESIGN LATERAL DISPLACEMENT 0.5"

NOTES TO DESIGNER:

1. A TS&L SUBMISSION IS REQUIRED FOR CMS SUPPORTED CANTILEVER STRUCTURES FOR DISTRICT BRIDGE UNIT REVIEW AND APPROVAL. THE TS&L DRAWINGS SHALL INCLUDE STRUCTURE TYPE AND ALL CRITICAL VERTICAL AND HORIZONTAL CLEARANCES. MEMBER SIZES ARE NOT REQUIRED IN THE TS&L SUBMISSION. IF A CANTILEVER STRUCTURE IS PROPOSED, PROVIDE JUSTIFICATION FOR REVIEW AND APPROVAL OF THE CHIEF BRIDGE ENGINEER. IT IS PREFERABLE TO SECURE A S-NUMBER AT THE TS&L APPROVAL STAGE.
2. PLACE THE FOLLOWING NOTE ON CONTRACT DRAWINGS - "PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH PENNDOT SPECIFICATION PUBLICATION 408 - (INDICATE YEAR AND CHANGE NUMBER), AASHTO/AWS D1.5-BRIDGE WELDING CODE AND CONTRACT SPECIAL PROVISIONS. USE AASHTO/AWS D1.1 FOR WELDING NOT COVERED IN AASHTO/AWS D1.5".
3. SUPPORT SIGN STRUCTURES INTENDED TO CARRY CMS NOT COVERED IN THESE STANDARDS MUST BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF PENNSYLVANIA AND SUBMITTED TO THE CHIEF BRIDGE ENGINEER FOR REVIEW AND APPROVAL. THE BD-641M STANDARDS MAY BE USED FOR PRELIMINARY MEMBER SIZES ONLY; DESIGN COMPUTATION MUST BE SUBMITTED FOR ALL COMPONENTS OF SUPPORT STRUCTURES CARRYING CMS.
4. ALUMINUM CMS SUPPORT STRUCTURES ARE PROHIBITED.
5. TELESCOPING (SLIP-FIT) FIELD SPLICES FOR CMS SUPPORT STRUCTURES ARE PROHIBITED.
6. THE STRUT CONNECTION DETAILS PROVIDED IN BC-741M FOR CANTILEVER SUPPORT STRUCTURES ARE NOT ACCEPTABLE FOR USE WITH CMS. THE CONNECTION BETWEEN THE HORIZONTAL STRUTS AND VERTICAL COLUMNS SHALL BE DESIGNED AND DETAILED ON THE CONTRACT DRAWINGS BASED ON DESIGN REQUIREMENTS AS SPECIFIED HEREIN.
7. FOUNDATION DETAILS PROVIDED IN BC-741M FOR CANTILEVER SUPPORT STRUCTURES ARE ACCEPTABLE FOR USE WITH CMS, PROVIDED THEY MEET ALL DESIGN CRITERIA SPECIFIED HEREIN. OBTAIN FOUNDATION APPROVAL FROM THE REPRESENTATIVE.
8. INCLUDE THE FOLLOWING NOTE IN THE CONTRACT SPECIAL PROVISIONS - "PROVIDE A CERTIFICATION LETTER, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF PENNSYLVANIA, CERTIFYING THAT THE INTERNAL STRUCTURE OF THE CMS AND THE CONNECTION TO THE SIGN STRUCTURE MEET THE REQUIREMENT OF THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS AS AMENDED BY PENNDOT." THE CERTIFICATION LETTER SHALL BE PREPARED BY THE CMS MANUFACTURER'S PROFESSIONAL ENGINEER AND SUBMITTED BY THE CONTRACTOR.
9. INCLUDE ALL ASSUMPTIONS OF THE CMS ON THE CONTRACT DRAWINGS INCLUDING MAXIMUM DIMENSIONS, DEAD LOAD, AND ECCENTRICITY.
10. SINGLE STRUT/CHORDS ARE NOT PERMITTED FOR CMS SUPPORT STRUCTURES.

*LEGEND:

- AASHTO SIGN SPEC: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS"
- AASHTO HIGHWAY BRIDGES: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" SPECIFICATIONS
- DM4: PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, DESIGN MANUAL PART 4, STRUCTURES
- U.N.O.: UNLESS NOTED OTHERWISE
- ACI: AMERICAN CONCRETE INSTITUTE - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE WITH COMMENTARY (ACI 318-99)
- CVN: CHARPY V-NOTCH
- CMS: CHANGEABLE MESSAGE SIGN

REFERENCE DRAWINGS

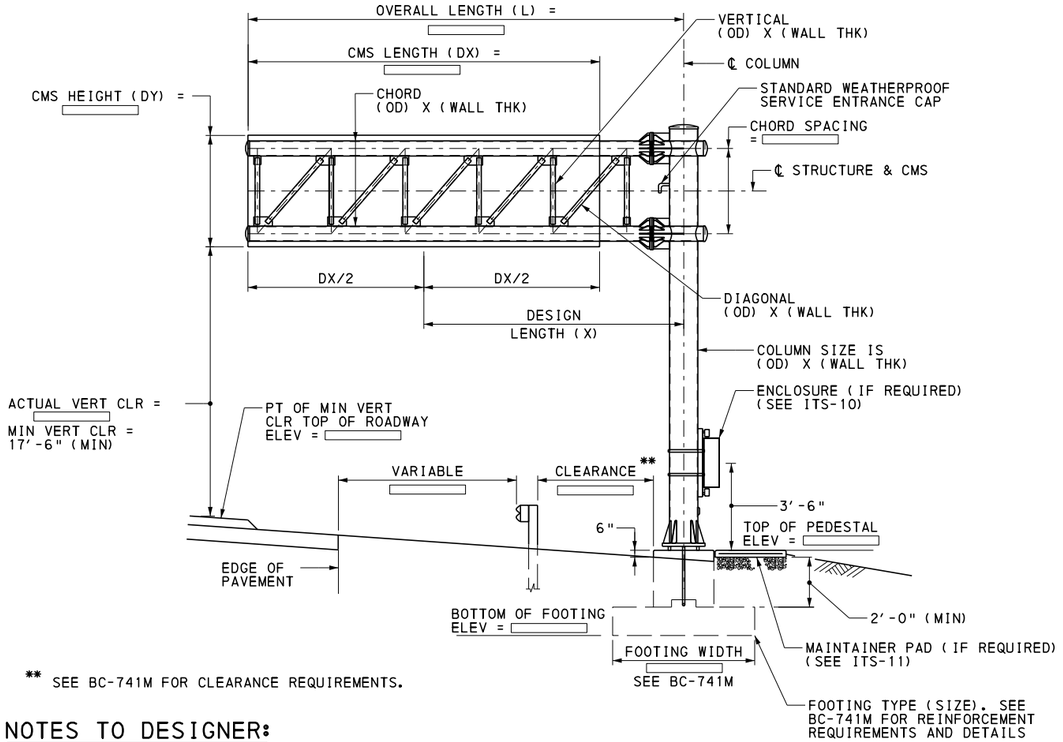
BC-736M	REINFORCEMENT BAR FABRICATION DETAILS
BC-741M	OVERHEAD SIGN STRUCTURES
ITS-62	CMS CONNECTION DETAILS
RC-11M	CLASSIFICATION OF EARTHWORK FOR STRUCTURES
RC-51M	TYPE 31 STRONG POST GUIDE RAIL
RC-53M	TYPE 2 WEAK POST GUIDE RAIL
RC-54M	BARRIER PLACEMENT AT OBSTRUCTIONS
RC-58M	SINGLE FACE CONCRETE BARRIER

