

DESIGN STANDARDS

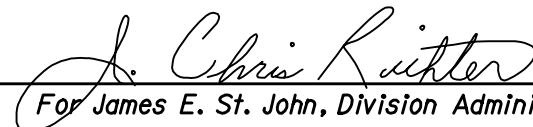
FOR DESIGN, CONSTRUCTION, MAINTENANCE AND UTILITY
OPERATIONS ON THE STATE HIGHWAY SYSTEM

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ENGLISH UNITS

Approved For Use On Federal Aid Projects


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**Revisions
Design Standards
2004**

TABULATED CHANGES

The changes tabulated below principally address functional changes in the standard drawings (indexes) since publication of the 2002 booklet. The items below are keyed to what is shown on the index sheets of this 2004 booklet. This approach is taken to diminish complexities that can arise when trying to compare line items of the two booklets and those of the multiple issues of special provisions and interim indexes that were produced to update the 2002 booklet.

Where a change has been applied to a feature that is common on more than one of the sheets within the same index, or within a series of indexes with a common function, the change will not be repeated in most cases; however, such sheets will indicate a 2004 revision date.

Index Number	Sheet Number	Description	Index Number	Sheet Number	Description
001	1 of 2	Revised or added the following abbreviations: "BCWE", "BLON", "CC", "CPT", "DFE", "DPI", "FL", "HW" and "LOS".	233	1 of 1	"GENERAL NOTES" - Note 1 revised.
	2 of 2	Added "NAVD", "SPT" and "TDL" abbreviations.	234	1 of 1	"GENERAL NOTES" - Note 1 revised.
199	1 of 1	The values expressed as force (N) changed to "kN" and "kN/m" values.	241	1 of 1	New Index- "SKIMMERS FOR FRENCH-DRAIN OUTLETS".
200	2 of 2	"WALL DESIGNS-RECTANGULAR STRUCTURES"-The "size" note at the bottom removed and incorporated to "GENERAL NOTES" -"I. SIZE is the inside dimensions(s) of a structure."	250	1 of 2	"STANDARD LOCATION CONTROL"- Detail and notations revised. "ENDWALL POSITIONS FOR SINGLE AND MULTIPLE PIPE AND SPACING FOR MULTIPLE PIPE"- "TOP VIEW"(s)-Location reference revised. "ENDWALL DIMENSIONS (EXCLUSIVE OF MULTIPLE PIPE SPACING)-Location reference deleted.
201	1 of 6	"COVER FOR ALL FRAMES"- "BOTTOM VIEW"-Underside cover identification number revised. "NOTES (FRAMES AND COVER)"- Note 1 and 2 revised.		2 of 2	Table-"ROUND CONCRETE AND CORRUGATED METAL PIPE" -Estimated quantities for "Double", "Triple", and "Quadruple"-Metal-54" pipe revised.
	2 of 6	"SUMP BOTTOM"- "NOTE:"-Notation revised.	251	1 of 2	"GENERAL NOTES"- Note 6 revised.
	3 of 6	"UTILITY PIPES THRU STORM SEWER STRUCTURES" -Details removed and placed on Index No. 307. A "Flag" notation was placed to reflect the removal of the details.	252	1 of 2	"GENERAL NOTES"- Note 6 revised.
	4 of 6	"DITCH BOTTOM INLET TYPE B"- "Partial Section BB" -Changed dimension to 3'-10".	253	1 of 2	"GENERAL NOTES"- Note 6 revised.
205	1 of 5	Changes to be consistent with the latest AASHTO Standard Specification for Highway Bridges-Tables- 1. "RIGID PAVEMENT"- table "CONCRETE"- "Round & Elliptical" changed the value from 6" to 9". "FLEXIBLE PAVEMENT"- table "CONCRETE"- "Round & Elliptical" changed the value from 6" to 7". "UNPAVED"- table "CONCRETE"- ROUND & ELLIPTICAL" Changed the value from 9" TO 12".	255	1 of 1	"GENERAL NOTES"- Note 6 revised.
	3 of 5	"Notes:"- "NS" notation revised to include HS-20 design loads.	272	6 of 6	"GENERAL NOTES"- Note 6 revised.
	4 of 5	"Notes:"- "NS" notation revised to include HS-20 design loads.	273	6 of 6	"GENERAL NOTES"- Note 4 revised.
206	1 & 2 of 2	New Index-"TRENCH DRAIN".	280	1 of 4	"CONCRETE JACKET FOR CONNECTING DISSIMILAR TYPES OF PIPE AND CONCRETE PIPES WITH DISSIMILAR JOINTS"- Revised notations to detail. "DETAIL OF BELL & SPIGOT CONCRETE PIPE JOINT USING ROUND OR PROFILE RUBBER GASKET"- dimensional values revised.
210	1 of 1	"GENERAL NOTES"- Note 7 revised.	282	1 of 1	All references to handrail modified.
211	1 of 2	"GENERAL NOTES"- Note 1, 7 and 8 revised. "SECTION QQ" and "SECTION PP"- Details revised.	285	1 of 2	"STANDARD CROSS SECTION"-Changed the depth notation of rock below the pipe and "LONGITUDINAL SECTION"- revised notation to clarify use of sump and weep hole. "GENERAL NOTES"- Note 9 deleted and "GENERAL NOTES"-renumbered.
212	1 of 1	"GENERAL NOTES"- Note 1 revised.	301	1 of 1	"DESIGN NOTES"-notation revised. Table-"RURAL CONDITIONS"-values revised.
213	1 of 1	"GENERAL NOTES"- Note 1 revised.	304	1 of 5	"GENERAL NOTES"-Note 3, paragraph 1, sentences 3 and 4 deleted. Note 5-Tactile surface references deleted and detectable warning requirements substituted. Notes 6, 7 & 9: Renumbered 7, 8 & 9: New Note 6 inserted. "DESIGN NOTES" added. In all views Tactile surfaces replaced with detectable warnings. "CURB RAMP DETECTABLE WARNING" detail added. "LINEAR SIDEWALK RAMPS" detail added.
214	1 of 1	"GENERAL NOTES"- Note 1, 2 and 8 revised.		2 thru 5	All "tactile surfaces" references removed and "detectable warning" added.
215	1 of 1	"GENERAL NOTES"- Note 1, 2 and 8 revised.	305	1 of 4	"TRANSVERSE JOINTS"-Table revised.
216	1 of 3	"DESIGN NOTES"- Note 1 and 2 revised.	306	1 of 1	"PLAN VIEW"-revised slab length 20' to 15' and 40' to 30'.
	2 of 3	"HANDRAIL FOR FLUME IN SIDEWALK"-Notations "Index No. 520" deleted and "See Plans For Handrail Requirements" replaced. "6" add to Toewall notation.	307	1 of 3	Sheet "NOTES", "GENERAL NOTES" and "title" revised.
217	1 of 1	"GENERAL NOTES"- Note 2 revised.		2 of 3	New Sheet-Details were transferred from Index No. 201 sheet 3 of 6 and revised.
218	1 of 2	"GENERAL NOTES"- Note 1 revised.		3 of 3	New Sheet- Details were transferred from Index No. 201 sheet 3 of 6 and revised.
219	1 of 2	"GENERAL NOTES"- Note 5 revised.	310	1 of 2	All "tactile surfaces" references removed and "detectable warning" added. "SECTION AA"-plan view removed.
220	1 of 2	"GENERAL NOTES"- Note 1 revised and Note 6 added.		2 of 2	"NOTES FOR CONCRETE SIDEWALKS ON UNCURBED ROADWAYS"- Note 2 revised. "PLAN"- Details for continuous sidewalk and discontinuous included. All "tactile surfaces" removed from details and "detectable warnings" replaced.
221	1 of 1	"GENERAL NOTES"- Note 1 revised and Note 7 added.	400	1 thru 31	Former Sheet 13 deleted and sheet numbers revised.
230	1 of 1	"GENERAL NOTES"- Note 7 added.		1 of 31	"GENERAL NOTES"- Note 3 revised to included reference to new Index No. 402. Note 8 revised. Note 9 revised to include Index 402 reference and Index No. 410. Note 10 added and notes renumbered. Note 11 revised to include Index No's 402, 440 and 441.
231	2 of 2	"GENERAL NOTES"- Note 1 revised.		6 of 31	"Detail E" references deleted and "Index No. 402" reference substituted.
232	1 of 5	"GENERAL NOTES" - Note 1 and 2 revised.			

**Revisions
Design Standards
2004**

Index Number	Sheet Number	Description	Index Number	Sheet Number	Description	
400 Cont.	9 of 31	"Detail E" references deleted and "Index No. 402" reference substituted.	515	1 of 6	"SKETCH ILLUSTRATING DEFINITIONS"-Sidewalk removed.	
	10 of 31	"Detail E" references deleted and "Index No. 402" reference substituted.		5 of 6	"LIMITS OF CLEARING & GRUBBING, STABILIZING AND BASE AT INTERSECTIONS"- Shoulder dimensional notation added.	
	12 of 31	"PLAN" view, notation for "Thrie-Beam Terminal Connector" line five-Text "(3½" Min. Thread Length)" inserted after word "Bolts".	518	1 of 2	Labels "Edge Of Pavement" changed to "Edge Of Traveled Way".	
	13 of 31	"Detail E" reference deleted and "Index No. 402" reference substituted.	520	1 of 1	"GENERAL NOTES"-Note 2 revised.	
	15 of 31	"PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS"-Table- "Notes:"-text revised.	521	1 of 1	Index deleted.	
	16 of 31	"DETAIL Q" -"Sections"- Added the SRT/HBA-6 Post notation.	525	1 of 5	"THREE APPROACH LANES-TWO THRU LANES, DETAIL B", traffic directional arrow shown in recovery area (taper beyond nose)-Arrow deleted.	
	17 of 31	"5/8" OVAL SHOULDER BUTT HEAD BOLT"-Table, footnotes revised. Note above table title deleted. "HEX BOLTS AND NUTS"-Text revised.		2 of 5	"GENERAL NOTES"-Note 1 revised. Details renamed.	
	18 of 31	"GALVANIZED STEEL BACK-UP PLATES FOR CONNECTING SPECIAL END SHOES AND TERMINAL CONNECTORS TO CONCRETE BRIDGE TRAFFIC RAILING BARRIERS AND CONCRETE BARRIER WALLS"-Plates added.		4 of 5	Subtitle and header-Word "EXPRESSWAY" deleted and word "FREEWAY" substituted. Plan Views-Shoulder widths revised.	
	19 of 31	"SPECIAL STEEL GUARDRAIL POSTS"-NOTES:-Note 1 added for a reference to Index No. 402 and Structures Index Nos. 771 thru 777. Title changed to be "STEEL POST ONLY FOR REPLACEMENT OF EXISTING W8x18 GUARDRAIL POST ON APPROACH SLABS AND BRIDGES".	527	1-3 of 3	New Index-"DIRECTIONAL MEDIAN OPENINGS".	
	23 of 31	"Detail E" reference deleted and "Index No. 402" reference substituted.	528	1 of 1	New Index-"MEDIAN BARRIER OPENING FOR EMERGENCY ACCESS".	
	24 of 31	"ET 2000 NOTES"-Note 6 revised.	532	1 of 3	"GENERAL NOTES"- Note 7 revised.	
	27 of 31	"LET NOTES"-Note 6 revised.	544	1 of 1	"BASIC GOOD TREE PLANTING"-Detail removed. "TREE BARRICADE"-Notations and Details revised. "SHRUB PLANTING"- "CONTAINER GROWN PLANT" subheading removed. "PALM PLANTING" and "TREE PLANTING"- Details revised. "NOTES:"-Notes 3 and 4 added.	
	29 of 31	FLEAT -350-Post spacing modified.	546	1-6 of 6	New Sheets.	
	402	1 thru 26	New Index-"GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES".	560	1 of 1	Sheets 2 thru 5 deleted and Sheet 1 reformatted.
	410	1 of 22	"GENERAL NOTES"- Note 1 revised. Sectional Views- No. 4 rebars added in stem. "WALL FACE SAFETY SHAPES", "*" notation-1st paragraph of notation deleted.	600	600 Series	Throughout the 600 series replaced "edge of pavement" with "edge of travel way" where appropriate. Updated drawing(s) to show Type B lights placed on traffic side of sign. The 2002 Standard Sign Manual required updates to some sign numbers.
		5 of 22	"PLAIN CONCRETE BARRIER WALL (SHOULDER)"-"WALL OPTIONS"- Sectional Views- No. 4 rebars added in stem.	600	1 of 10	"CONTENTS"- deleted text "Variable Message Signs (VMS)" and "Temporary Curb". Added text "Length of Lane Closures", "Portable Changeable (Variable) Message Sign (PCMS)" and "Business Entrance". "PREFACE"- 2nd paragraph; delete text "665" substitute text "670". "ABBREVIATIONS"-deleted text "COMM Traffic Control Standards Committee" and "Variable Message Signs (VMS)". Added text "CFR Code Of Federal Regulations", "Portable Changeable (Variable) Message Sign (PCMS)", "MOTC Maintenance of Traffic Committee", "MAS Mortorist Awareness System" and "NCHRP National Cooperative Highway Research Program". Modify text TCZ Traffic Control Zone. "SYMBOLS" third line-delete text "Roadway". Deleted text "Variable Message Signs (VMS)" "Portable Changeable (Variable) Message Sign (PCMS)" substituted.
	413	1 of 1	New Index "PROPRIETARY TEMPORARY CONCRETE BARRIERS".		2 of 10	"Travel Way" definition redefined. "TEMPORARY TRAFFIC CONTROL DEVICES" paragraph added. "LENGTH OF LANE CLOSURES" added.
	415	1 thru 10	Index reformatted. All sheets new or revised.		3 of 10	"HIGH-VISIBILITY CLOTHING"- Text revised. "HAND SIGNALING DEVICES"- Text "26 inches" deleted and text "24 inches" substituted. "FLAGGING STATIONS"- Last sentence "should" replaced by "shall".
	416	1 of 6	"GENERAL NOTES"-Note 10 revised. "SUPPLEMENTAL GENERAL NOTES FOR THE TRITON BARRIER", Note 7 revised.		4 of 10	"SIGN COVERING AND INTERMITTENT WORK STOPPAGE SIGNING"-Line 8-text "and sign blanks" deleted. Line 9-text "blanks" deleted. "SIGNING FOR DETOURS, LANE SHIFTS AND DIVERSIONS"- "MOT-2" and "MOT-3" text deleted and "MOT-2-04" and "MOT-3-04" substituted.
	5 of 6	"GENERAL NOTES"-Note 7 revised.		5 thru 7	Index 600 Sheets 5 thru 7 are renumbered.	
	6 of 6	New Sheet-"YODOCK LONGITUDINAL TRAFFIC BARRIERS" added.		5 of 10	New Sheet -"PLACEMENT OF BUSINESS ENTRANCE SIGNS AND WORK ZONE DEVICES AT BUSINESS ENTRANCE".	
435	1 of 6	"BAY SELECTION GUIDELINES"-Table, last row "*" notation added.		6 of 10	"PORTABLE MESSAGE SIGNS (VMS)"- Heading revised to "PORTABLE CHANGEABLE (VARIABLE) MESSAGE SIGN (PCMS)" and text abbreviations substituted. "WARNING LIGHTS"- 1st sentence revised and "Flashing"- "TYPE B"-Last sentence added. "MANHOLES/CROSSWALKS"-Text "½" deleted and text "¼" substituted.	
	3 of 6	"ASPHALTIC CONCRETE FOUNDATION"-Plan detail deleted.		7 of 10	Chart "DROPOFF PROTECTION REQUIREMENTS"-Deleted text "W8-9A" substitute text "W8-9A". "DROPOFF NOTES"-Note 3-text "Temporary Curb" removed. "TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING"- Notes 2 and 5 revised. Dropoff detail revised.	
441	1-8 of 8	New Index-Crash Cushion-"TAU-II".		8 of 10	Note 10 #2 first sentence- text "1 Mile" deleted text "2 Miles" substituted.	
451	1 of 2	"GENERAL NOTES"-Notes 5, 6c and 15 revised.		9 of 10	Completely revised. Signs were removed from the index that have been detailed in the Standard Highway Signs Manual. Signs were rearranged. FTP numbers were changed and new Signs were added.	
452	1 of 2	"GENERAL NOTES"-Note 6 revised.		10 of 10	Sheet details, notations and notes all revised to clarify use of RPM's in lieu of temporary tape or paint in work zones.	
453	1 of 1	"GENERAL NOTES"-Note 4 added.				
501	1 of 8	"GENERAL NOTES"-Note 2 revised.				
	2 of 8	Added Detail "REINFORCED EMBANKMENT". "GEOSYNTHETIC REINFORCED FOUNDATIONS CONSTRUCTED ON SOFT SOILS"- Detail revised.				
	3 thru 8	Tables revised.				
505	1 of 3	"FLEXIBLE PAVEMENT"- "*" Notation revised. "DESIGN NOTES"-Note 1 revised. Note 2 added.	602	1 of 1	Notation referring to the placement of cones at the "Work Area", line three text "25'" deleted and text "250'" substituted.	
	2 & 3	Sheet Nos. 2 & 3 reversed order.				
	2 of 3	"RIGID PAVEMENT-TREATED PERMEABLE BASE OPTION"- "*" Notation revised.				
	3 of 3	"RIGID PAVEMENT-SPECIAL SELECT SOIL OPTION"- "*" and Notations revised. "*" Notation deleted. Flagged note added.				

**Revisions
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Index Number	Sheet Number	Description	Index Number	Sheet Number	Description
606	1 of 1	Deleted "SPEEDING FINES DOUBLED WHEN WORKERS PRESENT" signs and updated the spacing.	17344	5 of 6	Reference to Amber lens changed to Yellow Lens.
611	1 of 1	Note 6- "Widths of lateral transition in feet. "Text "8' " Minimum added to note. "CONDITIONS" -Text "FOR A PERIOD OF 60 MINUTES OR GREATER" deleted.	Cont.	6 of 6	FTP Sign Numbers revised and reference to Amber Lens changed to Yellow Lens.
612	1 of 1	Upper right hand drawing, mark "L/2 "-deleted and "L" substituted.	17345	1 of 4	RPM's- "Colorless-Red" changed to "White-Red" and "Amber-Red" and changed to "Yellow-Red".
619	1 of 1	New Index-"WORK OUTSIDE THE TRAVEL WAY URBAN AREAS".		2 of 4	RPM's- "Colorless-Red" changed to "White-Red" and "Amber-Red" and changed to "Yellow-Red".
627	1 of 1	Updated drawing and notes to clarify sign and vehicle placement.		3 of 4	RPM's-"Colorless "Red" changed to "White-Red" and "Amber-Red" and changed to "Yellow-Red". Reference to 30'-10' skip changed to 10'-30' skip. "TYPICAL LANE DROP MARKINGS AT EXIT RAMPS"-Detail revised. "WRONG WAY ARROW"-Detail deleted and "TYPICAL MARKINGS AT DUAL LANE EXITS"-Detail added.
628	1 of 1	"SYMBOLS"- Revised. Plan detail-cone symbols removed and replaced with "Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only)" symbols.		4 of 4	RPM's- "Colorless-Red" changed to "White-Red" and "Amber-Red" changed to "Yellow-Red". "WRONG WAY ARROW"-Detail added.
642	1 of 1	"GENERAL NOTES"-Note 1 deleted.			
650	1 of 2	"PHASE II"- Added "SLIPPERY WHEN WET" sign.	17346	1 of 13	RPM's- "Amber-Red" changed to "Yellow-Red". "TYPES OF PERMANENT LONGITUDAL LINES."- 3'-9' skip added.
	2 of 2	"GENERAL NOTES", Note 4, Line 3, text "detour"-Text deleted and text "diversion" substituted.		2 of 13	"TYPICAL CROSSWALK MARKINGS FOR CURB RAMPS"- Details revised. "TWO WAY LEFT TURN LANE"-32' dimension between pavement arrows changed to 12'. Removed "MUTCD" reference note. "SIGNING FOR MOVEABLE AND NON-MOVEABLE BRIDGES WITH STEEL DECK"-W8-5 sign added.
660	1 of 1	Deleted existing Pedestrian Cross Walk Signs, substituted new Pedestrian Cross Walk signs."GENERAL NOTES"-Notes revised to accommodate ADA requirements.		4 of 13	"MEDIAN WIDTHS 30" AND GREATER" -Detail revised.
670	1 of 1	Updated description of "VMS" to "PCMS".		5 of 13	"RIGHT ROADWAY CENTERED ON EXISTING ROADWAY"-W6-2 Sign corrected.
700	1-2 of 2	New Index - "ROADSIDE OFFSETS".		6 of 13	"NOTES"- Note 4 revised.
9535	1 of 3	"GENERAL NOTES"- "STEEL BOLTS, NUTS, & WASHERS"- Note revised.		10 of 13	"PAVEMENT MARKING FOR PUBLIC SIDEWALK CURB RAMPS IN REST AREAS"-FTP numbers changed.
	2 of 3	"BOLT KEEPER WASHER DETAIL"- (0.0418") changed to 0.02". "SHIM DETAIL"- (0.0149") changed to 0.02", (0.0329") changed to 0.032" and additional dimensions added. "ALTERNATE BOLT KEEPER WASHER" (0.0164") changed to 0.02". "FOUNDATION DETAIL"- (W5.0) changed to W5.5. Sizes in chart changed under J, M1, M2, D2, R, t3, and Reinforcing Bars "V". NOTE: revised.	17351	1 of 2	FTP sign numbers revised.
	3 of 3	"BOLT KEEPER WASHER"- detail(0.0418") changed to 0.0149". "ALTERNATE BOLT KEEPER DETAIL" (0.0164") changed to 0.0149". FOUNDATION DETAIL (W5.0) changed to W5.5. Sizes in chart changed under D, t1, t2, Reinf Bars V and M. "*" - notation revised.	17352	1 of 2	"RPM's"- "Amber" changed to "Yellow". Colorless changed to "White".
11860	1-4 of 4	New sheet 4 added to index.		2 of 2	"RPM PLACEMENT FOR TRAFFIC CHANNELIZATION AT GORE"-RPM's moved inside the 8" solid white line and "NOTE"- changed to read "inside" of line. "PLACEMENT OF RPMS ON SHOULDER MARKINGS" and "PLACEMENT OF RPM'S AT INTERSECTIONS"-RPM's moved inside the 8" solid white line and "RPM's" - "Amber" changed to "Yellow". Colorless changed to "White".
	1 of 4	NOTE revised.			
	2 of 4	"GENERAL NOTES"- "GENERAL SPECIFICATIONS"- 1999 date removed.	17355	1-10 of 10	Completely Revised. Signs detailed in the Standard Highway Signs Manual were removed from the index. Signs were rearranged. FTP numbers were changed and new Signs were added. The number of sheets in the index was reduced from 14 to 10.
	4 of 4	New sheet added to Index No. 11860.	17357	1 of 1	FTP numbers updated. Notes 1 and 3 revised.
11861	1 of 1	Original Sheet 1 of 2 transferred to Index 11860. "NOTES"-Added.	17359	1 of 1	RPM's "INSERT A" and "INSERT B"- "Colorless"-changed to "White" and "Amber" changed to "Yellow". Note 6 added.
11862	1 of 1	Original Sheet 1 of 2 transferred to Index 11860. "NOTES"-Added.	17501	1 of 1	Notes 1 and 9 revised.
11863	1 of 1	Original Sheet 1 of 2 transferred to Index 11860. "NOTES"-Added.	17502	2 of 4	"POLE SPECIFICATIONS"-Paragraph 2 revised.
11864	1 of 1	Original Sheet 1 of 2 transferred to Index 11860. "NOTES"-Added.	17503	1 of 1	Minimum PSI changed from 2500 to 3000. Reinforcing steel changed from "Grade 40 or 60" to "Grade 60" completely revised. "METAL POLE CONCRETE FOUNDATION DETAIL"-Table- "NOTE"- Added.
11865	1 of 2	"NOTES"-Notes 1d and 4 revised. Dimensions under "SIGN MOUNTING USING CHANNELS OR SQUARE TUBES (DETAIL A, and B)" revised.	17515	1 of 7	"ELEVATION" drawing revised. "ALUMINUM LIGHT POLE NOTES"- Note 1 and 15 revised.
	2 of 2	"SIGN ATTACHMENT DETAIL"- Bearing plate removed. "PERPENDICULAR" added to "SIGN ATTACHMENT DETAIL" title. Sheet completely rearranged.		2 of 7	"ARM ELEVATION"-Drain hole, connection extrusion and bolt notations revised. "ARM TUBE EXTRUSION NOTES:" revised.
13417	1 of 1	12" max spacing added to "SECTION AA". "GENERAL NOTES"- "DESIGN SPECIFICATION:" "latest" text removed. "SHEETS AND PLATES:" 11200 changed to 1200. "ALUMINUM BOLTS, NUTS & LOCK WASHERS:" -ASTM designations revised. "MATERIAL STRESSES:"-note removed.		3 of 7	"POLE BASE ELEVATION" fillet weld notations revised.
17328	1 of 1	FTP Sign numbers revised.		5 of 7	"NOTES"-Note 2 added.
17344	1 of 6	Reference to sheet 9 of 13 changed to Sheet 2 and 7.		6 of 7	"NOTES"-Note 2 added.
	2 of 6	FTP Sign numbers revised and sign S5-1 updated.		7 of 7	"NOTES"-Note 2 added.
	3 of 6	FTP Sign numbers revised and FTP-31-04 updated.			
	4 of 6	FTP Sign Numbers revised and FTP-33-04 and S5-1 updated.			

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Index Number	Sheet Number	Description
17600	1 of 3	Sheet completely revised.
	2 of 3	New sheet. Added call box behind guardrail.
17723	1 of 3	"STEEL STRAIN POLE NOTES"-Note 1- ASTM numbers and grades revised.
	3 of 3	"SECTION D-D"- "Full Penetration Weld" notation changed to "Partial Penetration Weld".
17725	1 of 1	1994 date removed from first note.
17740	1-2 of 2	Index deleted.
17741	1-2 of 2	New Index. "INSTRUCTIONS AND EXAMPLES FOR DESIGNERS AND FABRICATORS OF STANDARD MAST ARM "B" & "C" ASSEMBLIES.
17742	1-2 of 2	Index deleted.
17743	1-2 of 2	New Index. "COMPONENT DATA FOR STANDARD MAST ARM "B" ASSEMBLIES.
17744	1-2 of 2	Index deleted.
17745	1-5 of 5	New Index. "MAST ARM ASSEMBLIES"
17746	1 of 4	"MONOTUBE SIGNAL STRUCTURE NOTES"-Note 1-ASTM numbers changed. Note 10-" $\frac{3}{4}$ " " in diameter changed to " $1\frac{1}{2}$ " diameter".
	4 of 4	"SECTION E-E"- "Full Penetration Weld" notation changed to "Partial Penetration Weld".
17764	1 of 1	All Pedestrian Signal Assemblies revised.
17784	1 of 2	ADA Pushbutton substituted. All Pedestrian Signal Assemblies revised.
	2 of 2	FTP numbers changed. RIO-3b sign added.
17882	3 of 4	Note 3 deleted. Notes renumbered.
17890	1 of 3	Note 11 added. Slippery When Wet Sign (WB-5) added.
	2 of 3	"FIGURE-G"-Sign, size, legend and border note added.
17900	1 of 9	Note 3 deleted.
	2 of 9	Note 3 deleted.
	3 of 9	Backplane circuit modified.
	5 of 9	Axle Sensors Placement detail modified.
	6 of 9	Mounting height and offset note revised. Min offset revised to 13'.
	8 of 9	In detail "H"- "Six" changed to "Eight".
	9 of 9	In detail "E" -1A and 1B corrected to 2A and 2B.

A	Area or Amperes	circ.	Circumference	F	Fill, Farad	J	Joule
AAA	American Automobile Association	Ckt.	Circuit	F or Final	Final Quantity	JB	Junction Box
AASHTO	American Association Of State Highway Officials	Cl. or Clear	Clearance	F & I	Furnish & Install	Jct.	Junction
AAASHO	American Association Of State Highway And Transportation Officials	CL, C/L or E	Center Line	F to F	Face to Face	Jt.	Joint
ABC	Asphalt Base Course	CM	Concrete Monument	FA	Federal Aid or Fine Aggregate	K	Design Hour Factor or Kelvin
Abd.	Abandoned	CMB	Concrete Median Barrier	FAC	Florida Administrative Code	k	Kilo (prefix)
ABS	Acrylonitrile-Butadiene-Styrene Pipe	CMP	Corrugated Metal Pipe	FAP	Federal Aid Project	kg	Kilogram
AC, Ac.	Acre	CMPA	Corrugated Metal Pipe Arch	FC	Friction Course	kg/m	Kilogram Per Meter
AC or Asph. Conc.	Asphaltic Concrete	Co.	County or Company	FD	French Drain	kg/m ²	Kilogram Per Square Meter
Accel.	Acceleration	Col.	Column	Fdn.	Foundation	kg/m ³	Kilogram Per Cubic Meter
Act.	Actuated	Com.	Commercial or Common	FDOT	Florida Department Of Transportation	Kilo	One Thousand
ADA	The Americans With Disabilities Act	COMM	Committee or By Committee	FE	Floor Elevation	Kip	1000 Pounds
Adh.	Adhesive	Comp.	Composite	Fed.	Federal	km	Kilometer
Adj.	Adjust	Con.	Connect or Connection	Fert.	Fertilizer	km/h	Kilometer Per Hour
ADT	Average Daily Traffic	Conc.	Concrete	FES	Flared End Section	kn	Knot
AADT	Annual Average Daily Traffic	Const.	Construct or Construction	FETS	Flared End Terminal Section	kPa	Kilopascal
Agg.	Aggregate	Contrl.	Controller	FH	Fire Hydrant	ksi	Kips Per Square Inch
Ah.	Ahead	Cont.	Continuation	FWA	Federal Highway Administration	kV	Kilovolt
AISC	American Institute Of Steel Construction	Contr.	Contractor	Fig.	Figure	kVA	Kilovolt Ampere
Aif.	Alternate	Coord.	Coordinate	Fin.	Finish	kWh	Kilowatt-hour
Al.	Aluminum	Corr.	Corrugated	F.L. or FL	Flow Line	L	Length, Length Of Curve, Liter, Left
AM	12:00 Midnight Until 11:59 Noon	CP	Concrete Pipe	FL, Fl. or Fla.	Florida	2-L	Two-Lane
ANSI	American National Standards Institute	CPE	Corrugated Polyethylene Pipe	Flex.	Flexible	2LIW	Two-Lane One-Way
AOS	Apparent Opening Size	CPT	Cone Penetration Test	FNQ	Fuse (Type Slow Burn)	2L2W	Two-Lane Two-Way
Appl.	Applied, Application	CR	Control Radius or County Road	FOC	Fiber Optics Cable	LA or L/A	Limited Access
Apprh.	Approach	CRA	Clear Recovery Area	FPM or fpm	Feet Per Minute	lane km	Lane Kilometer
Approx.	Approximate	Crs. or Cse.	Course	FRP	Fiber Reinforced Pipe	Lat.	Latitude
ARTBA	American Road & Transportation Builders Association	CS	Curve To Spiral	FPS or fps	Feet Per Second	Lb.	Pound
Artf.	Artificial	CSP	Corrugated Steel Pipe	FR or Fr.	Frame	lb/sy	Pounds Per Square Yard
Asph.	Asphalt	CT	Clear Trunk	Frang.	Frangible	LBR	Limerock Bearing Ratio
Assem.	Assembly	Chvr.	Cantilever	Freq.	Frequency	LC	Long Chord
Assn.	Association	Chr.	Center	FS	Far Side	LEO	Law Enforcement With Flashing Lights And Radar
Assoc.	Associate, Association	CU or Cu	Copper	Ft.	Foot or Feet	Lgth.	Length
ASTM	American Society For Testing Materials	Culv.	Culvert	FTB	Floating Turbidity Barrier	Lin.	Linear
Attn.	Attention	Cwt.	Hundredweight	Furn.	Furnish	lm	Lumen
Attuatr.	Attenuator	CY	Cubic Yard	Fut.	Future	Lmrk.	Limerock
Aux. or Auxil.	Auxiliary	Cyl.	Cylindrical			LOS	Limit Of Clear Sight
Ave.	Avenue	CZ	Clear Zone			Loc., LO	Location
AWG	American Wire Gauge	D	Degree Of Curvature, Depth, Density, Distance, Diameter or Directional Distribution			LS	Length Of Spiral
AWS	American Welding Society			G	Giga or Gauss	LT	Left Turn
Az.	Azimuth	DA	Drainage Area or Deflection Angle	g	Gram or Gravity	Lt.	Left
B to B	Back to Back	DBH	Diameter At Breast Height	Galv.	Galvanized	Ltd.	Lighted or Limited
Baso.	Bascule	DBI	Ditch Bottom Inlet	Ga.	Gauge or Gage	Lum.	Luminaire
Bbl.	Barrel	Dbl.	Double	Ga. or Gal.	Gallon	L/W	Lightweight
Bd. or Bnd.	Bond or Bonded	DCS	Degree Of Curvature (Spiral)	Gar.	Garage	lx	Lux
BC	Boffle Cap or Bolt Circle	DD	Dry Density	GD	Gutter Drain	M	Mass, Middle Ordinate Length or Mega
B/C, B.C.	Back Of Curb	DDHV	Directional Design Hour Traffic	GIP	Galvanized Iron Pipe	m	Meter or Milli
BCCMP	Bituminous Coated Corrugated Metal Pipe Culvert	Decel.	Deceleration	GM	Gas Main	m ²	Square Meter or Meter Square
BCPA	Bituminous Coated Pipe Arch Culvert	Deg.	Degree	GP	Grade Point	m ³	Cubic Meter or Meter Cubed
BCPCMP	Bituminous Coated And Paved Corrugated Metal Pipe Culvert	Delin.	Delinators	Gr.	Grade, Guardrail or Grate	m ³ /m	Cubic Meter Per Meter
BCPPA	Bituminous Coated And Paved Pipe Arch Culvert	Demobl.	Demobilization	Gr. or Gro.	Gross	m/s	Meters Per Second
BCT	Breakaway Cable Terminal	Dept.	Department	GRC	Galvanized Rigid Steel Conduit	Mach.	Machine
BCWE	Base Clearance Water Elevation	Det.	Detour, Defection, Detectable	Grd.	Ground	Maint.	Maintenance
BE	Buried Electric	DFE	Design Flood Elevation	gross km	Gross Kilometer	Matl.	Material
Beg.	Begin	DGN or Dgn.	Design	Gr. Wt. or gr. wt.	Gross Weight	Max.	Maximum
Bif.	Bituminous	DHW	Design Hourly Volume	Gtr.	Gutter	MB	Median Barrier
Bk.	Back	DT	Ditch	Gy	Gray	MBM	Thousand (Feet) Board Measure
BL, BLC	Base Line, Base Line Control	DI	Drop Inlet	H	Henry	Med.	Median
Bldg.	Building	DIa. or D	Diameter	h	Hour or Hecto	Mega	One Million
Blkhd.	Bulkhead	Dim.	Dimension	ha	Hectare	Memb.	Member
BLON	Begin Length Of Need	Dist.	Distance	HAR	Highway Advisory Radio	MES	Mitered End Section
Blv.	Boulevard	Disp.	Disposal	HB	Hay Bales	Mess.	Message
BM	Bench Mark	DLS	District Location Surveyor	HC	Horizontal Clearance	Mfg.	Manufactured or Manufacturer
Bndry.	Boundary	DMM	Domestic Mail Manual	HD	High Density or Heavy Duty	MG	1000 Gallons
Bdr.	Border	DOT	Department Of Transportation	HD or Hd.	Head	MH	Manhole
Bot.	Bottom	DPI or D.P.I.	Ditch Point Intersection	Hdwl.	Headwall	MHW	Mean High Water
BP	Borrow Pit	Dr. or DR.	Drain, Drive or Design Review	HH	Heavy Hex	μ	Micro
Bq.	Becquerel	DR	Design Review	Hndrl	Handrail	Mi.	Mile
Br.	Bridge	Drv.	Driven	HOA	Hand/Off/Automatic	Micro	One-Millionth
Brg.	Bearing	Drwy.	Driveway	Horiz. or Hor.	Horizontal	Mid.	Middle
Brkwy.	Breakaway	DS	Design Speed	HP	High Pressure or Horsepower	Mil	One-Thousandth Of An Inch
BT	Buried Telephone Cable or Duct	DSL	Design Service Life	Hr.	Hour	Mil.	Military
Btfly.	Butterfly	Dwg.	Drawing	HS	High Strength	Milli	One-Thousandth
BW	Barbed Wire, Bottom Width or Both Ways	E	East or External Distance	Hse.	House	MIn.	Minimum or Minute
BO	Basin Outlet	e	Rate Of Super-elevation	Ht.	Height	Misc.	Miscellaneous
C	Cantilever Length, Cut, Colorless, Coulomb or Cycle Length	E to E	End to End	HW or H.W.	High Water or Hot Water	mL	Milliliter
°C	Degree Celsius	EA or Ea.	Each	Hwy.	Highway	MLW	Mean Low Water
C & G	Curb And Gutter	EB	Eastbound	Hyd.	Hydrant or Hydraulic	mm	Millimeter
CA	Coarse Aggregate	EI. or Elev.	Elevation	HZ	Hertz	Mobl.	Mobilization
Cap.	Capacity	Elast.	Elastomeric	I	External Angle (Delta), Interstate Interchange	Mod.	Modify or Modified
CAP	Corrugated Aluminum Pipe	Elec.	Electric	I	Intchg. or Ichg.	Mon.	Monument
Caps.	Capital Letters	Ellip.	Elliptical	IES	Illuminating Engineering Society	MOT	Maintenance Of Traffic
CASP	Corrugated Aluminized Steel Pipe	Embk.	Embankment	ID	Inside Diameter or Identification	MP	Mile Post
CATV	Cable Television	Emul.	Emulsified	IMC	Intermediate Metal Conduit		
CB	Catch Basin	Encl.	Enclosure	In.	Inch		
CBC	Concrete Box Culvert	Engr.	Engineer	Incl.	Incorporated or Including		
CBS	Concrete Box Structure	EOS	End Of Survey or Equivalent Opening Size	Incl. or Inc.	Included		
CC, C/C, C to C, or C.C.	Center to Center, Crash Cushion	Eq.	Equation or Equal	Ind.	Industry or Industrial		
CCEW	Center to Center Each Way	Equip.	Equipment	IP	Iron Pipe		
CD	Cross Drain	Esm.	Easement	IP	Installed		
cd	Candela	Est. or Estm.	Estimate	Install.	Installed		
Cem.	Cement or Cemetery	Est.	Establish or Established	Isct.	Intersection		
Cem'd.	Cemented	Etc. or etc.	Et Cetera (And So Forth)	Isl.	Island		
CFS	Cubic Feet Per Second	EW	Endwall	ITE	Institute Of Transportation Engineers		
Ch.	Channel	Ex.	Except, Example				
Chchg.	Channel Change	Exc. or Excav.	Excavation				
Chg.	Changeable	Exist.	Existing				
CI	Cast Iron	Exp.	Expansion				
CIP	Cast Iron Pipe	Ext.	Extension				
CIPL	Cast In Place	Exwy.	Expressway				
cir. or circ.	Circle or Circular						

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
STANDARD ABBREVIATIONS				
Names	Dates	Approved By 		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	1 of 2	001

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
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
LJ	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

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STANDARD ABBREVIATIONS






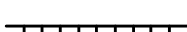


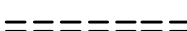








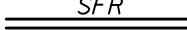








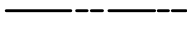
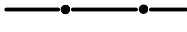
























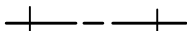



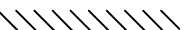

















































Names	Dates	Approved By		
Designed By			Roadway Design Engineer	
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	2 of 2	001

MPa	Megapascal
MPH or mph	Miles Per Hour
MSL	Mean Sea Level
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/m ²	Newtons Per Square Meter
N/m ³	Newtons Per Cubic Meter
N/mm ²	Newtons Per Square Millimeter
NA or N/A	Not Available or Not Applicable
N & C	Nail & Cap
NAVD	National American Vertical Datum
NB	Northbound
NC	National Coarse
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
NHW	Normal High Water
NIC	Not In Contract
NJ	New Jersey
N-m	Newton Meter
No.	Number
Nom.	Nominal
Norm.	Normal
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 P	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
Pr.	Pair
PRC	Point Of Reverse Curvature
Prcast.	Precast
Prest.	Prestressed
Prob.	Probability
Prod.	Product, Production, Producer or Produced
Prog.	Program or Progression
Proj.	Project or Projection
PRM	Permanent Reference Monument
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

Pr.	Pair
PRC	Point Of Reverse Curvature
Prcast.	Precast
Prest.	Prestressed
Prob.	Probability
Prod.	Product, Production, Producer or Produced
Prog.	Program or Progression
Proj.	Project or Projection
PRM	Permanent Reference Monument
Prov.	Provisions
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
Q	Peak Discharge or Flow Volume
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
RCP	Reinforced Concrete Pipe
RCPA	Reinforced Concrete Pipe Arch
Rd.	Road or Round
Rdsd.	Roadside
Rdwy.	Roadway
Rec.	Recovery
Rect.	Rectiline 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
RHW	Insulation (Moisture & Heat Resistant Rubber)
RW	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
R/W, ROW	Right Of Way
S or s	Speed, South, Seimens, 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
Secl.	Section
Sed.	Sediment
Sep.	Separator
Seq.	Sequential
Serv.	Service
SF	Adjustment Factor In Percent, Silt Fence
SG	Subgrade
SG or Sp.Gr.	Specific Gravity
Sh. or Sht.	Sheet
Shldr.	Shoulder
SHW	Seasonal High Water
Spa.	Space
Spag. 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
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.	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
T	Tangent, Length Of Curve, Percent Trucks, Tesla, Township
T, TWP or Twp.	T
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
Rd.	Telephone
Temp.	Temperature or Temporary
Traf.	Traffic
Theo.	Theoretical
THRMPLSTC	Thermoplastic
THW or THWN	Insulation (Flame Retardant, Moisture And Heat Resistant Thermoplastic)
Thick.	Thickness
TK	Thick, Thickness or Truck
Tn.	Ton
Trans.	Transition, Transverse, Translate or Transportation
Treat.	Treatment
TS	Tangent To Spiral
TSC	Length Of Tangent (Spiral Curve)
Typ.	Typical
Upass.	Underpass
UG	Underground
UL	Underwriters Laboratories
Ult.	Ultimate
Uld.	Unlimited
Uddr.	Underdrains
Undrwy.	Underroadway
UNL or Undl.	Unloaded
Untr.	Untreated
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
WB60	Tandem Semi Trailer
WM	Water Main
W.P.I.	Work Program Item
WT	Water Table Or Weight
WWF	Welded Wire Fabric
X	Coordinate Value (East-West Direction) or Extra
X Rd.	Cross Road
Xing.	Crossing
Xsec.	Cross Section
Y	Coordinate Value (North-South Direction)
Yr.	Year

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  Private Road  Streets In Inset Or Delimited Areas  Extension Of Local Roads Within Cities  Federal Aid Interstate Highway  Federal Aid Urban Highway  Federal Aid Primary Highway  Federal Aid Secondary Highway  National Forest Road  State Forest Road  State Park Road  Interstate Highway  US Numbered Highway  State Highway  County Road	 Free Ferry  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  Meandered Lake  Marsh Or Swamp  Mangroves  Levee Or Dike  Levee Or Dike With Road  Highway Bridge  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  Wayside Park Or Small Park  Park With Boat Ramp  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  Farmers Market  Game Preserve  Game Checking Station  Bird Sanctuary  Fire Control Headquarters  Lookout Tower  Fire Station  Patrol Or Police Station  Correctional Institution Or Road Camp  Department of Transportation Facility  Coast Guard Station  Armory  Junkyard  Sanitary Fill  Sewage Disposal Plant  Incinerator  Power Plant  Power Substation  Communications Facility  Locked Gate Or Fence  Triangulation Station
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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.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
STANDARD SYMBOLS				
	Names	Dates	Approved By	
Designed By			 Roadway Design Engineer	
Drawn By			Revision	Sheet No.
Checked By			00	1 of 3
			002	002

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
	18" SD Storm Drain
	Inlet
	Manhole
	Tied Longitudinal Joint
	Keyed Longitudinal Joint
	Doweled Transverse Expansion Joint
	Doweled Transverse Contraction Joint
	Transverse Contraction Joint Without Dowels
	Survey Reference Point
	Triangulation Station
	Bench Mark
	Point Of Intersection
	North Arrow
	Edges Of Existing Pavement And Sidewalk
	Guardrail
	Crash Cushion (Attenuator)
	Piling Pier Column
	Concrete Monument
	Base Line
	Centerline
	Property Line
	Delta Angle
	Approximate
	Round Or Diameter

	Curb
	Curb And Gutter
	Water Well, Spring
	Levee
	Railroad Mile Post
	Railroad Signal With Gate
	Railroad Switch
	Gate
	Pump Island
	Storage Tank (Surface)
	Storage Tank (Underground)
	Mine Or Quarry
	Borrow Pit
	Church
	Store
	Residence
	Barn
	School
	Hay Bales
	Silt Fence
	Floating Turbidity Barrier
	Staked Turbidity Barrier
	Stream
	Shore Line
	Marsh
	Wetland Boundary
	Hedge
	Trees
	Edge Of Wooded Area
	Shrubbery
	Grove Or Orchard
	Definition Of Skew For Cross Drains And Barrels Of Concrete Box Culverts
	Concrete
	Wood
	Rate Of Superelevation

UTILITY ADJUSTMENT SYMBOLS

	EXISTING	PROPOSED		EXISTING	PROPOSED	
			Manhole			Power Pole
			Fire Hydrant			Telephone Pole
			Meter (Type)			Combination Pole
			Valve (Type)			Guy Wire And Anchor Pin
			Valve Box (Type)			Guy Pole Deadman
			Valve Cover (Type)			Tower
			Vent (Type)			Light Pole
			Pump Station			Transformer
			Sewage Pump Station			Overhead Electric
			Cleanout			Overhead Telephone
			Cable TV Service Box			Overhead Cable Television
			Gas			Overhead Fiber Optic
			Water Main			Buried Electric
			Sanitary Sewer			Buried Telephone
			Buried Electric			Buried Cable Television
			Buried Telephone			Buried Fiber Optic
			Buried Cable Television			Casing
			Buried Fiber Optic			Duct
			Casing			Non Potable Water
			Duct			Petroleum
			Non Potable Water			Roof Drain
			Petroleum			Steam
			Roof Drain			
			Steam			

See General Note Sheet 1 Of 3.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
STANDARD SYMBOLS					
Designed By	Names	Dates	Approved By		
Drawn By	CDP	08/72	Revision	Sheet No.	Index No.
Checked By	COR	08/72	00	2 of 3	002

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)
		Walk - Dont Walk
		Flashing Dont Walk
		Signal Face Number
		Signal Lens
		Programmed Signal Head
		Messenger Wire
		Pole Tabulation Cross Reference
		Pole Tabulation Cross Reference (Joint Use Pole)
		Signal Phase

LIGHTING SYMBOLS

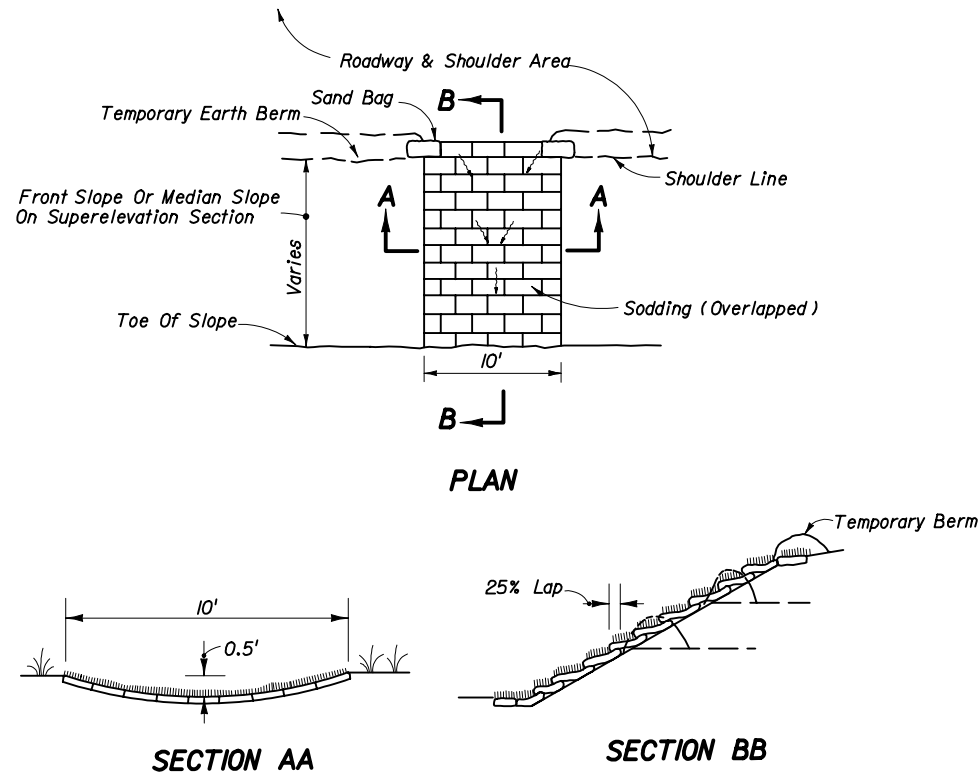
EXISTING	PROPOSED	
		Pole & Luminaire
		Existing Pole & Luminaire To Be Removed
		Final Position Of Relocated Or Adjusted Pole & Luminaire
		High Mast Lighting Tower
		City Or Utility Owned Luminaire & Pole
		PVC (Polyvinyl Chloride) Lighting Conduit And Conductors
		Rigid Galvanized Lighting Conduit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

SIGNING AND PAVEMENT MARKING SYMBOLS

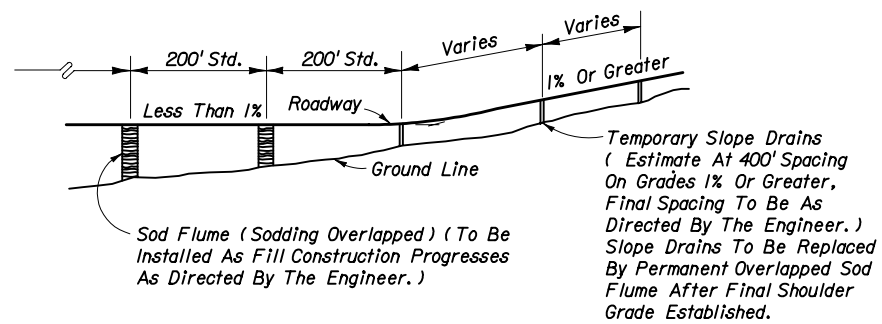
	Pavement Arrow
	Single Solid Line
	Double Solid Line
	Skip Line
	Stop Bar
	Traffic Sign (Post Mounted)
	Traffic Sign (Overhead)
	Sign Number
	Sign Item Number
	Traffic Flow Arrow

See General Note, Sheet 1 of 3

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
STANDARD SYMBOLS				
	Names	Dates	Approved By	
Designed By	CDP	08/72	Revision	Sheet No. 3 of 3
Drawn By	COR	08/72	Index No.	002
Checked By				

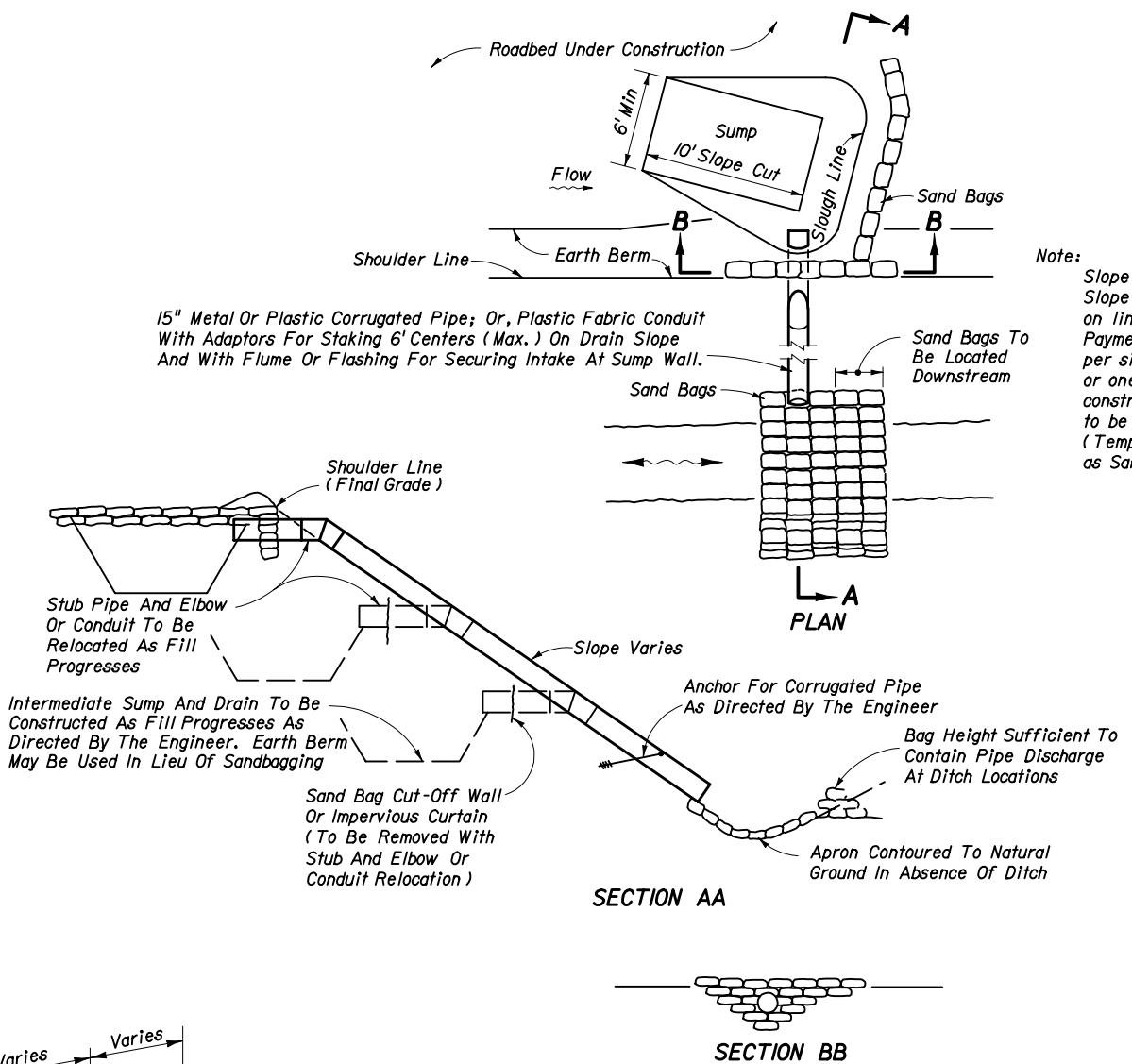


SOD FLUME (SODDING OVERLAPPED)



ELEVATION

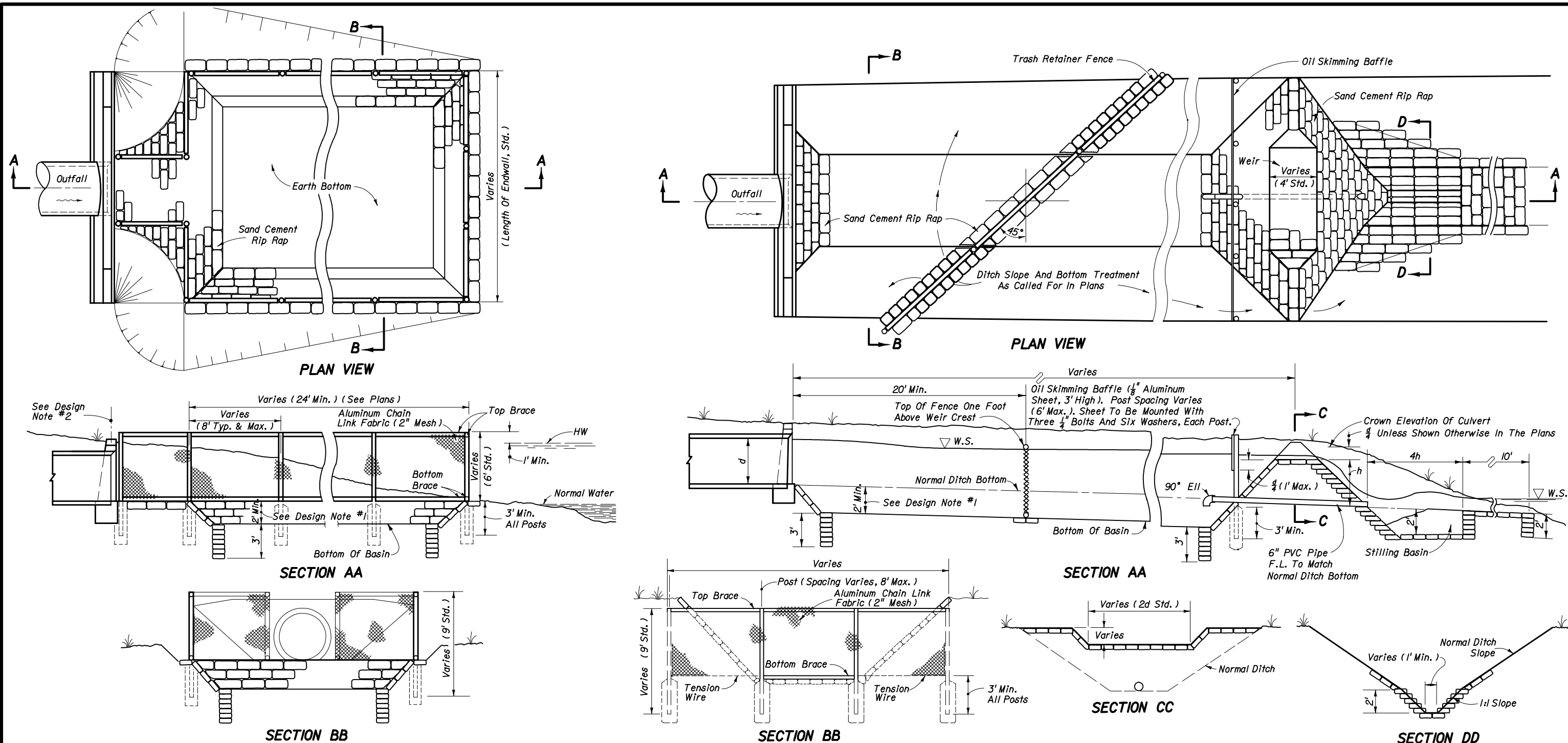
SLOPE DRAIN APPLICATION



Note:
 Slope drain pipe to be paid for as Slope Drains (Temporary) LF, based on linear feet of pipe or conduit installed. Payment to be made for one installation per site, including one stub and elbow or one intake flume or flashing. Sump construction and maintenance and curtains to be included in cost for Slope Drains (Temporary). Sand bags to be paid for as Sandbagging CY.

TEMPORARY SLOPE DRAIN

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY SLOPE DRAIN AND SOD FLUME				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	10/07/80	00	1 of 1	100



INTENDED FOR USE WHEN THE STORM SEWER OUTFALLS ADJACENT TO A SHORE LINE
TYPE A

INTENDED FOR USE WHEN THE STORM SEWER OUTFALLS IN AN OPEN DITCH
TYPE B

DESIGN NOTES

- Basins should be as deep as practical with a minimum depth of 2.0 feet.
- In Type A, when the top of endwall is below high water, fence also will be required along the top of the endwall.
- In Type B, the weir shall be located as far from the endwall as practical. On steep ditch grades two or more weirs may be required. Intermediate weirs shall be constructed without stilling basins.
- In Type B, the 6" PVC pipe shall be constructed unless shown otherwise in the plans.

GENERAL CONSTRUCTION NOTES

- Fence materials shall be aluminum or concrete only.
- Aluminum posts shall be 3" diameter minimum. Aluminum rail braces shall be in accordance with Index 452. Concrete posts and rail braces shall be in accordance with Index 451. All posts to be set in concrete.
- Fabric shall be installed to inside of posts and rail braces, and tied to posts and braces at 6" centers.
- For additional details on fencing, see Index Nos. 451 and 452.
- All basin slopes to be 1:1 unless detailed otherwise in the plans.
- Sediment basins to be constructed prior to commencement of upland construction. Maintenance and clean out to be by the Contractor until acceptance of project by the Engineer.

GENERAL NOTES

- The cost for Type A and Type B trash retainer and sediment basins shall include the cost for riprap, fencing, baffles, piping and for sump and weir earthwork over and above ditch excavation called for in the plans. Payment for both Type A Type B shall be under the contract unit price for Sediment Basins, Each. Cleanouts as called for in the plans shall be paid for under the contract unit price for Sediment Basin Cleanouts, CO.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRASH RETAINER AND SEDIMENT BASIN				
Names	Dates	Approved By		
Designed By	WJR	05/74	 State Drainage Engineer	
Drawn By				
Checked By	HLB	06/74	Revision	Sheet No.
			00	1 of 1
				101

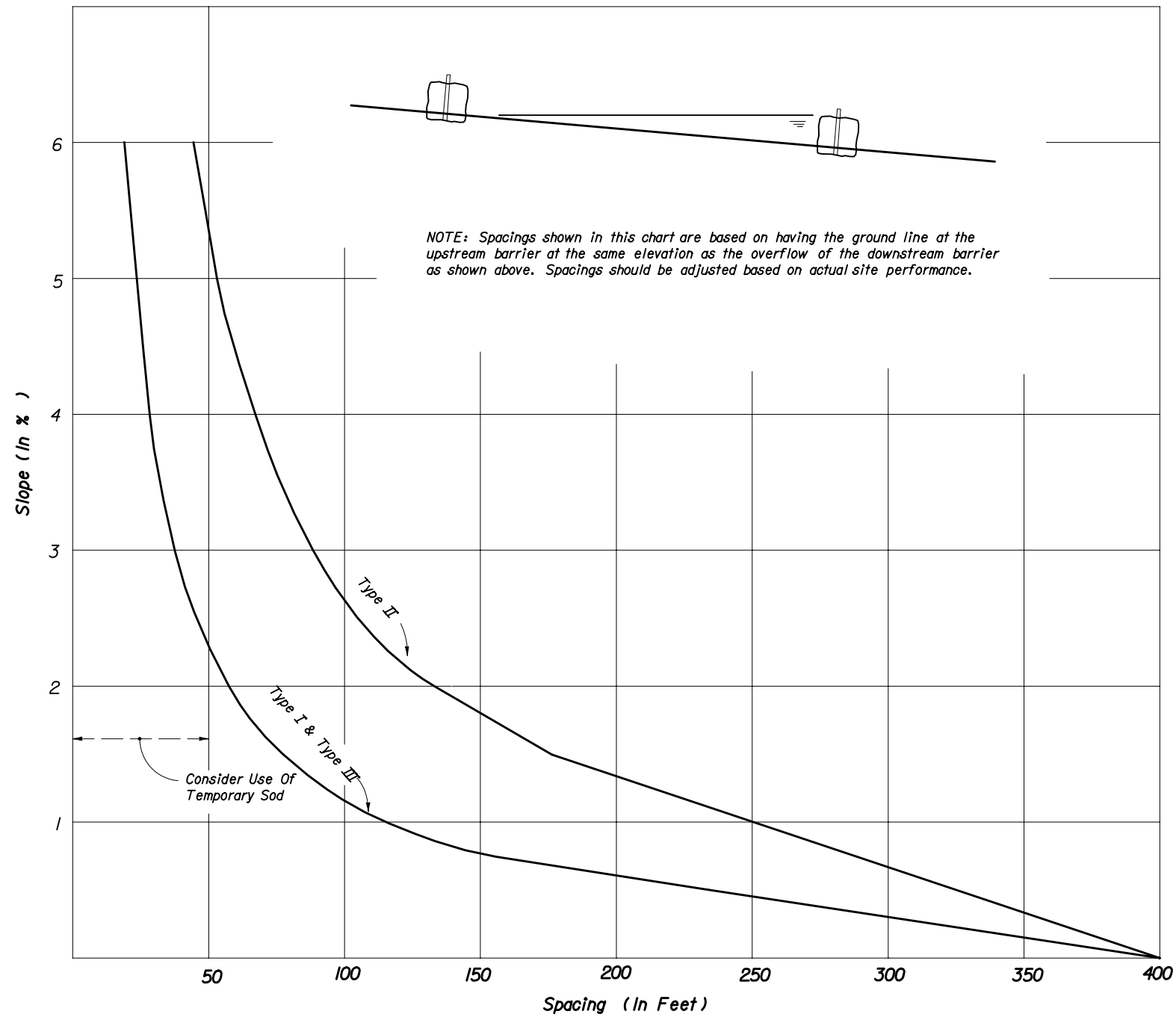
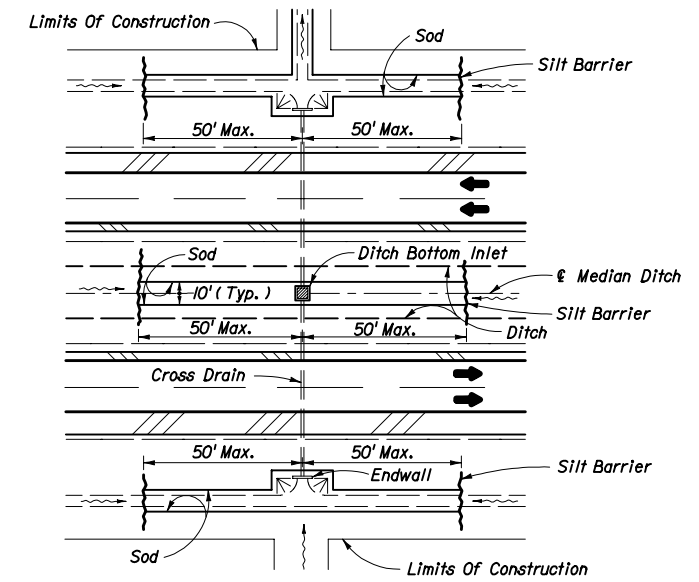


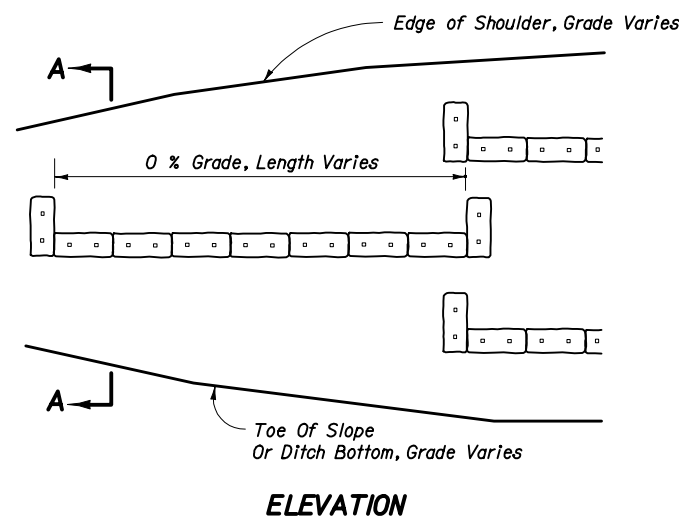
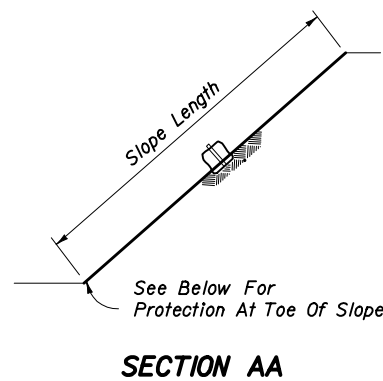
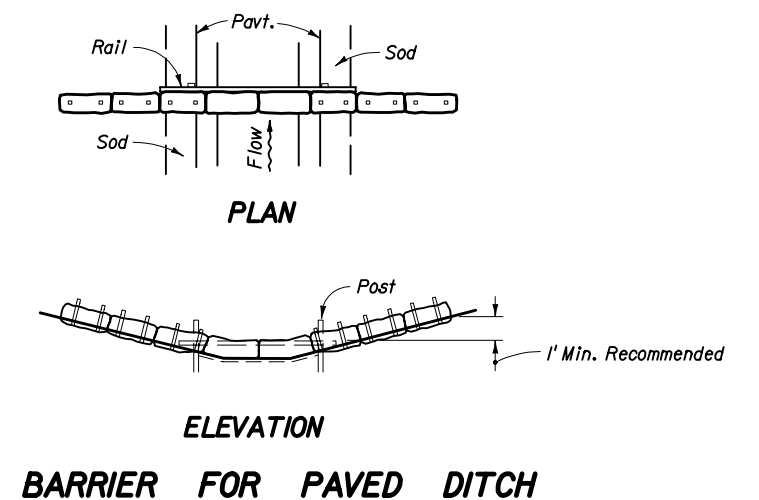
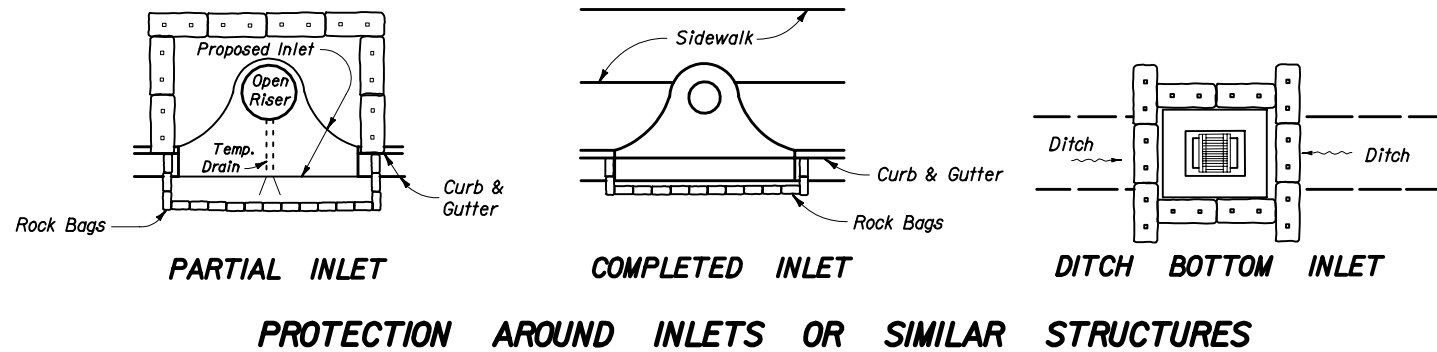
CHART I

RECOMMENDED SPACING FOR BALED HAY BARRIERS AND TYPE III SILT FENCE



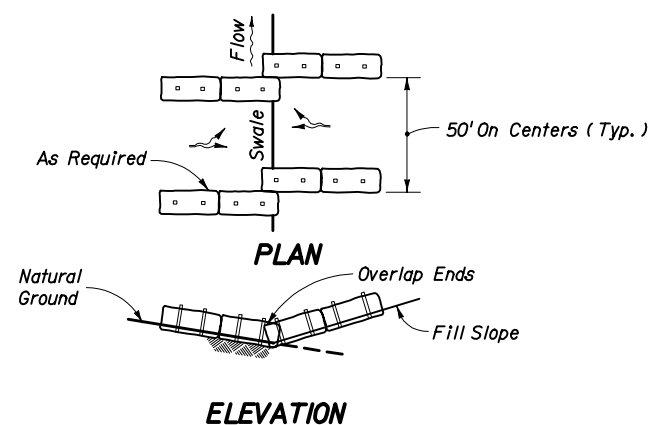
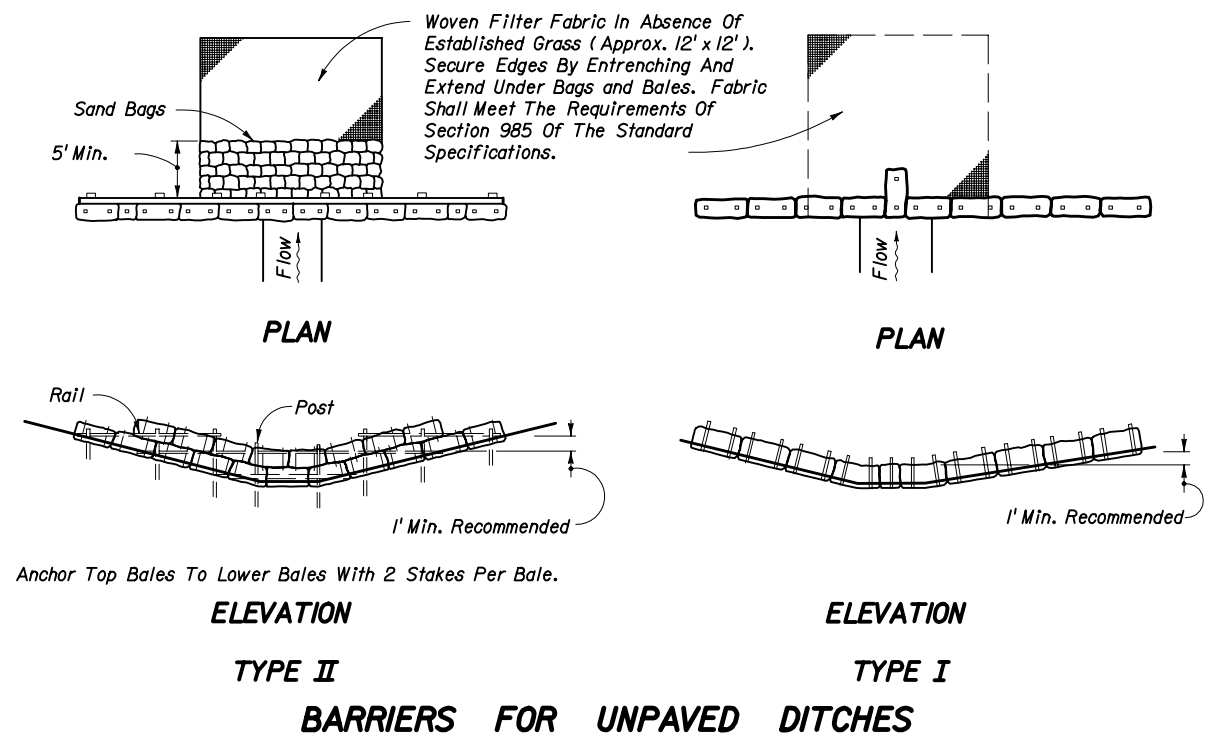
DITCH INSTALLATIONS AT DRAINAGE STRUCTURES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY EROSION AND SEDIMENT CONTROL				
Designed By	EGR	02/80	Approved By <i>[Signature]</i> State Drainage Engineer	
Drawn By	HSD	09/82	Revision	Sheet No. Index No.
Checked By	JVG	09/82	00	1 of 3 102

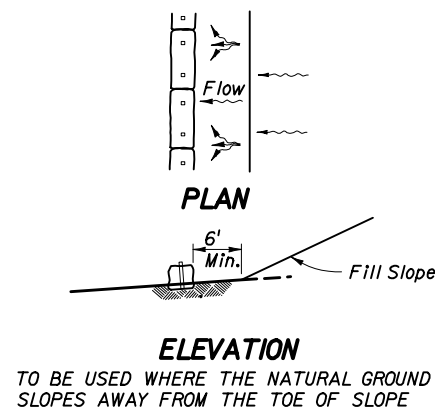


ALONG FILL SLOPE

Note:
Where the slope length exceeds 25 feet, construct one row of bale barriers at 0% longitudinal grade midway up the slope. Construct two rows of bale barriers where the slope length exceeds 50 feet.



TO BE USED WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF SLOPE



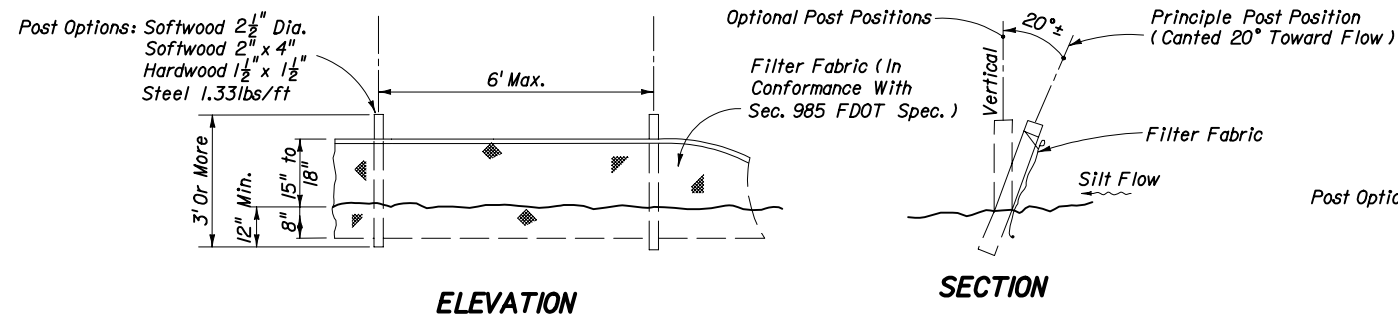
AT TOE OF SLOPE

BARRIERS FOR FILL SLOPES

NOTES FOR BALED HAY OR STRAW BARRIERS

1. Type I and II Barriers should be spaced in accordance with Chart 1, Sheet 1.
2. Hay bales shall be trenched 3" to 4" and anchored with 2 - 1" x 2" (or 1" dia.) x 4' wood stakes. Stakes of other material or shape providing equivalent strength may be used if approved by the Engineer. Stakes other than wood shall be removed upon completion of the project.
3. Rails and posts shall be 2" x 4" wood. Other materials providing equivalent strength may be used if approved by the Engineer.
4. Adjacent bales shall be butted firmly together. Unavoidable gaps shall be plugged with hay or straw to prevent silt from passing.
5. Where used in conjunction with silt fence, hay bales shall be placed on the upstream side of the fence.
6. Bales to be paid for under the contract unit price for Baled Hay or Straw, EA. The unit price shall include the cost of filter fabric for Type I and II Barriers. Sand bags shall be paid for under the unit price for Sandbagging, CY. Rock bags to be paid for under the contract unit price for Rock Bags, EA.

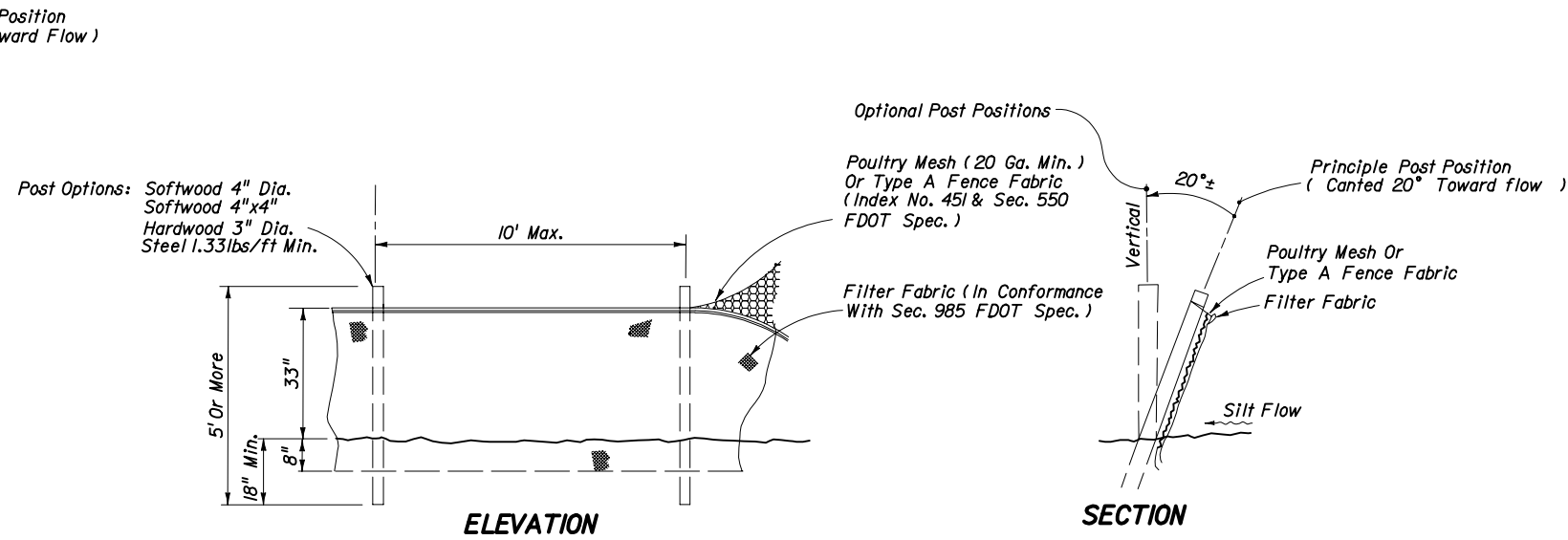
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY EROSION AND SEDIMENT CONTROL				
Designed By	Names	Dates	Approved By	
Drawn By	WJR	5/74	 State Drainage Engineer	
Checked By	HLB	6/74		
			00	2 of 3
				102



ELEVATION

SECTION

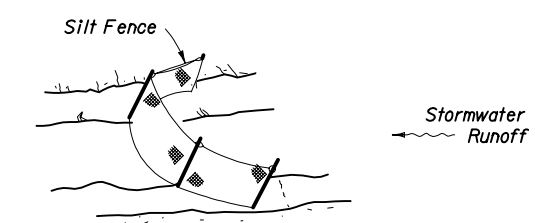
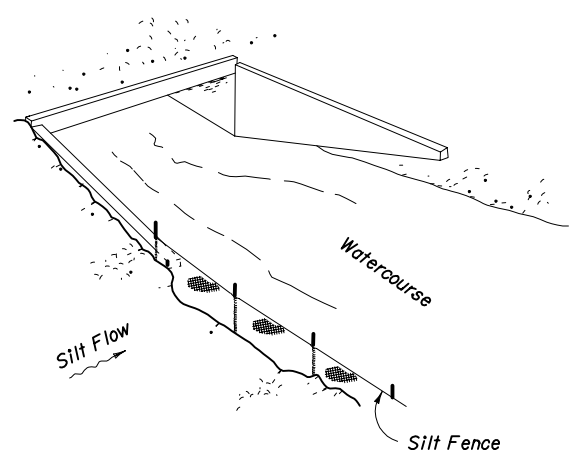
TYPE III SILT FENCE



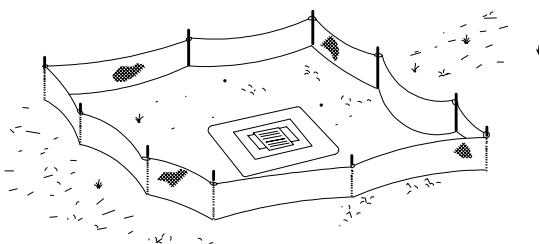
ELEVATION

SECTION

TYPE IV SILT FENCE

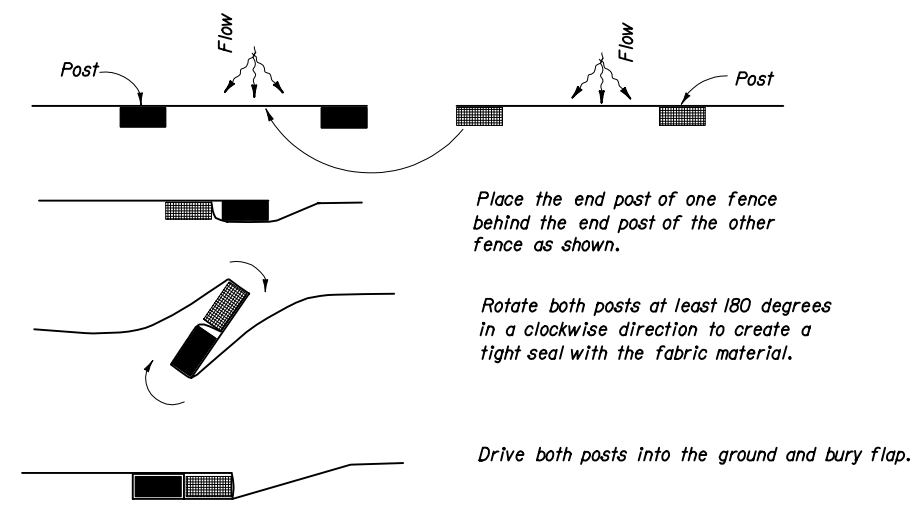


Silt Fence Protection in Ditches with Intermittent Flow



Silt Fence Protection Around Ditch Bottom Inlets.

SILT FENCE APPLICATIONS



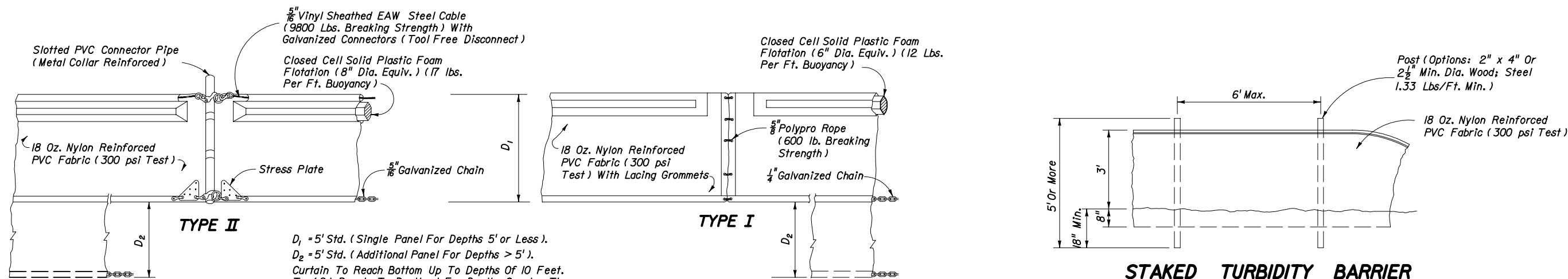
PLAN VIEW

JOINING TWO SILT FENCES

NOTES FOR SILT FENCES

1. Type III Silt Fence to be used at most locations. Where used in ditches, the spacing for Type III Silt fence shall be in accordance with Chart 1, Sheet 1.
2. Type IV Silt Fence to be used where large sediment loads are anticipated. Suggested use is where fill slope is 1:2 or steeper and length of slope exceeds 25 feet. Avoid use where the detained water may back into travel lanes or off the right of way.
3. Do not construct silt fences across permanent flowing watercourses. Silt fences are to be at upland locations and turbidity barriers used at permanent bodies of water.
4. Where used as slope protection, Silt Fence is to be constructed on 0% longitudinal grade to avoid channelizing runoff along the length of the fence.
5. Silt Fence to be paid for under the contract unit price for Staked Silt Fence, (LF).

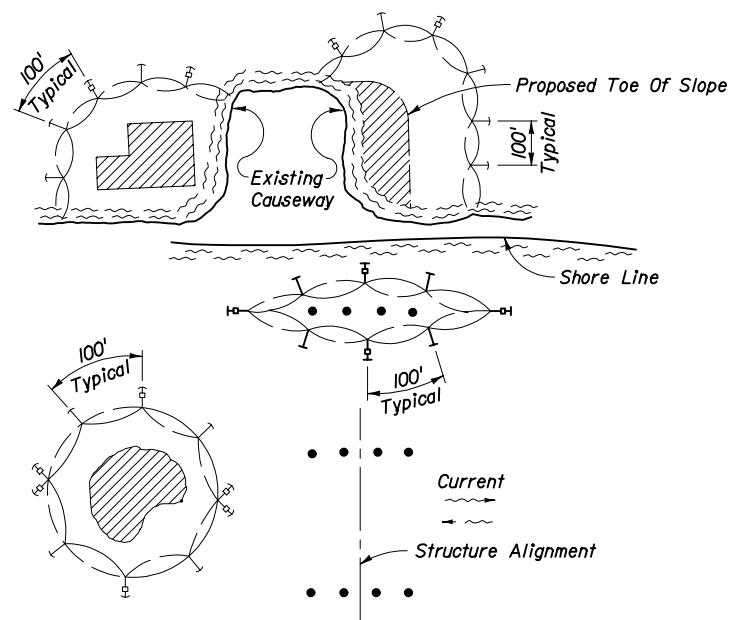
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY EROSION AND SEDIMENT CONTROL				
Designed By	RAA/CJA	Dates	09/85	Approved By
Drawn By	LRE	09/85	Revision	Sheet No.
Checked By	RAA	10/85	02	3 of 3
				Index No.
				102



$D_1 = 5'$ Std. (Single Panel For Depths 5' or Less).
 $D_2 = 5'$ Std. (Additional Panel For Depths > 5').
 Curtain To Reach Bottom Up To Depths Of 10 Feet.
 Two (2) Panels To Be Used For Depths Greater Than 10 Feet Unless Special Depth Curtains Specifically Called For In The Plans Or As Determined By The Engineer.

NOTICE: COMPONENTS OF TYPES I AND II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.

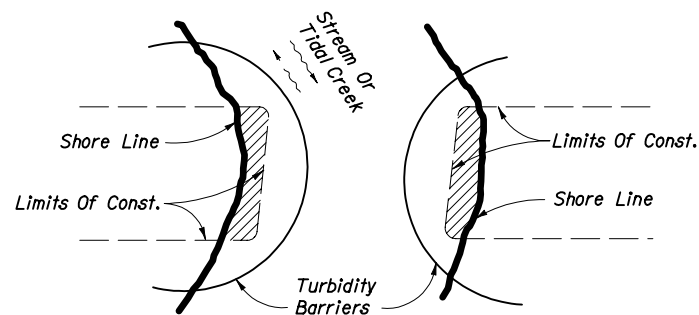
FLOATING TURBIDITY BARRIERS



LEGEND

- Pile Locations
- ▨ Dredge Or Fill Area
- Mooring Buoy w/Anchor
- Anchor
- ⤷ Barrier Movement Due To Current Action

- NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
 2. Number and spacing of anchors dependent on current velocities.
 3. Deployment of barrier around pile locations may vary to accommodate construction operations.
 4. Navigation may require segmenting barrier during construction operations.
 5. For additional information see Section 104 of the Standard Specifications.



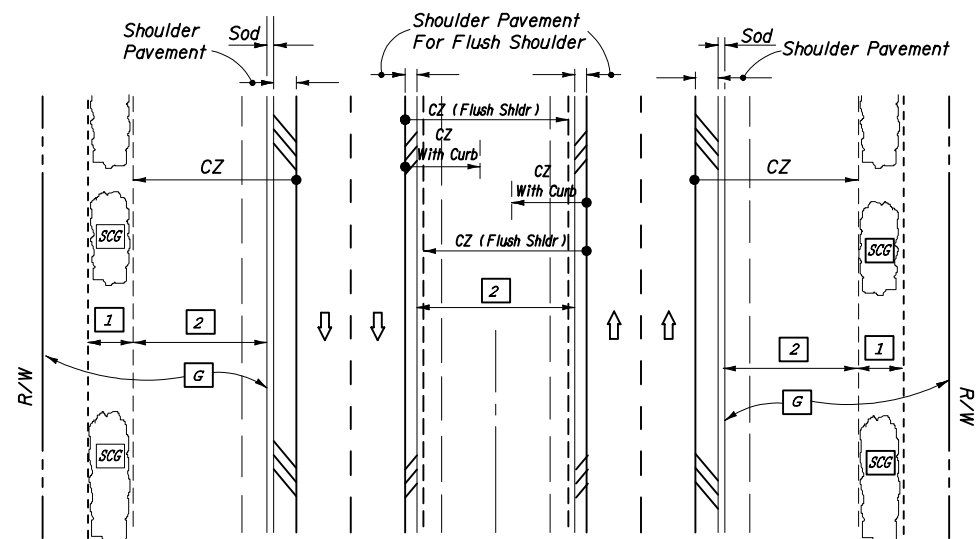
Note:
 Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the pay item(s) established in the plans for Floating Turbidity Barrier and/or Staked Turbidity Barrier. Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

GENERAL NOTES

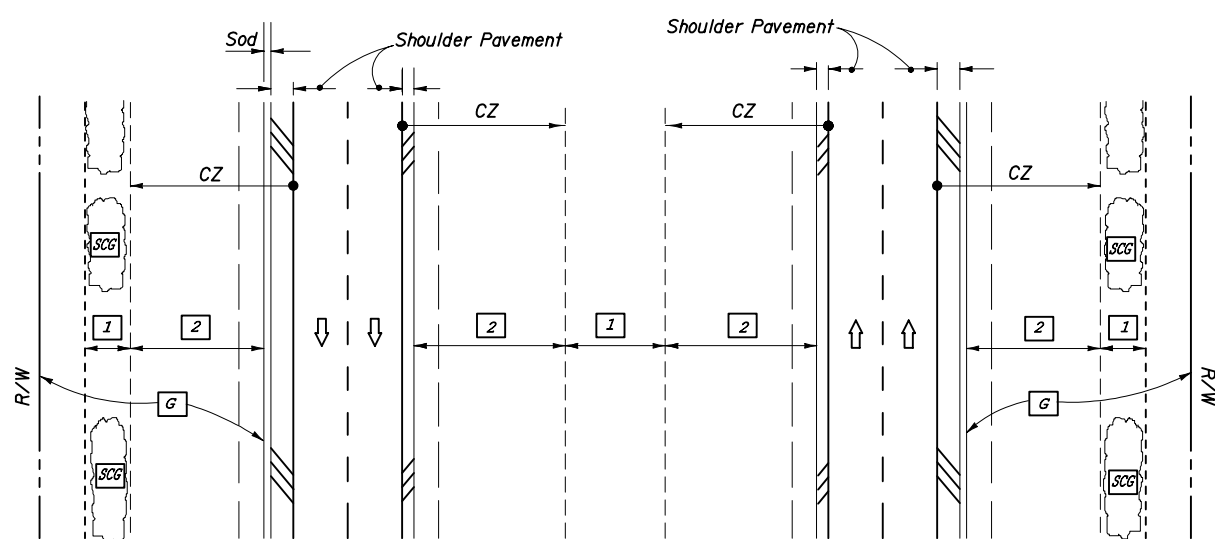
1. Floating turbidity barriers are to be paid for under the contract unit price for Floating Turbidity Barrier, LF.
2. Staked turbidity barriers are to be paid for under the contract unit price for Staked Turbidity Barrier, LF.

TURBIDITY BARRIER APPLICATIONS

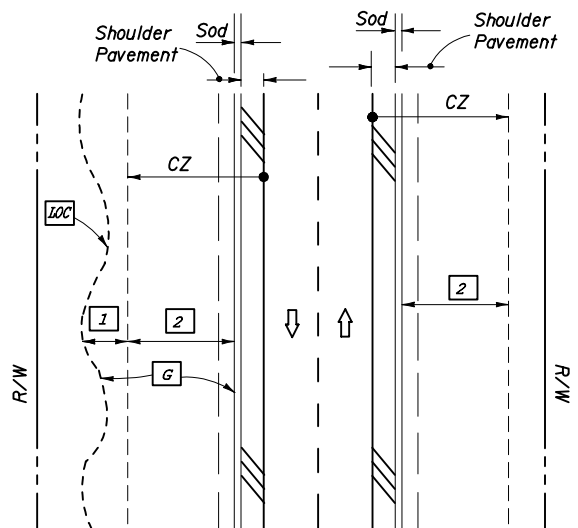
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TURBIDITY BARRIERS				
Designed By	Names	Dates	Approved By	
Drawn By	RAA/CJA	9/85	 State Drainage Engineer	
Checked By	LRE	9/85		
	RAA	10/85	Revision	Sheet No.
			00	1 of 1
				Index No. 103



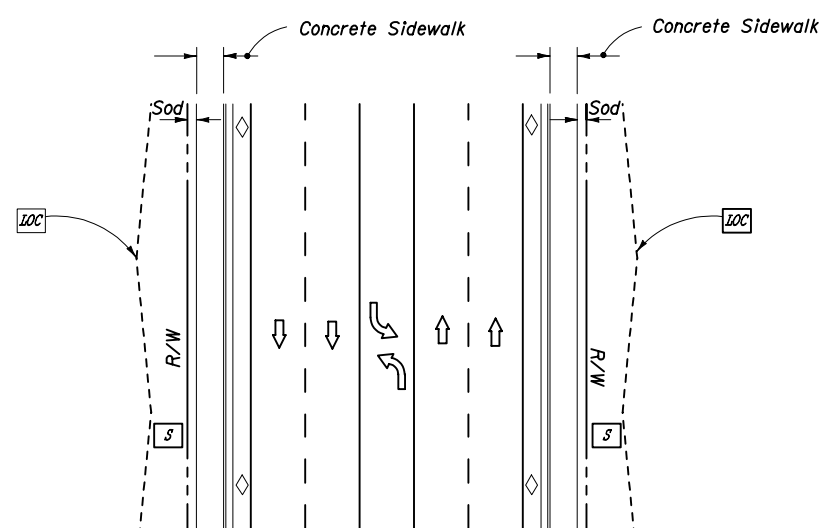
DIVIDED NARROW MEDIAN WITH OR WITHOUT CURBED MEDIAN



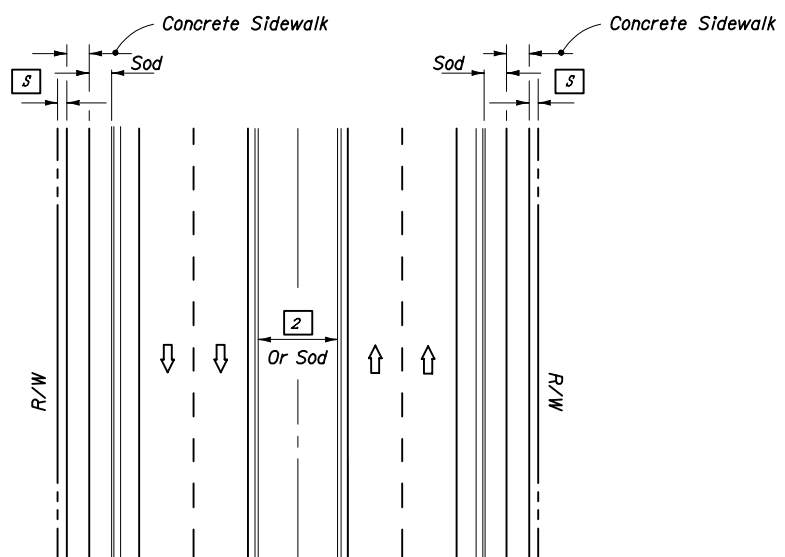
DIVIDED WIDE MEDIAN WITH OR WITHOUT CURBED MEDIAN



UNDIVIDED FLUSH SHOULDER



UNDIVIDED CURBED



DIVIDED CURBED

LEGEND

- 1 Wildflower Group #1
- 2 Wildflower Group #2
- G Grass-Seed/Seed & Mulch (To Limit of Construction)
- SCG Selective Clearing And Grubbing
- LOC Limits Of Construction
- S Seed, Seed And Mulch, Sod Or Seed, Sod

WILDFLOWERS SEEDING RATE	
Common Name (Botanical Name)	lbs/ac
#1 Group	
Black-Eyed Susan (<i>Rudbeckia hirta</i>)	2
Tickseed (<i>Coreopsis tinctoria</i>)	
Lance-Leaf Tickseed (<i>Coreopsis lanceolata</i>)	10
Indian Blanket (<i>Gaillardia pulchella</i>)	10
#2 Group	
Annual Phlox (<i>Phlox drummondii</i>)	10
Moss Verbena (<i>Berbera tenuisecta</i>)	6

SEEDING RATES (Lbs/Ac) FOR NEW SHOULDERS AND SLOPES*

TYPE OF SEED	ZONE I		ZONE II					
	COASTAL		INLAND					
	Mar. To Nov.	Nov. To Mar.	Mar. To Oct.	Oct. To Mar.	Feb. To Dec.	Dec. To Feb.	Feb. To Dec.	Dec. To Feb.
PERMANENT GRASSES								
Unhulled Bermuda	20	20	20	20	20	20	20	20
Bahia Argentina Or Pensacola Bahia			80	80			80	80
QUICK GROWING GRASS								
Annual Rye		20		20		20		20
TOTAL Lbs/ PER ACRE	20	40	100	120	20	40	100	120

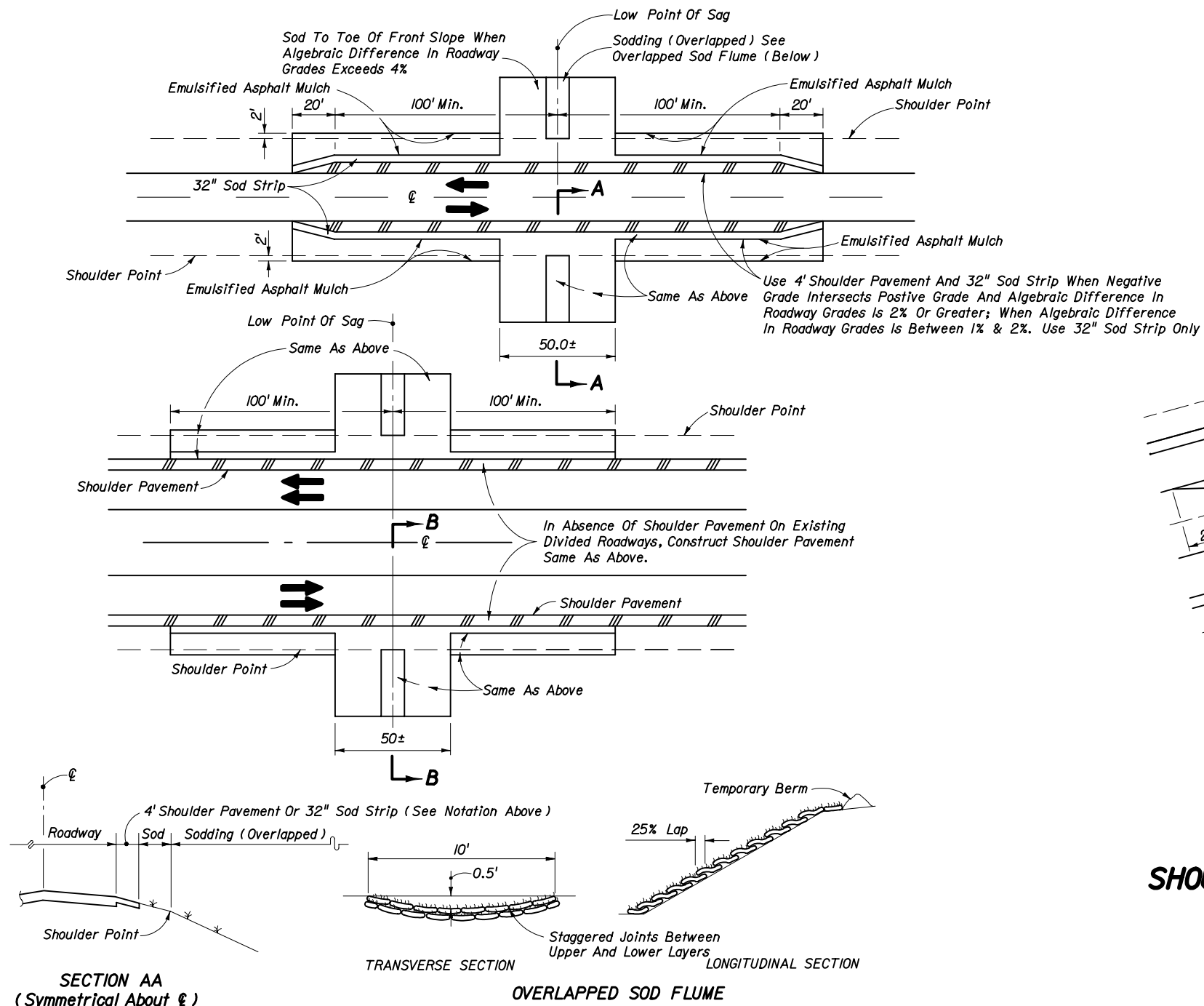
Note: The seeding rates shown in this table apply only when seed is spread by an approved mechanical spreader meeting the requirements of Section 570 and 577 of the Standard Specifications.
 *See Index No. 105 for zone boundaries and seeding rates for shoulder reworking.

SEEDING FOR PERMANENT GRASSING AND WILDFLOWERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

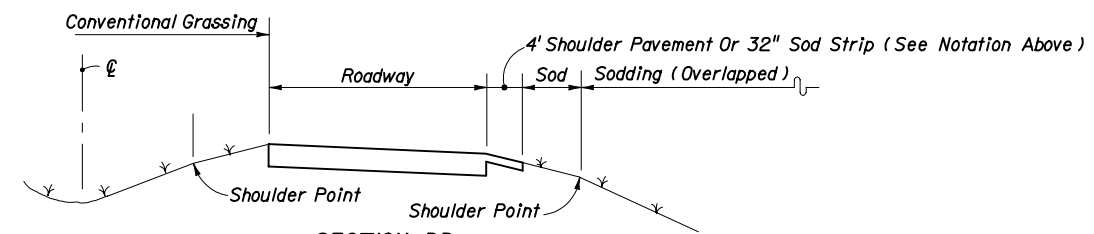
PERMANENT EROSION CONTROL

Names	Dates	Approved By	
Designed By	GLH 01/00	State Drainage Engineer	
Drawn By	HSD 01/00		
Checked By	GLH 01/00		
Revision	02	Sheet No.	Index No.
		1 of 2	104



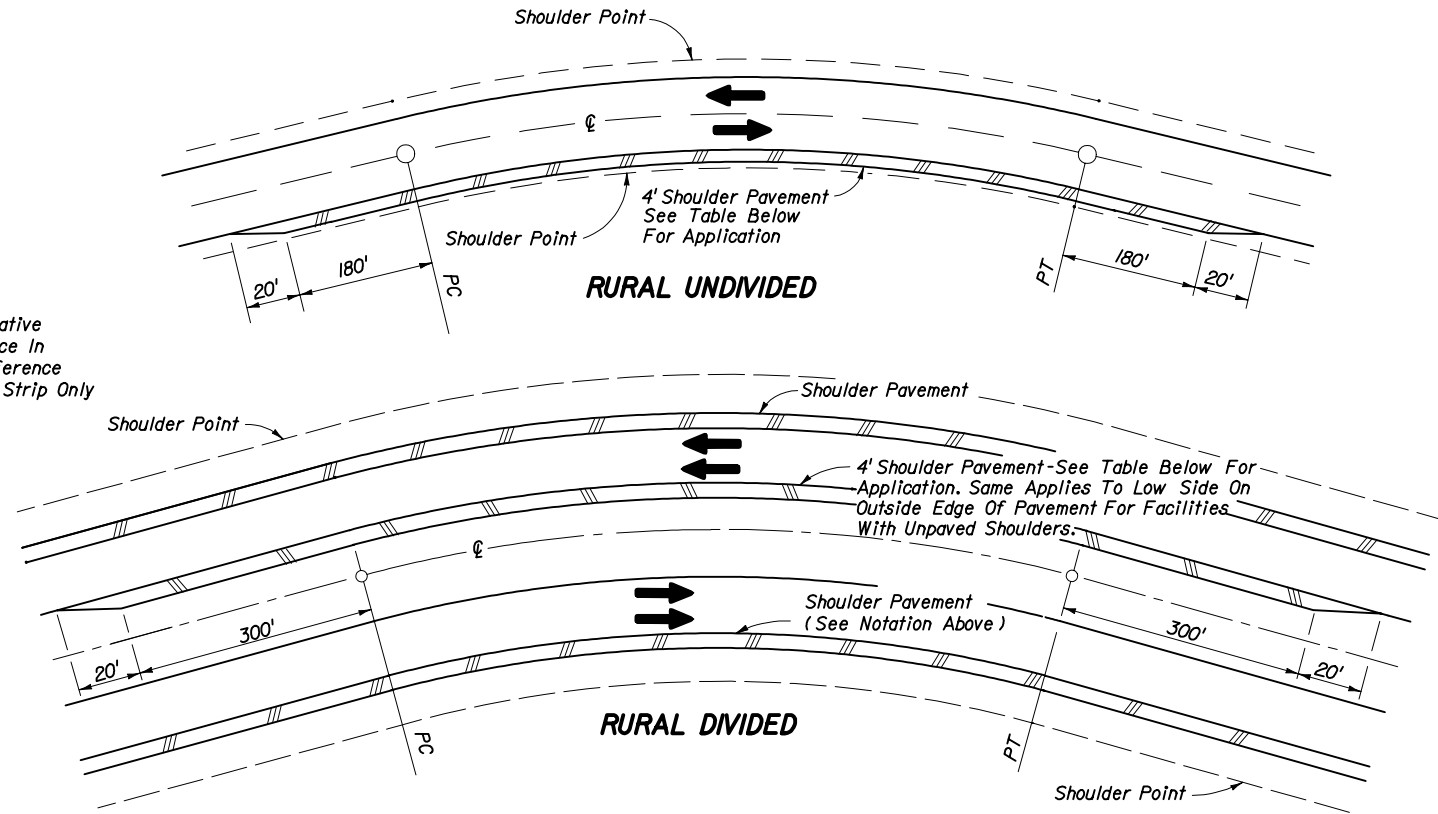
SECTION AA
(Symmetrical About ϵ)

OVERLAPPED SOD FLUME



SECTION BB
(Symmetrical About ϵ)

SHOULDER AND SLOPE TREATMENT IN SAG VERTICAL CURVES



CRITERIA FOR PAVING SHOULDER ON DIVIDED AND UNDIVIDED FACILITIES		
Design Speed (mph)	Radius Of Curve	Notes:
30	7° Or Greater	(1) Shoulder Pavement is required on all curves meeting the criteria tabulated. For curves not meeting the criteria, shoulders are to be paved where erosion of the shoulder is evident or anticipated. (2) If outside shoulder is paved as designated bike lane, the paved width within curves shall match the bike lane width.
40	5° Or Greater	
50	4° Or Greater	
60	3° Or Greater	
65	3° Or Greater	
70	2° Or Greater	

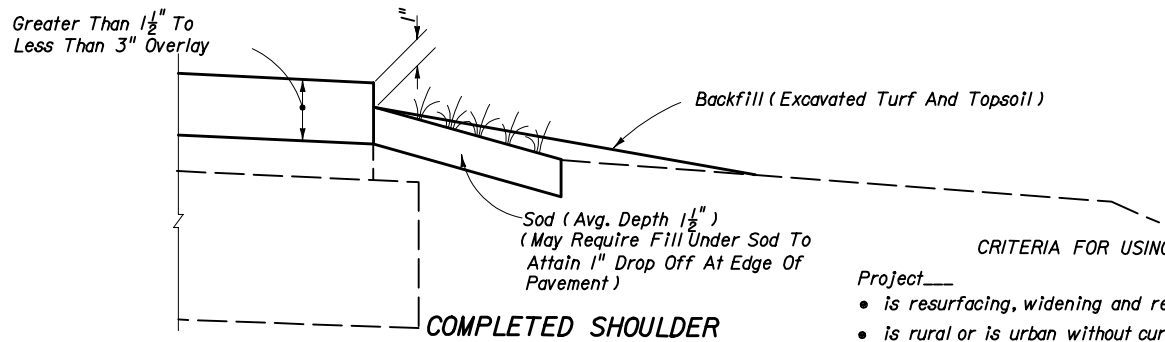
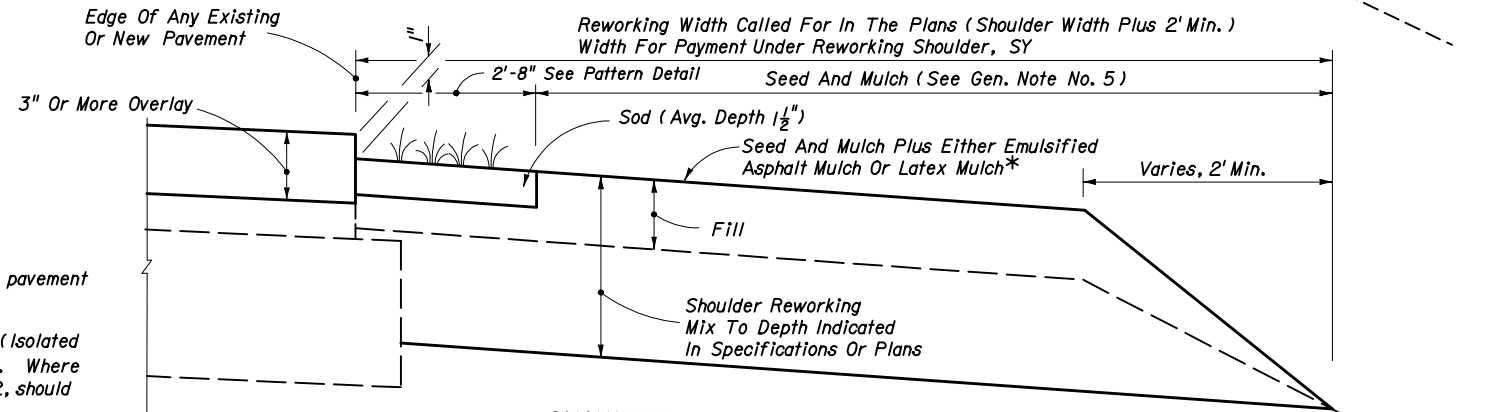
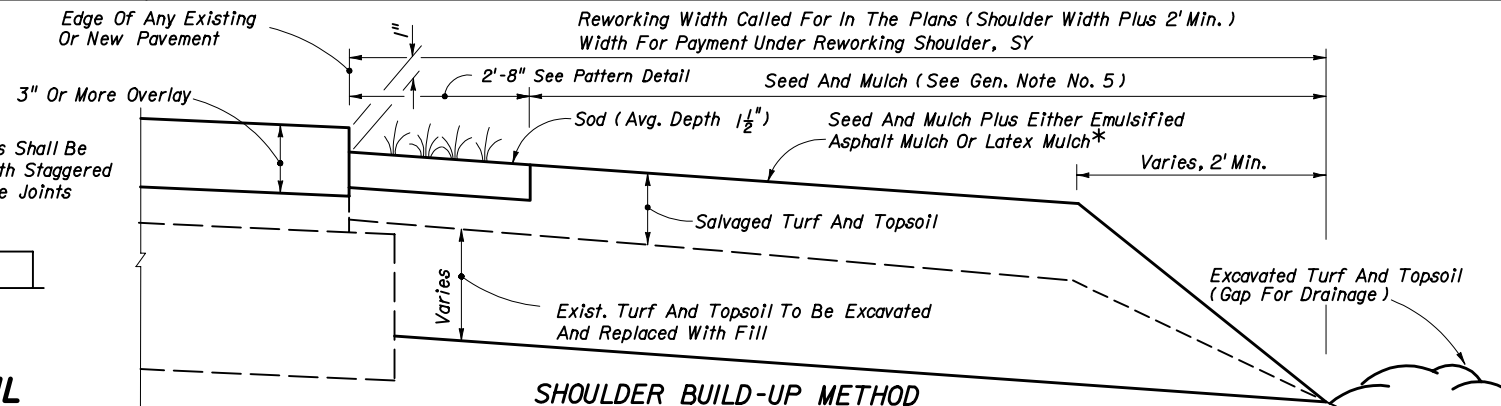
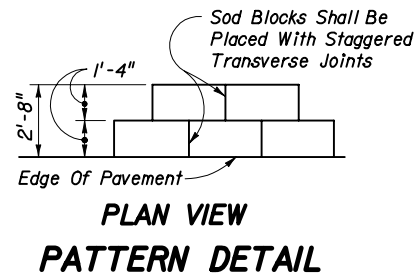
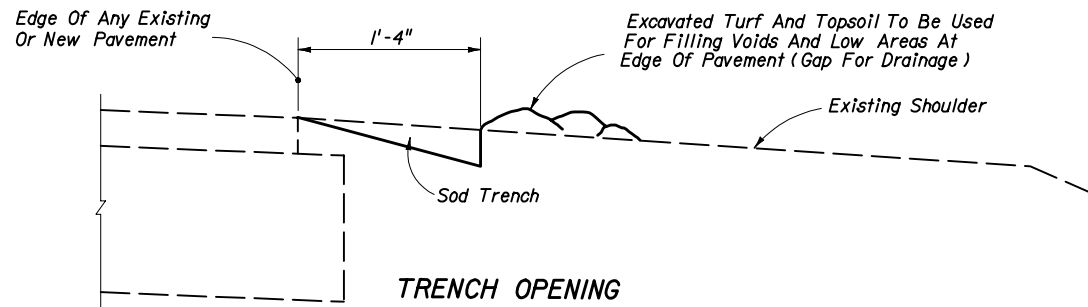
SHOULDER AND SLOPE TREATMENT FOR SUPERELEVATED ROADWAYS

NOTES

1. These treatments are applicable to new construction, reconstruction and RRR projects. Project requirements for shoulder pavement and sodding that exceed the limits of this standard take precedence.
2. For sodding adjacent to ditches and at headwalls, see Index No. 281.
3. All front slopes steeper than 1:3 are to be sodded.

TREATMENTS FOR PROTECTION FROM CONCENTRATED ROADWAY RUNOFF EROSION AND SHOULDER RAVELING

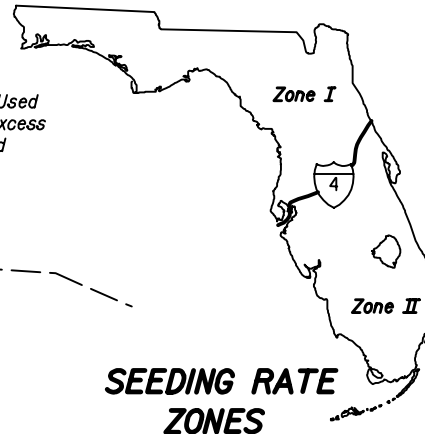
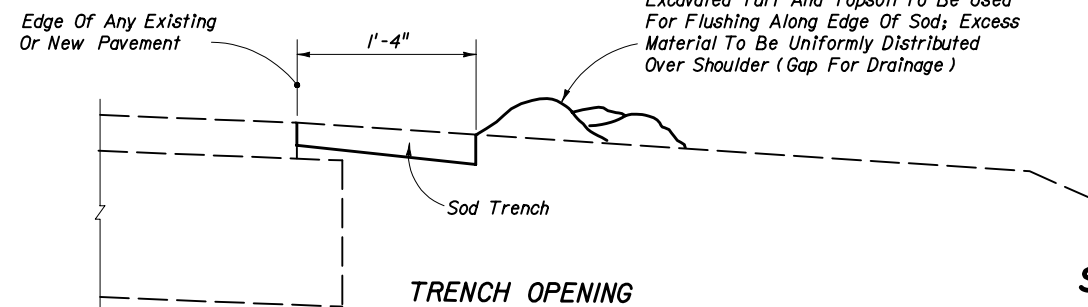
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PERMANENT EROSION CONTROL				
Names	Dates	Approved By		
Designed By HLG	04/75	State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By DCB	04/75	02	2 of 2	104



CRITERIA FOR USING TREATMENT TYPE R-1

- Project—
- is resurfacing, widening and resurfacing or construction of shoulder pavement
 - is rural or is urban without curb and gutter
 - has good existing soil and turf with no significant shoulder erosion (isolated areas of significant erosion will require additional special treatment. Where poor soil and/or turf conditions exist shoulder reworking, Type R-2, should be applied.)
 - resurfacing build-up is greater than 1 1/2" to less than 3"

TYPE R-1



SEEDING RATE ZONES

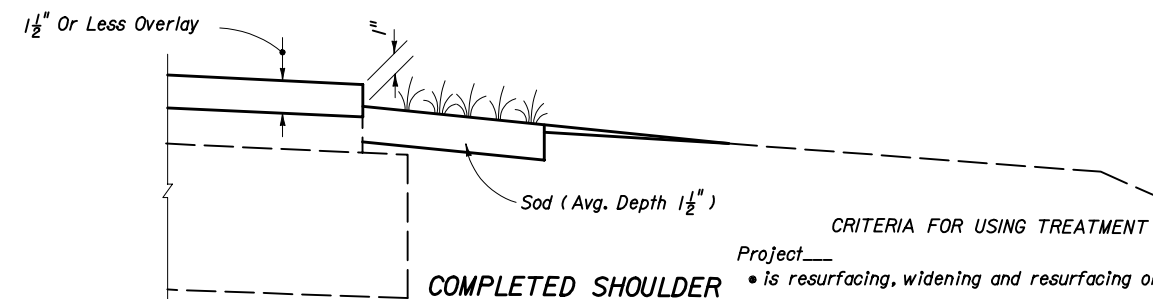
*Emulsified Asphalt Mulch Or Latex Mulch May Be Deleted For Low Volume Roadways (ADT Less Than 1600) Or Where Shoulder Pavement Is Constructed.

CRITERIA FOR USING TREATMENT TYPE R-2

- Project—
- is resurfacing or construction of shoulder pavement
 - is rural or is urban without curb and gutter
 - has good existing soil and turf
 - resurfacing build-up is 3" or more

A SIMILAR TREATMENT MAY BE USED FOR PROJECTS THAT REQUIRE SHOULDER WIDENING. DETAILS ARE TO BE SHOWN IN THE PLANS.

TYPE R-2



CRITERIA FOR USING TREATMENT TYPE R-3

- Project—
- is resurfacing, widening and resurfacing or construction of shldr. pavt.
 - is rural or is urban without curb and gutter
 - has good existing soil and turf with no significant shoulder erosion (isolated areas of significant erosion will require additional special treatment. Where poor soil and/or turf conditions exist shoulder reworking, Type R-2, should be applied.)
 - resurfacing build-up is 1 1/2" or less

TYPE R-3

SEEDING RATES (Lbs/Ac)

TYPE OF SEED	ZONE I		ZONE II					
	COASTAL		INLAND		COASTAL		INLAND	
	Mar. to Nov.	Nov. to Mar.	Mar. to Oct.	Oct. to Mar.	Feb. to Dec.	Dec. to Feb.	Feb. to Dec.	Dec. to Feb.
PERMANENT GRASSES								
Unhulled Bermuda	20	20	20	20	20	20	20	20
Bahia Argentina Or Pensacola Bahia			80	80			80	80
QUICK GROWING GRASS								
Annual Rye Grass		20		20		20		20
TOTAL POUNDS PER ACRE	20	40	100	120	20	40	100	120

Note: The seeding rates shown in this table apply only when seed is spread by an approved mechanical spreader meeting the requirements of Section 570 and 577 of the Standard Specifications.

Wildflowers destroyed by shoulder reworking are to be reestablished under the seeding rates prescribed for permanent wildflower #2 Group shown by table on Index No. 104.

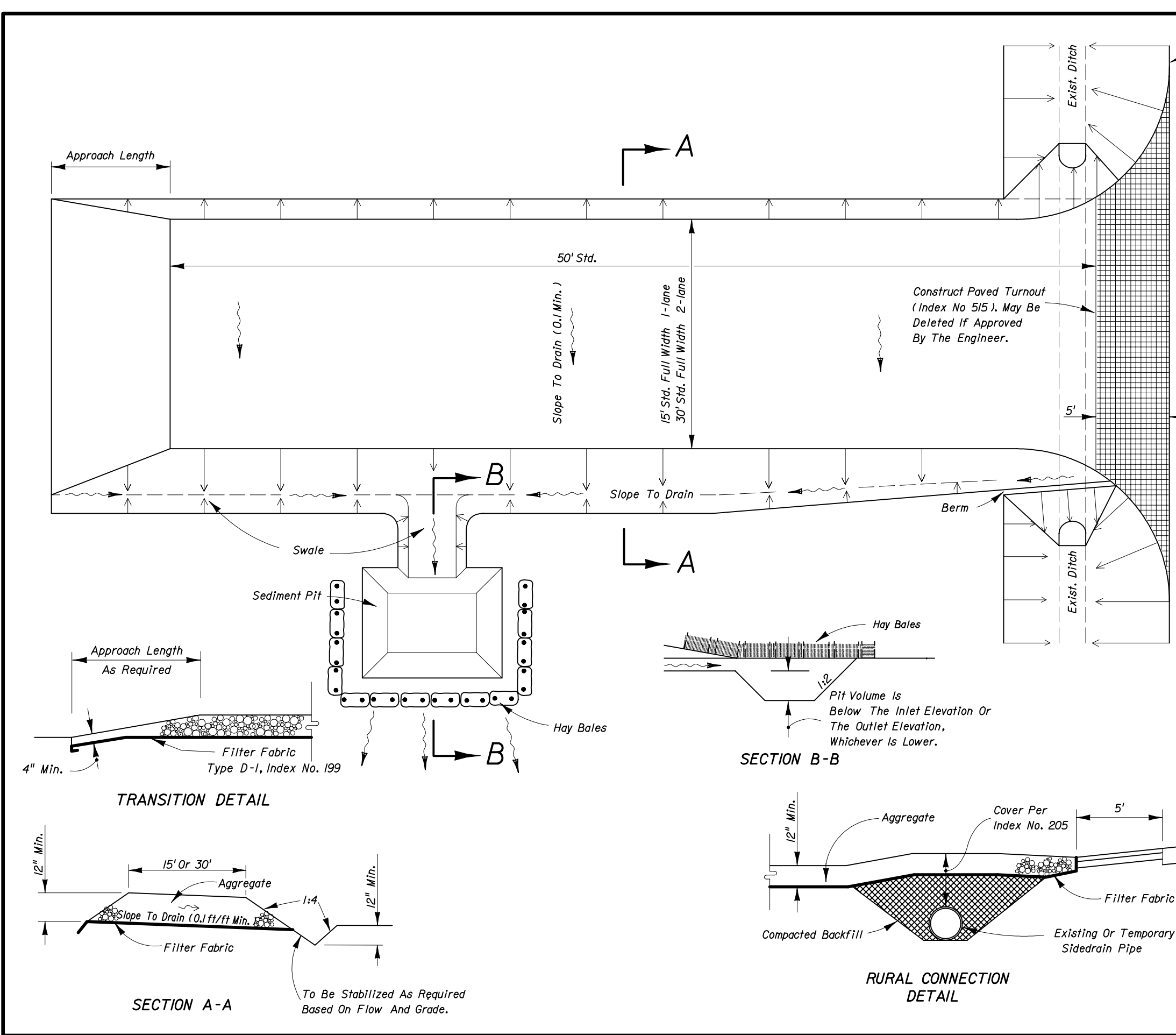
GENERAL NOTES

1. Special attention is to be directed to the construction of the required 1" drop-off at edge of pavement.
2. Fertilize entire unpaved shoulder and front slope to toe of slope or bottom of ditch.
3. Topsoil obtained from borrow pits or other sources may be used in lieu of excavated turf and topsoil when economically feasible. No additional payment will be made for substituting topsoil for excavated turf or topsoil.
4. Payment for excavation of turf and topsoil and for backfill of this material under Types R-1 and R-3, is to be included in the contract unit price for Sodding, SY.
5. Payment for reworking shoulders, shall include the cost for those seeding and mulching operations within the limits for reworking shoulders. Materials (Seed, Mulch, Fertilizer and Water) and Sodding shall be paid for as separate items. Reworking shoulders shall be paid for under the contract unit price for Reworking Shoulders, SY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SHOULDER SODDING AND REWORKING ON EXISTING FACILITIES

Names	Dates	Approved By		
Designed By	EGR 09/07/84	State Drainage Engineer		
Drawn By	HSD 09/07/84	Revision	Sheet No.	Index No.
Checked By	EGR 09/07/84	00	1 of 1	105




GENERAL NOTES

1. A Soil Tracking Prevention Device (STPD) shall be constructed at locations designated by the engineer for points of egress from unstabilized areas of the project to public roads where offsite tracking of mud could occur. Traffic from unstabilized areas of the construction project shall be directed thru a STPD. Barriers, flagging, or other positive means shall be used as required to limit and direct vehicular egress across the STPD.
2. The Contractor may propose an alternative technique to minimize offsite tracking of sediment. The alternative must be reviewed and approved by the Engineer prior to its use.
3. All materials spilled, dropped, or tracked onto public roads (including the STPD aggregate and construction mud) shall be removed daily, or more frequently if so directed by the Engineer.
4. Aggregates shall be as described in Section 901 excluding 901-2.3. Aggregates shall be FDOT size #1. If this size is not available, the next available smaller size aggregate may be substituted with the approval of the Engineer. Sizes containing excessive small aggregate will track off the project and are unsuitable.
5. The sediment pit should provide a retention volume of 3600 cubic feet/acre of surface area draining to the pit. When the STPD is isolated from other drainage areas, the following pit volumes will satisfy this requirement:
 $15' \times 50' = 100 \text{ ft}^3$ $30' \times 50' = 200 \text{ ft}^3$
 As an option to the sediment pit, the width of the swale bottom can be increased to obtain the volume. When the sediment pit or swale volume has been reduced to one half, it shall be cleaned. When a swale is used, hay bales or silt fence shall be placed along the entire length.
6. The swale ditch draining the STPD shall have a 0.2% minimum and a 1.0% maximum grade along the STPD and to the sediment pit.
7. Mitered end sections are not required when the sidedrain pipe satisfies the clear zone requirements.
8. The STPD shall be maintained in a condition that will allow it to perform its function. To prevent offsite tracking, the STPD shall be rinsed (daily when in use) to move accumulated mud downward thru the stone. Additional stabilization of the vehicular route leading to the STPD may be required to limit the mud tracked.
9. A STPD shall be paid for under the contract unit price for Soil Tracking Prevention Device, EA. The unit price shall constitute full compensation for construction, maintenance, replacement of materials, removal, and restoration of the area utilized for the STPD; including but not limited to excavation, grading, temporary pipe (including MES when required), filter fabric, aggregate, paved turnout (including asphalt and base construction), ditch stabilization, approach route stabilization, sediment removal and disposal, water, rinsing and cleaning of the STPD and cleaning of public roads, grassing and sod. Hay bales shall be paid for under the contract unit price for Hay or Straw Baled, EA. Silt fence shall be paid for under the contract unit price for Staked Silt Fence, LF.
10. The nominal size of a standard STPD is 15' x 50' unless otherwise shown in the plans. If the volume of entering and exiting vehicles warrant, a 30' width STPD may be used if approved by the Engineer. When a double width (30') STPD is used, the pay quantity shall be 2 for each location.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**SOIL TRACKING PREVENTION DEVICE
TYPE A**

Names		Dates	Approved By		
Designed By	COMM	11/94	 State Drainage Engineer		
Drawn By	JDT	1/96			
Checked By	CRH	1/96			
			Revision	Sheet No.	Index No.
			00	1 of 1	106

STANDARD CRITERIA

CLASS	TYPE (1)	APPLICATION DESCRIPTION	STANDARD INDEX NO.	PERMITTIVITY SEC ⁻¹	AOS SIEVE #	MIN. GRAB TENSILE STRENGTH KN	MIN. SEWN STRENGTH KN/m	MIN. PUNCTURE KN	MIN. TRAPEZOIDAL TEAR KN	MIN. WIDE WIDTH TENSILE STRENGTH KN/m	UV RESISTANCE (Min. Allowed)		COMMENTS	
											%	Time (Hrs.)		
DRAINAGE (D)	D-1	Revetment (Special)		(See D-2)	(See D-2)	1.40	1.26	0.50	0.50		50	500	Woven Monofilament Geotextiles only (Elongation < 50%) Provide 6" thick aggregate bedding layer.	
	D-2	Revetment (Standard)		% SOIL PASSING No. 200 SIEVE	% SOIL PASSING No. 200 SIEVE	Woven Monofilament	Woven Monofilament	Woven Monofilament	Woven Monofilament		50	500	Woven Geotextiles only. No Slit Film Geotextiles allowed. Provide 150 mm thick aggregate bedding layer for revetment (standard). The bedding layer may be omitted if a D-1 fabric is used with revetment (standard).	
		Articulating Block		< 15% 0.7	< 15% 40	1.10	0.99	0.40	0.25					
		Gabions		15% to 50% 0.2	15% to 50% 60	Other Geotextiles: Elongation < 50% 1.40	Other Geotextiles: Elongation < 50% 1.20	Other Geotextiles: Elongation > 50% 0.50	Other Geotextiles: Elongation > 50% 0.35					* For cohesive soils with a plasticity index > 7, maximum average role value for AOS is number 50 sieve.
	D-3	Rock, Rubble, Broken Concrete	281											
		Underdrain * * *	286	% SOIL PASSING No. 200 SIEVE	% SOIL PASSING No. 200 SIEVE	Elongation	Elongation	Elongation	Elongation		50	500	No woven slit film fabrics allowed. * For cohesive soils with a plasticity index > 7, maximum average role value for AOS is number 50 sieve. ** Required Trapezoidal tear for woven monofilament is 250. *** See Index No. 286 for the permittivity and AOS values of the internal filter fabric of type V underdrain.	
		French Drain	285	< 15% 0.5	< 15% 40	< 50% 1.10	< 50% 0.99	< 50% 0.40	< 50% 0.40 **					
		Sheet Piling Filter		15% to 50% 0.2	15% to 50% 60	> 50% 0.70	> 50% 0.63	> 50% 0.25	> 50% 0.25					
	D-4	Filter Fabric Jacket (Culvert)	280	> 50% 0.1	> 50% 70 *									
		Concrete Pavement Subdrainage	287											
D-5	Slope Pavement (Sand-Cement)													
	Ditch Pavement (Sand-Cement)	281	0.5	40	0.80	0.72	0.22	0.155		50	500	Non-woven, needle-punch only. Elongation ≥ 50%		
D-6	Mechanical Stabilized Retaining Wall													
	Cast-In-Place Retaining Wall		0.5	40	0.40	0.36	0.22	0.175		50	500			
EROSION (E)	Slope Pavement (Concrete)													
	Ditch Pavement (Concrete)	281	0.5	40	0.80	0.72	0.22	0.155		50	500	Non-woven, needle-punch only. Elongation ≥ 50%		
	E-1	Staked Silt Fence	102	0.05	NA	0.40	0.36	NA	0.155	80	500	Minimum Filtration Efficiency of 75% and minimum flow rate of 0.3 gal.		
	E-2	Wind Screen		0.05	NA	0.40	0.36	NA	NA	80	150			
	E-3	Plastic Erosion Mat (Turf Reinforcement Mat) (Type 1)	NA	NA	NA	NA	NA	NA	NA	2 x 1	80	500	Use where design shear stress is ≤ 100 Pa	
E-4	Plastic Erosion Mat (Turf Reinforcement Mat) (Type 2)	NA	NA	NA	NA	NA	NA	NA	4 x 2	80	500	Use where design shear stress is ≤ 170 Pa		
E-5	Plastic Erosion Mat (Turf Reinforcement Mat) (Type 3)	NA	NA	NA	NA	NA	NA	NA	8 x 4	80	500	Use where design shear stress is ≤ 240 Pa		
STABILIZATION (R)	R-1	Reinforcement		0.05	30	0.80	0.80	0.40	0.40		80	150		
	R-2	Separation		0.05	30	0.80	0.72	0.35	0.22		—	—		

(1) Type refers to FDOT class and application.

TABLE 1

Test	Unit	Test Method
Permittivity	sec ⁻¹	ASTM-D-4491
AOS	mm	ASTM-D-4751
Elongation	%	ASTM-D-4632
Grab Tensile Strength	kN	ASTM-D-4632
Wide With Tensile Strength	kN/m	ASTM-D-4595
Maximum Design Velocity	M/sec	See Design Note 3
Sewn Strength	kN/m	ASTM-D-4884
Puncture	kN	ASTM-D-4833
Trapezoidal Tear	kN	ASTM-D-4533
Ultraviolet Resistance	% Retained In Strength	ASTM-D-4355
Filtration Efficiency	%	ASTM-D-5141
Flow Rate	L ³ /min.	ASTM-D-5141

GENERAL NOTES

- Specifications for geotextiles are in Section 985. Physical criteria for each application is provided by this standard, in conjunction with those sections.
- All values except AOS are MINIMUM AVERAGE ROLL values in the weakest principal direction. Values for AOS are MAXIMUM AVERAGE ROLL values.
- Test soil or fill material adjacent to the geotextile for gradation to select values for permittivity and AOS.
- Unless specifically restricted in COMMENTS column, any type of material may be used.
- Wide width tensile strength is expressed in units of measure of kN/m, in machine direction and cross direction, as MD x CD.

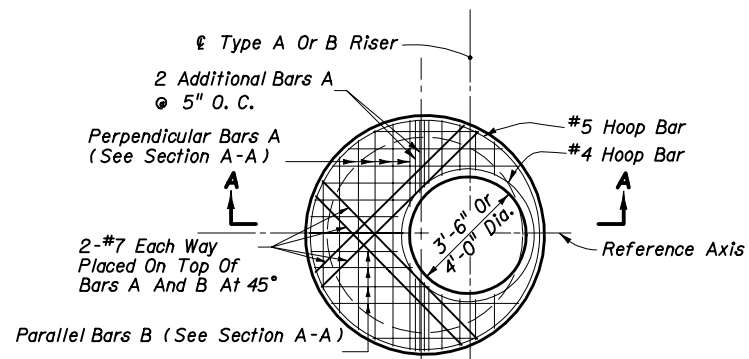
DESIGN NOTES

- The Designer shall review this criteria and adjust the values as necessary to satisfy project requirements. These adjustments shall be called for in the plans or contained in the project special provisions.
- UV Resistance: The value represents the percent of minimum textile strength retained (ASTM-D-4632) after weathering per ASTM-D-4355 for the test period (hours).
- Shear stress limits for plastic erosion mats determined by 30 minutes sustained flow in unvegetated state as determined by tests performed by Utah State University, Texas Transportation Institute or an independent testing laboratory approved by the State Drainage Engineer.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

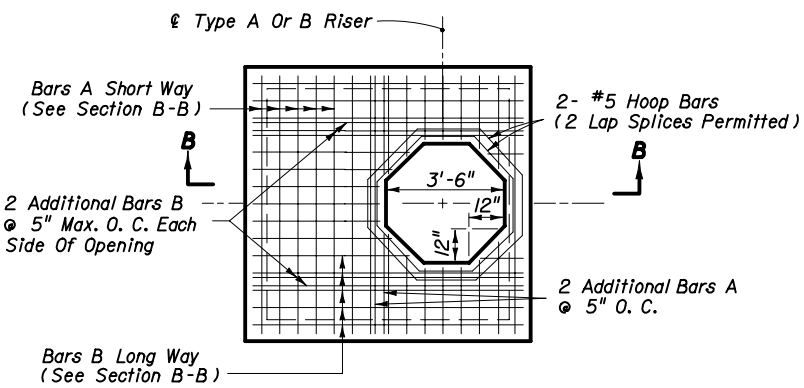
GEOTEXTILE CRITERIA

Names		Dates		Approved By	
Designed By	COM	8/91	 State Drainage Engineer		Index No.
Drawn By	DLD	8/91			Revision
Checked By	KHH	8/91	04	1 of 1	199

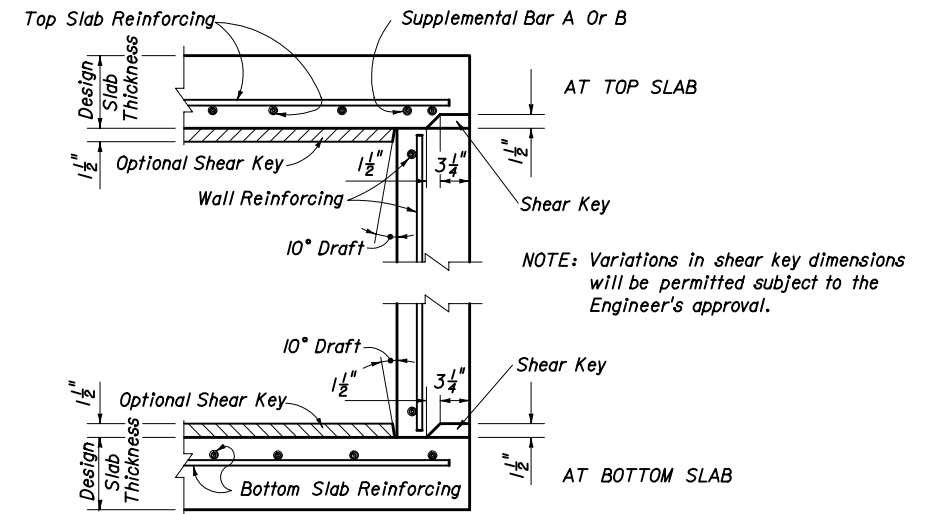


Note: Not Applicable For Type C, D & E Ditch Bottom Inlets. See Index No. 232.

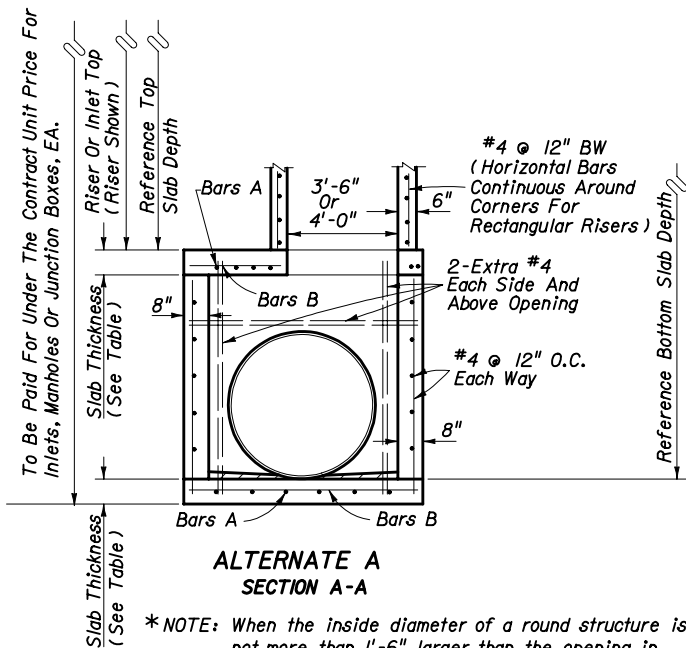
TOP SLAB REINFORCING STEEL DIAGRAM



TOP SLAB REINFORCING STEEL DIAGRAM

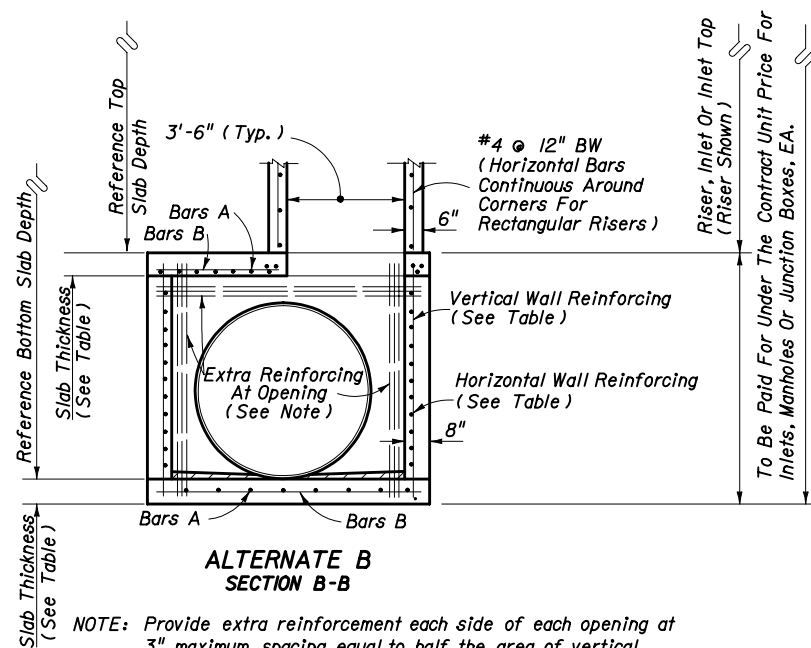


SLAB TO WALL DETAILS FOR PRECAST ALTERNATE WITH 8" WALLS



ALTERNATE A SECTION A-A

*NOTE: When the inside diameter of a round structure is not more than 1'-6" larger than the opening in the riser or top slab, the top of the structure or riser shall be constructed according to the "Special Top Slab" details on this sheet.

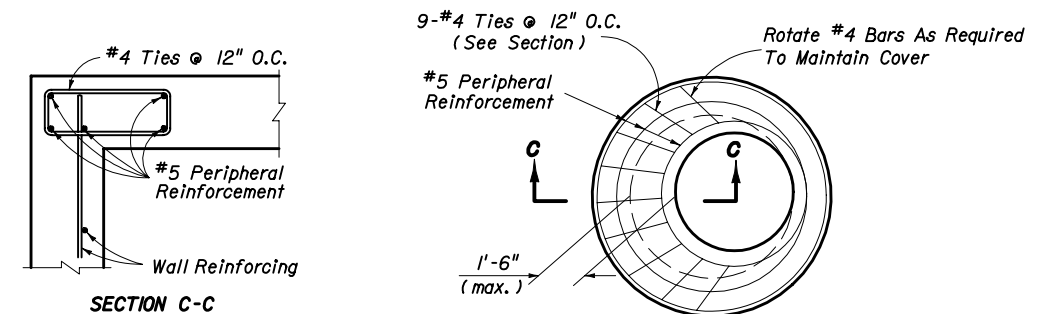


ALTERNATE B SECTION B-B

NOTE: Provide extra reinforcement each side of each opening at 3" maximum spacing equal to half the area of vertical reinforcement removed by the opening and provide the same area of reinforcement above each opening at 3" maximum spacing as removed by the opening.

GENERAL NOTES

- Standard structure bottoms 4'-0" diameter and smaller (Alt. A) and 3'-6" square (Alt. B) are designated Type P. Larger standard structure bottoms are designated Type J. Risers are permitted for all structures.
- Walls of circular structures (Alternate A) constructed in place may be of non-reinforced concrete or brick or reinforced concrete. Precast and rectangular structures (Alternate B) shall be constructed of reinforced concrete only.
- Wall thickness and reinforcement are for either reinforced cast-in-place or precast concrete units except that precast circular units may be furnished with walls in accordance with either ASTM C478 (up to 96" diameter) or ASTM C76, Class III, B Wall, modified where the elliptical steel cage area is placed in the center one-third of the wall.
- Top and floor slab thickness and reinforcement are for precast and cast in place construction. Top and floor slabs shall be of Class II concrete. Concrete as specified in ASTM C478 (4000 psi) may be used in lieu of Class I and Class II concrete in precast items manufactured in plants which are under the 'Standard Operating Procedures' for the inspection of precast drainage products.
- All reinforcement shown is ASTM A615/A615M Grade 60 steel, either smooth or deformed. Equivalent area Grade 40 steel or Grade 65KSI welded wire fabric may be substituted according to Index No. 201.
- Structure bottoms may be used in conjunction with curb inlet tops Types 1, 2, 3, 4, 5, 6, 9, and 10, and any manhole or junction box unless otherwise shown in the plans or other standard drawings. Alt. B structure bottoms may be used in conjunction with curb inlet Types 7 & 8, or any ditch bottom inlet unless otherwise shown in the plans or other standard drawings.
- Rectangular structures may be rotated as directed by the Engineer in order to facilitate connections between the structure walls and storm sewer pipes.
- Except when ACI hooks are specifically required, reinforcement top and slab shall be straight embedment.
- All steel bars shall have 1/2" minimum cover unless otherwise shown except for precast circular units manufactured under ASTM C76 or ASTM C478. Horizontal steel in rectangular structures shall be lapped a minimum of 24 bar diameters at corners.
- The corner fillets shown are necessary for rectangular structures used with circular risers and inlet throats and used on skew with rectangular risers, inlet and inlet throats. Fillets will be required in lieu of the bottom slab of the Alt. B riser when used with the Alt. A box. Each fillet shall be reinforced with 2-#5 bars.
- Inlet throats, riser or manhole tops shall be secured to structures as shown on Index No. 201.
- Structures with depths over 14' are to be checked for floatation by designer of project drainage.
- Units larger than specified standard may be substituted at the contractor's option when these units will not cause or increase the severity of utility conflicts. Such larger units shall be furnished at no additional cost to the Department. Larger Alternate A units cannot replace Alternate B units without approval of the Engineer. This note applies to this Index only.
- For manhole and junction box tops, for frames and covers, and, for supplementary details see Index No. 201.



SPECIAL TOP SLAB*

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
STRUCTURE BOTTOMS TYPE J AND P				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	200

SLAB DESIGNS - SQUARE AND RECTANGULAR STRUCTURES
(ALL SLABS 8" THICK - REINFORCING PARALLEL TO SHORT WAY AND LONG WAY)

SHORT-WAY		LONG-WAY	
SLAB DEPTH	SCHEDULE	SLAB DEPTH	SCHEDULE
SIZE: 3'-6" x UNLIMITED			
≥ 0.5' < 29'	B	≥ 0.5' < 40'	B
29' < 40'	C		
SIZE: 4'-0" x UNLIMITED			
≥ 0.5' < 19'	B	≥ 0.5' < 34'	B
19' < 29'	C	34' < 40'	C
29' < 40'	D		
SIZE: 5' x 5'			
≥ 0.5' < 3'	C	≥ 0.5' < 3'	C
3' < 19'	B	3' < 19'	B
19' < 28'	C	19' < 28'	C
28' < 38'	D	28' < 38'	D
38' < 40'	F	38' < 40'	F
SIZE: 5' x 6'			
≥ 0.5' < 3'	C	≥ 0.5' < 3'	C
3' < 16'	B	3' < 20'	B
16' < 24'	C	20' < 29'	C
24' < 34'	D	29' < 40'	D
34' < 40'	F		
SIZE: 5' x 7'			
≥ 0.5' < 3'	C	≥ 0.5' < 3'	C
3' < 14'	B	3' < 22'	B
14' < 21'	C	22' < 33'	C
21' < 39'	D	33' < 40'	D
39' < 40'	F		
SIZE: 5' x 8'			
≥ 0.5' < 3'	C	≥ 0.5' < 39'	B
3' < 8'	B	39' < 40'	C
8' < 17'	C		
17' < 23'	D		
23' < 40'	F		
SIZE: 5' x 9'			
≥ 0.5' < 3'	C	≥ 0.5' < 32'	B
3' < 8'	B	32' < 40'	C
8' < 17'	C		
17' < 23'	D		
23' < 40'	F		

SHORT-WAY		LONG-WAY	
SLAB DEPTH	SCHEDULE	SLAB DEPTH	SCHEDULE
SIZE: 6' x 6'			
≥ 0.5' < 3'	D	≥ 0.5' < 3'	D
3' < 4'	C	3' < 4'	C
4' < 14'	B	4' < 14'	B
14' < 21'	C	14' < 21'	C
21' < 28'	D	21' < 28'	D
28' < 40'	F	28' < 40'	F
SIZE: 6' x 7'			
≥ 0.5' < 3'	D	≥ 0.5' < 3'	D
3' < 4'	C	3' < 4'	C
4' < 12'	B	4' < 15'	B
12' < 19'	C	15' < 21'	C
19' < 26'	D	21' < 30'	D
26' < 40'	F	30' < 40'	F
SIZE: 6' x 8'			
≥ 0.5' < 3'	D	≥ 0.5' < 3'	D
3' < 4'	C	3' < 4'	C
4' < 7'	B	4' < 16'	B
7' < 16'	C	16' < 23'	C
16' < 23'	D	23' < 32'	D
23' < 40'	F	32' < 40'	F
SIZE: 6' x 9'			
≥ 0.5' < 3'	D	≥ 0.5' < 3'	D
3' < 15'	C	3' < 4'	C
15' < 21'	D	4' < 18'	B
21' < 27'	E	18' < 27'	C
27' < 40'	G	27' < 37'	D
		37' < 40'	E
SIZE: 7' x 7'			
≥ 0.5' < 3'	E	≥ 0.5' < 3'	E
3' < 4'	D	3' < 4'	D
4' < 16'	C	4' < 16'	C
16' < 22'	D	16' < 22'	D
22' < 28'	E	22' < 28'	E
28' < 40'	G	28' < 40'	G
SIZE: 7' x 8'			
≥ 0.5' < 3'	E	≥ 0.5' < 3'	E
3' < 4'	D	3' < 4'	D
4' < 15'	C	4' < 17'	C
15' < 21'	D	17' < 23'	D
21' < 27'	E	23' < 29'	E
27' < 40'	G	29' < 40'	G
SIZE: 7' x 9'			
≥ 0.5' < 3'	E	≥ 0.5' < 3'	E
3' < 4'	D	3' < 4'	D
4' < 12'	C	4' < 18'	C
12' < 18'	D	18' < 24'	D
18' < 24'	E	24' < 32'	E
24' < 40'	G	32' < 40'	G

SHORT-WAY		LONG-WAY	
SLAB DEPTH	SCHEDULE	SLAB DEPTH	SCHEDULE
SIZE: 8' x 8'			
≥ 0.5' < 3'	D	≥ 0.5' < 3'	D
3' < 4'	C	3' < 4'	C
4' < 9'	B	4' < 9'	B
9' < 17'	C	9' < 17'	C
17' < 31'	D	17' < 31'	D
31' < 40'	G	31' < 40'	G
SIZE: 8' x 9'			
≥ 0.5' < 3'	D	≥ 0.5' < 3'	E
3' < 4'	C	3' < 4'	D
4' < 16'	B	4' < 18'	C
16' < 22'	C	18' < 25'	D
22' < 29'	D	25' < 32'	F
29' < 40'	F	32' < 40'	G
SIZE: 9' x 9'			
≥ 0.5' < 3'	F	≥ 0.5' < 3'	F
3' < 14'	C	3' < 14'	C
14' < 20'	D	14' < 20'	D
20' < 26'	E	20' < 26'	E
26' < 40'	G	26' < 40'	G

SLAB DESIGNS - ROUND STRUCTURES

SLAB DEPTH	SLAB THICKNESS	REINFORCING (2 WAYS) SCHEDULE
SIZE: 3'-6"		
≥ 0.5' < 40'	8"	C
SIZE: 4'-0"		
≥ 0.5' < 40'	8"	C
SIZE: 5'-0"		
≥ 0.5' < 30'	8"	C
30' < 40'	8"	D
SIZE: 6'-0"		
≥ 0.5' < 8'	8"	B
8' < 18'	8"	C
18' < 30'	8"	D
30' < 37'	8"	E
37' < 40'	8"	G
SIZE: 8'-0"		
≥ 0.5' < 9'	10"	C
9' < 15'	10"	D
15' < 23'	10"	E
23' < 33'	12"	E
33' < 40'	12"	G
SIZE: 10'-0"		
≥ 0.5' < 6'	10"	C
6' < 11'	10"	D
11' < 17'	10"	E
17' < 23'	12"	E
23' < 40'	12"	G
SIZE: 12'-0"		
≥ 0.5' < 6'	12"	C
6' < 11'	12"	D
11' < 16'	12"	E
16' < 20'	14"	E
20' < 40'	14"	G

WALL DESIGNS - RECTANGULAR STRUCTURES

VERTICAL REINFORCING		HORIZONTAL REINFORCING	
WALL DEPTH	SCHEDULE	WALL DEPTH	SCHEDULE
SIZE: 3'-6" * SEE NOTE BELOW			
≥ 1.17' < 40'	A	≥ 1.17' < 40'	B
SIZE: 4'-0"			
≥ 1.17' < 40'	A	≥ 1.17' < 40'	B
SIZE: 5'-0"			
≥ 1.17' < 40'	A	≥ 1.17' < 33'	B
		33' < 40'	C
SIZE: 6'-0"			
≥ 1.17' < 40'	A	≥ 1.17' < 22'	B
		22' < 40'	C
SIZE: 7'-0"			
≥ 1.17' < 40'	A	≥ 1.17' < 15'	B
		15' < 25'	C
		25' < 40'	D
SIZE: 8'-0"			
≥ 1.17' < 40'	A	≥ 1.17' < 11'	B
		11' < 19'	C
		19' < 29'	D
		29' < 40'	F
SIZE: 9'-0"			
≥ 1.17' < 40'	A	≥ 1.17' < 15'	C
		15' < 22'	D
		22' < 40'	F

* Precast structures 3'-6" x 3'-6" maybe cast with 6" walls to depths of 15'. See Index No. 201.

GENERAL NOTES


- Size is the inside dimension(s) of a structure.
- Slab reinforcement is appropriate for top, intermediate, and bottom slabs.
- Slab depth is measured from finished grade to top of slab.
- Wall design depth is measured to the top of the bottom slab for boxes and to the top of the intermediate slab for risers.
- Wall height is the distance between top of lower slab to bottom of upper slab.
- Wall sizes exceeding 9'-0" require a special design.

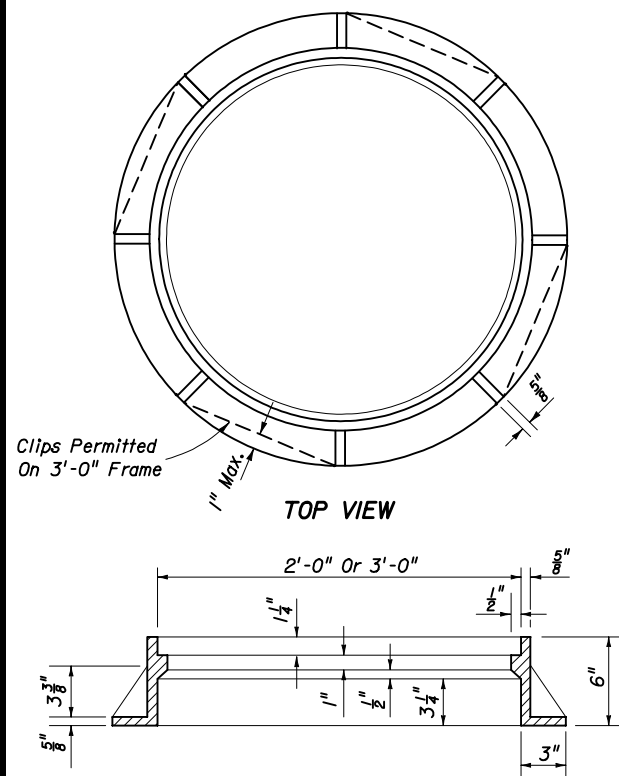
REINFORCING SCHEDULE

SCHEDULE	GRADE 60 STEEL OR 65 KSI (WIRE FABRIC) In ² /ft
A	0.20
B	0.24
C	0.37
D	0.53
E	0.73
F	1.06
G	1.45

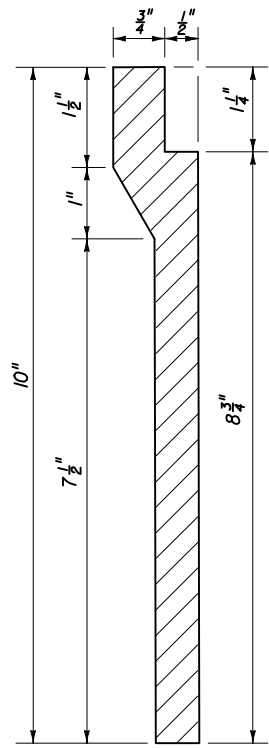
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**STRUCTURE BOTTOMS
TYPE J AND P**

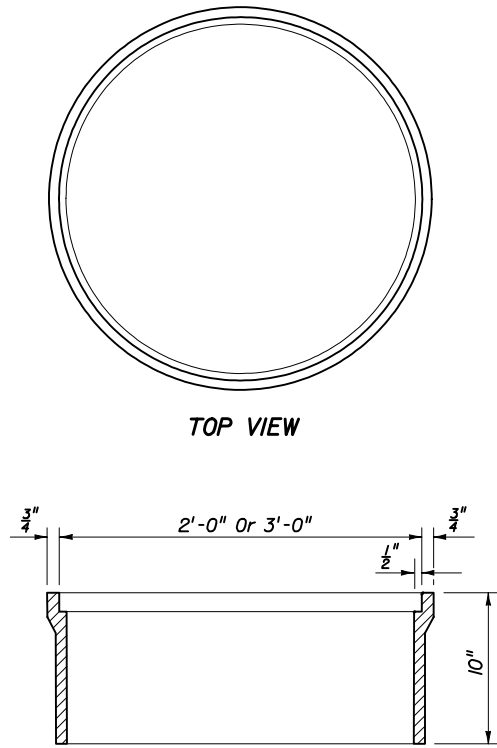
Names	Dates	Approved By 		
Designed By		State Design Engineer		
Drawn By	ods 05/86	Revision	Sheet No.	Index No.
Checked By	JBW 05/86	04	2 of 2	200



SECTION TYPE I
For Manholes

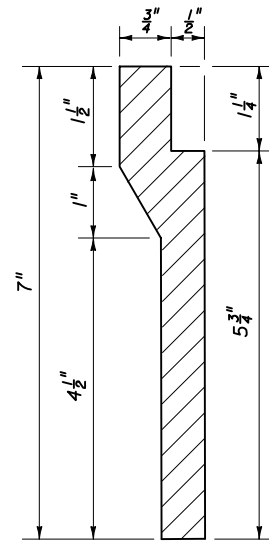


WALL SECTION TYPE II

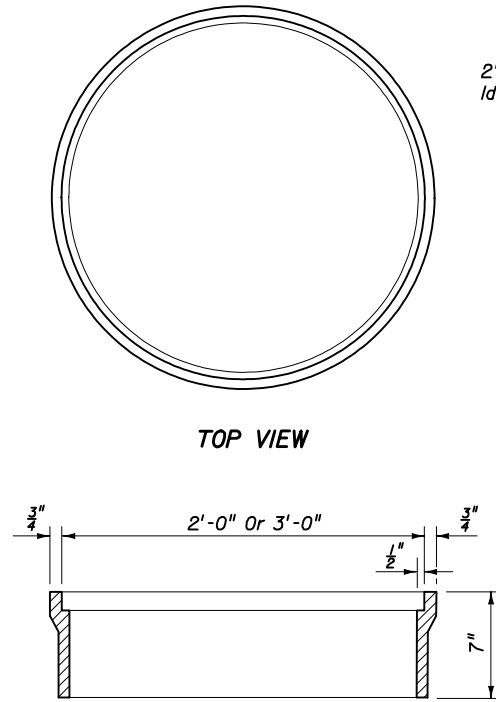


SECTION TYPE II

For Curb Inlets Types 1, 2, 3, & 4

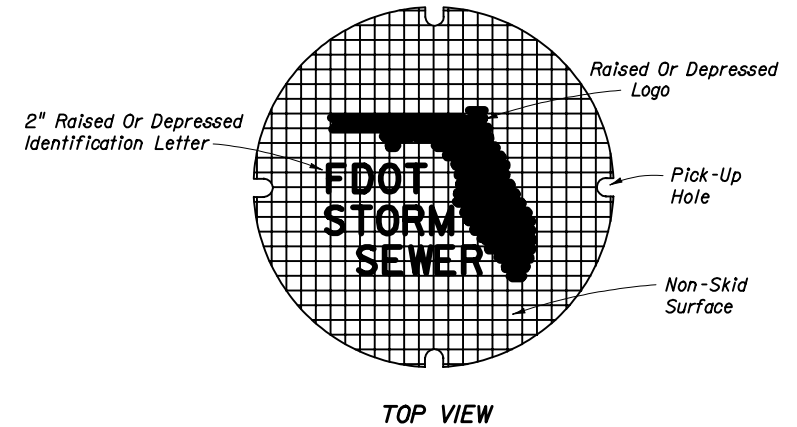


WALL SECTION TYPE III

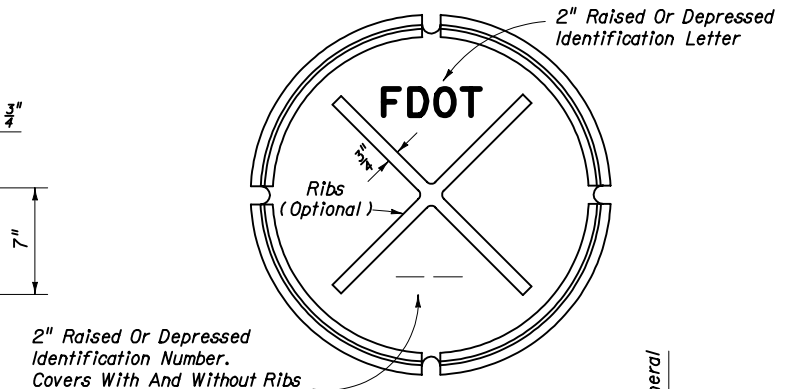


SECTION TYPE III

For Curb Inlets Types 7 & 8



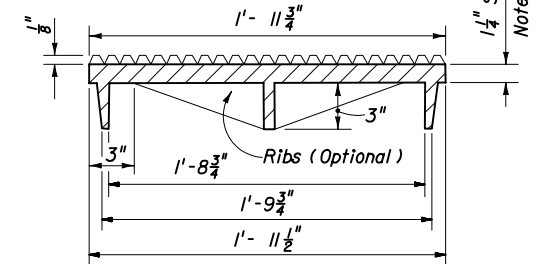
TOP VIEW



BOTTOM VIEW

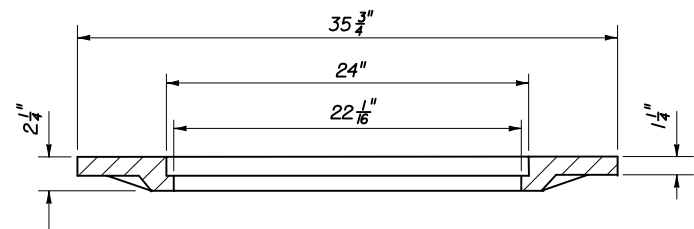
2" Raised Or Depressed Identification Number. Covers With And Without Ribs Shall Bear The Same Product Identification Number.

1/4" See General Note No. 1

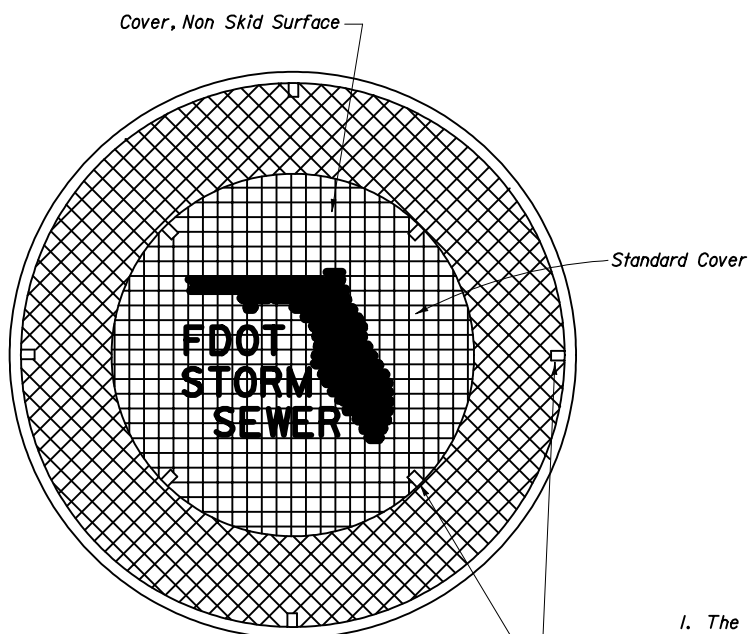


SECTION

COVER FOR ALL FRAMES



2-PIECE COVER



For Use With Types I, II And III Frames With 3'-0" Opening

2-PIECE COVER

CAST IRON FRAMES

NOTES (FRAMES, AND COVER)

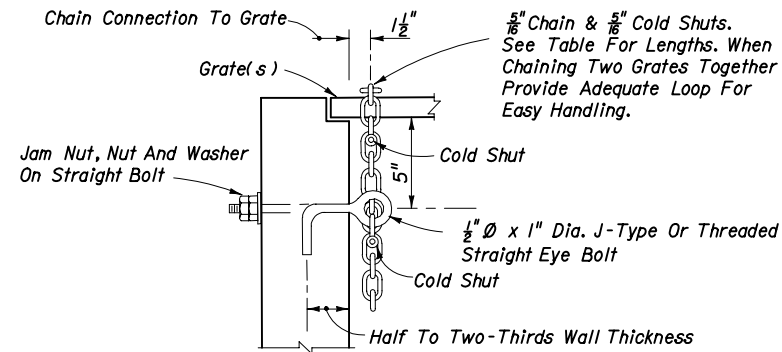
- The standard cover is to be used for all frames Types I, II, III and the 2-Piece Cover, and is the replacement cover for all previous frames with 1/2" deep seats (traffic type). The 185 lb. cover (non-traffic type), 1984 Roadway and Traffic Design Standards Index No. 201, is the replacement cover for existing frames with 1/2" deep seats. Installation of frames with 1/2" deep seats is not permitted.
- Use the 2'-0" cover, unless the 2-piece cover is called for in the plans. Consider using the 2-piece cover where depths exceed 5' and manual entry may be required for cleaning.

Frame Type	WEIGHT OF CASTINGS					
	2' OPENING		3' OPENING			
	Frame	Cover (Std.)	Frame	2-Piece Cover		
			Inside	Outside	Total	
I	155 Lbs.	190 Lbs.	220 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.
II	145 Lbs.	190 Lbs.	255 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.
III	90 Lbs.	190 Lbs.	180 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

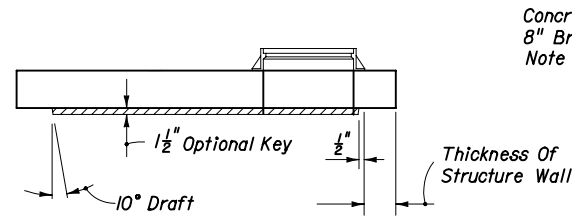
SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS

Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By	HSD 06/82			
Checked By	JBW 06/82	Revision	Sheet No.	Index No.
		04	1 of 6	201

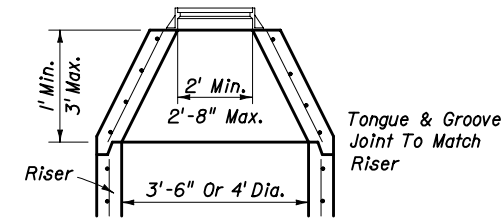
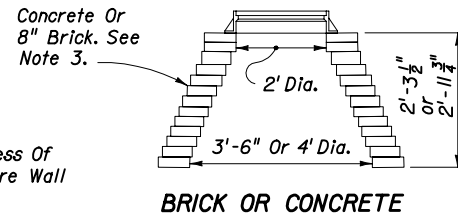


Note: When Alternate G grate is specified, the chain, bolt, nuts, washer and cold shuts shall be galvanized in accordance with the specifications for the grate.

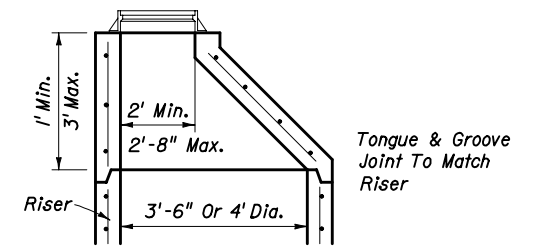
Cost of eye bolt and chain to be included in the contract unit price for inlets.



SECTION
Note: See Slab Designs Index No. 200.
TYPE 7



PRECAST CONCENTRIC CONE
TYPE 8



PRECAST ECCENTRIC CONE

MANHOLE TOPS

NOTES (TOPS)

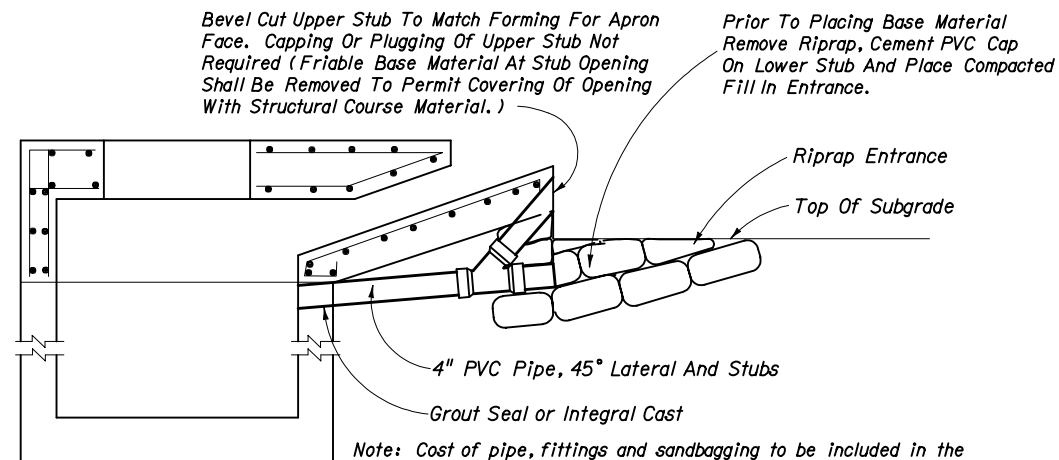
- Manhole top Type 7 slabs shall be of Class II concrete. Concrete as specified in ASTM C478 may be used for precast units; see General Note No. 3.
- Manhole top Type 7 slabs may be of cast-in-place or precast construction. The optional key is for precast tops and in lieu of dowels. Frame and slab openings are to be omitted when top is used over a junction box. Frames can be adjusted with one to six courses of brick.
- Manhole top Type 8 may be of cast-in-place or precast concrete construction or brick construction. For concrete construction, the concrete and steel reinforcement shall be the same as the supporting wall unit. An eccentric cone may be used.
- Manhole tops shall be secured to structures by optional construction joints as shown on Sheet 3 of 6.
- Substitution of manhole top Type 8 for manhole top Type 7 is allowed provided that minimum dimensions shown above are not reduced.

DESIGN NOTES

- Manhole top Type 8 should be specified in the plans when depths shown above can be maintained.

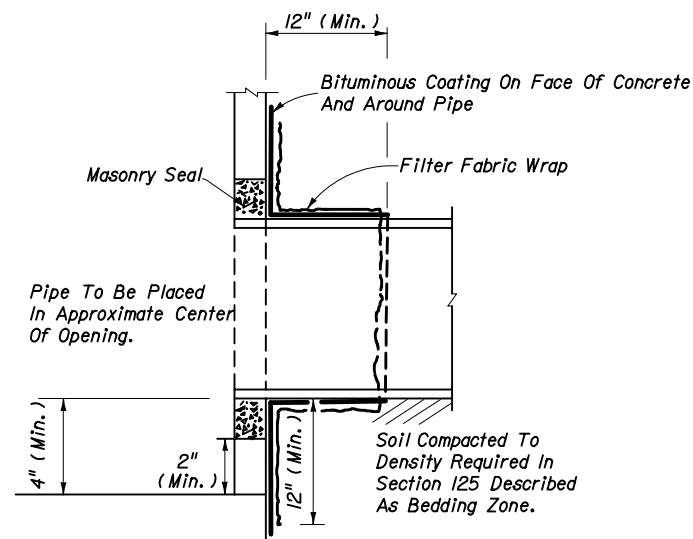
EYE BOLT AND CHAIN REQUIREMENTS				
Index Number	Inlet Type	Eye Bolts	Length Of Chain	Handling & Remarks
217	(MB) 1	1	4'-0"	Slide & Spin
	(MB) 2	1	4'-0"	Slide & Spin
	(MB) 3	2	2 @ 4'-0"	Slide & Spin
	(MB) 4	2	2 @ 4'-0"	Slide & Spin
	(MB) 5	2	2 @ 4'-0"	Slide & Spin
218	(BW)	1	3'-8"	Slide Or Slide & Spin
219	(BW, RGD)	1	4'-0"	Slide & Spin
220	S	1	4'-0"	Slide & Spin
221	V	1	4'-0"	Slide & Spin
230	A	1	3'-0"	Slide
231	B	1	5'-0"	Slide & Spin
232	C	1	2'-6"	Slide & Spin
	D	1	2'-6"	Slide & Spin
	E	2	2 @ 2'-6"	Slide & Spin
	H	2	2 @ 2'-6"	Flip Ctr. Grate and Slide & Spin Single Free Grate
233	F	1	3'-6"	Flip Or Slide & Spin
	G	1	6'-0"	Slide
			2'-0"	Lifting Loop
234	J	1	4'-0"	Slide & Spin

EYE BOLT AND CHAIN FOR LOCKING GRATES TO INLETS

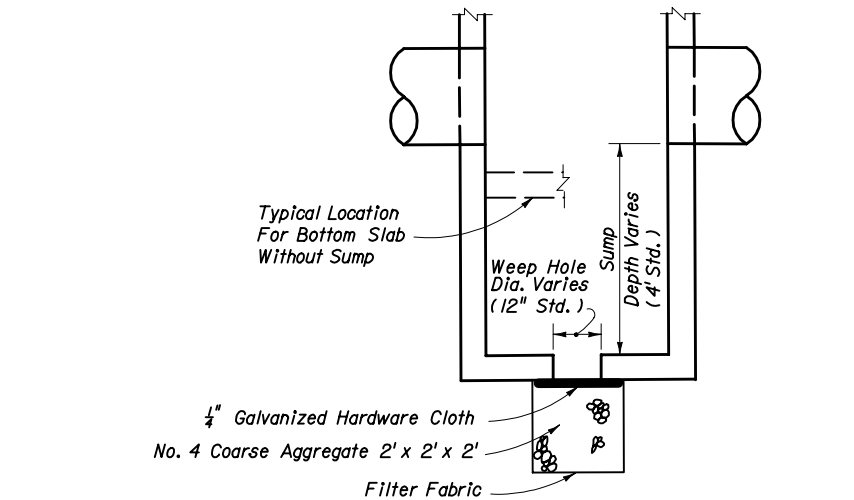


TEMPORARY DRAINS FOR SUBGRADE AND BASE

Note: Cost of pipe, fittings and sandbagging to be included in the contract unit price for inlets. See Index No. 102 for sediment control at inlet.

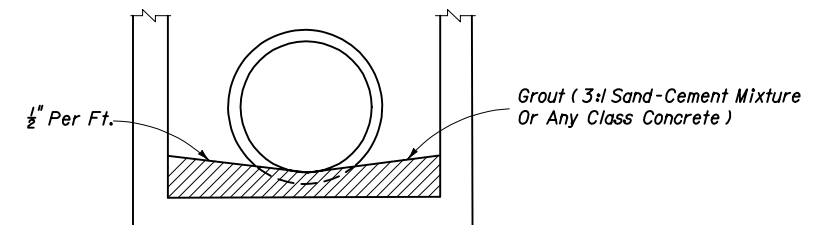


FILTER FABRIC WRAP ON GROUTED PIPE TO STRUCTURE JOINT



NOTE: Sump bottom appropriate for all manhole and inlet types. Sumps are to be constructed in inlet and manholes connected to French Drains unless excluded in the plans. At other locations, sump is to be constructed only where called for in the plans. Weep hole to be constructed in sump bottom only where called for in the plans. Cost of sump bottom and weep hole to be included in the contract unit price for inlet or manhole.

SUMP BOTTOM




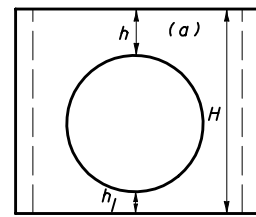
FOR ALL STRUCTURES UNLESS EXCLUDED BY SPECIAL DETAIL

ALL PIPE TYPES DRAINAGE STRUCTURE INVERT

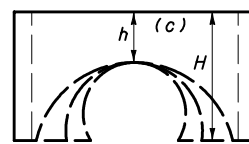
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS

Names	Dates	Approved By		
Designed By	HLB	04/75	 State Drainage Engineer	
Drawn By				
Checked By	LMF	04/75	Revision	04
			Sheet No.	2 of 6
			Index No.	201

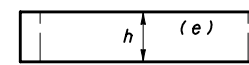


When $h_1 < 0.75h$ (min.) **Then (Req'd)** $h \geq 0.4H$
 $h_1 \geq 0.75h$ (min.) $h \geq h$ (min.)



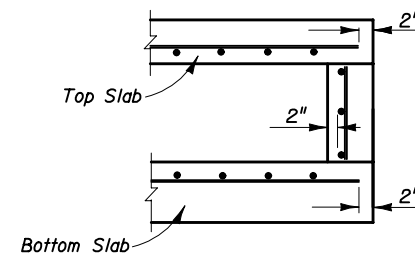
$h_{min} \leq h \leq 0.4H$

Segments may be inverted. Maximum opening for pipe shall be the pipe OD plus 6". If h can not be attained, then a top or bottom slab must be attached to the segment as shown below.



$h \geq h$ (min.)

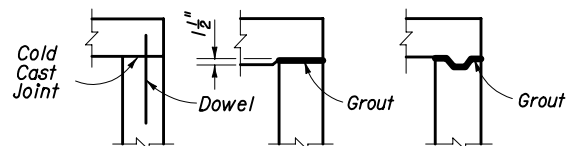
Minimum Value For h	
h (min.)	Box Or Riser Diameter
1'-0"	3'-6" & 4'-0"
1'-6"	5'-0" & 6'-0"
2'-0"	>6'-0"



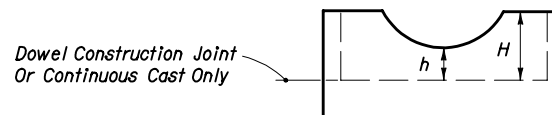
(NOTE: NOT APPLICABLE AROUND MANHOLE AND RISER OPENINGS)

REBAR STRAIGHT END EMBEDMENT FOR TOP AND BOTTOM SLABS

SEPARATE RISER SEGMENTS WITH CONSTRUCTION JOINTS OTHER THAN DOWEL OPTION



TOP SLABS TO WALLS

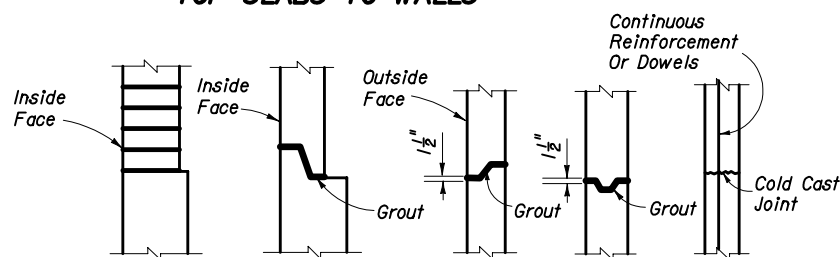


$h \geq \text{zero}$
 (h min Tabulated Above Do Not Apply)

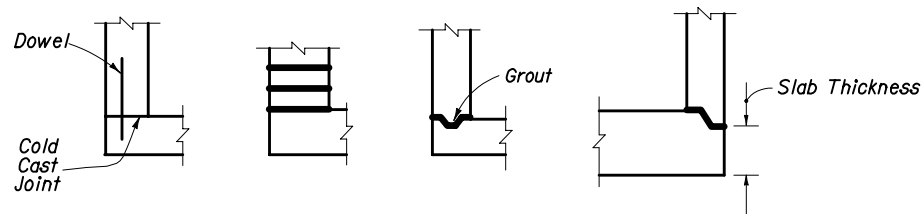
TOP OR BOTTOM SEGMENT FOR DOWEL CONSTRUCTION JOINTS OR CONTINUOUS CAST SEGMENTS

COMPARATIVE SIDE VIEWS

MINIMUM DIMENSIONS FOR BOX AND RISER SEGMENTS



WALL JOINTS



BOTTOM SLABS TO WALLS

- One or more types of joints may be used in a single structure, except brick wall structure. Brick wall construction is permitted on circular units only.
- All grouted joints are to have a maximum thickness of 1".
- Keyways are to be a minimum of 1/2" deep.
- Joint dowels are to be #4 bars, 12" long with a minimum of 6 bars per joint approximately evenly spaced for circular structures or 2 bars per side at approximate quarter points for rectangular. Bars are to be placed approximately 6" into fresh concrete leaving the remainder to extend into the secondary cast. Welded wire fabric may be substituted for the dowels bar in accordance with the equivalent steel area table on Sheet 4.
- Minimum cover on reinforcing bars is 1 1/2".
- Joints between wall segments and between wall segments and top or bottom slabs may be sealed either by preformed plastic gasket material using the procedures given in Section 430-7.3 or by grout.
- Approved product inserts may be used in lieu of dowel embedment.

OPTIONAL CONSTRUCTION JOINTS


The "UTILITY PIPES THRU STORM SEWER STRUCTURES" Details Have Been Moved To Index No. 307 "MISCELLANEOUS UTILITY DETAILS".

GENERAL NOTES

- For square or rectangular precast drainage structures, either deformed or smooth welded wire fabric may be used provided:
 - The smooth welded wire fabric shall comply with ASTM A185, and deformed welded wire fabric shall comply with ASTM A497.
 - Width and length of the unit is four times the spacing of the cross wires.
 - Wire fabric shall be continuous around the box, spliced at quarter points with overlap of not less than the spacing of the cross wires plus 2".
- For equivalent steel areas for precast drainage structures, see Sheet 4.
- Horizontal steel in the walls of rectangular structures shall be lapped a minimum of 24 bar diameter at corners.
- Welding of splices and laps is permitted. The requirements and restrictions placed on welding in AASHTO M259 shall apply.
- Rebar straight end embedment or peripheral reinforcement may be used in lieu of ACI standard hooks for top and bottom slabs except when hooks are specifically called for in plans or standard drawings.
- Concrete as specified in ASTM C478, (4000 psi) may be used in lieu of Class I and Class II concrete in precast items manufactured in plants which are under the 'Standard Operating Procedures For The Inspection Of Precast Drainage Products'.
- Maximum opening for pipe shall be the pipe OD plus 6". Mortar used to seal the pipe into the opening will be of such a mix that shrinkage will not cause leakage into or out of the structure.
- For pay item purposes, the height used to determine if a drainage structure is less than or greater than 10 feet shall be computed using (a) the elevation of the top of the manhole lid, (b) the grate elevation or the theoretical gutter grade elevation of an inlet, or (c) the outside top elevation of a junction box less the flow line elevation of the lowest pipe or to top of sump floor.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS

Names		Dates		Approved By		
Designed By	HLB	04/75	 State Drainage Engineer			
Drawn By						
Checked By	LWF	04/75	Revision	Sheet No.	Index No.	
			04	3 of 6	201	

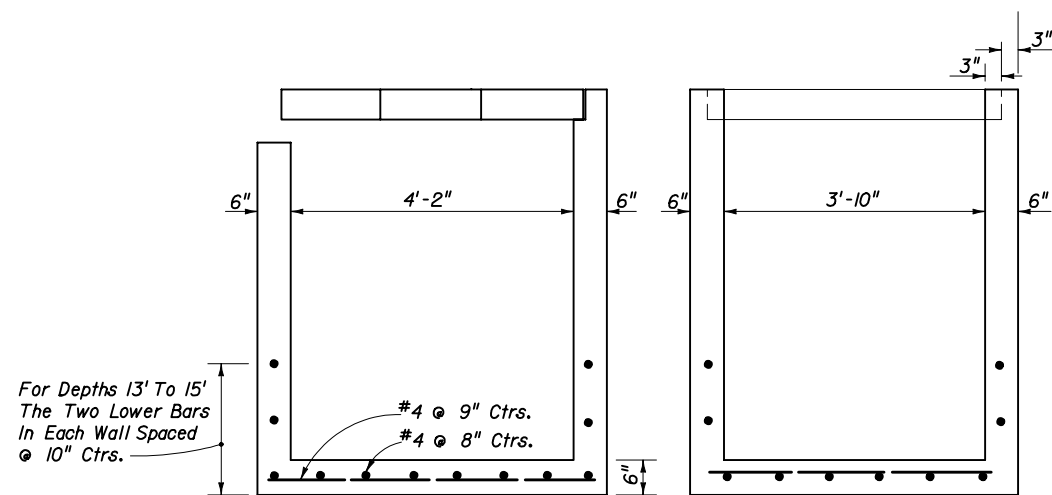
NOTES FOR THIN-WALL PRECAST OPTIONS

1. The details on Sheets 4, 5 & 6 are optional for precast inlet construction up to depths of 15'. These inlets can be used with Alt. "B" Bottoms, Index No. 200. Cast-in-place construction must adhere to the details contained on the referenced indexes.
2. Only the dimensions and reinforcement changes or other modifications are indicated. For all other dimensions and details, the referenced index drawings apply. When these precast units are used in conjunction with Alt "B" Structure Bottoms, Index No. 200, the interior dimensions of an Alt. "B" Bottom can be adjusted to reflect these inlet interior dimensions.
3. Concrete which meets the requirements of ASTM C478 shall be used for structures constructed to these details.
4. Reinforcement can be either deformed bar reinforcement or welded wire fabric. Bar reinforcement other than 40 ksi may be used, however only two grades are recognized; Grade 40 and Grade 60. Welded wire fabric, including deformed welded wire fabric, will be recognized as having a design strength of 65 ksi. The area of reinforcement required may be reduced in accordance with the Equivalent Steel Area Table provided. For bars and spacings not given, the steel area required can be determined by the following equations:

$$\text{Grade 60 Steel Area} = A_s 60 = \frac{60}{40} \times A_s 40$$

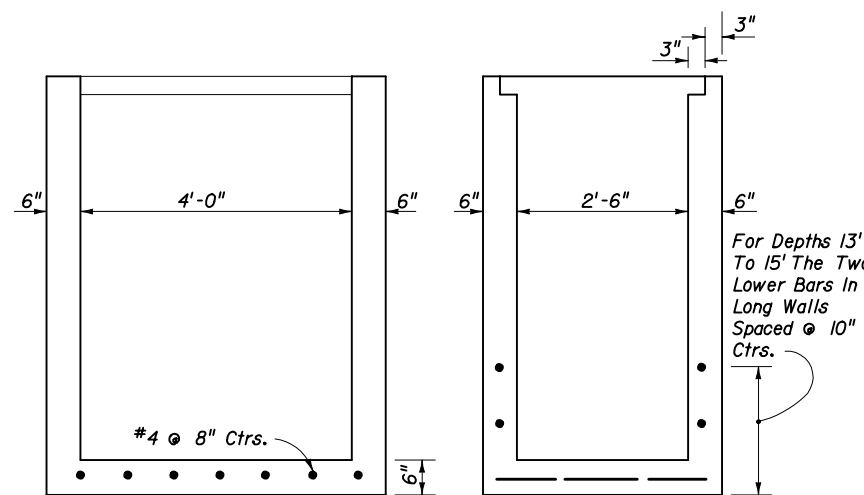
$$\text{Welded Wire Fabric Steel Area} = A_s 65 = \frac{65}{40} \times A_s 40$$

In no case will fabric with wires smaller than W3.1 or spacings greater than 8" be permitted. Bar reinforcement shall show the minimum yield designation grade mark of either the number 60 or one (1) grade mark line to be acceptable at the higher value. Maximum bar spacing shall not be greater than two (2) times the slab thickness with a maximum spacing of 12" or three (3) times the wall thickness, with a maximum spacing of 18".



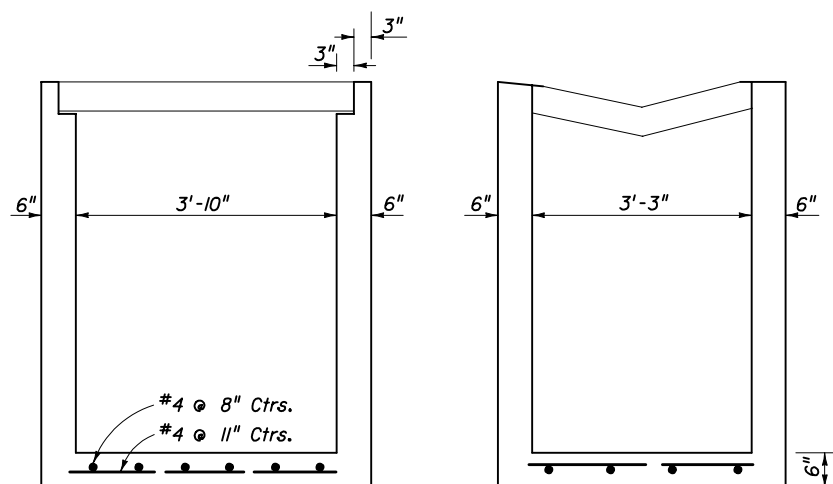
PARTIAL SECTION AA PARTIAL SECTION BB

DITCH BOTTOM INLET TYPE B
INDEX NO. 231



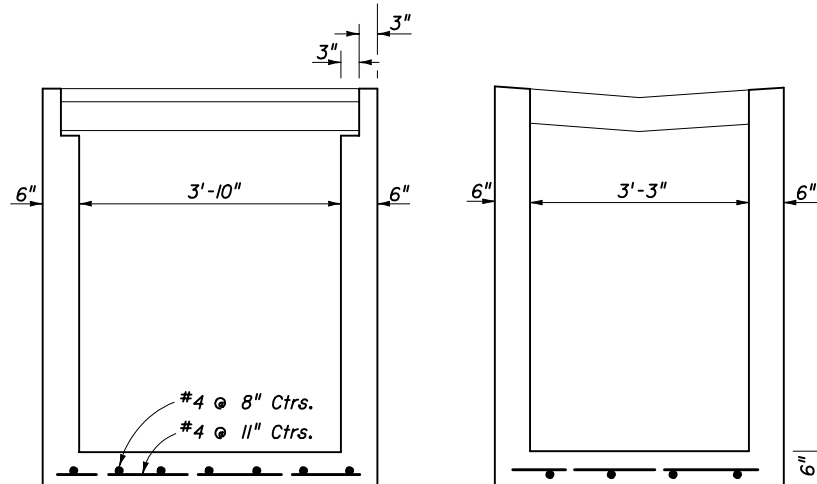
PARTIAL SECTION AA PARTIAL SECTION BB

DITCH BOTTOM INLET TYPE F
INDEX NO. 233



PARTIAL SECTION AA PARTIAL SECTION BB

GUTTER INLET TYPE S
INDEX NO. 220




PARTIAL SECTION AA PARTIAL SECTION BB

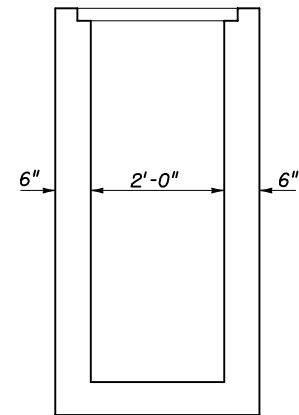
GUTTER INLET TYPE V
AND DITCH BOTTOM INLET TYPE J
INDEX NO. 221 & 234

EQUIVALENT STEEL AREA TABLE					
GRADE 40 REINFORCING BAR		EQUIVALENT GRADE 60 REINFORCING BAR		EQUIVALENT 65 KSI WELDED WIRE FABRIC	
Bar Size & Spacing	Steel Area	Bar Size & Spacing	Min. Steel Area	Style Designation	Min. Steel Area
#4 @ 12" CCEW	0.20	#3 @ 9 1/2" CCEW	.1333	3" x 3" - W3.1 x W3.1 or 4" x 4" - W4.5 x W4.5 or 6" x 6" - W6.5 x W6.5	.1230
#4 @ 9" CCEW	0.267	#4 @ 13 1/2" CCEW or #3 @ 7" CCEW	.1778	3" x 3" - W4.5 x W4.5 or 4" x 4" - W5.5 x W5.5 or 6" x 6" - W8.5 x W8.5	.1641
#6 @ 6" CCEW	0.88	#5 @ 6" CCEW or #6 @ 9" CCEW	.5867	4" x 4" - W20 x W20 or 6" x 6" - W30 x W30	.5415
#7 @ 6" CCEW	1.20	#6 @ 6 1/2" CCEW or #7 @ 9" CCEW	.80	4" x 4" - W26 x W26	.7385

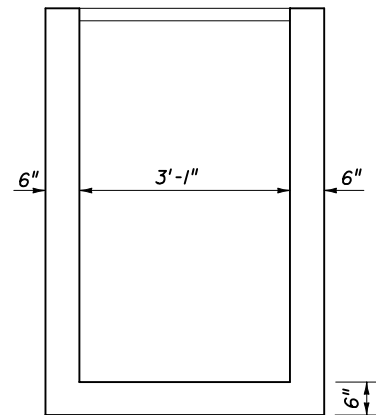
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS

Names	Dates	Approved By 		
Designed By	EGR/JGW	09/86	State Drainage Engineer	
Drawn By	WPH/dde	09/86	Revision	Sheet No.
Checked By	EGR	09/86	04	4 of 6
				Index No.
				201

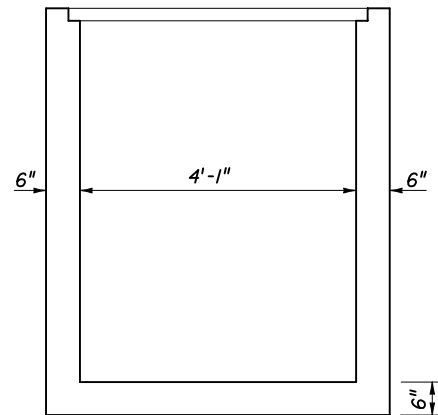


PARTIAL SECTION BB

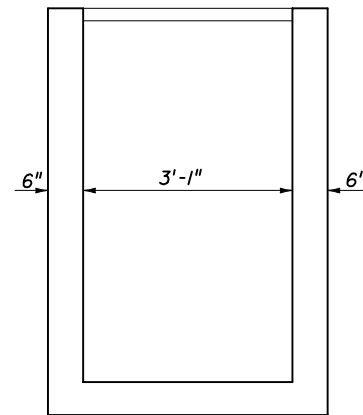


PARTIAL SECTION CC

DITCH BOTTOM INLET C
INDEX NO. 232

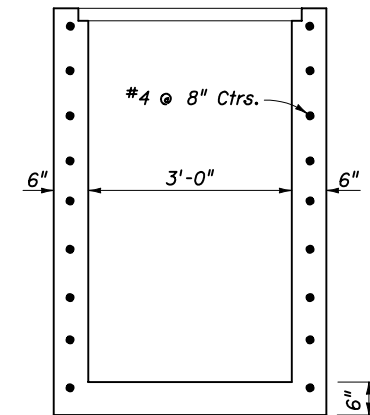


PARTIAL SECTION BB

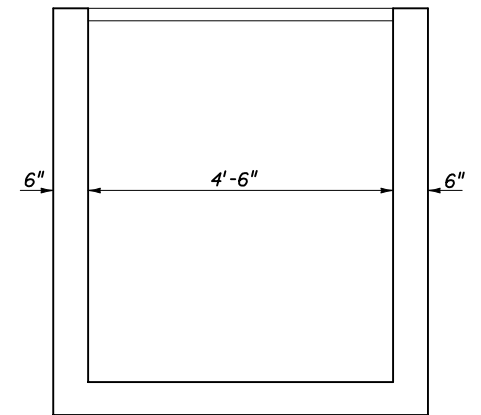


PARTIAL SECTION CC

DITCH BOTTOM INLET D
INDEX NO. 232

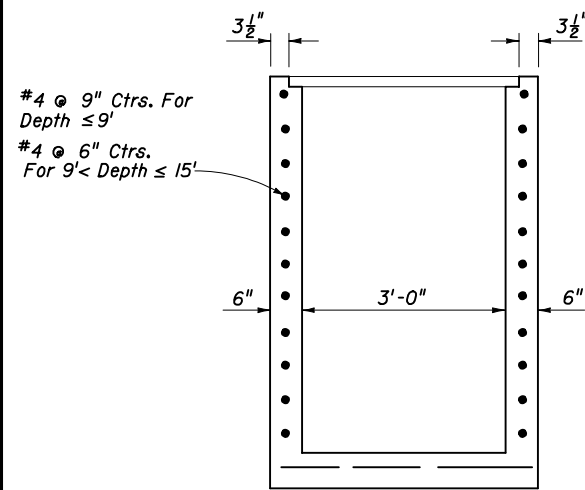


PARTIAL SECTION BB

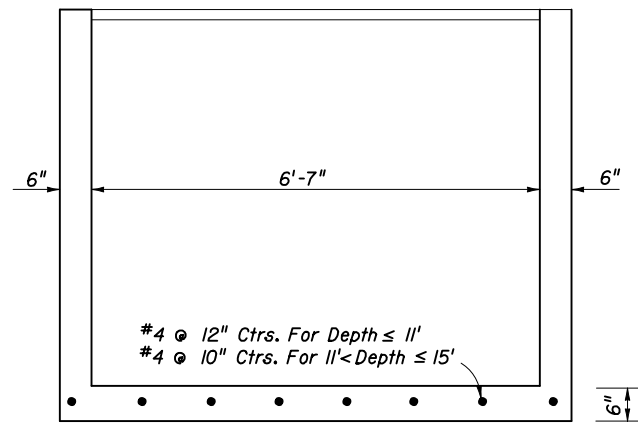


PARTIAL SECTION CC

DITCH BOTTOM INLET E
INDEX NO. 232

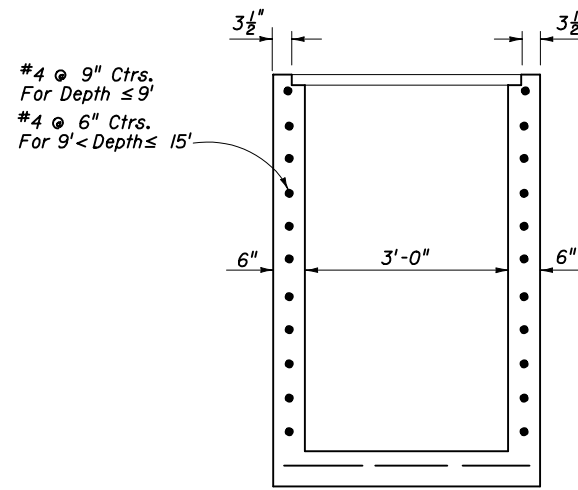


PARTIAL SECTION BB

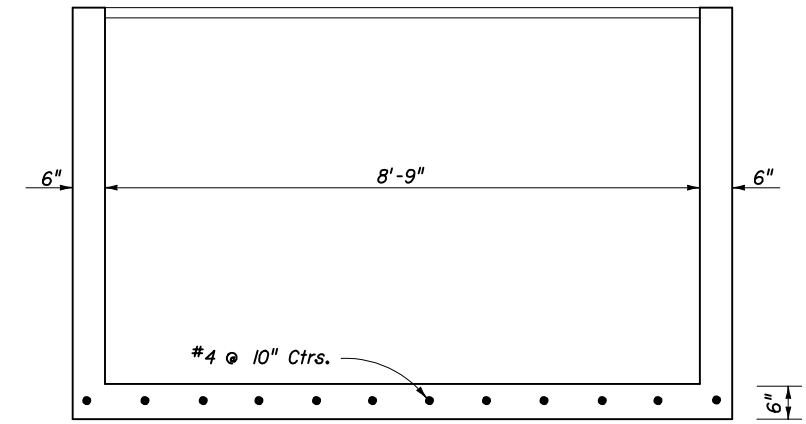


PARTIAL SECTION CC

DITCH BOTTOM INLET H (3-GRATE)
INDEX NO. 232



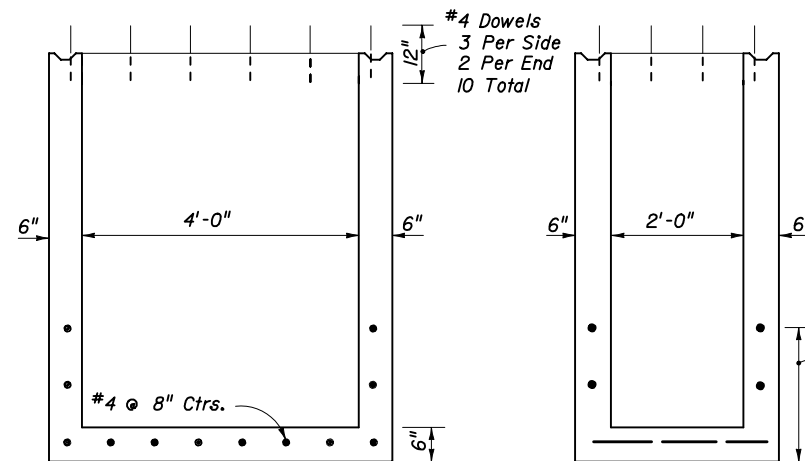
PARTIAL SECTION BB



PARTIAL SECTION CC

DITCH BOTTOM INLET H (4-GRATE)
INDEX NO. 232

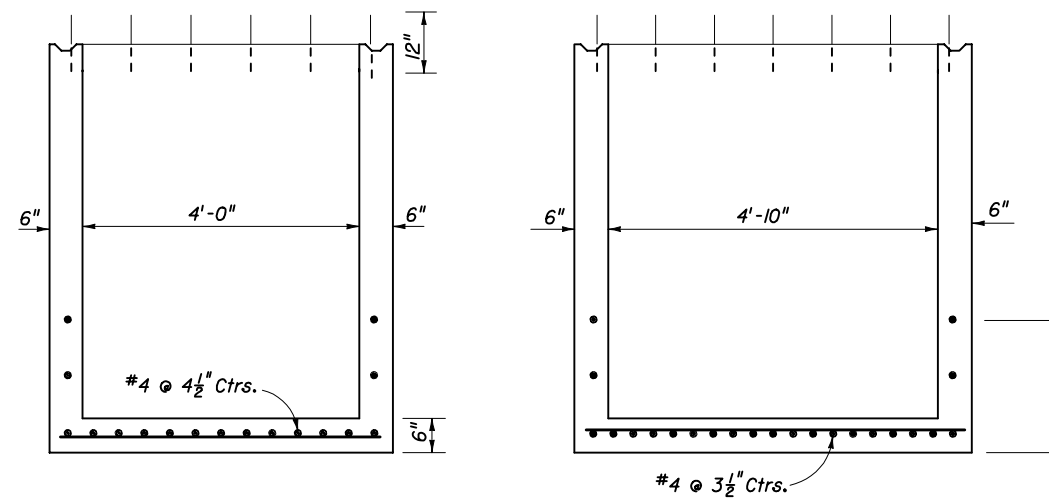
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS				
	Names	Dates	Approved By <i>[Signature]</i>	
Designed By	EGR/JGW	09/86	State Drainage Engineer	
Drawn By	WPH/dde	09/86	Revision	Sheet No.
Checked By	EGR	09/86	00	5 of 6
				Index No. 201



PARTIAL SECTION AA

PARTIAL SECTION BB

MEDIAN BARRIER INLET TYPES 1 & 2

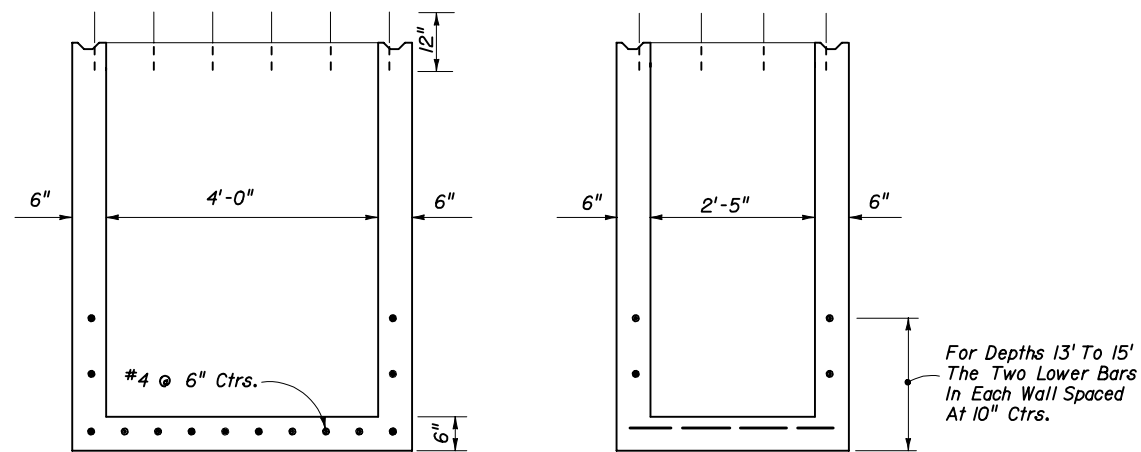


PARTIAL SECTION AA

PARTIAL SECTION BB

MEDIAN BARRIER INLET TYPES 3, 4, & 5

INDEX NO. 217

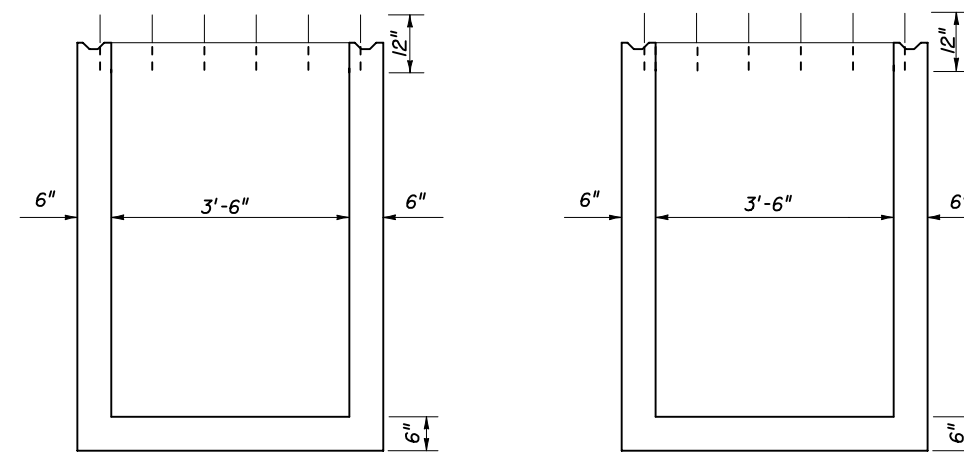


PARTIAL SECTION AA

PARTIAL SECTION BB

BARRIER WALL (RIGID) (C & G)

INDEX NO. 219



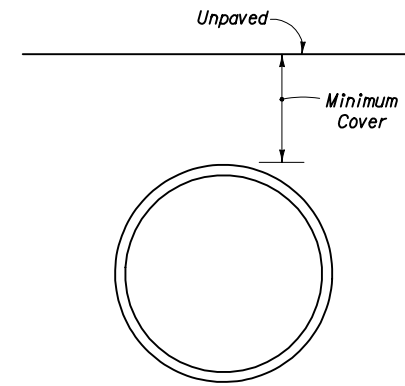
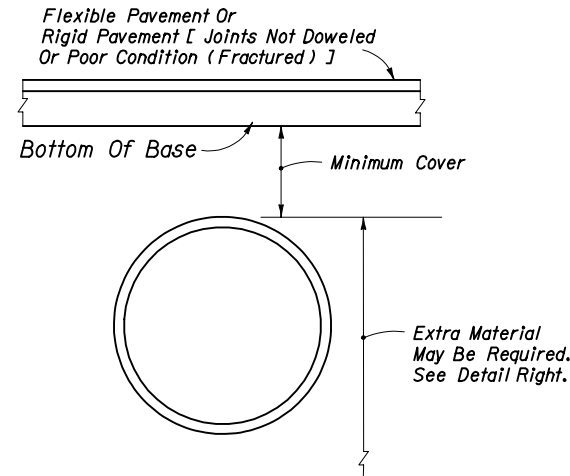
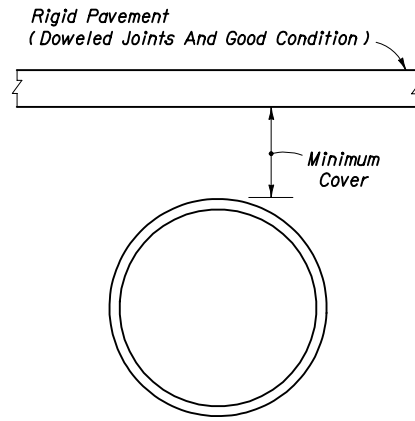
PARTIAL SECTION AA

PARTIAL SECTION BB

STRUCTURE BOTTOM TYPE P

INDEX NO. 200

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	6 of 6	201



RIGID PAVEMENT

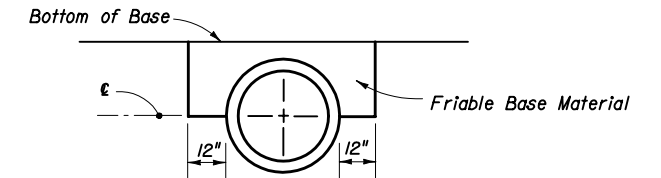
PIPE TYPE/SIZE & SHAPE	MINIMUM COVER
CONCRETE (See Note 6)	
Round & Elliptical	9"
CORRUGATED STEEL	
15"-72" Round & Arch Equiv.	9"
78" & Larger Round & Arch Eq.	15"
CORRUGATED ALUMINUM	
15"-72" Round & Arch Equiv.	9"
78"-102" Round & Arch Equiv.	15"
108" & Larger Round	18"
CORRUGATED POLYETHYLENE	
15"-48" Round	9"
POLYVINYL CHLORIDE	
15"-48" Round	9"

FLEXIBLE PAVEMENT

PIPE TYPE/SIZE & SHAPE	MINIMUM COVER
CONCRETE (See Note 6)	
Round & Elliptical	7"
CORRUGATED STEEL	
12"-30" Round	12" [12"]
36"-48" Round	18" (12") [15"]
54"-72" Round	21" (15") [18"]
78"-96" Round	(18") [27"]
102" & Larger Round	(24") [33"]
15"-30" Arch Equivalent	18" [18"]
36"-48" Arch Equivalent	24" (12") [18"]
54"-72" Arch Equivalent	27" (15") [24"]
78"-96" Arch Equivalent	(18") [30"]
102" & Larger Arch Equivalent	(24")
CORRUGATED ALUMINUM	
12"-24" Round	15" [12"]
30"-48" Round	18" (12") [18"]
54"-72" Round	24" (18") [24"]
78"-102" Round	(24") [30"]
108" & Larger	(30")
15"-24" Arch Equivalent	24" [21"]
30"-48" Arch Equivalent	27" (15") [24"]
54"-72" Arch Equivalent	30" (18") [27"]
78"-90" Arch Equivalent	(24") [30"]
96"-102" Arch Equivalent	(30")
CORRUGATED POLYETHYLENE	
15"-48" Round	15"
POLYVINYL CHLORIDE	
15"-48" Round	15"

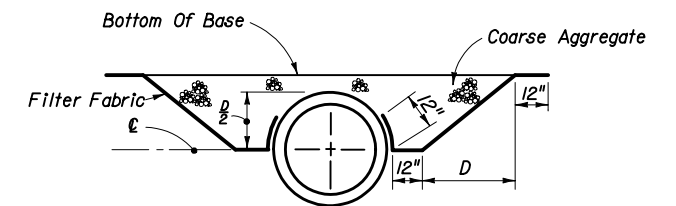
UNPAVED

PIPE TYPE/SIZE & SHAPE	MINIMUM COVER	
	COMMERCIAL	NON-COMMERCIAL
CONCRETE (See Note 6)		
Round & Elliptical	12"	3"
CORRUGATED STEEL		
12"-30" Round	18" [15"]	12" [12"]
36"-48" Round	18" (12") [15"]	12" (12") [12"]
54"-72" Round	18" (12") [15"]	15" (12") [12"]
78"-96" Round	(18") [27"]	(12") [12"]
102" & Larger Round	24" [33"]	18" [21"]
15"-30" Arch Equivalent	18" [18"]	12" [12"]
36"-48" Arch Equivalent	24" (12") [21"]	18" (12") [15"]
54"-72" Arch Equivalent	30" (18") [24"]	24" (12") [18"]
78"-96" Arch Equivalent	(24") [27"]	(18") [21"]
102" & Larger Arch Equivalent	(30")	(24")
CORRUGATED ALUMINUM		
12"-24" Round	21" [21"]	15" [15"]
30"-48" Round	24" (18") [21"]	18" (12") [15"]
54"-72" Round	30" (24") [27"]	24" (18") [21"]
78"-102" Round	(30") [33"]	(24") [27"]
108" & Larger	36"	30"
15"-24" Arch Equivalent	27" [24"]	24" [21"]
30"-48" Arch Equivalent	33" (21") [27"]	27" (15") [21"]
54"-72" Arch Equivalent	36" (24") [30"]	30" (18") [24"]
78"-90" Arch Equivalent	(30") [36"]	(24") [30"]
96"-102" Arch Equivalent	(36")	(30")
CORRUGATED POLYETHYLENE		
15"-48" Round	21"	15"
POLYVINYL CHLORIDE		
15"-48" Round	21"	15"



The cost of furnishing and installing the extra base material shall be included in the cost of the culvert.

FRIABLE BASE



The coarse aggregate shall be placed in 6 inch lifts and compacted sufficiently as to be firm and unyielding. The coarse aggregate shall be gravel or stone meeting the requirements of Section 901-2 or 901-3 respectively. The gradation shall meet Section 901-6, Grades 4, 467, 5, 56, or 57 unless restricted in the plans. The filter fabric shall be Type D-3 (See Index No. 199). The cost of furnishing and installing the coarse aggregate and filter fabric shall be included in the cost of the culvert.

ASPHALTIC CONCRETE BASE

Note: Extra material is required when cross culverts are located on facilities subject to high speed traffic (≥ 55 mph) or high traffic volumes (> 1600 ADT) and the cover is less than 12 inches For Concrete Pipe, 15 inches For Corrugated Steel Pipe And 18 inches For Corrugated Aluminum Pipe, Corrugated Polyethylene And Corrugated Polyvinyl Chloride Pipe.

GENERAL NOTES

- The tabulated values are recommended minimum dimensions to withstand anticipated highway traffic loads. Additional cover may be required to support construction equipment loads or highway traffic loads before pavement is completed. Some size thickness combinations may require minimum cover greater than those listed above. See Sheets 2, 3, & 4.
- Less than the tabulated minimum cover may be used provided suitable method (s) are detailed in the plans.
- Values shown in parentheses () are for 3" x 1" corrugations which must be specified to utilize the lesser cover.
- The tabulated values in the brackets [] apply to Type I-R (Spiral Rib) pipe which must be specified to utilize the lesser cover.
- Commercial and noncommercial refers to typical vehicular utilization of unpaved roads and drives where rutting and cover displacement may occur.
- For Pipe Class S with diameters of 12" to 30", the minimum height of fill measured from top of finished grade to outside top of pipe is 3 feet.

MINIMUM COVER FOR CONCRETE, STEEL, ALUMINUM, POLYETHYLENE AND POLYVINYL CHLORIDE PIPE

EXTRA MATERIAL FOR CROSS CULVERTS UNDER FLEXIBLE PAVEMENTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
COVER HEIGHT				
Names	Dates	Approved By		
Designed By	EGR 09/84	 State Drainage Engineer		
Drawn By	DAE 09/84	Revision	Sheet No.	Index No.
Checked By	EGR 09/84	04	1 of 5	205

ROUND PIPE DIMENSIONS				
Equiv. Dia. (In.)	Area (Sq. Ft.)	Wall Thickness (In.)* Classes II, III, IV, V		
		A WALL	B WALL	C WALL
12	0.8	1 3/4	2	NA
15	1.2	1 7/8	2 1/4	NA
18	1.8	2	2 1/2	NA
24	3.1	2 1/2	3	3 3/4
30	4.9	2 3/4	3 1/2	4 1/4
36	7.1	3	4	4 3/4
42	9.6	3 1/2	4 1/2	5 1/4
48	12.6	4	5	5 3/4
54	15.9	4 1/2	5 1/2	6 1/4
60	19.6	5	6	6 3/4
66	23.8	5 1/2	6 1/2	7 1/4
72	28.3	6	7	7 3/4
78	33.2	6 1/2	7 1/2	8 1/4
84	38.5	7	8	8 3/4
90	44.4	7 1/2	8 1/2	9 1/4
96	50.3	8	9	9 3/4
102	56.7	8 1/2	9 1/2	10 1/4
108	63.7	9	10	10 3/4
114	70.9	9 1/2	—	—
120	78.5	10	—	—

* For Informational Purposes Only
Do Not Specify Wall Thickness
Option B Wall Is Industry Standard

ELLIPTICAL PIPE DIMENSIONS						
Nominal Dimensions				Equiv. Dia. (In.)	Area (Sq.Ft.)	Wall Thickness (In.) Classes HE II, III, IV VE II, III, IV
Horiz.		Vert.				
Rise (In.)	Span (In.)	Rise (In.)	Span (In.)			
NA	NA	NA	NA	12	NA	NA
12	18	18	12	15	1.3	2 1/2
14	23	23	14	18	1.8	2 3/4
19	30	30	19	24	3.3	3 1/4
24	38	38	24	30	5.1	3 3/4
29	45	45	29	36	7.4	4 1/2
34	53	53	34	42	10.2	5
38	60	60	38	48	12.9	5 1/2
43	68	68	43	54	16.6	6
48	76	76	48	60	20.5	6 1/2
53	83	83	53	66	24.8	7
58	91	91	58	72	29.5	7 1/2
63	98	98	63	78	34.6	8
68	106	106	68	84	40.1	8 1/2
72	113	113	72	90	46.1	9
77	121	121	77	96	52.4	9 1/2
82	128	128	82	102	59.2	10
87	136	136	87	108	66.4	10 1/2
92	143	143	92	114	74.0	11
97	151	151	97	120	82.0	11 1/2

For Informational Purposes Only

ROUND PIPE INSTALLATIONS						
PIPE DIAMETER	Maximum Height of Fill (ft)					
	Class S	Class I	Class II	Class III	Class IV	Class V
12"-30"	9	13	17	24	36	55
36"-54"	8	12	16	22	34	52
60"-78"	7	11	15	21	33	51
84"-96"	6	10	14	20	32	49

Pipe Class S D-Load=600 Lbs/Ft/Ft (.01" Crack)
D-Load=900 Lbs/Ft/Ft (Ultimate)

Pipe Class I D-Load=800 Lbs/Ft/Ft (.01" Crack)
D-Load=1200 Lbs/Ft/Ft (Ultimate)

Pipe Class II D-Load=1000 Lbs/Ft/Ft (.01" Crack)
D-Load=1500 Lbs/Ft/Ft (Ultimate)

Pipe Class III D-Load=1350 Lbs/Ft/Ft (.01" Crack)
D-Load=2000 Lbs/Ft/Ft (Ultimate)

Pipe Class IV D-Load=2000 Lbs/Ft/Ft (.01" Crack)
D-Load=3000 Lbs/Ft/Ft (Ultimate)

Pipe Class V D-Load=3000 Lbs/Ft/Ft (.01" Crack)
D-Load=3750 Lbs/Ft/Ft (Ultimate)

Note: At the option of the pipe supplier or the contractor, a Pipe Class with greater strength may be substituted for the Pipe Class designated in the plans.

ELLIPTICAL PIPE INSTALLATIONS (All Sizes)			
Installation	Maximum Height Of Fill (Ft.)	Pipe Class	Bedding Class
Horizontal	1-6*	HE II*	C
	7-10	HE III	C
	11-16	HE IV	C
	17+	Special Design	Modified
Vertical	1-6*	VE II*	C
	7-10	VE III	C
	11-16	VE IV	C
	17+	Special Design	Modified

Pipe Class HE II D-Load=1000 Lbs/Ft/Ft (.01" Crack)
And VE II D-Load=1500 Lbs/Ft/Ft (Ultimate)

Pipe Class HE III D-Load=1350 Lbs/Ft/Ft (.01" Crack)
And VE III D-Load=2000 Lbs/Ft/Ft (Ultimate)

Pipe Class HE IV D-Load=2000 Lbs/Ft/Ft (.01" Crack)
And VE IV D-Load=3000 Lbs/Ft/Ft (Ultimate)

*Note: HE III and VE III pipe required for depths of cover less than 2' for 15", 18" and 24" equivalent.

**PIPE DIMENSIONS
CONCRETE PIPE**


**MAXIMUM COVER HEIGHTS
CONCRETE PIPE**

POLYETHYLENE PIPE	
DIAMETER	HEIGHT OF MAXIMUM FILL (Ft)
12"-48"	17'

POLYVINYL CHLORIDE PIPE	
DIAMETER	HEIGHT OF MAXIMUM FILL (Ft)
12"-48"	17'

MAXIMUM COVER FOR PLASTIC PIPE

Note: Height of fill (maximum cover) is measured from top of finished grade to outside top of pipe.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
COVER HEIGHT				
Designed By	EGR	09/85	Approved By 	
Drawn By	HSD	09/85	Revision	Sheet No.
Checked By	EGR	09/85	02	2 of 5
				Index No. 205

ROUND PIPE - 2 3/4" x 1/2" CORRUGATION							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.064 (16)	0.079 (14)	0.109 (12)	0.138 (10)	0.168 (8)	
12	.79	100+	100+	NA	NA	NA	See Sheet 1 of 5
15	1.23	100+	100+	NA	NA	NA	
18	1.77	100+	100+	100+	NA	NA	
21	2.40	100+	100+	100+	NA	NA	
24	3.14	100+	100+	100+	NA	NA	
30	4.91	85	100+	100+	NA	NA	
36	7.1	71+	88	100+	100+	NA	
42	9.6	60+	76	100+	100+	NA	
48	12.6	53	66	93	100+	100+*	
54	16.0	NS	59	82	100+	100+*	
60	19.6	NS	NS	74	95	100+*	
66	23.8	NS	NS	NS	87	100+*	
72	28.3	NS	NS	NS	79	97*	
78	33.2	NS	NS	NS	NS	90*	
84	38.5	NS	NS	NS	NS	83*	

ROUND PIPE - 3" x 1" CORRUGATION							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.064 (16)	0.079 (14)	0.109 (12)	0.138 (10)	0.168 (8)	
36	7.1	81	100+	100+	NA	NA	See Sheet 1 of 5
42	9.6	70	87	100+	NA	NA	
48	12.6	61	76	100+	100+	NA	
54	16.0	54	68	95	100+	NA	
60	19.6	48	61	85	100+	NA	
66	23.8	44	55	78	100	100+*	
72	28.3	40	51	71	91	100+*	
78	33.2	37	47	66	84	100+*	
84	38.5	35	43	61	78	100+*	
90	44.2	32	40	57	73	90*	
96	50.3	NS	38	53	68	84*	
102	56.7	NS	36	50	64	79*	
108	63.6	NS	NS	47	61	75*	
114	70.9	NS	NS	45	58	71*	
120	78.5	NS	NS	42	55	67*	
132	95.0	NS	NS	NS	50	61*	

ROUND PIPE - 5" x 1" CORRUGATION ③							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.064 (16)	0.079 (14)	0.109 (12)	0.138 (10)	0.168 (8)	
36	7.1	72	90	100+	NA	NA	See Sheet 1 of 5
42	9.6	62	77	100+	NA	NA	
48	12.6	54	68	95	100+	NA	
54	16.0	48	60	84	100+	NA	
60	19.6	43	54	76	98	NA	
66	23.8	39	49	69	89	100+*	
72	28.3	36	45	63	81	100*	
78	33.2	33	41	58	75	92*	
84	38.5	31	38	54	70	85*	
90	44.2	29	36	50	65	80*	
96	50.3	NS	34	47	61	75*	
102	56.7	NS	32	44	57	70*	
108	63.6	NS	NS	42	54	66*	
114	70.9	NS	NS	40	51	63*	
120	78.5	NS	NS	38	49	60*	
132	95.0	NS	NS	NS	44	54*	

Notes:

Increase the minimum cover values shown on Sheet 1 of 5 by 6" for gage and size combinations below the heavy lines.

Height of fill (maximum cover) is measured from top of finished grade to outside top of pipe.

*Recorrugated end not available. May be considered for cross drain and side drain applications only.

NA-Not Available

NS-Not Suitable (For Highway H-20 or HS-20 Loadings)

① Limited availability of this product. Check availability before specifying (generally limited to 3" x 1" corrugation pipe arch fabricated from 60" and smaller diameter round pipe in 12 ga. and thicker material).

② 360° perforated pipe arch (french drain pipe) is not recommended. Do not specify without checking suitability and availability.

③ 5" x 1" corrugated pipe is currently not manufactured for the Florida market. Check availability before specifying.

④ .109 in. (12 gage) for spiral rib, 8' maximum cover, 3/4" x 1" x 11 1/2" rib spacing (2 rib) only.

PIPE ARCH: SPIRAL RIB: 3/4" x 3/4" x 7 1/2" RIB SPACING							
PIPE ARCH: SPIRAL RIB: 3/4" x 1" x 11 1/2" RIB SPACING							
PIPE ARCH - 2 3/4" x 1/2" CORRUGATION							
Span (In.)	Rise (In.)	Equiv. Round Pipe (In.)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In.) (Ga.)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					Maximum Corner Pressure Lbs/Sq. Ft.		
					4000	6000	
17	13	15	1.1	.064 (16)	12	14	See Sheet 1 of 5
21	15	18	1.6	.064 (16)	10	14	
24	18	21	2.2	.064 (16)	7	13	
28	20	24	2.9	.064 (16)	5	11	
35	24	30	4.5	.064 (16)	NS	7	
42	29	36	6.5	.064 (16)	NS	7	
49	33	42	8.9	.079 (14)	NS	6	
57	38	48	11.6	.109 (12)	NS	8	
64	43	54	14.7	.109 (12)	NS	9	
71	47	60	18.1	.138 (10) ④	NS	10 ④	
77	52	66	21.9	.168 (8) * ④	5	10 ④	
83	57	72	26.0	.168 (8) * ④	5	10 ④	

PIPE ARCH-3" x 1" ①②③ and 5" x 1" ②③ CORR.								
Span (In.)	Rise (In.)	Equiv. Round Pipe (In.)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In.) (Ga.)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)	
					Maximum Corner Pressure Lbs/Sq.Ft.			
					4000	6000		
40	31	36	7.0	.079 (14)	8	12	See Sheet 1 of 5	
46	36	42	9.4	.079 (14)	8	13		
53	41	48	12.3	.079 (14)	8	13		
60	46	54	15.6	.079 (14)	8	13		
66	51	60	19.3	.079 (14)	9	13		
73	55	66	23.2	.079 (14)	11	16		
81	59	72	27.4	.079 (14)	11	17		
87	63	78	32.1	.079 (14)	10	16		
95	67	84	37.0	.079 (14)	11	17		
103	71	90	42.4	.109 (12)	10	15		
112	75	96	48.0	.109 (12)	10	16		
117	79	102	54.2	.109 (12)	10	15		
128	83	108	60.5	.138 (10)	9	14		
137	87	114	67.4	.138 (10)	8	13		
142	91	120	74.5	.168 (8)	7	12		


ROUND PIPE - SPIRAL RIB							
RIB SPACING (3/4" x 3/4" x 7 1/2") or (3/4" x 1" x 11 1/2")							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.064 (16)	0.079 (14)	0.109 (12)	0.138 (10)	0.168 (8)	
12	0.79	NA	NA	NA	NA	NA	See Sheet 1 of 5
15	1.23	NA	NA	NA	NA	NA	
18	1.77	68	72	NA	NA	NA	
21	2.40	58	62	100+	NA	NA	
24	3.14	51	72	100+	NA	NA	
30	4.91	41	58	97	NA	NA	
36	7.1	34	48	81	NA	NA	
42	9.6	29	41	69	NA	NA	
48	12.6	26	36	61	NA	NA	
54	16.0	23	32	54	NA	NA	
60	19.6	NS	29	49	NA	NA	
66	23.8	NS	26	44	NA	NA	
72	28.3	NS	24	40	NA	NA	
78	33.2	NS	NS	37	NA	NA	
84	38.5	NS	NS	35	NA	NA	
90	44.2	NS	NS	32	NA	NA	
96	50.3	NS	NS	30	NA	NA	
102	56.7	NS	NS	29	NA	NA	
108	63.6	NS	NS	27 ⑤	NA	NA	

⑤ = 3/4" x 1" x 11 1/2" Only.

MAXIMUM COVER FOR CORRUGATED STEEL PIPE ROUND AND PIPE ARCH

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION


COVER HEIGHT

Names	Dates	Approved By		
Designed By	EGR	09/85	 State Drainage Engineer	
Drawn By	HSD	09/85		
Checked By	EGR	09/85		
Revision	04	Sheet No.		
		3 of 5	205	

ROUND PIPE - 2 ⁵ / ₈ " x 1/2" CORRUGATION							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.060 (16)	0.075 (14)	0.105 (12)	0.135 (10)	0.164 (8)	
12	0.8	90	100+	NA	NA	NA	See Sheet 1 of 5
15	1.2	72	90	NA	NA	NA	
18	1.8	59	75	100+	NA	NA	
21	2.4	52	65	92	NA	NA	
24	3.1	44	56	79	NA	NA	
30	4.9	35 DR	44	63	NA	NA	
36	7.1	NS	36 DR	52	68	NA	
42	9.6	NS	NS	44 DR	58	NA	
48	12.6	NS	NS	38 DR	50 DR	61	
54	15.9	NS	NS	34 DR	45 DR	54 DR	
60	19.6	NS	NS	NS	39 DR	49 DR	
66	23.8	NS	NS	NS	NS	44 DR	
72	28.3	NS	NS	NS	NS	40 DR	

ROUND PIPE - 3" x 1" CORRUGATION							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.060 (16)	0.075 (14)	0.105 (12)	0.135 (10)	0.164 (8)	
36	7.1	33	42	60	NA	NA	See Sheet 1 of 5
42	9.6	28	36	51	NA	NA	
48	12.6	24	31	45	58	NA	
54	15.9	21	28	39	51	NA	
60	19.6	19	24	35	46	NA	
66	23.8	15 DR	22	32	42	51	
72	28.3	NS	20 DR	29	38	47	
78	33.2	NS	15 DR	27	35	43	
84	38.5	NS	NS	24 DR	32	40	
90	44.2	NS	NS	23 DR	30	37	
96	50.3	NS	NS	21 DR	28 DR	34	
102	56.7	NS	NS	NS	26 DR	32	
108	63.6	NS	NS	NS	24 DR	30 DR	
114	70.9	NS	NS	NS	NS	28 DR	
120	78.5	NS	NS	NS	NS	27 DR	

ROUND PIPE - SPIRAL RIB RIB SPACING (3/4" x 3/4" x 7 1/2")							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.060 (16)	0.075 (14)	0.105 (12)	0.135 (10)	0.164 (8)	
12	0.79	NA	NA	NA	NA	NA	See Sheet 1 of 5
15	1.23	63 ①	87 ①	NA	NA	NA	
18	1.77	55	76	NA	NA	NA	
21	2.40	47	65	NA	NA	NA	
24	3.14	41	57	NA	NA	NA	
30	4.91	33 DR	45	73	NA	NA	
36	7.1	27 ④	38 DR	61	NA	NA	
42	9.6	NS	32 ④	52	NA	NA	
48	12.6	NS	NS	46	65	NA	
54	16.0	NS	NS	40 DR	57	NA	
60	19.6	NS	NS	36 ④	52	NA	
66	23.8	NS	NS	NS	47 DR	NA	
72	28.3	NS	NS	NS	43 ④	NA	
78	33.2	NS	NS	NS	39 ④	NA	
84	38.5	NS	NS	NS	34 ④	NA	
90	44.2	NS	NS	NS	30 ①③④	NA	
96	50.3	NS	NS	NS	27 ①③④	NA	

 - NOTE
Special installation required.
Refer to AASHTO Standard Specifications
for Highway Bridges or ASTM B788-88
and manufacturer's recommendations.

PIPE ARCH - 2 ⁵ / ₈ " x 1/2" CORRUGATION ②							
Span (In.)	Rise (In.)	Equiv. Round Pipe (In.)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In.) (Ga)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					Maximum Corner Pressure-Lbs/Sq.Ft.		
					4000	6000	
17	13	15	1.1	.060 (16)	12	15	See Sheet 1 of 5
21	15	18	1.6	.060 (16)	10	14	
24	18	21	2.2	.060 (16)	7	13	
28	20	24	2.9	.075 (14)	5	11	
35	24	30	4.5	.075 (14)	NS	7	
42	29	36	6.5	.105 (12)	NS	7	
49	33	42	8.9	.105 (12)	NS	6	
57	38	48	11.6	.135 (10)	NS	8	
64	43	54	14.7	.135 (10)	NS	9	
71	47	60	18.1	.164 (8)	NS	10	
77	52	66	21.9	.164 (8)	NS	10	
83	57	72	26.0	.164 (8)	NS	10	

PIPE ARCH - 3" x 1" CORRUGATION ① ②							
Span (In.)	Rise (In.)	Equiv. Round Pipe (In.)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In.) (Ga)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					Maximum Corner Pressure-Lbs/Sq.Ft.		
					4000	6000	
40	31	36	7.0	.060 (16)	8	12	See Sheet 1 of 5
46	36	42	9.4	.060 (16)	8	13	
53	41	48	12.3	.060 (16)	8	13	
60	46	54	15.6	.075 (14)	8	13	
66	51	60	19.3	.075 (14)	8	13	
73	55	66	23.2	.105 (12)	11	16	
81	59	72	27.4	.105 (12)	11	17	
87	63	78	32.1	.105 (12)	10	16	
95	67	84	37.0	.105 (12)	11	17	
103	71	90	42.4	.135 (10)	10	15	
112	75	96	48.0	.135 (10)	10	16	
117	79	102	54.2	.164 (8)	10	15	

PIPE ARCH - SPIRAL RIB RIB SPACING (3/4" x 3/4" x 7 1/2")							
Span (In.)	Rise (In.)	Equiv. Round Pipe (In.)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In.) (Ga)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					Maximum Corner Pressure-Lbs/Sq.Ft.		
					4000	6000	
16	14	15	1.2	.060 (16)	12	13	See Sheet 1 of 5
20	16	18	1.7	.060 (16)	10	12	
23	19	21	2.3	.060 (16)	7	11	
27	21	24	3.0	.060 (16)	5	10	
33	26	30	4.7	.075 (14)	NS	9	
40	31	36	7.0	.075 (14)	NS	8	
46	36	42	9.4	.105 (12)	NS	8	
53	41	48	12.3	.105 (12)	NS	8	
60	46	54	15.6	.105 (10)	NS	8	
66	51	60	19.3	.135 (10)	NS	8	
73	55	66	23.2	.135 (10) ④	NS	8	
81	59	72	27.4	.135 (10) ④	NS	8	

MAXIMUM COVER FOR CORRUGATED ALUMINUM ALLOY ROUND PIPE AND PIPE ARCH

Notes:

Increase the minimum cover values shown on Sheet 1 of 5 by 6" for gage and size combinations below the heavy lines.

Height of fill (maximum cover) is measured from top of finished grade to outside top of pipe.

NA - Not Available

NS - Not Suitable (For Highway H-20 or HS-20 Loadings)

DR - Design Review is recommended for each specific application. The review should identify any special handling, installation, backfill procedures, and construction load restrictions which may be required. (The review performed by the designer does not relieve the contractor from analyzing and taking any necessary precautions required to protect partially or completely constructed pipe from the equipment used during construction.)

(NOTE: The DESIGNER may use a thicker gage in lieu of the Design Review.)

① Limited availability of this product. Check availability before specifying.


② 360° perforated pipe (french drain pipe) is not recommended in the pipe arch shape. Do not specify without checking both for suitability and availability.

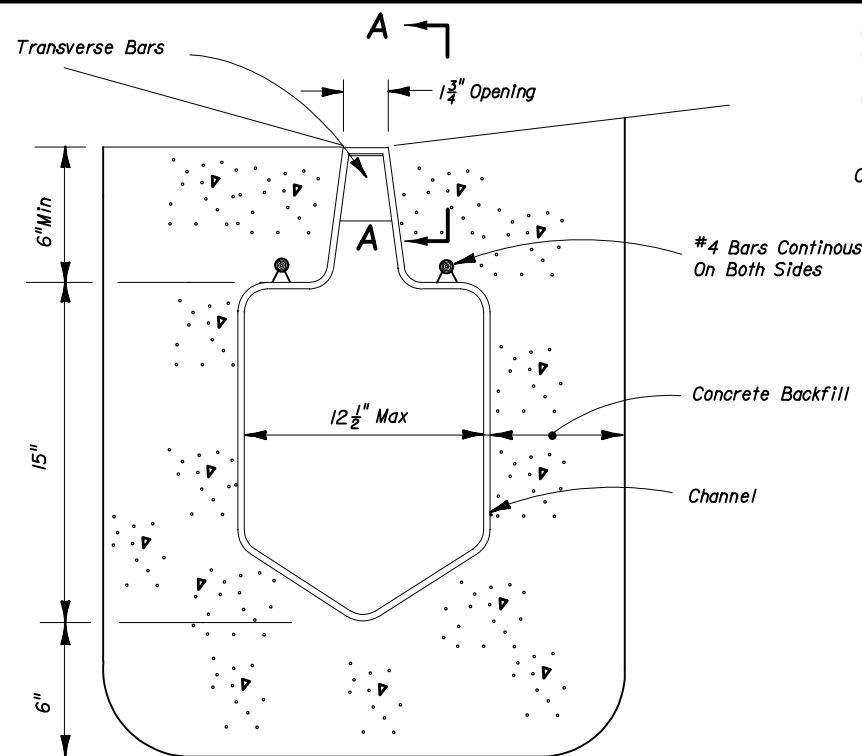
③ This size and gage combination must be strutted during installation per manufacturers recommendations. Extra care will be required during handling and installation.

④ Use of this size and gage combination must be approved by the State Drainage Engineer.

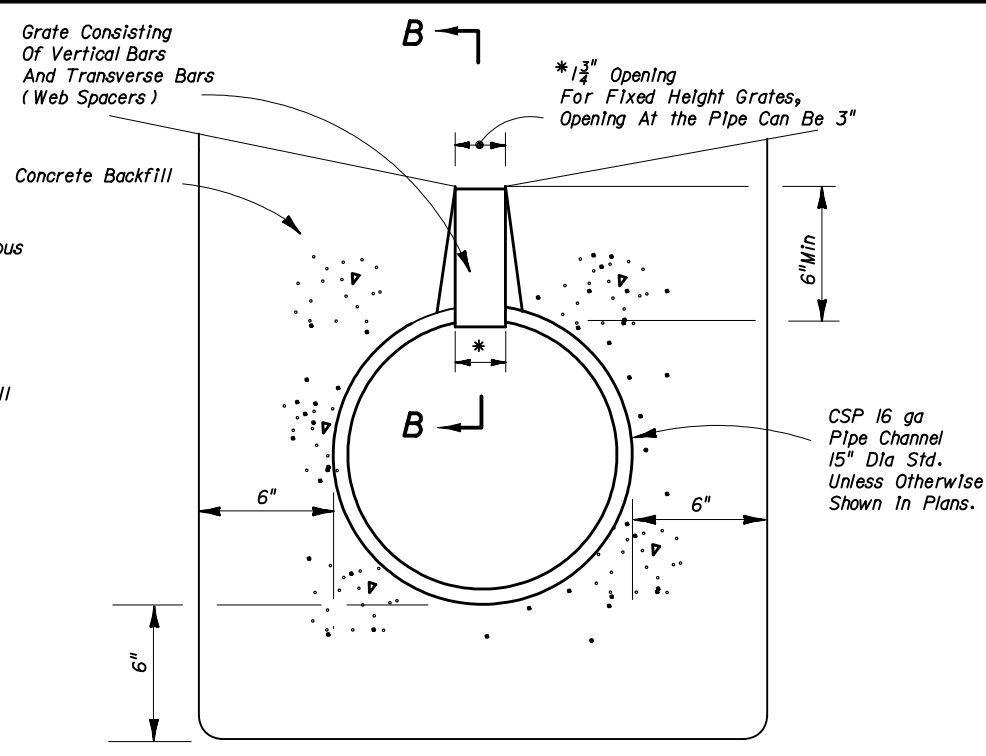
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

COVER HEIGHT

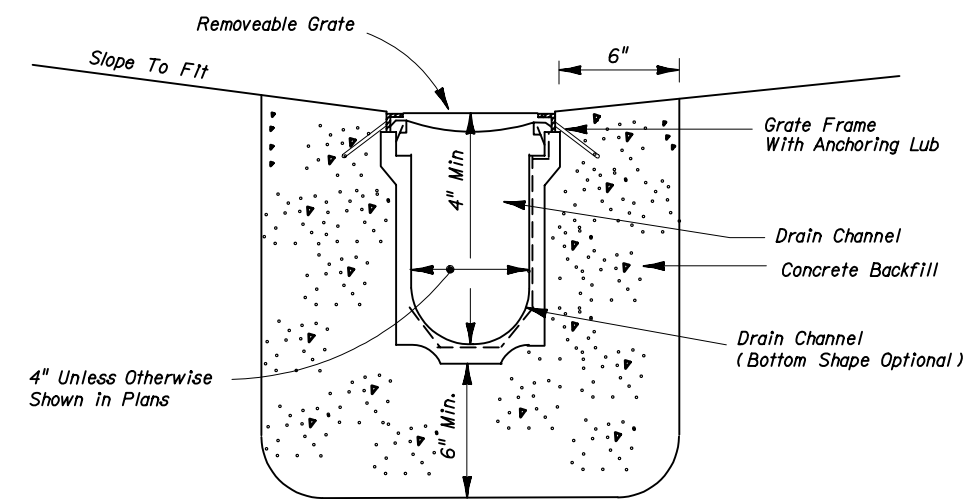
Names	Dates	Approved By 		
Designed By	EGR	09/85	State Drainage Engineer	
Drawn By	HSD	09/85	Revision	Sheet No.
Checked By	EGR	09/85	04	4 of 5
				Index No. 205



PREFORMED POLYETHYLENE ALTERNATE



ROUND CSP ALTERNATE



PREFORMED CHANNEL WITH REMOVABLE GRATE

SEE SHEET 2 FOR TYPICAL LOCATIONS

TYPE I (NON-REMOVABLE-GRATE)

SEE SHEET 2 FOR TYPICAL LOCATIONS

TYPE II

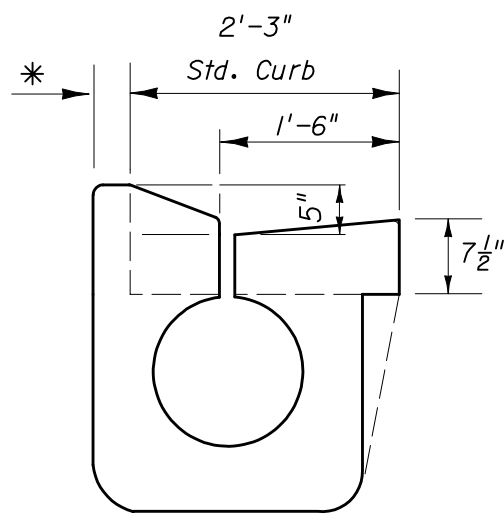
GENERAL NOTES

- Trench drain is intended for use in gutters and driveways as shown on the typical locations on Sheet 2. Type I is intended for use in Type E and F curbing, and adjacent to traffic separators and standard barrier walls, without grate. Grate is required across driveway openings in valley gutter and drop curb. Type II is intended for use across driveway openings in valley gutter and drop curb. Trench drain shall not be placed in designated pedestrian paths unless ADA compliant grates are used.
- Unless shown in the plans, outlet pipes and pre-formed channel inverts shall be sloped 0.6% or steeper toward the outlet regardless of the surface slope.
- Trench drain may be stubbed directly into drainage structures, or outlet pipes may be used to connect trench drain to drainage structures.
- A cleanout port compatible with the manufactured system shall be provided for Type I drains at the upstream end and at intervals not to exceed 50 feet. The cleanout port shall provide an opening 6" to 10" wide (transverse to the trench drain length) and 18" to 24" long. Where cleanouts are placed adjacent to raised curb or separator, the curb or separator shall be formed around the cleanout. The cleanout shall have a removable load resistant cover or grate.
- Trench excavation must allow for a minimum of 6 inches of concrete to be placed under and alongside the trench drain channel system. Under round CSP Concrete backfill shall meet the requirements of Section 347. At the end of all units (Type I or II), the concrete backfill shall extend 6" minimum past the end of the drain opening.
- Traverse bars for Type I trench drain shall be spaced 4 to 6 inches on center.
- Whenever the work disturbs existing conditions or work already completed, restore the same to its original condition in every detail. All such repair and replacement shall meet the approval of the Engineer.
- For payment and channel materials see specification Section 436.

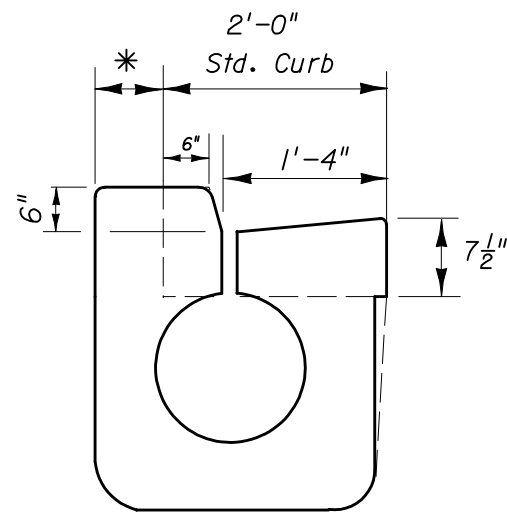
DESIGN NOTES

- Where placed adjacent to reinforced concrete barrier wall or median barrier wall, the designer shall detail in the plans the position of the drain relative to the wall to avoid conflicts with the L-wall and cantilever wall of the barrier wall. See Index 410.
- The designer shall identify the following in the plans:
 - The type of drain at each location,
 - The begin and end locations of the trench drain
 - The location of the outlet pipe if the trench drain is not stubbed directly into a drainage structure.
- Capture efficiency for Type I trench drain may be computed using the equations for slotted drain in FHWA's HEC 12 & 22.
- Round pipe alternate is available in 12, 18, 24, 36 inch CSP.

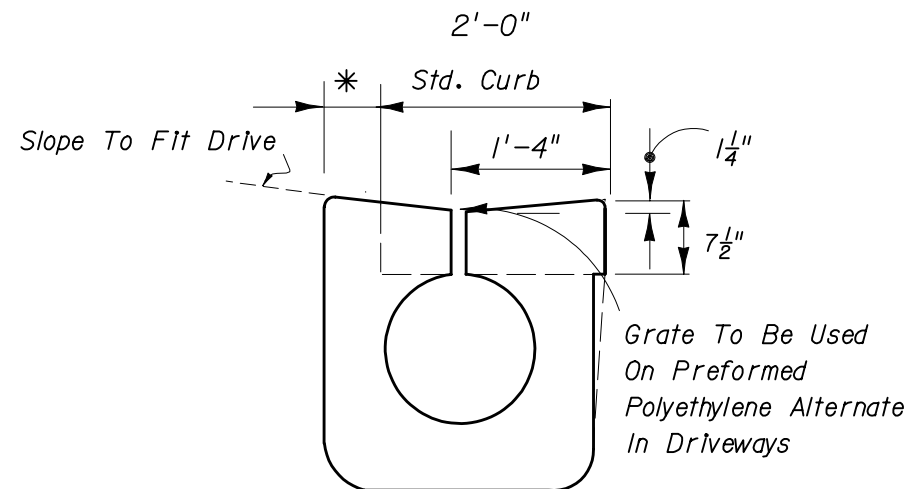
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRENCH DRAIN				
Names	Dates	Approved By		
Designed By	CH	02/01	 State Drainage Engineer	
Drawn By	JDT	02/01		
Checked By	CDP	02/02	Revision	Sheet No.
			04	1 of 2
				Index No. 206



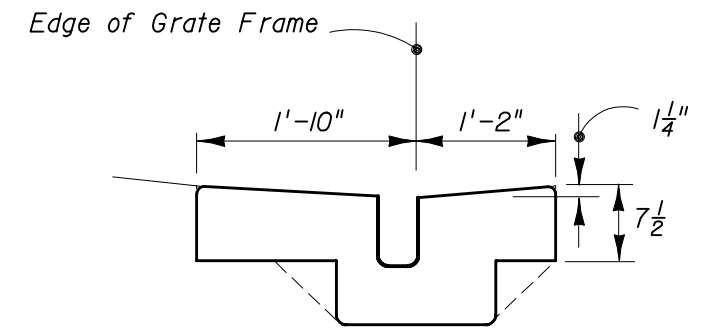
WITHIN TYPE E CURB



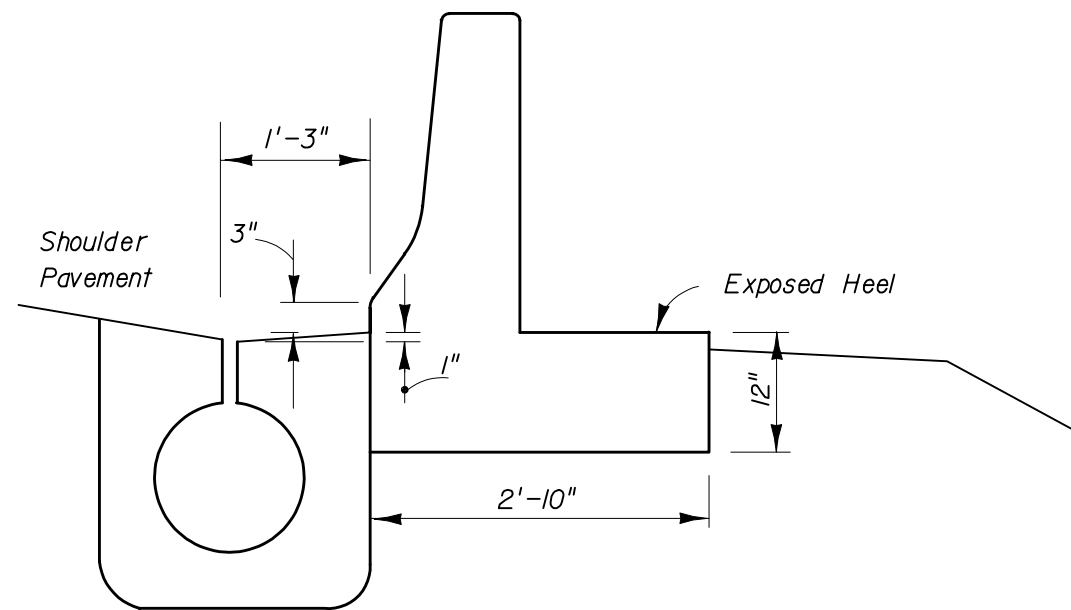
WITHIN TYPE F CURB



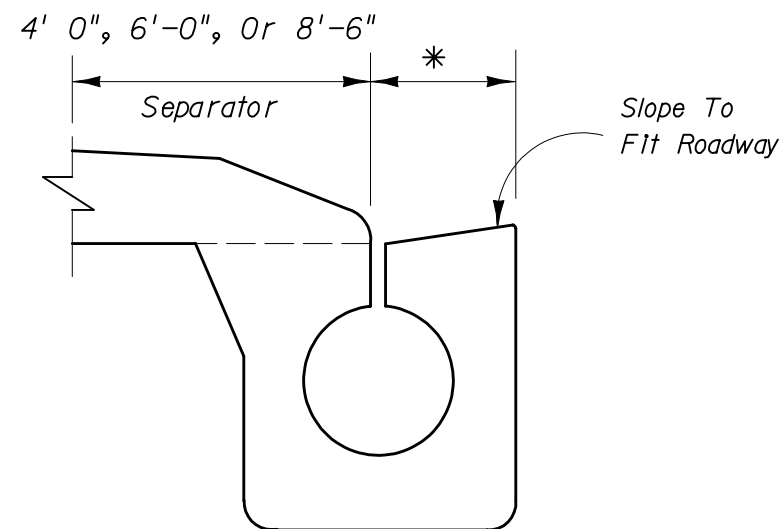
WITHIN DROP CURB



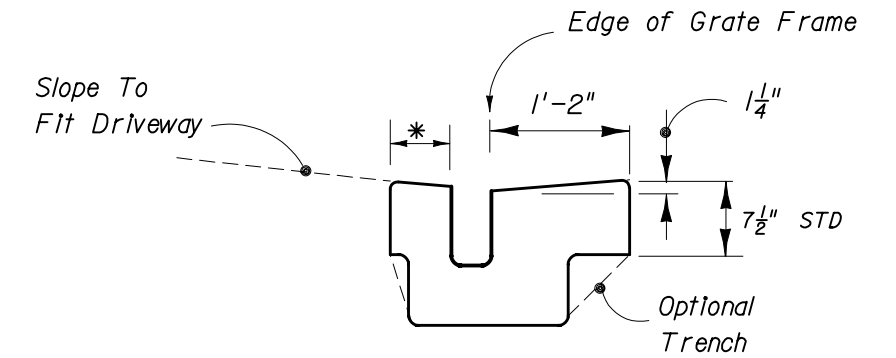
WITHIN VALLEY GUTTER



ADJACENT TO STANDARD BARRIER WALL



ADJACENT TO TRAFFIC SEPARATOR



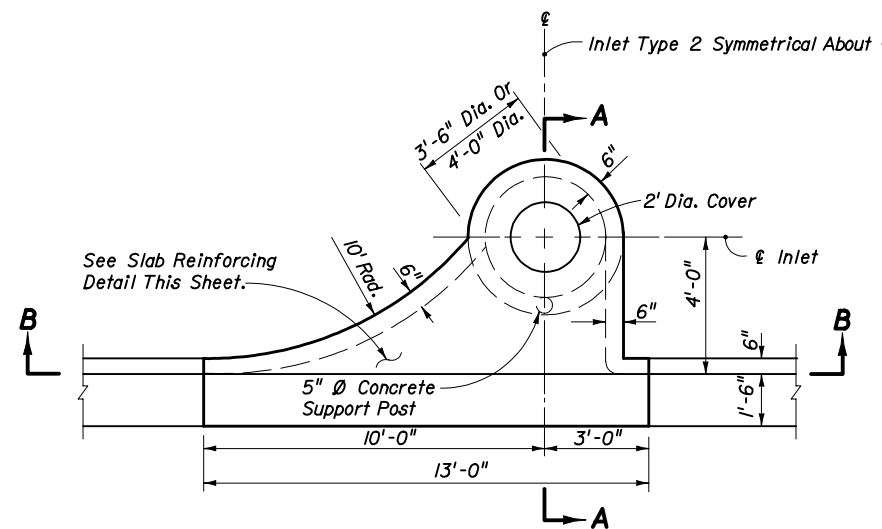
WITHIN DROP CURB
TYPICAL LOCATIONS FOR TYPE II

* As Necessary To Provide 6" Of Concrete On This Side Of Drain

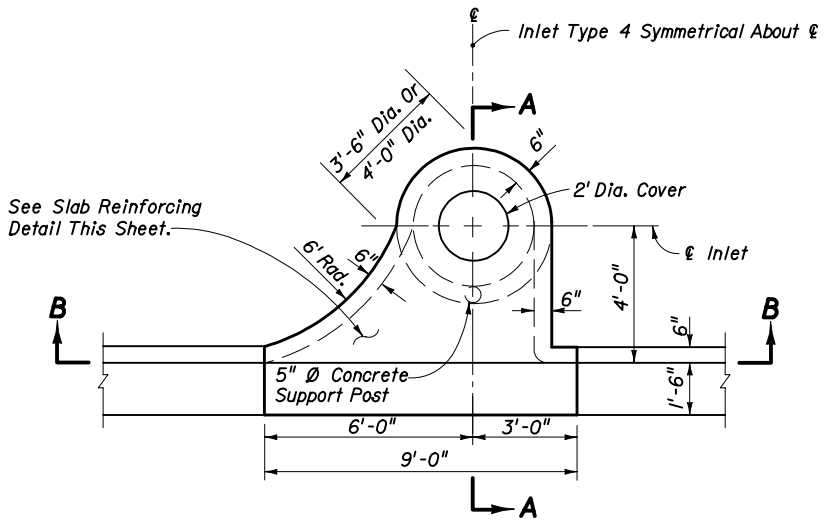
ROUND PIPE ALTERNATE SHOWN, BUT PREFORMED POLYETHYLENE ALTERNATE ACCEPTABLE

TYPICAL LOCATIONS FOR TYPE I

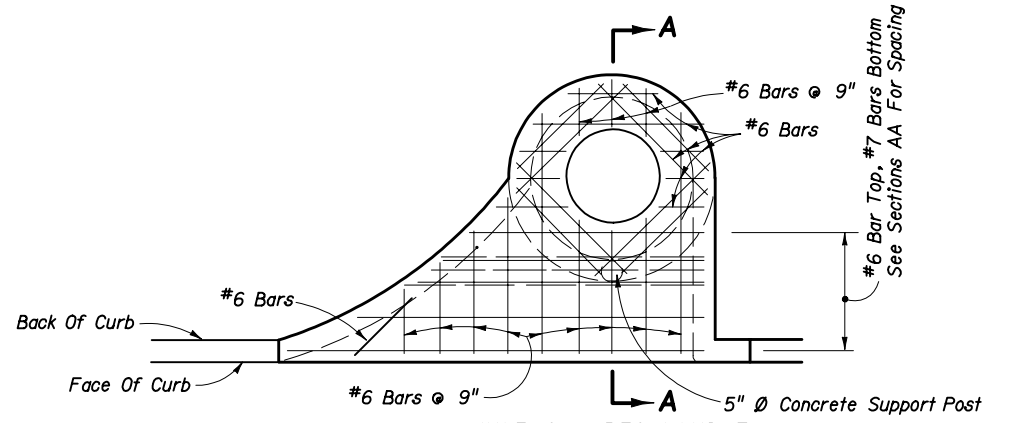
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRENCH DRAIN				
Names	Dates	Approved By		
Designed By	CR	02/01	 State Drainage Engineer	
Drawn By	JDZ	02/01		
Checked By	CDP	02/02	Revision	Index No.
			04	206
			2 of 2	



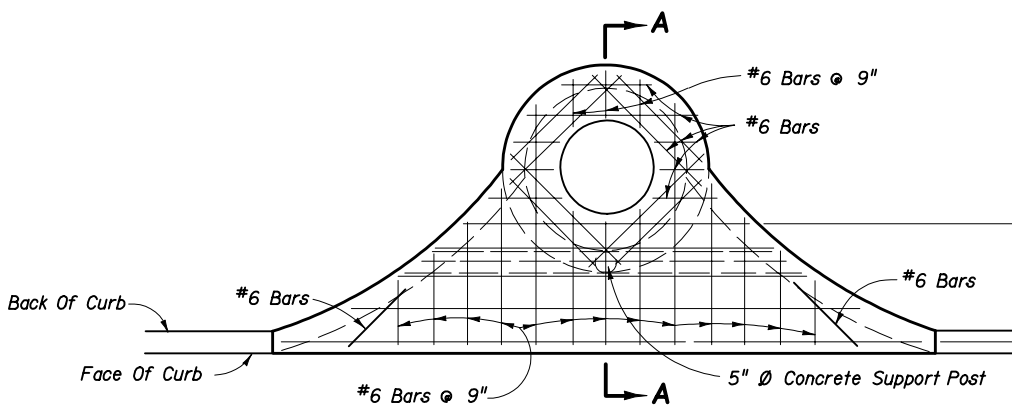
PLAN (INLET TYPE 2 SYMMETRICAL ABOUT €)



PLAN (INLET TYPE 4 SYMMETRICAL ABOUT €)

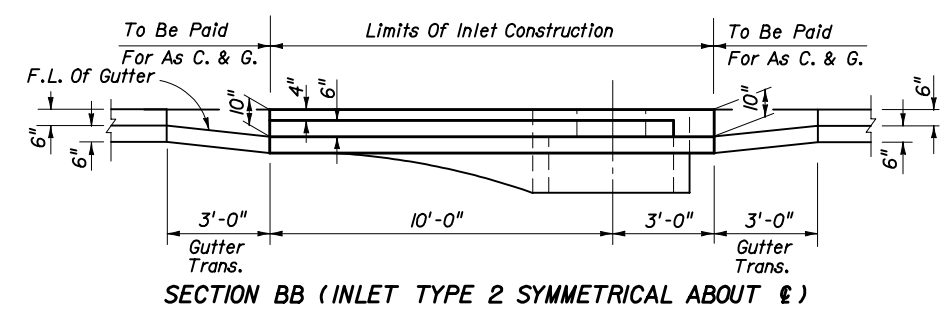


INLETS TYPES 1 AND 3

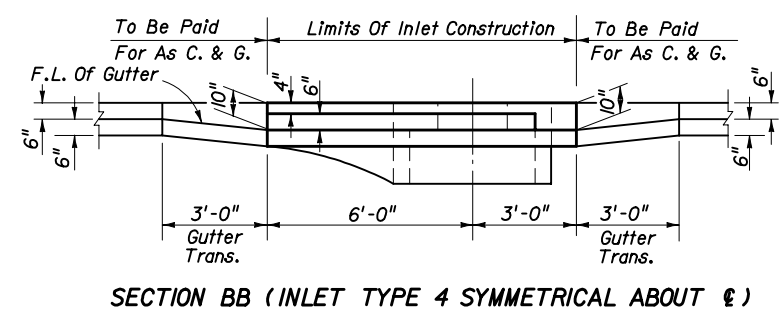


INLETS TYPES 2 AND 4

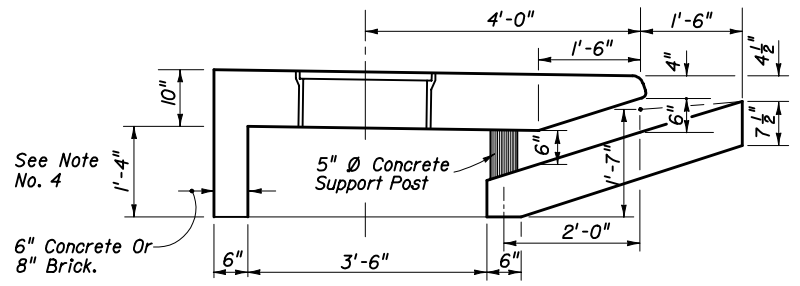
SLAB REINFORCING



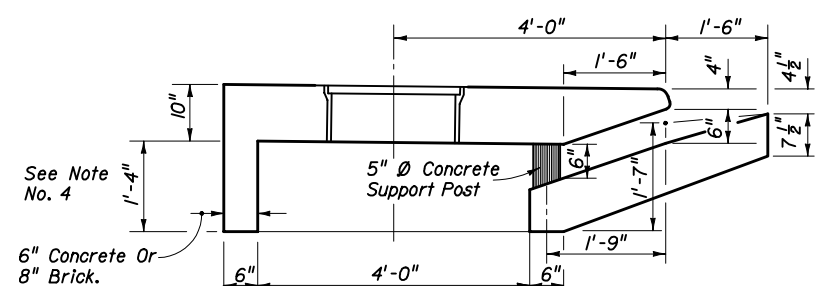
SECTION BB (INLET TYPE 2 SYMMETRICAL ABOUT €)



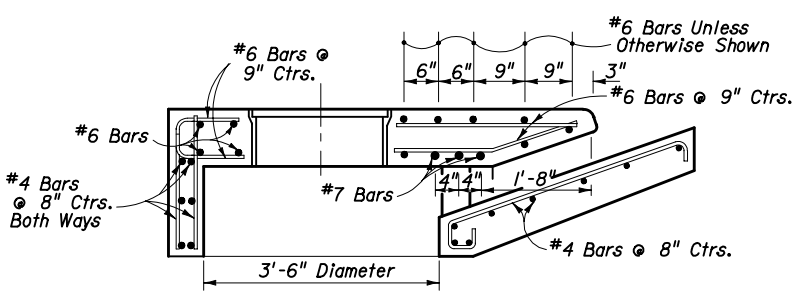
SECTION BB (INLET TYPE 4 SYMMETRICAL ABOUT €)



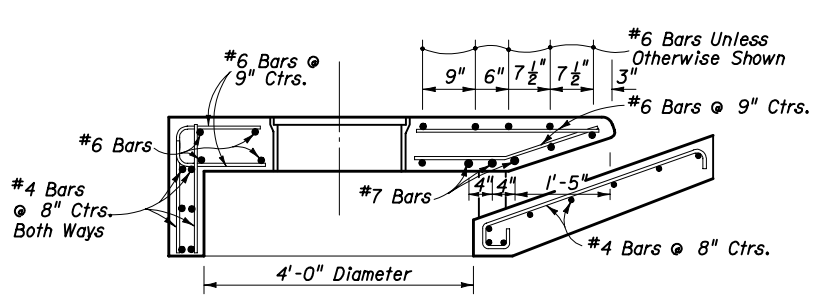
DIMENSIONAL SECTION
INLETS TYPES 1 AND 2



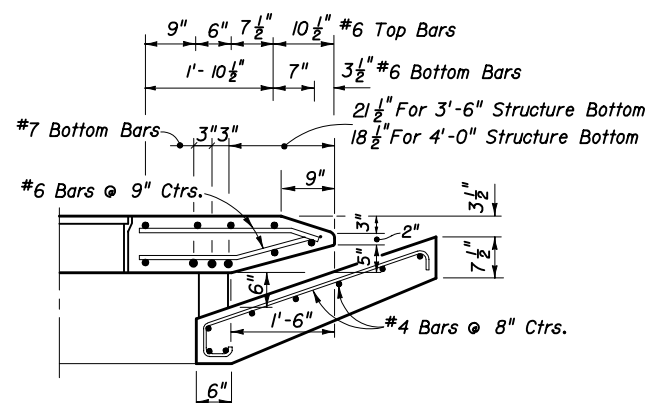
DIMENSIONAL SECTION
INLETS TYPES 3 AND 4



REINFORCING SECTION
3'-6" DIA. STRUCTURE BOTTOM (SECTION AA)



REINFORCING SECTION
4'-0" DIA. STRUCTURE BOTTOM (SECTION AA)



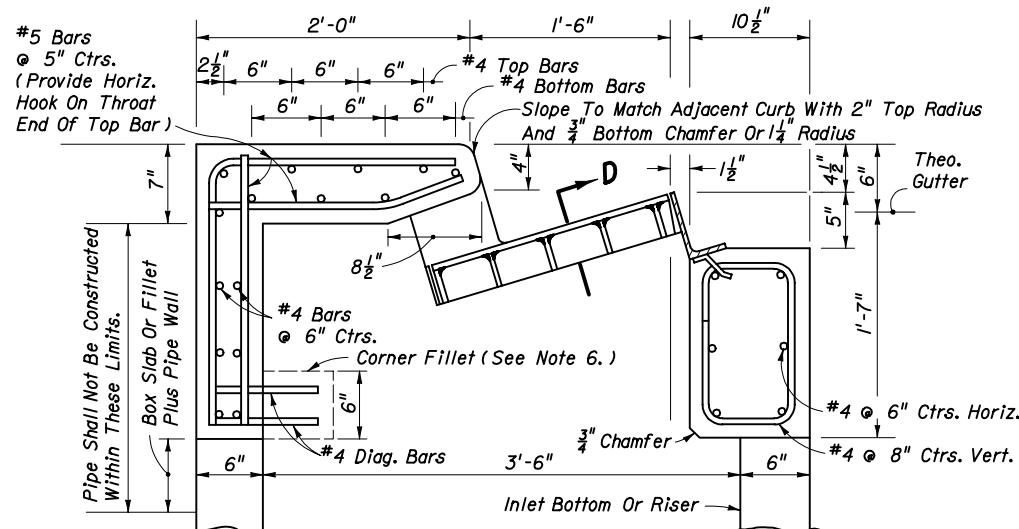
DIMENSION & REINFORCING HALF SECTION
TYPES A & E CURB (HALF SECTION AA)
(TYPE E GUTTER SHOWN)

GENERAL NOTES

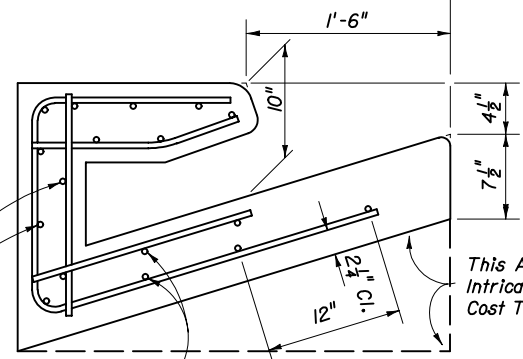
1. The finished grade and slope of the inlet tops are to conform with the finished cross slope and grade of the proposed sidewalk and/or border.
2. When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly. Bend steel when necessary.
3. All steel in inlet top shall have 1/2" minimum cover unless otherwise shown. Inlet tops shall be either cast-in-place or precast concrete.
4. The rear wall portion of inlet tops Types 1, 2, 3 & 4 may be constructed with brick. Dowels to top slab required.
5. For supplemental details see Index No. 201.
6. Only round concrete support post will be acceptable.
7. These inlets are designed for use with standard curb and gutter Type E and Type F. Locate inlet outside of pedestrian crosswalks.
8. For structure bottoms see Index No. 200.
9. Inlet to be paid for under the contract unit price for Inlets (Curb) (Type __), Each.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CURB INLET TOPS TYPES 1, 2, 3, & 4				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	1 of 1	210

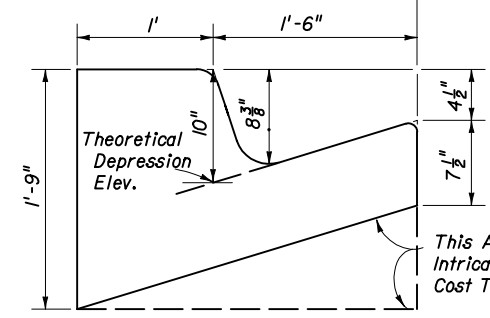
TRANSVERSE SECTIONS FOR INLETS TYPES 1, 2, 3 & 4



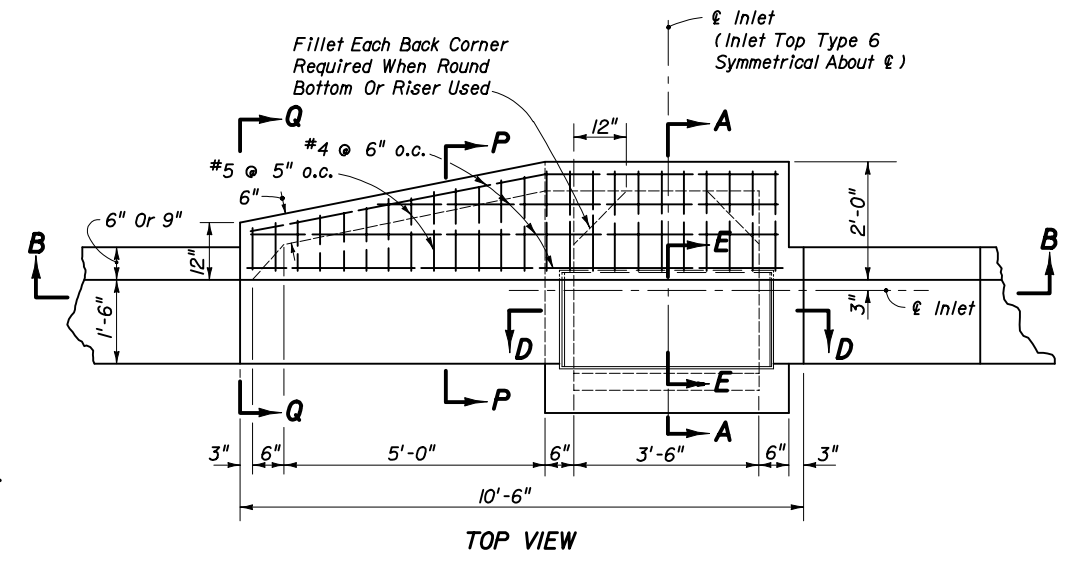
(Steel Cover Shown)
SECTION AA



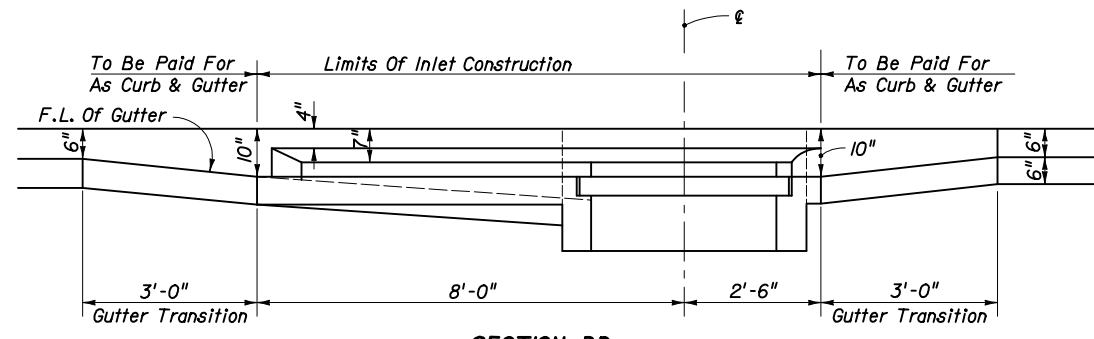
SECTION PP



SECTION QQ

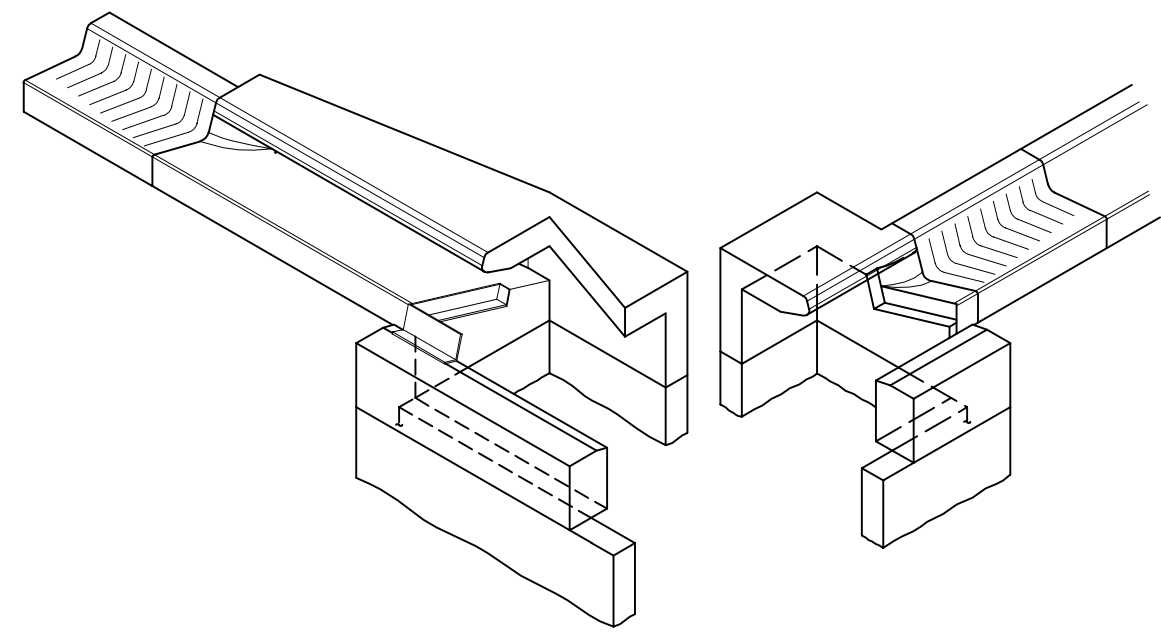


TOP VIEW



SECTION BB
(Curb Inlet Top Type 6 Symmetrical With Left Half)

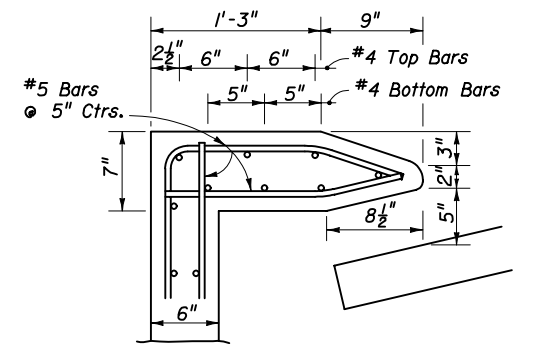
INLET TYPE 5



SKETCH SHOWING FRAME SEAT AND THROAT RECESS

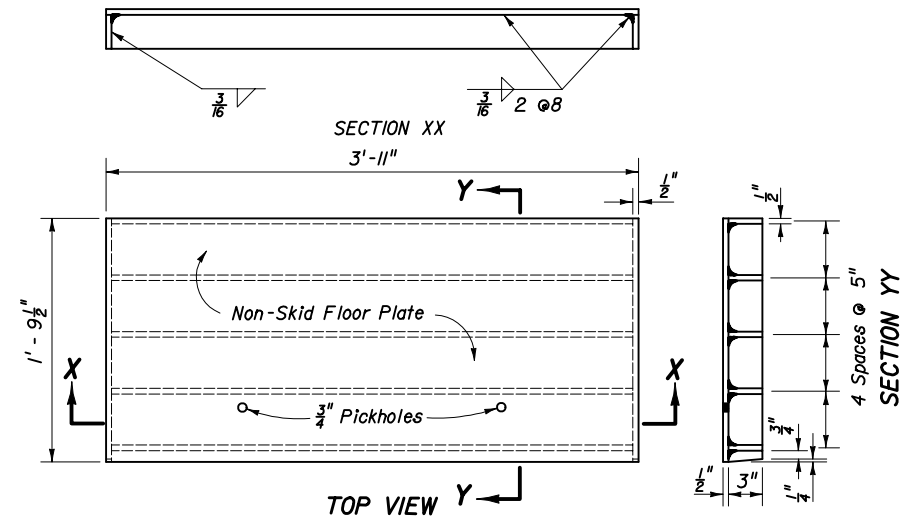
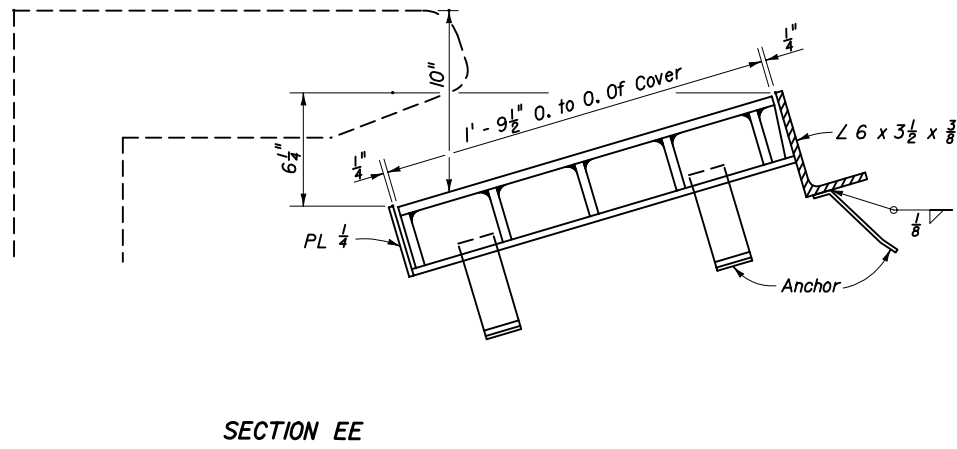
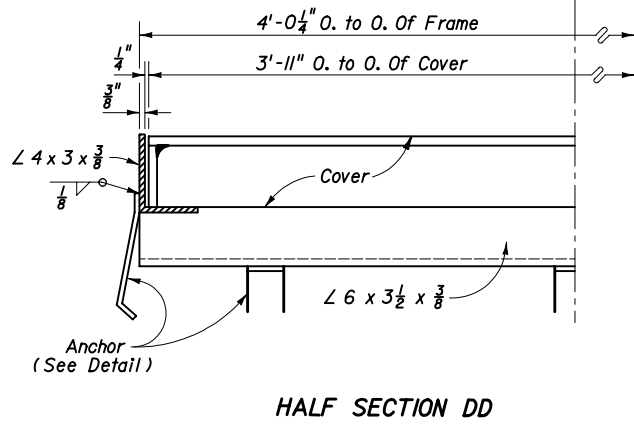
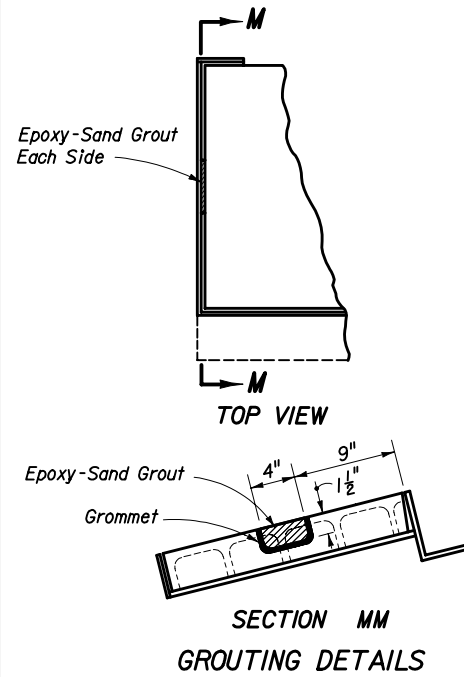
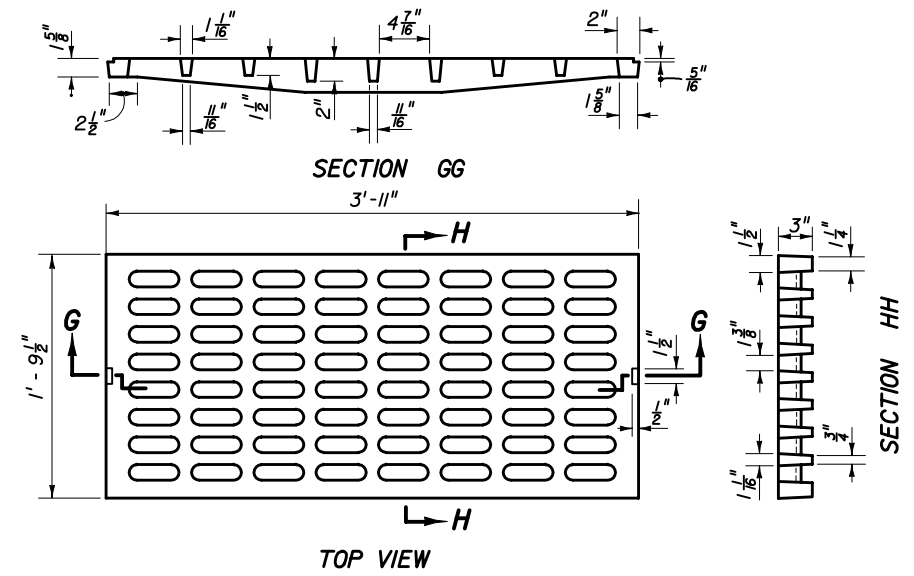
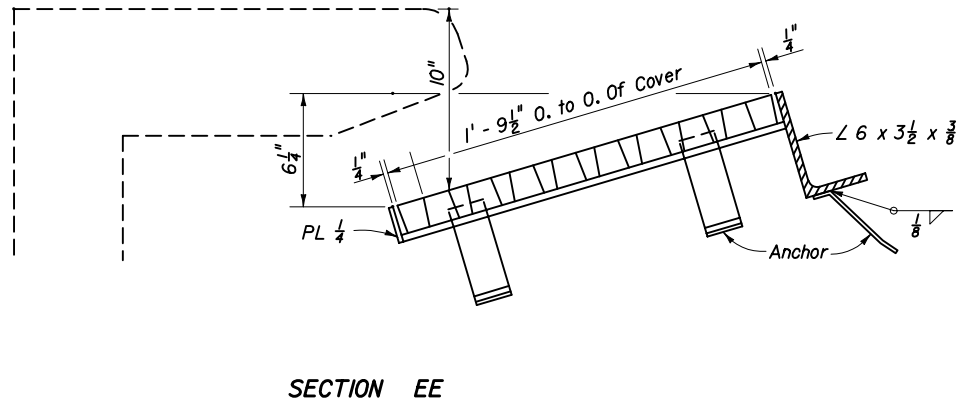
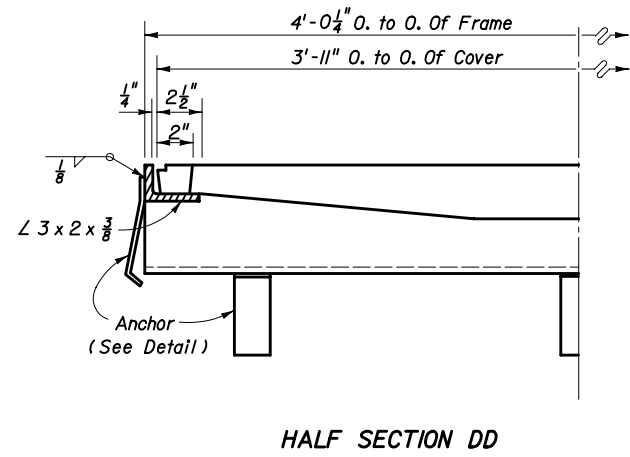
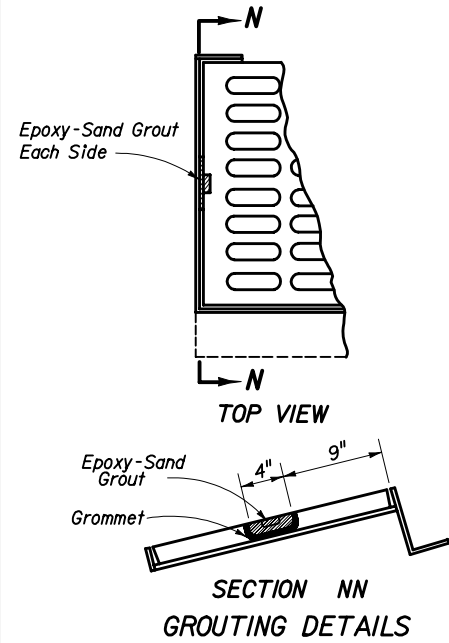
GENERAL NOTES

1. The finished grade and slope of the inlet tops are to conform with the finished cross slope and grade of the proposed sidewalk and/or border.
2. When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly. Bend steel when necessary.
3. All reinforcing steel shall have 1 1/4" minimum cover unless otherwise shown. Inlet tops shall be either cast-in-place or precast concrete.
4. Precasting of this inlet top will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer.
5. Concrete meeting the requirements of ASTM C478 (4,000 P.S.I.) may be used in lieu of Class I concrete for precast units, manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
6. The corner fillets shown for rectangular throats are necessary only when throats are to be used in conjunction with circular inlet bottoms or when used on skew with rectangular inlet boxes.
7. For inlet bottoms see Index No. 200. 4' and larger bottoms are to be used with 3'-6" riser.
8. These inlet tops are designed for use with standard curb and gutter Type E and Type F. Locate inlet outside of pedestrian crosswalks.
9. See Index No. 201 for supplemental details.
10. All steel used for frame and cover shall meet the requirements of ASTM A36/A36M.
11. Either cast iron covers or steel covers may be used. Iron covers shall be Class No. 30 castings in accordance with ASTM A48.
12. When Alternate "G" Cover is specified in plans either the cast iron cover and galvanized steel frame or the galvanized steel cover and frame must be used. Covers are to be grouted in accordance with the grouting detail shown on sheet 2 of 2, in lieu of tack welding.
13. Inlet to be paid for under the contract unit price for Inlets (Curb) (Type—), Each.



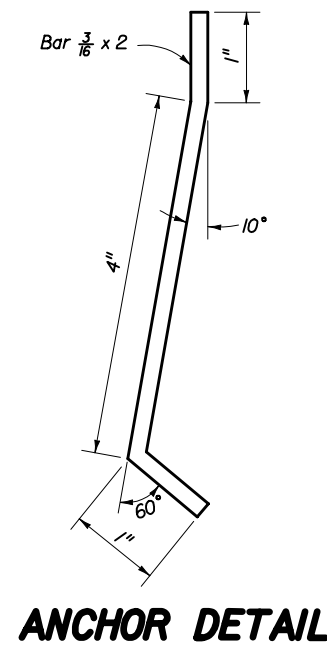
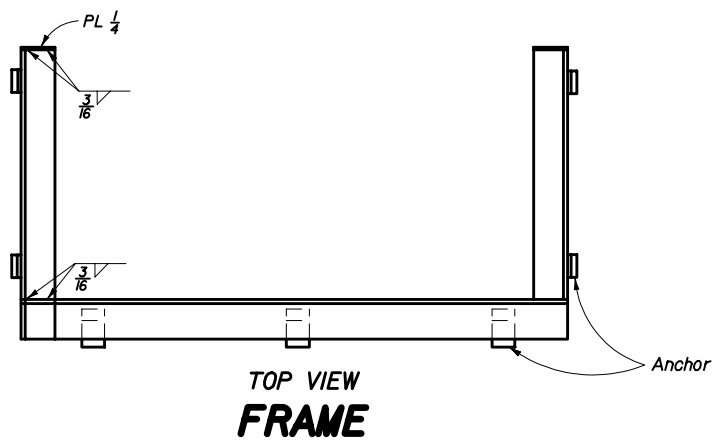
TOP MODIFICATION FOR TYPE E CURB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CURB INLET TOPS TYPES 5 & 6				
Designed By	Names	Dates	Approved By	
Drawn By			 State Drainage Engineer	
Checked By			Revision	Sheet No. / Index No.
			04	1 of 2 / 211

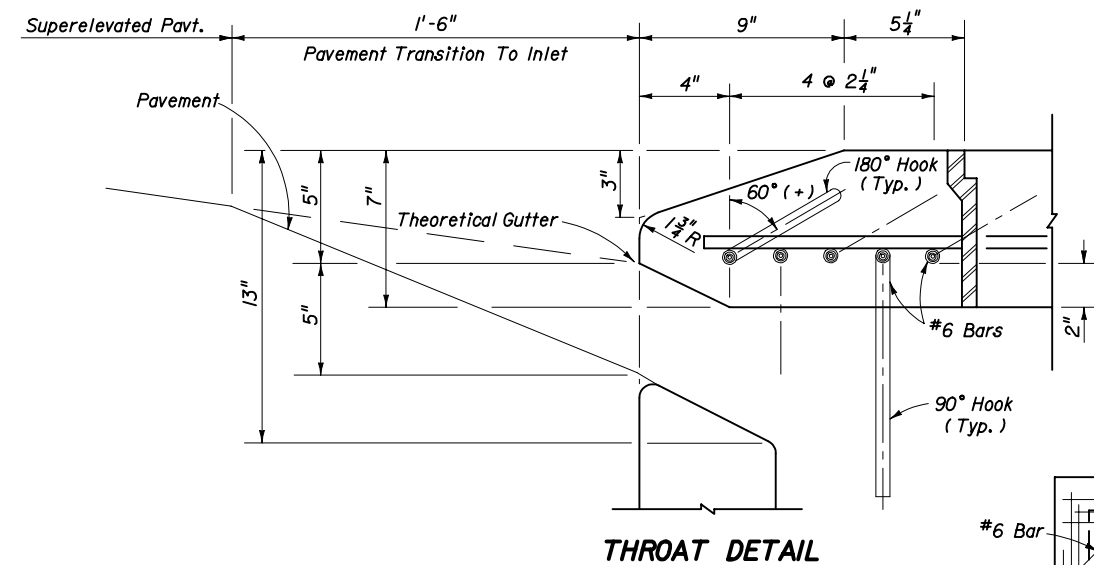
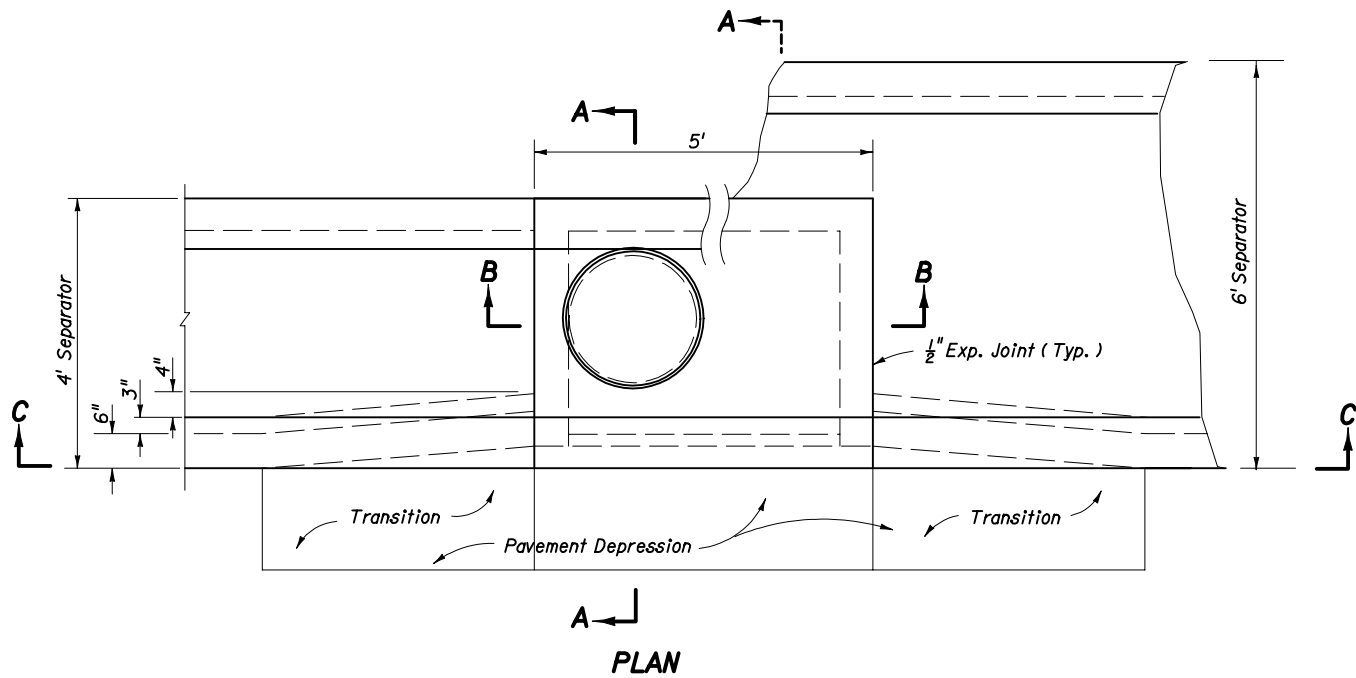


CAST IRON COVER

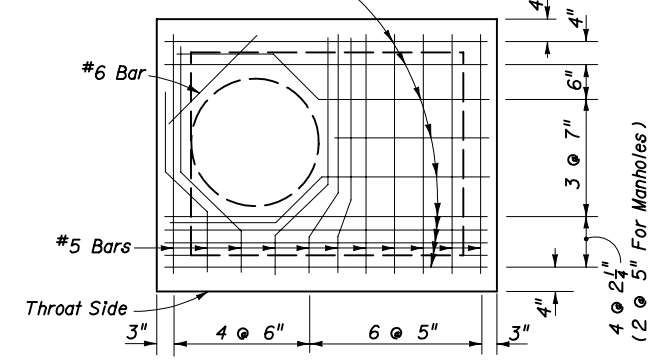
STEEL COVER



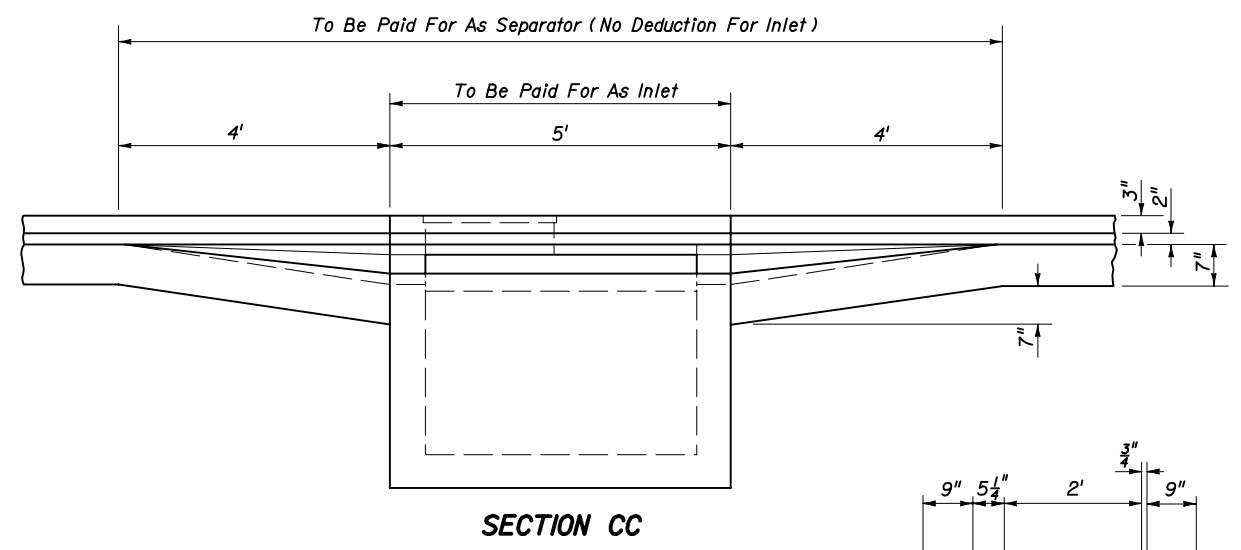
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CURB INLET TOPS TYPES 5 & 6				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 2	211



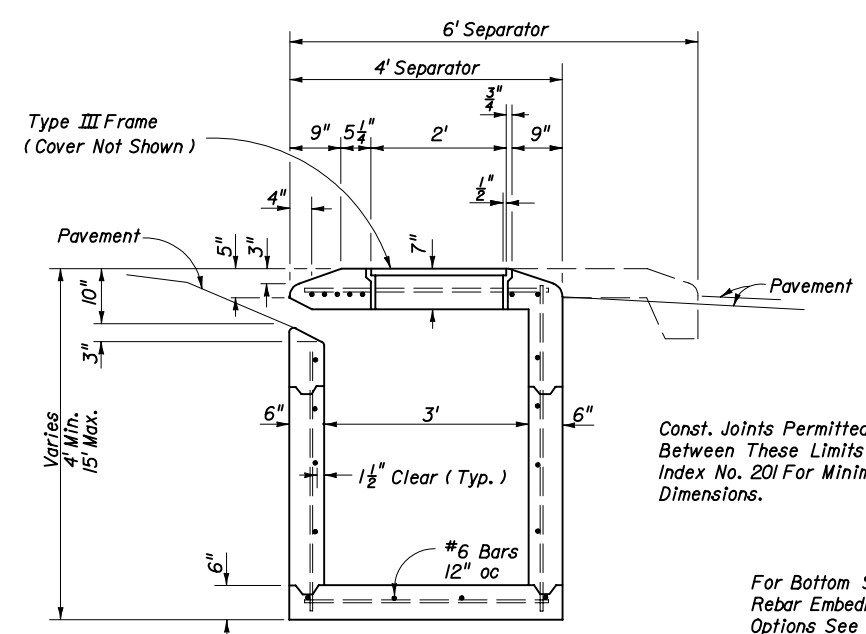
#6 Bars
 ACI Std. Hooks Required Each End Of
 Straight Bars And Right End Of Bent
 Bars: 180° Hooks, Canted 60° (+), On
 Odd Bars; 90° Hooks, Down, On Even
 Bars Numbered From Throat Side.



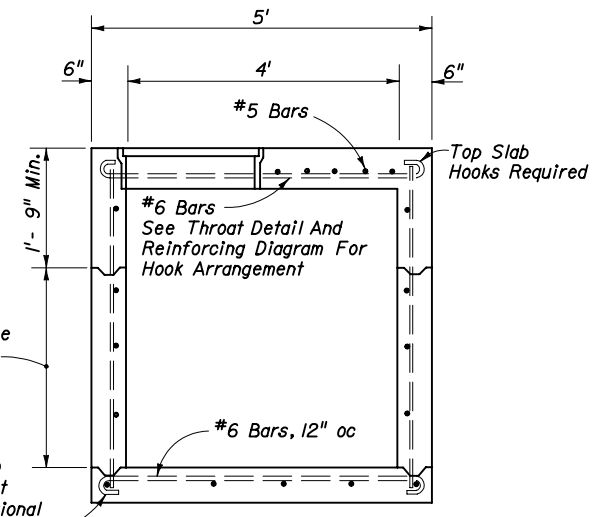
REINFORCING STEEL DIAGRAM
 TOP SLAB OF INLETS



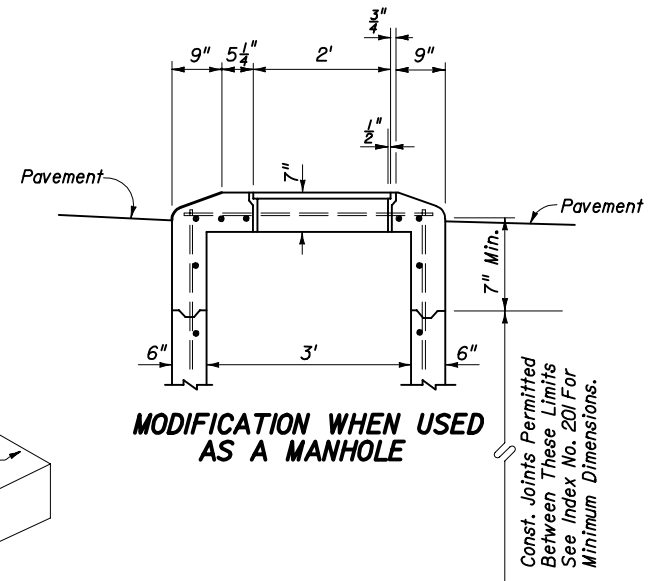
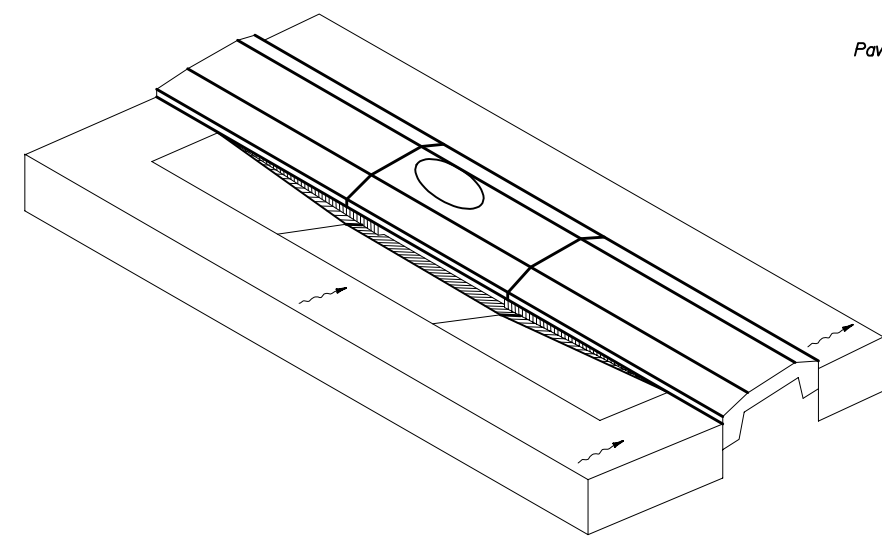
SECTION CC



SECTION AA



SECTION BB



MODIFICATION WHEN USED
 AS A MANHOLE

Const. Joints Permitted
 Between These Limits
 See Index No. 201 For
 Minimum Dimensions.

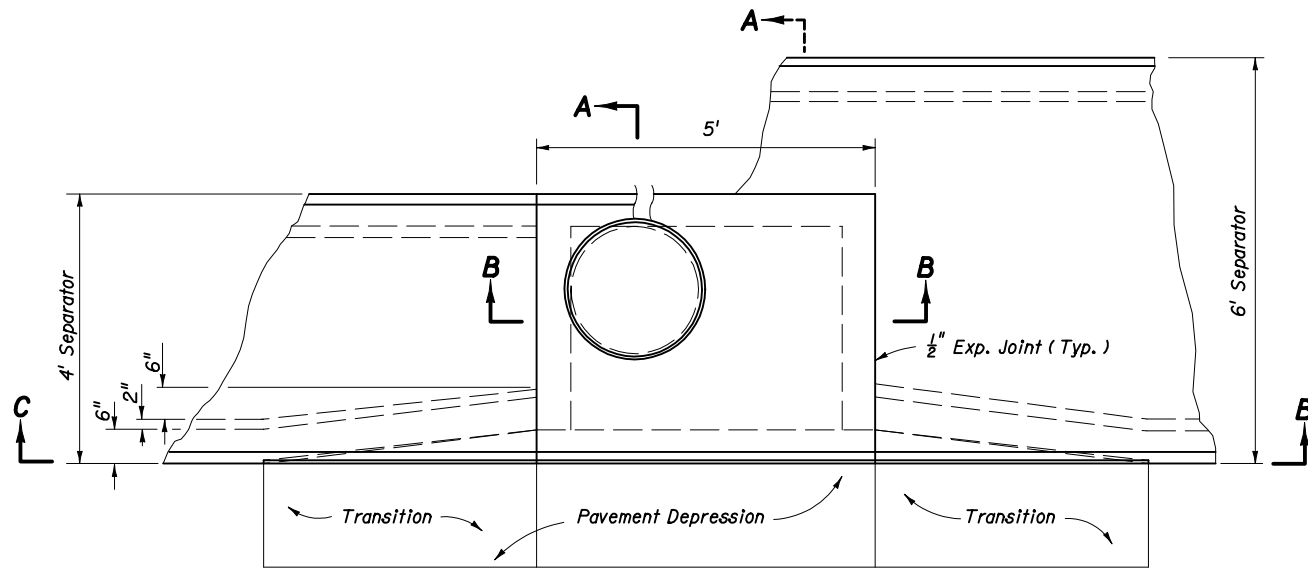
GENERAL NOTES

1. This inlet is used in Traffic Separators Types I and II; or, in separators constructed with Curbs Types A, B and E and sidewalk paving, which cannot accommodate inlets Types 1, 2, 3, 4, 5, or 6. Use of this Inlet on through traffic side of the separator is not permitted in medians with Curb Types A and B. Locate inlet outside of designated pedestrian travel way.
2. Reinforcing - #4 bars @ 12" centers unless otherwise noted. Cut or bend bars out of way of pipe when necessary. Bars to clear pipe by 1/2".
3. Recommended maximum pipe sizes are 24" longitudinal and 30" transverse. For larger pipe, inlets with Alt. B bottoms, Index No. 200 are recommended.
4. For supplementary details see Index No. 201.
5. Inlet to be paid for under the contract unit price for Inlets (Curb) (Type 7), Each.

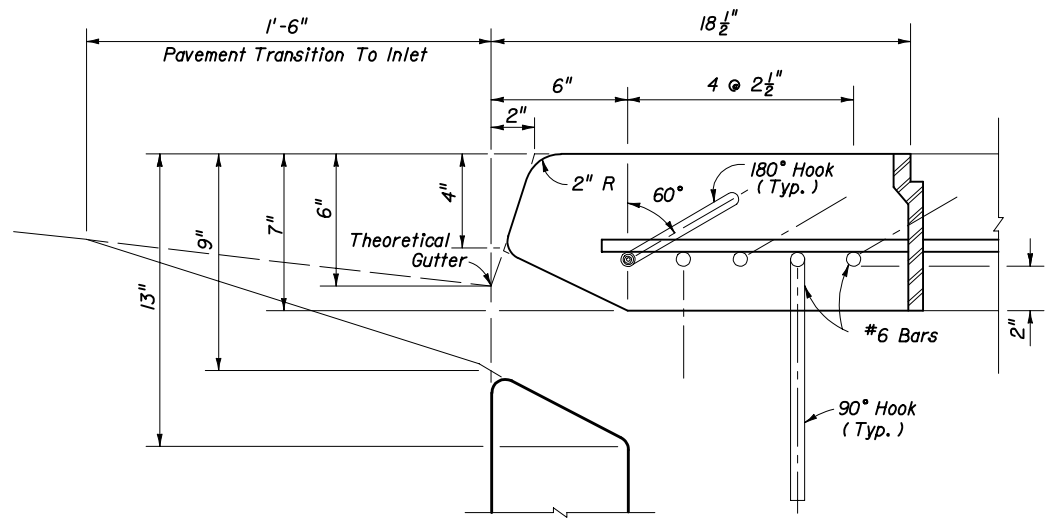
Const. Joints Permitted
 Between These Limits-See
 Index No. 201 For Minimum
 Dimensions.

For Bottom Slab
 Rebar Embedment
 Options See Optional
 Construction Joints,
 Index No. 201.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CURB INLET TYPE 7				
Designed By	EGR	08/81	Approved By <i>[Signature]</i> State Drainage Engineer	
Drawn By	HSD	08/81	Revision	Sheet No.
Checked By	JG	08/81	04	1 of 1
				Index No. 212

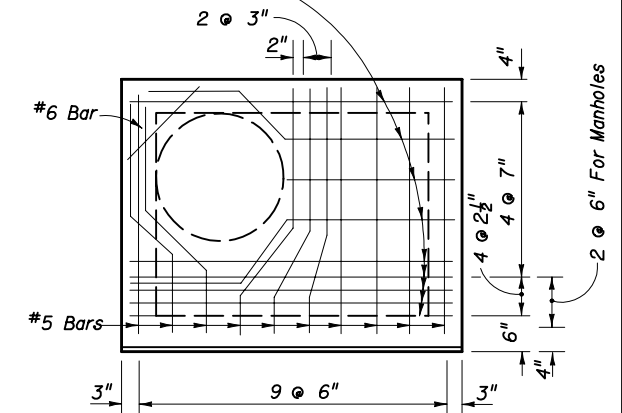


PLAN

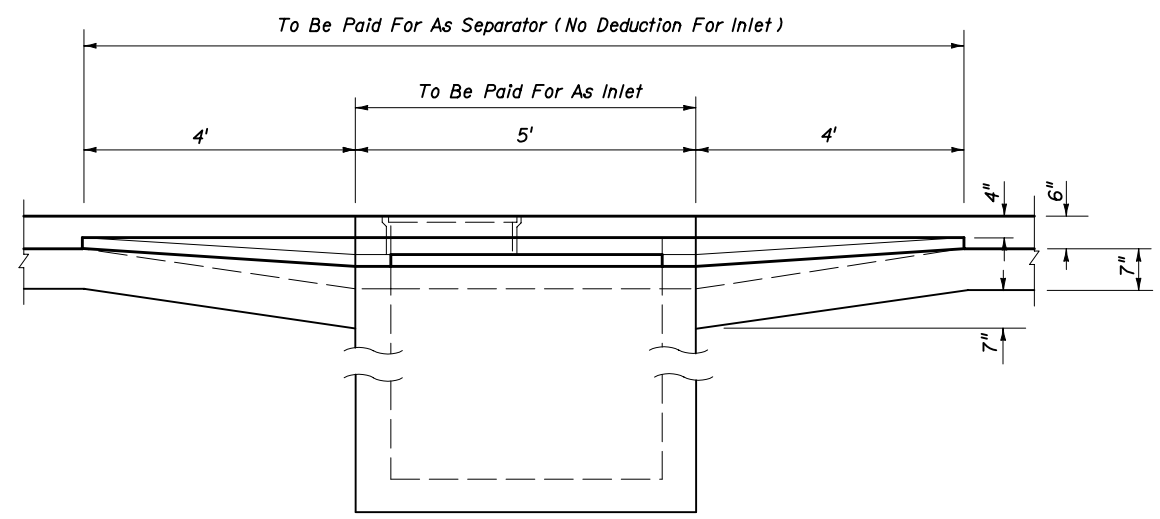


THROAT DETAIL (SECTION AA)

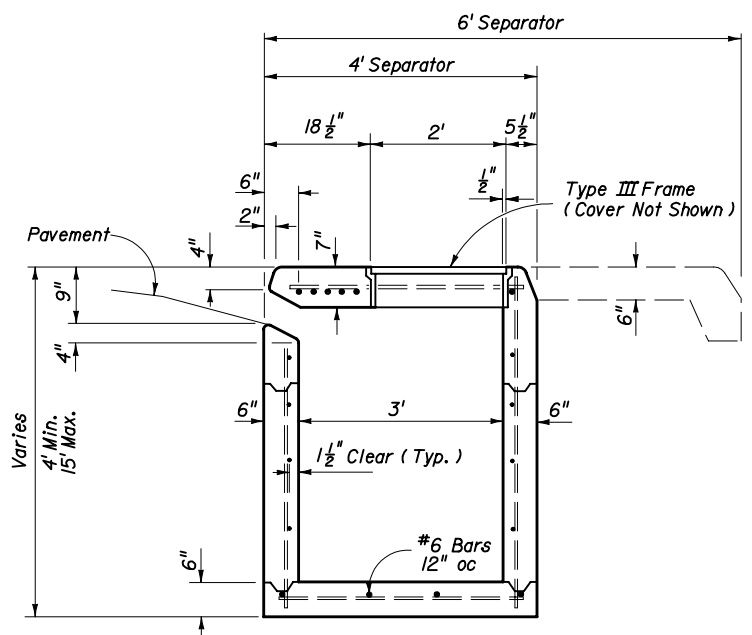
#6 Bars
 ACI Std. Hooks Required Each End Of
 Straight Bars And Right End Of Bent
 Bars. 180° Hooks, Canted 60° (+), On Odd
 Bars; 90° Hooks, Down, On Even Bars
 Numbered From Throat Side.



**REINFORCING STEEL DIAGRAM
 TOP SLAB OF INLET**

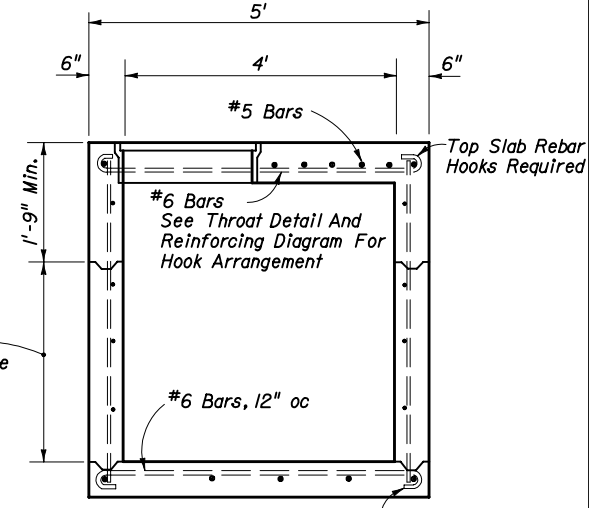


SECTION CC



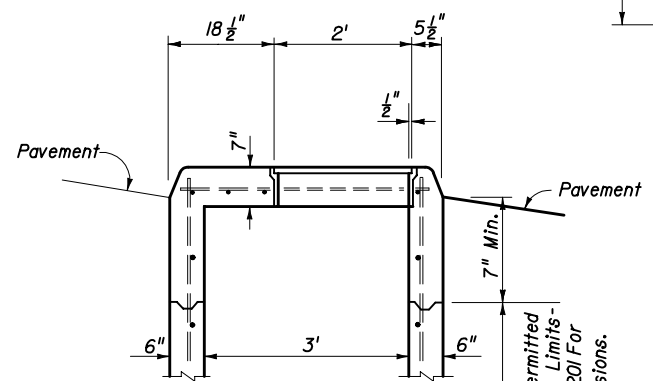
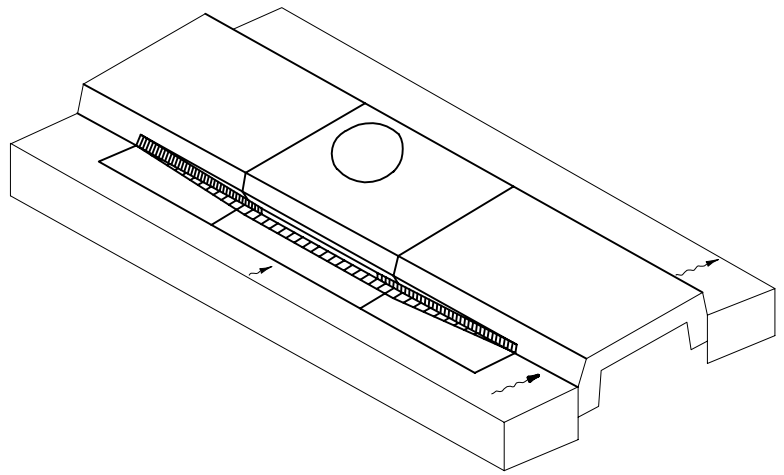
SECTION AA

Const. Joints Permitted
 Between These Limits - See
 Index No. 201 For Minimum
 Dimensions.



SECTION BB

For Bottom Slab
 Rebar Embedment
 Options See Optional
 Construction Joints,
 Index No. 201.



**MODIFICATION WHEN USED
 AS A MANHOLE**


Const. Joints Permitted
 Between These Limits -
 See Index No. 201 For
 Minimum Dimensions.

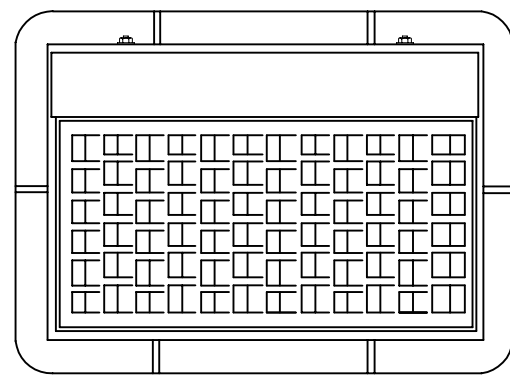
GENERAL NOTES

1. This inlet is to be used only in Traffic Separators Types IV and V; or, in separators constructed with Curbs Types D and F and sidewalk paving, which cannot accommodate Inlets Types 1, 2, 3, 4, 5 or 6. Use of this inlet on the through traffic side of the separator should be avoided in medians constructed with Curb Type D (Curb inlets Types 9 or 10 are recommended). Locate inlet outside of designated pedestrian travel way.
2. Reinforcing - #4 bars at 12" centers unless otherwise noted. Cut or bend bars out of way of pipe when necessary. Bars to clear pipe by 1 1/2".
3. Recommended maximum pipe sizes are 24" longitudinal and 30" transverse. For larger pipe, inlets with Alt. B bottoms, Index No. 200 are recommended.
4. For supplemental details see Index No. 201.
5. Inlet to be paid for under the contract unit price for Inlets (Curb) (Type 8), Each.

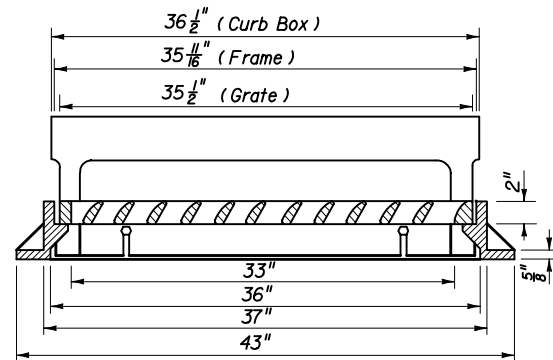
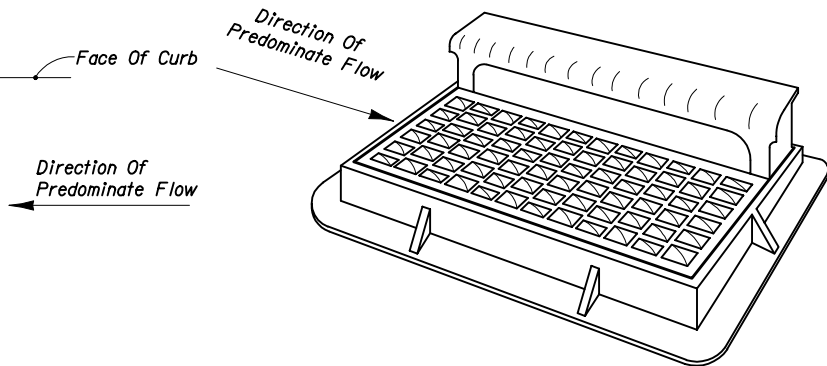
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**CURB INLET
 TYPE 8**

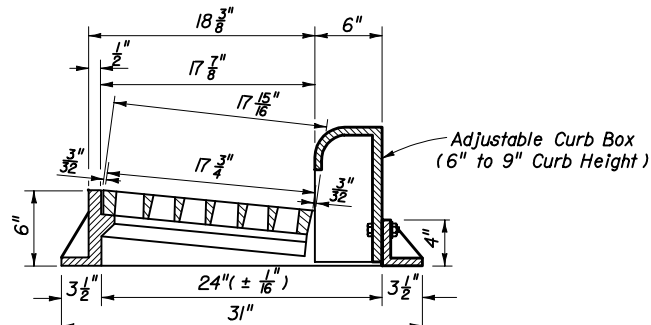
Names	Dates	Approved By		
Designed By	EGR 07/81	 State Drainage Engineer		
Drawn By	HSD 07/81			
Checked By	JG 07/81	Revision	Sheet No.	Index No.
		04	1 of 1	213



TOP VIEW

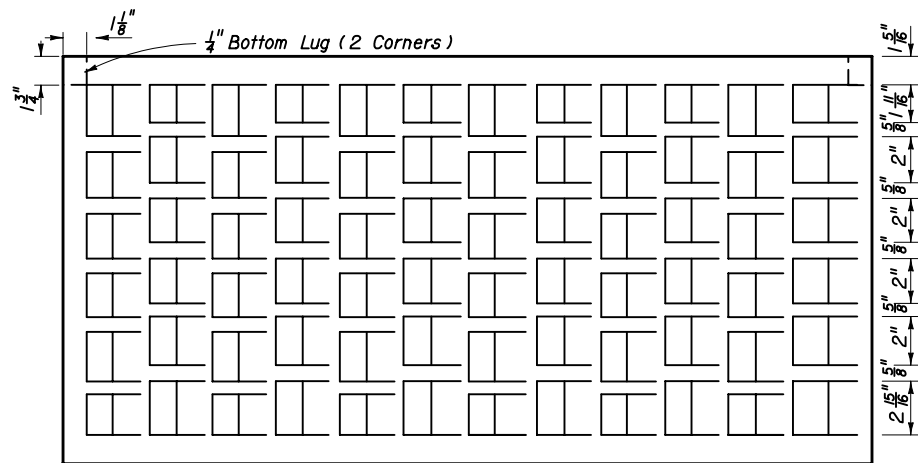


LONGITUDINAL SECTION

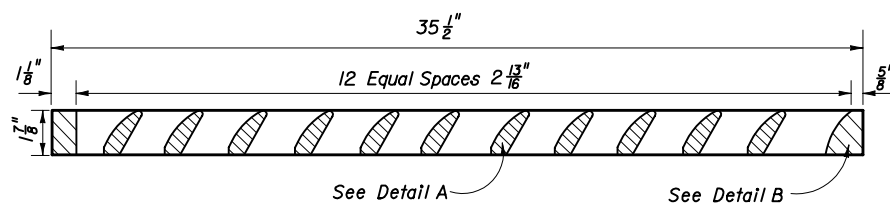


TRANSVERSE SECTION

FRAME AND GRATE

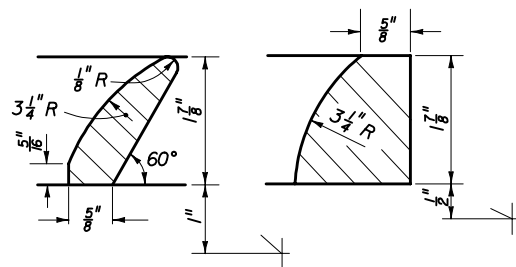


TOP VIEW



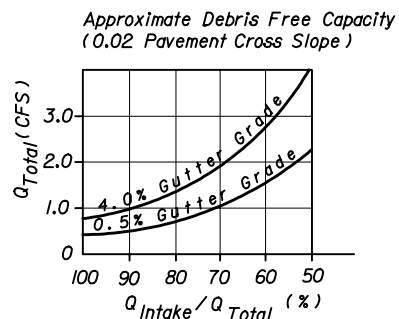
SECTION

GRATE DETAIL

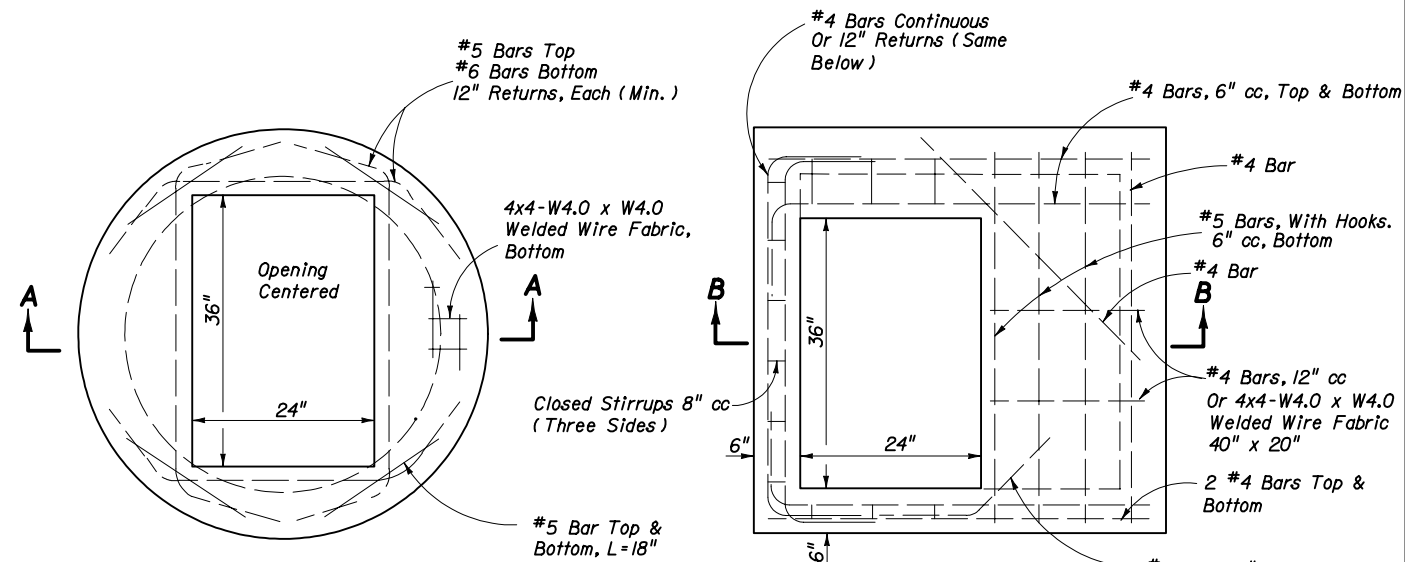


DETAIL A

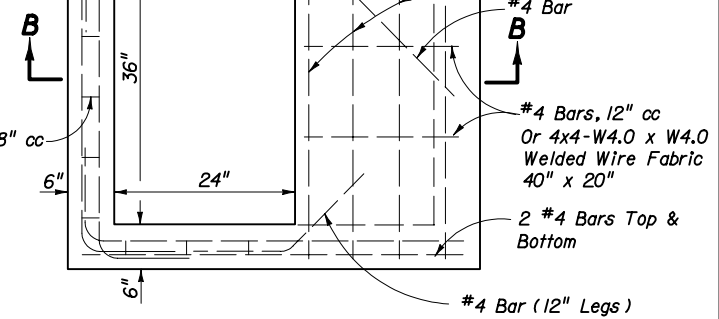
DETAIL B



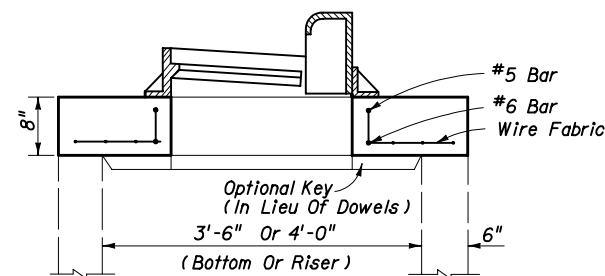
EFFICIENCY CURVE



TOP VIEW

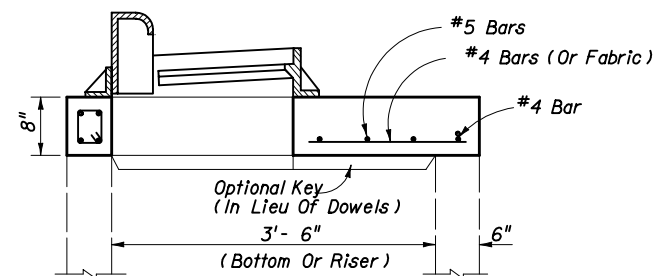


SECTION BB



SECTION AA

(SEE NOTE 6 BELOW)



SECTION BB

(SEE NOTE 6 BELOW)

TOP SLABS

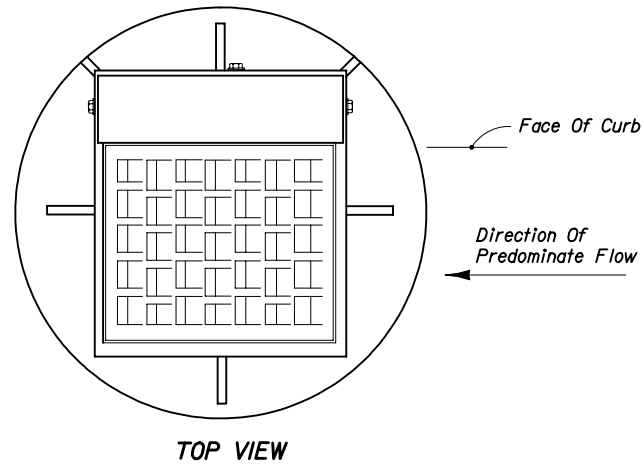
GENERAL NOTES

1. This inlet is primarily intended for locations with light to moderate flows where right of way does not permit the use of throated Curb Inlets Types 1 through 6. The typical application is on curb returns to city streets. The inlet grate is suitable for pedestrian and bicycle traffic.
2. This inlet to be located outside of curb ramp area in vertical faced curbs such as Curb and Gutter Type F. Grate shall be oriented with vanes directed toward predominate flow.
3. For structure bottoms see Index No. 200. For supplemental details see Index No. 201.
4. All steel in slab tops shall have 1 1/4" minimum cover unless otherwise shown. Tops shall be either cast-in-place or precast concrete.
5. For Alternate B applications, top slab openings shall be placed such that 2 edges of inlet frame will be located directly above bottom wall or riser wall.
6. When used on a structure with dimensions larger than those detailed above and risers are not applied, the top slab shall be constructed using Index No. 200 with the slab opening adjusted to 24" x 36". The "Special Top Slab" on Index No. 200 is not permitted.
7. Frame may be adjusted with one to six courses of brick.
8. Inlet and grate detail shown is Neenah R-3067-L. Vaned grates with approximately equal openings will be permitted that satisfy AASHTO HS-20 loading. Inlet and grate shall be Class 30 castings in accordance with ASTM A48 Grates shall be reversible, right or left.

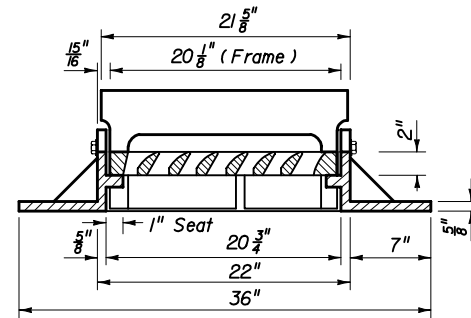
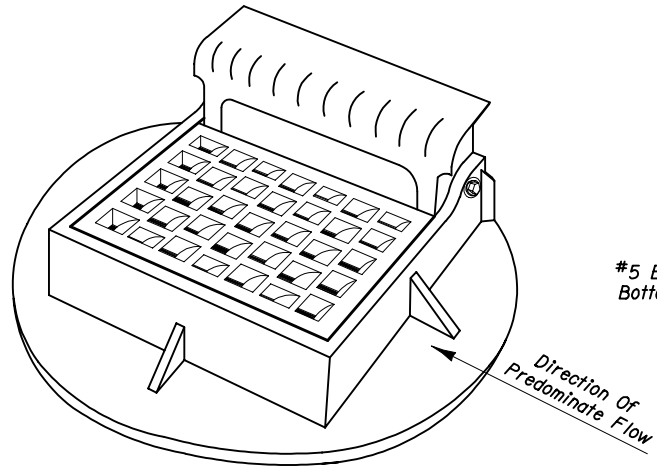
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CURB INLET TOP TYPE 9

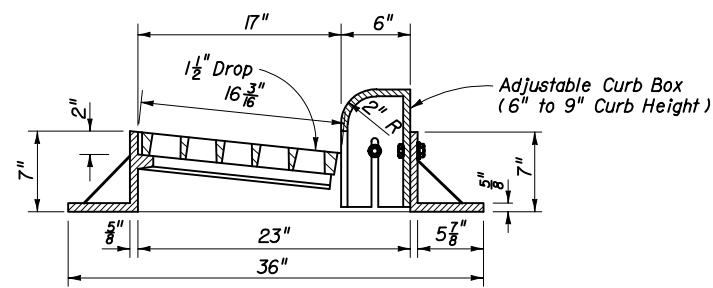
Names	Dates	Approved By		
Designed By	EGR	State Drainage Engineer		
Drawn By	HSD 01/81			
Checked By	JVG 01/81			
Revision	04			
Sheet No.	1 of 1	Index No.	214	



TOP VIEW

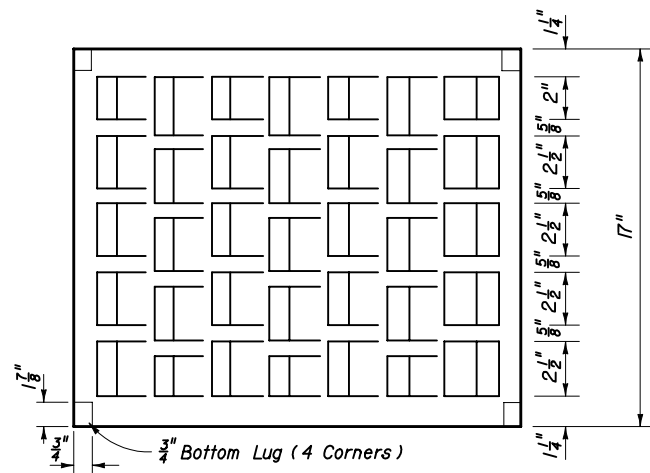


LONGITUDINAL SECTION

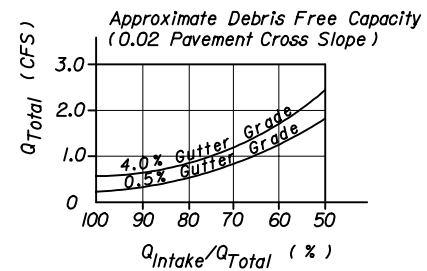


TRANSVERSE SECTION

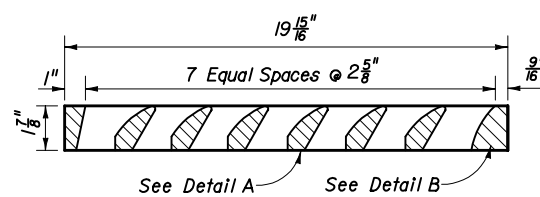
FRAME AND GRATE



PLAN

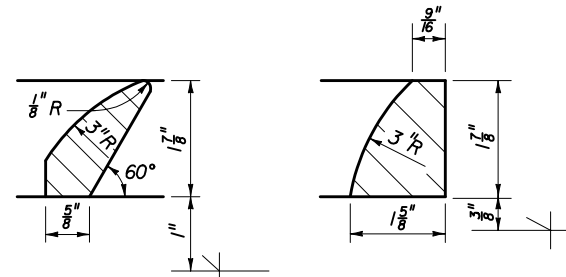


EFFICIENCY CURVE



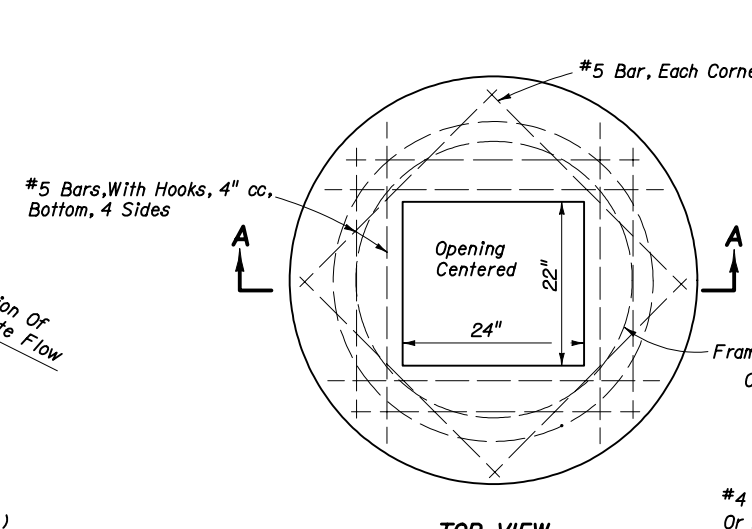
SECTION

GRATE DETAIL

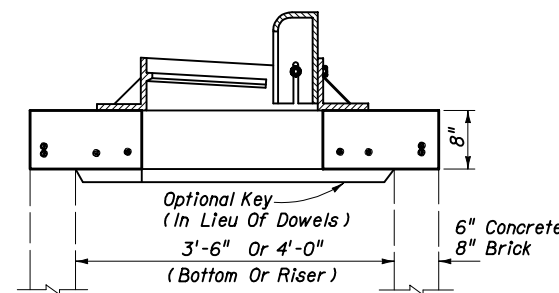


DETAIL A

DETAIL B



TOP VIEW



SECTION AA

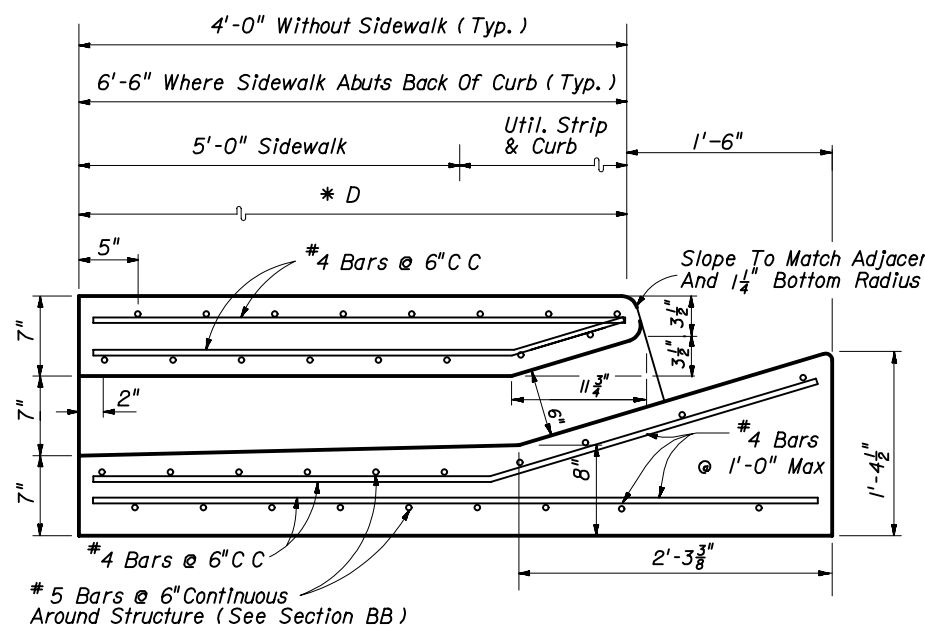
(SEE NOTE 6 BELOW)

TOP SLABS

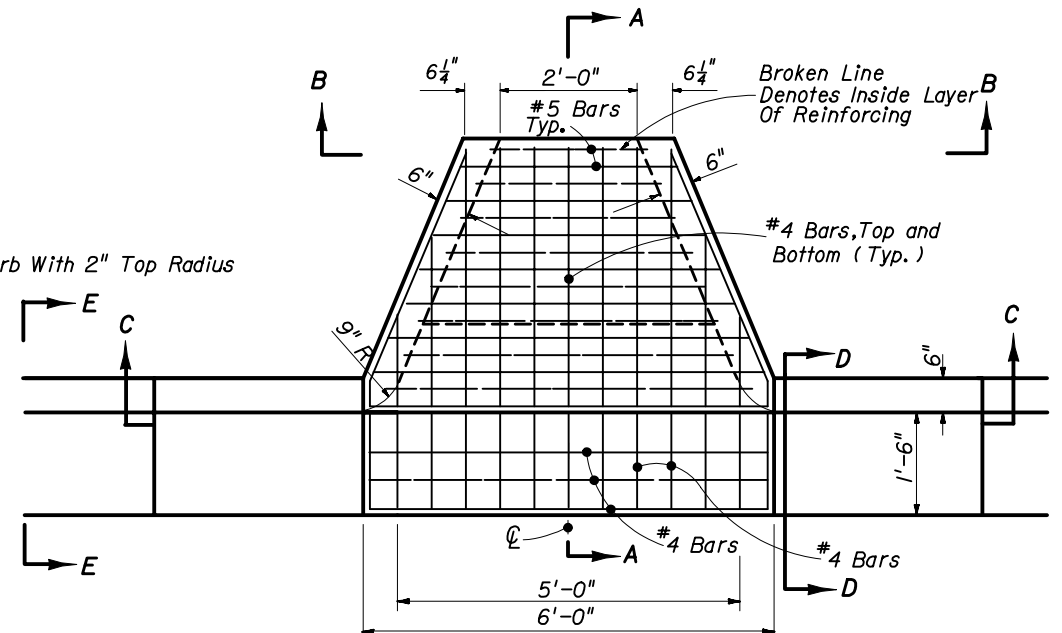
GENERAL NOTES

- This inlet is primarily intended for locations with light flows where right of way does not permit the use of throated Curb Inlets Types 1 through 6. The typical application is on curb returns to city streets. The inlet grate is suitable for pedestrian and bicycle traffic.
- This inlet to be located outside of curb ramp area in vertical faced curbs such as Curb and Gutter Type F. Grate shall be oriented with vanes directed toward predominate flow.
- For structure bottoms see Index No. 200. For supplemental details see Index No. 201.
- All steel in slab tops shall have 1 ¹/₄" minimum cover unless otherwise shown. Tops shall be either cast-in-place or precast concrete.
- For Alternate B applications, top slab openings shall be placed such that 2 edges of inlet frame will be located directly above bottom or riser walls.
- When used on a structure with dimensions larger than those detail above and risers are not applied, the top slab shall be constructed using Index No. 200 with the slab opening adjusted to 24" x 36". The "Special Top Slab" on Index No. 200 is not permitted.
- Frame may be adjusted with one to six courses of brick.
- Inlet and grate detail shown is Neenah R-3065-L. Vaned grates with approximately equal openings will be permitted that satisfy AASHTO HS-20 loading. Inlet and grate shall be Class 30 castings in accordance with ASTM A48. Grates shall be reversible, left or right.

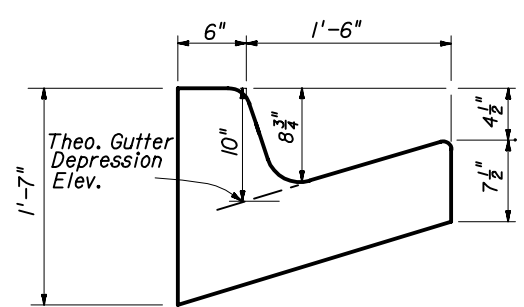
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
CURB INLET TOP TYPE 10					
Names	Dates	Approved By <i>[Signature]</i>			
Designed By	EGR	State Drainage Engineer			
Drawn By	HSD	1/81	Revision	Sheet No.	Index No.
Checked By	JVG	1/81	04	1 of 1	215



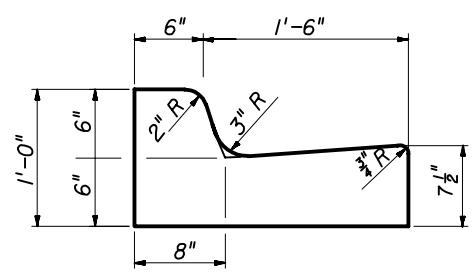
SECTION AA



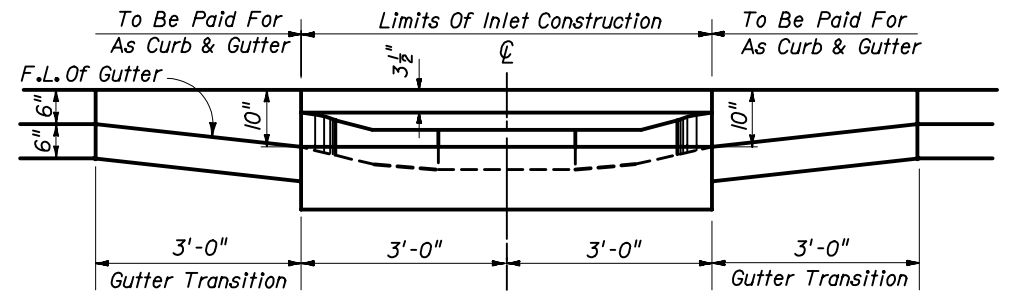
TOP VIEW



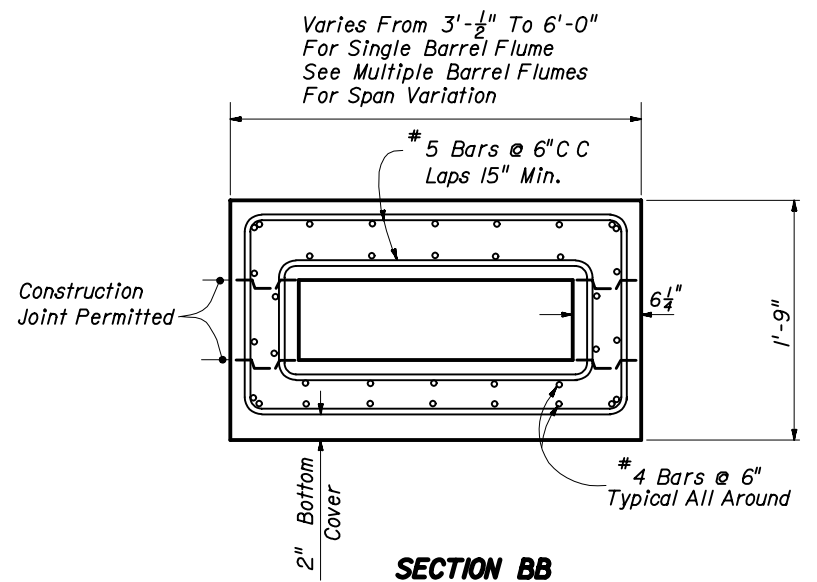
SECTION DD



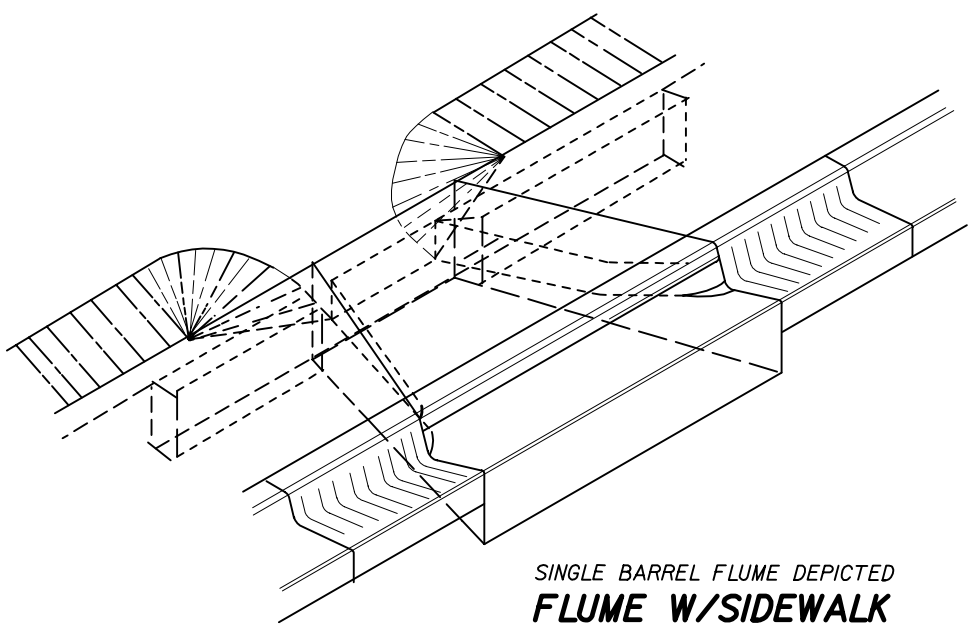
**Curb And Gutter Type F
SECTION EE**



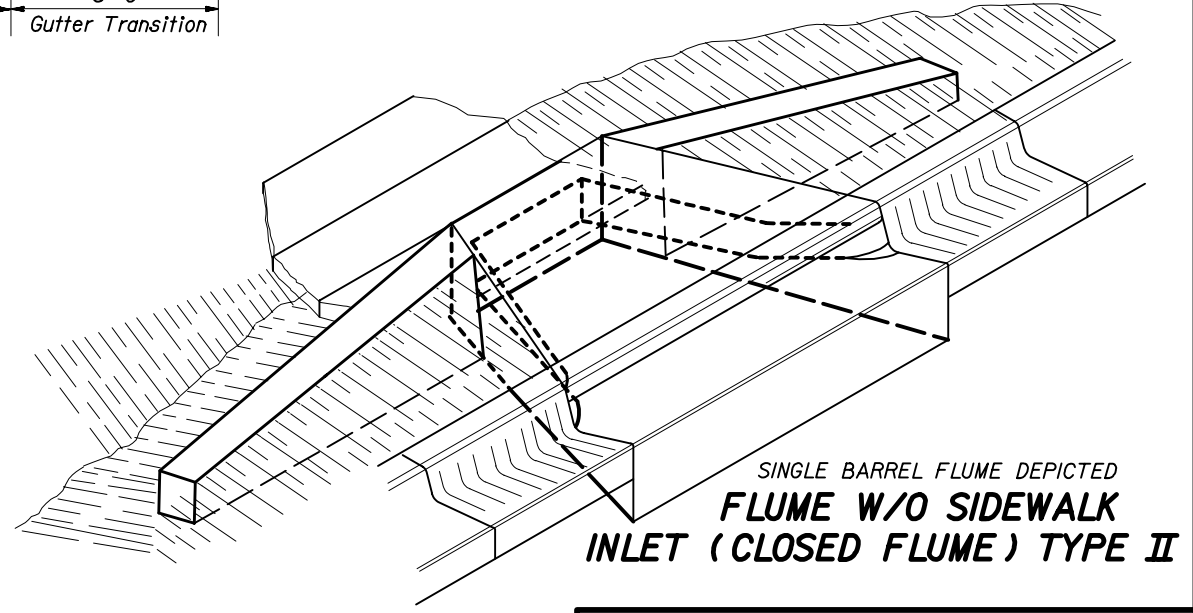
**SECTION CC
SINGLE BARREL FLUME**



SECTION BB



**SINGLE BARREL FLUME DEPICTED
FLUME W/SIDEWALK
INLET (CLOSED FLUME) TYPE I**



**SINGLE BARREL FLUME DEPICTED
FLUME W/O SIDEWALK
INLET (CLOSED FLUME) TYPE II**

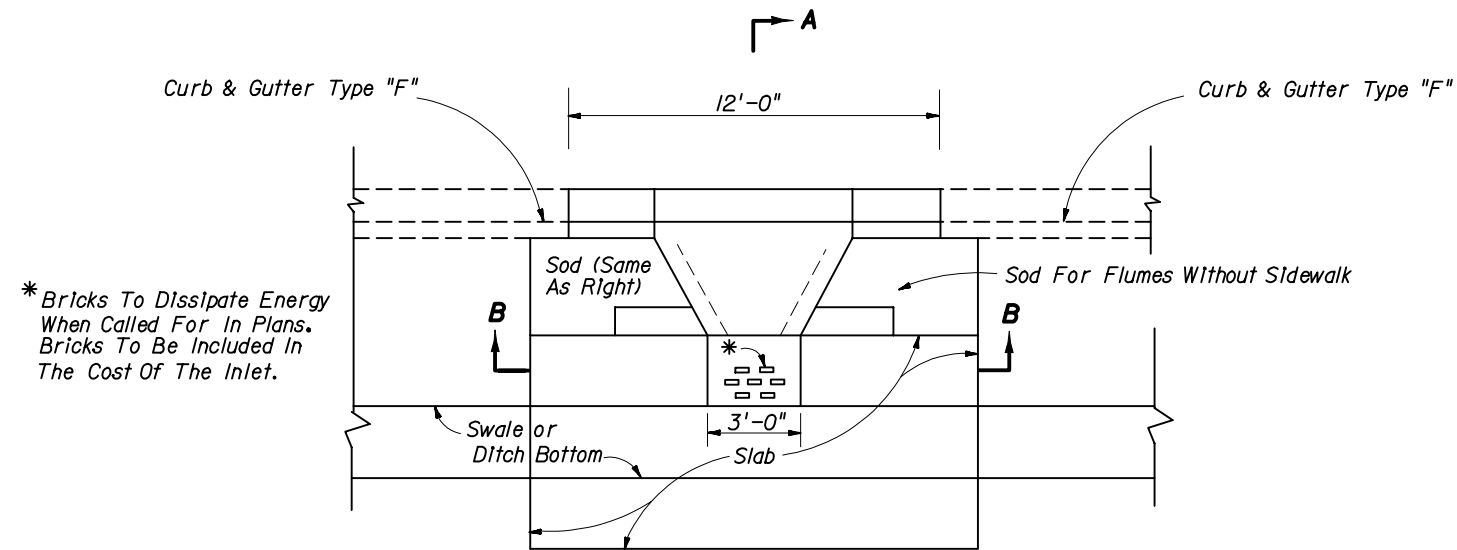
GENERAL NOTES

1. The finished grade and slope of the inlet top are to conform with the finished cross slope and grade of the proposed sidewalk and/or border.
2. When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly. Bend steel when necessary.
3. All steel shall have 1 1/4" minimum cover unless otherwise shown. Inlets can be either cast-in-place or precast concrete. Chamfer all exposed edges 3/4".
4. All reinforcement is ASTM A615/A615M Grade 60 steel, either smooth or deformed. Equivalent area grade 40 steel or 65 ksi welded wire fabric may be substituted.
5. Precasting of this inlet will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer.
6. Inlets to be paid for under the contract unit price for Inlets (Closed Flume) EA.

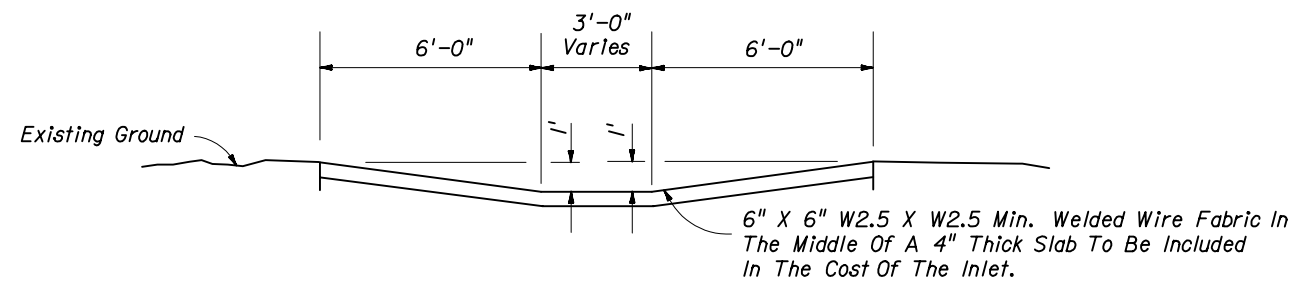
DESIGN NOTES

1. These inlets are designed for use with Type F curb and gutter only. Locate inlet outside of curb ramp area. The Single Barrel Flume is intended for locations with light to moderate flows. Multiple Barrel Flumes must be selected to meet design heavy flows.
2. Designer must specify Flume Type, "D" dimension, number of barrels and handrail requirements in plans.
3. Designer must specify where energy dissipating bricks are required.

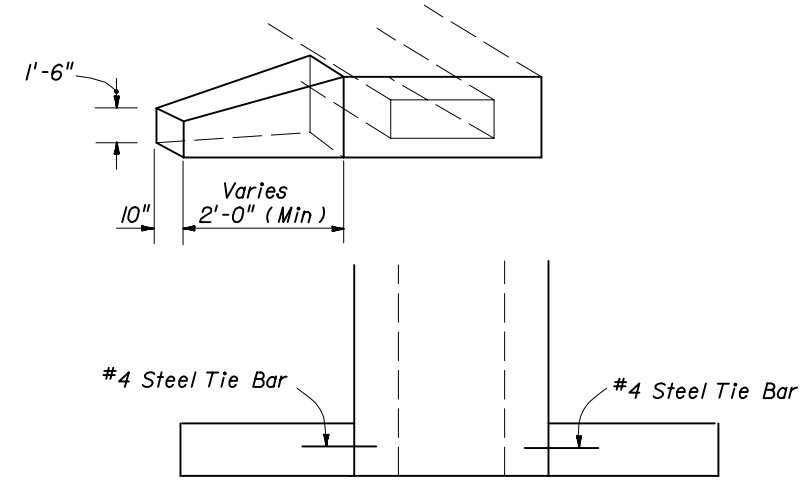
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CLOSED FLUME INLET				
Designed By	J.D.T.	Dates	03/96	Approved By
Drawn By		Revision	04	State Drainage Engineer
Checked By	W.P.H.	03/96	1 of 3	Index No.
				216



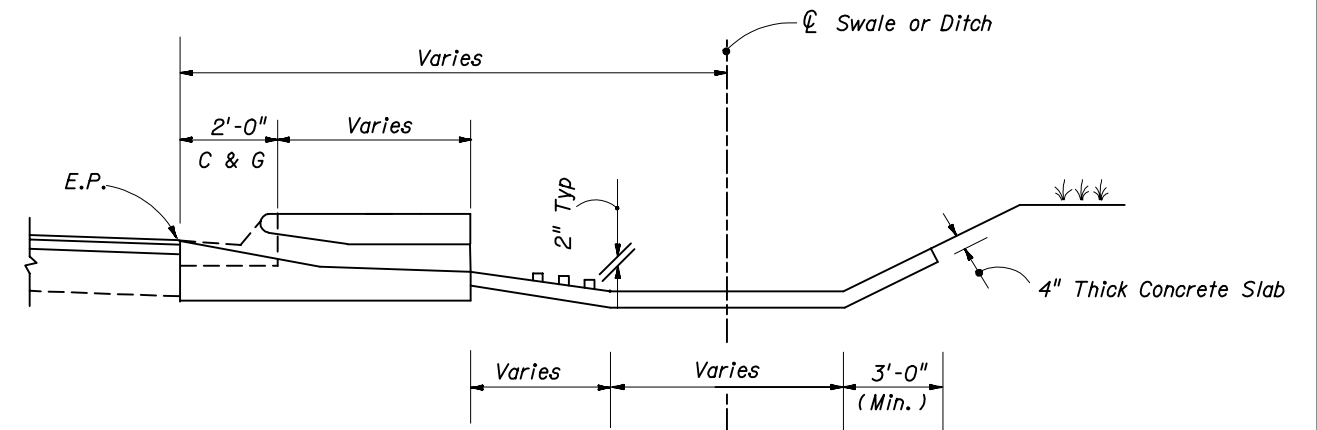
SINGLE BARREL FLUME DEPICTED
PLAN



SINGLE BARREL FLUME DEPICTED
SECTION BB

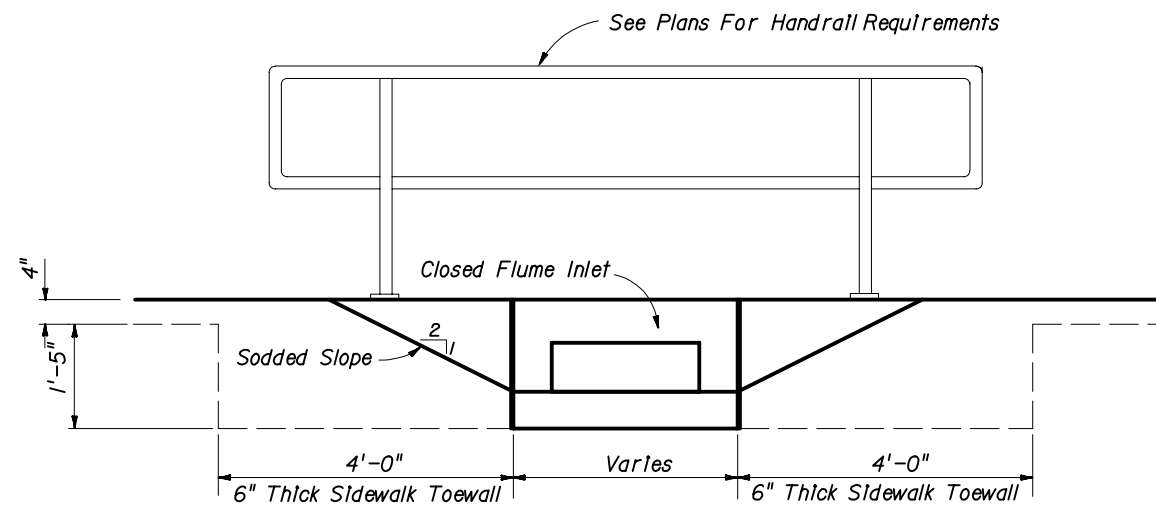


SINGLE BARREL FLUME DEPICTED
ENDWALL



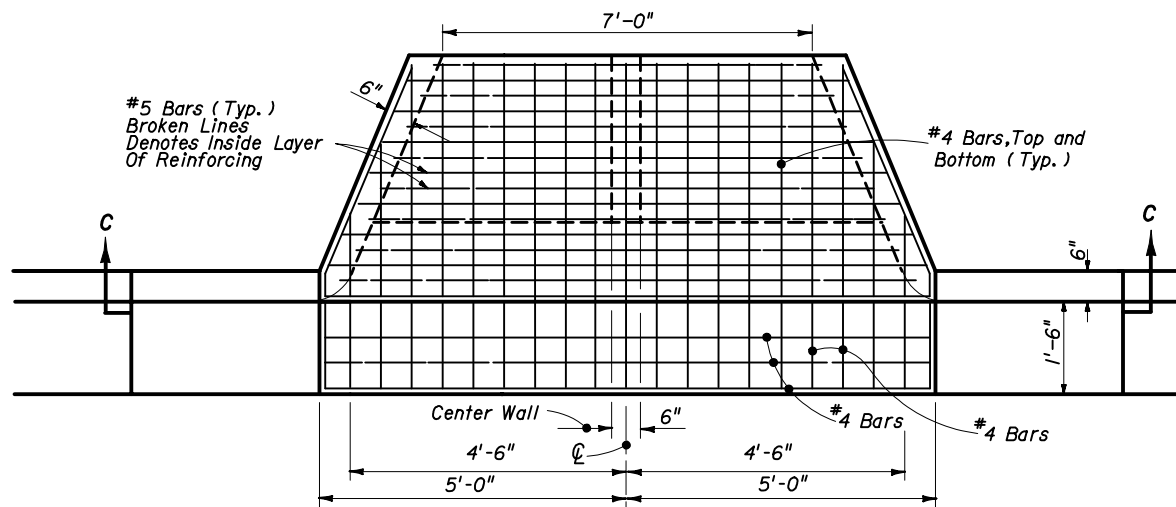
Ditch Pavement To Be Adjusted When Inlet Present
SECTION AA

SLOPES, DITCH APRON AND ENDWALLS

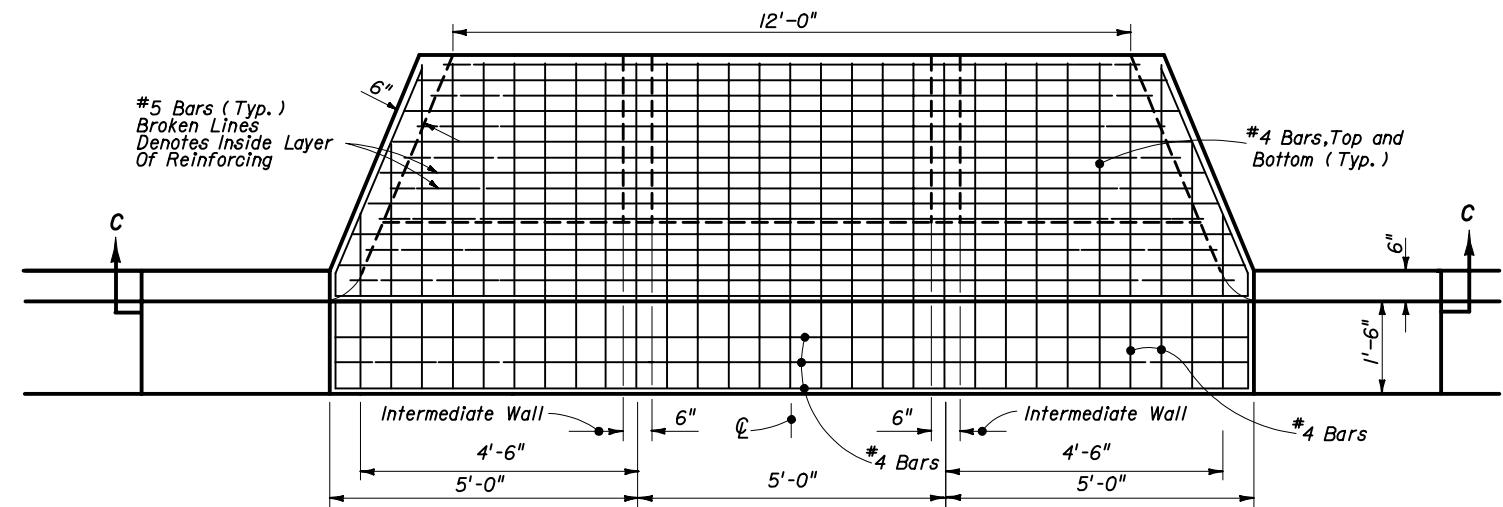


SINGLE BARREL FLUME DEPICTED
ELEVATION
HANDRAIL FOR FLUME IN SIDEWALK

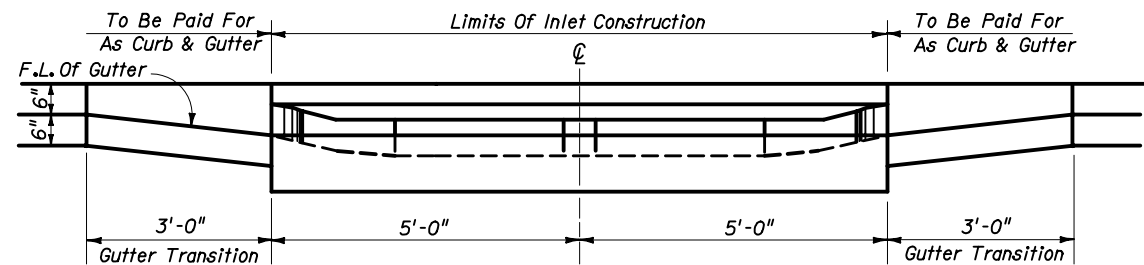
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CLOSED FLUME INLET				
Designed By	J.D.T.	Dates	03/99	Approved By
Drawn By				<i>[Signature]</i> State Drainage Engineer
Checked By	W.P.H.	03/99	Revision	04
			Sheet No.	2 of 3
			Index No.	216



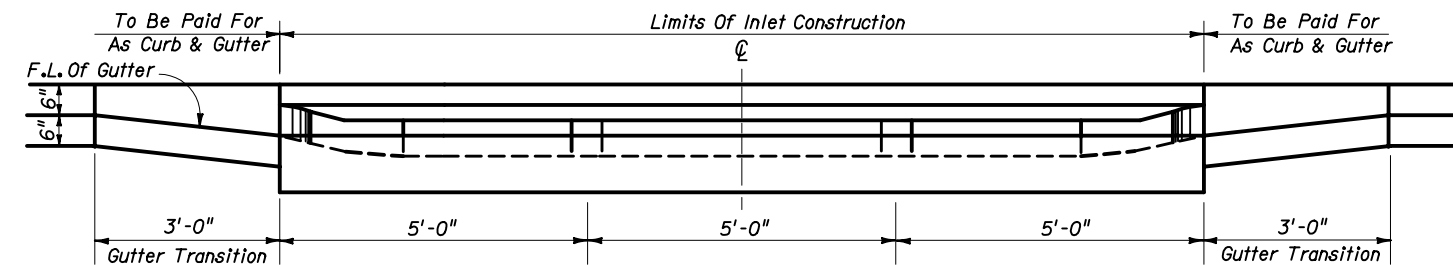
TOP VIEW



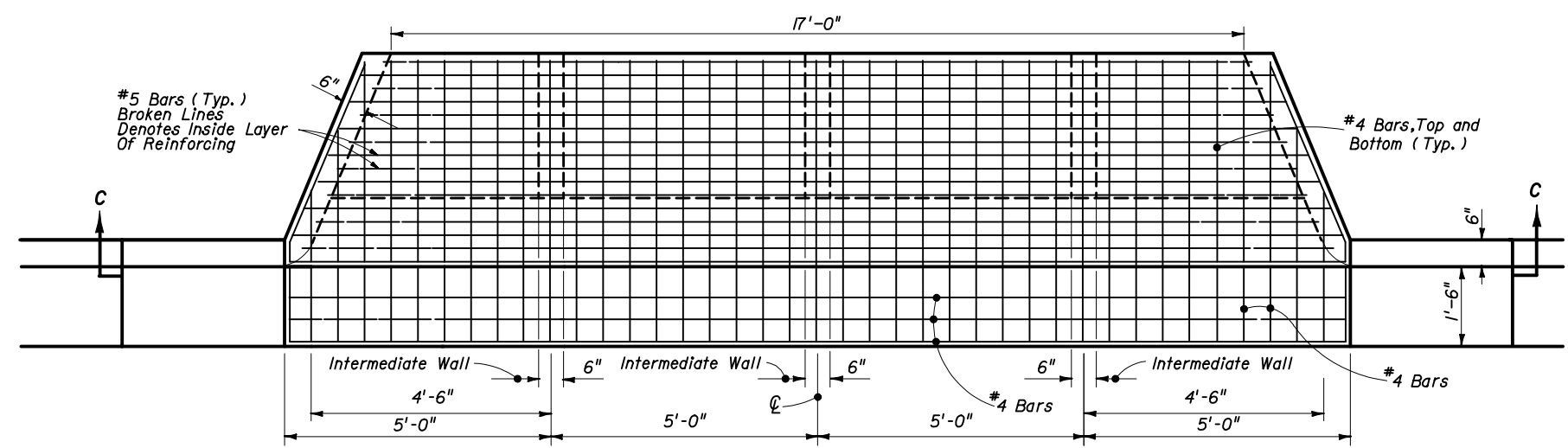
TOP VIEW



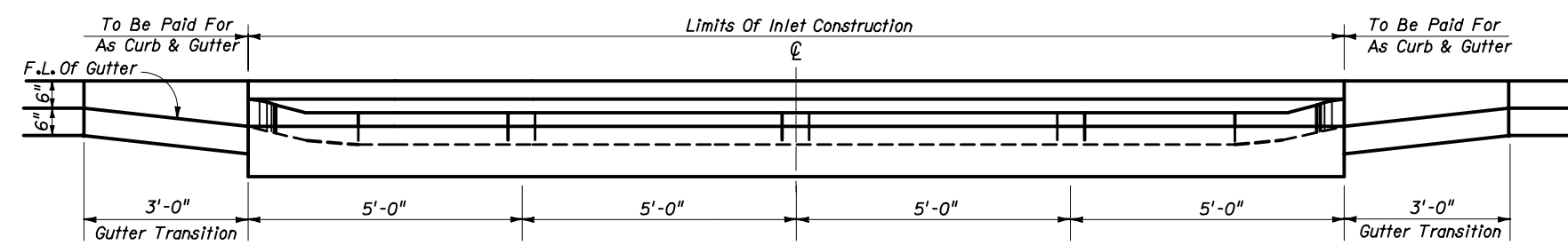
SECTION CC
DOUBLE BARREL FLUME



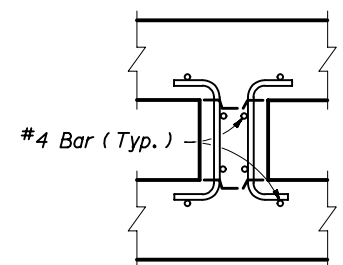
SECTION CC
TRIPLE BARREL FLUME



TOP VIEW



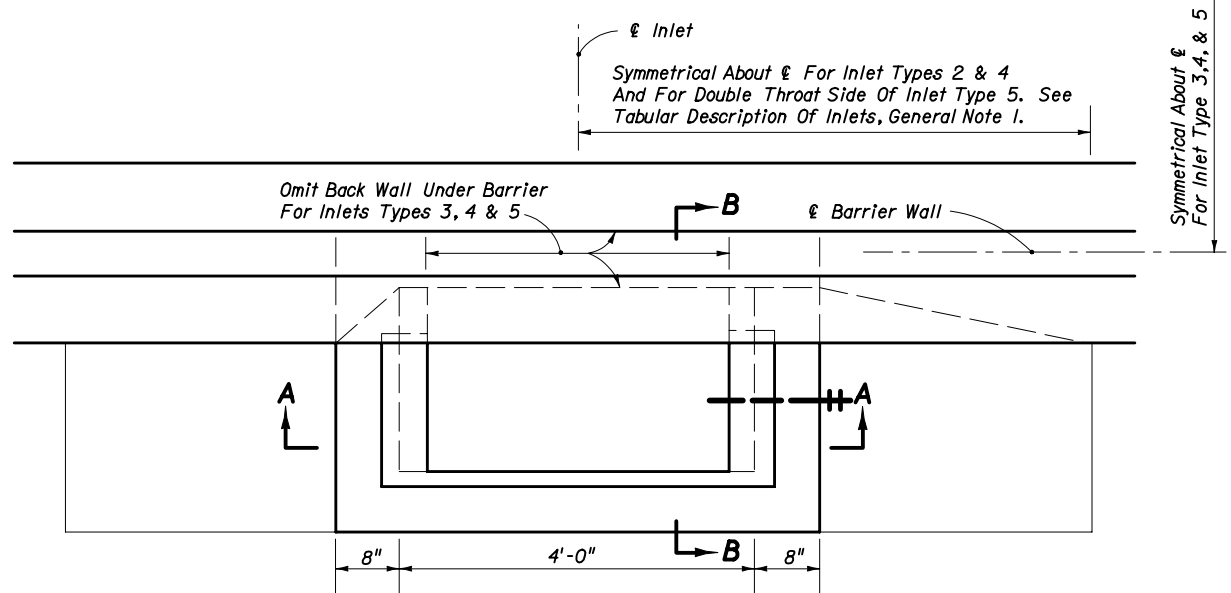
SECTION CC
QUADRUPLE BARREL FLUME



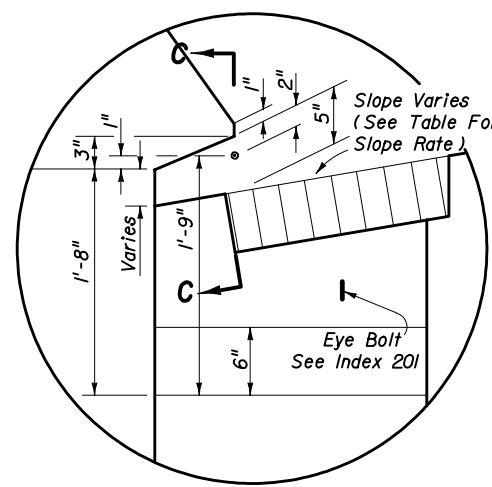
INTER WALL REINFORCING

NOTE: See Single Barrel Flume For Base Dimensions.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CLOSED FLUME INLET				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By			State Drainage Engineer	
Checked By			Revision 02	Sheet No. 3 of 3
				Index No. 216

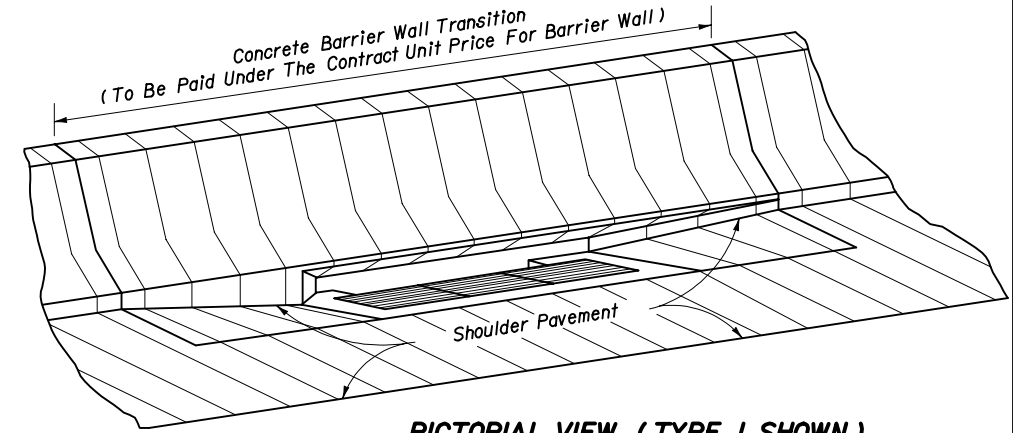


PLAN (INLETS TYPES 1 THRU 5)

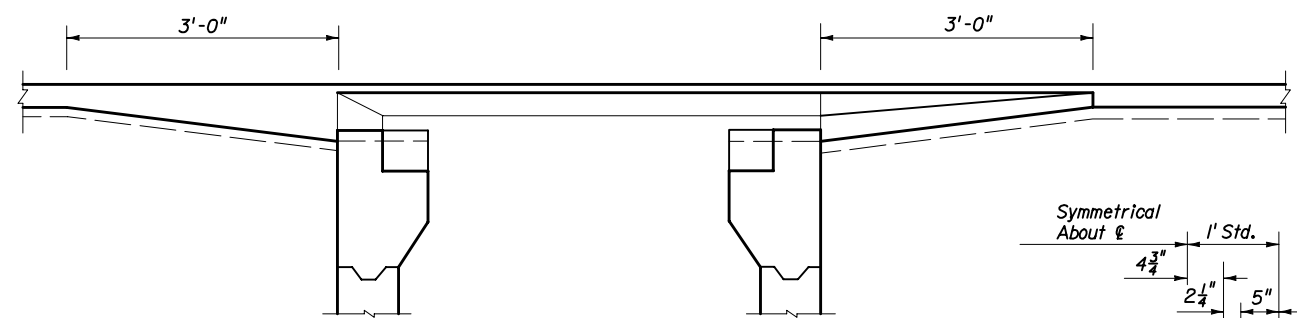


INSET A

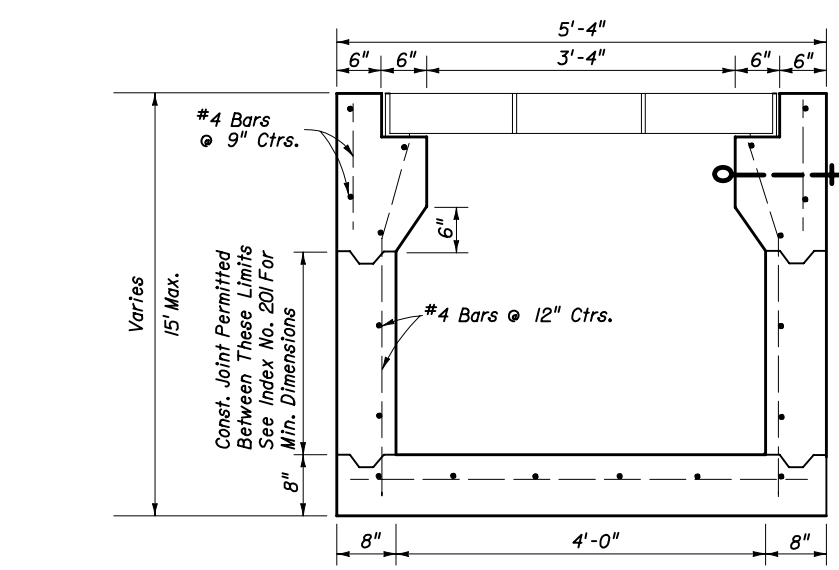
GRATE SLOPE		
Shoulder Slope	Grate Slope Rate	Remarks
0.03	1:6.7	Std. Med. Conc. Shldr.
0.05	1:6	Std. Med. Flex. Shldr.
0.06	1:5.6	
0.07	1:5.2	
0.08	1:5	
0.09	1:4.5	
0.10	1:4.5	e (max)



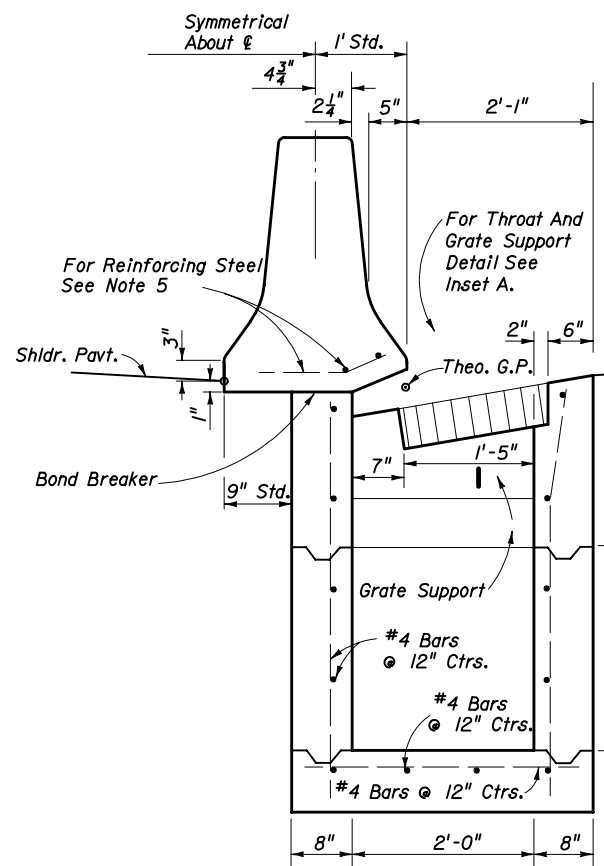
PICTORIAL VIEW (TYPE 1 SHOWN)



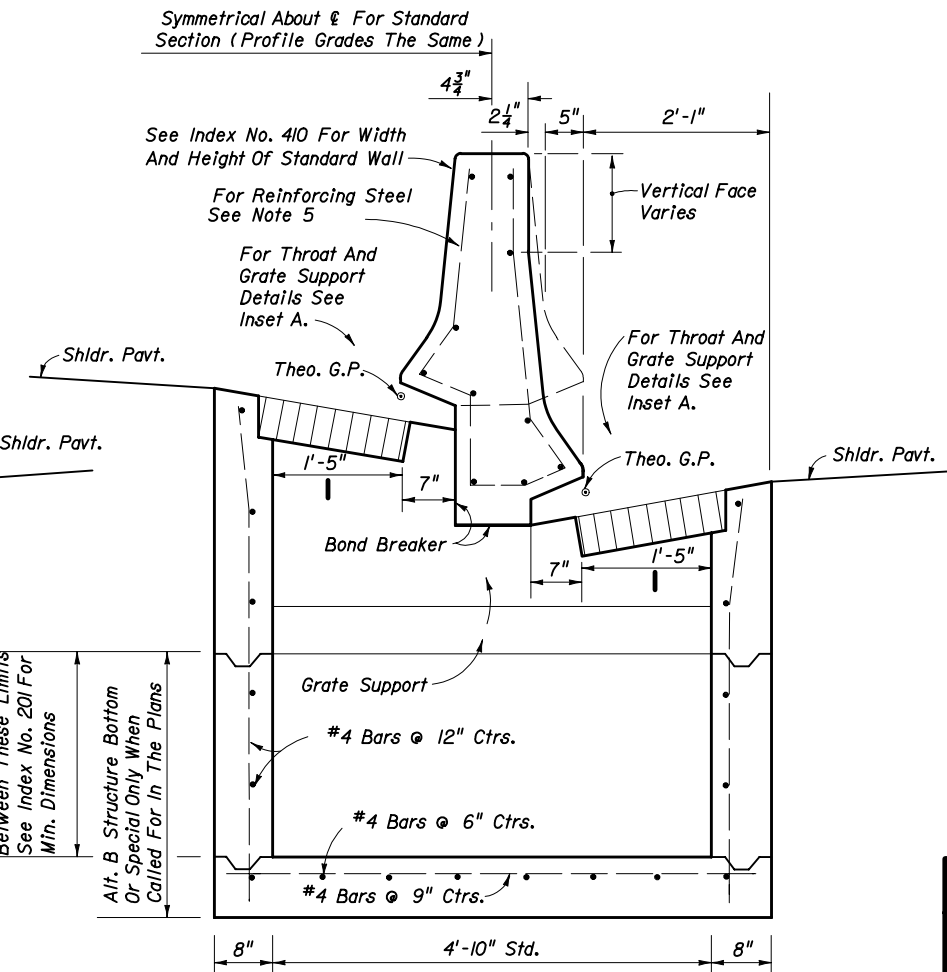
SECTION CC



SECTION AA



SECTION (INLETS TYPES 1 & 2)



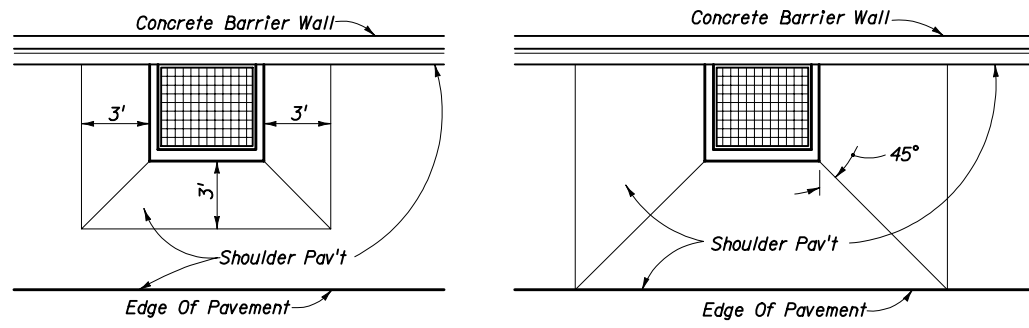
SECTION (INLETS TYPES 3, 4 & 5)
(NON-SYMMETRICAL SECTION SHOWN)

GENERAL NOTES

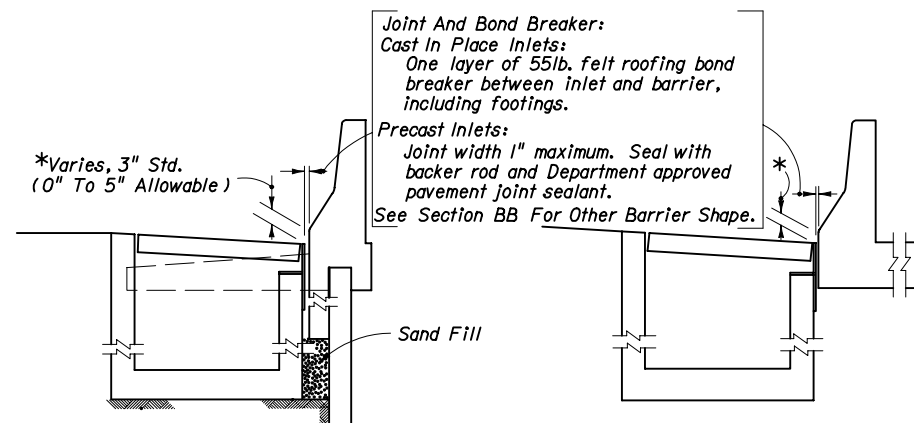
- Inlet Descriptions:**
 Type 1 Single throat, one side of barrier wall.
 Type 2 Double throats, one side of barrier wall.
 Type 3 Two single throats, opposite sides of barrier wall.
 Type 4 Two double throats, opposite sides of barrier wall.
 Type 5 Double throats, one side of barrier wall, and single throat other side of barrier wall.
- For grate details see Index No. 220. The parallel bar grate shall be used unless the reticuline grate is called for in the plans. The reticuline grate shall be specified where bicycle traffic is anticipated. Not suitable for pedestrian traffic.
- For standard concrete barrier wall dimensions, and for dimensions of concrete barrier wall incorporating light standards within the wall, see Index No. 410.
- Reinforcing steel shall have 2" minimum cover.
- All reinforcing steel #4 bars. Longitudinal steel bars extend over full length of concrete barrier wall transition. Tie bars @ 12" ctrs. Reinforcing to be paid for under the contract unit price for Concrete Barrier Wall, LF.
- For supplemental details see Index No. 201.
- Inlets to be paid for under the contract unit price for Inlets (Median Barrier Type...), EA. Barrier wall to be paid for under the contract unit price for Concrete Barrier Wall, LF.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MEDIAN BARRIER INLETS TYPES 1, 2, 3, 4 & 5				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	06/83	State Drainage Engineer	
Checked By	JVG/JBW	07/83	Revision	04
			Sheet No.	1 of 1
			Index No.	217

SECTION BB

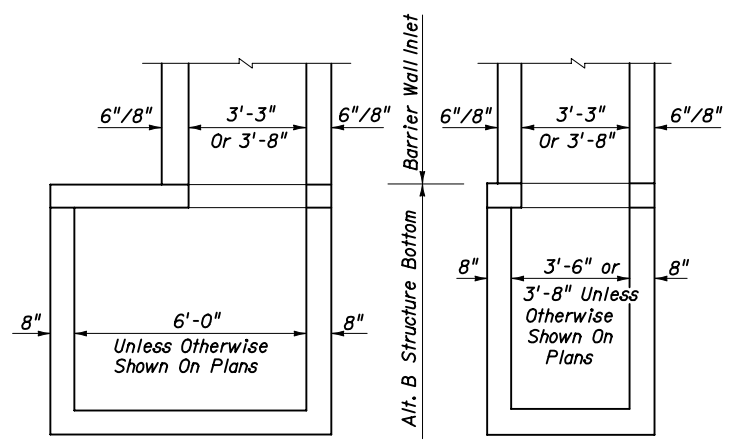


LOW SIDE SUPERELEVATION PAVEMENT WARP FOR SHOULDERS IN SUPERELEVATION **HIGH SIDE TRANSITION PAVEMENT WARP FOR SHOULDERS IN SUPERELEVATION**



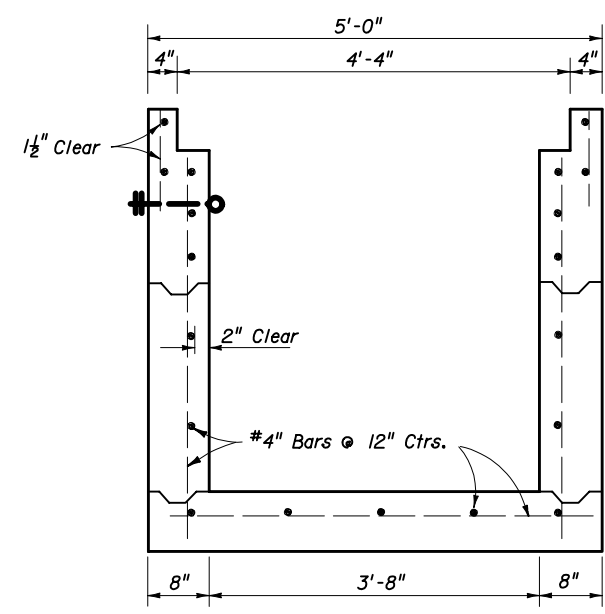
BARRIER WALL / RETAINING WALL **SINGLE FACE ROADWAY BARRIER**

INLET SECTION AT WALLS

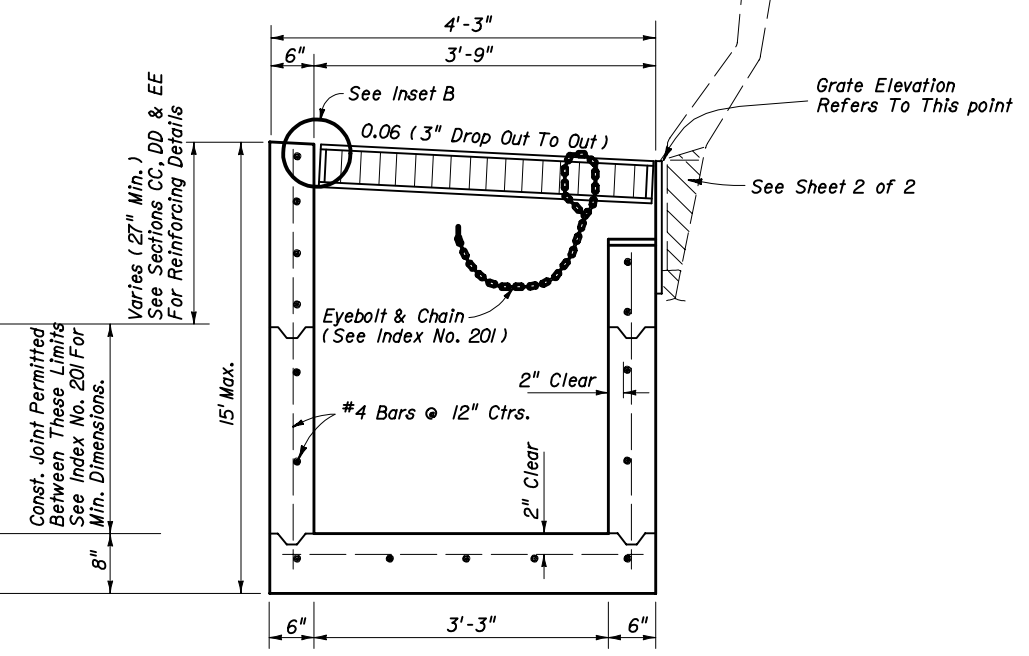


Note: Alt. B Structure Bottom Only. See Index No. 200.

