DESIGN STANDARDS

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

2010

TOPIC NO. 625-010-003

Approved For Use On Federal Aid Projects

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For Martin Knopp, Division Administrator

State of Florida, Department Of Transportation
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CERTIFICATION STATEMENT

I hereby certify that this Design Standard Book was compiled under my responsible charge from designs prepared, examined, adopted and implemented by the Florida Department of Transportation in accordance with established procedures, and as approved by the Federal Highway Administration.

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As To Planning
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17900

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As To ITS
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Index Number	Sheet Number	Description
001	1 thru 3	Added the following standard abbreviations: ℄ Base Line, Base Line Control ℄ Flow Line GRI Geosynthetic Research Institute HDPE High Density Polyethylene NPS Nominal Pipe Size
		Deleted the following standard abbreviations: Bbl Barrel FRCP Fiber Reinforced Concrete Pipe FRP Fiber Reinforced Pipe FS Far Side
002	2 of 3	Deleted Hand Drafting Symbols
102	2 of 3	NOTES FOR SYNTHETIC BALES OR BALE TYPE BARRIERS, Note 2, deleted the text "trenched 3" to 4" and" from the first sentence.
104	2 of 2	RURAL DIVIDED detail, changed "5' Shoulder Pavement" to "4' Shoulder Pavement".
105	1 of 1	TREATMENT I, Criteria for using Treatment I, replaced text of the last bullet with the following: "resurfacing build-up is less than 3" ".
200	1 of 5	TOP SLAB REINFORCING STEEL DIAGRAM (ALTERNATE B) to the notes "2 Additional Bars A @ 5" O.C." and "2 Additional Bars B @ 5" Max. O.C. Each Side Of Opening", added "(Minimum #4 Bars)".
	2 of 5	Note 9, Delete second sentence and substitute, "Additional bars used to restrain hole formers for precast structures with grouted pipe connections, may be left flush with the hole surface."
	4 of 5	SLAB AND WALL DESIGN TABLE NOTES, added the following to the end of Note 10: "See Index No. 201, Sheet 4 for allowable bar spacing adjustments when larger areas of reinforcing are substituted."
201	4 of 5	"Revised title of notes to ""NOTES FOR PRECAST OPTIONS AND EQUIVALENT REINFORCEMENT SUBSTITUTION"" and added the following to Note 4, ""When an increased area of reinforcing is provided, then the maximum bar spacing may be increased by the squared ratio of increased steel area, but not to exceed 12 inches: Max. Bar Spacing Provided < Max. Bar Spacing Required x (Steel Area Provided/Min. Steel Area Required)² "
205	1 of 6	Changed maximum size of allowed PVC pipe to 36".
	2 of 6	ROUND PIPE DIMENSIONS, deleted the column, "Wall Thickness (In.) Class III" and subcolumn "NRCHP" and heading "SRCP". Also deleted the ** note at the bottom of the table.
	3 of 6	NOTES: deleted note 4; table "PIPE ARCH: SPIRAL RIB: ¾" x¾" x 7½" RIB SPACING..." deleted references to note 4; table "ROUND PIPE - SPIRAL RIB", "Maximum Height of Fill (Ft.)", "Sheet Thickness In Inches (Gage)", "0.138 (10)" added measurements.
210	1 of 1	Delete General Note 4, and substitute the following: "For precast units the rear wall and apron may be precast as a separate piece from the top slab. Provide a minimum of 7 ~ #4 dowels in accordance with Index No. 201 "OPTIONAL CONSTRUCTION JOINTS".
211	1 thru 5	Revised index completely 3 sheets added, Reinforcing configuration and C.I.P. details revised; precast and WWR details added. Changed Note 4 to allow 4'-0" round risers.
213	1 of 1	In PLAN view changed "1/2" Exp. Joint (Typ)" to "1/2" Preformed Joint Filler (Typ)".
218	2 of 2	"STEEL GRATE", "TOP VIEW", for the overall dimension on the left side of the grate, inserted "44¼" ". For the small dimension at the upper left corner of the grate, inserted "3½" ".
219	1 of 2	In PLAN view and Section HH changed "Expansion Joint (Typ)" and "Expansion Material Joint" to "1/2" Preformed Joint Filler (Typ)".
220	1 of 3	"GUTTER INLET TYPE S", "SECTION BB", Changed the vertical dimension between the top of the inlet and the grate elevation from "5½" to "4½" ".
		"SECTION AA", at the top right corner, for precast thickness changed " 6" " to " 3" " (same as left side).
		"SECTION BB", at the top, changed "3'-11" Precast" to " 4'-3" Precast". "PLAN", at the top, changed " 3'-11" Precast to " 4'-3" Precast".
230	1 of 2	In "PLAN" view changed "1/2" Exp. Joint (typ)" to "1/2" Preformed Joint Filler (Typ)". Section E-E, Changed 4Z15.9 shape to built up section (3.5 x 3 x ½L + ½ x 3 Bar) for grating.
231	1 of 3	"DITCH BOTTOM INLET TYPE B", "SECTION BB", upper left side, deleted the dimension "2'-6" (Min.)" and replaced with "1'-10" (Min.)".
232	1 thru 7	Index was expanded due to font size change.
233	1 thru 2	Index was expanded due to font size change.
234	1 thru 2	Index was expanded due to font size change.
	2 of 2	Under Pavement & Sodding detail changed "1/2" Exp. Joint" to "1/2" Preformed Joint Filler".
235	1 of 2	"GENERAL NOTES", Note 3, deleted "Alternate B" replaced with "Index 200", Note 8 changed "Specification Section 962" to "Specification Section 975".
245	1 of 1	"GENERAL NOTES" Note 2, delete and replace with the following: "Concrete shall be Class I (Structural), except ASTM C478 (4000 psi) concrete may be substituted for precast items manufactured in plants meeting the requirements of Section 449 of the Specifications. Box shall be reinforced with No. 3 bars (Grade 60) on 8" centers both ways, sides and bottom.
250	1 of 2	"GENERAL NOTES" Note 5, deleted and replaced with the following: "Concrete shall be Class I (Structural), except ASTM C478 (4000 psi) concrete may be substituted for precast items manufactured in plants meeting the requirements of Section 449 of the Specifications."
251	1 of 2	"GENERAL NOTES" Note 4, deleted and replaced with the following: "Concrete shall be Class II, except ASTM C478 (4000 psi) concrete may be substituted for precast items manufactured in plants meeting the requirements of Section 449 of the Specifications."
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260	1 of 1	"GENERAL NOTES" Note 3 changed "Specification Section 962" to "Specification Section 975".
261	1 of 3	"GENERAL NOTES" Note 4 changed "Specification Section 962" to "Specification Section 975".
264	1 thru 2	Index was expanded due to font size change. General note 3 changed.
270	1 of 1	"GENERAL NOTES" Note 2 changed "Specification Section 941-1.5" to "Specification Section 449". Changed Note 3.
272	6 of 6	Reordered "GENERAL NOTES" and changed "Class I concrete" to "Class NS concrete".
273	1 thru 7	Index was expanded due to font size change.
	7 of 7	"GENERAL NOTES", Note 8, deleted "Class I concrete" and substituted "Class NS concrete".
280	1 thru 3	Index was expanded due to font size change.
	1 of 3	"DISSIMILAR TYPES CONCRETE JACKET FOR CONNECTING DISSIMILAR TYPES OF PIPE AND CONCRETE PIPES WITH DISSIMILAR JOINTS" detail, added the note, "Alternate connection must be approved by the State Drainage Engineer."
282	1 thru 3	Index was expanded due to font size change.
	1 of 3	"FRONT ELEVATION" and "SECTION AA" details changed "1/2" Exp. Matl. " to "1/2" Preformed Joint Filler".
	2 of 3	"PLAN" and "SECTION AA" details changed "1/2" Exp. Matl. " to "1/2" Preformed Joint Filler".
284	1 of 1	Deleted note "1" and substituted the following: "1. Spillway to be paid for as Shoulder Gutter, LF." Deleted note "2", and substituted the following: "2. If spillway empties into an unpaved ditch the detail should be modified as necessary."
287	1 thru 4	Sheet 3 is new. Renumbered other sheets.
	1 of 4	Changed all 3 occurrences of "Class I concrete" to "Class NS concrete".
288	1 of 1	New Index added "DEEP WELL INJECTION BOX".
289	6 of 7	Changed "FLARED ENDWALL" to "FLARED WINGWALL" and "STRAIGHT ENDWALL" to "STRAIGHT WINGWALL".
291	1 of 5	Changed "Class I Concrete" to "Class NS".
	5 of 5	Changed "Bond Beam" to "Link Slab", and "Class I Concrete" to "Class NS".
292	2 of 14	"GENERAL NOTES" note 1, changed AASHTO LRFD Bridge Specifications, to "4th Edition"; added note 10.

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Index Number	Sheet Number	Description
295	1 of 1	"GENERAL NOTES" Note 2 changed "Specification Section 962" to "Specification Section 975".
300	1 thru 2	Index was expanded due to change in font.
304	6 of 6	Added alternate location of detectable warnings on linear ramps. Added note "On curb ramps, landings and flush transitions perpendicular to the curb line: Rows of domes shall be aligned with the centerline of the ramp. (See Pictorial View A)" at top of sheet. Added Rail Road Crossing PLAN view.
305	1 & 4 of 4	Deleted bar spacing table and revised notes (Sheet 1); Changed width of outside lanes (Sheet 4).
307	2 of 3	"UTILITY CONFLICT PIPES THRU STORM SEWER STRUCTURES" changed to "UTILITY CONFLICT PIPES THRU STORM DRAIN STRUCTURES"
310	1 of 2	"SIDEWALK WITH EDGE BEAM FOR SURFACE MOUNTED RAILINGS", "Clear Width", deleted "3' Min." and substituted "4' Min. *".
		"NOTES FOR CONCRETE SIDEWALK ON CURBED ROADWAYS", deleted "Note 1", and substituted the following: "1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications. Public sidewalk curb ramps shall include detectable warnings and be constructed in accordance with Index No. 304. Detectable warnings are not required where sidewalks intersect urban flared turnouts."
		"Note 3" , deleted.
	2 of 2	"NOTES FOR CONCRETE SIDEWALKS ON UNCURBED ROADWAYS", Changed Note 2 to "Provide detectable warnings that extend the full width of the sidewalk and 24" deep from the edge of pavement where sidewalks adjoin the following vehicular ways: side roads and streets driveways with signalized entrances driveways with entrance volumes greater than 600 vpd driveways with entrance speeds of 25 mph or greater right in – right out composite driveways.
400	1 thru 26	Index expanded by one sheet due to font size change and added new sheet 2, "APPROACH END ANCHORAGE DETAILS", Index renumbered.
	1 of 26	"GENERAL NOTES" Note 17 changed "Specification Section 971" to "Specification Section 975".
	2 of 26	New sheet added showing limits of pay for guardrail, details of shoulder treatment and miscellaneous asphalt for guardrail approach end treatments.
	3 of 26	Corrected spelling of guardrail in last paragraph.
	15 of 26	"LOCATIONS ON FRONT SLOPES", deleted the details for guardrail on slope and rubrail termination and the chart for lateral placement on slopes. (See sheet 26)
	16 of 26	Deleted "REFLECTORS- DETAIL M" (See sheet 17)
	26 of 26	Added "GUARDRAIL ON SLOPES", details for guardrail on slope and rubrail termination and the chart for lateral placement on slopes.
410	1 thru 25	Index completely revised and reorganized.
411	2 of 10	Changed tangent offsets In Detail 'A' to "2.49'-Design Speed ≤45 mph; 1.76' - Design Speed ≥50 mph".
	4 of 10	Changed tangent offsets In Detail 'B' to "2.49'-Design Speed ≤45 mph; 1.76' - Design Speed ≥50 mph".
414	1 of 15	Updated Specification reference Section 971 to 975; Added steel option to ALTERNATE DESIGN note.
	5 of 15	Added PTFE tape option to anchor bolt details.
415	4 of 10	"NOTES FOR WALL END SHIELDING", Note 1, changed the second sentence to: "Except where the plans designate a particular type crash cushion for a specific location, the contractor has the option to construct any of the redirective crash cushions listed on the Qualified Products List, subject to the uses and limitations described on their respective drawings."
		"ANCHOR PLATE BOLTS", upper note, changed "?" to "3/4"".
420	1 of 3	Added the following to the NAME, DATE AND BRIDGE NUMBER note: "The Name shall be as shown in the General Notes in the Structures Plans."; Changed REFLECTIVE RAILING MARKERS note.
		Changed REFLECTIVE RAILING MARKERS note, "Reflective Railing Markers shall meet Specification Section 993. Install markers on top of the Traffic Railing 2" from the face on the traffic side at the spacing shown in the table above. Reflector color (white or yellow) shall match the color of the near edgeline. The cost of the reflective markers shall be included in the Contract Unit Price for the Traffic Railing."
421	1 of 3	Changed REFLECTIVE RAILING MARKERS note, "Reflective Railing Markers shall meet Specification Section 993. Install markers on top of the Traffic Railing along the centerline at the spacing shown in the table above. Reflector color (white or yellow) shall match the color of the near edgeline. The cost of the reflective markers shall be included in the Contract Unit Price for the Traffic Railing."
422	1 of 3	Added the following to the NAME, DATE AND BRIDGE NUMBER note: "The Name shall be as shown in the General Notes in the Structures Plans."; Changed REFLECTIVE RAILING MARKERS note.
		Changed REFLECTIVE RAILING MARKERS note, "Reflective Railing Markers shall meet Specification Section 993. Install markers on top of the Traffic Railing 2" from the face on the traffic side at the spacing shown in the table above. Reflector color (white or yellow) shall match the color of the near edgeline. The cost of the reflective markers shall be included in the Contract Unit Price for the Traffic Railing."
423	1 of 3	Added the following to the NAME, DATE AND BRIDGE NUMBER note: "The Name shall be as shown in the General Notes in the Structures Plans."; Bicycle Railing to "Special Height Bicycle Railing" and Post "B" to Post "B1".
		"TRAFFIC RAILING-(32" VERTICAL SHAPE)", deleted the "REFLECTIVE RAILING MARKERS" note and substituted the following: "Reflective Railing Markers shall meet Specification Section 993. Install markers on top of the Traffic Railing 2" from the face on the traffic side at the spacing shown in the table above. Reflector color (white or yellow) shall match the color of the near edgeline. The cost of the reflective markers shall be included in the Contract Unit Price for the Traffic Railing."
	2 of 3	Changed Bicycle Railing to "Special Height Bicycle Railing" and Post "B" to Post "B1".
	3 of 3	Changed 83 degrees to 93 degrees in CONVENTIONAL REINFORCING STEEL BENDING DIAGRAM Cross-slope table.
424	1 of 7	Added the following to the NAME, DATE AND BRIDGE NUMBER note: "The Name shall be as shown in the General Notes in the Structures Plans."
		"TRAFFIC RAILING - (CORRAL SHAPE)", deleted the "REFLECTIVE RAILING MARKERS" note and substituted the following: "Reflective Railing Markers shall meet Specification Section 993. Install markers on top of the Traffic Railing 2" from the face on the traffic side at the spacing shown in the table above. Reflector color (white or yellow) shall match the color of the near edgeline. The cost of the reflective markers shall be included in the Contract Unit Price for the Traffic Railing."
425	1 of 3	Added the following to the NAME, DATE AND BRIDGE NUMBER note: "The Name shall be as shown in the General Notes in the Structures Plans."
		"TRAFFIC RAILING - (42" F SHAPE)", added the following note: "REFLECTIVE RAILING MARKERS: Reflective Railing Markers shall meet Specification Section 993. Install markers on top of the Traffic Railing 2" from the face on the traffic side at the spacing shown in the table above. Reflector color (white or yellow) shall match the color of the near edgeline. The cost of the reflective markers shall be included in the Contract Unit Price for the Traffic Railing."
470	1 of 3	Added Field testing proof loads to the ADHESIVE BONDED ANCHORS AND DOWELS note; "TRAFFIC RAILING-(THRIE BEAM RETROFIT) GENERAL NOTES & DETAILS", deleted the "BRIDGE NAME PLATE" note and substituted the following: "If a portion of the existing Traffic Railing is to be removed that carries the bridge name, number and or date, or if the installation of the Traffic Railing (Thrie Beam Retrofit) will obscure the bridge name, number and or date, then replace the information that has been removed or obscured, with 3" tall black lettering on white nonreflective sheeting applied to the top of the adjacent guardrail. The information must be clearly visible from the right side of the approaching travel lane. The sheeting and adhesive backing shall comply with Specification Section 994 and may comprise of individual decals of letters and numbers."
		Added the following note: "NEOPRENE PADS: Neoprene pads must be plain pads with a durometer hardness of 60 or 70 and meet the requirements of Specification Section 932, except that testing of the finished pad will not be required."
	3 of 3	Changed offset of 7/8" dia. anchor bolts to 2 3/4" from back edge of base plate in SECTION B-B.
471	2 of 4	"SECTION A-A" and "SECTION B-B", changed "Resilient Pad" to "Neoprene Pad".
472	2 of 4	"SECTION A-A" and "SECTION B-B", changed "Resilient Pad" to "Neoprene Pad".
473	2 of 4	"SECTION A-A" and "SECTION B-B", changed "Resilient Pad" to "Neoprene Pad".
474	2 of 4	"SECTION A-A" and "SECTION B-B", changed "Resilient Pad" to "Neoprene Pad".
	4 of 4	"SECTION C-C", changed "Resilient Pad" to "Neoprene Pad".

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Index Number	Sheet Number	Description
475	2 of 4	"SECTION A-A" and "SECTION B-B", changed "Resilient Pad" to "Neoprene Pad".
476	2 of 4	"SECTION A-A" and "SECTION B-B", changed "Resilient Pad" to "Neoprene Pad".
480	1 of 2	"TRAFFIC RAILING-(VERTICAL FACE RETROFIT) GENERAL NOTES & DETAILS", added the following to the "ADHESIVE-BONDED ANCHORS AND DOWELS" note, "The field testing proof loads required by Specification Section 416 shall be 23,800 lbs. for Dowel Bars 6D on the inside face (traffic side) of the railing (1'-0" embedment) and 18,500 lbs for Dowel Bars 6D along the outside face of the traffic railing (5" min. embedment)." Added NEOPRENE PADS note. Also deleted the "REFLECTIVE RAILING MARKERS" note and substituted the following: "Reflective Railing Markers shall meet Specification Section 993. Install markers on top of the Traffic Railing 2" from the face on the traffic side at the spacing shown in the table below. Reflector color (white or yellow) shall match the color of the near edgeline."
	2 of 2	CONVENTIONAL REINFORCING STEEL BENDING DIAGRAM, added Bars 5E, 5F and 4G for Index No. 484
484	1-10 of 10	New Index added TRAFFIC RAILING (VERTICAL FACE RETROFIT) SPREAD FOOTING APPROACH
500	2 of 2	"HALF SECTION" detail, deleted "Storm Sewer Mains" replaced with "Storm Drain Trunk Lines"
501	3-9 of 9	Changed the REQUIRED TEST METHOD for Burst Strength, Soil-Geosynthetic Friction, Creep Reduction Factor & Joint Overlap to ASTM D 6706.
	4 of 9	Updated values for COMTRAC 70.70; Deleted AMOCO 2006, 2016 & 2044; Added GEOTEX 315ST, 2x2HF, 4x4, 3x3HF, 4x4HF & 4x6 woven geogrids.
	5 of 9	Changed Joint Strength Overlap value to 1.2 for all Marafi products.
	6 of 9	Deleted Application Usage 3 & 4 for SYNTEEN SF 11 & SF 12.
	7 of 9	Added Fornir 20
	8 of 9	Changed Creep Resistance and Creep Reduction Factors for TENSAR BX 1120, BX 1200, BX 1220 & BX 1500
	9 of 9	Updated values for TENAX MS 220 & TENAX MS 330. Added Combigrid 30/30, Secugrid 20/20 & 30/30 extruded geogrids.
505	1-4 of 4	Sheet 3 is new. Renumbered other sheets.
515	5 of 7	In second symbolized note changed "Section 102-6" to "Section 102-8".
	6 of 7	"PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILLIARY LANES TABLE 515-1", "NOTES", Note 5, Deleted "Class I concrete" substituted "Class NS concrete".
518	3 of 3	Revised width of rigid pavement outside travel lane and changed location of rumble strip.
520	1 of 1	"GENERAL NOTES", Note 7, Deleted "Class I Concrete (Retaining Walls)" and substituted "Class NS Concrete"
546	1 of 6	Added detail "PLAN", "PICTORIAL" and ** note. Index sheets reordered.
	5 of 6	Under "NOTES FOR 4-LANE DIVIDED ROADWAY", Note 1, changed reference from "Sheet 6" to "Sheet 2".
600	2 of 13	OVERHEAD WORK, deleted "OPTION 4 - - -" and substituted the following: OPTION 4 (OVERHEAD WORK MAINTAINING TRAFFIC WITH NO ENCROACHMENT BELOW THE OVERHEAD WORK AREA) Traffic shall be detoured, shifted, diverted or paced as to not encroach in the area directly below the overhead work operations in accordance with the appropriate standard index drawing or detailed in the plans. This option applies to, but not limited to, the following construction activities: (a) Beam, girder and segment placement. (b) Deck form placement and removal. (c) Concrete deck placement. (d) Railing construction located at edge of deck. (e) Structure demolition. DEFINITIONS, added the following after definition of TRAVEL WAY: a. Travel Lane: The designated widths of roadway pavement marked to carry through traffic and to separate it from opposing traffic or traffic occupying other lanes. b. Auxiliary Lane: The designated widths of roadway pavement marked to separate speed change, turning, passing and climbing maneuvers from through traffic. CLEAR ZONE WIDTHS FOR WORK ZONES, deleted the text "travel" in the first sentence and substituted "traffic". Replaced chart "CLEAR ZONE WIDTHS FOR WORK ZONES".
600	3 of 13	LANE WIDTHS, in the second sentence, change the word "expected" to "excepted".
	5 of 13	Changed note under "SIGN COVERING AND INTERMITTENT WORK STOPPAGE SIGNING"; added information for the use of the new "PROJECT INFORMATION SIGN".
	6 of 13	GENERAL NOTES, deleted note 1, substituted the following: "1. All signs shall be post mounted when work operations exceed one day except for: a) Road closure signs mounted in accordance with the vendor drawing for the Type III Barricade shown on the QPL. b) Pedestrian advanced warning or regulatory signs mounted on sign supports shown on the QPL." "2 POST SIGN SUPPORT MOUNTING DETAILS", updated text to include a tolerance between sign supports. Insert "+/- 3" " after "1'-6" "and insert "+/- 6" "after "2'-6" ". POST AND FOUNDATION TABLE FOR WORK ZONE SIGNS, expanded Note 2 by adding: "unless otherwise specified in the vendor drawing on the QPL." POST MOUNTED SIGN NOTES, added new notes 1 and 12.
	7 of 13	Added new sheet showing Project Information Sign and renumbered index.
605	1 of 1	"GENERAL NOTES", deleted the text of "Note 8" and substituted the following: "The two channelizing devices directly in front and directly at the end of the work area may be omitted provided vehicles in the work area have high intensity rotating, flashing, oscillating or strobe lights operating." Added new heading "DURATION NOTE" and placed the following note under this heading: 1. ROAD WORK AHEAD sign may be omitted if all of the following conditions are met: a) Work operations are 60 minutes or less. b) Speed is 45 mph or less. c) No sight obstructions to vehicles approaching the work area for a distance of 600 feet. d) Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating. e) Volume and complexity of the roadway has been considered.
625	1 of 1	New Index added "TEMPORARY ROAD CLOSURE- 5 MINUTES OR LESS".
655	1-3 of 3	New Index added "TRAFFIC PACING-LIMITED ACCESS".
667	1-6 of 6	New Index added "TOLL PLAZAS".
801	1 of 3	"GENERAL NOTES", Note 15 and 21, deleted "Class I" and substituted "Class NS".
802	1-3 of 3	Added tolerance to ground clearance; revised Notes 7a and 7b; rearranged sheets.
	1 of 3	"GENERAL NOTES", Note 6 and 13, deleted "Class I concrete" and substituted "Class NS concrete" for all occurrences.
803	1 of 1	"GENERAL NOTES", Note 4, deleted both occurrences of "Class I" and substituted "Class NS".
810	2 of 4	Deleted "Section 971" and substituted "Section 975" in ANCHOR RODS, NUTS AND WASHERS note.
811	3 of 3	Deleted "Section 971" and substituted "Section 975" in ANCHOR RODS, NUTS AND WASHERS note.
812	2 of 4	Deleted "Section 971" and substituted "Section 975" in ANCHOR RODS, NUTS AND WASHERS note.
820	1 of 1	Changed Top Rail to "Special Height Bicycle Railing" and added new Post "B2" for 3'-6" height Pedestrian/Bicycle Railing.
821	1 of 1	Changed designation of 4'-6" tall railing to "Special Height Bicycle Railing" and added 3'-6" tall Pedestrian/Bicycle Railing.
822	1 of 2	Changed designation of 4'-6" tall railing to "Special Height Bicycle Railing" and "Post B" to "Post B1"; Added "Post B2" details.
850	1 of 5	Changed "Pedestrian Railing" to "Pedestrian/Bicycle Railing" and "Bicycle Railing" to "Special Height Bicycle Railing"; Added anchor bolt requirements to SHOP DRAWINGS note.
	2 of 5	Added "DETAIL FOR NON-CONTINUOUS RAILING AT CORNERS" detail. Changed Pedestrain and Bicyle Railing designation; maximum ramp length for slopes less than 6.25%; and minimum clear picket opening at post to 3/4".
	3 of 5	Changed Pedestrain and Bicyle Railing designation.
	4 of 5	Added requirement for set screw to be set flush against outside face of rail and 18-8 Alloy option in DETAILS "D" & "E", option to notch post in SECTION G-G, and 1/4" joint tolerance in DETAIL "D".
	5 of 5	Added DETAIL "F" and note (*) to ANCHOR BOLT TABLE. Changed Pedestrain and Bicyle Railing designation. Corrected height dimension on steps to top of nosing.

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Index Number	Sheet Number	Description
851	1 of 2	Changed Pedestrain and Bicyle Railing designation.
	2 of 2	Added requirement for set screw to be set flush against outside face of rail and 18-8 Alloy option in DETAIL "B". Changed field splice joint tolerance to ¼" in DETAIL "B".
860	1 of 5	Changed "Pedestrian Railing" to "Pedestrian/Bicycle Railing" and "Bicycle Railing" to "Special Height Bicycle Railing"; Added anchor bolt requirements to SHOP DRAWINGS note. Added filler metal ER4043 to WELDING note.
	2 of 5	Added "DETAIL FOR NON-CONTINUOUS RAILING AT CORNERS" detail. Changed Pedestrain and Bicyle Railing designation; maximum ramp length for slopes less than 6.25%; and minimum clear picket opening at post to ¾".
	3 of 5	Changed Pedestrain and Bicyle Railing designation.
	4 of 5	Added requirement for set screw to be set flush against outside face of rail and 18-8 Alloy option in DETAILS "D" & "E"; option to notch post in SECTION G-G; ¼" joint tolerance in DETAIL "D"; Type B (Nonwelded) connection detail in SECTION A-A. Changed Expansion Joint sleeve embedded length to 10" in DETAIL "D" and picket fillet weld size to ⅛", handrail and top rail fillet weld size to ¼", and base plate fillet weld size to ⅜".
	5 of 5	Added DETAIL "F" and note (*) to ANCHOR BOLT TABLE. Changed Pedestrain and Bicyle Railing designation. Corrected height dimension on steps to top of nosing.
861	1 of 2	Changed designation of 54" tall railing to "Special Height Bicycle Railing".
	2 of 2	Added requirement for set screw to be set flush against outside face of rail and 18-8 Alloy option in DETAIL "B". Changed field splice joint tolerance to ¼" and "Steel Sleeve" to "Aluminum Sleeve" in DETAIL "B".
870	1 of 5	Deleted Pedestrian and Bicycle designations from DESIGN LIVE LOADS and ALTERNATE DESIGN notes.
	2 of 5	Deleted 4'-6" Bicycle Railing option and "**" note. Changed maximum ramp length for slopes less than 6.25%.
	3 of 5	Deleted 4'-6" Bicycle Railing option.
	4 of 5	Added requirement for set screw to be set flush against outside face of rail and 18-8 Alloy option in DETAILS "D" & "E"; and ¼" joint tolerance in DETAIL "D". Deleted Intermediate Rails from DETAILS "B" and "C".
	5 of 5	Added DETAIL "F". Deleted 4'-6" Bicycle Railing option. Corrected height dimension on steps to top of nosing.
880	1 of 5	Deleted Pedestrian and Bicycle designations from DESIGN LIVE LOADS and ALTERNATE DESIGN notes.
	2 of 5	Deleted 4'-6" Bicycle Railing option and "**" note. Changed maximum ramp length for slopes less than 6.25%.
	3 of 5	Deleted 4'-6" Bicycle Railing option.
	4 of 5	Added requirement for set screw to be set flush against outside face of rail and 18-8 Alloy option in DETAILS "D" & "E"; and ¼ joint tolerance in DETAIL "D". Deleted Intermediate Rails from DETAILS "B" and "C".
	5 of 5	Added DETAIL "F". Deleted 4'-6" Bicycle Railing option. Corrected height dimension on steps to top of nosing.
5100	2 of 2	Changed to plastic sleeve expansion joint and "Premoulded Expansion Material" to "Preformed Joint Filler". Changed wall and expansion joint key.
5200	1 of 1	Post caps added to note C.1.b; Changed note K.2 to allow 8 ft height panels. Added note K.11; Changed notes H.1, H.2 and O.2; Deleted note H.3.
5201	1 of 1	Texture Type "I" (Cut Coral Block) added.
5202	1 of 4	Added precast post cap; Changed clearance tolerance on stepped panel and Neoprene Pad options.
	3 of 4	Changed #4 Bar Mark to Bars P5 and P6 for Pile/Post Options A, B, & E; changed Texture Thickness to 1¼" Max.
5203	1 of 5	Added precast post cap; Changed clearance tolerance on stepped panel and Neoprene Pad options.
	3 of 5	Changed #4 Bar Mark to Bars P5 & P6 for Pile/Post Options A, B & E, and changed texture thickness dimension to ¼" Max.
	4 of 5	New sheet added for 45 degree corner post.
	5 of 5	Renumbered from Sheet 4 of 4.
5204	1 of 1	Changed "Ribbed" to "Slotted" in PLUG DETAIL.
5205	1, 3, 4 & 6 of 7	Added note in Elevation Views to 'Extend post 2" above high side wall panel when post caps are shown in the plans'.
	2 of 7	Added tolerance between Top of Precast Collar and Auger Cast Pile; Changed "Composite Bearing Pads" to "Fiber Reinforced Bearing Pads".
	5 of 7	Changed "Composite Bearing Pads" to "Fiber Reinforced Bearing Pads".
	7 of 7	Added "Octangonal Precast Collar" details and tolerance between Top of Precast Collar and Auger Cast Pile; Changed "Composite Bearing Pads" to "Fiber Reinforced Bearing Pads".
5206	1 of 1	Added "POST LENGTH WITH CAP" column, BARS D, P5 thru P8 to table and bar bending details for corner posts.
5207	1 of 1	New Index added "PRECAST SOUND BARRIERS-PRECAST POST CAPITAL".
5210	2 of 5	Changed NAME, DATE AND BRIDGE NUMBER note, and "Ribbed" to "Slotted" in NEOPRENE DIAPHRAGM PLUG DETAIL. Added REFLECTIVE RAILING MARKERS note and RELECTIVE RAILING MARKER SPACING table.
5211	3 of 3	Changed "Ribbed" to "Slotted" in NEOPRENE DIAPHRAGM PLUG DETAIL. Corrected Anchor Pin daimeter on FIRE HOSE ACCESS DETAIL.
5212	2 of 2	Added note for "Full Depth Structural Asphalt" above junction slab and changed coping dimension to 6" Min.
5300	3 of 19	Increased max. gap at back of precast coping and added timber blocking.
	6 of 19	Added note for "Full Depth Structural Asphalt" above junction slab and increased max. gap at back of precast coping.
	7 of 19	Added note for "Full Depth Structural Asphalt" above junction slab.
	12 & 15 of 19	Increased max. gap at back of precast coping. Corrected size of Bar 5U1 in BILL OF REINFORCING TABLE
11200	1-2 of 2	Deleted sheet 2
	1 of 2	Revised and rearranged notes, sheet renumbered to 1 of 2.
	2 of 2	Renumbered sheet 3 of 3 to sheet 2 of 2 revised and rearranged notes. Deleted "Class 1 (Special) Concrete" replaced with "Class 1 Concrete".
11300	1 of 1	Hanger table values revised; connection bolt size revised; sign depth for horizontal splice changed to 10'. U-Bolt material spec (A325) added to Typical Detail of Sign & Truss Connection.
11310	1 of 5	Deleted A307 bolts and Palnut (Note 4e). Changed foundation concrete (Note 7). Changed to ½" mesh (Note 9). Deleted grout pad and notes (former Notes 7c & 9). Added CSL tube note (Note 14).
	2 of 5	Changed foundation standoff distance and changed drilled shaft detail. Deleted grout pad and added wire screen. Added CSL tubes. Changed FC & FL reinforcing.
	5 of 5	Changed bolt spacing connection details.
11320	1 of 5	Deleted A307 bolts and Palnut (Note 4e). Changed foundation concrete (Note 7). Changed to ½" mesh (Note 9). Deleted grout pad and notes (former Notes 7c & 9). Added CSL tube note (Note 14).
	2 of 5	Changed foundation standoff distance. Deleted grout pad and added wire screen.
	4 of 5	Changed bolt spacing connection details.
	5 of 5	Changed drilled shaft detail. Added CSL tubes.
11860	1 of 8	Changed SINGLE COLUMN GROUND SIGN NOTES, Note 11, and GUIDE TO USE THIS STANDARD, Note 4 and example. Modified concrete classification. Modified "ALUMINUM COLUMN (POST) SELECTION TABLE".
	2 of 8	Changed maximum limits of sign cluster area and width in NOTE.
	3 of 8	Added Aluminum Soil Plate details and notes. Changed Post and Foundation Table depth values. Modified "ALUMINUM COLUMN (POST) SELECTION TABLE".
	4 of 8	Deleted "Signs at 90°" note. Added "*For" note. Changed number of Z-brackets for STOP and RECTANGULAR sign. Changed '1" Min.' to '0" Min.' and sign panel edge distance in VIEW A-A. Modified U-bolt size. Changed panel overhang length.
	5 of 8	Modified "DRIVEN POST DETAIL IN CONCRETE".
17302	1 of 1	CASE II, and CASE VIII dimensions and notes revised.
17328	1 of 1	Weigh Station and combination Weigh Station and Inspection Station signing details separated.

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Index Number	Sheet Number	Description
17344	2, 3, 4 & 6 of 6	SCHOOL SIGNS AND MARKINGS, on each sheet, in the Distance table at the bottom of the sheet, deleted the "A" column. Also deleted the "A" dimension from the detail drawings.
17345	2 of 4	NORMAL TAPERED ENTRANCE WITH ADDED LANE, note in lower left corner, arrow now points to the reflective markers on the LEFT side of the ramp.
	4 of 4	Deleted note 2
17346	1-14 of 14	Completely revised and renumbered.
17347	1-4 of 4	New Index BICYCLE MARKINGS added.
17349	1 of 1	Case I and Case II revised; 18" x 18" marker detail revised; notes at bottom right revised.
17355	1 of 11	Revised signs FTP-9A-06 & FTP-9B-06 and notes.
	7 of 11	For all signs with 1-800 phone number, deleted "1-800-998-RIDE" and substituted "1-8XX-XXX-XXXX" and below each sign added note: "Design Project Manager or Transit Administrator will supply correct 1-8XX number".
	8 of 11	Revised sign FTP-68A-06, bolt holes located outside of sign message, notes revised. Sign FTP-69-06 and FTP-68B-06 message and spacing revised.
	9 of 11	Revised sign FTP-82-08 and arrow detail. Added Sign FTP-83-08.
17356	1 of 1	Removed signal head from detail. Single point attachment details deleted from Index. (Deleted sheet 1.)
17359	1 of 2	Changed delineators to object markers; revised reference notes; sign W13-1 made optional. RURAL NARROW BRIDGE TREATMENT, changed the OM3L on the right side of the roadways to an OM3R.
	2 of 2	Notes revised; inserts reorganized
17500	1 of 3	Deleted concrete pole detail, added METAL POLE DETAIL AND WIRING DIAGRAM.
	2 of 3	Note 7, deleted "class I Concrete (Miscellaneous)" replaced with "Concrete and reinforcing for slabs around poles and pull boxes shall be included in the price for pull box or pole."
	3 of 3	Note 7, deleted "class I Concrete (Miscellaneous)" replaced with "Concrete and reinforcing for slabs around poles and pull boxes shall be included in the price for pull box or pole."
17501	1 of 1	Deleted note 28.
17502	3 of 7	Changed Note 9. Added Notes 10 & 11. Changed Notes 11 & 12. Deleted grout pad notes (former Notes 4 & 9). Added CSL tube note (Note 11).
	4 of 7	Added ID plate and changed base plate thickness. Deleted grout pad. Changed drilled shaft reinforcing.
	5 of 7	Changed Weld symbol in SECTION A-A. Added padlock tab to HANDHOLE RING. Added Section E-E detail and bottom baseplate washer to SECTION C-C. Deleted grout pad and added wire screen. Added CSL tubes.
	6 of 7	Grout notes and details removed, new wire screen.
	7 of 7	Note 3, changed "Concrete class" to "concrete NS"
17503	1 of 1	Index deleted.
17504	1 of 1	Dimensions 5'-6" added for height of meter base. Pole type changed from type "N" to type "P".
17505	1 of 2	Mercury Vapor Luminaires changed to Induction Luminaires. Luminaire chart deleted, dimensions revised on spacing detail note and added to structure detail.
17515	1 of 8	Added median barrier mounted light poles. Moved notes to sheet 2.
	2 of 8	New Sheet for Notes. Change Note 7 for QPL Criteria. Modified concrete classification. Added notes for median barrier mounted light pole and foundation.
	3 of 8	Sheet renumberd from 2 to 3. Added double arm configuration to ARM ELEVATION.
	4 of 8	Allowed fusion weld reinforcing cage (*) and changed foundation concrete note. Added 1" dimension to Double Nuts in FOUNDATION. Modified concrete classification. Renumbered sheet from 3 of 3 to 4 of 8.
	5-8 of 8	New Sheets for median barrier mounted light pole.
17600	2 of 3	Added detail for pole foundation to be used only behind guardrail.
	3 of 3	GENERAL NOTES, note 2, changed "Class II Concrete" to "Class I Concrete"; changed note 4.
17723	1 of 3	Changed Note 5i, 6 and 7. Added Note 8. Deleted grout pad and notes (former Notes 4d & 7). Added CSL tube note (Note 9).
	2 of 3	Changed number of bolts in VIEW B-B, number and size of foundation reinforcing bars, and TABLE OF STRAIN POLE VARIABLES. Added foundation standoff distance and washer for base plate. Deleted grout pad and added wire screen. Added CSL tubes. Changed drilled shaft reinforcing.
	3 of 3	Changed note in VIEW E-E; Added 1/4" and 3/8" cable clamps and changed weld criteria. Changed clevis size.
17725	1 of 2	Round pole note revised; pole height dimensions added to Type P-III through P-VIII; Copper Ground note changed.
	2 of 2	Notes revised and rearranged, D(feet) changed to H(feet) in both tables.
17727	1-2 of 2	Schedule 40 aluminum pipe (T6061) added as an alternate to stainless steel pipe in assembly details and signal head notes. Added backplates to signal head details.
17736	1 of 1	Added notes 5 & 6.
17743	1 of 3	Updated assembly dimensions. Changed drilled shaft reinforcing.
	2 of 3	Updated assembly dimensions. Changed drilled shaft reinforcing. Changed T3-BF.
	3 of 3	Updated assembly dimensions. Changed drilled shaft reinforcing.
17745	1 of 5	QPL requirements added in new note 17; added backplates to pole detail; Notes 6 & 14 revised, deleted note 19.
	2 of 5	Revised foundation reinforcing details, Section AA, Section DD and Foundation Plan details.
17748	1 of 1	Option 1 deleted and Options 2 and 3 renumbered; Note 1 revised. Added backplates to signal head displays.
17784	1 of 2	Dimensions revised on Figures A & B. Note 5 and Note to Designers revised.
	2 of 2	Revised details and spacing for signs FTP-68A-06 and FTP-68B-06, also located bolt holes outside of sign message.
17890	2-3 of 3	Added backplates to signal head displays.
17900	7 of 7	Changed pole type call outs, deleted "N-III" and substituted "P-III".
18111	1-2 of 2	Index totally revised.
18113	1-2 of 2	Index totally revised.
20110	1 of 1	Changed Insert Detail for Diaphragm Reinforcing.
20199	1 of 1	Changed BEAM CAMBER AND BUILD-UP NOTES.
20210	2 of 2	Added "Type Q" Epoxy to Note 9.
20299	1 of 1	Changed BEAM CAMBER AND BUILD-UP NOTES.
20500	1 of 1	Added Type C Pads for larger skew ranges. Changed specification of elastomer from "durometer" to "shear modulus".
20501	1 of 1	Changed Note 4.
20502	1 of 1	Changed Note 4.
20602	1 of 1	Changed EDC location to 1D from tip of pile.
20900	2 of 2	Changed coping width and End Bent lug from 6" to 5½" thickness.
20910	2 of 2	Changed coping width and End Bent lug from 6" to 5½" thickness.
21100	1 of 3	Deleted redundant notes from Specification Section 458.
	3 of 3	Changed Sidewalk Cover Plate edge treatment.
21110	1 of 2	Deleted redundant notes from Specification Section 458. Changed last line of title of bottom left detail to "DECK WITH SLOPES 2% OR GREATER".
	2 of 2	Changed Sidewalk Cover Plate edge treatment.
21200	1 of 2	Added "Anchor Plate (dashed lines) (provide Design) to ELEVATION VIEW and TYPICAL SECTION. Added design of anchor bolts and accessories.
	2 of 2	Added design of anchor bolts and accessories.
21600	1 of 7	Clarified INSTRUCTIONS TO DESIGNER for variable end span lengths.
	3 of 7	Added vertical dimensions between deck surface and underside of bearings, including depth of Truss Panel.
21802	1 of 1	Changed "Methyl Methacrylate" to "High Molecular Weight Methacrylate".
21803	1-2 of 3	Revised call-outs for Grout Outlets; Changed "Methyl Methacrylate" to "High Molecular Weight Methacrylate".
	3 of 3	Shrink wrap deleted from Duct Coupler Detail. Revised call-outs for Duct Couplers; Changed "Methyl Methacrylate" to "High Molecular Weight Methacrylate".