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CANTILEVER CMS SUPPORT STRUCTURE

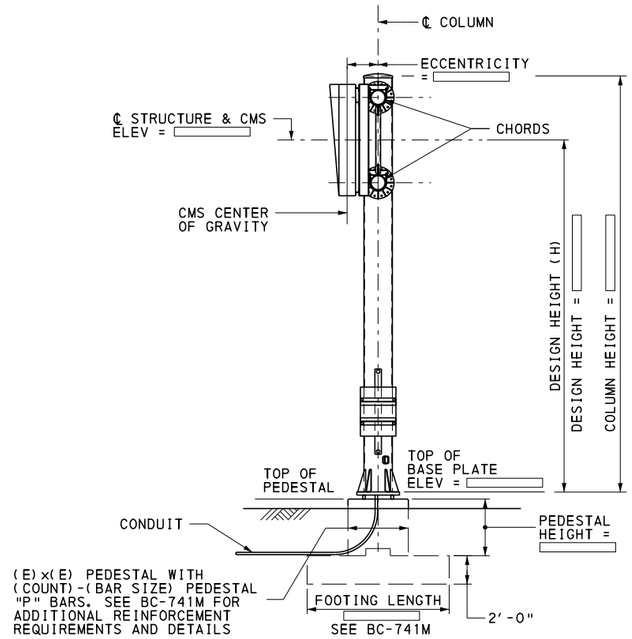
GENERAL NOTES

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 4
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-61

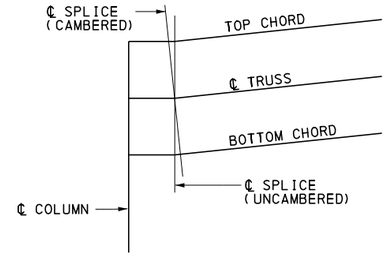


** SEE BC-741M FOR CLEARANCE REQUIREMENTS.

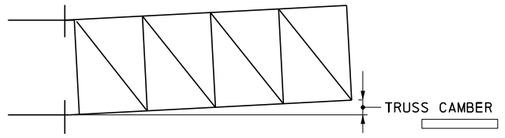
FRONT ELEVATION



SIDE ELEVATION



CAMBER DETAIL FOR CANTILEVER



TRUSS CAMBER DIAGRAM FOR CANTILEVER

TRUSS CAMBER NOTE

TRUSS CAMBER SHALL BE OBTAINED BY SHORTENING THE TOP CHORD STUB LENGTH AND LENGTHENING THE BOTTOM CHORD STUB LENGTH. CHORD SPLICE PLATES SHALL BE SKEWED ACCORDINGLY BEFORE WELDING TO CHORDS. NO FORCE SHALL BE APPLIED IN PROVIDING CAMBER. AN ALTERNATIVE METHOD OF OBTAINING CAMBER MAY BE USED AS APPROVED BY THE CHIEF BRIDGE ENGINEER.

NOTES TO DESIGNER:

1. CANTILEVER SUPPORT STRUCTURES SUPPORTING CMS REQUIRE SPECIAL DESIGN. CONNECTION DETAILS BETWEEN THE STRUT AND COLUMN AS DETAILED IN BC-741M ARE NOT PERMITTED. PROVIDE ALL CONNECTION DETAILS ON THE CONTRACT DRAWINGS IN ACCORDANCE WITH THIS STANDARD AND DESIGN REQUIREMENTS. SEE SHEETS 3 AND 4 FOR REQUIRED CONNECTION DETAILS.

2. CANTILEVER SUPPORT STRUCTURES WITHIN PENNDOT RIGHT-OF-WAY SUPPORTING CMS REQUIRE WRITTEN JUSTIFICATION AND CHIEF BRIDGE ENGINEER APPROVAL AT THE TS&L STAGE. CANTILEVER SUPPORT STRUCTURES ARE ONLY PERMITTED WHEN IT CAN BE DEMONSTRATED THAT A CENTER-MOUNT OR AN OVERHEAD TRUSS IS NOT FEASIBLE.

3. CANTILEVER SUPPORT STRUCTURES ARE LIMITED TO THE FOLLOWING:

   - LIMIT CMS TO EXTEND OVER THE LANE CLOSEST TO THE VERTICAL COLUMN ONLY. CMS OVER MORE THAN ONE LANE OR BEYOND THE LANE CLOSEST TO VERTICAL COLUMN ARE TO BE INSTALLED ON A FULL SPAN TRUSS STRUCTURE.
   - MAXIMUM CMS FRONT AREA = 120 SF
   - MAXIMUM CMS DEPTH = 4'-0"
   - MAXIMUM CMS DEAD LOAD = 2500 LBS
   - MAXIMUM OVERALL LENGTH = 30'-0"
   - SLIP FIT CONNECTIONS ARE NOT PERMITTED

4. PLACE THE FOLLOWING NOTES ON CONTRACT DRAWINGS BASED ON DESIGN REQUIREMENTS. DESIGNER MUST PROVIDE INFORMATION IN ( ) PARENTHESES.