INLET WITH STRUCTURE BOTTOM



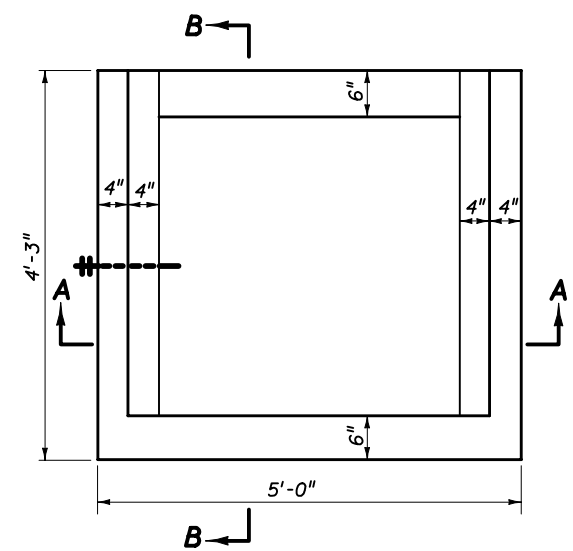
SECTION AA (WITHOUT GRATE)



SECTION BB

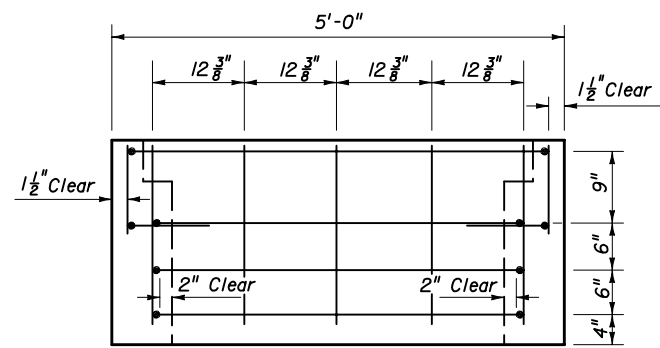
GENERAL NOTES

1. This inlet is primarily intended for use adjacent to concrete barrier walls on paved shoulders. Use of the inlet adjacent to other wall types shall be approved by the Drainage Engineer. The inlet is suitable for bicycle and occasional pedestrian traffic, but should not be placed in a designated pedestrian travel way. It is not intended for use in curb and gutter or other areas where throated inlets are required, nor areas subject to high debris.
2. Inlets located in embankments constructed with earth anchored retaining wall shall be designed with minimum depths to reduce adverse impact on the anchorage system. Runs of pipe parallel to and near anchored wall shall be avoided wherever practical. Special coordination must be exercised during the design and construction of storm water systems within anchored wall systems.
3. Inlet bottoms and/or tops may be either precast or cast-in-place. Whether cast as a single unit or as multiple segments, and whether precast or cast-in-place, the upper 2'-3" of the inlet shall be reinforced in accordance with sections CC, DD and EE.
4. Exposed edges shall be chamfered $\frac{3}{4}$ ".
5. When Alternate G grate is specified in the plans, the grate is to be hot dipped galvanized after fabrication. Field installation of the filler bar called for in Inset B will not be permitted, thereby requiring tolerance adjustment during fabrication and/or casting, or, matching grate to structure prior to galvanizing.
6. For supplemental details see Index Nos. 200 and 201.
7. Inlets to be paid for under the contract unit for Inlets (Barrier Wall), Each.

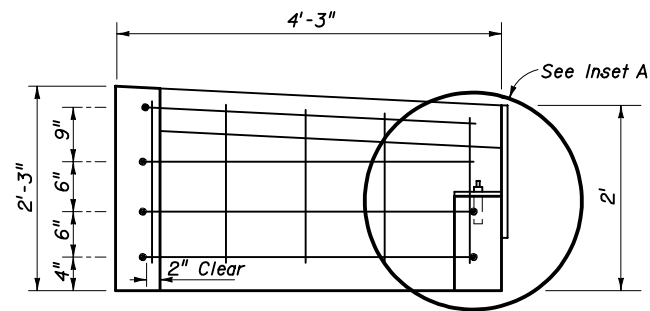


TOP VIEW (WITHOUT GRATE)

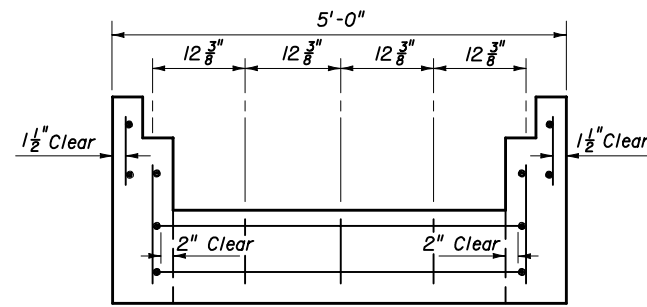
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
BARRIER WALL INLET				
Names	Dates	Approved By		
Designed By	JVG/EGR	09/86	State Drainage Engineer	
Drawn By	HSD	09/86	Revision	Sheet No.
Checked By	JVG	09/86	04	1 of 2
				Index No.
				218



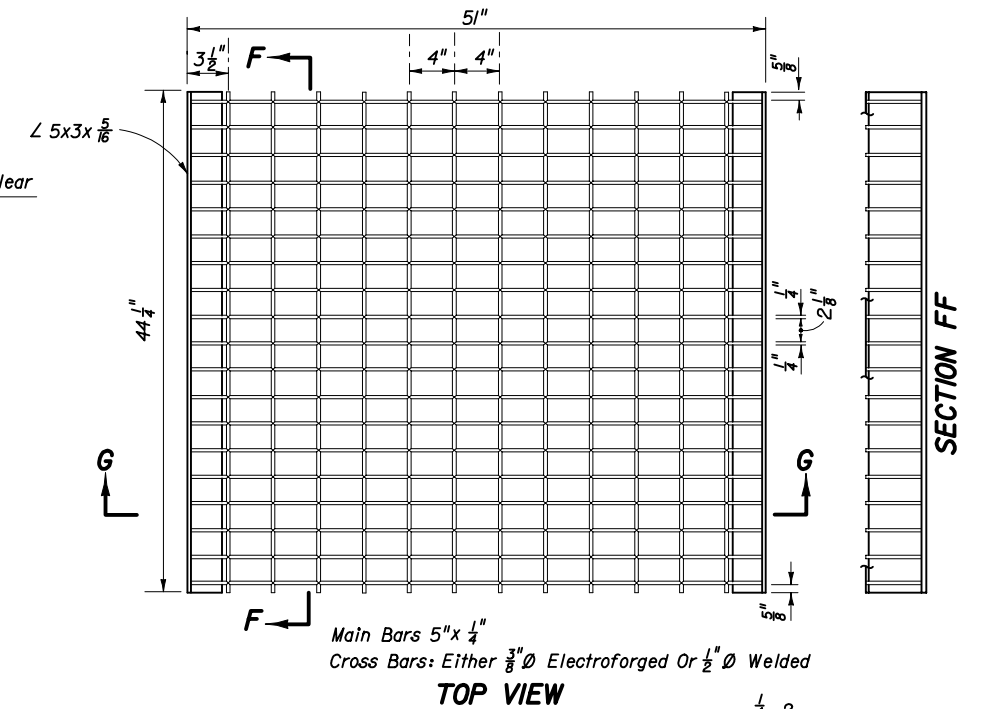
SECTION CC



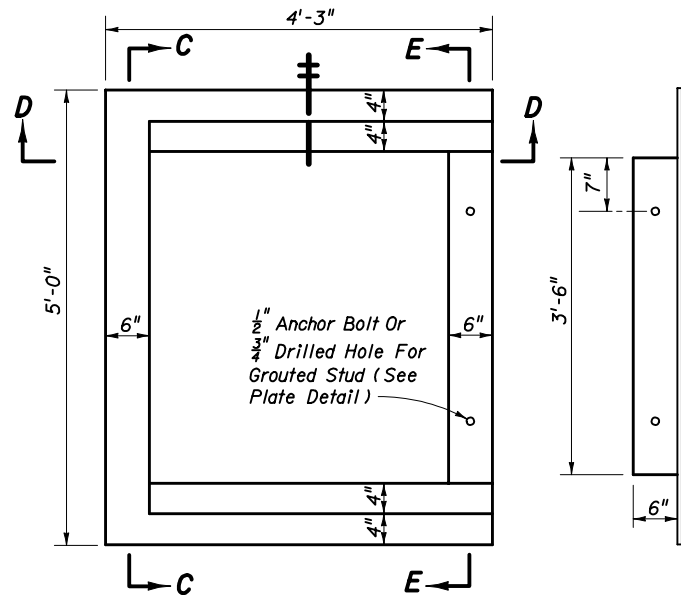
SECTION DD



SECTION EE

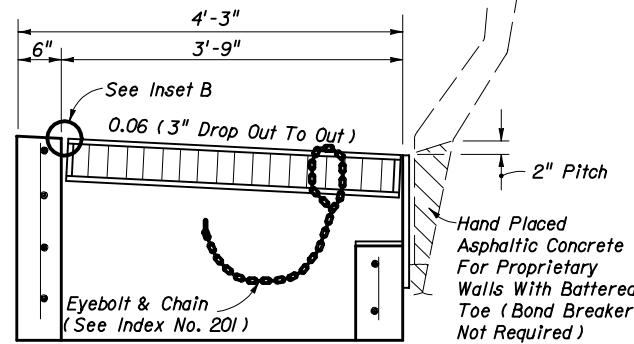


Main Bars 5" x 1/4"
Cross Bars: Either 3/8" ∅ Electroforged Or 1/2" ∅ Welded
TOP VIEW

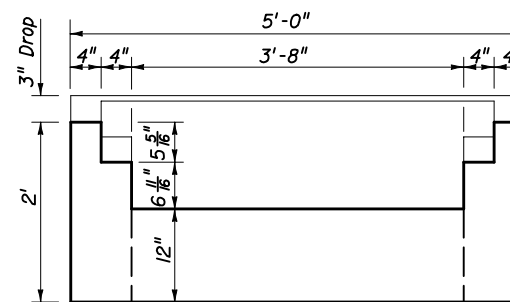


TOP VIEW OF INLET WITHOUT GRATE

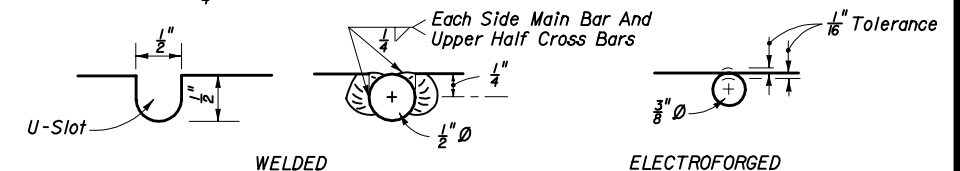
TOP VIEW OF METAL PLATE



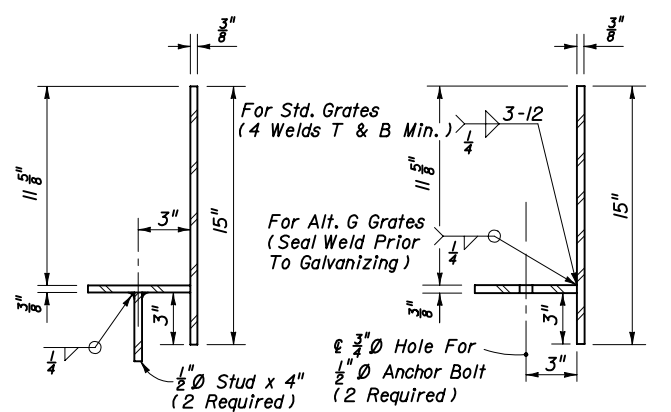
TRANSVERSE SECTION WITH GRATE & PLATE



BACK VIEW WITHOUT BACK PLATE



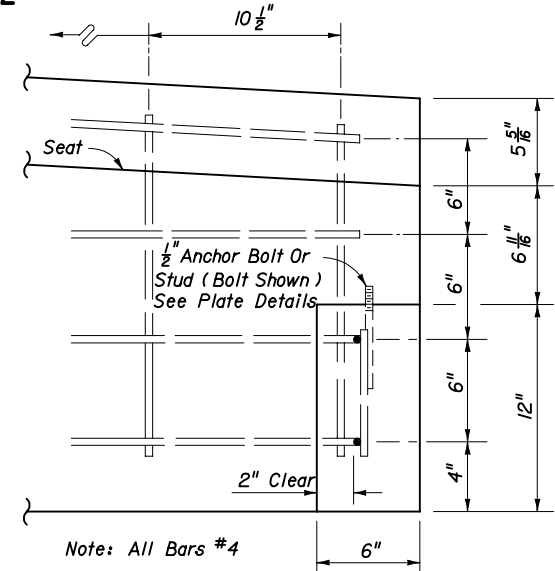
CROSS BAR OPTIONS
STEEL GRATE



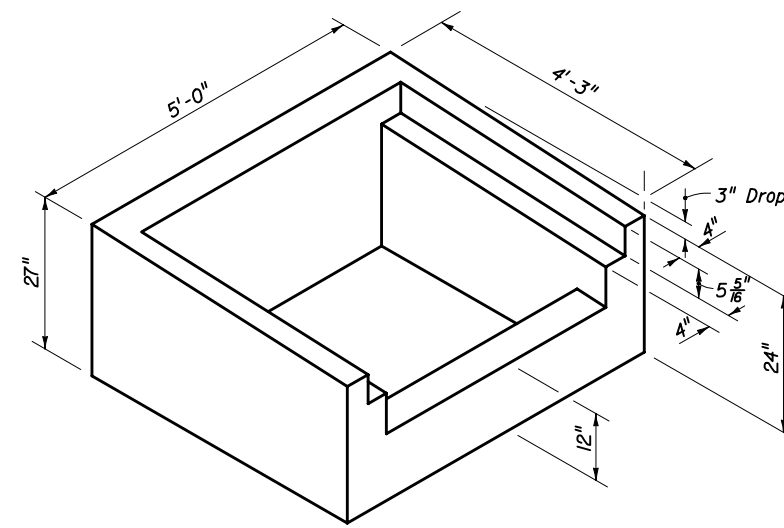
OPTION FOR GROUT STUD

OPTION FOR IMBEDDED ANCHOR

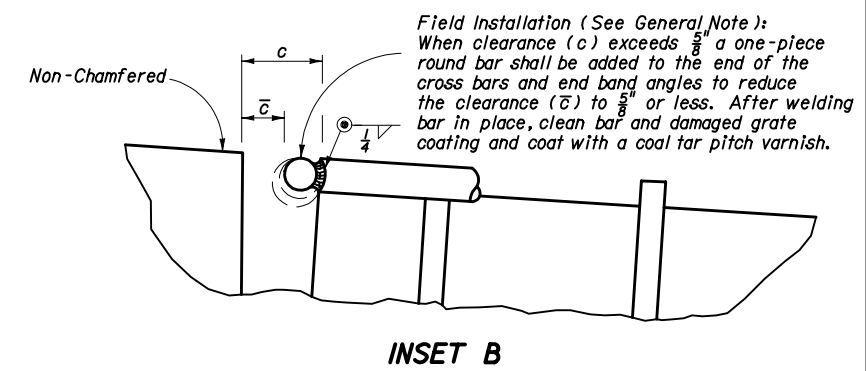
TRANSVERSE SECTIONS THRU BACKWALL PLATE



INSET A

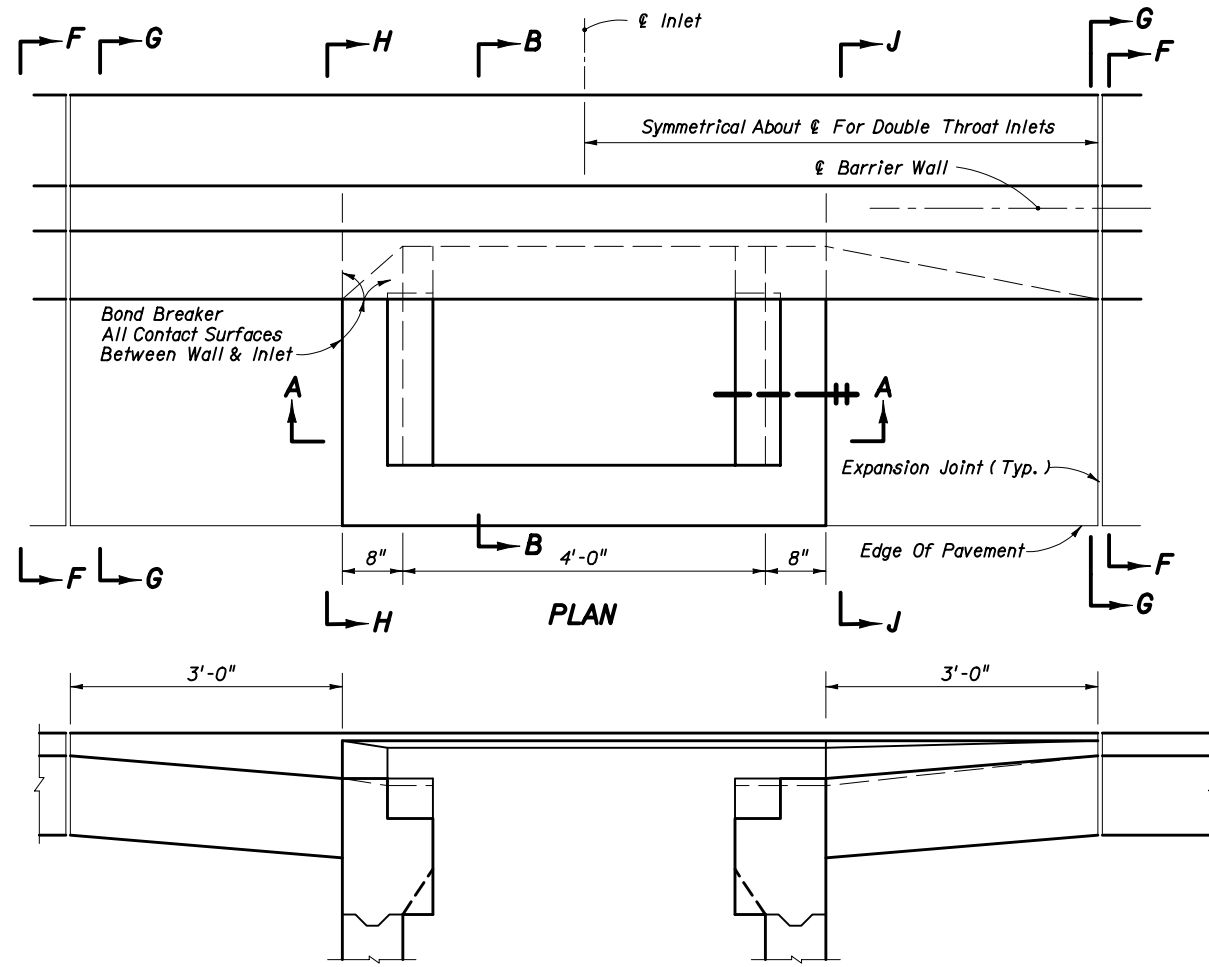


PICTORIAL VIEW

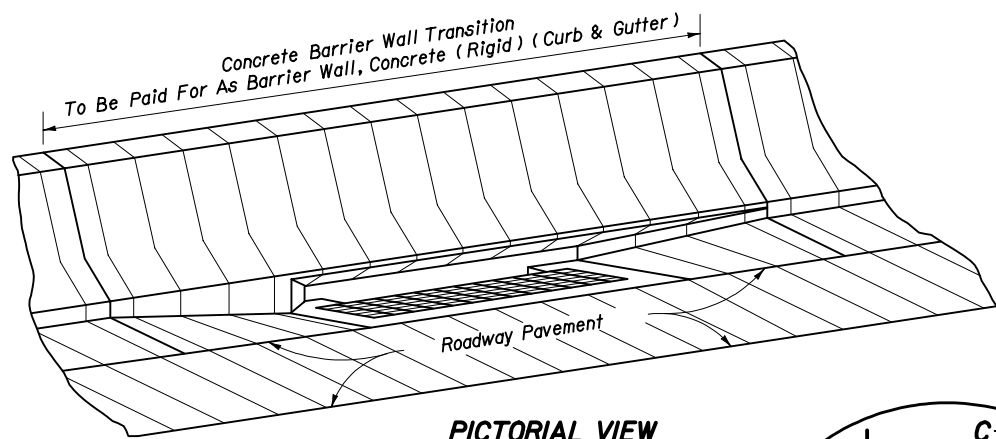


INSET B

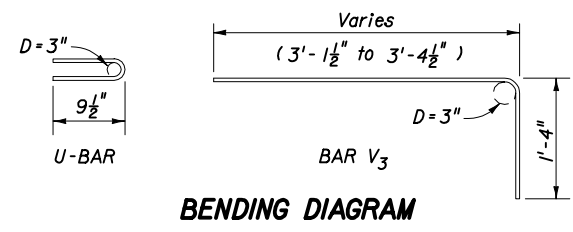
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
BARRIER WALL INLET				
Designed By	JVG/EGR	09/86	Approved By <i>[Signature]</i>	
Drawn By	HSD	09/86	Revision	Sheet No. 2 of 2
Checked By	JVG	09/86	00	Index No. 218



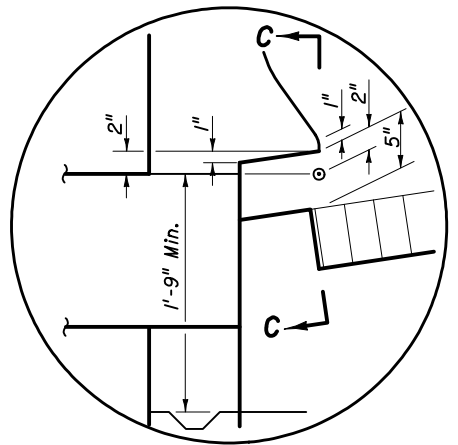
SECTION CC



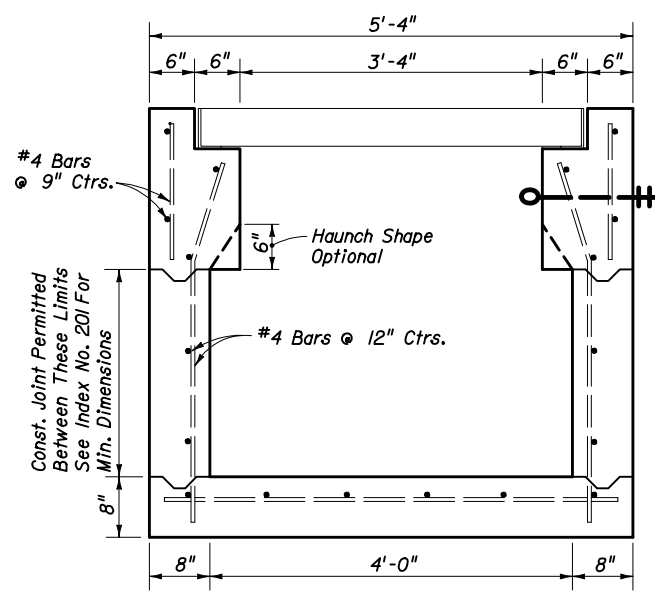
PICTORIAL VIEW



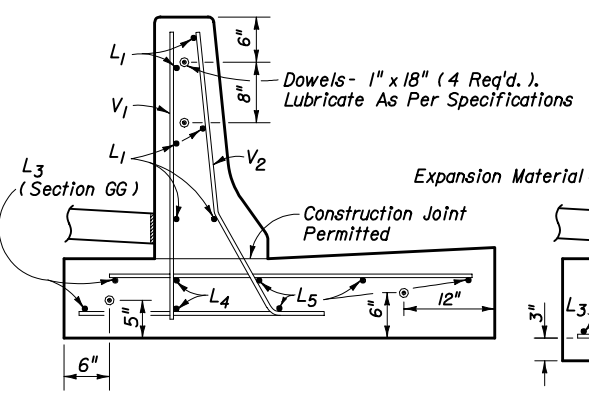
BENDING DIAGRAM



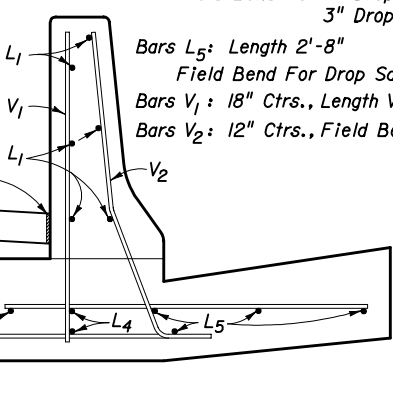
INSET A



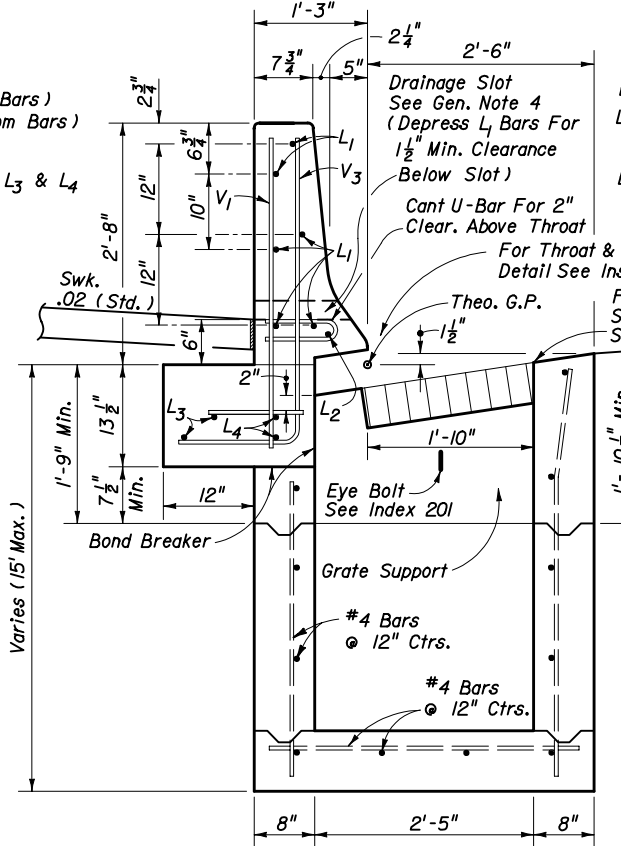
SECTION AA



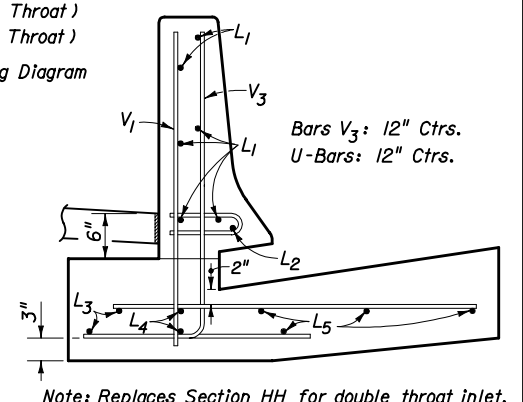
SECTION FF & GG



SECTION HH



SECTION BB




SECTION JJ

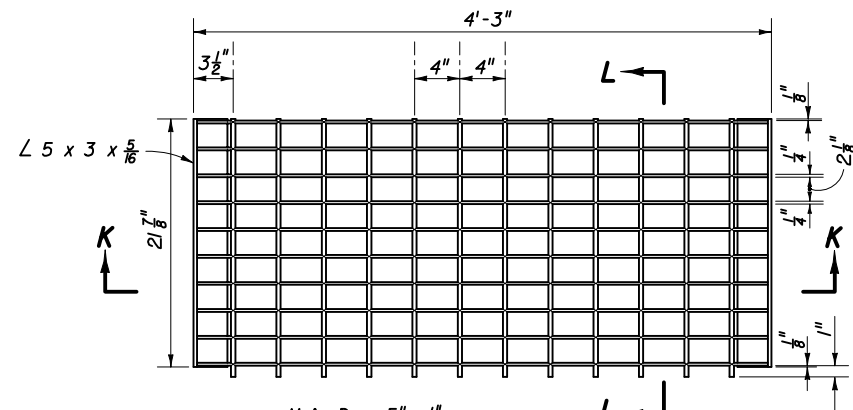
GENERAL NOTES

1. This inlet to be used in conjunction with Barrier Wall, Concrete (Rigid) (Curb & Gutter), Index No. 410.
2. All reinforcing steel #4 bars. Reinforcing shall have 2" min. cover unless otherwise shown. Cost to be included in cost for concrete barrier wall.
3. Barrier wall shall be Class II concrete, finished in accordance with Index No. 410.
4. A flat 18" x 2 1/2" drainage slot shall be constructed at the inlet centerline when the inlet is located in a curb sag. No more than one V1 bar, one V3 bar and one U-bar are to be deleted for construction of the drainage slot.
5. For supplemental details see Index Nos. 201 and 410.
6. Recommended maximum pipe sizes are 18" longitudinal and 30" transverse. For larger pipe, use Alt. B bottoms, Index No. 200.
7. Grates can be fabricated with reticuline bars or with either 3/8" dia electroforged or 1/2" dia welded cross bars and full depth bars as detailed.
8. When Alternate G grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
9. For pay item purposes the height of the structure shall be computed using the theoretical gutter elevation, less the flow line elevation of the lowest pipe or to top of sump floor.
10. Inlets to be paid for under the contract unit price for Inlets (Barrier Wall) (Rigid) (Curb & Gutter), Each.
11. Barrier wall to be paid for under the contract unit price for Barrier Wall, Concrete (Rigid-Curb & Gutter) LF.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

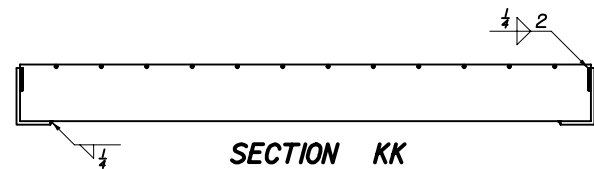
BARRIER WALL INLET
BARRIER WALL, CONCRETE (RIGID) (C & G)

Names	Dates	Approved By		
Designed By	EGR/JVG 9/89	 State Drainage Engineer		
Drawn By	JBW 9/89			
Checked By	EGR/JVG 9/89			
Revision	04			
Sheet No.	1 of 2	Index No.	219	

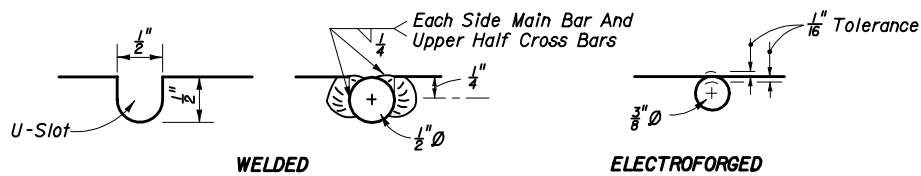


Main Bars 5" x 1/4"
 Cross Bars : Either 3/8" ∅ Electroforged Or 1/2" ∅ Welded

PLAN



SECTION KK

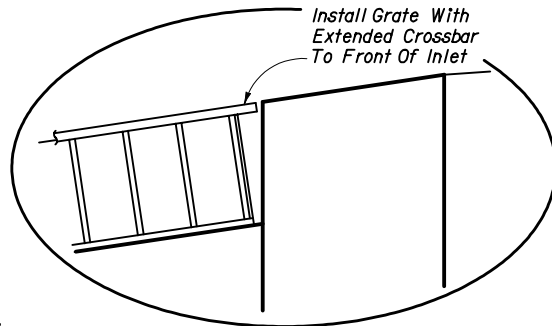


CROSS BAR OPTIONS

CROSS BAR

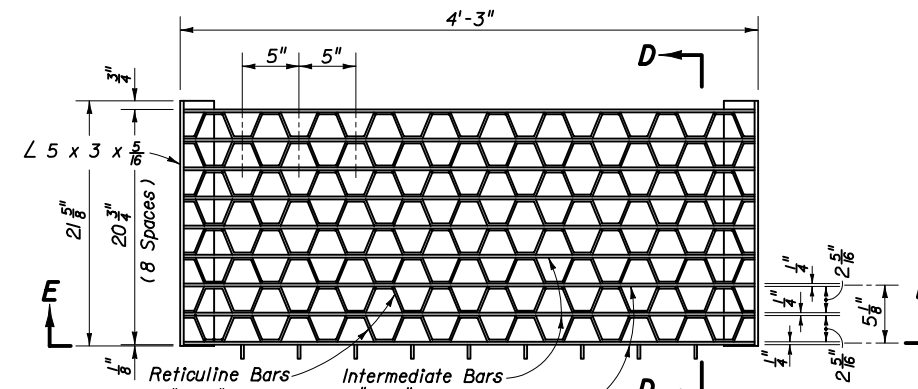


SECTION LL



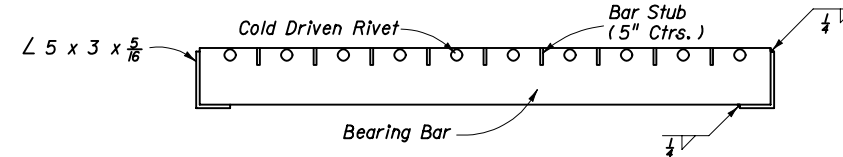
INSET B

Install Grate With
 Extended Crossbar
 To Front Of Inlet

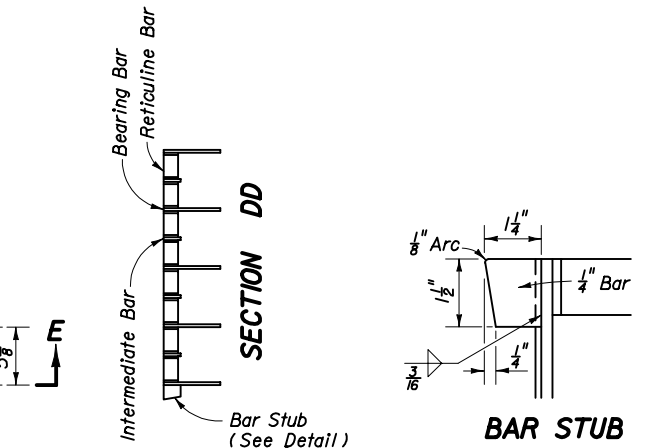


Reticuline Bars 1/4" x 3/16"
 Intermediate Bars 1 1/2" x 1/4"
 Bearing Bars 5" x 1/4"

PLAN

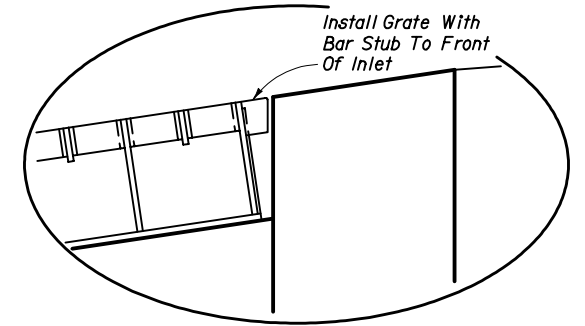
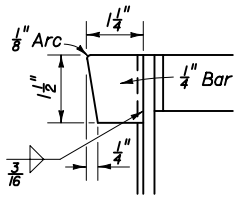


SECTION EE



SECTION DD

BAR STUB




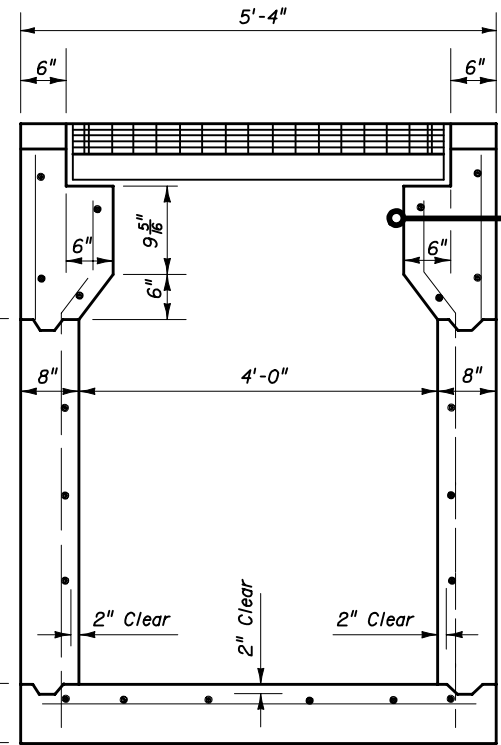
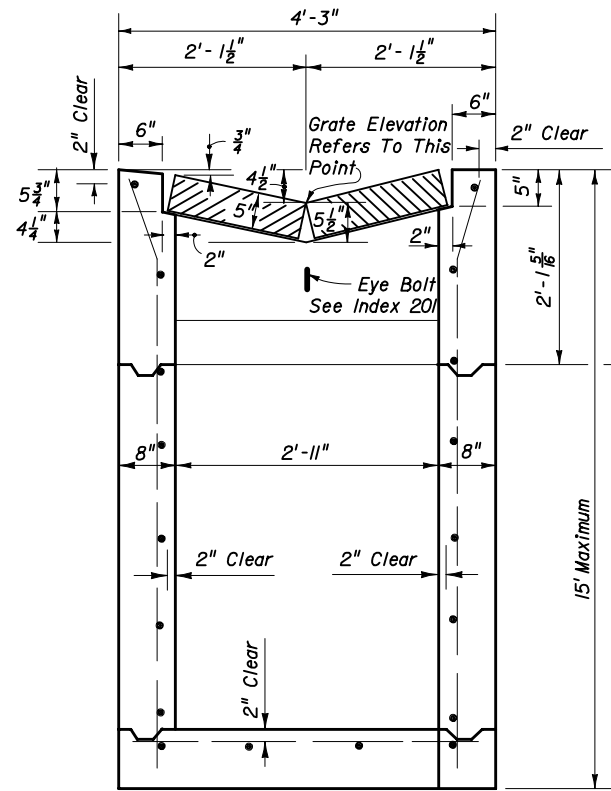
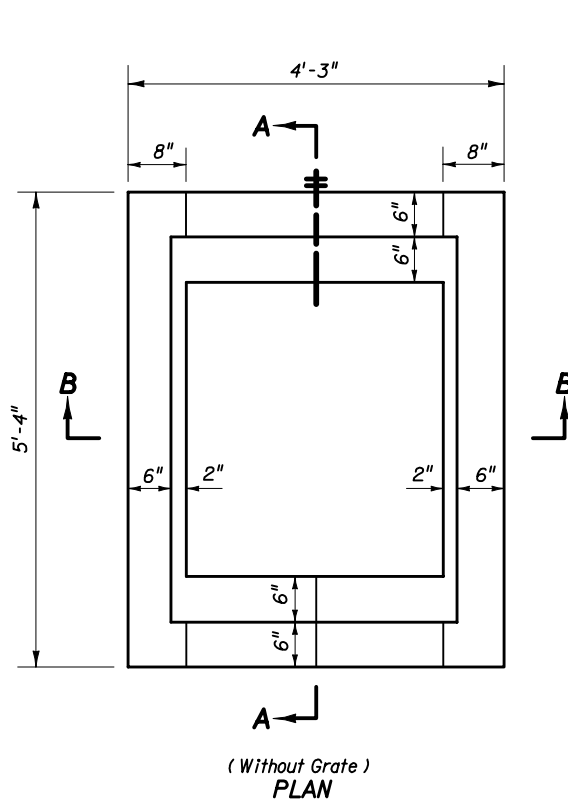
INSET C

Install Grate With
 Bar Stub To Front
 Of Inlet

OPTIONAL STEEL GRATES

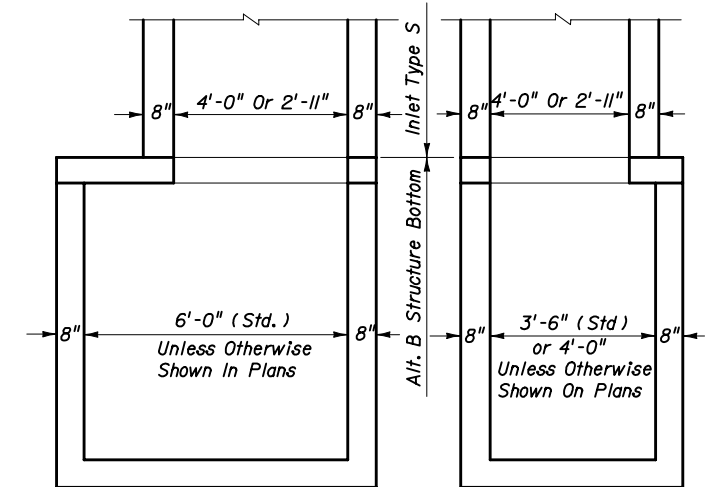
RETICULINE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
BARRIER WALL INLET				
BARRIER WALL, CONCRETE (RIGID) (C & G)				
Names	Dates	Approved By 		
Designed By	EGR/JVG	9/89	State Drainage Engineer	
Drawn By	JBW	9/89	Revision	Sheet No.
Checked By	EGR/JVG	9/89	00	2 of 2
				Index No. 219



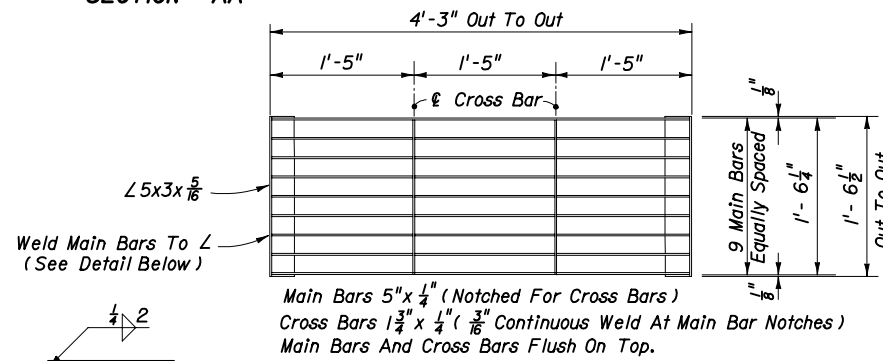
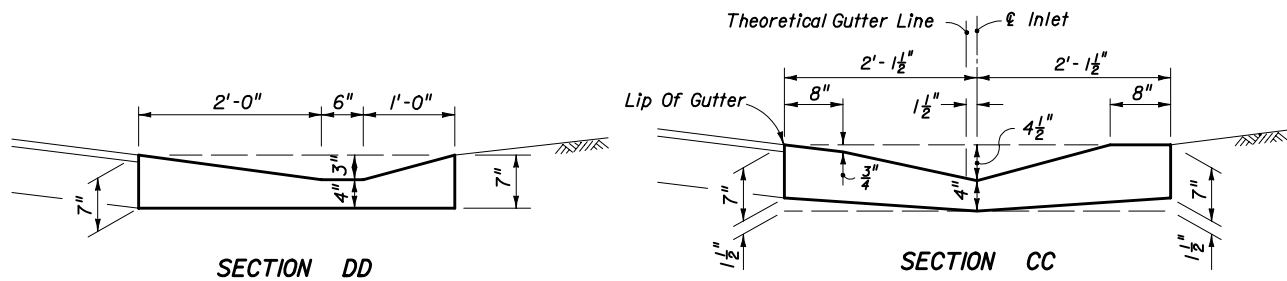
RECOMMENDED MAXIMUM PIPE SIZES	
INLET INSIDE WIDTH	PIPE SIZE
2'-11"	24"
4'-0"	30"

Note: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 201. For larger pipe see bottom detail right and Index No. 200.



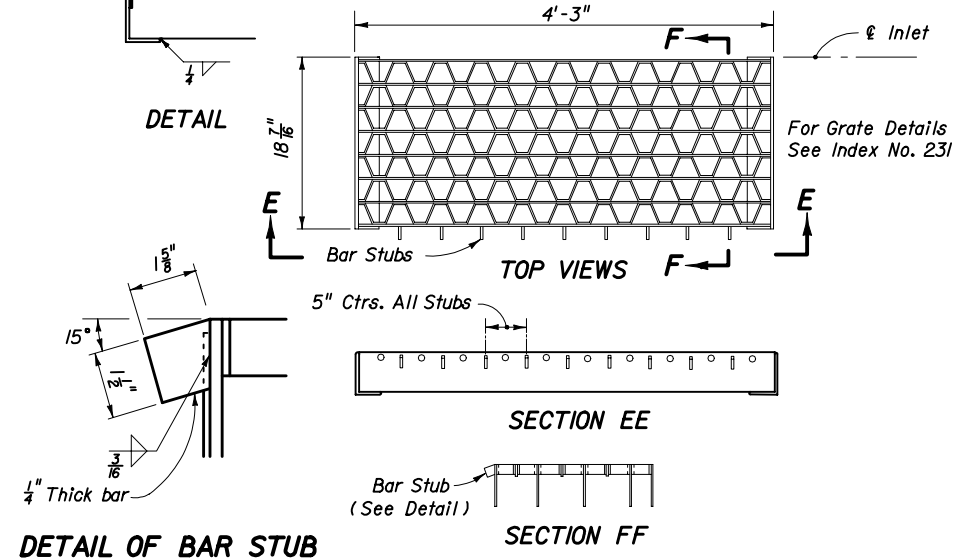
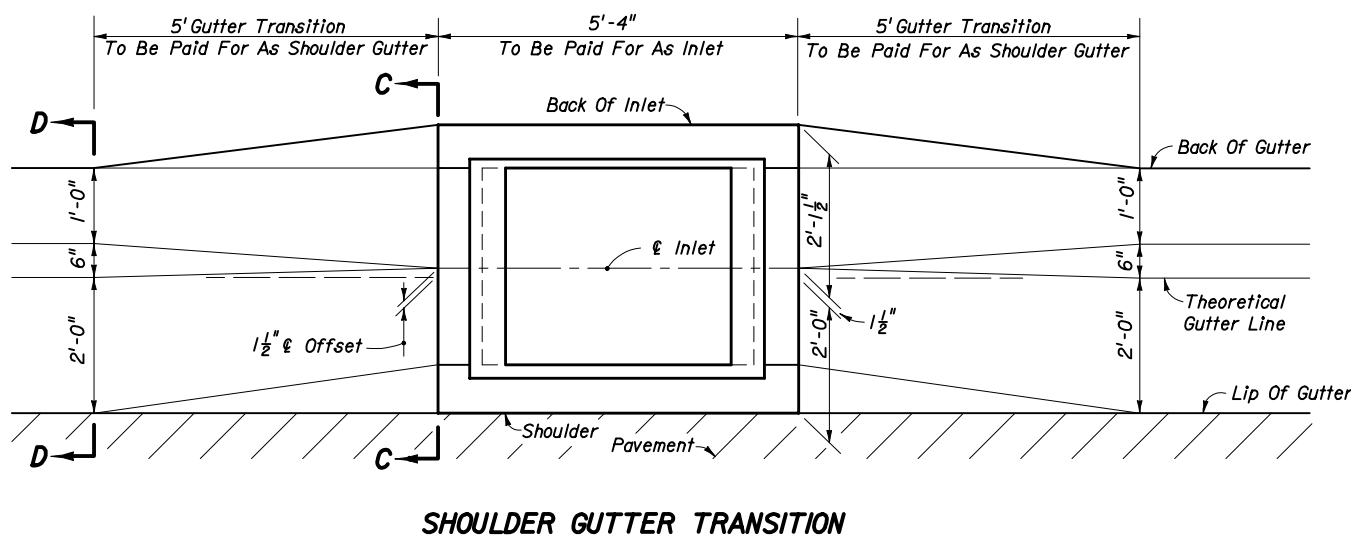
NOTE: Alt. B Structure Bottom Only. See Index No. 200 for structure bottom details and hole reinforcement.

INLET WITH STRUCTURE BOTTOM



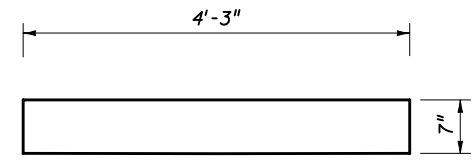
GENERAL NOTES

1. This inlet is intended for use in shoulder gutter on facilities subject to heavy wheel loads. The parallel bar grate shall be used on limited access facilities. On other facilities the reticuline grate shall be used. Locate inlet outside of designated pedestrian travel way.
2. Reinforcing steel all No. 4 bars at 12" centers both ways with 2" clearance to inside of walls and bottom. Bars to be cut or bent for 1 1/2" minimum clearance around pipe.
3. All exposed edges and corners shall be tooled to 3/8" radius.
4. When Alternate G grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
5. For supplementary details see Index Nos. 200 and 201.
6. Inlets to be paid for under the contract unit price for inlets (Gutter Type S), EA. Cost of concrete apron at terminal inlets to be included in the cost of the inlet.

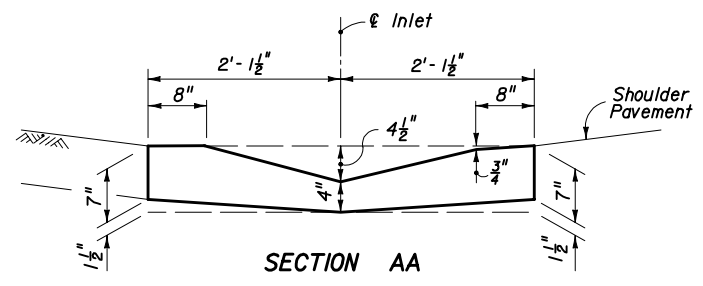


STEEL GRATE

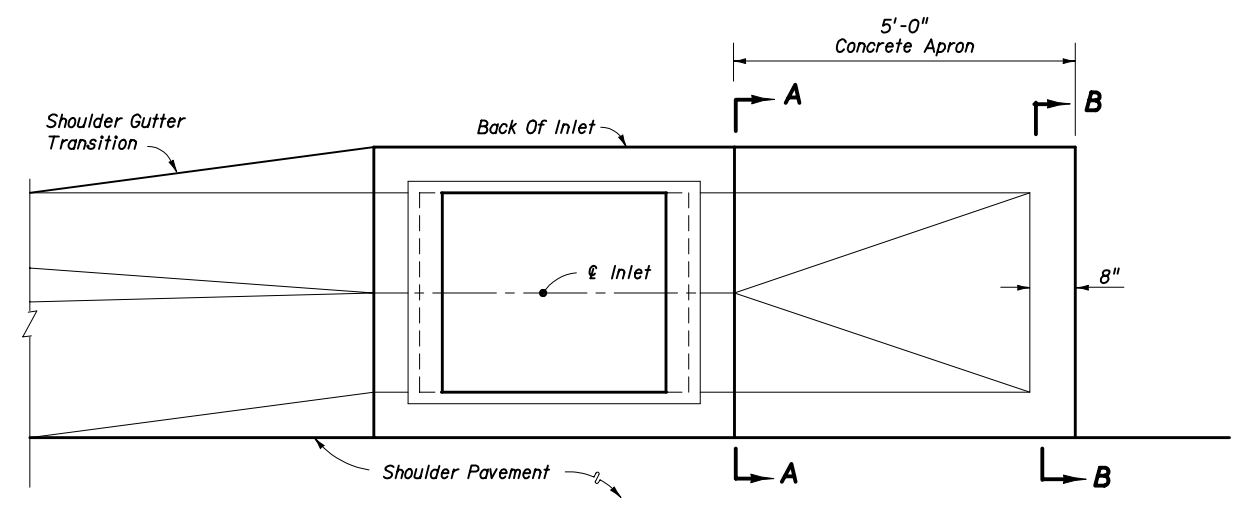
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUTTER INLET TYPE S				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By				
Checked By		Revision	Sheet No.	Index No.
		04	1 of 2	220



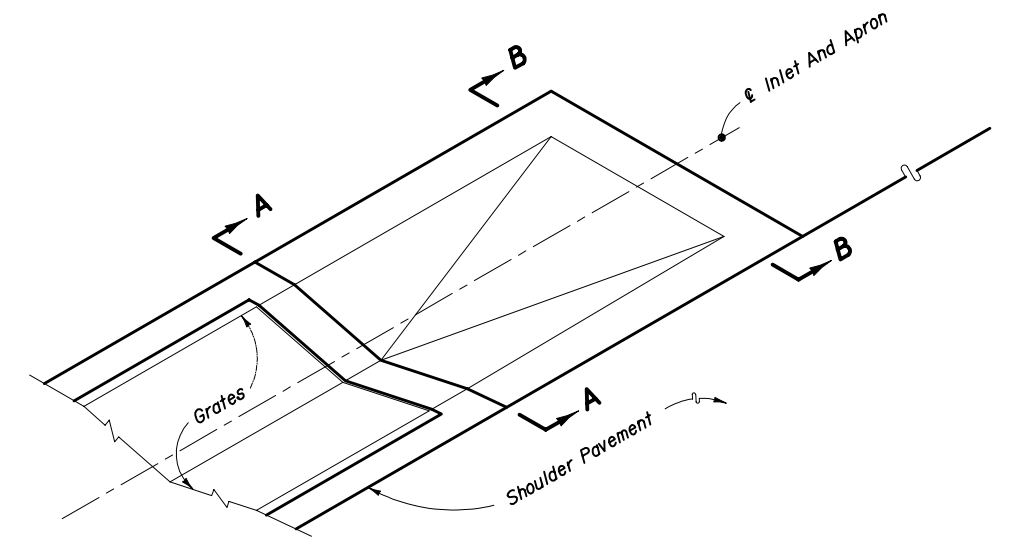
SECTION BB
(ENLARGED)



SECTION AA
(ENLARGED)



TOP VIEW



Grate Type Not Shown

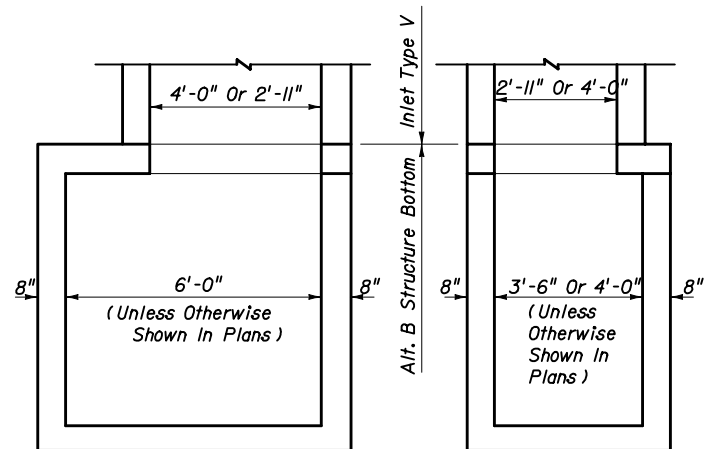
PICTORIAL VIEW

Apron To Be Constructed At The Most Downstream Inlet In A Run Of Shoulder Gutter
CONCRETE APRON AT TERMINAL INLETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**GUTTER INLET
TYPE S**

Designed By	Names	Dates	Approved By <i>[Signature]</i> State Drainage Engineer		
Drawn By	JDT	06/02	Revision	Sheet No.	Index No.
Checked By			04	2 of 2	220

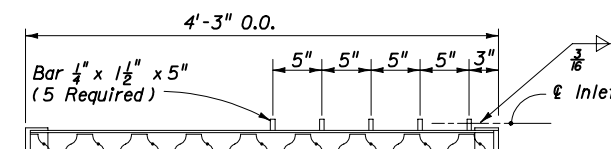


NOTE: Alt. B Structure Bottom Only. See Index No. 200 for structure bottom details and hole reinforcement. (For Pipes 30" Dia. And Larger)

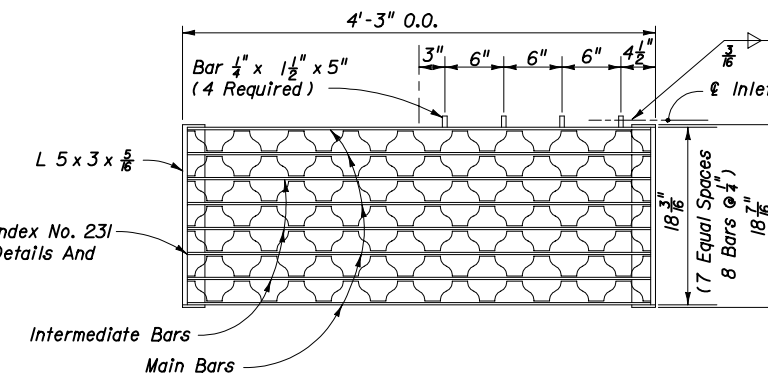
INLET WITH STRUCTURE BOTTOM

GENERAL NOTES

1. This inlet is suitable for village swales, ditches, or other areas subject to heavy wheel loads, minimum debris, and bicycle traffic. This inlet may be placed in areas subject to occasional pedestrian traffic such as landscaped areas and pavement areas where pedestrians can walk around the inlet.
2. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
3. Reinforcing - #4 bars at 12" ctrs. both ways. Cut or bend bars out of way of pipe to clear pipe 1/2".
4. All exposed edges and corners shall be tooled to 1/4" radius.
5. Recommended maximum pipe sizes shown are for concrete pipe.
6. For supplementary details see Index No. 201.
7. Inlet to be paid for under the contract unit price for Inlets (Gutter Type V), EA.

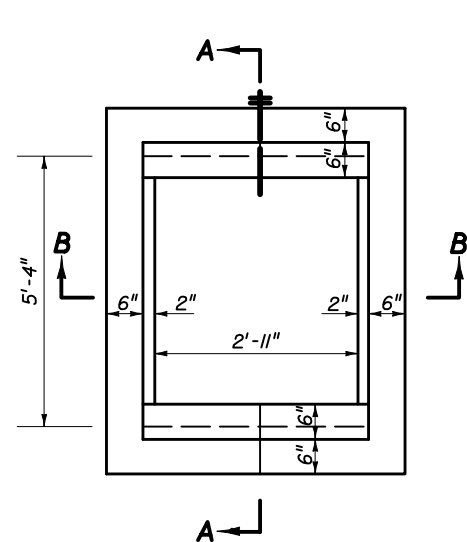


OPTIONAL BAR SPACING

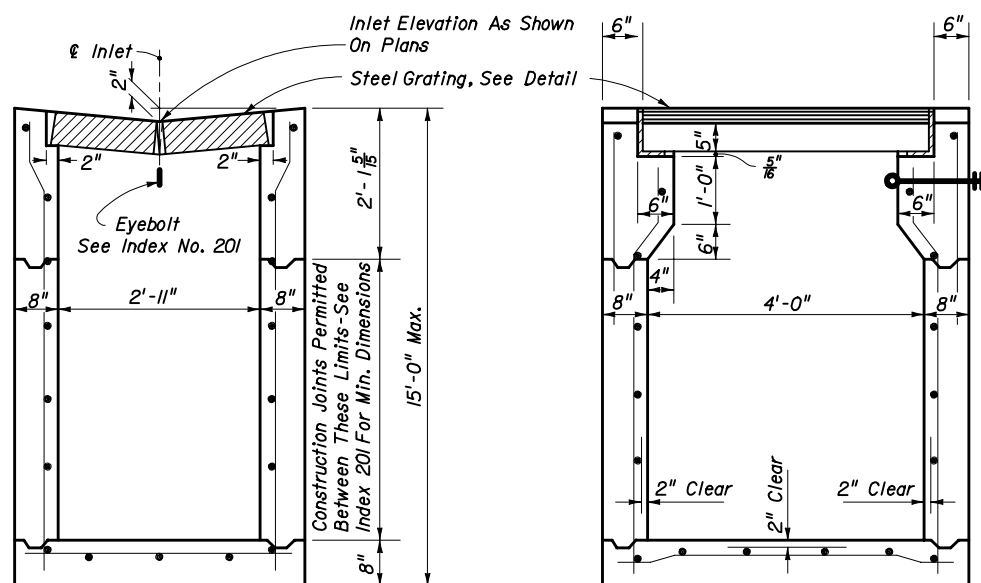


STEEL GRATE

TWO REQUIRED PER INLET
 5" Steel Grate Main Bars 5" x 1 1/2"
 Intermediate Bars 1 1/2" x 1/4" Reticuline Bars 1 1/4" x 3/8"
 Steel Grate : Manufactured By Borden, Florida Steel, U.S. Foundry Irving, Reliance, Greulich (Or Equal).



PLAN

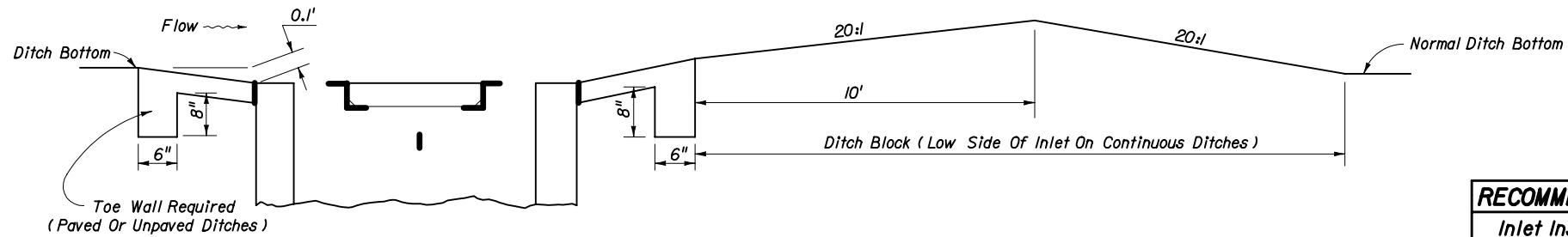


SECTION BB

Recommended Maximum Pipe Size:
 2'-11" Wall - 24" Size
 4'-0" Wall - 30" Size

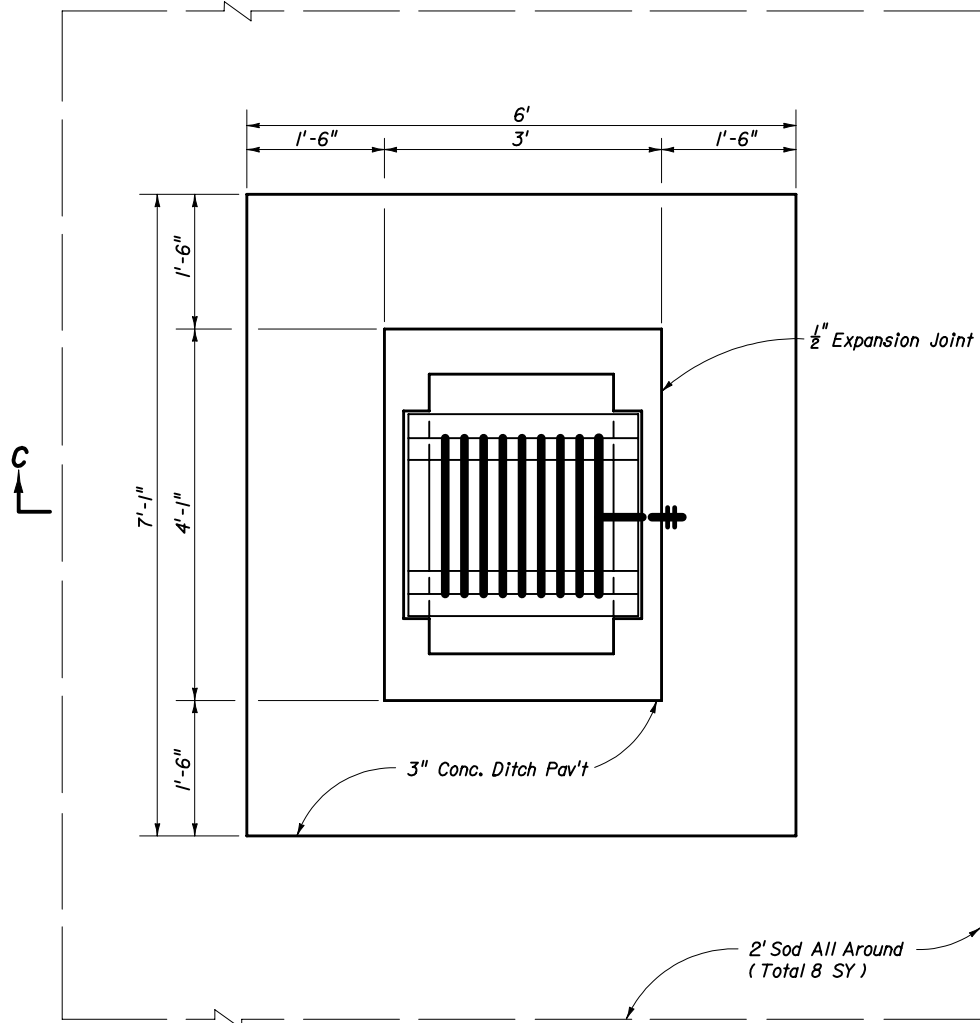
SECTION AA

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUTTER INLET TYPE V				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Drainage Engineer		
Drawn By	WHW 4/57	Revision	Sheet No.	Index No.
Checked By	RMM 4/57	04	1 of 1	221



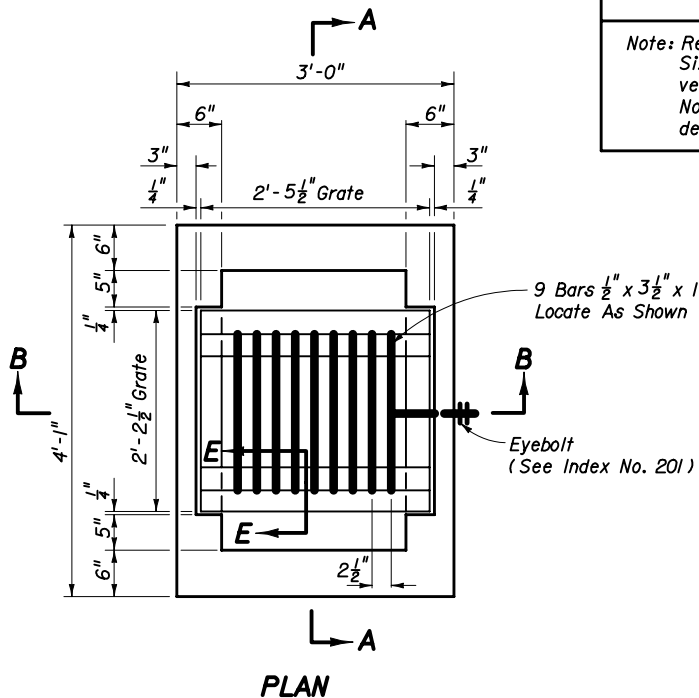
SECTION DD

D



SECTION CC

D

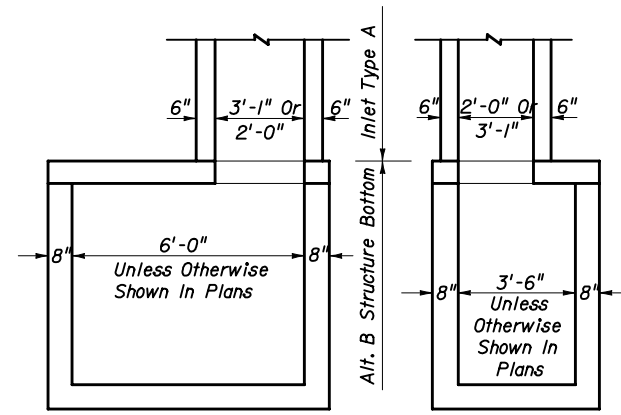


PLAN

Predominate Flow

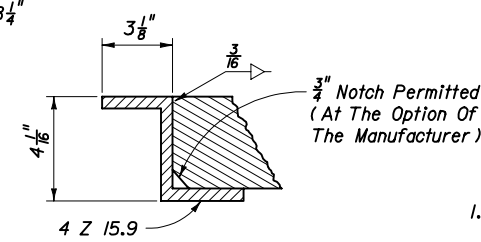
RECOMMENDED MAXIMUM PIPE SIZES	
Inlet Inside Width	Pipe Size
2'-0"	18"
3'-1"	24"
	18" where an 18" pipe enters a 2'-0" wall

Note: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 201. For larger pipe see bottom detail right and Index No. 200.



NOTE: Alt. B Structure Bottom Only. See Index No. 200 for Structure Bottom Details And Hole Reinforcement.

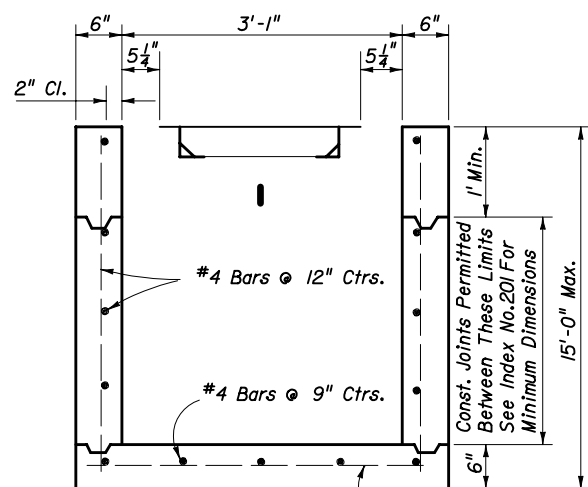
INLET WITH STRUCTURE BOTTOM



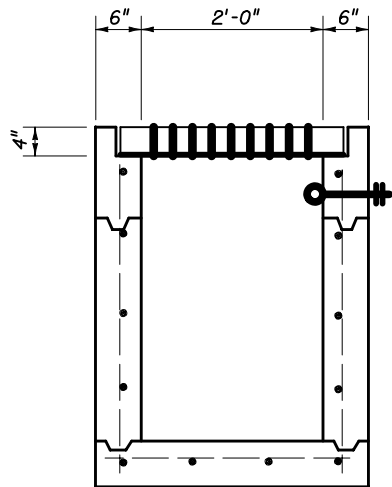
SECTION EE

GENERAL NOTES

1. This inlet is designed for ditches, medians, or other areas subject to heavy wheel loads on limited access facilities where debris may be a problem. This inlet is not for use in areas subject to pedestrian and/or bicycle traffic.
2. Reinforcing-2" clearance to inside face. Cut or bend bars out of way of pipe to clear pipe by 1 1/2".
3. Chamfer exposed edges (3/4" Chamfer).
4. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
5. Cost of ditch paving to be included in the cost of Inlet. Sodding to be paid for under contract unit price for Sodding, SY.
6. For supplemental details see Index No. 201.
7. Inlet to be paid for under the contract unit price for Inlets (Dt Bot Type A), EA.

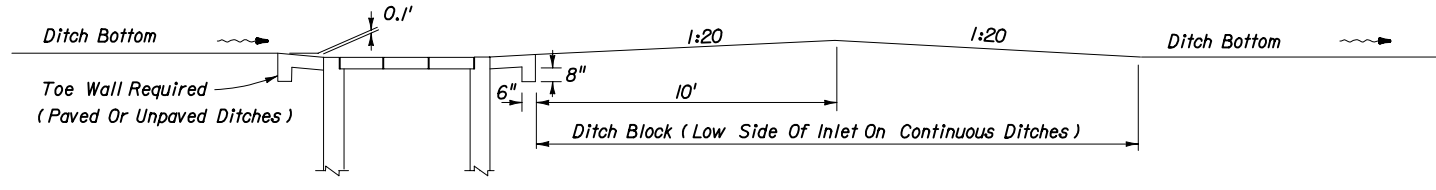


SECTION AA



SECTION BB

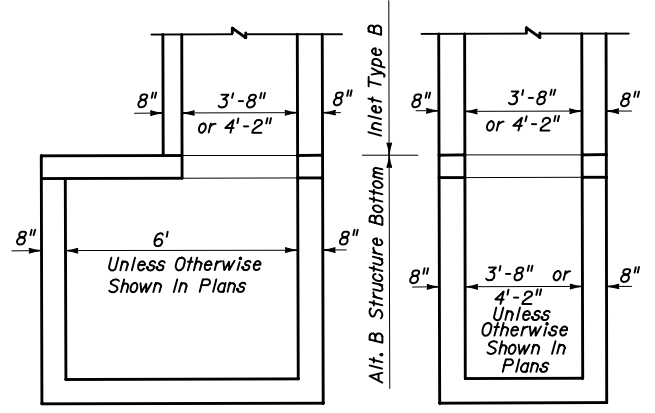
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
DITCH BOTTOM INLET TYPE A				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By			State Drainage Engineer	
Checked By	Revision	Sheet No.	Index No.	
	04	1 of 1	230	



**SECTION EE
DITCH BLOCK**

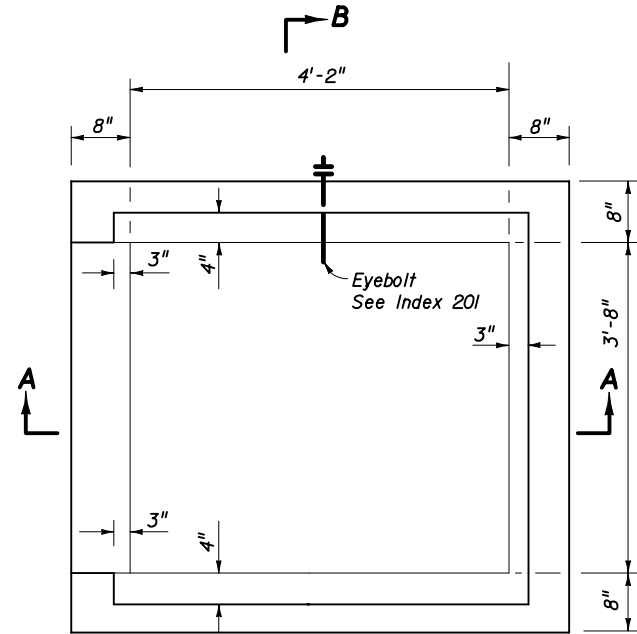
RECOMMENDED MAXIMUM PIPE SIZES	
INLET INSIDE WIDTH	PIPE SIZE
3'-8"	30"
4'-2"	36"

Note: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 201. For larger pipe see bottom detail above and Index No. 200.



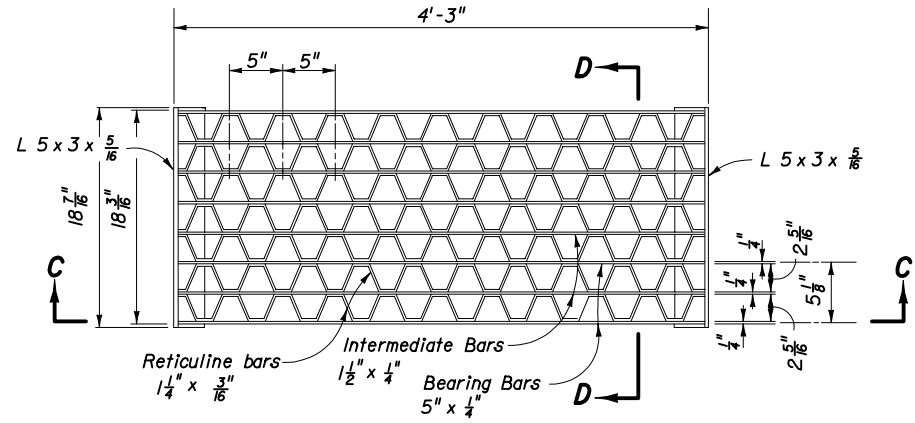
NOTE: Alt. B Structure Bottom Only. See Index No. 200 for structure bottom details and hole reinforcement.

INLET WITH STRUCTURE BOTTOM



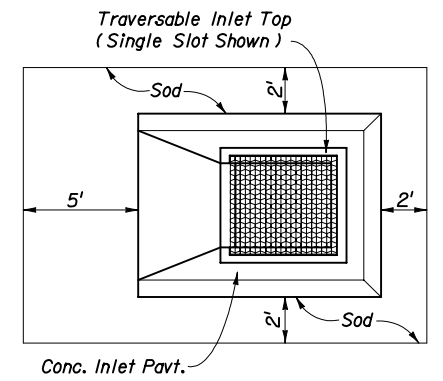
PLAN

Predominate Flow (s)
(Grate, Apron And Slot Not Shown)

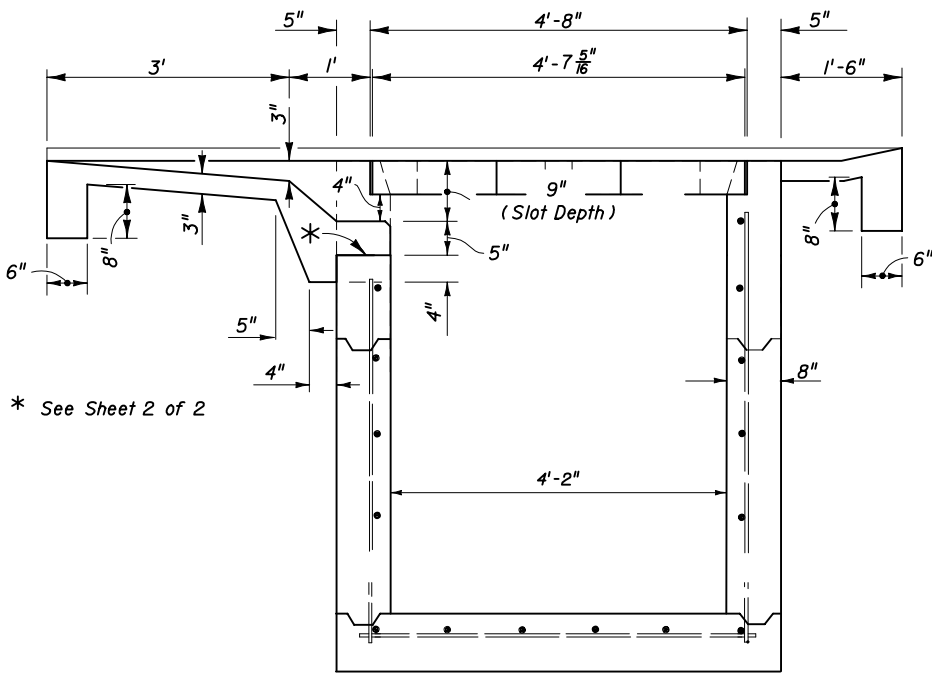


PLAN

ESTIMATED QUANTITIES For Informational Purposes Only			
SLOT TYPE	PAVEMENT		SOD
	SY	CY	SY
Single Slot	6.2	0.9	14
Double Slot	8.1	1.1	19

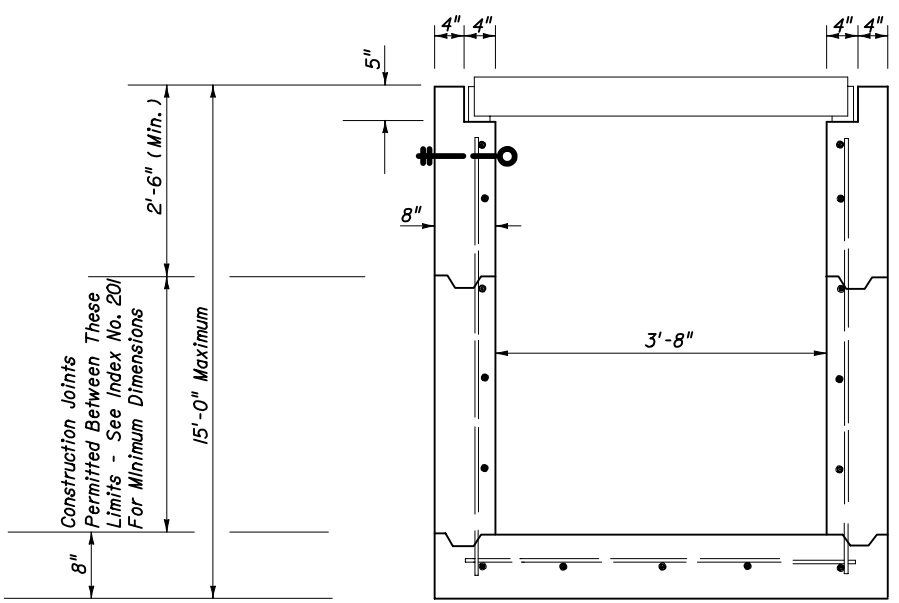


CONCRETE INLET PAVEMENT AND SODDING

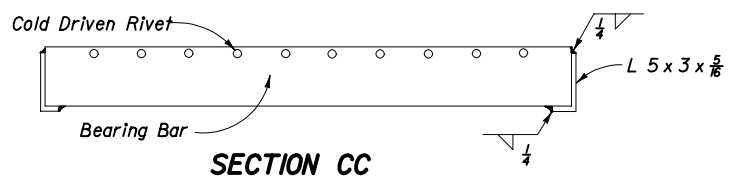


SECTION AA

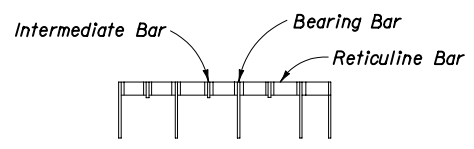
* See Sheet 2 of 2



SECTION BB



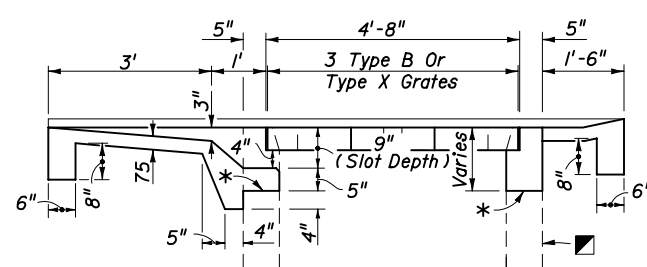
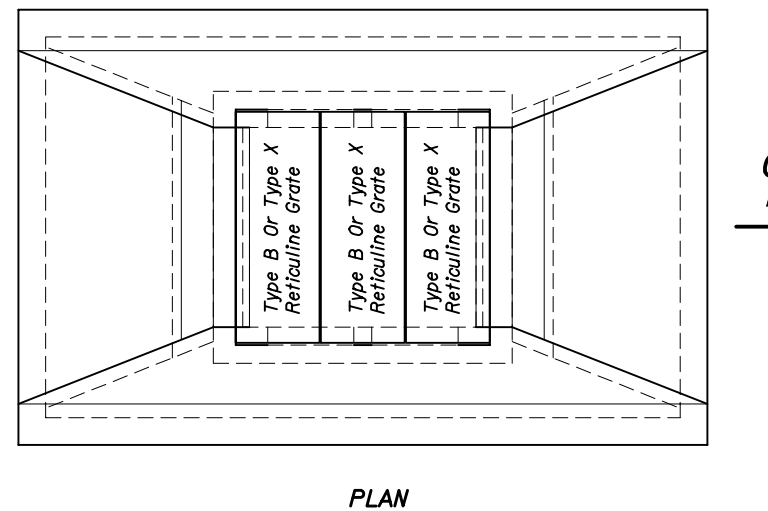
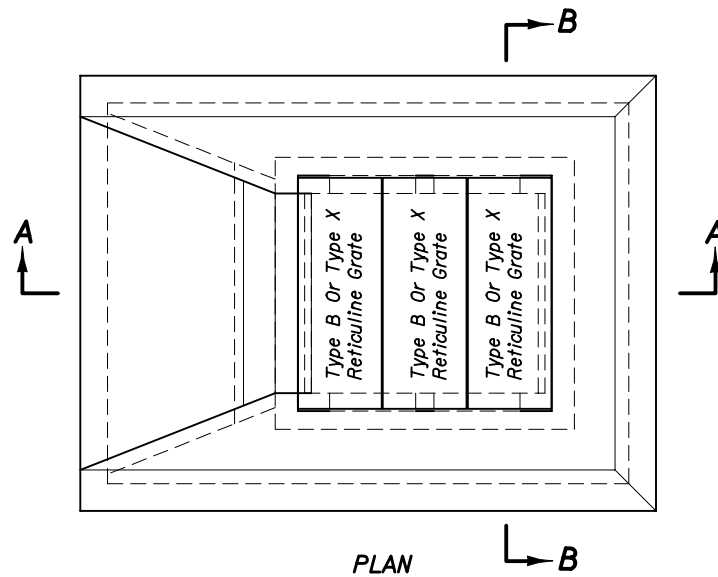
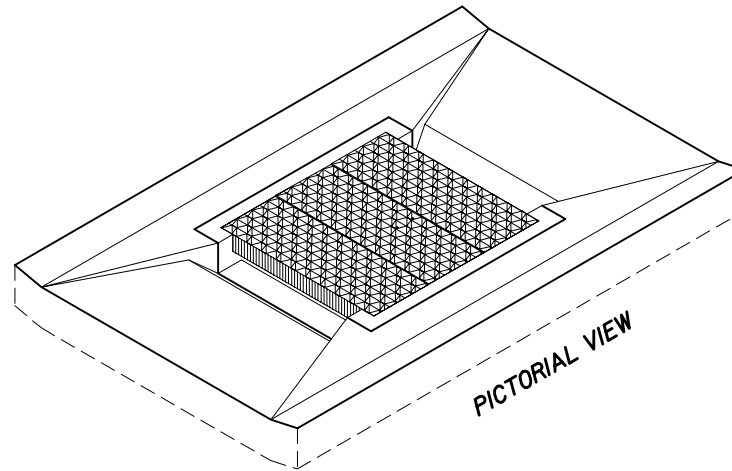
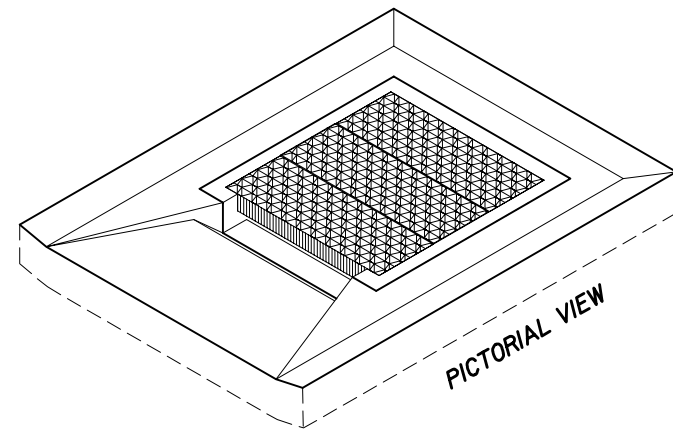
SECTION CC



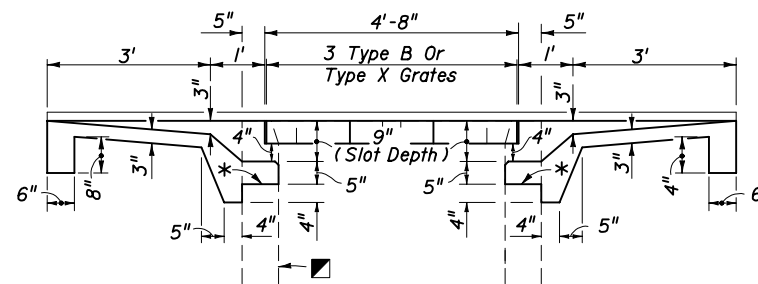
SECTION DD

STEEL GRATE

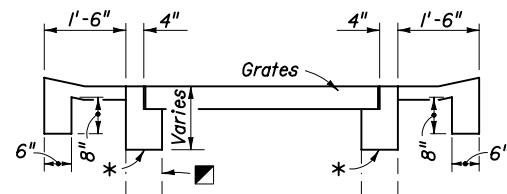
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
DITCH BOTTOM INLET TYPE B				
Names	Dates	Approved By		
Designed By	HAB 04/67	 State Drainage Engineer		
Drawn By	RWR 05/82			
Checked By	JVG 05/82	Revision	Sheet No.	Index No.
		00	1 of 2	231



SECTION AA
SINGLE SLOT



SECTION CC
DOUBLE SLOT



SECTION BB

■ Inlet Box (Line Type Indicates Existing Box To Facilitate Depiction Of Partial Construction On Existing Inlets)

* On new boxes the traversable top may be cast as a monolithic unit or cast in segments, and the location of this line may be lower to facilitate handling and placement; however, the slot depth is to remain at 9 inches. See Index No. 20I for top to wall connection. For converting to traversable tops on existing inlets remove concrete to this line and expose the existing reinforcement. Reshape or splice in reinforcement to penetrate the rim and returns of the grate seat, and bend the reinforcement into the slot shelf to extend into the abutting throat pavement.

GENERAL NOTES

1. The general purpose of the inlet top designs are:
 - a. For ditches, medians or other areas subject to heavy wheel loads. This inlet may be placed in areas subject to occasional pedestrian traffic such as landscaped areas and pavement areas where pedestrians can walk around the inlet.
 - b. Provide full grate and horizontal slot designs for new construction.
 - c. Provide full grate and horizontal slot designs for replacing the verticle slot tops on existing Inlets Type B and Type X that are in locations subject to occasional pedestrian traffic.
2. Box, walls and bottoms reinforcing steel all #4 bars at 12" centers both ways with 2" clearance to inside of walls and bottom. Bars to be cut or bent for 1/2" minimum clearance around pipe.
3. When Alternate G grates are specified in the plans, the grates are to be hot-dipped galvanized after fabrication.
4. Cost for constructing traversable tops on new inlet boxes shall be included in the contract unit price for Inlets (DT BOT) (Type B), EA., and shall include the cost for surrounding concrete inlet pavement. Existing Inlets Type B and Inlets Type X that are converted to traversable inlet tops shall be paid for under the contract unit price for Inlets (DT BOT) (Type B) (Partial), EA. Unit price and payment shall be full compensation for inlet conversion and shall include the removal and disposal of any existing concrete inlet pavement; the removal and stockpiling or disposal of sufficient material from the existing inlet box to facilitate construction of the required inlet top; construction of the required inlet conversion; backfill construction; construction of concrete inlet pavement; reusing, supplementing, transferring or replacing grates as required by plans or as directed by the Engineer; any required earthwork for ditch restoration within 30' of the inlet; and, seeding and mulching disturbed grasses.
5. Ditch pavement shall be paid for, separate from the inlet and concrete inlet pavement, by pavement types and units as called for in the plans.
6. Sod will be paid for under the contract unit price for Sodding, SY.
7. For supplementary details see Index No. 20I.

DESIGN NOTES

1. The type of top (single or double slots) depends on the approach ditch configuration and the hydraulic requirements of the site. The designer will stipulate in the plans the type of top to be constructed at each individual inlet location.

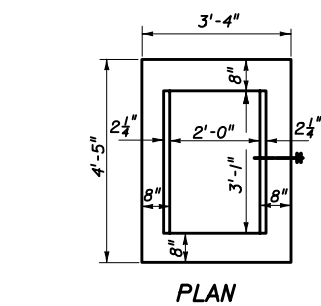
On existing inlets conversion grates shall be constructed at the original grate elevations unless other elevations are called for in the plans. When plans call for the inlet top to be constructed to support storm water detention, details for ditch modifications and underdrains shall be shown in the plans.

MAINTENANCE NOTES

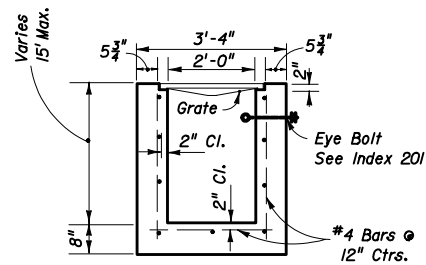
1. Traversable inlet tops that are constructed by maintenance contract or by maintenance forces may reuse the existing grates that are determined by the Maintenance Engineer to be functionally sound, and their reuse is so directed by the Maintenance Engineer. Existing grates approved for reuse and new grates may be mixed, matched or replaced as directed by the Maintenance Engineer.

TRAVERSABLE TOPS FOR INLETS TYPE B AND FOR CONVERSIONS OF EXISTING INLETS TYPE B AND TYPE X

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
DITCH BOTTOM INLETS TYPE B				
Names	Dates	Approved By		
Designed By WPH	02/98	State Drainage Engineer		
Drawn By JDZ	02/98	Revision	Sheet No.	Index No.
Checked By		04	2 of 2	231

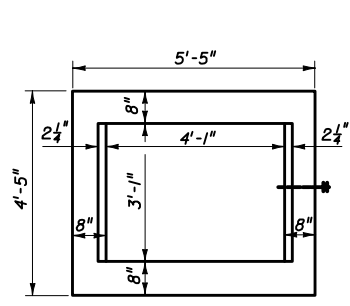


PLAN

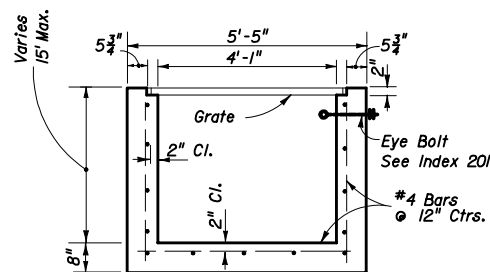


SECTION
TYPE C

Recommended Maximum Pipe Size:
2'-0" Wall 18" Pipe
3'-1" Wall 24" Pipe (18" where an 18" pipe enters a 2'-0" wall)

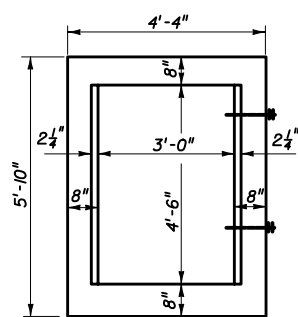


PLAN

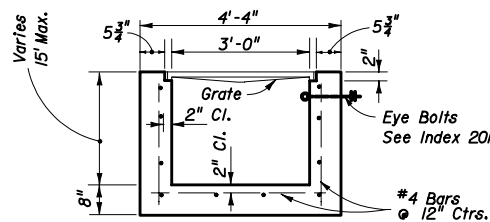


SECTION
TYPE D

Recommended Maximum Pipe Size:
3'-1" Wall-24" Pipe
4'-1" Wall-36" Pipe

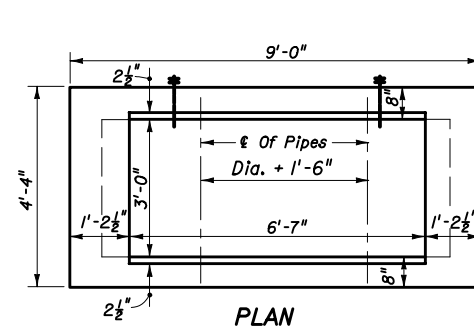


PLAN

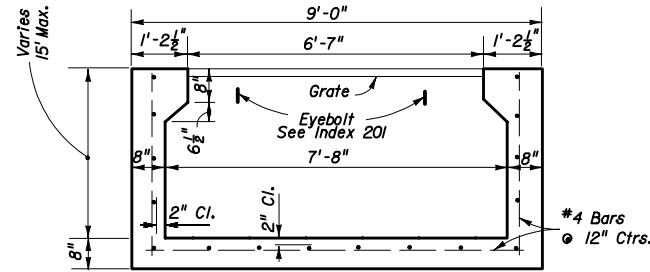


SECTION
TYPE E

Recommended Maximum Pipe Size:
3'-0" Wall-24" Pipe
4'-6" Wall-36" Pipe



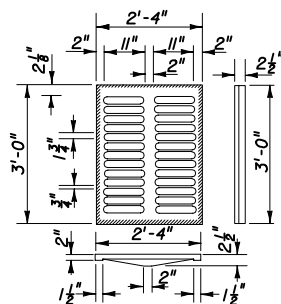
PLAN



SECTION
TYPE H

Recommended Maximum Pipe Size:
3'-0" Wall-24" Pipe
7'-8" Wall-1-66" Pipe
2-30" Pipe

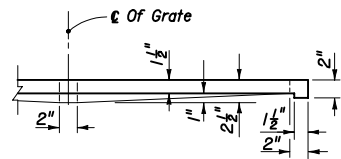
INLETS



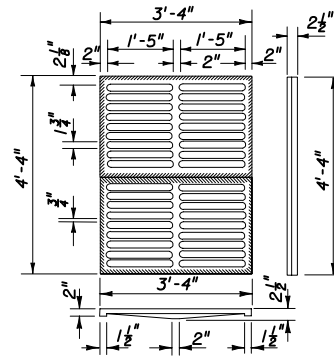
TYPE C

Approx. Weight 235 Lbs.

CAST IRON GRATE NOT PERMITTED ON INLET TYPE D

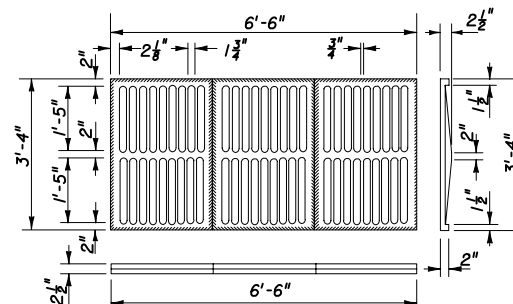


HALF SECTION CAST IRON GRATES



TYPE E

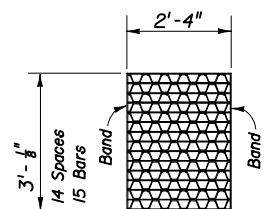
Approx. Weight 465 Lbs.



TYPE H

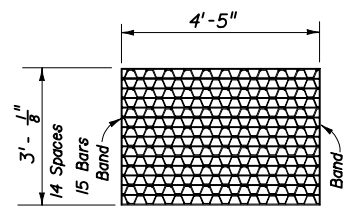
Approx. Weight 725 Lbs.

CAST IRON GRATES



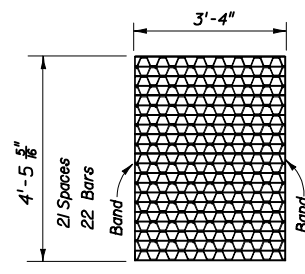
TYPE C

Straight Bars 2" x 1/4"
Reticuline Bars 1 1/4" x 3/16"
Bands 2" x 1/4"
Approx. Weight 104 Lbs.



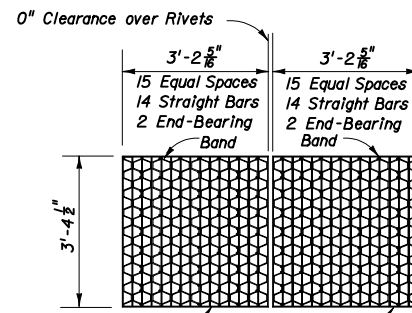
TYPE D

Straight Bars 2" x 1/4"
Reticuline Bars 1 1/4" x 3/16"
Bands 2" x 1/4"
Approx. Weight 190 Lbs.



TYPE E

Straight Bars 2" x 1/4"
Reticuline Bars 1 1/4" x 3/16"
Bands 2" x 1/4"
Approx. Weight 215 Lbs.



TYPE H

Straight End-Bearing Bars 2" x 3/8"
Straight Bearing Bars 2" x 1/4"
Reticuline Bars 1 1/4" x 3/16"
Bandling Bars 2" x 1/4"
Approx. Total Weight 310 Lbs.

NOTICE: Steel Grates Are Required On Inlets With Traversable Slots And On Inlets where Bicycle Traffic Is Anticipated.

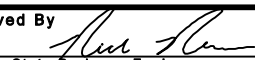
STEEL GRATES

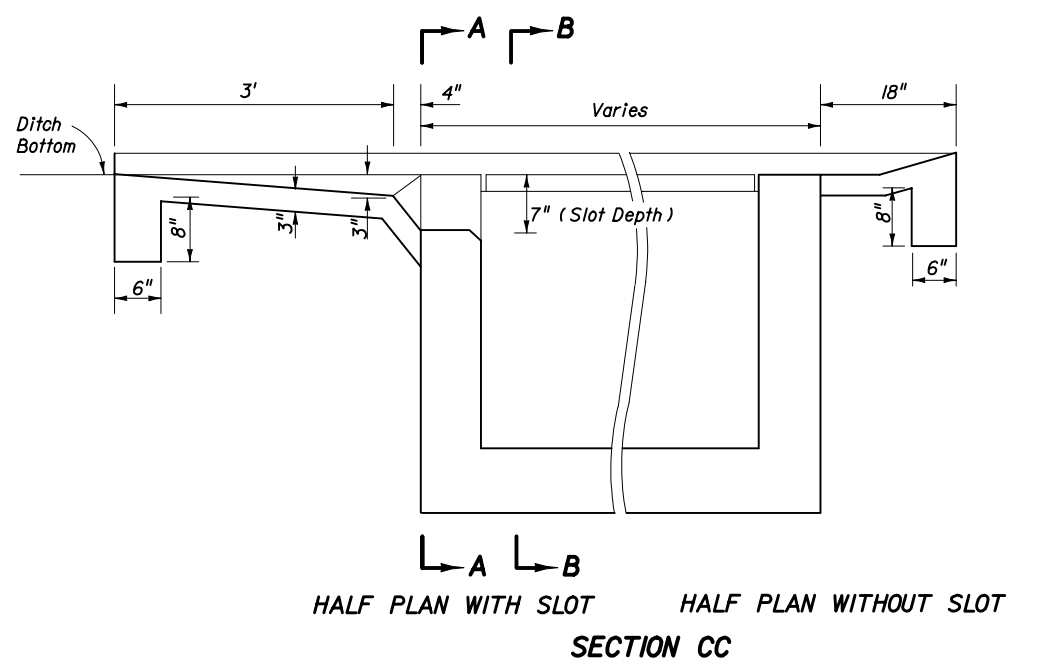
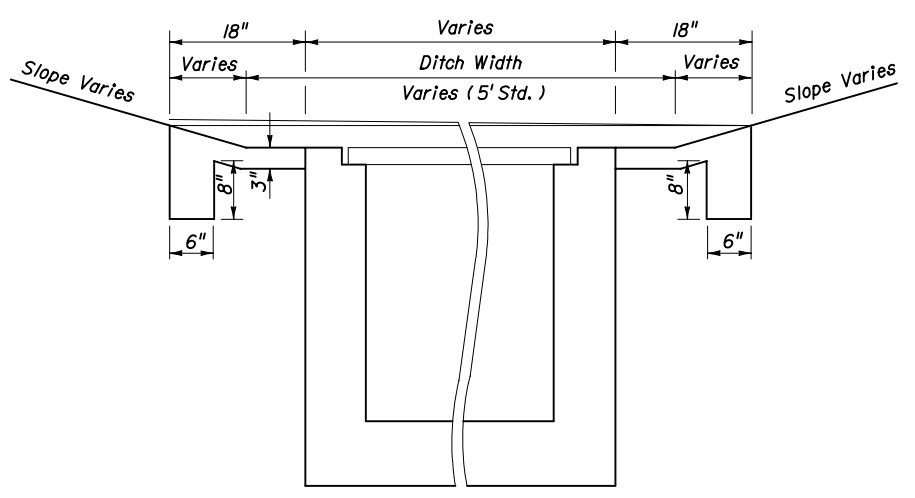
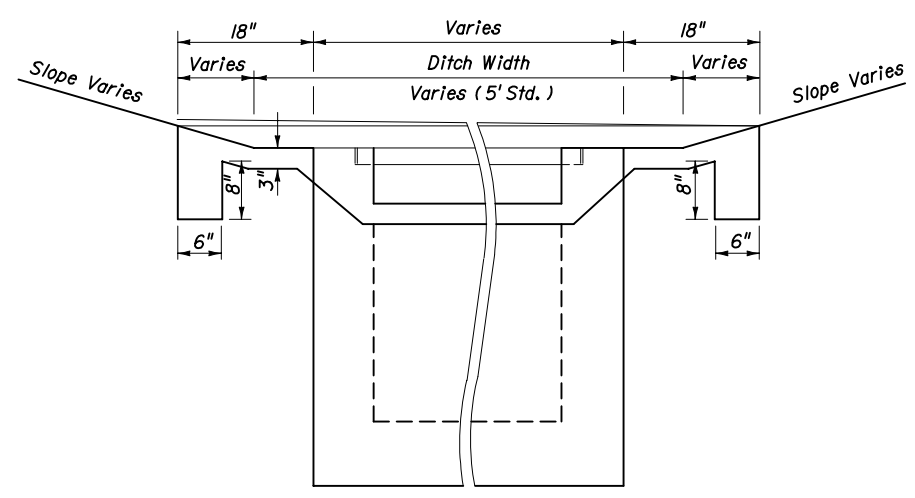
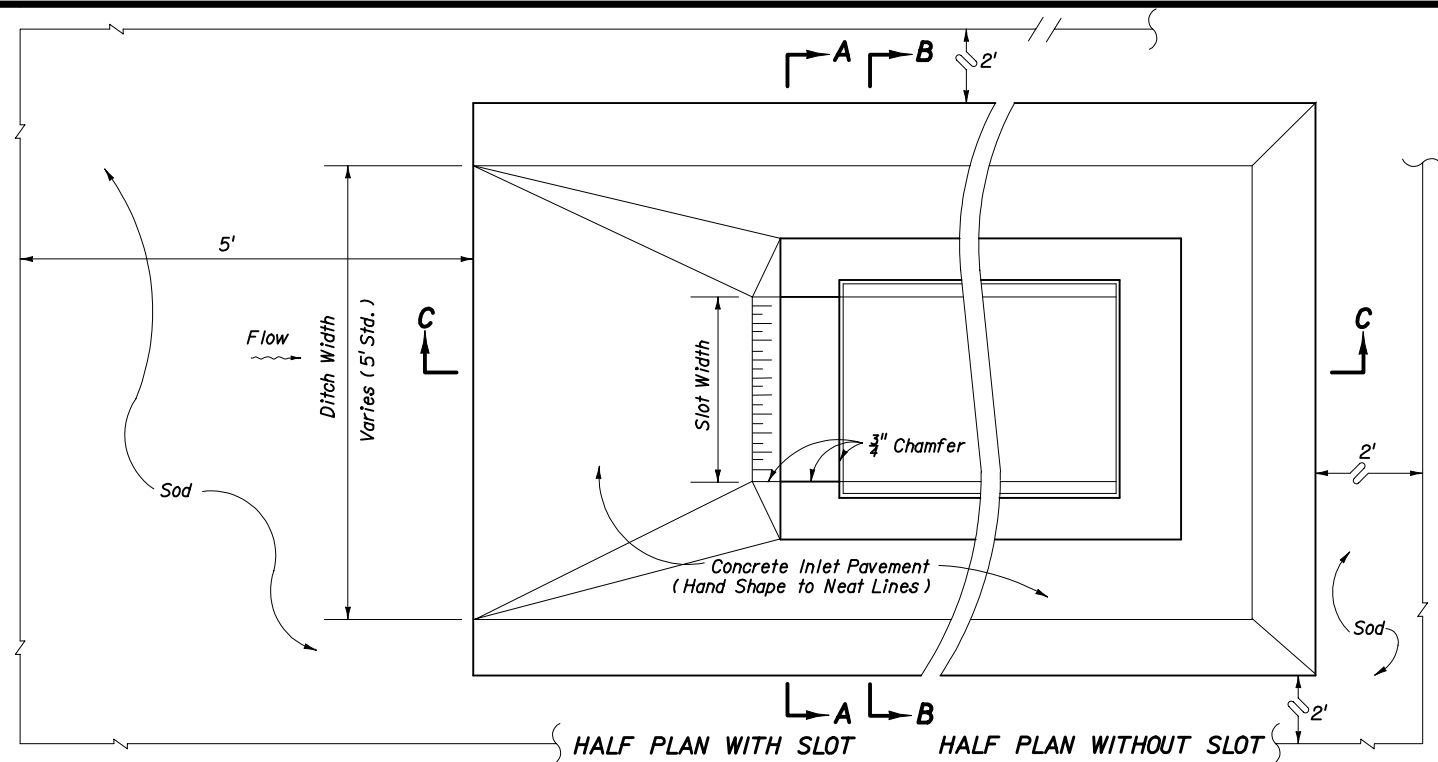
GENERAL NOTES

- These inlets are suitable for bicycle traffic and are to be used in ditches, medians and other areas subject to infrequent traffic loadings but are not to be placed in areas subject to any heavy wheel loads. This inlet may be placed in areas subject to occasional pedestrian traffic such as landscaped areas and pavement areas where pedestrians can walk around the inlet.
- Inlets subject to minimal debris should be constructed without slots. Where debris is a problem inlets should be constructed with slots. Slotted inlets located within roadway clear zones and areas subject to bicycles and/or pedestrians shall have traversable slots. The traversable slot modification is not adaptable to inlet Type H. Slots may be constructed at either or both ends as shown on plans.
- Steel grates are to be used on all inlets where bicycle traffic is anticipated. Steel grates are to be used on all inlets with traversable slots. Either cast iron or steel grates may be used on inlets without slots where bicycle traffic is not anticipated. Either cast iron or steel grates may be used on all inlets with non-traversable slots. Subject to the selection described above, when Alternate G grate is specified in the plans, either the steel grate, hot dipped galvanized after fabrication, or the cast iron grate may be used, unless the plans stipulate the particular type.
- Recommended maximum pipe sizes shown are for concrete pipe. Size for other types of pipe must be checked for fit.
- All exposed corners and edges of concrete are to be chamfered 3/4".
- Concrete inlet pavement to be used on inlets without slots and inlets with non-traversable slots only when called for in the plans; but required on all traversable slot inlets. Cost to be included in contract unit price for inlets. Quantities shown are for information only.
- Traversable slots constructed in existing inlets shall be paid for as inlets partial. For conversion work and method of payment see 'TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS'.
- Sodding to be used on all inlets not located in paved areas and paid for under contract concrete inlet pavement unit price for Sodding, SY.
- For supplementary details see Index No. 201.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH BOTTOM INLETS TYPES C, D, E & H

Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By				
Checked By	EGR/JG 07/81	Revision	Sheet No.	Index No.
		04	1 of 5	232



PAVEMENT AND SODDING QUANTITIES FOR TRAVERSABLE SLOTS

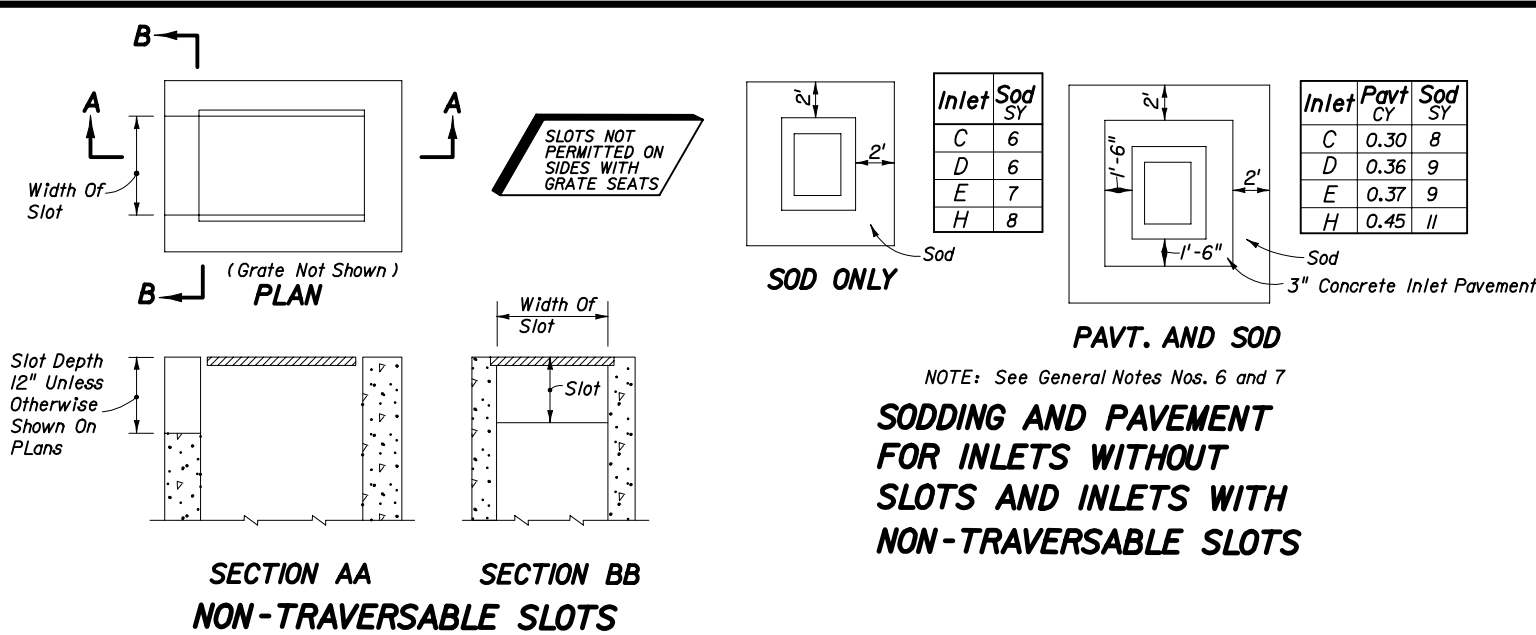
Inlet	Pavement				Sod	
	Single Slot		Double Slot		Single Slot	Double Slot
	SY	CY	SY	CY	SY	SY
C	4.87	0.77	6.16	0.93	12	16
D	5.99	0.91	7.70	1.10	14	19
E	5.88	0.91	7.37	1.08	14	18

TRAVERSABLE SLOTS

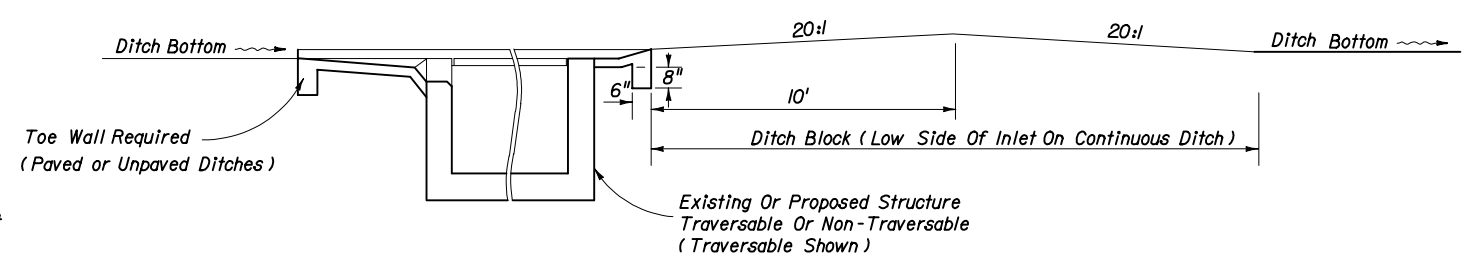
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH BOTTOM INLETS
TYPES C, D, E, & H

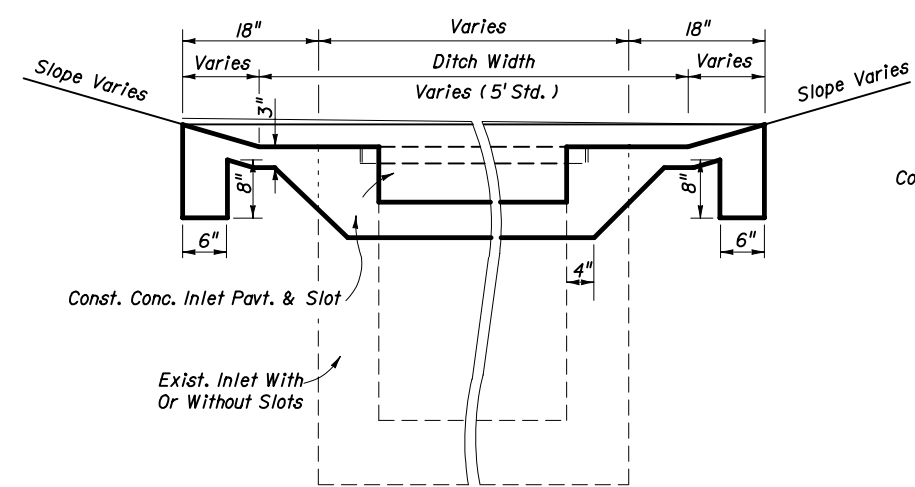
Names	Dates	Approved By		
Designed By	EGR 02/80	State Drainage Engineer		
Drawn By	JM 02/80			
Checked By	JVG 02/80	Revision	Sheet No.	Index No.
		00	2 of 5	232



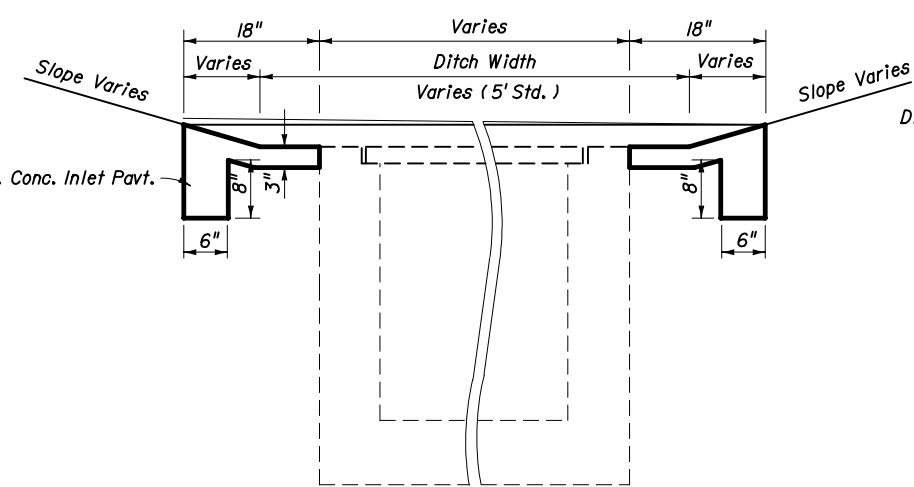
NOTE: See General Notes Nos. 6 and 7
SODDING AND PAVEMENT FOR INLETS WITHOUT SLOTS AND INLETS WITH NON-TRAVERSABLE SLOTS



DITCH BLOCK FOR INLETS WITH OR WITHOUT SLOTS

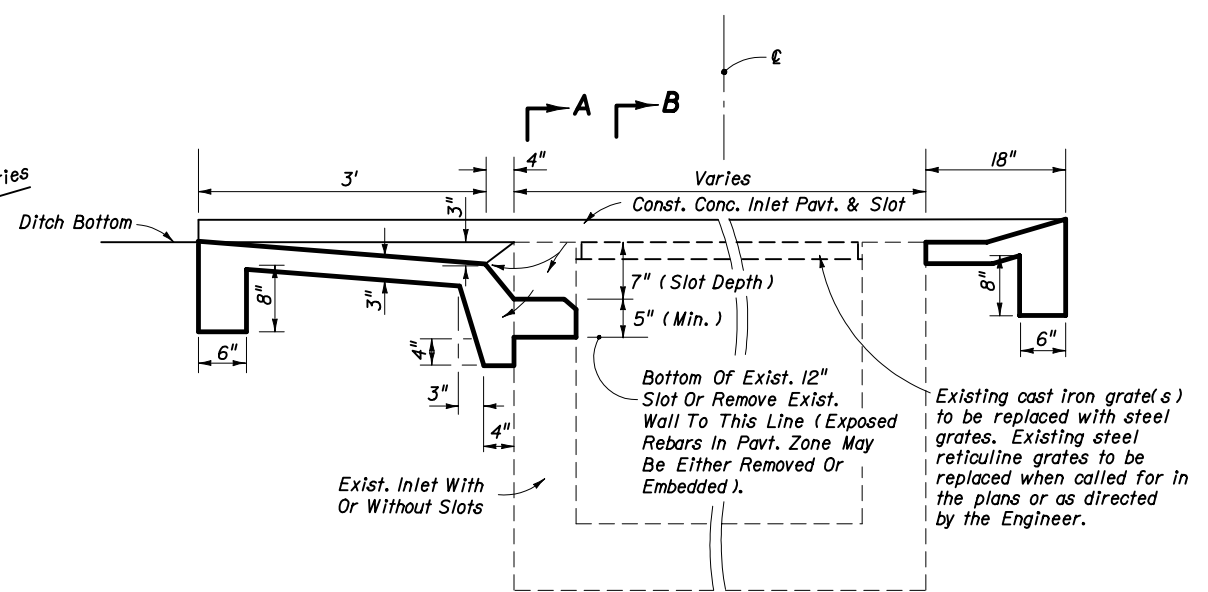


SECTION AA



SECTION BB

Inlet	PAVEMENT AND SODDING QUANTITIES FOR TRAVERSABLE SLOTS			
	Pavement		Sod	
	Single Slot SY	Double Slot CY	Single Slot SY	Double Slot SY
C	4.87	0.83	6.16	1.05
D	5.99	1.01	7.70	1.30
E	5.88	0.99	7.37	1.24



SECTION CC (CASE 1)
 SINGLE SLOT SHOWN (DOUBLE SLOTS SYMMETRICAL ABOUT CENTERLINE)

NOTE: For plan view and additional details see sheet 2 of 4.
 For payment see General Notes Nos. 6 and 7.

TRAVERSABLE SLOTS FOR EXISTING INLETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH BOTTOM INLETS TYPES C,D,E & H

Names	Dates	Approved By		
Designed By	EGR 07/84	 State Drainage Engineer		
Drawn By	DAE 07/84			
Checked By	JBW/JVG 07/84	Revision	Sheet No.	Index No.
		00	3 of 5	232

DESIGN NOTES FOR TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS

1. The general purpose of these conversions is to remove the hazard of the protruding inlet top, while not creating a hazard by depressing the top too deeply.
2. The corrective procedure depends on the approach ditch grade and hydraulic requirements of the site. The selection of the appropriate case depends on the relationship between inlet top and ditch elevation, and, on the vertical clearance between the top of the uppermost pipe(s) and the grate. The purpose for the Case 1 conversion is to add the traversable slot to an existing inlet where top removal, change in grate elevation and ditch transitions are not required. Case 2 will normally be applicable to ditches with flatter grades adjoining the inlet. Case 3 will normally be applicable to ditches with steeper grades adjoining the inlet where buildup of the existing ditch is acceptable.
3. The designer shall stipulate in the plans which case is to be constructed at each individual inlet location.

Where the existing inlet top is above the existing ditch (Case 2) but borrow material will be required to adjust the ditch (Case 3), and vertical clearance or other conditions do not prevent removal of the inlet top, the designer should call for Case 2. The designer shall determine if ditch reconstruction is required more than 35 feet beyond any traversable slot side and shall include separate pay items in the plans to cover the cost for that portion of required ditch reconstruction exceeding the 35 foot limit. The designer shall also determine whether ditch pavement is required for ditch restoration within the 35 foot limit and include that pavement under a pay item separate from the inlets partial.

When the detention ditch concept is to be used with Case 3, the designer shall stipulate 'Case 3 (Detention)' in the plans.

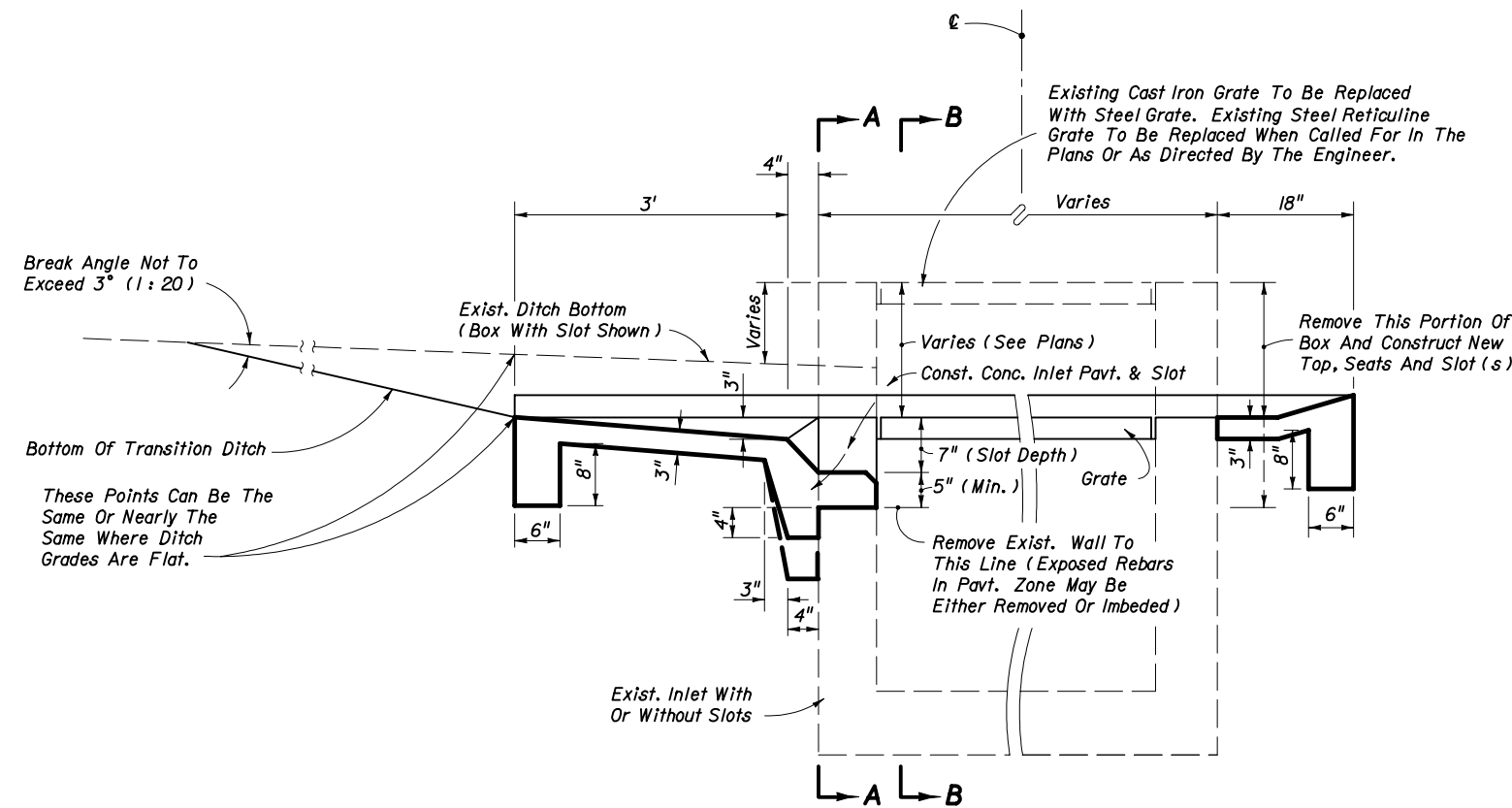
The designer shall determine whether tight soil or other conditions at each individual inlet indicates the need for underdrain in Case 3 conversions and shall call for Underdrain, Type I in the plans.

METHOD OF PAYMENT FOR TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS

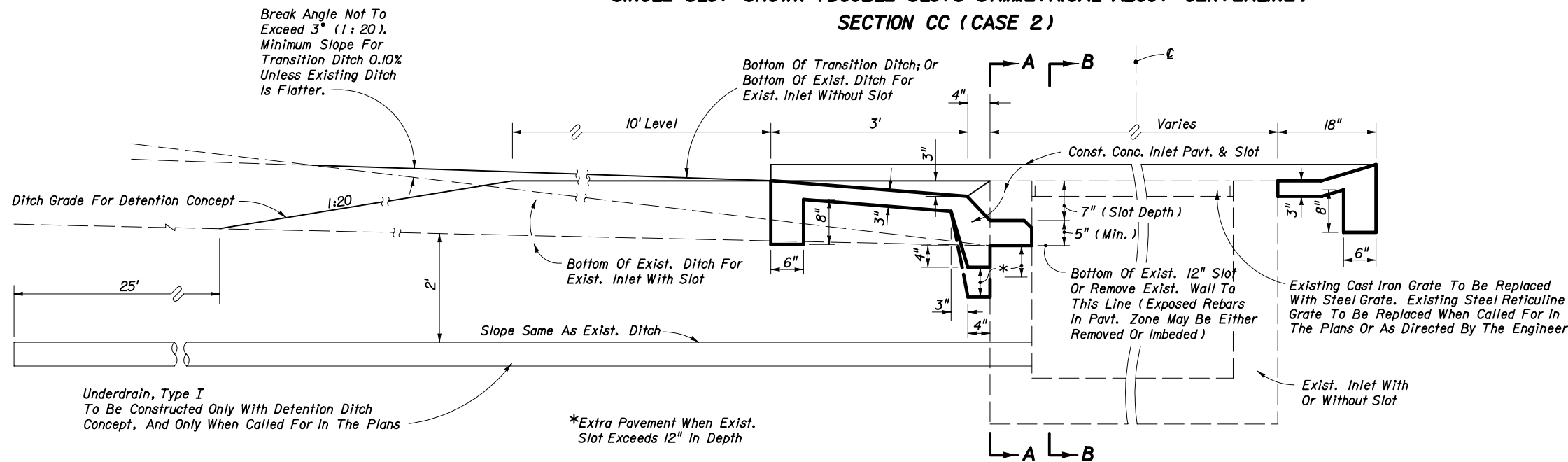
1. Existing inlets converted to traversable slot tops under Cases 1, 2 and 3 shall be paid for as inlets partial, each. Case shall not be included in the pay item description.
2. All ditch reconstruction work within 35 feet of each traversable slot conversion, whether required by these details or as a direct result of the conversion, shall be included as a part of the partial cost. Reconstruction work shall include excavation and removal of surplus materials or borrow materials in place, grading, compaction, shaping and seeding and mulching. Sodding, ditch pavement and underdrain are not included as part of the inlet partial cost and are to be paid for separately.
3. Concrete inlet pavement and sodding shall be in accordance with the sections on this detail and with the Plan on Sheet 2 and Sections AA, BB and CC (as Case 1) and tabular quantities on Sheet 3.
4. Unit price and payment shall constitute full compensation for inlet conversion (including concrete inlet paving and replacement grate(s)), ditch reconstruction, seeding and mulching, and shall be paid for under the contract price for Inlets (DT Bot) (Type ___) (Partial), each.

Sodding shall be paid for under the contract unit price for Sodding, SY.

Ditch pavement shall be paid for separate from the inlet by pavement type(s) and unit(s) as called for in the plans.



**SINGLE SLOT SHOWN (DOUBLE SLOTS SYMMETRICAL ABOUT CENTERLINE)
SECTION CC (CASE 2)**




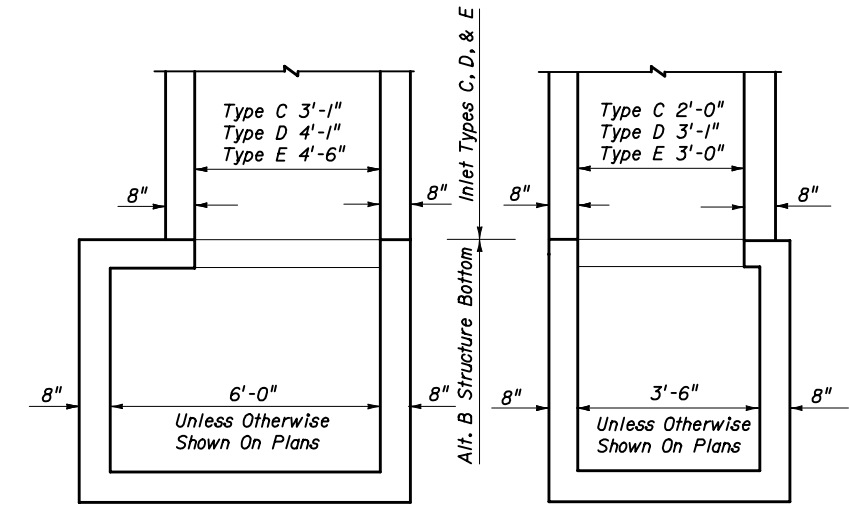
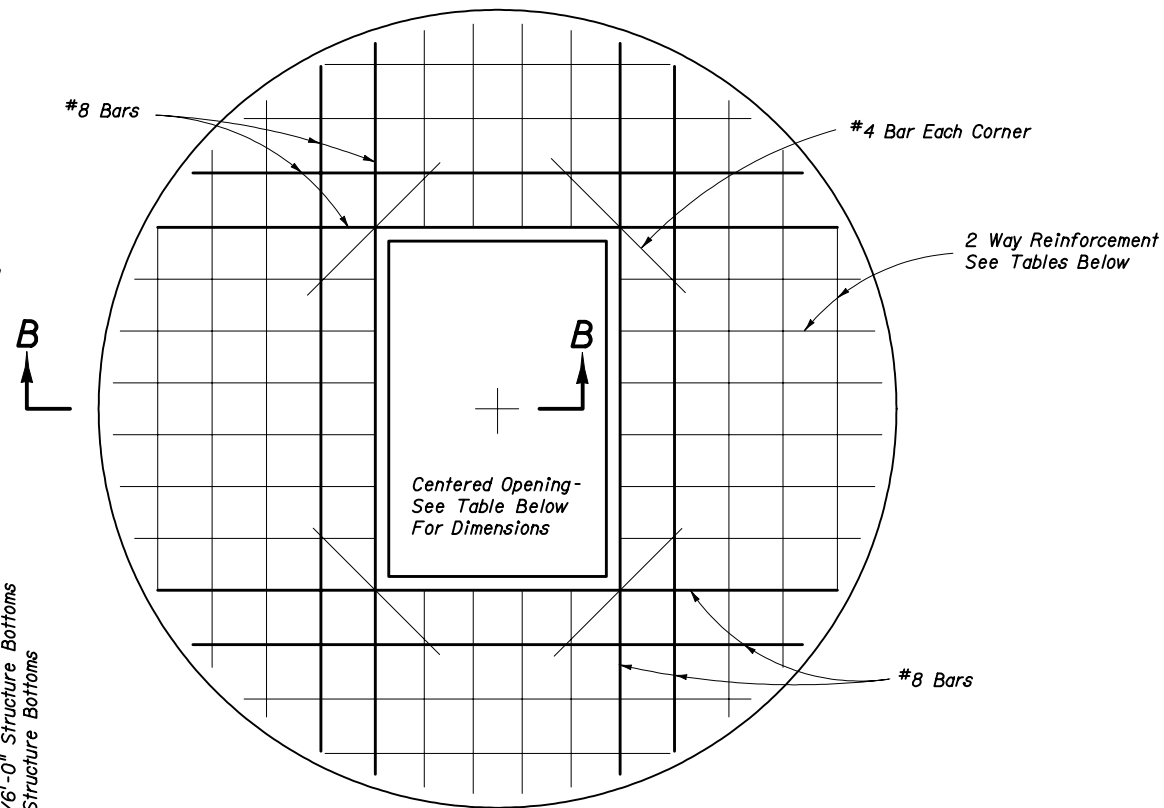
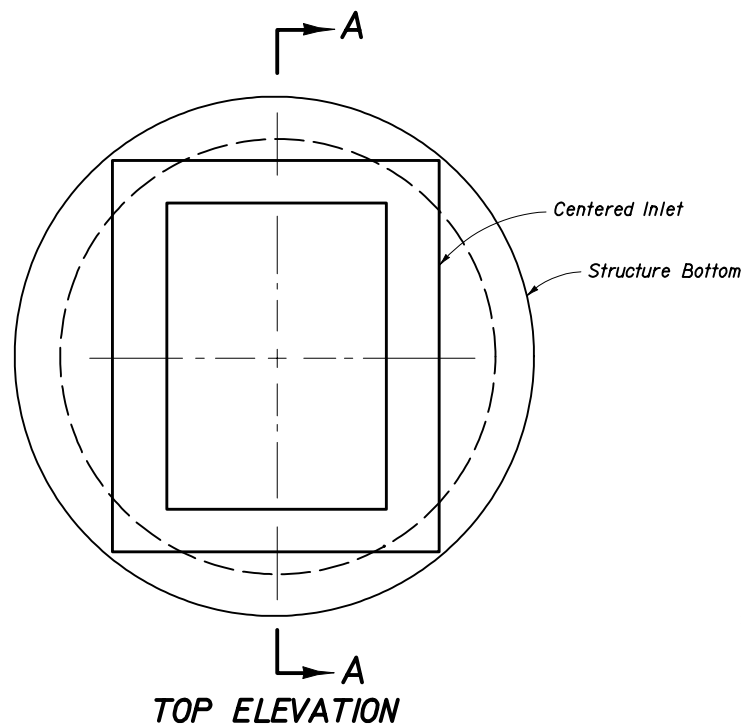
**SINGLE SLOT SHOWN (DOUBLE SLOTS SYMMETRICAL ABOUT CENTERLINE)
SECTION CC (CASE 3)**

TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**DITCH BOTTOM INLETS
TYPES C, D, E & H**

Names		Dates		Approved By	
Designed By	JVG/EGR	3/10/86	 State Drainage Engineer		
Drawn By	HSD/dde	5/20/86			
Checked By	JVG/EGR	5/22/86			
Revision		Sheet No.		Index No.	
00		4 of 5		232	

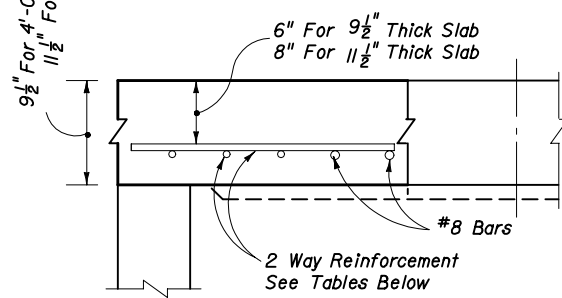


See Index No. 200 for structure bottom details and hole reinforcement.

ALT. B STRUCTURE BOTTOM FOR INLETS TYPE C, D & E

TOP SLAB OPENINGS		
DIAMETER	OPENING SIZE	
	MIN.	MAX.
4'-0"	2'-0" x 3'-1"	2'-0" x 3'-1"
5'-0"	2'-0" x 3'-1"	3'-1" x 4'-1"
6'-0"	2'-0" x 3'-1"	3'-0" x 4'-4"
8'-0"	2'-0" x 3'-1"	3'-0" x 4'-4"

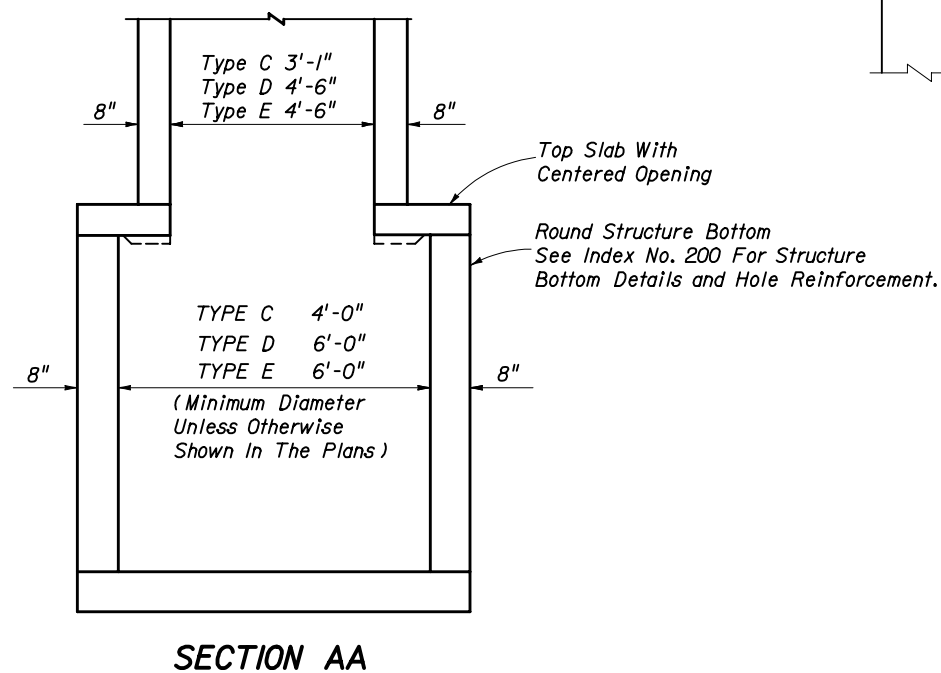
TOP SLAB REINFORCING DIAGRAM



SECTION BB

TOP SLAB WITH CENTERED OPENING		
SLAB DEPTH	SLAB THICKNESS	REINFORCING (2 WAYS) SCHEDULE
SIZE: 4'-0"		
≥ 0.5'-40'	9 1/2"	C
SIZE: 5'-0"		
≥ 0.5' < 30'	9 1/2"	C
30' - 40'	9 1/2"	D
SIZE: 6'-0"		
0.5' < 8'	9 1/2"	B
8' < 18'	9 1/2"	C
18' < 30'	9 1/2"	D
30' < 37'	9 1/2"	E
37' - 40'	9 1/2"	G
SIZE: 8'-0"		
≥ 0.5' < 9'	11 1/2"	C
9' < 15'	11 1/2"	D
15' < 23'	11 1/2"	E
23' < 33'	11 1/2"	E
33' - 40'	11 1/2"	G

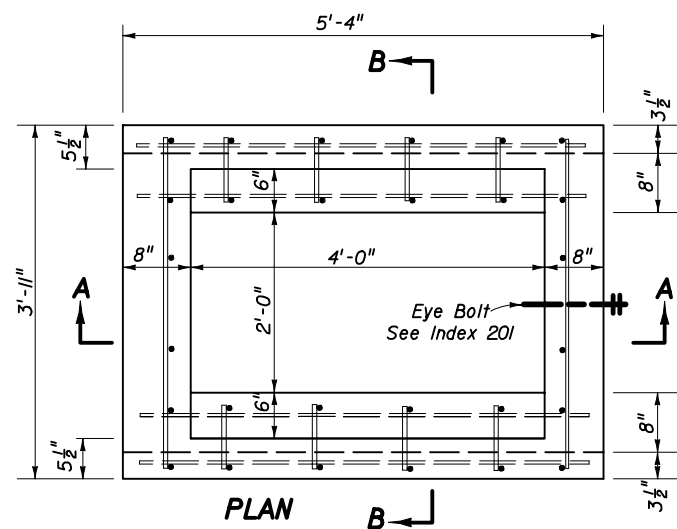
TOP SLAB REINFORCING SCHEDULE	
SCHEDULE	GRADE 60 OR 65KSI OR (WIRE FABRIC) In ² /ft
A	0.20
B	0.24
C	0.37
D	0.53
E	0.73
F	1.06
G	1.45



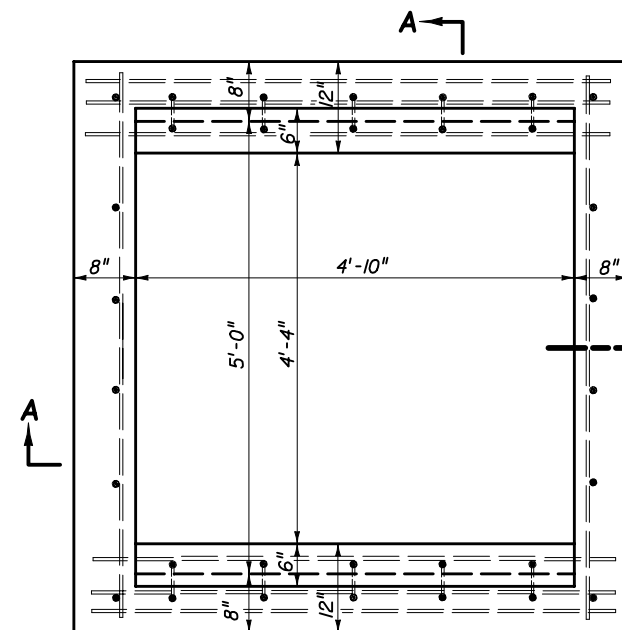
SECTION AA

ALT. A STRUCTURE BOTTOM FOR INLETS TYPE C, D AND E

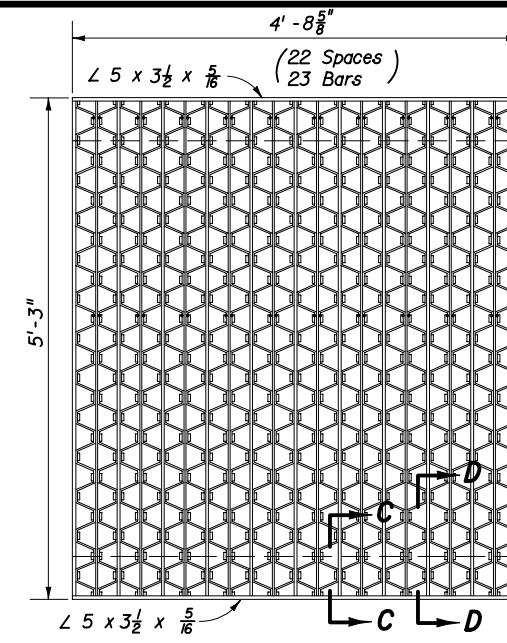
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
DITCH BOTTOM INLETS TYPES C, D, E & H				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By	JDP 02/99	Revision	Sheet No.	Index No.
Checked By		00	5 of 5	232



PLAN B

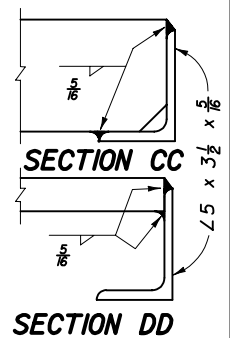


PLAN B

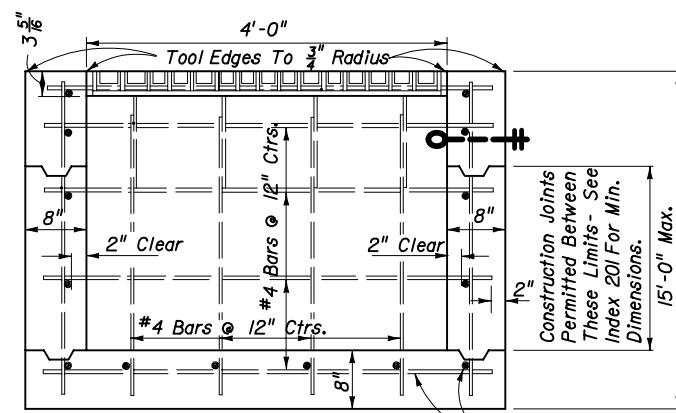


STEEL GRATE

5" Steel Decking, Weight 630 Lbs. Main Bars 5" x 1/4" Intermediate Bars 1 1/2" x 1/4", Reticuline Bars 1 1/4" x 3/16"

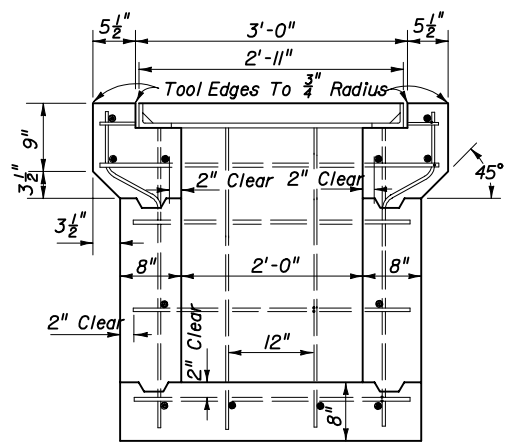


SECTION DD

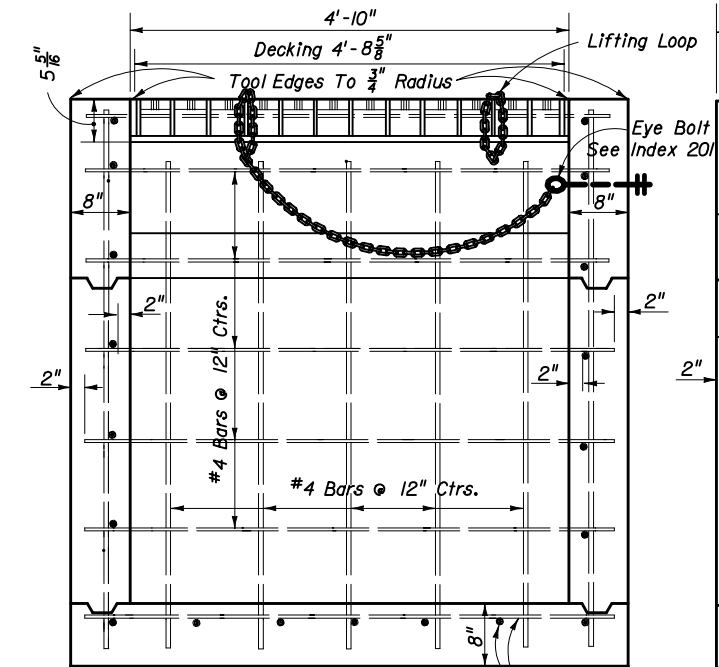


SECTION AA

#4 Bars @ 12" Ctrs.

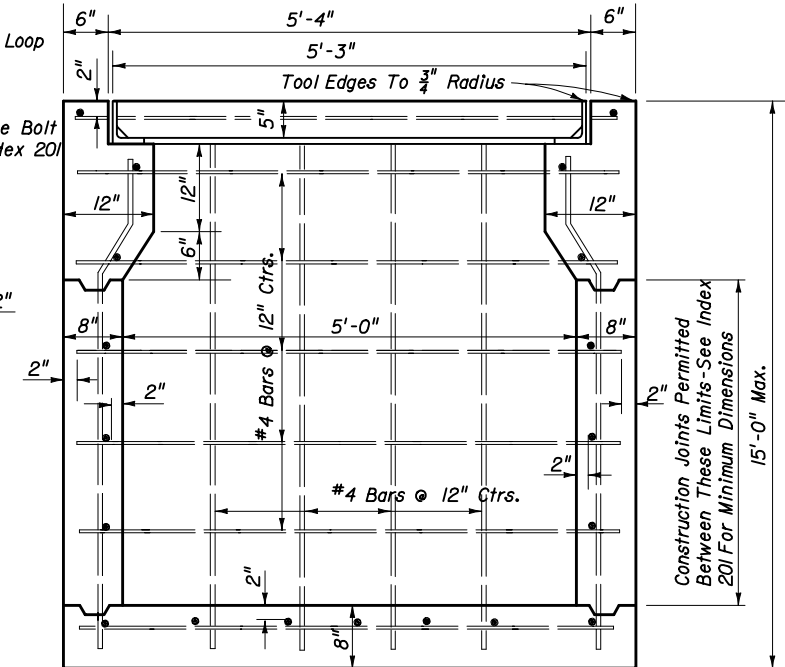


SECTION BB



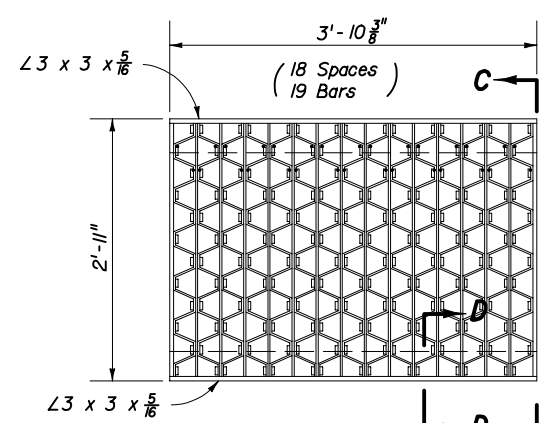
SECTION AA

#4 Bars @ 12" Ctrs.



SECTION BB

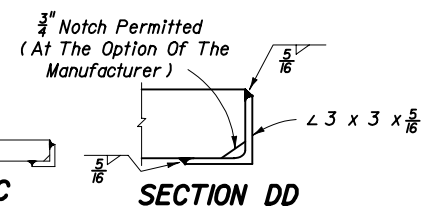
Construction Joints Permitted Between These Limits - See Index 201 For Minimum Dimensions



STEEL GRATE

Steel Grating, Straight Bars 3" x 1/4" Reticuline Bars 2" x 3/16"

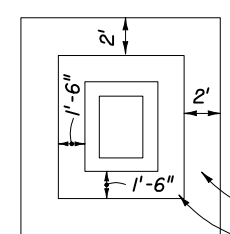
TYPE F



SECTION CC

SECTION DD

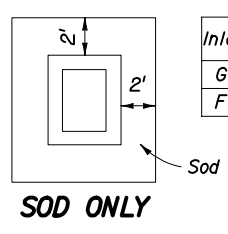
3/4" Notch Permitted (At The Option Of The Manufacturer)



PAVT. AND SOD

Inlet	Pavt Cy*	Sod SY
G	0.43	10
F	0.34	9

*For Estimating Purposes Only



SOD ONLY

Notes: 1. Pavement and/or sod to be used only where called for in the plans.
2. Cost of paving to be included in cost of inlet.

PAVEMENT AND SODDING

TYPE G

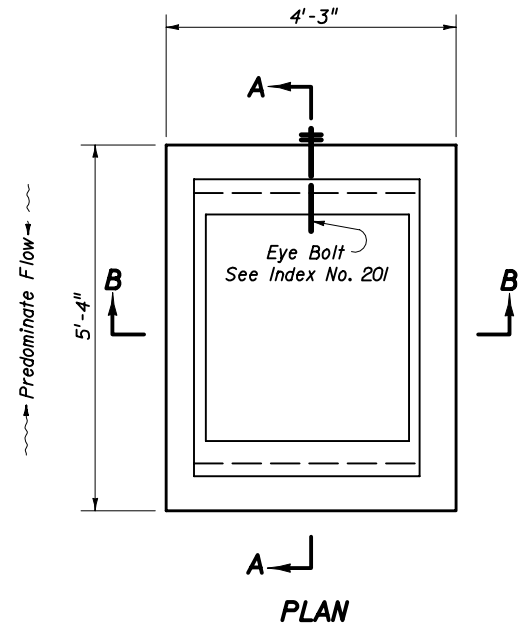
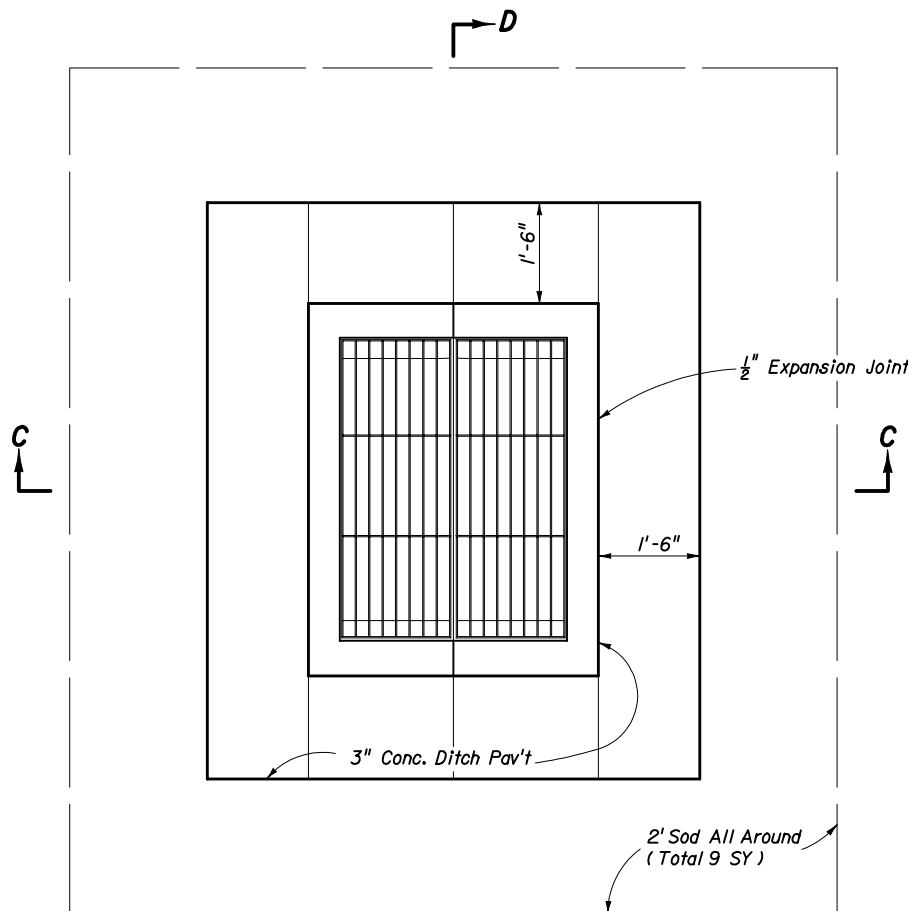
GENERAL NOTES

- These inlets are designed for use in ditches, medians, pavement areas, or other areas subject to heavy wheel loads, minimal debris, and bicycle traffic. This inlet may be placed in areas subject to occasional pedestrian traffic such as landscaped areas and pavement areas where pedestrians can walk around the inlet.
- When alternate G grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
- These inlets may be used with Alt. B structure bottoms, Index 200. The inlet and bottom combinations are to be paid for under the contract unit price for Inlets (DT Bot) (Type F (or G)) (J Bot, Depth), Ea.
- For supplemental details (Type F only), see Index 201.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

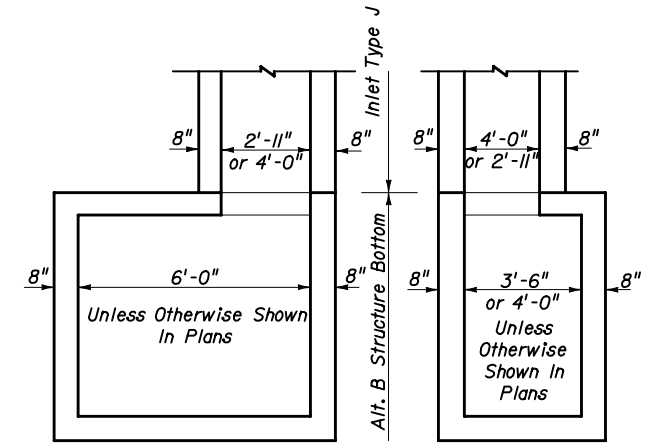
DITCH BOTTOM INLETS
TYPES F & G

Names	Dates	Approved By		
Designed By	TWJ 01/50	 State Drainage Engineer		
Drawn By	MEF 01/50			
Checked By	WHM 01/50			
Revision	04	Sheet No.	Index No.	
		1 of 1	233	

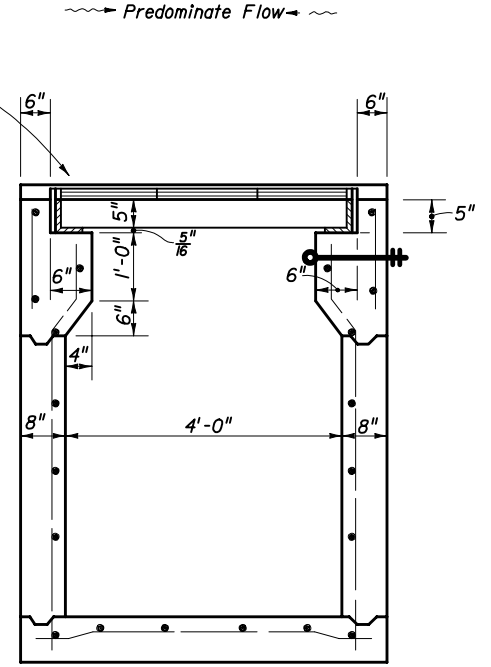
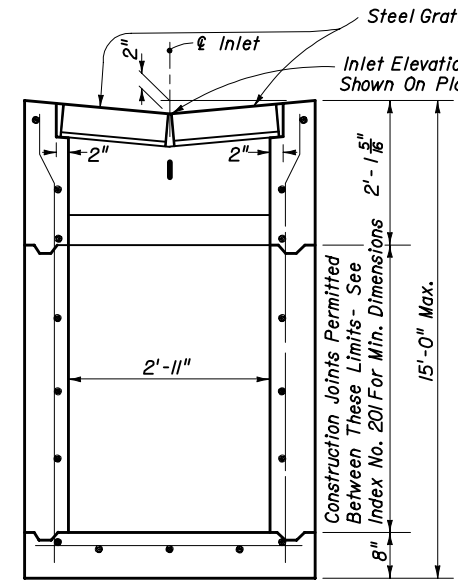
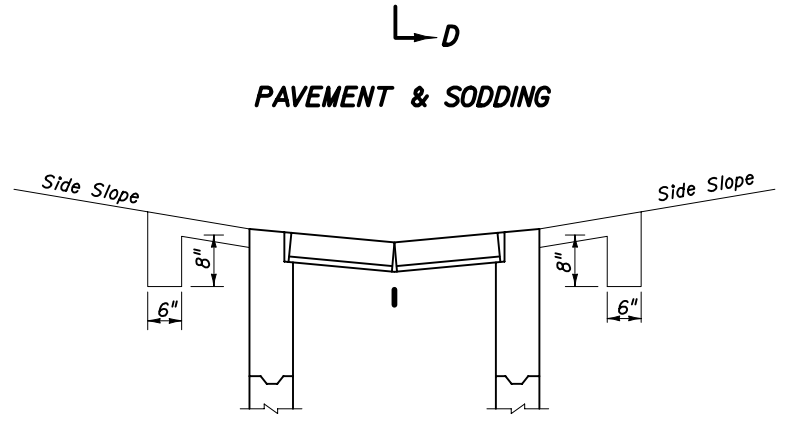


RECOMMENDED MAXIMUM PIPE SIZES	
INLET INSIDE WIDTH	PIPE SIZE
2'-11"	24"
4'-0"	30"

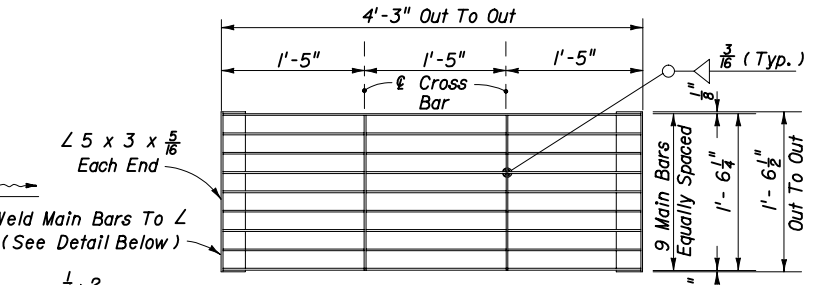
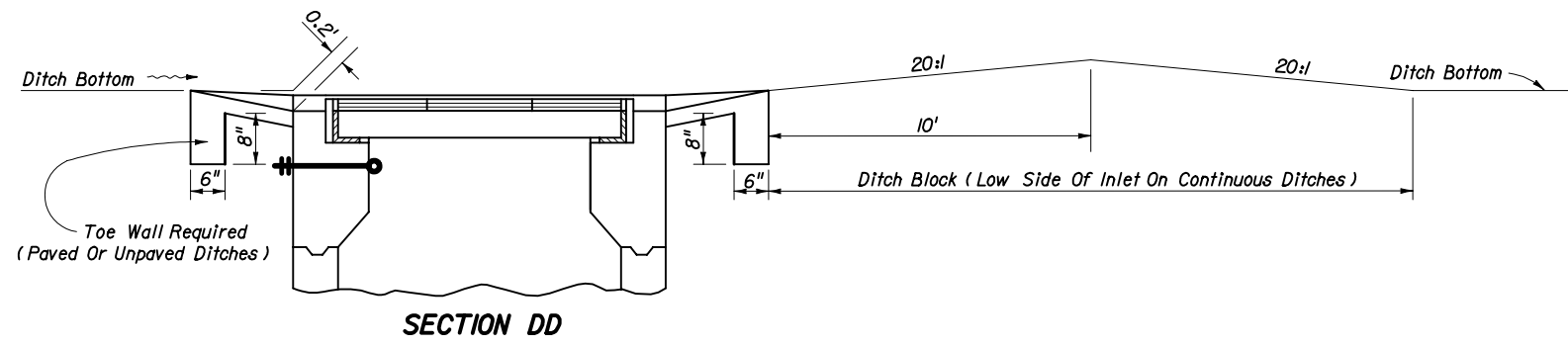
Note: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 201. For larger pipe see bottom detail right and Index No. 200.



NOTE: Alt. B Structure Bottom Only. See Index No. 200 for structure bottom details and hole reinforcement.

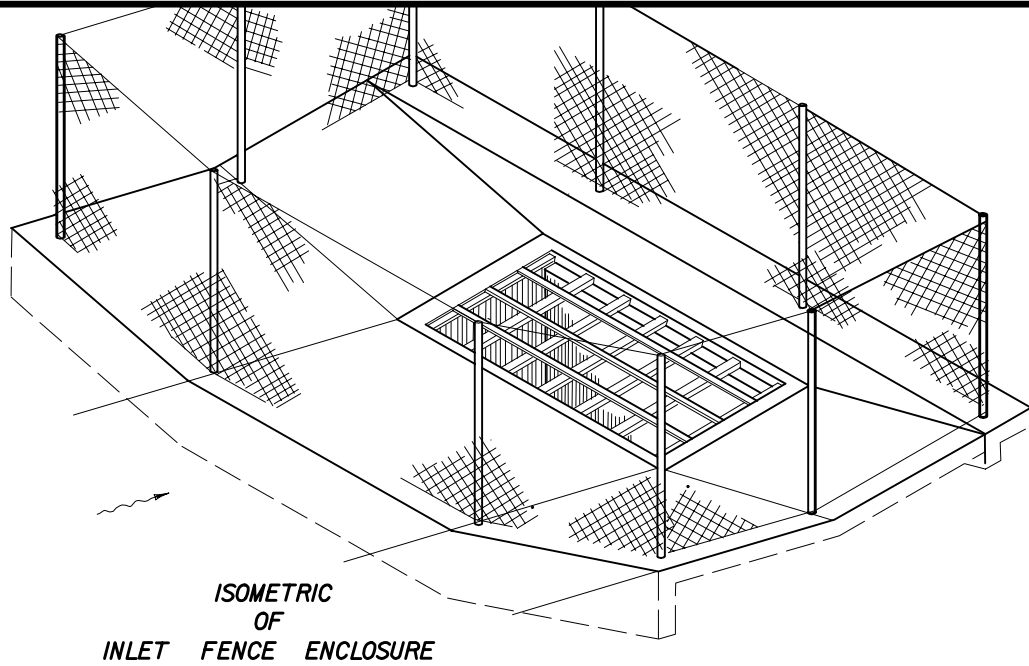
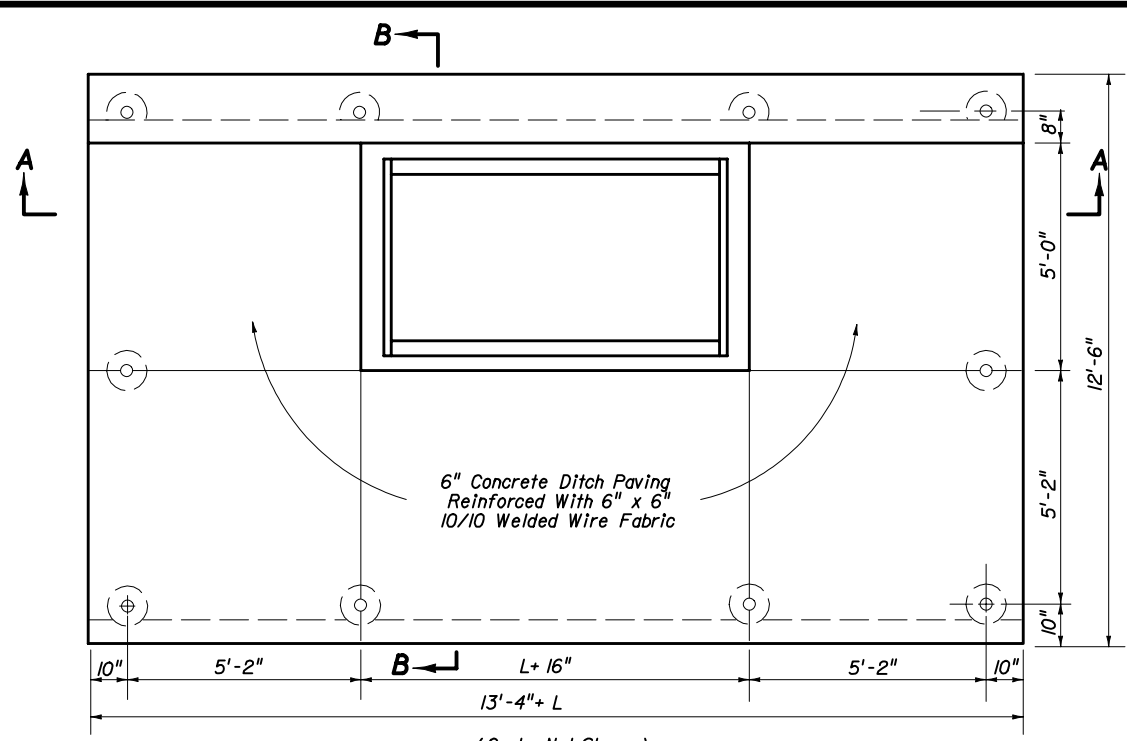


- GENERAL NOTES**
- This inlet is designed for use in ditches, medians, pavement areas or other areas subject to heavy wheel loads with minimal debris. This inlet is not for use in areas subject to bicycle traffic. This inlet may be placed in areas subject to occasional pedestrian traffic such as landscaped areas and pavement areas where Pedestrians can walk around the inlet.
 - Reinforcing- #4 bars at 12" centers both ways with 2" clearance to inside face. Cut or bend bars out of way of pipe when necessary; bars to clear pipe by 1/2".
 - When alternate G grate is specified in plans the grate is to be hot dipped galvanized after fabrication.
 - For supplemental details, see Index No. 201.
 - Cost of ditch paving to be included in cost of inlet. Sodding to be paid for under contract unit price for Sodding, SY.

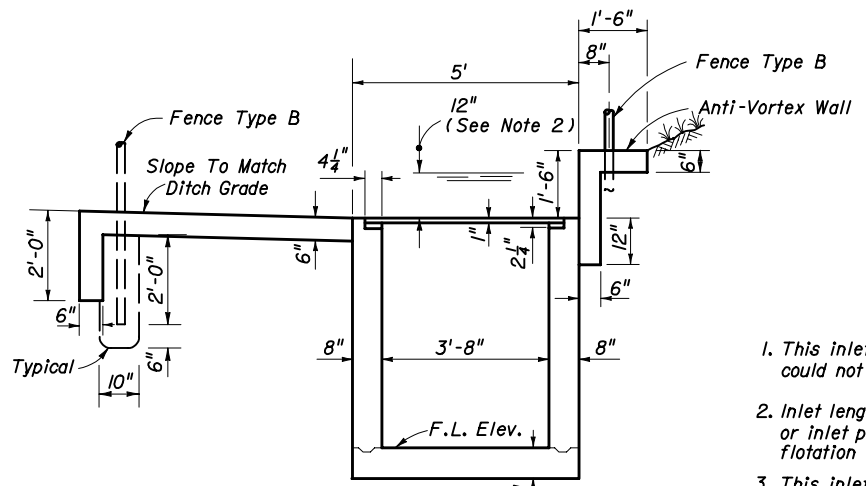
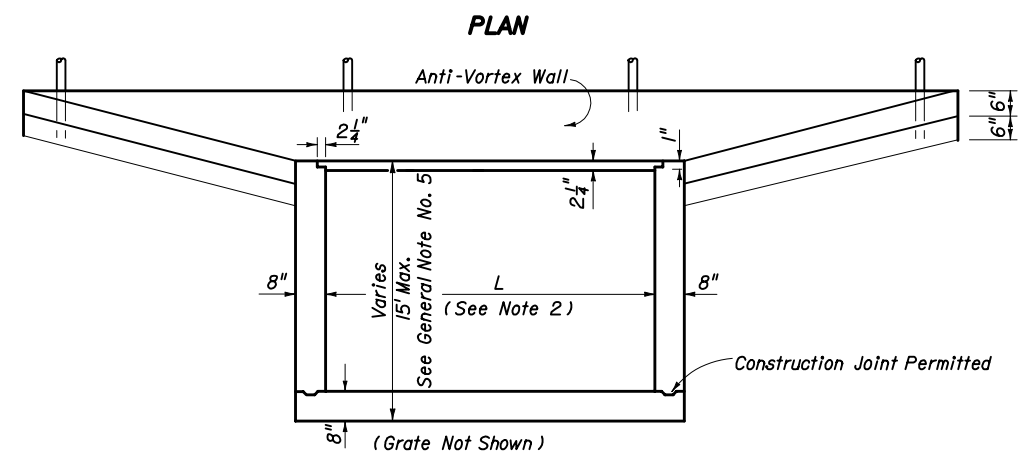


Note: Two Required Per Inlet
 Main Bars 5" x 1/4" (Notched For Cross Bars).
 Cross Bars 1 3/4" x 1/4" (Continuously Welded At Main Bar Notches).
 Main Bars And Cross Bars Flush On Top.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
DITCH BOTTOM INLET TYPE J				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By LMF	08/76	State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By SRL	08/76	04	1 of 1	234

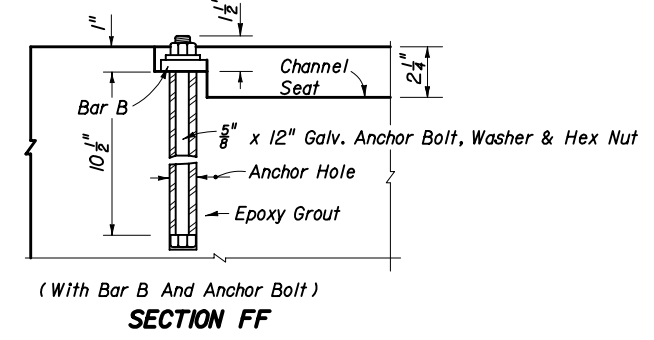
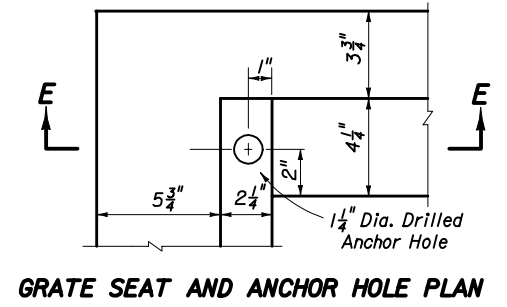
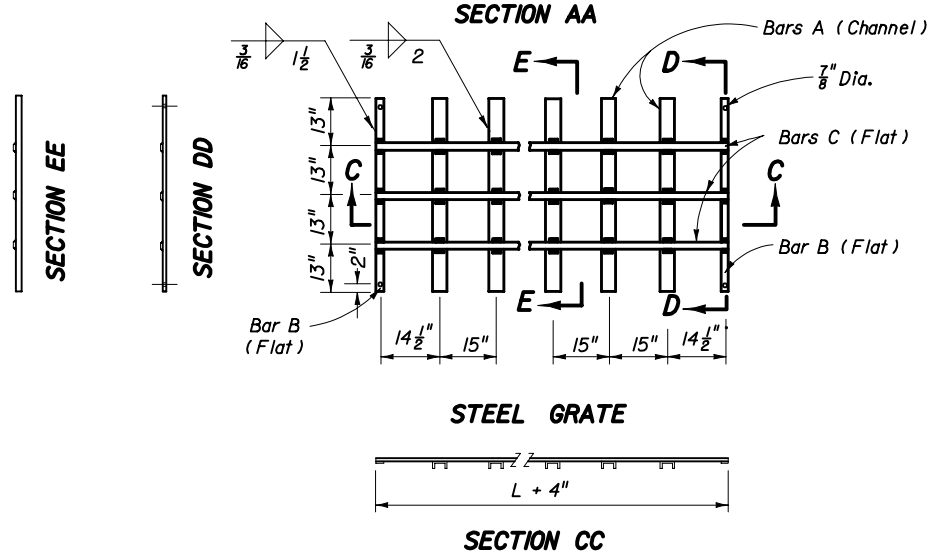


GRATE QUANTITIES						
PIPE SIZE	L	BILL OF STEEL			STEEL WEIGHT	
		BAR	No. REQ'D.	LENGTH	CHANNEL 4" x 5.4 #	FLAT 2" x 1/2" (3.4 #)
30" & 36"	4'-9"	A	3	4'-4"	70	
		B	2	4'-4"		30
		C	3	5'-1"		52
42" & 48"	6'-0"	A	4	4'-4"	94	
		B	2	4'-4"		30
		C	3	6'-4"		65
54" & 60"	7'-3"	A	5	4'-4"	117	
		B	2	4'-4"		30
		C	3	7'-7"		77
66" & 72"	8'-6"	A	6	4'-4"	140	
		B	2	4'-4"		30
		C	3	8'-10"		90
SPECIAL	9'-9"	A	7	4'-4"	164	
		B	2	4'-4"		30
		C	3	10'-1"		103
SPECIAL	11'-0"	A	8	4'-4"	187	
		B	2	4'-4"		30
		C	3	11'-4"		116
SPECIAL	12'-3"	A	9	4'-4"	211	
		B	2	4'-4"		30
		C	3	12'-7"		128
SPECIAL	13'-6"	A	10	4'-4"	234	
		B	2	4'-4"		30
		C	3	13'-10"		141
SPECIAL	14'-9"	A	11	4'-4"	257	
		B	2	4'-4"		30
		C	3	15'-1"		154
SPECIAL	16'-0"	A	12	4'-4"	281	
		B	2	4'-4"		30
		C	3	16'-4"		167
SPECIAL	17'-3"	A	13	4'-4"	304	
		B	2	4'-4"		30
		C	3	17'-7"		179
SPECIAL	18'-6"	A	14	4'-4"	328	
		B	2	4'-4"		30
		C	3	18'-10"		192



GENERAL NOTES

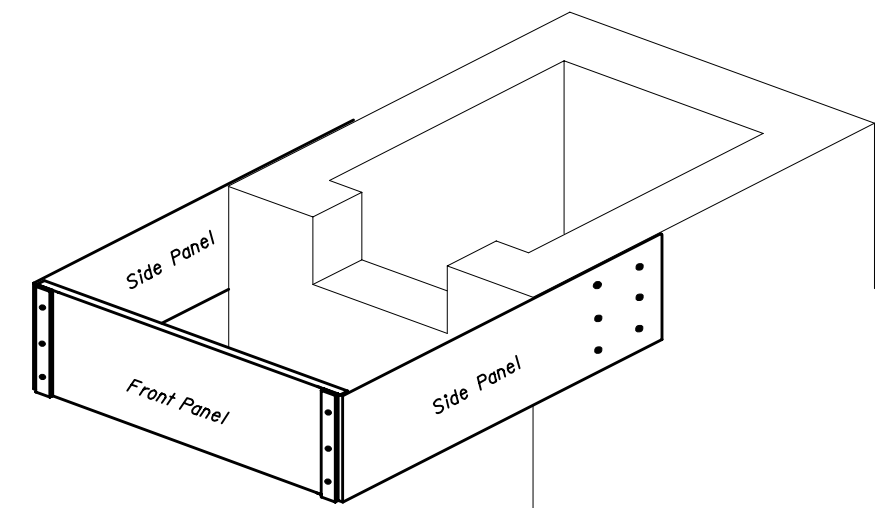
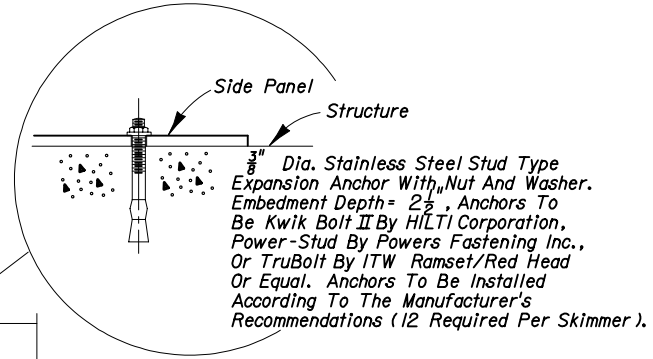
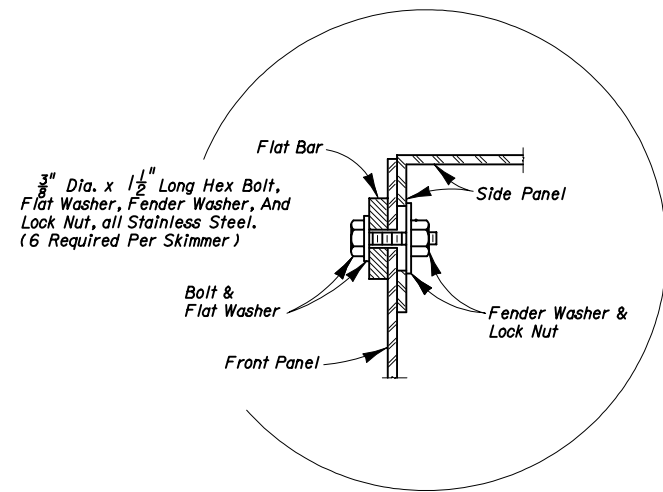
1. This inlet is to be used at locations having high flow rates, usually where an endwall could not be utilized without hazardous intake.
2. Inlet length (L) shall be set by the designer for the greater of either culvert requirement or inlet pool not to exceed 12" depth. Structures over 6' in depth are to be checked for flotation by the designer of project drainage.
3. This inlet is not intended for use with Alternate B structure bottoms.
4. Inlet and anti-vortex wall to be Class I Concrete.
5. Reinforcing - #4 bars at 12" centers both ways for pipe sizes up to 72" diameter; 1 1/2" clearance to inside face and bottom of Inlet. See Index No. 201, Sh. 4 & 5 for reinf. steel modification for depths 13' to 15'. Bend top and corner bars to clear anchor holes. Inlets for special size pipe require special reinforcement design and design approval by the project design engineer.
6. Channel section C 3 x 6 may be used as an alternate for the C 4 x 5.4 channel.
7. Channels and bars shall be ASTM A242/A242M, A572/A572M or A588/A588M, Grade 50 steel, and galvanized in accordance with Section 962-7 of the Standard Specifications.
8. Fence enclosure shall be Fence Type B (Index No. 452). All posts to be set in concrete. A minimum of 10 posts required. Corner and approach side posts to be 3" nominal diameter.
9. Cost of ditch paving, anti-vortex wall, grate, concrete, reinforcing steel and fence enclosure to be included in the cost of inlet. Inlet to be paid for under the contract unit price for Inlets (DT Bot) (Type K), Each.



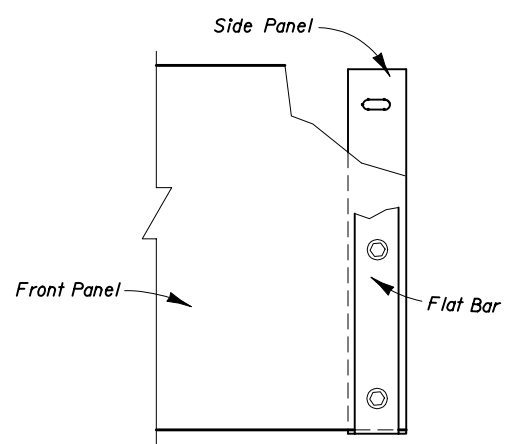
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH BOTTOM INLET TYPE K

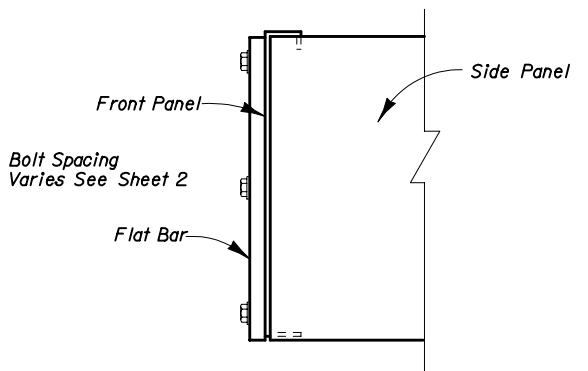
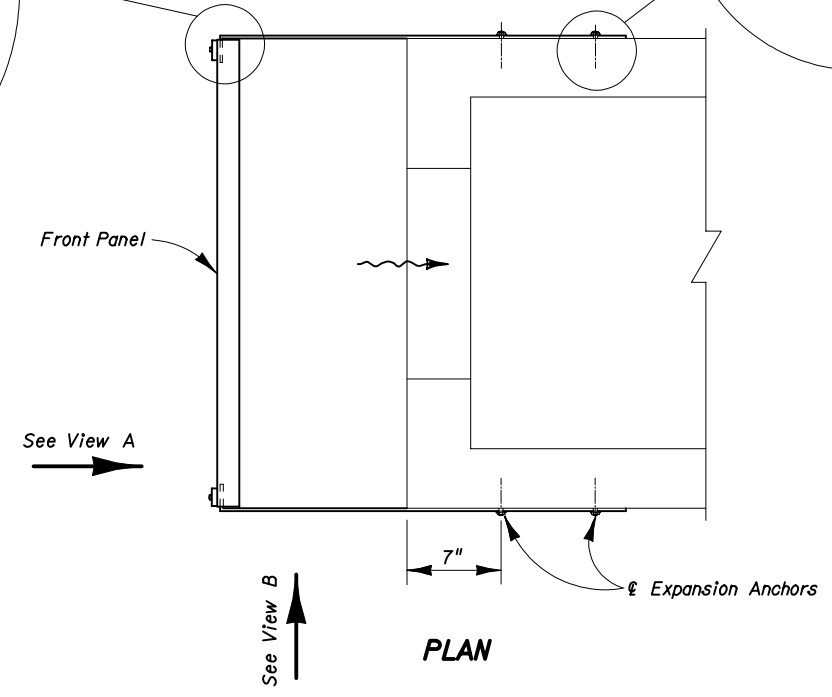
Designed By	FHWA	Names	Dates	Approved By	<i>[Signature]</i>
Drawn By	SM	6/79	Revision	Sheet No.	Index No.
Checked By	JG	6/79	00	1 of 1	235



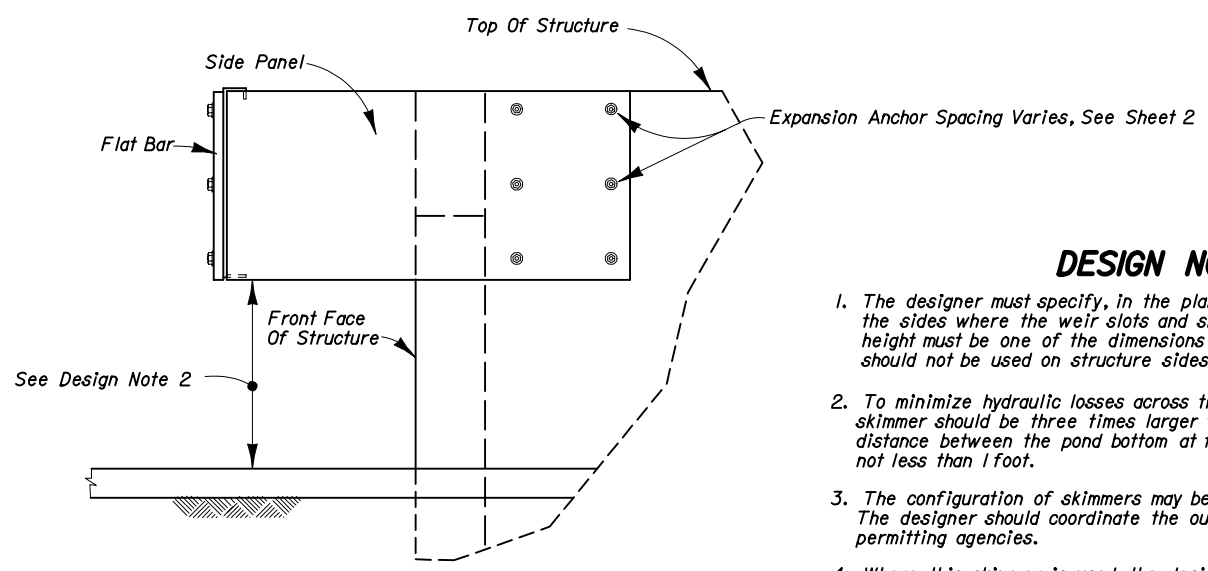
PICTORIAL VIEW



VIEW A



VIEW B



DESIGN NOTES

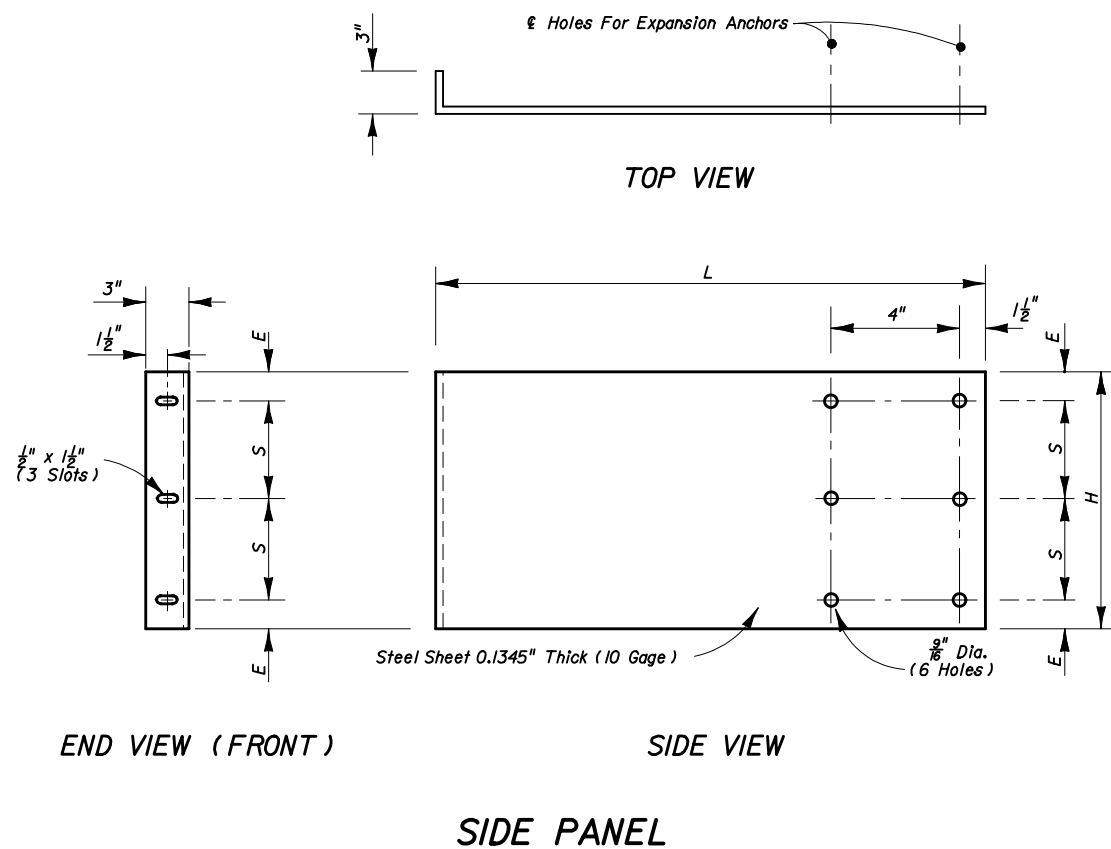
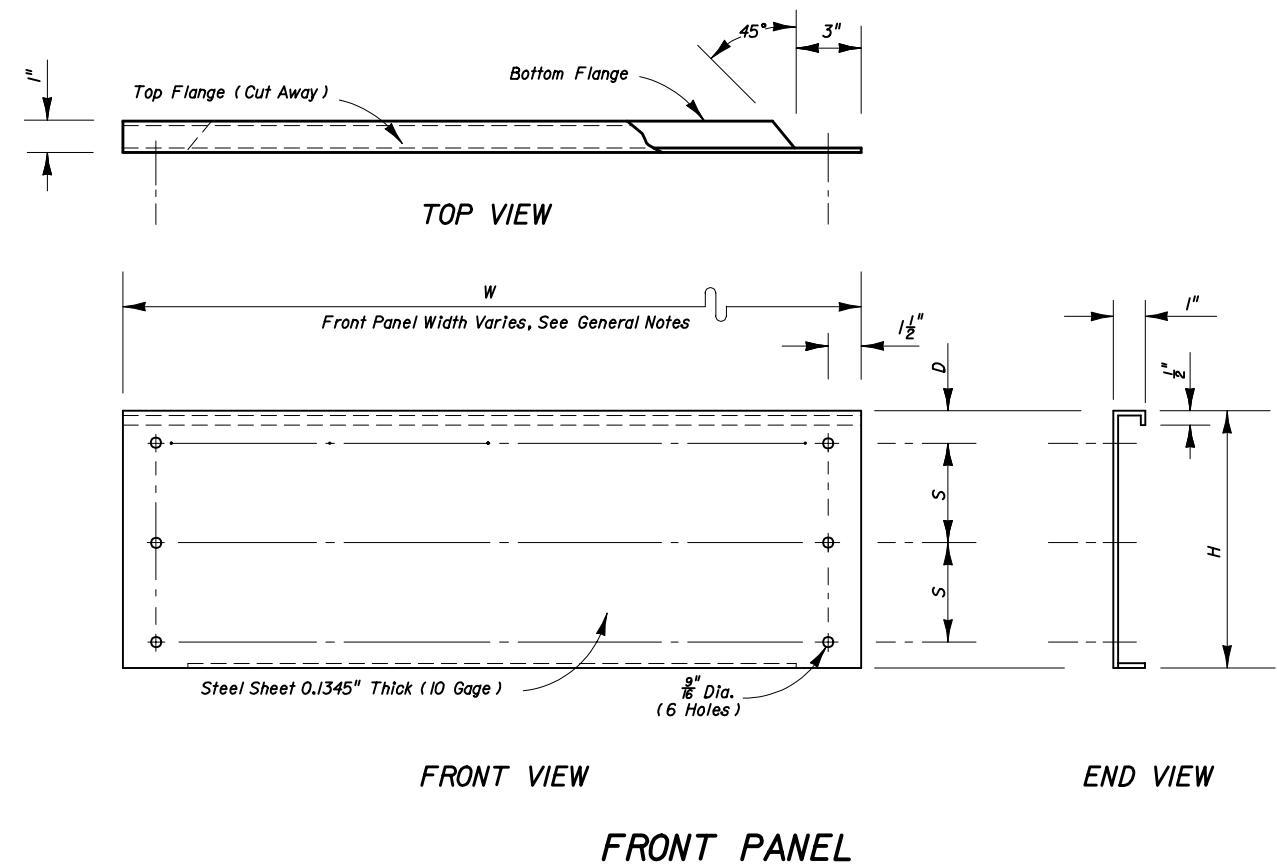
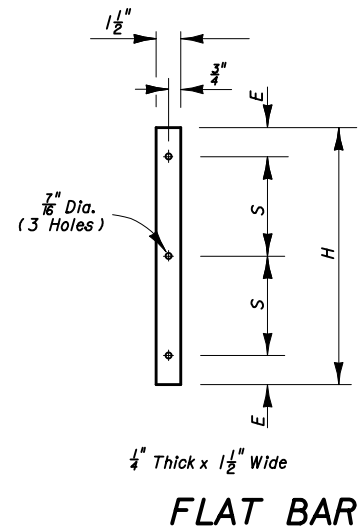
1. The designer must specify, in the plans, the skimmer height (dimension H) and the sides where the weir slots and skimmers are located. The skimmer height must be one of the dimensions shown in the table on Sheet 2. The skimmer should not be used on structure sides with outside dimensions greater than 6'-4".
2. To minimize hydraulic losses across the skimmer, the flow area under the skimmer should be three times larger than the flow area of the weir slot. The distance between the pond bottom at the structure and the skimmer shall be not less than 1 foot.
3. The configuration of skimmers may be subject to regulatory requirements. The designer should coordinate the outlet control structure details with the permitting agencies.
4. Where this skimmer is used, the designer should reference this index with the outlet control structure details. Where a different skimmer design is needed, the designer should provide skimmer details in the plans.
5. The designer shall evaluate if a grate is needed for safety reasons. Where a grate is not needed for safety reasons and is not desirable for hydraulic or other reasons, the designer may omit the grate by stating so in the outlet control structure details.
6. The designer must show the configuration of the weir slots in the outlet control structure detail.

GENERAL NOTES

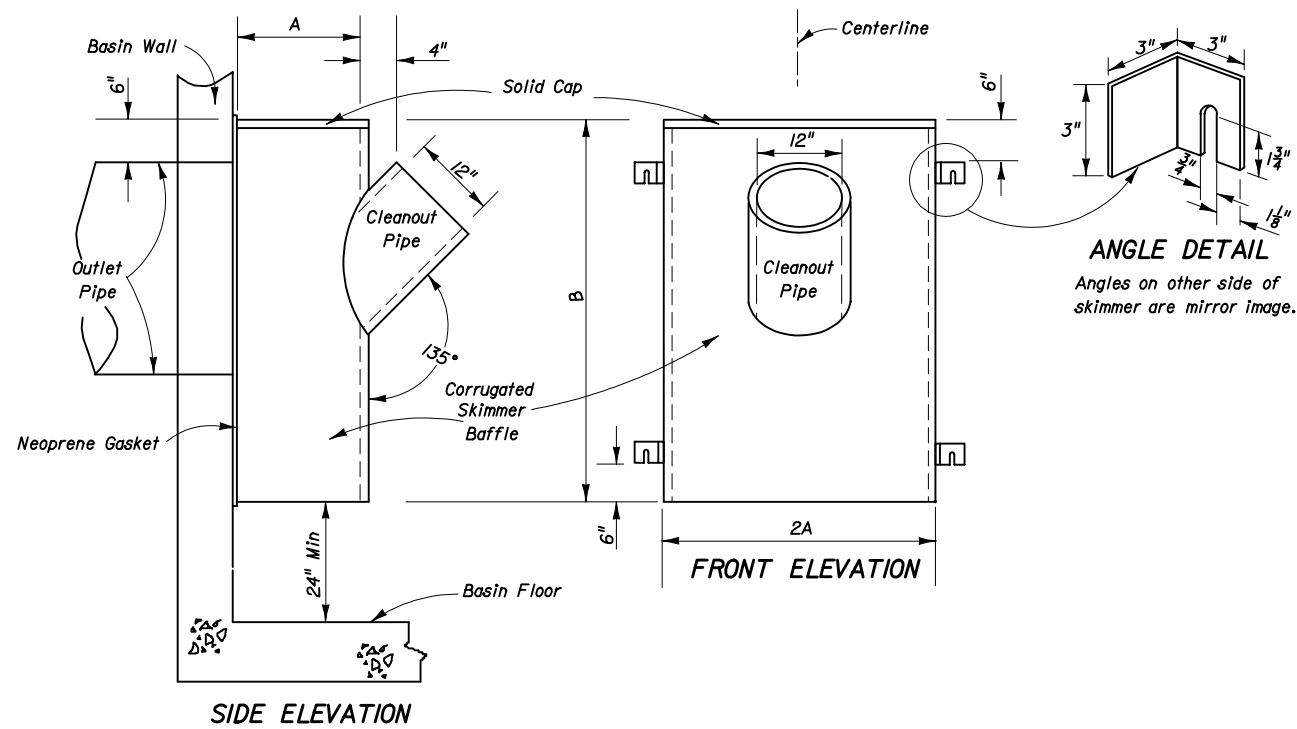
1. This skimmer is intended for use on Type C, D, or E Ditch Bottom Inlets that are used as outlet control structures of stormwater management facilities.
2. The side panels are dimensionally symmetric, therefore they may be used on either side of the structure.
3. Two (2) skimmers may be constructed on one structure provided they are on opposite ends.
4. The width of the front panel (dimension W) shall be the same as the outside dimension across the front of the structure.
5. The front panel, side panels, and flat bars are to be hot dipped galvanized after fabrication.
6. The location of the reinforcing steel in these structures must conform to the applicable standards to avoid conflict with the expansion anchors used to attach the skimmer.
7. Grates to be used on the inlets unless otherwise specified in the plans.
8. A skimmer consists of two (2) side panels, one front panel, two (2) flat bars, and accessory hardware. The cost of skimmers is to be included in the cost of the inlet.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SKIMMER FOR OUTLET CONTROL STRUCTURES				
Designed By	CRH	02/99	Approved By <i>[Signature]</i> State Drainage Engineer	
Drawn By	JT	02/99	Revision	Sheet No.
Checked By	WPH	02/99	00	1 of 2
				Index No. 240

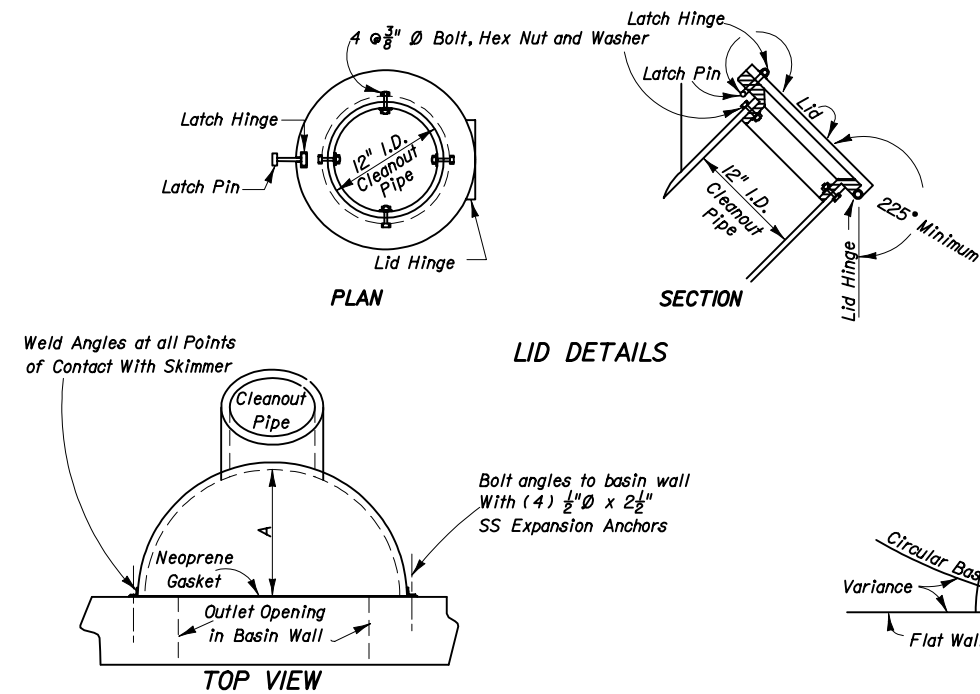
DIMENSIONS				
Skimmer Height as specified in the plans				Bolt Spacing
H	D	E	L	S
Inches				
12	3 $\frac{3}{8}$ "	3	28	3
14	3 $\frac{3}{8}$ "	3	28	4
16	3 $\frac{3}{8}$ "	3	28	5
18	3 $\frac{3}{8}$ "	3	28	6
20	4 $\frac{3}{8}$ "	4	31	6
22	4 $\frac{3}{8}$ "	4	31	7
24	4 $\frac{3}{8}$ "	4	31	8
26	4 $\frac{3}{8}$ "	4	31	9
28	4 $\frac{3}{8}$ "	4	31	10
30	5 $\frac{3}{8}$ "	5	31	10
32	5 $\frac{3}{8}$ "	5	31	11
34	5 $\frac{3}{8}$ "	5	31	12
36	6 $\frac{3}{8}$ "	6	31	12
38	6 $\frac{3}{8}$ "	6	31	13
40	6 $\frac{3}{8}$ "	6	31	14



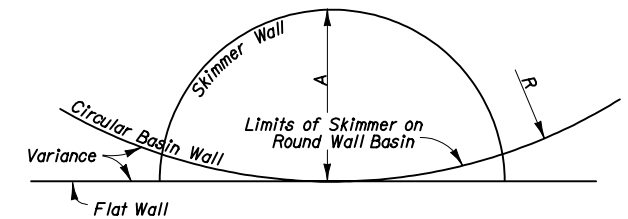
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SKIMMER FOR OUTLET CONTROL STRUCTURES				
Designed By	Names	Dates	Approved By	
Drawn By	CRH	02/99	 State Drainage Engineer	
Checked By	JT	02/99		
	WPH	02/99	Revision	Sheet No.
			00	2 of 2
				Index No. 240



TYPE I SKIMMER



TYPE I SKIMMER DIMENSION TABLE		
OUTLET PIPE	A	B
18"	12"	42"
24"	15"	48"
30"	18"	54"
36"	21"	60"



TOP VIEW SCHEMATIC

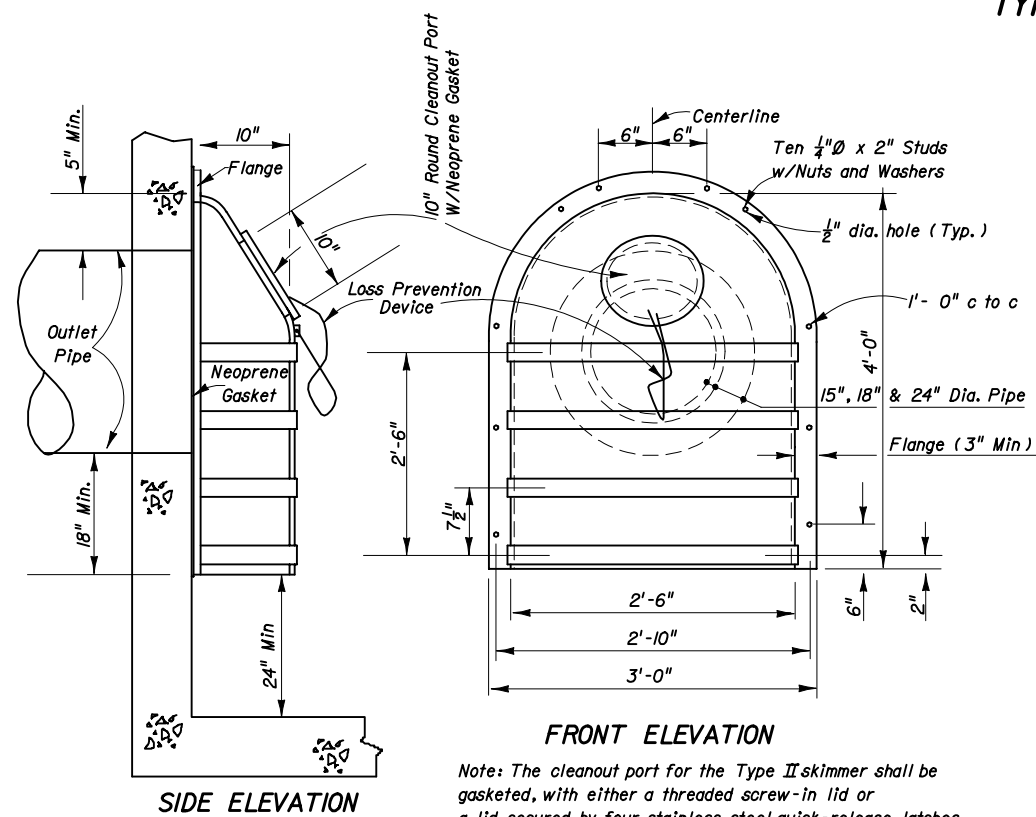
The backs of skimmers must conform to the shape of the basin walls on which they are mounted.
 Show, in the plans, the radii required for curved-back skimmers.
 Applies to both skimmer types.

GENERAL NOTES

1. The French-Drain Skimmer is a hooded cover, mounted over an outlet in a catch-basin, that prevents oil and floating debris from exiting the basin. Use this skimmer in french-drain catch-basins and in other locations where there is a need to prevent oil, debris or other floating contaminants from exiting catch-basins through outlet pipes.
2. Place neoprene gasket material between the skimmer and the catch-basin at all points of contact. Trim the gasket neatly to extend 1/2 inch beyond the joint on all sides.
3. Skimmer baffle, cleanout pipe and angles shall be primarily constructed of either galvanized steel, aluminum, polyvinyl chloride, polyethylene, fiberglass or acrylonitrile butadiene styrene. All steel components, other than stainless, shall be hot-dip galvanized.
4. Mounting hardware, hinges and latches shall all be stainless steel. Loss prevention device shall be either stainless steel chain or riveted nylon strap.
5. Material used in construction of skimmer bodies (baffles) and cleanout pipe shall comply with Standard Specification 943 for steel, 945 for aluminum or 948 for plastics.
6. All costs for furnishing and installing a french-drain skimmer shall be included in the cost of the basin in which it is installed. Retrofit skimmers shall be paid for as 'modify existing structure'.
7. Plastic Skimmers shall contain a minimum of 1.5% by weight of carbon black for UV protection.

DESIGN NOTES

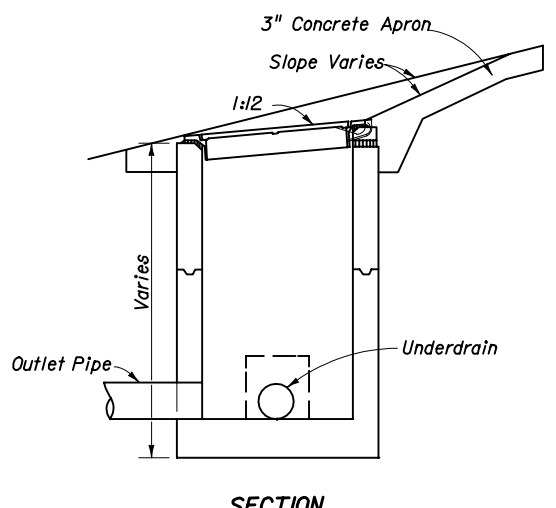
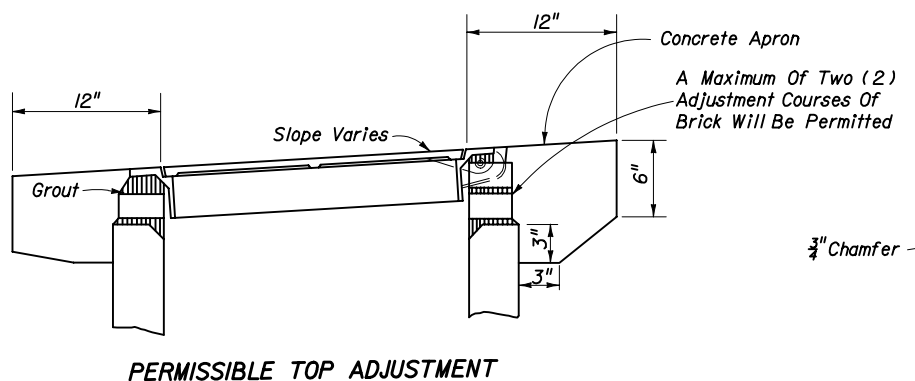
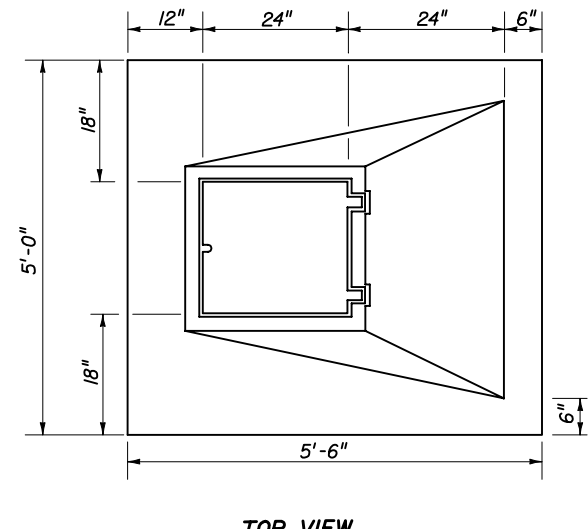
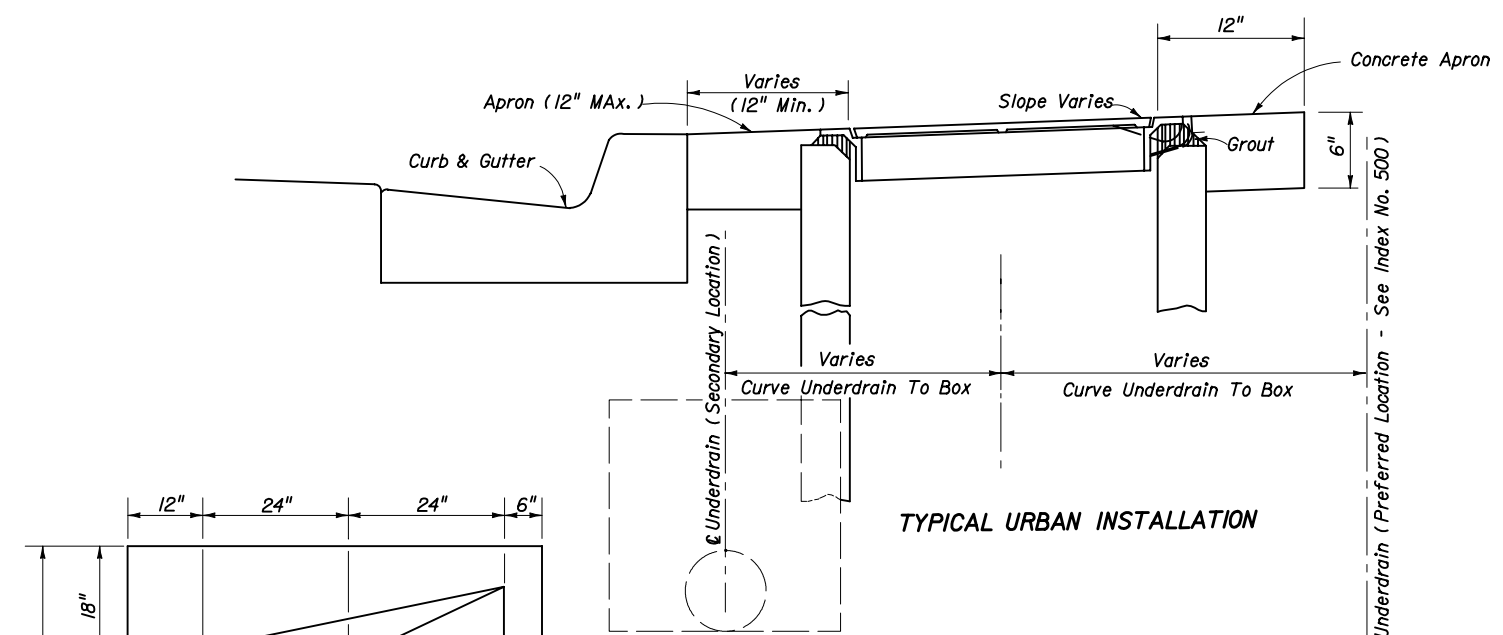
1. The contractor may submit an alternative design pre-fabricated French-Drain Skimmer for approval by the Engineer.
2. Show, in the plans, the location of the basin and indicate the interior side(s) of the basin on which a skimmer will be installed.
3. Type I Skimmer dimensions shall be based on the outlet pipe diameter as shown in the dimension table.
4. Type II Skimmers are to be used only with outlet pipe diameters of 15", 18", and 24".



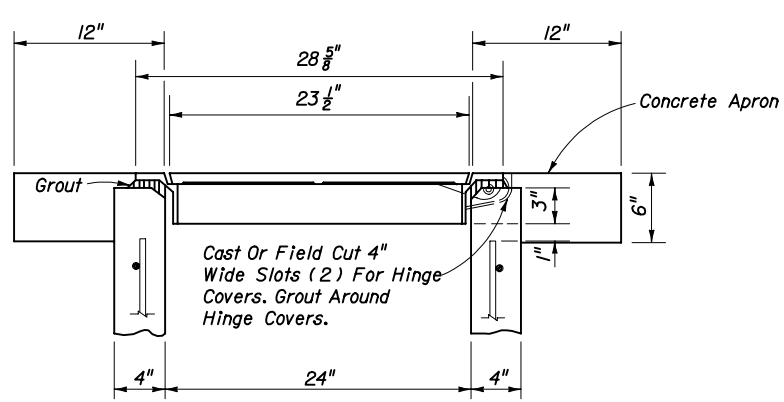
TYPE II SKIMMER

Note: The cleanout port for the Type II skimmer shall be gasketed, with either a threaded screw-in lid or a lid secured by four stainless steel quick-release latches.

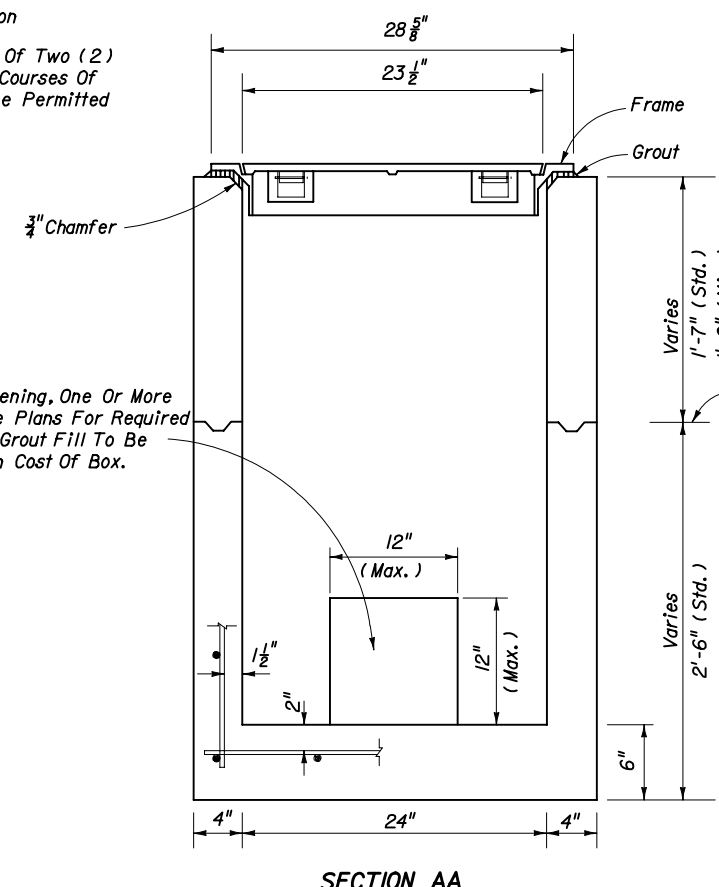
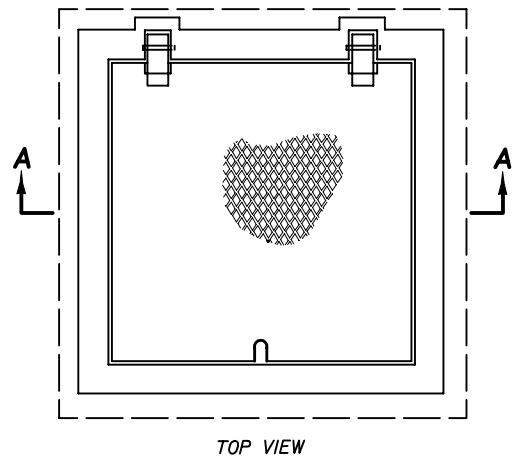
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SKIMMERS FOR FRENCH-DRAIN OUTLETS				
Designed By	Names	Dates	Approved By <i>[Signature]</i> State Drainage Engineer	
Drawn By	CDP	02/03	Revision	Sheet No. 1 of 1
Checked By	RS	02/03	04	Index No. 241



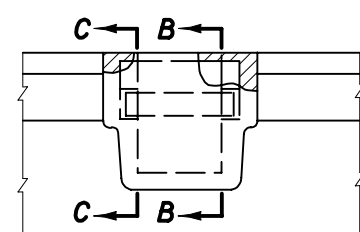
TYPICAL INSTALLATION ON SLOPES



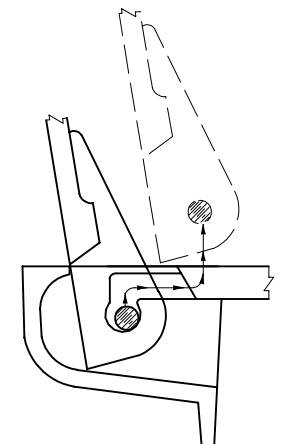
TYPICAL TOP AND APRON



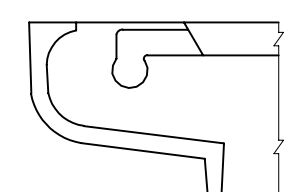
BOX AND TOP



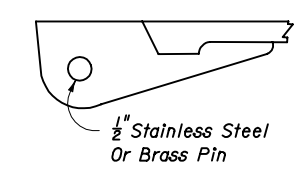
BACK VIEW



COVER REMOVAL



SECTION CC



SECTION BB


HINGE DETAIL

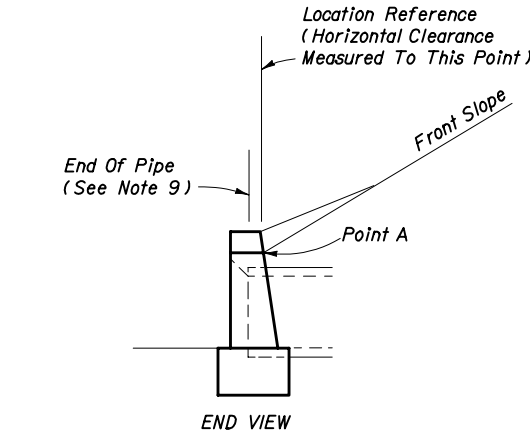
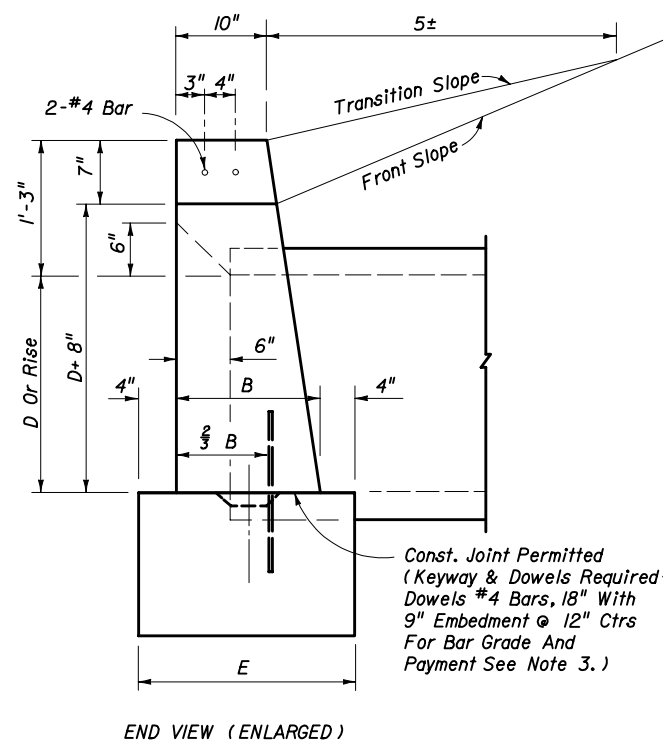
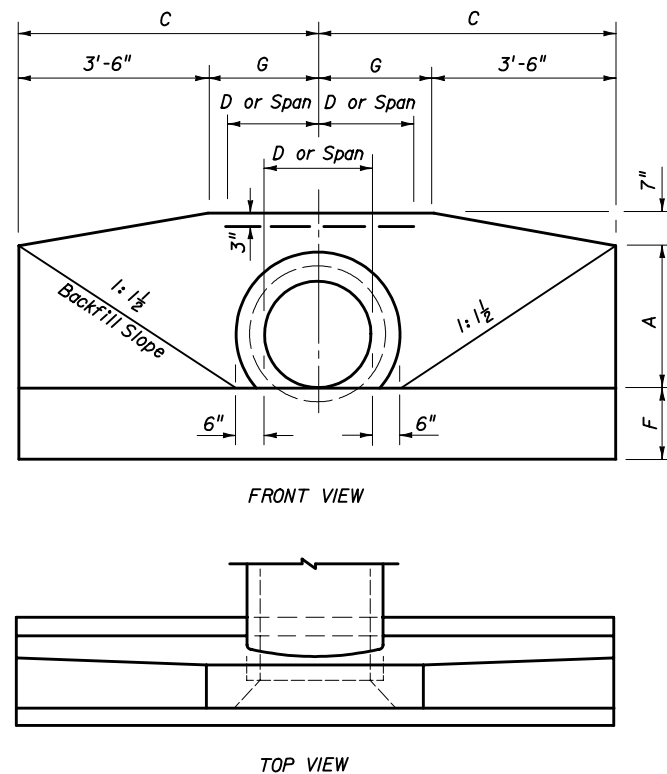
GENERAL NOTES

1. Cast iron cover and frame to be Neenah Foundry Company R-6660-JH, U.S. Foundry Manufacturing Corporation No. A-632 or equal. Neenah R-6660-JH detailed this index.
2. Box to be Class I Concrete, reinforced with No. 3 bars on 8" centers both ways, sides and bottom.
3. Concrete apron to be included in the contract unit price for Underdrain Inspection Box.
4. All covers shall be furnished with pick holes. Fitted lifts or handles are not permitted.
5. Manhole Type P Alternate A, Index No. 200, with Type I Frame and Cover, Index No. 201, may be used in lieu of the box detailed on this sheet, and is recommended when high ADT increases chance of the repeated vehicle loadings.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

UNDERDRAIN INSPECTION BOX

Names	Dates	Approved By		
Designed By	WS 05/81	 State Drainage Engineer		
Drawn By	JM 05/81			
Checked By	JVG 05/81	Revision	Sheet No.	Index No.
		00	1 of 1	245



1. Position is set by the intersection of the front slope and Point A where this intersection falls outside the clear zone.
2. Where the front slope and Point A intersects inside the clear zone, the endwall is positioned so the location reference point is at the clear zone limit. The front slope is transitioned to the endwall as shown in Index No. 280.

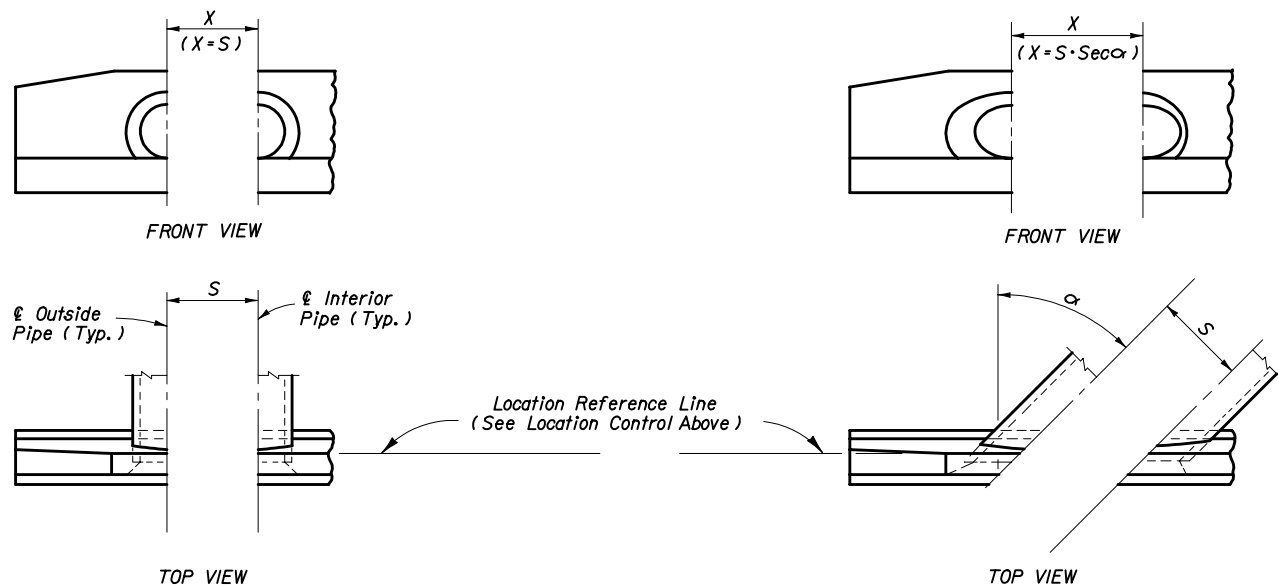
STANDARD LOCATION CONTROL

GENERAL NOTES

1. Endwall dimensions, locations and positions are for round and elliptical concrete pipe and for round and pipe-arch corrugated metal pipe. Round concrete pipe shown.
2. Front slope and ditch transitions shall be in accordance with Index No. 280.
3. Endwalls may be cast in place or precast concrete. Reinforcing steel shall be Grades 40 or 60. Additional reinforcement necessary for handling precast units shall be determined by the Contractor or the supplier. Cost of reinforcement shall be included in the contract unit price for concrete, (endwalls).
4. All exposed corners and edges of concrete are to be chamfered $\frac{3}{4}$ ".
5. Concrete meeting the requirements of ASTM C478 (4000 psi) may be used in lieu of Class I concrete in precast items manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
6. On outfall ditches with side slopes flatter than 1:1 1/2 provide 20' transitions from the endwall to the flatter side slopes, right of way permitting.
7. For sodding around endwalls see Index No. 281.
8. Payment for concrete quantities for endwalls skewed to the pipe shall be made on the following basis:

Endwall Skew To Pipe	Use Tabulated Value
0° to 5°	0°
6° to 15°	15°
16° to 30°	30°
31° or over	45°
9. Pipe length plan quantities shall be based on the pipe end locations shown in the standard location control end view, or lengths based on special endwall locations called for in the plans.
10. Payment for pipe in pipe culverts shall be based on plan quantities, adjusted for endwall locations subsequently established by the Engineer.
11. Endwalls to be paid for under the contract unit price for Concrete Class I (Endwalls), CY.

ENDWALL DIMENSIONS (EXCLUSIVE OF MULTIPLE PIPE SPACING)



NORMAL PIPE

SKewed PIPE

LEGEND

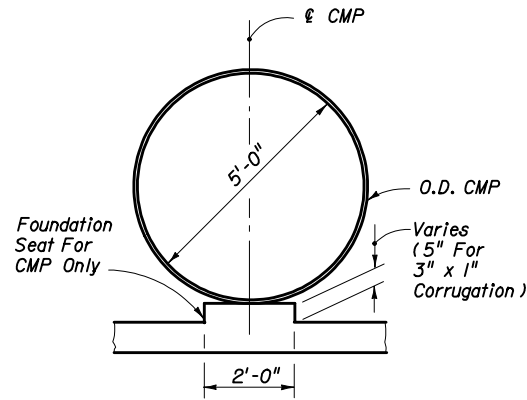
- α Pipe Skew
- S Center To Center Pipe Spacing
- X Centerline To Centerline Dimension At Face Of Headwall

ENDWALL POSITIONS FOR SINGLE AND MULTIPLE PIPE AND SPACING FOR MULTIPLE PIPE

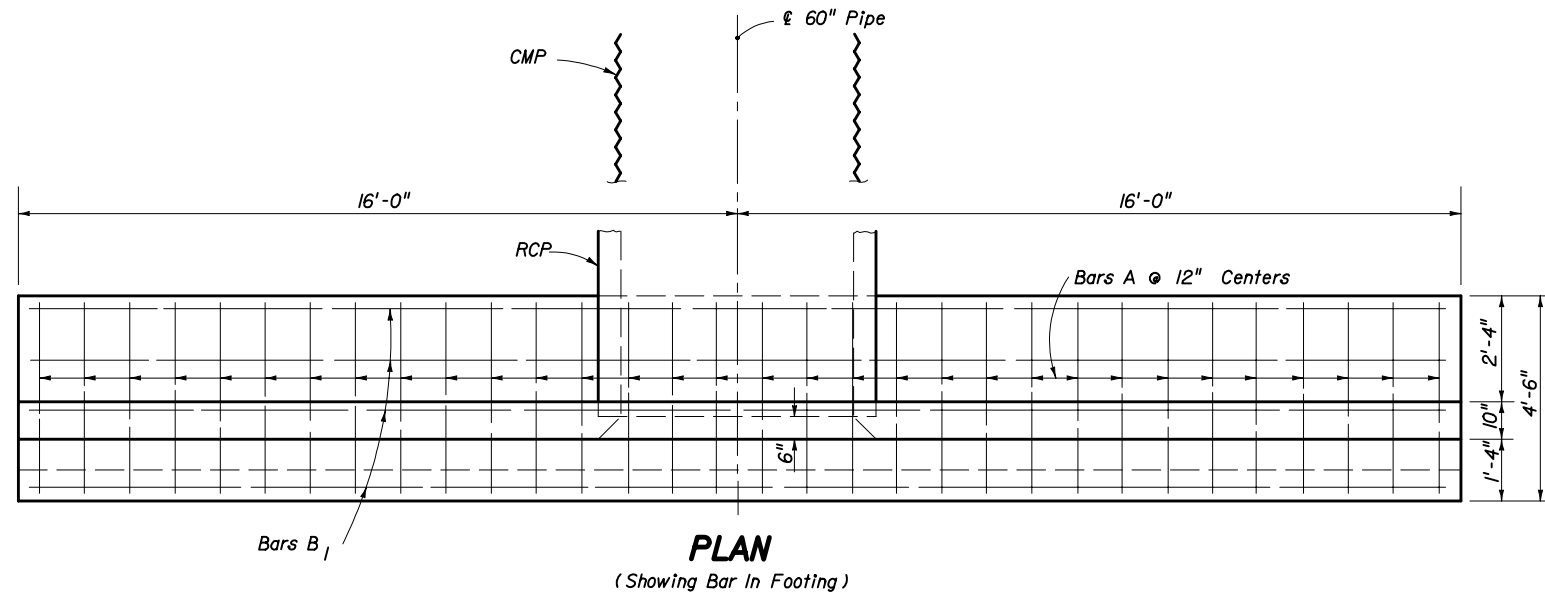
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT CONCRETE ENDWALLS SINGLE AND MULTIPLE PIPE

Designed By	HAB/EGR	Dates	73/83	Approved By	<i>[Signature]</i>
Drawn By	RWR/HSD	Revision	83	State Drainage Engineer	
Checked By	JBW/JVG	Sheet No.	83	Index No.	250
		1 of 2	04		



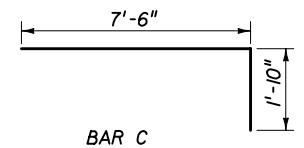
SECTION BB



PLAN
(Showing Bar In Footing)

BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	#4	32	4'-2"	Footing	Straight
B ₁	#4	13	31'-8"	Footing And Wall	Straight
B ₂	#4	4	12'-4"	Wall	Straight
B ₃	#4	4	13'-9"	Wall	Straight
C	#4	26	9'-4"	Wall	Bend
D	#4	18	7'-6"	Wall	Straight
E	#4	8	1'-8"	Footing And Wall	Straight

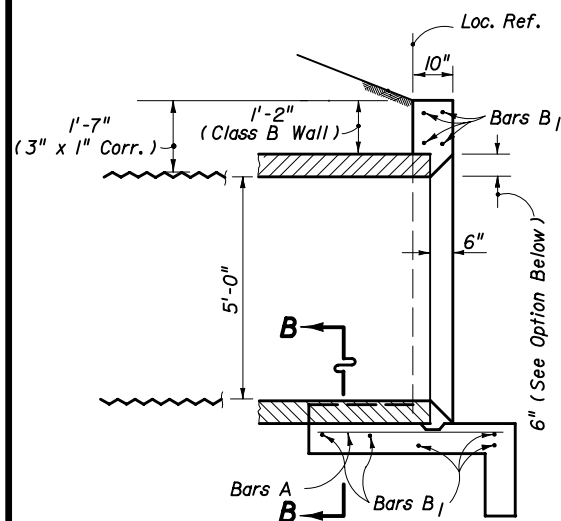
BENDING DIAGRAM



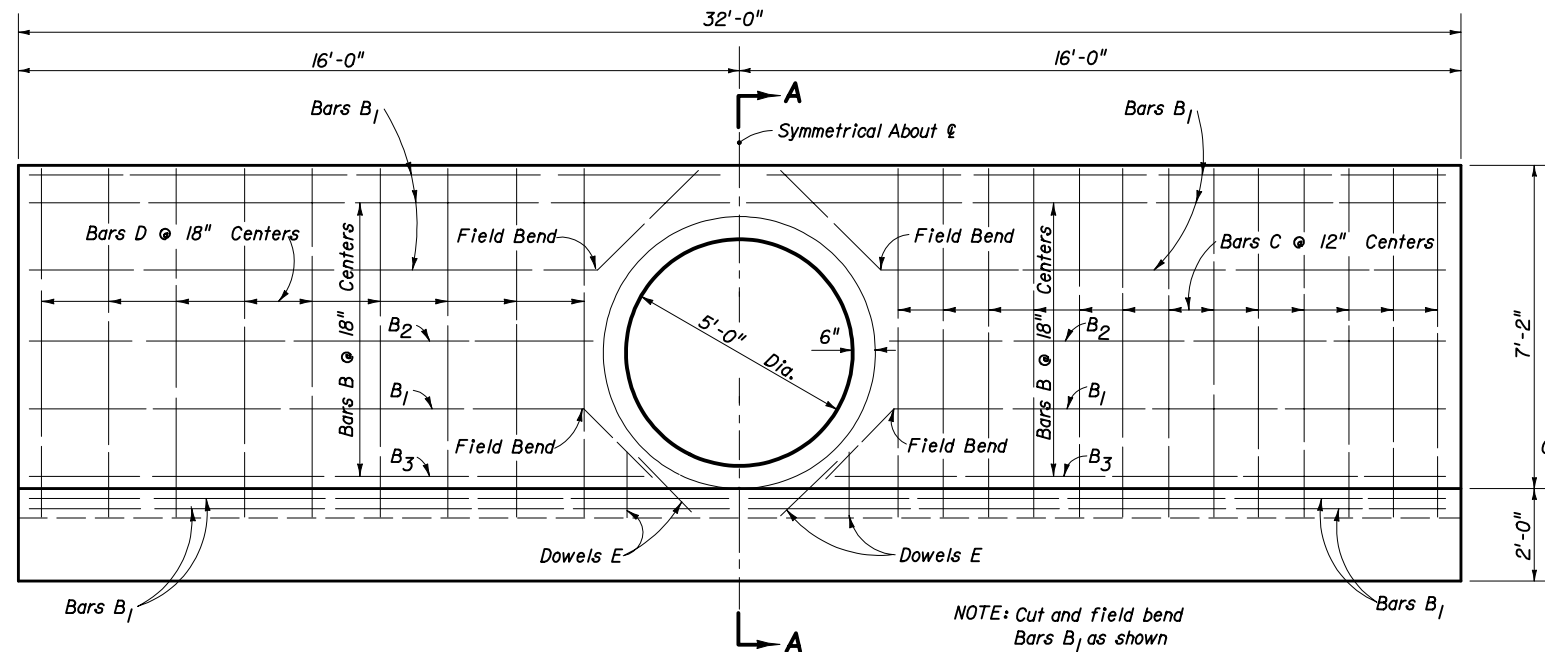
NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	11.3	11.4
Reinforcing Steel	Lb.	695	695

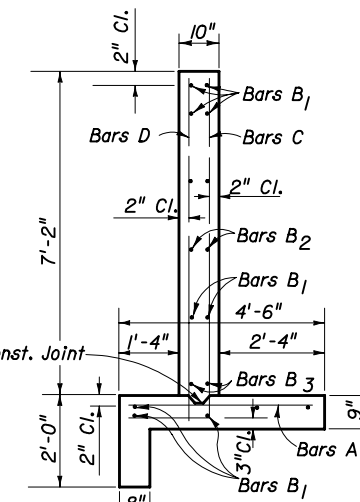


SECTION AA

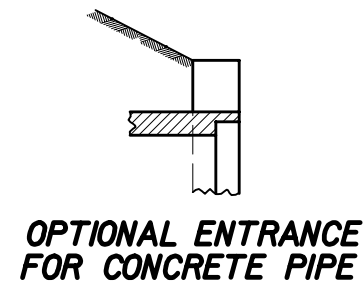


HALF ELEVATION
(Showing Bars In Front Face Of Wall)

HALF ELEVATION
(Showing Bars In Back Face Of Wall)



TYPICAL SECTION THRU ENDWALL



OPTIONAL ENTRANCE FOR CONCRETE PIPE

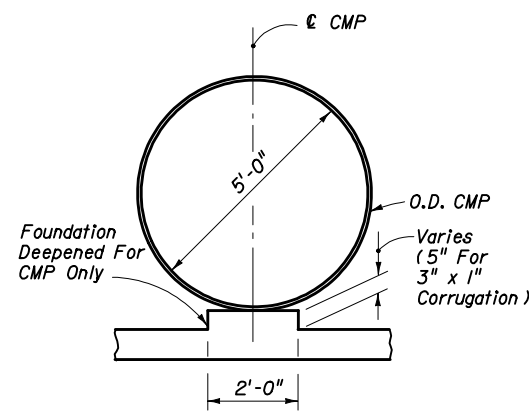
GENERAL NOTES

1. Straight concrete endwalls are intended for use outside the clear zone.
2. Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this index, design specifications AASHTO 1989. Precast construction which adheres to this index, including any additional reinforcement required for handling which shall be determined by the Contractor or supplier, does not require additional approvals. Deviations from this index, for precast units, shall require the approval of the State Drainage Engineer prior to construction. For precast construction, see Index No. 201 for opening and grouting details.
3. Reinforcing steel shall be either Grade 40 or 60.
4. Concrete shall be Class II except concrete meeting the requirements of ASTM C 478 (4000 PSI) may be used in lieu of Class II concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
5. Chamfer: All exposed edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown.
6. That portion of corrugated metal pipe in direct contact with the concrete slab and extending 12" beyond shall be bituminous coated prior to placing of the concrete.
7. Sodding shall be in accordance with Index No. 281 and paid for under the contract unit price for Sodding, SY.
8. Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated on the index. Concrete and reinforcing steel shall be paid for under the contract unit prices for Concrete, Class II (Endwalls), CY and Reinforcing Steel (Roadway), LB.

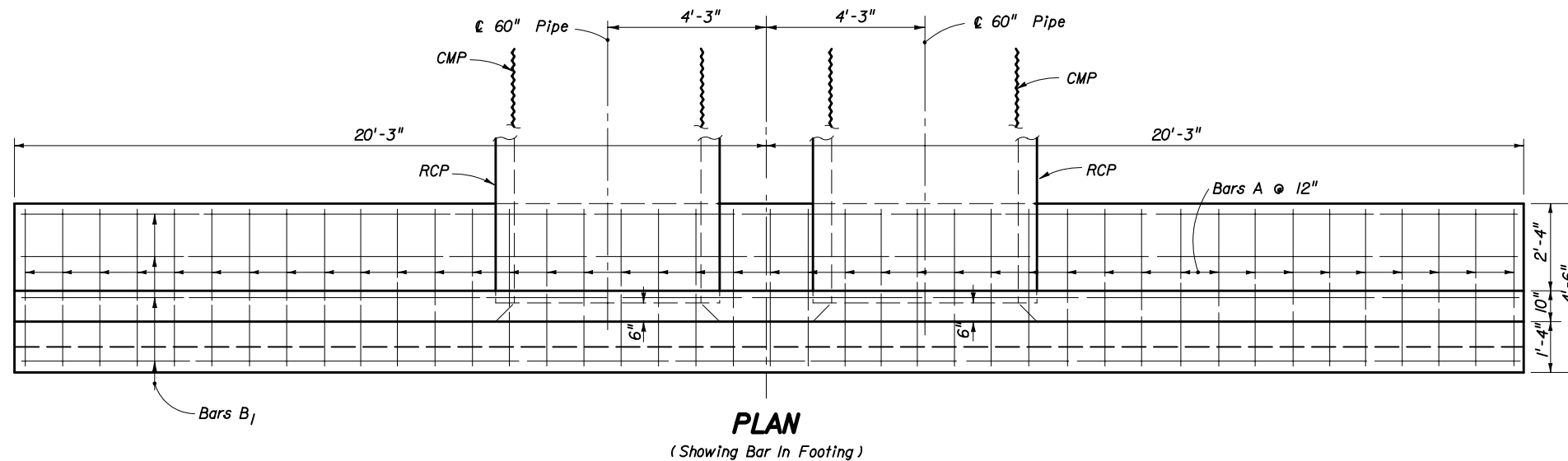
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 60" PIPE

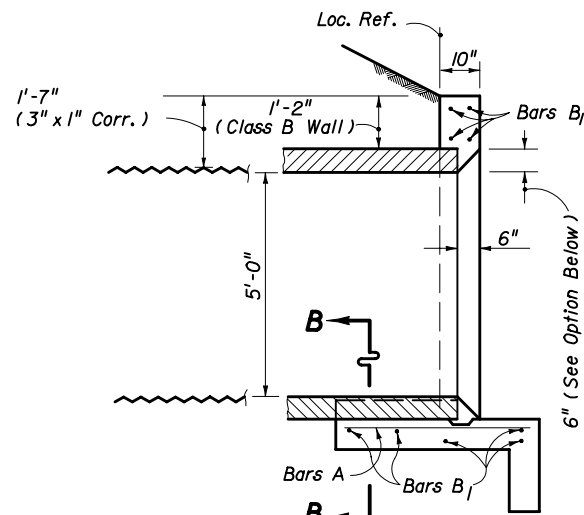
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By	TWJ 11/49			
Checked By	WHM 11/49			
Revision	04			
Sheet No.	1 of 2	Index No.	251	



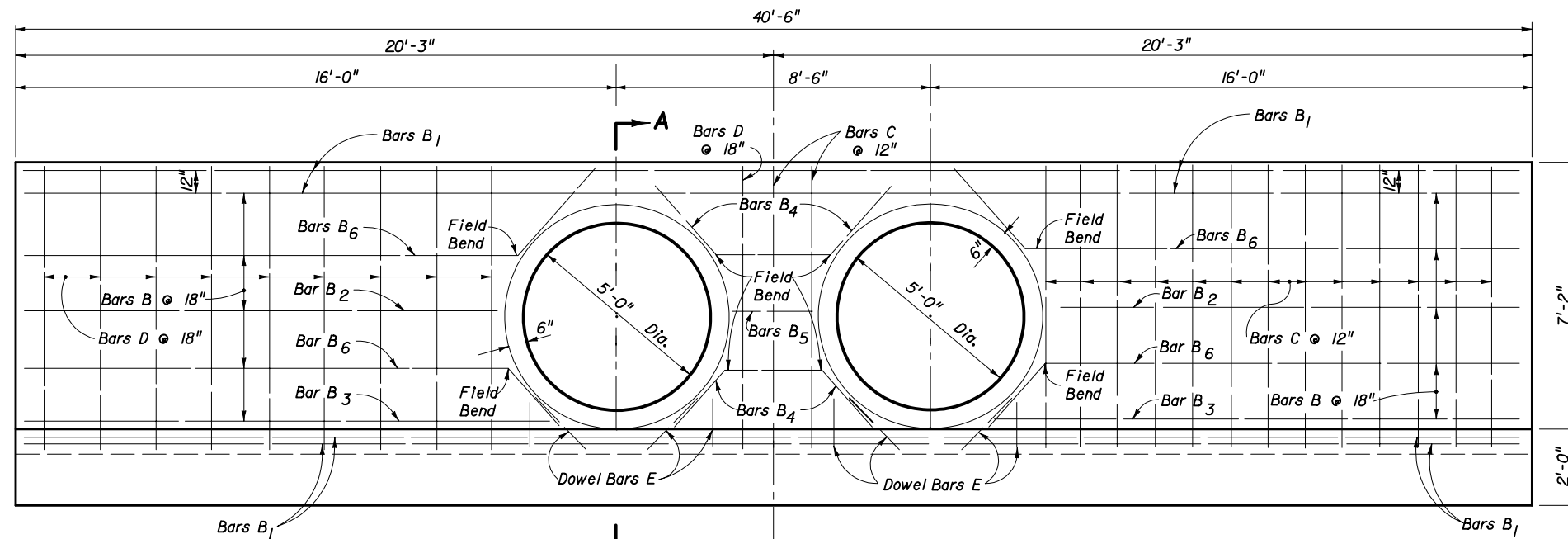
SECTION BB



PLAN
(Showing Bar In Footing)



SECTION AA

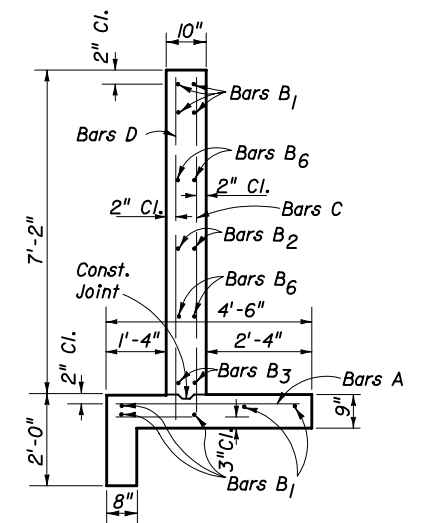


HALF ELEVATION

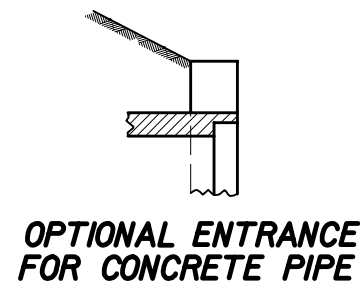
(Showing Bars In Front Face Of Wall)

HALF ELEVATION

(Showing Bars In Back Face Of Wall)



TYPICAL SECTION THRU ENDWALL

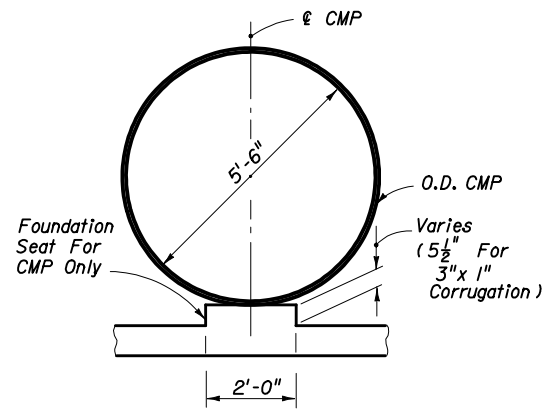


OPTIONAL ENTRANCE FOR CONCRETE PIPE

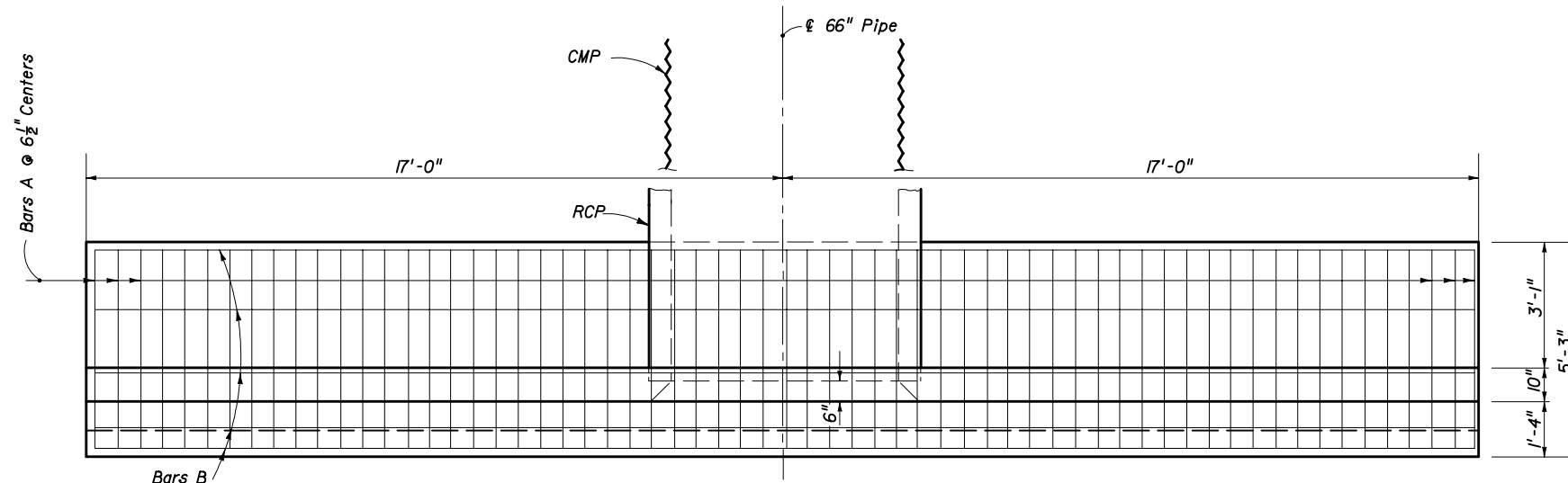
BILL OF REINFORCING STEEL						BENDING DIAGRAM			
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING	ESTIMATED QUANTITIES			
A	#4	41	4'-2"	Footing	Straight	Concrete Class II	Cu. Yd.	13.7	13.8
B ₁	#4	9	40'-2"	Footing & Wall	Straight				
B ₂	#4	4	12'-6"	Wall	Straight	Reinforcing Steel	Lb.	824	824
B ₃	#4	4	13'-9"	Wall	Straight				
B ₄	#4	4	6'-0"	Wall	Field Bend				
B ₅	#4	2	2'-2"	Wall	Straight				
B ₆	#4	8	15'-0"	Wall	Field Bend				
C	#4	29	9'-4"	Footing & Wall	Bend				
D	#4	20	7'-6"	Footing & Wall	Straight				
E	#4	16	1'-8"	Footing & Wall	Straight				

NOTE: See Sheet 1 of 2 For General Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
STRAIGHT CONCRETE ENDWALLS				
SINGLE AND DOUBLE 60" PIPE				
Designed By	Names	Dates	Approved By	
Drawn By	TWJ	11/49	State Drainage Engineer	
Checked By	WHM	11/49	Revision	Sheet No.
			00	2 of 2
				Index No.
				251



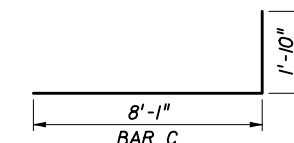
SECTION BB



PLAN
(Showing Bars In Footing)

BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	5	63	4'-11"	Footing	Straight
B	4	17	33'-8"	Footing & Wall	Straight
C	5	34	9'-11"	Wall	Bend
D	4	20	8'-1"	Wall	Straight
E	4	4	1'-8"	Wall	Straight

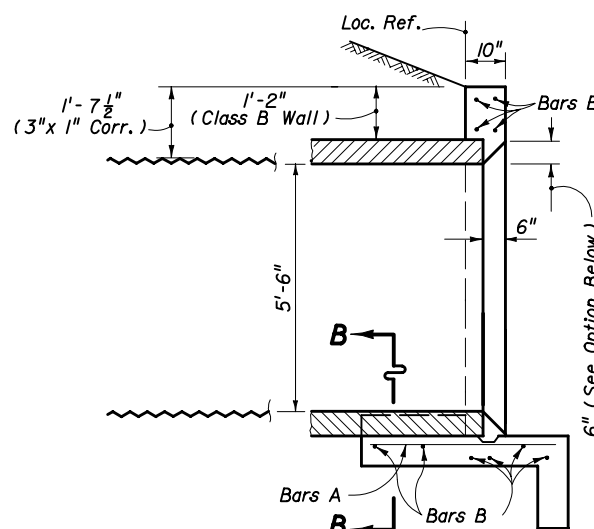
BENDING DIAGRAM



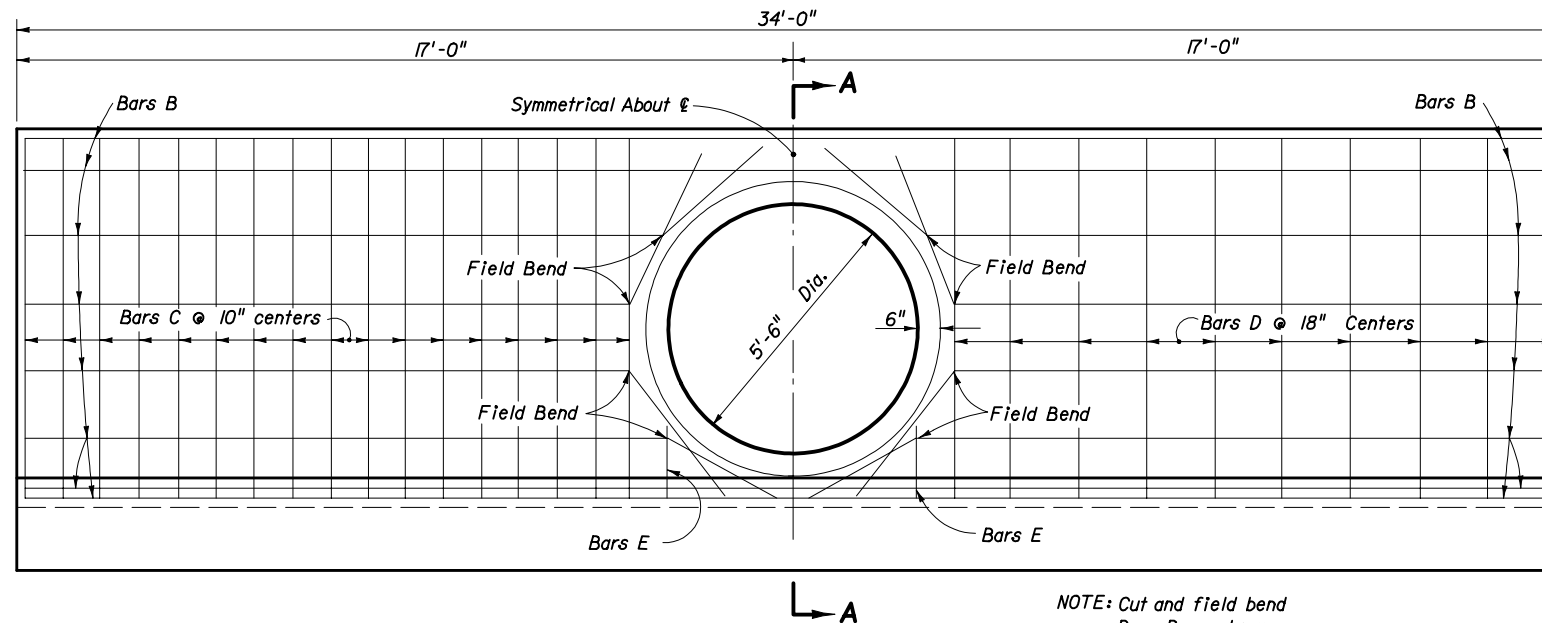
NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	13.2	13.3
Reinforcing Steel	Lb.	1170	1170

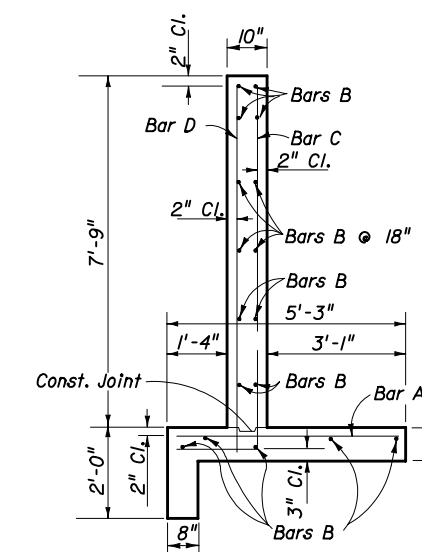


SECTION AA



HALF ELEVATION

(Showing Bars In Back Face Of Wall)



TYPICAL SECTION THRU ENDWALL

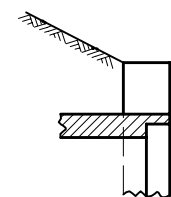
NOTE: Cut and field bend Bars B as shown

HALF ELEVATION

(Showing Bars In Front Face Of Wall)

GENERAL NOTES

1. Straight concrete endwalls are intended for use outside the clear zone.
2. Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this index, design specifications AASHTO 1989. Precast construction which adheres to this Index, including any additional reinforcement required for handling which shall be determined by the Contractor or supplier, does not require additional approvals. Deviations from this Index, for precast units, shall require the approval of the State Drainage Engineer prior to construction. For precast construction, see Index No. 201 for opening and grouting details.
3. Reinforcing steel shall be either Grade 40 or 60.
4. Concrete shall be Class II except concrete meeting the requirements of ASTM C 478 (4000 psi) may be used in lieu of Class II concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
5. Chamfer: All exposed edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown.
6. That portion of corrugated Metal pipe in direct contact with the concrete slab and extending 12" beyond shall be bituminous coated prior to placing of the concrete.
7. Sodding shall be in accordance with Index No. 281 and paid for under the contract unit price for Sodding, SY.
8. Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated on the Index. Concrete and reinforcing steel shall be paid for under the contract unit prices for Concrete Class II (Endwalls), CY and Reinforcing Steel (Roadway), LB.

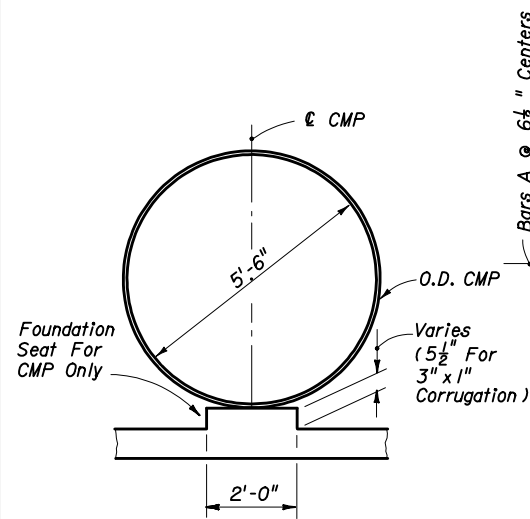


OPTIONAL ENTRANCE FOR CONCRETE PIPE

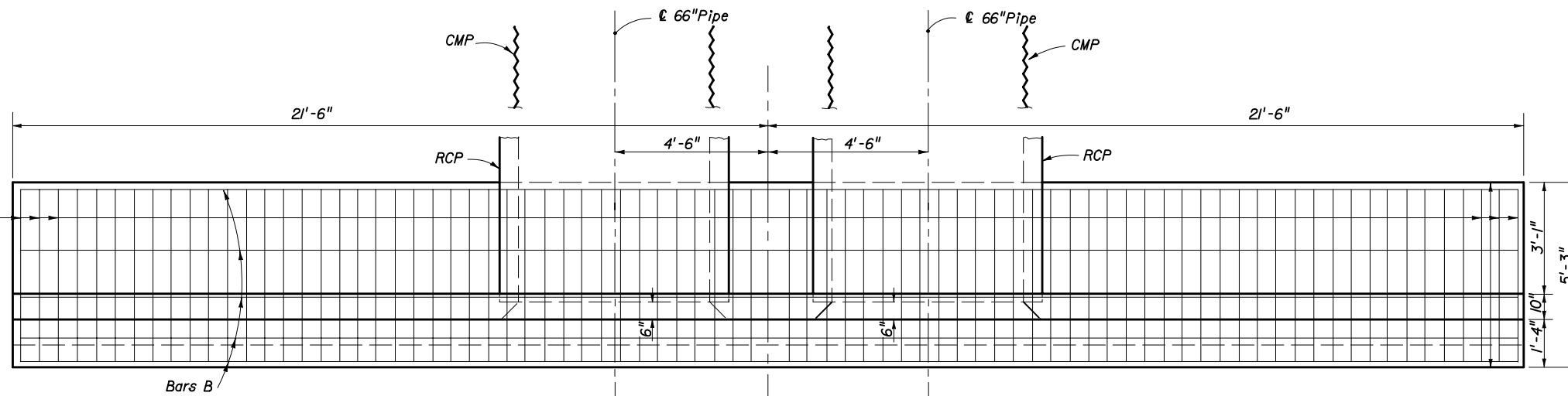
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 66" PIPE

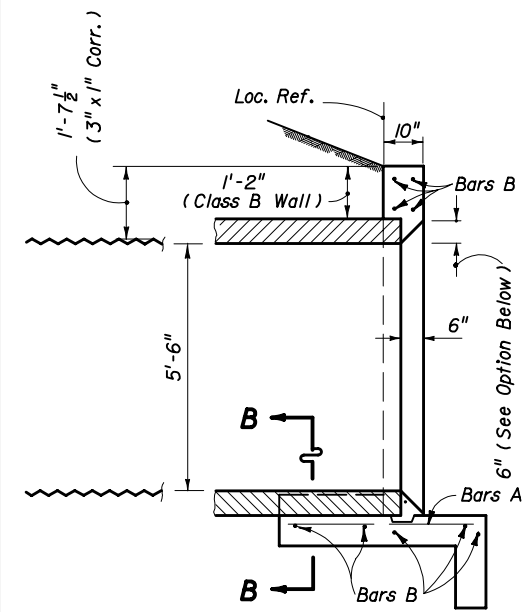
Designed By	JLW	Dates	03/54	Approved By	<i>[Signature]</i>
Drawn By		Revision		Sheet No.	1 of 2
Checked By	RCB	03/54	04	Index No.	252



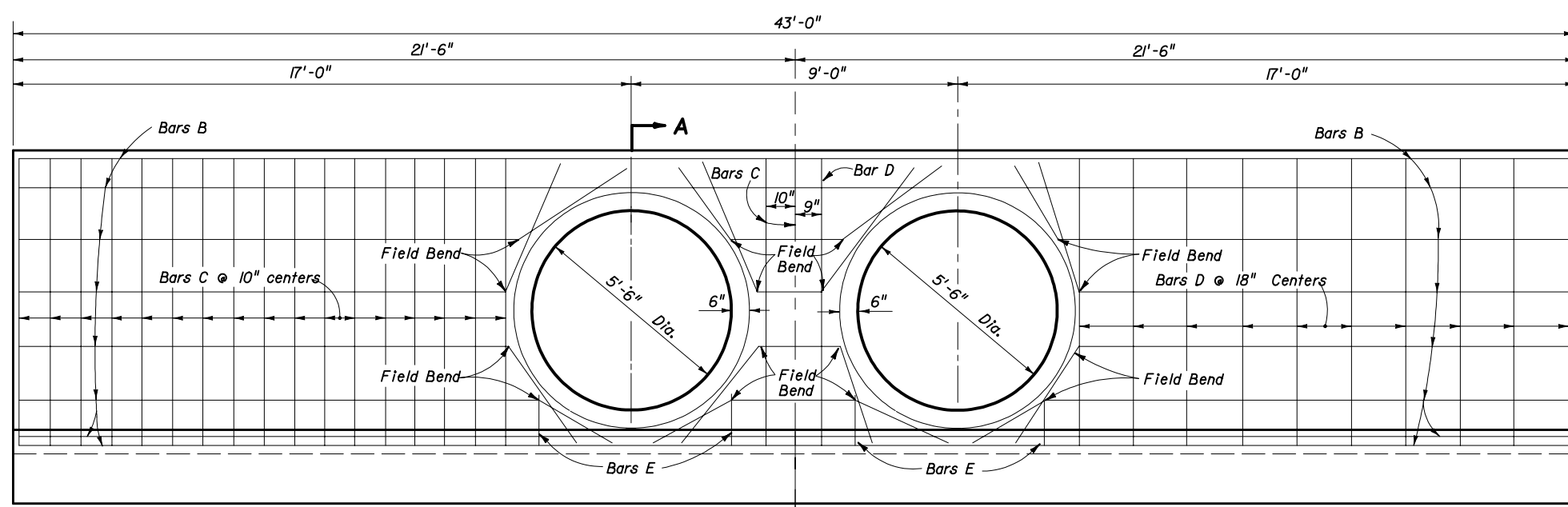
SECTION BB



PLAN
(Showing Bars In Footing)

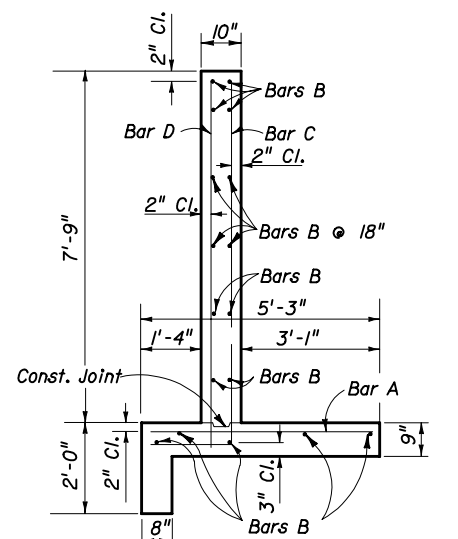


SECTION AA

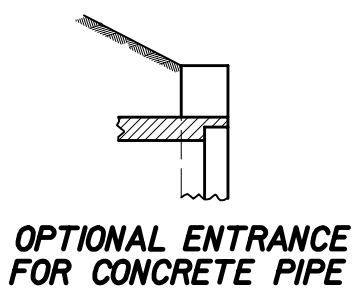


HALF ELEVATION
(Showing Bars In Back Face Of Wall)

HALF ELEVATION
(Showing Bars In Front Face Of Wall)



TYPICAL SECTION THRU ENDWALL



OPTIONAL ENTRANCE FOR CONCRETE PIPE

BILL OF REINFORCING STEEL						BENDING DIAGRAMS		ESTIMATED QUANTITIES			
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING			ITEM	UNIT	RCP	CMP
A	5	80	4'-11"	Footing	Straight			Concrete Class II	Cu. Yd.	16.0	16.2
B	4	17	42'-8"	Footing & Wall	Straight			Reinforcing Steel	Lb.	1,406	1,406
C	5	37	9'-11"	Wall	Bend						
D	4	22	8'-1"	Wall	Straight						
E	4	8	1'-8"	Wall	Straight						

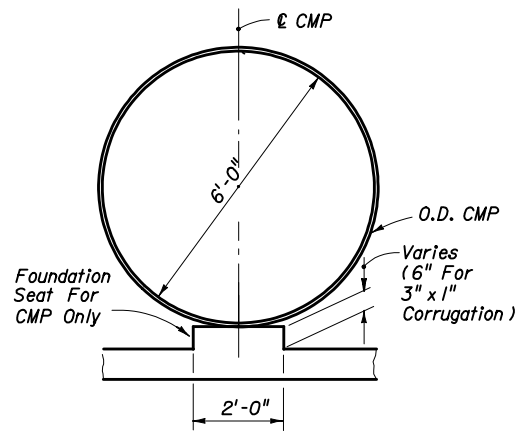
NOTE: All bar dimensions are out to out

NOTE: See Sheet 1 of 2 for General Notes.

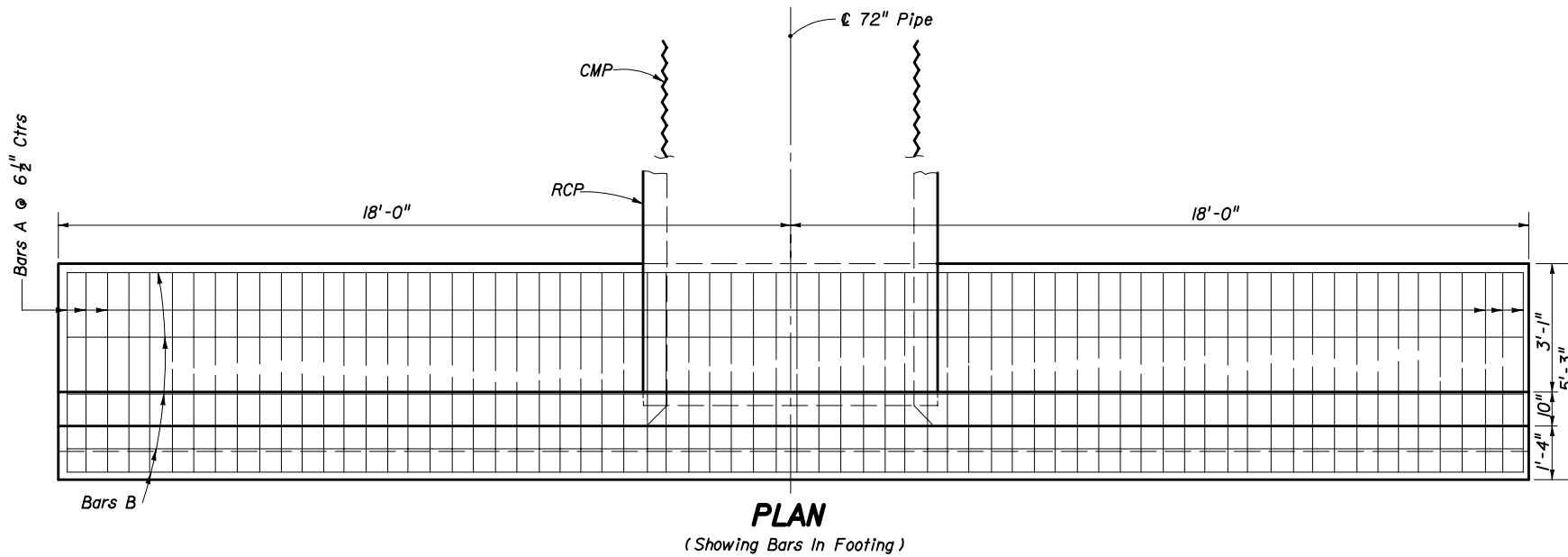
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 66" PIPE

Designed By	JSP	Dates	11/79	Approved By	
Drawn By	FWT	Revision	11/79	State Drainage Engineer	
Checked By		Sheet No.	00	2 of 2	Index No.
					252



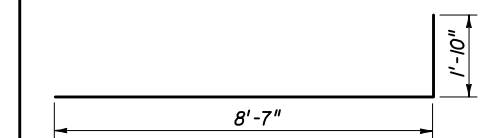
SECTION BB



PLAN
(Showing Bars In Footing)

BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	5	68	4'-11"	Footing	Straight
B	4	17	35'-8"	Footing & Wall	Straight
C	5	34	10'-5"	Wall	Bend
D	4	20	8'-7"	Wall	Straight
E	4	4	2'-6"	Wall	Straight
F	4	4	1'-6"	Wall	Straight

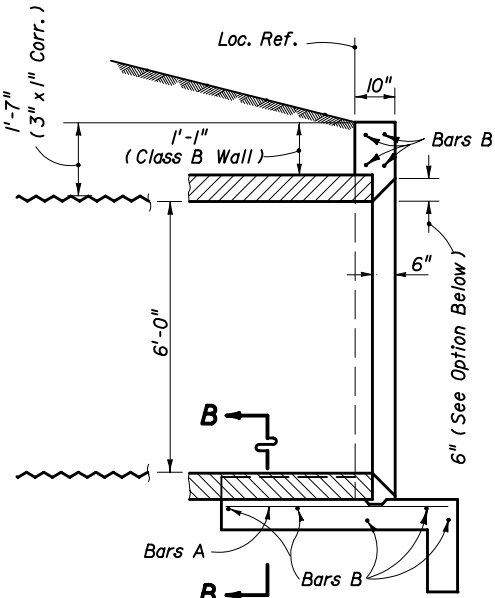
BENDING DIAGRAM



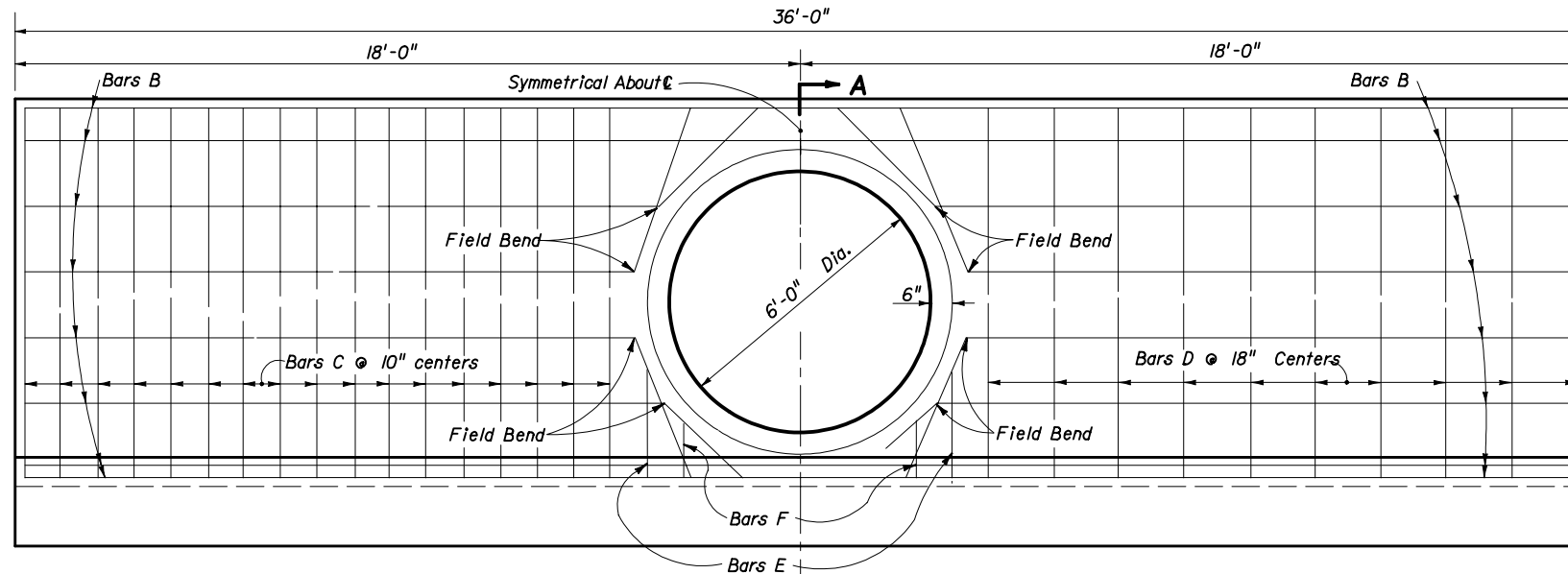
NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	14.4	14.5
Reinforcing Steel	Lb.	1249	1249



SECTION AA

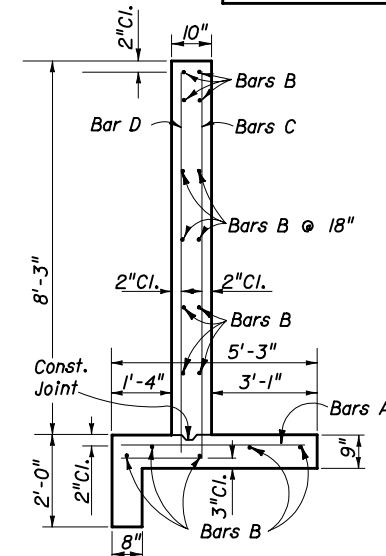


HALF ELEVATION
(Showing Bars In Back Face Of Wall)

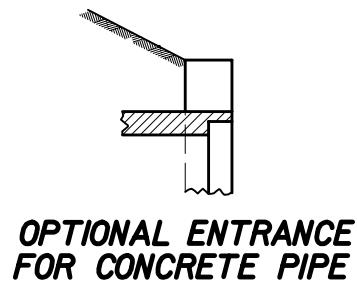
NOTE: Cut and field bend Bars B as shown

HALF ELEVATION
(Showing Bars In Front Face Of Wall)

GENERAL NOTES



TYPICAL SECTION THRU ENDWALL



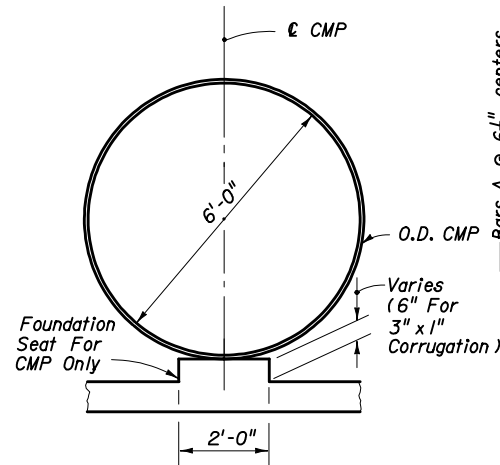
OPTIONAL ENTRANCE FOR CONCRETE PIPE

1. Straight concrete endwalls are intended for use outside the clear zone.
2. Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this index, design specifications AASHTO 1989. Precast construction which adheres to this index, including any additional reinforcement required for handling which shall be determined by the Contractor or supplier, does not require additional approvals. Deviations from this index, for precast units, shall require the approval of the State Drainage Engineer prior to construction. For precast construction, see Index No. 201 for opening and grouting details.
3. Reinforcing steel shall be either Grade 40 or 60.
4. Concrete shall be Class II except concrete meeting the requirements of ASTM C 478 (4000 PSI) may be used in lieu of Class II concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
5. Chamfer: All exposed edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown.
6. That portion of corrugated Metal pipe in direct contact with the concrete slab and extending 12" beyond shall be bituminous coated prior to placing of concrete.
7. Sodding shall be in accordance with Index No. 281 and paid for under the contract unit price for Sodding, SY.
8. Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated on the index. Concrete and reinforcing steel shall be paid for under the contract unit prices for Concrete, Class II (Endwalls), CY and Reinforcing Steel (Roadway), LB.

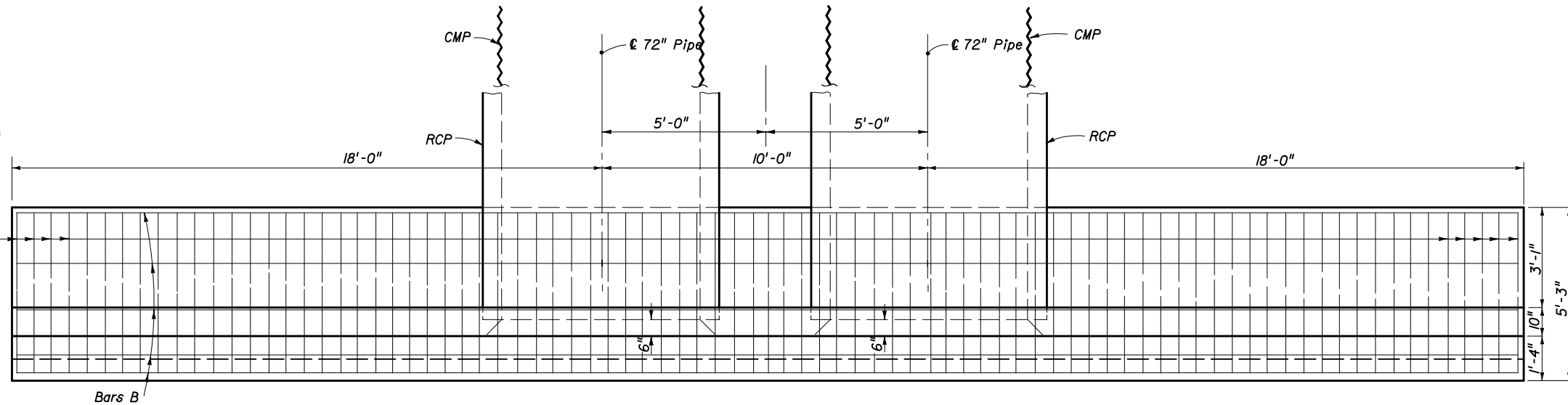
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 72" PIPE

Names	Dates	Approved By		
Designed By	EVC	10/55	 State Drainage Engineer	
Drawn By				
Checked By	WHW	10/55		
		Revision	Sheet No.	Index No.
		04	1 of 2	253

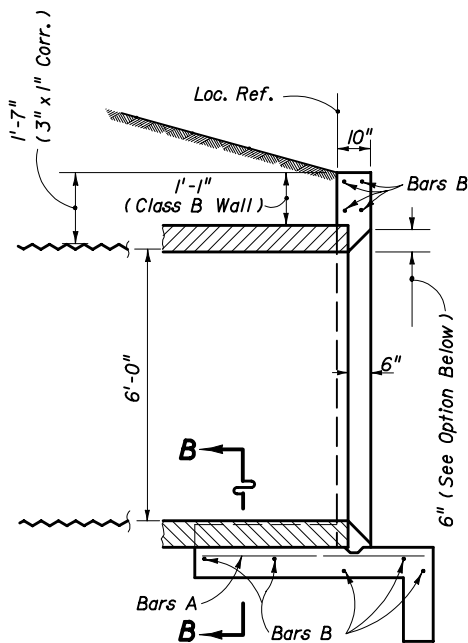


SECTION BB

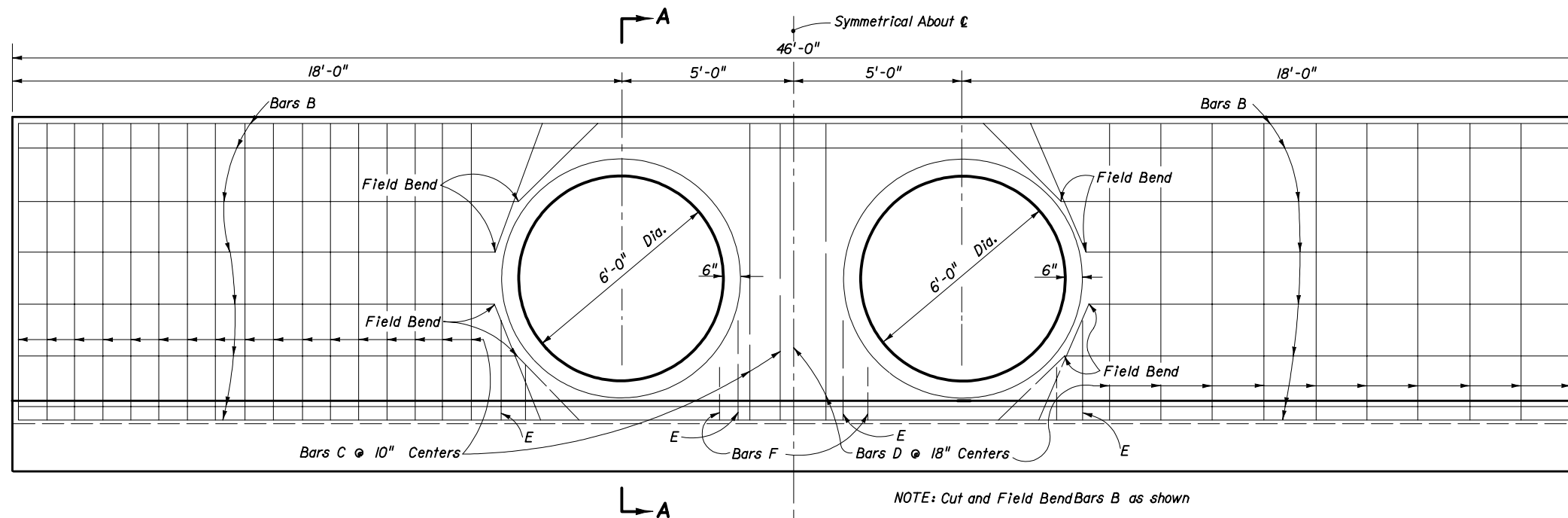


PLAN

(Showing Bars In Footing)



SECTION AA

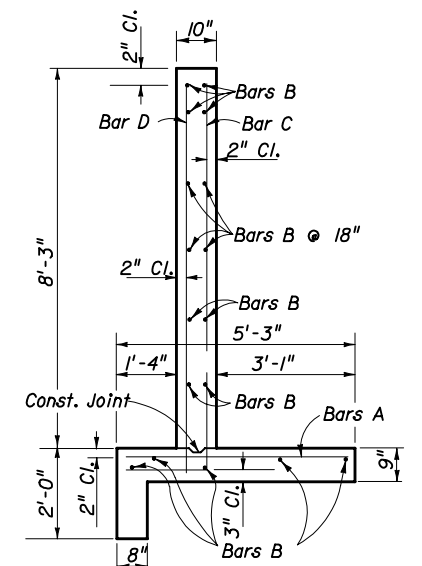


HALF ELEVATION

(Showing Bars In Back Face Of Wall)

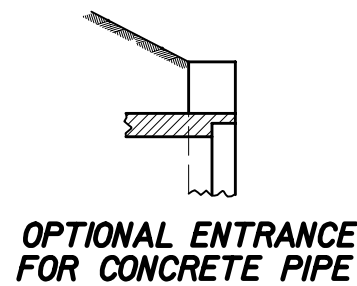
HALF ELEVATION

(Showing Bars In Front Face Of Wall)



TYPICAL SECTION THRU ENDWALL

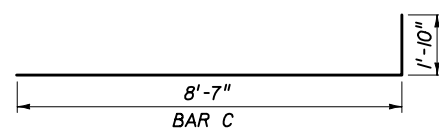
NOTE: Cut and Field Bend Bars B as shown



OPTIONAL ENTRANCE FOR CONCRETE PIPE

BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	5	85	4'-11"	Footing	Straight
B	4	17	45'-8"	Footing & Wall	Straight
C	5	38	10'-5"	Wall	Bend
D	4	23	8'-7"	Wall	Straight
E	4	8	2'-6"	Wall	Straight
F	4	8	1'-6"	Wall	Straight

BENDING DIAGRAM



NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

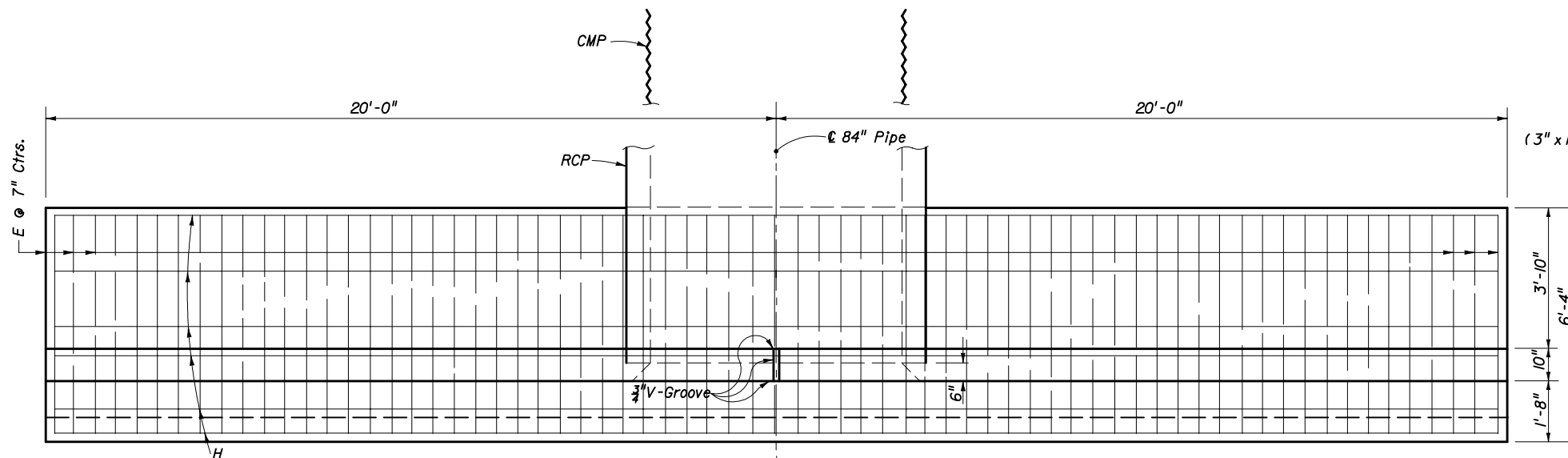
ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	17.5	17.8
Reinforcing Steel	Lb.	1519	1519

NOTE: See Sheet 1 of 2 for General Notes.

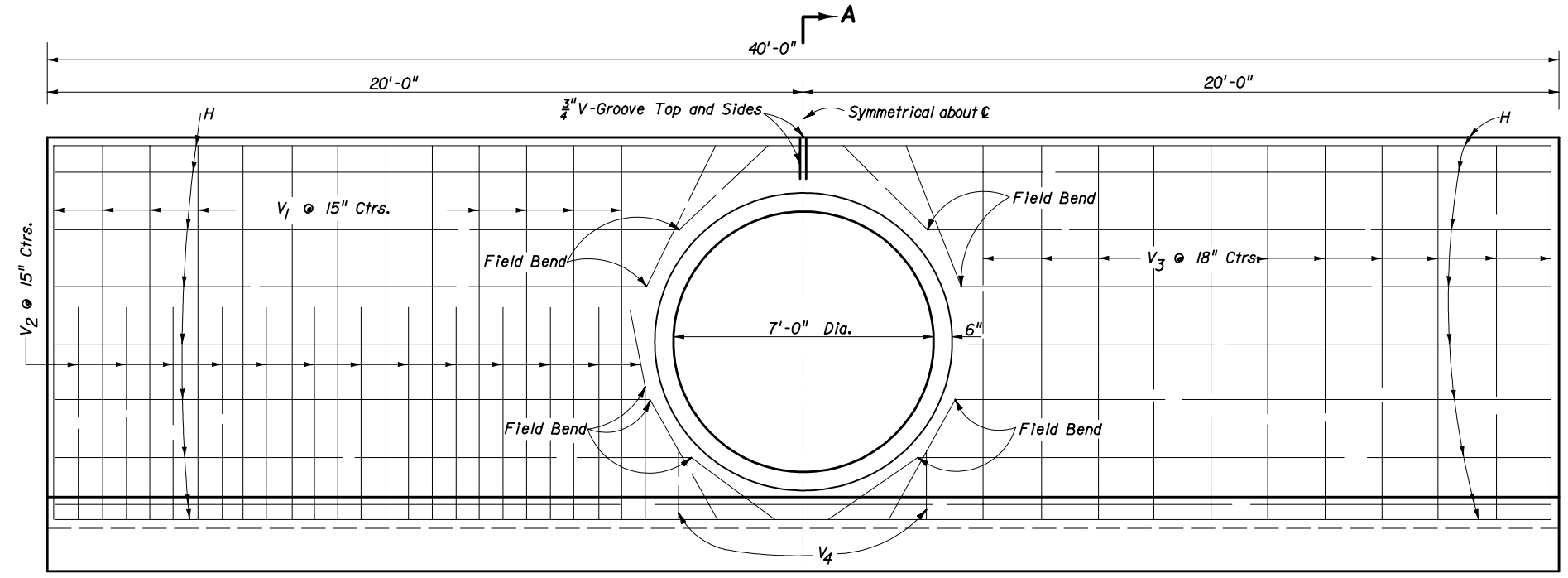
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 72" PIPE

Names	Dates	Approved By		
Designed By	EVC	10/55	 State Drainage Engineer	
Drawn By				
Checked By	WHW	10/55		
Revision	00	2 of 2	Index No.	253



PLAN
(Showing Bars In Footing)



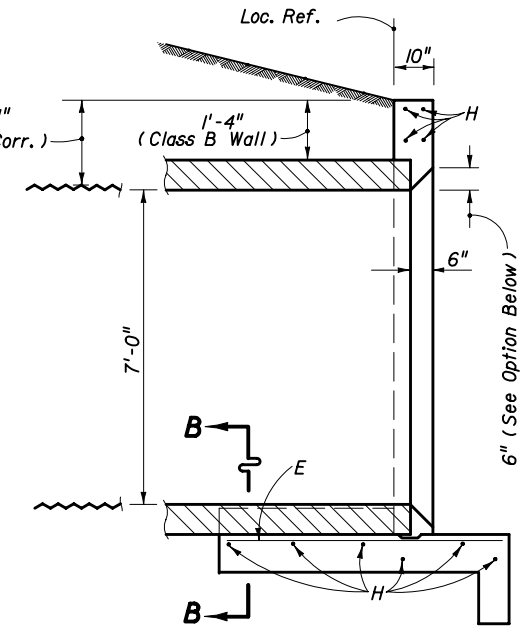
HALF ELEVATION
(Showing Bars In Back Face Of Wall)

GENERAL NOTES

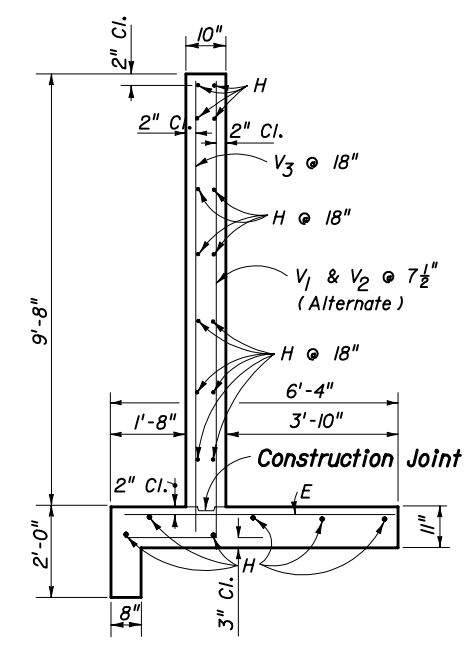
HALF ELEVATION
(Showing Bars In Front Face Of Wall)

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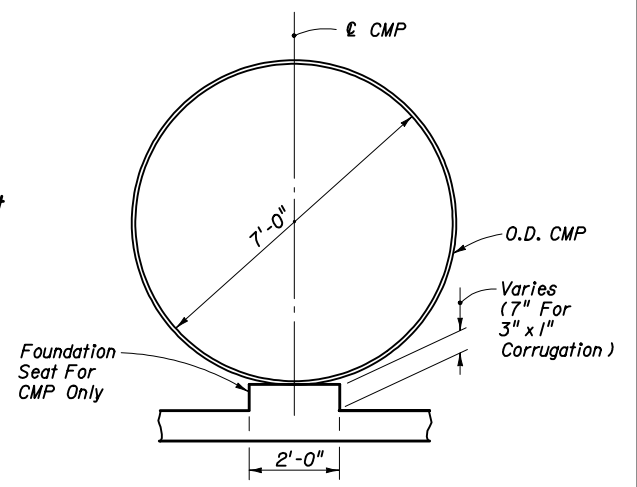
5. Chamfer: All exposed edges and corners to be chamfered 3/4" unless otherwise shown.
6. That portion of corrugated metal pipe in direct contact with the concrete slab and extending 12" beyond shall be bituminous coated prior to placing of the concrete.
7. Sodding shall be in accordance with Index No. 281 and paid for under the contract unit price for Sodding, SY.
8. Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated on the index. Concrete and reinforcing steel shall be paid for under the contract unit prices for Concrete, Class II (Endwalls), CY and Reinforcing Steel (Roadway), LB.



SECTION AA



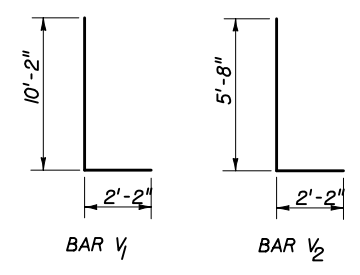
TYPICAL SECTION THRU ENDWALL



SECTION BB

BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
E	6	69	6'-0"
H	4	20	39'-8"
V1	6	26	12'-4"
V2	6	26	7'-10"
V3	4	22	10'-2"
V4	4	4	2'-0"

BENDING DIAGRAM



NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

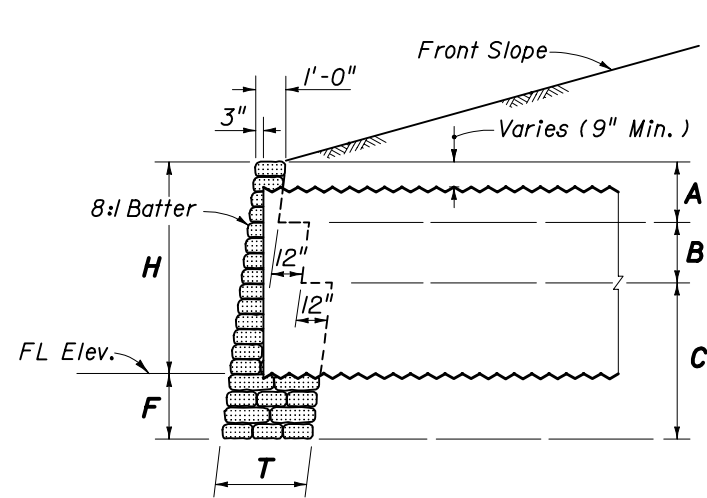
ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	20.0	20.2
Reinforcing Steel	Lb.	2,095	2,095

OPTIONAL ENTRANCE FOR CONCRETE PIPE

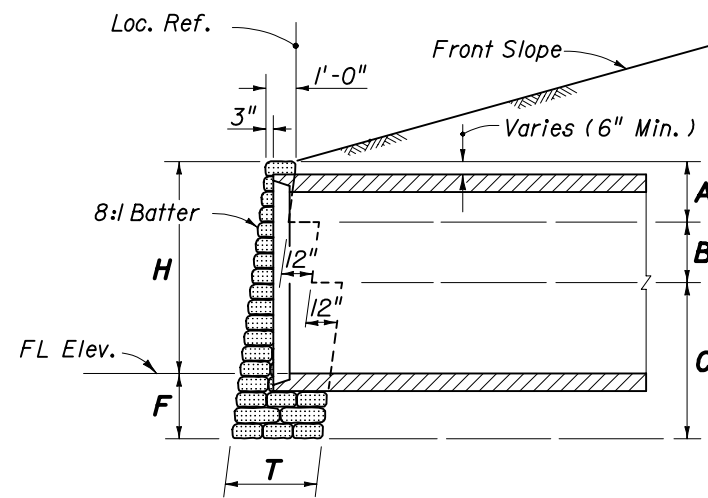
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT CONCRETE ENDWALL
SINGLE 84" PIPE

Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By	WHW 07/58			
Checked By	HCG 07/58	04	1 of 1	255

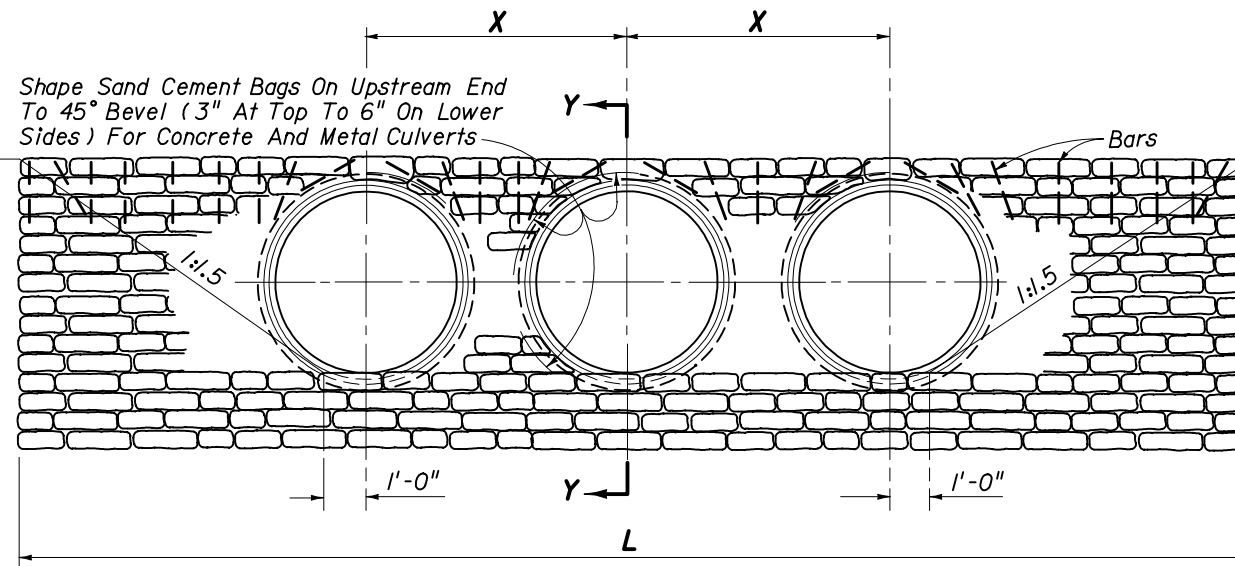


CORRUGATED METAL PIPE



CONCRETE PIPE

SECTION YY



- Note: (1) For concrete and corrugated metal pipes. Concrete pipe shown.
 (2) The top row of riprap bags shall be secured by pinning, using #4 reinforcing bars 18 inches in length, as follows:
 (a) The end bags shall be secured using two bars per bag, one vertical and one diagonal as shown.
 (b) The next to last bag on each end shall be secured with two bars vertically.
 (c) Bags located over the pipe shall be secured by a bar which is driven diagonally except that for concrete pipe two bars shall be used for single bags above the pipe.
 (d) Intermediate bags shall be secured with a single bar.
 Bars shall be driven to one inch below the surface of the bag.
 The cost of furnishing and installing the bars shall be included in the cost of the riprap.

FRONT ELEVATION

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE ENDWALL

SIZE OF PIPE	H	T	A	B	C	F	X	ONE PIPE CULVERTS		TWO PIPE CULVERTS		THREE PIPE CULVERTS		FOUR PIPE CULVERTS					
								L	RIPRAP CY		L	RIPRAP CY		L	RIPRAP CY		L	RIPRAP CY	
									CP	CMP		CP	CMP		CP	CMP		CP	CMP
18"	2'-3"	1'-0"	4'-0"	0'-0"	0'-0"	1'-9"	2'-10"	8'-9"	1.2	1.2	11'-7"	1.5	1.6	14'-5"	1.8	1.9	17'-3"	2.1	2.3
24"	2'-9"	2'-0"	2'-0"	2'-6"	0'-0"	1'-9"	3'-5"	10'-3"	2.4	2.5	13'-8"	3.0	3.2	17'-1"	3.7	4.0	20'-6"	4.3	4.7
30"	3'-4"	2'-0"	2'-0"	3'-2"	0'-0"	1'-10"	4'-3"	12'-0"	3.3	3.4	16'-3"	4.2	4.5	20'-6"	5.1	5.5	24'-9"	6.0	6.5
36"	3'-10"	2'-0"	2'-0"	3'-8"	0'-0"	1'-10"	5'-1"	13'-6"	4.0	4.2	18'-7"	5.2	5.7	23'-8"	6.3	6.9	28'-9"	7.4	8.2
42"	4'-5"	3'-0"	2'-0"	2'-0"	2'-4"	1'-11"	6'-0"	15'-3"	6.4	6.7	21'-3"	8.3	8.9	27'-3"	10.2	11.2	33'-3"	12.3	13.4
48"	4'-11"	3'-0"	2'-0"	2'-0"	2'-10"	1'-11"	6'-9"	16'-9"	7.7	8.1	23'-6"	10.0	10.8	30'-3"	12.3	13.5	37'-0"	14.5	16.2
54"	5'-6"	3'-0"	2'-0"	2'-0"	3'-6"	2'-0"	7'-8"	18'-6"	9.5	10.1	26'-2"	12.4	13.5	33'-10"	15.3	17.0	41'-6"	18.2	20.4
60"	6'-0"	3'-0"	2'-0"	2'-0"	4'-0"	2'-0"	8'-6"	20'-0"	11.0	11.7	28'-6"	14.4	15.8	37'-0"	17.8	19.8	45'-6"	21.1	23.8
66"	6'-7"	3'-0"	2'-0"	2'-0"	4'-8"	2'-1"	9'-3"	21'-9"	13.2	14.1	31'-0"	17.2	18.9	40'-3"	21.2	23.7	49'-6"	25.1	28.5
72"	7'-1"	3'-0"	2'-0"	2'-0"	5'-2"	2'-1"	10'-0"	23'-3"	15.0	16.0	33'-3"	19.4	21.4	43'-3"	23.9	26.8	53'-3"	28.3	32.3
78"	7'-8"	3'-0"	2'-0"	2'-0"	5'-10"	2'-2"	10'-9"	25'-0"	17.5	18.7	35'-9"	22.6	25.0	46'-6"	27.8	31.3	57'-3"	32.9	37.6
84"	8'-2"	3'-0"	2'-0"	2'-0"	6'-4"	2'-2"	11'-8"	26'-6"	19.5	20.9	38'-2"	25.3	28.1	49'-10"	31.1	35.2	61'-6"	36.9	42.4

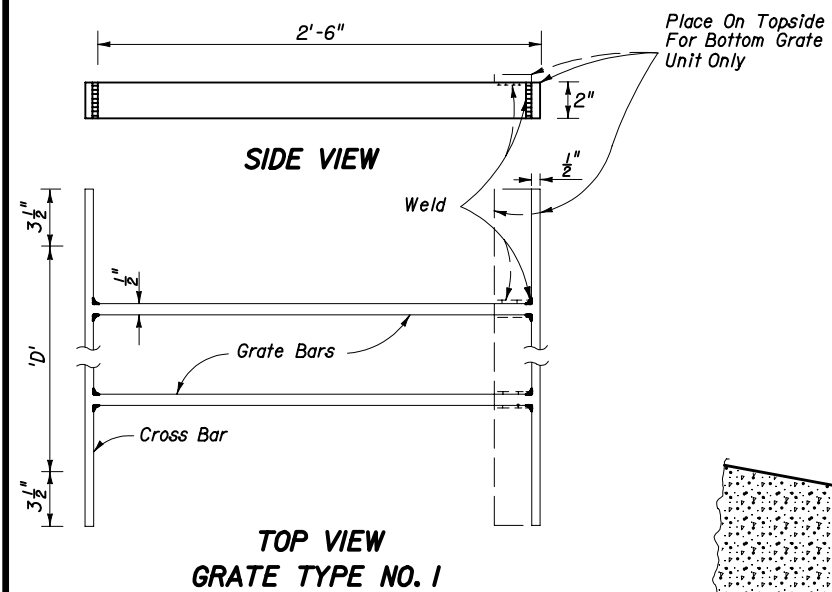
GENERAL NOTES

1. Straight sand-cement endwalls are intended for use outside the clear zone.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

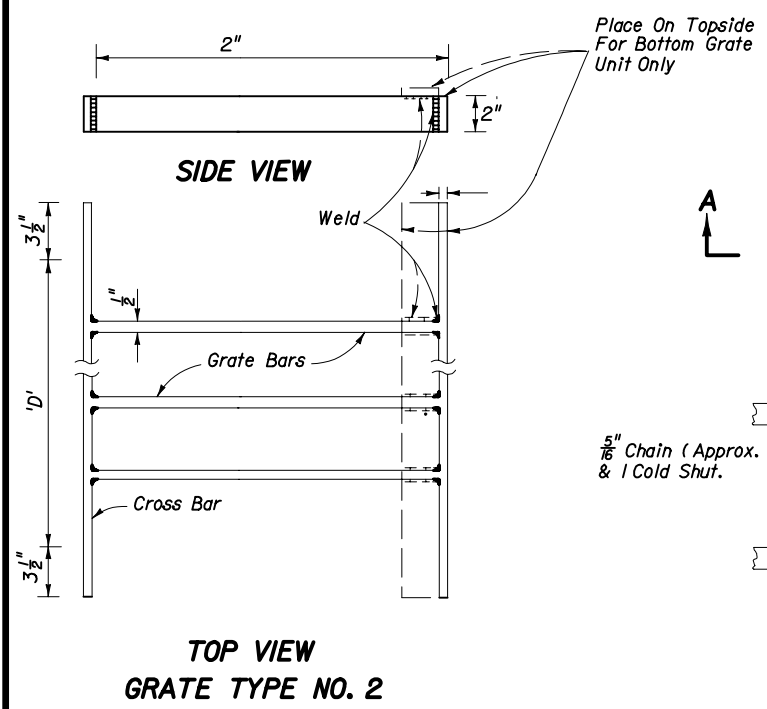
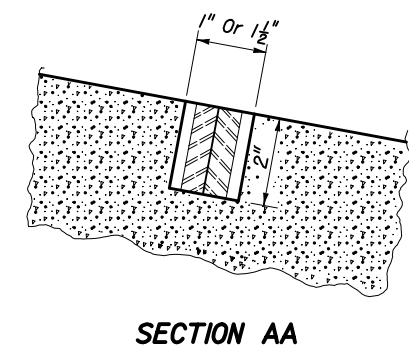
STRAIGHT SAND-CEMENT ENDWALLS

Designed By	Names	Dates	Approved By
Drawn By	JBW	07/88	<i>[Signature]</i> State Drainage Engineer
Checked By	JVG/EGR	08/88	Revision
			Sheet No. 1 of 1
			Index No. 258



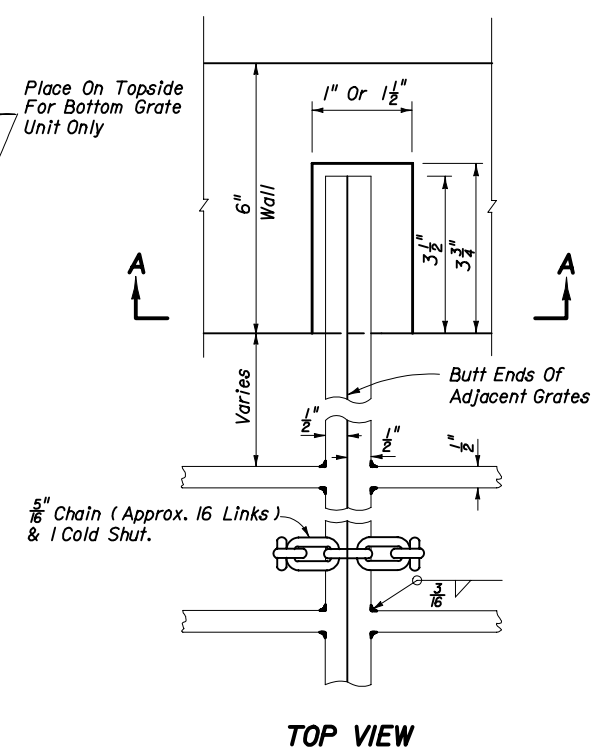
Pipe Size	Grate Bars Req'd.	Grate LB.
15"	2	28.93

Bars to be evenly spaced across dimension 'D'.
All bars 1/2" x 2".

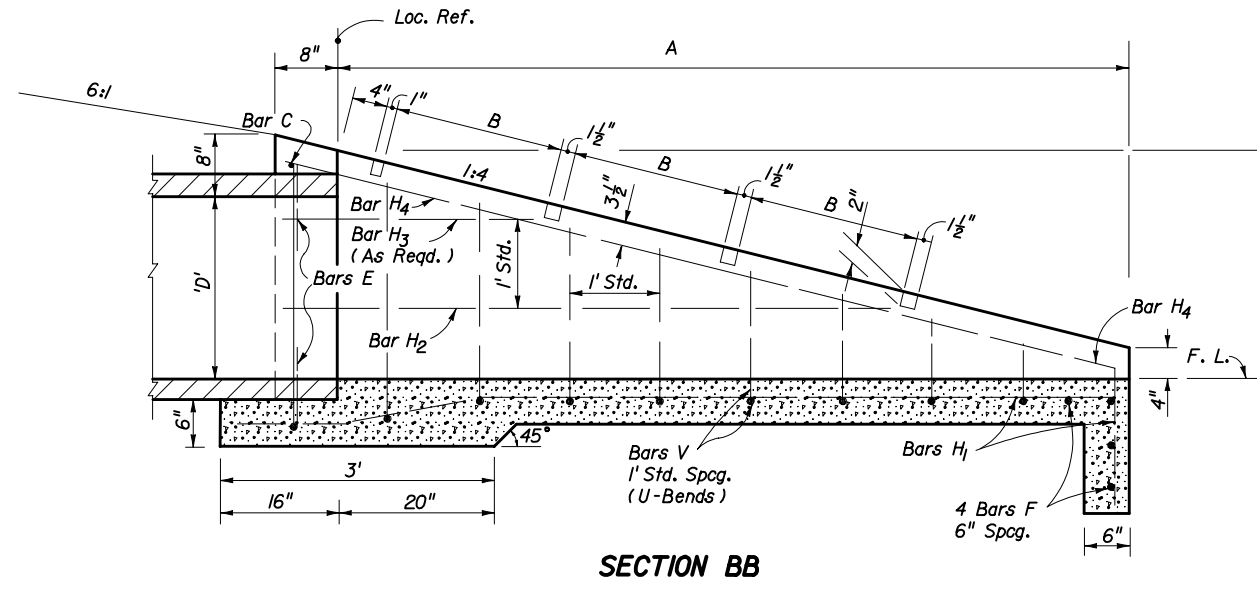


Pipe Size	Grate Bars Req'd.	Grate LB.
18"	3	33.69
24"	4	43.63
30"	5	53.55

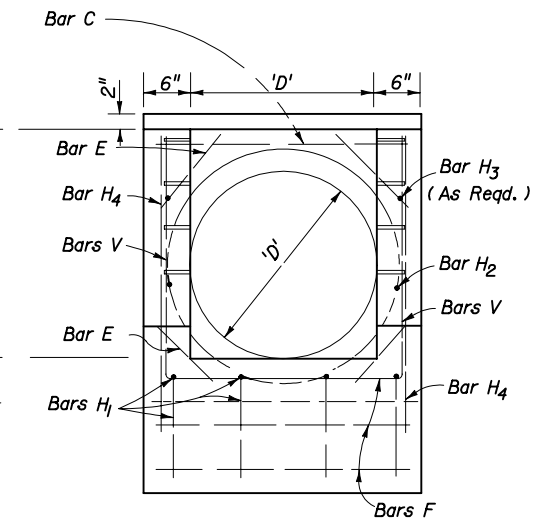
Bars to be evenly spaced across dimension 'D'.
All bars 1/2" x 2".



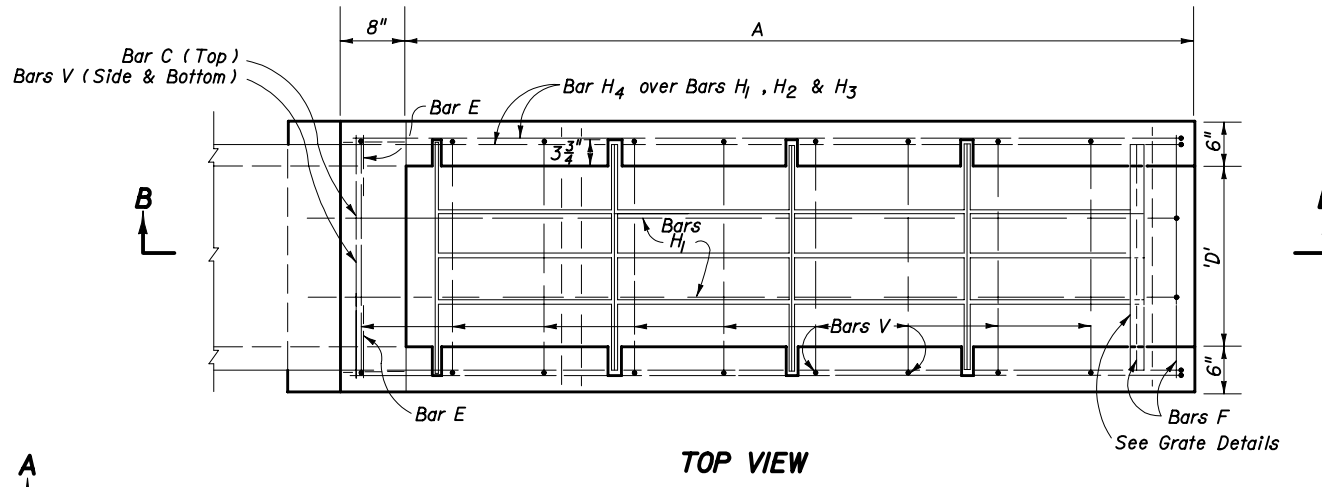
GRATE, SEAT, WELD & CHAIN DETAIL



SECTION BB



END VIEW

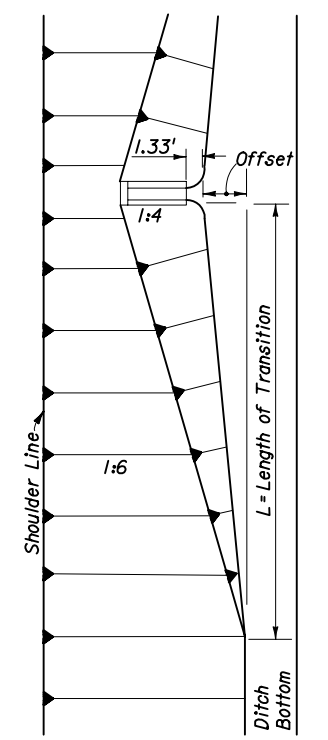


TOP VIEW

Slope	Pipe Size D	TABLE OF DIMENSIONS AND QUANTITIES		Conc. Class I (CY)	Reinf. Steel (Lbs.)	Number Of Grates Req'd		Total Grate Wt. (Lbs.)	Sodding (SY)	Slope Transition	
		A	B			Type No. 1	Type No. 2			Offset	L
4:1	15"	5.67'	2.38'	0.85	56	2	0	57.86	15	4.2'	42'
	18"	6.67'	1.875'	1.01	73	0	3	101.08	16	4.8'	48'
	24"	8.67'	1.875'	1.65	97	0	4	174.52	19	5.8'	58'
	30"	10.67'	1.875'	2.33	129	0	5	267.75	21	6.9'	69'

GENERAL NOTES

- This endwall is to be used only in the clear zone for the drainage of medians and other areas having low design velocities and negligible debris. Grates exposed to salt water shall be designated in the plan as Alternate G.
- Reinforcing steel: All bars are size #4. Spacings shown are center to center. Laps to be 12" minimum. Clearance is 2" except as noted.
Square welded wire fabric (two cages max.) having an equivalent cross sectional area (0.20 sq. in.) may be substituted for bar reinforcement.
- Grates shall be ASTM A242/A242M, A572/A572M or ASTM A588/A588M, Grade 50 steel, and galvanized in accordance with Section 962-7 of the Standard Specifications.
- Endwall to be paid for under the contract unit price for U-Endwall With Grate, Each. Payment shall include cost of concrete, reinforcing steel, grate, and accessories. Quantities shown are for estimating purposes only.
- Sod slopes 5' each side and above endwall. Sodding to be paid for under contract unit price for sodding.
- Precasting of this endwall will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer. Use Index No. 201 for opening and grouting details.
- Concrete meeting the requirements of ASTM C 478 (4,000 P.S.I.) may be used in lieu of Class I concrete for precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.



FRONT SLOPE TRANSITION AT ENDWALL

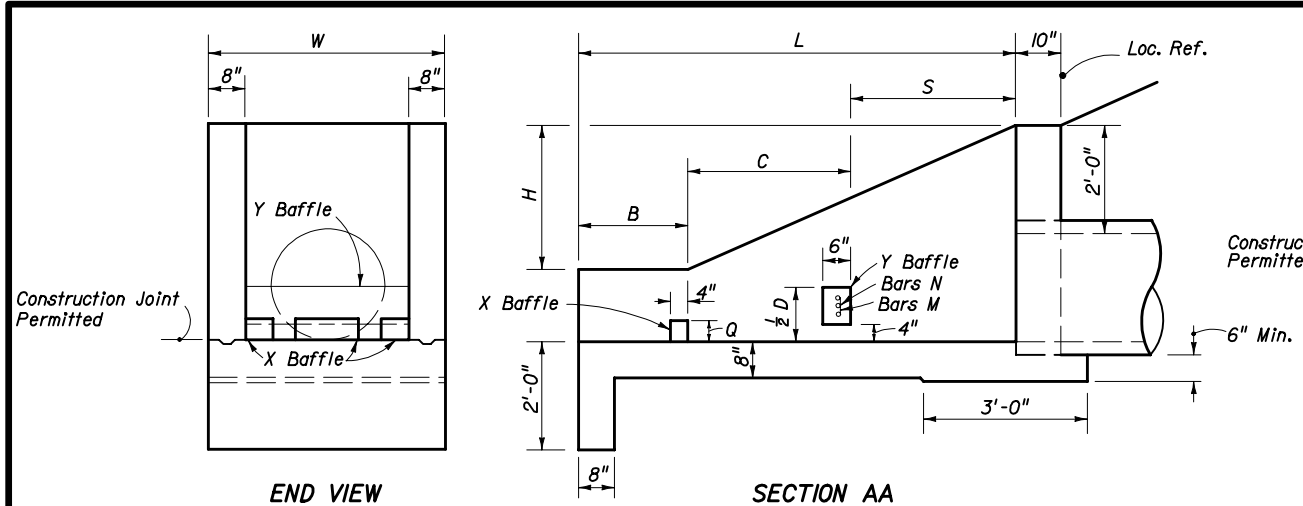
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

U-TYPE CONCRETE ENDWALLS WITH GRATES

15" TO 30" PIPE

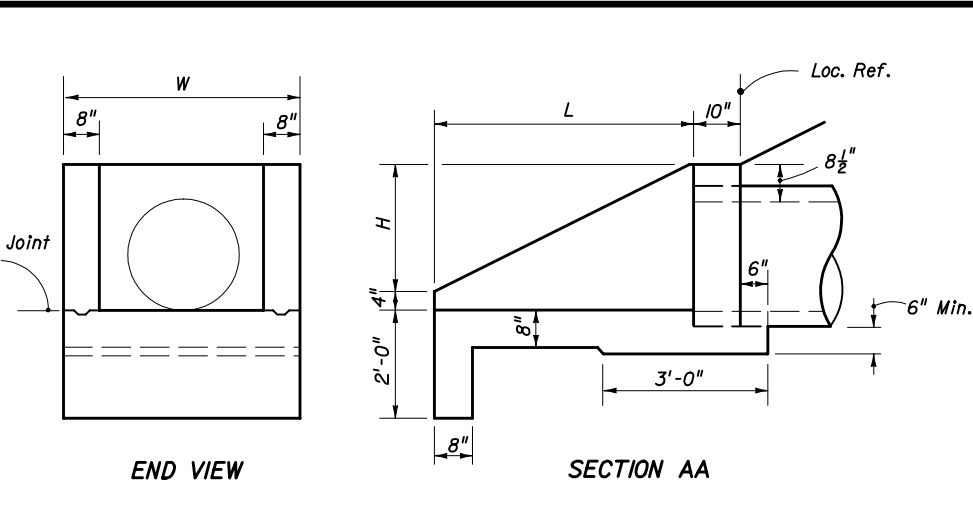
Names	Dates	Approved By
Designed By: EGR	06/77	<i>[Signature]</i> State Drainage Engineer
Drawn By: HKH	06/77	
Checked By: JVG	06/77	

Revision	Sheet No.	Index No.
00	1 of 1	260



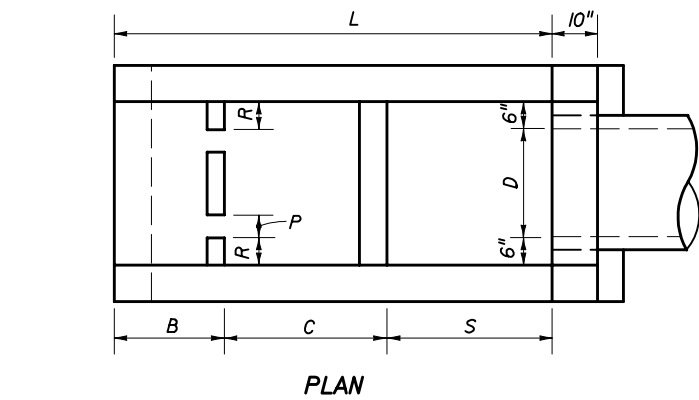
END VIEW

SECTION AA



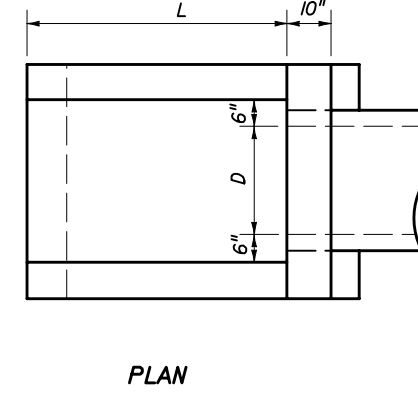
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SECTION AA



PLAN

DIMENSIONAL DETAILS

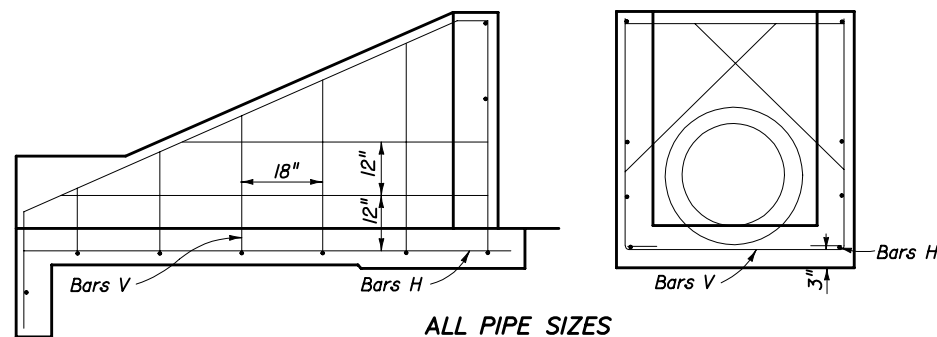


PLAN

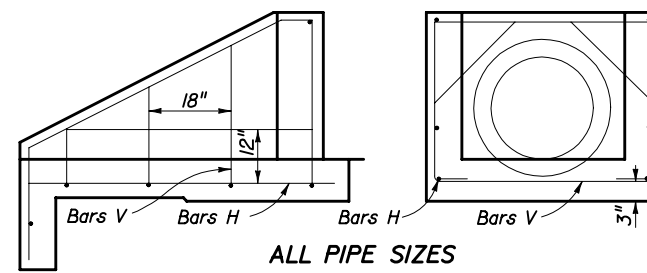
DIMENSIONAL DETAILS

GENERAL NOTES

1. Baffles to be constructed only when called for in plans.
2. When steel grating is required on endwall see Sheet 3 of 3 for details.
3. All reinforcing No. 4 bars with 2" clearance except as noted.
4. All angles, channels and bars shall be ASTM A242/A242M, A572/A572M or A588/A588M Grade 50 steel, when designated Alternate G in the plans galvanized in accordance with Section 962-7 of the Standard Specifications.
5. Channel section C 3 x 6 may be substituted for C 4 x 5.4 channel.
6. Precasting of this endwall will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer. Use Index No. 201 for opening and grouting details.
7. Concrete meeting the requirements of ASTM C-478 (4000 psi) may be used in lieu of Class I concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
8. Sodding shall be in accordance with Index No. 281, and paid for under the contract unit price for Sodding, SY.
9. Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY and Reinforcing Steel (Roadway), LB. Cost of grates to be paid for under the contract unit price for Endwall Grate, LB, plan quantity. Cost of galvanized bolts and nuts to be included in the bid price for the grate.



ALL PIPE SIZES
SIDE VIEW AND BACKWALL SECTION
REINFORCING DETAIL



ALL PIPE SIZES
SIDE VIEW AND BACKWALL SECTION
REINFORCING DETAIL

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL														
Pipe Size		X Baffle							Y Baffle Reinf. Steel		Concrete Class I Cu. Yd.	Reinf. Steel Lbs.		
D	Area Sq. Ft.	L	H	W	S	B	C	P	Q	R			Bar M	Bar N
15"	1.23	5'-9"	2'-3 1/2"	3'-7"	2'-3"	1'-3"	2'-3"	4"	4"	4"	2 #4	1 #4	1.61	72
18"	1.77	6'-6"	2'-5"	3'-10"	2'-6"	1'-6"	2'-6"	4"	4"	5"	3 #4	2 #4	1.89	86
24"	3.14	8'-0"	2'-8"	4'-4"	3'-0"	2'-0"	3'-0"	5"	5"	6"	4 #4	3 #4	2.52	108
30"	4.91	9'-6"	2'-11"	4'-10"	3'-6"	2'-6"	3'-6"	5"	5"	7"	4 #4	4 #4	3.34	131

WITH BAFFLES

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL						
Pipe Size		L	H	W	Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
D	Area Sq. Ft.	L	H	W	Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
15"	1.23	3'-3"	1'-7 1/2"	3'-7"	0.89	39
18"	1.77	3'-9"	1'-10 1/2"	3'-10"	1.05	43
24"	3.14	4'-9"	2'-4 1/2"	4'-4"	1.40	55
30"	4.91	5'-9"	2'-10 1/2"	4'-10"	1.88	64

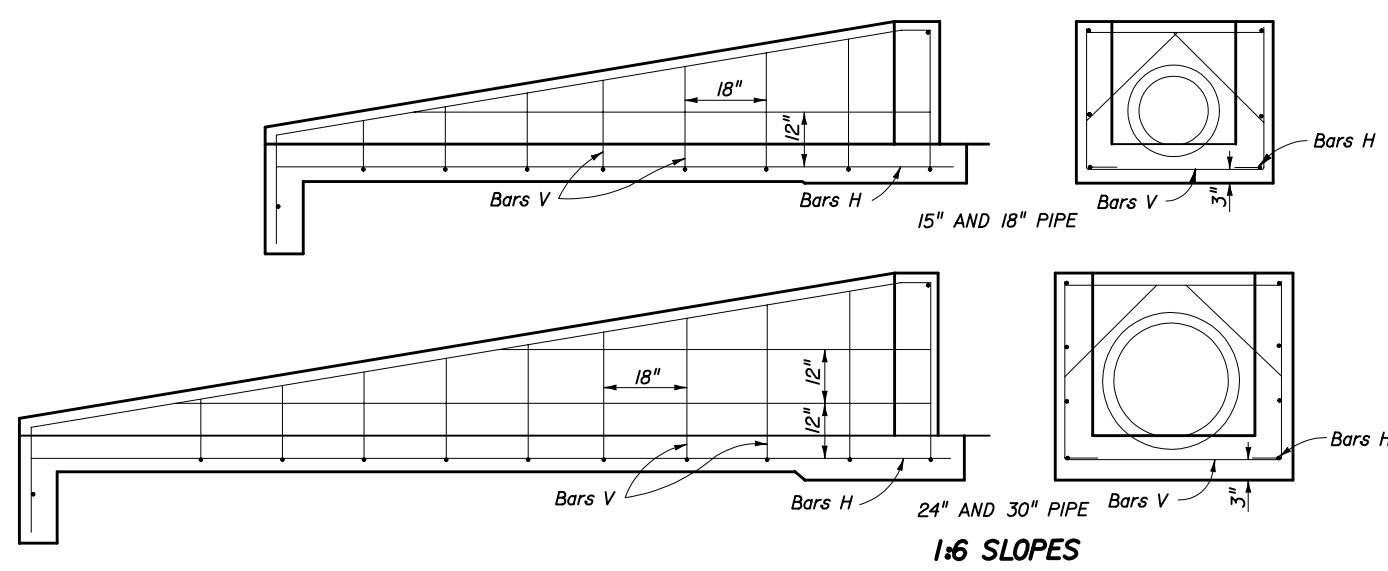
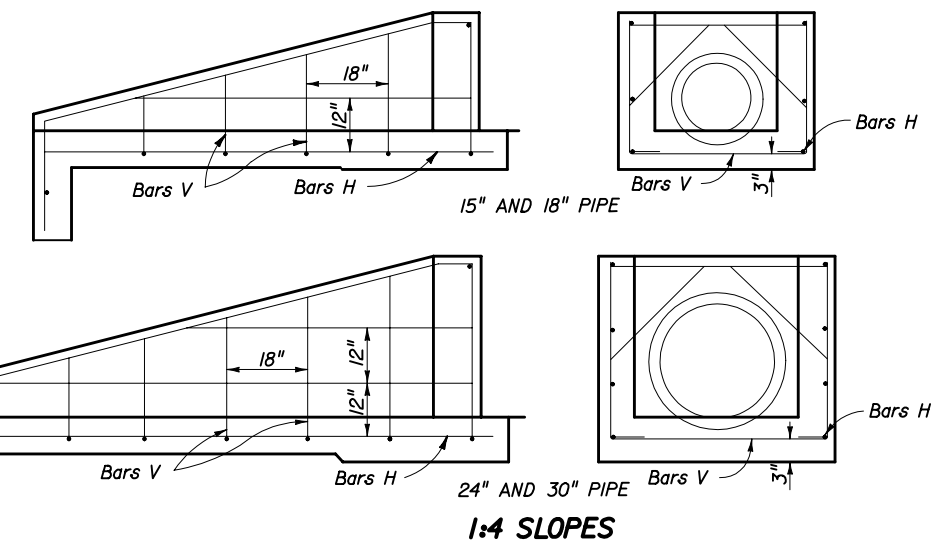
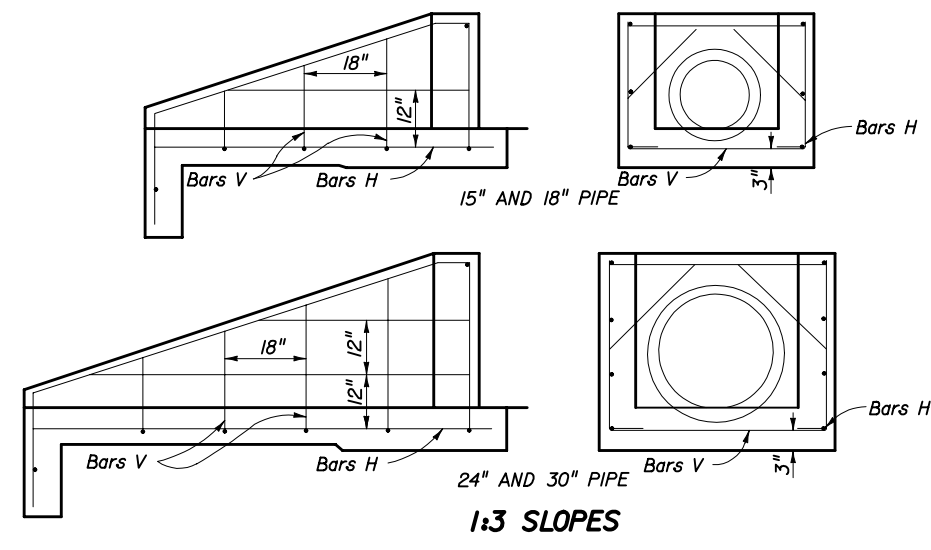
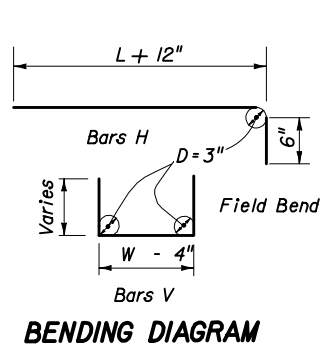
WITHOUT BAFFLES

ENDWALLS FOR 2:1 SLOPES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

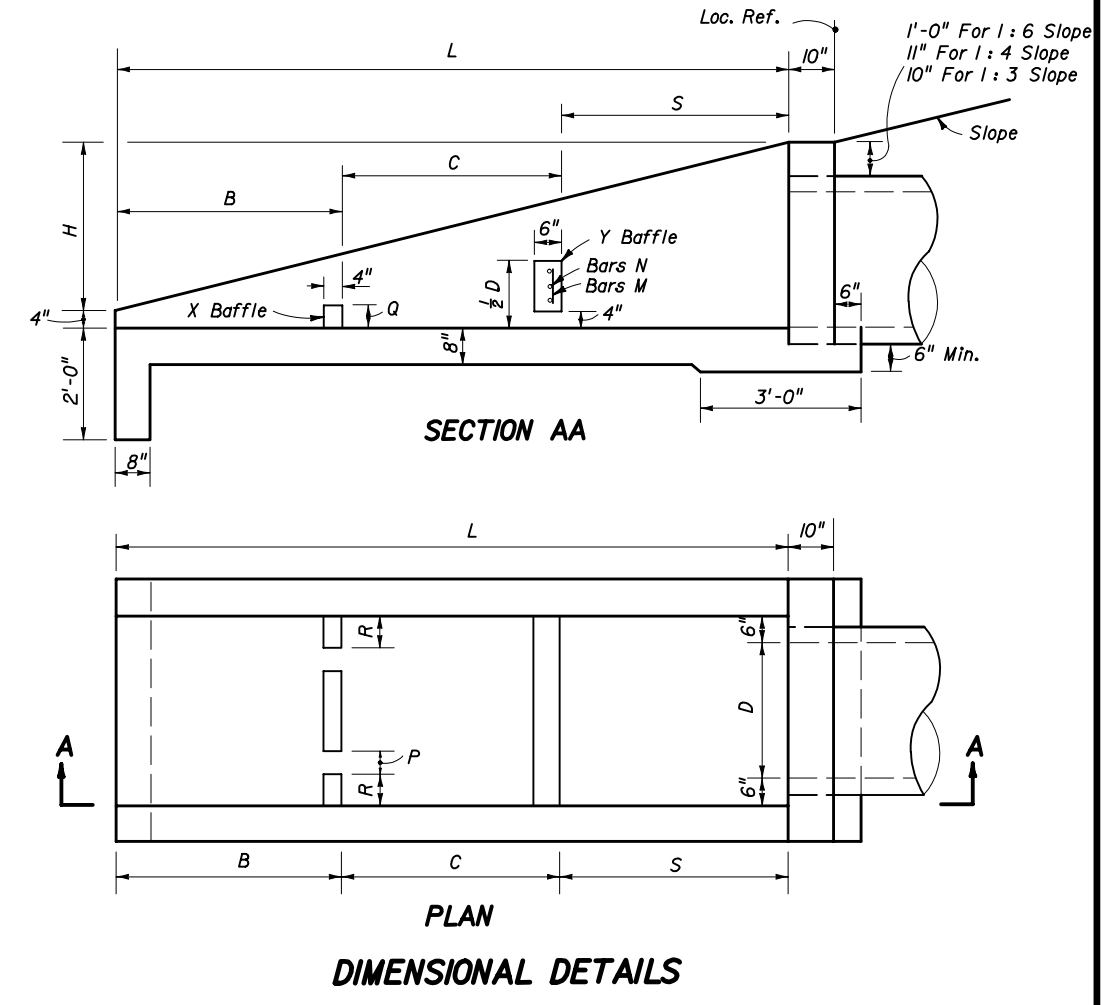
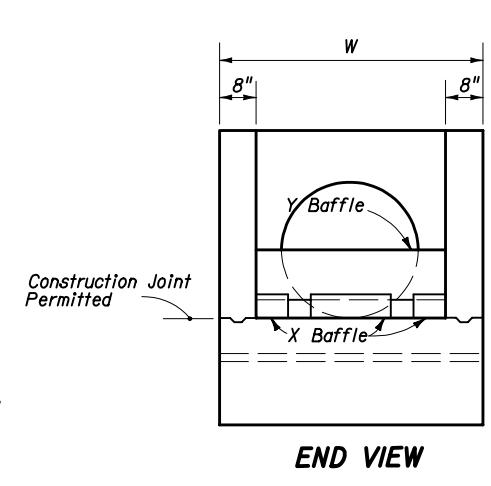
**U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRATE OPTIONAL
15" TO 30" PIPE**

Names	Dates	Approved By			
Designed By		State Drainage Engineer			
Drawn By	dde 09/85				
Checked By					
Revision	00				Sheet No.



SIDE VIEWS AND BACKWALL SECTIONS REINFORCING DETAILS

ENDWALLS WITH AND WITHOUT BAFFLES FOR 1:3, 1:4 AND 1:6 SLOPES



DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL

Rate Of Slope	Pipe Size		Baffle Locations (When Required)			Concrete Class I Cu. Yd.	Reinf. Steel Lbs.	
	D	Area Sq. Ft.	L	H	W			
1:3	15"	1.23	5'-3"	1'-9"	3'-7"	1'-9" 1'-9" 1'-9"	1.19	51
	18"	1.77	6'-0"	2'-0"	3'-10"	2'-0" 2'-0" 2'-0"	1.42	56
	24"	3.14	7'-6"	2'-6"	4'-4"	2'-6" 2'-6" 2'-6"	1.94	77
	30"	4.91	9'-0"	3'-0"	4'-10"	3'-0" 3'-0" 3'-0"	2.54	96
1:4	15"	1.23	7'-4"	1'-10"	3'-7"	2'-6" 2'-6" 2'-4"	1.54	64
	18"	1.77	8'-4"	2'-1"	3'-10"	2'-10" 2'-10" 2'-8"	1.84	71
	24"	3.14	10'-4"	2'-7"	4'-4"	3'-6" 3'-6" 3'-4"	2.53	92
	30"	4.91	12'-4"	3'-1"	4'-10"	4'-2" 4'-2" 4'-0"	3.34	124
1:6	15"	1.23	11'-6"	1'-11"	3'-7"	3'-10" 3'-10" 3'-10"	2.19	89
	18"	1.77	13'-0"	2'-2"	3'-10"	4'-4" 4'-4" 4'-4"	2.63	103
	24"	3.14	16'-0"	2'-8"	4'-4"	5'-4" 5'-4" 5'-4"	3.59	143
	30"	4.91	19'-0"	3'-2"	4'-10"	6'-4" 6'-4" 6'-4"	4.81	180

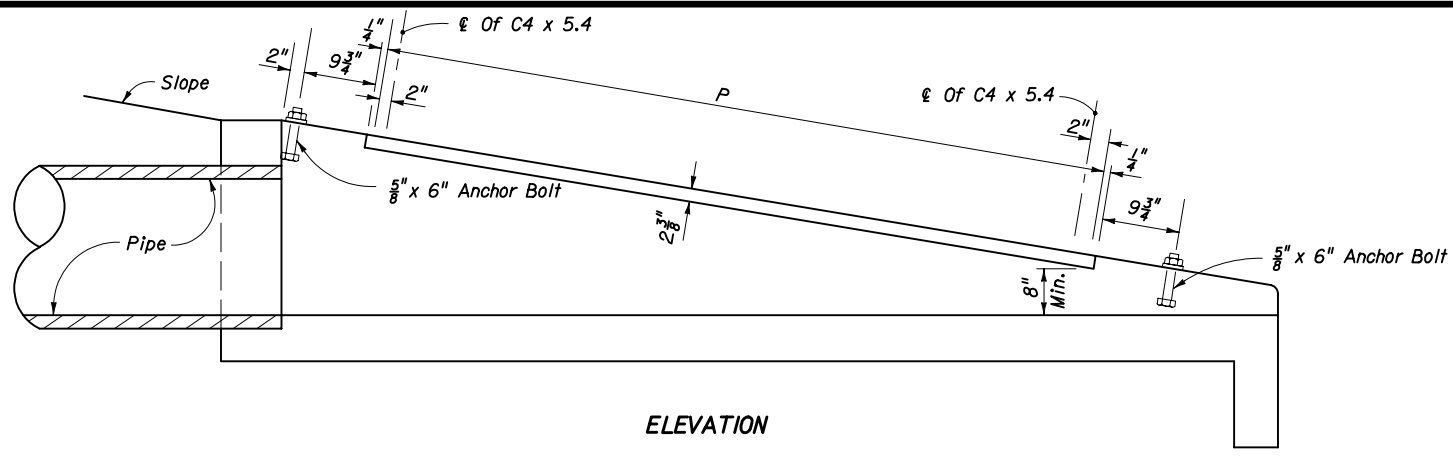
DIMENSIONS AND QUANTITIES FOR BAFFLES

Pipe Size D	X Baffle			Y Baffle Reinf. Steel	Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
	P Width	Q Height	R Length			
15"	4"	4"	4"	2-#4 1-#4	0.10	4
18"	4"	4"	5"	3-#4 2-#4		8
24"	5"	5"	6"	4-#4 3-#4		12
30"	5"	5"	7"	4-#4 4-#4		16

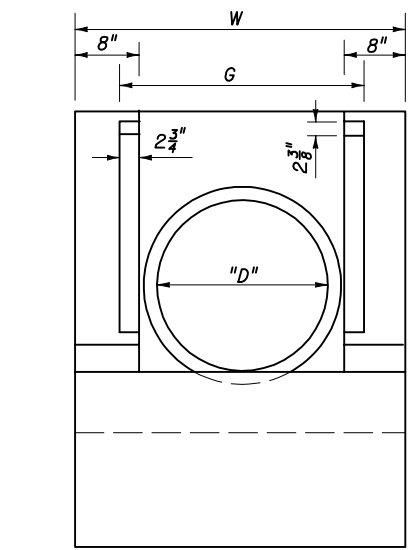
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

U-TYPE CONCRETE ENDWALLS BAFFLES AND GRATE OPTIONAL 15" TO 30" PIPE

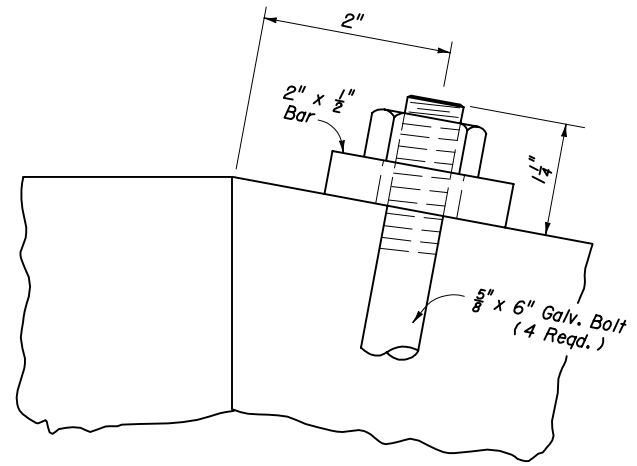
Designed By	Names	Dates	Approved By
Drawn By	ddd	9/85	State Drainage Engineer
Checked By			Revision
			Sheet No. 2 of 3
			Index No. 261



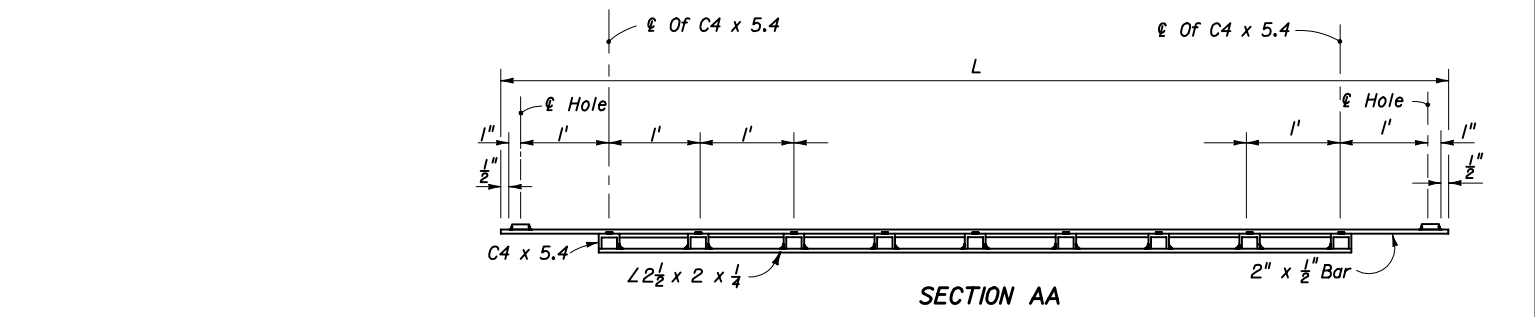
ELEVATION



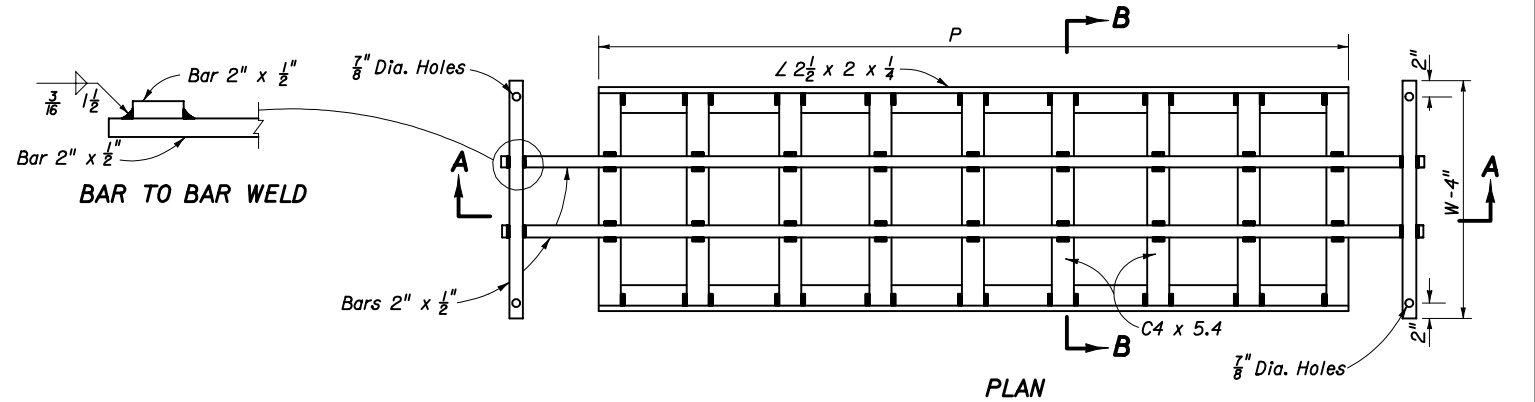
END VIEW



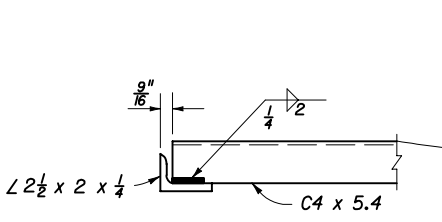
ANCHOR BOLT DETAIL



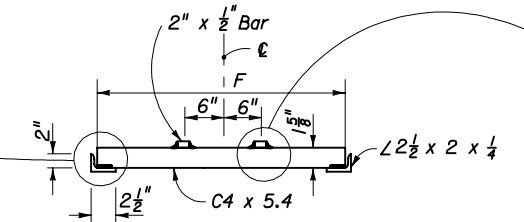
SECTION AA



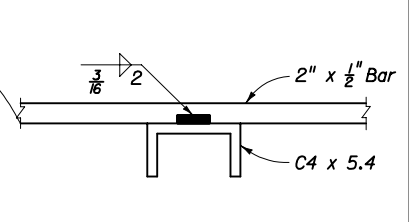
PLAN



CHANNEL TO ANGLE WELD



SECTION BB



BAR TO CHANNEL WELD

STEEL GRATE

MOUNTING FOR STEEL GRATE

STEEL GRATING USE CRITERIA

1. Grates to be used on pipe culvert endwalls located within the designated clear zone. Positive debris control shall be provided at all upgradient openings. Grates shall not be used unless one or more of the following conditions exist :
 - A. Drainage area to culvert consists of median or infield areas or areas where debris and/or drift is negligible.
 - B. Runoff to culvert is by sheet flow or in such ill defined channels that debris transport is not considered a major problem.
 - C. Runoff to culvert is minor except on an infrequent basis (10 to 15 year frequency); for example a drainage basin in flat sandy terrain with normally low ground water table.
 - D. Areas where culvert blockage with resultant backwater would not seriously affect roadway embankment, traffic operation or upland property.
2. Steel grating to be used only where called for in plans.

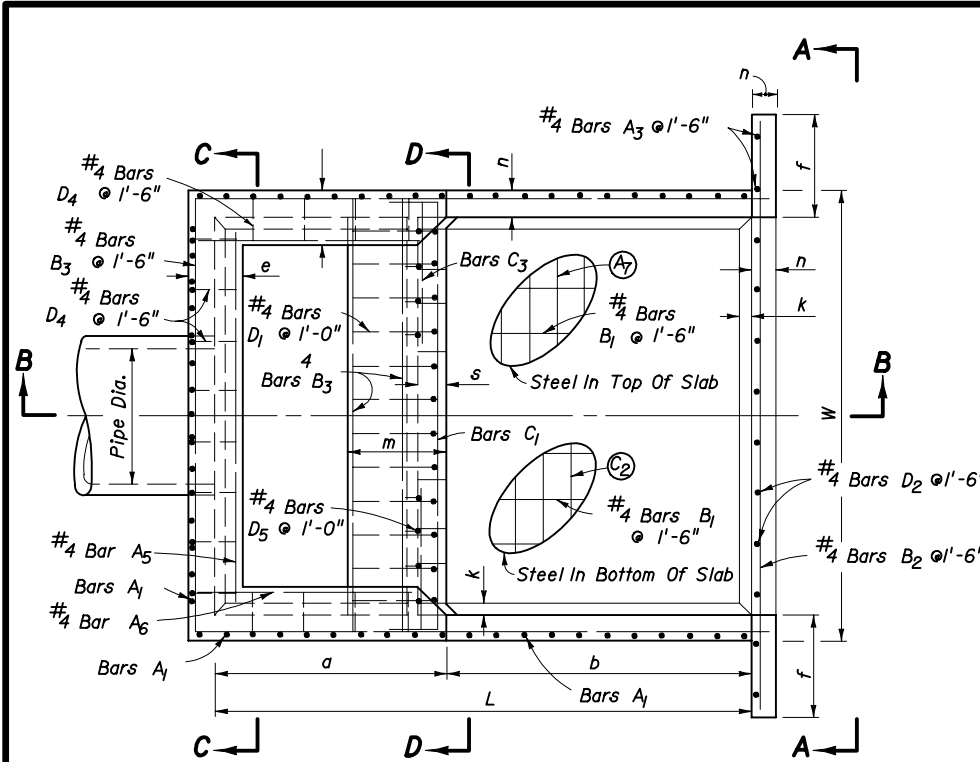
TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRATE

Rate Of Slope	Size Pipe " D "	G	2 Each Bars @ 3.4 Lbs./L.F.			(X) Channels @ 5.4 Lbs./L.F.			2 Angles @ 3.62 Lbs./L.F.		Total Weight Lbs.
			L	W-4"	Lbs.	(X)	F	Lbs.	P	Lbs.	
1:6	15"	2' - 8 1/2"	9' - 3"	3' - 3"	85	8	2' - 6 7/8"	111	7' - 4"	53	249
	18"	2' - 11 1/2"	10' - 3"	3' - 6"	94	9	2' - 9 7/8"	137	8' - 4"	62	292
	24"	3' - 5 1/2"	13' - 3"	4' - 0"	117	12	3' - 3 7/8"	215	11' - 4"	82	414
	30"	3' - 11 1/2"	16' - 3"	4' - 6"	141	15	3' - 9 7/8"	310	14' - 4"	104	555
1:4	15"	2' - 8 1/2"	6' - 3"	3' - 3"	65	5	2' - 6 7/8"	70	4' - 4"	32	167
	18"	2' - 11 1/2"	7' - 3"	3' - 6"	73	6	2' - 9 7/8"	92	5' - 4"	39	204
	24"	3' - 5 1/2"	9' - 3"	4' - 0"	90	8	3' - 3 7/8"	144	7' - 4"	53	287
	30"	3' - 11 1/2"	11' - 3"	4' - 6"	107	10	3' - 9 7/8"	206	9' - 4"	68	381
1:3	15"	2' - 8 1/2"	4' - 3"	3' - 3"	51	3	2' - 6 7/8"	42	2' - 4"	17	110
	18"	2' - 11 1/2"	5' - 3"	3' - 6"	60	4	2' - 9 7/8"	61	3' - 4"	24	145
	24"	3' - 5 1/2"	6' - 3"	4' - 0"	70	5	3' - 3 7/8"	90	4' - 4"	31	191
	30"	3' - 11 1/2"	8' - 3"	4' - 6"	87	7	3' - 9 7/8"	145	6' - 4"	46	278

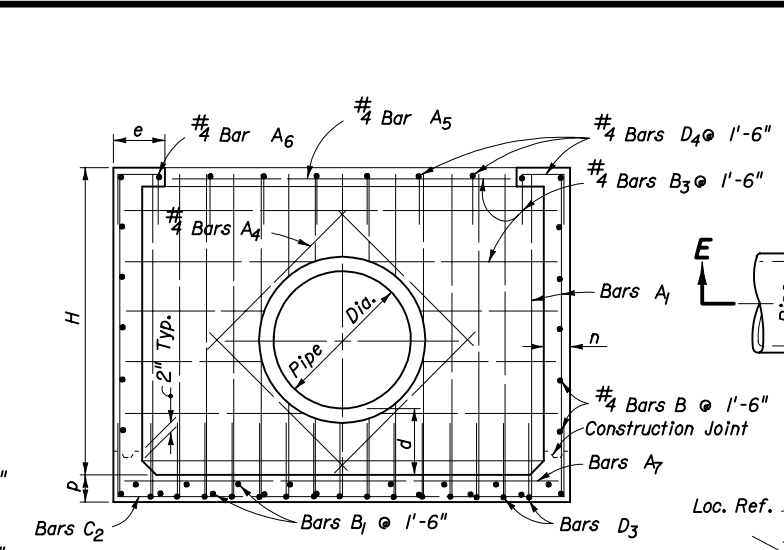
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRATE OPTIONAL
15" TO 30" PIPE**

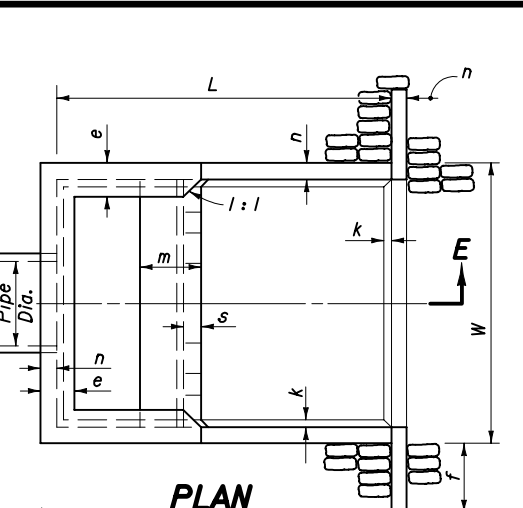
Designed By	Names	Dates	Approved By
Drawn By	CDP	07/71	State Drainage Engineer
Checked By			
Revision	00		
Sheet No.	3 of 3		
Index No.	261		



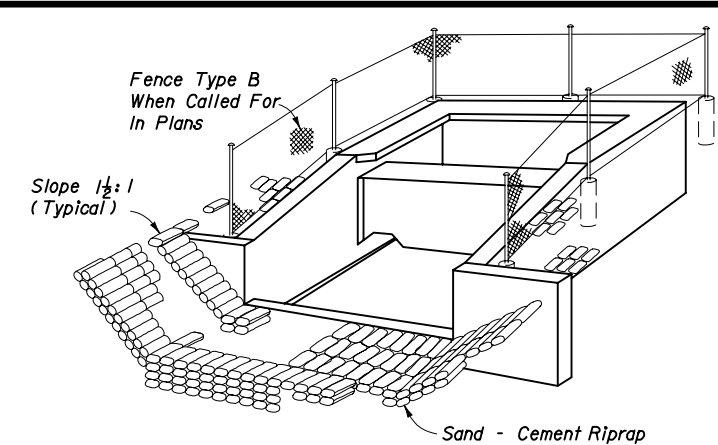
PLAN



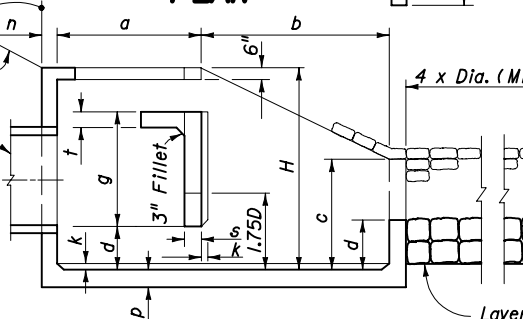
SECTION CC



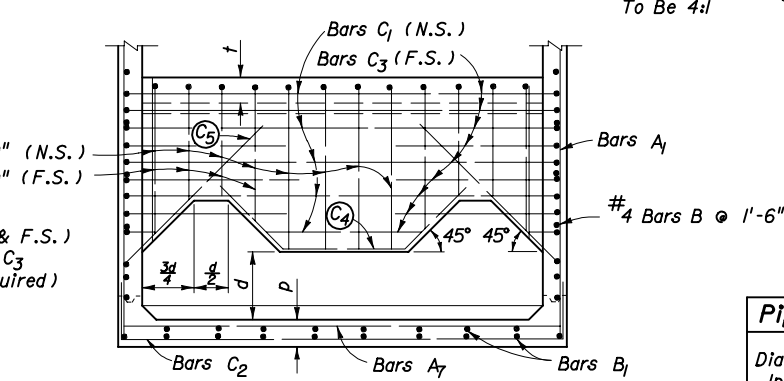
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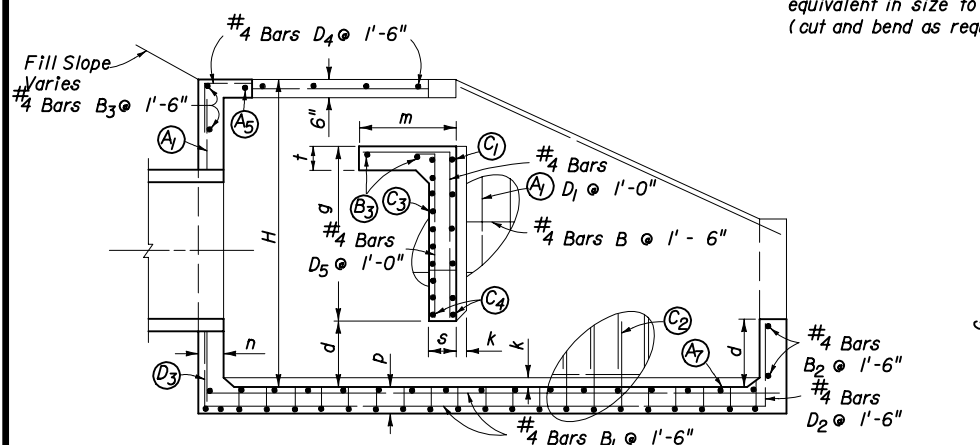
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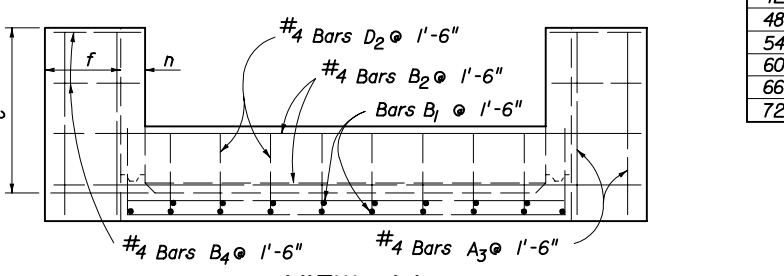
SECTION EE



SECTION DD



SECTION BB



VIEW AA

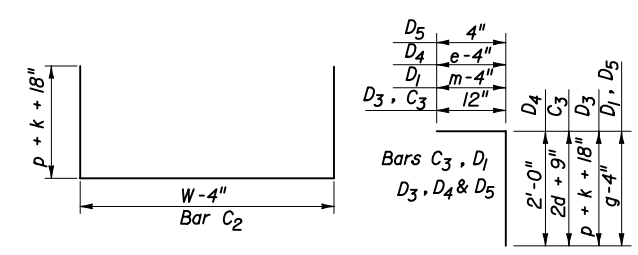
Note: Bars C₄ & C₅ (N.S. & F.S.) equivalent in size to C₃ (cut and bend as required)

Pipe Size Dia. In.	Area S.F.	Q (Max.) (cfs)	Dimensions															Concrete Class I C.Y.	Reinf. Steel Lbs.	Sand Cement Riprap C.Y. (Nom.)	
			Ft. - In.																		
			W	H	L	a	b	c	d	e	f	g	m	n	p	s	t				k
30	4.91	59	9-0	6-3	10-8	4-7	6-1	3-4	1-4	1-2	2-6	3-0	1-11	6	6 1/2	7	7	3	6.72	736	10.6
36	7.07	85	10-5	7-3	12-4	5-3	7-1	3-10	1-7	1-3	3-0	3-6	2-3	7	7 1/2	8	8	3	10.34	1,072	13.6
42	9.62	115	11-10	8-0	14-0	6-0	8-0	4-5	1-9	1-6	3-0	3-11	2-6	8	8 1/2	9	8	4	14.82	1,429	17.5
48	12.57	151	13-3	9-0	15-8	6-9	8-11	4-11	2-0	1-7	3-0	4-5	2-10	9	9 1/2	10	8	4	20.36	2,000	22.1
54	15.90	191	14-8	9-9	17-4	7-4	10-0	5-5	2-2	1-10	3-0	4-11	3-0	10	10 1/2	10	8	4	27.19	2,659	27.2
60	13.63	236	16-1	10-9	19-0	8-0	11-0	5-11	2-5	1-11	3-0	5-4	3-4	11	11 1/2	11	8	6	34.49	3,552	32.5
66	23.76	285	17-3	11-6	20-6	8-8	11-10	6-5	2-7	2-1	3-0	5-9	3-7	12	12 1/2	12	8	6	42.82	4,472	38.3
72	28.27	339	18-6	12-3	22-0	9-3	12-9	6-11	2-9	2-3	3-0	6-2	3-9	12	12 1/2	12	8	6	50.68	5,426	44.5

GENERAL NOTES

- U-type concrete endwall energy dissipators are intended for use outside the clear zone.
- Chamfer all exposed edges 3/4"
- Concrete meeting the requirements of ASTM C478 (4000 psi) may be used in lieu of Class I Concrete in precast items manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
- Reinforcing steel shall have 2" min. cover.
- Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY and Reinforcing Steel (Roadway), LB. Riprap to be paid for under the contract unit price for Riprap (Sand-Cement) (Roadway), CY. Cost of plastic filter fabric to be included in the contract unit price for riprap.
- Fencing, when called for in the plans, to be paid for under the contract unit price for Fencing, Type B, LF. Corner posts and end posts to be paid for under the contract unit price for Corner Post Assembly (Type B Fence), EA, and End Post Assembly (Type B Fence), EA, respectively. See Index No. 452 for details of Type B fencing.