A	Area or Amperes
AAA	American Automobile Association
AADT	Annual Average Daily Traffic
AASHO	American Association Of State Highway Officials
AASHTO	American Association Of State Highway And Transportation Officials
ABC	Asphalt Base Course
Abd.	Abandoned
ABS	Acrylonitrite-Butadiene-Styrene Pipe
AC, Ac.	Acre
AC or Asph. Conc.	Asphaltic Concrete
Accel.	Acceleration
ACI	American Concrete Institute
Act.	Actuated
ADA	The Americans With Disabilities Act
Adh.	Adhesive
Adj.	Adjust
ADT	Average Daily Traffic
AFAD	Automatted Flagger Assistance Device
Agg.	Aggregate
Ah.	Ahead
AISC	American Institute Of Steel Construction
Alt.	Alternate
Al.	Aluminum
AM	12:00 Midnight Until 11:59 Noon
ANSI	American National Standards Institute
AOS	Apparent Opening Size
Appl..	Applied, Application
Apprh.	Approach
Approx.	Approximate
ARTBA	American Road & Transportation Builders Association
Artf.	Artificial
Asph.	Asphalt
Assem.	Assembly
Assn.	Association
Assoc.	Associate, Association
ASTM	American Society For Testing And Materials
ATPB	Asphalt Treated Permeable Base
Attn.	Attention
Attnuatr.	Attenuator
Aux. or Auxil.	Auxiliary
Ave.	Avenue
AWG	American Wire Gauge
AWS	American Welding Society
Az	Azimuth
B to B	Back to Back
Basc.	Bascule
Bd. or Bnd.	Bond or Bonded
BC	Bottle Cap or Bolt Circle
B/C, B.C.	Back Of Curb
BCCMP	Bituminous Coated Corrugated Metal Pipe Culvert
BCPA	Bituminous Coated Pipe Arch Culvert
BCPCMP	Bituminous Coated And Paved Corrugated Metal Pipe Culvert
BCPPA	Bituminous Coated And Paved Pipe Arch Culvert
BCT	Breakaway Cable Terminal
BCWE	Base Clearance Water Elevation
BE	Buried Electric
Beg.	Begin
Bit.	Bituminous
Bk.	Back
BL, BLC, or ℄	Base Line, Base Line Control
Bldg.	Building
Blkhd.	Bulkhead
BLON	Begin Length Of Need
Blvd.	Boulevard
BM	Bench Mark
Bndry.	Boundary
Bdr.	Border
Bot.	Bottom
BO	Basin Outlet
BOS	Beginning Of Survey
BP	Borrow Pit
Bq.	Becquerel

Br.	Bridge
Brg.	Bearing
Brkwy.	Breakaway
BT	Buried Telephone Cable or Duct
Btfly.	Butterfly
BW	Barbed Wire, Bottom Width or Both Ways
C	Cantilever Length, Cut, Colorless, Coulomb or Cycle Length
°C	Degree Celsius
C & G	Curb And Gutter
CA	Coarse Aggregate
Cap.	Capacity
CAP	Corrugated Aluminum Pipe
Caps.	Capital Letters
CASP	Corrugated Aluminized Steel Pipe
CATV	Cable Television
CB	Catch Basin
CBC	Concrete Box Culvert
CBS	Concrete Box Structure
CC, C/C, C to C, or C.C.	Center to Center, Crash Cushion
CCEW	Center to Center Each Way
CCTV	Closed-Circuit Television
CD	Cross Drain, Cross Direction (Geotextiles)
cd	Candela
Cem.	Cement or Cemetery
Cem'd.	Cemented
CFS	Cubic Feet Per Second
Ch.	Channel
Chchg.	Channel Change
Chg.	Changeable
CI	Cast Iron
CIP	Cast Iron Pipe
CIPL, C.I.P., C-I-P	Cast In Place
circ.	Circumference
Ckt.	Circuit
Cl. or Clear	Clearance
CL, C/L or ℄	Center Line
CM	Concrete Monument
CMB	Concrete Median Barrier
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
Co.	County or Company
Col.	Column
Com.	Commercial or Common
COMM	Committee or By Committee
Comp.	Composite
Con.	Connect or Connection
Conc.	Concrete
Const.	Construct or Construction
Contrl.	Controller
Cont.	Continuation
Contr.	Contractor
Coord.	Coordinate
Cor.	Corner
Corr.	Corrugated
CP	Concrete Pipe
CPE	Corrugated Polyethylene Pipe
CPT	Cone Penetration Test
CR	Control Radius or County Road
CRA	Clear Recovery Area
Crs. or Cse.	Course
CS	Curve To Spiral
CSP	Corrugated Steel Pipe
CT	Clear Trunk
CTPB	Cement Treated Permeable Base
Ctlvr.	Cantilever
Ctr., Ctrs.	Center
CU or Cu	Copper
Culv.	Culvert
Cwt.	Hundredweight
CY,Cu. Yd., CY, or C.Y.	Cubic Yard
Cyl.	Cylindrical

D	Degree Of Curvature, Depth, Density, Distance, Diameter or Directional Distribution
DA	Drainage Area or Deflection Angle
DBH	Diameter At Breast Height
DBI	Ditch Bottom Inlet
Dbl.	Double
DCS	Degree Of Curvature (Spiral)
DD	Dry Density
DDHV	Directional Design Hour Traffic
Decel.	Deceleration
Deg.	Degree
Delin.	Delineators
Demobl.	Demobilization
Dept.	Department
Det.	Detour, Detection, Detectable
DFE	Design Flood Elevation
DGN or Dgn.	Design
DHV	Design Hourly Volume
DHW	Design High Water
DT	Ditch
DI	Drop Inlet
Dia. or D	Diameter
Dim.	Dimension
Disp.	Disposal
Dist.	Distance
DLS	District Location Surveyor
DMM	Domestic Mail Manual
DOT	Department Of Transportation
DPI or D.P.I.	Ditch Point Intersection
Dr. or DR.	Drain, Drive or Design Review
DR	Design Review
Driv.	Driven
Drwy.	Driveway
DS	Design Speed
DSL	Design Service Life
Dwg.	Drawing
E	East or External Distance
e	Rate Of Superelevation
E to E	End to End
EA or Ea.	Each
EB	Eastbound
EIA	Electronic Industries Alliance
El. or Elev.	Elevation
Elast.	Elastomeric
Elec.	Electric
Ellip.	Elliptical
Embk.	Embankment
Emul.	Emulsified
Encl.	Enclosure
Engr.	Engineer
EOS	End Of Survey or Equivalent Opening Size
E.P. or EOP	Edge Of Pavement
EPDM	Ethylene Propylene Diene Monomer
Eq.	Equation or Equal
Equip.	Equipment
Esmt.	Easement
Est. or Estm.	Estimate
Est.	Establish or Established
Etc. or etc.	Et Cetera (And So Forth)
ETP	Electronic Tough Pitch
EW	Endwall
Ex.	Except, Example
Exc. or Excav.	Excavation
Exist.	Existing
Exp.	Expansion
Ext.	Extension
Exwy.	Expressway

The abbreviations listed are the standard for contract plans production. This list is not all inclusive. Other Department accepted abbreviations may be used when deemed more appropriate. Where special abbreviations are used a descriptive tabulation may be necessary in the plans.

F	Fill, Farad
F or Final	Final Quantity
F & I	Furnish & Install
F to F	Face to Face
FA	Federal Aid or Fine Aggregate
FAC	Florida Administrative Code
FAP	Federal Aid Project
FC	Friction Course
FD	French Drain
Fdn.	Foundation
FDOT	Florida Department Of Transportation
FE	Floor Elevation
Fed.	Federal
Fert.	Fertilizer
FES	Flared End Section
FETS	Flared End Terminal Section
FH	Fire Hydrant
FHWA	Federal Highway Administration
Fig.	Figure
Fin.	Finish
F.L., FL or ℄	Flow Line
FL, Fl. or Fla.	Florida
Flex.	Flexible
FNQ	Fuse (Type Slow Burn)
FOC	Fiber Optics Cable
FPM or fpm	Feet Per Minute
FPS or fps	Feet Per Second
FR or Fr.	Frame
Frang.	Frangible
Freq.	Frequency
F.S.	Florida Statutes
Ft.	Foot or Feet
FTB	Floating Turbidity Barrier
FTBA	Florida Transportation Builder Association
FTP	Florida Traffic Plans
Furn.	Furnish
G	Giga or Gauss
g	Gram or Gravity
Galv.	Galvanized
Ga.	Gauge or Gage
Ga. or Gal.	Gallon
Gar.	Garage
GD	Gutter Drain
GFI	Ground Fault Interrupter
GIP	Galvanized Iron Pipe
GM	Gas Main
GP	Grade Point
Gr.	Grade, Guardrail or Grate
Gr. or Gro.	Gross
GRC	Galvanized Rigid Steel Conduit
Grd.	Ground
GRI	Geosynthetic Research Institute
gross km	Gross Kilometer
Gr. Wt. or gr. wt.	Gross Weight
Gttr.	Gutter
H	Henry
h	Hour or Hecto
ha	Hectare
HAR	Highway Advisory Radio
HB	Hay Bales
HC	Horizontal Clearance
HD	High Density or Heavy Duty
HD or Hd.	Head
HDPE	High Density Polyethylene
Hdwl.	Headwall
HH	Heavy Hex
Hndrl	Handrail
HOA	Hand/Off/Automatic
Horiz. or Hor.	Horizontal
HP	High Pressure or Horsepower
Hr.	Hour
HS	High Strength
HSHV	High Strength Horizontal Vertical
Hse.	House
Ht.	Height
HW or H.W.	High Water or Hot Water
Hwy.	Highway
Hyd.	Hydraulic
Hz	Hertz
I	External Angle (Delta), Interstate
Intchg. or Ichg.	Interchange
IES	Illuminating Engineering Society
ID, I.D.	Inside Diameter or Identification
IMC	Intermediate Metal Conduit
In.	Inch or Inches
Inc.	Incorporated or Including
Incl. or Inc.	Included
Ind.	Industry or Industrial
INV. or Inv.	Invert
IP	Iron Pipe
Install.	Installed
Isect.	Intersection
Isl.	Island
IR	Iron Rod
ITE	Institute Of Transportation Engineers
ITS	Intelligent Transportation Systems
J	Joule
JB	Junction Box
Jct.	Junction
Jt.	Joint
K	Design Hour Factor or Kelvin
k	Kilo (prefix)
kg	Kilogram
kg/m	Kilogram Per Meter
kg/m²	Kilogram Per Square Meter
kg/m³	Kilogram Per Cubic Meter
Kilo	One Thousand
Kip	1000 Pounds
km	Kilometer
km/h	Kilometer Per Hour
kn	Knot
kN	Kilonewton
kPa	Kilopascal
ksi	Kips Per Square Inch
kV	Kilovolt
kVA	Kilovolt Ampere
kWh	Kilowatthour
L	Length, Length Of Curve, Liter, Left
2-L	Two-Lane
2L1W	Two-Lane One-Way
2L2W	Two-Lane Two-Way
LA or L/A	Limited Access
Lat.	Lateral or Latitude
Lb.	Pound
LBS.	Pounds
lb/sy	Pounds Per Square Yard
LBR	Limerock Bearing Ratio
LC	Long Chord
LEO	Law Enforcement With Flashing Lights And Radar
LFD	Load Factor Design
Lgth.	Length
Lin.	Linear
lm	Lumen
Lmrk.	Limerock
LOS	Limit Of Clear Sight
Loc., LO	Location
Long.	Longitude
LRFD	Load Resistance Factor Design
LS	Length Of Spiral
LT	Left Turn
Lt.	Left
Ltd.	Lighted or Limited
Lum.	Luminaire
L/W	Lightweight
lx	Lux
M	Mass, Middle Ordinate Length or Mega
m	Meter or Milli
m²	Square Meter or Meter Square
m³	Cubic Meter or Meter Cubed
m³ /m	Cubic Meter Per Meter
m/s	Meters Per Second
Mach.	Machine
Maint.	Maintenance
Matl.	Material
Max.	Maximum
MB	Median Barrier
MBM	Thousand (Feet) Board Measure
MD	Machine Direction (Geotextiles)
Med.	Median
Mega	One Million
Memb.	Member
MES	Mitered End Section
Mess.	Message
Mfg.	Manufactured or Manufacturer
MG	1000 Gallons
MH, M.H.	Manhole, Mounting Height
MHW	Mean High Water
µ	Micro
Mi.	Mile
Micro	One-Millionth
Mid.	Middle
Mil	One-Thousandth Of An Inch
Mil.	Military
Milli	One-Thousandth
Min.	Minimum or Minute
Misc.	Miscellaneous
mL	Milliliter
MLW	Mean Low Water
mm	Millimeter
Mobl.	Mobilization
Mod.	Modify or Modified
Mol	Mole
Mon.	Monument
MOT	Maintenance Of Traffic
MP	Mile Post
MPa	Megapascal
MPH or mph	Miles Per Hour
MSL	Mean Sea Level
MSTCSD	Minimum Specifications For Traffic Control Signal Devices
Mtd.	Mounted
MUTCD	Manual On Uniform Traffic Control Device
MUTS	Manual On Uniform Traffic Studies
N	North or Newton
N/m	Newtons Per Meter
N/m²	Newtons Per Square Meter
N/m³	Newtons Per Cubic Meter
N/mm²	Newtons Per Square Millimeter
NA or N/A	Not Available or Not Applicable
N & C	Nail & Cap
N & D	Nail & Disk
NAVD	National American Vertical Datum
NB	Northbound
NC	National Coarse or Normal Crown
NCHRP	National Cooperative Research Program
NDCBU	Neighborhood Delivery And Collection Box Unit
NE	Northeast
net km	Net Kilometer
NEMA	National Electrical Manufacturers Association
NGVD	National Geodetic Vertical Datum of 1929
NGS	National Geodetic Survey
NHS	National Highway System
NHW	Normal High Water
NIC	Not In Contract
NJ	New Jersey
N m	Newton Meter
No.	Number
Nom.	Nominal
Norm.	Normal
N.P.	Non Plastic
NPS	Nominal Pipe Size
NPT	National Pipe Thread
NRCP	Non-Reinforced Concrete Pipe
NS	Non Stress, Not Suitable or Near Side
NT, N&T	Non Traffic, Nail & Tin
NTS	Not To Scale
NW	Northwest
Opass	Overpass
O to O, o to o or O.O.	Out to Out
OA	Overall
O.B.G.	Optional Base Group
OC or O.C.	On Center
OD or O.D.	Outside Diameter
OE	Overhead Electric
OH, OHD or Ohd.	Overhead
Opt.	Option, Optional or Optically
OT	Overhead Telephone
Oz.	Ounce
Ω	Ohm
P	Passenger Car & Light Delivery Truck
P or Plan	Plan Quantity
Pa	Pascal
Par.	Parallel
Pa•s	Pascal Second
Part.	Participation or Partition
Pavt.	Pavement
PC	Point Of Curvature
PCBC	Precast Concrete Box Culvert
PCC	Point Of Compound Curvature or Plain Cement Concrete
PCE	Permanent Construction Easement
PE	Professional Engineer
Ped	Pedestrian or Pedestal
Pen.	Penetration
PG	Profile Grade
PGL	Profile Grade Line
Ph.	Phase
pH	Measure Of Acidity or Alkalinity
PI	Point Of Intersection
Pkg.	Parking
Pkwy.	Parkway
PL or ℄	Property Line or Plate
PM	12:00 Noon Until 11:59 Midnight
POC	Point On Curve
POST	Point On Semi-Tangent
POT	Point On Tangent
PP	Power Pole
PPB	Pier Protection Barrier
Pr.	Pair
PRC	Point Of Reverse Curvature
Prcst.	Precast
Prest.	Prestressed
Prob.	Probability
Prod.	Product, Production, Producer or Produced
Prog.	Program or Progression
Proj.	Project or Projection
PRM	Permanent Reference Monument
Prop.	Proposed
Prov.	Provisions
PRS	Portable Regulatory Sign
PS & E	Plans, Specifications And Estimates
PSF or psf	Pounds Per Square Foot
PSI or psi	Pounds Per Square Inch
PT	Point Of Tangency or Pressure Treated
PVC	Polyvinyl Chloride
PW	Pressure Water

The abbreviations listed are the standard for contract plans production. This list is not all inclusive. Other Department accepted abbreviations may be used when deemed more appropriate. Where special abbreviations are used a descriptive tabulation may be necessary in the plans.

Q	Peak Discharge or Flow Volume
QPL	Qualified Products List
R	Right
R or Rad.	Radius
R or Rng.	Range
rad	Radian
rad/s	Radian Per Second
RBAC	Rock Base Asphaltic Concrete
RBST	Rock Base Surface Treatment
RC	Reverse Crown
RCP	Reinforced Concrete Pipe
RCPA	Reinforced Concrete Pipe Arch
Rd.	Road or Round
Rdsd.	Roadside
Rdwy.	Roadway
Rec.	Recovery
Rect.	Reticuline or Rectangular
Ref.	Reference
Refl.	Reflective
Reg.	Region, Regular, Registered or Regulation
Reinf.	Reinforced or Reinforcing
Rejuv.	Rejuvenation
Reloc.	Relocated
Rem.	Removal
Repl.	Replace
Req. or Reqd.	Required
Res.	Residence or Residential
RGS	Rigid Galvanized Steel
RHW	Insulation (Moisture & Heat Resistant Rubber)
RM	Reference Monument
r/min	Revolution Per Minute
RP	Reference Point
rpm	Revolution Per Minute
RPM	Raised Reflective Pavement Markers
r/s	Revolution Per Second
RR	Railroad
RSDU	Radar Speed Display Unit
Rsf.	Resurface
Rt.	Right
RU	Rack Unit
R/W, ROW	Right Of Way
RX	Receive
S or s	Speed, South, Siemens, Or Second
SAHM	Sand-Asphalt Hot Mix
SAN or San.	Sanitary
SB	Southbound
SBAC	Shell Base Asphaltic Concrete
SBRM	Sand Bituminous Road Mix
SBST	Shell Base Surface Treatment
SC	Seal Coat or Spiral To Curve
Sch.	Schedule
SCST	Sand-Clay Surface Treatment
SD	Side Drain, Storm Drain
SE	Southeast
Sec.	Second
Sect.	Section
Sed.	Sediment
Sep.	Separator
Seq.	Sequential
Serv.	Service
SF	Adjustment Factor In Percent, Silt Fence
SG	Subgrade
SG	Specific Gravity
Sh. or Sht.	Sheet
Shldr.	Shoulder
SHW	Seasonal High Water
SIP	Stay In Place
SP	Superpave
Spa.	Space
Spcg. or Sp.	Spacing
Spec.	Specification
SPT	Standard Penetration Test
Sq. Ft., SF, or S.F.	Square Foot
Sq. In.	Square Inch
Sq. Yd., SY or S.Y.	Square Yard
SR or S.R.	State Road
SRAP	Spiral Rib Aluminum Pipe
SRASP	Spiral Rib Aluminized Steel Pipe
SRCP	Steel Reinforced Concrete Pipe
SRD	State Road Department
SRSP	Spiral Rib Steel Pipe
SS	Sanitary Sewer
SSMD	Solid State Modular Design
ST	Surface Treatment or Spiral To Tangent
St. or ST.	Street
Sta.	Station
Stab.	Stability or Stabilization
STB	Staked Turbidity Barrier
Std.	Standard
Stg.	Strong
Stge.	Storage
Stl.	Steel
Str.	Structure
Sty.	Story
SU	Single Unit Trucks
Sub. or Subs.	Subsoil
Sub. or Subst.	Substitute
Subgr.	Subgrade
Suppts.	Supports
SUR or Sur.	Survey
Surf.	Surface
SW	Southwest
SW or Swk.	Sidewalk
Sys. or Syst.	System
Sv	Sievert
Sym.	Symmetrical
T	Tangent, Length Of Curve, Percent Trucks, Tesla,
T, TWP or Twp.	Township
t	Metric Ton
tan.	Tangent
TBM	Temporary Bench Mark
TC	Tangent To Curve
TCB	Temporary Concrete Barrier
TCE	Temporary Construction Easement
TCP	Terra Cotta Pipe
TCZ	Traffic Control Zone
TDLC	Transportation Design For Livable Communities
Tel.	Telephone
Temp.	Temperature or Temporary
Theo.	Theoretical
THRMPLSTC	Thermoplastic
THW or THWN	Insulation (Flame Retardant, Moisture And Heat Resistant Thermoplastic)
Thick.	Thickness
Tk	Thick, Thickness or Truck
Tn.	Ton
Traf.	Traffic
Trans.	Transition, Transverse, Translate or Transportation
Treat.	Treatment
TS	Tangent To Spiral
TSC	Length Of Tangent (Spiral Curve)
TTC	Temporary Traffic Control
TVSS	Transient Voltage Surge Suppression
TX	Transmit
Typ.	Typical
Upass.	Underpass
UG	Underground
UL	Underwriters Laboratories
Ult.	Ultimate
Ultd.	Unlimited
Unddr.	Underdrains
Undrdwy.	Underroadway
UNL or Undl.	Unloaded
Untr.	Untreated
UPS	Uninterruptible Power Supply
USC & GS	US Coast and Geodetic Survey (now National Geodetic Survey)
USGS	US Geological Survey
USPS	United States Postal Service
Util.	Utilities
UV	Ultraviolet
V	Volt, Velocity, Volume or Hourly Volume
Var.	Varies, Variable or Variance
VC	Vertical Curve
VCP	Vitrified Clay Pipe
VECP	Value Engineering Change Proposal
Veh.	Vehicle
Vert.	Vertical
VF	Vertical Foot
Vh	Verified Horizontal Location
VMS	Variable Message Sign
Vol.	Volume
VP	Vertical Panel
VPD or Vpd.	Vehicles Per Day
VPH or Vph.	Vehicles Per Hour
VPHPL or Vphpl.	Vehicles Per Hour Per Lane
VRMS	Volts Root Mean Square
Vv	Verified Vertical Elevation
Vvh	Verified Vertical Elevation And Horizontal Location
VW	Variable Width
W	Width, Wide, West or Watt
W/C	Water-Cement Ratio
WB	Westbound
Wb.	Weber
WB40	Intermediate Semi Trailer
WB50	Large Semi Trailer
WB62	Interstate Semi Trailer
WB67D	Tandem Semi Trailer
WM	Water Main
W.P.I.	Work Program Item
WT	Water Table Or Weight
WWF	Welded Wire Fabric
WWR	Welded Wire Reinforcing
X	Coordinate Value (East-West Direction) or Extra
X Rd.	Cross Road
Xing.	Crossing
Xsec.	Cross Section
Y	Coordinate Value (North-South Direction)
Yd.	Yard
Yr.	Year

The abbreviations listed are the standard for contract plans production. This list is not all inclusive. Other Department accepted abbreviations may be used when deemed more appropriate. Where special abbreviations are used a descriptive tabulation may be necessary in the plans.

UNITS OF MEASURE

US MEASUREMENT

AC	Acre
AS	Assembly
BU	Bushel
CF	Cubic Foot
CO	Cleanout
CY	Cubic Yard
EA	Each
ED	Each Day
GA	Gallon
GM	Gross Mile
LB	Pound
LF	Linear Foot
LM	Lane Mile
LO	Per Location
LS	Lump Sum
LU	Luminaire
MB	Thousand Board Measure
MG	Thousand Gallons
MH	Man Hour
NM	Net Mile
PA	Per Analysis
PB	Per Building
PE	Pile
PI	Per Intersection
PL	Plant
PM	Per Mile
PS	Per Set
PW	Per Well
SI	Square Inch
SF	Square Foot
SY	Square Yard
TN	Ton

METRIC MEASUREMENT

AS	Assembly
CO	Cleanout
DA	Day
EA	Each
ED	Each Day
GK	Gross Kilometer
HA	Hectare
HR	Hour
KG	Kilogram
KL	Kiloliter
KM	Kilometer
LI	Liter
LK	Lane Kilometer
LO	Per Location
LS	Lump Sum
LS/AS	Lump Sum Per Assembly
LS/DA	Lump Sum Per Day
LS/EA	Lump Sum Per Each
LS/HA	Lump Sum Per Hectare
LS/KG	Lump Sum Per Kilogram
LS/LS	Lump Sum Per Lump Sum
LS/MT	Lump Sum Per Metric Ton
LS/MI	Lump Sum Per Linear Meter
LS/M2	Lump Sum Per Square Meter
LU	Luminaire
MH	Man Hour
MO	Month
MT	Metric Ton
MI	Meter
M2	Square Meter
M3	Cubic Meter
NK	Net Kilometer
PA	Per Analysis
PB	Per Building
PI	Per Intersection
PL	Plant
PW	Per Well

STANDARD SYMBOLS FOR KEY MAP

- Highway With Full Control of Access
- Highway With Frontage Roads
- Highway Interchange
- Proposed Controlled Access Highway
- Divided Highway
- Hard Surfaced Road
- Soil, Gravel Or Shell Surfaced Road
- Graded And Drained Road
- Unimproved Road
- Primitive Road
- P — Private Road
- Streets In Inset Or Delimited Areas
- Extension Of Local Roads Within Cities
- FAI — Federal Aid Interstate Highway
- FAU — Federal Aid Urban Highway
- FAP — Federal Aid Primary Highway
- FAS — Federal Aid Secondary Highway
- NFR — National Forest Road
- SFR — State Forest Road
- SPR — State Park Road
- Interstate Highway
- US Numbered Highway
- State Highway
- County Road

- Railroad
- Double Track Railroad
- Abandoned Railroad
- Railroad Station
- Grade Crossing
- Railroad Above
- Railroad Below
- Military Field
- Commercial Or Municipal Airport
- Landing Area Or Strip
- Runways

- FF — Free Ferry
- TF — Toll Ferry
- Canal Or Drainage Ditch
- Intracoastal Waterway
- Narrow Stream
- Wide Stream
- Dam
- Dam Or Spillway With Lock
- Dam With Road
- Flood Control Structure
- Lake, Reservoir Or Pond
- Intermittent Pond
- M — Meandered Lake
- Marsh Or Swamp
- Mangroves
- Levee Or Dike
- Levee Or Dike With Road
- Highway Bridge
- 3 — Small Bridges Closely Spaced
- Drawbridge
- Highway Grade Separation
- Tunnel
- State Boundary Line
- County Boundary Line
- Civil Township Boundary
- Extended Township Line
- Land Grant Line
- Land Section Line
- State Survey Section Line
- Survey By Others
- Location Of Inset Boundary Within Map
- Military Reservation Boundary
- College Or University Boundary
- Corporate Limits
- Delimited Area, Population Est.
- Reservation, Forest Or Park Boundary
  Wildlife Refuge Boundary

- Residential Area Under Development
- Lighthouse
- State Capital
- County Seat
- Other City Or Village
- Seminole Indian Village
- Welcome Station
- WP — Wayside Park Or Small Park
- WP — Park With Boat Ramp
- B — Boat Ramp
- Museum
- Recreational Area Or Historic Site
- Scenic Site
- Post Office
- School
- Church
- Cemetery
- Church And Cemetery
- Hospital, Health Center Or Rest Home
- Toll House, Port Of Entry Or Weight Station
- Fair Grounds, Race Course Or Rodeo Arena
- Mine Or Strip Mine
- Governmental Research Station

- Agricultural Inspection Station
- FM — Farmers Market
- Game Preserve
- Game Checking Station
- Bird Sanctuary
- Fire Control Headquarters
- Lookout Tower
- FS — Fire Station
- Patrol Or Police Station
- Correctional Institution Or Road Camp
- DOT — Department of Transportation Facility
- Coast Guard Station
- A — Armory
- J — Junkyard
- F — Sanitary Fill
- S — Sewage Disposal Plant
- I — Incinerator
- Power Plant
- Power Substation
- Communications Facility
- Locked Gate Or Fence
- WOOD — Triangulation Station

GENERAL NOTE

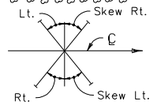
1. Symbols on this Index are intended for use on all Roadway, Signing And Marking, Signalization, and Lighting projects. For work zone traffic control symbols refer to Index 600. When additional or similar symbols are used, legends or notations may be required for clarity.

STANDARD SYMBOLS FOR PLAN SHEETS

GENERAL SYMBOLS

- State Line
- County Line
- Township Line
- Section Line
- City Line
- Base Or Survey Line
- Right-Of-Way
- Easement Line
- Limited Access Line
- Fence Line
- National Or State Park Or Forest
- Grant Line
- Railroad (Drainage Maps)
- Railroad (Detail Plans)
- Fence (Limited Access)
- Box Culvert
- Bridge
- Pipe Culvert-Mitered End Section
- Pipe Culvert-Straight Endwall
- Pipe Culvert-U-Type Endwall
- Pipe Culvert-Median Drain
- Pipe Culvert-Other End Treatments
- 18" SD — Storm Drain (Proposed)
- 18" SD - - - - Storm Drain (Existing)
- Inlet
- Manhole
- Tied Longitudinal Joint
- Keyed Longitudinal Joint
- Doweled Transverse Expansion Joint
- Doweled Transverse Contraction Joint
- Transverse Contraction Joint Without Dowels
- Survey Reference Point
- AL ACHUA — Triangulation Station
- B.M. NO. 112 — Bench Mark
- Point Of Intersection
- North Arrow
- TYP. TYPE PAV'T WALK — Edges Of Existing Pavement And Sidewalk
- Guardrail
- C. C. — Crash Cushion (Attenuator)
- Piling Pier Column
- Concrete Monument
- Base Line
- Centerline
- Flow Line
- Property Line
- Delta Angle
- Approximate
- Round Or Diameter

- Curb
- Curb And Gutter
- Water Well, Spring
- Levee
- MP 327 — Railroad Mile Post
- Railroad Signal With Gate
- Railroad Switch
- 12' — Gate
- Pump Island
- Storage Tank (Surface)
- Storage Tank (Underground)
- Mine Or Quarry
- B P — Borrow Pit
- Church
- S — Store
- RES — Residence
- B — Barn
- School
- Synthetic Bales
- Silt Fence
- Floating Turbidity Barrier
- Staked Turbidity Barrier
- Stream
- Shore Line
- Marsh
- Wetland Boundary (Proposed)
- Wetland Boundary (Existing)
- Hedge
- Trees
- Edge Of Wooded Area
- Shrubbery
- Grove Or Orchard



Definition Of Skew For Cross Drains And Barrels Of Conrete Box Culverts

- Concrete
- Wood
- e — Rate Of Superelevation

UTILITY ADJUSTMENT SYMBOLS

EXISTING	PROPOSED	
		Manhole
		Fire Hydrant
		Meter (Type)
		Valve (Type)
		Valve Box (Type)
		Valve Cover (Type)
		Vent (Type)
		Pump Station
		Sewage Pump Station
		Cleanout
		Cable TV Service Box
		Power Pole
		Telephone Pole
		Combination Pole
		Guy Wire And Anchor Pin
		Guy Pole Deadman
		Tower
		Light Pole
		Transformer

EXISTING	PROPOSED	
W - - - - 6" - - - - W	W W W W W W 6" M M M M M M	Water Main
NPW - - - 6" - - - NPW	NPW NPW 6" NPW NPW	Non Potable Water
S - - - - 8" - - - - S	S S S S S S 8" S S S S S	Sanitary Sewer
G - - - - 6" - - - - G	G G G G G G 6" G G G G G G	Gas
RD - - - - 4" - - - - RD	RD RD RD 4" RD RD	Roof Drain
PET - - - 8" - - - PET	PET PET 8" PET PET	Petroleum
STM - - - 12" - - - STM	STM STM 12" STM STM	Steam
CAS - - - 12" - - - CAS	CAS CAS 12" CAS CAS	Casing
DT - - - 4"x4" - - - DT	DT DT 4"x4" DT DT	Duct
BE - - (7.5 kV) - - BE	BE BE (7.5 kV) BE BE	Buried Electric
OE - - (7.5 kV) - - OE	OE OE (7.5 kV) OE OE	Overhead Electric
BTV - - - 3" - - - BTV	BTV BTV 3" BTV BTV	Buried Cable Television
OTV - - - -2" - - - OTV	OTV OTV 2" OTV OTV	Overhead Cable Television
BT - - - - 2" - - - - BT	BT BT BT 2" BT BT BT	Buried Telephone
OT - - - - 2" - - - - OT	OT OT OT 2" OT OT OT	Overhead Telephone
BFO - - - 2" - - - BFO	BFO BFO 2" BFO BFO	Buried Fiber Optic
OFO - - - -1" - - - - OFO	OFO OFO 1" OFO OFO	Overhead Fiber Optic

See General Note, Sheet 1 of 3

STANDARD SYMBOLS FOR PLAN SHEETS

TRAFFIC SIGNALS SYMBOLS

EXISTING	PROPOSED	
		Traffic Signal Head (Span Wire Mounted)
		Traffic Signal Head (Pedestal Mounted)
		Traffic Signal Head (Mast Arm Mounted)
		Traffic Signal Pole (Concrete, Wood, Metal)
		Vehicle Detector (Loop)
		Signal Cable (On Messenger Wire)
		Conduit
		Vehicle Detector (Points)
		Pedestrian Detector
		Pedestrian Signal Head (Pole Or Pedestal Mounted)
		Controller Cabinet (Base Mounted)
		Controller Cabinet (Pole Mounted)
W - D W		Walk - Dont Walk
FDW		Flashing Dont Walk
5		Signal Face Number
		Signal Lens
P		Programmed Signal Head
		Messenger Wire
3		Pole Tabulation Cross Reference
*3		Pole Tabulation Cross Reference (Joint Use Pole)
		Signal Phase

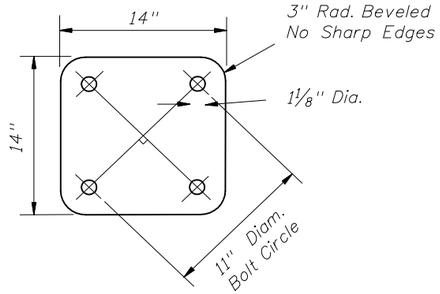
LIGHTING SYMBOLS

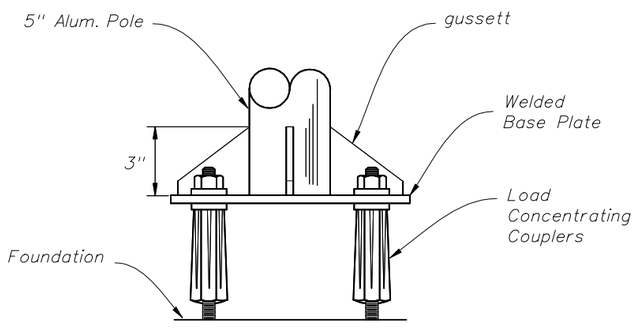
EXISTING	PROPOSED	
		Pole & Luminaire
		Existing Pole & Luminaire To Be Removed
		Final Position Of Relocated Or Adjusted Pole & Luminaire
		High Mast Lighting Tower
		City Or Utility Owned Luminaire & Pole
		PVC (Polyvinyl Chloride) Lighting Conduit And Conductors
		Rigid Galvanized Lighting Conduit And Conductors
		Lighting Pull-Box
		Light Distribution Point
		Joint Use Pole
		Pier Cap Underdeck Luminaire
		Pendant Hung Underdeck Luminaire

SIGNING AND PAVEMENT MARKING SYMBOLS

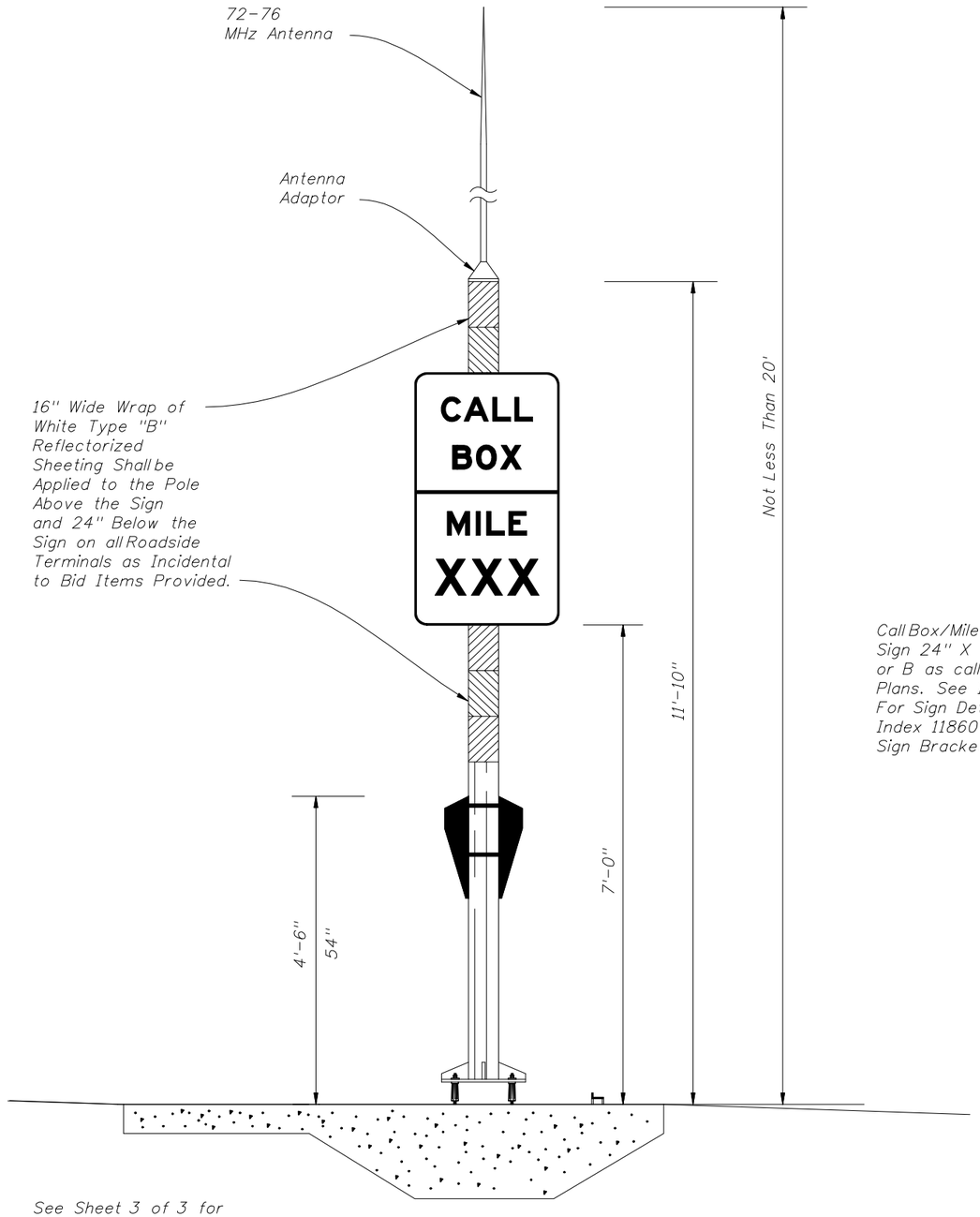
	Pavement Arrow
	Single Solid Line
	Double Solid Line
	Skip Line
	Stop Bar
	Traffic Sign (Post Mounted)
	Traffic Sign (Overhead)
13	Sign Number
700-83	Sign Item Number
	Traffic Flow Arrow

See General Note, Sheet 1 of 3





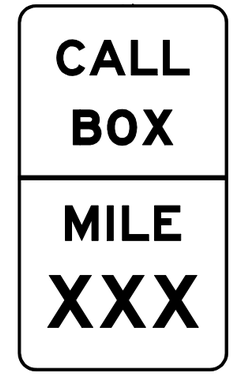
BASE PLATE & BOLT PATTERN



See Sheet 3 of 3 for
Concrete Pad Details.

TYPICAL MOTORIST AID CALL BOX TERMINAL

Call Box/Mile Marker
Sign 24" X 42". Sign A
or B as called for in
Plans. See Index 17355
For Sign Details and
Index 11860 for Type **
Sign Bracket Details.