   - (E)x(E) PEDESTAL WITH (COUNT) - (BAR SIZE) PEDESTAL "P" BARS. SEE BC-741M FOR ADDITIONAL REINFORCEMENT REQUIREMENTS AND DETAILS.
   - FOOTING TYPE (SIZE). SEE BC-741M FOR REINFORCEMENT REQUIREMENTS AND DETAILS.
   - COLUMN SIZE IS (OD) x (WALL THK). SEE BC-741M FOR ALL FABRICATION DETAILS EXCEPT FOR CHORD CONNECTIONS.
   - CHORD SIZE IS (OD) x (WALL THK). SEE SHEET (CONTRACT DRAWING SHEET NUMBER) FOR FABRICATION DETAILS.
   - VERTICAL BRACE SIZE (OD) x (WALL THK) SEE SHEET (CONTRACT DRAWING SHEET) FOR FABRICATION DETAILS.
   - DIAGONAL BRACE SIZE (OD) x (WALL THK) SEE SHEET (CONTRACT DRAWING SHEET) FOR FABRICATION DETAILS.
   - SEE BC-741M FOR ADDITIONAL FABRICATION DETAILS INCLUDING HAND HOLE, WEATHERPROOF ENCLOSURE, AND STANDARD WEATHERPROOF SERVICE ENTRANCE CAP.
   - SEAL BASE PLATE TO FOUNDATION GAP WITH GALVANIZED STEEL SCREEN, ⅜" BY ⅜" AND 0.045" DIAMETER WIRES. SCREEN IS TO PREVENT ENTRY OF RODENTS WHILE PERMITTING DRAINAGE. SCREEN IS TO BE REMOVABLE AND ATTACHED TO BASE PLATE WITH STAINLESS STEEL HARDWARE.

5. PROVIDE HAND HOLE, WEATHERPROOF ENCLOSURE, AND STANDARD WEATHERPROOF SERVICE ENTRANCE CAP SIZE AND LOCATIONS ON CONTRACT PLANS BASED ON SITE SPECIFIC REQUIREMENTS. ALTERNATE DETAILS FROM BC-741M MAY BE REQUIRED TO MEET CABLE BENDING RADIUS AND PROJECT SPECIFIC REQUIREMENTS.

6. PLACE CAMBER DIAGRAM ON CONTRACT DRAWINGS AND SPECIFY REQUIRED CAMBER BASED ON DESIGN REQUIREMENTS.

7. PROVIDE DIMENSIONS AND ELEVATIONS BASED ON ACTUAL STRUCTURE CONFIGURATION AS REQUIRED. SAMPLE INDICATES MINIMUM REQUIRED INFORMATION WITH ☐

8. PROVIDE GENERAL NOTES FROM SHEET 1.

9. PROVIDE CANTILEVER STRUCTURE DETAILS AND CONNECTION DETAILS FROM SHEETS 3 AND 4 ON THE CONTRACT DRAWINGS.

10. PROVIDE CMS CONNECTION DETAILS ON THE CONTRACT DRAWINGS IN ACCORDANCE WITH ITS-62.

11. FOR CAISSON ALTERNATIVE, PROVIDE CAISSON DIAMETER, TOP OF CAISSON ELEVATION, BOTTOM OF CAISSON ELEVATION, EMBEDMENT DEPTH, TOTAL CAISSON LENGTH, VERTICAL AND TIE REINFORCEMENT BAR NUMBER AND SIZE, AND ROCK SOCKET REQUIREMENTS AS REQUIRED.

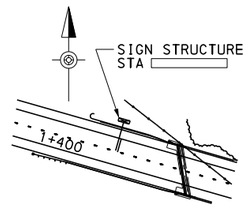
12. REFER TO PENNDOT PUBLICATION 852, TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) GUIDEBOOK PART II : DESIGN, CHAPTER 3 FOR DESIGN CONSIDERATIONS, LOCATION AND PLACEMENT GUIDELINES FOR CMS SUBSYSTEM.

CANTILEVER CMS SUPPORT STRUCTURE

TABLE OF ESTIMATED QUANTITIES			
ITEM NO.	ITEM	UNIT	QUANTITY
*	STEEL SIGN STRUCTURE	LBS	
0000-0000	CLASS 3 EXCAVATION	CY	
0000-0000	CLASS A CEMENT CONCRETE	CY	
0000-0000	REINFORCEMENT BARS	LBS	

* ITEMS SHOWN FOR INFORMATION ONLY, INCLUDED IN LUMP SUM ITEM NO. 0000 - 0000

DESIGN CRITERIA	
DESIGN CMS AREA (A) =	
DESIGN CMS LENGTH (DX) =	
DESIGN CMS HEIGHT (DY) =	
DESIGN HEIGHT (H) =	
CMS ECCENTRICITY =	
OVERALL LENGTH (L) =	
DESIGN LENGTH (X) =	
DESIGN WEIGHT OF CMS (W) =	