BARS												
Pipe Size	A ₁		A ₇		C ₁		C ₂		C ₃		D ₃	
	Size (No.)	Spacing (Ft.-In.)	Size (No.)	Spacing (Ft.-In.)	Size (No.)	Spacing (Ft.-In.)	Size (No.)	Spacing (Ft.-In.)	Size (No.)	Spacing (Ft.-In.)	Size (No.)	Spacing (Ft.-In.)
30"	4	0-9 1/2	4	1-6	5	0-11	4	0-9 1/2	5	0-5 1/2	4	0-9 1/2
36"	5	1-0	4	1-6	5	0-10	5	1-0	5	0-5	5	1-0
42"	5	0-11	4	1-6	6	1-1	5	0-11	6	0-6 1/2	5	0-11
48"	5	0-9 1/2	4	1-0	6	1-0	5	0-9 1/2	6	0-6	5	0-9 1/2
54"	5	0-8 1/2	4	0-10	7	1-1	5	0-8 1/2	7	0-6 1/2	5	0-8 1/2
60"	6	0-10	5	1-1	7	1-0	6	0-10	7	0-6	6	0-10
66"	6	0-8 1/2	5	0-11 1/2	7	0-11	6	0-8 1/2	7	0-5 1/2	6	0-8 1/2
72"	6	0-7 1/2	5	0-10	7	0-10	6	0-7 1/2	7	0-5	6	0-7 1/2



Note: All bar dimensions are out to out.

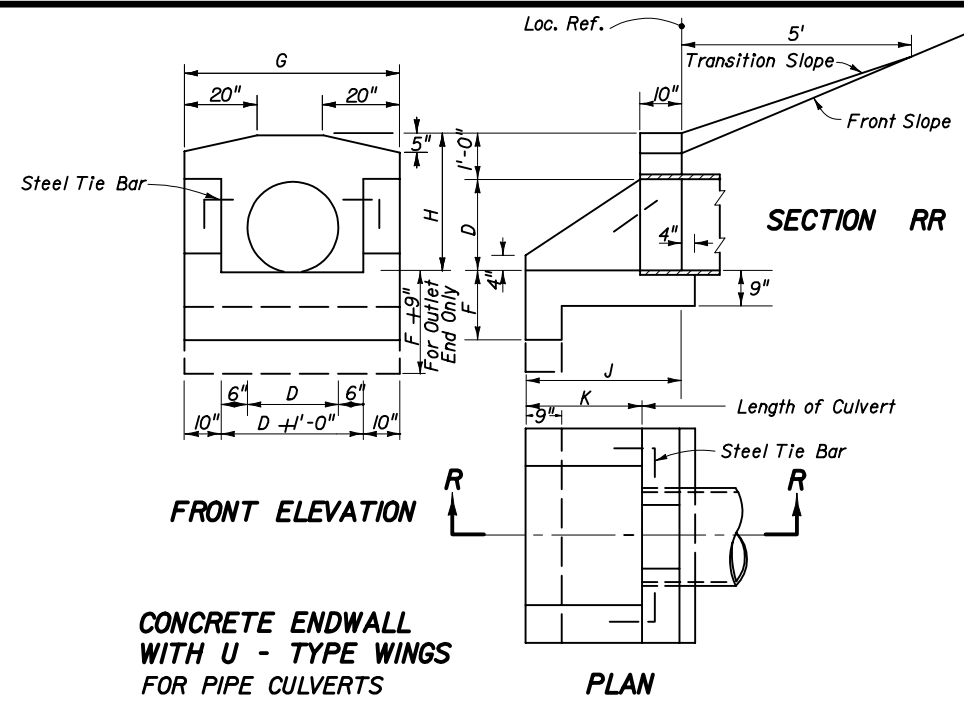
BENDING DIAGRAM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

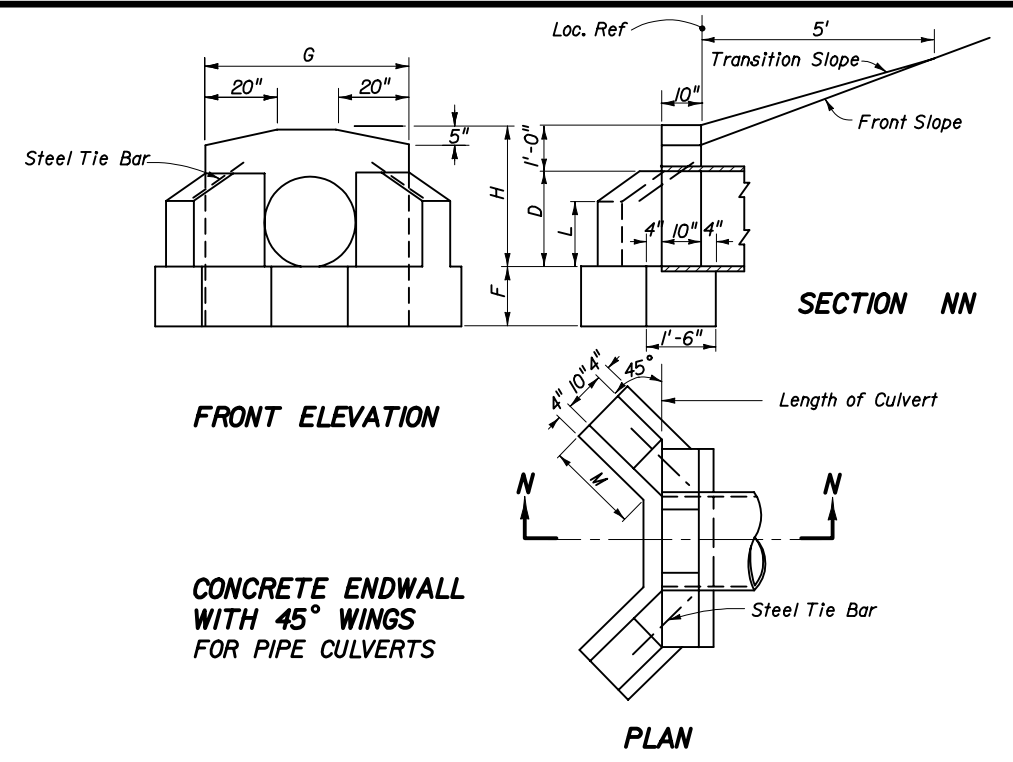
U-TYPE CONCRETE ENDWALL ENERGY DISSIPATOR

30" TO 72" PIPE

Designed By	HAB	10/69	Approved By	<i>[Signature]</i>
Drawn By	RWR	02/84	Revision	Sheet No.
Checked By	JVG	02/84	00	1 of 1
				Index No.
				264



CONCRETE ENDWALL WITH U - TYPE WINGS FOR PIPE CULVERTS



CONCRETE ENDWALL WITH 45° WINGS FOR PIPE CULVERTS

TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES PIPE CULVERT ENDWALLS WITH U - TYPE WINGS

Opening		DIMENSIONS					QUANTITIES IN ONE ENDWALL							
D	Area Sq.Ft.	Wall		Footing			Total Cu. Yds. Concrete, Class I						Steel Tie Bars	
		G	H	K	F	J	Conc. Pipe		C.M. Pipe		C.I. Pipe			
							Inlet	Outlet	Inlet	Outlet	Inlet	Outlet		
12"	0.8	3'-8"	2'-0"	1'-0"	1'-3"	2'-2"	0.48	0.55	0.49	0.57	0.49	0.57	none	
15"	1.2	3'-11"	2'-3"	1'-5"	1'-3"	2'-7"	0.59	0.67	0.62	0.70	0.61	0.70	none	
18"	1.8	4'-2"	2'-6"	1'-9"	1'-3"	2'-11"	0.70	0.79	0.74	0.82	0.74	0.82	none	
24"	3.1	4'-8"	3'-0"	2'-6"	1'-6"	3'-8"	1.01	1.11	1.06	1.16	1.06	1.16	2 - 3/8" x 2'-0"	
30"	4.9	5'-2"	3'-6"	3'-3"	1'-6"	4'-5"	1.33	1.44	1.41	1.51	1.40	1.51	2 - 3/8" x 2'-0"	
36"	7.1	5'-8"	4'-0"	4'-0"	1'-9"	5'-2"	1.73	1.85	1.84	1.96	1.82	1.94	2 - 3/8" x 2'-6"	
42"	9.6	6'-2"	4'-6"	4'-9"	2'-0"	5'-11"	2.19	2.32	2.32	2.45			2 - 3/8" x 2'-6"	
48"	12.6	6'-8"	5'-0"	5'-6"	2'-0"	6'-8"	2.64	2.78	2.81	2.95			2 - 3/8" x 3'-0"	

TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES PIPE CULVERT ENDWALLS WITH 45° WINGS

Opening		DIMENSIONS					QUANTITIES IN ONE ENDWALL			
D	Area Sq.Ft.	Wall				Footing	Concrete, Class I			Steel Tie Bars
		H	G	L	M	F	Total Cu. Yds.			
							Conc. Pipe	C.M. Pipe	C.I. Pipe	
18"	1.8	2'-6"	3'-10"	1'-2"	1'-7"	1'-3"	0.74	0.77	0.77	none
24"	3.1	3'-0"	4'-4"	1'-5"	2'-1"	1'-4"	1.01	1.06	1.06	2 - 3/8" x 2'-0"
30"	4.9	3'-6"	4'-10"	1'-9"	2'-5"	1'-6"	1.32	1.40	1.39	2 - 3/8" x 2'-0"
36"	7.1	4'-0"	5'-4"	2'-0"	2'-11"	1'-8"	1.72	1.83	1.82	2 - 3/8" x 3'-0"
42"	9.6	4'-6"	5'-10"	2'-3"	3'-6"	2'-0"	2.34	2.47		2 - 3/8" x 3'-0"
48"	12.6	5'-0"	6'-4"	2'-6"	4'-0"	2'-0"	2.74	2.90		2 - 3/8" x 3'-0"
15"	1.2	2'-3"	3'-7"	1'-0"	1'-3"	1'-3"	0.56	0.59	0.59	none

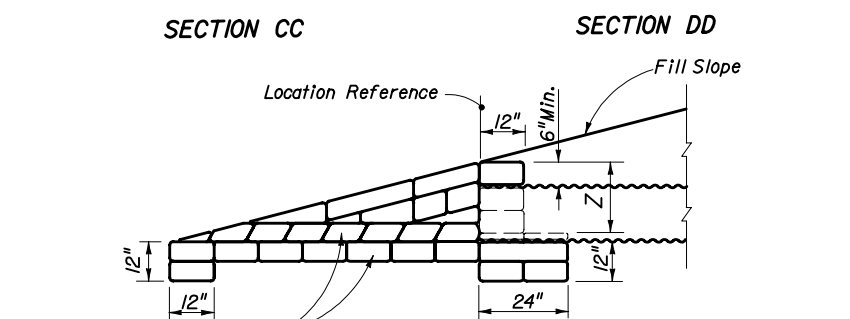
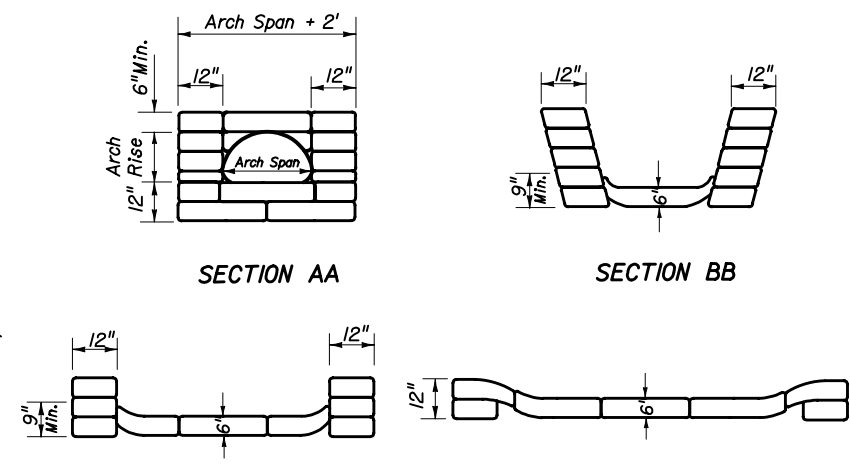
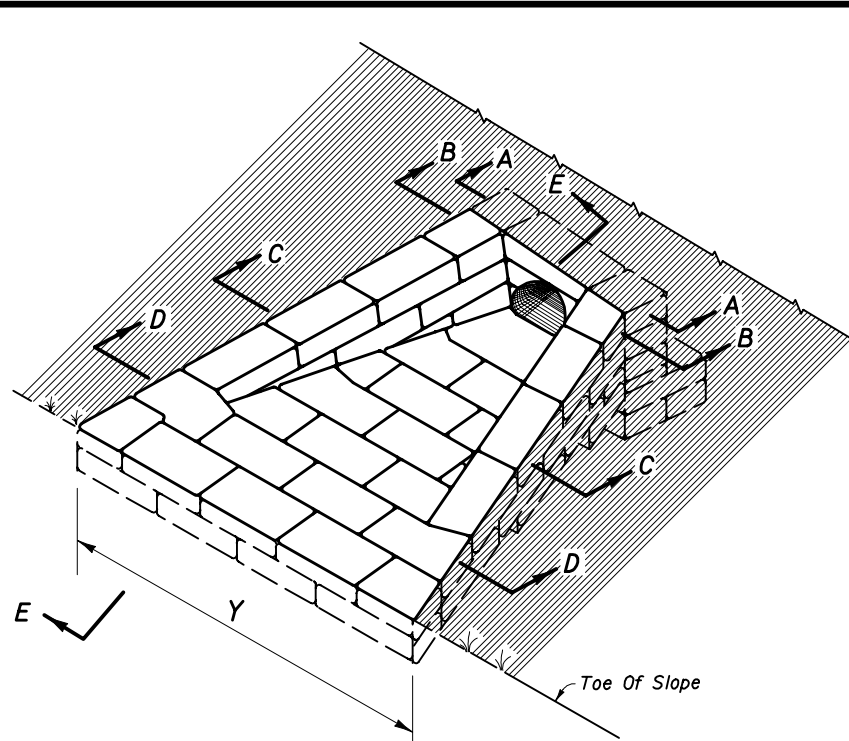
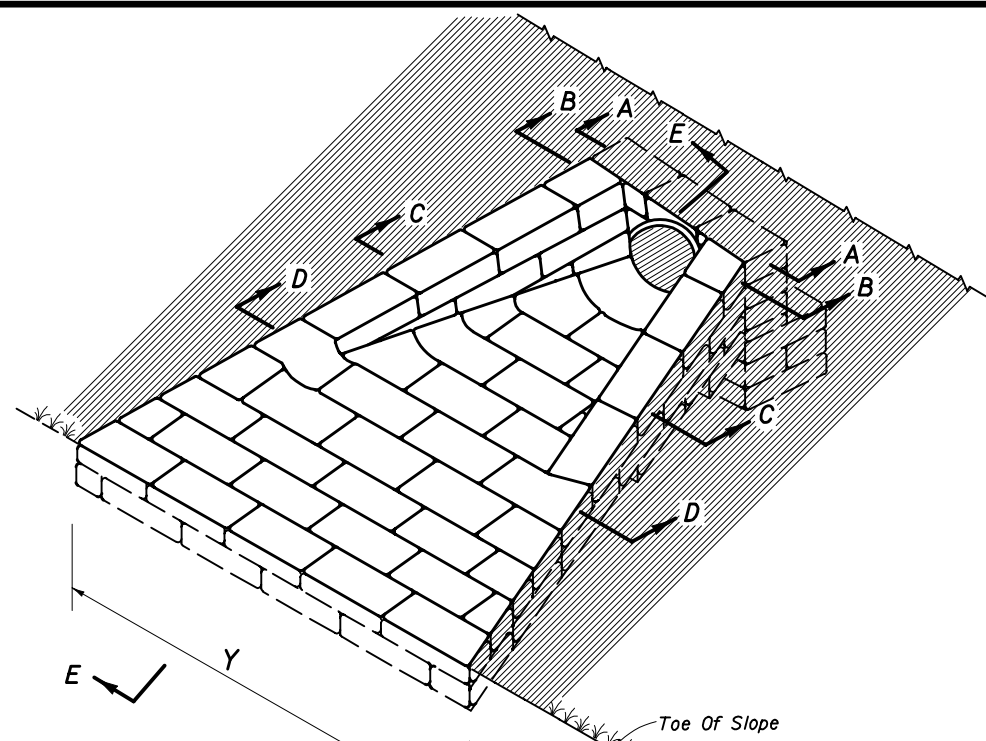
GENERAL NOTES

1. Winged concrete endwalls are intended for use outside the clear zone.
2. Chamfer all exposed edges 3/4"
3. Concrete meeting the requirements of ASTM C-478 (4000 psi) may be used in lieu of Class I concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
4. Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY. Cost of steel tie bars to be included in the contract unit price for Class I Concrete.
5. Sodding to be in accordance with Index No. 281, and paid for under the contract unit price for Sodding, SY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

WINGED CONCRETE ENDWALLS SINGLE ROUND PIPE

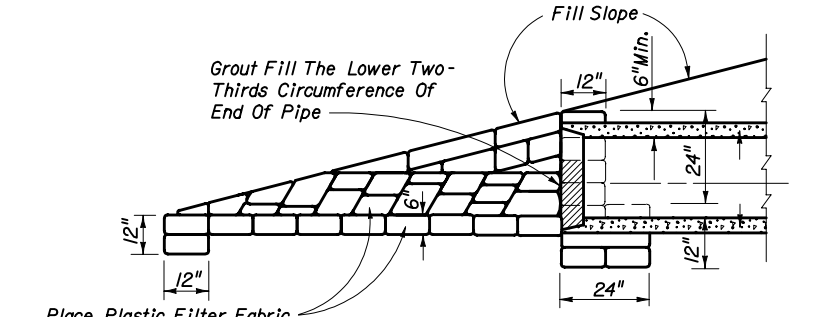
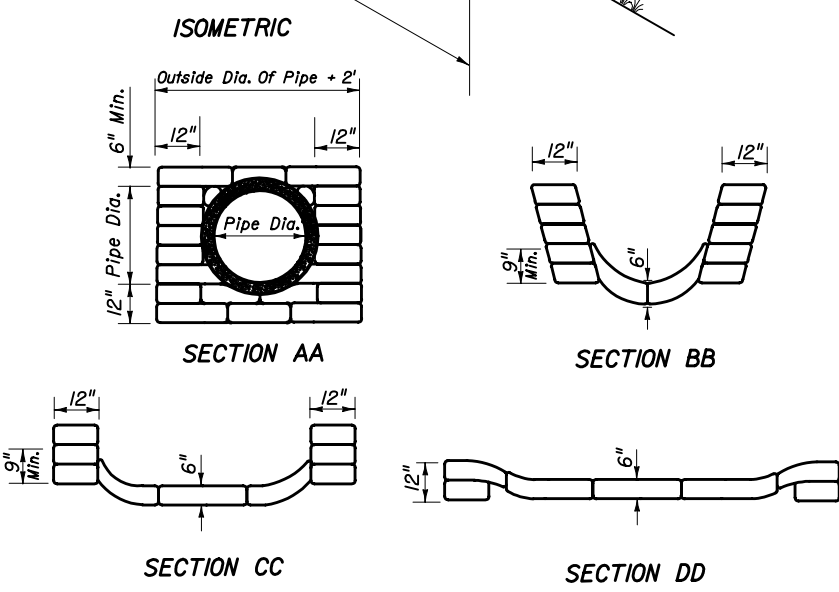
Designed By	Names	Date	Approved By
Drawn By	TJK	12/31	<i>[Signature]</i> State Drainage Engineer
Checked By	GEF	03/32	Revision
			Sheet No. 1 of 1
			Index No. 266



Place Plastic Filter Fabric Type D-4 (See Index No. 199) Around And Below Sand Cement Riprap. Cost Of Fabric To Be Included In Cost Of Sand Cement Riprap

DETAILS FOR SINGLE METAL PIPE ARCH CULVERTS

NOTE: For multiple metal pipe arch culvert spacing between arch centers = X



Place Plastic Filter Fabric Type D-4 (See Index No. 199) Around And Below Sand Cement Riprap. Cost Of Fabric To Be Included In Cost Of Sand Cement Riprap

DETAIL FOR SINGLE PIPE CULVERT

Note: For multiple pipe culvert spacing between pipe centers = X

DIMENSIONS AND QUANTITIES FOR METAL PIPE ARCH CULVERTS																							
Span	Rise	Dimensions							Quantity of Sand-Cement Riprap in Cu. Yds. for One Endwall														
		X	Y				Z	For 1:2 Slopes				For 1:4 Slopes				For 1:6 Slopes							
			1-Arch	2-Arch	3-Arch	4-Arch		1-Arch	2-Arch	3-Arch	4-Arch	1-Arch	2-Arch	3-Arch	4-Arch								
17"	13"	2'-6"	6'-6"	9'-0"	11'-6"	14'-0"	1'-7"	1.0	1.5	2.0	2.5	1.5	2.2	2.9	3.6								
21"	15"	2'-10"	7'-6"	10'-4"	13'-2"	16'-0"	1'-9"	1.2	1.8	2.4	3.0	1.9	2.7	3.5	4.3								
28"	20"	3'-5"	9'-3"	12'-8"	16'-1"	19'-6"	2'-0"	1.7	2.5	3.3	4.1	2.6	3.7	4.8	5.9								
35"	24"	4'-0"	11'-0"	15'-0"	19'-0"	23'-0"	2'-0"	2.2	3.1	4.0	4.9	3.4	4.7	6.0	7.3								
42"	29"	4'-9"	12'-9"	17'-6"	22'-3"	27'-0"	2'-0"	2.9	4.1	5.3	6.5	4.5	6.1	7.7	9.3								
49"	33"	5'-6"	14'-6"	20'-0"	25'-6"	31'-0"	2'-0"	3.5	4.9	6.3	7.7	5.5	7.4	9.3	11.2								
57"	38"	6'-4"	16'-6"	22'-10"	29'-2"	35'-6"	2'-0"	4.4	6.1	7.8	9.5	6.9	9.2	11.5	13.8								
64"	43"	7'-1"	18'-3"	25'-4"	32'-5"	39'-6"	2'-0"	5.1	7.0	8.9	10.8	8.1	10.7	13.3	15.9								
71"	47"	7'-10"	20'-0"	27'-10"	35'-8"	43'-6"	2'-0"	5.9	8.1	10.3	12.5	9.5	12.4	15.3	18.2								

GENERAL NOTES

1. U-Type Sand-Cement Endwalls Are Intended For Use Outside The Clear Zone.

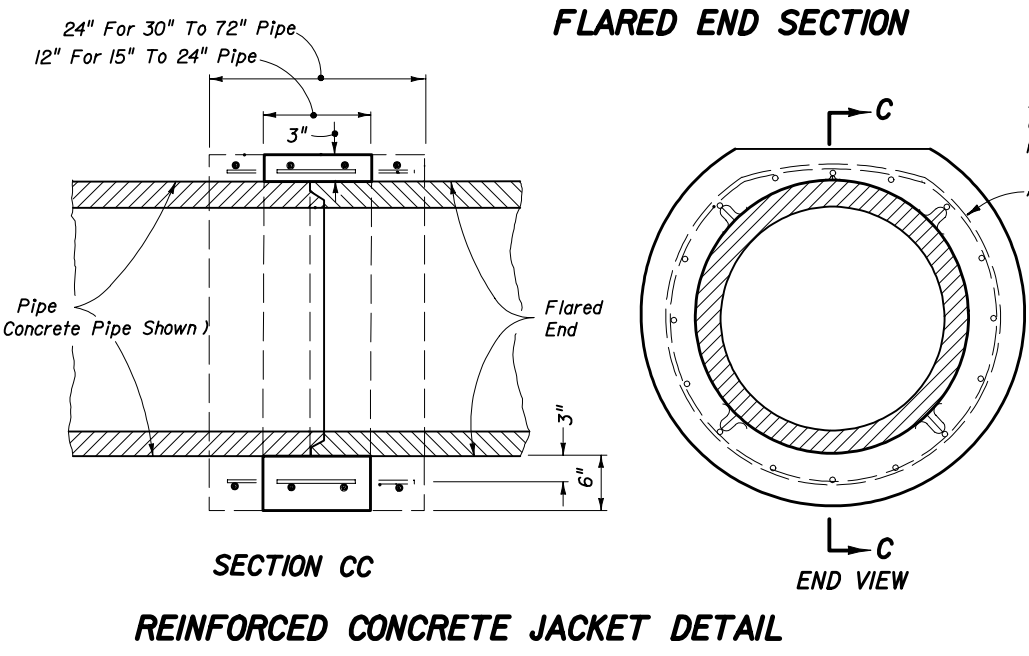
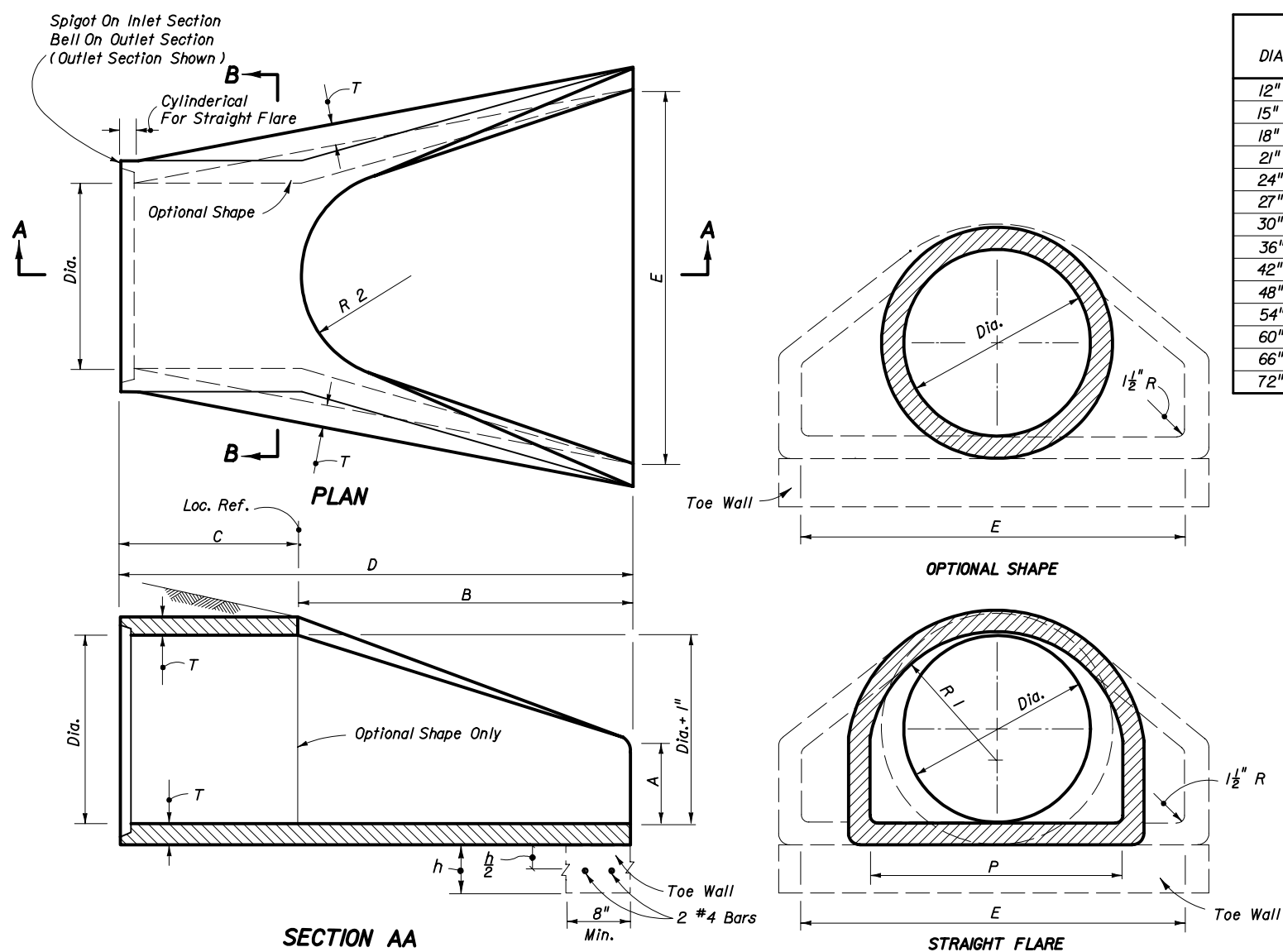
DIMENSIONS AND QUANTITIES FOR ROUND PIPE CULVERTS																								
Pipe Dia.	X	Dimensions				Quantity of Sand-Cement Riprap in Cu. Yds. for One Endwall																		
		Y				For 1:2 Slopes				For 1:4 Slopes				For 1:6 Slopes										
		1-Pipe	2-Pipes	3-Pipes	4-Pipes	1-Pipe	2-Pipes	3-Pipes	4-Pipes	1-Pipe	2-Pipes	3-Pipes	4-Pipes	1-Pipe	2-Pipes	3-Pipes								
15"	2'-7"	7'-0"	9'-7"	12'-2"	14'-9"	1.2	1.6	2.1	2.6	1.7	2.4	3.0	3.6											
18"	2'-10"	8'-0"	10'-10"	13'-8"	16'-6"	1.4	2.0	2.6	3.1	2.1	2.9	3.7	4.4											
24"	3'-5"	10'-0"	13'-5"	16'-10"	20'-3"	1.9	2.7	3.5	4.3	2.9	4.0	5.1	6.3											
30"	4'-3"	12'-0"	16'-3"	20'-6"	24'-9"	2.5	3.6	4.8	5.9	3.8	5.4	7.0	8.6											
36"	5'-1"	14'-0"	19'-1"	24'-2"	29'-3"	3.1	4.6	6.2	7.7	4.8	7.0	9.2	11.4											
42"	6'-0"	16'-0"	22'-0"	28'-0"	34'-0"	3.8	5.8	7.7	9.7	6.0	8.8	11.7	14.5											
48"	6'-9"	18'-0"	24'-9"	31'-6"	38'-3"	4.5	7.0	9.4	11.8	7.2	10.8	14.3	17.9											
54"	7'-8"	20'-0"	27'-8"	35'-4"	43'-0"	5.3	8.3	11.3	14.2	8.5	12.9	17.3	21.7											
60"	8'-6"	22'-0"	30'-6"	39'-0"	47'-6"	6.2	9.7	13.3	16.9	10.0	15.3	20.6	25.9											

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

U-TYPE SAND-CEMENT ENDWALLS

Designed By	JEP	12/48	Names	Dates	Approved By	<i>[Signature]</i>
Drawn By	HW	03/54	Revision	Sheet No.	Index No.	268
Checked By	CDD	03/54	00	1 of 1		

DIA.	T	REINF. SQ IN/LF	BELL Or SPIGOT	A	B	C	D	E	P	R 1	R 2	FLAT	WEIGHT (LBS.)	h	TOE WALL CLASS I CONC (Misc.) CY
12"	2"	0.07	1 1/2"	4"	2'-0"	4'-0 1/8"	6'-0 1/8"	2'-0"	19 15/16"	10 1/8"	9"	3 1/2"	530	12"	.06
15"	2 1/4"	0.07	2"	6"	2'-3"	3'-10"	6'-1"	2'-6"	24 1/8"	12 1/2"	11"	3 1/2"	740	12"	.07
18"	2 1/2"	0.07	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	29"	15 1/2"	12"	4"	990	15"	.11
21"	2 3/4"	0.07	2 3/4"	9"	2'-11"	3'-2"	6'-1"	3'-6"	31 5/8"	16 1/2"	13"	4"	1280	15"	.12
24"	3"	0.07	2 1/2"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	33 3/8"	16 13/16"	14"	4 1/2"	1520	18"	.17
27"	3 1/4"	0.148	2 1/2"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	4'-6"	36"	18 3/8"	14 1/2"	4 1/2"	1930	18"	.19
30"	3 1/2"	0.148	3"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	37"	18 1/2"	15"	5"	2190	21"	.24
36"	4"	0.148	3 1/2"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	47 13/16"	24 1/8"	20"	5 1/2"	4100	21"	.29
42"	4 1/2"	0.148	3 3/4"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	53 8/16"	27 1/2"	22"	5 1/2"	5380	24"	.36
48"	5"	0.148	4 1/2"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	56 1/2"	28 1/2"	22"	5 3/4"	6550	24"	.39
54"	5 1/2"	0.174	4 3/4"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"	65 1/2"	33 3/8"	24"	6 1/4"	8040	24"	.42
60"	6"	0.174	5"	2'-6"	5'-0"	3'-3"	8'-3"	8'-0"	72 1/2"	36 1/2"	24"	6 3/4"	8750	24"	.44
66"	6 1/2"	0.174	5 1/2"	2'-0"	6'-6"	1'-9"	8'-3"	8'-6"	72"	36 1/8"	24"	7 1/4"	10630	24"	.47
72"	7"	0.174	6"	2'-0"	6'-6"	1'-9"	8'-3"	9'-0"	77 15/16"	38 15/16"	24"	7 3/4"	12520	24"	.50



Any Wire Mesh Arrangement Which Provides 0.126 Square Inches Of Steel Area Per Linear Foot Both Ways May Be Used; Provided The Wires Are Spaced A Minimum Of 2" And/Or A Maximum Of 6" On Centers.

GENERAL NOTES

- Flared end sections shall conform to the requirements of ASTM C76 with the exception that dimensions and reinforcement shall be as prescribed in the table above. Circumferential reinforcement may consist of either one cage or two cages of steel. Compressive strength of concrete shall be 4000 psi. Shop drawings for flared end sections having dimensions other than above must be submitted for approval to the State Drainage Engineer.
- Connections between the flared end section and the pipe culvert may be any of the following types unless otherwise shown on the plans.
 - Joints meeting the requirements of Section 941-1.5 of the Standard Specifications (O-Ring Gasket). Flared end section joint dimensions and tolerances shall be identical or compatible to those used in the pipe culvert joint. When pipe culvert and flared end section manufacturers are different, the compatibility of joint designs shall be certified to by the manufacturer of the flared end sections.
 - Joints sealed with preformed plastic gaskets. The gaskets shall meet the requirements of Section 942-2 of the Standard Specifications and the minimum sizes for gaskets shall be as that specified for equivalent sizes of elliptical pipe.
 - Reinforced concrete jackets, as detailed on this drawing. Cost of the reinforced concrete jacket to be included in the contract unit price for the flared end section. When non-coated corrugated metal pipe is called for in the plans, the pipe shall be bituminous coated in the jacketed area as specified on Index No. 280. Bituminous coating to be included in the contract unit price for the pipe culvert. Concrete jacket shall be as specified on Index No. 280. Cost of concrete and reinforcement shall be included in the contract unit price for the pipe culvert.
- Toe walls shall be constructed when shown on the plans or at locations designated by the Engineer. Toe walls are to be cast-in-place with Class I Concrete and paid for under the contract unit price for Class I Concrete (Miscellaneous), CY. Reinforcing steel to be included in cost of toe wall.
- On skewed pipe culverts the flared end sections shall be placed in line with the pipe culvert. Side slopes shall be warped as required to fit the flared end sections.
- Flared End Section to be paid for under the contract unit price for Flared End Section (Concrete), Each. Sodding shall be in accordance with Index No. 281, and paid for under the contract unit price for Sodding, SY.

DESIGN NOTES

- Flared end sections are intended for use outside the clear zone on median drain and cross drain installation, except that flared end sections for pipe sizes 12" and 15" are permitted within the clear zone. When the slope intersection permits, 12" and 15" flared end sections may be located with the culvert opening as close as 8' beyond the outside edge of the shoulder.
Flared end sections are not intended for side drain installations.
- Reinforced concrete jackets shall be used at all locations where high velocities and/or highly erosive soils may cause disjuncting. These locations are to be shown on the plans.
- Toe walls shall be used whenever the anticipated velocity of discharge and soil type are such that erosive action would occur. Toe walls are not required where ditch pavement is provided, except when disjuncting would occur if the ditch pavement should fail.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
FLARED END SECTION				
Designed By	EGR	Dates	09/77	Approved By
Drawn By	HKH	Revision	09/77	State Drainage Engineer
Checked By	JVG	Sheet No.	00	Index No.
			1 of 1	270

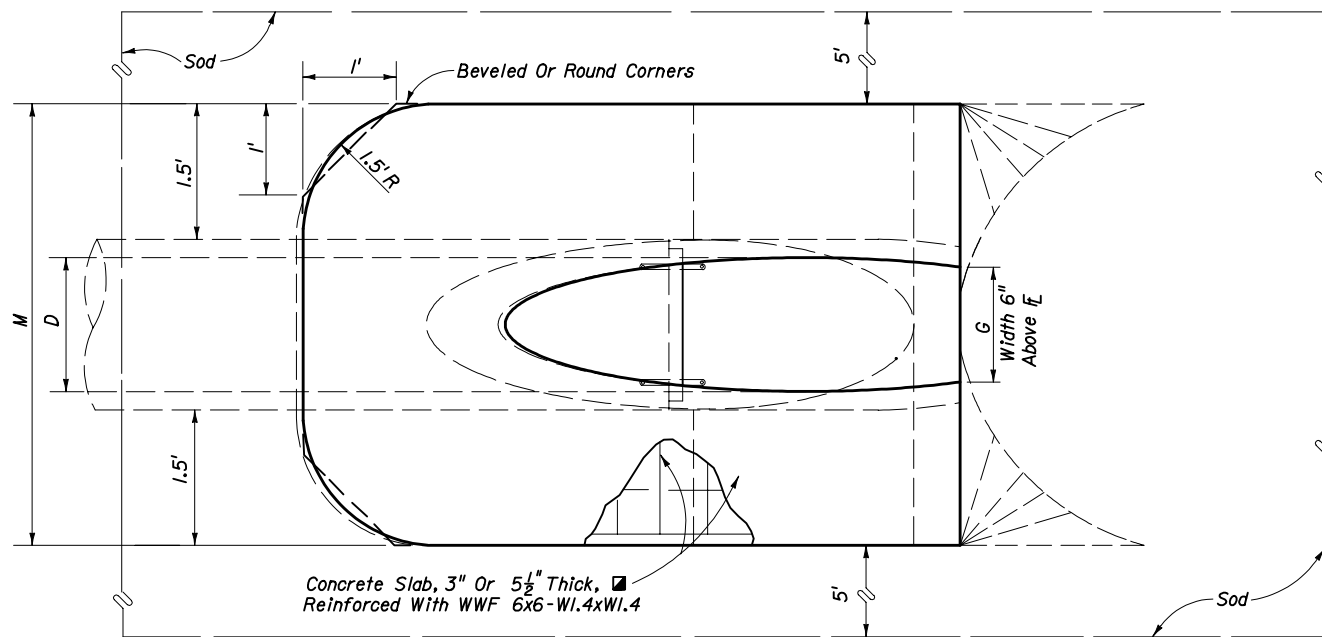
DIMENSIONS AND QUANTITIES

	D	X	A	B	C	E	F	G	H	M				N	5 1/2" CONCRETE SLAB (CY) ■				SODDING (SQ. YDS.)			
										Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	2'-7"	1.92'	2.18'	4.10'	2.06'	5'	1.22'	2.9'	4.63'	7.21'	9.79'	12.37'	1.19'	0.38	0.58	0.77	0.96	21	24	27	30
	18"	2'-10"	1.97'	2.74'	4.71'	2.56'	6'	1.41'	3.4'	4.92'	7.75'	10.58'	13.42'	1.21'	0.44	0.65	0.87	1.09	22	25	28	31
	24"	3'-5"	2.06'	3.85'	5.91'	3.56'	7'	1.73'	3.4'	5.50'	8.92'	12.33'	15.75'	1.25'	0.54	0.83	1.12	1.42	24	28	32	35
	30"	4'-3"	2.15'	4.95'	7.10'	4.56'	8'	2.00'	3.4'	6.08'	10.33'	14.58'	18.83'	1.29'	0.66	1.09	1.50	1.91	26	31	35	40
	36"	5'-1"	2.25'	6.08'	8.33'	5.56'	9'	2.24'	3.4'	6.67'	11.75'	16.83'	21.92'	1.33'	0.81	1.38	1.95	2.51	28	34	39	45
	42"	6'-0"	2.34'	7.21'	9.55'	6.56'	10'	2.45'	3.4'	7.25'	13.25'	19.25'	25.25'	1.38'	0.97	1.70	2.45	3.19	30	37	43	50
	48"	6'-9"	2.43'	8.33'	10.76'	7.56'	11'	2.65'	3.4'	7.83'	14.58'	21.33'	28.08'	1.42'	1.13	2.04	2.93	3.84	32	39	47	54
	54"	7'-8"	2.52'	9.44'	11.96'	8.56'	12'	2.83'	3.4'	8.42'	16.08'	23.75'	31.42'	1.46'	1.31	2.44	3.58	4.72	34	42	51	59
	60"	8'-6"	2.62'	10.56'	13.18'	9.56'	14'	3.00'	4.4'	9.00'	17.50'	26.00'	34.50'	1.50'	1.51	2.89	4.28	5.68	36	45	55	64
	66"	9'-2"	2.71'	11.68'	14.39'	10.56'	15'	3.18'	4.4'	9.58'	18.75'	27.92'	37.08'	1.54'	1.68	3.25	4.84	6.43	38	48	58	68
72"	10'-0"	2.80'	12.80'	15.60'	11.56'	16'	3.30'	4.4'	10.16'	20.16'	30.16'	40.16'	1.58'	1.89	3.74	5.59	7.45	40	51	62	73	
1:4 Slope	15"	2'-7"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.0'	4.63'	7.21'	9.79'	12.37'	1.19'	0.57	0.87	1.15	1.44	23	26	29	32
	18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.0'	4.92'	7.75'	10.58'	13.42'	1.21'	0.66	0.99	1.31	1.65	25	28	31	35
	24"	3'-5"	2.53'	7.18' Δ	9.71'	7.03' Δ	11'	1.73'	4.0'	5.50'	8.92'	12.33'	15.75'	1.25'	0.85	1.30	1.75	2.20	28	32	36	40
	30"	4'-3"	2.70'	9.25'	11.95'	9.03'	13'	2.00'	4.0'	6.08'	10.33'	14.58'	18.83'	1.29'	1.10	1.74	2.39	3.05	31	36	41	46
	36"	5'-1"	2.87'	11.31' ◇	14.18'	11.03' ◇	15'	2.24'	4.0'	6.67'	11.75'	16.83'	21.92'	1.33'	1.32	2.21	3.08	3.96	34	40	46	52
	42"	6'-0"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	4.0'	7.25'	13.25'	19.25'	25.25'	1.38'	1.58	2.76	3.91	5.09	38	44	51	58
	48"	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	4.0'	7.83'	14.58'	21.33'	28.08'	1.42'	1.85	3.30	4.73	6.17	41	48	56	63
	54"	7'-8"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	4.0'	8.42'	16.08'	23.75'	31.42'	1.46'	2.14	3.95	5.77	7.58	44	52	61	69
	60"	8'-6"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	4.0'	9.00'	17.50'	26.00'	34.50'	1.50'	2.45	4.66	6.87	9.07	47	56	66	75
	66"	9'-2"	3.73'	21.62'	25.35'	21.03'	25'	3.18'	4.0'	9.58'	18.75'	27.92'	37.08'	1.54'	2.88	5.54	8.18	10.84	49	59	69	80
72"	10'-0"	3.91'	23.68'	27.59'	23.03'	27'	3.30'	4.0'	10.16'	20.16'	30.16'	40.16'	1.58'	3.54	6.61	9.87	13.13	52	63	74	85	

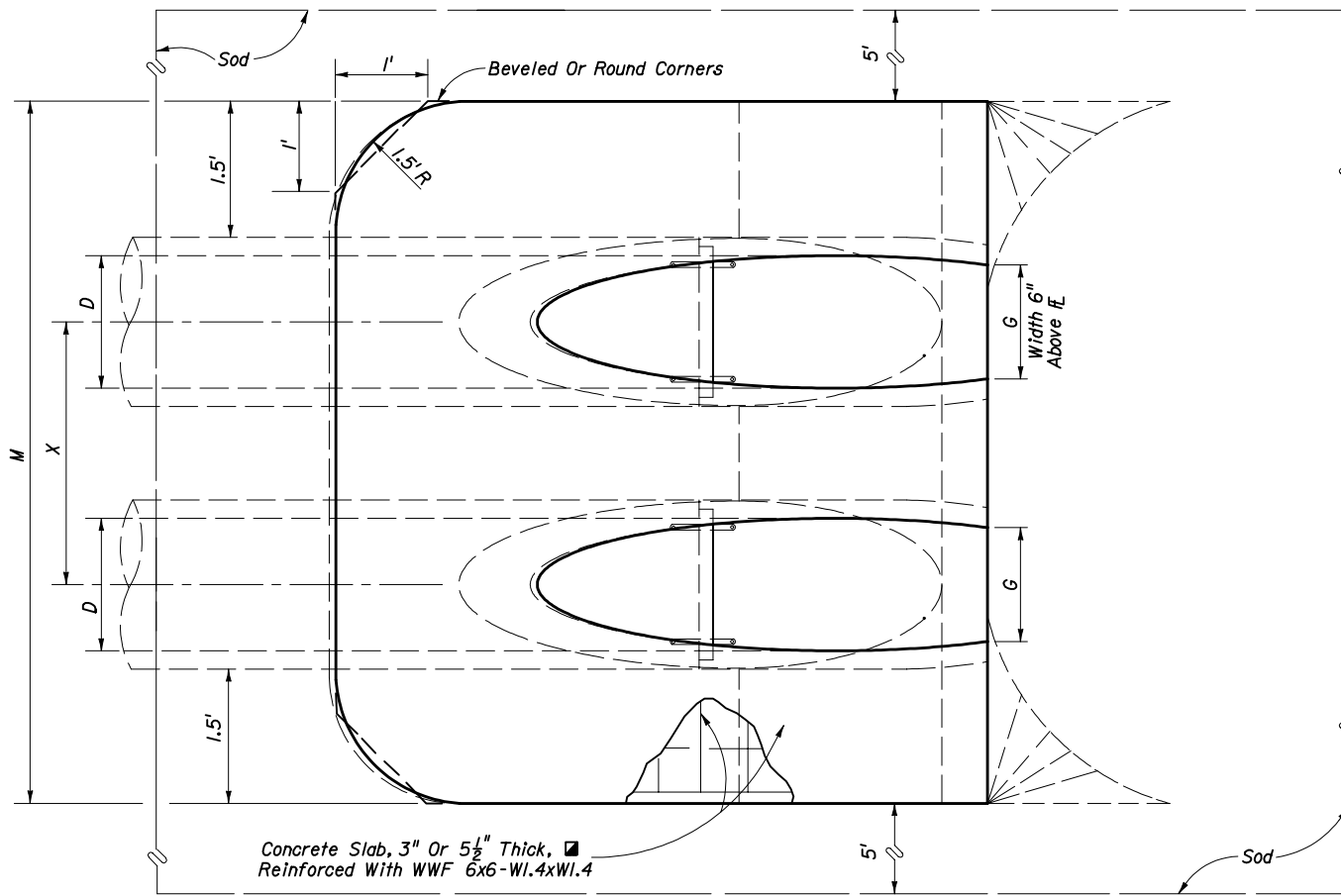
■ See General Note No. 3.
See Sheet 5 Of 6 For 3" Slab Quantities

■ Values shown for estimating pipe quantities and are for information only.

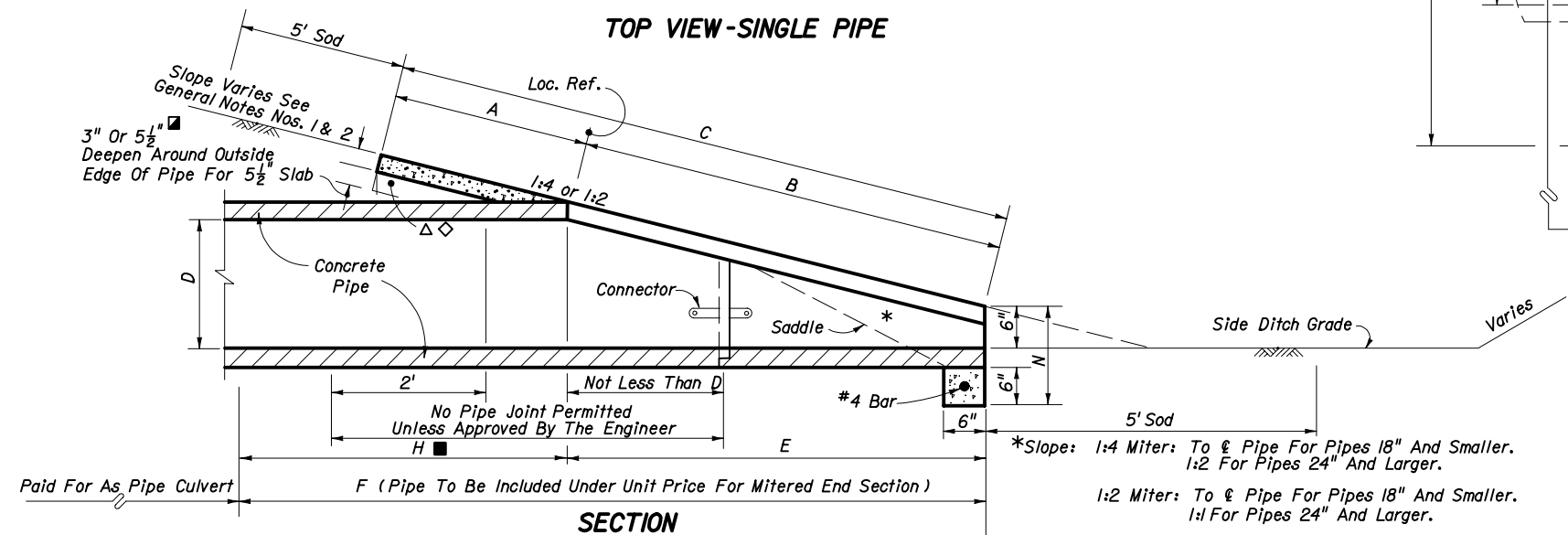
B **E**
 Δ 6.42' Δ 6.25' Dimensions permitted to allow use of 8' standard pipe lengths.
 ◇ 10.40' ◇ 10.10' Dimensions permitted to allow use of 12' standard pipe lengths.
 Δ◇ Concrete slab shall be deepened to form bridge across crown of pipe. See section below.



TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE



SECTION

NOTE: See sheet 6 for details and notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CROSS DRAIN MITERED END SECTION				
SINGLE AND MULTIPLE ROUND CONCRETE PIPE				
Names	Dates	Approved By		
Designed By	DCB	06/78	State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By	KNM	06/78	02	1 of 6
				272

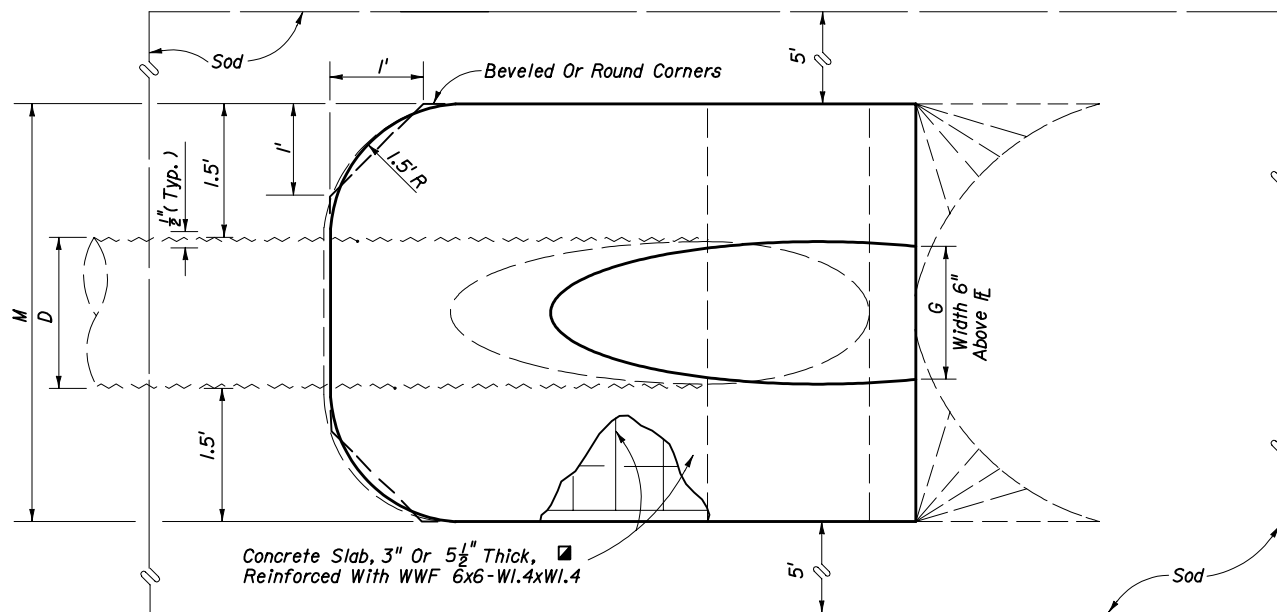
Paid For As Pipe Culvert

DIMENSIONS AND QUANTITIES

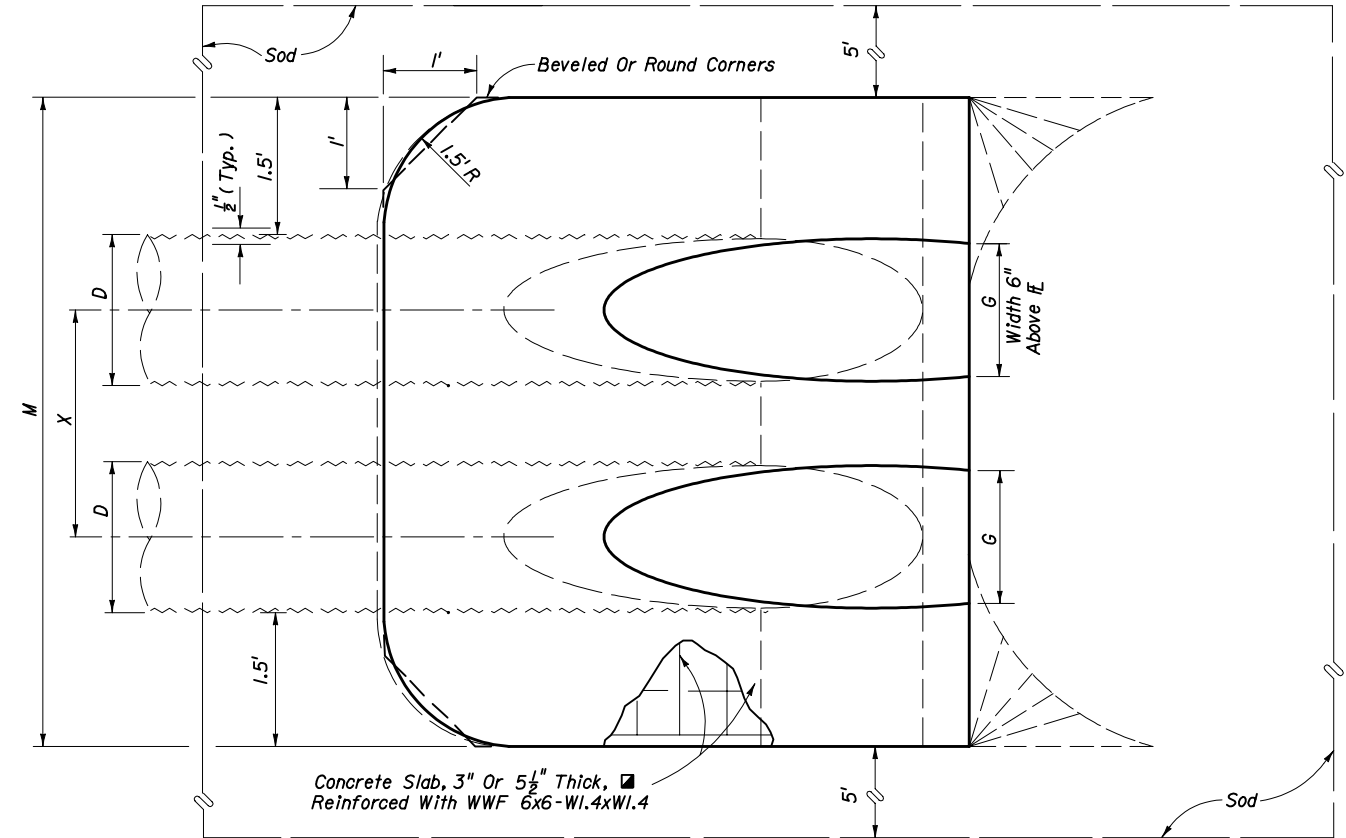
	D	X	A	B	C	E	F	G	H	M				N	5 1/2" CONCRETE SLAB (CY) ■				SODDING (SQ. YDS.)			
										Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	2'-7"	2.5'	1.68'	4.18'	1.50'	5'	1.23'	3.5'	4.33'	6.92'	9.50'	12.08'	1.04'	0.35	0.54	0.74	0.94	21	24	27	29
	18"	2'-10"	2.5'	2.24'	4.74'	2.00'	6'	1.41'	4'	4.58'	7.42'	10.25'	13.08'	1.04'	0.38	0.62	0.87	1.12	22	25	28	31
	24"	3'-5"	2.5'	3.35'	5.85'	3.00'	7'	1.73'	4'	5.08'	8.50'	11.92'	15.33'	1.04'	0.47	0.76	1.05	1.34	23	27	31	35
	30"	4'-3"	2.5'	4.47'	6.97'	4.00'	8'	2.00'	4'	5.58'	9.83'	14.08'	18.33'	1.04'	0.57	0.96	1.37	1.77	25	30	35	39
	36"	5'-1"	2.5'	5.59'	8.09'	5.00'	9'	2.24'	4'	6.08'	11.17'	16.25'	21.33'	1.04'	0.67	1.19	1.72	2.26	27	33	38	44
	42"	6'-0"	2.5'	6.71'	9.21'	6.00'	10'	2.45'	4'	6.58'	12.58'	18.58'	24.58'	1.04'	0.78	1.48	2.17	2.87	29	36	42	49
	48"	6'-9"	2.5'	7.83'	10.33'	7.00'	11'	2.65'	4'	7.08'	13.83'	20.58'	27.33'	1.04'	0.89	1.71	2.54	3.36	31	38	46	53
	54"	7'-8"	2.5'	8.94'	11.44'	8.00'	12'	2.83'	4'	7.58'	15.25'	22.92'	30.58'	1.04'	1.02	2.06	3.10	4.14	33	41	50	58
60"	8'-6"	2.5'	10.06'	12.56'	9.00'	13'	3.00'	4'	8.08'	16.58'	25.08'	33.58'	1.04'	1.14	2.38	3.63	4.89	34	44	53	63	
1:4 Slope	15"	2'-7"	2.5'	3.09'	5.59'	3.0'	7.0'	1.23'	4'	4.33'	6.92'	9.50'	12.08'	1.04'	0.44	0.68	0.91	1.15	22	25	28	31
	18"	2'-10"	2.5'	4.12'	6.62'	4.0'	8.0'	1.41'	4'	4.58'	7.42'	10.25'	13.08'	1.04'	0.49	0.77	1.03	1.31	24	27	30	33
	24"	3'-5"	2.5'	6.18'	8.68'	6.0'	10.0'	1.73'	4'	5.08'	8.50'	11.92'	15.33'	1.04'	0.65	1.09	1.38	1.77	27	30	34	38
	30"	4'-3"	2.5'	8.25'	10.75'	8.0'	12.0'	2.00'	4'	5.58'	9.83'	14.08'	18.33'	1.04'	0.81	1.34	1.90	2.44	29	34	39	44
	36"	5'-1"	2.5'	10.31'	12.81'	10.0'	14.0'	2.24'	4'	6.08'	11.17'	16.25'	21.33'	1.04'	0.97	1.68	2.41	3.14	32	38	44	49
	42"	6'-0"	2.5'	12.37'	14.87'	12.0'	16.0'	2.45'	4'	6.58'	12.58'	18.58'	24.58'	1.04'	1.13	2.08	3.06	4.02	35	42	48	55
	48"	6'-9"	2.5'	14.43'	16.93'	14.0'	18.0'	2.65'	4'	7.08'	13.83'	20.58'	27.33'	1.04'	1.29	2.49	3.69	4.88	38	46	53	60
	54"	7'-8"	2.5'	16.49'	18.99'	16.0'	20.0'	2.83'	4'	7.58'	15.25'	22.92'	30.58'	1.04'	1.48	2.98	4.47	5.98	41	49	58	66
60"	8'-6"	2.5'	18.55'	21.05'	18.0'	22.0'	3.00'	4'	8.08'	16.58'	25.08'	33.58'	1.04'	1.66	3.49	5.31	7.13	44	53	63	72	

■ See General Note No. 3.
See Sheet 5 Of 6 For 3" Slab Quantities

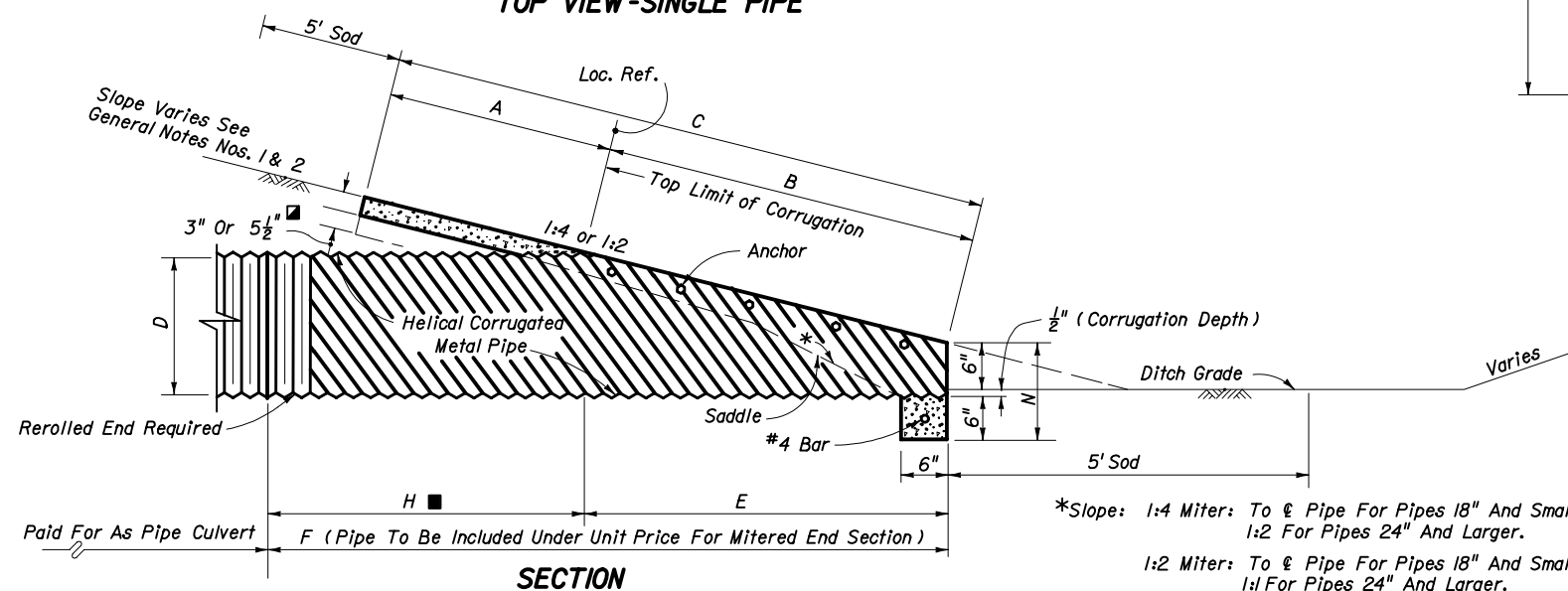
■ Values shown for estimating pipe quantities and are for information only



TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE



SECTION

*Slope: 1:4 Miter: To ϕ Pipe For Pipes 18" And Smaller.
1:2 For Pipes 24" And Larger.
1:2 Miter: To ϕ Pipe For Pipes 18" And Smaller.
1:1 For Pipes 24" And Larger.

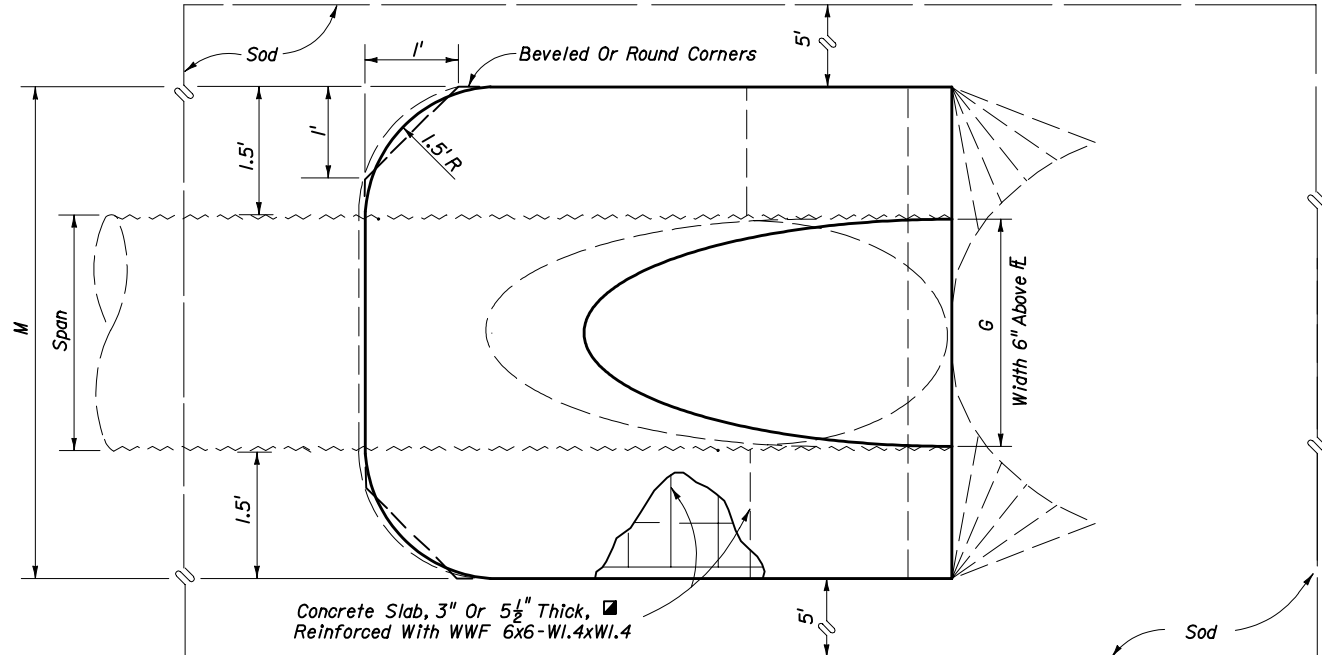
NOTE: See Sheet 6 For Details And Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CROSS DRAIN MITERED END SECTION				
SINGLE AND MULTIPLE ROUND CORRUGATED METAL PIPE				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	DCB	06/78	State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By	KNW	06/78	02	2 of 6
				Index No. 272

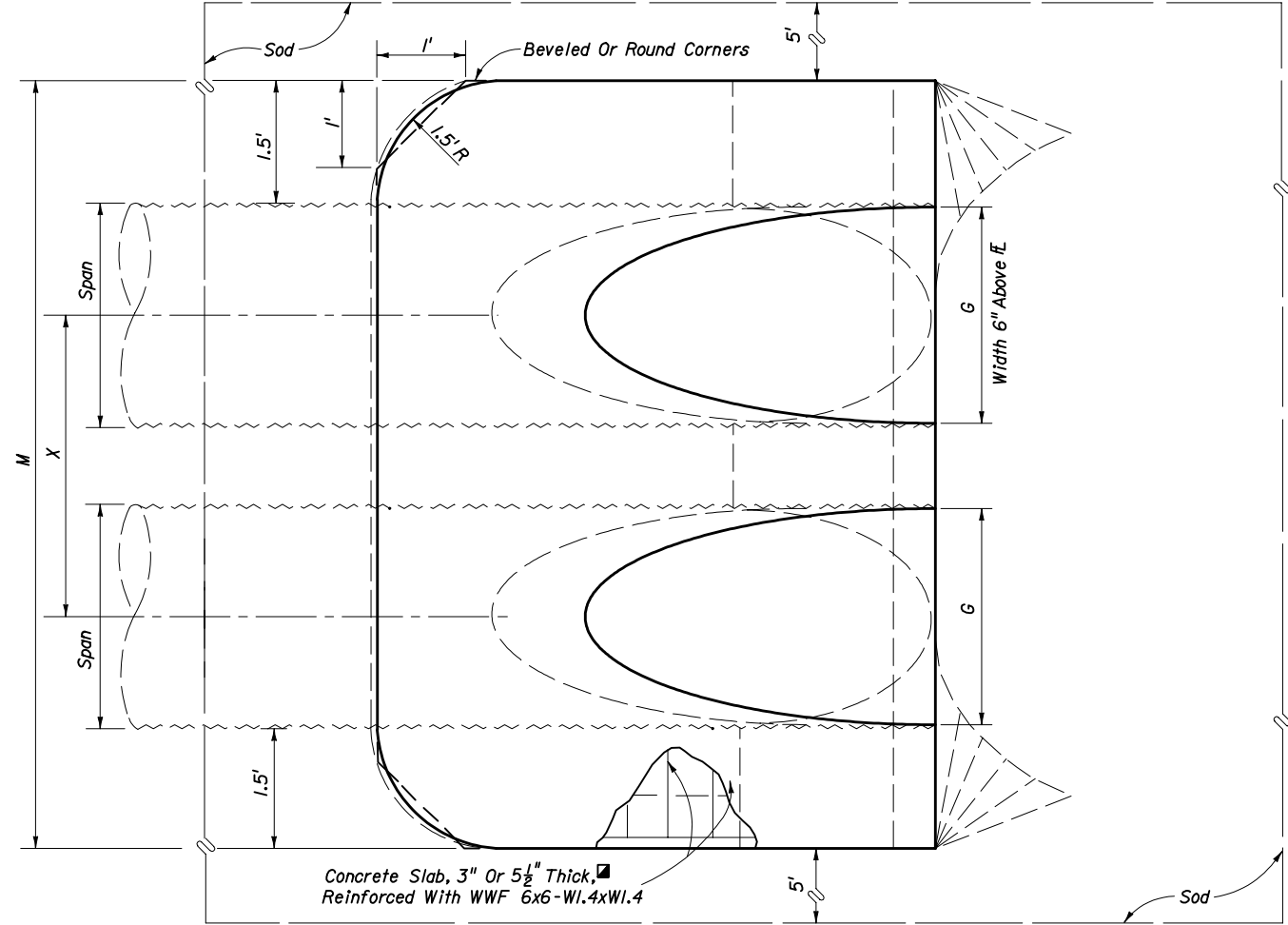
1974 AASHTO		DIMENSIONS AND QUANTITIES														5 1/2" CONCRETE SLAB (CY) ■				SODDING (SQ. YDS.)										
SPAN	RISE	X	A	B	C	E	F	G	H ■	M				N	Single Pipe				Double Pipe				Triple Pipe				Quad. Pipe			
										Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe				
1:2 Slope	17"	13"	2'-6"	2.5'	1.30'	3.80'	1.77'	4'	1.39'	2.8'	4.50'	7.00'	9.50'	12.00'	1.04'	0.41	0.61	0.81	1.02	21	23	26	29							
	21"	15"	2'-10"	2.5'	1.68'	4.17'	1.50'	5'	1.76'	3.5'	4.83'	7.67'	10.50'	13.33'	1.04'	0.43	0.66	0.88	1.10	22	25	28	31							
	28"	20"	3'-5"	2.5'	2.61'	5.11'	2.33'	6'	2.22'	3.7'	5.42'	8.83'	12.25'	15.67'	1.04'	0.51	0.78	1.06	1.33	23	27	30	34							
	35"	24"	4'-0"	2.5'	3.35'	5.85'	3.00'	7'	2.55'	4.0'	6.00'	10.00'	14.00'	18.00'	1.04'	0.57	0.90	1.22	1.55	24	29	33	38							
	42"	29"	4'-9"	2.5'	4.29'	6.79'	3.83'	8'	2.97'	4.2'	6.58'	11.33'	16.08'	20.83'	1.04'	0.64	1.04	1.46	1.87	26	31	37	42							
	49"	33"	5'-6"	2.5'	5.03'	7.53'	4.50'	9'	3.34'	4.5'	7.17'	12.67'	18.17'	23.67'	1.04'	0.73	1.23	1.72	2.22	28	34	40	46							
	57"	38"	6'-4"	2.5'	5.96'	8.46'	5.33'	10'	3.65'	4.7'	7.83'	14.17'	20.50'	26.83'	1.04'	0.83	1.44	2.04	2.64	29	36	44	51							
	71"	47"	7'-10"	2.5'	7.64'	10.14'	6.83'	12'	4.14'	5.2'	9.00'	16.83'	24.67'	32.50'	1.04'	1.05	1.89	2.74	3.57	33	41	50	59							
1:4 Slope	17"	13"	2'-6"	2.5'	2.41'	4.91'	2.33'	7'	1.39'	4.7'	4.50'	7.00'	9.50'	12.00'	1.04'	0.48	0.71	0.95	1.18	22	25	27	30							
	21"	15"	2'-10"	2.5'	3.09'	5.59'	3.00'	8'	1.76'	5.0'	4.83'	7.67'	10.50'	13.33'	1.04'	0.52	0.80	1.09	1.31	23	26	29	32							
	28"	20"	3'-5"	2.5'	4.81'	7.31'	4.67'	9'	2.22'	4.3'	5.42'	8.83'	12.25'	15.67'	1.04'	0.61	0.92	1.27	1.59	25	29	33	37							
	35"	24"	4'-0"	2.5'	6.18'	8.68'	6.00'	11'	2.55'	5.0'	6.00'	10.00'	14.00'	18.00'	1.04'	0.73	1.14	1.55	1.97	28	32	37	41							
	42"	29"	4'-9"	2.5'	7.90'	10.40'	7.67'	12'	2.97'	4.3'	6.58'	11.33'	16.08'	20.83'	1.04'	0.87	1.39	1.92	2.45	30	35	41	46							
	49"	33"	5'-6"	2.5'	9.28'	11.78'	9.00'	14'	3.34'	5.0'	7.17'	12.67'	18.17'	23.67'	1.04'	1.00	1.66	2.30	2.96	32	38	45	51							
	57"	38"	6'-4"	2.5'	11.00'	13.50'	10.67'	16'	3.65'	5.3'	7.83'	14.17'	20.50'	26.83'	1.04'	1.18	2.00	2.82	3.64	35	42	49	56							
	71"	47"	7'-10"	2.5'	12.71'	15.21'	12.33'	17'	3.89'	4.7'	8.42'	15.50'	22.58'	29.67'	1.04'	1.36	2.39	3.38	4.38	38	45	53	61							

■ See General Note No. 3.
See Sheet 5 Of 6 For 3" Slab Quantities

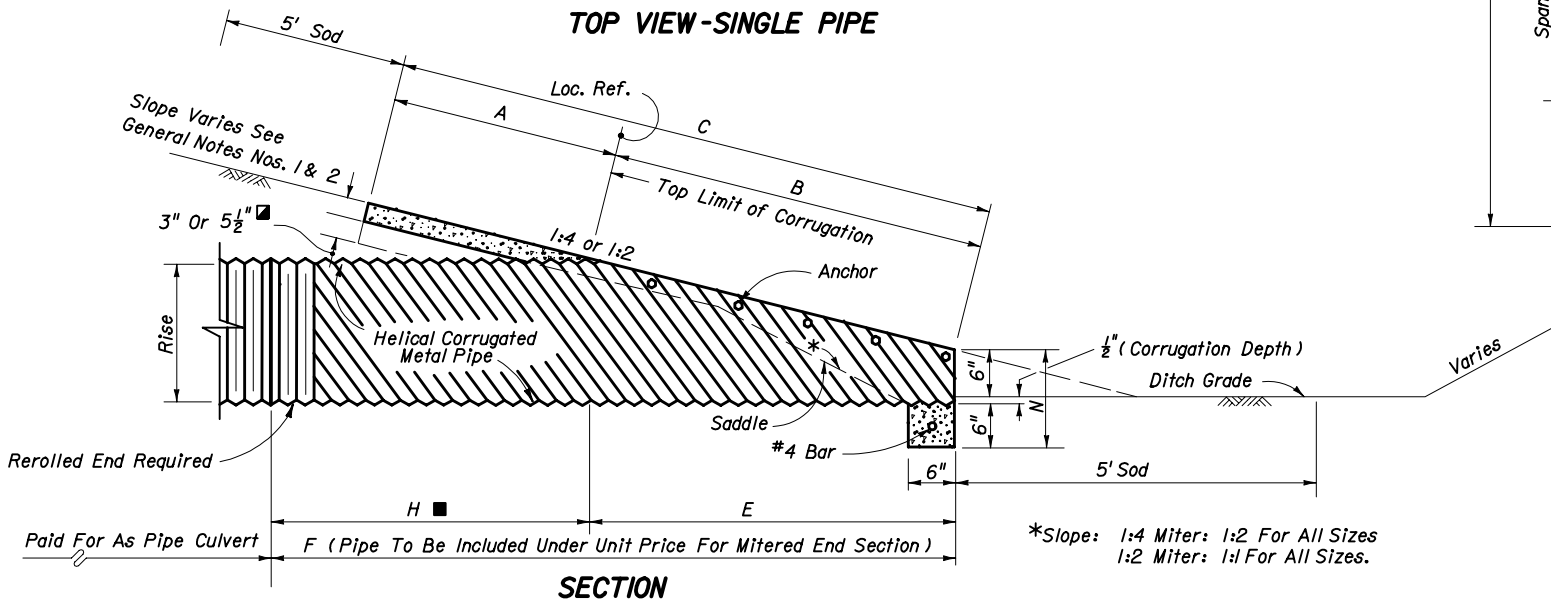
■ Values shown for estimating pipe quantities and are for information.



TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE



SECTION

NOTE: See Sheet 6 For Details And Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CROSS DRAIN MITERED END SECTION

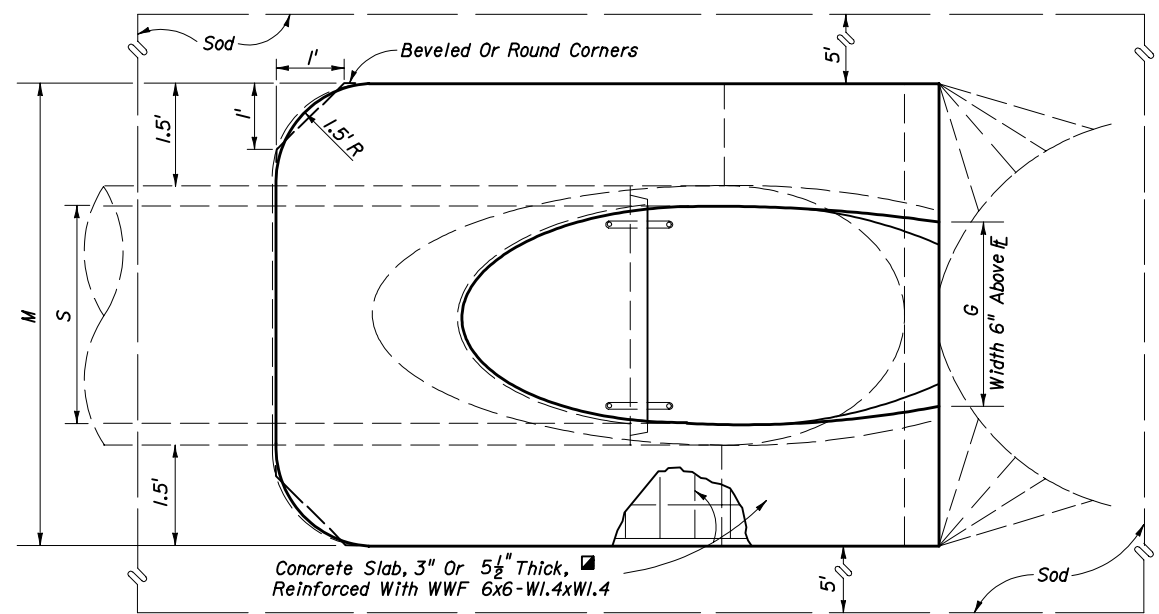
SINGLE AND MULTIPLE CORRUGATED METAL PIPE-ARCH

Designed By	DCB	06/78	Approved By	<i>[Signature]</i>	
Drawn By	KMW	06/78	Revision	Sheet No.	Index No.
Checked By			02	3 of 6	272

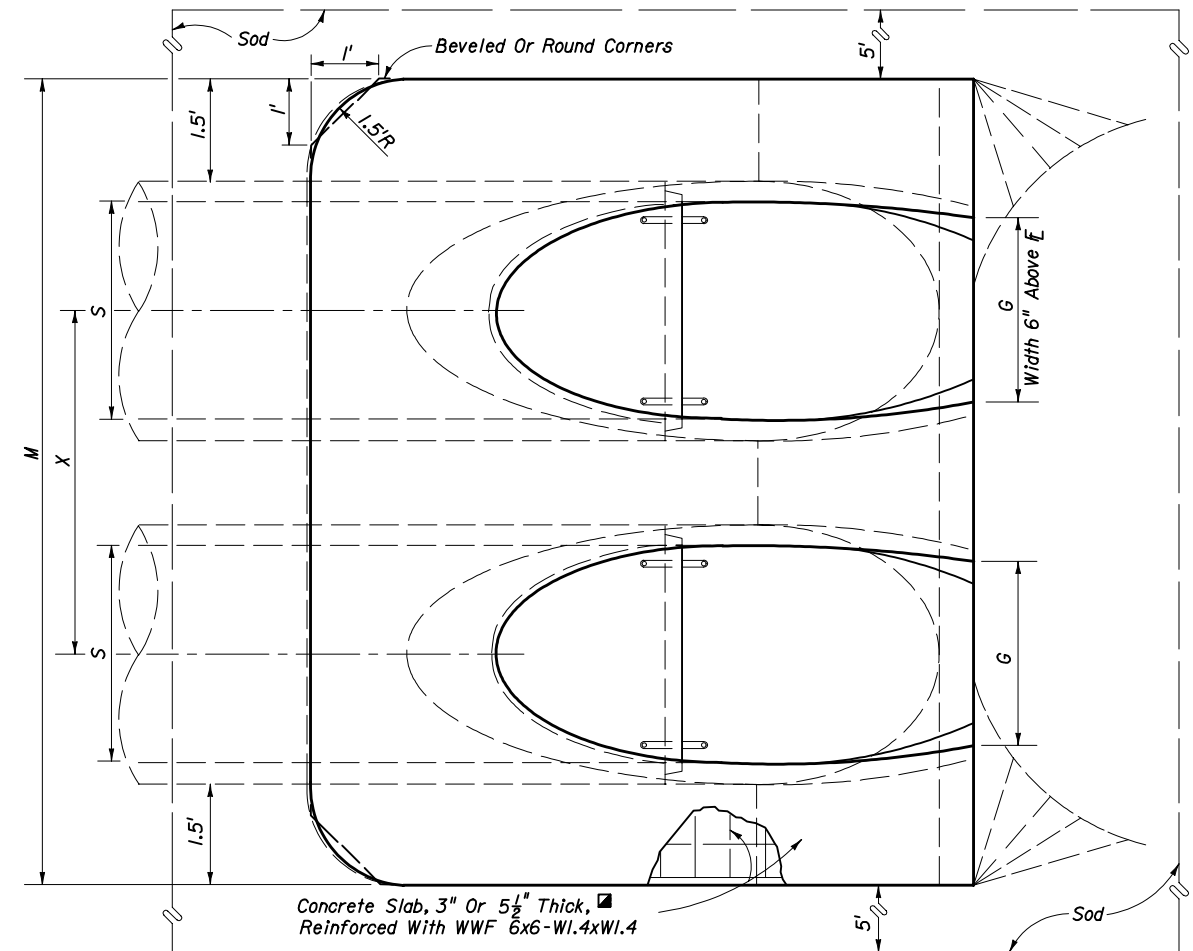
DIMENSIONS & QUANTITIES																							
Rise R	Span S	X	A	B	C	E	F	G	H	M				5 1/2" CONC. SLAB (CY)				SODDING (SQ. YDS.)					
										Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	N	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	
1:2 Slope	12"	18"	2'-10"	1.97'	1.62'	3.59'	1.56'	4'	1.50'	2.4'	4.92'	7.75'	10.58'	13.42'	1.21'	0.30	0.49	0.67	0.85	21	24	27	30
	14"	23"	3'-4"	2.01'	1.99'	4.00'	1.89'	5'	1.90'	3.1'	5.38'	8.71'	12.04'	15.38'	1.23'	0.37	0.59	0.81	1.02	22	26	29	33
	19"	30"	4'-0"	2.11'	2.92'	5.03'	2.73'	6'	2.37'	3.3'	6.04'	10.04'	14.04'	18.04'	1.27'	0.50	0.80	1.09	1.39	24	28	33	37
	24"	38"	5'-0"	2.20'	3.85'	6.05'	3.56'	7'	2.85'	3.4'	6.79'	11.79'	16.79'	21.79'	1.31'	0.62	1.03	1.45	1.86	26	31	37	42
	29"	45"	5'-11"	2.34'	4.79'	7.13'	4.39'	8'	3.19'	3.6'	7.50'	13.42'	19.33'	25.25'	1.38'	0.75	1.30	1.84	2.39	28	34	41	47
	34"	53"	7'-0"	2.43'	5.72'	8.15'	5.23'	9'	3.57'	3.8'	8.25'	15.25'	22.25'	29.25'	1.42'	0.90	1.61	2.32	3.03	30	37	45	53
	38"	60"	7'-10"	2.52'	6.46'	8.98'	5.89'	9'	3.95'	3.1'	8.92'	16.75'	24.58'	32.42'	1.46'	1.03	1.89	2.74	3.60	31	40	49	57
	43"	68"	8'-11"	2.62'	7.39'	10.01'	6.73'	10'	4.28'	3.3'	9.67'	18.58'	27.50'	36.42'	1.50'	1.19	2.26	3.33	4.40	33	43	53	63
	48"	76"	9'-11"	2.71'	8.33'	11.04'	7.56'	11'	4.59'	3.4'	10.42'	20.33'	30.25'	40.17'	1.54'	1.38	2.65	3.93	5.21	35	46	57	68
	53"	83"	10'-8"	2.80'	9.26'	12.06'	8.39'	12'	4.77'	3.6'	11.08'	21.75'	32.42'	43.08'	1.58'	1.55	3.03	4.50	5.96	37	49	61	73
58"	91"	11'-8"	2.90'	10.19'	13.09'	9.23'	13'	5.01'	3.8'	11.83'	23.50'	35.17'	46.83'	1.63'	1.75	3.47	5.20	6.93	39	52	65	78	
1:4 Slope	12"	18"	2'-10"	2.36'	3.06'	5.42'	3.03'	5'	1.50'	2.0'	4.92'	7.75'	10.58'	13.42'	1.21'	0.45	0.68	0.92	1.14	23	26	29	32
	14"	23"	3'-4"	2.44'	3.75'	6.19'	3.70'	6'	1.90'	2.3'	5.38'	8.71'	12.04'	15.38'	1.23'	0.53	0.83	1.13	1.42	24	28	32	35
	19"	30"	4'-0"	2.62'	5.47'	8.09'	5.36'	8'	2.37'	2.6'	6.04'	10.04'	14.04'	18.04'	1.27'	0.74	1.15	1.57	1.98	27	32	36	40
	24"	38"	5'-0"	2.79'	7.18'	9.97'	7.03'	10'	2.85'	3.0'	6.79'	11.79'	16.79'	21.79'	1.31'	0.97	1.57	2.19	2.81	30	36	41	47
	29"	45"	5'-11"	3.05'	8.90'	11.95'	8.70'	12'	3.19'	3.3'	7.50'	13.42'	19.33'	25.25'	1.38'	1.22	2.07	2.92	3.77	33	40	46	53
	34"	53"	7'-0"	3.22'	10.62'	13.84'	10.36'	13'	3.57'	2.6'	8.25'	15.25'	22.25'	29.25'	1.42'	1.48	2.62	3.77	4.92	36	44	52	59
	38"	60"	7'-10"	3.39'	11.99'	15.38'	11.70'	15'	3.95'	3.3'	8.92'	16.75'	24.58'	32.42'	1.46'	1.72	3.12	4.53	5.92	38	47	56	65
	43"	68"	8'-11"	3.56'	13.71'	17.27'	13.36'	17'	4.28'	3.6'	9.67'	18.58'	27.50'	36.42'	1.50'	2.02	3.78	5.56	7.32	41	51	61	71
	48"	76"	9'-11"	3.73'	15.43'	19.16'	15.03'	19'	4.59'	4.0'	10.42'	20.33'	30.25'	40.17'	1.54'	2.34	4.49	6.64	8.79	44	55	66	77
	53"	83"	10'-8"	3.91'	17.15'	21.06'	16.70'	20'	4.77'	3.3'	11.08'	21.75'	32.42'	43.08'	1.58'	2.66	5.17	7.66	10.16	47	59	71	83
58"	91"	11'-8"	4.08'	18.87'	22.95'	18.36'	22'	5.01'	3.6'	11.83'	23.50'	35.17'	46.83'	1.63'	3.02	5.98	8.95	11.90	50	63	76	89	

See General Note No. 3.
See Sheet 5 Of 6 For 3" Slab Quantities

Values shown for estimating pipe quantities and are for information only.

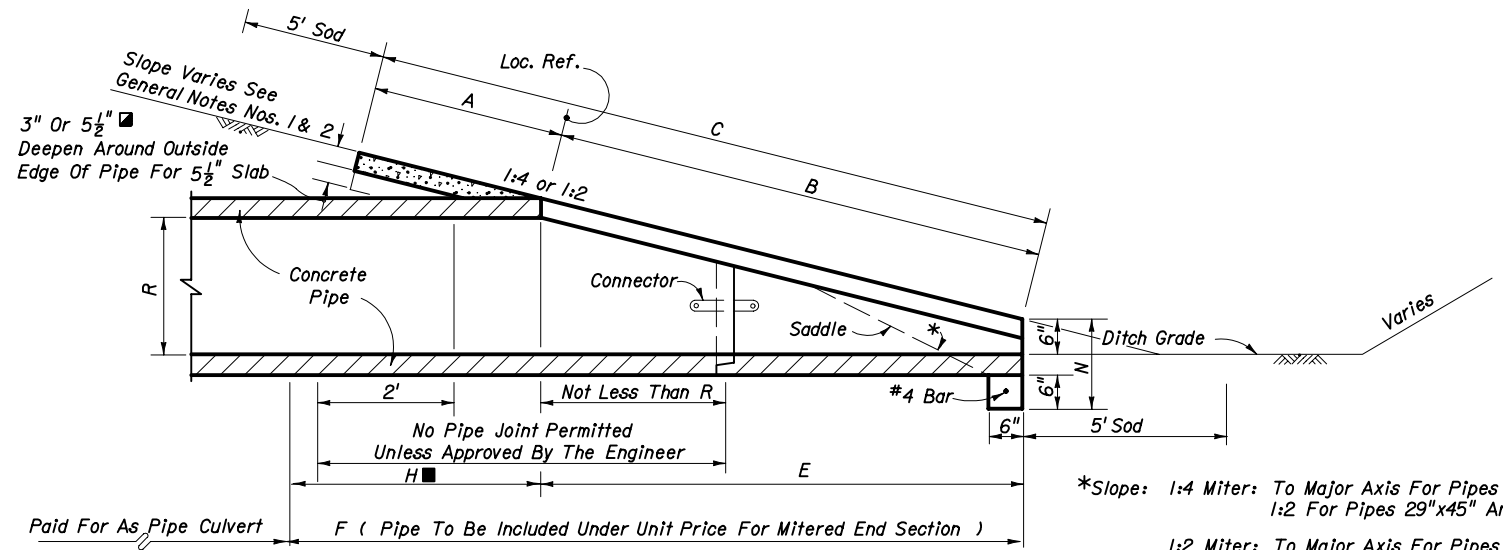


TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE

NOTE: See Sheet 6 For Details And Notes.



SECTION

*Slope: 1:4 Miter: To Major Axis For Pipes 24"x38" And Smaller.
1:2 For Pipes 29"x45" And Larger.

1:2 Miter: To Major Axis For Pipes 29"x45" And Smaller.
1:1 For Pipes 34"x53" And Larger.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CROSS DRAIN MITERED END SECTION
SINGLE AND MULTIPLE ELLIPTICAL CONCRETE PIPE

Designed By	EGR	06/81	Approved By	
Drawn By	HSD	06/81	State Drainage Engineer	
Checked By	JVG/JBW	06/81	Revision	02
Paid For As Pipe Culvert			Sheet No.	4 of 6
			Index No.	272


QUANTITIES FOR 3" THICK CONCRETE SLABS (CY)

	D	ROUND-CONCRETE			
		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	0.27	0.41	0.54	0.67
	18"	0.31	0.45	0.60	0.75
	24"	0.39	0.59	0.79	1.00
	30"	0.46	0.76	1.04	1.32
	36"	0.55	0.94	1.33	1.71
	42"	0.66	1.15	1.66	2.15
	48"	0.76	1.37	1.96	2.57
	54"	0.87	1.62	2.38	3.14
	60"	0.99	1.90	2.81	3.73
	66"	1.11	2.15	3.21	4.27
72"	1.24	2.46	3.68	4.90	
1:4 Slope	15"	0.40	0.61	0.80	1.00
	18"	0.47	0.69	0.91	1.14
	24"	0.60	0.90	1.21	1.52
	30"	0.76	1.19	1.63	2.07
	36"	0.89	1.48	2.05	2.63
	42"	1.05	1.82	2.57	3.34
	48"	1.21	2.15	3.07	4.00
	54"	1.39	2.55	3.72	4.88
	60"	1.59	3.02	4.44	5.86
	66"	1.91	3.66	5.40	7.15
72"	2.12	4.18	6.24	8.30	

	D	ROUND-CMP			
		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	0.24	0.37	0.51	0.64
	18"	0.26	0.43	0.61	0.78
	24"	0.32	0.52	0.72	0.91
	30"	0.38	0.64	0.91	1.18
	36"	0.44	0.78	1.13	1.48
	42"	0.51	0.96	1.41	1.87
	48"	0.57	1.09	1.63	2.15
	54"	0.65	1.32	1.99	2.66
	60"	0.71	1.49	2.28	3.07
	66"				
1:4 Slope	15"	0.31	0.47	0.63	0.79
	18"	0.34	0.53	0.71	0.90
	24"	0.44	0.69	0.92	1.18
	30"	0.53	0.88	1.25	1.60
	36"	0.62	1.07	1.53	2.00
	42"	0.71	1.30	1.92	2.52
	48"	0.80	1.54	2.29	3.02
	54"	0.91	1.83	2.74	3.67
	60"	1.02	2.15	3.27	4.39
	66"				

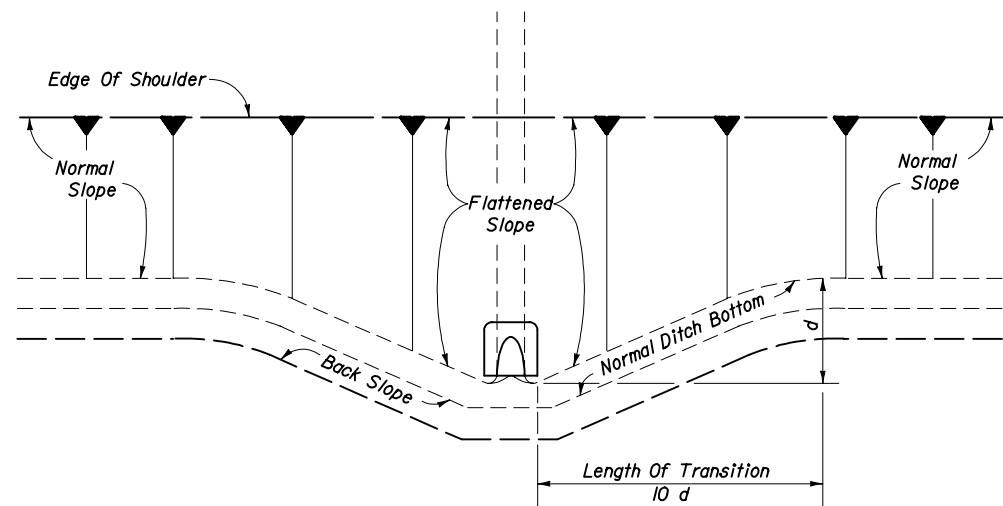
	Span	Rise	CMP-ARCH			
			Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	17"	13"	0.33	0.49	0.65	0.81
	21"	15"	0.33	0.50	0.67	0.83
	28"	20"	0.37	0.56	0.76	0.95
	35"	24"	0.40	0.62	0.84	1.07
	42"	29"	0.43	0.70	0.98	1.25
	49"	33"	0.49	0.82	1.15	1.48
	57"	38"	0.55	0.95	1.35	1.75
	64"	43"	0.62	1.10	1.57	2.05
	71"	47"	0.69	1.24	1.80	2.35
	78"					
1:4 Slope	17"	13"	0.38	0.56	0.74	0.92
	21"	15"	0.39	0.59	0.80	0.95
	28"	20"	0.43	0.64	0.88	1.10
	35"	24"	0.49	0.77	1.05	1.33
	42"	29"	0.57	0.92	1.27	1.62
	49"	33"	0.65	1.08	1.50	1.93
	57"	38"	0.76	1.30	1.83	2.37
	64"	43"	0.87	1.55	2.18	2.83
	71"	47"	0.95	1.68	2.43	3.17
	78"					

	Rise	Span	ELLIPTICAL-CONCRETE			
			Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	12"	18"	0.19	0.33	0.45	0.57
	14"	23"	0.25	0.40	0.55	0.69
	19"	30"	0.34	0.55	0.75	0.95
	24"	38"	0.43	0.71	1.00	1.28
	29"	45"	0.52	0.90	1.27	1.65
	34"	53"	0.62	1.11	1.60	2.09
	38"	60"	0.70	1.29	1.87	2.46
	43"	68"	0.81	1.54	2.26	2.99
	48"	76"	0.93	1.79	2.66	3.53
	53"	83"	1.04	2.04	3.03	4.02
58"	91"	1.17	2.33	3.49	4.66	
1:4 Slope	12"	18"	0.30	0.45	0.61	0.76
	14"	23"	0.36	0.56	0.76	0.95
	19"	30"	0.51	0.79	1.08	1.36
	24"	38"	0.68	1.10	1.53	1.96
	29"	45"	0.86	1.45	2.04	2.63
	34"	53"	1.02	1.81	2.60	3.39
	38"	60"	1.18	2.14	3.10	4.05
	43"	68"	1.38	2.58	3.79	4.99
	48"	76"	1.59	3.05	4.51	5.97
	53"	83"	1.80	3.50	5.19	6.88
58"	91"	2.04	4.04	6.05	8.05	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
CROSS DRAIN MITERED END SECTION					
Names	Dates	Approved By 			
Designed By		State Drainage Engineer			
Drawn By	dde	05/86	Revision	Sheet No.	Index No.
Checked By	JBW	05/86	00	5 of 6	272

GENERAL NOTES

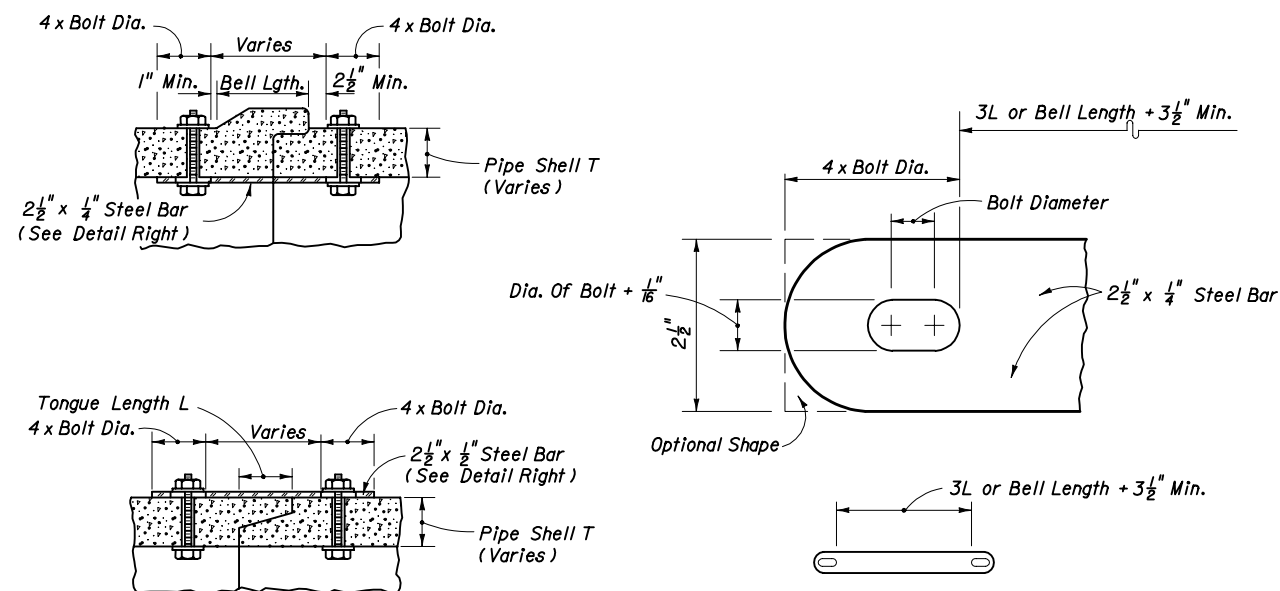
- Mitered end sections for pipe sizes 15", 18" and 24" round or equivalent pipe arch or elliptical pipe are permitted within the clear zone. When the slope intersection permits, the mitered end section may be located with the culvert opening as close as 8' beyond the outside edge of the shoulder.
- Slope and ditch transitions shall be used when the normal roadway slope must be flattened to place end section outside clear zone. See detail left.
- The reinforced concrete slab shall be constructed for all sizes of cross drain pipe and cast in place with Class I concrete. Slabs shall be 5½" thick unless 3" thickness called for in plans.
- Concrete pipe used in the assembly of mitered end sections shall be selective lengths to avoid excessive connections.
- Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered end section shall be repaired.
- That portion of corrugated metal pipe in direct contact with the concrete slab and extending 12" beyond shall be bituminous coated prior to placing of the concrete.
- Unless otherwise designated in the plans, concrete pipe mitered end sections may be used with any type of cross drain pipe; corrugated steel pipe mitered end sections may be used with any type of cross drain pipe except aluminum pipe; and, corrugated aluminum mitered end sections may be used with any type of cross drain pipe except steel pipe. When bituminous coated metal pipe is specified for cross drain pipe, mitered end sections shall be constructed with like pipe or concrete pipe.
- When the mitered end section pipe is dissimilar to the cross drain pipe, a concrete jacket shall be constructed in accordance with Standard Index 280.
- When existing multiple cross drain pipes are spaced other than the dimensions shown in this detail, or have non-parallel axes, or have non-uniform sections, the mitered end sections will be constructed either separately as single pipe mitered end sections or collectively as multiple pipe end sections as directed by the Engineer; however, mitered end sections will be paid for each based on each independent pipe end.
- The cost of all pipe(s), fasteners, reinforcing, connectors, anchors, concrete, sealants, jackets, and coupling bands shall be included in the cost for the mitered end section. Sodding shall be paid for separately under the contract unit price of Sodding, SY.
- Mitered end sections shall be paid for under the contract unit price for Mitered End Section (CD), Each, based on each independent pipe end.



PLAN

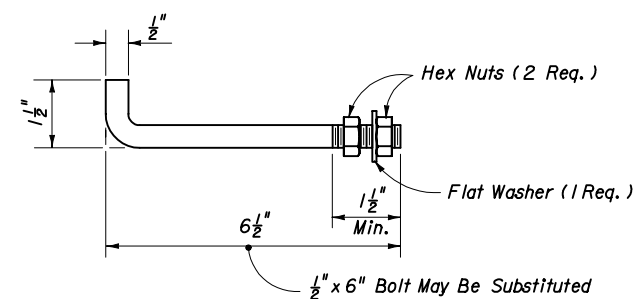
NOTE: See General Note 2

SLOPE AND DITCH TRANSITIONS



All bars, bolts, nuts and washers are to be galvanized steel.
Bolts diameters shall be 3/8" for 15" to 36" pipe and 5/8" for 42" to 72" pipe.
Two connectors required per joint, located 60° right and left of bottom center of pipe.
Bolt holes in pipe shell are to be drilled.

CONCRETE PIPE CONNECTOR



Anchors required for CMP only.

Anchor, washer and nuts to be galvanized steel.

Bend anchor where required to center in concrete slab. Damaged surfaces to be repaired after bending. Anchors are to be spaced a distance equal to four (4) corrugations. Place the anchors in the outside crest of corrugation.


Flat washers to be placed on inside wall of pipe.

Holes in the mitered end pipe are to be drilled or punched; burning not permitted.

ANCHOR DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CROSS DRAIN MITERED END SECTION SPECIAL DETAILS AND NOTES

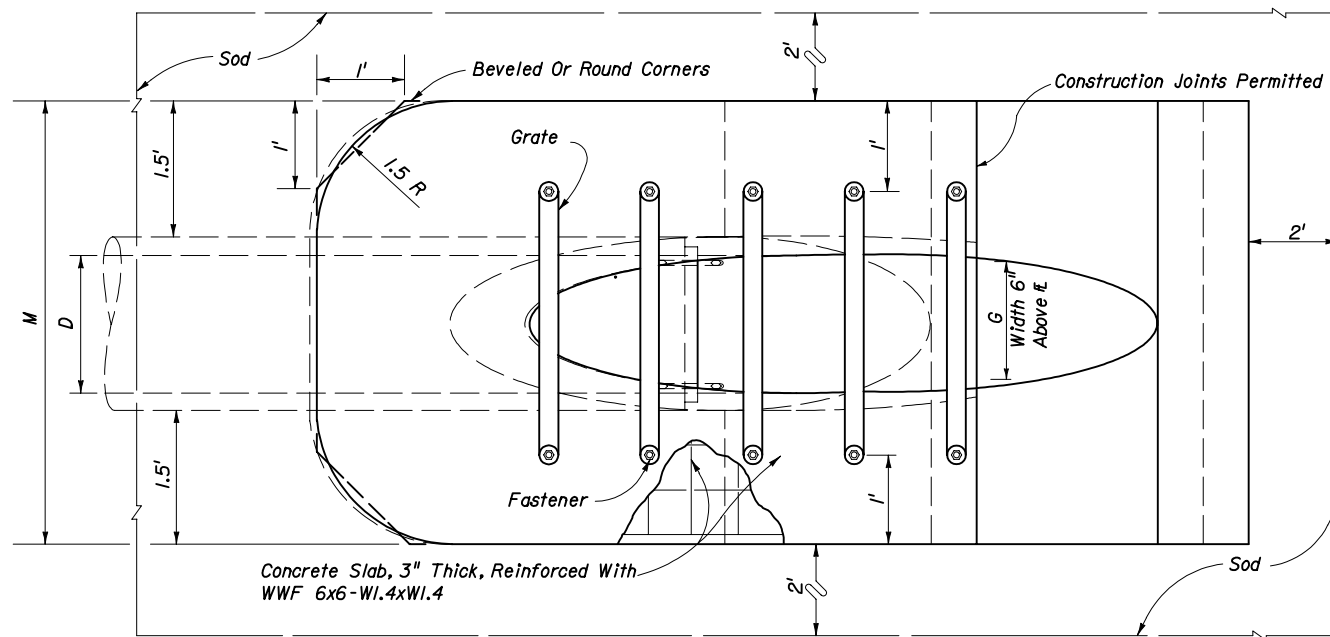
Names	Dates	Approved By		
Designed By	DCB	06/78	 State Drainage Engineer	
Drawn By				
Checked By	KNM	06/78		
Revision	04	Sheet No.	6 of 6	Index No.
				272

DIMENSIONS & QUANTITIES

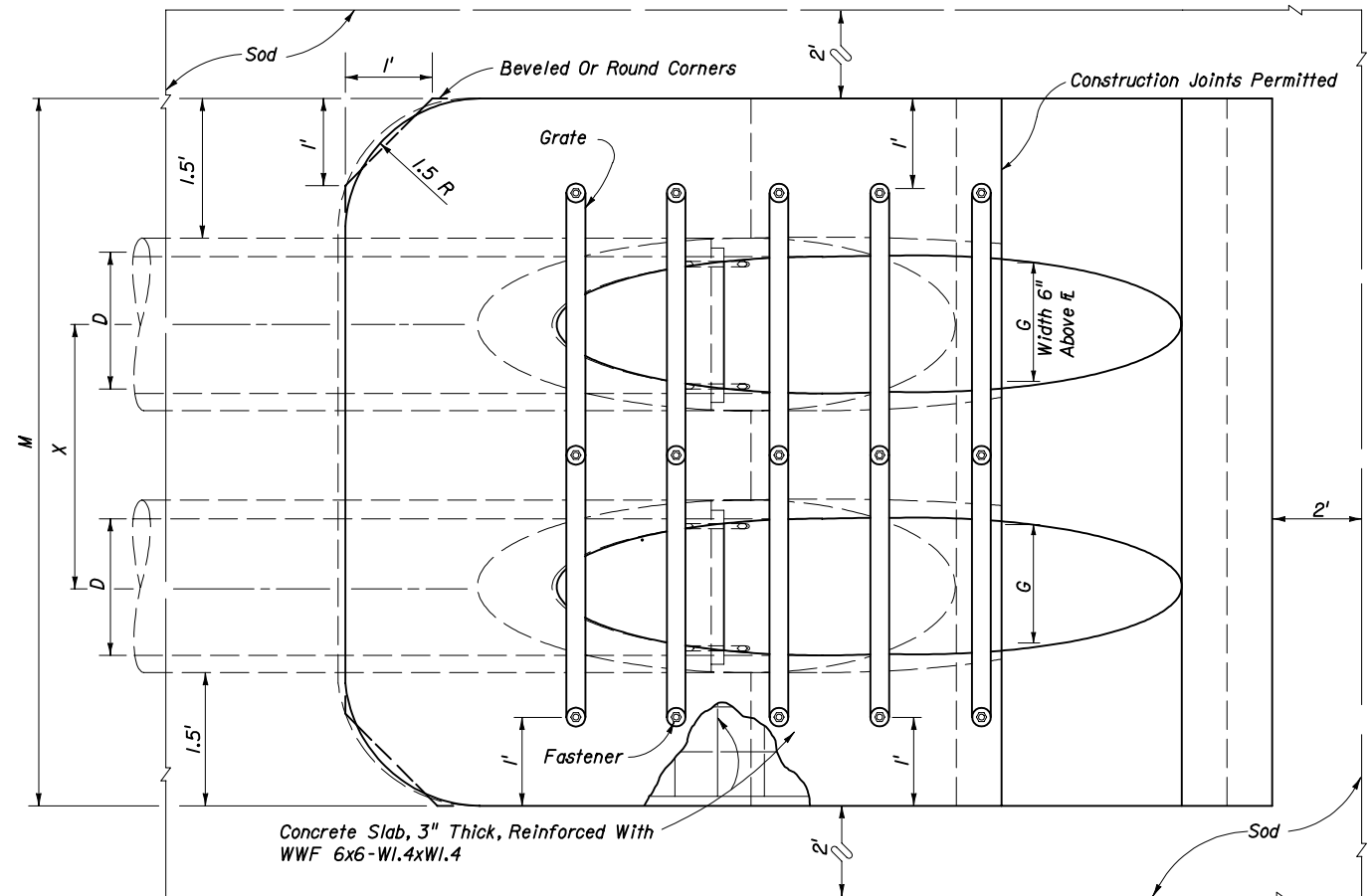
D	X	A	B	C	E	F	G	H	M				N	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)			
									Single Pipe	Double Pipe	Triple Pipe	Quad Pipe		Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad Pipe
15"	2'-7"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.0'	4.63'	7.21'	9.79'	12.37'	1.19'			0.76	1.16	1.54	1.94	8	10	11	12
18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.0'	4.92'	7.75'	10.58'	13.42'	1.21'			0.85	1.28	1.71	2.17	9	10	12	13
24"	3'-5"	2.53'	7.18' Δ	9.71'	7.03' Δ	11'	1.73'	4.0'	5.50'	8.92'	12.33'	15.75'	1.25'			1.02	1.58	2.15	2.75	10	12	13	15
30"	4'-3"	2.70'	9.25'	11.95'	9.03'	13'	2.00'	4.0'	6.08'	10.33'	14.58'	18.83'	1.29'	2 1/2"	3"	1.23	1.98	2.74	3.50	12	14	15	17
36"	5'-1"	2.87'	11.31' ◇	14.18'	11.03' ◇	15'	2.24'	4.0'	6.67'	11.75'	16.83'	21.92'	1.33'	2 1/2"	3"	1.40	2.38	3.33	4.24	13	15	17	20
42"	6'-0"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	4.0'	7.25'	13.25'	19.25'	25.25'	1.38'	2 1/2"	3 1/2"	1.60	2.83	4.04	5.26	14	17	19	22
48"	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	4.0'	7.83'	14.58'	21.33'	28.08'	1.42'	2 1/2"	3 1/2"	1.81	3.26	4.70	6.14	15	18	21	24
54"	7'-8"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	4.0'	8.42'	16.08'	23.75'	31.42'	1.46'	3"	4"	2.03	3.78	5.54	7.28	17	20	23	27
60"	8'-6"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	4.0'	9.00'	17.50'	26.00'	34.50'	1.50'	3"	4"	2.28	4.36	6.43	8.50	18	22	25	29

Δ 6.42' ◇ 10.40' Dimensions permitted to allow use of 8' standard pipe lengths.
 ◇ 10.40' ◇ 10.10' Dimensions permitted to allow use of 12' standard pipe lengths.
 Δ ◇ Concrete slab shall be deepened to form bridge across crown of pipe. See section below.

■ Values shown for estimating pipe quantities and are for information only.

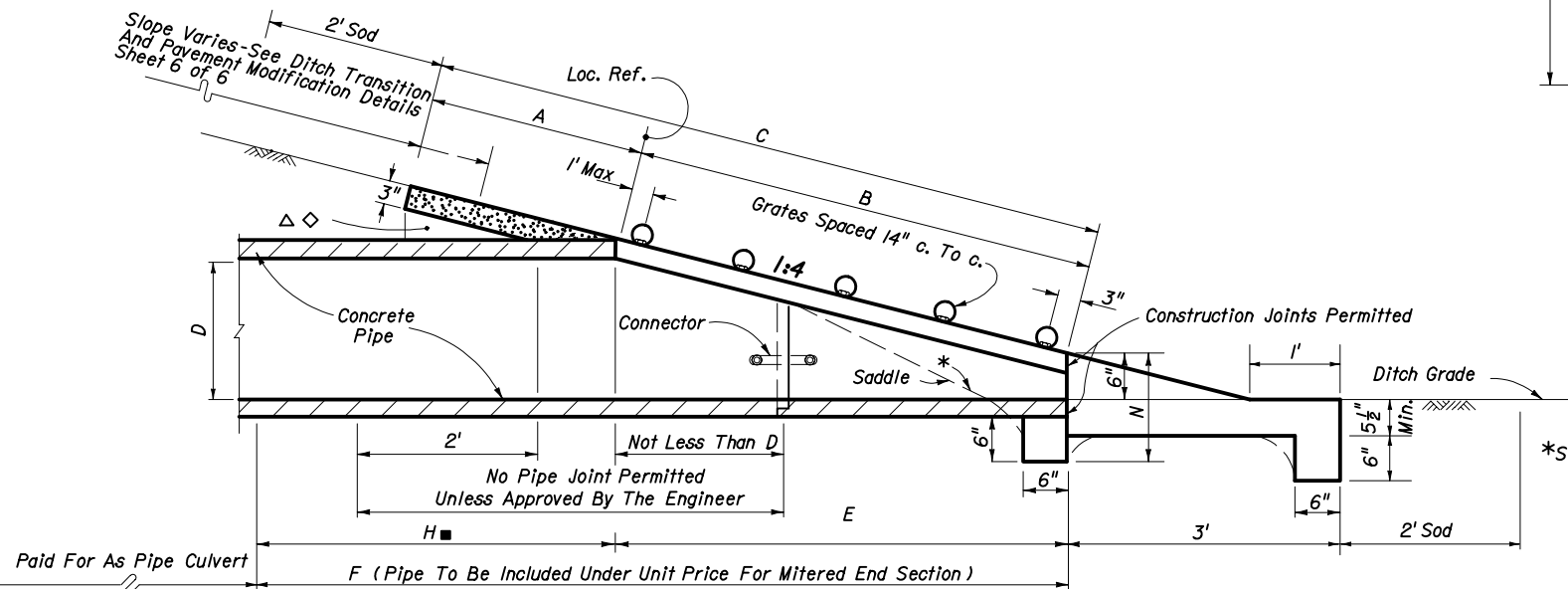


TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE

Note: See Sheets 5 and 6 for details and general notes.



SECTION

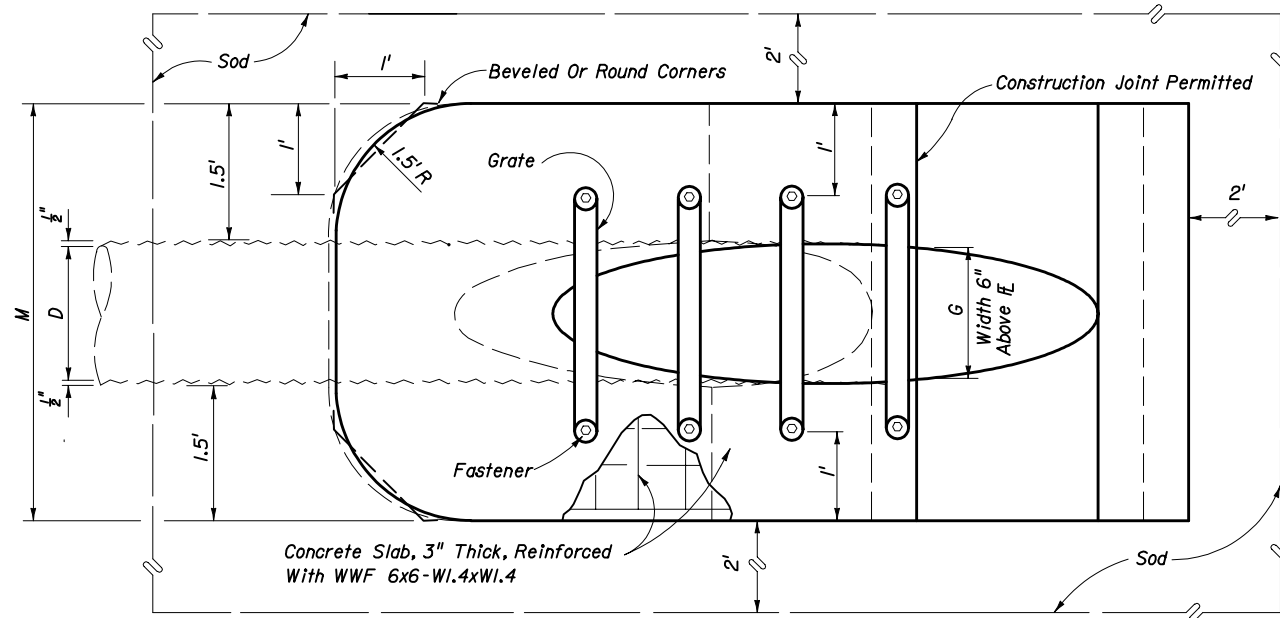
*Slope:
 To $\frac{1}{2}$ Pipe For Pipes 18" And Smaller
 1:2 For Pipes 24" And Larger.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SIDE DRAIN MITERED END SECTION				
SINGLE AND MULTIPLE ROUND CONCRETE PIPE				
Designed By	EGR	06/78	Approved By <i>[Signature]</i> State Drainage Engineer	
Drawn By	HKH	06/78	Revision	Sheet No.
Checked By	JVG	06/78	02	1 of 6
				273

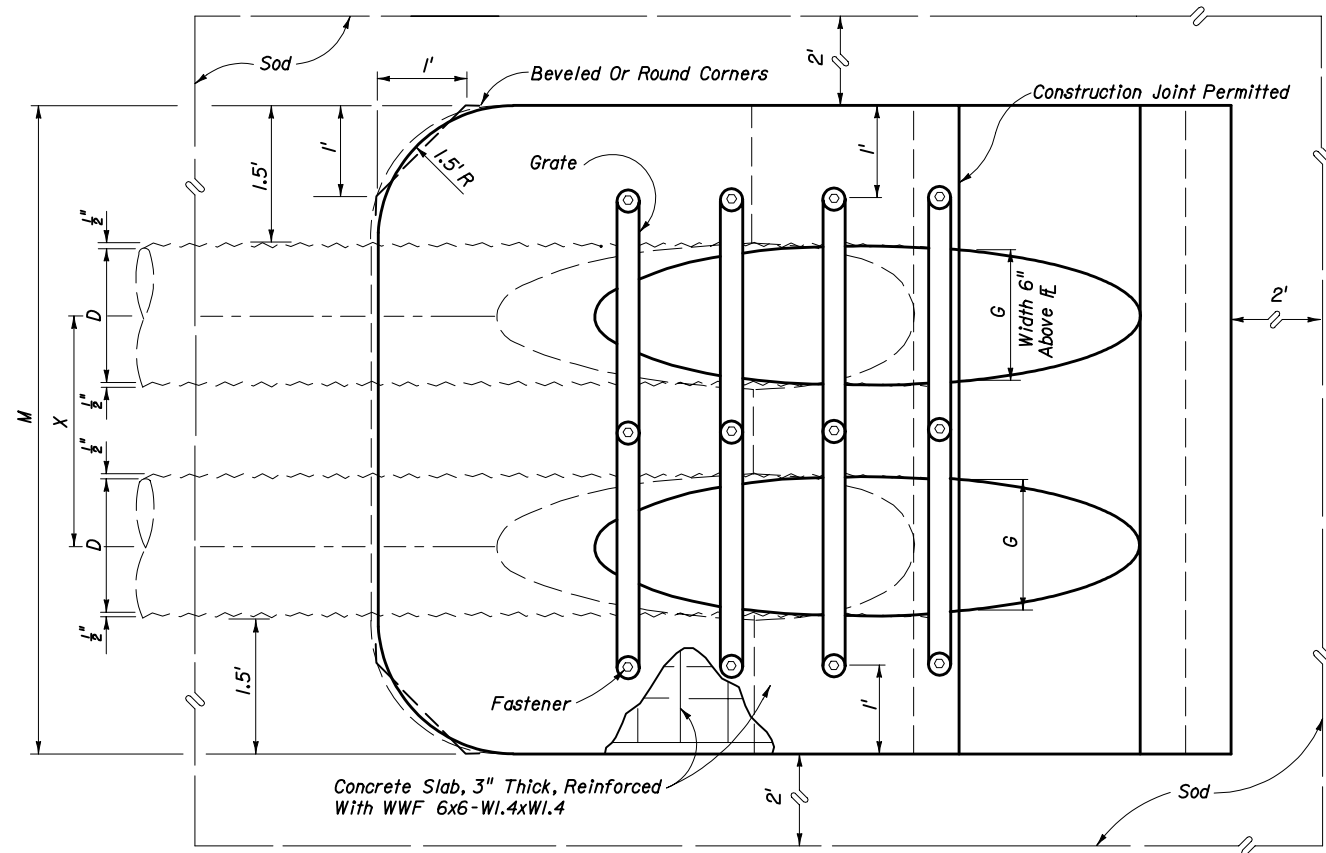
Paid For As Pipe Culvert

DIMENSIONS & QUANTITIES

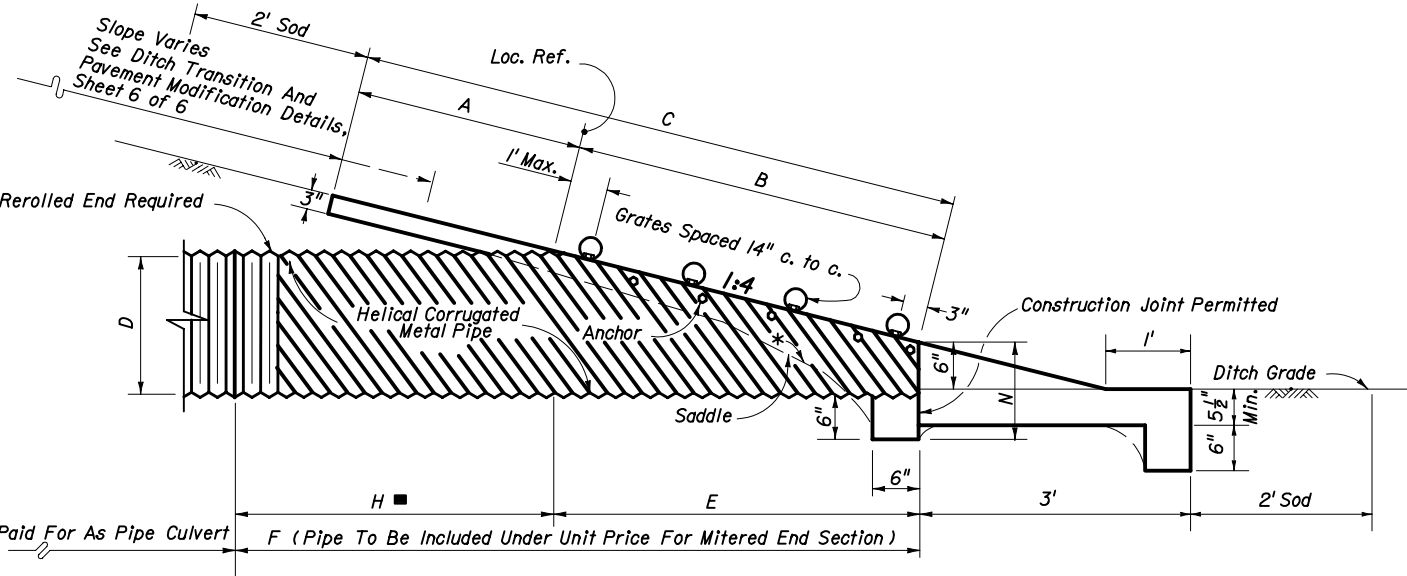
D	X	A	B	C	E	F	G	H	M				N	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)				REMARKS
									Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	
8"	2'-0"	2.5'	0.72'	3.22'	0.7'	4.0'	0.58'	3.3'	3.75'	5.75'	7.75'	9.75'	1.04'			0.52	0.90	1.22	1.54	7	8	8	9	These sizes are restricted to inlet and outlet treatment for water management systems or similar applications. ■ Values shown for estimating pipe quantities and are for information only.
10"	2'-2"	2.5'	1.34'	3.84'	1.3'	5.0'	0.81'	3.7'	3.92'	6.08'	8.25'	10.41'	1.04'			0.64	0.99	1.34	1.70	7	8	9	10	
12"	2'-4"	2.5'	2.06'	4.56'	2.0'	6.0'	1.00'	4.0'	4.08'	6.42'	8.75'	11.08'	1.04'			0.68	1.09	1.48	1.88	7	8	10	11	
15"	2'-7"	2.5'	3.09'	5.59'	3.0'	7.0'	1.23'	4.0'	4.33'	6.92'	9.50'	12.08'	1.04'			0.64	1.00	1.35	1.71	8	9	10	11	
18"	2'-10"	2.5'	4.12'	6.62'	4.0'	8.0'	1.41'	4.0'	4.58'	7.42'	10.25'	13.08'	1.04'			0.69	1.09	1.49	1.89	9	10	11	12	
24"	3'-5"	2.5'	6.18'	8.68'	6.0'	10.0'	1.73'	4.0'	5.08'	8.50'	11.92'	15.33'	1.04'			0.83	1.34	1.82	2.34	10	11	13	14	
30"	4'-3"	2.5'	8.25'	10.75'	8.0'	12.0'	2.00'	4.0'	5.58'	9.83'	14.08'	18.33'	1.04'	2½"	3"	0.96	1.63	2.32	2.99	11	13	15	17	
36"	5'-1"	2.5'	10.31'	12.81'	10.0'	14.0'	2.24'	4.0'	6.08'	11.17'	16.25'	21.33'	1.04'	2½"	3"	1.08	1.92	2.77	3.62	12	14	17	19	
42"	6'-0"	2.5'	12.37'	14.87'	12.0'	16.0'	2.45'	4.0'	6.58'	12.58'	18.58'	24.58'	1.04'	2½"	3½"	1.20	2.26	3.34	4.61	13	16	18	21	
48"	6'-9"	2.5'	14.43'	16.93'	14.0'	18.0'	2.65'	4.0'	7.08'	13.83'	20.58'	27.33'	1.04'	2½"	3½"	1.60	3.11	4.62	6.12	14	17	20	23	
54"	7'-8"	2.5'	16.49'	18.99'	16.0'	20.0'	2.83'	4.0'	7.58'	15.25'	22.92'	30.58'	1.04'	3"	4"	1.76	3.56	5.34	7.14	15	19	22	26	
60"	8'-6"	2.5'	18.55'	21.05'	18.0'	22.0'	3.00'	4.0'	8.08'	16.58'	25.08'	33.58'	1.04'	3"	4"	1.94	4.03	6.12	8.20	17	20	24	28	



TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE



SECTION

NOTE: See Sheets 5 and 6 for details and general notes.

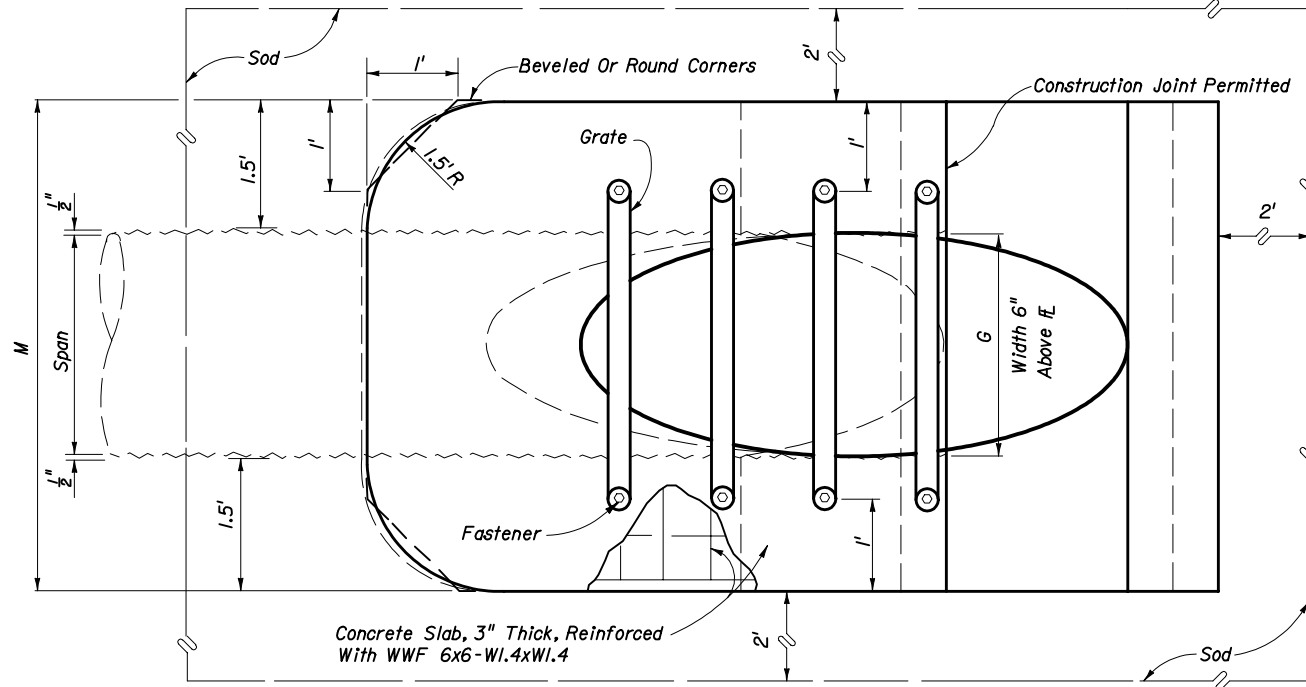
*Slope:
To ½ Pipe For Pipe 18" And Smaller
1:2 For Pipe 24" And Larger

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SIDE DRAIN				
MITERED END SECTION				
SINGLE AND MULTIPLE ROUND CORRUGATED METAL PIPE				
Designed By	EGR	08/77	Approved By	
Drawn By	HKH	08/77	<i>[Signature]</i> State Drainage Engineer	
Checked By	JVG	08/77	Revision	Sheet No.
			02	2 of 6
				273

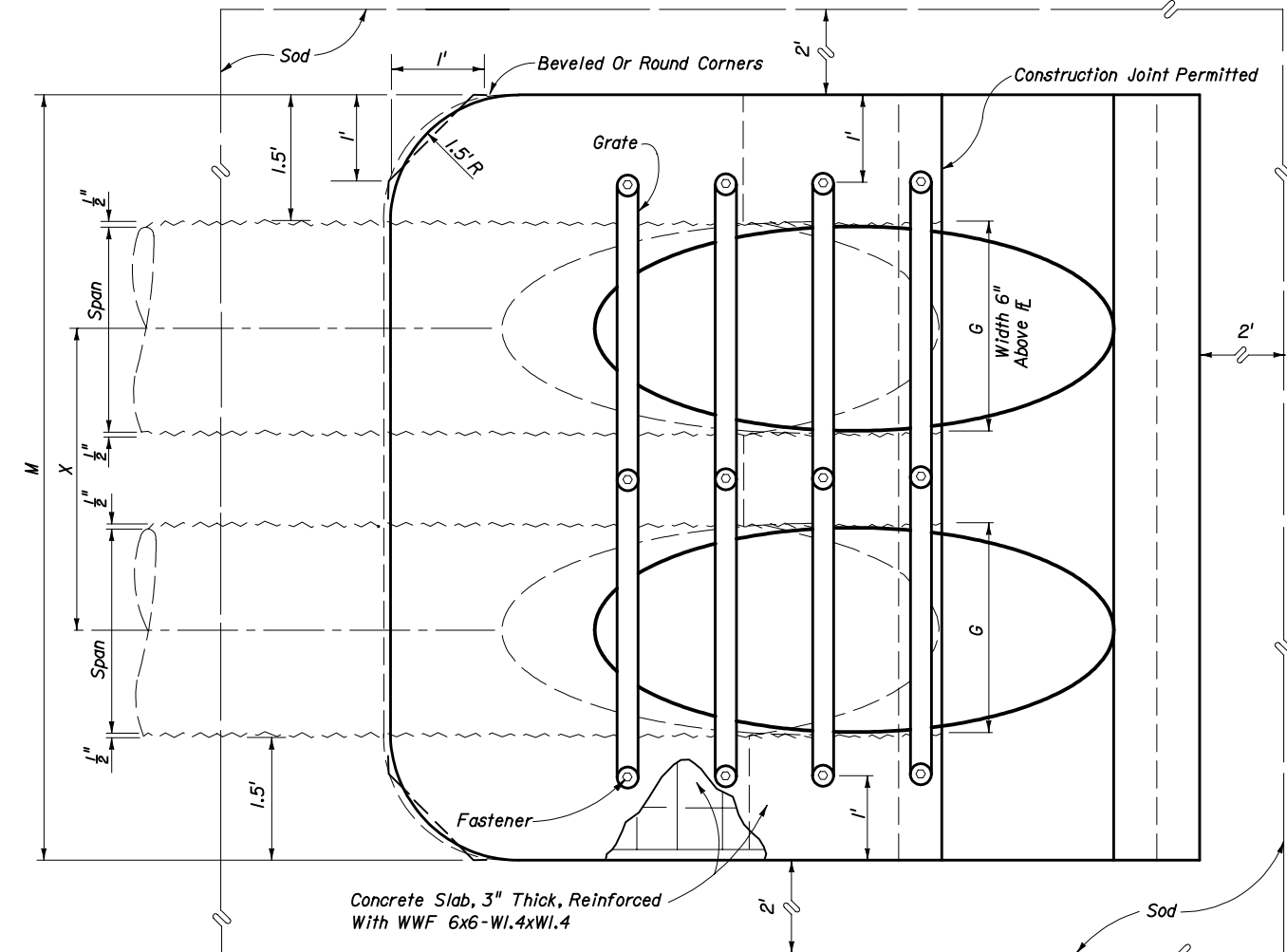
DIMENSIONS & QUANTITIES

1974 AASHTO		X	A	B	C	E	F	G	H	M				N	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)			
Span	Rise									Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
17"	13"	2'-6"	2.5'	2.4'	4.9'	2.33'	7'	1.39'	4.7'	4.50'	7.00'	9.50'	12.00'	1.04'			0.62	0.95	1.27	1.60	8	9	10	11
21"	15"	2'-10"	2.5'	3.09'	5.59'	3.00'	8'	1.76'	5.0'	4.83'	7.67'	10.50'	13.33'	1.04'			0.69	1.06	1.44	1.77	8	9	11	12
28"	20"	3'-5"	2.5'	4.81'	7.31'	4.67'	9'	2.22'	4.3'	5.42'	8.83'	12.25'	15.67'	1.04'			0.81	1.26	1.73	2.19	9	11	12	14
35"	24"	4'-0"	2.5'	6.18'	8.68'	6.00'	11'	2.55'	5.0'	6.00'	10.00'	14.00'	18.00'	1.04'	2 1/2"	3"	0.94	1.51	2.09	2.66	10	12	14	15
42"	29"	4'-9"	2.5'	7.90'	10.40'	7.67'	12'	2.97'	4.3'	6.58'	11.33'	16.08'	20.83'	1.04'	2 1/2"	3 1/2"	1.06	1.76	2.46	3.16	11	13	15	17
49"	33"	5'-6"	2.5'	9.28'	11.78'	9.00'	14'	3.34'	5.0'	7.17'	12.67'	18.17'	23.67'	1.04'	2 1/2"	3 1/2"	1.19	2.02	2.84	3.68	12	14	17	19
57"	38"	6'-4"	2.5'	11.00'	13.50'	10.67'	16'	3.65'	5.3'	7.83'	14.17'	20.50'	26.83'	1.04'	3"	4"	1.35	2.35	3.35	4.36	13	16	19	22
64"	43"	7'-1"	2.5'	12.71'	15.21'	12.33'	17'	3.89'	4.7'	8.42'	15.50'	22.58'	29.67'	1.04'	3"	4"	1.50	2.70	3.86	5.03	14	17	20	24
71"	47"	7'-10"	2.5'	14.09'	16.59'	13.67'	19'	4.14'	5.3'	9.00'	16.83'	24.67'	32.50'	1.04'	3"	4"	1.62	2.94	4.27	5.59	15	18	22	25

■ Values shown for estimating pipe quantities and are for information only.

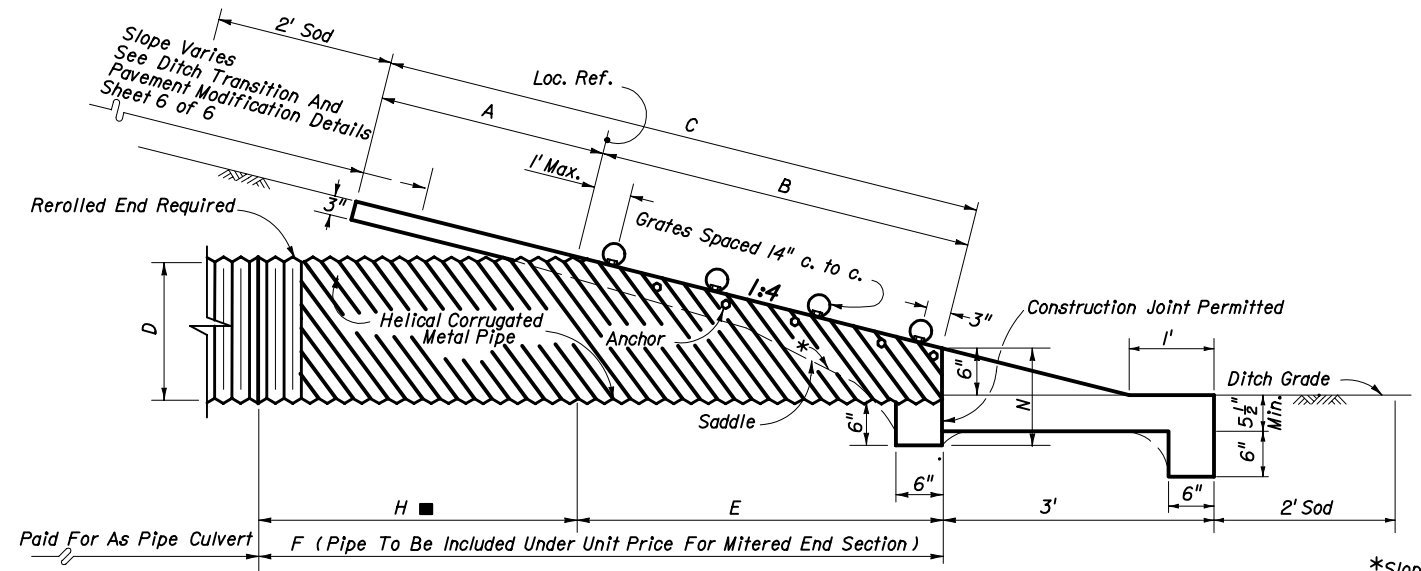


TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE

NOTE: See Sheets 5 and 6 for details and general notes.



SECTION

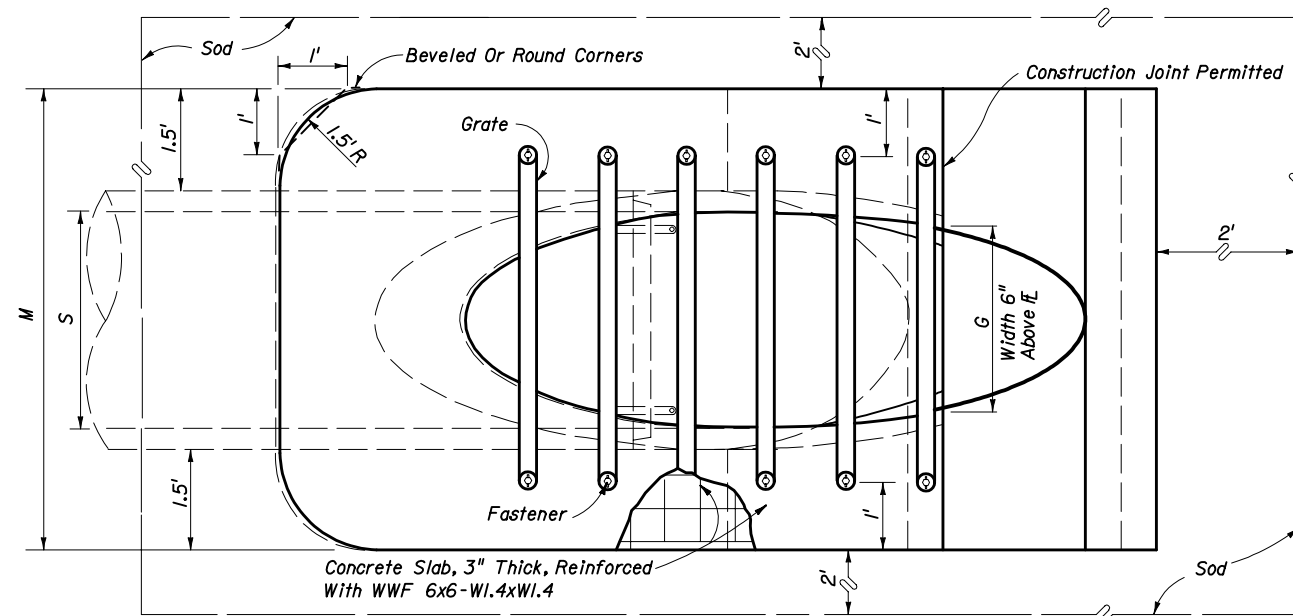
*Slope: To Span Line For Pipe Arch 28" x 20" And Smaller
1:2 For Pipe Arch 35" x 24" And Larger

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SIDE DRAIN				
MITERED END SECTION				
SINGLE AND MULTIPLE CORRUGATED METAL PIPE-ARCH				
Designed By	EGR	08/77	Approved By	
Drawn By	HKH	08/77	<i>[Signature]</i> State Drainage Engineer	
Checked By	JVG	08/77	Revision	Sheet No.
			02	3 of 6
				273

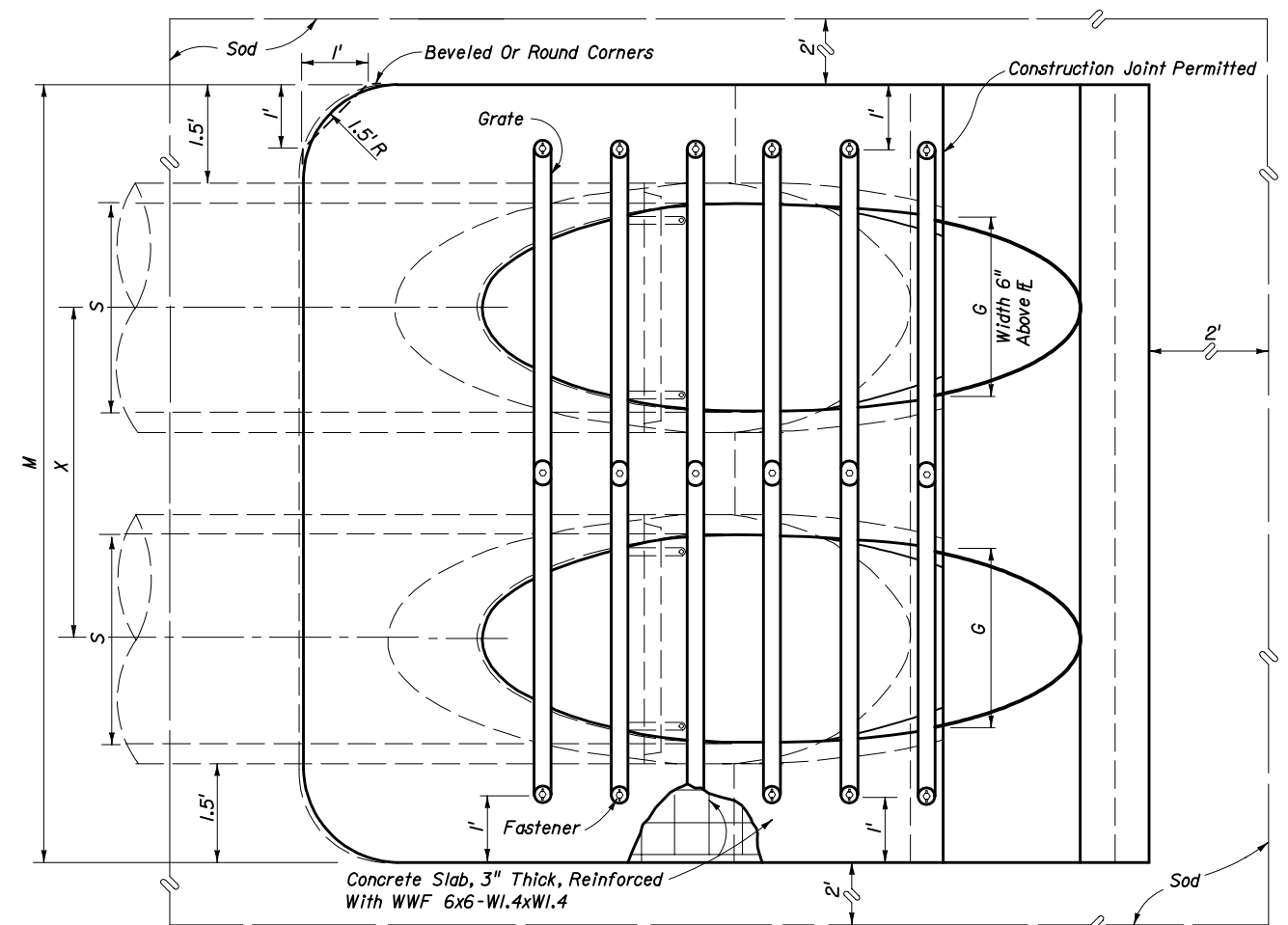
DIMENSIONS & QUANTITIES

Rise R	Span S	X	A	B	C	E	F	G	H	M				N	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)			
										Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
12"	18"	2'-10"	2.36'	3.06'	5.42'	3.03'	5'	1.50'	2.0'	4.92'	7.75'	10.58'	13.42'	1.21'			0.68	1.04	1.41	1.77	8	9	11	12
14"	23"	3'-4"	2.44'	3.75'	6.19'	3.70'	6'	1.90'	2.3'	5.38'	8.71'	12.04'	15.38'	1.23'			0.76	1.19	1.63	2.05	9	10	12	13
19"	30"	4'-0"	2.62'	5.47'	8.09'	5.36'	8'	2.37'	2.6'	6.04'	10.04'	14.04'	18.04'	1.27'	2 1/2"	3"	0.95	1.52	2.09	2.65	10	12	13	15
24"	38"	5'-0"	2.79'	7.18'	9.97'	7.03'	10'	2.85'	3.0'	6.79'	11.79'	16.79'	21.79'	1.31'	2 1/2"	3"	1.18	1.95	2.74	3.53	11	13	15	18
29"	45"	5'-11"	3.05'	8.90'	11.95'	8.70'	12'	3.19'	3.3'	7.50'	13.42'	19.33'	25.25'	1.38'	2 1/2"	3 1/2"	1.41	2.42	3.44	4.45	12	15	18	20
34"	53"	7'-0"	3.22'	10.62'	13.84'	10.36'	13'	3.57'	2.6'	8.25'	15.25'	22.25'	29.25'	1.42'	3"	3 1/2"	1.63	2.92	4.22	5.52	13	17	20	23
38"	60"	7'-10"	3.39'	11.99'	15.38'	11.70'	15'	3.95'	3.3'	8.92'	16.75'	24.58'	32.42'	1.46'	3"	4"	1.83	3.36	4.89	6.41	14	18	21	25
43"	68"	8'-11"	3.56'	13.71'	17.27'	13.36'	17'	4.28'	3.6'	9.67'	18.58'	27.50'	36.42'	1.50'	3"	4"	2.09	3.95	5.80	7.65	16	20	23	27
48"	76"	9'-11"	3.73'	15.43'	19.16'	15.03'	19'	4.59'	4.0'	10.42'	20.33'	30.25'	40.17'	1.54'	Special	Special	2.37	4.54	6.73	8.92	17	21	26	30
53"	83"	10'-8"	3.91'	17.15'	21.06'	16.70'	20'	4.77'	3.3'	11.08'	21.75'	32.42'	43.08'	1.58'	Special	Special	2.61	5.09	7.56	10.03	18	23	27	32
58"	91"	11'-8"	4.08'	18.87'	22.95'	18.36'	22'	5.01'	3.6'	11.83'	23.50'	35.17'	46.83'	1.63'	Special	Special	2.91	5.77	8.64	11.50	19	24	29	35

■ Values shown for estimating pipe quantities and are for information only.

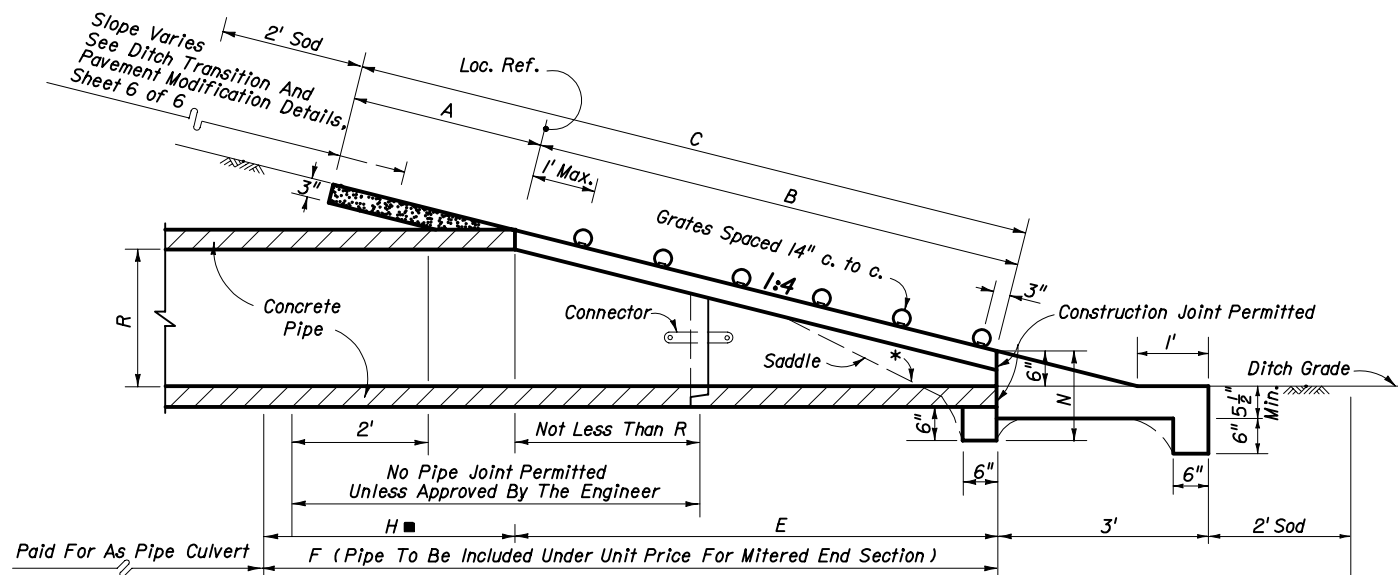


TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE

NOTE: See Sheets 5 and 6 for details and general notes.



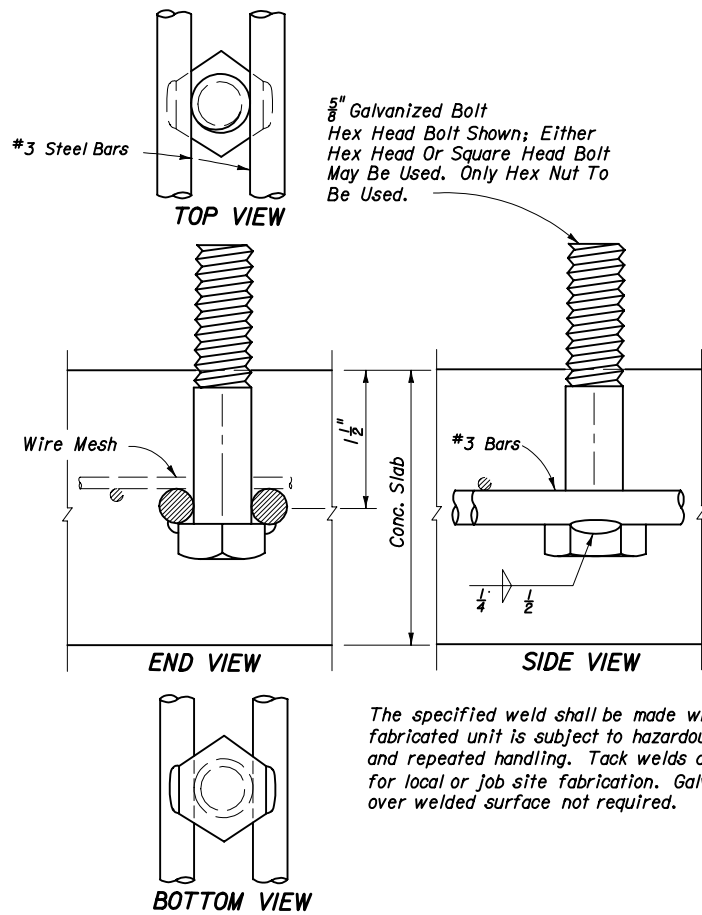
SECTION

*Slope:
To Major Axis For Pipes 24" x 38" And Smaller.
1:2 For Pipes 29" x 45" And Larger.

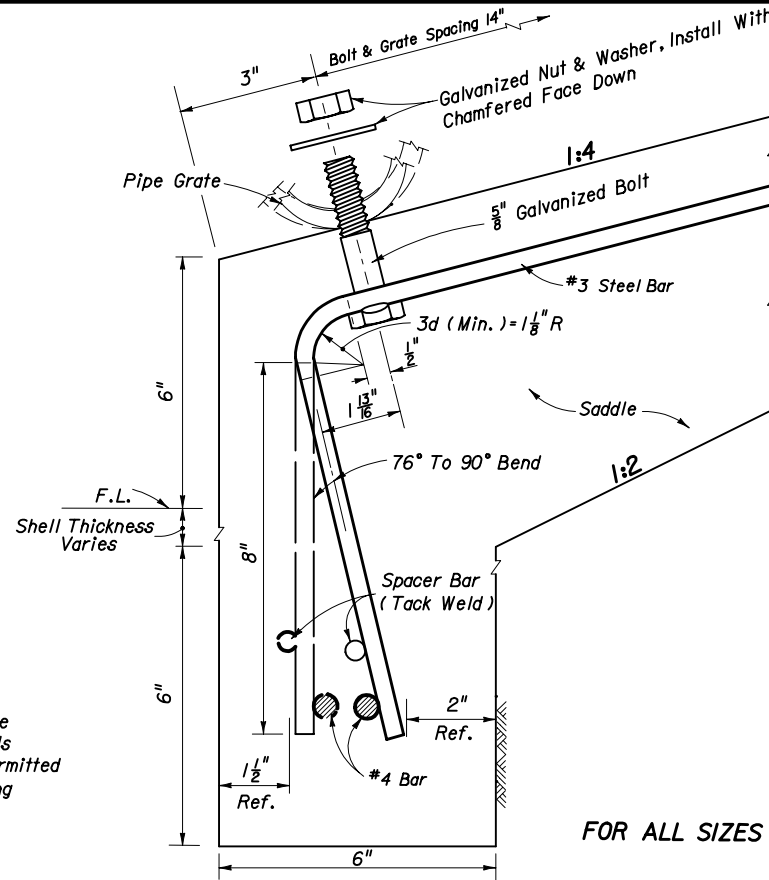
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIDE DRAIN MITERED END SECTION SINGLE AND MULTIPLE ELLIPTICAL CONCRETE PIPE

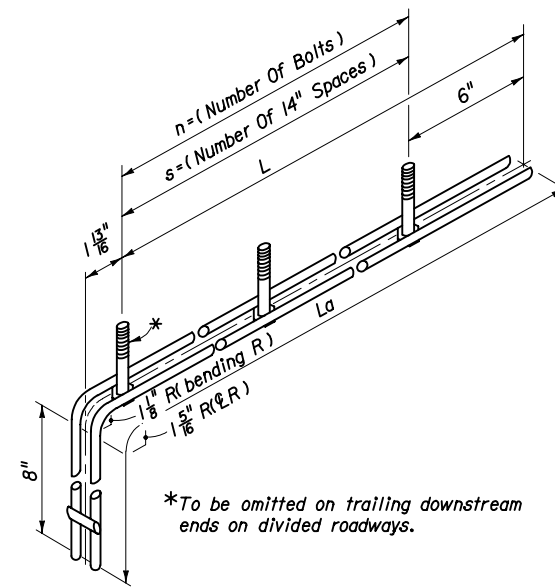
Names		Dates		Approved By	
Designed By	EGR	06/81	 State Drainage Engineer		
Drawn By	HSD	06/81			
Checked By	JVG/JBW	06/81			
Revision		Sheet No.		Index No.	
02		4 of 6		273	



The specified weld shall be made when the fabricated unit is subject to hazardous hauls and repeated handling. Tack welds are permitted for local or job site fabrication. Galvanizing over welded surface not required.



FOR ALL SIZES OF SINGLE AND MULTIPLE DRAIN PIPE
FASTENER UNIT



Drain Size	s	n	L	La
------------	---	---	---	----

CONCRETE PIPE (ROUND)

15"	3	4	4'-0"	4'-11"
18"	4	5	5'-2"	6'-1"
24"	6	7	7'-6"	8'-5"
30"	7	8	8'-8"	9'-7"
36"	9	10	11'-0"	11'-11"
42"	11	12	13'-4"	14'-3"
48"	13	14	15'-8"	16'-7"
54"	14	15	16'-10"	17'-9"
60"	16	17	19'-2"	20'-1"

CORRUGATED METAL PIPE (ROUND)

15"	2	3	2'-10"	3'-9"
18"	3	4	4'-0"	4'-11"
24"	5	6	6'-4"	7'-3"
30"	7	8	8'-8"	9'-7"
36"	8	9	9'-10"	10'-9"
42"	10	11	12'-2"	13'-1"
48"	12	13	14'-6"	15'-5"
54"	14	15	16'-10"	17'-9"
60"	15	16	18'-0"	18'-11"

CORRUGATED METAL PIPE (ARCH) ***

17" x 13"	1	2	1'-8"	2'-7"
21" x 15"	2	3	2'-10"	3'-9"
28" x 20"	4	5	5'-2"	6'-1"
35" x 24"	5	6	6'-4"	7'-3"
42" x 29"	6	7	7'-6"	8'-5"
49" x 33"	7	8	8'-8"	9'-7"
57" x 38"	9	10	11'-0"	11'-11"
64" x 43"	10	11	12'-2"	13'-1"
71" x 47"	12	13	14'-6"	15'-5"

Drain Size	s	n	L	La
------------	---	---	---	----

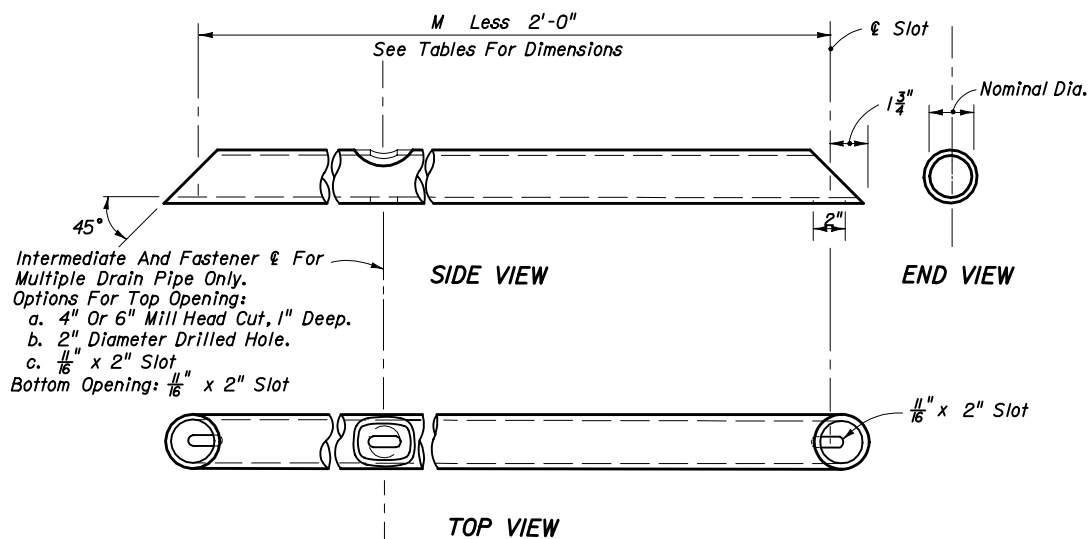
ELLIPTICAL CONCRETE PIPE

12" x 18"	2	3	2'-10"	3'-9"
14" x 23"	3	4	4'-0"	4'-11"
19" x 30"	4	5	5'-2"	6'-1"
24" x 38"	5	6	6'-4"	7'-3"
29" x 45"	7	8	8'-8"	9'-7"
34" x 53"	8	9	9'-10"	10'-9"
38" x 60"	10	11	12'-2"	13'-1"
43" x 68"	11	12	13'-4"	14'-3"
48" x 76"	13	14	15'-8"	16'-7"
53" x 83"	14	15	16'-10"	17'-9"
58" x 91"	15	16	18'-0"	18'-11"

Note: 5/8" x 3" bolts are standard for all grate fasteners, except when the contractor elects to use the slotted upper holes for the intermediate fasteners on multiple drain pipe, which will require the following bolt lengths:

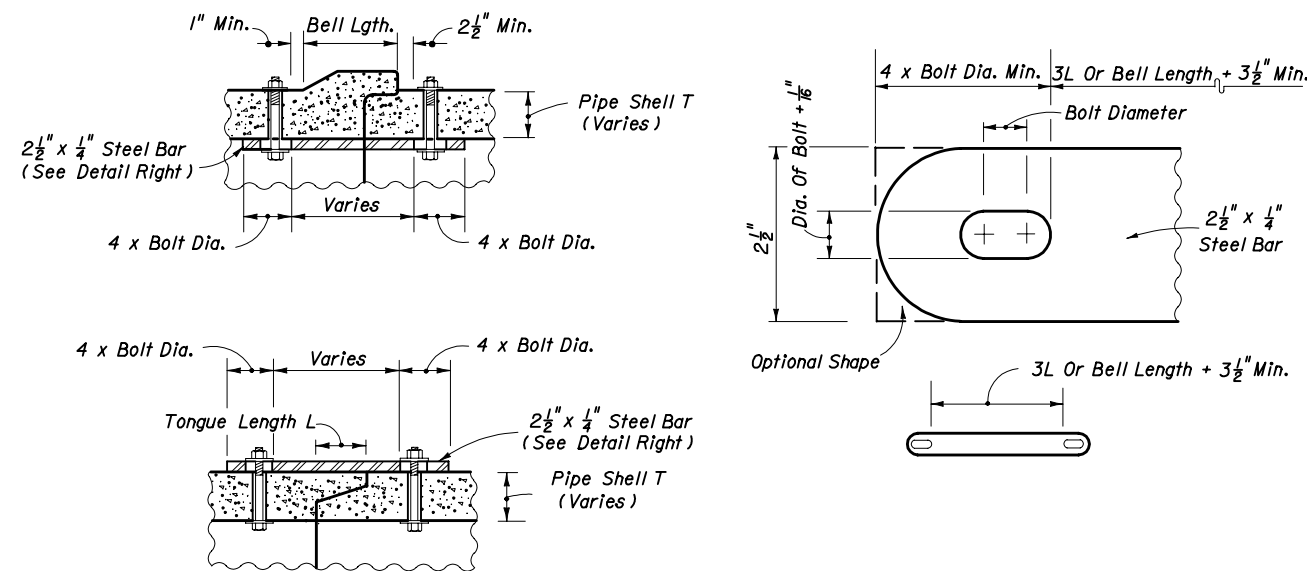
Grate Size (Std. & X-Stg.)	Bolt Length
2 1/2"	5 1/2"
3"	6"
3 1/2"	6 1/2"
4"	7"

**To be used only when grates are called for in the plans.
***1974 AASHTO Pipe Arch Sizes.



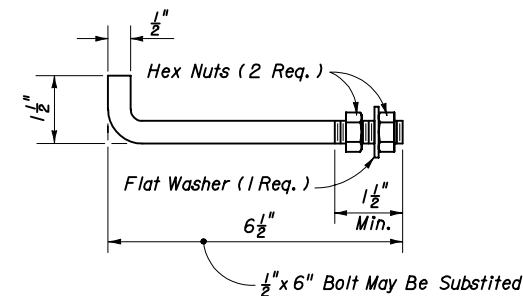
GRATE DETAIL
FOR SINGLE & MULTIPLE DRAIN PIPE

See General Notes, Sheet 6.



All bars, bolts, nuts and washers are to be galvanized steel.
Bolt diameters shall be 3/8" for 15" to 36" pipe and 5/8" for 42" to 60" pipe.
Two connectors required per joint, located 60° right and left of bottom center of pipe.
Bolt holes in pipe shell are to be drilled.

CONCRETE PIPE CONNECTOR DETAIL



Anchors required for CMP only.
Anchor, washer and nuts to be galvanized steel.
Bend anchor where required to center in concrete slab. Damaged surfaces to be repaired after bending.
Anchors are to be spaced a distance equal to four (4) corrugations. Place the anchors in the outside crest of corrugation.
Flat washer to be placed on inside wall of pipe.

Holes in the mitered end pipe are to be drilled or punched; burning not permitted.

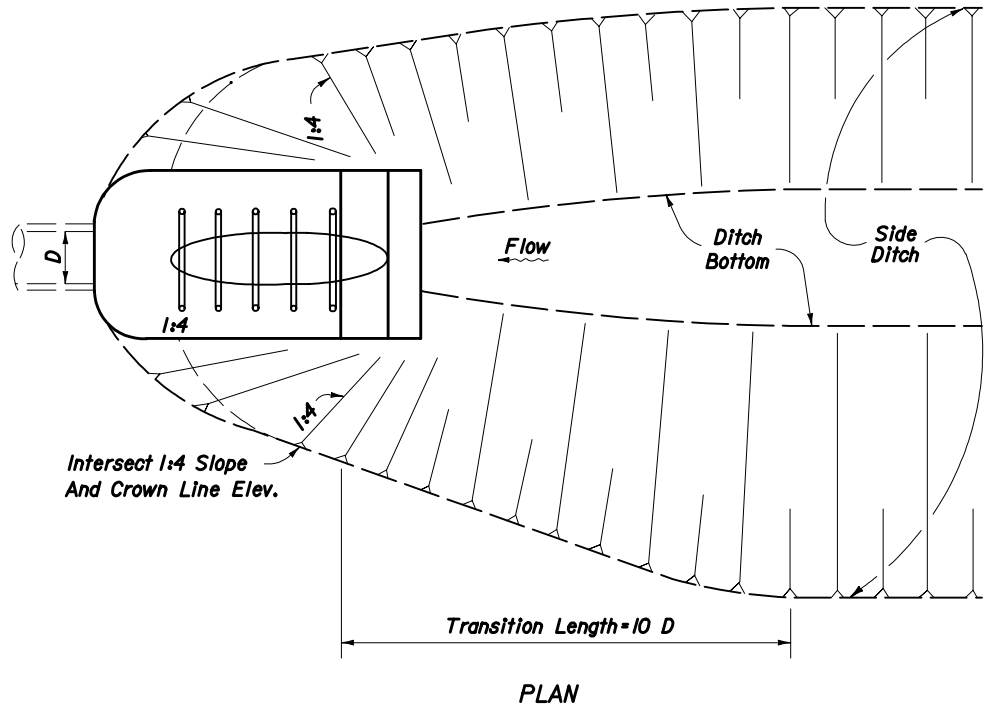
ANCHOR DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIDE DRAIN MITERED END SECTION
DETAILS FOR CONCRETE & CORRUGATED METAL PIPE

Names	Dates	Approved By	
Designed By	EGR 08/77	 State Drainage Engineer	
Drawn By	HKH 08/77		
Checked By	JVG 08/77		
Revision	00	Sheet No.	Index No.
		5 of 6	273

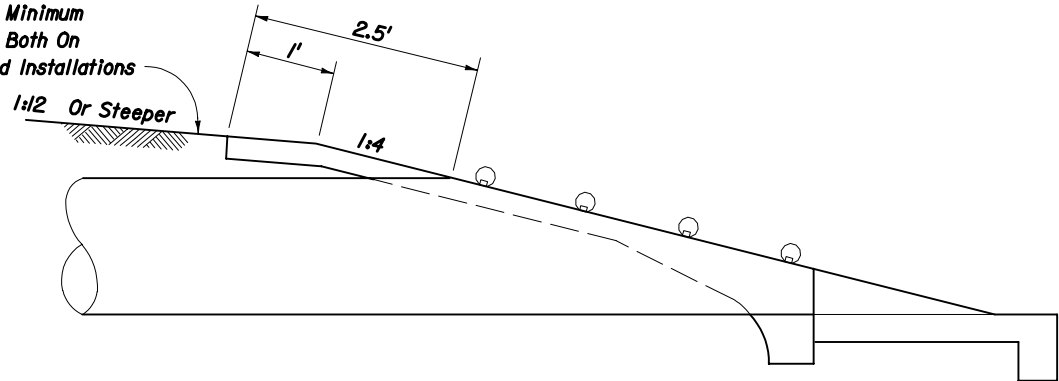
GENERAL NOTES



DITCH TRANSITION

1. Unless otherwise designated in the plans, concrete pipe mitered end sections may be used with any type of side drain pipe; corrugated steel pipe mitered end sections may be used with any type of side drain pipe except aluminum pipe; and, corrugated aluminum mitered end sections may be used with any type of side drain pipe except steel pipe. When bituminous coated metal pipe is specified for side drain pipe, mitered end sections shall be constructed with like pipe or concrete pipe. When the mitered end section pipe is dissimilar to the side drain pipe, a concrete jacket shall be constructed in accordance with Index No. 280.
2. Concrete pipe used in the assembly of mitered end sections shall be of selective lengths to avoid excessive connections.
3. Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered end section shall be repaired.
4. That portion of corrugated metal pipe in direct contact with the concrete slab and extending 12" beyond shall be bituminous coated prior to placing of the concrete.
5. Corrugated polyethylene pipe (CPE) for side drain application of 15", 18" or 24" diameter shall utilize either corrugated metal or concrete mitered end sections. When used in conjunction with corrugated metal mitered end sections, connection shall be by either a formed metal band specifically designated to join CPE pipe and metal pipe or other coupler approved by the State Drainage Engineer. When used in conjunction with a concrete mitered end section, connection shall be by concrete jacket constructed in accordance with Index No. 280.
6. When existing multiple side drain pipes are spaced other than the dimensions shown in this detail, or have non-parallel axes, or have non-uniform sections, the mitered end sections will be constructed either separately as single pipe mitered end sections or collectively as multiple pipe end sections as directed by the Engineer; however, mitered end sections will be paid for each, based on each independent pipe end.
7. In addition to the requirements of Section 430-4, side drain culverts shall comply with the cover requirements shown on Index No. 205.
8. The reinforced concrete slab shall be constructed for all sizes of side drain pipe and cast in place with Class I concrete.
9. Round pipe size 30" or greater, pipe-arch size 35" x 24" or greater and elliptical pipe 19" x 30" or greater shall be grated unless excepted in the plans. Smaller sizes of pipe shall be grated only when called for in plans. The lower grate on trailing downstream ends on divided highways shall be omitted.
10. Grates are to be fabricated from steel ASTM A53, Grade B, pipe. The lower grate on all traffic approach ends shall be Schedule 80 and all remaining grates shall be Schedule 40. Grates subject to salt free and corrosive free environment may be fabricated from galvanized pipe, with base metal exposed during fabrication repaired as specified in Section 562, Standard Specifications; or, fabricated from black pipe and hot dipped galvanized after fabrication in accordance with ASTM A123. Grates subject to salt water or highly corrosive environment shall be hot dipped galvanized after fabrication in accordance with ASTM A123.
11. Ditch transitions shall be used on all grades in excess of 3% as directed by the Engineer.
12. The project engineer shall contact the District Drainage Engineer for possible alternate treatment prior to constructing side drain mitered end sections where a minimum spacing of 30' will not result between the toe points of the mitered end sections.
13. The cost of all pipe (s), grates, fasteners, reinforcing, connectors, anchors, concrete, sealants, jackets and coupling bands shall be included in the cost for the mitered end section. Sodding shall be paid for separately under the contract unit price for Sodding, SY.
14. Mitered end sections shall be paid for under the contract unit price for Mitered End Section (SD), Ea., based on each independent pipe end.

Modified Slope When Minimum Cover Or Less Occurs Both On Existing And Proposed Installations



PERMISSIBLE PAVEMENT MODIFICATION

DESIGN NOTES

1. In critical hydraulic locations, grates shall not be used until potential debris transport has been evaluated by the drainage engineer and appropriate adjustments made. Ditch grades in excess of 3% or pipe with less than 1.5' of cover and grades in excess of 1% will require such an evaluation (General Note 9).
2. The design engineer shall determine highly corrosive locations and specify in the plans when the grates shall be hot-dipped galvanized after fabrication (General Note 10).
3. The design engineer shall determine and designate in the plans which alternate types of mitered end section will not be permitted. The restriction shall be based on corrosive or structural requirements.

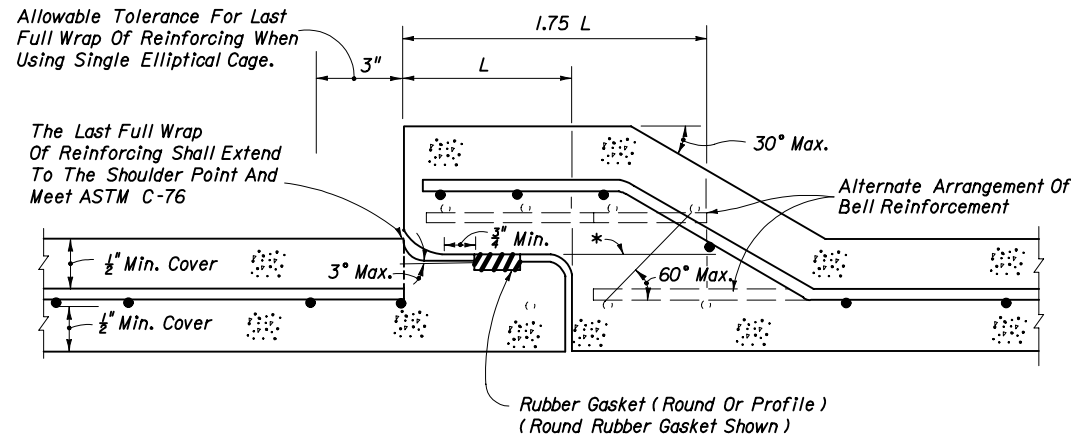
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SIDE DRAIN MITERED END SECTION				
NOTES & INFORMATION				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By EGR	08/77	State Drainage Engineer		
Drawn By HKH	08/77	Revision	Sheet No.	Index No.
Checked By JVK	08/77	04	6 of 6	273

SCHEDULE OF BELL REINFORCEMENT
Classes II, III, IV, V; Wall A, B, C

Nominal Pipe Diameter	Design Bell Reinforcement	Maximum Reinforcement Under Tolerance
	SQ. IN. PER FOOT	SQ. IN. PER FOOT
15"	0.07	0.010
18"	0.07	0.010
24"	0.09	0.010
30"	0.12	0.010
36"	0.14	0.010
42"	0.16	0.010
48"	0.19	0.011
54"	0.21	0.012
60"	0.23	0.0135
66"	0.26	0.015
72"	0.28	0.0165
78"	0.30	0.018
84"	0.33	0.0195
90"	0.35	0.021
96"	0.37	0.0225
102"	0.40	0.024
108"	0.42	0.0255

Allowable Tolerance For Last Full Wrap Of Reinforcing When Using Single Elliptical Cage.

The Last Full Wrap Of Reinforcing Shall Extend To The Shoulder Point And Meet ASTM C-76

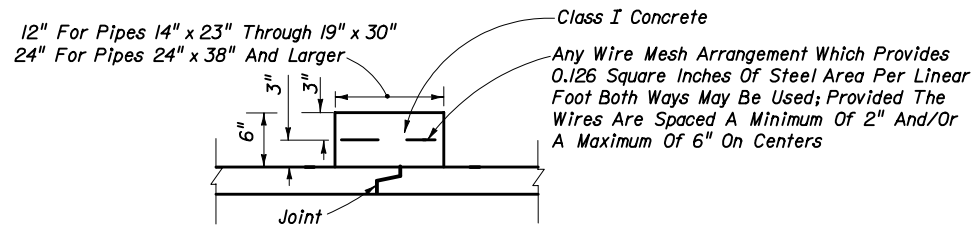


*All circumferential steel located above this line within 1.75 L is defined as bell reinforcement.

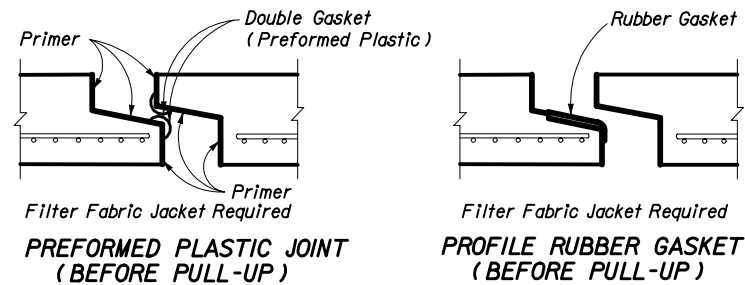
ROUND RUBBER GASKET SHOWN

DETAIL OF BELL & SPIGOT CONCRETE PIPE JOINT USING ROUND OR PROFILE RUBBER GASKET

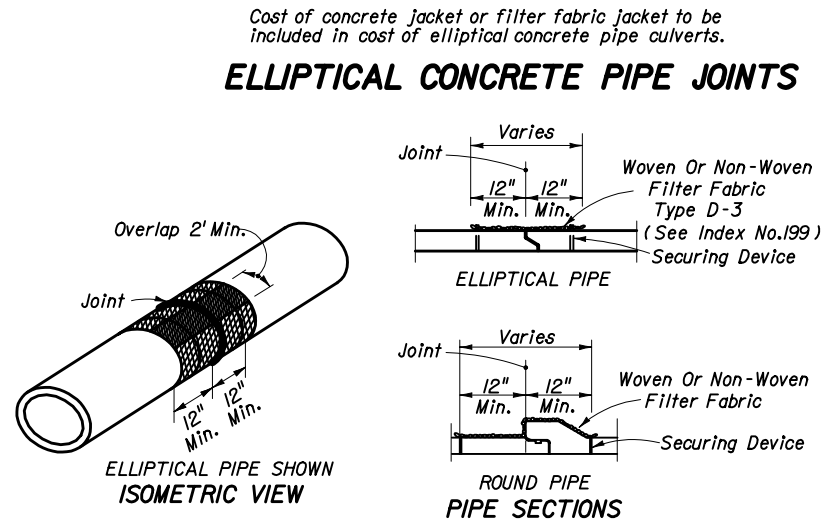
12" For Pipes 14" x 23" Through 19" x 30"
24" For Pipes 24" x 38" And Larger



CONCRETE JACKET

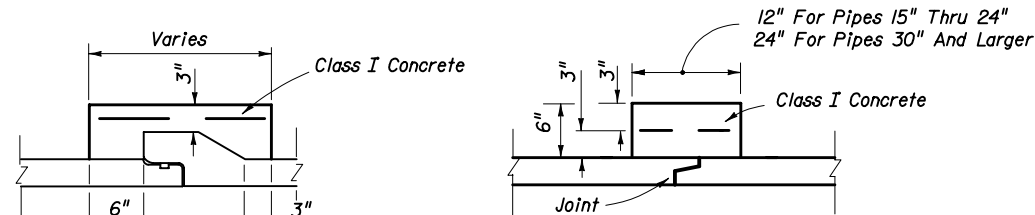


ELLIPTICAL CONCRETE PIPE JOINTS



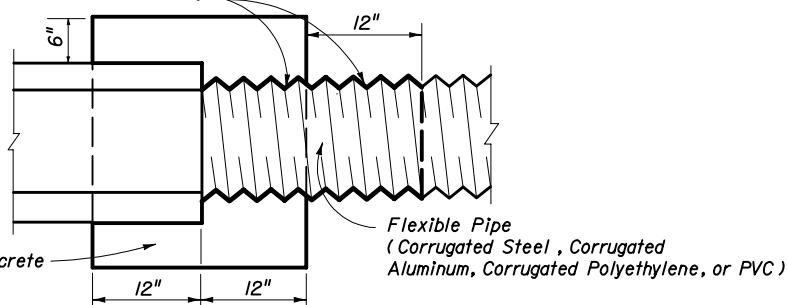
Cost of filter fabric jacket to be included in cost of pipe culverts.

FOR ALL PIPE TYPES - CONCRETE PIPE SHOWN
FILTER FABRIC JACKET



BELL AND SPIGOT TONGUE & GROOVE DISSIMILAR JOINTS

Bituminous Coating Required For CMP (Any Suitable Bituminous Material May Be Field Applied) Bituminous Coating To Extend 12" Beyond Concrete Collar

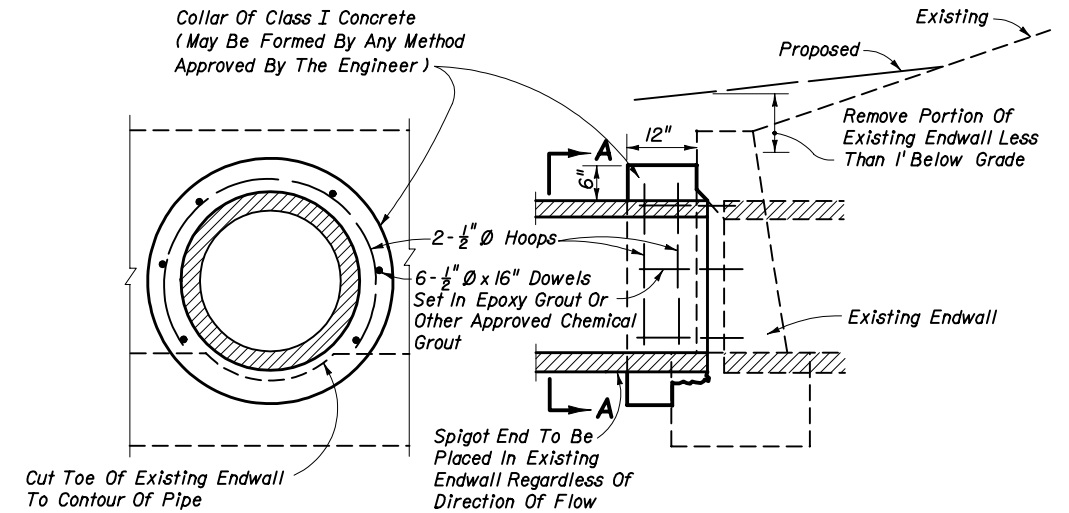


Note: Cost of concrete and bituminous coating to be included in contract unit price for either new pipe or Mitered End Section. A concrete jacket shall not be used to join:
(a) metal pipe of dissimilar materials
(b) flexible pipe when the minimum cover required in accordance with Index No. 205 cannot be obtained.

DISSIMILAR TYPES

CONCRETE JACKET FOR CONNECTING DISSIMILAR TYPES OF PIPE AND CONCRETE PIPES WITH DISSIMILAR JOINTS

Collar Of Class I Concrete (May Be Formed By Any Method Approved By The Engineer)

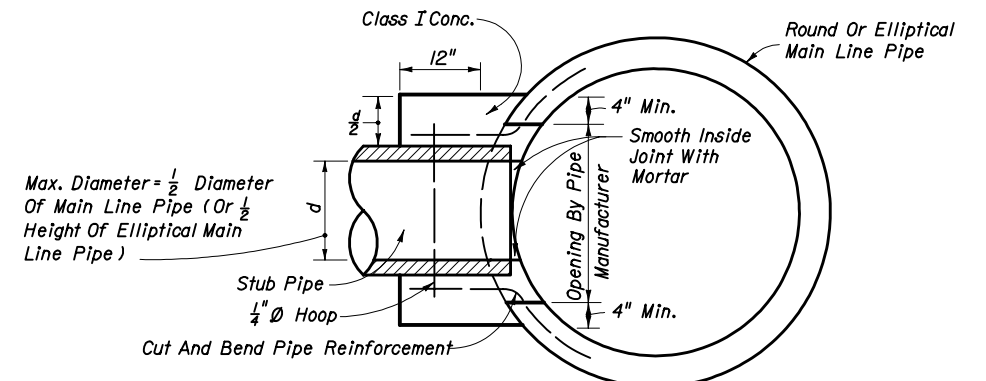


SECTION AA

LONGITUDINAL SECTION

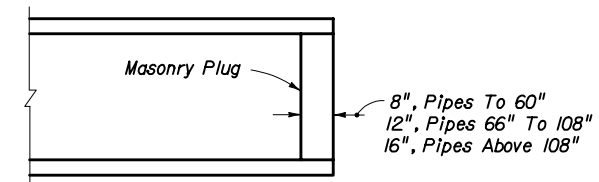
Note: Cost for removal and disposal of portions of top and toe of existing endwall and cost of concrete, reinforcing steel and construction of collar to be included in the contract unit price for pipe culvert.

CONCRETE COLLAR FOR EXTENSION OF EXISTING PIPE CULVERTS



Cost of concrete and steel to be included in contract unit price for pipe culvert.

CONCRETE COLLAR FOR JOINING MAINLINE PIPE AND STUB PIPE



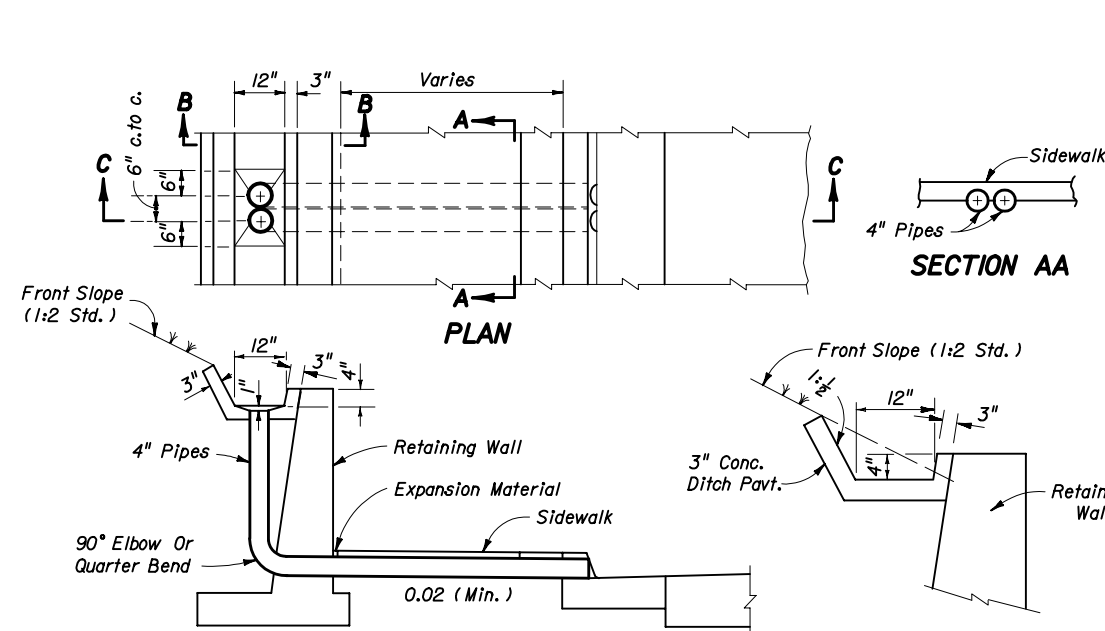
Note: Unless otherwise called for in the plans, the cost of plugging pipes to be included in contract unit price for new pipe.

PIPE PLUG

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

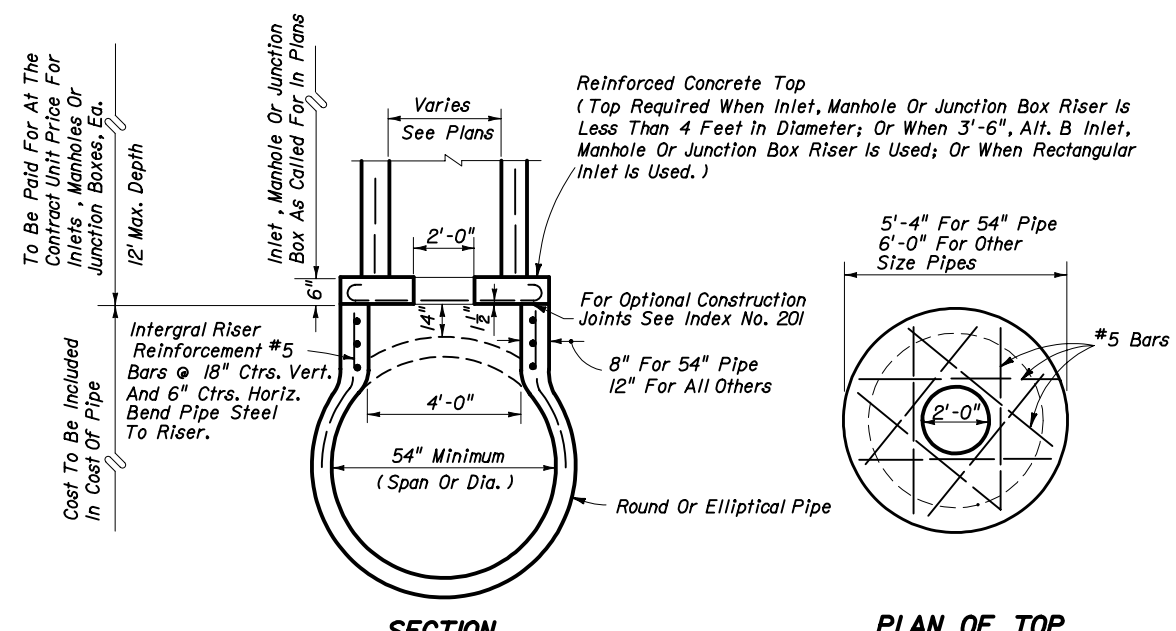
MISCELLANEOUS DRAINAGE DETAILS

Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By	HSD 01/85			
Checked By	JBW/JVG 09/85	04	1 of 4	280

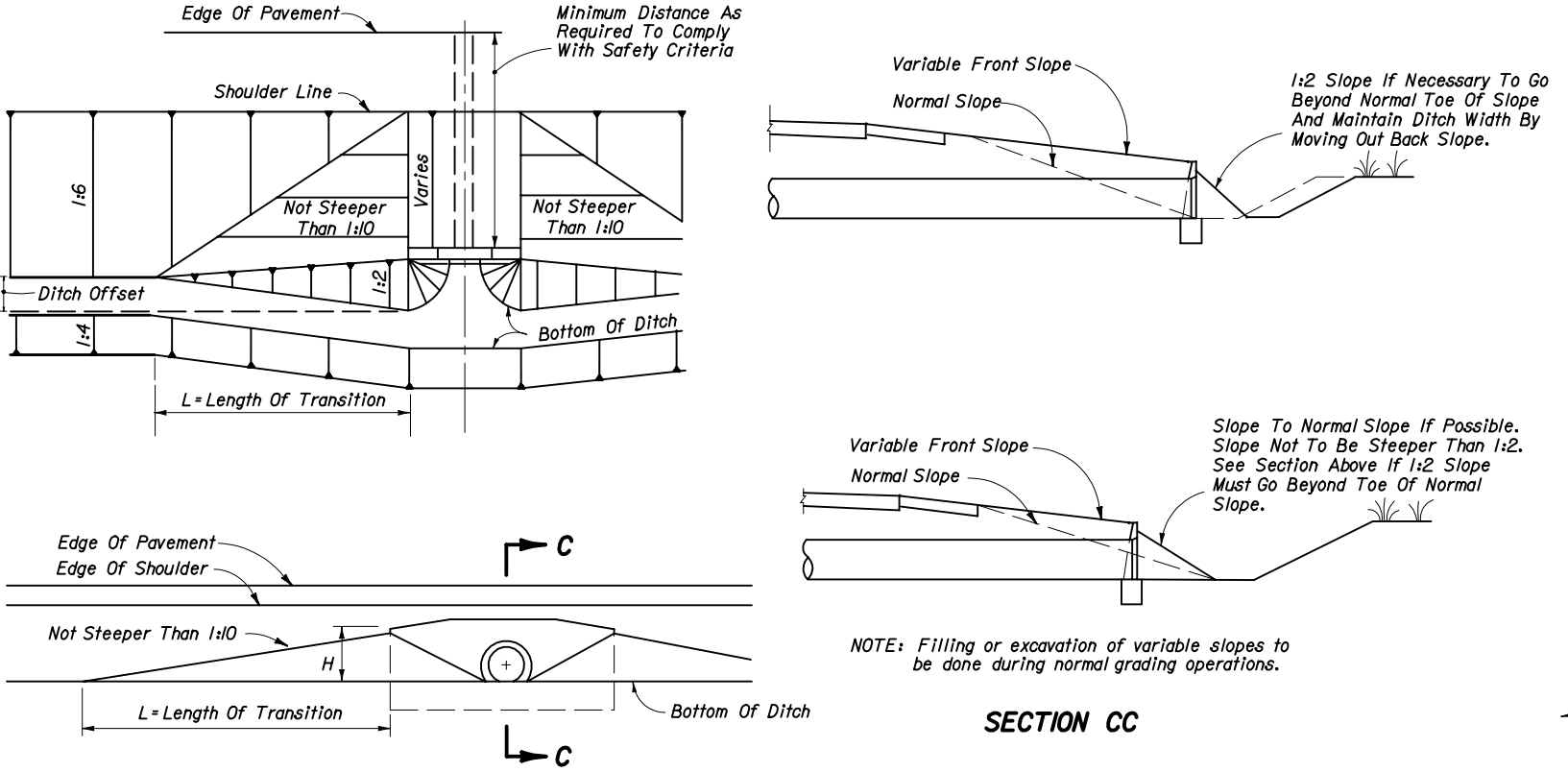
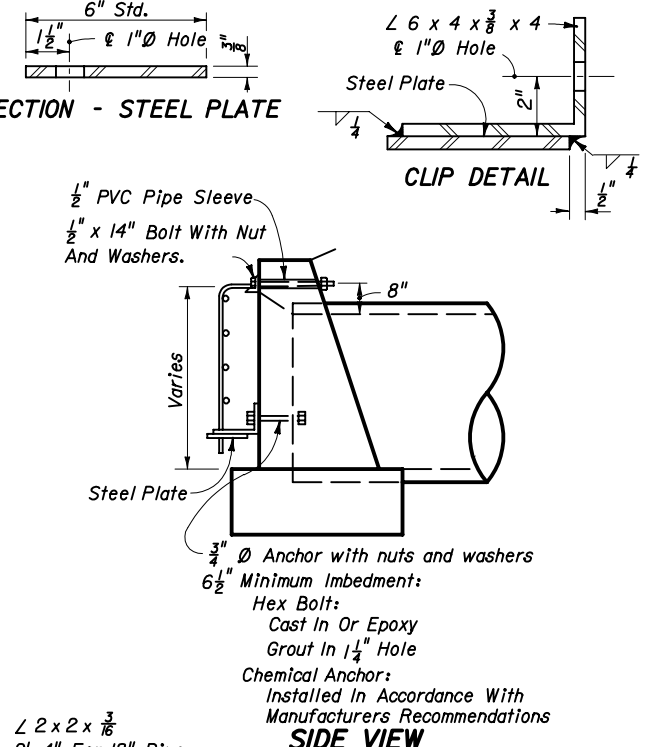


CONCRETE GUTTER AND DRAINS AT RETAINING WALLS

Note: Either cast iron pipe or PVC pipe, Schedule 40, may be used. Pipe to be paid for under the contract unit price for either Cast Iron Pipe For Roof Drains (4"), LF, or Polyvinyl Chloride Pipe Culvert (4"), LF.



INLETS, MANHOLES OR JUNCTION BOXES ON INTEGRAL PRECAST CONCRETE RISER FOR CONCRETE PIPE

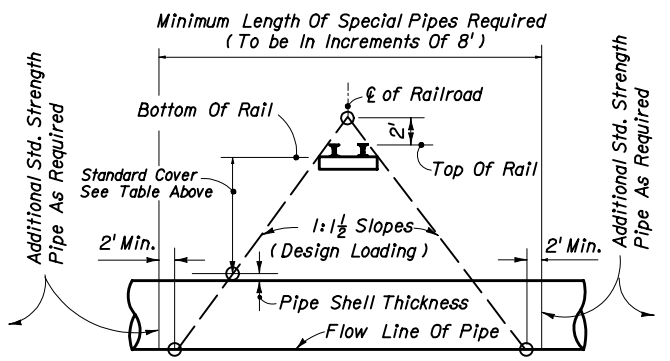


METHOD FOR SETTING LIMITS OF VARIABLE FRONT SLOPES AT DRAINAGE STRUCTURES

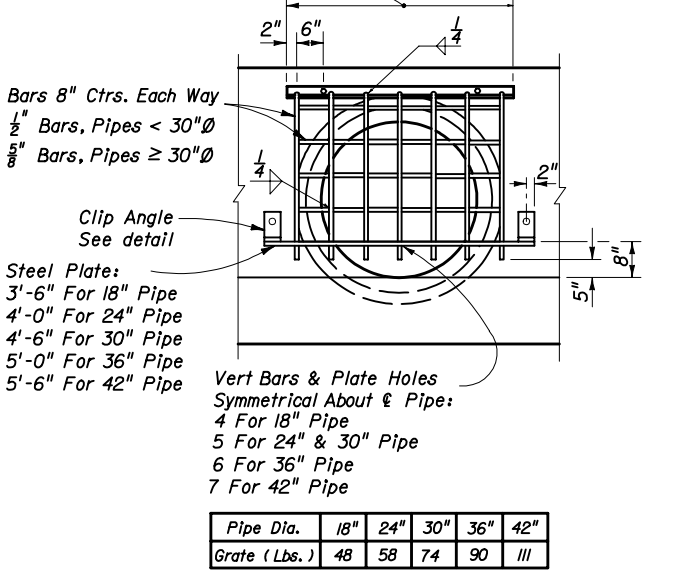
Use Larger Value Of Either:
 1. $L = 10 \times H$ (No Maximum)
 2. $L = 10 \times \text{Ditch Offset}$ (Maximum $L = 100'$)

RAILROAD COMPANY	CLEARANCE BELOW BOTTOM OF RAIL (FEET)	STRENGTH ASTM (C76) CLASS
Apalachicola Northern	4.0	IV
Atlanta And St. Andrews Bay	4.0	IV
Florida East Coast	5.5*	IV
Burlington Northern Railroad	S-TRK M/L 4.5 5.5	IV
CSX Transportation, Inc.	5.5	IV
Southern Railway System		
Georgia Southern And Florida	5.5	V
Live Oak Perry And South Georgia	5.5	V
St. Johns River Terminal	5.5	V

*Clearance is for casing pipe. All subgrade carrier pipelines and wirelines will be installed within a casing pipe which will extend from Right-of-Way line to Right-of-Way line.



METHOD FOR DETERMINING THE LENGTH OF SPECIAL PIPE REQUIRED UNDER RAILROADS



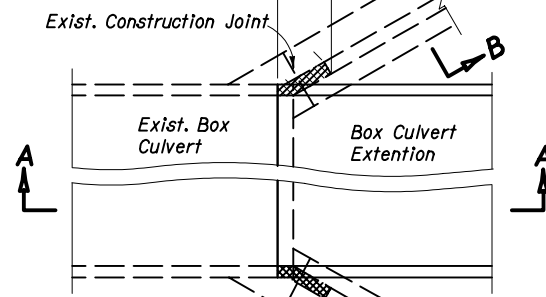
GUARD AT PIPE ENDS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS DRAINAGE DETAILS

Names	Dates	Approved By
Designed By		<i>[Signature]</i> State Drainage Engineer
Drawn By		Revision Sheet No. Index No.
Checked By		00 2 of 4 280

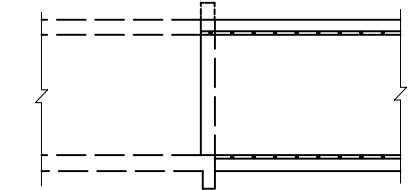
Remove Headwall, Outside Wall And Wingwall From Inside Face Of Headwall Sufficient To Construct Culvert Extension. Longitudinal Reinforcing Steel To Be Cleaned, Straightened And Extended Into Culvert Extension.



Length For Manually Estimated Or Computerized Quantities (Coding And Printout Lengths)

Tie-In Length

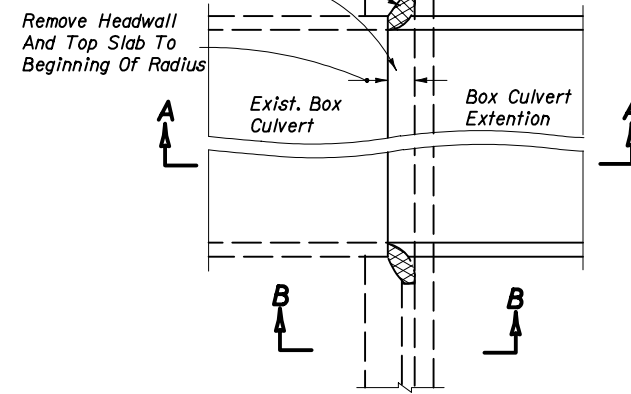
Culvert Extension (Length Tabulated On Drainage Structures And Summary Sheet For Standard Box Section Extension)



SECTION AA

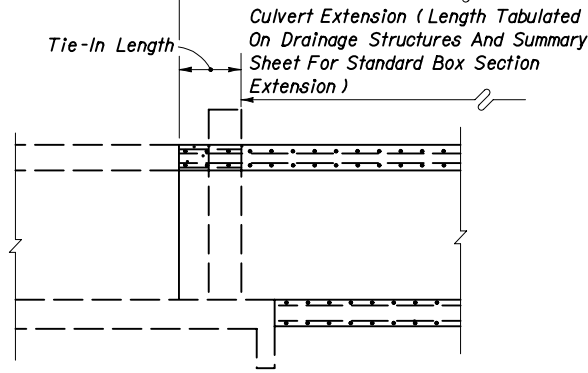
Longitudinal Reinforcing Steel In Top Slab And Wall Return To Be Cleaned, Straightened And Extended Into Culvert Extension.

Remove Wall And Headwall To Construction Joint



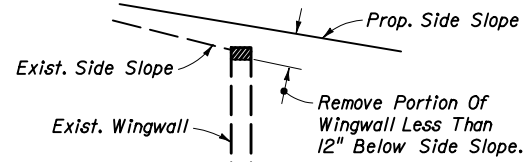
OUTSIDE WALLS-SINGLE, DOUBLE, TRIPLES, & QUADRUPLE BOXES

Length For Manually Estimated Or Computerized Quantities (Coding And Printout Lengths)

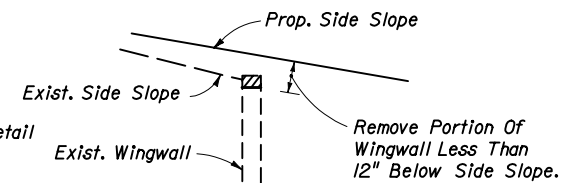


SECTION AA

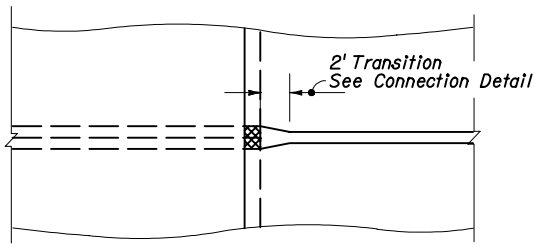
OUTSIDE WALLS-SINGLE, DOUBLE, TRIPLES, & QUADRUPLE BOXES



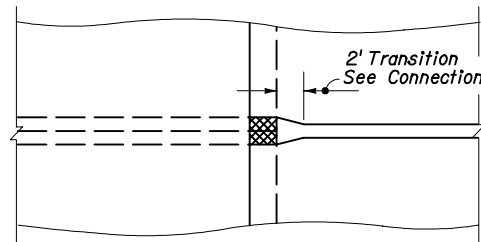
SECTION BB



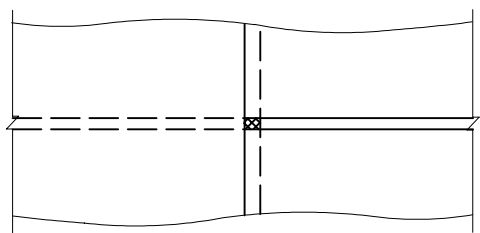
SECTION BB



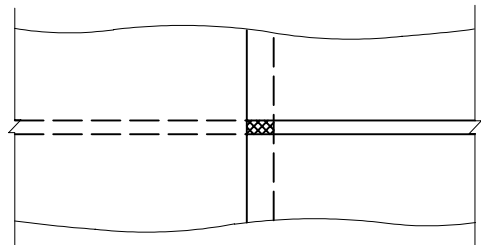
CENTER WALL-QUADRUPLE BOXES



CENTER WALL-QUADRUPLE BOXES



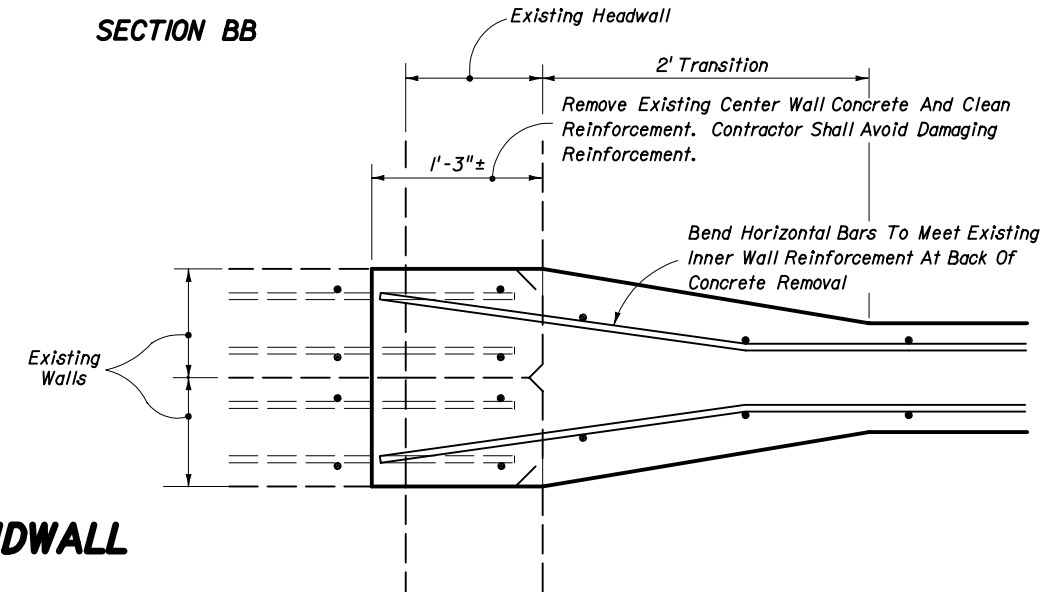
INTERIOR WALLS-DOUBLE & TRIPLE BOXES
INTERMEDIATE WALLS-QUADRUPLE BOXES



INTERIOR WALLS-DOUBLE & TRIPLE BOXES
INTERMEDIATE WALLS-QUADRUPLE BOXES

PLAN VIEWS

STRAIGHT ENDWALL



CONNECTION AT CENTER WALL OF QUADRUPLE CULVERTS

PLAN VIEWS

FLARED ENDWALL

NOTE: The computerized printout for reinforcing steel does not include the additional lengths needed for extension and overlaps or connections to the horizontal reinforcement in the interior walls of double, triple and quadruple existing concrete box culverts; the cost for additional reinforcement and the thickened concrete wall in the transitional area shall be included in the costs for constructing the tie-in.


Cost for removal and disposal of material from existing headwalls, wingwalls and the top slab, and cost of cleaning, straightening and extending longitudinal reinforcing steel shall be included in the cost for concrete and steel of the culvert extension.

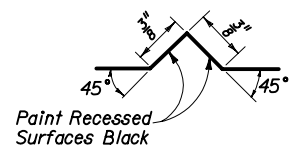
For concrete box culvert details, see Index No. 290.

CONNECTION DETAILS FOR CONCRETE BOX CULVERT EXTENSIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

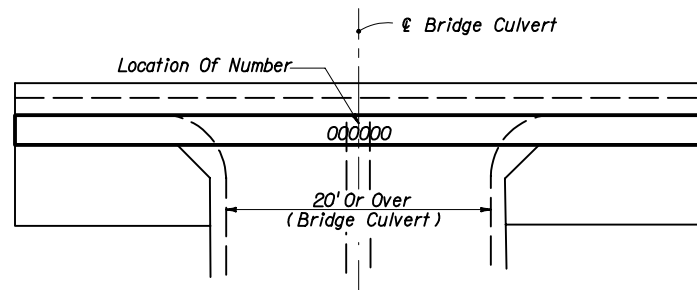
MISCELLANEOUS DRAINAGE DETAILS

Names	Dates	Approved By			
Designed By		 State Drainage Engineer			
Drawn By					
Checked By					
Revision	00				Sheet No.



Black Plastic Figures 3" in height as approved by the Engineer may be used in lieu of numbers formed by $\frac{3}{8}$ " V Grooves. V Grooves shall be formed by preformed figures.

SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED FIGURES

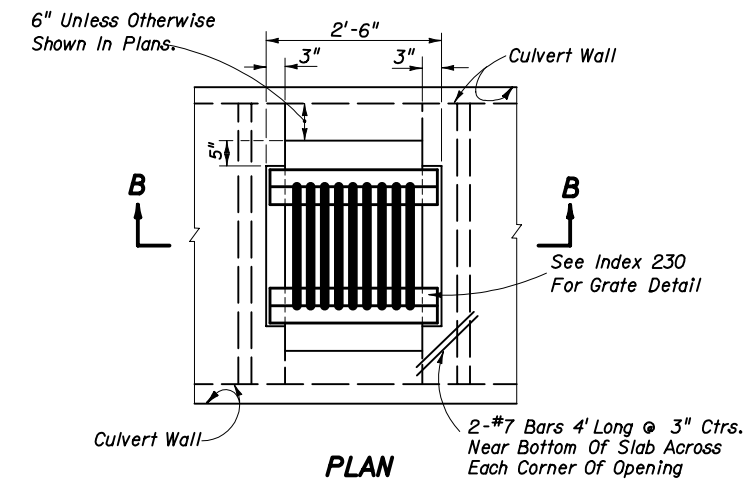
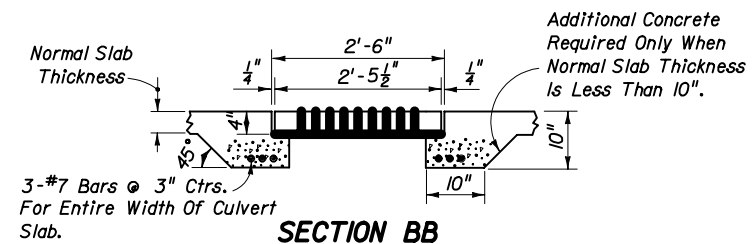


The number is to be placed in the center of the top surface of all bridge culvert headwalls.

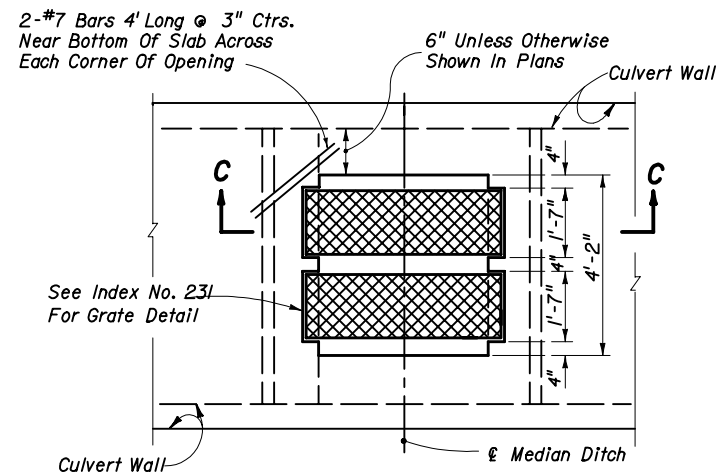
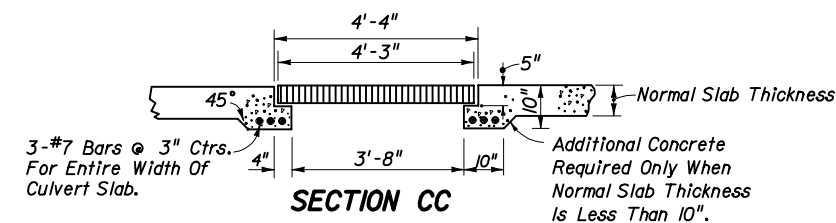
For Bridge Number See Plan-Profile Sheets.

TOP VIEW OF HEADWALL

BRIDGE CULVERT NUMBER LOCATION



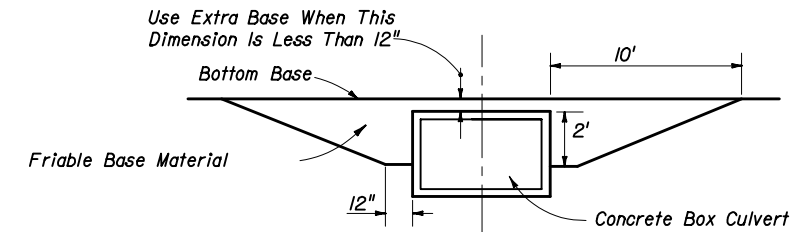
INLET TYPE A GRATE



**PLAN
INLET TYPE B GRATE**

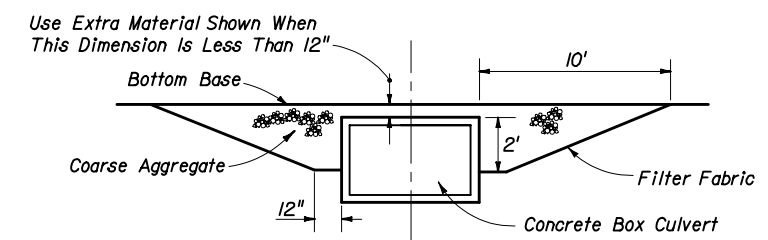
NOTE: 1. Cost of Steel Grating to be included in cost of Box Culvert.
2. All steel shall be $1\frac{1}{4}$ " clear.

INLET IN TOP OF BOX CULVERT



The cost of furnishing and installing extra friable base material shall be included in the cost of the Box Culvert.

FRIABLE BASE



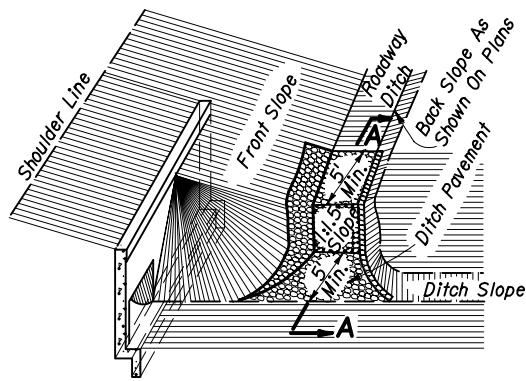
The coarse aggregate shall be placed in 6 inch lifts and compacted sufficiently as to be firm and unyielding. The coarse aggregate shall be gravel or stone meeting the requirements of Section 901-2 or 901-3 respectively. The gradation shall meet Section 901-6, Grades 4, 467, 5, 56, or 57 unless restricted in the plans. The filter fabric shall be Type D-3 (See Index No. 199). The cost of furnishing and installing the coarse aggregate and filter fabric shall be included in the cost of the Box Culvert.

ASPHALTIC CONCRETE BASE

NOTE: Extra base is required when cross box culverts are located on facilities subject to high speed traffic (>45 mph) or high traffic volumes (>1600 ADT) and the cover is within the range specified in the notation above.

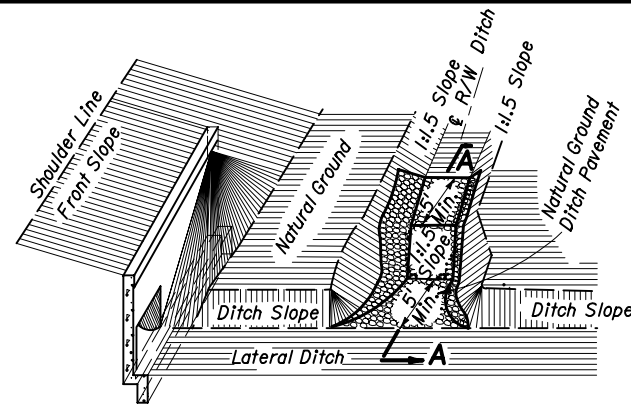
EXTRA BASE FOR CROSS BOX CULVERTS UNDER FLEXIBLE PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MISCELLANEOUS DRAINAGE DETAILS				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	4 of 4	280

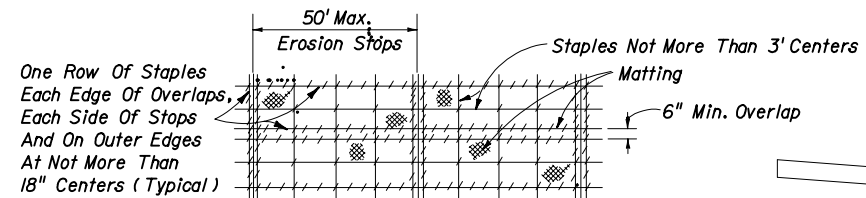


JUNCTION OF ROADWAY DITCH * AND LATERAL DITCH

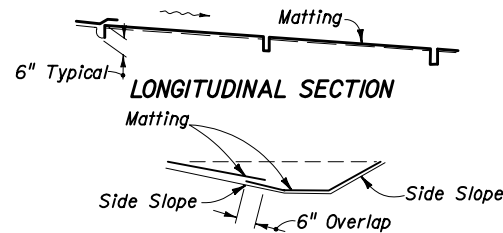
* Soil cement or misc. asphalt will not be permitted for this type of construction



JUNCTION OF R/W DITCH * AND LATERAL DITCH

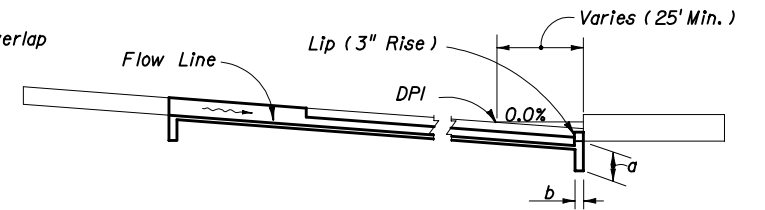


PLAN

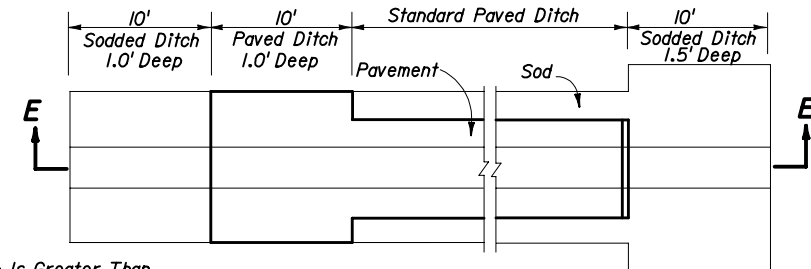


LONGITUDINAL SECTION

SECTION MATTING FOR DITCH

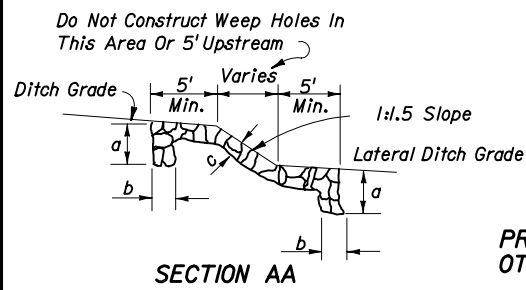


SECTION EE



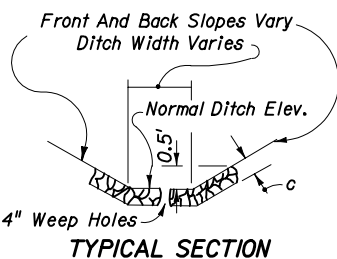
PLAN

PAVED DITCH END TREATMENT

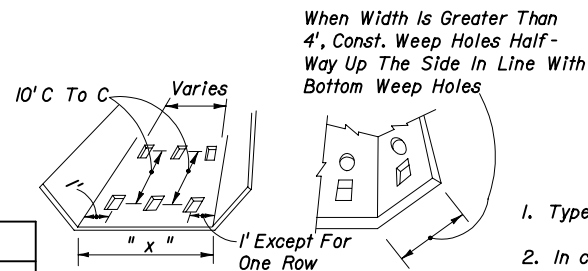


SECTION AA

PROFILE OF DITCH PAV'T AT LOCATIONS OTHER THAN JUNCTION WITH LATERAL DITCH



TYPICAL SECTION



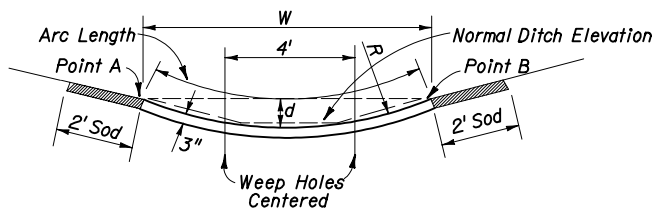
When "X" = 1' To 4' Const. 1 Row (Centered)
 "X" = 5' To 7' Const. 2 Rows
 "X" = 8' To 12' Const. 3 Rows
 "X" = 13' To 17' Const. 4 Rows
 "X" = 18' To 22' Const. 5 Rows

GENERAL NOTES

- Type of ditch pavement shall be as shown on plans.
- In concrete ditch pavement, contraction joints are to be spaced at 25' maximum intervals, or as directed by the Engineer. Contraction joints may be either formed (construction joint) or tooled. No open joints will be permitted.
- Lip at end of ditch pavement shall normally be located downstream of DPI or on flatter grades where there is a decrease in ditch velocity.
- Toewalls are to be used with all ditch paving. A toewall is not required adjacent to drainage structures.
- When directed by the Engineer, weep hole spacing may be reduced to 5' minimum.
- For junction of R/W ditch spillway and lateral ditch, sides of paving to be 1' high minimum.
- For ditch pavements requiring filter fabric the fabric shall be placed directly beneath the pavement for the entire length and width of the pavement. When weep holes with aggregate are used the filter fabric shall be placed below the aggregate to form a mat continuous with or overlapping the pavement fabric. (See Index No. 199 for fabric type and application).
- Ditch pavement requiring reinforcement shall be detailed in the plan.
- Cost of plastic filter fabric to be included in the contract unit price for ditch pavement.

Notes: All weep holes to be 3" x 4" rectangle or 4" or 5" dia. circular hole. 1/2 cu. ft. (12" x 12" x 6") of No. 6 aggregate to be placed under each hole. 1 sq. ft. of galvanized wire mesh (1/4" openings) shall be placed between the aggregate and the concrete. Cost of holes, aggregate and wire mesh to be included in the cost of ditch pavement.

WEEP HOLE ARRANGEMENT

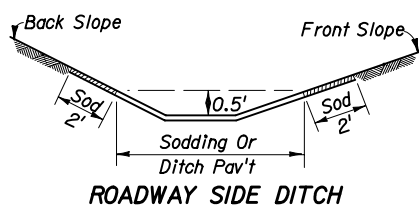


TO REPLACE:

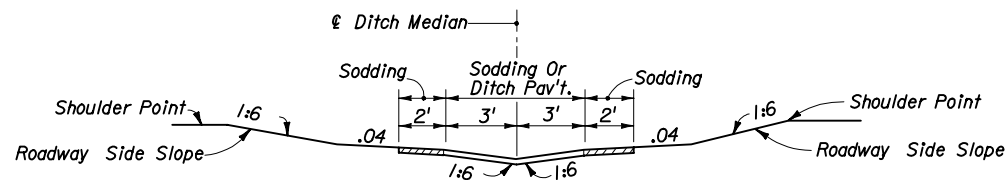
	W	d	R	No. Of Rows Of Weep Holes	Arc Length
6' Median Swale 1:6 Front Slopes; 1:4 Back Slope	6'	.24'	19'	0	6.0
5' B.W. Ditch	10'	.67'	19'	2	10.1
4' B.W. Ditch	9'	.54'	19'	2	9.1
1:4 Front Slopes & Back Slope					
5' B.W. Ditch	9'	.74'	14'	2	9.2
4' B.W. Ditch	8'	.58'	14'	1 (in center)	8.1

ALTERNATE DITCH PAVEMENT

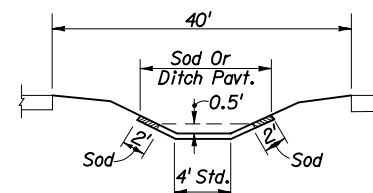
For use only where side slopes are 1:4 or flatter. Point "A" and "B" are to be the same elevation and should be used to locate the paved section.



ROADWAY SIDE DITCH



SWALED MEDIAN (No Weep Holes)

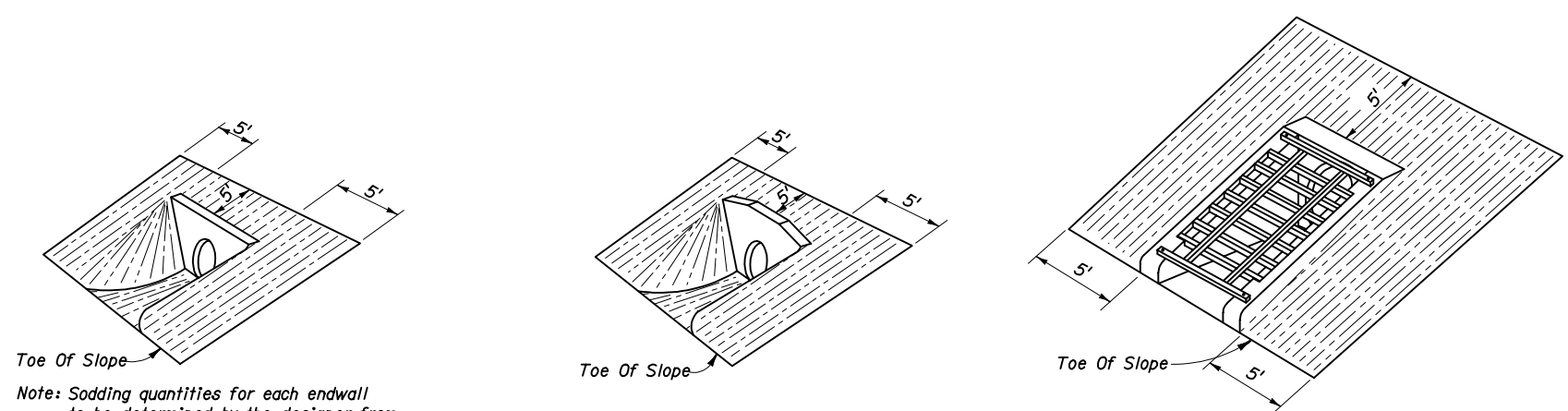


40' MEDIAN

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH PAVEMENT & SODDING

Designed By	Names	Dates	Approved By		
Drawn By			 State Drainage Engineer	Revision	Sheet No.
Checked By				00	1 of 2



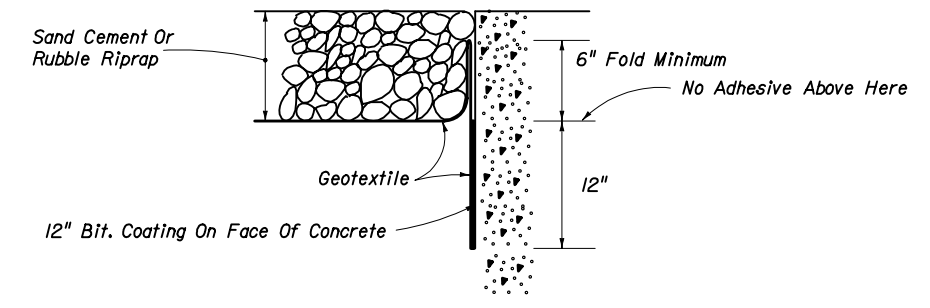
Toe Of Slope

Note: Sodding quantities for each endwall to be determined by the designer from this detail.

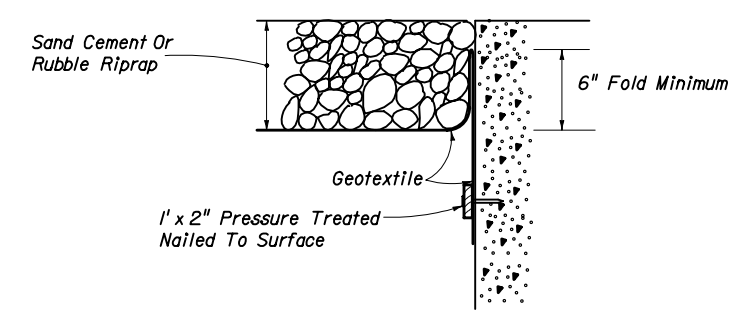
(EXCEPT INDEX NO. 250)
STRAIGHT ENDWALL

STRAIGHT ENDWALL
INDEX NO. 250

U - TYPE ENDWALL
INDEX NO. 261



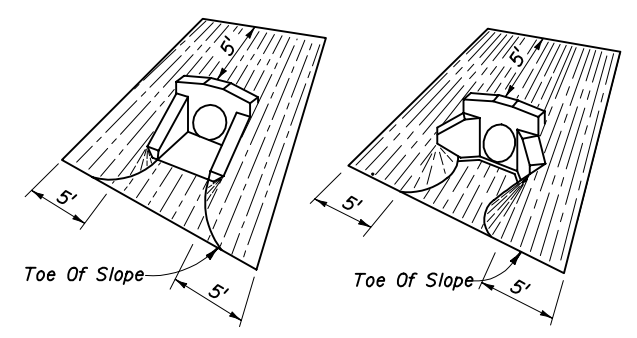
BONDED OPTION



NAILED OPTION

Note: Either option may be used unless otherwise called for in the plans.

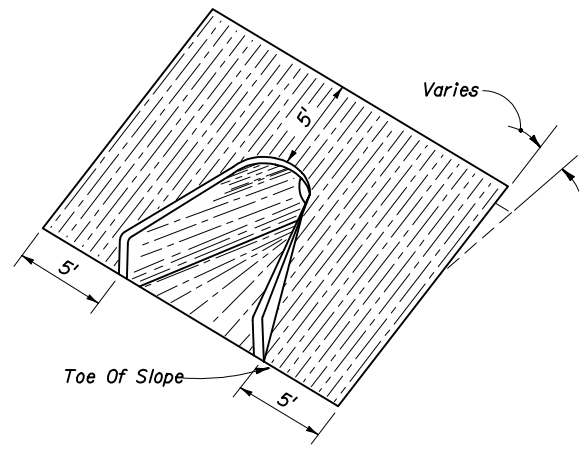
GEOTEXTILE PLACEMENT AT CONCRETE STRUCTURE



U - TYPE WINGS

45° WINGS

WINGED ENDWALLS
INDEX NO. 266



FLARED END SECTION
INDEX NO. 270

SODDING QUANTITIES (S. Y.)

PIPE SIZE	INDEX NO. 250												INDEX NO. 261				INDEX NO. 266				INDEX NO. 270	
	SLOPE												SLOPE				SLOPE					
	1:2			1:3			1:4			1:6			1:2	1:3	1:4	1:6	1:2	1:3	1:4	1:6		ALL SLOPES
	PIPES												PIPES				PIPES					PIPES
	1	2	3	1	2	3	1	2	3	1	2	3	1	1	1	1	1	1	1	1	1	
12"													13 (15)	16	17	23	14	15	18	22	10	
15"	19	21	24	22	26	29	26	30	33	34	38	43	15	17	20	25	15	17	20	25	11	
18"	21	24	27	25	29	33	30	34	38	39	44	50	14 (16)	17	19	25	16	18	22	28	11	
21"																					12	
24"	26	30	34	32	37	42	38	44	50	50	58	66	15 (17)	19	21	28	19	22	26	34	14	
27"																					15	
30"	31	37	42	39	46	53	46	55	63	62	74	85	17 (18)	21	24	32	21	25	30	40	16	
36"	37	44	52	46	56	65	56	67	79	76	91	107					24	29	35	47	18	
42"	43	53	62	55	67	79	67	82	96	91	111	132					27	32	39	54	19	
48"	50	62	73	64	79	93	78	97	115	108	133	158					30	36	44	61	21	
54"	57	71	85	74	92	110	91	113	136	126	157	188									21	
60"																					22	
66"																					25	
72"																					26	

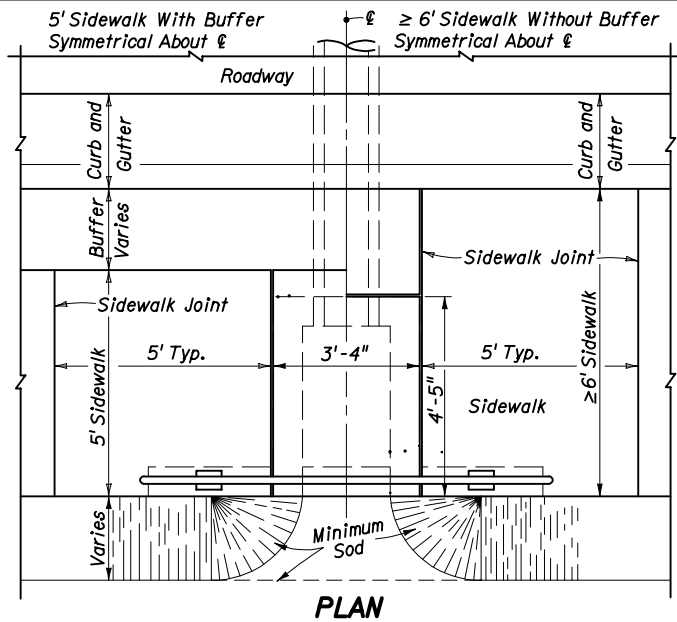
() Endwall With Baffles

SODDING

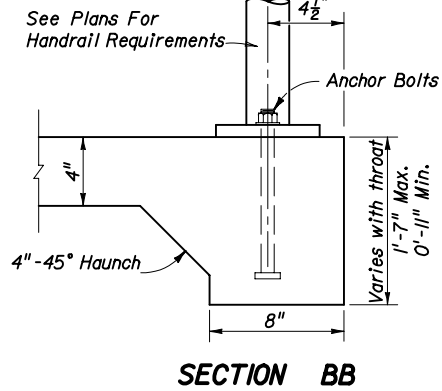
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH PAVEMENT & SODDING

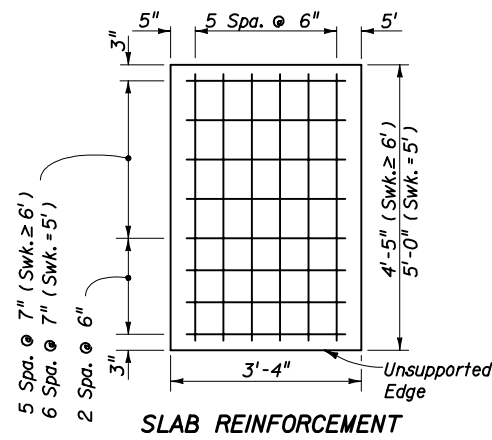
Designed By	Names	Dates	Approved By	
Drawn By	HSD	08/85	State Drainage Engineer	
Checked By	JBW/JVG	09/85	Revision	00
			Sheet No.	2 of 2
			Index No.	281



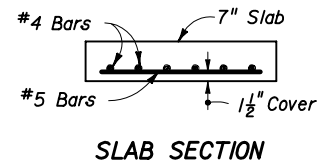
PLAN



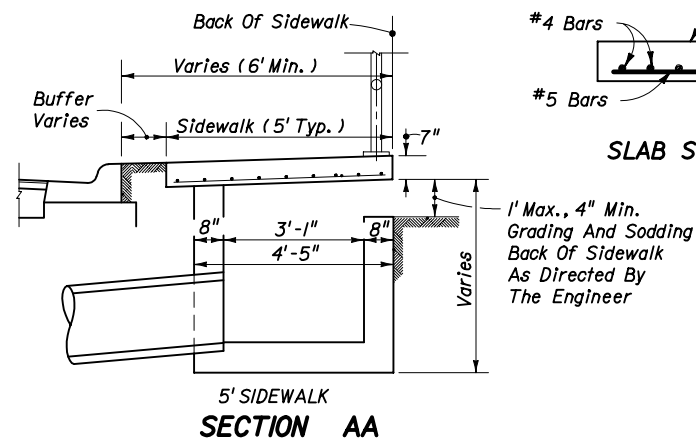
SECTION BB



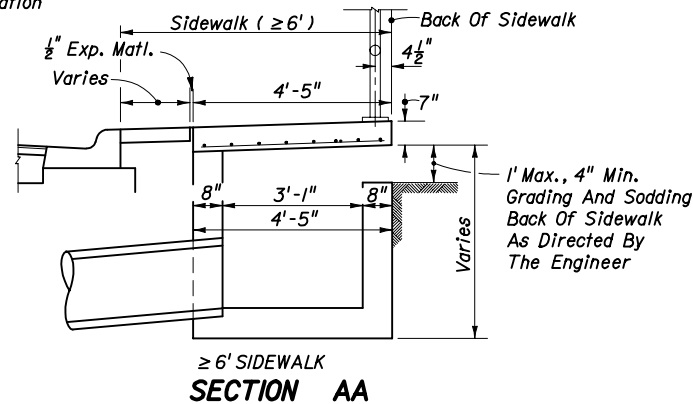
SLAB REINFORCEMENT



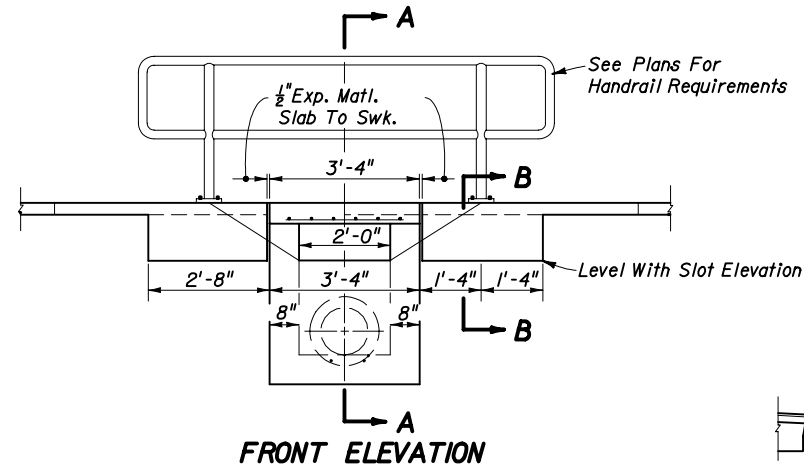
SLAB SECTION



SECTION AA



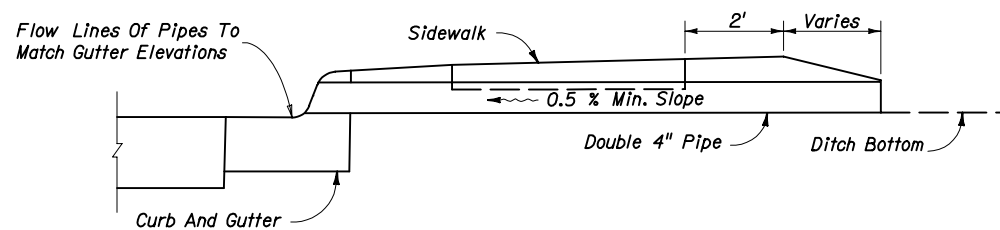
SECTION AA



FRONT ELEVATION

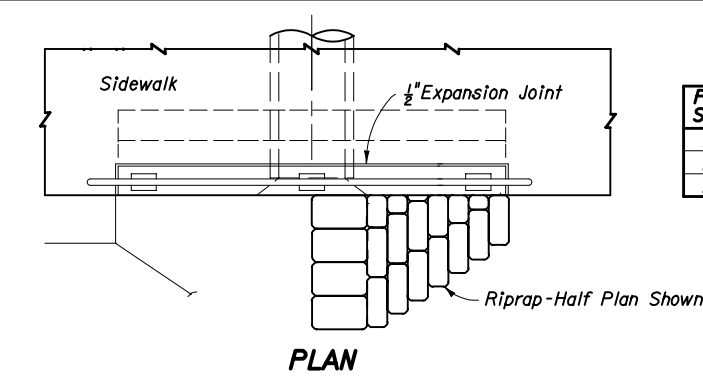
- Notes: 1. For additional details see Index No. 232.
 2. Inlet to be paid for under the contract unit price for Inlets (Ditch Bottom Type C Modified), EA. Handrail to be paid for under the contract unit price for Pipe Handrail, (Material), LF.

INLET TYPE C (MODIFIED)



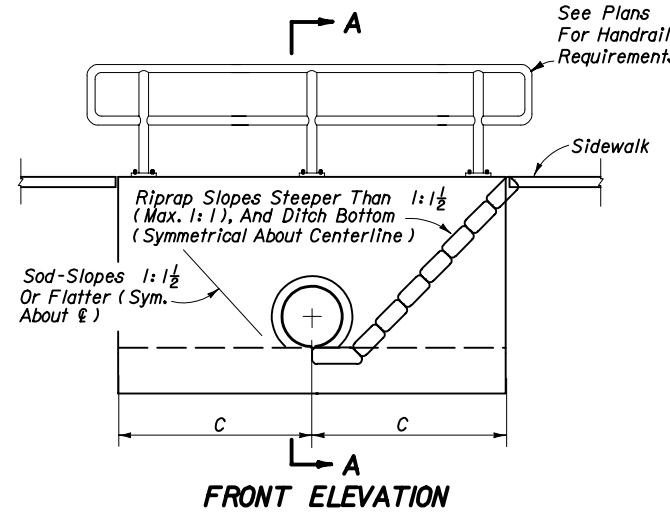
- Notes: 1. To be constructed at locations as directed by the Engineer.
 2. Either cast iron pipe or PVC rigid conduit, U.L. listed for direct sunlight exposure, Schedule 40, may be used.
 3. Pipe to be paid for under the contract unit price for either Cast Iron Soil Pipe (Standard) (4"), LF or Polyvinyl Chloride Pipe Culvert (4"), LF.

SHALLOW DITCHES

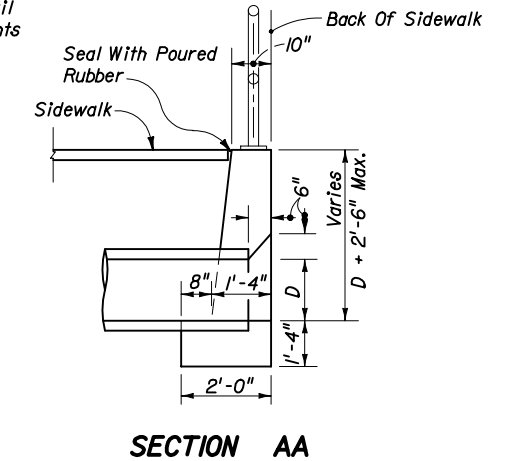


PLAN

Pipe Size	C	Conc. -CY	Riprap -CY (Sand-Cement)
15"	4'-9"	2.27	1.1
18"	5'-3"	2.59	1.3
24"	6'-3"	3.26	1.8



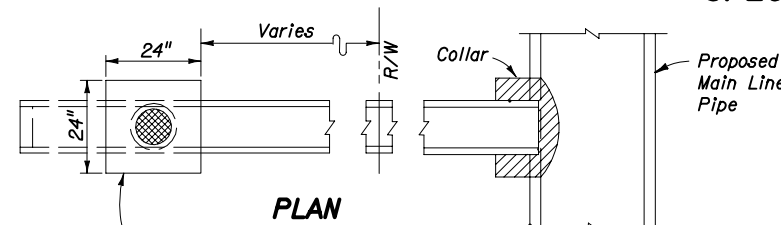
FRONT ELEVATION



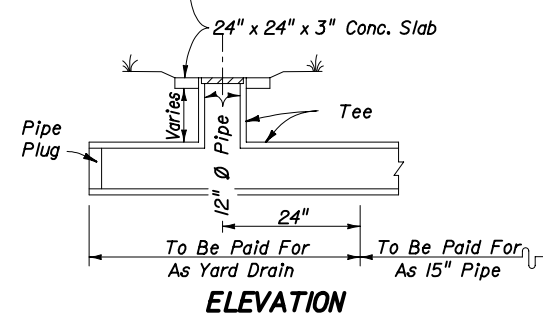
SECTION AA

- Notes: 1. Maximum pipe size shall be 24" diameter.
 2. Grading back of sidewalk varies and shall be done as directed by the Engineer.
 3. Concrete quantities shown are for maximum wall heights, and shall be basis for estimate and payment.
 4. Riprap quantities shown are for estimate purposes only. Cost of riprap to be included in cost of the endwall.
 5. Endwalls to be paid for under the contract unit price for Conc. Class I (Endwalls), CY. Handrail to be paid for under the contract unit price for Pipe Handrail, (Material), LF.

SPECIAL CONCRETE ENDWALL



PLAN



ELEVATION

YARD DRAIN ITEM INCLUDES :

- 15" x 15" x 12" Concrete or PVC Tee 4' long.
- One (1) Grate-Neenah No. R-4030, Phoenix No. P-1058, U.S. Foundry No. 5605 or equivalent.
- 12" pipe as necessary.
- 0.04 Cu. yds. conc. for slab.

- Notes: 1. Yard drains to be located outside the R/W. Drainage area should not exceed 750 SF (grate flow 0.1 Cfs).
 2. Yard drains may be constructed at the option of the property owner as shown on the plans.
 3. Cost of plugs and collars to be included in the cost for 15" pipe. For collar and plug details see Index No. 280.
 4. Yard drains to be paid for under the contract unit price for Yard Drains, EA.

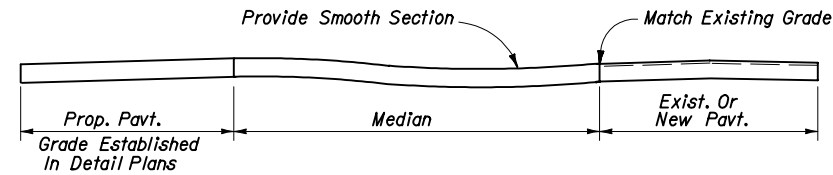
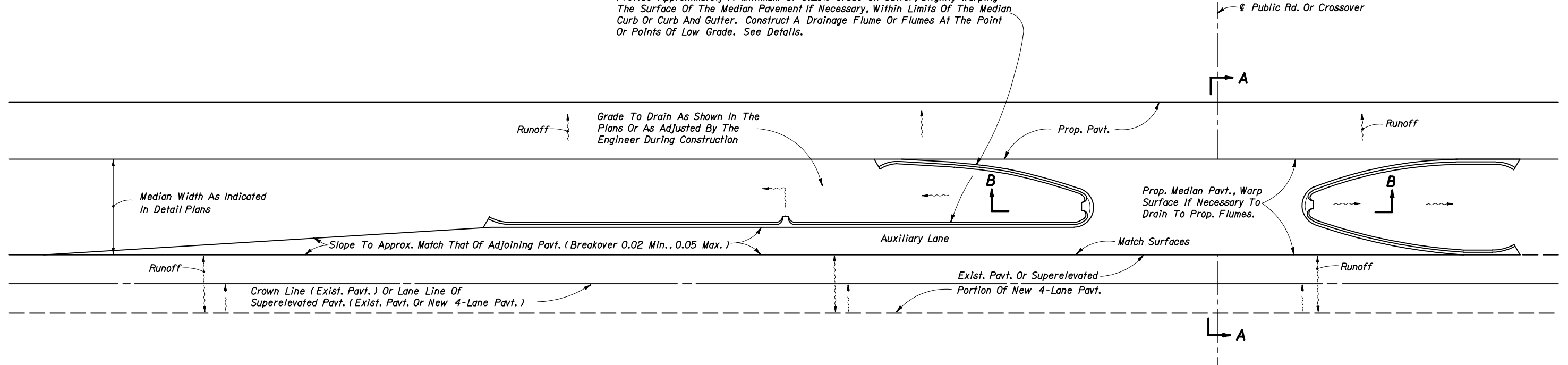
YARD DRAINS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

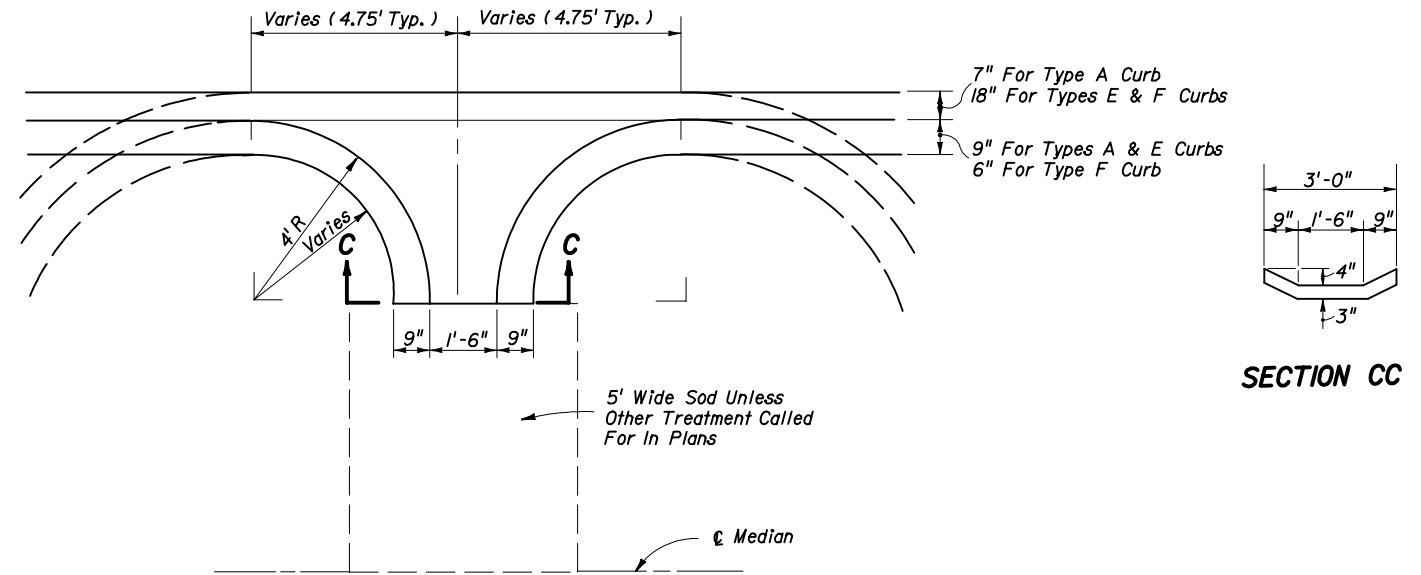
BACK OF SIDEWALK DRAINAGE

Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By				
Checked By				
		Revision	Sheet No.	Index No.
		04	1 of 1	282

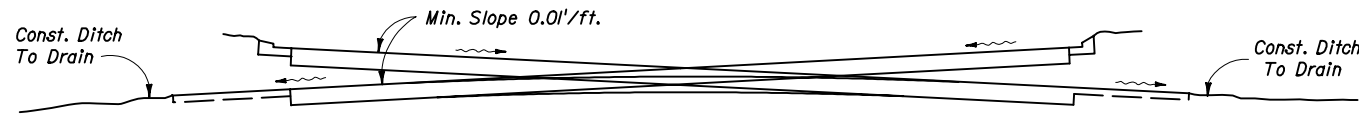
Provide Approximately A Minimum Of 0.20% Grade On Gutter, Slightly Warping The Surface Of The Median Pavement If Necessary, Within Limits Of The Median Curb Or Curb And Gutter. Construct A Drainage Flume Or Flumes At The Point Or Points Of Low Grade. See Details.



SECTION AA



SECTION CC



SECTION BB

(May Drain From Any Point Designated In the Plans Or As Adjusted By The Engineer During Construction)

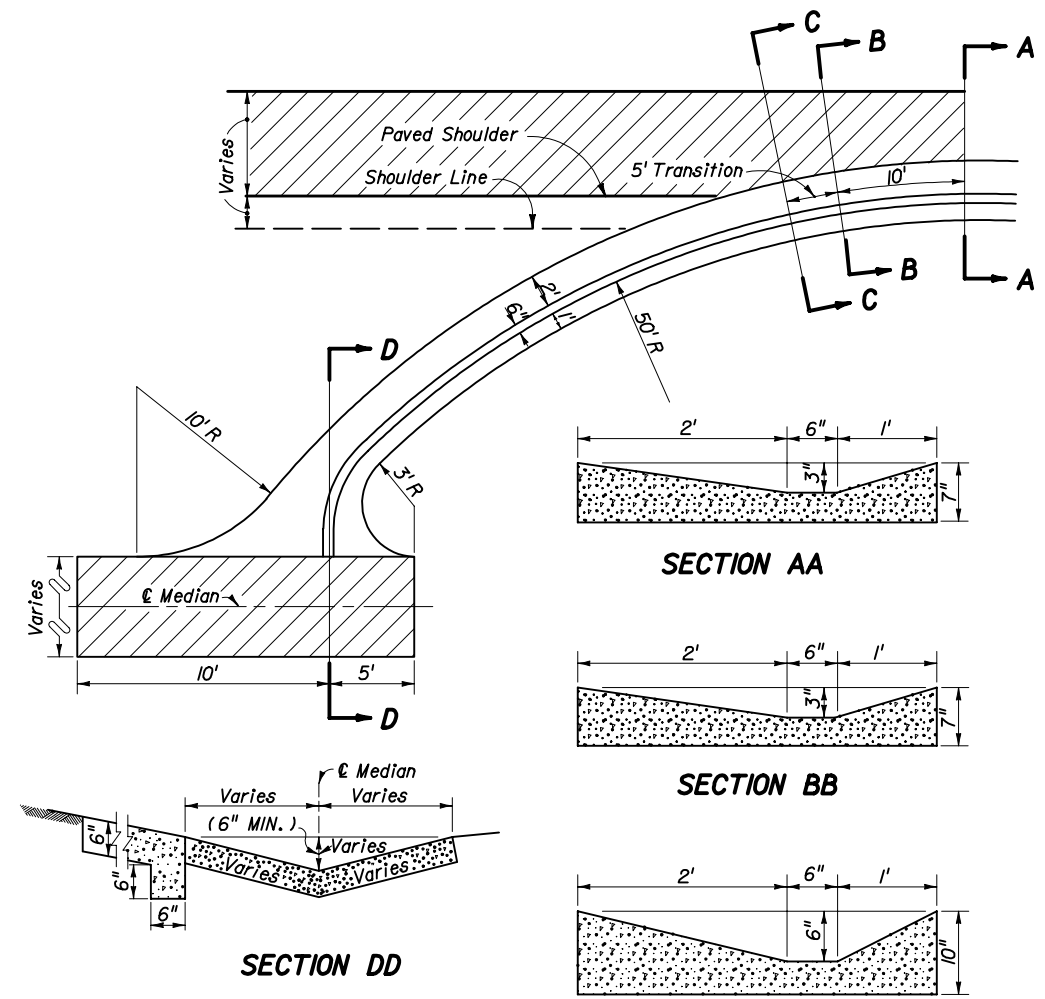
GENERAL NOTES

1. These details are to apply to projects which provide for the conversion of 2-lane sections to 4-lane divided highway sections and for superelevated sections of new 4-lane divided highways. Layout above is illustration only. Cost of flumes to be included in the contract price for Curb or Curb and Gutter. Sod to be paid for under the contract unit price for Sodding, SY.
2. Flumes to be located in low point of noses and at other points as designated in the plans. The locations may be adjusted by the Engineer during construction.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MEDIAN OPENING FLUME

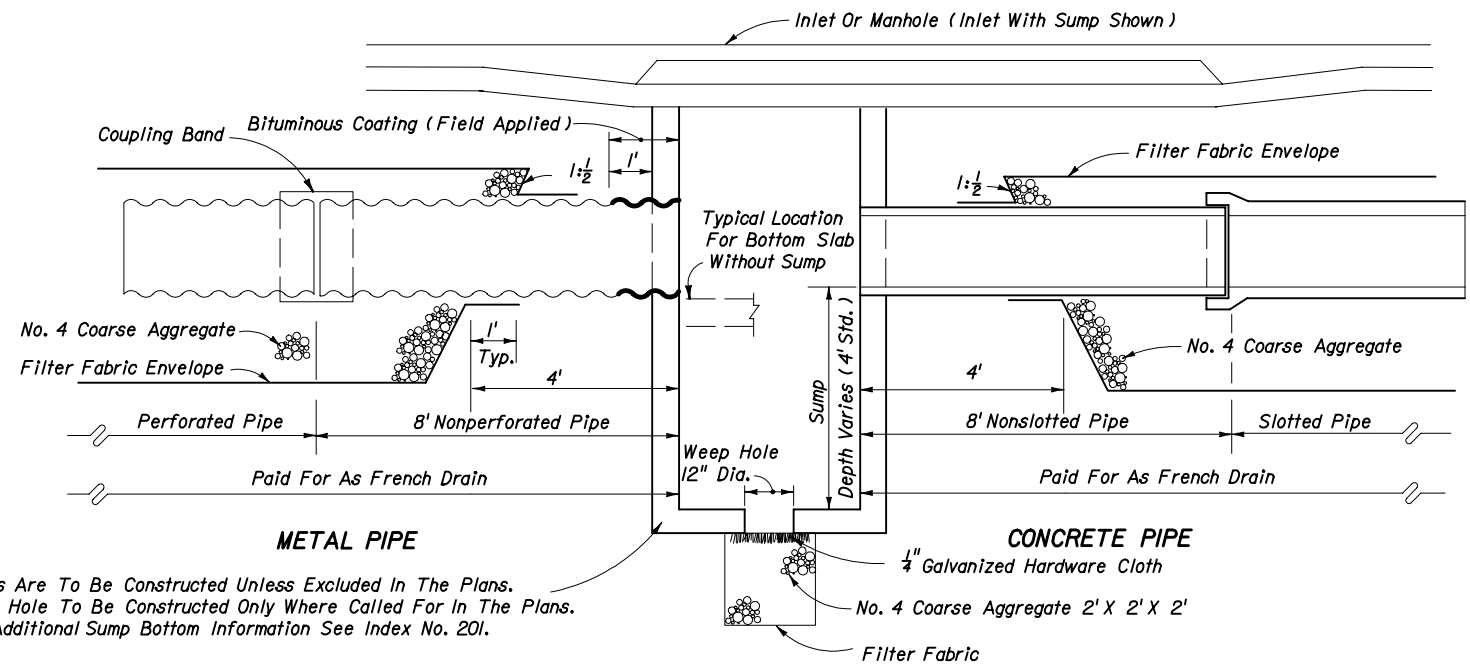
Designed By	CHR	Dates	03/59	Approved By	<i>[Signature]</i>
Drawn By		Revision		State Drainage Engineer	
Checked By	CDD	Sheet No.	00	Index No.	283
			1 of 1		



1. Spillway to be paid for as shoulder gutter.
2. If spillway empties into a shallow or median ditch, the detail should be modified as necessary.

DETAIL OF CONC. SPILLWAY AT END OF SHOULDER GUTTER
 (TO BE USED WHERE INLETS, PIPES & ENDWALLS ARE IMPRACTICAL)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE SPILLWAYS SHOULDER GUTTER SPILLWAY				
Designed By	Names	Dates	Approved By <i>[Signature]</i> State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By			00	1 of 1
				284



Sumps Are To Be Constructed Unless Excluded In The Plans.
Weep Hole To Be Constructed Only Where Called For In The Plans.
For Additional Sump Bottom Information See Index No. 201.

LONGITUDINAL SECTION

GENERAL NOTES

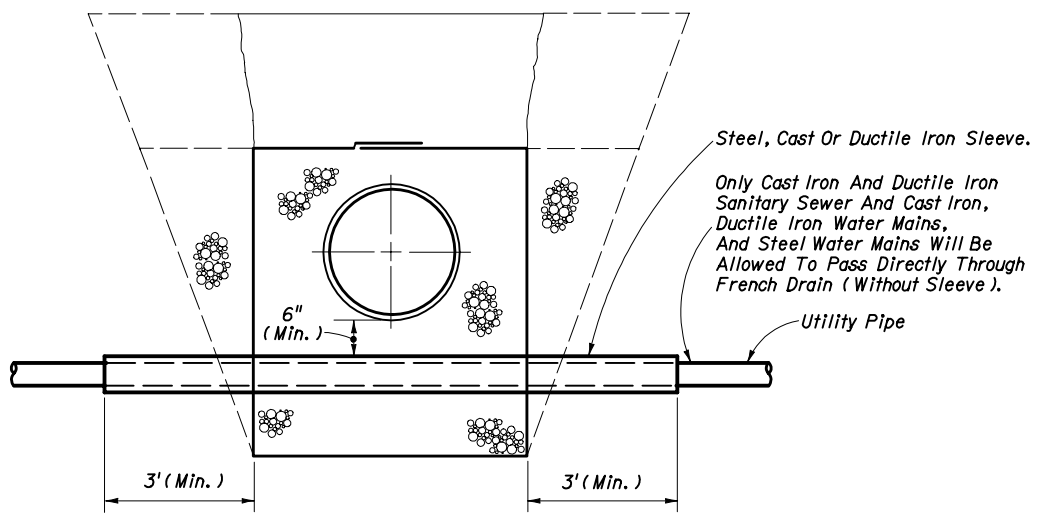
1. Pipe shall be any of the optional types permitted in Section 443 of the Specifications unless otherwise restricted in the plans. Dissimilar types of pipe will not be permitted in a continuous run of pipe.
2. Concrete pipe shall be placed with the slots positioned on sides.
3. Alignment joints are standard (gaskets not required). Recorrugation of metal pipe ends not required.
4. The contractor may submit other methods of providing slots having equal or greater area of opening, for approval by the Engineer.
5. Filter fabric shall be Subsurface Drainage type meeting the requirements of Section 985. All filter fabric joints shall lap a minimum of one (1) foot.
6. The standard cross section shall be constructed unless other section(s) described or detailed in the plans.
7. For supplemental details see Index No. 280.
8. The contractor shall take the necessary precautions to prevent contamination of the trench with sand, silt and foreign materials.
9. French drains following the typical cross section shall be paid for under the contract unit price for French Drains, LF. The unit price shall include the cost of pipe, pipe plugs, pipe fittings, coarse aggregate and filter fabric in place, and the cost for trench excavation, backfill and compaction. The unit price shall also include the cost for disposal of surplus excavated materials and cost for restoration of pavement removed or damaged by french drain construction, but shall not include payments for items paid for elsewhere.

French drains with a significantly different cross section shall be paid for under the contract unit prices for separate items as follows:

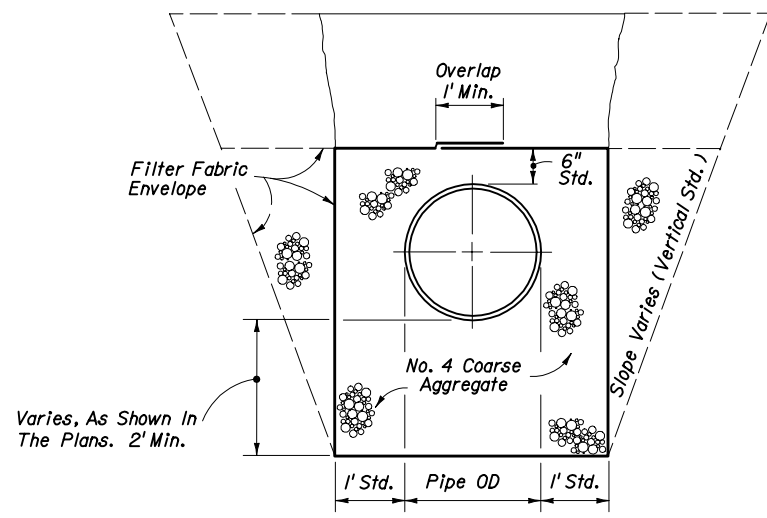
- (a) Slotted or Perforated Pipe Culvert, LF. Unit price shall include cost for pipe, pipe plugs and fittings in place.
- (b) Ballast Rock (French Drain Aggregate), CY. Unit price shall include cost for coarse aggregate in place, and cost for trench excavation, backfill and compaction. The unit price shall also include the cost for disposal of surplus excavated materials and cost for restoration of pavement removed or damaged by french drain construction, but shall not include payment for items paid for elsewhere.
- (c) Plastic Filter Fabric (Subsurface), SY. Unit price shall be for cost of fabric in place. Quantity shall be determined by plan neat dimensions of the fabric envelope.

DESIGN NOTES

1. Pipe invert should be at or above the water table whenever possible.
2. French drains with minor dimensional changes or otherwise different from the standard cross-section shall be either described or detailed in the plans.
French drains with significantly different cross-sections shall be detailed in the plans.



**ROUND PIPE SHOWN
UTILITY PIPES THRU FRENCH DRAIN**




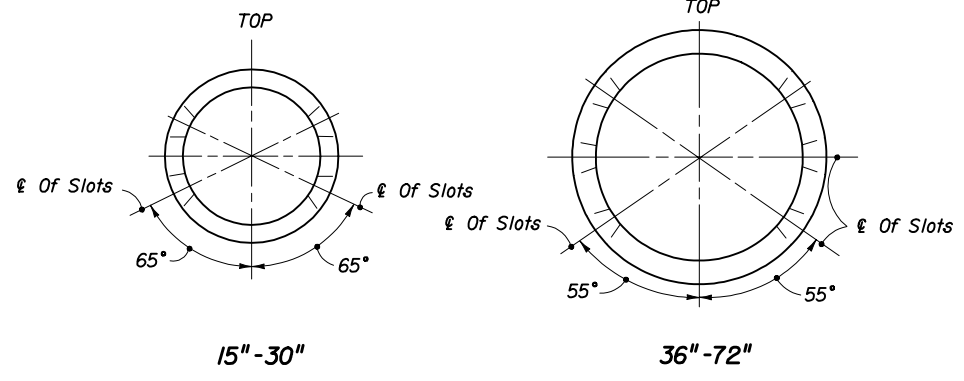
**ROUND PIPE SHOWN
STANDARD CROSS SECTION (ENLARGED)**

FRENCH DRAIN SYSTEM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

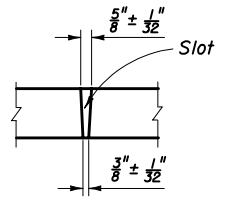
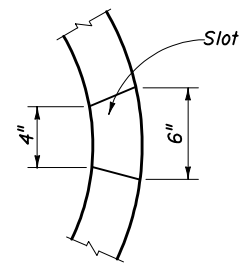
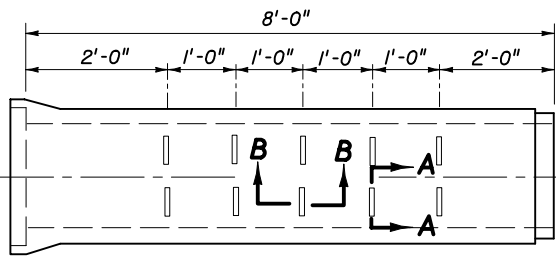
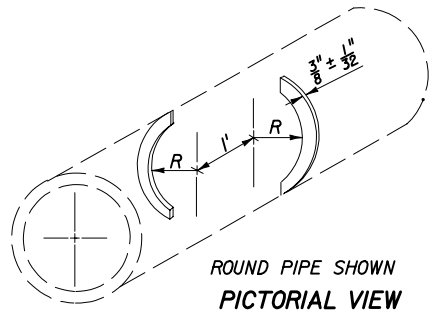
FRENCH DRAIN

Names	Dates	Approved By		
Designed By	MFS	09/83	 State Drainage Engineer	
Drawn By	RWR	09/83		
Checked By	EGR	09/83		
Revision	04	Sheet No.		
		1 of 2	285	

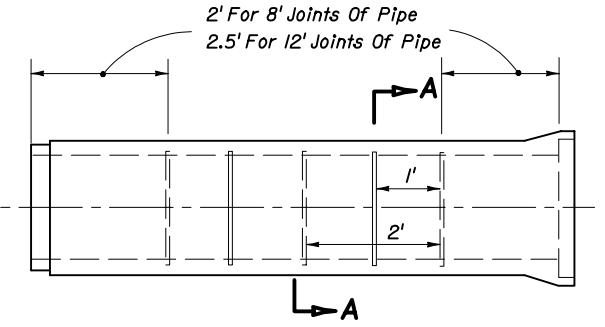
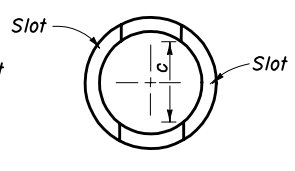
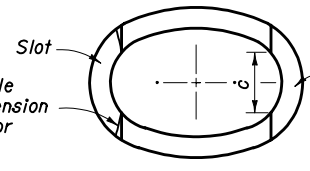


ELLIPTICAL PIPE		
Pipe Size	Slot Cut	
	Opening c	
	Min.	Max.
14"x23"	10"	12"
19"x30"	14"	16"
24"x38"	14"	16"
29"x45"	20"	22"
34"x53"	20"	22"
38"x60"	20"	22"

ROUND PIPE		
Pipe Size	Slot Cut	
	Opening c	
	Min.	Max.
15"	12"	14"
18"	12"	14"
24"	16"	18"
30"	16"	18"
36"	22"	24"
42"	22"	24"
48"	22"	24"
54"	24"	26"
60"	24"	26"
66"	24"	26"
72"	24"	26"



A curved cut is acceptable provided the control dimension is maintained (Typical For Elliptical & Round Pipe)



SIDE VIEW

SECTION AA

SECTION BB

ELLIPTICAL PIPE

ROUND PIPE

SECTION AA

SIDE VIEW

OPTION A - ROUND PIPE

OPTION B - ROUND OR ELLIPTICAL PIPE

SLOTTED PIPE OPTIONS

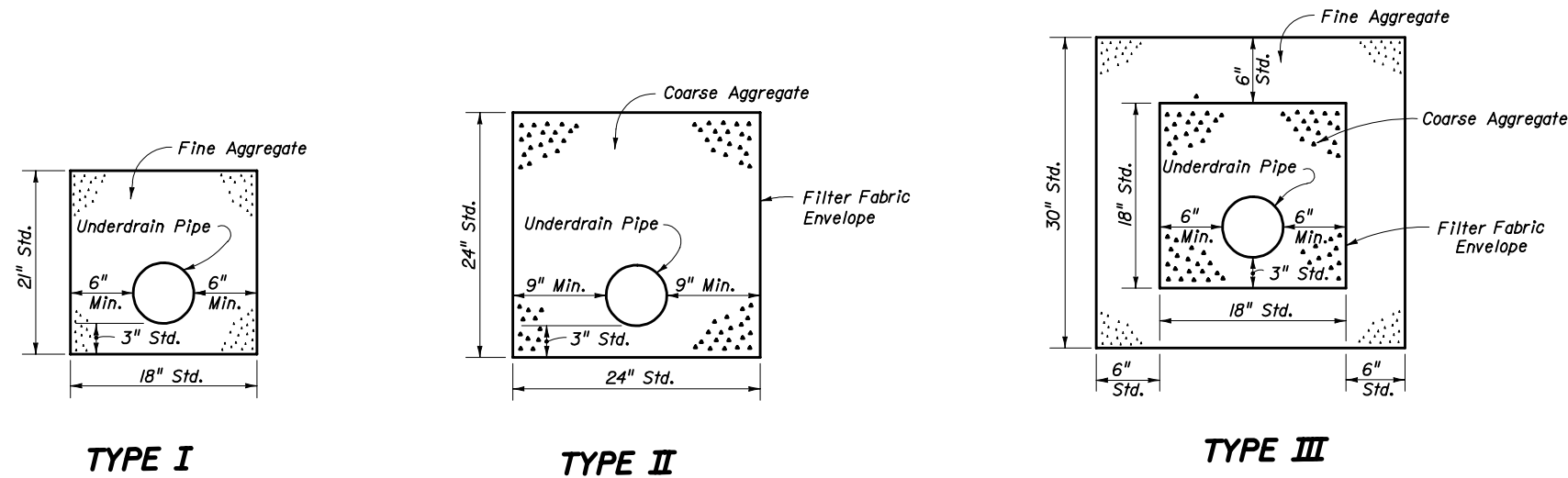
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

FRENCH DRAIN

Designed By	Names	Dates	Approved By		
Drawn By			Revision	Sheet No.	Index No.
Checked By			00	2 of 2	285

GENERAL NOTES

- The underdrain pipe shall be either 4" smooth or 5" corrugated tubing unless otherwise shown in the plans. The size to be furnished will be based on the nominal internal diameter of a pipe with a smooth interior wall. Except when prohibited by the plans, the special provisions or this standard, pipe with a corrugated interior wall may be provided based on the following size equivalency.
 - 4" smooth interior equivalent to 5" corrugated interior
 - 5" smooth interior equivalent to 6" corrugated interior
 - 6" smooth interior equivalent to 8" corrugated interior
 - 8" smooth interior equivalent to 10" corrugated interior
- Fine aggregate shall be quartz sand meeting the requirements of Sections 902-4 of the Standard Specifications.
- Coarse aggregate shall be gravel or stone meeting the requirements of Sections 901-2 or 901-3. The gradation shall meet Section 901, Grades 4, 467, 5, 56 or 57 stone unless otherwise shown restricted in the plans.
- Underdrain Type I, II, III and V shall be in accordance with Section 440.
- Filter fabric shall be Type D-3 (See Index No. 199). The internal filter fabric of Type V underdrain shall have a permittivity of 0.7 /sec and an AOS of #40 sieve.
- When corrugated polyethylene tubing with slots or 360° perforations is used in conjunction with fine aggregate, a filter fabric sock meeting Section 948 is required.
- See Index No. 500 for the standard location of Type I, II, and III underdrain. The location of Type V underdrain and non standard locations of Type I, II, and III underdrain will be as detailed in the plans.
- All Filter fabric joints shall overlap a minimum of 1'. The internal filter fabric of Type V underdrain shall overlap into the coarse aggregate or the fine aggregate a minimum of 1'.
- Underdrain outlet pipes shall be non-perforated and all bends shall be made using $\frac{1}{8}$ (45 deg.) elbows. 90 deg. bends shall be constructed with two $\frac{1}{8}$ elbows separated by at least 1' of straight pipe. Outlet pipes stubbed into inlets or other drainage structures shall be not less than 6" above the structure flow line. Outlet pipes discharging to grassed areas shall have concrete aprons, hardware cloth, and bordering sod as shown in Index No. 287 for Edgedrain outlets.
- Pay Item shall be based on the size of the smooth interior products. The contract unit price for Underdrain, LF, shall include the cost of pipe, fittings, aggregate, sock, filter fabric, underdrain cleanouts, and concrete aprons.
The contract unit price for Underdrain Outlet Pipe, LF, shall be full compensation for trench excavation, pipe and fittings, concrete aprons, hardware cloth for concrete aprons, stubbing into drainage structures, backfill in place, and disposal of excess materials.
The contract unit price for Underdrain Inspection Box, EA, shall be for the number completed and accepted.



TYPE I

TYPE II


TYPE III

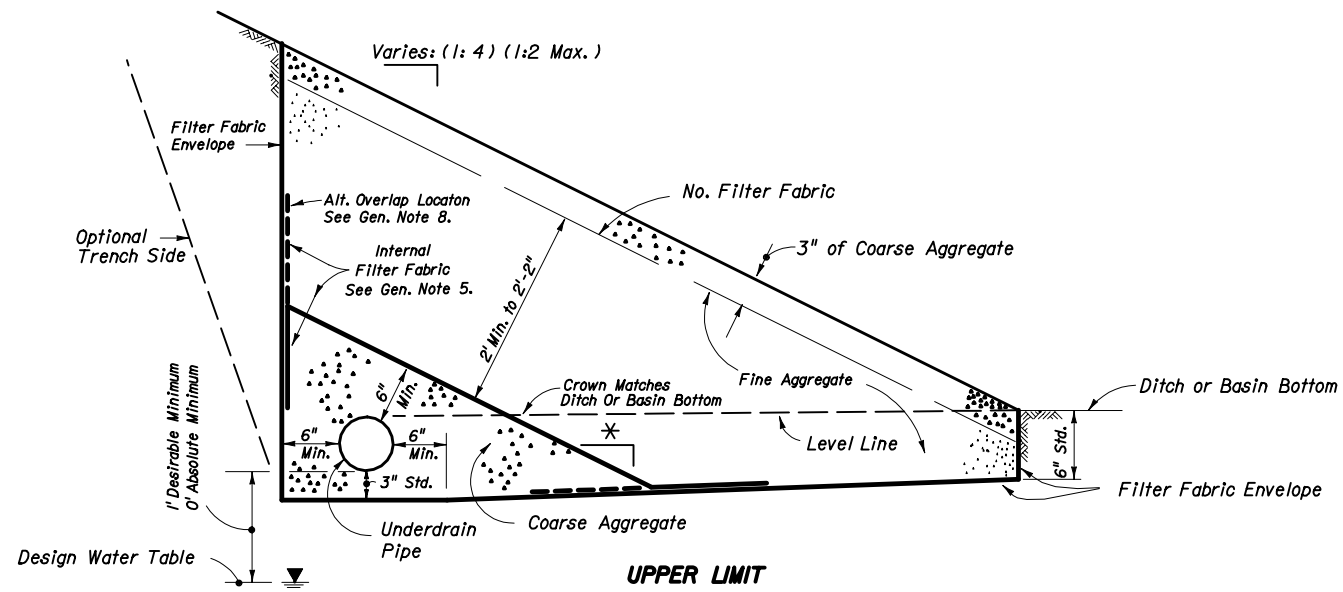
DESIGN NOTES

- The type of underdrain should be selected to meet design water removal rate and soil conditions. Caution is prescribed in the use of these typical sections since special designs may be required to satisfy project conditions.
- Type I underdrain is intended for minimum water removal conditions.
- Type II underdrain is intended for moderate water removal conditions. Where reactive conditions may create chemical clogging, the use of an inert material and/or elimination of the filter fabric may be necessary.
- Type III underdrain is intended for maximum water removal conditions. Filter fabric is required between the coarse aggregate or fine aggregate including those described in general notes 2 and 3. Design note 3 applies for reactive conditions.
- Type V underdrain is intended for use in detention basins and other locations which require a filtration system. The standard fine aggregate specified for Type V underdrain conforms to filtration gradation requirements of Chapter 62-25 F.A.C. .
- The designer should detail in the plans, the location of:
 - (a) Type V underdrain, (b) non-standard locations of Type I, II, and III underdrain, (c) underdrain inspection boxes, (d) cleanouts for Type V underdrain, and (e) underdrain outlet pipes.
- The designer should specify the flow line elevations at the beginning, bends, junctions and ends of underdrain pipes and outlet pipes.
- The designer should evaluate whether an external filter fabric envelope is required around underdrain Types I and III. When required, fabric shall be specified in the plans.

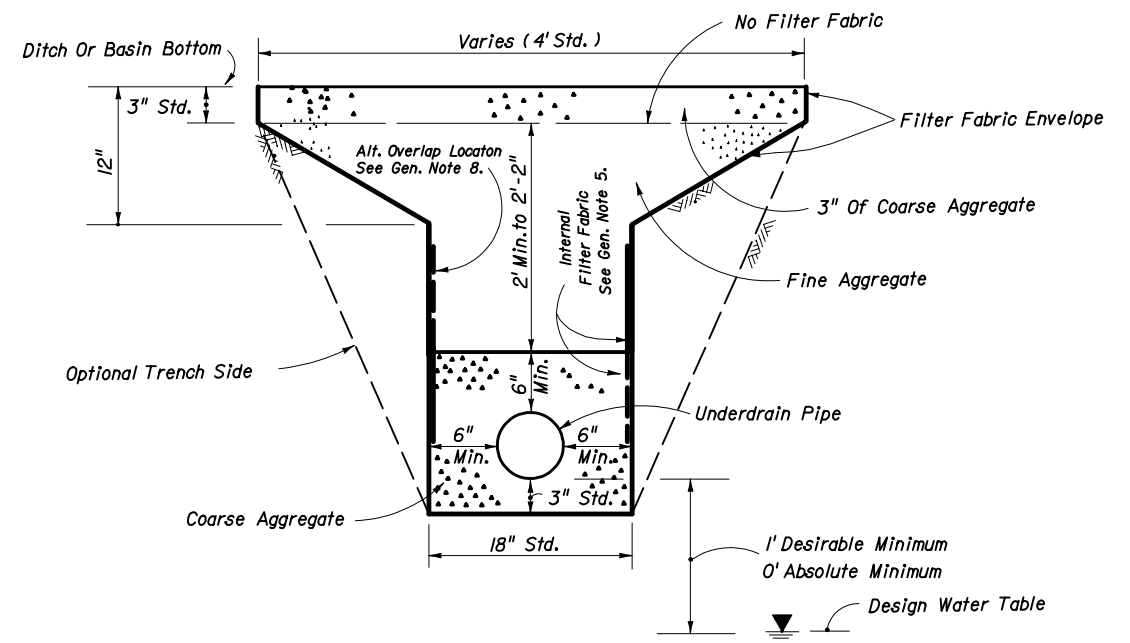
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

UNDERDRAIN

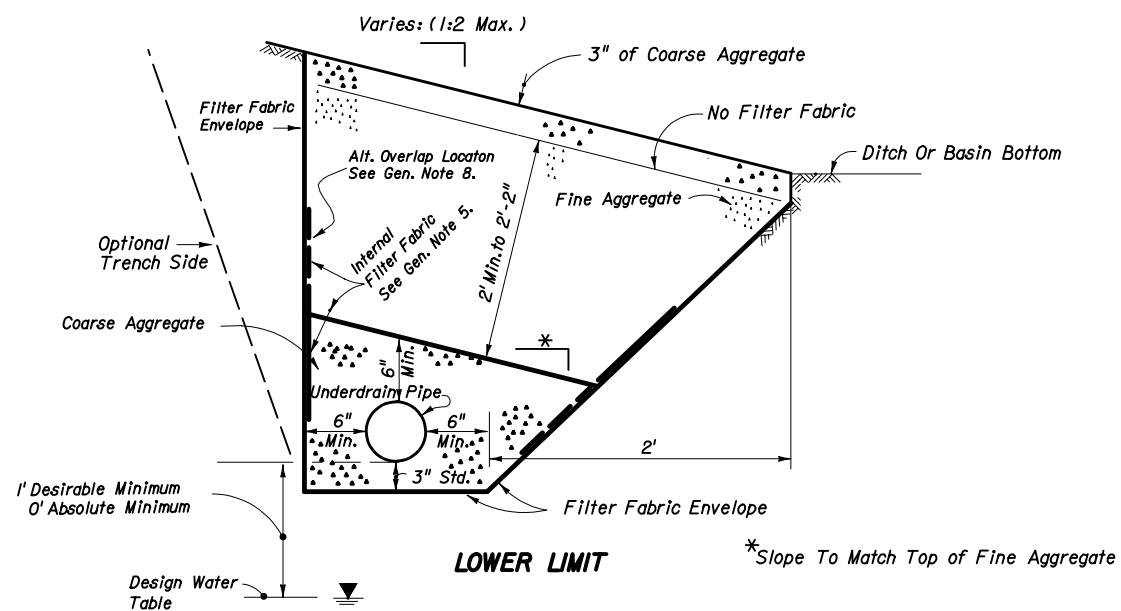
Names		Dates		Approved By		
Designed By	EGR	10/85	 State Drainage Engineer			
Drawn By	HSD	10/85				
Checked By	EGR	10/85				
Revision		Sheet No.		Index No.		
00		1 of 2		286		



* Slope To Match Top of Fine Aggregate

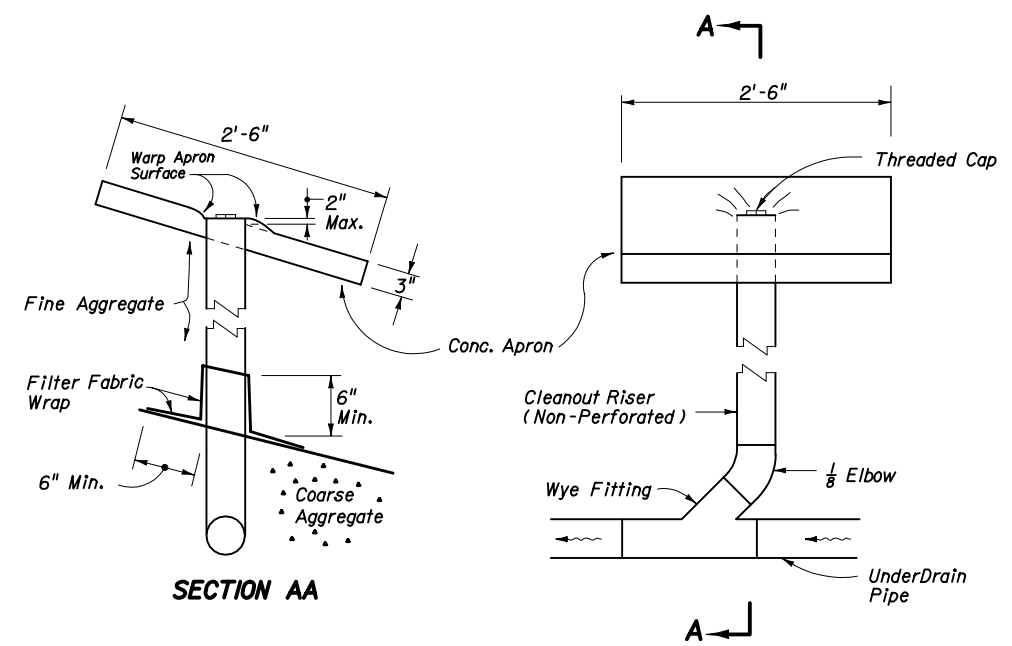


TYPE V b



* Slope To Match Top of Fine Aggregate

TYPE V a

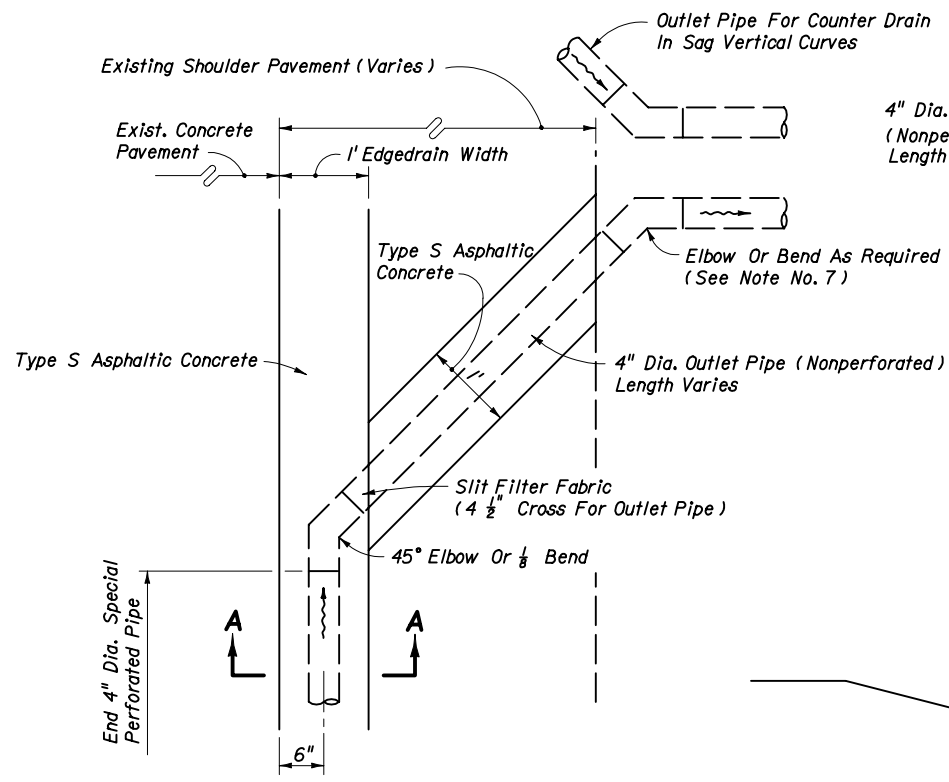


SECTION AA
CLEANOUT FOR TYPE V UNDERDRAIN

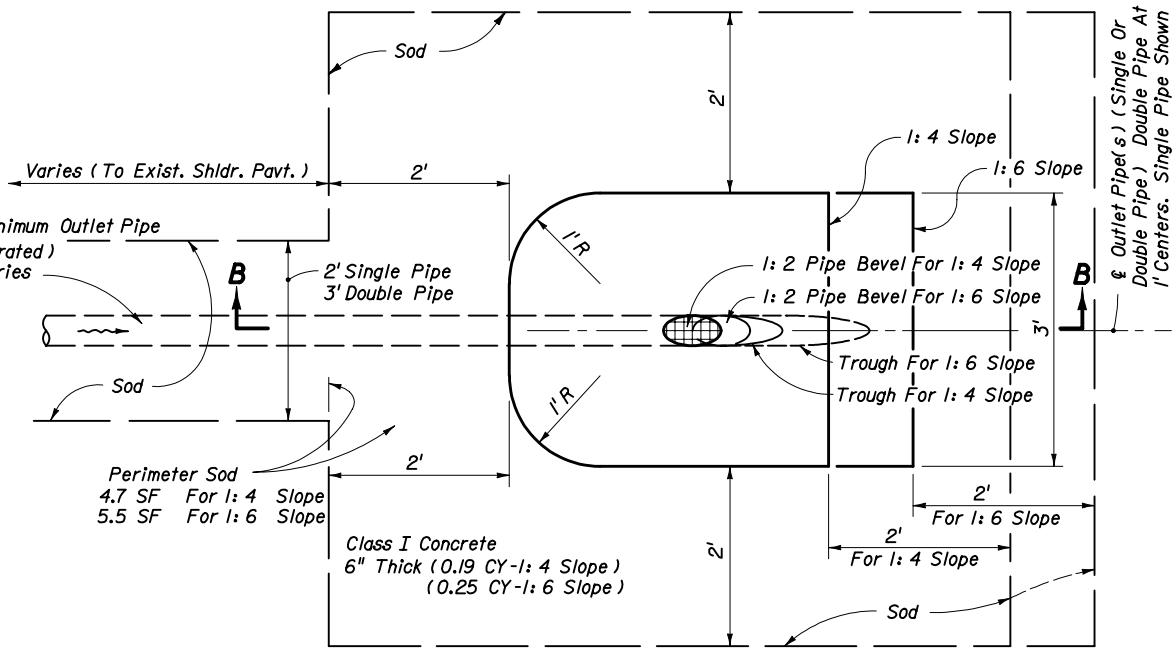
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
UNDERDRAIN				
Designed By	Names	Dates	Approved By <i>[Signature]</i> State Drainage Engineer	
Drawn By	JDT		Revision	Sheet No. Index No.
Checked By			02	2 of 2 286

GENERAL NOTES FOR CONCRETE PAVEMENT SUBDRAINAGE

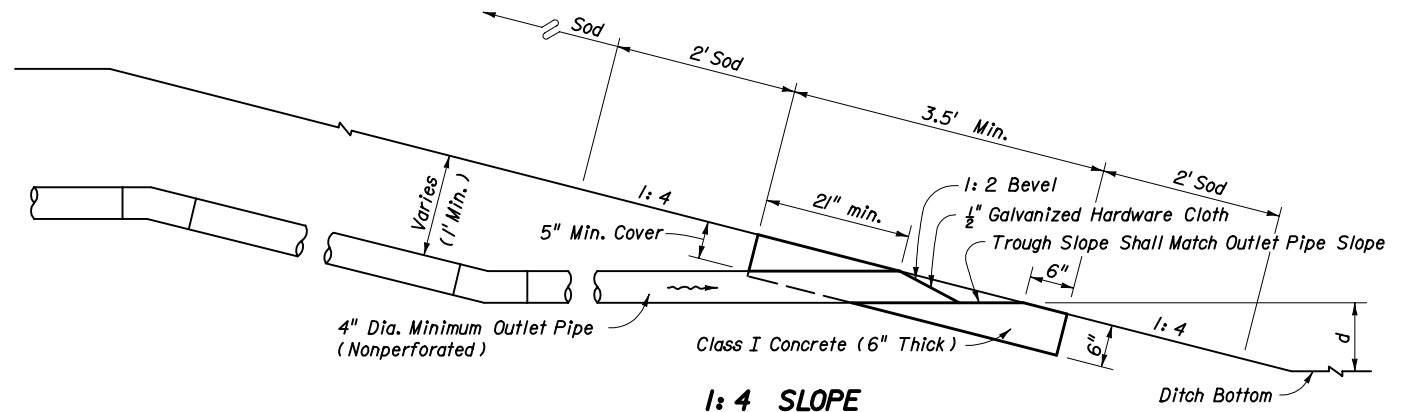
- No trench greater than 2' in depth will be allowed overnight. Trenches shall be barricaded at all times.
- Concrete pavement subdrainage shall be constructed adjacent to the low edge of the roadway pavement and under travel lanes, auxiliary pavement and shoulders, as called for in the plans. When the low edge shifts between outside and inside edges of pavement the concrete pavement subdrainage shall extend 50' beyond and begin 50' before the flat point (100' overlap).
Concrete pavement subdrainage shall be placed on the low side of ramps of crossroad terminals.
- Concrete pavement subdrainage shall be constructed on a grade parallel with the edge of pavement profile, except on profiles flatter than one-tenth percent (0.10%) the concrete pavement subdrainage shall be constructed on a grade of one-tenth percent (0.10%).
- Immediately prior to placing the filter fabric the entire vertical face of the concrete pavement shall be cleaned to remove adhering base material and soil.
- The Contractor shall devise a procedure for holding the filter fabric in position on the vertical face of the trench. The procedure must be approved by the Engineer prior to placement of the draincrete.
- The upper end of each separate run of the concrete pavement subdrainage pipe shall be capped.
- Outlet pipes shall be constructed at a maximum of 500' intervals. Elbows or 1/4 bends shall be used to connect the outlet pipe to the concrete pavement subdrain pipe. The elbows or bends shall be of the same material as the outlet pipe but compatible with the pipe.
When directed by the Engineer, outlet pipes shall be stubbed into existing inlets or into existing ditch pavements at an elevation 6" above the inlet flowline or ditch bottom. Concrete apron and bordering sod are not required for stubbed outlets, but replacement sodding will be required at trenches for pipes stubbed into paved ditches.
In sag vertical curves separate outlet pipes for concrete pavement subdrains from opposite directions shall use a single apron unless otherwise shown in the plans or otherwise directed by the Engineer.
Backfill around outlet pipes shall be of cohesive soils, draincrete will not be permitted.
- Existing paved shoulder that is removed for the construction of outlet pipes shall be replaced with Type S asphaltic concrete at the rate of 500 LB per SY.
- The contract unit price for Edgedrain Outlet Pipe (4") LF, shall be full compensation for removal of existing shoulder pavement, trench excavation, pipe and fittings, concrete apron, hardware cloth, sod, stubbing into existing inlets and paved ditches, restoration of ditch pavement, backfill in place, and disposal of excess materials.



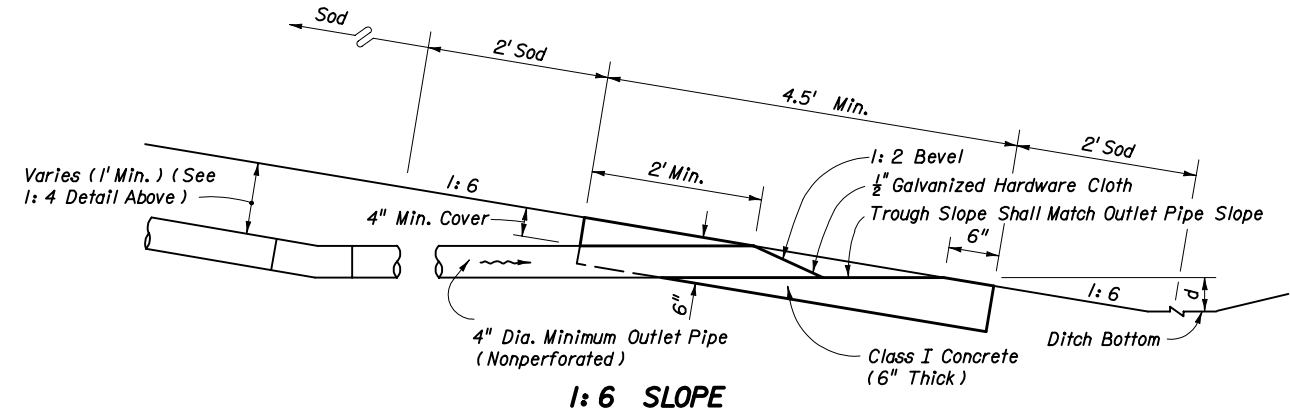
ALIGNMENT OF OUTLET PIPE



PLAN - OUTLET PIPE APRON



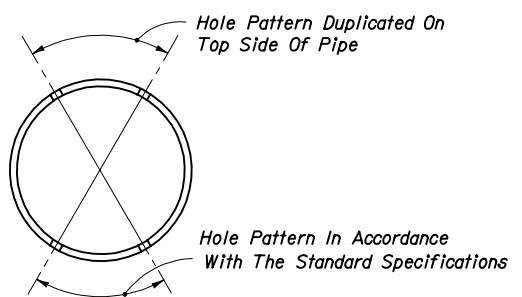
1:4 SLOPE



1:6 SLOPE

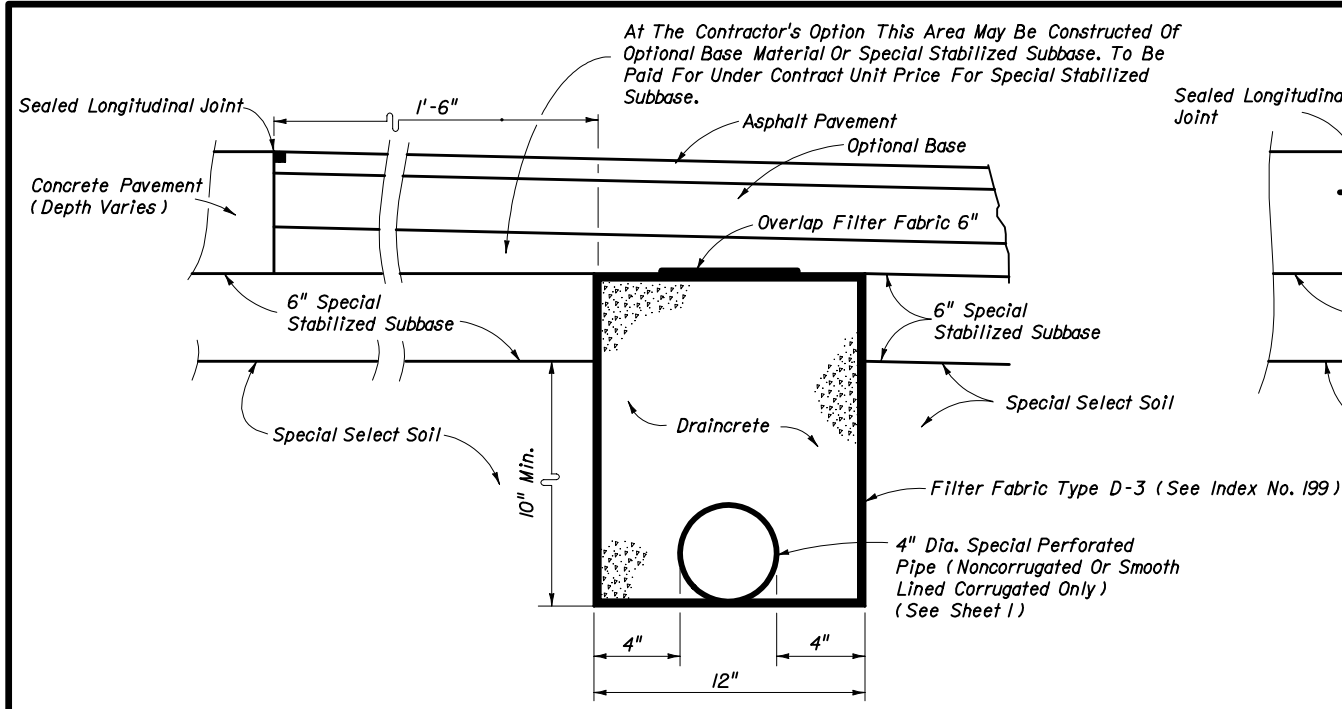
**SECTIONS BB
4" EDGEDRAIN
EDGEDRAIN OUTLET**

d 1.75' std. for grassed ditches
0.5' std. for paved ditches
[less is acceptable to provide minimum 0.1% outlet pipe slope]

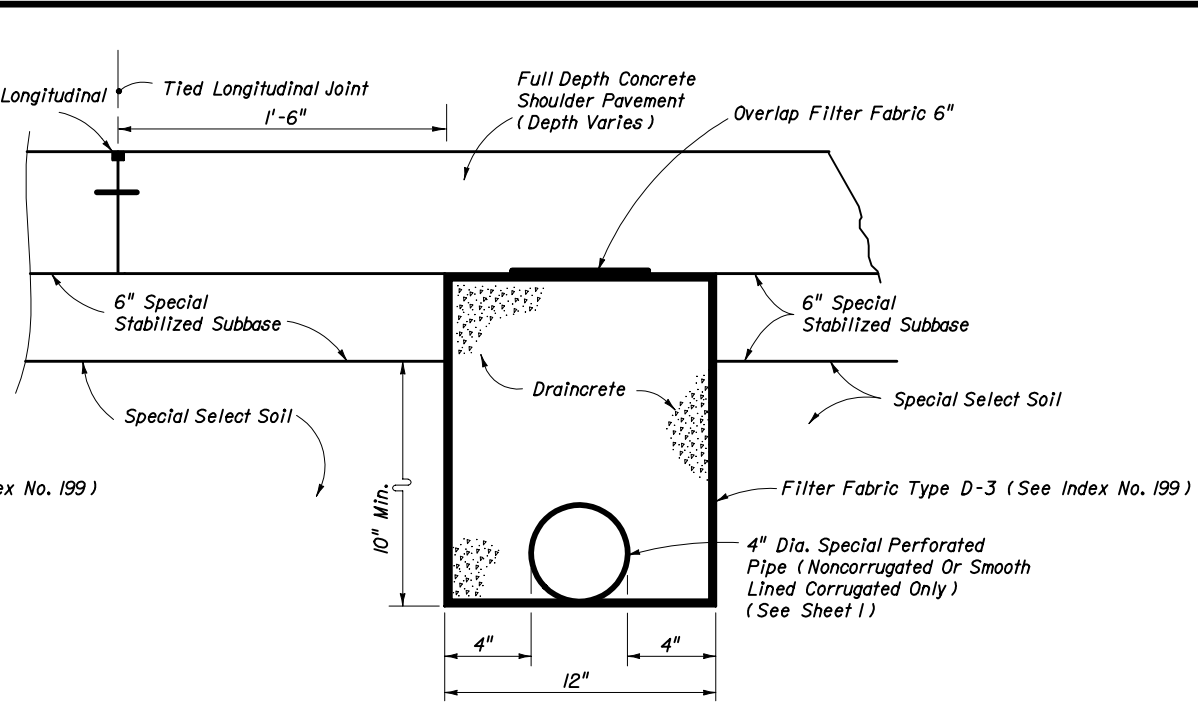


**HOLE PATTERN
SUBDRAINAGE PIPE**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE PAVEMENT SUBDRAINAGE				
Names	Dates	Approved By		
Designed By HMD	10/94	State Drainage Engineer		
Drawn By DLD	10/94	Revision	Sheet No.	Index No.
Checked By HMD/WPH	10/94	00	1 of 3	287



ASPHALT SHOULDERS



CONCRETE TRAVEL LANES, SHOULDERS, AND AUXILIARY PAVEMENT

NOTES FOR DRAINCRETE PAVEMENT SUBDRAINAGE

1. The edgedrain sections for DRAINCRETE SUBDRAINAGE are applicable to pavement construction identified as RIGID PAVEMENT Alternate #1 on Index No. 505 (sheet 2 of 3)
2. The contractor shall confine the construction of draincrete edgedrain to an area in which the entire operation can be carried out in five (5) work days, unless another construction period is called for in the plans, with sufficient time allowed for the draincrete to set before placement of pavement.

NEW CONSTRUCTION

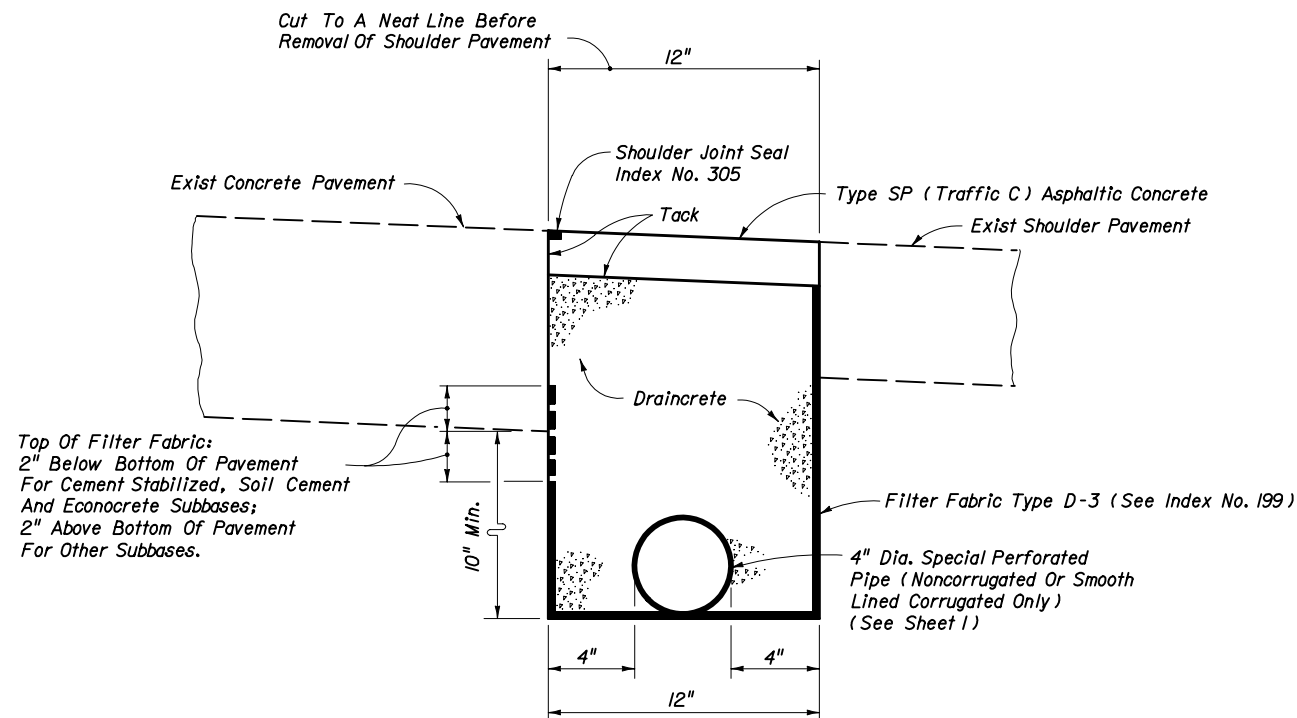
METHOD OF PAYMENT

NEW CONSTRUCTION:

1. The contract unit price for Edgedrain (Draincrete) LF shall be full compensation for trench excavation disposal of excess material, filter fabric, draincrete edgedrain pipe and fittings and draincrete.
Payment for outlet pipe shall be in accordance with General Note 9, Sheet 1 of 3.

FOR REHABILITATION:


1. The contract unit price for Edgedrain (Draincrete) LF, shall be full compensation for removal of existing shoulder pavement, trench excavation, disposal of excess materials, filter fabric, draincrete edgedrain pipe and fittings, and draincrete, necessary for edgedrain construction.
Payment for outlet pipe shall be in accordance with General Note 9, Sheet 1 of 3.
Shoulder pavement shall be paid for under the contract unit price for Type SP, Asphaltic Concrete.
Tack coat shall be paid for under the contract unit price for Bit Matl (Tack Coat), GA.
Shoulder joint seal shall be paid for under the contract unit price for Pavement Joint or, LF.

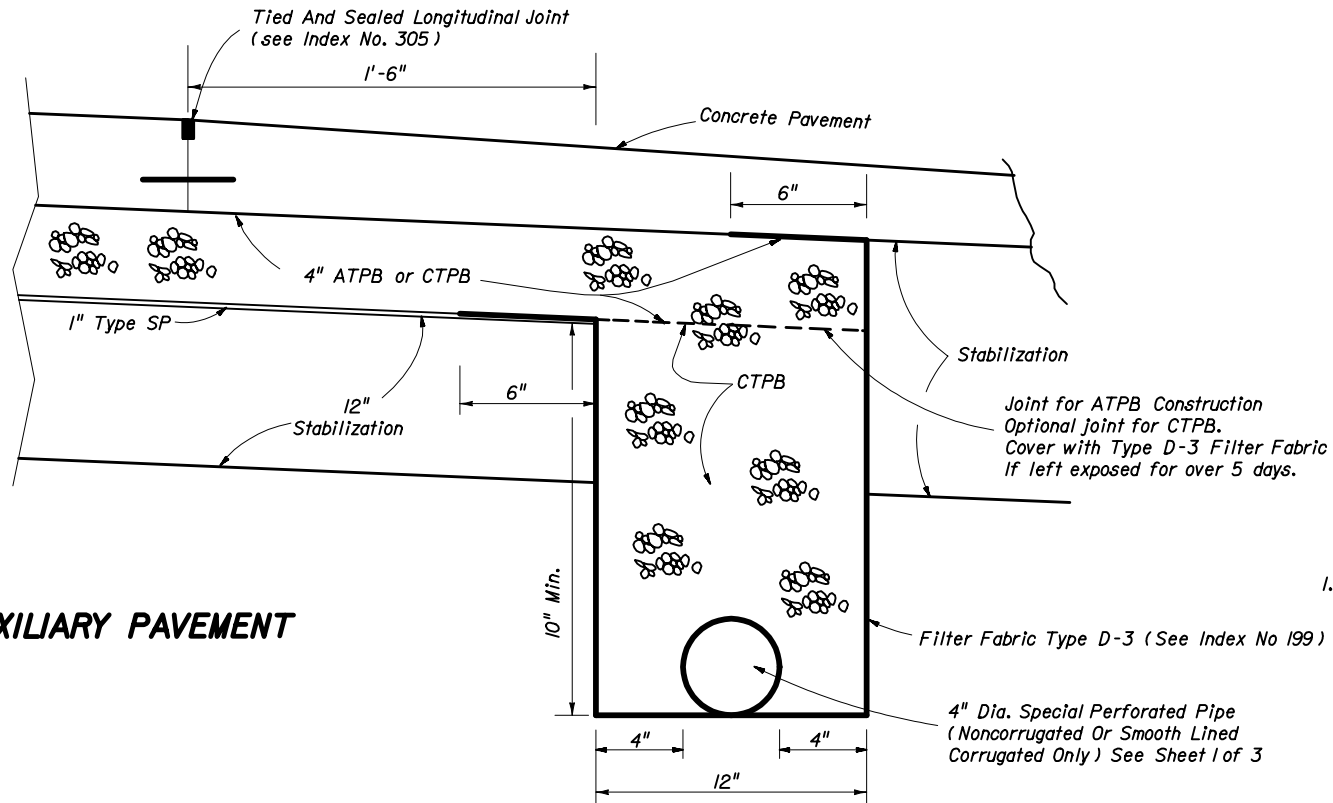
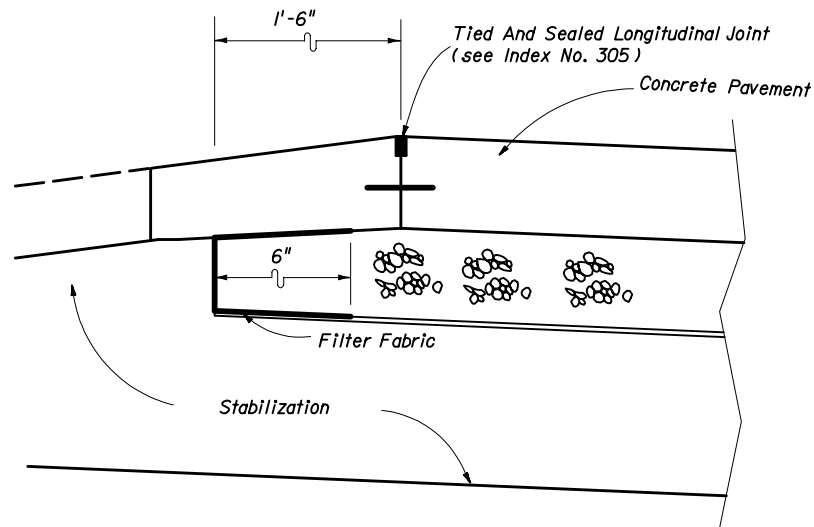


REHABILITATION

DRAINCRETE SUBDRAINAGE

Not to scale

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE PAVEMENT SUBDRAINAGE				
Designed By	HMD	10/94	Approved By 	
Drawn By	DLD	10/94	Revision	Sheet No. Index No.
Checked By	HMD/WPH	10/94	02	2 of 3 287



CONCRETE TRAVEL LANE, SHOULDERS, AND AUXILIARY PAVEMENT

GENERAL NOTES FOR TREATED PERMEABLE BASE EDGEDRAIN (NEW CONSTRUCTION)

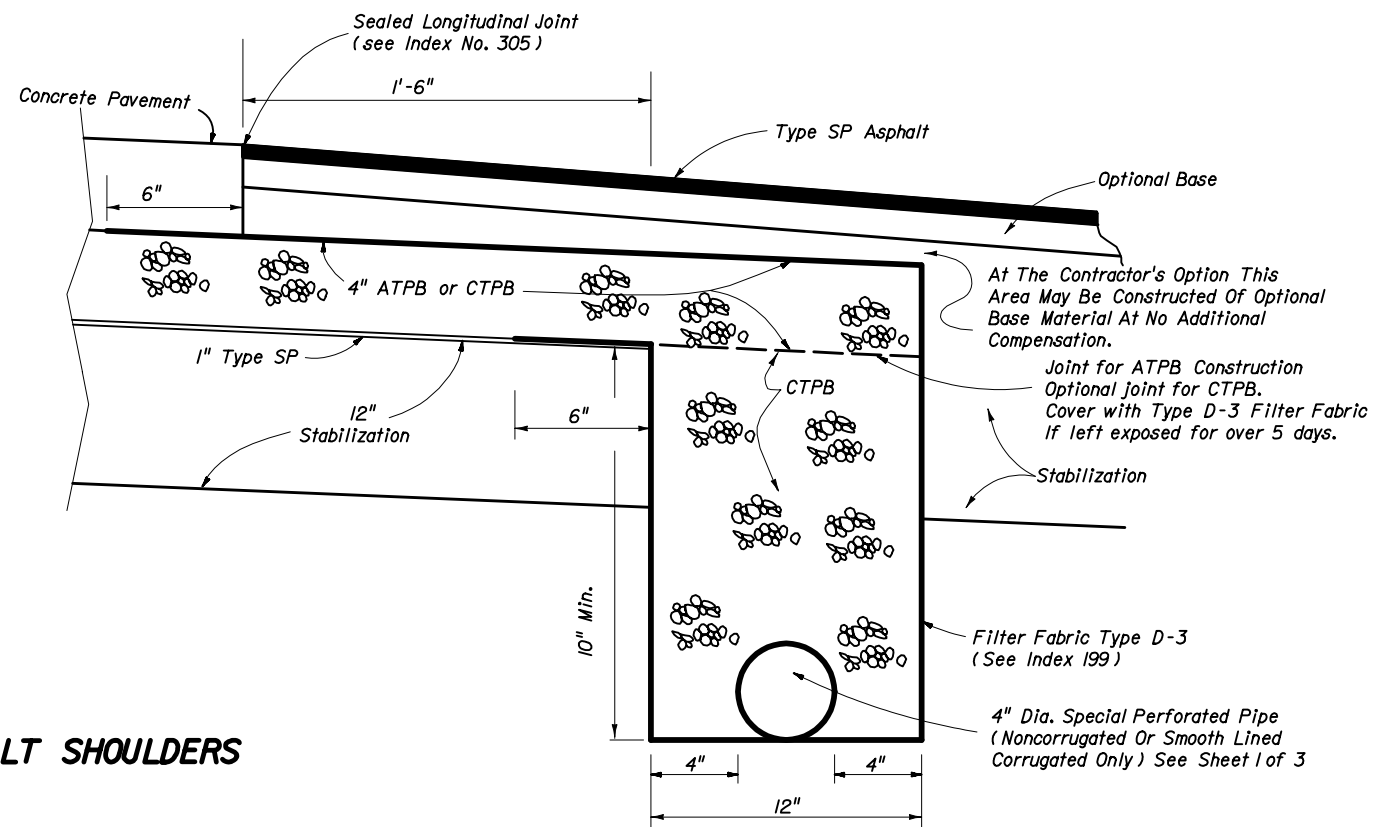
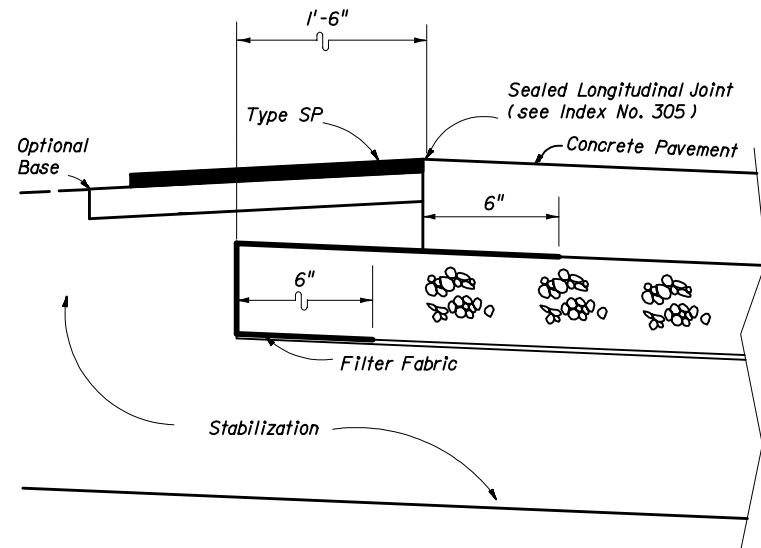
- The contractor shall confine the construction of edgedrain to an area in which the entire operation can be carried out in (5) work days, unless another construction period is called for the plans.

METHOD OF PAYMENT

NEW CONSTRUCTION

- Payment shall be full compensation for trench excavation, disposal of excess materials, filter fabric, pipe and fittings, necessary for concrete pavement subdrainage construction. Payment shall be included in the cost for Asphalt Treated Permeable Base, CY or Cement Treated Permeable Base, CY.

Payment for outlet pipe shall be in accordance with General Note 9, Sheet 1 of 3.

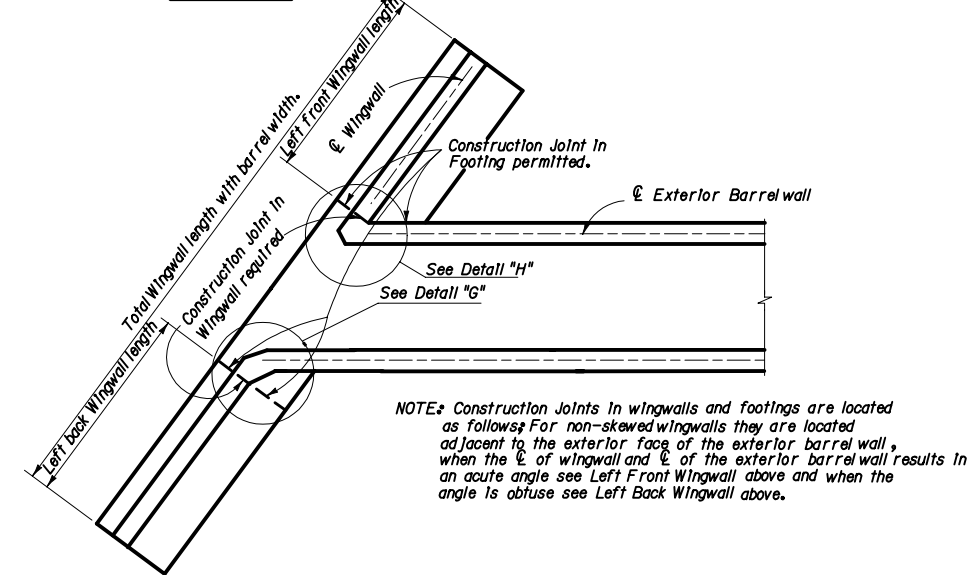
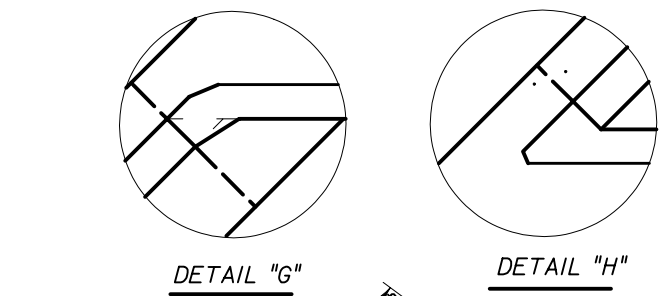
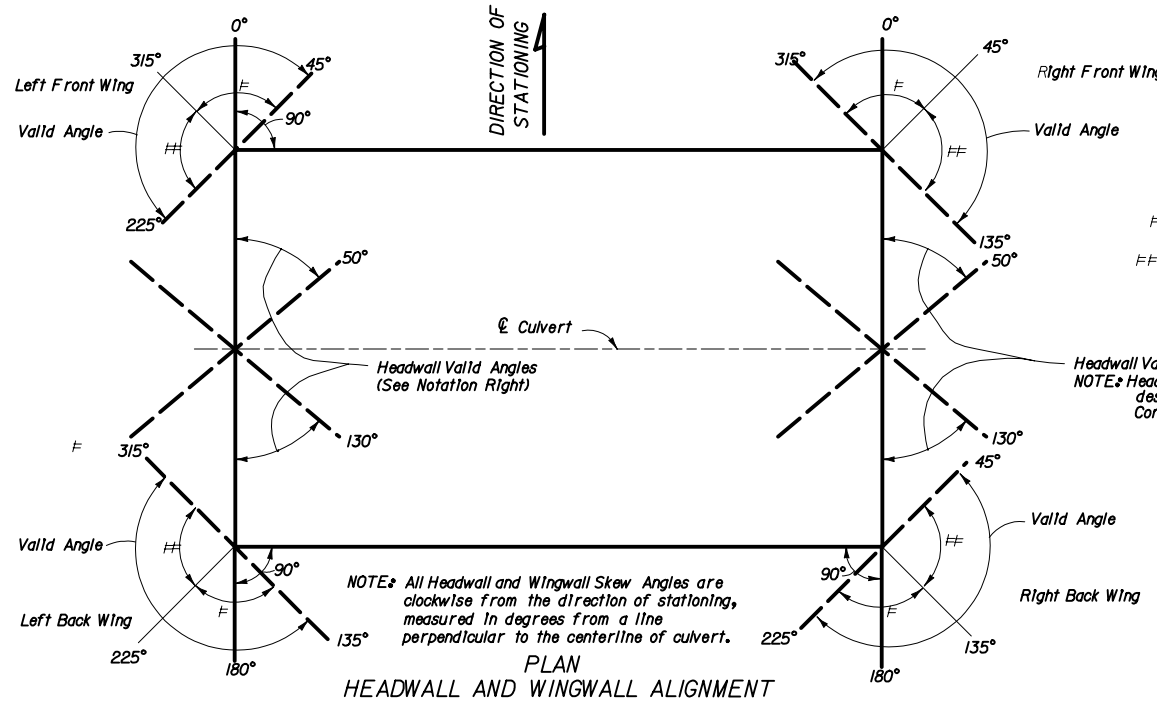


ASPHALT SHOULDERS

TREATED PERMEABLE BASE SUBDRAINAGE

Not To Scale

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE PAVEMENT SUBDRAINAGE				
Designed By	HMD	10/94	Approved By <i>[Signature]</i> State Drainage Engineer	
Drawn By	DLD	10/94	Revision	Sheet No. Index No.
Checked By	HMD/WPH	10/94	02	3 of 3 287



PART PLAN SHOWING WINGWALLS AND THE LOCATION OF CONSTRUCTION JOINTS

NOTE: Designs for box culverts under this Index are to be produced only by computer analysis, utilizing the program named PSTDN55. Designs under this Index are to be limited to the live loads and dimensional restraints shown in the General Notes of this Index and to the fill on the barrel(s) as shown in the roadway plans. It is the construction Contractor's responsibility to provide for supporting construction loads that exceed the above loadings.

≡ Within these limits the top surface of the Wingwalls shall be level.
 ≡≡ Within these limits the top surface of the Wingwalls shall be sloped.

NOTE: Headwalls with skew angles between 5° and 129° require special design authorization. Other design options should be considered. Contact the District Drainage Engineer to obtain authorization.

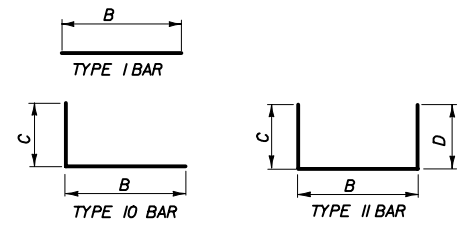
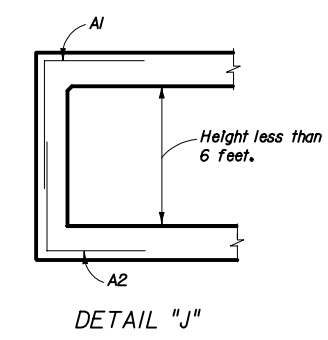
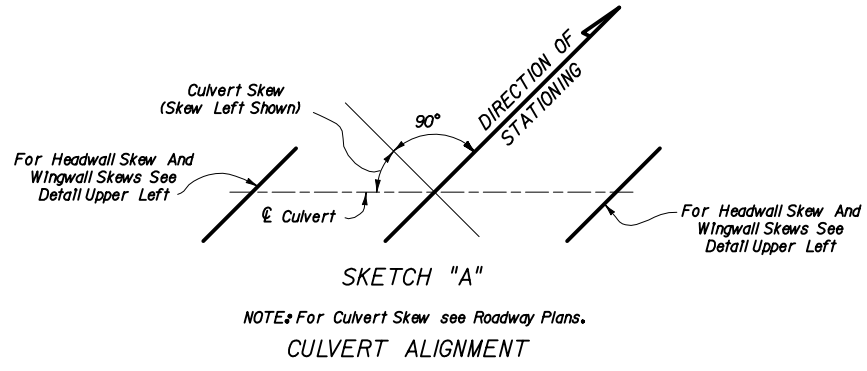
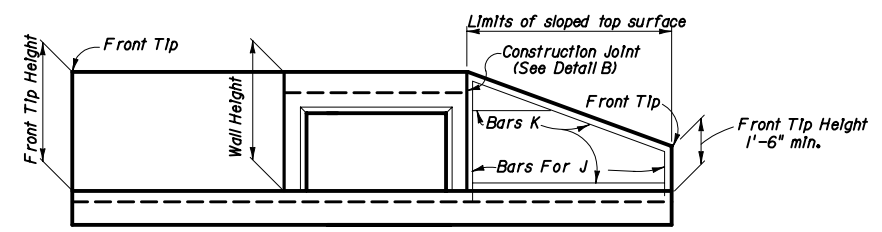


TABLE OF MINIMUM BAR SPLICE LENGTHS

BAR SIZE	SPLICE	BAR SIZE	SPLICE
#4	1'-10"	#8	4'-8"
#5	2'-4"	#9	5'-3"
#6	2'-9"	#10	5'-10"
#7	4'-0"	#11	6'-6"



END ELEVATION OF CULVERT

NOTE: Cut the vertical bars Fas required for the longest bar and use the remainder for the shortest bar in the wingwall. The vertical bars J and the horizontal bars K shall be constructed likewise. The lengths shown in the reinforcing steel bar schedule for bars F, J and K require cutting for sloped top wingwalls only.

GENERAL NOTES

- DESIGN SPECIFICATIONS: A.A.S.H.T.O. 1996.
- LOADING: HS20-44, Modified for Military Loading as Required or HS25, see Structures Design Guidelines.
- SURFACE FINISH: The Class Surface finish for all concrete surfaces shall be a general surface finish.
- SKewed CONSTRUCTION JOINTS: Construction joints in barrels of culverts with skewed wingwalls may be placed parallel to the headwalls and the reinforcing steel, in the slabs may be cut provided that the cut reinforcing steel extends beyond the construction joint enough for splices to be made in accordance with the table (lower right) this sheet. The cost of construction joints shall be at the expense of the contractor.
- CULVERT EXTENSIONS: For cut backs and ties into existing concrete box culverts see Index No. 280.

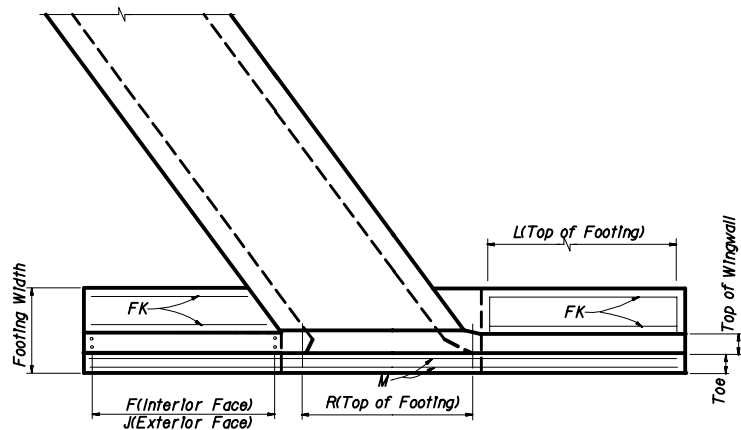
* REINFORCING BAR SCHEDULE:

- A. When the depth is less than or equal to 2.0 feet, Bars C2 are utilized in the bottom of the top slab. In all other cases, Bars C2 are replaced with Bars C1 spaced at 18 inches on centers.
- B. When the skew angle for a headwall equals 0 degrees plus or minus 11 degrees the respective S Bars (S2 or S3) will not be utilized.
- C. When the barrel height is less than 6 feet, Bars B2 will be eliminated as shown in Detail J.
- D. If the span is less than five feet, Bars A1 and A2 will be Type II Bars.
- E. The portions of Bars "N" that extend thru construction joints into wingwalls above footings shall be given one coat of approved zinc rich paint and shall be encased in approved capped plastic (PVC) pipes filled with approved durable lubricant or cut back asphalt. The length and inside diameter of the plastic pipe shall be approximately 1/4" larger than those of the bar.
- F. For culvert extensions Bar C1 is redesignated Bar C3 in the bottom slab.

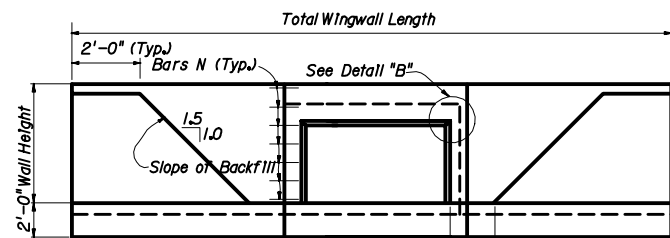
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BOX CULVERT
CULVERT DETAILS

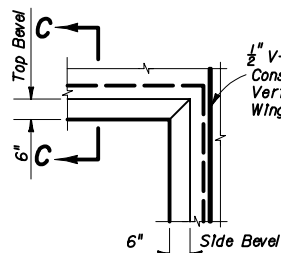
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Designed By		 State Drainage Engineer		
Drawn By	GFG 1-86			
Checked By	RCB 1-86	Revision	Sheet No.	Index No.
		00	1 of 5	290



PART PLAN AT END OF CULVERT



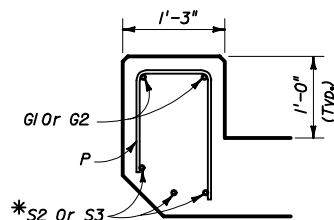
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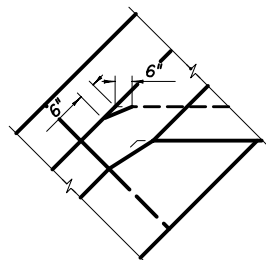
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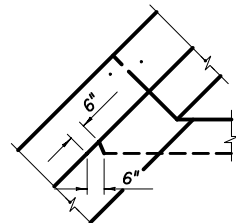
SECTION C-C



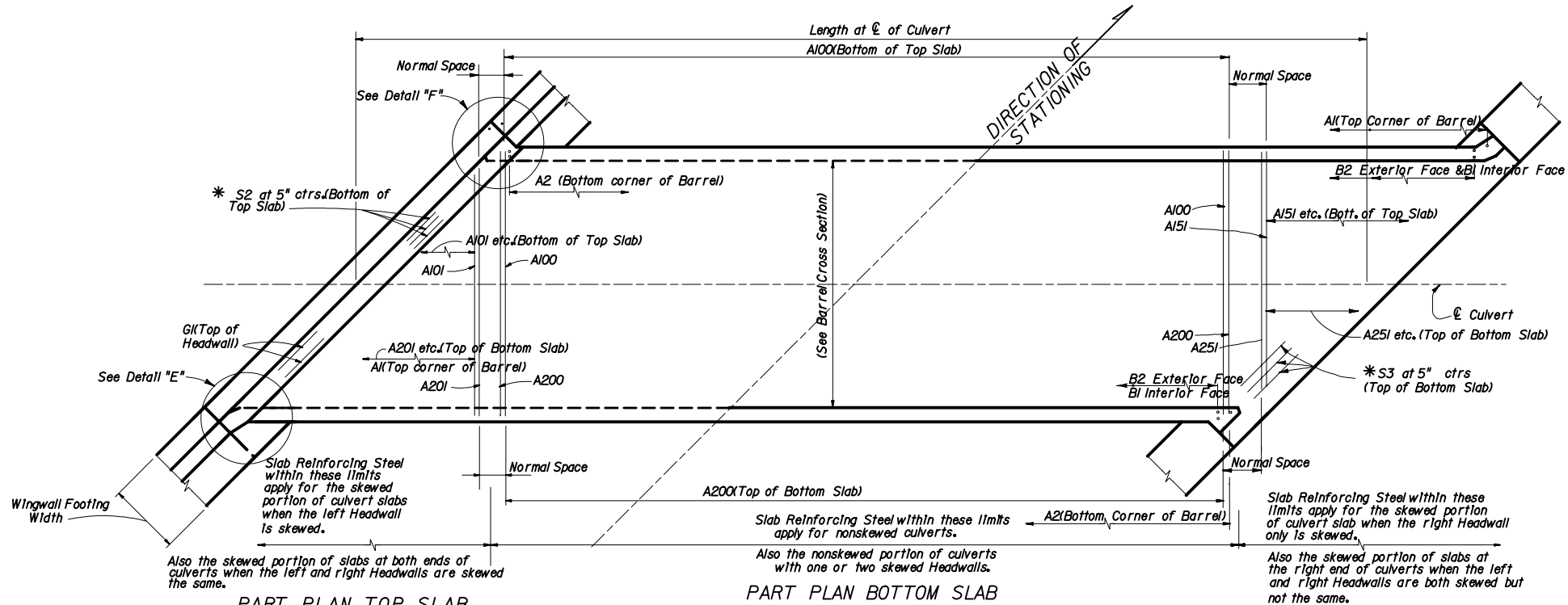
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DETAIL "E"

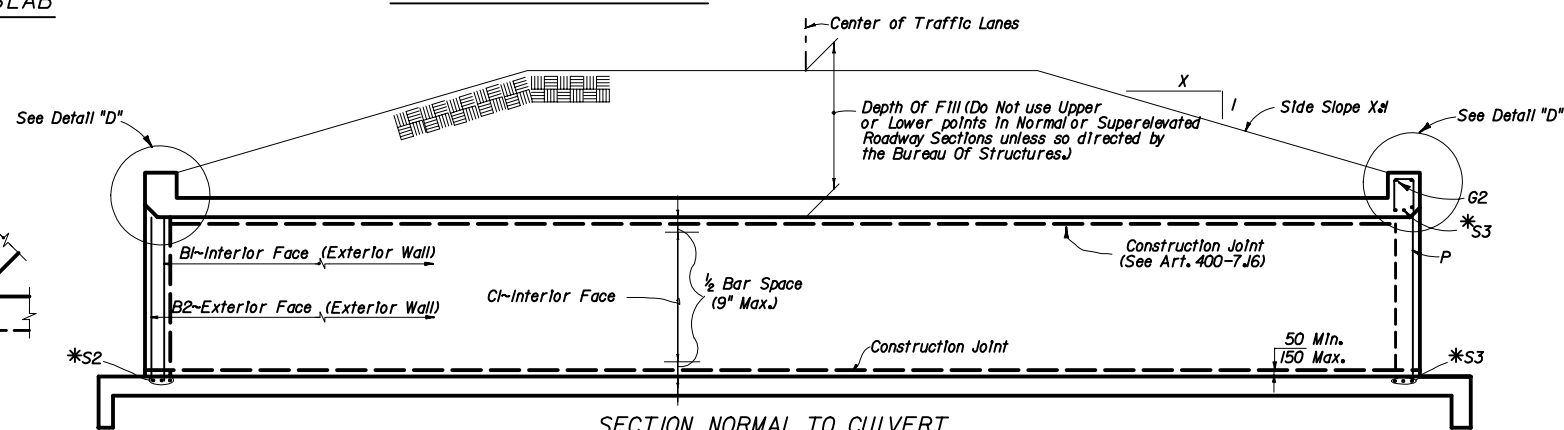


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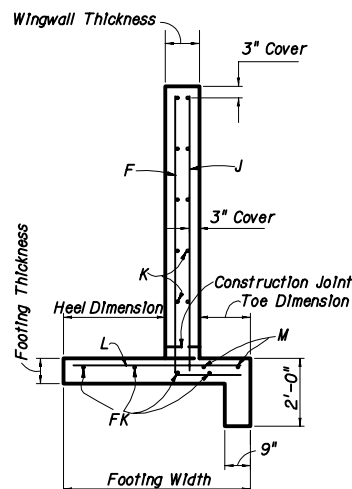


PART PLAN TOP SLAB

PART PLAN BOTTOM SLAB

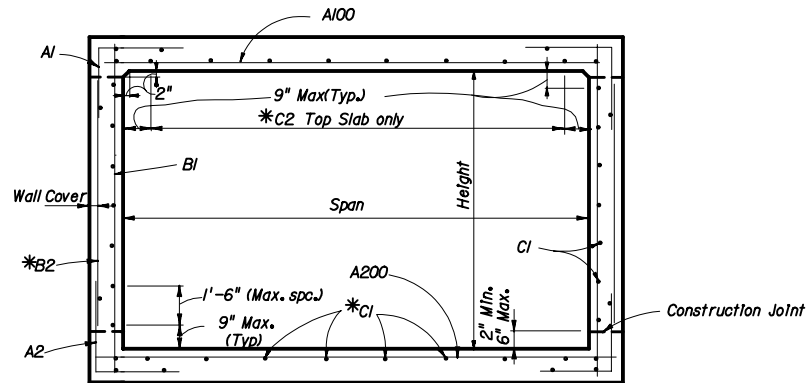


SECTION NORMAL TO CULVERT



SECTION THRU WINGWALL

NOTE: For Bars F, J, K, L and or FK in the Wingwalls, the subscripts 1 thru 4 apply as follows:
 1-Left Front
 2-Left Back
 3-Right Front
 4-Right Back




SECTION THRU BARREL

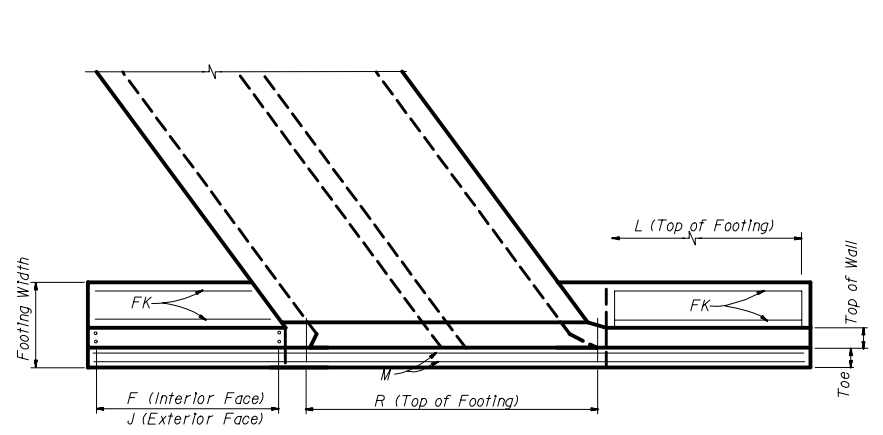
NOTE: The location of the first bar from the ends of the culvert shall not be less than 3", but not greater than one half the bar spacing.

* See Culvert Details and Reinforcing Bar Schedule, Sheet 1 of 5

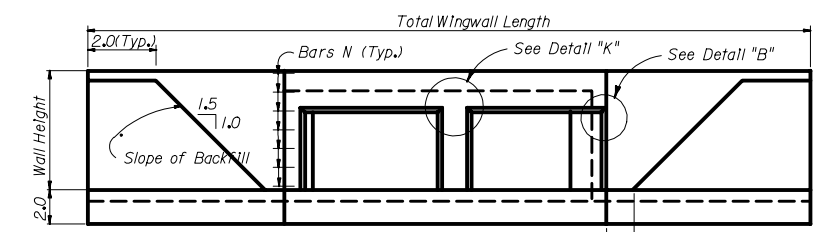
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BOX CULVERT
SINGLE BARREL

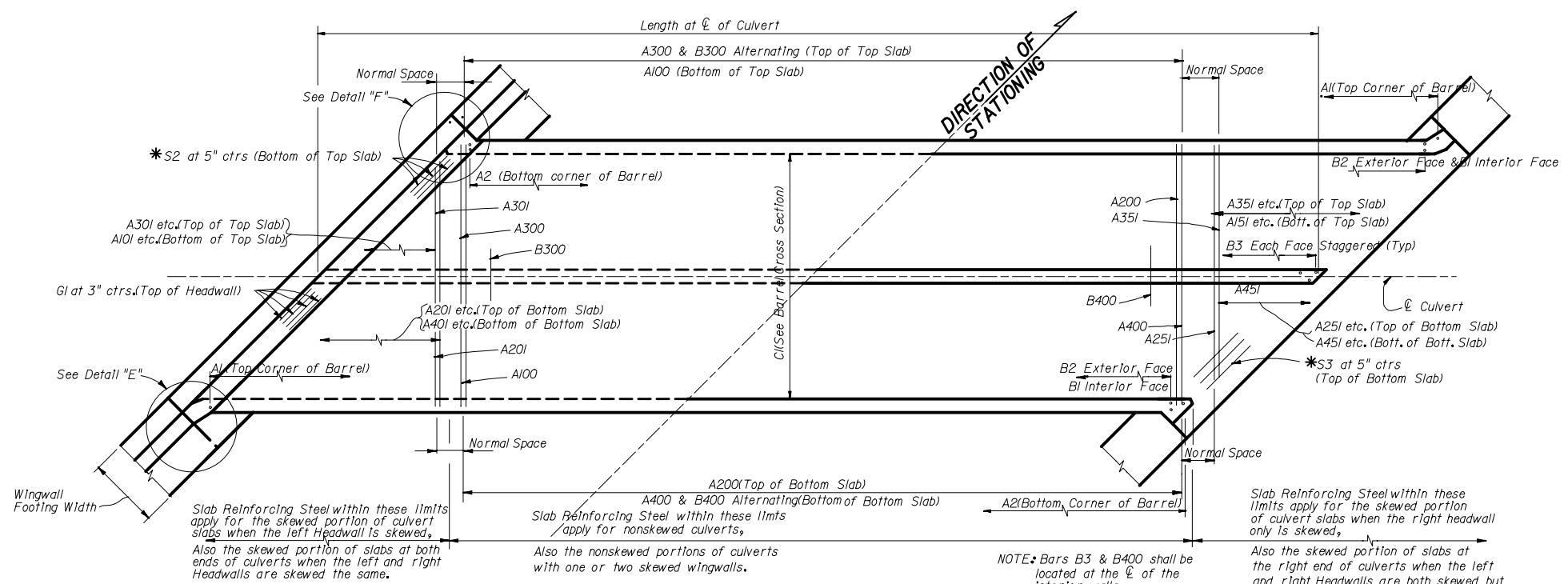
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Designed By		 State Drainage Engineer		
Drawn By	GFG 1-86			
Checked By	RCB 1-86	00	2 of 5	290



PART PLAN AT END OF CULVERT

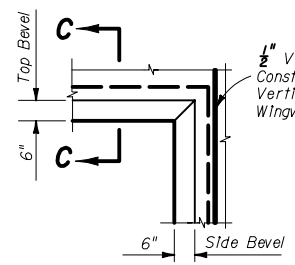


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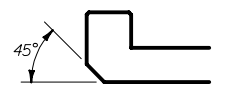


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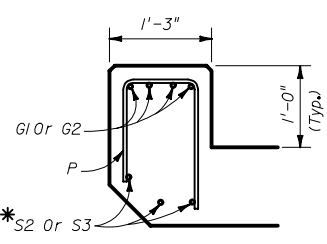
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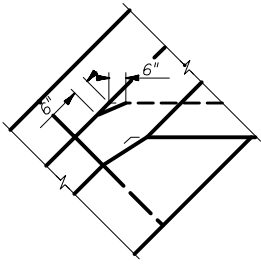
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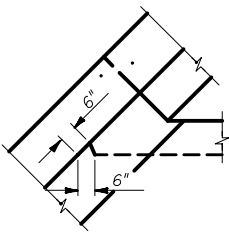
SECTION C-C



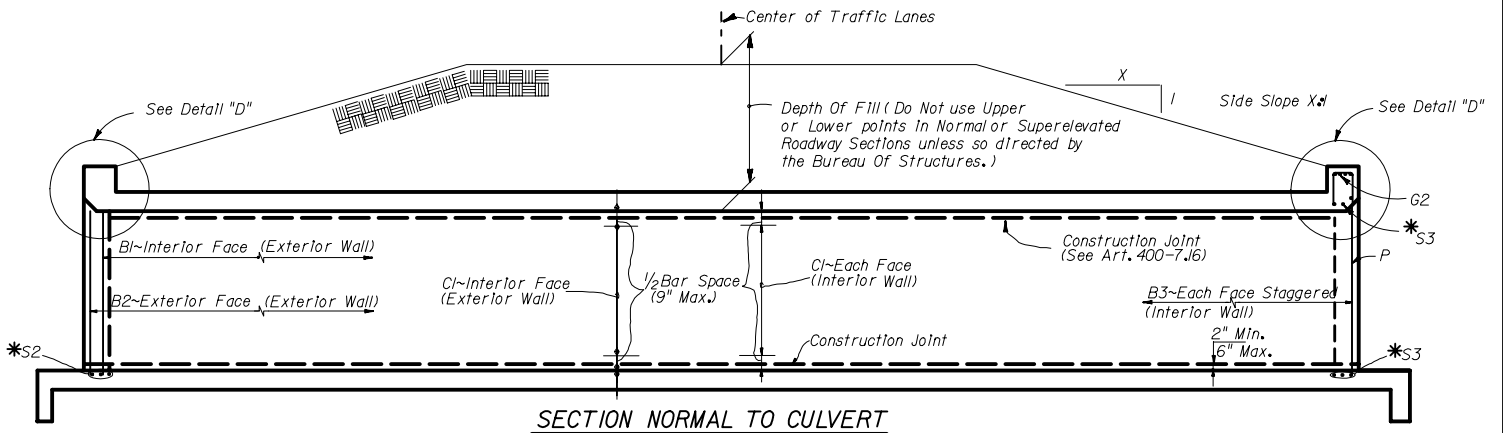
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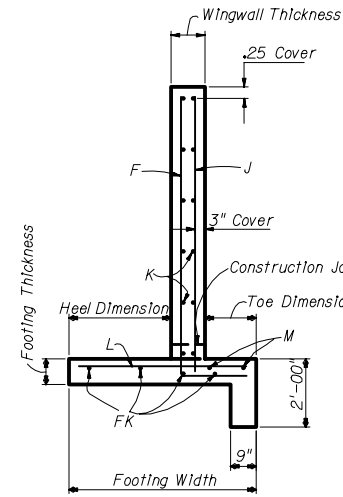
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DETAIL "F"

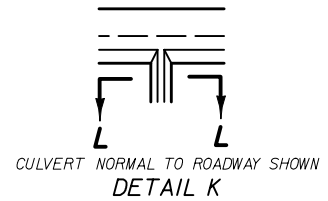


SECTION NORMAL TO CULVERT

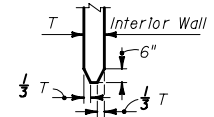


SECTION THRU WINGWALL

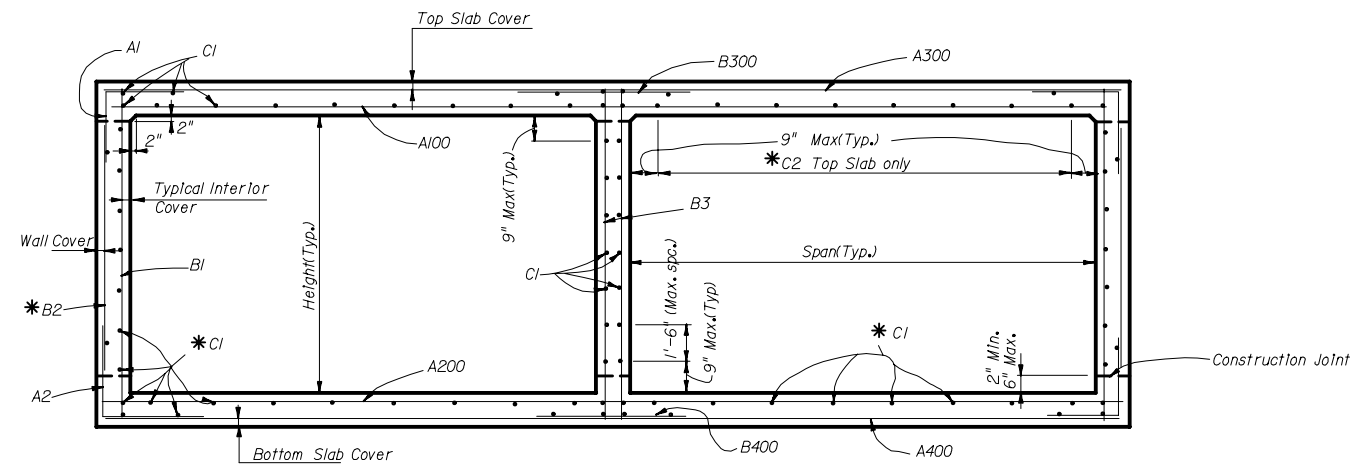
NOTE: For Bars F, J, K, L, and FK in the Wingwalls, the subscripts 1 thru 4 apply as follows:
 1-Left Front
 2-Left Back
 3-Right Front
 4-Right Back



CULVERT NORMAL TO ROADWAY SHOWN
DETAIL K



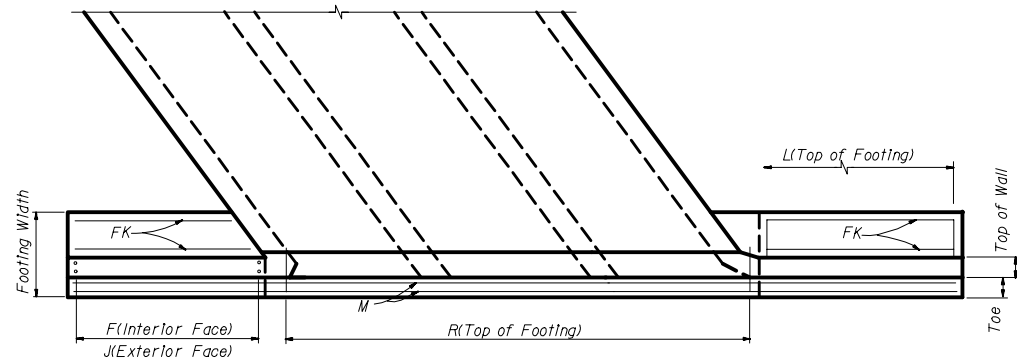
SECTION LL



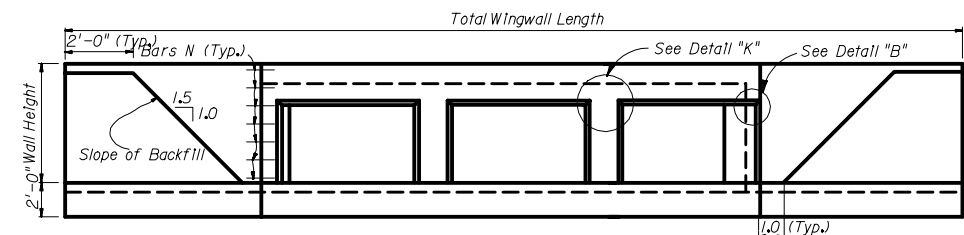
SECTION THRU BARREL

NOTE: The location of the first bar from the ends of the culvert shall not be less than 25, but not greater than one half the bar spacing.

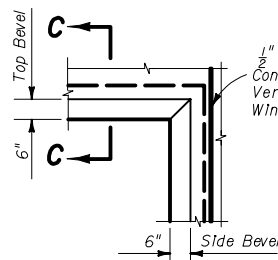
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CONCRETE BOX CULVERT DOUBLE BARREL				
Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By	GFG 1-86			
Checked By	RCB 1-86	Revision	Sheet No.	Index No.
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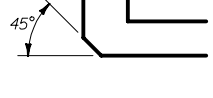
PART PLAN AT END OF CULVERT



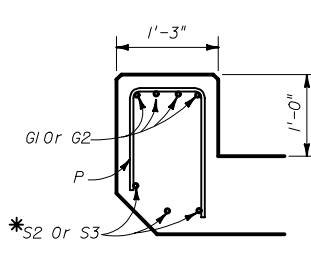
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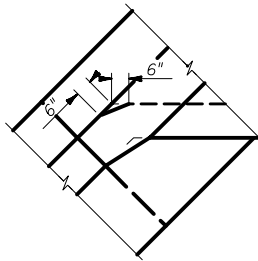
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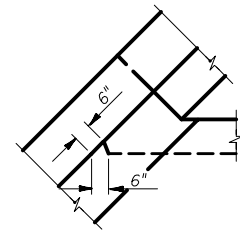
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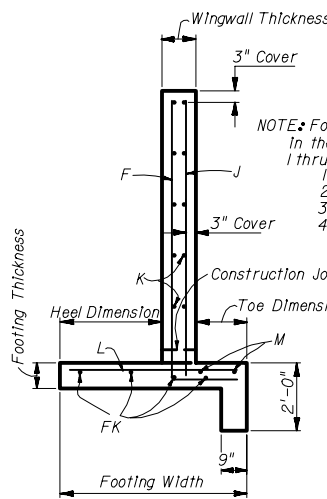
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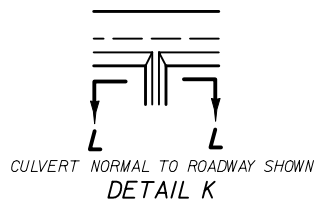
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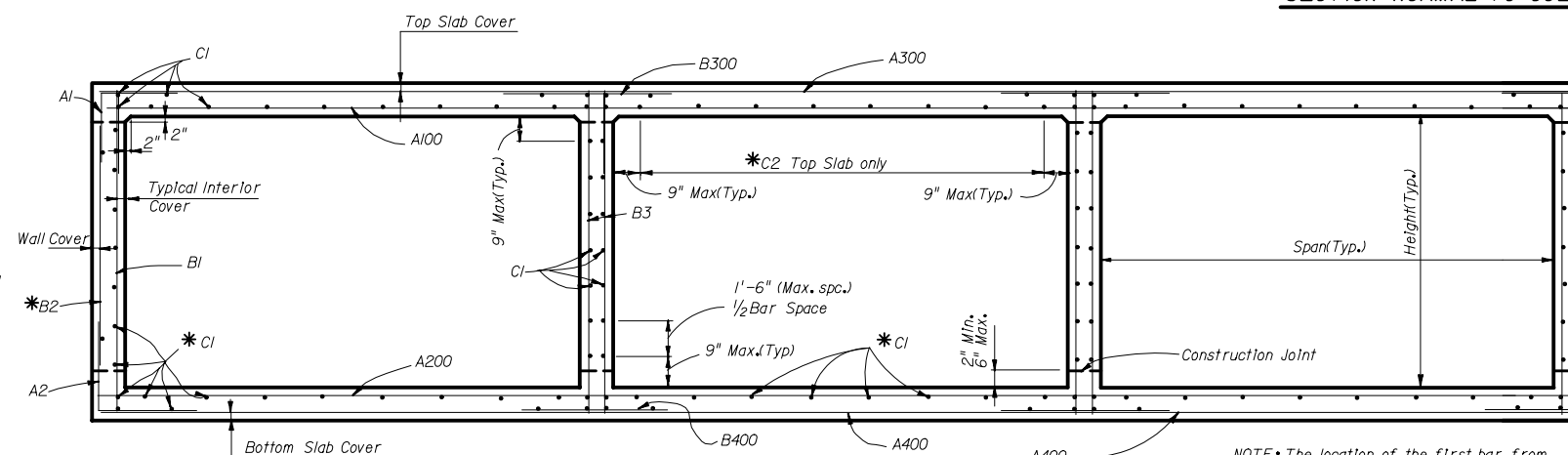
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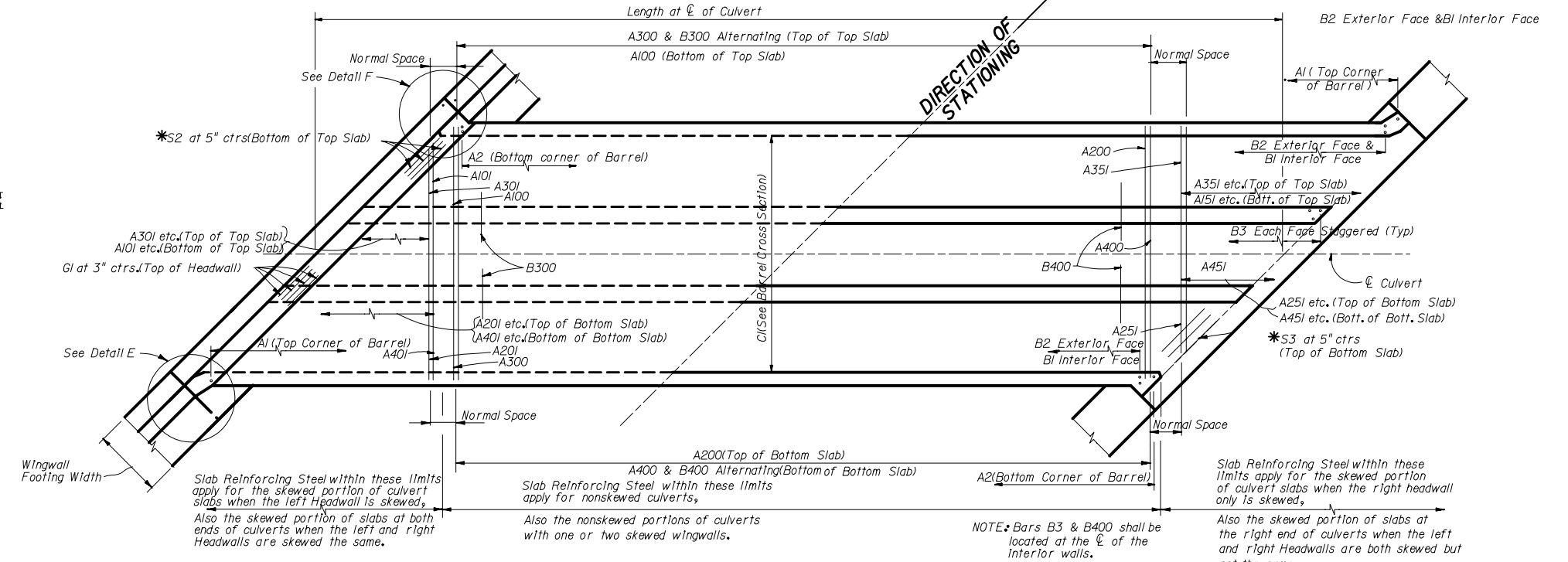
SECTION THRU WINGWALL



SECTION LL

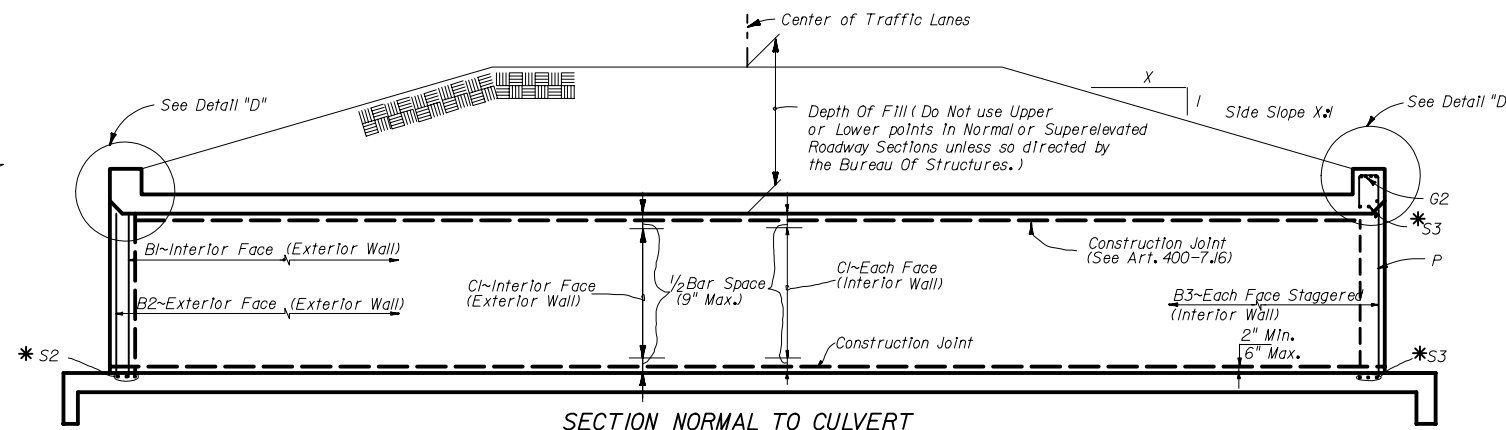


SECTION THRU BARREL




PART PLAN TOP SLAB

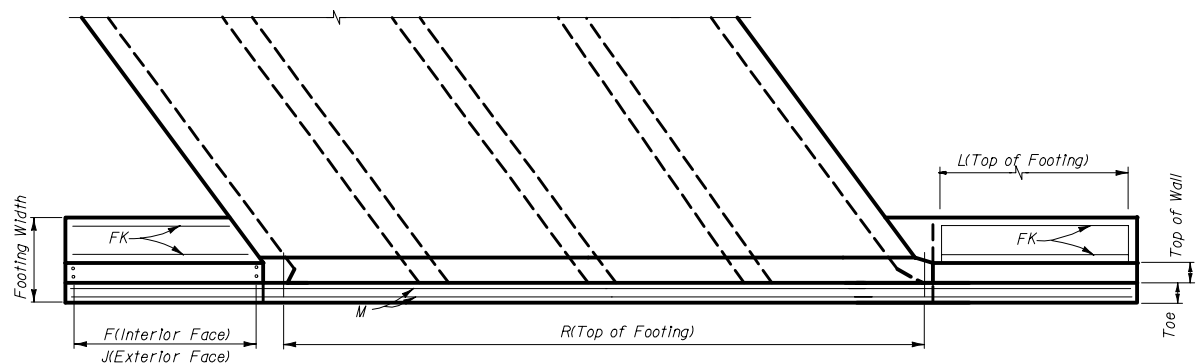
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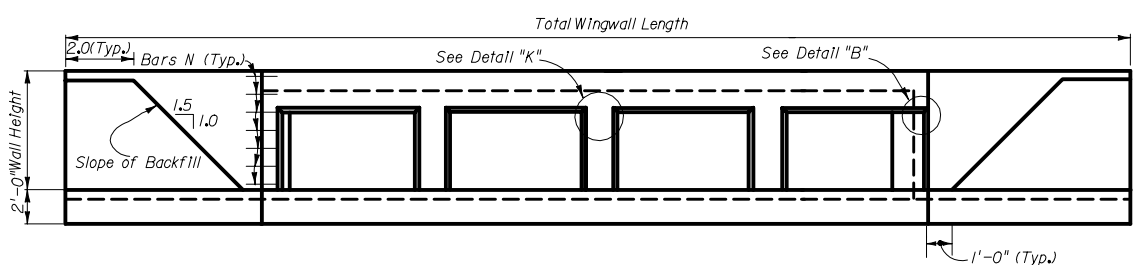
SECTION NORMAL TO CULVERT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
CONCRETE BOX CULVERT
TRIPLE BARREL

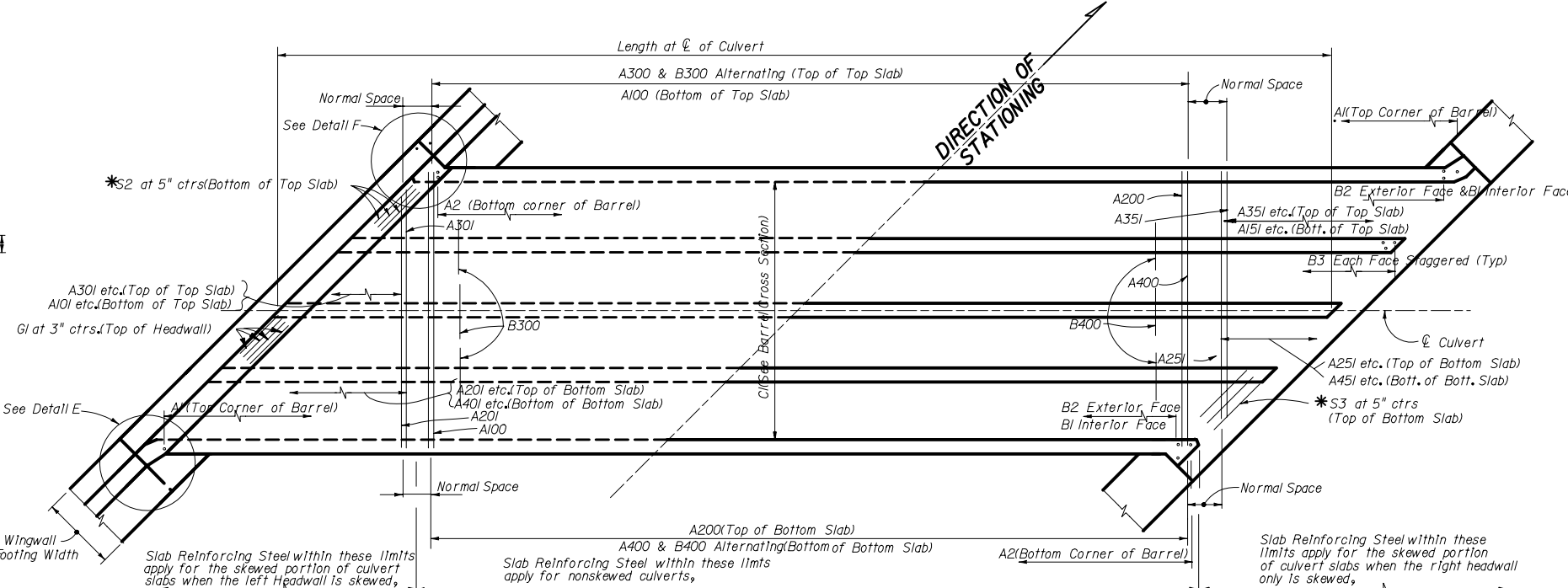
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Designed By			 State Drainage Engineer		
Drawn By	GFC	1-86			
Checked By	RCB	1-86			
Revision	00		Sheet No.	Index No.	
			4 of 5	290	



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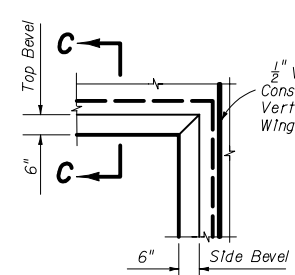


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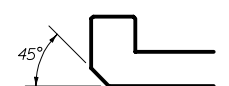


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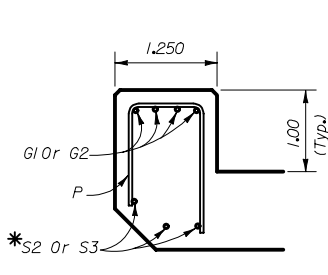
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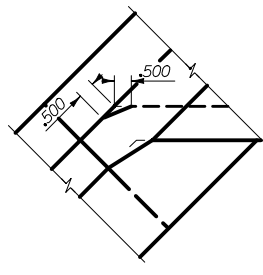
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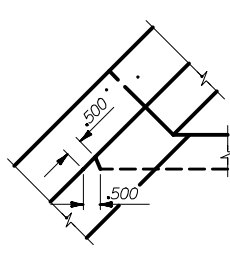
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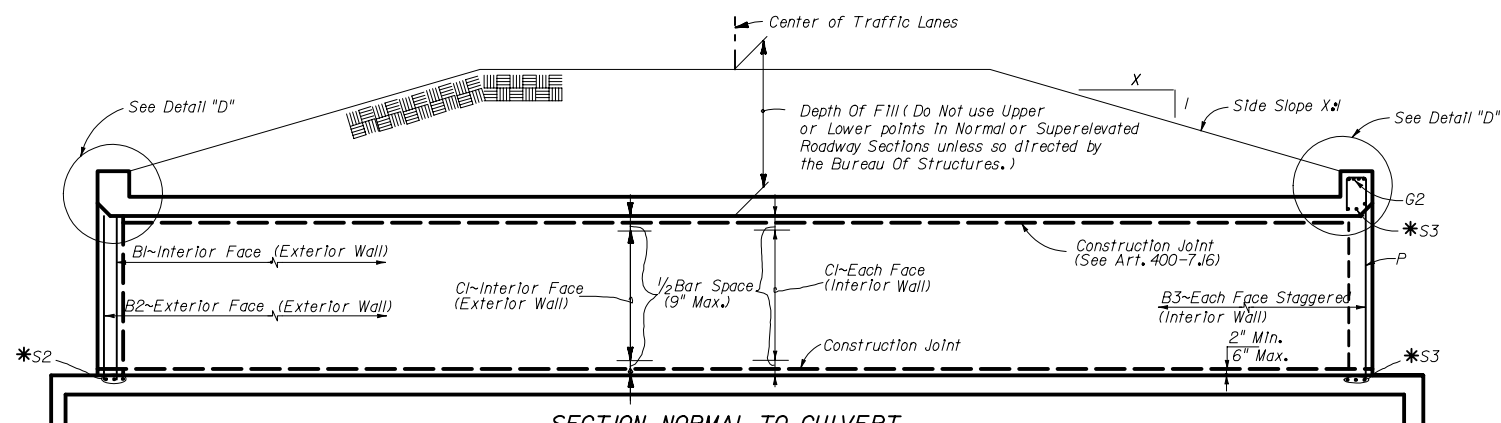
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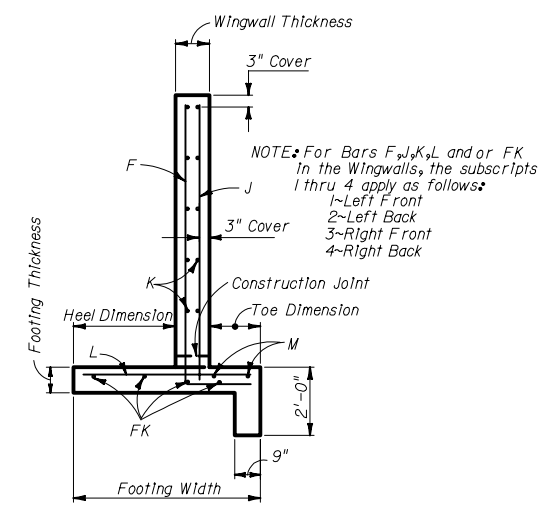
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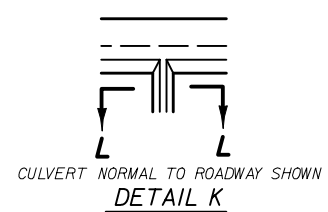
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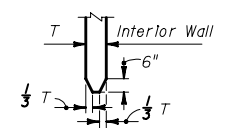
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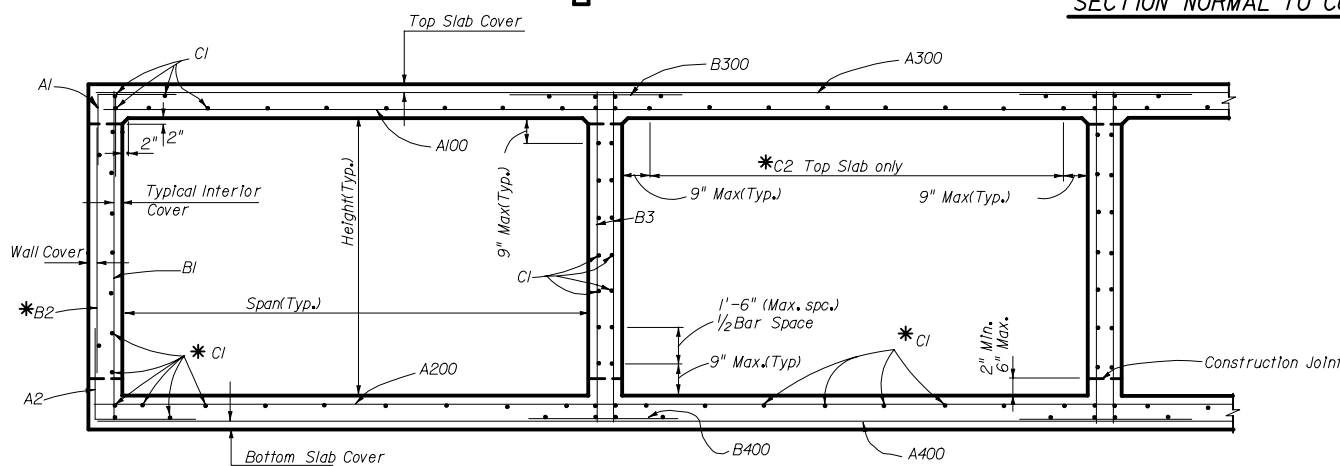
SECTION THRU WINGWALL



DETAIL K



SECTION LL

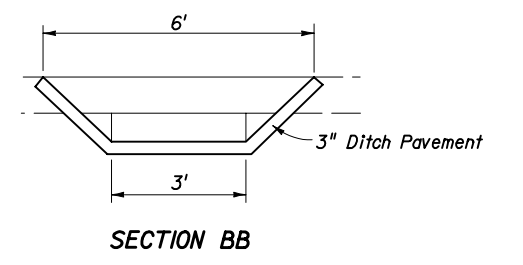
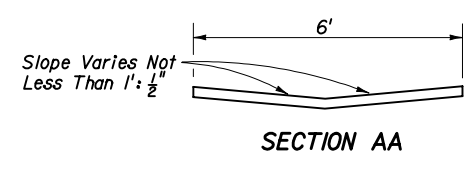
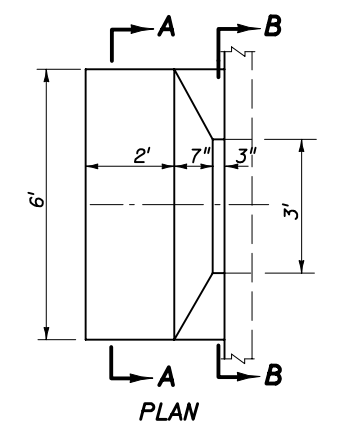
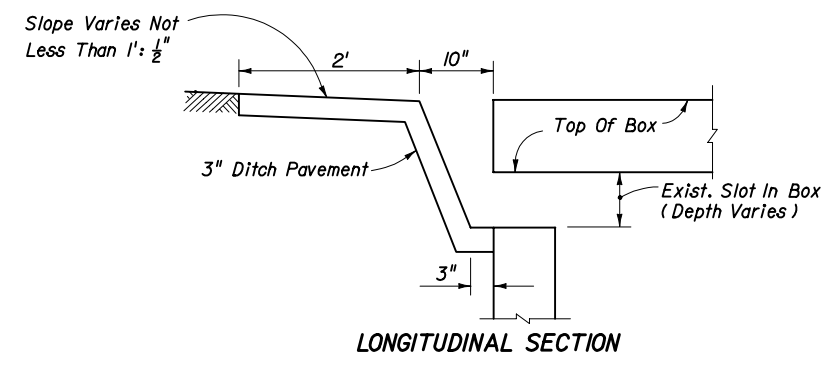


SECTION THRU BARREL

NOTE: The location of the first bar from the ends of the culvert shall not be less than 3", but not greater than one half the bar spacing.