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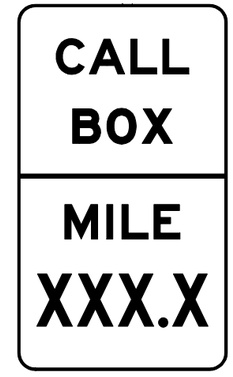
SIGN A



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SIGN B

2010 FDOT Design Standards

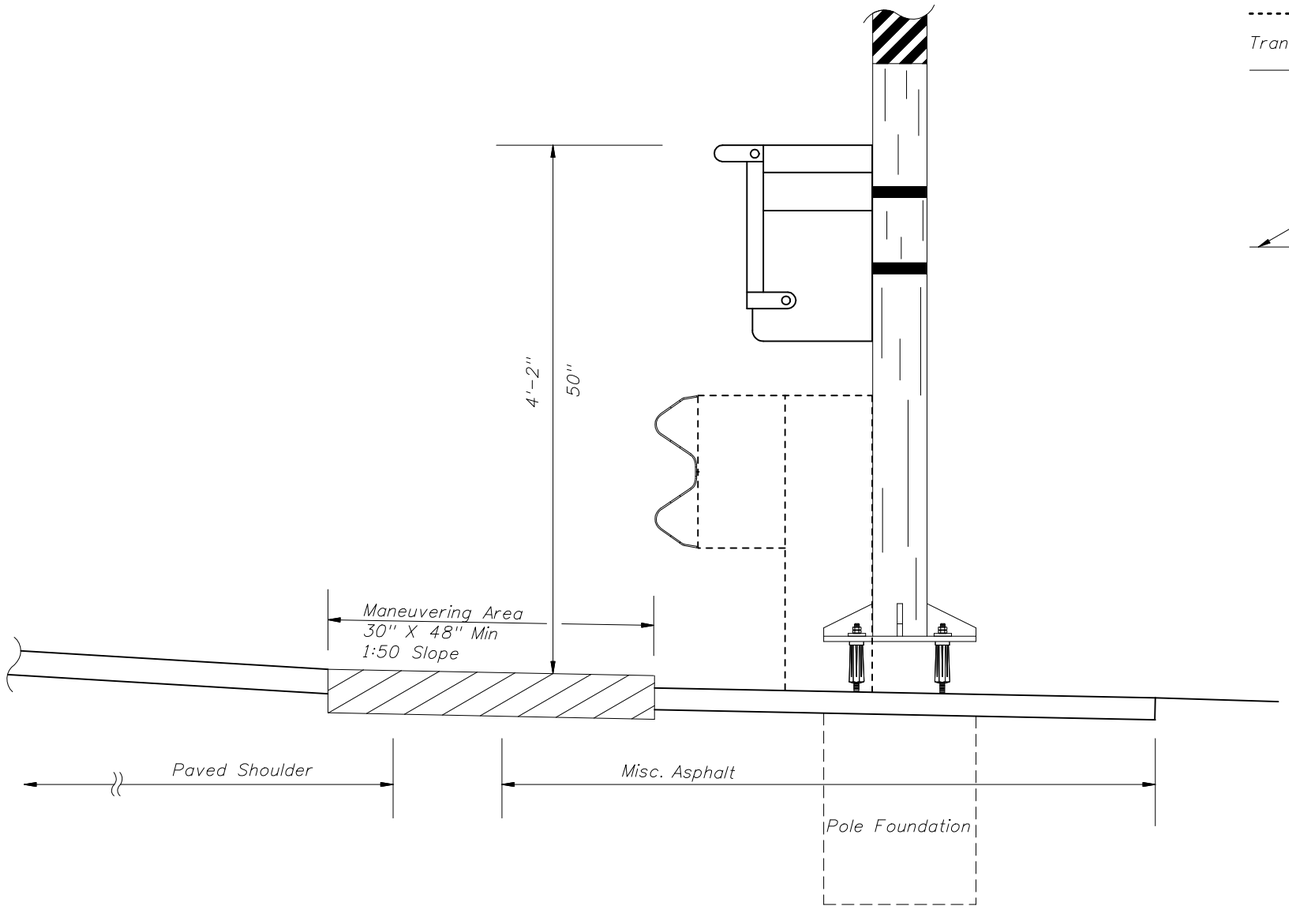
MOTORIST AID CALL BOX

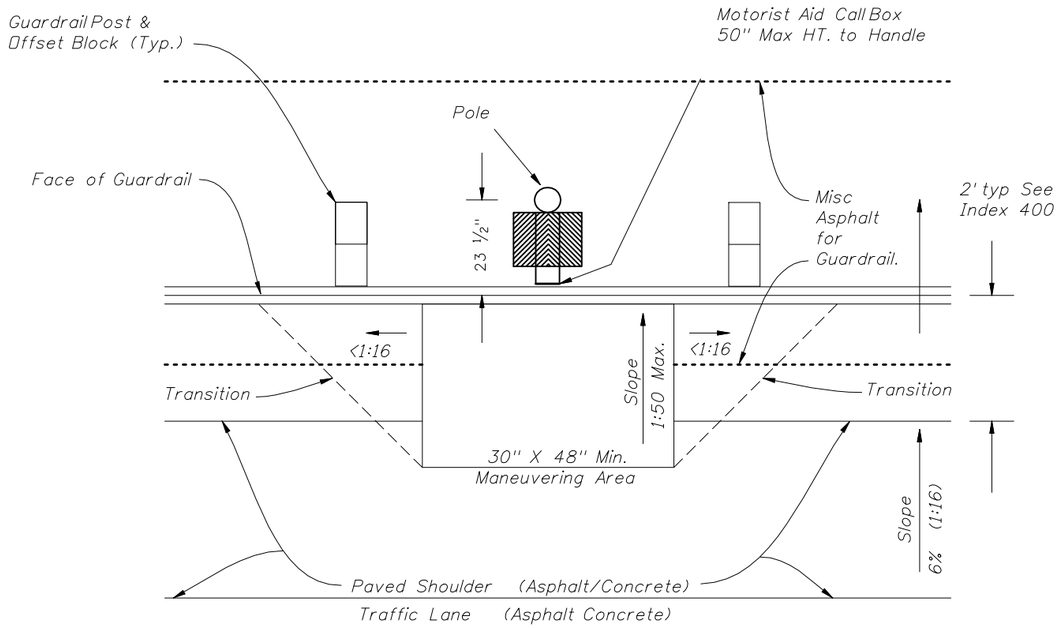
Last Revision	Sheet No.
07/01/04	1 of 3

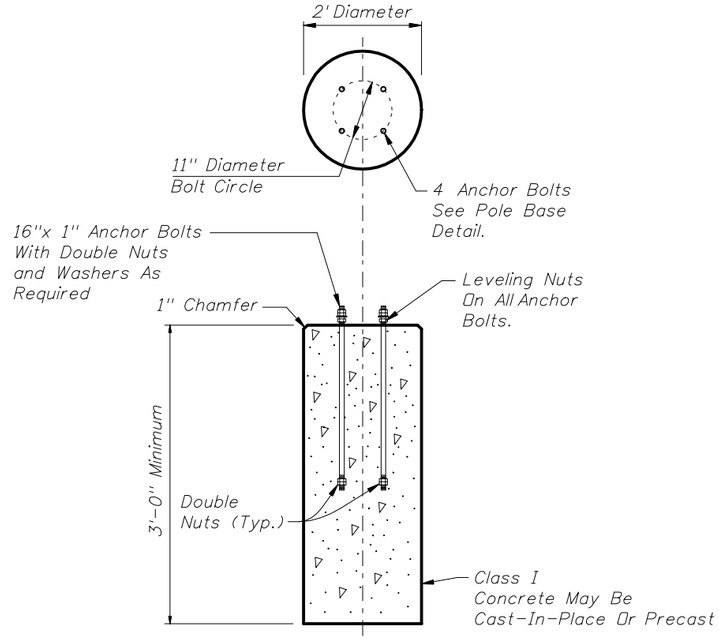
Index No. 17600

EXISTING PAVEMENT INSTALLATION
Remove existing pavement minimum 1" depth throughout transition and maneuvering area, replace with misc asphalt.

NEW CONSTRUCTION
Hand work final shoulder pavement lift to plan dimensions.







MOTORIST AID CALL BOX POLE FOUNDATION
TO BE USED ONLY BEHIND GUARDRAIL

CALL BOX BEHIND GUARDRAIL

2010 FDOT Design Standards

MOTORIST AID CALL BOX

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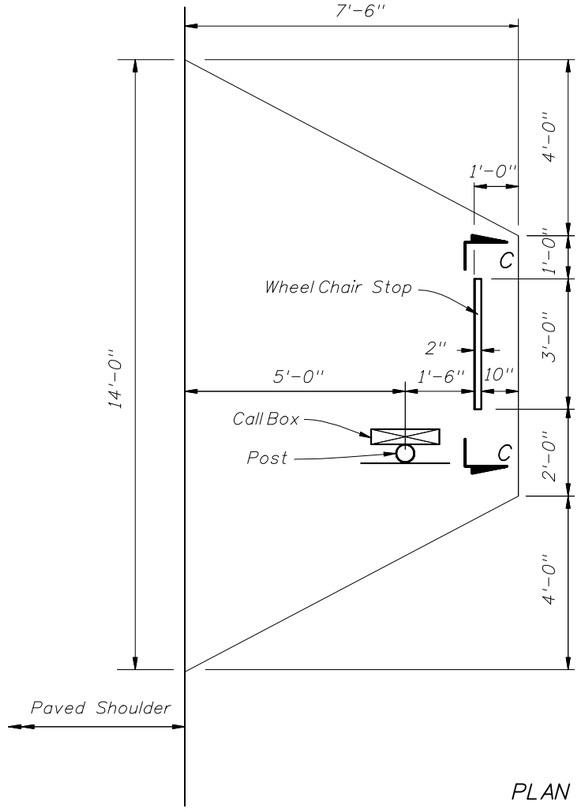
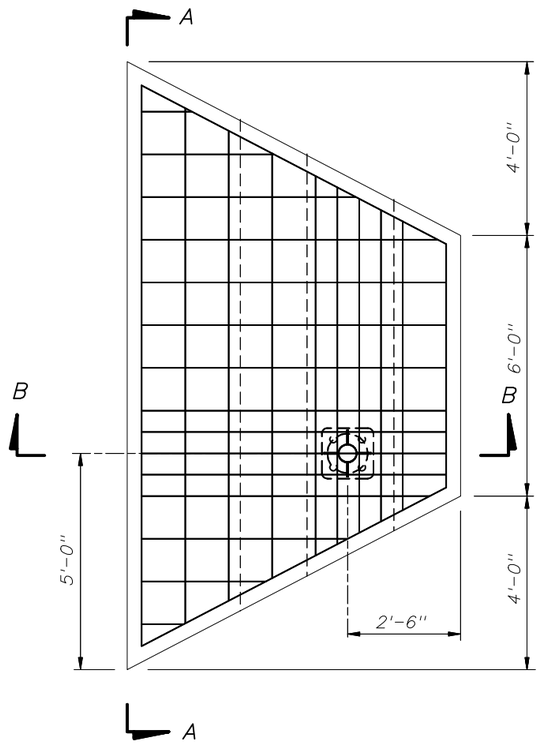
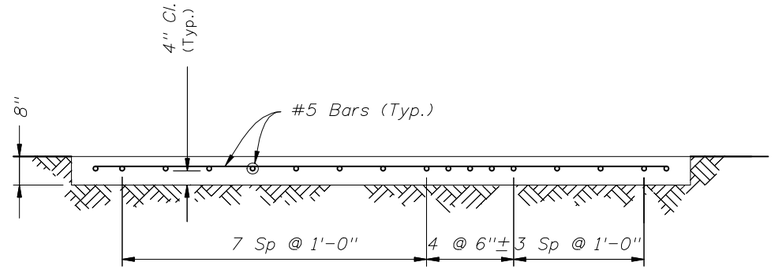


PLAN

Call Box Attachment To Slab
As Per Manufacturer's Recommendation.

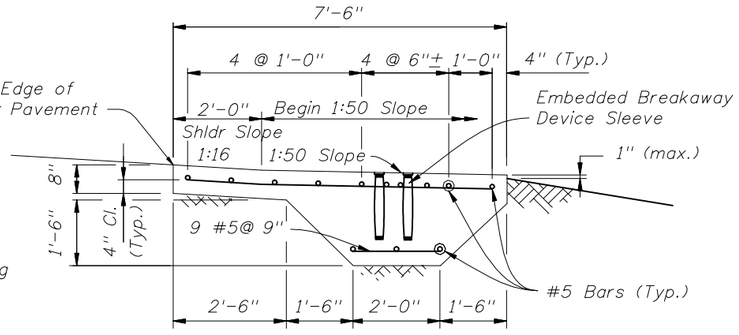




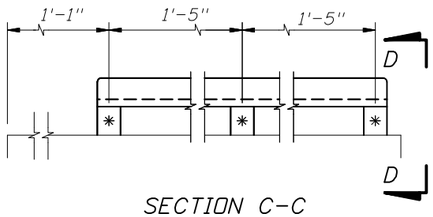
SECTION A-A

MOTORIST AID CALL BOX CONCRETE PAD QUANTITIES

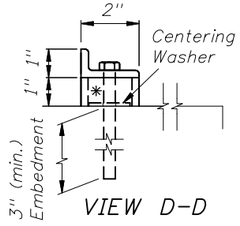
Concrete : 3.5 c.y. (each)
Reinforcing Steel: 243 lb (each)



SECTION B-B



SECTION C-C



VIEW D-D

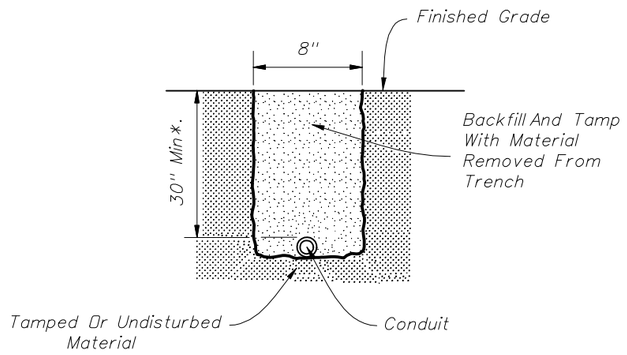
2" x 1" x ¼" Galv. Angle And
3-⅜"Φ x 5" Galvanized Steel Expansion
Anchor Bolt With 3" Min. Embedment

* 1 ½" Φ x 1" High
Galvanized Steel Pipe Spacer

GENERAL NOTES

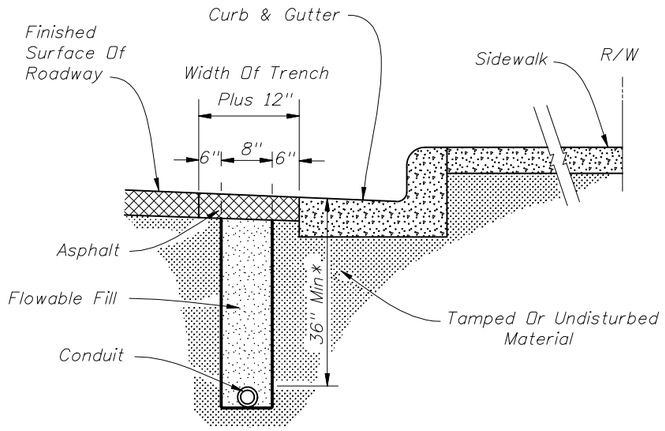
1. Design Specifications: AASHTO Standard Specifications For Highway Bridges (Current Edition and approved revisons thereto).
2. Concrete: Concrete strength shall be Class I (f'c=3,000 psi).
3. Reinforcing Steel: Reinforcing Steel shall conform to ASTM A615, Grade 60.
4. Payment: Concrete Pad and Foundation shall be included in the contract unit price of call box assembly or terminal. It shall also include all labor, materials, and installation of embedded breakaway device sleeves, and miscellaneous galvanized steel for wheel chair stop and attachments.
5. Breakaway Device shall be paid for under Call Box Assembly.

WHEEL CHAIR STOP DETAIL



FOR USE IN AREAS NOT EXPOSED TO VEHICULAR TRAFFIC AND UNDER DRIVEWAYS

FIGURE A

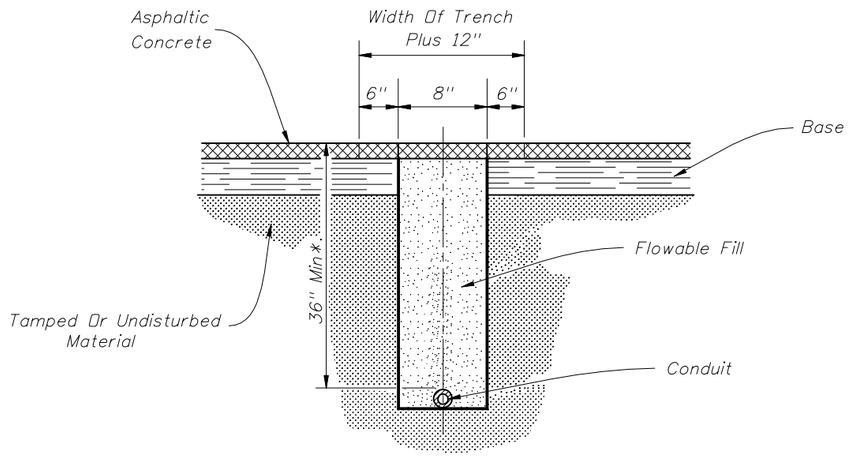


FOR USE IN ASPHALT ROADWAY ADJACENT TO GUTTER WHEN PLACEMENT OUTSIDE OF THE PAVEMENT IS NOT FEASIBLE.

Note

1. Trench not to be open more than 250' at a time when construction area is subject to vehicular or pedestrian traffic.
2. Asphalt to be sawcut and removed to leave neat lines on both sides of the 12'' pavement cut.
3. See note 3 Figure C.

FIGURE B



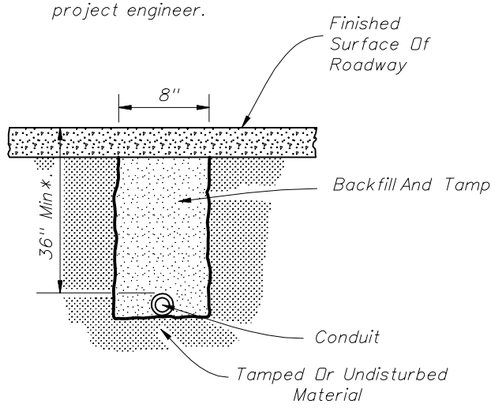
FOR USE IN INSTALLING CONDUIT UNDER EXISTING ASPHALT PAVEMENT NOT ADJACENT TO GUTTER WHEN JACKING IS NOT FEASIBLE

Note:

1. Rigid conduit must be used when jacking under existing pavement at 36'' minimum depth.
2. Asphalt to be sawcut at the edges of the trench.
3. The removal and replacement of the additional pavement width (6'') will not be required when the trench can be constructed without disturbing the asphalt surface on either side.

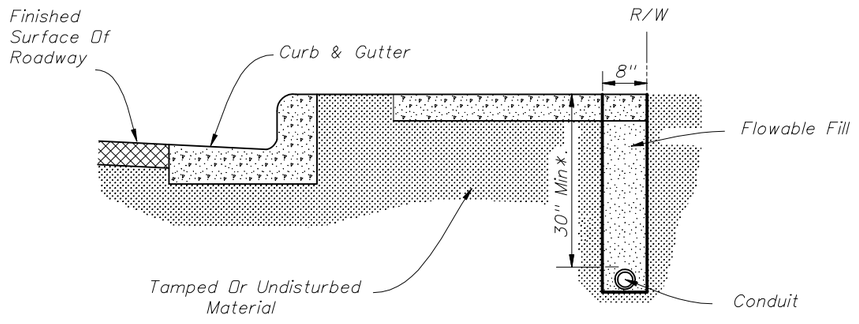
FIGURE C

*May be adjusted due to field conditions upon approval of project engineer.



FOR USE INSTALLING CONDUIT UNDER A NEW ROADWAY PRIOR TO INSTALLATION OF CURBS, BASE AND PAVEMENT

FIGURE D



FOR USE IN INSTALLING CONDUIT UNDER SIDEWALK

Note:

1. Sidewalk patches to match existing joints.
2. Entire sidewalk slab must be replaced when specified in the plans.
3. Backfill and tamp with material from trench except at driveways. At driveways, backfill a length of trench within the driveway entirely with Flowable Fill.

FIGURE E

2010 FDOT Design Standards

CONDUIT INSTALLATION DETAILS

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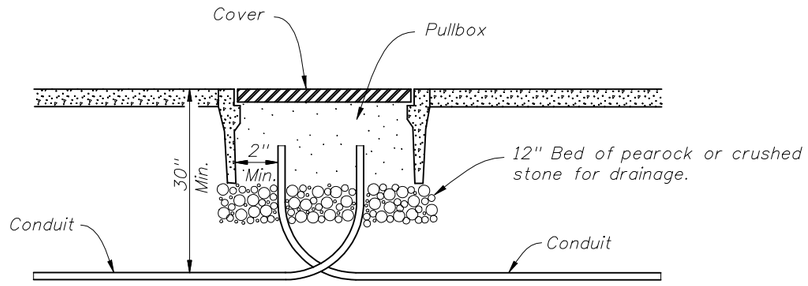
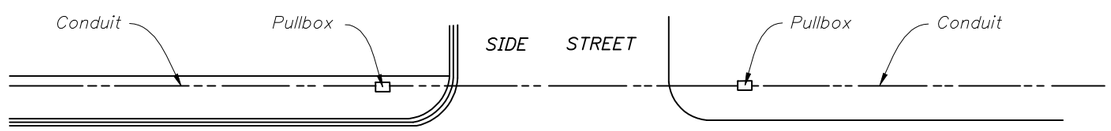


PULLBOX ENTRY OF CONDUIT UNDER SIDEWALKS

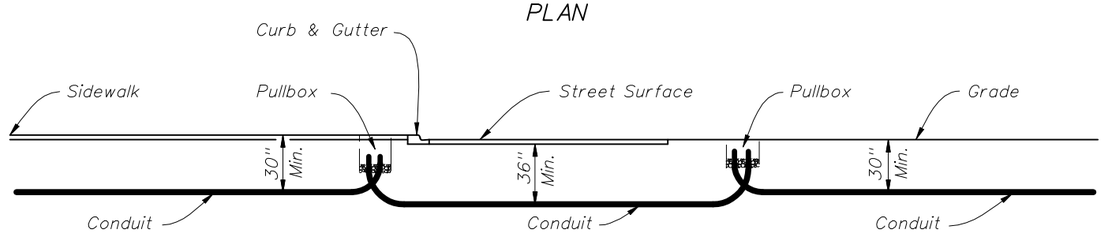
FIGURE A

Note:
Ends of conduit shall be sealed in accordance with Section 630 of the Standard Specifications for Road and Bridge Construction.



ROADWAY

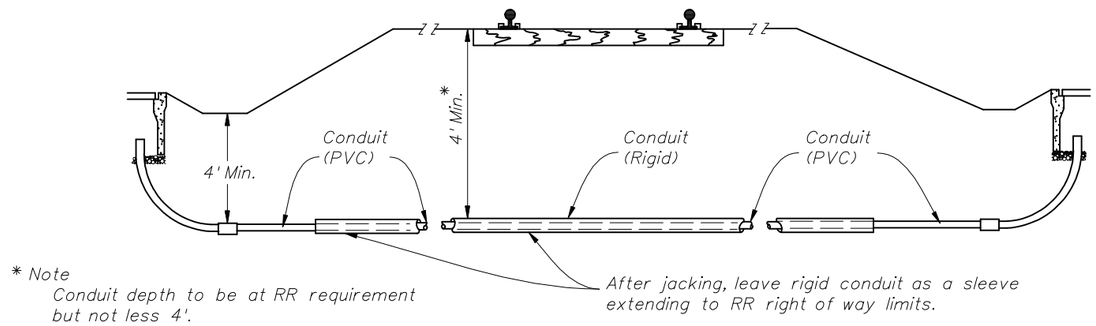
PLAN



UNDER SIDEWALK | UNDER ROADWAY | UNDER NONTRAFFIC BEARING SURFACE

SECTION

FIGURE B



* Note
Conduit depth to be at RR requirement but not less 4'.

FOR USE UNDER RAILROADS

FIGURE C

Note:
One run of conduit (between pullboxes) shall not contain more than 360° of bend including pullbox bends.

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	CONDUIT INSTALLATION DETAILS	Index No. 17721	

STEEL STRAIN POLE NOTES

1) Designed in accordance with FDOT Structures Manual and the 2001 (4th) Edition AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interims.

2) Perform all welding in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). No Field welding is permitted on any part of the pole.

3) See Standard Index No. 17727 for grounding and span wire details.

4) Foundation Materials:
   a. Reinforcing Steel: ASTM A615 Grade 60.
   b. Concrete: Class IV, (Drilled Shaft) 4,000 psi (f'c) minimum Compressive Strength at 28-days for all environmental classifications.
   c. Anchor Bolts: ASTM F1554 Grade 55 with ASTM A563 Grade A heavy-hex nuts and ASTM F436 Type 1 washers (all galvanized in accordance with ASTM F2329)

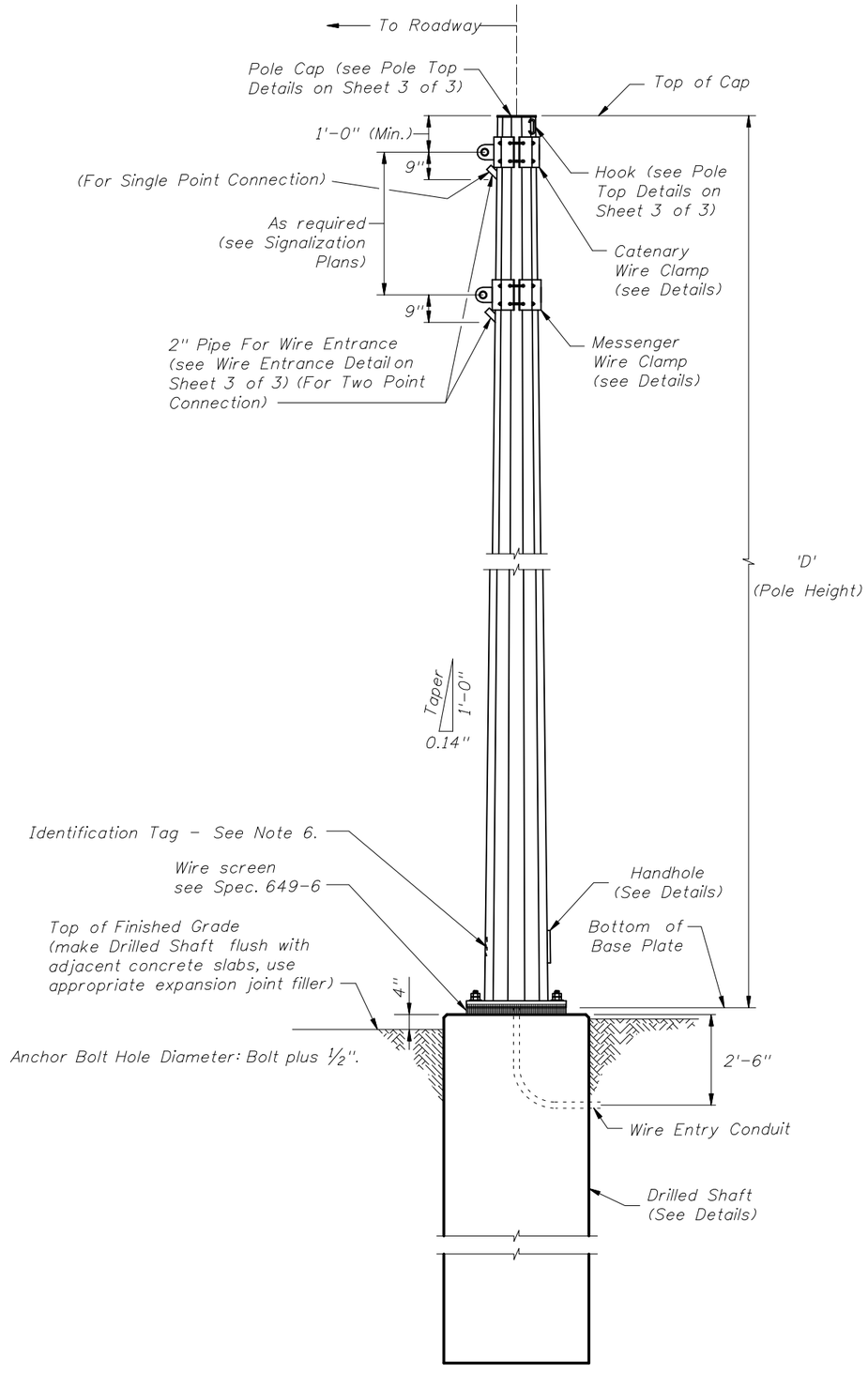
5) Strain Pole Specifications:
   a. Poles: ASTM A1011 Grade 50, 55, 60 or 65 (less than 1/4") or ASTM A572 Grade 50, 55, 60, or 65 (1/4" and over) or ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield).
   b. Steel Plates: ASTM A36.
   c. Weld Metal: E70XX.
   d. Bolts: A325, Type 1. Hole Diameter: Bolt diameter plus 1/16".
   e. Base Plate: Hole Diameter; anchor bolt diameter plus 1/2".
   f. Handhole: Frame; ASTM A709 Grade 36 or ASTM A36, Cover; ASTM A1011 Grade 50, 55, 60 or 65.
   g. Aluminum Caps and Covers: ASTM B-26 (319-F).
   h. Stainless Steel Screws: AISI Type 316.
   i. Galvanization: All nuts, bolts and washers; ASTM F2329, All other steel; ASTM A123.

6) Pole Notes:
   a. See the Signalization Plans for clamp spacing, cable sizes and forces, signal and sign mounting locations and details.
   b. Tapered with the diameter changing at a rate of 0.14 inch per foot.
   c. Transverse welds are allowed only at the base.
   d. Poles constructed out of two or more sections with overlapping splices are not permitted.
   e. Locate the handhole 180 degrees from 2-inch wire entrance pipe.
   f. Furnish each pole with a 2"x4" (max) aluminum identification tag. Submit details for approval. Secure to pole with 0.125" stainless steel rivets or screws. Locate Identification Tag on the inside of pole and visible from handhole. Include the following information: Financial Project ID, Pole Type, Pole Height, Manufacturer's Name & Certification number and QPL number.

7) One hundred percent of full-penetration groove welds and a random 25 percent of partial penetration groove welds shall be inspected. Full-penetration groove weld inspection shall be performed by nondestructive methods of radiography or ultrasonics.

8) Manufacturers seeking approval of a steel strain pole assembly for inclusion on the Qualified Products List must submit a QPL Product Evaluation Application along with drawings showing the product meets all specified requirements of this Standard.

9) Verify CSL access tubes will not interfere with anchor bolt installation before excavating the shaft. When CSL access tube locations conflict with anchor bolt locations, move the CSL access tube location ± two inches along the inner circumference of the reinforcing cage. Notify the Engineer before excavating the shaft if the CSL access tube locations cannot be moved out of conflict with anchor bolt locations.



ELEVATION

ELEVATION AND NOTES

2010 FDOT Design Standards

STEEL STRAIN POLE

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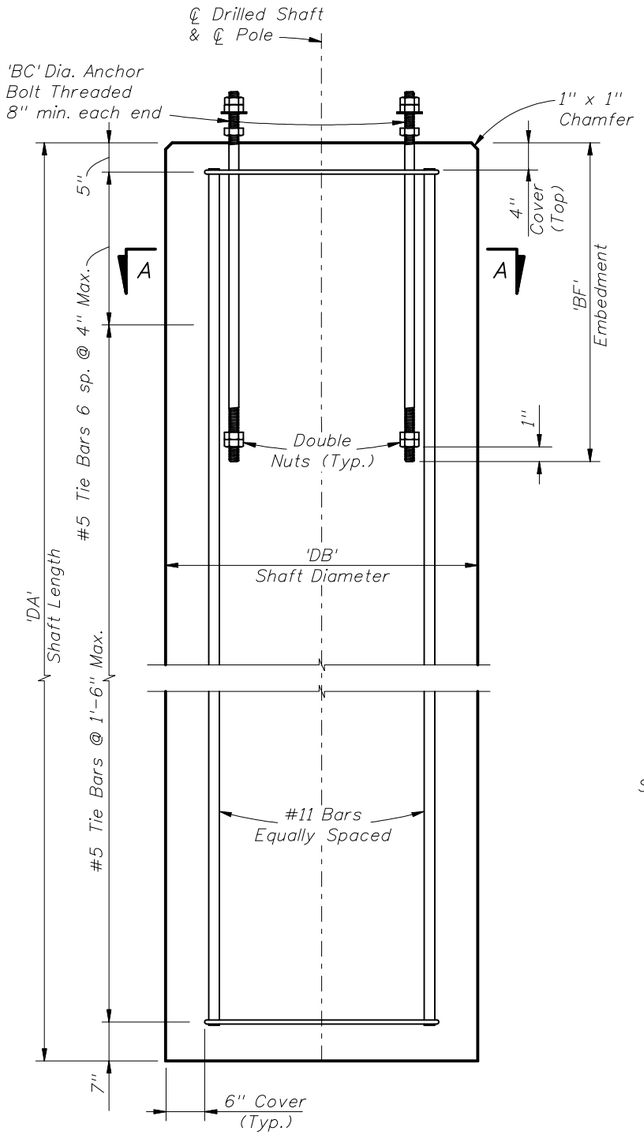
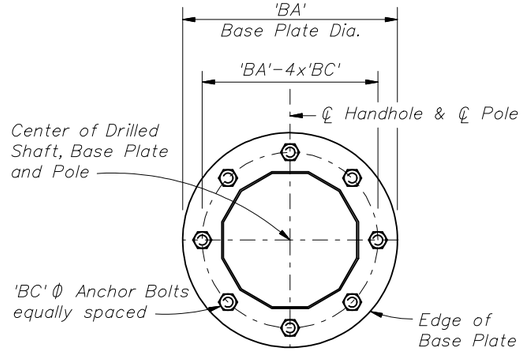
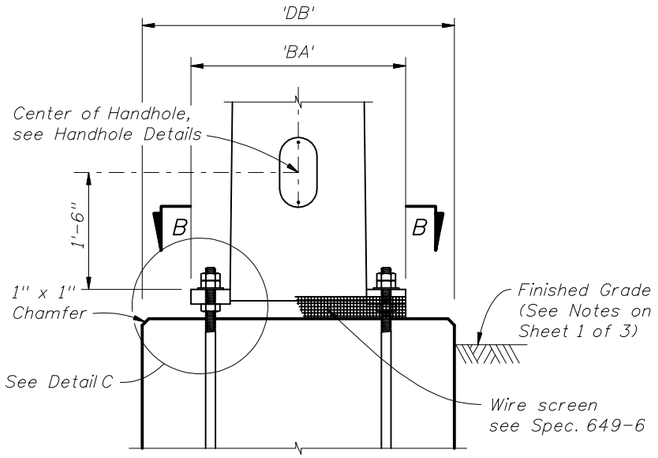


DRILLED SHAFT ELEVATION

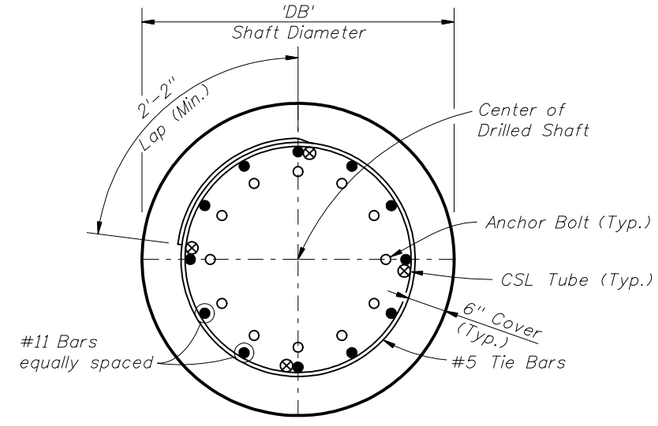


VIEW B-B

NOTE: Number of bolts shown for illustration purposes only.

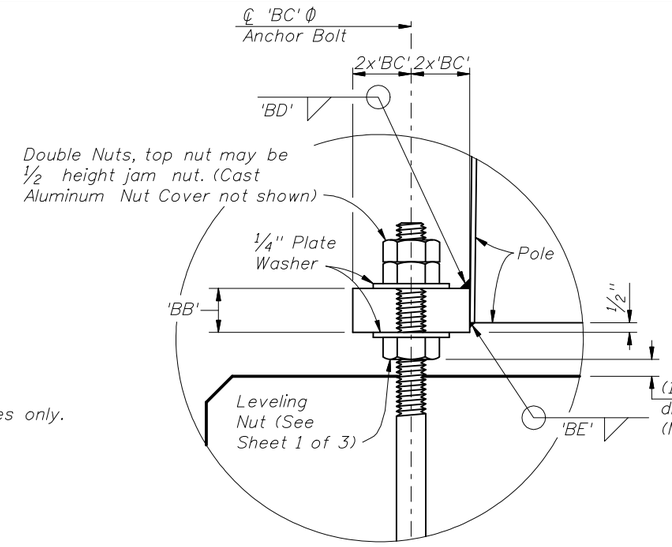


PARTIAL ELEVATION
(Showing Base Plate, Anchor bolts and Handhole)

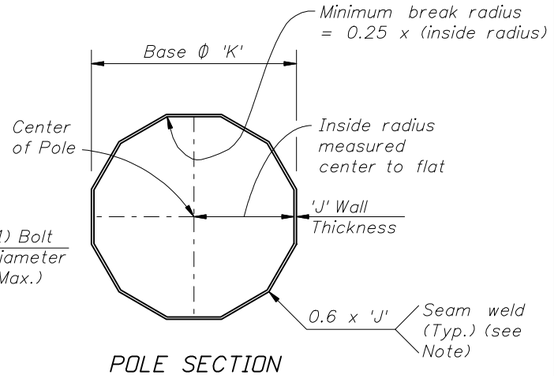


SECTION A-A

(Number of bars shown is for illustration purposes only.)



DETAIL C



POLE SECTION

NOTE:
Longitudinal seam welds within 6" of circumferential welds shall be complete penetration welds.

TABLE OF STRAIN POLE VARIABLES

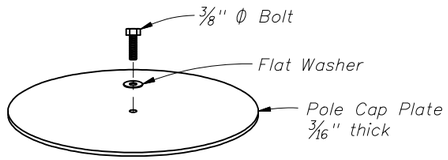
POLE TYPE	MAXIMUM ALLOWABLE MOMENT (kip-ft)	POLE		BASE CONNECTION							SHAFT		
		J (in.)	K (in.)	No. of Bolts	BA (in.)	BB (in.)	BC (in.)	BD (in.)	BE (in.)	BF (in.)	DA (ft)	DB (ft)	No. of #11 bars
PS-IV	95.4	0.250	14	8	25	2.25	1⅜	7/16	3/16	57	15.0	3.5	10
PS-V	158.9	0.313	16	10	28	2.50	1½	½	¼	56	16.5	3.5	10
PS-VI	203.6	0.313	18	12	30	2.50	1½	½	¼	55	17.0	3.5	10
PS-VII	280.3	0.313	21	14	33	2.50	1½	9/16	¼	56	17.0	4.0	14
PS-VIII	338.0	0.313	23	16	35	2.50	1½	9/16	¼	55	18.0	4.0	14
PS-IX	400.9	0.313	25	12	39	2.75	1¾	9/16	¼	57	17.5	4.5	16
PS-X	469.1	0.313	27	14	41	2.75	1¾	9/16	¼	56	18.5	4.5	16

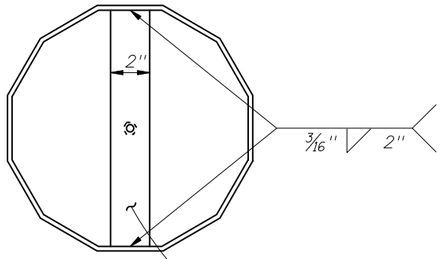
FOUNDATION NOTES:
The foundations for Steel Strain Poles are designed based upon the following conservative soil criteria which covers the great majority of soil types found in Florida:

Classification = Cohesionless (Fine Sand)
Friction Angle = 30 Degrees (30°)
Unit Weight = 50 lbs./cu. ft. (assumed saturated)

Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, SPT borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single boring or sounding may cover several foundations. Furthermore, borings in the area that were performed for other purposes may be used to confirm the assumed soil properties.

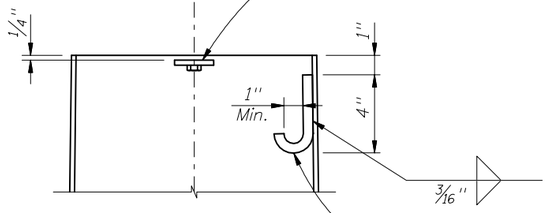
BASE AND FOUNDATION DETAILS AND TABLE OF VARIABLES





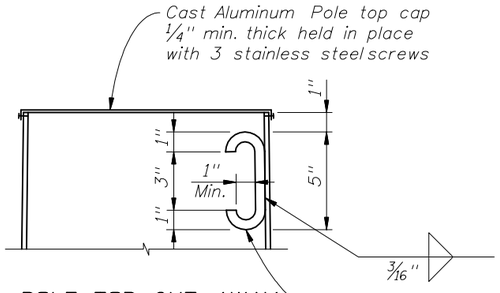
TOP VIEW

1/4" x 2" Lifting Bar with 5/16" Ø hole and 3/8" Nut tack welded to underside of bar



POLE TOP CUT-AWAY
(Option 'a')

'J' Hook for wiring, 1/2" Ø commercial grade hot rolled bar welded to inside of pole.

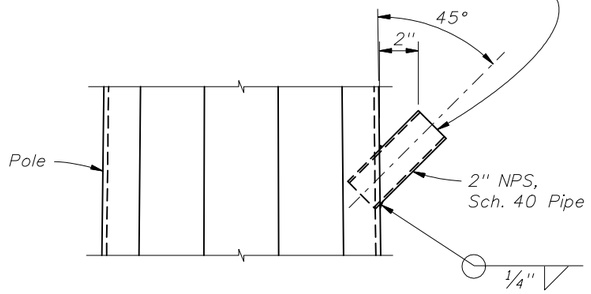


POLE TOP CUT-AWAY
(Option 'b')

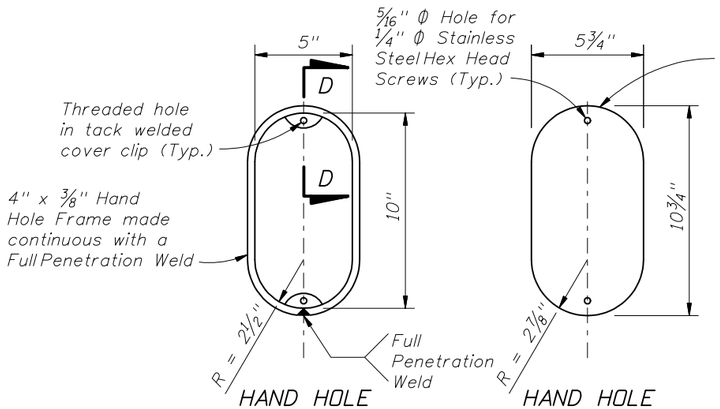
'C' Hook for wiring and lifting, 1/2" Ø commercial grade hot rolled bar welded to inside of pole.

POLE TOP NOTE:
Any combination of the above two options may be used, provided both lifting and wiring is accommodated.

NOTE: A properly sized Service Head (Weather Head), shall be installed and fastened securely on to the standard pipe for each pole location. At locations other than service entrance, the service head face is to be left closed to outside atmosphere. Service entrance installation per Index No. 17727.

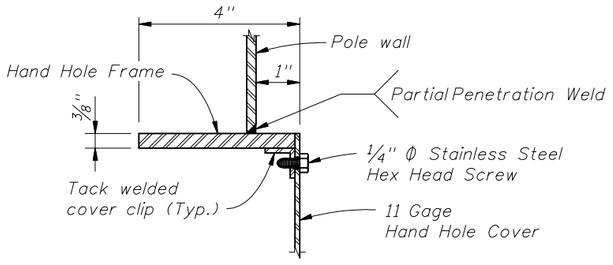


WIRE ENTRANCE DETAILS



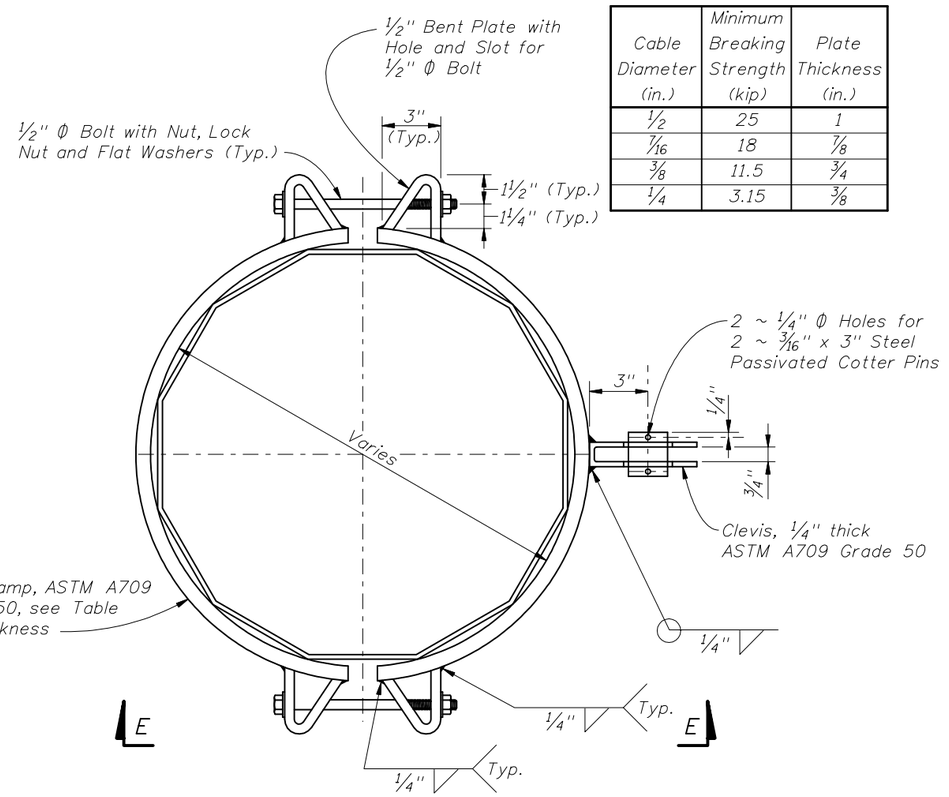
HAND HOLE FRAME

HAND HOLE COVER



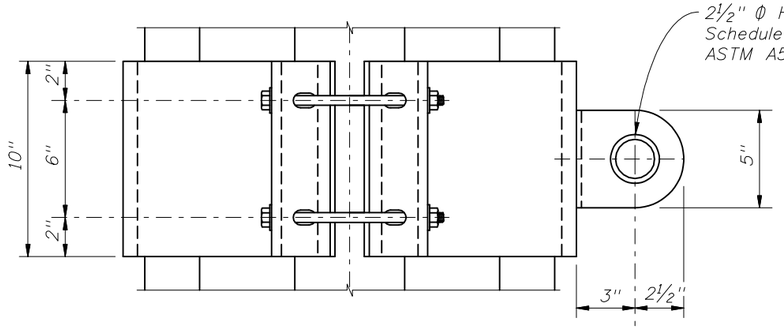
SECTION D-D
(thru Hand Hole)

Cable Diameter (in.)	Minimum Breaking Strength (kip)	Plate Thickness (in.)
1/2	25	1
7/16	18	7/8
3/8	11.5	3/4
1/4	3.15	3/8



CATENARY AND MESSENGER WIRE CLAMPS

NOTE: Clamps have been sized for Design Cable Loads shown in the Table, and a Maximum Pole Diameter at the Clamp location of 2'-1".