SEE PLAN SHEET ☐ FOR SIGN STRUCTURE LOCATION

LOCATION PLAN

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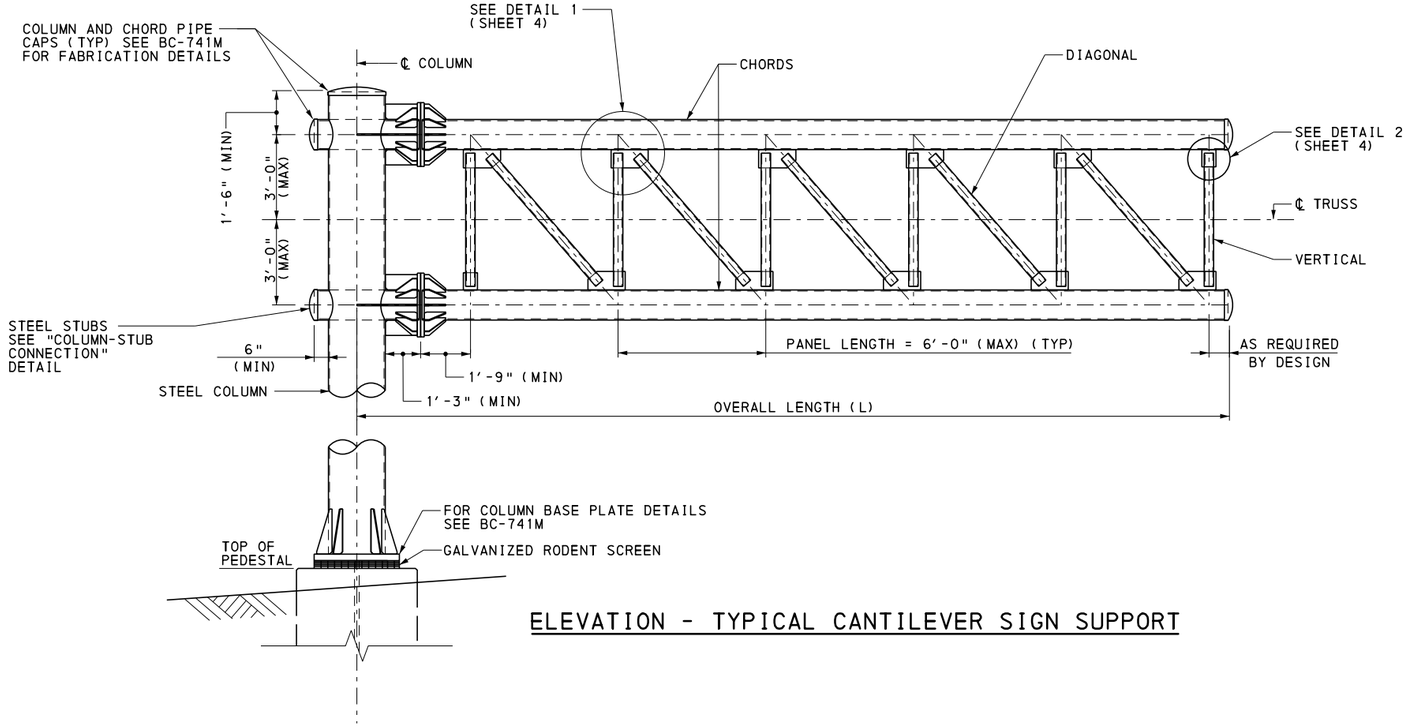
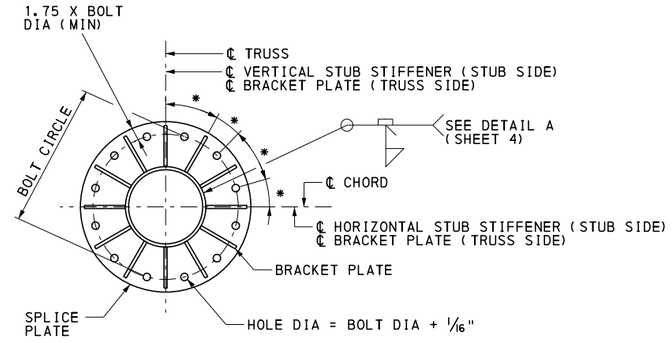
CANTILEVER CMS SUPPORT STRUCTURE

SAMPLE CONTRACT PLANS

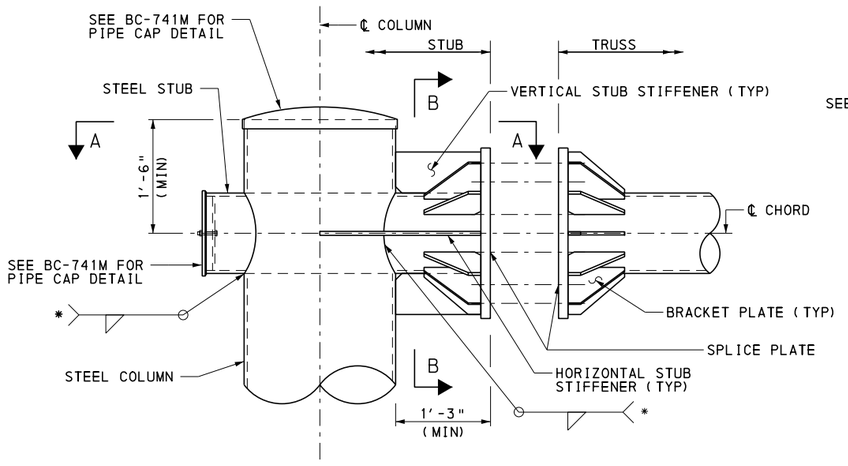
RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 2 OF 4 ITS-61



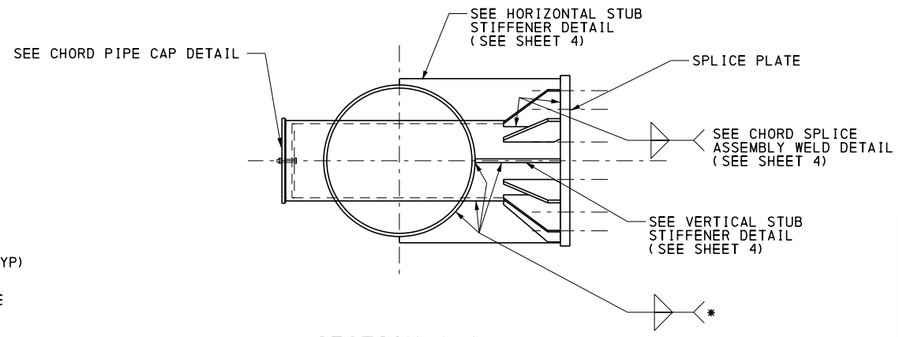
ELEVATION - TYPICAL CANTILEVER SIGN SUPPORT



SECTION B-B



COLUMN - STUB CONNECTION



SECTION A-A

* AS REQUIRED BY DESIGN

NOTES TO DESIGNER:

1. THE CONNECTION DETAILS SHOWN IN THESE STANDARDS ARE CONCEPTUAL AND ARE THE MINIMUM REQUIREMENTS. ALL MEMBERS, PLATES, AND BOLTS SHALL BE DETAILED ON THE CONTRACT PLANS AS REQUIRED BY DESIGN.