* See Culvert Details and Reinforcing Bar Schedule, Sheet 1 of 5


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BOX CULVERT QUADRUPLE BARREL				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By	GFG 1-86			
Checked By	RCB 1-86	Revision	Sheet No.	Index No.
		00	5 of 5	290

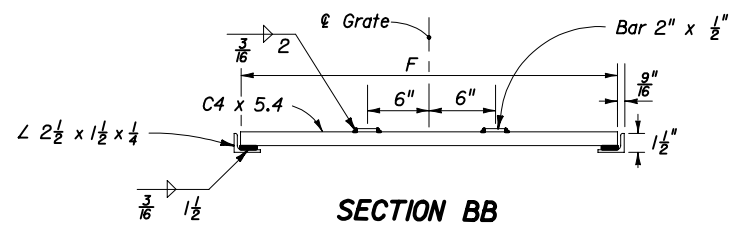
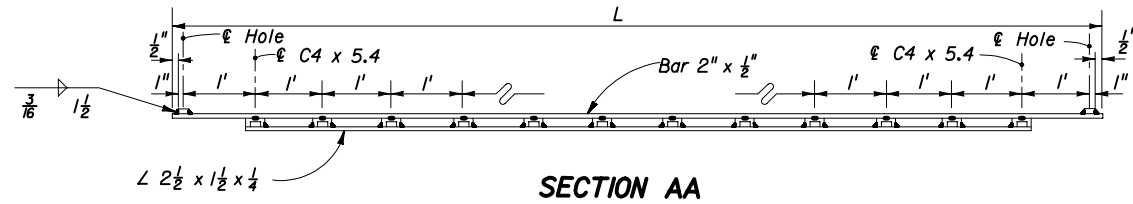
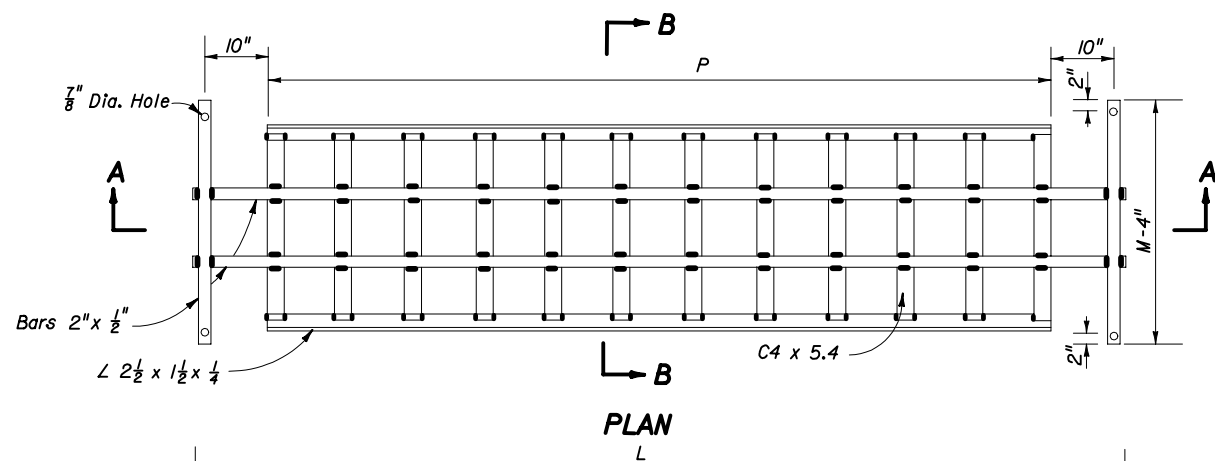


SAFETY MODIFICATION FOR INLETS IN BOX CULVERTS

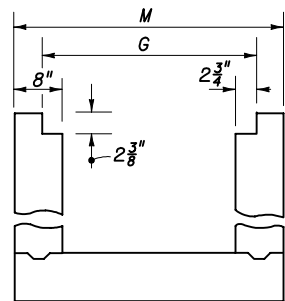
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**SAFETY MODIFICATIONS
FOR INLETS IN BOX CULVERTS**

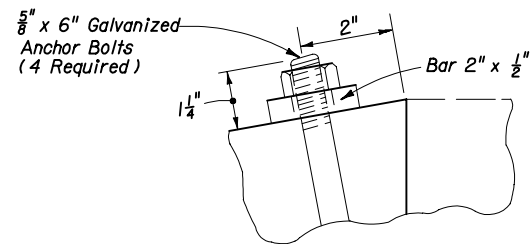
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Designed By	HAB	07/67	State Drainage Engineer		
Drawn By	MJT	07/67	Revision	Sheet No.	Index No.
Checked By	DWS	07/67	00	1 of 1	293



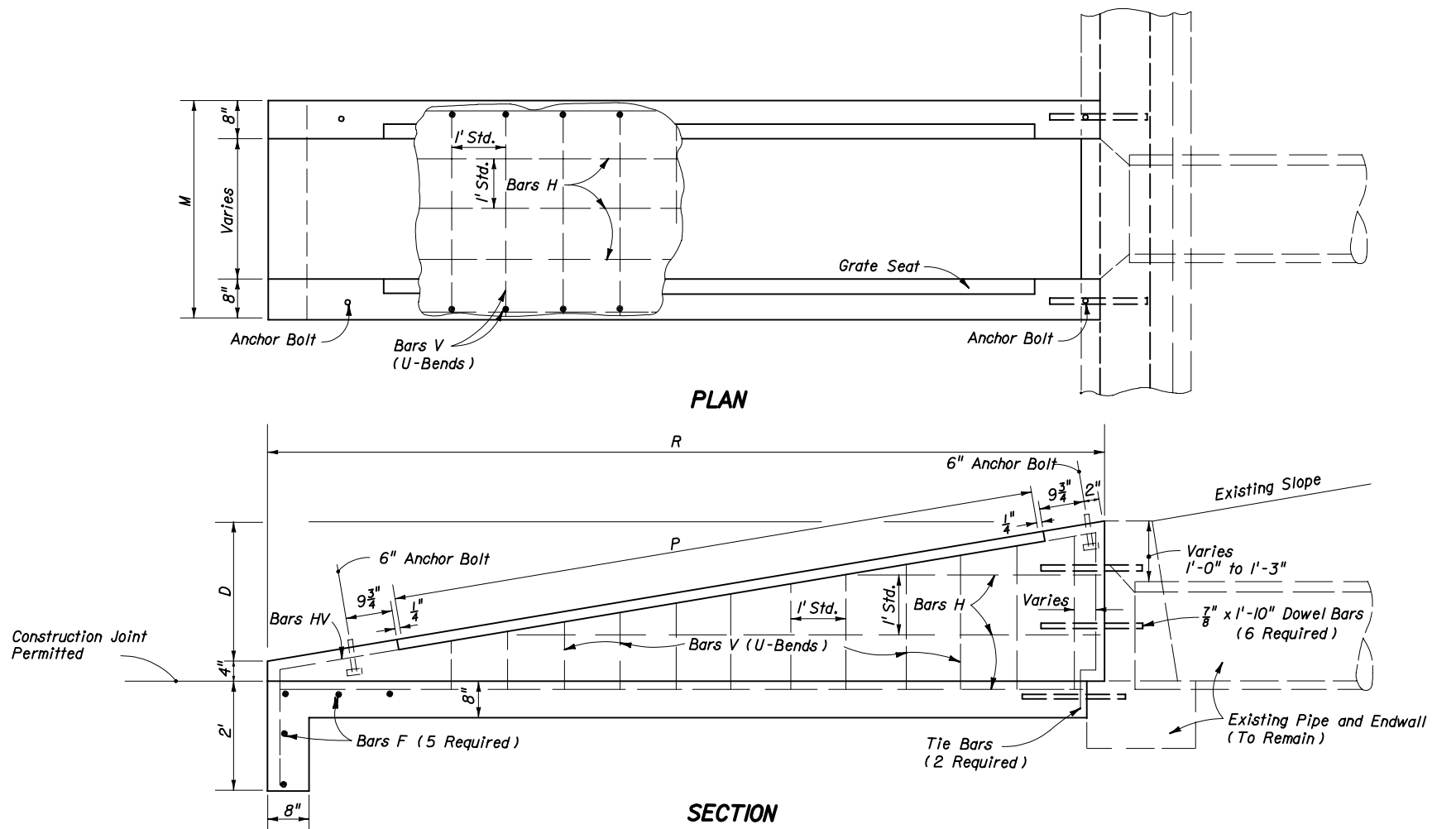
GRATE DETAIL



GRATE SEAT DETAIL



ANCHOR BOLT DETAIL



GENERAL NOTES

1. For use criteria see " Steel Grating Use Criteria " Index No. 261.
2. Gates shall be ASTM A242/A242M, A572/A572M or A588/A588M, Grade 50 steel, and galvanized in accordance with Section 962-7 of the Standard Specifications.
3. Channel section C3 x 6.0 may be substituted for the C4 x 5.4 channel.
4. All reinforcing No. 4 bars with 2" clearance except as noted. Spacings shown are center to center. Laps to be 12" minimum. Welded wire fabric (two cages max.) having an equivalent cross section area (0.20 sq. in.) may be substituted for bar reinforcement.
5. Drill 1 3/4" holes 8" deep with a rotary drill in existing endwall for dowel bars. Holes shall be thoroughly cleaned prior to placing dowel bars and epoxy.
6. Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY and Reinforcing Steel (Roadway), LB. Cost of dowel bars and epoxy mortar to be included in the contract unit price for reinforcing steel. Cost of grates to be paid for under the contract unit price for Endwall Grate, LB., plan quantity. Cost of galvanized bolts and nuts to be included in the contract unit price for the grate.
7. Sod slopes 5' each side and above endwall. Sodding to be paid for under the contract unit price for Sodding, SY.

DIMENSIONS AND QUANTITIES PER GRATE


Slope	Pipe Size	Channels @ 5.4 Lbs./L.F.		Bars @ 3.4 lbs/L.F. (2 ea.)			Angles @ 3.2 Lbs./L.F. (2)		Total Weight-Lbs.	
		Quantity	F	Lbs.	L	M-4"	Lbs.	P		Lbs.
1:6	15"	10	2'-6 7/8"	139	11'-3"	3'-3"	99	9'-4"	60	298
	18"	12	2'-9 7/8"	183	13'-3"	3'-6"	114	11'-4"	73	370
	24"	15	3'-3 7/8"	269	16'-3"	4'-0"	138	14'-4"	92	499
	30"	18	3'-9 7/8"	372	19'-3"	4'-6"	162	17'-4"	111	645
1:4	15"	6	2'-6 7/8"	83	7'-3"	3'-3"	71	5'-4"	34	188
	18"	7	2'-9 7/8"	107	8'-3"	3'-6"	80	6'-4"	41	228
	24"	9	3'-3 7/8"	161	10'-3"	4'-0"	97	8'-4"	53	311
	30"	11	3'-9 7/8"	227	12'-3"	4'-6"	114	10'-4"	66	407

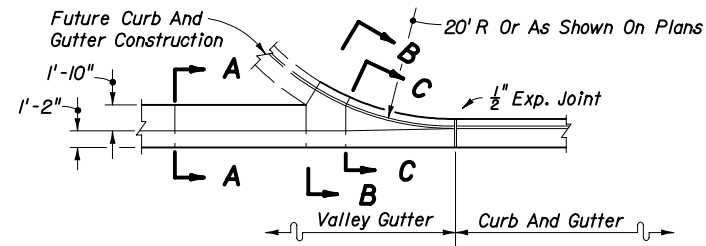
DIMENSIONS AND QUANTITIES PER U-ENDWALL

Pipe Size	G	M	D	R	P	Class I Concrete-C.Y.	Reinforcing Steel-Lbs.	Sodding S Y
15"	2'-8 1/2"	3'-7"	2'-2"	13'-0"	9'-4"	2.12	167	23
18"	2'-11 1/2"	3'-10"	2'-5"	14'-6"	11'-4"	2.53	173	25
24"	3'-5 1/2"	4'-4"	2'-11"	17'-6"	14'-4"	3.48	238	29
30"	3'-11 1/2"	4'-10"	3'-5"	20'-6"	17'-4"	4.57	315	32
15"	2'-8 1/2"	3'-7"	2'-2"	8'-8"	5'-4"	1.44	120	19
18"	2'-11 1/2"	3'-10"	2'-5"	9'-8"	6'-4"	1.72	130	20
24"	3'-5 1/2"	4'-4"	2'-11"	11'-8"	8'-4"	2.36	167	22
30"	3'-11 1/2"	4'-10"	3'-5"	13'-8"	10'-4"	3.09	225	25

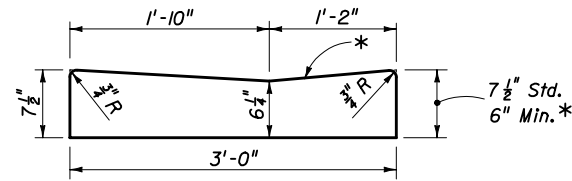
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SAFETY MODIFICATIONS FOR ENDWALLS

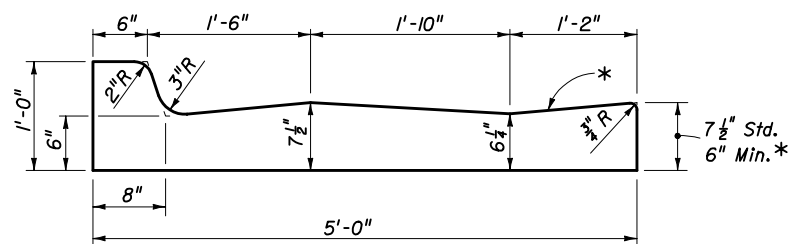
Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By				
Checked By				
		Revision	Sheet No.	Index No.
		00	1 of 1	295



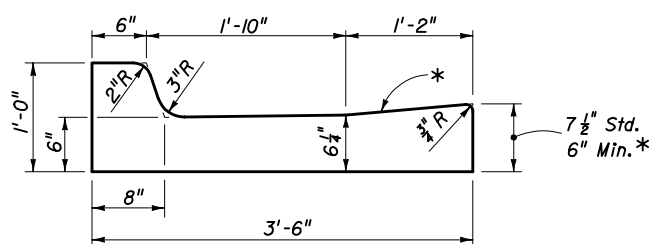
PLAN



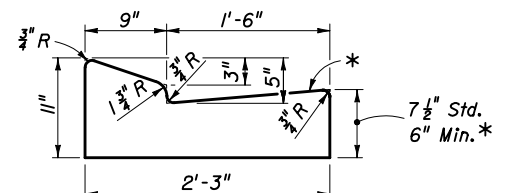
SECTION AA



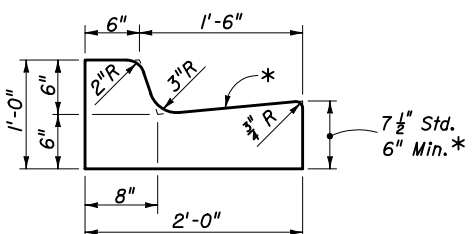
SECTION BB



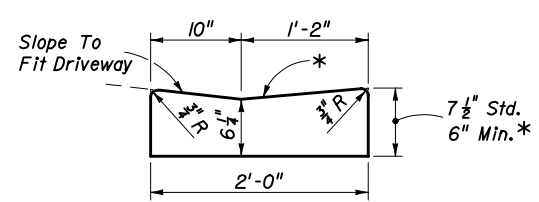
SECTION CC
VALLEY GUTTER



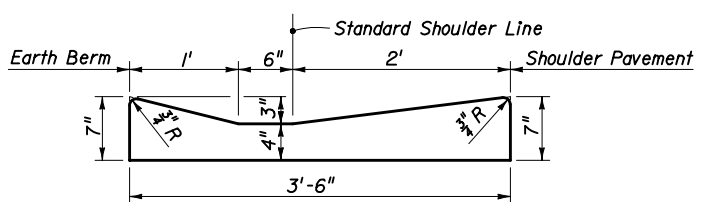
TYPE E



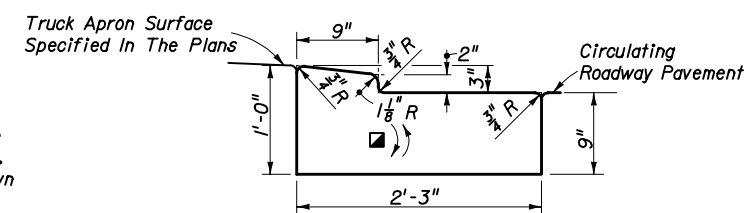
TYPE F



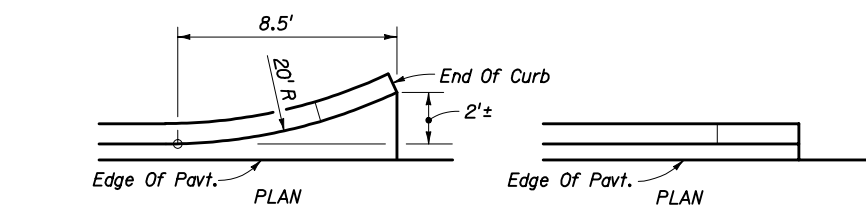
DROP CURB



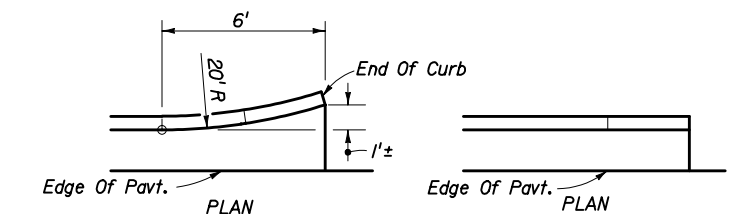
SHOULDER GUTTER



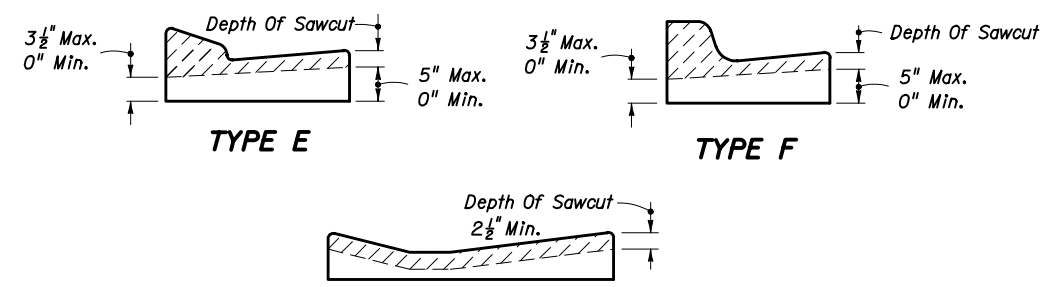
TYPE RA



CURB TYPE A



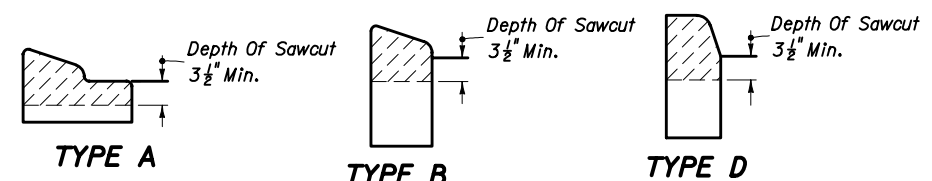
CURB AND GUTTER TYPES E & F



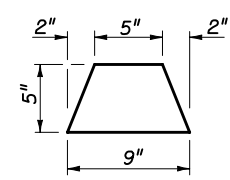
SHOULDER GUTTER

Sawcuts should be avoided within valley gutter and within curb and gutter endings.

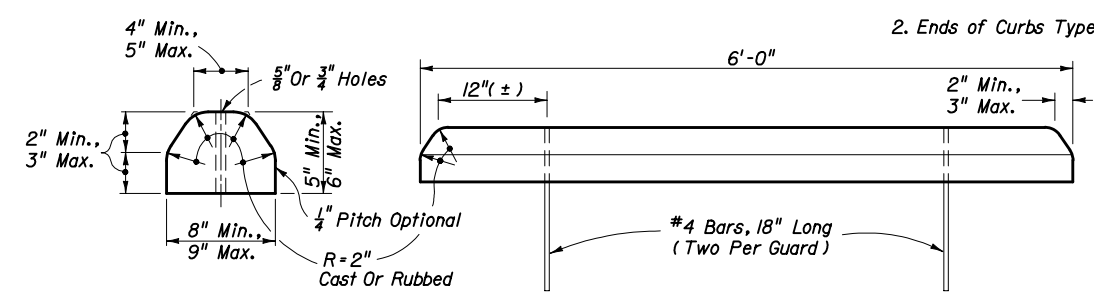
CONTRACTION JOINT IN CURB AND GUTTER



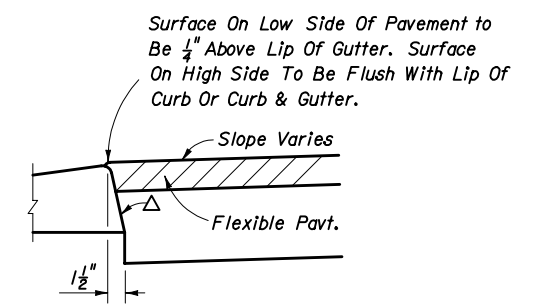
CONTRACTION JOINT IN CURB



ASPHALTIC CONCRETE CURB

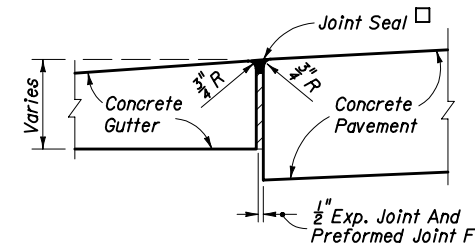


CONCRETE BUMPER GUARD



△ Applies to both high and low sides of pavement, low side shown. Applies to shoulder gutter only where adjoining traffic lanes.

CURB AND GUTTER AND TYPE A CURB ADJACENT TO FLEXIBLE PAVEMENT



□ Applies to both high and low sides of pavement, low side shown.

EXPANSION JOINT BETWEEN GUTTER AND CONCRETE PAVEMENT

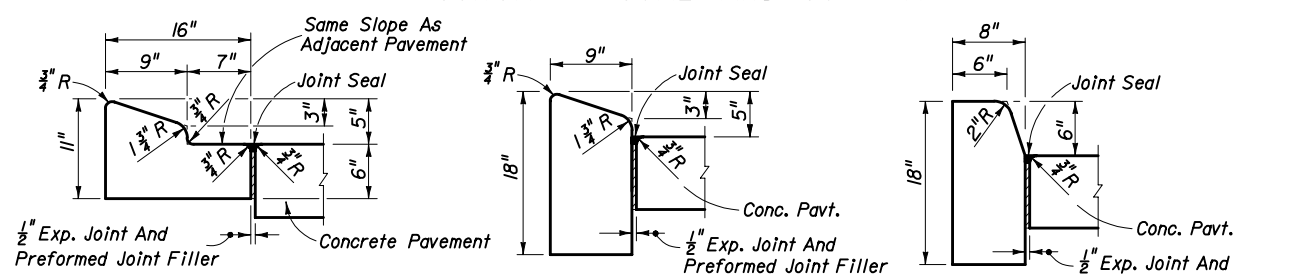
GENERAL NOTES

- For curb, gutter and curb & gutter provide 1/8" - 1/4" contraction joints at 10' centers (max.). Contraction joints adjacent to concrete pavement on tangents and flat curves are to match the pavement joints, with intermediate joints not to exceed 10' centers. Curb, gutter and curb & gutter expansion joints shall be located in accordance with Section 520 of the standard specifications.
- Ends of Curbs Types B and D shall transition from full to zero heights in 3'.

- * When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement. The thickness of the lip shall be 6", unless otherwise shown on plans.
- ☑ Rotate entire section so that gutter cross slope matches slope of adjacent circulating roadway pavement.

Note: For use adjacent to concrete or flexible pavement. For details depicting usage adjacent to flexible pavement, see diagram right. Expansion joint, preformed joint filler and joint seal are required between curb & gutter and concrete pavement only, see diagram right.

CONCRETE CURB AND GUTTER



TYPE A

TYPE B

TYPE D

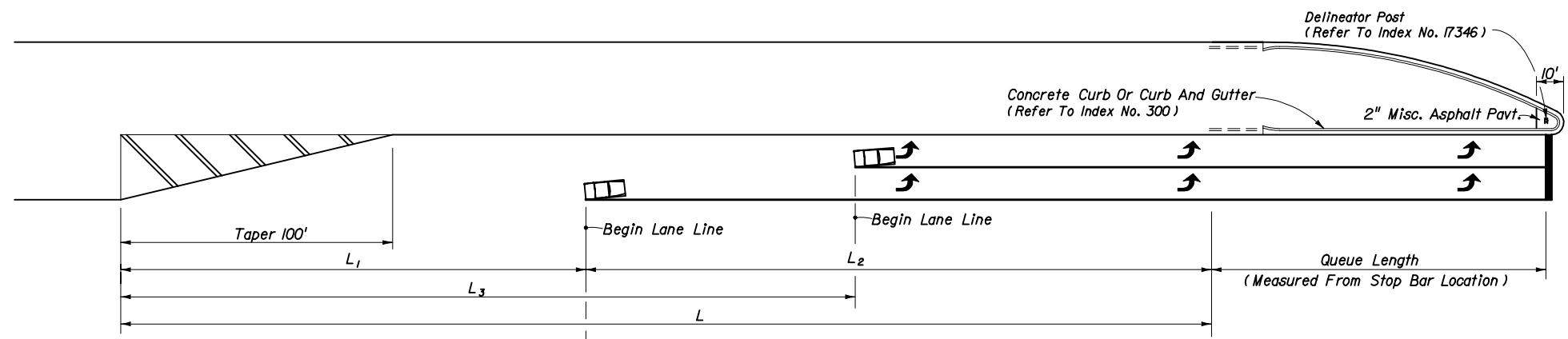
Note: For use adjacent to concrete or flexible pavement, concrete shown. Expansion joint, preformed joint filler and joint seal are required between curbs and concrete pavement only, see diagram right.

CONCRETE CURB

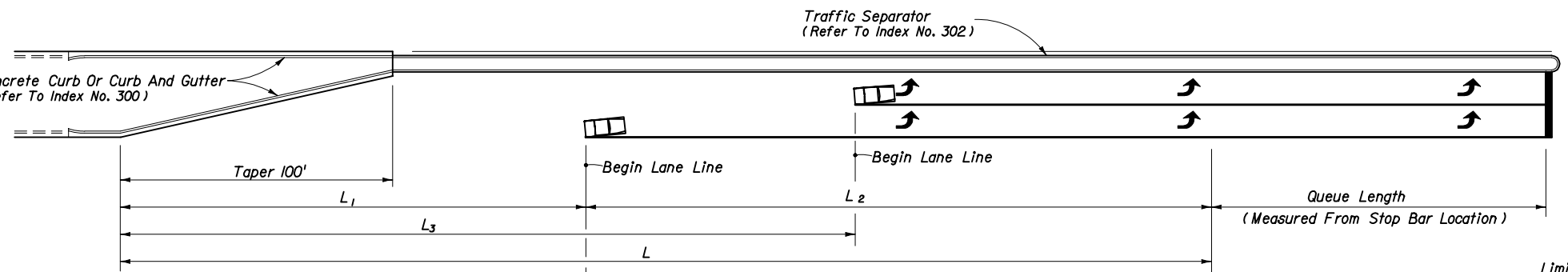
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CURB & CURB AND GUTTER

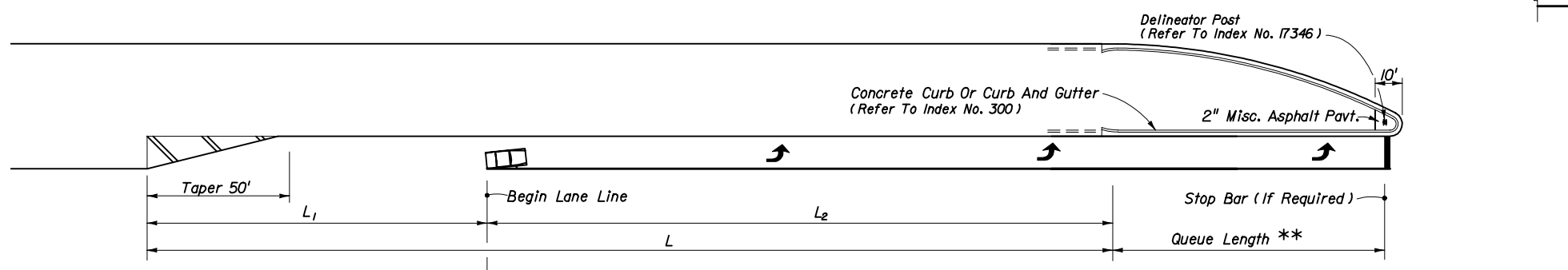
Designed By	Names	Dates	Approved By	<i>James D. Mill</i>
Drawn By			Roadway Design Engineer	
Checked By			Revision	Sheet No.
			00	1 of 1
				Index No.
				300



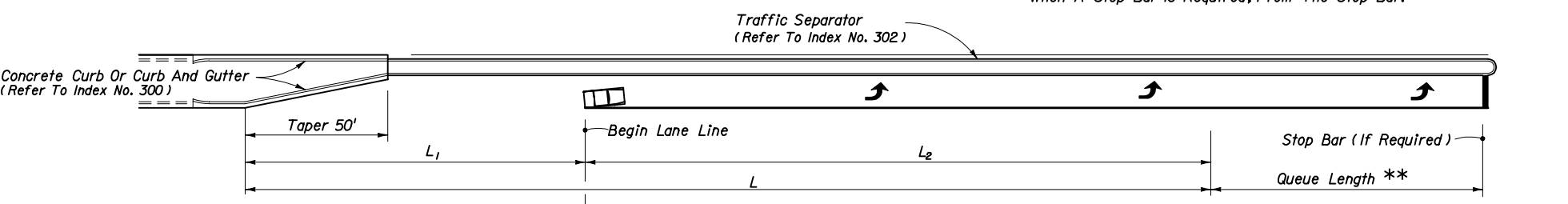
FLUSH AND/OR CURBED SEPARATION



RAISED SEPARATION DOUBLE LEFT TURNS



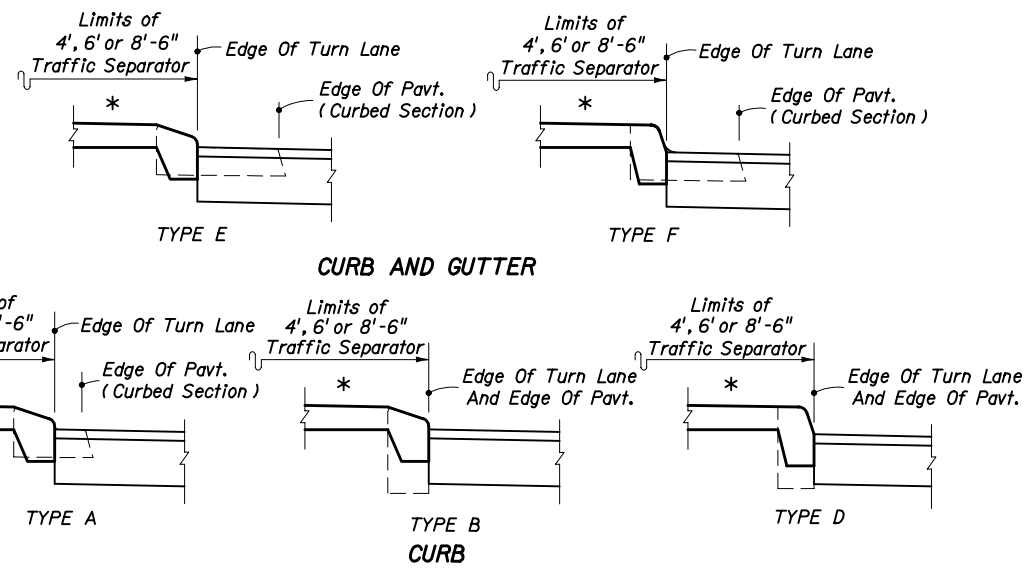
FLUSH AND/OR CURBED SEPARATION



RAISED SEPARATION SINGLE LEFT TURNS

TURN LANES

TURN LANES • CURBED AND UNCURBED MEDIANS								
Design Speed (mph)	Entry Speed (mph)	Clearance Distance L ₁	URBAN CONDITITONS			RURAL CONDITITONS		
			Brake To Stop Distance L ₂	Total Decel. Distance L	Clearance Distance L ₃	Brake To Stop Distance L ₂	Total Decel. Distance L	Clearance Distance L ₃
35	25	70'	75'	145'	110'	---	---	---
40	30	80'	75'	155'	120'	---	---	---
45	35	85'	100'	185'	135'	---	---	---
50	40/44	105'	135'	240'	160'	185'	290'	160'
55	48	125'	---	---	---	225'	350'	195'
60	52	145'	---	---	---	260'	405'	230'
65	55	170'	---	---	---	290'	460'	270'

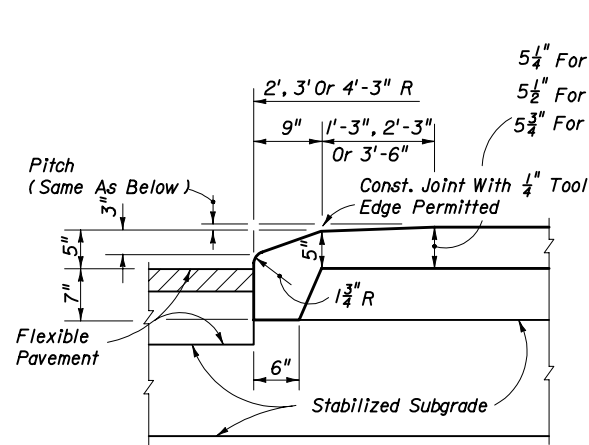


CURB AND GUTTER
 For Curb And Curb & Gutter Types, See Index No. 300
 * Option I Separators Shown (Refer To Index No. 302)
MEDIAN CURB AND TRAFFIC SEPARATOR JUNCTURE DETAILS

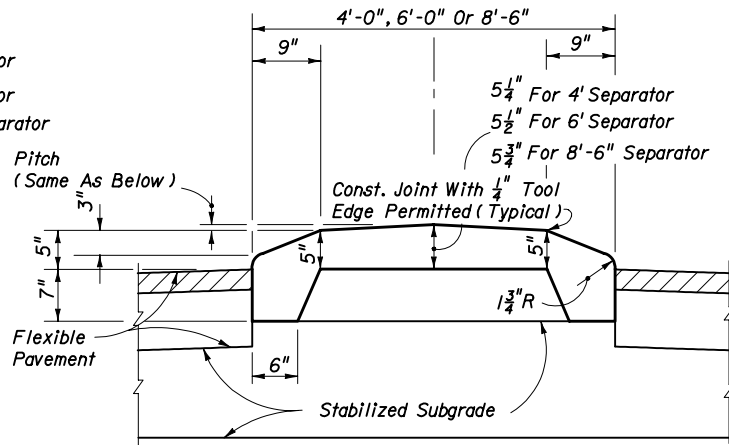
- GENERAL NOTES**
1. The plan views shown are for turn lane taper shapes and dimensional purposes only, they do not prescribe the use of curb, curb and gutter, shoulders nor separators specifically to either rural or urban conditions.
 2. Total deceleration distances must not be reduced except where lesser values are imposed by unrelocatable control points.
 3. Right turn lane tapers and distances identical to left turn lanes under stop control conditions. Right turn lane tapers and/or distances are site specific under free flow or yield conditions.
 4. These left turn configurations apply to continuous left turn lanes only where specifically called for in the plans.
 5. For pavement markings see Index No. 17346.

- DESIGN NOTES**
1. Basis for turn lane configurations:
 - Informed Driver.
 - Stop condition (With Or Without Stop Control).
 - Wet Pavement.
 - Reaction preceding entry point.
 - Minimum braking distance for urban conditions.
 - 75' min. for L₂.
 - Comfortable deceleration rates for rural conditions (AASHTO 2001 threshold rate of 11.2 ft/s²).

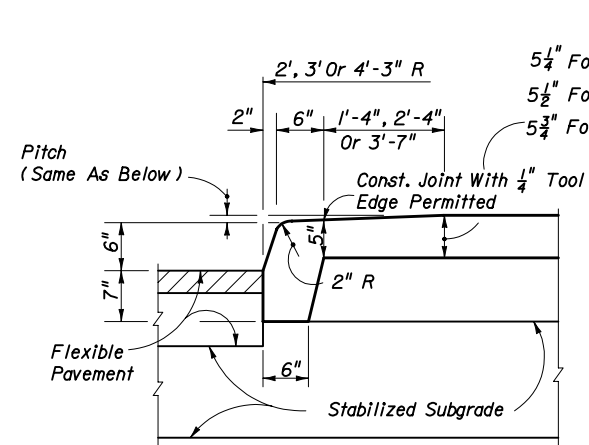
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TURN LANES				
Names	Dates	Approved By		
Designed By	RER	05/91	 Raymond D. Smith Roadway Design Engineer	
Drawn By	HSD/HKH	05/91		
Checked By	JVG/RER	05/91	Revision	04
			Sheet No.	1 of 1
			Index No.	301



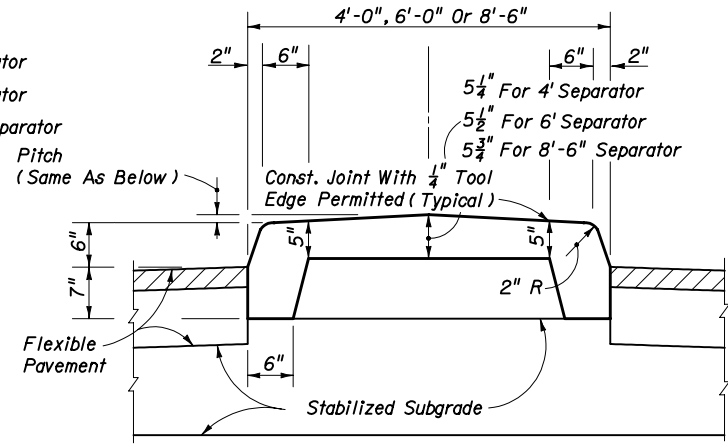
LONGITUDINAL SECTION (NOSE)



TRANSVERSE SECTION



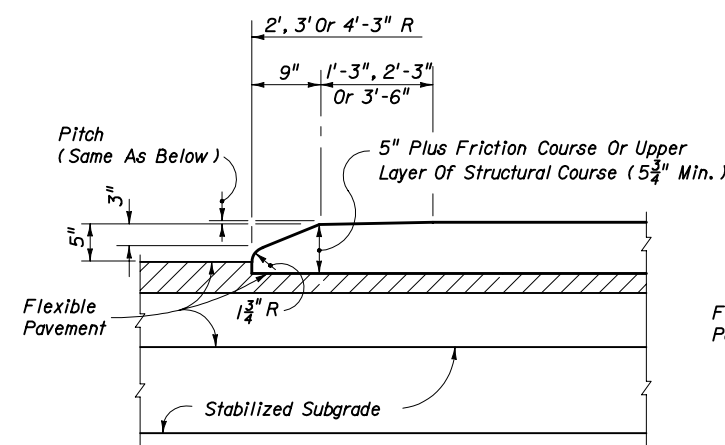
LONGITUDINAL SECTION (NOSE)



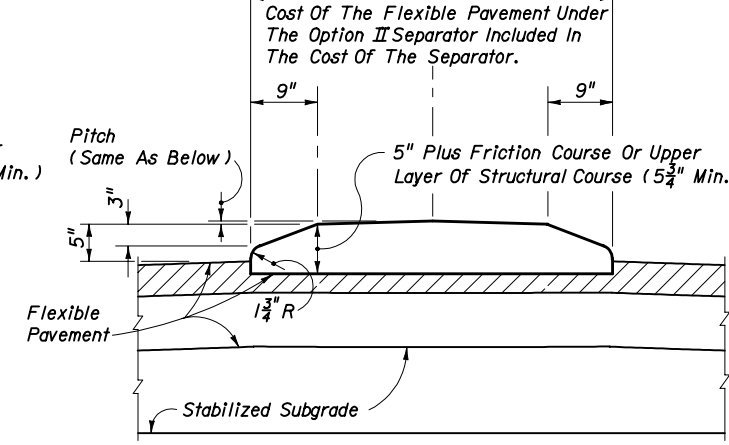
TRANSVERSE SECTION

OPTION I

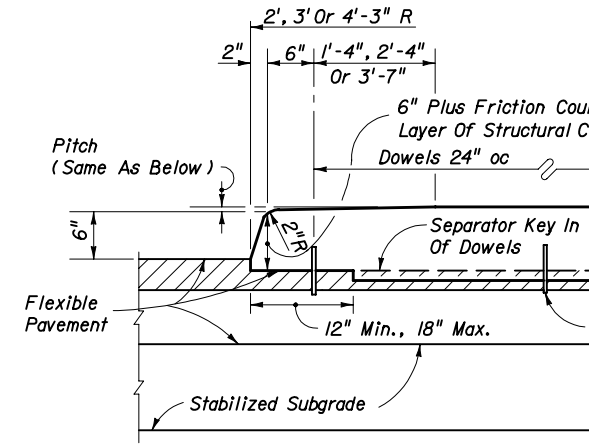
OPTION I



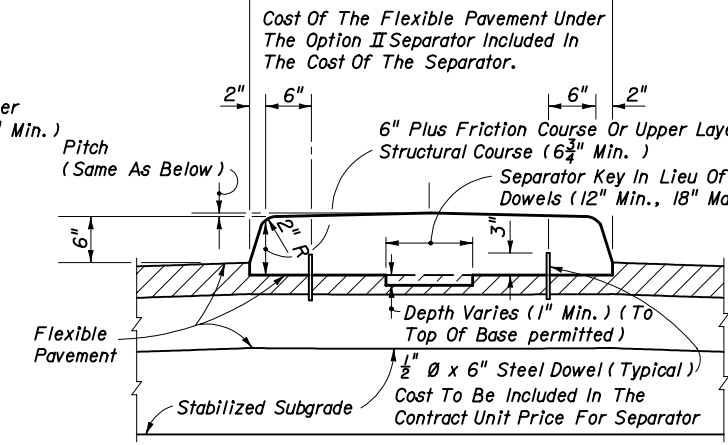
LONGITUDINAL SECTION (NOSE)



TRANSVERSE SECTION



LONGITUDINAL SECTION (NOSE)



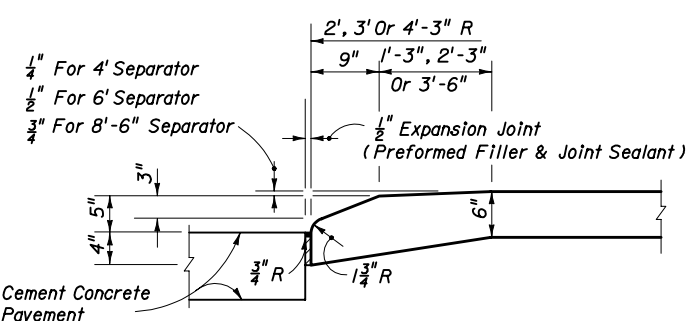
TRANSVERSE SECTION

OPTION II

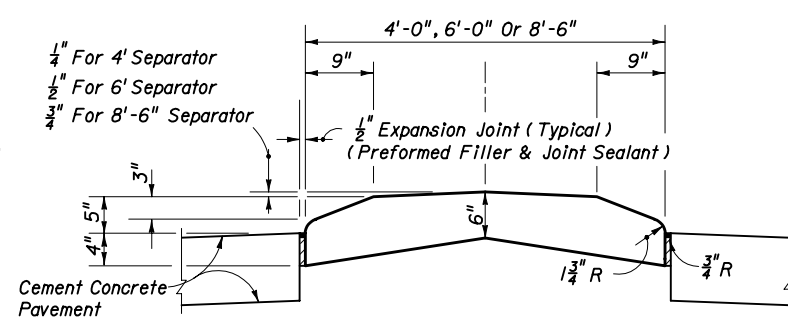
OPTION II

TYPE I CONCRETE TRAFFIC SEPARATOR

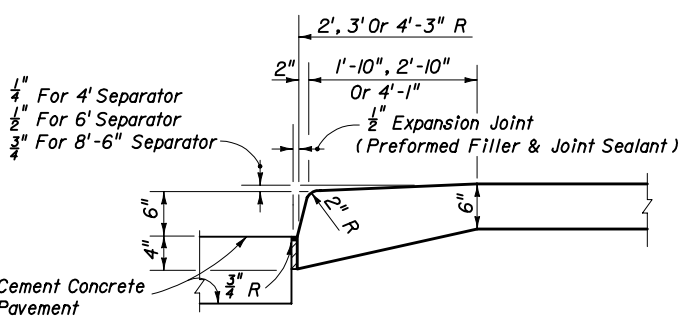
TYPE IV CONCRETE TRAFFIC SEPARATOR



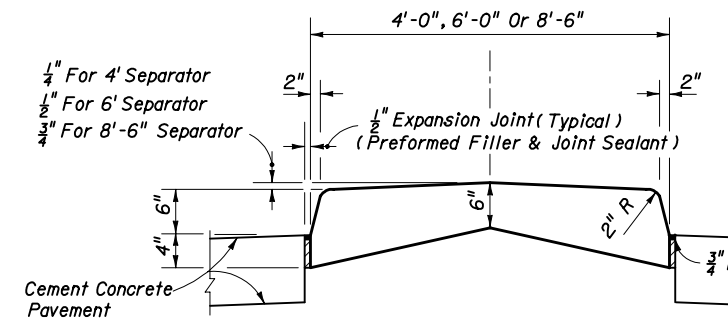
LONGITUDINAL SECTION (NOSE)



TRANSVERSE SECTION



LONGITUDINAL SECTION (NOSE)



TRANSVERSE SECTION

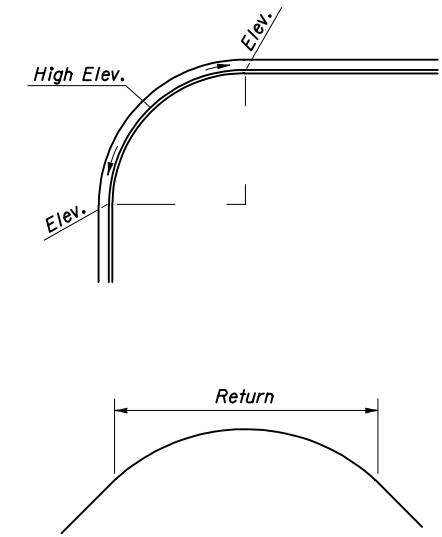
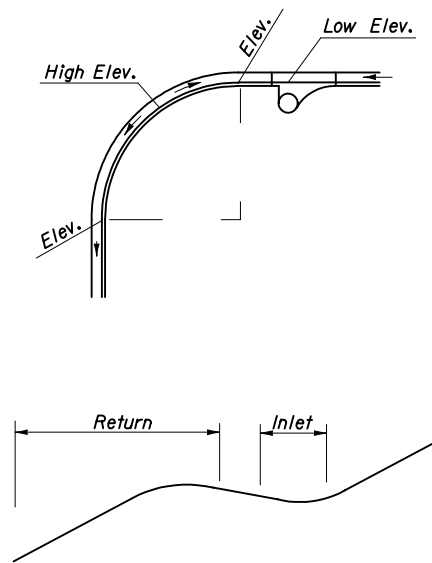
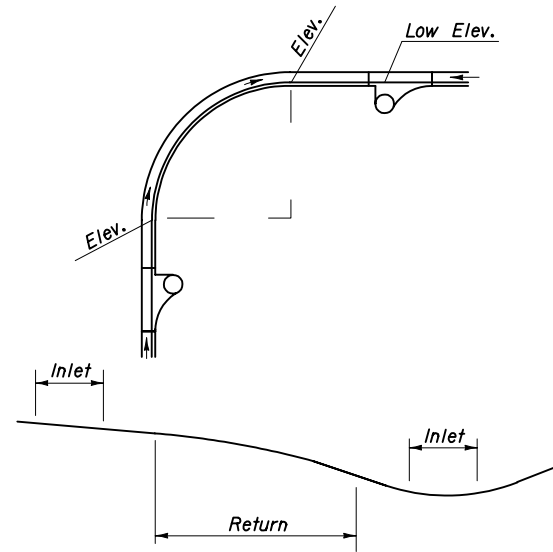
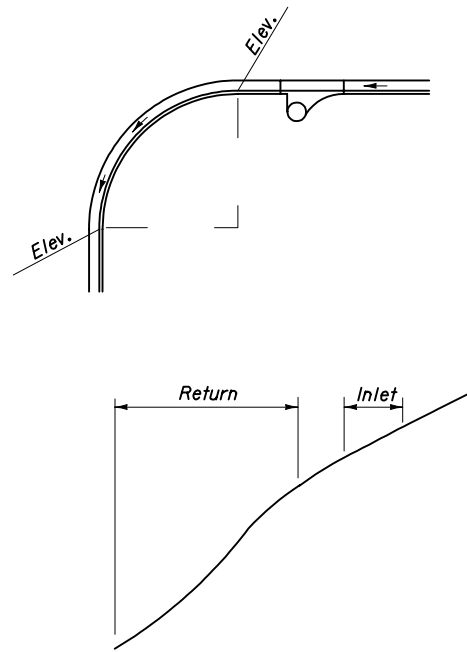
TYPE II CONCRETE TRAFFIC SEPARATOR

TYPE V CONCRETE TRAFFIC SEPARATOR

NOTES

- Separators Type I and IV are to be used with flexible pavement. Separators Types II and V are to be used with rigid pavement.
- Either Option I or Option II may be used for Types I and IV separators except when a specific option is called for in the plans.
- For all separators provide 1/8" - 1/4" contraction joints at 10' centers (max.). Contraction joints adjacent to concrete pavement on tangents and flat curves are to match the pavement joints, with intermediate joints not to exceed 10' centers.
- Separators having widths of 4', 6' or 8'-6" shall be paid for under the contract unit price for Concrete Traffic Separator (Type ___) (___' Wide) LF. Separators having widths other than 4', 6' or 8'-6" shall be detailed in the plans as special separators and paid for under the contract unit price for Concrete Traffic Separator (Special) SY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC SEPARATORS				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	09/81	Roadway Design Engineer	
Checked By	JVG	09/81	Revision	Sheet No.
			02	1 of 1
				302



Note:

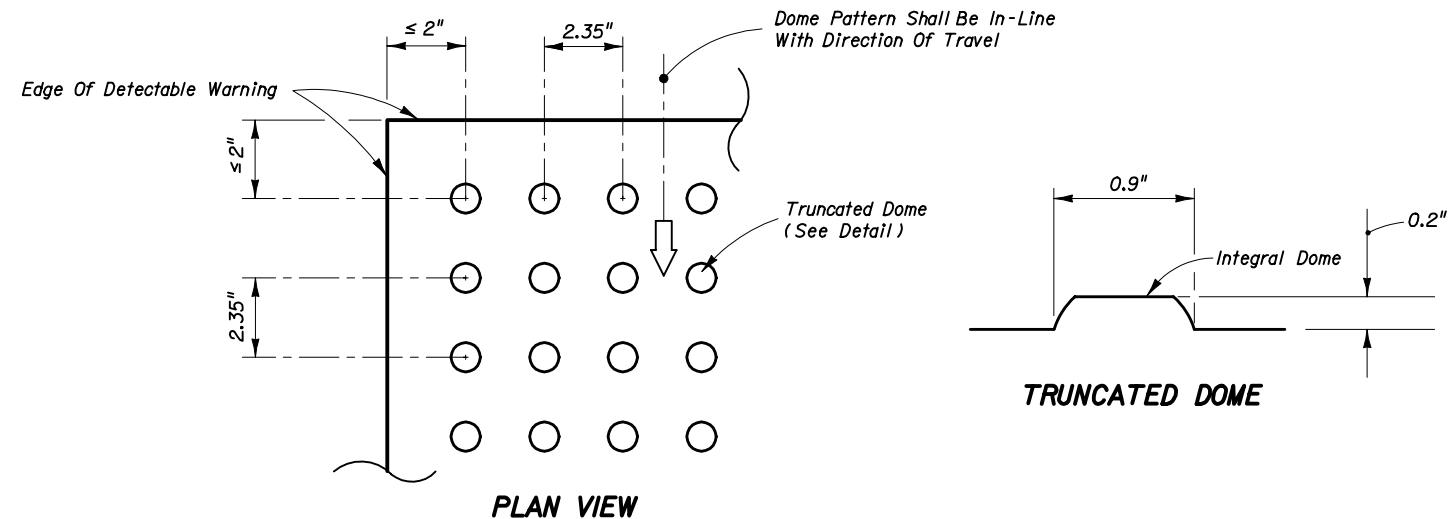
Profile grades should be established that will allow Inlets to be located outside the return whenever practical. Inlets should be located to avoid conflict with pedestrian movement. Special care must be exercised to prevent conflict with public sidewalk curbed ramps for the disabled. For information on public sidewalk curbed ramps refer to Index No. 304.

**SHOWING LOCATION OF INLETS ON RETURN
TYPICAL RETURN PROFILES**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

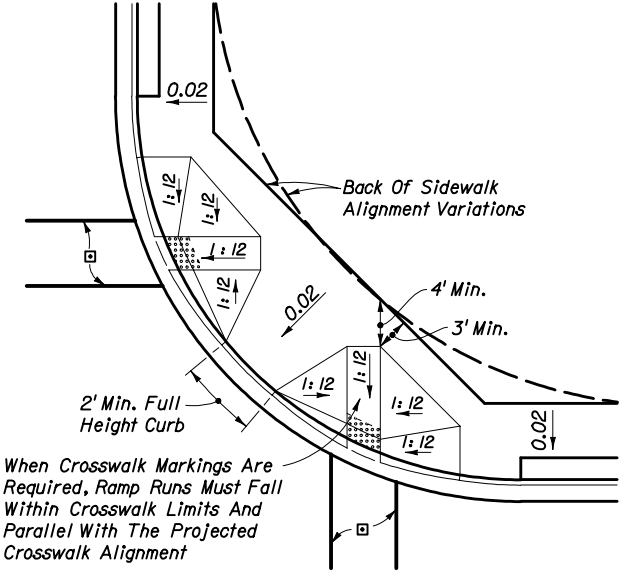
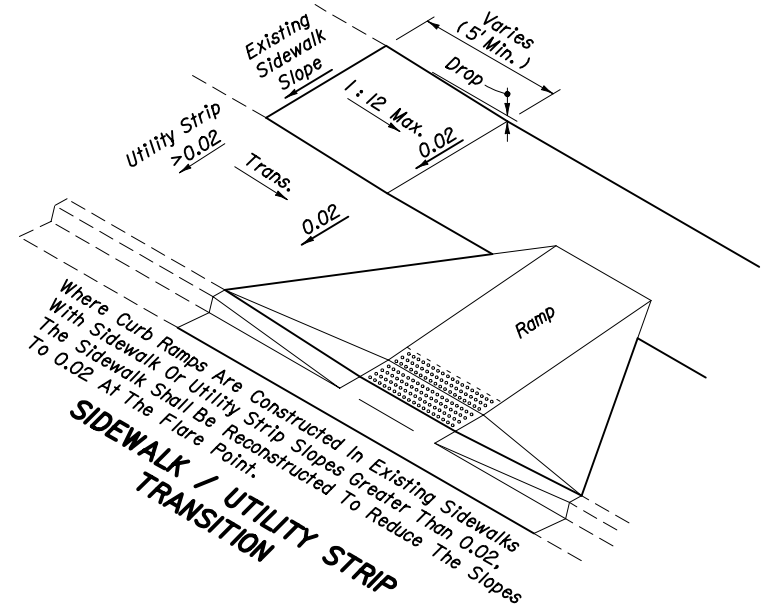
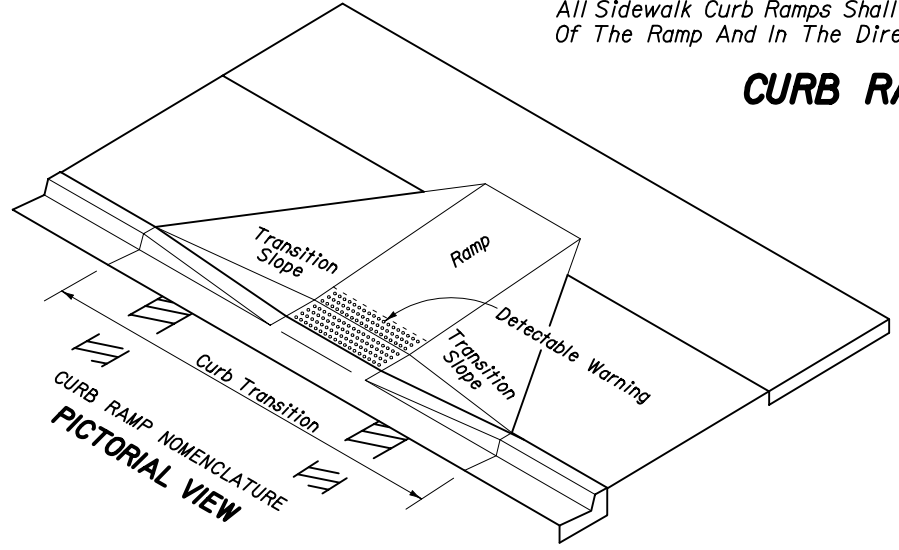
CURB RETURN PROFILES

	Names	Dates	Approved By <i>Samuel D. Hill</i>		
Designed By			Roadway Design Engineer		
Drawn By			Revision	Sheet No.	Index No.
Checked By			00	1 of 1	303



All Sidewalk Curb Ramps Shall Have Detectable Warning Surfaces That Extend The Full Width Of The Ramp And In The Direction Of Travel 24 Inches (610 mm) From The Back Of Curb.

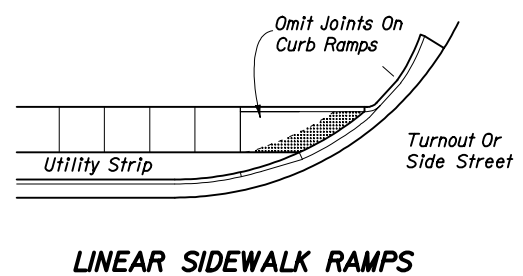
CURB RAMP DETECTABLE WARNING



□ Crosswalk widths and configuration vary; must conform to Index No. I7344 and I7346.

TYPICAL PLACEMENT OF PUBLIC SIDEWALK CURB RAMPS AT CURBED RETURNS

Note: A portion of one or both ramps may extend outside the return.



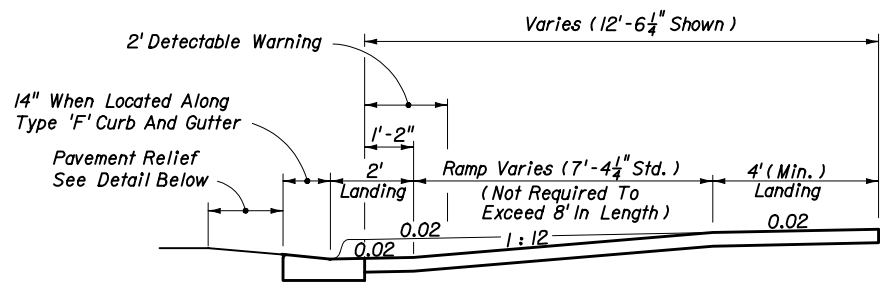
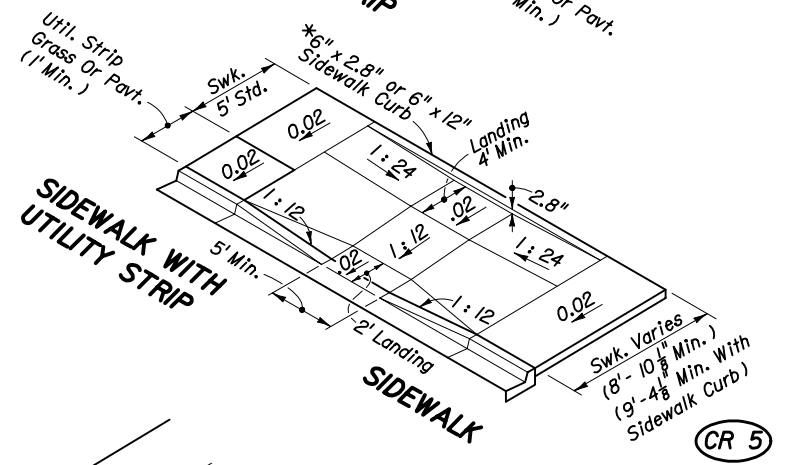
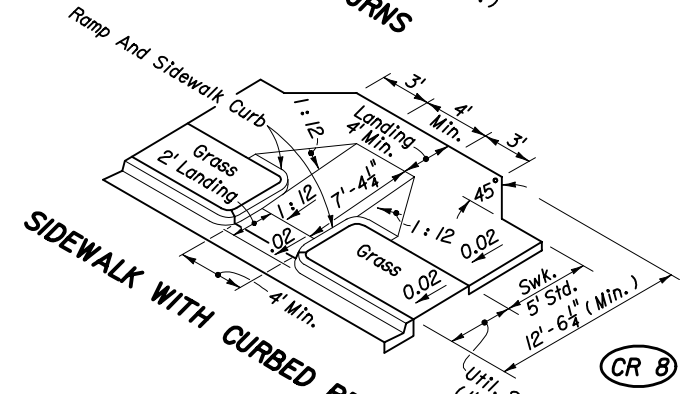
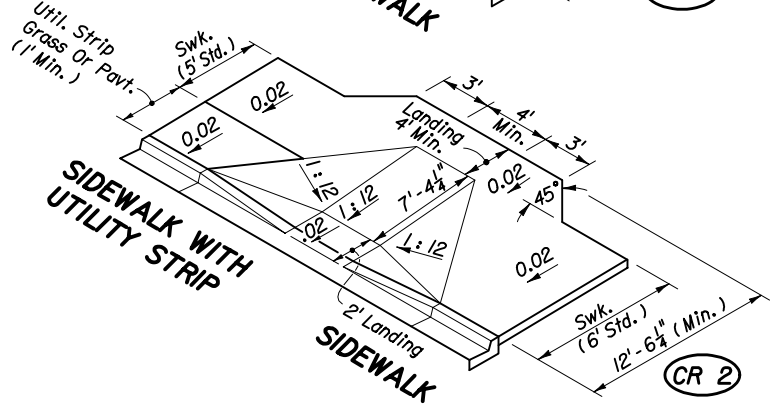
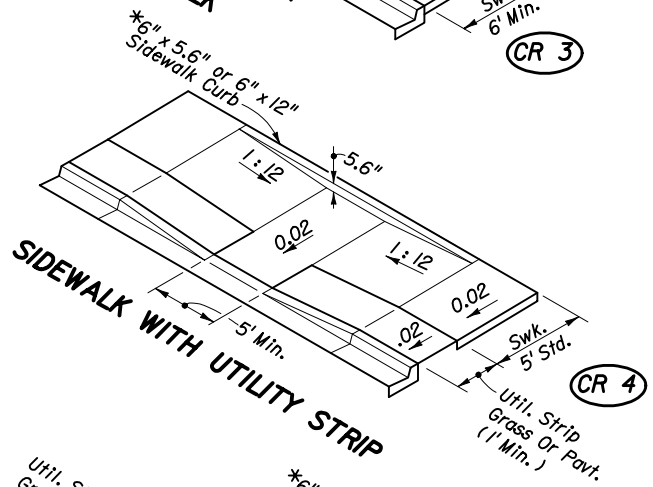
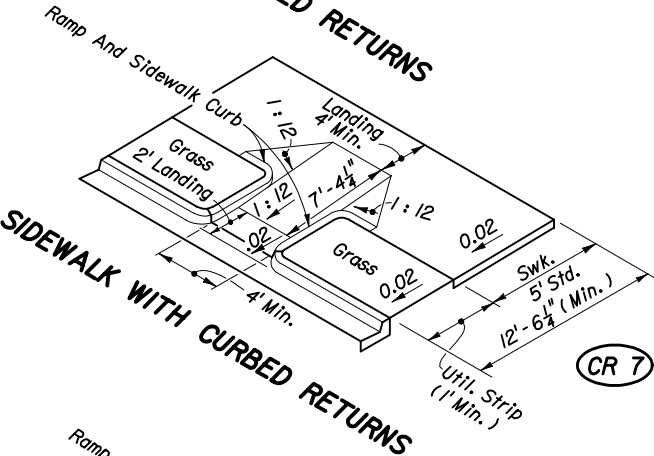
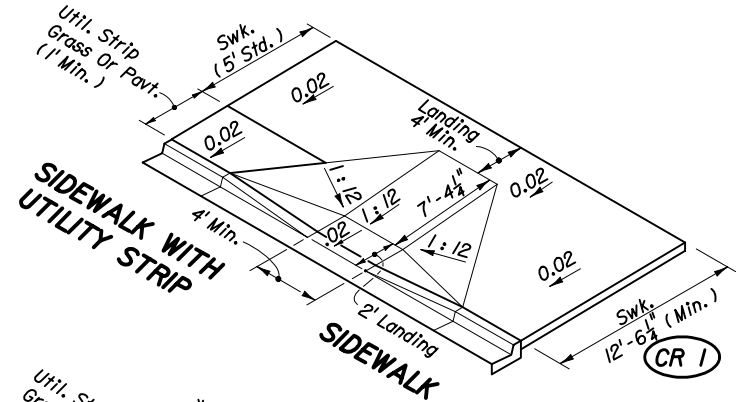
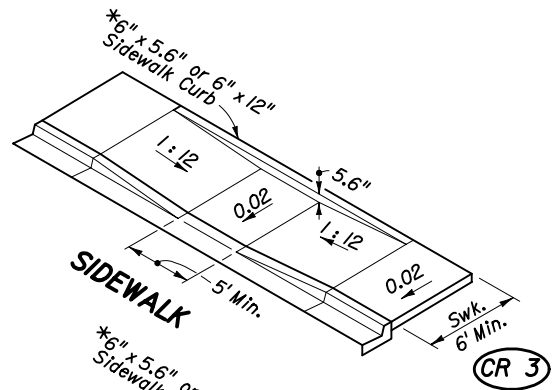
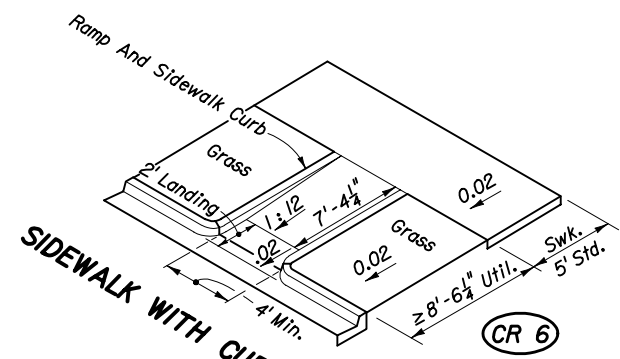
GENERAL NOTES

- Public sidewalk curb ramps shall be constructed in the public right of way at locations that will provide continuous unobstructed pedestrian circulation paths to pedestrian areas, elements and facilities in the public right of way and to accessible pedestrian routes on adjacent sites. Curbed facilities with sidewalks and those without sidewalks are to have curb ramps constructed at all street intersections and at turnouts that have curbed returns. Partial curb returns shall extend to the limit prescribed by Index No. 515 to accommodate curb ramps. Ramps constructed at locations without sidewalks shall have a landing constructed at the top of each ramp, see Sheet 5.
- The location and orientation of curb ramps shall be as shown in the plans.
- Curb ramp running slopes at unrestrained sites shall not be steeper than 1:12 and cross slope shall be 0.02 or flatter. Transition slopes shall not be steeper than 1:12.
When altering existing pedestrian facilities where existing site development precludes the accommodation of a ramp slope of 1:12, a running slope between 1:12 and 1:10 is permitted for a rise of 6" maximum and a running slope of between 1:10 and 1:8 is permitted for a rise of 3" maximum. Where compliance with the requirements for cross slope cannot be fully met, the minimum feasible cross slope shall be provided.
Ramp running slope is not required to exceed 8' in length, except at sites where the plans specify a greater length.
- If a curb ramp is located where pedestrians must walk across the ramp, then the walk shall have transition slopes to the ramp; the maximum slope of the transitions shall be 1:12. Ramps with curb returns may be used at locations where other improvements provide guidance away from that portion of curb perpendicular to the sidewalk; improvements for guidance are not required at curb ramps for linear pedestrian traffic.
- Curb ramp detectable warning surfaces shall extend the full width of the ramp and in the direction of travel 24" from the back of curb. Detectable warning surfaces shall be constructed by texturing a truncated dome pattern in conformance with U.S. Department of Justice A.D.A. Standards For Accessible Design, A.D.A. Accessibility Guidelines, Section 4.29.2, (detail shown above left). Transition slopes are not to have detectable warnings.
- Unless otherwise called out in the plans, the ramp detectable warning surface shall be colored in accordance with Section 35I of the Standard Specifications.
- Where a curb ramp is constructed within existing curb, curb and gutter and/or sidewalk, the existing curb or curb and gutter shall be removed to the nearest joint beyond the curb transitions or to the extent that no remaining section of curb or curb and gutter is less than 5' long. The existing sidewalk shall be removed to the nearest joint beyond the transition slope or walk around or to the extent that no remaining section of sidewalk is less than 5' long.
- Alpha-numeric identifications are for reference (plans, permits, etc.).
- Public sidewalk curb ramps are to be paid for as follows:
Ramps, reconstructed sidewalks, walk around sidewalks, sidewalk landings and sidewalk curbs are to be paid for under the contract unit price for Sidewalk Concrete, (___" Thick), SY. Curb transitions and reconstructed curbs are to be paid for under the contract unit price for the parent curb, i.e., Curb Conc., (Type ___), LF or Curb and Gutter Conc., (Type ___), LF.
When a separate pay item for the removal and disposal of existing curb, curb and gutter, and/or sidewalk is not provided in the plans, the cost of removal and disposal of these features shall be included in the contract unit price for new curb, curb and gutter and/or sidewalk respectively.

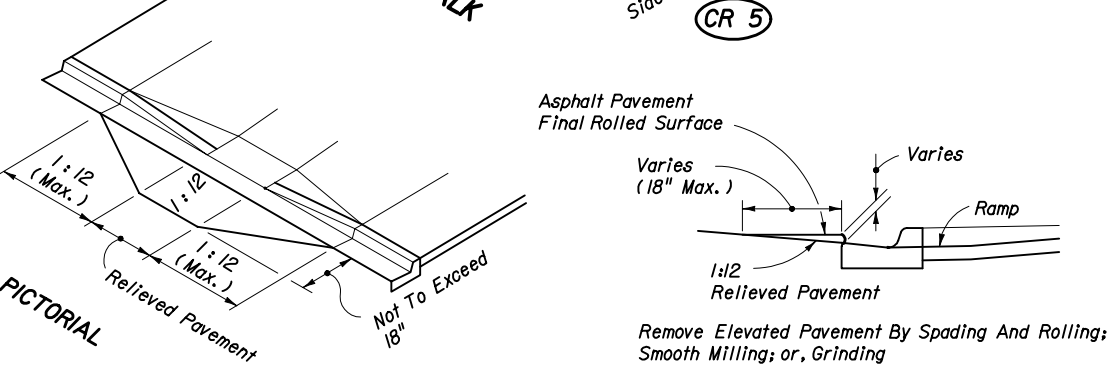
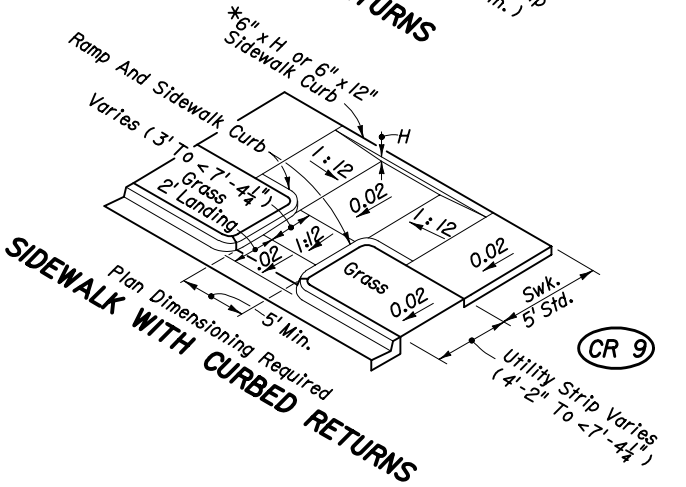
DESIGN NOTES

- The color requirement in General Note 6 is to provide a dark-on-light visual contrast between the detectable warning surface and the adjacent walking surface. Where adjacent walking surfaces are colored or are constructed with materials other than standard Class I Portland Cement Concrete in accordance with Section 522 of the Standard Specifications, the plans must provide for detectable warning surface colors or materials that provide the necessary contrast, either dark-on-light or light-on-dark.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PUBLIC SIDEWALK CURB RAMPS				
Names	Dates	Approved By		
Designed By	STAFF	10/94	<i>Samuel D. Mill</i> Roadway Design Engineer	
Drawn By	HKH	10/94	Revision	Sheet No.
Checked By	JVG	10/94	04	1 of 5
				Index No. 304



SECTION THROUGH RAMP RUN AND LANDINGS WITH UPPER LANDING AT NORMAL SIDEWALK ELEVATION

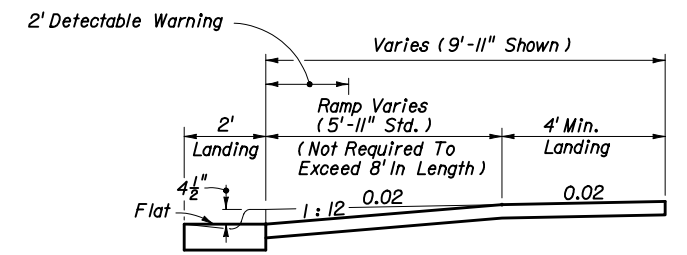
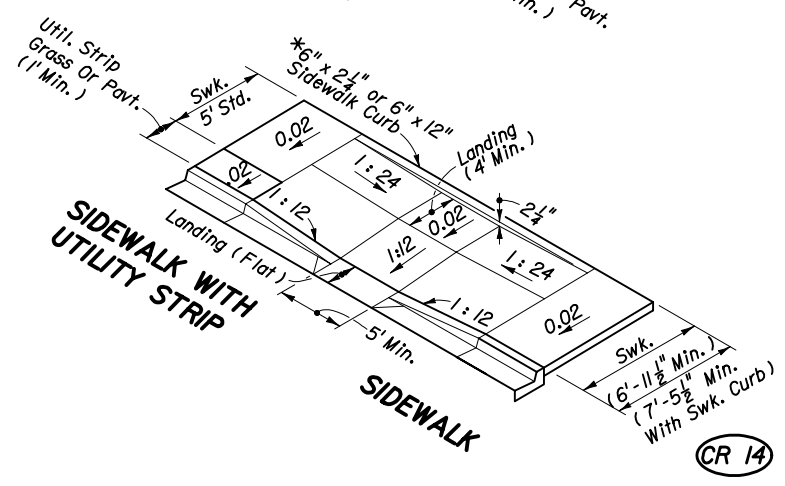
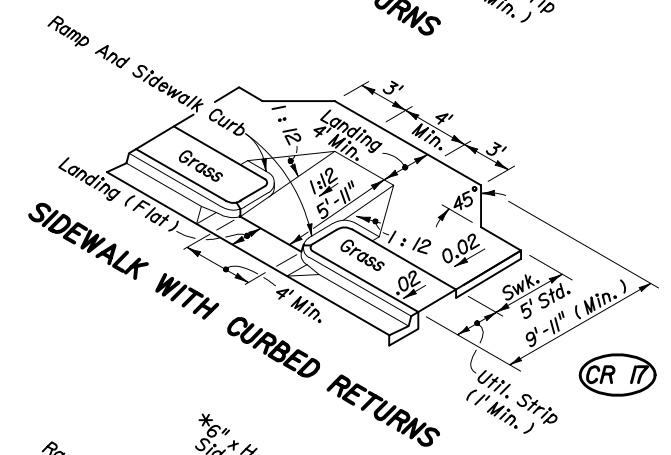
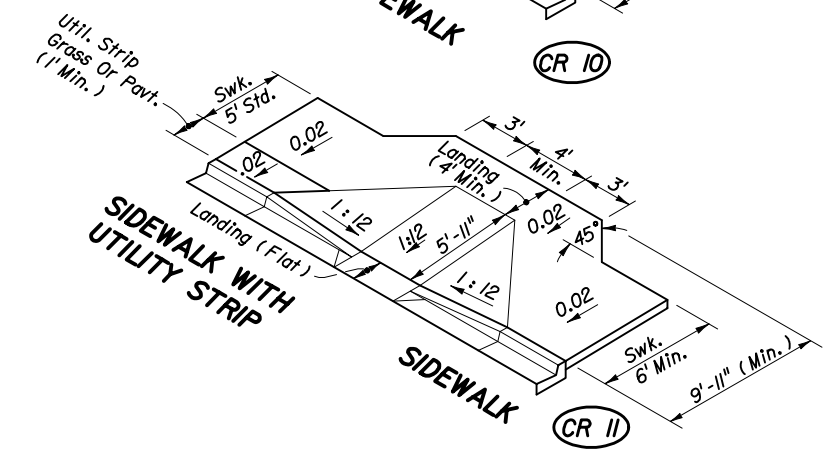
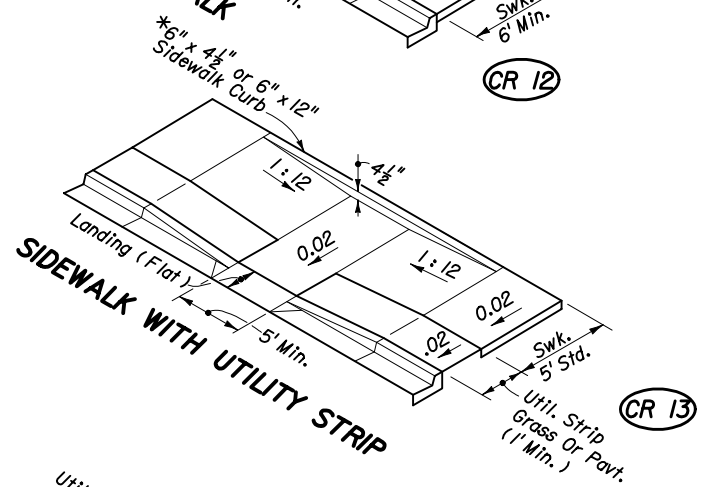
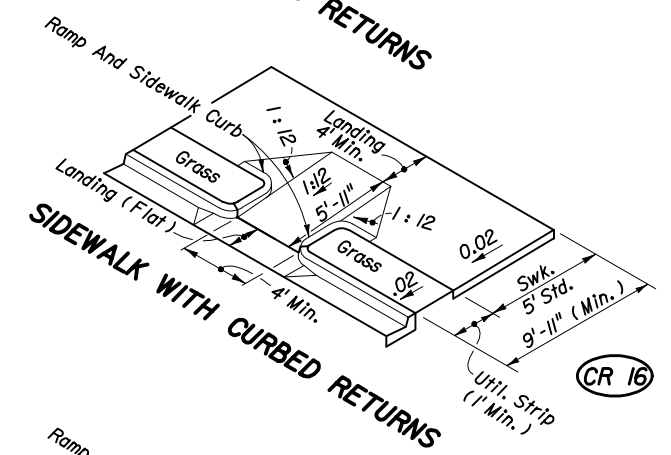
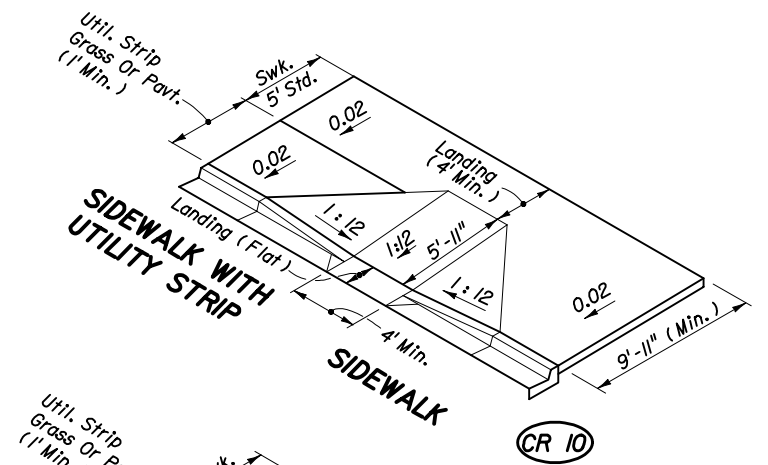
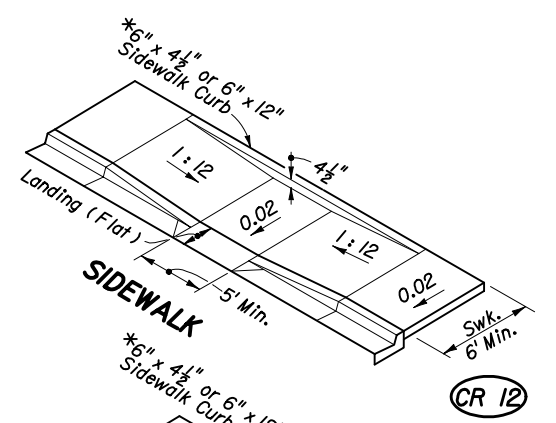
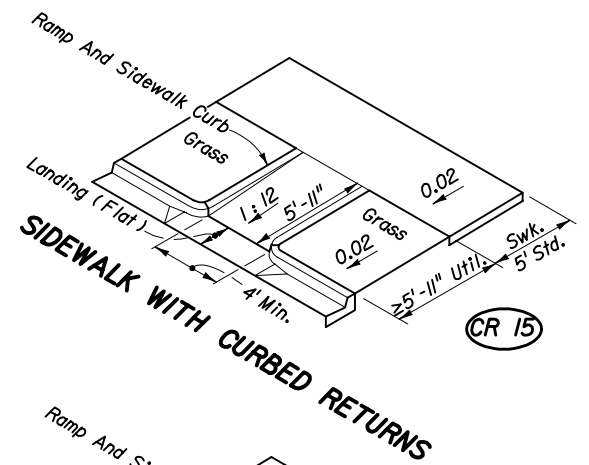


PAVEMENT RELIEF AT LIP OF CURB

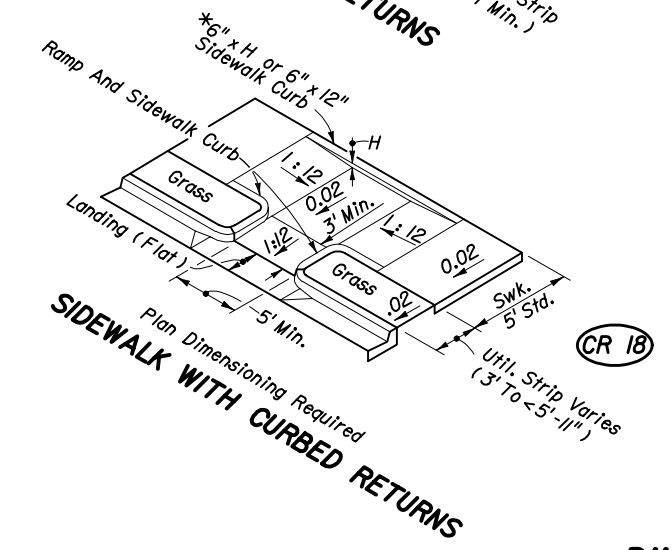
* For BACK OF SIDEWALK CURB OR BUFFER TRANSITION And For RAMP AND SIDEWALK CURB OPTIONS See Sheet 4.

DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE NOT RESTRICTED BY RIGHT OF WAY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PUBLIC SIDEWALK CURB RAMPS				
Names	Dates	Approved By <i>Lamed D. Mill</i>		
Designed By	STAFF	10/94	Roadway Design Engineer	
Drawn By	HKH	10/94	Revision	Sheet No.
Checked By	JVG	10/94	04	2 of 5
				Index No. 304



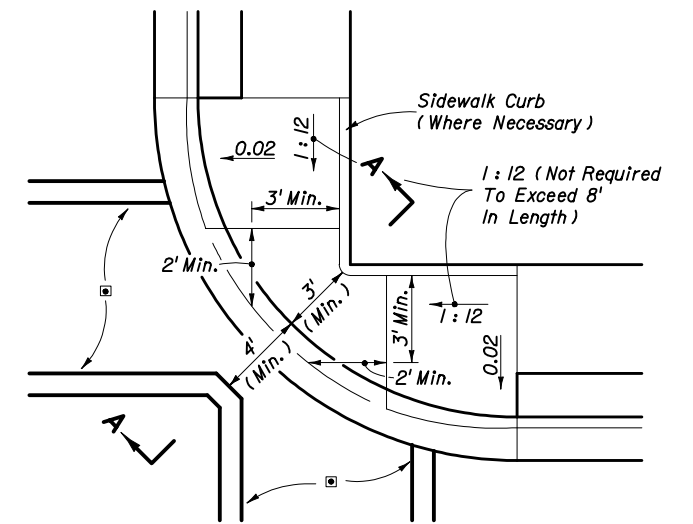
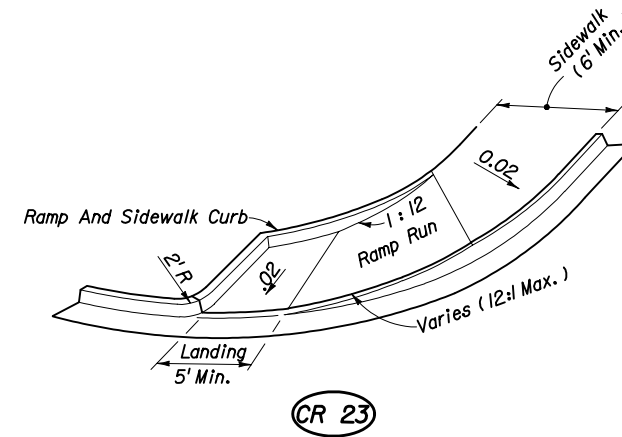
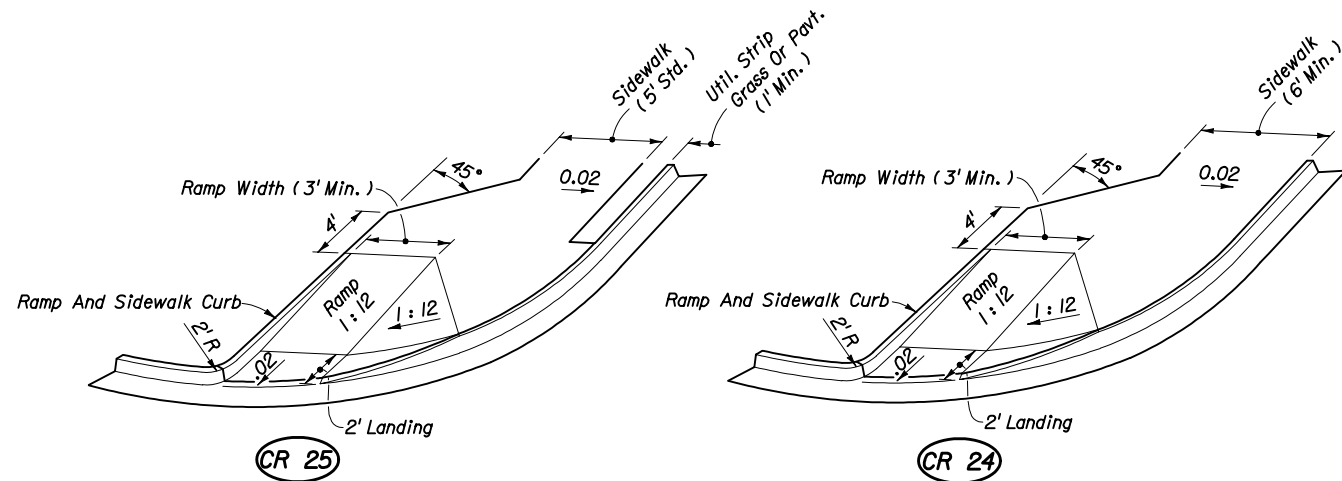
SECTION THROUGH RAMP RUN AND LANDINGS WITH UPPER LANDING AT NORMAL SIDEWALK ELEVATION



* For BACK OF SIDEWALK CURB OR BUFFER TRANSITION And For RAMP AND SIDEWALK CURB OPTIONS See Sheet 4.

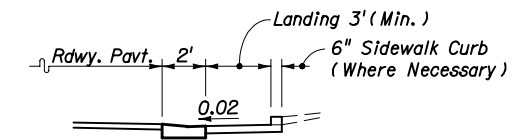
DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE RESTRICTED BY RIGHT OF WAY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PUBLIC SIDEWALK CURB RAMPS				
Names	Dates	Approved By <i>Jamell D. Hill</i>		
Designed By STAFF	10/94	Roadway Design Engineer		
Drawn By HKH	10/94	Revision	Sheet No.	Index No.
Checked By JVG	10/94	04	3 of 5	304



□ Crosswalk width and configuration vary; must conform to Index No. 17344 and 17346.

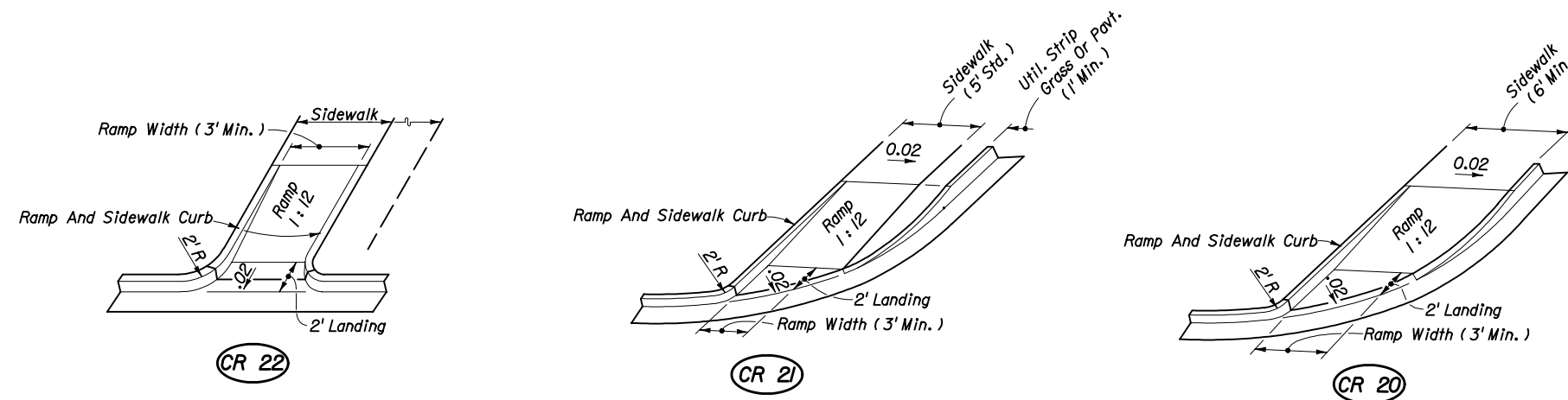
PLAN



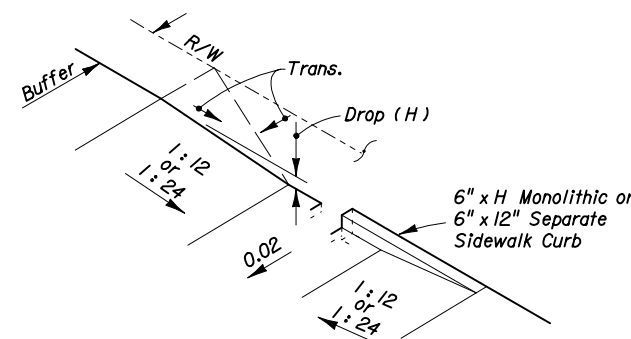
SECTION AA

CR 26

DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS FOR LINEAR PEDESTRIAN TRAFFIC

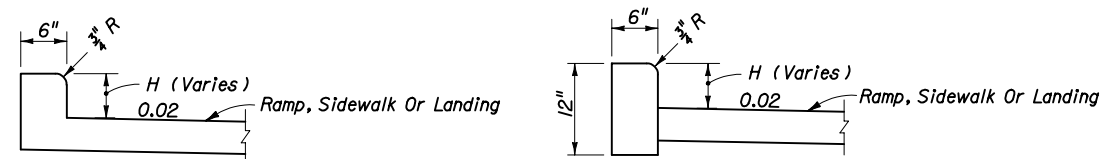


DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK COMBINED CORNER RAMPS UNDER CONDITIONS OF INFEASIBILITY



Construct Sidewalk Curb In Absence Of Adequate Buffer, Maintainable Surface Contour, Abutting Structure, Or When Called For In The Plans Or Standards

BACK OF SIDEWALK CURB OR BUFFER TRANSITION



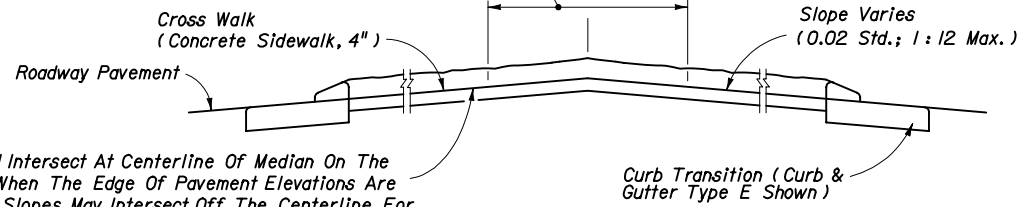
MONOLITHIC CAST CURB

SEPARATELY CAST CURB

RAMP AND SIDEWALK CURB OPTIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PUBLIC SIDEWALK CURB RAMPS				
Names	Dates	Approved By <i>Samuel D. Mill</i>		
Designed By STAFF	10/94	Roadway Design Engineer		
Drawn By HKH	10/94	Revision	Sheet No.	Index No.
Checked By JVG	10/94	04	4 of 5	304

5' Refuge With Maximum Slope Of 0.02 Must Be Provided When Slopes Of 0.05 Or Flatter And 5' In Length Are Not Available On Crosswalk; The Refuge Can Be Constructed At Any Location Within The Crosswalk; Or, A 5' x 5' Concrete Landing With Maximum Slope Of 0.02 Can Be Constructed Adjacent To The Crosswalk.

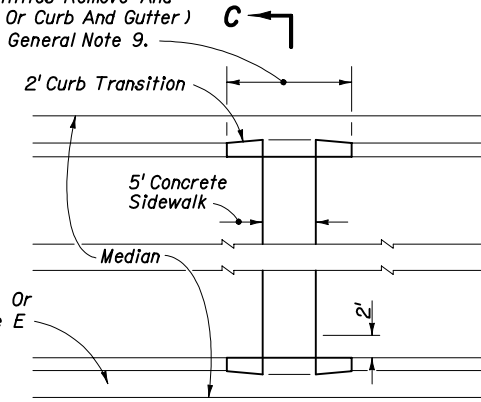


Slopes Shall Intersect At Centerline Of Median On The 0.02 Rate When The Edge Of Pavement Elevations Are Equal. The Slopes May Intersect Off The Centerline For Variable Edge Of Pavement Elevations Or To Accommodate Other Construction In The Median; However, Slopes Shall Not Be Steeper Than 1:12.

SECTION CC

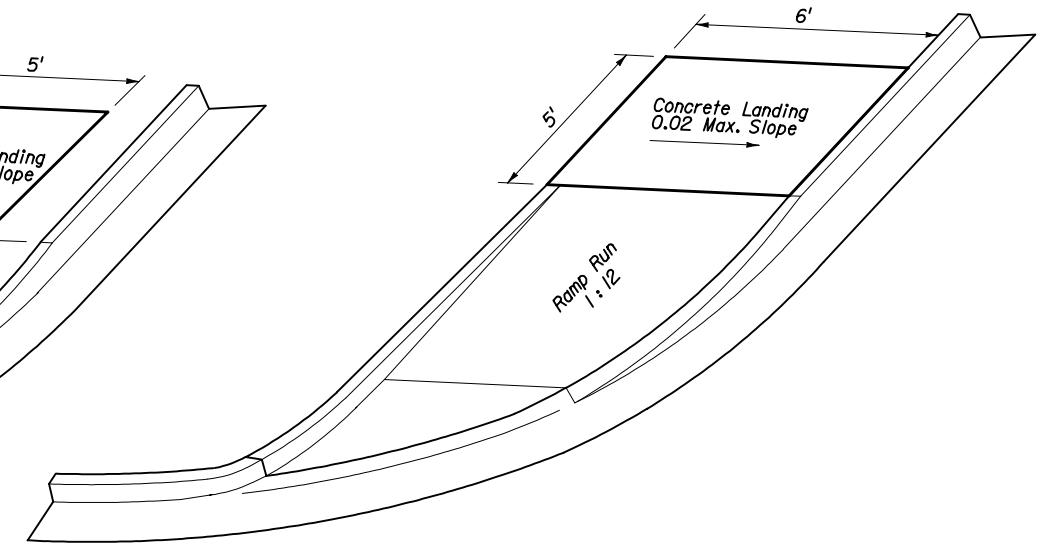
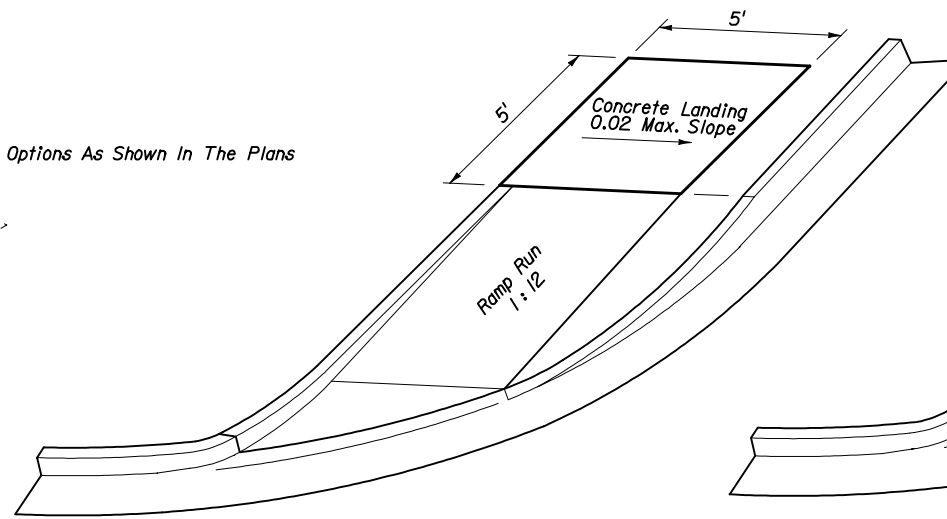
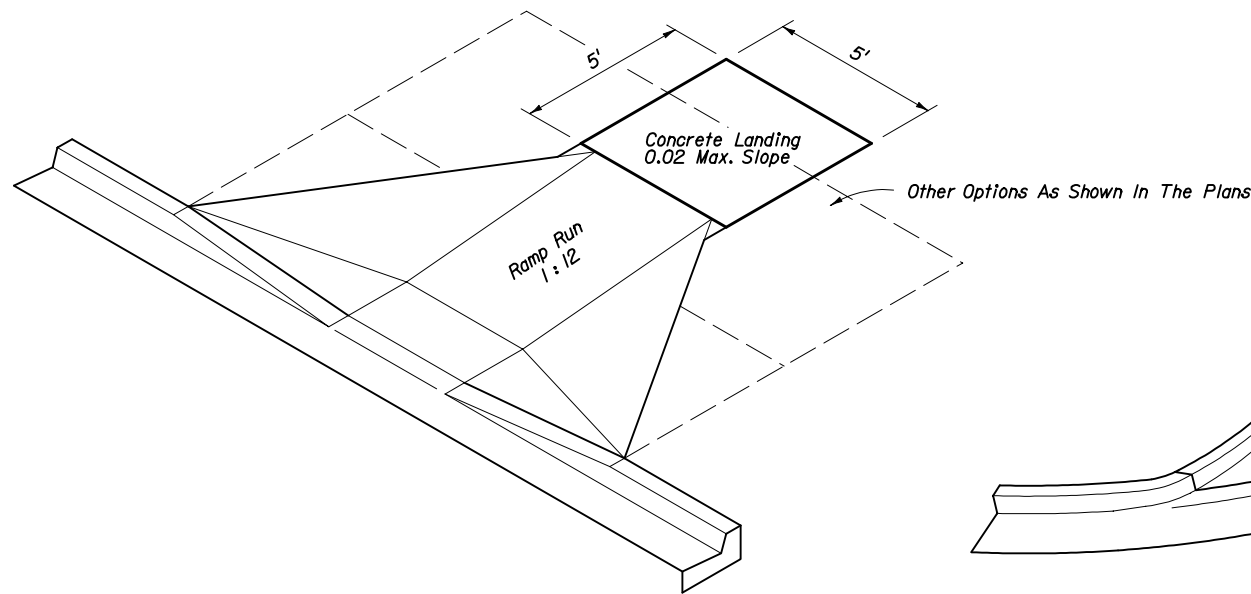
MEDIAN CROSSWALKS

Curb Transition (On Existing Facilities Remove And Reconstruct Curb Or Curb And Gutter) For Payment See General Note 9.



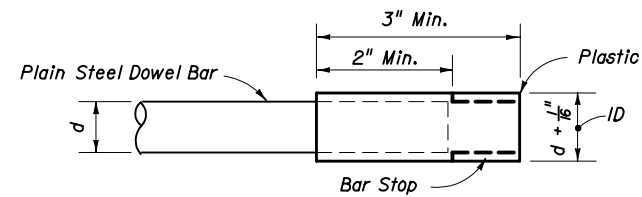
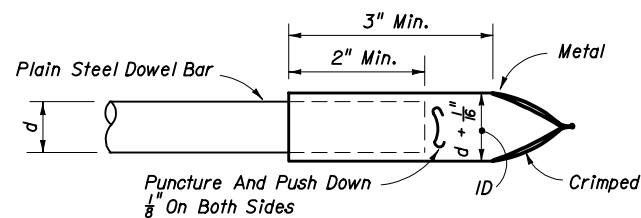
Curb Types A Or B Or Curb & Gutter Type E (Curb And Gutter Type E Shown)

PLAN

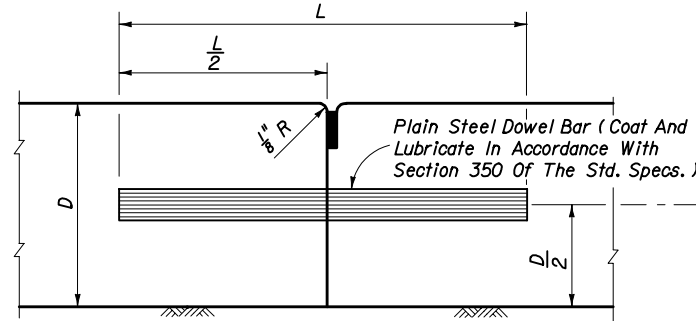
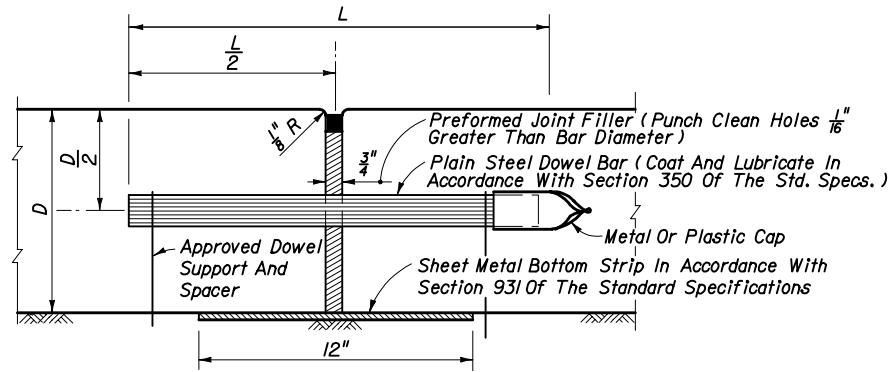


LANDINGS FOR RAMPS WITHIN PUBLIC RIGHT OF WAY CONSTRUCTED AT LOCATIONS WHERE FUTURE SIDEWALKS ARE PROPOSED, WHERE STABLE SURFACES OTHER THAN SIDEWALKS ARE PART OF A CONTINUOUS PASSAGE OR WHERE A CURB FALLS ALONG THE CIRCULATION PATH TO PEDESTRIAN ROUTES ON ADJACENT SITES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PUBLIC SIDEWALK CURB RAMPS				
Designed By	STAFF	Dates	10/94	Approved By
Drawn By	HKH	10/94	Revision	Sheet No.
Checked By	JVG	10/94	04	5 of 5
			Index No.	304



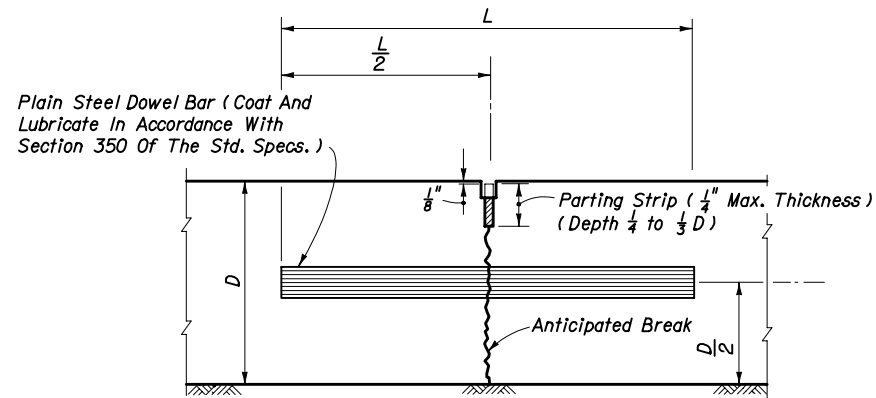
METAL OR PLASTIC CAPS FOR DOWEL BARS



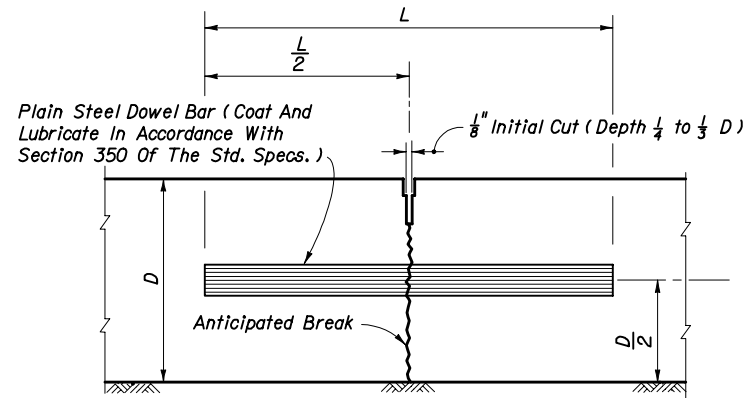
BUTT CONSTRUCTION JOINT TO BE USED AT DISCONTINUANCES OF WORK

Note: Expansion joints to be placed on approaches to bridges, at street intersections and other locations indicated in detail plans.

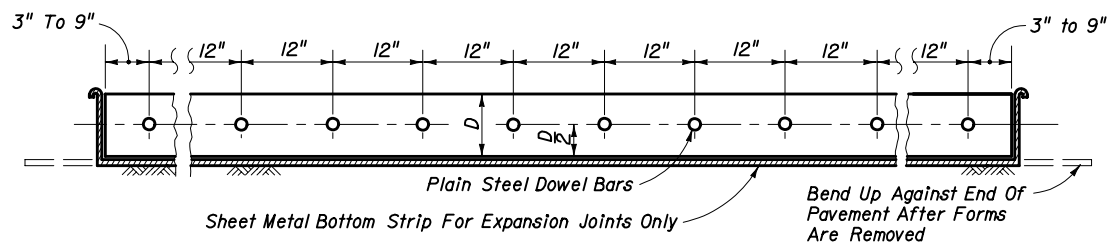
TRANSVERSE EXPANSION JOINT



TRANSVERSE CONTRACTION JOINT, VIBRO CAST METHOD



TRANSVERSE CONTRACTION JOINT, SAWED METHOD



DOWEL BAR LAYOUT

DOWELS (LENGTH 18")	
Pavement Thickness "D"	Diameter
6" - 6 1/2"	3/4"
7" - 8 1/2"	1"
9" - 10 1/2"	1 1/4"
≥ 11"	1 1/2"

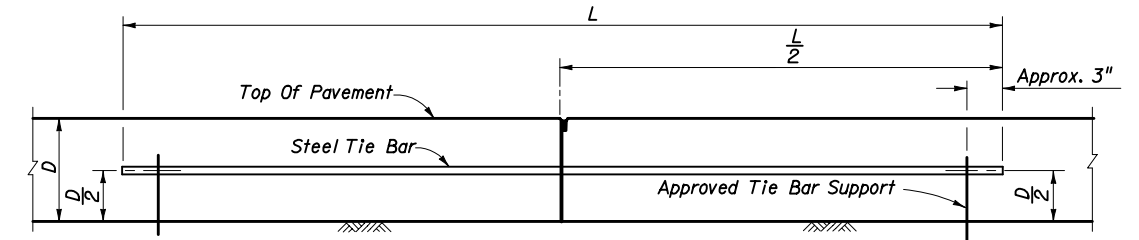
TRANSVERSE JOINTS

TRANSVERSE JOINTS ARE TO BE SPACED AT A MAXIMUM OF 15'. DOWELS ARE REQUIRED AT ALL TRANSVERSE JOINTS UNLESS OTHERWISE NOTED IN PLANS.

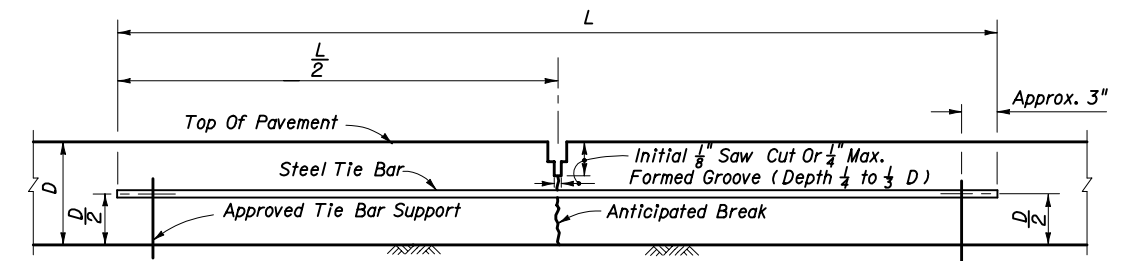
Pavement Thickness "D"	MAXIMUM TIE BAR SPACING			
	Distance To Closest Free Edge			
	12'	24'	24'	24'
	#4 Bars Length 25"	#5 Bars Length 30"	#4 Bars Length 25"	#5 Bars Length 30"
6"	48"	48"	26"	41"
7"	45"	48"	22"	35"
8"	39"	48"	19"	31"
9"	35"	48"	17"	27"
10"	31"	48"	15"	24"
11"	29"	45"	14"	22"
12"	26"	41"	13"	20"
13"	24"	38"	12"	19"
14"	22"	35"	11"	17"
15"	21"	33"	10"	16"

Tie bars are deformed #4 or #5 reinforcing steel bars meeting the requirements of Section 931 of the Standard Specifications.

When the distance to the closest free edge exceeds 24', provide a standard load transfer tied joint with #4 bars at 24" spacing. This joint can then be considered a free edge for determination of tie bar spacing on other joints.



Note: Tie bar spacing shall not exceed 24" at these joints.
LONGITUDINAL BUTT CONSTRUCTION JOINT



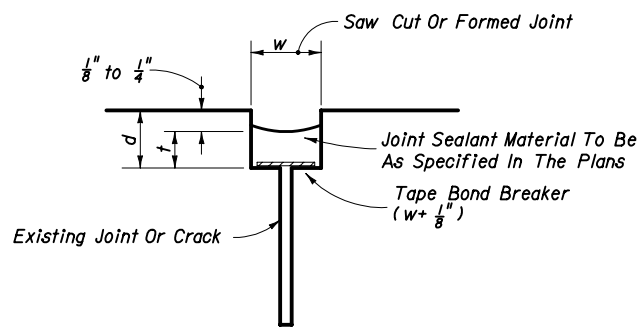
Note: Slabs poured simultaneously. Tie bars may be inserted in the plastic concrete by means approved by the Engineer.

LONGITUDINAL LANE-TIE JOINT

LONGITUDINAL JOINTS

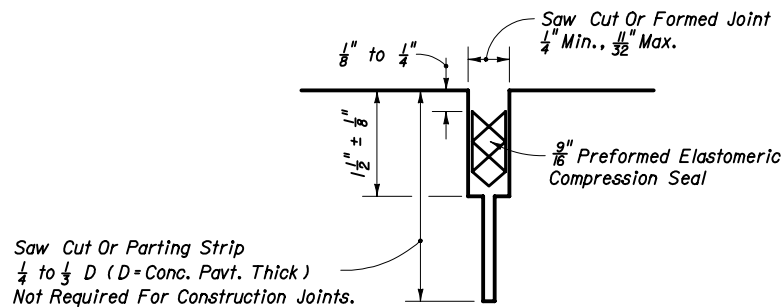
Note: For joint seal dimensions see Sheet 2.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE PAVEMENT JOINTS				
Names	Dates	Approved By		
Designed By		Bryan Distel State Pavement Design Engineer		
Drawn By	HW 08/57	Revision	Sheet No.	Index No.
Checked By	HEC 08/57	04	1 of 4	305

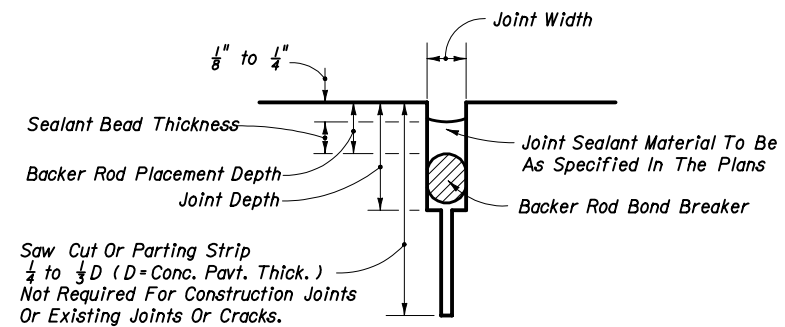


Note: Dimension w will be shown in the plans or established by the Engineer based on field conditions. Dimension d will be constructed so that the shape factor $\frac{d}{w}$ has a maximum value of 2.0 and a minimum value of 1.0.

FOR REHABILITATION PROJECTS
TAPE BOND BREAKER



FOR NEW PROJECTS
PREFORMED ELASTOMERIC COMPRESSION SEAL

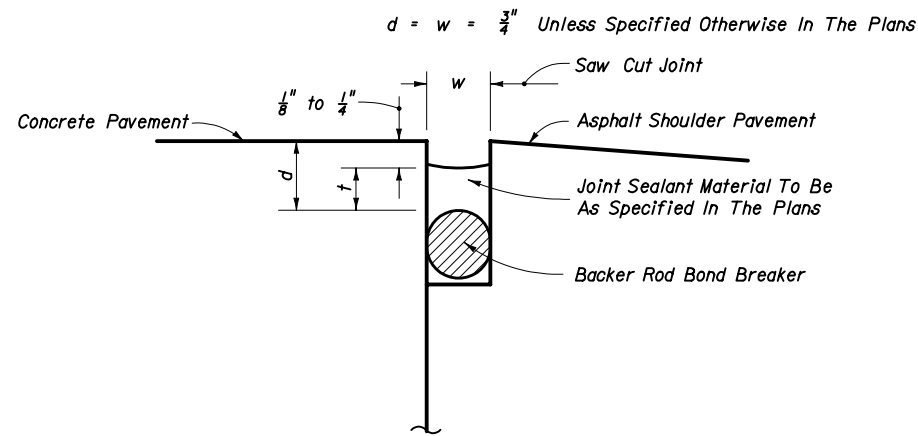


FOR NEW AND REHABILITATION PROJECTS
BACKER ROD BOND BREAKER

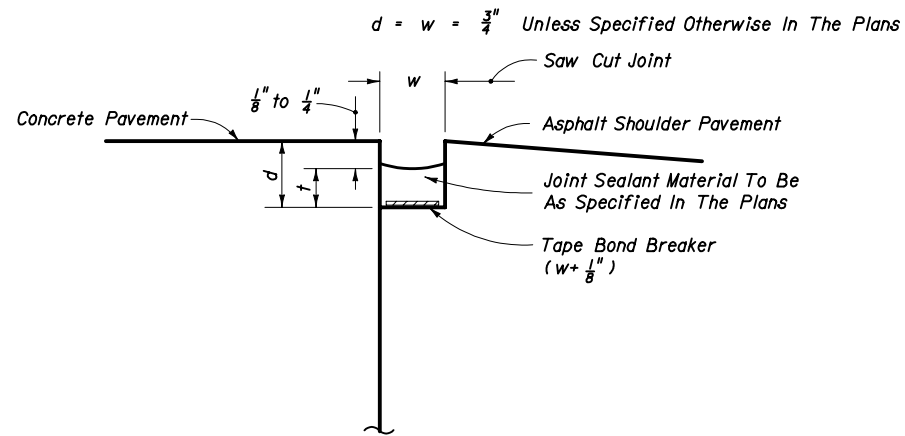
BACKER ROD BOND BREAKER (CONCRETE-CONCRETE JOINTS)				
JOINT DIMENSIONS (INCHES)				
JOINT WIDTH	SEALANT BEAD THICKNESS	BACKER ROD DIAMETER	MINIMUM JOINT DEPTH	BACKER ROD PLACEMENT DEPTH
1/4	1/4	3/8	1	1/2
3/8	1/4	1/2	1 1/4	1/2
1/2	1/4	5/8	1 1/4	1/2
5/8	5/16	3/4	1 1/2	9/16
3/4	3/8	1	1 3/4	5/8
7/8	7/16	1 1/8	1 3/4	11/16
1	1/2	1 1/4	2	3/4
> 1	1/2	1 1/2 +	2 +	3/4

Unless otherwise indicated on the plans the joint width for new construction will be 1/4" for construction joints, 3/8" for all other joints.
For rehabilitation projects the joint width will be shown on the plans or established by the Engineer based on field conditions.

CONCRETE-CONCRETE JOINTS



BACKER ROD BOND BREAKER



TAPE BOND BREAKER

FOR NEW AND REHABILITATION PROJECTS;
EITHER TAPE OR BACKER ROD BOND BREAKER REQUIRED;
SHOULDER MUST BE REPAIRED IF PROPER JOINT SHAPE
CAN NOT BE ATTAINED

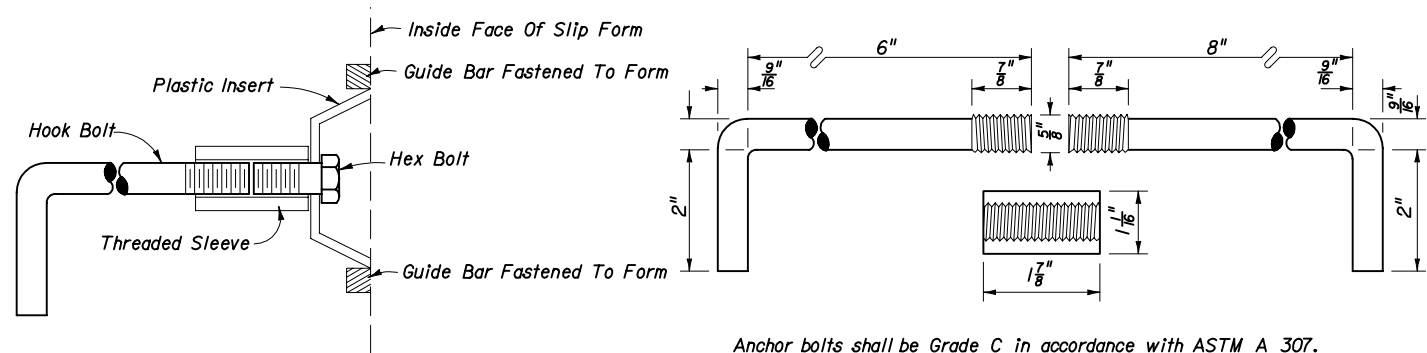
CONCRETE-ASPHALT SHOULDER JOINTS

JOINT SEAL DIMENSIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE PAVEMENT JOINTS

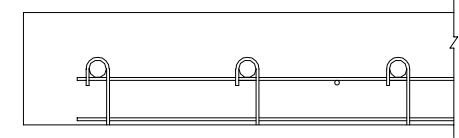
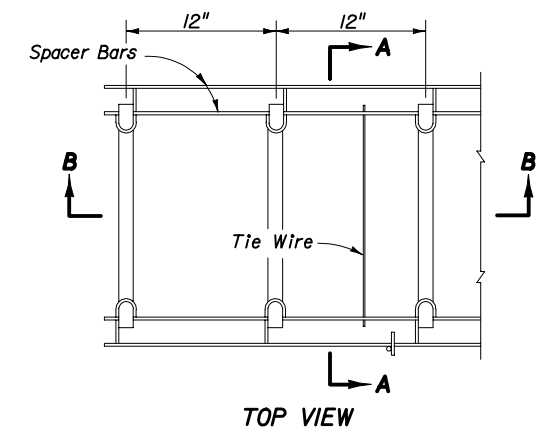
Designed By	NHL	05/86	Approved By <i>Bruce Distal</i> State Pavement Design Engineer	
Drawn By	HSD	05/86	Revision	Sheet No. 2 of 4
Checked By	JVG	05/86	00	Index No. 305



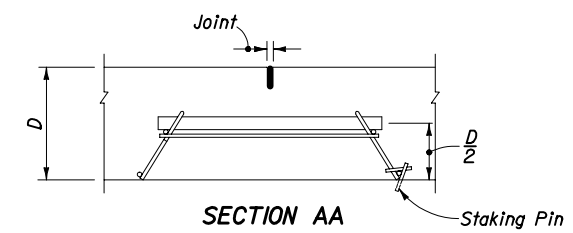
NOTE: After the concrete has set to the extent that the keyway will retain its shape, the hex bolt and plastic insert shall be removed. The remaining portion of the hook bolt assembly shall be installed immediately prior to placing of concrete in the adjacent lane.

Anchor bolts shall be Grade C in accordance with ASTM A 307. Threaded sleeves shall develop the full strength of the bolt and meet the material and thread requirements of ASTM A 563.

**ALTERNATE KEYWAY AND HOOK BOLT
STEEL HOOK BOLT ASSEMBLY**

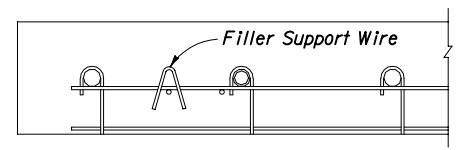
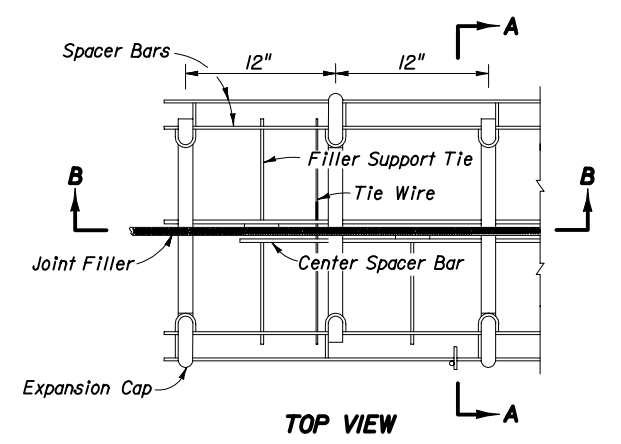


SECTION BB

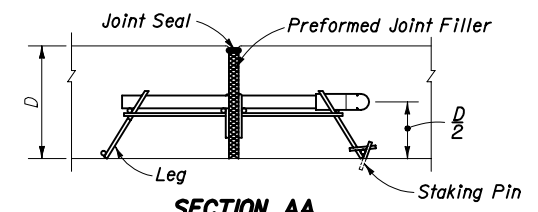


SECTION AA

CONTRACTION ASSEMBLY



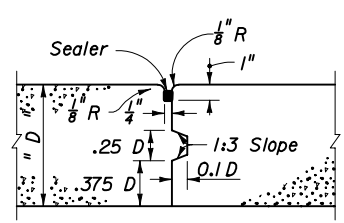
SECTION BB



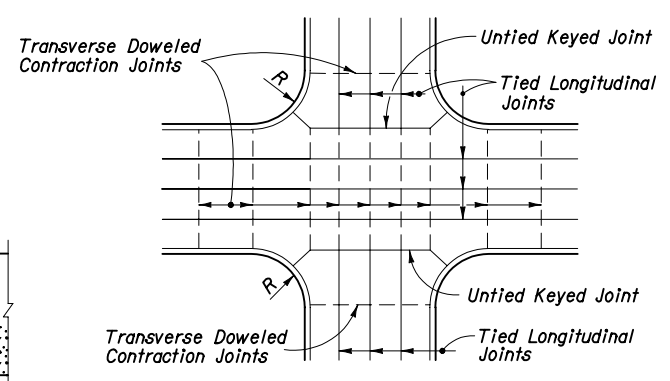
SECTION AA

EXPANSION ASSEMBLY

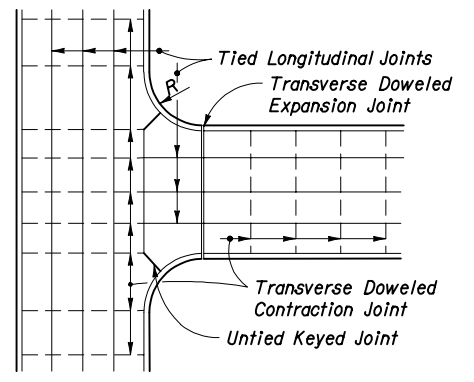
Note: Proprietary contraction and expansion assemblies may be used. Products shall be introduced to the State Construction Office in accordance with section (C) of the Product Evaluation Procedure.



KEYED JOINT



JOINT LAYOUT AT THRU INTERSECTION



JOINT LAYOUT AT 'T' INTERSECTIONS

NOTES

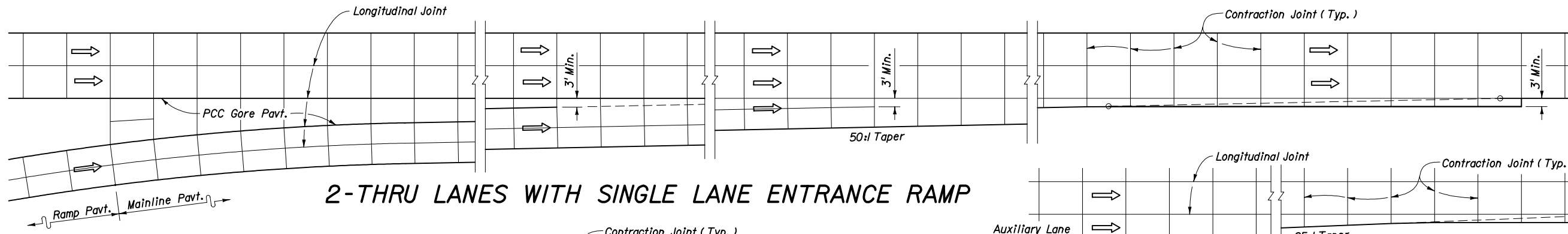
1. Longitudinal joints will not be required for single lane pavement 14' or less in width. For entrance and exit ramp joint details, see Sheet 4 of 4.
2. Arrangement of longitudinal joints are to be as directed by the Engineer.
3. All manholes, meter boxes and other projections into the pavement shall be boxed-in with 1/2" preformed expansion joint material.

JOINT ARRANGEMENT

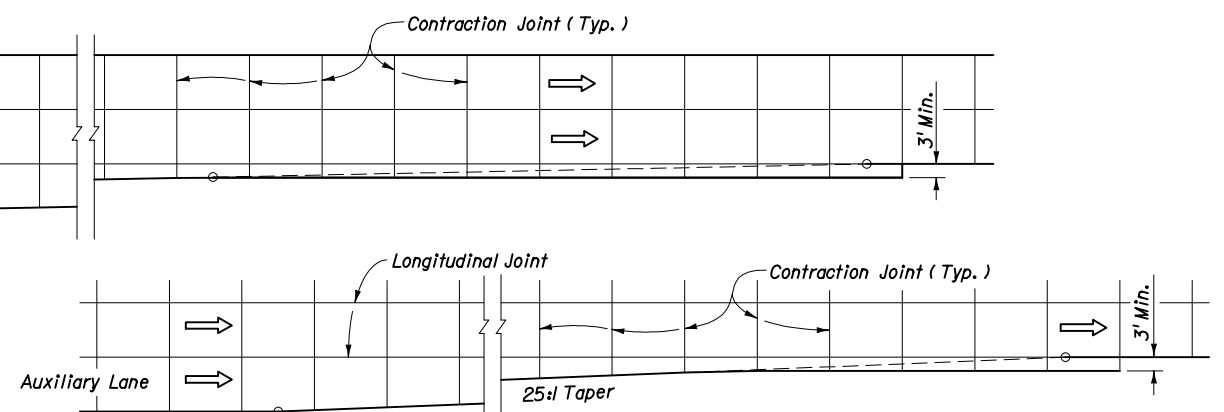
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE PAVEMENT JOINTS

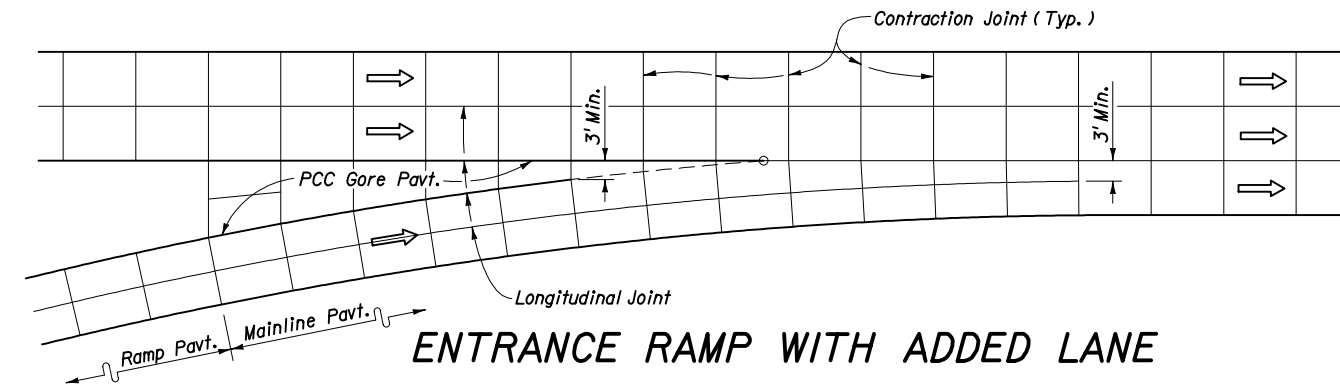
Names	Dates	Approved By		
Designed By	HMD 07/97	 State Pavement Design Engineer		
Drawn By	HSD 07/94			
Checked By	HMD 07/97	Revision	Sheet No.	Index No.
		00	3 of 4	305



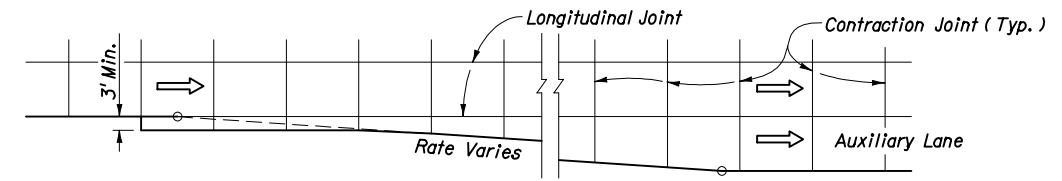
2-THRU LANES WITH SINGLE LANE ENTRANCE RAMP



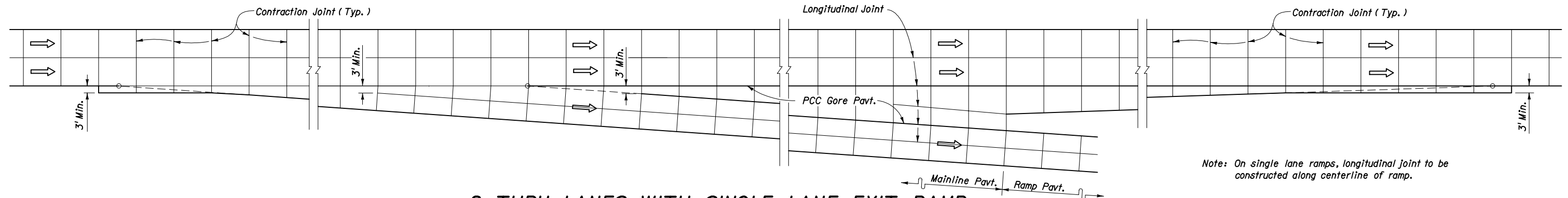
ENTRANCE TAPER WITH AUXILIARY LANE



ENTRANCE RAMP WITH ADDED LANE

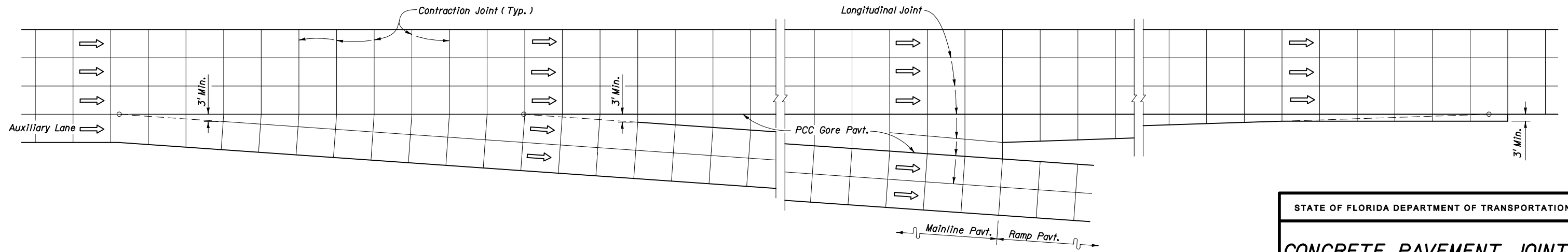


EXIT TAPER WITH AUXILIARY LANE



2-THRU LANES WITH SINGLE LANE EXIT RAMP

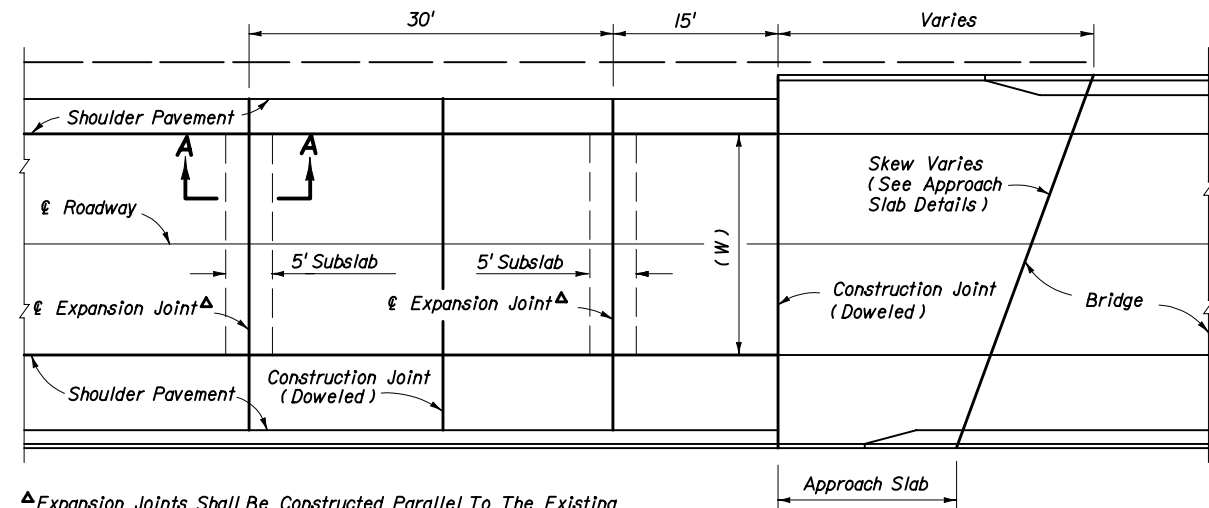
Note: On single lane ramps, longitudinal joint to be constructed along centerline of ramp.



3-THRU LANES WITH AUXILIARY LANE AND 2-LANE EXIT RAMP

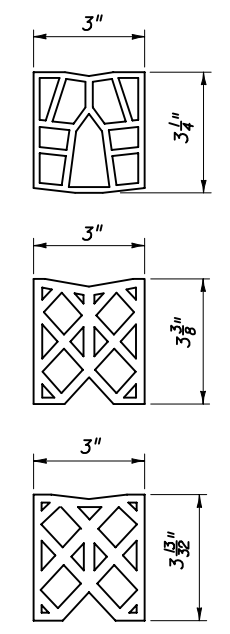
JOINT LAYOUT AT ENTRANCE AND EXIT RAMP TERMINALS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE PAVEMENT JOINTS				
Designed By	Names	Dates	Approved By	
Drawn By	HKH/STD	11/91	<i>Bruce Dittus</i>	
Checked By	WNL	11/91	Revision	Sheet No.
			00	4 of 4
			Index No.	305

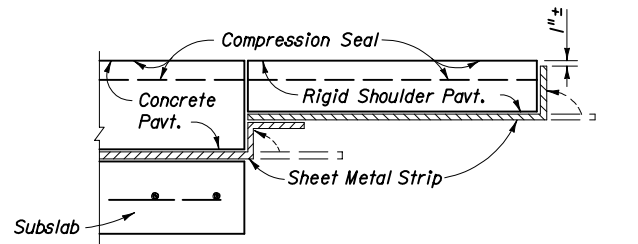


▲ Expansion Joints Shall Be Constructed Parallel To The Existing Transverse Pavement Joints On Rehabilitation Projects, And Parallel To The Standard Transverse Pavement Joints Shown In The Plans For New Construction.

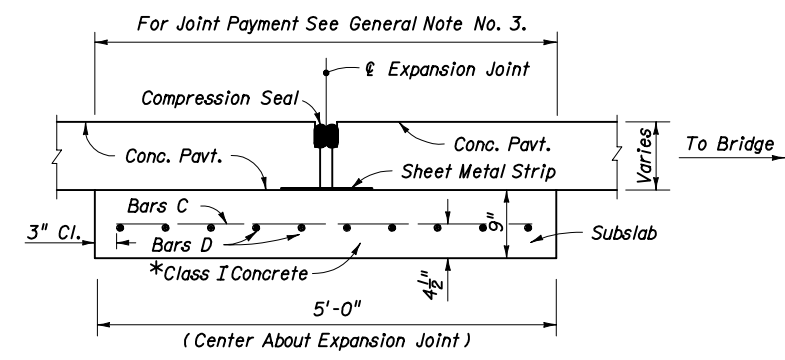
PLAN



OPTIONAL SEALS



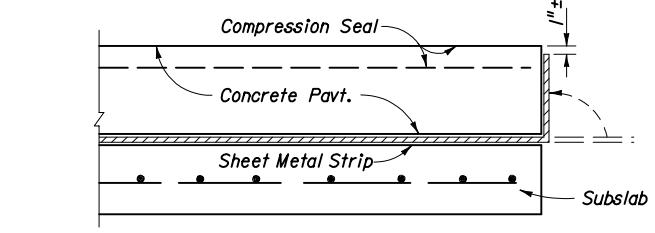
WITH RIGID SHOULDER PAVEMENT



REINFORCING STEEL				
Mark	Size	Spac.	No. Req.	Lgth.
C	5	6"	Varies	4'-6"
D	5	6"	10	W Minus 6"

*Finish surface smooth. Cure with heavy coating of wax base white pigmented curing compound. Apply second application immediately prior to placing pavement.

SECTION AA EXPANSION JOINT

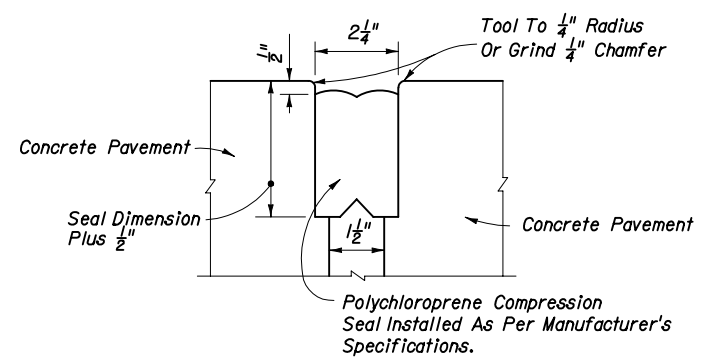


WITH GRASSED SHOULDER OR FLEXIBLE SHOULDER PAVEMENT

Note: Immediately prior to placing the seal, the joint shall be thoroughly cleaned of all foreign material. Immediately after the seal is placed, sheet metal strip shall be bent up against the pavement edge.

The sheet metal strip shall be a minimum 16 gage steel, 12" wide and shall be galvanized in accordance with ASTM A-526, Coating Designation G90.

DETAIL SHOWING SHEET METAL STRIP



Note: All contacting surfaces between the compression seal and concrete shall be thoroughly coated with a lubricant-adhesive.

JOINT DIMENSIONS COMPRESSION SEAL DETAIL

DESIGN NOTES

- For rehabilitation projects, the designer must indicate in the plans the number of slabs to be removed, the number of subslabs to be constructed/reconstructed, and the location of expansion joints.
- Pay quantity of expansion joint to be calculated across pavement at right angles to the centerline of the roadway pavement. Shoulder pavement joint included.

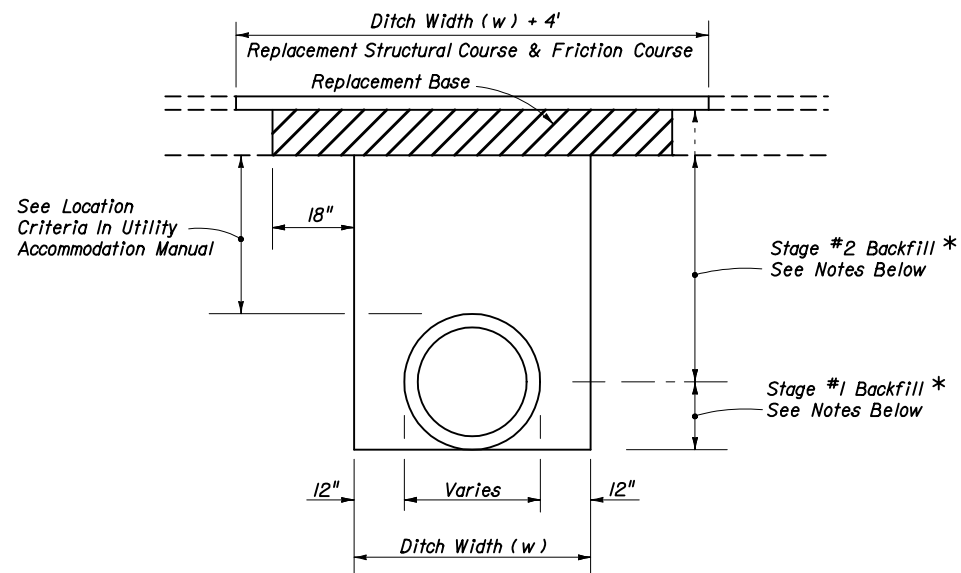
GENERAL NOTES

- The centerline of roadway and the centerline of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the centerline of the roadway pavement shall be determined.
- For information on other types of concrete pavement joints see Index No. 305.
- Pay quantity for expansion joint is the length of joint to be constructed across the roadway and shoulder pavements, measured at right angles to the centerline of the roadway. Payment for expansion joint shall be full compensation for joint construction, including reinforced concrete subslab, sheet metal strip and compression seal, but, not including roadway pavement reconstruction associated with joint replacement or reconstruction. Expansion joint to be paid for under the contract unit price for Bridge Approach Expansion Joint, LF.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

BRIDGE APPROACH EXPANSION JOINT-CONCRETE PAVEMENT

Names	Dates	Approved By <i>Bruce Distel</i>		
Designed By		State Pavement Design Engineer		
Drawn By	LMP 06/75	Revision	Sheet No.	Index No.
Checked By	SEA 06/75	04	1 of 1	306



FLEXIBLE PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

Pavement shall be mechanically sawed.

The replacement asphalt shall match the existing structural and friction courses for type and thickness.

The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 514).

BACKFILL

COMPACTED AND STABILIZED FILL OPTION

Backfill material shall be placed in accordance with Section 125 of the Standard Specifications.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct compacted fill along the sides of the pipe and up to the bottom of the base, with the upper 12" receiving Type B Stabilization. In lieu of Type B Stabilization, the Contractor may construct using Optional Base Group 3.

*** FLOWABLE FILL OPTION**

If compaction can not be achieved, through normal mechanical methods then flowable fill may be used.

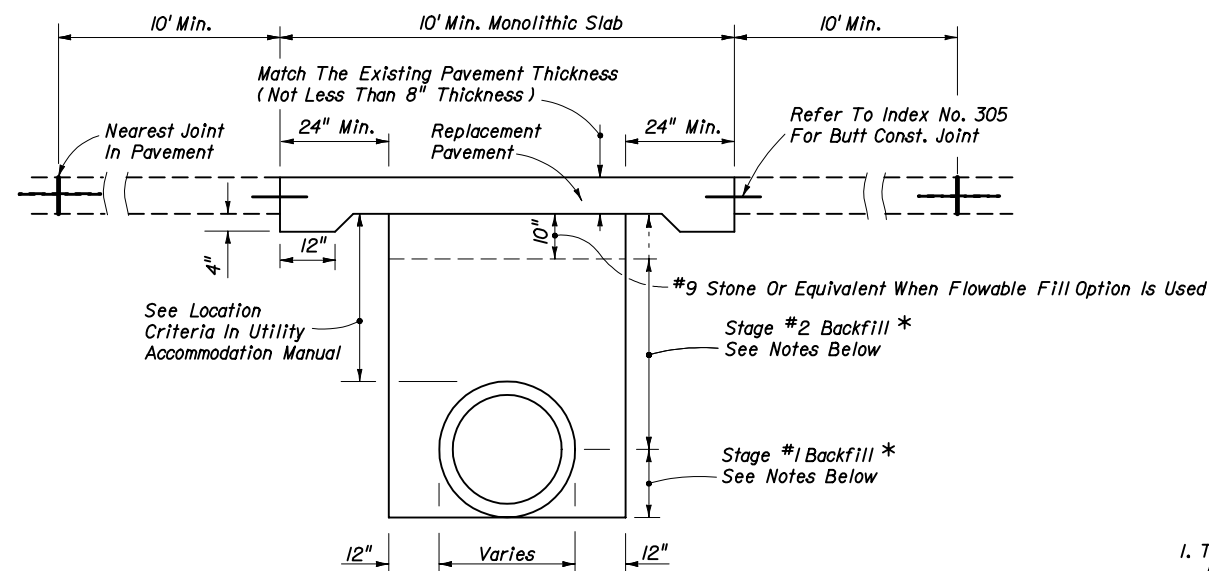
Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the existing base course.

FLEXIBLE PAVEMENT CUT



RIGID PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

High early strength cement concrete (3000 psi) meeting the requirements of Standard Specification 346 shall be used for rigid pavement replacement.

Pavement shall be mechanically sawed and restored to conform with existing pavement joints within 12 hours. (See Index No. 305)

GRANULAR BACKFILL

Any edgedrain system that is removed shall be replaced with the same type materials. Any edgedrain system that is damaged shall be repaired with methods approved by the Engineer.

Fill material shall be placed in accordance with the Standard Specifications. Fill material shall be special select soil in accordance with Index No. 505.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct fill along the sides of the pipe and up to the bottom of replacement pavement.

*** FLOWABLE FILL OPTION**

If mechanical compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the stone layer.

RIGID PAVEMENT CUT

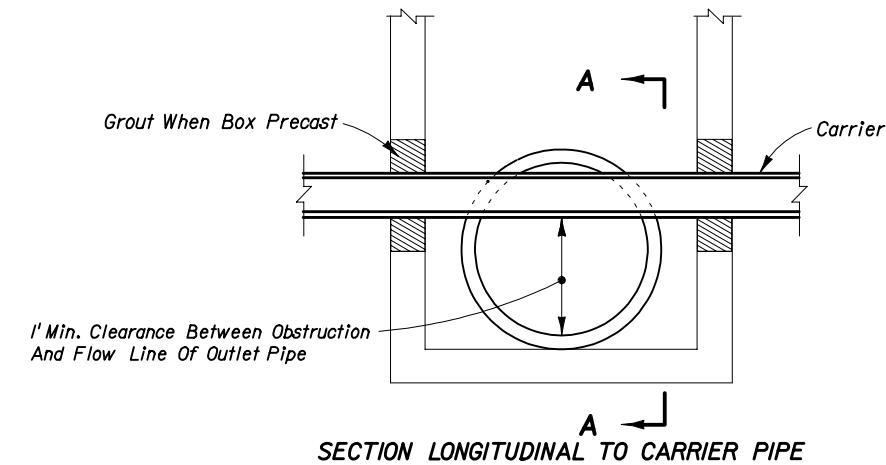
GENERAL NOTES

- The details provided in this standard index apply to cases in which jack and bore or directional boring methods are not required by the Engineer.
- Flowable fill shall not be placed directly over loose, or high plastic, or muck material (see Index 505) which will cause settlement due to fill weight. Where highly compressible material exists, the amount, shape and depth of flowable fill must be engineered to prevent pavement settlement.
- These details do not apply to utility cuts longitudinal to the centerline of the roadway which may require the additional use of geotextiles, special bedding and backfill, or other special requirements.
- Method of construction must be approved by the Engineer.
- Some pipe may require special granular backfill up to 6" above top of pipe. Geotextiles may be required to encapsulate the special granular material.
- Where asphalt concrete overlays exist over full slab concrete pavement, the replacement pavement shall have an overlay constructed over the replacement slab. The overlay shall match the existing asphalt pavement thickness. The replacement friction course shall match the existing friction course, except structural course may be used in lieu of dense graded friction course.

Existing broken and seated pavements shall be treated as flexible pavements.
- All shoulder pavement, curb, curb and gutter, and their substructure disturbed by utility trench cut construction shall be restored in kind.
- The use of flowable fill to reduce the time traffic is taken off a facility is acceptable but must have prior approval by the Engineer. Flowable fill use is allowed only when properly engineered for pavement crossings, whether straight or diagonal, and shall not be installed for significant depths or lengths. The maximum length shall be fifty (50) feet and a maximum depth of six (6) feet unless supported by an engineering document prepared by a registered professional engineer that specializes in soils engineering. The engineering document shall address the evaluation of local groundwater flow interruption and settlement potential.
- Excavatable flowable fill is to be used when the flowable fill option is selected.
- When approved by the Engineer, in lieu of the pavement and base, non-excavatable flowable fill may be used for manhole stabilization and ring and cover adjustments. Excavatable flowable fill shall not be used within the limits of the pavement and base.

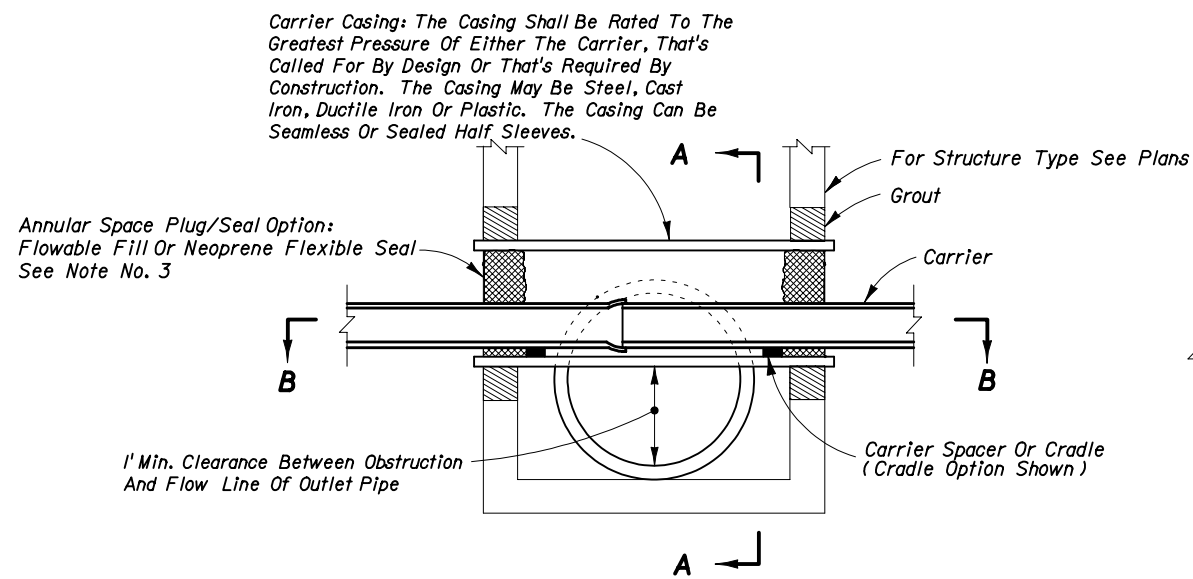
TRENCH CUTS AND RESTORATIONS ACROSS ROADWAYS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MISCELLANEOUS UTILITY DETAILS				
Designed By	Names	Dates	Approved By <i>Kenneth C. Wilson</i> State Utilities Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			04	1 of 3 307



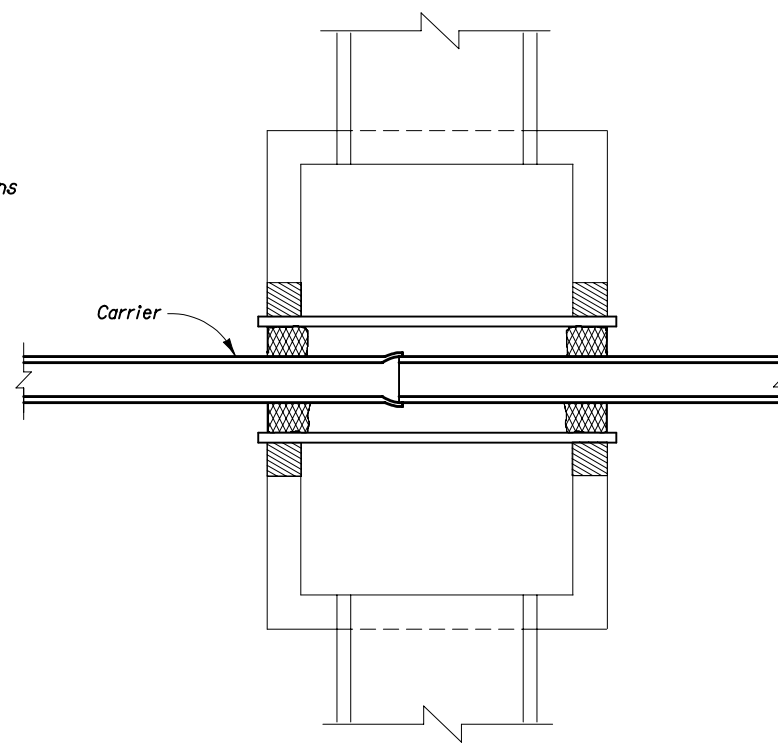
No Joints Allowed Within Structure
 (Non-Pressure Or Non-Fluid Carrier Installations)

UTILITY CONFLICT CONDITION I

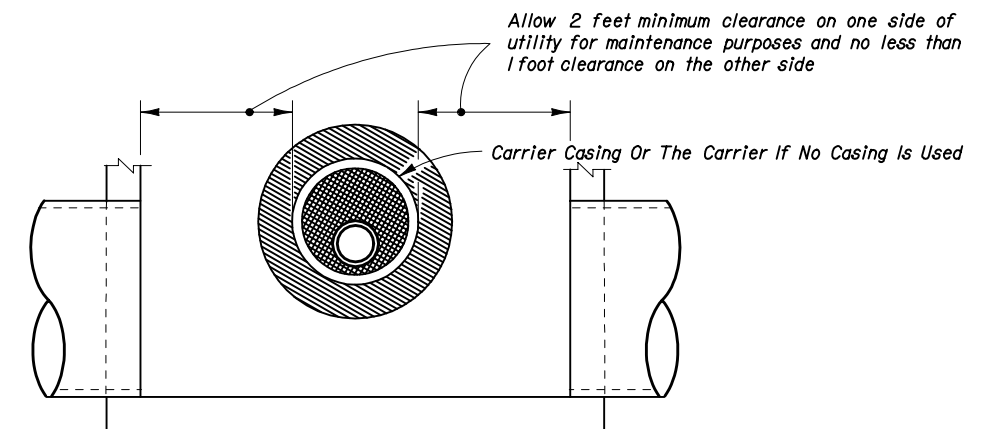


SECTION LONGITUDINAL TO CARRIER PIPE
 (Pressure Or Fluid Carrier Installations)

UTILITY CONFLICT CONDITION II



SECTION BB



DESIGNERS NOTE

"Sumped" Conflict Manholes Shall Not Be Used Unless The System Is Hydraulically Designed To Account For The Headloss Generated If The Sump Is Completely Blocked

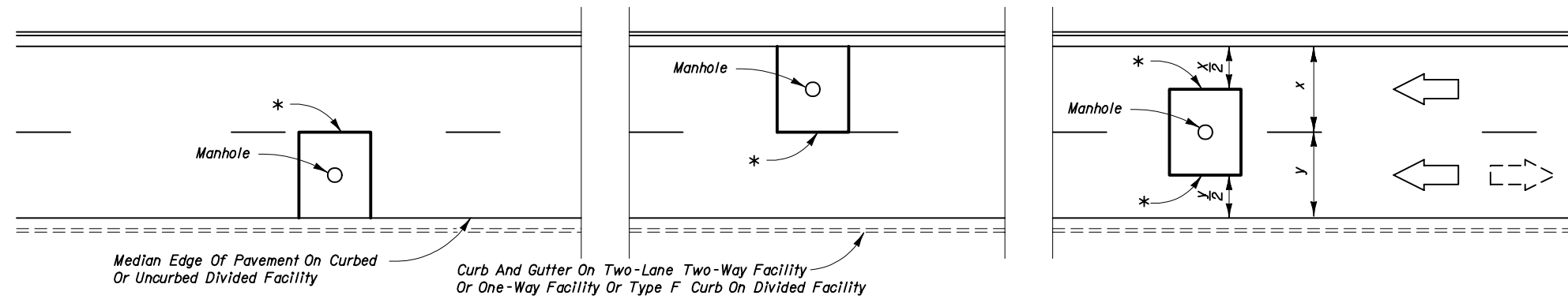
SECTION AA

NOTES FOR UTILITY CONFLICT PIPE

1. These details are for construction field expediency to resolve utility conflicts that cannot be remedied by relocation. For conflicts determined during design, use the construction shop drawings for structure details.
2. Concrete used in conflict structures shall be as specified in ASTM C478. 4000 psi may be used in lieu of Class I concrete.
3. Maximum opening for pipe shall be the pipe OD plus 6". Mortar used to seal the pipe into the opening will be of such mix that shrinkage will not cause leakage into or out of the structure.
4. If the conflict structure is round or there are multiple inlet or outlet pipes, then the wall section should be reviewed for strength.

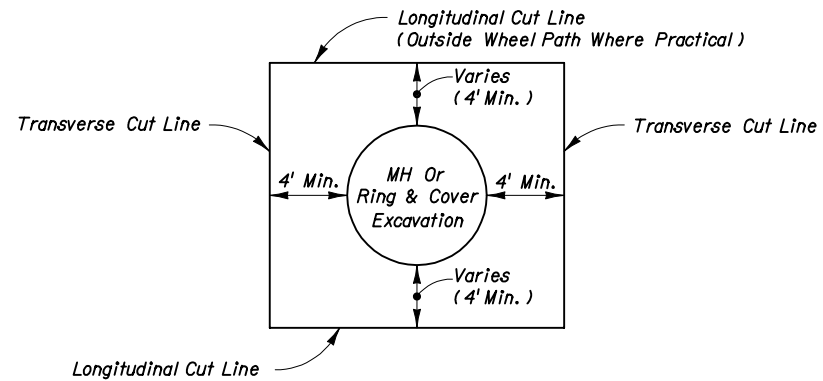
UTILITY CONFLICT PIPES THRU STORM SEWER STRUCTURES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MISCELLANEOUS UTILITY DETAILS				
Designed By	Names	Dates	Approved By <i>Kenneth C. Welton</i> State Utilities Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			04	2 of 3 307



* Longitudinal Cut Lines For Both Curbed And Uncurbed Facilities Must Coincide With A Regular Seam Or Mid-Lane Point In Order To Be Outside The Wheel Path

**PLAN VIEW
FOR TWO OR MORE LANES (TWO LANES SHOWN)**



PARTIAL CUTS FOR RING AND COVER ADJUSTMENTS

NOTES

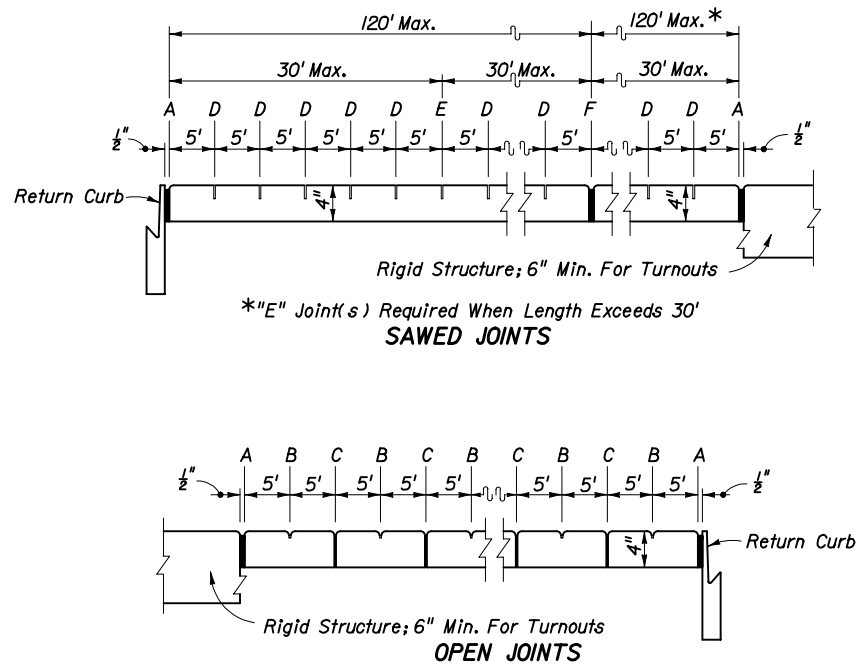
1. No irregular seams are permitted. All seams must be clean sawed.
2. Pavement cut seams for underground utility structures in rigid pavement are the same longitudinally, but the transverse seams shall extend to the nearest existing joint.
3. See Sheet 1 for replacement pavement.

NON-TRENCH PAVEMENT CUTS FOR UNDERGROUND UTILITY STRUCTURES IN PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**MISCELLANEOUS
UTILITY DETAILS**

Designed By	Names	Dates	Approved By <i>Kevin P. C. ...</i> State Utilities Engineer		
Drawn By			Revision	Sheet No.	Index No.
Checked By			04	3 of 3	307



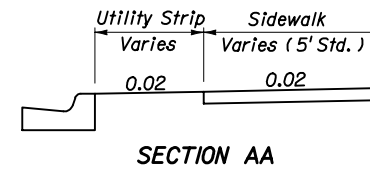
EXAGGERATED SCALE
LONGITUDINAL SECTION
SIDEWALK JOINTS

JOINT LEGEND

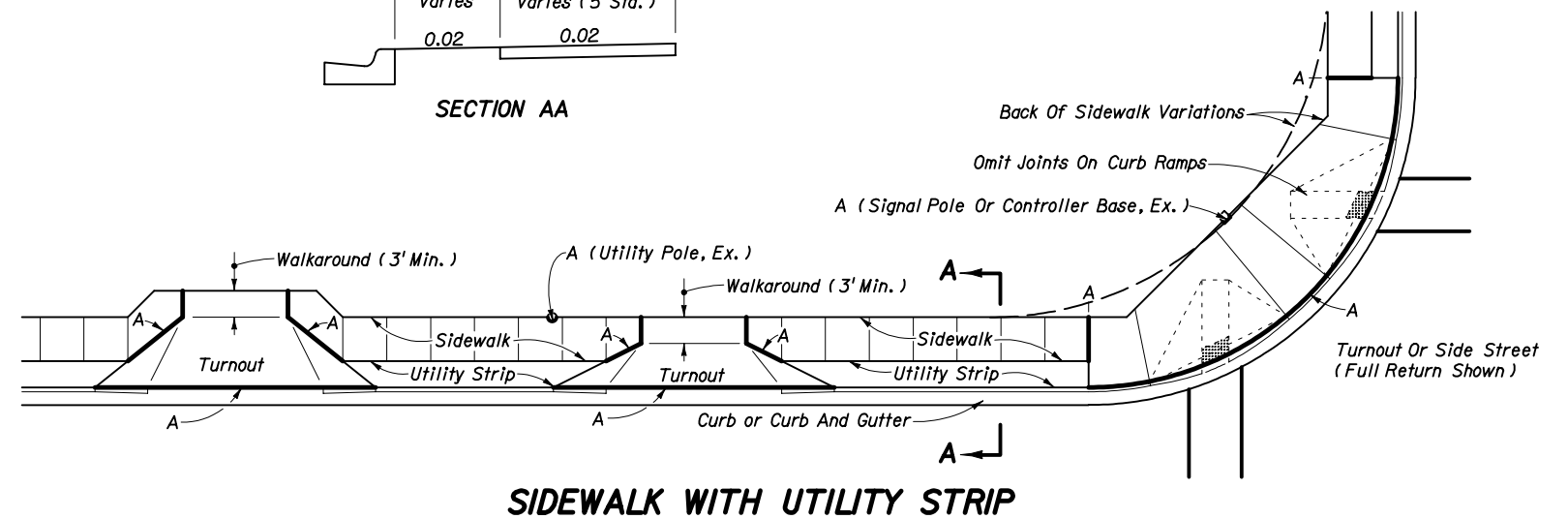
- A- $\frac{1}{2}$ " Expansion Joints (Preformed Joint Filler)
- B- $\frac{1}{8}$ " Dummy Joints, Tooled
- C- $\frac{1}{8}$ " Formed Open Joints
- D- $\frac{3}{16}$ " Saw Cut Joints, $1\frac{1}{2}$ " Deep (96 Hour) Max. 5' Centers
- E- $\frac{3}{16}$ " Saw Cut Joints, $1\frac{1}{2}$ " Deep (12 Hour) Max. 30' Centers
- F- $\frac{1}{2}$ " Expansion Joint When Run Of Sidewalk Exceeds 120'.
Intermediate locations when called for in the plans or at locations as directed by the Engineer.
- G- Cold Joint With Bond Breaker, Tooled

NOTES FOR CONCRETE SIDEWALK ON CURBED ROADWAYS

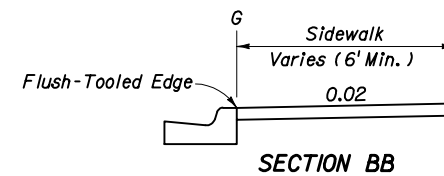
1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications except for public sidewalk curb ramp runs which shall be finished in accordance with Index No. 304.
2. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils nor more than $\frac{1}{2}$ ".
3. For public sidewalk curb ramps see Index No. 304.
4. For turnouts see Index No. 515.
5. Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (___ Thick), S.Y.



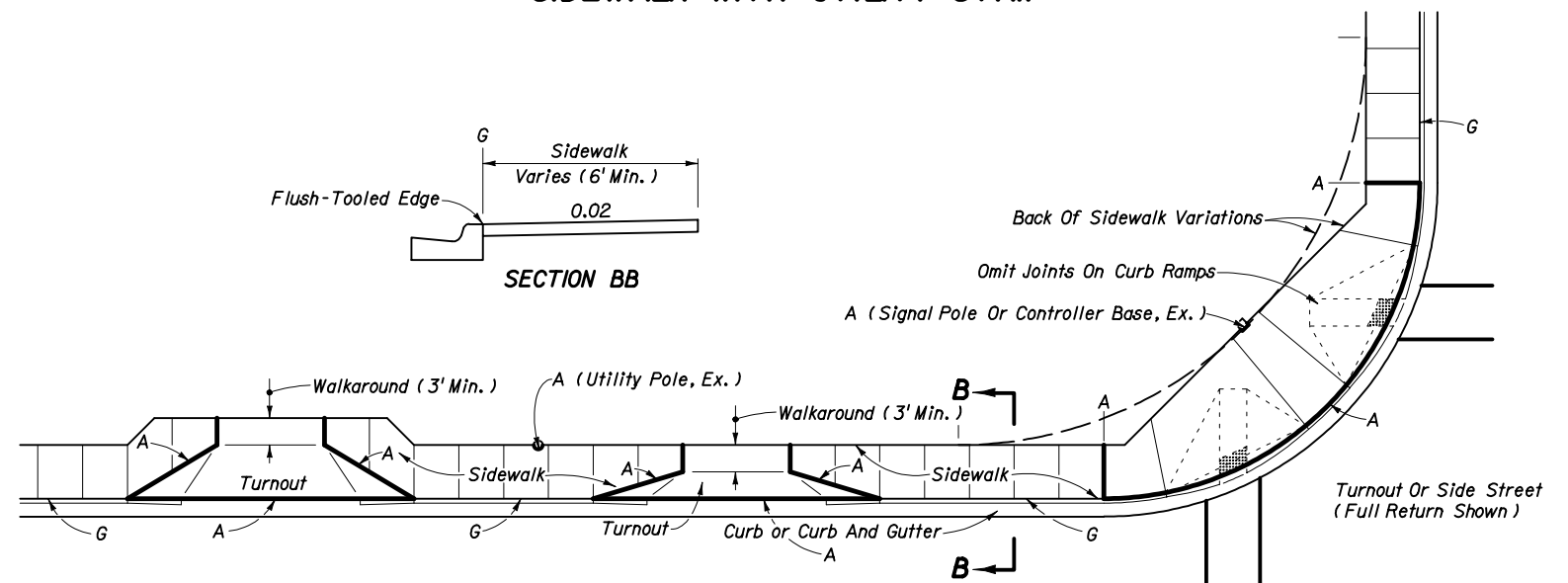
SECTION AA



SIDEWALK WITH UTILITY STRIP



SECTION BB



SIDEWALK WITHOUT UTILITY STRIP

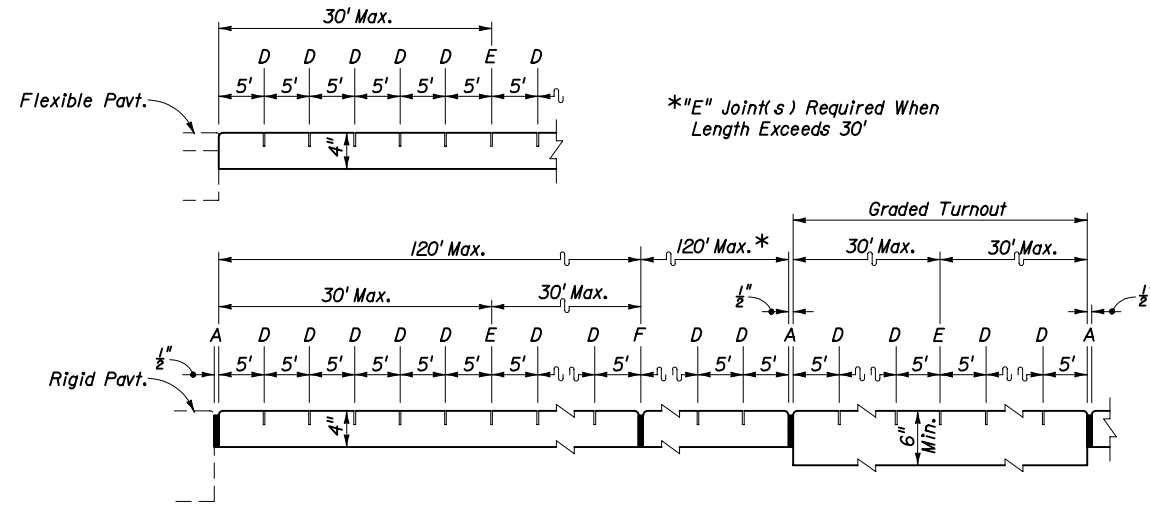
CONCRETE SIDEWALK FOR CURBED ROADWAYS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE SIDEWALK				
Designed By	SPBCS	Dates	Approved By <i>Jamell D. Mill</i> Roadway Design Engineer	
Drawn By	HKH	11/93	Revision	Sheet No. Index No.
Checked By	JVG	11/93	04	1 of 2 310

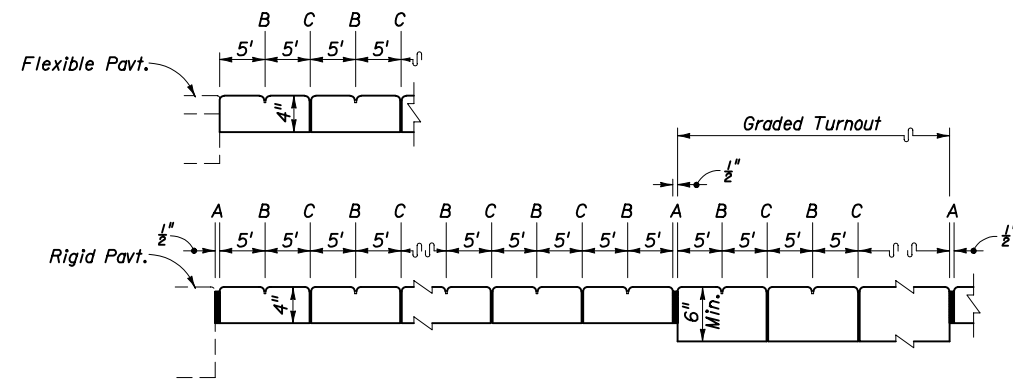
NOTES FOR CONCRETE SIDEWALKS ON UNCURBED ROADWAYS

1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications.
2. Sidewalks adjoining driveways 24' and wider, right in-right out composite driveways and side roads and streets shall have a detectable warning surface that extends the full width of the sidewalk and in the direction of travel 24" (610 mm) from the edge of driveways and edge of side roads and streets. Detectable warning surfaces shall conform to the requirements described in the General Notes on Index No. 304.

For sidewalks continuous through driveways, detectable warning surfaces are not required.
3. For turnouts see Index No. 515.
4. Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (___ Thick), SY.



SAWED JOINTS

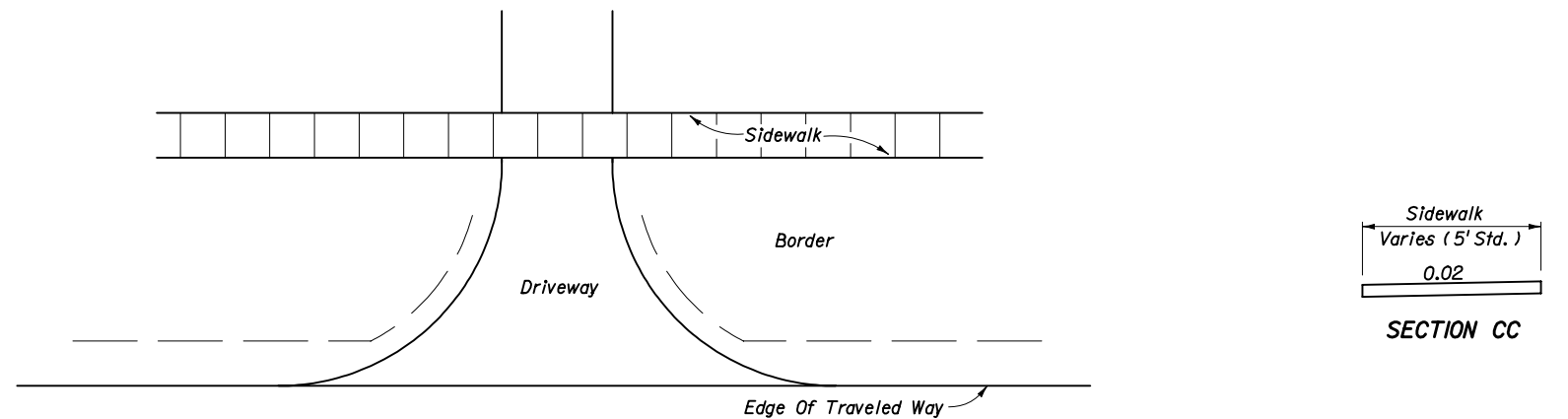


OPEN JOINTS

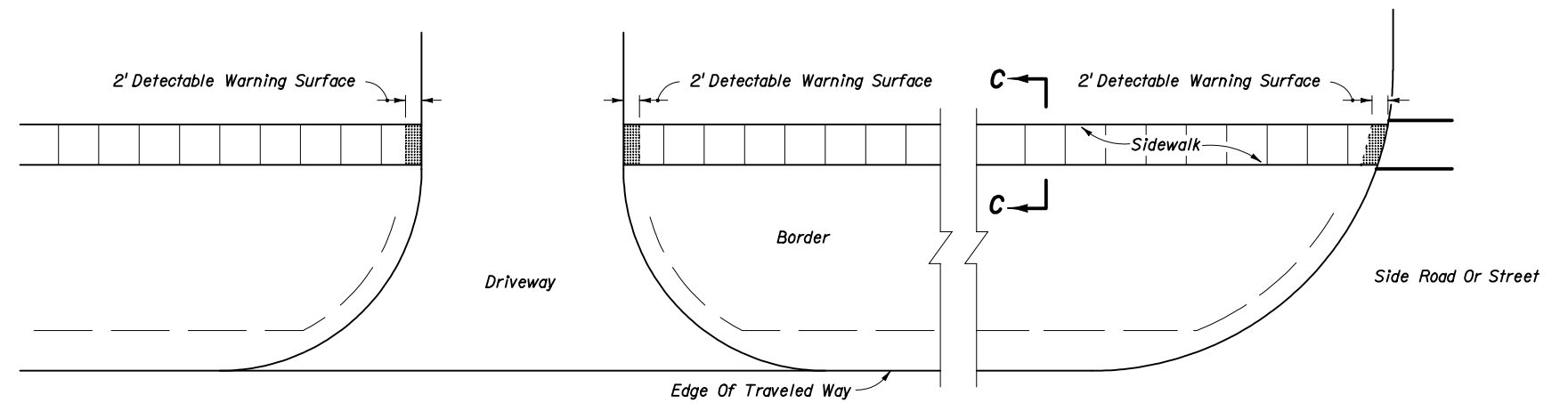
**EXAGGERATED SCALE
LONGITUDINAL SECTIONS
SIDEWALK JOINTS**

JOINT LEGEND

- A - 1/2" Expansion Joints (Preformed Joint Filler)
- B - 1/8" Dummy Joints, Tooled
- C - 1/8" Formed Open Joints
- D - 3/8" Saw Cut Joints, 1 1/2" Deep (96 Hour) Max. 5' Centers
- E - 3/8" Saw Cut Joints, 1 1/2" Deep (12 Hour) Max. 30' Centers
- F - 1/2" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.



CONTINUOUS SIDEWALK



DISCONTINUOUS SIDEWALK

PLAN

CONCRETE SIDEWALK FOR UNCURBED ROADWAYS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE SIDEWALK				
Designed By	SPBCS	Dates	Approved By <i>Lamell D. Mill</i> Roadway Design Engineer	
Drawn By	HKH	4/99	Revision	Sheet No. Index No.
Checked By	JVG	4/99	04	2 of 2 310


GENERAL NOTES

1. The illustrations for guardrail applications are standard configurations; adjustments are to be made as required by site specific conditions to attain optimum design for function, economy and serviceability.
2. The beginning of guardrail need shall be at the greatest of the upstream distances from the hazard, as determined from Figures 1 and 2, and other application details of this Index.
3. One Panel (i.e. panel length) equals 12'-6". Guardrail shall be constructed with rail elements 12'-6" in length except where 25'-0" elements are called for by this and other standards (indexes) or specifically called for in the plans.

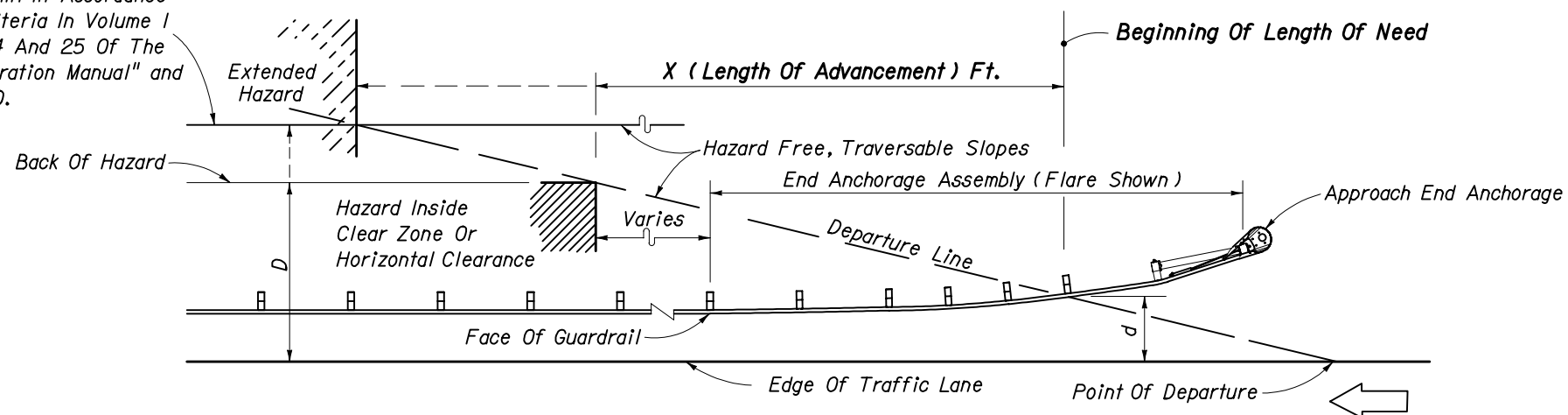
Post spacings shall be 6'-3" except that reduced spacings shall be used for (a) transitions to anchorages at rigid structures such as bridges (See Detail J and Index No. 402) and transitions to redirective crash cushions, (b) the conditions in Note No. 7 below, (c) special post applications, (d) reduced post spacing required for specific end anchorage assemblies, and, (e) specific spacings called for in the plans.
4. Guardrail mounting height for the W-beam without rubrail and for thrie-beam is 1'-9" to the center of beam, and for W-beam with rubrail 2'-0" to center of beam. Modified thrie-beam shall be mounted at a height of 2'-0" to center of beam. The height is critical and shall be attained in all cases; a tolerance of 3" above and 1" below the standard mounting heights is permissible over necessary surface irregularities (e.g., across shoulder gutters, inlets and roadway surface break lines).
5. All guardrail panels, end sections and special end shoes shall be lapped in the direction of adjacent traffic.
6. Flared end anchorage assemblies providing 4' offset are the standard end treatments for single face free standing guardrail approach ends. Parallel end anchorage assemblies for guardrail approach end treatments will be constructed only when restraints prevent construction of flared end anchorages.
7. At above ground rigid hazards where the face of guardrail is offset from the hazard less than the 4' minimum for standard W-beam, other guardrail configurations may be applicable; see General Note No. 10 and the minimum offset table on Sheet 17. For guardrail with post spacing less than 6'-3" the reduced spacing should extend a minimum of one panel in advance of the hazard. When minimum offset cannot be attained safety shape concrete barrier shall be used unless other shielding is approved by the Engineer of Record. See Index No. 410 for safety shape concrete barriers and typical applications, and the plans for special barrier shapes and applications.
8. In addition to use at roadside hazards or other areas where the Engineer has deemed guardrail necessary, guardrail will be required on flush shoulder sections where fill slopes are steeper than 1:3 within the clear zone, and curbed sections where fill slopes are steeper than 1:3 within 4' of the face of curb when fill heights are 6' or greater.
9. The guardrail to bridge connections contained in this Index are for bridges with Test Level 4 traffic railing barriers. For guardrail to concrete barrier wall connections see Index No. 410. For existing bridges receiving retrofit traffic railing barriers see Index No. 402.
10. The W-beam guardrail system in this index is the standard system to be used on the State Highway System where a Test Level 3 semi-rigid barrier is required.
11. Thrie-beam guardrail panels shall be used in guardrail transitions to bridge traffic railing barriers, to concrete and certain water filled safety shaped barriers, certain crash cushions and as a continuous barrier when called for in the plans. For additional information on rail attachment, post spacings, nested rails, location of thrie-beam transition panels and offset block configurations see details elsewhere in this Index, and Index Nos. 402, 410, 416, 435, 440 and 441. The use of thrie-beam guardrail with standard offset blocks (Test Level 3 semi-rigid system) may be considered where one or more of the conditions listed below or similar conditions are anticipated or exist:
 - a. W-beam deflection is marginal,
 - b. W-beam with rubrail considered functionally deficient,
 - c. Vehicle overriding W-beam is probable,
 - d. Drainage will be impeded or blocked by the use of concrete barrier wall (subject to deflection space requirements),
 - e. High frequency of repairs to W-beam,
 - f. Spandrel beam with low deflection needed around unrelocatable structure, and,
12. Single face median guardrail for bridges located on divided roadways shall be constructed the same as outer roadway guardrail under the following conditions:
 - (a) Wide medians where approach end anchor is located outside of opposing roadway clear zone.
 - (b) Medians of uniform width that are occupied by other transportation and joint use facilities.
 - (c) Medians of uniform or variable widths with independent vertical alignments not suited to normal median guardrail installations.
 - (d) Medians of bifurcated roadways.
13. Straight rail sections may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shop-bent) to fit.
14. Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in lieu of Type II assemblies located in the approach clear zones.
15. Corrugated sheet steel beams, end shoes, end sections and back-up plates shall conform to the current requirements of AASHTO M180, Class A, Type II (zinc) coating. All other metallic components, hardware and accessories shall be in conformance with the appropriate current AASHTO requirements.

Recycled beams: Used Class A guardrail beams that have been refurbished to condition new (AASHTO M180) may be used for both construction of new guardrail and maintenance of existing guardrail. Refurbishing shall include stripping of the existing galvanizing, restoration of the base metal in section and straightness free of warp and deformation, and, regalvanizing to AASHTO Type II specifications. Refurbished beams that retain ruptured holes, gashes or tears will not be accepted.
16. Steel offset blocks other than modified thrie-beam offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. Permissible post and offset block combinations are tabulated on Sheet 15.
17. Where necessary to enlarge or add holes to galvanized guardrail, the work will be done by drilling or reaming. Damaged galvanized guardrail will be metalized in accordance with Sections 562 and 971 of the Standard Specifications. No burning of holes will be permitted.
18. Guardrail reflector color (white or yellow) shall conform to the color of the near lane edgeline.
19. Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using timber or steel posts. Repair within a run of guardrail with existing concrete posts can be made with either steel, timber, sound salvaged concrete posts; replacement in kind of damaged posts is to be made when like posts are on hand at time of repair.
20. Substitutions between thrie-beam guardrail and concrete barrier wall are not eligible for VECP consideration.
21. On roadways designated for reverse laning, all downstream ends of guardrail that are not shielded or that are not designed as approach end terminals shall be marked with post-mounted Type 3 Object Markers. Trailing bridge ends and trailing shoulder concrete barrier wall ends shall be marked with Type 3 Object Markers except where there is trailing end guardrail. Object markers to be installed facing reverse laning traffic.

The modified thrie-beam guardrail is a Test Level 4 semi-rigid system and may be used where a Test Level 4 guardrail is required.

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Clear Zone Limit Or Horizontal Clearance Limit In Accordance With The Criteria In Volume 1 Chapters 2, 4 And 25 Of The "Plans Preparation Manual" and Index No. 700.



Design Speed mph	X (Length Of Advancement) Ft. [■]
≤ 45	= 16 (D-d)
≥ 50	= 13 (D-d)

■ Length of advancement determined from the diagram and equations above establishes the location of the upstream beginning length of need for guardrail, however, the length of advancement can be no less than that required by other details of this index.

The flared end anchorage with 4' nose offset is shown in the diagram above, however, the diagram applies to other configurations that may occur at the beginning of length of need, such as, other flare designs; upstream returns; and, other upstream deflected, tangent and curvilinear conditions.

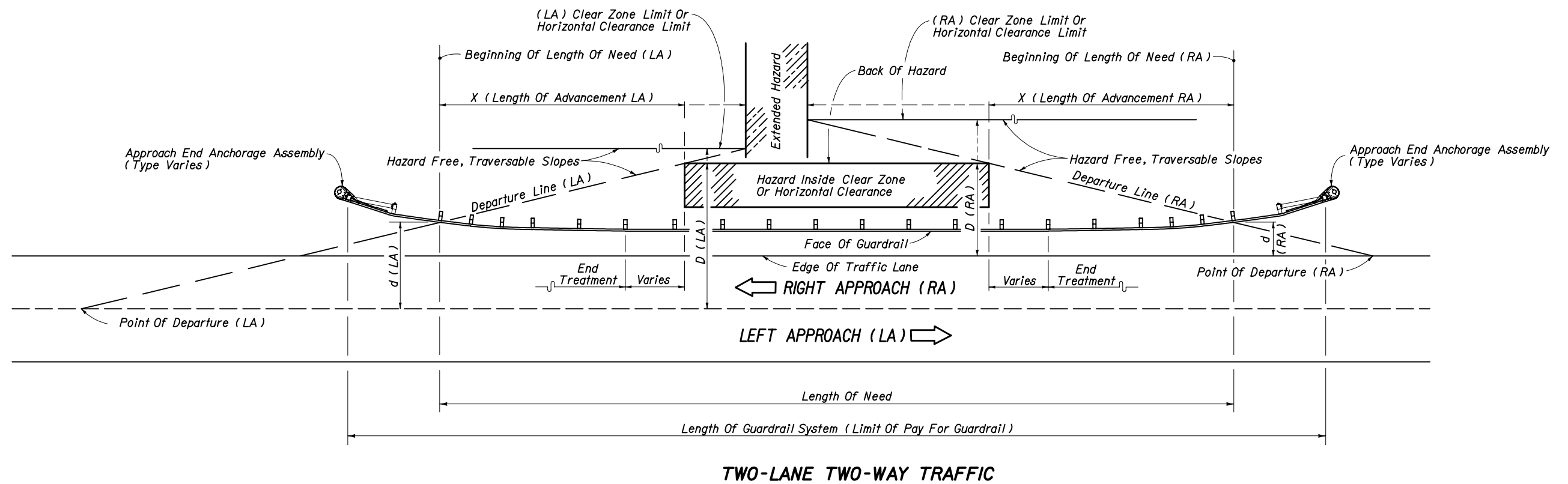
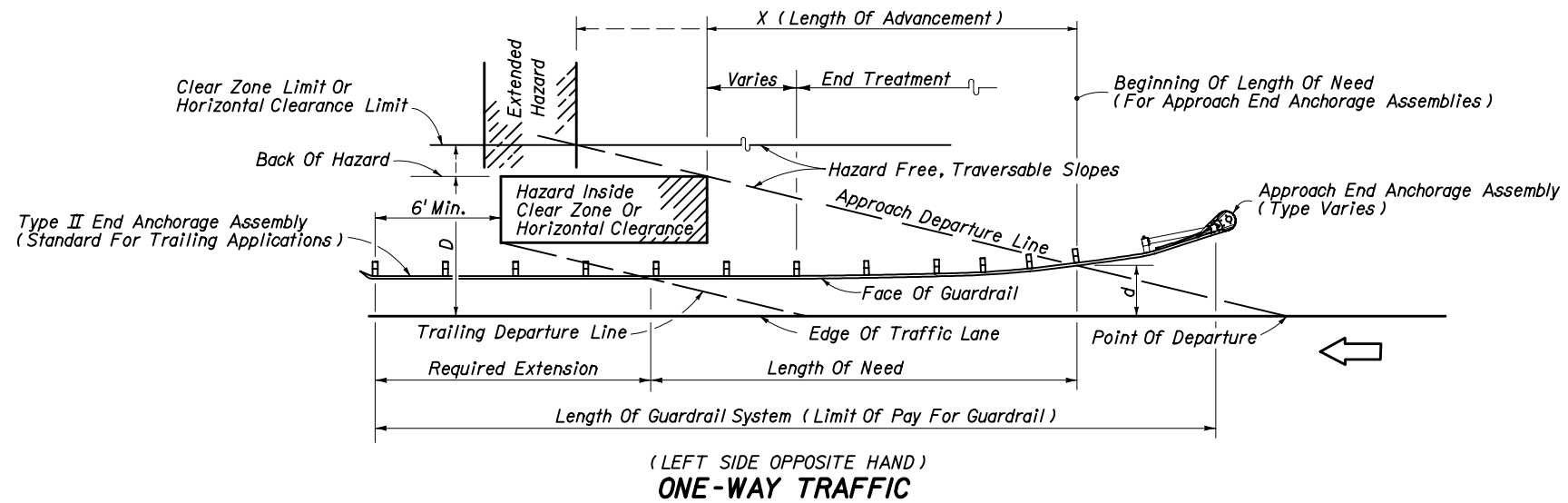
Equation Variables:

D=Distance in feet from near edge of the near approach traffic lane to either (a) the back of hazard, when the hazard is located inside the clear zone or horizontal clearance or (b) the clear zone or horizontal clearance outer limit, when the hazard extends to or goes beyond the clear zone or horizontal clearance limit. For left side hazards on two-way undivided facilities, D is measured from the inside edge of the near approach traffic lane (see Figure 2).

d=Distance in feet from the near edge of the near approach traffic lane to the face of guardrail at its intersection with the departure line. For left side hazards on two-way undivided facilities, d is measured from the inside edge of the near approach traffic lane (see Figure 2).

LENGTH OF ADVANCEMENT - FIGURE 1

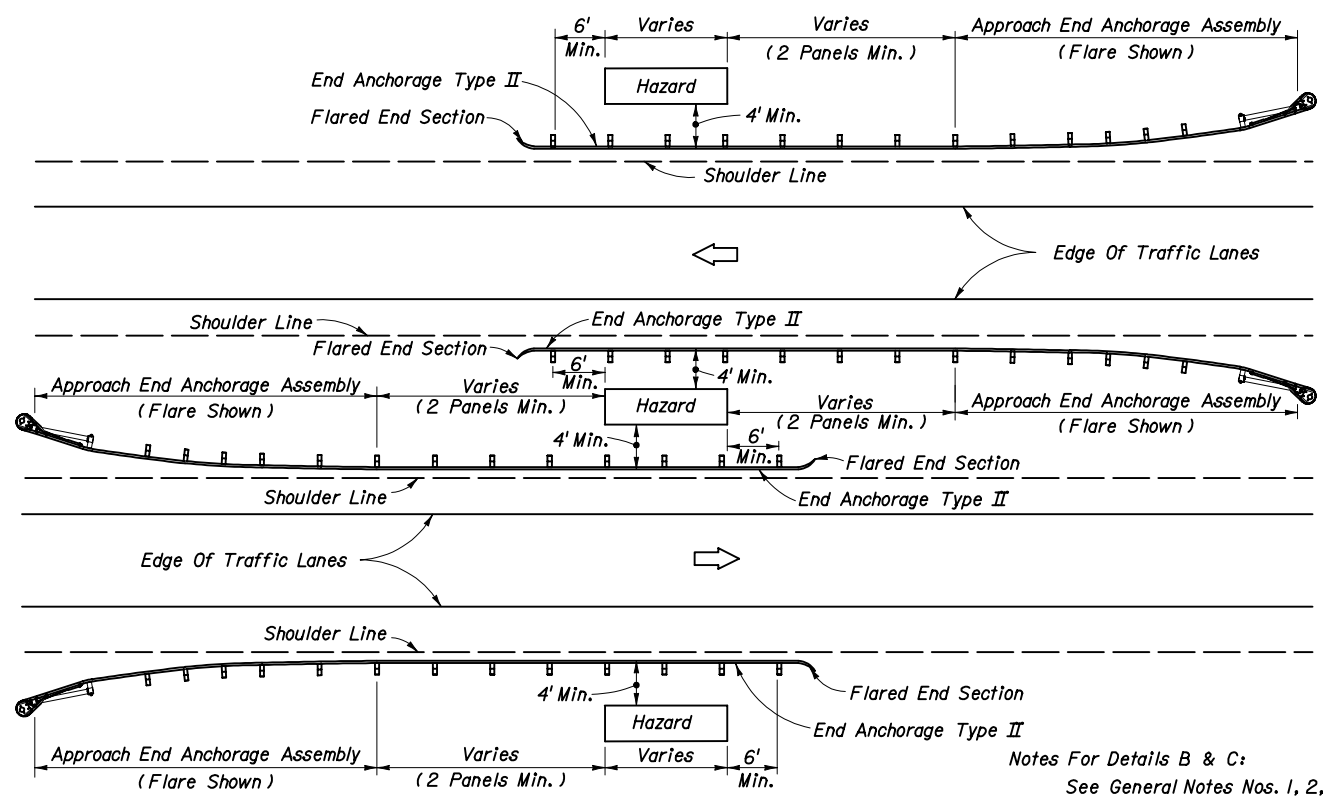
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For description of the dimensions D , d and X , see Length of Advancement - Figure 1.
 For additional shoulder guardrail information, see Details B and C.

LOCATING TERMINALS ON SHOULDER GUARDRAILS - FIGURE 2

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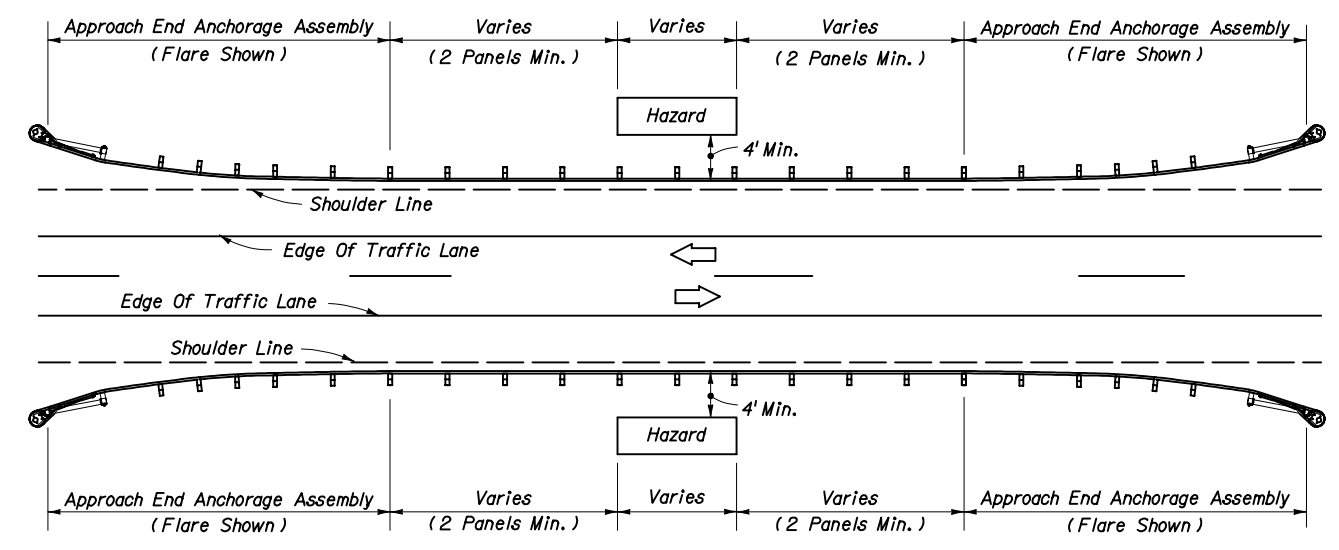


Median Guardrail Applications Shown Are For Locations Where Approach End Anchorage Assemblies Are Outside Of The Opposing Roadway Clear Zone.

DIVIDED ROADWAY- DETAIL B

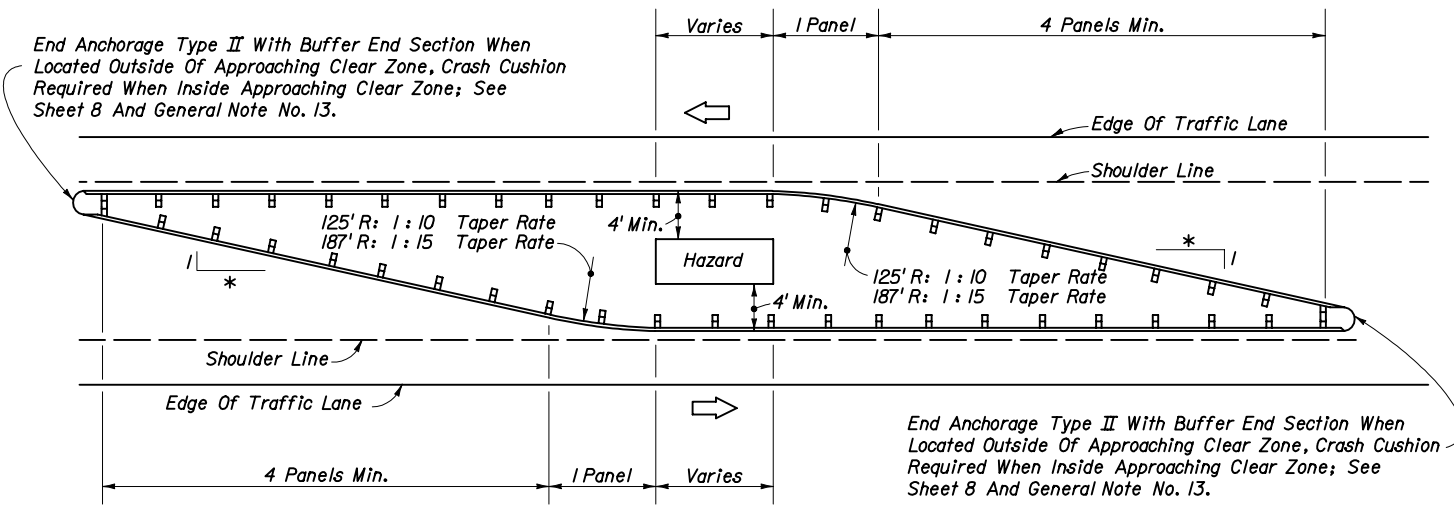
Notes For Details B & C:

See General Notes Nos. 1, 2, 3, 4, 5, 6, 7 and 8.
 See Details K and L for guardrail offsets.
 For end anchorage assemblies see sheets elsewhere in this index and the plans.
 For hazards that require shielding and are located back of curb see other sheets of this index, and where rigid barrier is required see Index No. 410.



UNDIVIDED ROADWAY- DETAIL C

GUARDRAIL APPLICATION FOR ROADSIDE HAZARDS

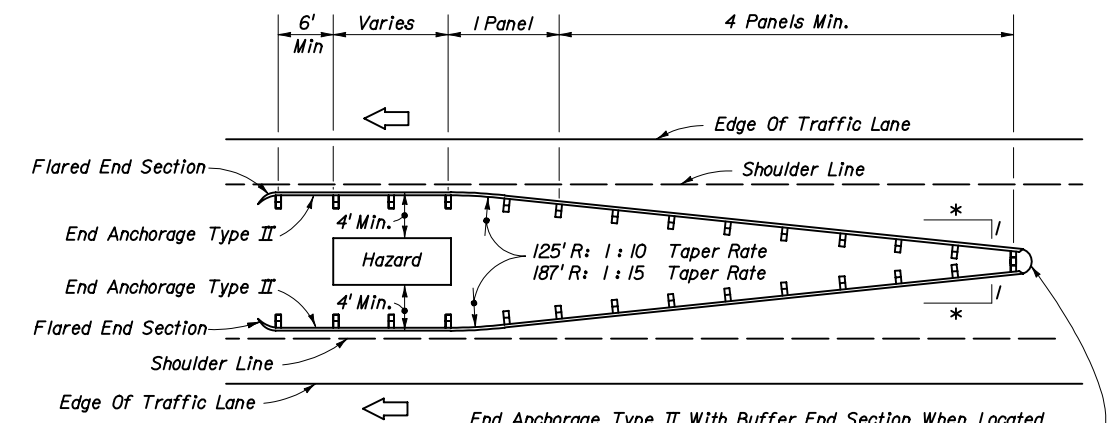


This Guardrail Configuration Applies Where Approach End Anchorage Assemblies Cannot be Located Outside Of The Opposing Roadway Clear Zone.

OPPOSING TRAFFIC- DETAIL D

Notes For Details D & G:
 See General Notes Nos. 1, 2, 3, 4, 5, 7, and 13.
 See Details K and L for guardrail offsets.
 For hazards that require shielding and are located back of curb see other sheets of this index, and where rigid barrier is required see Index No. 410.

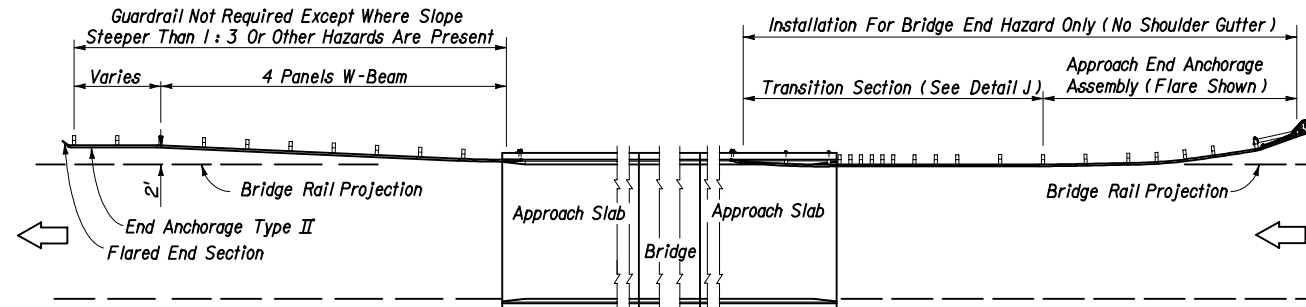
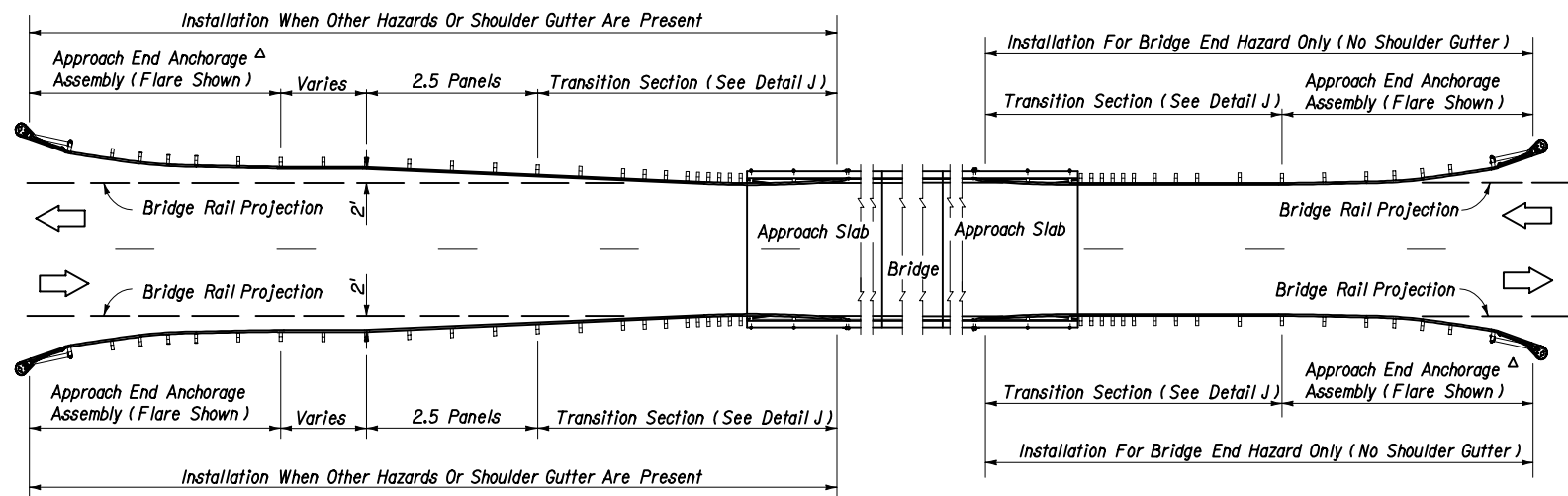
GUARDRAIL APPLICATION FOR NARROW MEDIAN AND GORE HAZARDS



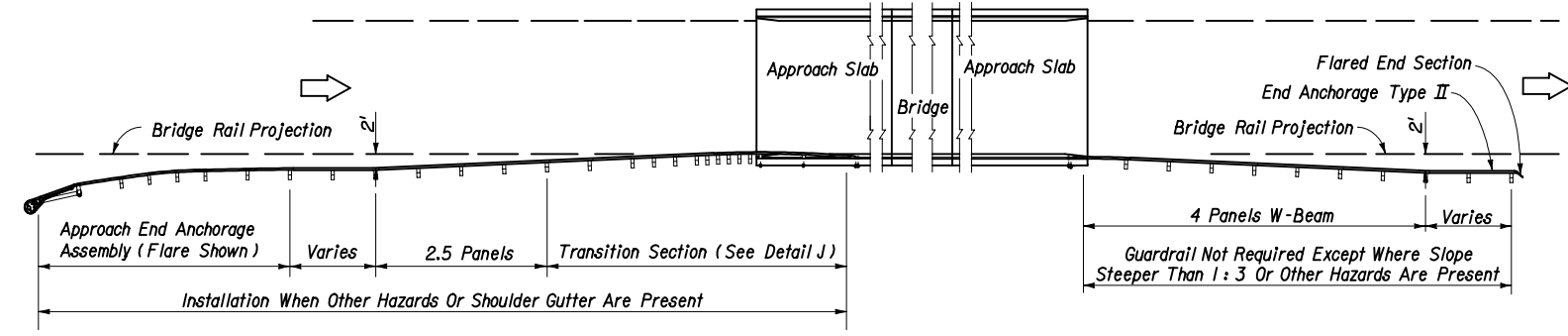
End Anchorage Type II With Buffer End Section When Located Outside Of Approaching Clear Zone, Crash Cushion Required When Inside Approaching Clear Zone. See General Note No. 13

ONE-WAY TRAFFIC- DETAIL G

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
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For Median Guardrail See Sheets 7 & 8 And General Note II.




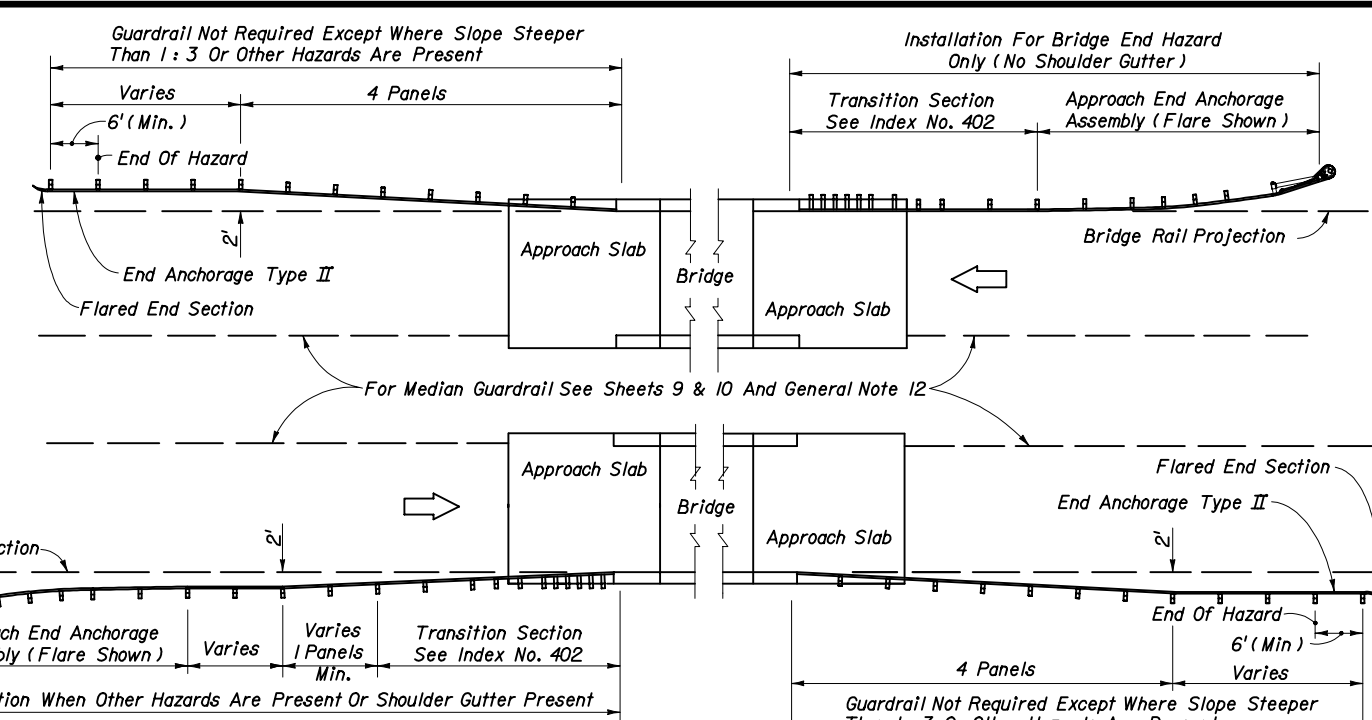
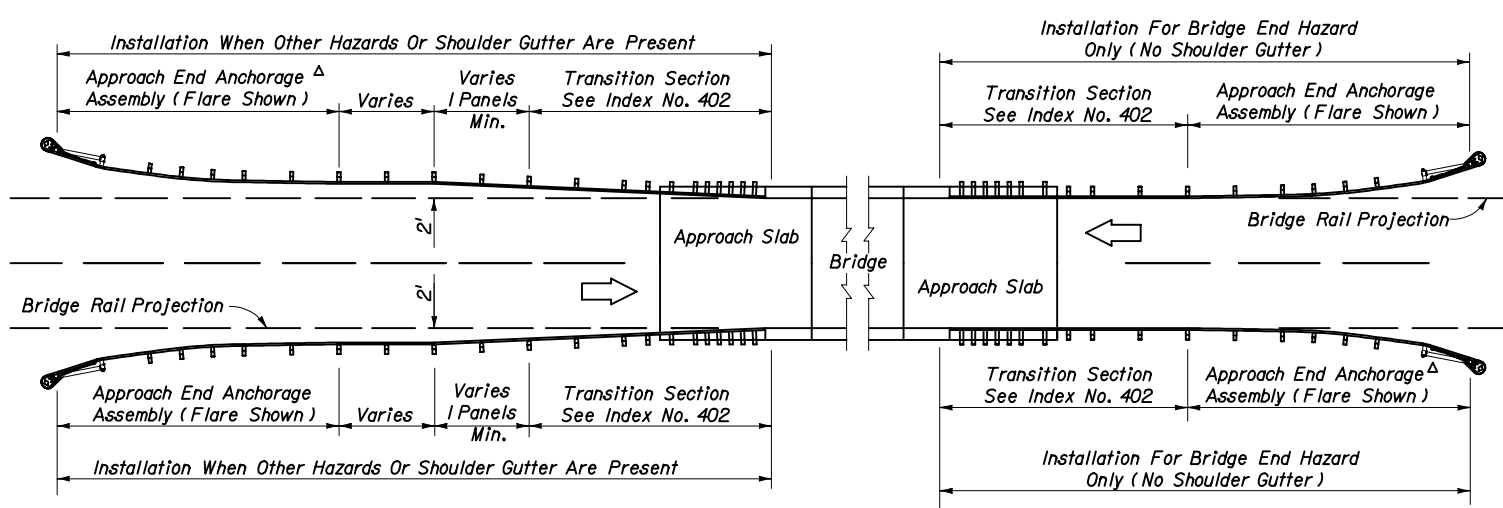
^ΔWith Four Or More Lanes Trailing Guardrail Anchorages May Be As Shown In Detail P Unless Other Anchorage Called Out In The Plans
UNDIVIDED ROADWAY - DETAIL O

DIVIDED ROADWAY - DETAIL P

Notes For Details O & P:
 See General Notes Nos. 1, 2, 3, 4, 5, 6, 8 and 9. See Detail J for connections to bridges.
 For end anchorage assemblies see sheets elsewhere in this Index and the plans.
 Shoulder gutter in itself does not require the installation of guardrail.

GUARDRAIL APPLICATIONS FOR BRIDGES WITH FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING FULL LENGTH OF APPROACH SLAB

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GUARDRAIL				
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Approved By			 Roadway Design Engineer	



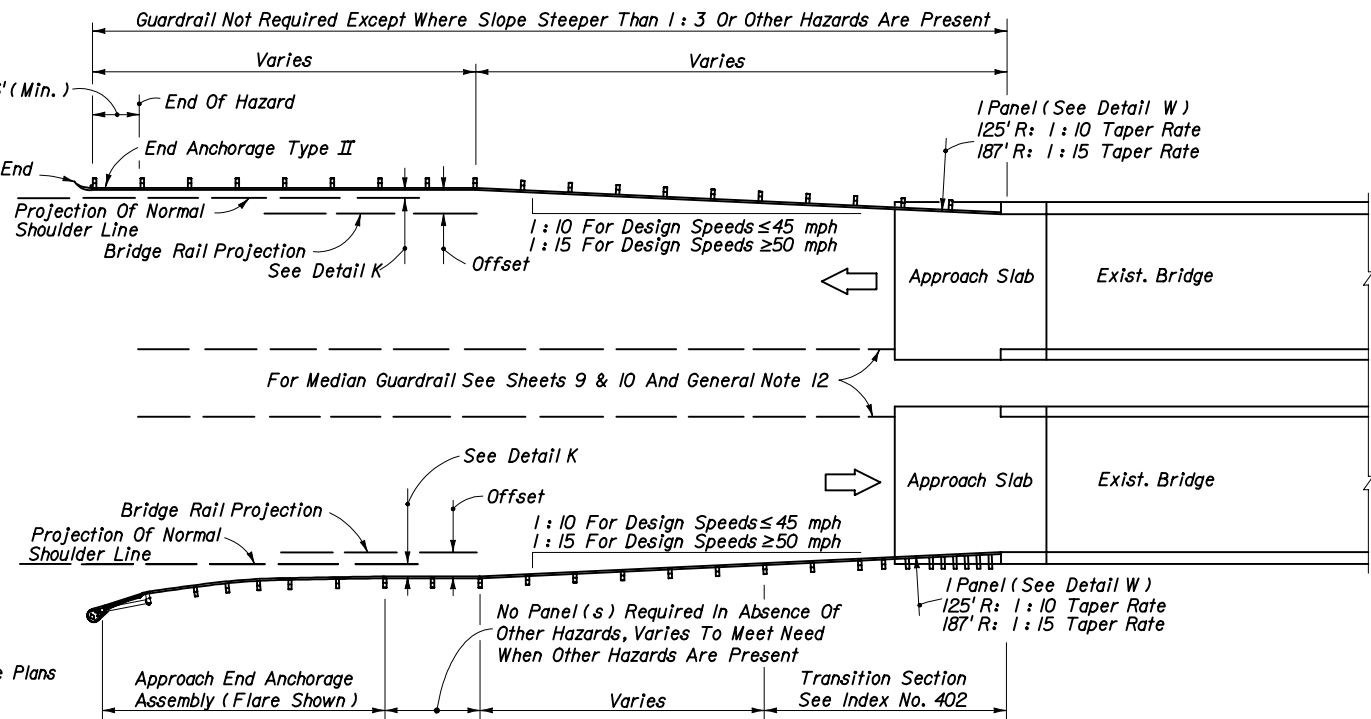
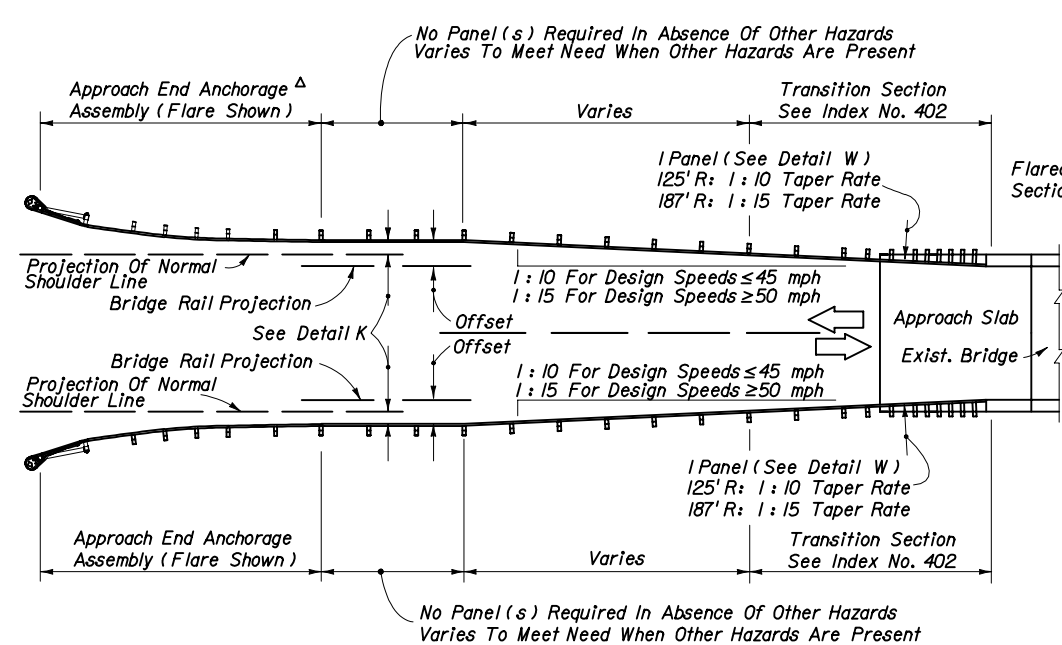
Δ With Four Or More Lanes Trailing Guardrail Anchorages May Be As Shown In Detail I Unless Other Anchorage Called Out In The Plans

UNDIVIDED ROADWAY - DETAIL H

DIVIDED ROADWAY - DETAIL I

Notes For Details H & I:
 See General Notes Nos. 1, 2, 3, 4, 5, 6, 8, and 9. See Detail N and Index No. 402 for approach connections to bridges.
 For end anchorage assemblies see sheets elsewhere in this Index and in the plans.
 Shoulder gutter in itself does not require the installation of guardrail.

GUARDRAIL APPLICATIONS FOR BRIDGES WITH FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH

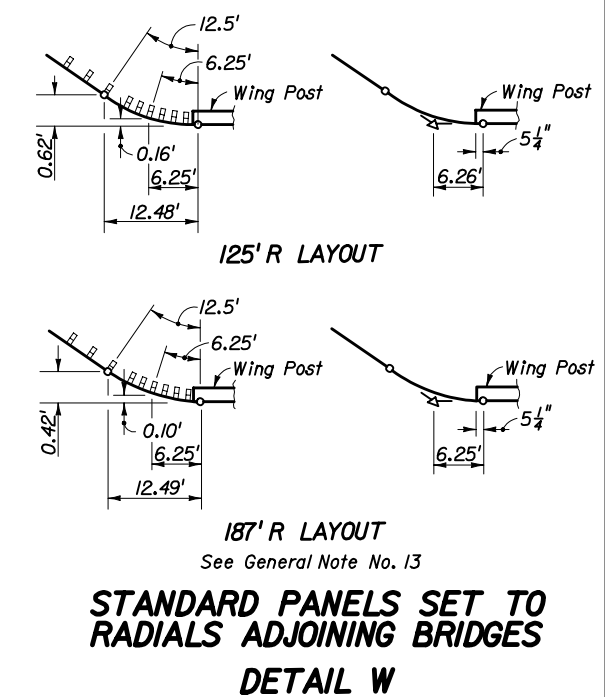


UNDIVIDED ROADWAY - DETAIL S

DIVIDED ROADWAY - DETAIL T

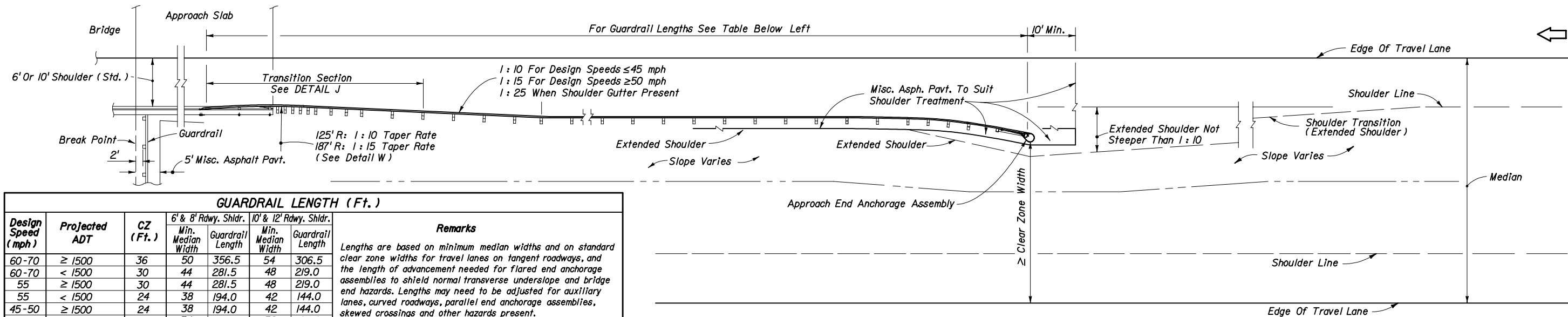
Notes for Details S & T:
 See General Notes Nos. 1, 2, 3, 4, 5, 6, 8 and 9. See Detail N and Index No. 402 for approach connections to bridges.
 For end anchorage assemblies see sheets elsewhere in this Index and the plans.

GUARDRAIL APPLICATIONS FOR BRIDGES WITH LESS THAN FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH



STANDARD PANELS SET TO RADIALS ADJOINING BRIDGES DETAIL W

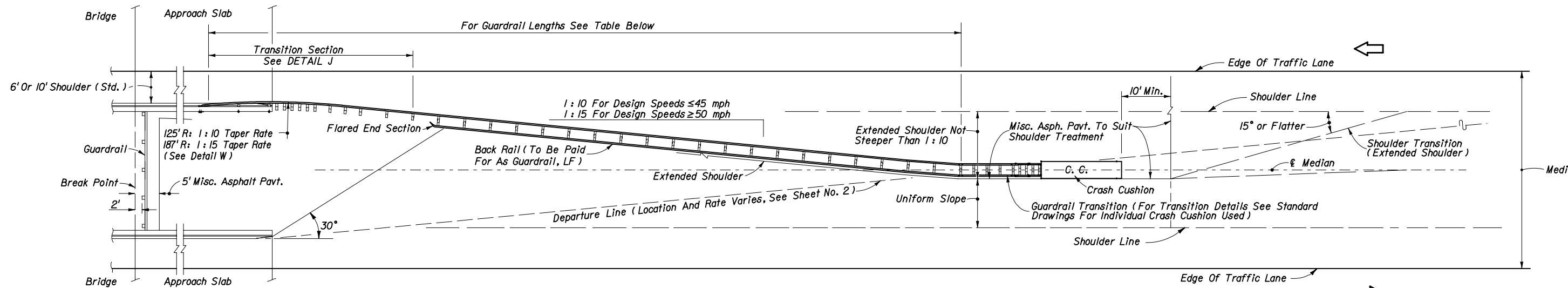
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GUARDRAIL LENGTH (Ft.)						
Design Speed (mph)	Projected ADT	CZ (Ft.)	6' & 8' Rdwy. Shldr.		10' & 12' Rdwy. Shldr.	
			Min. Median Width	Guardrail Length	Min. Median Width	Guardrail Length
60-70	≥ 1500	36	50	356.5	54	306.5
60-70	< 1500	30	44	281.5	48	219.0
55	≥ 1500	30	44	281.5	48	219.0
55	< 1500	24	38	194.0	42	144.0
45-50	≥ 1500	24	38	194.0	42	144.0
45-50	< 1500	20	34	144.0	38	94.0
45-50	Urban % Curb	24	38	194.0	42	144.0
35-40	Urban % Curb	18	32	144.0	36	81.5

Remarks: Lengths are based on minimum median widths and on standard clear zone widths for travel lanes on tangent roadways, and the length of advancement needed for flared end anchorage assemblies to shield normal transverse underslope and bridge end hazards. Lengths may need to be adjusted for auxiliary lanes, curved roadways, parallel end anchorage assemblies, skewed crossings and other hazards present.

Note: For approach end anchorage assemblies see sheets elsewhere in this Index and the plans.
WHEN END TERMINAL IS OUTSIDE OF OPPOSING ROADWAY CLEAR ZONE



Median Width (Ft.)	GUARDRAIL LENGTHS															
	1:10 TAPER RATE								1:15 TAPER RATE							
	6' Bridge Shoulder				10' Bridge Shoulder				6' Bridge Shoulder				10' Bridge Shoulder			
	Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)	
32	9.5	6	15.5	193.75	6.5	4	10.5	131.25	13.5	10	23.5	293.75	8.5	6	14.5	181.25
34	10.5	7	17.5	218.75	7.5	5	12.5	156.25	14.5	11	25.5	318.75	9.5	7	16.5	206.25
36	10.5	7	17.5	218.75	7.5	5	12.5	156.25	15.5	12	27.5	343.75	10.5	8	18.5	231.25
38	11.5	8	19.5	243.75	8.5	6	14.5	181.25	16.5	13	29.5	368.75	11.5	9	20.5	256.25
40	12.5	9	21.5	268.75	9.5	6	15.5	193.75	17.5	13	30.5	381.25	13.5	11	24.5	306.25
42	13.5	9	22.5	281.25	10.5	7	17.5	218.75	19.5	15	34.5	431.25	14.5	11	25.5	318.75
44	14.5	10	24.5	306.25	10.5	7	17.5	218.75	20.5	16	36.5	456.25	15.5	12	27.5	343.75
46	14.5	10	24.5	306.25	11.5	8	19.5	243.75	21.5	17	38.5	481.25	16.5	13	29.5	368.75
48	15.5	11	26.5	331.25	12.5	9	21.5	268.75	22.5	17	39.5	493.75	17.5	13	30.5	381.25

The lengths shown on this table are typical for roadways with standard width shoulders. Length requirements shall be determined on a site specific basis for both standard width and narrow bridge shoulders and end anchorage or end shielding use.

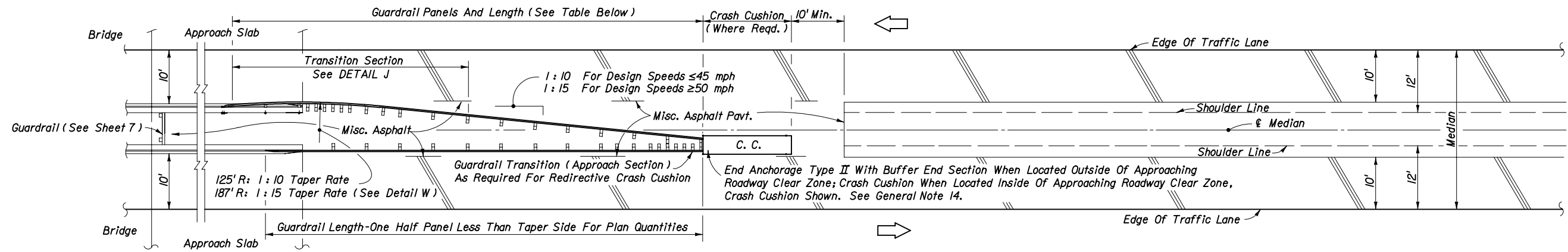
WHEN END TERMINAL CANNOT BE LOCATED OUTSIDE OF OPPOSING ROADWAY CLEAR ZONE

**APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING
 EXTENDING FULL APPROACH SLAB LENGTH IN WIDE MEDIANS WITH FLUSH SHOULDERS**

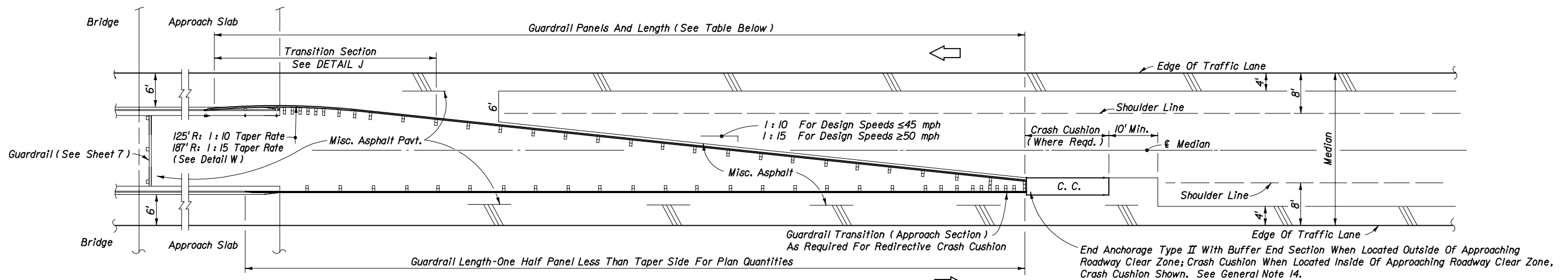
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

Names	Dates	Approved By		
Designed By			Roadway Design Engineer	
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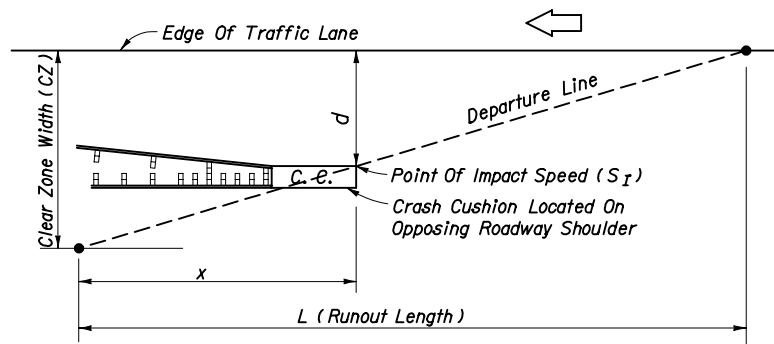


MEDIANS WITH 10' BRIDGE SHOULDERS



MEDIANS WITH 6' BRIDGE SHOULDERS

Note: The guardrail configurations shown apply only to parallel or near parallel bridges with open medians.



Speed (S_I) For Determining Crash Cushion Size:

$$S_I = \frac{x}{L} (\text{Design Speed}) = \frac{(CZ-d)}{CZ} [\text{Design Speed}]$$

SIZING CRASH CUSHIONS LOCATED ON OPPOSING ROADWAY SHOULDERS

GUARDRAIL LENGTHS								
MEDIAN WIDTH (Ft.)	6' BRIDGE SHOULDERS				10' BRIDGE SHOULDERS			
	1:10 TAPER RATE		1:15 TAPER RATE		1:10 TAPER RATE		1:15 TAPER RATE	
	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)
30	14.5	181.25	20.5	256.25	7.5	93.75	10.5	131.25
28	12.5	156.25	18.5	231.25	6.5	81.25	8.5	106.25
26	11.5	143.75	15.5	193.75	5.5*	68.75	6.5	81.25
24	9.5	118.75	13.5	168.75	5.5*	68.75	5.5*	68.75

The lengths shown in this table are based on standard widths for roadway and bridge median shoulders. Length requirements for both standard width and narrow bridge shoulders and end anchorage or end shielding requirements shall be determined on a site specific basis. When crash cushions are required on opposing roadway shoulders, their sizes may be determined by the residual speeds (S_I 's) along the runouts from the approach roadways; however, when calculated speeds (S_I 's) are less than 30 mph; crash cushions shall be no less in size than for 30 mph, see speed diagram left. The number of panels may be reduced when installing a crash cushion more than 2.5' in width, see * below.

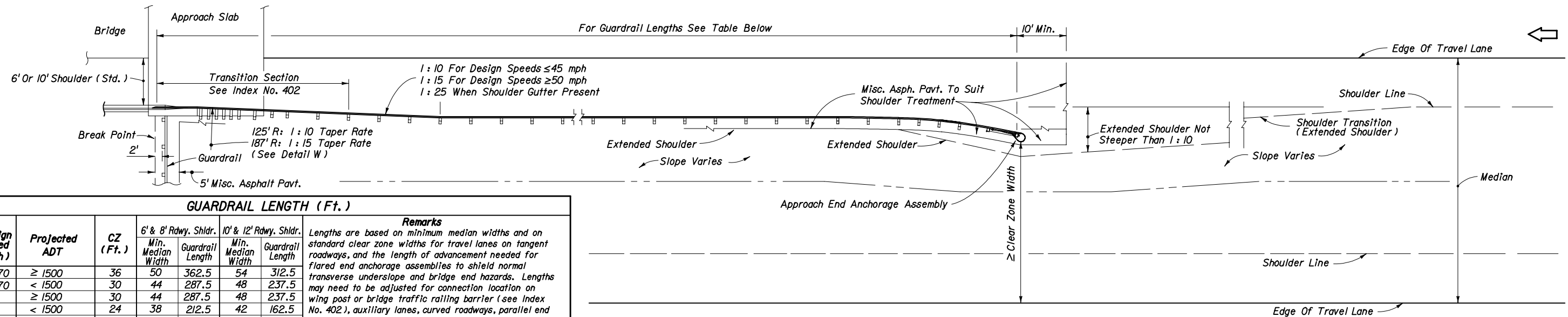
* Number shown is the minimum number of panels plus a W-Three beam transition panel; single faced guardrail must have a length of five (5) or more panels.

APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING EXTENDING FULL APPROACH SLAB LENGTH IN NARROW MEDIANS WITH FLUSH SHOULDERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

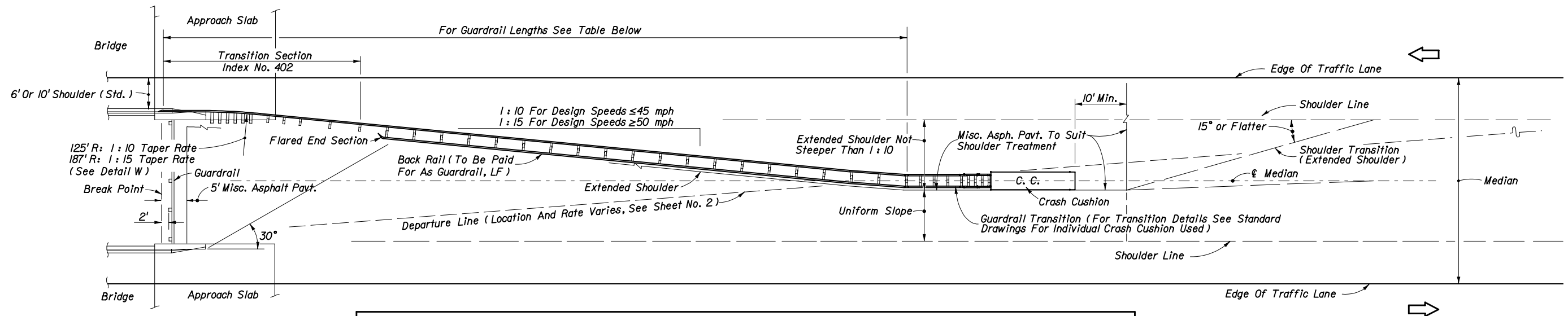
GUARDRAIL

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Drawn By	RWR	08/82	Roadway Design Engineer	
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GUARDRAIL LENGTH (Ft.)							
Design Speed (mph)	Projected ADT	CZ (Ft.)	6' & 8' Rdwy. Shldr.		10' & 12' Rdwy. Shldr.		Remarks
			Min. Median Width	Guardrail Length	Min. Median Width	Guardrail Length	
60-70	≥ 1500	36	50	362.5	54	312.5	Lengths are based on minimum median widths and on standard clear zone widths for travel lanes on tangent roadways, and the length of advancement needed for flared end anchorage assemblies to shield normal transverse underslope and bridge end hazards. Lengths may need to be adjusted for connection location on wing post or bridge traffic railing barrier (see Index No. 402), auxiliary lanes, curved roadways, parallel end anchorage assemblies, skewed crossings and other hazards present. When the wing post is replaced by bridge traffic railing barrier, reference Detail J and see Index No. 402.
60-70	< 1500	30	44	287.5	48	237.5	
55	≥ 1500	30	44	287.5	48	237.5	
55	< 1500	24	38	212.5	42	162.5	
45-50	≥ 1500	24	38	212.5	42	162.5	
45-50	< 1500	20	34	162.5	38	112.5	
45-50	Urban % Curb	24	38	212.5	42	162.5	
30-40	Urban % Curb	18	32	162.5	36	100.0	

Note: For approach end anchorage assemblies see sheets elsewhere in this Index and the plans.
WHEN END TERMINAL IS OUTSIDE OF OPPOSING ROADWAY CLEAR ZONE



Median Width (Ft.)	GUARDRAIL LENGTHS															
	1:10 TAPER RATE								1:15 TAPER RATE							
	6' Bridge Shoulder				10' Bridge Shoulder				6' Bridge Shoulder				10' Bridge Shoulder			
	Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)	
Front	Back	Total	Total	Front	Back	Total	Total	Front	Back	Total	Total	Front	Back	Total	Total	
32	7.5	6	13.5	168.75	4.5	3	7.5	93.75	11.5	9	20.5	256.25	7.5	6	13.5	168.75
34	8.5	6	14.5	181.25	5.5	4	9.5	118.75	12.5	10	22.5	281.25	7.5	6	13.5	168.75
36	9.5	7	16.5	206.25	6.5	5	11.5	143.75	13.5	11	24.5	306.25	8.5	7	15.5	193.75
38	10.5	8	18.5	231.25	7.5	6	13.5	168.75	14.5	12	26.5	331.25	10.5	9	19.5	243.75
40	10.5	8	18.5	231.25	7.5	6	13.5	168.75	16.5	13	29.5	368.75	11.5	9	20.5	256.25
42	11.5	8	19.5	243.75	8.5	6	14.5	181.25	17.5	14	31.5	393.75	12.5	10	22.5	281.25
44	12.5	9	21.5	268.75	9.5	7	16.5	206.25	18.5	15	33.5	418.75	13.5	11	24.5	306.25
46	12.5	9	21.5	268.75	10.5	8	18.5	231.25	19.5	16	35.5	443.75	14.5	12	26.5	331.25
48	14.5	11	25.5	318.75	11.5	9	20.5	256.25	20.5	16	36.5	456.25	16.5	13	29.5	368.75

The lengths shown on this table are typical for roadways with standard width shoulders and a relocated connection to the existing wing post. When the wing post is replaced by bridge traffic railing barrier, reference Detail J and see Index No. 402. Length requirements shall be determined on a site specific basis for both standard width and narrow bridge shoulders and for end anchorage or end shielding use.

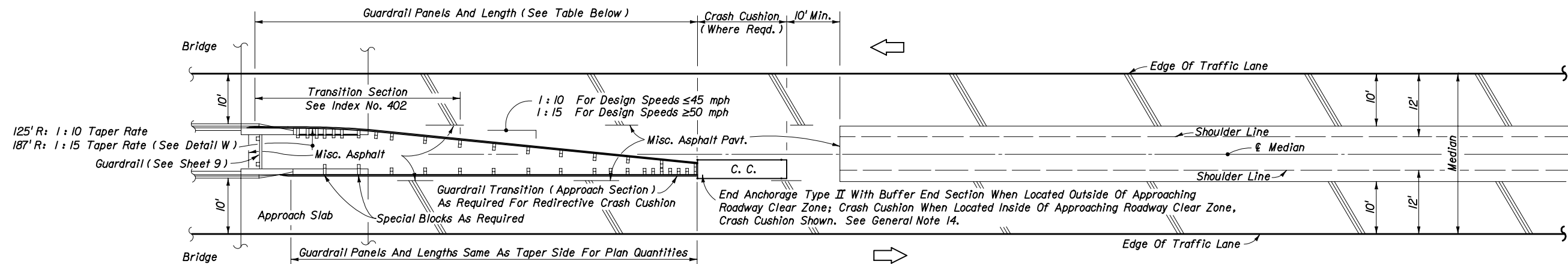
WHEN END TERMINAL CANNOT BE LOCATED OUTSIDE OF OPPOSING ROADWAY CLEAR ZONE

APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING EXTENDING LESS THAN FULL APPROACH SLAB LENGTH IN WIDE MEDIANS WITH FLUSH SHOULDERS

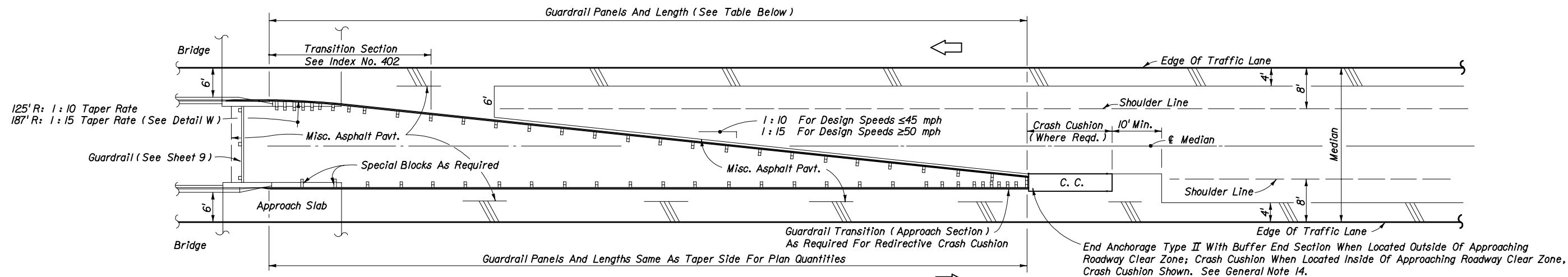
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GUARDRAIL

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Checked By	JBN/JVG	09/81	Approved By	[Signature]				

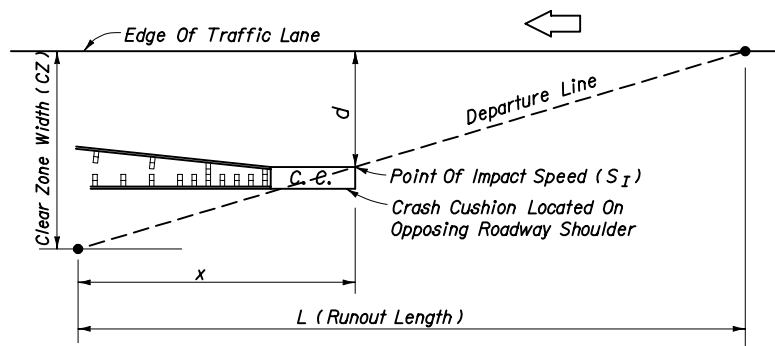


MEDIANS WITH 10' BRIDGE SHOULDERS



MEDIANS WITH 6' BRIDGE SHOULDERS

Note: The guardrail configurations shown apply only to parallel or near parallel bridges with open medians.



Speed (S_I) For Determining Crash Cushion Size:

$$S_I = \frac{x}{L} (\text{Design Speed}) = \frac{(CZ-d)}{CZ} [\text{Design Speed}]$$

SIZING CRASH CUSHIONS LOCATED ON OPPOSING ROADWAY SHOULDERS

GUARDRAIL LENGTHS								
MEDIAN WIDTH (Ft.)	6' BRIDGE SHOULDERS				10' BRIDGE SHOULDERS			
	1:10 TAPER RATE		1:15 TAPER RATE		1:10 TAPER RATE		1:15 TAPER RATE	
	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)
30	12.5	156.25	18.5	231.25	6.5	81.25	9.5	118.75
28	11.5	143.75	16.5	206.25	5.5	68.75	7.5	93.75
26	9.5	118.75	14.5	181.25	5.5*	68.75	5.5*	68.75
24	8.5	106.25	11.5	143.75	5.5*	68.75	5.5*	68.75

The lengths shown in this table are based on standard widths for roadway and bridge median shoulders. Length requirements for both standard width and narrow bridge shoulders and end anchorage or end shielding requirements shall be determined on a site specific basis. When crash cushions are required on opposing roadway shoulders, their sizes may be determined by the residual speeds (S_I 's) along the runouts from the approach roadways; however, when calculated speeds (S_I 's) are less than 30 mph crash cushions shall be no less in size than for 30 mph; see speed diagram left. The number of panels may be reduced when installing a crash cushion more than 2.5' in width; see * below.

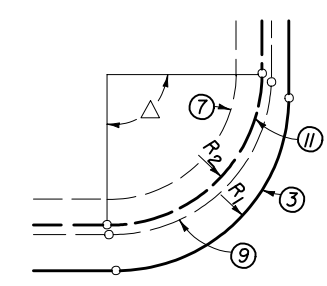
*Number shown is the minimum number of panels plus a W-Three beam transition panel; single faced guardrail must have a length of five (5) or more panels.

**APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING
EXTENDING LESS THAN FULL APPROACH SLAB LENGTH IN NARROW MEDIANS WITH FLUSH SHOULDERS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	RWR	08/82	Revision	Sheet No. 10 of 31
Checked By	JVG/JBN	08/82	04	Index No. 400

RADIAL GUARDRAIL						
Normal Turnouts						
		Taper			Simple Curve	
R_1	R_2	Panels Required	Δ	R_2	Panels Required	Δ
15'	25'	3	85° 56'	25'	3	85° 56'
20'	25'	3	85° 56'	25'	3	85° 56'
25'	25'	3	85° 56'	25'	3	85° 56'
30'	25'	3	85° 56'	25'	3	85° 56'
35'	25'	3	85° 56'	25'	3	85° 56'
40'	40'	5	89° 31'	40'	5	89° 31'
45'	40'	5	89° 31'	40'	5	89° 31'
50'	40'	5	89° 31'	40'	5	89° 31'

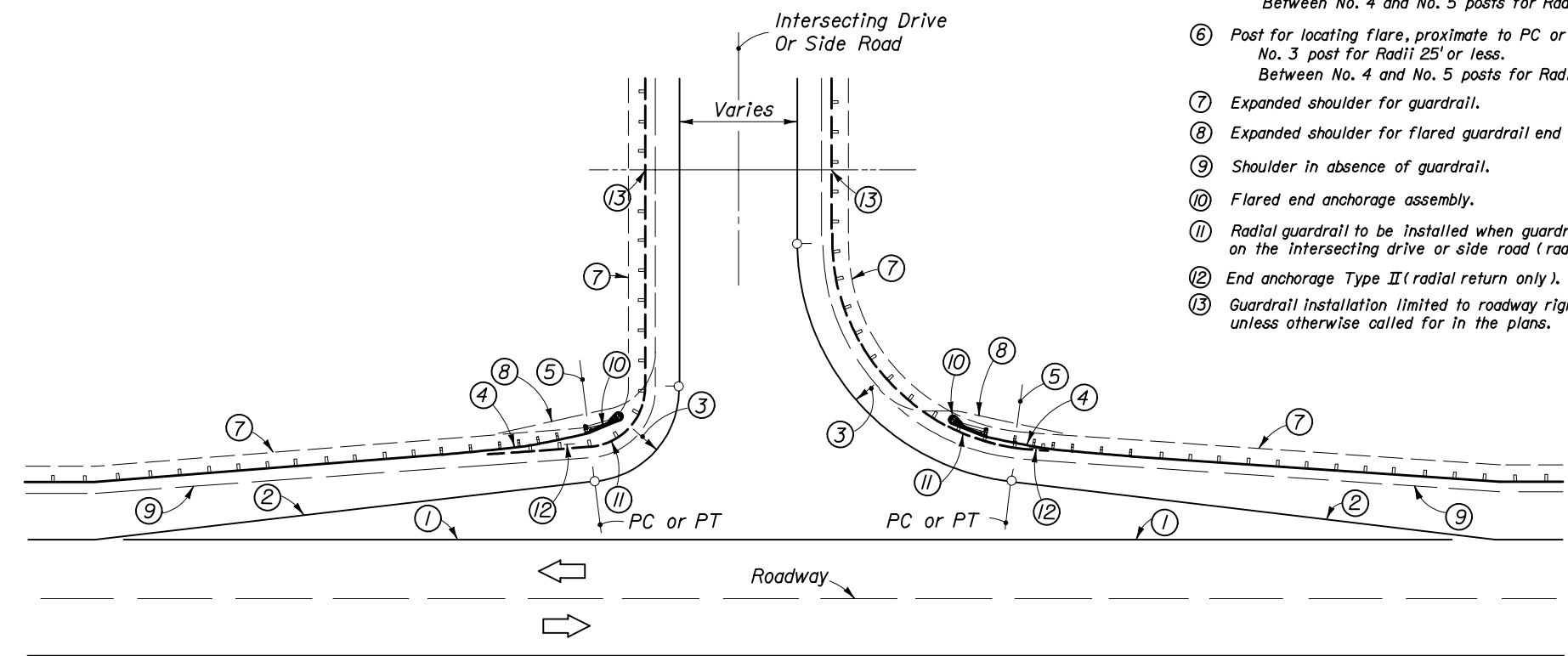
Note: Only 25' and 40' radius panels are to be used for return guardrail on normal turnouts. On skewed turnouts the number of panels used and their arrangement with straight panels will be as shown in the plans or as directed by the Engineer.



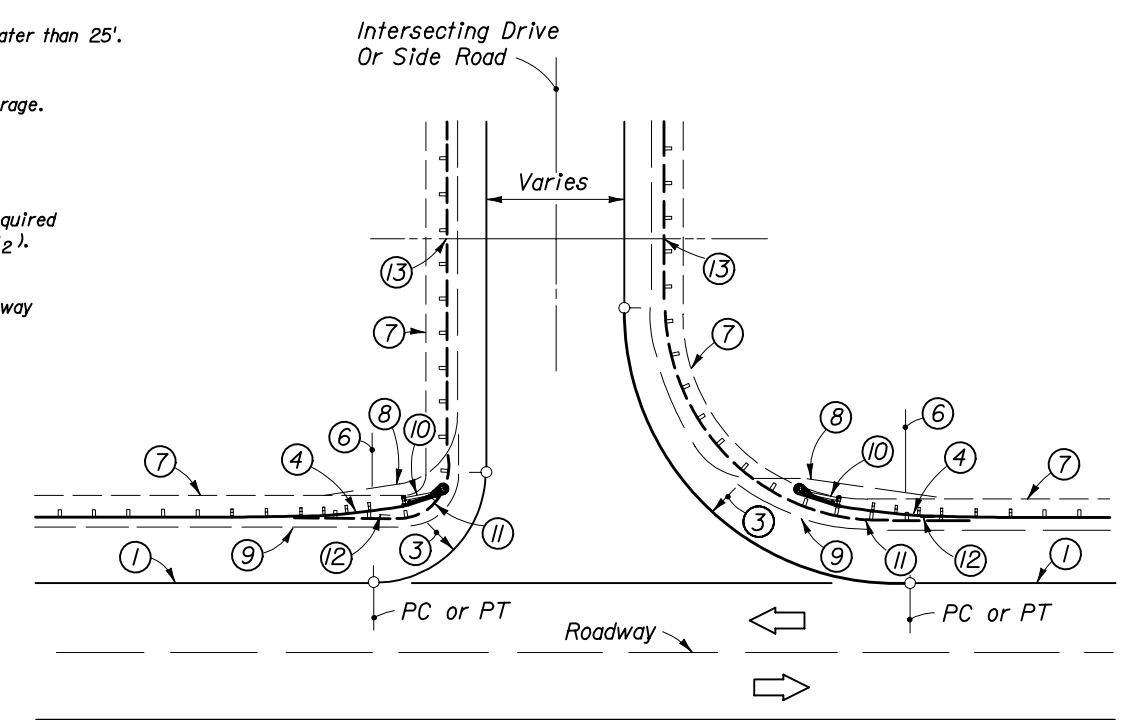
RADIAL GUARDRAIL

LEGEND

- ① Edge of traffic lane for simple curve turnouts. Edge of travel lane for taper turnouts.
- ② Taper.
- ③ Pavement return (radius R_1).
- ④ Flared end anchorage to be installed except when existing guardrail on intersecting drive or side road adjoins the project.
- ⑤ Post for locating flare, proximate to PC or PT:
No. 2 post for Radii 25' or less.
No. 3 post for Radii >25' and <50'.
Between No. 4 and No. 5 posts for Radii 50' or greater.
- ⑥ Post for locating flare, proximate to PC or PT:
No. 3 post for Radii 25' or less.
Between No. 4 and No. 5 posts for Radii greater than 25'.
- ⑦ Expanded shoulder for guardrail.
- ⑧ Expanded shoulder for flared guardrail end anchorage.
- ⑨ Shoulder in absence of guardrail.
- ⑩ Flared end anchorage assembly.
- ⑪ Radial guardrail to be installed when guardrail required on the intersecting drive or side road (radius R_2).
- ⑫ End anchorage Type II (radial return only).
- ⑬ Guardrail installation limited to roadway right of way unless otherwise called for in the plans.



TAPER TURNOUTS



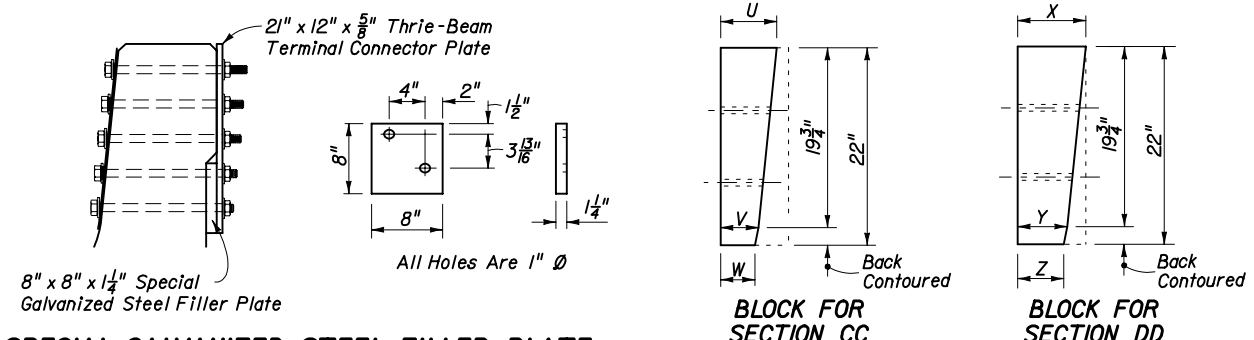
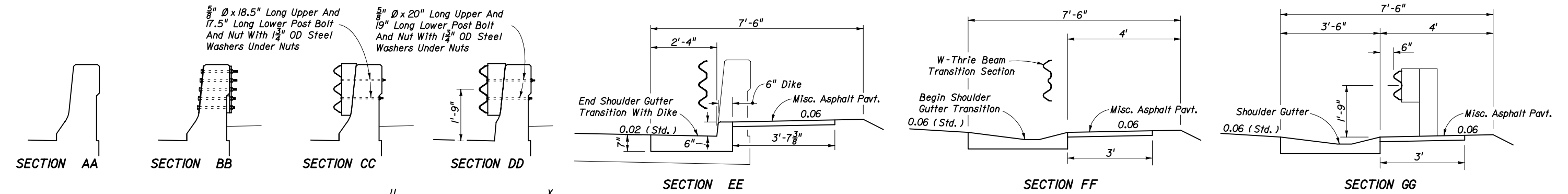
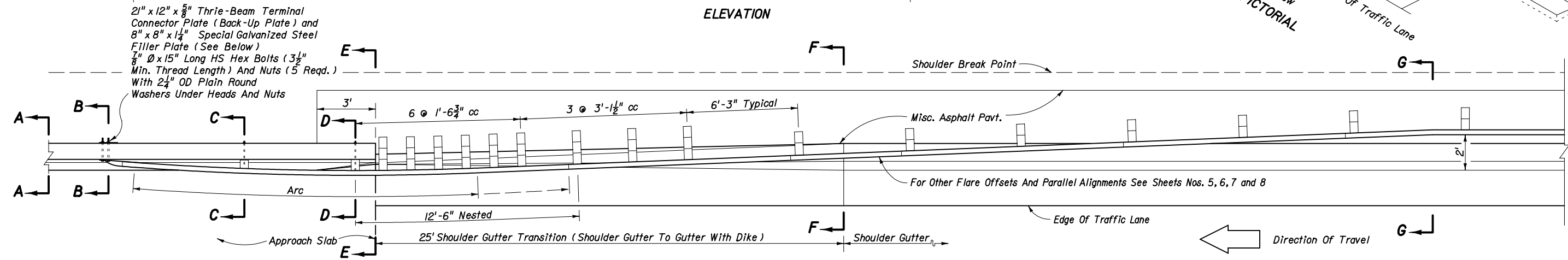
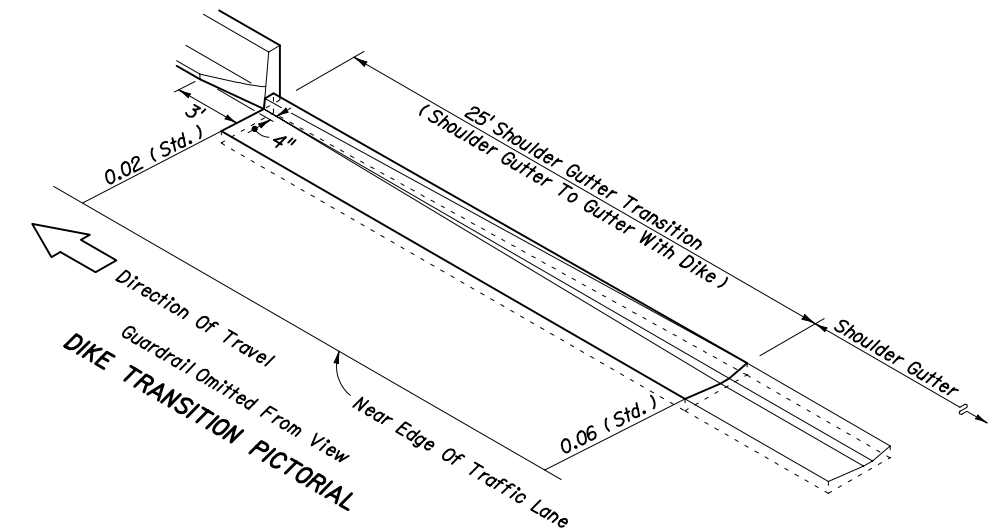
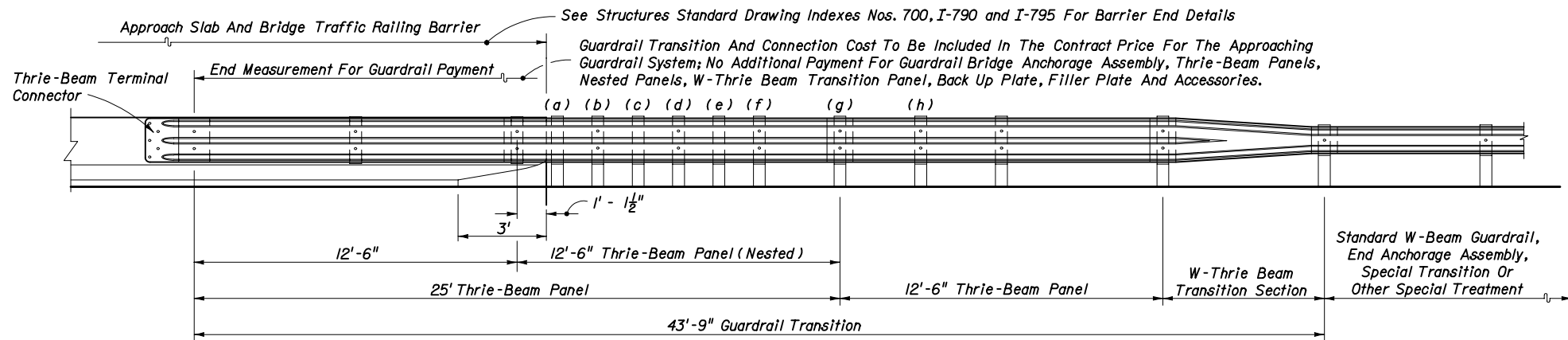
SIMPLE CURVE TURNOUTS

Note: The guardrail application shown on this sheet are for highways with flush shoulders and no restraints for constructing flared end anchorages and minimum lengths of guardrail. For highways with flush shoulders and restraints to constructing flared anchorages, see General Note No. 6.

Where openings in guardrail are required in close proximity to bridge traffic rails or ends of concrete barrier walls, and minimum length guardrail with flared end anchorages can not be applied, either controlled release returns or energy absorbing terminals are to be applied.

GUARDRAIL APPLICATIONS FOR INTERSECTING DRIVES AND SIDE ROADS ON RURAL FACILITIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Names	Dates	Approved By		
Designed By		Roadway Design Engineer		
Drawn By	HSD 09/83	Revision	Sheet No.	Index No.
Checked By	JVG 09/83	04	11 of 31	400



APPLICATIONS	SECTION CC			SECTION DD		
	U	V	W	X	Y	Z
Single Face Guardrail	6 1/8"	4 1/8"	3 5/8"	7 1/2" nom.	5 1/2" nom.	5" nom.
Double Face Guardrail With Timber Posts	5 1/8"	3 1/8"	2 5/8"	6 1/2" nom.	4 1/2" nom.	4" nom.
Double Face Guardrail With Steel Posts	4 3/8"	2 3/8"	1 7/8"	5 3/4"	3 3/4"	3 1/4"

For Double Face Guardrail Connections To Median Bridge Traffic Railing Barrier, See Index No. 410 'Guardrail Connection To Concrete Barrier Wall Approach Ends'.

GUARDRAIL TRANSITION NOTE

When shoulder gutter is required, the 25' long dike transition, shown in the 'PLAN' and 'PICTORIAL' above, is required. Double offset blocks are shown for guardrail installations adjacent to shoulder gutter/dike transitions; single offset blocks shall be installed in absence of shoulder gutter. Nested rails shall not be bolted to the blocks and posts at posts (a), (c), and (e). One 16d galvanized nail shall be driven between each post and block, and between double blocks, in order to prevent block rotation, see '16d NAIL FOR PREVENTION OF OFFSET BLOCK ROTATION', this Index.

THRIE-BEAM OFFSET BLOCKS FIELD TRIMMED FOR USE AT SECTIONS CC & DD

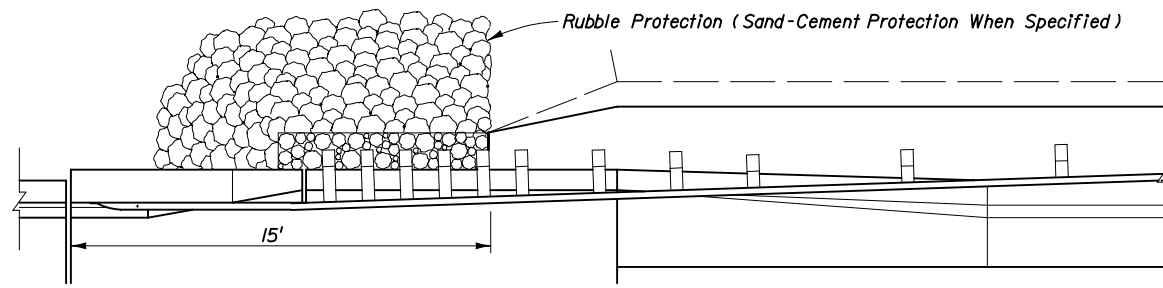
GUARDRAIL APPROACH TRANSITION AND CONNECTION FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIERS EXTENDING FULL LENGTH OF APPROACH SLAB

DETAIL J

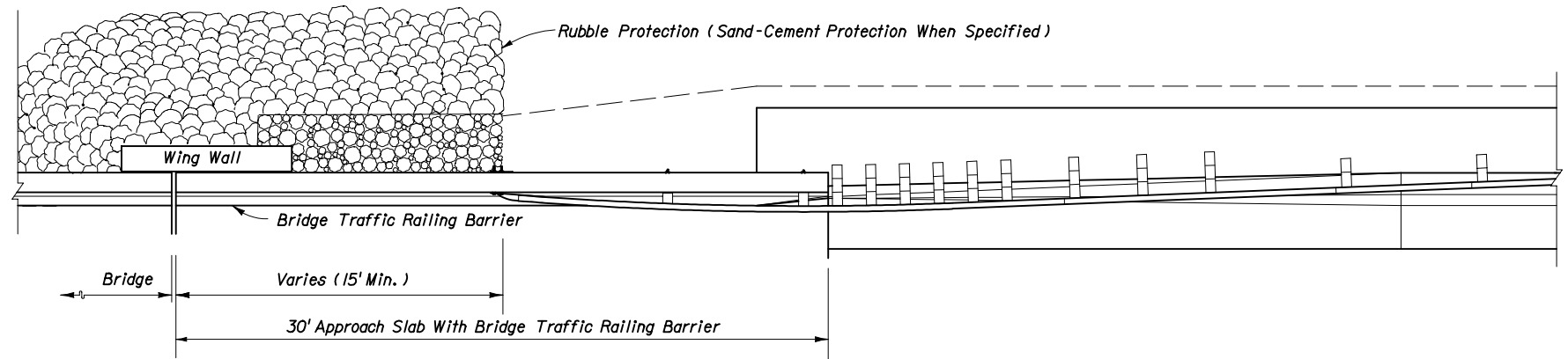
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

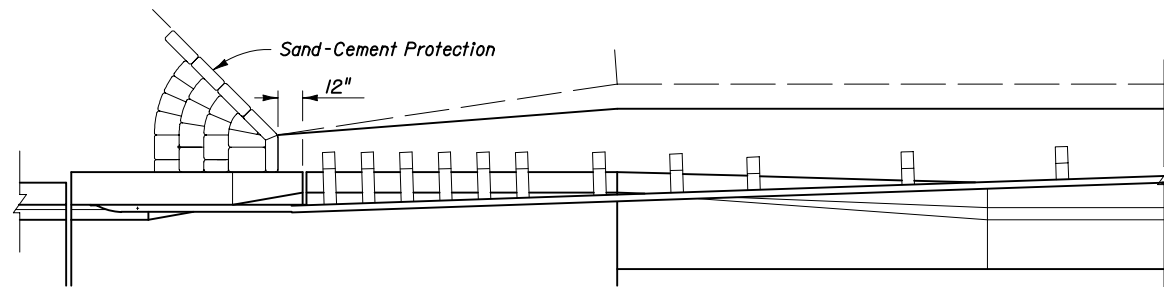
Designed By	Names	Dates	Approved By		
Drawn By	JKK	9-98	 Roadway Design Engineer		
Checked By	JVG	9-98			
Revision	04		Sheet No.	12 of 31	Index No.
					400



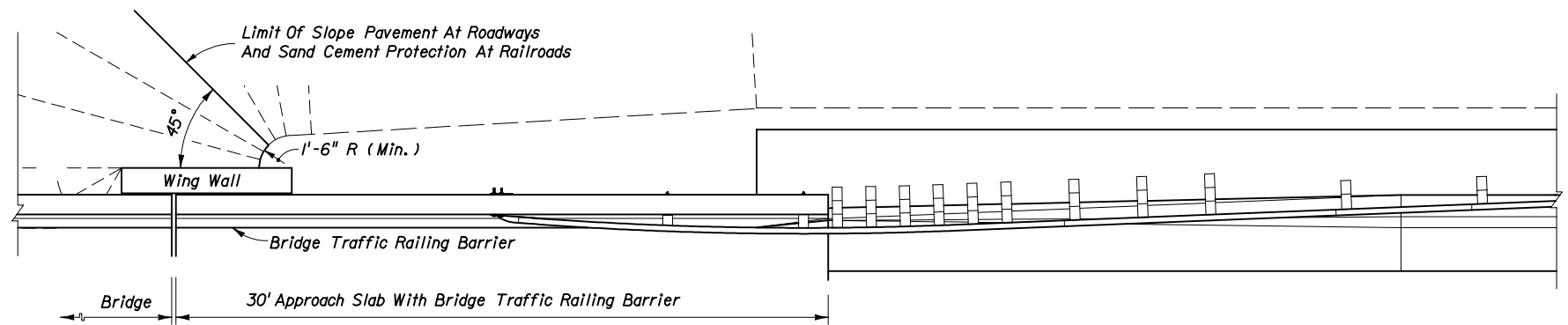
BRIDGES OVER STREAMS



BRIDGES OVER STREAMS



BRIDGES OVER RAILROADS



BRIDGES OVER ROADWAYS OR RAILROADS

For Additional Information See Index No. 402

SKETCHES - BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH

For Additional Guardrail Information See Sheet I2

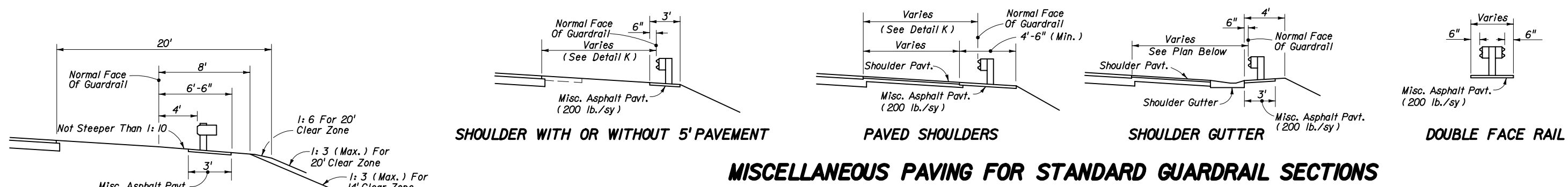
SKETCHES - BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING FULL APPROACH SLAB LENGTH

SKETCH NOTES

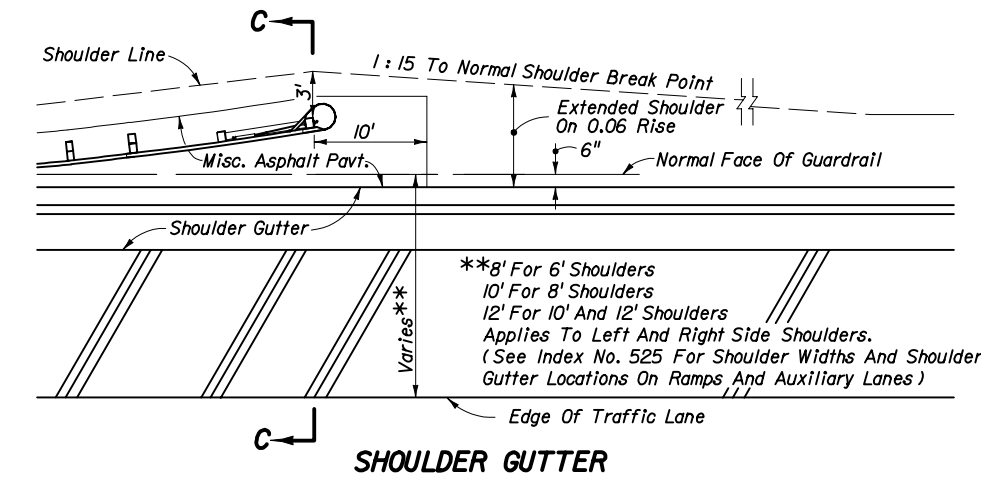
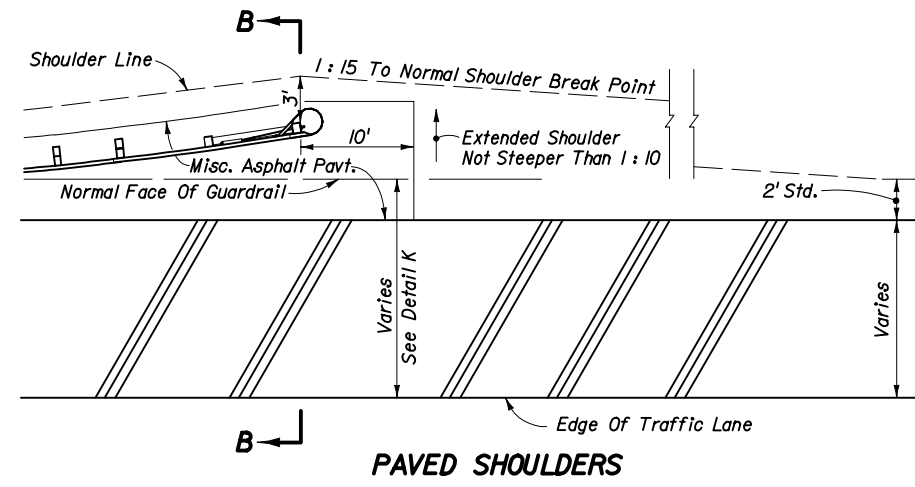
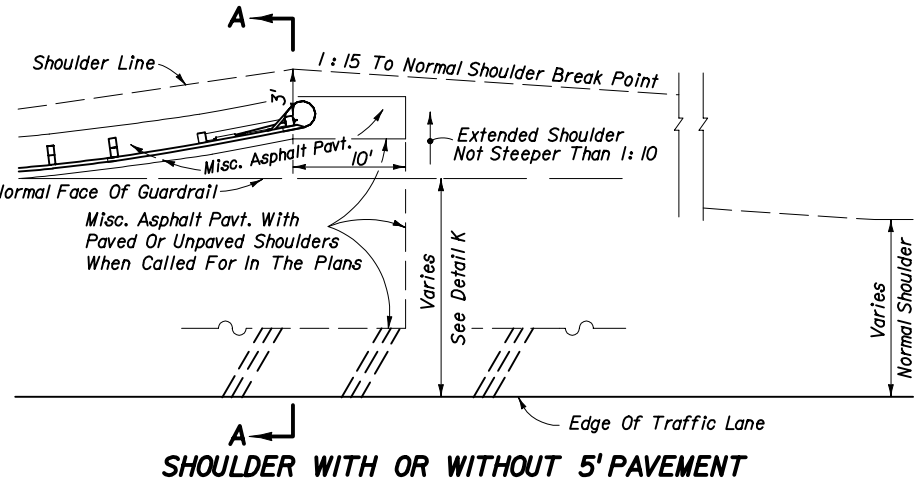
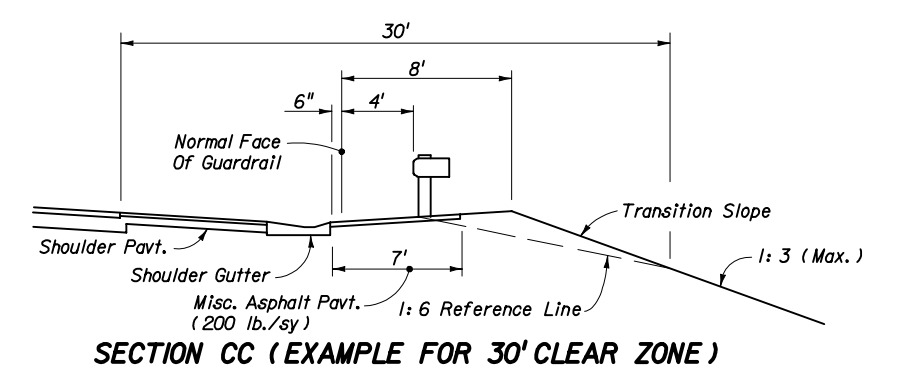
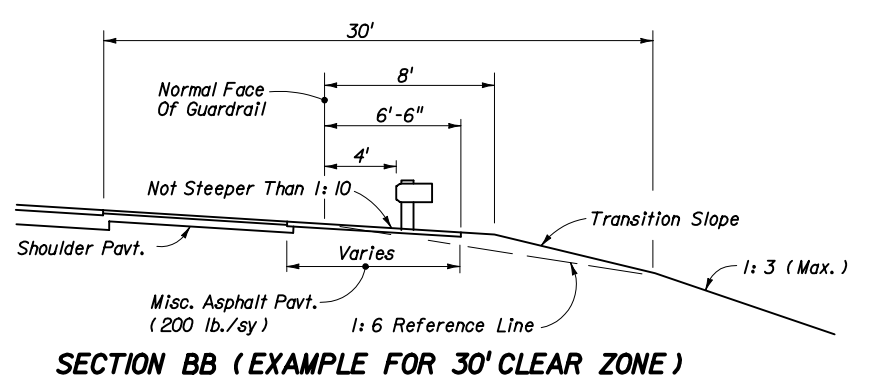
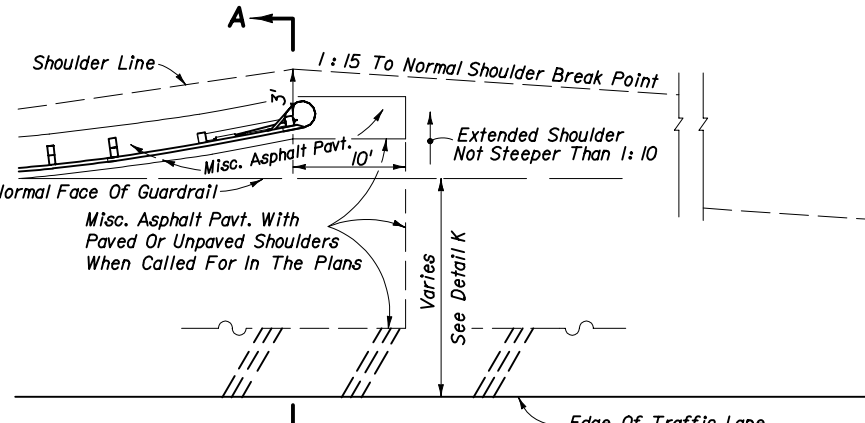
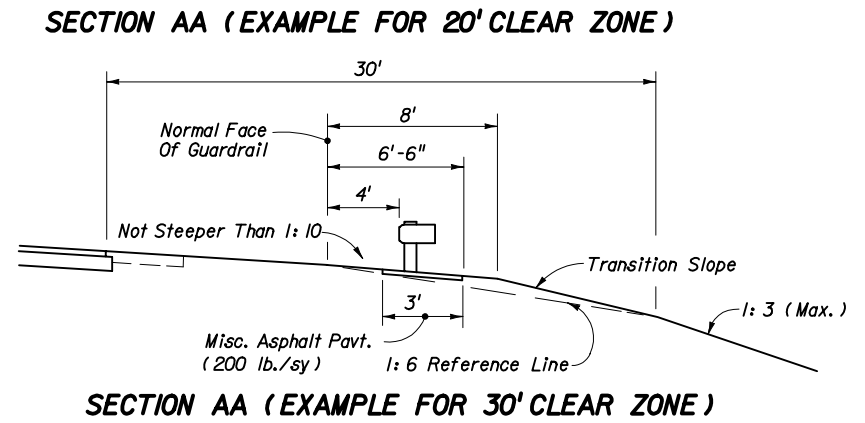
1. These sketches are for showing shoulder interface between roadways and bridges where crossings are normal to other roadways, railroads and streams. For site specific applications and details see the plans and the FDOT Structures Design Office "Detailing Manual" and "Design Guidelines".
2. Shoulder treatments shown in these sketches are for locations with shoulder gutter; shoulder hinge location will vary for facilities without shoulder gutter.

SHOULDER INTERFACE BETWEEN ROADWAYS AND BRIDGES

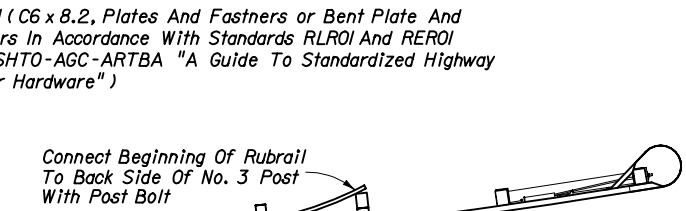
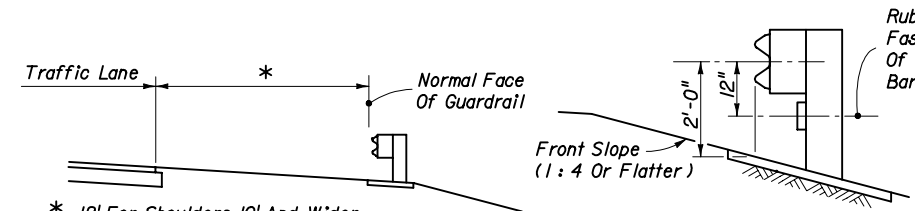
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	Names	Dates	Approved By <i>Chowdhury</i> Roadway Design Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			04	13 of 31 400



MISCELLANEOUS PAVING FOR STANDARD GUARDRAIL SECTIONS



SHOULDERS, SLOPES AND MISCELLANEOUS PAVING FOR FLARED END ANCHORAGE ASSEMBLIES



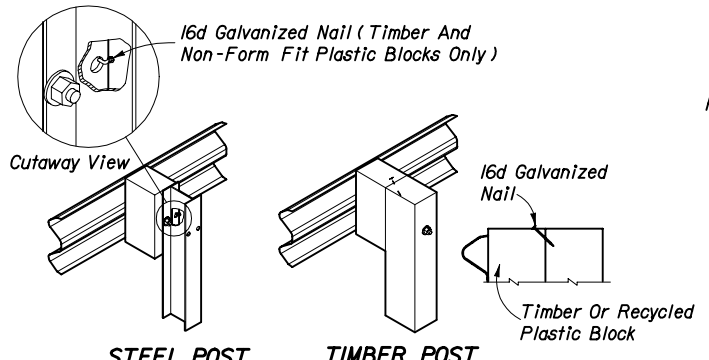
LATERAL PLACEMENT ON FRONT SLOPES (FROM EDGE OF TRAFFIC LANE)			
SLOPE	NOT RECOMMENDED	ACCEPTABLE WITH RUBRAIL	Notes:
4:1	14' to 27'	28' to 45'	For shoulders less than 12' in width the tabulated values will be reduced by the difference between 12' and the shoulder width. Placement of guardrail on front slopes steeper than 4:1 not recommended. Cost of rubrail to be included in the contract unit price for guardrail.
5:1	15' to 25'	26' to 45'	
6:1	17' to 22'	23' to 45'	
7:1	21' to 24'	25' to 45'	
8:1	Acceptable to 25'	26' to 45'	
9:1	Acceptable to 26'	27' to 45'	
10:1	Acceptable to 27'	28' to 45'	

GUARDRAIL LOCATION-DETAIL K

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

Names	Dates	Approved By		
Designed By		 Roadway Design Engineer	Revision	Sheet No.
Drawn By	JM 07/81		00	14 of 31
Checked By	JBW/JVG 07/81			Index No. 400

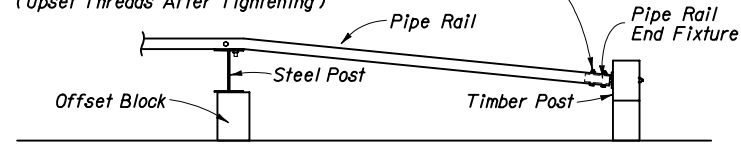


STEEL POST TIMBER POST

16d Galvanized Nail Driven After Post Bolt Pull-Up, Single And Double Face Guardrail, Single Face Guardrail Shown (16d Nail Between Blocks For Multiple Offset Blocks).

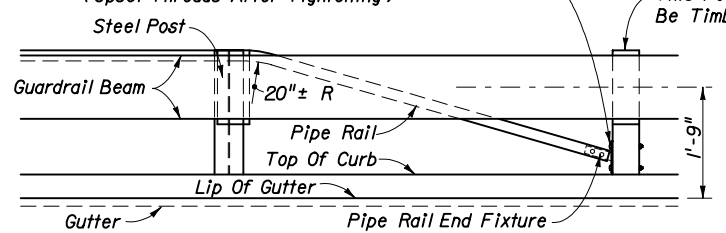
16d NAIL FOR PREVENTION OF OFFSET BLOCK ROTATION

Install Pipe Rail Over Pipe Rail End Fixture And Thru-bolt With $\frac{1}{2}$ " x $3\frac{1}{2}$ " Long Hex Bolts And Nuts With $\frac{1}{2}$ " Plain Round Washers Under Heads And Nuts (2 Req.) (Upset Threads After Tightening)

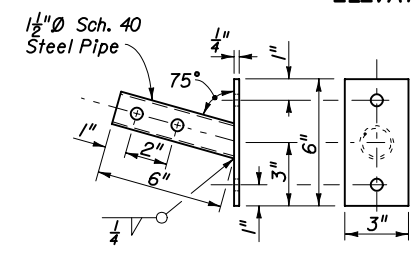


PLAN

Attach Pipe Rail End Fixture To Post With $\frac{1}{2}$ " x 7" Long Hex Bolts And Nuts With $\frac{1}{2}$ " Plain Round Washers Under Heads And Nuts (2 Req.) (Upset Threads After Tightening)

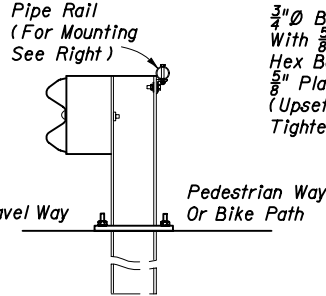


ELEVATION



All Holes Shall Be $\frac{5}{8}$ " ϕ Galvanize After Drilling And Welding

PIPE RAIL END FIXTURE

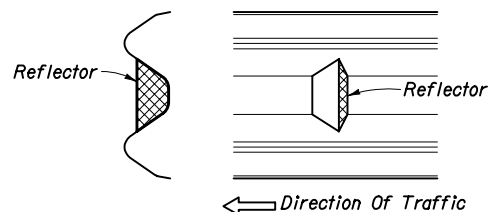


STEEL POST SECTION

NOTES

1. Pipe Rail required on steel guardrail posts when pedestrian ways and bikeways are located 4' or less from back of the posts. Begin and end the pipe rail in accordance with this detail.
2. When guardrails with timber posts are located with the back of posts 4' or less from the near edge of the pedestrian way or bikeway, the bolt ends will require one of the following treatments:
 - (a) Trimming back flush with the face of nut and metalizing or
 - (b) Use of post bolts 15" in length with the washers and nuts counter sunk into sinks 1" to $1\frac{1}{2}$ " deep or
 - (c) Use of post bolts 15" in length with sleeve nuts and washers.
3. The cost for Pipe Rail, mounting components and installation shall be included in the contract unit price for guardrail. Bolt end treatment for timber post shall be included in the contract unit price for guardrail.

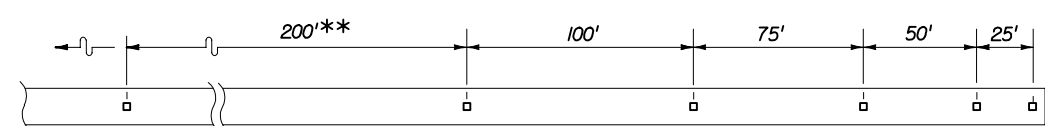
FOR LOCATIONS USED BY PEDESTRIANS OR CYCLISTS
PEDESTRIAN SAFETY TREATMENTS



SECTIONAL VIEW FACE VIEW

Reflectors shall be centered in the channel of W-beam and in the top channel of thrie-beam.

REFLECTOR MOUNTING



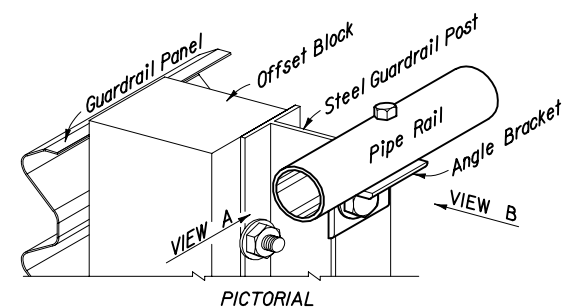
Note: Adjustment in spacing may be required to fit exact guardrail lengths as directed by the Engineer. For minimum installations (length 62.5') provide one reflector at each end and at approximate center.

**For curves greater than 2° the spacing shall be reduced to 100' through the curve.

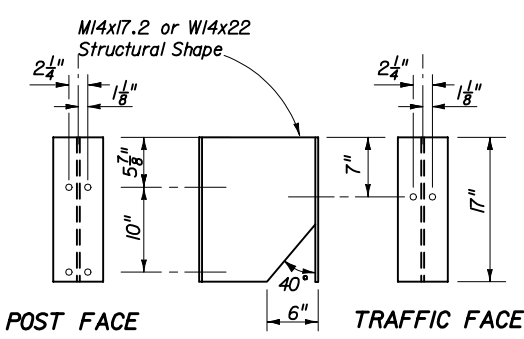
REFLECTOR NOTES

1. Reflectors shall conform to Section 993 of the Standard Specifications.
2. Reflector color (white or yellow) shall conform to the color of the near lane edgeline.
3. Face of rail bolt, screw, rivet or bracket mounted reflectors shall not be used in lieu of adhesive mounted reflectors.
4. Post mounted reflectors approved on the 'Qualified Products List' may be used by FDOT Maintenance to replace damaged or missing reflector in a continuous run of existing post mounted reflectors. Adhesive and post mounted reflectors shall not be intermixed in a continuous run of guardrail.
5. The cost for reflectors shall be included in the contract unit price for Guardrail.

**REFLECTOR SPACING
ADHESIVE REFLECTORS-DETAIL M**



PICTORIAL



POST FACE TRAFFIC FACE

SIDE VIEW

All Holes Are $\frac{15}{16}$ " ϕ

**STEEL MODIFIED THRIE-BEAM
OFFSET BLOCK**

$\frac{5}{8}$ " ϕ Bracket And Pipe Holes With $\frac{1}{2}$ " x $3\frac{1}{2}$ " Long Hex Bolt And Nut With $\frac{1}{2}$ " Plain Round Washer (Upset Threads After Tightening)

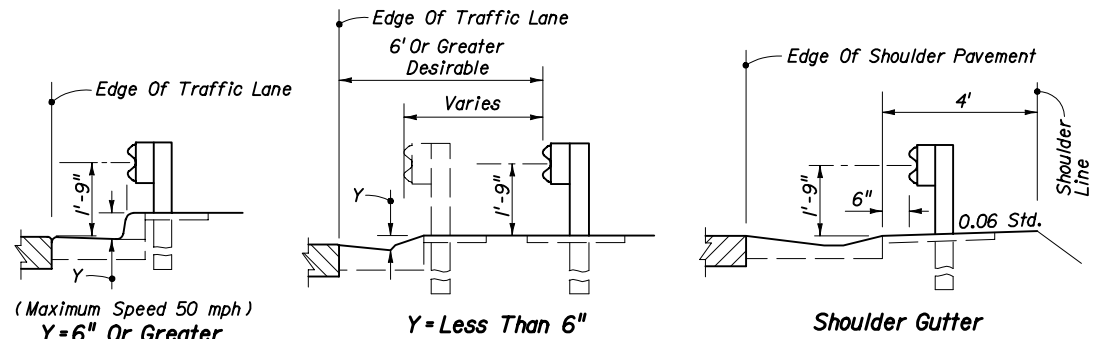
$\frac{3}{4}$ " ϕ Bracket Hole With $\frac{1}{2}$ " x 2" Long Hex Bolt And Nut With $\frac{1}{2}$ " Plain Round Washers (Upset Threads After Tightening)



$\frac{1}{8}$ " Offset From ϕ Of Guardrail Post

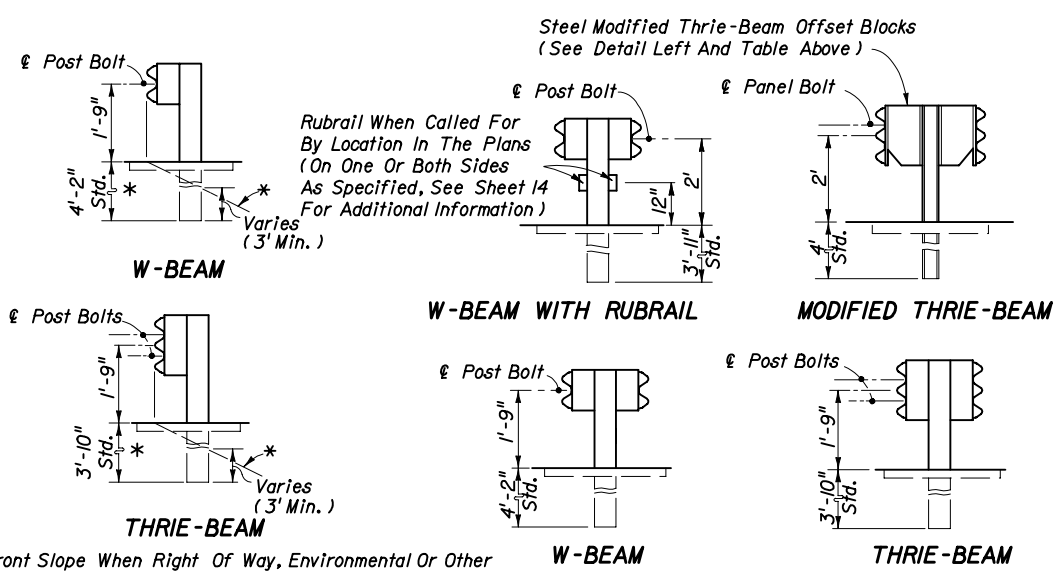
VIEW A VIEW B

PIPE RAIL MOUNTING



LOCATION AT CURB & GUTTER SECTIONS-DETAIL L

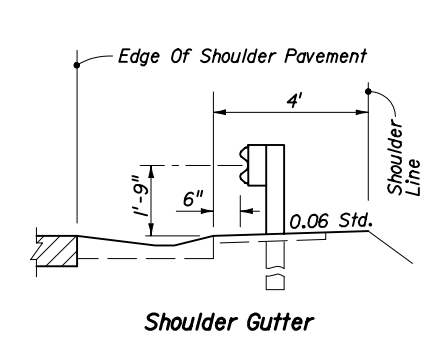
PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS



SINGLE FACED GUARDRAIL

DOUBLE FACED GUARDRAIL

MOUNTING HEIGHTS ON SHOULDERS AND IN MEDIANS



Shoulder Gutter

LOCATION AT CURB & GUTTER SECTIONS-DETAIL L

*Front Slope When Right Of Way, Environmental Or Other Restrictions Prohibit Normal Shoulder Extension

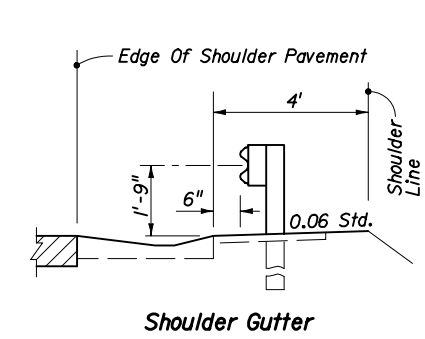
SINGLE FACED GUARDRAIL

DOUBLE FACED GUARDRAIL

SINGLE FACED GUARDRAIL

DOUBLE FACED GUARDRAIL

MOUNTING HEIGHTS ON SHOULDERS AND IN MEDIANS



Shoulder Gutter

LOCATION AT CURB & GUTTER SECTIONS-DETAIL L

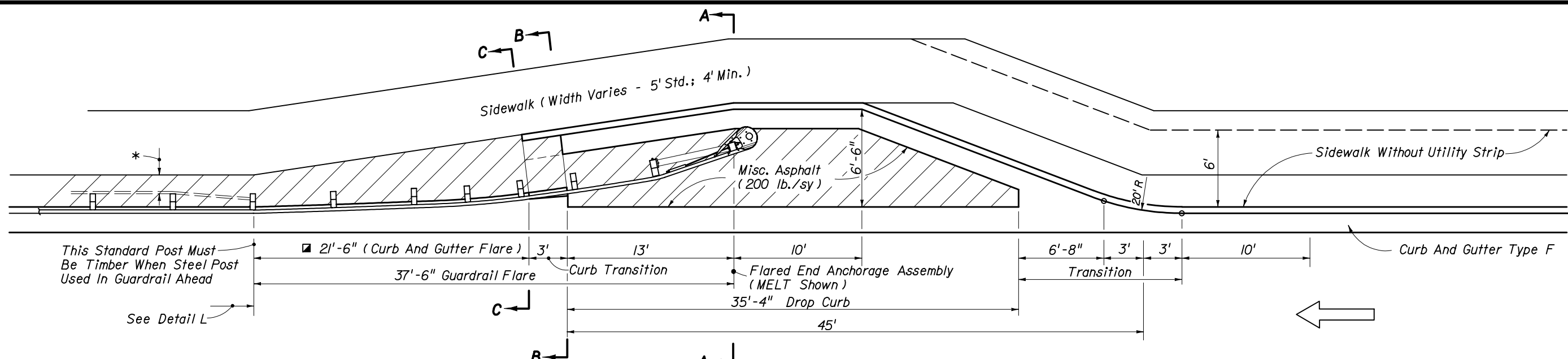
POSTS	OFFSET BLOCKS	REMARKS
Timber	Timber 6" x 8" x 14" (Nominal) For W-Beam And 6" x 8" x 22" (Nominal) For Thrie-Beam Recycled Plastic (See Notes)	Post bolt hole in timber and plastic blocks to be centered ($\pm \frac{1}{4}$ "). All timber offset blocks shall be dressed on all four sides (S4S). One 16d galvanized nail per block is to be used to prevent rotation of block (see detail left).
Steel W6x8.5, W6 x 9 Or 6" C	Timber 6" x 8" x 14" (Nominal) For W-Beam And 6" x 8" x 22" (Nominal) For Thrie-Beam Recycled Plastic (See Notes)	Same as above for timber and plastic blocks except that form fit plastic block holes align with holes in steel posts and do not require nails.
Steel W6x8.5, W6 x 9 Or 6" C	W14 x 22 x 17" (M14 x 18 x 17") (Steel Modified Thrie-Beam)	$\frac{5}{8}$ " ϕ x $1\frac{1}{2}$ " long hex head bolts with full length thread and nuts (2 Req.) and $\frac{3}{8}$ " plain round washers (4 Req.) for mounting steel block to post. Bolts are to be installed in opposite holes, top and bottom.

Notes: 1. Timber and recycled plastic offset blocks of identical size and shape can be intermixed within a run of rail.
2. Recycled plastic offset blocks shall meet the passing evaluation criteria for Test Level 3 of NCHRP 350. The blocks shall be tested as a component in a semi-rigid guardrail test article under full scale crash test conditions. The blocks shall be in conformance with Sections 536 and 972 of the Specifications and be included on the Qualified Products List. W-Beam blocks shall be 14" in height and thrie-beam blocks shall be 22" in height. The blocks shall be capable of providing a $1\frac{1}{2}$ " (Min.) offset.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

Names	Dates	Approved By		
Designed By		 Roadway Design Engineer		
Drawn By	HSD 09/81			
Checked By	JBW/JVG 09/81	Revision	Sheet No.	Index No.
		04	15 of 31	400

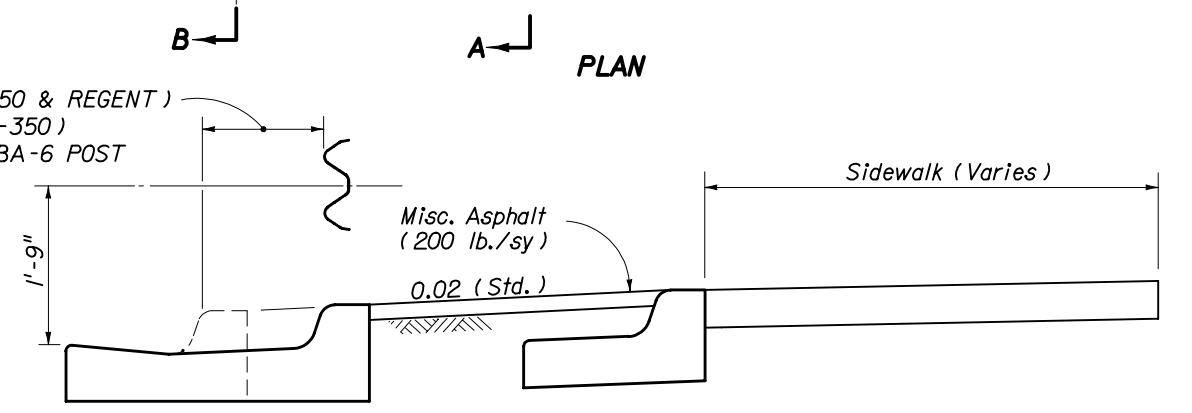


This Standard Post Must Be Timber When Steel Post Used In Guardrail Ahead
See Detail L

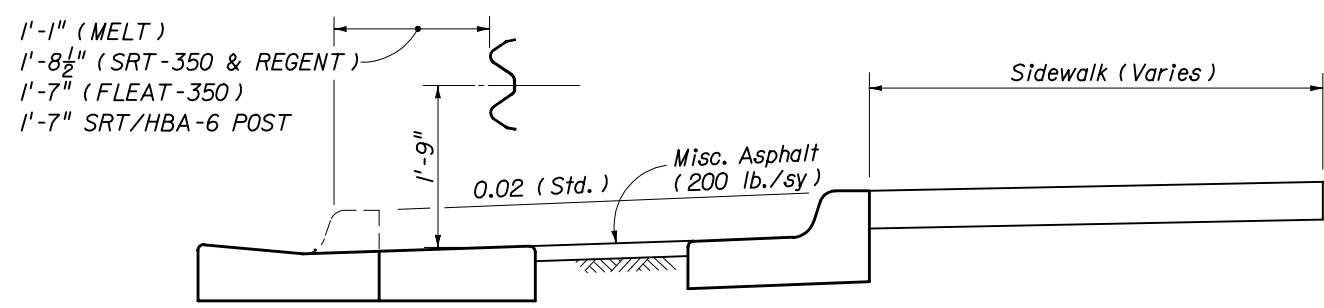
- 0'-9" (MELT)
- 1'-3 1/2" (SRT-350 & REGENT)
- 2'-3 1/2" (FLEAT-350)
- 2'-3 1/2" SRT/HBA-6 POST

*Safety pipe rail is required when the back of steel guardrail posts are 4' or less from the near edge of a pedestrian way or bikeway and post bolt treatment is required when the back of timber posts are 4' or less from the near edge of a pedestrian way or bikeway; see 'PEDESTRIAN SAFETY TREATMENTS'.

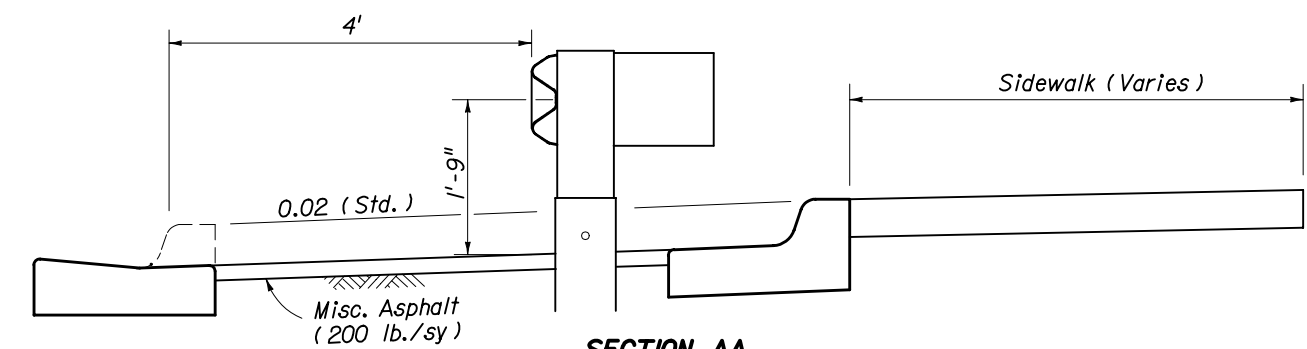
▣ Curb flare shall follow guardrail flare, see elsewhere in this Index for additional guardrail flare information.



SECTION CC



SECTION BB



SECTION AA

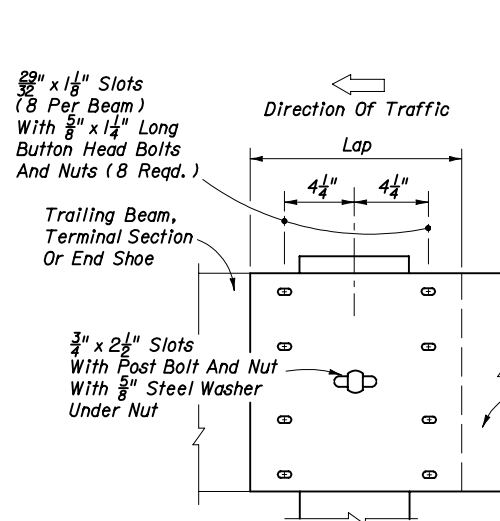
APPROACH TREATMENT FOR CURB AND GUTTER

DETAIL Q

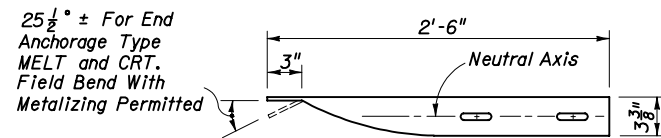
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

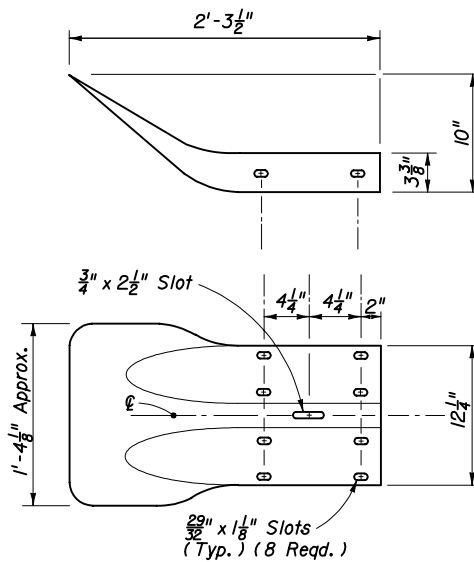
Names		Dates	Approved By		
Designed By	JVG/JBW	10/87	Roadway Design Engineer		
Drawn By	JBW	10/87			
Checked By	JVG	10/87			
Revision	04		Sheet No.	16 of 31	Index No.
					400



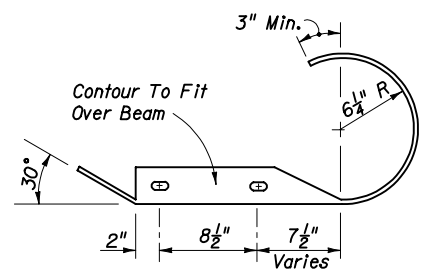
W-BEAM RAIL SPLICE



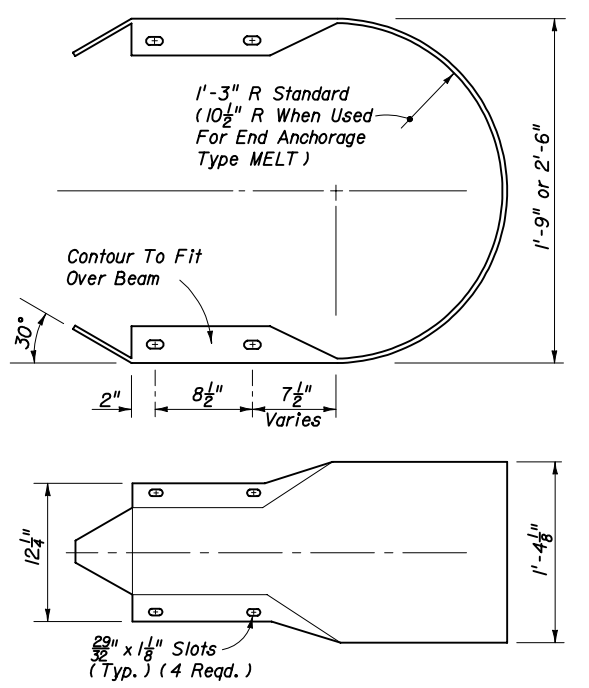
SPECIAL END SHOE



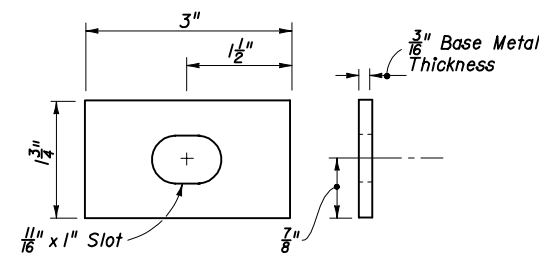
FLARED END SECTION



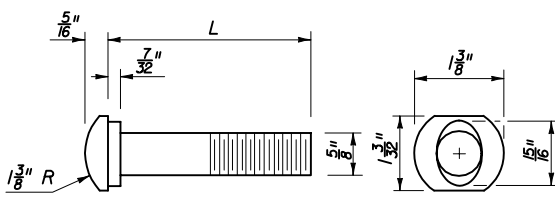
ROUNDED END SECTION



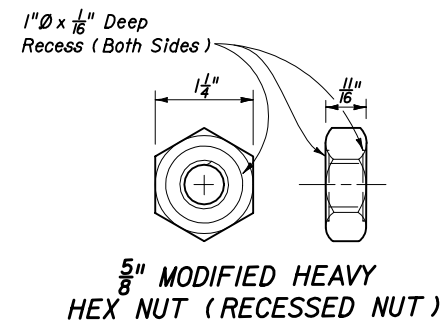
BUFFER END SECTION



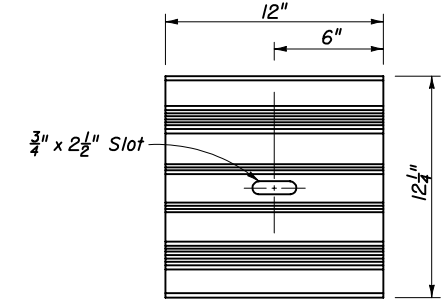
(RECTANGULAR PLATE WASHER) BEAM WASHER



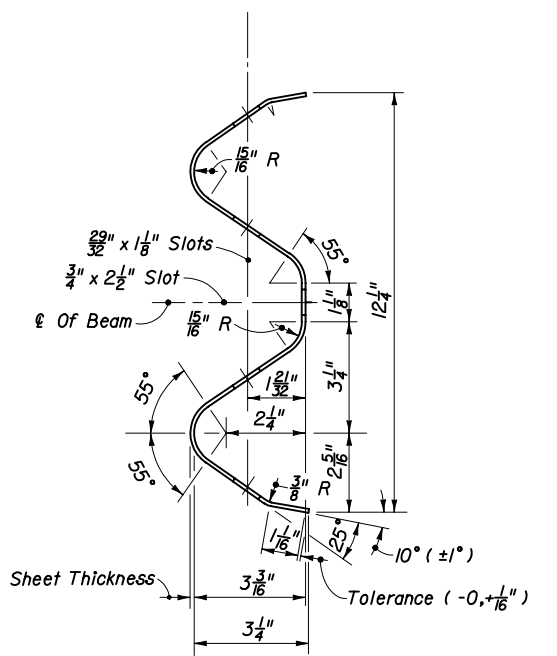
5/8" OVAL SHOULDER BUTTON HEAD BOLT



5/8" MODIFIED HEAVY HEX NUT (RECESSED NUT)



W-BEAM BACK-UP PLATE



W-BEAM

Note: For beam washer requirements on end terminals, see individual end anchorage assembly details. Washers are to be used where necessary to accomplish alignment or where the posts bolt head shows tendency to pull through the rail slot. Washers installed on guardrail, between end anchorages, prior to July 1, 1990 may remain in place until the guardrail is relocated or until repairs require removal and reinstallation of a post bolt.

Note: The round washer is not intended for use under the recess nut for the beam to beam rail splice. The washer is required under the recess nut for connecting the beam to the special end shoe; under the post bolt nut for connecting the beam to the timber post and offset blocks; for connecting the beam to steel posts with timber offset blocks; under the hex bolt head for securing the beam anchor plate to the beam; and, for general guardrail connections by 5/8 inch diameter hex bolts and nuts. For supplemental information see BEAM ANCHOR PLATE, PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS, individual end anchorage assembly details, SPECIAL STEEL GUARDRAIL POSTS, SPECIAL END SHOE, W-BEAM RAIL SPLICE, THRIE-BEAM RAIL SPLICE, and THRIE-BEAM TERMINAL CONNECTOR details.

Note: 5/8 inch diameter steel washer required with splice bolts

Note: For application information see individual end anchorage assembly details.

L (In.)	THREAD LENGTH (Min.) (In.)	APPLICATION
1 1/4"	Full Length	Rail Splice Bolt
10"	4"	Single Or Double Faced Guardrail Timber Or Recycled Plastic Offset Block(s) On Steel Post
18"	4"	Post Bolt - Single Faced Guardrail Timber Posts
25"*	4"	Post Bolt - Double Faced Guardrail Timber Posts

Special bolts having lengths of 10" or greater shall have a thread length of not less than 4".

For applications where special bolts having lengths greater than 25" are required, the Contractor may use a 5/8" diameter threaded rod (field cut to length). A hex nut and beam washer shall be used at the guardrail face with no more than 3/4" of the threaded rod projecting beyond the top of the nut. The projecting thread on both ends shall be distorted to secure the nuts, and both ends of the threaded rod metalized with organic zinc-rich coating.

* Use of the 25" AASHTO-AGC-ARTBA standard length post bolt on double faced guardrail that results in the bolt projecting more than 3/4" beyond the face of the nut after pull-up shall be trimmed to 3/4" reveal and metalized with organic zinc-rich coating.

HS Hex bolts for THRIE-BEAM TERMINAL CONNECTORS shall conform to the requirements of ASTM A449 (Type 1) with heavy hex nuts and washers. All other hex bolts shall conform to the requirements of ASTM A563. Bolts, nuts and washers shall be hot dip galvanized. Heavy hex nut may be used in lieu of hex nuts and hex nuts used for jam nuts.

HEX BOLTS AND NUTS

POST SPACING (Ft.)	OFFSETS (Ft.) Measured From Face Of Guardrail To Front Of Above Ground Rigid Hazard			
	SINGLE BEAM W-Beam	THRIE-BEAM Thrie-Beam	NESTED BEAMS W-Beam	NESTED BEAMS Thrie-Beam
6'-3"	4'	3'-3"	N/A	N/A
3'-1 1/2"	3'	2'-8"	2'-8"	2'-4"
1'-6 3/4"	N/A	N/A	2'-4"	2'

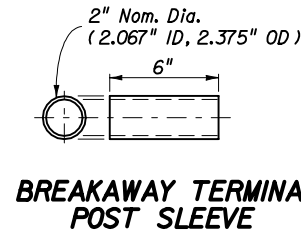
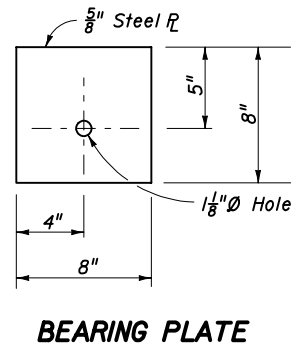
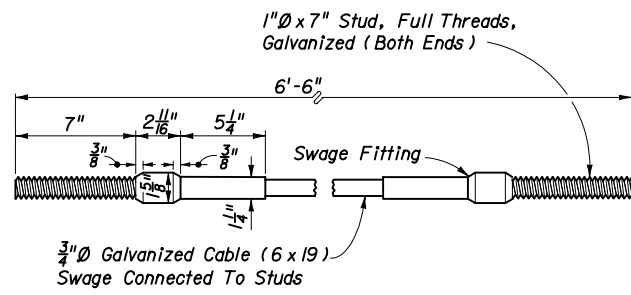
Note: The values shown should be utilized unless changes are supported by imperial validation. Those desiring to develop offset values from the simulated deflection values shown in Table 5.4 of the AASHTO Roadside Design Guide are cautioned to proceed only if background in the table development is understood.

MINIMUM OFFSET FOR SINGLE FACED GUARDRAIL (Ft.)

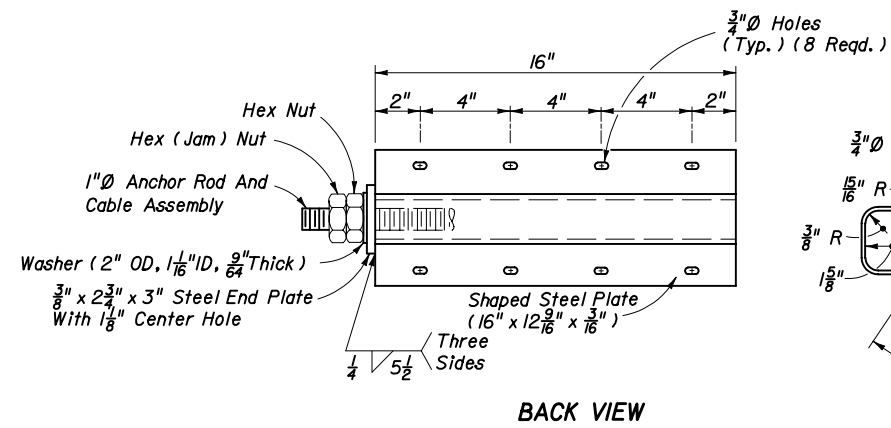
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

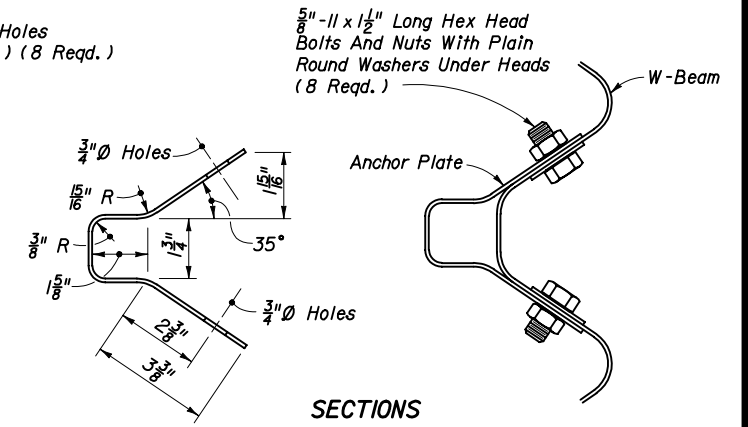
Designed By	Names	Dates	Approved By
Drawn By	HSD	8/81	<i>[Signature]</i> Roadway Design Engineer
Checked By	JBW/JVG	8/81	Revision
		04	Sheet No. 17 of 31
			Index No. 400



BREAKAWAY TERMINAL POST SLEEVE



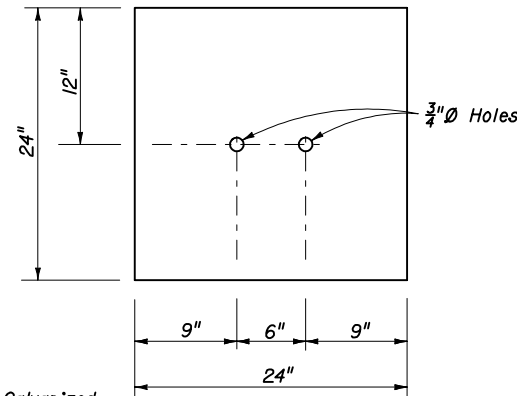
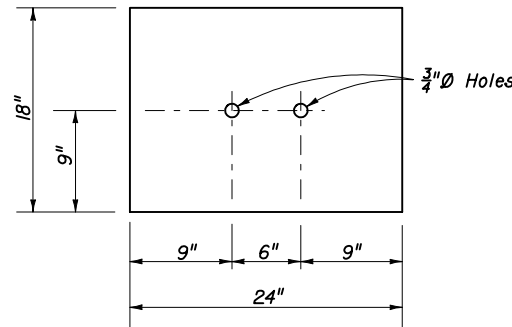
BACK VIEW



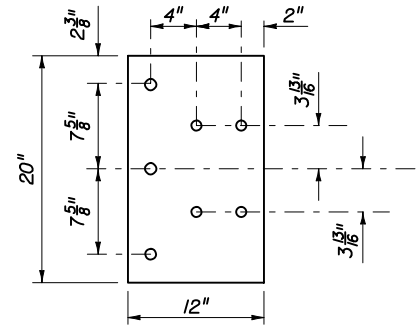
SECTIONS

Note: Cable assemblies shall be in accordance with the specifications of AASHTO-AGC-ARTBA 'A Guide To Standardized Highway Barrier Hardware' Cable Anchor Assembly FCAOI. An additional cable assembly 9' in length with a swaged fitting on one (1) end is required for each end anchorage assembly Type CRT.

CABLE ASSEMBLY

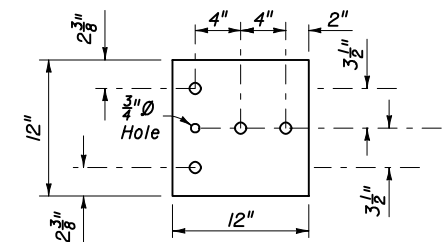


SOIL PLATES

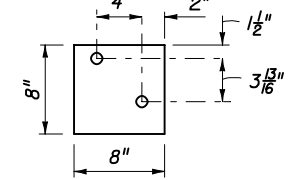


THRIE-BEAM TERMINAL CONNECTOR

BEAM ANCHOR PLATE

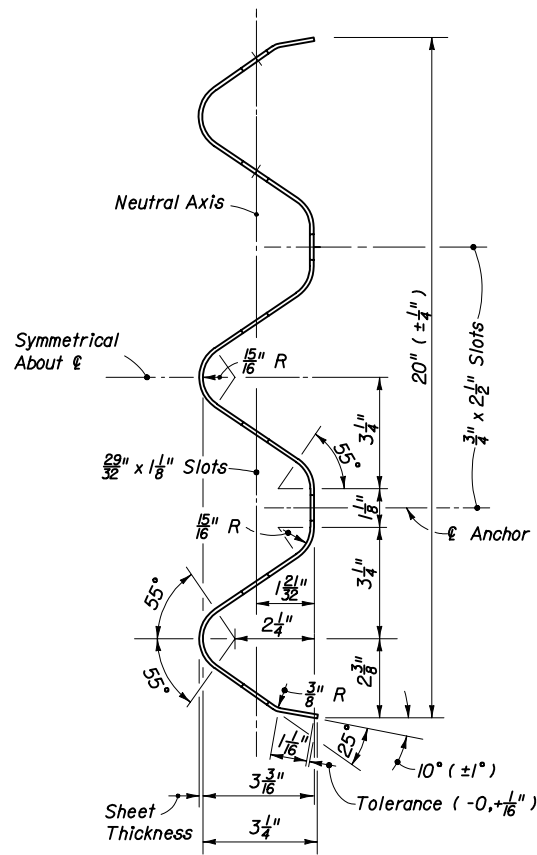


SPECIAL END SHOE

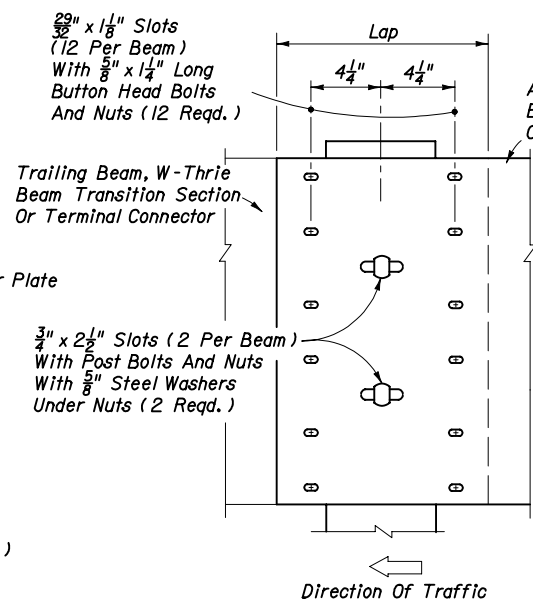


FILLER PLATE

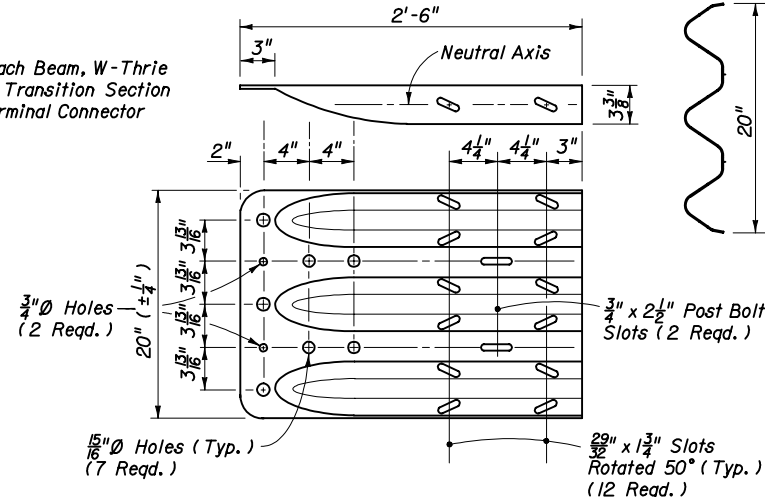
GALVANIZED STEEL BACK-UP PLATES FOR CONNECTING SPECIAL END SHOES AND TERMINAL CONNECTORS TO CONCRETE BRIDGE TRAFFIC RAILING BARRIERS AND CONCRETE BARRIER WALLS



THRIE-BEAM

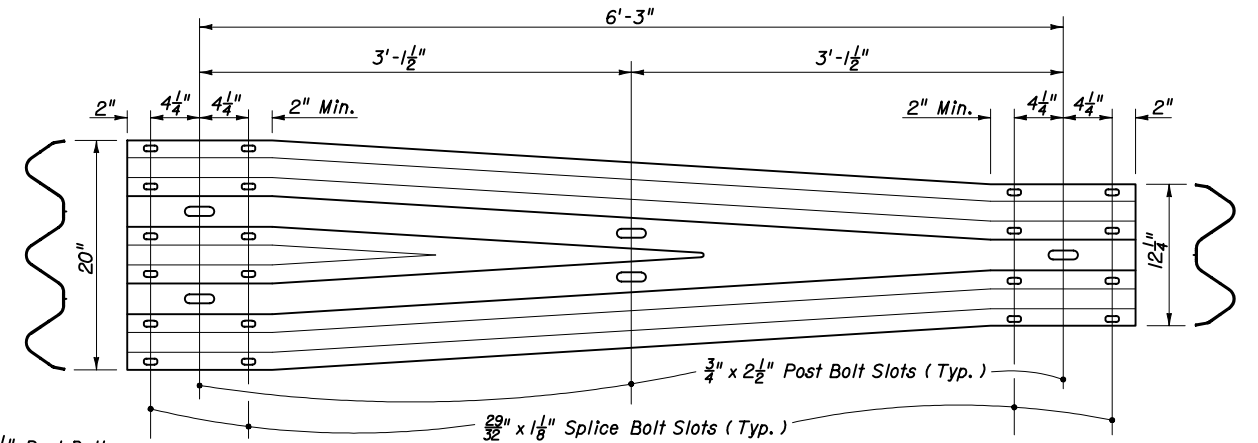


THRIE-BEAM RAIL SPLICE



Note: 5/8 inch diameter steel washer required with splice bolts


THRIE-BEAM TERMINAL CONNECTOR

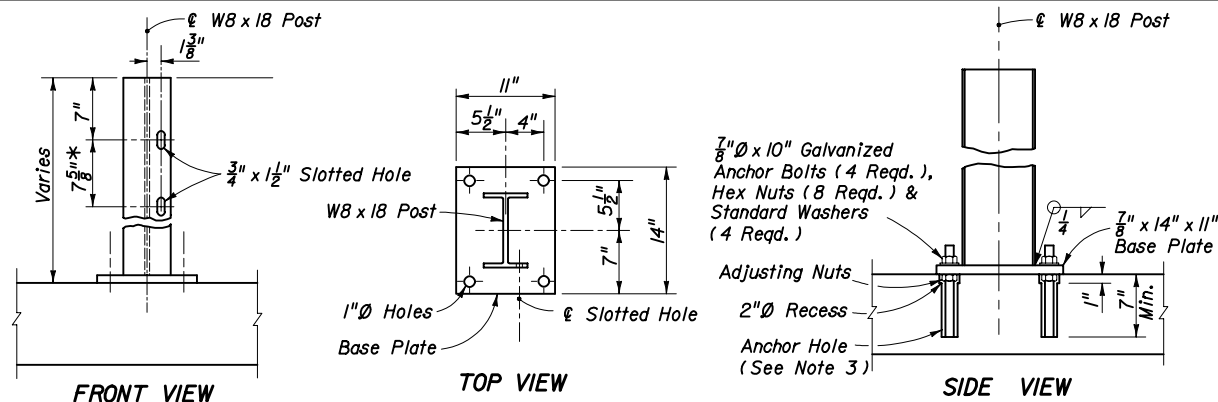


W-THRIE BEAM TRANSITION SECTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

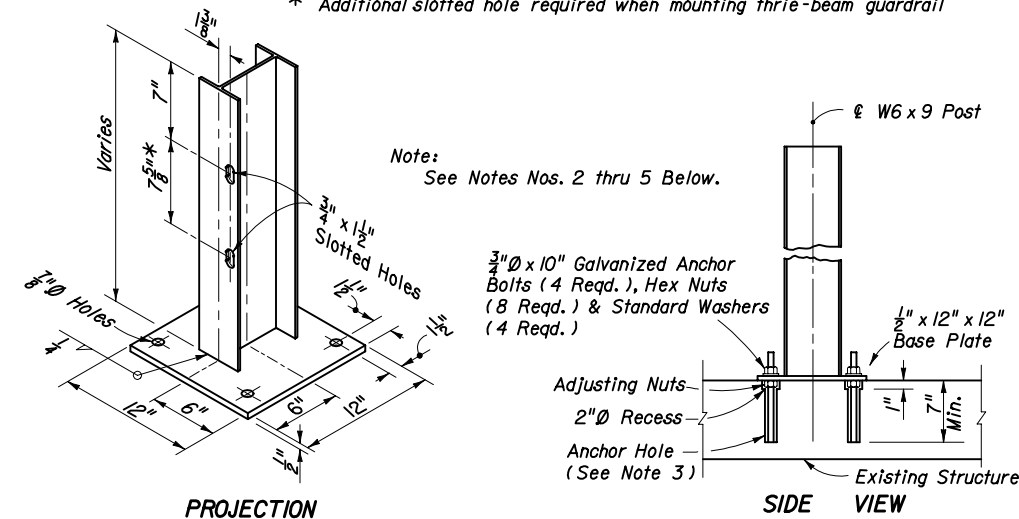
GUARDRAIL

Names		Dates	Approved By				
Designed By			 Roadway Design Engineer				
Drawn By		Revision				Sheet No.	Index No.
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FOR REPLACEMENT OF EXISTING W8 x 18 GUARDRAIL POSTS ON APPROACH SLABS AND BRIDGES

* Additional slotted hole required when mounting three-beam guardrail

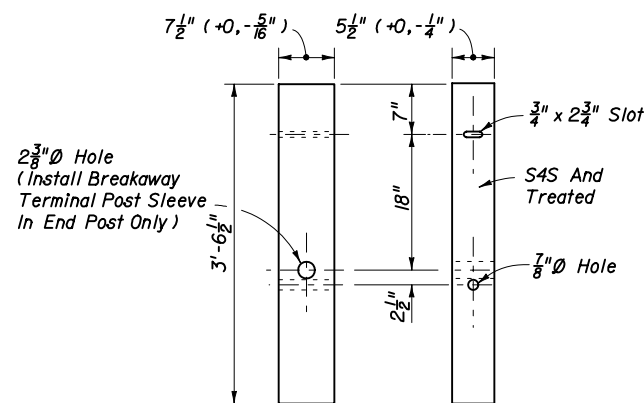


FOR CONSTRUCTION OF GUARDRAIL WHERE CULVERT, PIER FOOTING OR OTHER STRUCTURE PRECLUDES DRIVEN POST INSTALLATION

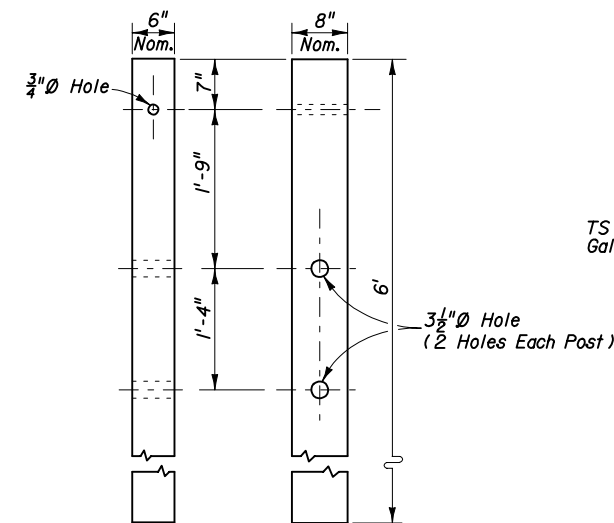
NOTES: (SPECIAL STEEL POST)

- See Index No. 402 for special steel posts required for construction and repair of guardrail transitions to bridge traffic railing barrier retrofits on existing bridges. See Structures Index Nos. 771 through 777 for steel posts required to construct traffic railing barrier retrofits on existing bridges.
- Either anchor bolts, concrete wedge anchors or approved Adhesive-Bonded Anchors for Structural Applications may be used.
Anchor bolts, wedge anchors and adhesive anchors shall have a minimum tensile strength of 60,000 psi and galvanized in accordance with ASTM A153 (stainless steel components may be substituted but components plated in accordance with ASTM B-633 are not acceptable). Adhesive anchor rods shall be equal in diameter to that detailed for anchor bolts. Wedge anchors are to be installed in accordance with the manufacturer's recommendations, assuming 3,000 psi compressive strength for concrete. Wedge anchors shall also meet the following requirements: (a) tensile load each anchor: approach slabs 14,000 lbs.; other structures 8,000 lbs. (b) shear load each anchor: approach slabs 15,000 lbs.; other structures 7,800 lbs.
- Posts are to be plumbed by adjusting nuts or mortar seating. Posts installed using anchor bolts and adhesive anchors are to be set with adjusting nuts as detailed, unless the Engineer approves the use of mortar seating in lieu of adjusting nuts. Posts installed using wedge anchors are to be set with mortar seating. Base plates shall be grouted with neat finish.
- Adhesive-Bonded Anchors for Structural Applications shall comply with Section 937 and be installed in accordance with Section 416. Drilled hole diameter shall be in accordance with the manufacturer's instructions.
- Anchor holes and recesses shall be drilled; wedge anchor holes are to be drilled in accordance with the manufacturer's specifications. Encountered reinforcing steel shall be drilled through. Holes shall be thoroughly cleaned when setting bolts and anchors and dry when setting wedge anchors.
- Steel post and base units shall be galvanized in accordance with ASTM A123. Any damaged galvanized areas are to be metalized in accordance with Section 562 of the Standard Specifications.

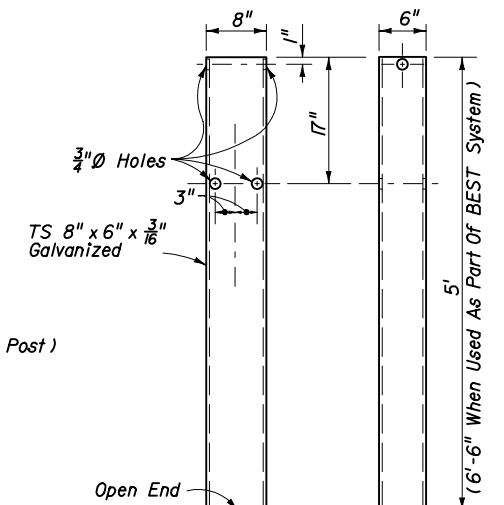
SPECIAL STEEL GUARDRAIL POSTS



SHORT TIMBER BREAKAWAY POST

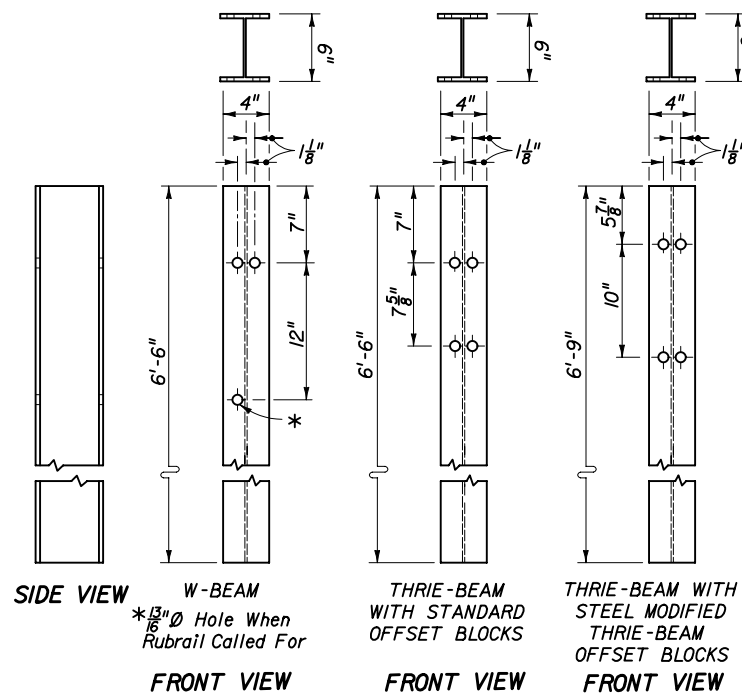


CRT TIMBER POST



STEEL TUBE

SPECIAL TIMBER GUARDRAIL POSTS



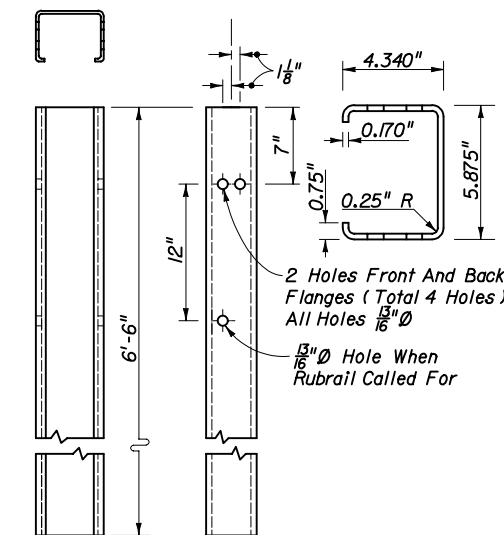
W-BEAM THRIE-BEAM WITH STANDARD OFFSET BLOCKS THRIE-BEAM WITH STEEL MODIFIED THRIE-BEAM OFFSET BLOCKS

All Holes Shall Be 1/8" Identical Front And Back Flanges
Note: W6 x 8.5 or W6 x 9 steel posts may be either rolled or welded structural shapes conforming to or exceeding the design properties of ASTM A6/A6M. Welding shall be in accordance with the requirements of ASTM A769/A769M. Posts shall be cut to length and the ends seal welded between web and flange before galvanizing. Posts to be galvanized in accordance with ASTM A123.

W6 x 8.5 OR W6 x 9 STEEL POST

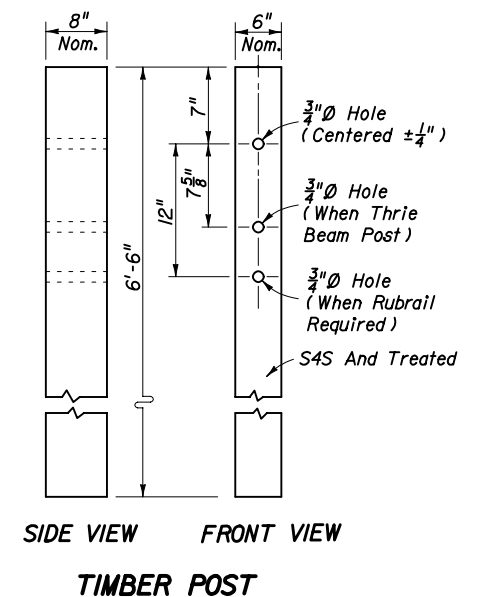
STANDARD TIMBER AND STEEL GUARDRAIL POSTS

GUARDRAIL POSTS



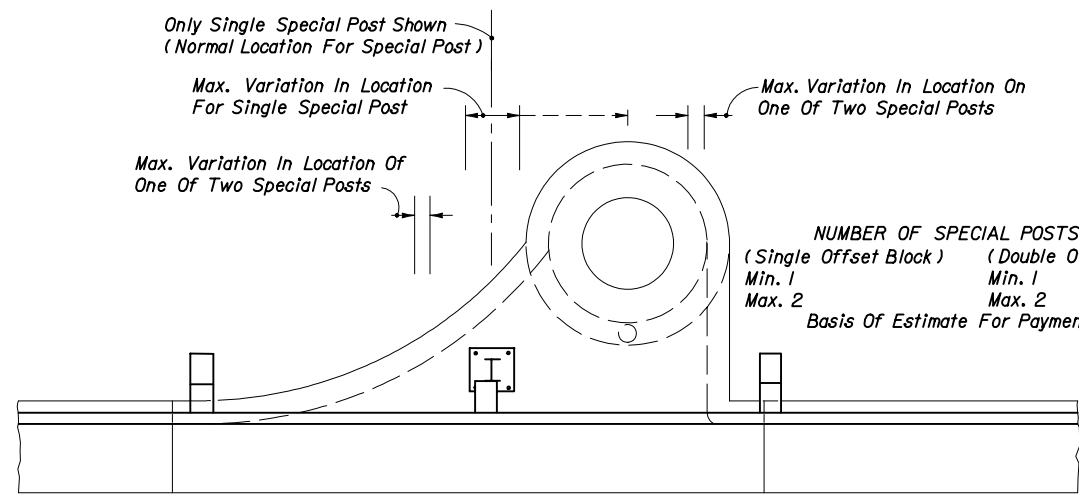
6'-C STEEL POST

Note: 6'-C steel posts are to face the same direction in any continuous run of guardrail. Posts to be galvanized in accordance with ASTM A123.

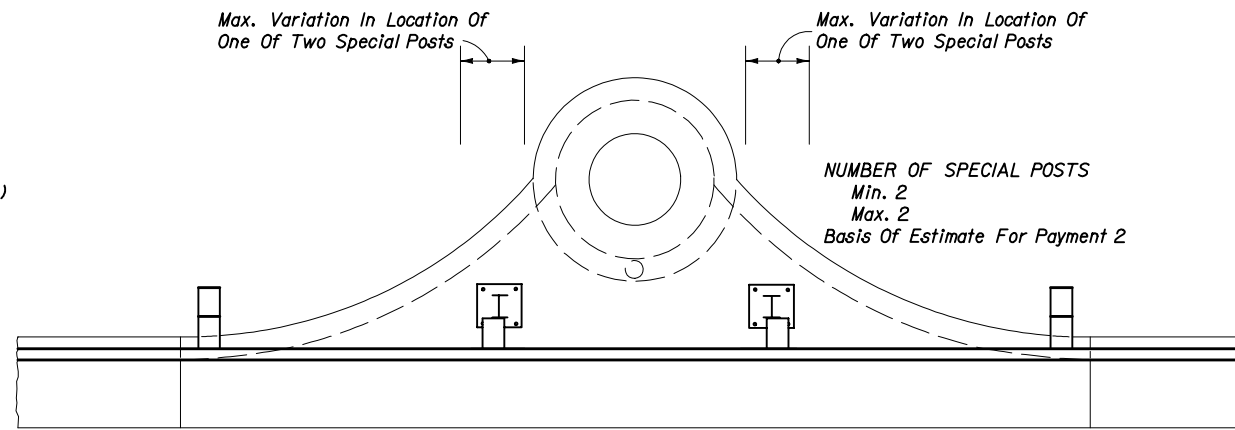


TIMBER POST

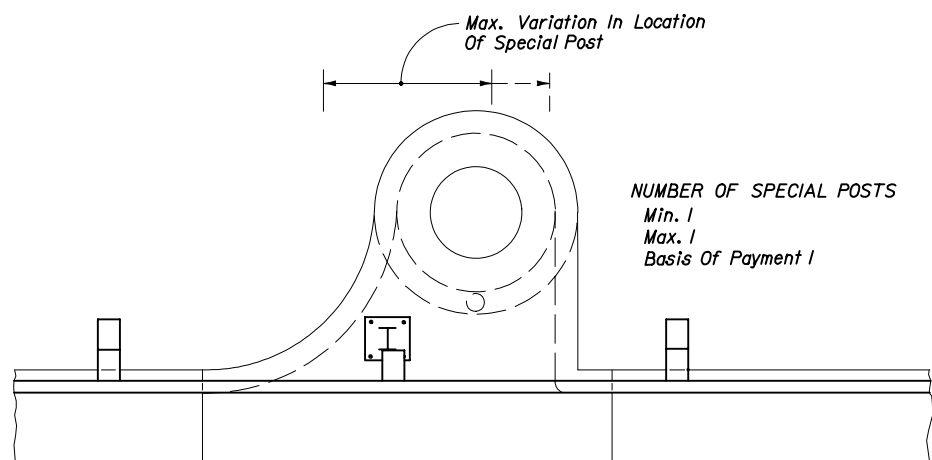
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Names	Dates	Approved By		
Designed By		Roadway Design Engineer		
Drawn By	JM 08/81	Revision	Sheet No.	Index No.
Checked By	JVG/JBW 08/81	04	19 of 31	400



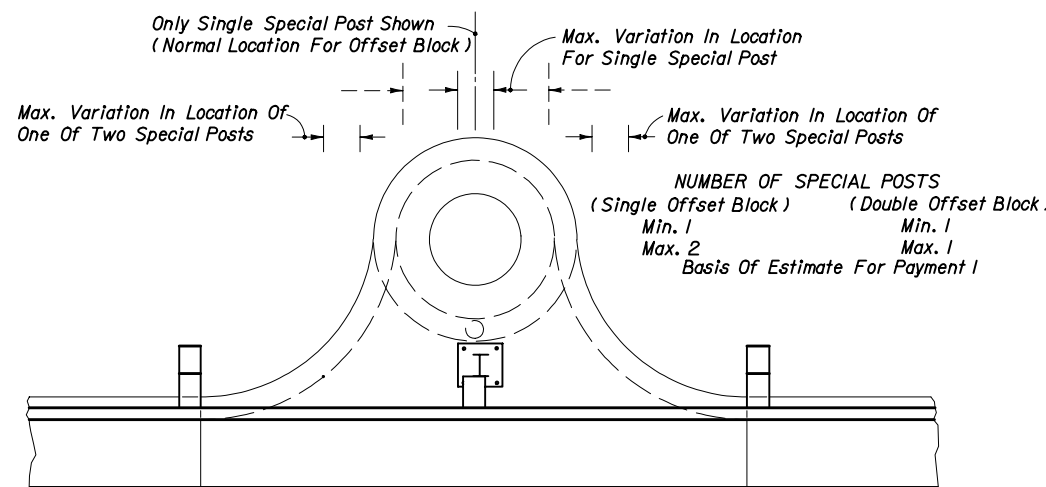
CURB INLET TYPE 1



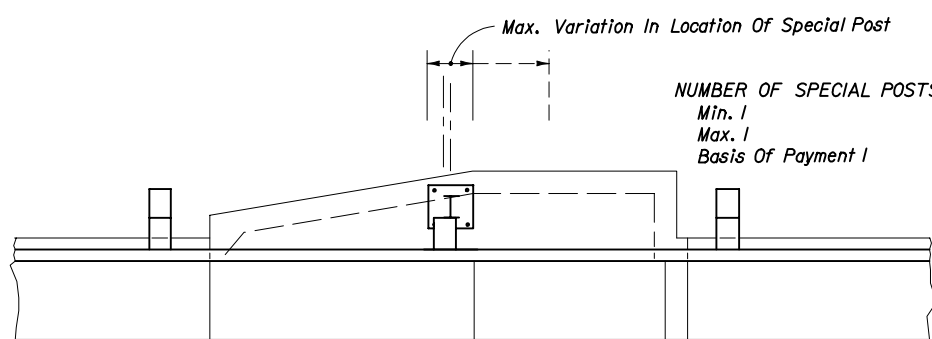
CURB INLET TYPE 2



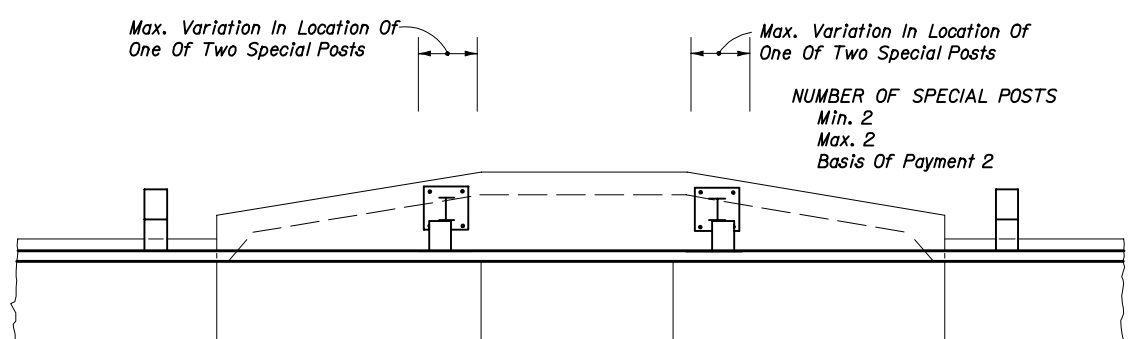
CURB INLET TYPE 3



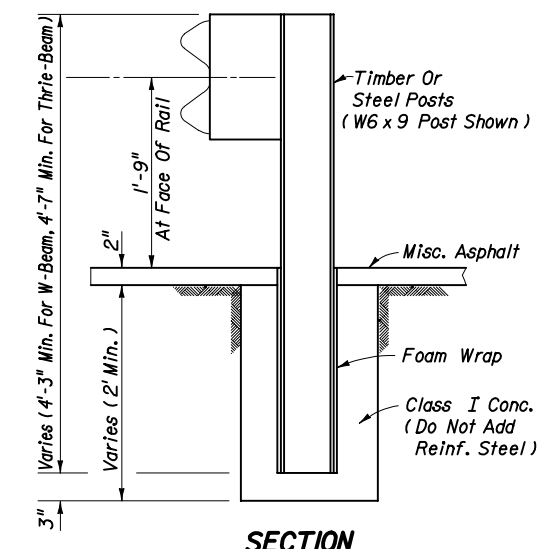
CURB INLET TYPE 4



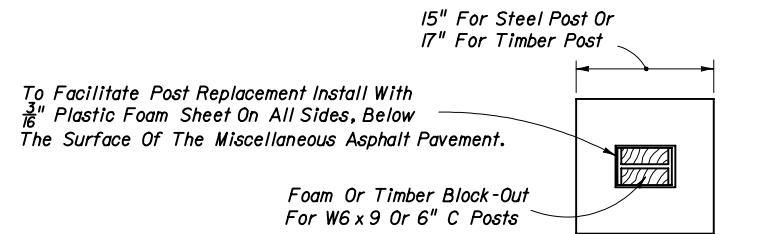
CURB INLET TYPE 5



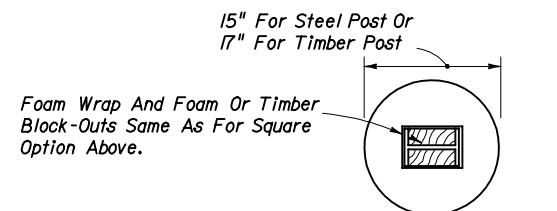
CURB INLET TYPE 6



SECTION



PLAN (SQUARE OPTION)



PLAN (ROUND OPTION)

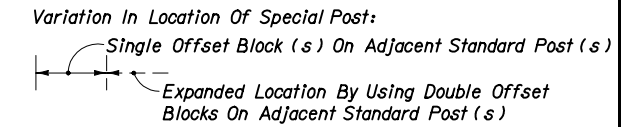
Note: For line post applications only, i.e., not to be used with breakaway post applications nor be used to modify End Anchorage Assemblies Type II.

TO BE USED PRINCIPALLY OVER SHALLOW UTILITIES
ENCASED GUARDRAIL POST

Notes:

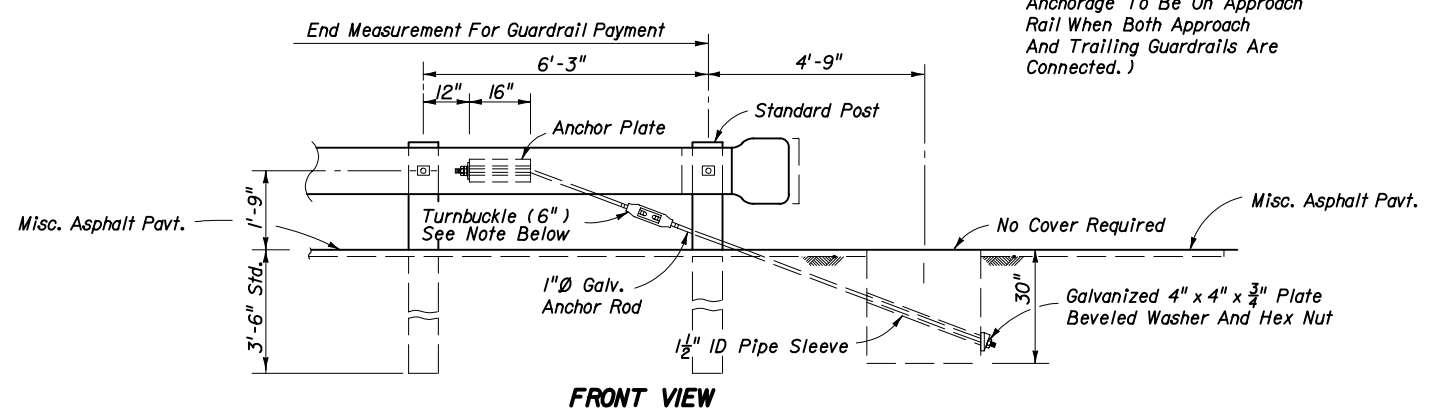
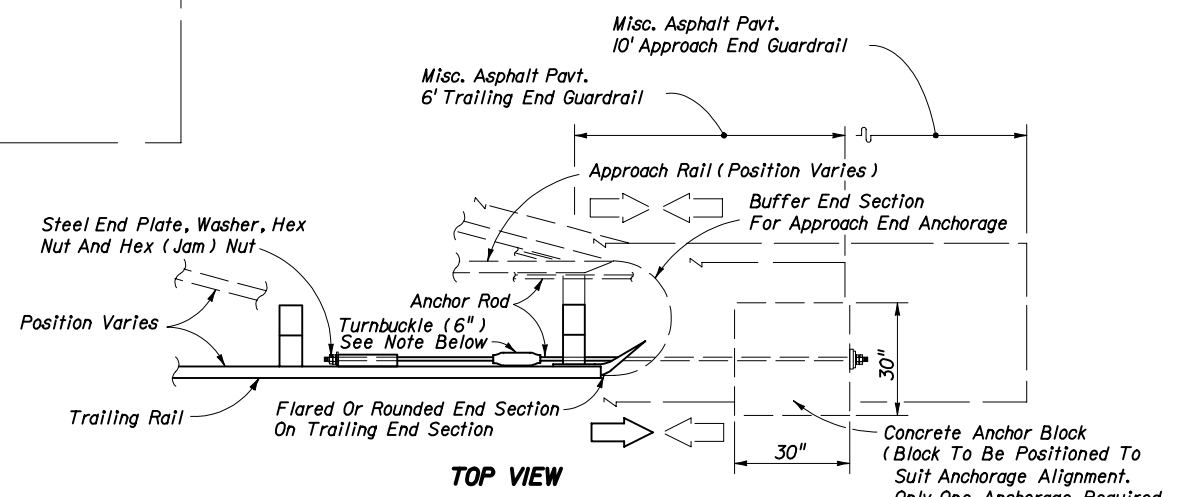
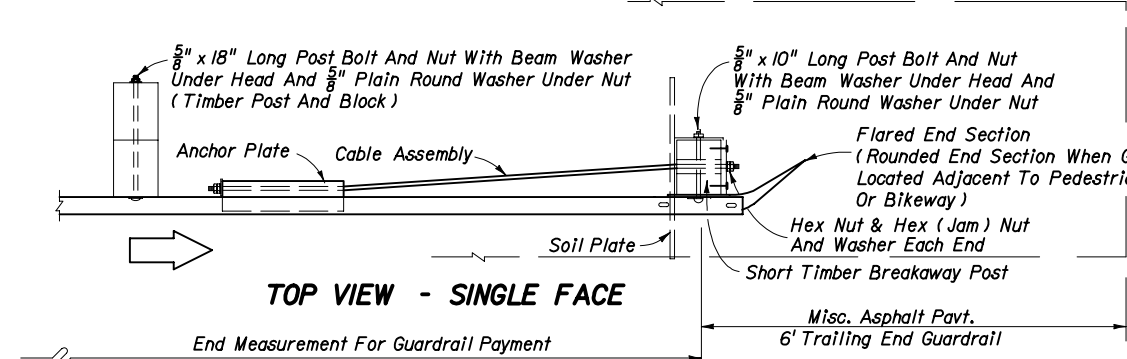
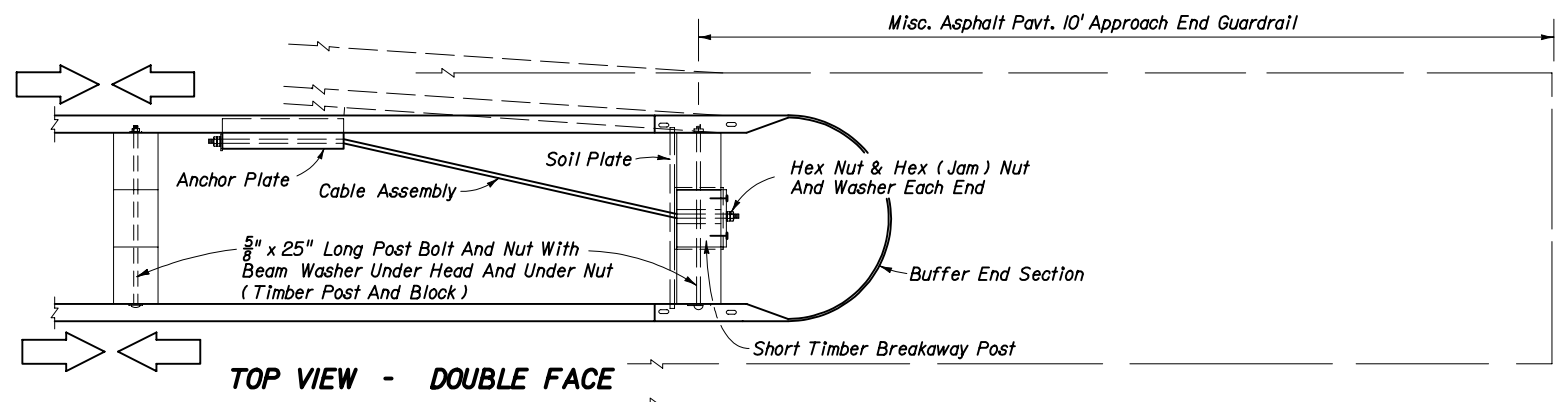
- The locations shown for special posts mounted on inlets are to be used as guidelines for positioning the posts and for estimating the number of required posts.
- Special posts and their anchorages mounted on curb inlets shall be in accordance with special steel guardrail posts Sheet 19, and paid for under the contract unit price for Special Guardrail Post, EA.
- Variations shown for the locations of special posts mounted on inlets are established from standard post spacing (6'-3"); clearance of standard posts from inlets (4" min.); use of single and double offset blocks on standard posts adjacent to the inlets; optional flange mountings; and, concrete anchor edge distances (2" for grouted and $3\frac{3}{4}$ " for expansion anchors). The number of posts and their locations may vary by reducing post spacing and adjusting the length of rail panel (s).
- Encased guardrail posts shall conform in section to standard timber and steel posts, and be paid for under the contract unit price for Special Guardrail Post, EA. Payment shall include cost of foam wrap and concrete encasement.

LEGEND



SPECIAL POST LOCATIONS ON CURB INLETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	HSD	08/83	Revision	Sheet No. Index No.
Checked By	JVG	08/83	00	20 of 31 400



Turnbuckle to be used only for guardrail that is reset vertically. The existing anchor rod (1" or 1/4" Dia.) shall be field cut, threaded 4" on each end, and metalized in accordance with Sections 562 and 971 of the Standard Specifications. The cost for cutting, threading, metalizing and the turnbuckle shall be included in the contract unit price for Reset Guardrail, LF.

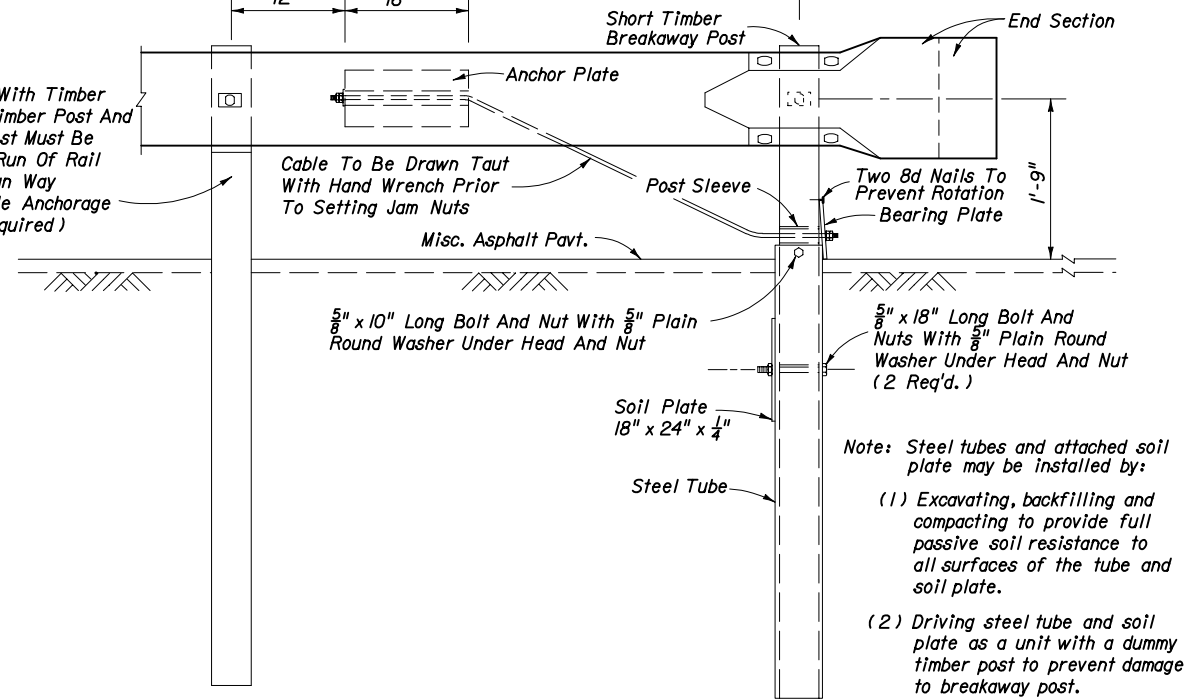
The payment for the items of End Anchorage Assembly Type II (Concrete Anchor Block Option) shall be full compensation for furnishing and installing the Beam Anchor Plate, Anchor Rod, Pipe Sleeve, Anchor Block, either Flared, Rounded or Buffer End Section, and the necessary hardware.

CONCRETE ANCHOR BLOCK OPTION

TYPE II NOTES

1. Unless specified in the plans, the contractor can supply either the cable anchor option or the concrete anchor block option.
2. Type II end anchorage assemblies are approved for all speeds and are intended for use as:
 - (a) trailing end anchorages for single face free standing guardrail systems;
 - (b) approach end anchorages for single face free standing guardrail systems when end anchorage is located outside of the clear zone; and,
 - (c) both approach and trailing ends of double face guardrail systems.
 Crash cushions shall be constructed at or in lieu of approach Type II end anchorages located inside the clear zone.
3. These end anchors are to be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Type II), EA as called for in the plans or by permit.

Timber Or Steel Post With Timber Block May Be Used, Timber Post And Block Shown (This Post Must Be Timber In Steel Post Run Of Rail Adjacent To Pedestrian Way Or Bikeway, To Provide Anchorage For Pipe Rails As Required)



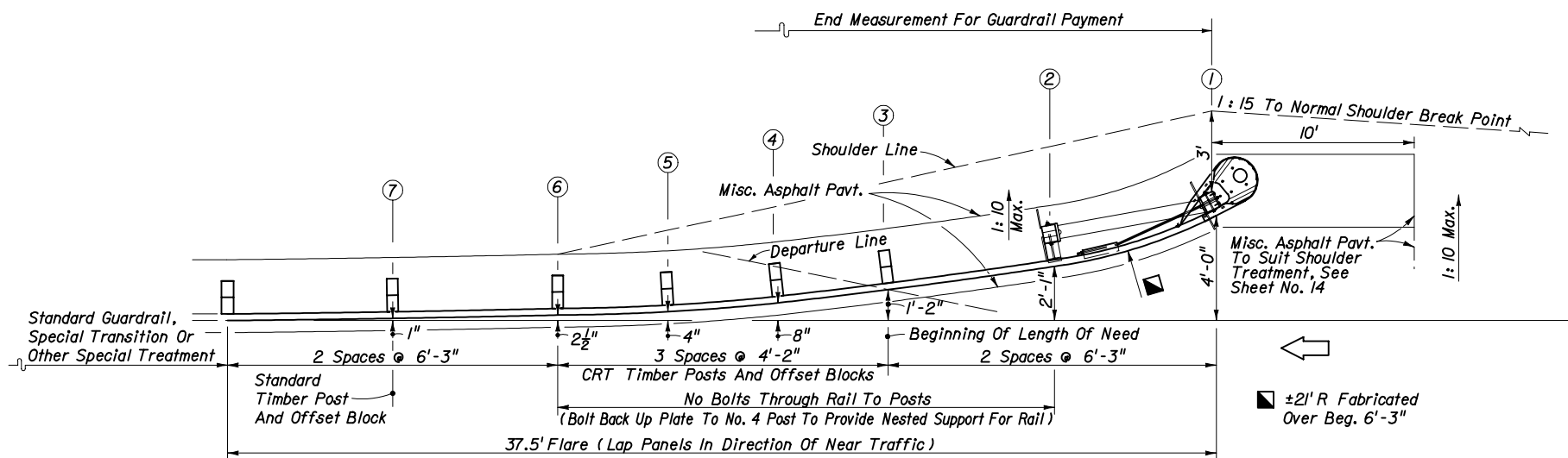
The payment for the items of End Anchorage Assembly Type II (Cable Option) shall be full compensation for furnishing and installing either the Round or the Buffer End Section, the Beam Anchor Plate, Cable Assembly, Pipe Sleeve, Soil Plate, Steel Tube, Bearing Plate, Short Timber Breakaway Post, Offset Blocks and the necessary hardware.

CABLE ANCHOR OPTION

- Note: Steel tubes and attached soil plate may be installed by:
- (1) Excavating, backfilling and compacting to provide full passive soil resistance to all surfaces of the tube and soil plate.
 - (2) Driving steel tube and soil plate as a unit with a dummy timber post to prevent damage to breakaway post.

END ANCHORAGE ASSEMBLY TYPE II

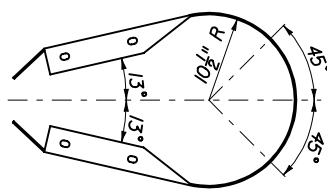
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	Names	Dates	Approved By	
Drawn By	JM	01/81	Revision	Sheet No. 21 of 31
Checked By	JGV	01/81	00	Index No. 400



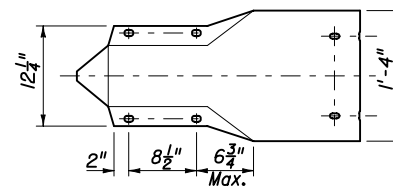
PLAN
MODIFIED ECCENTRIC LOADER TERMINAL (MELT)

MODIFIED ECCENTRIC LOADER TERMINAL NOTES

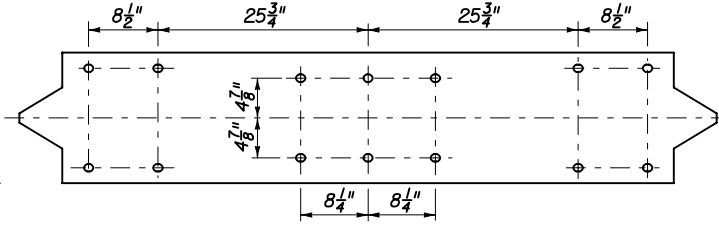
1. The MELT is applicable for design speeds up to 45 mph. The MELT is intended for use as an approach end guardrail anchorage for shoulder guardrail. Its alignment is a flare from the normal guardrail alignment with an effective length of 37.5' including three standard W-beam panel outside of any standard guardrail, guardrail transitions or other special treatments.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the MELT and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the MELT when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The MELT shall be assembled in accordance with the distributor's detailed drawings, procedures and specifications.
4. The first two post must be short timber breakaway posts with steel foundation tubes and soil plates, post Nos. 3 thru 6 must be CRT timber posts and post No. 7 must be a standard timber post.
5. The MELT can not be used in medians where horizontal clearance requires the use of a backrail.
6. See the General Notes for galvanizing requirements of metallic components.
7. If the plans call for the MELT at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly that meet the applications for that location. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
8. The MELT shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans, the distributor's detailed drawings, procedures and specifications and this Index.



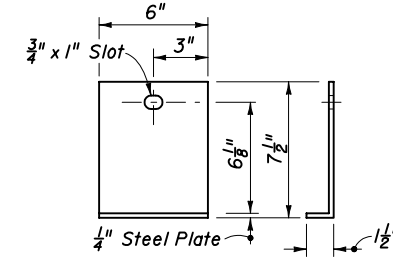
PLAN



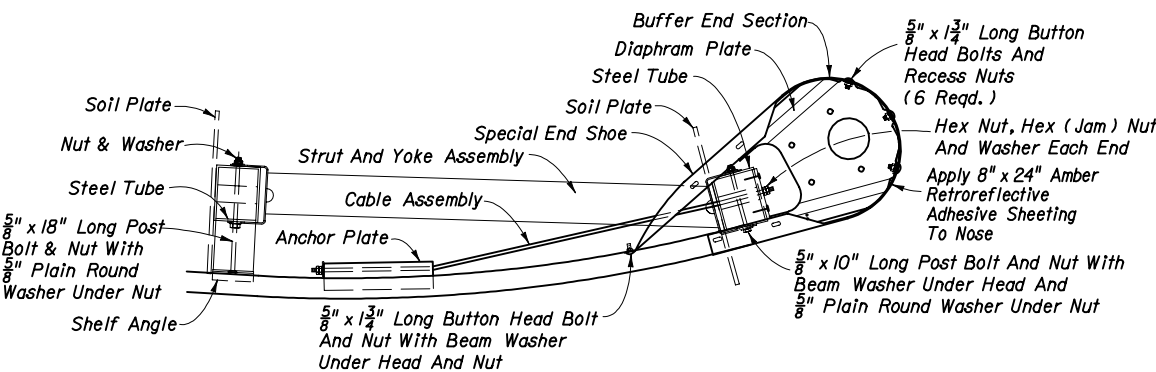
ELEVATION



FLAT PLATE LAYOUT

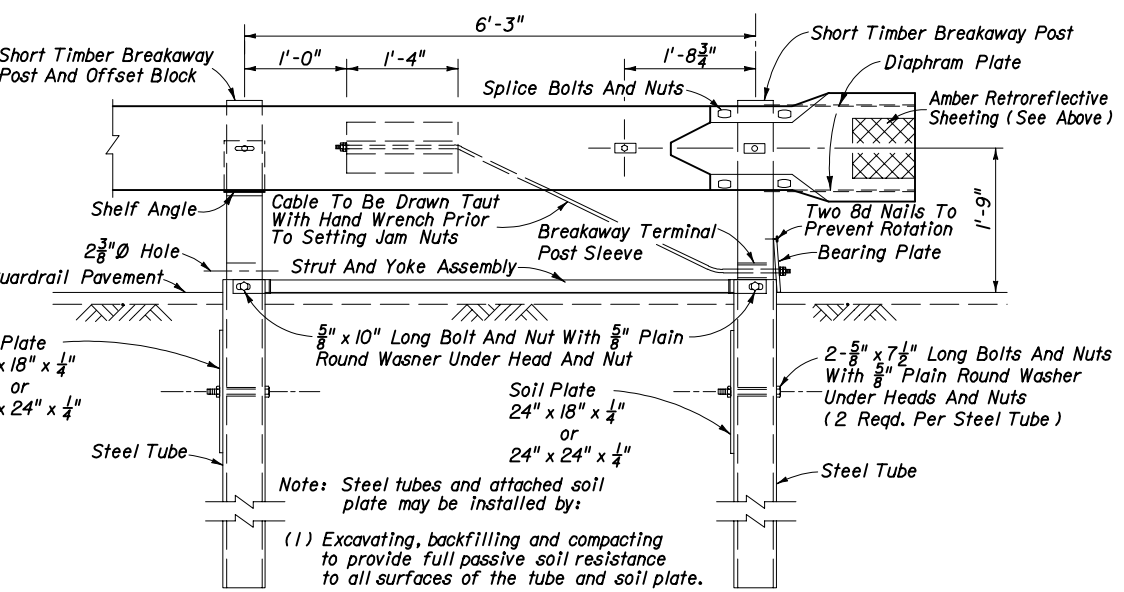


SHELF ANGLE

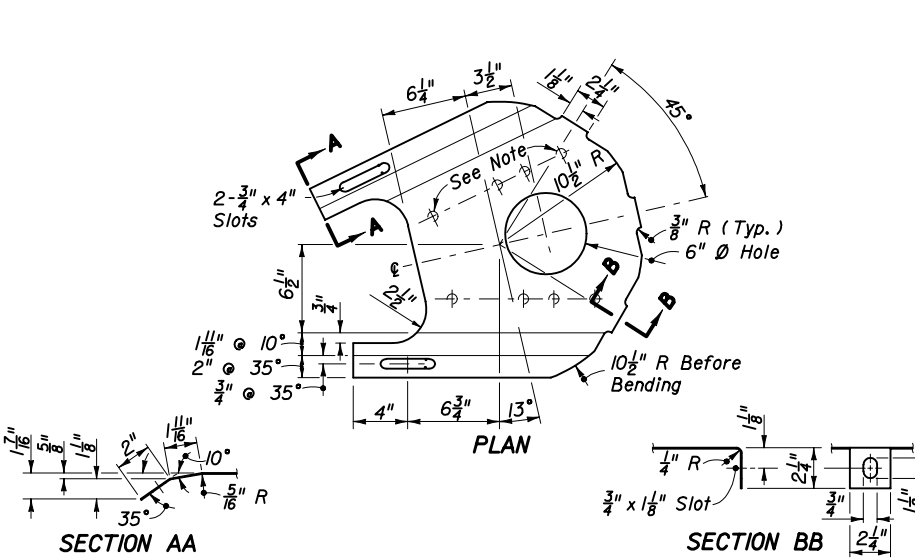


TOP VIEW

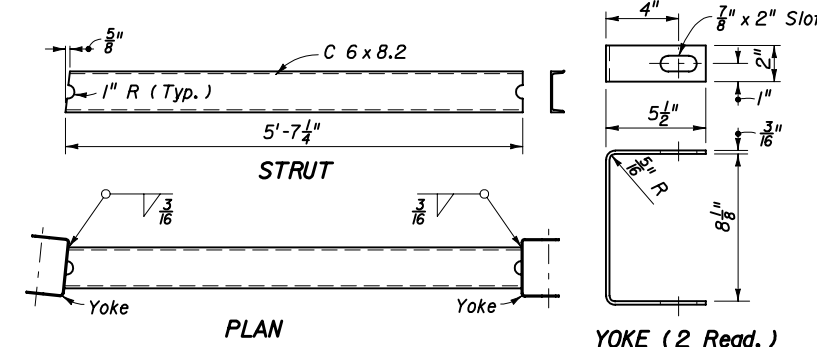
BUFFERED END SECTION
All Slots Shall Be 3/32" x 1 1/8"



FRONT VIEW



DIAPHRAGM PLATE (2 Req'd.)