VIEW E-E

ATTACHMENT DETAILS

2010 FDOT Design Standards

STEEL STRAIN POLE

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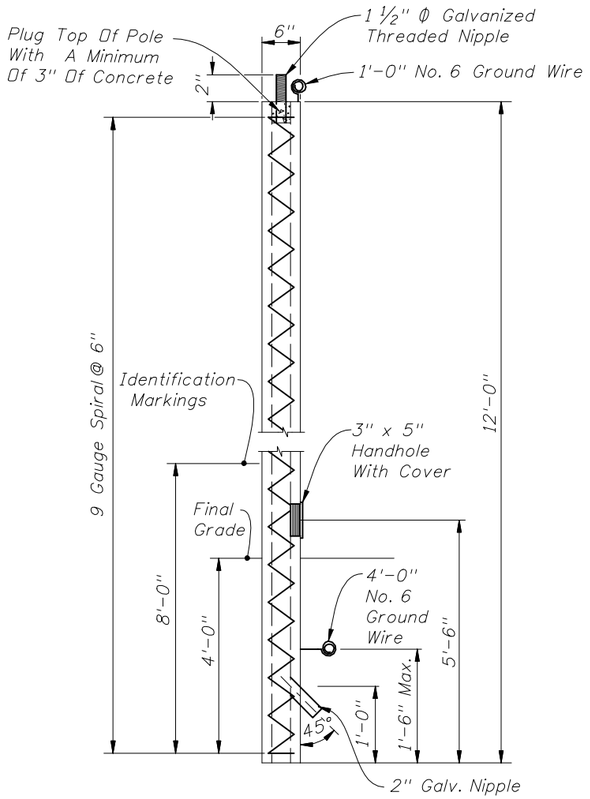
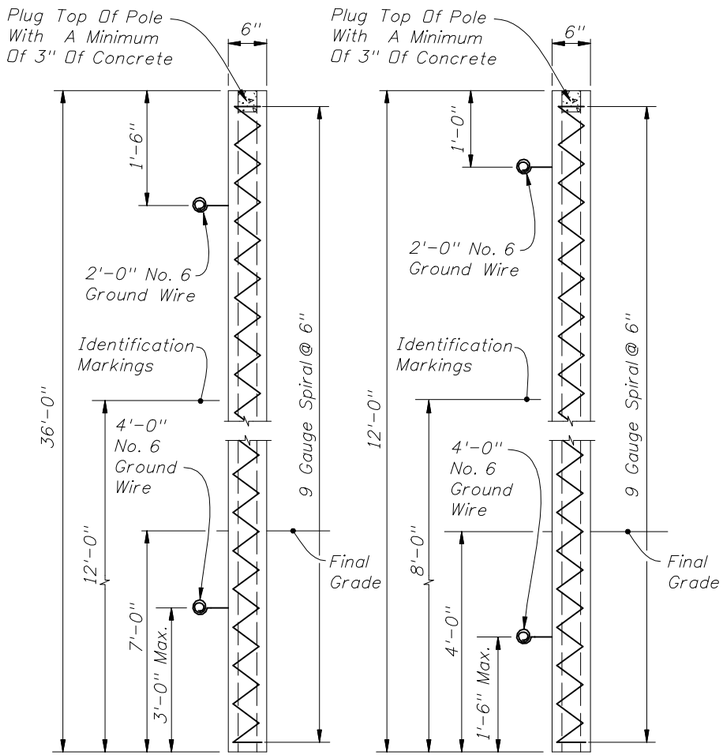
TYPE OF POLE	CONCRETE POLE **	
	SIZE AT TOP (T)	SHEAR REINFORCING
Type P-II	6" x 6"	9 Gauge Spiral @ 6"
Type P-III	6" x 6"	6 Gauge Spiral @ 6"
Type P-IV	8" x 8"	5 Gauge Spiral @ 6"
Type P-V	10" x 10"	5 Gauge Spiral @ 6"
Type P-VI	12" x 12"	5 Gauge Spiral @ 6"
Type P-VII	14" x 14"	5 Gauge Spiral @ 6"
Type P-VIII	16" x 16"	5 Gauge Spiral @ 6"

** Round poles require the same taper as square poles and top diameter not less than 1.4 times the top width (dimension "T") of a square pole.

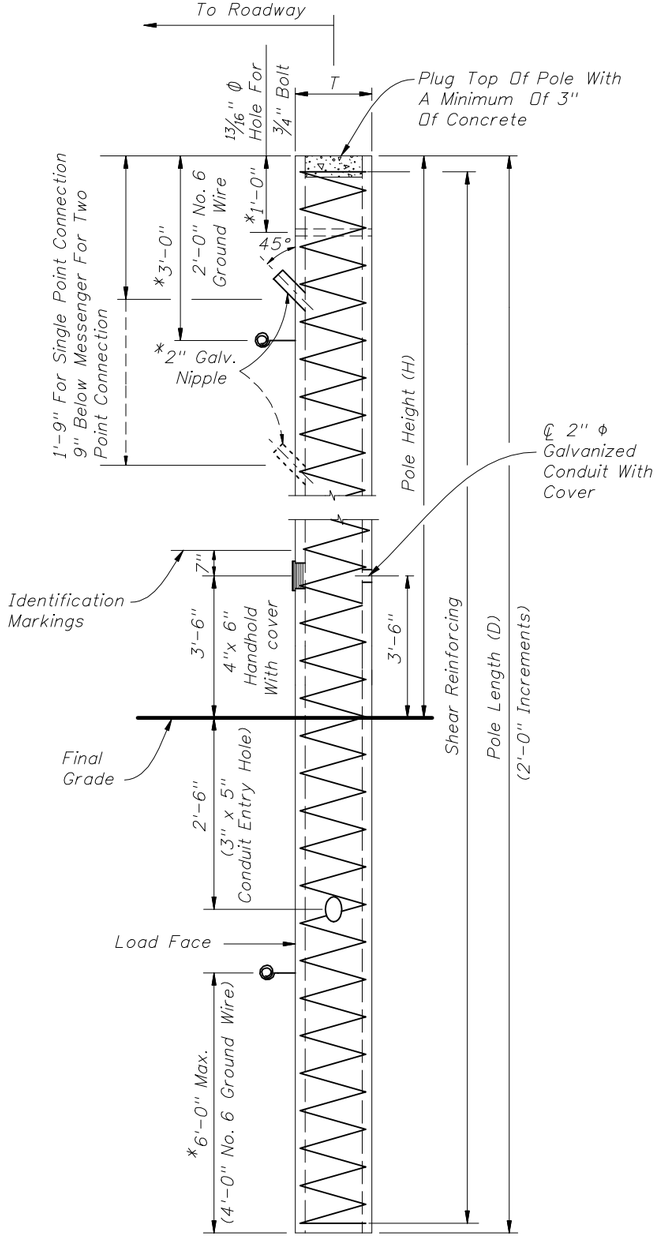


TYPE P-II PEDESTAL POLE



TYPE P-II SERVICE POLE

(For Installation, refer to Roadway and Traffic Design Standard. Index No. 17504)



TYPE P-III LIGHTING AND TRAFFIC MONITORING POLES
TYPES P-IV THROUGH P-VIII STRAIN POLES

* Do not apply these items to Type P-III Lighting and ITS Poles. Establish bolt hole locations, ground wire location and conduit location as shown in the plans.

Ref. Index 17900 and Sec. 744 for modifications to Type P-III poles used at traffic monitoring sites.

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CONCRETE POLES

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DESIGN NOTES:
Design according to FDOT Structures Manual (current edition) and the 2001 edition of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" with Interim.

Manufacturers seeking approval of a prestressed concrete pole for inclusion on the Qualified Products List must submit a QPL Products Evaluation Application along with design documentation and drawings showing the product meets all specified requirements of this Index.

Place the prestressing symmetrically about one axis. Supply a sufficient amount of prestressing to provide a calculated compressive stress of 1.0 ksi for Type P-II pole (12 ft) and 1.8 ksi for Type P-II (36 ft) pole and Type P-III pole at the top of pole after all losses.

Design concrete Strain poles using Class V Special with strength of 6 ksi minimum at 28 days and 4 ksi minimum at transfer of the Prestressing force.

Reinforcing steel shall be A615 Grade 60. Provide a minimum area of non-prestressed reinforcement equal to 0.33% of the concrete area.

Prestressed Strands shall be A416 Grade 270 stress relieved or low relaxation.

One turn required for spiral splices and two turns required at the top and bottom of poles. Spiral shall be manufactured from cold-drawn steel wire meeting the requirements of ASTM A82.

Use cover plates made of non-corrosive materials and attached to the pole using lead anchors or threaded inserts embedded in the pole and round head chrome plated screws.

Attach ground wires to the reinforcing steel in the pole as necessary to prevent the ground wire from being displaced during concreting operations.

Identify concrete poles as to pole manufacturer, Department's pole type, length and Qualified Product List qualification number by inset numerals 1" in height inscribed on the same face of the pole as the handhole and ground wire.

Provide a Class 3 Surface Finish as specified in Section 400-15.2.4 of the Standard Specifications.

Provide a minimum cover of 1".

Provide all poles with a total taper of 0.162 IN/FT.

INSTALLATION NOTES:
Attach span wire assemblies (consisting of the catenary wire, the messenger wire, and the tether wire) to the concrete poles in accordance with Section 634 of the Standard Specifications.

If a two point attachment is required by the plans, provide an eye bolt hole for the messenger wire, or field drill one at the location indicated in the plans. Field drill the eyebolt hole for the tether wire, when required, prior to installation.

Rake pole back from the span wire as necessary to achieve a final rake of ½ ± ¼ inch per foot.

TABLE I
MINIMUM REQUIRED ALLOWABLE SERVICE MOMENT CAPACITY (Ms)

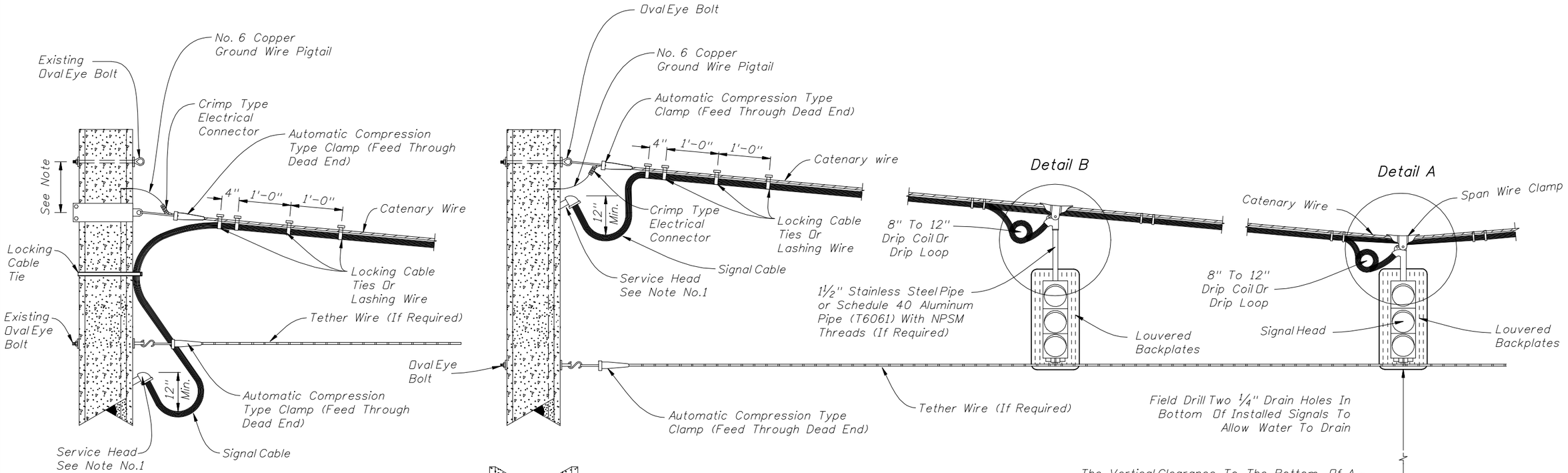
H (feet)	TYPE OF STRAIN POLE				
	P-IV (k-ft)	P-V (k-ft)	P-VI (k-ft)	P-VII (k-ft)	P-VIII (k-ft)
20	21	86	121	165	204
22	24	90	126	171	210
24	26	93	131	176	215
26	29	97	135	182	221
28	32	101	140	187	227
30	34	104	144	192	232
32	37	108	149	197	238
34	39	111	153	202	243
36	41	114	157	207	248
38	44	117	161	212	253
40	46	120	165	217	258
42	48	123	169	221	263
44	50	126	173	226	268
46	52	129	177	230	272
48	54	132	180	235	277
50	56	135	184	239	281

TABLE I shall be used for checking allowable stress in concrete for Dead Load. MS ≥ MDL, where MDL = moment due to dead load only.

TABLE II
MINIMUM REQUIRED ULTIMATE MOMENT CAPACITY (Ø Mn)

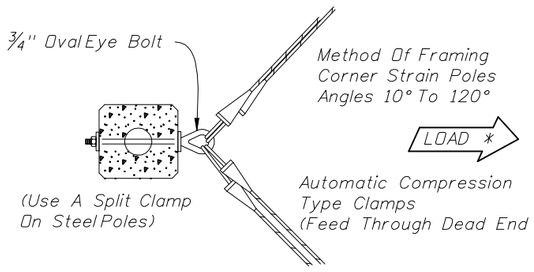
H (feet)	TYPE OF STRAIN POLE				
	P-IV (k-ft)	P-V (k-ft)	P-VI (k-ft)	P-VII (k-ft)	P-VIII (k-ft)
20	43	138	198	273	346
22	48	145	206	283	357
24	53	151	215	294	369
26	58	158	224	304	381
28	63	165	232	315	392
30	68	172	241	325	404
32	73	178	250	335	415
34	77	185	258	346	427
36	82	192	267	356	439
38	87	199	276	367	450
40	92	205	284	377	462
42	97	212	293	387	474
44	102	219	302	398	485
46	107	226	310	408	497
48	112	232	319	419	508
50	117	239	328	429	520

TABLE II shall be used for checking ultimate moment strength under factored loading combinations of dead load plus wind load, and is the Nominal Moment Strength (Mn) multiplied by Strength Reduction factor (Ø = 0.9) Ø Mn ≥ Mu = 1.3 (MDL+MWL), where MDL = moment due to dead load, and MWL = moment due to wind load.

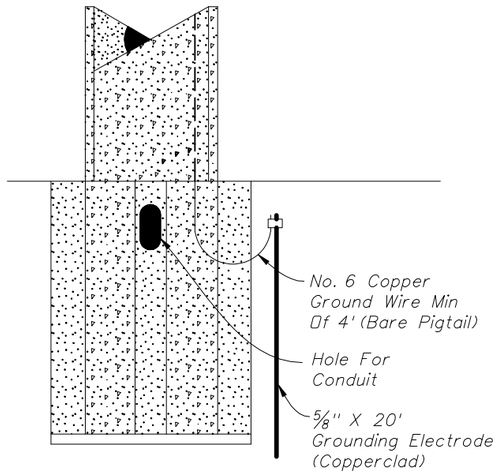


RETROFIT INSTALLATION

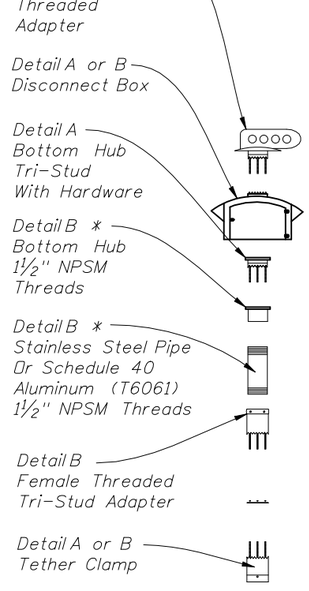
Note:
Clamp location shall be adjusted to compensate for reduced sag and vertical clearance to bottom of signal head.



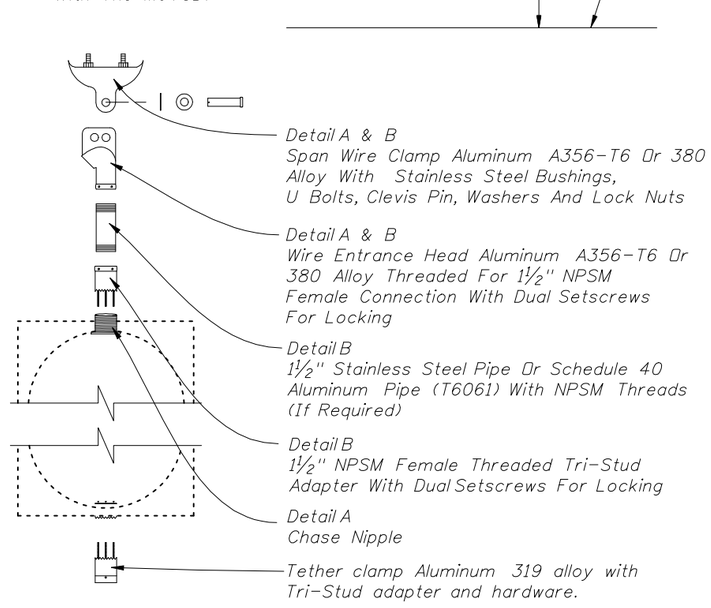
* The load face of pole shall be perpendicular to load.



PRESTRESSED CONCRETE POLE NEW CONSTRUCTION



* For long pipe hangers a wire entrance head may be substituted for balancer and the drop pipe installed above the disconnect box.



SINGLE POINT ATTACHMENT

Notes:

1. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
2. Lashing wire should normally be used for distances of 12' or greater.
3. All hardware for signal attachment shall be stainless steel.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.

2010 FDOT Design Standards

SIGNAL CABLE & SPAN WIRE INSTALLATION DETAILS

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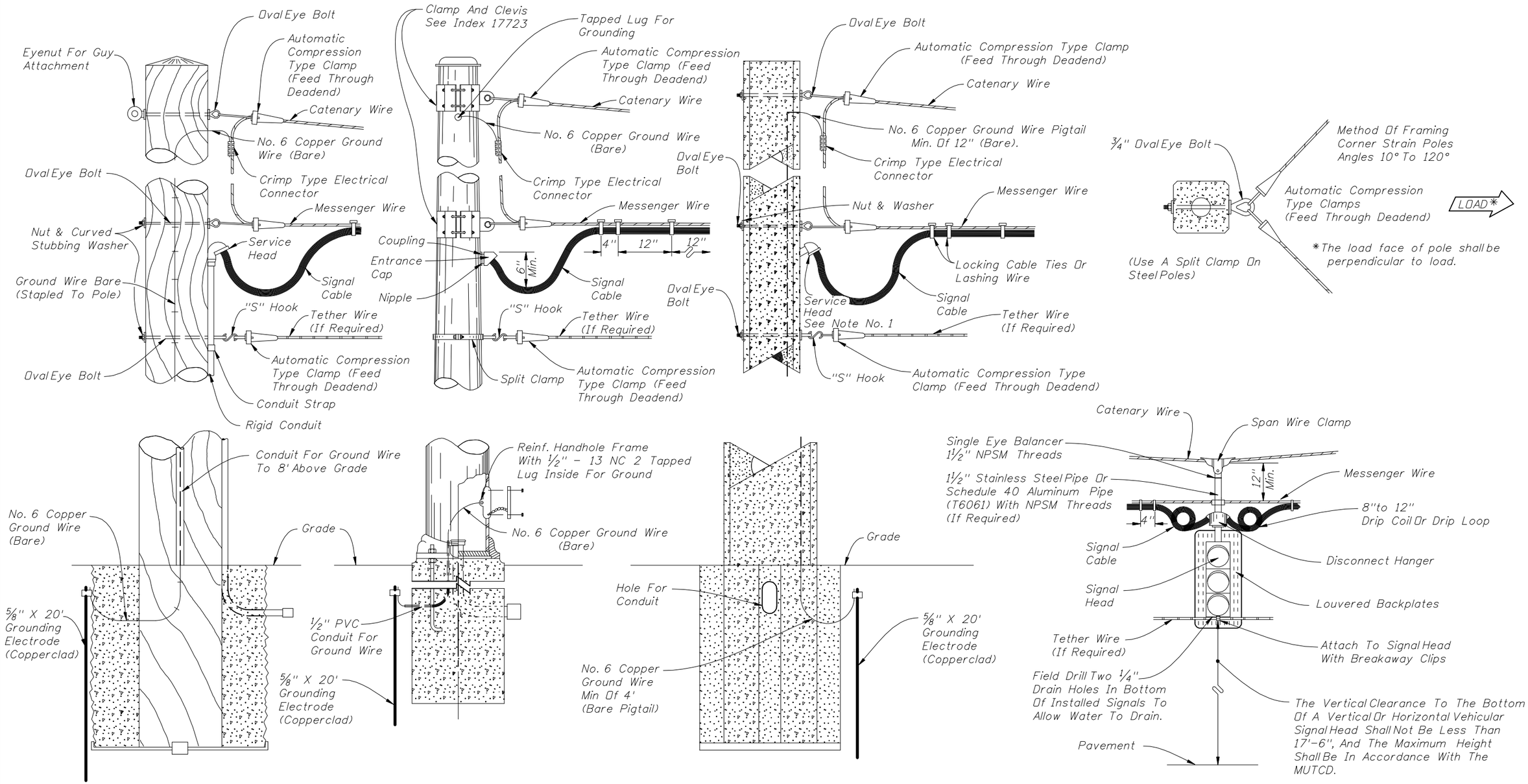

WOOD POLE

STEEL POLE

PRESTRESSED CONCRETE POLE

Notes:

1. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
2. Lashing wire should normally be used for distances of 12' or greater.
3. The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing of 2" between bolts.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.

TWO POINT ATTACHMENT

2010 FDOT Design Standards

SIGNAL CABLE & SPAN WIRE INSTALLATION DETAILS

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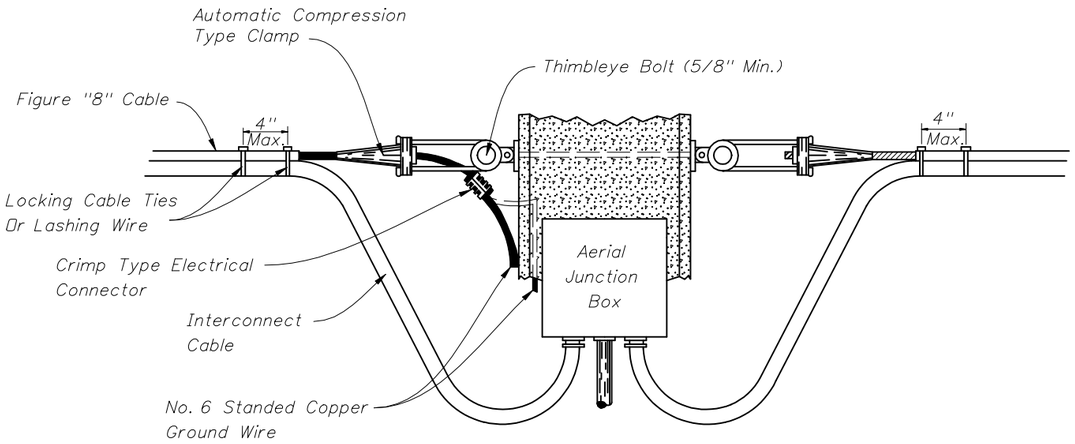

FIGURE A
CABLE DROP AND
TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "8"

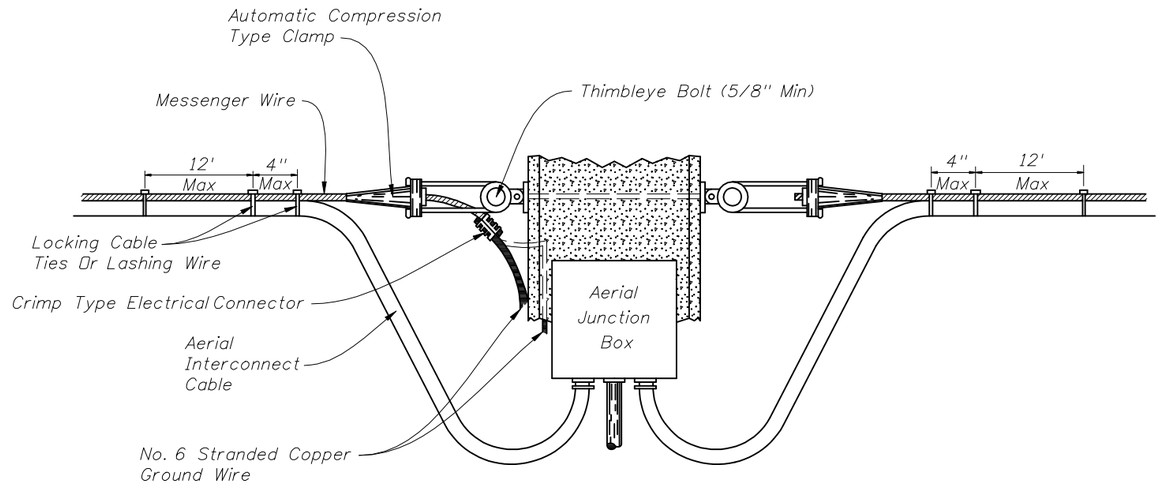

FIGURE B
CABLE DROP AND
TERMINATION DETAIL
AERIAL INTERCONNECT MESSENGER
WIRE WITH CLAMPS

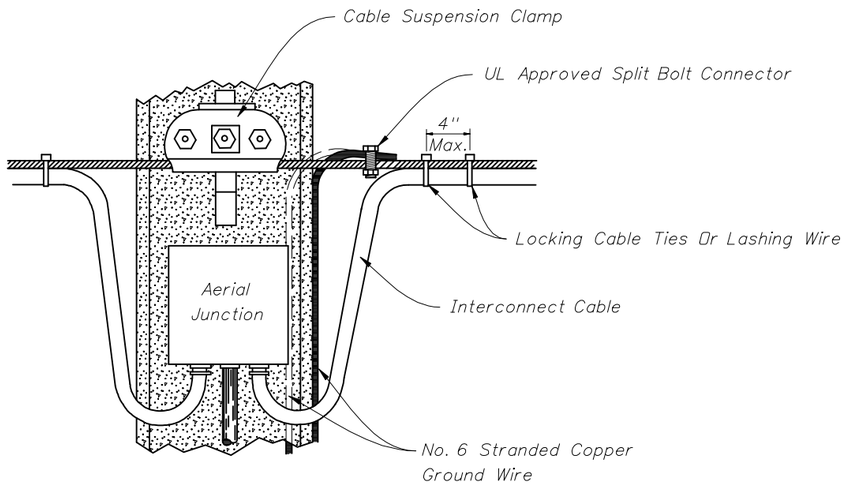

FIGURE C
CABLE DROP DETAIL
AERIAL INTERCONNECT MESSENGER
WIRE WITH CLAMPS

Notes:

1. The messenger wire of the interconnect cables shall be grounded to the copper ground wire of the pole or to the external wire extending down the pole.

2. When utilizing the external ground wire to the pole, a piece of ½" conduit shall extend up the pole externally to a point 8' above finish grade to protect the ground wire connecting the messenger wire to the ground rod.

3. Locking cable ties or lashing wire when used shall be placed no further than 12" apart except at the point of cable drop or terminations where one (1) shall be placed at the point where the cables separate from the messenger wire and another placed 4" (max) from that tie. When using figure "8" interconnect cable only the locking cable ties shall be used.

4. If accessible the internal ground wire of the support pole may be used to ground the messenger wire.

5. Lashing wire should normally be used for distances of 12' or greater.

6. Meet all grounding requirements of Section 620 of the Standard Specifications.

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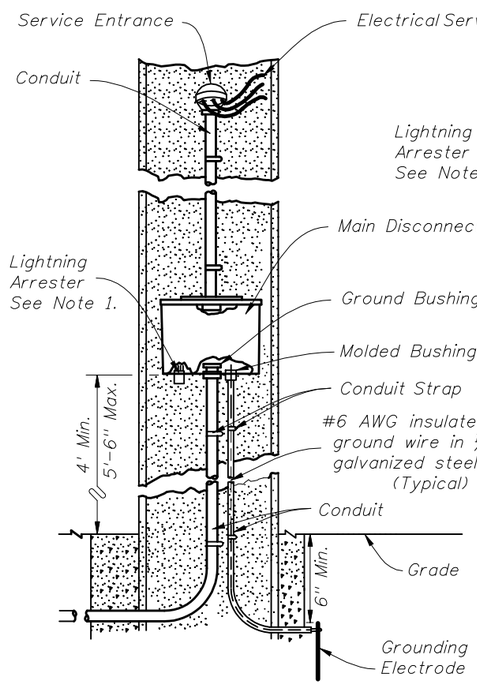
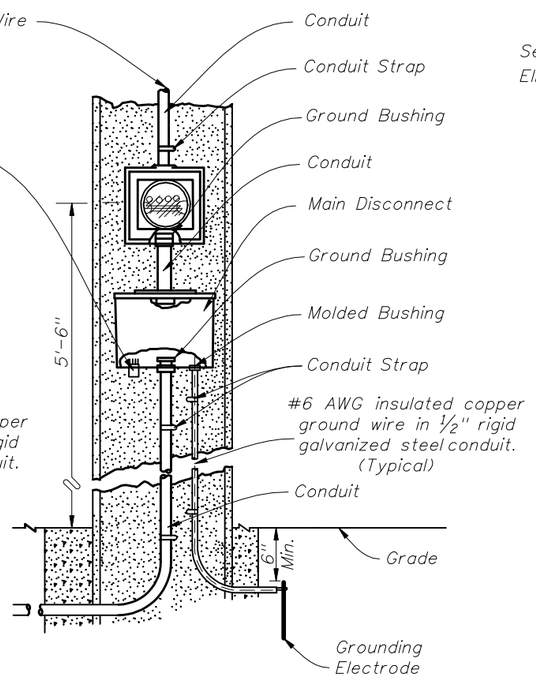
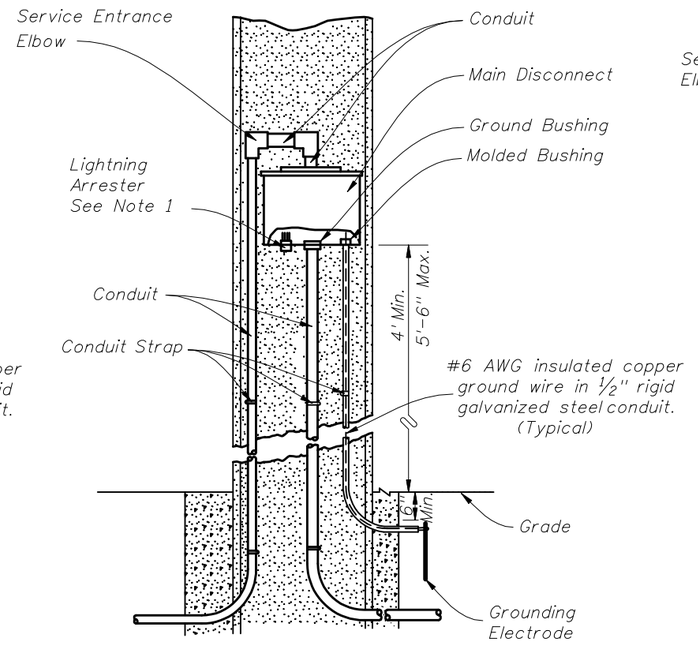


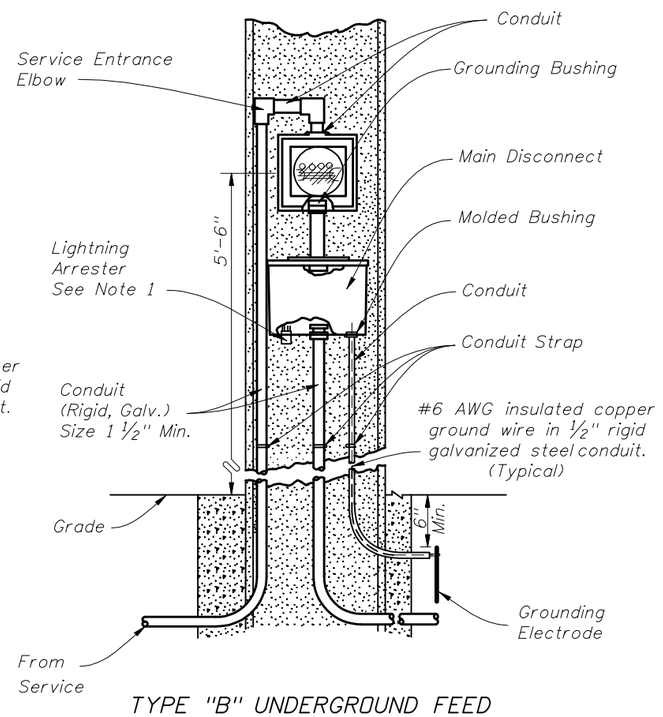
AERIAL FEED
(NO METER USED)
FIGURE A



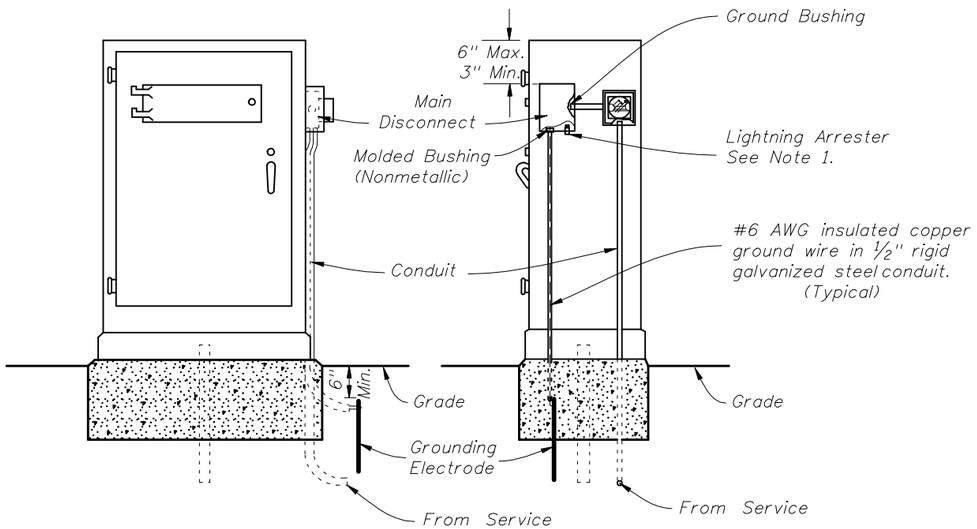
AERIAL FEED
(METER USED)
FIGURE B



UNDERGROUND FEED
(NO METER USED)
FIGURE C



TYPE "B" UNDERGROUND FEED
(METER USED)
FIGURE D



UNDERGROUND CABINET MOUNTED
(METER USED)
FIGURE E

NOTES:

1. The lightning arrester can be located on the side or bottom of the main disconnect enclosure at the Contractor's Option.
2. Liquidtight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.
3. Bond all elements together to form an Intersection Grounding Network in accordance with Section 620 of the Department's current Standard Specifications for Road and Bridge Construction. The bond wire shall be run in conduit with the Electrical Service Wire or Signal Cable.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.
5. The Main Disconnect shall be lockable by padlock and four keys provided to the maintaining agency. The door shall have a minimum of three hinges and be lockable. No screws to be used to attach door.
6. The Main Disconnect shall be Nema 3R or better.