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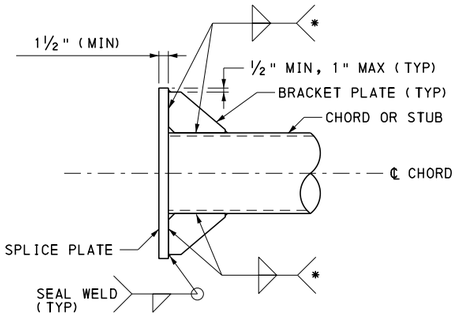
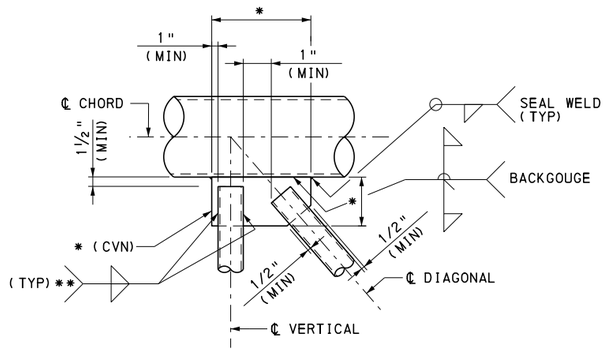
CANTILEVER CMS SUPPORT STRUCTURE

TRUSS AND COLUMN DETAILS

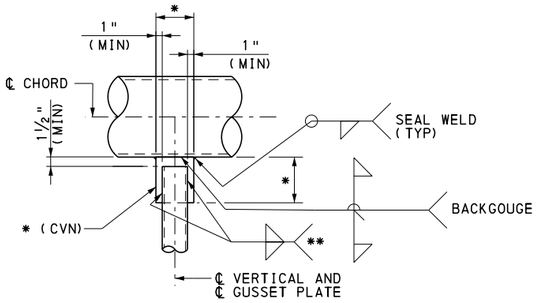
RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 3 OF 4
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-61



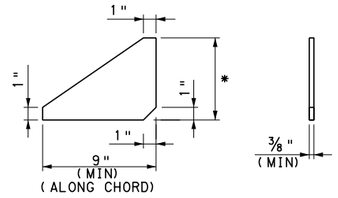
CHORD SPLICE ASSEMBLY WELD DETAIL



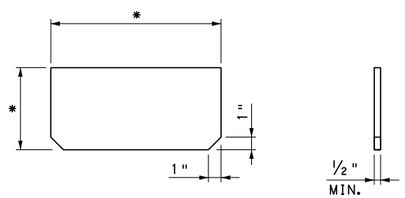
DETAIL 1 - K GUSSET



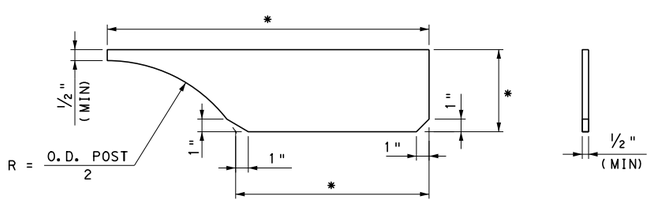
DETAIL 2 - T GUSSET



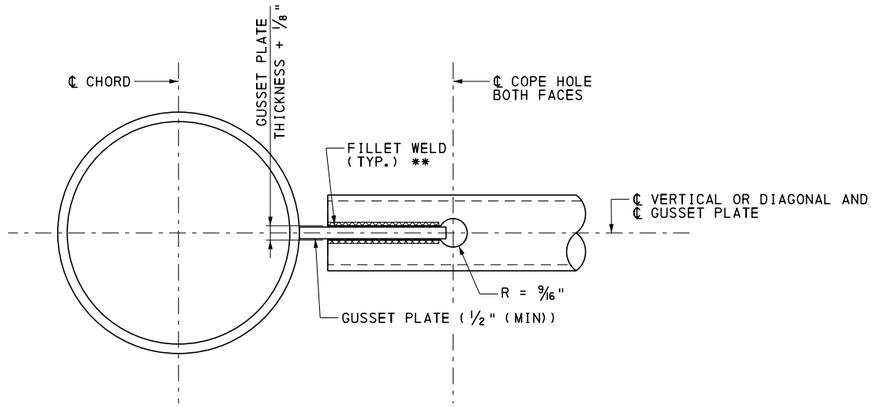
BRACKET PLATE DETAIL



VERTICAL STUB STIFFENER DETAIL



HORIZONTAL STUB STIFFENER DETAIL



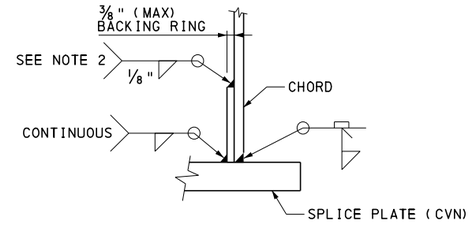
COPE HOLE DETAIL

** PROVIDE A WELD "HOLD BACK" AT THE EDGE OF THE GUSSET PLATE IN THE VERTICAL OR DIAGONAL EQUAL TO THE MINIMUM WELD SIZE REQUIREMENT.

GUSSET PLATE NOTE:

SIZE GUSSET PLATE (LENGTH, WIDTH AND THICKNESS) AS REQUIRED BY DESIGN. REFER TO BC-745M, DETAILS #4 AND #5 AND THE TRUSS GUSSET PLATE TABLE ON SHEET 7, FOR MINIMUM GUSSET PLATE DIMENSIONS.

* AS REQUIRED BY DESIGN



DETAIL A

DETAIL A NOTES:

1. BACKING RING MUST BE FITTED / SIZED TO THE PIPE CHORD AND CONTINUOUSLY FILLET WELDED TO THE SPLICE PLATE BEFORE FULL PENETRATION GROOVE WELD IS MADE. BACKING PLATE MUST BE FABRICATED AS A CONTINUOUS RING.
2. FOR CHORDS LESS THAN 19" DIA., THIS FILLET WELD IS NOT REQUIRED BUT SHOP IS TO APPLY SILICON CAULKING TO THIS LOCATION AFTER CHORD SPLICE ASSEMBLY IS GALVANIZED.