STEEL STRUT AND YOKE ASSEMBLY

Note: Assembly installed with channel turned down for right side guardrail and turned up for left side guardrail.

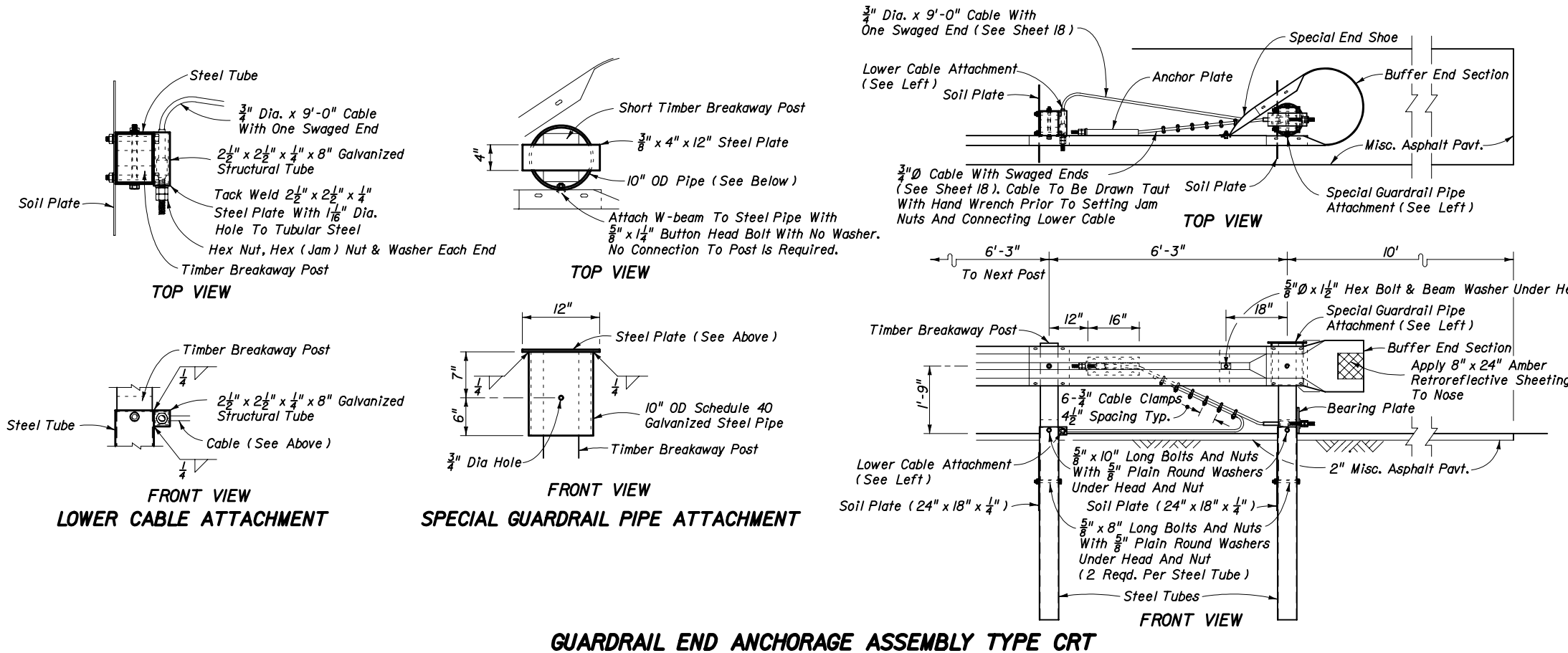
- Note: Steel tubes and attached soil plate may be installed by:
- (1) Excavating, backfilling and compacting to provide full passive soil resistance to all surfaces of the tube and soil plate.
 - (2) Driving steel tube and soil plate as a unit with a dummy timber post to prevent damage to breakaway post.

END ANCHORAGE ASSEMBLY TYPE MELT

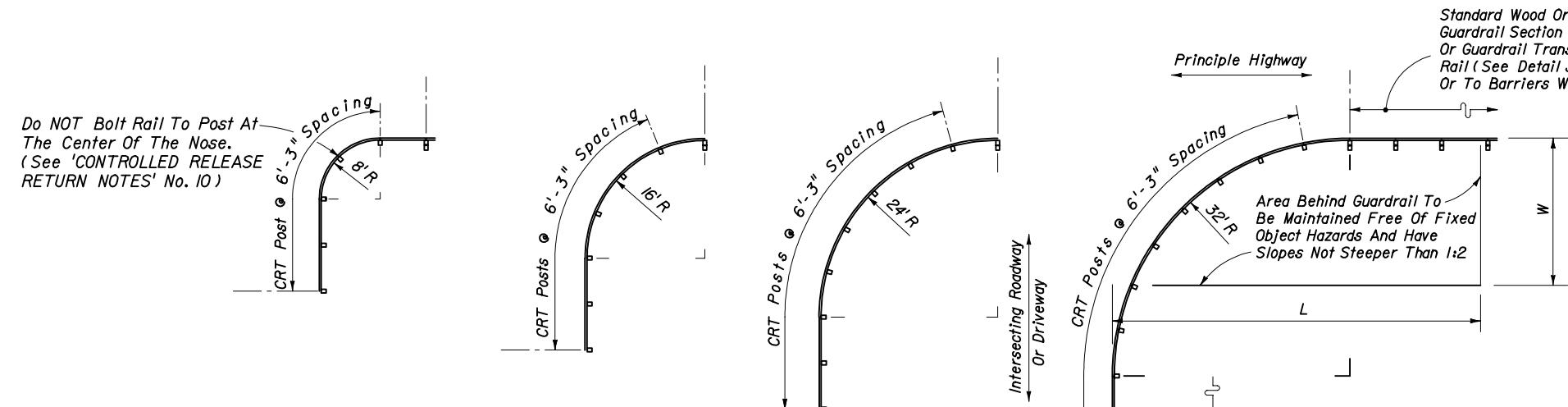
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	FHWA	3/95	Approved By <i>[Signature]</i> Roadway Design Engineer	
Drawn By	HKH	3/95	Revision	Sheet No.
Checked By	JVG	3/95	02	22 of 31
				400

CONTROLLED RELEASE RETURN NOTES

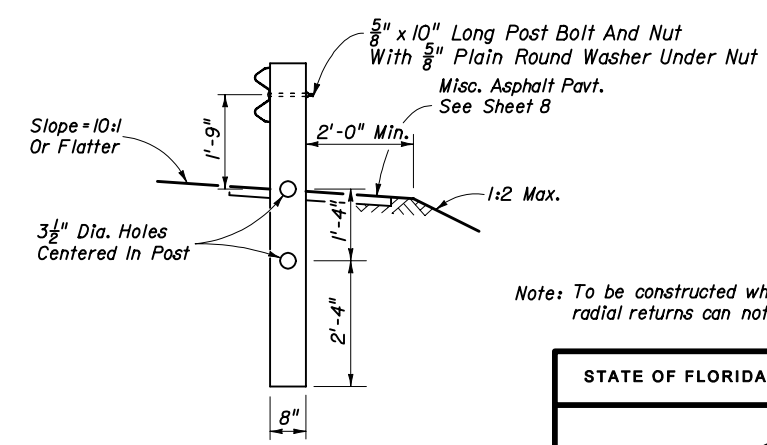
- Controlled release returns are intended for use (a) in openings in continuous guardrail for driveway and side road access when flares and transitions or standard radial returns can not be applied (Sheet II); and, (b) for shielding the ends of bridge traffic rails and barrier walls where the driveway and side road access is in close proximity to the structure and space does not permit the proper use of approved flared and parallel types of Guardrail End Anchorage Assemblies.
- Controlled release returns are not intended as a substitute or replacement for the appropriate use of approved vehicle impact attenuators.
- Controlled release returns with either 8', 16' or 24' radii are designed for highway speeds of 60 mph or less; the 32' radius return is to be used only for highway speeds of 45 mph or less.
- The controlled release returns shown are designed as full returns based on an intersection angle of 90°. The return can be terminated with the Guardrail End Anchorage Assembly Type CRT or connected to standard guardrail as shown or as otherwise detailed in the plans.
- The Guardrail End Anchorage Assembly Type CRT is to be used only for the controlled release returns with 8', 16', 24' and 32' radii as shown; the assembly is not to be used in any tangent rail or flared rail applications. Other types of end anchorage assemblies are not to be used in the controlled release returns.
- The area immediately behind the control release return shall have slopes not steeper than 1:2 and be maintained free of fixed objects in accordance with the area limits tabulated in the plan below.
- The surface approaching the controlled release return shall have a transverse slope not exceeding 1:10. The effective width of the transverse surface is to be based on standard vehicle departure, return radii and preceding shielding; the width (beyond shoulder) shall be not greater than the corresponding 15' and 20' W values tabulated below.
- The curved guardrail portion of the controlled release return shall be full section shop bent panels (12.5' or 25' panels).
- Washers are not to be used between the guardrail beam and the head of the button head post bolts at any controlled release terminal (CRT) post or at any Guardrail End Anchorage Assembly Type CRT breakaway timber post.
- The guardrail beam of the 8' radius return is not bolted to the center control release post.
- See the General Notes for galvanizing requirements of metallic components.
- Controlled release return systems shall be paid for under the contract unit prices for Guardrail (Roadway), LF, Guardrail (Shop-bent Panels), LF, and Guardrail, End Anchorage Assembly (Type CRT), EA as called for in the plans or by permit and shall be full compensation for furnishing and installing all components in accordance with the plans and with this index. CRT posts are included in the cost for guardrail.



GUARDRAIL END ANCHORAGE ASSEMBLY TYPE CRT



Return Nom. R	Length Of Shop Bent Panels	No. Of CRT Posts	Required Area Free Of Hazards L W
8'	12.5'	5	25' x 15'
16'	25'	6	30' x 15'
24'	37.5'	8	40' x 20'
32'	50'	11	50' x 20'

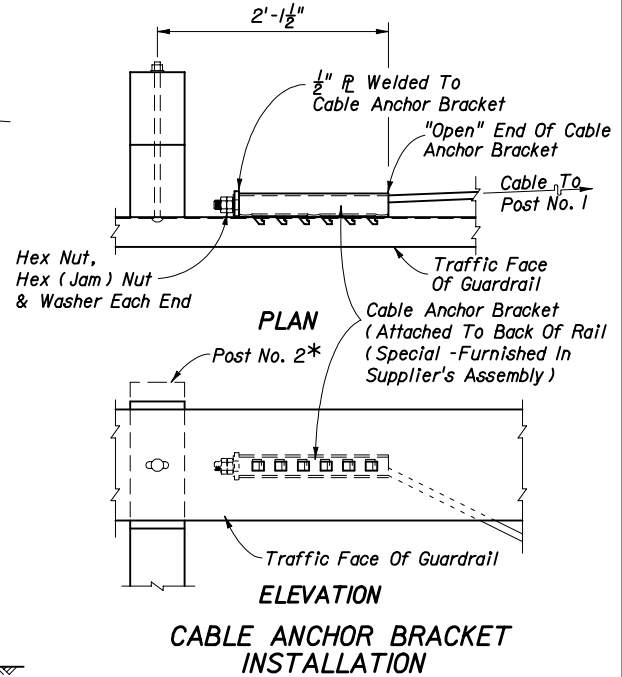
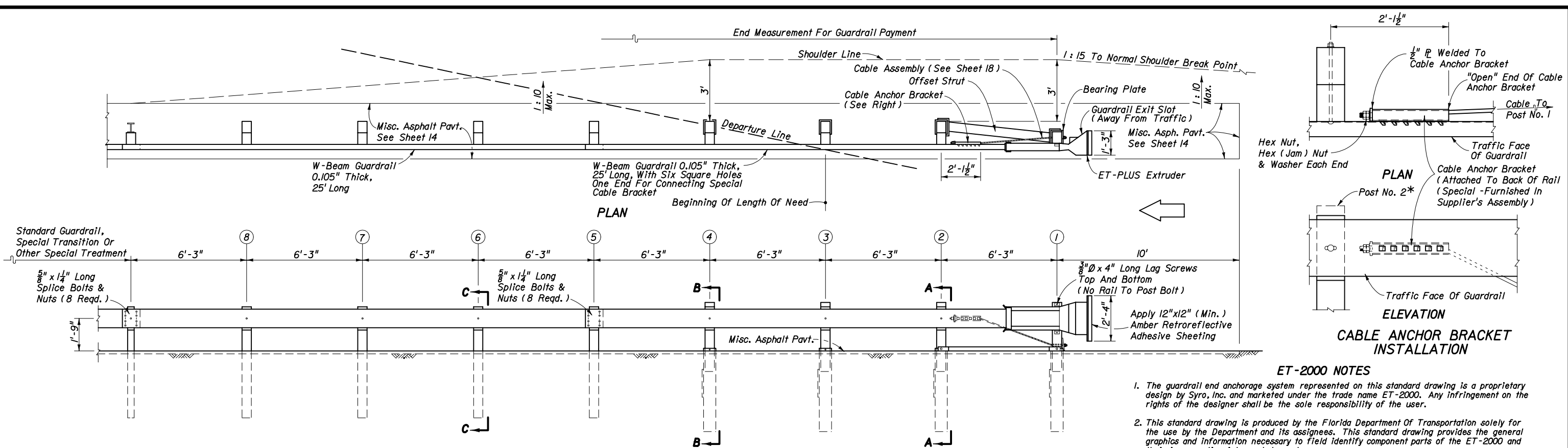


CRT TIMBER POST

Note: To be constructed when flares and transitions or standard radial returns can not be applied. See Sheet II.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	FHWA	Dates	Approved By <i>[Signature]</i>	
Drawn By	HSD	1/93	Revision	Sheet No. Index No.
Checked By	JVG	1/93	04	23 of 31 400

CONTROLLED RELEASE RETURN FOR SIDE ROAD AND DRIVEWAY ACCESS

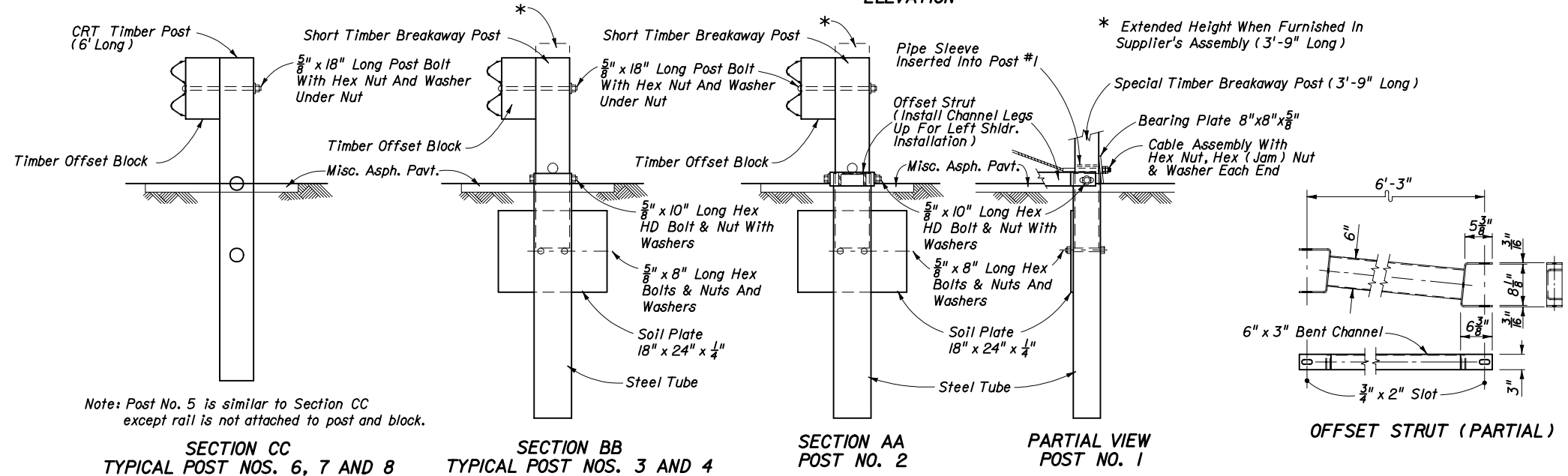


ET-2000 NOTES

- The guardrail end anchorage system represented on this standard drawing is a proprietary design by Syro, Inc. and marketed under the trade name ET-2000. Any infringement on the rights of the designer shall be the sole responsibility of the user.
- This standard drawing is produced by the Florida Department of Transportation solely for the use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the ET-2000 and their incorporation into a whole system.
- This standard drawing is sufficient for plan details for the ET-2000 when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The ET-2000 shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
- The ET-2000 is intended for use as an approach end guardrail anchorage for shoulder guardrail located parallel to traffic lanes. The effective length of the ET-2000 is 50' including two 25' W-Beam panels of guardrail. The effective length is outside of any standard guardrail, guardrail transitions or other special treatments. The ET-2000 alignment is an extension of the normal guardrail alignment, except when constructed with curb the alignment of the ET-2000 will be flared over the first 25' at a rate of 1:25.
- The ET-2000 can not be used in medians where horizontal clearance requires the use of a backrail.
- Post Options:
 (a) Posts at location Nos. 1, 2, 3 and 4 are timber breakaway posts with steel foundation tubes. The breakaway posts at location Nos. 5, 6, 7 and 8 may be constructed as shown in Section CC or may utilize timber breakaway posts with steel foundation tubes as shown in Section BB.
 (b) Posts shown in Option (a) can be replaced by hinged steel breakaway posts and the steel channel offset strut can be replaced by two parallel 3" x 3" x 1/4" steel angles, one angle each side between Posts No. 1 and No. 2. Post No. 1 can be replaced by the steel hinged post with the manufacturer's identification of HBA Post Type J1, and Post Nos. 2 through 8 can be replaced by steel hinged posts with the manufacturer's identification of HBA Post Type J2.
- See the General Notes for galvanizing requirements of metallic component.
- If the plans call for the ET-2000 at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'parallel' at a specific location the contractor has the option to construct any FDOT approved parallel assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
- The ET-2000 shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.

Do Not Attach Rail To Block At Post No. 5 And Rail To Post At Post No. 1.

ELEVATION



OFFSET STRUT (PARTIAL)

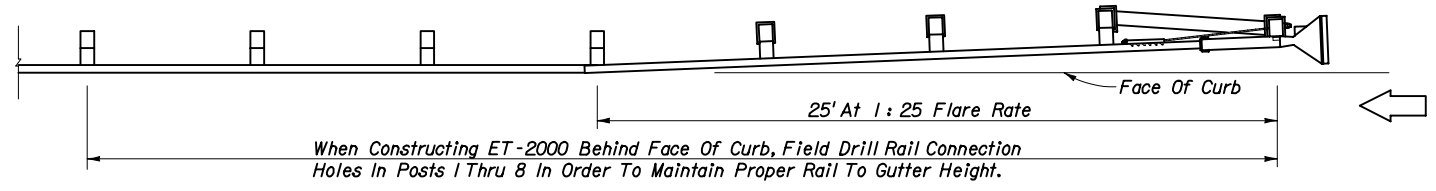
Note: Post No. 5 is similar to Section CC except rail is not attached to post and block.

SECTION CC
TYPICAL POST NOS. 6, 7 AND 8

SECTION BB
TYPICAL POST NOS. 3 AND 4

SECTION AA
POST NO. 2

PARTIAL VIEW
POST NO. 1



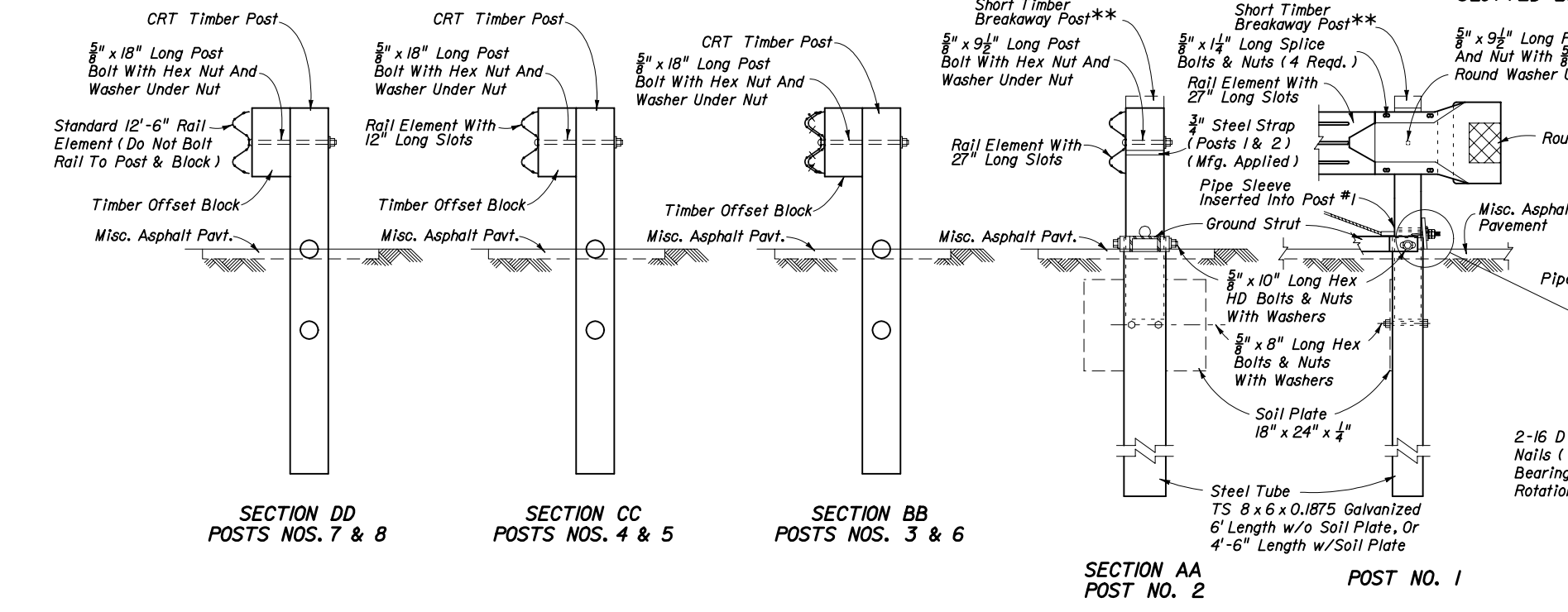
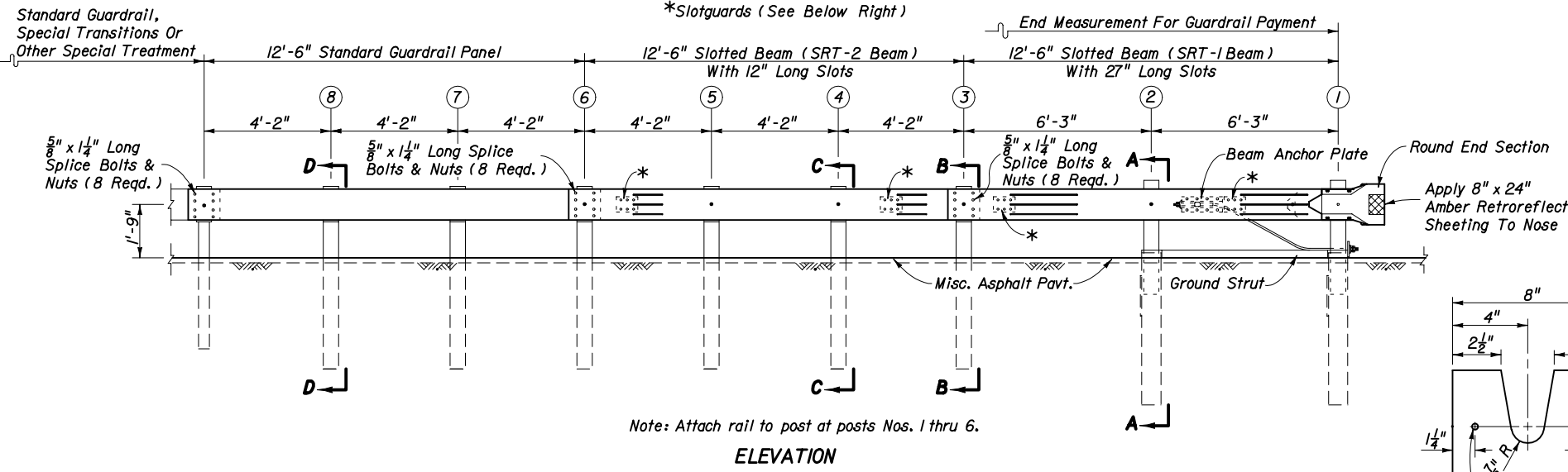
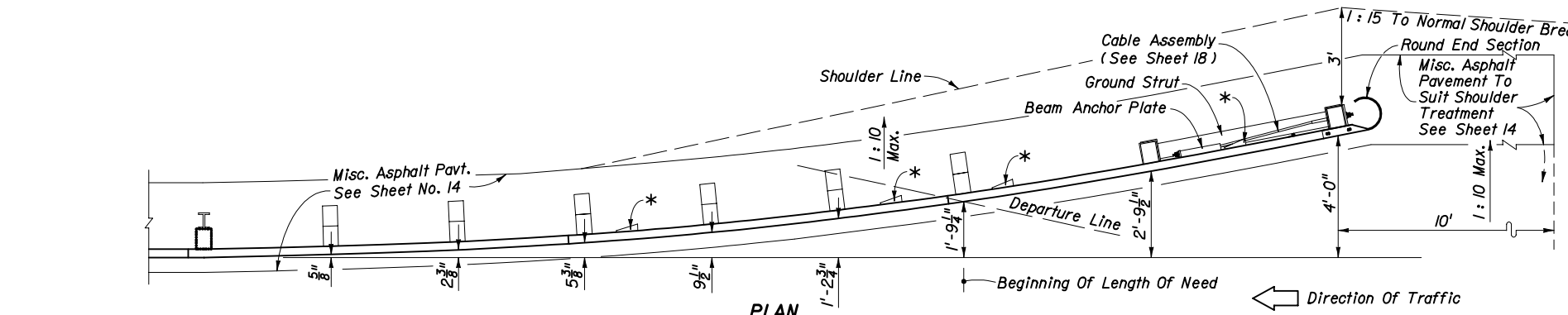
PLACEMENT AT CURBED LOCATIONS

DESIGN NOTES

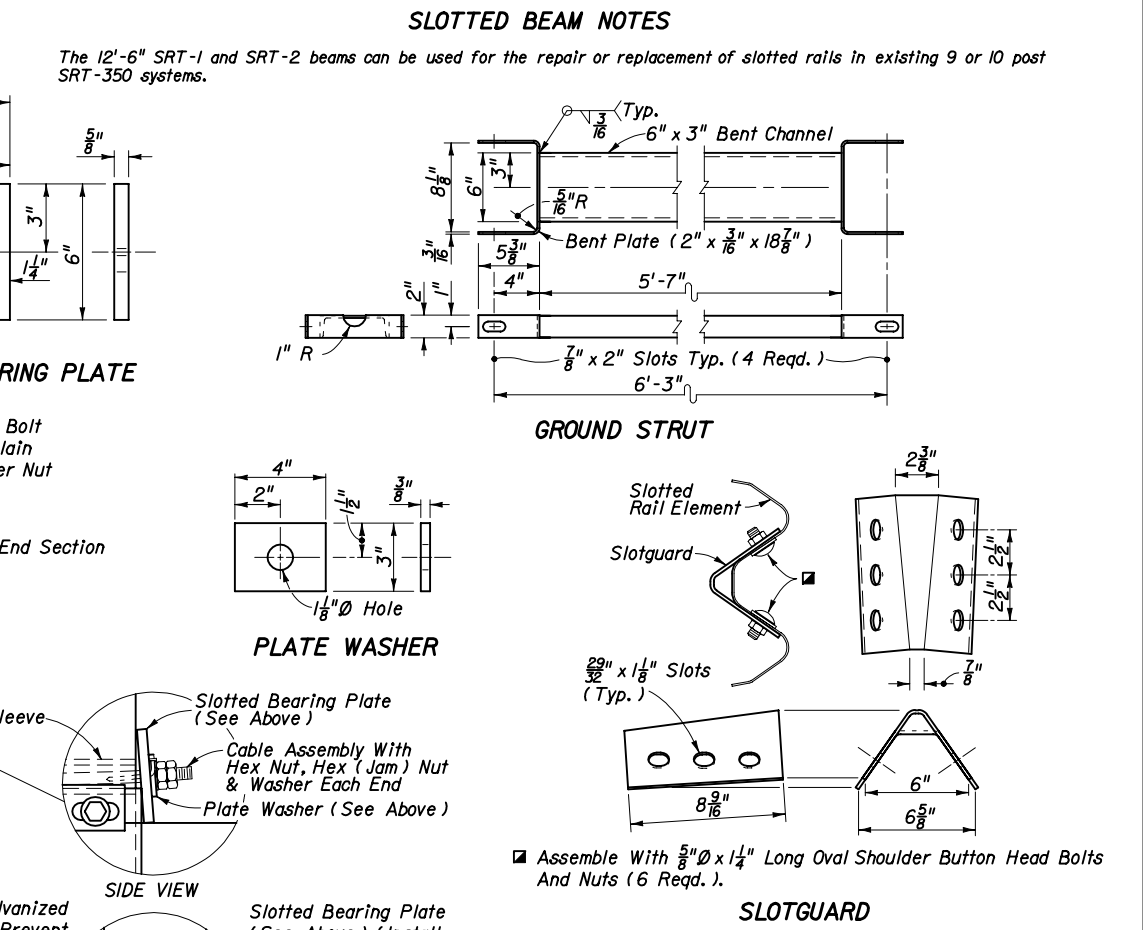
- A special site evaluation should be considered prior to using the ET-2000 where there is less than 25' clear area on the extrusion side (back side) of the ET-2000.
- The ET-2000 is suitable for all design speeds.

END ANCHORAGE ASSEMBLY TYPE ET-2000

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By MFG	8/95	Roadway Design Engineer		
Drawn By HKH	8/95	Revision	Sheet No.	Index No.
Checked By JVG	8/95	04	24 of 31	400



- SRT-350 NOTES**
- The guardrail end anchorage system represented on this drawing is a proprietary eight (8) post design by Trinity Industries, Inc. and marketed by Syro, Inc. under the trade name SRT-350, short for Slotted Rail Terminal. Any infringement on the rights of the designer shall be the sole responsibility of the user.
 - This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the SRT-350 and their incorporation into a whole system.
 - This drawing is sufficient for plan details for the SRT-350 when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless called for elsewhere in the plans. The SRT-350 shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
 - The SRT-350 can not be used in medians where horizontal clearance requires the use of a backrail.
 - The SRT-350 is suitable for all design speeds. The SRT-350 is intended for use as an approach end anchorage for shoulder guardrail. Its alignment is a parabolic flare from the normal guardrail alignment with an effective length of 37.5' including two special slotted W-Beam panels and one standard W-Beam panel outside of any standard guardrail, guardrail transitions or other special treatments.
 - Posts 1 and 2 must be timber breakaway posts each with a $\frac{3}{4}$ " steel strap located approximately 1" below the post bolt and a steel foundation tube. CRT breakaway posts shall be used at all other locations within the system.
 - See the General Notes for galvanizing requirements of metallic component.
 - If the plans call for the SRT-350 at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
 - The SRT-350 shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans, the manufacturer's detail drawings, procedures and specifications and this index.

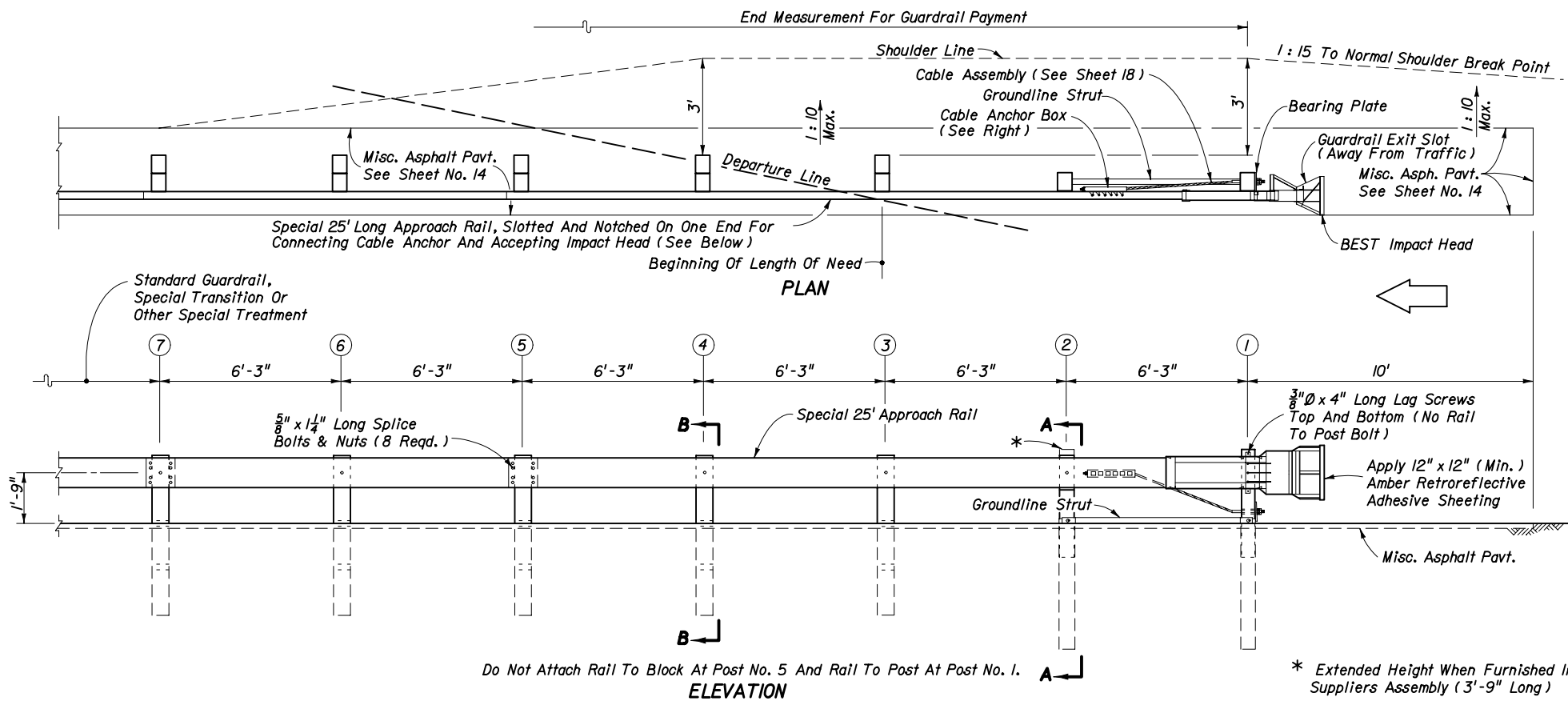


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

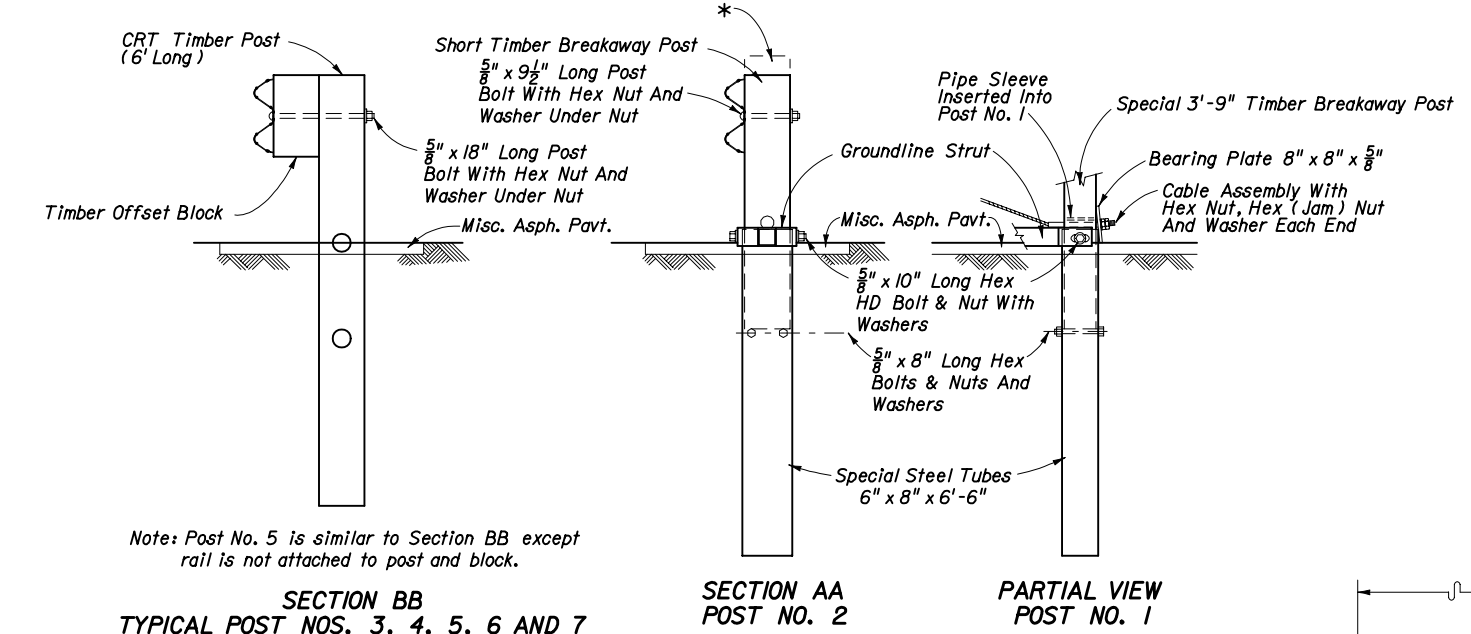
Names	Dates	Approved By		
Designed By	MFG 2/96	 Roadway Design Engineer		
Drawn By	HKH 2/96			
Checked By	JVG 2/96			
		Revision	Sheet No.	Index No.
		02	25 of 31	400

END ANCHORAGE ASSEMBLY TYPE SRT-350 (8 POST SYSTEM)

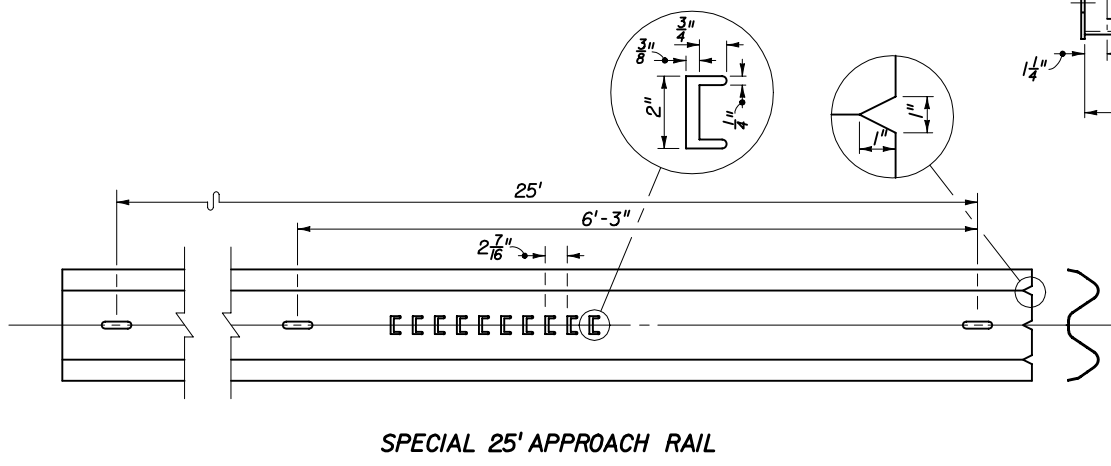
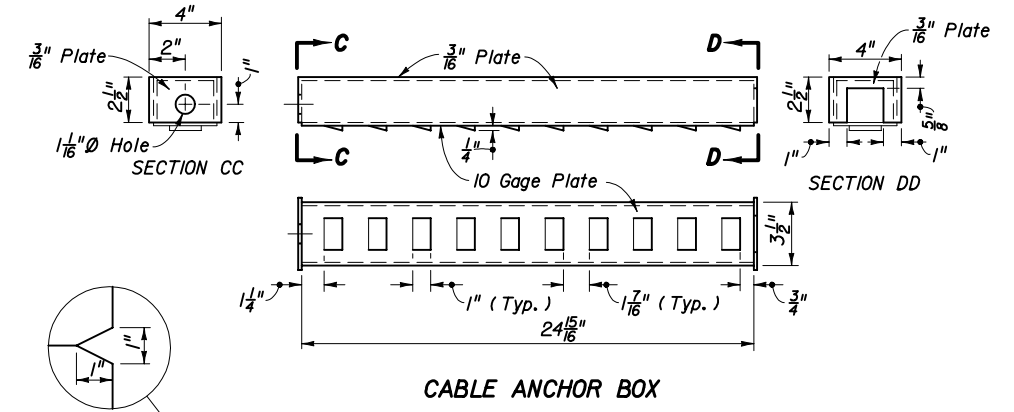
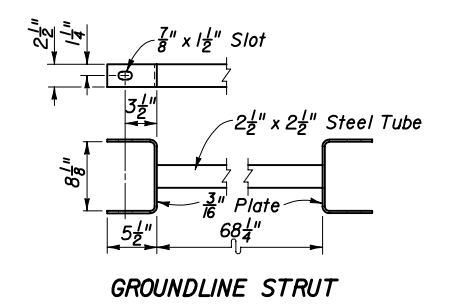
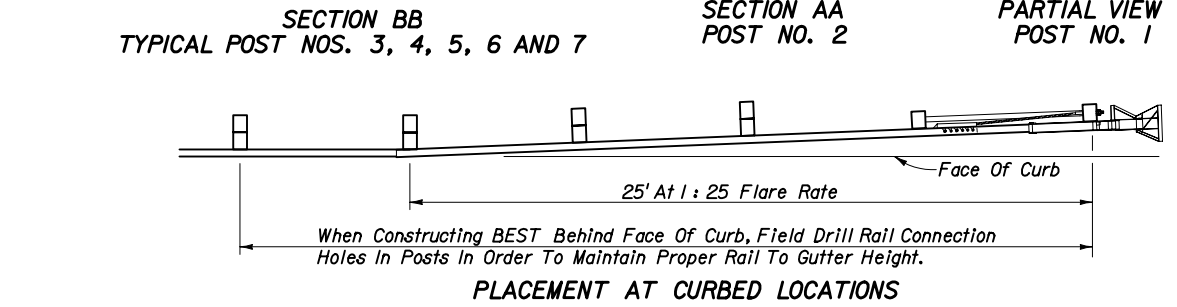


- ### 'BEST' NOTES
1. The guardrail end anchorage system represented on this standard drawing is a proprietary design by Interstate Steel Corporation and marketed under the trade name BEST. Any infringement on the rights of the designer shall be the sole responsibility of the user.
 2. This standard drawing is produced by the Florida Department Of Transportation solely for the use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the BEST and their incorporation into a whole system.
 3. This standard drawing is sufficient for plan details for the BEST when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The BEST shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
 4. The BEST is intended for use as an approach end guardrail anchorage for shoulder guardrail located parallel to traffic lanes. The effective length of the BEST is 37.5' including a 25' special W-Beam panel plus one 12.5' standard W-Beam panel outside of any other standard guardrail, guardrail transitions or other special treatments. The alignment of the BEST is an extension of the normal guardrail alignment, except when constructed with curb the alignment of the BEST will be flared over the first 25' at a rate of 1:25.
 5. The BEST can not be used in medians where horizontal clearance requires the use of a backrail.
 6. Posts at location Nos. 1 and 2 must be timber breakaway posts with special length steel foundation tubes without soil plates. The posts at location Nos. 3, 4, 5, 6 and 7 shall be CRT timber posts.
 7. See the General Notes for galvanizing requirements of metallic components.
 8. If the plans call for the 'BEST' at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'parallel' at a specific location, the contractor has the option to construct any FDOT approved parallel assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchor will not be eligible for VECP consideration.
 9. The BEST shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.

- ### DESIGN NOTES
1. A special site evaluation should be considered prior to using the BEST where there is less than 25' clear area on the extrusion side (back side) of the BEST.
 2. The BEST is suitable for all design speeds.

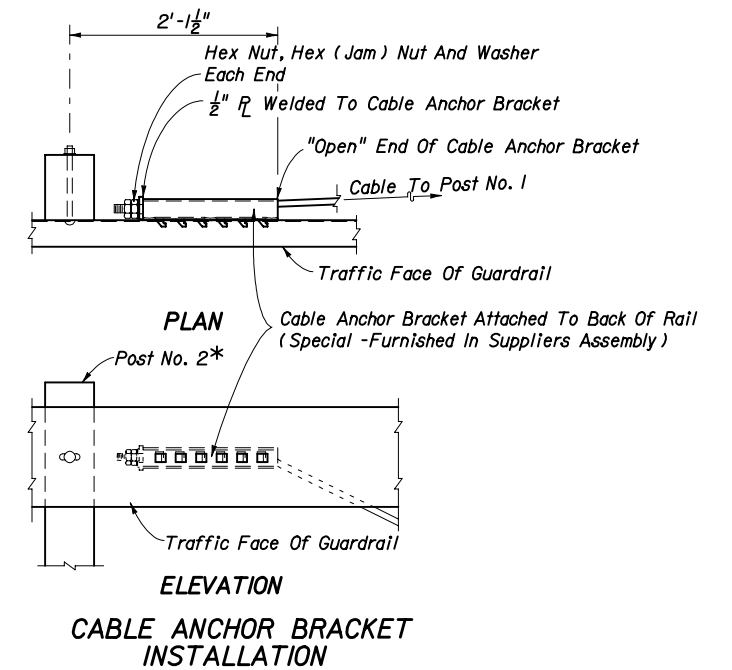
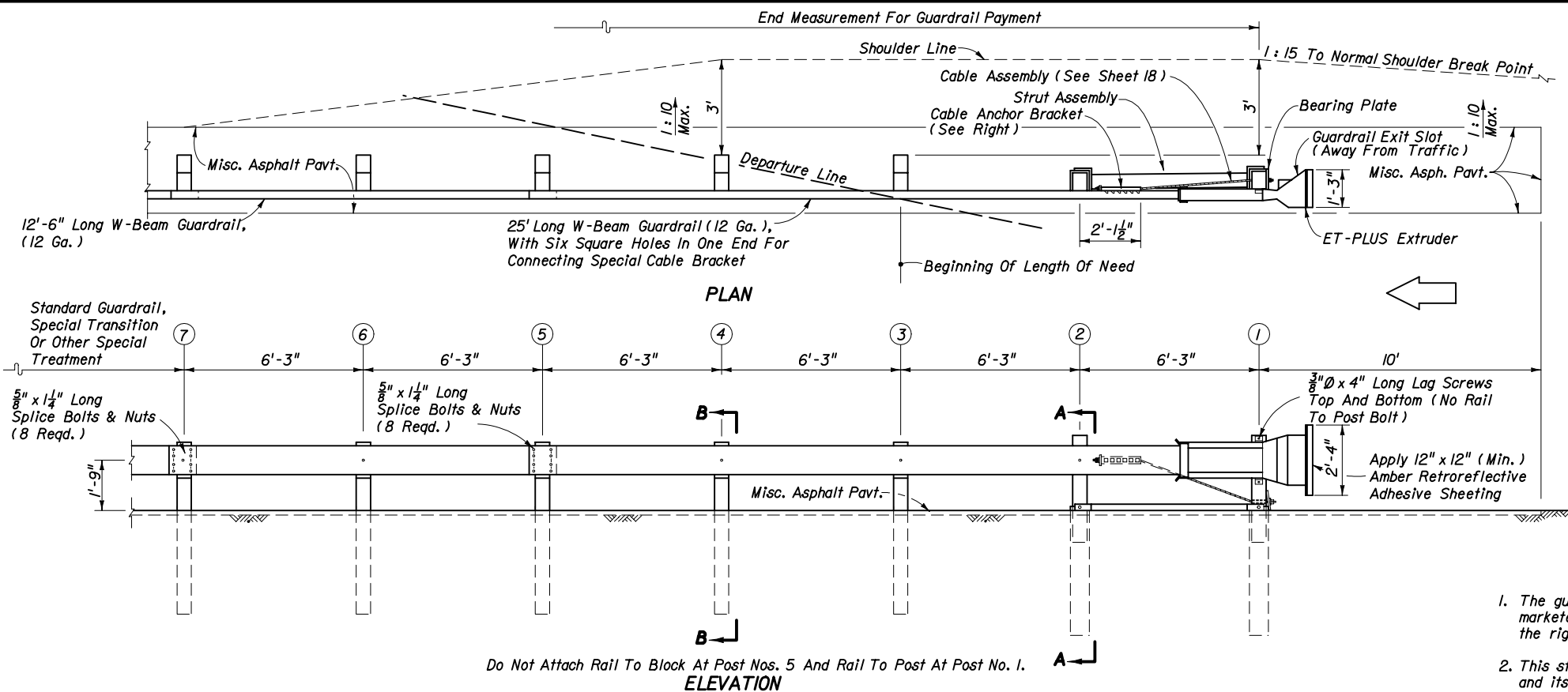


Note: Post No. 5 is similar to Section BB except rail is not attached to post and block.



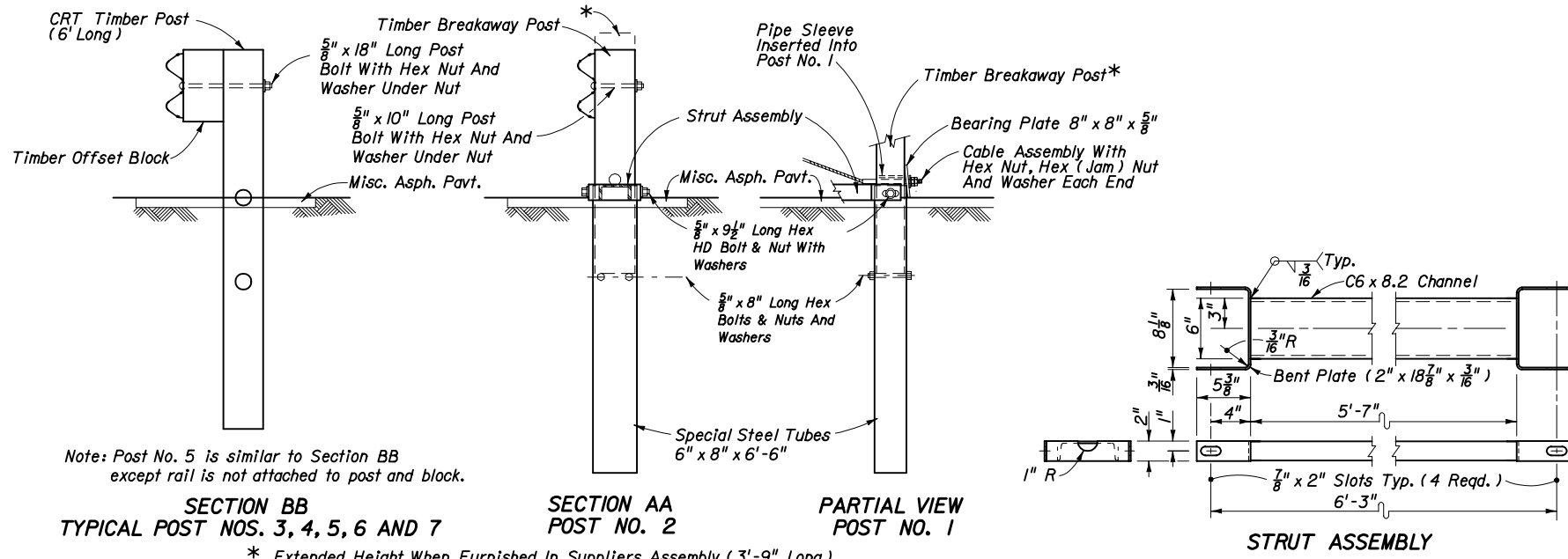
END ANCHORAGE ASSEMBLY TYPE BEST

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	Names	Dates	Approved By	
Drawn By	MFG	8/95	 Roadway Design Engineer	
Checked By	HKH	8/95		
	JVG	8/95	Revision	Sheet No.
			00	26 of 31
				Index No.
				400



LET NOTES

1. The guardrail end anchorage system represented on this standard drawing is a proprietary design by Syro, Inc. and marketed under the trade name ET-2000 LET hereafter referred to and identified as LET. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the LET and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the LET when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The LET shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The LET is intended for use as an approach end guardrail anchorage for shoulder guardrail located parallel to traffic lanes. The effective length of the LET is 37.5' including one 25' special W-Beam panel and one 12.5' standard W-Beam panel. The effective length is outside of any other standard guardrail, guardrail transitions or other special treatments. The LET alignment is an extension of the normal guardrail alignment, except when constructed with curb the alignment of the LET will be flared over the first 25' at a rate of 1 : 25.
5. The LET can not be used in medians where horizontal clearance requires the use of a backrail.
6. Post Options:
 - (a) Posts at location Nos. 1 and 2 are timber breakaway posts with special length steel foundation tubes without soil plates. Posts at location Nos. 3, 4, 5, 6 and 7 are CRT timber posts.
 - (b) Posts shown in Option (a) can be replaced by hinged steel breakaway posts and the steel channel offset strut can be replaced by two parallel 3" x 3" x 1/4" steel angles, one angle each side between Posts No. 1 and No. 2. Post No. 1 can be replaced by the steel hinged post with the manufacturer's identification of HBA Post Type J1, and Post Nos. 2 through 8 can be replaced by steel hinged posts with the manufacturer's identification HBA Post Type J2.
7. See the General Notes for galvanizing requirements of metallic components.
8. If the plans call for the 'LET' at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'parallel' at a specific location, the contractor has the option to construct any FDOT approved parallel assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchor will not be eligible for VECP consideration.
9. The LET shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detailed drawings, procedures and specifications and this Index.



Note: Post No. 5 is similar to Section BB except rail is not attached to post and block.

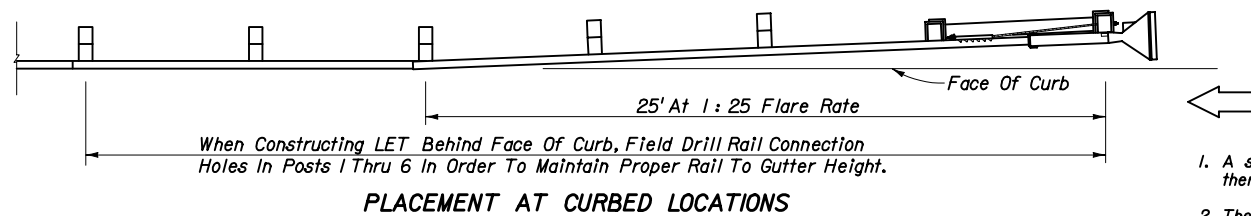
**SECTION BB
TYPICAL POST NOS. 3, 4, 5, 6 AND 7**

* Extended Height When Furnished In Suppliers Assembly (3'-9" Long)

**SECTION AA
POST NO. 2**

**PARTIAL VIEW
POST NO. 1**

STRUT ASSEMBLY



PLACEMENT AT CURBED LOCATIONS


DESIGN NOTES

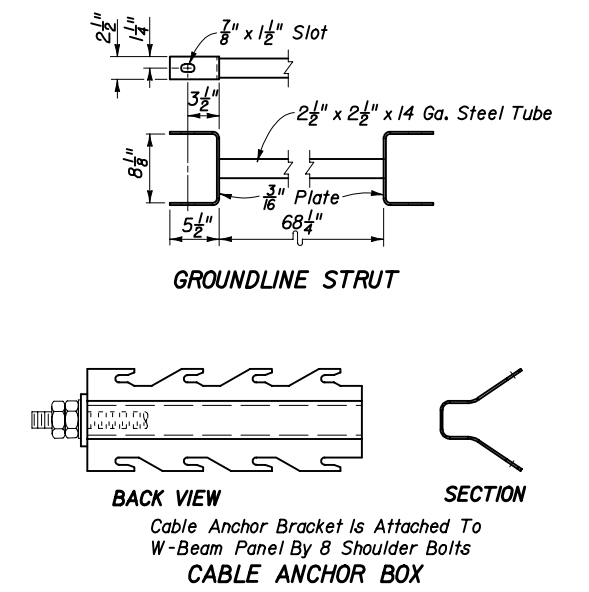
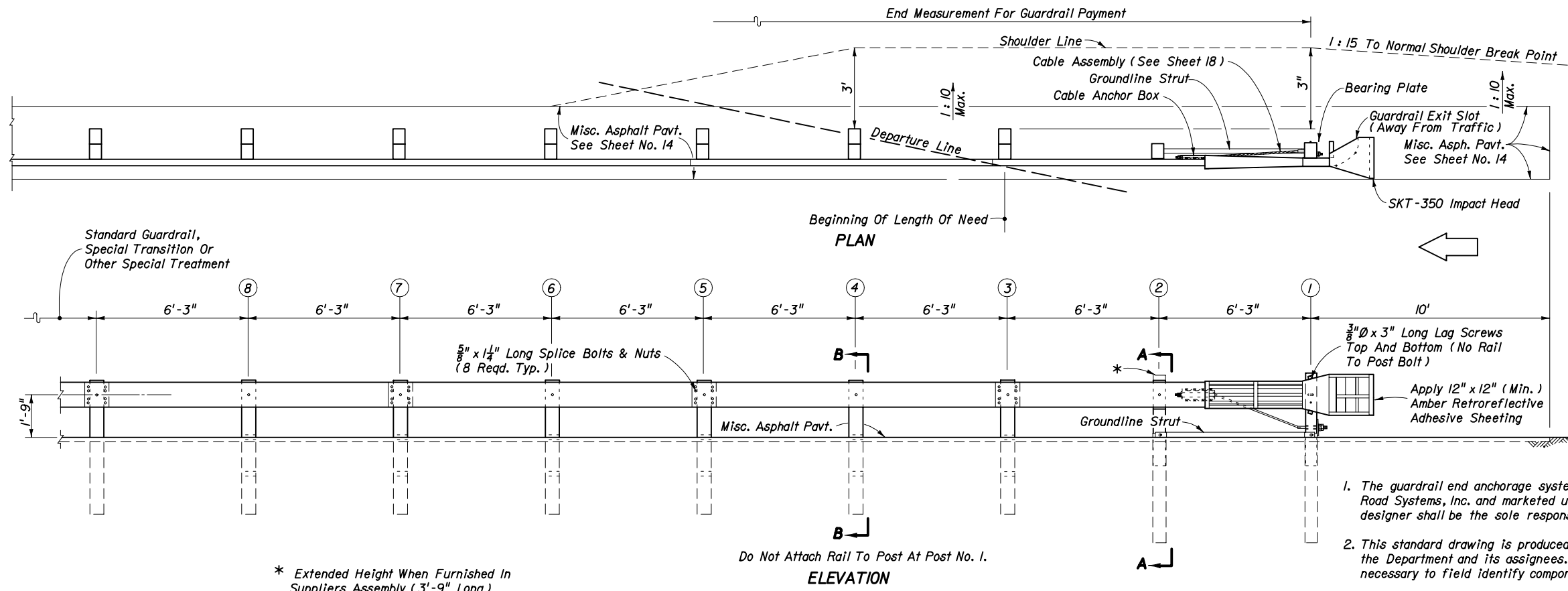
1. A special site evaluation should be considered prior to using the LET where there is less than 25' clear area on the extrusion side (back side) of the LET.
2. The LET is suitable for all design speeds.

END ANCHORAGE ASSEMBLY TYPE LET

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

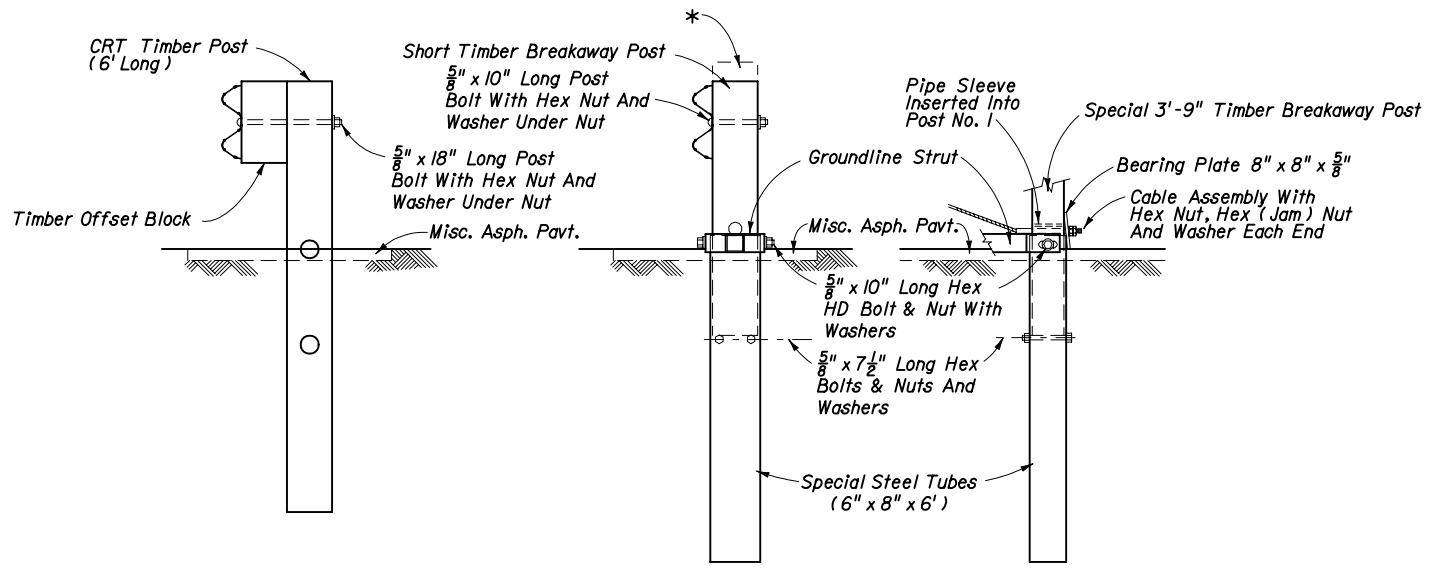
GUARDRAIL

Names	Dates	Approved By				
Designed By	STAFF	10/97	 Roadway Design Engineer			
Drawn By	HKH	10/97			Revision	Sheet No.
Checked By	JVG	10/97			04	27 of 31
			Index No.	400		



* Extended Height When Furnished In Suppliers Assembly (3'-9" Long)

Do Not Attach Rail To Post At Post No. 1.



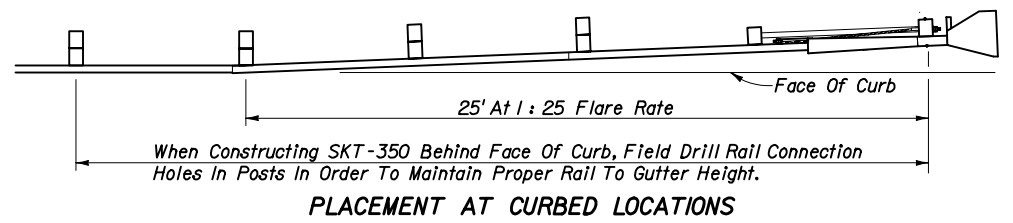
SECTION BB
TYPICAL POST NOS. 3, 4, 5, 6, 7 AND 8

SECTION AA
POST NO. 2

PARTIAL VIEW
POST NO. 1

'SKT-350' NOTES

1. The guardrail end anchorage system represented on this standard drawing is a proprietary design by Road Systems, Inc. and marketed under the trade name SKT-350. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for the use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the SKT-350 and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the SKT-350 when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The SKT-350 shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The SKT-350 is intended for use as an approach end guardrail anchorage for shoulder guardrail located parallel to traffic lanes. The effective length of the SKT-350 is 50'. The alignment of the SKT-350 is an extension of the normal guardrail alignment, except when constructed with curb the alignment of the SKT-350 will be flared over the first 25' at a rate of 1:25.
5. The SKT-350 can not be used in medians where horizontal clearance requires the use of a backrail.
6. Posts at location Nos. 1 and 2 must be timber breakaway posts with special length steel foundation tubes without soil plates. The posts at location Nos. 3, 4, 5, 6, 7 and 8 shall be CRT timber posts.
7. See the General Notes for galvanizing requirements of metallic components.
8. If the plans call for the 'SKT-350' at a specific location, substitution with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'parallel' at a specific location, the contractor has the option to construct any FDOT approved parallel assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchor will not be eligible for VECP consideration.
9. The SKT-350 shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.



PLACEMENT AT CURBED LOCATIONS


DESIGN NOTES

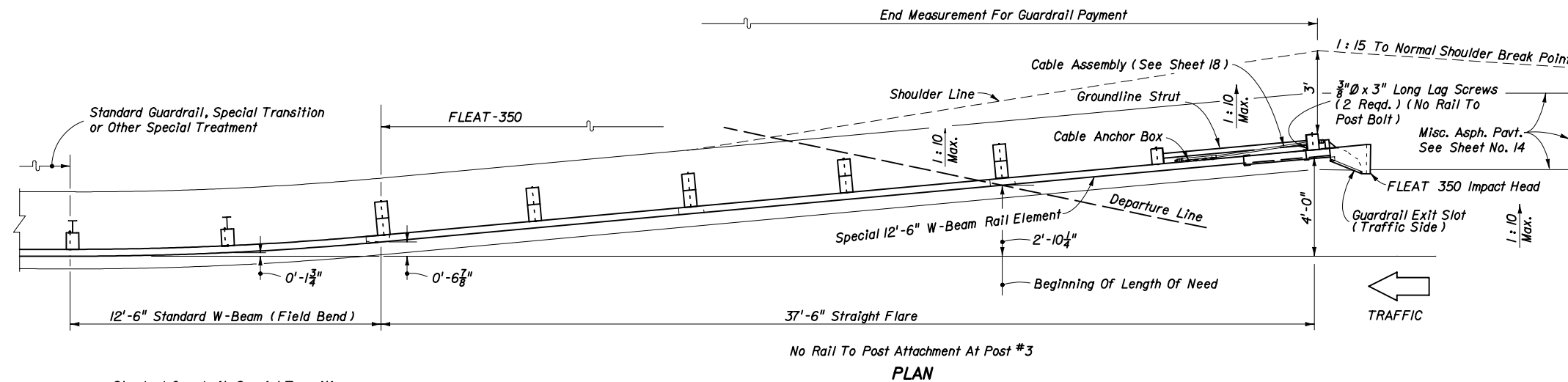
1. A special site evaluation should be considered prior to using the SKT-350 where there is less than 25' clear area on the extrusion side (back side) of the SKT-350.
2. The SKT-350 is suitable for all design speeds.

END ANCHORAGE ASSEMBLY TYPE SKT-350

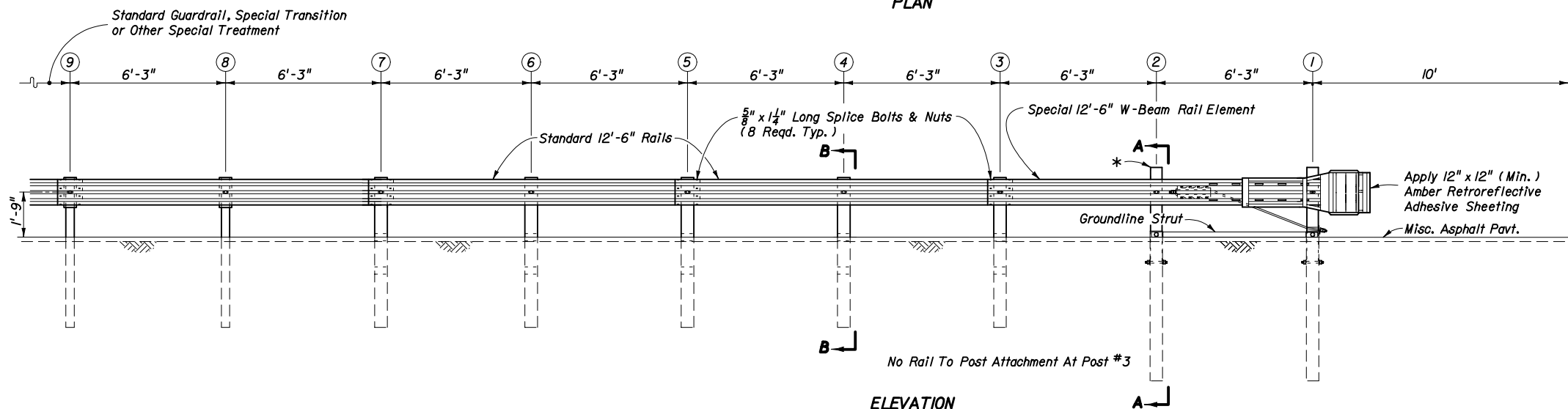
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

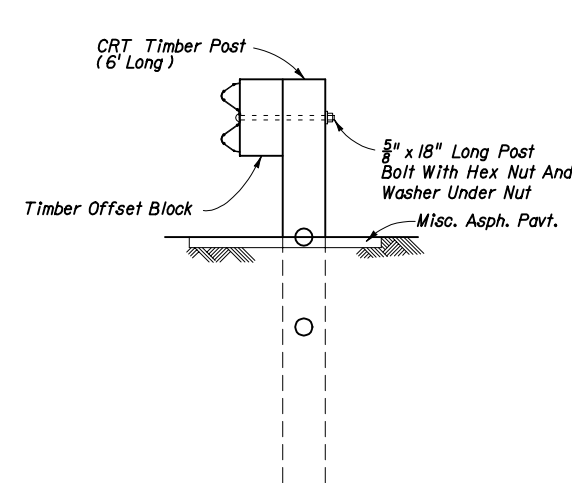
Names			Dates			Approved By		
Designed By	MFG	8/95	 Roadway Design Engineer			Revision	Sheet No.	Index No.
Drawn By	HKH	8/95				02	28 of 31	400
Checked By	JVG	8/95						



PLAN

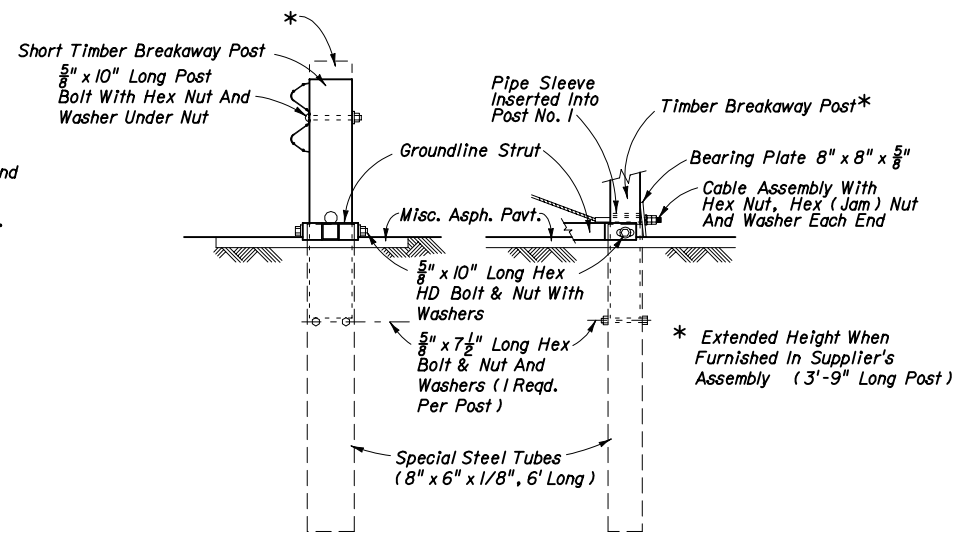


ELEVATION



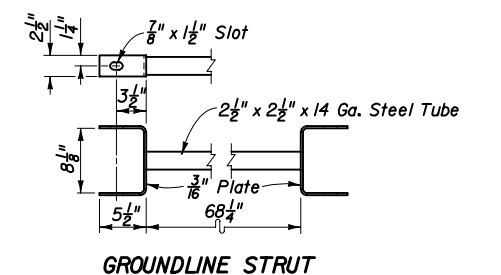
Note: Do not attach rail to block at post location 3.

SECTION BB
TYPICAL POST NOS. 3, 4, 5, 6 AND 7

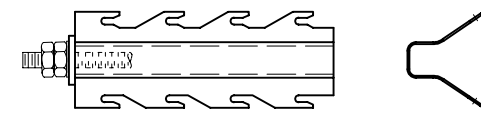


SECTION AA
POST NO. 2

PARTIAL VIEW
POST NO. 1



GROUNDLINE STRUT



BACK VIEW
SECTION
Cable Anchor Bracket Is Attached To
W-Beam Panel By 8 Shoulder Bolts
CABLE ANCHOR BOX

'FLEAT-350' NOTES

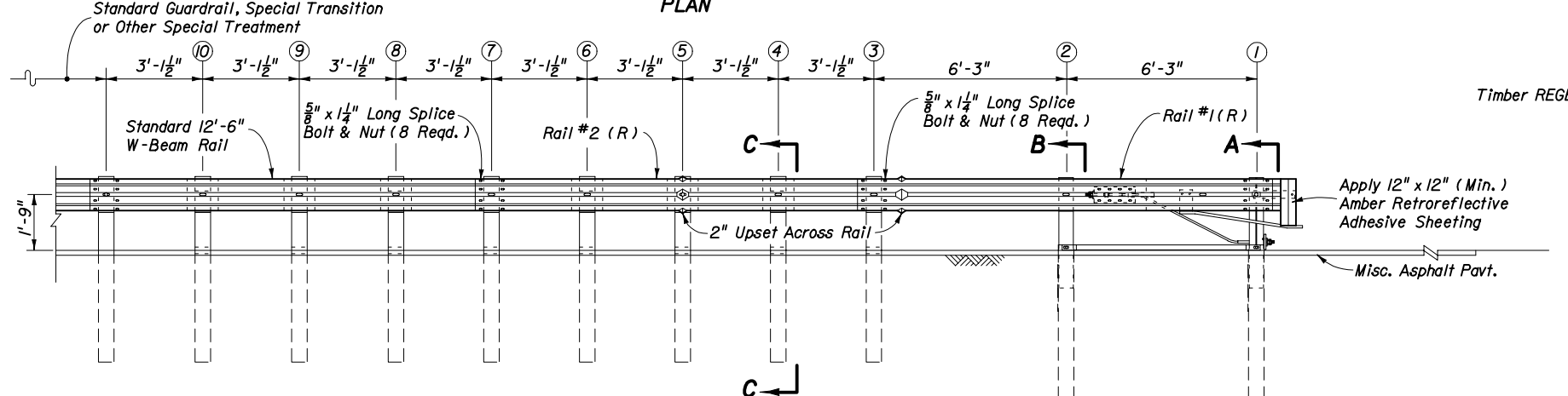
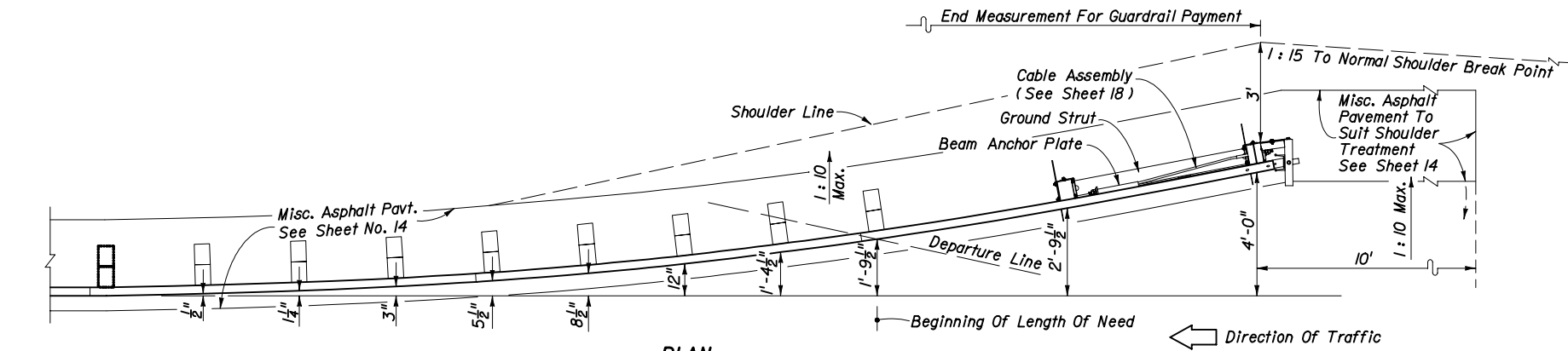
1. The guardrail end anchorage system represented on this standard drawing is a proprietary design by Road Systems, Inc. and marketed under the trade name FLEAT-350. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for the use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the FLEAT-350 and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the FLEAT-350 when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The FLEAT-350 shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The FLEAT-350 is intended for use as an approach end guardrail anchorage for shoulder guardrail. The effective length of the FLEAT-350 is 37.5' including one 12.5' special W-Beam panel plus two 12.5' standard W-Beam panels outside of any other standard guardrail, guardrail transitions or other special treatments. The alignment of the FLEAT-350 is a straight flare with an upstream offset of 4' and a downstream offset of 0'-6 7/8" from the normal guardrail alignment.
5. The FLEAT-350 can not be used in medians where horizontal clearance requires the use of a backrail.
6. Posts at location Nos. 1 and 2 must be timber breakaway posts with special length steel foundation tubes without soil plates. The posts at location Nos. 3, 4, 5, 6, and 7 shall be CRT timber posts.
7. See the General Notes for galvanizing requirements of metallic components.
8. If the plans call for the 'FLEAT-350' at a specific location, substitution with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
9. The FLEAT-350 shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.

DESIGN NOTES

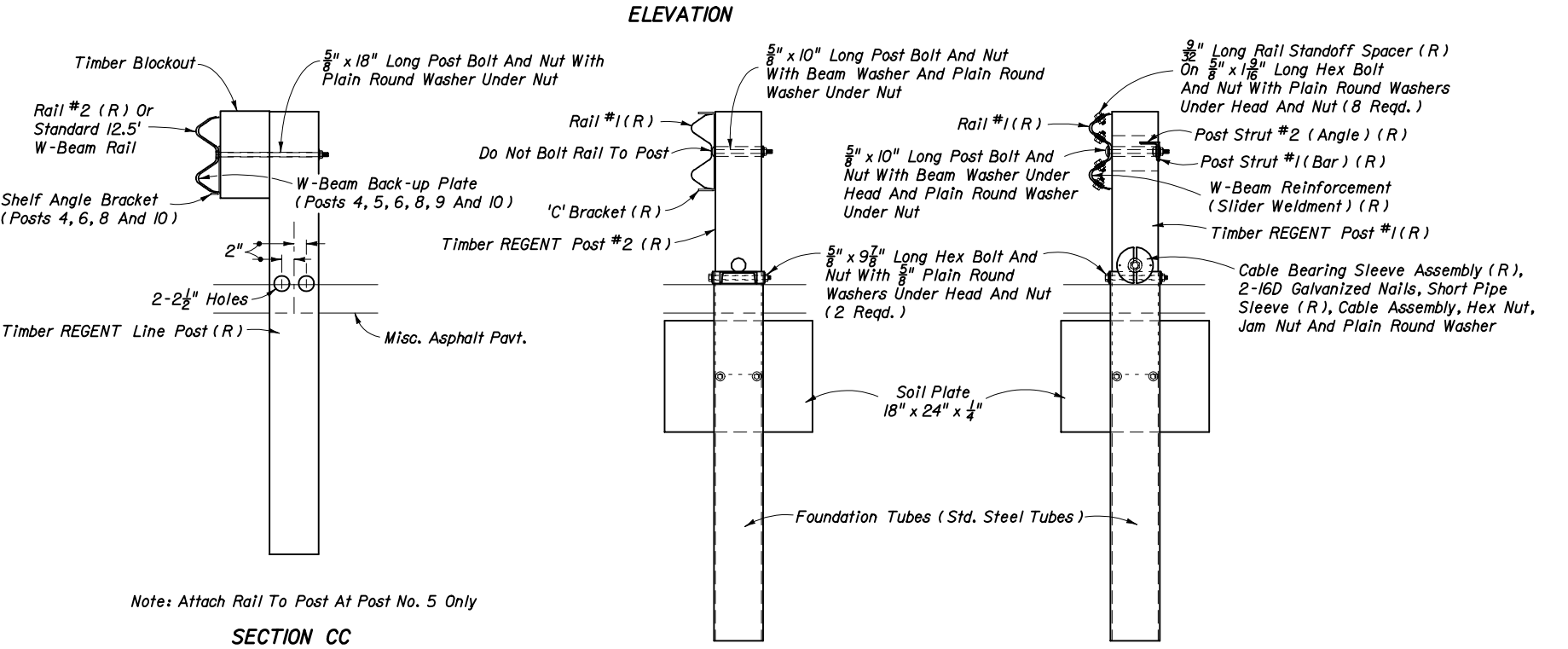
1. The FLEAT-350 is suitable for all design speeds.

END ANCHORAGE ASSEMBLY TYPE FLEAT-350

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	07/98	Roadway Design Engineer	
Checked By	JVG	07/98	Revision	Sheet No.
			04	29 of 31
				Index No. 400



Note: Attach rail to post at posts Nos. 1 and 5 only. W-Beam back-up plates are to be installed at posts Nos. 4, 5, 6, 8, 9 and 10 only. Shelf angle brackets are to be installed at posts Nos. 4, 6, 8 and 10 only.



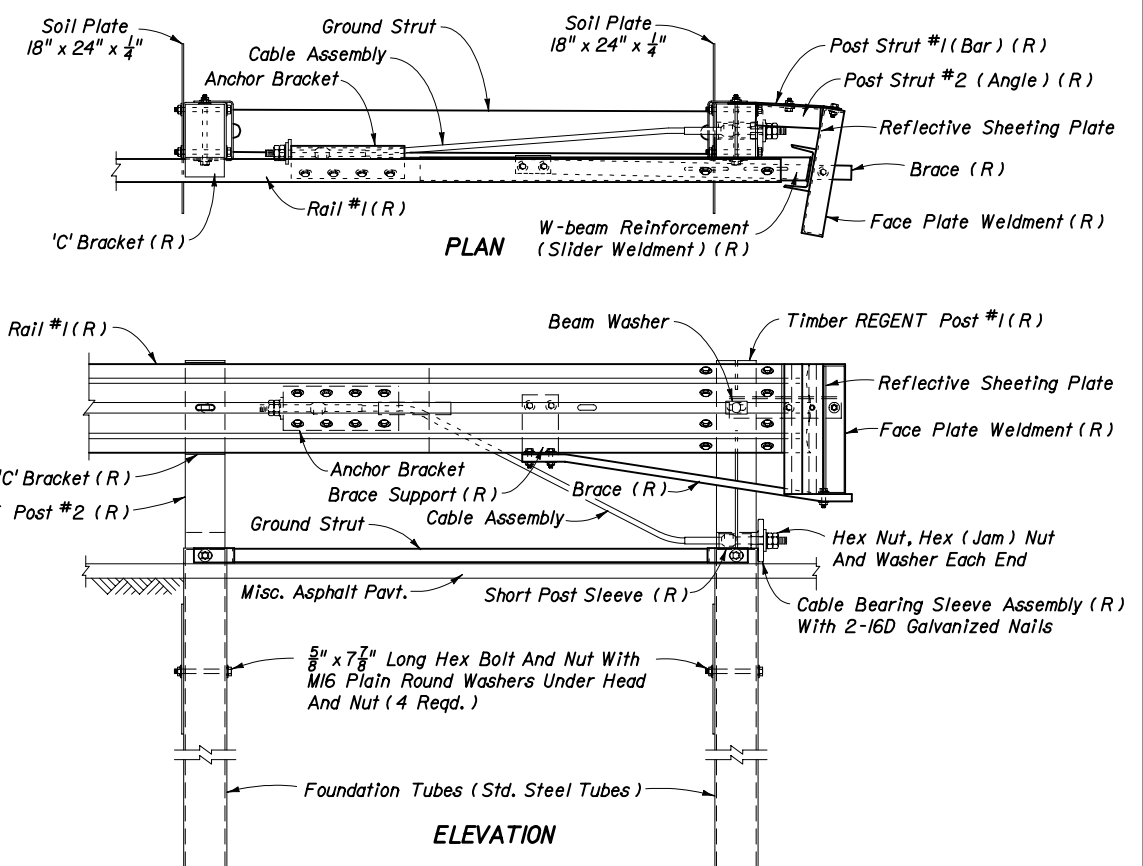
Note: Attach Rail To Post At Post No. 5 Only

SECTION CC
TYPICAL POST NOS. 3 THRU 10

SECTION BB
POST NO. 2

SECTION AA
POST NO. 1

END ANCHORAGE ASSEMBLY TYPE REGENT



ELEVATION

'REGENT' NOTES

- The REGENT is suitable for all design speeds. The REGENT is intended for use as an approach end guardrail anchorage for shoulder guardrail. Its alignment is a parabolic flare from the normal guardrail alignment with an effective length of 37.5' including two special W-Beam panels and one standard W-Beam panel outside of any standard guardrail, guardrail transitions or other special treatments.
- This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the REGENT and their incorporation into a whole system.
- This standard drawing is sufficient for plan details for the REGENT when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The REGENT shall be assembled in accordance with the distributor's detailed drawings, procedures and specifications.
- The first post must be a timber REGENT Post #1 with a steel foundation tube and soil plate; the second post must be a timber REGENT Post #2 with a steel foundation tube and soil plate; and, posts Nos. 3 thru 10 must be timber REGENT line posts.
- The suffix (R) indicates components unique to the REGENT System, these components along with bolts, nuts and washers not labeled are to be furnished in the distributor's package.
- The REGENT can not be used in medians where horizontal clearance requires the use of a backrail.
- See the General Notes for galvanizing requirements of metallic components.
- If the plans call for the 'REGENT' at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
- The REGENT shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the distributor's detailed drawings, procedures and specifications and this Index.

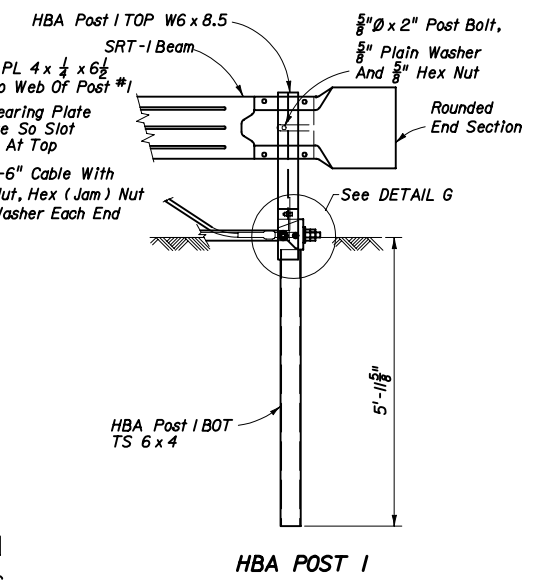
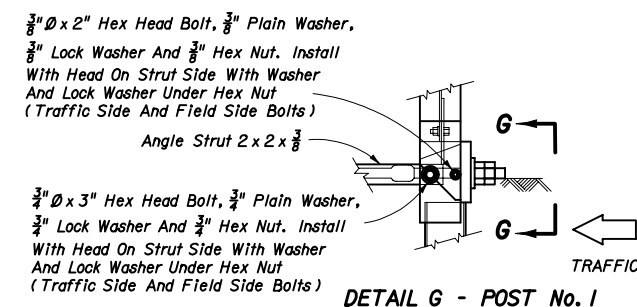
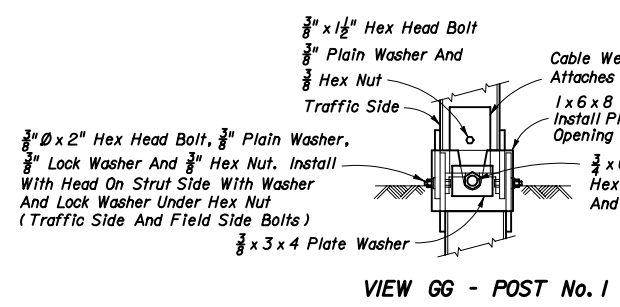
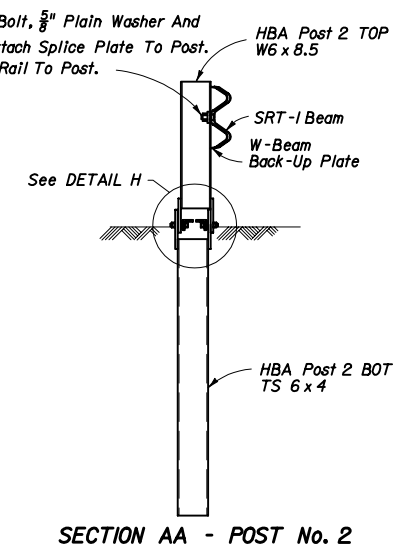
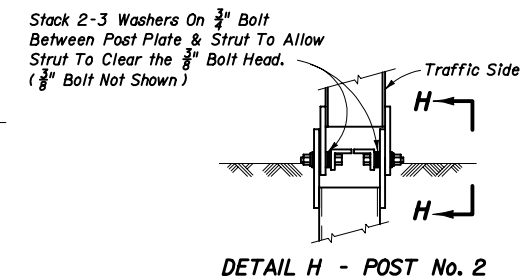
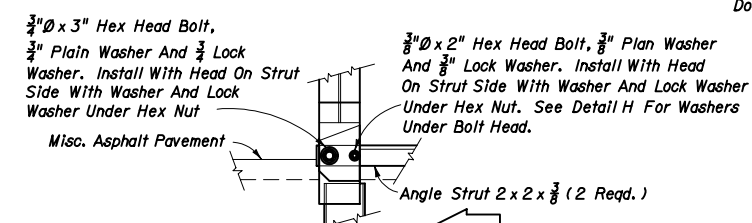
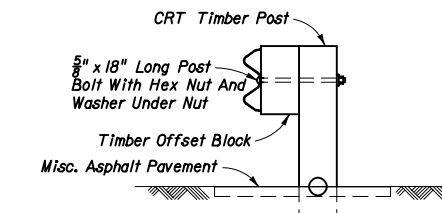
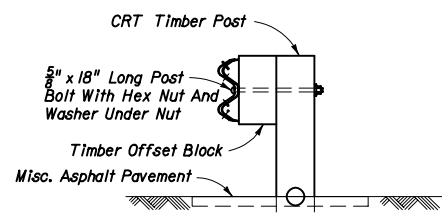
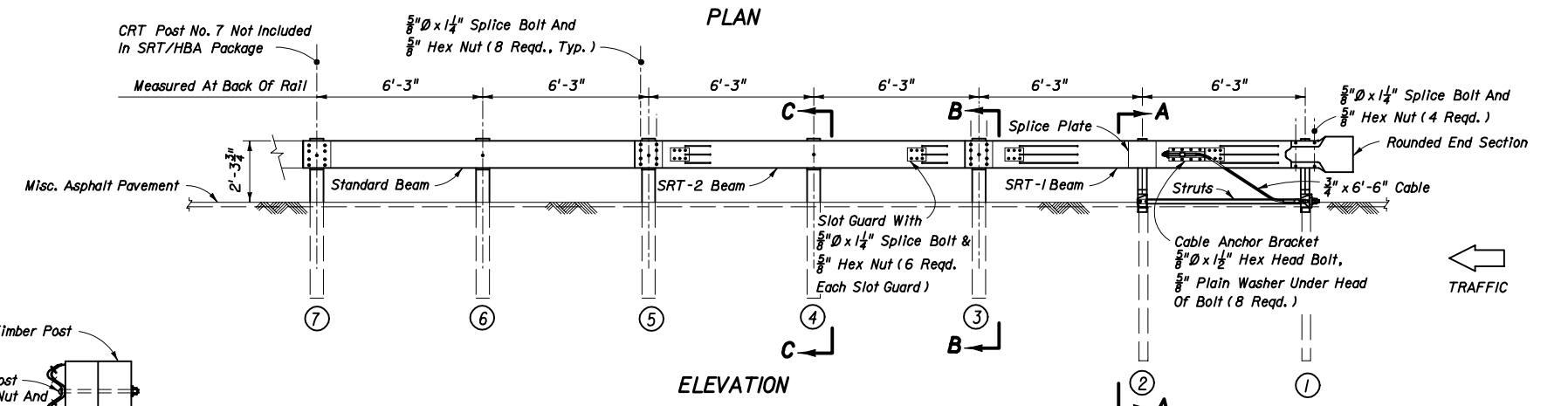
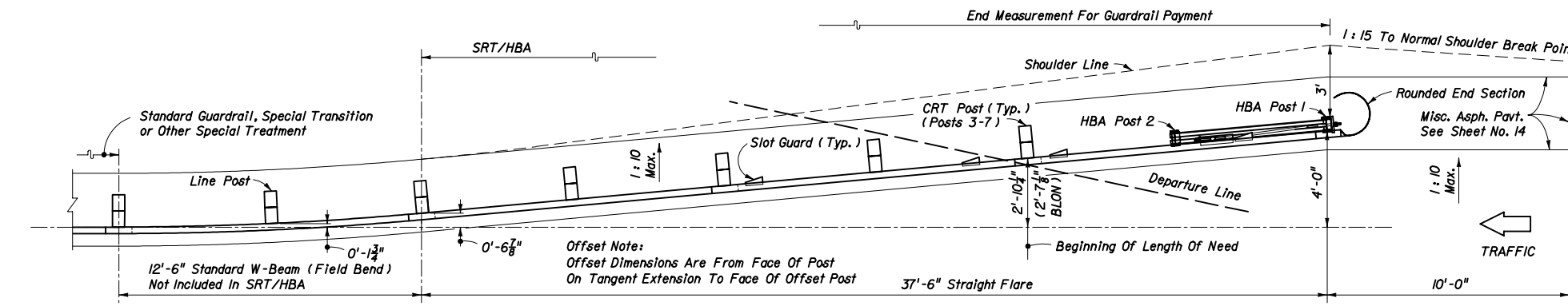
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

Designed By	MFG	07/98	Approved By		<i>[Signature]</i>
Drawn By	HKH	07/98	Roadway Design Engineer		
Checked By	JVG	07/98	Revision	00	Sheet No. 30 of 31
					Index No. 400

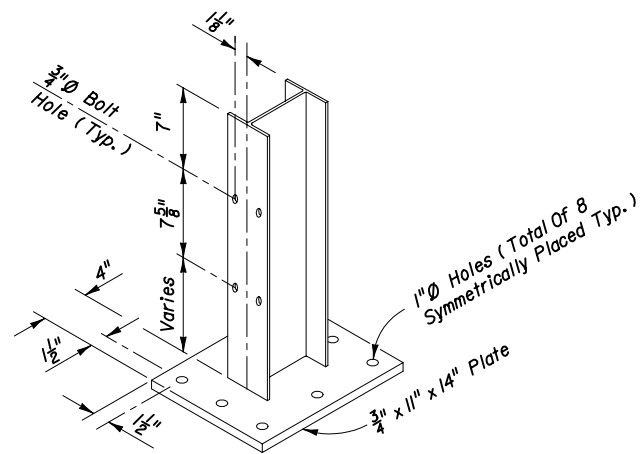
SRT/HBA 6 POST SYSTEM NOTES

1. The guardrail end anchorage system represented on this drawing is a proprietary six (6) post design by Trinity Industries, Inc. and marketed by Syro, Inc. under the trade name SRT/HBA 6 Post. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the SRT/HBA 6 Post and their incorporation into a whole system.
3. This drawing is sufficient for plan details for the SRT/HBA 6 Post when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless called for elsewhere in the plans. The SRT/HBA 6 Post shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The SRT/HBA 6 Post can not be used in medians where horizontal clearance requires the use of a backrail.
5. The SRT/HBA 6 Post is suitable for all design speeds. The SRT/HBA 6 Post is intended for use as an approach end anchorage for shoulder guardrail. Its alignment is a straight flare from the normal guardrail alignment with an effective length of 37.5' including two special slotted W-Beam panels and one standard W-Beam panel outside of any standard guardrail, guardrail transitions or other special treatments.
6. Posts 1 and 2 must be hinged breakaway steel posts. CRT breakaway posts shall be used at all other locations within the system.
7. See the General Notes for galvanizing requirements of metallic component.
8. If the plans call for the SRT/HBA 6 Post at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
9. The SRT/HBA 6 Post shall be paid for under the contract unit price for Guardrail End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.

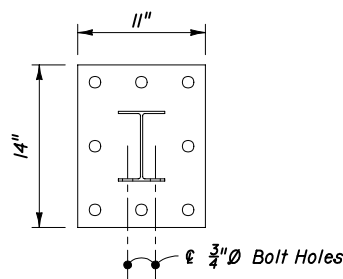


SRT/HBA-6 POST SYSTEM

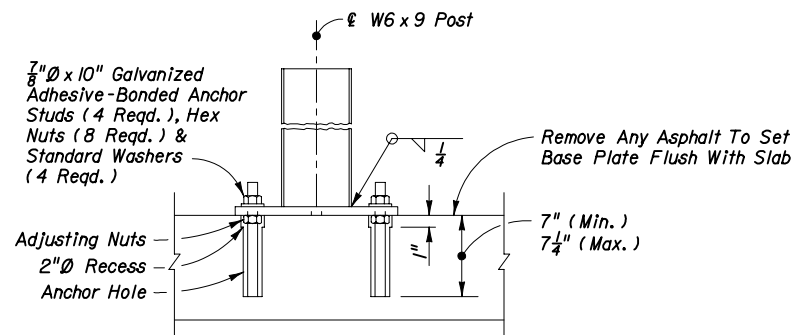
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL				
Designed By	Names	Dates	Approved By	
Drawn By	SBC	3/01	 Roadway Design Engineer	
Checked By	JVG	3/01		
			Revision	Sheet No.
			02	31 of 31
				Index No.
				400



PICTORIAL



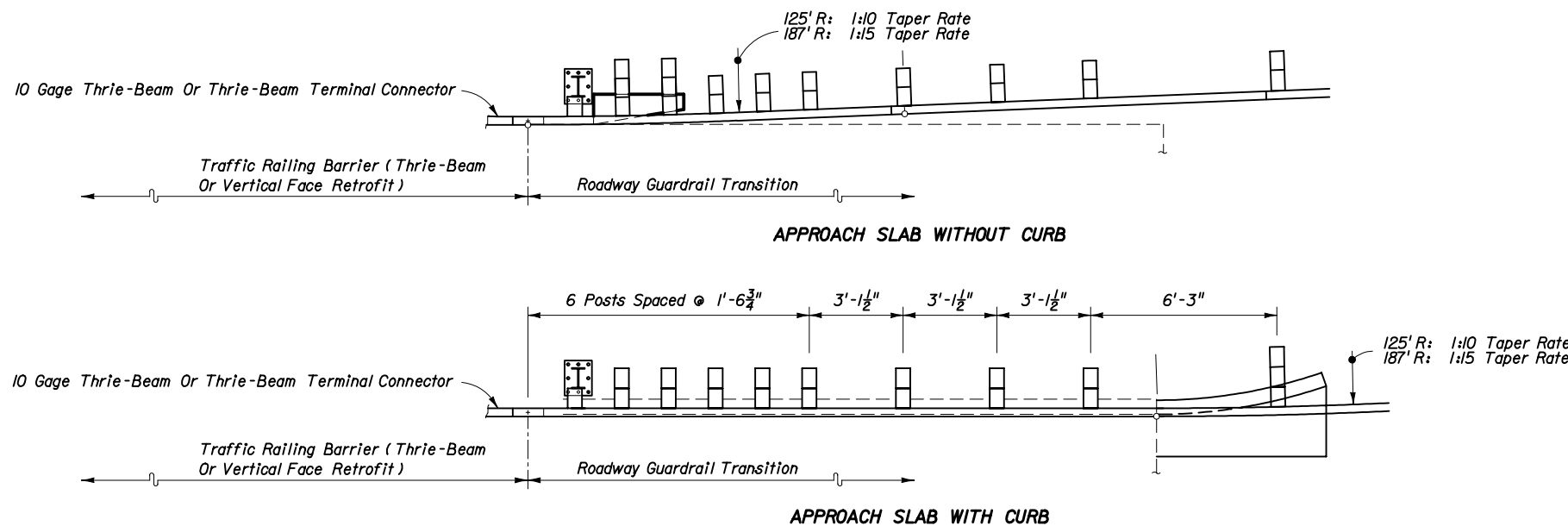
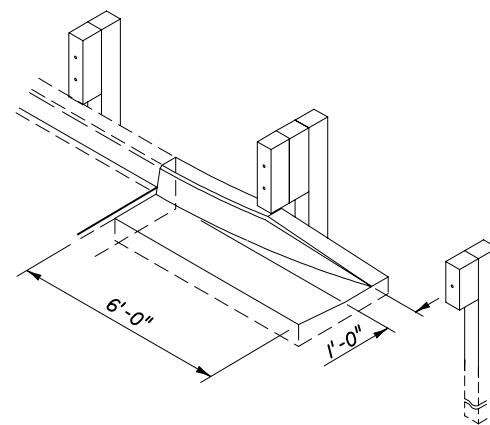
TOP VIEW



SIDE VIEW

SPECIAL STEEL POST FOR ROADWAY THRIE-BEAM TRANSITIONS TO BRIDGE RETROFIT TRAFFIC RAILINGS

CURB TYPE F FLARE WHEN END OF EXISTING APPROACH SLAB CURB EXPOSED



Longitudinal Location Of Transition Blocks And Curb End Flares Will Vary With Scheme Type

PARTIAL PLAN VIEWS

GUARDRAIL TRANSITION ALIGNMENTS FOR BRIDGE THRIE-BEAM AND VERTICAL FACE BARRIER RETROFIT

GENERAL NOTES

1. This index provides thrie-beam transition and connection details for approach end guardrail on existing bridges, and anchorage details for trailing end traffic railing barrier retrofits and safety shapes on existing bridges. Sheets 1 through 25 apply to bridges with retrofitted traffic railing barriers. (Sheet 25 shows the trailing end guardrail connections). Sheets 26 applies to bridges with safety shaped traffic railing barriers. Sheet 25 shows the trailing end guardrail connections.
2. The schemes identified by Arabic numerals in this index are complimentary to the bridge traffic railing barrier retrofit schemes with like numeral identification in Structures Index Nos. 771, 772 through 777, 781 and 782 through 785. The schemes in this index identified by Roman numerals are complimentary to bridge safety shaped traffic railing barrier where determined to be in accordance with applications of Structures Standard Drawing Nos. I-790 and I-795.
3. For guardrail applications and details of related hardware and accessories that are not provided on this index, refer to Index No. 400.

NOTES FOR GUARDRAIL TRANSITIONS CONNECTING TO TRAFFIC RAILING RETROFITS ON EXISTING BRIDGES

1. The transition detail shown on this sheet shows (a) the standard post spacings within the typical thrie-beam approach transitions connecting to existing bridges with retrofitted traffic railing barriers, and (b) depict the typical alignments of the approach transitions.
2. The curb and gutter flare shown on this sheet is typical of flares that are to be constructed when approach slab curbs extend to the beginning of the slab, and where other treatment to curb blunt ends are not in place.
3. The special steel post for roadway thrie-beam transitions detailed on this sheet is specific to all transition applications on this index that require one or more steel posts.

The special steel post and base plate assembly shall be fabricated using ASTM A36 or ASTM A709 Grade 36 steel. Welding shall conform to ANSI/AASHTO/AWS D1.5. The assembly shall be hot-dip zinc coated in accordance with Section 536 of the Specifications.

Anchor studs shall be fully threaded rods in accordance with ASTM F1554 Grade 36 or ASTM A193 Grade B7. All nuts shall be heavy hex in accordance with ASTM A563 or ASTM A194. Anchor studs and nuts shall be hot-dip zinc coated in accordance with the Specifications. After the nuts have been snug tightened, the anchor stud threads shall be single punch distorted immediately above the top nuts to prevent loosening of the nuts. Distorted threads shall be coated with a galvanizing compound in accordance with the Specifications.

Adhesive bonding material systems for anchors shall comply with Specification Section 937 and be installed in accordance with Specification Section 416.


4. Nested beam extensions and points for terminal connector attachments will vary for traffic railing barrier vertical face retrofits. The plan views for the vertical face retrofit barriers show the primary configurations for each particular scheme. The associated pictorial views show the variations.
5. For installing thrie-beam terminal connector to traffic railing barrier vertical face retrofits, see notations on Sheets 12 through 15 and the flag notation on Sheet 25.
6. Payment for connections to traffic railing barrier vertical face retrofits are to be made under the contract unit price for Bridge Anchorage Assembly, EA., and shall be full compensation for bolt hole construction, terminal connector, terminal connector plate and bolts, nuts and washers.

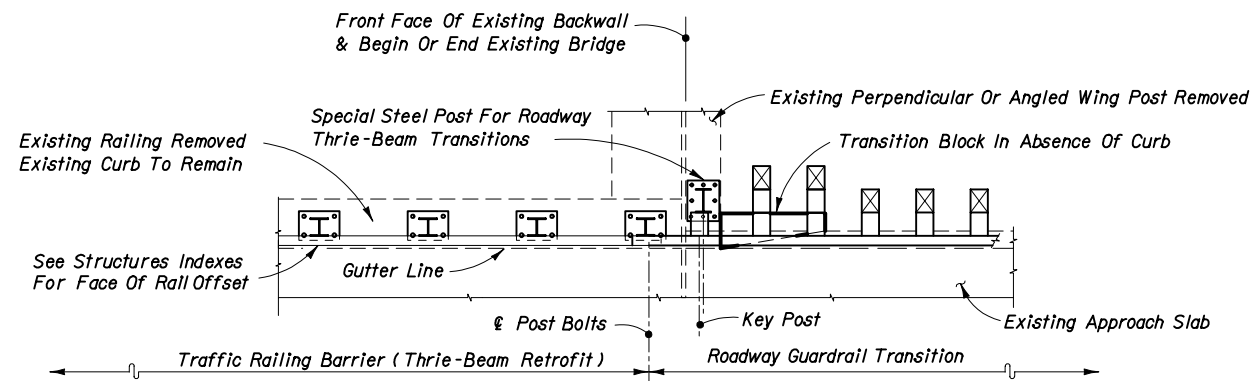
DESIGN NOTES FOR GUARDRAIL TRANSITIONS CONNECTING TO TRAFFIC RAILING RETROFITS ON EXISTING BRIDGES

1. For selection of an appropriate transition scheme, see Structures Instruction Index Nos. I-770 and I-780 for instructions to the Structures and Roadway engineers.

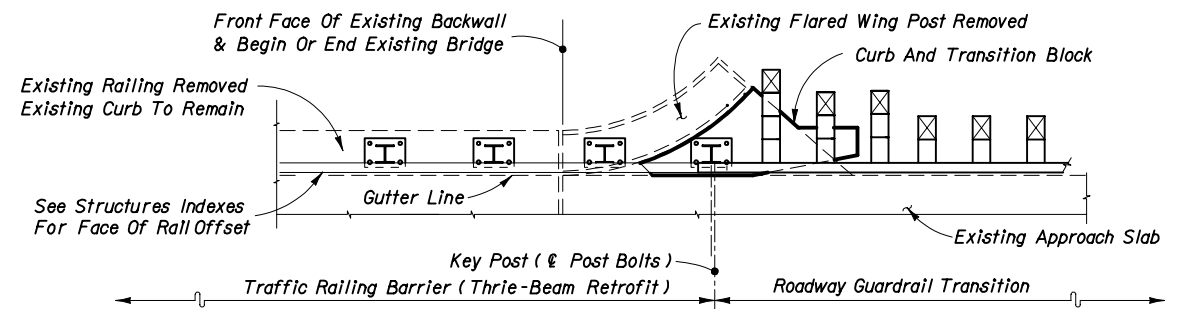
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

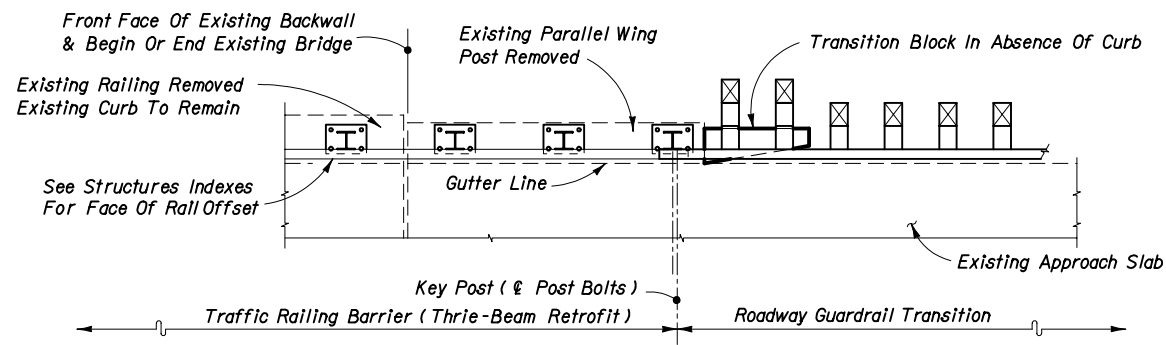
Names	Dates	Approved By		
Designed By	JVG/CGB 12/02	 Roadway Design Engineer		
Drawn By	HSD/SBC 12/02			
Checked By	JVG/JAM 12/02	Revision	Sheet No.	Index No.
		04	1 of 26	402



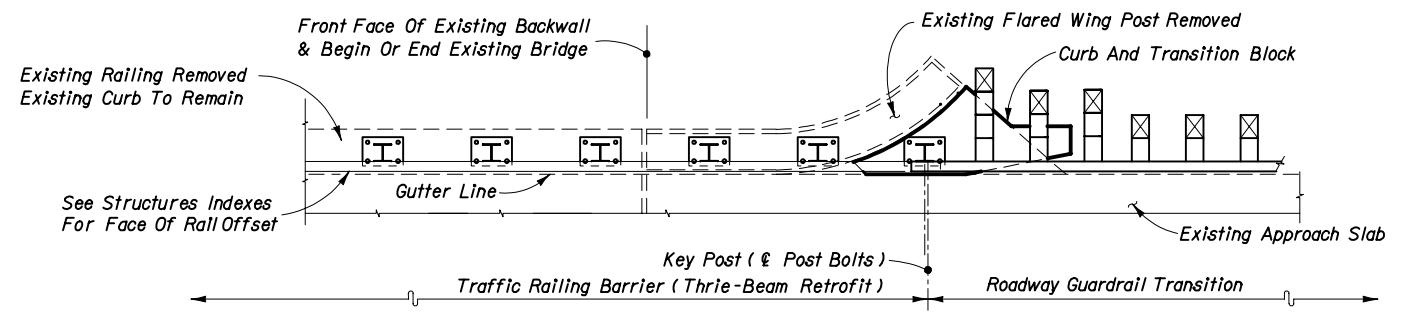
SEE STRUCTURES INDEX NO. 772 - SCHEME 1



SEE STRUCTURES INDEX NO. 772 - SCHEME 3



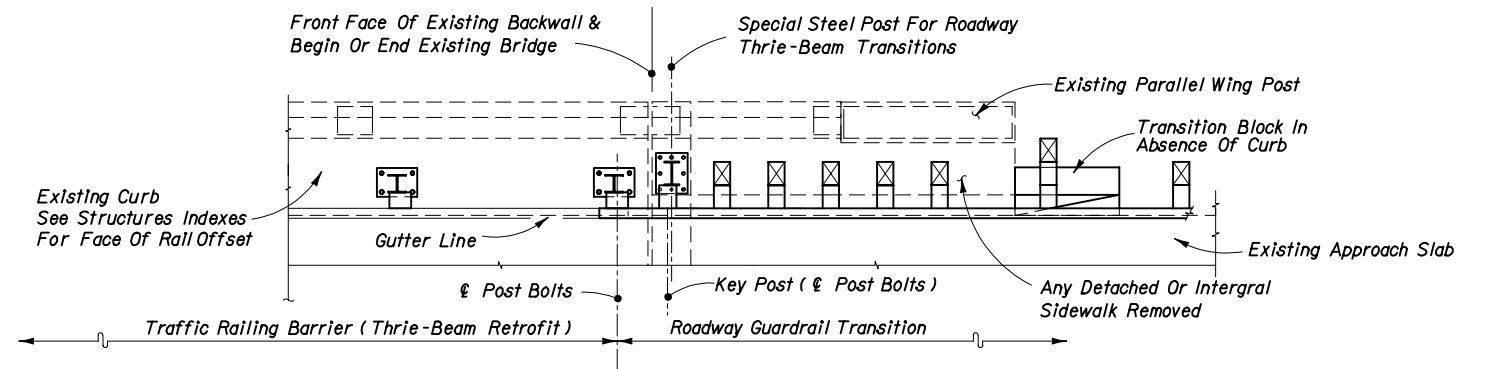
SEE STRUCTURES INDEX NO. 772 - SCHEME 2



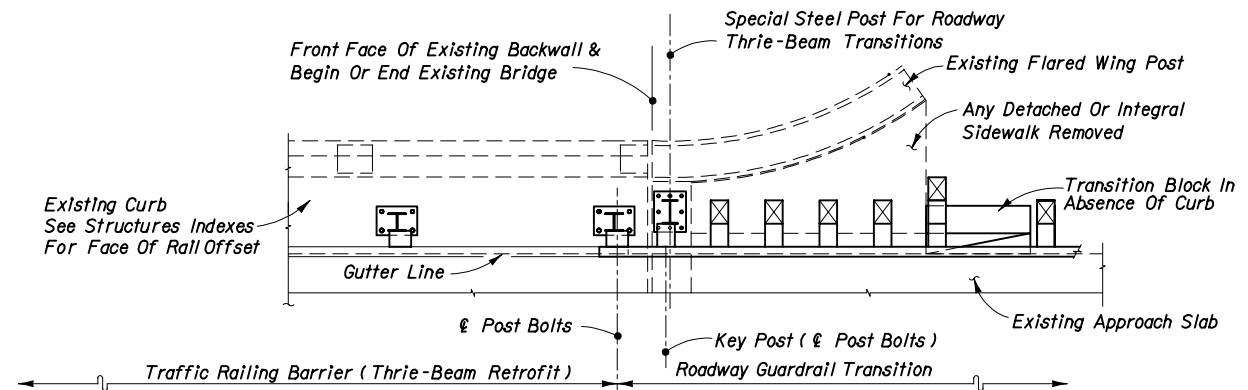
SEE STRUCTURES INDEX NO. 772 - SCHEME 3

PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (THRIE-BEAM RETROFIT)

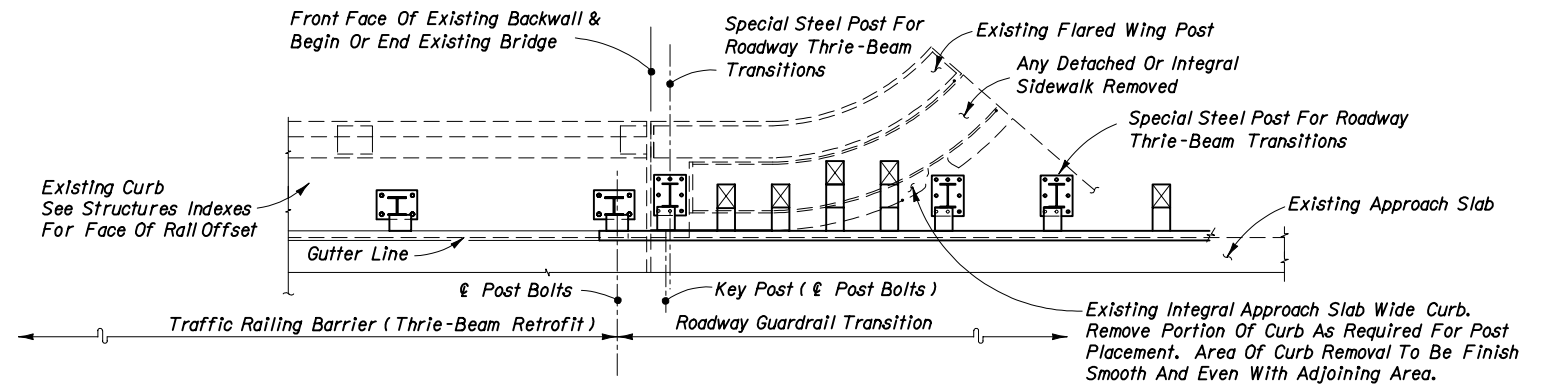
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
	Names	Dates	Approved By	
Designed By	JVG/CEB	12/02	<i>Samuel D. Hill</i> Roadway Design Engineer	
Drawn By	HSD/SBC	12/02	Revision	Sheet No.
Checked By	JVG/JAM	12/02	04	2 of 26
				Index No. 402



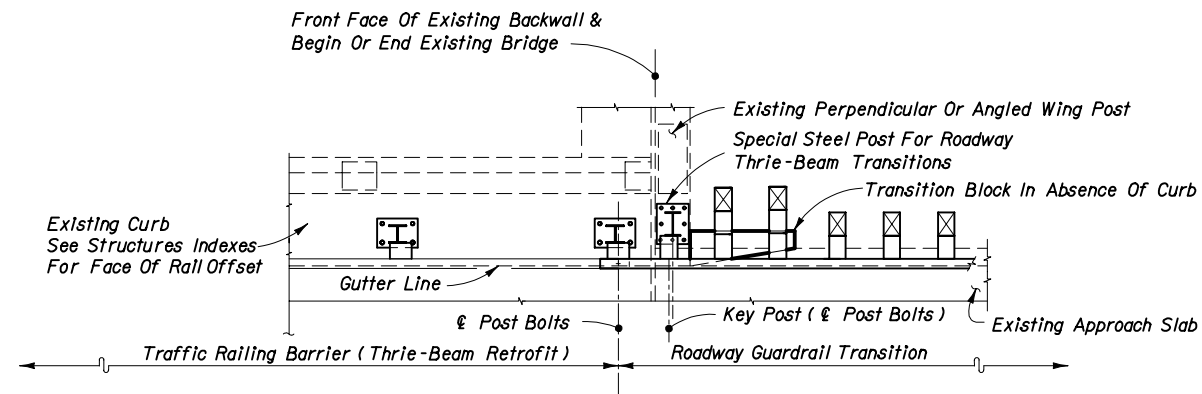
SEE STRUCTURES INDEX NOS. 773 & 776 - SCHEME 2



SEE STRUCTURES INDEX NOS. 773 & 776 - SCHEME 2



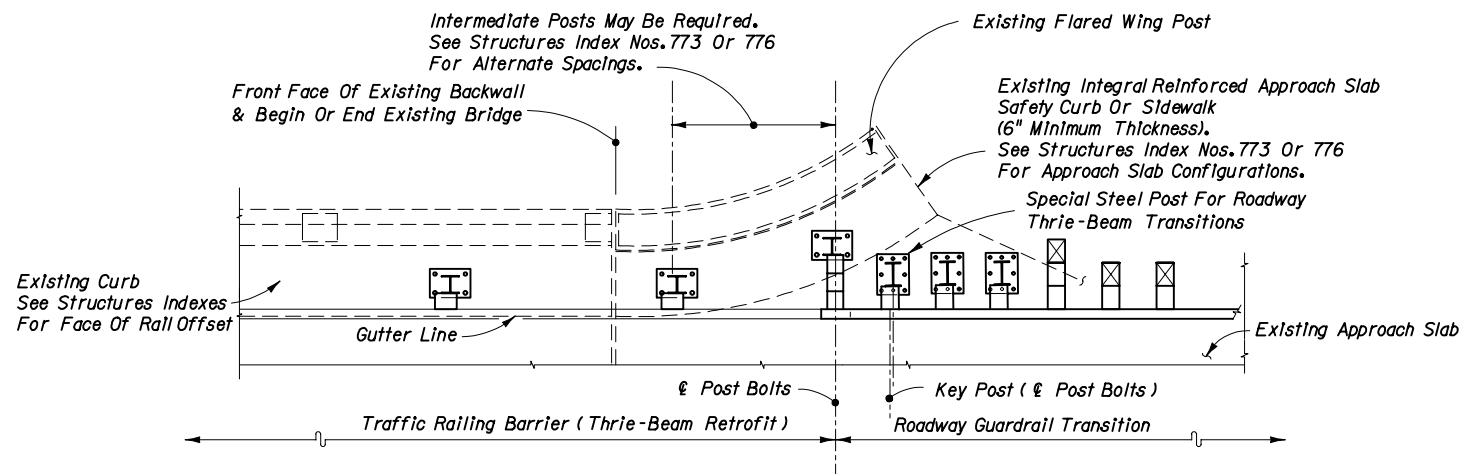
SEE STRUCTURES INDEX NOS. 773 & 776 - SCHEME 2



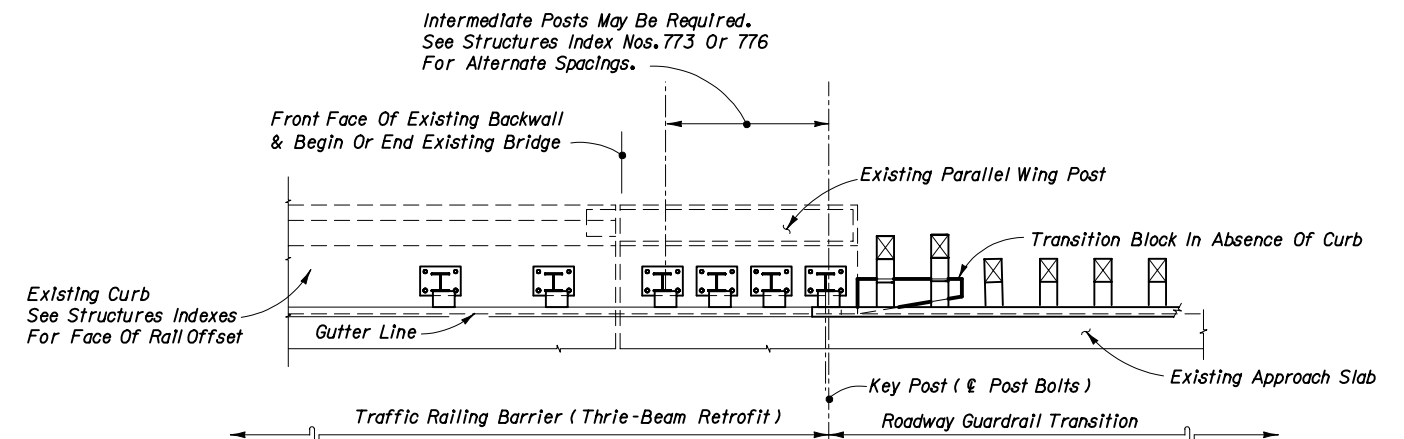
SEE STRUCTURES INDEX NOS. 773 & 776 - SCHEME 1

PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (THRIE-BEAM RETROFIT)

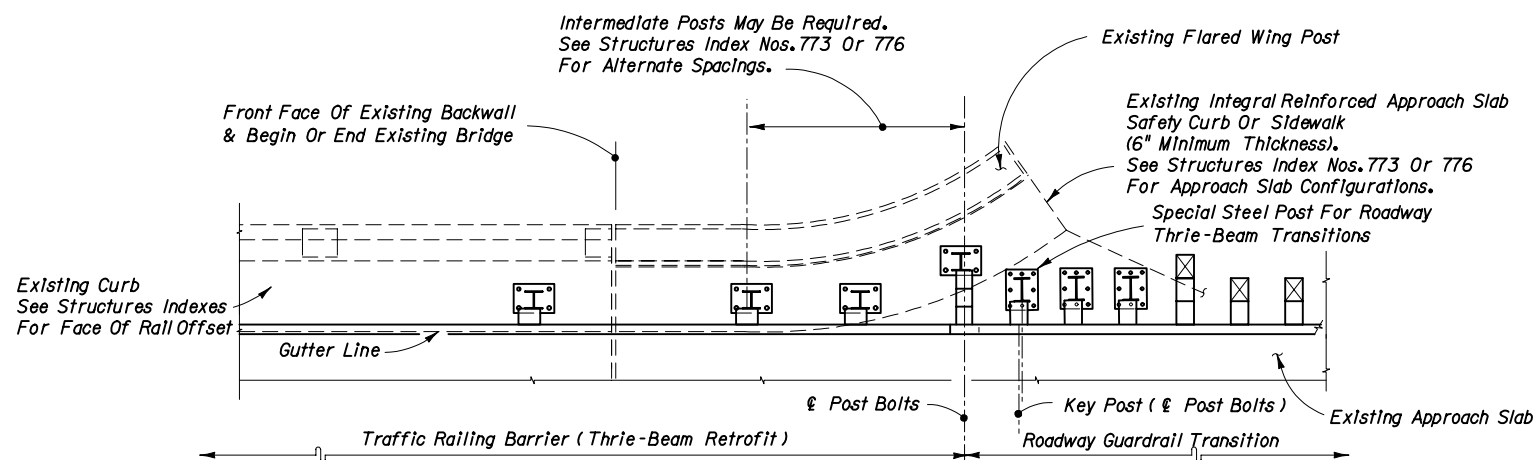
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
Designed By	JVG/CEB	12/02	Approved By <i>Jamell D. Milk</i> Roadway Design Engineer	
Drawn By	HSD/SBC	12/02	Revision	Sheet No. Index No.
Checked By	JVG/JAM	12/02	04	3 of 26 402



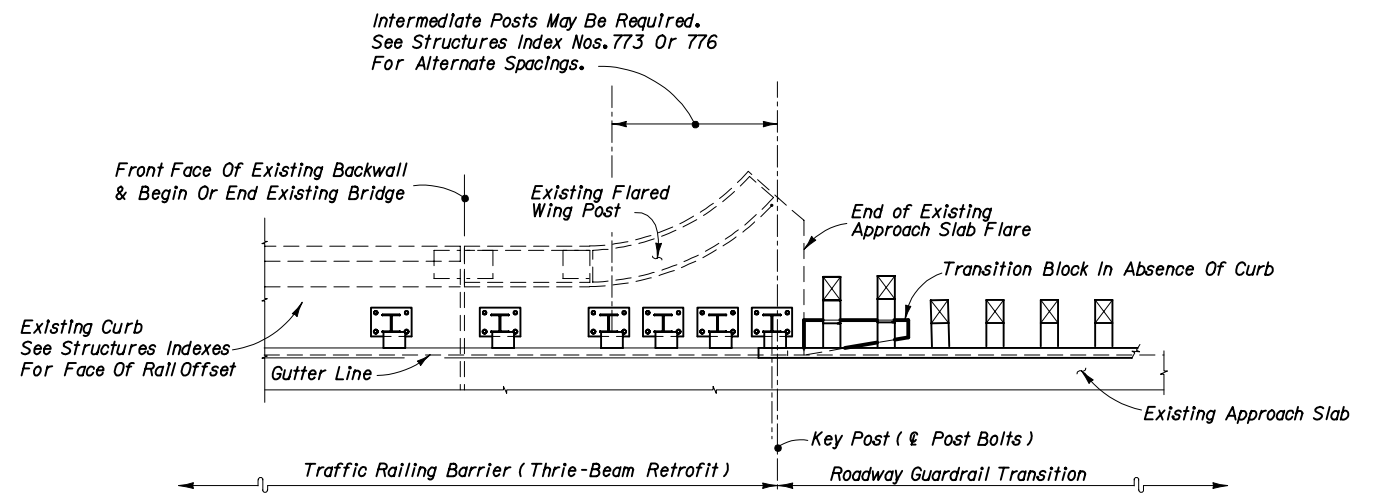
SEE STRUCTURES INDEX NOS. 773 & 776 - SCHEME 3 & 4



SEE STRUCTURES INDEX NOS. 773 & 776 - SCHEME 5 & 6



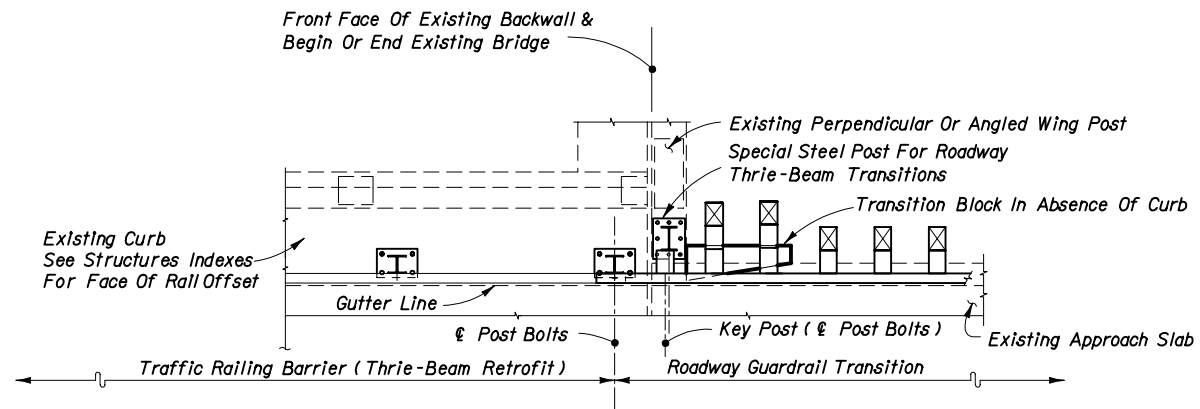
SEE STRUCTURES INDEX NOS. 773 & 776 - SCHEME 3 & 4



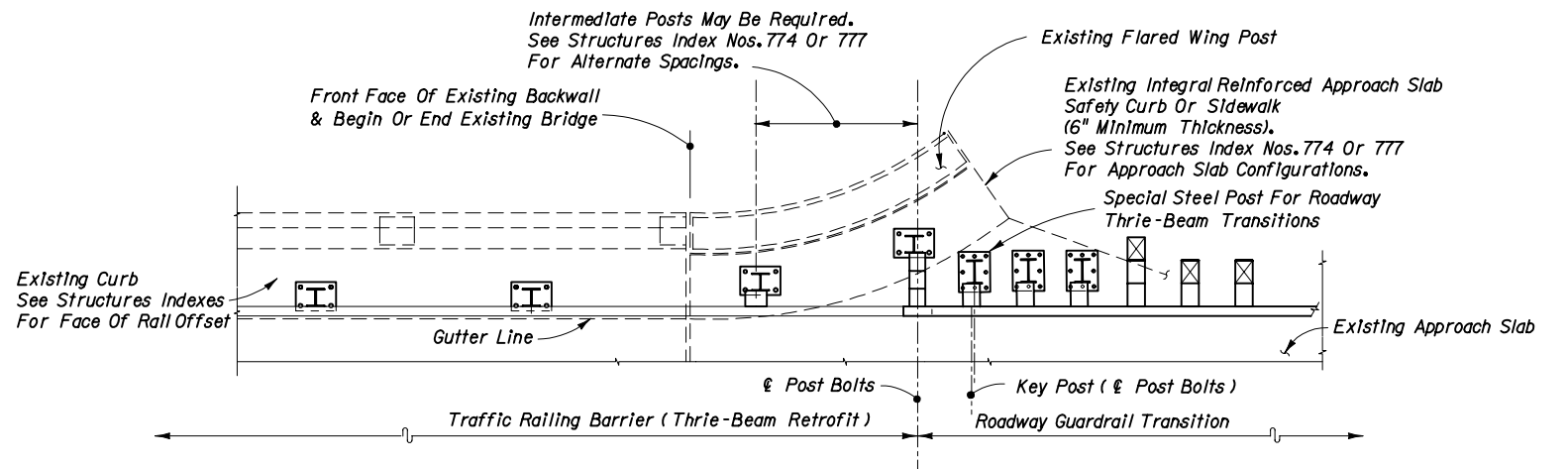
SEE STRUCTURES INDEX NOS. 773 & 776 - SCHEME 5 & 6

PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (THRIE-BEAM RETROFIT)

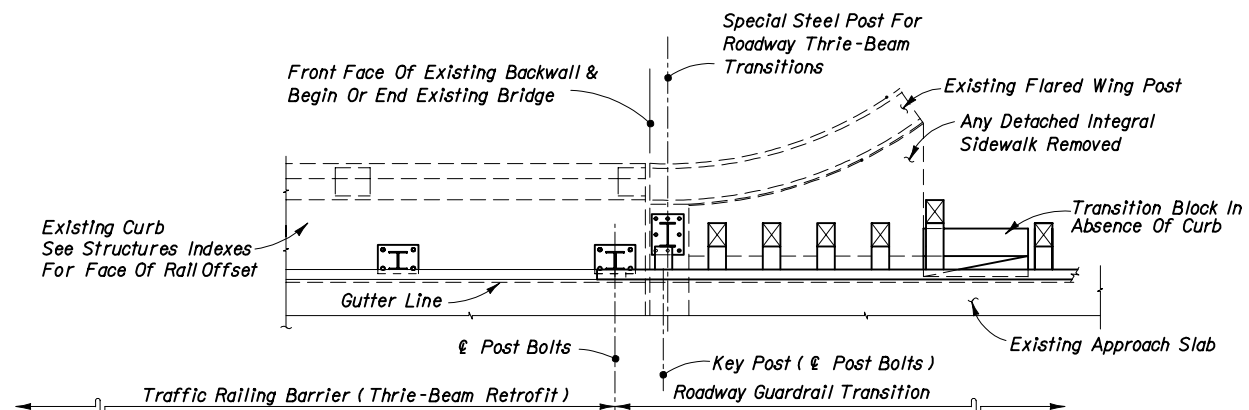
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GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
Designed By	JVG/CEB	12/02	Approved By <i>Samuel D. Hill</i> Roadway Design Engineer	
Drawn By	HSD/SBC	12/02	Revision	Sheet No.
Checked By	JVG/JAM	12/02	04	4 of 26
				Index No. 402



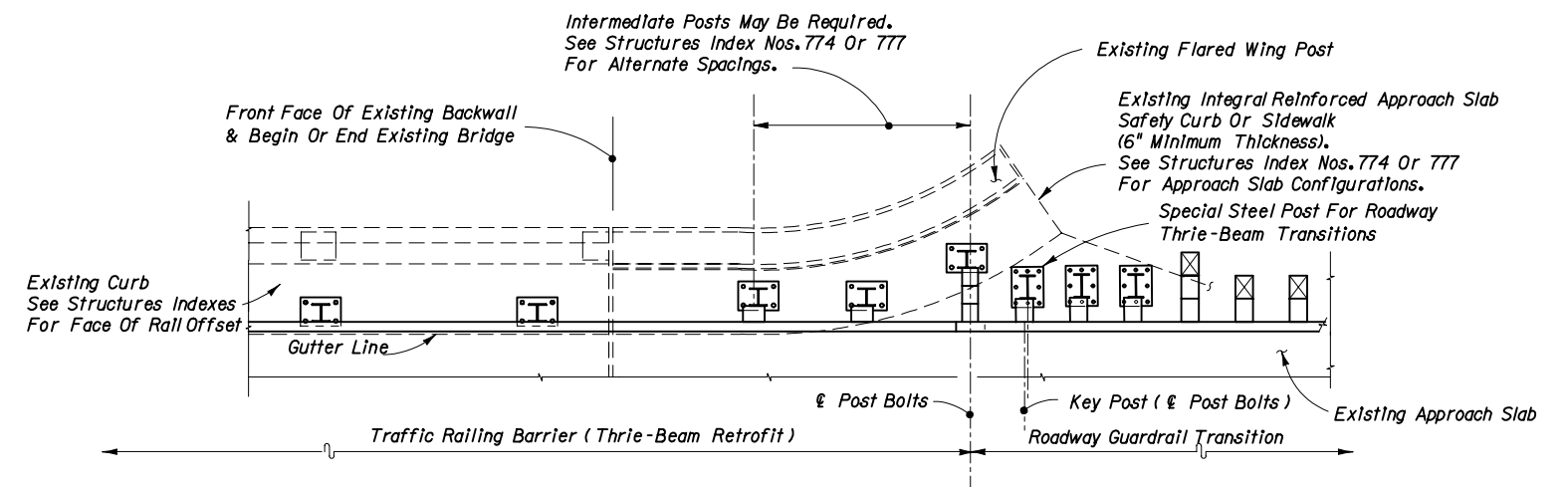
SEE STRUCTURES INDEX NOS. 774 & 777 - SCHEME 1



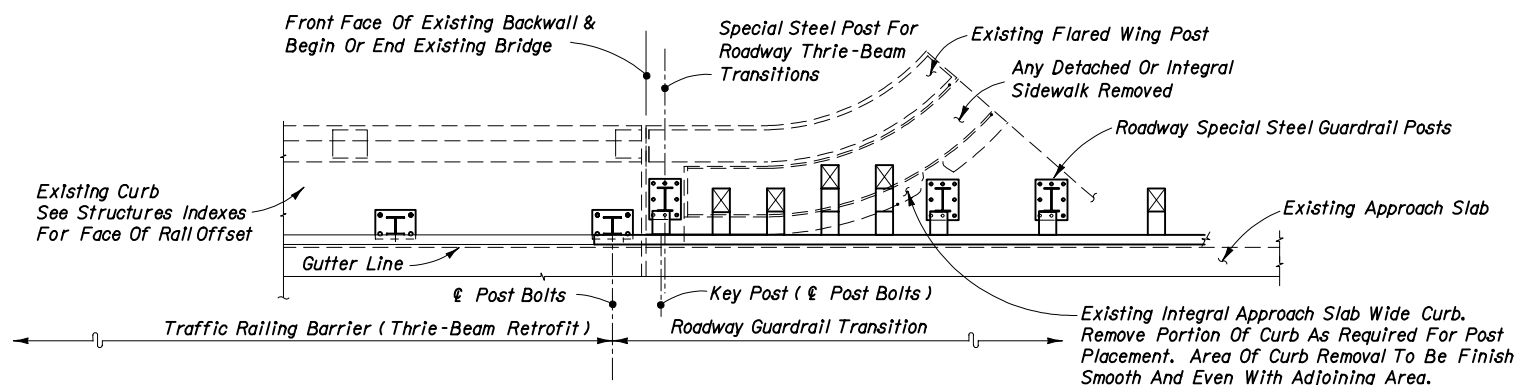
SEE STRUCTURES INDEX NOS. 774 & 777 - SCHEME 3 & 4



SEE STRUCTURES INDEX NOS. 774 & 777 - SCHEME 2



SEE STRUCTURES INDEX NOS. 774 & 777 - SCHEME 3 & 4




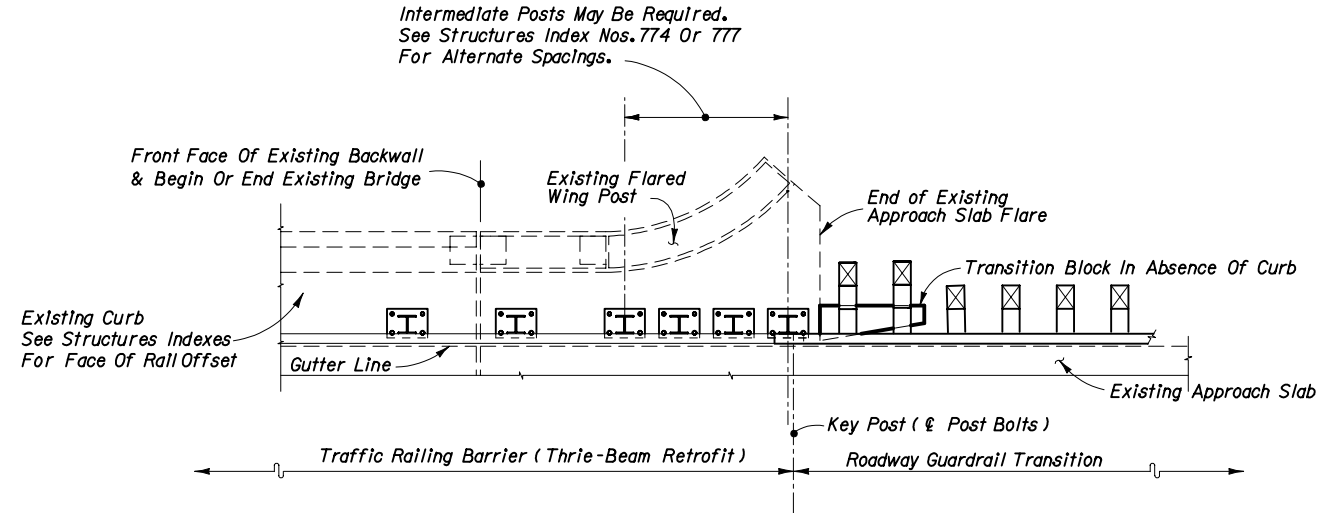
SEE STRUCTURES INDEX NOS. 774 & 777 - SCHEME 2

PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (THRIE-BEAM RETROFIT)

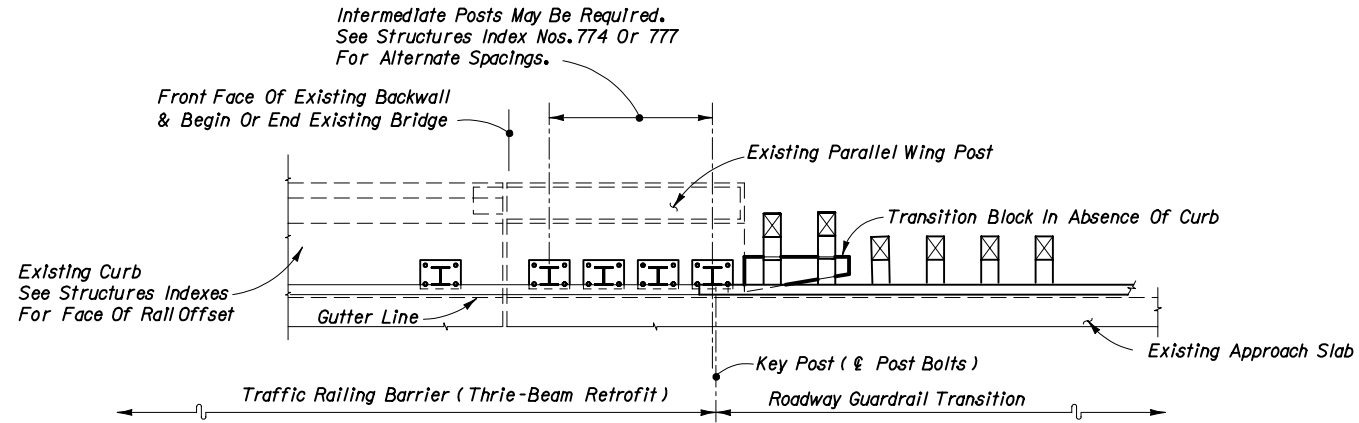
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

Names		Dates	Approved By		
Designed By	JVG/CGB	12/02	 Raymond D. Hill Roadway Design Engineer		
Drawn By	HSD/SBC	12/02			
Checked By	JVG/JAM	12/02	Revision	Sheet No.	Index No.
			04	5 of 26	402



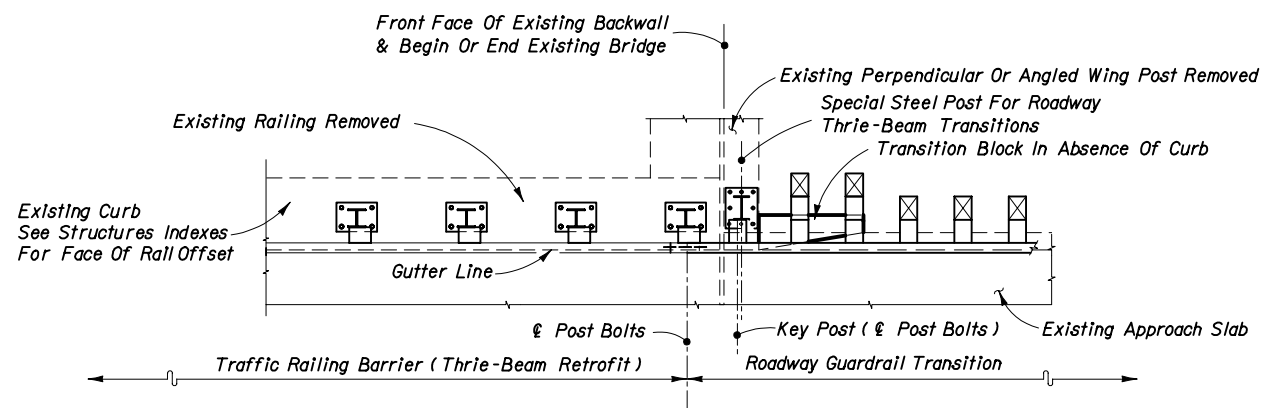
SEE STRUCTURES INDEX NOS. 774 & 777 - SCHEME 5 & 6



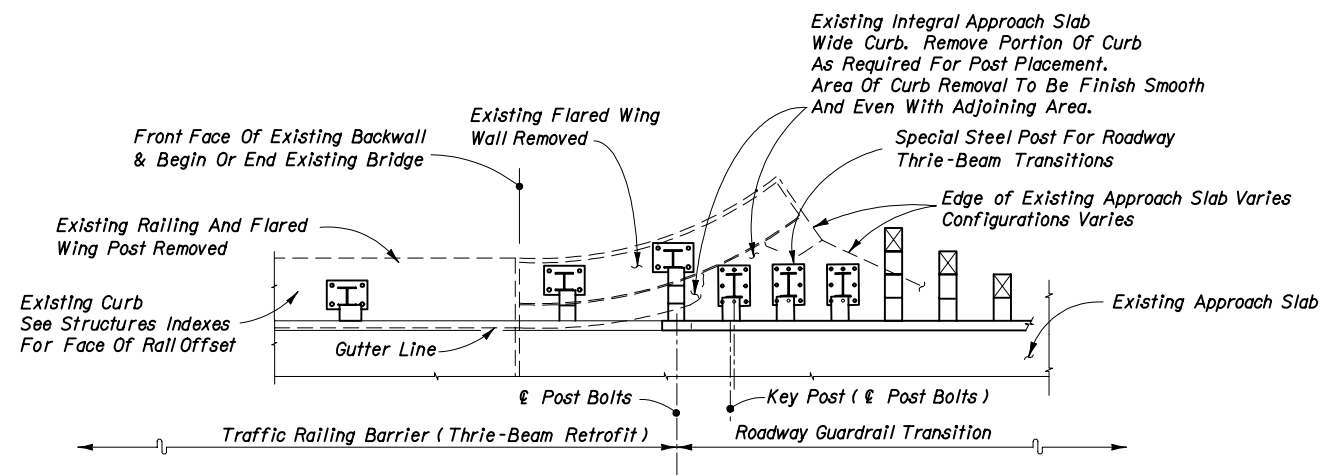
SEE STRUCTURES INDEX NOS. 774 & 777 - SCHEME 5 & 6

**PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS
FOR BRIDGE TRAFFIC RAILING BARRIER (THRIE-BEAM RETROFIT)**

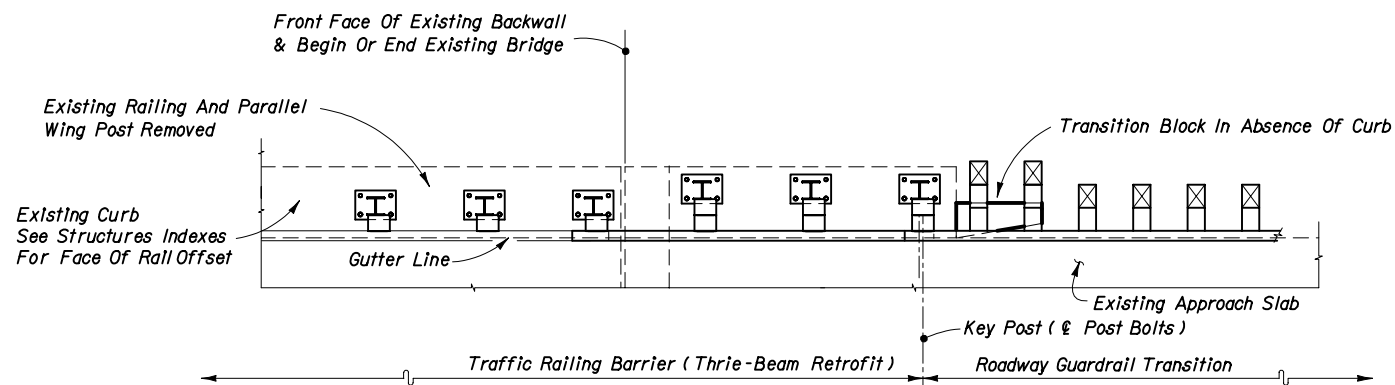
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES					
Designed By	JVG/CEB	12/02	Approved By <i>Samuel D. Hill</i> Roadway Design Engineer		
Drawn By	HSD/SBC	12/02	Revision	Sheet No.	Index No.
Checked By	JVG/JAM	12/02	04	6 of 26	402



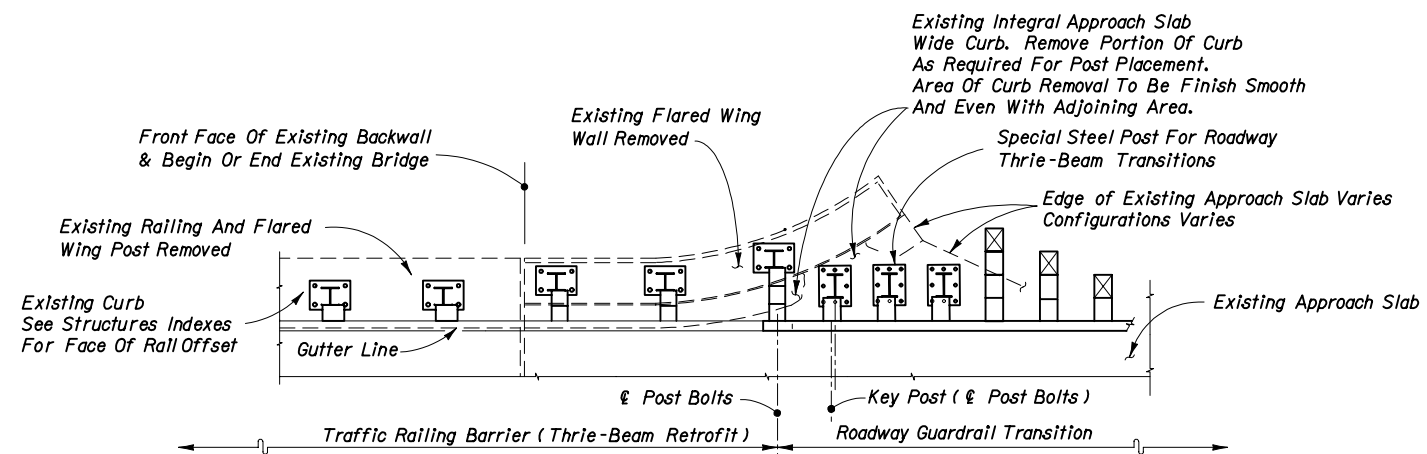
SEE STRUCTURES INDEX NO. 775 - SCHEME 1



SEE STRUCTURES INDEX NO. 775 - SCHEME 3



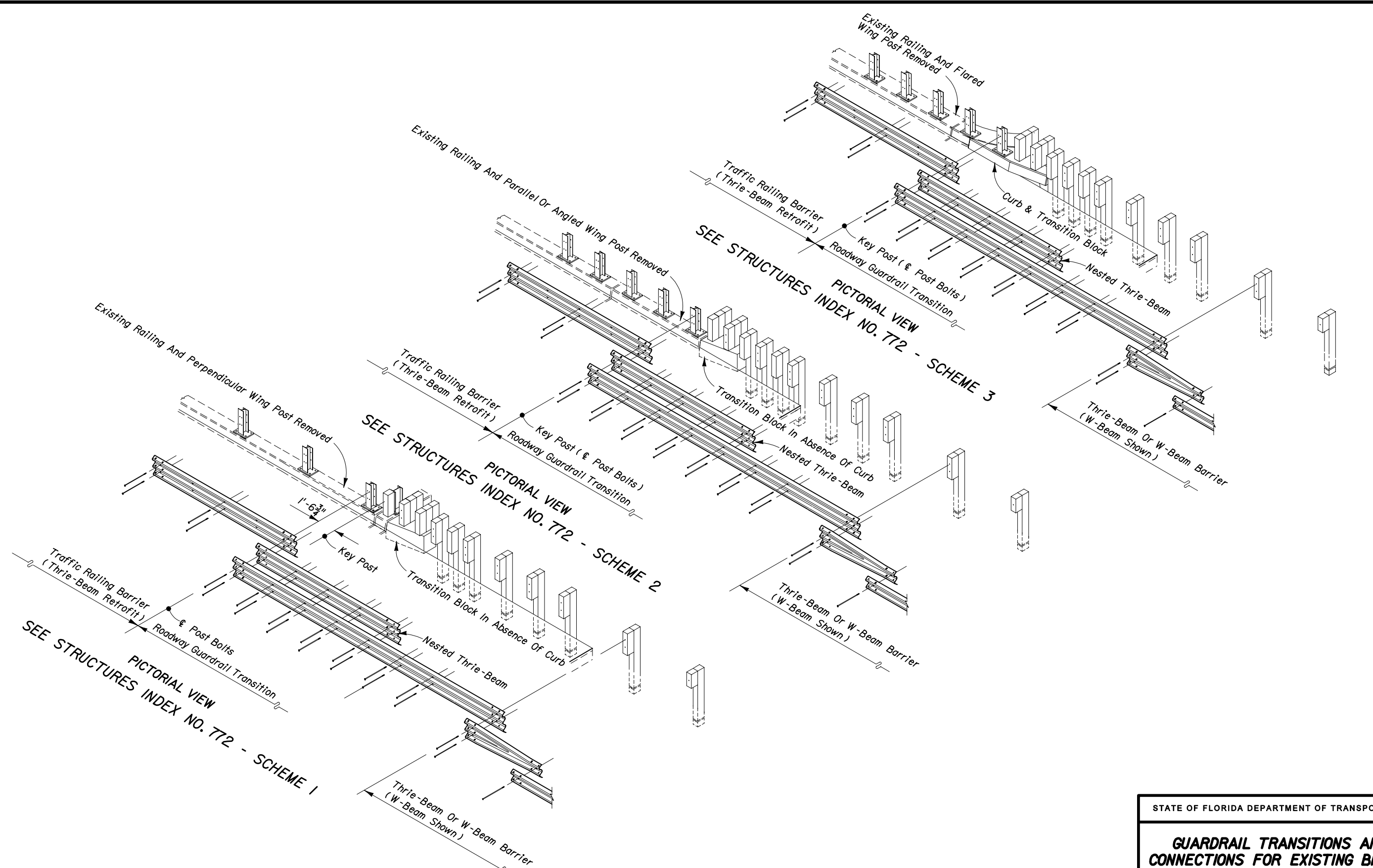
SEE STRUCTURES INDEX NO. 775 - SCHEME 2



SEE STRUCTURES INDEX NO. 775 - SCHEME 3

PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (THRIE-BEAM RETROFIT)


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
Designed By	JVG/CGB	12/02	Approved By <i>Samuel D. Hill</i> Roadway Design Engineer	
Drawn By	HSD/SBC	12/02	Revision	Sheet No.
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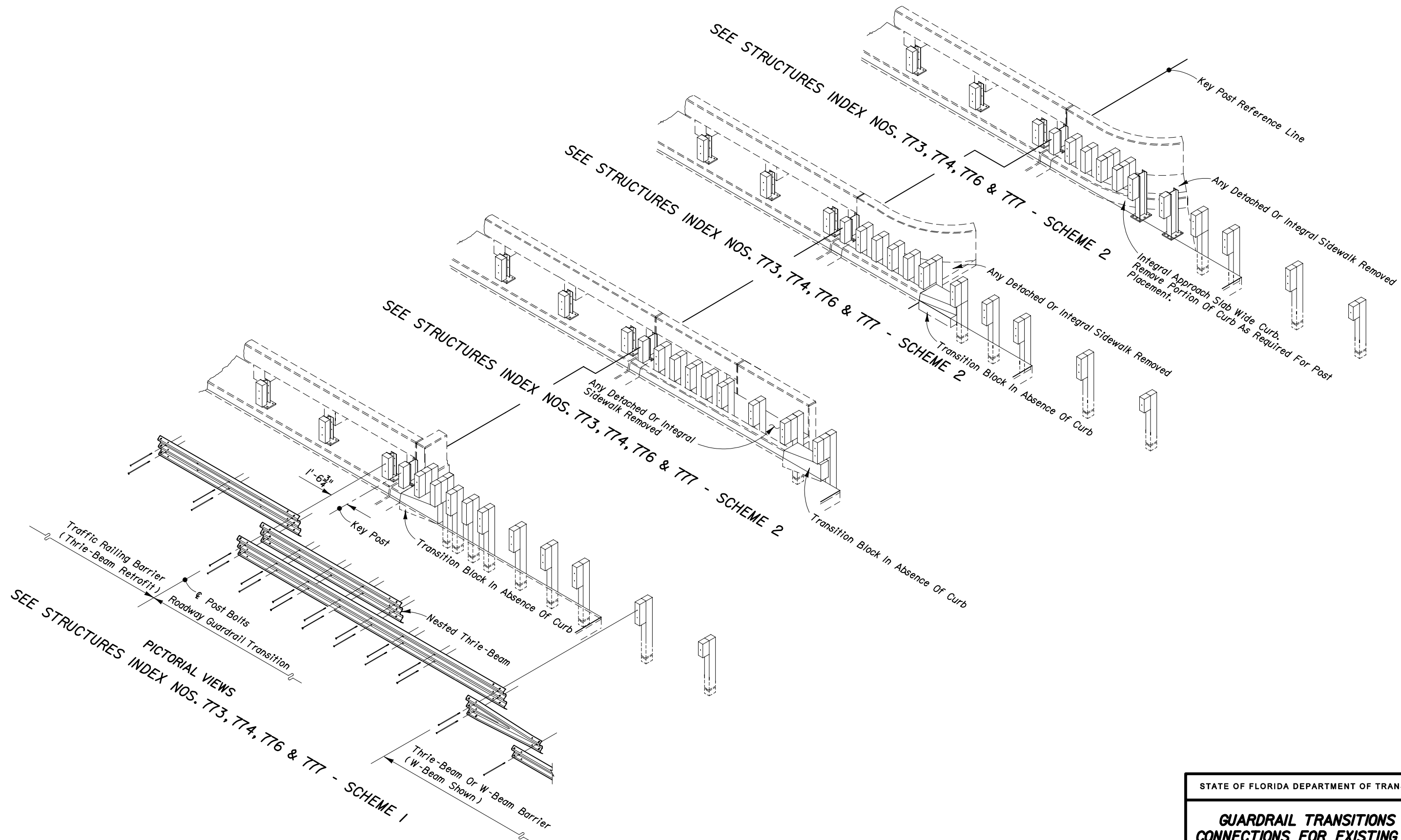


PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (THRIE-BEAM RETROFIT)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

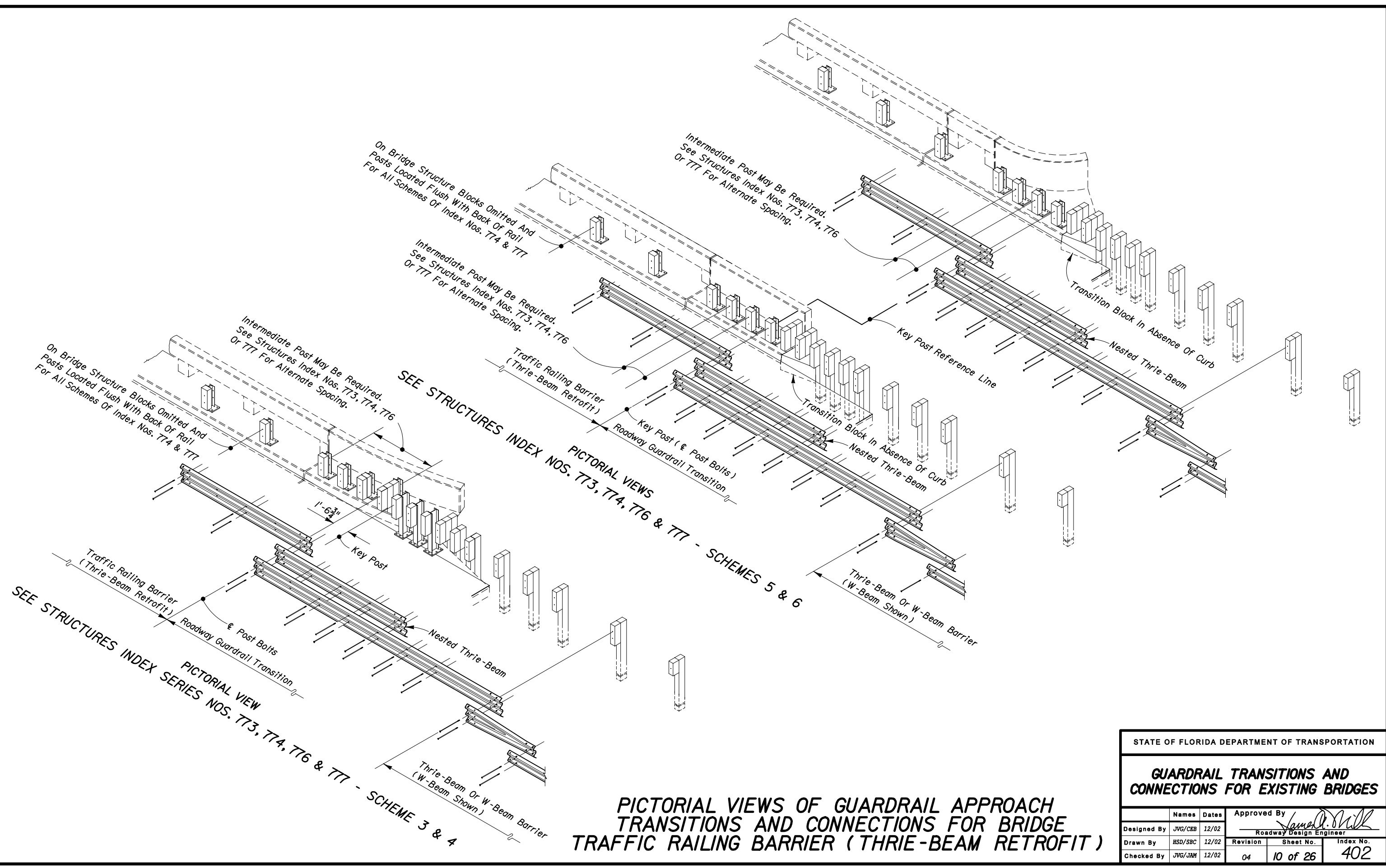
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

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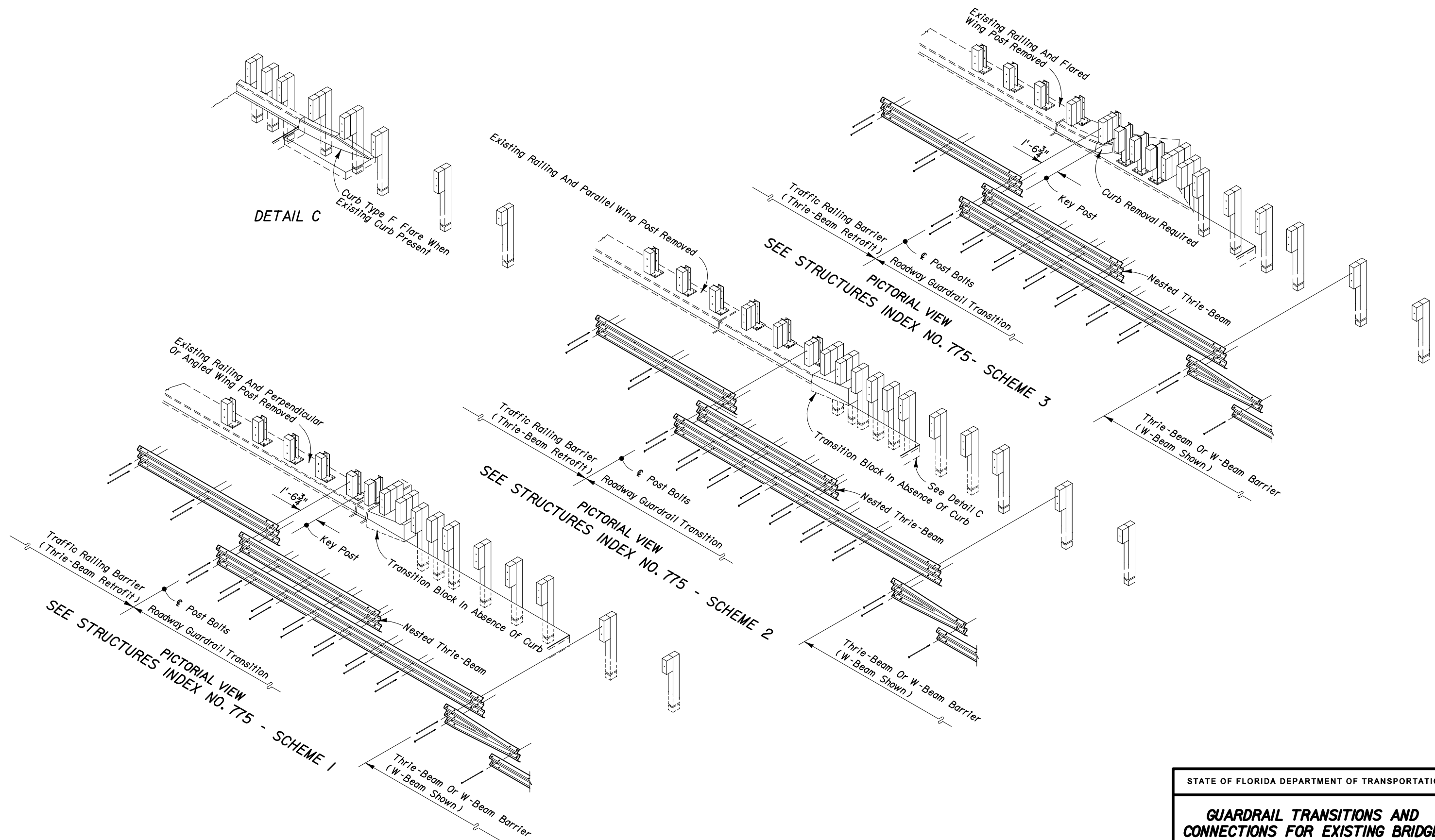
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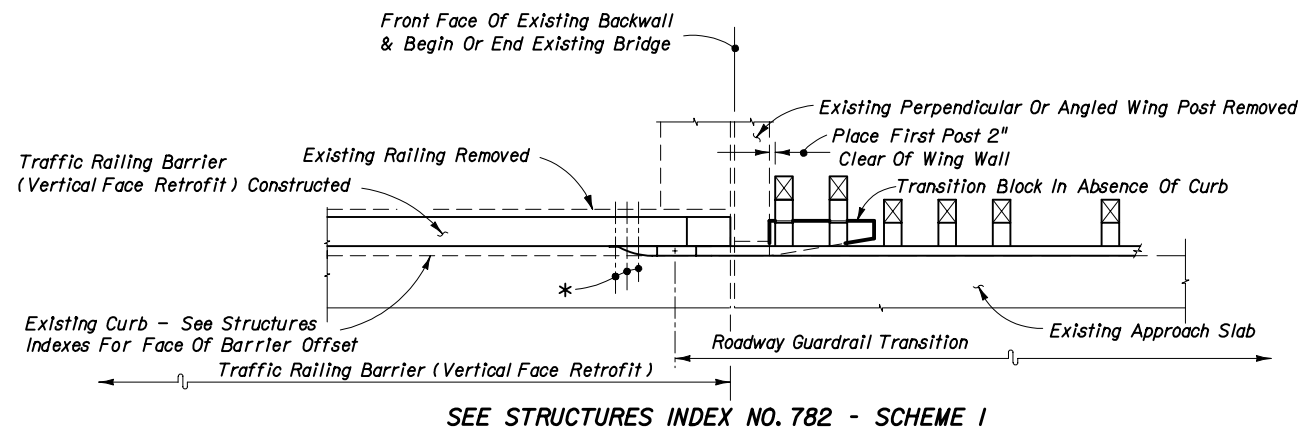
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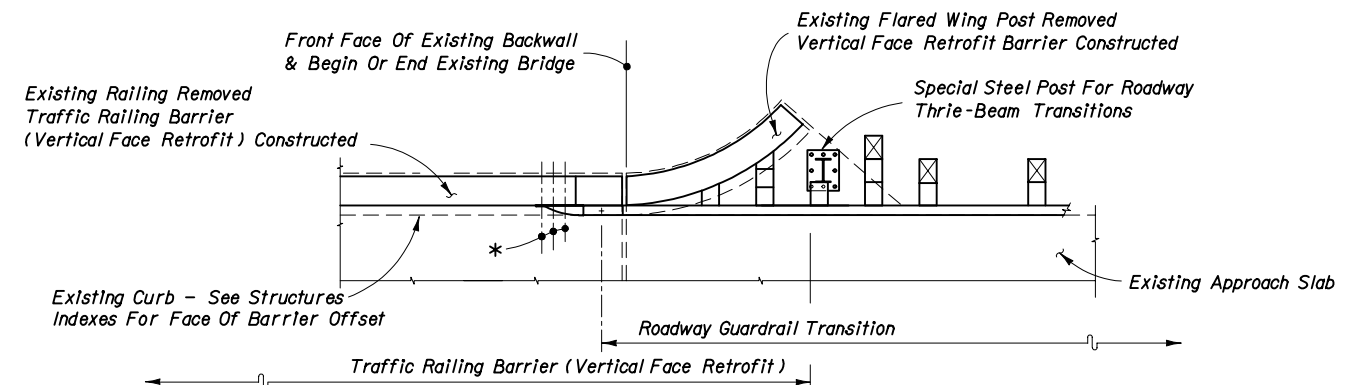


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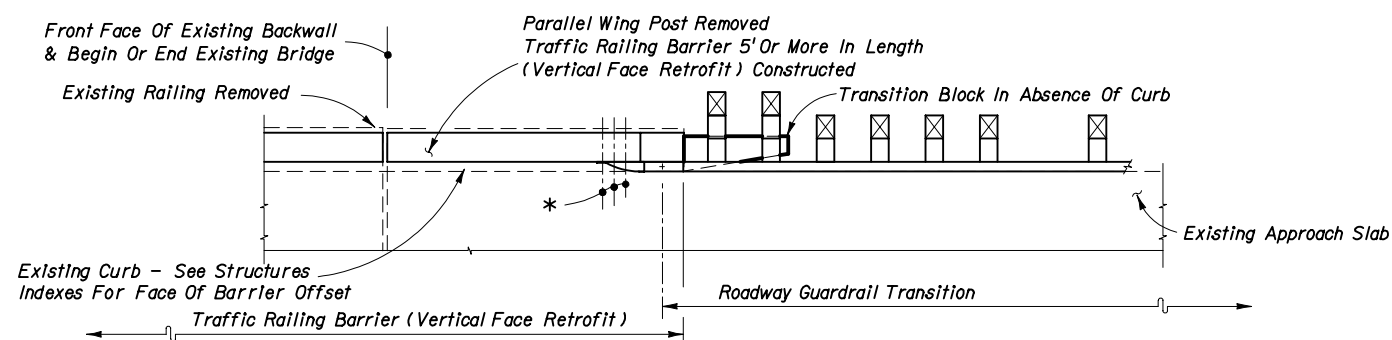
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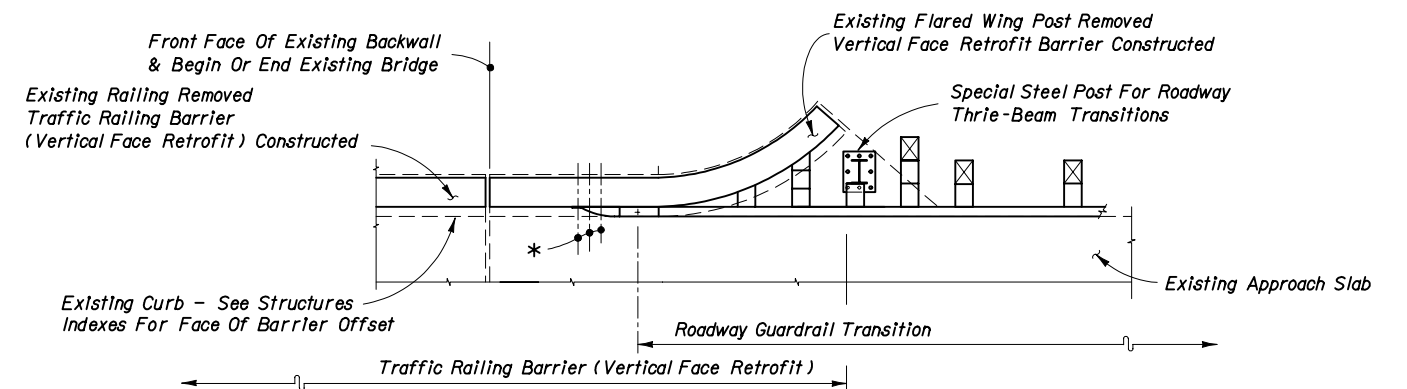
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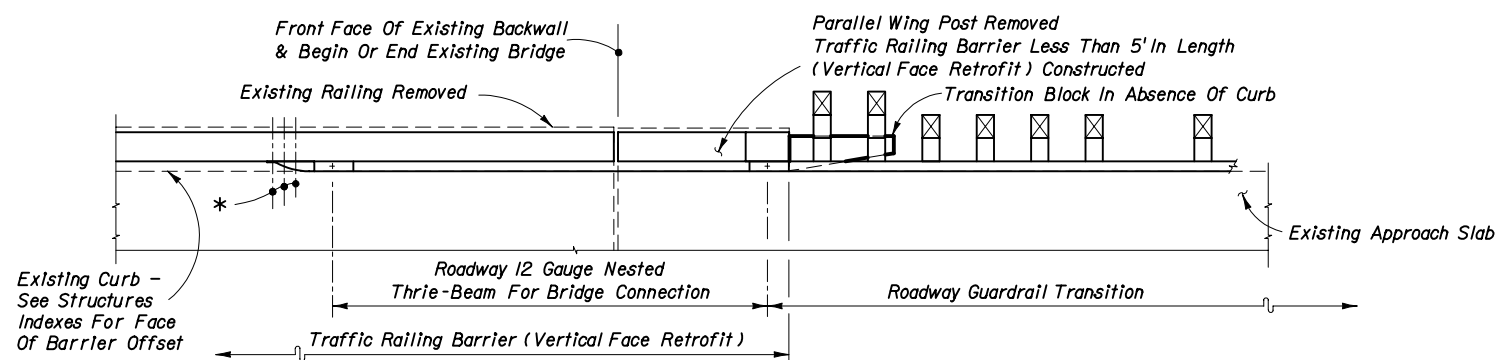
SEE STRUCTURES INDEX NO. 782 - SCHEME 3



SEE STRUCTURES INDEX NO. 782 - SCHEME 2



SEE STRUCTURES INDEX NO. 782 - SCHEME 3

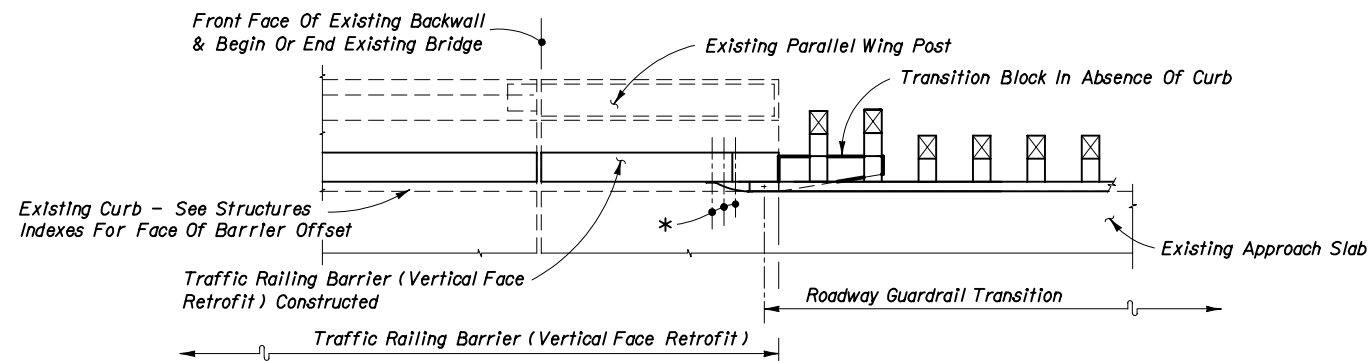


SEE STRUCTURES INDEX NO. 782 - SCHEME 2

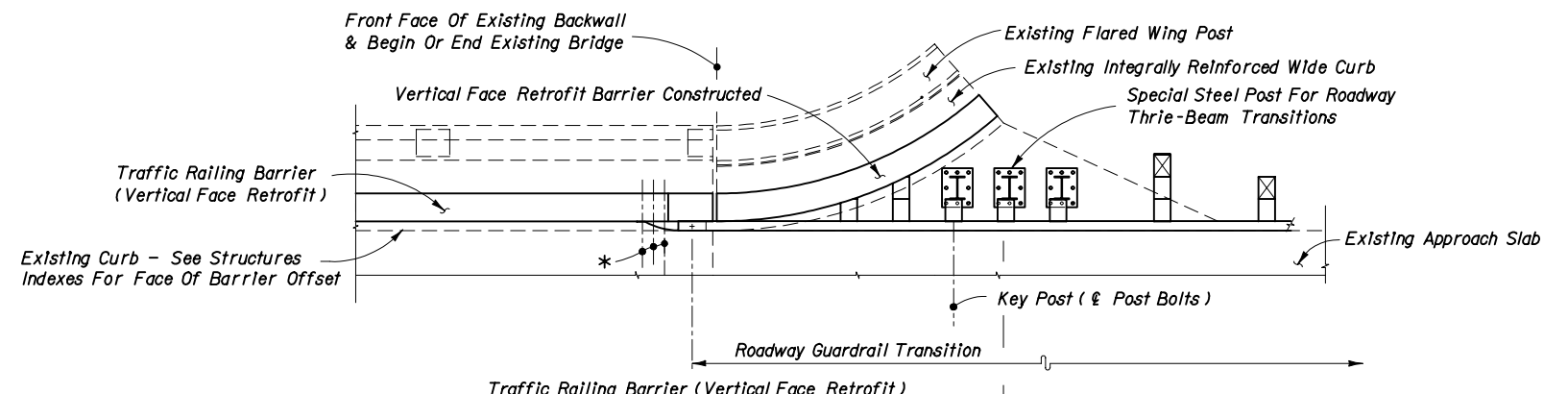
Note:
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PARTIAL PLAN VIEWS OF TRAFFIC RAILING BARRIER (VERTICAL FACE RETROFIT)

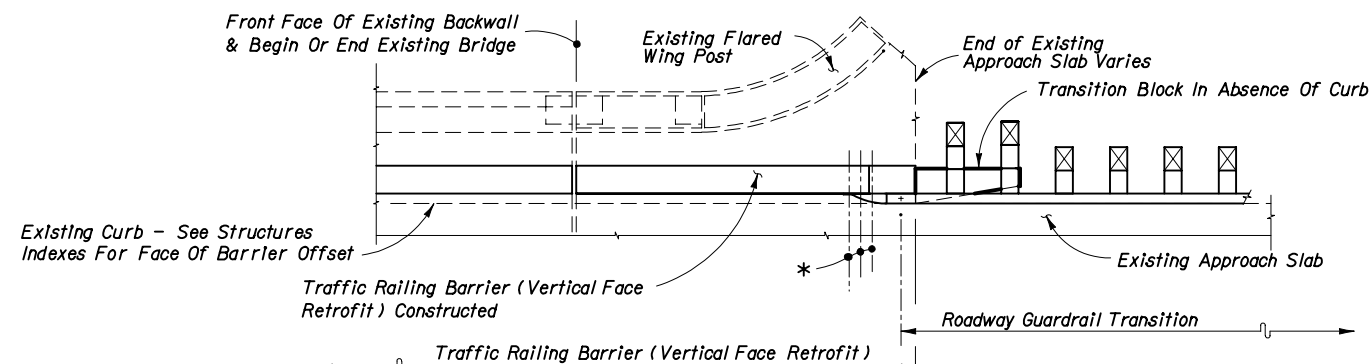
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GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
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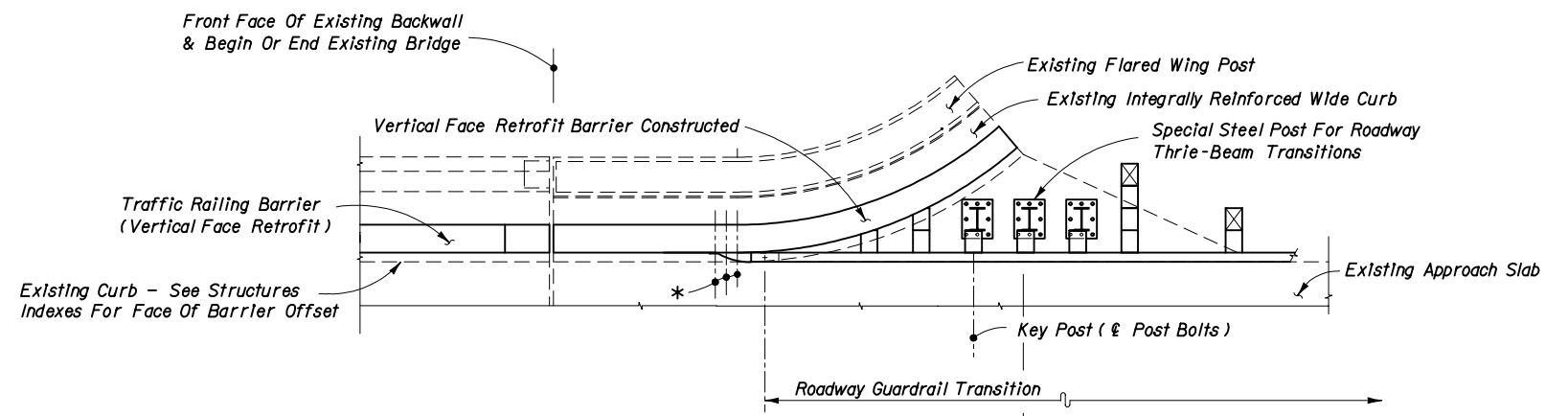
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SEE STRUCTURES INDEX NO. 783- SCHEME 2



SEE STRUCTURES INDEX NO. 783 - SCHEME 1




SEE STRUCTURES INDEX NO. 783- SCHEME 2

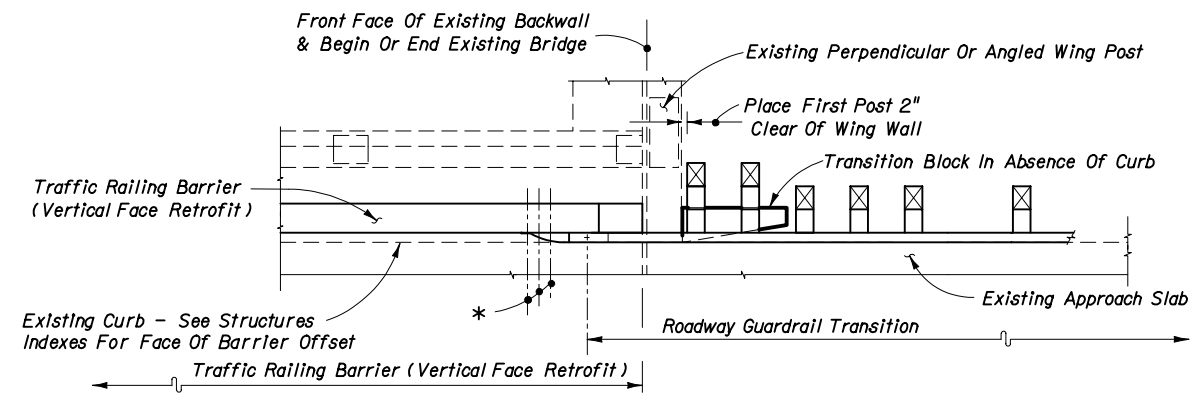
Note:
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 HS Hex Bolts And Nuts (5 Req'd.) With 2 1/4" OD Plain Round Washers Under Heads And Nuts

PARTIAL PLAN VIEWS OF TRAFFIC RAILING BARRIER (VERTICAL FACE RETROFIT)

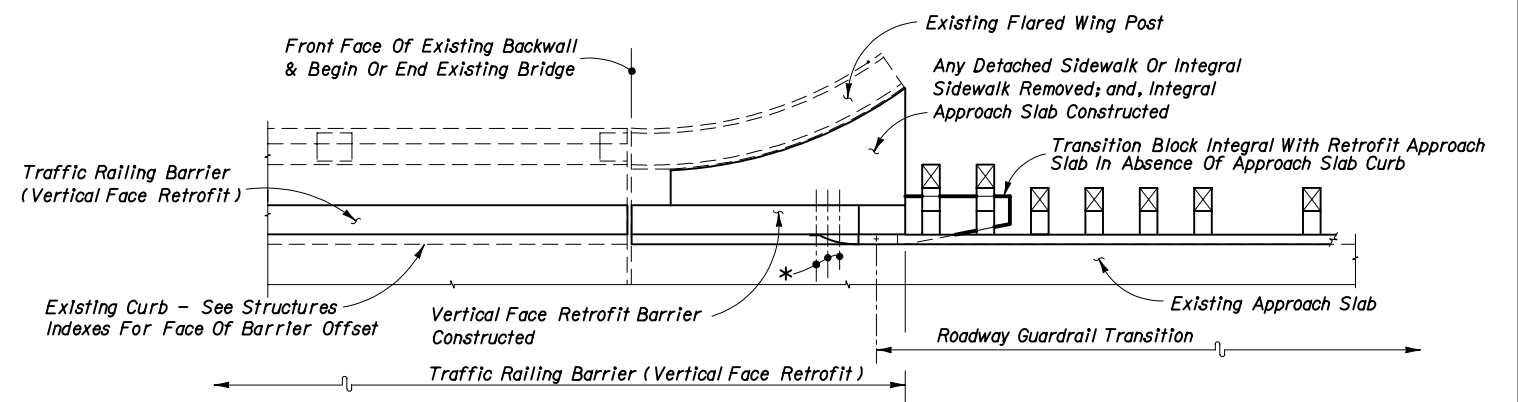
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

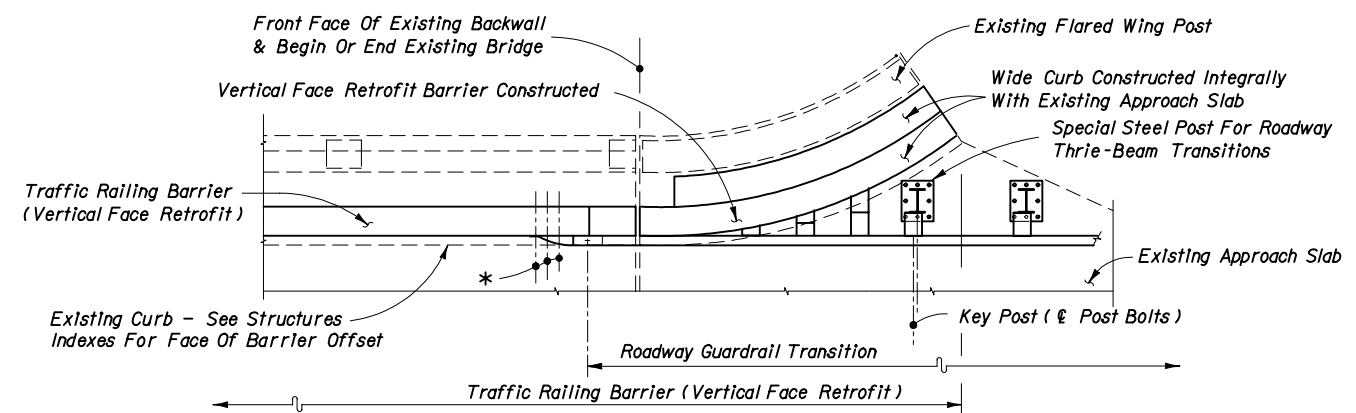
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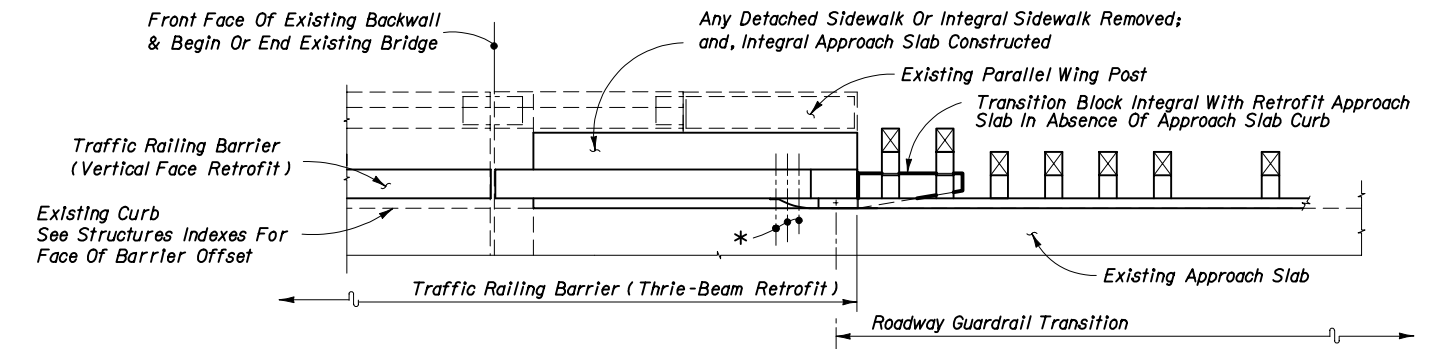
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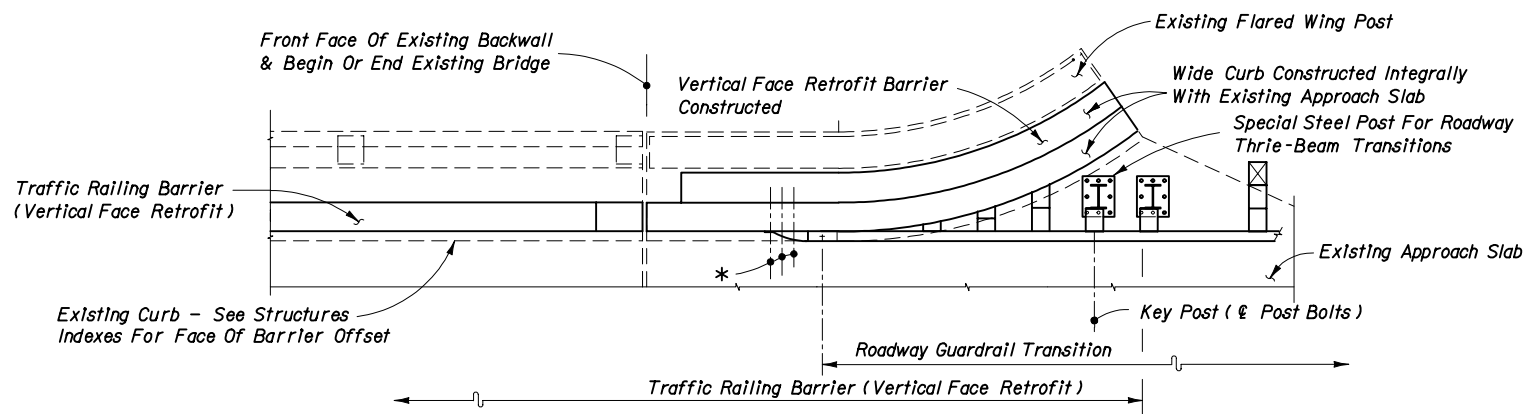
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SEE STRUCTURES INDEX NO. 784 - SCHEME 2



SEE STRUCTURES INDEX NO. 784 - SCHEME 3

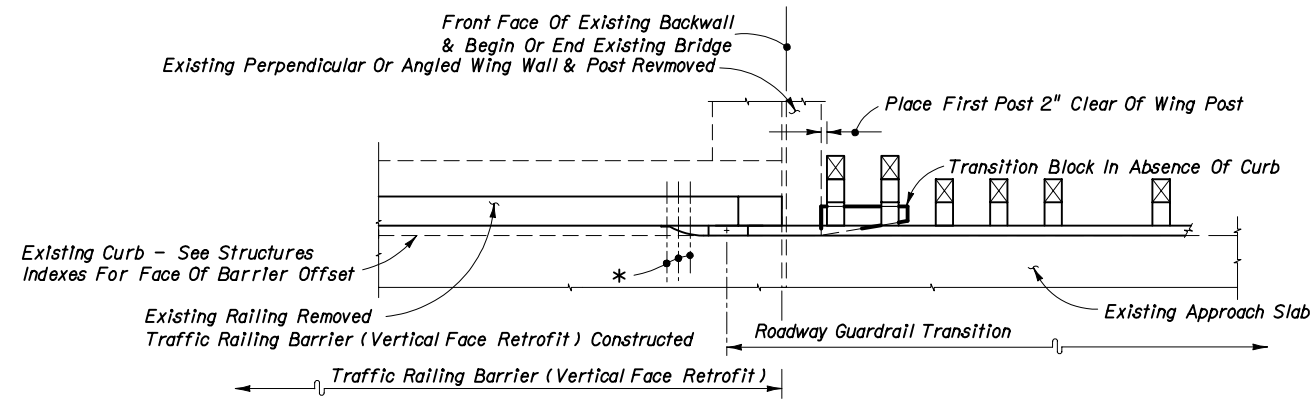


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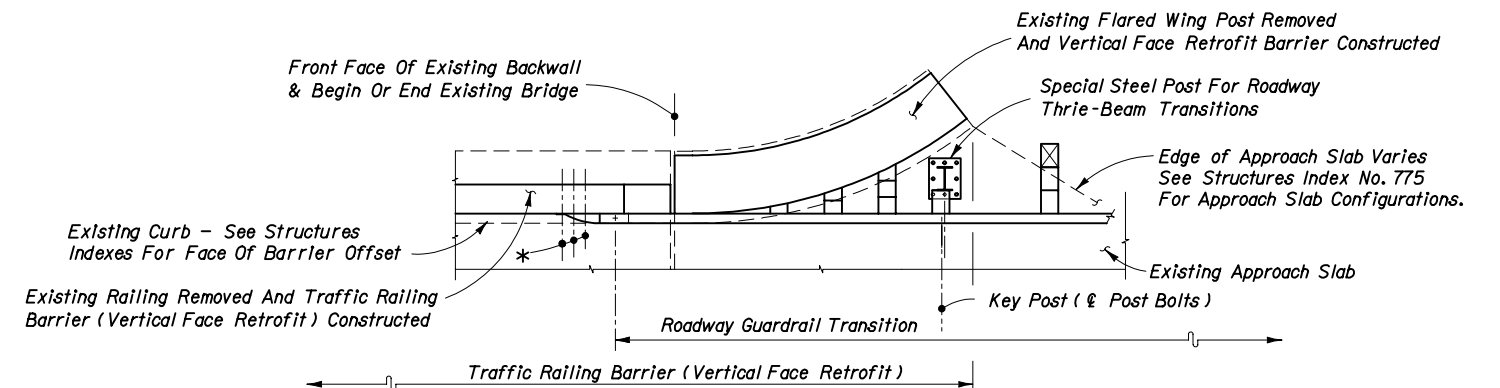
Note:
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 HS Hex Bolts And Nuts (5 Reqd.) With 2 1/4" OD Plain Round Washers Under Heads And Nuts

PARTIAL PLAN VIEWS OF TRAFFIC RAILING BARRIER (VERTICAL FACE RETROFIT)

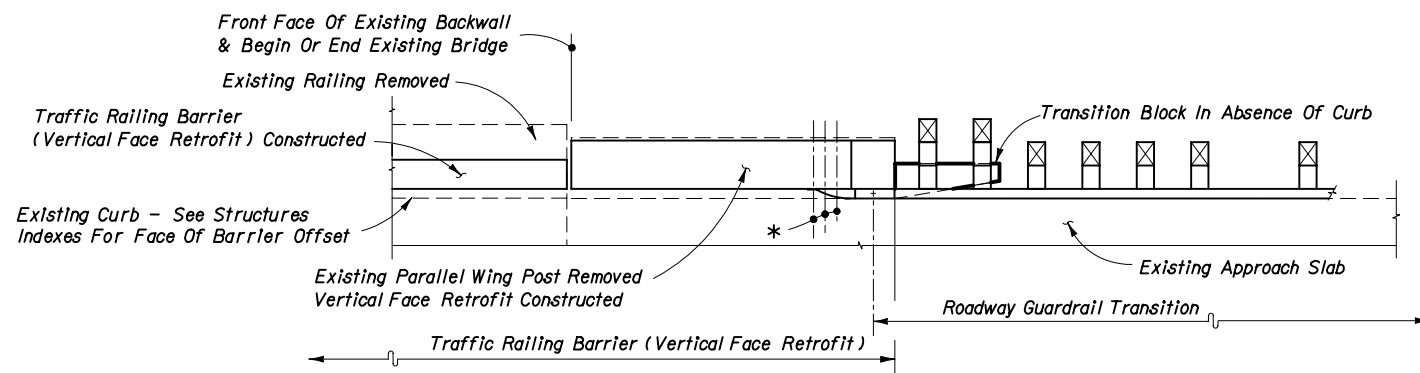
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
Designed By	JVG/CEB	12/02	Approved By <i>Lamar D. Mill</i> Roadway Design Engineer	
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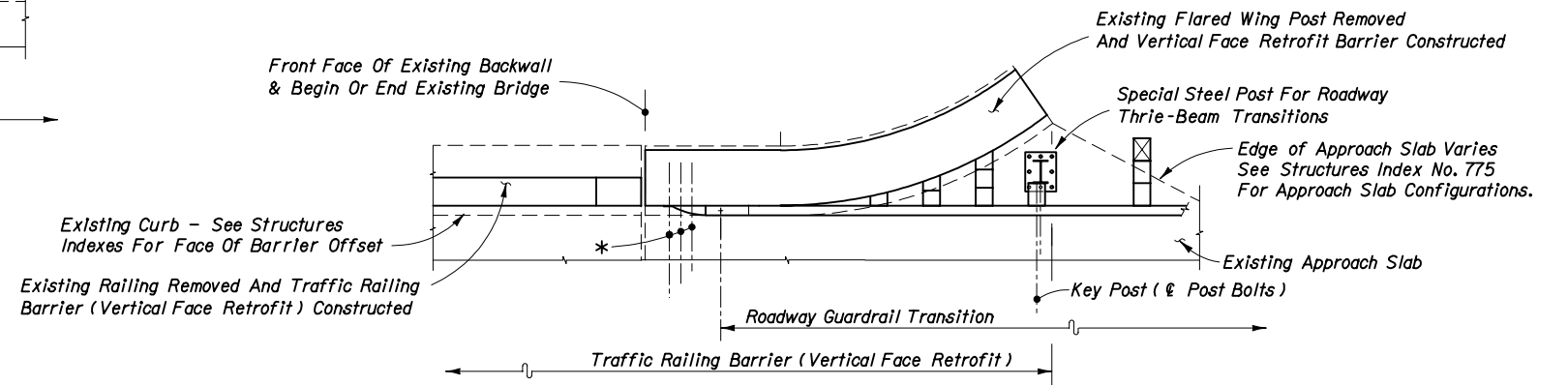
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SEE STRUCTURES INDEX NO. 785 - SCHEME 3



SEE STRUCTURES INDEX NO. 785 - SCHEME 2

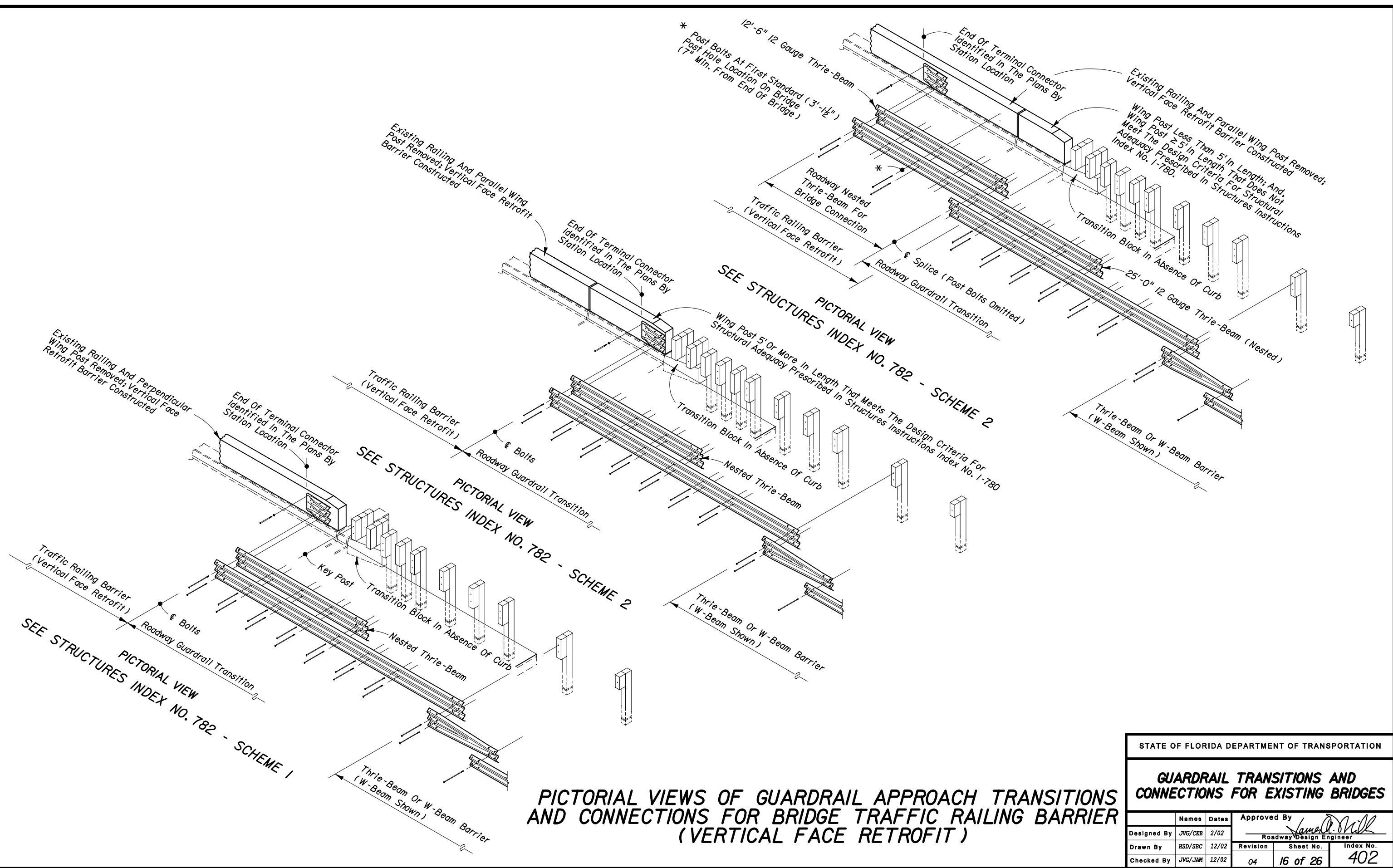


SEE STRUCTURES INDEX NO. 785 - SCHEME 3

Note:
*2"x12"x 5/8" Thrie-Beam Terminal Connector Plate (Back-Up Plate), And 7/8" HS Hex Bolts And Nuts (12" Long For Scheme 1 And Length To Fit For Schemes 2 And 3) (5 Req.) With 2 1/4" OD Plain Round Washers Under Heads And Nuts

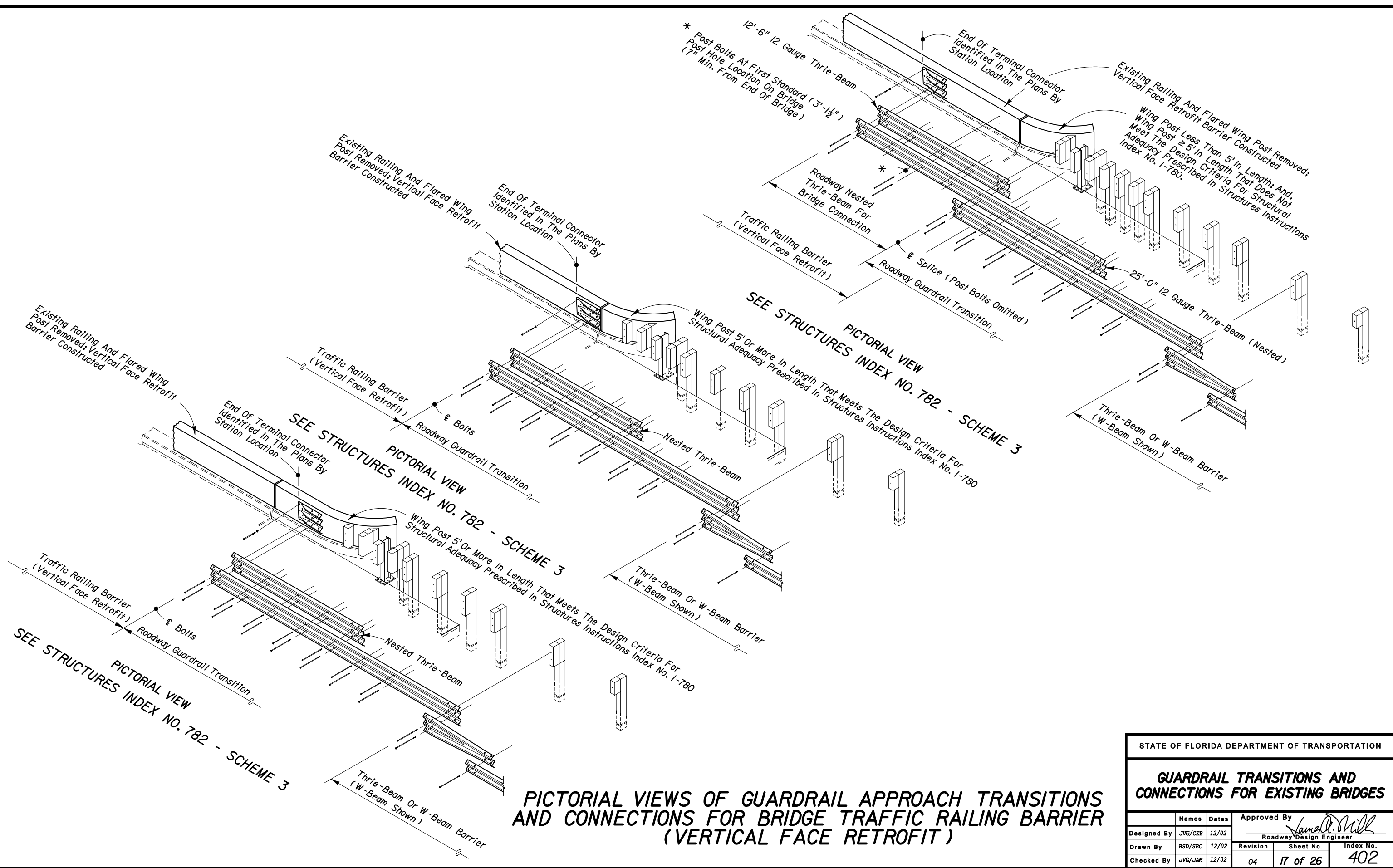
PARTIAL PLAN VIEWS OF TRAFFIC RAILING BARRIER (VERTICAL FACE RETROFIT)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
Designed By	JVG/CEB	12/02	Approved By <i>Lamell D. Hill</i> Roadway Design Engineer	
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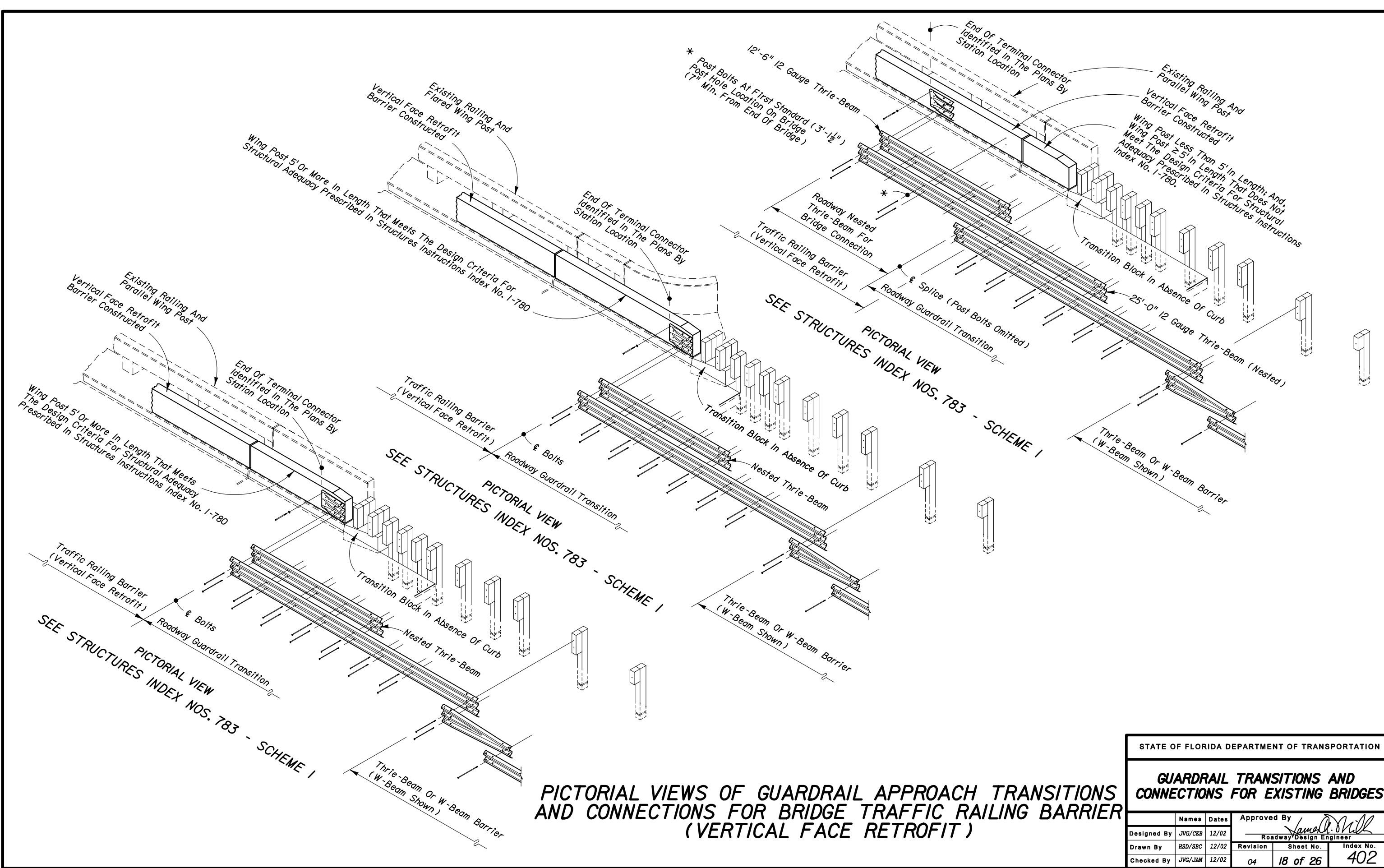
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (VERTICAL FACE RETROFIT)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
Names	Dates	Approved By <i>Jamell D. Mill</i>		
Designed By	JVG/CEB	2/02	Roadway Design Engineer	
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PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (VERTICAL FACE RETROFIT)


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
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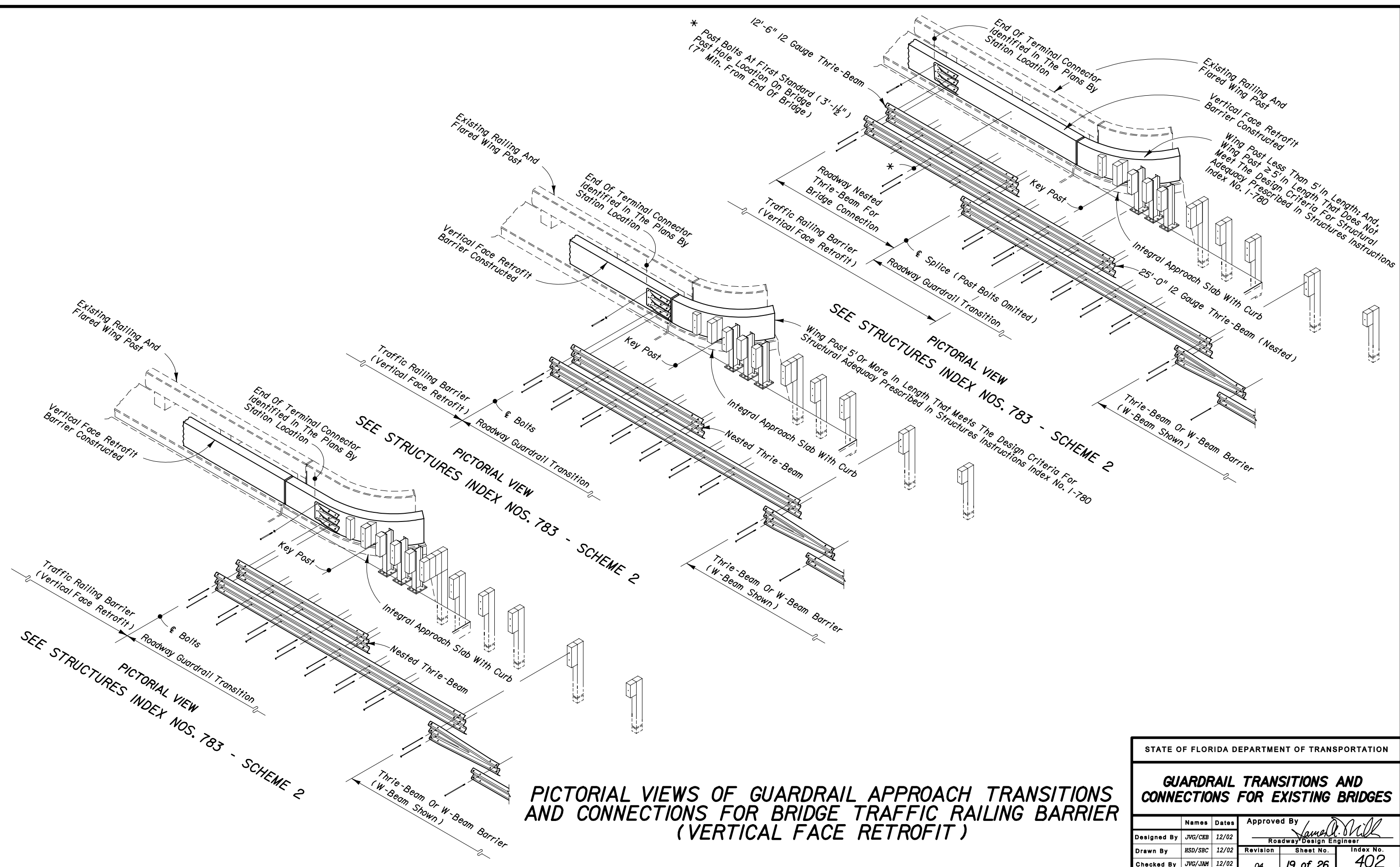


PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (VERTICAL FACE RETROFIT)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

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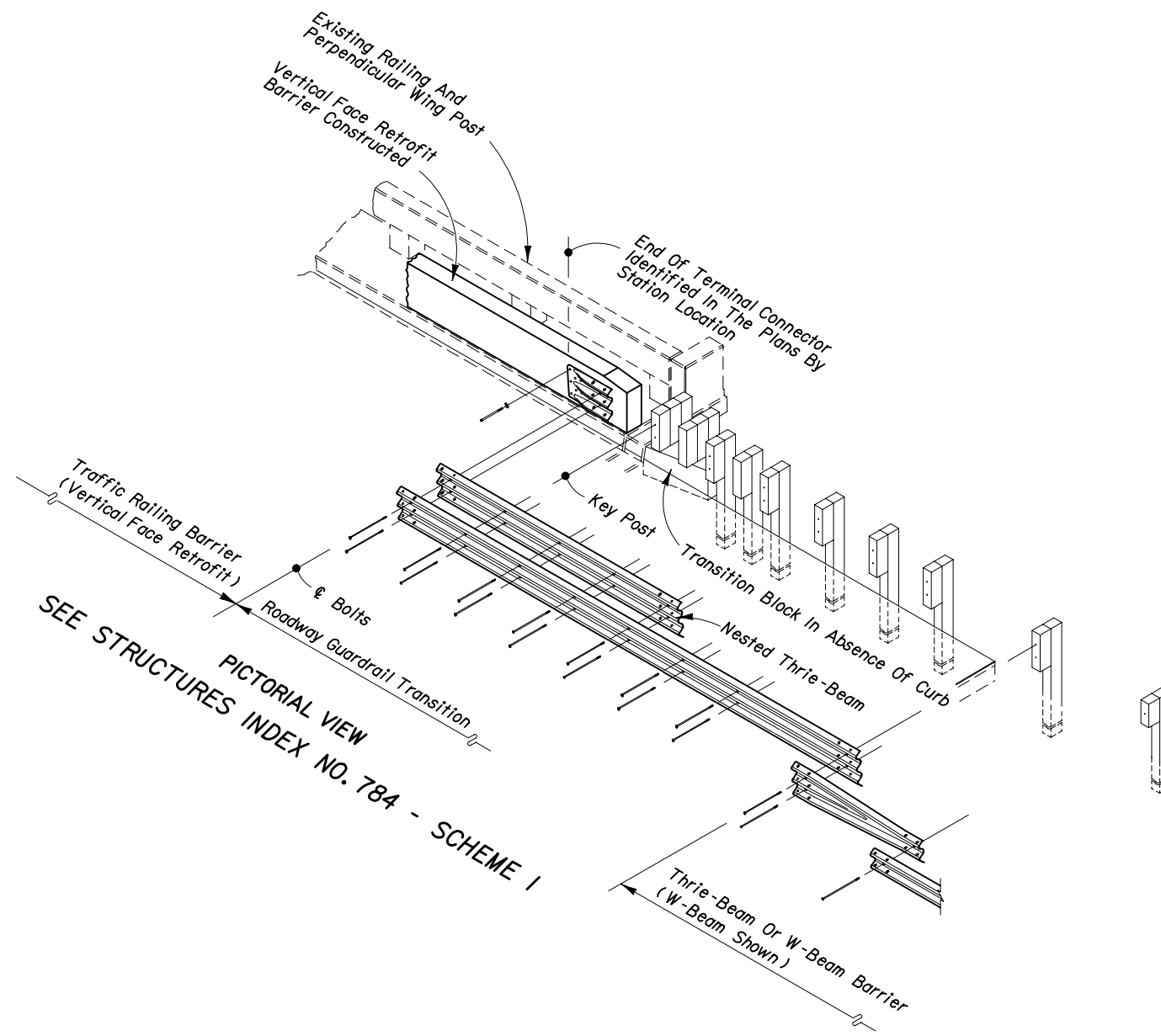


PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING BARRIER (VERTICAL FACE RETROFIT)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

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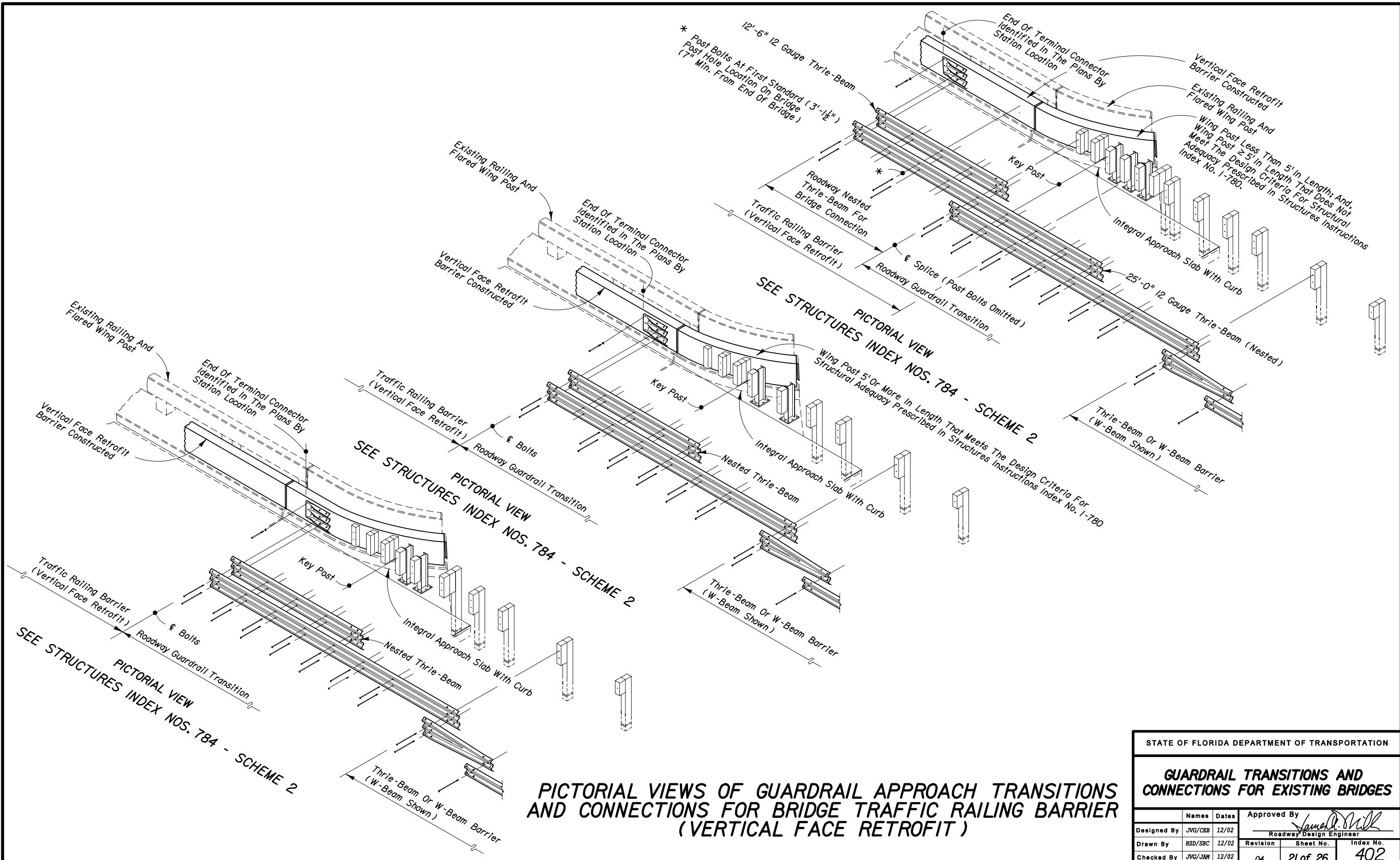


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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

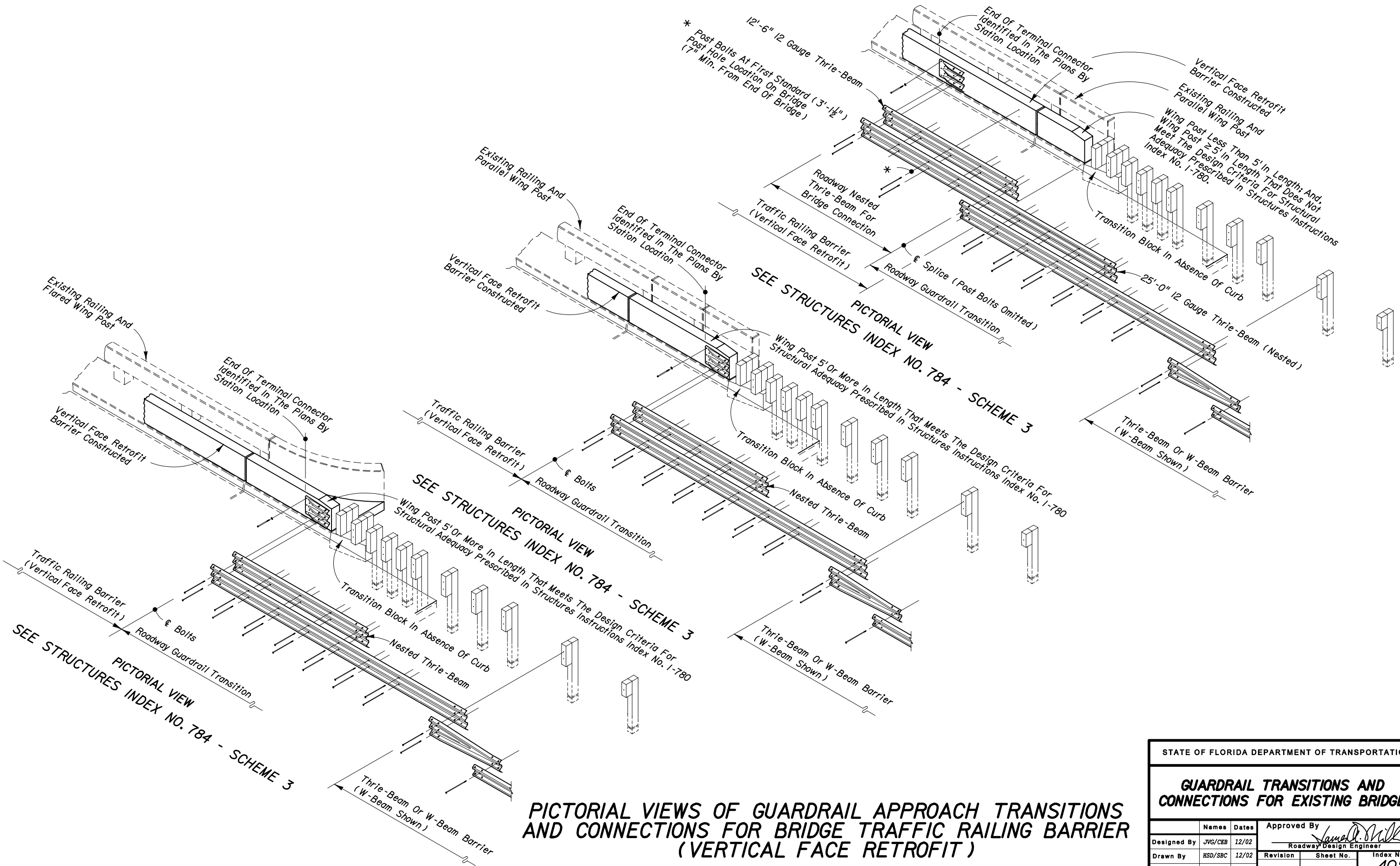
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

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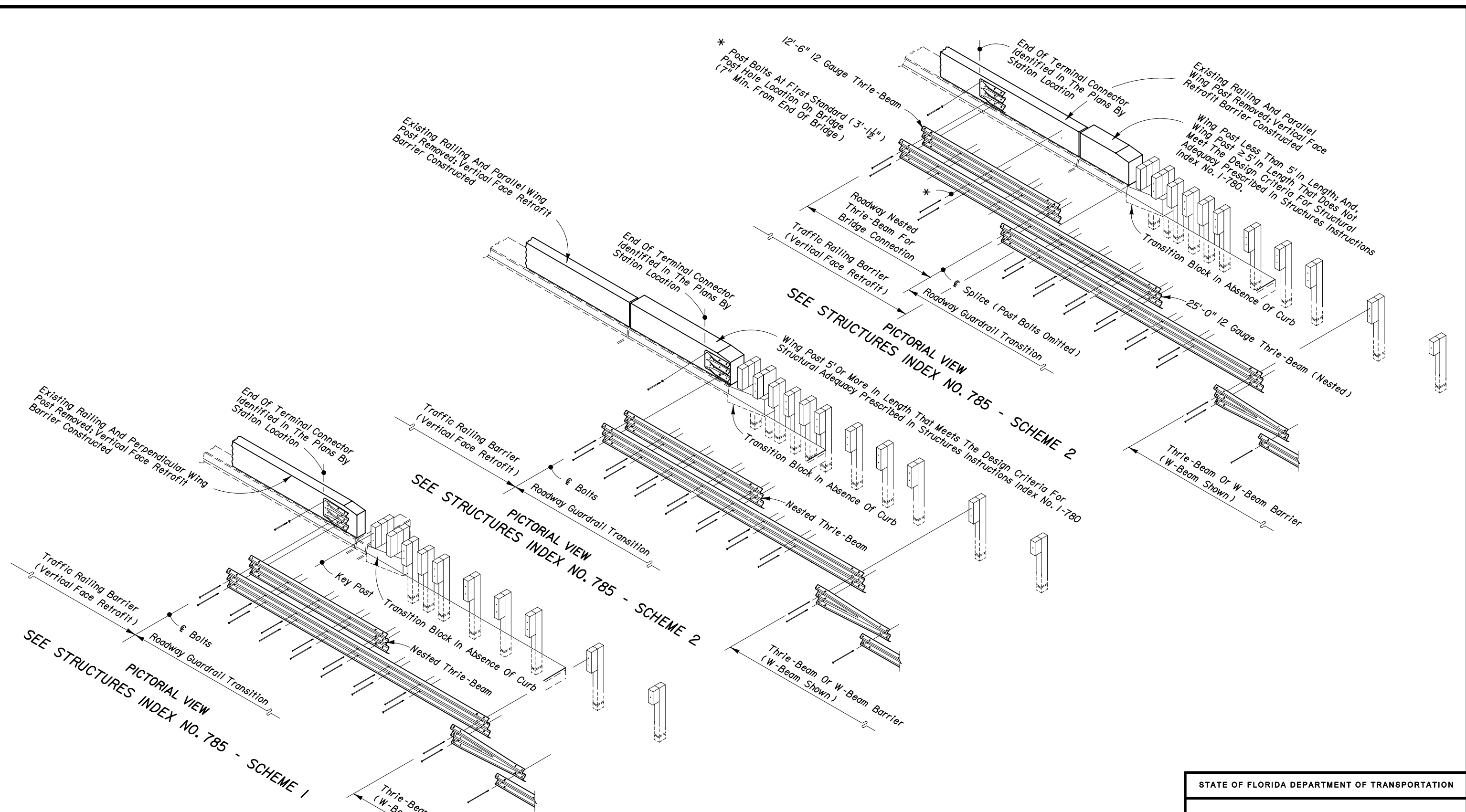


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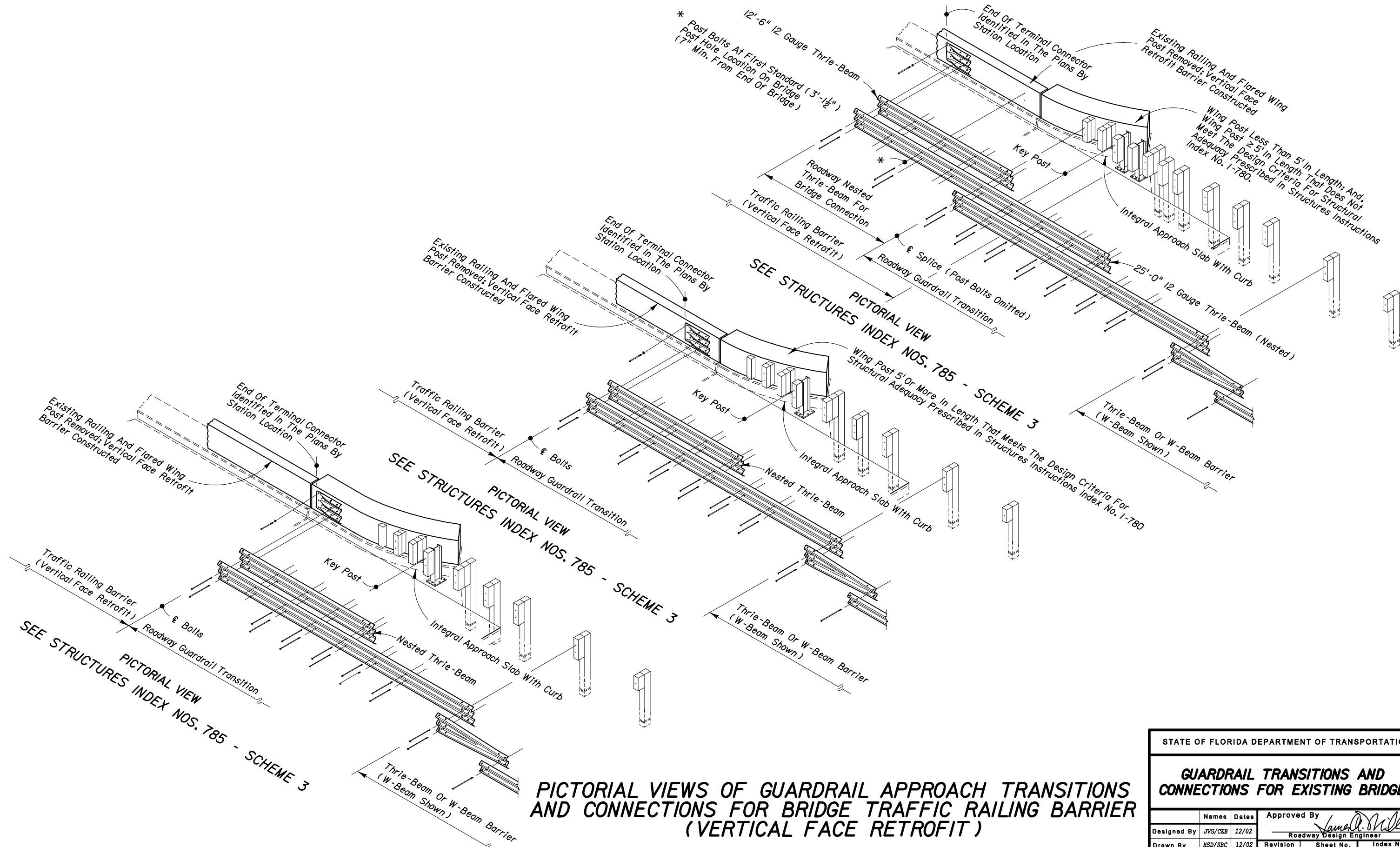


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GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES				
Names	Dates	Approved By <i>Lamed D. Milk</i>		
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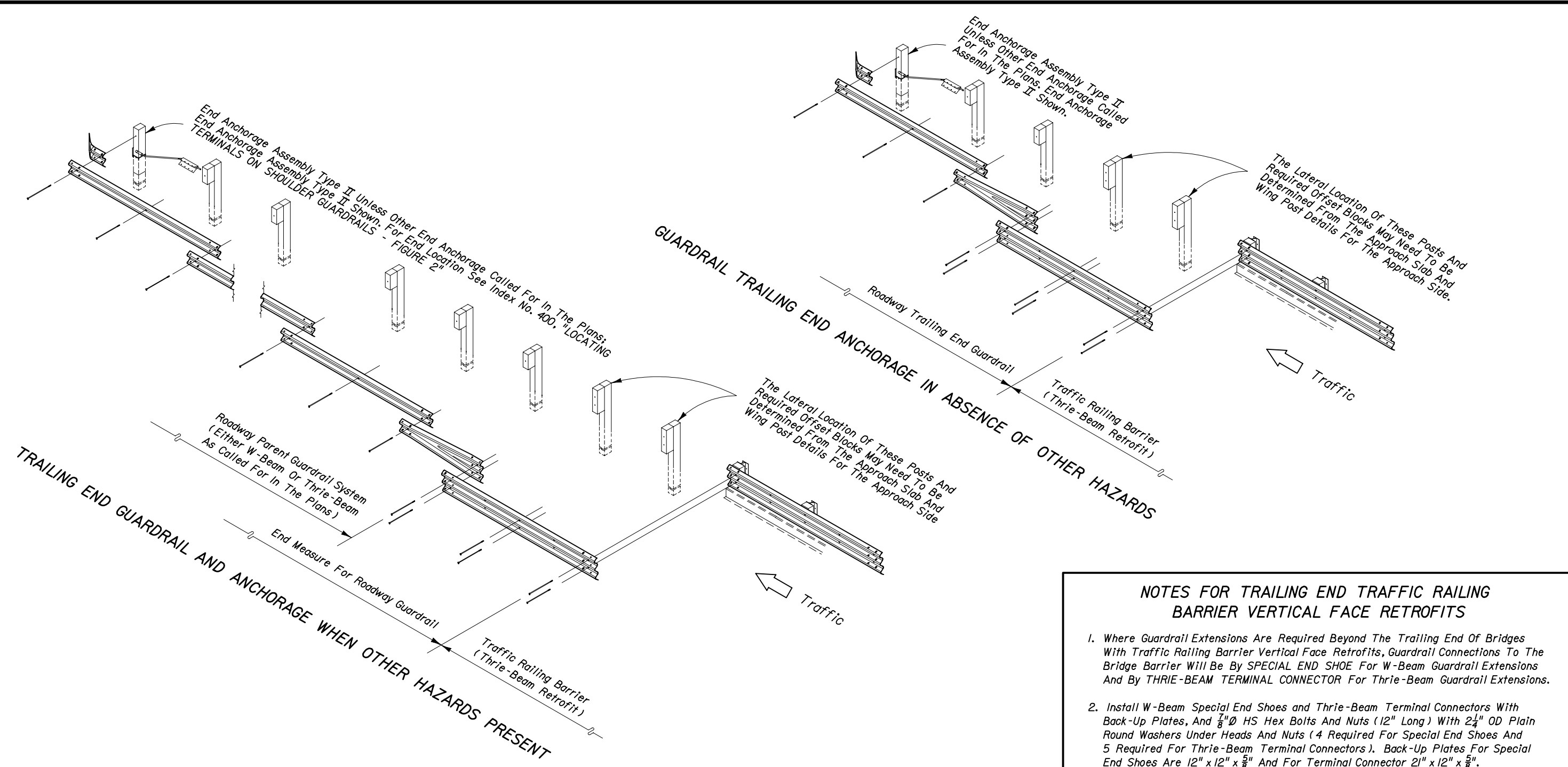
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TRAILING END GUARDRAIL AND ANCHORAGE FOR BRIDGE TRAFFIC RAILING BARRIER THRIE-BEAM RETROFITS

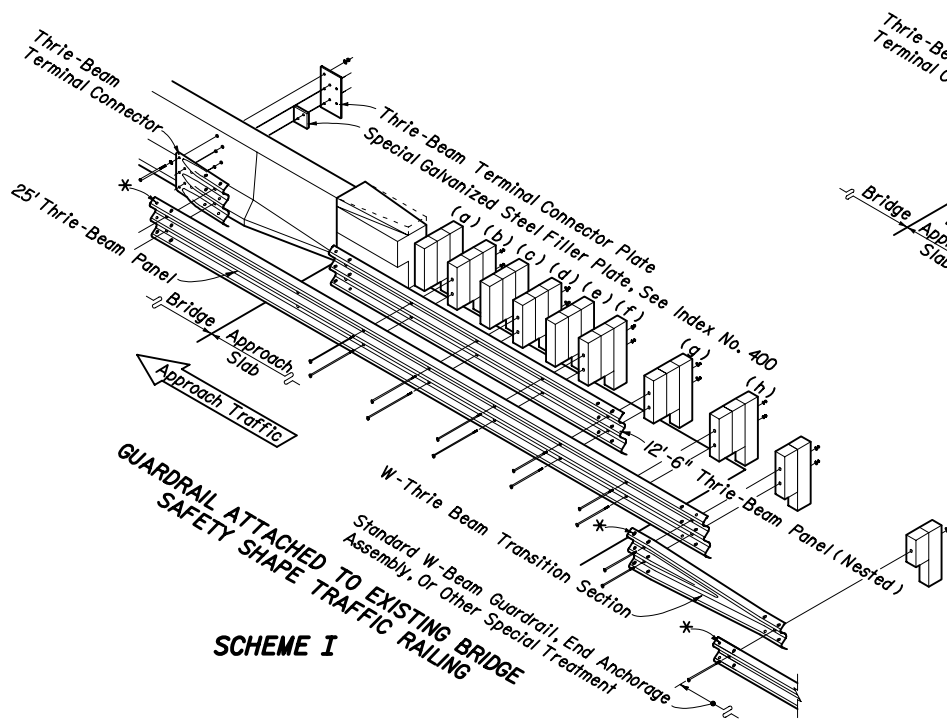
THRIE-BEAM RETROFIT NOTES

1. See Structures indexes for bridge thrie-beam traffic railing barrier retrofits.
2. Trailing end guardrail to be paid for under the contract unit price for the parent roadway guardrail; end measure includes length of end anchorage assembly; additional payment made for end anchorage assembly. No additional payment for connecting roadway thrie-beam to bridge thrie-beam retrofit.

- NOTES FOR TRAILING END TRAFFIC RAILING BARRIER VERTICAL FACE RETROFITS**
1. Where Guardrail Extensions Are Required Beyond The Trailing End Of Bridges With Traffic Railing Barrier Vertical Face Retrofits, Guardrail Connections To The Bridge Barrier Will Be By SPECIAL END SHOE For W-Beam Guardrail Extensions And By THRIE-BEAM TERMINAL CONNECTOR For Thrie-Beam Guardrail Extensions.
 2. Install W-Beam Special End Shoes and Thrie-Beam Terminal Connectors With Back-Up Plates, And $\frac{7}{8}$ " \varnothing HS Hex Bolts And Nuts (12" Long) With $2\frac{1}{4}$ " OD Plain Round Washers Under Heads And Nuts (4 Required For Special End Shoes And 5 Required For Thrie-Beam Terminal Connectors). Back-Up Plates For Special End Shoes Are 12" x 12" x $\frac{5}{8}$ " And For Terminal Connector 21" x 12" x $\frac{5}{8}$ ".
 3. Payment For Connecting Trailing End Special End Shoes And Thrie-Beam Terminal Connectors To Traffic Railing Barrier Vertical Face Retrofits Will Be Made Under The Contract Unit Price For Guardrail Bridge Anchorage Assembly, EA..

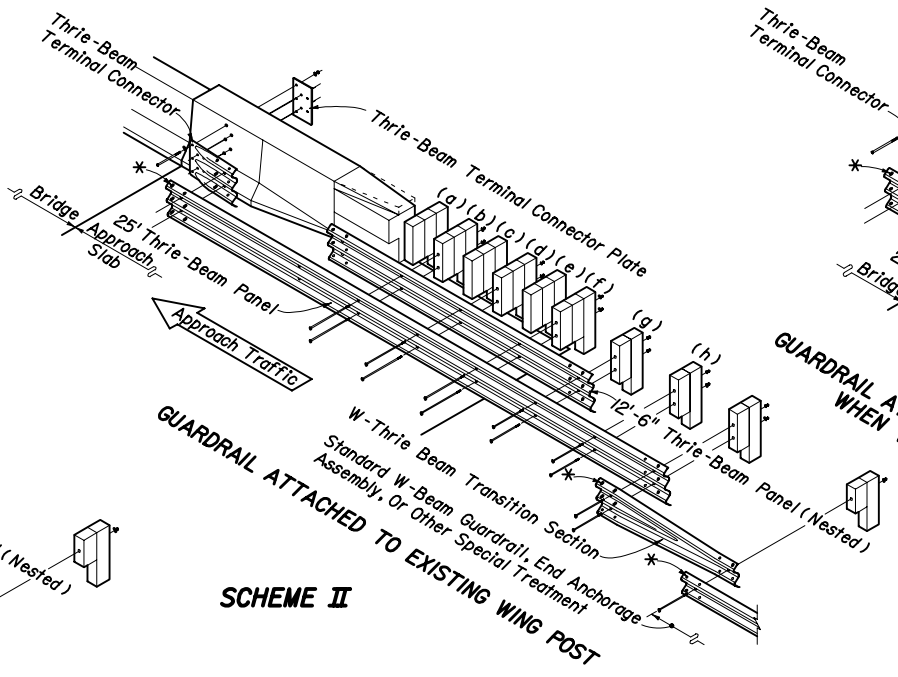
TRAILING END GUARDRAIL AND ANCHORAGE FOR BRIDGE TRAFFIC RAILING BARRIER RETROFITS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
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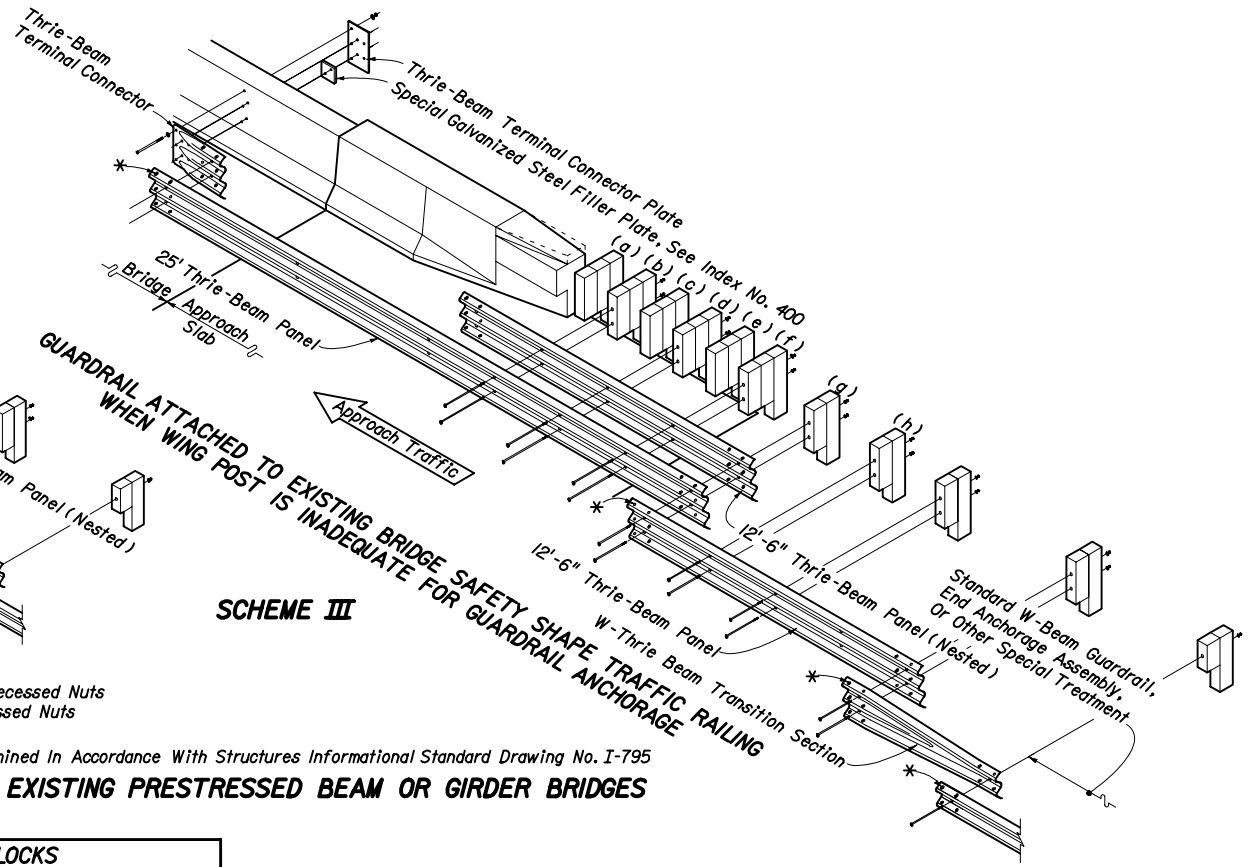
SCHEME I

Use Of Scheme I Shall Be Determined In Accordance With Structures Informational Standard Drawing No. I-790
GUARDRAIL TRANSITION TO EXISTING FLAT SLAB BRIDGES



SCHEME II

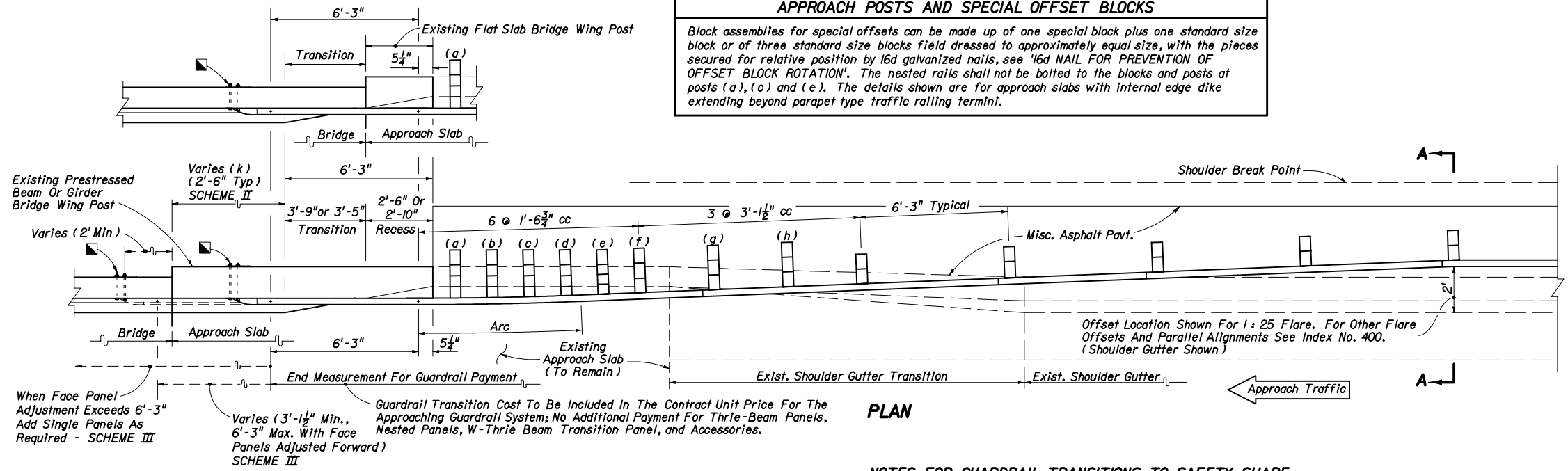
Use Of Schemes II And III Shall Be Determined In Accordance With Structures Informational Standard Drawing No. I-795
GUARDRAIL TRANSITIONS TO EXISTING PRESTRESSED BEAM OR GIRDER BRIDGES



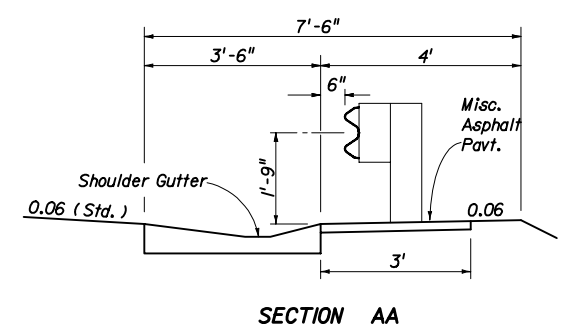
SCHEME III

* Splice Locations: Thrie-Beam - 12 Guardrail Splice Bolts And Recessed Nuts
 W-Beam - 8 Guardrail Splice Bolts And Recessed Nuts

APPROACH POSTS AND SPECIAL OFFSET BLOCKS
 Block assemblies for special offsets can be made up of one special block plus one standard size block or of three standard size blocks field dressed to approximately equal size, with the pieces secured for relative position by 16d galvanized nails, see '16d NAIL FOR PREVENTION OF OFFSET BLOCK ROTATION'. The nested rails shall not be bolted to the blocks and posts at posts (a), (c) and (e). The details shown are for approach slabs with internal edge dike extending beyond parapet type traffic railing termini.



PLAN



SECTION AA

NOTES FOR GUARDRAIL TRANSITIONS TO SAFETY SHAPE TRAFFIC RAILING BARRIERS ON EXISTING BRIDGES

- When the existing wing post is to be replaced with a bridge traffic railing barrier in accordance with Structure Standard Drawings No. I-790 or No. I-795, the thrie-beam guardrail connection shall be in accordance with Detail J of Index No. 400.
- When retrofitting thrie-beam guardrail to existing wing posts or existing bridge safety shape traffic railing, attachment construction to be paid for under the contract unit price for Guardrail Bridge Anchorage Assembly, EA., and shall be full compensation for bolt hole construction, terminal connector, terminal connector plate(s) and bolts, nuts and washers.

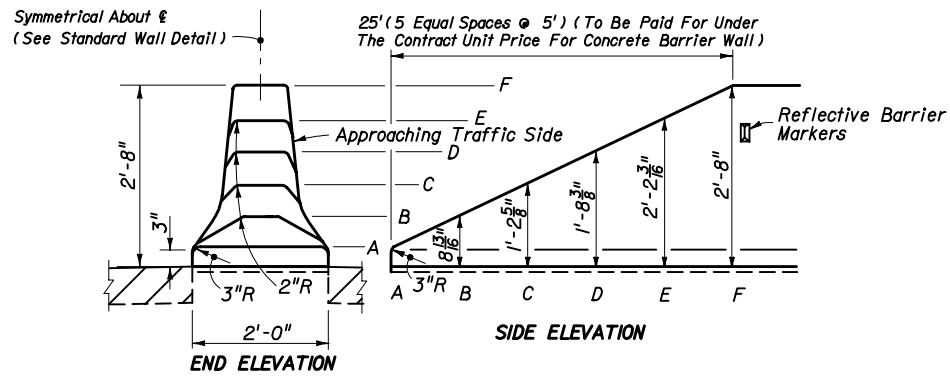
21" x 12" x 5/8" Thrie-Beam Terminal Connector Plate (Back-Up Plate), And 7/8" Ø x 18" Long [15" Long With 3 1/2" Min. Thread Length For Bridge Safety Shape Railing] HS Hex Bolts And Nuts (5 Reqd.) With 2 1/4" OD Plain Round Washers Under Heads And Nuts. [When Attaching Guardrail To Existing Wing Posts Or Bridge Rails, Care Should Be Exercised To Avoid Damaging Conduits And Their Utilities That May Be Routed Through Wing Posts Or Bridge Rails. When Conduits And Their Utilities Are Encountered, At Least Five 5/8" HS Hex Bolts Shall Be Installed In Any Of The Seven Holes Provided In The Thrie-Beam Terminal Connector.]

GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR EXISTING FLAT SLAB, PRESTRESSED BEAM AND GIRDER BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH

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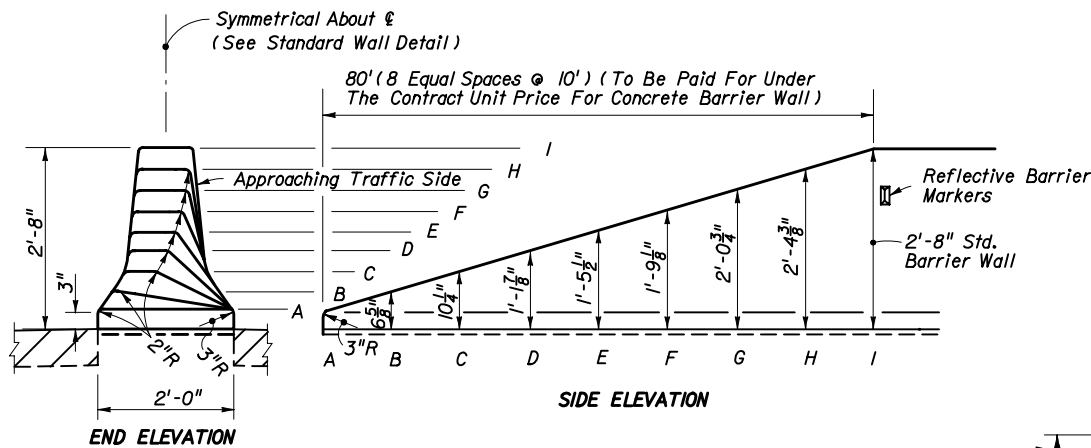
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

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Checked By	JVG 9-98	Revision	Sheet No.	Index No.
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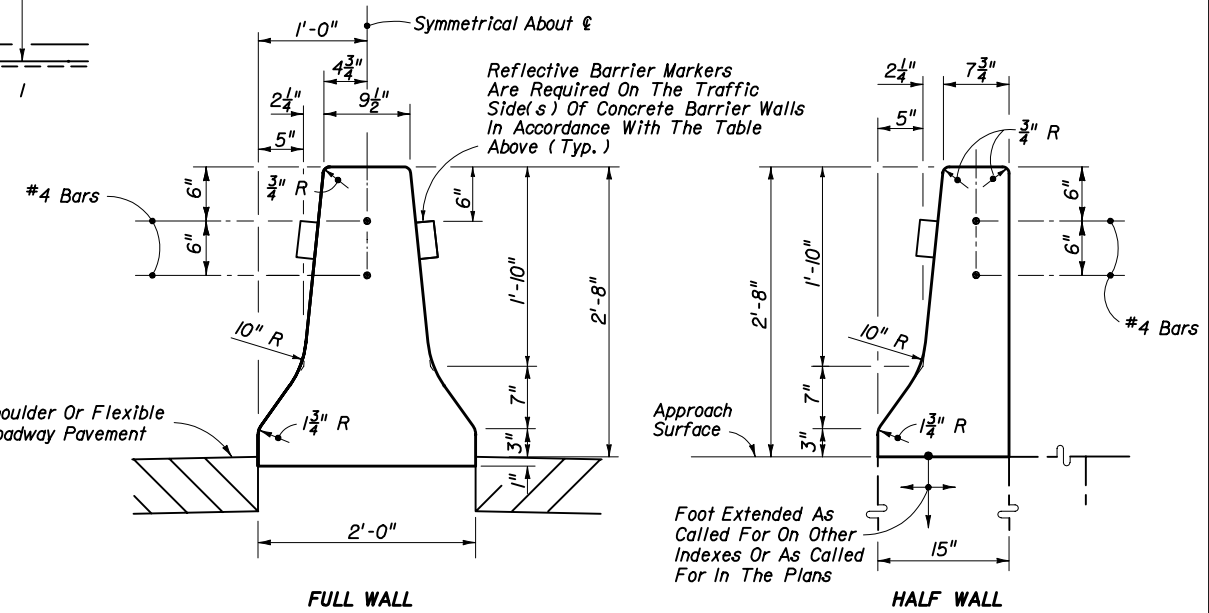
TO BE USED ONLY WHERE TERMINAL LOCATED CLEAR ZONE WIDTH FROM EDGE OF THE NEAR APPROACH TRAFFIC LANE.

CONCRETE BARRIER WALL TERMINAL DETAIL II



CONCRETE BARRIER WALL TERMINAL FOR NARROW MEDIAN DETAIL III

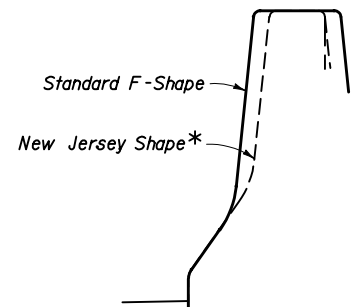
REFLECTIVE BARRIER MARKER SPACING ON WALL		
Distance - Edge of Travel Lane to Barrier Wall. (Ft.)	Spacing (Ft.)	REMARKS
< 4'	40'	1. Reflectors shall conform to Section 993-5 of the Standard Specifications. 2. Reflector color (white or yellow) shall conform to the color of the near edgeline.
4' to 8'	80'	
> than 8'	none required	



For concrete barrier wall details at piers, highway lighting and guardrail connections, see other sheets of this Index.

Standard barrier to be paid for under the contract unit price for Concrete Barrier Wall, LF.

STANDARD BARRIER WALL SECTIONS



* Where standard F-Shape walls abut existing NJ Shape walls, face transitions of not less than 5' in length shall be constructed at the adjoining end of the F-Shape wall.

WALL FACE SAFETY SHAPES

GENERAL NOTES

- Class II concrete shall be used for all reinforced and plain (nonreinforced) concrete barrier walls; except, in moderately and extremely aggressive environments, Class IV concrete shall be used. All reinforcing steel with undesignated size shall be #4 bars. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 521 of the Standard Specifications, unless other finish called for in the plans. The surfaces shall have a Class 5 Applied Finished Coating in accordance with Section 400 only when called for in the plans.
- Concrete barrier wall terminal notes for design speeds ≥ 50 mph.
 - Terminated outside clear zone of the approach traffic with 'DETAIL II' end treatment.
 - Terminated within a shielded location.
 - Terminal protection by the use of a crash cushion system.
 - Terminated in conjunction with a suitably designed transition to another barrier.
- Expansion joints in wall required only at bridge ends and/or at locations where wall is an integral part of existing or proposed concrete slab; wall joints are to match an existing or proposed expansion joint.
- When the barrier is installed adjacent to the pavement the top 12" of the subgrade shall be compacted to at least 100% of the density as defined in the AASHTO T-99 specifications.
- Cast-in-place barrier wall normally will be a continuous pour without transverse contraction joints. Cast-in-place segments with a length < 40' shall be joined to adjacent sections by doweling. See Detail B.
- Precast construction is allowed as an alternate to cast-in-place construction.
 - Wall segments < 40' in length shall be joined by a transverse joint in accordance with Details C & D. The minimum segment length is 20'.
 - Bedding of the precast sections shall be facilitated by the use of sand-cement grout or equal method to assure uniform bearing.
 - Reinforcement may be required for handling stresses.
- Cost of reinforcing steel and reflective barrier markers shall be included in the contract unit price for concrete barrier wall. See individual details for pay item information.
- For barrier wall inlet details see Indexes Nos. 217, 218 and 219.

Note: Wall segments shall be 20' or more in length.

Design Criteria:

Vehicle: 4000 lbs., 60 mph, 25°, Avg. Lat. Impact Deceleration Force - 7G's (28 kips)
Vehicle Force Applications: 1000 lbs. Vert. At Top of Toe; 28 kips Horiz. At 5 1/2" Above Pavt.

Unless the plans stipulate a specific wall type, either the cantilever wall or the "L" wall may be constructed at the Contractor's option.

Steel not required in walls of heights Y=0' To 0'-6" when footing and stem cast as one unit. When footing and stem cast separately by construction joint, the footing joint surface shall be roughened and #4 dowels 24" long installed at the centerline of the stem on 24" centers with 9" embedment in the footing.

Cost of the steel and concrete footing to be included in the contract unit price for Barrier Wall Concrete, LF.

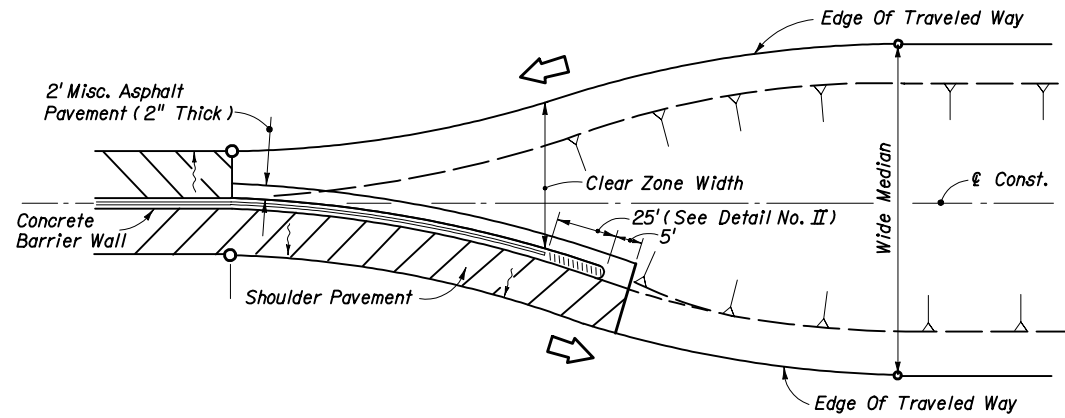
	Height Y	0'-0"	0'-6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"
Cantilever Wall	Width X	4'-10"	5'-0"	5'-2"	5'-3"	5'-5"	5'-6"	5'-7"	5'-9"	5'-10"
"L" Wall	Width X ₁	4'-0"	4'-4"	4'-8"	5'-0"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"

MEDIAN BARRIER WALL FOR SUPERELEVATED SECTIONS OR FOR VARIABLE ROADWAY PROFILE GRADES

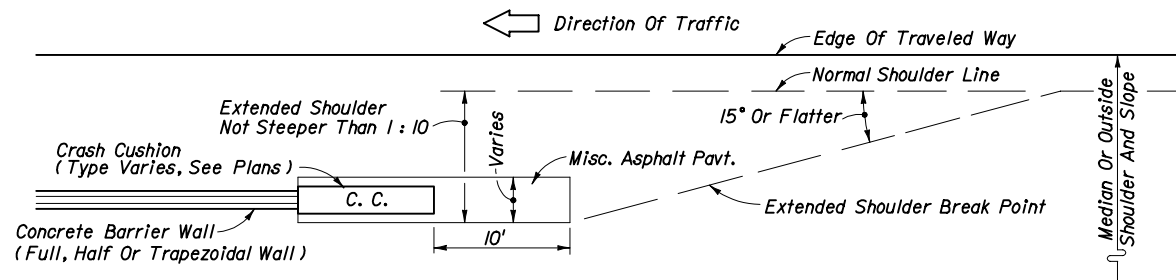
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER WALL

Designed By	Names	Dates	Approved By
Drawn By	AF/HSD	73/91	<i>Samuel D. Mill</i> Roadway Design Engineer
Checked By	LMF/JG	73/91	Revision
		04	Sheet No. 1 of 22
			Index No. 410

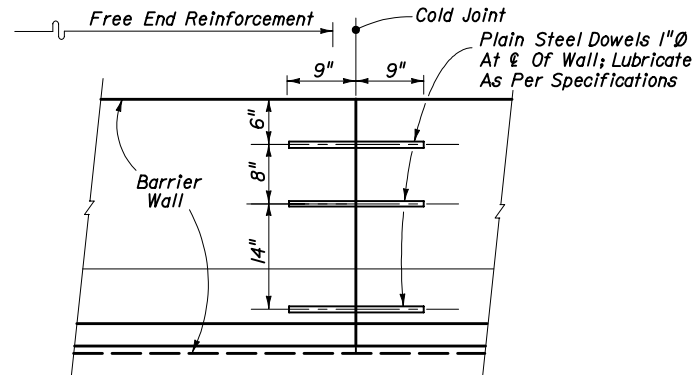


CONCRETE BARRIER WALL TRANSITION BETWEEN WIDE AND NARROW MEDIANS WHEN BARRIER WALL END LOCATED OUTSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE



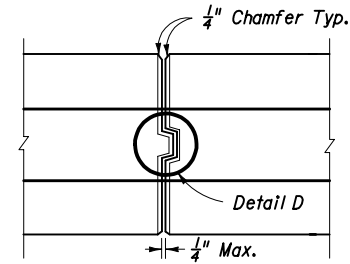
SHOULDER TREATMENT WHEN CRASH CUSHIONS SHIELDING CONCRETE BARRIER WALL END LOCATED INSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE

DETAIL A

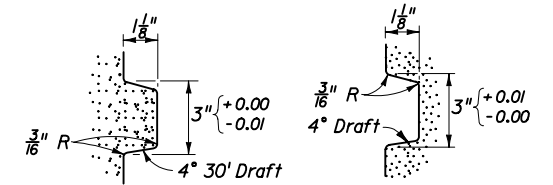


DOWELED TRANSVERSE CONSTRUCTION JOINT WHEN ABUTTING SEGMENT(S) LESS THAN 40' IN LENGTH

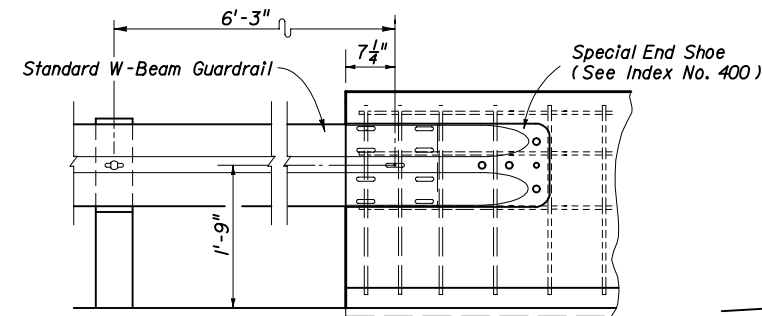
DETAIL B



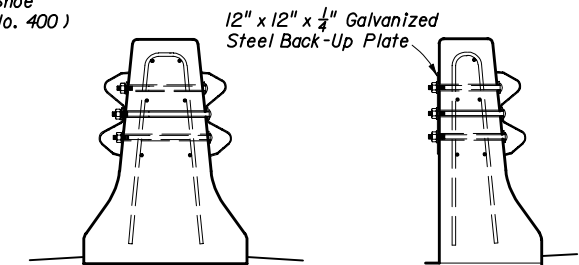
**PRECAST BARRIER TRANSVERSE JOINTS
DETAIL C**



**TOP VIEW
STRAIGHT TONGUE AND GROOVE
DETAIL D**



FRONT VIEW



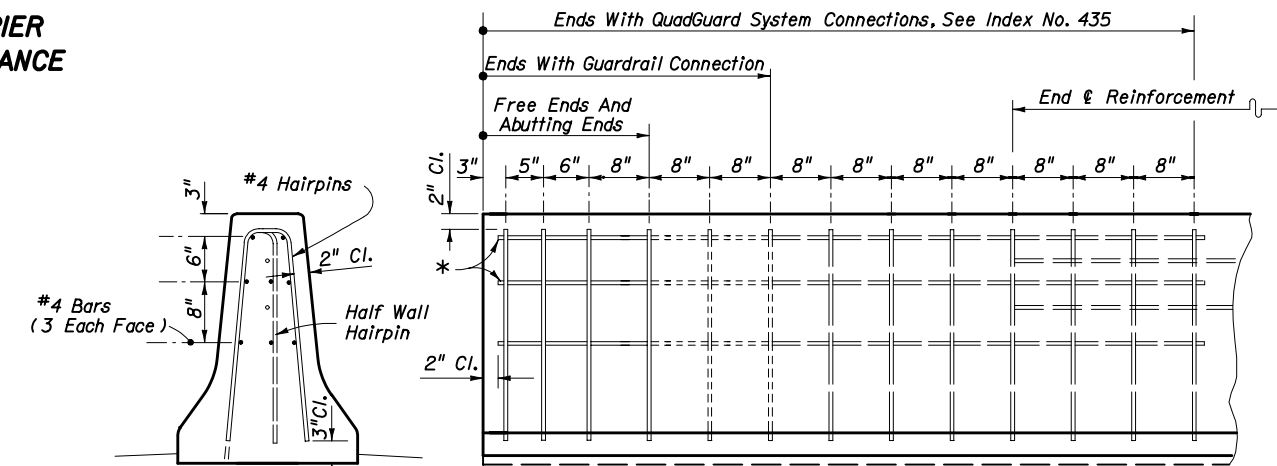
END VIEW

END VIEW

NOTES

- End of wall flush mounted connections are not applicable to two-lane two-way facilities. See Sheets 18 and 20 for trailing end connections on two-lane two-way facilities and for approach guardrail connections.
- Trailing guardrail connections to double face safety shaped walls will be under one of the following traffic conditions and mounting methods:
 - One-way traffic trailing condition one side only - flush mount with flat steel back-up plate on back side.
 - One-way traffic trailing condition both sides - flush mount both sides.
 - For trailing condition one side and approach traffic condition opposite side - see "Median Barrier Wall" mounting, Sheet 20.

W-BEAM GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL TRAILING ENDS



END VIEW

SIDE VIEW


Hairpin Front Face Bend Extended As Required By Other Indexes For Mounting Half Walls On Rigid Concrete Surfaces

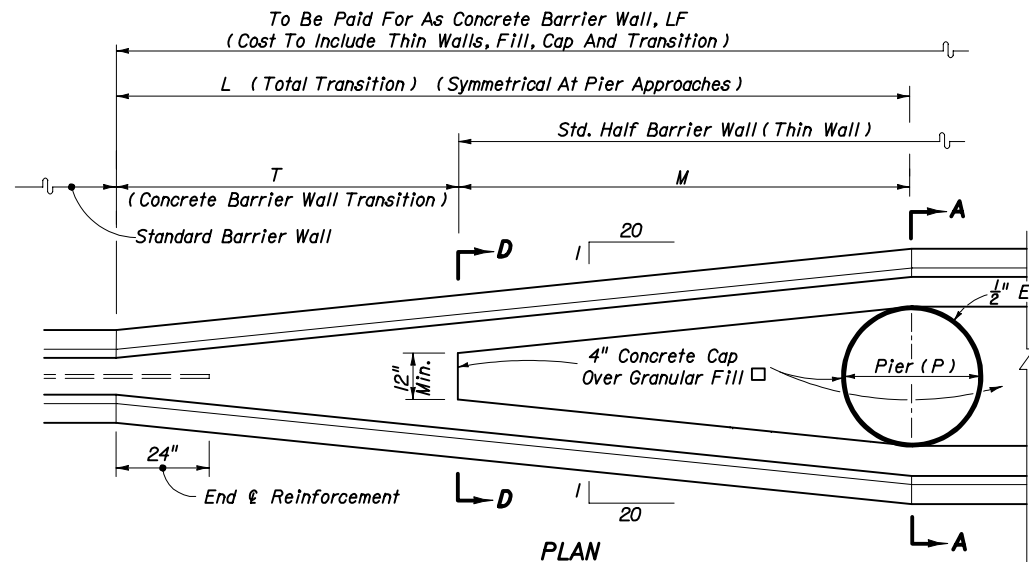
Note: Free end reinforcement required for nonreinforced walls at all exposed ends; abutting ends of true joints; ends with guardrail connections; ends with QuadGuard System connections; and, ends connecting to bridge traffic rails or other rigid barrier walls.

FREE END REINFORCEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

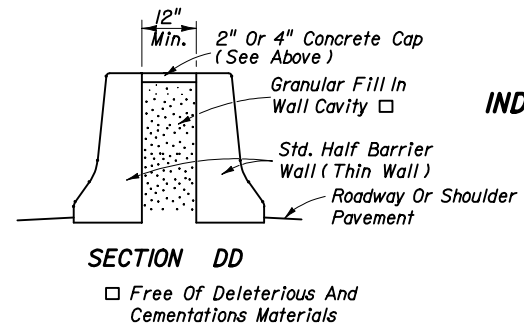
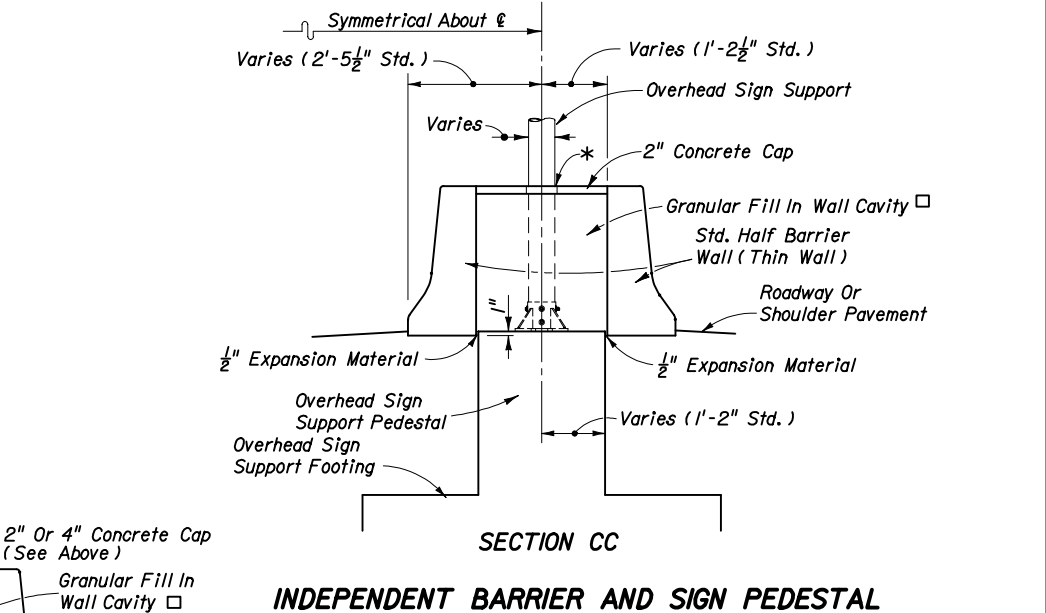
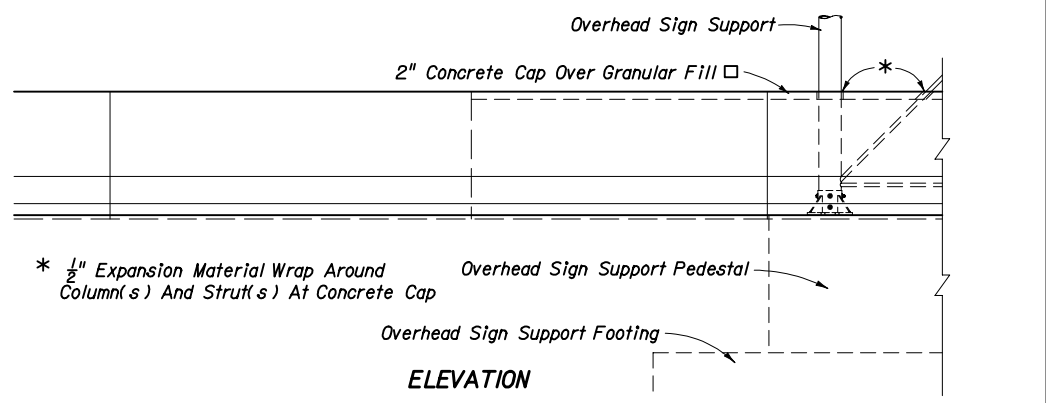
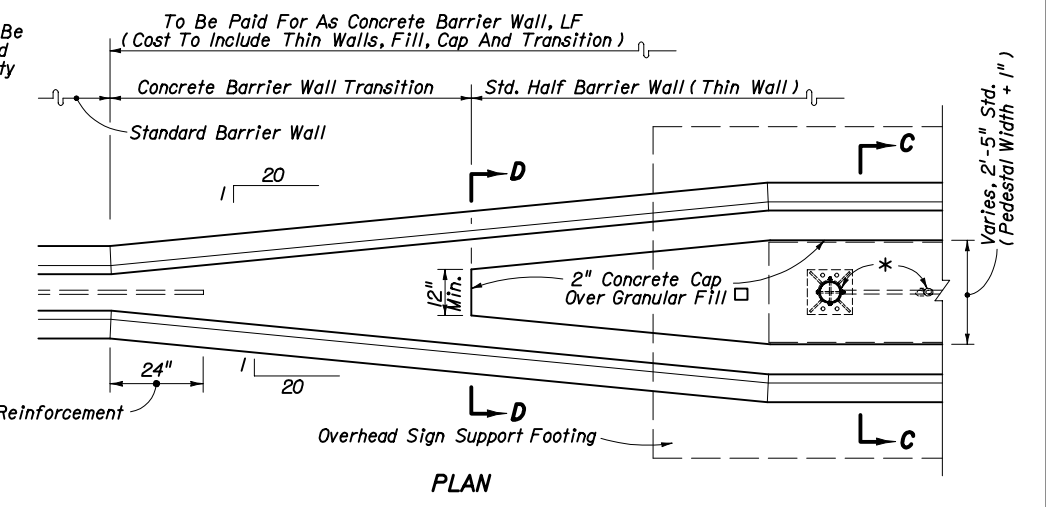
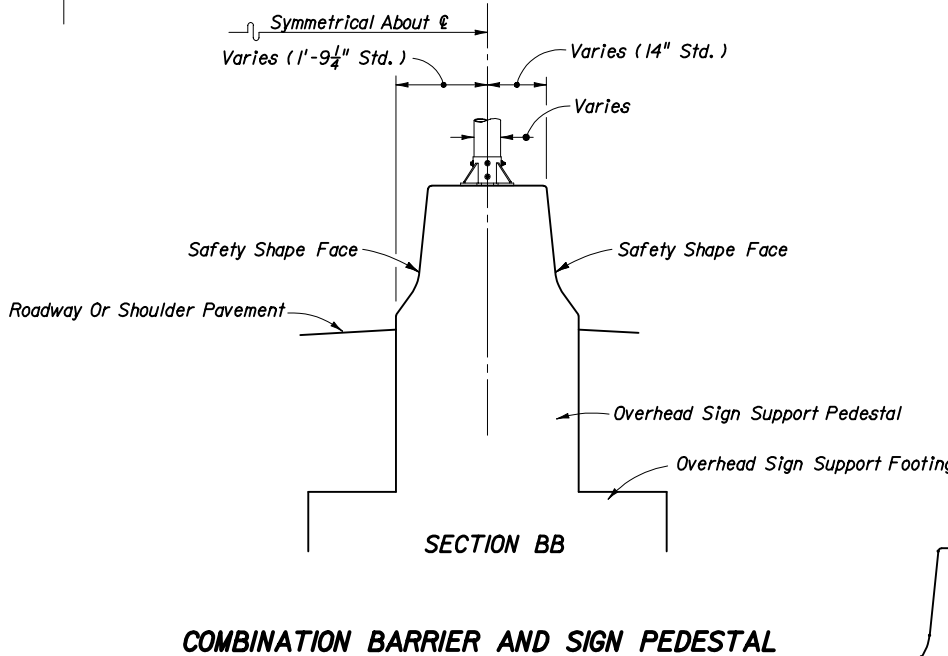
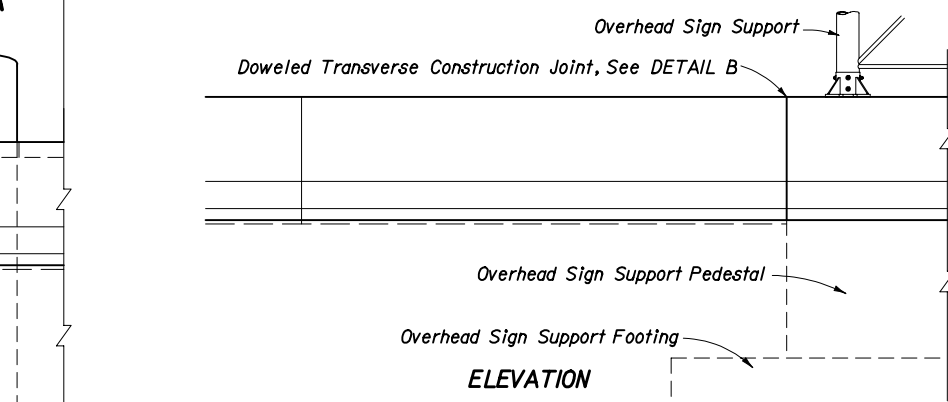
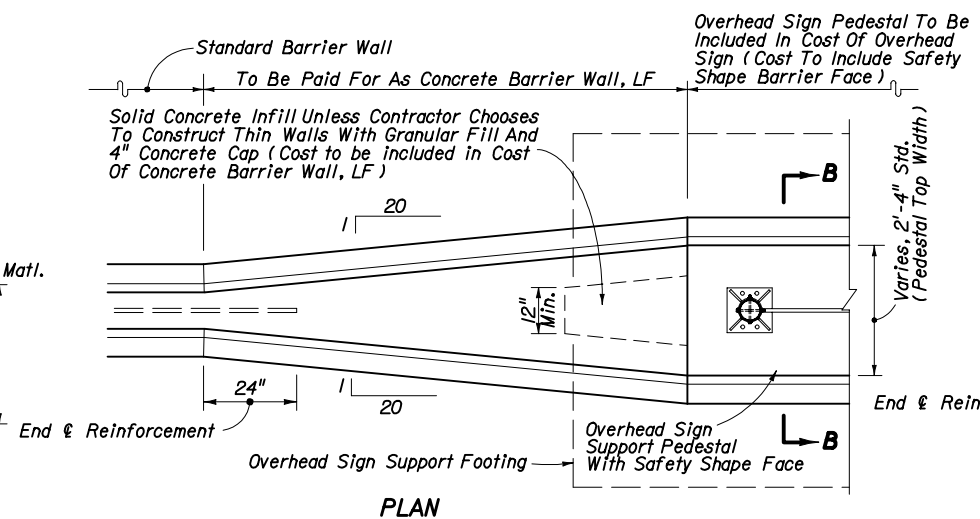
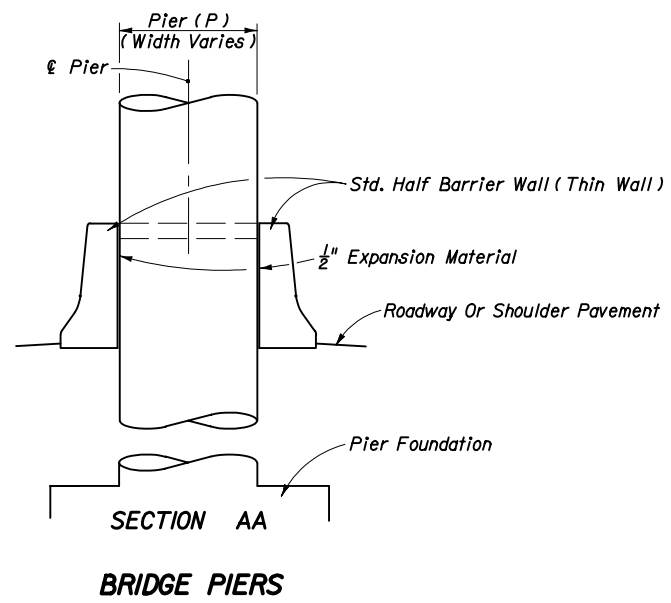
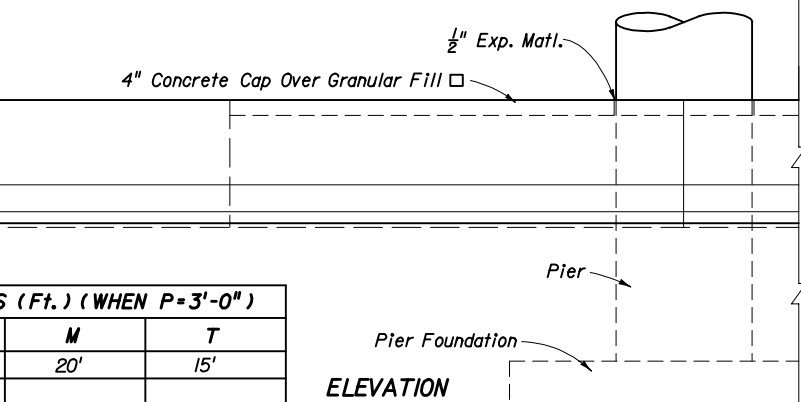
CONCRETE BARRIER WALL

Names	Dates	Approved By		
Designed By		 Roadway Design Engineer		
Drawn By	AF/HSD 73/91			
Checked By	LMF/JVG 73/91	Revision	Sheet No.	Index No.
		00	2 of 22	410



DIMENSIONS (Ft.) (WHEN P=3'-0")

L	M	T
35'	20'	15'

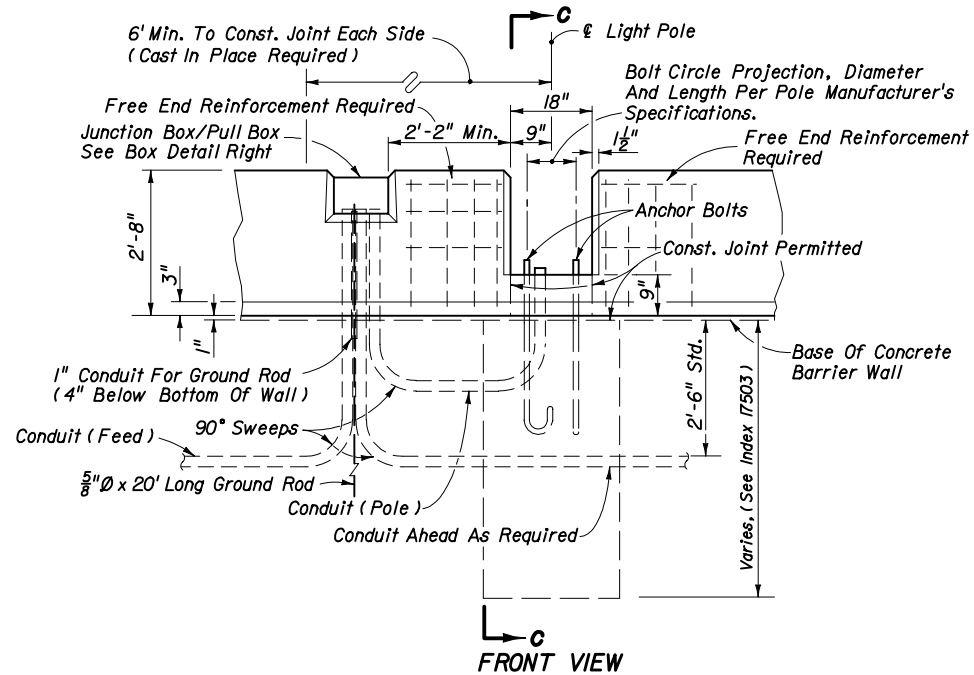
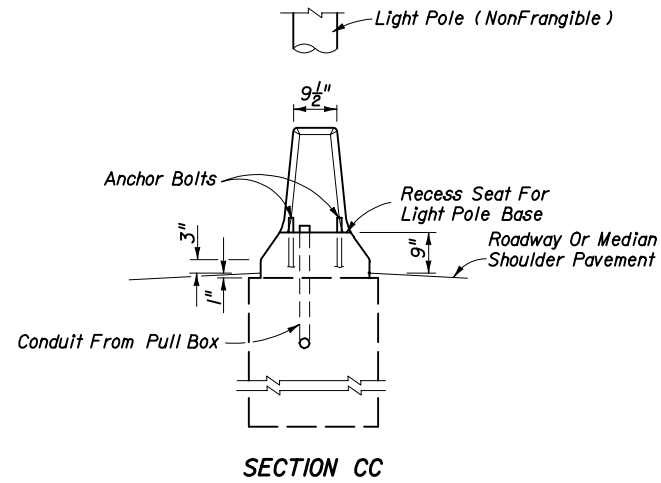
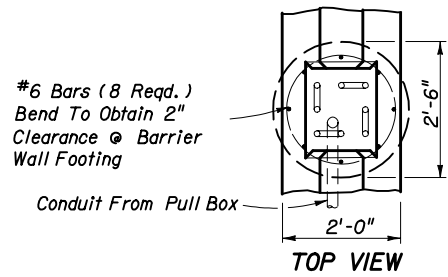


CONCRETE MEDIAN BARRIER WALL TRANSITIONS AT BRIDGE PIERS AND OVERHEAD SIGN SUPPORTS

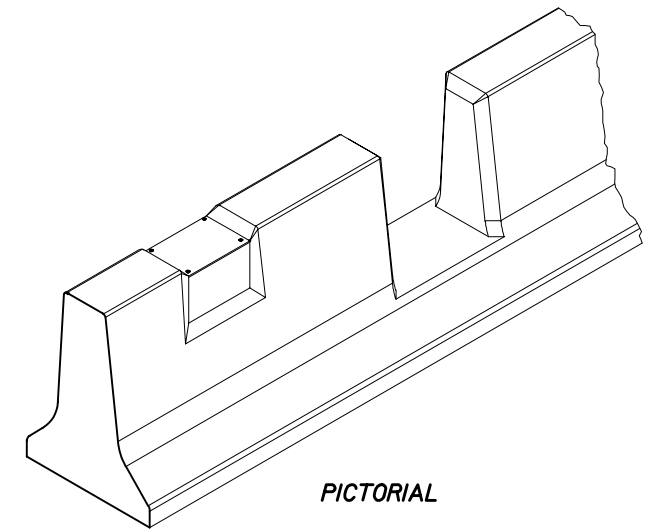
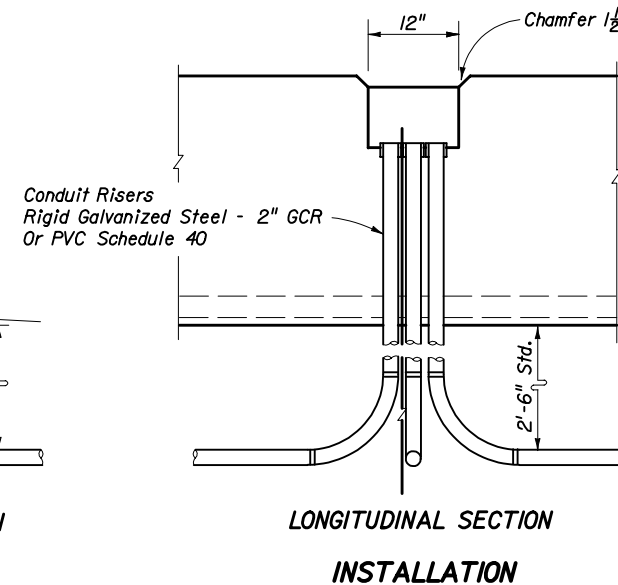
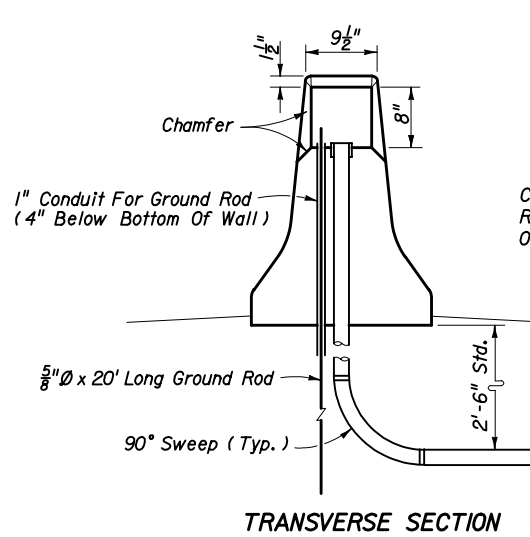
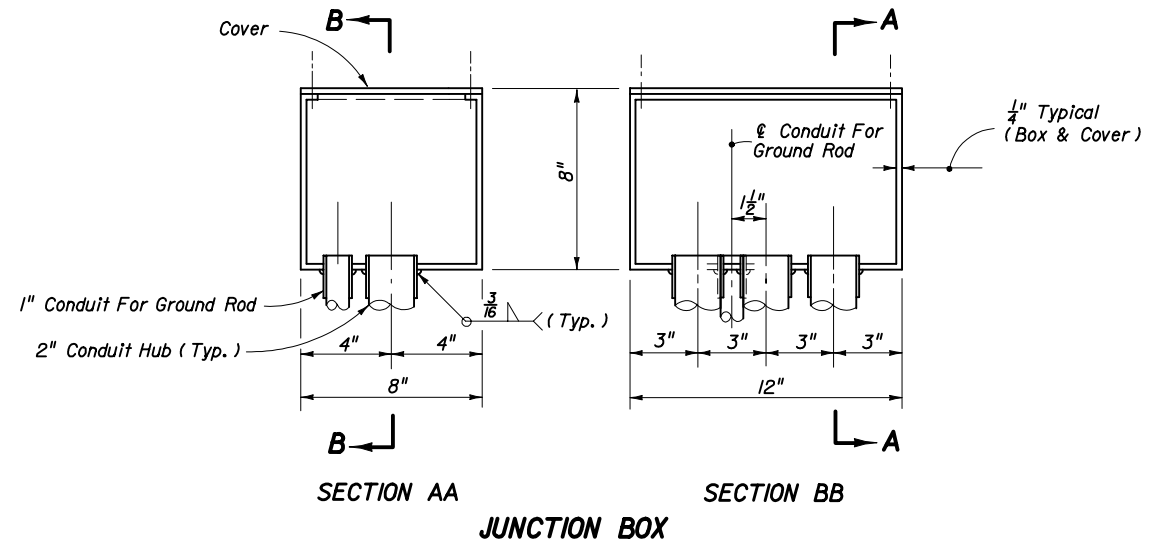
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER WALL

Names	Dates	Approved By
Designed By		<i>Jamell D. Milk</i> Roadway Design Engineer
Drawn By		Revision
Checked By		Sheet No. 3 of 22
		Index No. 410



Note: For foundation design and details see Index No. I7503.
Refer to Lighting Plans for size of conduit.
Payment for the 2'-6" concrete shaft including reinforcing steel, anchor bolts and accessories shall be included in the contract unit price for Light Pole Complete, EA.



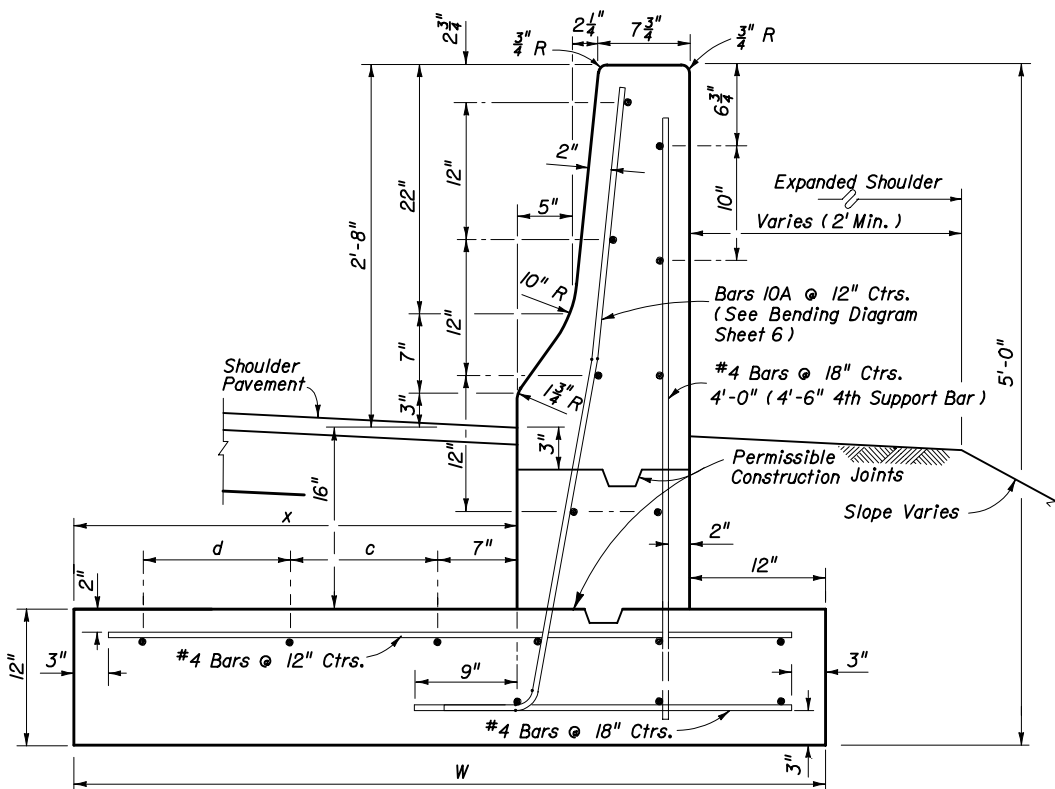
JUNCTION BOX NOTES

1. Junction boxes are to be fabricated from steel conforming to ASTM A36 and be hot dipped galvanized after fabrication. All seams shall be continuously welded and ground smooth. A neoprene gasket shall be attached to the box to provide a watertight cover. The cover screws shall be fully galvanized.
2. Remove excess concrete while green and hand form chamfers.
3. Junction box complete and conduit risers are incidental to the construction and cost of the barrier wall; there is to be no separate compensation for the box, risers or installation unless specifically called for in the plans.

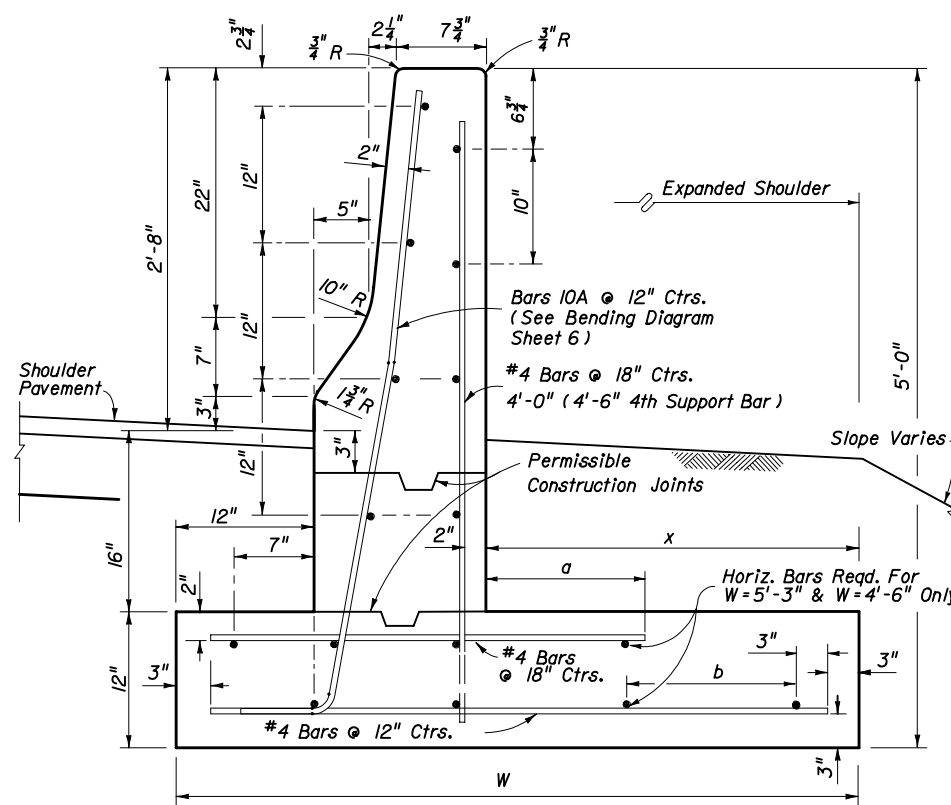
JUNCTION BOX - ELECTRICAL

LIGHT POLE MOUNTING IN MEDIAN BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By <i>Jamell D. Milk</i> Roadway Design Engineer	
Drawn By	HSD	9/85	Revision	Sheet No. 4 of 22
Checked By	JVG	9/85	00	Index No. 410

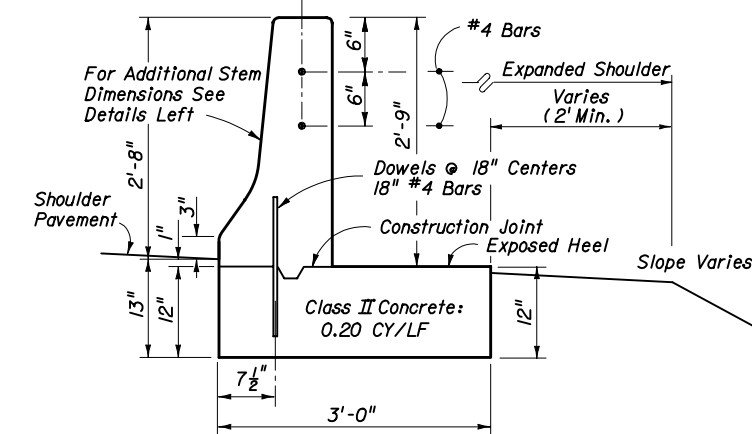
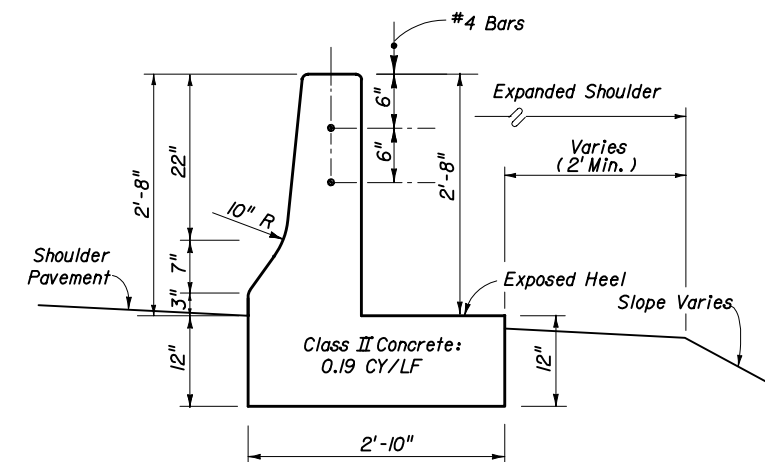


CANTILEVER WALL



L-WALL

NOTE: All longitudinal reinforcement #4 bars.

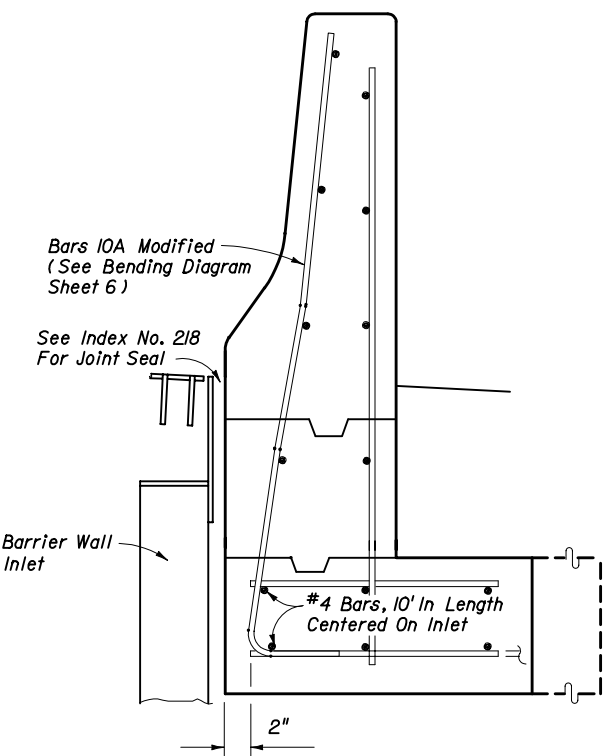


WALL OPTIONS

NOTE: Wall to be paid for under the contract unit price for Concrete Barrier Wall (Plain-Shoulder), LF.

DESIGN NOTE: Wall shall have a length of 40' or greater. Wall of 40' or more in length may be made up of segments of 20' or more in length provided the segments are joined by a transverse joint in accordance with Detail B, Sheet 2; segments shall have dimensions same as wall shown above.

PLAIN CONCRETE BARRIER WALL (SHOULDER)



REINFORCING STEEL MODIFICATIONS AT BARRIER WALL INLETS (INDEX NO. 218)

DIMENSIONS AND QUANTITIES													
CANTILEVER WALL						L-WALL							
Length* Of Barrier Wall	W	x	c	d	Class II Concrete CY Per Lin. Ft.	Reinforcing Steel LBS. Per Lin. Ft.	Length* Of Barrier Wall	W	x	a	b	Class II Concrete CY Per Lin. Ft.	Reinforcing Steel LBS. Per Lin. Ft.
≥ 40'	3'-3"	1'-0"	NA	NA	0.27	18	≥ 40'	3'-3"	1'-0"	6"	NA	0.27	18
35' to 39'	3'-6"	1'-3"	NA	NA	0.28	18	35' to 39'	3'-6"	1'-3"	6"	NA	0.28	18
30' to 34'	4'-0"	1'-9"	NA	NA	0.29	19	30' to 34'	3'-9"	1'-6"	6"	NA	0.29	18
25' to 29'	4'-6"	2'-3"	14"	NA	0.31	20	25' to 29'	4'-0"	1'-9"	9"	NA	0.30	19
21' to 24'	5'-0"	2'-9"	18"	NA	0.33	20	20' to 24'	4'-6"	2'-3"	12"	12"	0.31	20
19' & 20'	5'-6"	3'-3"	13"	13"	0.35	21	15' to 19'	5'-3"	3'-0"	16"	17"	0.34	21
17' & 18'	6'-0"	3'-9"	16"	16"	0.37	21							
15' & 16'	6'-6"	4'-3"	18"	18"	0.39	22							

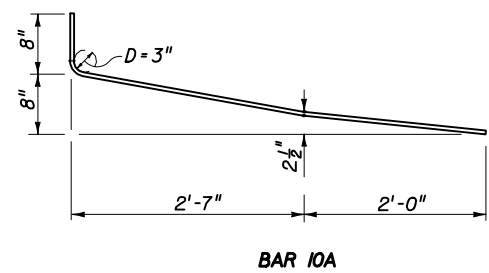
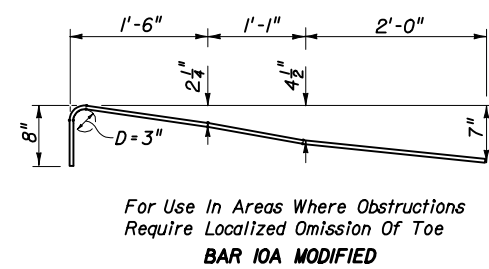
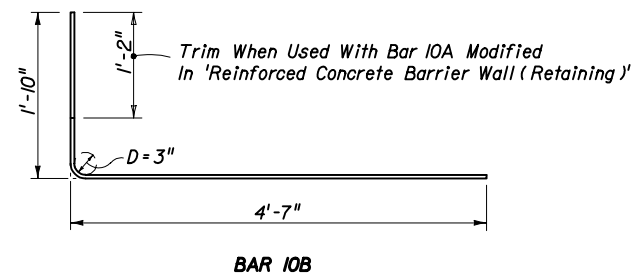
Quantities shown are for information only. For method of payment see payment note below.
Barrier wall inlets (Index 218) shall be isolated from the barrier wall stem and footing by 1" expansion material.
*Any length less than 40' must be a continuous (nonjointed) segment. Walls of 40' or more in length may be made up of segments of 20' or more in length provided the segments are joined by a transverse joint in accordance with Detail B, Sheet 2; segments shall have dimensions same as wall ≥ 40' above.

PAYMENT: Wall to be paid for under the contract unit price for Concrete Barrier Wall (Rigid-Shoulder), LF.

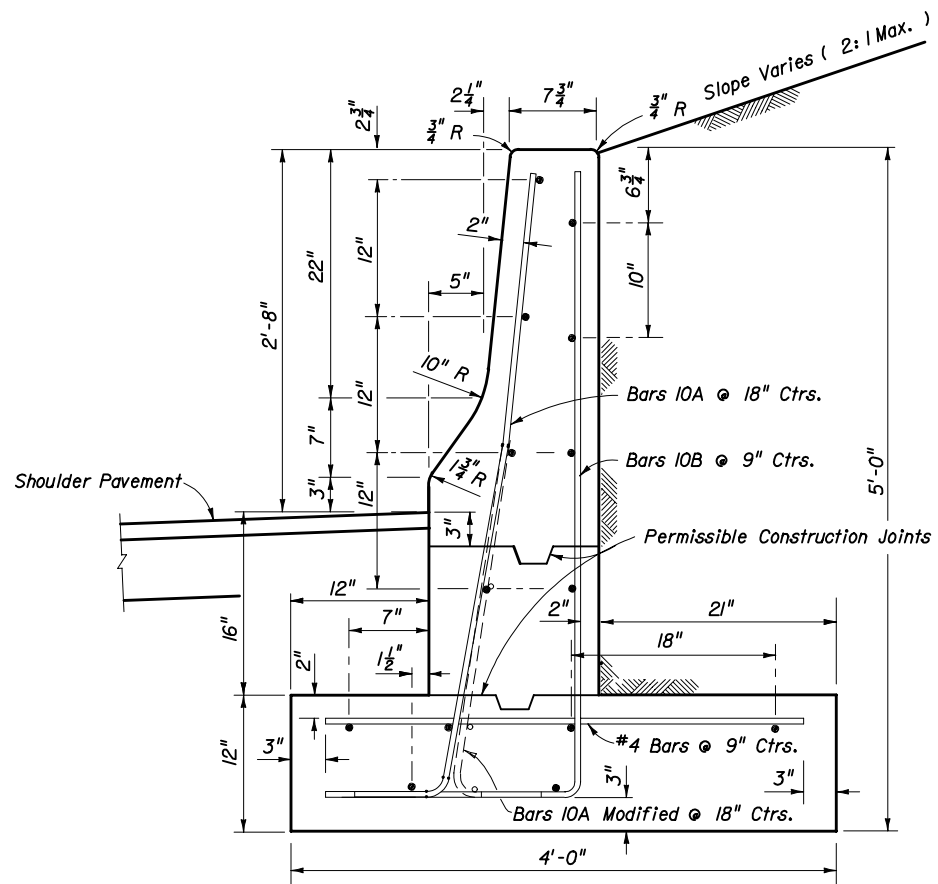
DESIGN NOTES: Use of this barrier wall should be limited to special applications such as hazard encroachment into the clear zone where barrier wall deflection, rotation or translation cannot be tolerated; example hazards to consider are as follows:
(a) Structure supporting piers, bents and pylons (b) Pumping, metering, control or other similar critical stations (c) Quarries (d) Intolerable vertical drops (e) Historic structures or monuments (f) Rail transit travel way or passenger station (g) Other similar occupancies

REINFORCED CONCRETE BARRIER WALL (SHOULDER)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
CONCRETE BARRIER WALL					
Names	Dates	Approved By			
Designed By		<i>Jamell D. Mill</i> Roadway Design Engineer			
Drawn By	HSD 9/85	Revision	Sheet No.	Index No.	
Checked By	JVG 9/85	04	5 of 22	410	



BENDING DIAGRAMS

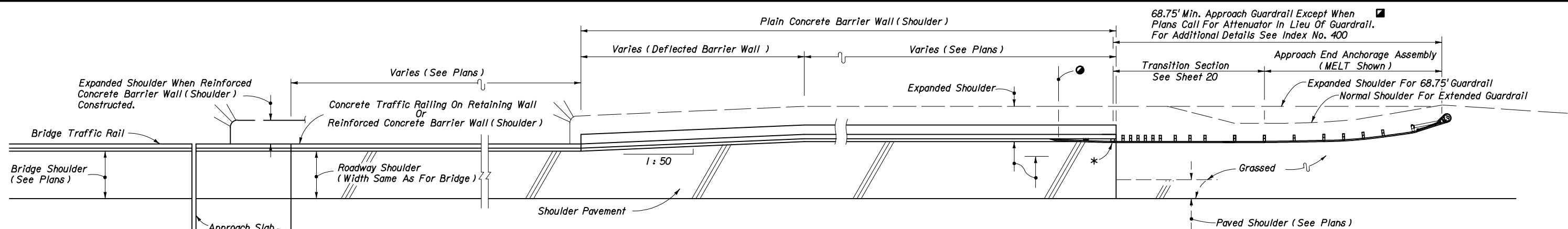


NOTE: All longitudinal reinforcement #4 bars.
Minimum segment length for this wall is 20 feet.
Wall to be paid for under the contract unit price for Concrete Barrier Wall (Rigid-Retaining), LF.

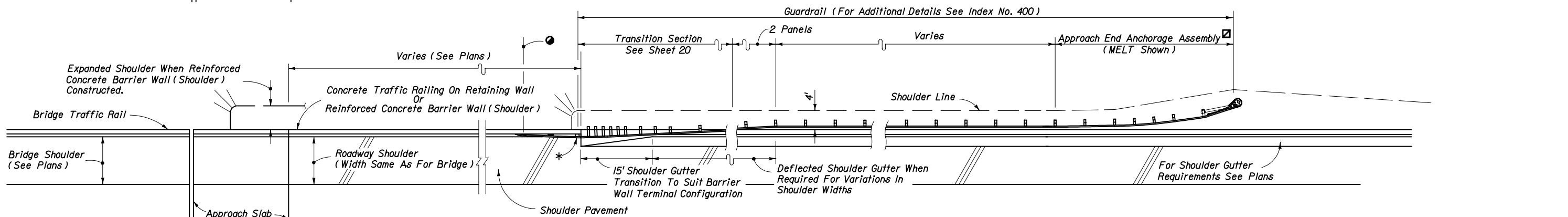
QUANTITIES: Class II Concrete 0.29 CY/LF
Reinforcing Steel 21 LBS/LF

REINFORCED CONCRETE BARRIER WALL (RETAINING)

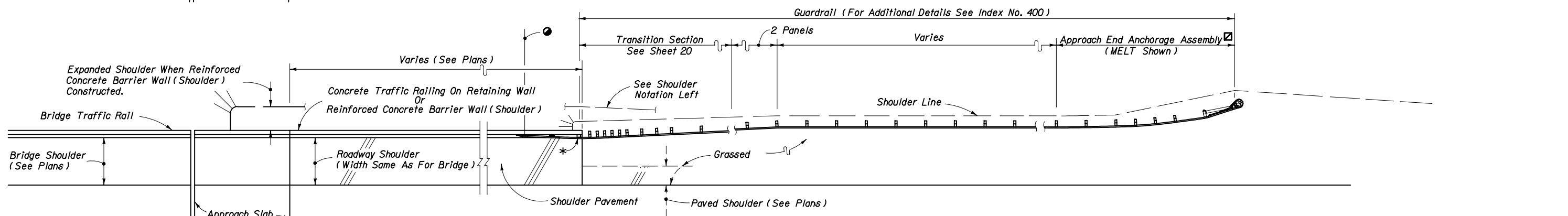
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By <i>Samuel D. Mill</i> Roadway Design Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			00	6 of 22 410



WITH PLAIN CONCRETE BARRIER WALL (SHOULDER)



WITH SHOULDER GUTTER AND GUARDRAIL



WITH GRASSED OR PAVED SHOULDERS AND GUARDRAIL

△ Views show approach roadside barriers when length of need exceeds the length of either retaining walls with concrete traffic railings* or Reinforced Concrete Barrier Wall (Shoulder) on shoulders. When either of these rigid barriers alone satisfies the approach length of need, the wall ends shall be shielded by crash cushions, or, by guardrail the same as for bridge traffic rails, as detailed in Index No. 400.
See other flagged notes for trailing end treatments.
Miscellaneous asphalt paving under guardrail not shown.

* Guardrail connection to concrete traffic railings on retaining walls shall be in accordance with the Structures Design Office Standard Drawings and the plans. Approach guardrail connections to shoulder concrete barrier walls shall be in accordance with the details shown on Sheets 2 and 20 of this Index and Index No. 400, Detail J.

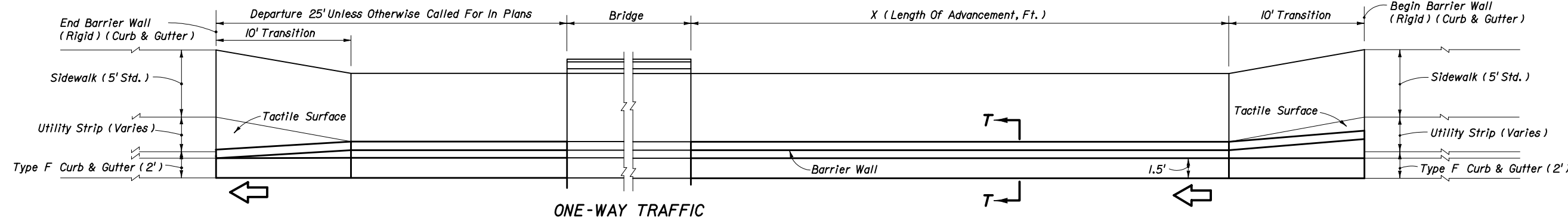
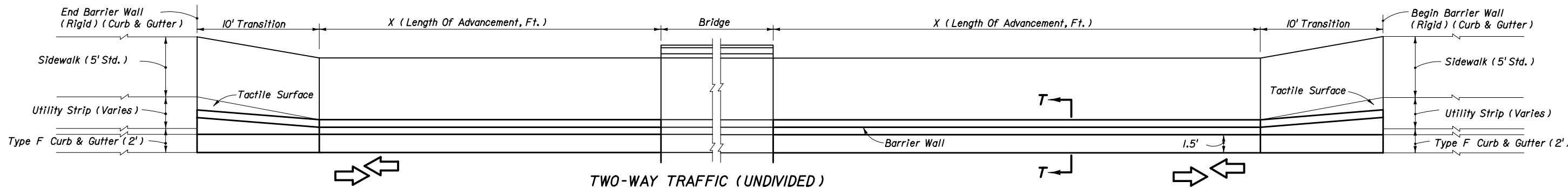
● End measurement for guardrail payment when guardrail connected to shoulder barrier walls. See Index No. 400, Detail J for end measurement when guardrail connected to concrete traffic rails constructed with approach slab or on retaining walls.

☑ To be deleted on trailing ends except for 2-lane 2-way facilities. The tangent guardrail shall be anchored by End Anchorage Type II, Index No. 400.

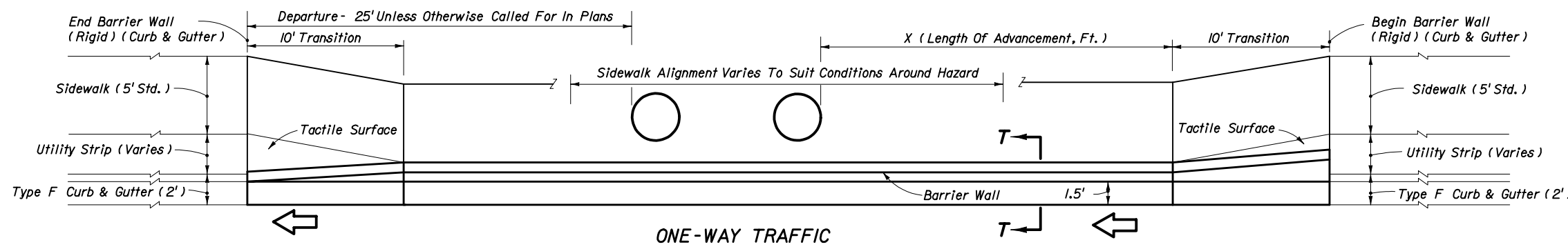
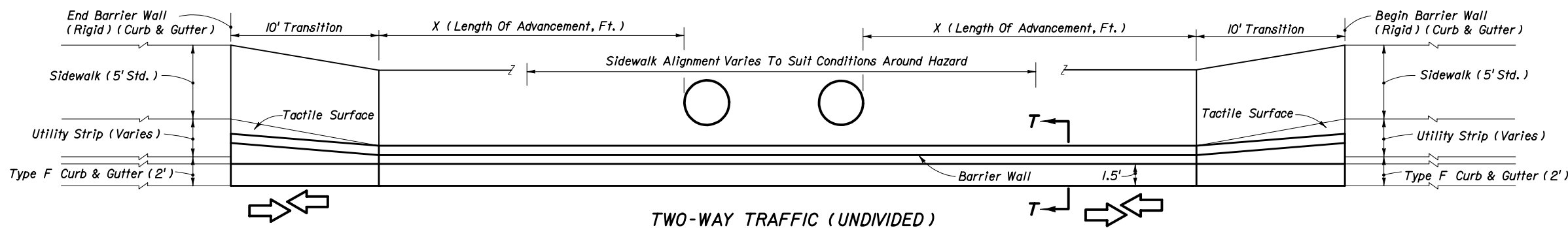
☑ To be deleted on trailing ends except for 2-lane 2-way facilities.

**EITHER REINFORCED CONCRETE BARRIER WALL (SHOULDER) OR RETAINING WALL WITH CONCRETE TRAFFIC RAILING △
CONCRETE BARRIER WALLS ON APPROACHES TO BRIDGES**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	8/89	<i>Jamell D. Milk</i> Roadway Design Engineer	
Checked By	KNM/JVG	8/89	Revision	Sheet No.
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				Index No. 410



BRIDGE END HAZARD

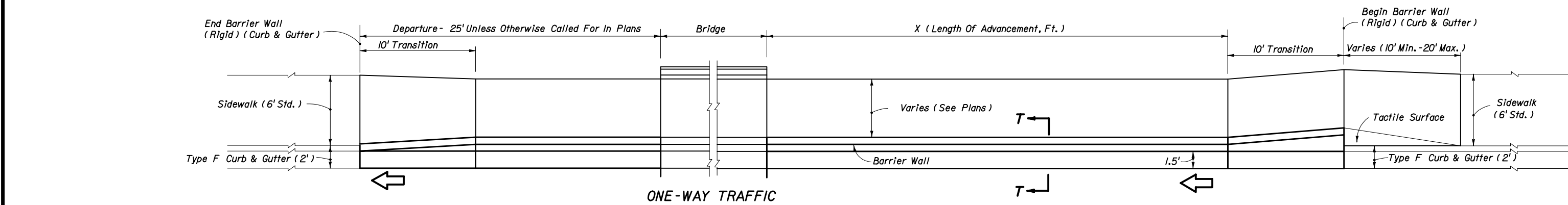
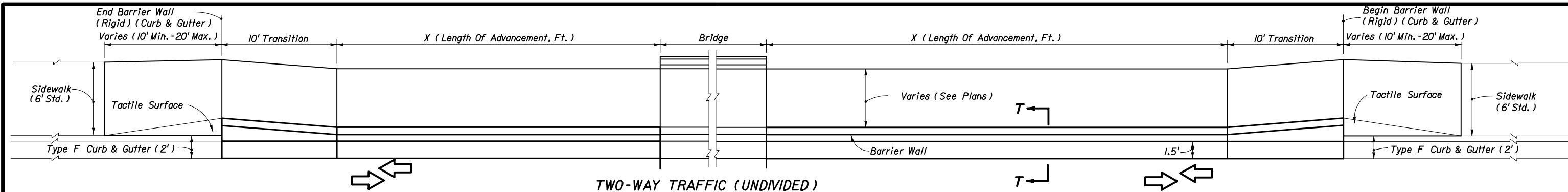


HAZARD 4' OR LESS FROM FACE OF CURB

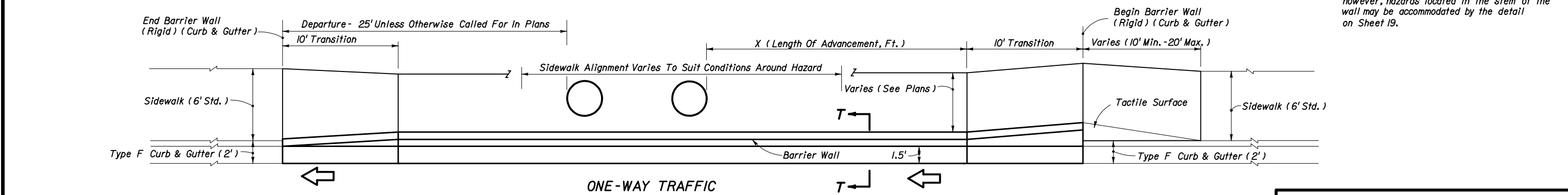
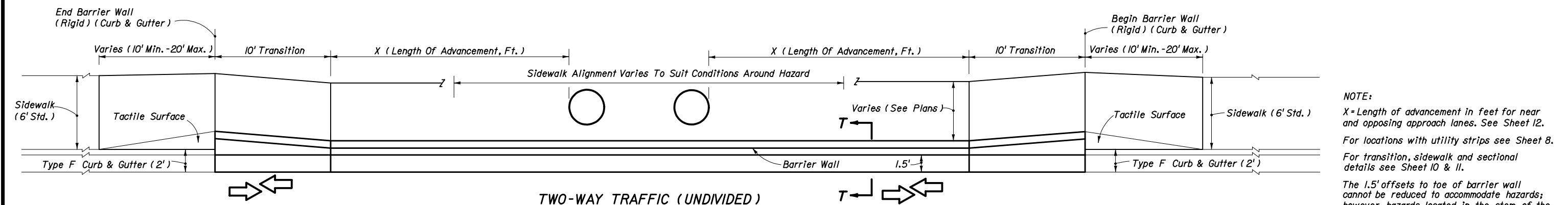
**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
CURB AND GUTTER WITH UTILITY STRIP AND WITH ADJACENT BICYCLE LANE**

NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 12.
 For locations without utility strips see Sheet 9.
 For transition, sidewalk and sectional details see Sheets 10 & 11.
 The 1.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheet 19.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	STAFF	10/97	Approved By <i>Jamall D. Milk</i> Roadway Design Engineer	
Drawn By	HKH	10/97	Revision	Sheet No. Index No.
Checked By	JVG	10/97	00	8 of 22 410



BRIDGE END HAZARD

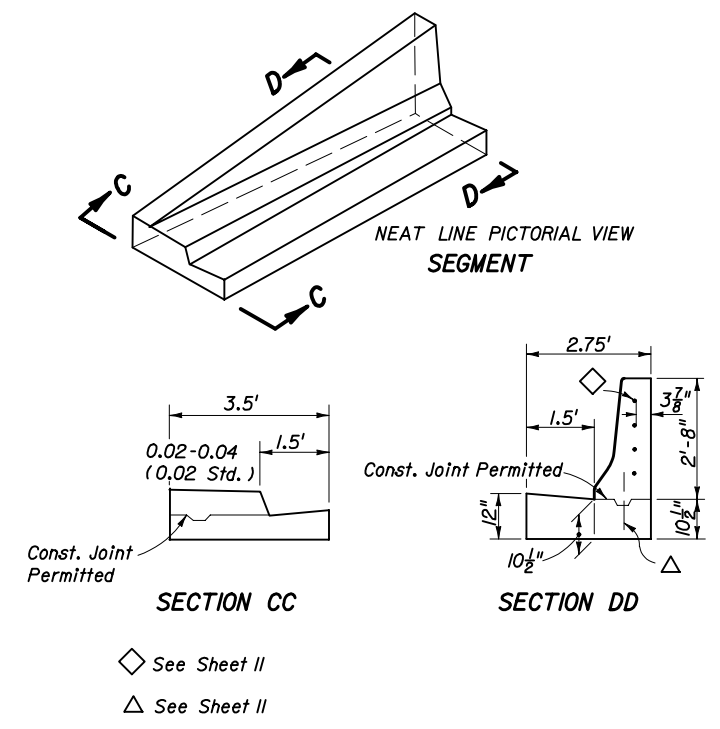
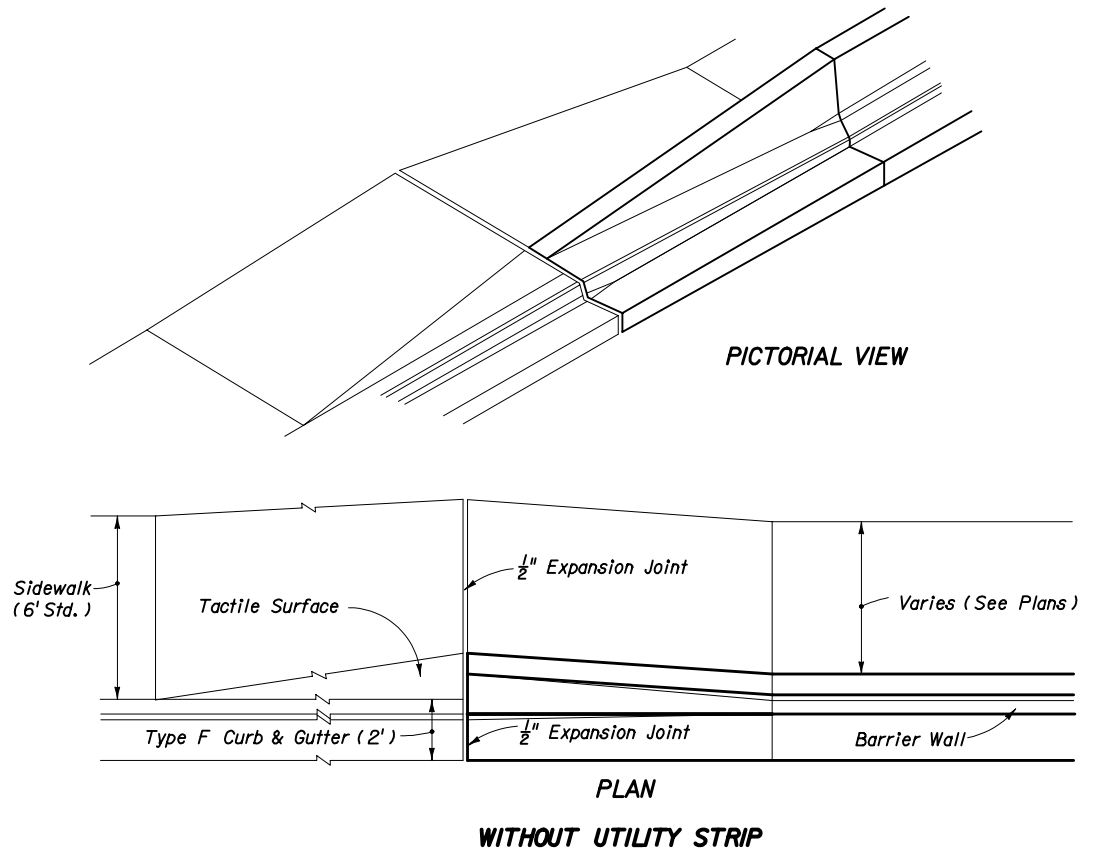
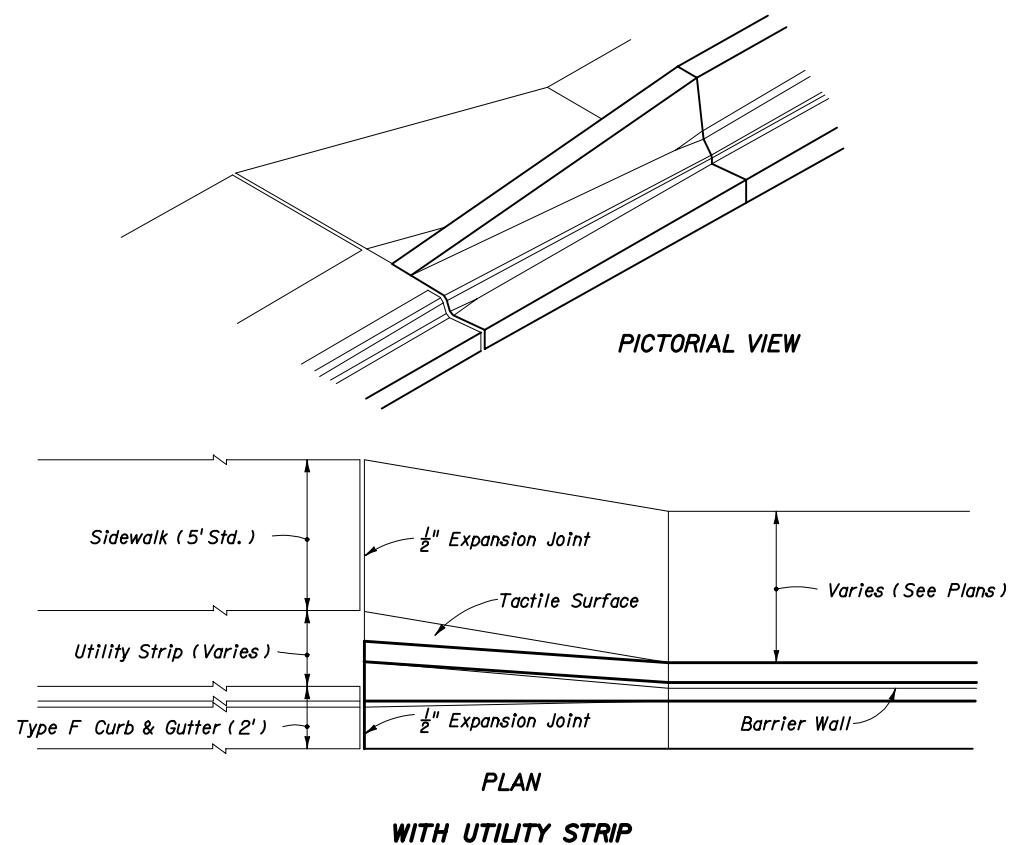


HAZARD 4' OR LESS FROM FACE OF CURB

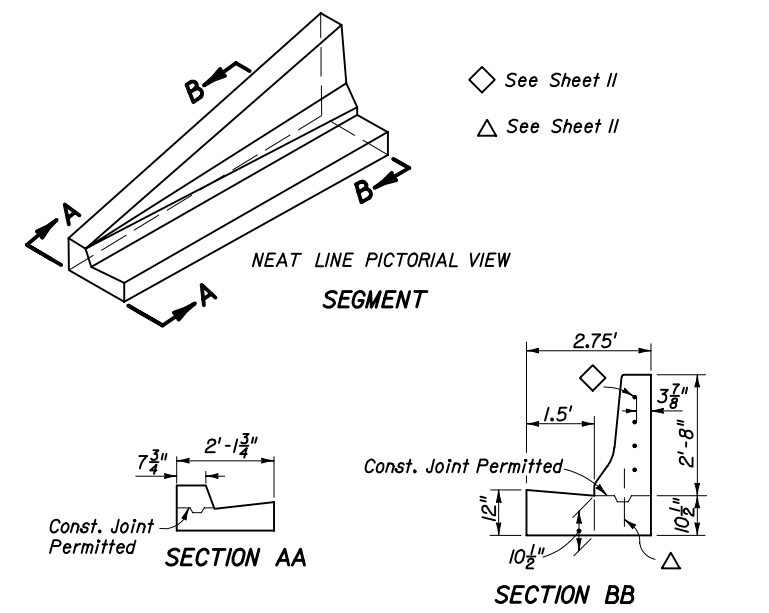
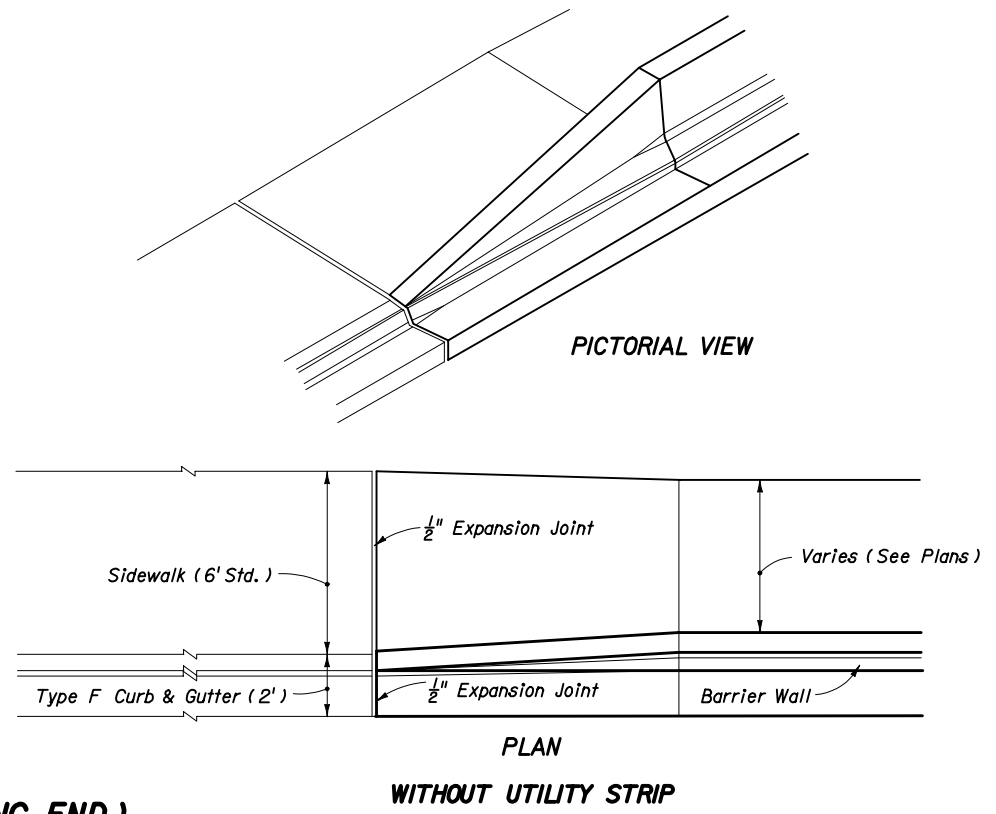
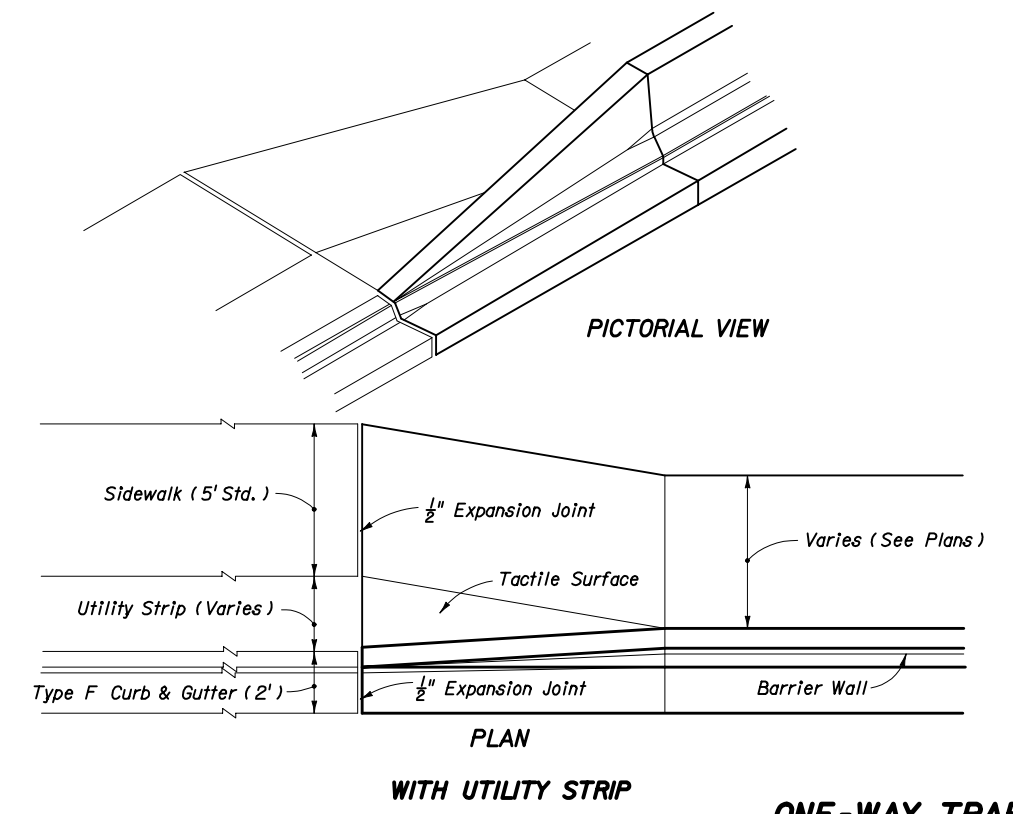
NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 12.
 For locations with utility strips see Sheet 8.
 For transition, sidewalk and sectional details see Sheet 10 & 11.
 The 1.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheet 19.

**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
 CURB AND GUTTER WITHOUT UTILITY STRIP AND WITH ADJACENT BICYCLE LANE**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	STAFF	Dates	10/97	Approved By
Drawn By	HKH	10/97	Revision	Sheet No.
Checked By	JVG	10/97	00	9 of 22
				Index No. 410



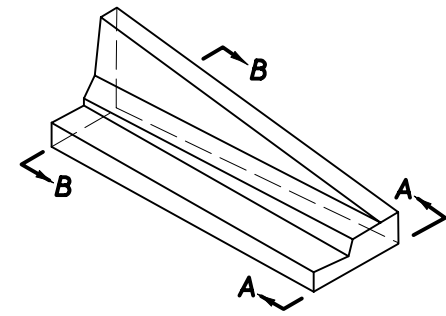
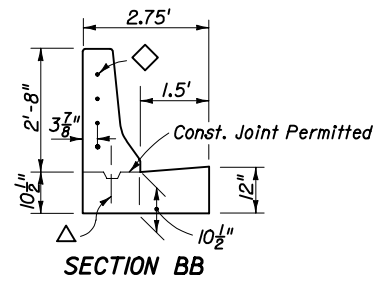
TWO-WAY TRAFFIC (OPPOSING LANE APPROACH)



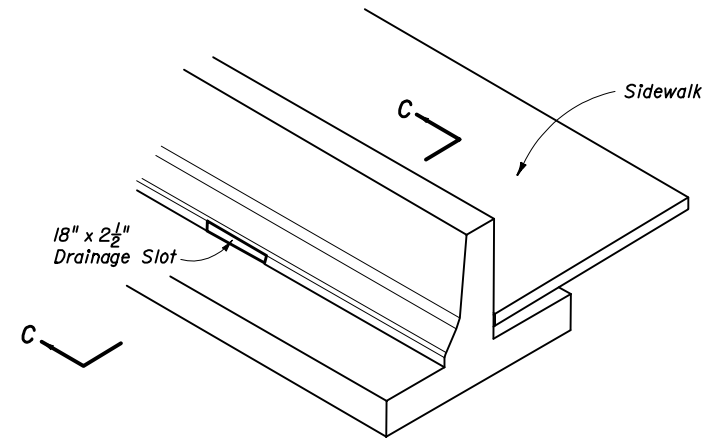
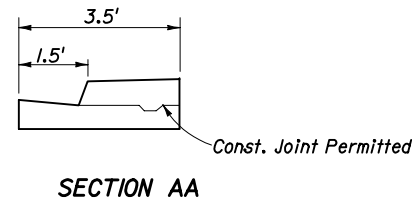
ONE-WAY TRAFFIC (TRAILING END)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENTS • WITH ADJACENT BICYCLE LANE

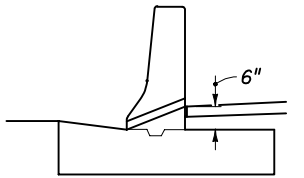
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Names	Dates	Approved By <i>Samuel D. Milk</i>		
Designed By STAFF	10/97	Roadway Design Engineer		
Drawn By HKH	10/97	Revision	Sheet No.	Index No.
Checked By JVG	10/97	00	10 of 22	410



WITH OR WITHOUT UTILITY STRIP
NEAT LINE PICTORIAL VIEW

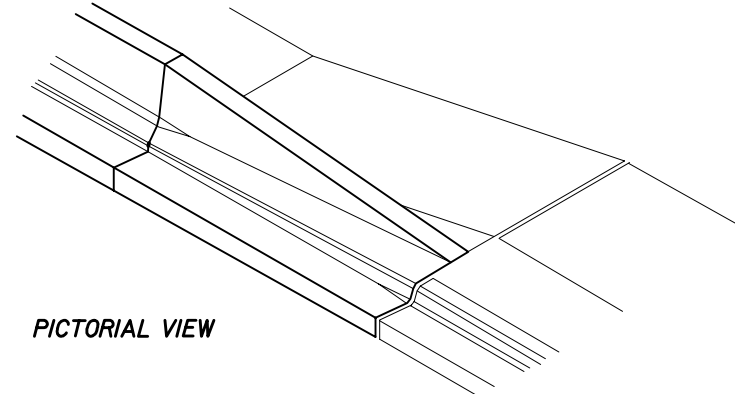


NEAT LINE PICTORIAL VIEW

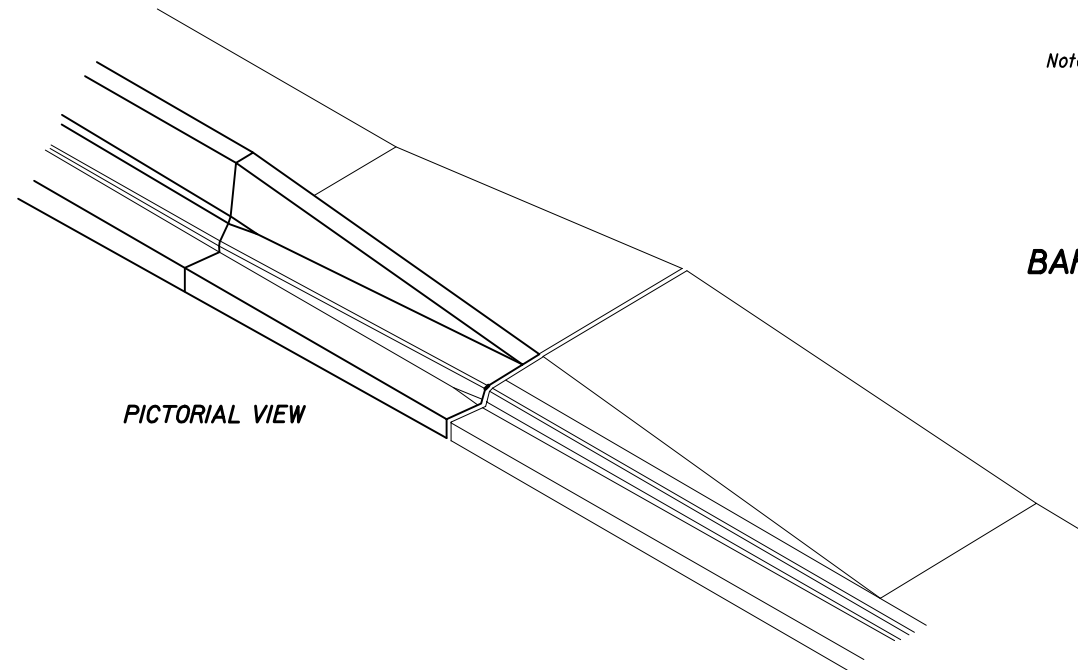


SECTION CC

◇ See Notes This Sheet
△ See Notes This Sheet



PICTORIAL VIEW



PICTORIAL VIEW

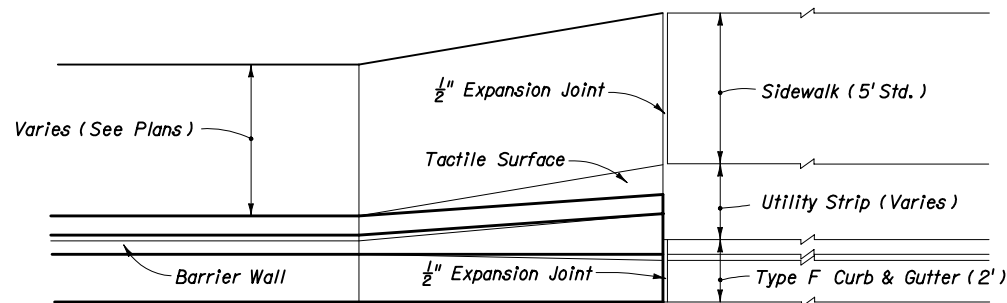
Note: Drainage slots shall be located at all low points along the sidewalk, and, unless otherwise shown in the plans, slots shall be spaced at intervals not exceeding 50' in fill sections and 20' in cut sections. Slots shall be located such that only one bar is cut away or deleted in front and back lines of vertical reinforcement.

SIDEWALK DRAINAGE SLOT FOR BARRIER WALL (RIGID) (CURB & GUTTER)

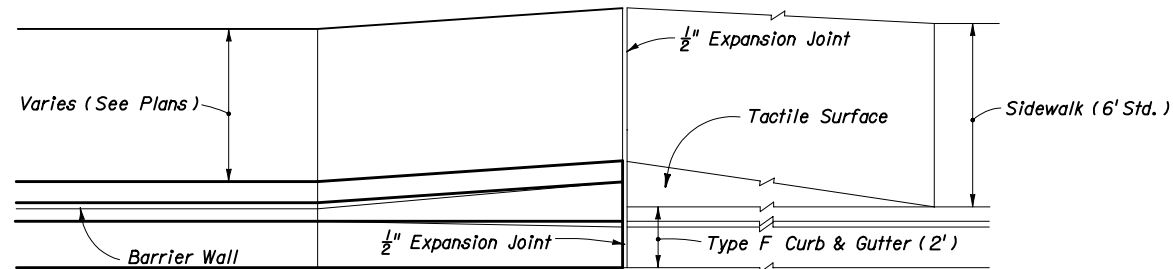
NOTE:

◇ Transition Segments Shall Be Doweled Into The End Of The Barrier Wall In The Following Manner:
Four 1 1/4" diameter holes 6" deep on 6" centers shall be drilled in the end of the barrier and #6 bars 15" long set in epoxy mortar. The ends of the dowels extending into the transition segment shall be wrapped with one layer of 15 lb. Type I asphalt-saturated roofing felt with the ends crimped.

△ When Construction Joints Are Utilized For Transition Segment Construction The Stem Shall Be Doweled To The Footing In The Following Manner:
Five #5 bars 15" long shall be embedded 7" into the footing. The dowels shall be spaced 15" on centers with the first dowel located 12" from the barrier wall. Dowels may be placed within or adjacent to the keyway.



PLAN
WITH UTILITY STRIP



PLAN
WITHOUT UTILITY STRIP

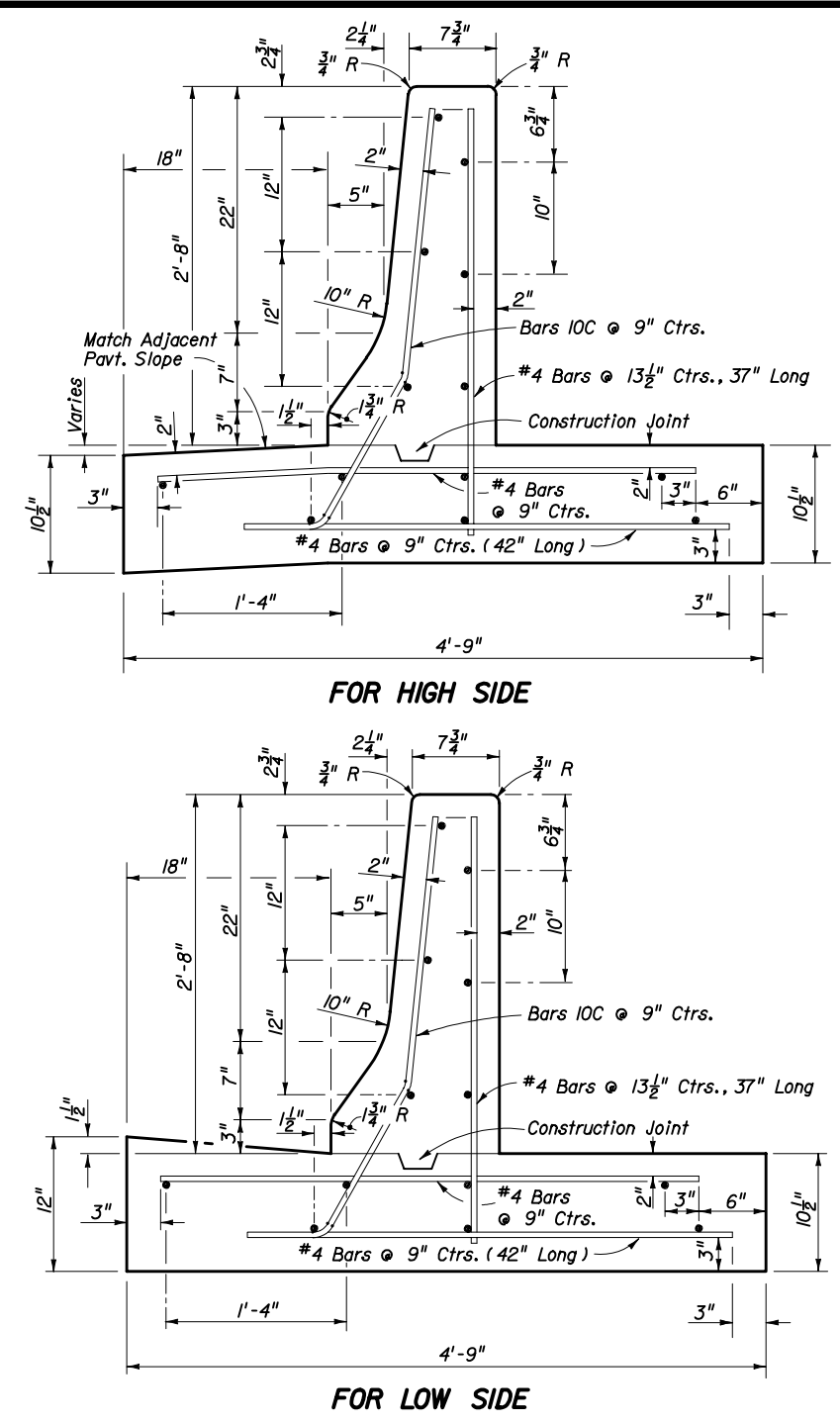
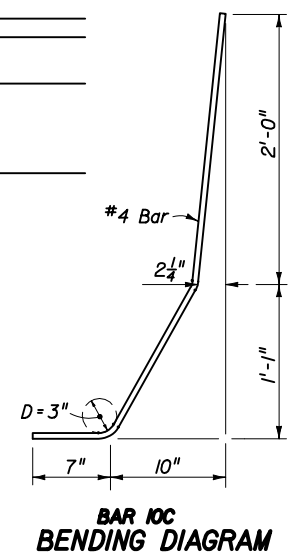
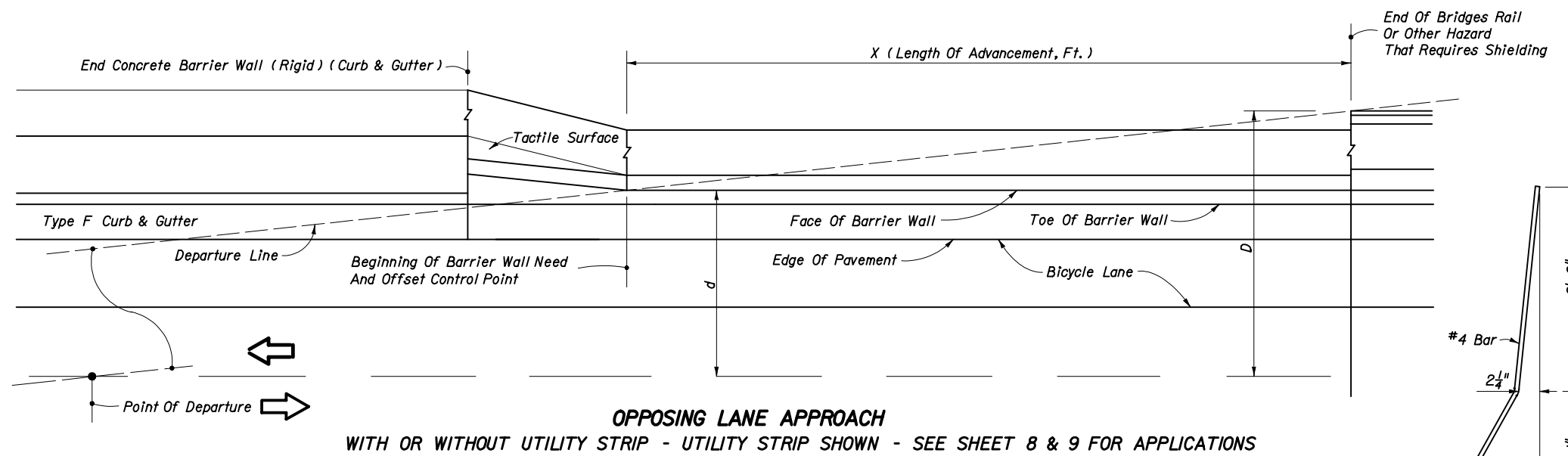
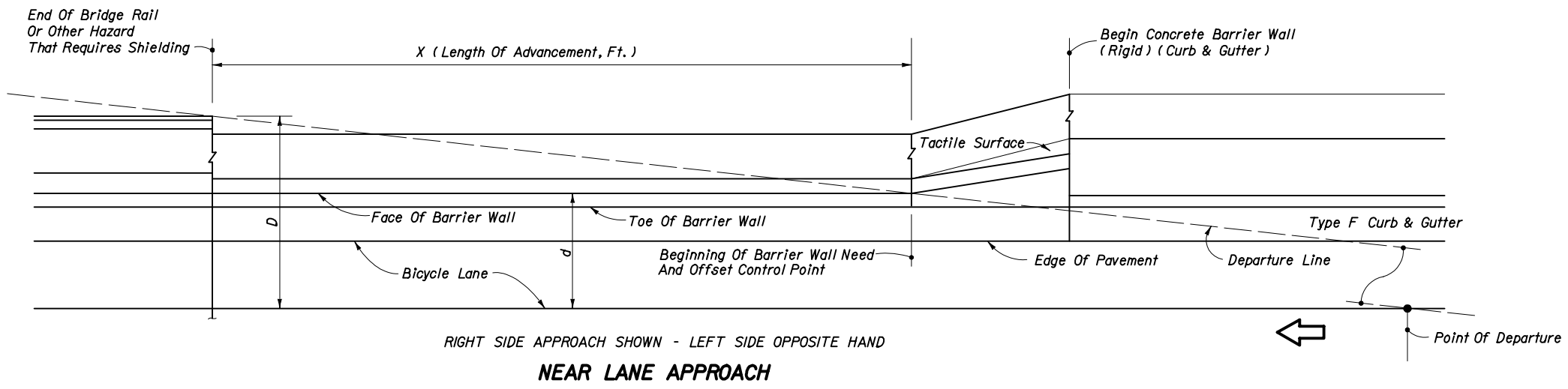
RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE HAND
ONE-WAY AND TWO-WAY TRAFFIC (NEAR LANE APPROACH)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENT • WITH ADJACENT BICYCLE LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER WALL

Names	Dates	Approved By		
Designed By	STAFF	10/97	 Roadway Design Engineer	
Drawn By	HKH	10/97		
Checked By	JVG	10/97	Revision	00
			Sheet No.	11 of 22
			Index No.	410



Design Speed mph	Length Of Advancement, Ft. (X)
≤45	= 16 (D-d)

Note: The minimum length of advancement for both near and opposing lane approaches is 40'.

Equation Variables:

D = Distance in feet from near edge of the near approach traffic lane to back of hazard or clear zone width whichever is lesser. For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the near approach traffic lane.

d = Distance in feet from near edge of the near approach traffic lane to the face of barrier (at offset control point). For left side hazards on two-way undivided facilities d is measured from the inside edge of the nearest opposing traffic lane.

Note: All longitudinal reinforcement #4 bars. Minimum segment length for this wall is 40'. Shorter segments due to construction or expansion joint shall be dowled in the manner described for 'Transition Segments' on Sheet II. Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at intervals so that spacing will not exceed 100'. For barrier wall inlet details see Index No. 219. Inlet extends into bicycle lane 12". Wall to be paid for under the contract unit Price for Concrete Barrier Wall (Rigid-Curb & Gutter), LF.

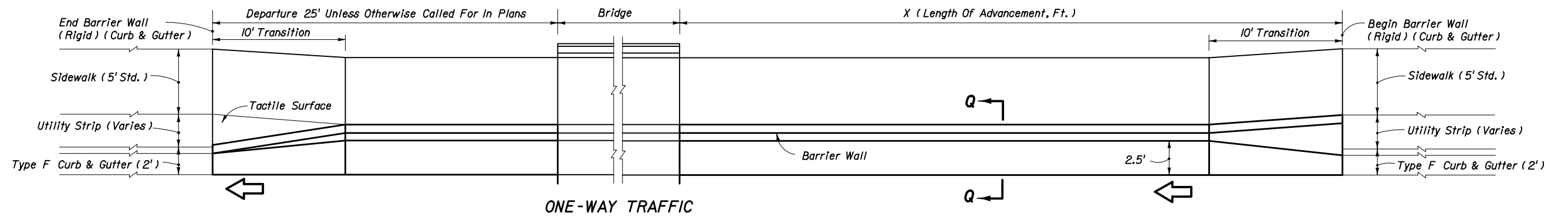
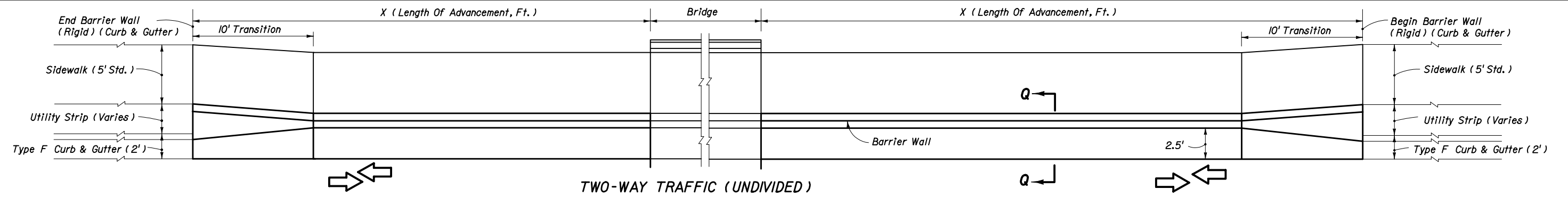
Estimated Quantities Per Linear Foot Of Wall:
Class II Concrete: 0.23 C.Y.
Reinforcing Steel: 20.7 Lbs.

LENGTH OF ADVANCEMENT

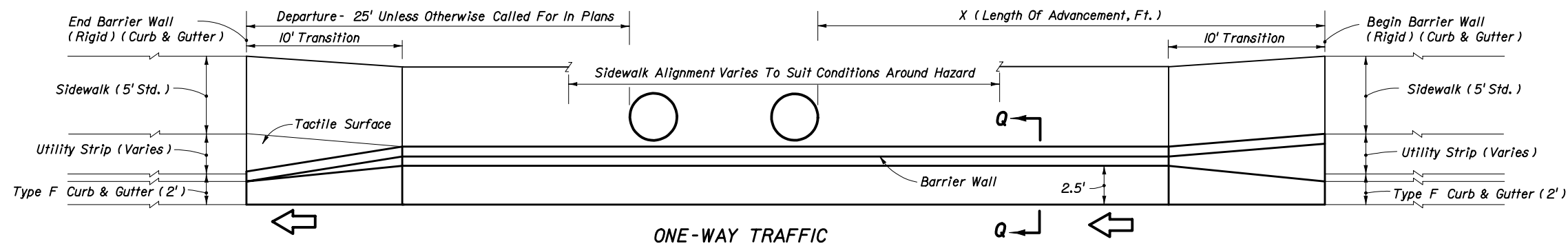
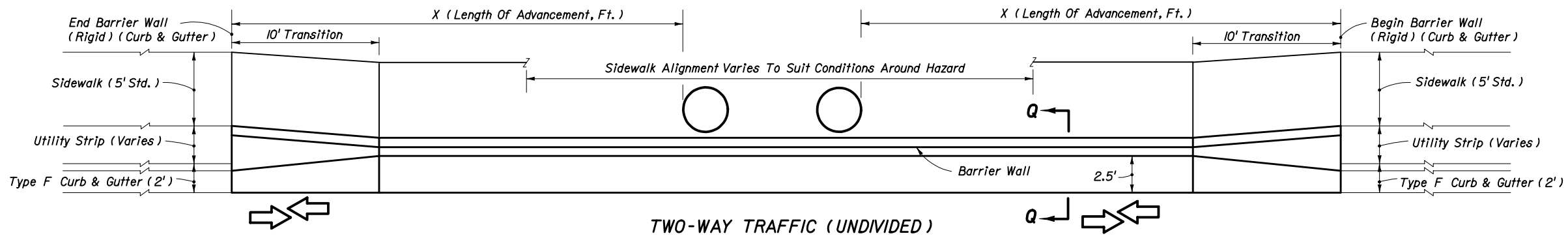
CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • WITH ADJACENT BICYCLE LANE

SECTION TT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Names	Dates	Approved By		
Designed By	STAFF	10/97	 Roadway Design Engineer	
Drawn By	HKH	10/97		
Checked By	JVG	10/97		
Revision	00	Sheet No.	12 of 22	Index No.
				410



BRIDGE END HAZARD

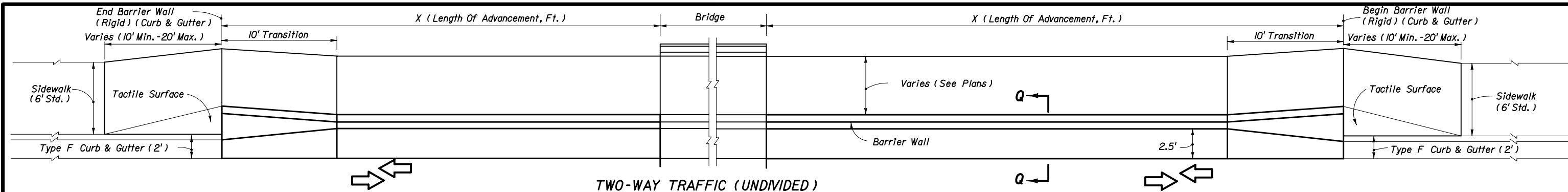


HAZARD 4' OR LESS FROM FACE OF CURB

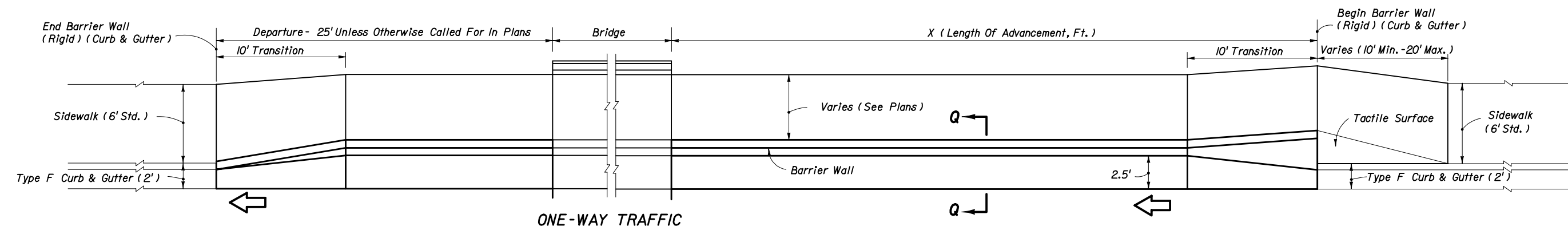
**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
CURB AND GUTTER WITH UTILITY STRIP AND WITHOUT ADJACENT BICYCLE LANE**

NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 17.
 For locations without utility strips see Sheet 14.
 For transition, sidewalk and sectional details see Sheets 15 & 16.
 The 2.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheet 19.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By <i>Jamell D. Milk</i>	
Drawn By	HSD	10/85	Revision	Sheet No. 13 of 22
Checked By	JBW/JVG	10/85	00	Index No. 410

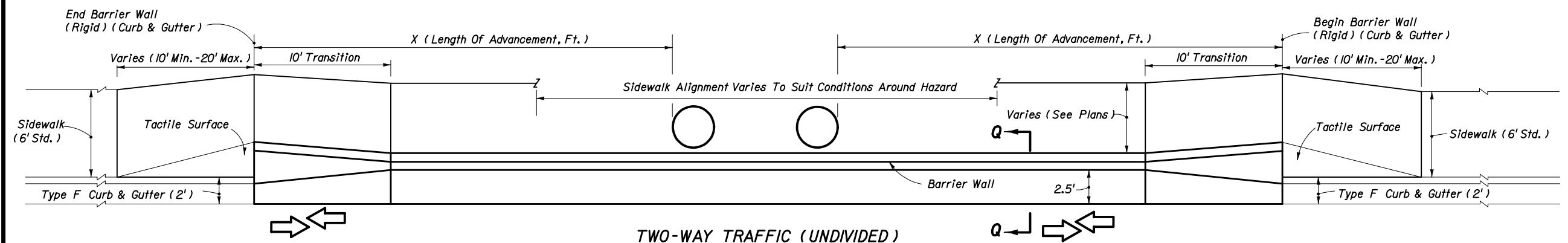


TWO-WAY TRAFFIC (UNDIVIDED)

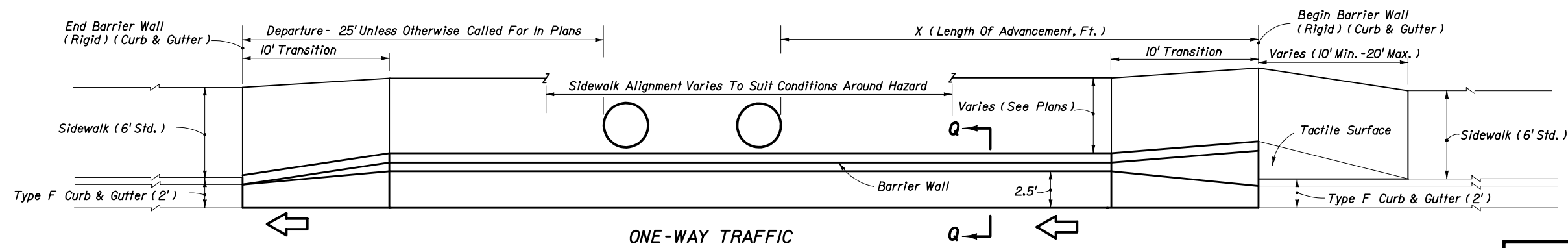


ONE-WAY TRAFFIC

BRIDGE END HAZARD



TWO-WAY TRAFFIC (UNDIVIDED)



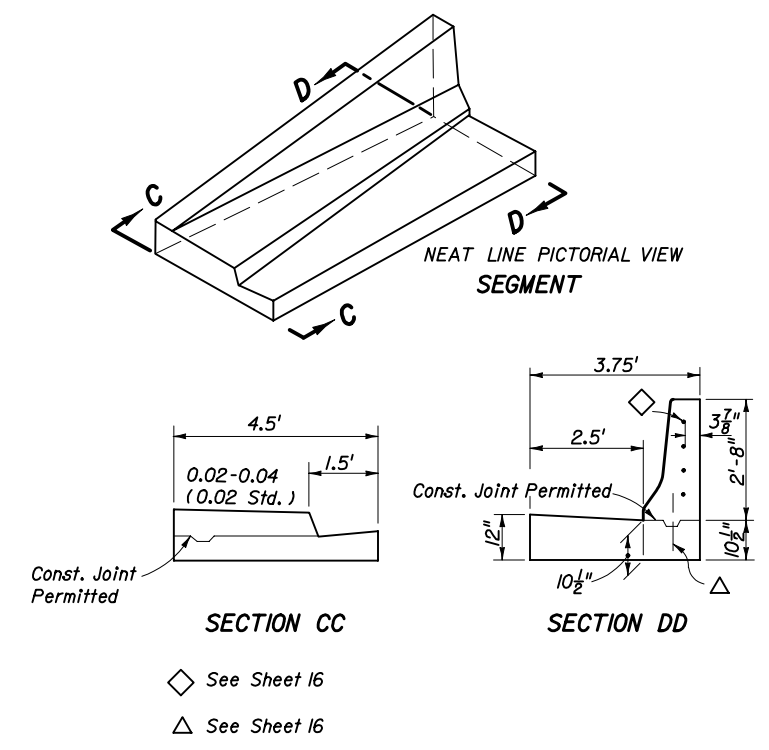
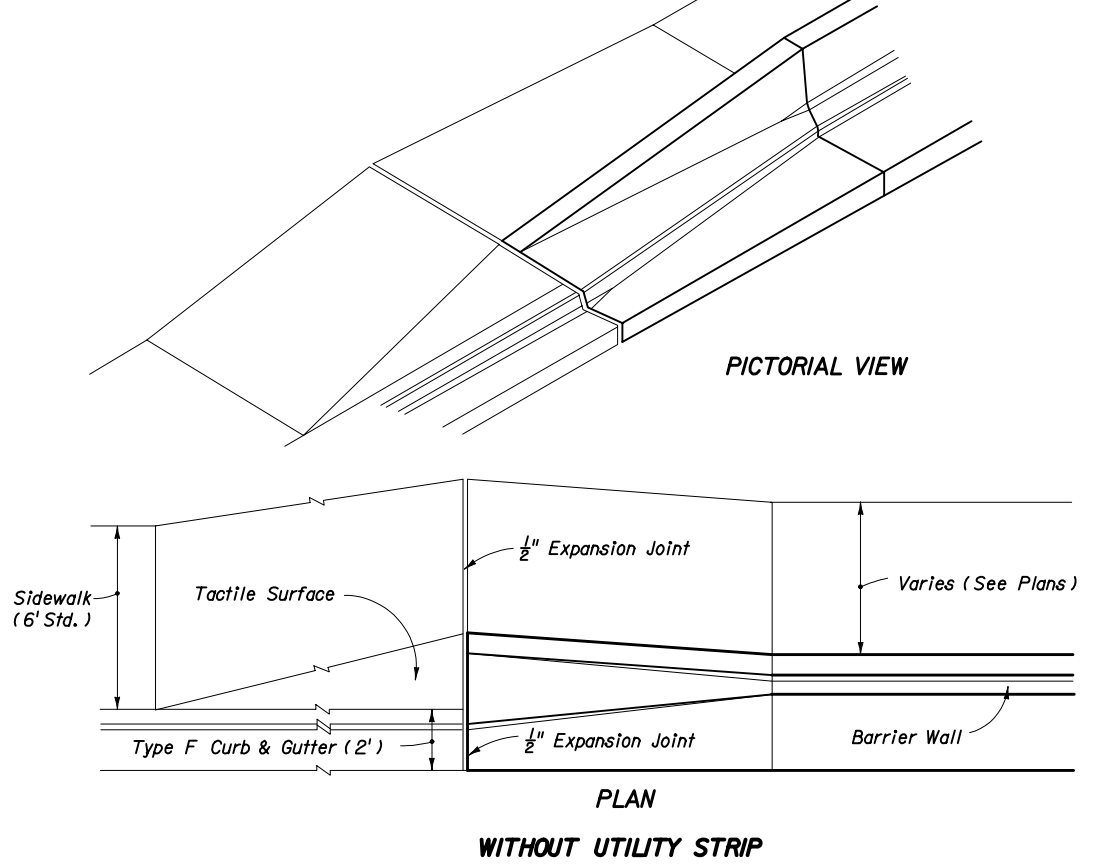
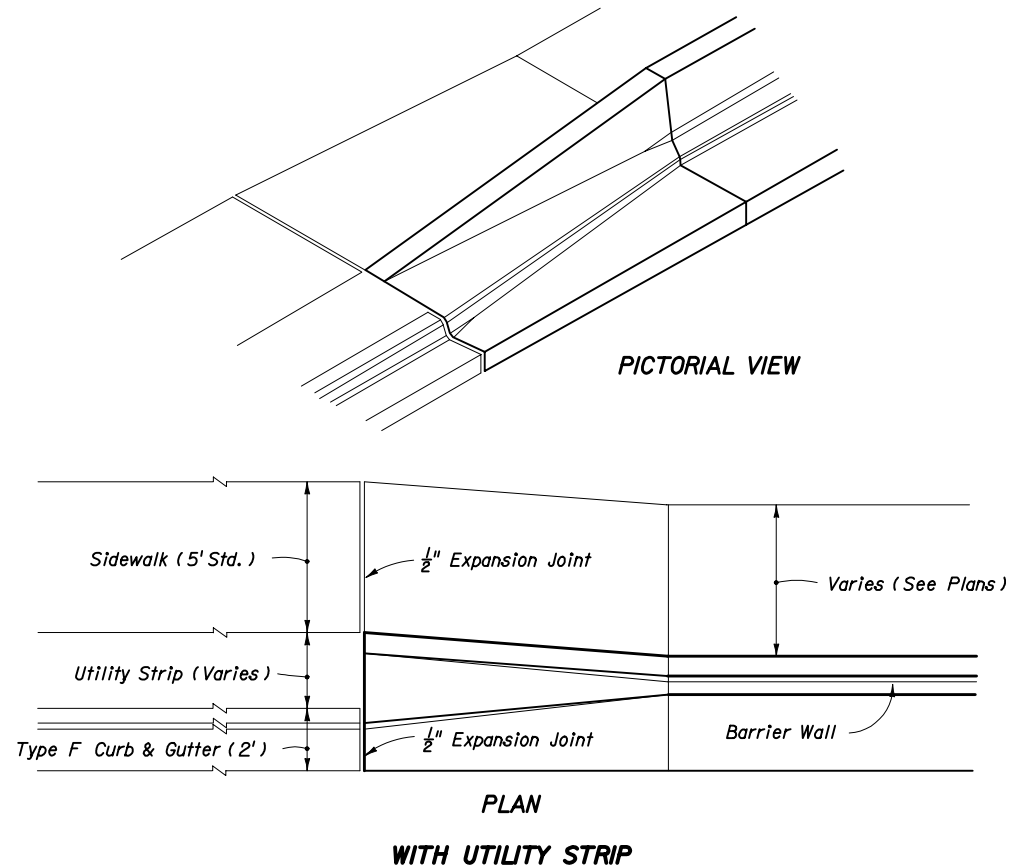
ONE-WAY TRAFFIC

HAZARD 4' OR LESS FROM FACE OF CURB

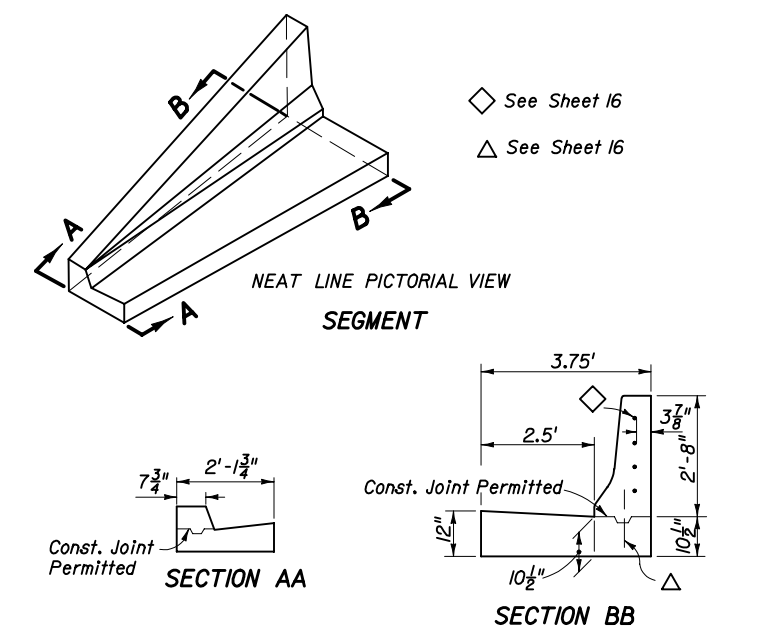
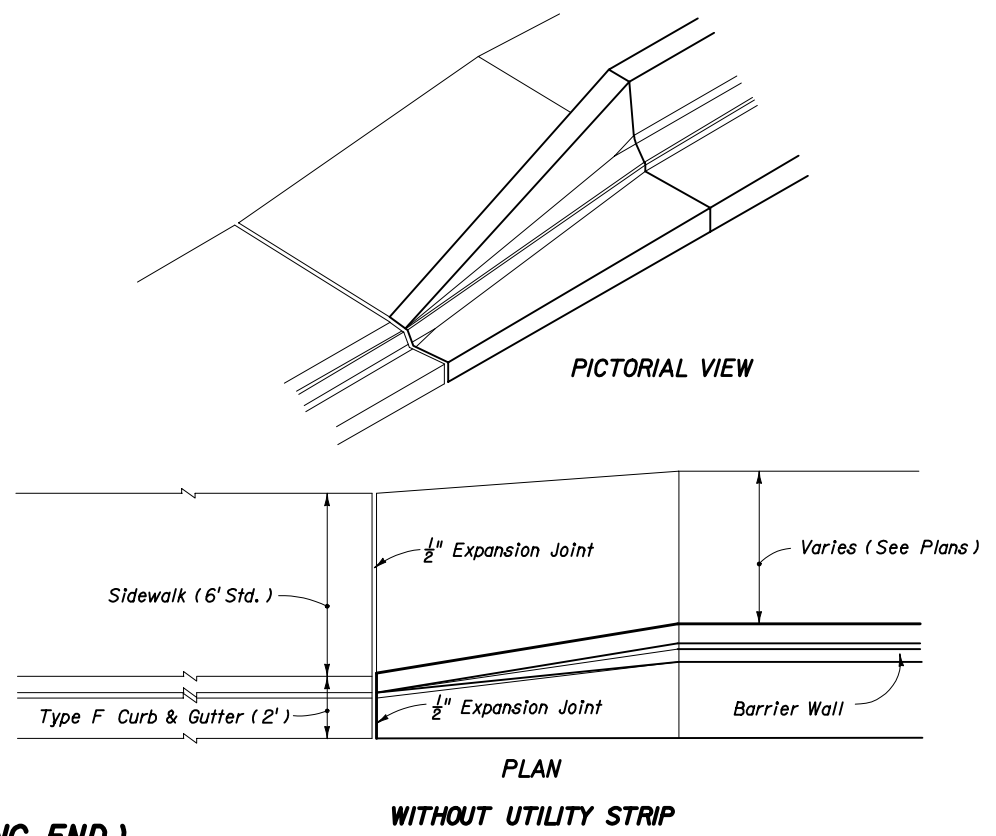
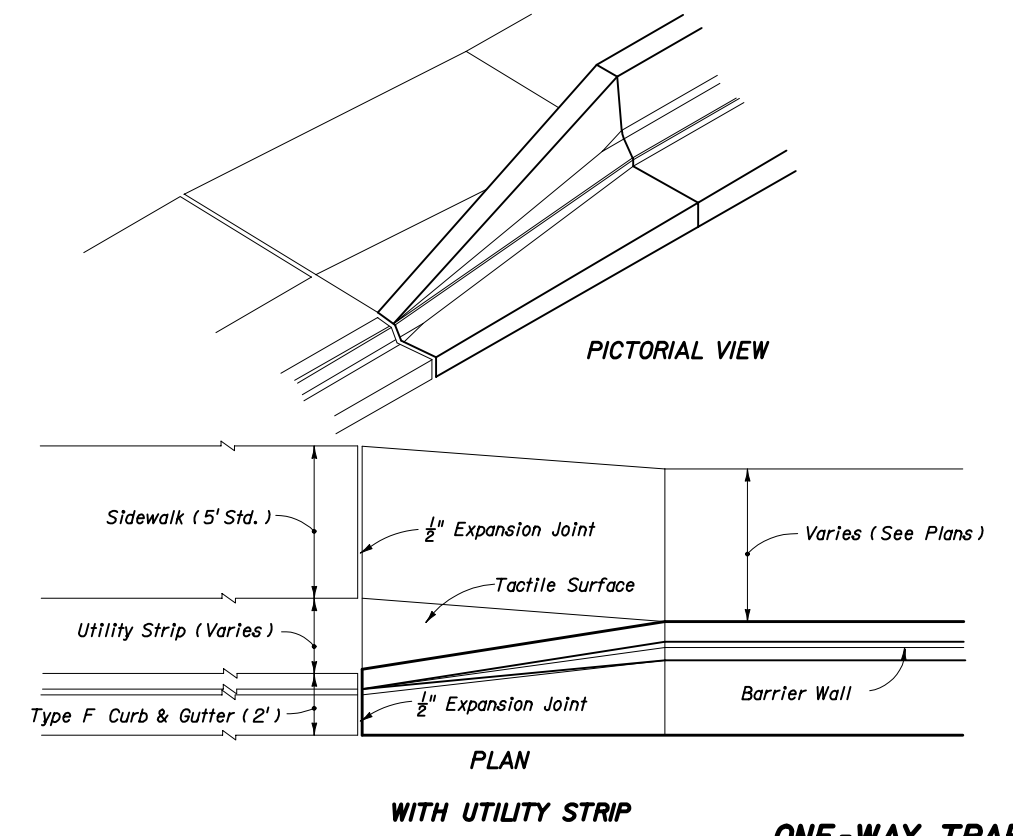
NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 17.
 For locations with utility strips see Sheet 13.
 For transition, sidewalk and sectional details see Sheet 15 & 16.
 The 2.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheet 19.