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ELECTRIC POWER SERVICE

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POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE

Arm Type	D1	D3	D5	D6	D7
Pole Type	S1 & S21 Lum	S2 & S22 Lum	S3 & S23 Lum	S4 & S24 Lum	S6

POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE

Arm Type	D1 - D1	D3 - D1	D5 - D2	D6 - D2	D4 - D4	D5 - D4	D6 - D4	D5 - D5	D6 - D5	D6 - D6
Pole Type	S1	S2	S3	S4	S3	S4	S4	S4	S4	S5

Arm 1 is listed first

ARM DESIGN TABLE - ALL CASES

ARM TYPE	ARM LENGTH	MAST ARM				ARM EXTENSION				ARM CONNECTION & WELDS				
		FA/SA (ft)	FB/SB (in)	FC/SC (in)	FD/SD (in)	FE/SE (ft)	FF/SF (in)	FG/SG (in)	FH/SH (in)	HT (in)	FJ/SJ (in)	FK/SK (in)	FM/SM (in)	FQ/SQ (in)
D1	36'-0"	36	8.96	14	0.1793	-	-	-	-	20	25	2.5	0.125	0.313
D2	36'-0"	36	8.96	14	0.1793	-	-	-	-	30	36	3	0.125	0.313
D3	46'-0"	36.3	8.92	14	0.1793	11.7	13.36	15	0.313	20	25	2.5	0.25	0.375
D4	46'-0"	36.3	8.92	14	0.1793	11.7	13.36	15	0.313	30	36	3	0.25	0.375
D5	60'-0"	36	7.96	13	0.1793	26	12.36	16	0.375	30	36	3	0.313	0.563
D6	70'-6"	39.4	9.49	15	0.1793	33.1	14.37	19	0.375	30	36	3	0.313	0.563
D7	78'-0"	40	8.44	14	0.1793	40.0	13.40	19	0.375	30	34	3	0.313	0.625

Arm Camber Angle = 2 degrees

POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM

POLE TYPE	UA(ft)	UC(in)	UD(in)	UE(in)	UG(ft)	UPRIGHT BASE CONNECTION							CONNECTION PLATE DATA									DRILLED SHAFT DATA			
						No. Bolts	BA (in)	BB (in)	BC (in)	BD (in)	BE (in)	BF (in)	HT (in)	FJ/SJ (in)	FL/SL (in)	FN/SN (in)	FO/SO (in)	FP/SP (in)	FR/SR (in)	FS/SS (in)	FT/ST (in)	DA (ft)	DB (ft)	RA	RB
S1	24	12.64	16	0.375	-	6	30	1.75	1.75	0.375	0.313	36	20	25	0.75	0.438	15.5	1	2	8	0.438	13	3.5	11	10
S2	24	14.64	18	0.375	-	6	32	1.75	1.75	0.375	0.313	36	20	25	0.75	0.438	15.5	1	2	8	0.438	13	4	11	14
S3	24	17.64	21	0.375	-	6	37	1.75	2	0.375	0.313	40	30	36	0.75	0.438	22	1.25	2.5	12.5	0.438	15	4	11	14
S4	24	22.64	26	0.375	-	6	42	1.75	2	0.375	0.313	40	30	36	0.75	0.438	22	1.25	2	12.5	0.438	17	4.5	11	16
S5	24	23.64	27	0.375	-	6	45	1.75	2.25	0.375	0.313	45	30	36	0.75	0.438	22	1.25	2	12.5	0.438	19	4.5	11	16
S6	24	21.64	25	0.375	-	6	41	1.75	2	0.375	0.313	40	30	34	0.75	0.5	16.5	1.25	2	12.5	0.5	15	4.5	11	16
S21 Lum	39	10.54	16	0.375	37.5	6	30	1.75	1.75	0.375	0.313	40	20	25	0.75	0.438	11.5	1	2	8	0.438	13	3.5	11	10
S22 Lum	39	12.54	18	0.375	37.5	6	32	1.75	1.75	0.375	0.313	40	20	25	0.75	0.438	12.5	1	2	8	0.438	13	4	11	14
S23 Lum	39	15.54	21	0.375	37.5	6	37	1.75	2	0.375	0.313	40	30	36	0.75	0.438	15	1.25	2.5	12.5	0.438	14	4	11	14
S24 Lum	39	20.54	26	0.375	37.5	6	42	1.75	2	0.375	0.313	40	30	36	0.75	0.438	17	1.25	2	12.5	0.438	15	4.5	11	16

LUMINAIRE AND LUMINAIRE CONNECTION

LA(ft)	LB(ft)	LC(in)	LD(in)	LE	LF(ft)	LG(in)	LH(in)	LJ(in)	LK(in)	LL(deg)	UG(ft)
40	10	3	0.125	0.5	8	0.5	0.75	0.25	0.25	0	37.5

NOTES:

1. Work this Index with Index No. 17745.
2. Standard Mast Arm "D" Assemblies are designed to Loading Trees as indicated in Plans Preparation Manual.
3. Design Speed = 150 mph with Signal Backplates

"D" MAST ARMS

2010 FDOT Design Standards

STANDARD MAST ARM ASSEMBLIES

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POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE					
Arm Type	E1	E3	E5	E6	E7
Pole Type	T1 & T21 Lum	T2 & T22 Lum	T3 & T23 Lum	T4 & T24 Lum	T6

POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE										
Arm Type	E1 - E1	E3 - E1	E5 - E2	E6 - E2	E4 - E4	E5 - E4	E6 - E4	E5 - E5	E6 - E5	E6 - E6
Pole Type	T1	T2	T3	T4	T3	T4	T4	T4	T4	T5

Arm 1 is listed first

ARM DESIGN TABLE - ALL CASES														
ARM TYPE	ARM LENGTH	MAST ARM				ARM EXTENSION				ARM CONNECTION & WELDS				
		FA/SA (ft)	FB/SB (in)	FC/SC (in)	FD/SD (in)	FE/SE (ft)	FF/SF (in)	FG/SG (in)	FH/SH (in)	HT (in)	FJ/SJ (in)	FK/SK (in)	FM/SM (in)	FQ/SQ (in)
E1	36'-0"	36.0	5.96	11	0.25	-	-	-	-	22	22	2	0.187	0.313
E2	36'-0"	36.0	5.96	11	0.25	-	-	-	-	30	32	2.75	0.187	0.313
E3	46'-0"	36.3	7.06	12.14	0.25	11.7	11.36	13	0.313	22	22	2	0.25	0.375
E4	46'-0"	36.3	7.06	12.14	0.25	11.7	11.36	13	0.313	30	32	2.75	0.25	0.375
E5	60'-0"	36.0	6.10	11.14	0.25	26	10.36	14	0.375	30	32	2.75	0.313	0.5
E6	70'-6"	39.4	6.63	12.15	0.25	33.1	11.37	16	0.375	30	32	2.75	0.313	0.563
E7	78'-0"	40.0	7.50	13.10	0.1793	40	12.40	18	0.375	30	32	2.5	0.313	0.563

Arm Camber Angle = 2 degrees

POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM																							
POLE TYPE	UA(ft)	UC(in)	UD(in)	UE(in)	UG(ft)	UPRIGHT BASE CONNECTION							CONNECTION PLATE DATA									DRILLED SHAFT DATA			
						No. Bolts	BA (in)	BB (in)	BC (in)	BD (in)	BE (in)	BF (in)	HT (in)	FJ/SJ (in)	FL/SL (in)	FN/SN (in)	FQ/SQ (in)	FP/SP (in)	FR/SR (in)	FS/SS (in)	FT/ST (in)	DA (ft)	DB (ft)	RA	RB
T1	24	10.64	14	0.375	-	6	26	1.75	1.5	0.375	0.313	36	22	22	0.5	0.375	14	1	2.0	9	0.375	12	3.5	11	10
T2	24	12.64	16	0.375	-	6	28	1.75	1.5	0.375	0.313	36	22	22	0.5	0.375	14	1	2.0	9	0.375	14	3.5	11	10
T3	24	15.64	19	0.375	-	6	35	1.75	2	0.375	0.313	40	30	32	0.75	0.375	19.5	1.25	2.0	12.5	0.375	15	4	11	14
T4	24	18.64	22	0.5	-	6	38	1.75	2	0.5	0.438	40	30	32	0.75	0.375	19.5	1.25	2.0	12.5	0.375	19	4	11	14
T5	24	18.64	22	0.5	-	6	38	1.75	2	0.5	0.438	40	30	32	0.75	0.375	19.5	1.25	2.0	12.5	0.375	21	4	11	14
T6	24	18.64	22	0.375	-	6	38	1.75	2	0.375	0.313	40	30	32	0.75	0.438	15	1.25	2.0	12.5	0.438	18	4	11	14
T21 Lum	39	8.54	14	0.375	37.5	6	26	1.75	1.5	0.375	0.313	40	22	22	0.5	0.375	10	1	2.0	9	0.375	12	3.5	11	10
T22 Lum	39	10.54	16	0.375	37.5	6	30	1.75	1.75	0.375	0.313	40	22	22	0.5	0.375	11	1	2.0	9	0.375	13	3.5	11	10
T23 Lum	39	13.54	19	0.375	37.5	6	35	1.75	2	0.375	0.313	40	30	32	0.75	0.375	13	1.25	2.25	12.5	0.375	14	4	11	14
T24 Lum	39	16.54	22	0.375	37.5	6	38	1.75	2	0.375	0.313	40	30	32	0.75	0.375	15	1.25	2.0	12.5	0.375	17	4	11	14

LUMINAIRE AND LUMINAIRE CONNECTION											
LA(ft)	LB(ft)	LC(in)	LD(in)	LE	LF(ft)	LG(in)	LH(in)	LJ(in)	LK(in)	LL(deg)	UG(ft)
40	10	3	0.125	0.5	8	0.5	0.75	0.25	0.25	0	37.5

NOTES:

1. Work this Index with Index No. 17745.
2. Standard Mast Arm "E" Assemblies are designed to Loading Trees as indicated in Plans Preparation Manual.
3. Design Speed = 130 mph with Signal Backplates or 150 mph without Signal Backplates

"E" MAST ARMS

POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE					
Arm Type	F1	F3	F5	F6	F7
Pole Type	W1 & W21 Lum	W2 & W22 Lum	W3 & W23 Lum	W4 & W24 Lum	W6

POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE										
Arm Type	F1 - F1	F3 - F1	F5 - F2	F6 - F2	F4 - F4	F5 - F4	F6 - F4	F5 - F5	F6 - F5	F6 - F6
Pole Type	W1	W2	W3	W4	W3	W4	W4	W4	W4	W5

Arm 1 is listed first

ARM DESIGN TABLE - ALL CASES														
ARM TYPE	ARM LENGTH	MAST ARM				ARM EXTENSION				ARM CONNECTION & WELDS				
		FA/SA (ft)	FB/SB (in)	FC/SC (in)	FD/SD (in)	FE/SE (ft)	FF/SF (in)	FG/SG (in)	FH/SH (in)	HT (in)	FJ/SJ (in)	FK/SK (in)	FM/SM (in)	FQ/SQ (in)
F1	36'-0"	36	5.96	11	0.1793	-	-	-	-	20	20	2	0.125	0.25
F2	36'-0"	36	5.96	11	0.1793	-	-	-	-	29	29	2.25	0.125	0.25
F3	46'-0"	36.3	5.92	11	0.1793	11.7	10.36	12	0.25	20	20	2	0.188	0.313
F4	46'-0"	36.3	5.92	11	0.1793	11.7	10.36	12	0.25	29	29	2.25	0.188	0.313
F5	60'-0"	36	5.96	11	0.1793	26.0	10.36	14	0.313	29	29	2.25	0.25	0.375
F6	70'-6"	39.4	5.49	11	0.1793	33.1	10.37	15	0.313	29	29	2.25	0.25	0.438
F7	78'-0"	40	6.43	12	0.1793	40.0	11.26	17	0.313	29	29	2.25	0.25	0.438

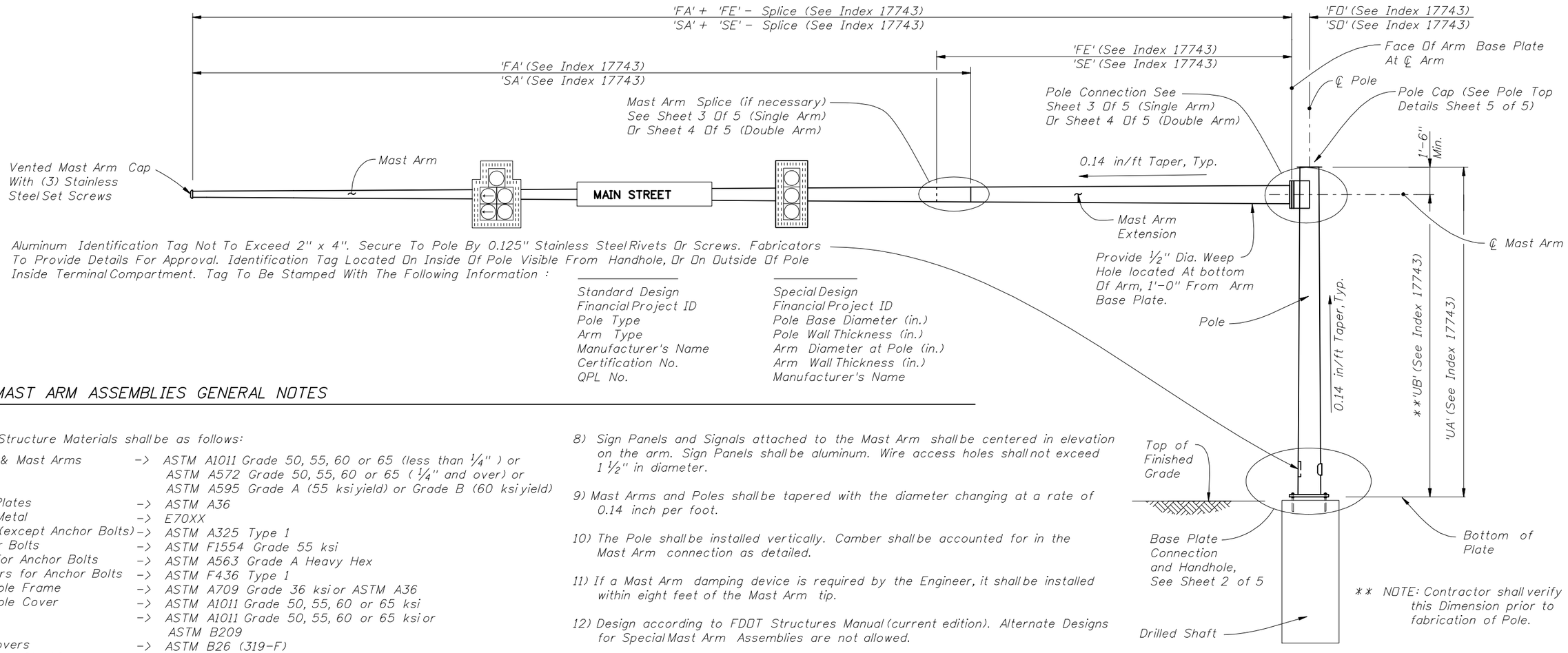
POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM																							
POLE TYPE	UA(ft)	UC(in)	UD(in)	UE(in)	UG(ft)	UPRIGHT BASE CONNECTION							CONNECTION PLATE DATA									DRILLED SHAFT DATA			
						No. Bolts	BA (in)	BB (in)	BC (in)	BD (in)	BE (in)	BF (in)	HT (in)	FJ/SJ (in)	FL/SL (in)	FN/SN (in)	FO/SO (in)	FP/SP (in)	FR/SR (in)	FS/SS (in)	FT/ST (in)	DA (ft)	DB (ft)	RA	RB
W1	24.0	9.64	13	0.375	-	6	25	1.5	1.5	0.375	0.313	36	20	20	0.5	0.313	13	0.75	2.0	8.5	0.313	12	3.5	11	10
W2	24.0	11.64	15	0.375	-	6	27	1.5	1.5	0.375	0.313	36	20	20	0.5	0.313	14	0.75	2.0	8.5	0.313	14	3.5	11	10
W3	24.0	14.64	18	0.375	-	6	32	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	17.5	1	2.0	12.5	0.313	15	4	11	14
W4	24.0	17.64	21	0.375	-	6	35	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	17.5	1	2.0	12.5	0.313	19	4	11	14
W5	24.0	17.64	21	0.375	-	6	35	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	17.5	1	2.0	12.5	0.313	21	4	11	14
W6	24.0	17.64	21	0.375	-	6	35	1.5	1.75	0.375	0.313	36	29	29	0.5	0.375	14	1.25	2.0	12	0.375	18	4	11	14
W21 Lum	39.0	7.54	13	0.375	37.5	6	25	1.5	1.5	0.375	0.313	36	20	20	0.5	0.313	9	0.75	2.0	8.5	0.313	10	3.5	11	10
W22 Lum	39.0	9.54	15	0.375	37.5	6	27	1.5	1.5	0.375	0.313	36	20	20	0.5	0.313	10	0.75	2.0	8.5	0.313	13	3.5	11	10
W23 Lum	39.0	12.54	18	0.375	37.5	6	32	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	11.5	1	2.0	12.5	0.313	14	4	11	14
W24 Lum	39.0	15.54	21	0.375	37.5	6	35	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	13	1	2.0	12.5	0.313	17	4	11	14

LUMINAIRE AND LUMINAIRE CONNECTION											
LA(ft)	LB(ft)	LC(in)	LD(in)	LE	LF(ft)	LG(in)	LH(in)	LJ(in)	LK(in)	LL(deg)	UG(ft)
40	10	3	0.125	0.5	8	0.5	0.75	0.25	0.25	0	37.5

NOTES:

1. Work this Index with Index No. 17745.
2. Standard Mast Arm "F" Assemblies are designed to Loading Trees as indicated in Plans Preparation Manual.
3. Design Speed = 110 mph with Signal Backplates or 130 mph without Signal Backplates.

"F" MAST ARMS



** NOTE: Contractor shall verify this Dimension prior to fabrication of Pole.

ELEVATION VIEW

(Single Arm Shown, Double Arm Similar)
(Luminaire Arm Not Shown)

Aluminum Identification Tag Not To Exceed 2" x 4". Secure To Pole By 0.125" Stainless Steel Rivets Or Screws. Fabricators To Provide Details For Approval. Identification Tag Located On Inside Of Pole Visible From Handhole, Or On Outside Of Pole Inside Terminal Compartment. Tag To Be Stamped With The Following Information :

Standard Design	Special Design
Financial Project ID	Financial Project ID
Pole Type	Pole Base Diameter (in.)
Arm Type	Pole Wall Thickness (in.)
Manufacturer's Name	Arm Diameter at Pole (in.)
Certification No.	Arm Wall Thickness (in.)
QPL No.	Manufacturer's Name

MAST ARM ASSEMBLIES GENERAL NOTES

1) Signal Structure Materials shall be as follows:

Poles & Mast Arms	–>	ASTM A1011 Grade 50, 55, 60 or 65 (less than ¼") or ASTM A572 Grade 50, 55, 60 or 65 (¼" and over) or ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield)
Steel Plates	–>	ASTM A36
Weld Metal	–>	E70XX
Bolts (except Anchor Bolts)	–>	ASTM A325 Type 1
Anchor Bolts	–>	ASTM F1554 Grade 55 ksi
Nuts for Anchor Bolts	–>	ASTM A563 Grade A Heavy Hex
Washers for Anchor Bolts	–>	ASTM F436 Type 1
Handhole Frame	–>	ASTM A709 Grade 36 ksi or ASTM A36
Handhole Cover	–>	ASTM A1011 Grade 50, 55, 60 or 65 ksi
Caps	–>	ASTM A1011 Grade 50, 55, 60 or 65 ksi or ASTM B209
Nut Covers	–>	ASTM B26 (319-F)
Stainless Steel Screws	–>	AISI Type 316
Threaded Bars/Studs	–>	ASTM A36 or ASTM A307

2) Reinforcing Steel shall be ASTM A615 Grade 60 ksi.

3) Concrete shall be Class IV (Drilled Shaft) with a minimum 28-day compressive strength of 4,000 psi for all environmental classifications.

4) All welding shall conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).

5) All steel items shall be galvanized as follows:
All Nuts, Bolts, Washers and Threaded Bars/Studs –> F2329
All other steel items (including Pole & Mast Arm) –> ASTM A123

6) Locate handhole 180° from arm on single arm poles or 180° from first arm of double arm poles or see special instructions on Mast Arm Tabulation Sheet.

7) Except for Anchor Bolts, all bolt hole diameters shall be equal to the bolt diameter plus 1/16", prior to galvanizing. Hole diameters for Anchor Bolts shall not exceed the bolt diameter plus ½".

8) Sign Panels and Signals attached to the Mast Arm shall be centered in elevation on the arm. Sign Panels shall be aluminum. Wire access holes shall not exceed 1 ½" in diameter.

9) Mast Arms and Poles shall be tapered with the diameter changing at a rate of 0.14 inch per foot.

10) The Pole shall be installed vertically. Camber shall be accounted for in the Mast Arm connection as detailed.

11) If a Mast Arm damping device is required by the Engineer, it shall be installed within eight feet of the Mast Arm tip.

12) Design according to FDOT Structures Manual (current edition). Alternate Designs for Special Mast Arm Assemblies are not allowed.

13) Provide "J","S" or "C"-Hook at top of pole for signal cable support.

14) First and Second Arm Camber Angle = 2°.

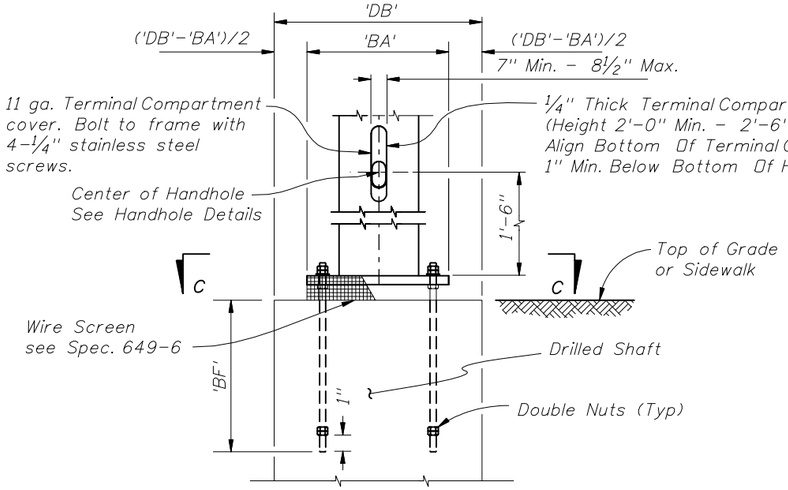
15) Details for the Ground Rod, Signal and Sign Locations, Signal Head attachment, Sign Attachment, Pedestrian Head Attachment, and Foundation Conduit are not shown for clarity.

16) One hundred percent of full-penetration groove welds and a random 25 percent of partial penetration groove welds shall be inspected. Full-penetration groove weld inspection shall be performed by nondestructive methods of radiography or ultrasonics.

17) Manufactuers seeking approval of a steel mast arm assembly for inclusion on the Qualified Products List must submit a QPL Product Evaluation Application along with design documentation and drawings showing the product meets all specified requirements of this Index and Index 17743.

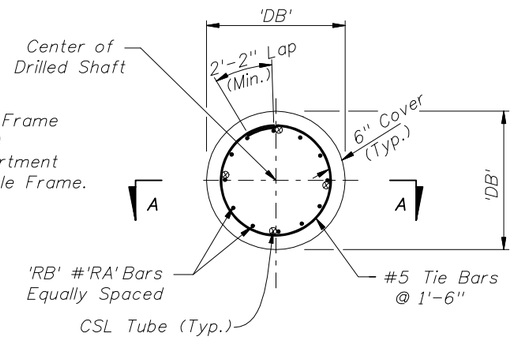
18) Verify CSL access tubes will not interfere with anchor bolt installation before excavating the shaft. When CSL access tube locations conflict with anchor bolt locations, move the CSL access tube location +/- two inches along the inner circumference of the reinforcing cage. Notify the Engineer before excavating the shaft if the CSL access tube locations cannot be moved out of conflict with anchor bolt locations.

TYPICAL ELEVATION AND NOTES

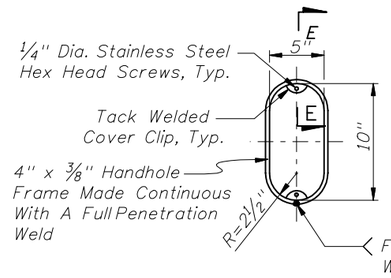


BASE PLATE AND ANCHORAGE ELEVATION

(Reinforcement Not Shown)

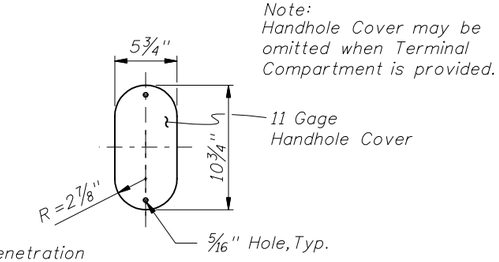


FOUNDATION PLAN

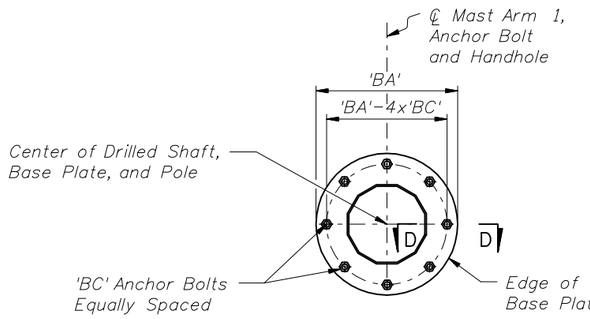


HANDHOLE FRAME

(w/Terminal Compartment Omitted)



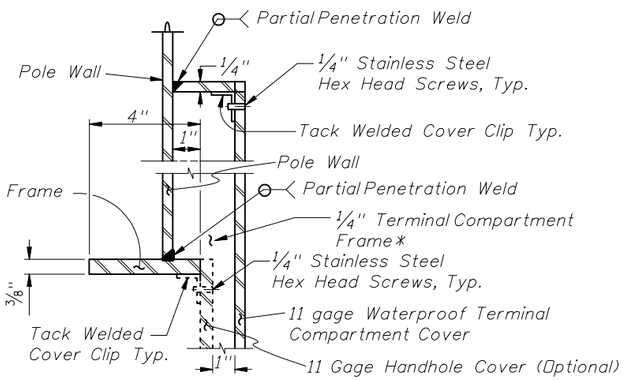
HANDHOLE COVER



SECTION C-C

Alternate Detail

(8 Anchor Bolts)

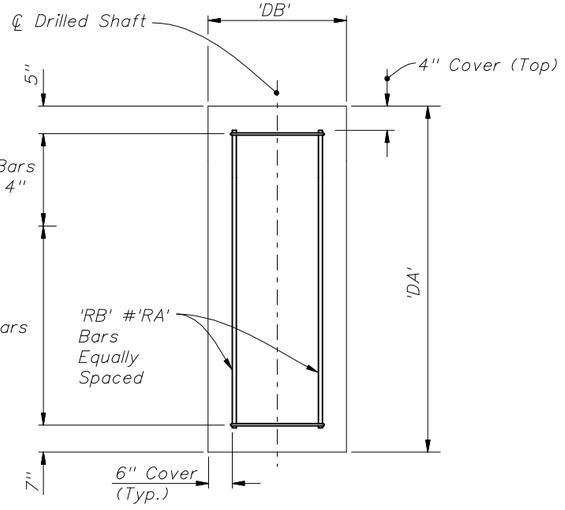


*Terminal Compartment is optional. See Mast Arm Tabulation for locations.

**Water proof all splices or use gasket with terminal compartment.

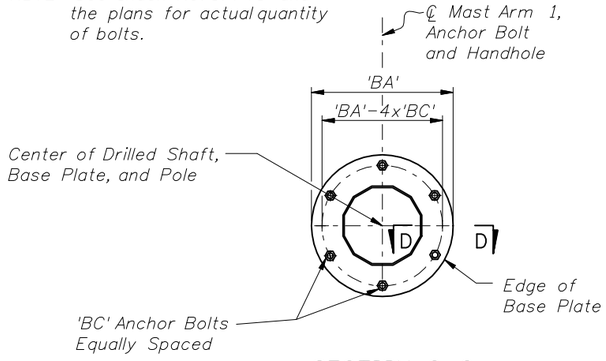
SECTION E-E

(Thru Handhole & Terminal Compartment)



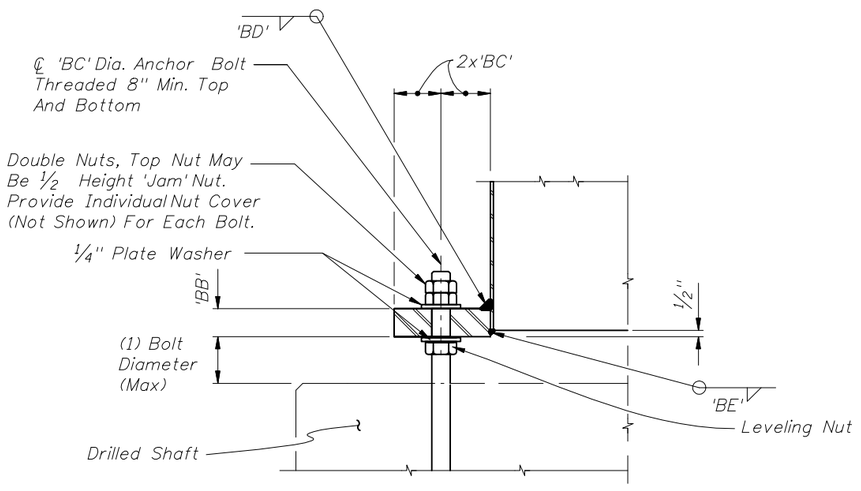
SECTION A-A

NOTE: See Index No. 17743 and the plans for actual quantity of bolts.



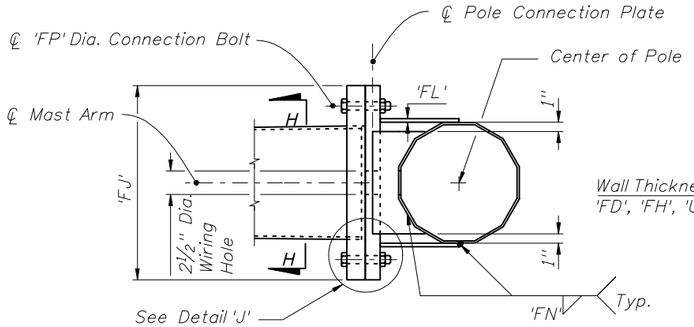
SECTION C-C

(6 Anchor Bolts)

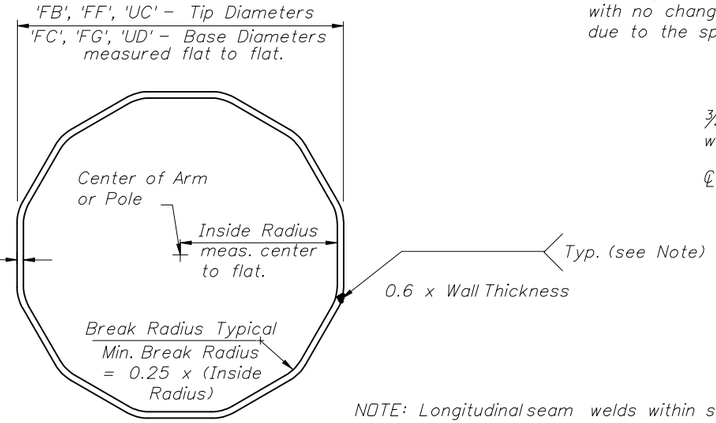


SECTION D-D

TYPICAL FOUNDATION AND BASE PLATE DETAILS

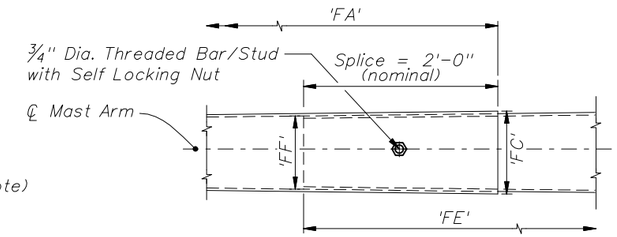


SECTION F-F



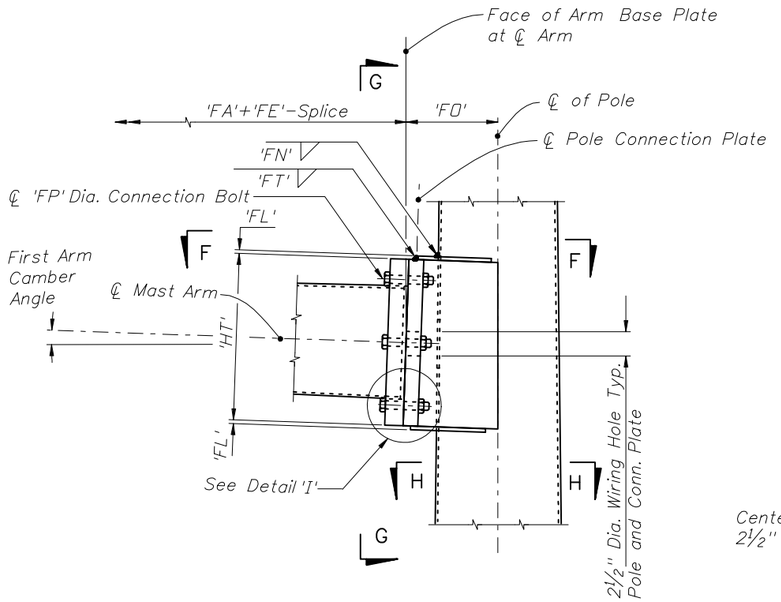
SECTION H-H

The 'Slip Joint' splice shall be a tight fit with no change in the Mast Arm slope due to the splice.



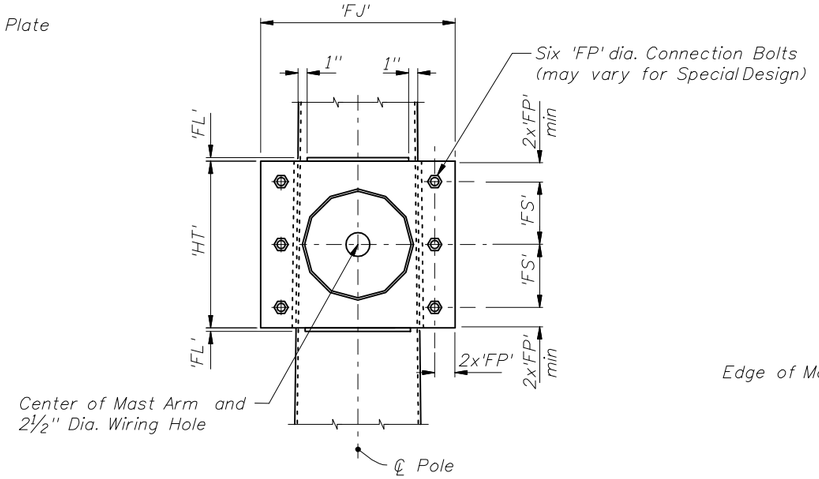
Arm Splice Detail

NOTE: Longitudinal seam welds within six inches of circumferential welds shall be complete penetration welds. Longitudinal seam welds at telescopic field splices shall be complete penetration welds for the splice length plus six inches. For tubes greater than 70" in circumference, two longitudinal seam welds are allowed.

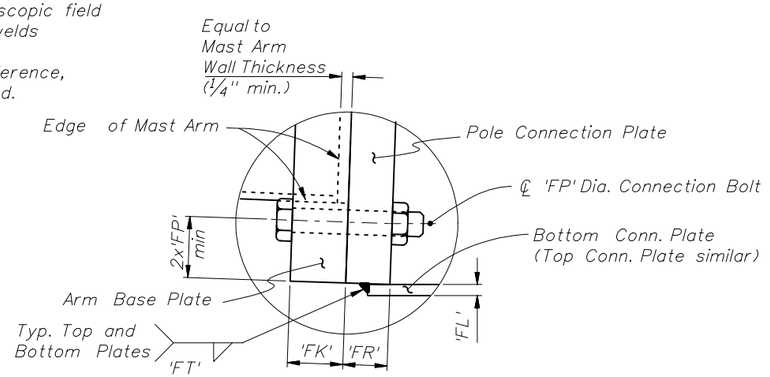


ELEVATION

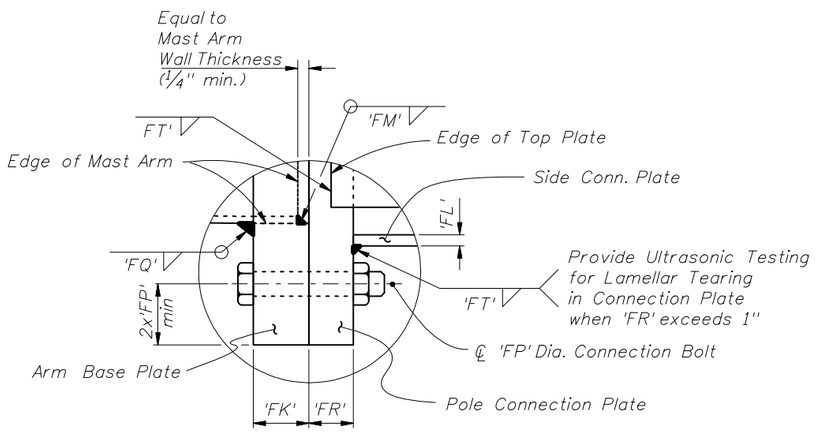
(Single Arm Connection)



SECTION G-G



DETAIL 'I'

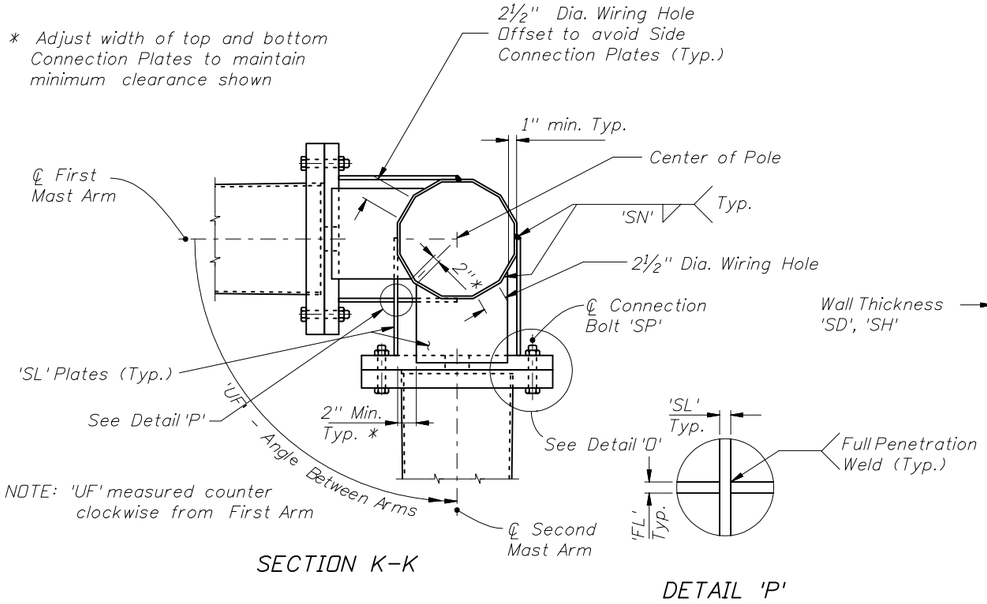


DETAIL 'J'

NOTE:
1. Details shown on this sheet are for 12 sided pole sections. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced.

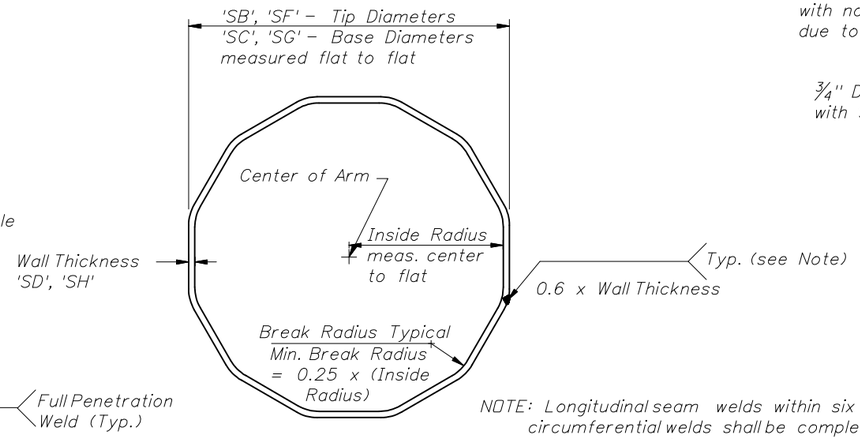
2. Mast Arm and Connection Plates shall be match marked to ensure proper assembly.

TYPICAL SINGLE ARM CONNECTION DETAILS



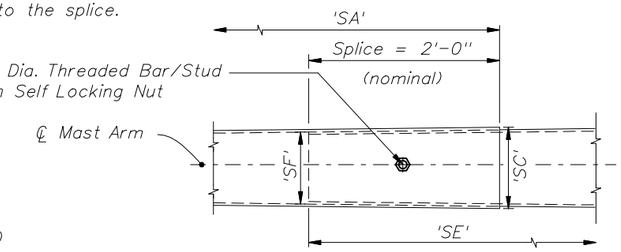
SECTION K-K

DETAIL 'P'



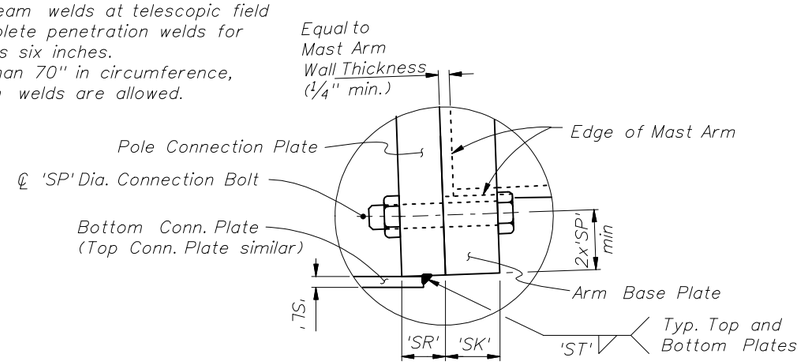
SECTION M-M

The 'Slip Joint' splice shall be a tight fit with no change in the Mast Arm slope due to the splice.

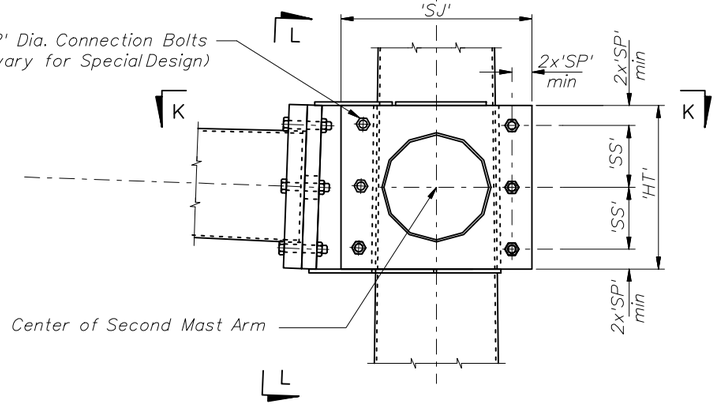


Arm Splice Detail

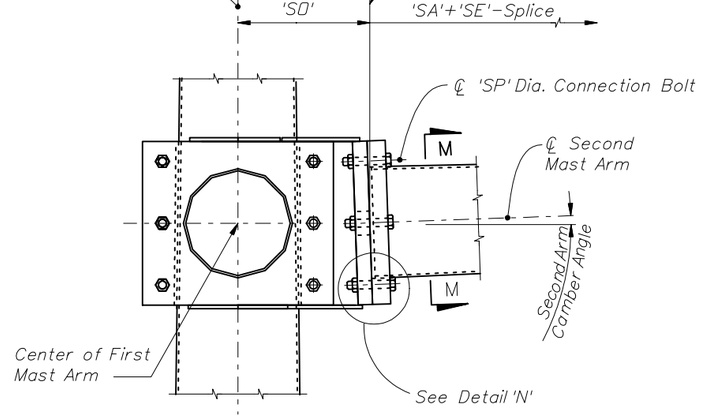
NOTE: Longitudinal seam welds within six inches of circumferential welds shall be complete penetration welds. Longitudinal seam welds at telescopic field splices shall be complete penetration welds for the splice length plus six inches.
For tubes greater than 70" in circumference, two longitudinal seam welds are allowed.



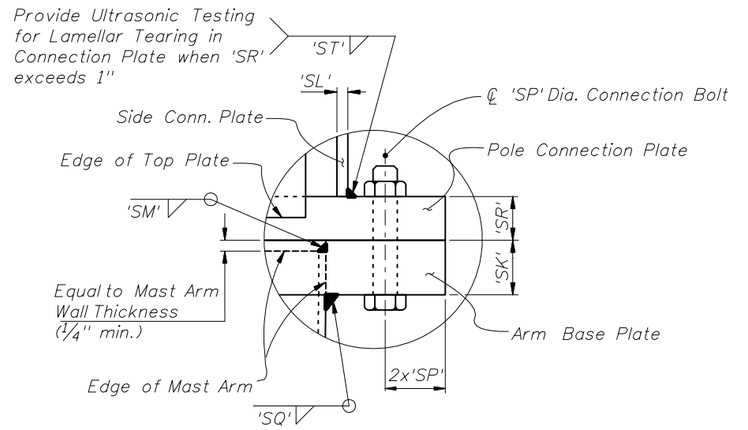
DETAIL 'N'



ELEVATION
(Double Arm Connection)



SECTION L-L



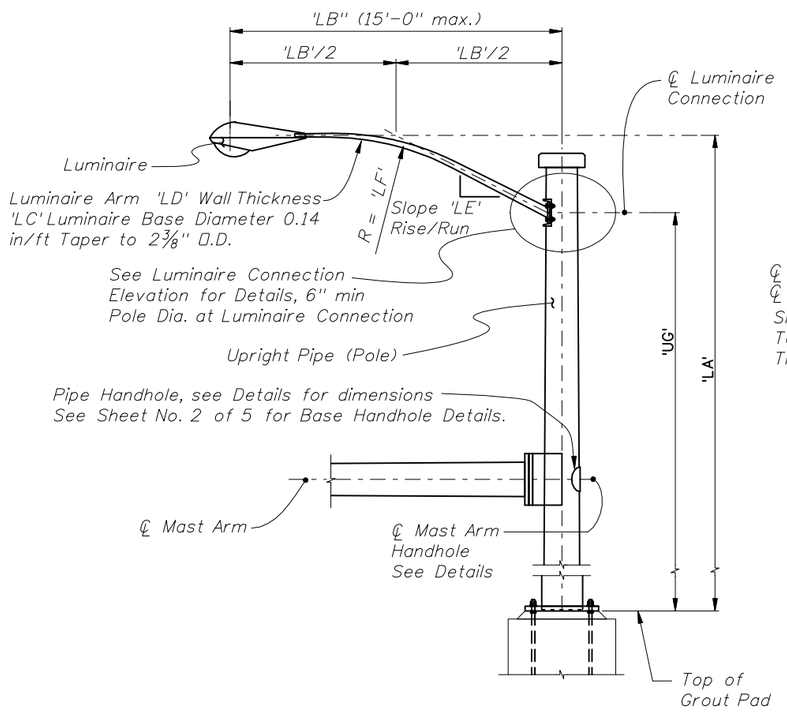
DETAIL 'O'

NOTE:
1. Details shown on this sheet are for 12 sided pole sections. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced.

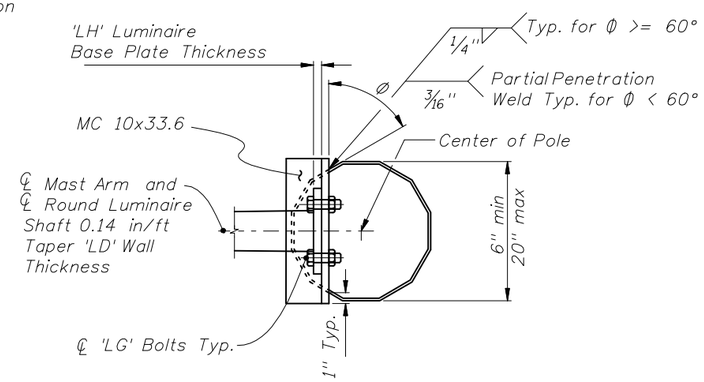
2. Mast Arm and Connection Plates shall be match marked to ensure proper assembly.