NOTES TO DESIGNER:

1. THE CONNECTION DETAILS SHOWN IN THESE STANDARDS ARE CONCEPTUAL AND ARE THE MINIMUM REQUIREMENTS. ALL MEMBERS, PLATES, AND BOLTS SHALL BE DETAILED ON THE CONTRACT PLANS AS REQUIRED BY DESIGN.
2. CHORD INTERMEDIATE SPLICING WILL NOT BE PERMITTED UNLESS APPROVED BY THE CHIEF BRIDGE ENGINEER.

COMMONWEALTH OF PENNSYLVANIA
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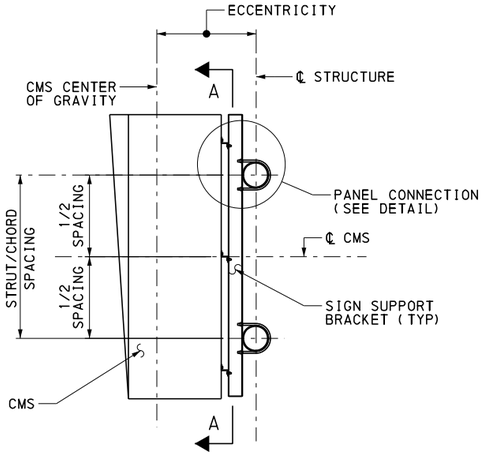
CANTILEVER CMS SUPPORT STRUCTURE

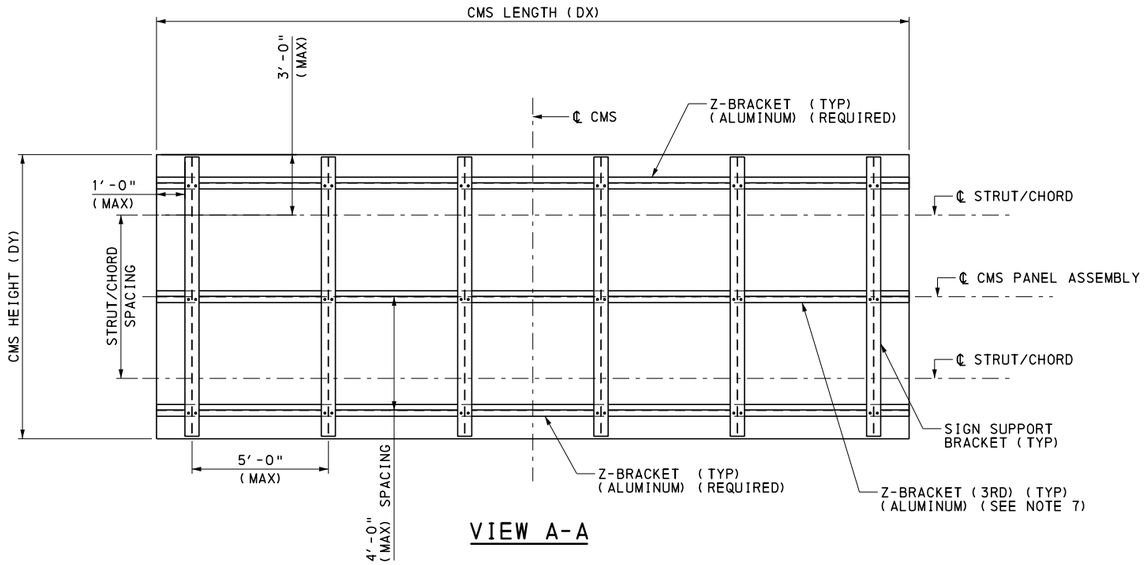
TRUSS AND COLUMN DETAILS

RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 4 OF 4 ITS-61



PANEL CONNECTION

(CANTILEVER STRUCTURE SHOWN, OTHERS SIMILAR)



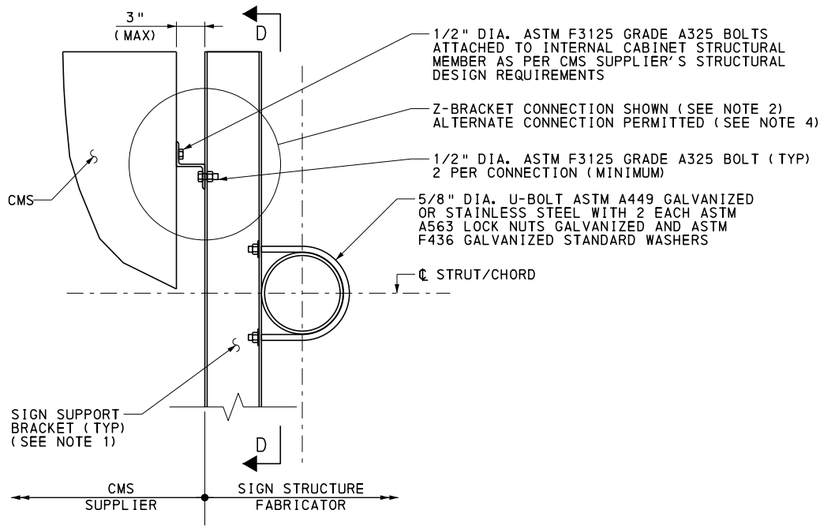
VIEW A-A

NOTES TO DESIGNER:

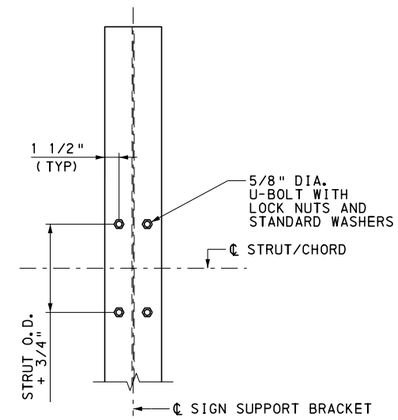
1. MINIMUM SIZE OF SIGN SUPPORT BRACKET IS W6x15.
2. HORIZONTAL Z-BRACKETS SHALL BE MADE OF ALUMINUM ALLOY 6061-T6 OR AS APPROVED BY THE CHIEF BRIDGE ENGINEER AND SHALL BE A MINIMUM OF 1/4" THICK.
3. CONNECTION DETAILS PROVIDED ON THIS SHEET HAVE BEEN DESIGNED BASED ON THE FOLLOWING DMS ASSUMPTIONS:

MAXIMUM DEAD LOAD	6000 LBS
MAXIMUM ECCENTRICITY	5'-0"
MAXIMUM LENGTH (DX)	30'-0"
MAXIMUM HEIGHT (DY)	10'-0"
MAXIMUM DEPTH	4'-0"