**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
 CURB AND GUTTER WITHOUT UTILITY STRIP AND WITHOUT ADJACENT BICYCLE LANE**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	10/85	<i>James D. Mill</i> Roadway Design Engineer	
Checked By	JBW/JVG	10/85	Revision	Sheet No.
			00	14 of 22
			Index No.	410



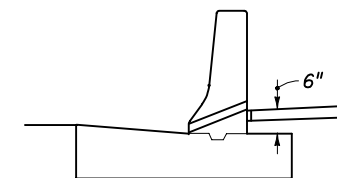
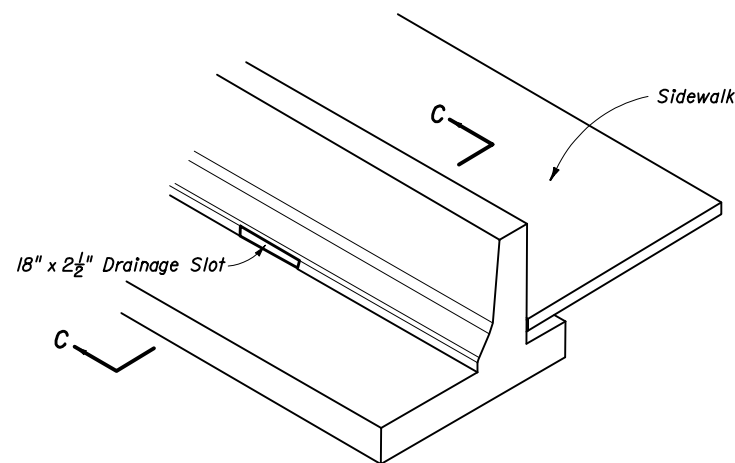
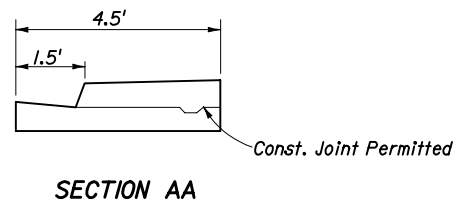
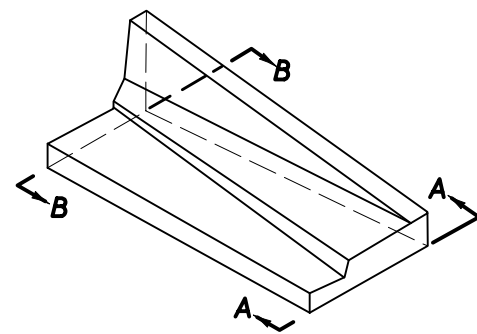
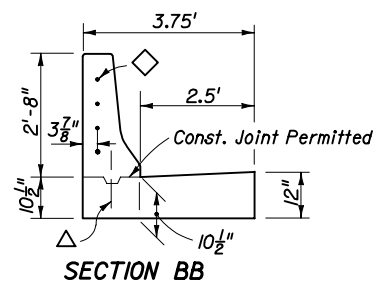
TWO-WAY TRAFFIC (OPPOSING LANE APPROACH)



ONE-WAY TRAFFIC (TRAILING END)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENTS • WITHOUT ADJACENT BICYCLE LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Names	Dates	Approved By <i>James D. Mill</i>		
Designed By		Roadway Design Engineer		
Drawn By	HSD 10/85	Revision	Sheet No.	Index No.
Checked By	JBW/JVG 10/85	00	15 of 22	410



◇ See Notes This Sheet
 △ See Notes This Sheet

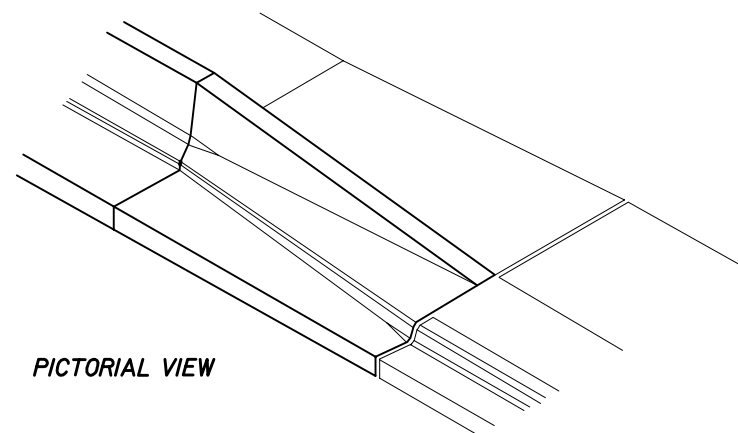
WITH OR WITHOUT UTILITY STRIP
 NEAT LINE PICTORIAL VIEW

NEAT LINE PICTORIAL VIEW

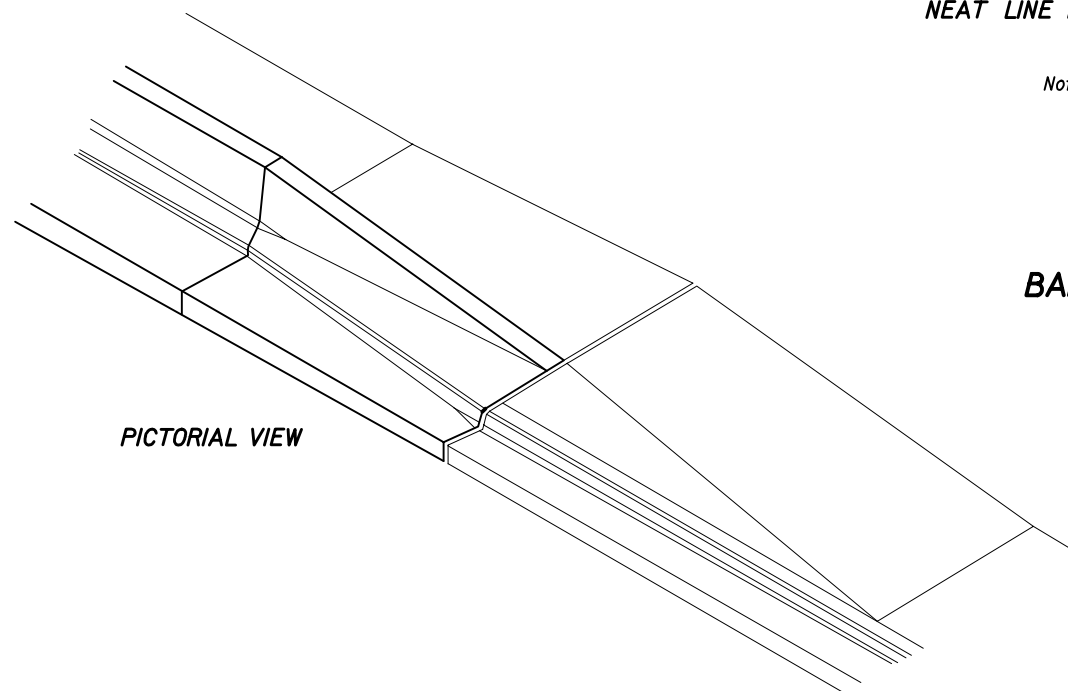
SECTION CC

Note: Drainage slots shall be located at all low points along the sidewalk, and, unless otherwise shown in the plans, slots shall be spaced at intervals not exceeding 50' in fill sections and 20' in cut sections. Slots shall be located such that only one bar is cut away or deleted in front and back lines of vertical reinforcement.

SIDEWALK DRAINAGE SLOT FOR BARRIER WALL (RIGID) (CURB & GUTTER)



PICTORIAL VIEW

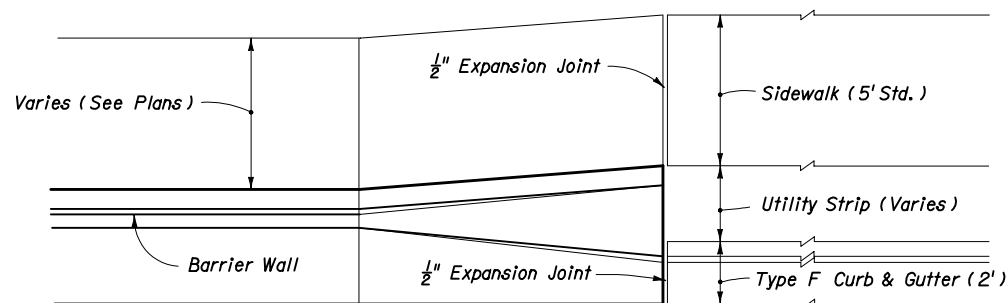


PICTORIAL VIEW

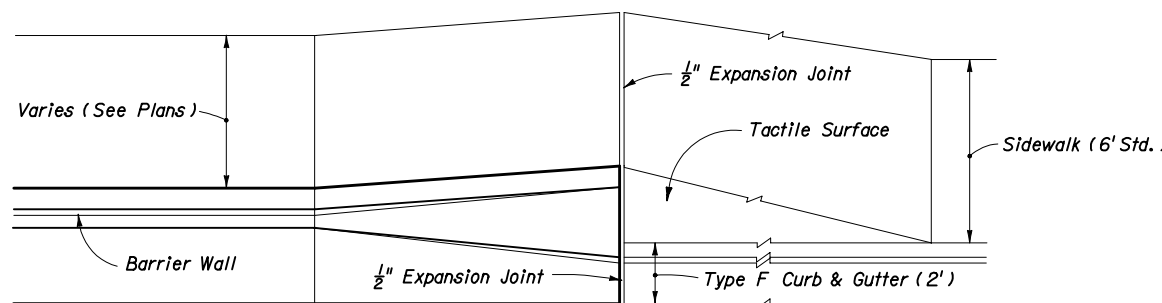
NOTE:

◇ Transition Segments Shall Be Doweled Into The End Of The Barrier Wall In The Following Manner:
 Four 1 1/4" diameter holes 6" deep on 6" centers shall be drilled in the end of the barrier and #6 bars 15" long set in epoxy mortar. The ends of the dowels extending into the transition segment shall be wrapped with one layer of 15 lb. Type I asphalt-saturated roofing felt with the ends crimped.

△ When Construction Joints Are Utilized For Transition Segment Construction The Stem Shall Be Doweled To The Footing In The Following Manner:
 Five #5 bars 15" long shall be embedded 7" into the footing. The dowels shall be spaced 15" on centers with the first dowel located 12" from the barrier wall. Dowels may be placed within or adjacent to the keyway.



PLAN
 WITH UTILITY STRIP



PLAN
 WITHOUT UTILITY STRIP


RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE HAND

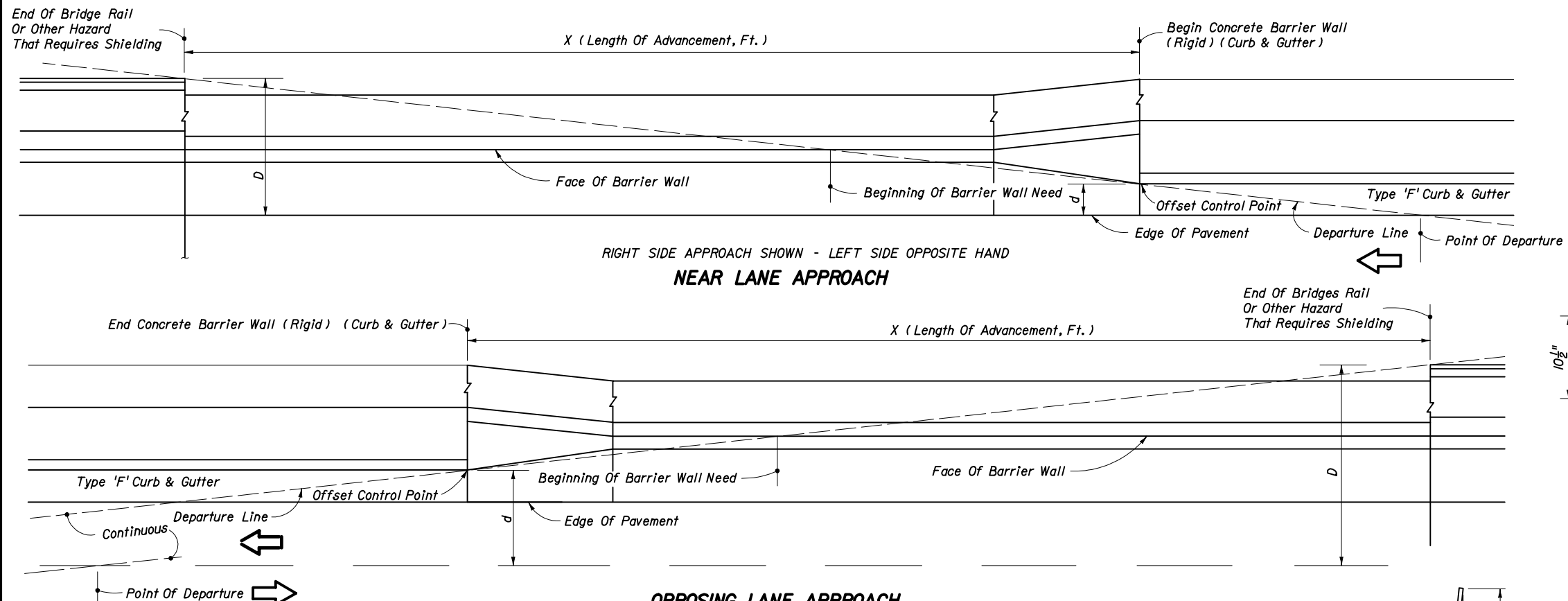
ONE-WAY AND TWO-WAY TRAFFIC (NEAR LANE APPROACH)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENT • WITHOUT ADJACENT BICYCLE LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER WALL

Names	Dates	Approved By		
Designed By		 Roadway Design Engineer		
Drawn By	HSD 10/85			
Checked By	JBW/JVG 10/85	Revision	Sheet No.	Index No.
		00	16 of 22	410



OPPOSING LANE APPROACH
WITH OR WITHOUT UTILITY STRIP - UTILITY STRIP SHOWN - SEE SHEET 13 & 14 FOR APPLICATIONS

Design Speed mph	Length Of Advancement, Ft. (X)
≤ 45	16 (D-d)

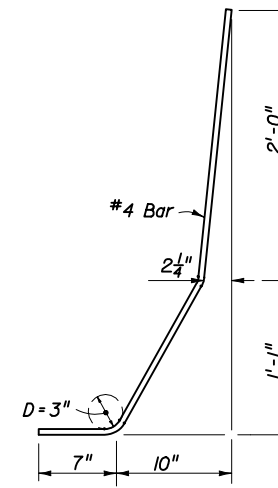
Note: The minimum length of advancement for both near and opposing lane approaches is 40'.

Equation Variables:

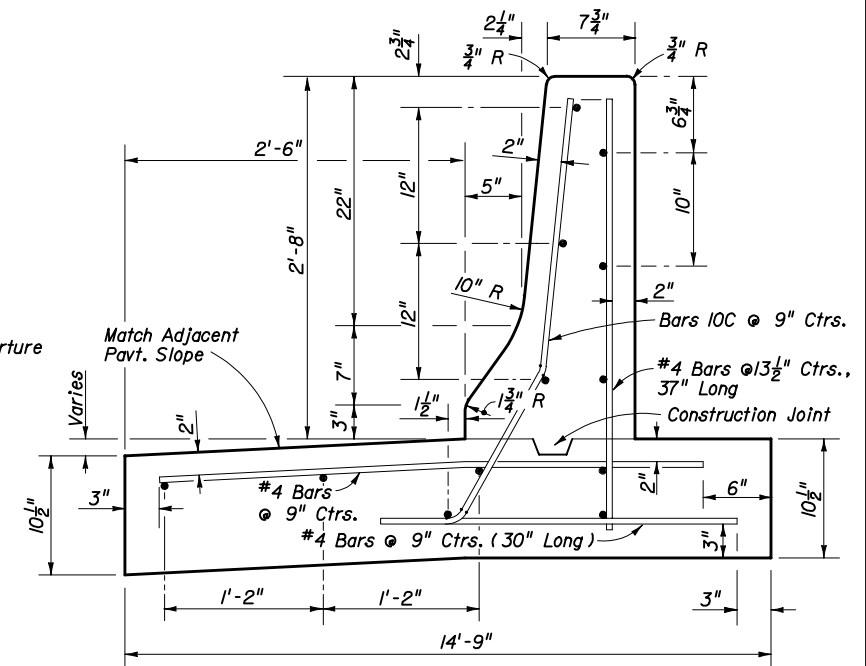
D = Distance in feet from near edge of the near approach traffic lane to back of hazard or clear zone width whichever is lesser. For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the near approach traffic lane.

d = Distance in feet from near edge of the near approach traffic lane to the face of curb (at offset control point). For left side hazards on two-way undivided facilities d is measured from the inside edge of the nearest opposing traffic lane.

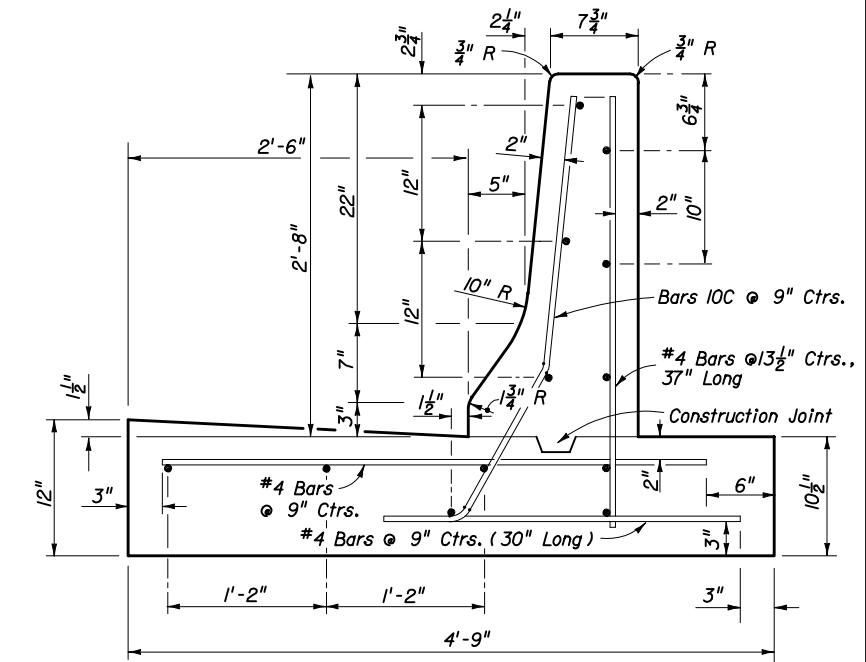
LENGTH OF ADVANCEMENT



BAR 10C BENDING DIAGRAM



FOR HIGH SIDE



FOR LOW SIDE

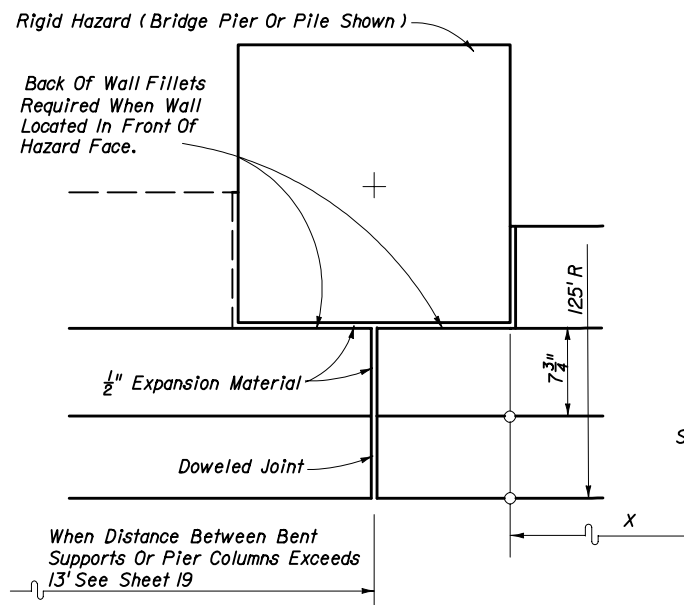
Note: All longitudinal reinforcement #4 bars. Minimum segment length for this wall is 40'. Shorter segments due to construction or expansion joint shall be doweled in the manner described for 'Transition Segments' on Sheet 16. Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at intervals so that spacing will not exceed 100'. For barrier wall inlet details see Index No. 219. Wall to be paid for under the contract unit Price for Concrete Barrier Wall (Rigid-Curb & Gutter), LF.

Estimated Quantities Per Linear Foot Of Wall:
Class II Concrete: 0.23 C.Y.
Reinforcing Steel: 19.7 Lbs.

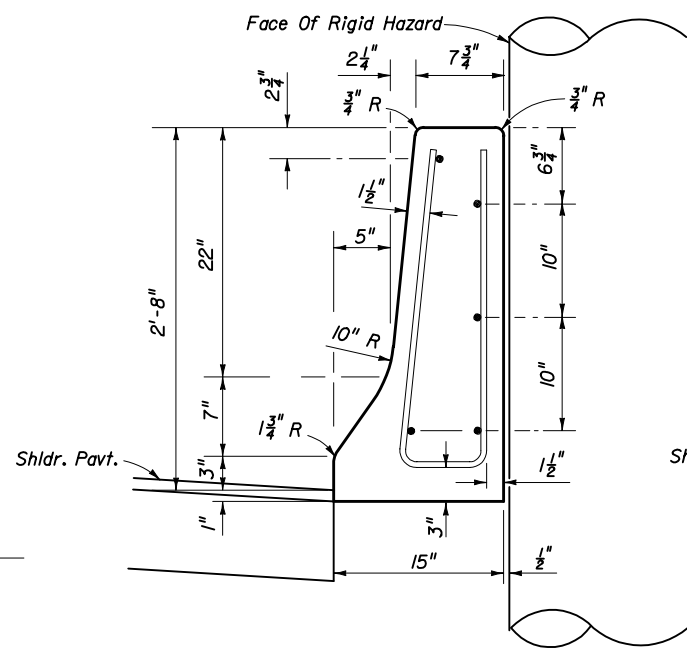
SECTION QQ

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • WITHOUT ADJACENT BICYCLE LANE

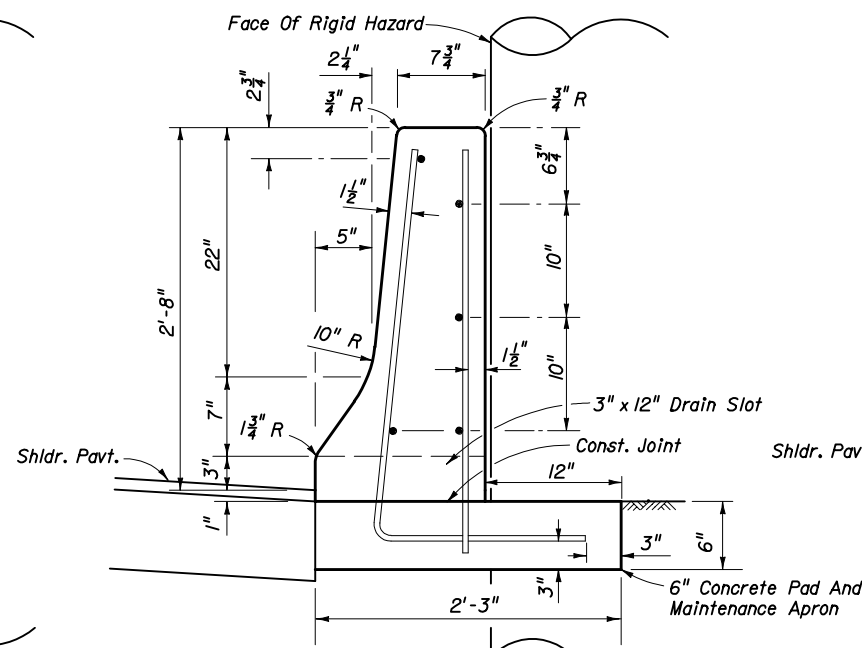
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Names	Dates	Approved By <i>James D. Milk</i>		
Designed By		Roadway Design Engineer		
Drawn By	HSD 10/85	Revision	Sheet No.	Index No.
Checked By	JBW/JVG 10/85	00	17 of 22	410



BARRIER WALL AT SQUARE OR RECTANGULAR SHAPED HAZARD
PARTIAL PLAN

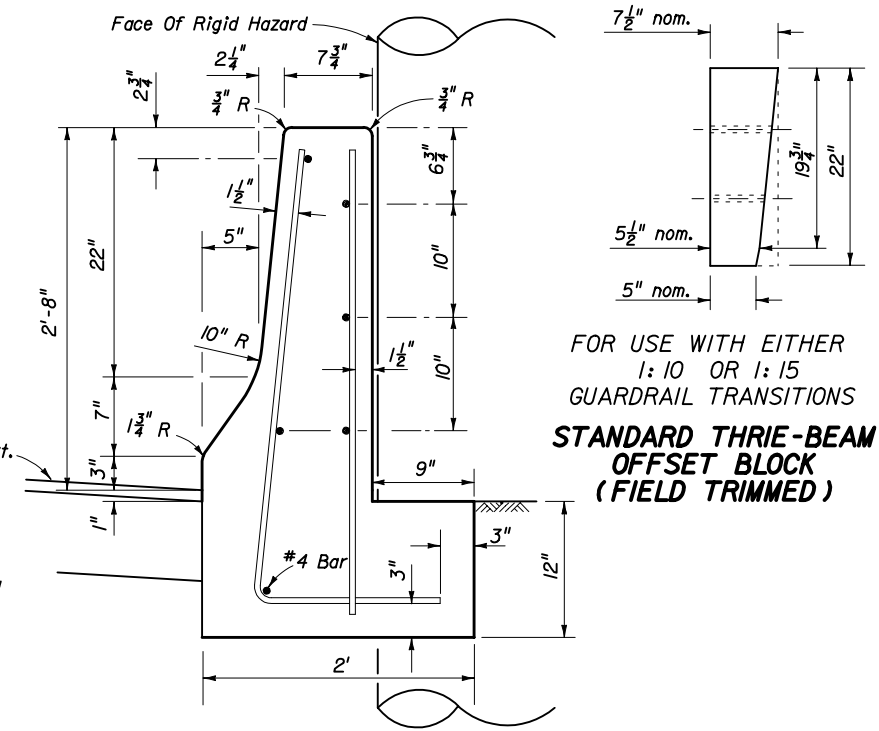


SECTION AA



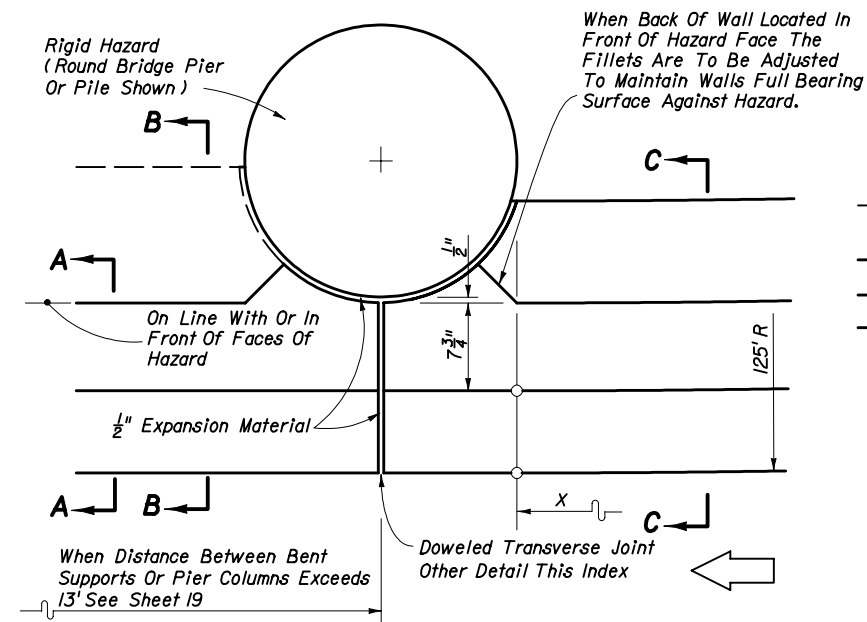
SECTION BB

TO BE CONST. IN LIEU OF SECTION AA WHEN THRU DRAINAGE REQUIRED



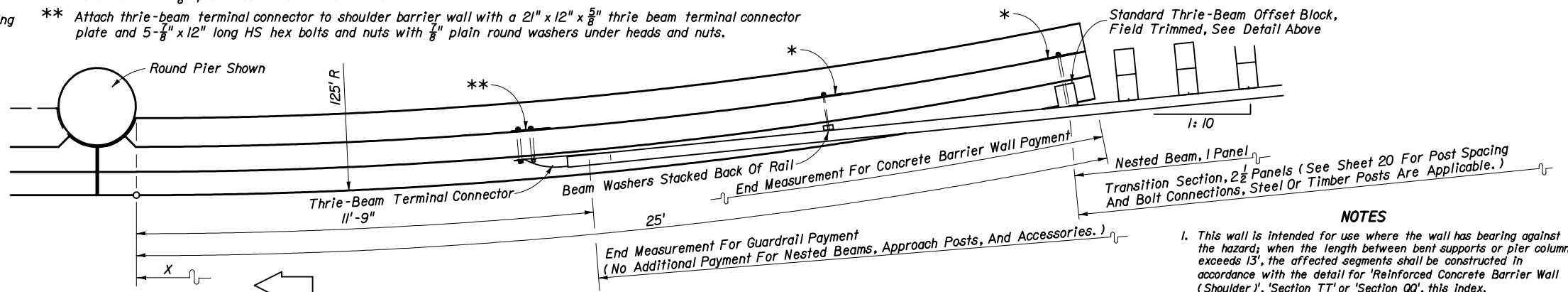
SECTION CC

FOR USE WITH EITHER
1:10 OR 1:15
GUARDRAIL TRANSITIONS
**STANDARD THRIE-BEAM
OFFSET BLOCK
(FIELD TRIMMED)**

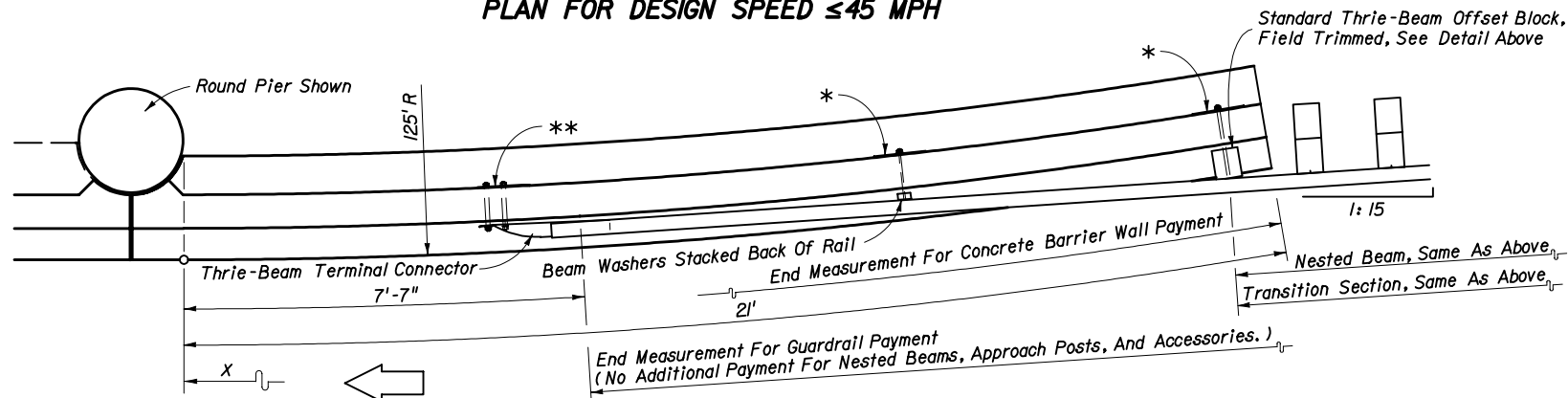


BARRIER WALL AT ROUND HAZARD
PARTIAL PLAN

- * 12" x 12" x 1/4" galvanized steel back-up plate with 5/8" post bolts (either 14" or 18" long) and nuts with 5/8" plain round washers under nuts.
- ** Attach thrie-beam terminal connector to shoulder barrier wall with a 21" x 12" x 5/8" thrie beam terminal connector plate and 5-7/8" x 12" long HS hex bolts and nuts with 1/8" plain round washers under heads and nuts.



PLAN FOR DESIGN SPEED ≤ 45 MPH



PLAN FOR DESIGN SPEED ≥ 50 MPH

Note: For continuous barrier between independent bents or single pier columns see Sheet 19.

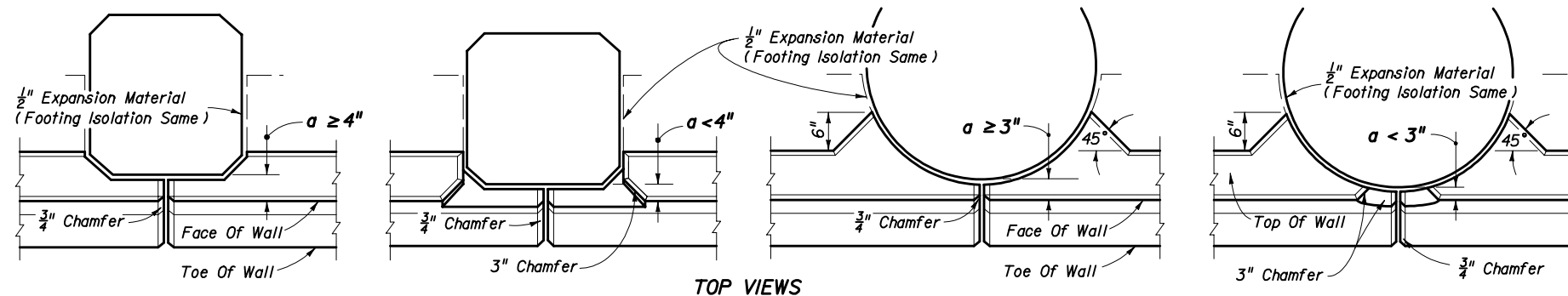
**SHOULDER BARRIER WALL AT ABOVE GROUND RIGID HAZARDS
WHEN GUARDRAIL OFFSET FROM HAZARD LESS THAN 3'**

- NOTES**
- This wall is intended for use where the wall has bearing against the hazard; when the length between bent supports or pier columns exceeds 13', the affected segments shall be constructed in accordance with the detail for 'Reinforced Concrete Barrier Wall (Shoulder)', 'Section TT' or 'Section QQ', this index. In cases where the barrier wall and slope pavement or other structure would occupy the same location, the wall and structure are to be modified as detailed in the plans.
 - The barrier wall radial segments are intended for use on approach and trailing ends of both one-way and two-way facilities. The guardrail connections shown on this sheet apply to one-way approaches and to the approaching and trailing ends of two-lane two-way facilities. On trailing ends of two-way multilane and one-way facilities the end connection on Sheet 2 may be used. For walls with normal offsets from hazards and their guardrail connections, see Sheet 20.
 - All vertical reinforcement #4 bars at 12" centers. All horizontal bars #5 bars.
 - Refer to Index No. 400 for additional guardrail information.
 - Wall to be paid for under the contract unit price for Barrier Wall Concrete (Rigid-Shoulder), LF.

ARC LENGTH (FT)	DISTANCE "x" (FT)	OFFSETS "y" "y" (FT)
4	4.00	0.06
8	7.99	0.26
12	11.98	0.58
16	15.96	1.02
20	19.91	1.60
24	23.85	2.30
25	24.83	2.49

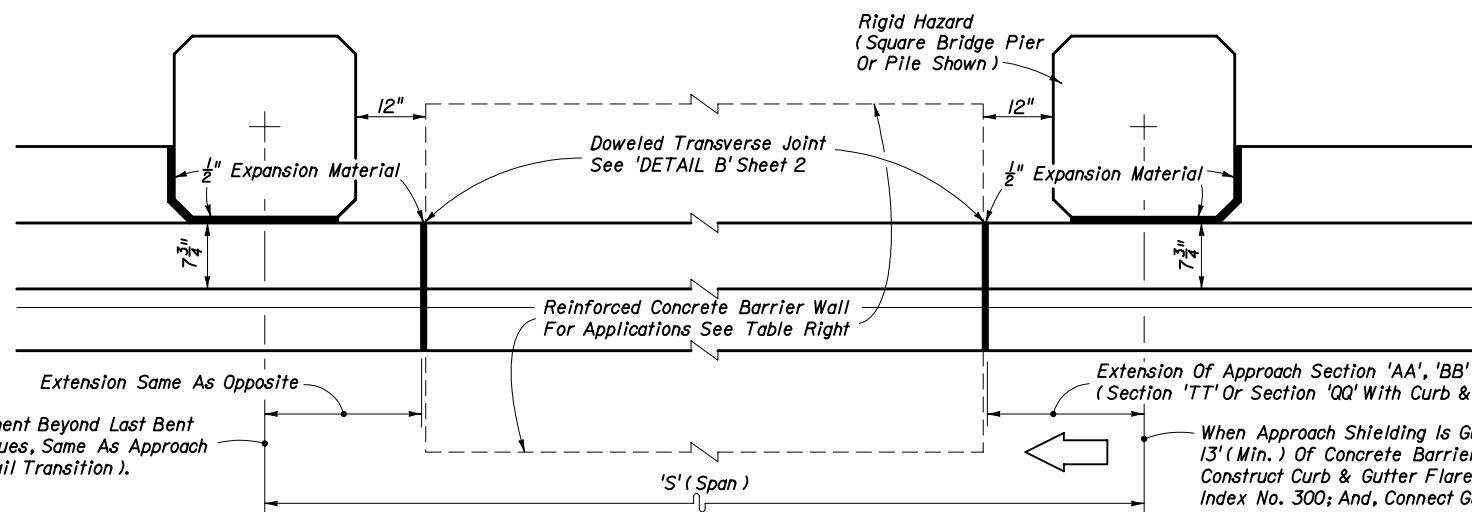
Note: Wall may be constructed in chords having lengths ≤ 4 feet.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	11/89	<i>James D. Milk</i> Roadway Design Engineer	
Checked By	JVG/KNM	11/89	Revision	Sheet No.
			00	18 of 22
				Index No. 410



'a' Varies (Circular Or Octagonal Hazard Not More Than 2" In Front Of Face Of Wall).
 Applicable To Sections 'AA' And 'BB' With Spans Of $\leq 13'$, And To Section 'CC', Sheet No. 18.
 Applicable To Other Rigid Walls Of This Index For Spans $> 13'$ Unless Otherwise Shown In The Plans.

HAZARD PENETRATING STEM OF RIGID CONCRETE BARRIER WALLS

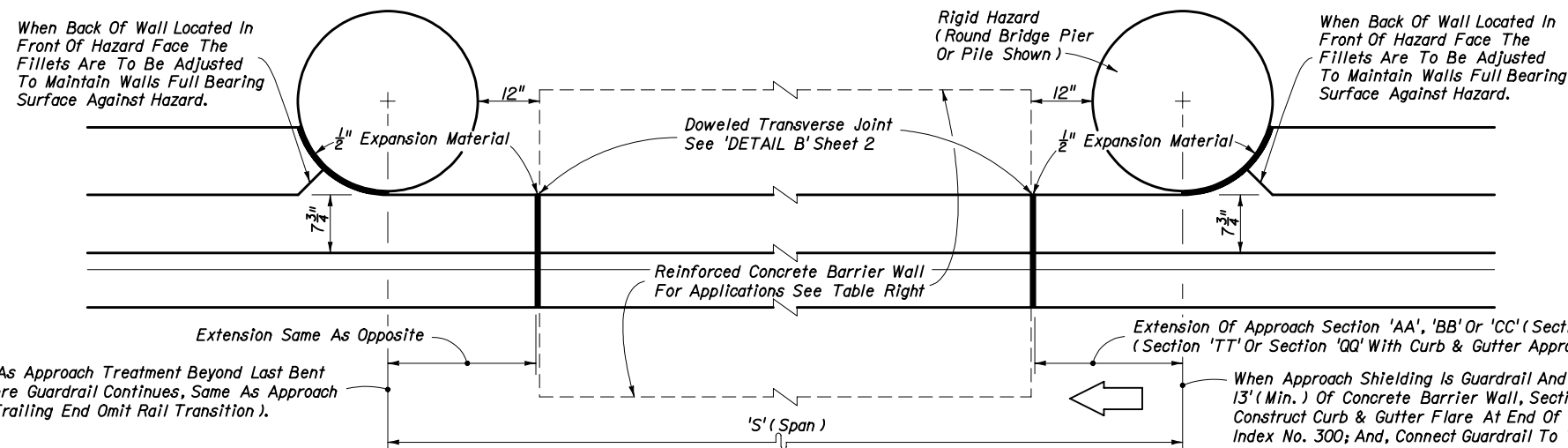


Construct Wall Same As Approach Treatment Beyond Last Bent Support Or Pier (Where Guardrail Continues, Same As Approach Except On One Way Trailing End Omit Rail Transition).

TOP VIEW
BARRIER WALL AT SQUARE PIER

'S' feet	REINFORCED CONCRETE BARRIER WALL APPLICATIONS
>13'	'Reinforced Concrete Barrier Wall (Shoulder)' With Flush Shoulders; Or, Section 'TT' Or Section 'QQ' With Curb & Gutter
Barrier wall footings that conflict with bent or pier foundations shall be modified as described in the plans.	

Extension Of Approach Section 'AA', 'BB' Or 'CC' (Section 'CC' Shown) (Section 'TT' Or Section 'QQ' With Curb & Gutter Approach)
 When Approach Shielding Is Guardrail And Curb & Gutter, Construct 13' (Min.) Of Concrete Barrier Wall, Section 'TT' Or Section 'QQ'; Construct Curb & Gutter Flare At End Of Wall With Full Height Curb, Index No. 300; And, Connect Guardrail To Wall With Transition Rails In Accordance With Sheet No. 20.




Construct Wall Same As Approach Treatment Beyond Last Bent Support Or Pier (Where Guardrail Continues, Same As Approach Except On One Way Trailing End Omit Rail Transition).

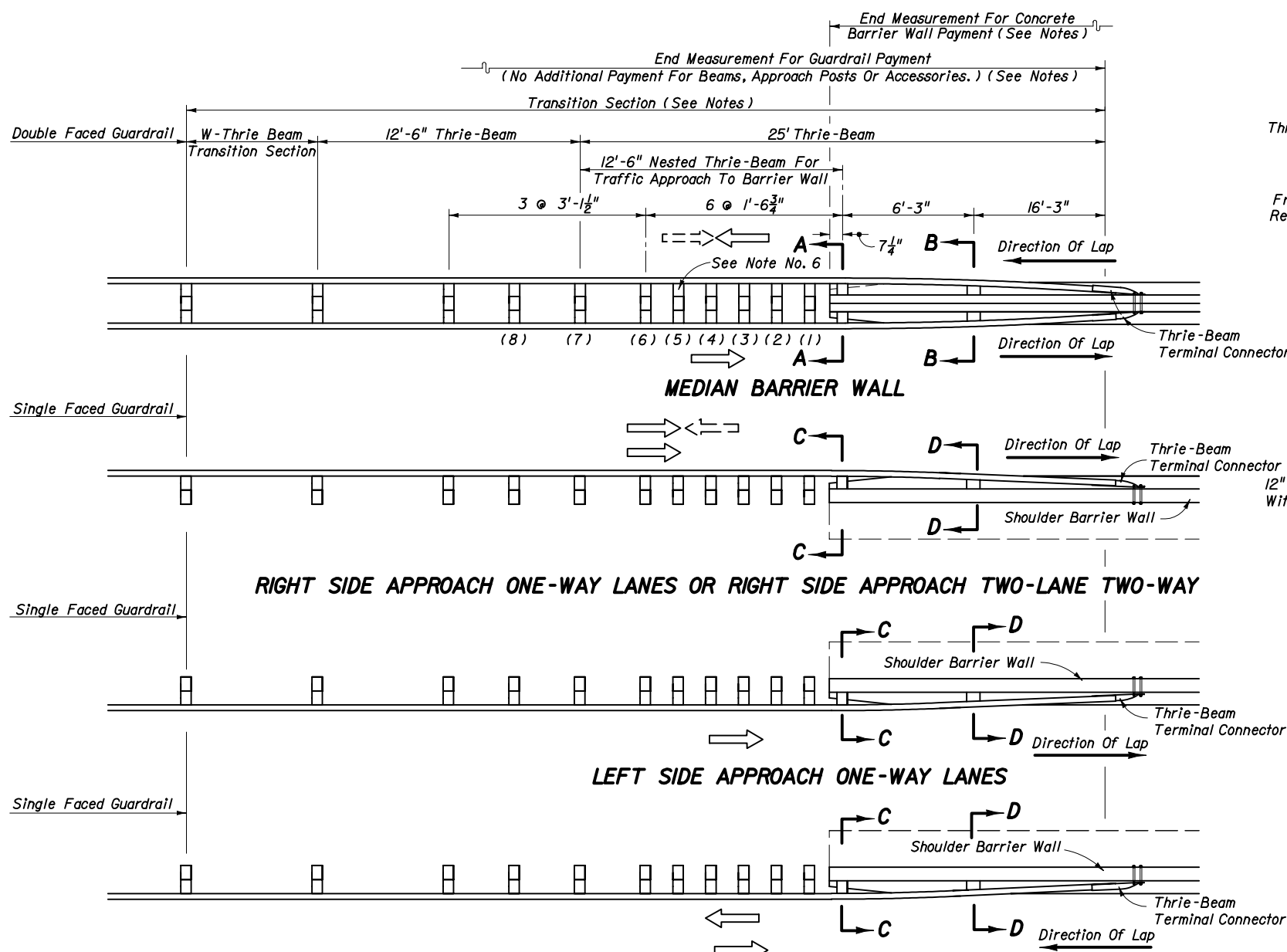
TOP VIEW
BARRIER WALL AT ROUND PIER

The details on this sheet are treatments to the F-shape concrete barrier walls depicted on Sheet Nos. 8 through 18, where site conditions impose reduced clearances between above ground hazards and the walls. Bridge bent supports and piers are shown. These treatments are not applicable to hazards that cannot provide lateral support for the walls. See the plans for limits of wall sections applied and other associated wall treatments.

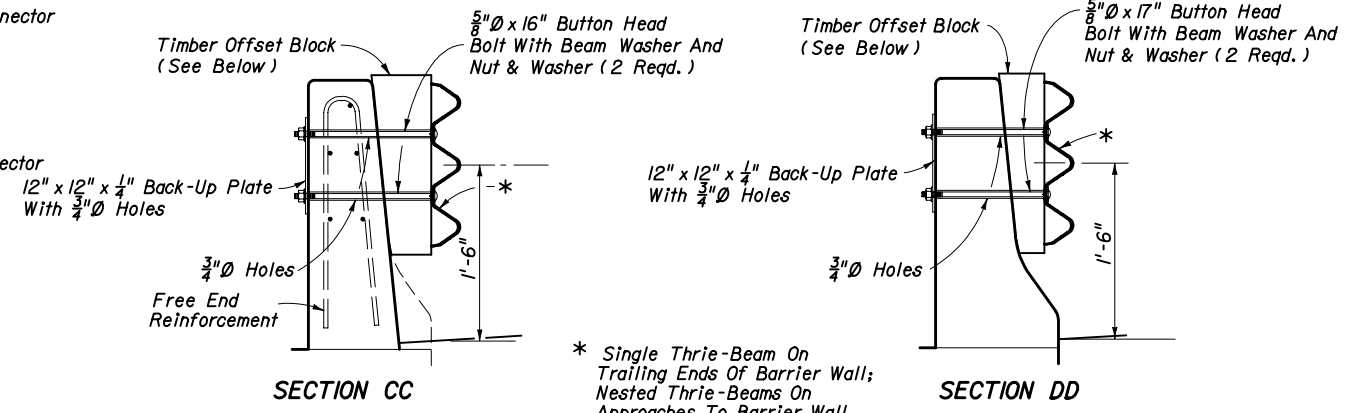
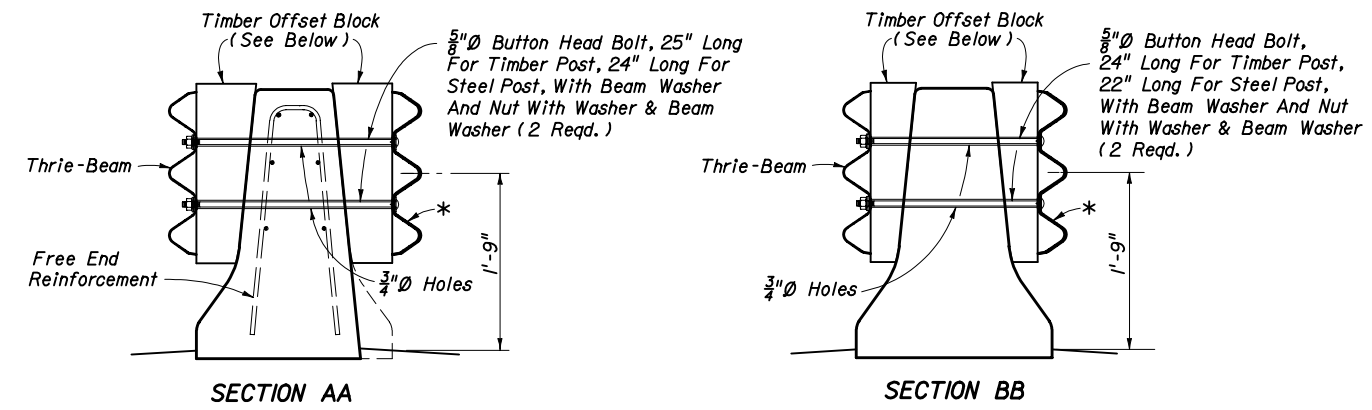
CONCRETE BARRIER WALL WHEN SPAN BETWEEN BENT SUPPORTS OR PIER COLUMNS EXCEEDS 13'

CONCRETE BARRIER WALL WHEN GUARDRAIL OFFSET FROM BENT OR PIER LESS THAN 3 FEET OR WHERE WALL STEM ABUTTS SUPPORTS OR PIER COLUMN

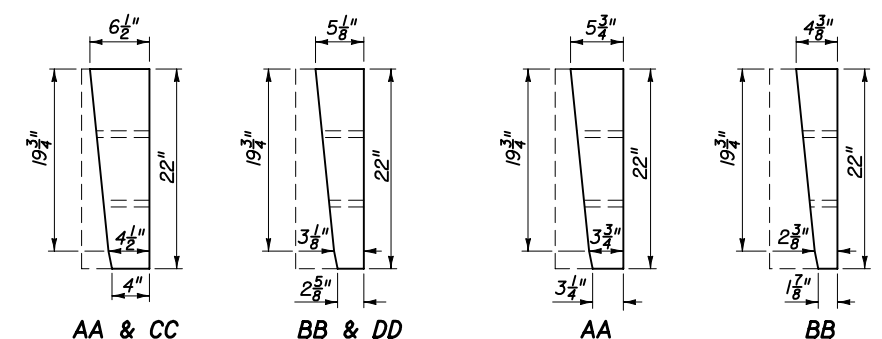
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Names	Dates	Approved By		
Designed By	STAFF	10/97	 Roadway Design Engineer	
Drawn By	HKH	10/97		
Checked By	JVG	10/97	Revision	00
			Sheet No.	19 of 22
			Index No.	410



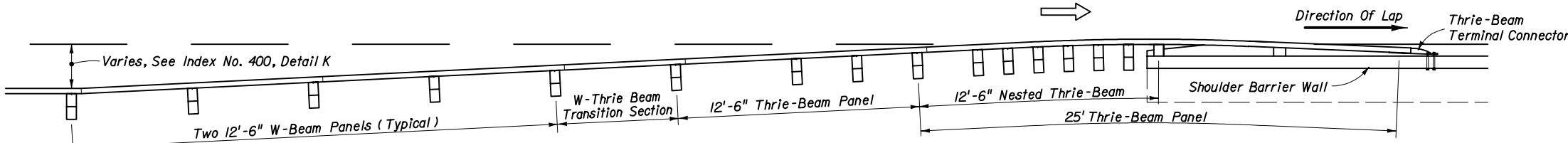
Attach thrie-beam terminal connector to median barrier wall with 5- $\frac{7}{8}$ " x 15" long HS hex bolts and nuts with $\frac{7}{8}$ " plain round washers under heads and nuts. Attach to shoulder barrier wall with a 21" x 12" x $\frac{3}{8}$ " thrie-beam terminal connector plate and 5- $\frac{7}{8}$ " x 12" long HS hex bolts and nuts with $\frac{7}{8}$ " plain round washers under heads and nuts.



* Single Thrie-Beam On Trailing Ends Of Barrier Wall; Nested Thrie-Beams On Approaches To Barrier Wall.



FOR DOUBLE FACED GUARDRAIL USING TIMBER POSTS AND FOR SINGLE FACED GUARDRAIL USING EITHER TIMBER OR STEEL POSTS
STANDARD TIMBER OR PLASTIC OFFSET BLOCKS • FIELD TRIMMED FOR USE AT SECTIONS AA, BB, CC & DD



STANDARD GUARDRAIL APPROACH TO SHOULDER BARRIER

NOTES

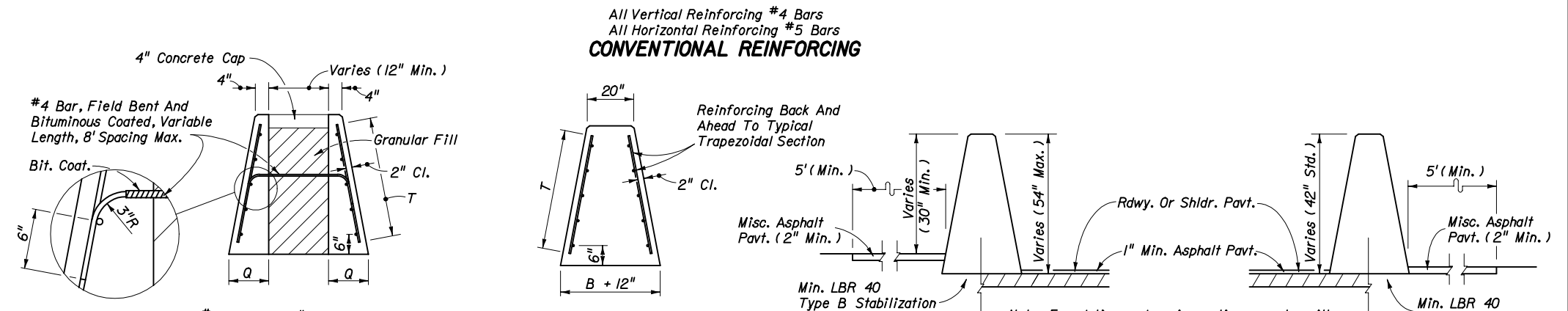
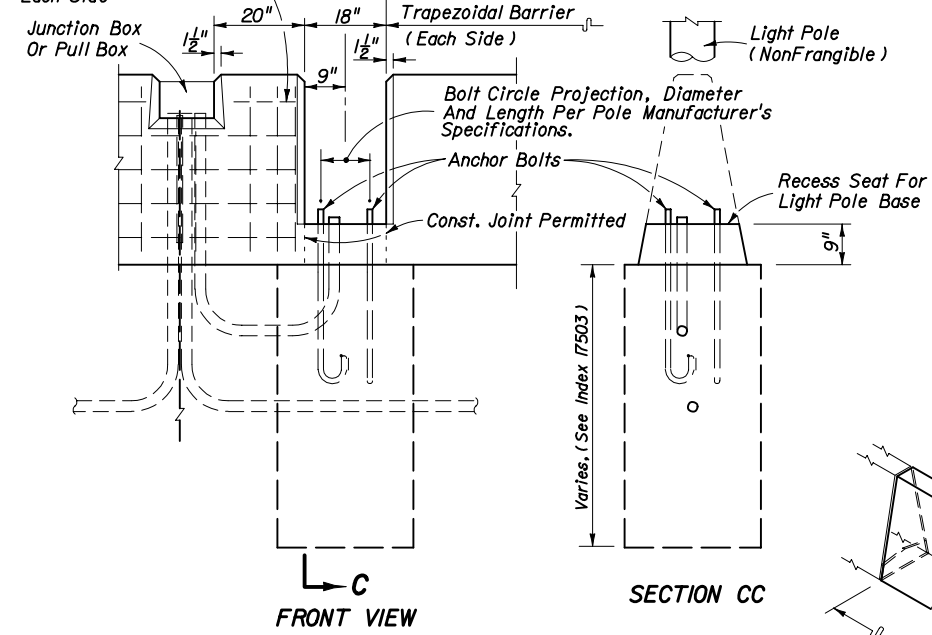
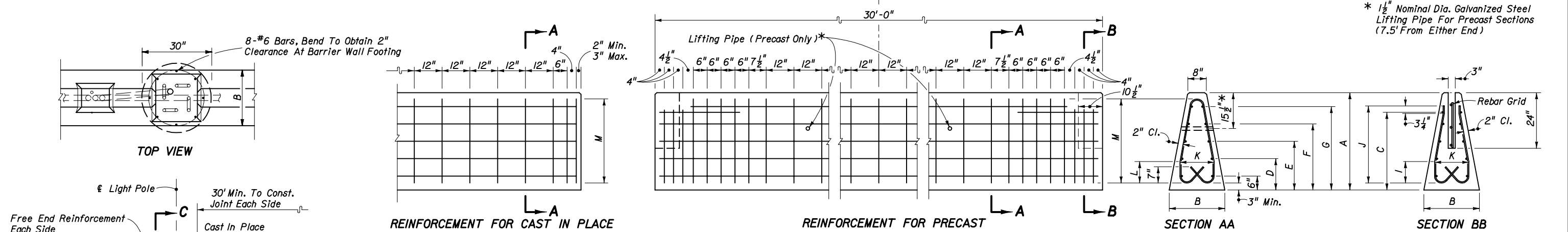
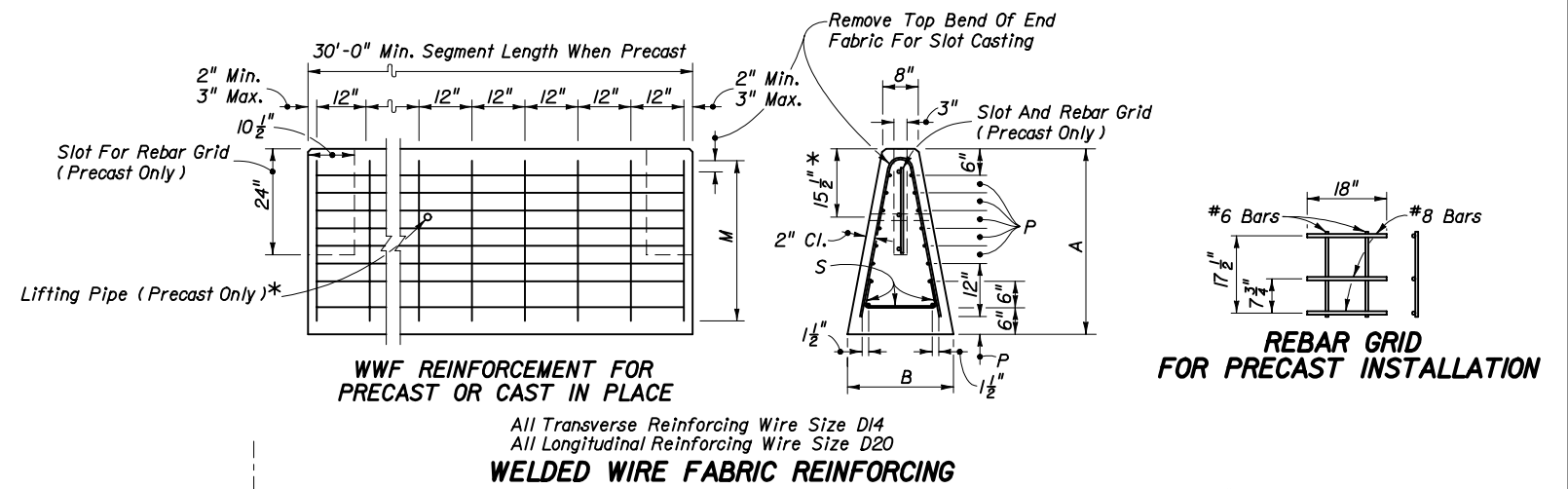
- The longitudinal dimensions and payment limits shown for median concrete barrier wall also apply to shoulder concrete barrier walls.
- W-beam elements do not apply to these transition schemes. For barrier wall trailing end guardrail connections for one-way lanes, see Sheet 2.
- Where reaming is necessary to fit nested beams the reamed surfaces shall be metalized in accordance with Index No. 400.
- Either steel or timber guardrail post may be used, timber posts shown.
- The nested beams shall not be bolted to blocks and posts at posts numbers (1), (3) and (5).
- On the trailing side of MEDIAN BARRIER WALL, offset blocks may be omitted at posts numbers 1, 2, 3, 5, 6 and 8.
- For additional guardrail information refer to Index No. 400.

GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL APPROACH ENDS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	JVG	05/91	Approved By <i>Samuel D. Mill</i> Roadway Design Engineer	
Drawn By	HSD	05/91	Revision	Sheet No.
Checked By	JVG	05/91	00	20 of 22
				Index No. 410

GENERAL NOTES FOR TRAPEZOIDAL BARRIER WALL

- Concrete trapezoidal barrier wall can be either precast or cast in place. The wall is designed for zero deflection and shall have a minimum system length of 120'.
- Where concrete trapezoidal barrier wall height changes from 42" to 48" or from 48" to 54", height change will be uniform for each 6" of height change per 90' of wall. Steel placement shall meet the dimensional positioning requirements of 42", 48" and 54" high barriers at the respective points along the vertical transition, with the vertical steel uniformly lengthened and the horizontal steel uniformly splayed throughout.
- Welded wire fabric (WWF) made in accordance with ASTM A497 may be used as an option to the conventional reinforcement for precast or cast in place barrier wall, with the exception that only conventional reinforcement shall be used for horizontal transition and half wall sections. These sections shall be cast in place with length, shape and reinforcement as shown in this Index.
- To attain system length, precast segments shall be interconnected with rebar grids placed in the preformed slots and grouted into place. Segment length shall be not less than 30' unless otherwise specified in the plans.
- The centerline axis of the barrier shall be vertical except where the roadway is superelevated in which case it shall be normal to the cross slope unless otherwise shown in the plans or directed by the Engineer.
- For reflective barrier marker requirements see 'STANDARD BARRIER WALL SECTIONS' and the GENERAL NOTES, Sheet I.
- The concrete trapezoidal barrier wall is considered by the Federal Highway Administration to be innovative and may be used as such on Federal Aid projects.
- The concrete trapezoidal barrier wall is to be paid for under the contract unit price for Barrier Wall Concrete (Trapezoidal), LF. This price will include full payment for transitions, half walls, fill and concrete caps.



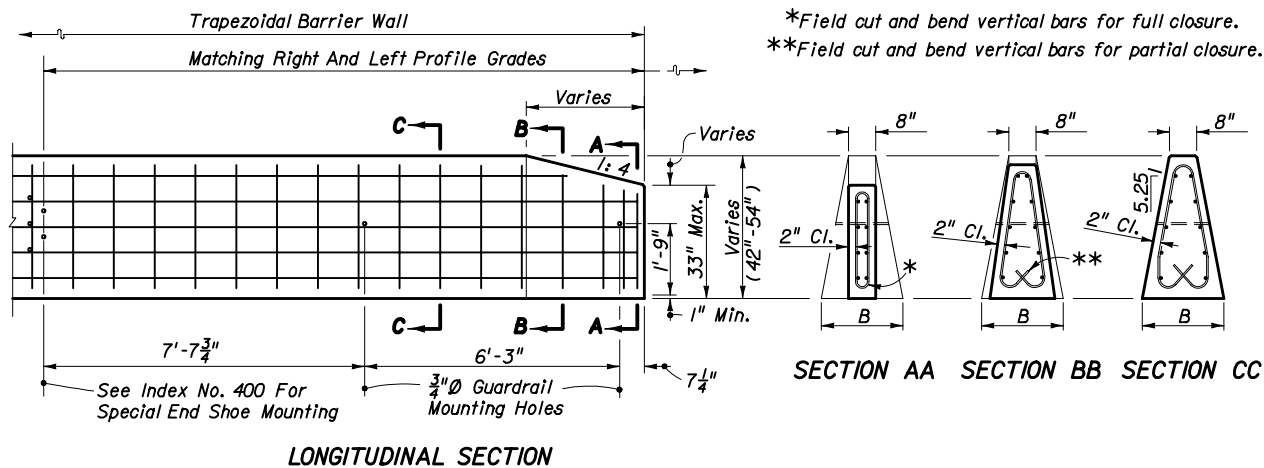
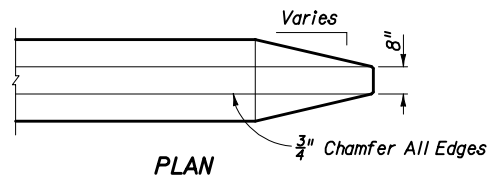
Barrier Height (in.)	DIMENSIONS (Inches)																	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	S	T
42	42	24	33 1/2	13 1/2	21	28 1/2	36	15	9 1/4	33 1/4	15	9 1/4	36	72	4	12	28	36
48	48	26 3/8	39 1/2	15	24	33	42	17 1/4	10 3/4	39 1/4	17 1/4	10 3/4	42	84	5	13 3/8	31 1/2	42
54	54	28 3/16	45 1/2	16 1/2	27	37 1/2	48	19 1/2	12 1/4	45 1/4	19 1/2	12 1/4	48	96	6	14 3/8	34 3/4	48

TRAPEZOIDAL BARRIER WALL

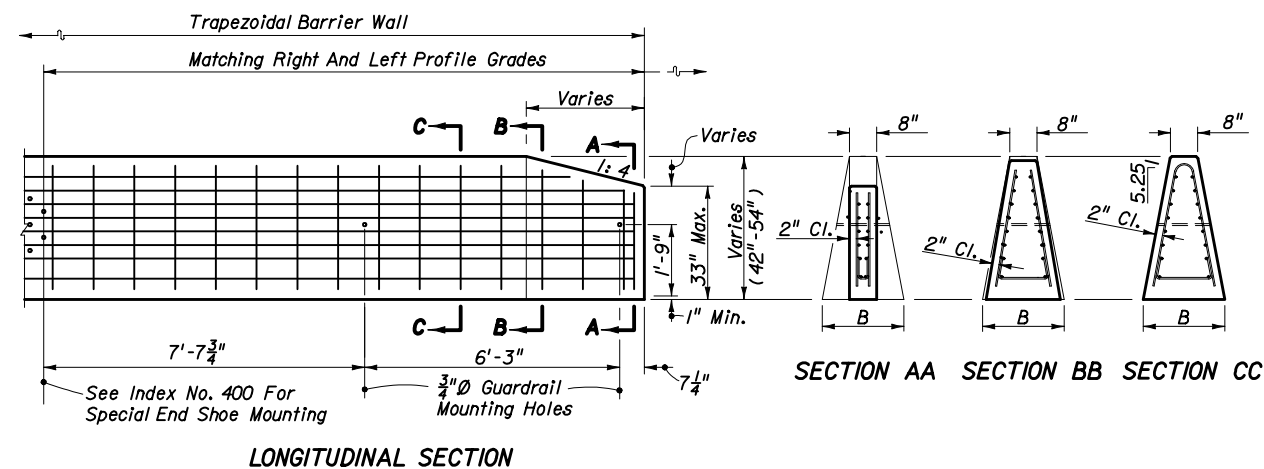
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER WALL

Designed By	FHWA	11/93	Approved By	<i>Samuel D. Mill</i>
Drawn By	HKH	11/93	Revision	Sheet No.
Checked By	JVG	11/93	00	21 of 22
				410



CONVENTIONAL REINFORCEMENT



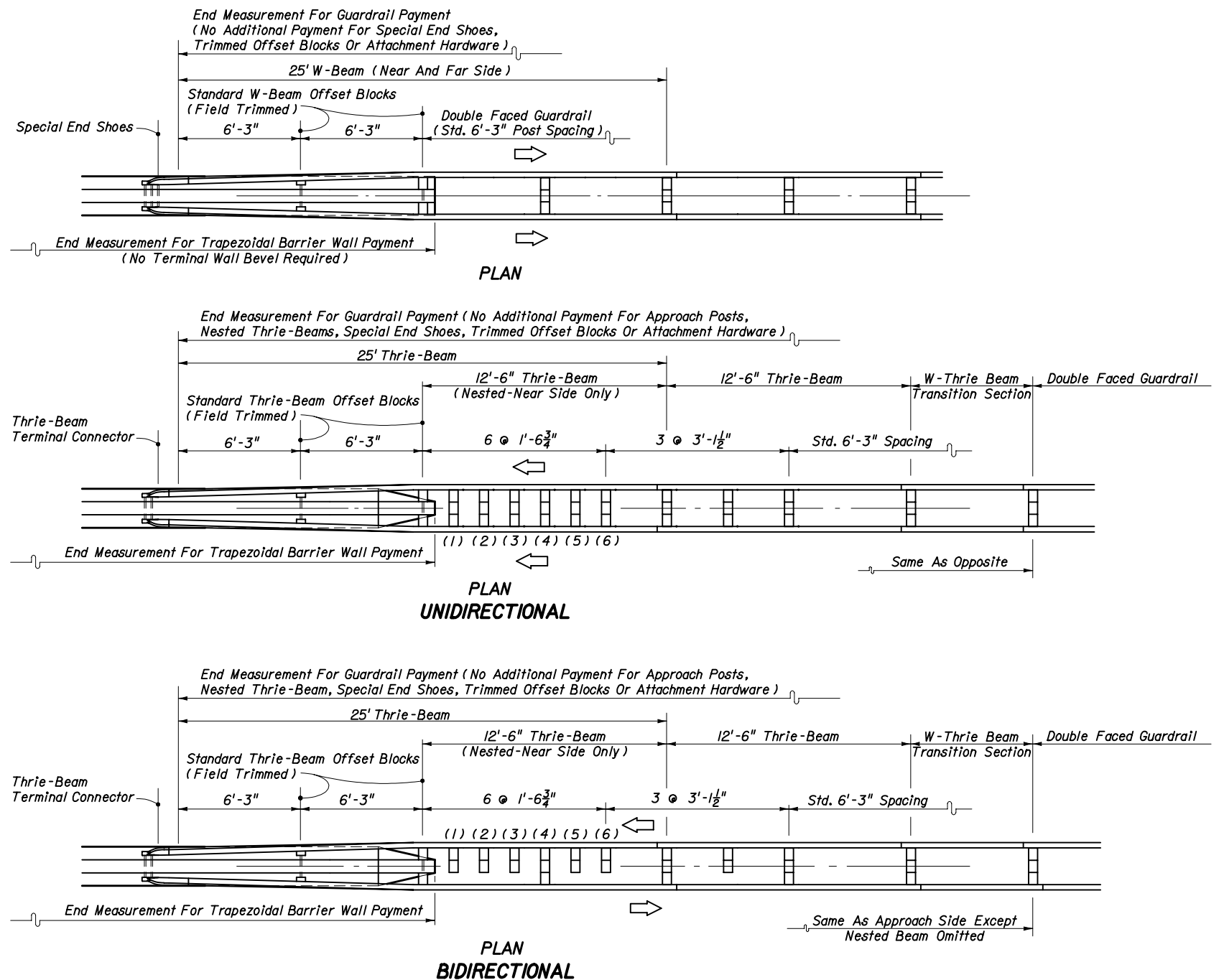
WELDED WIRE FABRIC REINFORCEMENT

END TREATMENT FOR PRECAST OR CAST-IN-PLACE WALLS

NOTES

1. Where reaming is necessary to fit nested beams the reamed surface shall be metalized in accordance with Index No. 400.
2. The nested beams shall not be bolted to the posts and blocks at post numbers (1), (3) and (5).
3. For additional wall details, see Sheet 21.
4. For additional guardrail information refer to Index No. 400.

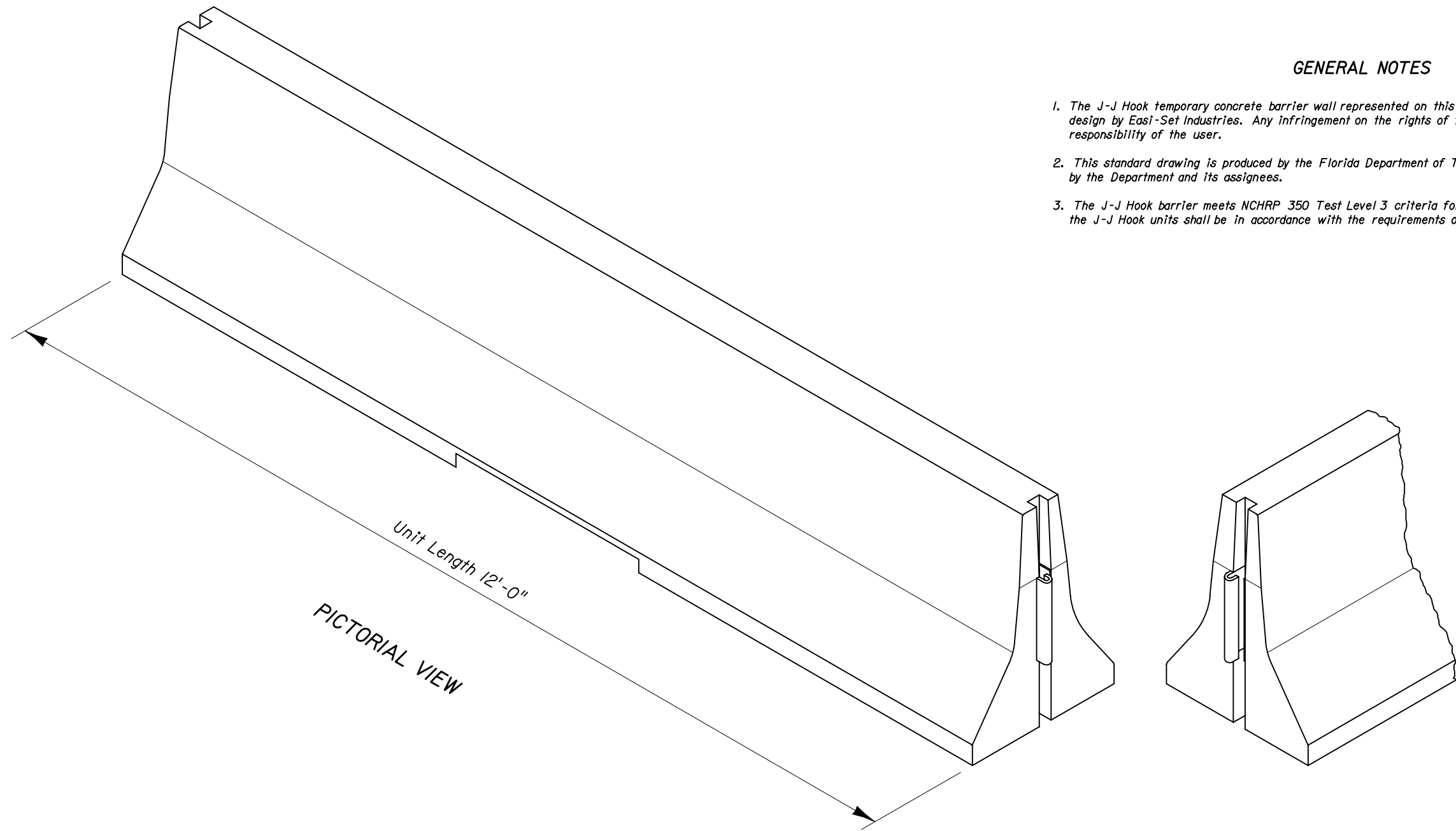
GUARDRAIL CONNECTION TO TRAPEZOIDAL BARRIER WALL



Note: Timber or steel posts may be used, timber posts shown.

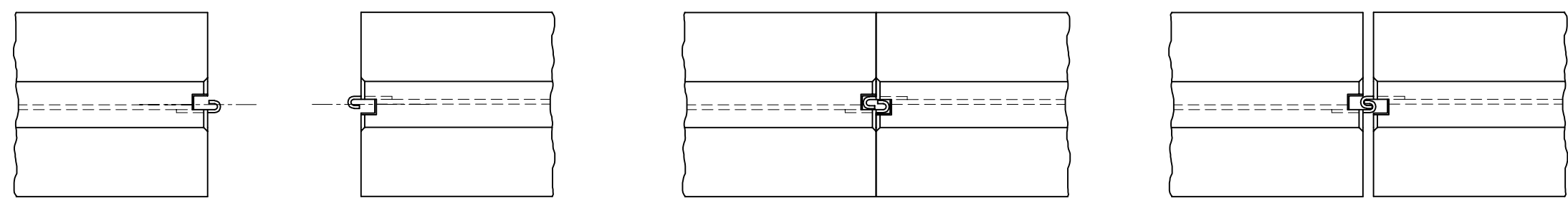
GUARDRAIL TRANSITIONS AND CONNECTIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONCRETE BARRIER WALL				
Designed By	JVG/HKH	7/96	Approved By <i>Jamell D. Milk</i> Roadway Design Engineer	
Drawn By	HKH	7/96	Revision	Sheet No. Index No.
Checked By	JVG	7/96	00	22 of 22 410



GENERAL NOTES

1. The J-J Hook temporary concrete barrier wall represented on this standard drawing is a proprietary design by Easi-Set Industries. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department of Transportation solely for the use by the Department and its assignees.
3. The J-J Hook barrier meets NCHRP 350 Test Level 3 criteria for longitudinal barrier. Use of the J-J Hook units shall be in accordance with the requirements of Index No. 415.



Separated

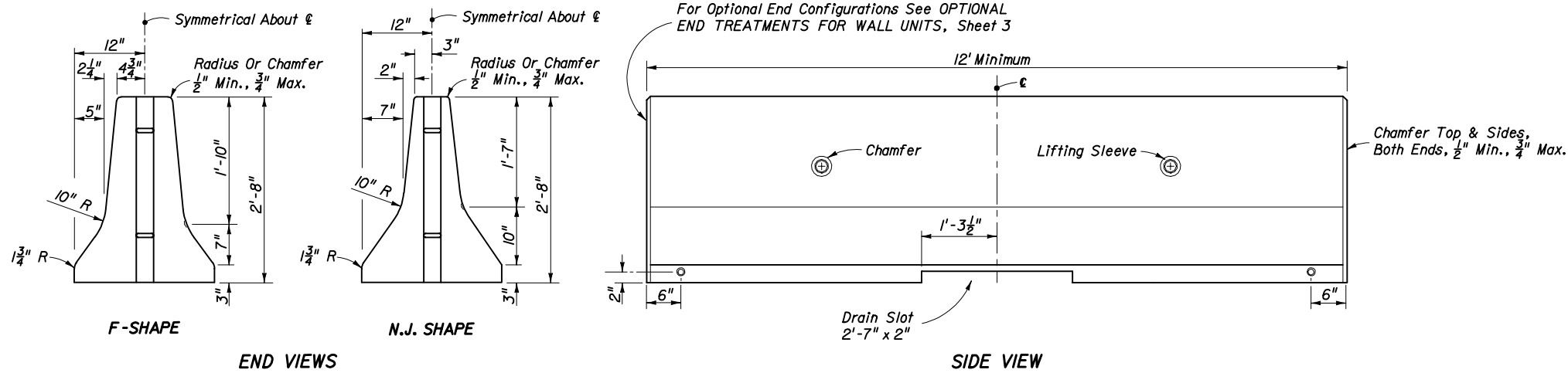
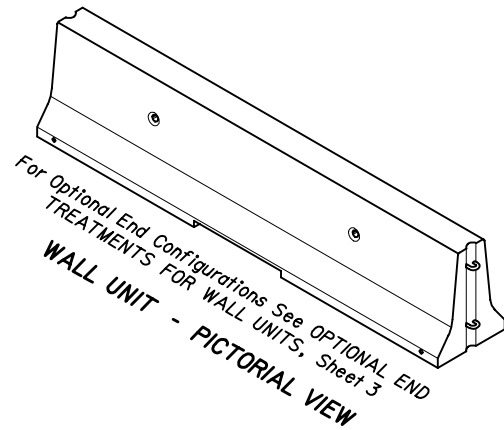
Closed

Maximum Opening

TOP VIEW

J-J HOOK CONNECTED TEMPORARY CONCRETE BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PROPRIETARY TEMPORARY CONCRETE BARRIERS				
	Names	Dates	Approved By <i>Jamal D. Milk</i>	
Designed By	MRG	12/02	Roadway Design Engineer	
Drawn By	SBC	12/02	Revision	Sheet No. Index No.
Checked By	JVG	12/02	04	1 of 1 413



REINFORCEMENT AND OTHER UNIT FABRICATION DETAILS NOT SHOWN. SEE 'NOTICE' BELOW.

WALL UNIT

NOTICE

THE TEMPORARY CONCRETE BARRIER WALL UNIT SHOWN ON THIS INDEX THAT WAS PRODUCED PRIOR TO OCTOBER 1, 2002, AND THAT IS IN GOOD CONDITION, CAN BE USED ON STATE HIGHWAY PROJECTS THROUGH SEPTEMBER 30, 2012. TEMPORARY CONCRETE BARRIER UNITS PRODUCED ON AND AFTER OCTOBER 1, 2002 FOR USE ON STATE HIGHWAY PROJECTS MUST MEET NCHRP 350 CRITERIA, AND MUST BE INCLUDED ON THE QUALIFIED PRODUCTS LIST. IF AND WHEN A GENERIC TEMPORARY CONCRETE BARRIER WALL UNIT IS APPROVED FOR USE ON STATE HIGHWAY PROJECTS, THE UNIT DESIGN WILL BE POSTED ON THE ROADWAY DESIGN WEB SITE.

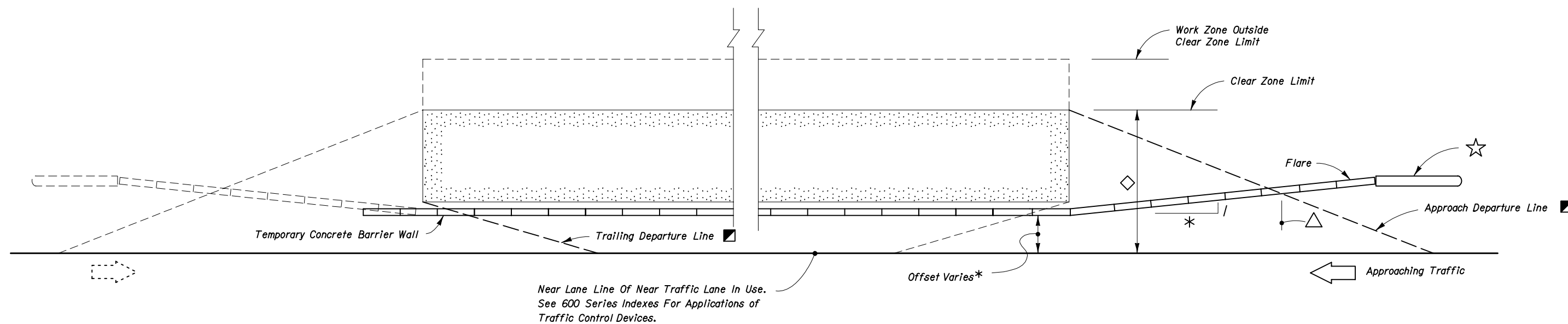
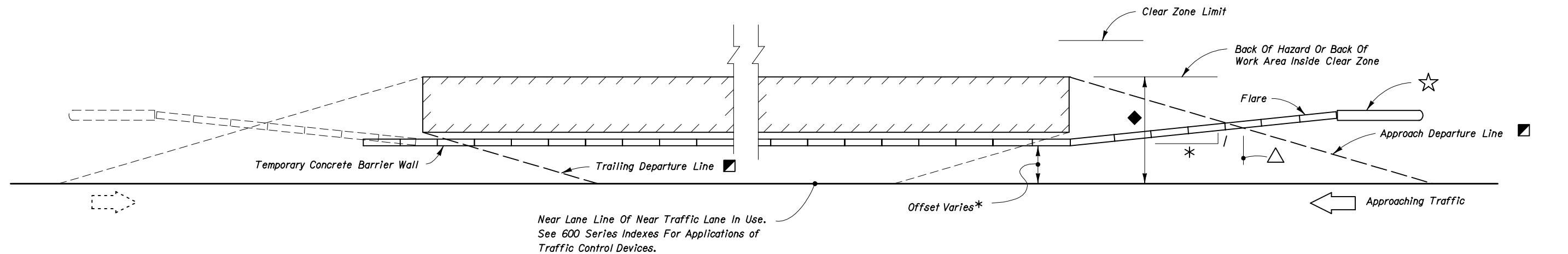
GENERAL NOTES

1. Temporary Concrete Barrier walls on roadways may be any of the following:
 - a. The FDOT 415 Temporary Concrete Barrier wall unit shown on Sheets 1 and 3 of this index, if manufactured prior to October 1, 2002, in good condition, and installed in accordance with this Index. Units may be either F-Shape or New Jersey Shape. The FDOT 415 unit shown in this Index is the design provided in Index No. 415 in prior editions of the Design Standards. See "NOTICE" below. Since units produced after October 1, 2002 cannot be used, complete fabrication details are omitted in this edition of the Design Standards.
 - b. The JJ Hook System (Index 413). Units may be either F-Shape or New Jersey Shape unless otherwise noted in the plans.
 - c. The FDOT Type K Temporary Concrete Barrier Wall (Structures Design Standard Index 715). F-Shape Units only.
 - d. Temporary concrete barrier wall systems meeting NCHRP 350 Test Level 3 criteria and included on the Qualified Products List.

For temporary concrete barrier walls on bridges see Structures Design Standard Index No. 715.
2. The FDOT 415 units with the optional end connections shown in this index may be interconnected within a run of wall. However, intermixing units with different shapes (F-Shape, New Jersey Shape) and units with dissimilar end connections (415, JJ Hook, Type K, or other) within a continuous run of wall is not permitted. See Sheets 6 through 8 of 10 for required treatment for continuation of runs of barrier with different shapes or dissimilar connectors.
3. Alignment, length of need, anchorage and end treatment shall be in accordance with this index.
4. Wall units shall not be used for permanent barrier wall construction regardless of unit length, unless specifically permitted by the plans.
5. If the plans specify Barrier Wall (Temporary) (Type K), substitution with other barrier types is not permitted.
6. If the plans specify temporary concrete barrier wall, substitution with water filled barriers is not permitted.
7. Type C Steady-Burn Lights are to be mounted on top of temporary concrete barrier walls that are used as barriers along traveled ways in work zones. The lights are to be spaced at 50' centers in transitions, 100' centers on curves and 200' centers on tangent roadways. For additional information refer to Index 600.
8. Wall units used for work zone traffic control and other temporary applications shall be paid for under the contract unit price for Barrier Wall (Temporary), LF. Type C Steady-Burn Lights shall be paid for under the contract unit price for Lights, Temporary, Barrier Wall Mount (Type C, Steady-Burn), ED.

FDOT 415 TEMPORARY CONCRETE BARRIER WALL UNIT AND GENERAL NOTES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
Designed By	J/G	Dates	04/03	Approved By <i>Lamont D. Mill</i> Roadway Design Engineer
Drawn By	SBC	04/03	Revision	Sheet No. Index No.
Checked By	JAM	04/03	04	1 of 10 415



△ The approach departure line location is determined by the line intersect with the back of the hazard or the area to be shielded, however the intersect offset distance is not to be beyond the clear zone limit. The trailing departure line is determined by the line intersect with the front of the downstream end of the hazard or the area to be shielded.

The length of barrier wall need is the distance from the approach departure line intersect with the upstream toe of the temporary concrete barrier wall to the trailing departure line intersect with the downstream toe of the temporary concrete barrier wall.

Where temporary concrete barrier wall end units are not anchored, two and one-half (2½) wall units (min.) are required beyond the length of barrier need for wall end anchorage. Temporary concrete barrier wall end units shall be located at or outside the clear zone or shielded by other structure, earth embedment or a crash cushion.

Proprietary redirective crash cushions designed for use with temporary concrete barriers have the beginning length of need and departure line intersect point indicated on the Design Standard drawing for each proprietary crash cushion. Where redirective crash cushions are located on the departure line by their length of need reference point, the wall upstream end unit must be aligned with the crash cushion, and the wall's end unit secured with the anchor plates shown on Sheet 4 of this index. See Sheets 5 through 8 for configurations requiring end unit anchorage.

* The wall offset from the near traffic lane, wall flare rate and wall flare length are to be in conformance with the alignment called for in the plans and the alignments called for by Department Design Standards specified in the plans; in absence of either plan requirement, the offset shall be as determined by the Engineer, and, unless other flare rates are approved by the Engineer the flare rates to be applied are 1:10 or flatter for speeds ≤ 45 mph and 1:15 or flatter for speeds ≥ 50 mph; see Index No. 600 for other flare rates on expressway facilities.

■ Departure Rates
 1:16 For Speeds ≤ 45 mph
 1:13 For Speeds ≥ 50 mph

◆ Area Shielded When Work Zone Hazards Or The Work Area Occupy Space Less Than Clear Zone Width


◇ Area Shielded When Work Zone Hazards Or The Work Area Extend To Or Beyond Clear Zone Limit

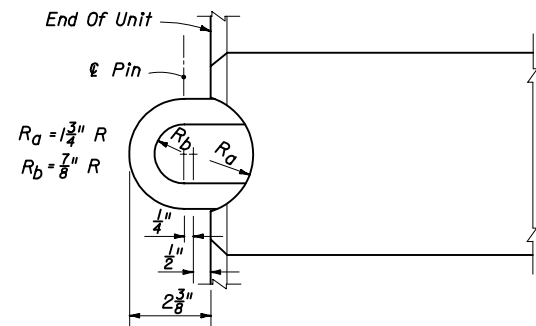
☆ Crash Cushion In Absence Of Other Wall End Shielding. See △ Notations And Sheet 5 Through 8 For Varied Locations For Wall End Units And Crash Cushions.

ALIGNMENT AND LENGTH OF NEED

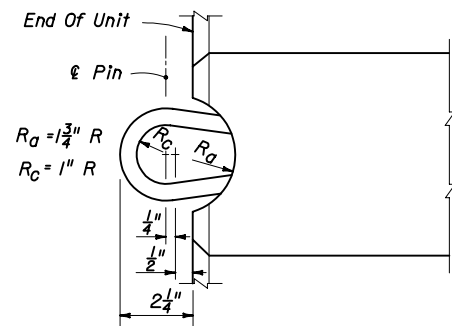
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TEMPORARY CONCRETE BARRIER

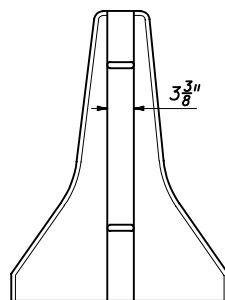
Names		Dates	Approved By		
Designed By	JVG	04/03	 Roadway Design Engineer		
Drawn By	SBC	04/03			
Checked By	JAM	04/03	Revision	Sheet No.	Index No.
			04	2 of 10	415



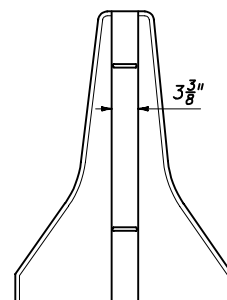
TOP VIEW



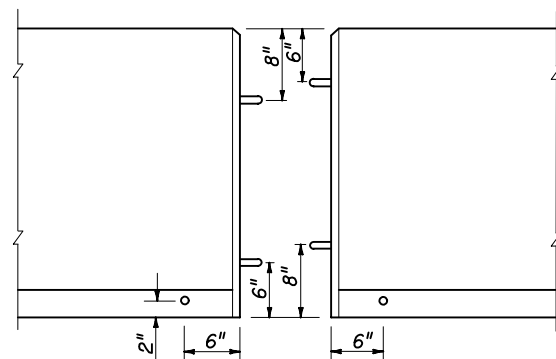
TOP VIEW



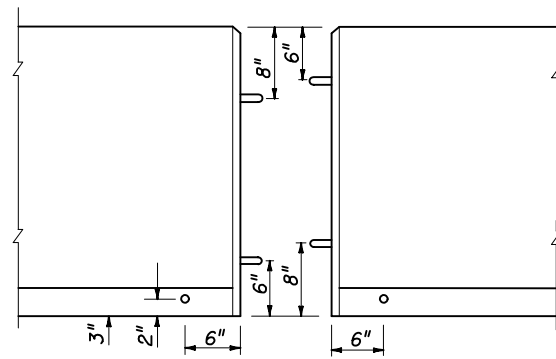
END VIEW



END VIEW

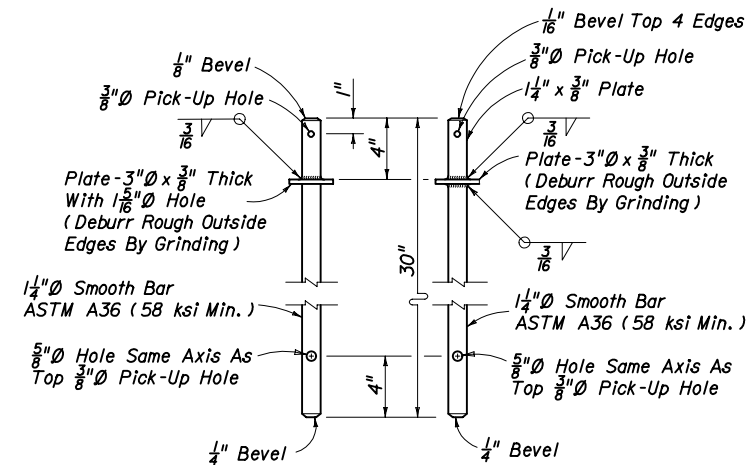


SIDE VIEW
ROUND BAR CONNECTOR

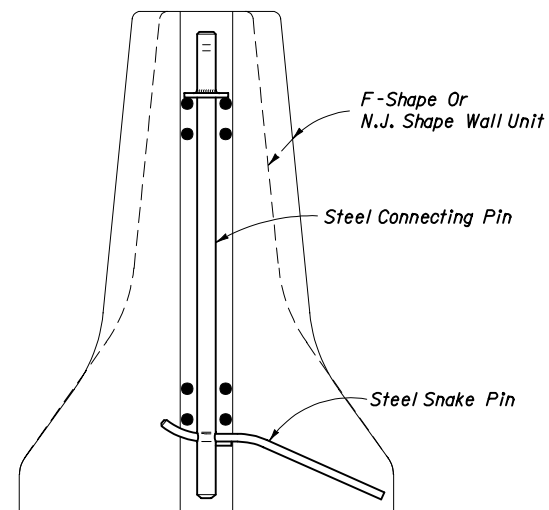


SIDE VIEW
WIRE ROPE CONNECTOR

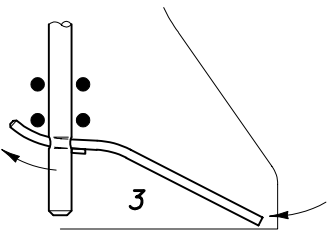
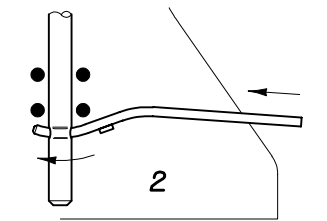
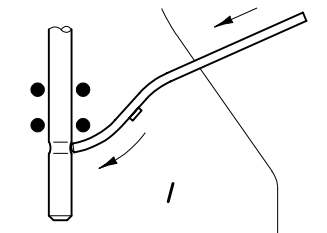
OPTIONAL END TREATMENTS FOR WALL UNITS



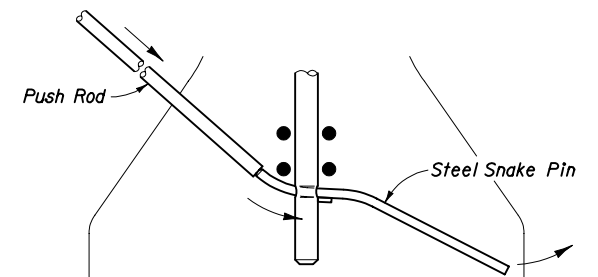
OPTIONAL PINS
STEEL CONNECTING PIN



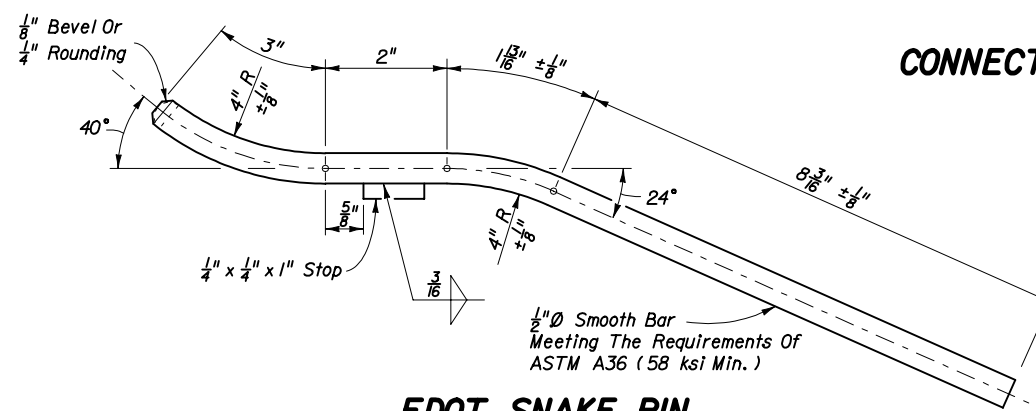
ASSEMBLED UNIT



INSERTING FDOT SNAKE PIN



REMOVING FDOT SNAKE PIN



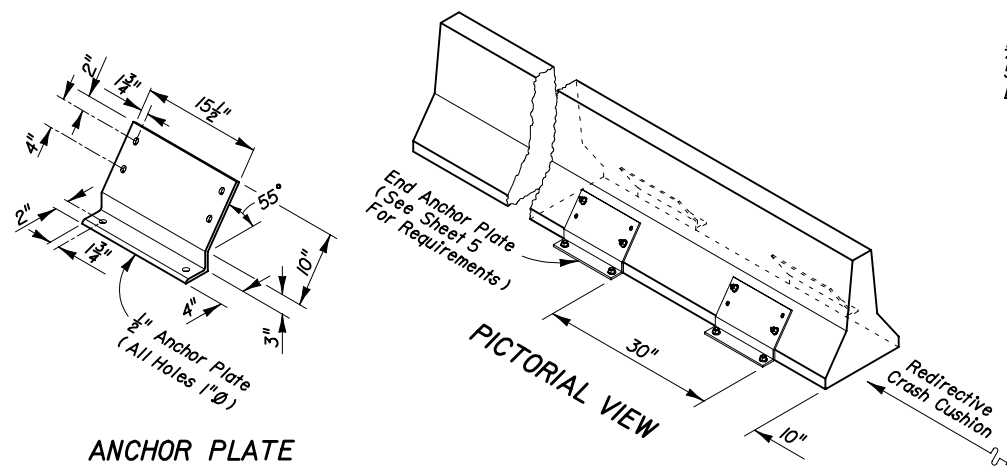
FDOT SNAKE PIN

CONNECTING PIN ASSEMBLY

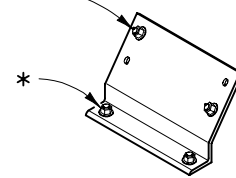
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
Designed By	JVG	Dates	04/03	Approved By <i>Samuel D. Hill</i> Roadway Design Engineer
Drawn By	SBC	04/03	Revision	Sheet No. Index No.
Checked By	JAM	04/03	04	3 of 10 415

NOTES FOR WALL END SHIELDING

1. Redirective crash cushions are the principal (standard) device to be used for shielding approach ends of temporary concrete barrier walls. Except where the plans designate a particular type of redirective crash cushion for a specific location, the contractor has the option to construct either the REACT 350, QuadGuard, ADIEM 350, TRACC or TAU-II crash cushions subject to the uses and limitations described on Index Nos. 434, 435, 436, 440 and 441 respectively. The barrier wall end unit must be anchored to a paved surface using anchor plates in accordance with "Anchor Plate Notes" and the details on this sheet.
2. Temporary redirective crash cushions shall be installed in accordance with the manufacturer's specifications and recommendations. Temporary crash cushions can be either new or functionally sound used devices. Performance of intended function is the only condition for acceptance, whether the crash cushion is new, used, refurbished, purchased, leased, rented, on loan, shared between projects, or made up of mixed new and used components.
3. Inertial crash cushions are not optional systems for locations designated for redirective crash cushions by the plans; can not be substituted for redirective crash cushions, and are not eligible for VECP consideration.
4. A yellow post mounted Type I Object Marker shall be centered 3' in front of the nose of all temporary crash cushions. Mounting hardware shall be in accordance with Index Nos. I1860 and I1865. The cost of the Object Marker shall be included in the cost of the crash cushion.
5. Optional temporary redirective crash cushions are to be paid for per location under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

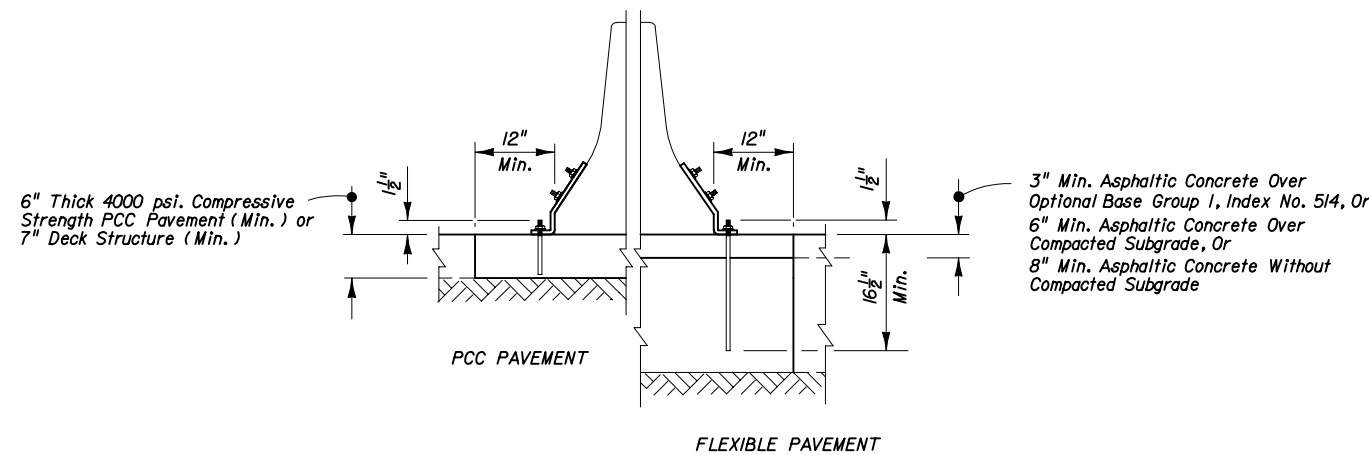


$\frac{3}{4}$ " \varnothing x $6\frac{1}{2}$ " Adhesive Bonded Anchor Bolts (EAS MP-3 Or Equal), 5" Embedment, Two (2) Required Each Anchor Plate Installed In Diagonally Opposing Holes



* $\frac{3}{4}$ " \varnothing x $6\frac{1}{2}$ " Adhesive Bonded Anchor Bolts (EAS MP-3 Or Equal), 5" Embedment Where Installed On Concrete Pavement Or Decking, Two (2) Required Each Anchor Plate. $\frac{3}{4}$ " \varnothing x 18" MP-3 Threaded Rod Longbolt System Or Other Approved $\frac{3}{4}$ " \varnothing x 18" Threaded Rod With Chemical Anchorage Full Embedment Depth Where Installed On Asphaltic Concrete Pavement Prescribed Below, Two (2) Required Each Anchor Plate.

ANCHOR PLATE BOLTS



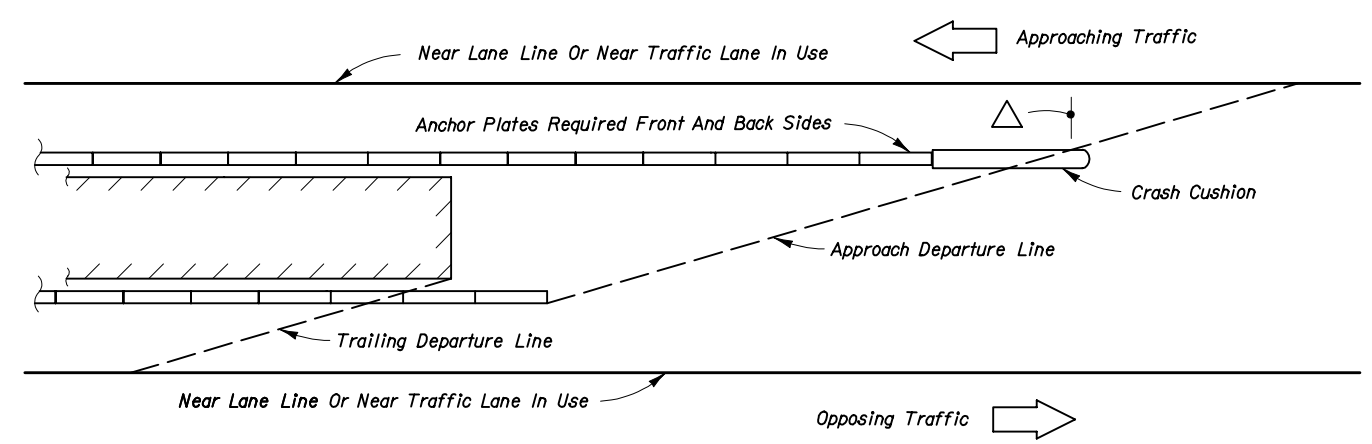
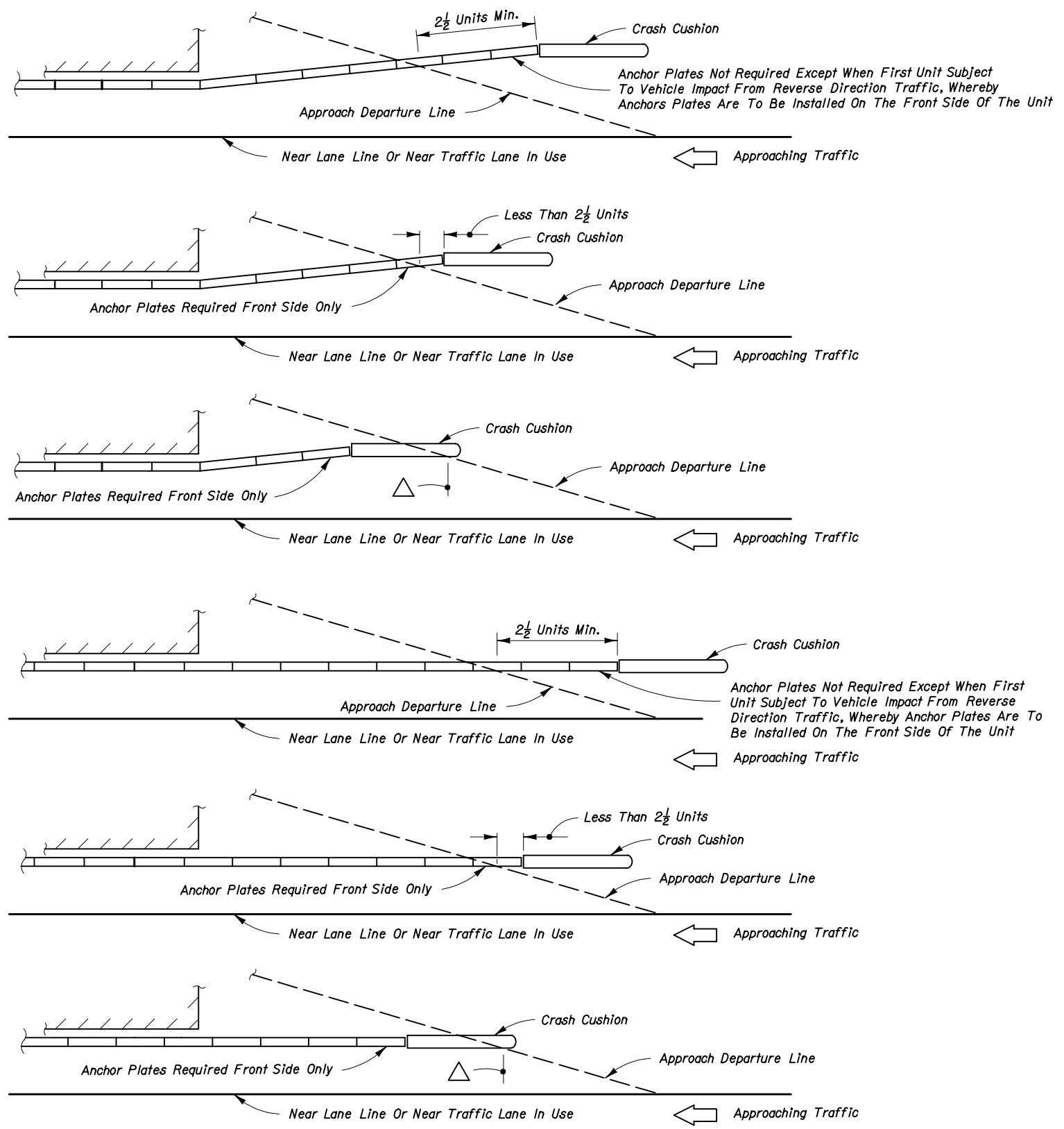
SURFACE ANCHORAGE REQUIREMENTS

ANCHOR PLATE NOTES

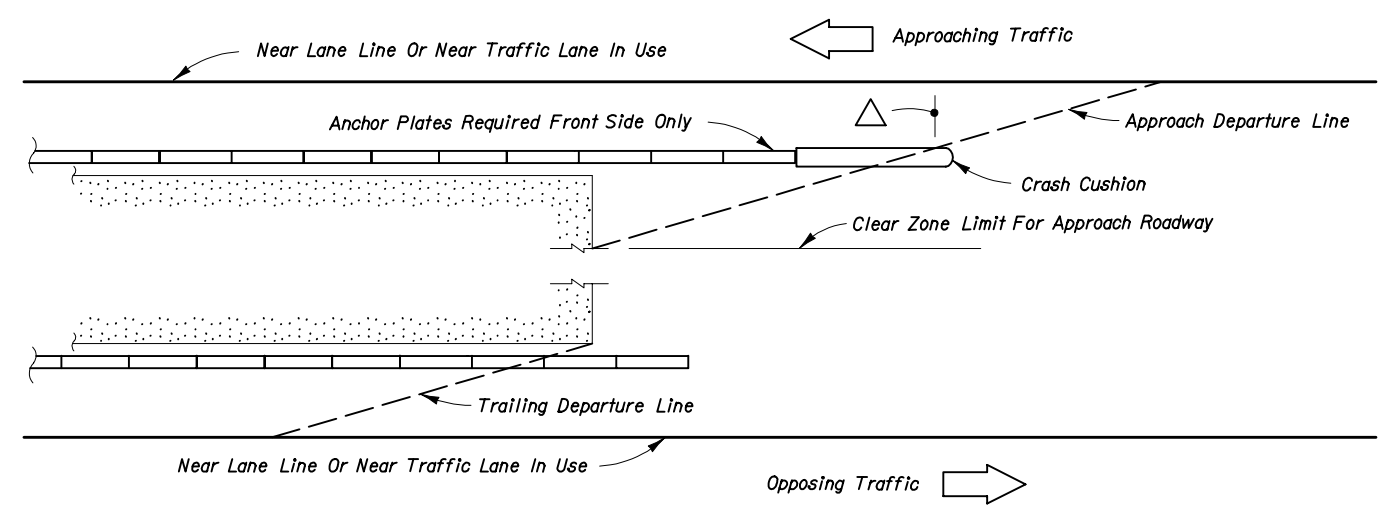
1. For temporary barrier wall end units requiring anchor plates, see sheets 5 through 8.
2. The temporary concrete barrier wall anchor plate depicted above is a proprietary design by Energy Absorption Systems, Inc. Other temporary anchorage methods can be substituted when wall rigidity is assured by any of the following:
 - (a) proven by associated crash test of redirective crash cushions, or
 - (b) meet anchorage prescribed in 'A Guide To Standardized Highway Barrier Hardware', or
 - (c) crash cushion manufacturer's engineered design, or
 - (d) approved shop drawings on a case by case basis.
3. The cost for anchoring the wall segment will be included in the cost for the adjoining redirective crash cushion.

ANCHOR PLATE REQUIREMENTS FOR BARRIER WALL END UNITS ABUTTING CRASH CUSHIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
Names	Dates	Approved By <i>Samuel D. Mill</i>		
Designed By	JVG	04/03	Roadway Design Engineer	
Drawn By	SBC	04/03	Revision	Sheet No. Index No.
Checked By	JAM	04/03	04	4 of 10 415



MEDIAN HAZARDS WITHIN CLEAR ZONES BOTH ROADWAYS



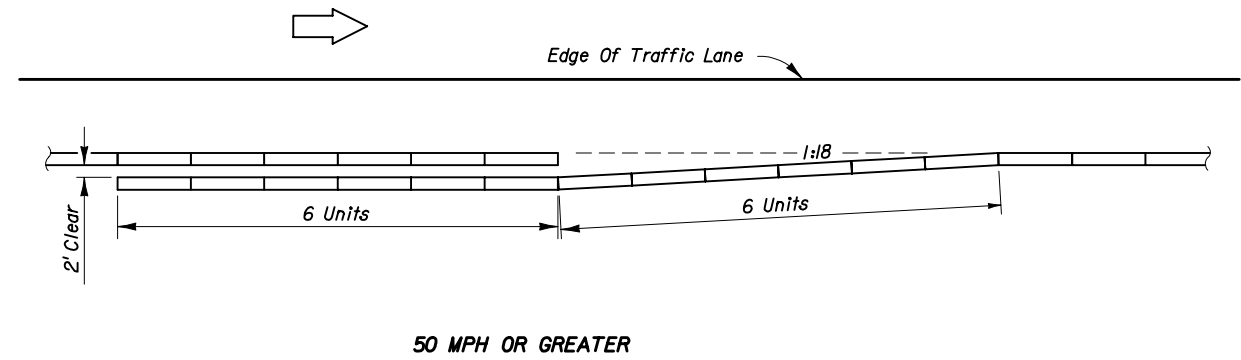
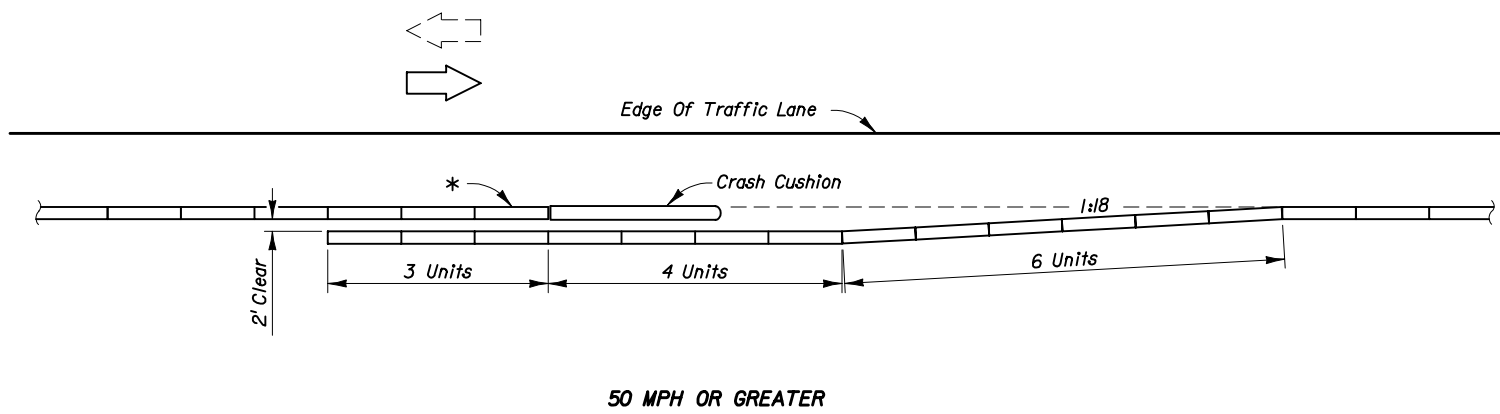
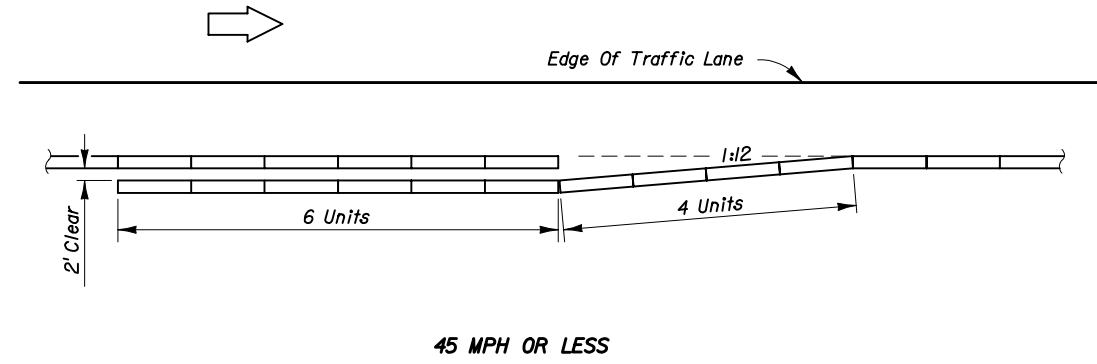
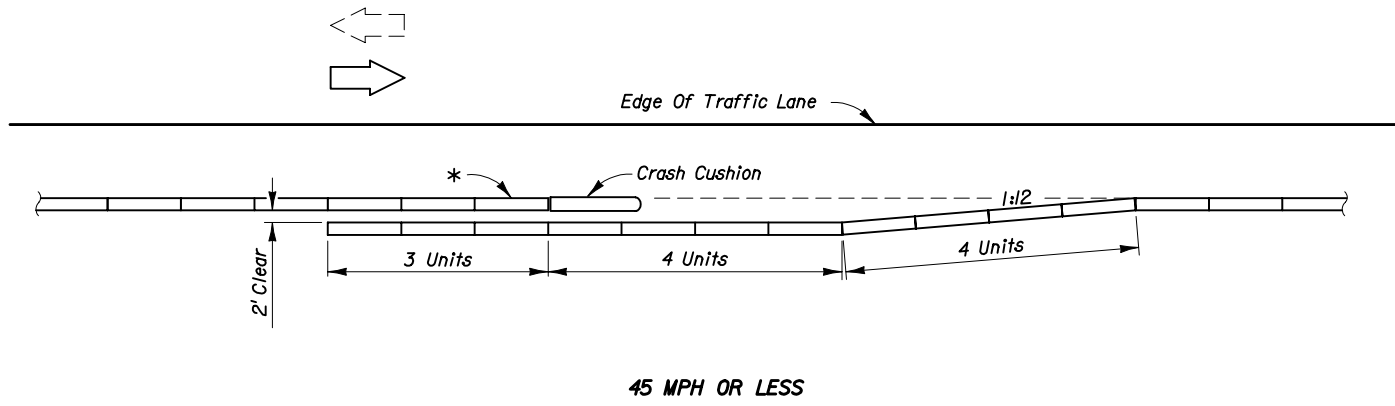
MEDIAN HAZARDS EXTENDS TO OR BEYOND CLEAR ZONES BOTH ROADWAYS

Note: Anchor Plates Required Only On End Units Abutting Crash Cushions.

△ See Sheet 2

BARRIER WALL END UNIT ANCHORAGE

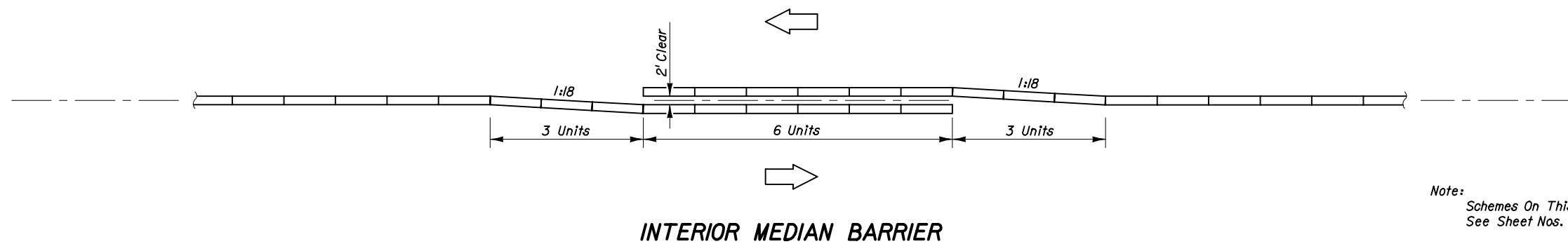
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
Designed By	JVG	Dates	04/03	Approved By
Drawn By	SBC	04/03	Revision	Sheet No.
Checked By	JAM	04/03	04	5 of 10
				Index No.
				415



* Anchor Plates Required Front Side Only On Unit Abutting Crash Cushion (See Sheet 4).

SHOULDER BARRIER ON UNDIVIDED FACILITIES

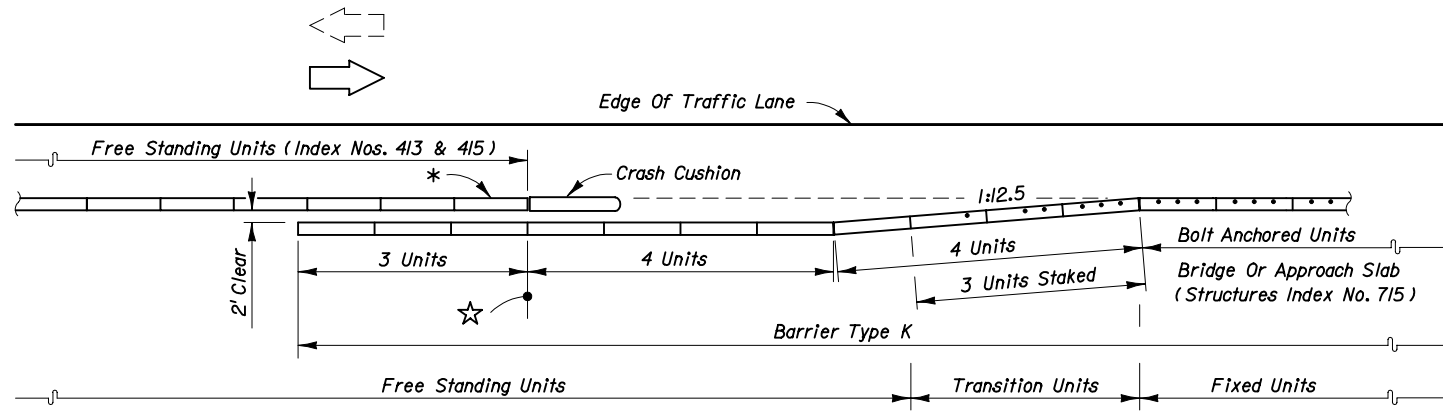
SHOULDER BARRIER ON DIVIDED FACILITIES



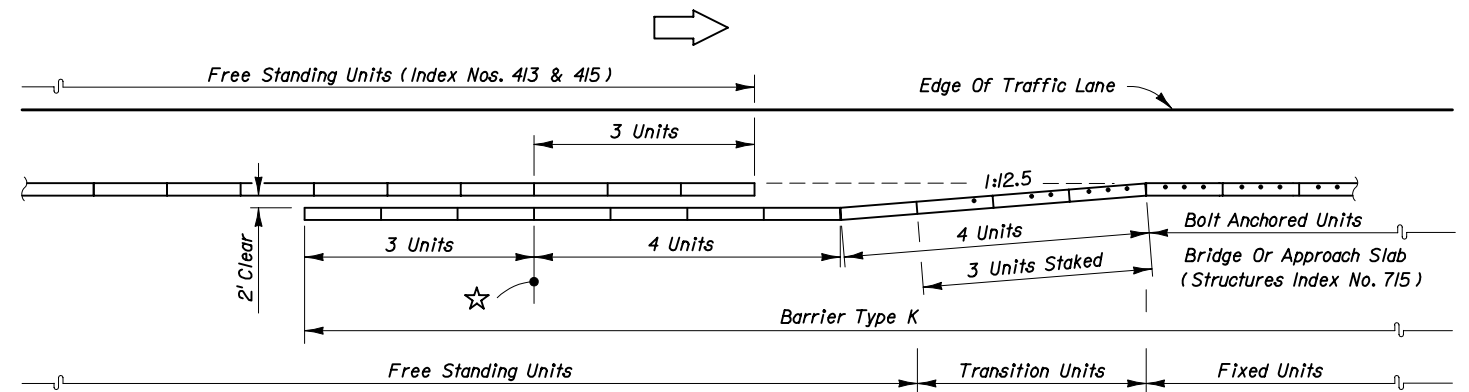
Note:
Schemes On This Sheet Based On 12' Units.
See Sheet Nos. 7 & 8 For Bridge Applications With Barrier Type K.

CONTINUATION OF RUNS OF BARRIER WITH DISSIMILAR CONNECTORS

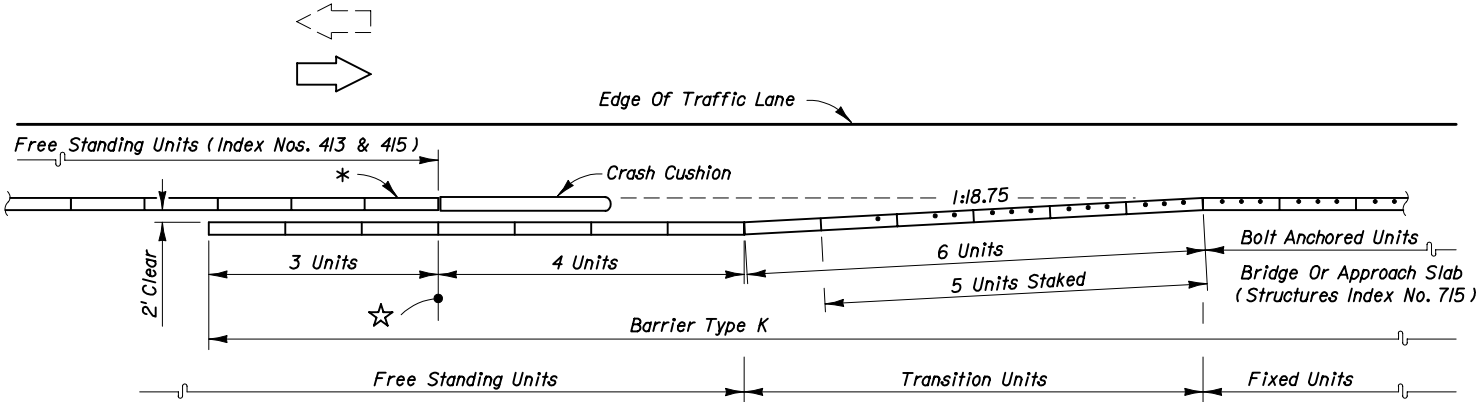
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
Designed By	JVG	Dates	04/03	Approved By <i>Lamont D. Hill</i> Roadway Design Engineer
Drawn By	SBC	Revision	04/03	Sheet No. Index No.
Checked By	JAM	04	6 of 10	415



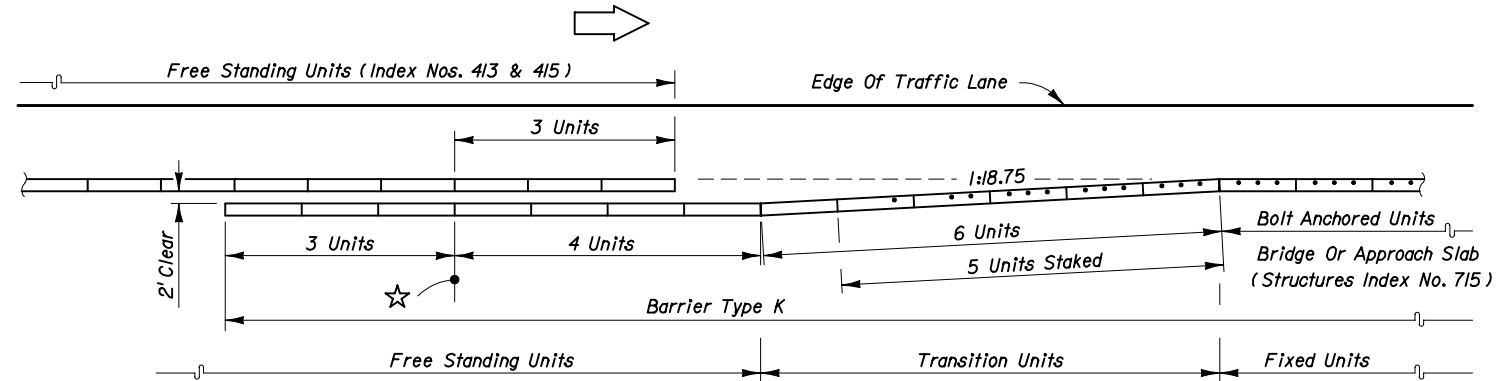
45 MPH OR LESS



45 MPH OR LESS



50 MPH OR GREATER



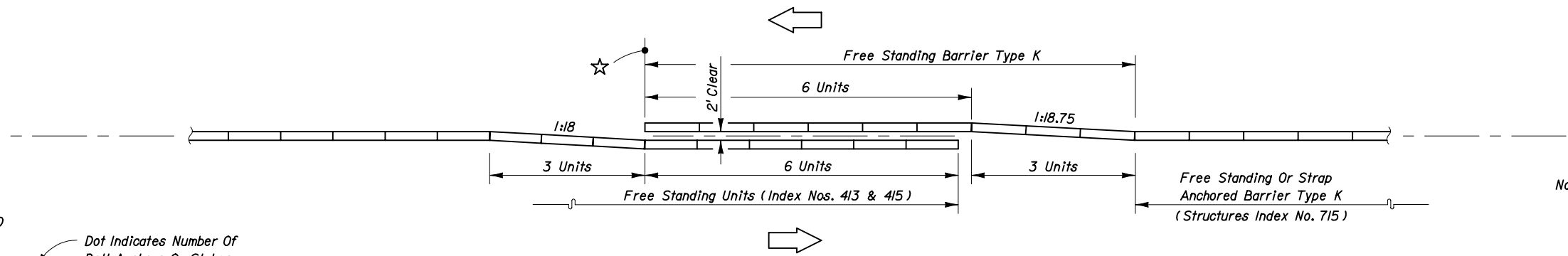
50 MPH OR GREATER

* Anchor Plates Required Front Side Only On Unit Abutting Crash Cushion (See Sheet 4).
 ☆ Overlap Reference Line

APPROACH SHOULDER BARRIER ON UNDIVIDED FACILITIES

APPROACH SHOULDER BARRIER ON DIVIDED FACILITIES

LEGEND
 Dot Indicates Number Of Bolt Anchors Or Stakes

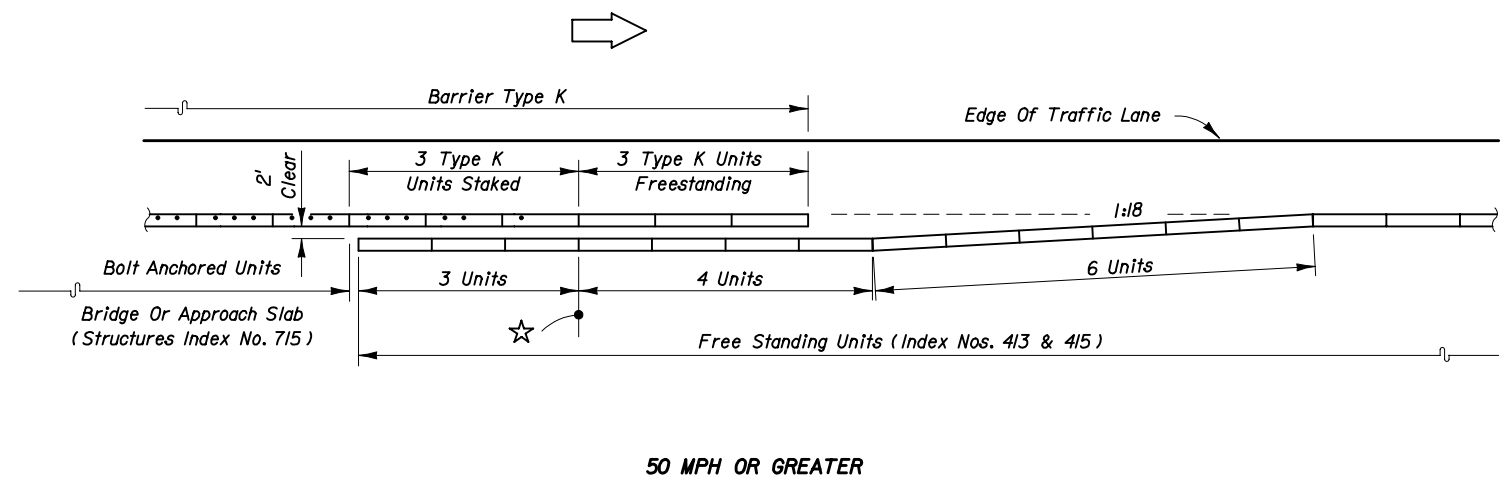
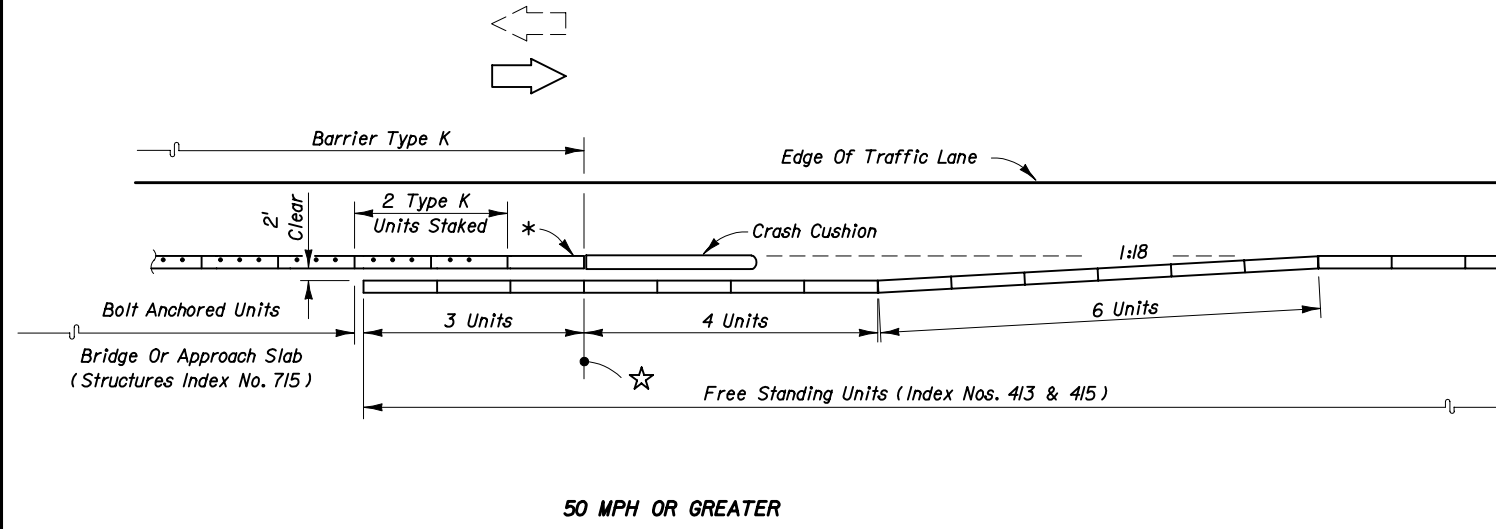
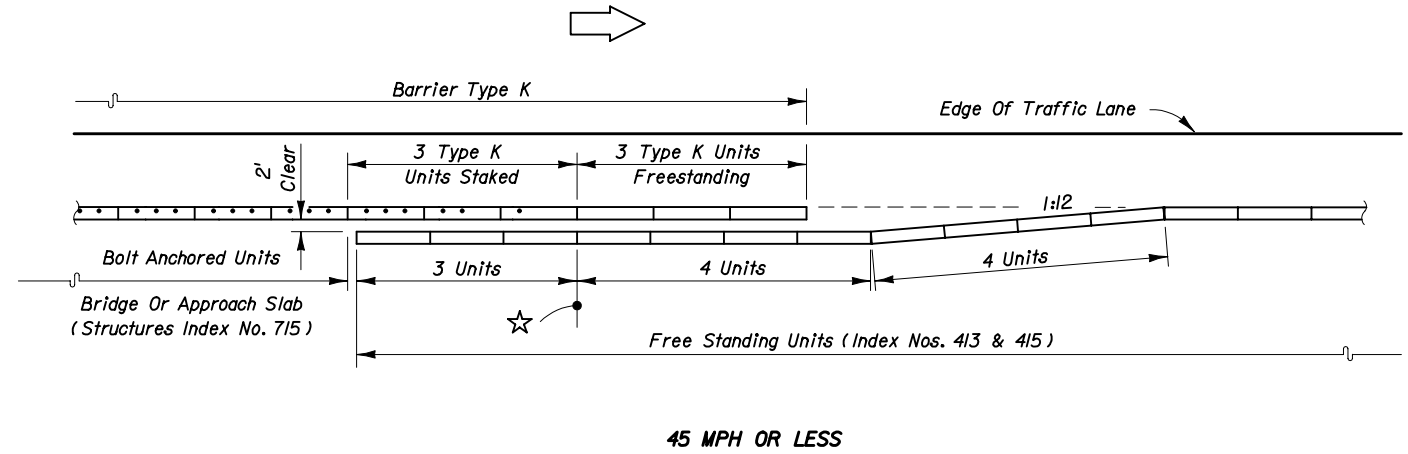
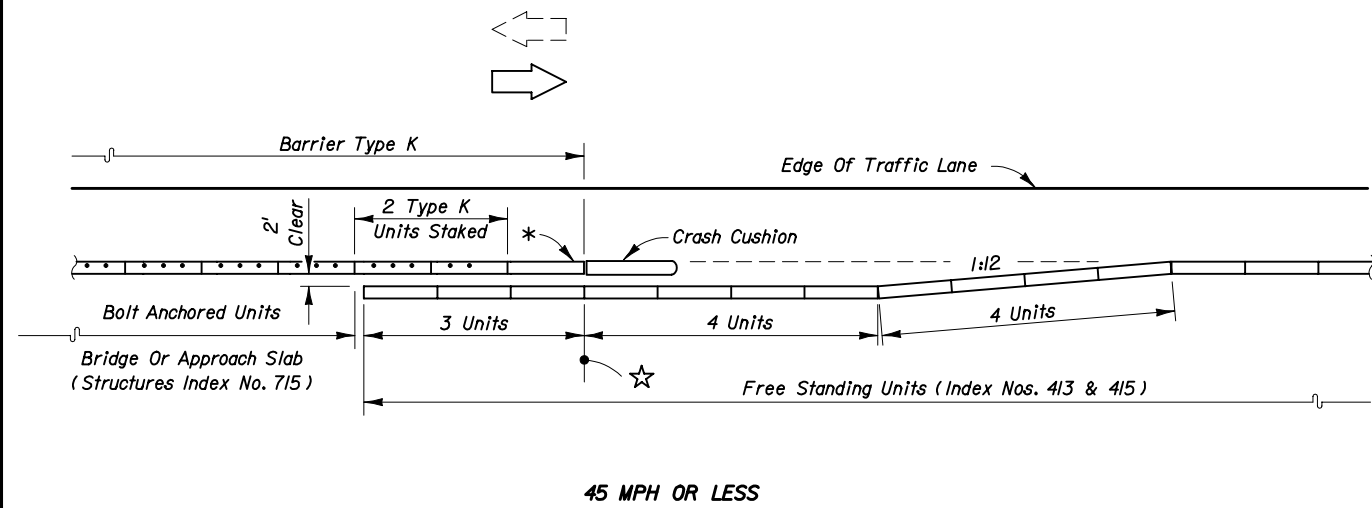


INTERIOR MEDIAN BARRIER

Note:
 See Sheet No. 8 For Departure Shoulder Applications.

**CONTINUATION OF BARRIER • INDEX NOS. 413 & 415 BARRIERS TO BARRIER TYPE K
 BARRIER TYPE K ON BRIDGES AND APPROACH SLABS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
Designed By	JVG	Dates	04/03	Approved By
Drawn By	SBC	04/03	Revision	Sheet No.
Checked By	JAM	04/03	04	7 of 10
				Index No. 415



* Anchor Plates Required Front Side Only On Unit Abutting Crash Cushion (See Sheet 4).
 ☆ Overlap Reference Line

DEPARTURE (TRAILING) SHOULDER BARRIER ON UNDIVIDED FACILITIES

DEPARTURE (TRAILING) SHOULDER BARRIER ON DIVIDED FACILITIES

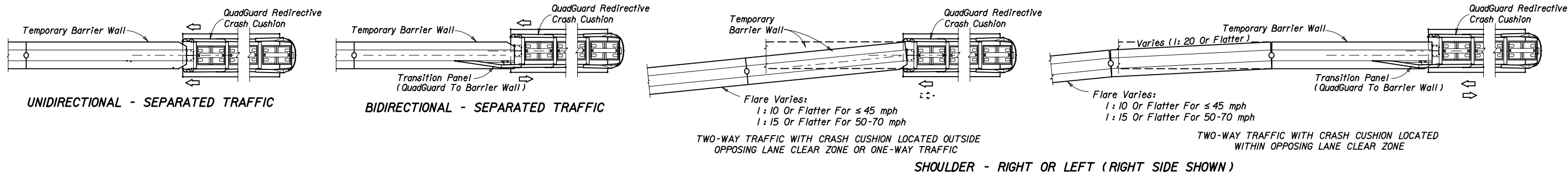
LEGEND
 Dot Indicates Number Of Bolt Anchors Or Stakes

Note:
 See Sheet No. 7 For Approach Shoulder Applications.
 See Sheet No. 7 For Interior Median Applications.

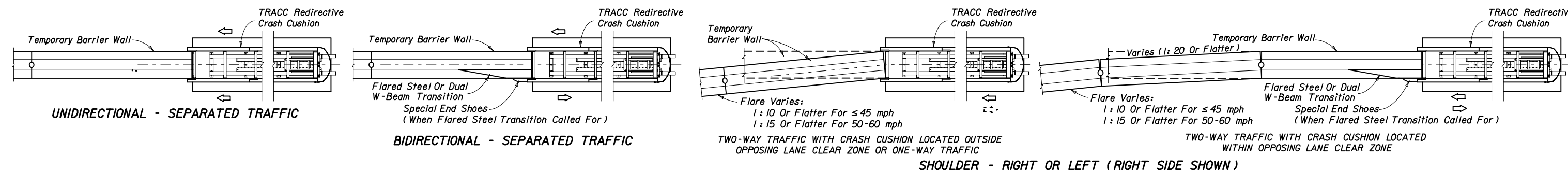
CONTINUATION OF BARRIER • FROM BARRIER TYPE K TO INDEX NOS. 413 & 415 BARRIERS

BARRIER TYPE K ON BRIDGES AND APPROACH SLABS

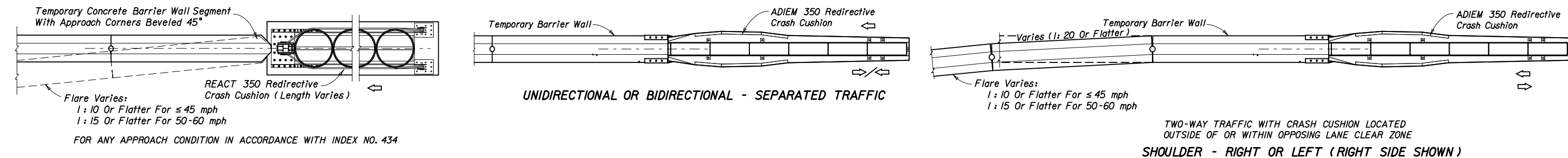
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
Designed By	JVG	Dates	04/03	Approved By
Drawn By	SBC	04/03	Revision	Sheet No.
Checked By	JAM	04/03	04	8 of 10
				Index No. 415



WALL END TREATMENT WHEN SHIELDED BY A QuadGuard CRASH CUSHION (INDEX NO. 435)



WALL END TREATMENT WHEN SHIELDED BY A TRACC CRASH CUSHION (INDEX NO. 440)



WALL END TREATMENT WHEN SHIELDED BY A REACT 350 CRASH CUSHION (INDEX NO. 434)

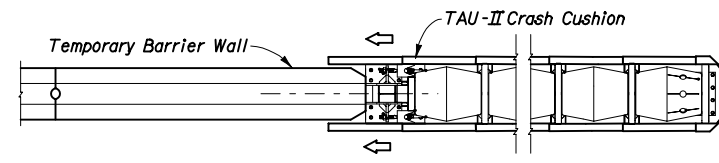
END TREATMENT WHEN SHIELDED BY AN ADIEM 350 CRASH CUSHION (INDEX NO. 436)

NOTES

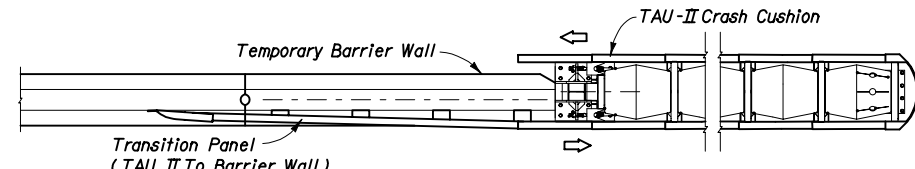
1. For alignment and length of need see Sheets 2 and 5 through 8.
2. Anchor plates required only on units abutting crash cushions.

**SHIELDING WALL ENDS WITH REDIRECTIVE CRASH CUSHIONS (REDIRECTIVE OPTION)
(CONTINUATION ON SHEET 10)**

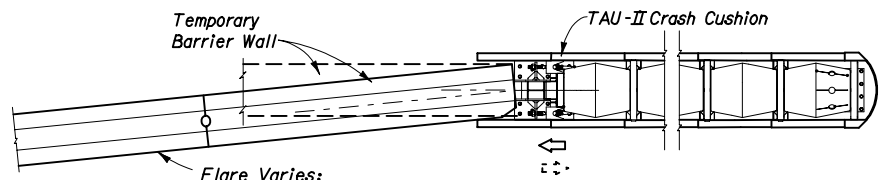
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
Names	Dates	Approved By <i>Jamell D. Milk</i>		
Designed By JVG	04/03	Roadway Design Engineer		
Drawn By SBC	04/03	Revision	Sheet No.	Index No.
Checked By JAM	04/03	04	9 of 10	415



UNIDIRECTIONAL - SEPARATED TRAFFIC

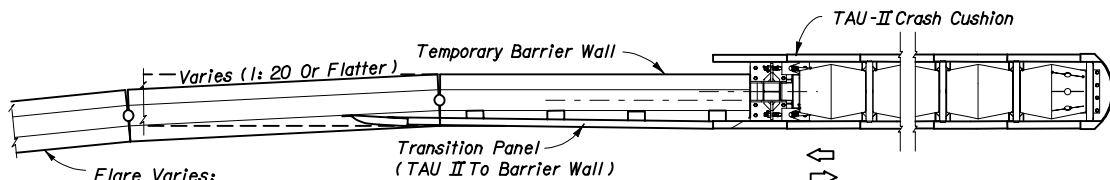


BIDIRECTIONAL - SEPARATED TRAFFIC



Flare Varies:
 1: 10 Or Flatter For ≤ 45 mph
 1: 15 Or Flatter For 50-70 mph
 TWO-WAY TRAFFIC WITH CRASH CUSHION LOCATED OUTSIDE
 OPPOSING LANE CLEAR ZONE OR ONE-WAY TRAFFIC

SHOULDER - RIGHT OR LEFT (RIGHT SIDE SHOWN)



Flare Varies:
 1: 20 Or Flatter
 1: 10 Or Flatter For ≤ 45 mph
 1: 15 Or Flatter For 50-70 mph
 TWO-WAY TRAFFIC WITH CRASH CUSHION LOCATED
 WITHIN OPPOSING LANE CLEAR ZONE

SHOULDER - RIGHT OR LEFT (RIGHT SIDE SHOWN)

WALL END TREATMENT WHEN SHIELDED BY TAU II CRASH CUSHION (INDEX NO. 441)

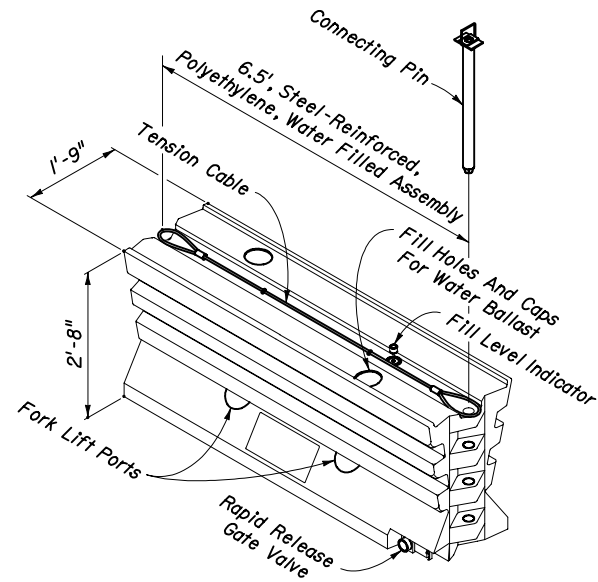
NOTES

1. For alignment and length of need see Sheets 2 and 5 through 8.
2. Anchor plates required only on units abutting crash cushions.

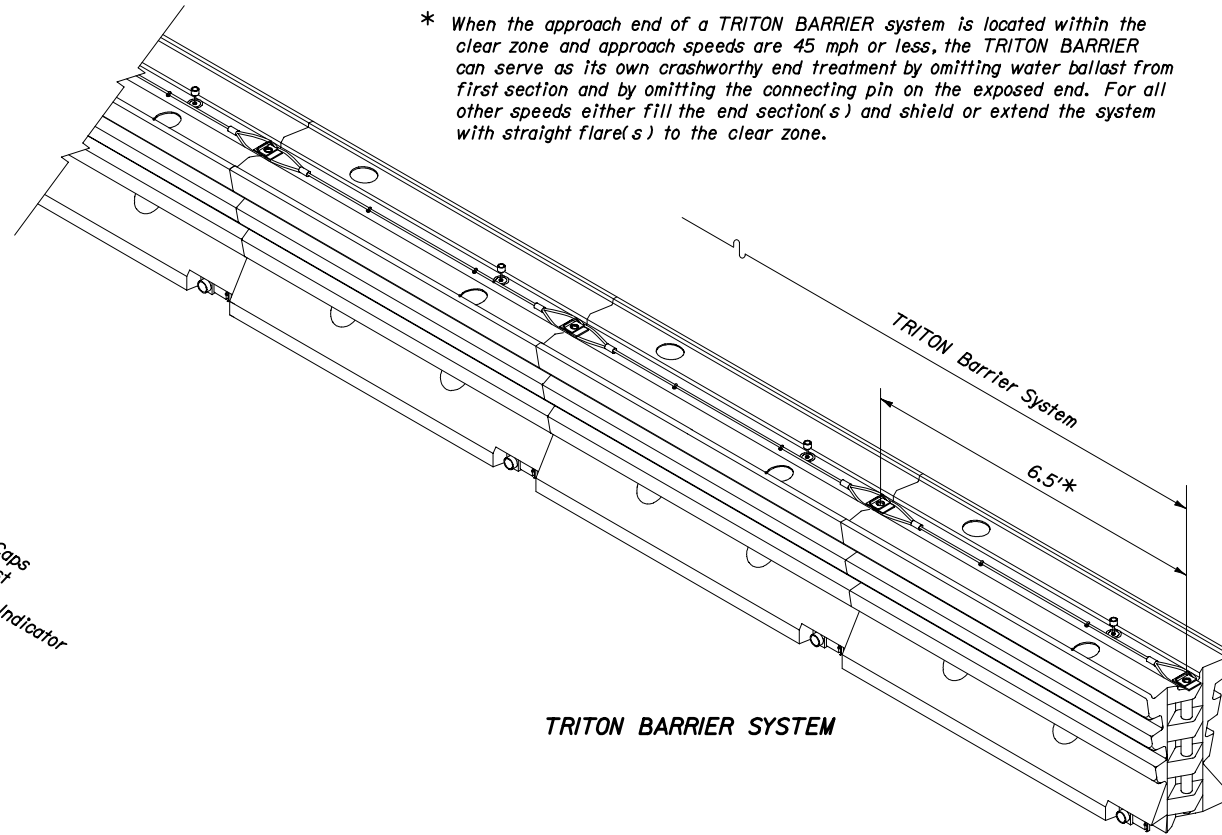
SHIELDING WALL ENDS WITH REDIRECTIVE CRASH CUSHIONS (REDIRECTIVE OPTION)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TEMPORARY CONCRETE BARRIER				
	Names	Dates	Approved By <i>Jamell D. Mill</i>	
Designed By	JVG	04/03	Roadway Design Engineer	
Drawn By	SBC	04/03	Revision	Sheet No. Index No.
Checked By	JAM	04/03	04	10 of 10 415

* When the approach end of a TRITON BARRIER system is located within the clear zone and approach speeds are 45 mph or less, the TRITON BARRIER can serve as its own crashworthy end treatment by omitting water ballast from first section and by omitting the connecting pin on the exposed end. For all other speeds either fill the end section(s) and shield or extend the system with straight flare(s) to the clear zone.



TRITON BARRIER SECTION



TRITON BARRIER SYSTEM

SUPPLEMENTAL GENERAL NOTES FOR THE TRITON BARRIER

1. The system presented on this standard drawing (index) under the label TRITON BARRIER is a proprietary design by Energy Absorption Systems, Inc. and is marketed under the trade name TRITON BARRIER.
2. This index provides the general graphics and information necessary to field identify component parts of the TRITON BARRIER and their incorporation as a whole system for Department standard applications.
3. The TRITON BARRIER system can be installed as a free standing system or in combination with other Department temporary and permanent barrier systems, exclusive of other proprietary water filled barrier systems.
4. Connections between the TRITON BARRIER and other barrier systems shall be as shown in the 'TRITON BARRIER TRANSITION HARDWARE ASSEMBLIES'. Variation from these connections shall be as detailed in the plans or as prescribed by the manufacturer.
5. The TRITON BARRIER section or sections are not to be used as perpendicular road closure blocks, whether connected, unconnected, filled or unfilled.
6. Sections shall be installed in alternating white and work zone safety orange colors.
7. The TRITON BARRIER systems shall be paid for under the contract unit price for Barrier (Temporary) (Water Filled), LF, and shall be full compensation for furnishing and installing TRITON BARRIER in accordance with this index, with the plans and with the manufacturer's detailed drawings, procedures and specifications. The cost for transition hardware detailed in this index shall be included in the contract unit price for the barrier. TRITON modules considered a part of the system's crashworthy end treatment shall be included in the linear measure; other crashworthy end terminals, crash cushions or other shielding required for use of the TRITON barrier will not be included in the contract unit price for the barrier.

SUPPLEMENTAL DESIGN NOTES AND GUIDELINES FOR THE TRITON BARRIER

1. The longitudinal system can be used for work zone speeds of 60 mph or less. Transition hardware can be used in areas where speeds are limited to 45 mph or less.
2. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the TRITON BARRIER, and until such alternatives are available, the TRITON BARRIER need not be bid against other proprietary items.

TRITON BARRIER

GENERAL NOTES

1. This standard drawing (index) presents proprietary temporary water filled barrier designs and is produced by the Florida Department Of Transportation solely for use by the Department and its assignees.
2. Any system presented on this index can be used as a temporary barrier in traffic control work zones and other Department permitted traffic control zones but cannot be constructed as a permanent barrier.
3. All systems shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications; however, installation will be limited to the applications shown on this index, except when otherwise detailed in the plans or approved by shop drawings or approved by the Engineer.
4. Water filled barrier systems are to be used only as longitudinal systems. A longitudinal system may include encapsulating work space barriers within low speed intersections only where the approach longitudinal system deflects the traffic alignment around the work space enclosure.
5. One type proprietary water filled barrier system is not to be used in conjunction with another type proprietary water filled barrier system, except when specifically called for and detailed in the plans.
6. All water filled barrier system sections shall be interconnected with manufacturer and Department approved crash tested connections, i.e., no individual sections or interconnected sections of substandard length are to stand alone, except when specifically called for and detailed in the plans, or for specific applications of interconnected sections around work spaces shown on this index.
7. Water filled barrier systems are not to be used on surfaces with cross slopes exceeding 0.05 (steeper than 1:20), including the surface within the design deflection space behind the barrier.
8. Water filled barrier systems are not to be used on grades steeper than 5%, nor placed over surface irregularities that cause vertical deflection exceeding 1:20 between connected sections.
9. Water filled barrier systems are not permitted on bridges or approach slabs; however, they can be placed over box culverts, including those of bridge length, where design deflection space is adequate. The system should be used on concrete pavements only where the Engineer determines that the dynamic loading of pavement slabs will not cause the system to crab out of alignment.
10. Temporary water filled barriers are to be paid for under the contract unit price for Barrier (Temporary) (Water Filled), LF. If the plans specify Barrier (Temporary) Water Filled, substitution with concrete barriers will not be permitted. For additional payment information see the supplemental general notes for the individual barrier systems.

Type C Steady-Burn lights are to be mounted on top of all water filled barriers used along travelways in work zones. The lights are to be spaced at 50' centers on transitions, 100' centers on curves and 200' centers on tangent roadways. Lights shall be paid for under the contract unit price for Light (Temporary Barrier Wall Mount) (Type C Steady-Burn), ED.

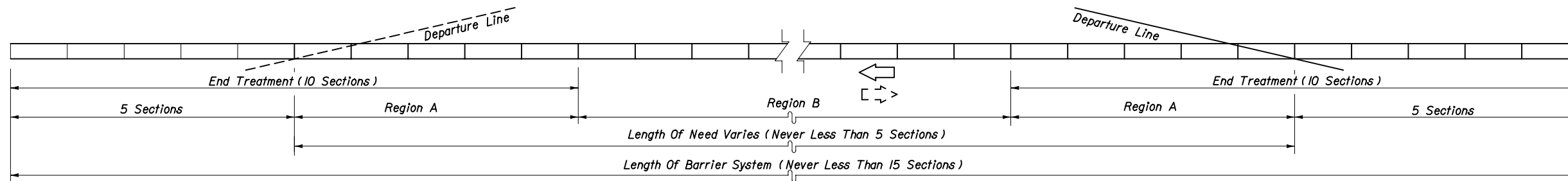
DESIGN NOTES

1. The TRITON and GUARDIAN water filled barriers are considered by the Federal Highway Administration to be innovative temporary barriers, and, may be used as such toward compliance with the percentage of innovative barrier required in the total median barrier on Federal Aid Projects.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TEMPORARY WATER FILLED BARRIERS

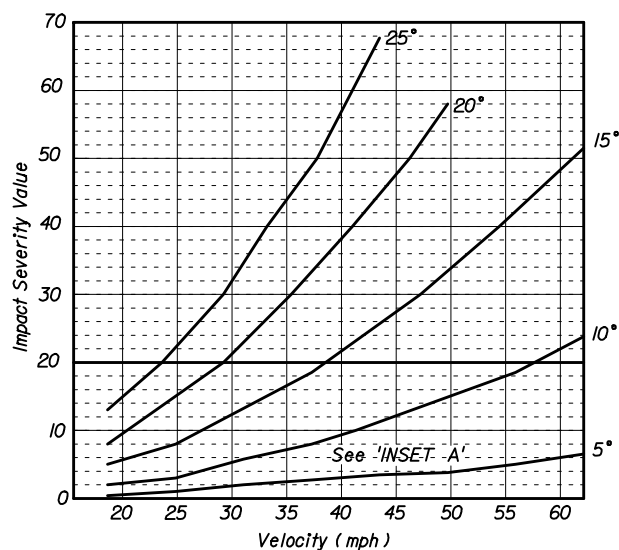
Designed By	MFG/HKH	6/95	Approved By <i>[Signature]</i> Roadway Design Engineer		
Drawn By	HKH	6/95	Revision	Sheet No.	Index No.
Checked By	JVG	6/95	04	1 of 6	416



Note: For Departure Line requirements see Index No. 400.

When TRITON BARRIER is used as its own end treatment fill all sections with water ballast except the approach end section(s). Do not use connecting pin on the exposed end of the end section(s).

SYSTEM LENGTHS FOR UNIDIRECTIONAL OR BIDIRECTIONAL TRAFFIC

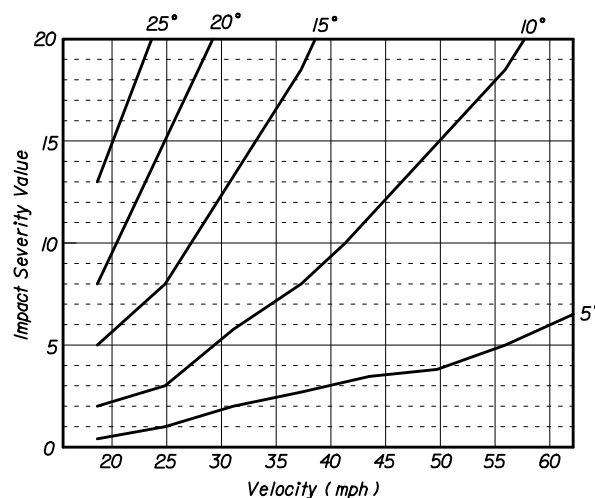
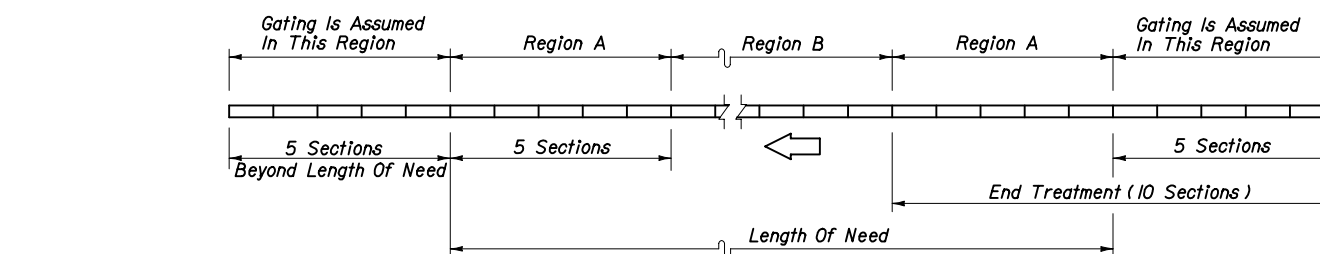


DETERMINING THE IMPACT ANGLE CURVE TO APPLY

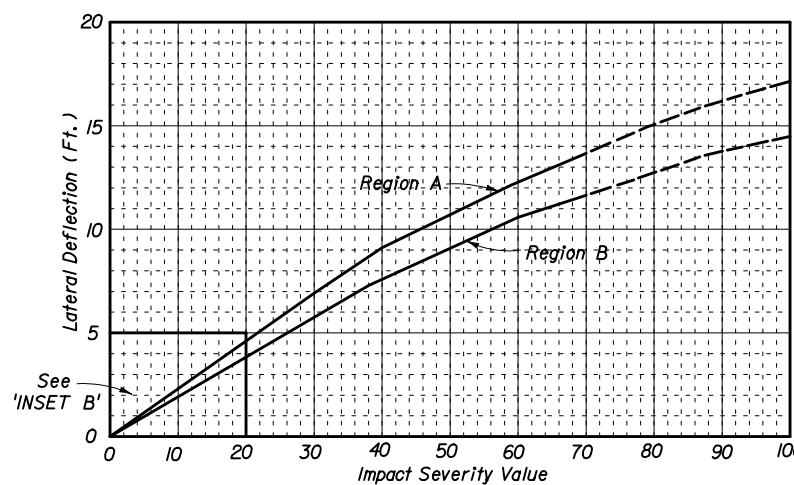
Except where the plans call for the use of a certain impact angle curve, or where a certain impact angle is anticipated by site specific conditions, the impact angle curve to be used in determining impact severity will be selected on the following basis:

Barrier Location	Graph Curve
Parallel to tangent roadway	5°
Parallel to and on the inside of roadway curve	5°
Standard lane shift or drop ($WS & \frac{WS^2}{60}$)	5°
Parallel to and on the outside of roadway curve	5° (10°) [15°]
Approach flared end section on inside of roadway curve	10°
Approach flared end section on approach tangent roadway	10°
Approach flared end section on outside of roadway curve	10° (15°) [25°]
() Max. Curvature (Min. Radius), High Speed Facilities	
[] Max. Curvature (Min. Radius), Low Speed Facilities	

IMPACT SEVERITY DETERMINATION FOR VEHICLES
≤4400 LB IMPACTING SINGLE ROW TRITON SYSTEM



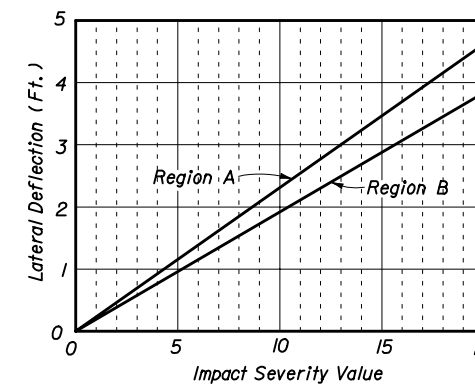
INSET A



Notes: Curves for Regions 'A' and 'B' apply to vehicles ≤ 4400 lbs.

--- Indicates impact severity levels created by higher impact angles not anticipated in work zone.

SINGLE ROW TRITON BARRIER INSTALLATION DEFLECTION CURVES



INSET B

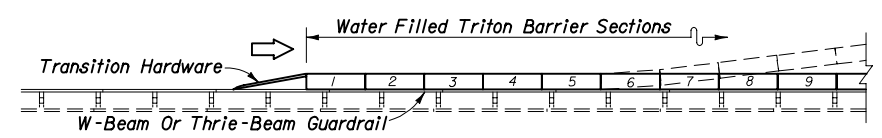
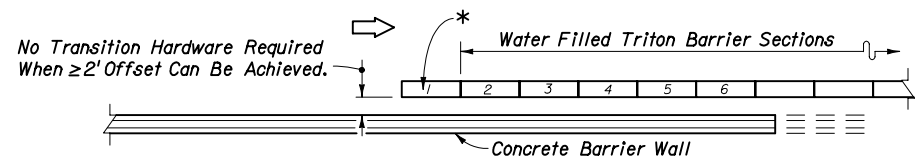
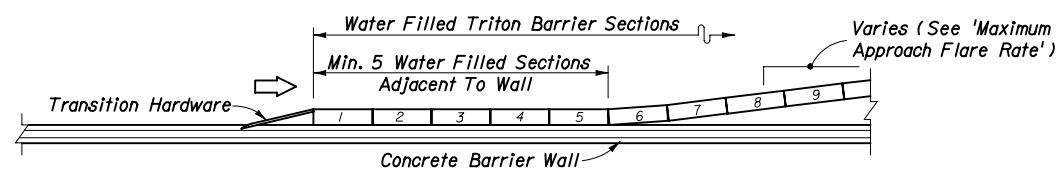
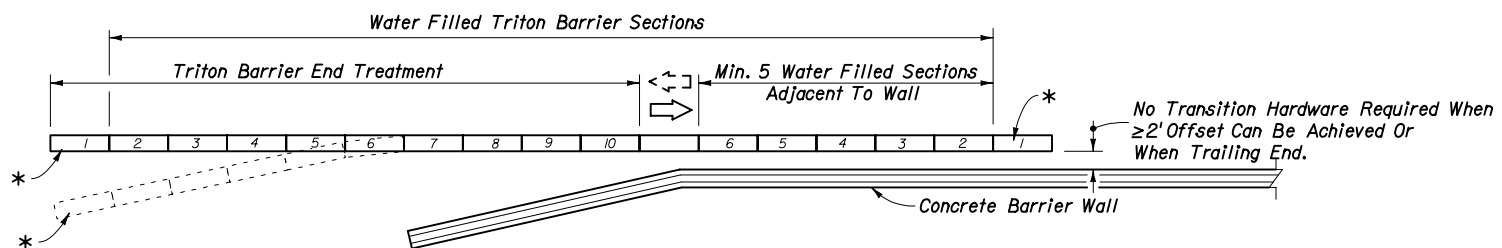
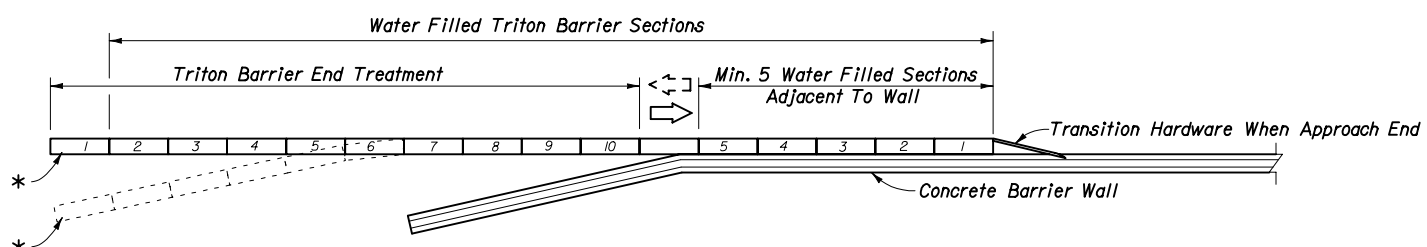
IMPACT SEVERITY AND LATERAL DEFLECTION DISTANCES

TRITON BARRIER SYSTEM LENGTHS AND DEFLECTIONS

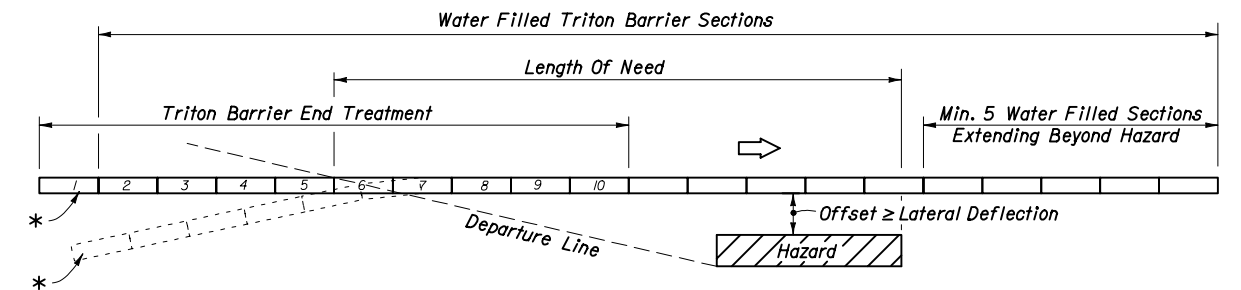
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TEMPORARY WATER FILLED BARRIERS

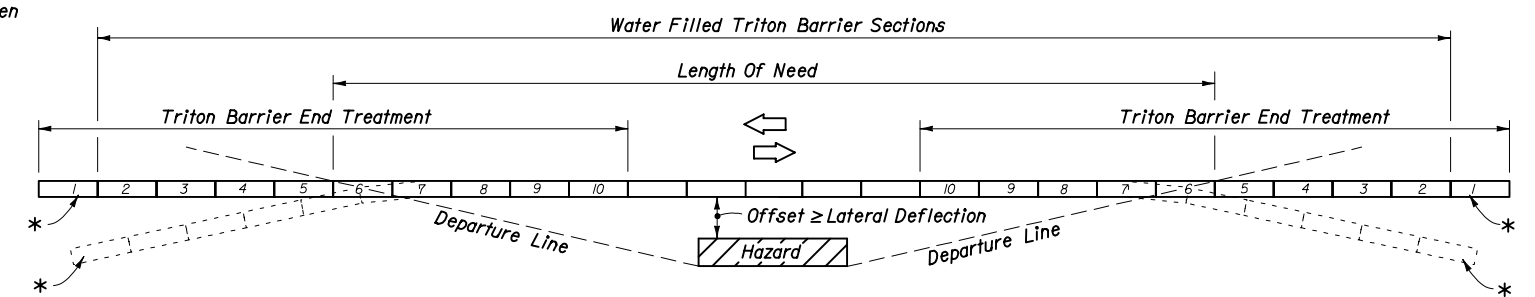
Names	Dates	Approved By		
Designed By	MFG/HKH 6/95			
Drawn By	HKH 6/95			
Checked By	JVG 6/95	Revision	Sheet No.	Index No.
		00	2 of 6	416



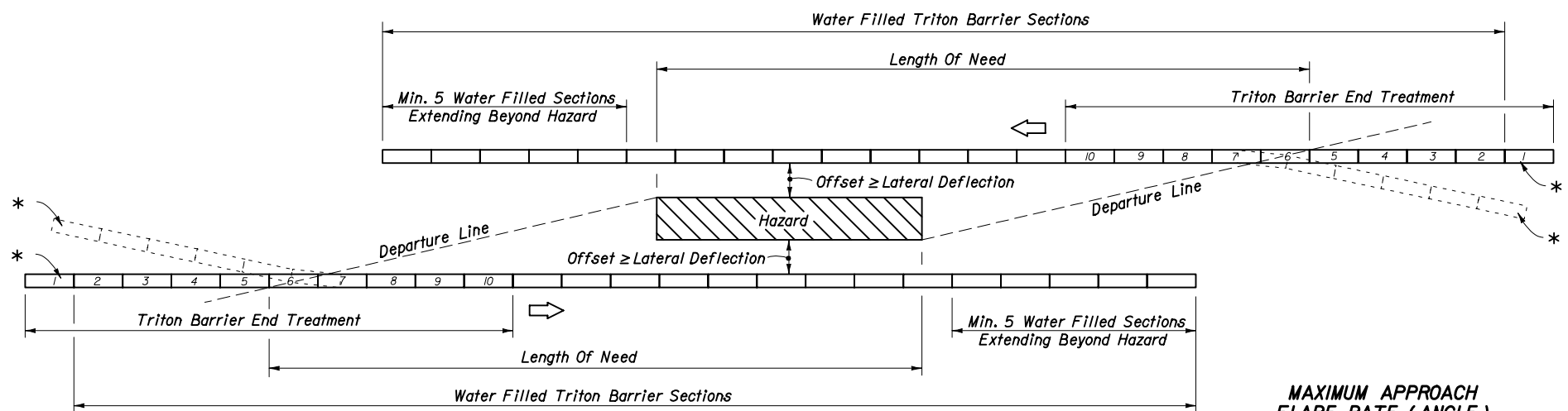
BARRIER SYSTEM IN COMBINATION WITH OTHER BARRIER SYSTEMS WHEN SPEEDS ARE ≤45 mph



TYPICAL UNIDIRECTIONAL SHOULDER LAYOUT



TYPICAL BIDIRECTIONAL SHOULDER LAYOUT

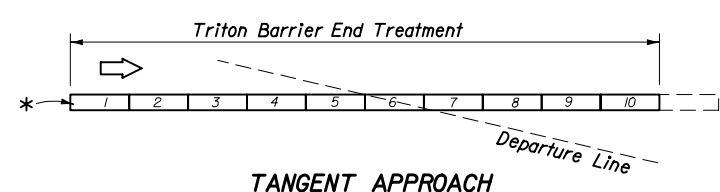


TYPICAL MEDIAN LAYOUT FREE STANDING BARRIER SYSTEMS

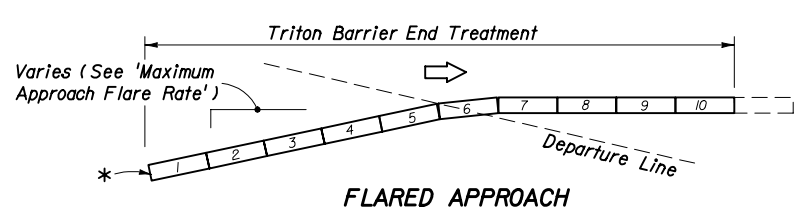
MAXIMUM APPROACH FLARE RATE (ANGLE)

≤40 mph	1:9 (6°)
45 mph	1:10 (5.5°)
50 mph	1:11 (5°)
55 mph	1:12 (4.5°)
60 mph	1:13 (4°)

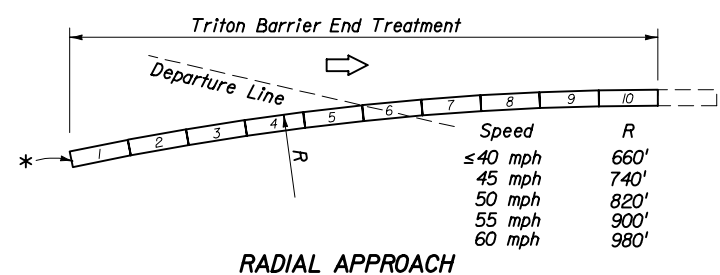
For Departure Line requirements see Index 400.
 * When used as an approach end treatment for speeds ≤45 mph, omit water ballast from first section and omit connecting pin on exposed end. For speeds ≥50 mph fill and shield or extend with straight flare to CZ.



TANGENT APPROACH



FLARED APPROACH



RADIAL APPROACH

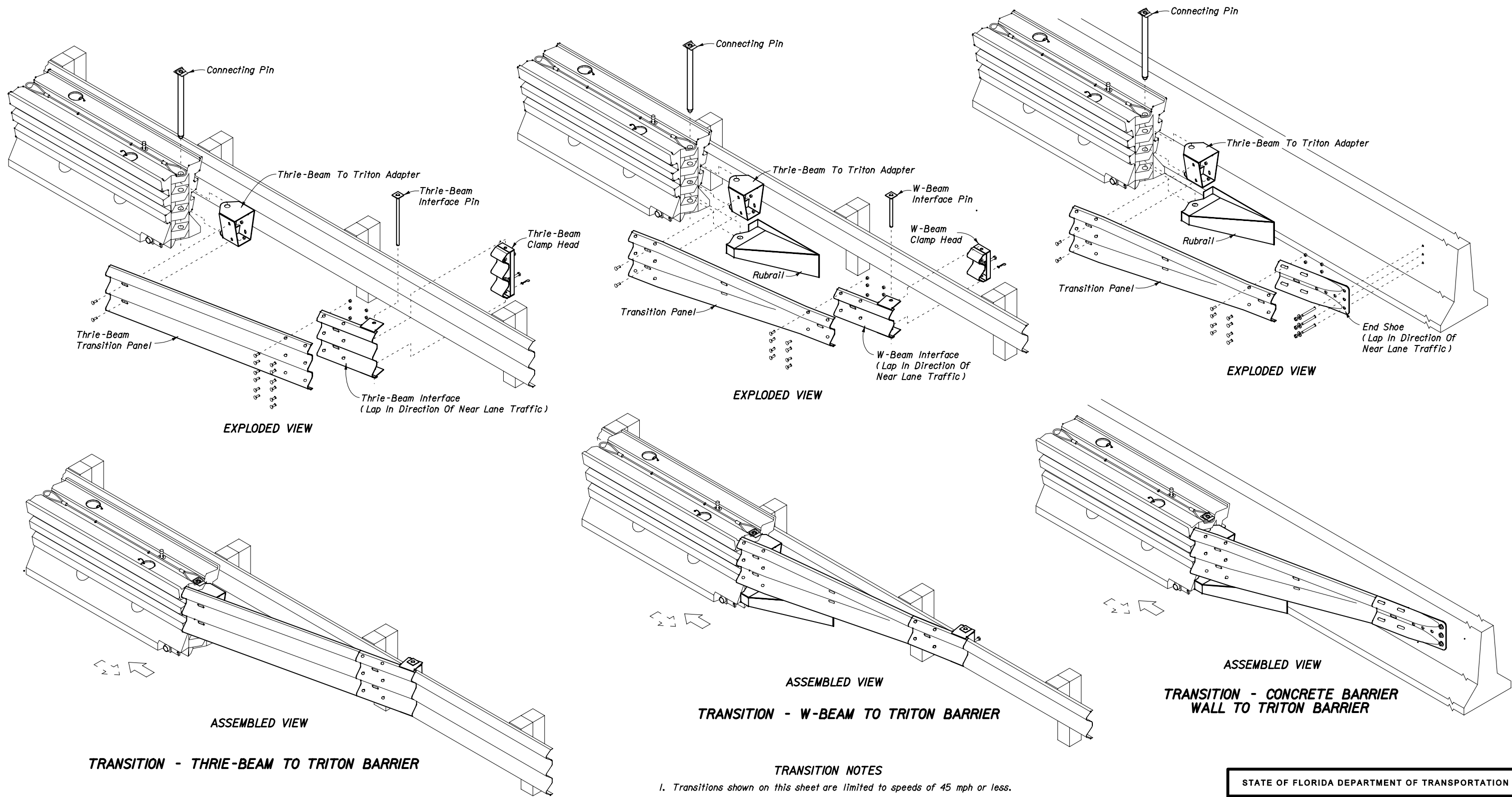
END TREATMENT CONFIGURATIONS

TRITON BARRIER - TYPICAL APPLICATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TEMPORARY WATER FILLED BARRIERS

Names	Dates	Approved By		
Designed By	MFG/HKH	6/95	Roadway Design Engineer	
Drawn By	HKH	6/95	Revision	Sheet No.
Checked By	JVG	6/95	00	3 of 6
				Index No.
				416



TRANSITION - THRIE-BEAM TO TRITON BARRIER

TRANSITION - W-BEAM TO TRITON BARRIER

TRANSITION - CONCRETE BARRIER WALL TO TRITON BARRIER

TRANSITION NOTES

1. Transitions shown on this sheet are limited to speeds of 45 mph or less.
2. Transition hardware can be placed on either end of TRITON section.
3. Transition hardware can be located on left or right side of roadway, right side shown.
4. TRITON Barrier end sections must be filled with water when using transition hardware assemblies.
5. Install transition hardware in accordance with the manufacturer's recommendations and specifications.

TRITON BARRIER TRANSITION HARDWARE ASSEMBLIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TEMPORARY WATER FILLED BARRIERS

Designed By	MFG/HKH	Dates	6/95	Approved By	<i>[Signature]</i>
Drawn By	HKH	Revision	00	Sheet No.	4 of 6
Checked By	JVG	Index No.			416

SUPPLEMENTAL GENERAL NOTES FOR THE GUARDIAN BARRIER

1. The barrier units presented on this standard drawing (index) and the label GUARDIAN are proprietary designs by Safety Barrier Systems and are marketed under the trade name GUARDIAN Safety Barrier.
2. This index provides general schematics and information necessary to field identify the water filled polyethylene segmental barrier module and the module frame and basic connections, but does not identify the incorporation of the modules and frame connections into a whole system. Any use of the GUARDIAN must be in accordance with the details on the plans, or by shop drawing approval or by the Engineer in absence of plan detail.
3. The GUARDIAN modules are approved for use on highways with all design speeds and only when the "GUARDIAN 350 Highway Kit" is incorporated throughout the system in use.
4. The GUARDIAN modules can be used only in a stand alone system. i.e., not connected to other types of barrier systems.
5. The GUARDIAN can be used only as a longitudinal barrier on the State maintained highway system. Any longitudinal system must have a minimum of eleven (11) longitudinally connected modules in advance of and following the length of need; in no case can the longitudinal run of barrier be less than 33 modules.

The approach end of the GUARDIAN must either extend to the outer limit of the clear zone; be shielded by a crash cushion; or, begin behind but not connected to another barrier or shielding feature.

6. The GUARDIAN system must be placed on a cross slope not exceeding 1:10, and located to provide a deflection distance between the system and hazards in accordance with the table below.

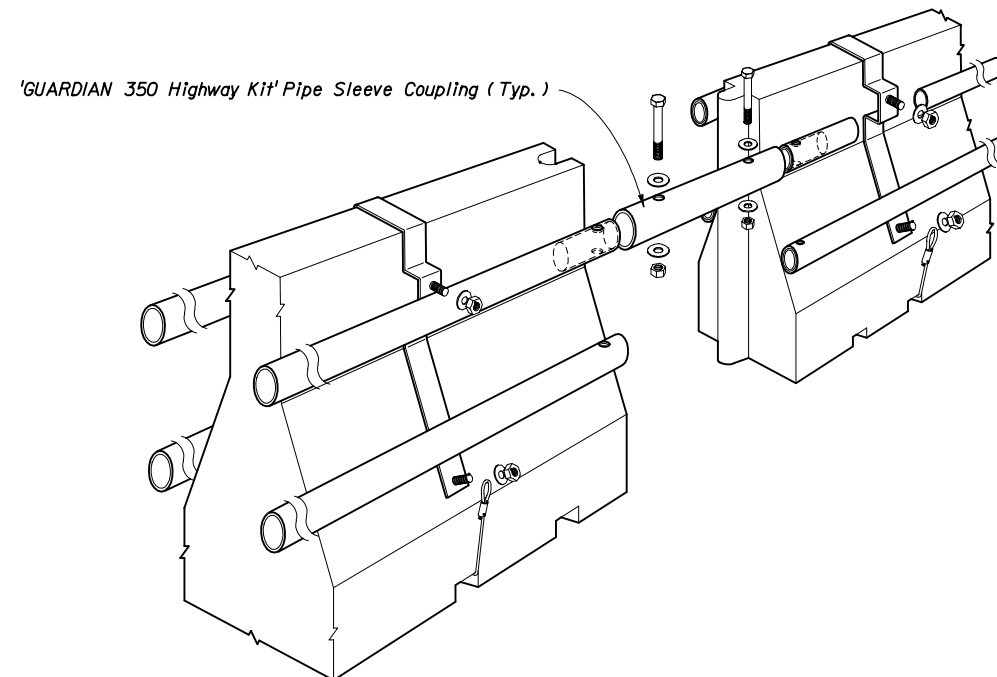
GUARDIAN BARRIER WITH 350 HIGHWAY KIT ESTIMATED BARRIER DEFLECTION (FEET)					
Vehicle Speed (mph)	Vehicle Impact Angle (Degrees)				
	25°	20°	15°	10°	5°
≤ 45	6.5	5.3	4.0	2.7	1.3
50	8.0	6.4	4.9	3.3	1.6
55	9.5	7.7	5.8	4.0	2.0
60	11.2*	9.0	6.9	4.6	2.3

* Observed Value (Crash Test Result)
Other Values Manufacturers Calculated Estimates


7. The GUARDIAN barrier system shall be paid for under the contract unit price for Barrier (Temporary) (Water Filled), LF, and shall be full compensation for furnishing and installing GUARDIAN barrier in accordance with this index, with the plans and with the manufacturer's detailed drawings, procedures and specifications. Any crashworthy end terminal, crash cushion or other shielding required for use of the GUARDIAN barrier will not be included in the contract unit price for the barrier.

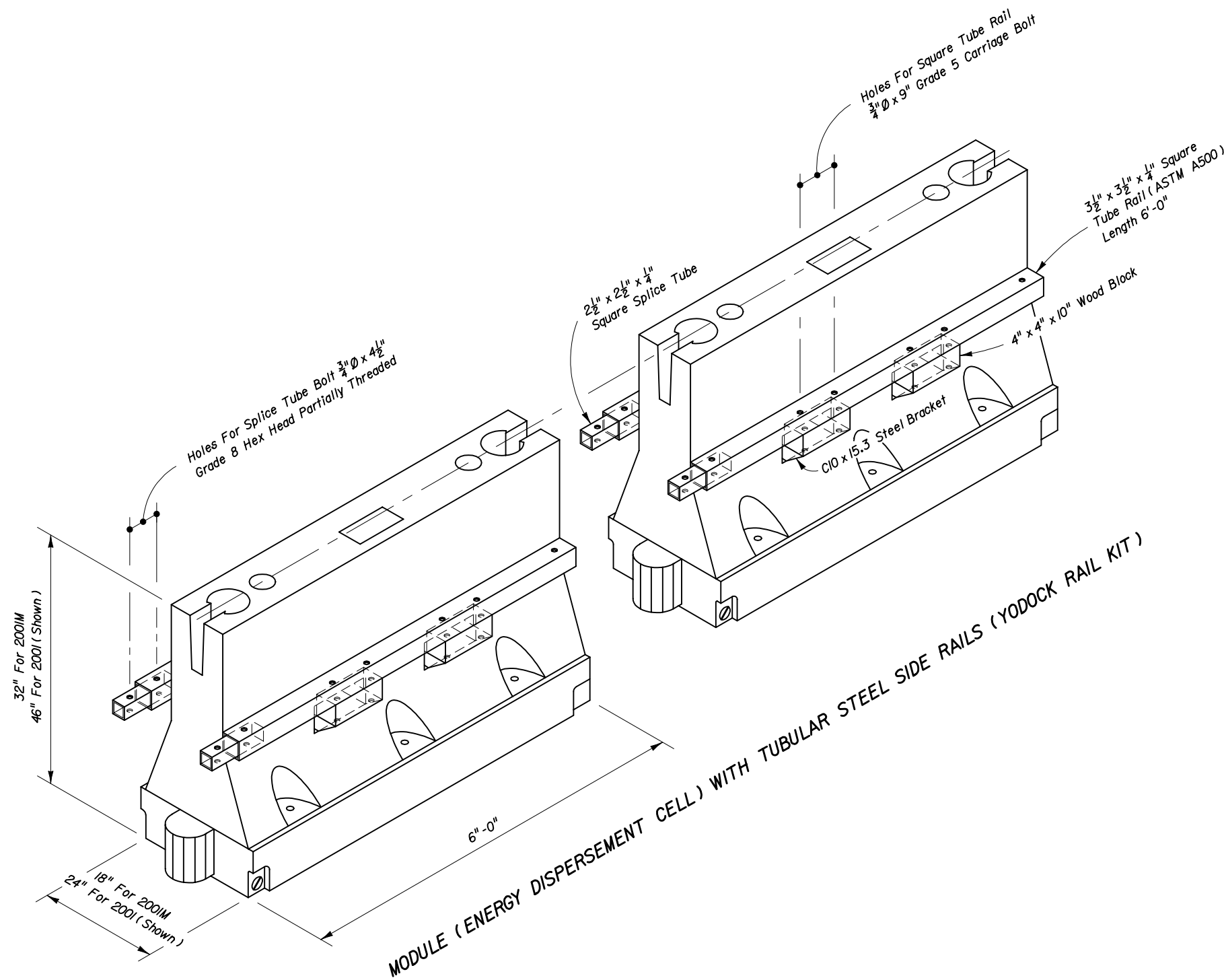
SUPPLEMENTAL DESIGN NOTES FOR THE GUARDIAN BARRIER

1. At time of publication of this standard no crash test data was available to provide a crashworthy end terminal design using the barrier modules; only the requirement for eleven (11) interconnected modules preceding and following the length of need, based on available crash test data.
2. Systems included in any maintenance of traffic plan will require detailed location and placement information.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the GUARDIAN barrier, and until such alternatives are available, the GUARDIAN barrier need not be bid against other proprietary items.



GUARDIAN BARRIER WITH 350 HIGHWAY KIT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
TEMPORARY WATER FILLED BARRIERS					
Names	Dates	Approved By 			
Designed By	MFG/HKH	6/95	Roadway Design Engineer		
Drawn By	HKH	6/95	Revision	Sheet No.	Index No.
Checked By	JVG	6/95	04	5 of 6	416



YODOCK LONGITUDINAL TRAFFIC BARRIER

GENERAL NOTES FOR THE YODOCK BARRIER

1. The longitudinal traffic barrier systems presented on this standard drawing (index) and the label YODOCK are proprietary designs by THE YODOCK WALL COMPANY and are marketed under the trade name YODOCK BARRIER.
2. This index provides general schematics and information necessary to field identify the water filled polyethylene segmental barrier module (Energy Dispersment Cell) and the module frame and basic connections, but does not identify the incorporation of the modules and frame connections into a whole system. Any use of the YODOCK Barrier must be in accordance with the details on the plans, or by shop drawing approval or by the Engineer in absence of plan detail.
3. The Model 200I barrier system is approved for use on highways with all design speeds. The Model 200IM is limited to use on highways with a design speed of 45 mph and less.
4. The YODOCK longitudinal traffic barrier system can be used only in a stand alone system. i.e., not connected to other types of barrier systems.
5. The YODOCK longitudinal traffic barrier system must have a minimum of eight (8) longitudinally connected modules in advance of the length of need; in no case can the longitudinal run of barrier be less than 25 modules.

The approach end of the YODOCK system must either extend to the outer limit of the clear zone; be shielded by a crash cushion; or, begin behind but not connected to another barrier or shielding feature.
6. The YODOCK longitudinal barrier system must be placed on a cross slope not exceeding 1:10, and located to provide a deflection distance between the system and hazards in accordance with the table below.

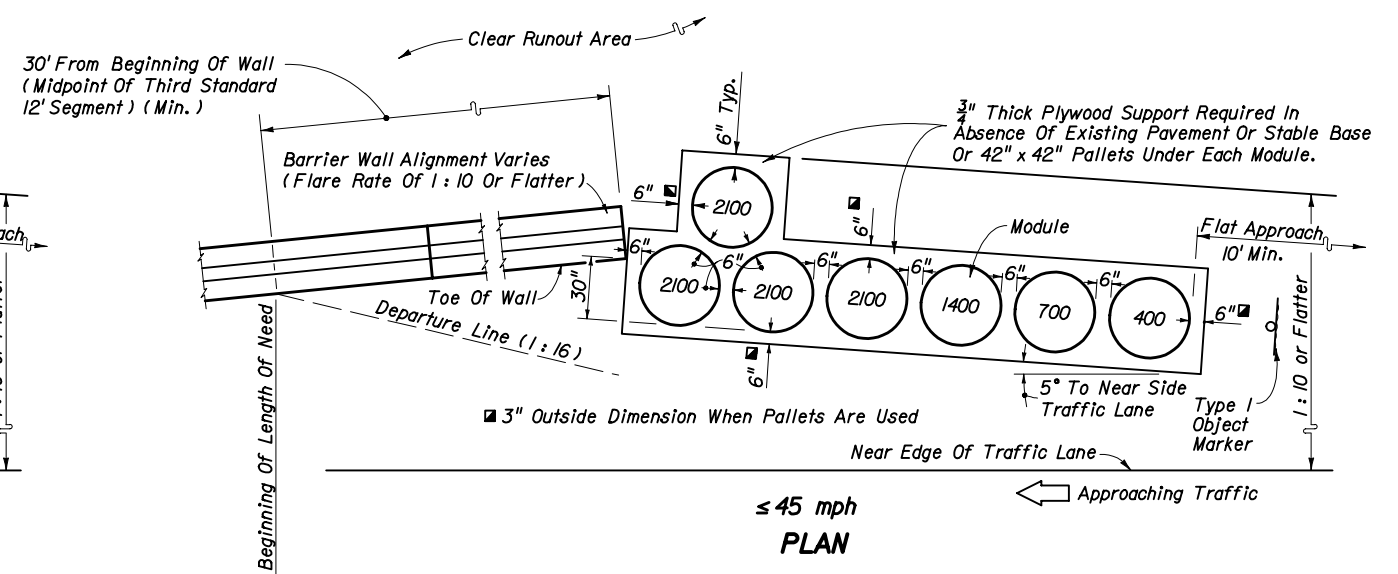
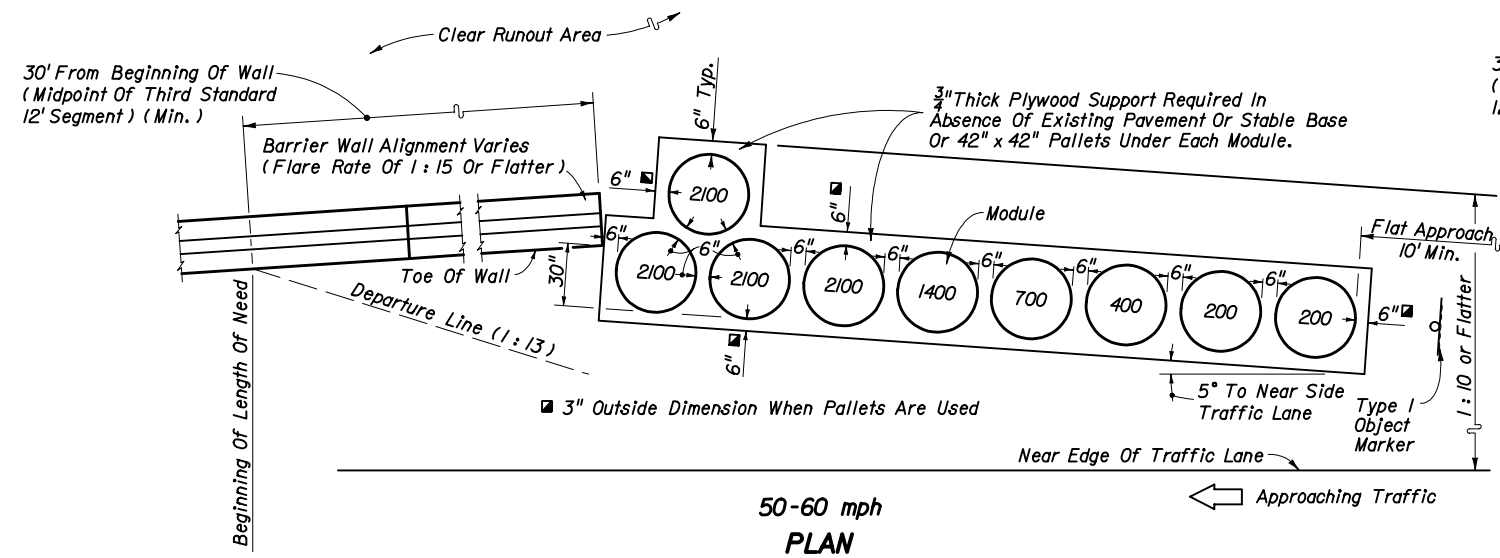
BARRIER WITH TUBULAR STEEL SIDE RAILS					
ESTIMATED BARRIER DEFLECTIONS (FEET)					
YODOCK 200IM BARRIER					
Vehicle Speed (mph)	Vehicle Impact Angle (Degrees)				
	25°	20°	15°	10°	5°
20	3.0	2.0	1.0	0.5	0.5
25	4.5	3.0	1.5	1.0	0.5
35	8.5	5.5	3.0	1.5	0.5
40	11.0	7.5	4.0	2.0	0.5
45	14.0	9.0	5.5	2.5	0.5
YODOCK 200I BARRIER					
45	8.0	5.0	3.0	1.5	0.5
50	9.5	6.0	3.5	1.5	0.5
55	11.0	7.5	4.5	2.0	0.5
60	14.0	9.0	5.0	2.5	0.5

7. The YODOCK longitudinal traffic barrier system shall be paid for under the contract unit price for Barrier (Temporary) (Water Filled), LF, and shall be full compensation for furnishing and installing YODOCK barrier in accordance with this index, with the plans and with the manufacturer's detailed drawings, procedures and specifications. Any crashworthy end terminal, crash cushion or other shielding required for use of the YODOCK barrier will not be included in the contract unit price for the barrier.

DESIGN NOTES FOR THE YODOCK BARRIER

1. Systems included in any maintenance of traffic plan will require detailed location and placement information.
2. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the YODOCK barrier, and until such alternatives are available, the YODOCK barrier need not be bid against other proprietary items.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
TEMPORARY WATER FILLED BARRIERS					
Names	Dates	Approved By			
Designed By	MRG	12/02	Roadway Design Engineer		
Drawn By	SBC	12/02	Revision	Sheet No.	Index No.
Checked By	JVG/TRB	12/02	04	6 of 6	416

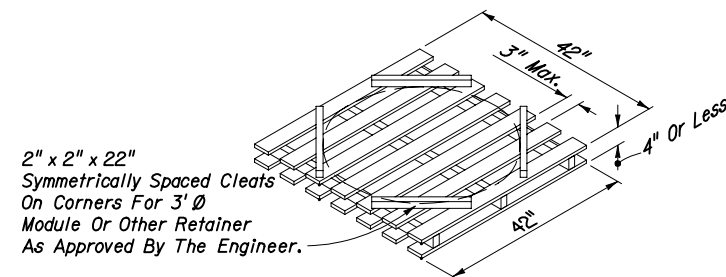


Note: Numbers shown inside modules indicate mass in pounds of sand. All modules are approximately 3' in diameter with heights ranging from 3' to 3'-9".

INERTIAL CRASH CUSHION ARRAYS

NOTES FOR TEMPORARY INERTIAL CRASH CUSHIONS

1. The crash cushion arrays shown on this index can be used on the State highway system only for shielding temporary concrete barrier wall approach ends. These arrays can not be substituted for redirective crash cushions called for in the plans, and are not eligible for VECF considerations.
2. Inertial crash cushions are gating type crash cushions, and a clear runout area back of the array must be provided. The arrays shown can be used for outer roadway applications, exclusive of gore areas, and for median applications where the median width is sufficient to provide clear zone width between the back side module and the near lane of the opposing traffic.
3. Inertial crash cushion modules shall be installed in accordance with the manufacturer's specifications and recommendations, and can be constructed of either new or functionally sound used modules.
4. Anchorage of barrier wall end segment is not required.
5. A yellow post mounted Type I Object Marker shall be centered 3' in front of the nose of all crash cushion arrays. Mounting hardware shall be in accordance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the modules.
6. Temporary inertial crash cushions are to be paid for per module under the contract unit price for Impact Attenuator Modules (Inertial) (Temporary), EA.



Pallet Shall Be Constructed Of Wood Or Other Frangible Or Resilient Materials Other Than Metals, And, Shall Be Sufficiently Durable To Support Modules For Their Expected Period Of Use; Wood Pallet Detail Shown.

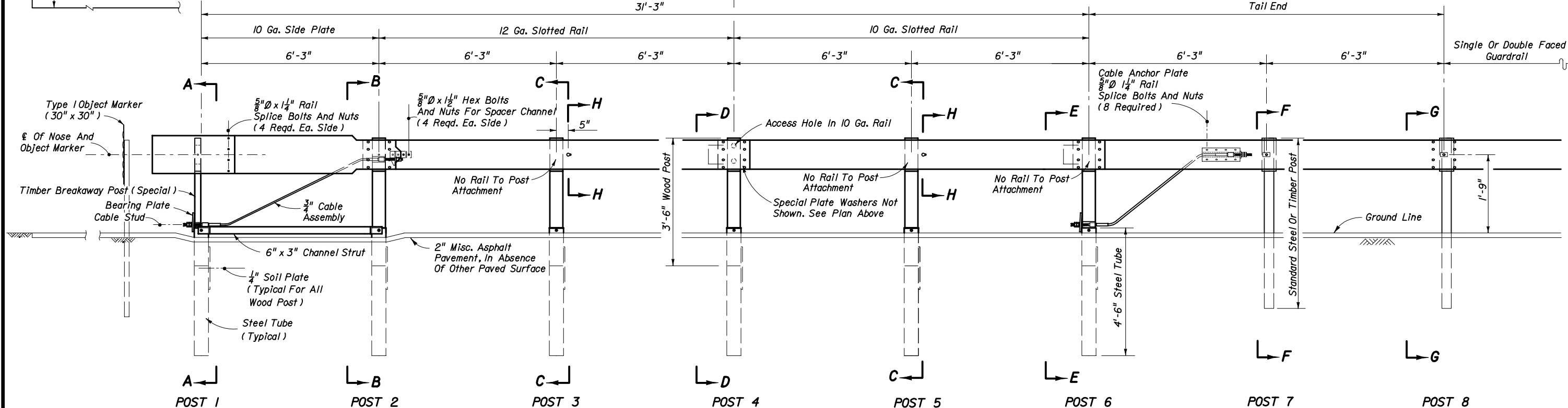
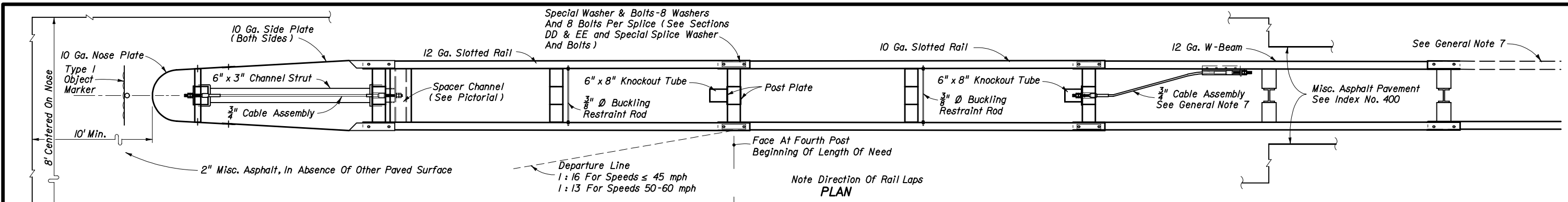
INERTIAL MODULE PALLET

TEMPORARY INERTIAL CRASH CUSHIONS FOR SHIELDING ENDS OF TEMPORARY CONCRETE BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

INERTIAL CRASH CUSHION

Designed By	Names	Dates	Approved By <i>Samuel D. Milk</i>		
Drawn By	HKH	3/99	Roadway Design Engineer		
Checked By	JVG	3/99	Revision	Sheet No.	Index No.
			02	1 of 1	417



GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by SYRO Inc. and marketed under the trade name C-A-T 350, short for Crash Cushion/Attenuating Terminal. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the C-A-T 350 system and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the C-A-T 350 system installed in connection with standard single and double faced W-beam guardrail systems, and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.
4. The C-A-T 350 system shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
5. The C-A-T 350 system is suitable for speeds ≤ 60 mph.
6. The C-A-T 350 system shall be located on slopes of 1:10 or flatter and not closer than 11' to any traffic lane.
7. The 'tail end' section represented on this drawing applies to connections with single and double faced guardrail. The cable anchorage at Post No. 6 is to be used with single faced guardrail connections only.

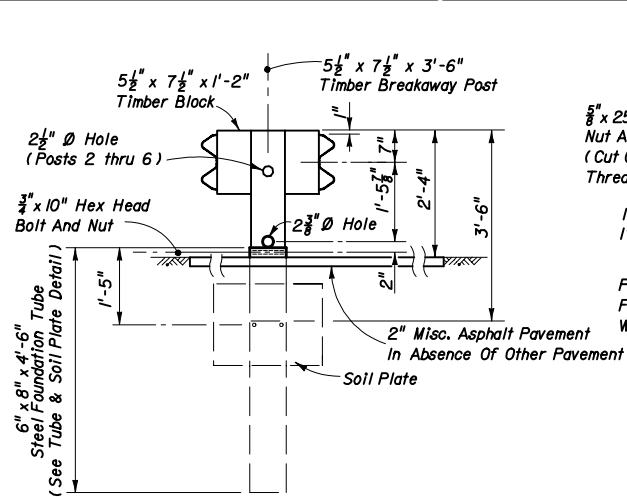
Where the C-A-T 350 system is installed in conjunction with a rigid structure, a guardrail transition section shall be constructed between the C-A-T 350 system and the structure connection. The transition sections shown on Indexes 400 and 410 shall be constructed for connected to bridge concrete traffic rails and roadway concrete barrier walls; transition sections for connections to other rigid structures shall be as detailed in the plans and/or as approved by shop drawings.

8. Metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
9. A yellow Type I Object Marker shall be centered 3' in front of the nose of the C-A-T 350 system. Mounting hardware shall be in conformance with Index No. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the C-A-T 350.
10. The C-A-T 350 system for single and double faced guardrail applications will be paid for the under the contract unit price for Impact Attenuator Vehicular (CAT), EA.

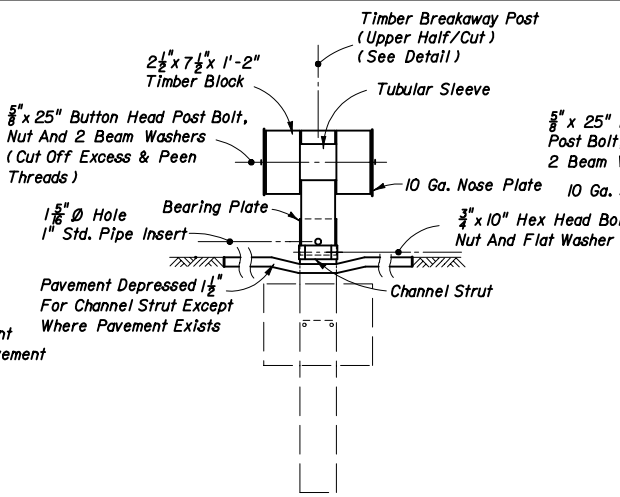
DESIGN NOTES AND GUIDELINES

1. The C-A-T 350 system is designed to cushion automobile end-on hits and to redirect automobiles from side hits when impacting at speeds up to and including 60 mph. The C-A-T 350 system has a singular design for all speeds of 60 mph or less, and any adjustment to its design will not be permitted except as authorized by the manufacturer.
2. The C-A-T 350 system is not intended for use in gores of freeway and expressway mainline ramp terminals; gores of roadway forks; or other gore locations where there is a history of high frequency vehicle departure from the roadway or the potential exists for such departures. The C-A-T 350 system is not a restorable design and therefore requires complete replacement after having sustained either an end-on or a side vehicular impact. Deformed side rail elements that will inhibit the shearing of lands between the rail slots will be subfunctional and are to be replaced immediately; deformed elements are not to be refurbished for reuse.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the C-A-T 350, and until such alternatives are available, the C-A-T 350 need not be bid against other proprietary items.

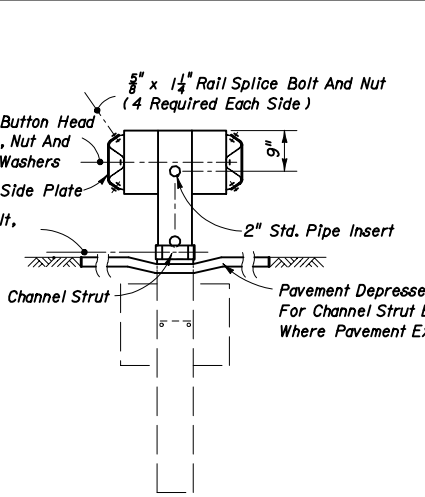
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
C-A-T 350				
Designed By	MFG/JVG	7/91	Approved By <i>[Signature]</i> Roadway Design Engineer	
Drawn By	HSD	7/91	Revision	Sheet No.
Checked By	JVG/RER	7/91	00	1 of 2
				Index No. 432



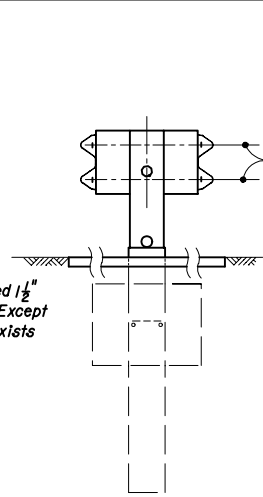
TYPICAL DIMENSIONING



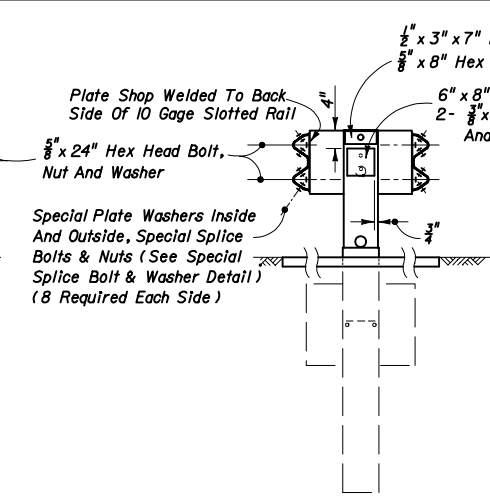
SECTION AA
POST NO. 1



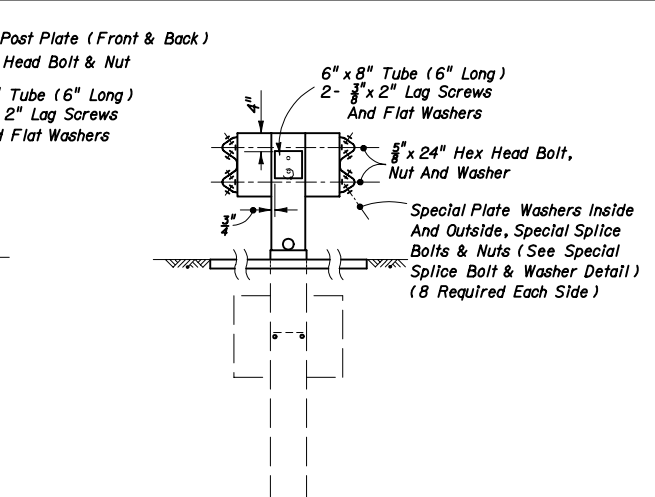
SECTION BB
POST NO. 2



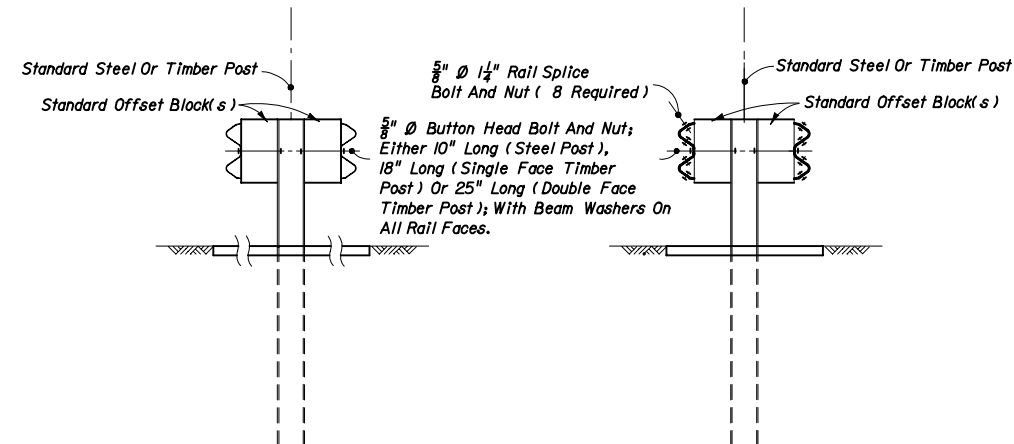
SECTION CC
POST 3 & 5



SECTION DD
POST NO. 4

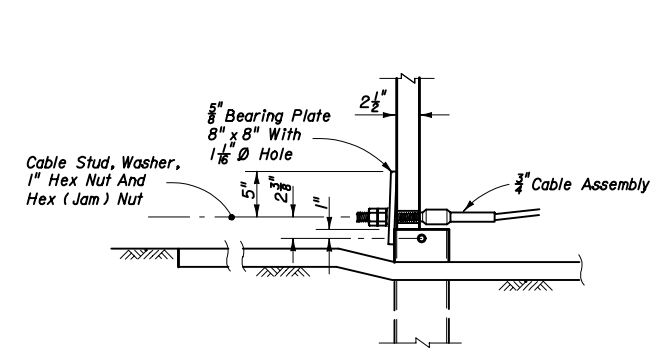


SECTION EE
POST NO. 6

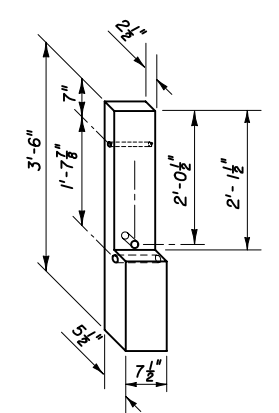


SECTION FF
POST NO. 7

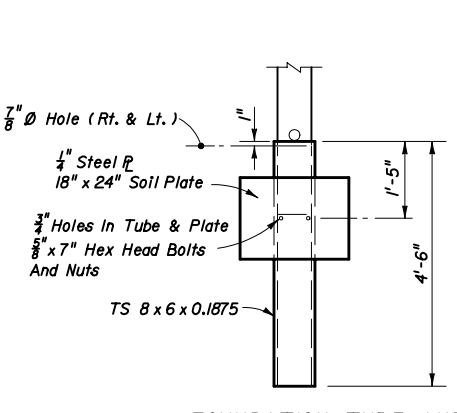
SECTION GG
POST NO. 8



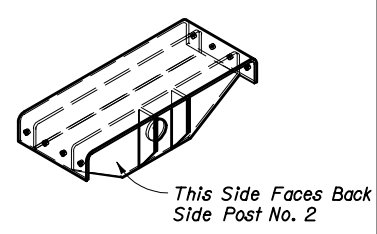
SIDE VIEW
(Channel Strut Not Shown)
CABLE-LOWER ASSEMBLY
POST NO. 1



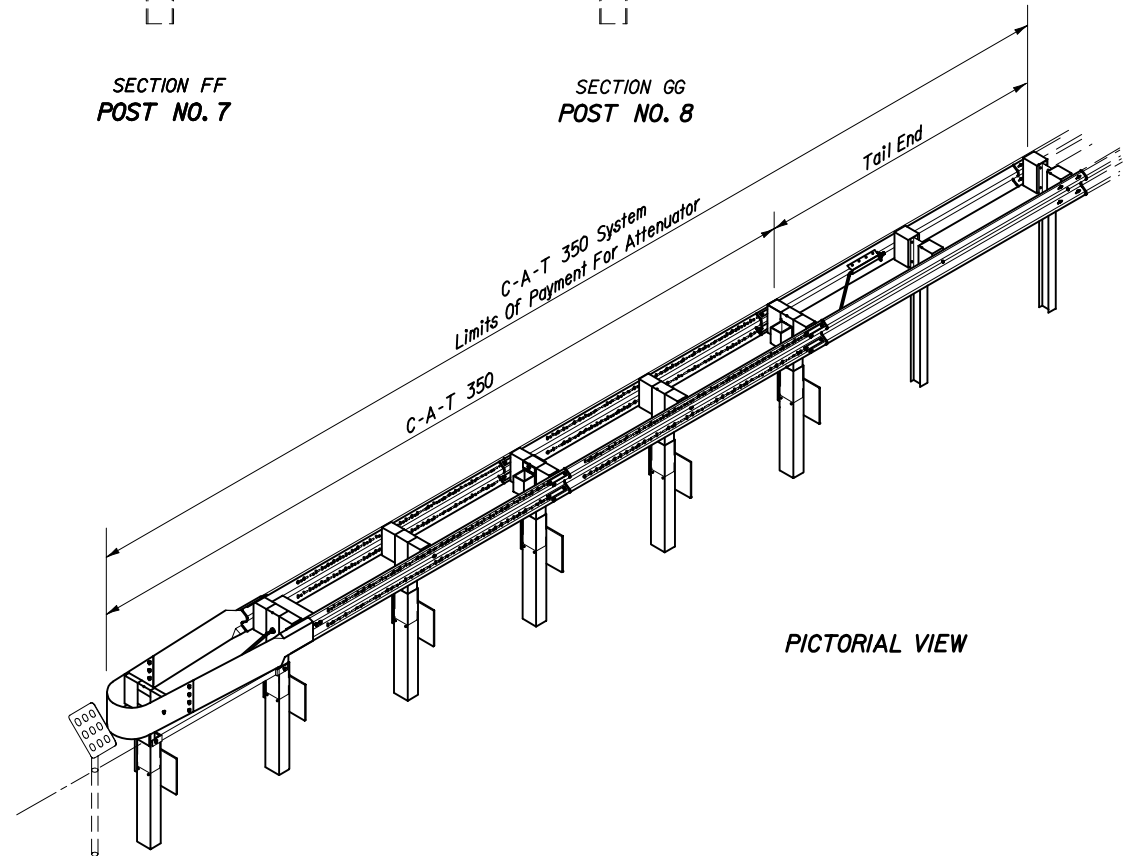
OBlique VIEW-BACK VIEW
POST NO. 1



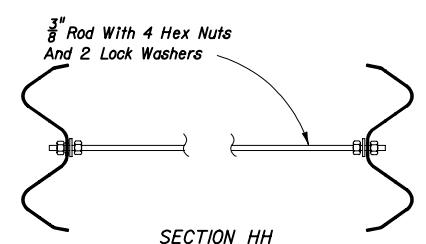
FOUNDATION TUBE AND
SOIL PLATE



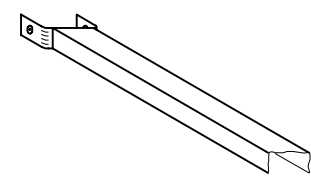
PICTORIAL VIEW
SPACER CHANNEL



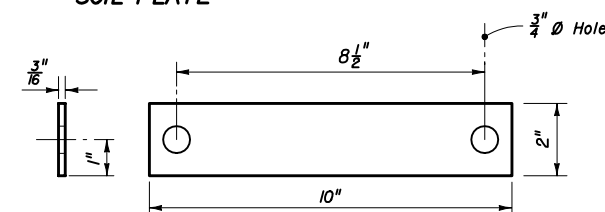
PICTORIAL VIEW



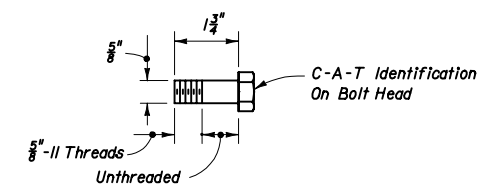
SECTION HH
BUCKLING RESTRAINT ROD



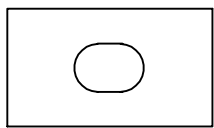
OBlique HALF SECTION
6" x 3" CHANNEL STRUT



SPECIAL PLATE WASHER

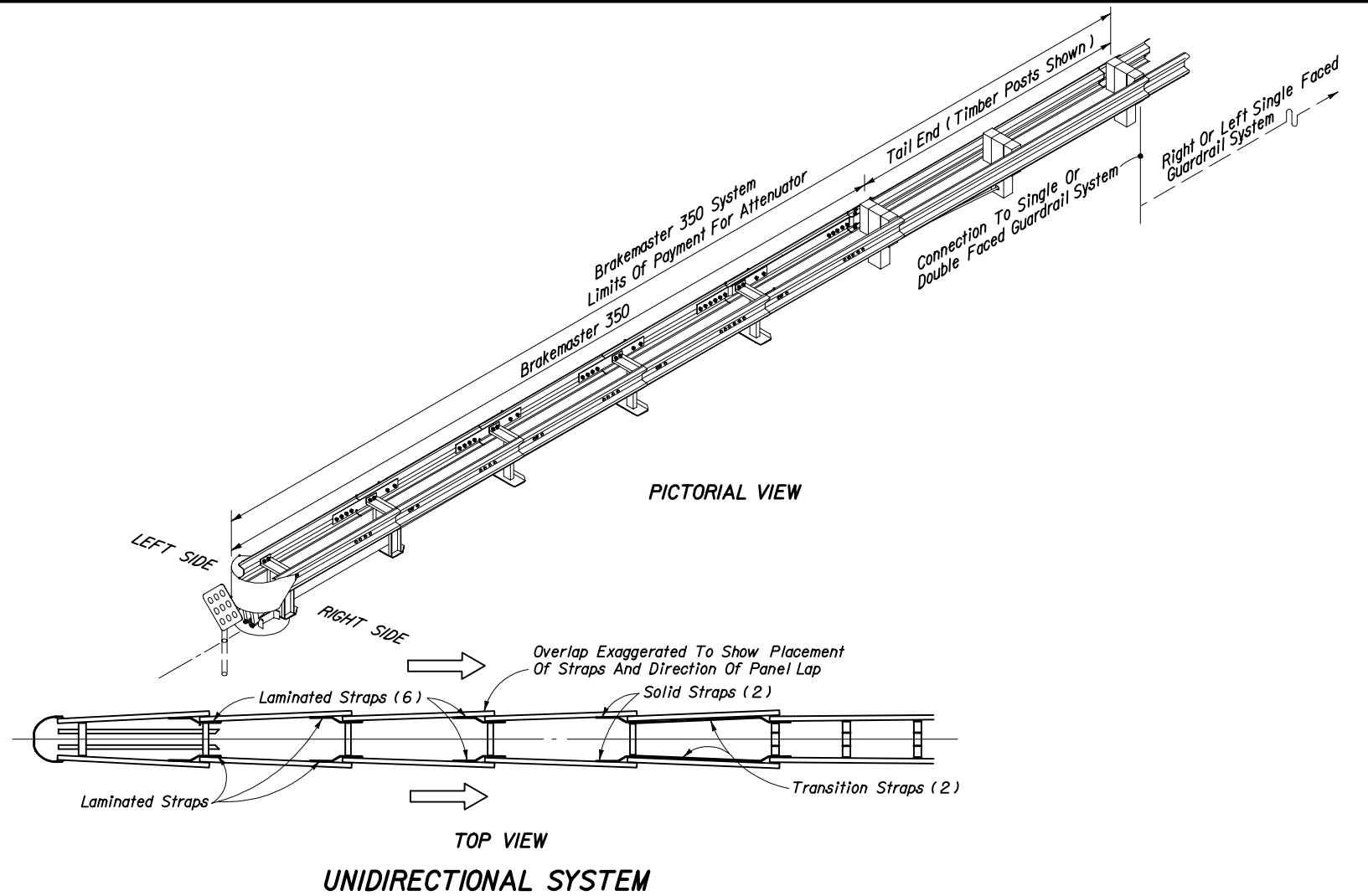
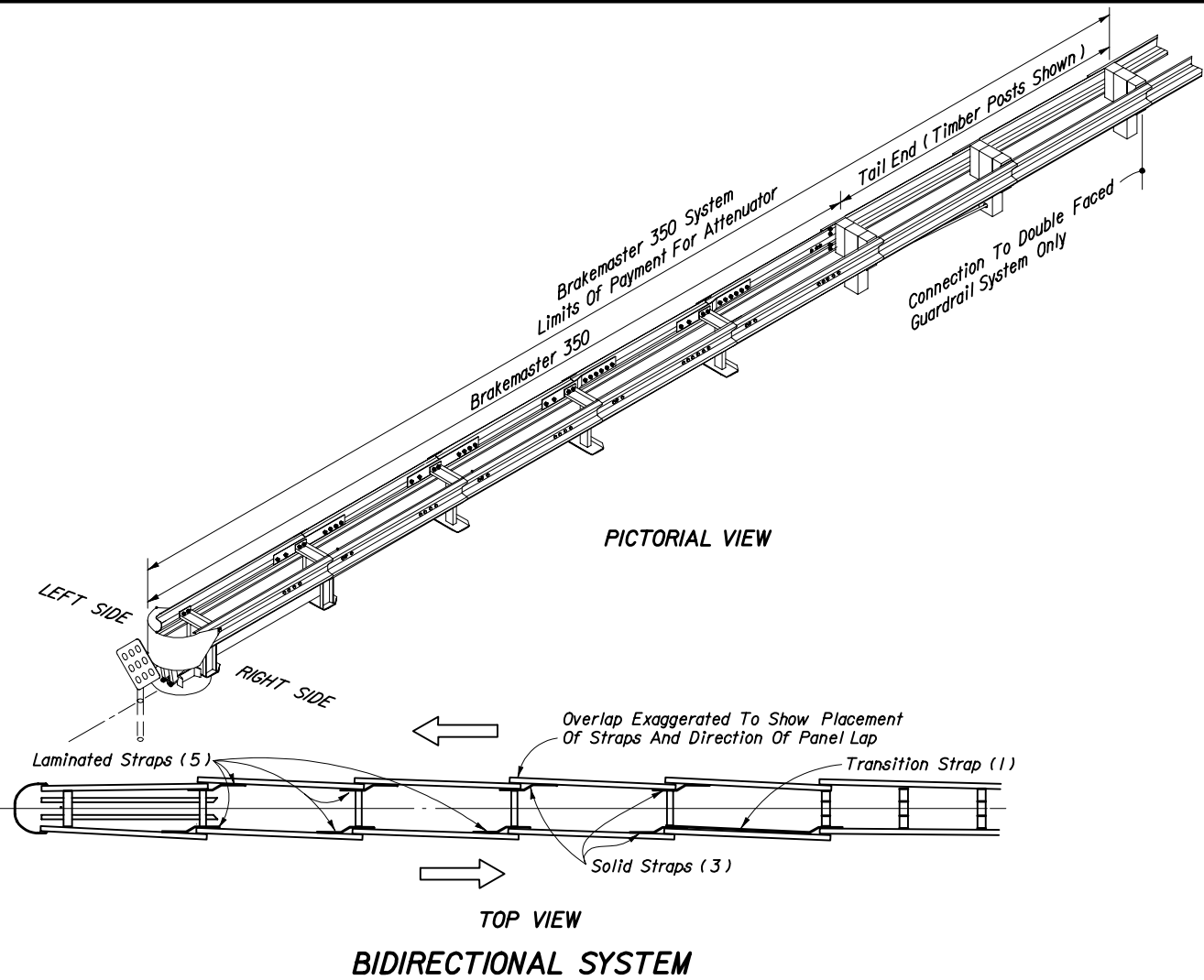


SPECIAL HEX HEAD BOLT
SPECIAL PLATE WASHER AND SPLICE BOLT



See Index 400 For Details
BEAM WASHER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
C-A-T SYSTEM				
DESIGNED BY	NAMES	DATES	APPROVED BY	
MFG/JVG	MFG/JVG	7/91	ROADWAY DESIGN ENGINEER	
DRAWN BY	HSD	7/91		
CHECKED BY	JVG/REB	7/91	REVISION NO.	SHEET NO.
F. H. W. A. APPROVED			00	2 of 2
				INDEX NO. 432



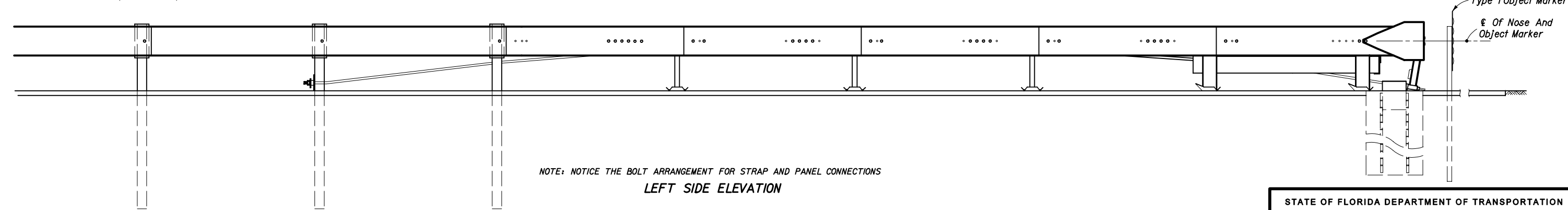
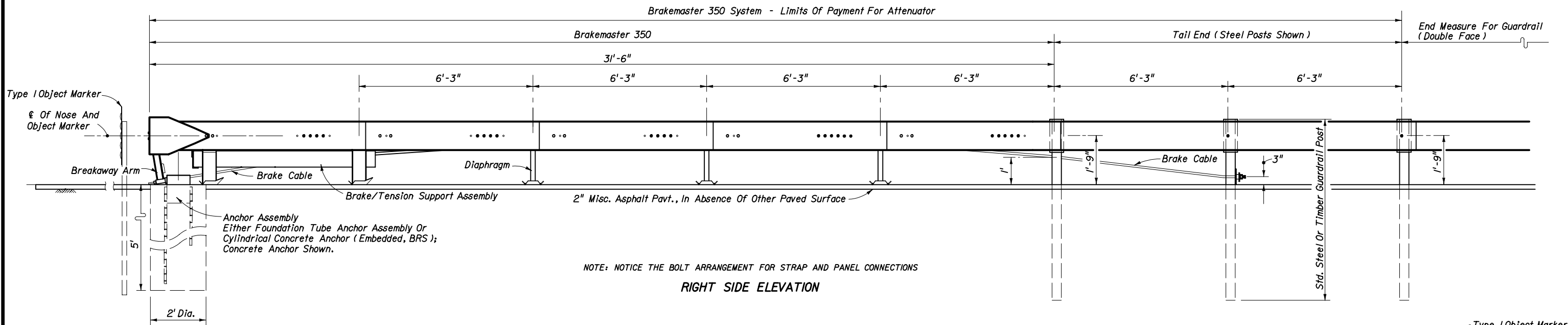
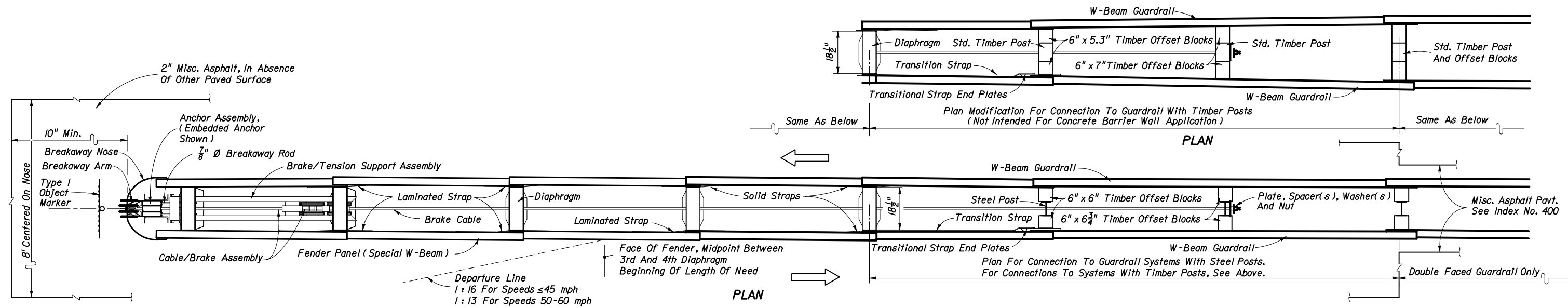
GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name Brakemaster 350. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general information and graphics necessary to field identify component parts of the Brakemaster 350 system and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the Brakemaster 350 system installed in connection with standard single and double faced W-beam guardrail systems, and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.
4. The Brakemaster 350 system shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
5. The Brakemaster 350 system is suitable for speeds ≤ 60 mph.
6. The Brakemaster 350 system shall be located on slopes of 1:10 or flatter and not closer than 11' to any traffic lane.
7. The 'tail end' section represented on this drawing applies to connections with single and double faced guardrail. Where the Brakemaster 350 system is installed in conjunction with safety shaped or vertical faced barrier walls or other rigid structures, a special transitional guardrail section between the Brakemaster 350 and wall or structure shall be as detailed on Index No. 410 or as approved by shop drawings.
8. Metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
9. A yellow Type I Object Marker shall be centered 3' in front of the nose of the Brakemaster 350 system. Mounting hardware shall be in conformance with Index No. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the BRAKEMASTER 350.
10. The Brakemaster 350 system will be paid for under the contract unit price for Impact Attenuator Vehicular (Brakemaster), EA.

DESIGN NOTES AND GUIDELINES

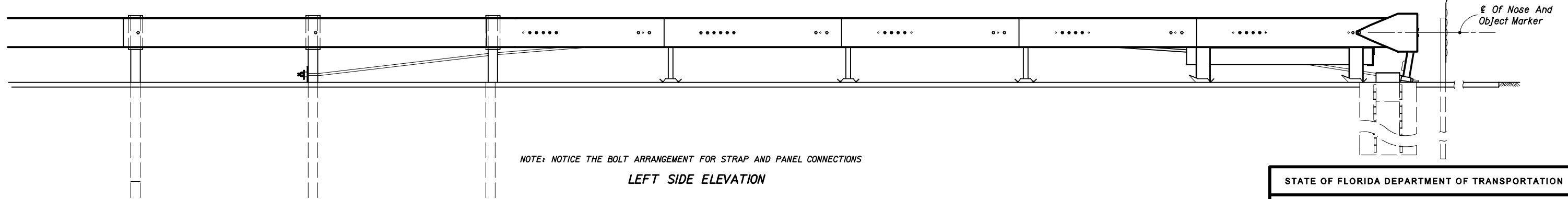
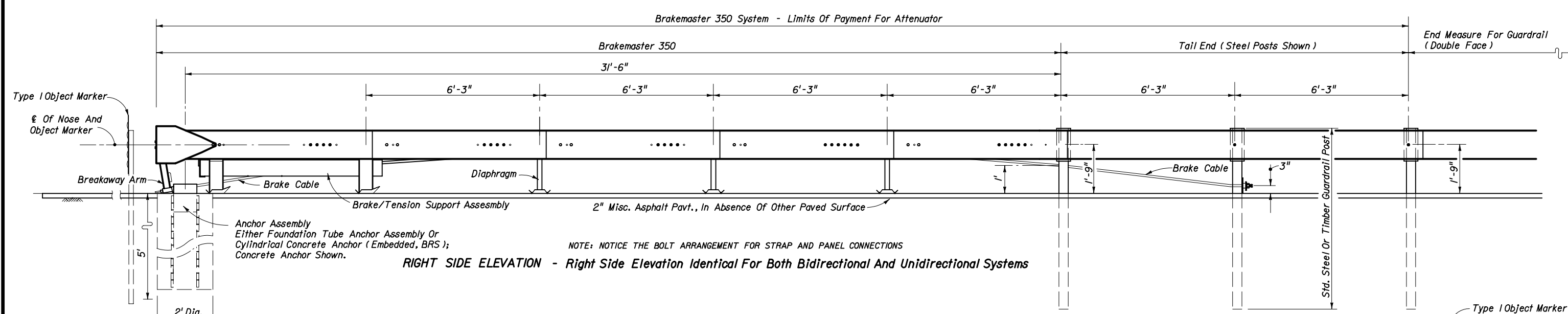
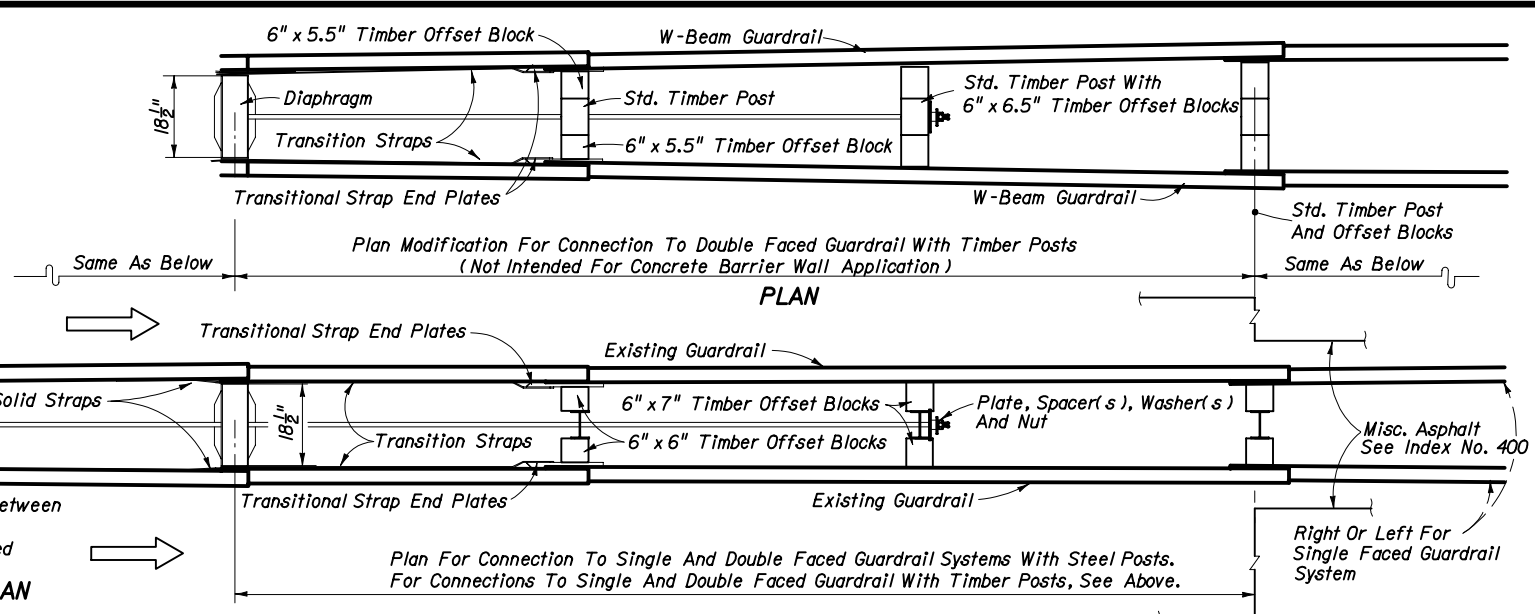
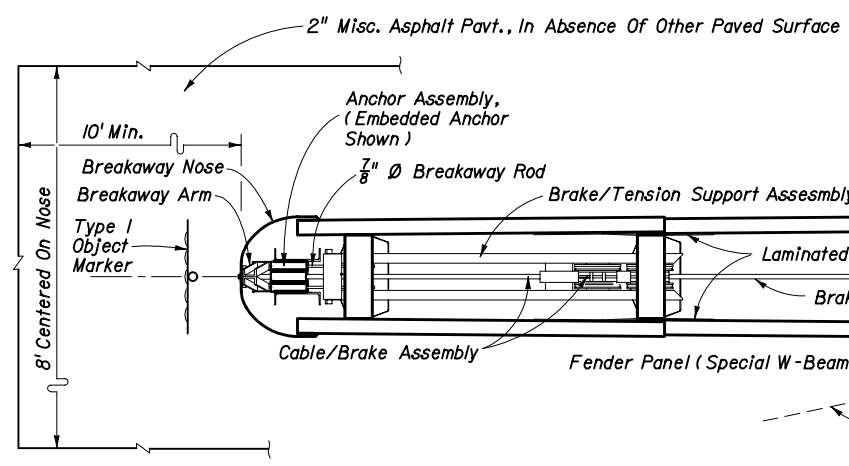
1. The Brakemaster 350 system is designed to cushion automobile end-on hits and to redirect automobiles from side hits when impacting at speeds up to and including 60 mph. The Brakemaster 350 system has a singular design for all speeds of 60 mph or less, and any adjustment to its design will not be permitted except as authorized by the manufacturer.
2. The Brakemaster 350 system is specially designed to shield both narrow hazards and the ends of other fixed barriers located in low frequency impact areas. The Brakemaster 350 system is not intended for use in gores of freeways and expressway mainline ramp terminals; gores of roadway forks; and, other gore locations where there is a history of high frequency vehicle departures from the roadway or the potential exists for such departures. The Brakemaster 350 system is not a restorable design and therefore requires complete replacement after having sustained either an end-on or a side vehicular impact. Deformed side rail elements of the Brakemaster 350 will be subfunctional and are to be replaced immediately; deformed elements are not to be refurbished for reuse. When replacing an impacted Brakemaster 350 system the cable/brake assembly is not to be reused, if the cable sleeve is exposed. After vehicle impact on the Brakemaster 350 system the cable/brake assembly can be returned to the manufacturer for credit toward replacement of the cable.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the Brakemaster 350, and until such alternatives are available, the Brakemaster 350 need not be bid against other proprietary items.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
BRAKEMASTER 350				
	Names	Dates	Approved By	
Designed By	MFG/JVG	7/91	 Roadway Design Engineer	
Drawn By	HSD	7/91		
Checked By	JVG	7/91		
	Revision	Sheet No.	Index No.	
	00	1 of 4	433	



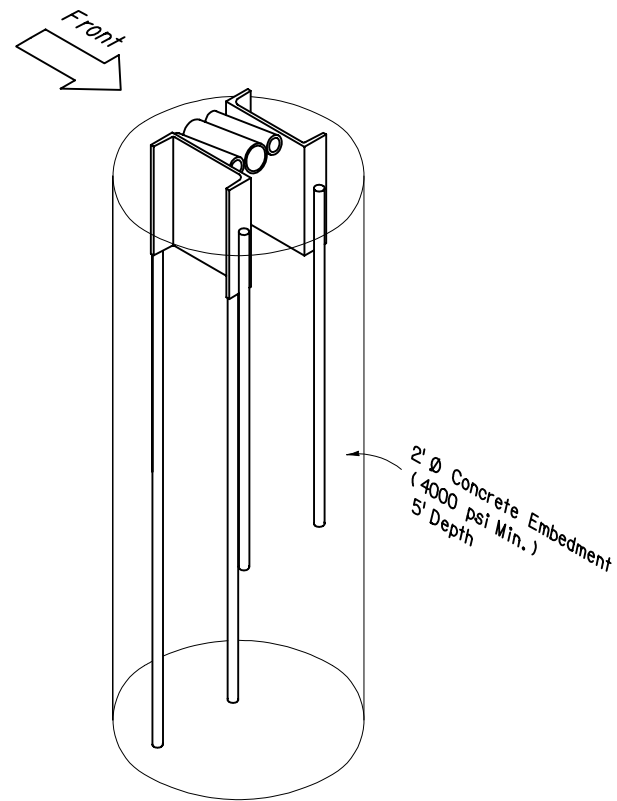
BIDIRECTIONAL SYSTEM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
BRAKEMASTER 350				
Names	Dates	Approved By		
Designed By	MFG/JVG	7/91	 Roadway Design Engineer	
Drawn By	HSD	7/91		
Checked By	JVG	7/91	Revision	00
			Sheet No.	2 of 4
			Index No.	433



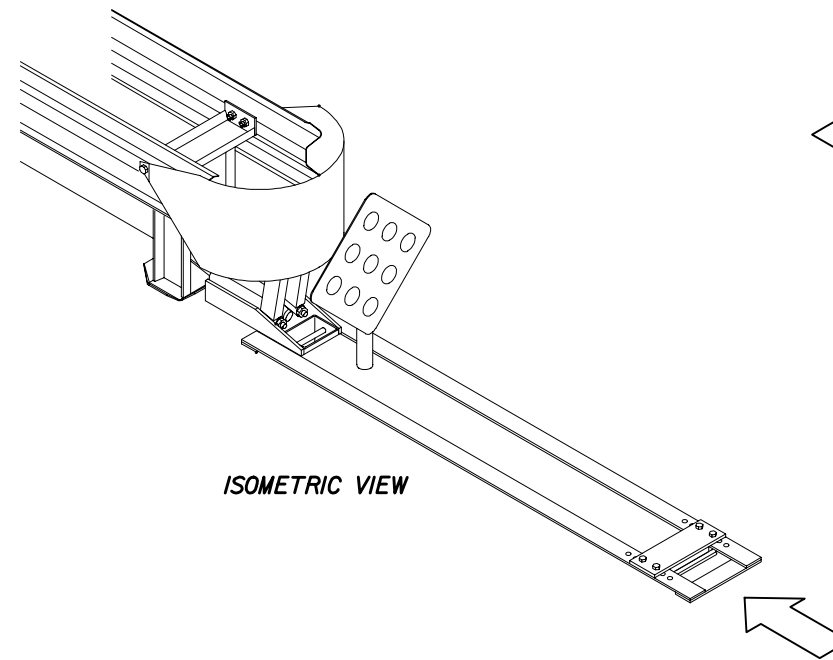
UNIDIRECTIONAL SYSTEM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
BRAKEMASTER 350				
Designed By	MFG/JVG	7/91	Approved By <i>[Signature]</i> Roadway Design Engineer	
Drawn By	HSD	7/91	Revision	Sheet No.
Checked By	JVG	7/91	00	3 of 4
				Index No. 433

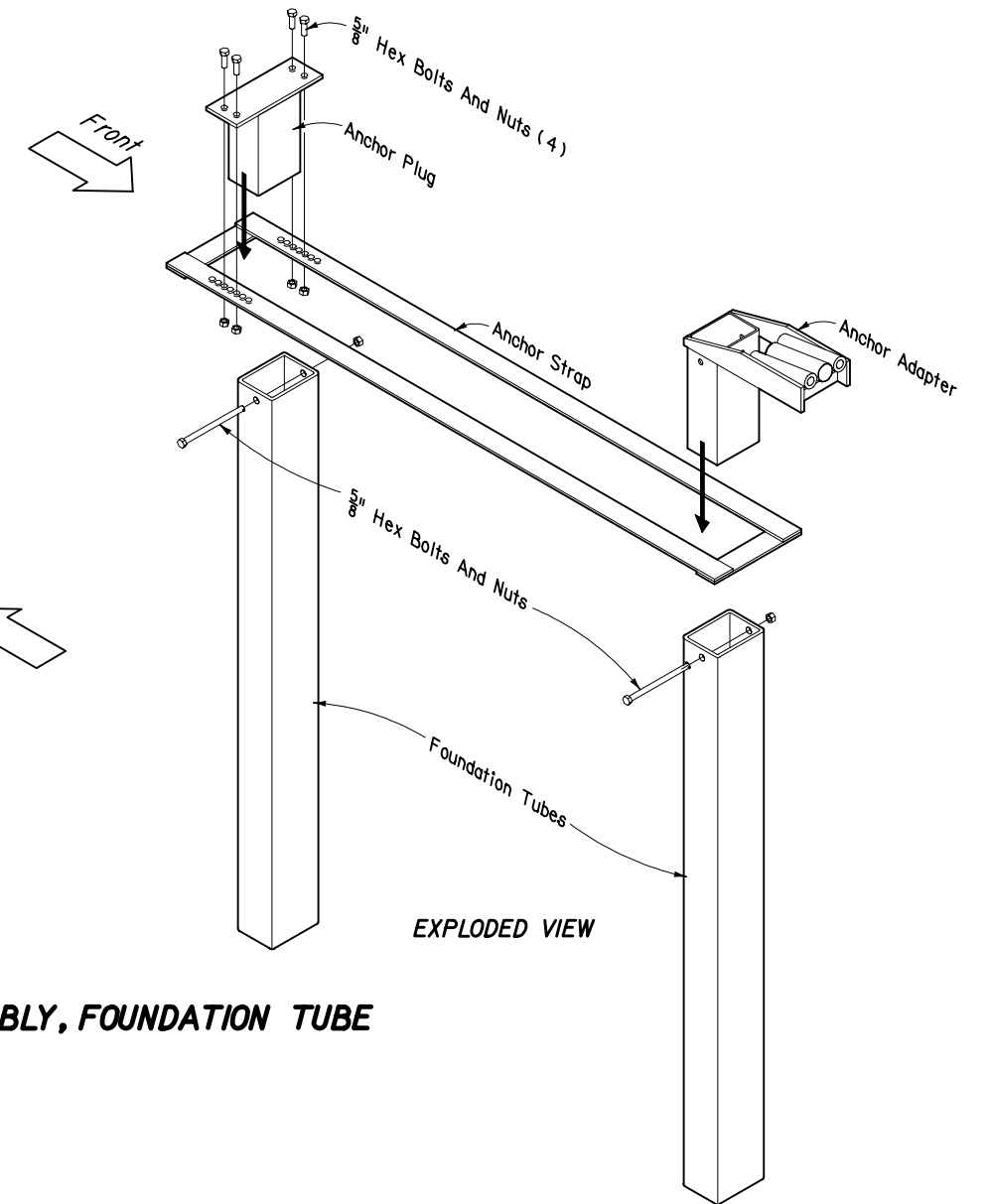


ISOMETRIC VIEW

ANCHOR ASSEMBLY, EMBEDDED BRS

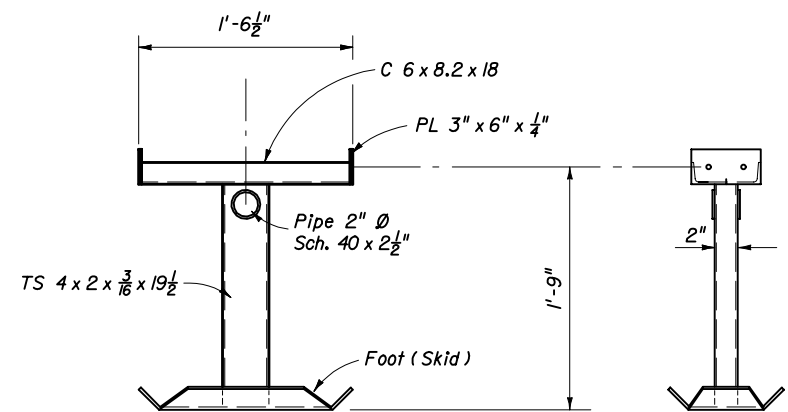


ISOMETRIC VIEW



EXPLODED VIEW

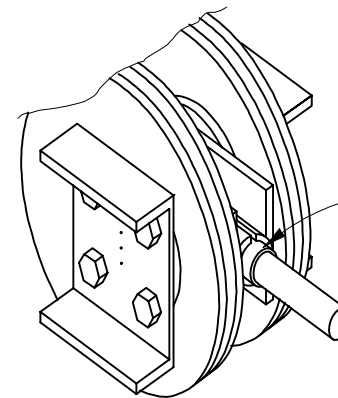
ANCHOR ASSEMBLY, FOUNDATION TUBE



FRONT VIEW

SIDE VIEW

DIAPHRAGM, BRS




Cable Replacement Required When Cable Sleeve Exposed. See "Design Notes And Guidelines", Note No. 2, For Additional Information.

BRAKE/CABLE REPLACEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

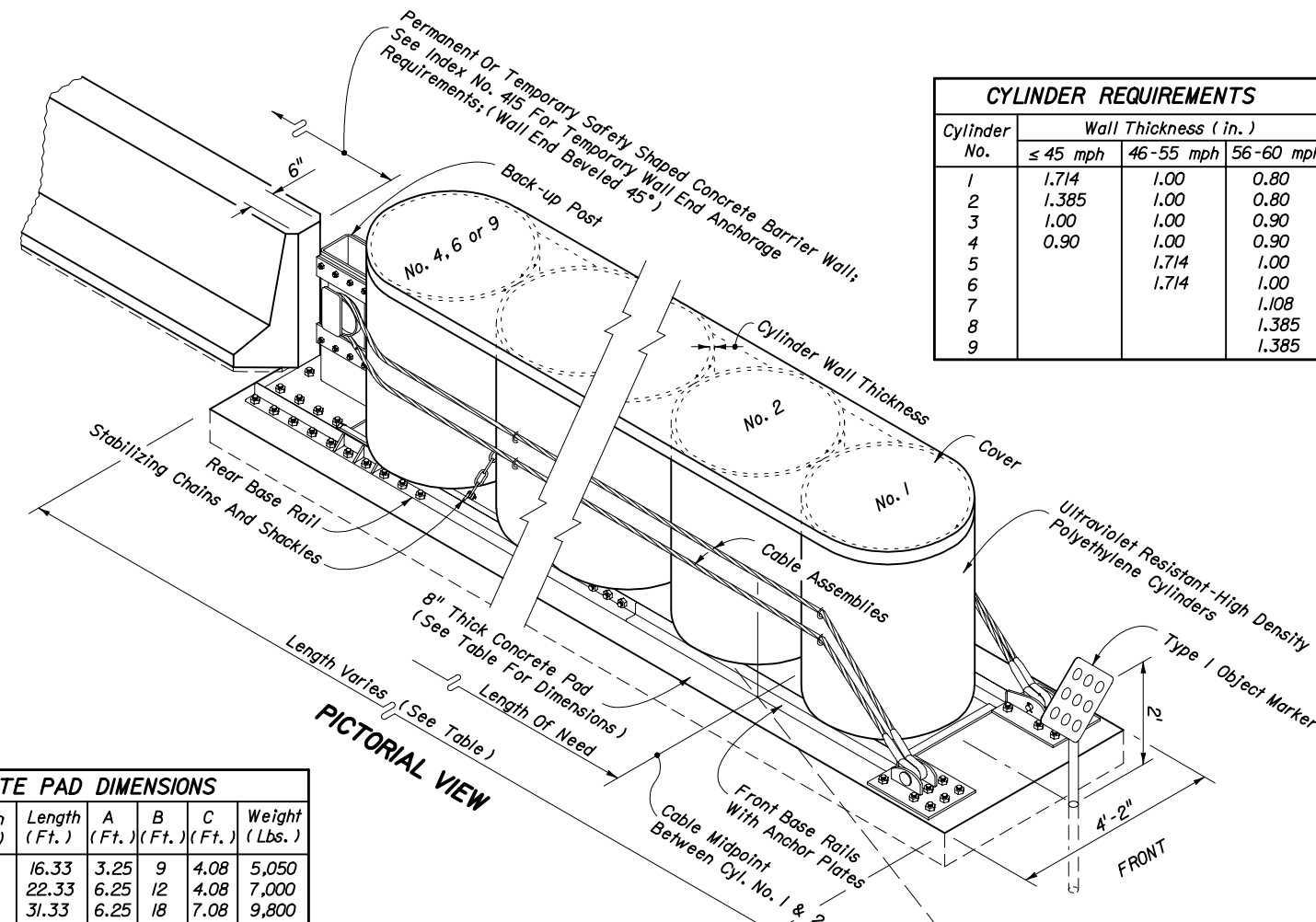
BRAKEMASTER 350

Names		Dates	Approved By		
Designed By	MFG/JVG	7/91	 Roadway Design Engineer		
Drawn By	HSD	7/91			
Checked By	JVG	7/91	Revision	Sheet No.	Index No.
			00	4 of 4	433

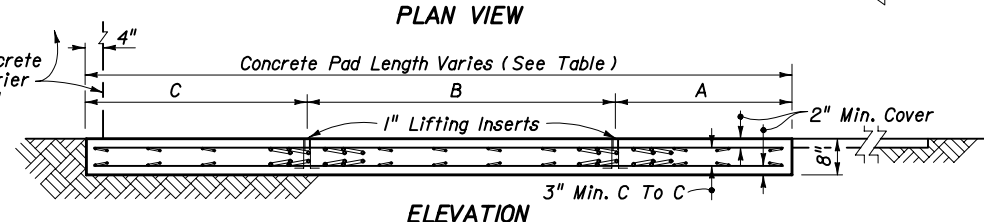
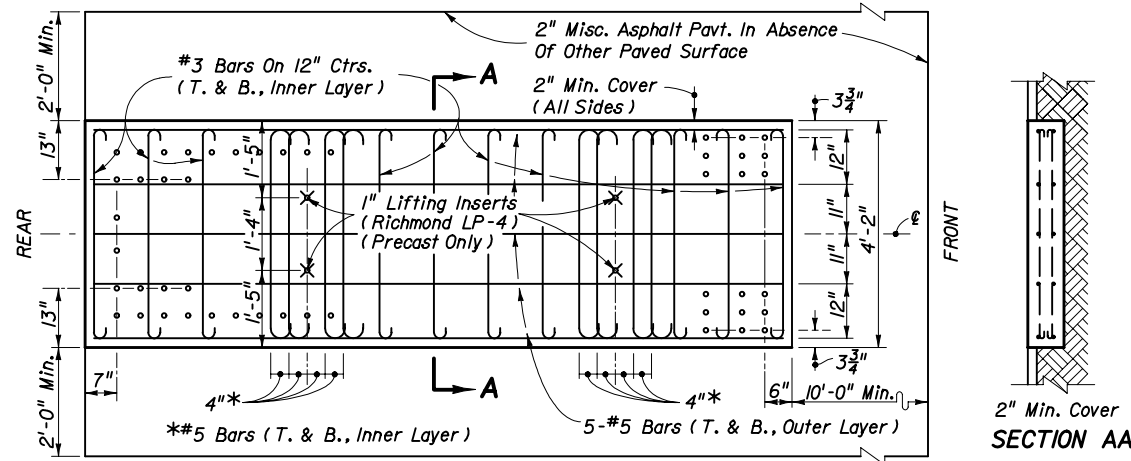
GENERAL NOTES

- The energy absorbing unit represented on this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name REACT 350, short for Reusable Energy Absorbing Crash Terminal. Any infringement on the rights of the designer shall be the sole responsibility of the user.
- This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the REACT 350 and their incorporation into a whole unit.
- This standard drawing is sufficient for plan details for the REACT 350 installed as a free standing unit shielding safety shaped concrete barrier wall ends and for that use precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. Use of the REACT 350 for shielding other hazards will require plan details, shop drawings, or both where called for in the plans.
- The REACT 350 shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
- Concrete foundations shall be constructed with 4000 psi min. compressive strength concrete.
- The REACT 350 is suitable for speeds ≤ 60 mph.
- The REACT 350 shall be constructed on cross slopes 1:10 or flatter.
- On facilities with speeds of ≤ 45 mph, the REACT 350 can be used in any location specified by the plans or by Department permit. On facilities with speeds of 50-60 mph, units shall not be used in narrow medians where post impact trajectory from end on crashes (rebound) will result in the crash vehicle rebounding into opposing traffic lanes, nor used in gore locations where the crash vehicle is likely to rebound into either the continuing or departing traffic lanes; units can be used in medians and gores where other features such as profile differentials, berms, ditches or other barriers will prevent adverse rebounding encroachment into traffic lanes.
- Due to the overall unit height of 4'-0", which exceeds the drivers height of eye, caution is to be exercised in locating the REACT 350 to avoid blockage of required sight distance.
- All metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
- A yellow Type I Object Marker shall be centered 3' in front of the nose of the REACT 350. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the REACT 350.
- For REACT 350 units that have been impacted by vehicle crashes and are to remain in service, close inspection must be made on the anchorages of the front cable anchor plates and the rear pylon; the anchorages must be in design condition when restoration is complete.
- Quantity for payment of both permanently and temporarily installed REACT 350 units will be based on each independent installation as called for in the plans or as directed by the Engineer. Payment for the permanently installed REACT 350 is for an assembled and installed system including the foundation, and will be paid for under the contract unit price for Impact Attenuator Vehicular (REACT 350), EA. Payment for the temporary REACT 350 is for an assembled and installed unit with components as described for the permanent installation with the addition of miscellaneous asphalt pavement and will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (REACT 350), LO, or when the REACT 350 is used as an option in accordance with Index No. 415 it will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

Cylinder No.	Wall Thickness (in.)		
	≤ 45 mph	46-55 mph	56-60 mph
1	1.714	1.00	0.80
2	1.385	1.00	0.80
3	1.00	1.00	0.90
4	0.90	1.00	0.90
5		1.714	1.00
6		1.714	1.00
7			1.108
8			1.385
9			1.385

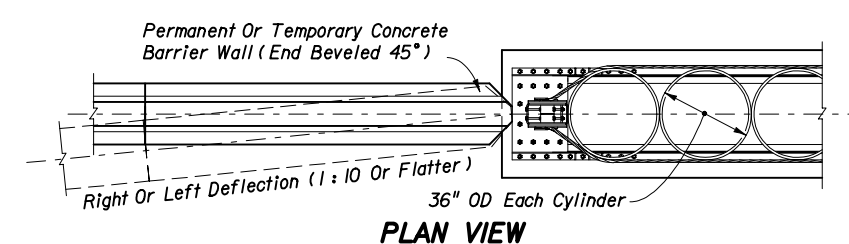


CONCRETE PAD DIMENSIONS						
Number of Cylinders	Width (Ft.)	Length (Ft.)	A (Ft.)	B (Ft.)	C (Ft.)	Weight (Lbs.)
4	4	16.33	3.25	9	4.08	5,050
6	4	22.33	6.25	12	4.08	7,000
9	4	31.33	6.25	18	7.08	9,800



Note: Concrete pads may be precast or cast in place. Precast pads may be permanent or temporary and can be relocated and require reinforcement. Cast in place pads can be permanent or temporary and cannot be relocated and do not require reinforcement.

CONCRETE PAD



REACT 350

DESIGN NOTES

- The REACT 350 is designed to cushion automobile end-on hits and to redirect automobiles from side hits. The number of cylinders to be used in a specific unit will be determined by the design speed, except where the Engineer determines that another speed is more applicable.
- The REACT 350 is a restorable system that is particularly suited to shielding hazards in areas with a history of frequent errant vehicle departures from the roadway or the potential exists for such departures. Until further development is completed in the application of the REACT 350 to shielding other hazards, this Index is limited to use with safety shaped concrete barrier walls. The REACT 350 alone is not suited to shielding a wide hazard.
- The REACT 350 crash data accepted by the Federal Highway Administration (FHWA) covers vehicular impacts at speeds of 60 mph with 9 cylinder units and 45 mph with 4 cylinder units. The 6 cylinder unit has been developed by analytical deduction based on relative energy imparted by an impacting vehicle at various speeds. Until crash test data, accident data or other in service data is available to indicate change in application, the Department will support appropriate use of the six 6 cylinder units at locations where speeds are 55 mph or less. See 'CYLINDER REQUIREMENTS' table above.
- The REACT 350 is a proprietary device with distinct performance, vehicular response and restoration characteristics, unlike other redirective crash cushions. Currently the Department recognizes the devices selective features and does not recognize other proprietary devices as equal alternatives, and until such alternatives are available the REACT 350 need not be bid against other proprietary items.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
REACT 350				
Designed By	MFG	8-95	Approved By	
Drawn By	HKH	8-95	Revision	Sheet No. Index No.
Checked By	JVG	8-95	00	1 of 1 434

GENERAL NOTES

- The energy absorbing system represented on this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name QuadGuard. Any infringement on the rights of the designer shall be the sole responsibility of the user.
- This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the QuadGuard System and their incorporation into a whole system.
- This standard drawing is sufficient for plan details for the QuadGuard installed as a free standing system or installed in connection with concrete barrier walls and other fixed barrier systems, and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.

The QuadGuard tension strut backup is the primary backup to be used on Florida Department Of Transportation projects. Use of concrete backups will be permitted, but will require call out and detailing in the plans for site specific construction; concrete backups must meet manufacturers specifications, installation guidelines and transition hardware requirements.
- The QuadGuard shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
- The QuadGuard is available in 24", 30", and 36" nominal widths for narrow hazards and 69" and 90" nominal widths for wide hazards. The system width will be as called out in the plans, permit or other contract document for each location.
- Only the QuadGuard Type I and Type II cartridges shall be used in bay and nose locations as described in the 'BAY SELECTION GUIDELINES' table.
- Cement concrete foundations and cement concrete backup assemblies shall be constructed with 4000 psi min. compressive strength concrete.
- The QuadGuard shall be constructed on cross slopes 1 : 10 or flatter.
- All metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
- A yellow Type I Object Marker shall be centered 3' in front of the nose of the QuadGuard. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the QuadGuard.
- Quantity for payment is based on each independent location as called for in the plans or as directed by the Engineer. The cost for foundations, subgrade preparation and miscellaneous asphalt shown on this index will be included in the cost for the QuadGuard system. The permanent QuadGuard System will be paid for under the contract unit price for Impact Attenuator Vehicular (QuadGuard), EA; temporary units will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (QuadGuard), LO, or when the QuadGuard system is used as an option in accordance with Index No. 415, it will be paid for under contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

DESIGN NOTES AND GUIDELINES

- The QuadGuard System is designed to cushion automobile end-on hits and to redirect automobiles from side hits. The QuadGuard is designed to shield fixed hazards or the ends of other temporary and permanent barrier systems. The number of bays to be used in a specific unit will be determined by the design speed, except where the Engineer determines that another speed is more applicable. The unit width will be determined by the width of the object to be shielded or by the connecting barrier system. The backup assembly for a specific unit will be determined by either (a) the unit standing free of the object to be shielded or (b) the barrier system(s) to which it is connected.
- The QuadGuard is a restorable system that is particularly suited to shielding hazards subject to high speed traffic, high volume traffic, and/or traffic with a history of frequent errant vehicle departures from the roadway or the potential exists for such departures. The QuadGuard is particularly suited to shielding hazards where the approach space is limited; and, is particularly suited to conditions where the terminal must be located close to the traffic lane.
- Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the QuadGuard, and until such alternatives are available, the QuadGuard need not be bid against other proprietary items. However, for temporary use where the QuadGuard and other approved redirective crash cushions meet or exceed the minimum requirements for a specific location, the approved crash cushions will be considered optional systems and paid for as described in General Note II above.

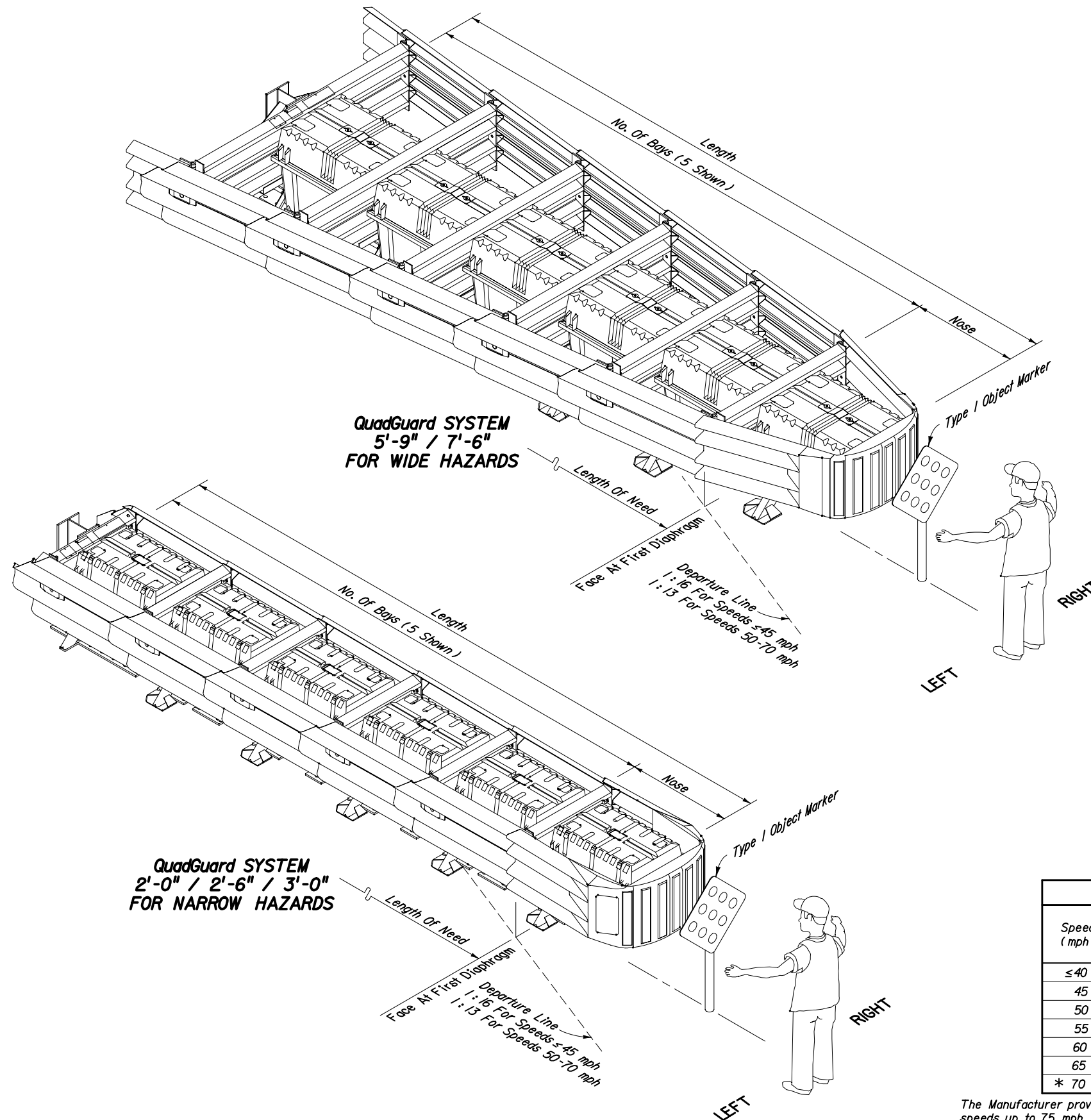
BAY SELECTION GUIDELINES

Speed (mph)	No. Of Bays	Number Of Cartridges		Length
		Type I (Front)	Type II (Rear)	
≤40	2	2	1	8'-8"
45	3	3	1	11'-8"
50	4	3	2	14'-8"
55	5	4	2	17'-8"
60	6	4	3	20'-8"
65	7	4	4	23'-8"
* 70	9	4	6	29'-8"

The Manufacturer provides QuadGuard units with up to 12 bays designed for use with speeds up to 75 mph. These larger units may be utilized when called for in the plans or as directed by the Engineer.


*QuadGuard HS units can be substituted for conventional 9-bay units.

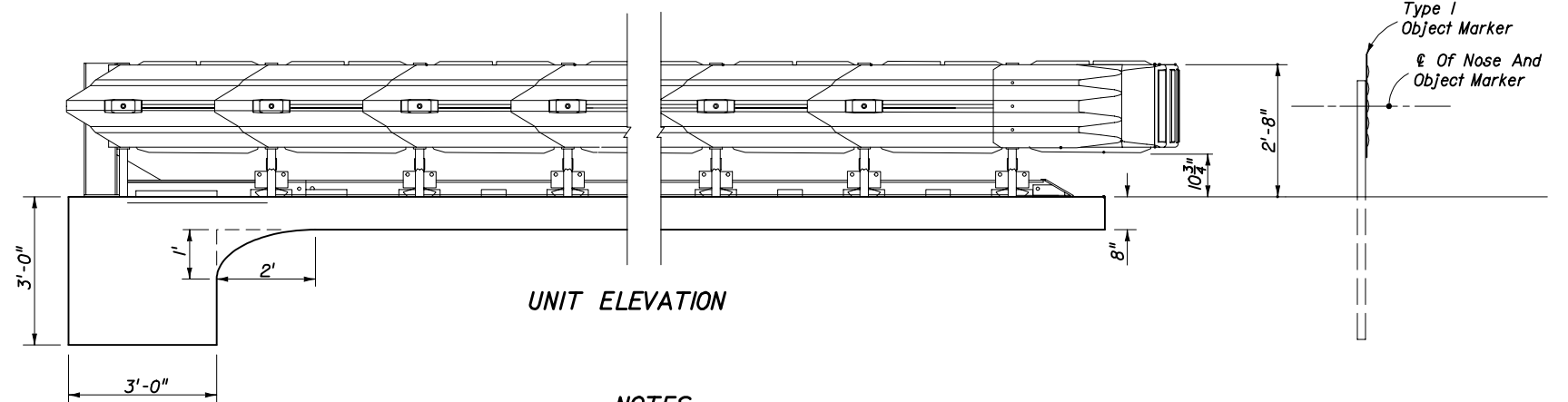
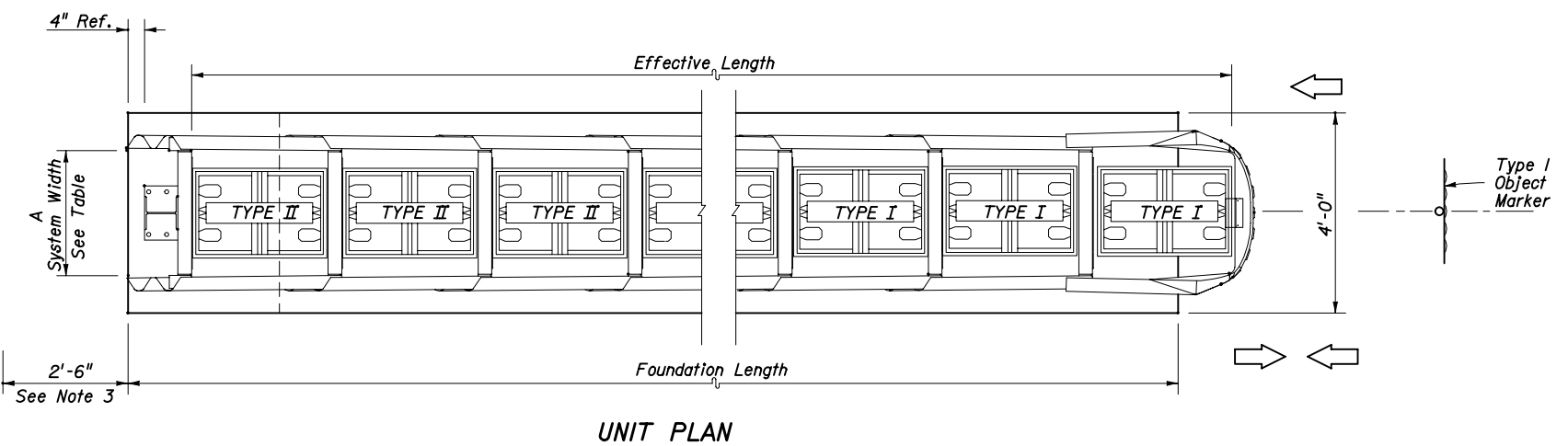
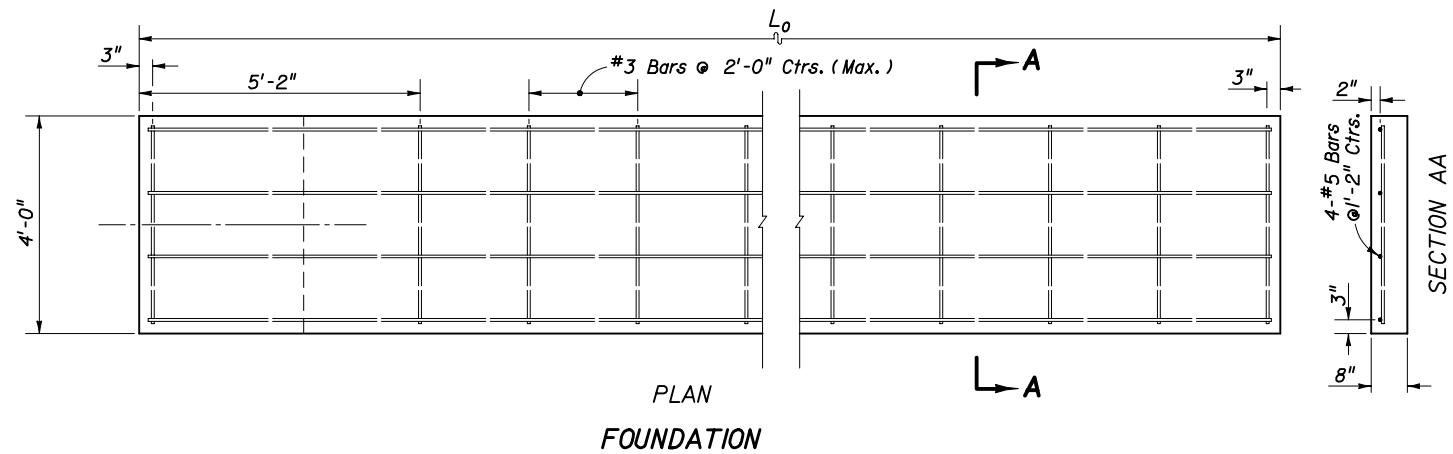
GENERAL SYSTEM FEATURES AND BAY SELECTION GUIDELINES



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

QuadGuard

Names	Dates	Approved By		
Designed By	MF6/STD	 Roadway Design Engineer		
Drawn By	HKH			
Checked By	JVG			
Revision	04			
		1 of 6	435	



Nominal System Width	A (Backup Width)
2'-0"	2'-0"
2'-6"	2'-6"
3'-0"	3'-0"
5'-9"	5'-3 3/4"
7'-6"	6'-10 5/8"

ESTIMATED FOUNDATION QUANTITIES For Informational Purposes Only				
No. Of Bays	L ₀	REINFORCEMENT		CONCRETE (CY)
		#3	#5	
2	9'-0"	14'-8"	34'-8"	2.0
3	12'-0"	22'-0"	46'-8"	2.3
4	15'-0"	25'-8"	58'-8"	2.6
5	18'-0"	33'-0"	70'-8"	2.9
6	21'-0"	36'-8"	82'-8"	3.2
7	24'-0"	44'-0"	94'-8"	3.5
9	30'-0"	55'-0"	118'-8"	4.1

Note: Monorail anchorage bolt spacing to be in accordance with the manufacturer's installation drawings and specifications.

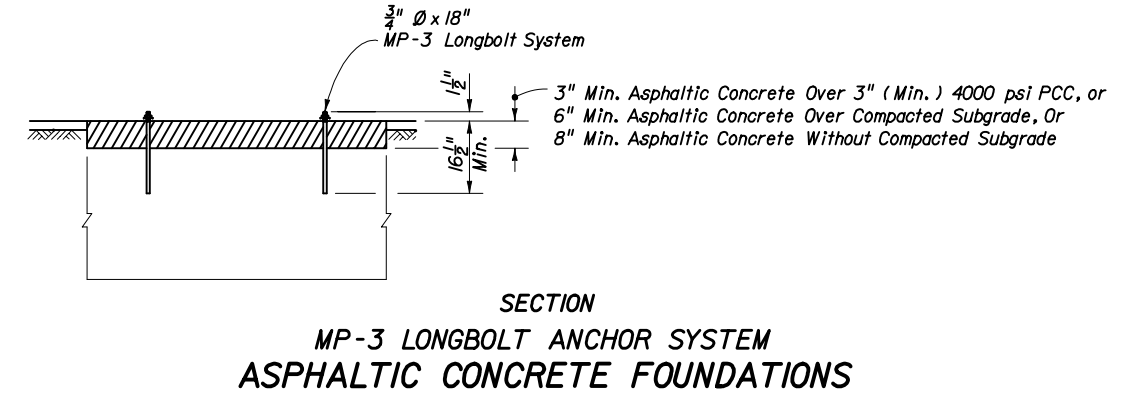
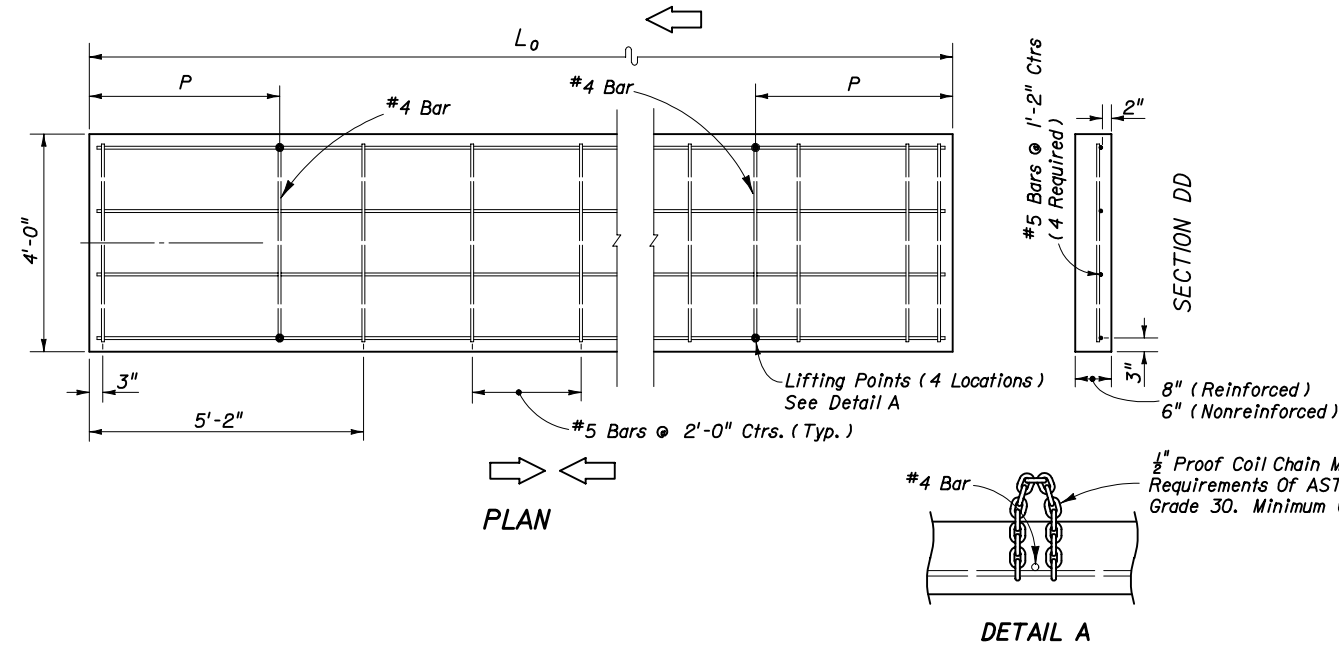
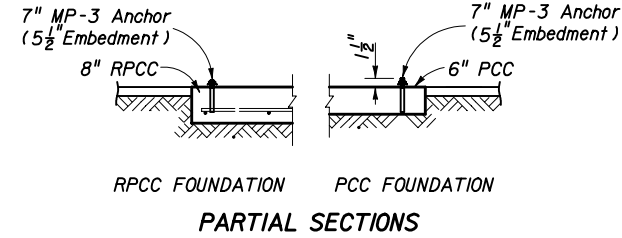
NOTES

1. The foundation depicted on this sheet is applicable to QuadGuard systems for both narrow and wide hazards, 2'-6" system shown.
2. For the number of bays required see table, Sheet 1.
3. Provision shall be made for rear fender panels to slide rearward upon impact 2'-6" min.
4. For barrier connections see 'TRANSITIONS', Sheet Nos. 4 and 5.

PERMANENT FOUNDATION FOR TENSION STRUT BACKUP ASSEMBLY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
QuadGuard				
Names	Dates	Approved By		
Designed By	MFG/STD	 Roadway Design Engineer		
Drawn By	HKH			
Checked By	JVG	Revision	Sheet No.	Index No.
		02	2 of 6	435

ESTIMATED FOUNDATION QUANTITIES For Informational Purposes Only					
No. Of Bays	L ₀	P	REINFORCED		NONREINFORCED
			Rebar Required	Concrete Required (CY)	Concrete Required (CY)
3	12'	3'-0"	68'-0"	1.2	0.9
4	15'	3'-9"	83'-8"	1.5	1.1
5	18'	4'-6"	103'-0"	1.8	1.3
6	21'	5'-3"	118'-8"	2.1	1.6
7	24'	6'-0"	138'-0"	2.4	1.8
9	30'	7'-6"	173'-0"	3.0	2.2



RIGID FOUNDATION NOTES

- The reinforced portland cement concrete (RPCC) foundation is designed to make the temporary QuadGuard a transportable system. The slab foundation shall be constructed with 4000 psi min. compressive strength concrete. The slab shall be seated so the top of the slab is flush with the surface intended for approaching vehicles. In absence of other pavement the surrounding surface shall be paved with 2" of miscellaneous asphalt pavement as depicted in 'ASPHALTIC CONCRETE FOUNDATIONS'. The QuadGuard shall be anchored exclusively with the 7" MP-3 anchor system supplied with the QuadGuard unit, unless another anchor is supplied or approved by the QuadGuard manufacturer.
- The nonreinforced portland cement concrete (PCC) foundation shall be Class I concrete, having depth equal to or greater than 6". The PCC foundation utilization options are as follows: (a) Poured in place as an expendable slab, having a thickness of not less than 6"; disposal of the slab will be as approved by the Engineer, (b) Project constructed roadway PCC pavement, or, (c) Existing 9" PCC roadway pavement.

The utilization option applied shall be as approved by the Engineer on a site specific basis. The top of the foundation shall be flush with the surface intended for approaching vehicles. In absence of surrounding pavement the surrounding surface shall be paved as shown on this sheet in 'ASPHALTIC CONCRETE FOUNDATIONS'.

The QuadGuard installed on PCC pavement shall be anchored only with the MP-3 anchor system supplied with the QuadGuard unit. Holes for the 7" anchors shall be drilled in both existing and new pavements. When the QuadGuard is removed from the project pavement or from existing pavement that is to remain in place, the anchor shall be cut off flush with the top of the pavement, unless the plans call for other treatment.
- For additional information see the General Notes.

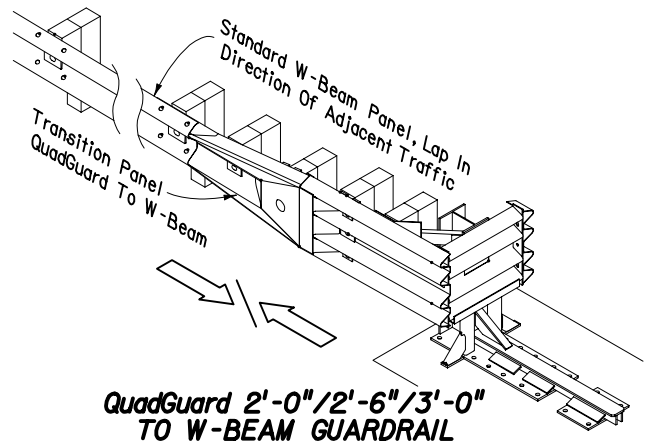
NOTES

- For the number of bays required see table, Sheet 1.
- For barrier connections see 'TRANSITIONS', Sheet Nos. 4 and 5.

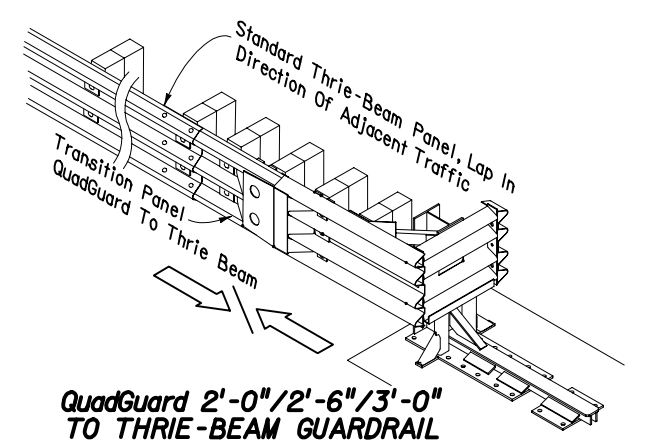
REINFORCED AND NONREINFORCED CONCRETE PAD SYSTEMS
CEMENT CONCRETE FOUNDATIONS

TEMPORARY FOUNDATIONS

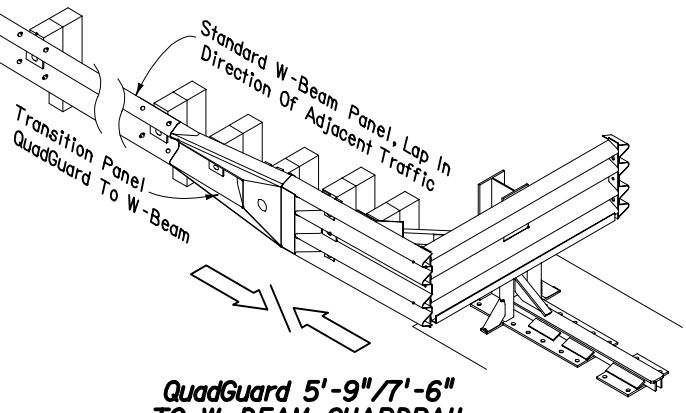
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
QuadGuard				
Designed By	MFG	Dates	Approved By	
Drawn By	HKH	8/97	Revision	Sheet No.
Checked By	JVG	8/97	04	3 of 6
				Index No. 435



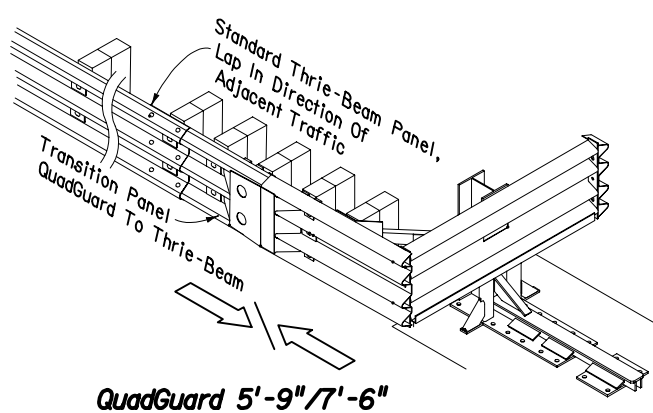
QuadGuard 2'-0"/2'-6"/3'-0" TO W-BEAM GUARDRAIL



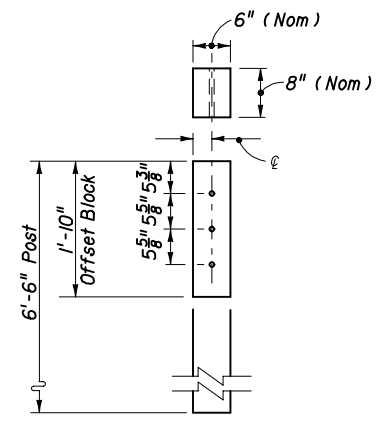
QuadGuard 2'-0"/2'-6"/3'-0" TO THRIE-BEAM GUARDRAIL



QuadGuard 5'-9"/7'-6" TO W-BEAM GUARDRAIL



QuadGuard 5'-9"/7'-6" TO THRIE-BEAM GUARDRAIL



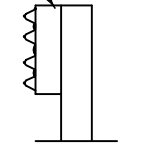
TIMBER

NOTES

- All holes $\frac{3}{4}$ " \varnothing .
- When using a special steel post with a timber offset block at location #2, field drill matching attachment holes in block and in post flange. When drilling special steel posts metalize holes in accordance with Index No. 400.
- For double face guardrail applications with special steel posts and 2'-0" or 2'-6" system widths, and, with timber posts and 2'-6" system widths, turning wide side of standard offset block to post or field trimming will be required, see Sections right.

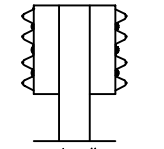
POSTS AND OFFSET BLOCKS FOR LOCATIONS #1 AND #2

Steel Or Timber Post And Std. Block, Mirror For Right Side



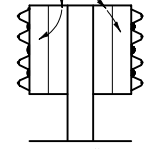
SINGLE BEAM ALL SYSTEM WIDTHS

Std. Offset Block. Turn Wide Side To Post.



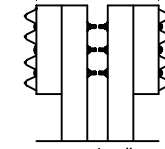
2'-0" SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



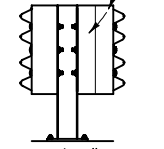
2'-6" SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



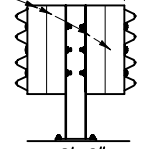
$\geq 3'-0"$ SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



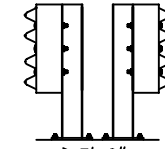
2'-0" SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



2'-6" SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.

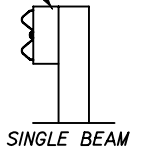


$\geq 3'-0"$ SYSTEM WIDTH

SPECIAL STEEL POST WITH TIMBER OFFSET BLOCKS

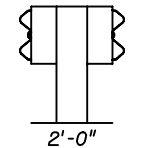
SECTION AA (POSTS #1 AND #2)

Steel Or Timber Post And Std. Block, Mirror For Right Side



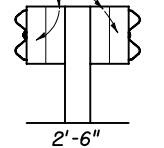
SINGLE BEAM ALL SYSTEM WIDTHS

Std. Offset Block. Turn Wide Side To Post.



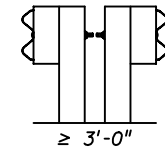
2'-0" SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



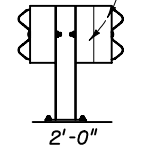
2'-6" SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



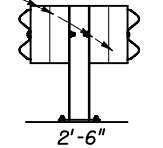
$\geq 3'-0"$ SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



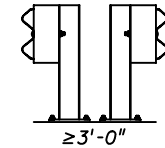
2'-0" SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



2'-6" SYSTEM WIDTH

Std. Offset Block. Turn Wide Side To Post.



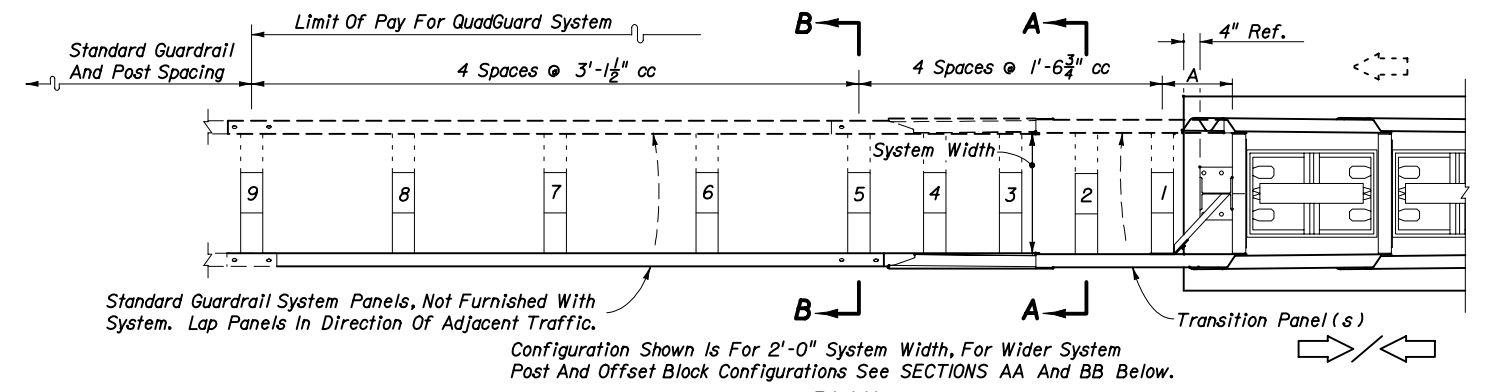
$\geq 3'-0"$ SYSTEM WIDTH

SPECIAL STEEL POST WITH TIMBER OFFSET BLOCKS

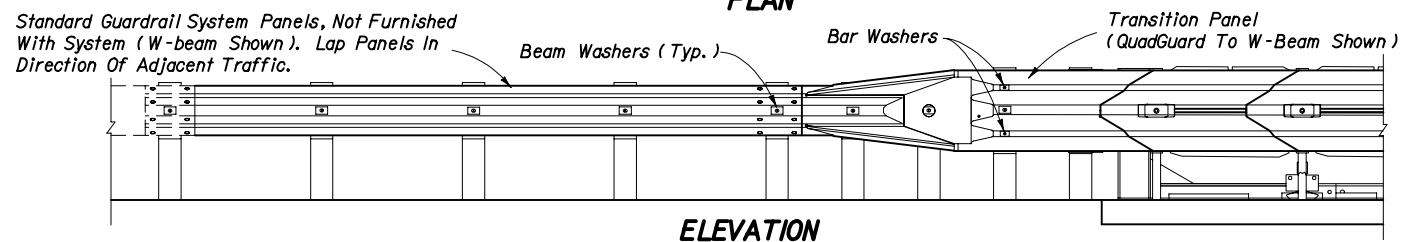
SECTION BB (POSTS #3 THRU #9)

Post And Offset Block Configurations Are Identical For W-beam Or Thrie-beam, W-beam Shown

SECTION BB (POSTS #3 THRU #9)



PLAN



ELEVATION

NOTES

- Transitions are required when connecting the QuadGuard to any guardrail system.
- Post spacing identical for W-beam or thrie-beam, W-beam shown.
- Post #1 is not bolted directly to transition panel(s).
- Install beam washers on post bolts on posts #2 thru #9, with supplementary bar washers at post #2.
- W-Beam Transition:
Posts #1 and #2 - Posts and offset blocks as shown below.
Posts #3 thru #9 - Standard W-beam posts and offset blocks, see Index No. 400.
Thrie-Beam Transition:
Posts #1 and #2 - Posts and offset blocks as shown below.
Posts #3 thru #9 - Standard thrie-beam posts and offset blocks, see Index No. 400.
Transitions using steel posts: Use limited to rigid surface mounting (decks and slabs). See Index No. 400 for special steel guardrail posts. See section below. Δ

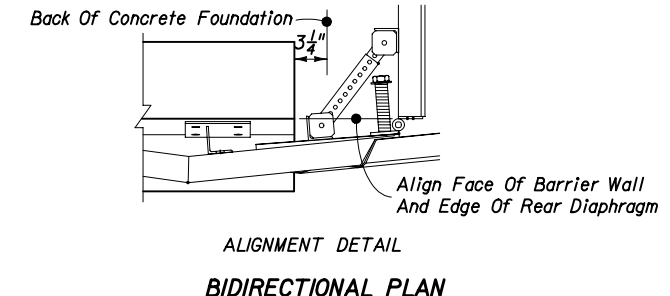
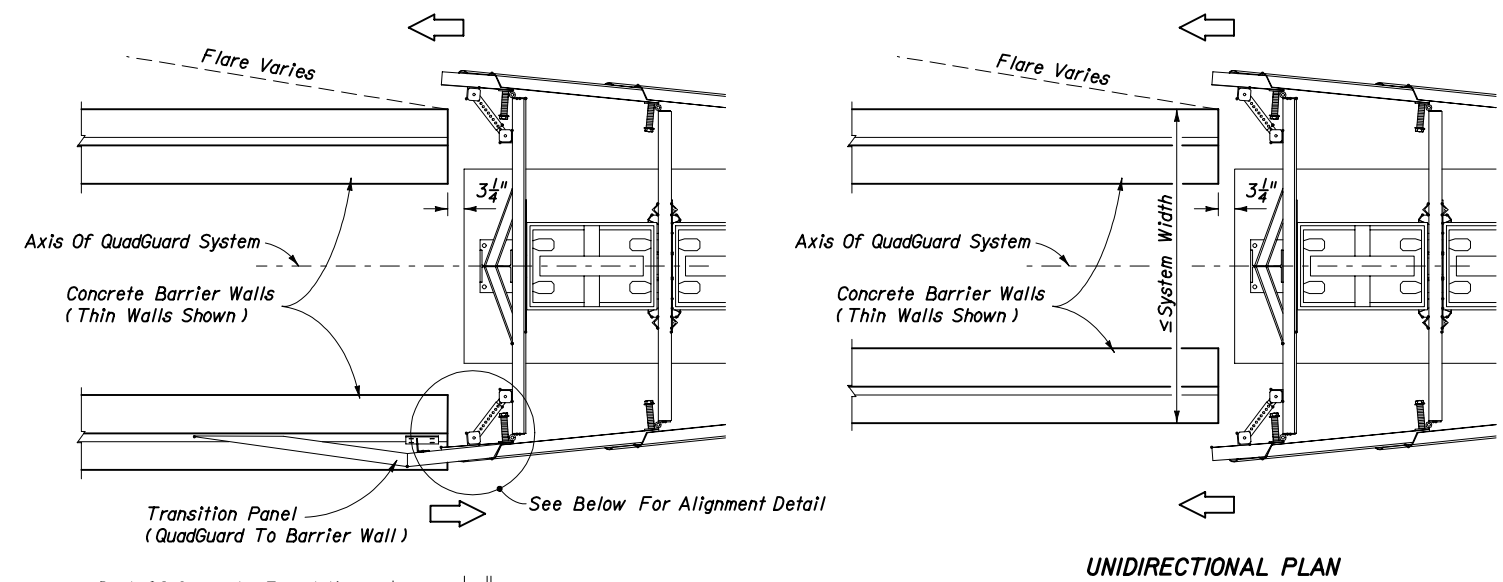
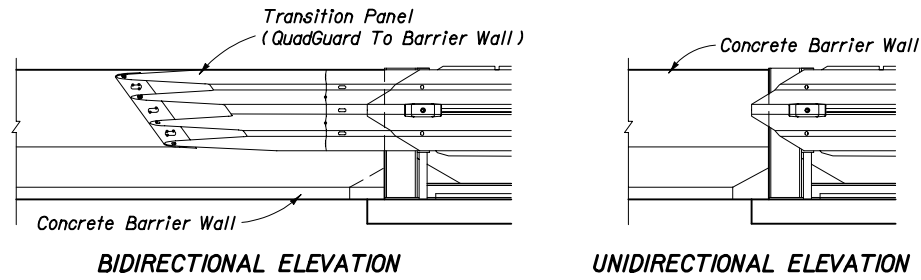
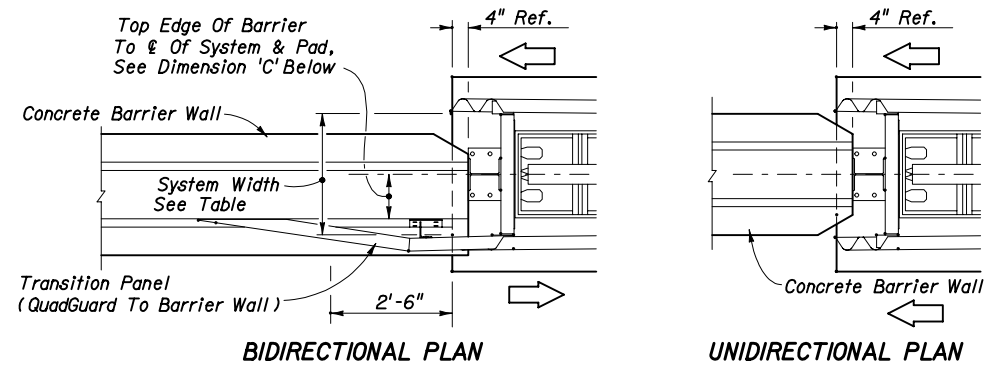
System Width	A
2'-0"/2'-6"/3'-0"	18.7"
5'-9"/7'-6"	21.93"

QuadGuard TO GUARDRAIL TRANSITIONS

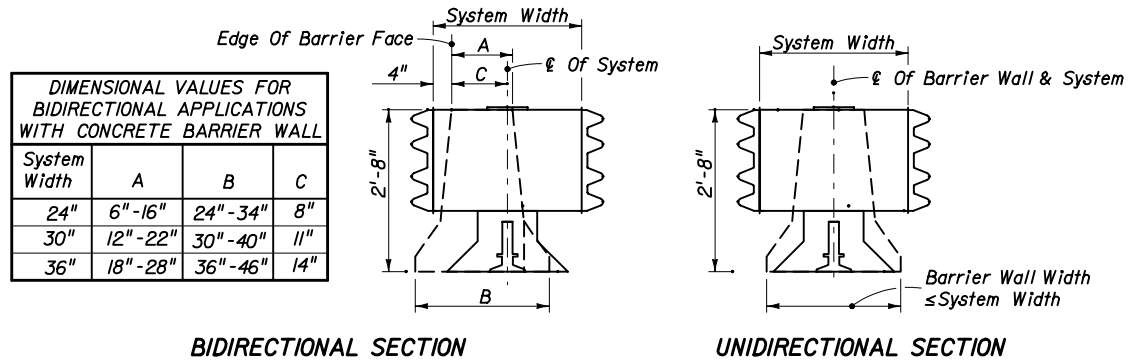
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

QuadGuard

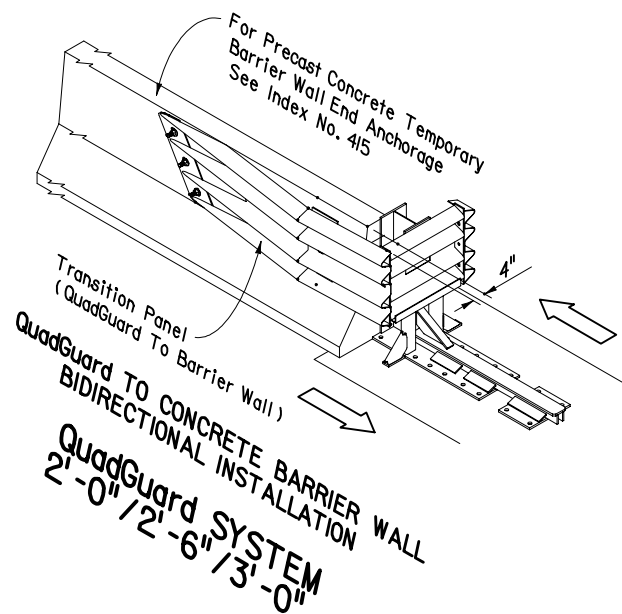
Names	Dates	Approved By		
Designed By: MFG/JVG	09/97	[Signature] Roadway Design Engineer		
Drawn By: HKH	09/97			
Checked By: JVG	09/97	Revision: 00	Sheet No. 4 of 6	Index No. 435



The axis of the QuadGuard relative to concrete barriers will be established on site specific basis. The QuadGuard supplier shall furnish dimensional data for setback between the barrier wall end and the system foundation, and for the alignment between the face of the barrier wall and the rear diaphragm where dimensions other than those above apply.



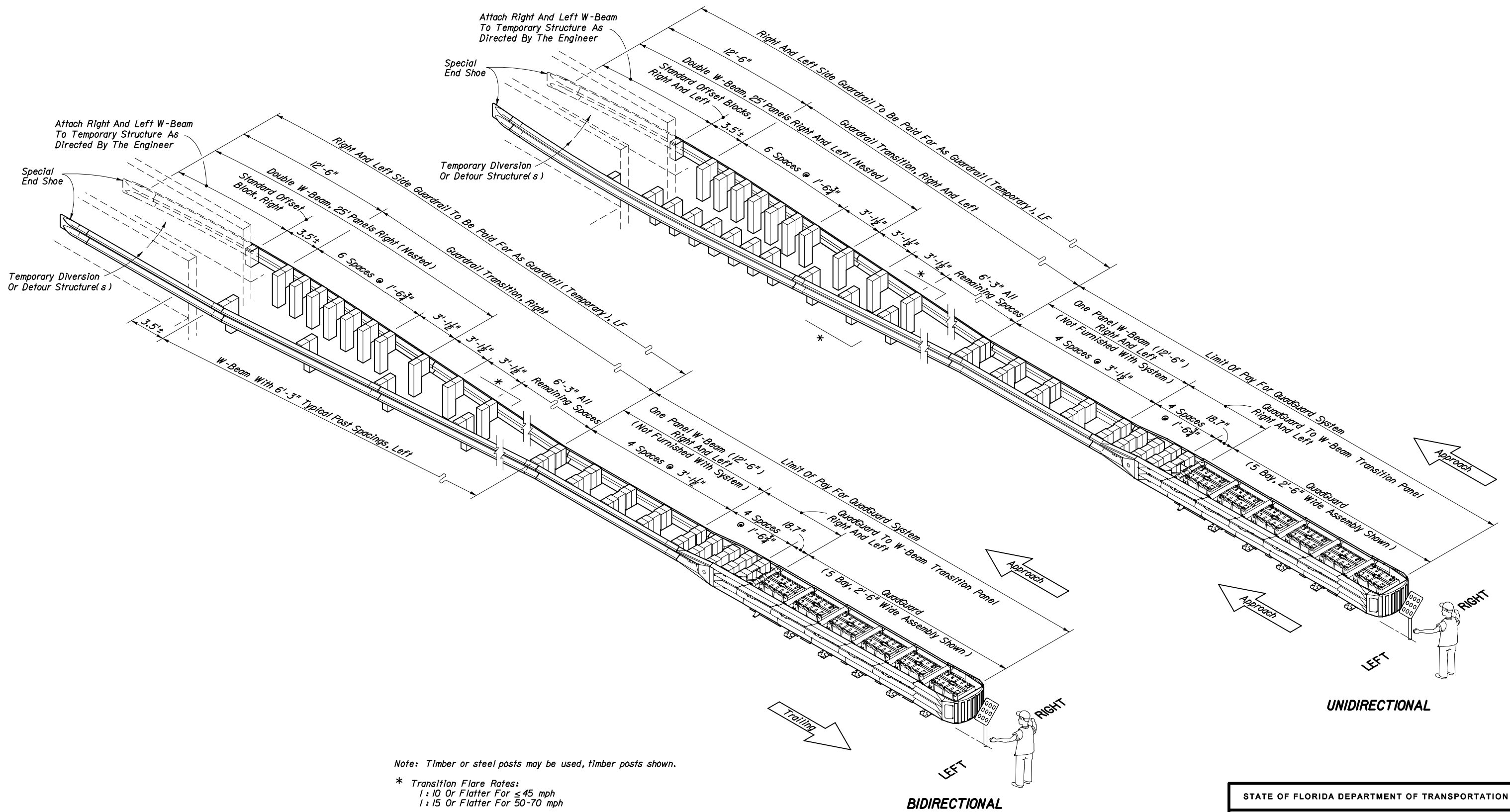
QuadGuard SYSTEM
5'-9" / 7'-6"



BARRIER WALL TRANSITION NOTE
Barrier wall free end must be reinforced in accordance with Index No. 410 and temporary walls must be adequately anchored for proper impact performance in accordance with Index No. 415.

QuadGuard TO CONCRETE BARRIER WALL TRANSITIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
QuadGuard				
Names	Dates	Approved By		
Designed By	MFG/JVG	09/97	Roadway Design Engineer	
Drawn By	HKH	09/97	Revision	Sheet No.
Checked By	JVG	09/97	00	5 of 6
				Index No. 435



Note: Timber or steel posts may be used, timber posts shown.

* Transition Flare Rates:
 1:10 Or Flatter For ≤ 45 mph
 1:15 Or Flatter For 50-70 mph

GUARDRAIL TRANSITION TO TEMPORARY DIVERSION OR DETOUR STRUCTURES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
QuadGuard				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	MFG/STD	Roadway Design Engineer		
Drawn By	HKH	Revision	Sheet No.	Index No.
Checked By	JVG	00	6 of 6	435

GENERAL NOTES

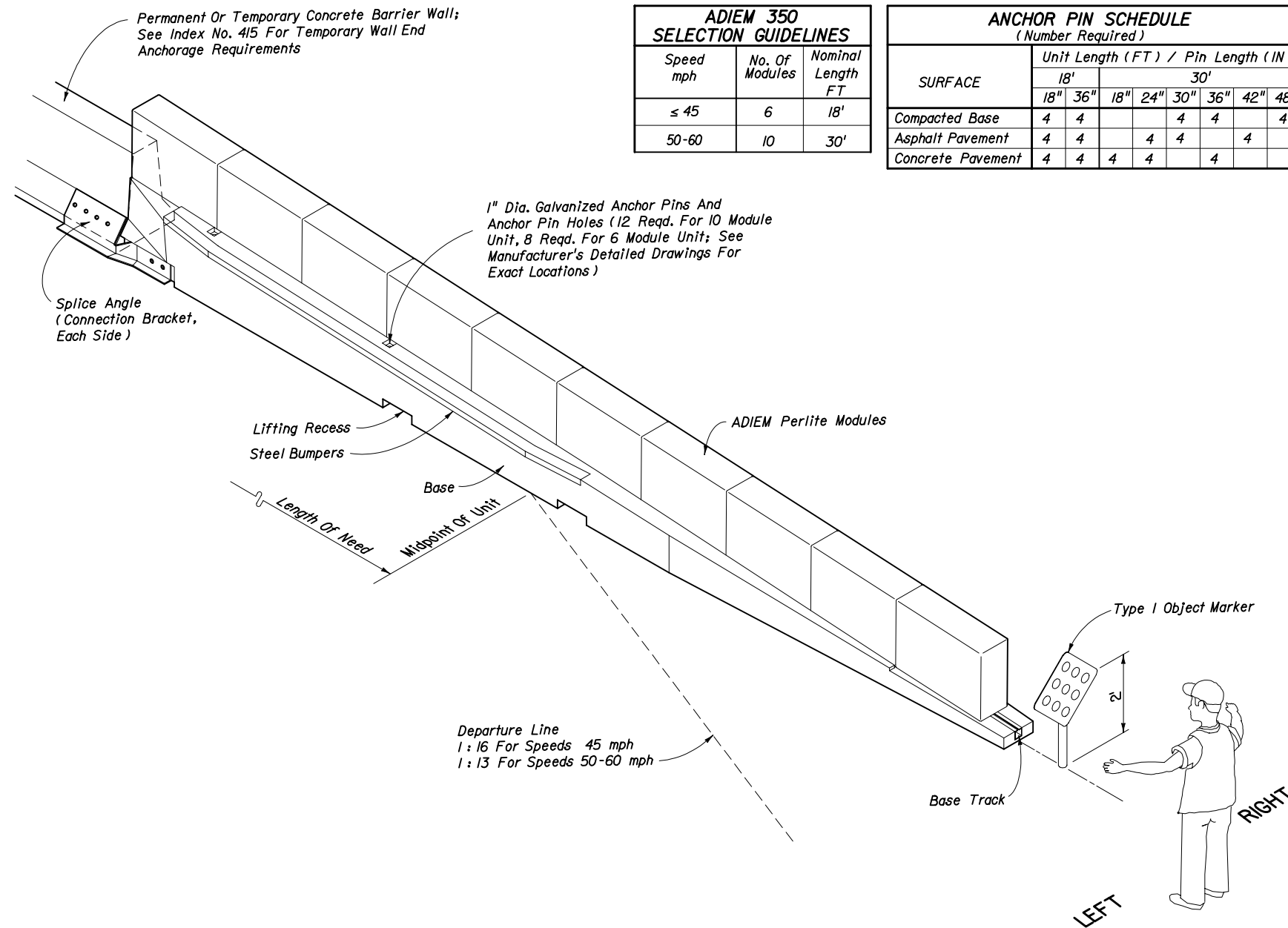
- The energy absorbing system represented on this standard drawing is a proprietary design by SYRO Inc. and marketed under the trade name ADIEM 350. Any infringement on the rights of the designer shall be the sole responsibility of the user.
- This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the ADIEM 350 and their incorporation into a whole system.
- This standard drawing is sufficient for plan details for the ADIEM 350 installed in connection with permanent or temporary concrete barrier walls, and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.
- The ADIEM 350 shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
- The ADIEM 350 can be located on compacted base, asphalt or concrete. Driving of anchor pins into compacted base or soft asphalt will be permitted while drilling will be necessary for hard asphalt or concrete pavements. See schedule left for anchor pin requirements.
- The ADIEM 350 is suitable for speeds ≤ 60 mph.
- The ADIEM 350 shall be located parallel to the approach travel lane(s), on 1:10 or flatter cross slopes. Until there is further development in the application of the ADIEM 350, the system is not to be located in narrow medians, gores or locations where frequent side impacts can be expected.
- All modules are alike in size and mass (interchangeable).
- Due to the overall unit height of 4', which exceeds the drivers height of eye, caution is to be exercised in locating the ADIEM 350 to avoid blockage of required sight distance.
- Attach splice angle (connection bracket) to ADIEM 350 base with 2-1/8" dia. x 25" long HD hex bolts. Attach splice angle to barrier wall with 8 field drilled 5/8" dia. x 6" long chemical anchors.
- A yellow Type I Object Marker shall be centered 3' in front of the nose of the ADIEM 350. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the ADIEM 350.
- Temporary ADIEM 350 systems can be reused provided the bases have the structural integrity and surface qualities of new systems, and the modules are condition new. Refurbished systems can be made up of mixed new and used components. New and used systems can be purchased, leased, rented, on loan or shared between projects.
- The permanent ADIEM 350 will be paid for under the contract unit price for Impact Attenuator Vehicular (ADIEM), EA; temporary units will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (ADIEM), LO, or when the ADIEM 350 is used as an option in accordance with Index No. 415, it will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

DESIGN AND MAINTENANCE NOTES AND GUIDELINES

- The ADIEM 350 is designed to cushion automobile end-on hits and to redirect automobiles from side hits within the length of need while shielding the ends of permanent or temporary concrete barrier walls.
- The ADIEM 350 is a restorable system that is particularly suited to shielding concrete barrier wall ends. The 18' unit is applicable for speeds of 45 mph or less, the 30' unit is applicable for speeds of 50-60 mph.
- The upstream half of the system (3 or 5 modules) is a gating design. Each module (cartridge) has a mass of 180 lbs. Care must be exercised in locating the system where debris scatter may pose a hazard. Upstream modules or their residual components must be removed to replace damaged downstream modules.
- The ADIEM 350 will require close monitoring for damage that will open module encasement; immediate repair is essential to prevent moisture absorption into module core.
- Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the ADIEM 350, and until such alternatives are available, the ADIEM 350 need not be bid against other proprietary items. However, where the ADIEM 350 and other approved temporary redirective crash cushions meet or exceed the minimum requirements for a specific location, the approved crash cushions will be considered optional systems and paid for as described in General Note 13 above.

ADIEM 350 SELECTION GUIDELINES		
Speed mph	No. Of Modules	Nominal Length FT
≤ 45	6	18'
50-60	10	30'


ANCHOR PIN SCHEDULE (Number Required)								
SURFACE	Unit Length (FT) / Pin Length (IN)							
	18'		30'					
	18"	36"	18"	24"	30"	36"	42"	48"
Compacted Base	4	4			4	4		4
Asphalt Pavement	4	4		4	4		4	
Concrete Pavement	4	4	4	4		4		

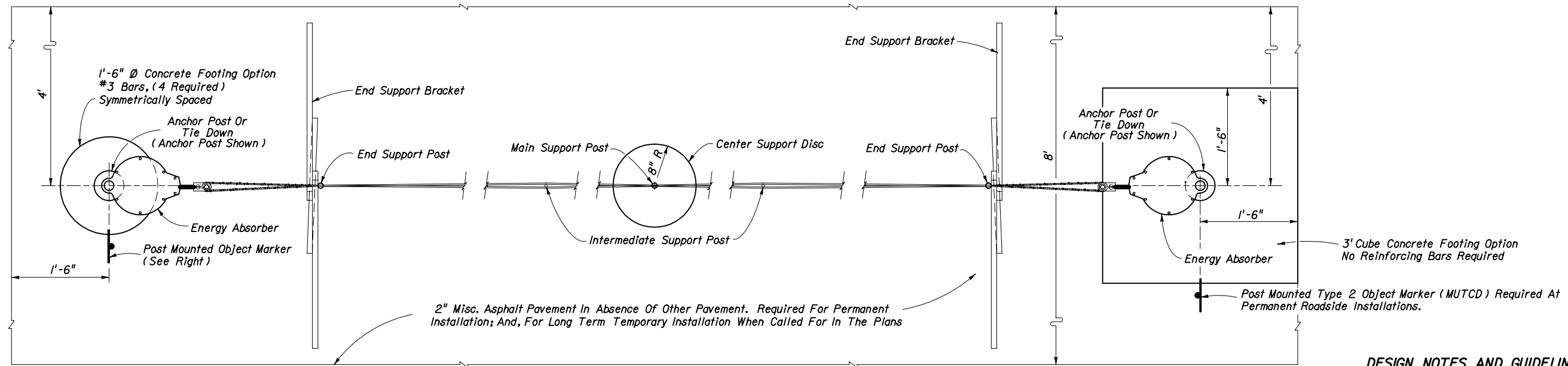


GENERAL SYSTEM FEATURES AND GUIDELINES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

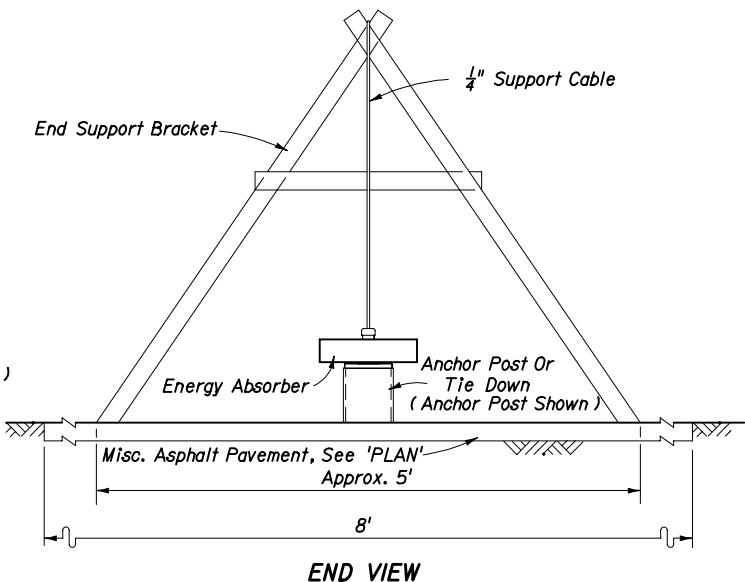
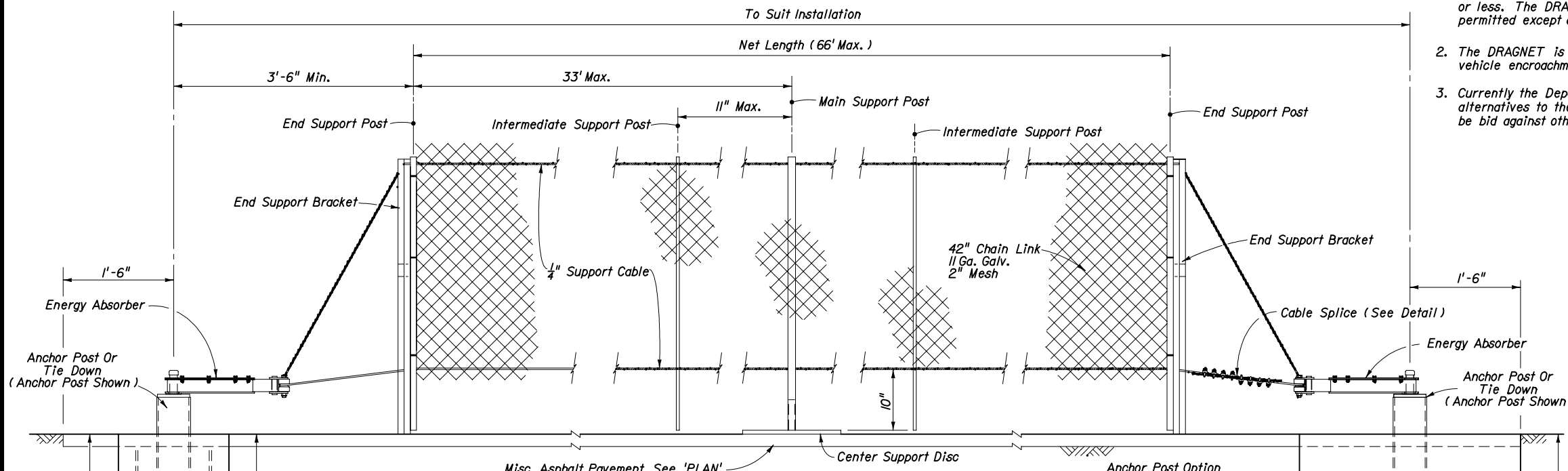
ADIEM 350

Names		Dates	Approved By		
Designed By	HRG		 Roadway Design Engineer		
Drawn By	HRG	7/97			
Checked By	JVG	7/97	Revision	Sheet No.	Index No.
			00	1 of 1	436



DESIGN NOTES AND GUIDELINES

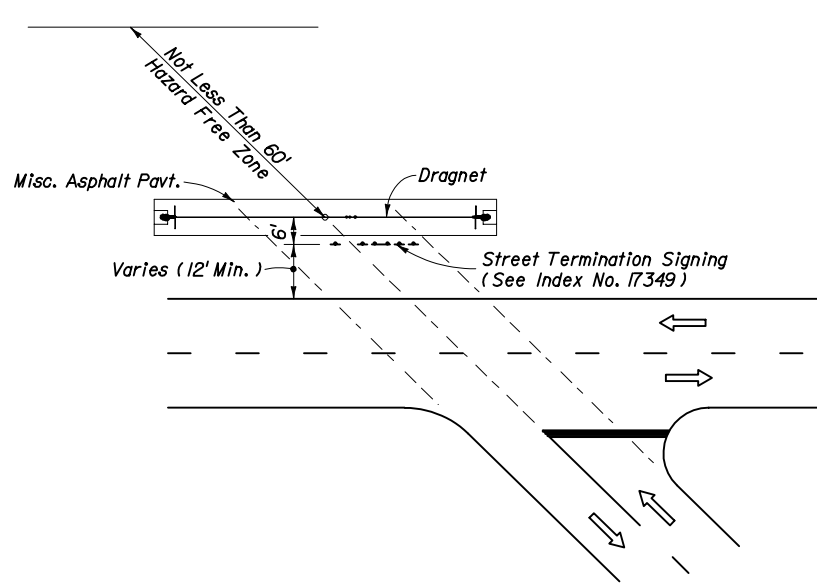
1. The DRAGNET is designed to safely stop automobiles when impacted at speeds of 60 mph or less. The DRAGNET has a singular design and any adjustment to its design will not be permitted except as authorized by the manufacturer.
2. The DRAGNET is a restorable system that is particularly suited to the prevention of head-on vehicle encroachment into hazardous areas.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the DRAGNET and until such alternatives are available, the DRAGNET need not be bid against other proprietary items.



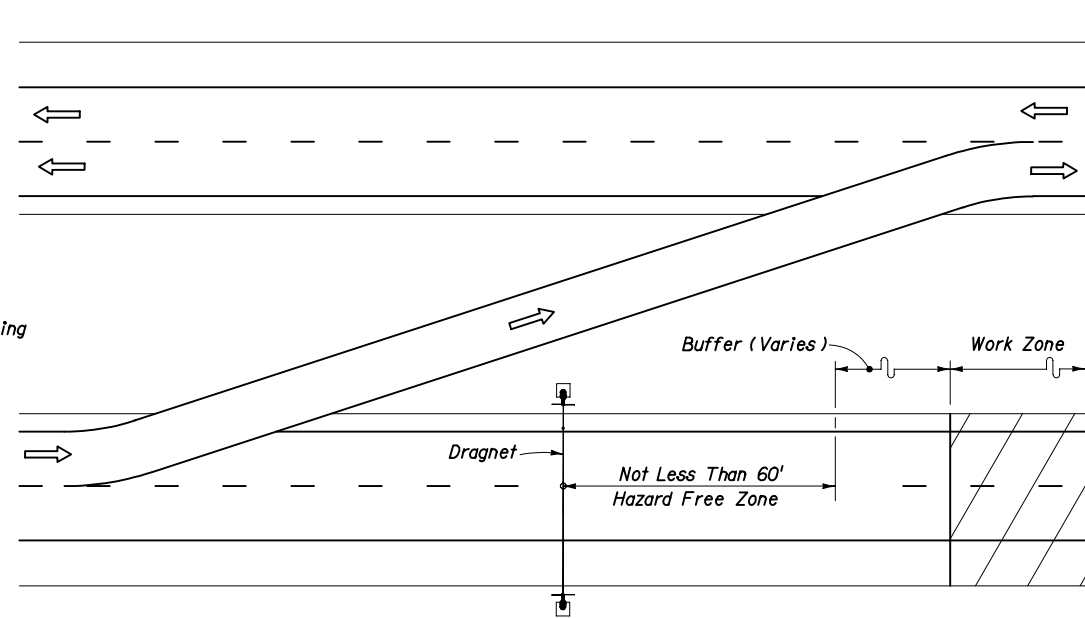
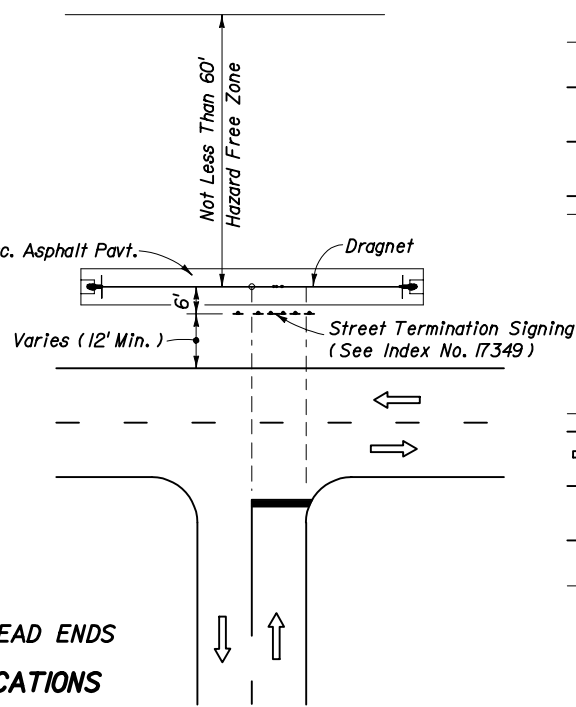
GENERAL NOTES

1. The vehicle arresting barrier represented on this standard is a proprietary product of Energy Absorption Systems, Inc. and marketed under the trade name DRAGNET. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the DRAGNET system and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the DRAGNET installed as a free standing system and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.
4. The DRAGNET shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
5. Concrete footings shall be constructed with Class I concrete.
6. Each temporary DRAGNET assembly shall include a spare parts package consisting of two extra arresting tapes and a set of end support brackets. The spare parts package shall be stored on site at locations approved by the Engineer. Damaged attenuators shall be restored within 24 hours. The cost of furnishing and maintaining spare parts packages for each attenuator shall be included in the cost of the attenuator.
7. The cost of the DRAGNET shall include furnishing and installing all components and materials necessary for a complete installation and will be paid for under the contract unit price for Impact Attenuator Vehicular (Dragnet), EA., for permanent installations or Vehicle Arresting Barrier (Net Type), EA., for temporary installations.

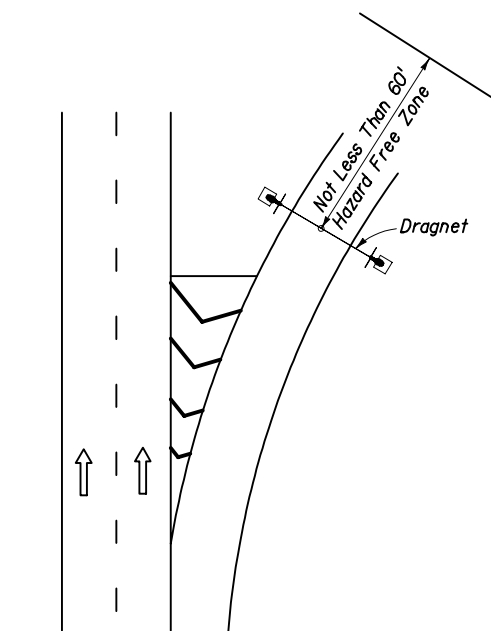
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
DRAGNET				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	10/91	Roadway Design Engineer	
Checked By	JVG	10/91		
			Revision	Sheet No.
			00	1 of 2
				Index No.
				438



**'T' INTERSECTIONS OR DEAD ENDS
PERMANENT APPLICATIONS**



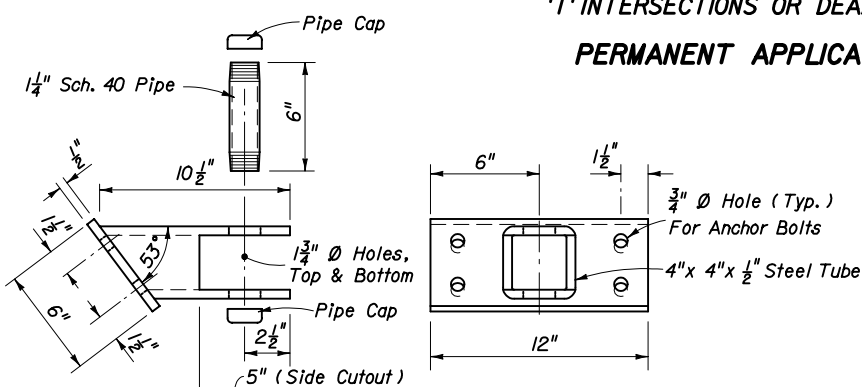
TEMPORARY ROADWAY CLOSURES



TEMPORARY RAMP CLOSURES

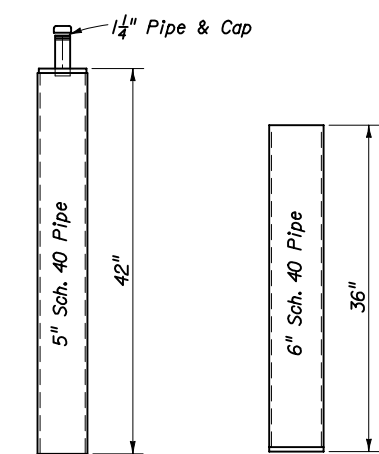
See Index No. 600 For Traffic Control Through Work Zones

TEMPORARY APPLICATIONS



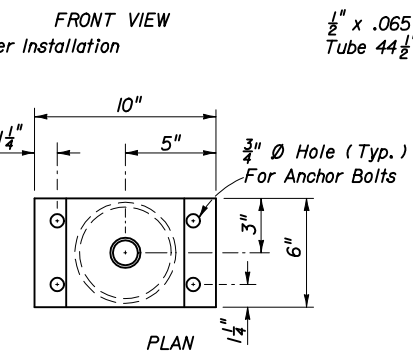
**SIDE VIEW
For Use On Concrete Barrier Installation
TIE DOWN**

FRONT VIEW

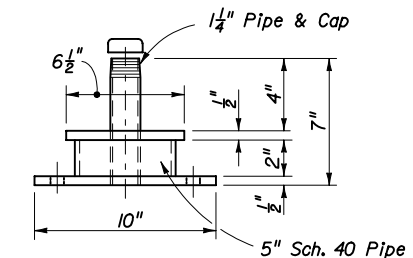


**ANCHOR POST
ASSEMBLY**

**ANCHOR POST
SOCKET**



PLAN



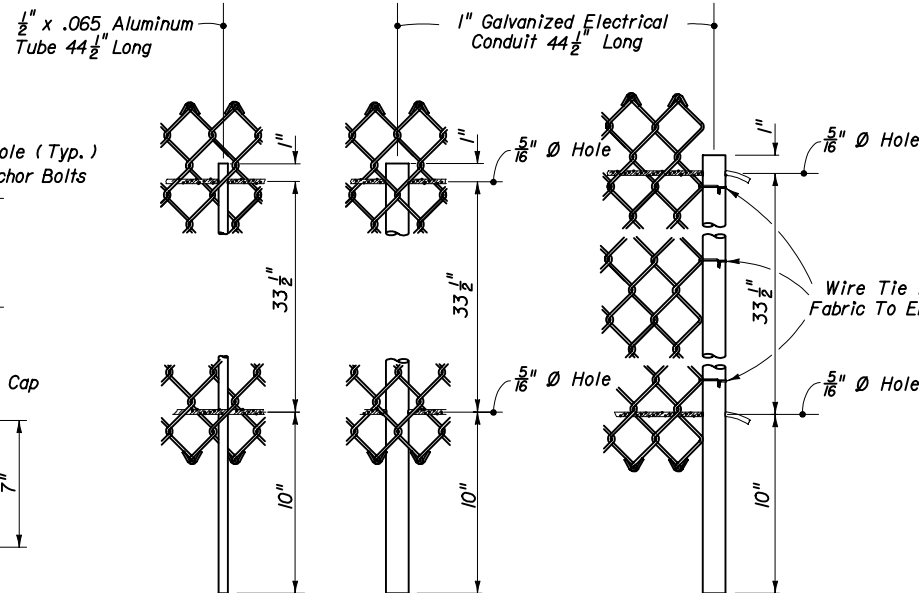
ELEVATION

For Use Where Anchor Post Is To Be Removed.

For Use Inside Clear Zone. Can Be Used With Either Concrete Footing Option Or On Existing Concrete Slab.

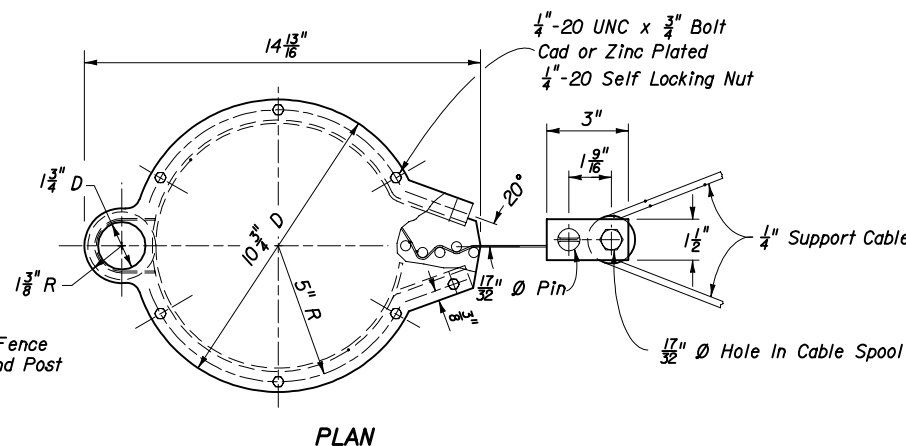
Note: Tie down anchor bolts shall be 1/2" dia. adhesive anchors with 4 1/2" min. embedment, installed to manufacturer's specifications; 4 required per tie down.

ANCHOR DETAILS

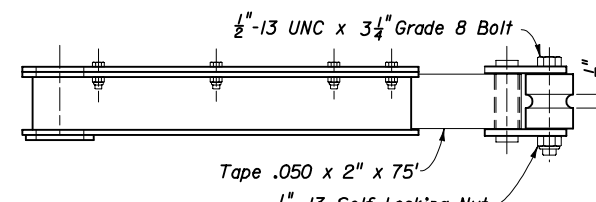


**INTERMEDIATE
SUPPORT POST MAIN
SUPPORT POST END
SUPPORT POST**

SUPPORT POST DETAILS

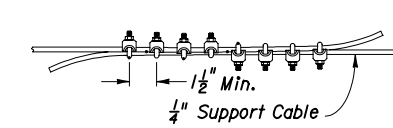


PLAN



ELEVATION

ENERGY ABSORBER ASSEMBLY




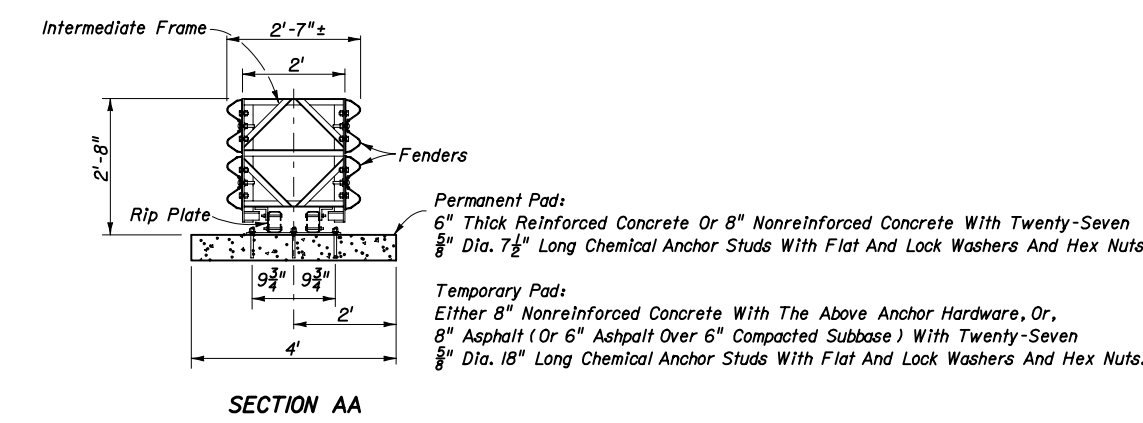
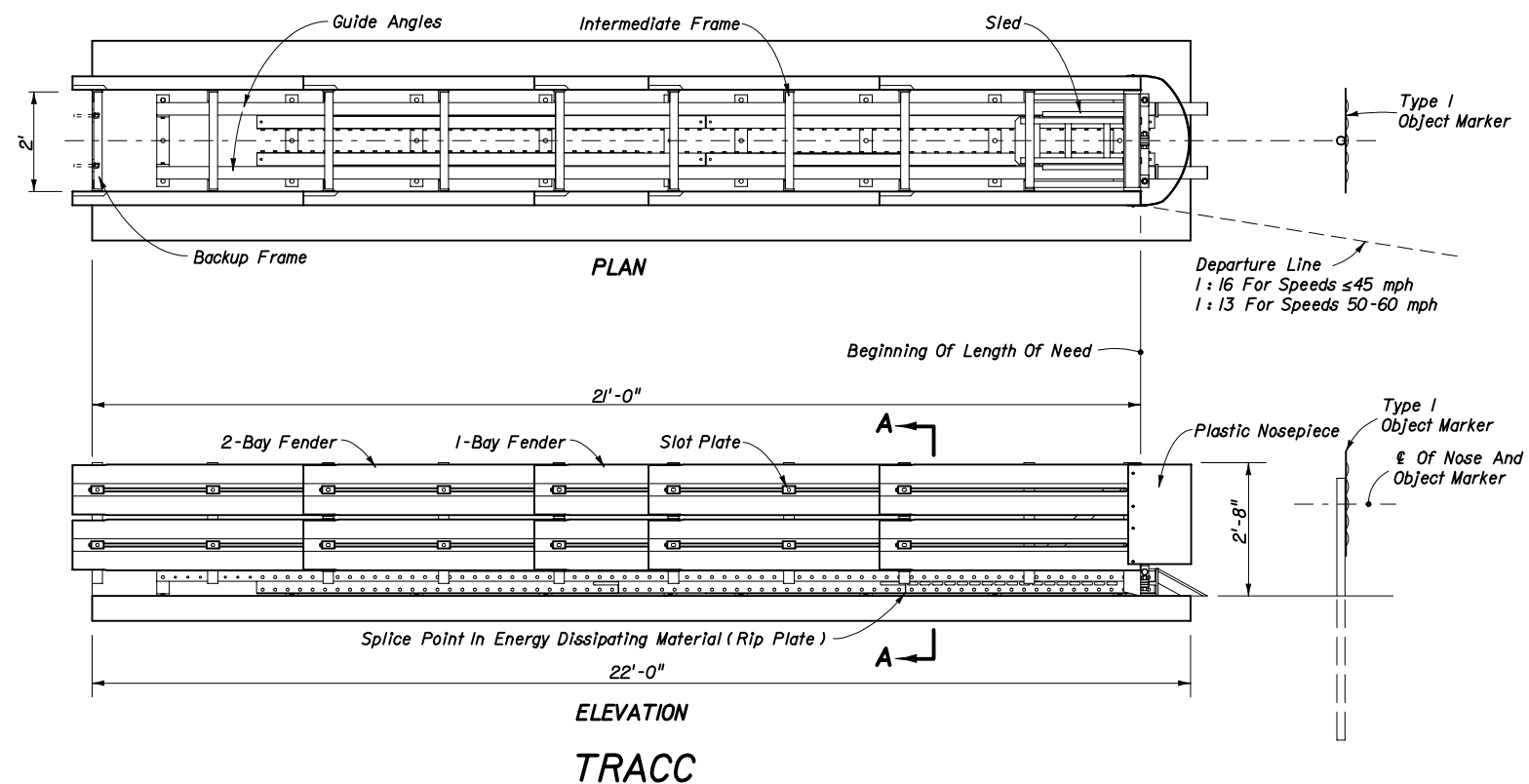
U-bolt Presses Against Dead End Of Cable. Torque Nuts To 130 In. Lbs. (8 Required)

CABLE SPLICE DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DRAGNET

Names		Dates	Approved By		
Designed By	MGR/HKR	10/91	 Roadway Design Engineer		
Drawn By	HKR	10/91			
Checked By	JVG	10/91			
Revision	00	2 of 2			



TRACC MODULE GUIDELINES		
Speed (mph)	Manufacturer's Naming Convention	Length (Feet)
≤45	SHORTTRACC	14'-1"
>45 ≤60	TRACC	21'-0"
>60 ≤70	FASTRACC	26'-0"

GENERAL NOTES

- The energy absorbing system represented on this standard drawing is a proprietary design by Trinity Industries, Inc. and marketed under the trade names SHORTTRACC, TRACC, and FASTRACC. Any infringement on the rights of the designer shall be the sole responsibility of the user.
- This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of TRACC Systems and their incorporation into a whole system. This standard drawing is sufficient for plan details, and precludes the requirement for shop drawing submittals unless the plans call for such submittals.
- TRACC Systems shall be installed in accordance with the manufacturer's detailed drawings, procedures and specifications, except that transition section posts will be set to connect to guardrail at standard W-beam center bolt height (1'-9").
- TRACC Systems include pre-assembled energy absorbing modules that are available in three sizes. Larger modules can be substituted for smaller modules. See selection table below.
- When TRACC Systems are installed at permanent locations they shall be anchored to either a reinforced 6" thick concrete pad or a nonreinforced 8" thick concrete pad with twenty-seven 7 1/2" long 5/8" dia. chemical anchor studs, flat and lock washers, and, hex nuts. When TRACC Systems are installed at temporary locations they shall be anchored to a nonreinforced 8" thick concrete pad with the above mentioned anchor hardware, or a 8" thick asphalt pad (or a 6" thick asphalt over 6" of compacted subbase) using twenty-seven 18" long 5/8" dia. Grade 5 threaded chemical anchor studs, flat and lock washers, and, hex nuts.
- TRACC Systems shall be located parallel to the approach travel lane(s), on 1:10 or flatter cross slopes.
- In-place repairs on TRACC modules are limited to (a) end-on impacts which cause the sled to stroke 54" or less, and (b) side impacts where permanent distortion is limited to fender panels and where distortion of the intermediate frame(s) can be restored manually and (c) end on impacts that cause the sled to stroke more than 54", yet where repair can be accomplished in a period not to exceed 24 continuous hours. Unit replacement is required when damage exceeds these conditions. Temporary construction units and units under Maintenance responsibility may be shop repaired units utilizing new or salvaged parts which will produce condition new units. All permanent units shall be factory new at completion of construction.
- A yellow Type I Object Marker shall be centered 3' in front of the nose of the TRACC System. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the TRACC System.
- Permanent TRACC Systems will be paid for under the contract unit price for Vehicular Impact Attenuator (TRACC), EA. Temporary TRACC Systems will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (TRACC), LO. However, when a TRACC system is used as an option in accordance with Index No. 415, it will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

DESIGN NOTES AND GUIDELINES

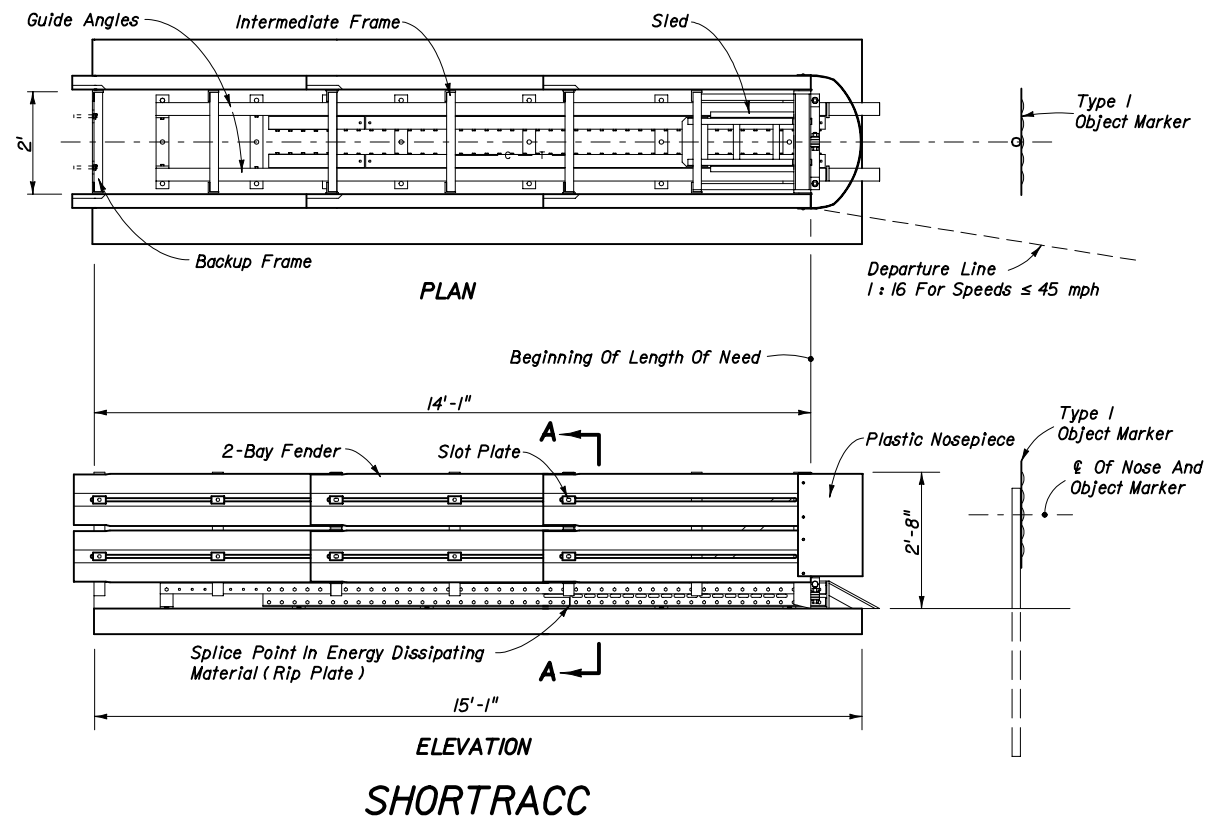
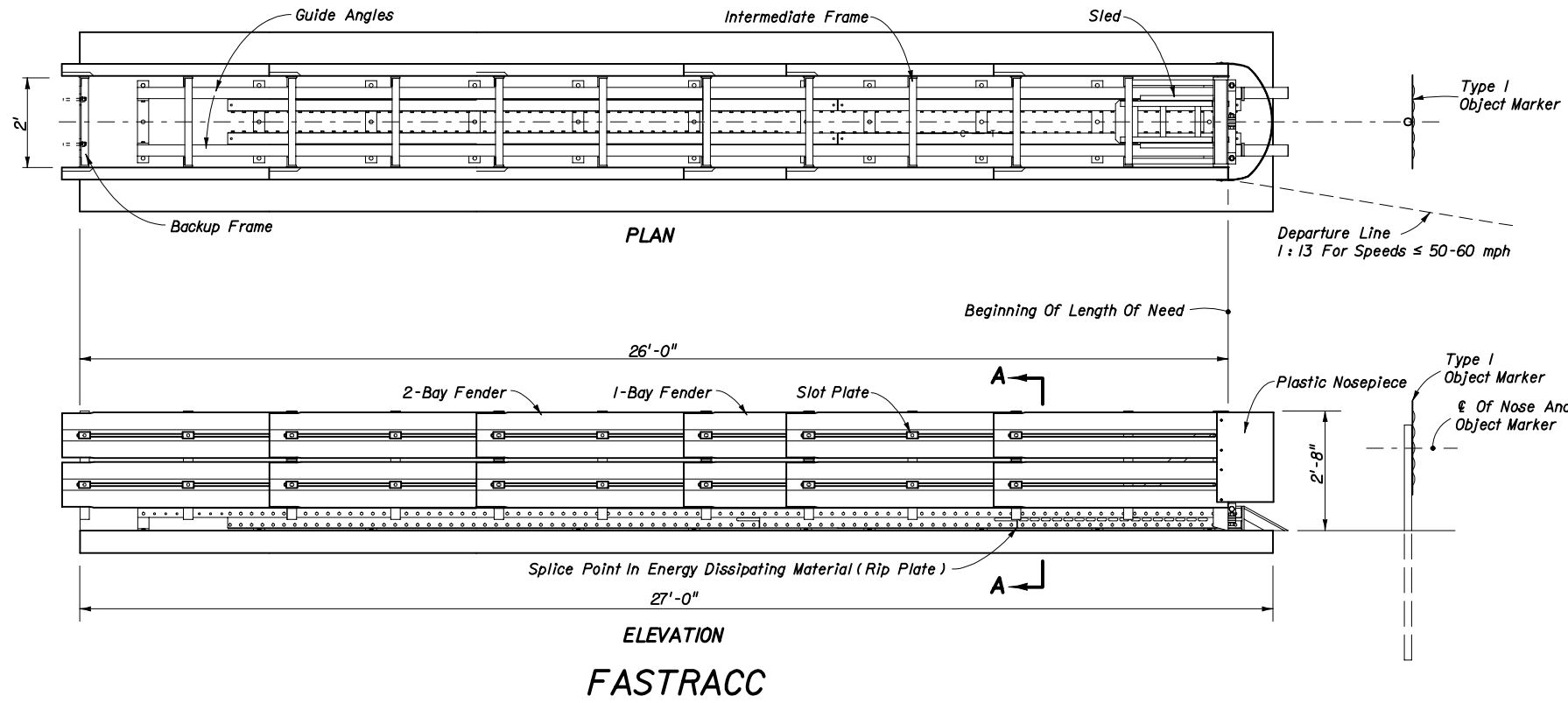
- TRACC Systems are designed to cushion automobile end-on hits and to redirect automobiles from side hits within the length of need while shielding the ends of permanent or temporary concrete barrier walls or double faced guardrails.
- The TRACC System is not field-restorable for all impacts. Repairs or replacement will be in accordance with GENERAL NOTE 7 above.

Until additional replacement and repair experience is available, the TRACC System should not be permanently installed in gore of freeways and expressway mainline ramp terminals; gore of roadway forks; or other gore locations where the Engineer of Record has identified a specific history of high frequency vehicle departure from the roadway or the potential exists for such departures.

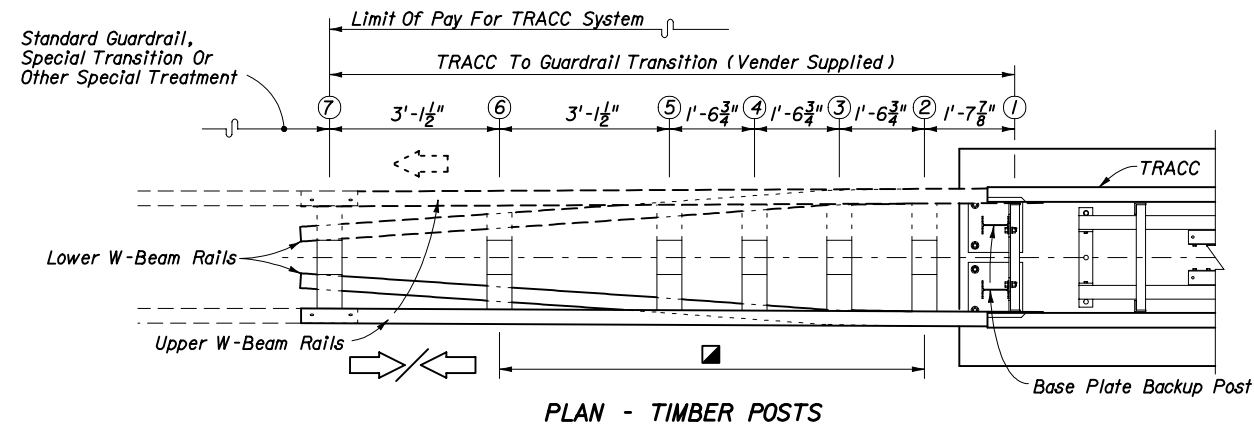
The TRACC can be used in any temporary location identified in the plans for optional redirective crash cushion in accordance with Index No. 415, and will be used as a temporary crash cushion in any location identified in the plans for Vehicle Impact Attenuator (Temporary) (TRACC); likewise the TRACC is not to be substituted when the plans call for other crash cushion systems at specified locations.
- Currently the Department does not recognize other proprietary items as being equally suitable alternatives to TRACC Systems, and until such alternatives are available, the TRACC Systems need not be bid against other proprietary items. However, where the TRACC Systems and other approved temporary redirective crash cushions meet or exceed the minimum requirements for a specific location, the approved crash cushions will be considered optional systems and paid for as described in General Note 9 above.

GENERAL SYSTEM FEATURES AND GUIDELINES

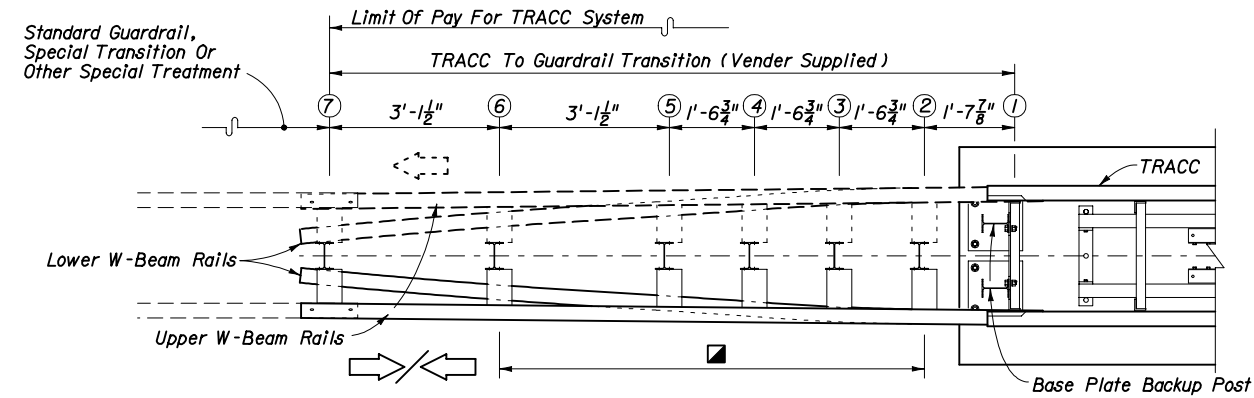
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
TRACC SYSTEMS					
Designed By	Names	Dates	Approved By		
Drawn By	HKH	7/97	 Roadway Design Engineer		
Checked By	JVG	7/97			
	Revision	02	Sheet No.	Index No.	
			1 of 5	440	



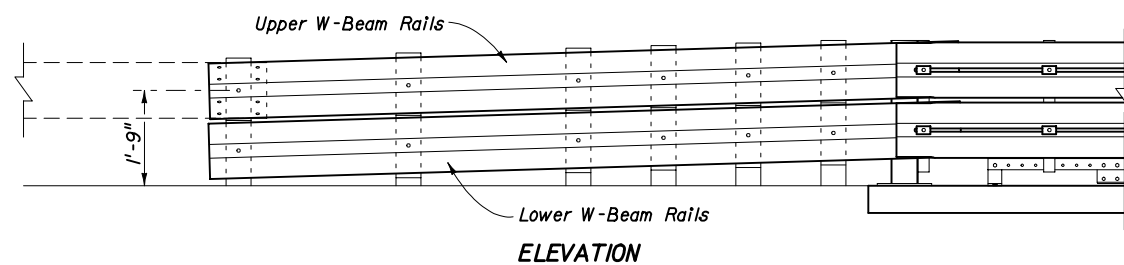
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRACC SYSTEMS				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	HKH	7/97	Revision	Sheet No. Index No.
Checked By	JVG	7/97	02	2 of 5 440



PLAN - TIMBER POSTS



PLAN - STEEL POSTS

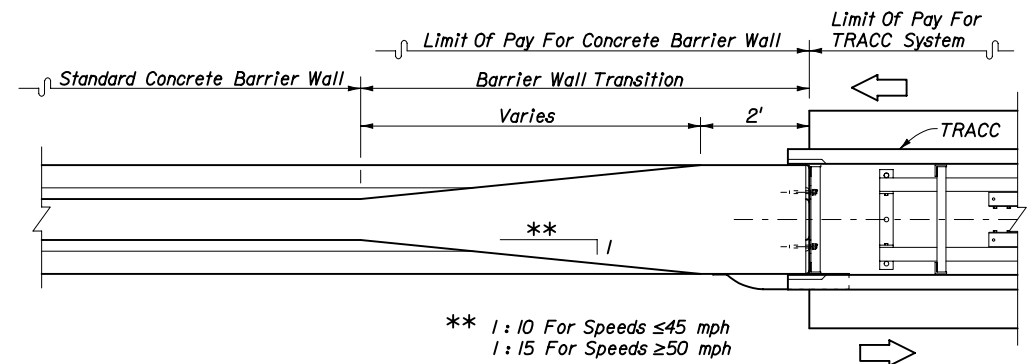


ELEVATION

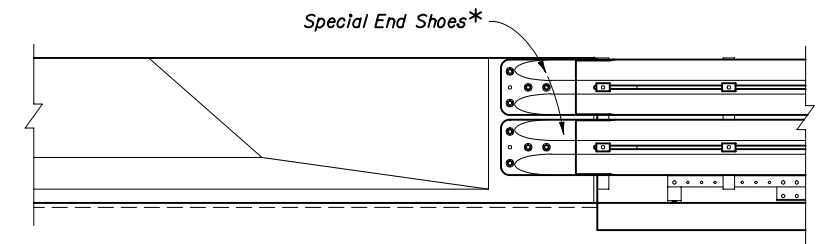
Offset blocks that exceed standard block depth can be made up of blocks of special size or multiple standard blocks field trimmed to approximately equal size to achieve full transition width. Offset blocks for lower W-beam that are less in depth than standard blocks may be field trimmed standard blocks. All blocks are to be secured to plan position by 16d galvanized nails.

Transitions are required when connecting the TRACC System to any guardrail system.

TRACC TO GUARDRAIL



PLAN



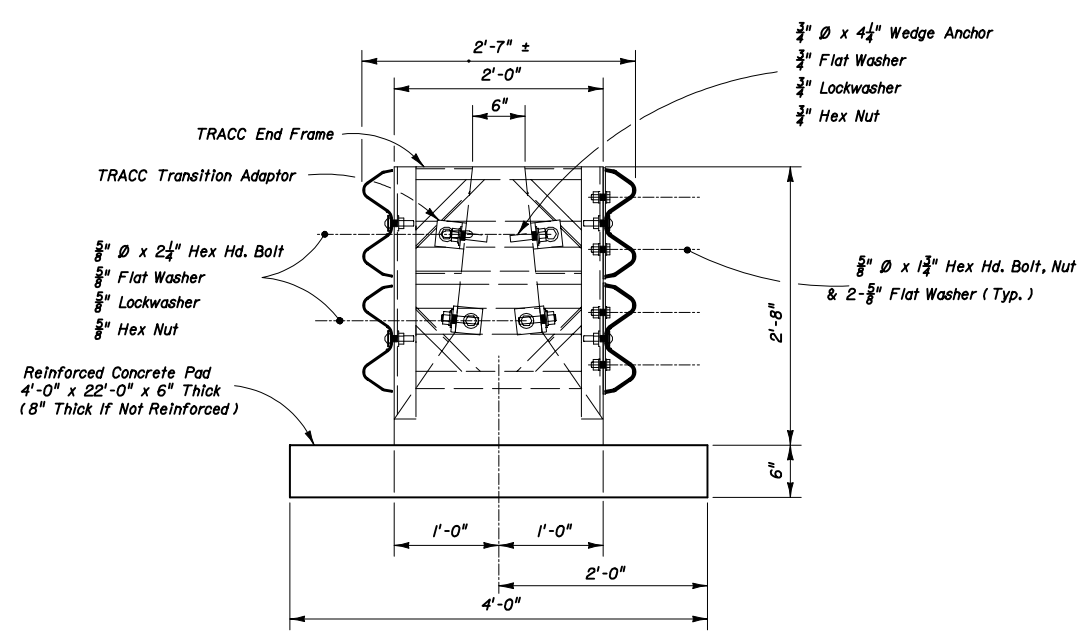
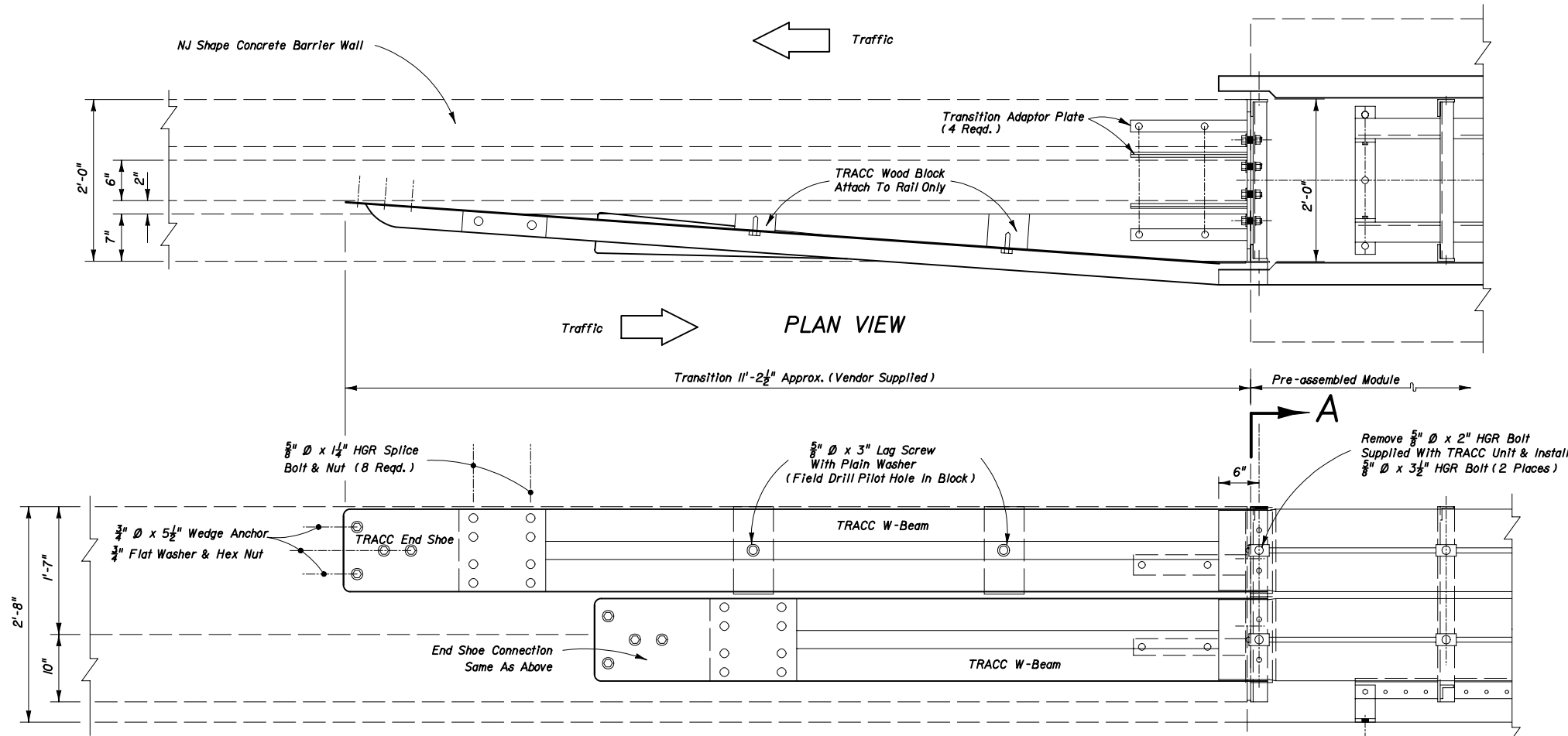
ELEVATION

* To Be Included In Cost Of TRACC System

**INTEGRAL WALL TRANSITION
TRACC TO CONCRETE BARRIER WALL**

TRACC TRANSITIONS

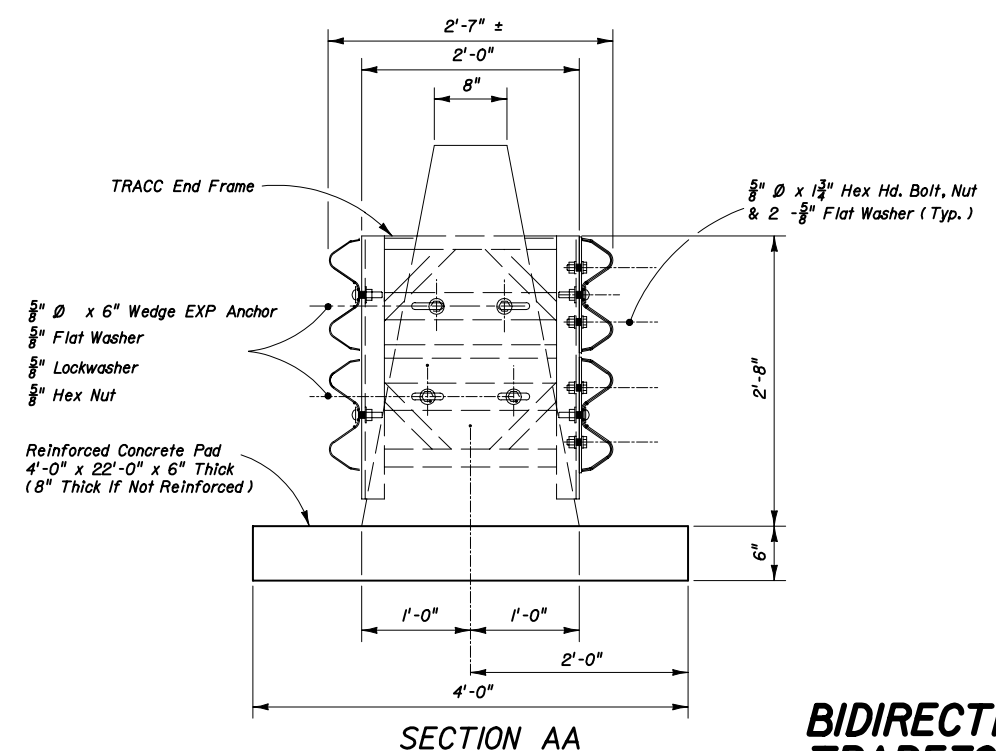
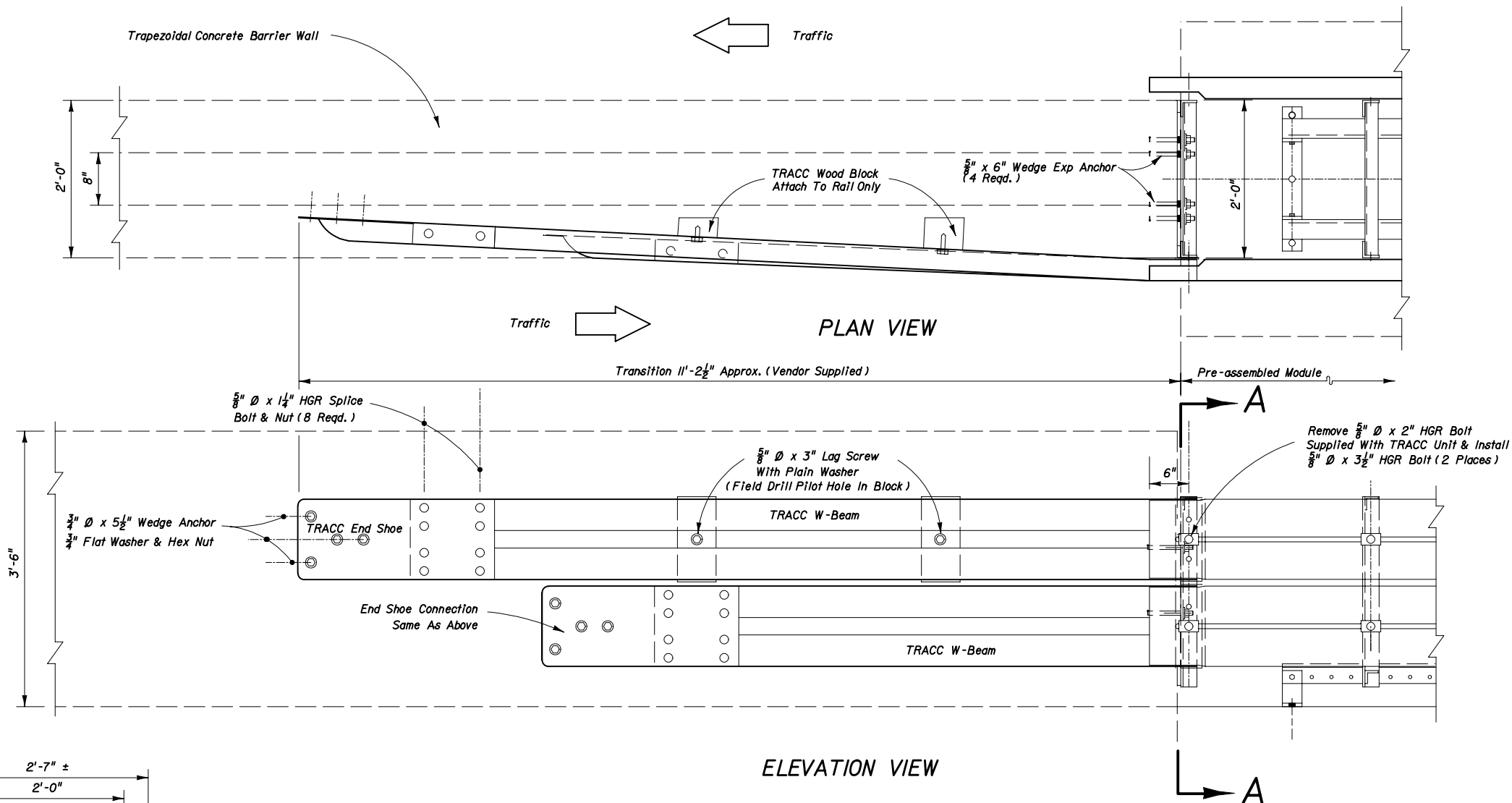
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRACC SYSTEMS				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	7/97	 Roadway Design Engineer	
Checked By	JVG	7/97	Revision	Sheet No.
			02	3 of 5
			Index No.	440



SECTION AA

BIDIRECTIONAL TRANSITION FOR CONNECTION TO NJ SHAPE CONCRETE BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRACC SYSTEMS				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	7/97	 Roadway Design Engineer	
Checked By	JVG	7/97		
	Revision	02	Sheet No.	Index No.
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BIDIRECTIONAL TRANSITION FOR CONNECTION TO TRAPEZOIDAL SHAPE CONCRETE BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRACC SYSTEMS				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	HKH	7/97	Roadway Design Engineer	
Checked By	JVG	7/97	Revision	Sheet No. Index No.
			02	5 of 5 440


GENERAL NOTES

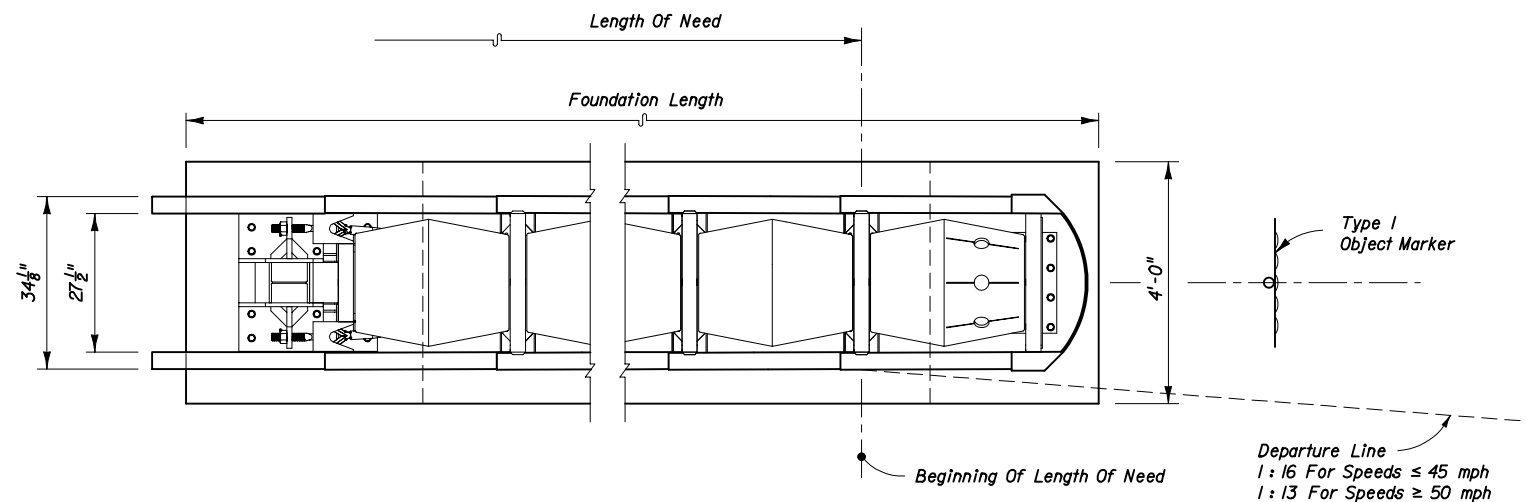
1. The energy absorbing system represented on this standard is a proprietary design by Barrier Systems, Inc. and marketed under the trade name TAU-II. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard is produced by the Florida Department of Transportation solely for use by the Department and its assignees.
3. The TAU-II is a redirective non-gating crash cushion produced in two models, each model designed to shield narrow hazards. The TAU-II TL-3 (8 bay model) may be used on Florida highways for all speeds. The TAU-II TL-2 (4 bay model) is limited to use on Florida highways with speeds of 45 mph or less.
4. The TAU-II is supplied in a single width of 27 1/2".
5. There are two types of Energy Absorbing Cartridges (EAC) used in the TAU-II crash cushions. They are to be placed according to the manufacturer's specifications and in the configurations illustrated below.
6. Permanent and portable portland cement concrete foundations shall be constructed with 4000 psi minimum compressive strength concrete. Reinforcing steel shall be in accordance with the schedule on this index.
7. The TAU-II 'Compact Backup' is the primary backup to be used on Florida Department of Transportation projects. Use of concrete backups shall be called out in the plans for site specific construction; concrete backup connections shall meet the guidelines of this index and must meet manufacturer's specifications, installation guidelines and transition hardware requirements.
8. The TAU-II shall be constructed parallel to the approach travel lane and on cross slopes 1:10 or flatter.
9. All metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
10. A yellow Type I Object Marker shall be centered 3' in front of the nose of the TAU-II. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the TAU-II system.
11. Quantity for payment is based on each independent location as called for in the plans or as directed by the Engineer. The cost for manufacturer's transition hardware, foundations and subgrade preparation will be included in the cost for the TAU-II system.