TYPICAL DOUBLE ARM CONNECTION DETAILS

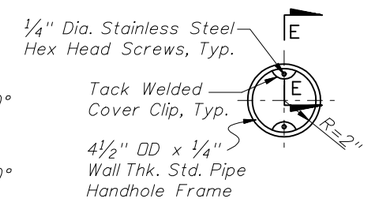
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	2010 FDOT Design Standards	Last Revision 07/01/05	Sheet No. 4 of 5
	MAST ARM ASSEMBLIES		Index No. 17745



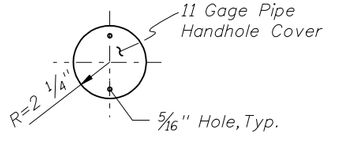
LUMINAIRE ELEVATION



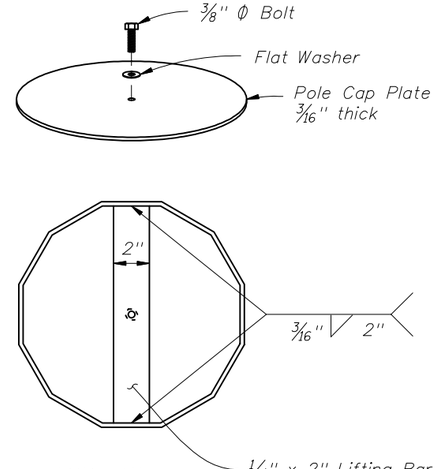
SECTION A-A



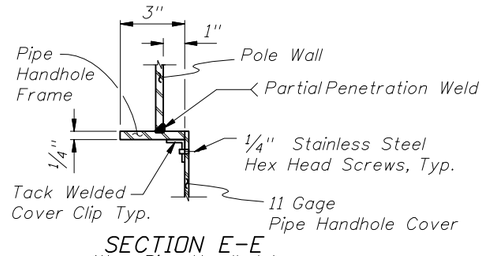
Pipe Handhole Frame



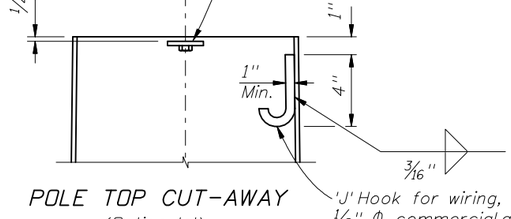
Pipe Handhole Cover



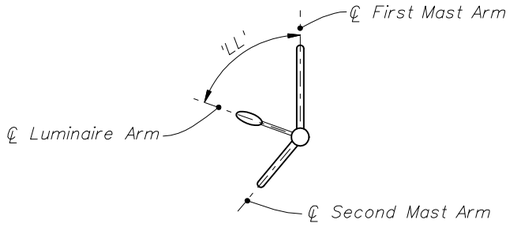
TOP VIEW



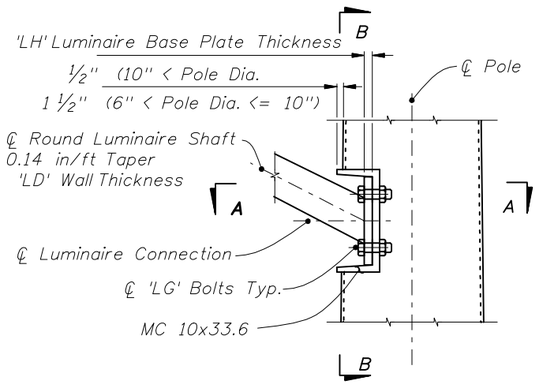
SECTION E-E
(thru Pipe Handhole)



POLE TOP CUT-AWAY
(Option 'a')

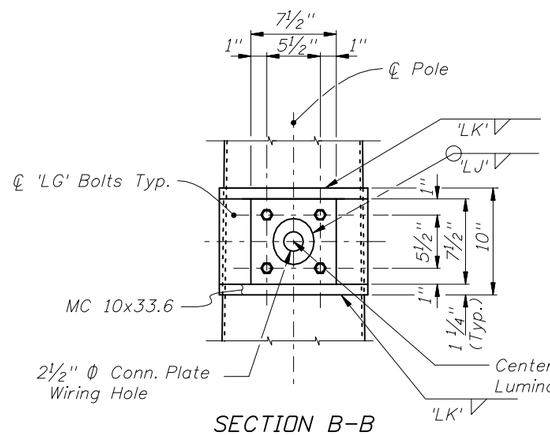


LUMINAIRE ORIENTATION



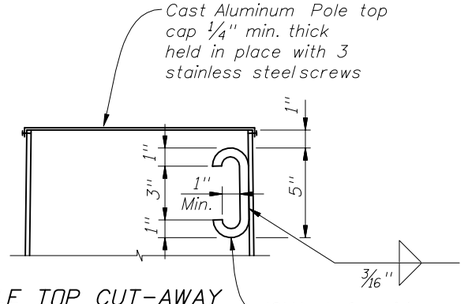
LUMINAIRE CONNECTION ELEVATION

NOTE: The Pole shown on this sheet is a 12 sided section. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced



SECTION B-B

NOTE: The Fabricator may substitute a ½" thick bent plate with the same flange width, height, and length as the MC 10x33.6 Channel section.



POLE TOP CUT-AWAY
(Option 'b')

POLE TOP DETAILS

NOTE:
Any combination of the above two options may be used, provided both lifting and wiring is accommodated.

NOTES:

1. Luminaire type and Luminaire to Arm Connection Details can be found elsewhere.
2. Align Luminaire Arm with single Mast Arm or first Arm of Double Mast Arm unless indicated otherwise in plans.

TYPICAL LUMINAIRE ARM AND CONNECTION DETAILS

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MAST ARM ASSEMBLIES

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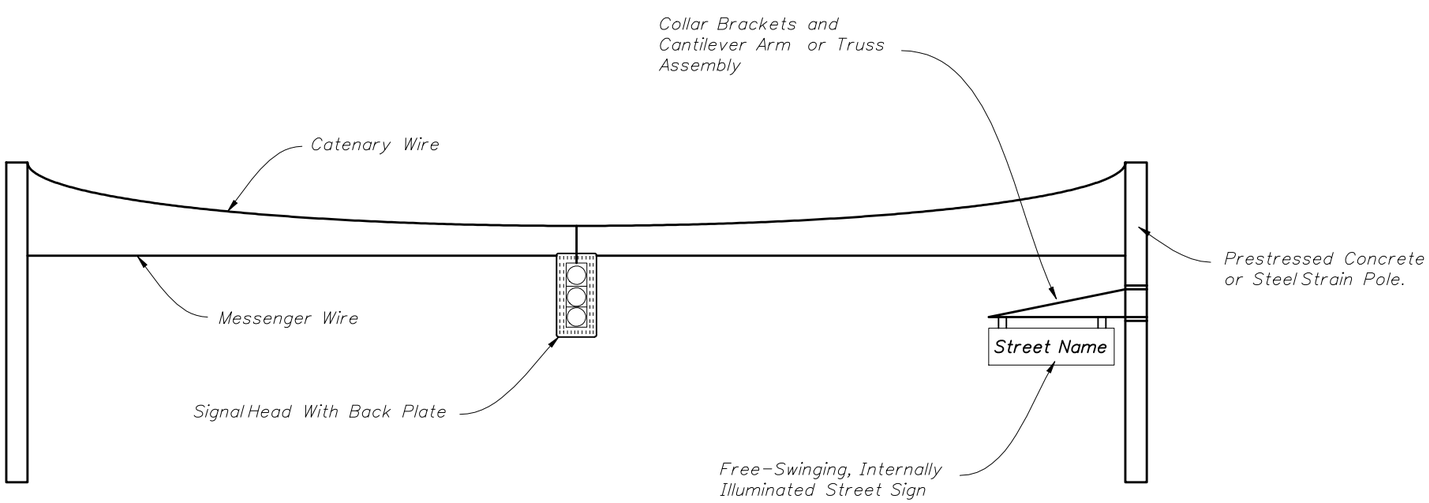
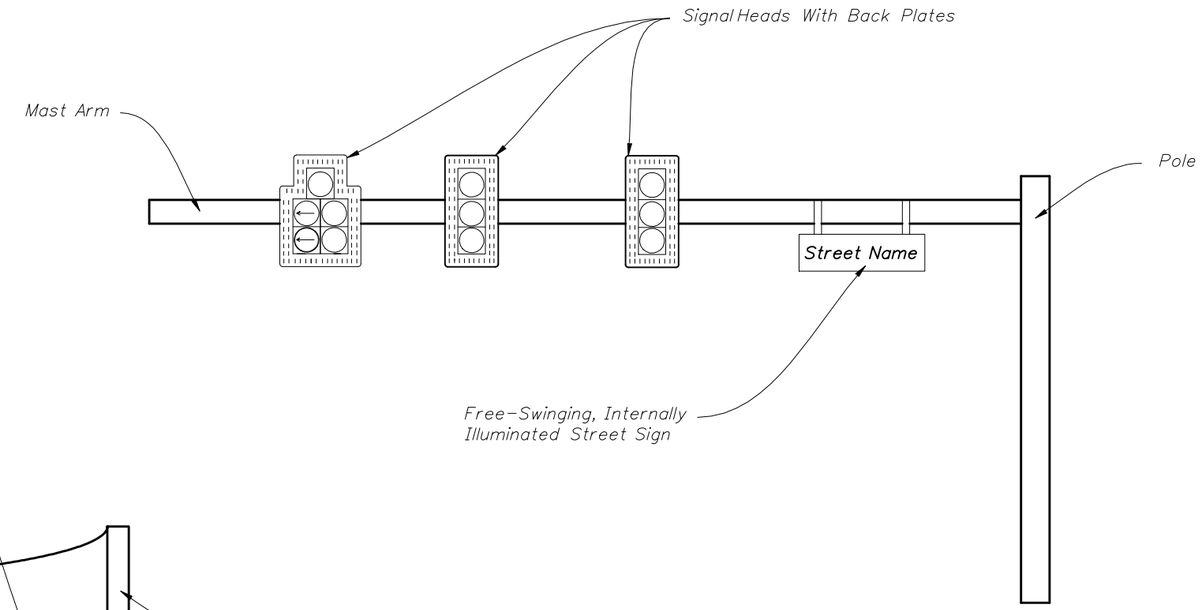


OPTION 1
(For Span Wire Assembly)



OPTION 2
(For Mast Arm Assembly)

NOTES:

1. Free-swinging, internally-illuminated street signs shall only be installed on the signal pole for span wire assemblies. For mast arm assemblies the street sign may be installed on the arm or pole.

2. Free-swinging, internally-illuminated street signs shall meet the requirements of Section 699 of the Standard Specifications for Road and Bridge Construction.

3. Pole attachments and cantilever arm (or truss) assemblies may be accepted by Contractor certification provided the signs being supported meet the weight and area limitations included in Section 699 for "Acceptance by Certification".

4. Pole attachments and cantilever arm (or truss) assemblies supporting signs not meeting the weight or area limitations included in Section 699 for "Acceptance by Certification" require the submittal of structural calculations and Shop Drawings that have been prepared by and sealed by the Specialty Engineer.

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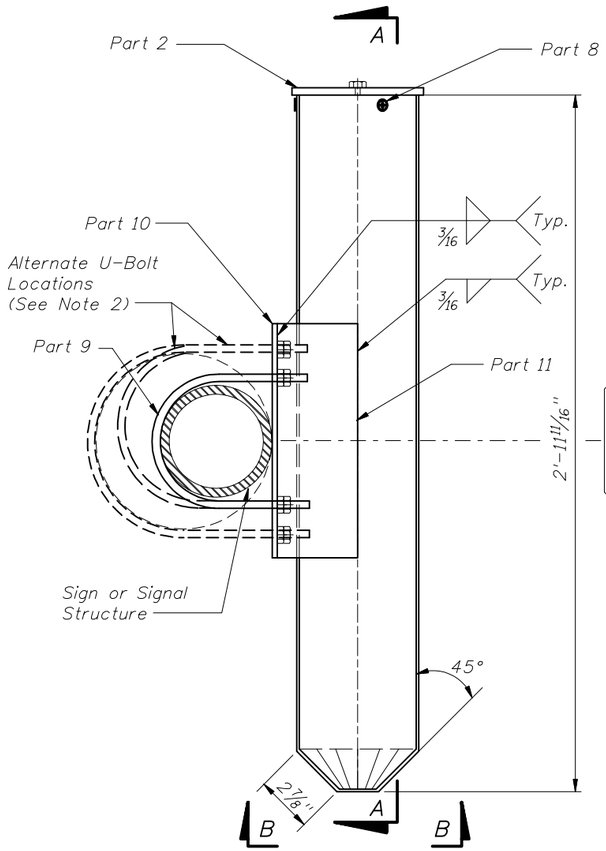
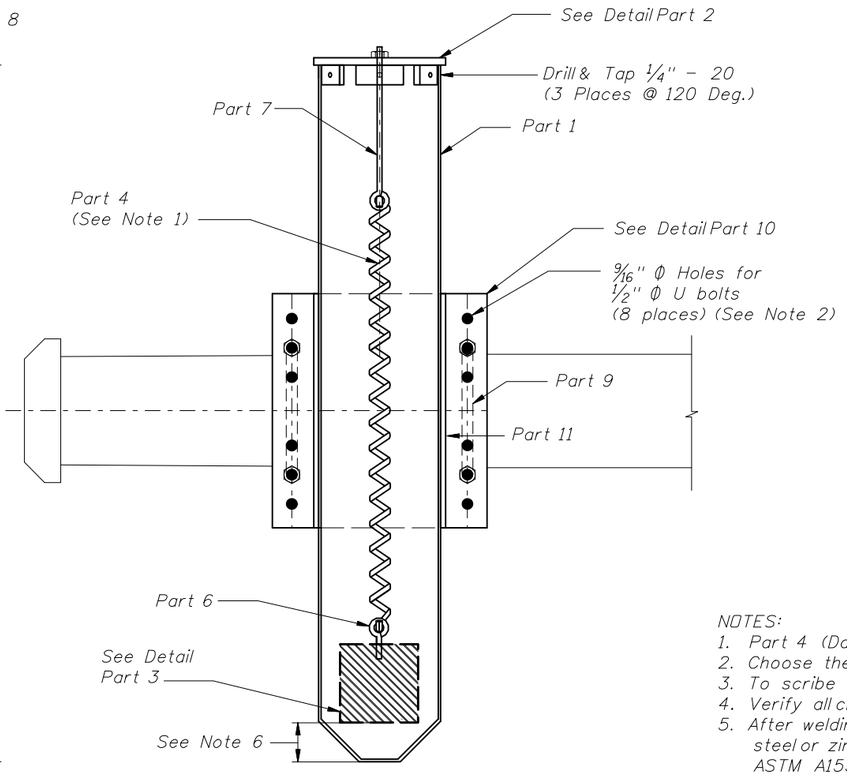


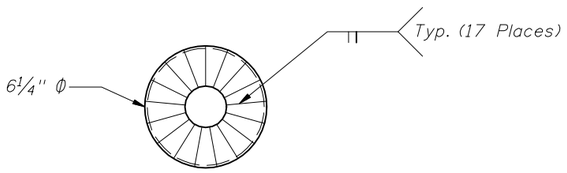
SIDE VIEW
DAMPING DEVICE



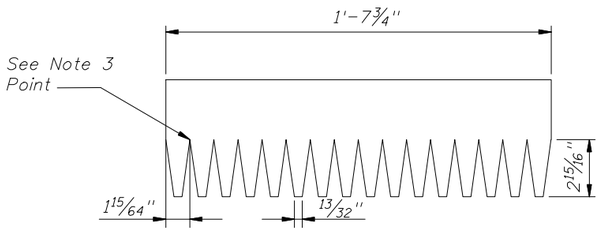
SECTION A-A

#	PART	PART DESCRIPTION	QUANTITY
1	Damper Tube	6" ID, 3'-6" long before fabrication, t=0.125", ASTM A513, Type 1	1
2	Tube Cap	Cap Assembly, 1/4" Steel plate , ASTM A36	1
3	Internal Weight	4"Ø, 15 lb. cylindrical, steel weight, ASTM A36.	1
4	Damper Spring	Century Spring (Spring Stock #147) Stiffness= 0.69 lb/in, length = 8.05", OD= 1.062"	1
5	Hex Nut	1/4" - 20 steel hex nut (zinc plated)	1
6	Eye Bolt	1/4"x2" Steel Eye Bolt (zinc plated)	1
7	Eye Bolt	1/4"x8" Steel Eye Bolt (zinc plated)	1
8	Cap Screw	#8 2'-8"x3"x3/4" Stainless Steel Machine Screws (Flat Head Phillips)	4
9	U Bolt	1/2" Ø ASTM, A307 with washers and 4 self locking nuts (Size to fit Mast Arm)	2
10	1/4" Plate	1'-0"x11", ASTM A36	1
11	1/4" Plate	1'-0"x4 1/8" ASTM A36 (Weld to Part 1 and Part 10)	2

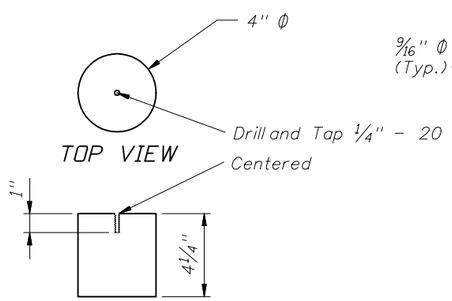
NOTES:
1. Part 4 (Damper Spring) is shown schematically and not to scale.
2. Choose the appropriate diameter U-bolt (Part 9) based on the structure's pipe arm diameter.
3. To scribe tube for taper, wrap template around tube such that points are 2'-9 5/8" from top of tube.
4. Verify all clearances, tolerances and dimensions before fabrication.
5. After welding, hot dip galvanize all steel items except screws, bolts, and nuts noted to be stainless steel or zinc plated, and the spring (Part 4). Galvanize bolts, nuts and washers in accordance with ASTM A153. Galvanize all other items in accordance with ASTM A123.
6. Install spring with 2" separation from bottom of pipe to weight at rest.



VIEW B-B



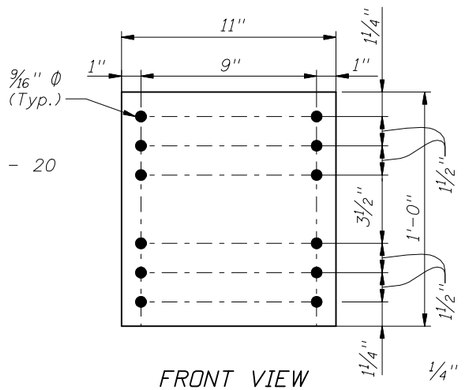
TEMPLATE FOR SCRIBING AND CUTTING TAPER FOR PART 1



TOP VIEW

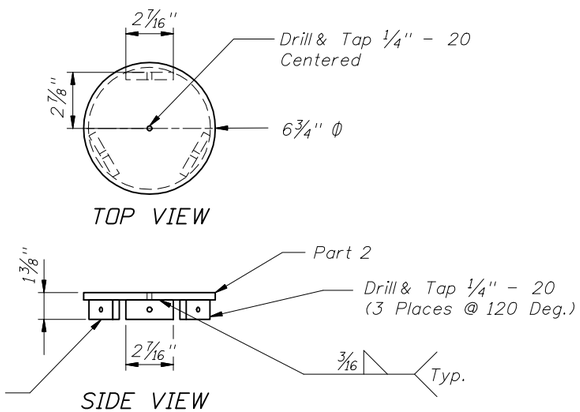
SIDE VIEW

PART 3
INTERNAL WEIGHT



FRONT VIEW

PART 10
BACKING PLATE



TOP VIEW

SIDE VIEW

PART 2
TUBE CAP

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DAMPING DEVICE FOR MISCELLANEOUS STRUCTURES

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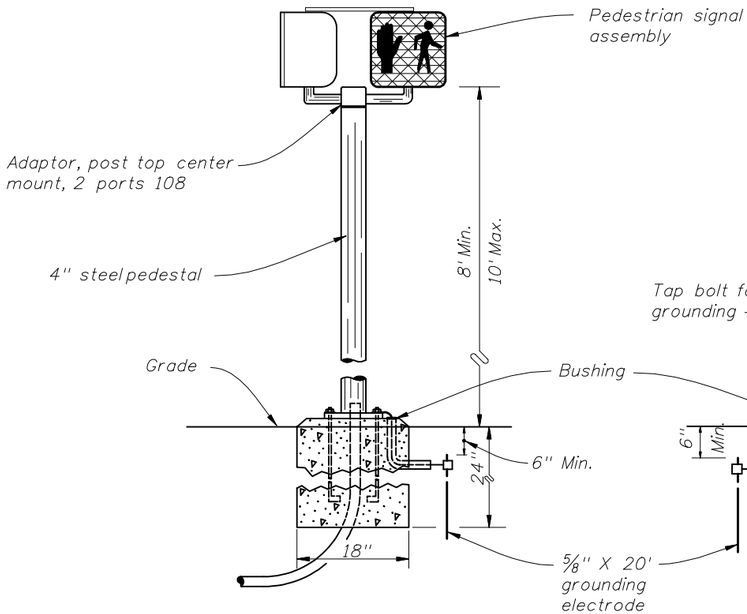


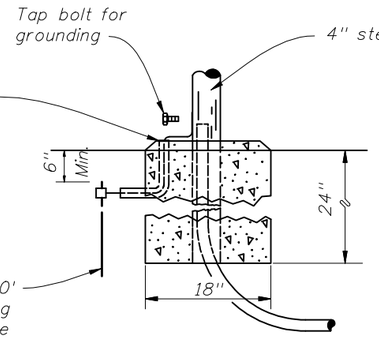
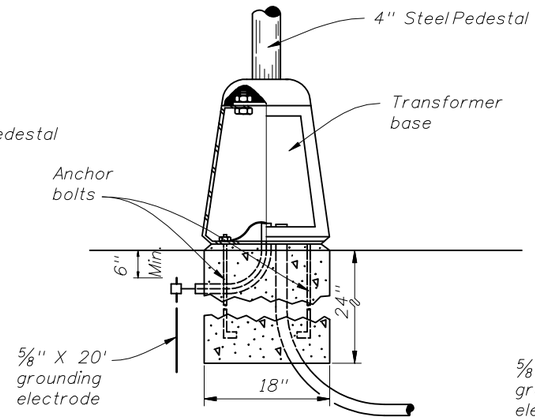


FIGURE A



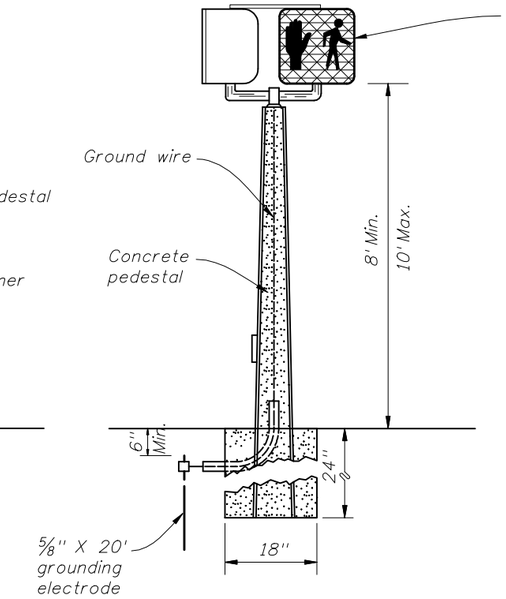


FIGURE B

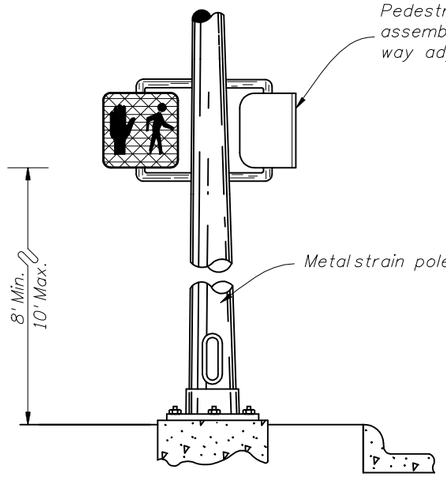


FIGURE C

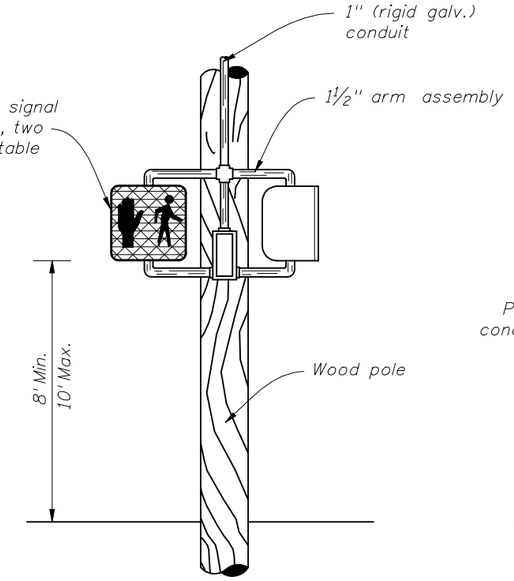


FIGURE D

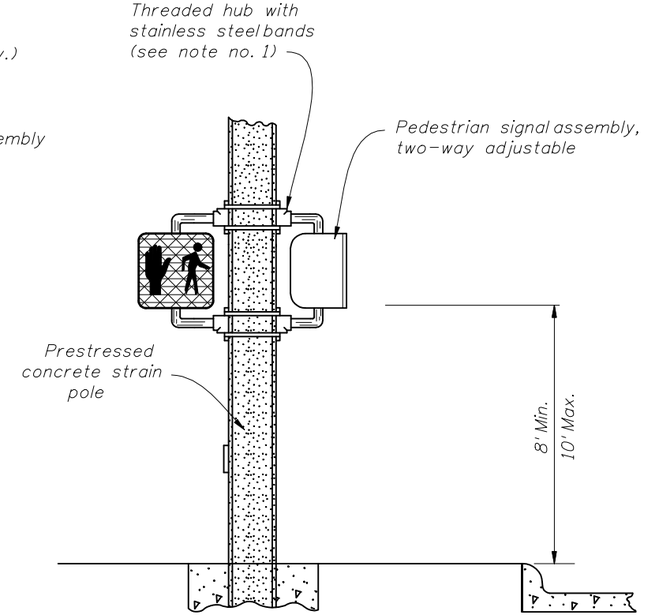


FIGURE E

Notes:

1. As an option, the contractor will be allowed to install pedestrian signals on concrete poles and pedestals with the use of lead anchors (two bolts same size per hub) in lieu of the stranded steel bands.
2. Holes drilled or punched in metal poles or pedestals shall be thoroughly reamed, cleaned of all burrs and covered with two (2) coats of zinc rich paint as specified in the standard specifications for road and bridge, construction. Grommets or bushings shall be installed in holes.
3. Meet all grounding requirements of Section 620 of the Standard Specifications.

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PEDESTRIAN CONTROL SIGNAL INSTALLATION DETAILS

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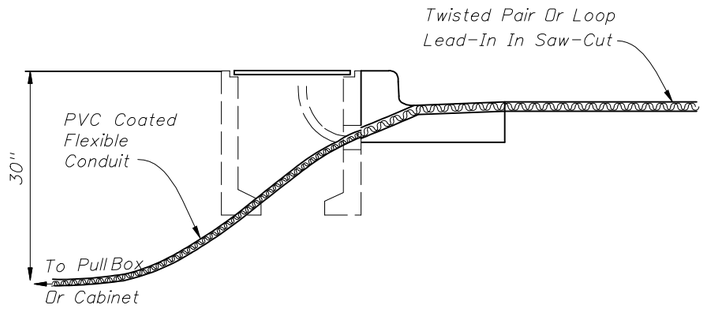
TWISTED PAIR AND LOOP LEAD-IN INSTALLATION WITH CURB & GUTTER

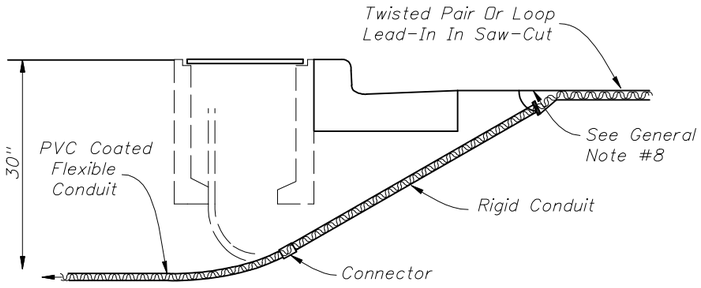
ALTERNATIVE 1

Drill A Hole Through The Curb At The Point Which The Required Saw-Cut Depth Is Obtained Just Prior To Cutting The Top Inside Edge Of The Curb. Slide A Section Of Flexible Conduit At Least 6" Into The Hole From The Back Side Of The Curb But Not Within 2" Of The Top Of The Hole. The Conduit Shall Fit Snug Within The Drilled Hole. Fill The Top Of The Hole With Loop Sealant To The Level Of The Curb Surface. A Nonmetallic Material Should Be Used To Prevent Excessive Loop Sealant From Entering The Flexible Conduit.



ALTERNATIVE 2

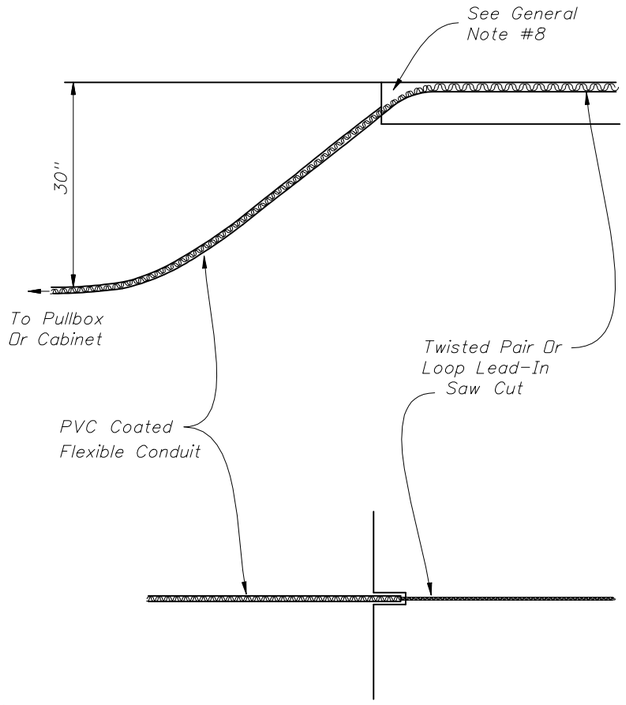
Drill A Hole ½" To 1" Larger In Diameter Than The Rigid Conduit To Be Used Through The Roadway Asphalt (Or Concrete) Surface And Base At An Appropriate Angle To Intercept The Trench Or Pull Box Hole. Place A Predetermined Length Of Rigid Conduit In The Hole And Drive The Conduit Into The Trench Or Hole. Install A Molded Bushing (Nonmetallic) On The Roadway End Of The Rigid, Conduit. The Top Of The Rigid Conduit Shall Be Approximately 2" Below The Roadway Surface. Fill The Hole With Loop Sealant To The Level Of The Roadway Surface. A Nonmetallic Material Should Be Used To Prevent Excessive Loop Sealant From Entering The Rigid Conduit.



Note
Other alternatives may be approved by the State Traffic Operations Engineer.

TWISTED PAIR AND LOOP LEAD-IN INSTALLATION WITHOUT CURB & GUTTER

Cut A Slot In The Edge Of The Roadway Of Sufficient Size And Depth To Snugly Place The End Of The Flexible Conduit. The End Of The Conduit Shall Be At Least 6" Into The Roadway And approximately 2" Below The Top Of The Roadway Surface. The Departure Angle Of The Conduit From The Roadway Shall Be 30° To 45°.



Note
Other alternatives may be approved by the State Traffic Operations Engineer.

GENERAL NOTES

1. If the loop lead-in is 75' or less from the edge of the loop detector to controller cabinet, continue the twisted pair to the cabinet. If the loop lead-in is greater than 75' continue the twisted pair to the specified pullbox, splice to shielded lead-in wire and continue to the controller cabinet.

2. The width of all saw cuts shall be sufficient to allow unforced placement of loop wires or lead-in cables into the saw cut. The depth of all saw cuts, except across expansion joints, shall be 3" standard with a maximum of 4".

3. On resurfacing or new roadway construction projects, the loop wires and lead-in cables may be installed in the asphalt structural course prior to the placement of the final asphalt wearing course. The loop wires and lead-in cables shall be placed in a saw cut in the structural course. The depth of the cables below the top of the final surface shall comply with note 2.

4. A nonmetallic hold down material shall be used to secure loop wires and lead-ins to the bottom of saw-cuts. Hold down material shall be placed at approximately 12" intervals around loops and 24" intervals on lead-ins.

5. The minimum distance between the twisted pairs of loop lead-in wire is 6" from the loop to 12" from the pavement edge or curb.

6. Splice Connections in pull boxes with UL listed, watertight, insulated enclosures. Place one enclosure over the end of each conductor and place a third enclosure over the exposed end of the shielded cable.

7. As an alternate, a larger diameter enclosure that will accommodate both the splices of the conductors and the exposed end of the shielded cable may be used.

8. The maximum area of asphalt to be disturbed shall be 6"x 6". This area shall be restored as directed by the Engineer.

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VEHICLE LOOP INSTALLATION DETAILS

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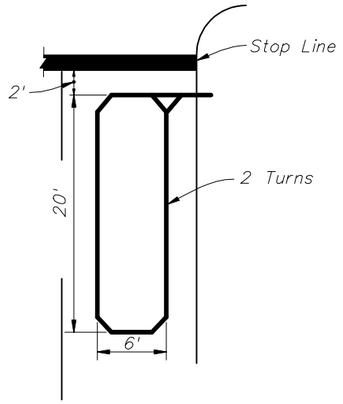
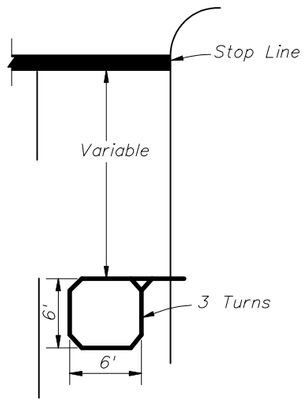
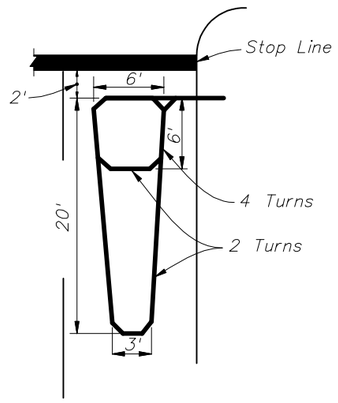


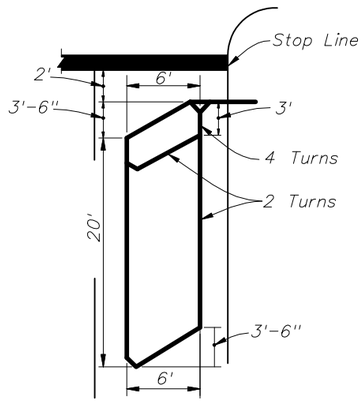
TYPE A



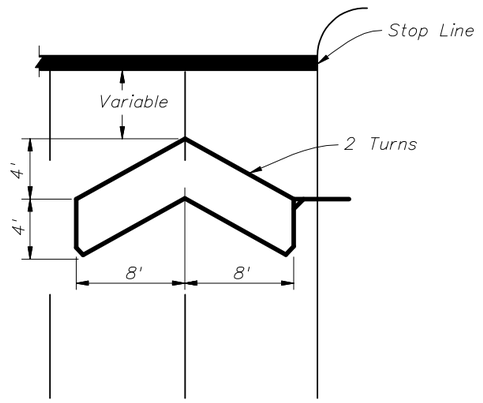
TYPE B



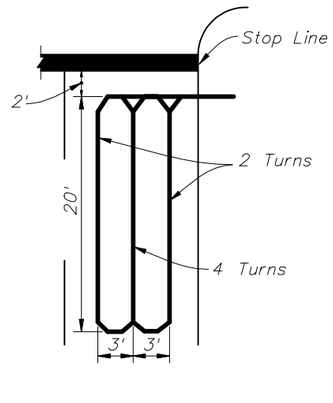
TYPE C



TYPE D

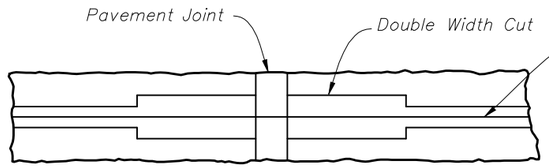


TYPE E

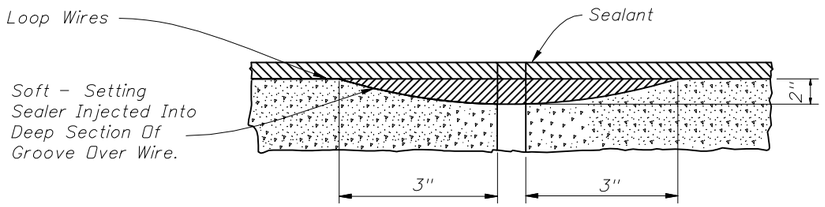


TYPE F

Note: Loop conductors must follow saw-cut to bottom forming slack section at joint.

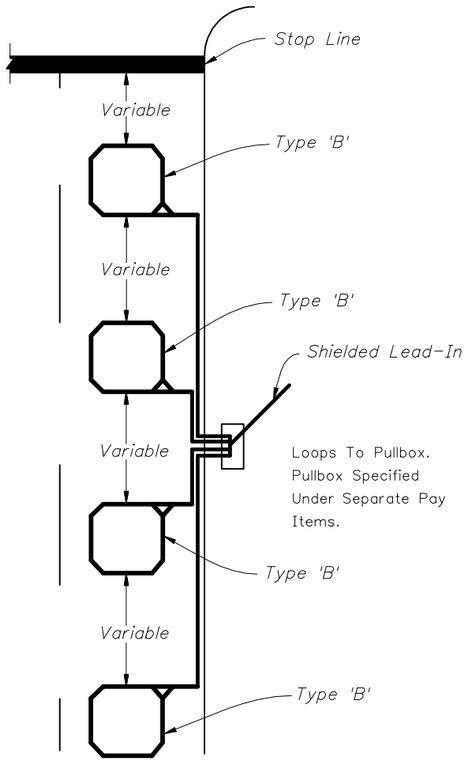


PLAN

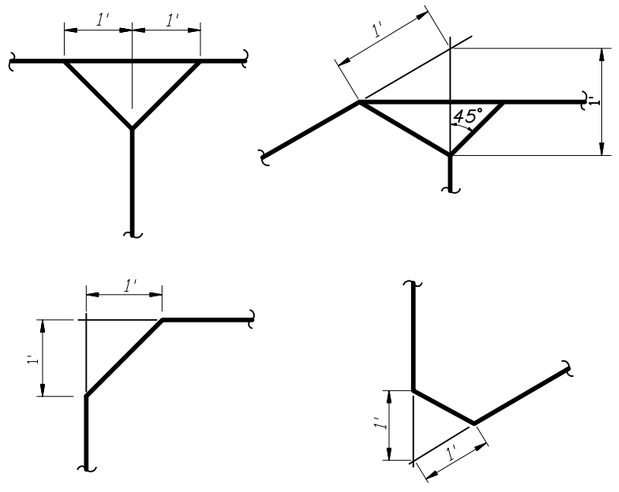


VERTICAL SECTION

CONCRETE PAVEMENT EXPANSION JOINTS



TYPE G



LOOP CORNER AND LEAD-IN DETAILS

Notes:

1. The "number of turns" indicated at the specified point on the loop refers to the number of passes of loop wires which are placed in the saw-cut forming the complete loop.
2. Loop types or details not drawn to scale.
3. Loop Types are centered in a single lane except Type E which is centered on two lanes.
4. The number of individual loops in the Type G loop may vary up to a maximum of four (4).
5. Lead-in may be connected to either end of loop.
6. The leading edge of loop Types A,C,D,& F may extend past the stop line a maximum of 10'. The length of these loops may be extended to a maximum of 60'. Each intersection should be individually designed and if the modifications noted above is required it must be noted or detailed in tne plans.
7. Loop lead-in wires should not be installed in the same pullbox with signal power cable.