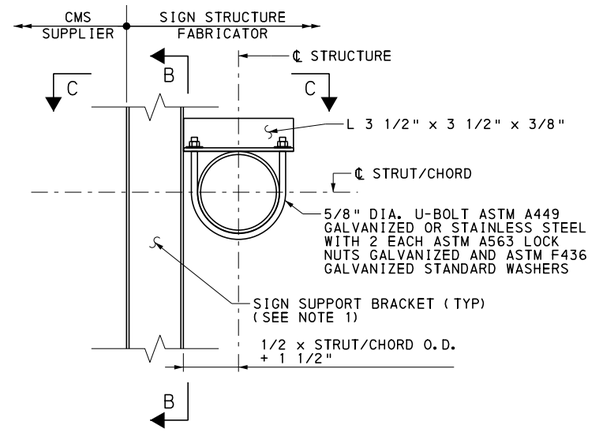
   DESIGN CALCULATIONS ARE REQUIRED FOR DEVIATIONS TO THESE ASSUMPTIONS.
4. ALTERNATE CONNECTION DETAILS ARE PERMITTED, BUT REQUIRE CALCULATIONS PREPARED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF PENNSYLVANIA AND VERIFIED BY A SECONDARY INDEPENDENT PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF PENNSYLVANIA. THE CMS MANUFACTURER IS RESPONSIBLE FOR PROVIDING THESE CALCULATIONS AND HAVING THEM SIGNED AND SEALED BY BOTH THE PROFESSIONAL ENGINEERS.
5. DETAILS PROVIDED ARE THE MINIMUM REQUIREMENTS. ANY DEVIATIONS REQUIRE SPECIAL DESIGN.
6. FIELD WELDED CMS CONNECTIONS ARE NOT PERMITTED.
7. USE OF 3RD Z-BRACKET IS BASED ON PROJECT AND WIND LOADING REQUIREMENTS. MOUNTING CALCULATIONS TO BE COMPLETED TO AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION, 2001, INCLUDING INTERIMS THROUGH 2006 AND SUBMITTED BY THE DESIGNER.



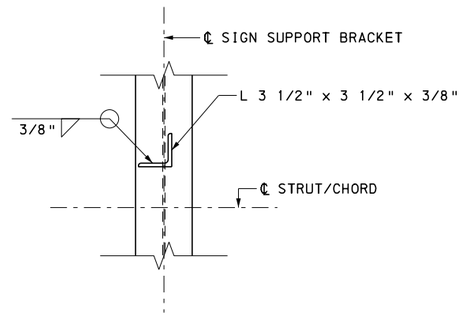
PANEL CONNECTION DETAIL



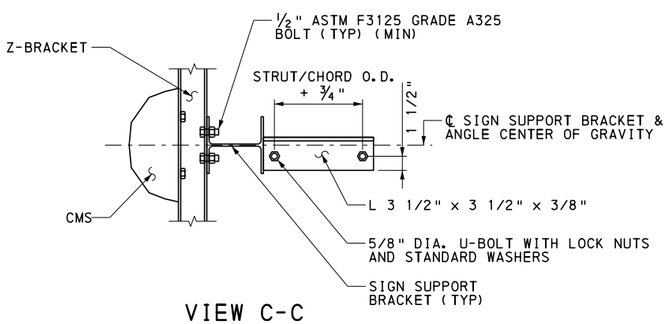
VIEW D-D



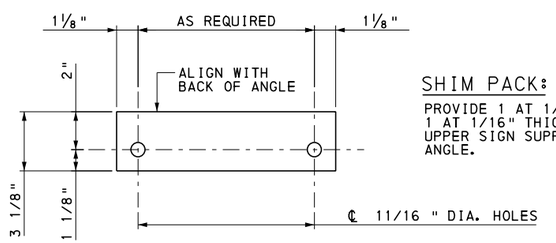
ALTERNATE PANEL CONNECTION DETAIL



VIEW B-B



VIEW C-C



SHIM DETAIL

SHIM PACK:

PROVIDE 1 AT 1/4", 3 AT 1/8" AND 1 AT 1/16" THICKNESS FOR EACH UPPER SIGN SUPPORT CONNECTION ANGLE.

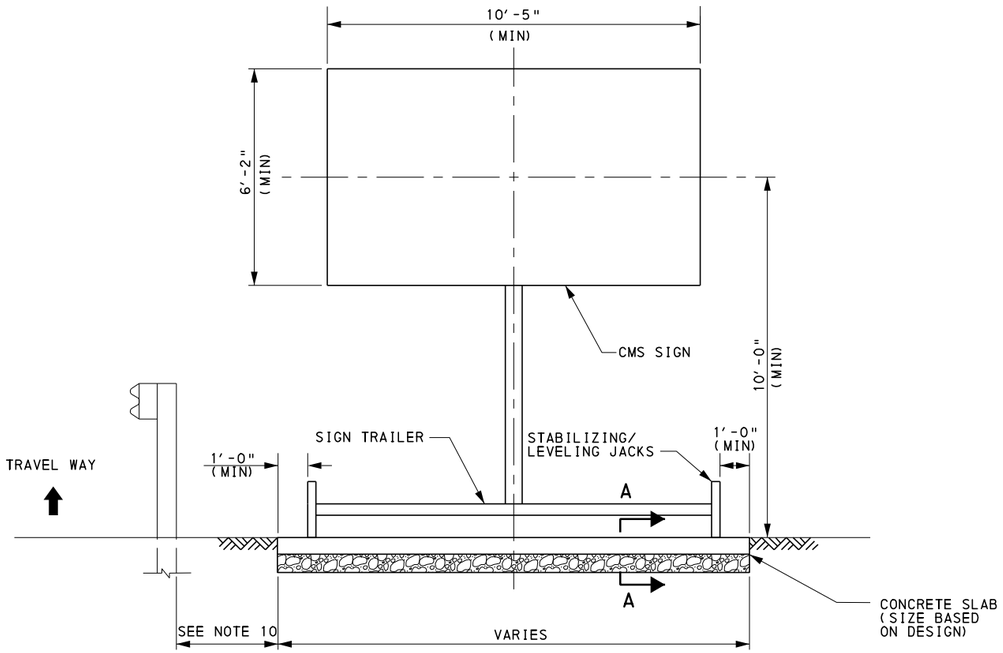
NOTE:

SHIM AS REQUIRED BETWEEN ANGLE AND TOP OF CHORD TO PROVIDE TIGHT FIT. (SEE SHIM DETAIL BELOW)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF OPERATIONS

CMS CONNECTION DETAILS

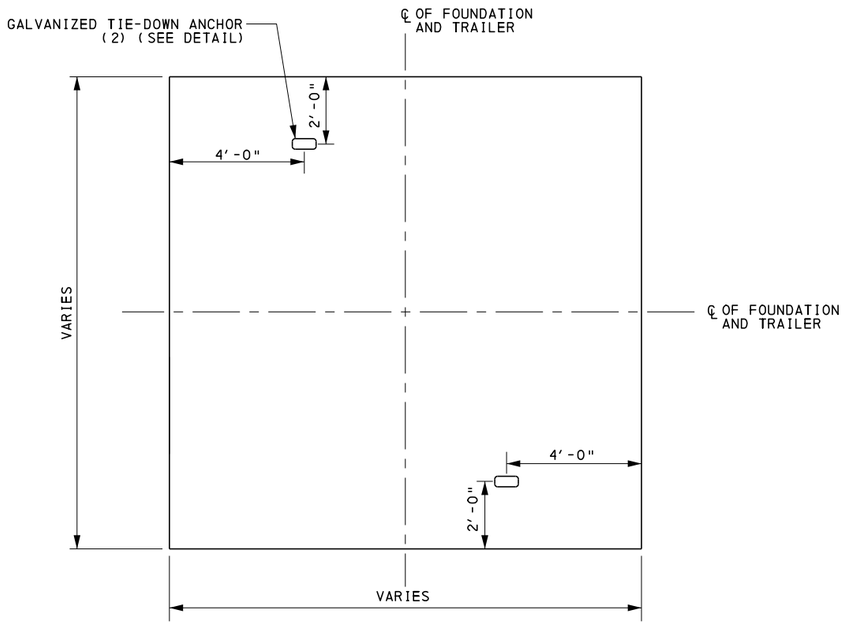
RECOMMENDED FEB. 20, 2024 CHIEF, TSMO ARTERIALS AND PLANNING SECTION	RECOMMENDED FEB. 20, 2024 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT 1 OF 1 ITS-62



PAD NOTES:

1. CONCRETE SLAB REINFORCEMENT NOT SHOWN FOR CLARITY.
2. SEE CONTRACT DOCUMENTS FOR LOCATION OF PORTABLE CMS PAD.

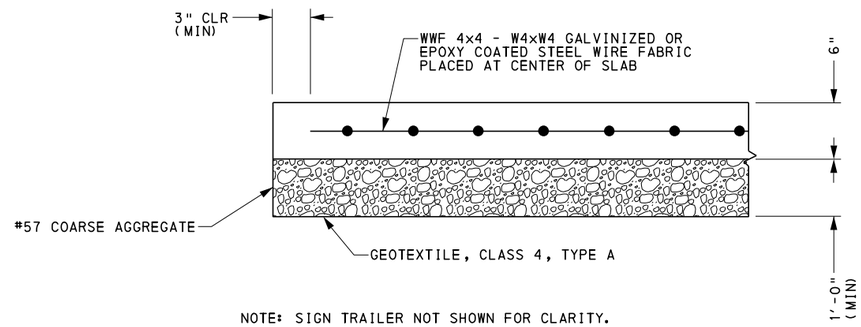
PORTABLE CMS ELEVATION



PLAN VIEW

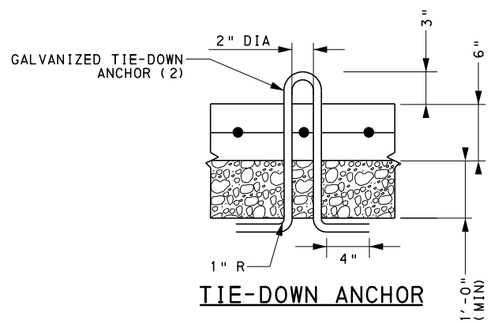
GENERAL NOTES:

1. PROVIDE PORTABLE CHANGEABLE MESSAGE SIGN IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1231.2.
2. DIMENSIONS ARE BASED ON A NORMAL TEMPERATURE OF 68° F.
3. ALL DIMENSIONS SHOWN ARE HORIZONTAL, EXCEPT AS NOTED.
4. USE CLASS A CEMENT CONCRETE IN CMS SLAB.
5. CHAMFER EXPOSED CONCRETE EDGES 1" X 1" EXCEPT AS NOTED.
6. VERIFY ALL ELEVATIONS AND DIMENSIONS IN THE FIELD PRIOR TO FABRICATION AND FOUNDATION CONSTRUCTION.
7. SLOPE CONCRETE SLAB 2% TO PREVENT RUNOFF ON TO THE TRAVEL WAY.
8. CONCRETE SLAB SHALL BE SIZED TO ACCOMMODATE ALL STABILIZING/ LEVELING JACKS AND ALL OTHER EQUIPMENT NEEDED TO SECURE AND OPERATE PORTABLE CMS. A 1'-0" (MIN) BUFFER SHALL BE ADDED TO EACH SIDE.
9. PAD MAY BE USED WITH LONG-TERM PORTABLE CLOSED CIRCUIT TELEVISION CAMERA. PROVIDE PORTABLE CLOSED CIRCUIT TELEVISION CAMERA IN ACCORDANCE WITH PENNDOT PUB 408 SECTION 1211.2.
10. CLEARANCE MUST MEET MINIMUM REQUIREMENT FOR PLACEMENT BEHIND GUIDE RAIL OR BARRIER INSTALLED AT THE SITE PER BC-741M, TABLE A.



NOTE: SIGN TRAILER NOT SHOWN FOR CLARITY.

SECTION A-A



TIE-DOWN ANCHOR

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CONCRETE PAD DETAILS

RECOMMENDED FEB. 20, 2024	RECOMMENDED FEB. 20, 2024	SHT 1 OF 1
CHIEF, TSMO ARTERIALS AND PLANNING SECTION	CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	ITS-90