Permanent systems will be paid for under the contract unit price for Impact Attenuator Vehicular (TAU-II), EA; temporary units will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (TAU-II), LO, or when the TAU-II system is used as an option in accordance with Index No. 415, it will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective), LO.

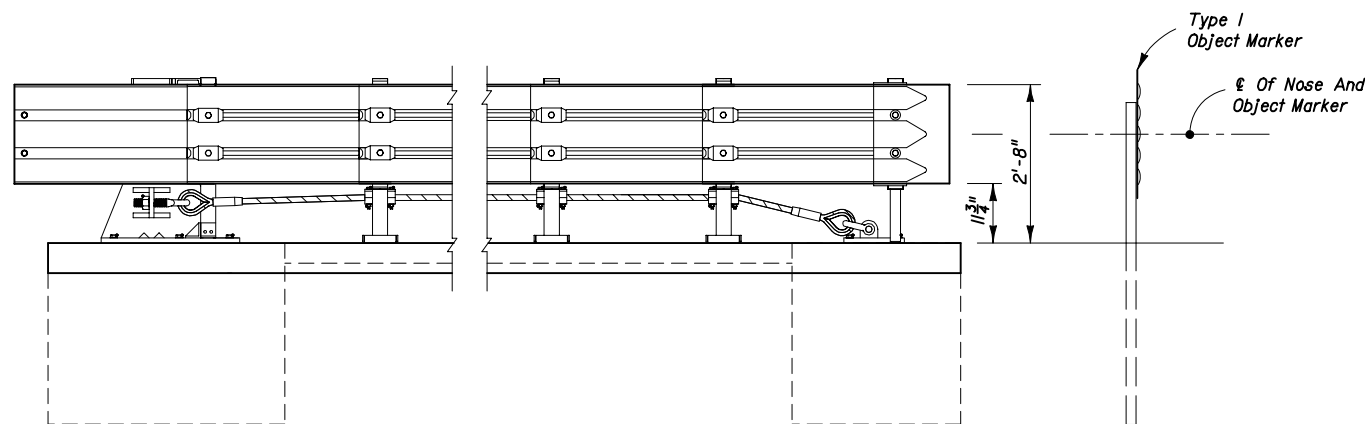
DESIGN NOTES AND GUIDELINES

1. The beginning length of need shall be at the point of intersection between the face of the cushion and the transverse centerline of the diaphragm back of cartridge No. 1.
2. The TAU-II System is designed to cushion automobile end-on hits and to redirect automobiles from side hits. The TAU-II is designed to shield fixed hazards or the ends of other temporary and permanent barrier systems. The number of bays to be used in a specific unit will be determined by the design speed, except where the Engineer determines that another speed is more applicable.
3. The TAU-II is a restorable system that is particularly suited to shielding hazards subject to high speed traffic, high volume traffic, and/or traffic with a history of frequent errant vehicle departures from the roadway or the potential exists for such departures. The TAU-II is particularly suited to shielding hazards where the approach space is limited; and, is particularly suited to conditions where the terminal must be located close to the traffic lane.
4. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the TAU-II, and until such alternatives are available, the TAU-II need not be bid against other proprietary items. However, for temporary use where the TAU-II and other approved redirective crash cushions meet or exceed the minimum requirements for a specific location, the approved crash cushions will be considered optional systems and paid for as described in General Note 11 above.

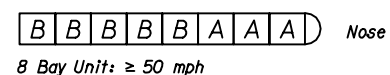
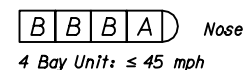
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TAU-II				
Designed By	Names	Dates	Approved By	
Drawn By	MRG	12/02	 Roadway Design Engineer	
Checked By	SBC	12/02		
	JVG/TRB	12/02	Revision	Sheet No.
			04	1 of 8
				Index No.
				441



UNIT PLAN



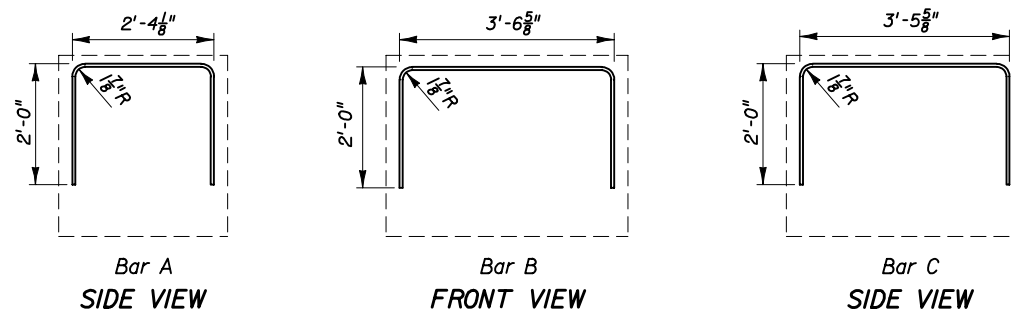
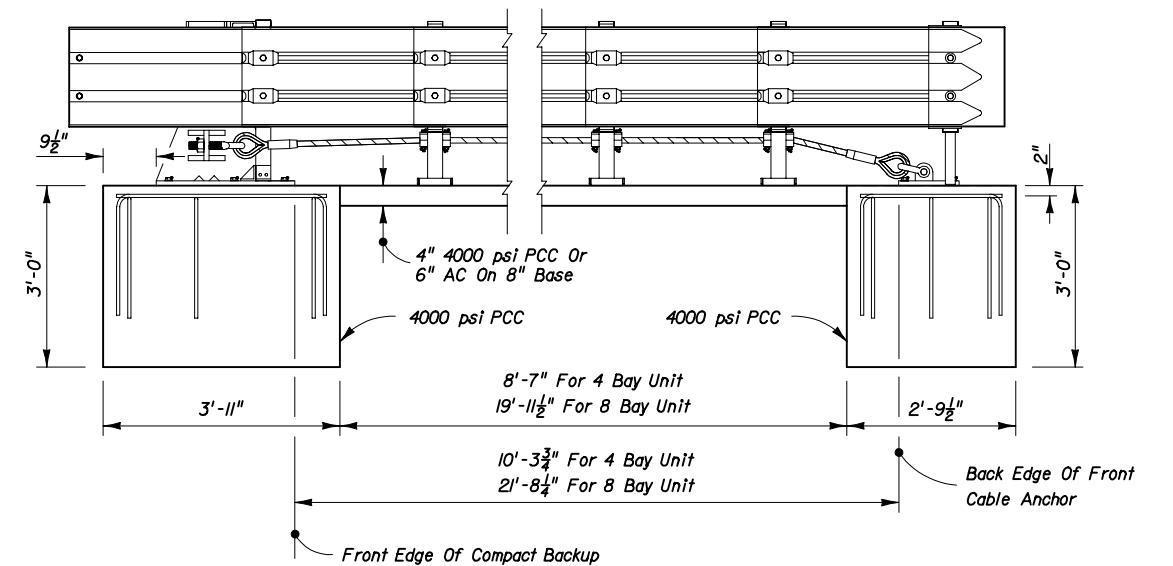
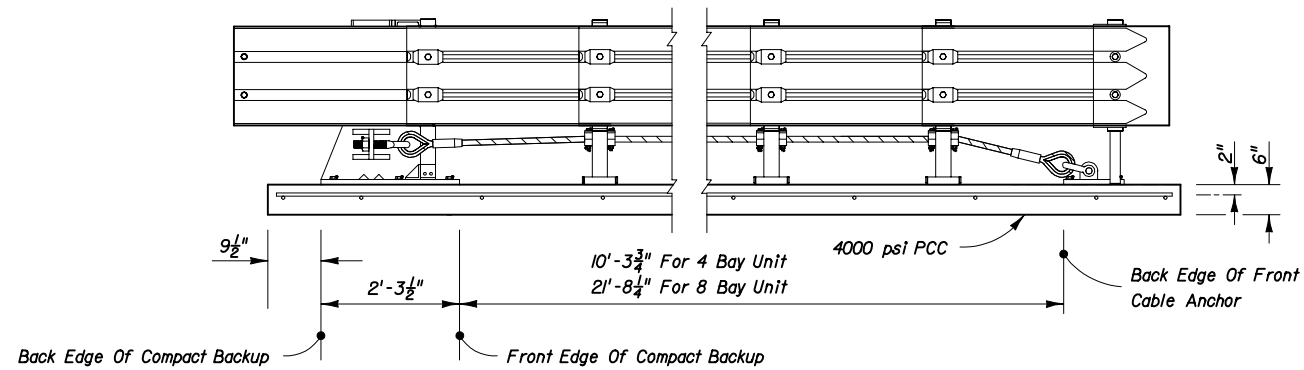
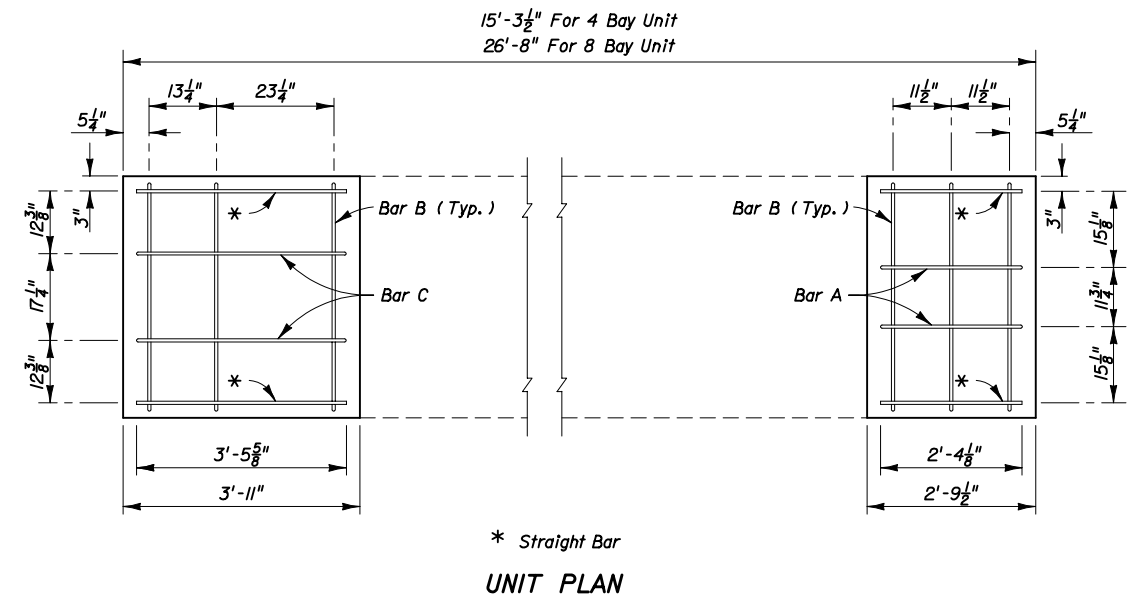
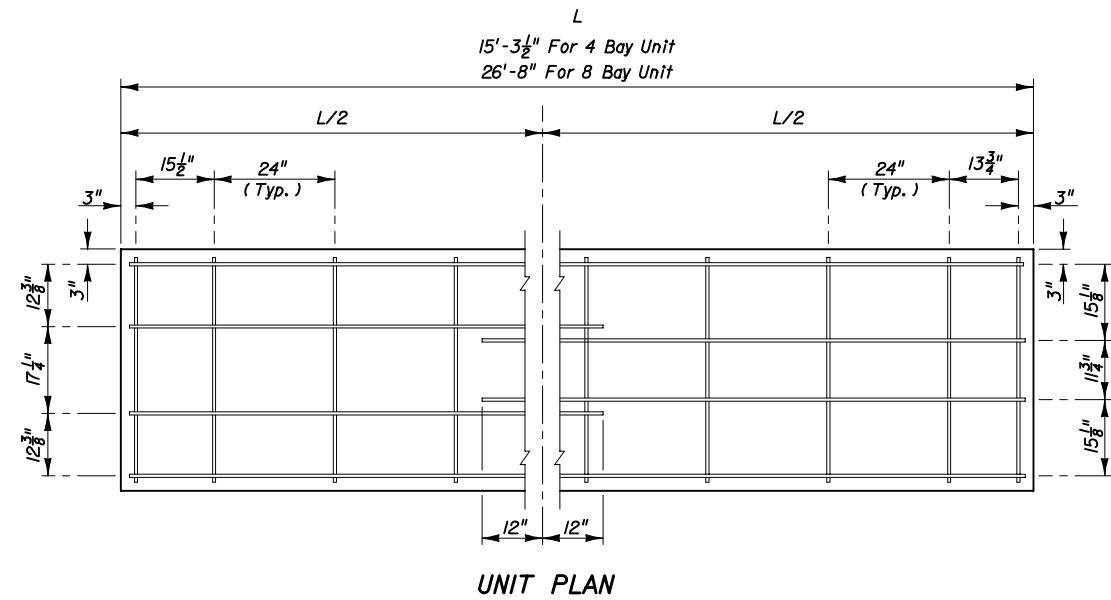
UNIT ELEVATION



- \boxed{A} = Type "A" EAC
- \boxed{B} = Type "B" EAC

TAU-II CONFIGURATIONS

GENERAL SYSTEM FEATURES



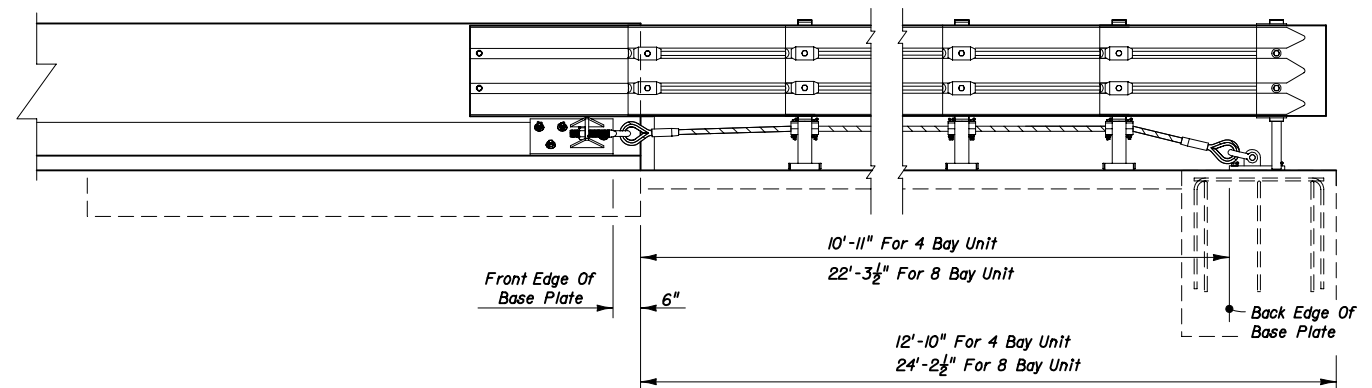
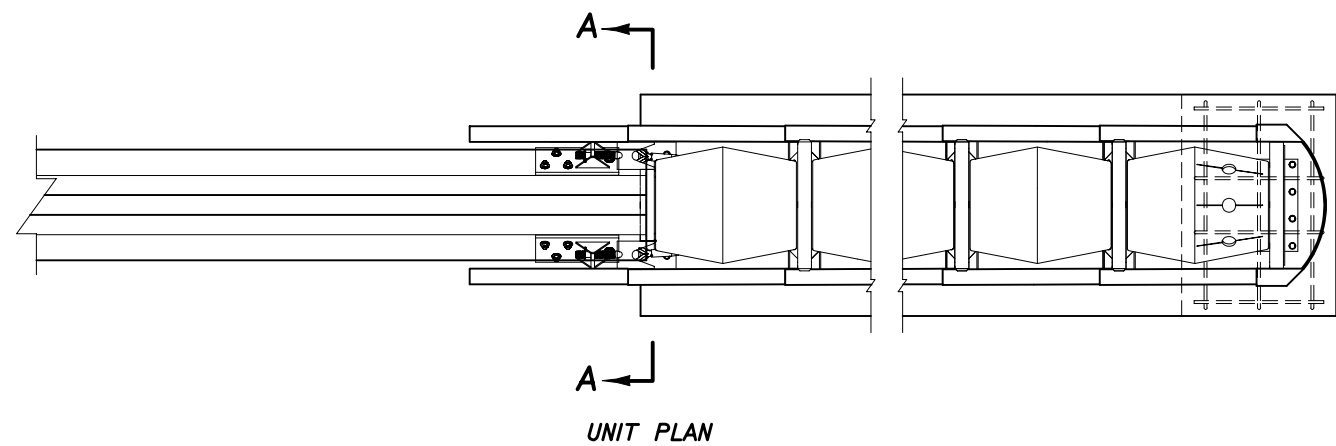
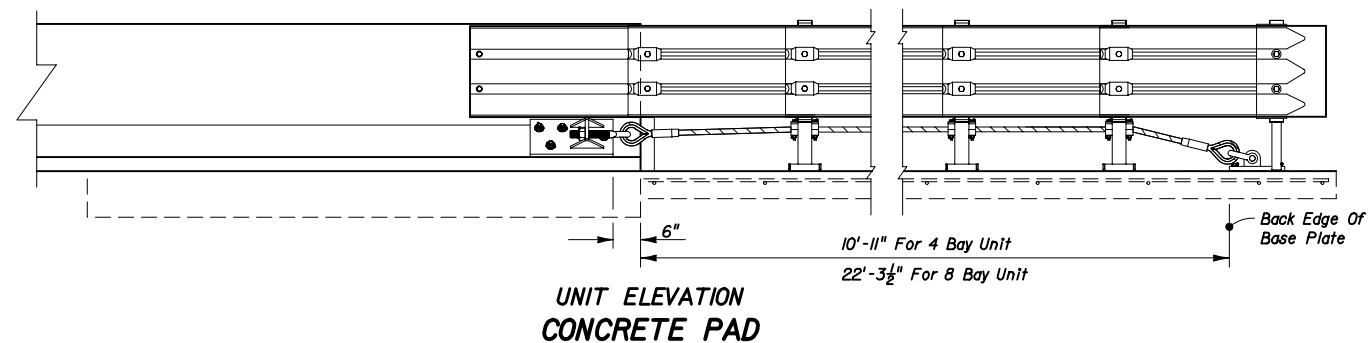
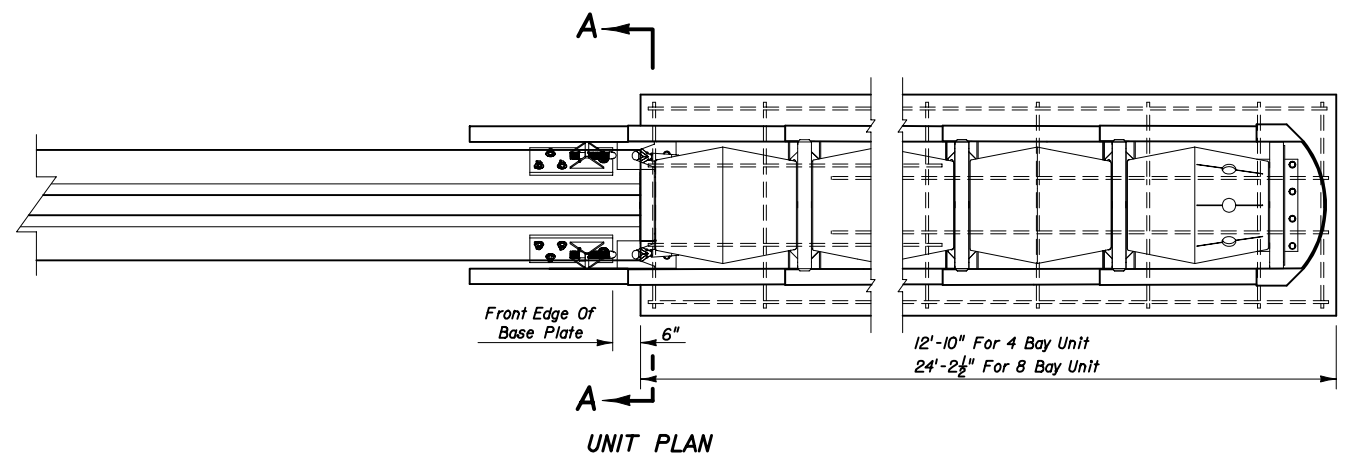
Note: All reinforcement #5 bars. All dimensions out to out.

BENDING DIAGRAM

**REINFORCED CONCRETE PAD OR ANCHOR BLOCKS OR
CONCRETE ROADWAY PAVEMENT OR BRIDGE DECK**

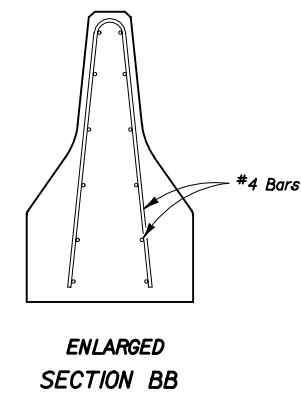
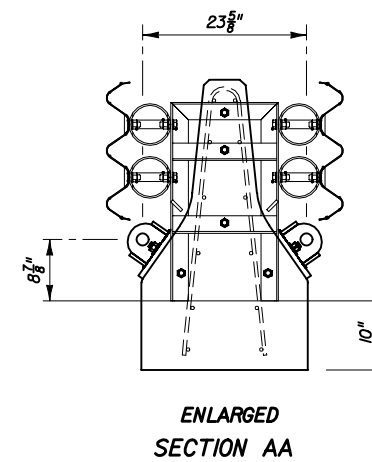
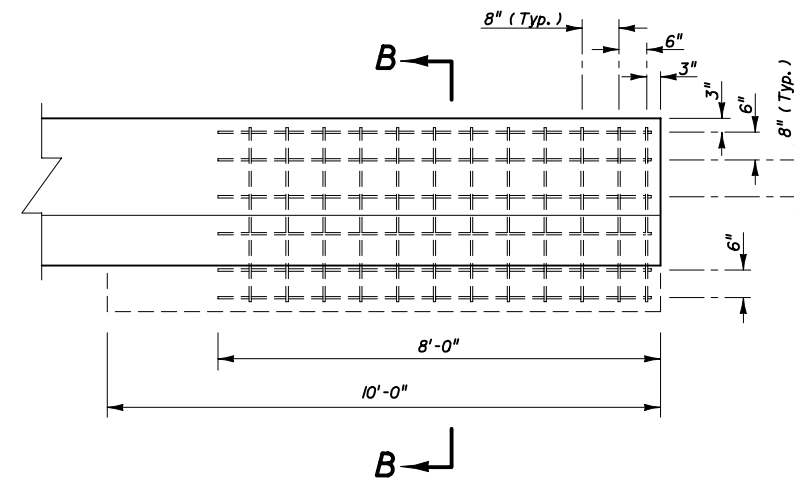
FOUNDATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TAU-II				
	Names	Dates	Approved By	
Designed By	MRG	12/02	Roadway Design Engineer	
Drawn By	SBC	12/02	Revision	Sheet No.
Checked By	JVG/TRB	12/02	04	2 of 8
				Index No. 441

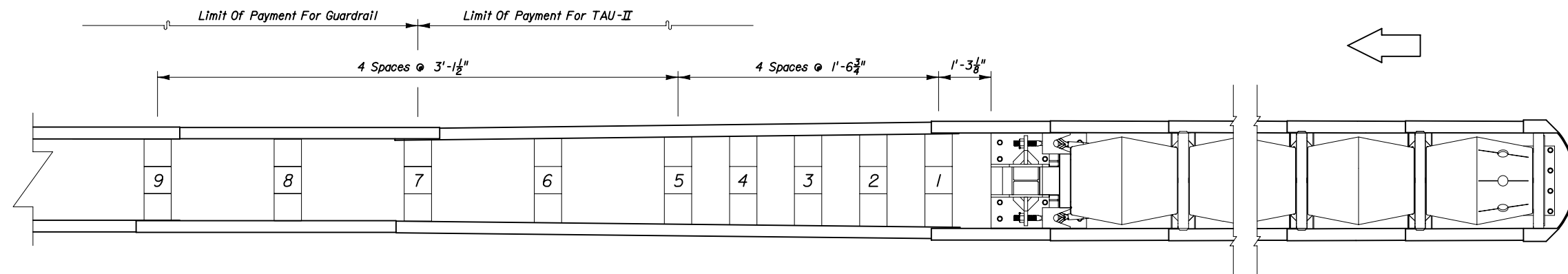


UNIT ELEVATION
CONCRETE ANCHOR BLOCK

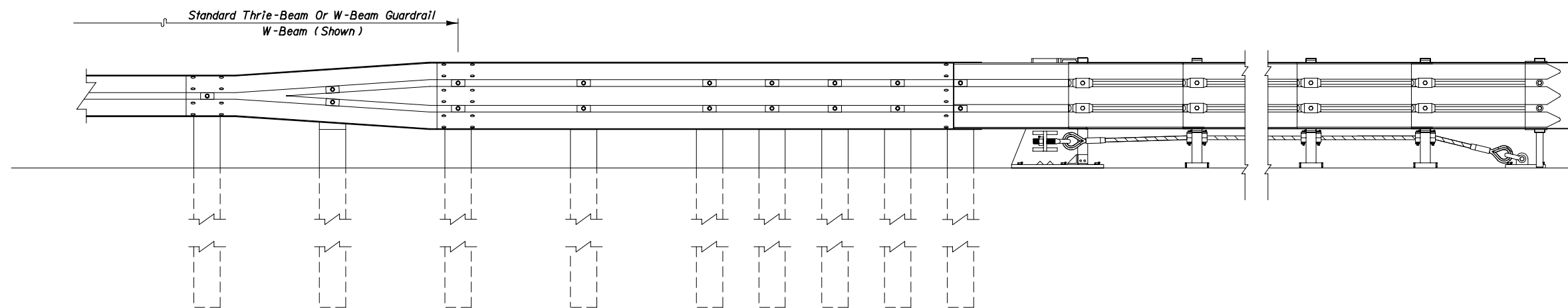
PERMANENT CONCRETE BARRIER WALL BACKUP



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TAU-II				
Designed By	Names	Dates	Approved By	
Drawn By	MFG	12/02	 Roadway Design Engineer	
Checked By	SBC	12/02		
	JVG/TRB	12/02	Revision	Sheet No.
			04	3 of 8
				Index No.
				441



UNIT PLAN




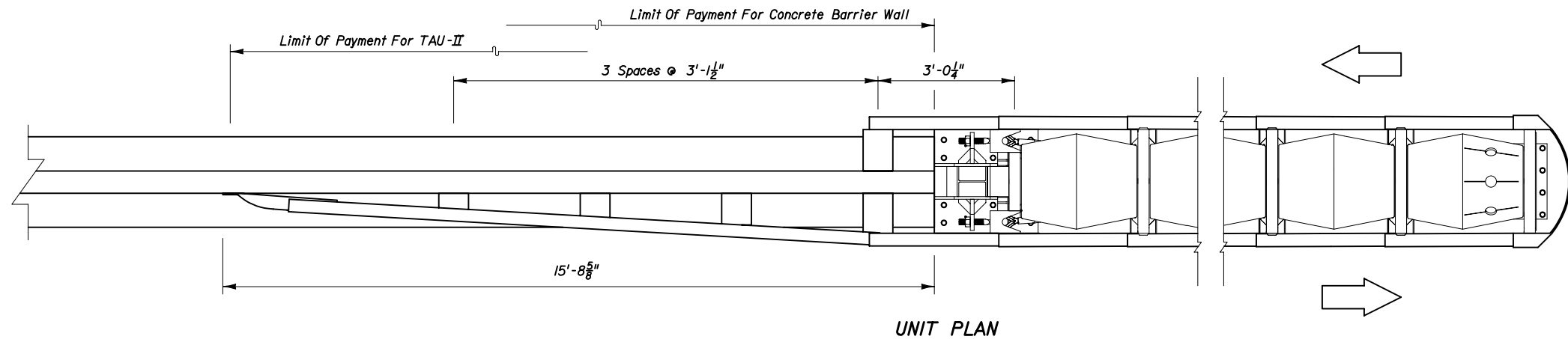
UNIT ELEVATION

TRANSITION TO DOUBLE FACE GUARDRAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

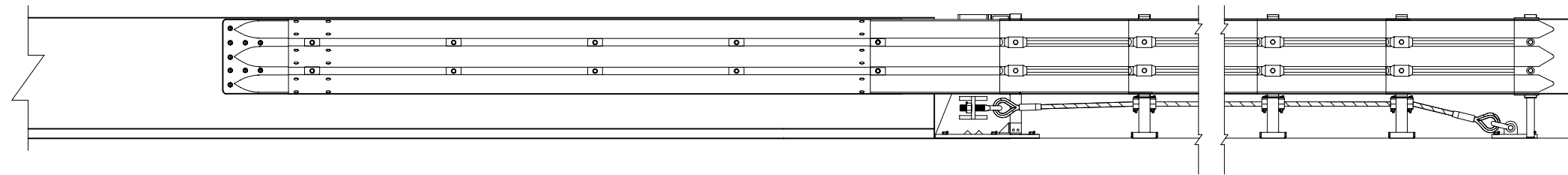
TAU-II

Names		Dates	Approved By		
Designed By	MPG	12/02	 Roadway Design Engineer		
Drawn By	SBC	12/02			
Checked By	JVG/TRB	12/02	Revision	Sheet No.	Index No.
			04	4 of 8	441

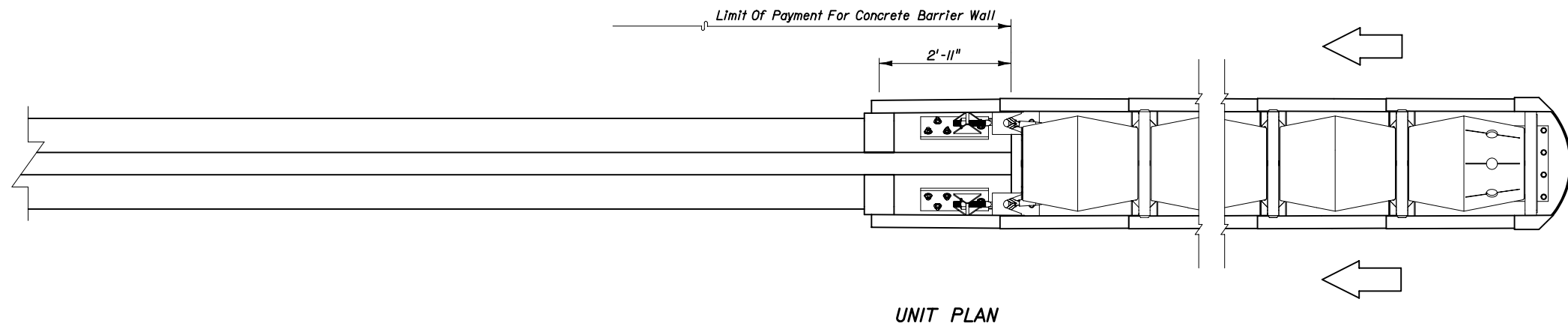


UNIT PLAN

Approach Two-Way Traffic

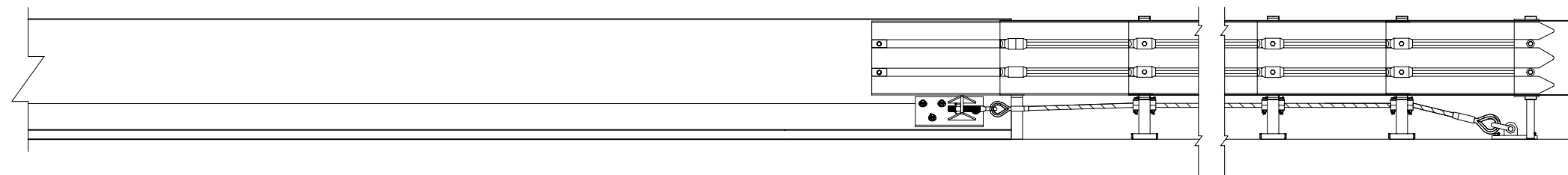


UNIT ELEVATION
COMPACT BACKUP



UNIT PLAN

Approach One-Way Traffic




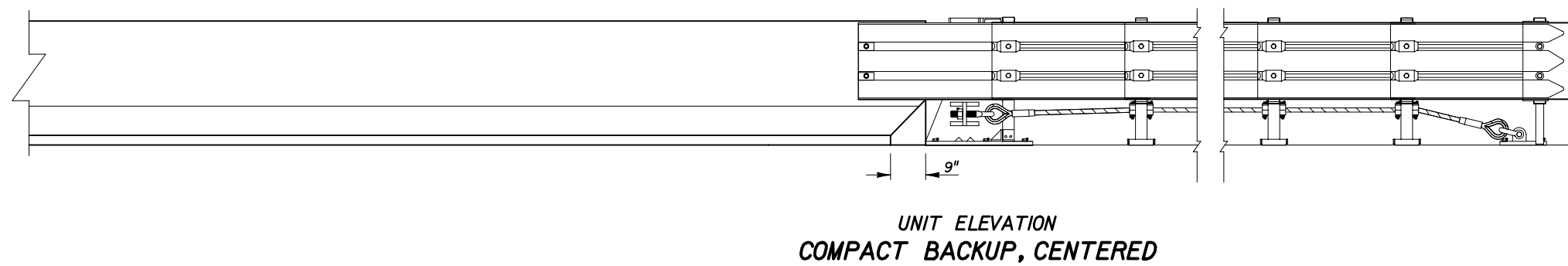
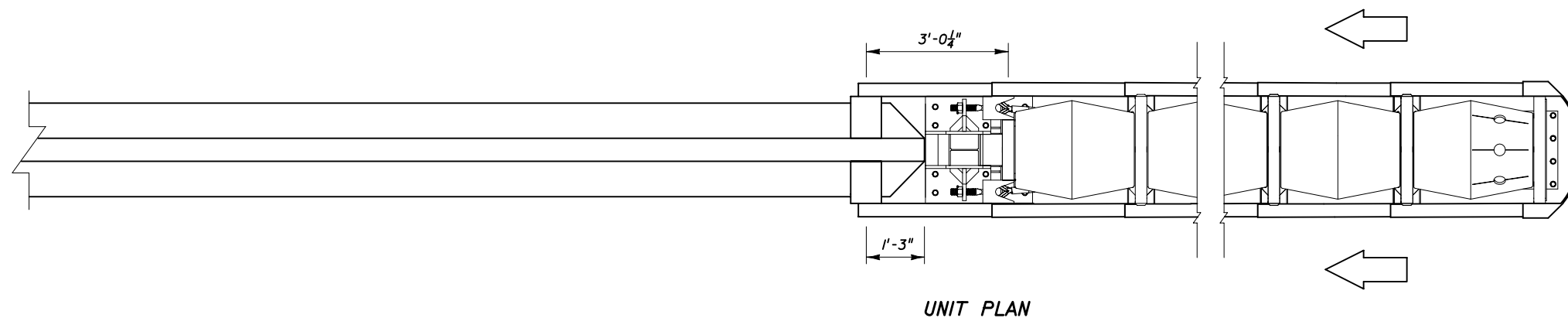
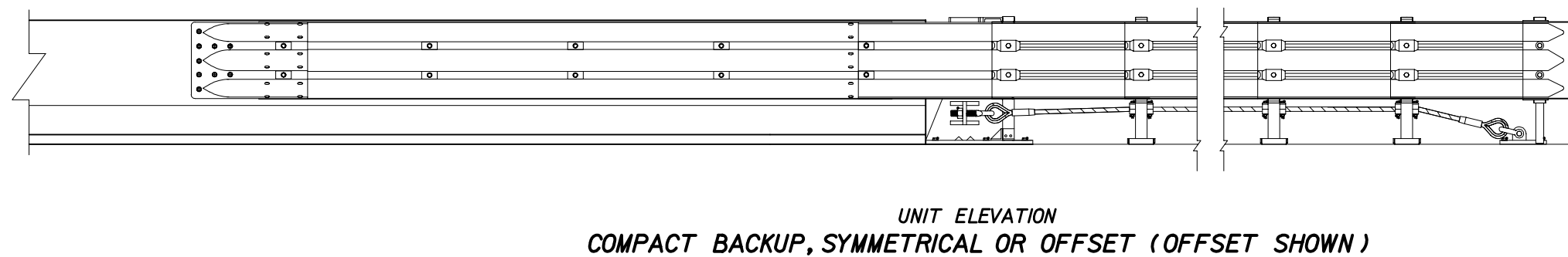
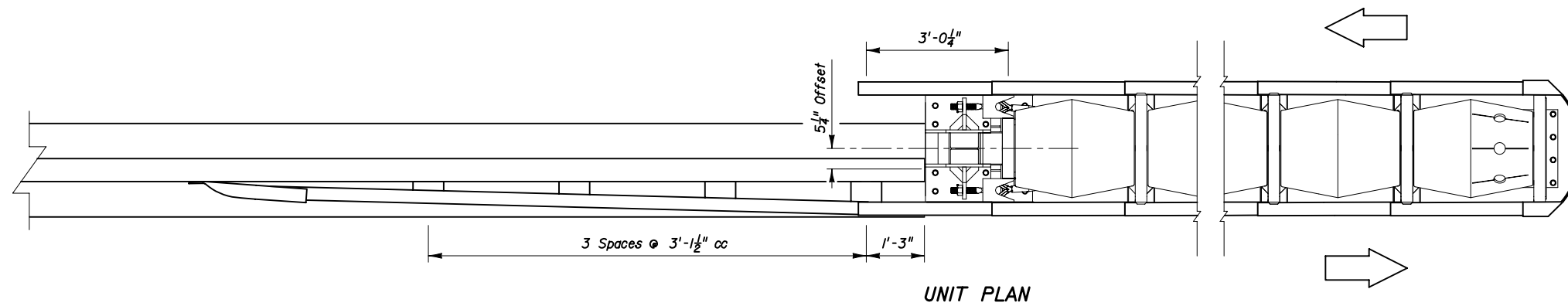
UNIT ELEVATION
WALL BACKUP

TRANSITION TO PERMANENT CONCRETE BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TAU-II


Names		Dates	Approved By		
Designed By	MRG	12/02	 Roadway Design Engineer		
Drawn By	SBC	12/02			
Checked By	JVG/TRB	12/02	Revision	Sheet No.	Index No.
			04	5 of 8	441

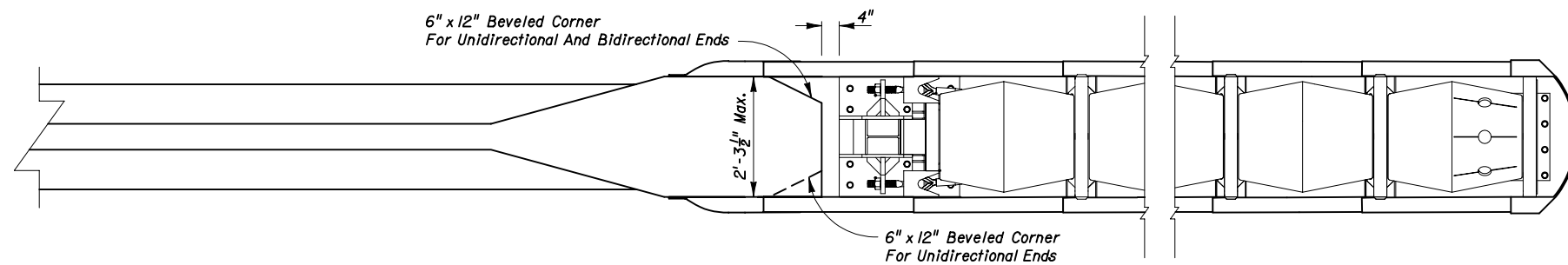


TRANSITION TO SAFETY SHAPE PERMANENT CONCRETE BARRIER WALL

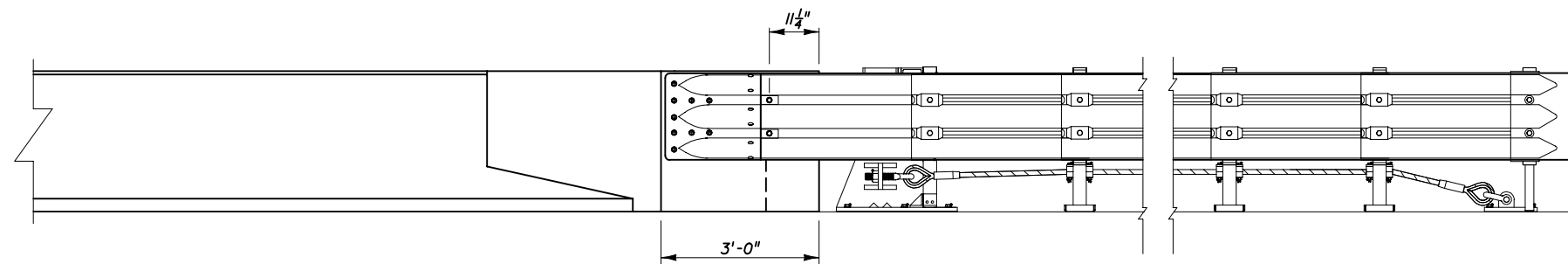
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TAU-II

Names		Dates	Approved By		
Designed By	MRG	12/02	 Roadway Design Engineer		
Drawn By	SBC	12/02			
Checked By	JVG/TRB	12/02	Revision	Sheet No.	Index No.
			04	6 of 8	441



UNIT PLAN




UNIT ELEVATION

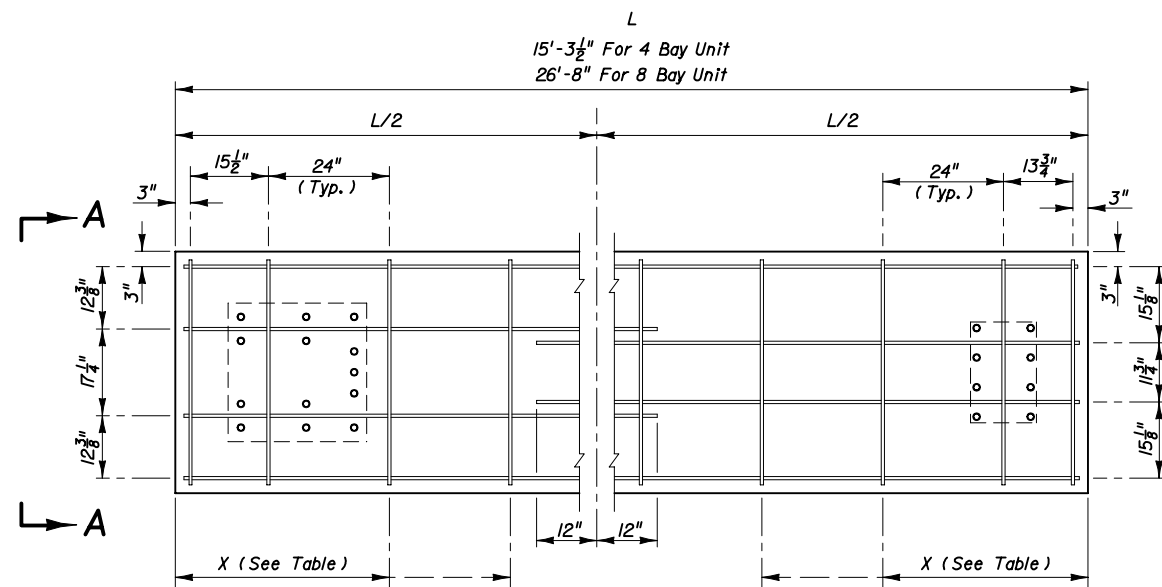
COMPACT BACKUP, CONCRETE END SHOE TO BULBED END BARRIER

TRANSITION TO PERMANENT CONCRETE BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

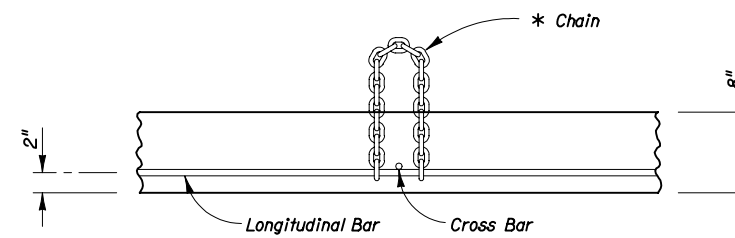
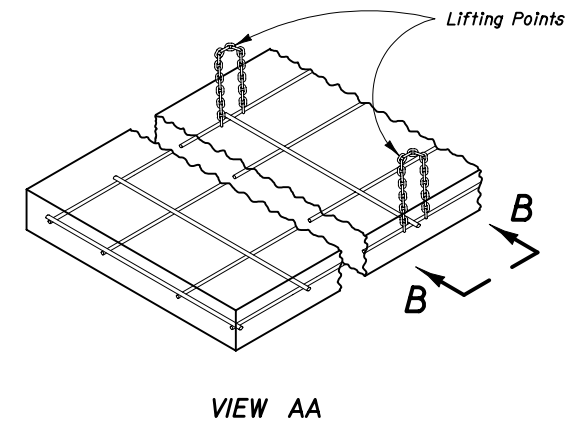
TAU-II

		Names	Dates	Approved By		
Designed By	MRG	12/02	 Roadway Design Engineer			
Drawn By	SBC	12/02				
Checked By	JVG/TRB	12/02	Revision	Sheet No.	Index No.	
			04	7 of 8	441	



Note: All reinforcement #5 bars.
UNIT PLAN

PICKUP POINT LOCATIONS		
No. Of Bays	Pad Length, L	Pickup Points, X
4	15'-3 1/2"	42" ± 2"
8	26'-8"	66" ± 2"

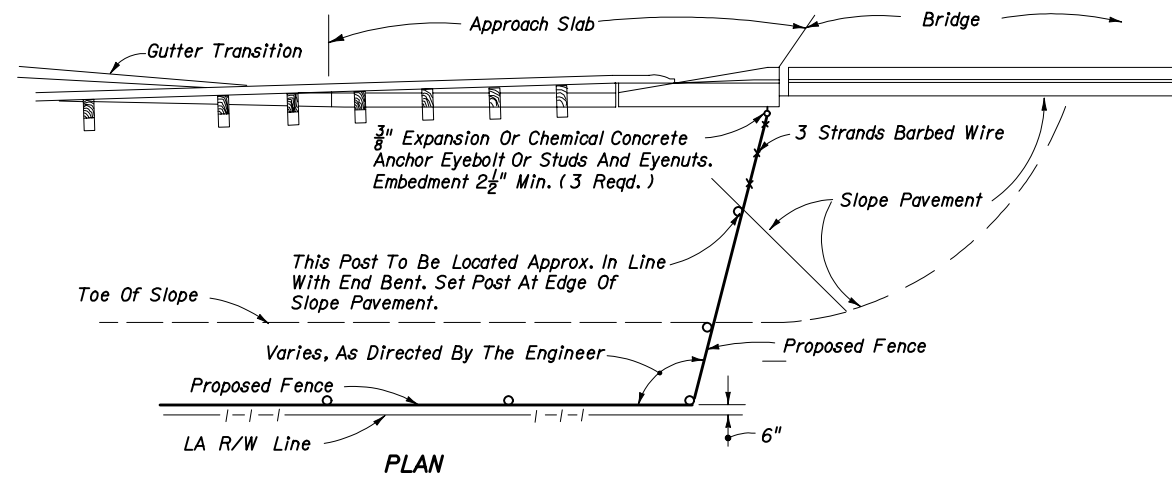


* 1/2" Proof Coil Chain Must Meet The Requirements Of ASTM A413 Grade 28.
 The Minimum Length Is 15 Links And The Rebar Will Be Inserted Through Both End Links As Shown.

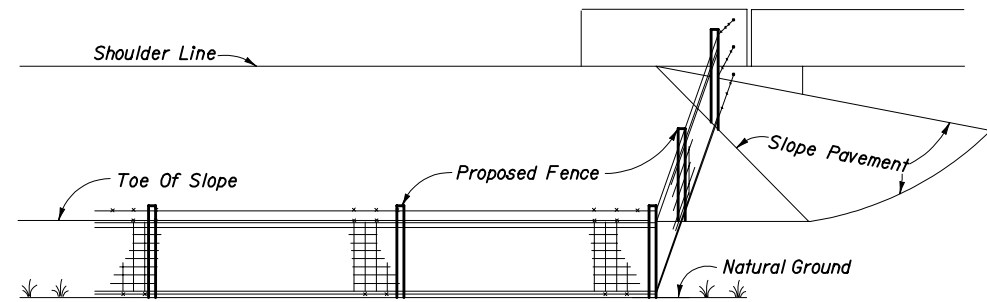
**ENLARGED
 VIEW BB**

PORTABLE REINFORCED CONCRETE PAD

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TAU-II				
Designed By	Names	Dates	Approved By	
Drawn By	SBC	12/02	 Roadway Design Engineer	
Checked By	JVG/TRB	12/02		
			Revision	Sheet No.
			04	8 of 8
				Index No.
				441

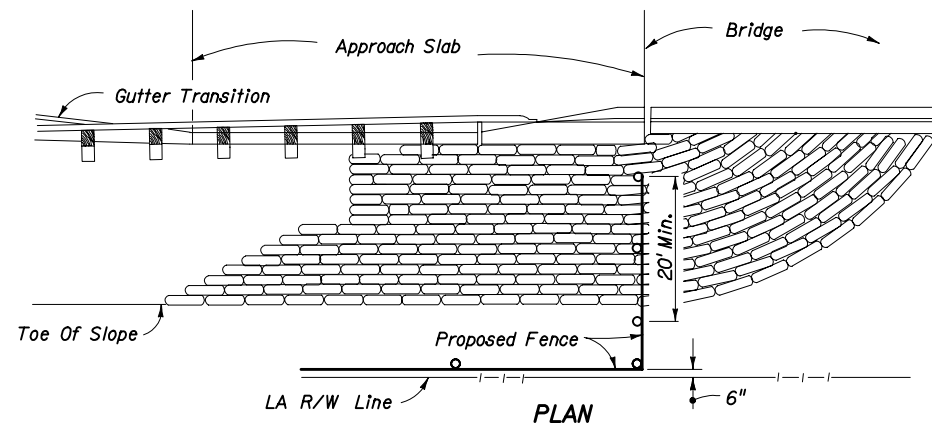


PLAN

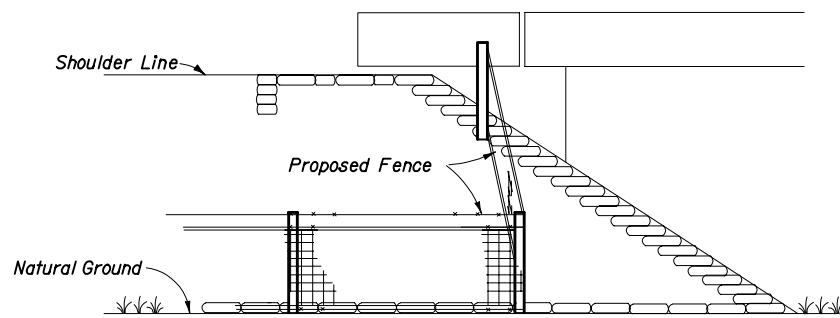


ELEVATION

FENCING TERMINALS AT BRIDGE ENDS (ROADWAY)

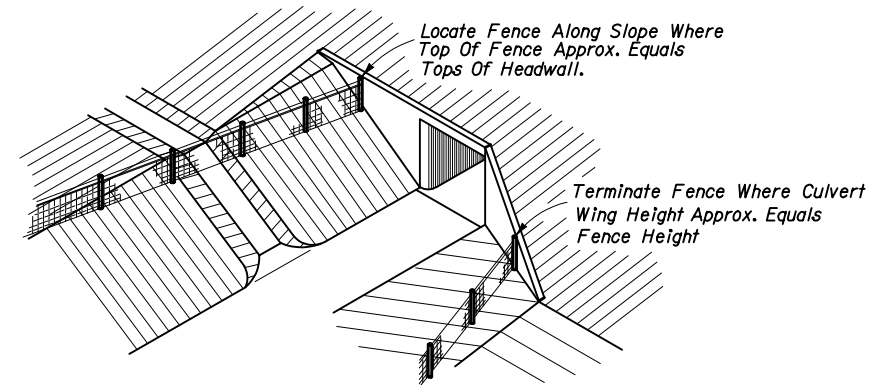


PLAN

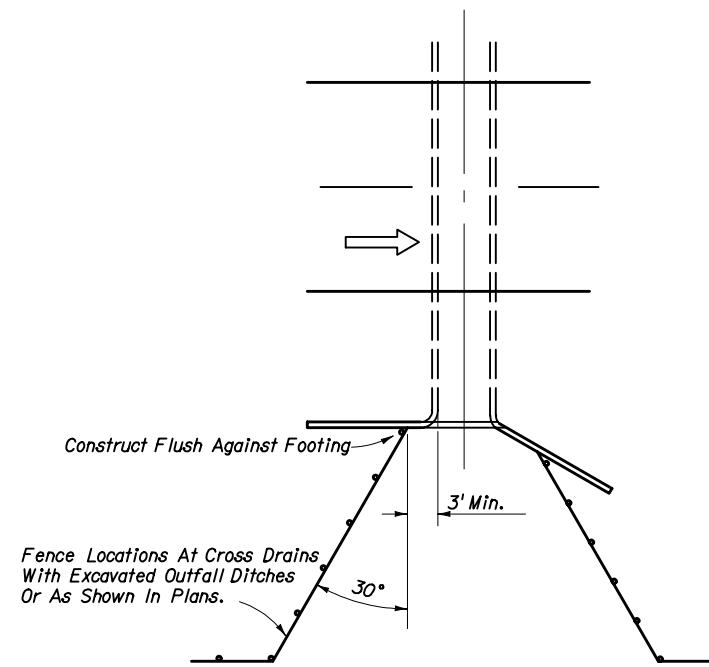


ELEVATION

FENCING TERMINALS AT BRIDGE ENDS (STREAM CROSSING)

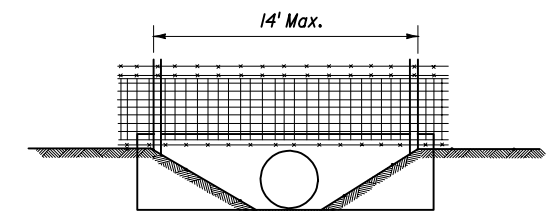


PICTORIAL VIEW



PLAN

(For Heights Of Headwall Greater Than 4') FENCING TERMINALS AT BOX CULVERTS



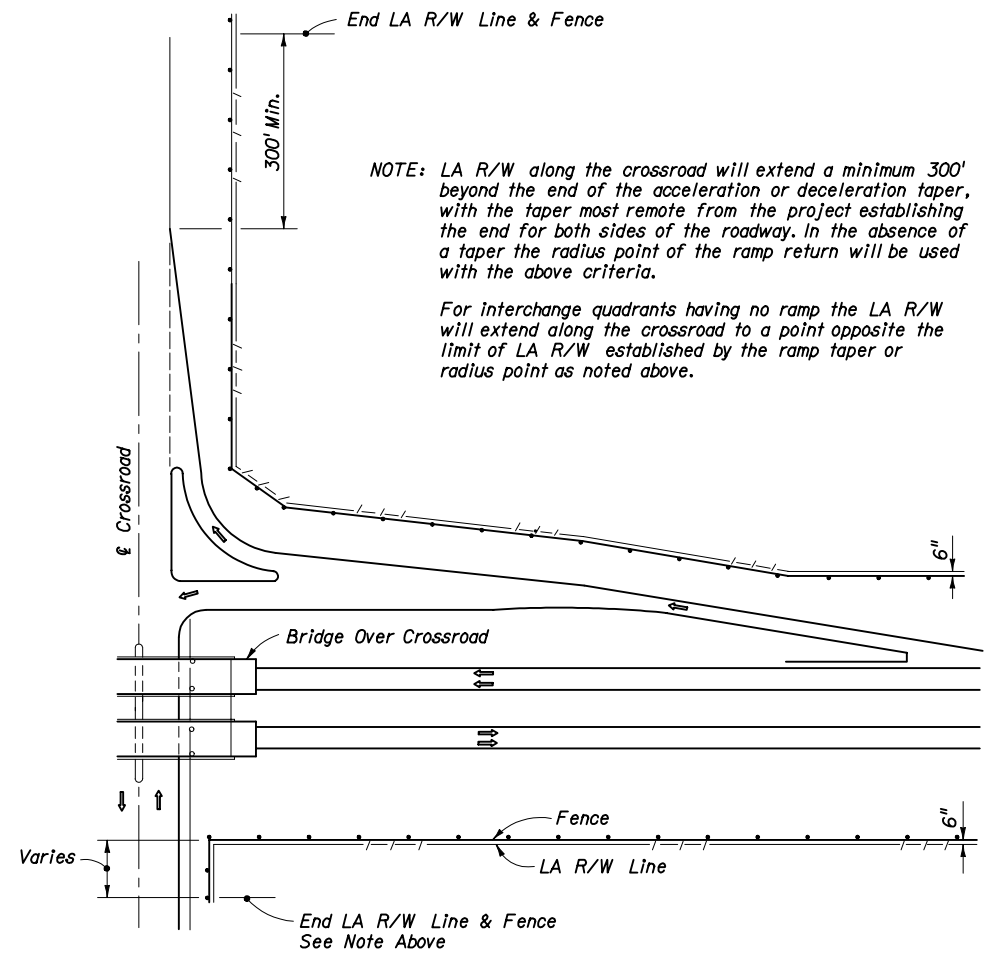
FENCING DETAIL AT CULVERT (For Heights Of Headwalls 4' Or Less.)

Note: When height of headwall is 4' or less (drainage pipe 36" or less) the fence shall not be tied to the headwall, but shall span the lateral ditch.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

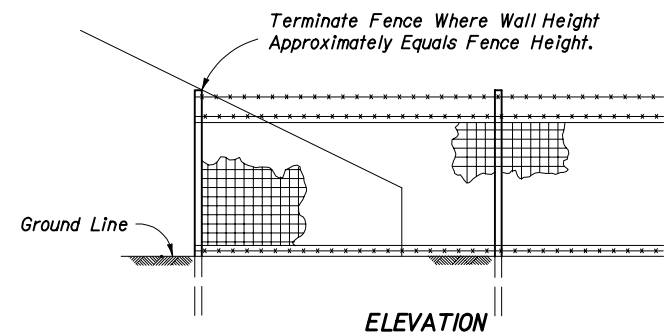
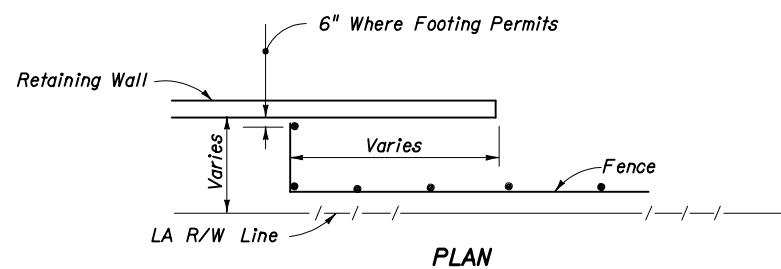
FENCE LOCATION

Designed By	HFW	02/65	Approved By <i>James D. Milk</i> Roadway Design Engineer		
Drawn By	HFW	02/65	Revision	Sheet No.	Index No.
Checked By	RLO	02/65	00	1 of 2	450

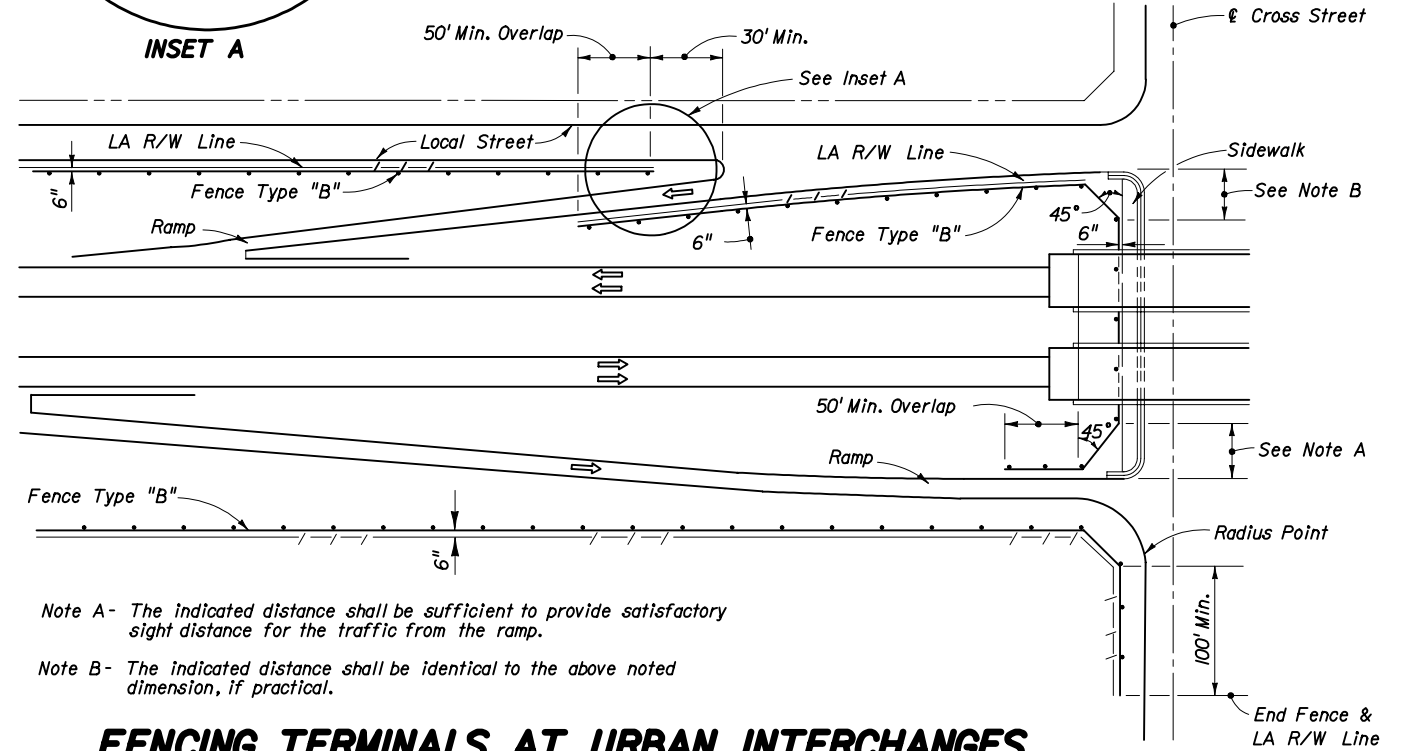
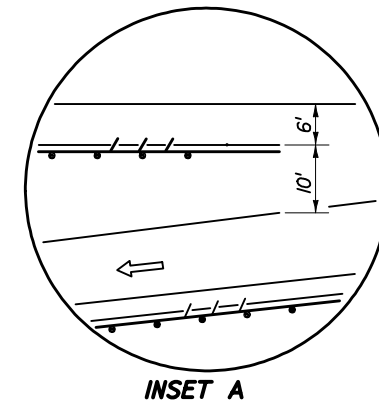


APPLIES TO BRIDGE OVER CROSSROAD AND CROSSROAD OVER FREEWAY (BRIDGE OVER CROSSROAD SHOWN)

FENCING TERMINALS AT RURAL INTERCHANGES



FENCING TERMINALS AT RETAINING WALLS




Note A - The indicated distance shall be sufficient to provide satisfactory sight distance for the traffic from the ramp.

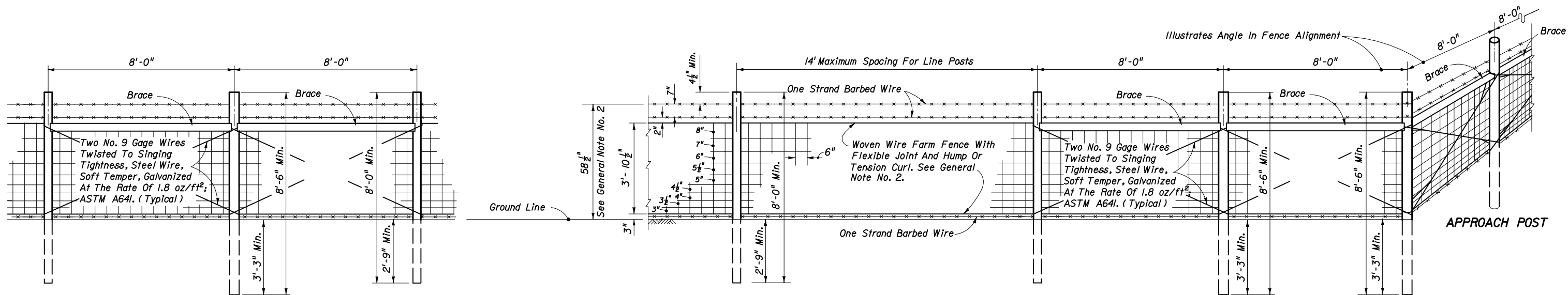
Note B - The indicated distance shall be identical to the above noted dimension, if practical.

FENCING TERMINALS AT URBAN INTERCHANGES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

FENCE LOCATION

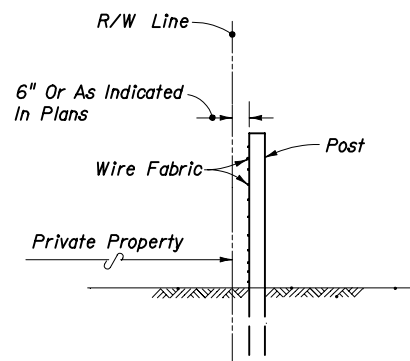
Names	Dates	Approved By		
Designed By	HFV 02/65	 Roadway Design Engineer		
Drawn By	HFV 02/65			
Checked By	RLO 02/65	Revision	Sheet No.	Index No.
		00	2 of 2	450



LINE POST PULL POST LINE POST **GENERAL NOTES** LINE POST LINE POST APPROACH POST CORNER OR END POST

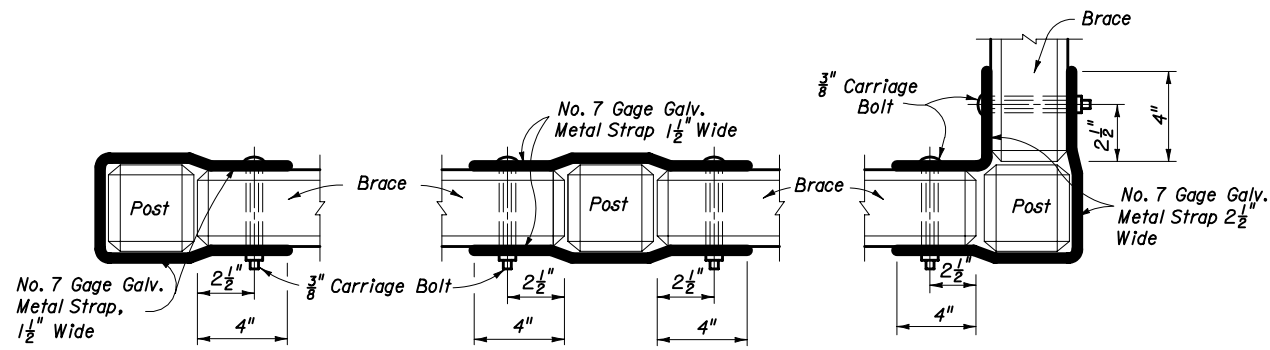
- This fence to be provided generally in rural areas. For supplemental information see Section 550 of the FDOT Specifications.
- Fabric shall be woven wire, either galvanized steel, meeting the requirements of ASTM A16, No. 9 Farm, Design Number 1047-6-9, with Class 3 zinc coating, or aluminum coated steel, meeting the requirements of ASTM A584, No. 9 Farm, Design Number 1047-6-9, with a minimum coating weight of 0.40 oz./ft². For additional information see payment note below.
- Fence shall be installed with wire side to private property except on horizontal curves greater than 3° the fence shall be installed so as to pull against all posts.
- Posts may be either timber, steel, recycled plastic or concrete. Unless a specific post material is called for in the plans, the Contractor may elect to use either a single material or a combination of timber, steel, recycled plastic or concrete materials. Line posts of one material may be used with corner, pull and end post assemblies of a different material. Line posts of only one optional material and pull post assemblies of only one optional material will be permitted between corner and end post assemblies. Within individual corner and end post assemblies only one optional material will be permitted.
- Timber posts shall meet the material requirements of Specification Section 954. Timber line posts are to be minimum 4" diameter. Timber corner, pull, approach and end posts are to be a minimum 5" diameter. Timber braces are to be minimum 4" diameter.
 - Staples for line posts to be 1 1/4" minimum length; for approach, corner and pull posts 1 1/2" minimum length. At approach, corner and pull posts, staple every line wire. At line posts, staple every line wire in top half and alternate line wires in bottom half. Staples shall be driven diagonally across the line wire with the points in separate grains.
 - Connections between timber posts and braces to be provided by dowels as shown in fastener details.
 - Wire to be wrapped and tied, as shown in the splice details, at the following locations:
 - All end posts,
 - Corner post, including the assemblies at vertical breaks of 15° or more and
 - Pull posts where the wire is not spliced and pulled through the assembly; see General Note 18.
- Steel posts and braces shall be standard steel posts, galvanized at the rate of 2 oz/ft², together with necessary hardware and wire clamps and meeting the following requirements:
 - Line posts: 8' long; 1.33 lbs./ft.; roll formed studding; anchor plate attached (23 in²).
 - Approach posts: 2 1/2" x 2 1/2" x 1/4" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - Pull, end and corner posts: 2 1/2" x 2 1/2" x 1/4" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - Braces: 2" x 2" x 1/4" angles with necessary hardware and fabricated for attaching to post.
 - The pull, corner, approach and end posts are to be set in concrete as per detail. (Also see Note No. 15)
- Recycled plastic posts shall meet the material requirements of specification Section 972 and be one of the products included on the Qualified Products List current at the time of installation. Line posts shall have a minimum section of 4" round or 4" square. Plastic posts shall not be used as corner, pull, end or approach posts unless such use specifically detailed in the plans. Plastic posts can be set by either digging and tamped backfill or by driving into full depth preformed holes 1/4" to 1/2" smaller than cross section of post. Staples for fabric and barbed wire connection to plastic line posts shall be the same size, count and location as that for timber posts.
- The Contractor, at his option, may use any suitable precast or prestressed concrete posts; however, approval by the Engineer, of posts not shown on this index, will be required prior to construction of the fence. Precast posts shall be Class I concrete. Prestressed posts shall be Class III concrete. Lengths of concrete post to be as indicated for timber posts.
- Aluminum post, braces and accessory framing hardware shall not be used unless the plans specifically detail their application or the Engineer specifically approves their incorporation in fence construction or repair. Aluminum framed gates are permitted as described in General Note 19.

- The woven wire shall be attached to steel and concrete posts by a minimum of five tie wires. The single wire ties shall be applied to the top, bottom and three intermittent line wires. The ends of each tie wire shall have a minimum of two tight turns around the line wire. Tie wires shall be steel wire not less than 0.120" diameter, zinc coating Class 3, soft temper, in accordance with ASTM A641.
- Steel Barbed Wire can be either of the following types:
 - Type I: This type shall conform to the requirements of ASTM A121, with two strands of 12 1/2 gage wire; four point barbs, wire size 14 gage, twisted around both line wires; and, Class 3 coating.
 - Type II: This type same as Type I except the two strand wires are twisted in alternating directions between consecutive barbs.
 Aluminum Barbed Wire shall be fabricated of two strands of 0.110-inch wire with 0.08-inch diameter four-point barbs spaced at approximately 5 1/2", and at a maximum spacing of 6". The wire for the strands and for the barbs shall be of ASTM B211M Alloy 5052-H38 or equal.
- The woven wire shall be stretched only until one-half the tension curl has been pulled out of the line wires.
- Posts to be set by driving or digging. If by digging, the posts shall be set at the center of the hole and the soil tamped securely on all sides.
- Longer posts than those indicated above may be required by the plans or for deeper installations.
- Concrete bases for angular steel posts (pull, corner, end and approach) shall be Class I as specified in Section 347. Materials for Class I concrete may be proportioned by volume and/or by weight.
- Pull post assemblies shall be installed at approximately 330' centers except that this maximum interval may be reduced by the Engineer on curves where the radius is less than 3°.
- Corner post assemblies are to be installed at all horizontal and vertical breaks in fence of 15° or more.
- A maximum length of 1320' of wire may be installed as a unit. For pulls through a pull post assembly the fabric shall be spliced by crimping sleeves only. Pulls through a corner post assembly will not be permitted.
- Unless otherwise called for in the plans gates shall be commercially available metal swing gates assembled and installed in accordance with the manufacturer's specifications as approved by the Engineer. Chain link swing gates in accordance with Index No. 452 may be substituted for metal swing gates as approved by the Engineer. Gate size is full opening width whether single leaf or double leaves. Payment for gates shall include the gate, single or double, all necessary hardware for installation and any additional length and/or size for posts at the opening. Gates shall be paid for under the contract unit price for Fence Gates, Type A, EA.
- For construction and pay purposes assemblies are defined as follows: End post assemblies shall consist of: one end post, one approach post, two braces, four diagonal tension wires and all necessary fittings and hardware. Pull post assemblies shall consist of: one pull post, two braces, four diagonal tension wires and necessary fittings and hardware. Corner post assemblies shall consist of: one corner post, two approach posts, four braces, eight diagonal tension wires and all necessary fittings and hardware.
- This index details fencing that is constructed with farm fabric 4 1/2" (47" nominal) in height and with specific ground clearance and specific barbed wire spacings, and, is to be paid for under the contract unit price for Fencing, Type A, LF. When the plans detail other combinations of materials or variation in dimensions, the fence shall be paid for under the contract unit price for Fencing, Type A, (_' Height), LF. Fencing Type A, LF, shall be inclusive of the lengths of pull, end and corner post assemblies but exclusive of gate widths. Assemblies shall be paid for as follows:
 - Corner Post Assemblies, EA.
 - Pull and End Post Assemblies, EA.

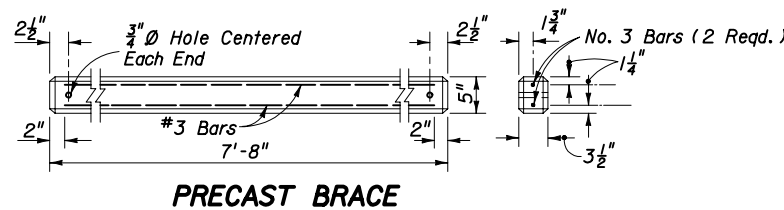
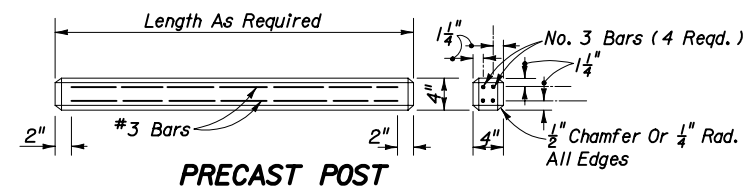
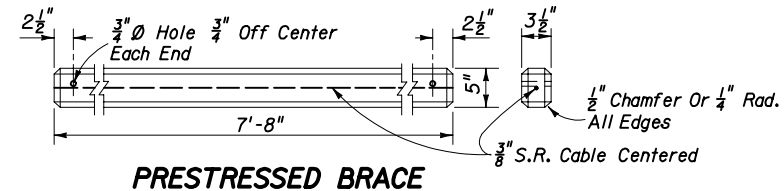
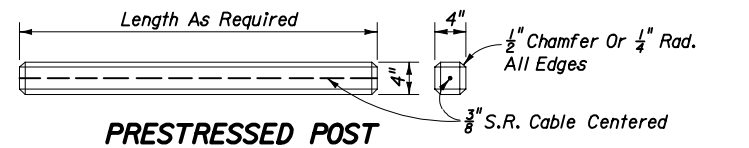


FENCE POSITION AT LOCATIONS WITHOUT FRONTAGE ROADS
(REFER TO DETAIL PLANS FOR FENCE POSITION AT LOCATIONS WITH FRONTAGE ROADS)

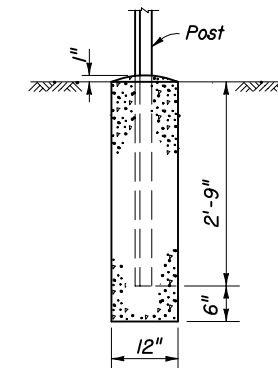
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
FENCE TYPE A				
Names	Dates	Approved By <i>Lamar D. Mill</i>		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	1 of 2	451



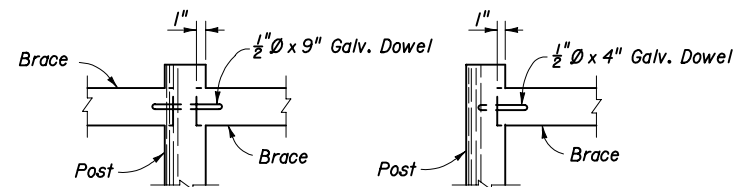
BRACE AND POST BRACE TO BRACE ON LINE BRACE TO BRACE AT CORNER
FASTENER FOR CONCRETE POST AND BRACES



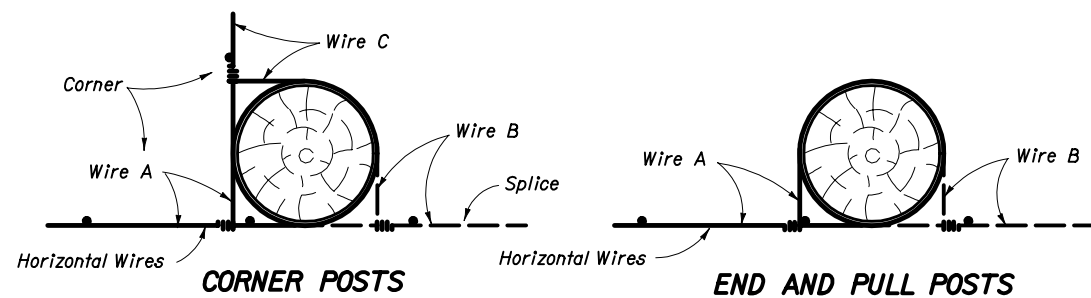
ALTERNATE CONCRETE POSTS AND BRACES



(Pull, Corner, End And Approach Posts)
CONCRETE BASE FOR ANGULAR STEEL POST



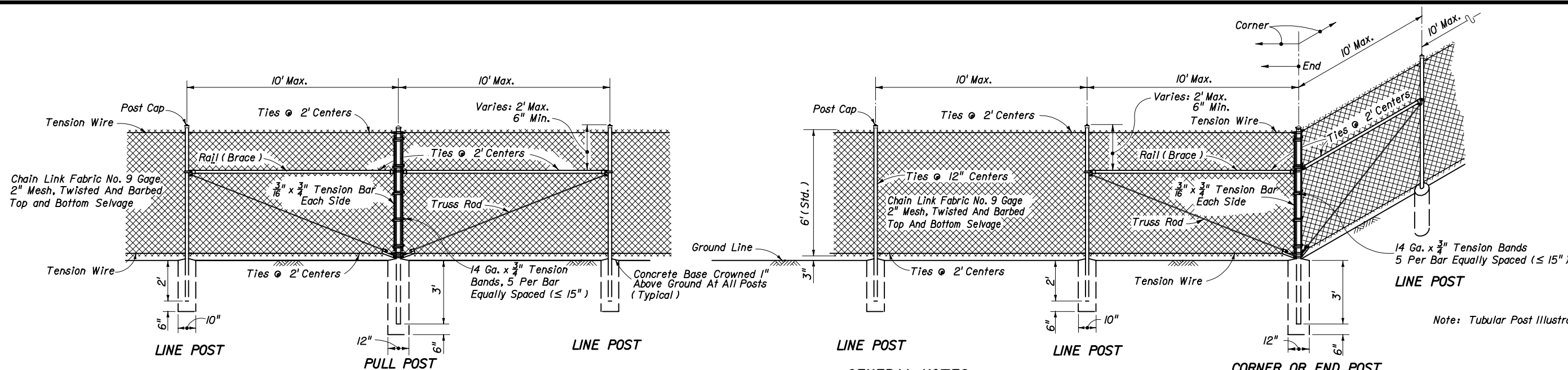
FASTENER FOR TIMBER POST AND BRACE



Each horizontal wire to be wrapped around corner, end and pull posts and tied to same wire. See General Notes 5 and 17. Timber post illustrated. These methods also apply to steel and concrete post illustrations.

SPLICES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
FENCE TYPE A				
Designed By	Names	Dates	Approved By <i>James D. Mill</i> Roadway Design Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			00	2 of 2 451



- This fence to be used generally in urban areas.
- For supplemental information refer to Section 550 of FDOT Standard Specifications.
- Chain link fabric, posts, rails, truss rods, tension wires, tie wires, stretcher bars, gates and all miscellaneous fittings and hardware shall meet the requirements of AASHTO M181 unless otherwise specified by this index. Stipulated AASHTO and ASTM signify current reference.
- Fence Component Options:
 - Line post options:
 - Galvanized steel pipe, Schedule 40- 1 1/2" nominal dia. zinc galvanized at the rate of 1.8 oz/sf: ASTM A53 Table X 2, ASTM F1083, and AASHTO M111.
 - Aluminum coated steel pipe; ASTM A53, X 2 Tables Schedule 40; 1 1/2" nominal dia., 1.90" OD; coated at the rate 0.40 oz/sf: AASHTO M111.
 - Aluminum alloy pipe- 2" nominal dia.: ASTM B241 or B221, Alloy 6063, T6.
 - Steel H-Beam- 1 1/8" x 1 5/8": Zinc Galv. 1.8 oz/sf: AASHTO M111 and Detail.
 - Aluminum alloy H-Beam- 1 1/8" x 1 5/8": Detail.
 - Steel C- 1 1/2" x 1 1/2": Galv.: 1.8 oz/sf zinc: AASHTO M111; or, 0.9 oz/sf zinc- 5% aluminum-mischmetal: ASTM F1043 and Detail.
 - Resistance welded steel pipe; 50,000 psi min. yield strength ASTM A569/A569M, A653/A653M or undepleted stock of discontinued A446/A446M base materials; ASTM F669 Group IV (Alternative Design); fence industry 2" OD, 1 1/2" NPS, 1.900" dec. equiv., 0.120" min. wall thick. and min. wt. 2.28 lb/ft; with ASTM F1043 metric equivalent internal coating Types A, B, C or D and external coating Types A, B, or C; the chromate conversion coating of external Type B shall have a thickness of 15 µg/in² min. and the polymer film topcoat shall have a thickness of 0.0003" min.; internal and external coatings are not restricted to the combinations of Table 2, ASTM F1043.
 - Corner, end, and pull post options:
 - Galvanized steel pipe, Schedule 40- 2" nominal dia. zinc galvanized at the rate of 1.8 oz/sf: ASTM A53 Table X 2, ASTM F1083, and AASHTO M111.
 - Aluminum coated steel pipe; ASTM A53 steel, X 2 Tables Schedule 40; 2" nominal dia., 2.375" OD; coated at the rate 0.40 oz/sf: AASHTO M111.
 - Aluminum alloy pipe- 2 1/2" nominal dia.: ASTM B241 or B221, Alloy 6063, T6.
 - Resistance welded steel pipe; 50,000 psi min. yield strength ASTM A569/A569M, A653/A653M or undepleted stock of discontinued A446/A446M base materials; ASTM F669 Group IV (Alternative Design); fence industry 2 1/2" OD, 2" NPS, 2.375" dec. equiv., 0.130" min. wall thick. and min. wt. 3.17 lb/ft; with ASTM F1043 metric equivalent internal coating Types A, B, C or D and external coating Types A, B, or C; the chromate conversion coating of external Type B shall have a thickness of 15 µg/in² min. and the polymer film topcoat shall have a thickness of 0.0003" min.; internal and external coatings are not restricted to the combinations of Table 2, ASTM F1043.
 - Rail options:
 - Galvanized steel pipe, Schedule 40- 1 1/4" nominal dia. zinc galvanized at the rate of 1.8 oz/sf: ASTM A53 Table X 2, ASTM F1083, and AASHTO M111.
 - Aluminum coated steel pipe; ASTM A53 steel, X 2 Tables Schedule 40; 1 1/4" nominal dia., 1.660" OD; coated at the rate 0.40 oz/sf: AASHTO M111.
 - Aluminum alloy pipe- 1 1/4" nominal dia.: ASTM B241 or B221, Alloy 6063, T6.
 - Resistance welded steel pipe; 50,000 psi min. yield strength ASTM A569/A569M, A653/A653M or undepleted stock of discontinued A446/A446M base materials; ASTM F669 Group IV (Alternative Design); fence industry 1 1/2" OD, 1 1/4" NPS, 1.660" dec. equiv., 0.111" min. wall thick. and min. wt. 1.836 lb/ft; with ASTM F1043 metric equivalent internal coating Types A, B, C or D and external coating Types A, B, or C; the chromate conversion coating of external Type B shall have a thickness of 15 µg/in² min. and the polymer film topcoat shall have a thickness of 0.0003" min.; internal and external coatings are not restricted to the combinations of Table 2, ASTM F1043.

- Chain link fabric options (2" mesh with twisted and barbed selvage top and bottom for all options except as described in Note No. 10):
 - AASHTO M181 Type I - Zinc Coated Steel, No. 9 gage (coated wire diameter), coated at the rate of 1.8 oz/sf (M181 Class D 2.0 oz/sf modified to 1.8 oz/sf).
 - AASHTO M181 Type II - Aluminum Coated Steel, No. 9 gage (coated wire diameter), coated at the rate of 0.40 oz/sf.
 - AASHTO M181 Type III - Polyvinyl Chloride (PVC) Coated Steel, No. 9 gage (coated core wire diameter), core wire-zinc coated steel. PVC coating: M181 Class A (either extruded or extruded and bonded) or Class B (bonded). See table right. Unless the plans call for M181 standard colors medium green, dark green or black the coating color shall be soft gray matching that of No. 36622 of Federal Standard 595a.
- Tension wire options:
 - Steel wire No. 7 gage zinc galvanized at the rate of 1.2 oz/sf: AASHTO M181.
 - Aluminum alloy wire with a diameter of 0.1875" or larger conforming to the requirements of ASTM B211, Alloy 5056 Temper H38, or, Alclad Alloy 5056 Temper H192.
 - Aluminum coated steel wire No. 7 gage coated at the rate of 0.40 oz/sf: AASHTO M181.
- Tie wire and hog ring options:
 - Steel wire No. 9 gage zinc galvanized at the rate of 1.2 oz/sf.
 - Aluminum alloy wire with a diameter of 0.1443" or larger conforming to the requirements of ASTM B211, Alloy 5056 Temper H38, or, Alclad Alloy 5056 Temper H192.
 - Aluminum coated steel wire No. 7 gage coated at the rate of 0.40 oz/sf.
- Unless a specific material is called for in the plans the Contractor may elect to use either a single type of material or a combination of material types from the component options listed above. Combinations of optional materials are restricted as follows: (a) Only one fabric optional material will be permitted between corner and/or end post assemblies. (b) Only one line post optional material will be permitted between corner and/or end post assemblies. (c) Pull post assemblies shall be optional materials identical to either the line post optional material or the corner and end post assembly optional material; but, pull post assemblies shall be the same optional material between any set of corner and/or end post assemblies.
- Concrete for bases shall be Class I concrete as specified in Section 347 of the Standard Specifications or a packaged, dry material meeting the requirements of a concrete under ASTM C-387. Materials for Class I concrete may be proportioned by volume and/or by weight.
- Line posts are to be set in concrete as detailed above or by the following methods:
 - In accordance with special details and/or as specifically described in the contract plans and specifications.
 - In accordance with ASTM F567 Subsections 4.4 through 4.7 and 4.9 and 4.10 as approved by the Engineer.
 - Posts mounted on concrete structure or solid rock shall be mounted in accordance with the base plate detail "Fence Mounting On Concrete Endwalls And Retaining Wall", Sheet 2; or, by embedment in accordance with ASTM F567 Subsection 4.5.

- Pull posts shall be used at breaks in vertical grades of 15° or more, or at approximately 350' centers except that this maximum interval may be reduced by the Engineer on curves where the curve is greater than 3°.
- Corner posts are to be installed at all horizontal breaks in fence at 15° or more and as required at vertical breaks over 15° as determined by the Engineer.
- When fence has an installed top of fabric height less than 6', knuckled top and bottom selvages shall be used unless the plans specifically identify locations for twisted selvage fabrics.
- Unless sliding gates or special gates are called for in the plans, all gates shall be chain link swing gates meeting the material requirements described above as approved by the Engineer. Payment shall include the gates, single or double, all necessary hardware for installation and any additional length and/or size for posts at the opening. Gates shall be paid for under the contract unit price for Fence Gates, Type B, EA.
- Line posts, tension wires, chain link fabric, tie wires, Class I concrete, and all miscellaneous fittings and hardware to be included in the cost for Fencing Type B, LF. The standard 6' high fence shall be paid for under the contract unit price for Fencing Type B, LF. Fence having other height, line components and/or barbed wire attachments shall be paid for under the contract unit price for Fencing Type B (), LF.

Corner post assemblies shall consist of one corner post, two braces, two truss rods, and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for Corner Post Assembly (Type B Fence), EA.

End post assemblies shall consist of one end post, one brace, one truss rod and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for End Post Assembly (Type B Fence), EA.

TYPE IV VINYL COATED FABRIC								
AASHTO M181 Table 4 Redefined As Follows								
Specified Diameter Of Metallic Coated Core Wire		Minimum Weight Of Zinc Coating		PVC Thickness Range				
				M181 Class A (Extruded Or Extruded And Bonded Coating)		M181 Class B (Bonded Coating)		
in.	mm	gage	oz/sf	g/m ²	in.	mm	in.	mm
0.148	3.77	9	0.30	92	0.015 to 0.025	0.38 to 0.64	0.006 to 0.010	0.15 to 0.25

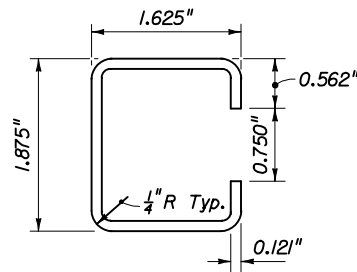
End, pull and corner post assemblies shall be set in concrete as detailed above for all soil conditions other than solid rock. Posts within assemblies that are located on concrete structures or solid rock shall be set by base plate or by embedment as prescribed under (b) above for line posts.

Line and assembly posts set in concrete bases shall be set an additional 3" in depth for each 1' of fence height greater than 6'.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

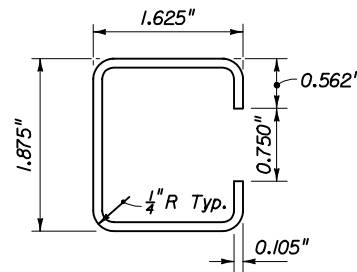
FENCE TYPE B

Names	Dates	Approved By
Designed By		<i>Samuel D. Miller</i> Roadway Design Engineer
Drawn By		Revision
Checked By		Sheet No.
		Index No.
	02	1 of 2
		452



Galv. Wt. Per. Ft. = 2.34# ±5%
Yield p.s.i. (Min.) 45,000

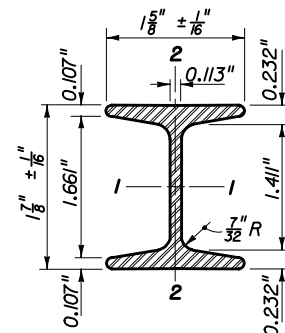
STANDARD WALL



Galv. Wt. Per. Ft. = 1.85# ±5%
Yield p.s.i. (Min.) 45,000

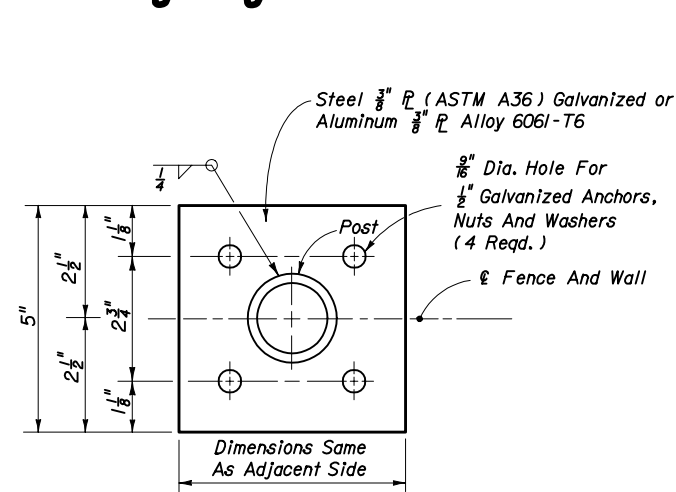
THINWALL

OPTIONAL "C" LINE POST

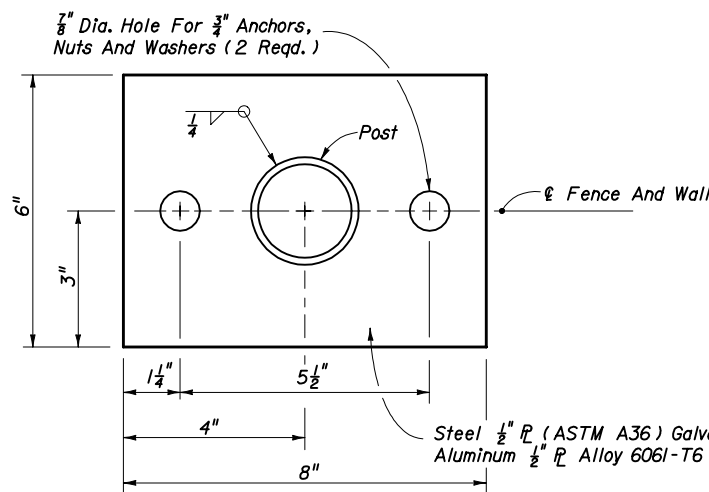


	STEEL		ALUMINUM	
	1-1	2-2	1-1	2-2
Area (Sq. In.)	724	724	724	724
Weight (Lb./Ft.)	2.72 ±5% (Galv.)	0.91 ±5%	0.91 ±5%	0.91 ±5%
Surface Area (SF/Ft.)	0.776	0.776	0.776	0.776
Tensile Strength (psi Min.)	80,000	30,000	30,000	30,000
Yielding Point (psi Min.)	48,000	25,000	25,000	25,000
	Axes		Axes	
Moment of Inertia	0.428	0.101	0.428	0.101
Section Modulus	0.456	0.124	0.456	0.124
Rad. Of Gyration	0.779	0.373	0.779	0.373

OPTIONAL 1 7/8" x 1 5/8" H-BEAM LINE POST

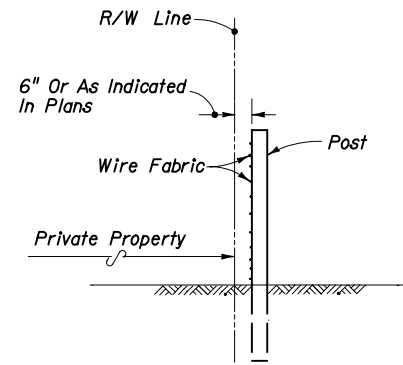


TOP VIEW
FOUR ANCHOR OPTION

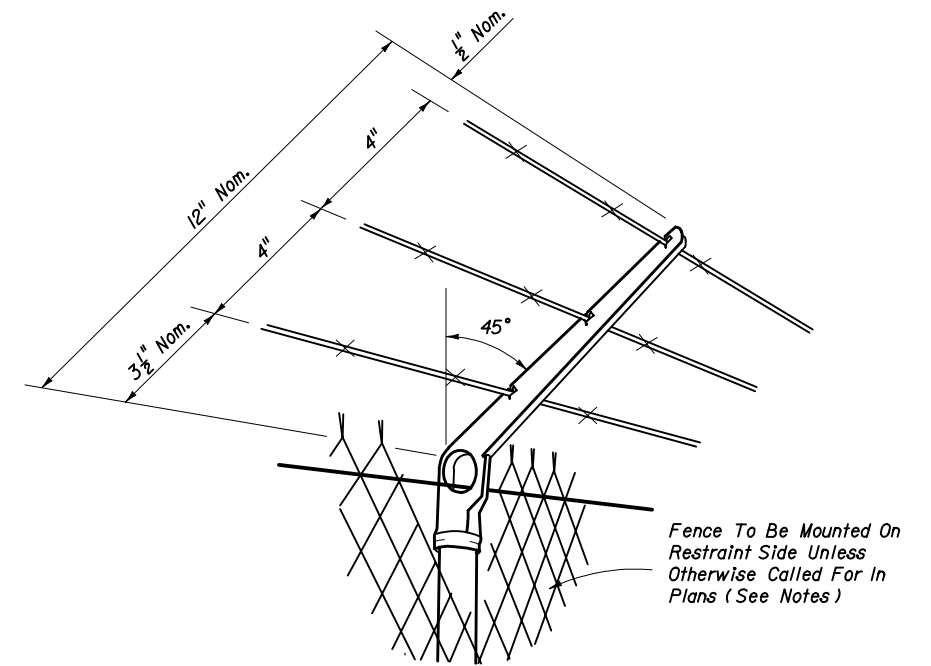


TOP VIEW
TWO ANCHOR OPTION

FENCE MOUNTING ON CONCRETE ENDWALL AND RETAINING WALLS



FENCE POSITION AT LOCATIONS WITHOUT FRONTAGE ROADS
(REFER TO DETAIL PLANS FOR FENCE POSITION AT LOCATIONS WITH FRONTAGE ROADS)



NOTES

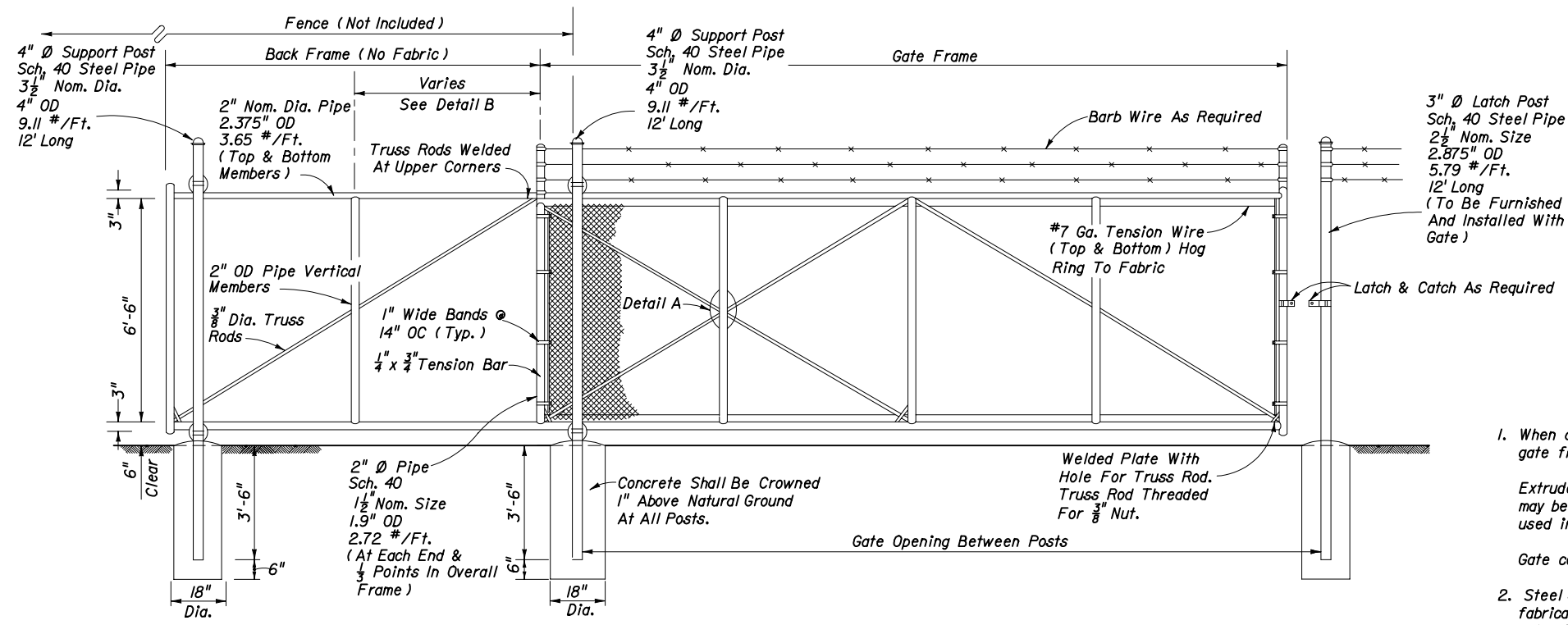
- Attachments to be used only when called for in the plans.
Attachments to extend in direction of restraint. Unless otherwise called for in plans, direction of restraint will be as follows:
- Outward on limited access right of way line.
 - Outward on controlled access right of way line.
 - Outward from utilities and hazardous facilities located within highway right of way.
 - Outward from lateral ditches, outfalls, retention basins, canals, borrow areas and similar support facilities.
 - Inward on pedestrian ways.

The cap-arm shall be designed to provide a drive fit over the top of posts and to exclude moisture in posts with tubular sections.
Attachments to be paid for under the contract unit price for Fencing, Type B (With Barb Wire Attachment) LF.

BARB WIRE ATTACHMENT

- BASE PLATE AND ANCHOR NOTES:**
- Base plate identical for line, pull, end and corner posts and shall be considered an integral part of the respective posts for basis of payment.
 - Post to be plumbed by grout shim under base plate.
 - Anchors (Galvanized Steel):
12" Cast In Place, 10 1/2" Embedment:
Headed Bolts, U-Bolts or Cluster Plates.
8" Adhesive Anchors, 6" Min. Embedment.*
*Adhesive anchors shall be headless anchor bolts set in drilled holes with an Adhesive Material System in accordance with Specification Sections 416 and 937; drilled holes shall be 1/8" larger in diameter than the anchor bolt.
Expansion Bolts Not Permitted.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
FENCE TYPE B				
Names	Dates	Approved By <i>Jamell D. Milk</i>		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 2	452

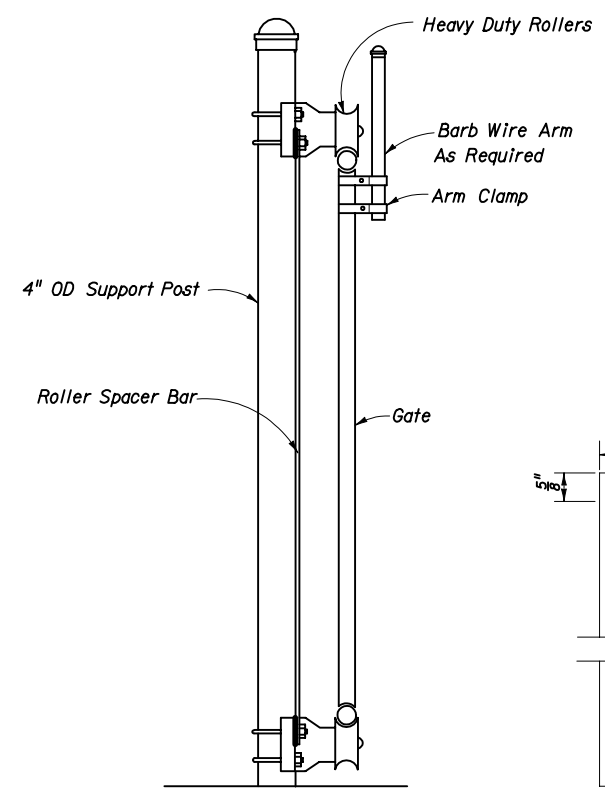


FRONT ELEVATION

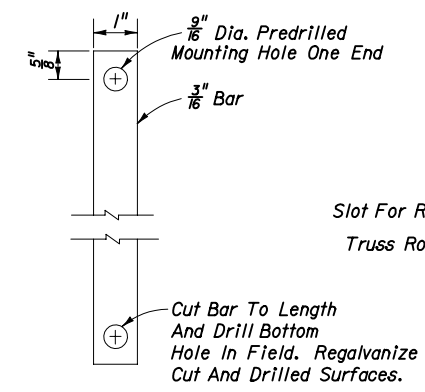
- GENERAL NOTES**
- When approved by the Engineer the Contractor may substitute any cantilever slide gate from the fencing systems on the Qualified Products List.

Extruded, rolled or formed components that provide equal strength and stability may be used in lieu of the pipe components shown; and, internal rollers may be used in lieu of the external roller units shown.

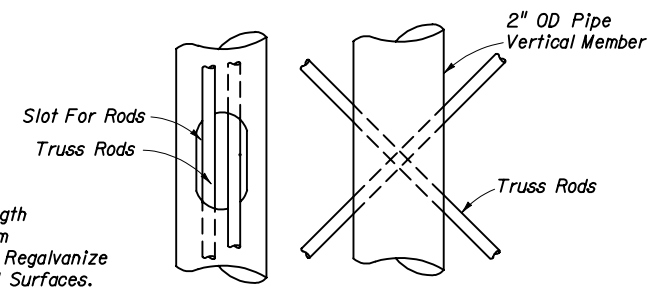
Gate components shall meet or exceed the protective coatings specified on Index No. 452.
 - Steel gate frame shall be fabricated prior to galvanizing, except that truss rods may be fabricated following frame galvanizing provided surfaces damaged during welding are galvanized in accordance with Section 24 of AASHTO M36; or, fabricated from pipe components with protective coating meeting the requirements of Index No. 452 that are tolerant of welding (low burn back), and a protective coating applied to the weld and damaged pipe surfaces that is equivalent to the protective coating of the fabricated pipe stock.
 - All fabric shall be knuckled top and bottom selvages.
 - Concrete for bases shall be either Class I concrete as specified in Section 347 of the Standard Specifications or a packaged, dry material meeting the requirements of a concrete under ASTM C-387. Materials for Class I concrete may be proportioned by volume and/or by weight.
 - Cost of all gate components shall be included in the contract unit price for Sliding Fence Gate (Cantilever), EA.



SUPPORT POST DETAIL

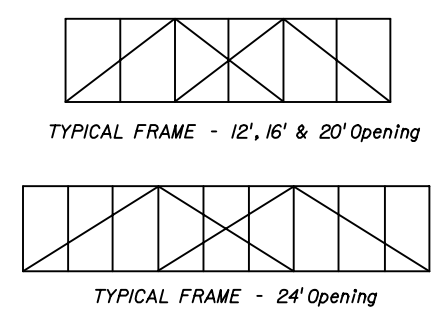


ROLLER SPACER BAR



DETAIL A

GATE OPENING	GATE FRAME	BACK FRAME
12'	12'-3"	6'
16'	16'-3"	8'
20'	20'-3"	10'
24'	24'-3"	12'

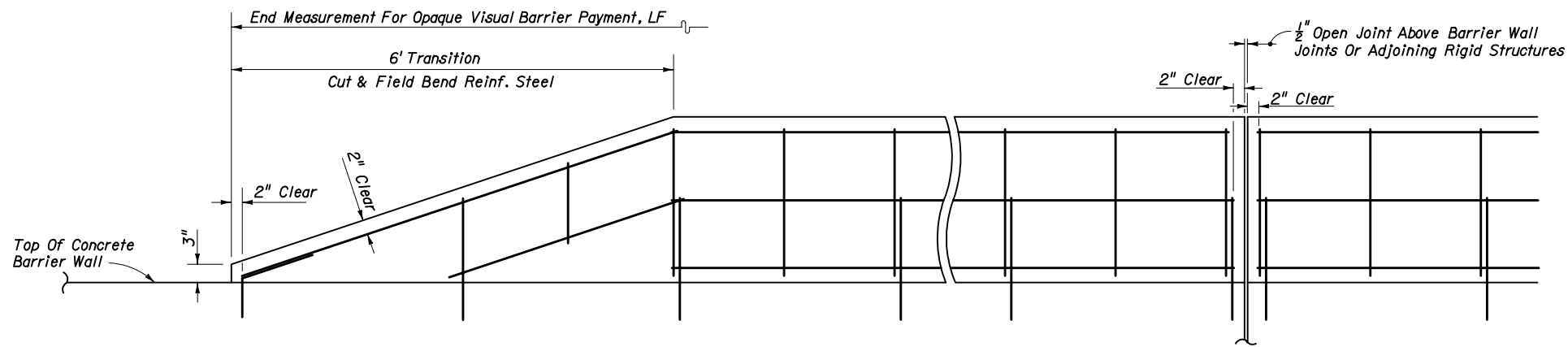


DETAIL B

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**CANTILEVER SLIDE GATE
TYPE B FENCE**

Designed By	HDD	9/78	Approved By	<i>James D. Mill</i> Roadway Design Engineer	
Drawn By	LMF	9/78	Revision	Sheet No.	Index No.
Checked By			04	1 of 1	453



ELEVATION OF REINFORCEMENT AND DOWELING

GENERAL NOTES

1. The opaque visual barrier is intended to function as a visual screen, and is not intended to resist vehicle impact loads nor to restrain, contain or restrict vehicles or cargo. The barrier is designed to withstand zone wind loading and strikes by light debris; and, designed to yield to exceptional strikes by vehicles or cargo, and to contain ruptured segments of the screen when yielding to such strikes.
2. When the opaque visual barrier is constructed on an existing barrier wall, dowels shall be 1'-8" in length, embedded 6" into the barrier wall and set with an approved chemical grout. Embedment holes shall be 3/8" diameter, drilled to a depth 1/4" below the tip of the dowel unless greater depth is required to accept manufactured grout capsules.

When the opaque visual barrier is constructed in conjunction with project concrete barrier walls, dowels may be set as described above, in either the drilled or preformed the drilled or preformed holes; or, placed when the barrier wall is cast. For dowels that are placed when the wall is cast, the dowel shall be 2'-2" in length and embedded to a depth of 12".

3. For both double and single faced concrete barrier walls the opaque visual barrier is to be located in the center of the top of the wall.

For single faced barrier walls that are constructed around other vertical structure, the opaque visual barrier shall follow the alignments of only one of the walls and be centered atop that wall.

For dual median barrier walls that follow differential profiles, the opaque visual barrier shall be constructed atop the wall with the higher elevation, unless conditions dictate otherwise. Lateral transitions or end overlaps for opaque visual barriers that alternate between dual walls shall be detailed in the plans.

For median barrier walls that are divided when connecting to separated bridges, the opaque visual barrier shall be constructed atop the approach side barrier wall, unless differential profiles dictate locating the opaque visual barrier on the departure side barrier wall.

Opaque visual barriers to be located on capped fills between dual barrier walls shall be detailed in the plans.

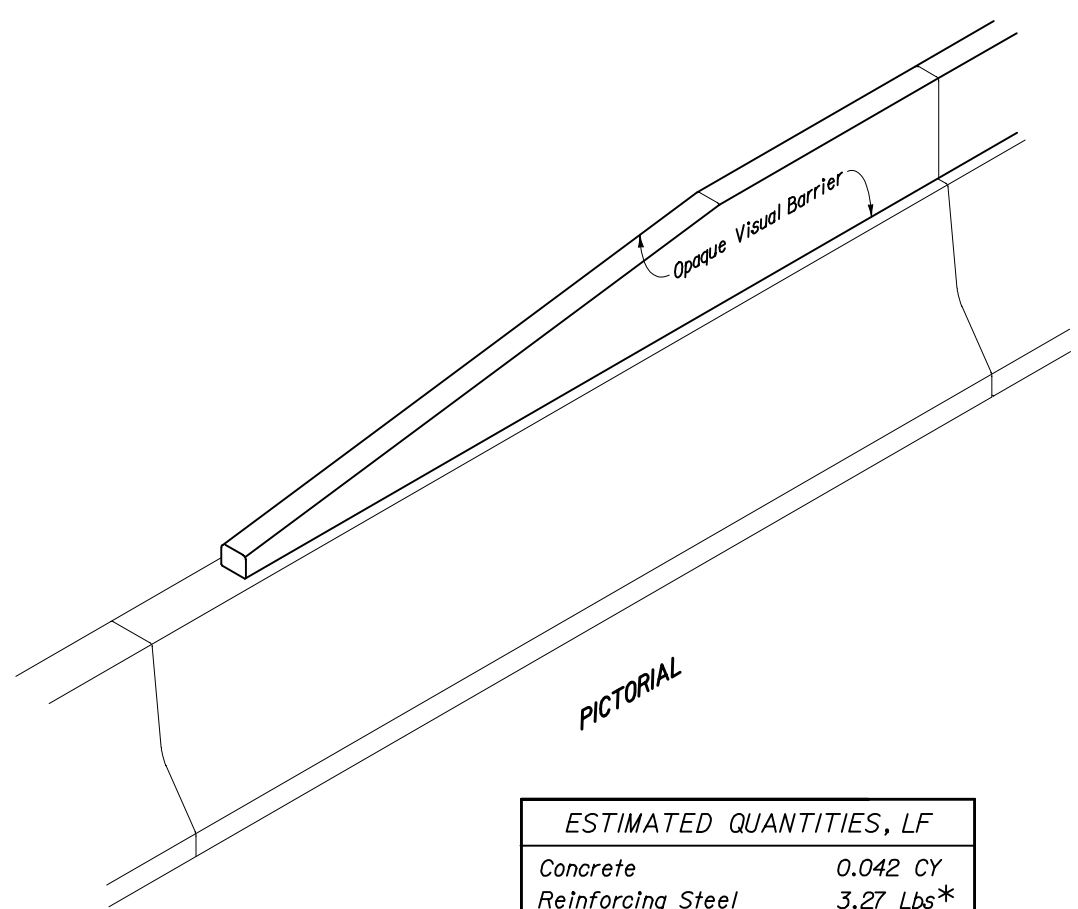
4. In lieu of the reinforcement shown the Contractor may substitute welded wire fabric equal to or better than that shown, when approved by the Engineer. Details shall be submitted with requests for substitution.

5. The Contractor may construct contiguous precast concrete panels in lieu of the cast-in-place opaque screen when approved by the Engineer. Panel design and method for anchorage to the barrier wall shall be detailed by shop drawings when requesting the Engineers approval.

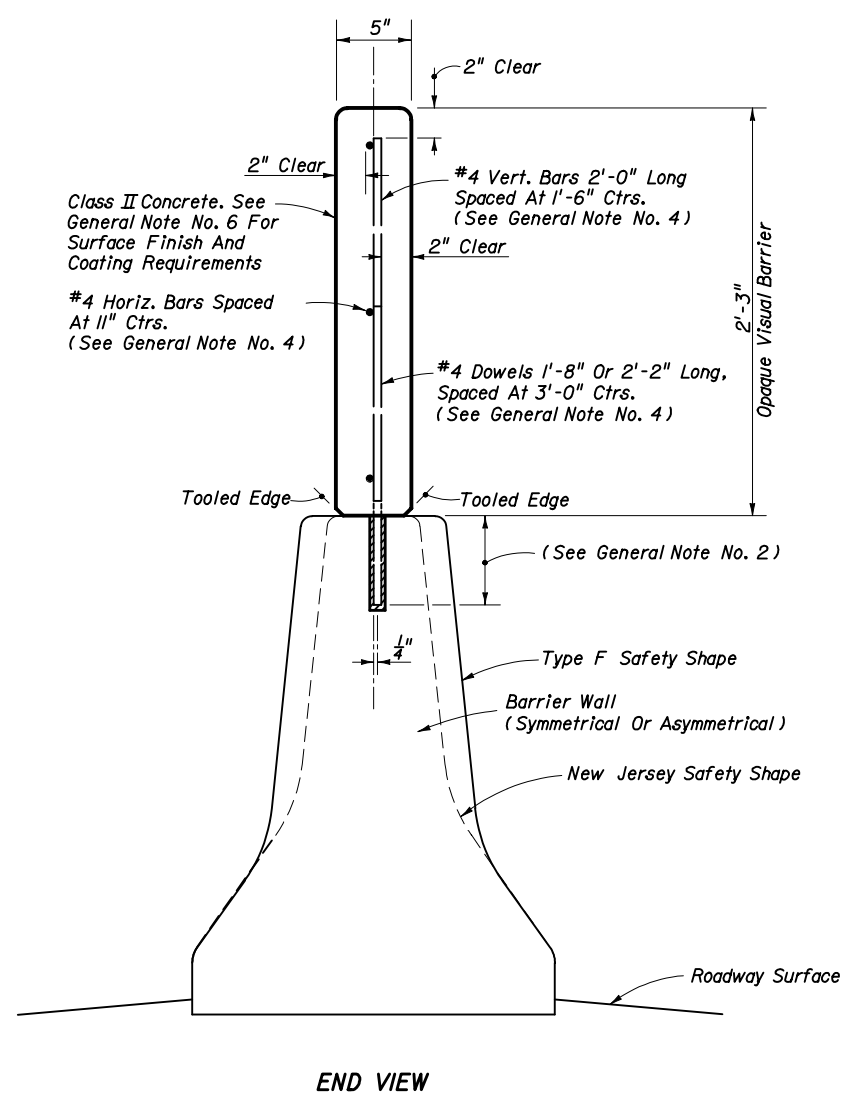
The Contractor may construct the opaque screen monolithically with the barrier wall, however, the screen design shall not be modified so as to cause the wall to be dynamically active from strikes on the screen; see design considerations in Note No. 1 above.

6. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 521 of the Standard Specification, unless other finish called for in the plans. The surfaces shall have a Class 5 Applied Finish Coating in accordance with Section 400 only when called for in the plans.

7. Payment for opaque visual barrier shall be full compensation for concrete, reinforcement, dowels, casting, placement, drilling, grouting, tooling, finishing and work incidental thereto, and shall be paid for under the contract unit price for Opaque Visual Barrier (Concrete) (2'-3" Height), LF.

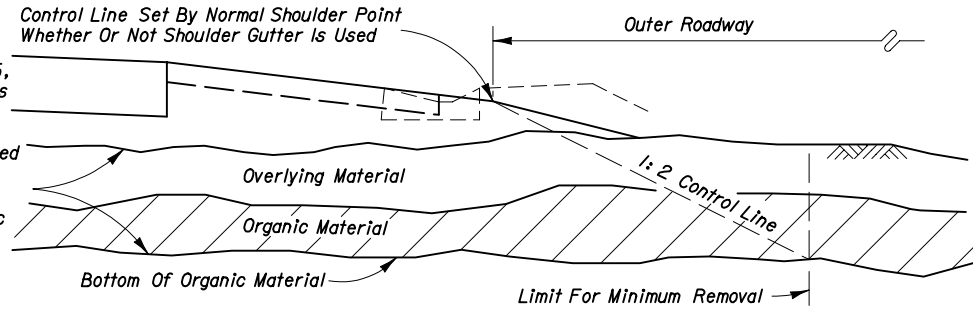


ESTIMATED QUANTITIES, LF	
Concrete	0.042 CY
Reinforcing Steel	3.27 Lbs*
*3.38 Lbs. With 2'-2" Dowels	



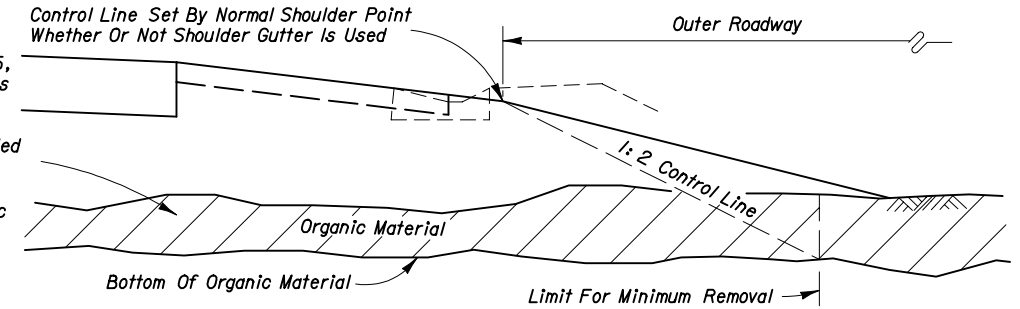
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
OPAQUE VISUAL BARRIER				
Names	Dates	Approved By		
Designed By	DCB/JVG	9/87	Roadway Design Engineer	
Drawn By	JBW	9/87		
Checked By	DCB/JVG	9/87	Revision	00
			Sheet No.	1 of 1
			Index No.	461

Remove Overlying Material And Organic Material Within The Limits Shown And Backfill In Accordance With Index No. 505, Unless Otherwise Called For In The Plans Or Directed Otherwise By The District Geotechnical Engineer; The Limits Include Full Median Width When Applied To Divided Facilities With Median Widths Up To 64'; When Median Width Is Greater Than 64' And For Bifurcated Roadways The Organic Material Removal Limits Will Be Set By A 1:2 Control Line Complimentary To The Outer Roadway That Will Accomodate One Future Median Lane On Each Roadway Unless Specified Otherwise By The Plans.



WITH OVERBURDEN - HALF SECTION

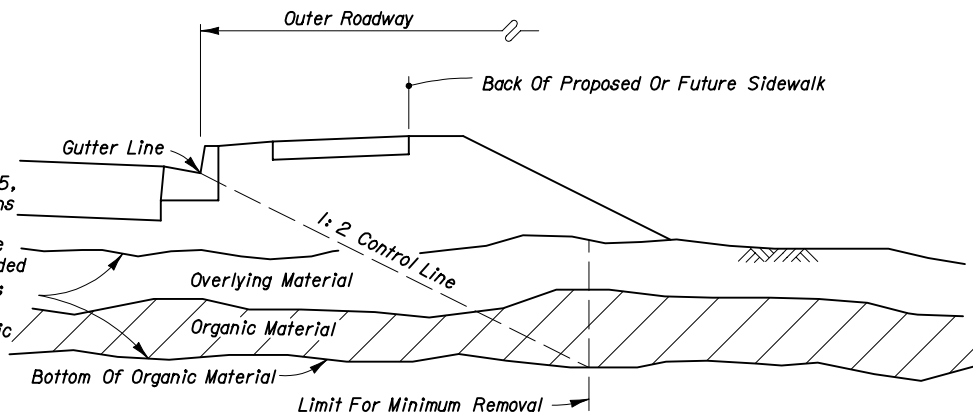
Remove Overlying Material And Organic Material Within The Limits Shown And Backfill In Accordance With Index No. 505, Unless Otherwise Called For In The Plans Or Directed Otherwise By The District Geotechnical Engineer; The Limits Include Full Median Width When Applied To Divided Facilities With Median Widths Up To 64'; When Median Width Is Greater Than 64' And For Bifurcated Roadways The Organic Material Removal Limits Will Be Set By A 1:2 Control Line Complimentary To The Outer Roadway That Will Accomodate One Future Median Lane On Each Roadway Unless Specified Otherwise By The Plans.



WITHOUT OVERBURDEN - HALF SECTION

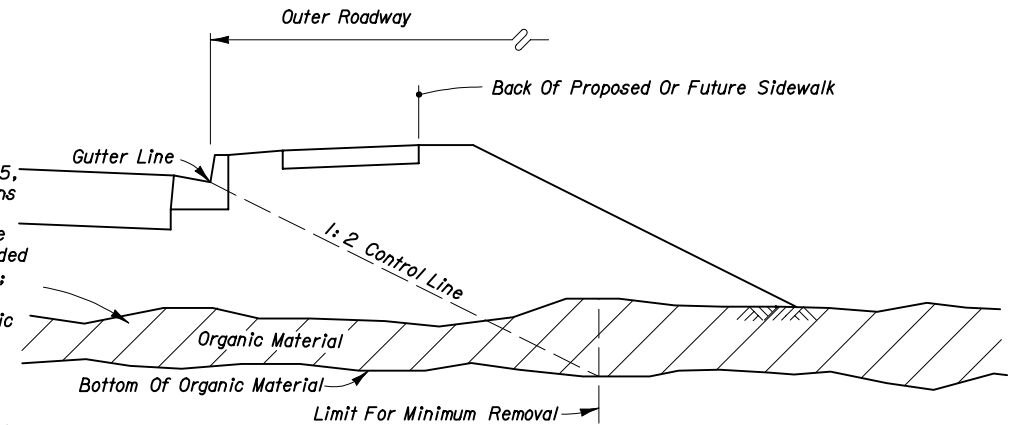
IN RURAL CONSTRUCTION

Remove Overlying Material And Organic Material Within The Limits Shown And Backfill In Accordance With Index No. 505, Unless Otherwise Called For In The Plans Or Directed Otherwise By The District Geotechnical Engineer; The Limits Include Full Median Width When Applied To Divided Facilities With Median Widths Up To 64'; When Median Width Is Greater Than 64' And For Bifurcated Roadways The Organic Material Removal Limits Will Be Set By A 1:2 Control Line Complimentary To The Outer Roadway That Will Accomodate One Future Median Lane On Each Roadway Unless Specified Otherwise By The Plans.



WITH OVERBURDEN - HALF SECTION

Remove Overlying Material And Organic Material Within The Limits Shown And Backfill In Accordance With Index No. 505, Unless Otherwise Called For In The Plans Or Directed Otherwise By The District Geotechnical Engineer; The Limits Include Full Median Width When Applied To Divided Facilities With Median Widths Up To 64'; When Median Width Is Greater Than 64' And For Bifurcated Roadways The Organic Material Removal Limits Will Be Set By A 1:2 Control Line Complimentary To The Outer Roadway That Will Accomodate One Future Median Lane On Each Roadway Unless Specified Otherwise By The Plans.



WITHOUT OVERBURDEN - HALF SECTION

IN URBAN CONSTRUCTION

REMOVAL OF ORGANIC MATERIAL

GENERAL NOTES

1. All details shown on this index for removal of organic and plastic materials apply unless otherwise shown on the plans.
2. Utilization of excavated materials shall be in accordance with Index No. 505.
3. Where organic or plastic material is undercut, backfill shall be made of suitable material in accordance with Index No. 505, unless otherwise shown on the plans.
4. The term "Plastic Material" used in this index in conjunction with removal of plastic soil is as defined under soil classifications for Plastic (P) and High Plastic (H) on Index No. 505.
5. The term "Organic Material" as used on this index is defined as any soil which has an average organic content greater than five (5.0) percent, or an individual organic content test result which exceeds seven (7.0) percent. Organic material shall be removed as shown on this index and the plans unless directed otherwise by the District Geotechnical Engineer.
6. The normal depth of side ditches shall be 3.5' below the shoulder point except in special cases.
7. In municipal areas, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain filter material will not extend above the bottom of the stabilized section of the subgrade. Gradation of the filter material shall conform to FDOT specifications. Minimum grade on underdrain pipe shall be 0.2%.
8. See Index No. 506 for miscellaneous earthwork details.

DESIGN NOTES

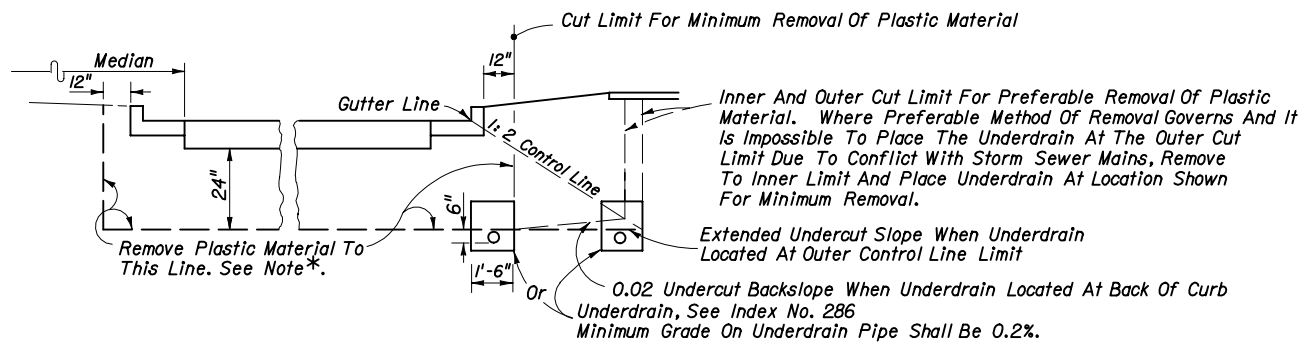
1. At locations where organic material or other soft soil deposits persists to such depth that removal is impractical, the construction of a geosynthetic foundation over those soils should be considered. The Engineer of Record should request guidance from the District Geotechnical Engineer and make a geosynthetic foundation design in accordance with Index No. 501 when pursuing geosynthetic alternates.
2. The designer shall take into consideration the expectancy of roadway widening to the outside, and where widening is anticipated specify in the plans the limits of removal of organic and plastic materials necessary to accommodate anticipated widening.

Average organic content shall be determined from the test results from a minimum of three randomly selected samples from each stratum. Tests shall be performed in accordance with AASHTO T 267 on the portion of a sample passing the No. 4 sieve.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

REMOVAL OF ORGANIC AND PLASTIC MATERIAL

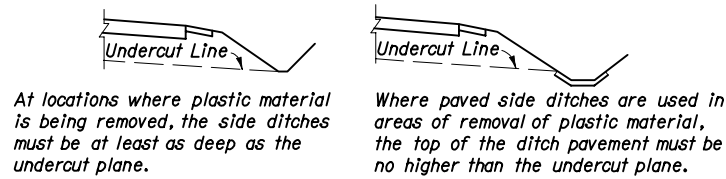
Designed By	GEOTECH	9/93	Approved By <i>[Signature]</i> State Geotechnical Engineer		
Drawn By	HKH	9/93	Revision	Sheet No.	Index No.
Checked By	BTD/FLS	9/93	02	1 of 2	500



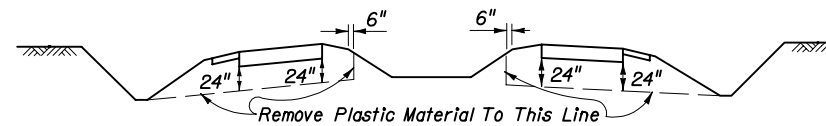
HALF SECTION

NOTES: Refer to roadway cross sections to determine whether minimum or preferable removal is used.
 *Where frequency of median breaks indicates that it is impractical to leave plastic material in the median, the designer may elect to indicate total removal of this material. If during construction it becomes apparent, due to normal required construction procedures, that it is impractical to leave the plastic material in the median, total removal of this material shall be approved by the Engineer.

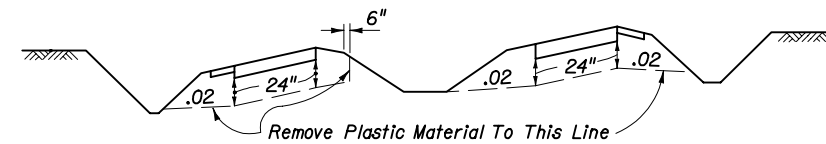
REMOVAL OF PLASTIC MATERIAL AND LOCATION OF UNDERDRAIN IN URBAN CONSTRUCTION



MISCELLANEOUS DETAILS

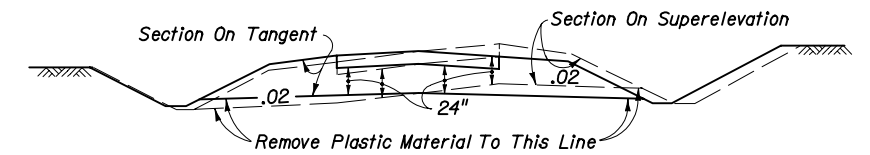


TYPICAL CUT SECTION ON TANGENT



TYPICAL CUT SECTION ON SUPERELEVATION

REMOVAL OF PLASTIC MATERIAL ON INTERSTATE FACILITIES, FREEWAYS, DIVIDED ARTERIALS AND MAJOR COLLECTORS HAVING DEPRESSED MEDIANS



TYPICAL CUT SECTION

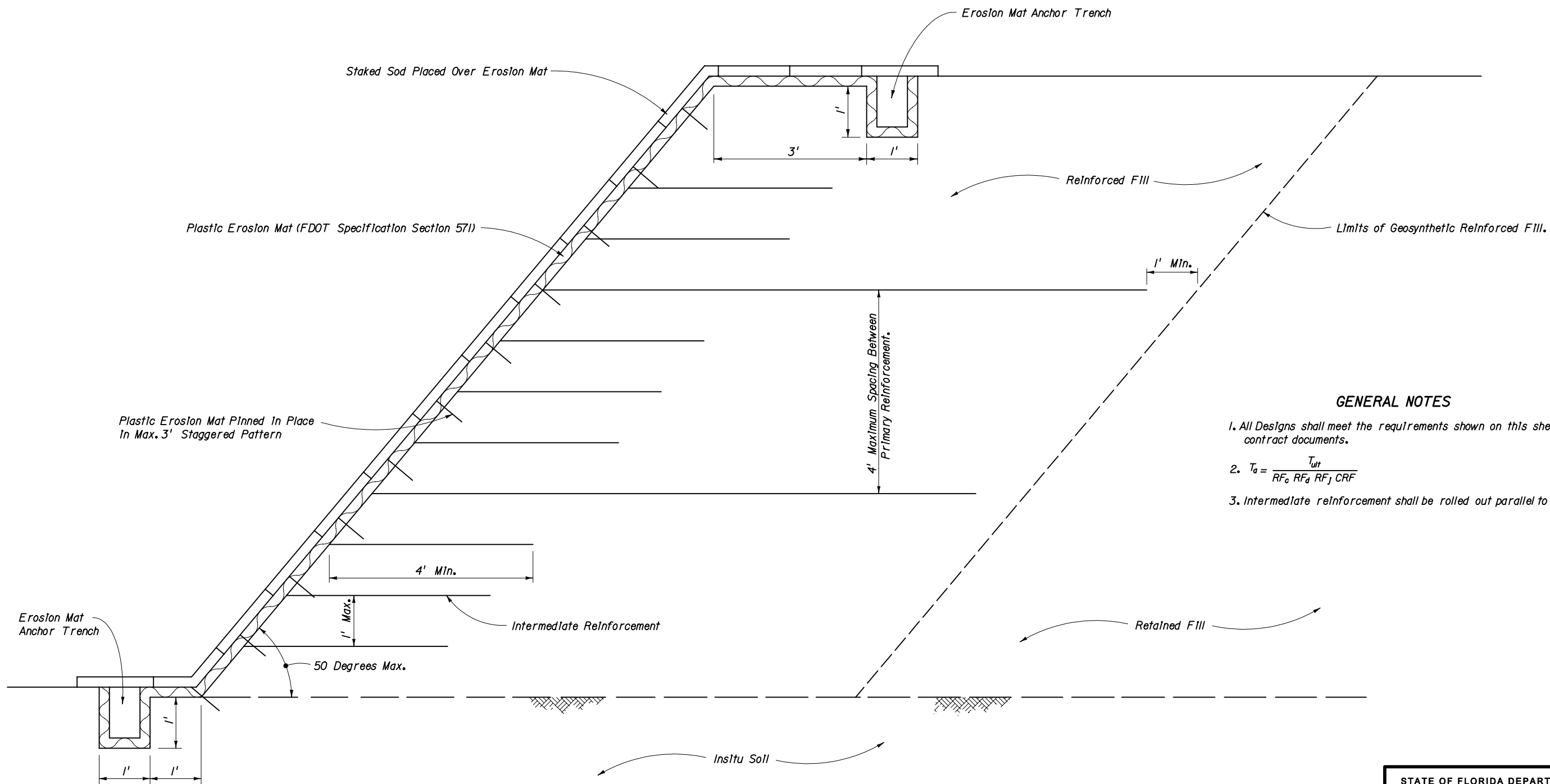
Note: When this detail is applied to minor collectors and local facilities, the undercut may be reduced to 18".

REMOVAL OF PLASTIC MATERIAL ON DIVIDED FREEWAYS, ARTERIALS AND MAJOR COLLECTORS HAVING FLUSH MEDIANS, AND, ON UNDIVIDED ARTERIALS AND MAJOR COLLECTORS

REMOVAL OF PLASTIC MATERIAL

Note: For GENERAL NOTES see Sheet 1.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
REMOVAL OF ORGANIC AND PLASTIC MATERIAL				
Designed By	KHH/WNL	05/91	Approved By <i>[Signature]</i> State Geotechnical Engineer	
Drawn By	HKH	05/91	Revision	Sheet No.
Checked By	JVG/WNL	05/91	00	2 of 2
				Index No. 500

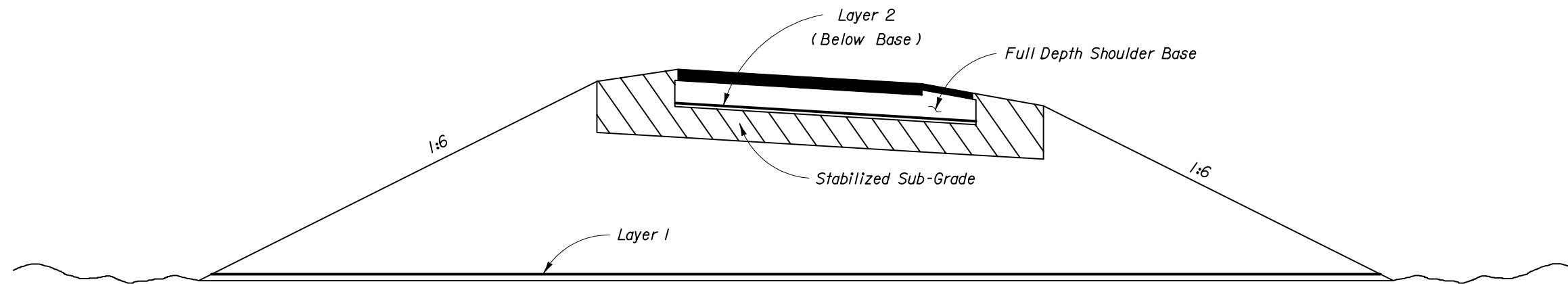


GENERAL NOTES

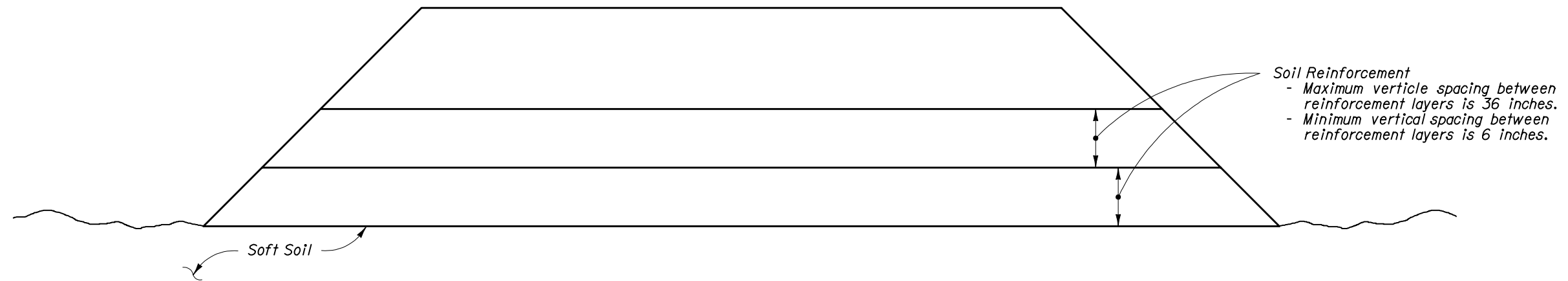
1. All Designs shall meet the requirements shown on this sheet and the contract documents.
2. $T_a = \frac{T_{ult}}{RF_c RF_d RF_j CRF}$
3. Intermediate reinforcement shall be rolled out parallel to slope face.

GEOSYNTHETIC REINFORCED SOIL SLOPES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GEOSYNTHETIC REINFORCED SOILS				
Designed By	PDP	07/99	Approved By <i>[Signature]</i> State Geotechnical Engineer	
Drawn By	SM	07/99	Revision	Sheet No. / Index No.
Checked By	PWL	08/99	04	1 of 8 / 501



REINFORCED EMBANKMENT



GEOSYNTHETIC REINFORCED FOUNDATIONS CONSTRUCTED ON SOFT SOILS


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GEOSYNTHETIC REINFORCED SOILS				
	Names	Dates	Approved-By	
Designed By	PDP	07/99	 State Geotechnical Engineer	
Drawn By	SM	07/99	Revision	Sheet No. / Index No.
Checked By	PDP	08/99	04	2 of 8 / 501

TABLE OF WOVEN GEOTEXTILE VALUES

PROPERTY	REQUIRED TEST METHOD	MIRAFI HP 370	MIRAFI HP 470	MIRAFI HP 570	MIRAFI HP 670	MIRAFI HP 770	MIRAFI HS 400	MIRAFI HS 600	MIRAFI HS 800	MIRAFI HS 1150
Permittivity (0.05 sec ⁻¹ Min.)	ASTM D 4491	0.52	0.20	0.40	0.50	0.23	0.026	0.32	0.20	0.32
UV Stability (Min. Retained Strength @ 500 hr.)	ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%
Burst Strength (psi)	GRI & GSI	800	1,200	1,200	1,200	1,200	—	—	—	—
Grab Strength (lb)	ASTM D 4632	400 x 250	380 x 350	475 x 440	650 x 450	600 x 550	—	—	—	—
A.O.S. (In)	ASTM D 4751	0.0236	0.0335	0.0236	0.0335	0.0236	0.0118	0.0335	0.0335	0.0236
Tensile Strength (lb/ft)										
Machine Direction	Ultimate	3,240	3,600	4,800	6,420	7,200	4,800	7,200	9,600	13,800
	2% Ultimate	540	900	960	1,080	1,080	—	—	—	—
	5% Ultimate	1,356	1,800	2,400	2,700	3,000	1,080	2,040	3,600	4,800
Cross Direction	Ultimate	2,700	3,600	4,800	4,800	4,800	4,800	3,600	3,600	3,600
	2% Ultimate	540	1,200	1,320	1,200	1,320	—	—	—	—
	5% Ultimate	1,356	1,800	2,400	2,700	2,400	2,400	—	—	—
Strain @ Ultimate Tensile Strength (lb/ft)		14%	10%	10%	14%	12%	15%	15%	10%	12%
Secant Modulus @	2% strain	27,000	45,000	48,000	54,000	54,000	—	—	—	—
	5% strain	27,120	36,000	48,000	54,000	60,000	21,600	40,800	72,000	96,000
	10% strain	24,000	36,000	48,000	54,000	66,000	33,600	57,600	96,000	120,000
Seam Breaking Strength (lb/ft)	ASTM D 4884	1,440	1,800	3,000	3,600	1,200	2,400	2,400	2,400	2,400
Puncture Resistance (lb)	ASTM D 4833	180	170	190	200	220	—	—	—	—
Tear Strength (lb)	Machine Direction	180	130	180	250	250	—	—	—	—
	Cross Direction	110	200	180	200	400	—	—	—	—
Soil-Geosynthetic Friction	GRI & GG5, GT7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9
Creep Resistance-T _{creep} (lb/ft)	ASTM D 5262	—	—	—	—	—	2,880	4,320	5,760	8,280
Creep Reduction Factor (T _{ult} /T _{creep})	GRI & GG3 & GT5	5.0	5.0	5.0	5.0	5.0	1.67	1.67	1.67	1.67
Installation Damage (RF _c)	Sand	1.25	1.25	1.5	1.5	1.5	1.3	1.25	1.2	1.5
	Limestone	1.5	1.5	1.35	1.35	1.35	5	3.5	1.85	1.7
Durability (RF _d)	Chemical	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Biological	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Joint Strength (RF _j)	Mechanical	—	—	—	—	—	—	—	—	—
	Overlap *	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Approved Application Usage		3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4

Approved Application Usage: 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
 4 = Reinforced Embankment
 5 = Construction Expedient

* Minimum 3' Overlap

**APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEOTEXTILES)
 APPLICATION AND PROPERTIES**


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By		
Designed By PDP	07/99	 State Geotechnical Engineer		
Drawn By PDP	08/99	Revision	Sheet No.	Index No.
Checked By FWL	08/99	04	3 of 8	501

TABLE OF WOVEN GEOTEXTILE VALUES

PROPERTY	REQUIRED TEST METHOD	MIRAFI HS 1400	MIRAFI HS 1715	MIRAFI HS 2400	MIRAFI HS 3000	MIRAFI HS 3600	AMOCO 2006	AMOCO 2016	AMOCO 2044	COMTRAC 70/70
Permittivity (0.05 sec ⁻¹ Min.)	ASTM D 4491	0.20	0.32	0.02	0.02	0.02	0.05	0.70	0.15	0.20
UV Stability (Min. Retained Strength @ 500 hr.)	ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%
Burst Strength (psi)	GRI & GSI	—	—	—	—	—	1,000	1,100	1,500	—
Grab Strength (lb)	ASTM D 4632	—	—	—	—	—	315	315	600/500	—
A.O.S. (In)	ASTM D 4751	0.0335	0.0335	0.0118	0.0118	0.0118	0.0167	0.0167	0.0236	0.0335
Tensile Strength (lb/ft)										
Machine Direction	Ultimate	16,800	20,580	28,800	36,000	43,200	2,100	2,400	4,800	16,800
	2% Ultimate	—	—	—	—	—	156	276	456	—
	5% Ultimate	6,000	8,400	14,400	18,000	21,600	564	744	1,452	6,000
Cross Direction	Ultimate	3,600	3,600	3,600	3,600	3,600	2,100	2,400	4,800	3,600
	2% Ultimate	—	—	—	—	—	576	660	1,380	—
	5% Ultimate	—	—	—	—	—	1,104	1,404	2,604	—
Strain @ Ultimate Tensile Strength		14%	14%	10%	10%	10%	8%	8%	8%	14%
Modulus @ (lb/ft)	2% strain	—	—	—	—	—	7,800	13,800	22,800	—
	5% strain	120,000	168,000	288,000	360,000	432,000	11,280	14,880	29,040	120,000
	10% strain	120,000	162,000	288,000	360,000	432,000	10,440	12,480	31,200	120,000
Seam Breaking Strength (lb/ft)	ASTM D 4884	2,400	2,400	3,600	3,600	3,600	—	—	—	2,400
Puncture Resistance (lb)	ASTM D 4833	—	—	—	—	—	120	120	170	—
Stitch Strength (lb)	Machine Direction	—	—	—	—	—	120	120	250	—
	Cross Direction	—	—	—	—	—	120	120	250	—
Soil-Geosynthetic Friction	GRI & GG5, GT7	0.9	0.9	0.9	0.9	0.9	0.65	0.65	0.65	0.9
Creep Resistance-T _{creep} (lb/ft)	ASTM D 5262	10,080	12,348	17,280	21,600	21,600	600	685	1,371	—
Creep Reduction Factor (T _{ult} /T _{creep})	GRI & GG3 & GT5	1.67	1.67	1.67	1.67	1.67	3.5	3.5	3.5	1.67
Installation Damage (RF _G)	Sand	1.15	1.15	1.1	1.1	1.1	1.10	1.05	1.05	1.15
	Limestone	1.5	1.35	1.25	1.25	1.25	1.20	1.20	1.10	1.5
Durability (RF _D)	Chemical	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Biological	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Joint Strength (RF _J)	Mechanical	—	—	—	—	—	—	—	—	—
	Overlap *	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.0
Approved Application Usage		3, 4	3, 4	3, 4	3, 4	3, 4	3	3	3	3

Approved Application Usage: 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
 4 = Reinforced Embankment
 5 = Construction Expedient

* Minimum 3' Overlap

**APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEOTEXTILES)
 APPLICATION AND PROPERTIES**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GEOSYNTHETIC REINFORCED SOILS				
Designed By	PDP	07/99	Approved By <i>[Signature]</i> State Geotechnical Engineer	
Drawn By	PDP	08/99	Revision	Sheet No. / Index No.
Checked By	FWL	08/99	04	4 of 8 / 501

TABLE OF WOVEN GEOGRID VALUES

PROPERTY	REQUIRED TEST METHOD	MIRAFI MG 2XT	MIRAFI MG 3XT	MIRAFI MG 5XT (Matrex 30)	MIRAFI MG 7XT	MIRAFI MG 8XT	MIRAFI MG 10XT (Matrex 60)	MIRAFI MG 18XT (Matrex 90)	MIRAFI MG 20XT (Matrex 120)	MIRAFI MG 22XT (Matrex 180)	MIRAFI MG 24XT (Matrex 240)	
UV Stability (Min. Retained Strength @ 500 hr.)	ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	
Tensile Strength (lb/ft)	ASTM D 6637	Ultimate	2,000	2,800	3,590	4,350	6,230	8,300	9,360	12,420	17,760	25,380
Machine Direction		2% Ultimate	—	—	—	—	—	—	—	—	—	—
		5% Ultimate	1,200	1,056	1,740	2,160	2,520	3,120	4,400	5,340	7,140	10,020
Cross Direction		Ultimate	2,000	—	—	—	—	—	—	—	—	—
		2% Ultimate	—	—	—	—	—	—	—	—	—	—
		5% Ultimate	—	—	—	—	—	—	—	—	—	—
Strain @ Ultimate Tensile Strength	ASTM D 6637	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	
Secant Modulus @ (lb/ft)		2% strain	—	—	—	—	—	—	—	—	—	—
		5% strain	—	21,200	34,800	43,200	50,400	62,400	88,800	106,800	142,800	200,400
		10% strain	—	—	—	—	—	—	—	—	—	—
Junction Strength (lb/ft)	GRI # GG2	—	—	—	—	—	—	—	—	—	—	
Soil-Geosynthetic Friction	GRI # GG5, GT7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Creep Resistance- T_{creep} (lb/ft)	ASTM D 5262	1,200	1,680	2,154	2,610	3,738	4,980	5,616	7,221	10,326	14,756	
Creep Reduction Factor (T_{ult}/T_{creep})	GRI # GG3 & GT5	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	
Installation Damage (RF _c)	Sand	GRI # GG4 & GT7	1.25	1.20	1.15	1.15	1.15	1.1	1.1	1.1	1.1	1.1
	Limestone		Not Permitted	1.75	1.3	1.3	1.3	1.25	1.25	1.25	1.25	1.25
Durability (RF _d)	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Joint Strength (RF _j)	Mechanical	ASTM D 6637, GRI # GG4 & GT7	—	—	—	—	—	—	—	—	—	
	Overlap *	GRI # GG5 & GT6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Approved Application Usage		3	3	3	3	3	3	3	3	3	3	

Approved Application Usage: 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
 4 = Reinforced Embankment
 5 = Construction Expedient

* Minimum 3' Overlap

**APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEOGRIDS)
 APPLICATION AND PROPERTIES**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By		
Designed By	PDP 07/99	<i>[Signature]</i> State Geotechnical Engineer		
Drawn By	PDP 08/99	Revision	Sheet No.	Index No.
Checked By	FWL 08/99	04	5 of 8	501

TABLE OF WOVEN GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	SYNTEEN SF 20	SYNTEEN SF 35	SYNTEEN SF 40	SYNTEEN SF 50	SYNTEEN SF 55	SYNTEEN SF 80	SYNTEEN SF 110	Raugrid 3/3	Raugrid 4/2	Raugrid 6/3	Raugrid 8/3	Raugrid 10/3
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	95%	95%	95%	95%	95%
Tensile Strength (lb/ft)		ASTM D 6637												
Machine Direction	Ultimate		1,672	2,627	3,050	3,731	3,774	5,583	7,462	2,233	2,843	4,350	5,288	6,590
	2% Ultimate		370	462	488	791	736	1,016	1,186	—	—	—	—	—
	5% Ultimate		670	725	970	922	1,159	1,273	1,684	712	767	1,144	1,165	1,582
Cross Direction	Ultimate		1,630	2,556	3,050	3,933	2,499	2,206	2,179	2,213	1,459	1,959	2,089	2,192
	2% Ultimate		370	399	430	630	604	882	1,274	—	—	—	—	—
	5% Ultimate	670	583	765	815	796	1,563	1,581	541	356	452	507	521	
Strain @ Ultimate Tensile Strength		ASTM D 6637	9.4%	14.1%	9.9%	14.2%	11.5%	13.9%	18.8%	10.8%	11.8%	13.1%	12.2%	11.5%
Secant Modulus @ (lb/ft)	2% strain		18,494	23,114	24,408	39,551	36,799	50,807	59,298	—	—	—	—	—
	5% strain		13,397	14,499	19,404	18,432	23,174	25,459	33,712	—	—	—	—	—
	10% strain		15,206	15,234	22,089	18,432	27,137	37,910	27,380	—	—	—	—	—
Junction Strength (lb/ft)		GRI : GG2	—	—	—	—	—	—	—	N/A	100%	100%	100%	100%
Soil- Geosynthetic Friction		GRI : GG5, GT7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Creep Resistance- T_{creep} (lb/ft)		ASTM D 5262	1,005	1,523	1,525	2,201	2,265	3,182	4,029	1,466	1,870	2,862	3,479	4,335
Creep Reduction Factor (T_{ult}/T_{creep})		GRI : GG3 & GT5	1.66	1.73	2.00	1.70	1.67	1.75	2.02	1.52	1.52	1.52	1.52	1.52
Installation Damage (RF _c)	Sand	GRI : GG4 & GT7	1.05	1.15	1.15	1.08	1.08	1.08	1.08	1.10	1.10	1.10	1.10	1.10
	Limestone		1.75	1.70	1.60	1.55	1.55	1.55	1.35	1.17	1.17	1.17	1.17	1.17
Durability (RF _d)	Chemical	ASTM D 5322	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.15	1.15	1.15	1.15	1.15
	Biological	ASTM D1987, D3083, G21 & G22	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.15	1.15	1.15	1.15	1.15
Joint Strength (RF _j)	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—	—	—	—	—	—
	Overlap *	GRI : GG5 & GT6	1.10	1.10	1.10	1.10	1.10	1.10	1.10	—	—	—	—	—
Approved Application Usage			3	3	3	3	3	3	3	2, 5	2, 5	2, 5	2, 5	2, 5

Approved Application Usage: 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
 4 = Reinforced Embankment
 5 = Construction Expedient

* Minimum 3' Overlap

**APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEOGRID)
 APPLICATION AND PROPERTIES**


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GEOSYNTHETIC REINFORCED SOILS				
Designed By	PDP	07/99	Approved By	
Drawn By	PDP	08/99	Revision	Sheet No. / Index No.
Checked By	FWL	08/99	04	6 of 8 / 501

TABLE OF EXTRUDED GEOGRID VALUES									
PROPERTY		REQUIRED TEST METHOD	TENSAR BX 4100	TENSAR BX 4120	TENSAR BX 4200	TENSAR BX 4220	TENSAR BX 1100	TENSAR BX 1200	TENSAR BX 1500
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	—	90%	—	90%	90%	90%	90%
Tensile Strength (lb/ft)		ASTM D 6637							
Machine Direction	Ultimate		860	860	1,270	1,270	850	1,315	1,790
	2% Ultimate		240	240	370	370	280	410	580
	5% Ultimate		480	480	705	705	580	810	1,200
Cross Direction	Ultimate		875	875	1,370	1,370	1,300	1,975	2,055
	2% Ultimate		300	300	500	500	450	670	685
	5% Ultimate	635	635	960	960	920	1,360	1,370	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10%	10%	10%	10%	10%	10%	10%
Secant Modulus @ (lb/ft)	2% strain		11,995	11,995	18,506	18,506	14,000	20,500	29,000
	5% strain		9,596	9,596	14,092	14,092	11,600	16,200	27,400
	10% strain		—	—	—	—	—	—	—
Junction Strength (lb/ft)		GRI # GG2	90%	90%	90%	90%	93%	93%	93%
Soil-Geosynthetic Friction		GRI # GG5, GT7	—	0.90	0.95	0.95	0.90	0.90	0.90
Creep Resistance - T_{creep} (lb/ft)		ASTM D 5262	250	250	420	420	180/280	255/555	470/575
Creep Reduction Factor (T_{ult} / T_{creep})		GRI # GG3 & GT5	3.5	3.5	3.27	3.27	2.07	1.61	2.09
Installation Damage (RF _C)	Sand	GRI # GG4 & GT7	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Limestone		1.43	1.43	1.35	1.35	1.35	1.35	1.35
Durability (RF _D)	Chemical	ASTM D 5322	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Joint Strength (RF _J)	Mechanical	ASTM D 6637, GRI # GG4 & GT7	—	—	—	—	—	—	—
	Overlap *	GRI # GG5 & GT6	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Approved Application Usage			2, 4, 5	3, 4, 5	2, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5

Approved Application Usage: 1 = Steepened Slopes
2 = Reinforcement of Foundations over Soft Soils
3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
4 = Reinforced Embankment
5 = Construction Expedient

* Minimum 3' Overlap

**APPROVED GEOSYNTHETIC PRODUCTS
(EXTRUDED GEOGRID)
APPLICATION AND PROPERTIES**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By		
Designed By	PDP 07/99	State Geotechnical Engineer		
Drawn By	PDP 08/99	Revision	Sheet No.	Index No.
Checked By	PWL 08/99	04	7 of 8	501

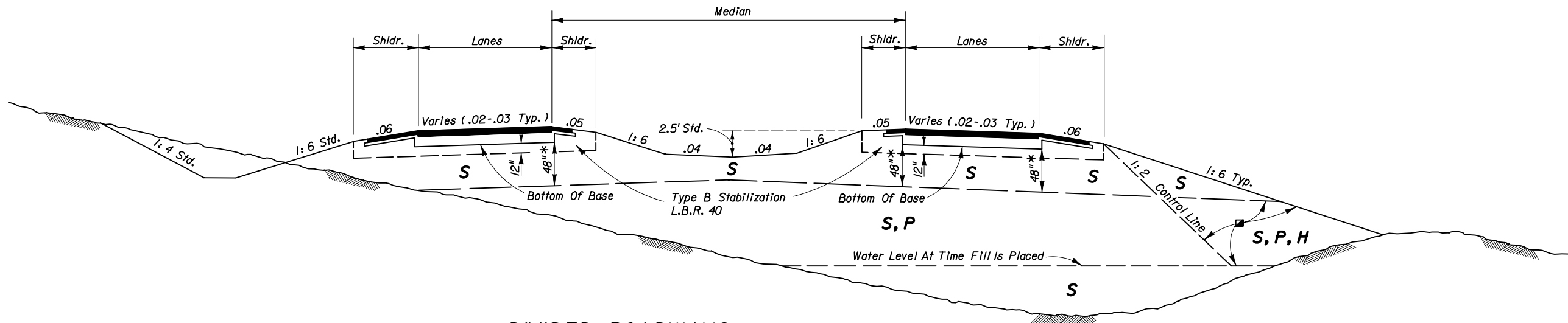
TABLE OF EXTRUDED GEOGRID VALUES								
PROPERTY		REQUIRED TEST METHOD	TENSAR UX 1400 HS UX 1400 MSE UX MESA 3	TENSAR UX 1500 HS UX 1500 MSE UX MESA 4	TENSAR UX 1600 HS UX 1600 MSE UX MESA 5	TENSAR UX 1700 HS UX 1700 MSE UX MESA 6	TENAX MS 220	TENAX MS 330
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	90%	90%	90%	90%	85%	85%
Tensile Strength (lb/ft)		ASTM D 6637						
Machine Direction	Ultimate		4,790	7810	9,860	11,980	925	1,370
	2% Ultimate		1,100	1,850	2,330	2,740	300	418
	5% Ultimate		2,130	3,560	3,980	5,140	615	925
Cross Direction	Ultimate		—	—	—	—	1,400	2,100
	2% Ultimate		—	—	—	—	445	616
	5% Ultimate	—	—	—	—	890	1,340	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10%	10%	10%	10%	12%	12%
Secant Modulus @ (lb/ft)	2% strain		55,000	92,500	116,500	137,000	15,000	20,900
	5% strain		42,600	71,200	79,600	102,800	12,330	18,500
	10% strain		—	—	—	—	—	—
Junction Strength (lb/ft)		GRI # GG2	90%	90%	90%	90%	835	1,230
Soil- Geosynthetic Friction		GRI # GG5, GT7	0.462	0.462	0.462	0.462	—	—
Creep Resistance- T_{creep} (lb/ft)		ASTM D 5262	1,970	3,000	3,960	4,975	—	—
Creep Reduction Factor (T_{ult} / T_{creep})		GRI # GG3 & GT5	2.43	2.60	2.49	2.41	5.0	5.0
Installation Damage (RF _G)	Sand	GRI # GG4 & GT7	1.0	1.0	1.0	1.0	3.0	3.0
	Limestone		1.20	1.20	1.20	1.20	3.0	3.0
Durability (RF _D)	Chemical	ASTM D 5322	1.0	1.0	1.0	1.0	2.0	2.0
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	2.0	2.0
Joint Strength (RF _J)	Mechanical	ASTM D 6637, GRI # GG4 & GT7	1.0	1.0	1.0	1.0	—	—
	Overlap *	GRI # GG5 & GT6	1.0	1.0	1.0	1.0	—	—
Approved Application Usage			3	3	3	3	2	2

Approved Application Usage: 1 = Steepened Slopes
2 = Reinforcement of Foundations over Soft Soils
3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
4 = Reinforced Embankment
5 = Construction Expedient

* Minimum 3' Overlap

**APPROVED GEOSYNTHETIC PRODUCTS
(EXTRUDED GEOGRID)
APPLICATION AND PROPERTIES**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By		
Designed By	PDP 07/99	State Geotechnical Engineer		
Drawn By	PDP 08/99	Revision	Sheet No.	Index No.
Checked By	FWL 08/99	04	8 of 8	501



DIVIDED ROADWAYS

GENERAL NOTES

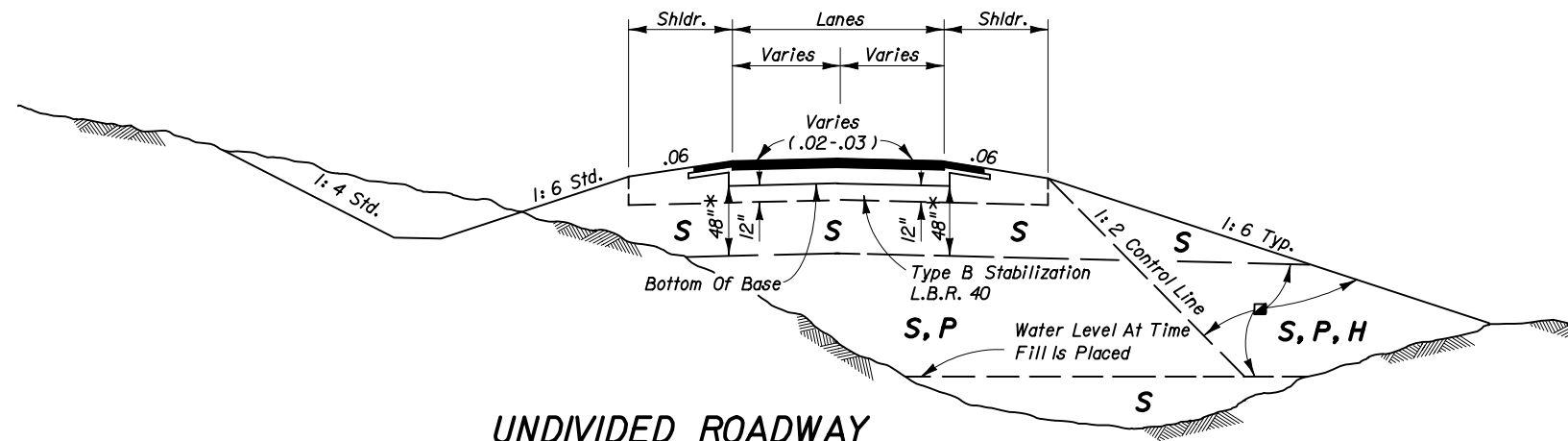
1. Roadway dimensions are representative. Subgrade dimensions and control lines are standard. The details shown on this Index do not supersede the details shown in the plans or on Index Nos. 500 or 506.
2. Plastic (P) soils may be placed above the existing water level (at the time of construction) to within 4 feet of the proposed base. It should be placed uniformly in the lower portion of the embankment for some distance along the project rather than full depth for short distances.
3. High Plastic (H) soils excavated within the project limits may be used in embankment construction as indicated on this index. High Plastic soils are not to be used for embankment construction when obtained from outside the project limits.
4. Select (S) soils having an average organic content of more than two and one-half (2.5) percent, or having an individual test value which exceeds four (4) percent, shall not be used in the subgrade portion of the roadbed.

Select (S), Plastic (P), or High Plastic (H) soils having an average organic content of more than five (5) percent, or an organic content individual test result which exceeds seven (7) percent, shall not be used in the portion of embankment inside the control line, unless written authorization is provided by the District Geotechnical Engineer; these soils may be used for embankment construction outside the control line, unless restricted by the plans or otherwise specified in the plans, provided they can be compacted sufficiently to sustain a drivable surface for operational vehicles as approved by the Engineer.

Average organic content shall be determined from the test results from a minimum of three randomly selected samples from each stratum or stockpile of a particular material. Tests shall be performed in accordance with AASHTO T 267 on the portion of a sample passing the No. 4 sieve.

5. Highly organic soils, composed primarily of partially decayed organic matter, often dark brown or black in color with an odor of decay, and sometimes fibrous, shall be designated as muck. Further, any stratum or stockpile of soil which contains pockets of highly organic material may be designated as Muck (M).

Highly organic soils shall not be used within the subgrade or embankment portion of the roadbed, with the exception of muck used as a supplement to construct a finish soil layer as described in Section 162 of the FDOT Standard Specifications.



UNDIVIDED ROADWAY

DESIGN NOTES

1. The designer shall take into consideration the expectancy of roadway widening to the outside, and where widening is anticipated, specify in the plans the location of the future widening control line for utilization of High Plastic (H) soils and/or soils classified as organic material in the embankment.
2. The designer shall take into consideration the position of the drainage swales in the portion of the embankment where Plastic (P) soils, High Plastic (H) soils, or soils classified as organic material would be allowed. The designer shall limit the use of Plastic (P) soils, High Plastic (H) soils, and/or soils classified as organic material to locations that will not inhibit the infiltration of stormwater from the swales.

SYMBOL	SOIL	CLASSIFICATION (AASHTO M 145)
S	Select	A-1, A-3, A-2-4 **
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

Classification listed left to right in order of preference.

See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.


** Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the roadbed when approved by the District Materials Engineer. A-2-4 material placed below the existing water level must be non-plastic and contain less than 15% passing the No. 200 U.S. Standard sieve.

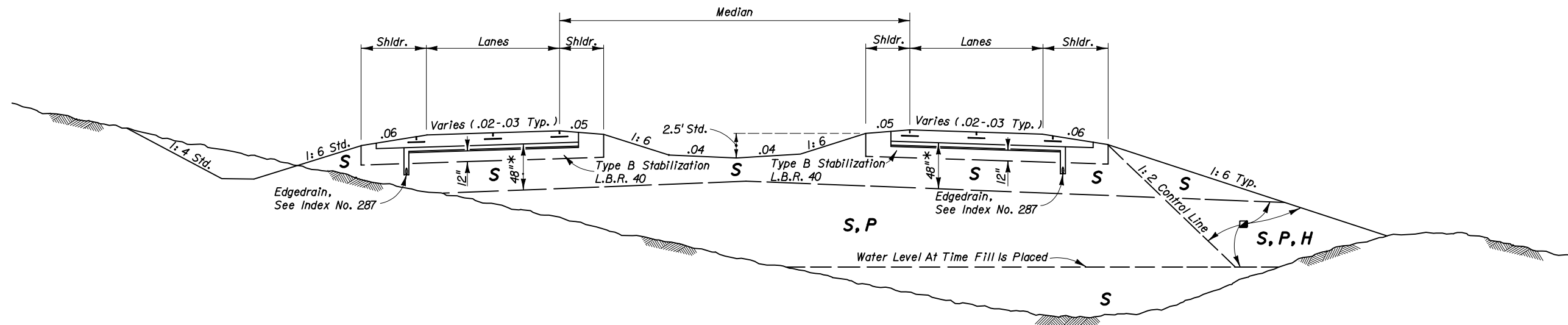
* For cut sections this dimension may be reduced to 24"; see Index No. 500. For minor collectors and local facilities this dimension may be reduced to 18".

FLEXIBLE PAVEMENT

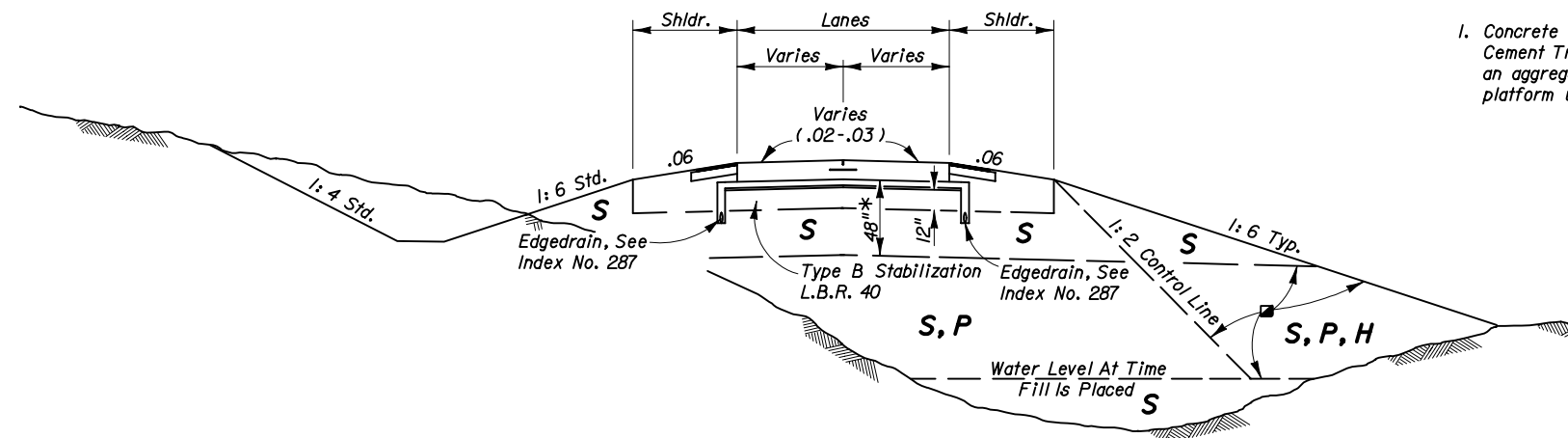
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

EMBANKMENT UTILIZATION

Names	Dates	Approved By		
Designed By	GEOTECH 09/93	 State Geotechnical Engineer		
Drawn By	HSD 09/93			
Checked By	BTD 09/93	Revision	Sheet No.	Index No.
		04	1 of 3	505



DIVIDED ROADWAYS



UNDIVIDED ROADWAY

DESIGN NOTE

1. Concrete pavement is to be placed over 4" of Asphalt Treated Permeable Base (ATPB) or Cement Treated Permeable Base (CTPB) as identified in the plans. This will be placed on an aggregate separator layer using 1" Type SP (Traffic C). This will be placed on a working platform using 12" of Type B Stabilization.

SYMBOL	SOIL	CLASSIFICATION (AASHTO M 145)
S	Select	A-1, A-3, A-2-4 **
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8


Classification listed left to right in order of preference.

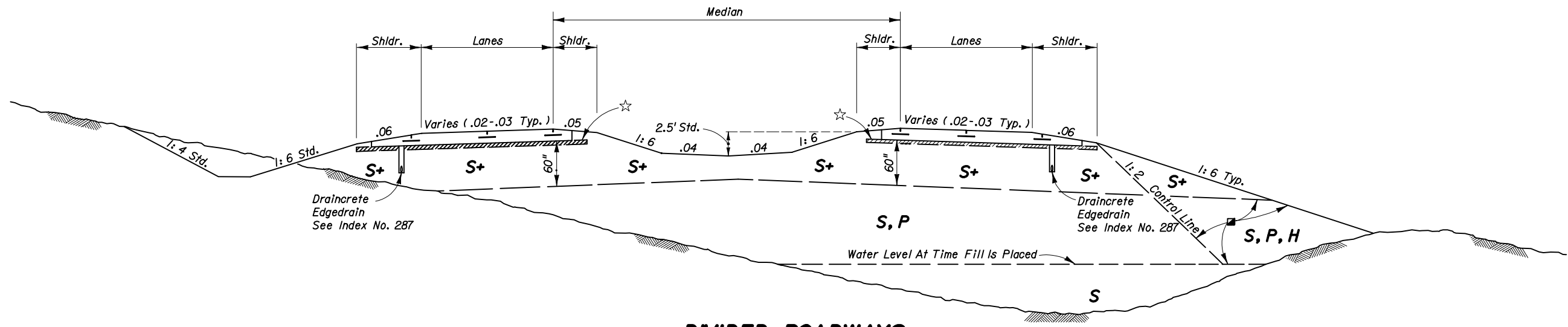
- ☑ See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.
- * * Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the roadbed when approved by the District Materials Engineer. A-2-4 material placed below the existing water level must be non-plastic and contain less than 15% passing the No. 200 U.S. Standard sieve.
- * For cut sections this dimension may be reduced to 24"; see Index No. 500. For minor collectors and local facilities this dimension may be reduced to 18".

RIGID PAVEMENT - TREATED PERMEABLE BASE OPTION

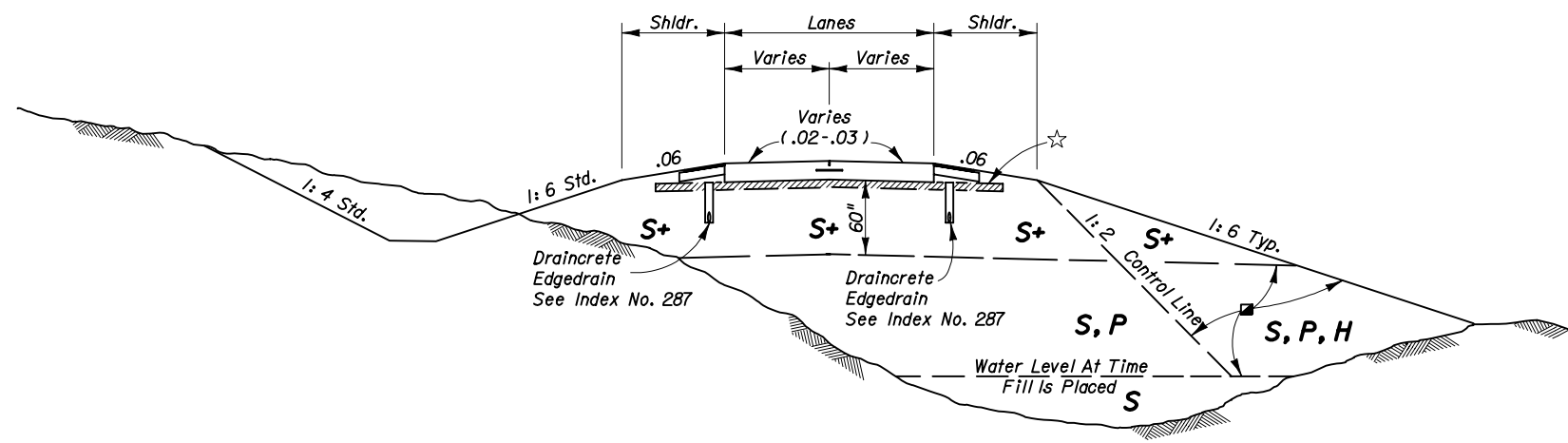
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

EMBANKMENT UTILIZATION

Names	Dates	Approved By		
Designed By	HMD 09/93	 State Geotechnical Engineer		
Drawn By	HSD 09/93			
Checked By	BTD 09/93	Revision	Sheet No.	Index No.
		04	2 of 3	505



DIVIDED ROADWAYS



UNDIVIDED ROADWAY

SYMBOL	SOIL	CLASSIFICATION (AASHTO M 145)
S	Select	A-1, A-3, A-2-4 **
S+	Special Select	A-3 *** With Minimum Average Lab Permeability of 5×10^{-5} cm/sec (0.14 ft./day) as per FM 1-T215
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

Classification listed left to right in order of preference.

See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.

*** When allowed by the plans, some types of A-2-4 material may be approved in writing by the District Materials Engineer. This material must meet the minimum lab permeability requirement, be non-plastic, and not exceed 12% passing the No. 200 U.S. Standard sieve.

** Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. A-2-4 material placed below the existing water level must be non-plastic and contain less than 15% passing the No. 200 U.S. Standard sieve.


☆ 3" of #57 Coarse Aggregate Mixed Into Top 6".

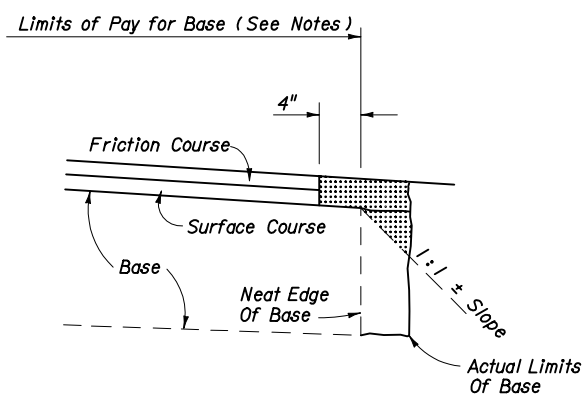
Note: SPECIAL SELECT SOIL OPTION may be used only when approved in writing by the District Materials Engineer and shown in the plans.

RIGID PAVEMENT - SPECIAL SELECT SOIL OPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

EMBANKMENT UTILIZATION

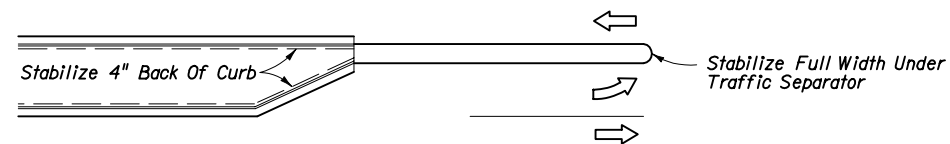
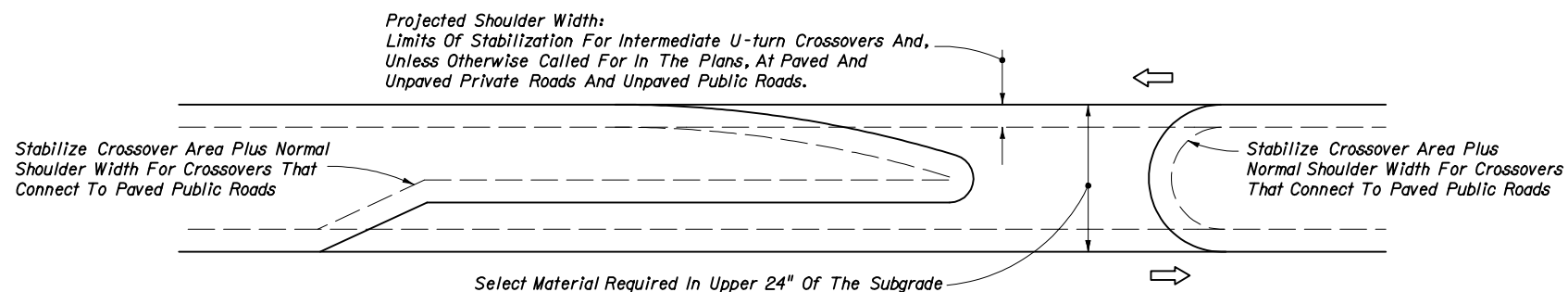
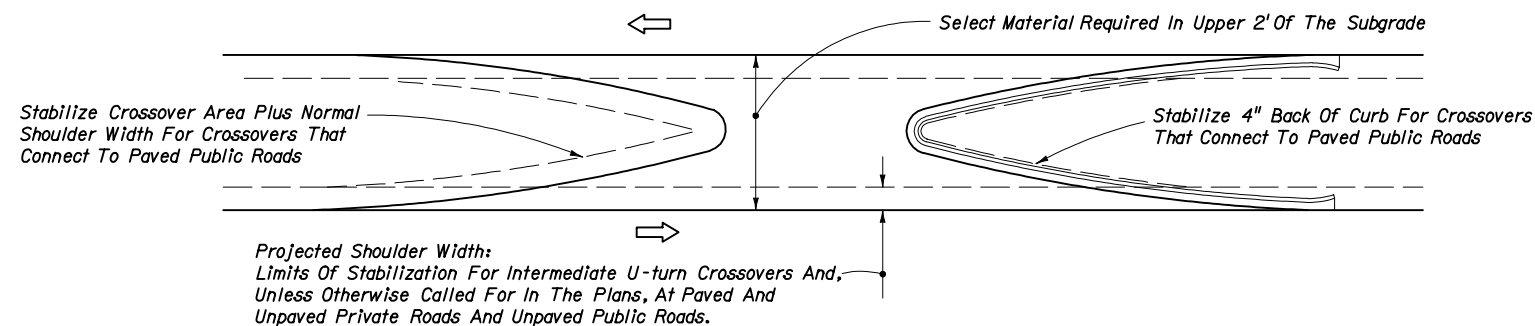
Names	Dates	Approved By		
Designed By	HMD 09/93	 State Geotechnical Engineer		
Drawn By	HSD 09/93			
Checked By	BTD 09/93	Revision	Sheet No.	Index No.
		04	3 of 3	505



NOTES

1. All material in the shaded area is excess base to be removed.
2. The cost for removal of excess base material shall be included in the contract unit price for base.
3. Payment for base shall be calculated using normal width.

REMOVAL OF EXCESS BASE MATERIAL

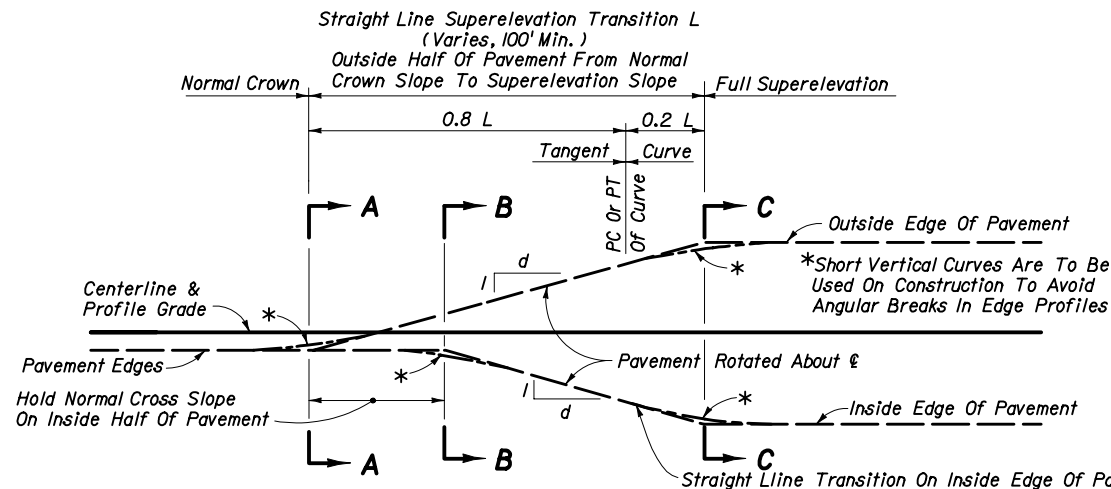


NOTES

1. When the median has curb or curb and gutter, stabilize 4" back of curb.
2. When the median has shoulder with no curb or curb and gutter, stabilize to normal shoulder width.
3. See the details above for stabilizing requirements at crossroads.
4. Stabilize entire area under all paved traffic islands.
5. Stabilize full width under all traffic separators.
6. Select material as defined on Index No. 505. For minor collectors and local facilities the depth of select material thickness may be reduced from 24" to 18".

MEDIAN STABILIZING DETAILS

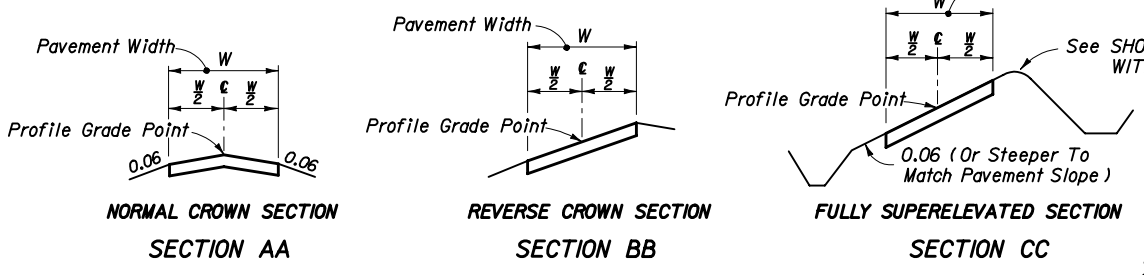
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MISCELLANEOUS EARTHWORK DETAILS				
Designed By	Names	Dates	Approved By	
Drawn By	RL/WNL	05/91	<i>Samuel D. Milk</i> Roadway Design Engineer	
Checked By	HKH	05/91	Revision	Sheet No.
	JVG/WNL	05/91	00	1 of 1
				Index No. 506



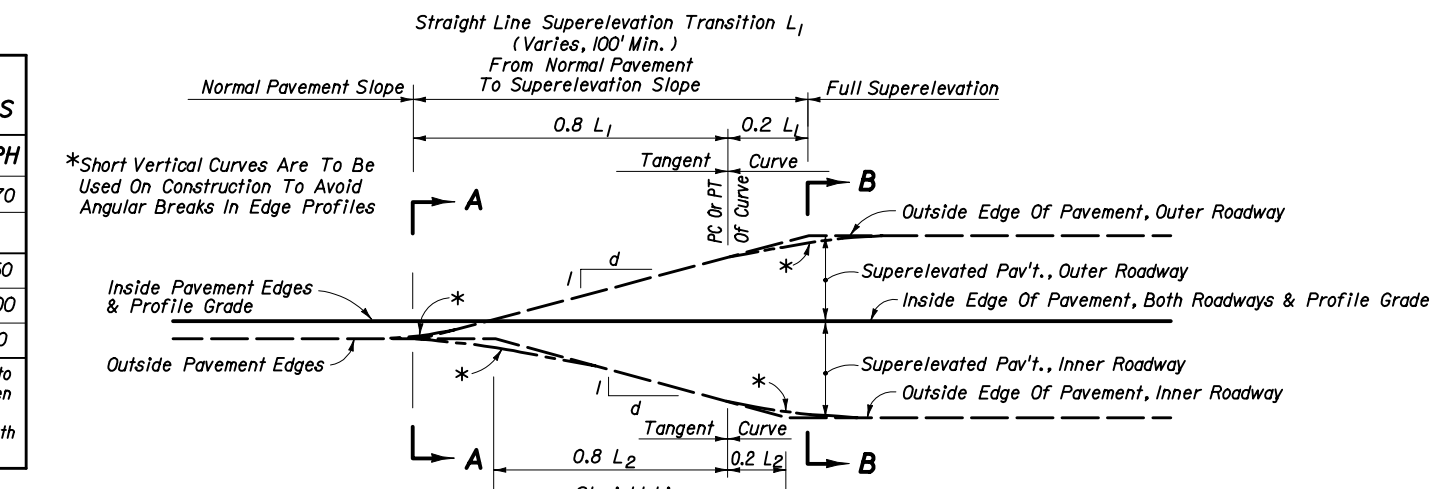
PROFILES

SLOPE RATIOS FOR SUPERELEVATION TRANSITIONS			
SECTION	DESIGN SPEED, MPH		
	45-50	55-60	65-70
2 Lane & 4 Lane	1: 200	1: 225	1: 250
6 Lane	1: 160	1: 180	1: 200
8 Lane	1: 150	1: 170	1: 190

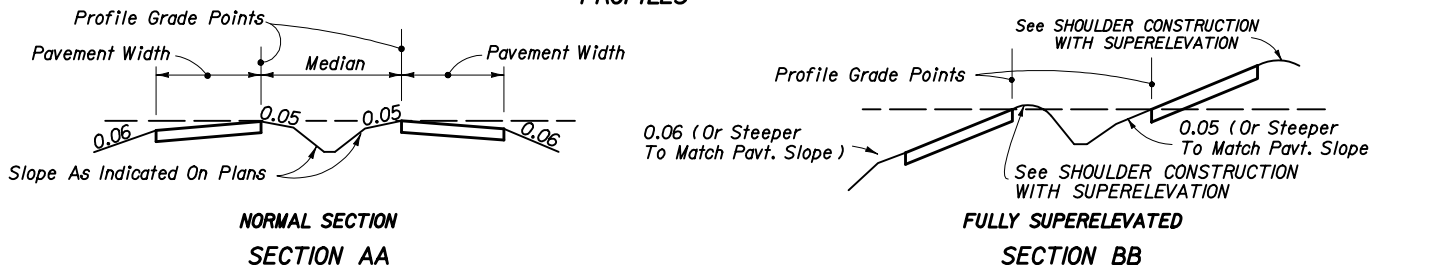
The length of superlevation transition is to be determined by the relative slope between the travel way edge of pavement and the profile grade, except that the minimum length of transition shall be 100 ft.



2-LANE, 4-LANE OR 6-LANE PAVEMENT, NO MEDIAN



PROFILES



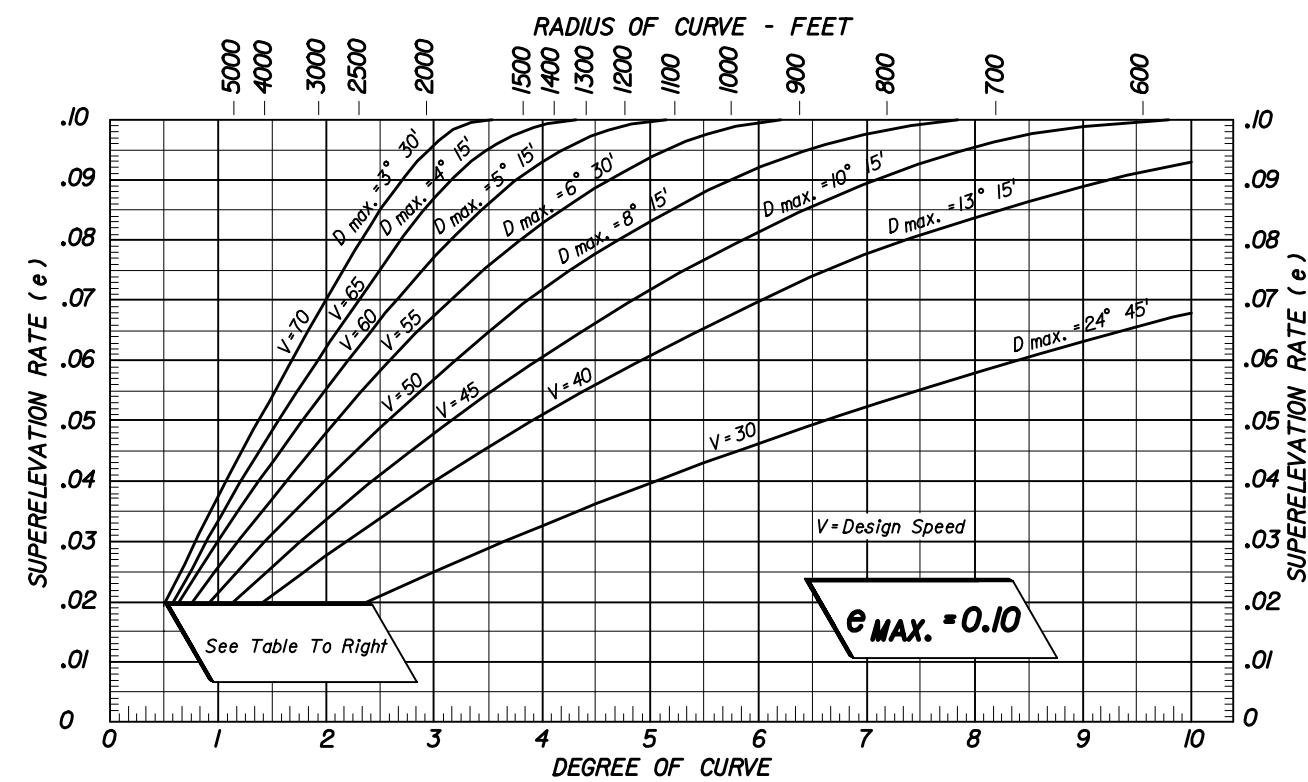
4-LANE OR 6-LANE PAVEMENT WITH MEDIAN

THESE TRANSITION DETAILS ARE TO APPLY IN ALL IN ALL CASES, EXCEPT UNDER THE FOLLOWING CONDITIONS:

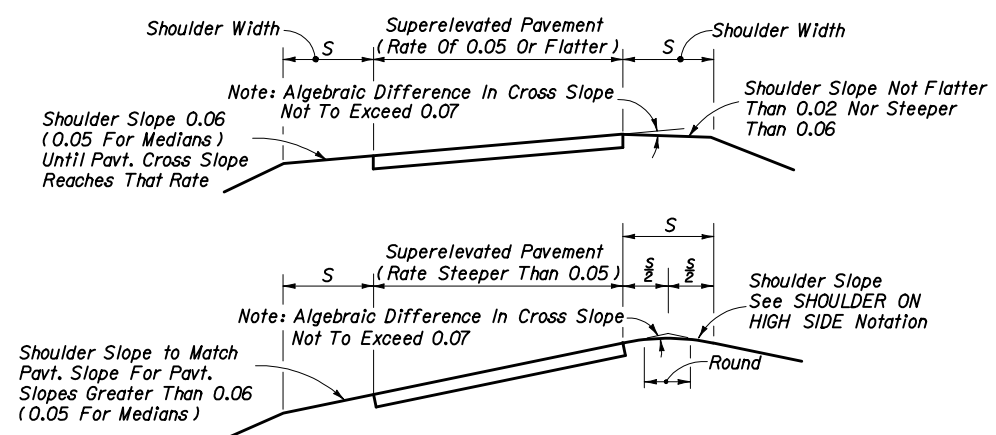
1. Curves of insufficient length.
2. Insufficient tangent length between curves.
3. Deficient transition distance between a curve and other control point(s).
4. At PCC's or PRC's (Runoff rates are applicable).

Transitions for these exceptions are to be as detailed in the plans.

SUPERELEVATION TRANSITIONS



DESIGN SUPERELEVATION RATES FOR RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS



SHOULDER ON HIGH SIDE: A shoulder slope of 0.06 downward from the edge of pavement will be maintained until a 0.07 break in slope at the pavement edge is reached due to superlevation of the pavement. As the pavement superlevation increases, the 0.07 break in slope will be maintained and the shoulder flattened until the shoulder slope reaches the minimum of 0.02 downward from the edge of pavement. Any further increase in pavement superlevation will necessitate sloping the inside half of the shoulder toward the pavement and the outer half outward, both at 0.02 for superelevations 0.06-0.09 and both at 0.03 for superlevation 0.10.

SHOULDER ON LOW SIDE: Maintain 0.06 drop across inside shoulder until pavement cross slope reaches 0.06. For pavement cross slopes greater than 0.06, shoulder to have same slope as pavement. These slopes are the same as those shown pictorially on sheet 2.

NOTE: These details apply to both paved and grassed shoulders. For median shoulders use 0.05 in lieu of 0.06.

SHOULDER CONSTRUCTION WITH SUPERELEVATION

DEGREE OF CURVE (D)	DESIGN SPEED, V MPH						
	30	40	45/50	55	60	65	70
0° 15'	NC	NC	NC	NC	NC	NC	NC
0° 30'	NC	NC	NC	NC	RC	RC	RC
0° 45'	NC	NC	RC	RC	0.023	0.025	0.028
1° 00'	NC	NC	0.021	0.025			
1° 30'	NC	0.021	SEE DESIGN SUPERELEVATION RATE TO LEFT				
2° 00'	RC						

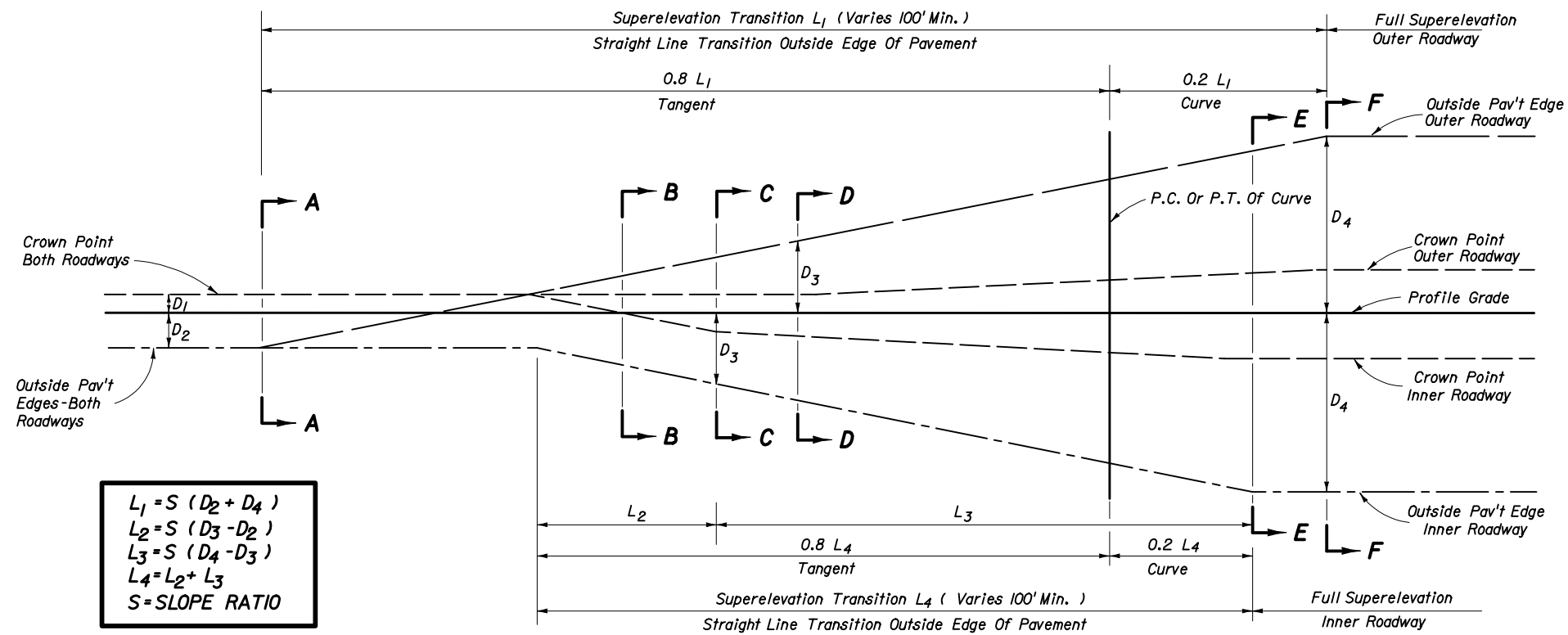
GENERAL NOTES
1. For curves in urban highways and high speed urban streets, see Index No. 511.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SUPERELEVATION
RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS

Designed By	HFW	5/65	Approved By	
Drawn By	LMF	10/74	Revision	
Checked By			00	1 of 2

Index No. 510



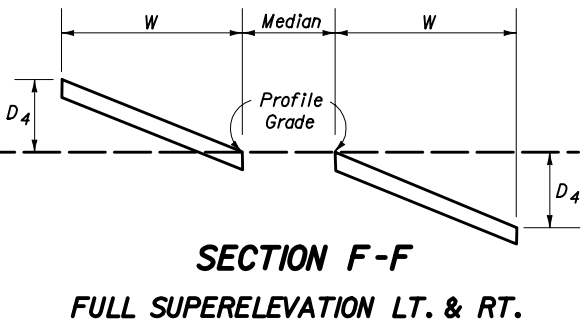
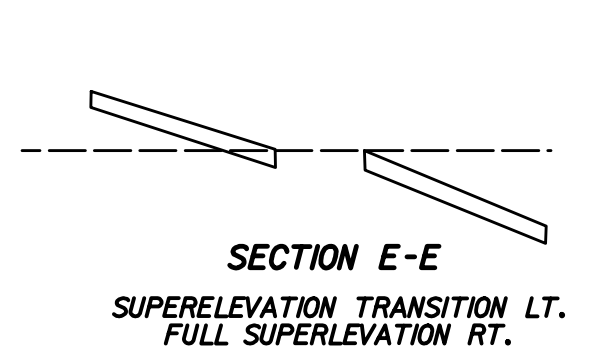
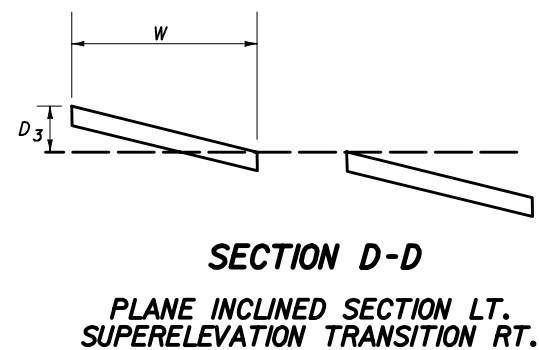
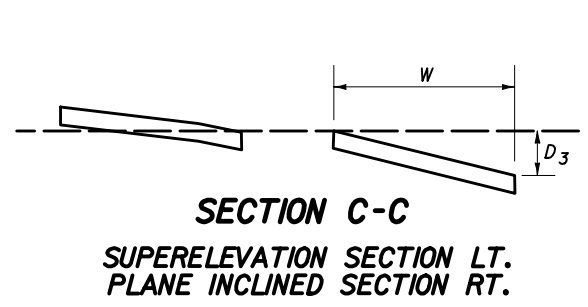
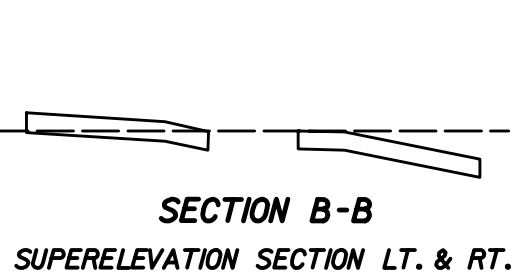
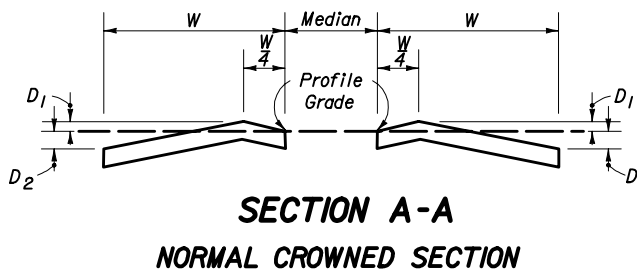
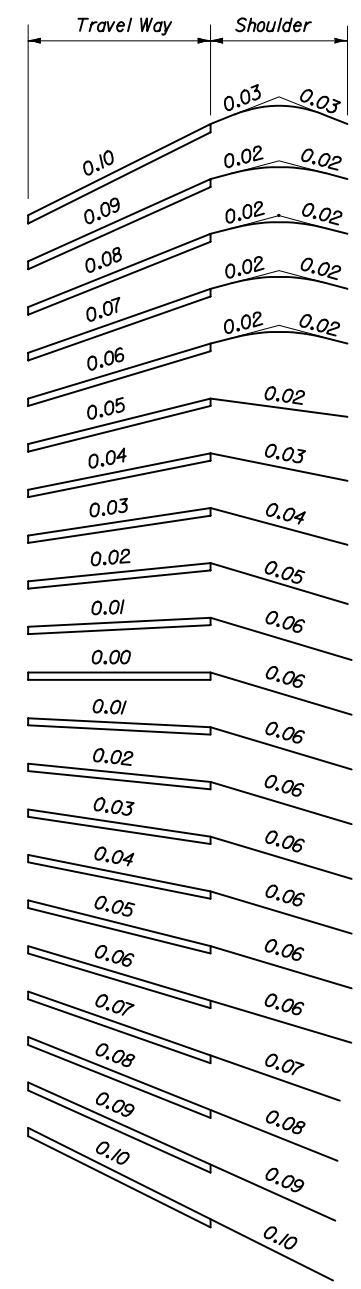
$$L_1 = S (D_2 + D_4)$$

$$L_2 = S (D_3 - D_2)$$

$$L_3 = S (D_4 - D_3)$$

$$L_4 = L_2 + L_3$$

$$S = \text{SLOPE RATIO}$$



SLOPES OF TRAVELED WAY
AND ABUTTING SHOULDERS
**SHOULDER SLOPES ON
SUPERELEVATION SECTIONS**

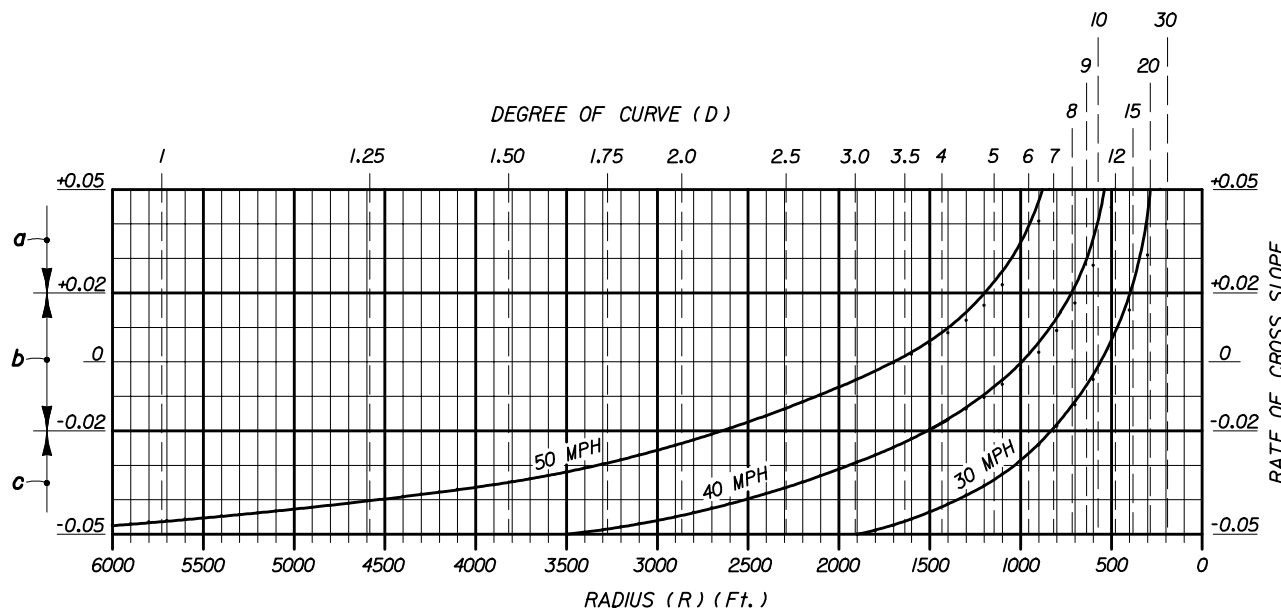
8-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SUPERELEVATION				
RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS				
Names	Dates	Approved By		
Designed By	WAL 8/77	 Roadway Design Engineer		
Drawn By	JMP 8/77	Revision	Sheet No.	Index No.
Checked By	WAL 8/77	00	2 of 2	510

SUPERELEVATION RATES (e) FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

$e_{max} = 0.05$

TABULATED VALUES		CHARTED VALUES				
Degree Of Curve (D)	Radius (R) (Ft.)	Design Speed (mph)				
		30	35	40	45	50
2° 00'	2,865	NC	NC	NC	NC	NC
2° 15'	2,546					RC
2° 45'	2,083				NC	
3° 00'	1,910				RC	
3° 45'	1,528			NC		
4° 00'	1,432			RC		
4° 45'	1,206					RC
5° 00'	1,146		NC			0.023
5° 15'	1,091		RC			0.027
5° 30'	1,042					0.030
5° 45'	996					0.035
6° 00'	955				RC	0.040
6° 15'	917				0.022	0.045
6° 30'	881				0.024	0.050
6° 45'	849				0.027	$D_{max.} = 6° 30'$
7° 00'	819	NC			0.030	
7° 15'	790	RC			0.033	
7° 30'	764				0.037	
7° 45'	739				0.041	
8° 00'	716			RC	0.045	
8° 15'	694			0.022	0.050	
8° 30'	674			0.025	$D_{max.} = 8° 15'$	
8° 45'	655			0.027		
9° 00'	637			0.030		
9° 30'	603			0.034		
10° 00'	573			0.040		
10° 30'	546		RC	0.047		
11° 00'	521		0.023	$D_{max.} = 10° 45'$		
11° 30'	498		0.026			
12° 00'	477		0.030			
13° 00'	441		0.036			
14° 00'	409	RC	0.045			
15° 00'	382	0.023	$D_{max.} = 14° 15'$			
16° 00'	358	0.027				
17° 00'	337	0.032				
18° 00'	318	0.038	NC = Normal Crown			
19° 00'	302	0.043	RC = Reverse Crown (+.02 Superelevation)			
20° 00'	286	0.050				
		$D_{max.} = 20° 00'$				



- a: When the speed curves and the degree of curve or radius lines intersect above this line, the pavement is to be superelevated (positive slope) at the rates indicated at the lines intersecting points.
- b: When the speed curves and the degree of curve or radius lines intersect between these limits, the pavement is to be superelevated at the rate of 0.02 (positive slope).
- c: When the speed curves and the degree of curve or radius lines intersect below this line, the pavement is to have normal crown (typically 0.02 and 0.03 downward slopes).

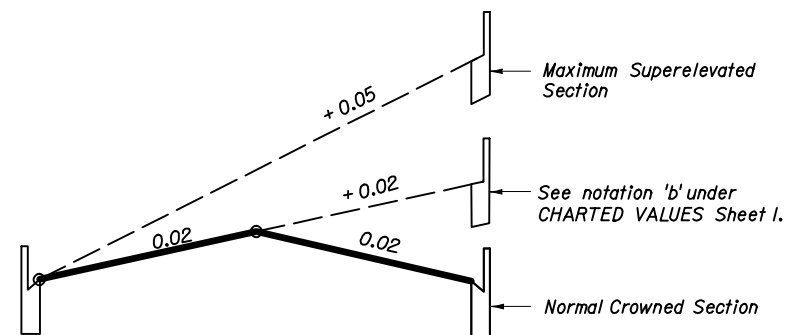
GENERAL NOTES

1. Maximum rate of superelevation for urban highways and high speed urban streets shall be 0.05.
2. Superelevation shall be obtained by rotating the plane successively about the break points of the section until the plane has attained a slope equal to that required by the chart. Should the rotation traverse the entire section and further superelevation be required, the remaining rotation of the plane shall be about the low edge of the inside travel lane.
Crown is to be removed in the auxiliary lane to the outside of the curve only when the adjoining travel lanes require positive superelevation.
3. When positive superelevation is required, the slope of the gutter on the high side shall be a continuation of the slope of the superelevated pavement.
4. In construction, short vertical curves shall be placed at all angular profile breaks within the limits of the superelevation transition.
5. The variable superelevation transition length "L" shall have a minimum value of 50 feet for design speeds under 40 MPH and 75 feet for design speeds of 40 MPH or greater.
6. Roadway sections having lane arrangements different from those shown, but composed of a series of planes, shall be superelevated in a similar manner.
7. For superelevation of lower speed urban streets, see the FDOT 'Manual Of Uniform Minimum Standards For Design, Construction And Maintenance For Streets And Highways'. For superelevation of curves on rural highways, urban freeways and high speed urban highways, see Index No. 510.

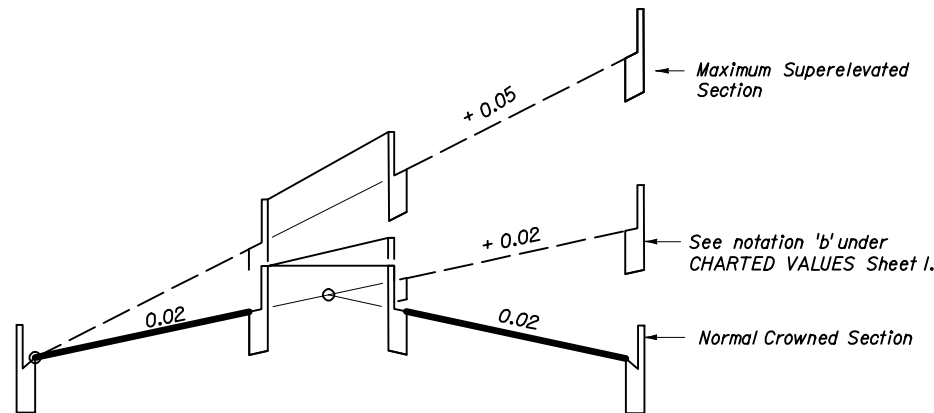
$e_{max} = 0.05$

SUPERELEVATION FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

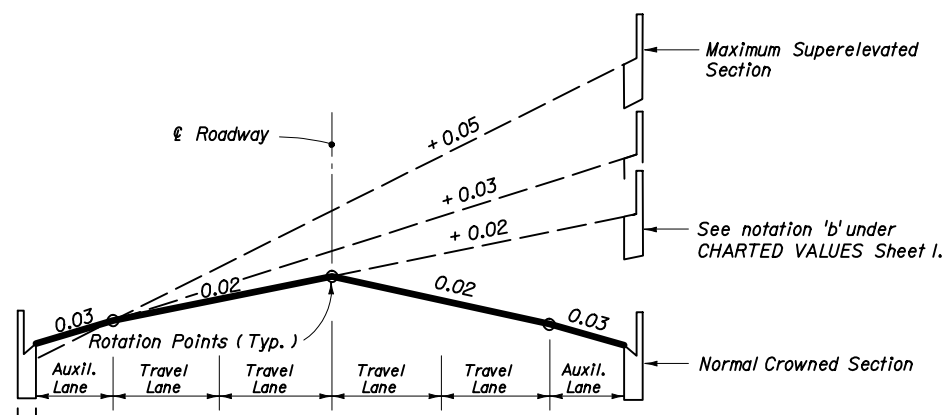
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SUPERELEVATION				
URBAN HIGHWAYS AND STREETS				
Names	Dates	Approved By		
Designed By	WLB/JVG 66 & 90	Roadway Design Engineer		
Drawn By	CDR/HSD 67 & 90	Revision	Sheet No.	Index No.
Checked By	RLD/JVG 67 & 90	00	1 of 3	511



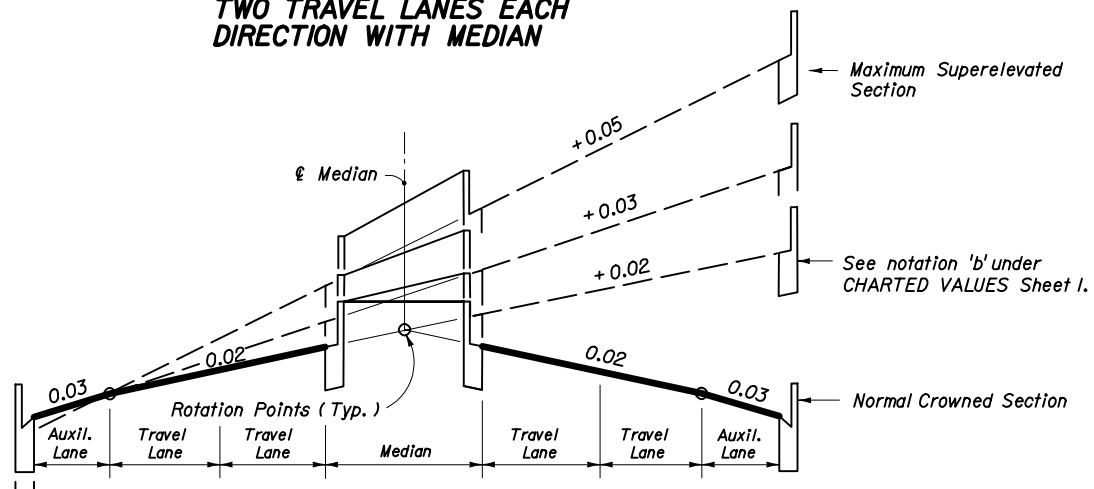
TWO TRAVEL LANES EACH DIRECTION



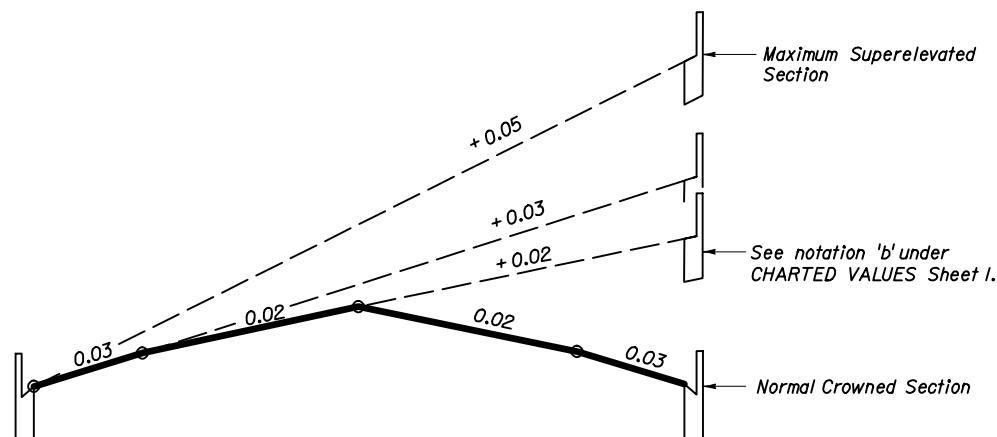
TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN



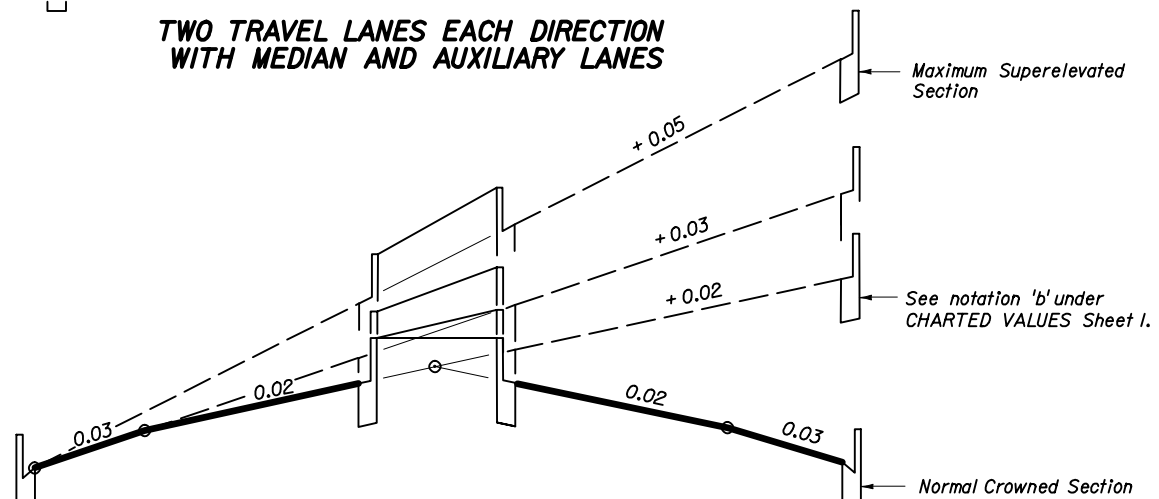
TWO TRAVEL LANES EACH DIRECTION WITH AUXILIARY LANES



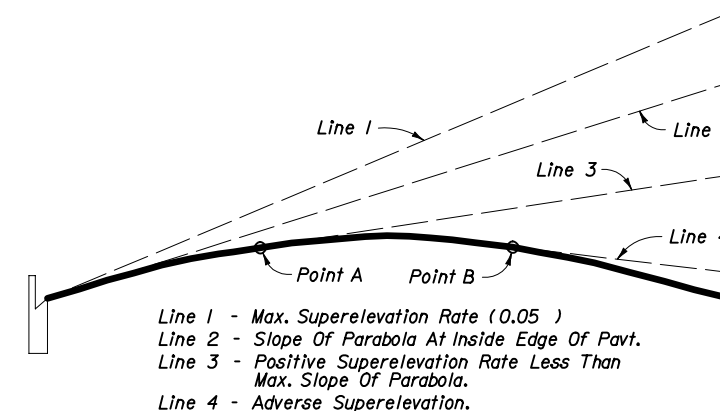
TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANES



THREE TRAVEL LANES EACH DIRECTION



THREE TRAVEL LANES EACH DIRECTION WITH MEDIAN



Line 1 - Max. Superelevation Rate (0.05)
 Line 2 - Slope Of Parabola At Inside Edge Of Pavt.
 Line 3 - Positive Superelevation Rate Less Than Max. Slope Of Parabola.
 Line 4 - Adverse Superelevation.

Superelevation rates obtained from the chart or table on Sheet I are also applicable to a parabolic crown section. When this section is used, superelevation is established by rotating a tangent about the arc of the parabolic crown until the desired slope is attained (points A & B on sketch). The normal parabolic crown will be maintained outside the limits of the plane thus formed.

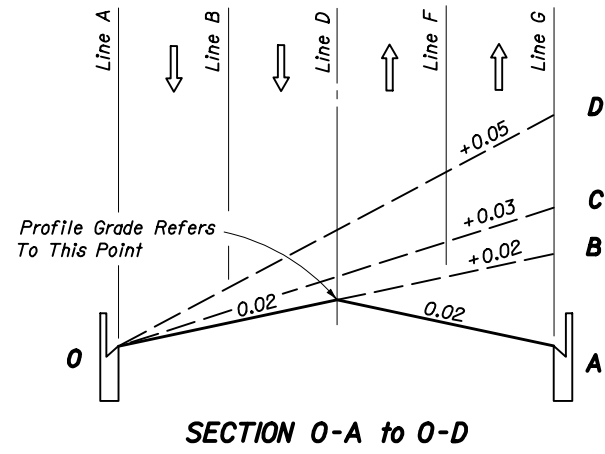
PARABOLIC SECTION

UNDIVIDED FACILITIES

DIVIDED FACILITIES

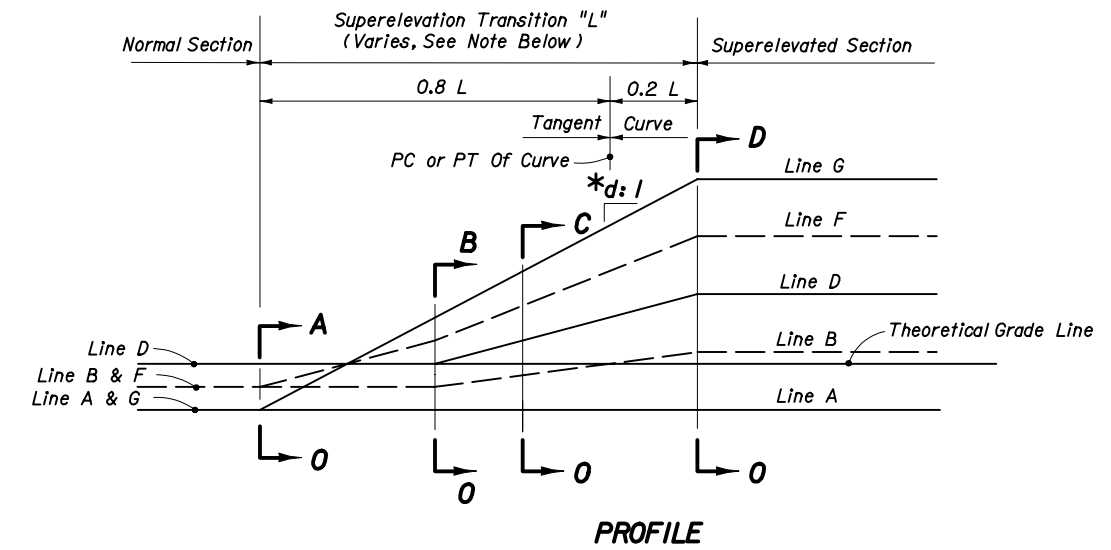
**SUPERELEVATION TRANSITION SECTIONS
 FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SUPERELEVATION				
URBAN HIGHWAYS AND STREETS				
Names	Dates	Approved By		
Designed By	WLB/JVG	66/90	 Roadway Design Engineer	
Drawn By	CDR/HSD	67/90		
Checked By	RLO/JVG	67/90		
Revision	00	Sheet No.		
		2 of 3	511	



SECTION 0-A to 0-D

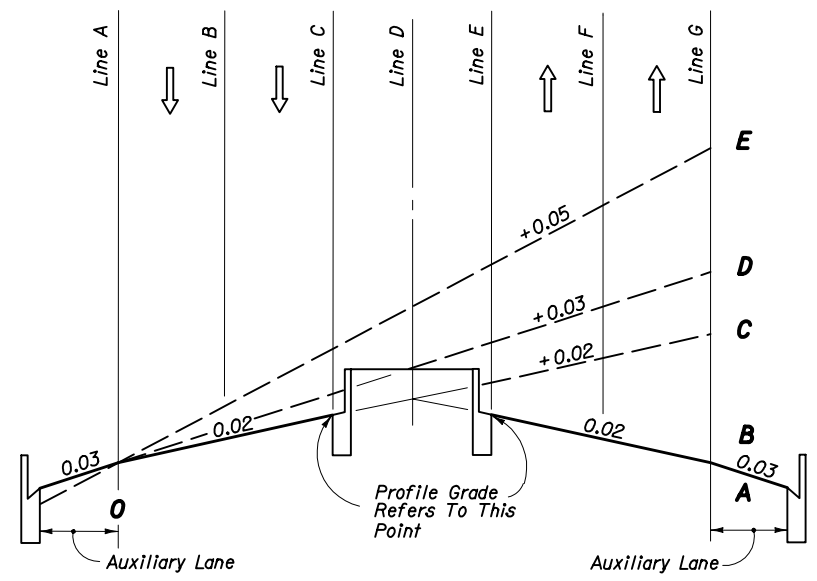
TWO LANES EACH DIRECTION



PROFILE

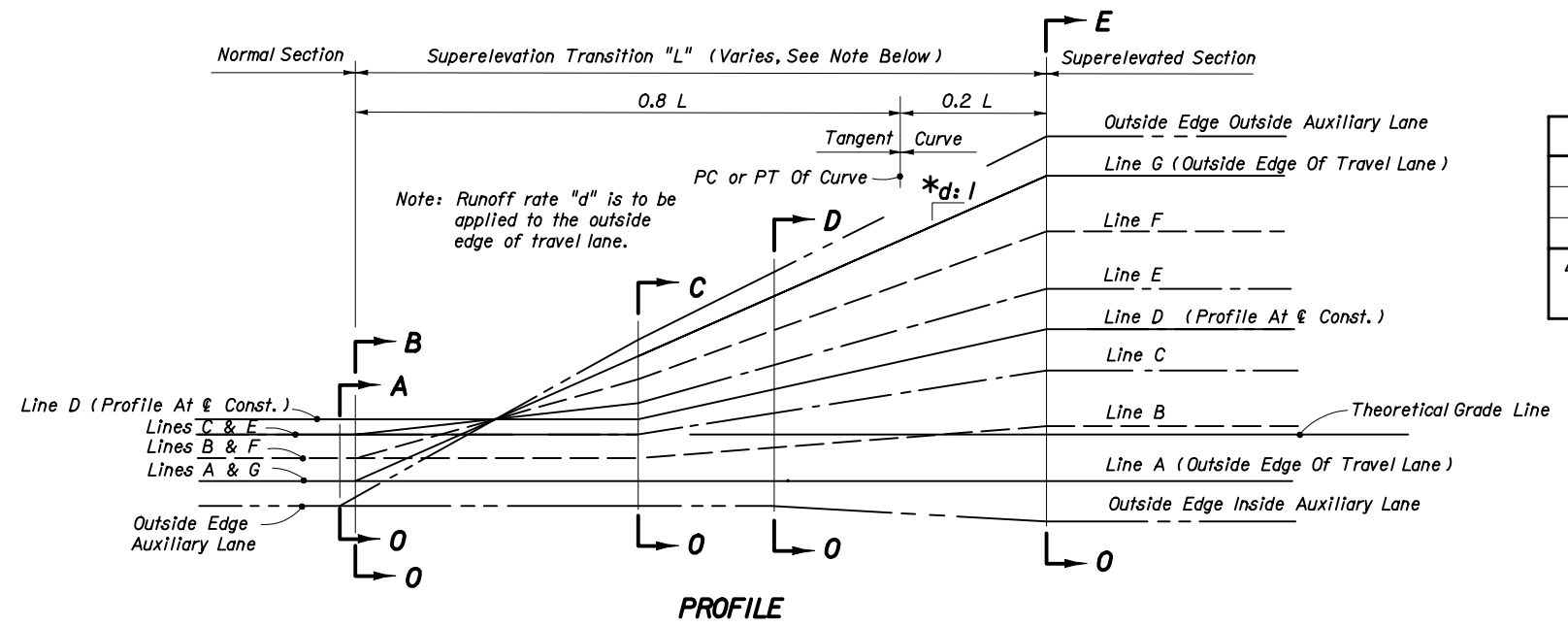
LINE	DESCRIPTION
A	Inside Travel Lane
B	Inside Lane Line
C	Inside Median Edge Pavement
D	℄ Construction
E	Outside Median Edge Pavement
F	Outside Lane Line
G	Outside Travel Lane

Inside And Outside Are Relative To Curve Center



SECTION 0-A to 0-E

TWO LANES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANE



PROFILE

*d (Slope Ratio)	
30 MPH	1: 100
40 MPH	1: 125
45-50 MPH Δ	1: 150

Δ 1: 125 May Be Used For 45 MPH Under Restricted Conditions.

Note: The sections and profiles shown are examples of superelevation transitions. Similar schemes should be used for roadways having other sections.

EXAMPLE SUPERELEVATION SECTIONS AND PROFILES FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SUPERELEVATION URBAN HIGHWAYS AND STREETS

Names	Dates	Approved By		
Designed By	WLB/JVG 66/90	Roadway Design Engineer	Revision	Sheet No.
Drawn By	CDR/HSD 67/90		00	3 of 3
Checked By	RLO/JVG 67/90		Index No.	511

BASE THICKNESS AND OPTION CODES										
Base Group	Structural Range	Base Group Pay Item Number	Base Options							RAP Base
			Limerock LBR 100	Cemented Coquina LBR 100	Shell Rock LBR 100	Bank Run Shell LBR 100	Graded Aggregate Base LBR 100	Type B-12.5	B-12.5 And 4" Granular Subbase, LBR 100 *	
			Structural Number (Per. in.)							
			(.18)	(.18)	(.18)	(.18)	(.15)	(.30)	(.30 & .15)	
1	.65-.75	701	4"	4"	4"	4"	4 1/2"	△ 4"	□ 5"	
2	.80-.90	702	5"	5"	5"	5"	5 1/2"	△ 4"		
3	.95-1.05	703	5 1/2"	5 1/2"	5 1/2"	5 1/2"	6 1/2"	△ 4"		
4	1.05-1.15	704	6"	6"	6"	6"	7 1/2"	△ 4"		
5	1.25-1.35	705	7"	7"	7"	7"	8 1/2"	4 1/2"		
6	1.35-1.50	706	8"	8"	8"	8"	9"	5"		
7	1.50-1.65	707	8 1/2"	8 1/2"	8 1/2"	8 1/2"	10"	5 1/2"		
8	1.65-1.75	708	9 1/2"	9 1/2"	9 1/2"	9 1/2"	11"	5 1/2"		
9	1.75-1.85	709	10"	10"	10"	10"	12"	6"	4"	
10	1.90-2.00	710	11"	11"	11"	11"	∅ 13"	6 1/2"	4 1/2"	
11	2.05-2.15	711	12"	12"	12"	12"	∅ 14"	7"	5"	
12	2.20-2.30	712	12 1/2"	12 1/2"	12 1/2"	12 1/2"		7 1/2"	5 1/2"	
13	2.35-2.45	713	∅ 13 1/2"	∅ 13 1/2"	∅ 13 1/2"	∅ 13 1/2"		8"	6"	
14	2.45-2.55	714	∅ 14"	∅ 14"	∅ 14"	∅ 14"		8 1/2"	6 1/2"	
15	2.60-2.70	715						9"	7"	

GENERAL NOTES

1. On new construction and complete reconstruction projects where an entirely new base is to be built, the design engineer may specify just the Base Group and any of the unrestricted General Use Optional Bases shown in that base group may be used. Note, however, that some thick granular bases are limited to widening which prevents their general use.
2. Where base options are specified in the plans, only those options may be bid and used.
3. The designer may require the use of a single base option, for instance Type B-12.5 in a high water condition. This will still be bid as Optional Base.

* For granular subbase, the construction of both the subbase and Type B-12.5 will be paid for under the contract unit price for Optional Base. Granular subbases include Limerock, Cemented Coquina, Shell Rock, Bank Run Shell and Graded Aggregate Base at LBR 100. The base thickness shown is Type B-12.5. All subbase thicknesses are 4".

∅ To be used for widening only, three feet or less.

△ Based on minimum practical thicknesses.

□ Restricted to non-limited access shoulder base construction.

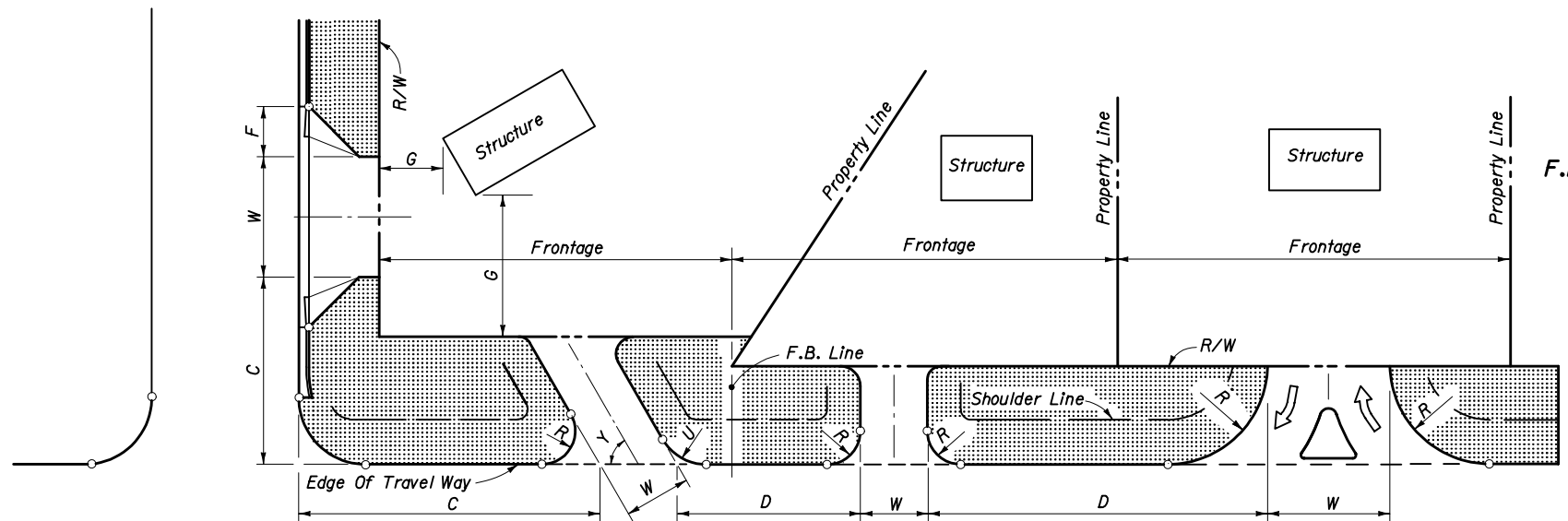
GENERAL USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
OPTIONAL BASE GROUP AND STRUCTURAL NUMBERS				
Designed By	HMD	12/93	Approved By <i>Bruce Distel</i> State Pavement Design Engineer	
Drawn By	HKH	12/93	Revision	Sheet No. Index No.
Checked By	BTD	12/93	00	1 of 2 514

BASE THICKNESS AND OPTION CODES									
Base Group	Structural Range	Base Group Pay Item Number	Base Options						
			Limerock Stabilized LBR 70	Shell LBR 70	Shell Stabilized LBR 70	Sand-Clay LBR 75	Soil Cement (300 psi) (Plant Mixed)	Soil Cement (300 psi) (Road Mixed)	Soil Cement (500 psi) (Plant Mixed)
			Structural Number (Per. in.)						
			(.12)	(.12)	(.10)	(.12)	(.15)	(.15)	(.20)
1	.60-.75	701	5"	5"	7"	5"	5"	5"	4"*
2	.75-.90	702	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	4"
3	.95-1.05	703	8"	8"	9 $\frac{1}{2}$ "	8"	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	5"
4	1.05-1.15	704	9"	9"	10 $\frac{1}{2}$ "	9"	7 $\frac{1}{2}$ "	7 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "
5	1.20-1.35	705	10"	10"	12"	10"	8 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	6"
6	1.30-1.45	706	11"	11"		11"	9"		7"
7	1.45-1.60	707	12 $\frac{1}{2}$ "	12 $\frac{1}{2}$ "		12 $\frac{1}{2}$ "	10"		7 $\frac{1}{2}$ "
8	1.65-1.75	708					11"		8 $\frac{1}{2}$ "
<p>Not Recommended For 20 Year Design Accumulated 18 kip Equivalent Single Axle (ESAL) Loads Greater Than 1,000,000</p>									
<p>Note: These base materials may be used on FDOT projects when approved in writing by the District Materials Engineer and shown in the plans. * Based On Minimum Practical Thickness</p>									

LIMITED USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
OPTIONAL BASE GROUP AND STRUCTURAL NUMBERS				
Designed By	HMD	12/93	Approved By <i>Bruce Dietel</i> State Pavement Design Engineer	
Drawn By	HKH	12/93	Revision	Sheet No. Index No.
Checked By	BTD	12/93	00	2 of 2 514



- LEGEND**
- Return Radius Point Or Flare Point
 - Buffer Areas
 - F.B. Line** Frontage Boundary Line
 - W** Driveway Width
 - Y** Driveway Angle
 - C** Corner Clearance
 - G** Setback
 - R** Outside Radius
 - U** Inside Radius
 - D** Distance Between Connections
 - F** Flare

GENERAL NOTES

1. For definitions and descriptions of access connection "Categories" and access "Classifications" of highway segments, and for other detailed information on access to the State Highway System, refer to FDOT Rule Chapter 14-96, "State Highway Connection Permits Administrative Process" and Rule Chapter 14-97, "State Highway System Access Management Classification System And Standards"
2. For this index the term 'turnout' applies to that portion of driveways, roads or streets adjoining the outer roadway. For this index the term 'connection' encompasses a driveway, street or road and their appurtenant islands, separators, transition tapers, auxiliary lanes, travelway flares, drainage pipes and structures, crossovers, sidewalks, curb cut ramps, signing, pavement marking, required signalization, maintenance of traffic or other means of access to or from controlled access facilities. The turnout requirements set forth in this index do not provide complete intersection design, construction or maintenance requirements.
3. The location, positioning, orientation, spacing and number of connections and median openings shall be in conformance with FDOT Rule Chapter 14-97.
4. On Department construction projects all driveways not shown on the plans are to be reconstructed at their existing location in conformance to these standards, or, in conformance to permits issued during the construction project.
5. Driveways shall have sufficient length and size for all vehicular queueing, stacking, maneuvering, standing and parking to be carried out completely beyond the right of way line. Except for vehicles stopping to enter the highway, the turnout areas and drives within the right of way shall be used only for moving vehicles entering or leaving the highway.
6. Connections with expected daily traffic over 4000 vpd are to be constructed as intersecting streets or roads. The design requirement of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.

For connections with expected daily traffic less than 4000 vpd, the Department will determine if drop curbs or radius returns are required in accordance with existing or planned connections. Where radius returns apply, the design requirements of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.

For connections that are intended to daily accommodate either multi-unit vehicles or single unit vehicles exceeding 30' in length, returns with 50' radii are to be used, unless otherwise called for in the plans or otherwise stipulated by permit. Where large numbers of multi-unit vehicles will use the connection, the connection width and radii are to be increased and auxiliary lanes, tapers, lane flares, separators and/or islands constructed, as determined by the Department to be necessary for safe turning movements.
7. Any connection on a highway having a posted or operating speed over 45 mph shall have radial returns. Any connection requiring or having a specified median opening with left turn storage and served directly by that opening shall have radial returns.
8. Where a connection is intended to align with a connection across the highway, the through lanes are to align directly with the corresponding through lanes.
9. For new connections and for connections on all new construction and reconstruction projects, pavement materials and thicknesses shall meet the requirements applicable to either that detailed for "Urban Flared Turnouts", or, that described in "Table 515-1" for connections with radial returns and/or auxiliary lanes.
10. The responsibility for the cost of construction or alteration to an access connection shall be in accordance with FDOT Rule Chapter 14-96.

For Additional Information Refer To FDOT Rules Chapters 14-96 And 14-97.

SKETCH ILLUSTRATING DEFINITIONS

DESIGN NOTES

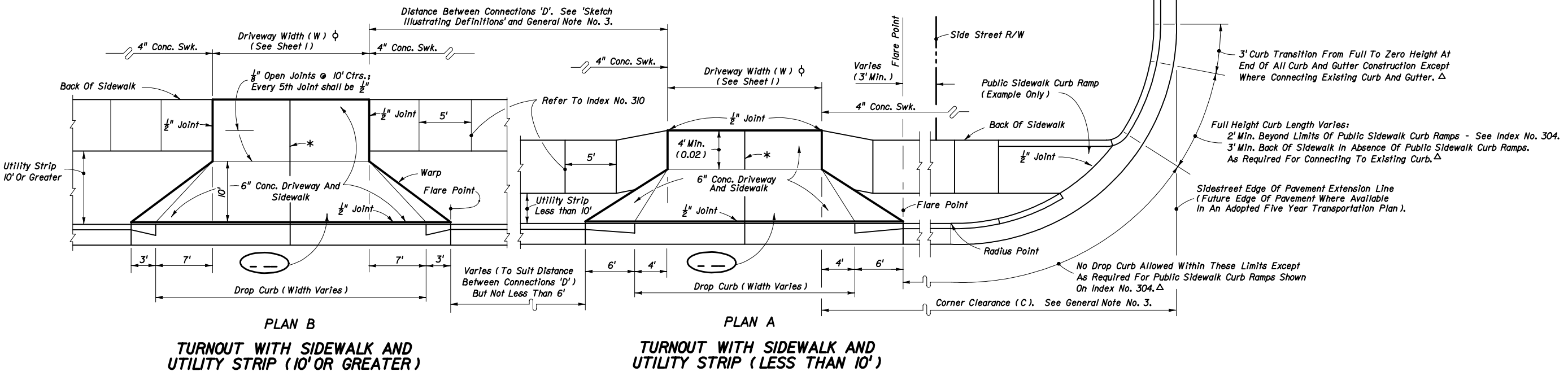
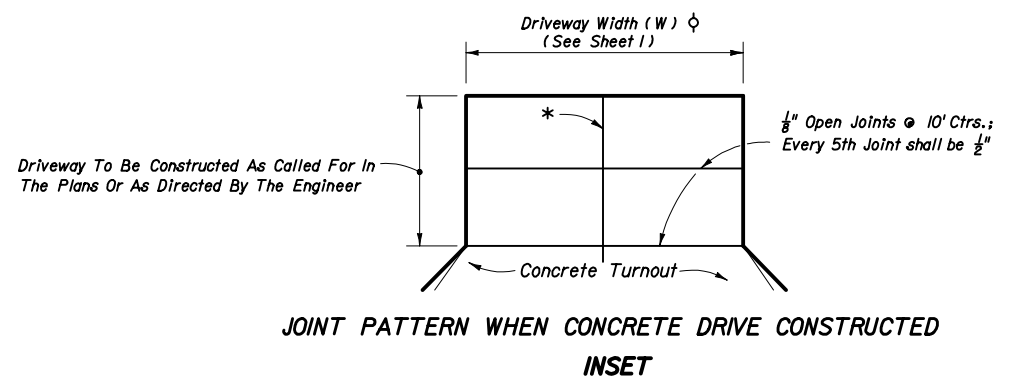
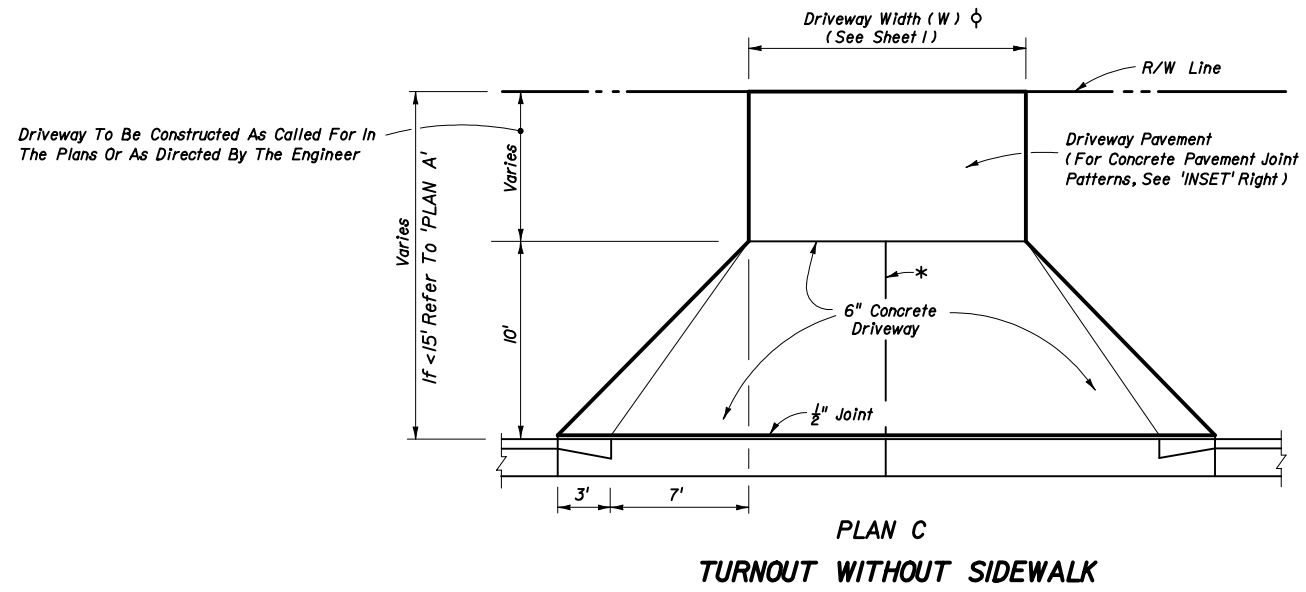
1. Prior to the adoption of FDOT Rules Chapters 14-96 and 14-97, connections to the State Highway System were defined and permitted by Classes. Connections have been redefined by Categories under Rule 14-96; and, the term "Class" has been applied to highway segments of the State Highway System as defined under Rule 14-97.

ELEMENT DESCRIPTION	URBAN (CURB & GUTTER)			RURAL		
	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day [■] or 61-400 Trips/Hour	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day [■] or 61-400 Trips/Hour
		2-Way □	2-Way □		2-Way □	2-Way □
CONNECTION WIDTH W	12' Min. 24' Max.	24' Min. 36' Max. ☆	24' Min. 36' Max. ☆	12' Min. 24' Max.	24' Min. 36' Max. ☆	24' Min. 36' Max. ☆
FLARE (Drop Curb) F	10' Min.	10' Min.	N/A	N/A	N/A	N/A
RETURNS (Radius) R & U	N/A	△	25' Min. 50' Std. 75' Max.	15' Min. 25' Std. 50' Max.	25' Min. 50' Std. 75' Max.	25' Min. 50' Std. (Or 3-Centered Curves)
ANGLE OF DRIVE Y		60°-90°	60°-90°		60°-90°	60°-90°
DIVISIONAL ISLAND (Throat Median)		4'-22' Wide	4'-22' Wide		4'-22' Wide	4'-22' Wide
SETBACK G	12' Min., All categories. See General Note No. 5.					

- Street or road intersection design, with possible auxiliary lanes and channelization, may be necessary. Intersection design, with possible auxiliary lanes and channelization, should be considered for connections with more than 4000 trips/days.
 - "2-Way" refers to one "in" movement and one "out" movement i.e. not exclusive left or right turn lanes on the connection.
 - ☆ When more than 2 lanes in the turnout connection are required, the 36' max. width may be increased to relieve interference between entering and exiting traffic which adversely affects traffic flow. These cases require documented site specific study and design.
 - △ Small radii may be used in lieu of flares as approved by the Department.
- DESIGN NOTE: 1-Way connections will be designed to effectively eliminate unpermitted movements.

NOT INTENDED FOR FULL INTERSECTION DESIGN
SUMMARY OF GEOMETRIC REQUIREMENTS FOR TURNOUTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
TURNOUTS					
Names	Dates	Approved By			
Designed By	COM/JV	90/91	<i>James D. Milk</i> Roadway Design Engineer		
Drawn By	HSD	03/91	Revision	Sheet No.	Index No.
Checked By	JVG	03/91	04	1 of 6	515



Footnotes:

- All 1/2" joints shall be constructed with preformed joint filler.
- * 1/8" Open Joints placed at equal (20' max.) intervals for driveways over 20' wide. Joints in curb and gutter to match joints in driveways.
- Δ When connecting to sidewalk curb and gutter sections, the no drop curb limits should extend back to the sidewalk radius point. With or without curb and gutter, no driveway should encroach on the corner radius.
- φ Driveways (6" concrete) shall be of a uniform width (W) to the right of way line.
- ⊖ Alpha-numeric identification of a flared driveway type specifically called for in the plans, see sheets 3 and 4.

SPECIAL NOTES FOR URBAN FLARED TURNOUTS

1. Driveway 6" concrete pavement and drop curb shall meet the material and construction requirements of Sections 522 and 520 respectively of the FDOT Standard Specifications. The driveway foundation shall meet the requirement of Subarticle 522-4.
2. For details of drop curb and public sidewalk curb ramps refer to Index Nos. 300 and 304 respectively.
3. Where turnouts are constructed within existing curb and gutter, the existing curb and gutter shall be removed either to the nearest joint beyond the flare point or to the extent that no remaining section is less than 5' long; and, drop curb constructed in accordance with Notes Nos. 1 and 2.
4. Cost for preformed joint filler shall be included in the cost for the concrete pavement (concrete sidewalk, 6" thick).
5. For turnouts with radial returns see the requirements under the "Summary Of Geometric Requirements For Turnouts", the "General Notes", the details of "Rural Turnout Construction" and the detail of "Limits Of Clearing & Grubbing, Stabilization And Base At Intersections".
6. Department maintenance of pavement shall extend out to the right of way or 2' back of sidewalk, whichever distance is less.
7. The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.
8. All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.
9. All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.
10. Turnouts will be paid for under the contract unit price for Concrete Sidewalk (6" Thick), SY.

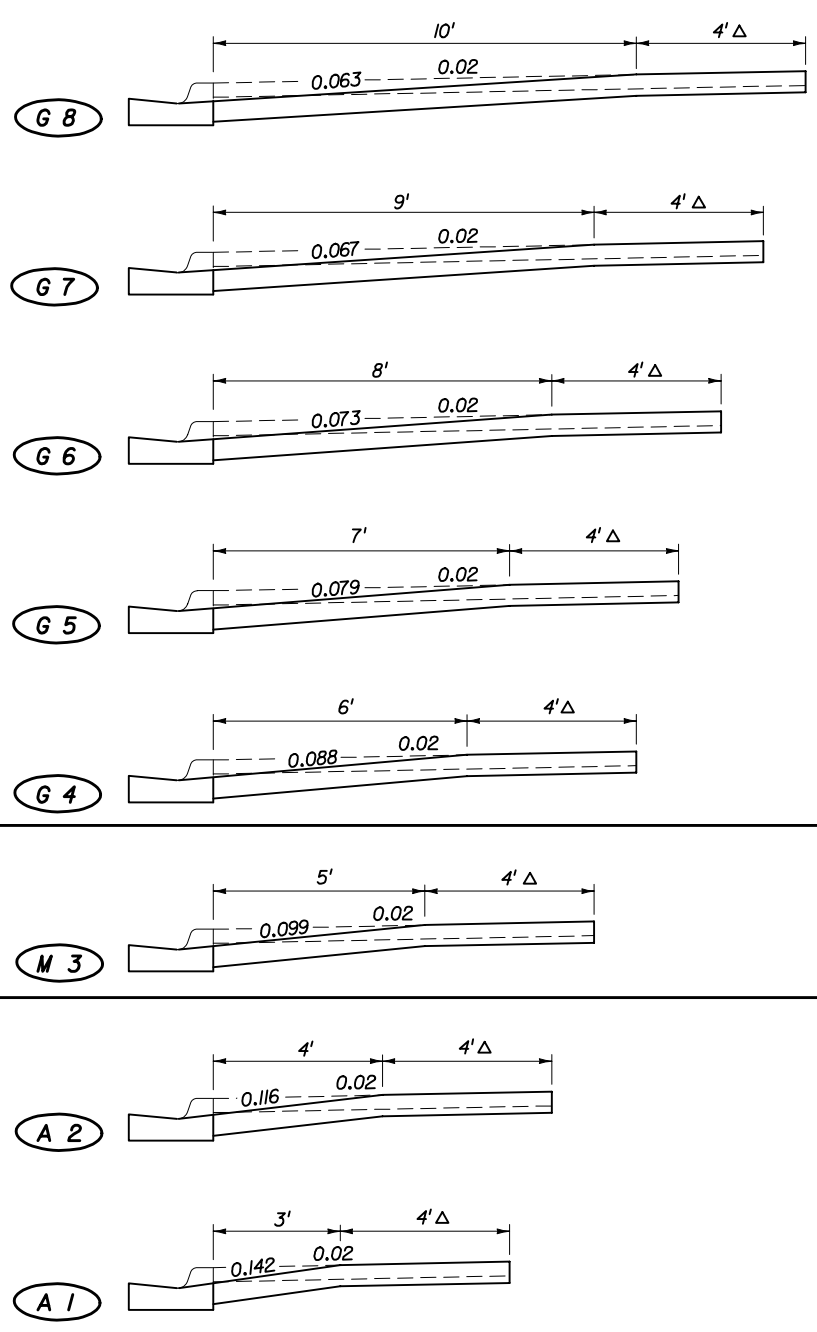
DESIGN NOTES FOR URBAN FLARED TURNOUTS

1. Driveways indicated as 'Adverse Applications' are those with slopes that can cause overhang drag for representative standard passenger vehicles under fully loaded conditions; or, those with slopes that can cause drivers who are leaving the roadway to slow or pause to the extent that traffic demand volumes will be impeded.
 2. The standard flared driveways on this index may not accommodate vehicles with low beds, low undercarriage or low appendage features. Where such vehicles are design vehicles driveways are to have site specific flare designs or Category III designs.
 3. When specific flare type driveways are to be constructed, the type shall be designated in the plans using the assigned alpha-numeric designation.
- Driveways indicated as 'Marginal Applications' are those with slopes that can cause overhang drag for representative standard passenger vehicles under fully loaded conditions when the driveway is located on the low side of fully superelevated roadways.
- Driveways indicated as 'General Applications' are those with slopes that can readily accommodate representative standard passenger vehicles and those that can accommodate representative standard trucks, vans, buses and recreational vehicles operating under normal crown and superelevation conditions.

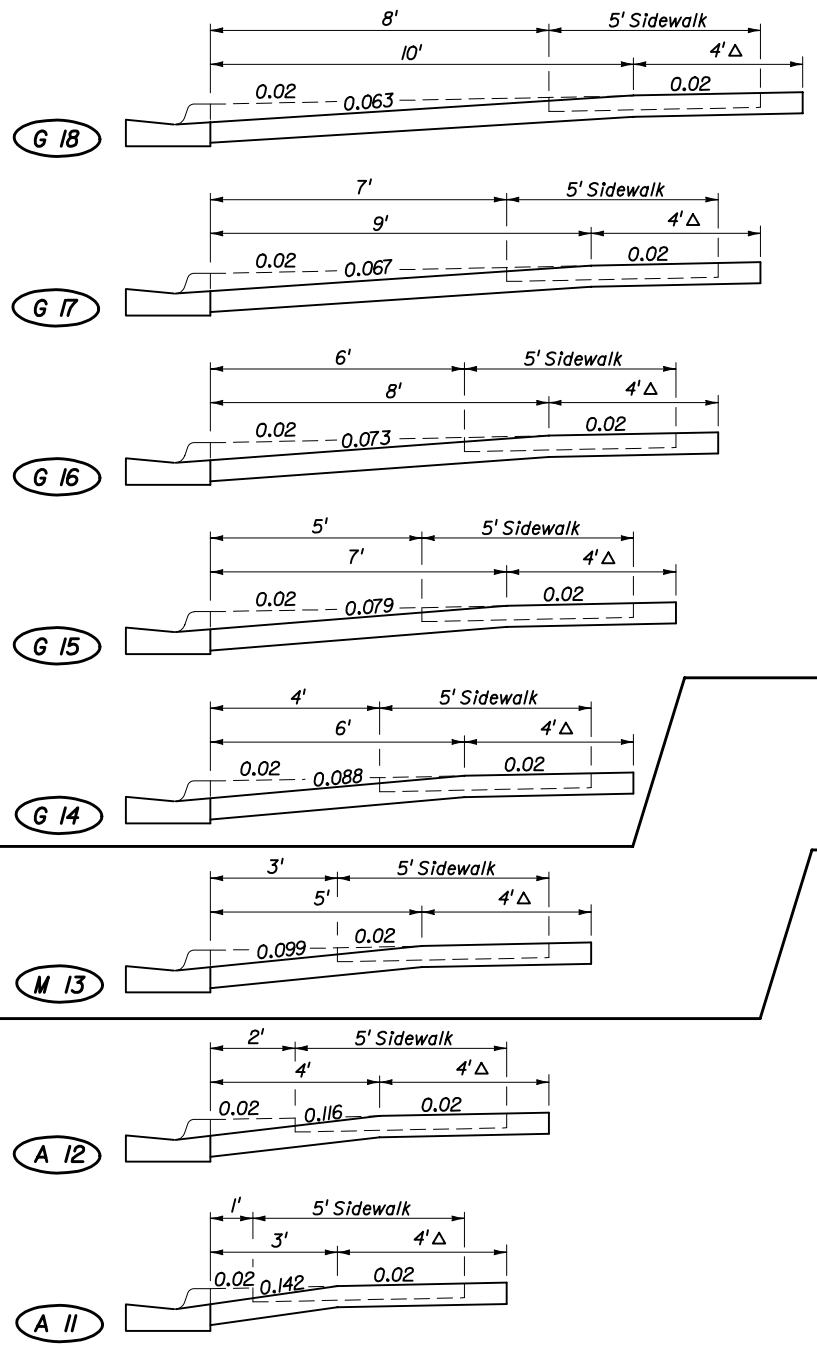
URBAN FLARED TURNOUTS

Note: See sheet 1 for 'GENERAL NOTES'

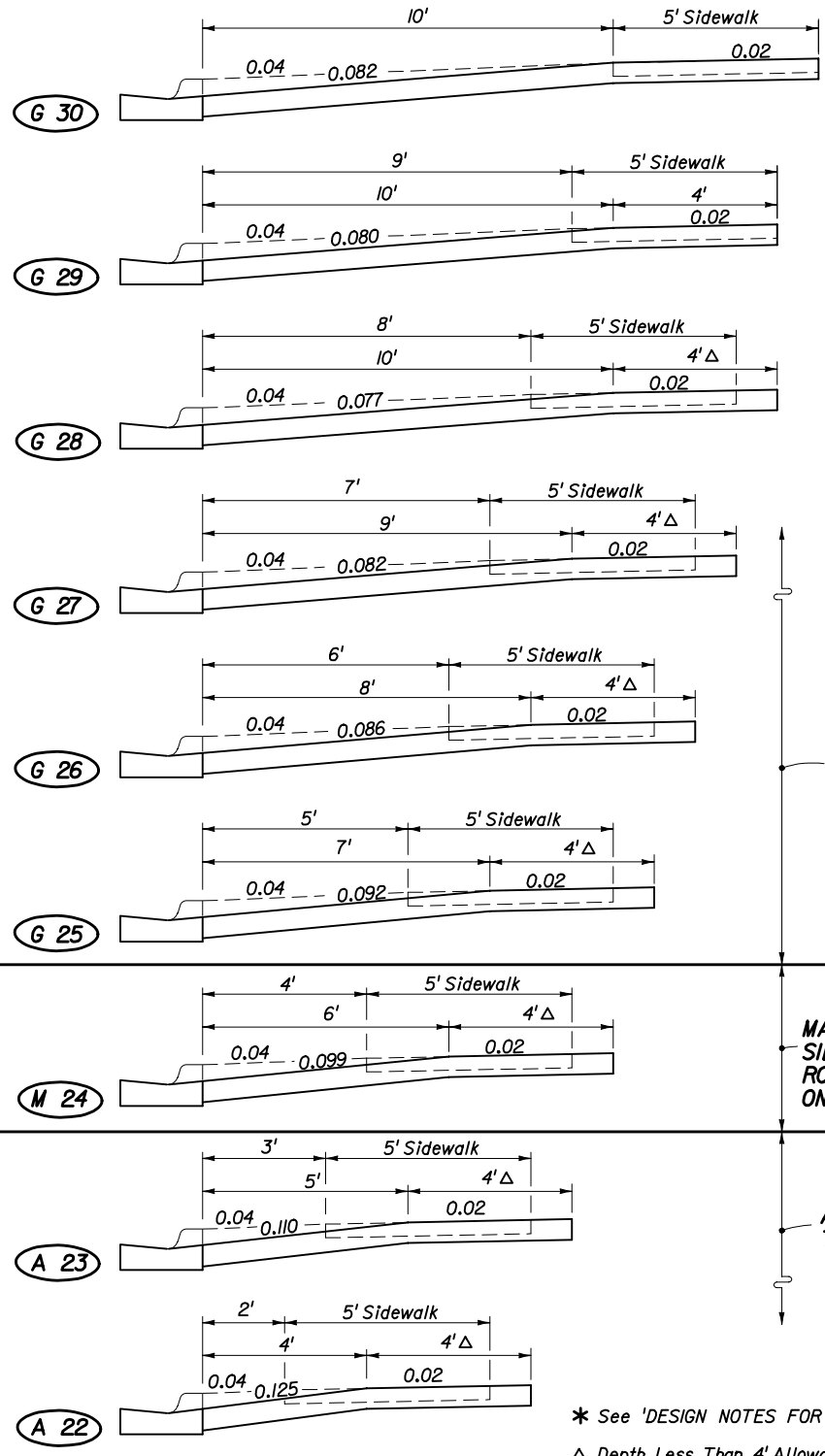
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TURNOUTS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By JVG/HKH	09/93	Roadway Design Engineer		
Drawn By HKH	09/93	Revision	Sheet No.	Index No.
Checked By JVG	09/93	00	2 of 6	515



SIDEWALK ADJACENT TO CURB



SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE



SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE

GENERAL* APPLICATIONS

MARGINAL* APPLICATIONS ON LOW SIDE OF FULLY SUPERELEVATED ROADWAY (REFER TO MODIFICATIONS ON SHEET 4)


ADVERSE* APPLICATIONS (REFER TO MODIFICATIONS ON SHEET 4)

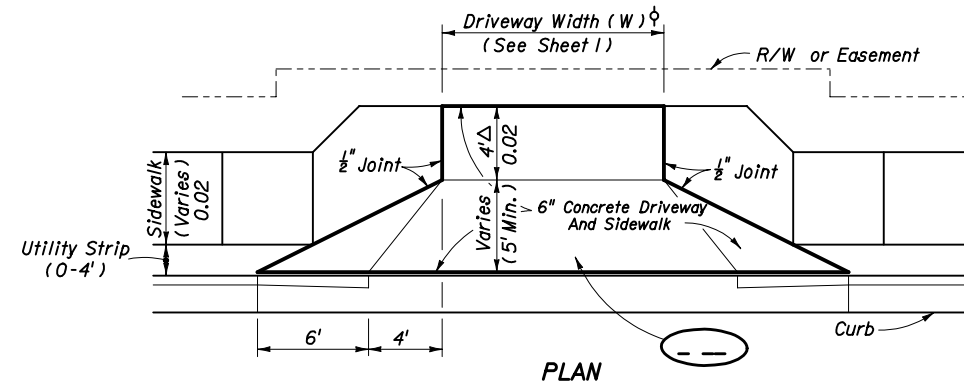
* See 'DESIGN NOTES FOR URBAN FLARED TURNOUTS' On Sheet 2.
 Δ Depth Less Than 4' Allowable Only Under Findings Of Infeasibility.

DRIVEWAY SECTIONS ON CURBED FACILITIES WITH SIDEWALKS

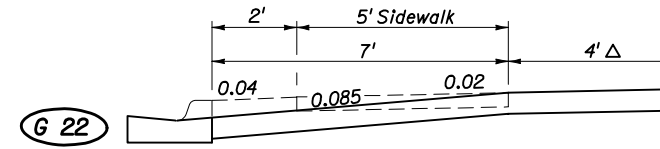
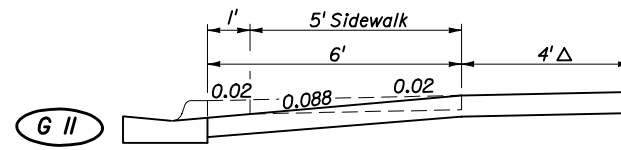
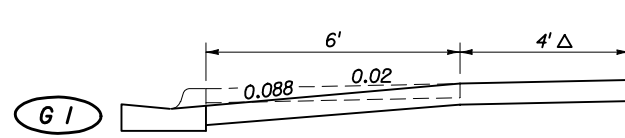
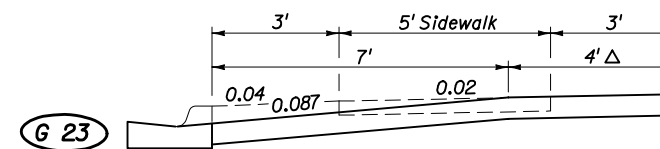
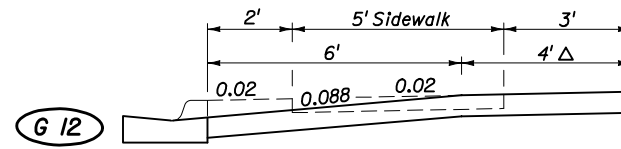
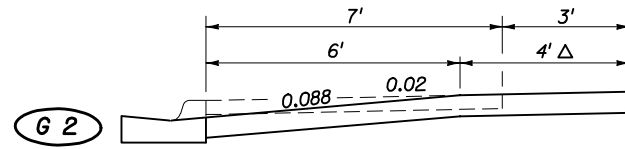
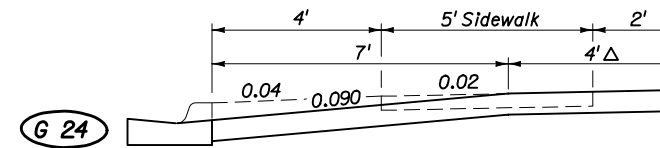
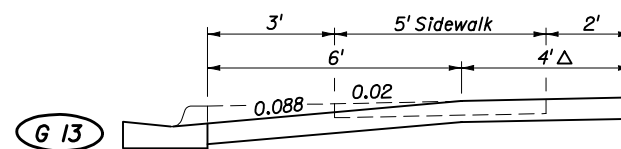
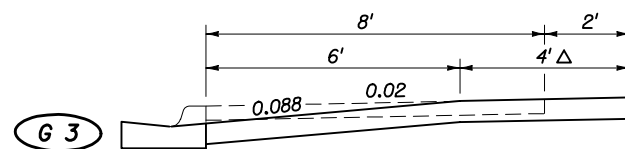
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TURNOUTS

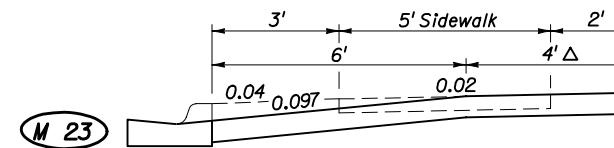
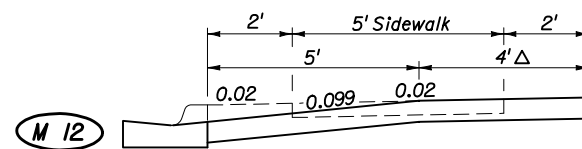
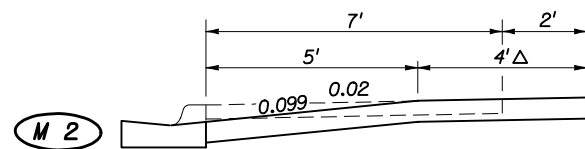
Names	Dates	Approved By		
Designed By	JVG/HKH	9/93	 Roadway Design Engineer	
Drawn By	HKH	9/93		
Checked By	JVG/FLS	9/93		
Revision	00	Sheet No.		
		3 of 6	515	



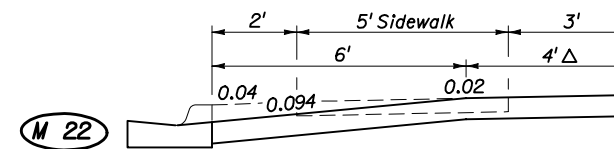
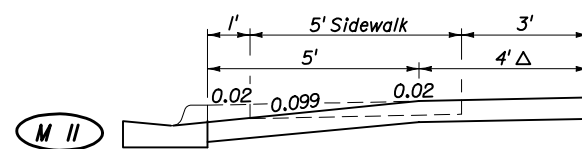
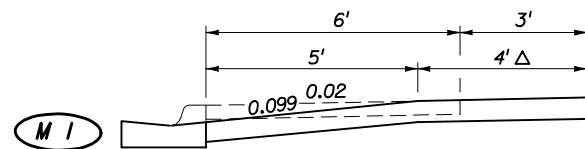
MODIFICATIONS OF 'ADVERSE' AND 'MARGINAL' APPLICATIONS



ADVERSE* AND MARGINAL* SECTIONS MODIFIED TO ACHIEVE GENERAL* APPLICATION



ADVERSE* SECTIONS MODIFIED TO ACHIEVE MARGINAL* APPLICATION



* See 'DESIGN NOTES FOR URBAN FLARED TURNOUTS' On Sheet 2.
Δ Depth Less Than 3' Allowable Only Under Findings Of Infeasibility.

SIDEWALK ADJACENT TO CURB


SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE

SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE

MODIFICATIONS TO ADVERSE AND MARGINAL SECTIONS

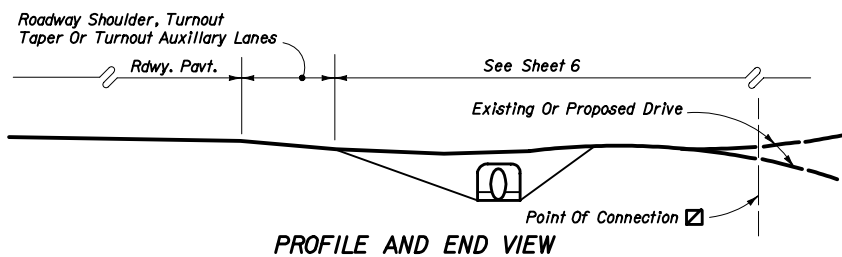
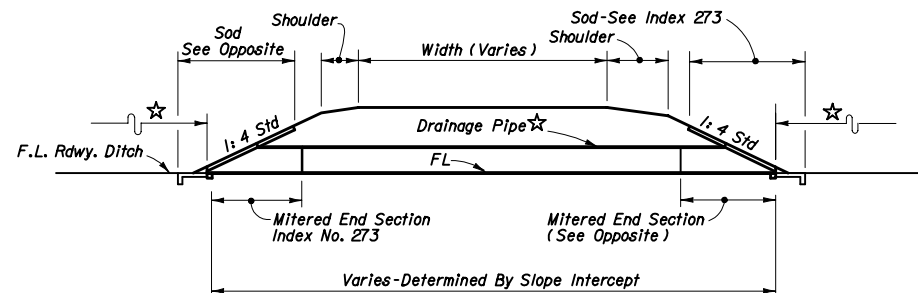
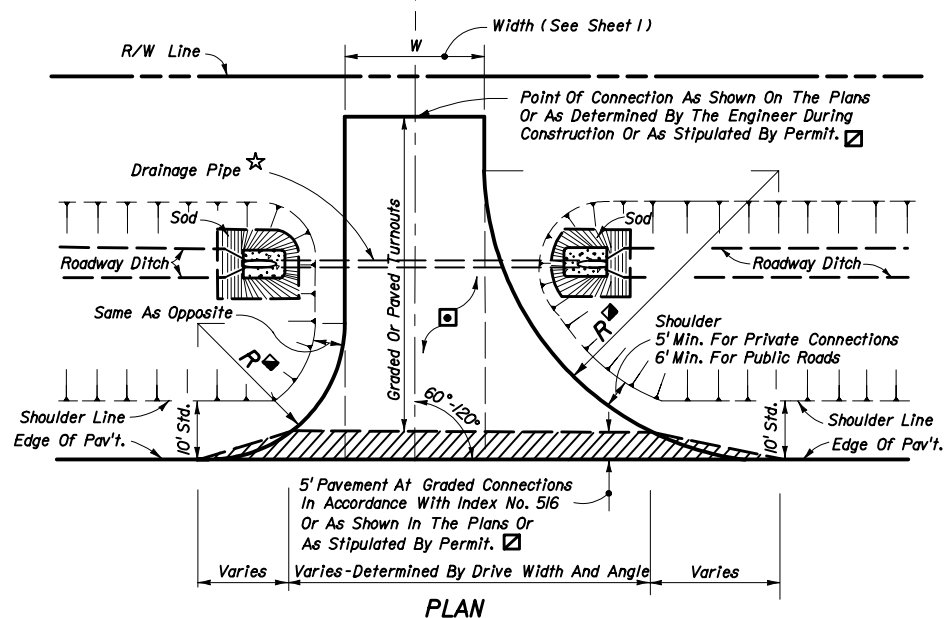
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TURNOUTS

Names	Dates	Approved By		
Designed By	JVG/HKH	9/93	 Roadway Design Engineer	
Drawn By	HKH	9/93		
Checked By	JVG/PLS	9/93	Revision	00
			Sheet No.	4 of 6
			Index No.	515

Typical Half Section For Low Volume/Residential Connections

Typical Half Section For Higher Volume Connections



☆ Drainage pipe size and length shall be that shown on the plans, or as stipulated by permit, or, as determined by the Engineer during construction. The size shall be at least that established by the FDOT District, but not less than 15" diameter or equivalent. For minimum cover over drainage pipe see Index No. 205. Pipe arch or elliptical pipe may be required to obtain necessary cover. At minimal cover applications a modified pavement apron is permitted. See 'PERMISSIBLE PAVEMENT MODIFICATION' Index No. 273. For spacing between adjacent pipe end treatments see Index No. 273.

☐ Stable material may be required for graded turnouts to private property as directed by the Engineer in accordance with Section 102-6 of the Standard Specifications.

☑ The 5' pavement at graded connections is not required where there is paved shoulder 4' or more in width. The 5' pavement requirement may be waived for connections serving one or two homes or field entrances with less than 20 trips per day, or 5 trips per hour as approved by permit or by the Engineer, or when not itemized in the plans.

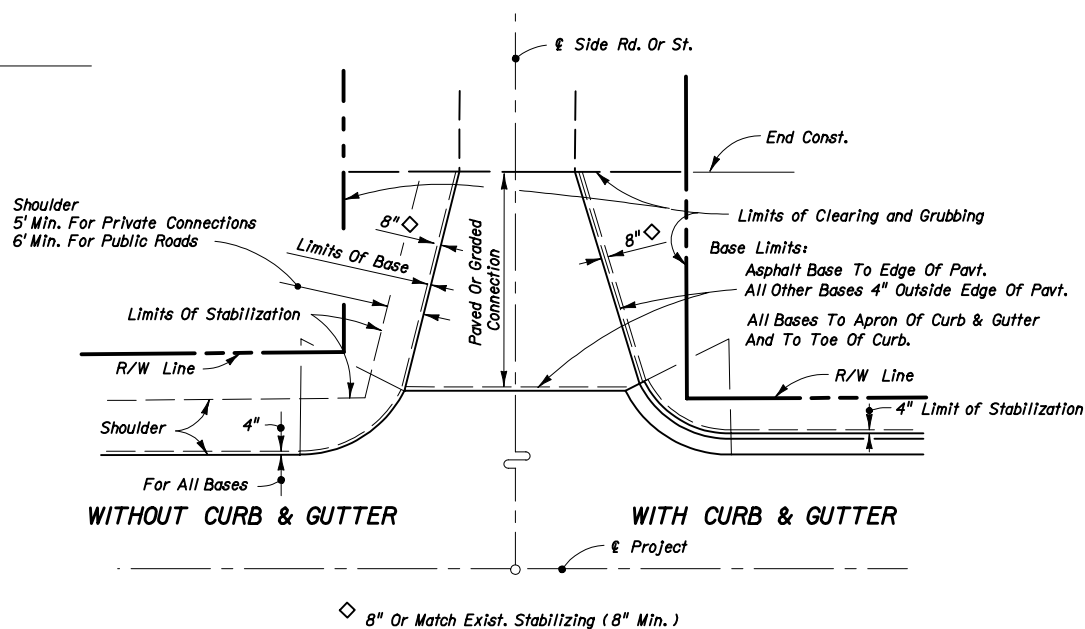
Paved turnouts are to be constructed for all paved connecting facilities. The connecting point will be determined by the Engineer.

Paved turnouts are to be constructed for all business, commercial, industrial or high volume residential graded connecting facilities. The connecting point shall be 30' from edge of roadway pavement or at R/W line, whichever is less.

Paved turnouts are to be constructed for all connecting facilities over 4000 vehicles per day. The connecting point shall be at the R/W line.

☑ See "Summary Of Geometric Requirements For Turnouts" chart for return radii lengths and supplemental information.

RURAL TURNOUT CONSTRUCTION



LIMITS OF CLEARING & GRUBBING, STABILIZING AND BASE AT INTERSECTIONS

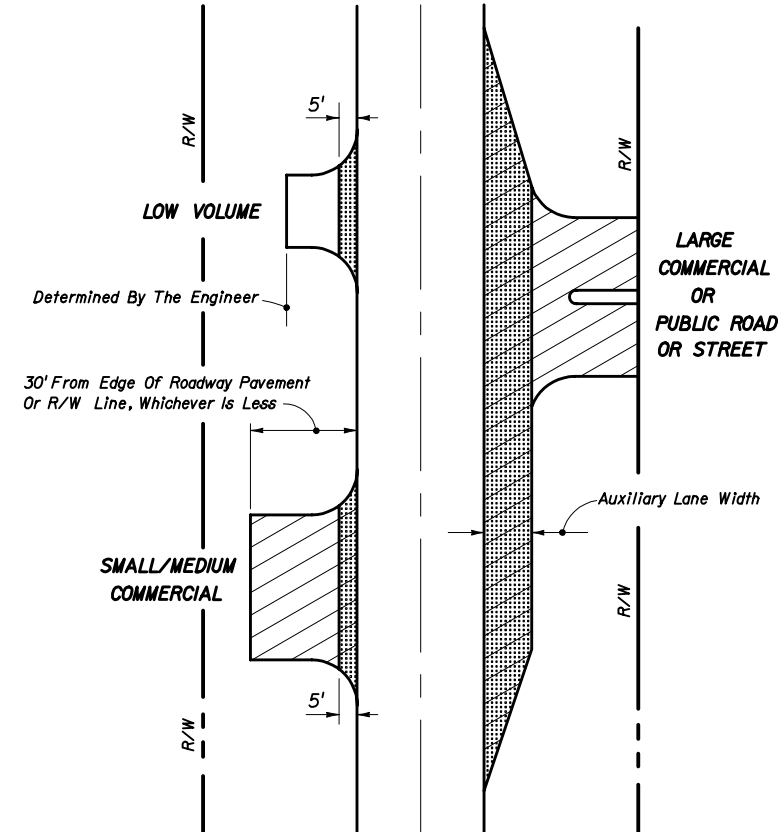
MATERIAL TYPES AND THICKNESSES IN DRIVING AREAS FOR RURAL AND URBAN CONNECTIONS			
Course	Materials ②	Thickness (in.) ①	
		Connections ③	Roadway ④
Structural	Asphaltic Concrete	1"	1 1/2"
Bases	Optional Base (See Index No. 514)	O.B.G. 1	O.B.G. 3

① Minimum thickness.
 ② All materials shall be approved by the Department prior to being placed.
 ③ Connection structure other than traffic lanes. See Notes 1 and 2 below.
 ④ Travel way flares (bypass lanes), auxiliary lanes serving more than a single connection, and all median crossovers including their auxiliary lanes and/or transition tapers. See Notes 1 and 2 below.

NOTES

- The pavement should be structurally adequate to meet the expected traffic loads and should not be less than that shown above, except as approved by the Department for graded connections. Other Department approved pavement equivalences may be used at the discretion of the Engineer. For additional information see Index No. 514.
- Auxiliary lanes and their transition tapers shall be the same structure as the abutting roadway pavement or any of the roadway structures tabulated above, whichever is thicker.
- If an asphalt base course is used for a turnout, its thickness may be increased to match the edge of roadway pavement in lieu of a separate structural course. 6" of Portland cement concrete will be acceptable in lieu of the asphalt base and structural courses. See Notes 4 and 5 below.
- A structural course is required for flexible pavements when they are used for auxiliary lanes serving more than a single connection.
- Connections paved with Portland cement concrete shall be Class I concrete at least 6" thick. The Department may require greater thickness when called for in the plans or stipulated by permit. Materials and construction are to conform with FDOT Standard Specifications Sections 346, 350 and 522.
- The Department may require other pavement criteria where local conditions warrant.

PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILIARY LANES TABLE 515-1



LEGEND

- Graded Or Paved
- Required Paving
- Limits Of Department Maintenance

NOTES

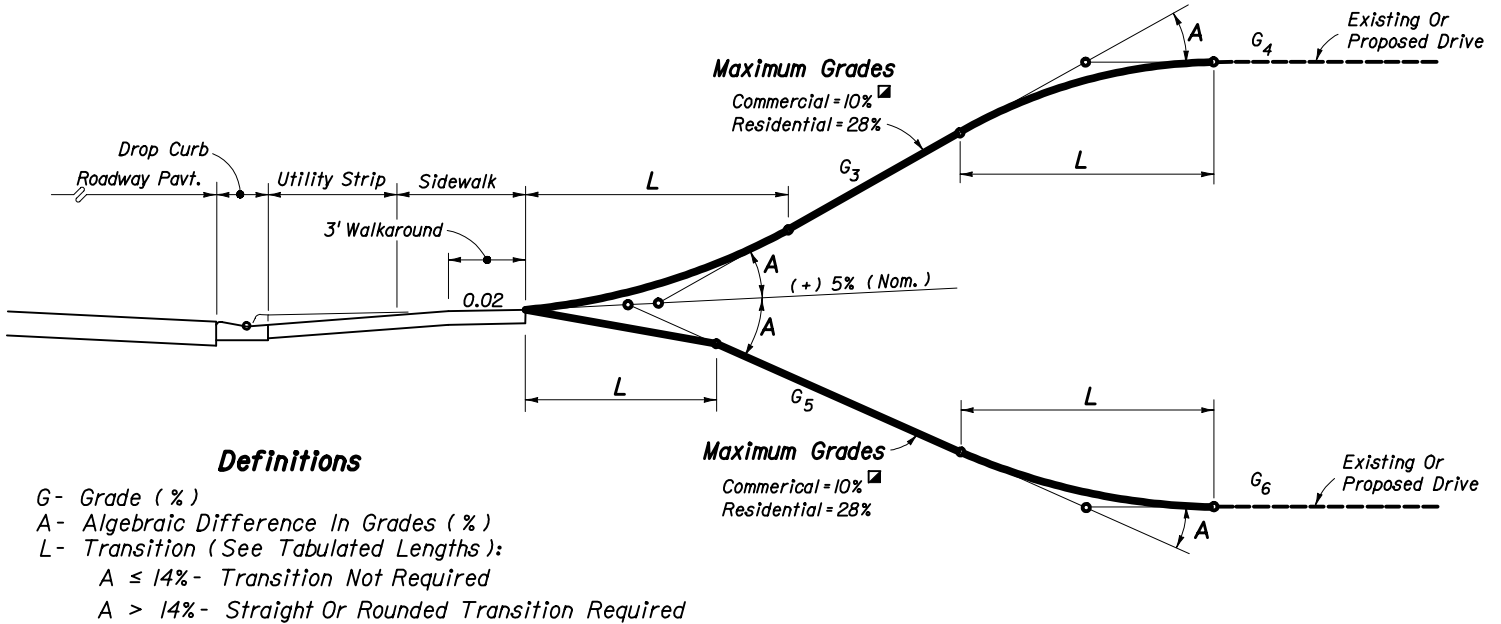
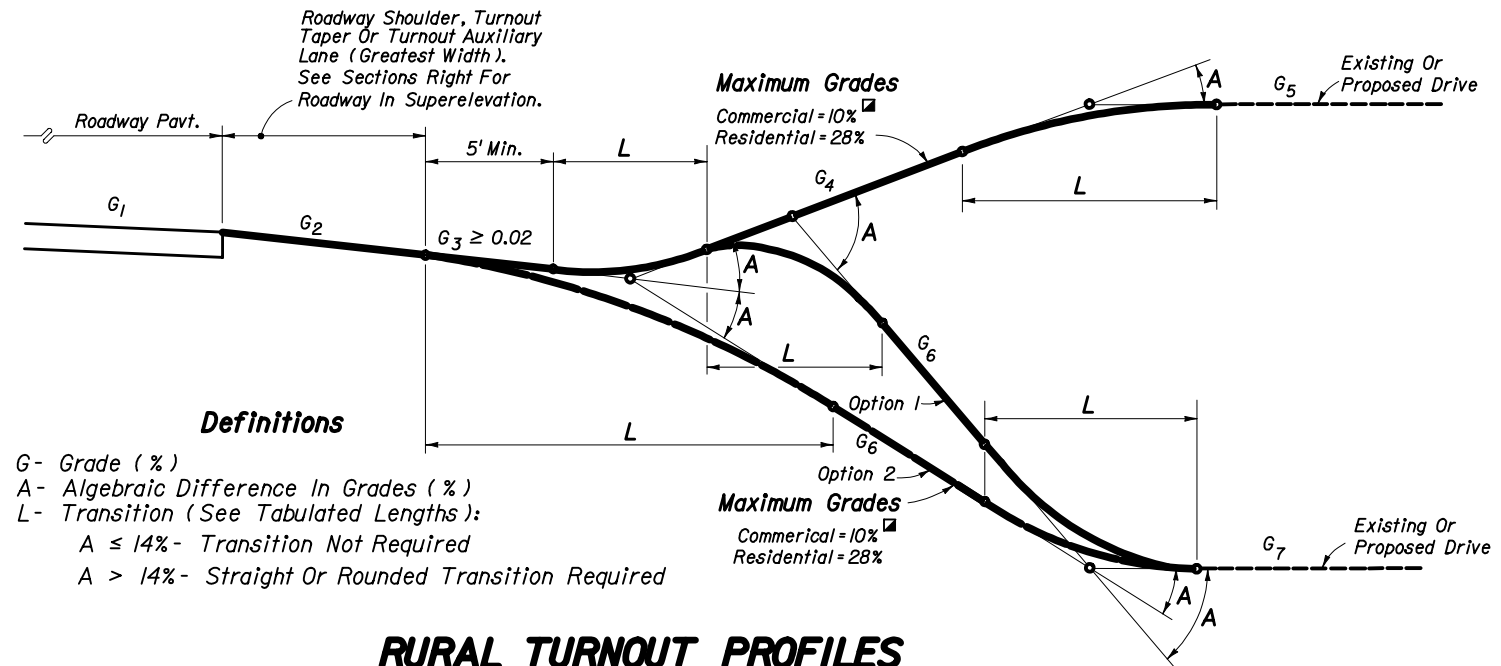
- Auxiliary lane pavements and crossover pavements shall be maintained by the Department.
- Department maintenance of turnout pavement shall extend out to 5' from edge of the travel way or limits of paved shoulders, and, extend to include auxiliary lanes. The remainder of any turnout paved area on the right of way shall be maintained by the owner or his authorized agent. As a function of routinely reworking shoulders, the Department may grade and shape existing material on non-paved areas beyond the maintained pavement.
- Control and maintenance of drainage facilities within the right of way shall be solely the responsibility of the Department, unless specified differently by Department permit.
- The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.
- All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.
- All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.

LIMITS OF CONSTRUCTION AND MAINTENANCE FOR RURAL CONNECTIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TURNOUTS

Names	Dates	Approved By		
Designed By	COM/JV	90/91	 Roadway Design Engineer	
Drawn By	HSD	3/91		
Checked By	JVG	03/91		
Revision	Sheet No.	Index No.		
	04	5 of 6	515	

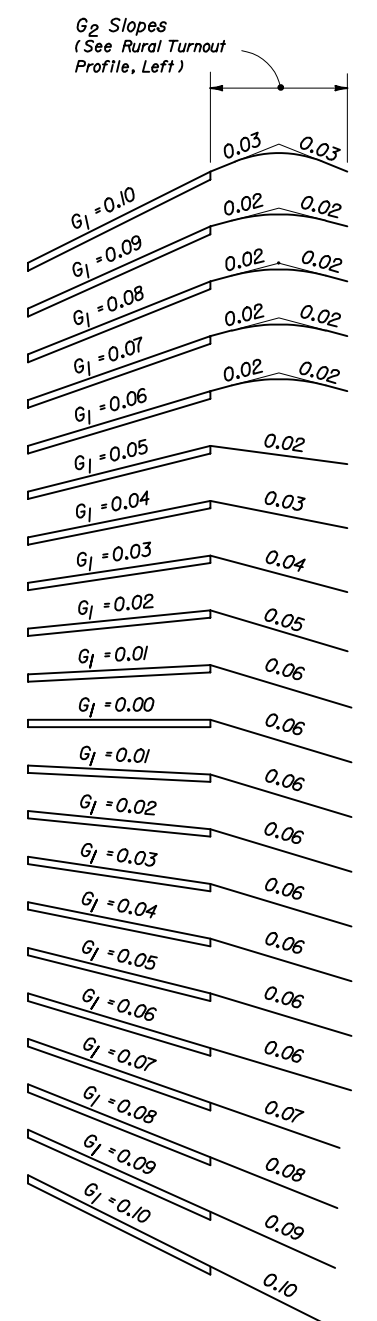


LENGTHS (L) (FT.)

A	CRESTS				SAGS			
	STRAIGHT		ROUNDED		STRAIGHT		ROUNDED	
	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum
6-13%	3	0	5	0	3	0	5	0
14%	3	0	10	0	3	0	10	0
15%	3	2.5	10	3	5	3	10	5
16%	5	3	10	4	6	4	10	6
17%	6	3.5	10	5	8	5	10	7
18%	6	4	10	6	9	6	10	8
19%	7	4.5	10	7	11	7	12	9
20%	8	5	11	8	12	8	13	10
21%	9	5.5	12	9	13	8.5	14	11
22%	10	6	13	10	14	9	16	12
23%	10	6.5	14	10.5	14	9.5	16	12.5
24%	11	7	15	11	15	10	17	13
25%	12	7.5	15	11.5	16	10.5	18	13.5
26%	12	8	16	12	17	11	18	14
27%	13	8.5	17	12.5	17	11.5	19	14.5
28%	14	9	17	13	18	12	20	15
29%	NA	NA	22	14	NA	NA	21	17
30-31%	NA	NA	23	15	NA	NA	22	18
32-33%	NA	NA	24	16	NA	NA	23	20
34-36%	NA	NA	26	17	NA	NA	25	21
37-38%	NA	NA	27	18	NA	NA	26	22
39-41%	NA	NA	29	19	NA	NA	28	24
42-43%	NA	NA	30	20	NA	NA	29	25
44-46%	NA	NA	32	21	NA	NA	31	26
47-48%	NA	NA	33	22	NA	NA	32	27
49-51%	NA	NA	34	23	NA	NA	34	28
52-54%	NA	NA	36	24	NA	NA	35	30
55-56%	NA	NA	37	25	NA	NA	36	31

Rounded: Either circular, parabolic or spline curvature. The plans or the Engineer may specify a particular type of curvature.
 Desirable: Desirable minimum lengths. } Greater lengths than minimum and desirable are recommended where practical for flatter and smoother profile.
 Minimum: Absolute minimum lengths.

RECOMMENDED TURNOUT PROFILE TRANSITION LENGTHS (L) (FT)



STORMWATER RUNOFF AND PROFILE OPTION NOTES

1. Turnouts shall neither cause water to flow on or across the roadway pavement, nor cause water ponding or erosion within the State right of way. On all rural turnouts the transition (L) nearest the roadway shall be sloped or crowned to direct stormwater runoff to the roadside ditch. Inlets, flumes or other appropriate runoff control devices shall be constructed when runoff volumes are sufficient to cause erosion of the shoulder. Similar runoff control devices shall be constructed as necessary to properly direct and control the stormwater runoff on urban turnouts.
2. The Option 1 profile is intended for locations where roadway, turnout taper and auxiliary lane stormwater runoff volumes are relatively large. The Option 2 profile is intended for locations where runoff volumes are relatively small and/or where there is no roadside ditch.

ROADWAY PAVEMENT SLOPES AND SLOPES OF ABUTTING RURAL TURNOUT SURFACES (G₂) SUPERELEVATION SECTIONS

When restoring or reconstructing existing commercial turnout connections on new construction and reconstruction projects, the maximum 10% commercial grade may be exceeded provided this does not create any adverse roadway operational or safety impacts. This shall be approved by the District Design Engineer and be supported by documented site specific findings.

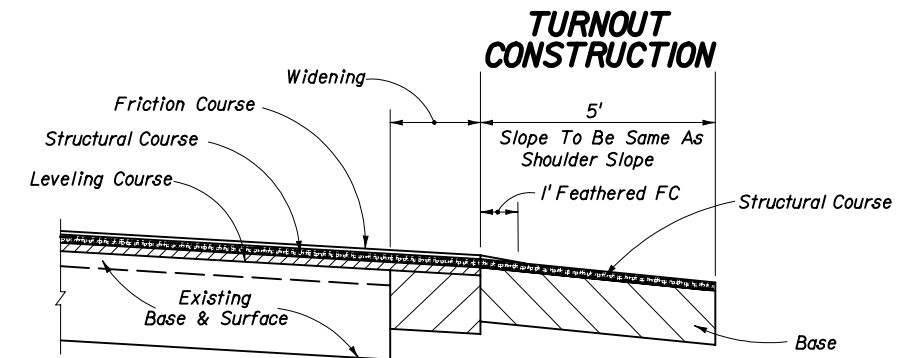
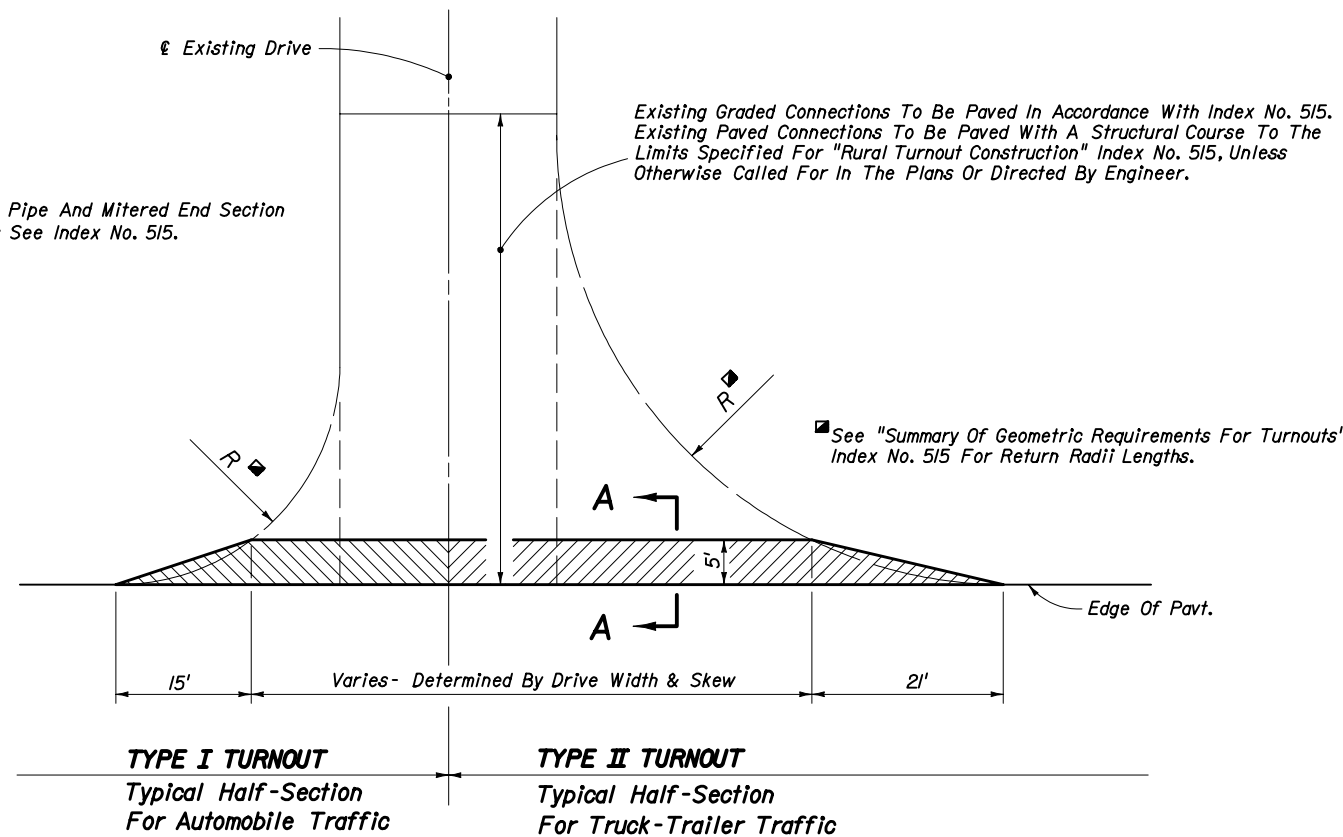
TURNOUT PROFILES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

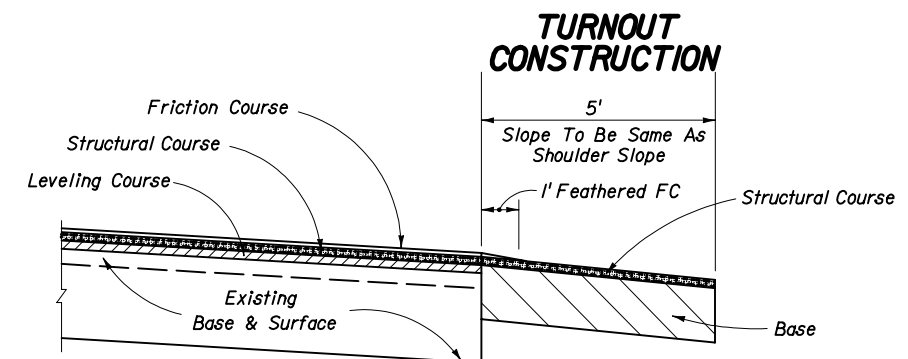
TURNOUTS

Designed By	Names	Dates	Approved By		
Drawn By	HSD	08/82	 Roadway Design Engineer		
Checked By	JVG	08/82			
Revision	02	6 of 6	Sheet No.	Index No.	515

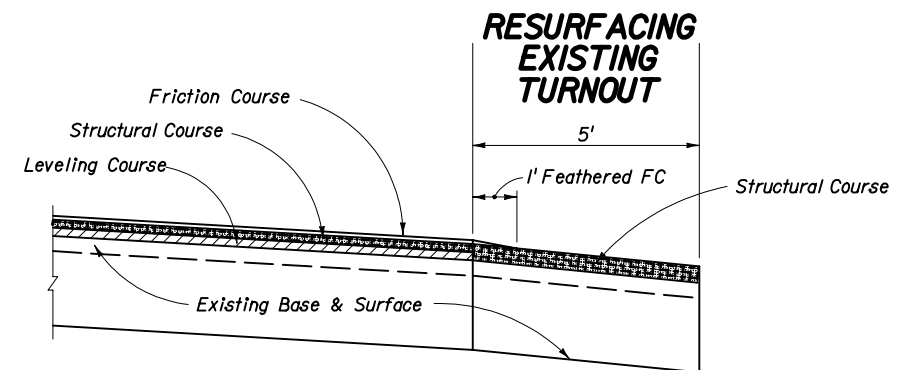
For Drainage Pipe And Mitered End Section Requirements See Index No. 515.



SECTION AA WITH WIDENING



SECTION AA



SECTION AA

Drive Width (Ft.)	AREAS FOR ONE 5' DEEP TURNOUT (SY)			
	Intersection			
	Normal		Skewed	
	Type I	Type II	Type I	Type II
12	26	51	31	60
14	27	52	33	61
16	28	53	34	63
18	29	54	35	64
20	31	55	37	65
22	32	56	38	67
24	33	57	39	68
26	34	58	40	69
28	35	59	42	70
30	36	61	43	72
32	37	62	44	73
34	38	63	46	74
36	39	64	47	76
38	41	65	48	77
40	42	66	49	78
42	43	67	51	79
44	44	68	52	81
46	45	69	53	82
48	46	71	55	83
50	47	72	56	85
52	48	73	57	86
54	49	74	58	87
56	51	75	60	88
58	52	76	61	90
60	53	77	62	91

PAVEMENT STRUCTURE FOR 5' DEEP TURNOUTS		
Course	Material	Minimum Thickness
Structural	Asphaltic Concrete	1"
Base	Optional Base (See Index No. 514)	O.B.G. 1

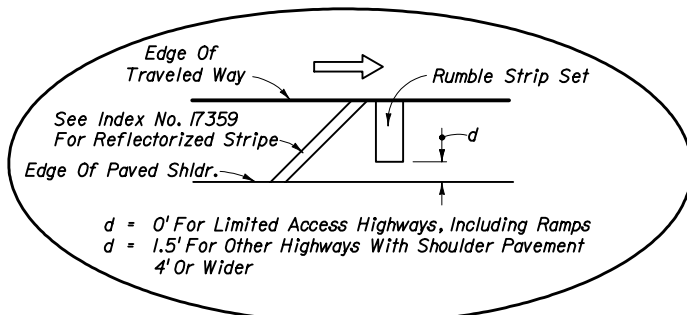
Notes:

- Turnout structural course to be the same material as roadway leveling or structure course. Structural course not required if asphalt base course and its thickness increased to match edge of roadway pavement.
- Any Department approved pavement structure equivalence may be used at the discretion of the Engineer.
- Additional structural strength may be required if heavy truck loads are anticipated.

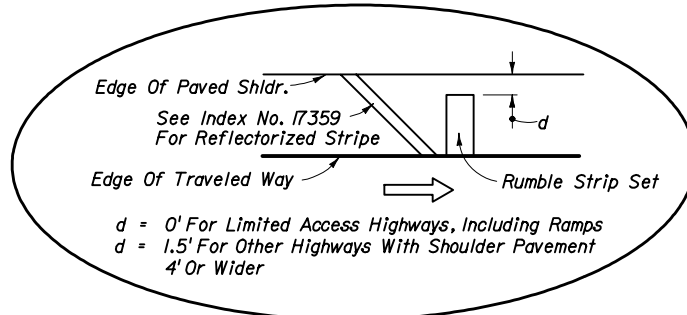
GENERAL NOTES

- Turnouts are to be constructed or resurfaced for low volume (single family, duplex, farm, etc.) residential connections as directed by the Engineer.
- Turnout construction not required for low volume residential connections where roadway shoulders are paved.
- Connections outside the 5' limit are to be constructed as directed by the Engineer.
- The contract unit price for Turnout Construction includes the cost for excavation and base.
- Payment for structural course to be included in roadway resurfacing pay item.
- Payment for feathering friction course to be included in the unit price for Asphaltic Concrete Friction Course placed on the roadway. Feathered areas will not be included in measured quantities. Feathering not required for FC-5 friction course.

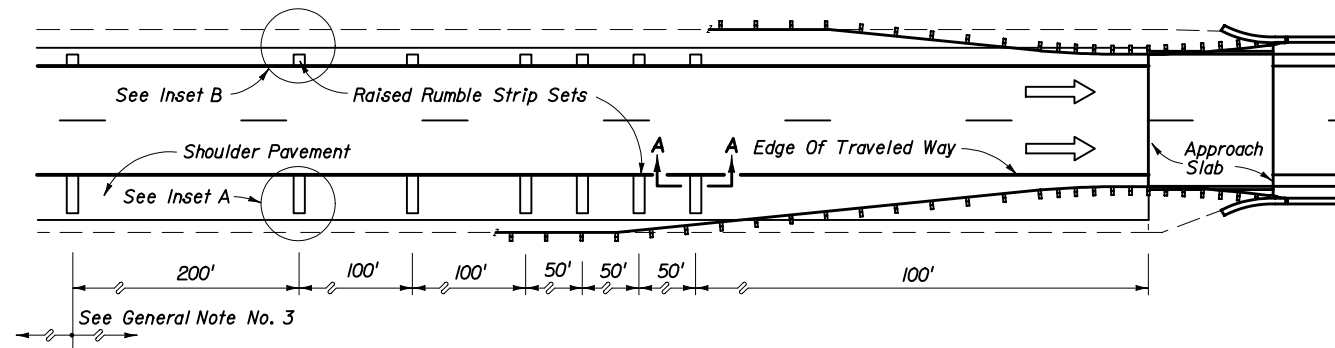
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TURNOUTS RESURFACING PROJECTS				
Names	Dates	Approved By <i>Jamal D. Milk</i>		
Designed By DCB	11/77	Roadway Design Engineer		
Drawn By HKH	11/77	Revision	Sheet No.	Index No.
Checked By JVG	11/77	00	1 of 1	516



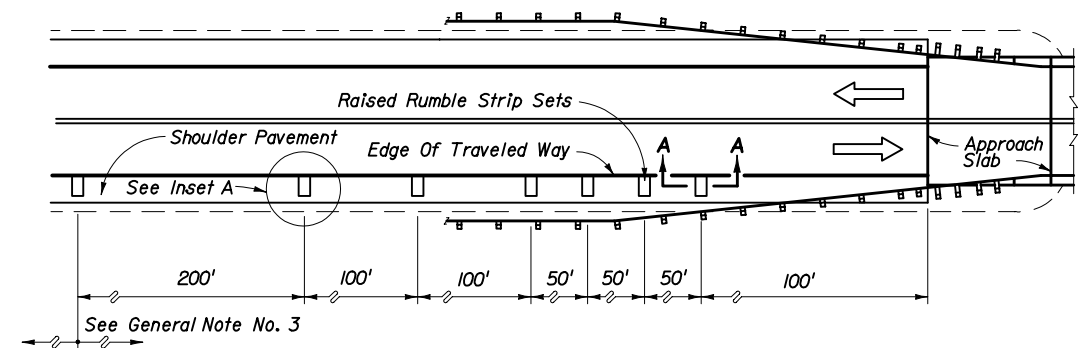
INSET A



INSET B

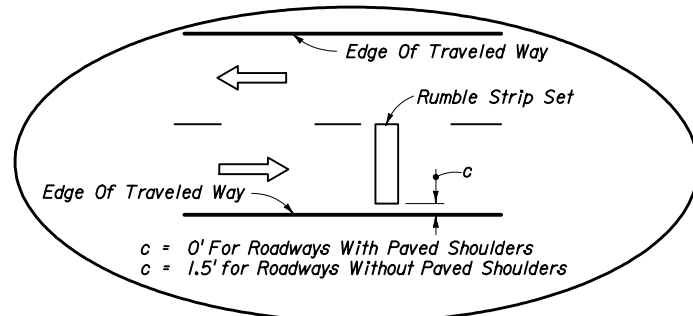


PLAN • ONE-WAY



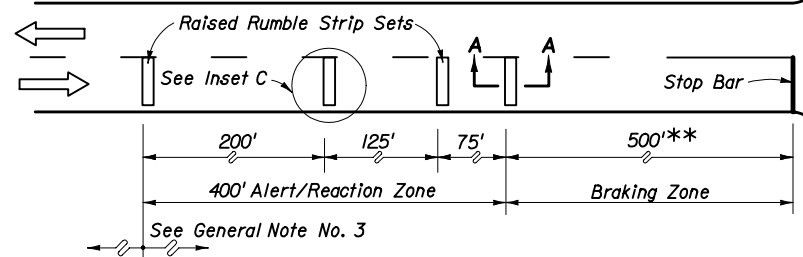
PLAN • TWO-WAY

STRUCTURES WITH LESS THAN FULL WIDTH SHOULDERS



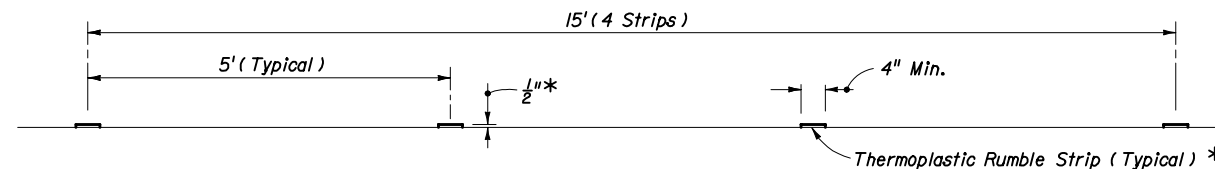
INSET C

Note: Rumble strips may be required for one or more legs of the intersection (one leg shown for spacing information). Rumble strips shall be constructed only on the legs identified in the plans. See General Note No. 1.



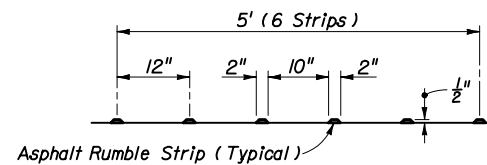
** May be decreased in urban areas with low operating speeds.

PLAN
INTERSECTIONS



* Use multiple applications to achieve desired 1/2" thickness
Note: Shoulder thermoplastic rumble strip sets shall match edgeline color. Intersection thermoplastic rumble strip sets shall be white.

THERMOPLASTIC SET



ASPHALT SET

SECTION AA • FOR THERMOPLASTIC AND ASPHALT RUMBLE STRIP SETS


RAISED RUMBLE STRIPS

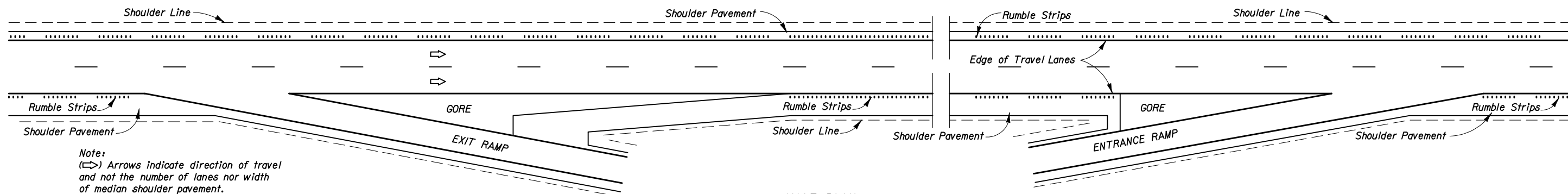
GENERAL NOTES FOR RAISED RUMBLE STRIPS

1. Raised rumble strips shall be constructed on all paved shoulders approaching structures, where the structure shoulder width is less than the usable shoulder width of the approach roadway. Raised rumble strips at intersections shall be constructed only when specified in the plans.
2. Raised rumble strips are to be constructed in accordance with Section 546 of the Specifications.
3. When any portion of a curve falls within the limit of rumble strips shown in these details, additional rumble strip sets spaced at 200' centers shall be constructed throughout the remainder of the approaching curve.
4. Raised rumble strips shall be paid for per set under the contract unit price for Rumble Strips Sets, PS. Such price and payment shall be full compensation for all work and materials required without adjustment due to width of pavement receiving the strips or length of strips.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

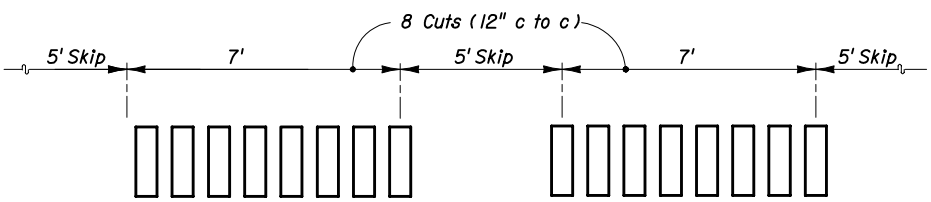
RUMBLE STRIPS

Names	Dates	Approved By		
Designed By	KRM/CAS	10/87	 Roadway Design Engineer	
Drawn By	JBW	10/87		
Checked By	KRM/JVG	10/87	Revision	04
			Sheet No.	1 of 2
			Index No.	518

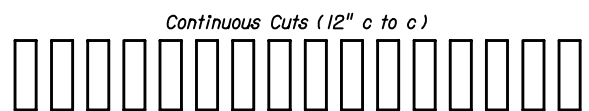


Note:
 (→) Arrows indicate direction of travel
 and not the number of lanes nor width
 of median shoulder pavement.

HALF PLAN
 LIMITED ACCESS FACILITIES
SHOULDER GROUND-IN RUMBLE STRIP PLACEMENT

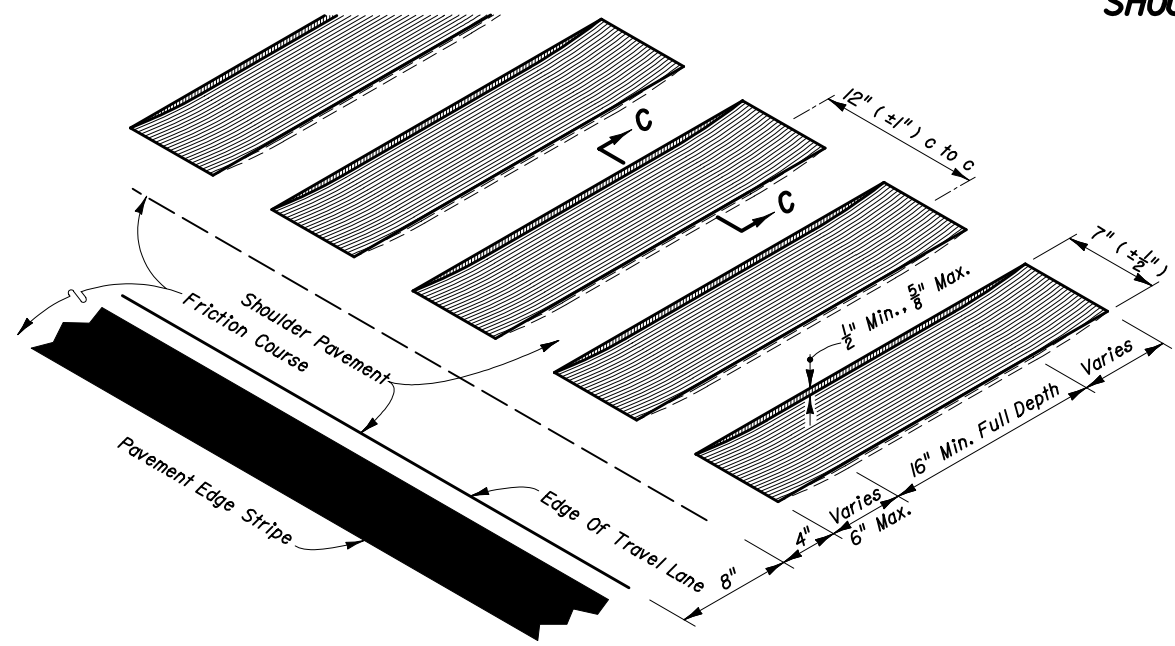


SKIP ARRAY

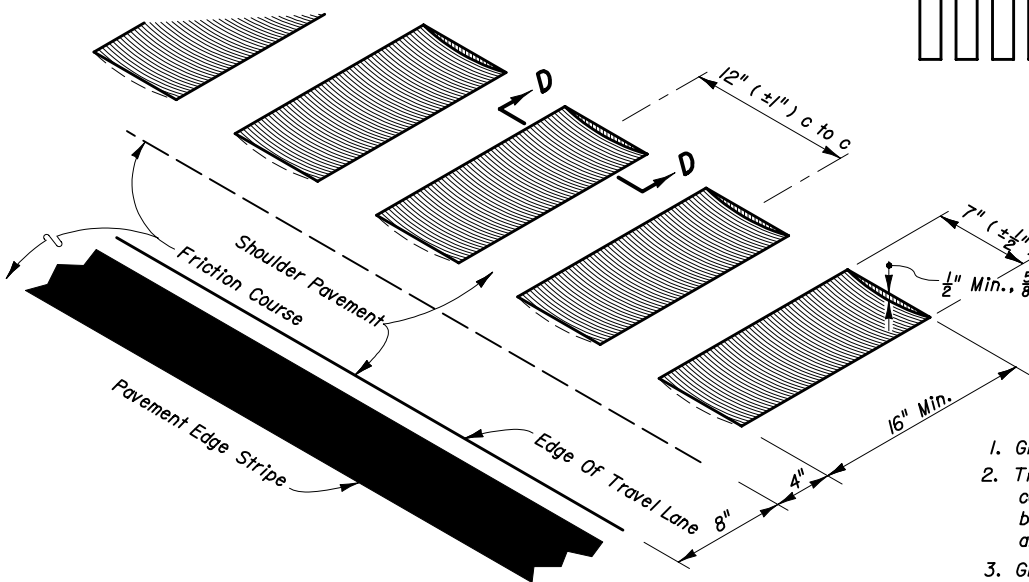


CONTINUOUS ARRAY

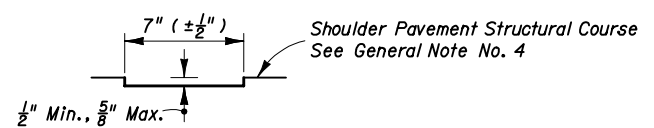
ARRAYS



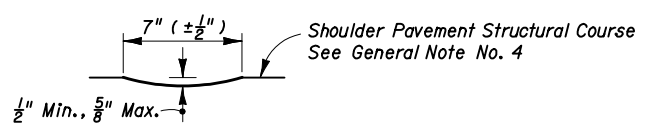
ISOMETRIC - TRANSVERSE CUT



ISOMETRIC - LONGITUDINAL CUT



SECTION CC
 TRANSVERSE CUT



SECTION DD
 LONGITUDINAL CUT

GENERAL NOTES FOR SHOULDER GROUND-IN RUMBLE STRIPS

1. Ground-in rumble strips shall be constructed on limited access facilities.
2. The skip array is the standard array. The continuous array shall be constructed in advance of bridge ends for a distance of 1000', or back to the gore recovery area for mainline interchange bridges; and constructed at other specific locations as called for in the plans.
3. Ground-in rumble strips are to be constructed in accordance with Section 546 of the Specifications.
4. When friction course extends more than 8" beyond the edge of the travel lane, the extended friction course shall be bladed off back to the 8" line, prior to rumble strip grinding.
5. Both arrays shall be paid for under the contract unit price for Rumble Strips (Ground-In), PM. Such price and payment shall be full compensation for all work and materials required.

DESIGN NOTE

1. The rumble strips described on this sheet are intended for use on flexible pavement shoulders. When constructing ground-in rumble strips on existing rigid (concrete) shoulders, no rumble strips shall be located closer than 6" from any pavement joint. When specifying ground-in rumble strips on existing rigid shoulders their location and array shall be detailed in the plans.
2. Other methods and types of applications shall not be used unless approved in writing by the State Roadway Design Engineer. Approval will be considered only with sufficient documented justification for variance from this standard.

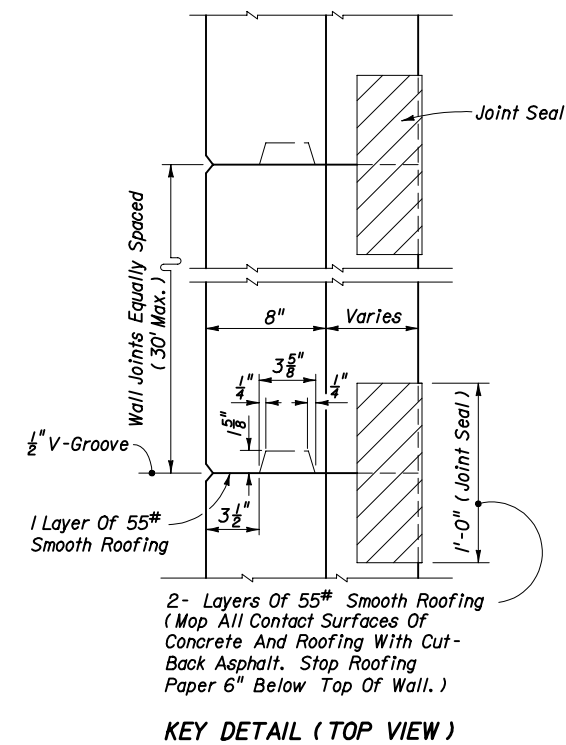
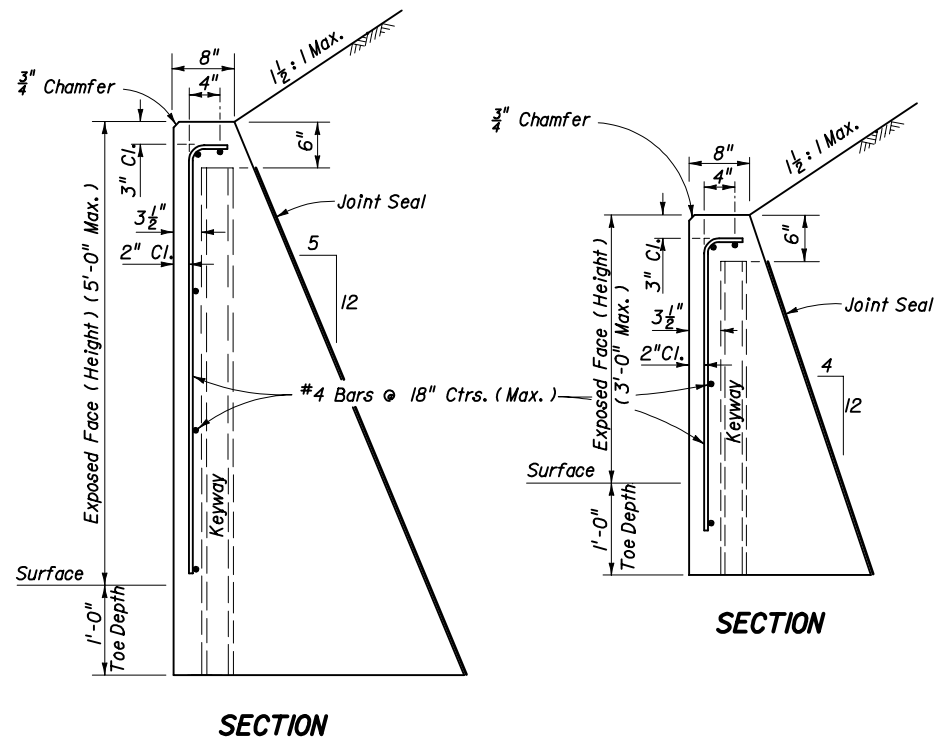
LOCATION ALONG SHOULDER (FLEXIBLE PAVEMENT)

SHOULDER GROUND-IN RUMBLE STRIPS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RUMBLE STRIPS

Designed By	COM	11/93	Approved By	<i>Lamell D. Mill</i> Roadway Design Engineer		
Drawn By	HKH	11/93	Revision	Sheet No.	Index No.	
Checked By	FLS/JVG	11/93	02	2 of 2	518	



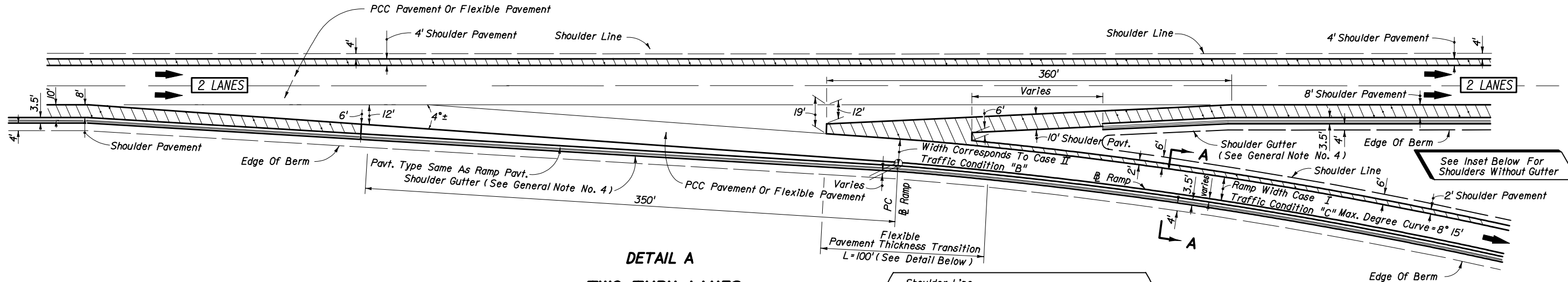
HEIGHT (EXPOSED FACED)	ESTIMATED QUANTITIES FOR WALL PER LINEAR FOOT OF WALL	
	CLASS I CONCRETE (CY)	STEEL (LB)
1'	0.07	3
2'	0.13	4
3'	0.20	5
4'	0.32	6
5'	0.43	7

GENERAL NOTES

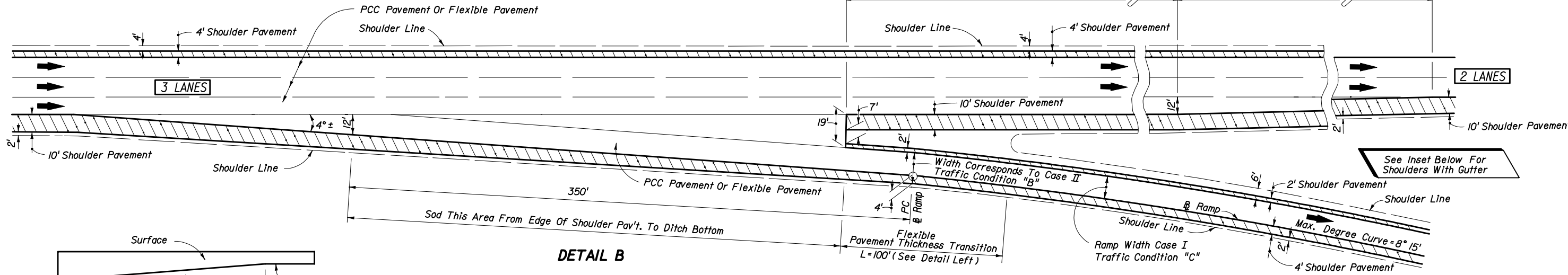
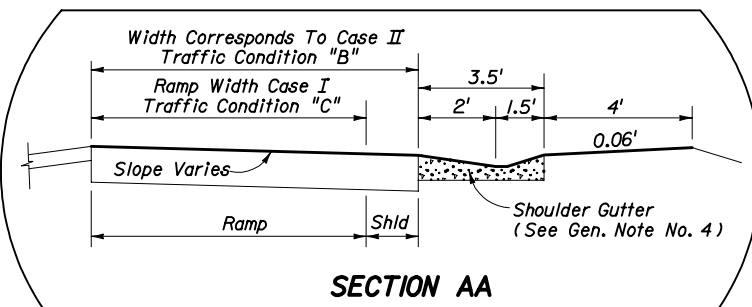
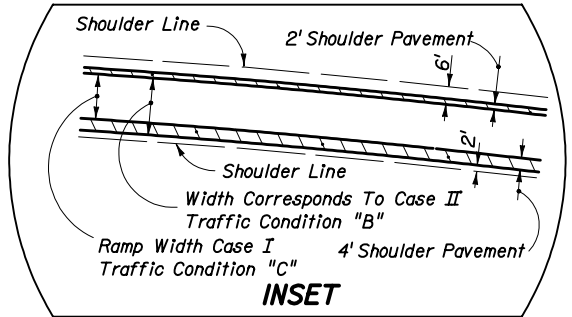
- Gravity walls constructed as extensions of reinforced concrete retaining walls, except walls of proprietary designs, shall have the same face texture and finish as the reinforced concrete retaining wall.
- When required, for adjunct handrail see the plans and for adjunct fence see Index No. 452.
- Cost of reinforcing steel, face texture, finish and joint seal to be included in the contract unit price for Class I Concrete (Retaining Walls) CY.

GRAVITY WALL

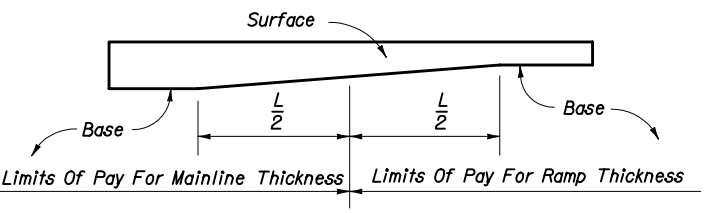
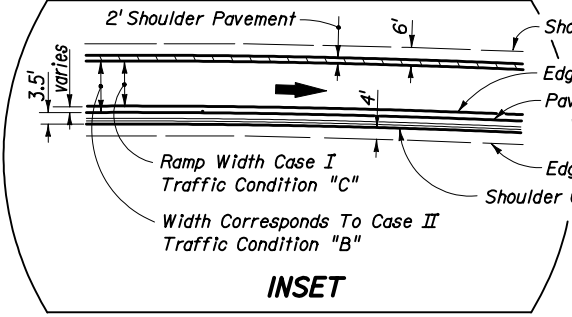
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
GRAVITY WALL				
Designed By	Names	Dates	Approved By <i>Samuel D. Mill</i> Roadway Design Engineer	
Drawn By	CDR	02/68	Revision	Sheet No. Index No.
Checked By	RHC	02/68	04	1 of 1 520



**DETAIL A
TWO THRU LANES**



**DETAIL B
THREE APPROACH LANES - TWO THRU LANES**




FLEXIBLE PAVEMENT THICKNESS TRANSITION

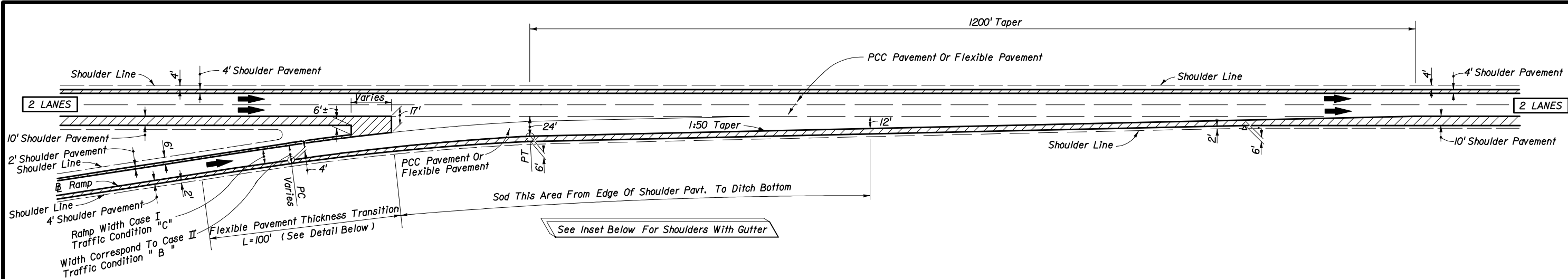
**EXIT TERMINALS
SINGLE - LANE RAMPS**

NOTE: For General Notes See Sheet No. 2

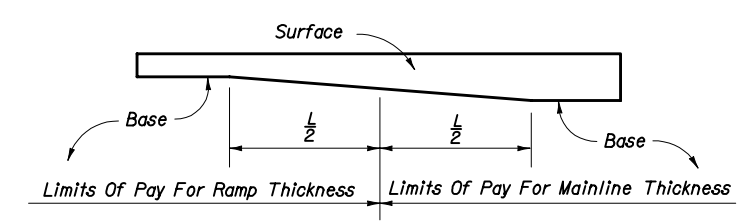
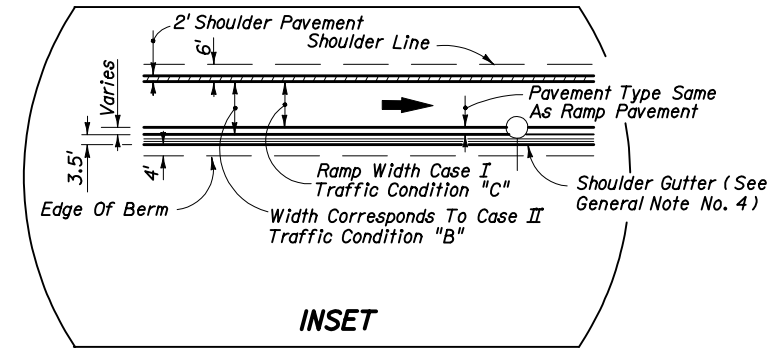
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RAMP TERMINALS

Names	Dates	Approved By		
Designed By	EHH 01/65	 Roadway Design Engineer		
Drawn By	HEW 01/65			
Checked By	RLO 06/67	Revision	Sheet No.	Index No.
		04	1 of 5	525



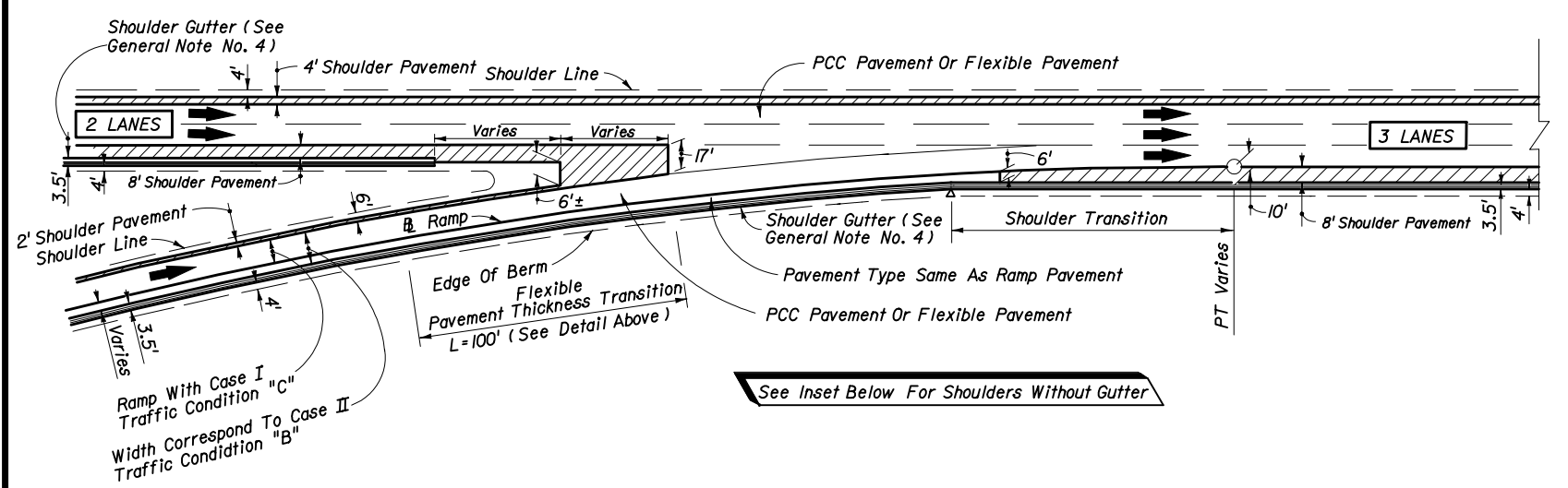
**DETAIL C
TAPER-TYPE ENTRANCE**



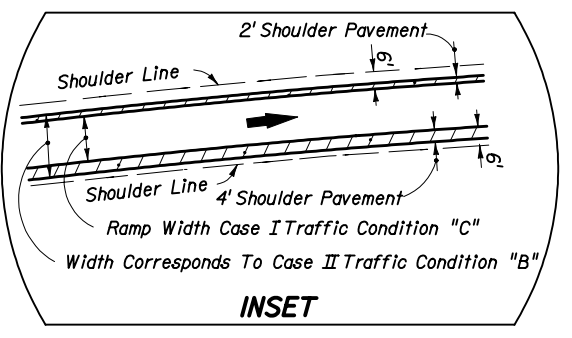
FLEXIBLE PAVEMENT THICKNESS TRANSITION

GENERAL NOTES

1. Taper-Type exit and entrance terminals as detailed shall not be used on ramps for which a speed of 50 MPH or greater cannot be maintained. For such ramps, parallel deceleration and acceleration lanes shall be used in place of tapers with lengths set according to AASHTO.
2. (a.) PCC Pavement Projects:
Where shoulder pavement adjacent to shoulder gutter is less than 6' wide, it shall be identical to the adjacent roadway pavement beginning with the tranverse joint nearest the point of 6' width.
- (b.) Flexible Pavement Projects:
Where shoulder pavement used in conjunction with shoulder gutter is less than 6' uniform width, it shall be identical to the adjacent roadway pavement.
3. For concrete pavement joint details and layouts at entrance and exit ramp terminals see Index No. 305.
4. Shoulder gutter applications will be determined by drainage design.

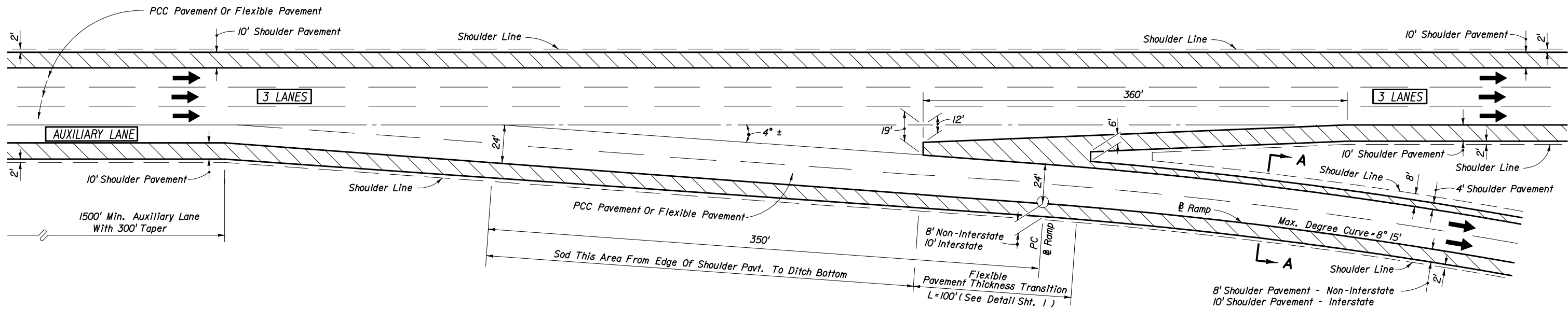


**DETAIL D
PARALLEL-TYPE ENTRANCE**

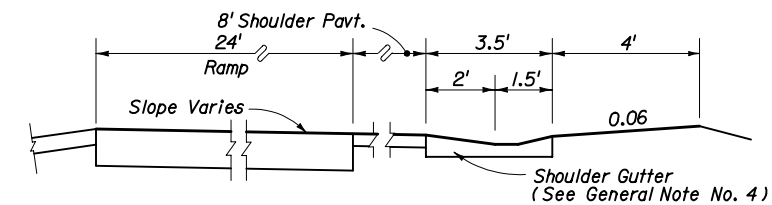


**ENTRANCE TERMINALS
SINGLE-LANE RAMPS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RAMP TERMINALS				
Designed By	FHH	01/65	Approved By <i>Samuel D. Milk</i> Roadway Design Engineer	
Drawn By	HFW	01/65	Revision	Sheet No.
Checked By	RLO	06/67	04	2 of 5
				Index No. 525



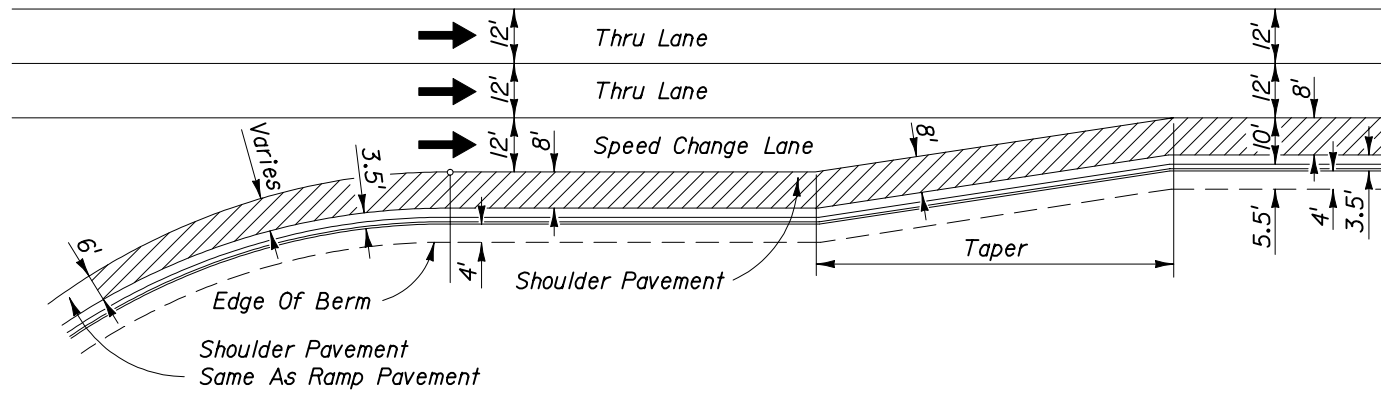
THREE THRU LANES - APPROACH AUXILIARY LANE



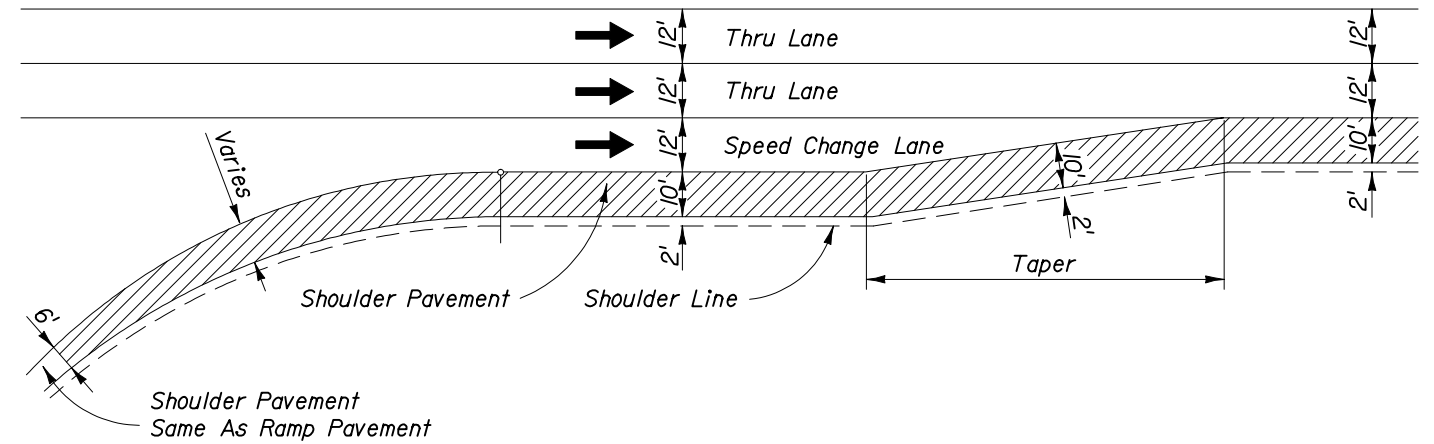
SECTION WHEN SHOULDER GUTTER USED
SECTION AA

EXIT TERMINALS
TWO-LANE RAMPS

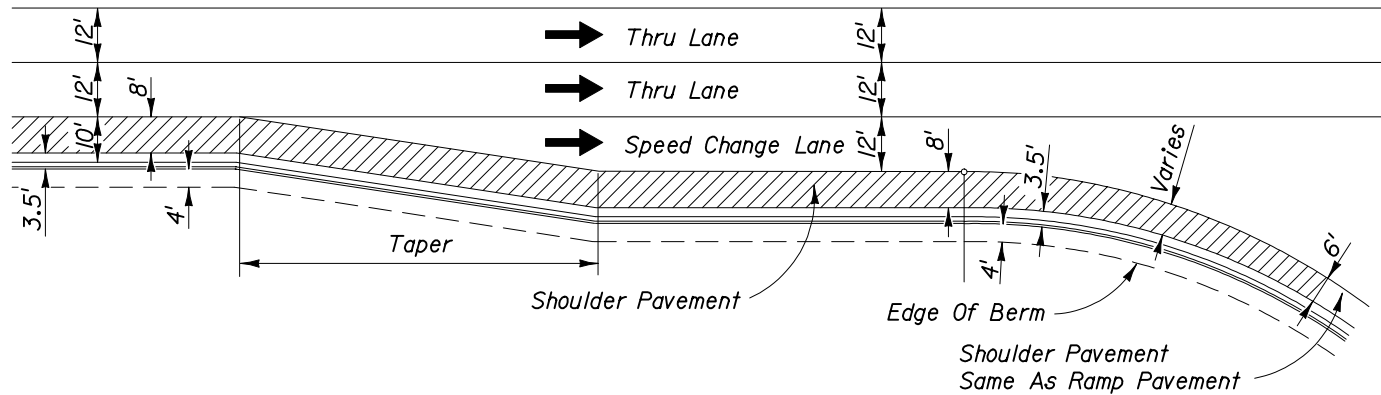
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RAMP TERMINALS				
Designed By	DCB	07/86	Approved By <i>Jamall D. Milk</i> Roadway Design Engineer	
Drawn By	DDS	07/86	Revision	Sheet No. 3 of 5
Checked By	DCB	07/86	00	Index No. 525



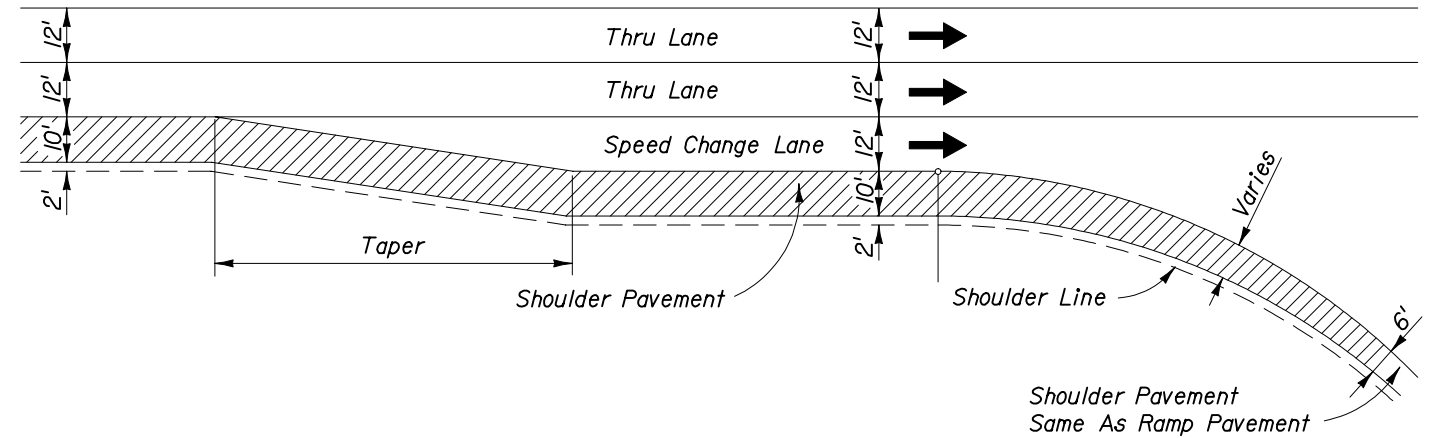
ACCELERATION LANE WITH SHOULDER GUTTER



ACCELERATION LANE WITHOUT SHOULDER GUTTER



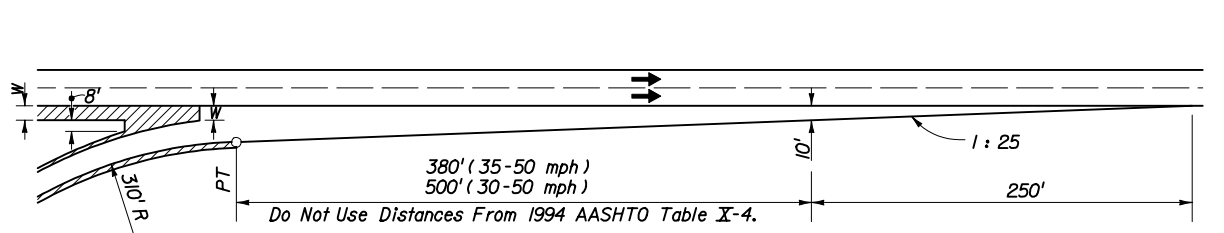
DECELERATION LANE WITH SHOULDER GUTTER



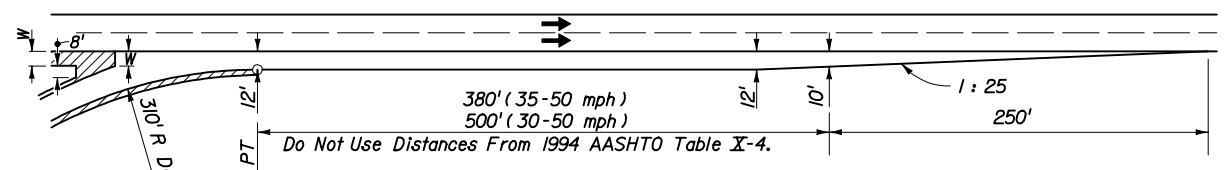
DECELERATION LANE WITHOUT SHOULDER GUTTER

**SHOULDER TREATMENT
AT SPEED CHANGE LANES AT FREEWAY RAMP TERMINALS
FREEWAY RAMP TERMINALS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RAMP TERMINALS				
Designed By	EHH	Dates	01/65	Approved By
Drawn By	HEW	01/65	Revision	Sheet No.
Checked By	RLO	06/67	04	4 of 5
			Index No.	525

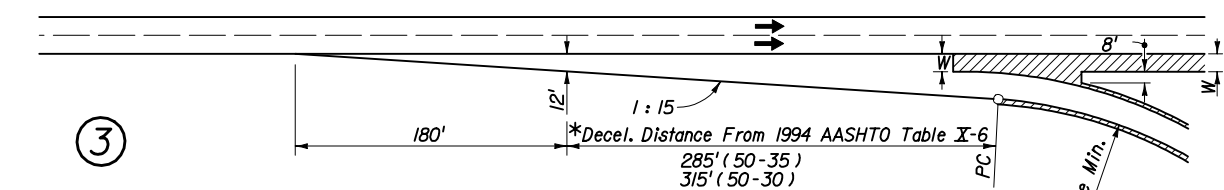


Standard cross road entrance terminals. To be used when roadway alignment is tangent and no bridges are located within the merging lane.

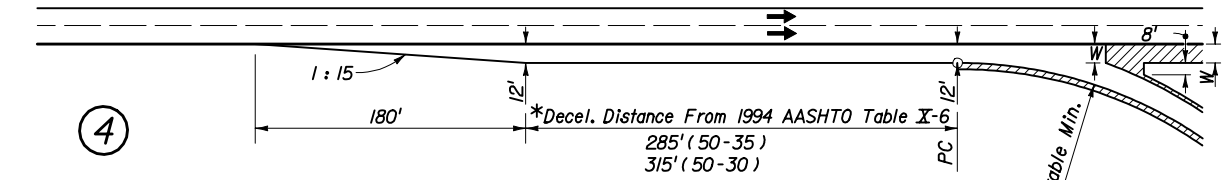


Parallel cross road entrance terminals. Recommended when a bridge is located within the merging lane, turning roadway speed is less than 60% of thru roadway speed or for the combinations of horizontal alignment shown elsewhere on this sheet.

UNSIGNALIZED ENTRANCES



Standard cross road exit terminal. To be used when roadway alignment is tangent.



Parallel cross road exit terminals. Recommended when exit is partially hidden over the crest of vertical curve or when turning roadway speed is less than 60% of the thru roadway speed, or for the combinations of horizontal alignment shown elsewhere on this sheet.

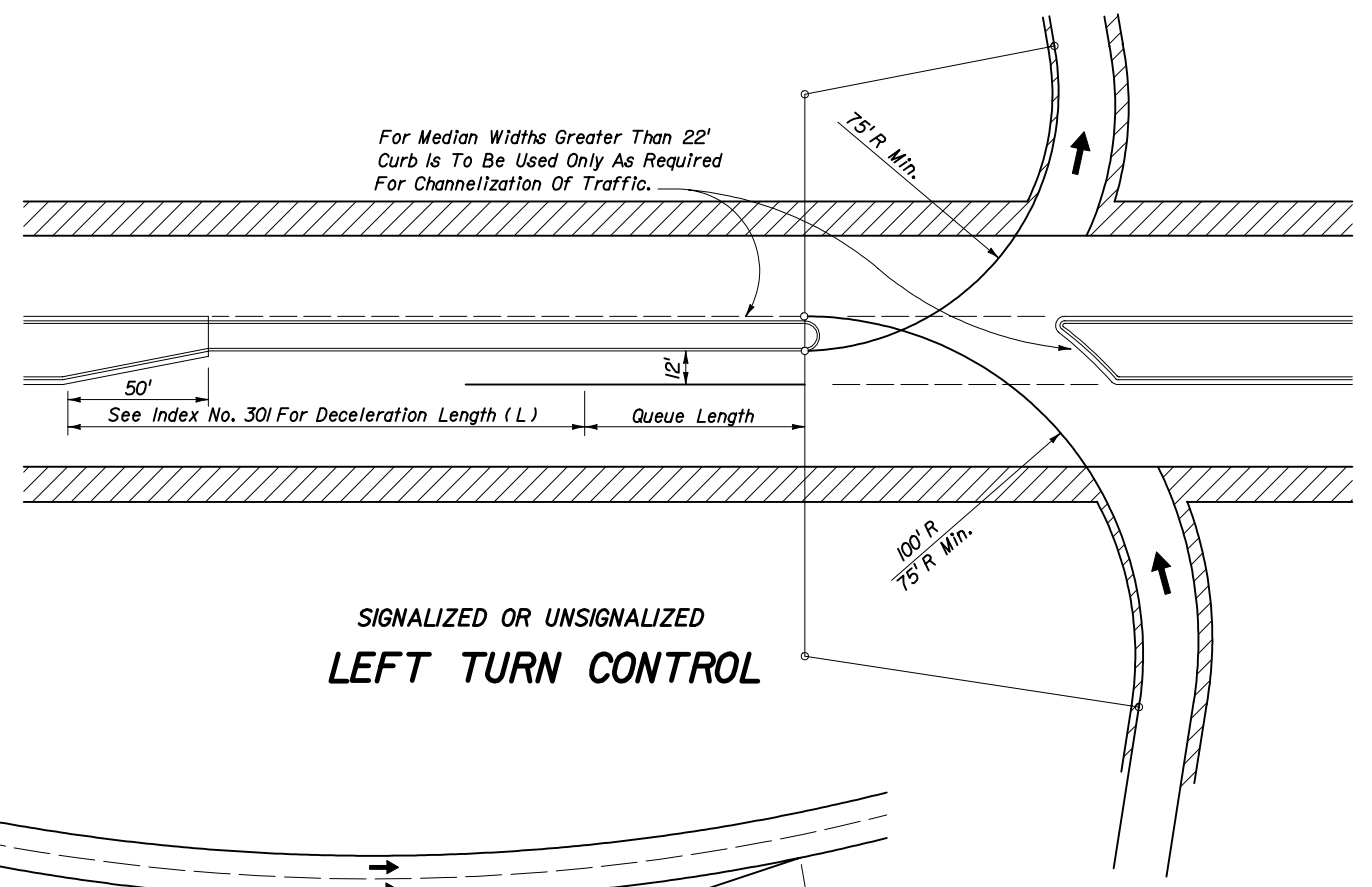
UNSIGNALIZED EXITS

FOOTNOTES:

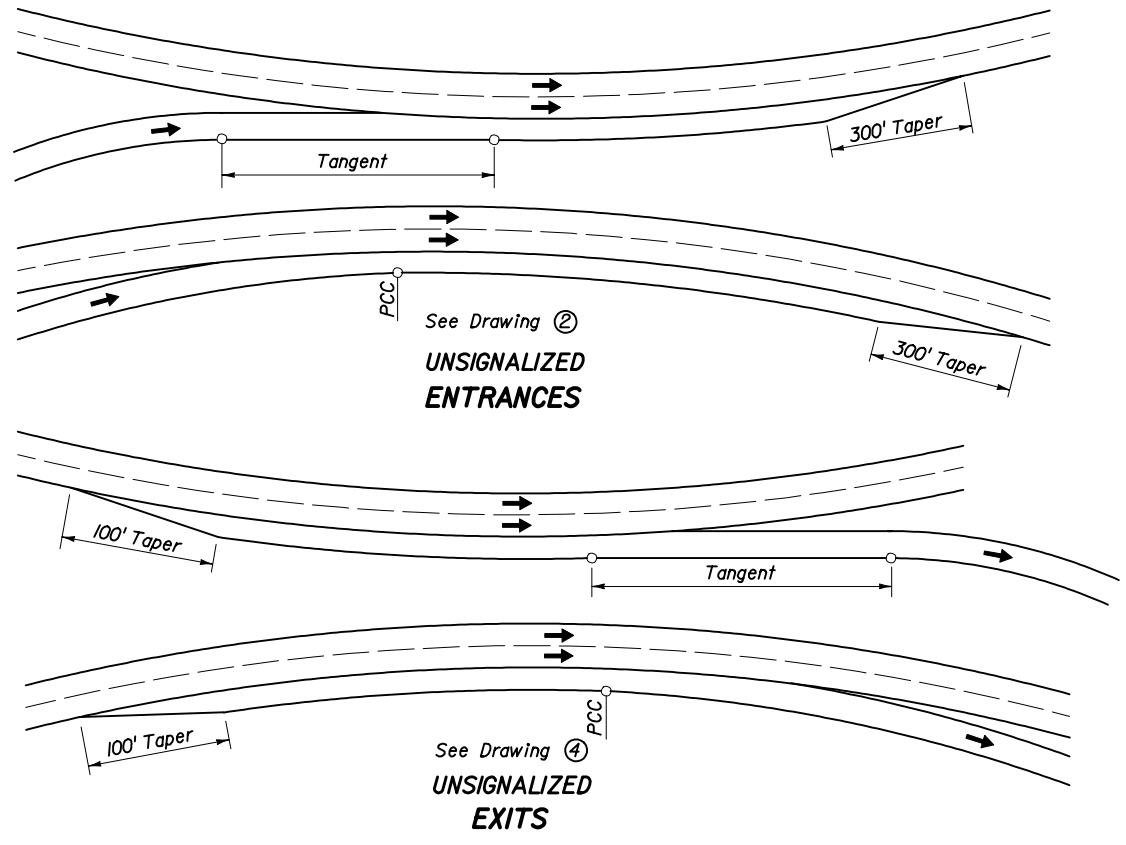
- W Normal shoulder pavement width.
- * Adjust for grades if greater than 2% (See Table X-5, AASHTO).

RAMP TERMINALS

CROSSROAD TERMINALS



SIGNALIZED OR UNSIGNALIZED LEFT TURN CONTROL



UNSIGNALIZED ENTRANCES


UNSIGNALIZED EXITS

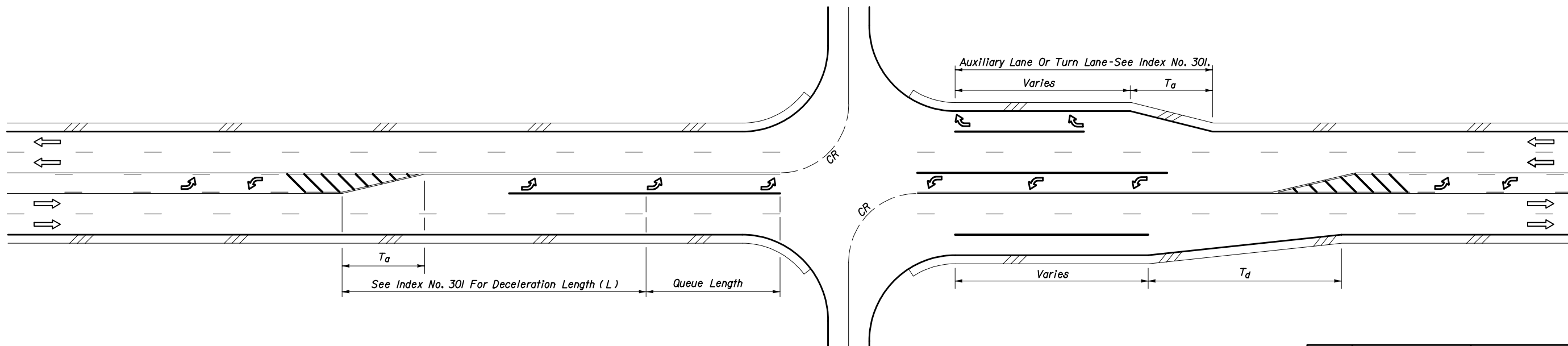
NOTE: Ramp terminals on curves should be avoided when possible.

RAMP TERMINALS ON CURVES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RAMP TERMINALS

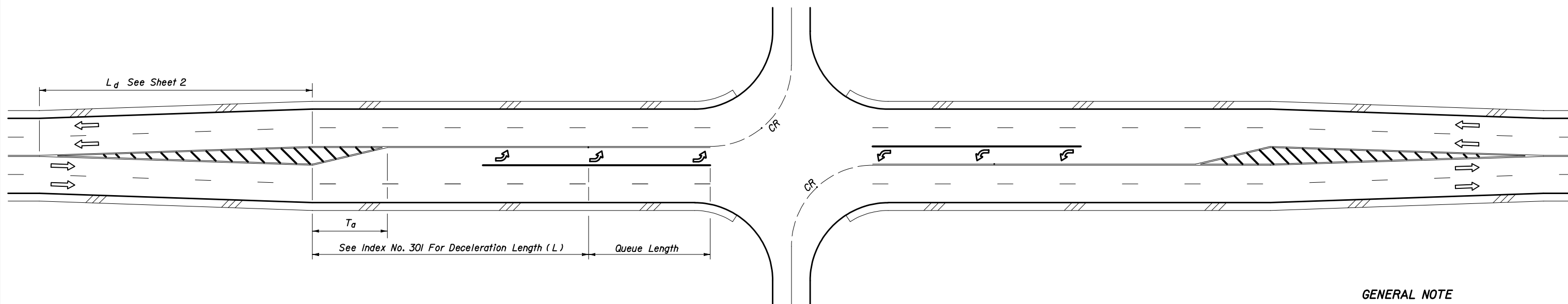
Names	Dates	Approved By		
Designed By	EHH 1/65	 Roadway Design Engineer		
Drawn By	HFW 1/65			
Checked By	RLO 6/67	Revision	Sheet No.	Index No.
		00	5 of 5	525



4-LANE WITH TWO-WAY LEFT-TURN LANES

DESIGN SPEED (mph)	T_a (FEET)	T_d
	ADD LANE	LANE DROP
< 30	50' (± 1 : 4)	1 : 25
30-45		1 : 30
> 45		1 : 40

Note: For locations with unrelocatable control points minimum taper rates for lane drop (T_d) will be 1 : 20.



4-LANE UNDIVIDED FLARED - SYMMETRICAL

INTERSECTION TURNS AND STORAGE

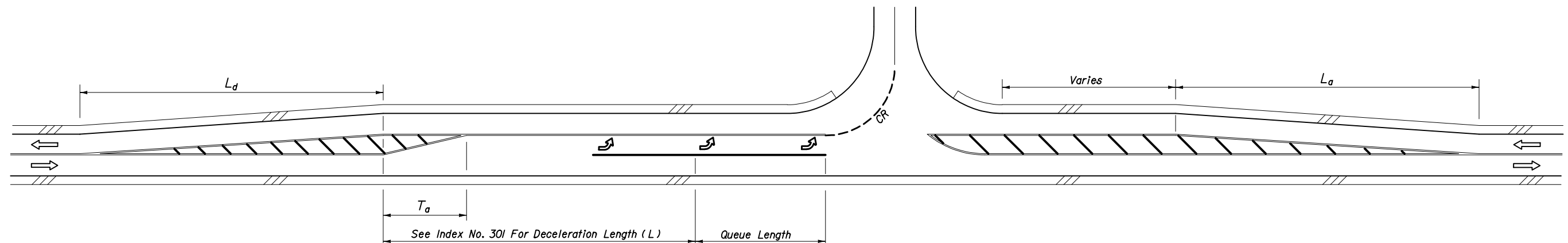
GENERAL NOTE

1. For pavement markings refer to Index No. 17346.

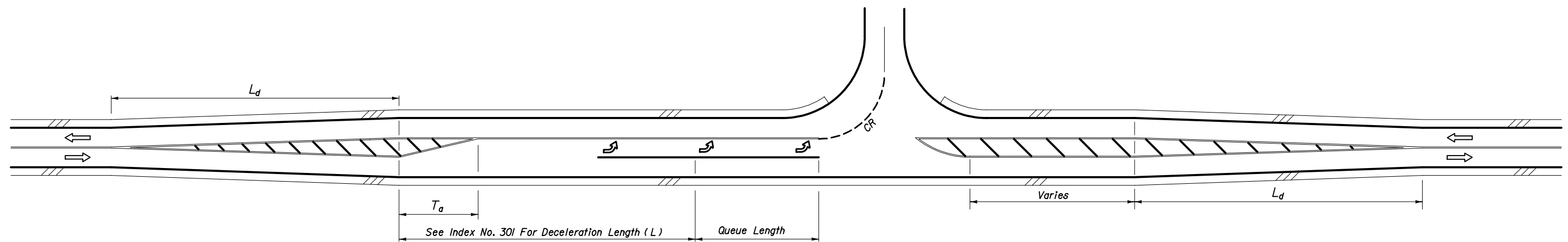
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROADWAY TRANSITIONS

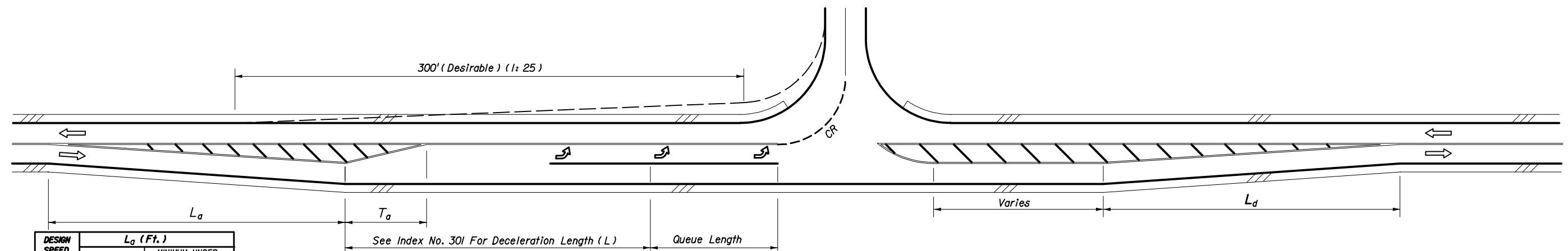
Designed By	KNM	9/89	Approved By <i>Samuel D. Mill</i> Roadway Design Engineer		
Drawn By	JBW	9/89	Revision	Sheet No.	Index No.
Checked By	KNM/JVG		00	1 of 8	526



LEFT SIDE WIDENING



CENTERED WIDENING



RIGHT SIDE WIDENING


DESIGN SPEED (mph)	L _a (Ft.)	
	STANDARD	MINIMUM UNDER RESTRAINTS
30	180	120
40	320	150
50	500	180
60	720	240

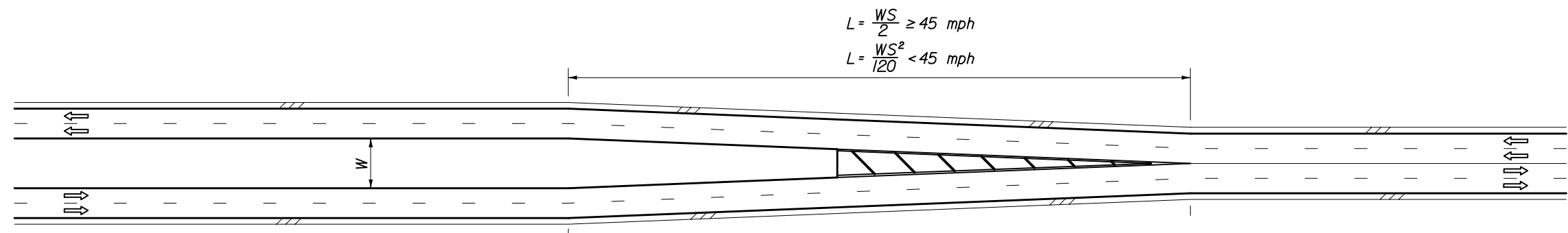
(mph)	L _d (Ft.)	
30	180	120
40	240	150
50	360	180
60	480	240

FLARED & PAINTED LEFT TURNS FOR 2-LANE 2-WAY ROADWAYS

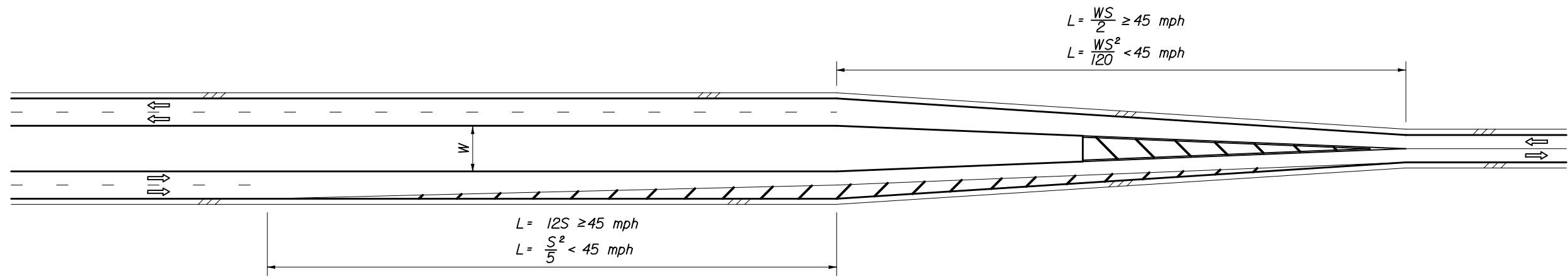
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROADWAY TRANSITIONS

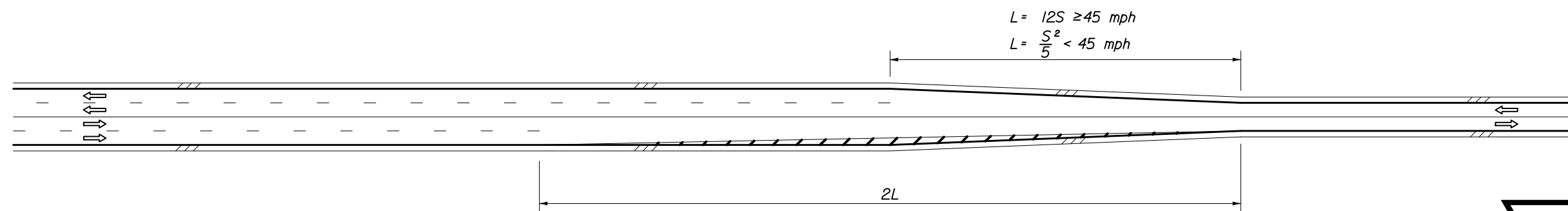
Names	Dates	Approved By		
Designed By	RER/JVG 9/98	 Roadway Design Engineer		
Drawn By	JBW 9/98			
Checked By	RER/JVG 9/98			
Revision	00			
Sheet No.	2 of 8	Index No.	526	



4-LANE DIVIDED TO 4-LANE UNDIVIDED



4-LANE DIVIDED TO 2-LANE UNDIVIDED

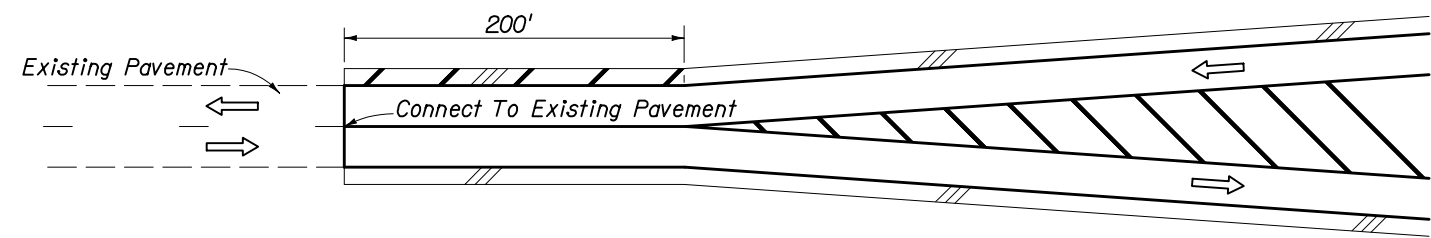


4-LANE UNDIVIDED TO 2-LANE UNDIVIDED

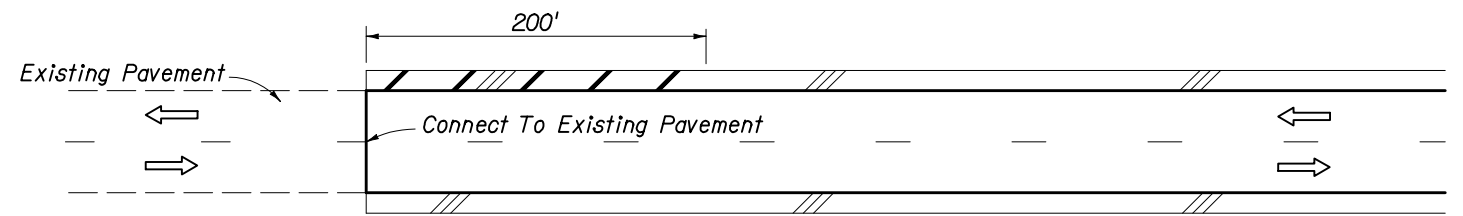
S = Design speed (mph).