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VEHICLE LOOP INSTALLATION DETAILS

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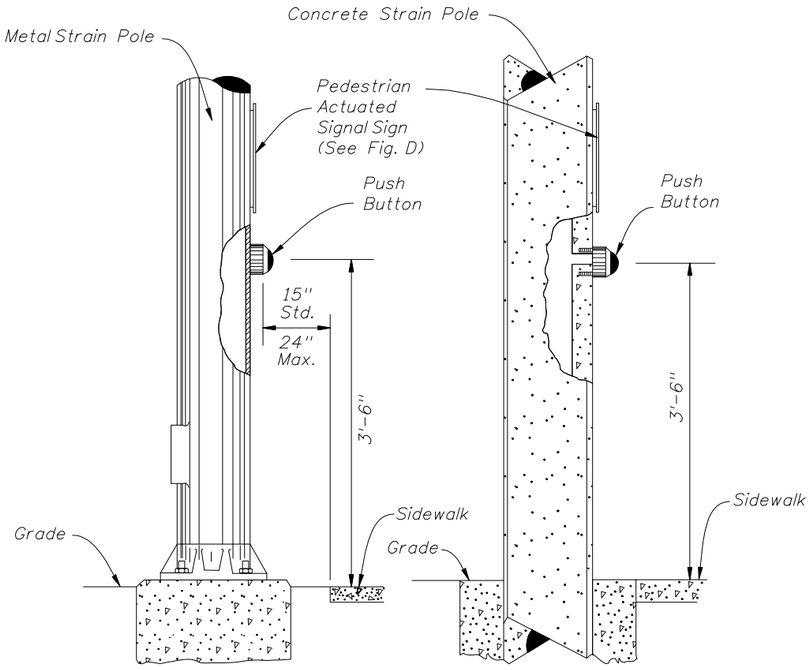
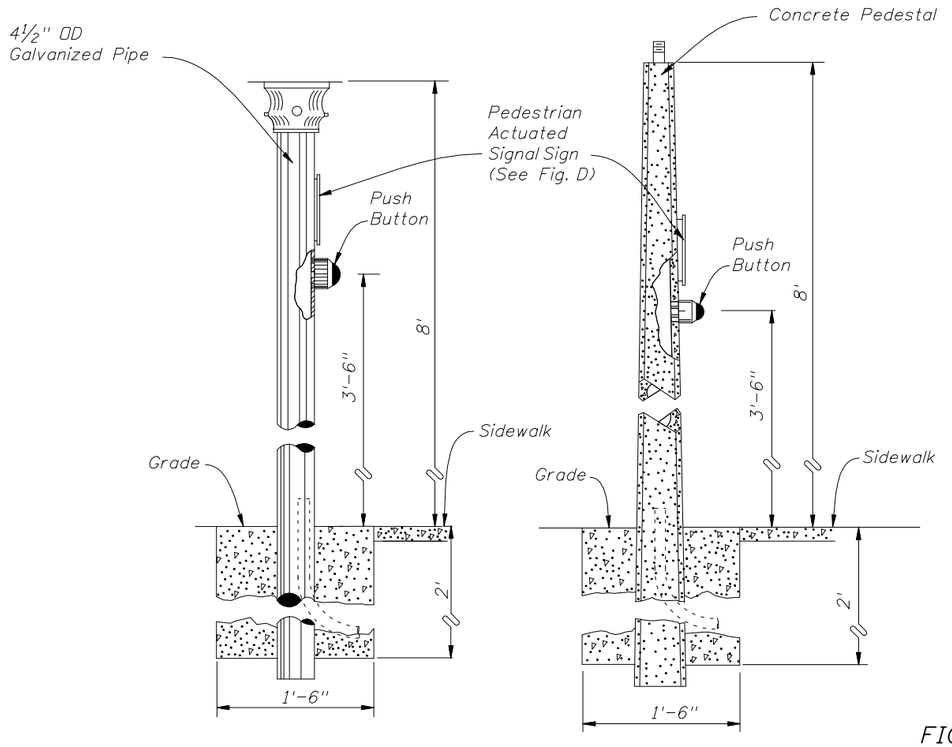


FIGURE A
POLE MOUNTED
DETECTOR STATION



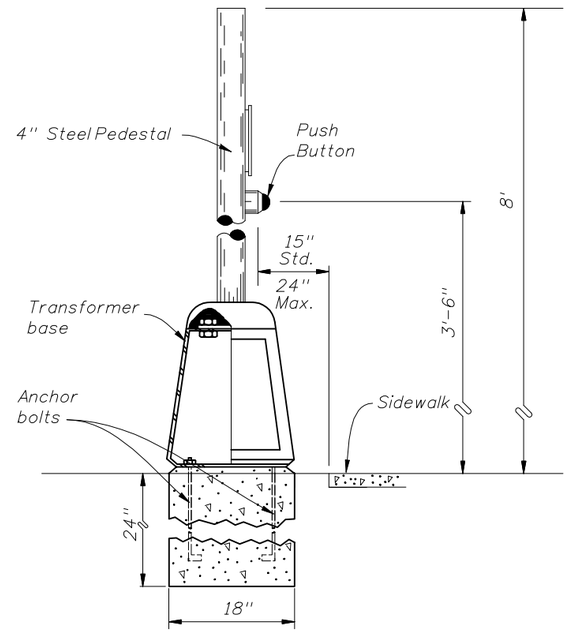


FIGURE B
PEDESTAL STATION
DETECTOR STATION

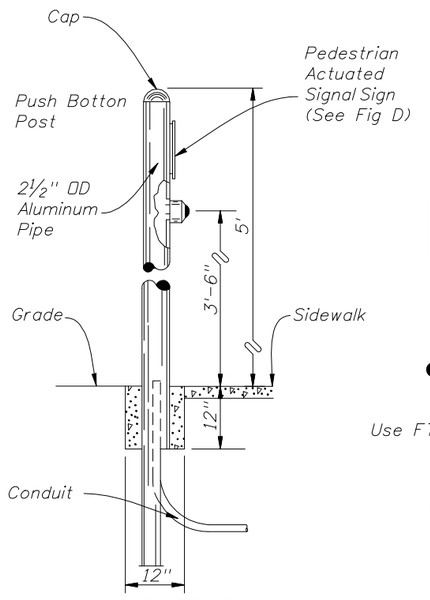


FIGURE C
POST DETECTOR STATION
DETECTOR STATION

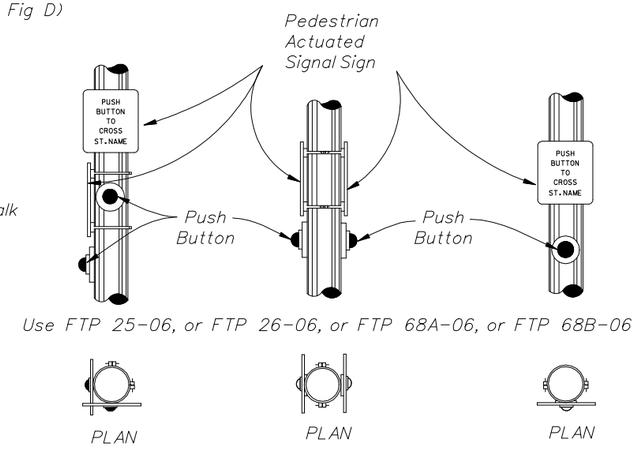


FIGURE D

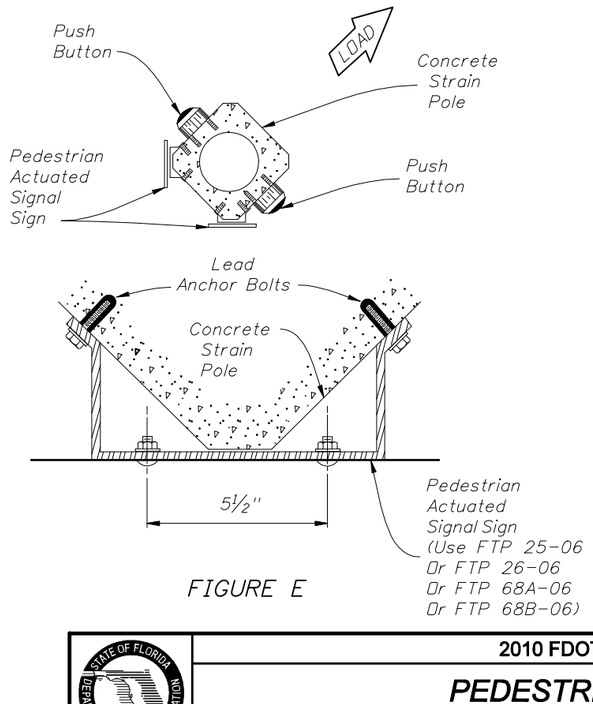


FIGURE E

Notes:

1. *Signs shall be mounted above detectors, explaining their purpose and use.*
2. *The positioning of pedestrian push button should clearly indicate which crosswalk signal is actuated by each push button.*
3. *Push buttons and signs are to be mounted in accordance with Standard Specifications, section 665.*
4. *Meet all grounding requirements of Section 620 of the Standard Specifications.*
5. *A 30"X48" landing is required centered on each push button.*

Note To Designers:

The designer should ensure the distance to the Push Button in Figure A & B is maintained. This distance can vary depending on post or pedestal type or whether a frangible base is used and sidewalk configuration. This is specified to meet Americans with Disabilities Act.

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PEDESTRIAN DETECTOR ASSEMBLY INSTALLATION DETAILS

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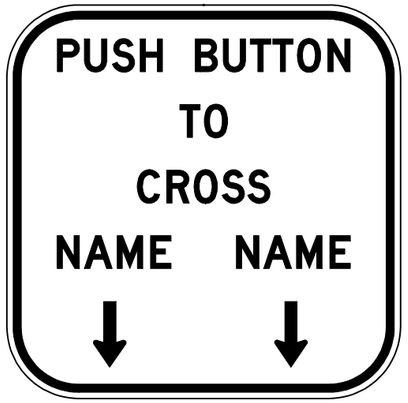
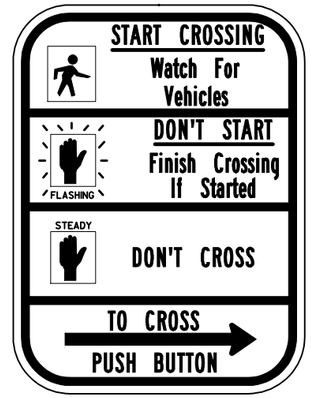
FTP-25-06



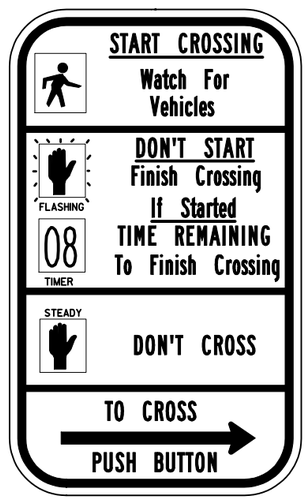
FTP-26-06

FTP-68A-06

FTP-68B-06



R10-3b
(Use Only for Case I)



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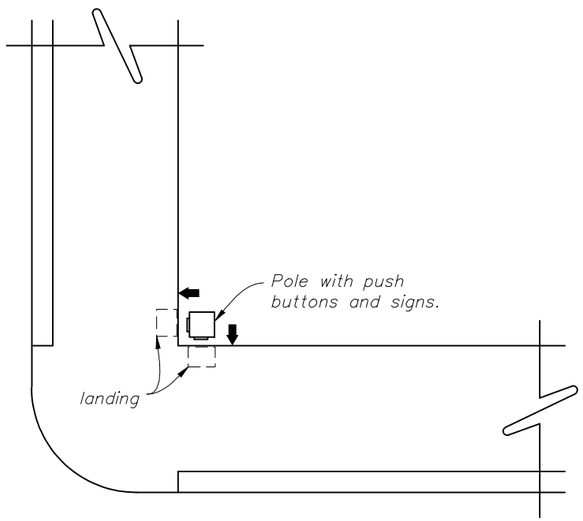
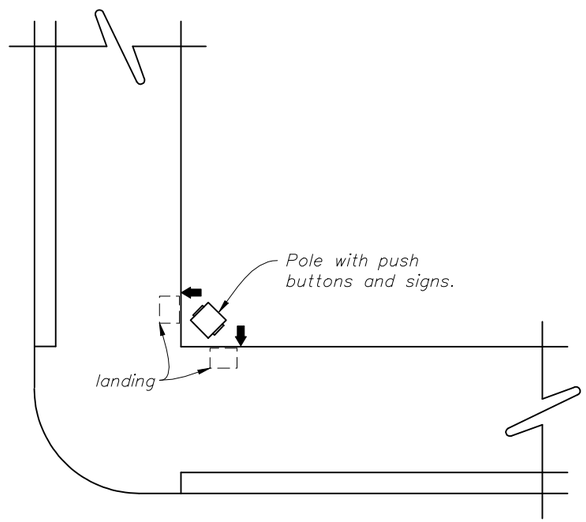


CASE I
POLE PARALLEL TO CURBLINE
ALTERNATE TO FIGURE F



CASE II
POLE DIAGONAL TO CURBLINE

NOTE:
1. Refer to the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES figure 2B-18 Pedestrian Signs, The STANDARD HIGHWAY SIGNS MANUAL (English) Sign R10-3b for Text Size, Spacing and Symbol size. Also see DESIGN STANDARDS Index 17355 for details of FTP signs.

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PEDESTRIAN DETECTOR ASSEMBLY INSTALLATION DETAILS

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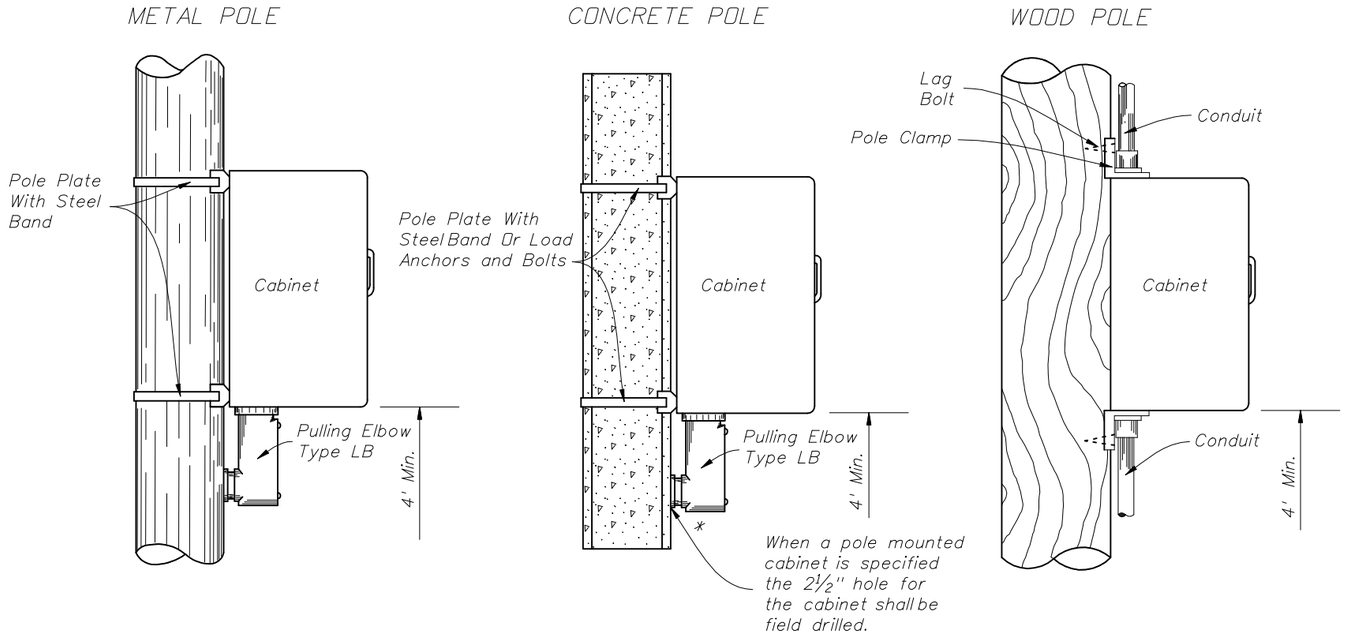
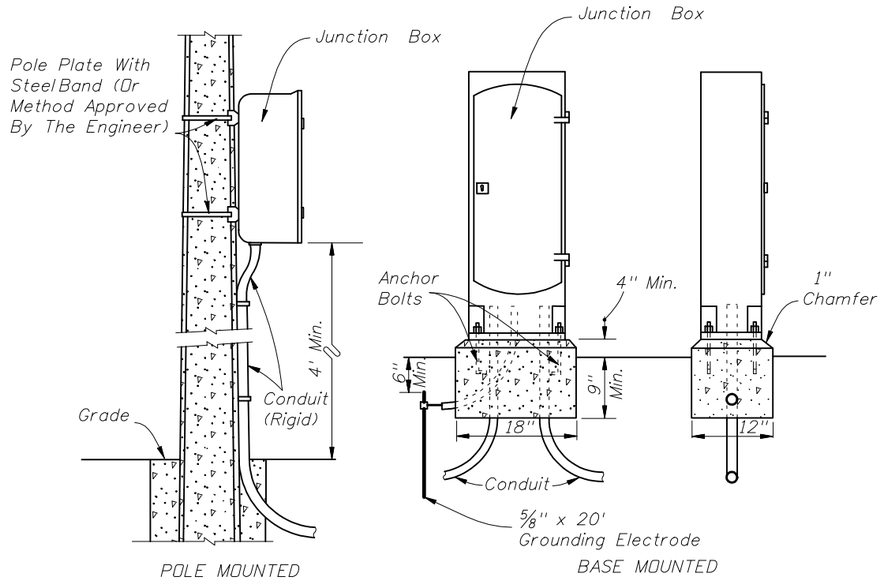


POLE MOUNTED CABINET

Liquidtight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.

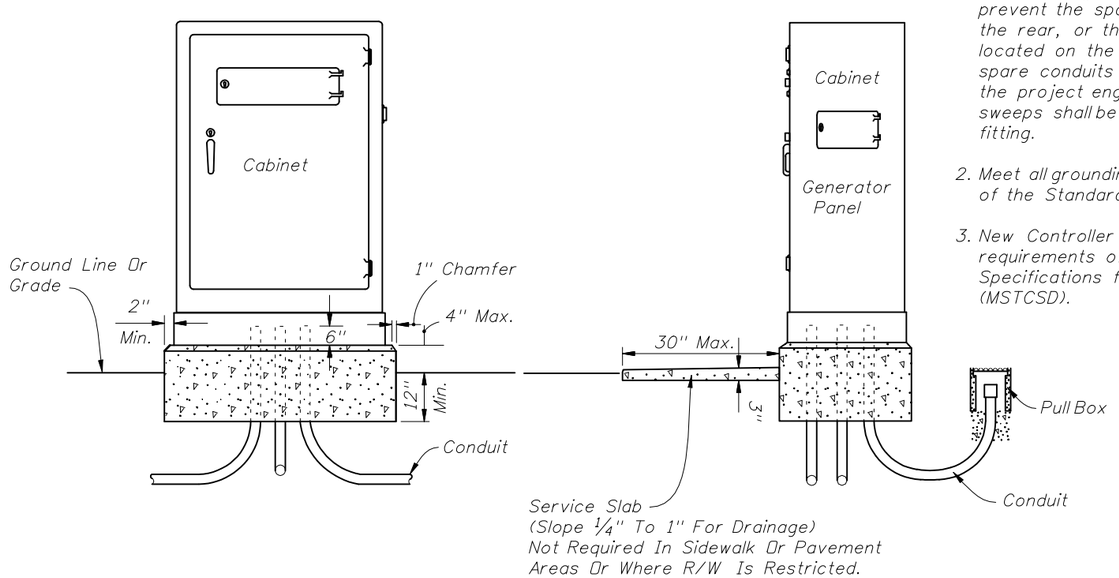
* If holes for cabinet mounting require relocation, original holes shall be filled in with concrete or covered with a noncorrosive cover plate.



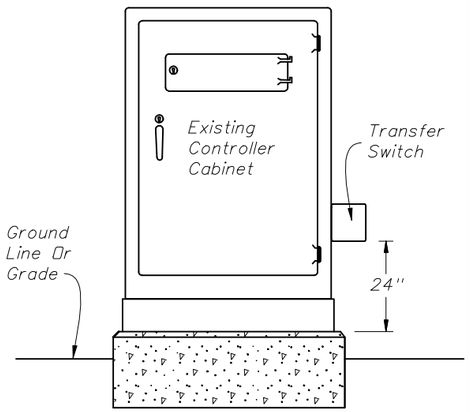
INTERCONNECT JUNCTION BOX

Notes:

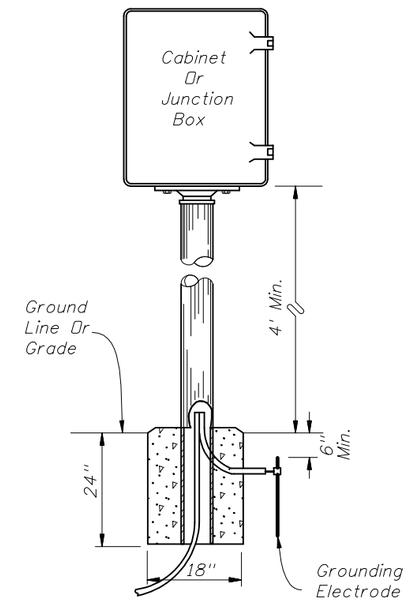
1. The number, size and orientation of conduit sweep will vary according to site condition or locations. Two spare 2" PVC conduits shall be provided in all bases. The spares shall exit in the direction of the center rear of the cabinet base, into a pullbox and capped with a weathertight fitting. If obstructions prevent the spare conduit from exiting to the rear, or the rear of the cabinet is located on the R/W line, a side exit of the spare conduits will have to be approved by the project engineer. All spare conduit sweeps shall be capped with a weatherproof fitting.
2. Meet all grounding rquirements of Section 620 of the Standard Specifications.
3. New Controller Cabinet installation shall meet the requirements of Section A676-1 of the Minimum Specifications for Traffic Control Signal Devices (MSTCSD).



BASE MOUNTED CABINET



Existing controller cabinets to be retrofitted shall meet the requirements of Section A678-16 of the Minimum Specifications for Traffic Control Signal Devices (MSTCSD).
The signalized intersection controller cabinet retrofit installation procedures are located at http://www.dot.state.fl.us/TrafficOperations/Document Library
Generator Power for Signalized Intersection



PEDESTAL MOUNTED

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CABINET INSTALLATION DETAILS

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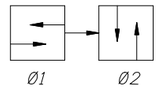
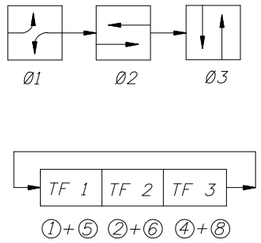


SOP 1



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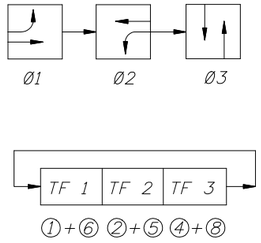

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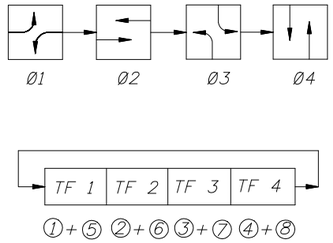

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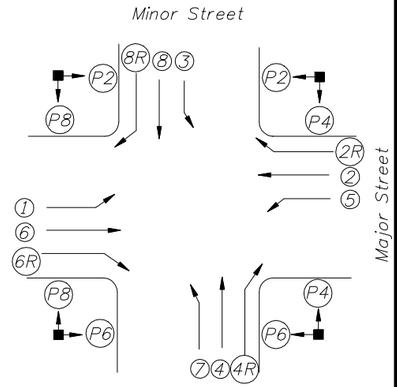
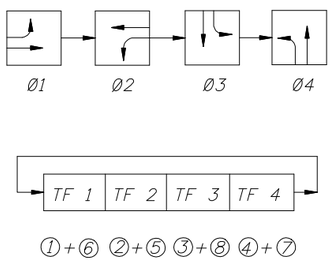


SIGNALIZED INTERSECTION

Vehicle movements & signalhead number assignments are not directionally oriented but shall maintain their relative orientation about the intersection (I.E., movements 7 and 4 are always to the right of movements 1 and 6 etc.).

LEGEND

- (X) Vehicle Movement Number
- (PX) Pedestrian Movement Number
- TF X Timing Function Number
- ØX Phase Number
- Green Arrow (Left or Right)
- Red Arrow
- Yellow Arrow



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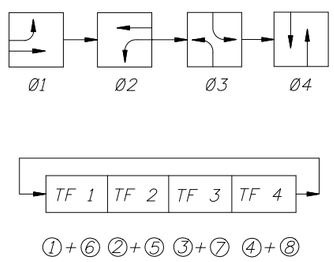

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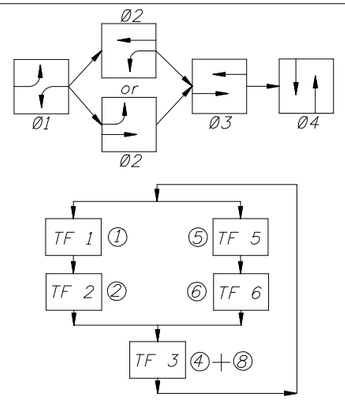
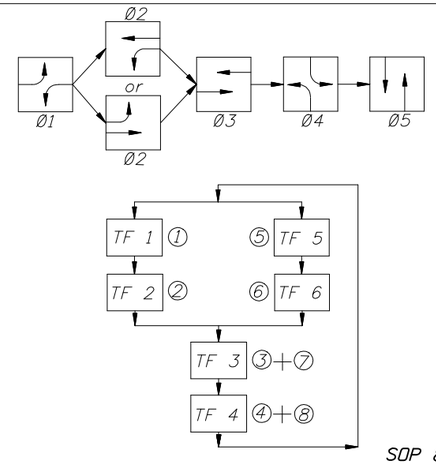


SOP 7



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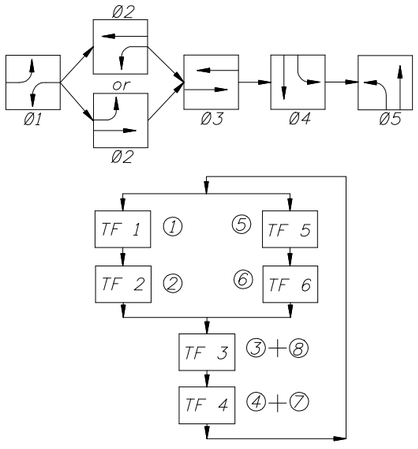
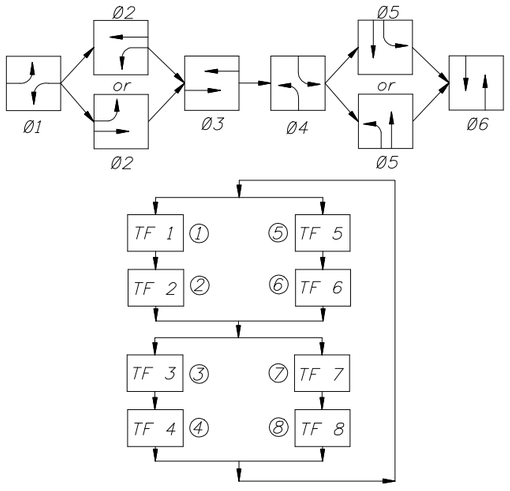


SOP 9



SOP 10

SIGNAL CLEARANCE TABLE

(Blank Indicates No Clearance Required)

From \ To		R	← R	G		← G	↑ G	WALK	DONT WALK
SIGNAL INDICATIONS	R			Y		←	Y		
	← R			Y		←	Y		
	G					←			
	← G								
	↑ G								
	WALK								
	DONT WALK							Flash DONT WALK	

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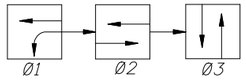

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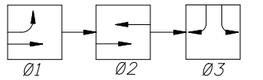

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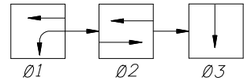
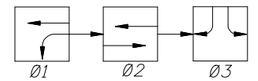
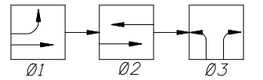


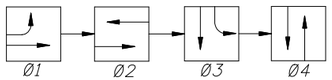
SOP 13
(ONE- WAY STREET INTERSECTION)



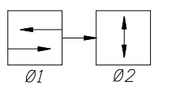
SOP 14
(DIAMOND INTERCHANGE OPERATION)



SOP 15
(DIAMOND INTERCHANGE OPERATION)

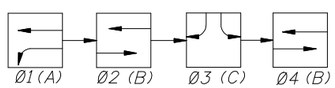


SOP 16



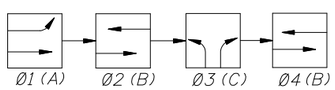
(MIDBLOCK)

SOP 17



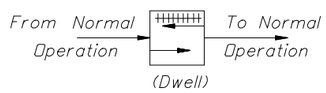
NOTE:
Only Ø2 Or Ø4 Used, Not Both To Obtain ABC, Or ACB Operation.

SOP 18
(DIAMOND INTERCHANGE OPERATIONS)

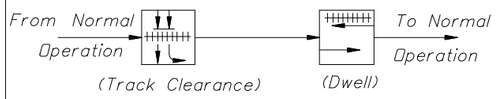


NOTE:
Only Ø2 Or Ø4 Used, Not Both To Obtain ABC, Or ACB Operation.

SOP 19
(DIAMOND INTERCHANGE OPERATIONS)

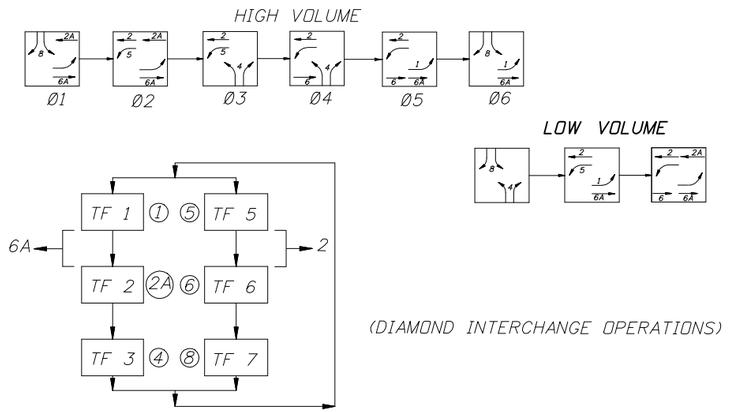


POP 1



POP 2

POP 3



(DIAMOND INTERCHANGE OPERATIONS)

SOP 20

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STANDARD SIGNAL OPERATION PLANS

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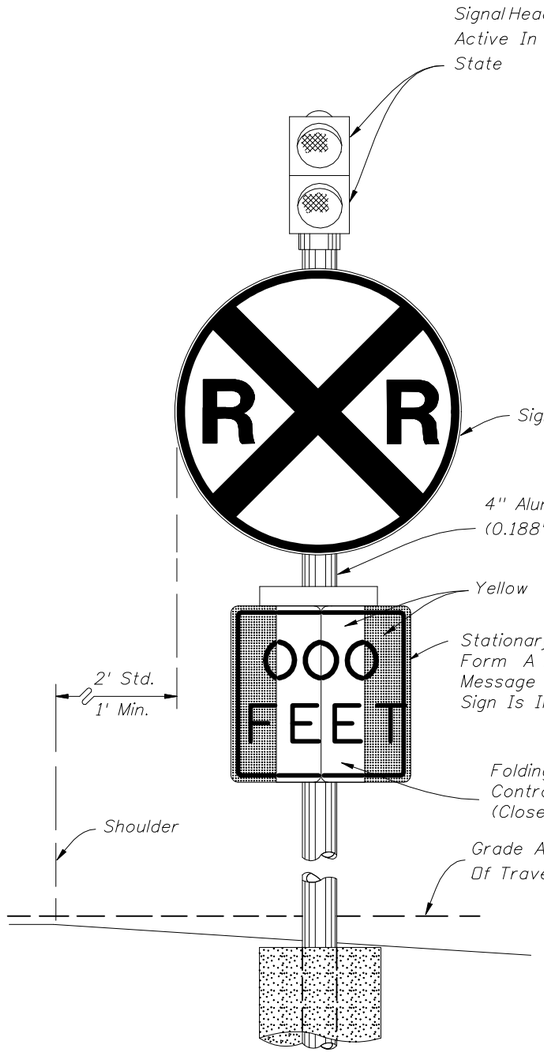
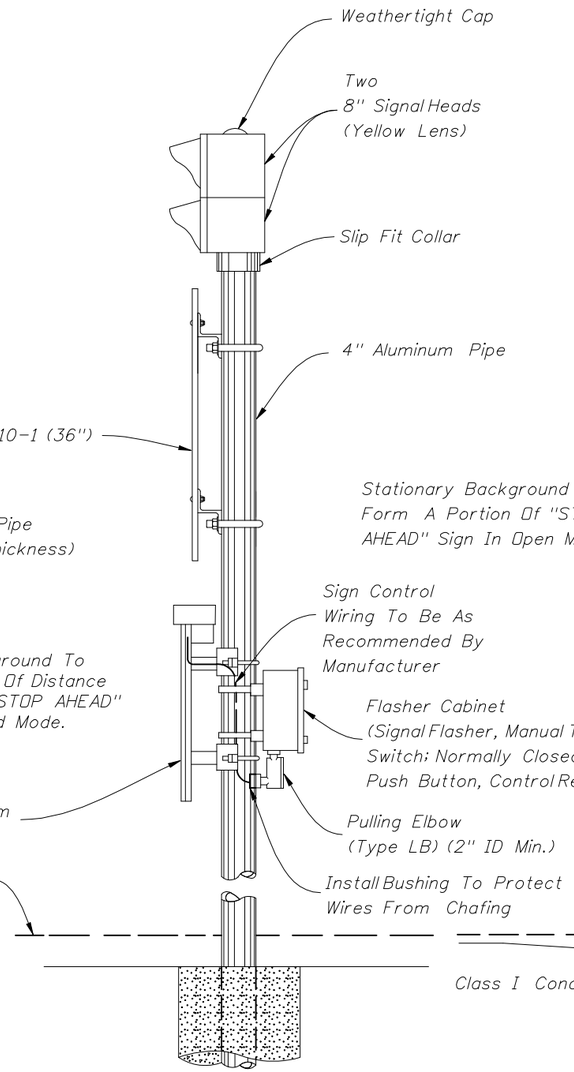
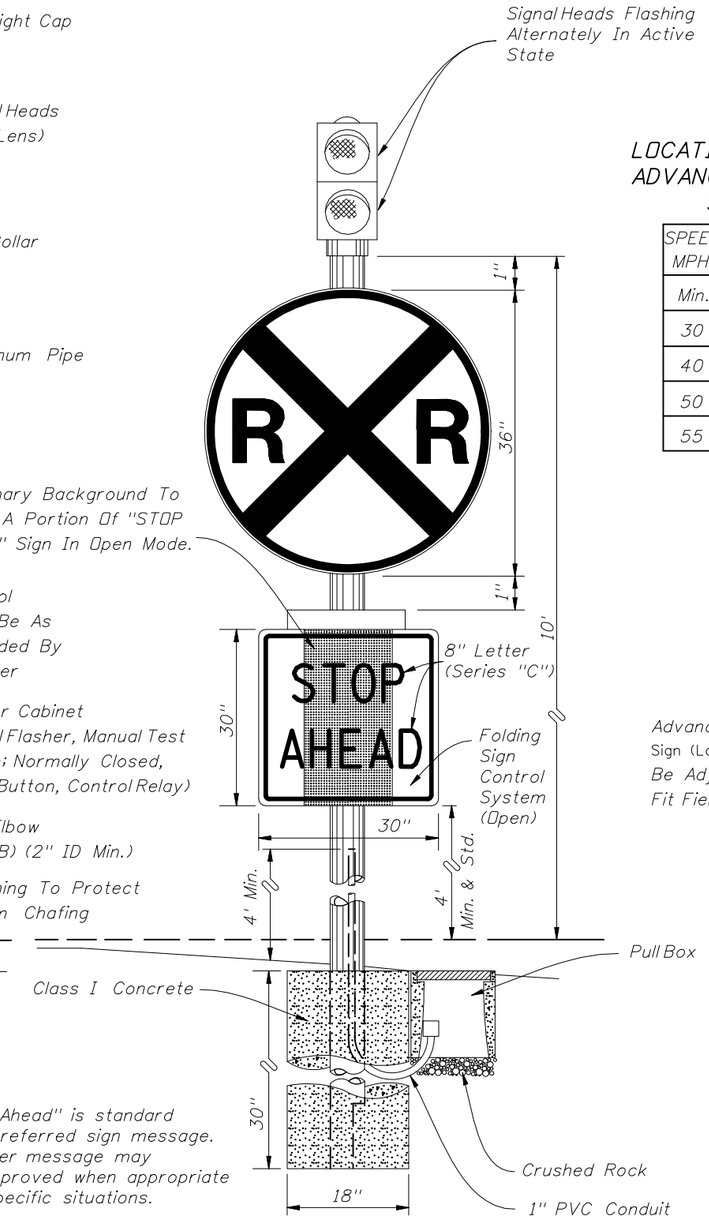


FRONT VIEW



SIDE VIEW

PASSIVE STATE
(TRAIN CIRCUIT NOT ACTUATED)



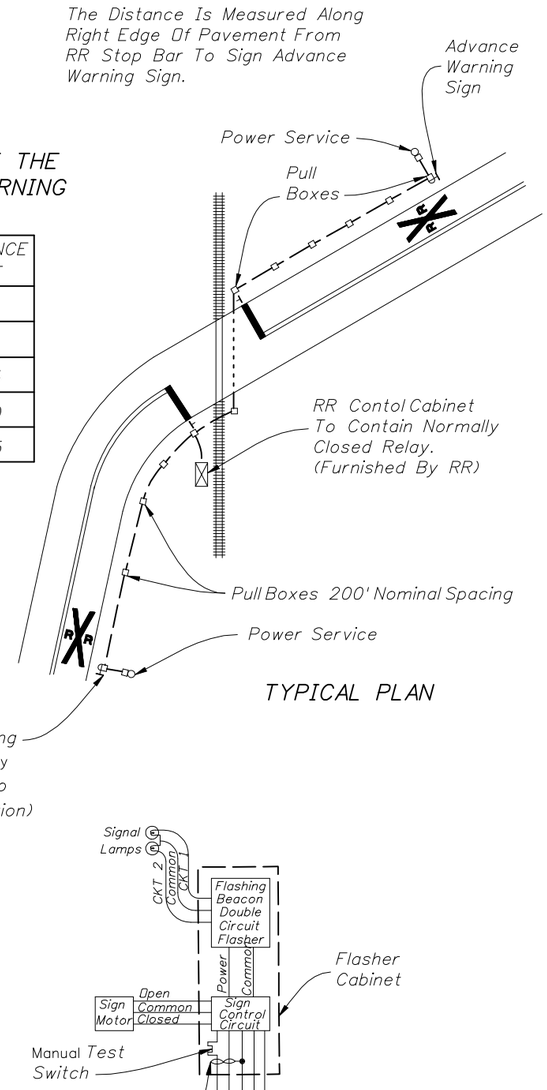
NOTE:
1. "Stop Ahead" is standard and preferred sign message. Another message may be approved when appropriate for specific situations.

FRONT VIEW

ACTIVE STATE
(TRAIN CIRCUIT ACTUATED)

LOCATION OF THE ADVANCE WARNING SIGN

SPEED MPH	DISTANCE FEET
Min.	50
30	75
40	125
50	250
55	325



TYPICAL PLAN

NOTE:
Conduit and cable from the normally closed relay of RR controller cabinet to the junction box shall be furnish & installed by RR.

FUNCTIONAL BLOCK DIAGRAM

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ADVANCE WARNING FOR R.R. CROSSING

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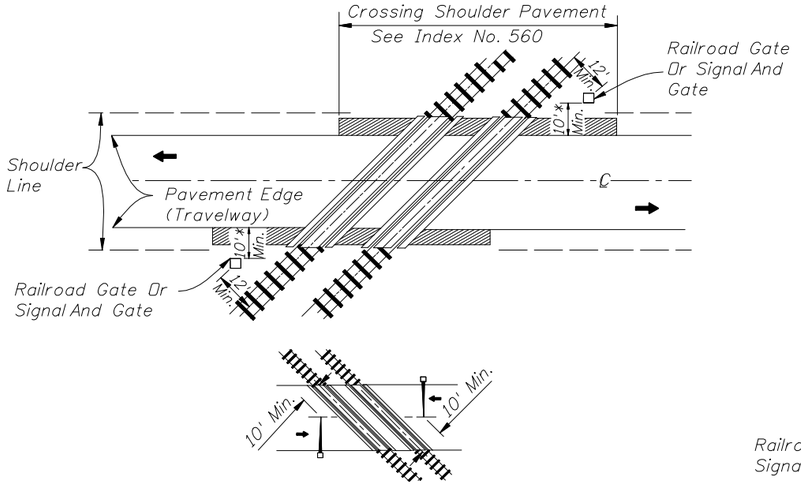
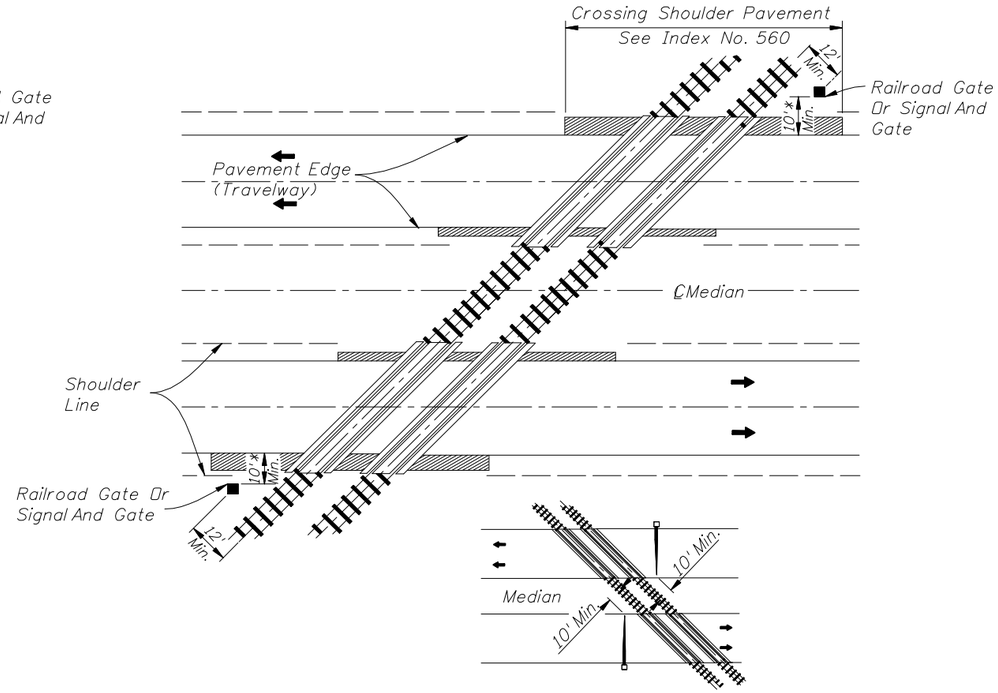
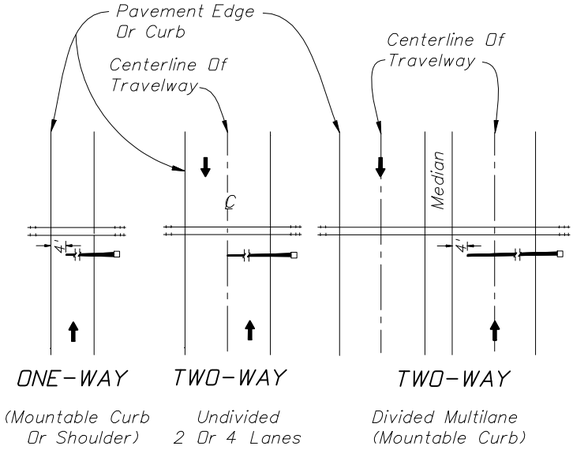


SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 - LANE DESIGN)

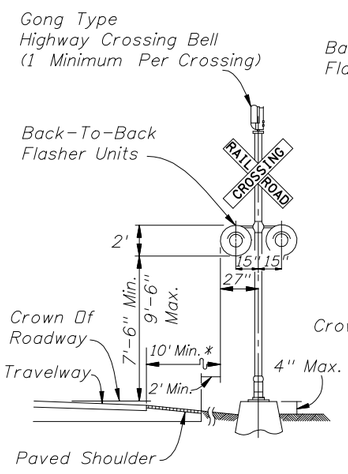


SIGNAL PLACEMENT AT RAILROAD CROSSING
(4 - LANE DESIGN)

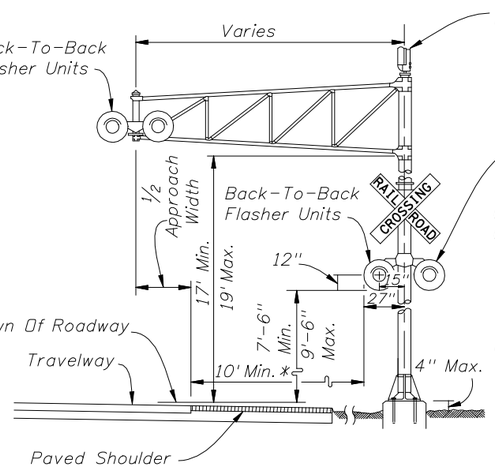


Note :
Arrows denote direction of travel not lane indication

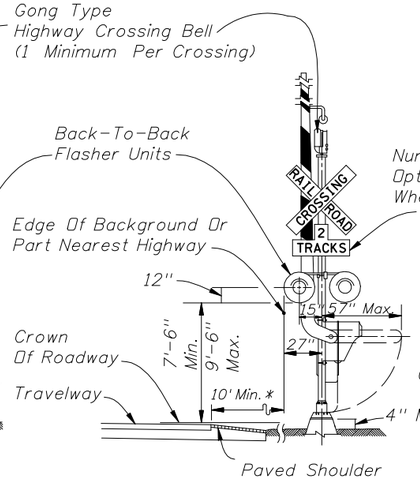
FIGURE 1
Gate Length Requirements
See Note 5 Sheet 3



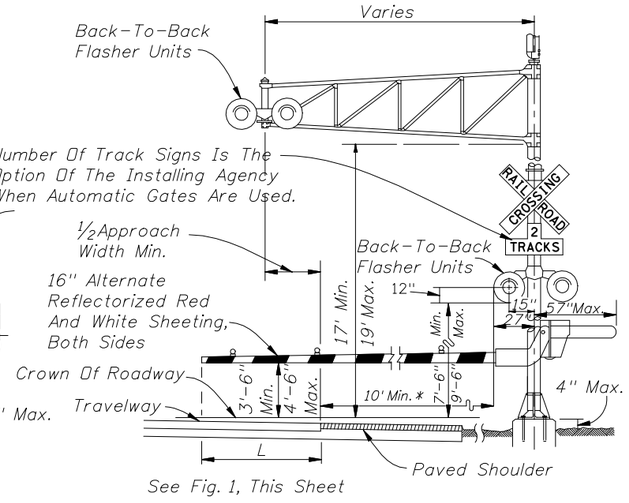
TYPE I



TYPE II



TYPE III



See Fig. 1, This Sheet

TYPE IV

General Notes

1. No guardrail is proposed for signals; however, some form of impact attenuation device may be specified for certain locations.

2. Advance flasher to be installed when and if called for in plans or specifications.

3. Top of foundation shall be no higher than 4" above finished shoulder grade.

4. Type of traffic control device
   I Flashing signals
   II Flashing signals with cantilever
   III Flashing signals with gate
   IV Flashing signals with cantilever & gate
   V Gate

5. Class of traffic control devices
   I Flashing signals - one track
   II Flashing signals - multiple tracks
   III Flashing signals and gates - one track
   IV Flashing signals and gates - multiple tracks

* When 10' is deemed impracticle the control device can be located as close as 2' from the edge of a paved shoulder but not less than 6' from the edge of the near traffic lane.

Note:
Two separate foundations may be required (one for signals, one for gate), depending on type of equipment used.

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RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES

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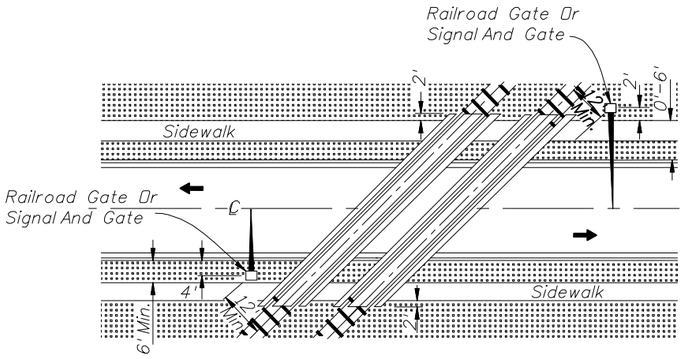
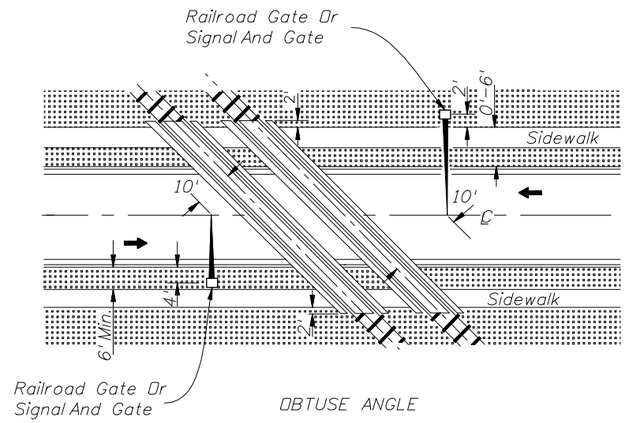


ACUTE ANGLE (AND RIGHT ANGLE)

SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 LANES, CURB & GUTTER)

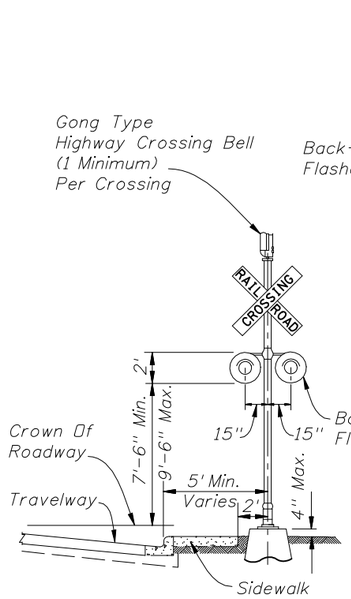


OBTUSE ANGLE

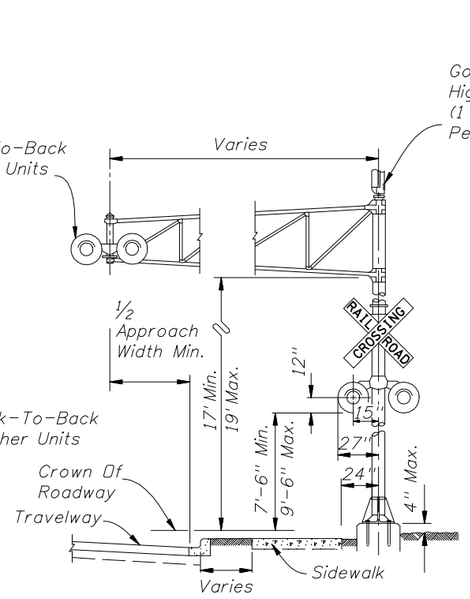
SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 LANES, CURB & GUTTER)

GENERAL NOTES

1. The location of flashing signals and stop lines shall be established based on future (or present) installation of gate with appropriate track clearances.
2. Where plans call for railroad traffic control devices to be installed in curbed medians, the minimum median width shall be 12'-6".
3. Location of railroad traffic control device is based on the distance available between face of curb & sidewalk.
   0' to 6' -Locate device outside sidewalk.
   Over 6' - Locate device between face of curb and sidewalk.
4. Stop line to be perpendicular to edge of roadway, approx. 15' from nearest rail; or 8' from and parallel to gate when present.



TYPE I



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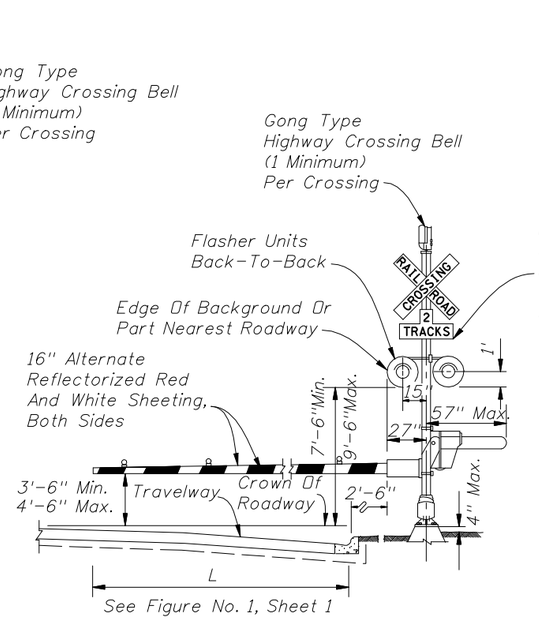

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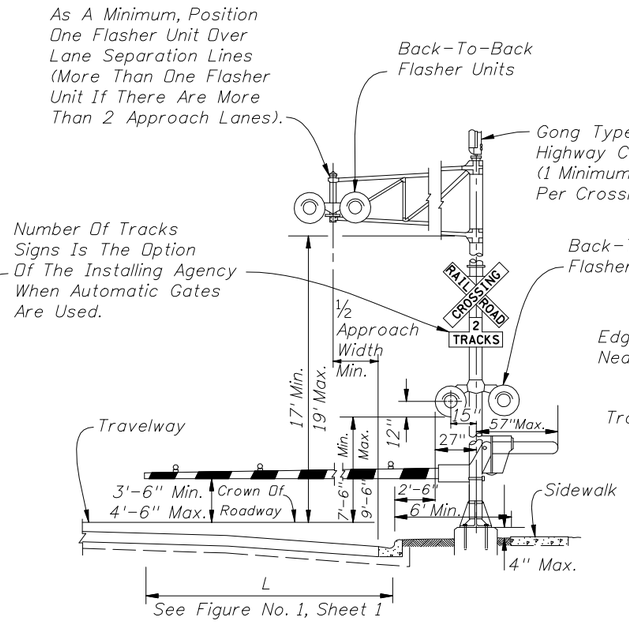

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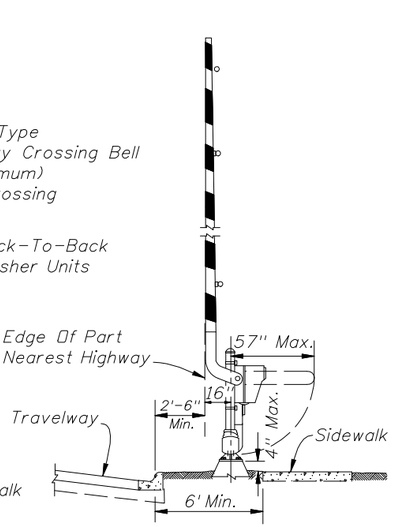

TYPE V

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RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES

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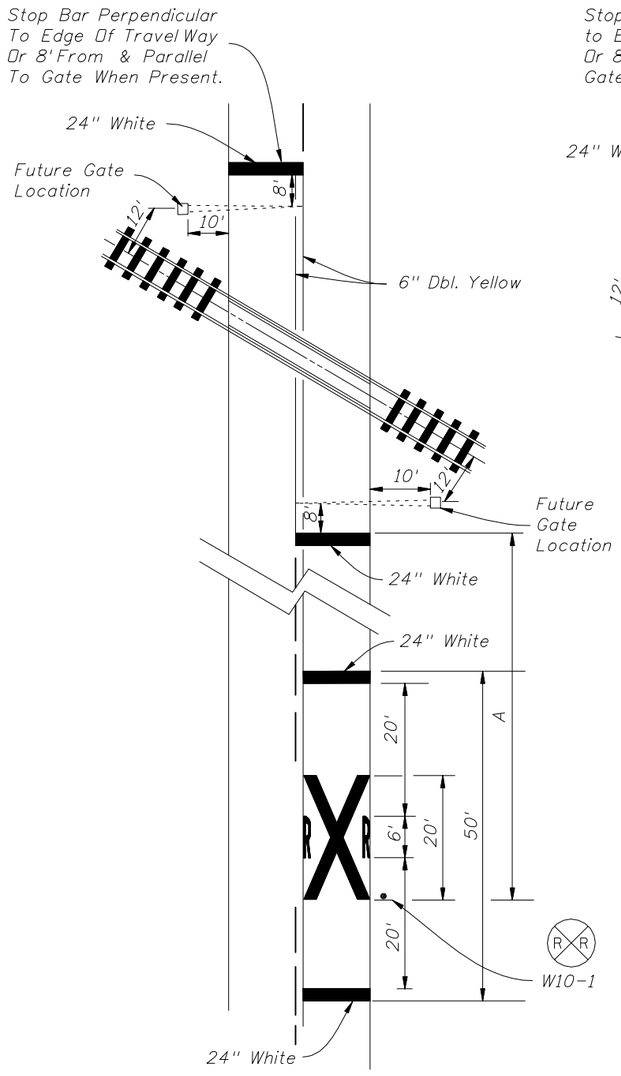
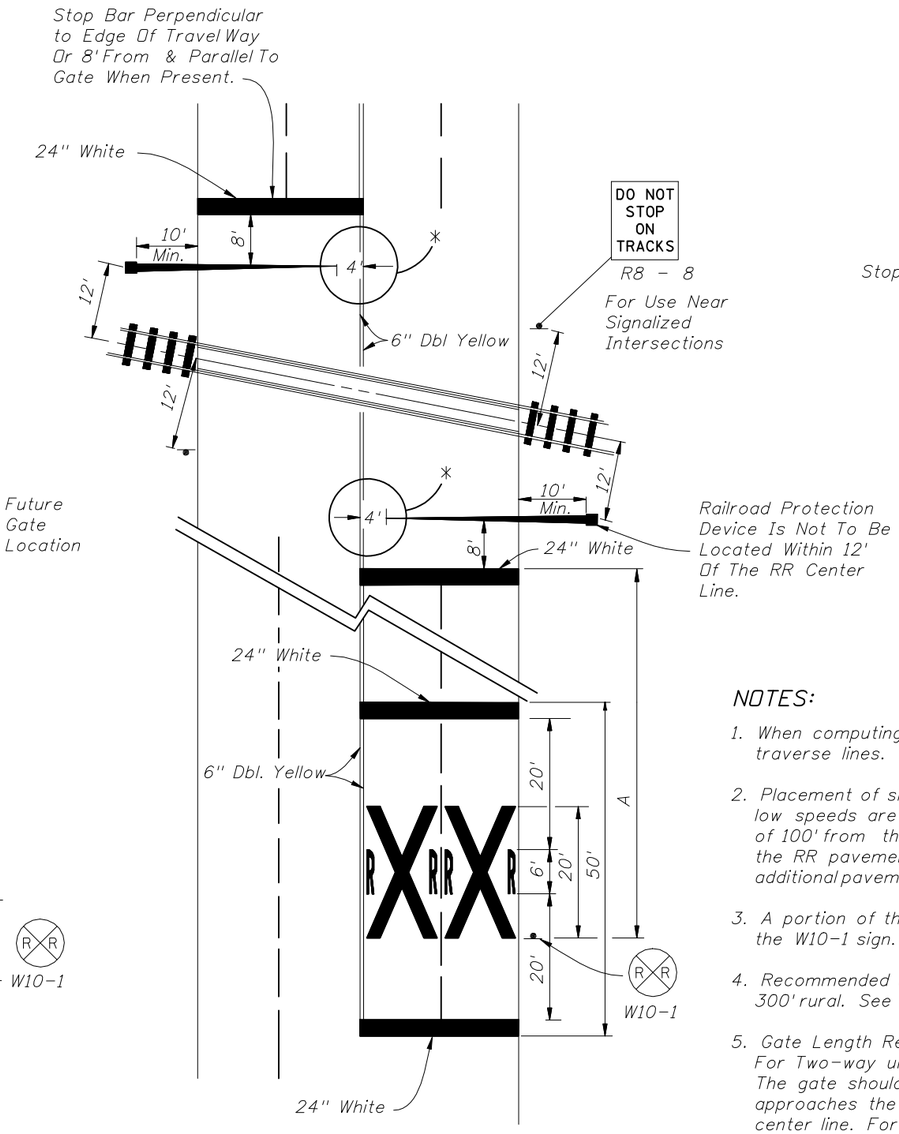
RAILROAD CROSSING AT TWO (2)-LANE ROADWAY

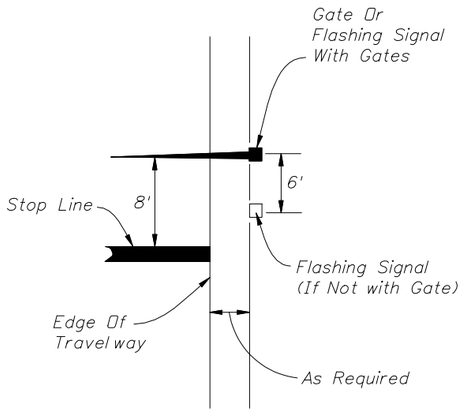


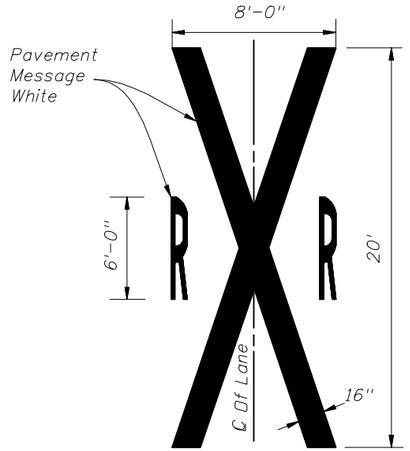
RAILROAD CROSSING AT MULTILANE ROADWAY



SPEED MPH	" A " IN FT.
60	400
55	325
50	250
45	175
40	125
35	100
URBAN	85 MIN.

RELATIVE LOCATION OF CROSSING TRAFFIC CONTROL DEVICES

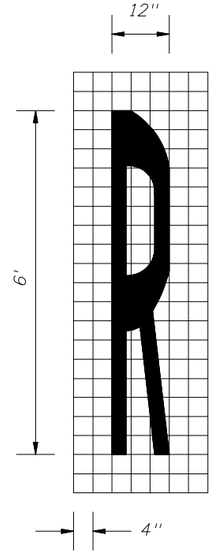




NOTES:

1. When computing pavement message, quantities do not include traverse lines.
2. Placement of sign W10-1 in a residential or business district, where low speeds are prevalent, the W10-1 sign may be placed a minimum distance of 100' from the crossing. Where street intersections occur between the RR pavement message and the tracks an additional W10-1 sign and additional pavement message should be used.
3. A portion of the pavement markings symbol should be directly opposite the W10-1 sign.
4. Recommended location for FTP-61-06 or FTP-62-06 signs, 100' urban and 300' rural. See Index 17355 for sign details.
5. Gate Length Requirements:
   For Two-way undivided sections:
   The gate should extend to within 1' of the center line. On multiple approaches the maximum gate length may not reach to within 1' of the center line. For those cases, the distance from the gate to the center line shall be a maximum of 4'.

   For one-way or divided sections:
   The gate shall be of sufficient length such that the distance from the gate tip to the inside edge of pavement is a maximum of 4'.



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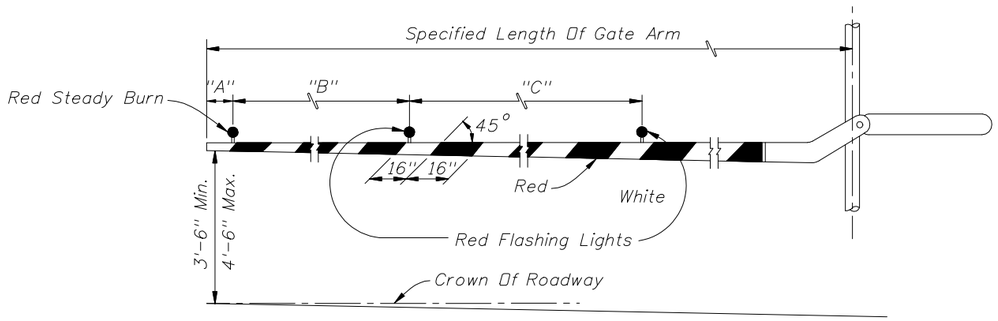
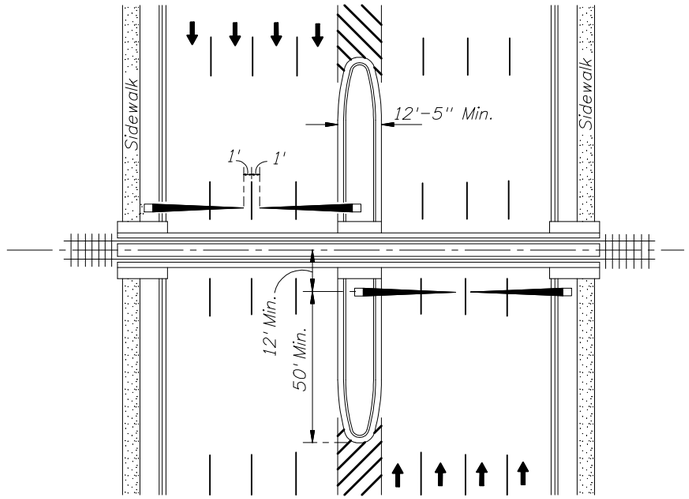
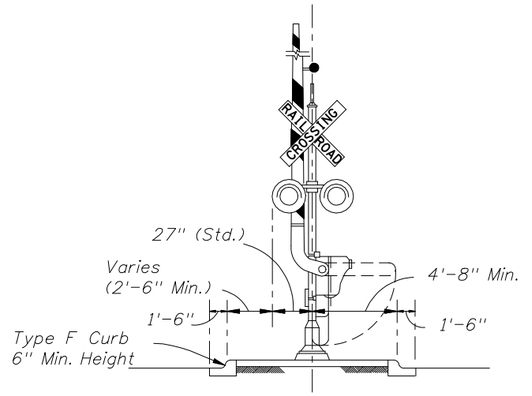




PLAN



MEDIAN SECTION AT SIGNAL GATES

NOTE:
For additional information see the "Manual On Uniform Traffic Control Devices", Part 8; The "Traffic Control Handbook" , Part VIII; and AASHTO "A Policy On Geometric Design Of Streets And Highways".

RAILROAD GATE ARM LIGHT SPACING

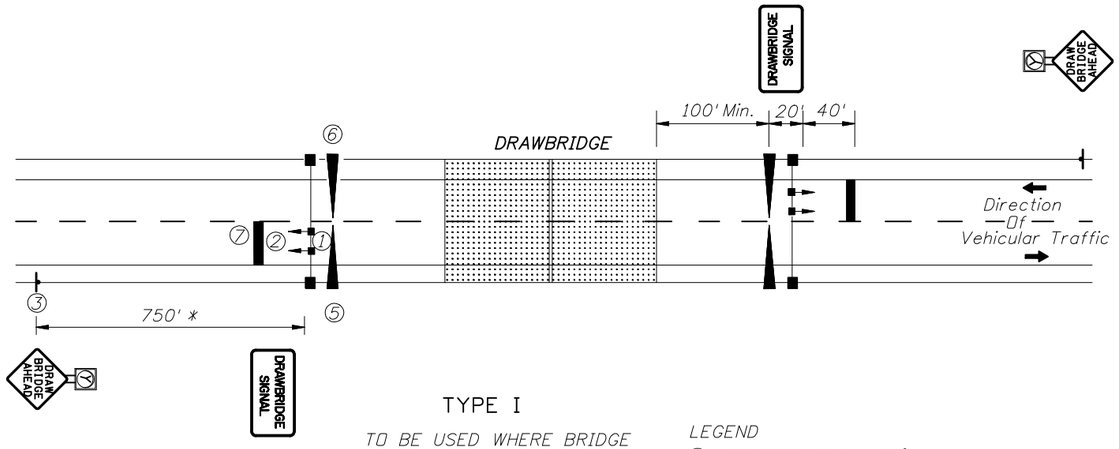
Specified Length Of Gate Arm	Dimension "A"	Dimension "B"	Dimension "C"
14 Ft.	6"	36"	5'
15 Ft.	18"	36"	5'
16-17 Ft.	24"	36"	5'
18-19 Ft.	28"	41"	5'
20-23 Ft.	28"	4'	5'
24-28 Ft.	28"	5'	5'
29-31 Ft.	36"	6'	6'
32-34 Ft.	36"	7'	7'
35-37 Ft.	36"	9'	9'
38 And Over	36"	10'	10'

MEDIAN SIGNAL GATES FOR

MULTILANE UNDIVIDED URBAN SECTIONS

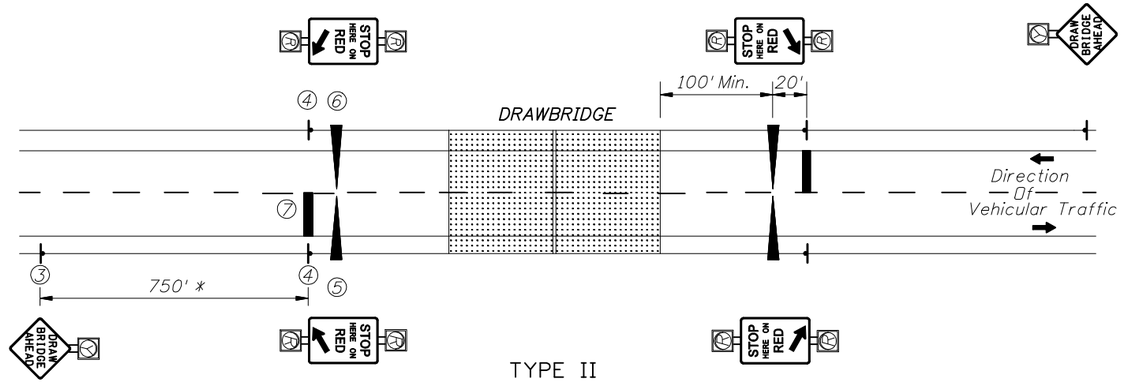
(THREE OR MORE DRIVING LANES IN ONE DIRECTION, 45 MPH OR LESS)

TYPICAL BRIDGE MOUNTS



TYPE I

TO BE USED WHERE BRIDGE OPERATORS ARE FULL TIME OR A DAILY BASIS.



TYPE II

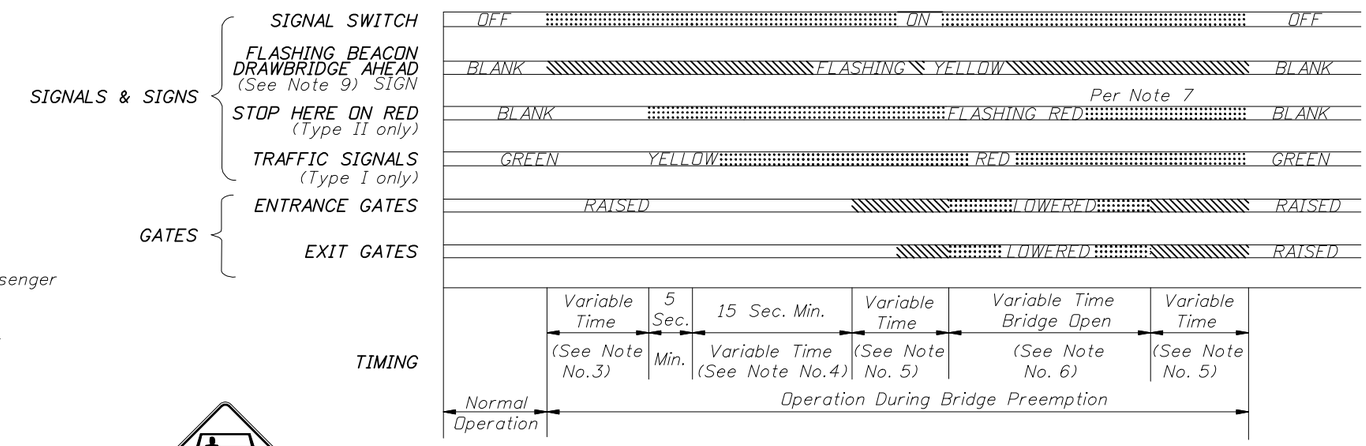
TO BE USED WHERE TYPE I IS NOT APPLICABLE (USUALLY WHEN THE BRIDGE OPERATOR IS "ON CALL").

* Field conditions may require adjustment of this standard distance.

LEGEND

① TRAFFIC SIGNALS } Mast Arm Mounted (Off Bridge)
② DRAWBRIDGE SIGN } Monotube Support Mounted (On Bridge)
③ DRAWBRIDGE AHEAD SIGN WITH YELLOW FLASHING BEACON } Ground Mounted
④ STOP HERE ON RED SIGN WITH RED FLASHING BEACONS } Ground Mounted
⑤ ENTRANCE GATE
⑥ EXIT GATE
⑦ 24" THERMOPLASTIC STOP BAR

SEQUENCE CHART



NOTES:

1. A bypass switch shall be installed to override each timing interval in case of a malfunction.
2. "STOP HERE ON RED" is omitted in Type I operation and "TRAFFIC SIGNALS" are omitted in Type II operation.
3. The time between beginning of flashing yellow on "Drawbridge Ahead" sign and the clearance of traffic signal to red, or beginning of flashing red should not be less than the travel time of a passenger car, from the sign location to the stop line, traveling at the 85 percentile approach speed.
4. Beginning of operation of drawbridge gates shall not be less than 15 seconds after steady red or 20 seconds after flashing red (Actual time may be determined by the bridge tender.)
5. Time of gate lowering and raising is dependent upon gate type.
6. Time of bridge opening is determined by the bridge tender.
7. Each gate shall be operated by a separate switch.
8. On each approach (Type II), all four red signals shall be on the same two circuit flashers, with the two top signals on one circuit, and the two bottom signals on the alternately flashing circuit.
9. A Drawbridge Ahead sign is required for both types of signal operation, However a flashing beacon shall be added to the sign when physical conditions prevent a driver traveling at the 85% approach speed from having continuous view of at least one signal indication for approximately 10 seconds.
10. Requirements on gate installation are contained in Section 4I of the "Manual on Uniform Traffic Control Devices".
11. "In accordance with Traffic Engineering Manual (Topic Number 750-000-005) Section 2.1, SLIPPERY WHEN WET SIGNS shall be placed in advance of all MOVABLE and NONMOVABLE STEEL DECK BRIDGES."

W8-5
SLIPPERY WHEN WET SIGN
See Note 11.

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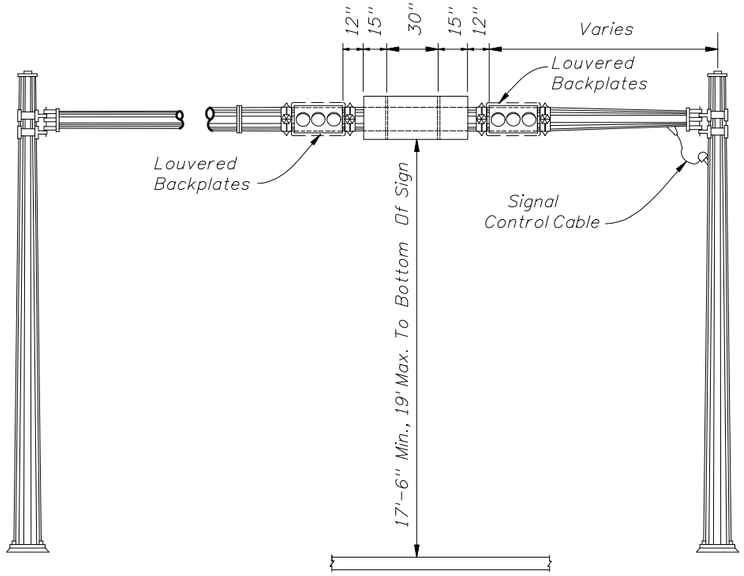


FIGURE - A

MONOTUBE SUPPORT MOUNTING

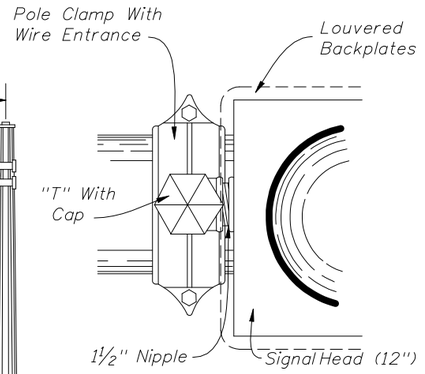


FIGURE - C

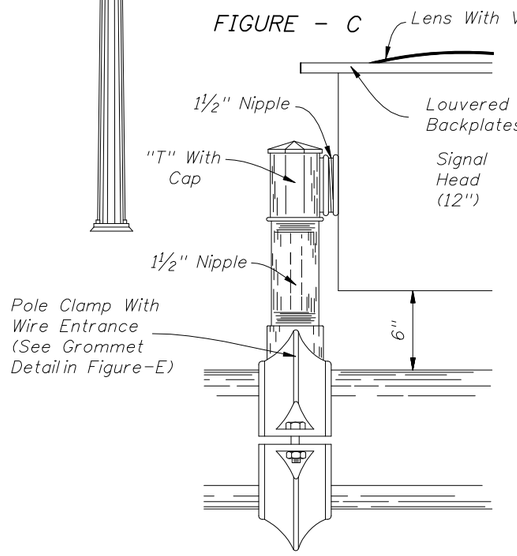
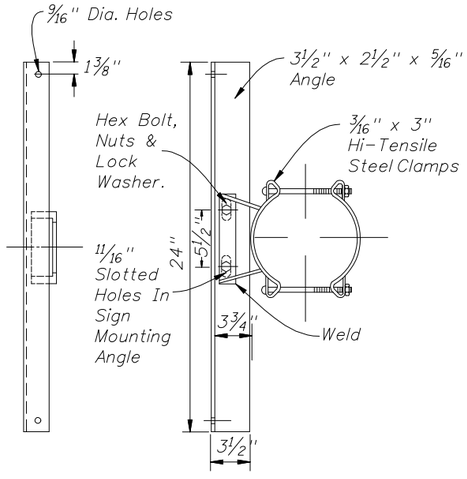


FIGURE - D



SIGN PANEL MOUNTING ASSEMBLY

FIGURE - B

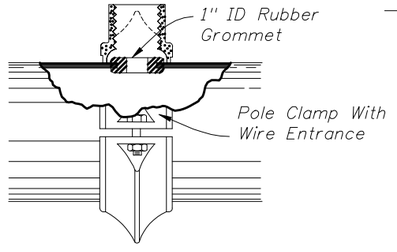


FIGURE - E

SIGNAL HEAD MOUNTING ASSEMBLY

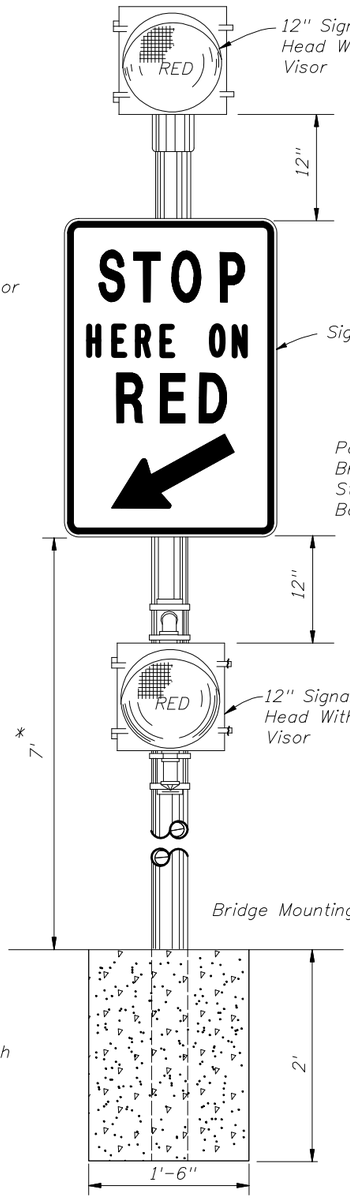


FIGURE - F

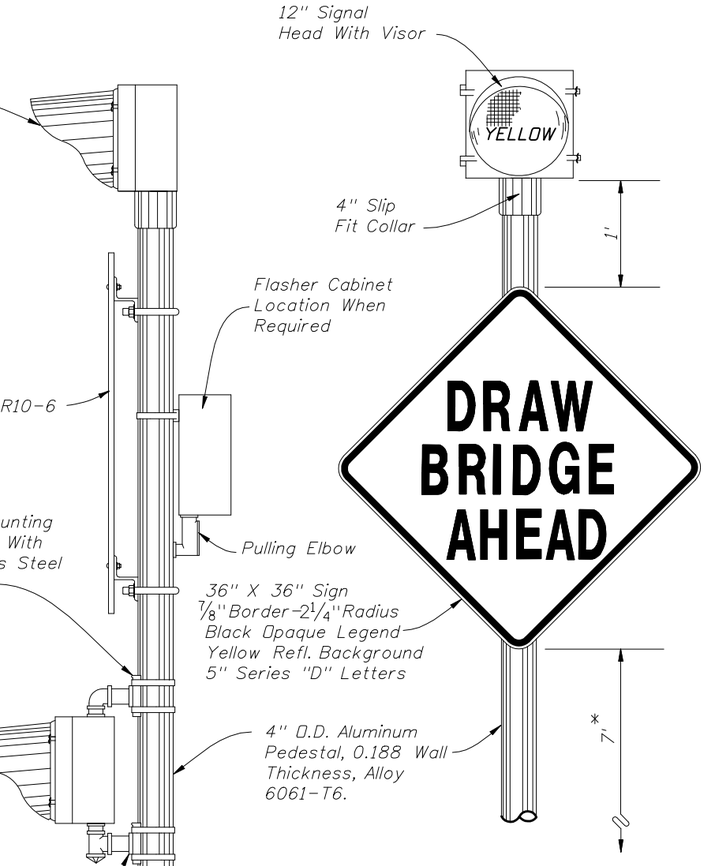


FIGURE - G

* Measured from the bottom of the sign to the near edge of the pavement. Horizontal distance between edge of the pavement and inside edge of sign will vary with condition at job site.

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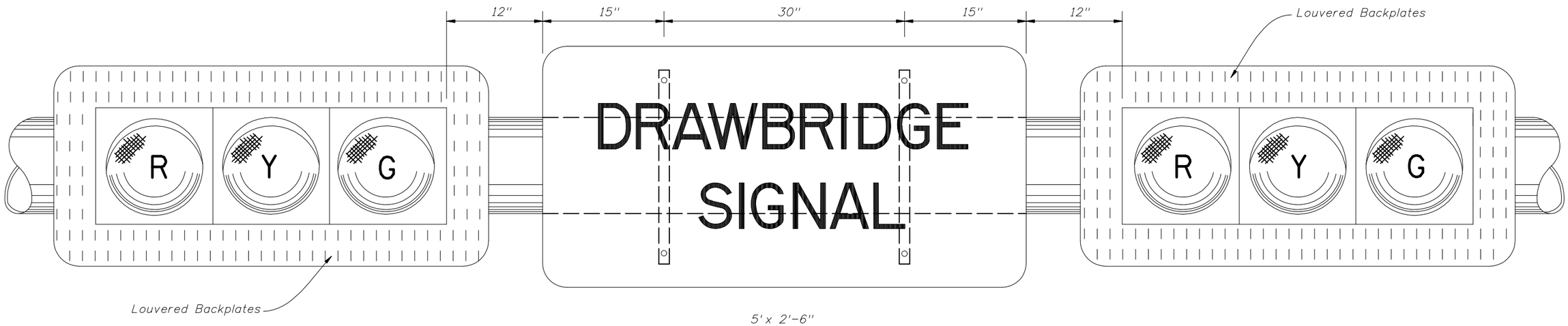
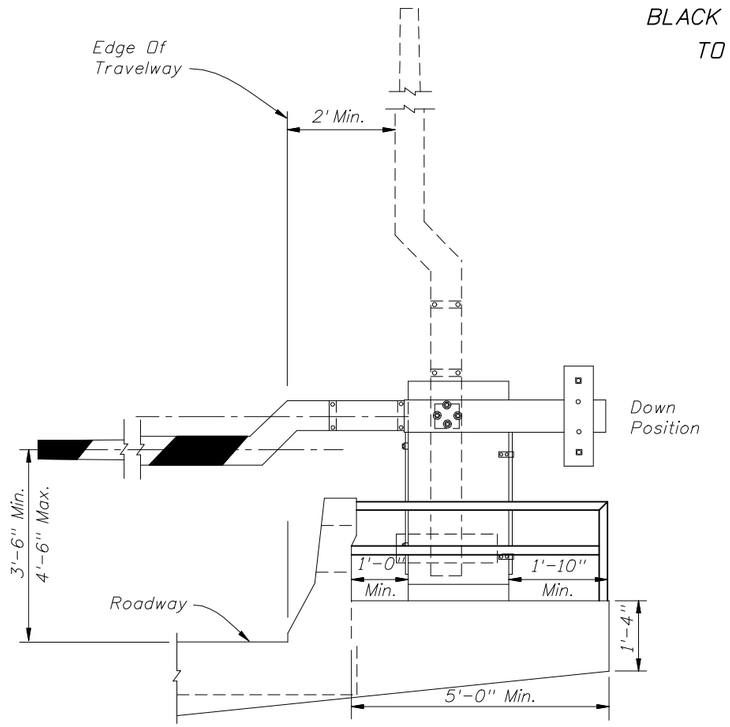
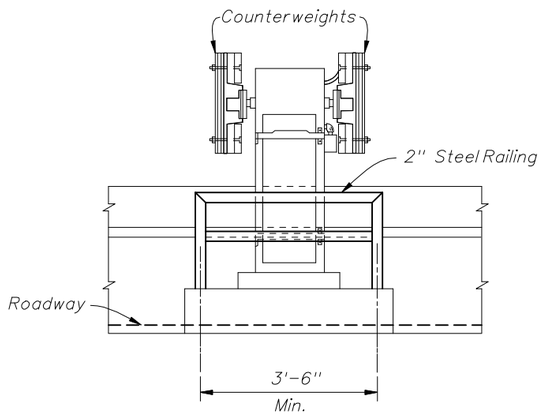


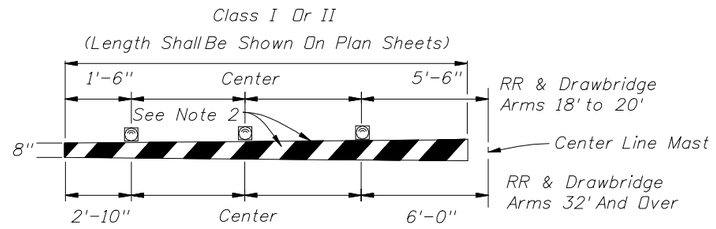
5'x 2'-6"
2" Border-4" Radius
6" Series "D" Letters

BLACK OPAQUE LEGEND AND BORDER ON REFLECTORIZED YELLOW BACKGROUND
TO BE USED WITH TYPE I OPERATION, AS SHOWN ON PREVIOUS SHEET
MONOTUBE SUPPORT MOUNTING





GATE & ARM DETAIL



NOTES:

1. 12 volt flashing red lights shall be mounted on gate arm and shall operate in the flashing mode only when gate arm is in the lower position or in the process of being lowered. The number of lights shall vary accordingly to length of the gate arm.
2. 16" alternate diagonal fully reflectorized red and white stripes.

TYPICAL LAMP PLACEMENT

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