LANE DIVERGENCE AND CONVERGENCE FOR CENTERED ROADWAYS

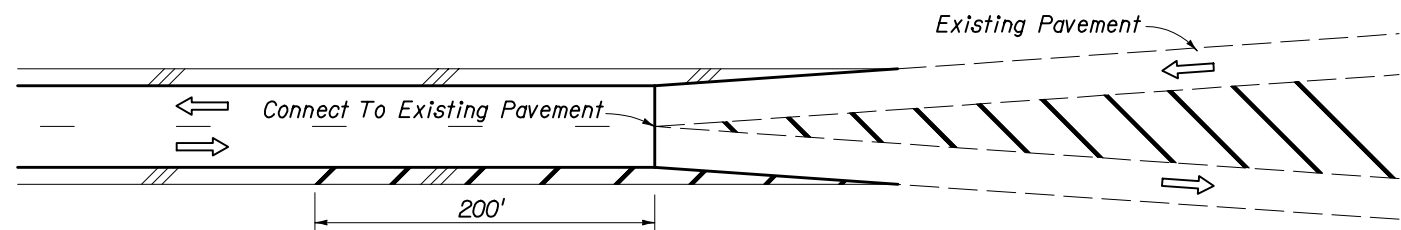
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROADWAY TRANSITIONS				
Designed By	KNM	9/89	Approved By <i>Jamell D. Mill</i> Roadway Design Engineer	
Drawn By	JBW	9/89	Revision	Sheet No.
Checked By	KNM/JVG	9/89	00	3 of 8
				Index No. 526



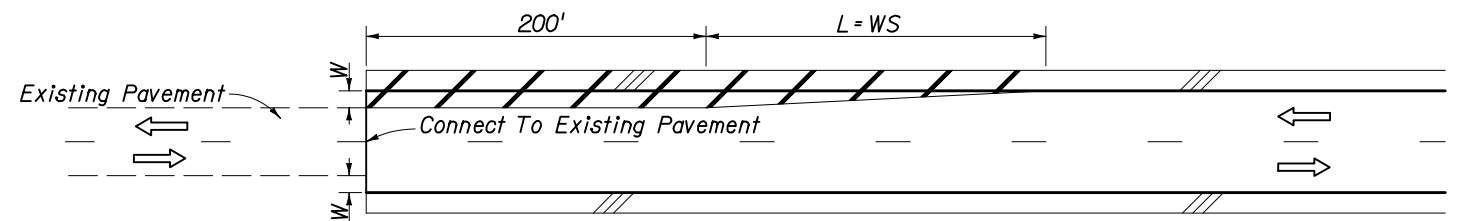
CONNECTING FLARE WITH PAVED SHOULDERS TO EXISTING ROADWAY WITHOUT PAVED SHOULDERS



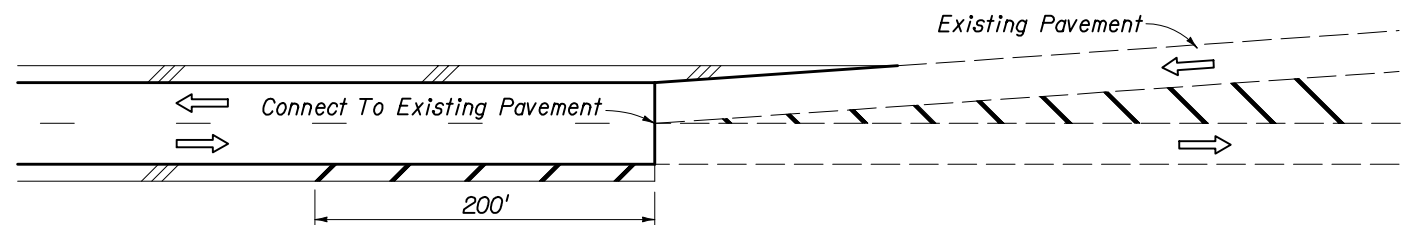
CONNECTING SIMILAR WIDTH PAVEMENTS



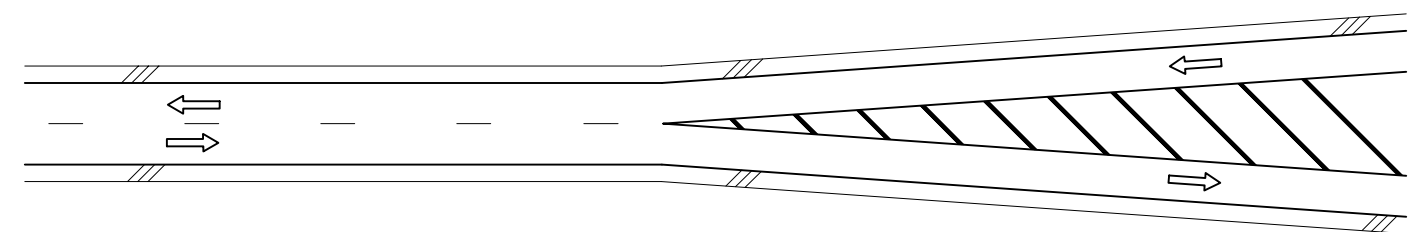
CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING SYMMETRICAL FLARE WITHOUT PAVED SHOULDERS



CONNECTING DIFFERENT WIDTH PAVEMENTS



CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING ASYMMETRICAL FLARE WITHOUT PAVED SHOULDERS




FLARED - PAVED SHOULDERS

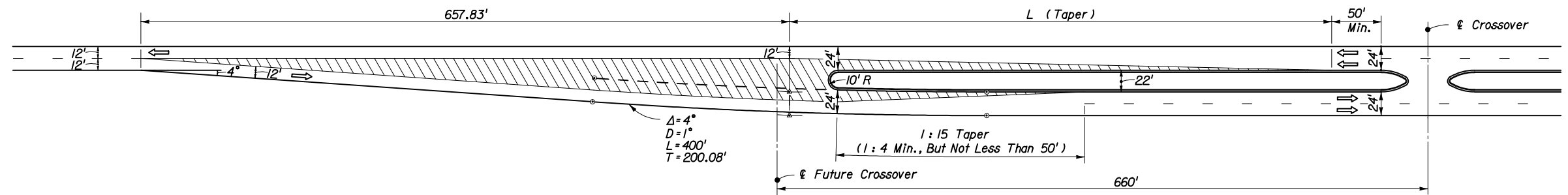
S = Design speed (mph).

PAVED SHOULDER TREATMENT AT TRANSITIONS AND CONNECTIONS

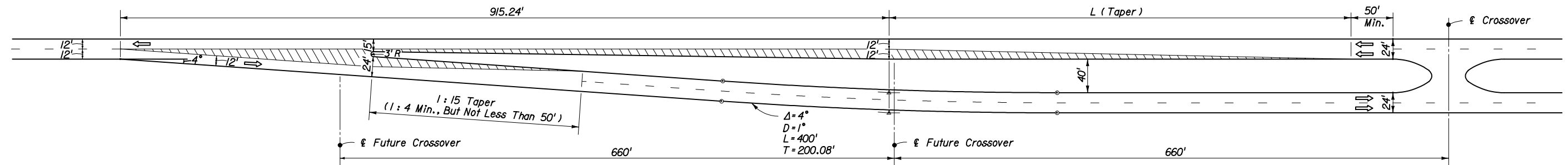
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROADWAY TRANSITIONS

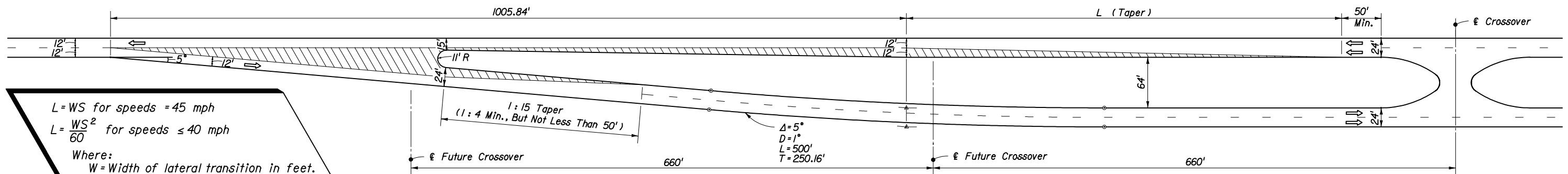
Names		Dates	Approved By		
Designed By	KNM	9/89	 Raymond D. Milk Roadway Design Engineer		
Drawn By	JBW	9/89			
Checked By	KNM/JVG	9/98	Revision	Sheet No.	Index No.
			00	4 of 8	526



22' MEDIAN



40' MEDIAN



64' MEDIAN

$L = WS$ for speeds = 45 mph
 $L = \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Design speed.

NOTES FOR SHEETS 5 THRU 8

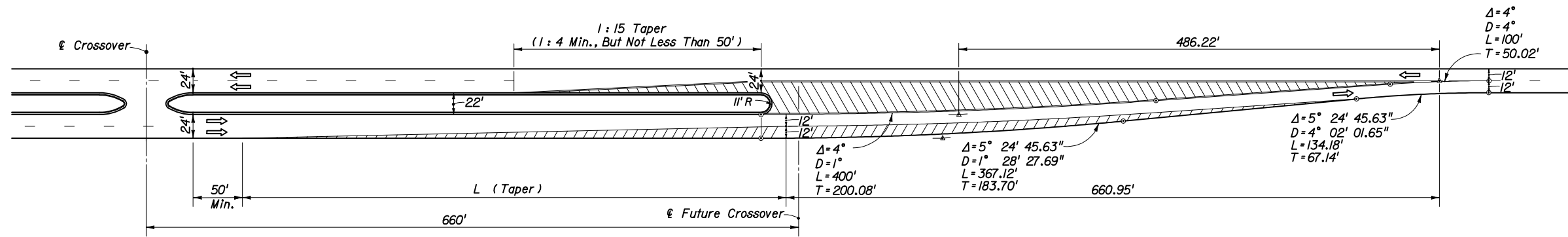
1. The transition details as represented on sheets 5 thru 8 are intended as guidelines only. The transition lengths, curve data, nose radii and offsets are valid only for tangent alignment, design speeds ≤ 45 mph, the median widths and lane widths shown.
2. Approach lane departures ($\Delta = 5^\circ$) are suitable for design speeds up to 60 mph. Interior curves ($D = 1^\circ$) are suitable for normal crown for design speeds up to 50 mph. Merging curves ($D \geq 5^\circ$) will require superelevation.
3. The geometrics of these schemes are associated with the standard subsectional spacing for sideroads, but in any case will require modification to accommodate sideroad location, multilane and/or divided sideroads, oblique sideroads, crossover widths, storage and speed change lane requirements, and, other related features.

**LEFT ROADWAY CENTERED ON APPROACH ROADWAY
TWO LANE TO FOUR LANE TRANSITION**

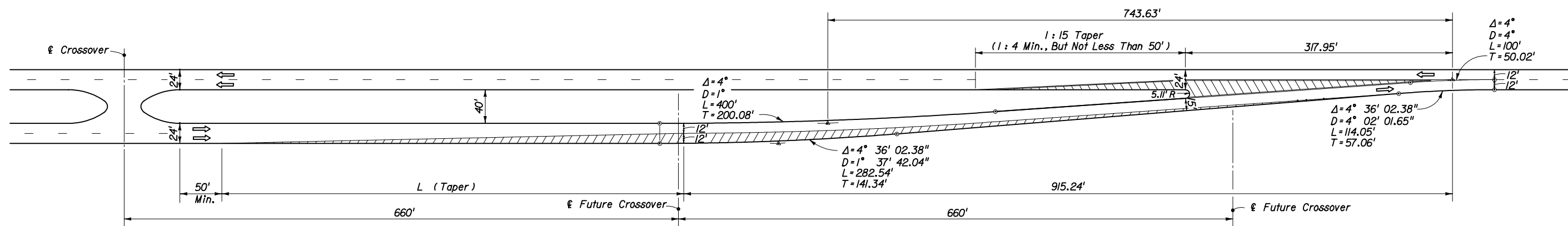
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROADWAY TRANSITIONS

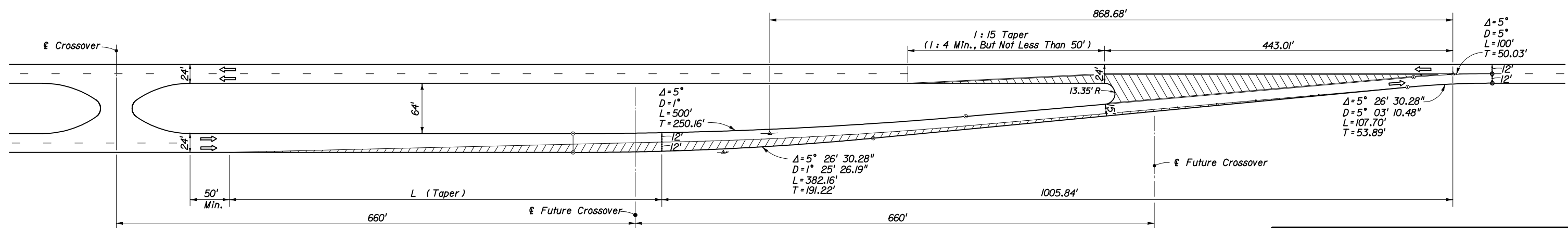
Designed By	KNM	Dates	9/89	Approved By	<i>Samuel D. Milk</i> Roadway Design Engineer		
Drawn By	HKH	Revision	2/94	Sheet No.	5 of 8	Index No.	526
Checked By	JVG	Revision	2/94	00			



22' MEDIAN



40' MEDIAN



64' MEDIAN

$L = WS$ for speeds = 45 mph

$L = \frac{WS^2}{60}$ for speeds ≤ 40 mph


Where:

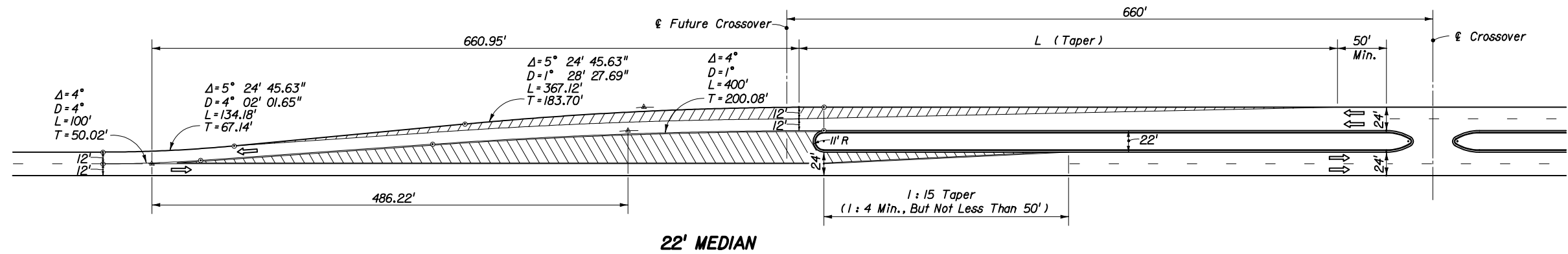
W = Width of lateral transition in feet.
S = Design speed.

**LEFT ROADWAY CENTERED ON THRU ROADWAY
FOUR LANE TO TWO LANE TRANSITION**

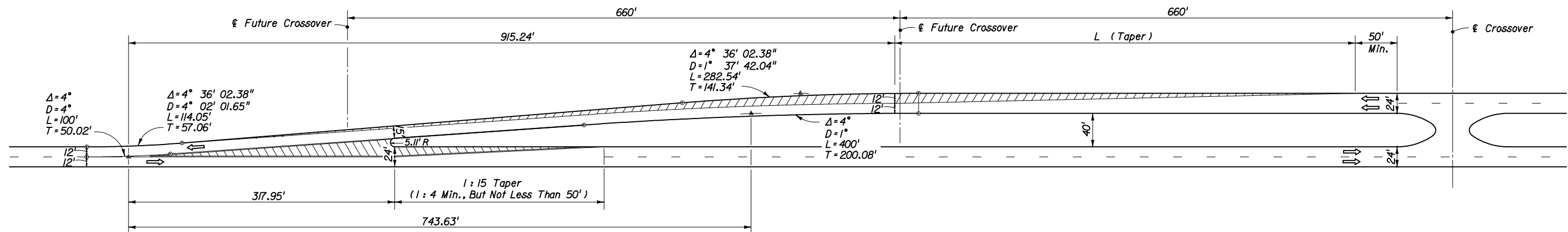
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROADWAY TRANSITIONS

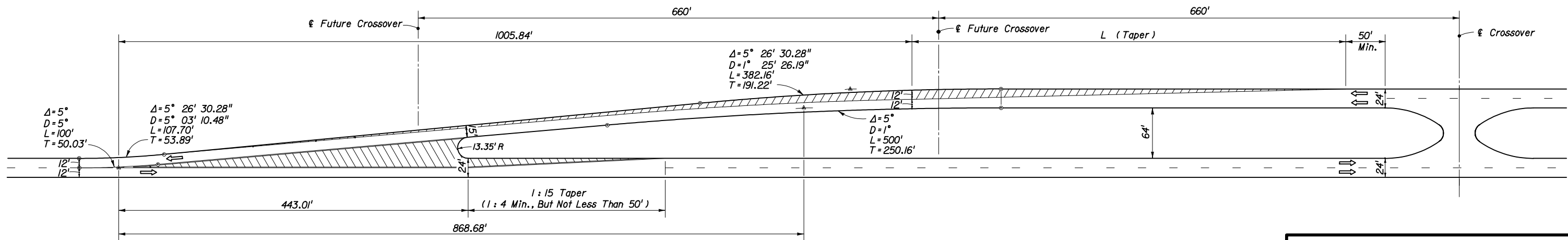
Names	Dates	Approved By		
Designed By	KNM 9/89	 Roadway Design Engineer		
Drawn By	HKH 2/94			
Checked By	JVG 2/94	00	6 of 8	526



22' MEDIAN



40' MEDIAN

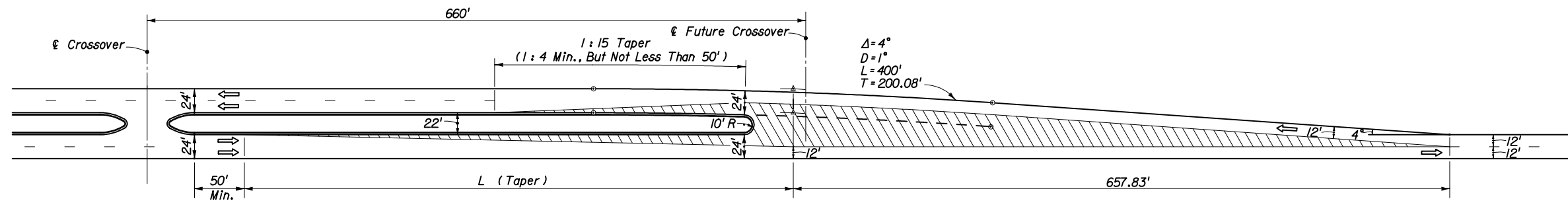


64' MEDIAN

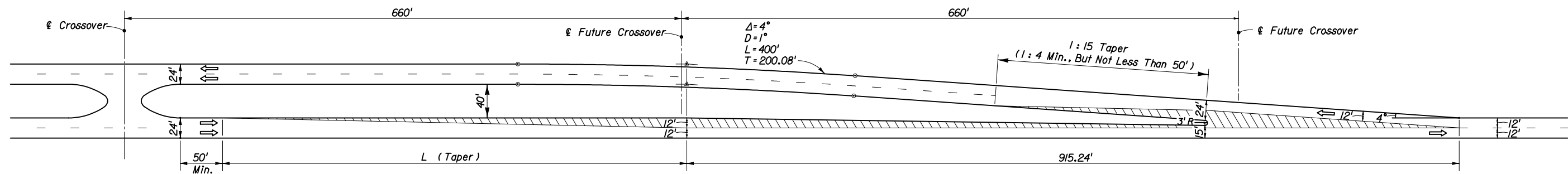
$L = WS$ for speeds = 45 mph
 $L = \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Design speed.

RIGHT ROADWAY CENTERED ON APPROACH ROADWAY
TWO LANE TO FOUR LANE TRANSITION

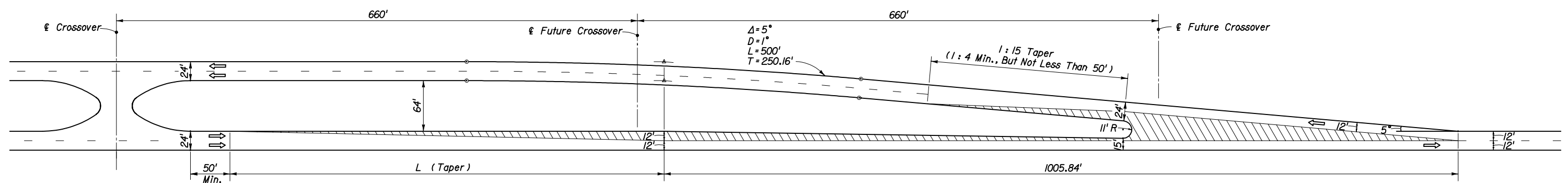
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROADWAY TRANSITIONS				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	2/94	<i>Samuel D. Milk</i> Roadway Design Engineer	
Checked By	JVG	2/94	Revision	Sheet No.
			00	7 of 8
				Index No. 526



22' MEDIAN



40' MEDIAN




64' MEDIAN

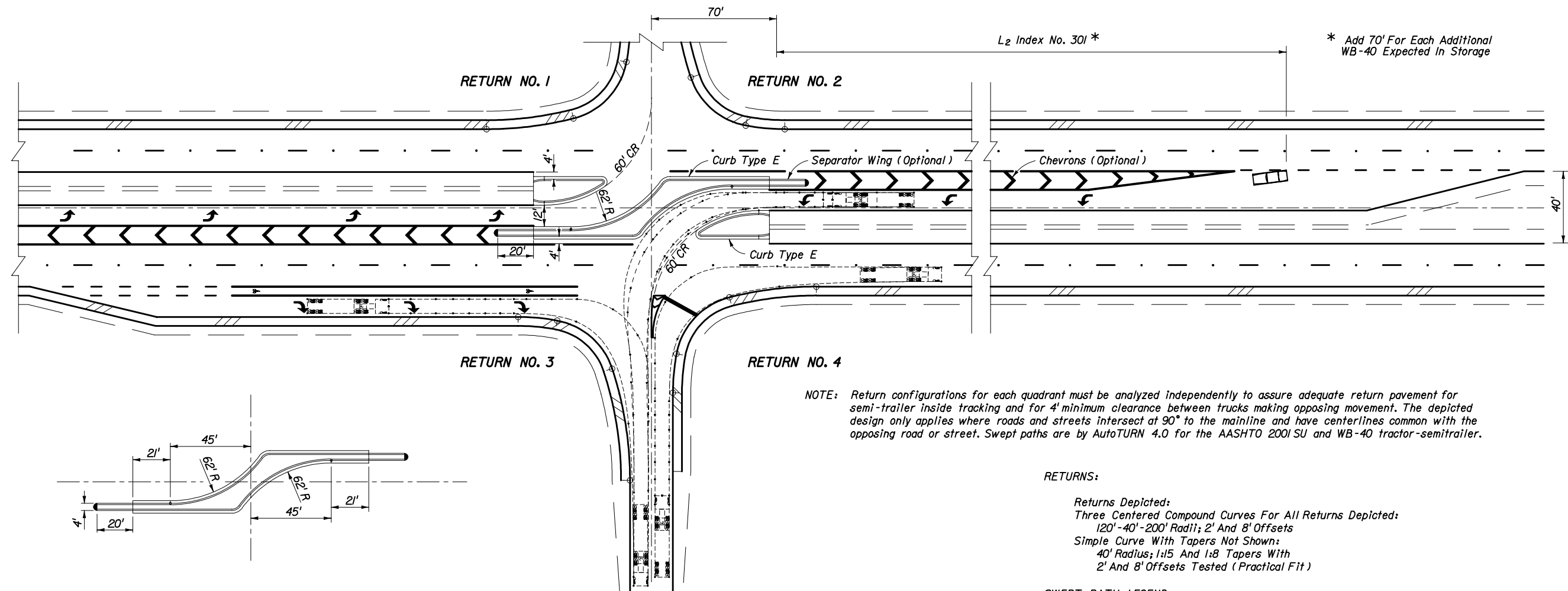
$L = WS$ for speeds = 45 mph
 $L = \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Design speed.

**RIGHT ROADWAY CENTERED ON THRU ROADWAY
FOUR LANE TO TWO LANE TRANSITION**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROADWAY TRANSITIONS

Names		Dates	Approved By		
Designed By	KNM	9/89	 Roadway Design Engineer		
Drawn By	HKH	2/94			
Checked By	JVG	2/94			
Revision	00		Sheet No.	8 of 8	Index No.
					526



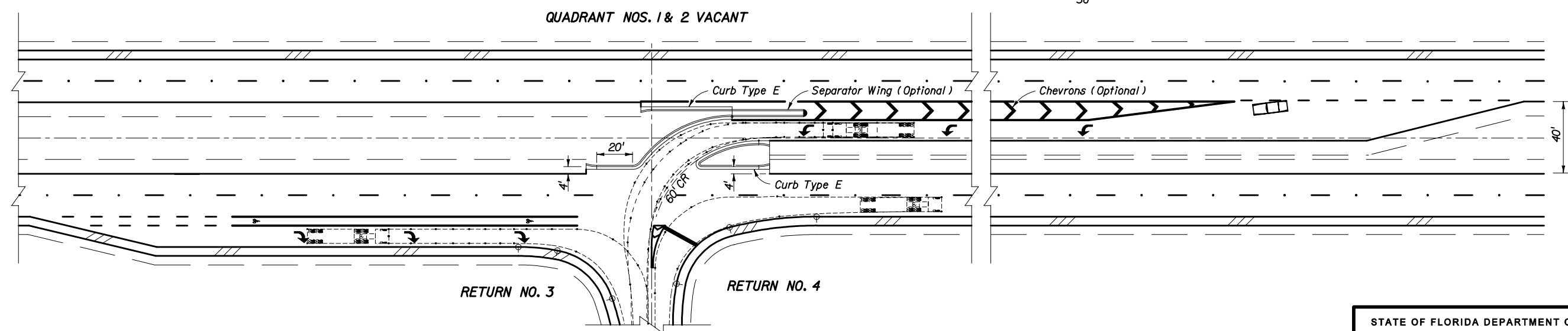
NOTE: Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking and for 4' minimum clearance between trucks making opposing movement. The depicted design only applies where roads and streets intersect at 90° to the mainline and have centerlines common with the opposing road or street. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 SU and WB-40 tractor-semitrailer.

RETURNS:

Returns Depicted:
 Three Centered Compound Curves For All Returns Depicted:
 120'-40'-200' Radii; 2' And 8' Offsets
 Simple Curve With Tapers Not Shown:
 40' Radius; 1:15 And 1:8 Tapers With
 2' And 8' Offsets Tested (Practical Fit)

SWEPT PATH LEGEND:

WB 40 -----
 SU - - - - -




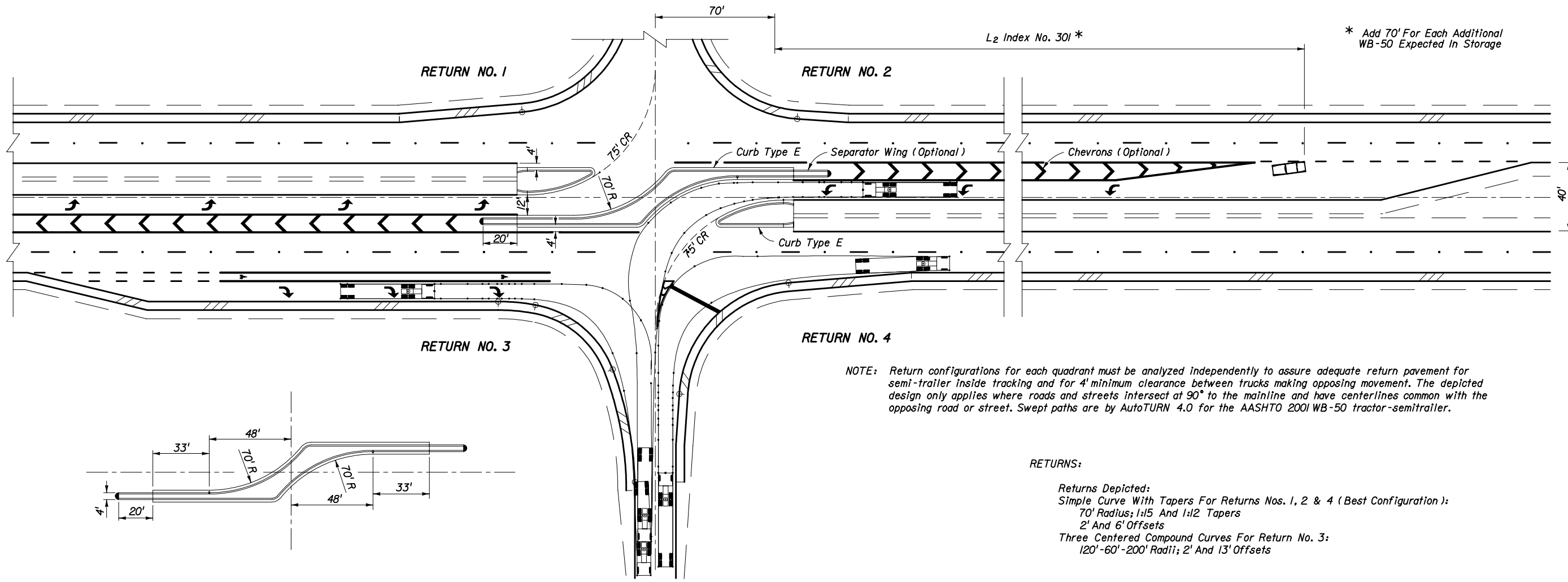
NOTE: Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking. The depicted design only applies where roads and streets intersect at 90° to the mainline. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 SU and WB-40 tractor-semitrailer.

40' MEDIAN • 4-LANE DIVIDED • PARALLEL TURN BAY • 2001 AASHTO SU & WB-40 (WB-12)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**DIRECTIONAL
 MEDIAN OPENINGS**

Names	Dates	Approved By		
Designed By	JVG/JAM 12/02	 Roadway Design Engineer		
Drawn By	SBC 12/02			
Checked By	JVG/JAM 12/02	Revision	Sheet No.	Index No.
		04	1 of 3	527



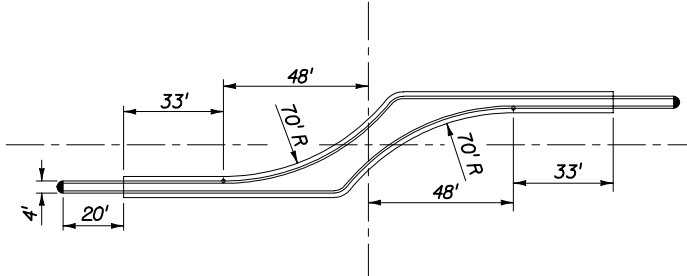
L₂ Index No. 301*

* Add 70' For Each Additional WB-50 Expected In Storage

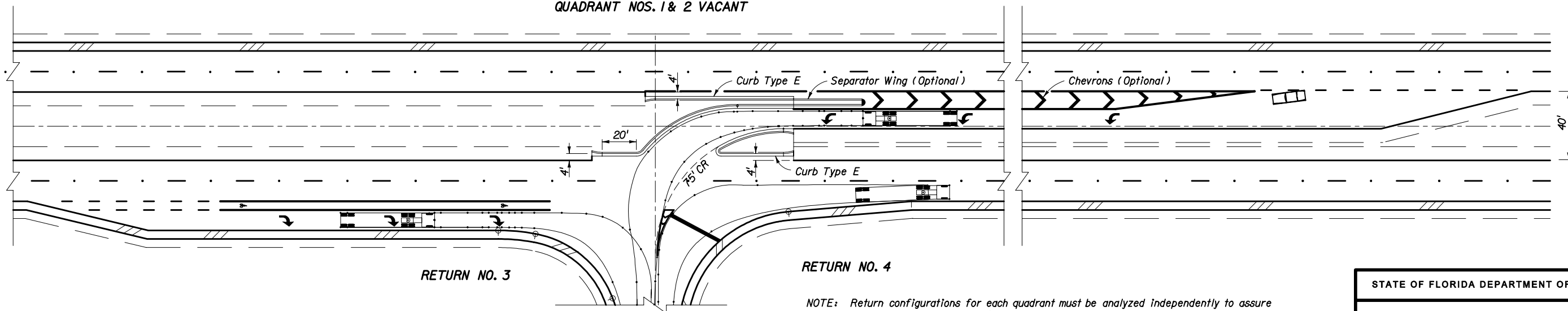
NOTE: Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking and for 4' minimum clearance between trucks making opposing movement. The depicted design only applies where roads and streets intersect at 90° to the mainline and have centerlines common with the opposing road or street. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 WB-50 tractor-semi-trailer.

RETURNS:

- Returns Depicted:
- Simple Curve With Tapers For Returns Nos. 1, 2 & 4 (Best Configuration):
- 70' Radius; 1:15 And 1:12 Tapers
- 2' And 6' Offsets
- Three Centered Compound Curves For Return No. 3:
- 120'-60'-200' Radii; 2' And 13' Offsets



QUADRANT NOS. 1 & 2 VACANT



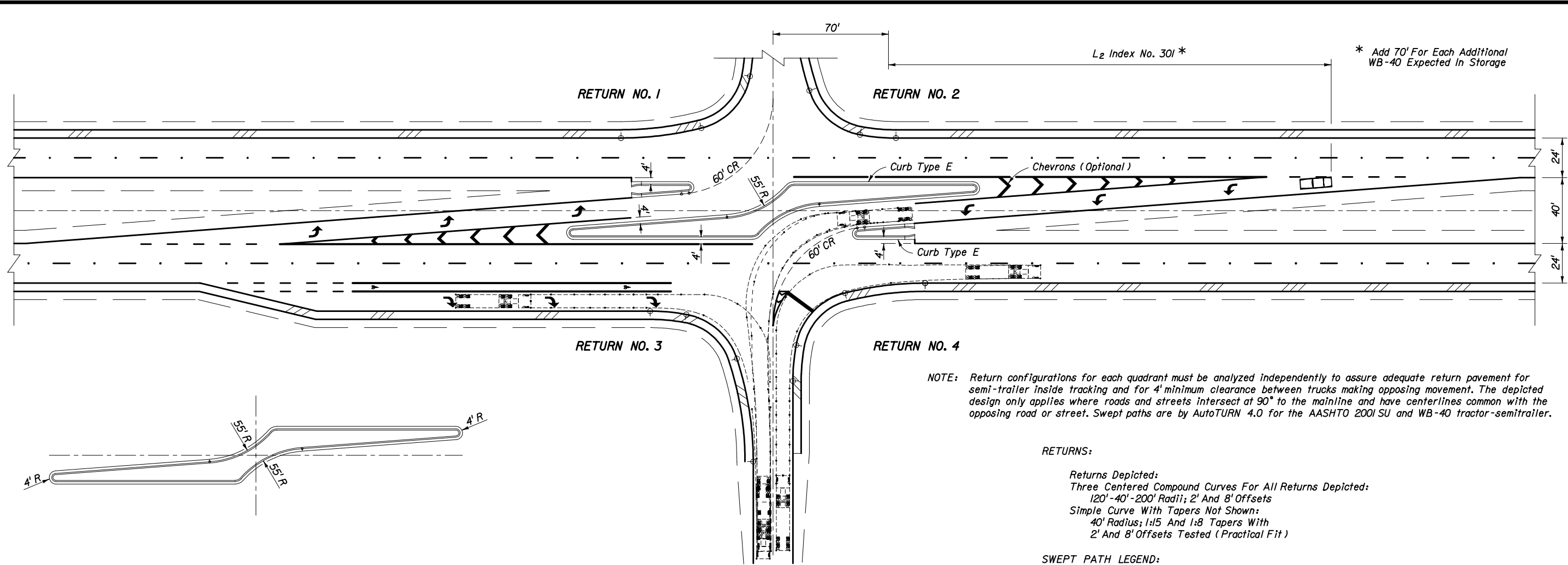
NOTE: Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking. The depicted design only applies where roads and streets intersect at 90° to the mainline. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 WB-50 tractor-semi-trailer.

40' MEDIAN • 4-LANE DIVIDED • PARALLEL TURN BAY • 2001 AASHTO WB-50 (WB-15)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

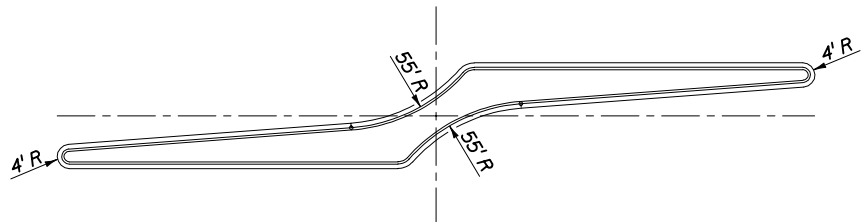
DIRECTIONAL MEDIAN OPENINGS

Designed By	JVG/JAM	12/02	Approved By <i>James D. Mill</i> Roadway Design Engineer		
Drawn By	SBC	12/02	Revision	Sheet No.	Index No.
Checked By	JVG/JAM	12/02	04	2 of 3	527



L₂ Index No. 301 *

* Add 70' For Each Additional WB-40 Expected In Storage



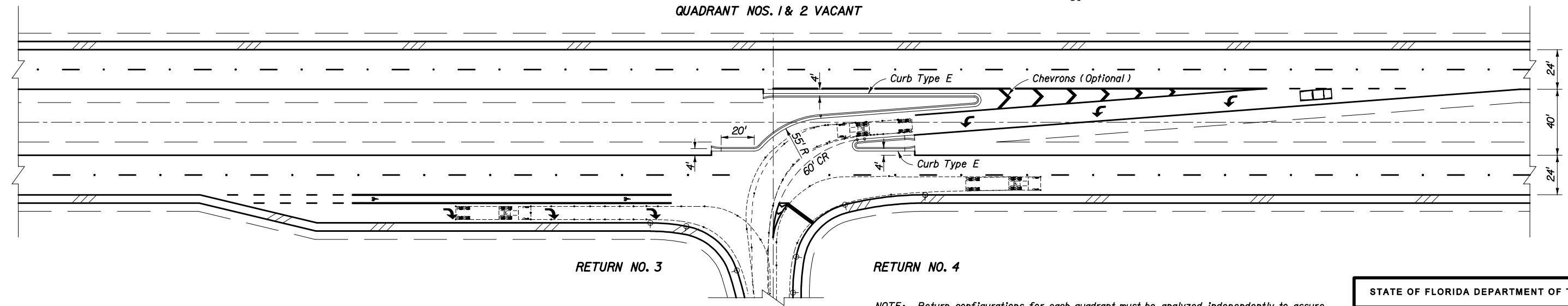
RETURNS:

Returns Depicted:
 Three Centered Compound Curves For All Returns Depicted:
 120'-40'-200' Radii; 2' And 8' Offsets
 Simple Curve With Tapers Not Shown:
 40' Radius; 1:5 And 1:8 Tapers With
 2' And 8' Offsets Tested (Practical Fit)

SWEPT PATH LEGEND:

WB 40 -----
 SU -----

QUADRANT NOS. 1 & 2 VACANT




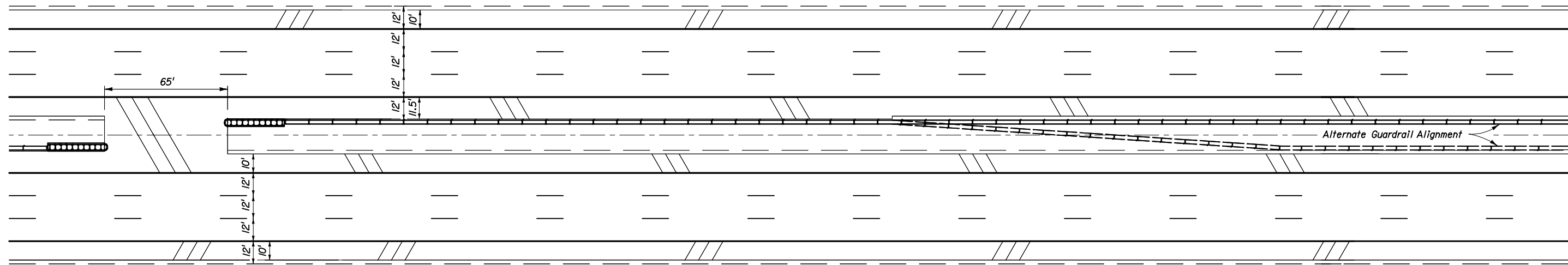
NOTE: Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking. The depicted design only applies where roads and streets intersect at 90° to the mainline. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 SU and WB-40 tractor-semi-trailer.

40' MEDIAN • 4-LANE DIVIDED • TAPERED TURN BAY • 2001 AASHTO SU & WB-40 (WB-12)

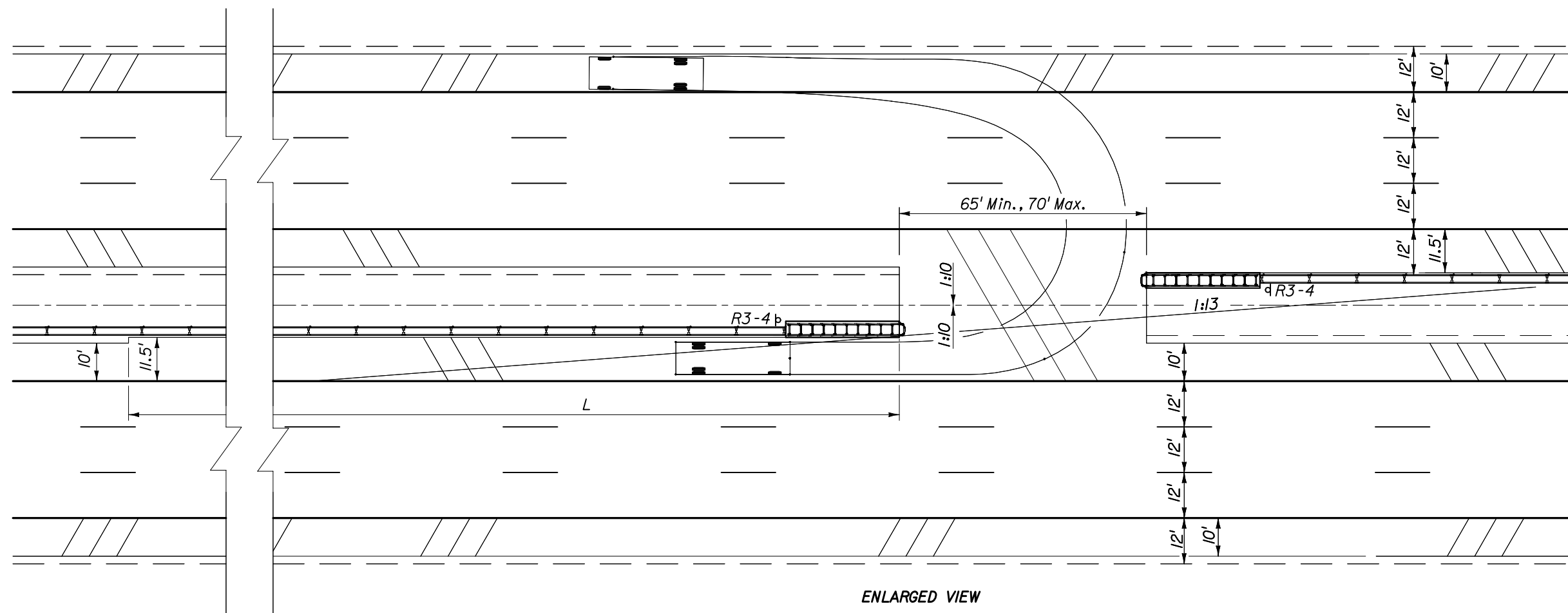
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**DIRECTIONAL
 MEDIAN OPENINGS**

Names	Dates	Approved By		
Designed By	JVG/JAM 12/02	 Roadway Design Engineer		
Drawn By	SBC 12/02			
Checked By	JVG/JAM 12/02	Revision	Sheet No.	Index No.
		04	3 of 3	527



TRANSITION PLAN

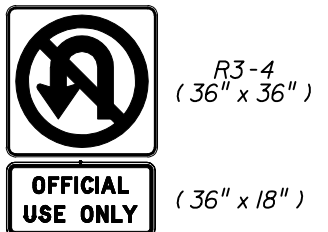


ENLARGED VIEW

PLAN VIEWS

DISTANCE "L"	
Design Speed (mph)	L (ft.)
50	350
55	400
60	460
65	530
70	600

Basis For Length L:
2 Sec. Brake React.
13.4 ft/sec² Decel.



LEGEND

- Crash Cushion
- Barrier
- Sign

GENERAL NOTES

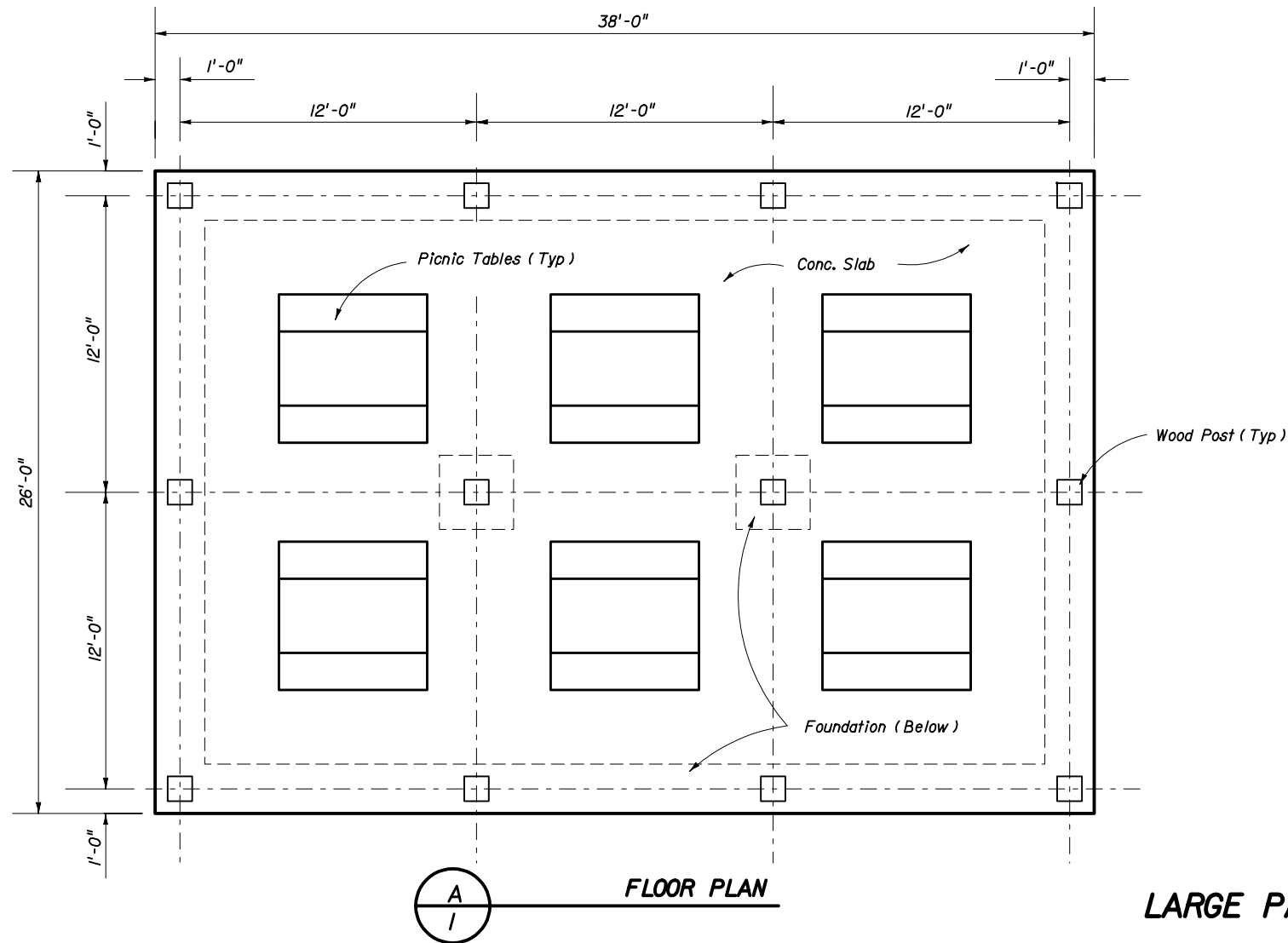
1. The purpose of this index is to provide the designer a reference for developing emergency vehicle access through median barriers on limited access facilities. This standard is not to be applied when developing work zone median crossovers; See Index Nos. 630 and 631 for work zone crossovers.
2. Location of median barrier openings for emergency access are to be as directed by the District Design Engineer or District Traffic Operations Engineer.
3. Turn simulations generated by AutoTURN 4.0. Minimum turning radius shown.
4. Six lane facility with 40' median shown. For other lane and median configurations, adjustments in turn radii or added pavement may be required.
5. Contact the State Roadway Design Office for 'OFFICIAL USE ONLY' sign details.

LIMITED ACCESS • MEDIANS 40' OR GREATER • 2001 AASHTO SU VEHICLE

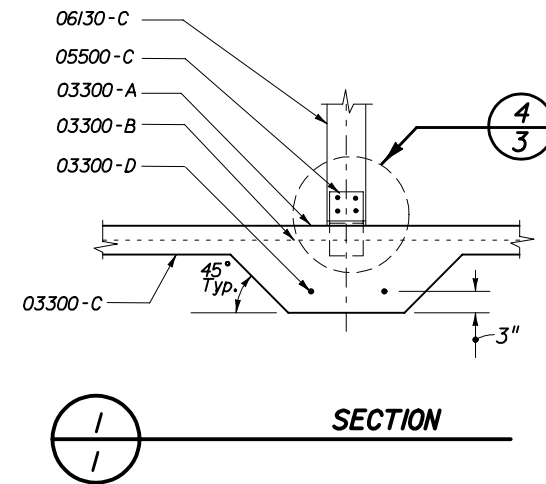
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MEDIAN BARRIER OPENING FOR EMERGENCY ACCESS

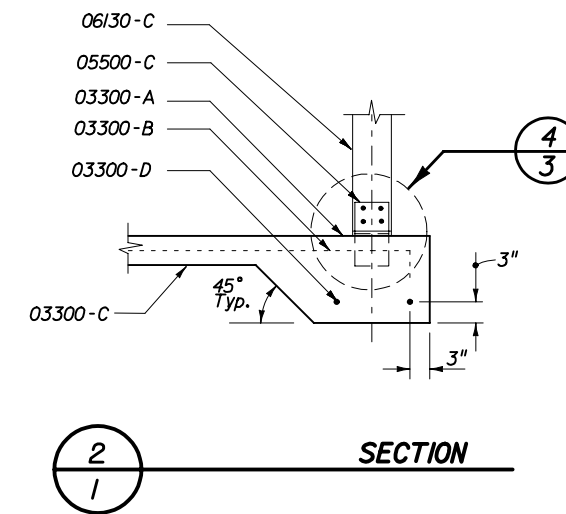
Designed By	JVG/JAM	12/02	Approved By	
Drawn By	SBC	12/02	Revision	04
Checked By	JVG/JAM	12/02	Sheet No.	1 of 1
			Index No.	528



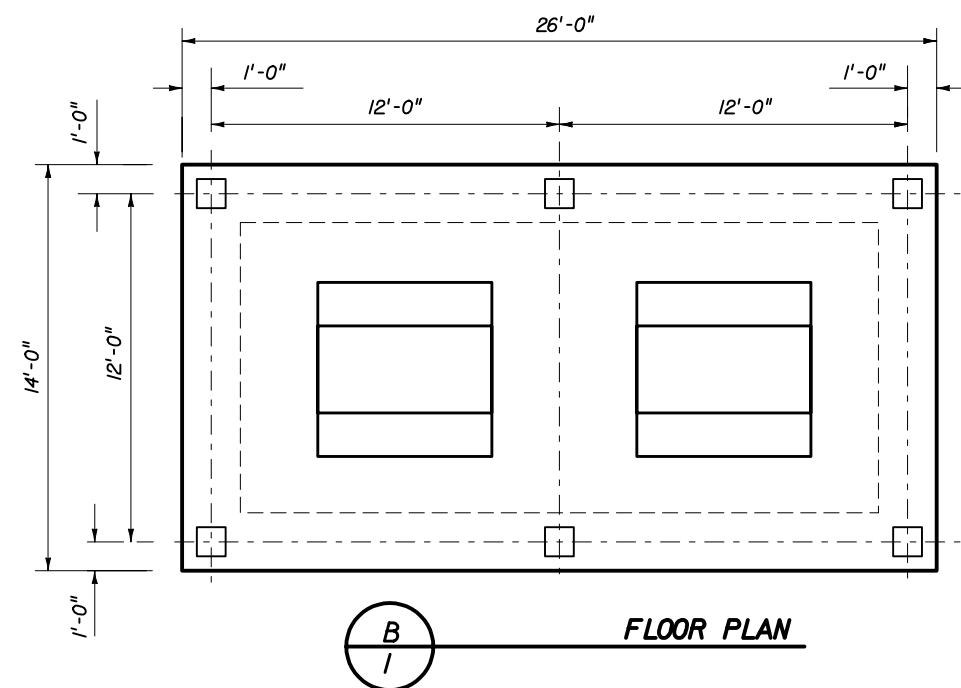
LARGE PAVILION



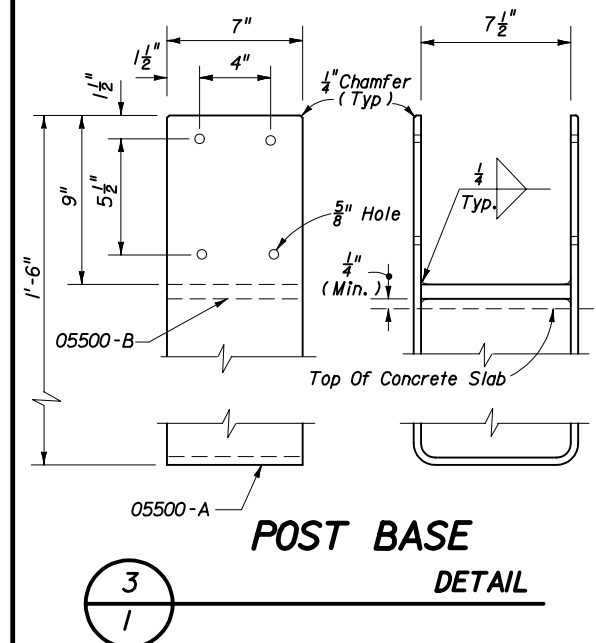
SECTION



SECTION



SMALL PAVILION



**POST BASE
DETAIL**

NOTES

Keynotes On Sheet 2.

FLOOR

6" Reinf. Concrete Slab w/WWF6 x 6-WI.4 x WI.4

1'-6" x 1'-6" Drop Footing At Slab Perimeter & Interior Posts.

Harden & Broom Finish Slab Surface.

STRUCTURE

Posts: 8 x 8 PT

Beams: 4 x 6 PT

Framing: 4x PT As Described.

Misc Members: 1x and 2x As Described.

ROOF

3" x 6" T&G Wood Decking.

30# Asphalt Impregnated Fiberglass Felt Underlayment.

Standing Seam Metal Roof (24 GA Steel Or .032 Alum.) w/ Kynar 500 Finish.

Structure, Decking And Roofing Shall Be Designed To Withstand 130 mph Wind Load.

BUILDING CODE

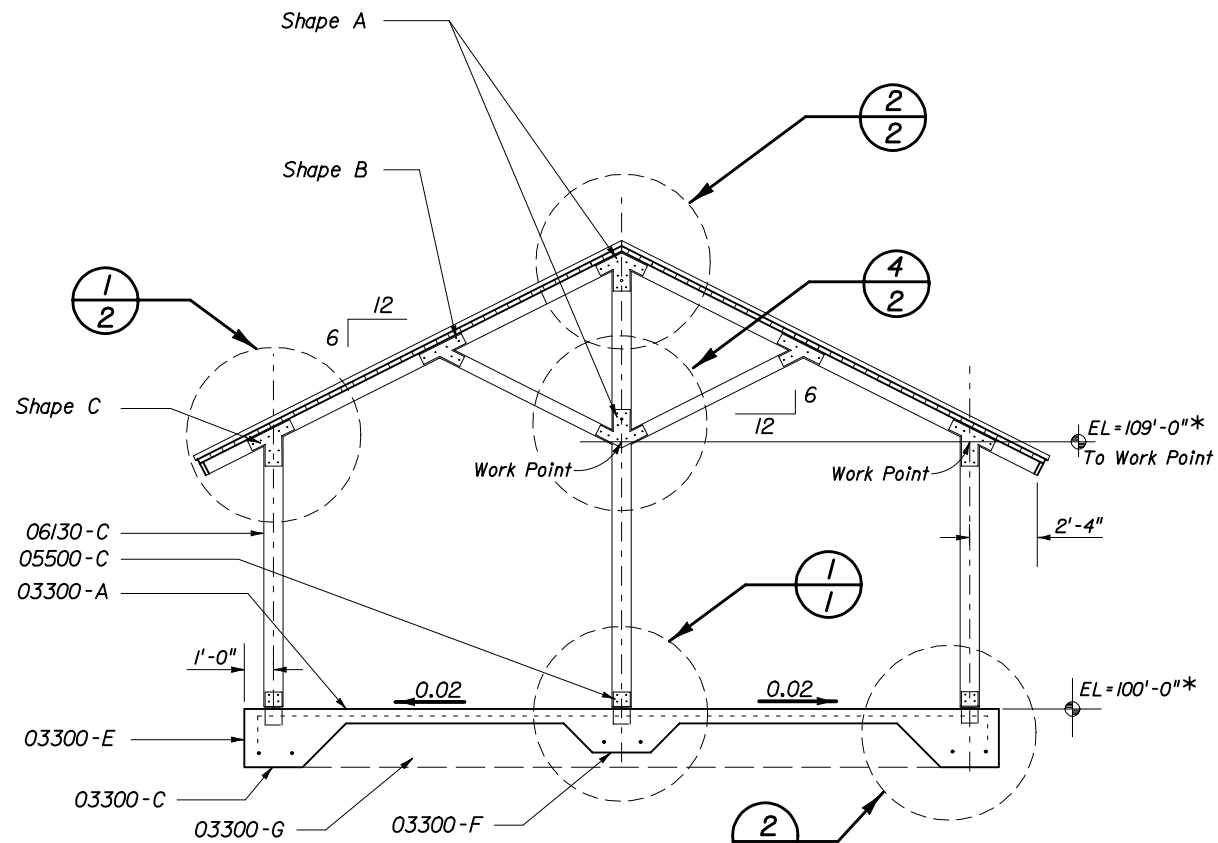
Picnic Pavilions Shall Be Constructed According To The Requirements Of The Appropriate Sections Of Applicable "Standard Building Code" or "South Florida Building Code", Current, Adopted Edition.

PICNIC PAVILIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

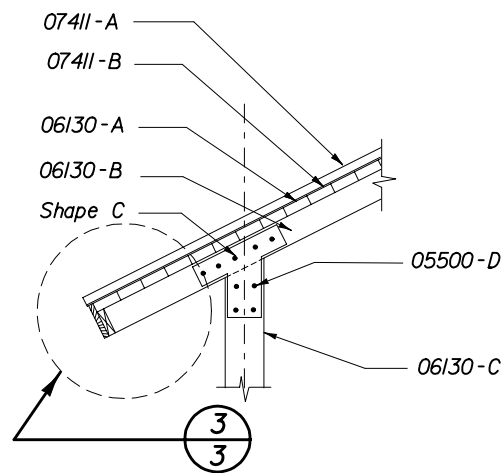
REST AREA EQUIPMENT

Names		Dates		Approved By				
Designed By	HDP	6/93		 SPECIAL STRUCTURES ARCHITECT				
Drawn By	HDP	6/95	Revision				Sheet No.	Index No.
Checked By	ABK	9/95	00				1 of 3	530

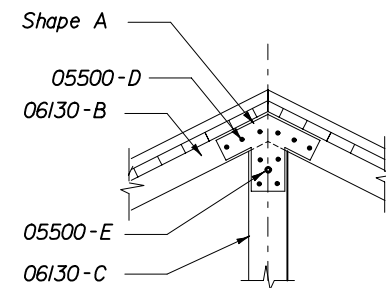


* REFERENCE ELEVATION ONLY

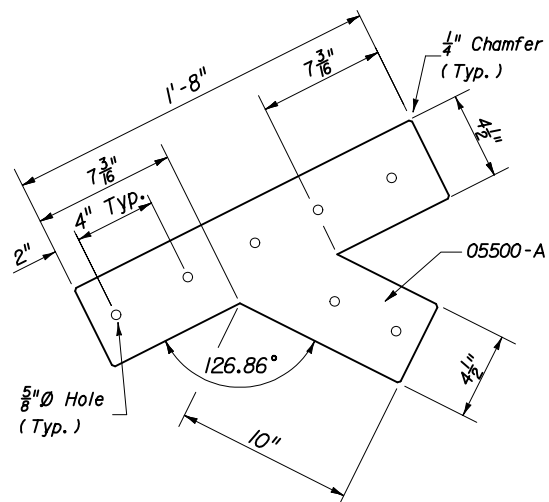
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A/2



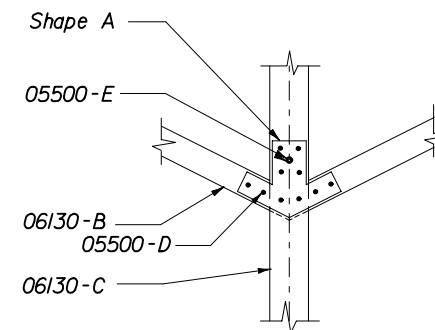
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1/2



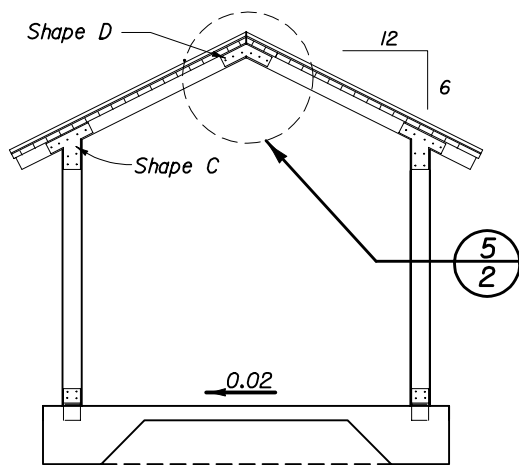
SECTION
2/2



SHAPE B
DETAIL
3/2

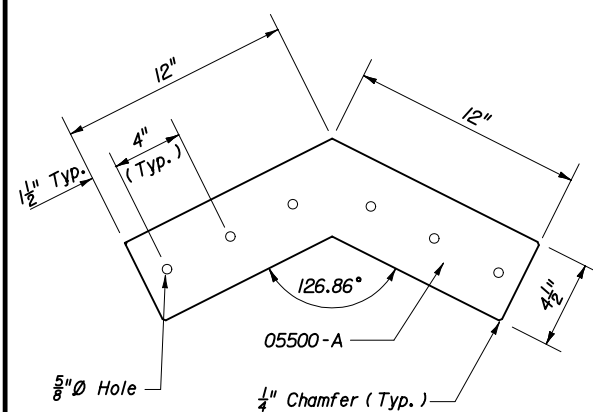


SECTION
4/2

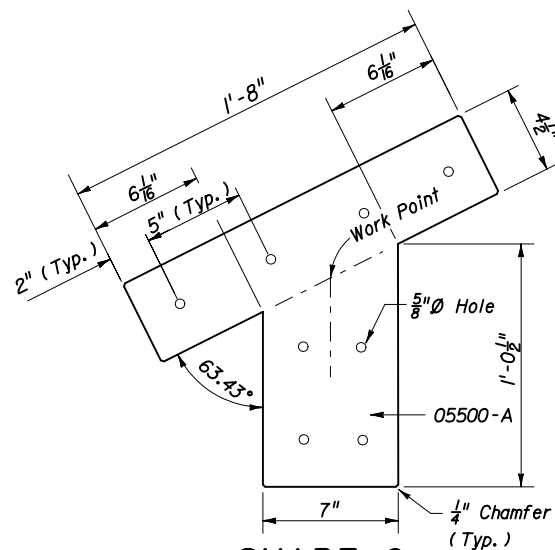


NOTE: DETAILS TO MATCH THOSE OF LARGE PICNIC PAVILION

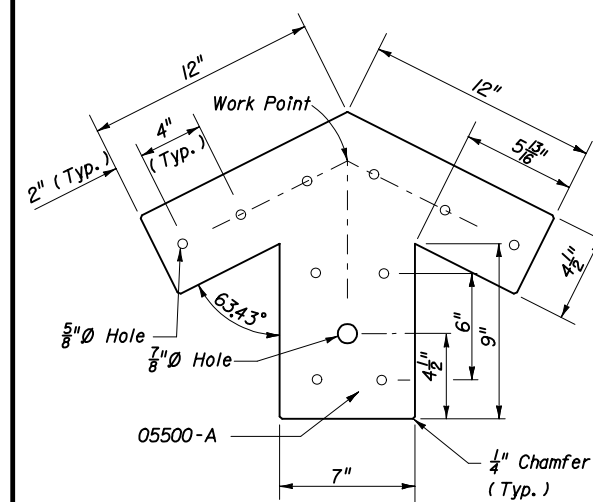
SECTION
B/2



SHAPE D
DETAIL
5/2



SHAPE C
DETAIL
6/2



SHAPE A
DETAIL
7/2

KEYNOTES

- 03300-A Class II Conc Slab
- 03300-B 6" x 6" - W1.4 x W1.4 @ 12" Of Slab
- 03300-C 6 Mil Vapor Barrier
- 03300-D #5 Rebar Cont. (2 Required)
- 03300-E 24" x 24" Drop Footing
- 03300-F 18" x 18" Drop Footing
- 03300-G 6" Min Comp Sand Fill
- 03300-H #5 x 18" Rebar (4 Required)

- 05500-A 3/8" Galv. Steel Plate
- 05500-B 1/2" Galv. Steel Plate
- 05500-C Post Base
- 05500-D 1/2" Dia Bolt, Washer & Nut (Typ)
- 05500-E 3/4" Dia Eyebolt, Washer & Nut For Cross Brace Bars
- 05500-F 1/2" Dia Steel Rod w/Turnbuckle

- 06130-A 3" x 6" T&G Wood Decking
- 06130-B 4" x 6" PT Wood Frame
- 06130-C 8" x 8" PT Wood Post
- 06130-D 2" x 6" PT Wood Fascia
- 06130-E 1" x 10" PT Wood Fascia
- 06130-F 3/4" ± Wood Shim

- 07411-A Standing Seam Metal Roof
- 07411-B Felt Underlayment

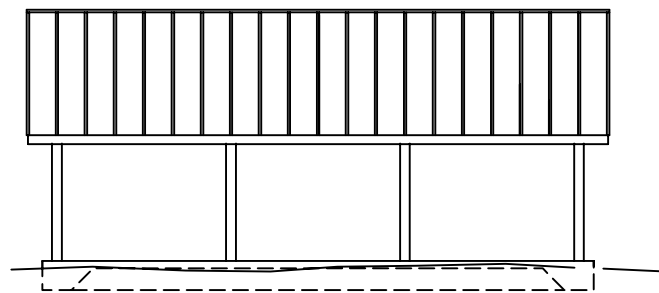
Alternate Material Note:
These structures are shown with timber frames and decking. Alternate materials (ie. aluminum, steel, etc.) may be used when submittals are signed and sealed by a specialty engineer as per Section 5.1 of the Standard Specifications and when approved by the Engineer.

PICNIC PAVILIONS

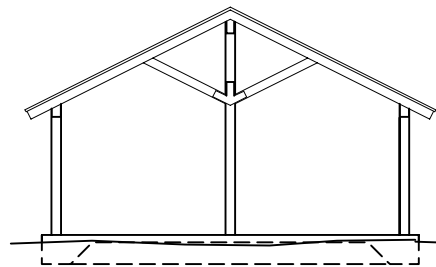
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

REST AREA EQUIPMENT

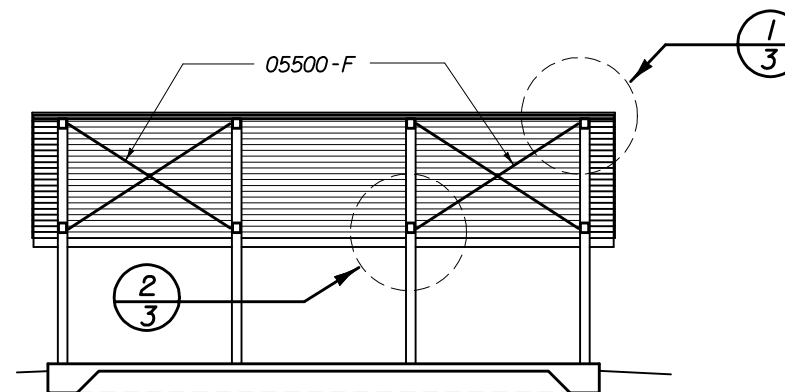
Names	Dates	Approved By	
Designed By	HDP 6/93	 SPECIAL STRUCTURES ARCHITECT	
Drawn By	HDP 9/95		
Checked By	ABK 9/95		
Revision	00	Sheet No.	Index No.
		2 of 3	530



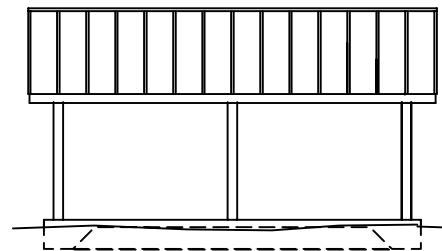
A
3 SIDE ELEVATION



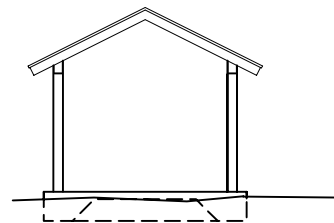
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3 END ELEVATION



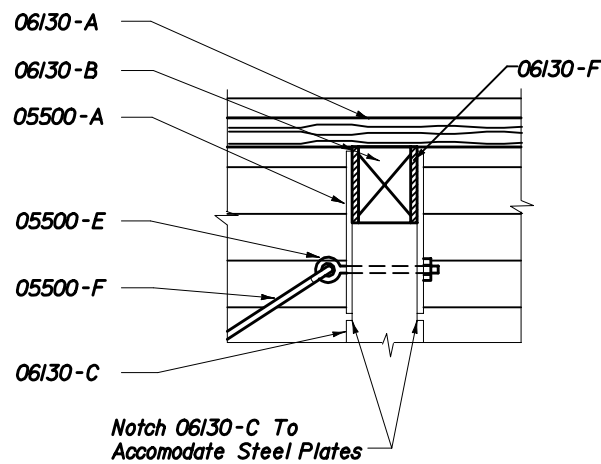
C
3 SECTION



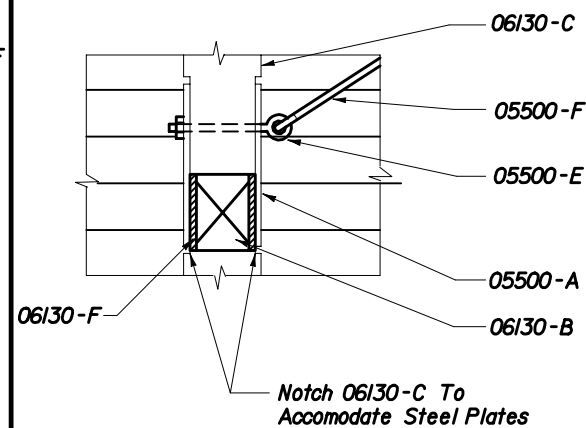
D
3 SIDE ELEVATION



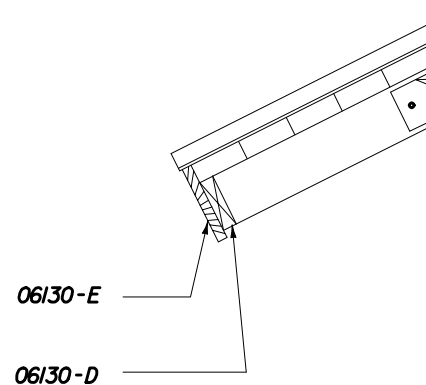
E
3 END ELEVATION



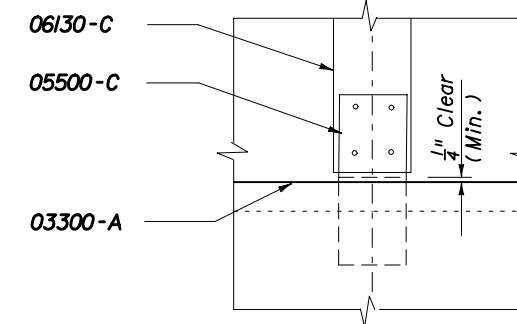
1
3 DETAIL



2
3 DETAIL



3
3 DETAIL
Similar At Roof Rake



4
3 DETAIL

SPECIFICATIONS

Keynotes On Sheet 2.

CONCRETE

Concrete: FDOT Class II.
Reinforcing Bars: ASTM A615/A615M, Grade 400.
Welded Wire Fabric: ASTM A-185.
Vapor Barrier: Black 6-Mil Polyethylene.

STEEL

Galvanized Steel Plate: Steel Plate ASTM A446 With G90 Zinc Coating.
Galvanized Fasteners: High-Strength Bolts And Nuts, ASTM A325 With G90 Zinc Coating.
Galvanize Shapes After Fabrication, Make Field Repairs To Galvanizing With High Zinc Dust Content Paint, Complying With SSPC-Paint-20.

WOOD

Comply With American Institute For Timber Construction AITC 108, "Standard For Heavy Timber Construction."
For Solid Wood Decking, Comply With AITC 112, Standard For Tongue And Groove Heavy Timber Standard."
Species: Douglas Fir, Hem-fir, Or Southern Pine, At Fabricator's Option.
Preservative Treatment: Pressure Treat Fabricated Members With Waterborne Solution For Above Ground Use, Complying With AWPA C2.
Wood Decking: Predrill Decking At 30" Centers For Lateral Spiking To Adjacent Units. Spikes To Be 20d Galvanized Common.

PICNIC TABLES

Picnic Tables And Benches Shall Be 6' x 6' w/Heavy Galvanized Pipe Frames And Recycled Plastic Wood Seats And Table Tops. All Tables Shall Be Of Walk Thru Design Suitable For Exterior Locations. Tables At Accessible Pavilions Shall Meet The Requirements Of The Americans With Disabilities Act (ADA) Accessibility Guidelines.

PICNIC PAVILIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

REST AREA EQUIPMENT

Names	Dates	Approved By		
Designed By	HDP	6/95	 SPECIAL STRUCTURES ARCHITECT	
Drawn By	HDP	9/95		
Checked By	ABK	9/95		
Revision		Sheet No.	Index No.	
00		3 of 3	530	

GENERAL NOTES

1. The location and construction of mailboxes shall conform to the rules and regulations of the United States Postal Service as modified by this design standard.

2. Mailboxes will not be permitted on Interstate highways, freeways, or other highways where prohibited by law or regulation.

3. The contractor shall give the Postmaster of the delivery route(s) written notice of project construction 7 days prior to the beginning of work, with Saturdays, Sundays and Holidays excluded.

The Contractor shall furnish and install one mailbox in accordance with this design standard at each mail patron delivery location and maintain the box throughout the contract period. The Contractor shall apply box numbers to each patron box in accordance with identification specifications of the Domestic Mail Manual of the U. S. Postal Service; where local street names and house numbers are authorized by the Postmaster as a postal address, the Contractor shall inscribe the house number on the box; if the box is located on a different street from the patrons residence, the Contractor shall inscribe the street name and house number on the box.

The Contractor shall coordinate removal of the patrons existing mailboxes. Immediately after installing the new mailboxes the Contractor must notify each "Mail Delivery Patron" by Certified Mail that removal of the existing mailboxes must be accomplished in 21 days after receipt of notices. Patrons shall have the option of removing their existing mailboxes or leaving the mailboxes in place for removal by the Contractor; removal by the Contractor shall be included in the contract unit price for Mailbox, Each. The Contractor shall dispose of mailboxes and supports in areas provided by him.

Reuse of existing mailboxes by the Contractor will not be a requirement under any construction project; however where an existing mailbox meets the design requirements of this standard and is structurally and functionally sound, the Contractor at his option may elect to reuse the existing mailbox in lieu of constructing a new mailbox. Any use of existing mailboxes must be approved by the Engineer.

4. Mailboxes shall be metal construction only, in traditional style only, and only in Size 1 as prescribed by the Domestic Mail Manual of the U. S. Postal Service (DMM).

Mailbox production standards, lists of approved manufacturers and suppliers of mailboxes, design approval and guidance may be obtained by writing to the Rural Delivery Division, Delivery Service Department, Operations Group, USPS Headquarters, Washington, DC 20260.

5. Mailboxes shall be located on the right-hand side of the roadway in the direction of the delivery route, except on one-way roads and streets where they may be placed on the left-hand side.

Mailboxes on rural highways shall be set with the roadside face of the box offset from the edge of the traveled way a minimum distance of the greater of the following:

- (a) Shoulder width plus 8" to 12".
- (b) 10' for ADT over 10,000 vpd.
- 8' for ADT 100 to 10,000 vpd.
- 6' for ADT under 100 vpd.
- 2'-6" for low speed and ADT under 100 vpd.

When a mailbox is installed within the limits of guardrail it should be placed behind the guardrail whenever practical.

Mailboxes on curbed highways, roads and streets shall be set with the face of the box between 6" and 12" back of the face of curb. If the sidewalk abuts the curb or if an unusual condition exists which makes it difficult or impractical to install or serve boxes at the curb, the Contractor with concurrence of the local postal authority may be permitted to install all mailboxes at the back edge of the sidewalk, where they can be served by the carrier from the sidewalk.

6. Mailboxes shall be set with the bottom of the box between 42" and 48" above the mail stop surface, unless the U.S. Postal Service establishes other height restrictions.

7. No more than two mailboxes may be mounted on a support structure unless the support structure and mailbox arrangements have been shown to be safe by crash testing in accordance with NCHRP Report 350 and listed on the Department's Qualified Products List (QPL).

Neighborhood Delivery and Collection Box Units (NDCBU) are a specialized multiple mailbox installation that must be located outside the highway and street clear zones. The location of NDCBUs is the sole responsibility of the Postmaster for the delivery route under consideration.

8. Lightweight newspaper receptacles may be mounted below the mailbox on the side of the support post in conformance with the USPS Domestic Mail Manual. The mail patron shall be responsible for newspaper receptacle installation and maintenance.

9. Wood and steel support posts for both single and double mailbox mountings shall be embedded no more than 24" into the ground.

Concrete, block, brick, stone or other rigid foundation structure or encasement, either above or below the shoulder groundline, will not be permitted for mailboxes on rural highways. On urban roads and streets where mailbox support posts are set within rigid pavement back of curb, the support posts shall be separated from the pavement by a minimum of 1" of expansion material.

Support posts shall not be fitted nor installed with surface mount base plates.

10. At driveway entrances mailboxes shall be placed on the far side of the driveway in the direction of the delivery route.

At intersecting roads mailboxes shall be located 100' or more from the centerline of the intersecting road on the far side in the direction of the delivery route, with the distance increased to 200' when the route volume exceeds 400 vehicles per day.

11. Wood support posts shall be in conformance with the material and dimensional requirements of Section 952 and the treatment requirements of Section 955 of the Standard Specifications.

Steel support posts shall have an external finish equal to or better than two coats of weather resistant, air dried or baked, paint or enamel. Surfaces(s) shall be cleaned of all loose scale prior to finishing. The Postal Service prefers that posts be painted white, but other colors may be used when approved by the Engineer. When galvanized posts are used painting is not required.


Mounting brackets, plates, platforms, shelves and accessory hardware surface finishes are to be suited to support post finish.

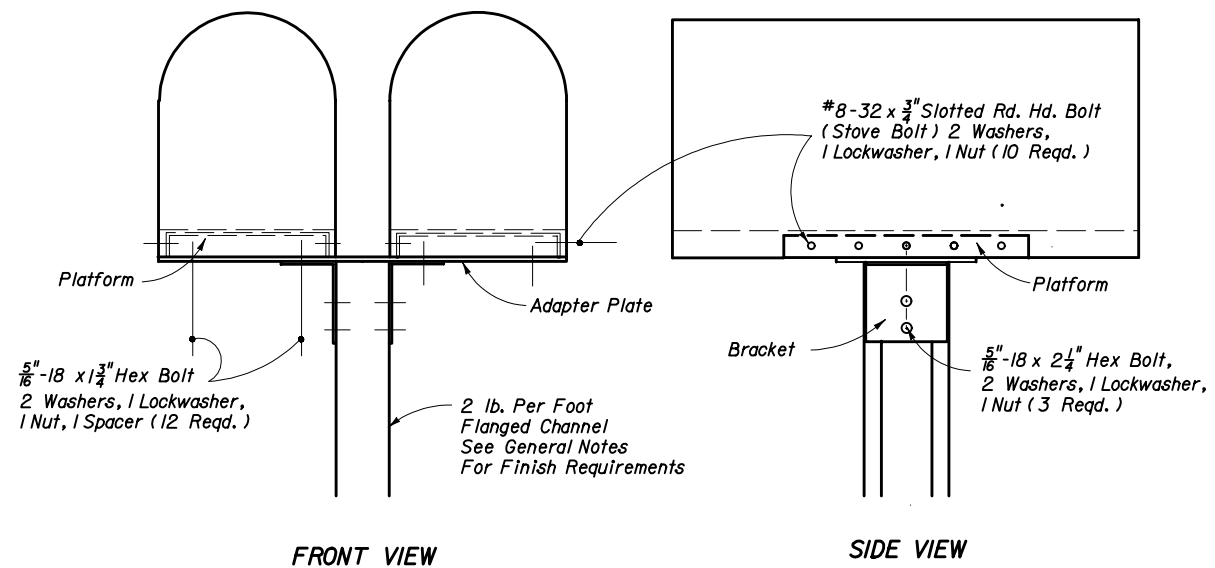
12. Mailboxes shall be paid for under the contract unit price for Mailboxes, Each. Payment shall be full compensation for boxes, posts and accessory items essential for installation in accordance with this standard; erection; adjustments to suit construction needs; and, for identification letters and numbers.

Payment shall be limited to one mailbox per patron address whether the mailbox is new, reused, salvaged, reset or relocated. Payment shall be per mailbox regardless of the number of mailboxes per support or grouping arrangement.

The above compensation shall include any work and cost incurred by the contractor for removal and disposal of existing mailboxes.

There shall be no payment participation for NDCBU furnishing, assembly, installation, resetting or relocation.

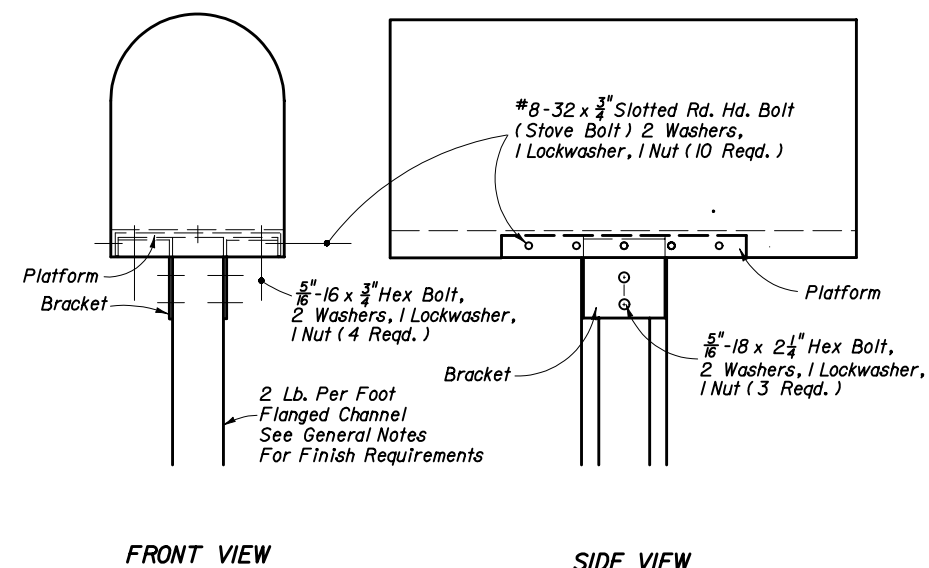
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MAILBOXES				
	Names	Dates	Approved By	
Designed By			 Roadway Design Engineer	
Drawn By	HSD		Revision	Sheet No.
Checked By	JVG/JBN		04	1 of 3
				Index No. 532



FRONT VIEW

SIDE VIEW

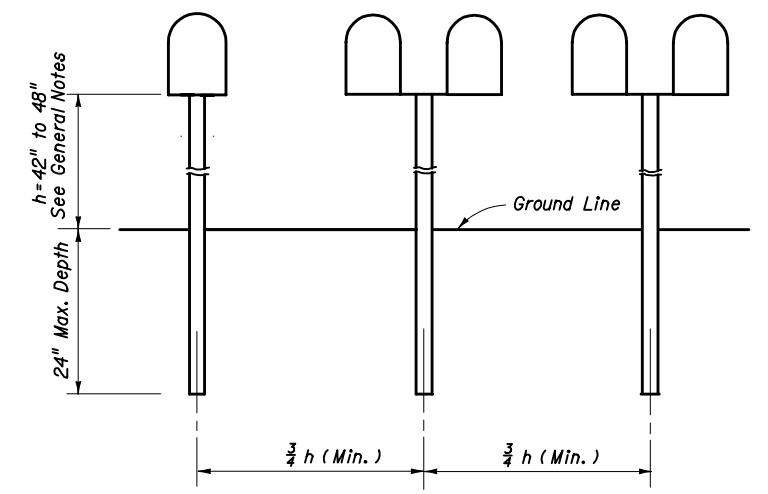
FLANGED CHANNEL



FRONT VIEW

SIDE VIEW

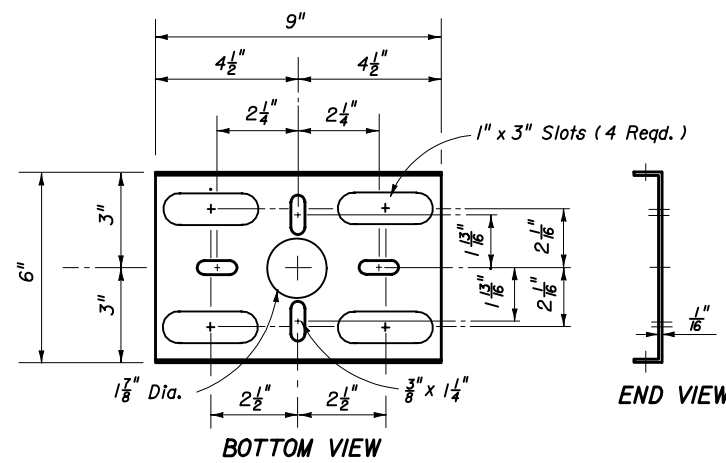
FLANGED CHANNEL



ELEVATION

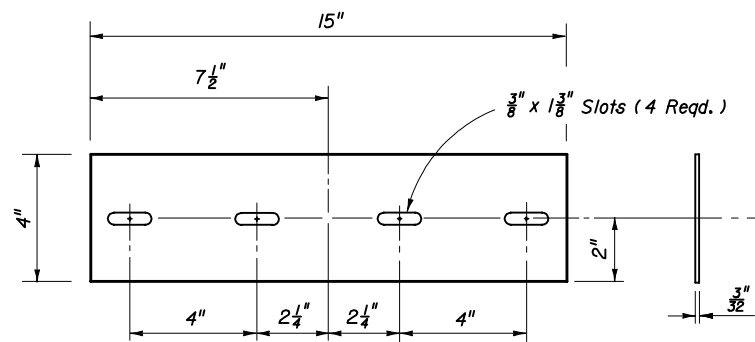
SINGLE OR COMBINED WOOD, FLANGED CHANNEL OR PIPE POST TYPES SHOWN ON THIS INDEX

POST SPACING



BOTTOM VIEW

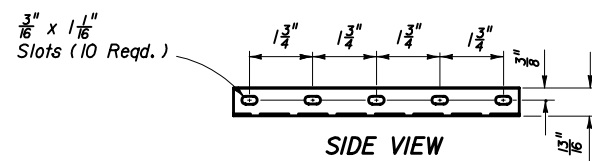
END VIEW



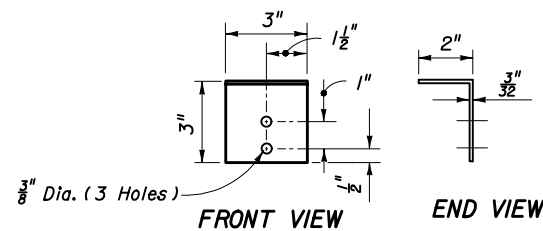
TOP VIEW

END VIEW

STEEL ADAPTER PLATE



STEEL PLATFORM

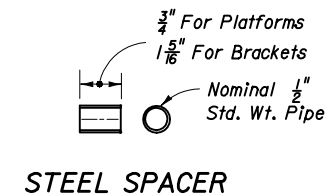


FRONT VIEW

END VIEW

TOP VIEW

STEEL BRACKET

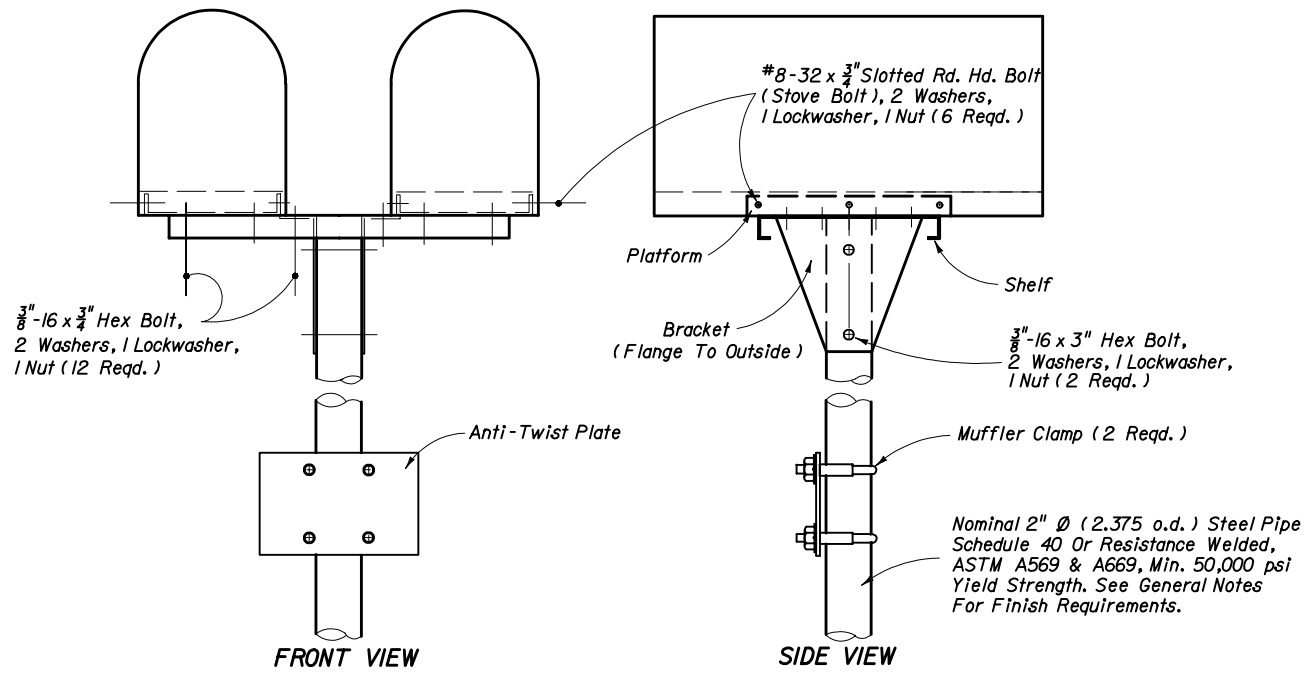


STEEL SPACER

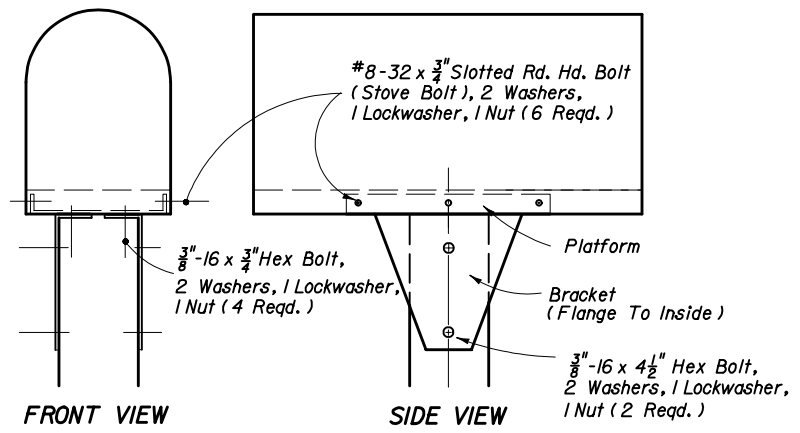
Note: See General Notes for finish requirements.

STEEL FLANGED CHANNEL SUPPORT POSTS

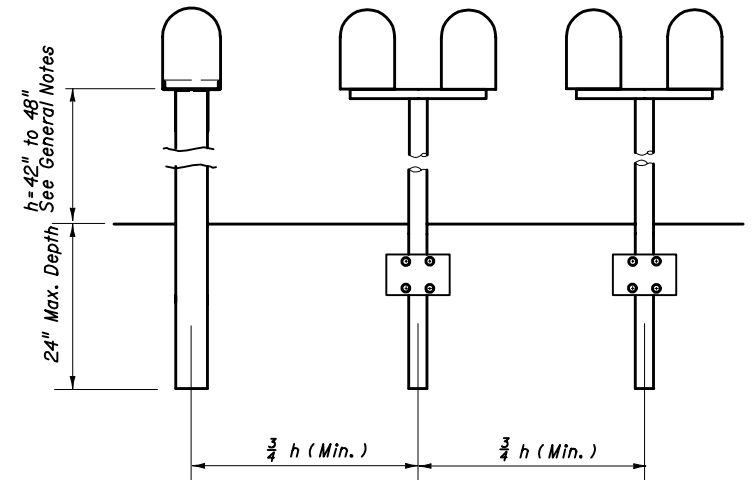
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MAILBOXES				
Designed By	Names	Dates	Approved By <i>Jamell D. Milk</i>	
Drawn By	HSD	7/87	Revision	Sheet No. 2 of 3
Checked By	JVG/JBW	7/87	00	Index No. 532



2" Ø PIPE POST

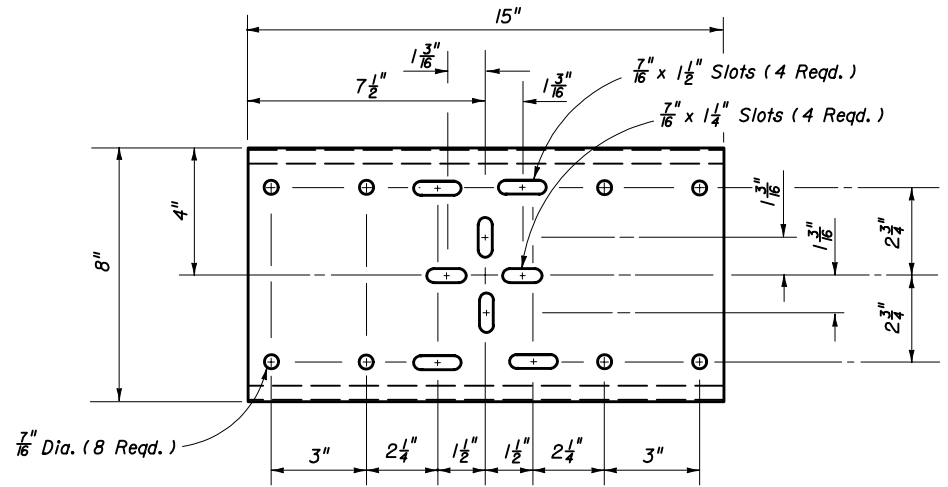


4" X 4" WOOD POST

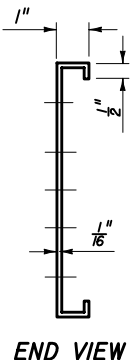


ELEVATION

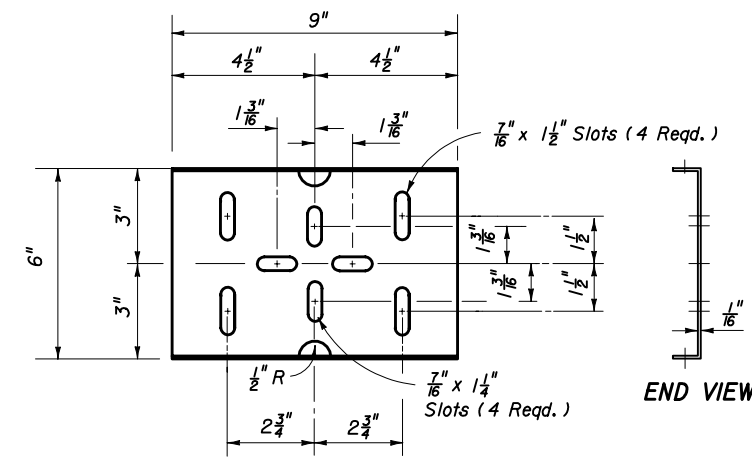
SINGLE OR COMBINED WOOD, FLANGED CHANNEL OR PIPE POST TYPES SHOWN ON THIS INDEX
POST SPACING



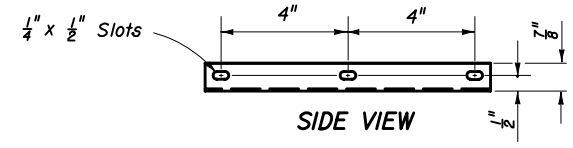
**TOP VIEW
STEEL SHELF**



END VIEW



BOTTOM VIEW

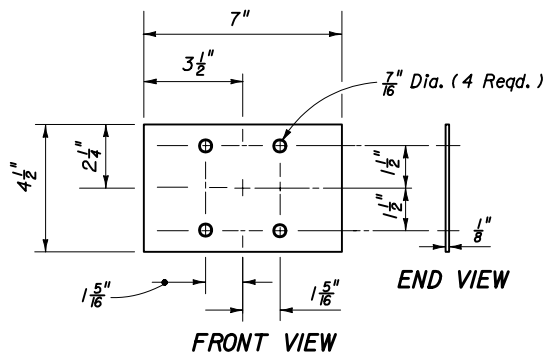


SIDE VIEW

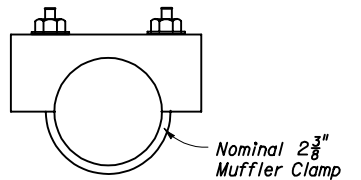
STEEL PLATFORM

END VIEW

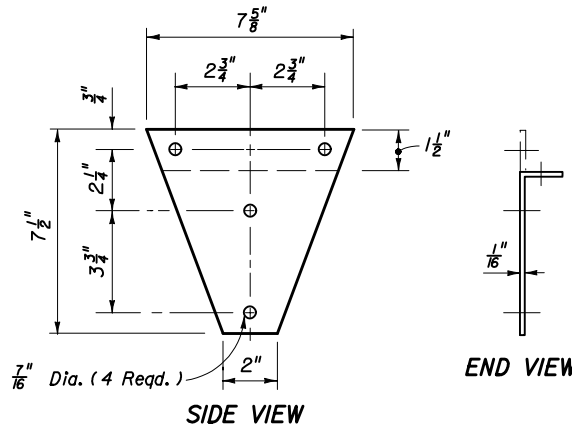
Note: See General Notes for finish requirements



STEEL ANTI-TWIST PLATE



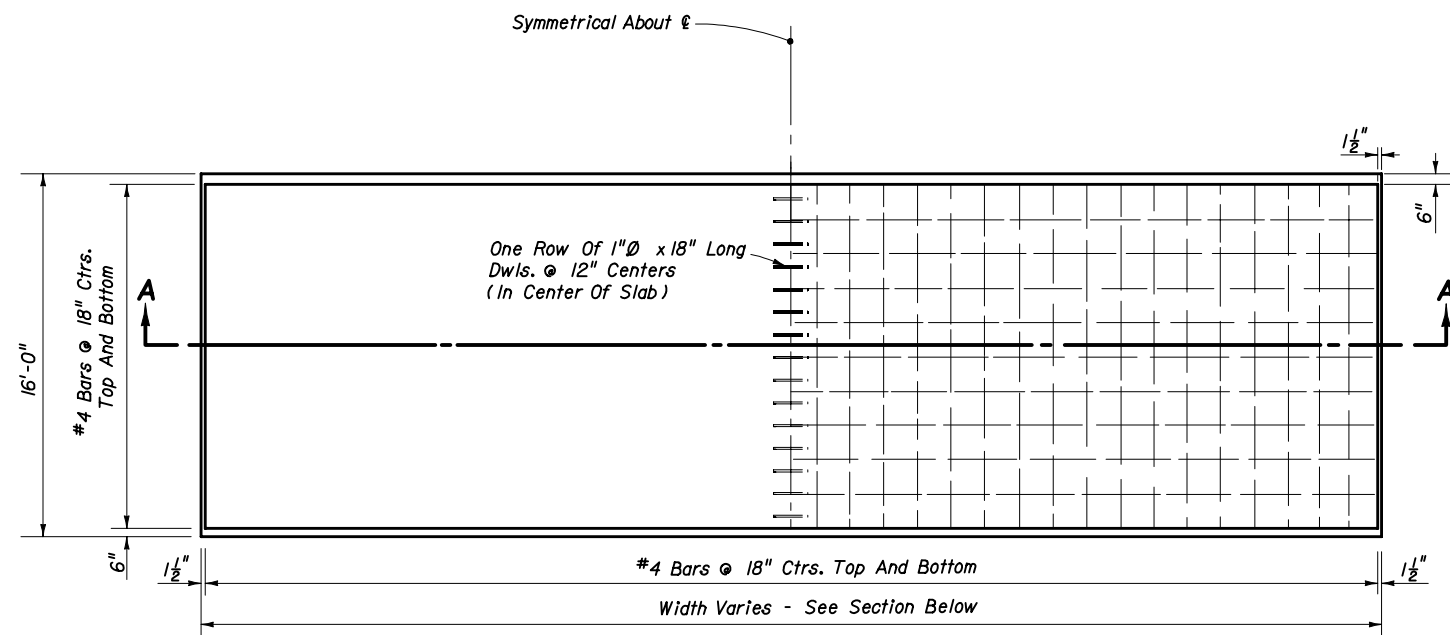
STEEL CLAMP



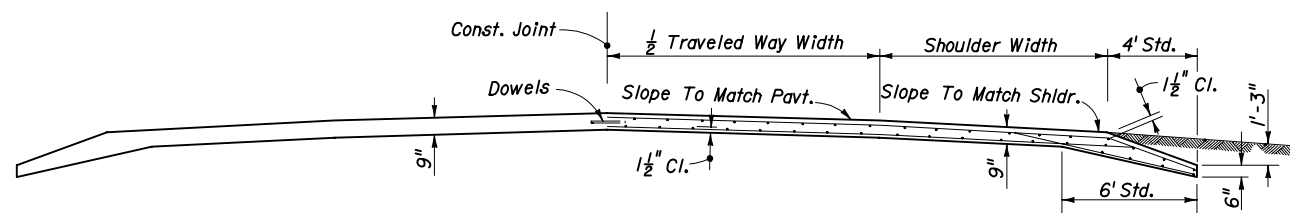
STEEL BRACKET

STEEL PIPE AND WOOD SUPPORT POSTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MAILBOXES				
Designed By	Names	Dates	Approved By <i>James D. Milk</i>	
Drawn By	HSD	7/87	Revision	Sheet No. 3 of 3
Checked By	JVG/JBN	7/87	00	Index No. 532



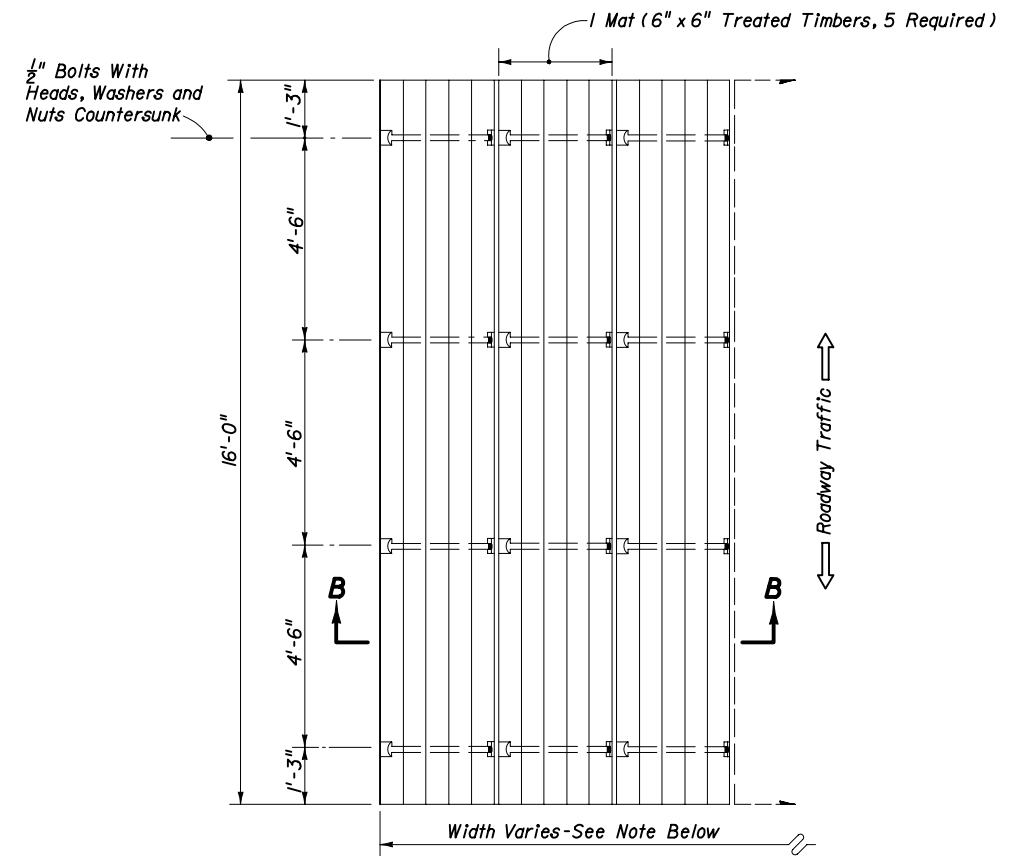
PLAN



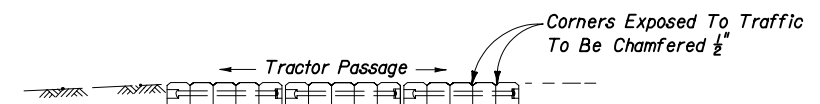
SECTION AA

Note: Class I concrete is to be used unless otherwise noted in plans or special provisions.

**REINFORCED CONCRETE
TYPE A**



PLAN



SECTION BB

Note: Tractor crossing to be constructed to match pavement cross slope.

The number of mats required will vary with the pavement width. A sufficient number of mats will be used so that the tractor crossing will extend a minimum of four feet (4') beyond roadway shoulders.

**TREATED TIMBER
TYPE B**


GENERAL NOTES

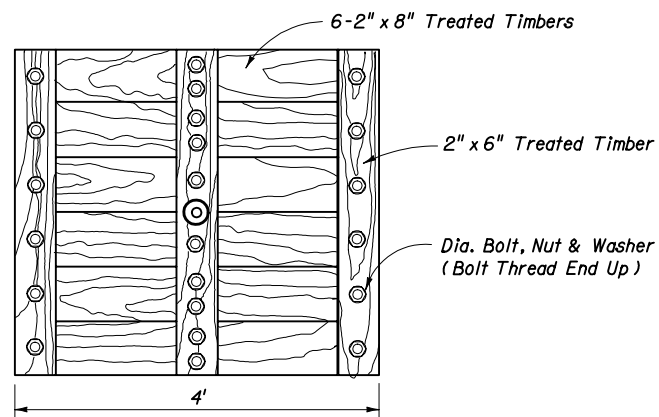
- Tractor crossing shall be paid for under the contract unit price for Tractor Crossing, EA.

TRACTOR CROSSINGS

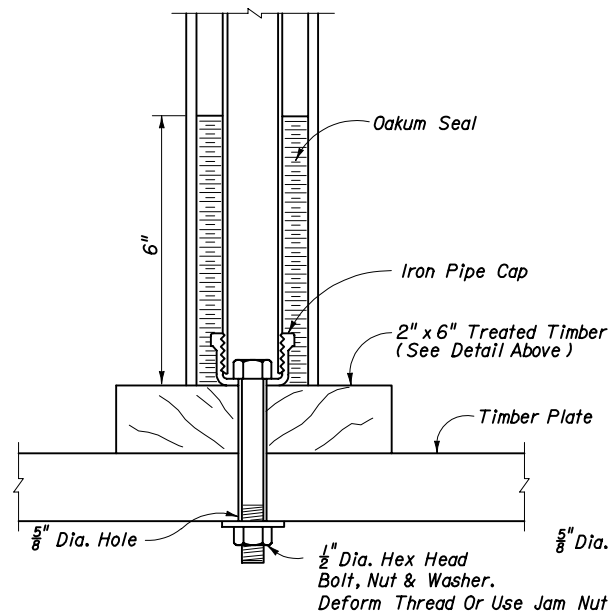
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRACTOR CROSSINGS

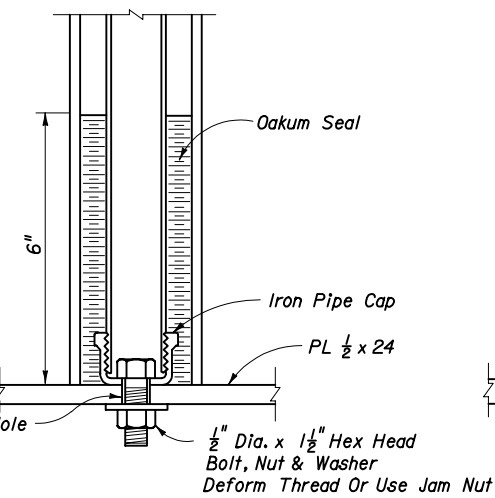
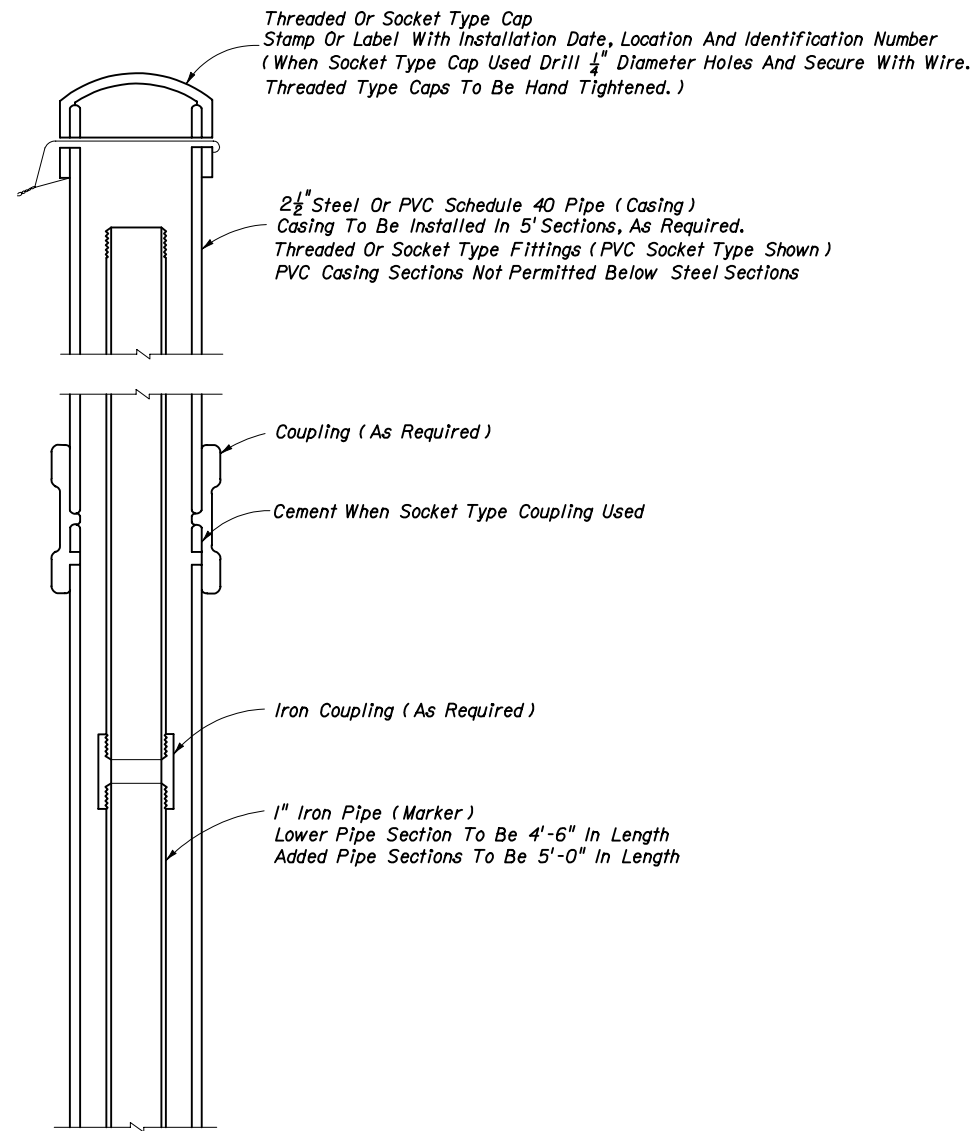
Names	Dates	Approved By		
Designed By		 Roadway Design Engineer		
Drawn By	LH 01/61			
Checked By	CDD 01/61	00	1 of 1	535



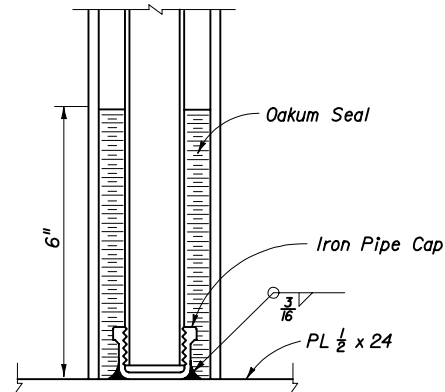
**PLAN
TIMBER PLATE**



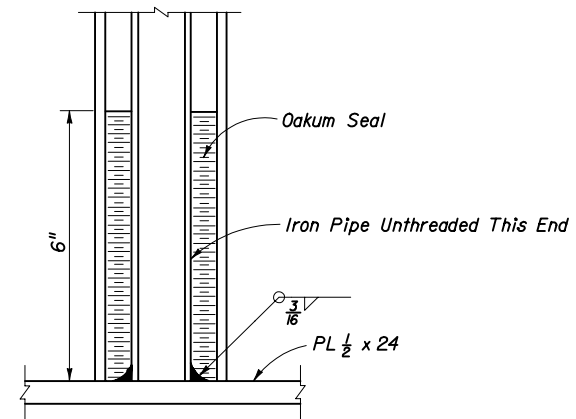
TIMBER PLATE



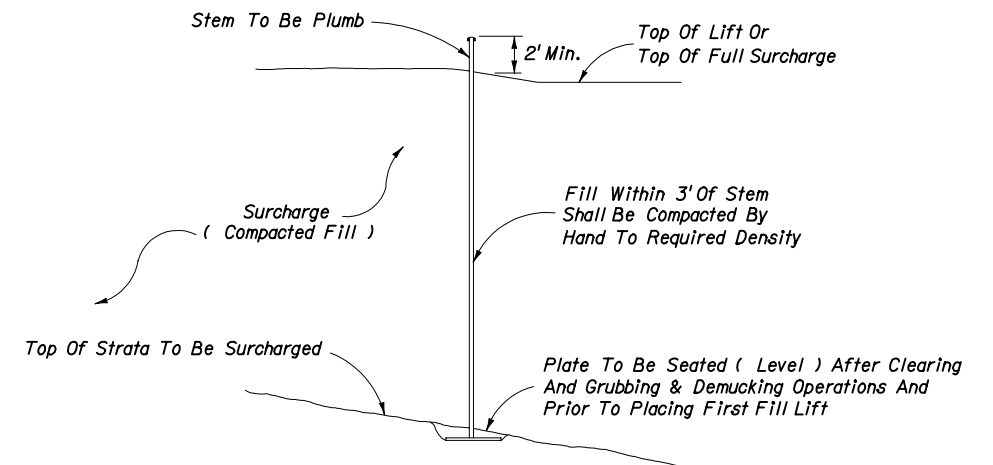
STEM AND PLATE OPTIONS



STEEL PLATE



STEEL PLATE



INSTALLATION

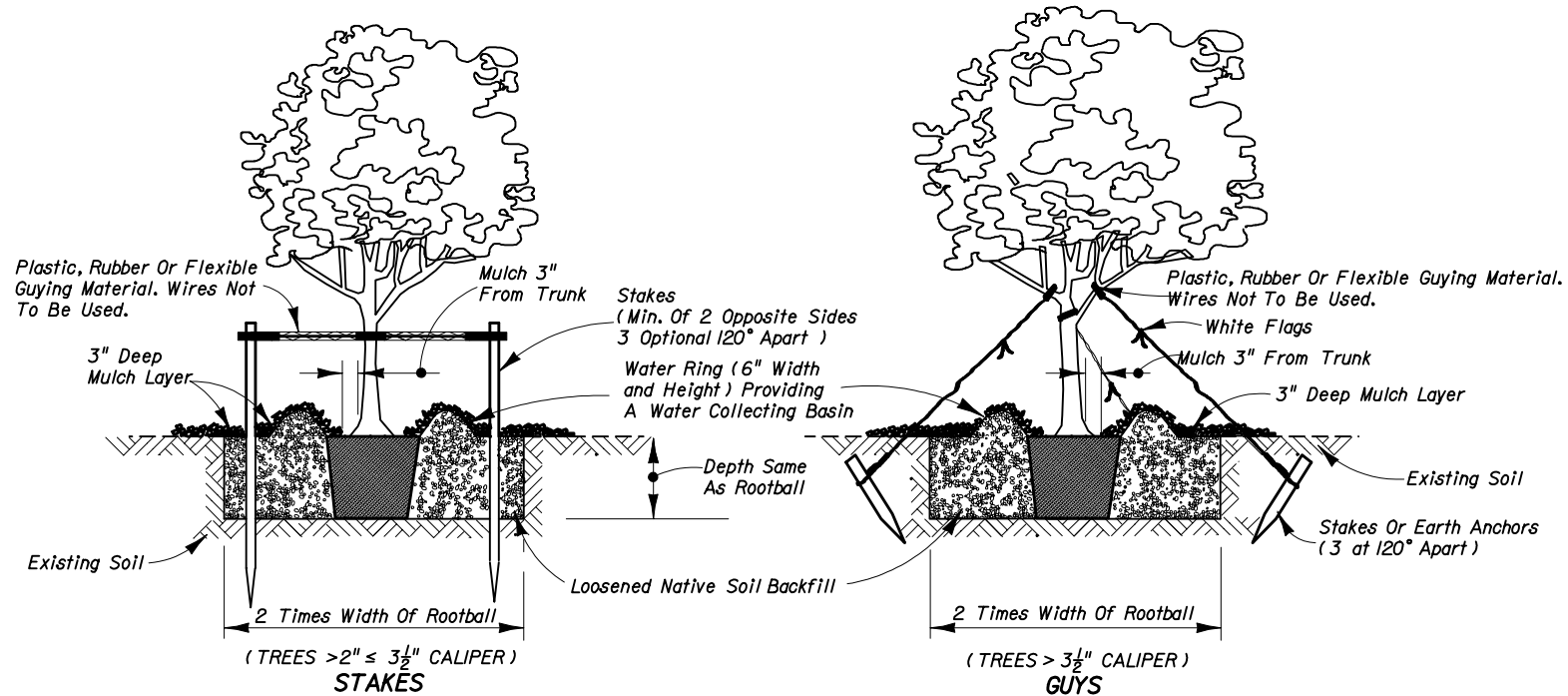
NOTES

1. Elevation of the top of each length of marker pipe shall be determined as soon as it is installed and also immediately before the next length of marker pipe is added.
2. Settlement plate locations shall be flagged and protected from construction vehicles and equipment. If settlement plates are disturbed, they shall be replaced in kind.
3. Oakum used to construct seal should not have a mesh covering (plastic or other synthetic material).
4. The settlement plates shall be paid for under the contract unit price for Settlement Plate Assembly, AS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

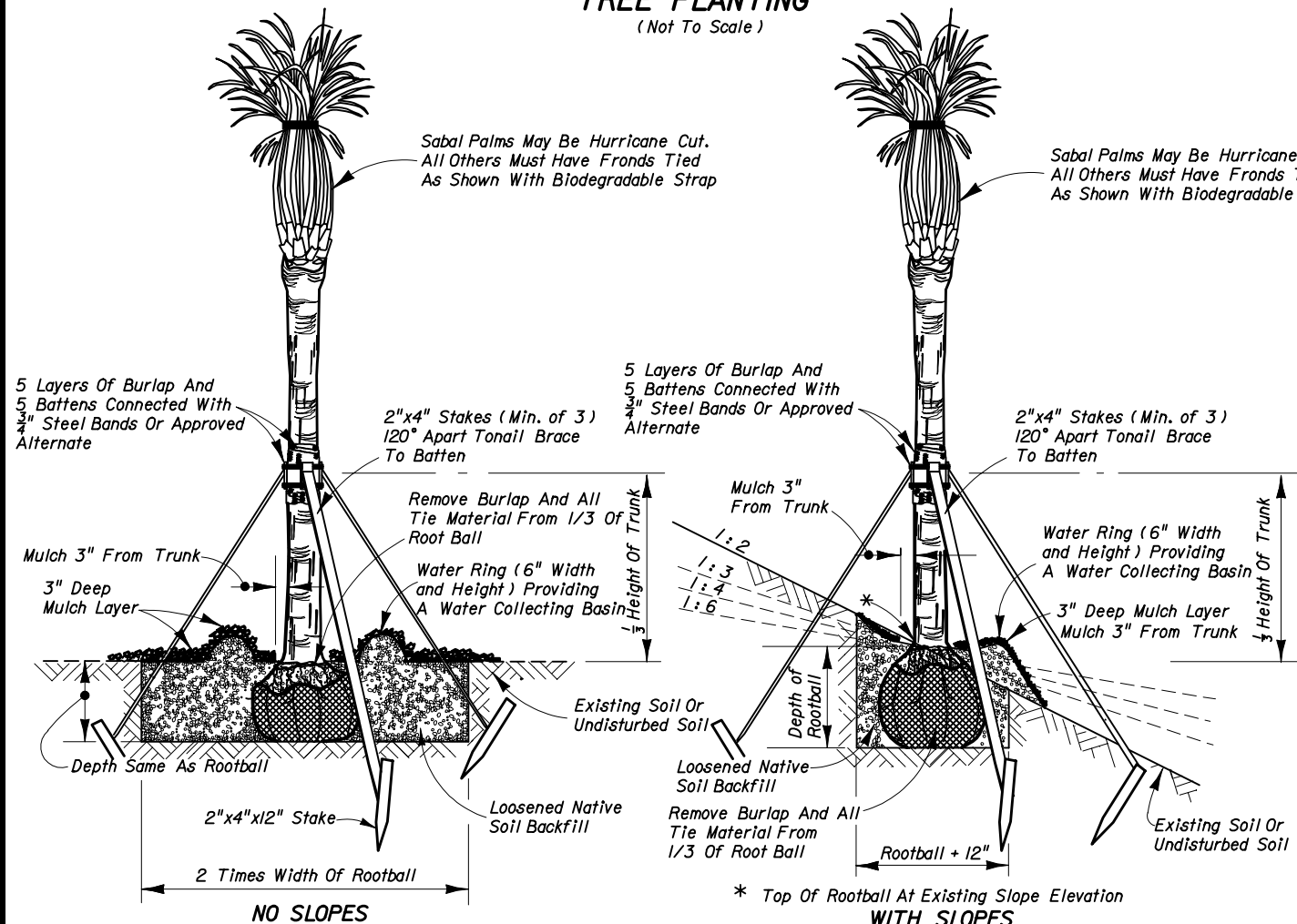
SETTLEMENT PLATE

Names	Dates	Approved By		
Designed By	JVG 10/79	Roadway Design Engineer		
Drawn By	HSD 10/79			
Checked By	JBW 10/79	Revision	Sheet No.	Index No.
		00	1 of 1	540



Trees planted on slopes are to be set relative to grade as shown in SHRUB PLANTING-WITH SLOPES. Trees Larger than 6" caliper shall be staked using the palm tree staking method.

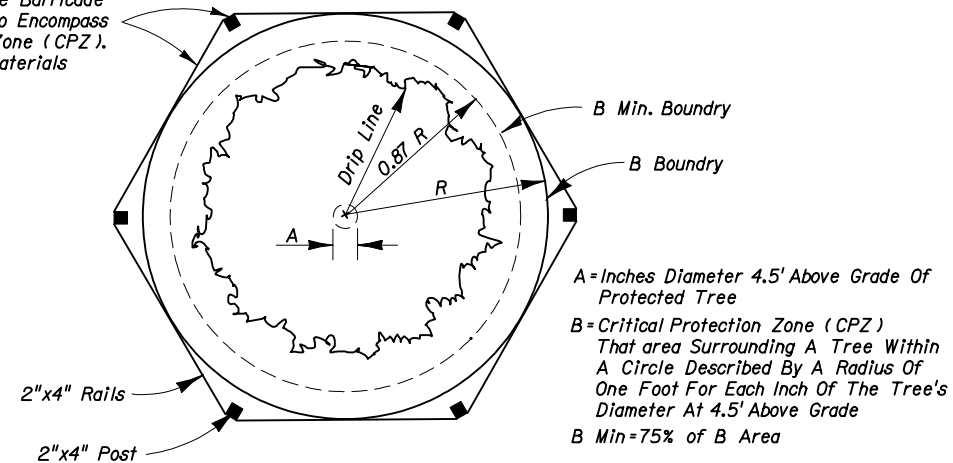
TREE PLANTING (Not To Scale)



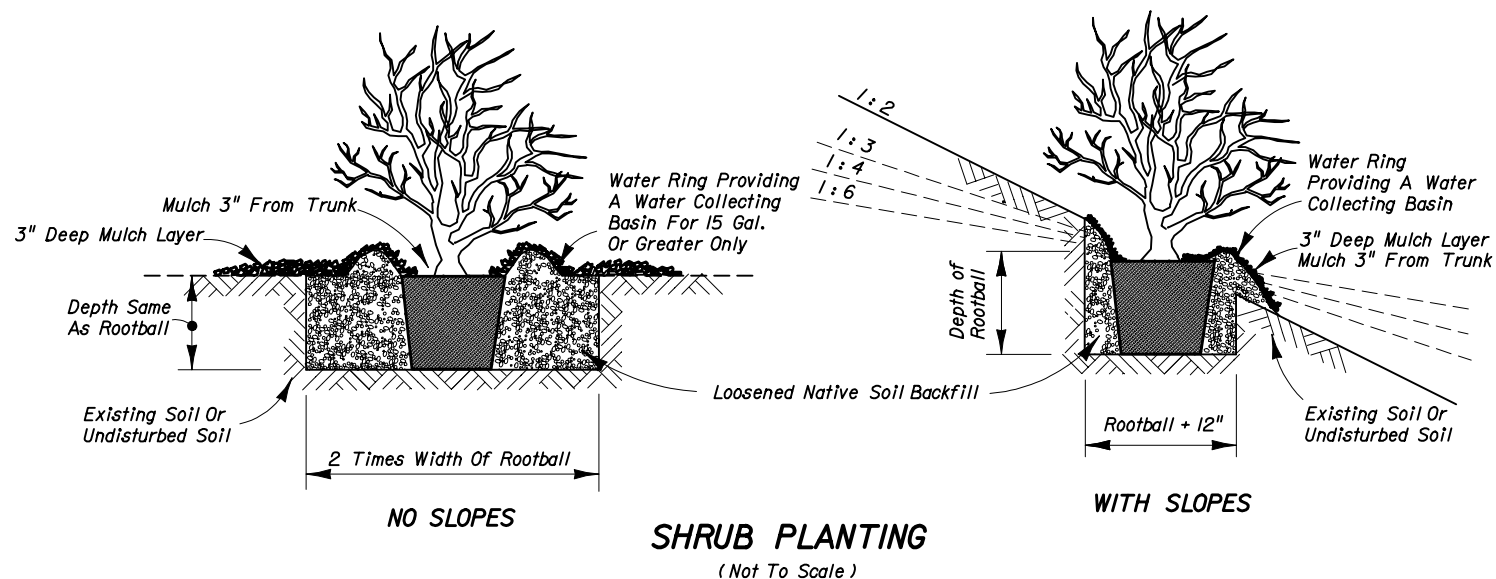
PALM PLANTING (Not To Scale)



Note:
Barricade With Orange Mesh Construction Fencing. The Barricade Shall Be Placed So As To Encompass The Critical Protection Zone (CPZ). No Work Or Staging Of Materials Within CPZ Shall Occur.



TREE BARRICADE



SHRUB PLANTING (Not To Scale)

NOTES:

1. All trees and shrubs are to be positioned vertically regardless of the slope of the ground in which they are planted. Water rings are to be constructed which will most effectively serve the purpose of retaining water at the base of the plant.
2. Tree, palm and shrub planting shall be carried out in accordance with Section 580 of the Standard Specifications.
3. For clear sight development and maintenance at intersecting highways, roads and streets see Index No. 546. For offset from travel lane see Index No. 700.
4. The top 10% of rootball shall be above soil surface prior to mulch application.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

LANDSCAPE INSTALLATON

Names	Dates	Approved By
Designed By: GLB/JHC	01/00	[Signature]
Drawn By: HSD	01/00	
Checked By: GLB/JHC	01/00	State Transportation Landscape Architect
		Revision: 04
		Sheet No: 1 of 1
		Index No: 544

GENERAL NOTES

1. Details apply to both rural and urban intersections under stop sign control or flashing beacon control. For full signal controlled intersections see Design Note No 4.
2. Sight distance (d) applies to normal and skewed intersections (intersecting angles between 60° and 120°), and where vertical and/or horizontal curves are present. Sight distance (d) is measured along the major roadway from the center of the entrance lane of the minor roadway to the center of the near approach lane (right or left) of the major roadway. Distances d_L and d_r are measured from the centerline of the entrance lane of the minor roadway to a point on the edge of the near side outer traffic lane on the major roadway. Distance d_m is measured from the centerline of the entrance lane of the minor roadway to a point on the median clear zone limit or horizontal clearance limit for the far side roadway of the major roadway.
3. a. The limits of clear sight define a corridor throughout which a clear sight window must be preserved. See WINDOW DETAIL, Sheet 6.
b. Clear sight must be provided between vehicles at intersection stop locations, and vehicles on the major roadway within dimension 'd'.
c. Since observations are made in both directions along the line of sight, the reference datum between roadways is 3'-6" above respective pavements.
4. Barrier systems within intersection sight corridors, where penetration into the sight window might occur, shall be located to provide the least adverse affect practical.
5. The corridor defined by the limits of clear sight is a restricted planting area. Drivers of vehicles on the intersecting roadway and vehicles on the major roadway must be able to see each other clearly throughout the limits of 'd' and 'd_a'. If in the Engineers judgement, landscaping interferes with the line of sight corridor prescribed by these standards the Engineer may rearrange, relocate or eliminate plantings. Plants within the restricted areas are limited to selections as follows:

Ground Cover & Trunked Plants (Separate or Combined):

Ground Covers - Plant selection of low growing vegetation which at maturity does not attain a height greater than 18" below the sight line datum.

For ground cover in combination with trees and palms; the following heights below the sight line datum will apply: 24" for trees and palms ≤ 11" dia.; and, 18" for sabal palms > 11" ≤ 18" dia. (dia. -within Sight Window).

Trunked Plants - Plant selection of a mature trunk diameter 4" or less measured at 6" above the ground. Canopy or high borne foliage shall never be lower than 5' above the sight line datum. These selections shall be spaced no closer than 20'.

Trees:

Trees can be used with lawn; pavers; pavement; gravel, bark or wood chip beds; ground covers or other Department approved material. The clear sight window must be in conformance with the 'WINDOW DETAIL' modified to attain the height requirements listed in 'Ground Covers' above. Tree size and spacing shall conform to the following tabular values:

Description	Speed (mph)													
	30		35		40		45		50		55		60	
	(Inches)													
Diameter (Within Limits Of Sight Window)	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18
	(Feet)													
Minimum Spacing (c. to c. Of Trunk)	22	91	27	108	33	126	40	146	45	165	52	173	60	193

Sizes and spacings are based on the following conditions:

- (a) A single line of trees in the median parallel to but not necessarily colinear with the centerline.
- (b) A straight approaching mainline, within skew limits as described in No. 2 above.
- (c) 1. Trees and palms ≤ 11" in diameter casting a vertical 6' wide shadow band on a vehicle entering at stop bar location when viewed by mainline driver beginning at distance 'd'; see SHADOW DIAGRAM, Sheet 6.
2. Sabal palms with diameters > 11" to ≤ 18" spaced at intervals providing a 2 second full view of entering vehicle at stop bar location when viewed by mainline driver beginning at distance 'd'; see PERCEPTION DIAGRAM, Sheet 6.
- (d) Trees with diameters ≤ 11" intermixed with trees with diameters > 11" ≤ 18" are to be spaced based on trees with diameters > 11" ≤ 18".


For any other conditions the tree sizes, spacings and locations shall be detailed in the plans; see Design Note No. 5.

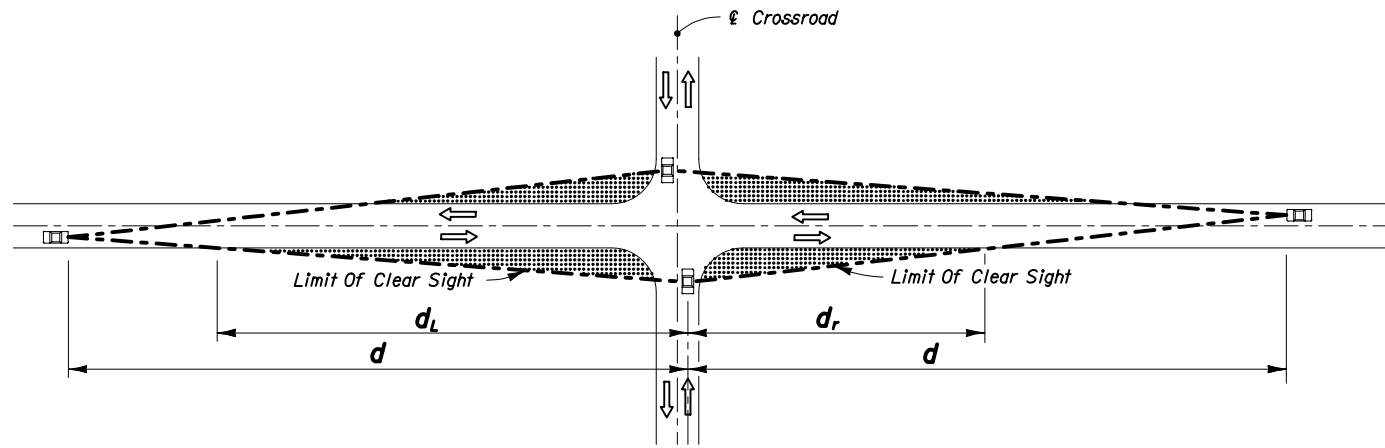
DESIGN NOTES

1. The information shown on this index is intended solely for the purpose of clear sight development and maintenance at intersecting highways, roads and streets, and is not intended to be used to establish roadway and roadside safety except as related to clear sight corridors. An analysis of sight distance shall be documented for all intersections.
2. Details are based on the AASHTO 'A Policy On Geometric Design Of Highways And Streets, 2001', CHAPTER 9, Intersection Sight Triangles, CASES B and C, and Department practices for channelized median openings (left turns from major roadways).
3. The minimum driver eye setback of 14.5' from the edge of the traveled way may be adjusted on any intersection leg only when justified by a documented, site specific field study of vehicle stopping position and driver eye position.
4. For SIGNALIZED INTERSECTIONS sight distances should be developed based on AASHTO 'Case D- Intersections With Traffic Signal Control'. 'At signalized intersections, the first vehicle stopped on one approach should be visible to the driver of the first vehicle stopped on each of the other approaches. Left-turning vehicles should have sufficient sight distance to select gaps in oncoming traffic and complete left turns. Apart from these sight conditions, there are generally no other approach or departure sight triangles needed for signalized intersections. However, if the traffic signal is to be placed on two-way flashing operation (i.e. flashing yellow on the major-road approaches and flashing red on the minor-road approaches) under off-peak or nighttime conditions, then the appropriate departure sight triangles for Case B, both to the left and to the right, should be provided for the minor-road approaches. In addition, if right turns on a red signal are to be permitted from any approach, then the appropriate departure sight triangle to the left for Case B2 should be provided to accommodate right turns from that approach.'
5. Where curvature, superelevation, adverse split profiles or other conditions preclude the use of standard tree sizes and spacing, proof of view and shadowing restraints must be documented and the size and location of trees in medians detailed in the plans.
6. Intersection sight distance values are provided for Passenger Vehicles, SU Vehicles and Combination Vehicles. Intersection sight distance based on the Passenger Vehicle is suitable for most intersections. Where substantial volumes of heavy vehicles enter the major-road, such as from ramp terminals with stop control or roadways serving truck terminals, the use of tabulated values for SU Vehicles or Combination Vehicles should be considered.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIGHT DISTANCE AT INTERSECTIONS

Names	Dates	Approved By		
Designed By	KNM/JVG	10/89	 Roadway Design Engineer	
Drawn By	HSD	10/89	Revision	Sheet No.
Checked By	JVG/JAM	10/02	04	1 of 6
				Index No. 546



PICTORIAL
2 LANE UNDIVIDED

Design Speed	d	d _L	d _r
30	335	240	150
35	390	275	175
40	445	315	200
45	500	350	225
50	555	390	250
55	610	430	275
60	665	470	300
65	720	510	325

Passenger Vehicle

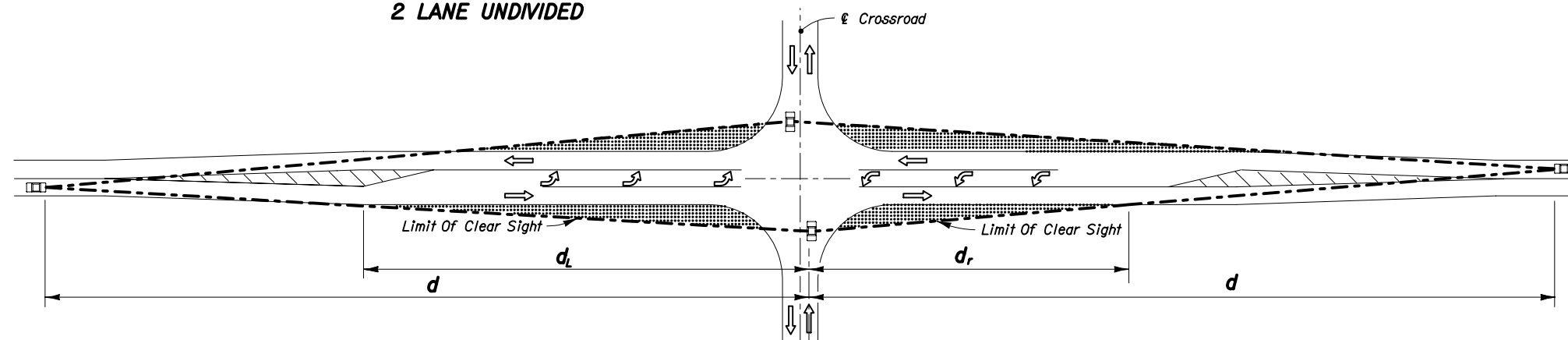
Design Speed	d	d _L	d _r
30	420	295	190
35	490	345	220
40	560	395	250
45	630	445	280
50	700	495	310
55	770	545	345
60	840	595	375
65	910	645	405

SU Vehicle

Design Speed	d	d _L	d _r
30	510	360	225
35	595	420	265
40	680	480	305
45	765	540	340
50	845	600	375
55	930	660	415
60	1015	720	450
65	1100	780	490

Combination Vehicle

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_L, d_r) (FEET)
2 LANE UNDIVIDED



PICTORIAL
2 LANE 2 WAY • FLARED FOR OPPOSING LEFT TURN CENTERED ON ALIGNMENT

Design Speed	d	d _L	d _r
30	355	195	135
35	415	225	155
40	475	260	180
45	530	290	200
50	590	325	220
55	650	355	245
60	710	390	265
65	765	420	290

Passenger Vehicle

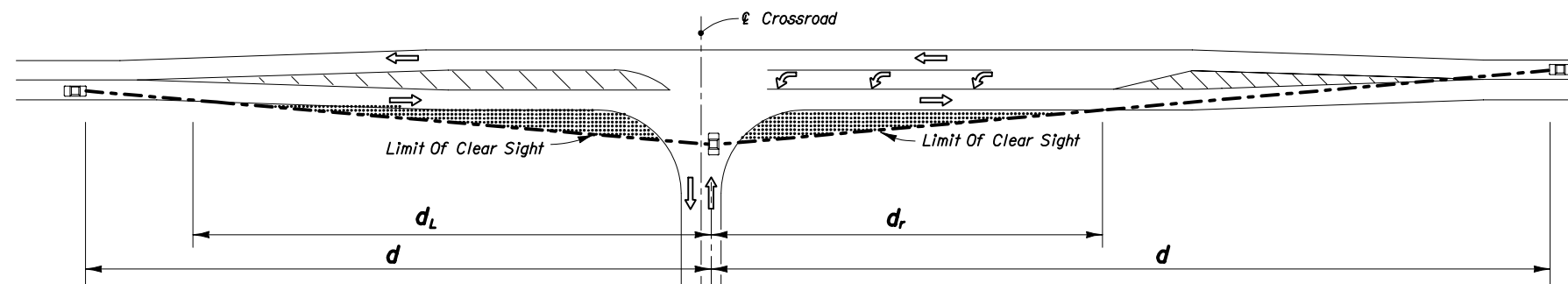
Design Speed	d	d _L	d _r
30	450	250	170
35	525	290	200
40	600	330	225
45	675	370	255
50	750	410	285
55	825	450	310
60	900	490	340
65	975	530	370

SU Vehicle

Design Speed	d	d _L	d _r
30	540	295	205
35	630	345	240
40	720	395	270
45	810	445	305
50	900	495	340
55	990	540	375
60	1080	590	405
65	1170	640	440

Combination Vehicle

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_L, d_r) (FEET)
2 LANE 2 WAY • FLARED FOR LEFT TURNS



PICTORIAL
2 LANE 2 WAY • FLARED FOR SINGLE SIDE LEFT TURN CENTERED ON ALIGNMENT

LEGEND

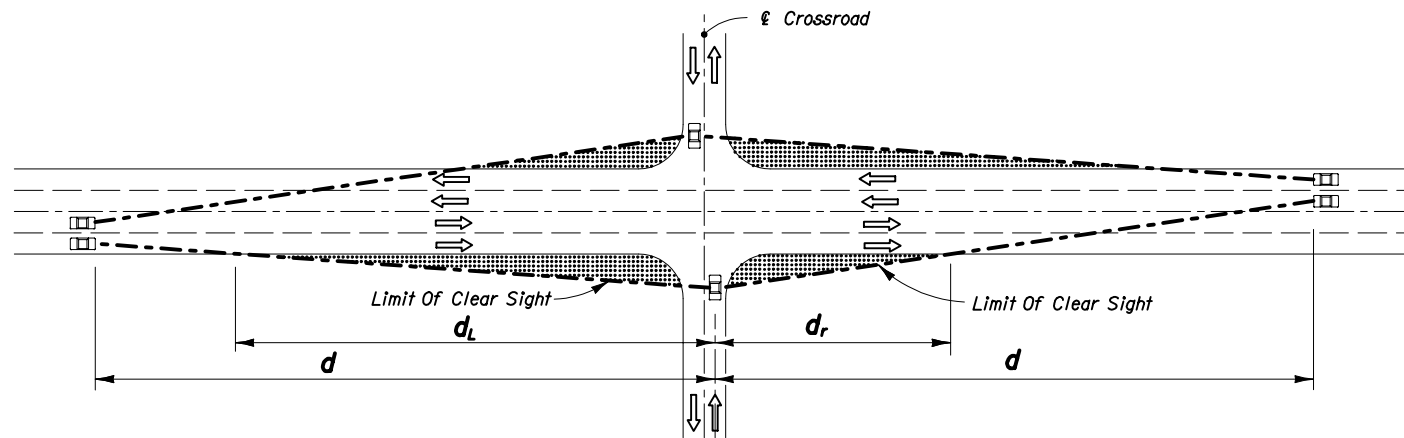
Areas Free Of Sight Obstructions

NOTE: See Sheet 6 for intersecting roadway origin of clear sight and quadrant corner clips.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIGHT DISTANCE
AT INTERSECTIONS

Names	Dates	Approved By		
Designed By	KRM/JVG 10/89			
Drawn By	HSD 10/89			
Checked By	JVG/JAM 10/02	Revision	Sheet No.	Index No.
		04	2 of 6	546



Design Speed	d	d _L	d _r
30	355	250	115
35	415	295	135
40	475	335	155
45	530	375	175
50	590	415	195
55	650	460	210
60	705	500	230
65	765	540	250

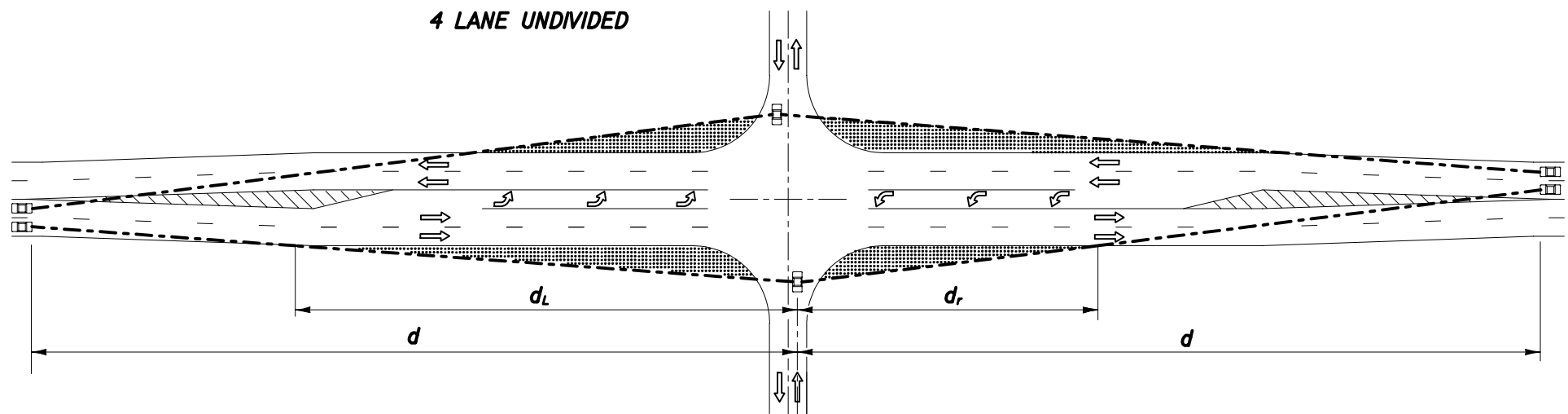
Design Speed	d	d _L	d _r
30	450	320	150
35	525	370	170
40	600	425	195
45	675	475	220
50	750	530	245
55	825	585	270
60	900	635	295
65	975	690	320

Design Speed	d	d _L	d _r
30	540	380	175
35	630	445	205
40	720	510	235
45	810	570	265
50	900	635	295
55	990	700	320
60	1080	765	350
65	1170	825	380

Passenger Vehicle SU Vehicle Combination Vehicle

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_L, d_r) (FEET)
4 LANE UNDIVIDED

PICTORIAL
4 LANE UNDIVIDED



Design Speed	d	d _L	d _r
30	375	205	120
35	440	240	145
40	500	275	165
45	565	310	185
50	625	340	205
55	690	375	225
60	750	410	245
65	815	445	265

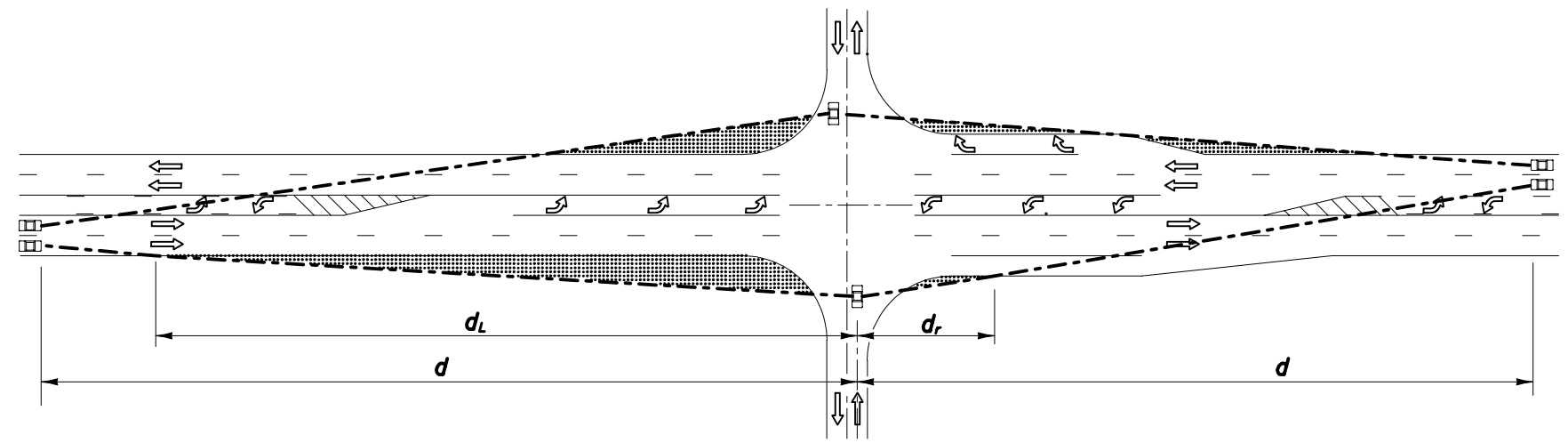
Design Speed	d	d _L	d _r
30	480	220	155
35	560	255	180
40	640	290	210
45	720	330	235
50	800	365	260
55	880	400	285
60	960	440	310
65	1040	480	340

Design Speed	d	d _L	d _r
30	570	310	185
35	665	365	215
40	760	415	250
45	855	470	280
50	950	520	310
55	1045	570	340
60	1140	625	370
65	1235	675	400

Passenger Vehicle SU Vehicle Combination Vehicle

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_L, d_r) (FEET)
4 LANE UNDIVIDED FLARED - SYMMETRICAL

PICTORIAL
4 LANE UNDIVIDED FLARED - SYMMETRICAL



Design Speed	d	d _L	d _r
30	375	265	95
35	440	310	115
40	500	355	130
45	565	400	145
50	625	440	160
55	690	490	172
60	750	530	195
65	815	575	210

Design Speed	d	d _L	d _r
30	480	340	125
35	560	395	145
40	640	450	165
45	720	510	185
50	800	565	205
55	880	620	225
60	960	680	245
65	1040	735	265

Design Speed	d	d _L	d _r
30	570	405	145
35	665	470	170
40	760	540	195
45	855	605	220
50	950	670	245
55	1045	740	270
60	1140	805	295
65	1235	875	320

Passenger Vehicle SU Vehicle Combination Vehicle

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_L, d_r) (FEET)
4 LANE UNDIVIDED WITH OPTIONAL LANE

PICTORIAL
4 LANE UNDIVIDED WITH OPTIONAL LANE

LEGEND

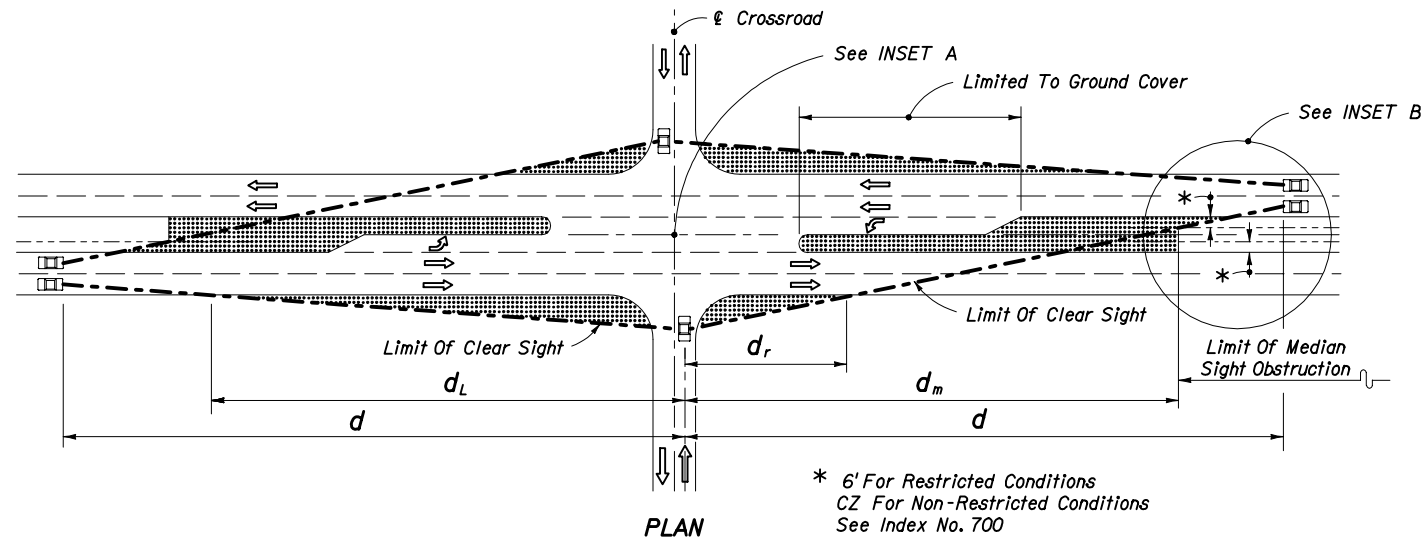
Areas Free Of Sight Obstructions

NOTE: See Sheet 6 for intersecting roadway origin of clear sight and quadrant corner clips.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIGHT DISTANCE AT INTERSECTIONS

Names	Dates	Approved By		
Designed By	KNM/JVG 10/89			
Drawn By	HSD 10/89			
Checked By	JVG/JAM 10/02	Revision	Sheet No.	Index No.
		04	3 of 6	546



LEGEND
 Areas Free Of Sight Obstructions

MEDIAN 22' OR LESS

Design Speed	d	d _L	d _R	d _M
30	390	280	90	320
35	460	330	100	380
40	520	370	110	430
45	590	420	130	480
50	650	460	140	530
55	720	510	160	590
60	780	550	170	640
65	850	600	190	700

25'-64' MEDIAN

Design Speed	d	d _L	d _V	d _{VL}
30	290	210	330	230
35	330	230	390	280
40	380	270	440	310
45	430	300	500	350
50	480	340	550	390
55	530	370	610	430
60	570	400	660	470
65	620	440	720	510

PASSENGER VEHICLE (P)

MEDIAN 35' OR LESS

Design Speed	d	d _L	d _R	d _M
30	540	380	100	460
35	630	450	110	530
40	720	510	130	610
45	810	570	150	690
50	900	640	160	760
55	990	700	180	840
60	1080	760	200	920
65	1170	830	210	990

40'-64' MEDIAN

Design Speed	d	d _L	d _V	d _{VL}
30	370	260	420	300
35	440	310	490	350
40	500	350	560	400
45	560	400	630	450
50	620	440	700	500
55	690	490	770	540
60	750	530	840	590
65	810	570	910	640

SINGLE-UNIT TRUCK (SU)

MEDIAN 30' OR LESS

Design Speed	d	d _L	d _R	d _M
30	620	440	120	520
35	720	510	140	600
40	820	580	160	690
45	930	660	180	780
50	1030	730	200	860
55	1130	800	220	950
60	1240	880	240	1040
65	1340	950	260	1120

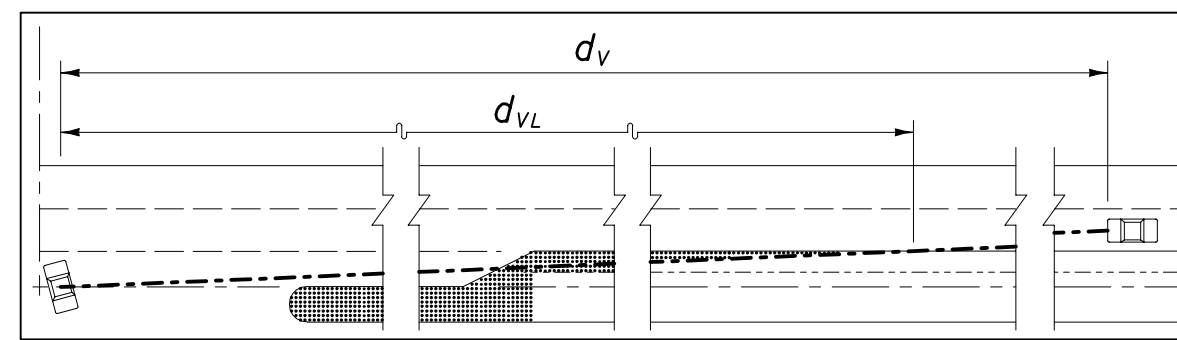
35'-50' MEDIAN

Design Speed	d	d _L	d _R	d _M
30	670	470	100	580
35	780	550	120	680
40	890	630	140	780
45	1000	710	150	870
50	1110	790	170	970
55	1220	860	190	1070
60	1330	940	200	1160
65	1440	1020	220	1260

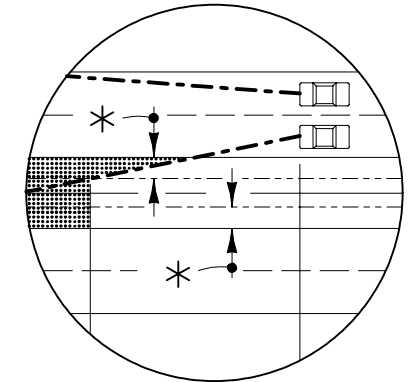
64' MEDIAN

Design Speed	d	d _L	d _V	d _{VL}
30	460	330	510	360
35	540	380	590	420
40	620	440	680	480
45	690	490	760	540
50	770	540	850	600
55	850	600	930	660
60	920	650	1020	720
65	1000	710	1100	780

INTERMEDIATE SEMI-TRAILERS (WB-40 & WB-50)



Where The Median Is Sufficiently Wide For The Design Vehicle To Pause In The Median (Vehicle Length Plus 6' Min.) The Clear Line Of Sight To The Right (d_V) Is Measured From The Vehicle Pause Location, i.e. Not From The Cross Road Stop Position; Distances d_r & d_m Do Not Apply.



INSET B

INSET A

Vehicle Type	Vehicle Length (Ft.)
Passenger (P)	19
Single Unit (SU)	30
Large School Bus	40
WB-40	45.5
WB-50	55

NOTES FOR 4-LANE DIVIDED ROADWAY

- See Sheet 6 for origin of clear sight line on the minor road.
- Values shown in the tables are the governing (controlling) sight distances calculated based on 'AASHTO Case B - Intersection with Stop Control on the Minor Road.'

SIGHT DISTANCES (d) & (d_V) AND RELATED DISTANCES (d_L , d_R , d_M & d_{VL}) (FEET)

4 LANE DIVIDED ROADWAY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIGHT DISTANCE AT INTERSECTIONS

Names	Dates	Approved By <i>Janet D. Mill</i>		
Designed By	KNM/JVG 10/89	Roadway Design Engineer		
Drawn By	HSD 10/89	Revision	Sheet No.	Index No.
Checked By	JVG/JAM 10/02	04	4 of 6	546

MEDIAN 22' OR LESS				
Design Speed	d_x	d_L	d_r	d_m
30	410	290	80	350
35	480	340	90	410
40	550	390	100	470
45	620	440	110	530
50	690	490	130	580
55	760	540	140	640
60	830	590	150	700
65	900	640	170	760

25'-64' MEDIAN				
Design Speed	d	d_L	d_v	d_{vL}
30	310	220	330	230
35	360	250	390	280
40	410	290	440	310
45	460	330	500	350
50	510	360	550	390
55	570	400	610	430
60	620	440	660	470
65	670	470	720	510

PASSENGER VEHICLE (P)

MEDIAN 35' OR LESS				
Design Speed	d_x	d_L	d_r	d_m
30	590	420	90	510
35	690	490	110	600
40	780	550	120	680
45	880	620	140	760
50	980	690	160	850
55	1080	760	170	940
60	1170	830	190	1020
65	1270	900	200	1100

40'-64' MEDIAN				
Design Speed	d	d_L	d_v	d_{vL}
30	410	290	420	300
35	470	330	490	350
40	540	380	560	400
45	610	430	630	450
50	680	480	700	500
55	740	520	770	540
60	810	570	840	590
65	880	620	910	640

SINGLE-UNIT TRUCK (SU)

MEDIAN 30' OR LESS				
Design Speed	d_x	d_L	d_r	d_m
30	670	470	110	580
35	780	550	130	670
40	890	630	150	770
45	1000	710	170	860
50	1110	790	190	960
55	1220	860	200	1050
60	1330	940	220	1150
65	1440	1020	240	1240

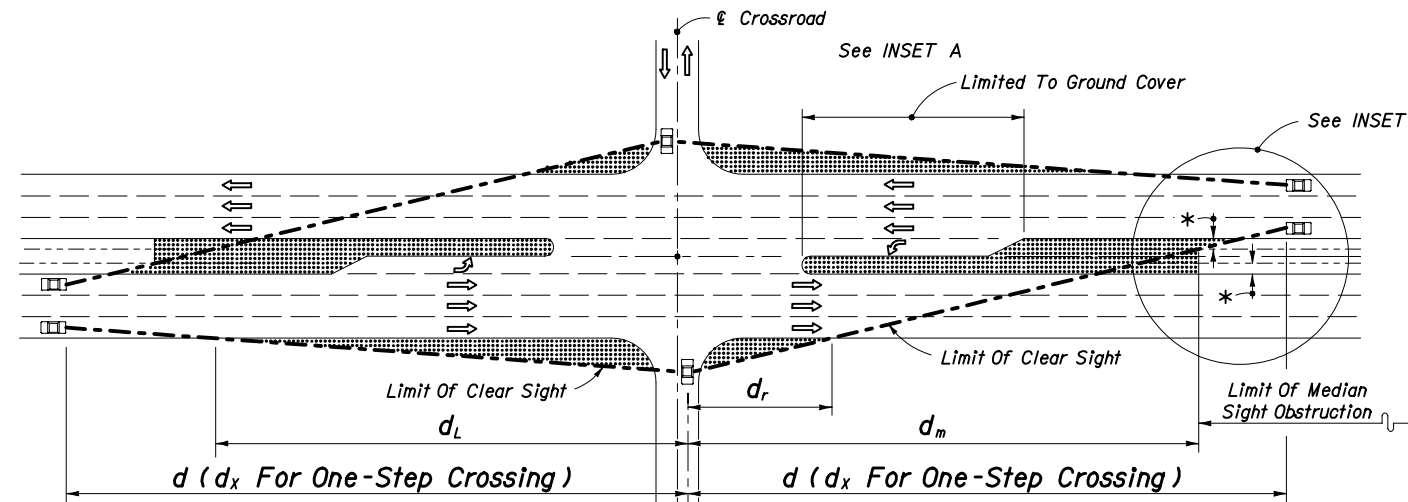
35'-50' MEDIAN				
Design Speed	d_x	d_L	d_r	d_m
30	720	510	100	640
35	830	590	110	740
40	950	670	130	840
45	1070	760	150	950
50	1190	840	160	1060
55	1310	930	180	1160
60	1430	1010	190	1270
65	1550	1100	210	1380

64' MEDIAN				
Design Speed	d	d_L	d_v	d_{vL}
30	490	350	510	360
35	580	410	590	420
40	660	470	680	480
45	740	520	760	540
50	820	580	850	600
55	910	640	930	660
60	990	700	1020	720
65	1070	760	1100	780

INTERMEDIATE SEMI-TRAILERS (WB-40 & WB-50)

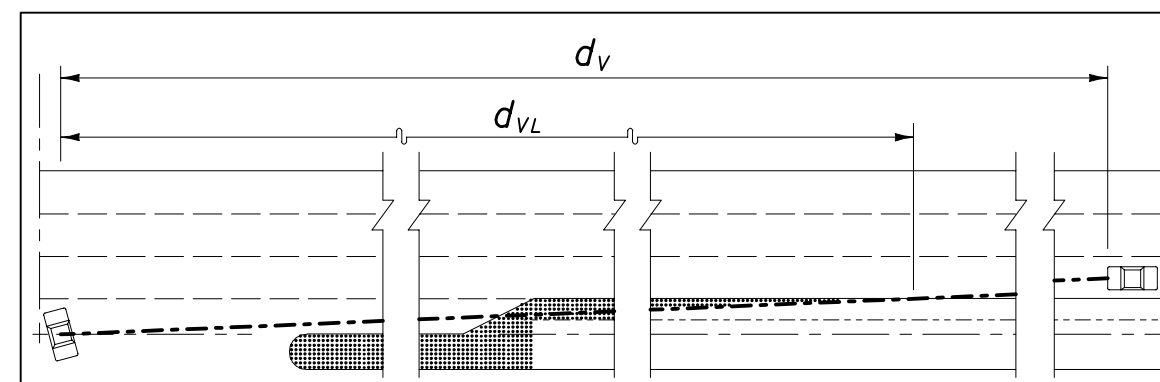
SIGHT DISTANCES (d), (d_v) & (d_x) AND RELATED DISTANCES (d_L , d_r , d_m & d_{vL}) (FEET)

6 LANE DIVIDED



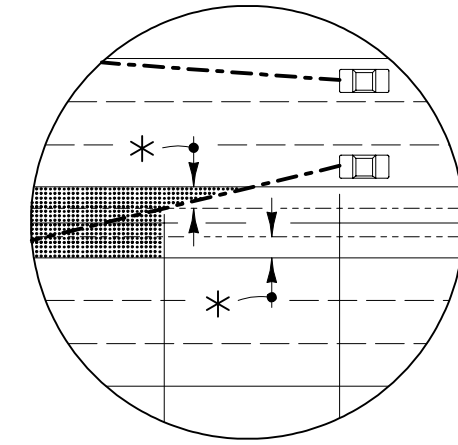
PLAN
PICTORIAL
* 6' For Restricted Conditions
CZ For Non-Restricted Conditions
See Index No. 700

LEGEND
 Areas Free Of Sight Obstructions



Where The Median Is Sufficiently Wide For The Design Vehicle To Pause In The Median (Vehicle Length Plus 6' Min.) The Clear Line Of Sight To The Right (d_v) Is Measured From The Vehicle Pause Location, i.e. Not From The Cross Road Stop Position; Distances d_r & d_m Do Not Apply.

INSET A

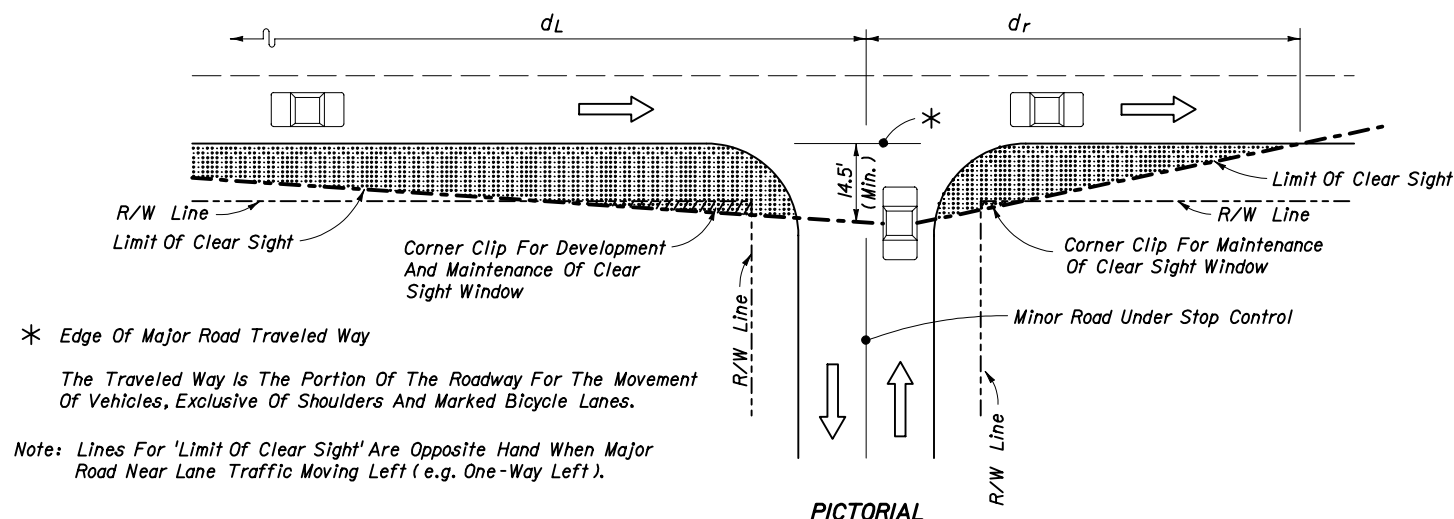


INSET B

NOTES FOR 4-LANE DIVIDED ROADWAY

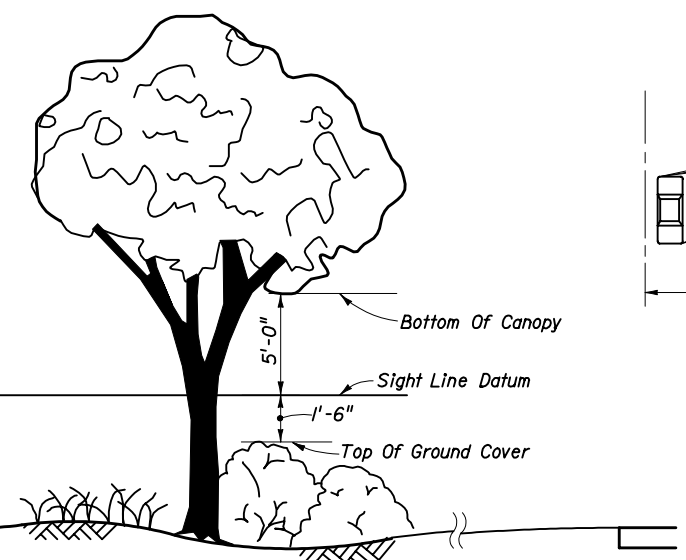
- See Sheet 6 for origin of clear sight line on the minor road.
- Values shown in the tables are the governing (controlling) sight distances calculated based on 'AASHTO Case B - Intersection with Stop Control on the Minor Road.'

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SIGHT DISTANCE AT INTERSECTIONS				
Names	Dates	Approved By		
Designed By	KNM/JVG	10/89	Roadway Design Engineer	
Drawn By	HSD	10/89	Revision	Sheet No.
Checked By	JVG/JAM	10/02	04	5 of 6
				Index No. 546



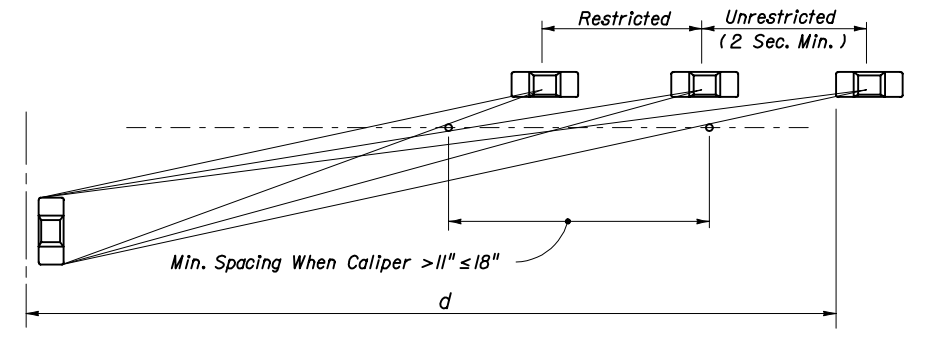
* Edge Of Major Road Traveled Way
 The Traveled Way Is The Portion Of The Roadway For The Movement Of Vehicles, Exclusive Of Shoulders And Marked Bicycle Lanes.
 Note: Lines For 'Limit Of Clear Sight' Are Opposite Hand When Major Road Near Lane Traffic Moving Left (e.g. One-Way Left).

PICTORIAL
 ORIGIN OF CLEAR SIGHT LINE
 ON MINOR ROAD

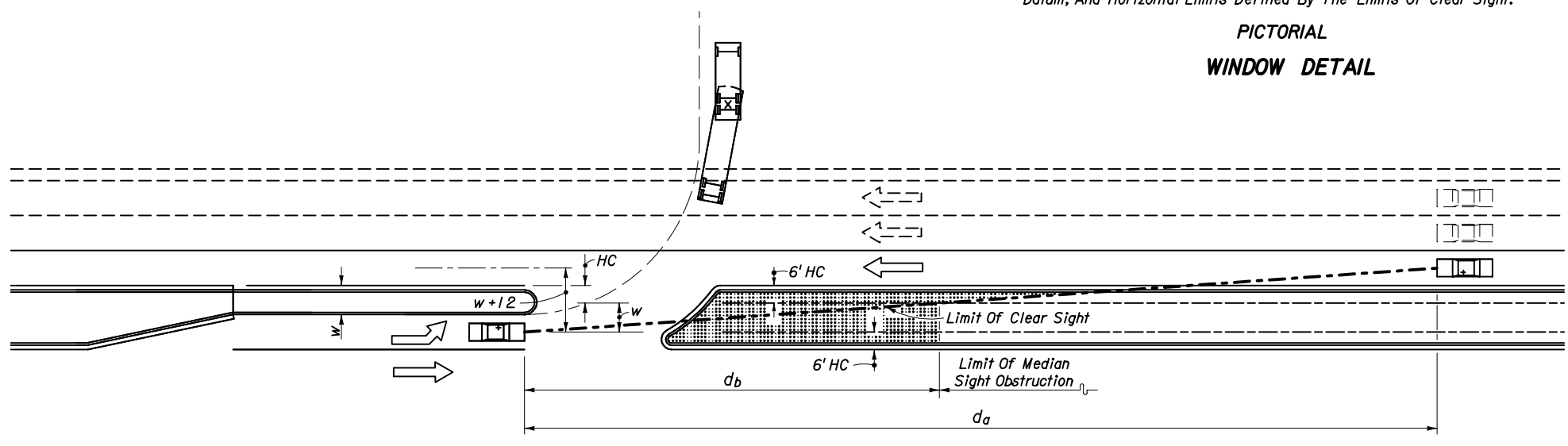


The Intent Of This Standard Is To Provide A Window With Vertical Limits Of Not Less Than 5' Above And 1'-6" Below The Sight Line Datum, And Horizontal Limits Defined By The Limits Of Clear Sight.

PICTORIAL
 WINDOW DETAIL



PERCEPTION DIAGRAM
 SETTING SABAL PALM (STATE TREE) SPACING



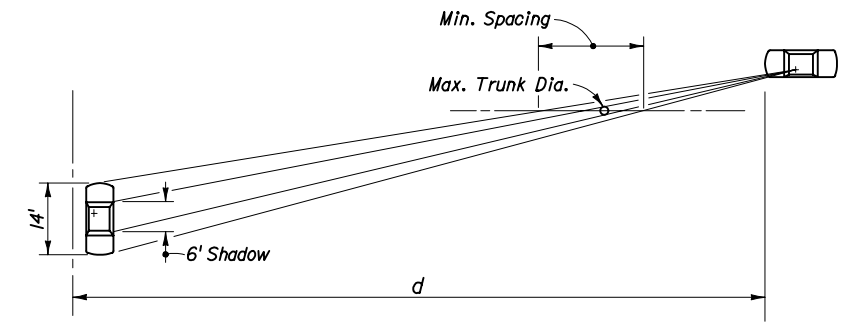
PICTORIAL

Design Speed MPH	d_a (Feet)								
	1 Lane Crossed			2 Lanes Crossed			3 Lanes Crossed		
	P	SU	Comb.	P	SU	Comb.	P	SU	Comb.
30	245	285	330	265	320	360	285	350	390
35	285	335	385	310	370	420	335	405	460
40	325	380	440	355	425	480	380	465	525
45	365	430	495	395	475	540	430	520	590

☆ See Note.

☆ The d_a values in this table were established by the method referenced in Design Note 2, and are applicable to urban, predominantly curbed roadways with design speeds of 45 mph or less and meeting the restricted conditions defined in Index No. 700. For horizontal clearance (HC) of six feet (6'), the values for d_b may be determined by the equation $d_b = d_a (w/w+12)$. For roadways with non-restricted conditions, d_a and d_b should be based on the geometry for the left turn storage and on clear zone widths (See Index No. 700).

CHANNELIZED DIRECTIONAL MEDIAN OPENINGS



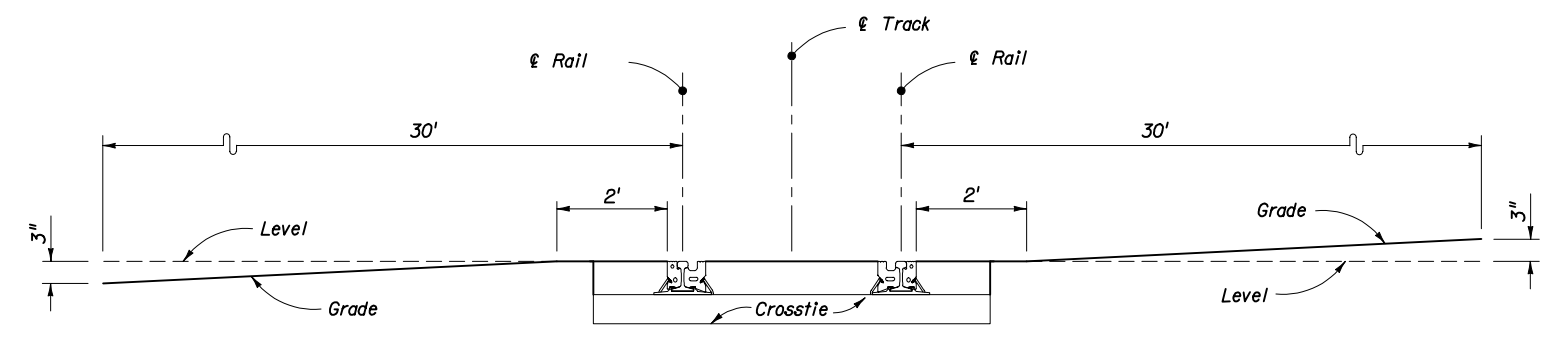
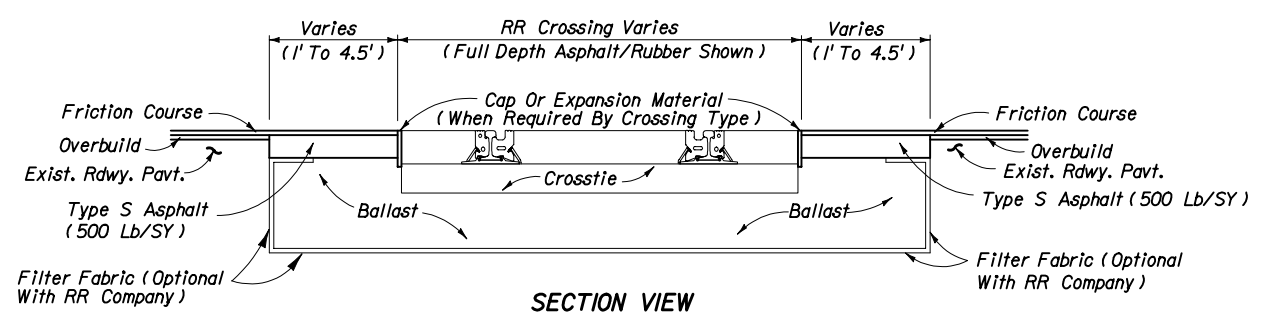
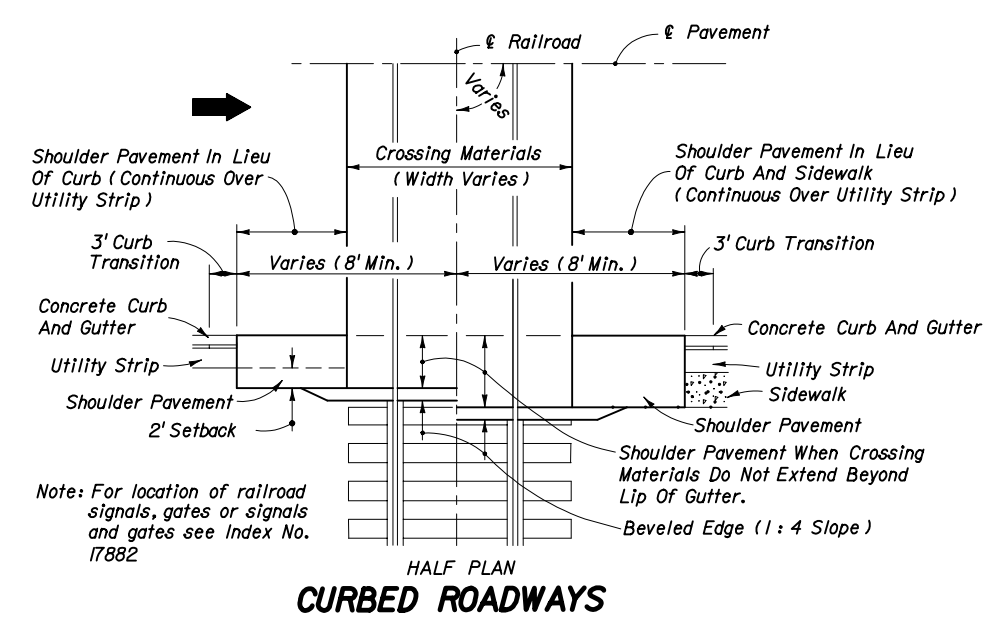
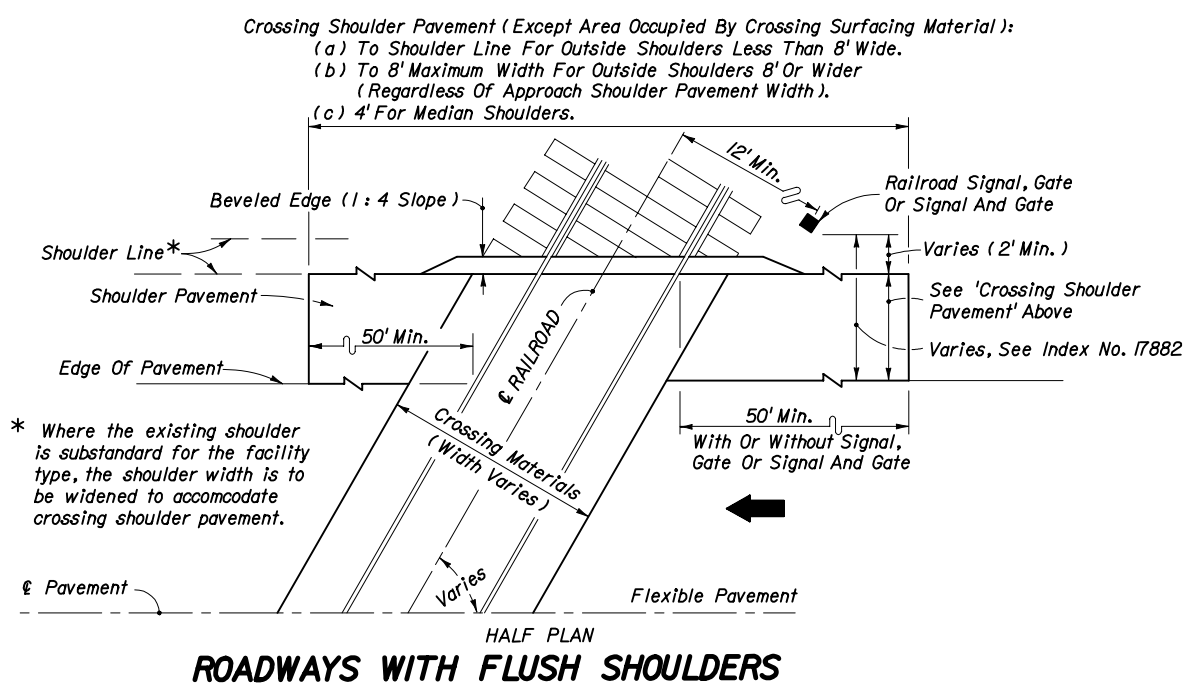
SHADOW DIAGRAM

LEGEND
 Areas Free Of Sight Obstructions

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIGHT DISTANCE AT INTERSECTIONS

Designed By	KRM/JVG	10/89	Approved By	<i>Jamell D. Milk</i> Roadway Design Engineer	
Drawn By	HSD	10/89	Revision	Sheet No.	Index No.
Checked By	JVG/KRM	10/89	04	6 of 6	546



To prevent low-clearance vehicles from becoming caught on the tracks, the crossing surface should be at the same plane as the top of the rails for a distance of 2 feet outside the rails. The surface of the highway should also not be more than 3 inches higher or lower than the top of the nearest rail at a point 30 feet from rail unless track superelevation makes a different level appropriate. Vertical curves should be used to traverse from the highway grade to a level plane at the elevation of the rails. Rails that are superelevated, or a roadway approach sections that is not level, will necessitate a site specific analysis for rail clearances.

VERTICAL ROADWAY ALIGNMENT THROUGH A RAILROAD CROSSING

CROSSING SURFACES	
Type	Definition
C	Concrete
R	Rubber
RA	Rubber/Asphalt

General Notes

STOP ZONE FOR RUBBER CROSSING	
Design Speed (mph)	Zone Length (Distance From Stop)
45 Or Less	250'
50 - 55	350'
60 - 65	500'
70	600'

- Notes:
- Type R Crossings are NOT to be used for multiple track crossings within zones for an existing or scheduled future vehicular stop. Zone lengths are charted above.
 - Single track Type R Crossings within the zones on the chart may be used unless engineering or safety considerations dictate otherwise.

- The Railroad Company will furnish and install all track bed (ballast), crossties, rails, crossing surface panels and accessory components. All pavement material, including that through the crossing, will be furnished and installed by the Department or its Contractor, unless negotiated otherwise.
- When a railroad grade crossing is located within the limits of a highway construction project, a transition pavement will be maintained at the approaches of the crossing to reduce vehicular impacts to the crossing. The transition pavement will be maintained as appropriate to protect the crossing from low clearance vehicles and vehicular impacts until the construction project is completed and the final highway surface is constructed.
- The Central Rail Office will maintain a list of currently used Railroad Crossing Products and will periodically distribute the current list to the District Offices as the list is updated.
- The Railroad Company shall submit engineering drawings for the proposed crossing surface type to the Construction Project Engineer and/or the District Rail Office for concurrence along with the List of Railroad Crossing Products. The approved engineering drawings of the crossing surface type shall be made a part of the installation agreement.
- Sidewalks shall be constructed through the crossing between approach sidewalks of the crossing. Sidewalks shall be constructed with appropriate material to allow unobstructed travel through the crossing in accordance with ADA requirements.
- All asphalt shall be installed in accordance with Index No. 514 and Section 300 of the Standard Specifications.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RAILROAD CROSSINGS				
Names	Dates	Approved By <i>John M. Spindel</i>		
Designed By RAIL BU	12/02	Administrator, Rail Operations		
Drawn By HSD	12/02	Revision	Sheet No.	Index No.
Checked By JVG/GF	12/02	04	1 of 1	560

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- Symbols
- Definitions
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- Overweight/Oversize Vehicles
- Lane Widths
- Length of Lane Closures
- Sight Distance To Delineation Devices
- Above Ground Hazard
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- Superelevation
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- Warning Lights
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- Dropoffs In Work Zones
- Identifications-Channelizing And Lighting Devices
And Advance Warning Arrow Panel Modes
- Commonly Used Warning and Regulatory Signs
In Work Zones
- Pavement Markings

PREFACE

All projects and works on highways, roads and streets shall have a traffic control plan. All work shall be executed under the established plan and Department approved procedures. This index contains information specific to the Federal and State guidelines and standards for the preparation of traffic control plans and for the execution of traffic control in work zones, for construction and maintenance operations and utility work on highways, roads and streets.

Index No. 600 provides Department policy and standards. Changes are only to be made thru Department approved procedures. Index Nos. 601 thru 670 provide typical applications for various situations. Modification can be made to these indexes as long as the changes comply with the MUTCD and Department Design Standards.

The sign spacings shown on the indexes are typical (recommended) distances. These distances may be increased or decreased based on field conditions, in order to avoid conflicts or to improve site specific traffic controls.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

The Florida Department of Transportation has adopted the "Manual On Uniform Traffic Control Devices For Streets And Highways" (MUTCD) and subsequent revisions and addendums, as published by the U.S. Department of Transportation, Federal Highway Administration, for mandatory use on the State Maintained Highway System whenever there exists the need for construction, maintenance operations or utility work.

ABBREVIATIONS





















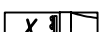







Abbreviations assigned to the 600 series Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:


CFR	Code of Federal Regulations
DTOE	District Traffic Operations Engineer
FDOT	Florida Department Of Transportation
HAR	Highway Advisory Radio
L	Taper Length, Buffer Length Or Taper Length Plus Buffer Space
LEO	Law Enforcement Officer
MAS	Motorist Awareness System
MOT	Maintenance Of Traffic
MOTC	Maintenance Of Traffic Committee
MUTCD	Manual On Uniform Traffic Control Devices For Streets And Highways
NCHRP	National Cooperative Highway Research Program
PCMS	Portable Changeable (Variable) Message Sign
PRS	Portable Regulatory Sign
R	Radius
RPM	Raised Retroreflective Pavement Marker
RSDU	Radar Speed Display Unit
S	Posted Speed Of Off-Peak 85 Percentile Speed (MPH)
TCP	Traffic Control Plan(s)
TCZ	Traffic Control Zones
TMA	Truck Mounted Attenuator
VECP	Value Engineering Change Proposal
W	Width Of Taper Transition In Feet i.e., Lateral Offset

SYMBOLS

The symbols shown are found in the Traffic Control Zone Cell Library (TCZ.cel) on the CADD system.

Symbols assigned to the 600 series Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:

-  Work Area, Hazard Or Work Phase (Any pattern within a boundary)
-  Sign With 18" x 18" (Min.) Orange Flag And Type B Light
-  Type I Or Type II Barricade Or Vertical Panel Or Drum
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
-  Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
-  Cone Or Tubular Marker
-  Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)
-  Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Steady Burning Light)
-  Type III Barricade
-  Type III Barricade (With Flashing Light)
-  Type III Barricade (With Steady Burning Light)
-  Work Zone Sign
-  Flagger
-  Traffic Signal
-  Advance Warning Arrow Panel
-  Portable Signal
-  Crash Cushion
-  Stop Bar
-  Work Vehicle With Flashing Beacon
-  Shadow (S) Or Advance Warning (AW) Vehicle With Advance Warning Arrow Panel And Warning Sign
-  Truck Mounted Attenuator (TMA)
-  Orange Flag For TCZ Signs
-  Type B Light For TCZ Signs
-  Law Enforcement Officer
-  Portable Regulatory Sign
-  Radar Speed Display Unit
-  Portable Changeable (Variable) Message Sign

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES				
	Names	Dates	Approved By 	
Designed By		02	Roadway Design Engineer	
Drawn By			Revision	Sheet No.
Checked By			04	1 of 10
				Index No. 600

DEFINITIONS

Regulatory Speed (In Work Zones)

The maximum permitted travel speed posted for the work zone as indicated by the regulatory speed limit signs. The work zone speed must be shown or noted in the plans. This speed should be used as the minimum design speed to determine runout lengths, departure rates, flare rates, lengths of need, clear zone widths, taper lengths, crash cushion requirements, marker spacings, superelevation and other similar features.

Advisory Speed

The maximum recommended travel speed through a curve or a hazardous area.

Travel Way

The portion of the roadway for the movement of vehicles. For traffic control through work zones, travel way may include the temporary use of shoulders and any other permanent or temporary surface intended for use as a lane for the movement of vehicular traffic.

Detour, Lane Shift, and Diversion

A detour is the redirection of traffic onto another roadway to bypass the temporary traffic control zone. A lane shift is the redirection of traffic onto a different section of the permanent pavement. A diversion is the redirection of traffic onto a temporary roadway, usually adjacent to the permanent roadway and within the limits of the right-of-way.

Above Ground Hazard

An above ground hazard is any object, material or equipment other than traffic control devices that encroaches upon the travel way or that is located within the clear zone which does not meet the Department's safety criteria, i.e., anything that is greater than 4" in height and is firm and unyielding or doesn't meet breakaway requirements.

TEMPORARY TRAFFIC CONTROL DEVICES

All temporary traffic control devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, temporary traffic control devices that are no longer appropriate shall be removed or covered. Arrow Panels, Portable Changeable Message Signs, Radar Speed Display Trailers, Portable Regulatory Signs, and any other NCHRP 350 Category 4 devices shall be moved outside the travel way and clear zone or be shielded by a barrier or crash cushion when not in use.

PEDESTRIAN AND BICYCLIST

When an existing pedestrian way or bicycle way is located within a traffic control work zone, accommodation must be maintained and provision for the disabled must be provided.

Only approved temporary traffic control devices may be used to delineate a temporary traffic control zone pedestrian walkway.

Advanced notification of sidewalk closures and detours marked shall be provided by appropriate signs.

RAILROADS

Railroad crossings affected by a construction project should be evaluated for traffic controls to reduce queuing on the tracks. The evaluation should include as a minimum: traffic volumes, distance from the tracks to the intersections, lane closure or taper locations, signal timing, etc.

OVERHEAD WORK

No work shall be allowed over a traffic lane using a bucket truck, unless a lane closure has been set up in accordance with the appropriate Index.

OVERWEIGHT/OVERSIZE VEHICLES

Restrictions to Lane Widths, Heights or Load Capacity can greatly impact the movement of over dimensioned loads. The Contractor shall notify the Engineer who in turn shall notify the State Permits Office, phone no. (850) 410-5777, at least seven calendar days in advance of implementing a maintenance of traffic plan which will impact the flow of overweight/oversized vehicles. Information provided shall include location, type of restriction (height, width or weight) and restriction time frames. When the roadway is restored to normal service the State Permits Office shall be notified immediately.

LANE WIDTHS

Lane widths of through roadways should be maintained through work zone travel ways wherever practical. The minimum widths for work zone travel lanes shall be as follows: 11' for Interstate with at least one 12' lane provided in each direction, unless formally excepted by the Federal Highway Administration; 11' for freeways; and 10' for all other facilities.

LENGTH OF LANE CLOSURES

Lane closures shall not exceed 2 miles in total length in any given direction on the Interstate or on state highways with a posted speed of 55 MPH or greater.

SIGHT DISTANCE TO DELINEATION DEVICES

Transition tapers should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve), the taper should begin well in advance of the view obstruction. The beginning of tapers should not be hidden behind curves.

ABOVE GROUND HAZARD

Above ground hazards (see definitions) are to be considered work areas during working hours and treated with appropriate work zone traffic control procedures. During non-working hours, all objects, materials and equipment that constitute an above ground hazard must be stored/placed outside the travel way and clear zone or be shielded by a barrier or crash cushion.

For above ground hazards within a work zone the clear zone required should be based on the regulatory speed posted during construction.

CLEAR ZONE WIDTHS FOR WORK ZONES

The term 'clear zone' describes the unobstructed relatively flat area, impacted by construction, extending outward from the edge of the travel lane. The table below gives clear zone widths in work zones for medians and roadside conditions other than for roadside canals; where roadside canals are present, clear zone widths are to conform with the distances to canals as described in Volume I Chapter 4, Sec 4.2 and Exhibit 4-A and 4-B of the Plans Preparation Manual.

CLEAR ZONE WIDTHS FOR WORK ZONES	
WORK ZONE SPEED (MPH)	WIDTHS (feet)
60-70	30
55	24
45-50	18
30-40	14
ALL SPEEDS CURB & GUTTER	4' BEHIND FACE OF CURB

SUPERELEVATION

Horizontal curves constructed in conjunction with work zone traffic control should have the required superelevation applied to the design radii. Under conditions where normal cross slope controls curvature, the minimum radii that can be applied are listed in the table below.

MINIMUM RADII FOR NORMAL CROSS SLOPES	
DESIGN SPEED	MINIMUM RADIUS R
MPH	feet
65	3130
60	2400
55	1840
50	1390
45	1080
40	820
35	610
30	430
Superelevate When Smaller Radii Used	

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REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCPs) for all projects must include specific regulatory speeds for each phase of work. This can either be the posted speed or a reduced speed. The speed shall be noted in the TCPs; this includes indicating the existing speed if no reduction is to be made. Regulatory speeds are to be uniformly established through each phase.

In general, the regulatory speed should be established to route vehicles safely through the work zone as close to normal highway speed as possible. The regulatory speed should not be reduced more than 10 mph below the posted speed and never below the minimum statutory speed for the class of facility. When a speed reduction greater than 10 mph is imposed, the reduction is to be done in 10 mph per 500' increments.

Temporary regulatory speed signs shall be removed as soon as the conditions requiring the reduced speed no longer exist. Once the work zone regulatory speeds are removed, the regulatory speed existing prior to construction will automatically go back into effect unless new speed limit signing is provided for in the plans.

On projects with interspaced work activities, speed reductions should be located in proximity to those activities which merit a reduced speed, and not "blanketed" for the entire project. At the departure of such activities, the normal highway speed should be posted to give the motorist notice that normal speed can be resumed.

If the existing regulatory speed is to be used, consideration should be given to supplementing the existing signs when the construction work zone is between existing regulatory speed signs. For projects where the reduced speed conditions exist for greater than 1 mile in rural areas (non-interstate) and on rural or urban interstate, additional regulatory speed signs are to be placed at no more than 1 mile intervals. Engineering judgement should be used in placement of the additional signs. Locating these signs beyond ramp entrances and beyond major intersections are examples of proper placement. For urban situations (non-interstate), additional speed signs are to be placed at a maximum of 1000' apart.

When field conditions warrant speed reductions different from those shown in the TCP the contractor may submit to the project engineer for approval by the Department, a signed and sealed study to justify the need for further reducing the posted speed, or, the engineer may request the District Traffic Operations Engineer (DTOE) to investigate the need. It will not be necessary for the DTOE to issue regulations for regulatory speeds in work zones due to the revised provisions of F.S. 316.0745(2)(b). Advisory Speed plates will be used at the option of the field engineer for temporary use while processing a request to change the regulatory speed specified in the plans when deemed necessary. Advisory speed plates cannot be used alone but must be placed below the construction warning sign for which the advisory speed is required.

For additional information refer to the FDOT Roadway Plans Preparation Manual, Volume I, Chapter 10.

FLAGGER CONTROL

Where flaggers are used, a FLAGGER symbol or legend sign must replace the WORKERS symbol or legend sign.

The flagger must be clearly visible to approaching traffic for a distance sufficient to permit proper response by the motorist to the flagging instructions, and to permit traffic to reduce speed or to stop as required before entering the work site. Flaggers shall be positioned to maintain maximum color contrast between the Flagger's reflective garments and equipment and the work area background.

HIGH-VISIBILITY CLOTHING

For daytime work, the flagger's vest, shirt, or jacket shall be orange, or a fluorescent version of this color. For nighttime work, similar outside garments shall be retroreflective. The retroreflective material shall be either orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and be visible at a minimum distance of 1,000 ft. The retroreflective clothing shall be designed to clearly identify the wearer as a person.

HAND-SIGNALING DEVICES

STOP/SLOW paddles are the primary hand-signaling device. The STOP/SLOW paddle shall have an octagonal shape on a rigid handle. STOP/SLOW paddles shall be at least 24 inches wide with letters at least 6 inches high and should be fabricated from light semi-rigid material. The background of the STOP face shall be red with white letters and border. The background of the SLOW face shall be orange with black letters and border. When used at night-time, the STOP/SLOW paddle shall be retroreflectorized.

Flag use is limited to immediate emergencies, intersections, and when working on centerline or shared left turn lanes where two (2) flaggers are required and there is opposing traffic in the adjacent lanes. Flags, when used, shall be a minimum of 24 inches square, made of a good grade of red material, and securely fastened to a staff that is approximately 36 inches in length. When used at nighttime, flags shall be retroreflectorized red.

Flashlight, lantern or other lighted signal that will display a red warning light shall be used at night.

FLAGGER STATIONS

Flagger stations shall be located far enough in advance of the work space so that approaching road users will have sufficient distance to stop before entering the work space. When used at nighttime, the flagger station shall be illuminated.

SURVEY WORK ZONES

The SURVEY CREW AHEAD symbol or legend sign shall be the principal Advance Warning Sign used for Traffic Control Through Survey Work Zones and may replace the ROAD WORK AHEAD sign when lane closures occur, at the discretion of the Party Chief. Type B Light or dual orange flags shall be used at all times to enhance the SURVEY CREW AHEAD sign, even with mesh signs.

When Traffic Control Through Work Zones is being used for survey purposes only, the END ROAD WORK sign as called for on certain 600 Series Indexes should be omitted.

SURVEY BETWEEN ACTIVE TRAFFIC LANES OR SHARED LEFT TURN LANES

The following provisions apply to Main Roadway Traffic Control Work Zones. These provisions must be adjusted by the Party Chief to fit roadway and traffic conditions when the Survey Work Zone includes Intersections.

- (A) A STAY IN YOUR LANE (MOT-1) sign shall be added to the Advance Warning Sign sequence as the second most immediate sign from the work area.
- (B) Elevation Surveys-Cones may be used at the discretion of the Party Chief to protect prism holder and flagger(s). Cones, if used, may be placed at up to 50' intervals along the break line throughout the work zone.
- (C) Horizontal Control-With traffic flow in the same direction, cones shall be used to protect the backsight tripod and/or instrument. Cones shall be placed at the equipment, and up to 50' intervals for at least 200' towards the flow of traffic.
- (D) Horizontal Control-With traffic flow in opposite directions, cones shall be used to protect the backsight tripod and/or instrument. Cones shall be placed at the equipment, and up to 50' intervals for at least 200' in both directions towards the flow of traffic.

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SIGN PLACEMENT

Post-mounted signs installed at the side of the road shall be mounted at a height at least 7 feet measured from the bottom of the sign to a horizontal line extended from the near edge of the pavement. Signs mounted on barricades, or other portable supports shall be no less than 1 foot above the travel way.

ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING

Adjoining work zones may not have sufficient spacing for standard placement of signs and other traffic control devices in their advance warning areas or in some cases other areas within their traffic control zones. Where such restraints or conflicts occur or are likely to occur, one of the following methods will be employed to avoid conflicts and prevent conditions that could lead to misunderstanding on the part of the traveling public as to the intended travel way by the traffic control procedure applied:

- For scheduled projects the engineer in responsible charge of project design will resolve anticipated work zone conflicts during the development of the project traffic control plan. This may entail revision of plans on preceding projects and coordination of plans on concurrent projects.
- Unanticipated conflicts arising between adjoining in progress highway construction projects will be resolved by the Resident Engineer for projects under his residency, and, by the District Construction Engineer for in progress projects under adjoining residencies.
- The District Maintenance Engineer will resolve anticipated and occurring conflicts within scheduled maintenance operations.
- The Unit Maintenance Engineer will resolve conflicts that occur within routine maintenance works; between routine maintenance work, unscheduled work and/or permitted work; and, between unit controlled maintenance works and highway construction projects.

SIGN COVERING AND INTERMITTENT WORK STOPPAGE SIGNING

Existing signs that conflict with temporary work zone signing shall be removed or covered as approved by the Engineer. Traffic control signs that require covers when no work is being performed in a work area shall be fully covered with a durable opaque sheet material.

Plastic film and woven fabrics including burlap will not be permitted.

Covering of only the legend or symbol will not be permitted.

Reflective coverings will not be permitted.

Hinged signs designed to cover when folded will be permitted.

Covers, hinged panels and intermittent work stoppage shields and plaques are incidental to work operation signs and are not to be paid for separately.

SIGN MATERIALS

Mesh signs may be used only for Daylight Operations as noted in the standards. Type B Lights and Orange Flags are not required except for survey work zones.

Vinyl signs may be used for Day or Night Operations not to exceed 12 hours except as noted in the standards. Type B Lights and Orange Flags are not required except for survey work zones.

WORK ZONE SIGN SUPPORTS

All signs shall be post mounted if operation exceeds 12 hours except as noted in the standards.

Signs mounted on temporary supports or barricades, and barricade/sign combination shall be crashworthy in accordance with NCHRP 350 requirements and included on the Qualified Products List (QPL).

All post mounted Work Zone signs shall be installed on either round aluminum or steel channel post as specified in the table below.

SUPPORTS FOR MAINTENANCE OF TRAFFIC SIGNS					
SIGN SIZE	SIGN BRACKET	ROUND ALUMINUM	DEPTH IN GROUND	STEEL CHANNEL	DEPTH IN GROUND
24" x 36"	2-I	NPS 2.0" x $\frac{1}{8}$ "	2'-0"	2.5 lb F/M*	3'-0"
48" x 48" DIAMOND	2-I & 1-II	NPS 3.5" x $\frac{3}{16}$ "	3'-4"	**	3'-0"
60" x 48"	3-I	NPS 3.5" x $\frac{3}{16}$ "	3'-4"	**	3'-0"
24" x 30"	2-I	NPS 2.0" x $\frac{1}{8}$ "	2'-0"	2.5 lb F/M*	3'-0"
48" x 48"	2-II	NPS 3.0" x $\frac{1}{8}$ "	2'-6"	**	3'-0"
60" x 24"	3-I	NPS 3.0" x $\frac{1}{8}$ "	2'-6"	3.0 lb F/M*	3'-0"
60" x 36"	3-I	NPS 3.5" x $\frac{3}{16}$ "	3'-4"	4.0 lb F/M*	3'-0"

* F/M Indicates Type F or Type M

** Requires two 3 lb/ft steel channel (F/M) at 2'-6" center to center. All sign brackets shall be Type I. The total number of brackets shall be per post as tabulated, except the "Diamond" sign which shall use two Type I brackets per post.

The 4 lb/ft steel channel shall be installed with approved breakaway bases.

Refer to Index No. 11860, Sheet 3, for round aluminum sign bracket details, and Index No. 11865, Sheet 2, for steel channel breakaway bases, and notes.

SIGNING FOR DETOURS, LANE SHIFTS AND DIVERSIONS

Detours should be signed clearly over their entire length so that motorists can easily determine how to return to the original roadway. The W1-4R, MOT-2-04, and MOT-3-04 warning signs should be used for the advanced warning for a lane shift. A diversion should be signed as a lane shift.

EXTENDED DISTANCE ADVANCE WARNING SIGNS

Advance Warning Signs shall be used at extended distance of one-half mile or more when limited sight distance or the nature of the obstruction may require a motorist to bring their vehicle to a stop. Extended distance Advanced Warning Signs may be required on any type roadway, but particularly be considered on multi-lane divided highways where vehicle speed is generally in the higher range (45 MPH or more).

SPEEDING FINES DOUBLED WHEN WORKERS PRESENT SIGN

The SPEEDING FINES DOUBLED WHEN WORKERS PRESENT sign should be installed on all projects. The placement should be 500 ft beyond the ROAD WORK AHEAD sign or midway to the next sign whichever is less.

LENGTH OF ROAD WORK SIGN

The length of road work sign (G20-1) bearing the legend ROAD WORK NEXT _____ MILES is required for all projects of more than 2 miles in length. The number of miles entered should be rounded up to the nearest mile. The sign shall be located at begin construction points.

INTERSECTING ROAD SIGNING

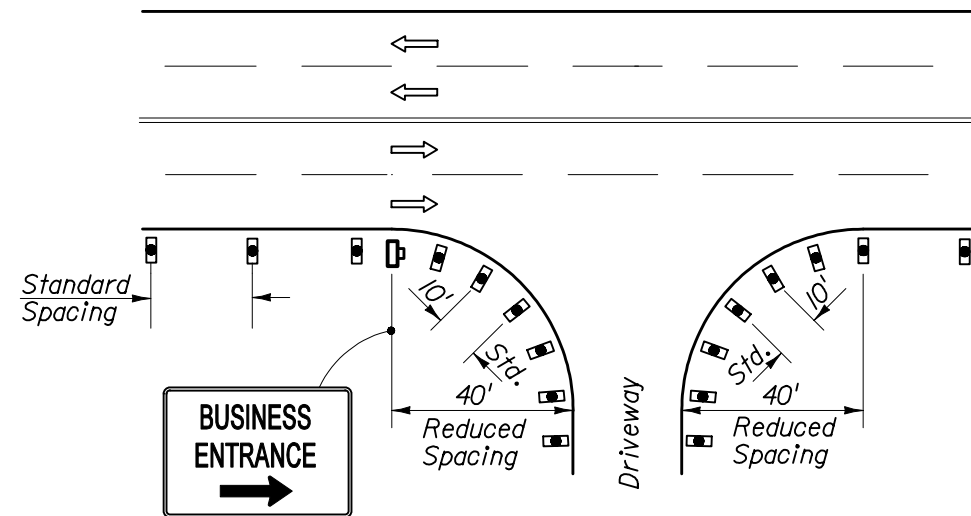
Signing for the control of traffic entering and leaving work zones by way of intersecting highways, roads and streets shall be adequate to make drivers aware of work zone conditions. Under no condition will intersecting leg signing be less than a ROAD WORK AHEAD sign, including light and flag, for approaching vehicles.

END ROAD WORK SIGNS

The END ROAD WORK sign (G20-2A) should be erected approximately 500 feet beyond the end of a construction or maintenance project unless other distance called for in the plans. When other Construction or Maintenance Operations occur within 1 mile this sign should be omitted and signing coordinated in accordance with Index No. 600, ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING.

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1. Sign height shall be 7' minimum. Sign offset from edge of travel way should be between 6' and 10' and relatively consistent through the project phase.
2. Place one business sign for each driveway entrance affected. When several businesses share a common driveway entrance, place one sign per common driveway entrance.
3. Channelizing devices should be placed at a reduced spacing on each side of the driveway entrance.



PLACEMENT OF BUSINESS ENTRANCE SIGNS AND CHANNELIZING DEVICES AT BUSINESS ENTRANCE

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PORTABLE CHANGEABLE (VARIABLE) MESSAGE SIGNS (PCMS)

The PCMS can be used to:
 (1) Supplement standard signing in construction/maintenance work zones.
 (2) Reinforce static advance warning messages.
 (3) Provide motorists with updated guidance information.

PCMS should be placed approx. 500 to 800 feet in advance of the work zone conflicts or 1.5 to 2 miles in advance of complex traffic control schemes which require new and/or unusual traffic maneuvers.

If PCMS are to be used at night, the intensity of the flashers shall be reduced during darkness when lower intensities are desirable.

For additional information refer to the *FDOT Roadway Plans Preparation Manual, Volume I, Chapter 10.*

CHANNELIZING AND LIGHTING DEVICES

Channelizing and lighting devices for work zone traffic control shall be as prescribed in Part VI of the MUTCD, subject to supplemental revisions provided in the contract documents.

Primary work zone traffic control devices are shown on Sheet 8 for the purpose of ready identification. Approved devices are listed on the Department's Qualified Product List.

CHANNELIZING AND LIGHTING DEVICE CONSISTENCY

Barricades, vertical panels, cones, tubular markers and drums shall not be intermixed within either the lateral transition or within the tangent alignment.

REMOVING PAVEMENT MARKINGS

Existing pavement markings that conflict with temporary work zone delineation shall be removed by any method approved by the Engineer, where operations exceed one daylight period; however, painting over existing pavement markings will not be permitted. Full pavement width overlays of either asphalt concrete SP 9.5 or FC-6 are a positive means to achieve obliteration.

SIGNALS

Existing traffic signal operations that require modification in order to carry out work zone traffic control shall be included in the TCP and be approved by the District Traffic Operations Engineer.

Maintain all existing actuated or traffic responsive mode signal operations for main and side street movements for the duration of the Contract and require restoration of any loss of detection within 12 hours. The contractor shall select only detection technology listed on the Department's Approved Products List (APL) and approved by the Engineer to restore detection capabilities. The plans should identify the intersections where Temporary Traffic Detection is required.

WARNING LIGHTS

Warning lights shall be in accordance with Section 6F-72 of the MUTCD except for the application limitations stipulated below:

Flashing

Type A Low Intensity Flashing Warning Lights are to be mounted on barricades, drums, vertical panels or advance warning signs (except as noted below) and are intended to continually warn drivers that they are approaching or proceeding in a hazardous area. Flashing lights shall not be used to delineate the intended path of travel, and not placed with spacings that will form a continuous line to the drivers eye. The Type A light will be used to mark obstructions that are located adjacent to or in the intended travel way. Type A lights shall not be used in conjunction with the first advance warning sign nor the second such sign when used.

Type B High Intensity Flashing Warning Lights shall be mounted on the first advanced warning sign and on the first and second advanced warning sign where two or more signs are used; this applies to all approaches to any work zone. The light shall be mounted on the channel post or on the upper edge of the sign nearest the traffic.

Steady-Burn

Type C Steady-Burn Lights are to be mounted on barricades, drums, concrete barrier walls or vertical panels and used in combination with those devices to delineate the travel way on lane closures, lane changes, diversion curves and other similar conditions. Steady-burn lights are intended to be placed in a line to delineate the traveled way through and around obstructions in the transition, buffer, work and termination areas of the traffic control zone. Their intended purpose is not for warning drivers that they are approaching or proceeding through a hazardous area.

ROADSIDE BARRIERS

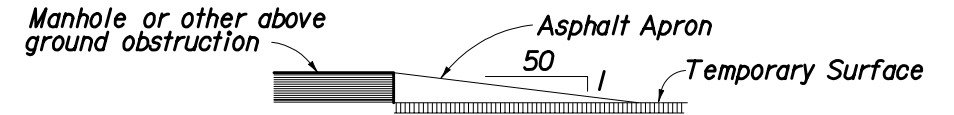
When connecting temporary concrete barrier wall to guardrail the connection shall be made in accordance with Index No. 410. All guardrail end anchorages to be included in the cost of Temporary Guardrail.

TRUCK MOUNTED ATTENUATORS

Truck-mounted attenuators (TMA) can be used for moving operations and short-term stationary operations. For moving operations, see Index No. 627. For short-term, stationary operations, see Part VI of the MUTCD.

MANHOLES/CROSSWALKS

Manholes extending 1" or more above the travel lane and crosswalks having an uneven surface greater than 1/4" shall have a temporary asphalt apron constructed as shown in the diagram below.

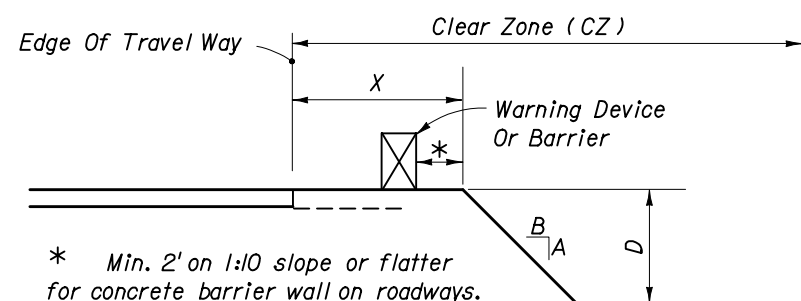


The apron is to be removed prior to constructing the next lift of asphalt. The cost of the temporary asphalt shall be included in the Contract Unit Price for Maintenance of Traffic, LS.

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DROPOFF CONDITION NOTES

1. A dropoff is defined as a drop in elevation, parallel to the adjacent travel lanes, greater than 3" with slopes (A:B) steeper than 1:4. When dropoffs occur within the clear zone due to construction or maintenance activities, protection devices are required. See chart.
2. Distance X is to be the maximum practical under project conditions.
3. Distance from the travel lane to the barrier or warning device should be maximum practical for project conditions.
4. Any dropoff condition that is created and restored within the same work period will not be subject to the use of barriers; however, warning devices will be required.
5. When permanent curb heights are $\geq 6"$, no warning device will be required. For curb heights $< 6"$, see chart.



* Min. 2' on 1:10 slope or flatter for concrete barrier wall on roadways. For concrete barrier wall on bridges, see Structures Design Standard 715.

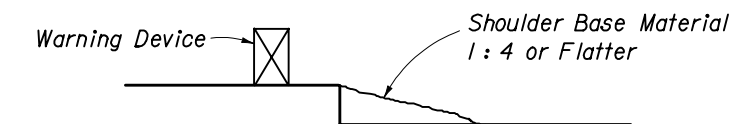
DROPOFF PROTECTION REQUIREMENTS ALL SPEEDS NO CURB AND GUTTER		
X (ft)	D (in)	Device Required
0-CZ	≤ 3	Sign W8-9A
0-12	> 3	Barrier
12-CZ	> 3 to ≤ 5	Warning Device
0-CZ	> 5	Barrier

For Clear Zone widths, see Index No. 600 sheet 2.

DROPOFF NOTES

1. These conditions and treatments can be applied only in work areas that fall within a properly signed work zone.
2. The following are defined as acceptable warning devices:
 - a. Vertical panel
 - b. Type I Or Type II barricades
 - c. Drum
 - d. Cone (where allowed)
 - e. Tubular marker (where allowed)
3. Where a barrier is specified, any of the types below may be used as shown in the plans:
 - a. Concrete temporary barrier wall
 - b. Temporary guardrail and end anchorage
 - c. Temporary water filled barriers
4. Warning device spacing shall be as follows:
 - A. On Taper
Maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH and greater.
 - B. On Alignments
Maximum spacing between cones or tubular markers shall be 25'. Maximum spacing between for Type I or Type II barricades on vertical panels or drums is 50' on center for the first 250'; thereafter, cones or tubular markers at 50' on center and Type I or Type II barricades, or drums or vertical panels at 100' on center.

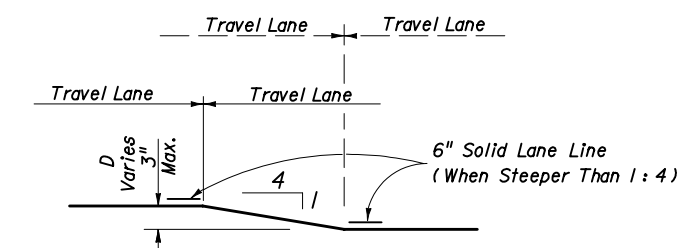
DROPOFFS IN WORK ZONES



NOTES

1. Shoulder treatment may be used in lieu of barrier. Warning devices are required.
2. Daily inspections shall be conducted to assure that no erosion, excessive slopes, rutting, or other adverse conditions exist. Any deficiencies shall be repaired immediately.
3. Compensation for the placement and removal of the material required for the shoulder treatment shall be included in the cost for Maintenance Of Traffic, LS. Use of shoulder treatment in lieu of a barrier is not eligible for VECP consideration.


SHOULDER TREATMENT

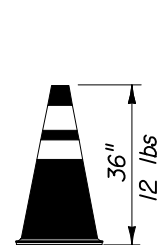


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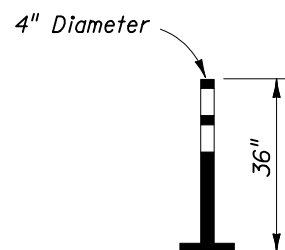
1. This treatment applies to resurfacing or milling operations between adjacent travel lanes.
2. Whenever there is a difference in elevation between adjacent travel lanes, the W8-11 sign with "UNEVEN LANES" is required at intervals of $\frac{1}{2}$ mile maximum.
3. If D is $1\frac{1}{2}"$ or less, no treatment is required.
4. Treatment allowed only when D is 3" or less.
5. If the slope is steeper than 1:4 (not to be steeper than 1:1), the R4-1 and MOT-1-04 signs shall be used as a supplement to the W8-11; this condition should never exceed 3 miles in length.

TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING

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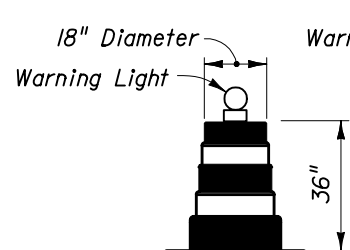


CONES



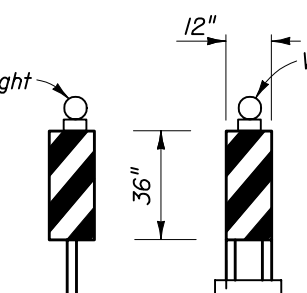
TUBULAR NON-FIXED MARKER TO BE USED DURING DAYLIGHT ONLY

TUBULAR MARKER



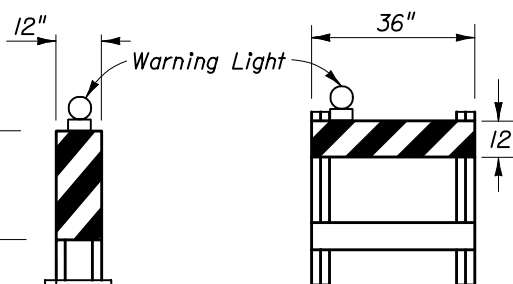
STEEL DRUMS NOT PERMITTED

PLASTIC DRUMS

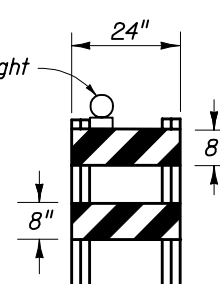
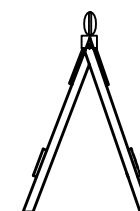


POST MOUNT

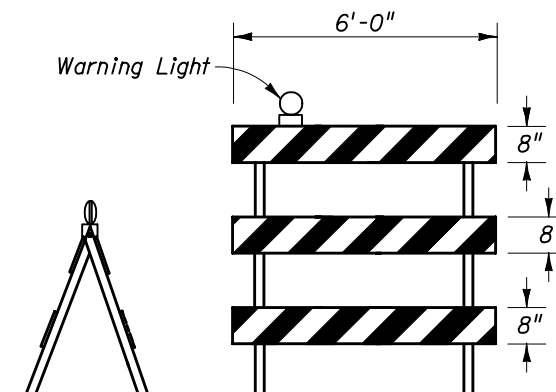
VERTICAL PANEL



TYPE I BARRICADE



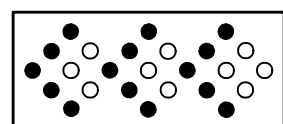
TYPE II BARRICADE



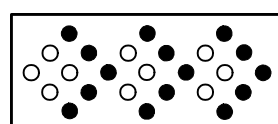
TYPE III BARRICADE

CHANNELIZING AND LIGHTING DEVICE AND ADVANCE WARNING ARROW PANEL NOTES

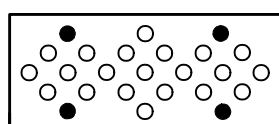
- Only approved traffic control devices included on the Qualified Products List (QPL) may be used.
- The FDOT approval number shall be engraved on the device at a convenient and readily visible location. Where engraving is not practical a water-resistant type label may be used.
- The details shown on this sheet are for the following purposes: (a) For ease of identification and (b) To provide information that supplements or supersedes that provided by the MUTCD.
- The Type III Barricade shall have a unit length of 6'-0" only. When barricades of greater lengths are required those lengths shall be in multiples of the 6'-0" unit. Signs used in conjunction with Type III Barricades may be mounted on or above the barricade. These signs should not cover more than 50 percent of the top two rails or 33 percent of the total area of the three rails.
- During hours of darkness, warning lights shall be used on drums, vertical panels, Type I, Type II and Type III barricades in accordance with 'Warning Lights' Sheet 3.
- Ballast shall not be placed on top rails or any striped rails or higher than 13" above the driving surface.
- For rails less than 3'-0" long, 4" stripes shall be used.
- When Advance Warning Arrow Panels are used at night, the intensity of the flashers shall be reduced during darkness when lower intensities are desirable.
- A single arrow panel shall not be used to merge traffic laterally more than one lane. When arrow panels are used to close multiple lanes, a single panel shall be used at the merging taper for each closed lane.
- Cones shall:
 - Be used only in work zones where workers are present.
 - Not exceed 2 miles in length of use at any one time nor exceed a 12 hour work period.
 - Have as a minimum, one designated person for the purpose of continuous monitoring and maintenance of cones during lane closures.
 - Be reflectorized as per the MUTCD with Department approved reflective collars when used at night.
- The splicing of sheeting is not permitted on either channelizing devices or MOT signs.



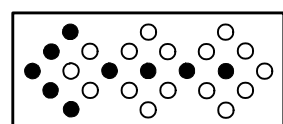
Or



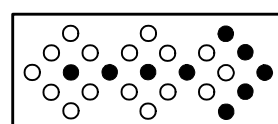
Or



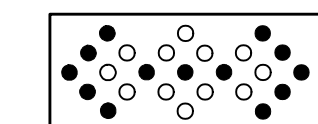
CAUTION



MOVE/MERGE LEFT



MOVE/MERGE RIGHT



MOVE/MERGE RIGHT OR LEFT

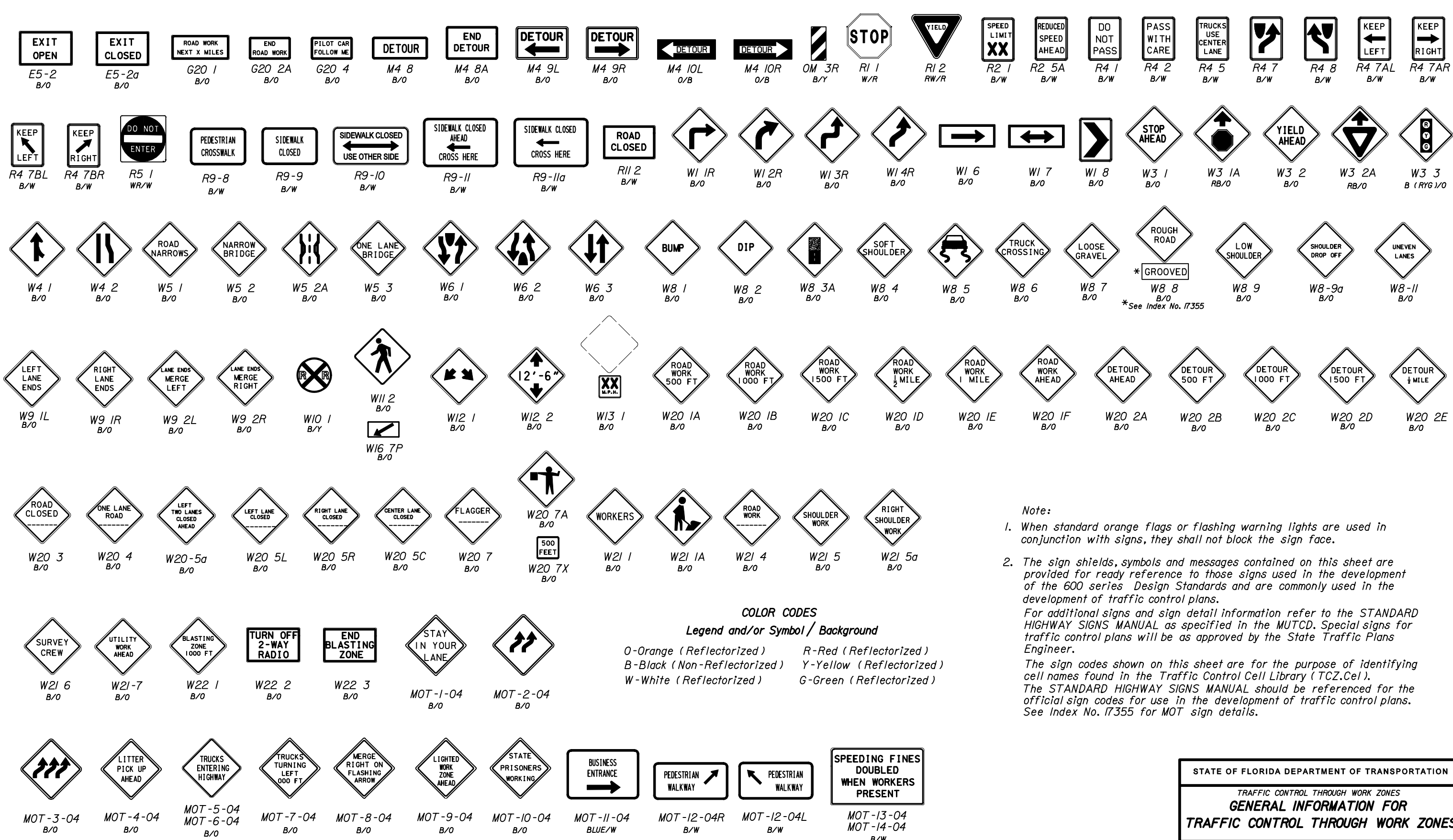
- Minimum Required Lamps
- Additional Lamps Allowed

MODES

ADVANCE WARNING ARROW PANELS

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES AND ADVANCE WARNING ARROW PANEL MODES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
GENERAL INFORMATION FOR				
TRAFFIC CONTROL THROUGH WORK ZONES				
Names	Dates	Approved By		
Designed By	12/87	[Signature]		
Drawn By	12/87	Roadway Design Engineer		
Checked By	12/87	Revision	Sheet No.	Index No.
		04	8 of 10	600



COLOR CODES
Legend and/or Symbol / Background

O-Orange (Reflectorized) R-Red (Reflectorized)
 B-Black (Non-Reflectorized) Y-Yellow (Reflectorized)
 W-White (Reflectorized) G-Green (Reflectorized)

Note:

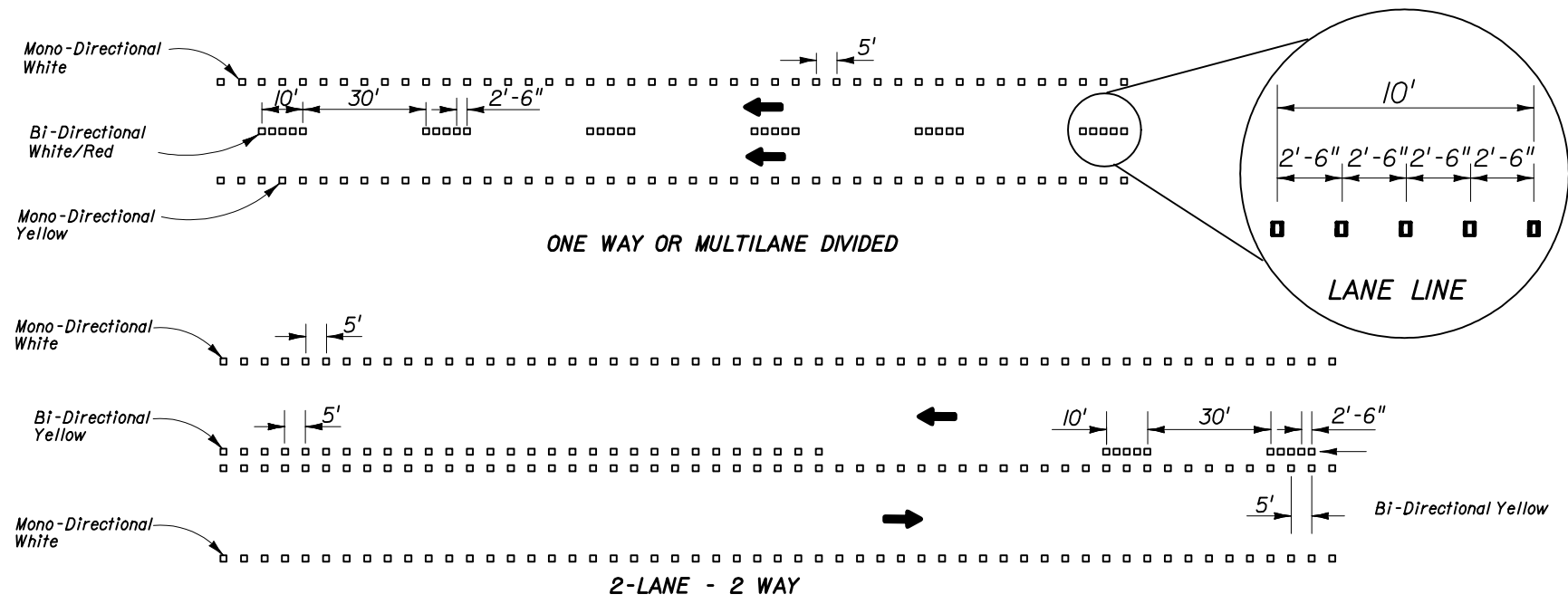
- When standard orange flags or flashing warning lights are used in conjunction with signs, they shall not block the sign face.
- The sign shields, symbols and messages contained on this sheet are provided for ready reference to those signs used in the development of the 600 series Design Standards and are commonly used in the development of traffic control plans.

For additional signs and sign detail information refer to the STANDARD HIGHWAY SIGNS MANUAL as specified in the MUTCD. Special signs for traffic control plans will be as approved by the State Traffic Plans Engineer.

The sign codes shown on this sheet are for the purpose of identifying cell names found in the Traffic Control Cell Library (TCZ.Cel). The STANDARD HIGHWAY SIGNS MANUAL should be referenced for the official sign codes for use in the development of traffic control plans. See Index No. 17355 for MOT sign details.

COMMONLY USED WARNING AND REGULATORY SIGNS IN WORK ZONES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES				
Names	Dates	Approved By		
Designed By	12/87	James D. Mill		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	04	9 of 10	600



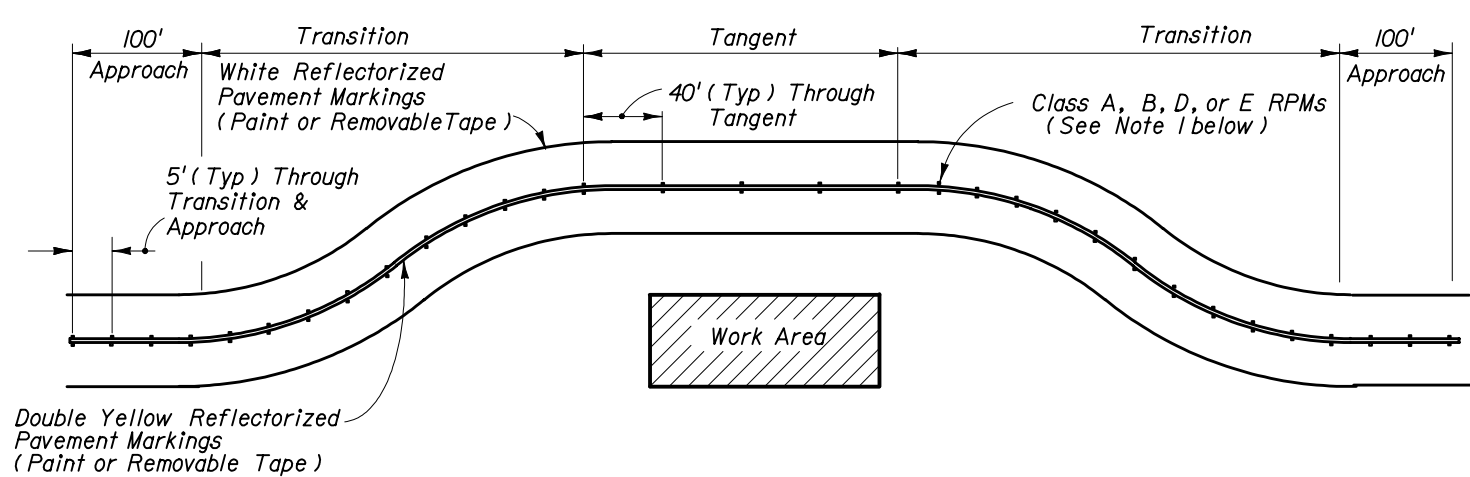
USE OF RPMS IN LIEU OF PAINT OR REMOVABLE TAPE IN WORK ZONES

1. In all transition areas paint or removable tape shall be used in addition to RPMS.
2. The color of the RPM body and the reflective face shall conform to the color of the marking for which they substitute.
3. In work zones, CLASS A, B or D RPMS may be used to form lane lines, edge lines and temporary gore areas, in lieu of paint or removable tape at the spacing shown above. Where the RPMS will be used for five (5) days or less, CLASS E RPMS may be used to form lane or edge lines.

RPM CLASS	APPLICATION FOR REFLECTIVE PAVEMENT MARKERS
A	Permanent Applications In Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
B	Permanent Application In Traffic And Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
D	Work Zone Application Only, For Traffic And Non-Traffic Areas.
E	Temporary Work Zone Application Only, Not Exceeding Five (5) Continuous Days, For Traffic And Non-Traffic Areas.

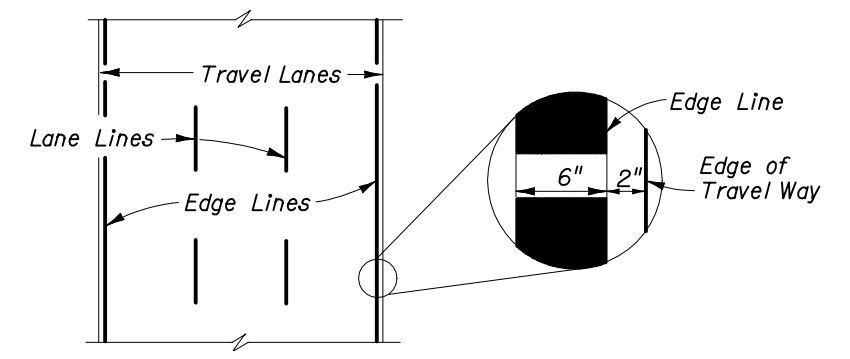
NOTES FOR REFLECTIVE PAVEMENT MARKERS

1. The color of the raised pavement marker under both day and night conditions shall conform to the color of the marking for which they serve as a positioning guide, or for which they supplement or substitute.
2. To provide contrast on concrete pavement, or light asphalt, the five (5) white RPMS shall be followed by five black RPMS. The spacing between RPMS shall be 2'-6". Black RPMS will not be required for contrast with yellow RPMS.
3. It shall be the contractors responsibility to replace damaged or missing RPMS.
4. RPMS used to supplement lane lines are to be paid for as Reflective Pavement Marker (Temporary), EA. RPMS used in lieu of paint or removable tape are to be paid for as Reflective Pavement Marker (Temporary), EA.



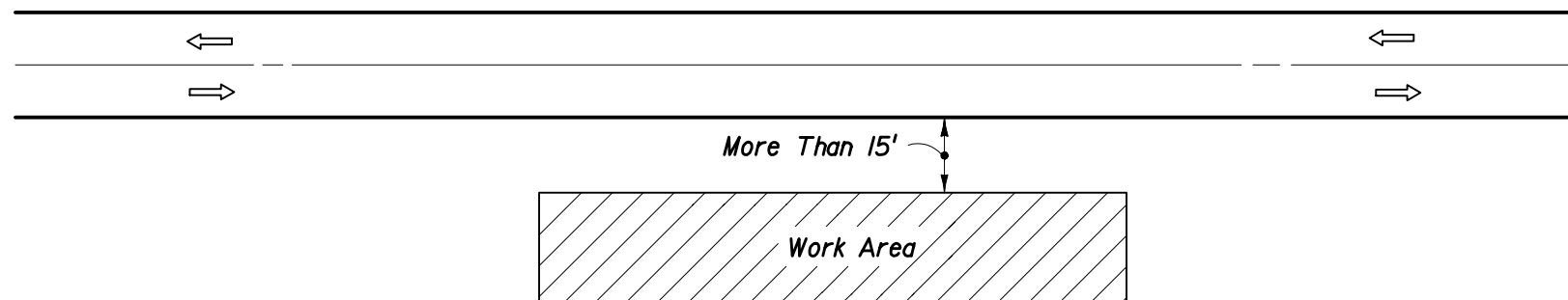
USE OF RPMS TO SUPPLEMENT PAINT OR REMOVABLE TAPE IN WORK ZONES

1. RPMS shall be installed as a supplement to all lane lines and the edge lines of gore areas during construction. Placement of RPMS should be as shown in Index No. 17352 with the following exceptions:
 RPMS shall be placed at 5 feet center to center in approach and transition areas.
 Class D markers be placed at a maximum spacing of 5 feet center to center.



PLACEMENT OF PAVEMENT MARKINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
GENERAL INFORMATION FOR				
TRAFFIC CONTROL THROUGH WORK ZONES				
Names	Dates	Approved By <i>Samuel D. Smith</i>		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	10 of 10	600



GENERAL NOTES

1. If the work operation requires that two or more work vehicles cross the 15' zone in any one hour, traffic control will be in conformance with Index No. 602.
2. No special signing is required.
3. Arrows denote direction of traffic only and do not reflect pavement markings.
4. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
5. For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS


 Work Area

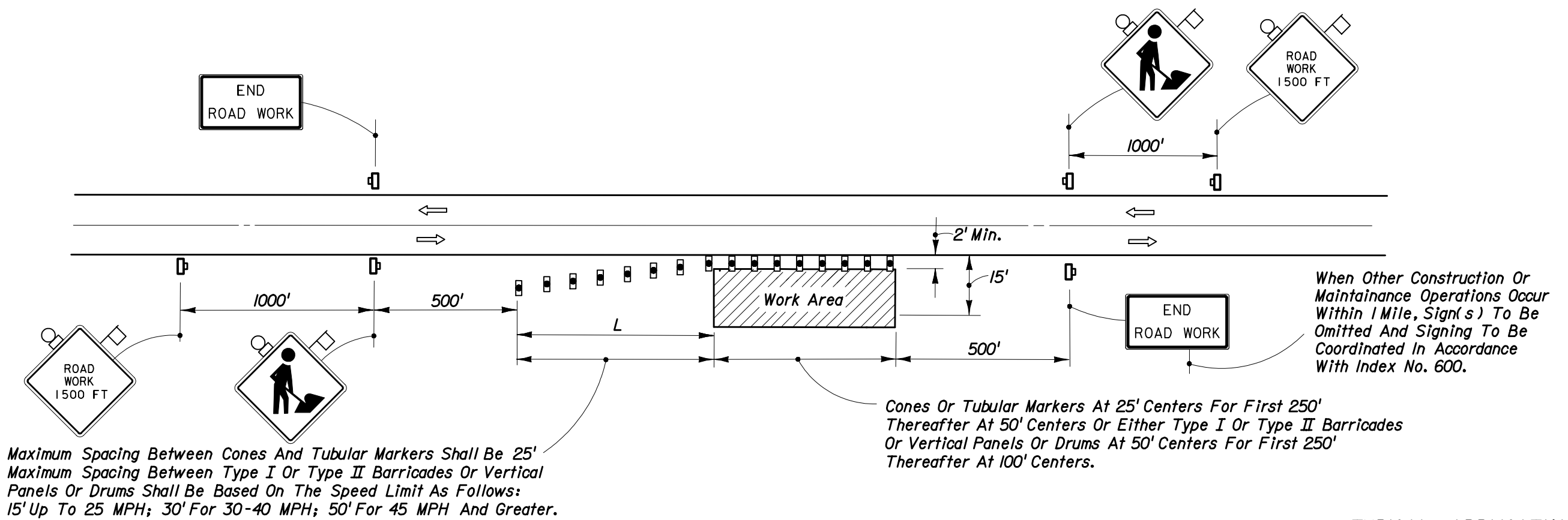
TYPICAL APPLICATIONS

- Landscaping Work
- Utility Work
- Fencing Work
- Cleaning Drainage Structures
- Reworking Ditches

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 15' FROM THE EDGE OF TRAVEL WAY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
TRAFFIC CONTROL THROUGH WORK ZONES					
TWO-LANE, TWO-WAY • RURAL					
DAY OR NIGHT OPERATIONS					
Designed By	Names	Dates	Approved By 		
Drawn By		12/87	Roadway Design Engineer		
Checked By		12/87	Revision	Sheet No.	Index No.
			04	1 of 1	601



Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH And Greater.

Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50' Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers For First 250'
 Thereafter At 100' Centers.

GENERAL NOTES

- All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.
- If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
- When four or more work vehicles enter the through traffic lanes in a one hour period or less, the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs, see Index No. 603.
- The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations
 Type B Lights and Orange Flags are not required.
- The WORKERS legend sign may be substituted for the symbol sign.
- All signs shall be post mounted if the work operation time exceeds 12 hours.
- $L (min) = \frac{WS}{2}$ for speeds ≥ 45 mph
 $= \frac{WS^2}{120}$ for speeds ≤ 40 mph
 Where:
 W = Width of shoulder in feet, 8' minimum.
 S = Posted speed limit (mph)
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- WORKERS sign to be removed or fully covered when no work is being performed.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Culvert Extensions
- Side Slope Work
- Guardrail Work
- Landscaping Work
- Cleaning Drainage Structures
- Reworking Ditches
- Sign Installation And Maintenance
- Shoulder Repair

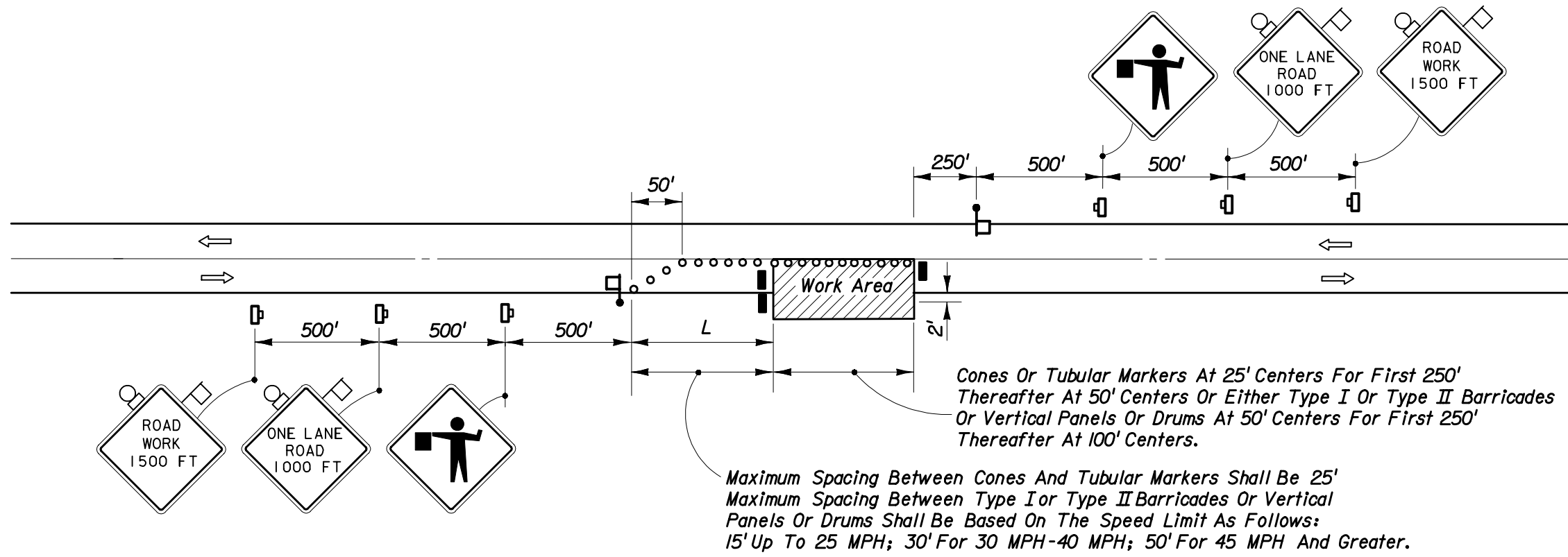
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF TRAVEL WAY.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
 (Tubular Markers May Be Used During Daylight Only).
 Cones May Be Used - See Index No. 600.)
- Work Zone Sign

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	James D. Mill Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	04	1 of 1	602



GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
2. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
3. If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
4. Additional one-way control may be effected by the following means:
 (1) Flag-carrying vehicle; (2) Official vehicle;
 (3) Pilot vehicles; (4) Traffic signals.
 When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
5. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
6. The FLAGGER legend sign may be substituted for the symbol sign.
7. $L (min) = \frac{WS}{2}$ for speeds ≥ 45 mph
 $= \frac{WS^2}{120}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet
 S = Posted speed limit (mph)
8. The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
12. For general TCZ requirements and additional information, refer to Index No. 600.

TYPICAL APPLICATIONS

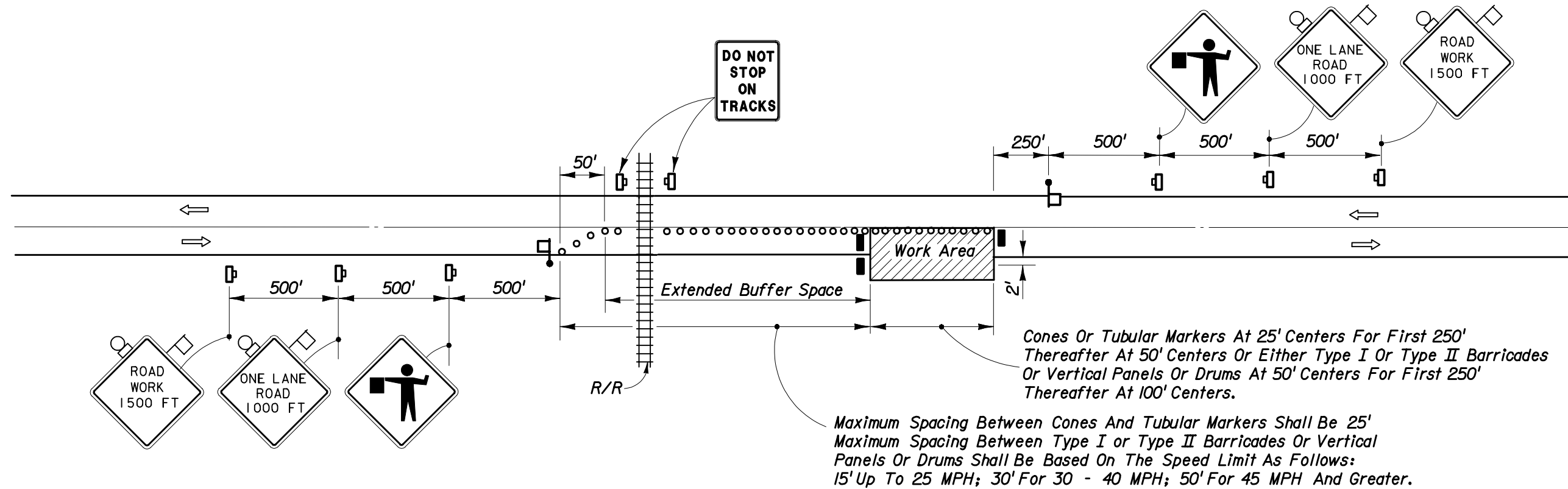
- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF TRAVEL WAY.

- SYMBOLS**
- Work Area
 - Sign With 18" x 18" (Min.) Orange Flag And Type B Light
 - Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
 - Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
 - Work Zone Sign
 - Flagger

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL OPERATIONS ONE DAYLIGHT PERIOD OR LESS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	04	1 of 2	603



GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
2. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
3. When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
4. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
5. The FLAGGER legend sign may be substituted for the symbol sign.
6. The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
7. Arrows denote direction of traffic only and do not reflect pavement markings.
8. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
9. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
10. For general TCZ requirements and additional information, refer to Index No. 600.
11. Discontinuing of extended buffer space will not occur until the queue length plus 300' is reached.

TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work

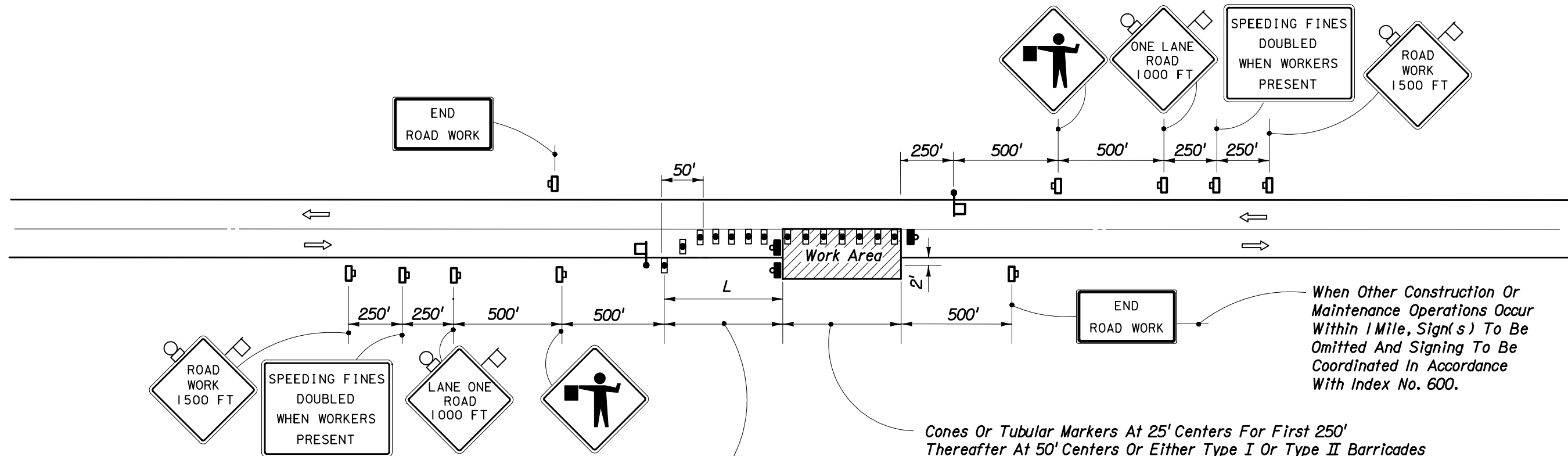
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF TRAVEL WAY THAT REQUIRES A LANE CLOSURE IN THE VICINITY OF A RAILROAD CROSSING.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL OPERATIONS ONE DAYLIGHT PERIOD OR LESS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	04	2 of 2	603



Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I or Type II Barricades Or Vertical
 Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH And Greater.

Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50' Centers Or Either Type I Or Type II Barricades
 Or Vertical Panels Or Drums At 50' Centers For First 250'
 Thereafter At 100' Centers.

GENERAL NOTES

- Construction operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
- All vehicles, equipment, workers, (except flaggers) and their activities are restricted at all times to one side of the roadway.
- Additional one-way control may be effected by the following means:
 (1) Flag-carrying vehicle; (2) Official vehicle;
 (3) Pilot vehicles; (4) Traffic signals.
 When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
- The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
- The FLAGGER legend sign may be substituted for the symbol sign.
- All signs shall be post mounted if the closure time exceeds 12 hours.

7. $L (min) = \frac{WS}{2}$ for speeds ≥ 45 mph
 $= \frac{WS^2}{120}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph)

- The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Pavement Repair
- Culvert Construction
- Utility Work
- Bridge Repair

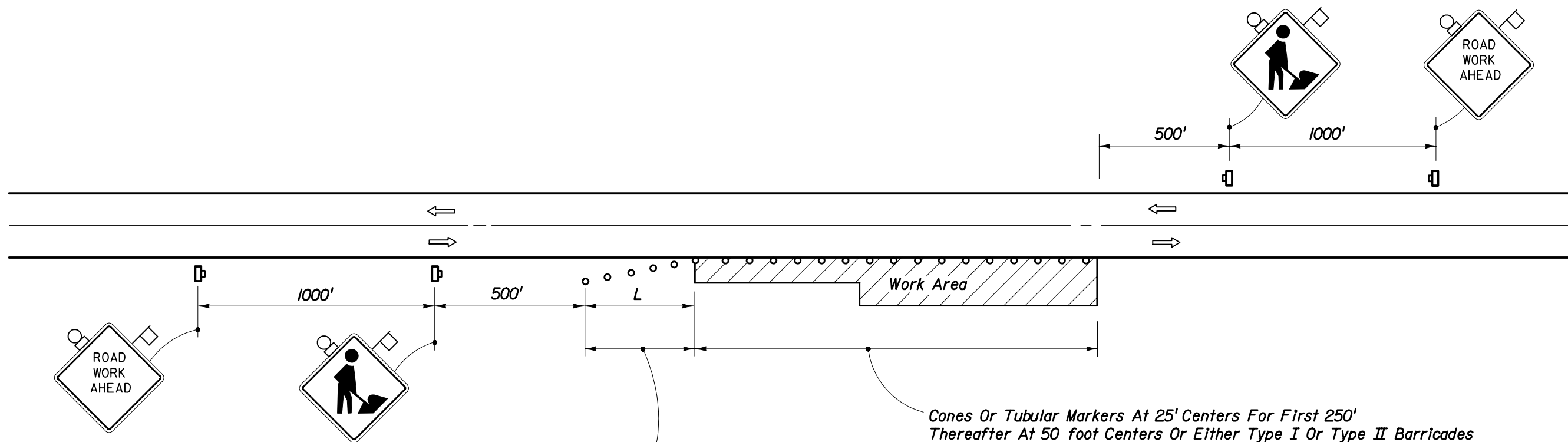
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF TRAVEL WAY.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)
- Work Zone Sign
- Flagger

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	04	1 of 1	604



*Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50 foot Centers Or Either Type I Or Type II Barricades
 Or Vertical Panels Or Drums At 50' Centers For First 250'
 Thereafter At 100' Centers.*

*Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical
 Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH And Greater.*

TYPICAL APPLICATIONS

- Shoulder And Slope Work
- Utility Work
- Guardrail Work
- Landscape Work
- Delineator Installation And Maintenance
- * Mowing
- * Litter Removal

GENERAL NOTES

1. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
2. If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
3. If the work operation encroaches on the through traffic lanes or when four or more work vehicles enter the through traffic lanes in a one hour period flaggers shall be provided and the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs see Index No. 603.
4. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
5. The WORKERS legend sign may be substituted for the symbol sign.
- * 6. Where work activities within 2' of the edge of travel way are incidental (ie. Mowing, Litter Removal) the Engineer may delete requirements for cones and signs provided a vehicle with flashing warning lights is present.
7. L (min.) = $\frac{WS}{2}$ for speeds ≥ 45 mph
 $= \frac{WS^2}{120}$ for speeds ≤ 40 mph
- Where:
 W = Width of shoulder in feet, 8' minimum.
 S = Posted speed limit (mph)
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
11. For general TCZ requirements and additional information, refer to Index No. 600.

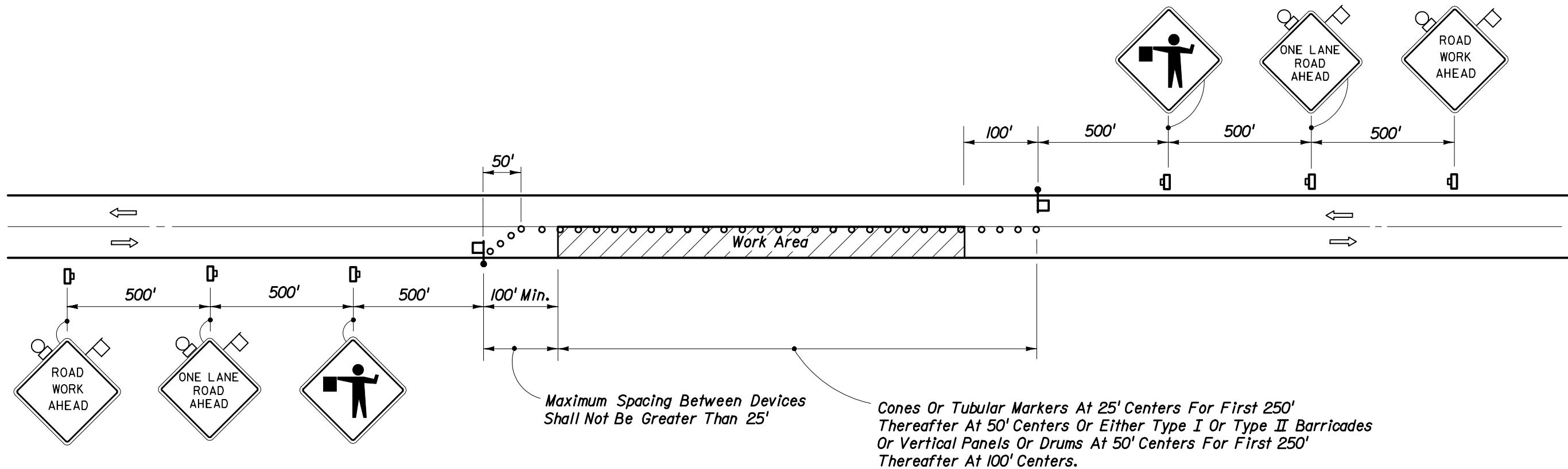
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE AN INTERMITTENT OR CONTINUOUS MOVING OPERATION ON THE SHOULDER OR SHOULDER AND SLOPES.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL MOVING OPERATIONS-DAYLIGHT ONLY				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	04	1 of 1	605



GENERAL NOTES

1. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
2. Minimum length of work area is 200'. Maximum length to be determined by the Engineer, but in no case to exceed the length of one-half ($\frac{1}{2}$) days operation or 2 miles whichever is less.
3. If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
4. Additional one-way control may be effected by the following means:
(1) Flag-carrying vehicle; (2) Official vehicle;
(3) Pilot vehicles; (4) Traffic signals.

When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
5. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
6. The FLAGGER legend sign may be substituted for the symbol sign.
7. The ONE LANE ROAD AHEAD and FLAGGER signs are to be removed or fully covered when no work is being performed and the highway is open to two-way traffic.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
11. For general TCZ requirements and additional information, refer to Index No. 600.

TYPICAL APPLICATIONS

- Pavement Repair
- Pavement Resurfacing
- Utility Work
- Delineator Maintenance
- Crack Sealing
- Core Boring

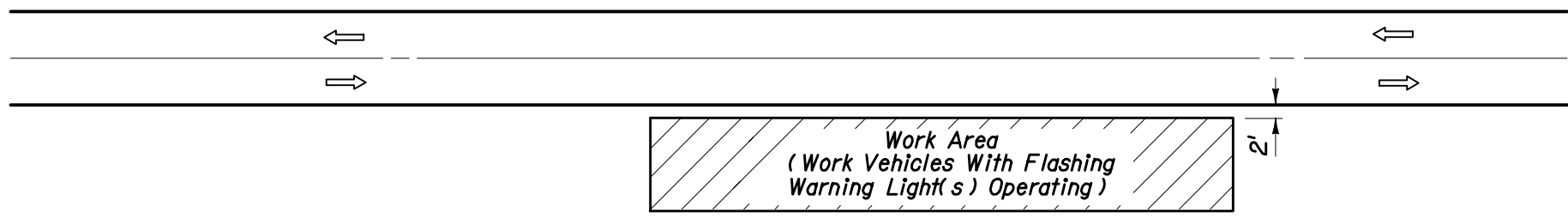
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE AN INTERMITTENT OR CONTINUOUS MOVING OPERATION ON THE PAVEMENT WHERE THE AVERAGE SPEED OF MOVEMENT IS LESS THAN 4 MILES PER HOUR.

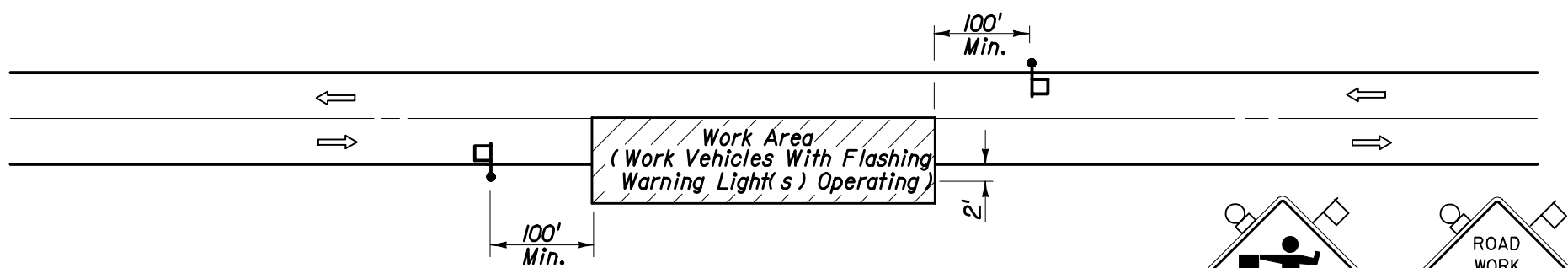
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger

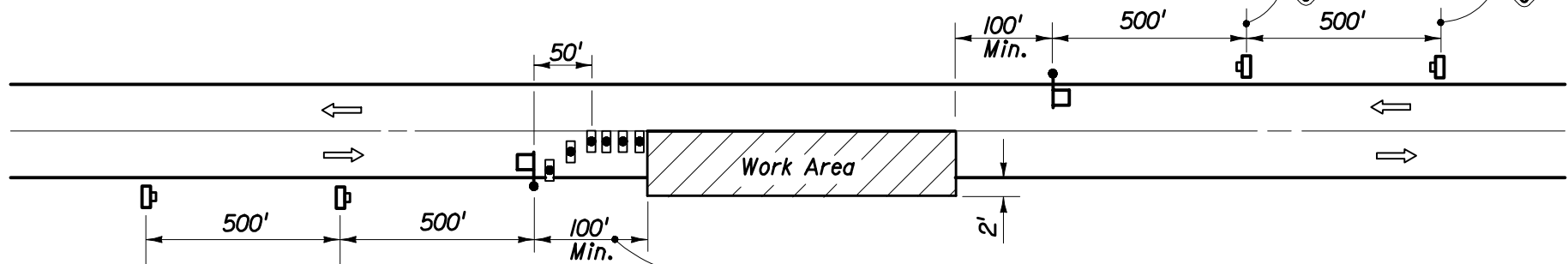
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL				
MOVING OPERATIONS-DAYLIGHT ONLY				
Names	Dates	Approved By		
Designed By	12/87	 Roadway Design Engineer		
Drawn By	12/87			
Checked By	12/87	Revision	Sheet No.	Index No.
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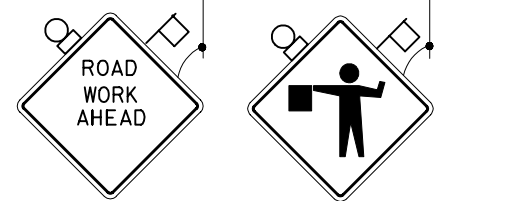
CONDITIONS
 FOR ANY OPERATION THAT IS 2' OR MORE OUTSIDE THE EDGE OF THE TRAVEL WAY FOR A PERIOD OF LESS THAN 60 MINUTES.



CONDITIONS
 FOR ANY OPERATION THAT ENCROACHES IN THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF THE TRAVEL WAY FOR A PERIOD OF 15 MINUTES OR LESS.



CONDITIONS
 FOR ANY OPERATION THAT ENCROACHES IN THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF THE TRAVEL WAY FOR A PERIOD IN EXCESS OF 15 MINUTES BUT LESS THAN 60 MINUTES.



Maximum Spacing Between Devices Shall Not Be Greater Than 25'

GENERAL NOTES

- The maximum length of work area to be determined by the Engineer, but in no case to exceed the length of one-half (1/2) days operation or 2 miles whichever is less.
- All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.
- Additional one-way control may be effected by the following means:
 (1) Flag-carrying vehicle; (2) Official vehicle; (3) Pilot vehicles; (4) Traffic signals.
 When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
- The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
- The FLAGGER legend sign may be substituted for the symbol sign.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

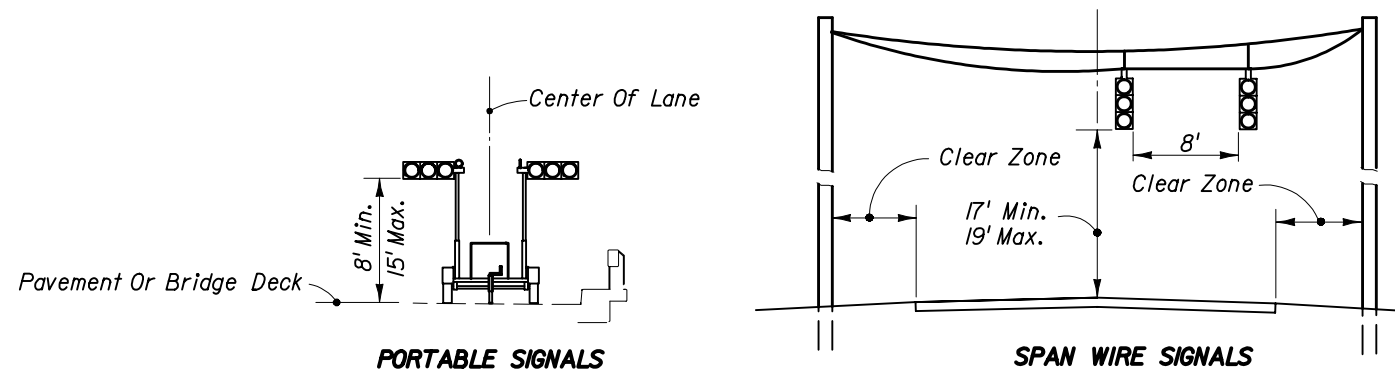
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
 (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign
- Flagger

TYPICAL APPLICATIONS

- Marking Patches
- Field Patches
- String Line
- Utility Work
- Cleaning Up Debris On Pavement
- Pavement Coring And Straight Edging

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE TWO-WAY • RURAL				
SHORTTIME				
DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No.
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				Index No. 607



SIGNAL MOUNT DETAILS

GENERAL NOTES

1. Work operations shall be confined to one traffic lane, except for haul road crossings, leaving the opposite lane open to traffic.
2. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway, except for haul road crossings.
3. The installation and timing of signals shall be approved by the District Traffic Operations Engineer prior to signals being placed in operation.
Where sight distance to the signal is limited, the signals may be mounted on span wire at the discretion of the Engineer.
The maximum distance between portable traffic signals (receiver/controllers) shall be 0.25 mile, however, in no case shall the distance exceed the maximum distance at which the remote operator (transmitter) can positively and safely operate both portable signals.
4. Flaggers to supplement the signal operator/flagger shall be used when needed to assure safe movements between traffic and operating equipment, as determined by the Engineer.
5. The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
6. When needed, an additional warning sign may be installed in advance of the ROAD WORK AHEAD sign. The distance between successive signs shall be 500'.
7. The SIGNAL AHEAD legend sign may be substituted for the symbol sign.
8. All signs shall be post mounted if the closure time exceeds 12 hours.
9. SIGNAL AHEAD and EQUIPMENT CROSSING AHEAD signs are to be removed or fully covered when no work is being performed and the highway is open to two-way traffic. Type III Barricades shall be in place to block haul road access when the haul road is not in operation and a flagger/signal operator is not on duty, except when the haul road is an existing properly marked road.
10. Arrows denote direction of traffic only and do not reflect pavement markings.
11. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
12. When a side road intersects the highway on which work is being performed, additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
13. For general TCZ requirements and additional information, refer to Index No. 600.
14. Span wire signals are to be used only in work zones with workers present, where the contractor can monitor signal operation and maintain traffic with flaggers in the event of a power failure.










TYPICAL APPLICATION


- Pavement Repair
- Shoulder & Roadside Work
- Bridge Work
- Box Culvert Work
- Drainage Work
- Utility Work
- Haul Road Crossing

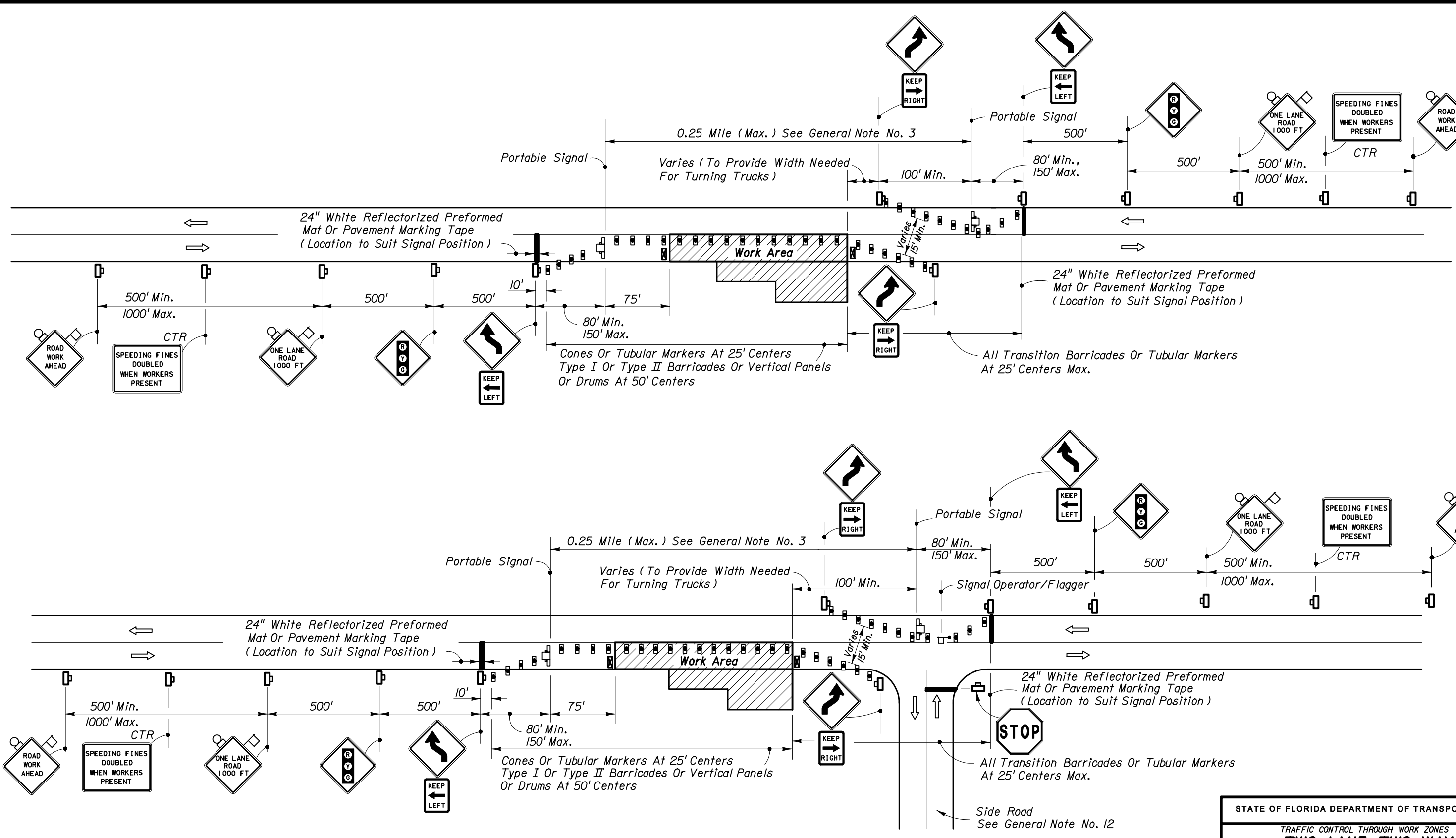
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON ONE LANE OR MOMENTARILY ENCROACH ON BOTH LANES OF A TWO-LANE TWO-WAY ROADWAY AND TRAFFIC SIGNALS ARE NEEDED.

SYMBOLS

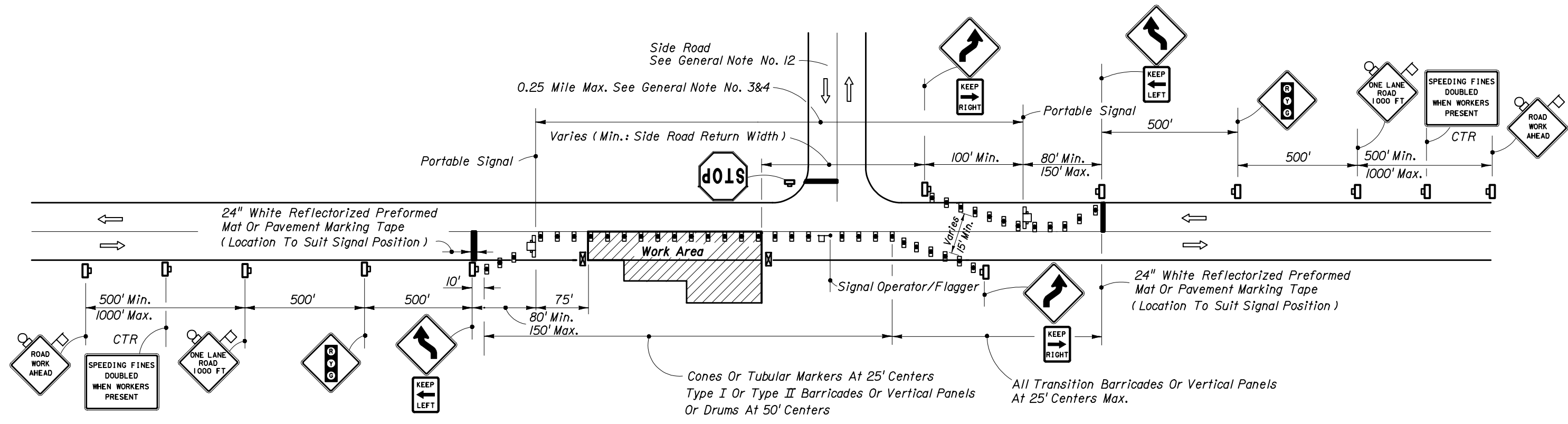
-  Work Area
-  Sign With 18" x 18" (Min.) Orange Flag And Type B Light
-  Work Zone Sign
-  Traffic Signal
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
-  Type III Barricade
-  Stop Bar
-  Flagger
-  Portable Signal

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY				
LANE CLOSURE BY SIGNAL CONTROL				
DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By 	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
			00	1 of 4 608

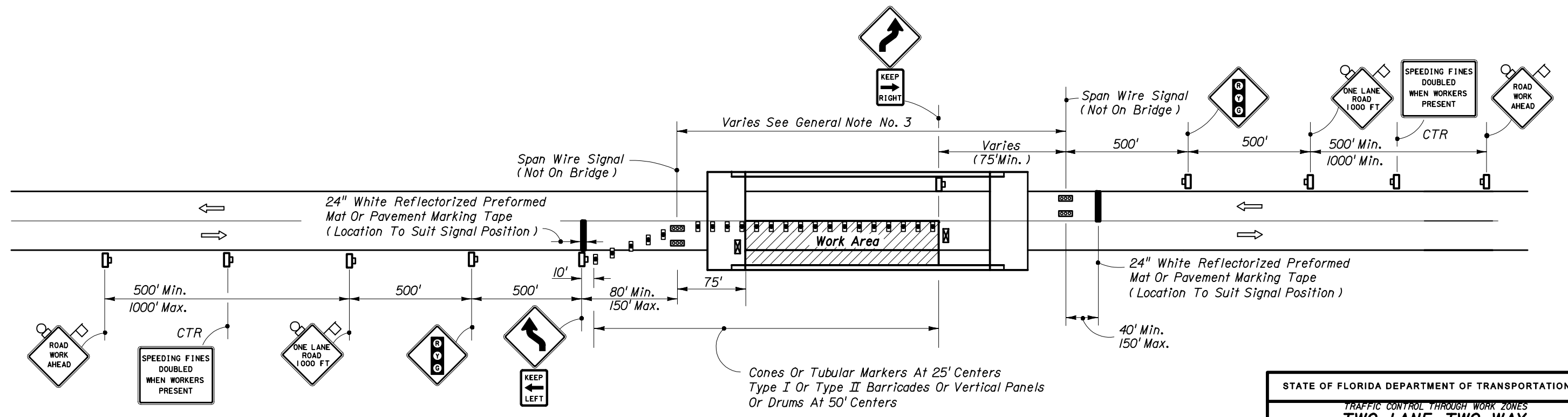


SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY				
LANE CLOSURE BY SIGNAL CONTROL				
DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	5/89	Samuel D. Hill Roadway Design Engineer		
Drawn By	5/89	Revision	Sheet No.	Index No.
Checked By	5/89	04	2 of 4	608

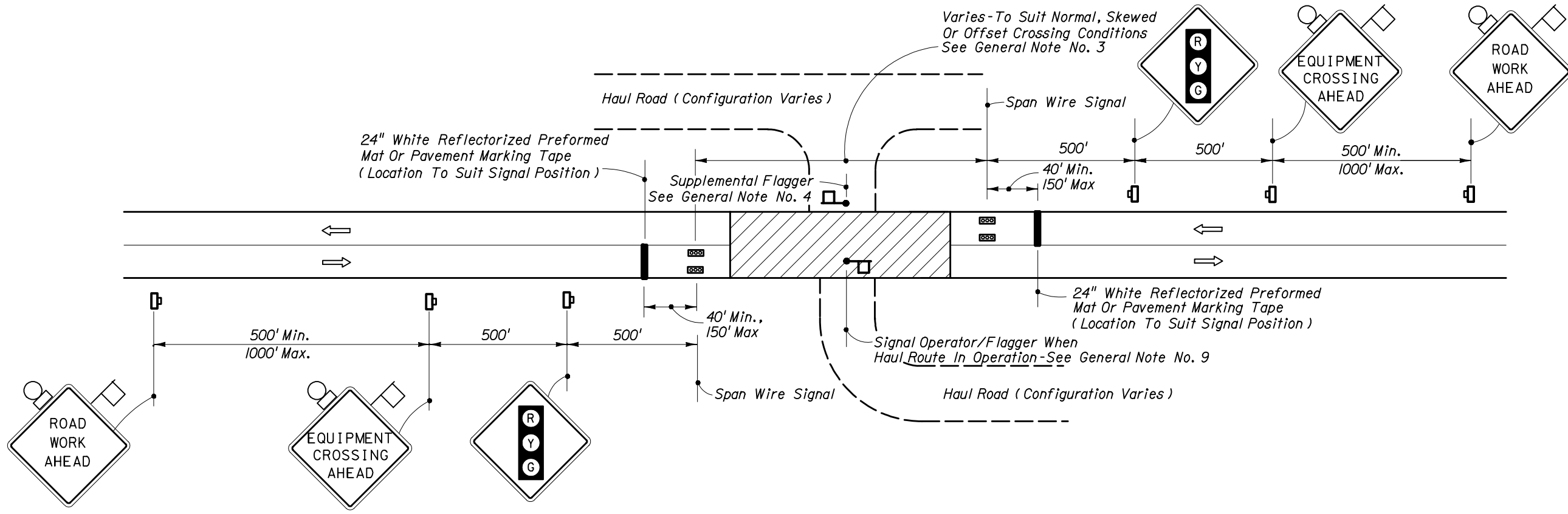


SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS



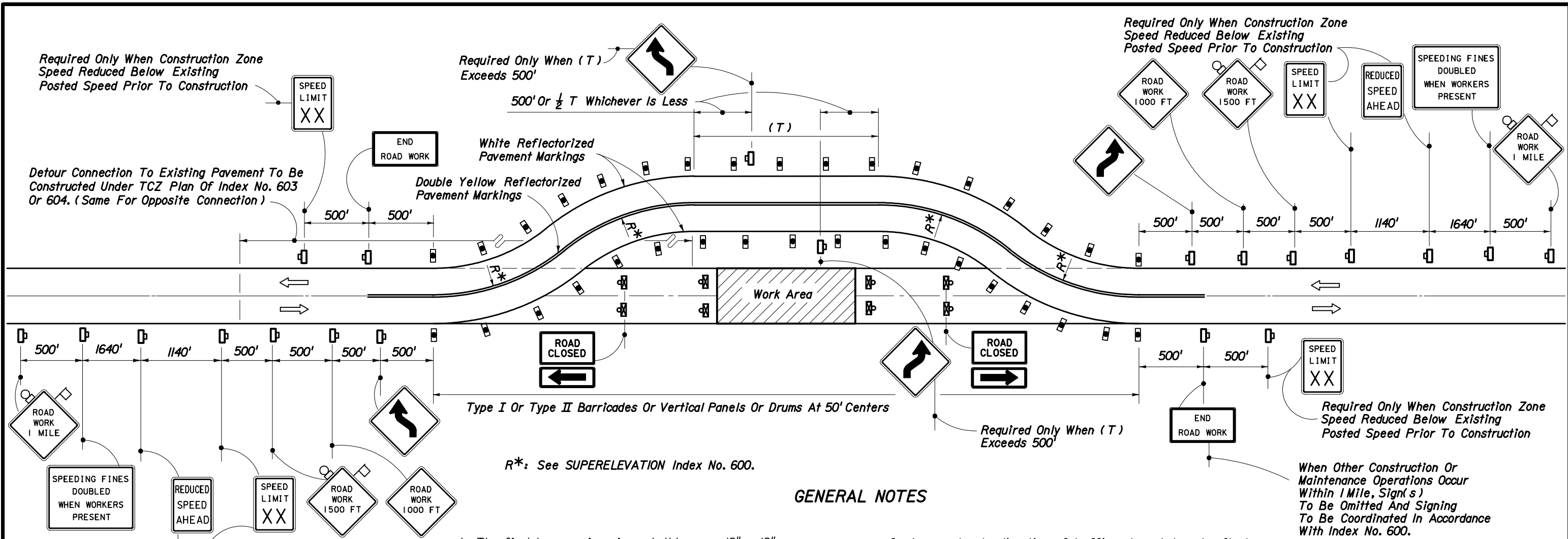
SINGLE LANE CLOSURE • SHORT BRIDGES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY				
LANE CLOSURE BY SIGNAL CONTROL				
DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	5/89	[Signature]		
Drawn By	5/89	Roadway Design Engineer		
Checked By	5/89	Revision	Sheet No.	Index No.
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MOMENTARY ROADWAY CLOSURE • HAUL ROUTE CROSSING

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY				
LANE CLOSURE BY SIGNAL CONTROL				
DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By <i>Jamal D. Mill</i>	
Drawn By		5/89	Roadway Design Engineer	
Checked By		5/89	Revision	Sheet No. Index No.
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R*: See SUPERELEVATION Index No. 600.

GENERAL NOTES

1. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
2. For speed sign applications see Index No. 600.
3. Where the tangent distance (T) exceeds 600', spacing between cones or tubular markers may be increased to 50' or spacing between Type I or Type II barricades, vertical panels or drums may be increased to 100' within limits of the tangent, or post mounted delineators at 50' centers may be substituted for the barricades, vertical panels or drums.
4. On the existing pavement all existing markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for marking a new centerline and edge lines.
5. Where the tangent distance (T) exceeds 600' and no passing or stopping sight distance restrictions exist, the yellow reflectorized markings used to indicate the centerline of the traveled way may be replaced with yellow reflectorized markings in a broken pattern. For raised pavement marker application see Index No. 600 and Index No. 17352.
6. Arrows denote direction of traffic only and do not reflect pavement markings.
7. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
8. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ indexes.
9. If temporary structures are required on the diversion traffic control will be in conformance with Index No. 650.
10. For general TCZ requirements and additional information refer to Indexes Nos. 600 and 17352.
11. If posted speed for Work Zone is 45 mph or less use "ROAD WORK 1/2 MILE" and space accordingly.

SYMBOLS


-  Work Area
-  Sign With 18" x 18" (Min.) Orange Flag And Type B Light
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
-  Type III Barricade (With Flashing Light)
-  Work Zone Sign

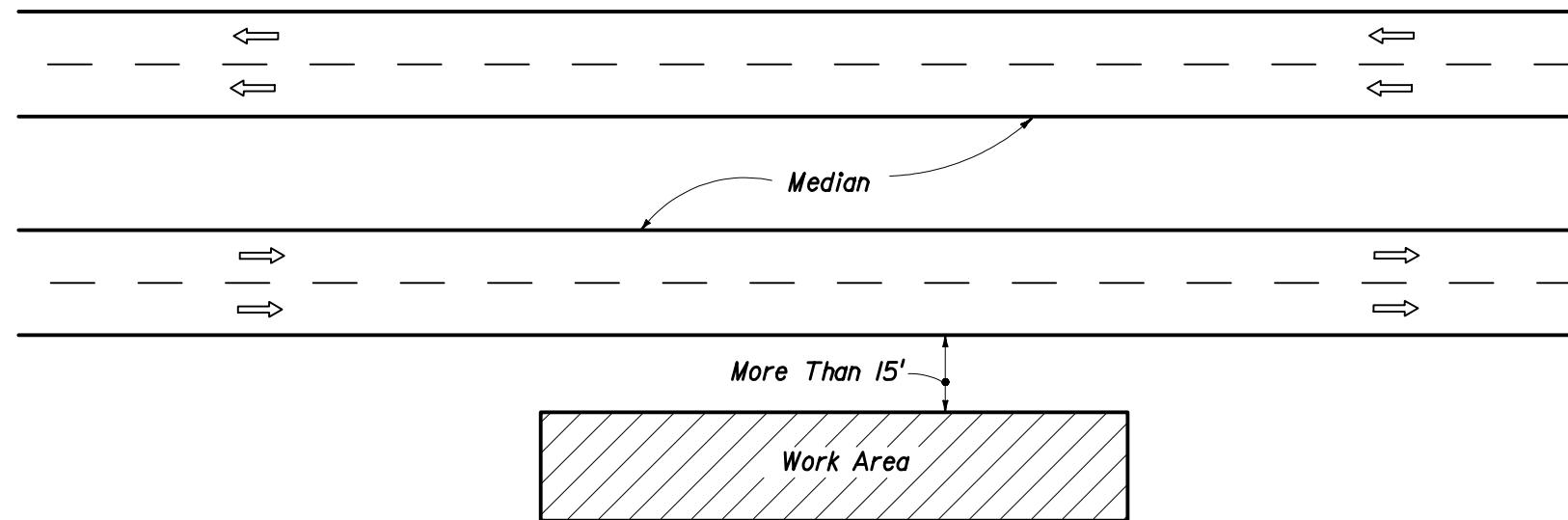
TYPICAL APPLICATIONS

- Bridge Construction
- Subgrade Restoration
- Culvert Repair Or Construction

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF BOTH LANES AND A TEMPORARY DIVERSION IS CONSTRUCTED

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL				
TEMPORARY CONNECTION				
DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Roadway Design Engineer		
Checked By	12/87	Revision	Sheet No.	Index No.
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GENERAL NOTES

1. If the work operation requires that two or more work vehicles cross the 15' zone in any one hour, traffic control will be in conformance with Index No. 602 undivided or Index No. 611 divided.
2. No special signing is required.
3. This index also applies when work is being performed on a multilane undivided highway.
4. This index also applies to work performed in the median more than 15' from edge of travel way, both roadways.
5. Arrows denote direction of traffic only and do not reflect pavement markings.
6. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
7. For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Landscaping Work
- Utility Work
- Fencing Work
- Cleaning Drainage Structures
- Reworking Ditches

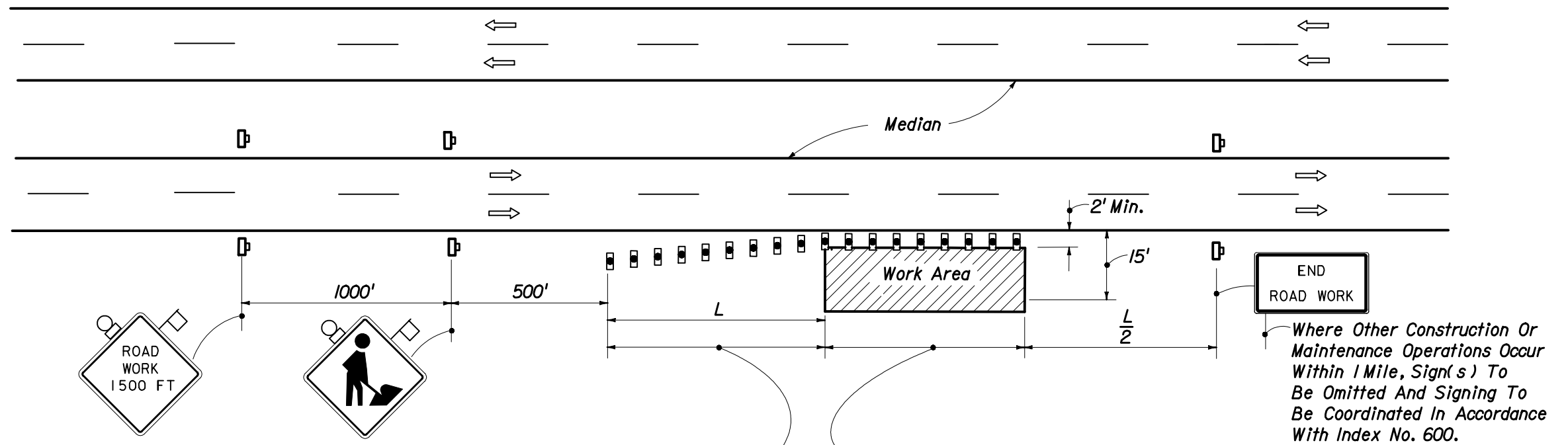
CONDITIONS

WHERE ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 15' FROM THE EDGE OF TRAVEL WAY.

SYMBOLS

Work Area

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
TRAFFIC CONTROL THROUGH WORK ZONES					
MULTILANE DIVIDED OR UNDIVIDED					
RURAL • DAY OR NIGHT OPERATIONS					
Designed By	Names	Dates	Approved By		
Drawn By		12/87	Roadway Design Engineer		
Checked By		12/87	Revision	Sheet No.	Index No.
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Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical
 Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH And Greater.

Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50' Centers Or Either Type I Or Type II Barricades
 Or Vertical Panels Or Drums At 50' Centers For First 250'
 Thereafter At 100' Centers.

GENERAL NOTES

- All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
- If the work operation encroaches on the through traffic lanes or when four or more work vehicles enter the through traffic lanes in a one hour period a flagger shall be provided and a FLAGGER sign shall be substituted for the WORKERS sign. The flagger shall be positioned at the point of vehicle entry or departure from the work area.
- This TCZ plan also applies to work performed in the median more than 2' but less than 15' from the edge of either pavement.
- The first two warning signs, each side, shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
- The WORKERS legend sign may be substituted for the symbol sign.
- $L (min) = \frac{WS}{2}$ for speeds ≥ 45 mph
 $= \frac{WS^2}{120}$ for speeds ≤ 40 mph
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
- WORKERS signs to be removed or fully covered when no work is being performed.
- END ROAD WORK signs required only when work exceeds one daylight period.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- If the work operation is less than 60 minutes, signs, barricades, vertical panels, cones, tubular markers, or drums will not be required provided vehicles in the work area have warning light(s) operating.
- For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Culvert Extensions
- Side Slope Work
- Guardrail Work
- Landscaping Work
- Cleaning Drainage Structures
- Reworking Ditches
- Sign Installation And Maintenance
- Shoulder Repair


CONDITIONS

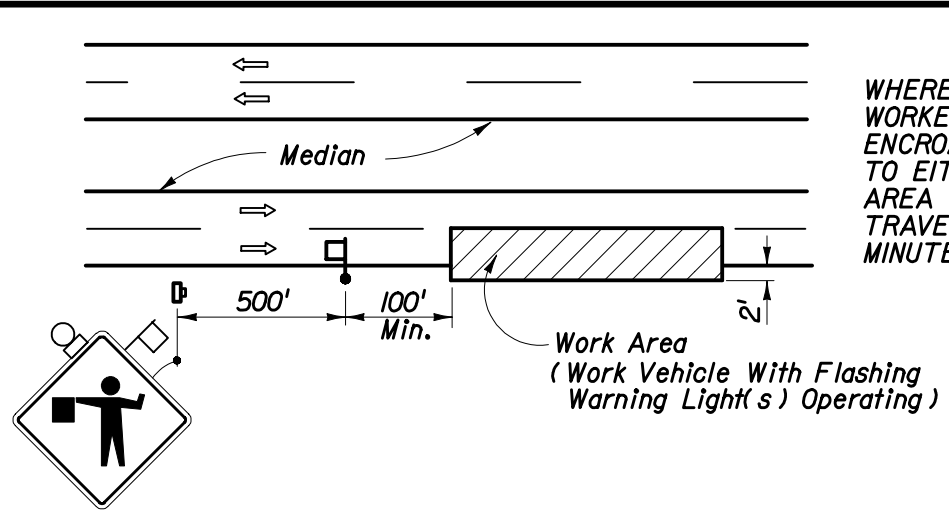
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF TRAVEL WAY.

SYMBOLS

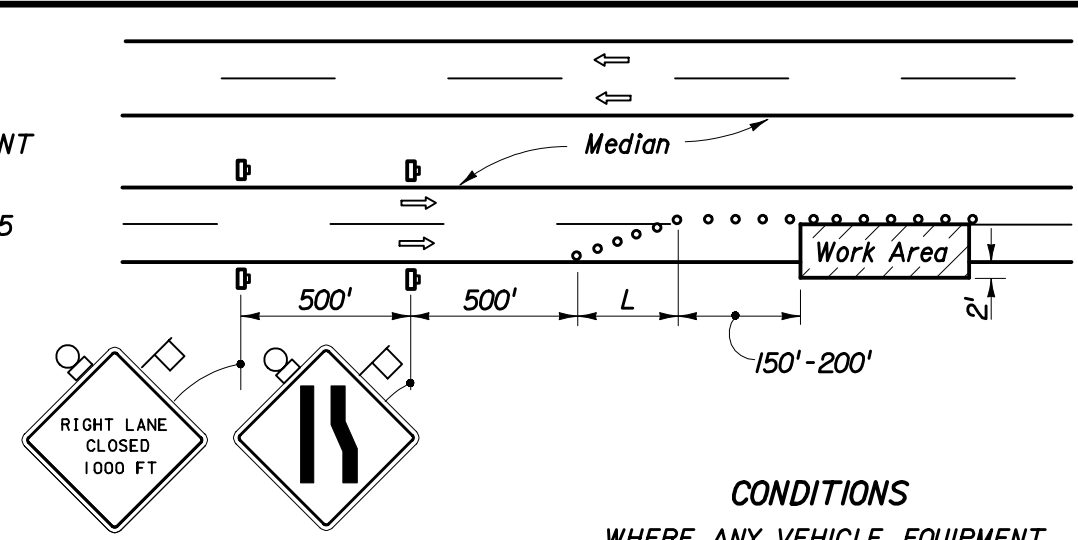
- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign

Where:
 W = Width of lateral transition in feet, 8' minimum.
 S = Posted speed limit (mph)

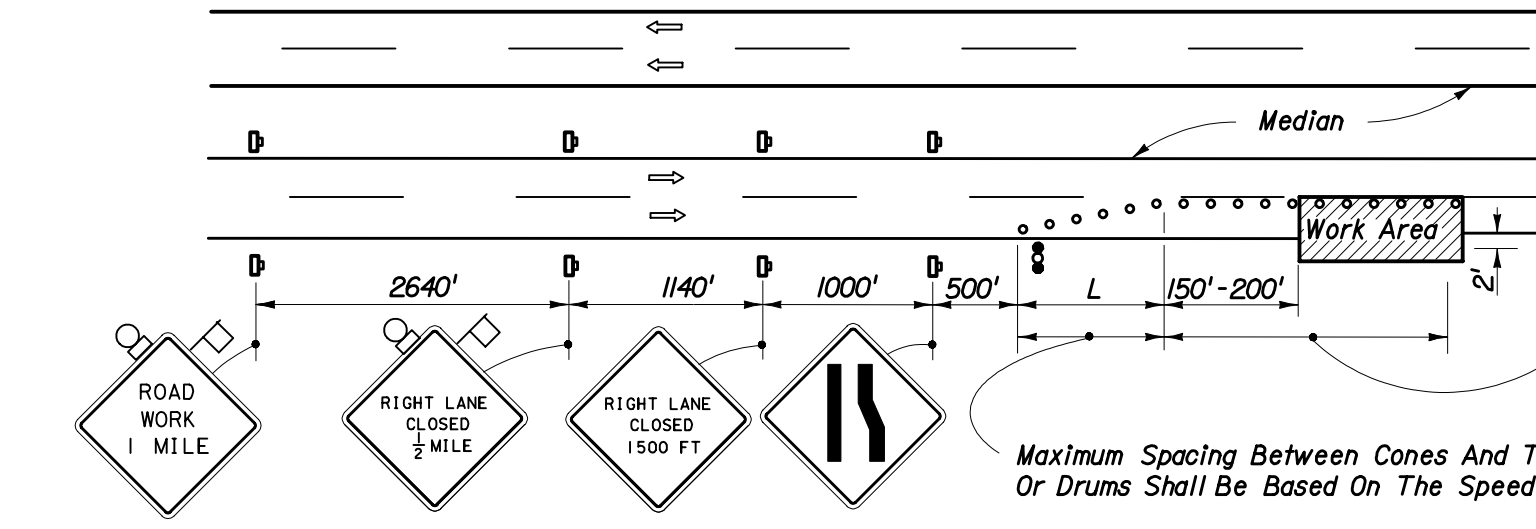
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED OR UNDIVIDED RURAL • DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	 Roadway Design Engineer		
Drawn By	12/87			
Checked By	12/87	Revision	Sheet No.	Index No.
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CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF TRAVEL WAY FOR A PERIOD OF 15 MINUTES OR LESS.



CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF TRAVEL WAY FOR A PERIOD OF MORE THAN 15 MINUTES BUT LESS THAN 60 MINUTES.



CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF TRAVEL WAY FOR A PERIOD OF 60 MINUTES OR GREATER.

Cones Or Tubular Markers At 25' Centers For First 250' Thereafter At 50' Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers For First 250' Thereafter At 100' Centers.

Maximum Spacing Between Cones And Tubular Markers Shall Be 25'. Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows: 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH And Greater.

GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the adjacent lane open to traffic.
2. All vehicles, equipment, workers, and their activities are restricted at all times to one side of the roadway.
3. The first two warning signs, each side, shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
4. On undivided highways the median signs as shown are to be omitted.
5. When work is performed in the median lane on divided highways the barricading plan is inverted and left lane closed and lane reduction signs substituted for the right lane closed and lane reduction signs.
 The same applies to undivided highways with the following exceptions:
 (a) Work shall be confined within one median lane. (b) Additional barricades, cones, or drums shall be placed along the centerline abutting the work area and across the trailing end of the work area.
6. The RIGHT (LEFT) LANE CLOSED signs are to be removed or fully covered when no work is being performed and the highway is open to traffic.
7. L (min.) = Length of taper feet :
 = WS for speeds ≥ 45 mph
 = $\frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet
 S = Posted speed limit
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
11. This TCZ plan does not apply when work is being performed in the middle or inside lane(s) of a six or more lane highway. See Index Nos. 616 and 617.
12. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
13. For general TCZ requirements and additional information, refer to Index No. 600.

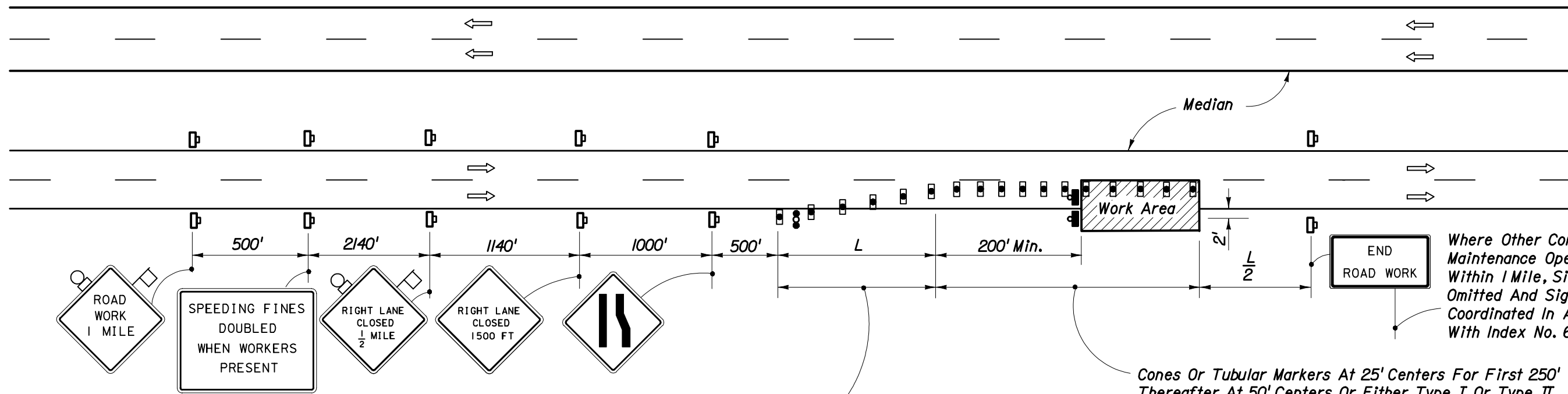
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger
- Advance Warning Arrow Panel

TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work
- Pavement Coring And Straight Edging

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, DIVIDED AND UNDIVIDED RURAL OPERATIONS ONE DAYLIGHT PERIOD OR LESS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
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Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical
 Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH And Greater.

Where Other Construction Or
 Maintenance Operations Occur
 Within 1 Mile, Signs To Be
 Omitted And Signing To Be
 Coordinated In Accordance
 With Index No. 600.

Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50' Centers Or Either Type I Or Type II
 Barricades Or Vertical Panels Or Drums At 50' Centers
 For First 250' Thereafter At 100' Centers.

GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the adjacent lane open to traffic.
2. All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
3. The first two warning signs, each side, shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
4. All signs shall be post mounted if the closure time exceeds 12 hours.
5. On undivided highways the median signs as shown are to be omitted.
6. When work is performed in the median lane on divided highways the barricading plan is inverted and left lane closed and lane reduction signs substituted for the right lane closed and lane reduction signs. The same applies to undivided highways with the following exceptions: (a) Work shall be confined within one median lane. (b) Additional barricades, cones, or drums shall be placed along the centerline abutting the work area and across the trailing end of the work area. When work on undivided highways occurs across the centerline so as to encroach on both median lanes, the inverted plan is applied to the approach of both roadways.
7. Signs and traffic control devices are to be modified in accordance with INTERMITTENT WORK STOPPAGE details (sheet 2 of 2) when no work is being performed and the highway is open to traffic.
8. L (min.) = Length of taper in feet:
 = WS for speeds ≥ 45 mph
 = $\frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet
 S = Posted speed limit (mph).
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
12. When a side road intersects the highway on which work is being performed, additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
13. For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)
- Work Zone Sign
- Advance Warning Arrow Panel

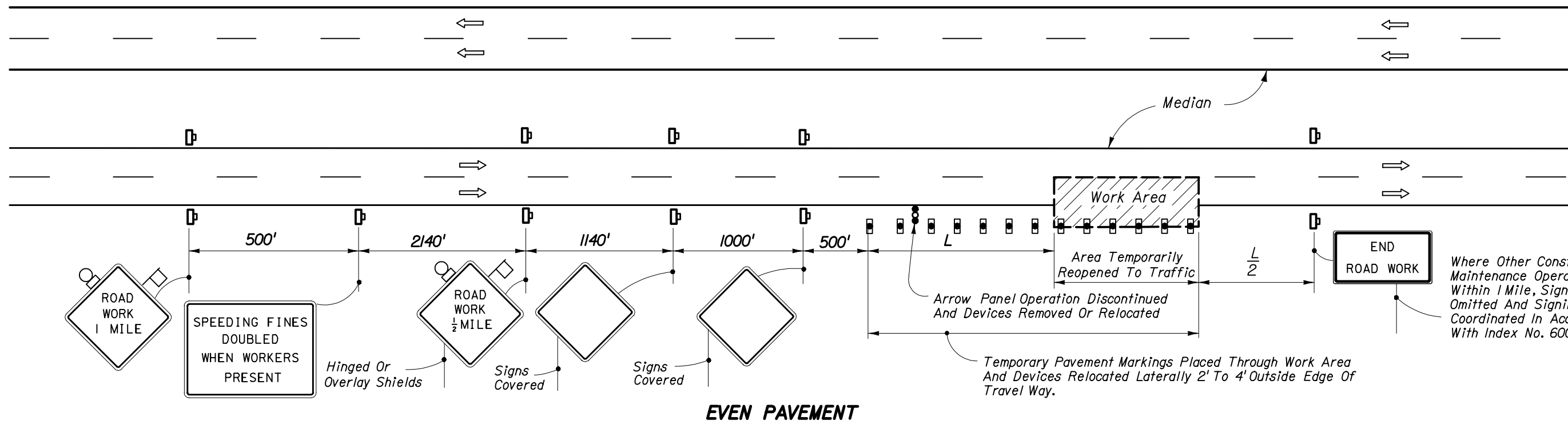
TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work

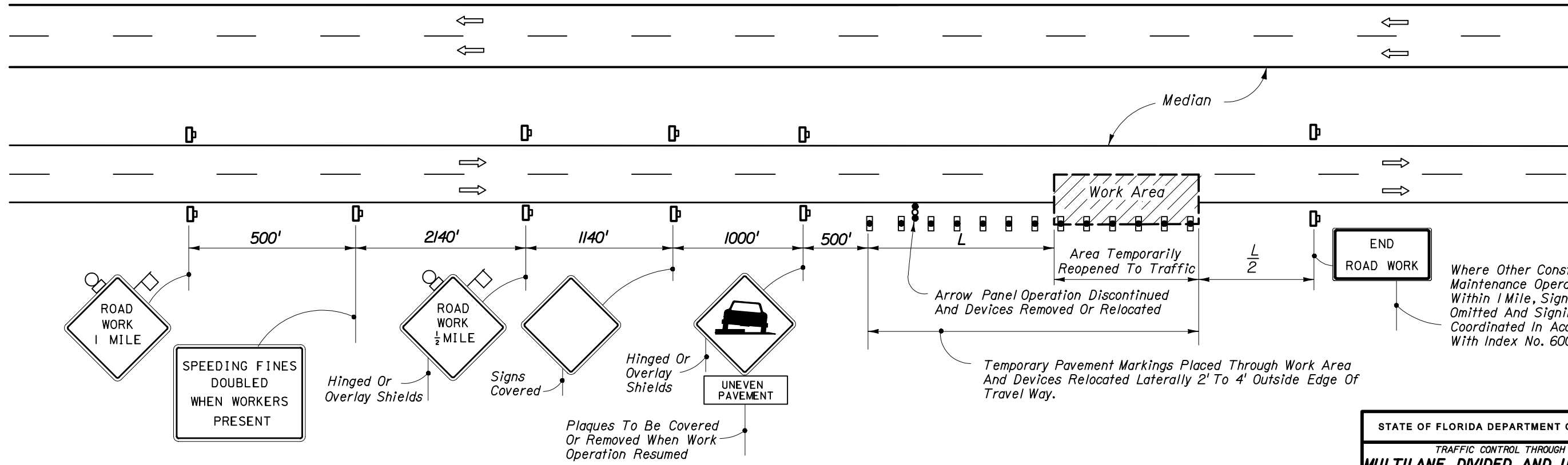
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF TRAVEL WAY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, DIVIDED AND UNDIVIDED • RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD				
Designed By	Names	Dates	Approved By <i>Samuel D. Mill</i>	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
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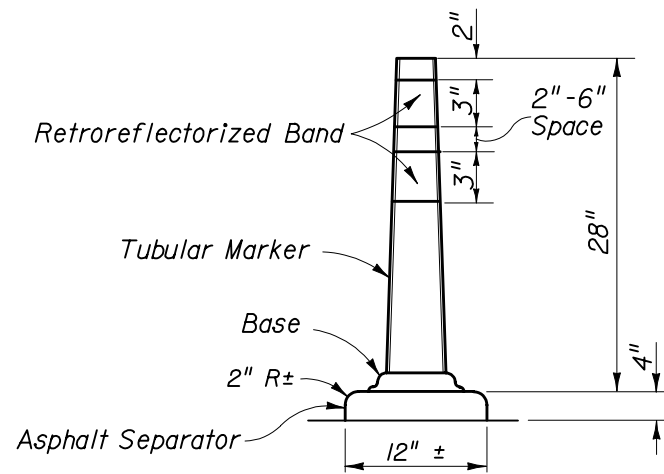
EVEN PAVEMENT



UNEVEN PAVEMENT

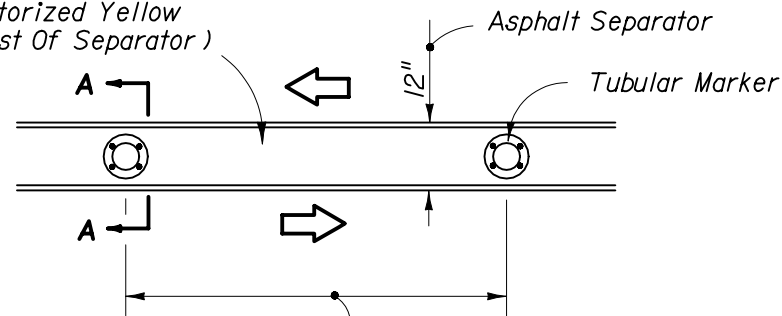
INTERMITTENT WORK STOPPAGE • RIGHT LANE REOPENED TO TRAFFIC • DAYTIME OR NIGHTTIME

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, DIVIDED AND UNDIVIDED • RURAL				
NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	[Signature]	
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SECTION AA

Entire Separator Shall Be Painted Reflectorized Yellow (Included In Cost Of Separator)



Based On Speed Limit As Follows:
15' Up To 25 MPH; 30' For 30-40 MPH;
50' For 45 MPH And Greater.

PLAN

- Notes: (a) The tubular marker is to be made of a flexible material or have a flexible joint at the base such that it will not cause damage to vehicles upon impact and will return to its original shape after being struck by a 5000 lb. vehicle at a velocity of 75 ft/sec.
- (b) The tubular marker shall be orange with two white retroreflective bands.
- (c) The tubular marker may be attached by bituminous adhesive or other methods approved by the Engineer.
- (d) Reflectorized materials shall have a smooth sealed outer surface which will display the same approximate color day and night.
- (e) 12" openings for drainage will be constructed in the separator island every 25' in areas with grades of 1% or less or every 50' in areas with grades over 1% as directed by the Engineer.

DETAIL OF TEMPORARY ASPHALT TRAFFIC SEPARATOR

APPLICATIONS

- Scheme 1:** Restricted Construction Limits
- Scheme 2:** Unrestricted Construction Limits And Light To Moderate Traffic
- Scheme 3:** Unrestricted Construction Limits And Moderate To Heavy Traffic
- Where:** Construction Limits Are The Outward Beginning Or Ending Of Lane Reductions
- Where:** Unless A Specific Scheme Is Called For In The Plans, Scheme Selection Shall Be At The Contractors Option And As Approved By The Engineer

GENERAL NOTES

- All vehicles, equipment, workers and their activities are restricted at all times to one side of the highway.
- The first two warning signs, each side, shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
- All signs shall be post mounted.
- TWO-WAY TRAFFIC sign(s) shall be repeated every 1/4 mile in each direction, throughout the tangent distance (T).
- L (min.) = WS for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph).
- Where the tangent distance (T) exceeds 250', spacing between Type I or II barricades or vertical panels or drums may be increased to 100' within the limits of the tangent, or post mounted delineators at 50' centers may be substituted for barricades, vertical panels or drums.
- All existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for marking new edge lines.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When side roads, cross roads or interchanges are located within the limits for work zone traffic control additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.
- The contractor has the option of using temporary traffic separators and tubular type warning devices from the qualified products list in lieu of the temporary asphalt traffic separator and tubular warning device detailed above.
- Temporary Traffic Separator shall be paid for under the contract unit price for Maintenance of Traffic, LS, and will include all materials and work necessary to construct, maintain and remove the temporary traffic separator. Any damage to existing pavement caused by the removal of temporary traffic separator shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of Maintenance of Traffic, LS.

SYMBOLS

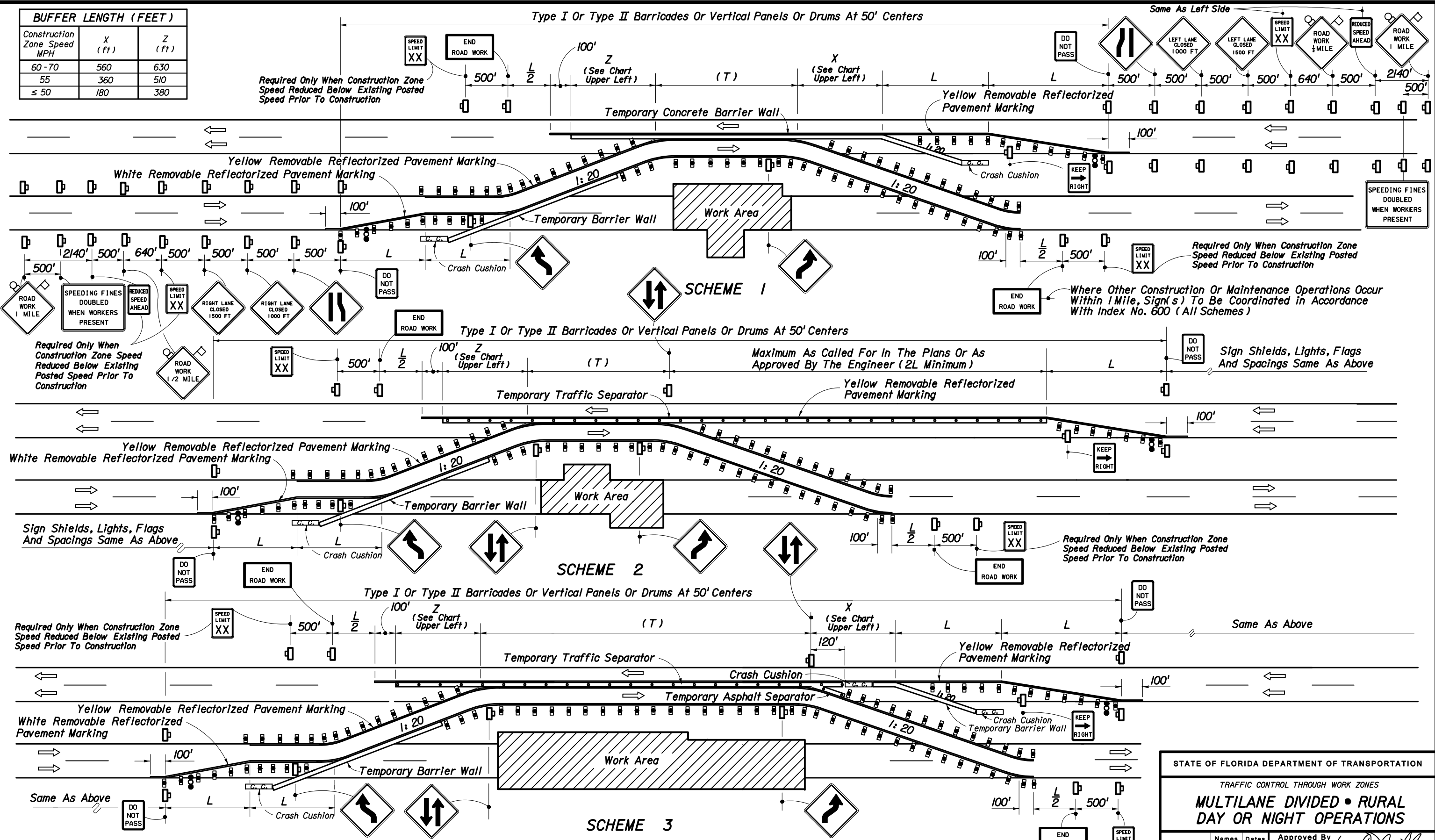
- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign
- Advance Warning Arrow Panel

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF ONE ROADWAY AND THE OPPOSING ROADWAY IS CONVERTED TO TEMPORARY TWO-WAY TRAVEL BY WAY OF CROSSOVERS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED • RURAL DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87			
Checked By	12/87	Revision	Sheet No.	Index No.
		04	1 of 2	614

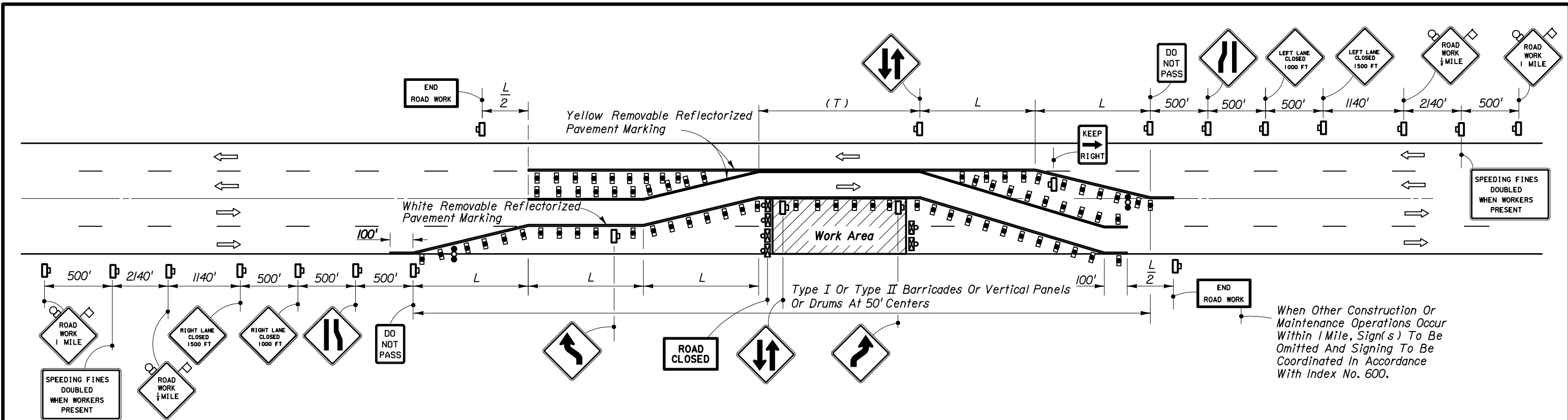
BUFFER LENGTH (FEET)		
Construction Zone Speed MPH	X (ft)	Z (ft)
60-70	560	630
55	360	510
≤ 50	180	380



Note: See Sheet 1 of 2 for Scheme Applications

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED • RURAL				
DAY OR NIGHT OPERATIONS				
Designed By	12/87	Approved By	<i>J. D. Hill</i> Roadway Design Engineer	
Drawn By	12/87	Revision	Sheet No.	Index No.
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When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

GENERAL NOTES

- All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
- The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
- All signs, except those required in paved areas, shall be post mounted if the closure time exceeds 12 hours.
- TWO-WAY TRAFFIC signs shall be repeated every 1/4 mile in each direction, through the tangent distance (T).
- L (min.) = WS for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph).
- Where the tangent distance (T) exceeds 250', spacing between cones or tubular markers may be increased to 50' or spacing between Type I or Type II barricades or vertical panels or drums may be increased to 100' within the limits of the tangent.
- This index does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special maintenance of traffic details will be required.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS

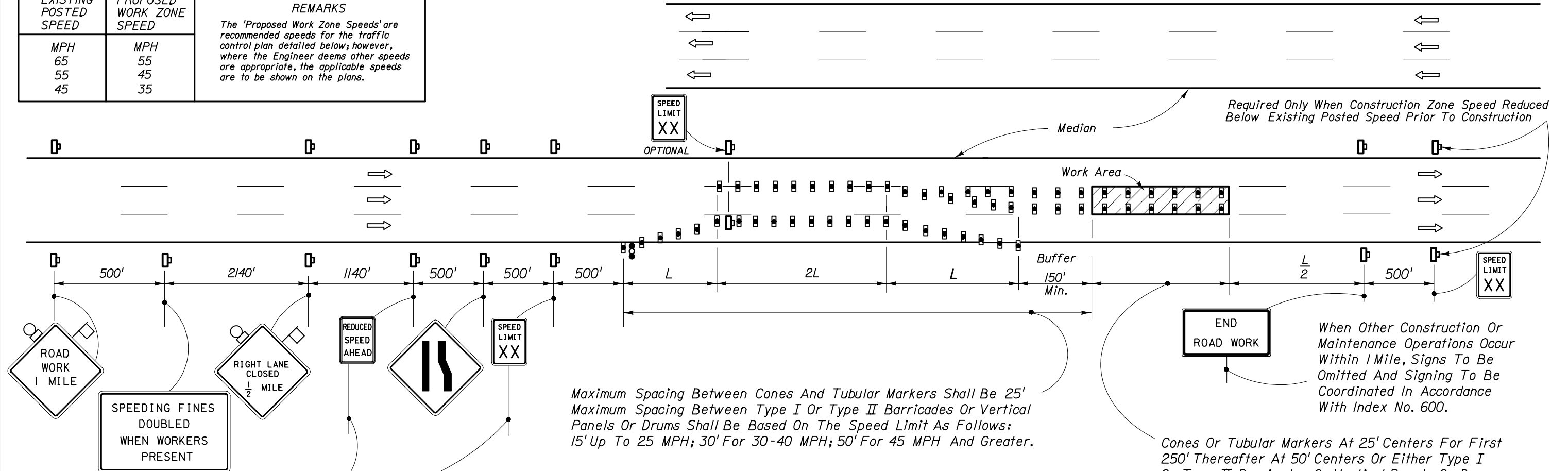
- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type III Barricade (With Flashing Light)
- Work Zone Sign
- Advance Warning Arrow Panel

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF THE LANES IN ONE DIRECTION AND A DIVERSION IS PROVIDED BY UTILIZING ONE LANE OF THE OPPOSING TRAFFIC LANES.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE UNDIVIDED • RURAL				
DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
			04	1 of 1 615

EXISTING POSTED SPEED	PROPOSED WORK ZONE SPEED	REMARKS
MPH	MPH	The 'Proposed Work Zone Speeds' are recommended speeds for the traffic control plan detailed below; however, where the Engineer deems other speeds are appropriate, the applicable speeds are to be shown on the plans.
65	55	
55	45	
45	35	



Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH And Greater.

CONDITION NOTES

1. The RIGHT LANE CLOSED and lane reduction signs are to be removed or fully covered when no work is being performed and the center lane is opened to traffic.
2. For work performed in the outside lane refer to Index Nos. 612 and 613. For work performed in the inside lane refer to Index Nos. 617.
3. When the lane closure exceeds a continuous 24 hour period all existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement marking used for marking new edge lines and centerline.

GENERAL NOTES

1. All vehicles, equipment, workers, and their activities are restricted at all times to one side of the highway.
2. The first two warning signs each side shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
3. All signs shall be post mounted if closure time exceeds 12 hours.
4. L (min.) = WS for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph).
5. Arrows denote direction of traffic only and do not reflect pavement markings.
6. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
7. END ROAD WORK signs required only when work exceeds one daylight period.
8. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
9. For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
 (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign
- Advance Warning Arrow Panel

TYPICAL APPLICATIONS

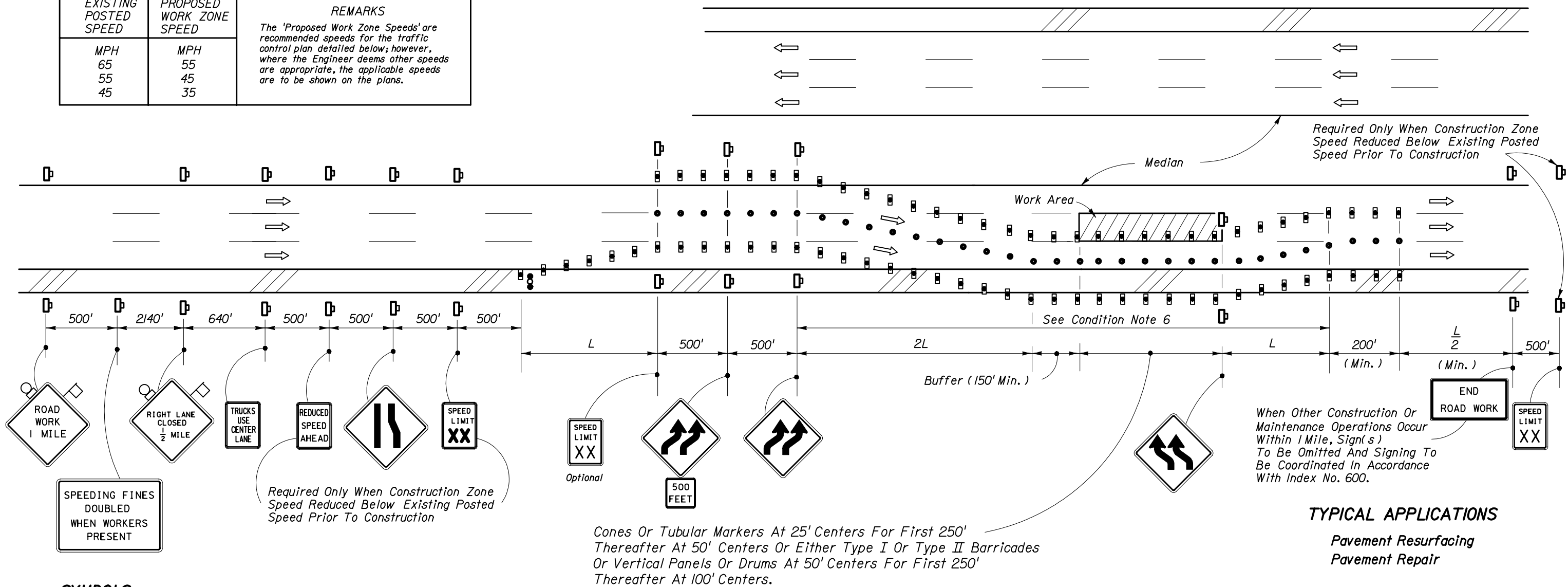
Pavement Resurfacing
 Pavement Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON ANY PORTION OF A CENTER LANE OF A MULTILANE HIGHWAY, AND TWO DRIVING LANES ARE MAINTAINED ON THE TRAVEL WAY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED • RURAL				
Designed By	Names	Dates	Approved By	
Drawn By		12/87		
Checked By		12/87	Revision	Sheet No.
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				Index No. 616

EXISTING POSTED SPEED	PROPOSED WORK ZONE SPEED	REMARKS
MPH	MPH	The 'Proposed Work Zone Speeds' are recommended speeds for the traffic control plan detailed below; however, where the Engineer deems other speeds are appropriate, the applicable speeds are to be shown on the plans.
65	55	
55	45	
45	35	



SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign
- Advance Warning Arrow Panel
- Cone Or Tubular marker (Except At Night Use Vertical Panels)

Cones Or Tubular Markers At 25' Centers For First 250' Thereafter At 50' Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers For First 250' Thereafter At 100' Centers.

CONDITION NOTES

1. See General Notes, Sheet 1 of 2.
2. Maximum spacing between devices (ft) to be equal to the speed limit (mph) but not greater than 25' for cones or tubular markers or 50' for Type I or Type II barricades or or vertical panels or drums. Barricades, vertical panels or drums shall be used to delineate the edge lines of the transition areas (i.e. L and 2L). Beyond the transition area, any of the above noted devices may be used to delineate the edge lines. Cones or tubular markers shall be used to delineate the center line. (Except at night use vertical panels)
3. Length of time that traffic is using shoulder should be minimized. For example, remove lane closure and lane shift at night (unless performing nightwork) if practical.
4. The RIGHT LANE CLOSED, lane reduction and reverse curve signs are to be removed or fully covered when no work is being performed and the travel way is open to traffic.
5. When the lane closure exceeds a continuous 24 hour period all existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for marking new edge lines and centerlines.
6. For general TCZ requirements and additional information refer to Index No. 600.

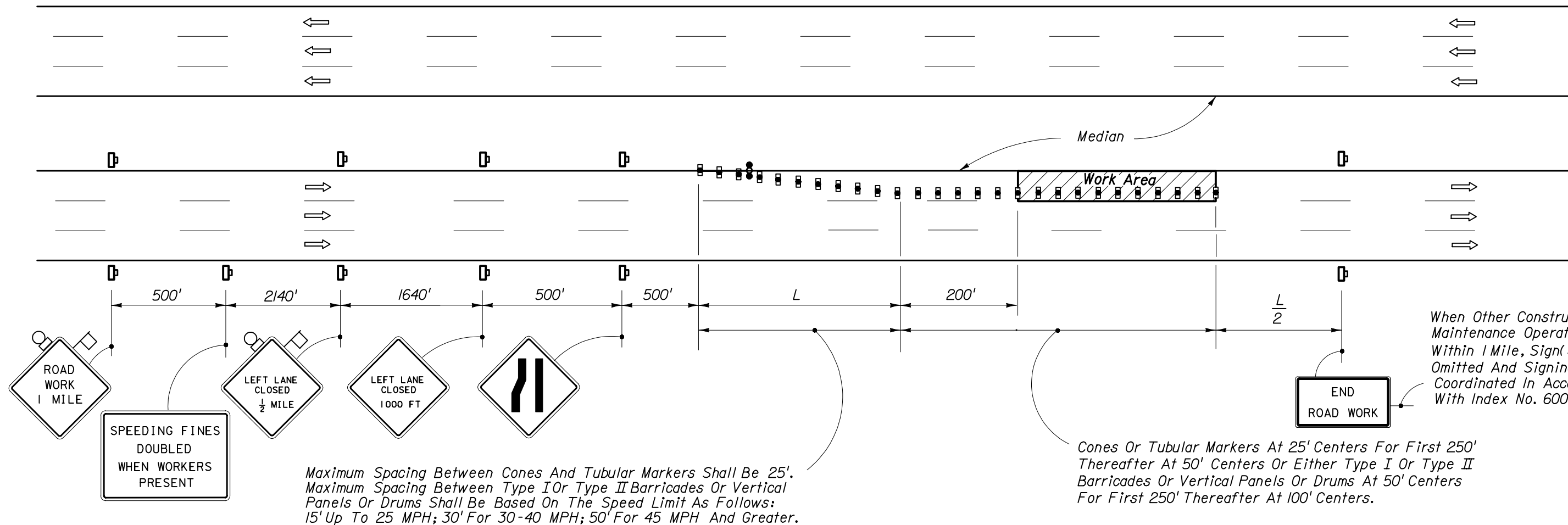
TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON ANY PORTION OF A CENTER LANE OF A MULTILANE HIGHWAY, AND TWO DRIVING LANES ARE MAINTAINED, AND, THE OUTSIDE SHOULDER PAVEMENT IS TEMPORARILY USED AS A TRAVEL LANE.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED • RURAL				
Designed By	Names	Dates	Approved By <i>James D. Hill</i>	
Drawn By		6/09	Roadway Design Engineer	
Checked By		6/09	Revision	Sheet No. Index No.
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Maximum Spacing Between Cones And Tubular Markers Shall Be 25'.
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH And Greater.

Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50' Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers For First 250' Thereafter At 100' Centers.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign
- Advance Warning Arrow Panel

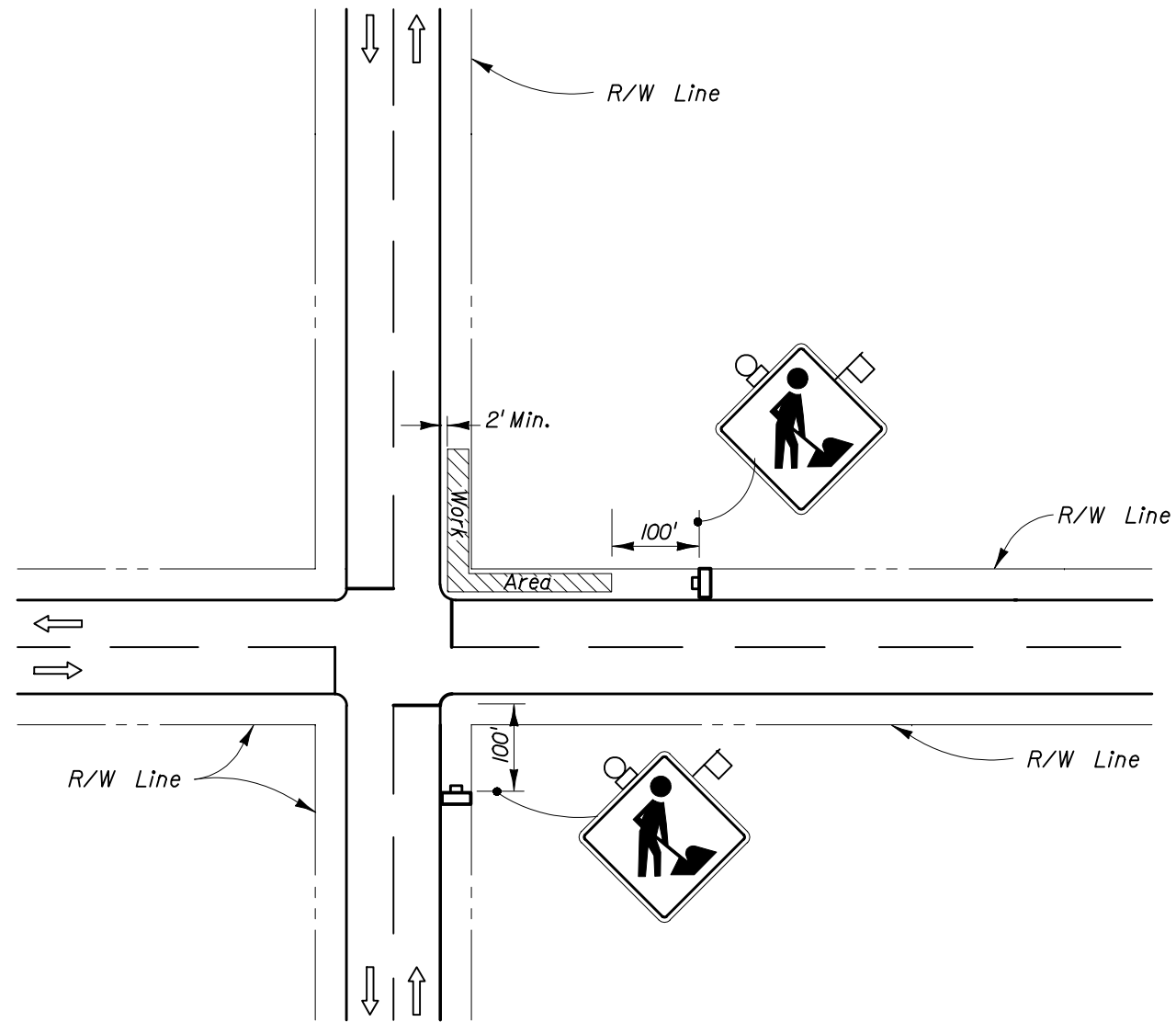
GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the highway.
2. The first two warning signs, each side, shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.
3. All signs shall be post mounted if closure time exceeds 12 hours.
4. L (min.) = WS for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet
 S = Posted speed limit (mph).
5. The LEFT LANE CLOSED and lane reduction signs are to be removed or fully covered when no work is being performed and the inside lane is open to traffic.
6. Advance warning arrow panels are required for both day and night operation. Either the right flashing arrow or the right sequential arrow modes may be used; the caution mode shall not be used.
7. Arrows denote direction of traffic only and do not reflect pavement marking.
8. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
9. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
10. For work performed in the outside lane refer to Index Nos. 612 and 613. For work performed in the center lane refer to Index No. 616.
11. For general TCZ requirements and additional information refer to Index No. 600.

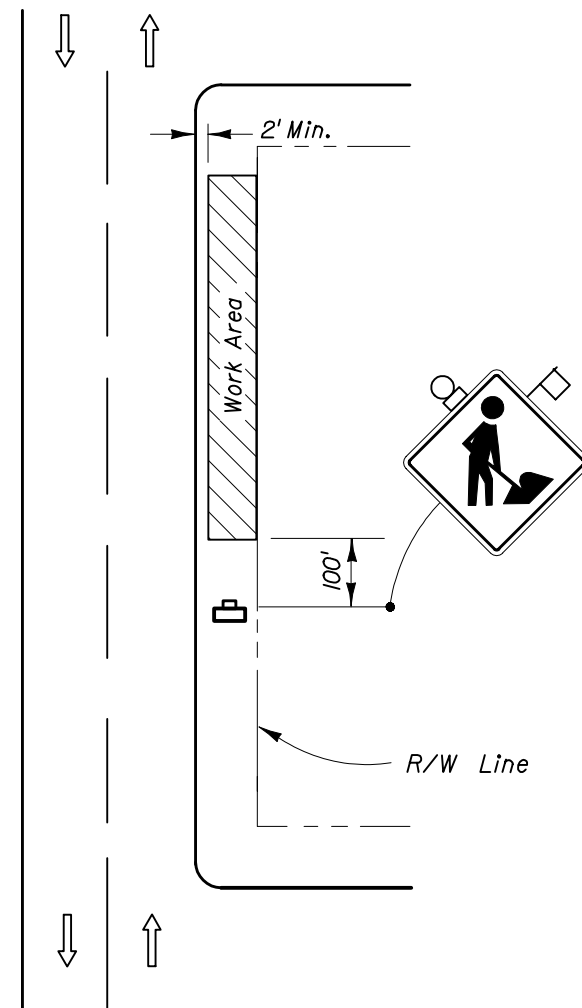
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON ANY PORTION OF THE INSIDE LANE OF A MULTILANE HIGHWAY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED • RURAL				
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Checked By		12/87	Revision	Sheet No.
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				Index No. 617



CORNER WORK






MID-BLOCK WORK

TYPICAL APPLICATIONS
Utility Work

CONDITIONS


WHERE CURB AND GUTTER EXISTS AND WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' (OR THE RIGHT OF WAY LINE, WHICHEVER IS CLOSER) BUT NOT CLOSER THAN 2' TO THE EDGE OF TRAVEL WAY FOR A PERIOD OF MORE THAN 60 MINUTES.

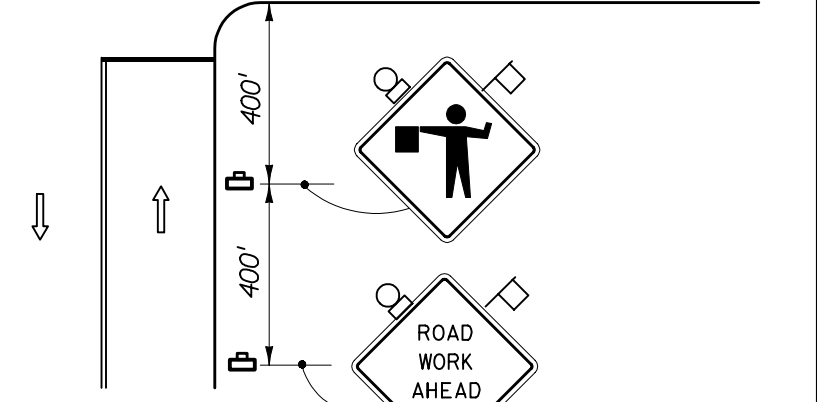
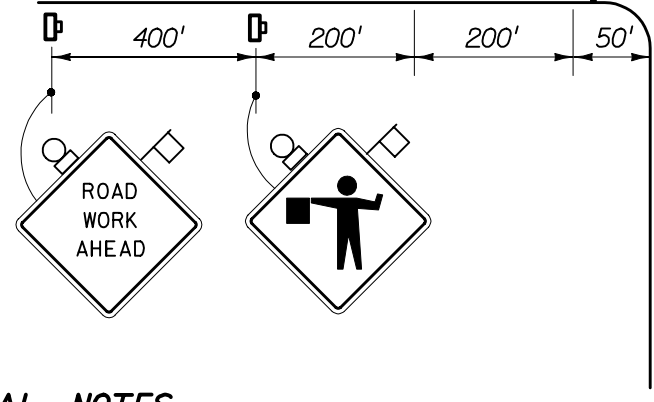
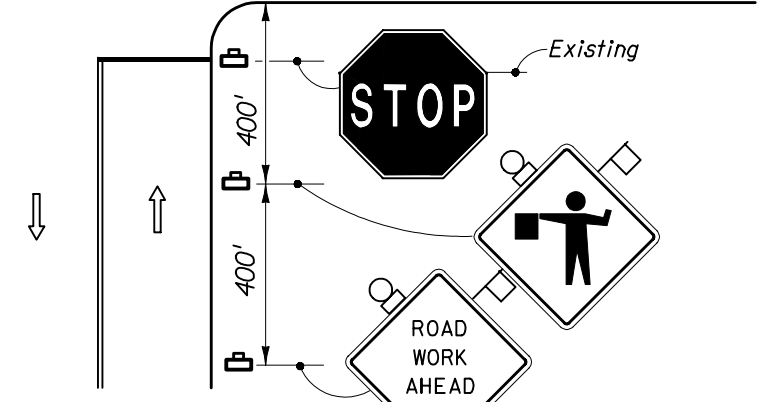
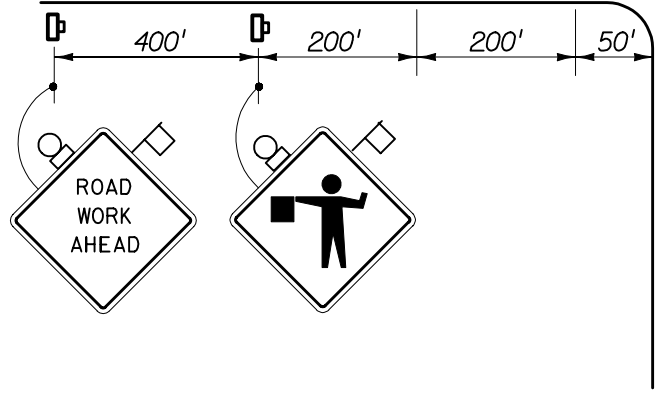
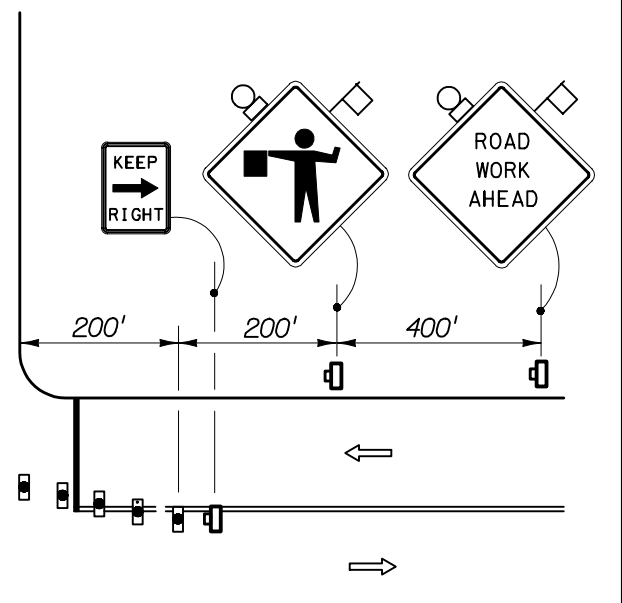
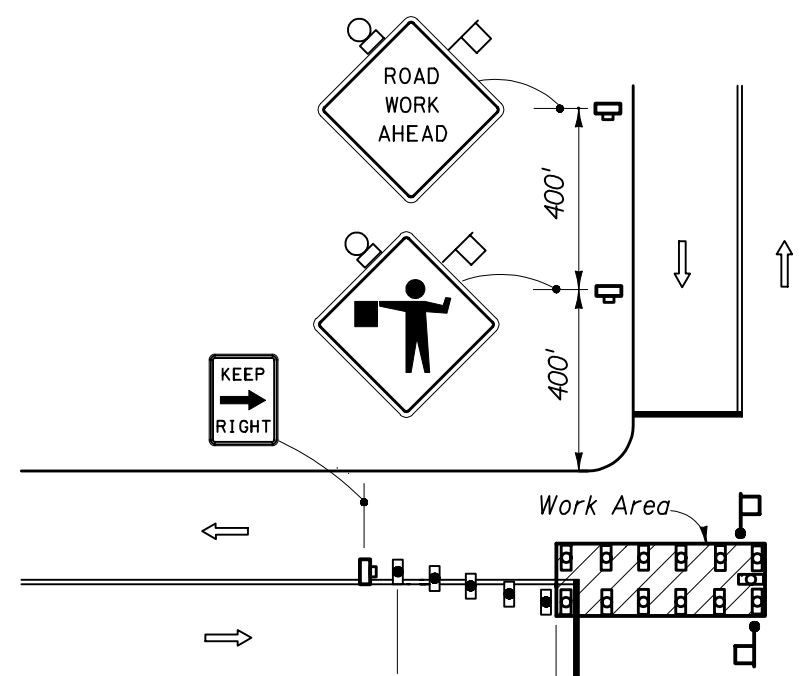
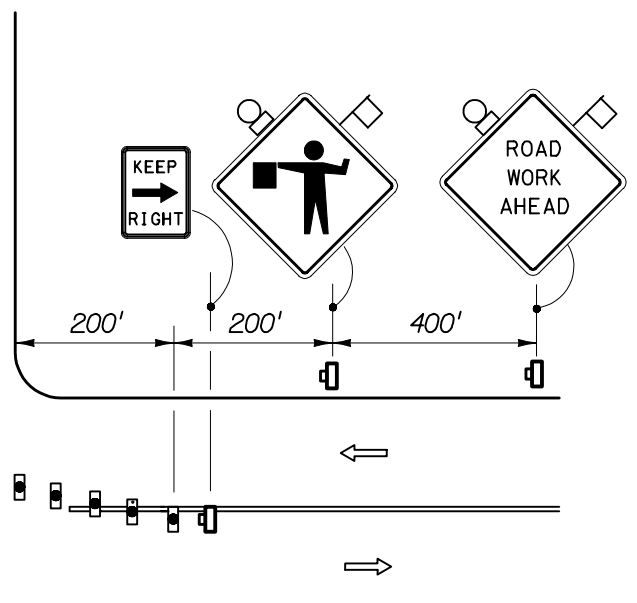
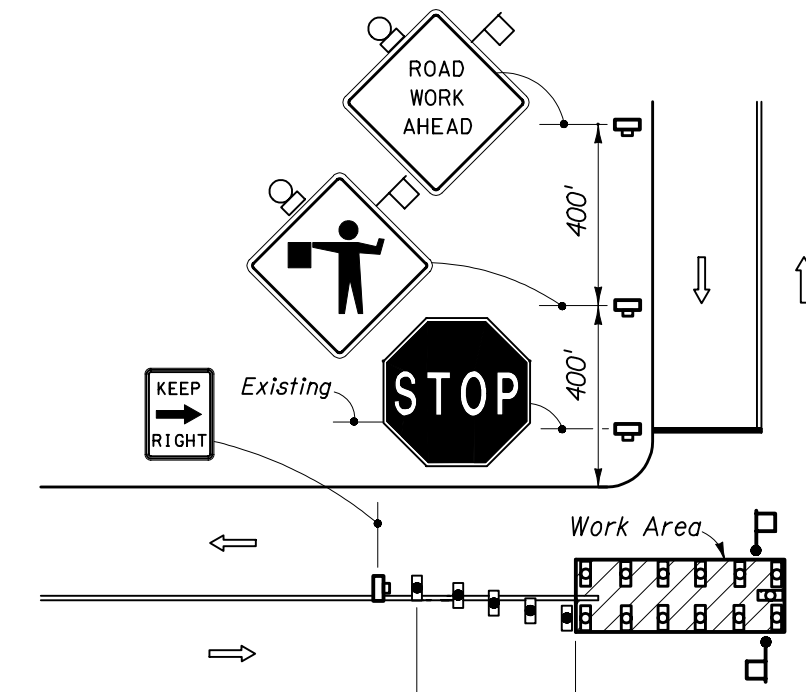
SYMBOLS

-  Work Area
-  Work Zone Sign
-  Sign With 18" x 18" (Min.) Orange Flag And Type B Light

GENERAL NOTES

1. When construction activities encroach on a sidewalk refer to Index No. 660.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
WORK OUTSIDE THE TRAVEL WAY URBAN AREAS				
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Checked By			Revision	Sheet No. Index No.
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UNSIGNALIZED

GENERAL NOTES

SIGNALIZED

TYPICAL APPLICATIONS

Utility Work
Pavement Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF A PORTION OF ONE OR MORE TRAFFIC LANES IN AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

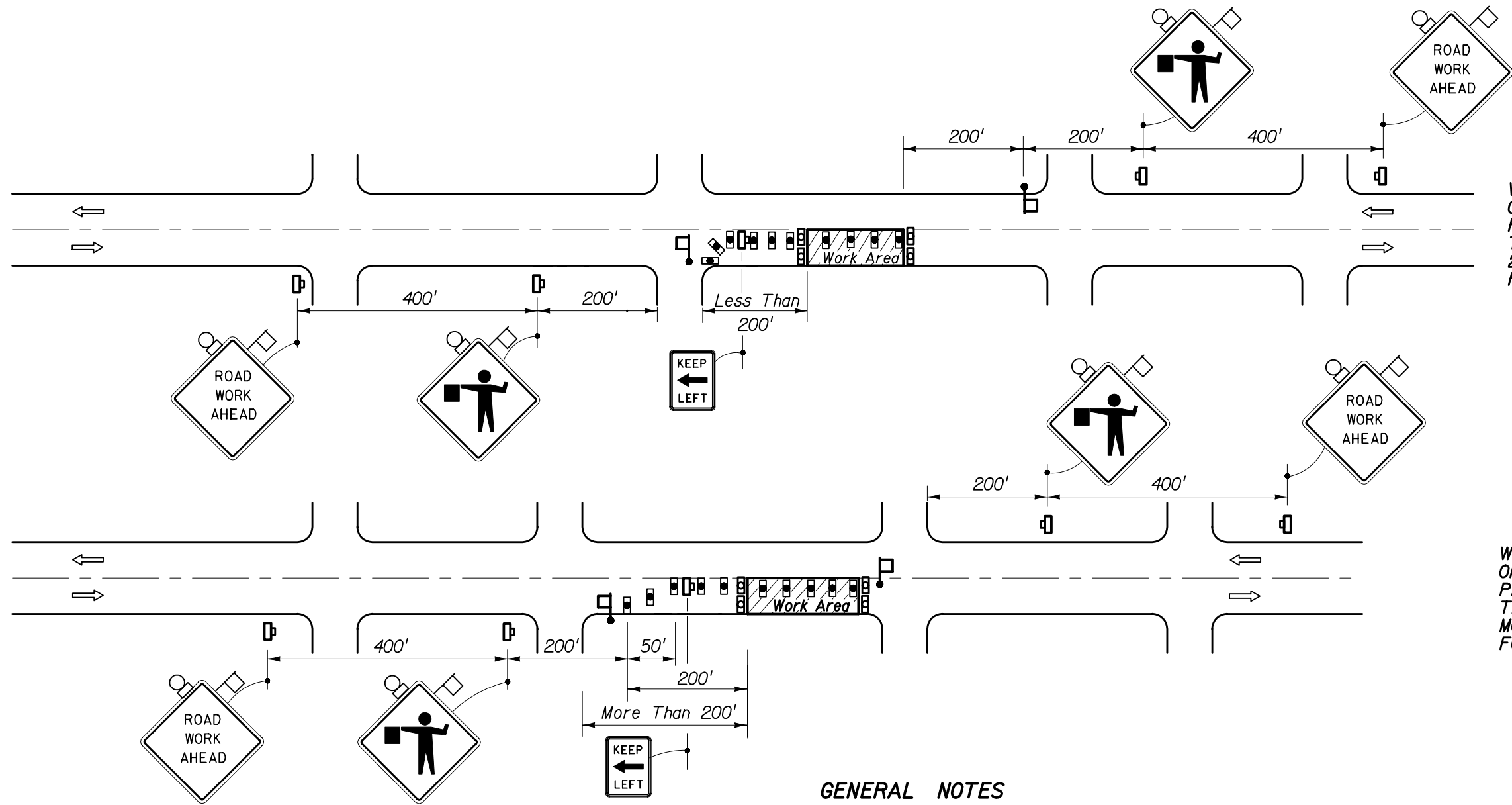
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Flagger
- Stop Bar

1. All vehicles, equipment, workers (except flaggers) and their activities are forbidden in lane and intersection areas reserved for traffic.
2. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
3. The FLAGGER legend sign may be substituted for the symbol sign.
4. All signs shall be post mounted if closure time exceeds 12 hours.
5. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
6. Flaggers shall be located where they can control more than one direction of traffic. Flaggers shall be in sight of each other or in direct communication at all times.

7. Maximum spacing between barricades, vertical panels, tubular markers and drums shall be not greater than 25'.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. Temporary signal phasing modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.
11. Work performed for a period of 60 minutes or less is to be conducted in accordance with Index No. 607.
12. For general TCZ requirements and additional information refer to Index No. 600.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • URBAN DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
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CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF ONE TRAFFIC LANE, FOR WORK AREAS LESS THAN 200' DOWNSTREAM FROM AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF ONE TRAFFIC LANE, FOR WORK AREAS 200' OR MORE DOWNSTREAM FROM AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

GENERAL NOTES

1. Work operations shall be confined to one travel lane, leaving the opposing travel lane open to traffic.
2. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.
3. For work operations of 60 minutes or less see Index No. 607.
4. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
5. If work area is confined to an outside auxiliary lane the work area shall be barricaded and the FLAGGER signs replaced by ROAD WORK AHEAD signs. Flaggers are not required.
6. Flaggers shall be in sight of each other or in direct communication at all times.
7. The ROAD CONSTRUCTION AHEAD and FLAGGER signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
8. The FLAGGER legend sign may be substituted for the symbol sign.
9. All signs shall be post mounted if the closure time exceeds 12 hours.
10. The maximum spacing between devices shall be not greater than 25'.
11. Arrows denote direction of traffic only and do not reflect pavement markings.
12. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
13. For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS








- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Flagger

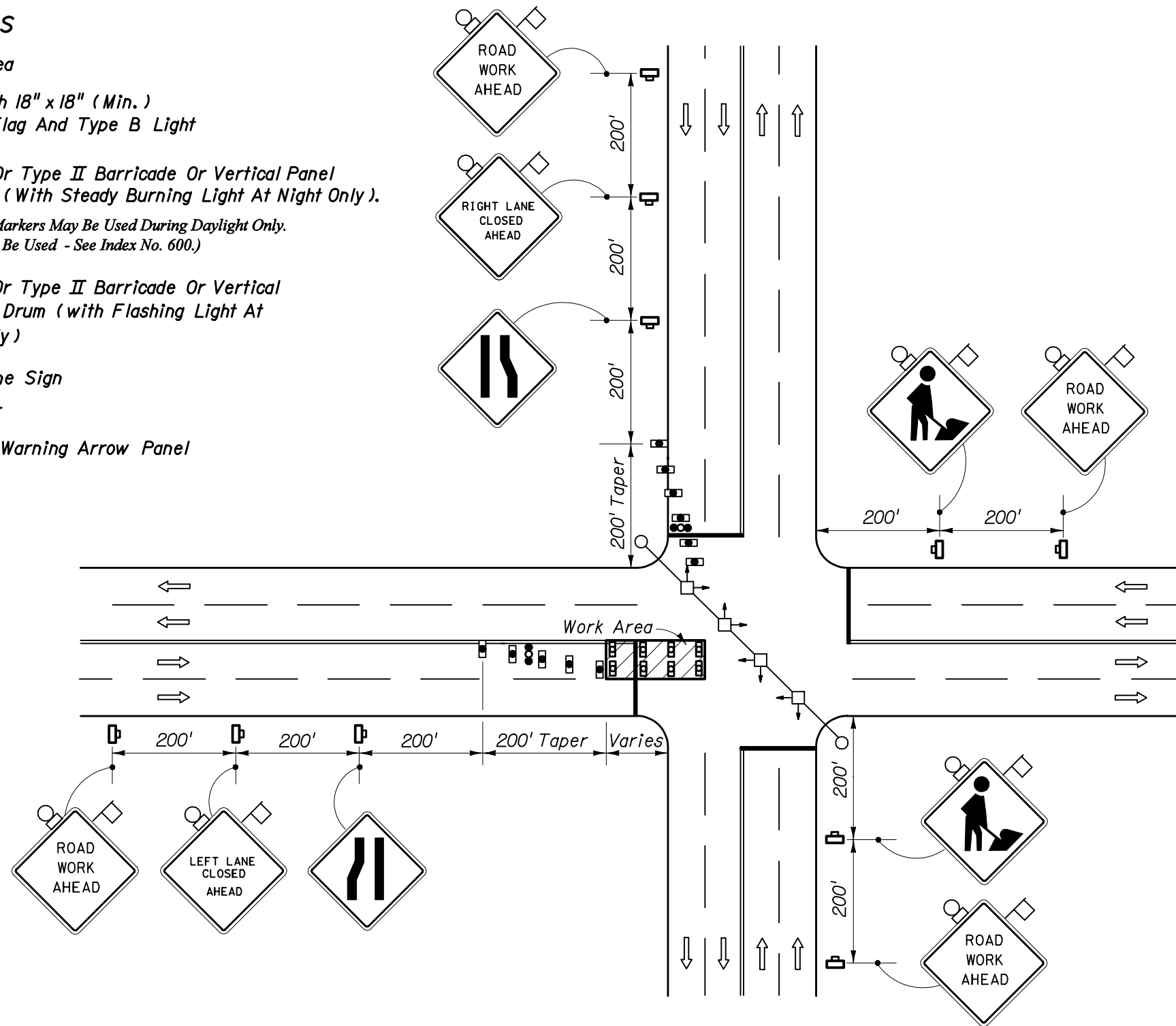
TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • URBAN DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
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SYMBOLS

-  Work Area
-  Sign With 18" x 18" (Min.) Orange Flag And Type B Light
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
-  Work Zone Sign
-  Stop Bar
-  Advance Warning Arrow Panel



SIGNALIZED

GENERAL NOTES

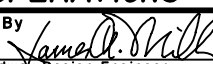
1. All vehicles, equipment, workers (except flaggers) and their activities are forbidden in lane and intersection areas reserved for traffic.
2. For work operations of 60 minutes or less see Index No. 607.
3. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations
Type B Lights and Orange Flags are not required.
4. All signs shall be post mounted if closure time exceeds 12 hours.
5. The WORKERS legend sign may be substituted for the symbol sign.
6. Dual signs are required for divided roadways.
7. Arrows denote direction of traffic only and do not reflect pavement markings.
8. Maximum spacing between barricades, vertical panels, cones, tubular markers and drums shall be not greater than 25'.
9. Temporary signal phasing modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCZ requirements and additional information refer to Index No. 600.

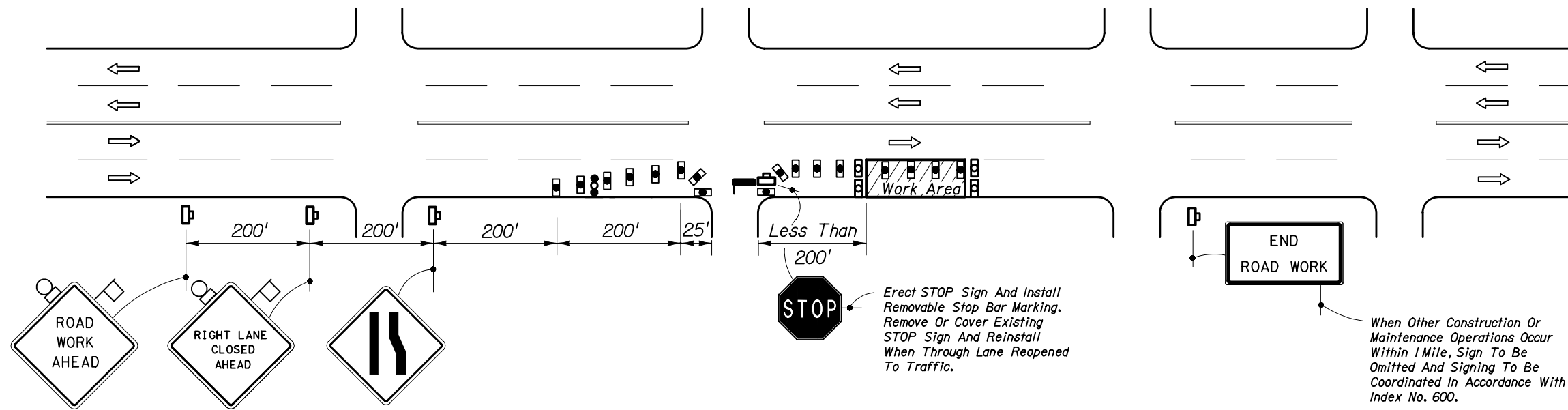
TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF AT LEAST ONE MEDIAN TRAFFIC LANE FOR A PERIOD OF MORE THAN 60 MINUTES.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, TWO-WAY • URBAN DIVIDED OR UNDIVIDED DAY OR NIGHT OPERATIONS				
	Names	Dates	Approved By 	
Designed By		12/87	Roadway Design Engineer	
Drawn By		12/87	Revision	Sheet No.
Checked By		12/87	04	1 of 1
				Index No. 622



CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE OUTSIDE TRAVEL LANE, AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE OUTSIDE TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel
- Stop Bar

GENERAL NOTES

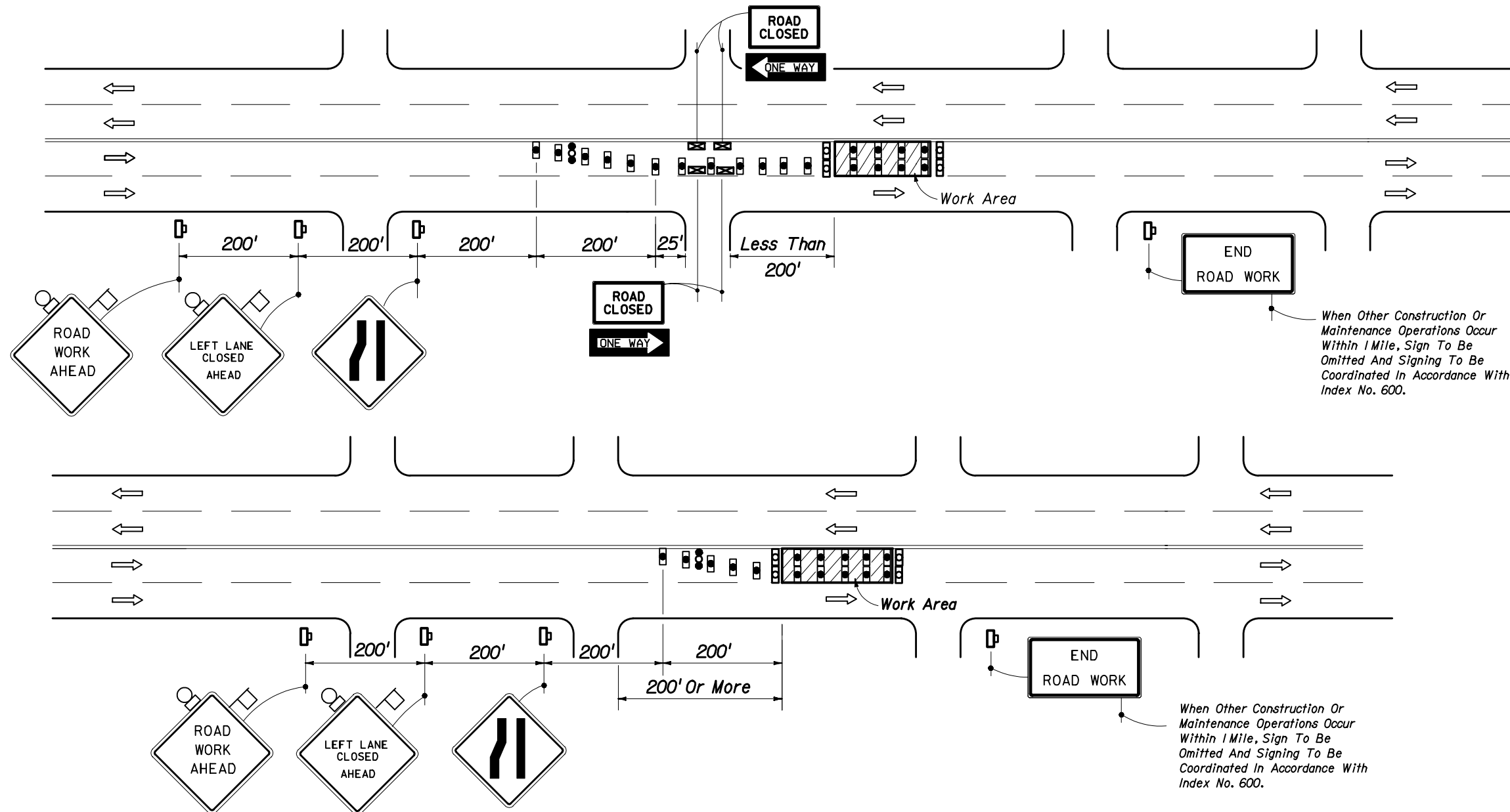
1. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times at one side of the roadway.
2. Work operations shall be confined to either one lane or lane combinations as follows:
 (a) Outside travel lane; (b) Outside auxiliary lane;
 (c) Outside travel lane and adjoining auxiliary lane;
 (d) Inside travel lane; (e) Inside auxiliary lane;
 (f) Inside travel lane and adjoining auxiliary lane;
 Δ See Sheet 2 of 2
 If the work area is confined to an auxiliary lane the work area shall be barricaded and the RIGHT (LEFT) LANE CLOSED AHEAD signs replaced by ROAD WORK AHEAD signs, and the merge symbol signs eliminated.
3. For work operations of 60 minutes or less see Index No. 612.
4. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
5. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.
6. All signs shall be post mounted if the closure times exceeds 12 hours.
7. Dual signs are required for divided roadways.

(Continued)

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repairs
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, TWO-WAY • URBAN DIVIDED OR UNDIVIDED DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	<i>J. M. [Signature]</i> Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No.
			04	1 of 2
				Index No. 623



CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE INSIDE TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE INSIDE TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Type III Barricade
- Work Zone Sign
- Advance Warning Arrow Panel

GENERAL NOTES (CONT.)

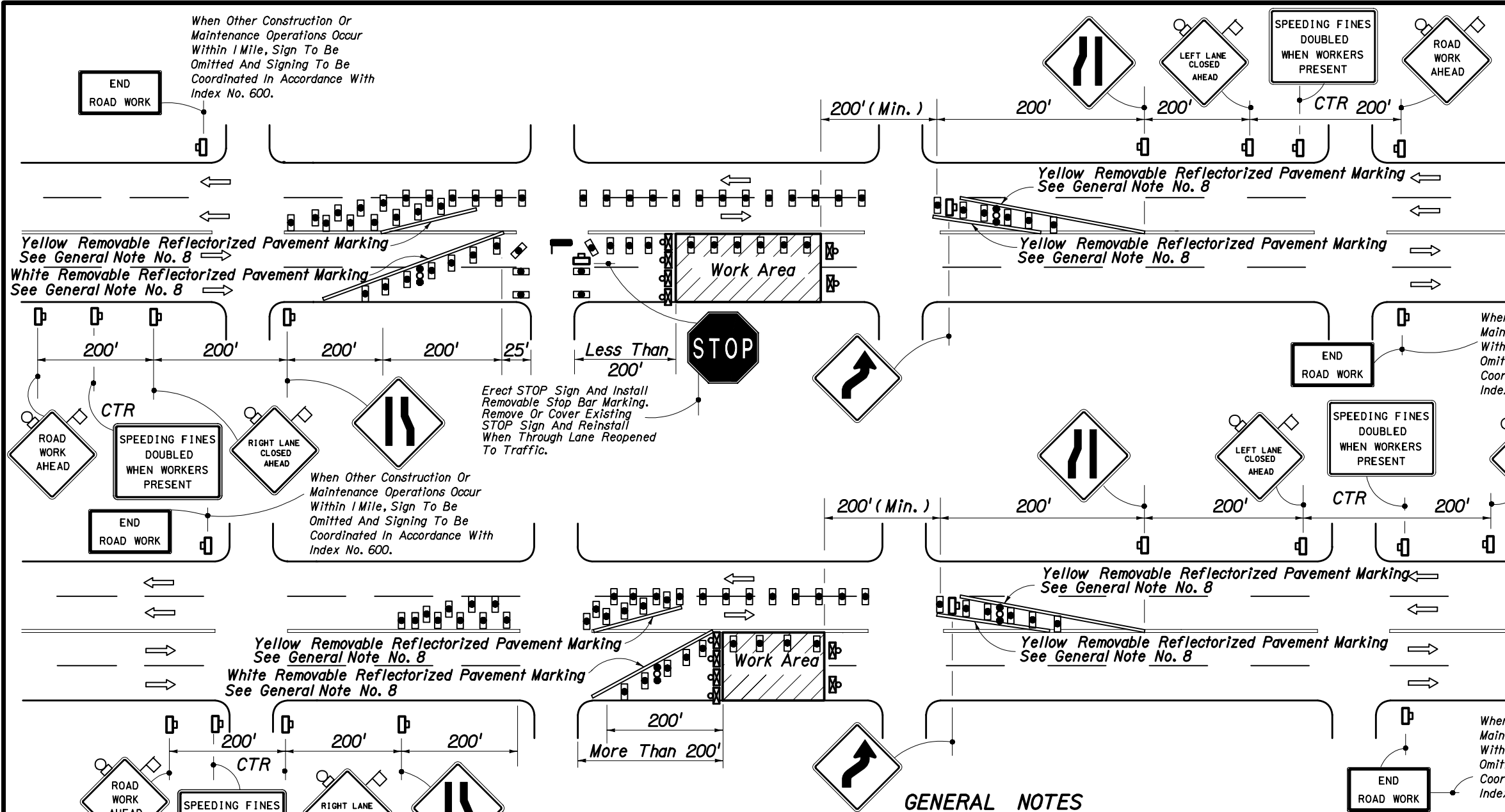
8. Within the lateral transitions, the maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater.

Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' Centers for Type I or Type II barricades or vertical panels or drums for 250', thereafter cones or tubular markers at 50' centers and Type I or Type II barricades or vertical panels or drums at 100' centers.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repairs
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, TWO-WAY • URBAN DIVIDED OR UNDIVIDED DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Revision	Sheet No. 2 of 2
Checked By		12/87	04	Index No. 623



CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF TRAFFIC LANES IN ONE DIRECTION AND THE USE OF ONE OPPOSING TRAFFIC LANE TO MAINTAIN TWO-WAY TRAFFIC, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF TRAFFIC LANES IN ONE DIRECTION AND THE USE OF ONE OPPOSING TRAFFIC LANE TO MAINTAIN TWO-WAY TRAFFIC, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

- SYMBOLS**
- Work Area
 - Sign With 18" x 18" (Min.) Orange Flag And Type B Light
 - Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
 - Type III Barricade (With Flashing Light)
 - Work Zone Sign
 - Advance Warning Arrow Panel
 - Stop Bar

- GENERAL NOTES**
1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the pavement.
 2. For work operations of 60 minutes or less (daylight only) see Index No. 607.
 3. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
 4. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.
 5. All signs shall be post mounted if the closure time exceeds 12 hours.
 6. Dual signs are required for divided roadways.
 7. Channelizing devices are to be spaced with Type I or Type II barricades or vertical panels or drums at 50' centers, except in tangent work areas spacing may be increased to 100' after the first 250' when approved by the Engineer.
 8. Removable reflectorized pavement markings shall be used when closure time exceeds one daylight period.
 9. Arrows denote direction of traffic only and do not reflect pavement markings.
 10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
 11. For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS
 Utility Work
 Pavement Repair
 Structure Adjustments

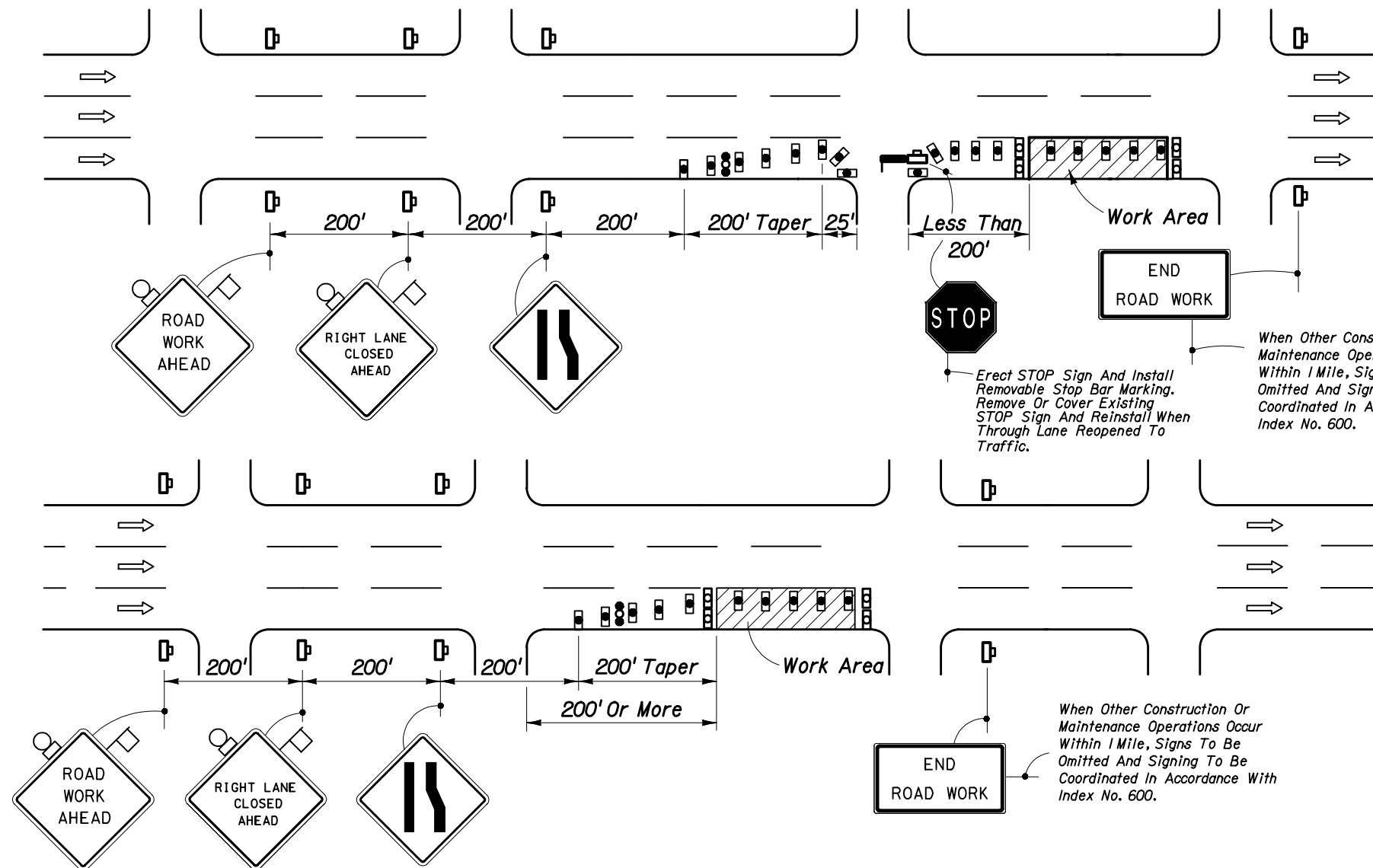
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED WITH TRAVERSABLE MEDIAN OR UNDIVIDED URBAN DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
			04	1 of 1 624

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE OR THE MEDIAN TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE OR THE MEDIAN TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.



GENERAL NOTES

- All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
- Work operations shall be confined to either one lane or a combination of lanes as follows:
 - (a) Outside travel lane; (b) Outside auxiliary lane;
 - (c) Outside travel lane and adjoining auxiliary lane;
 - (d) Outside travel lane and adjoining center lane;
 - (e) Outside travel lane and adjoining auxiliary and center lanes;
 - (f) Median travel lane^Δ; (g) Median auxiliary lane^Δ;
 - (h) Median travel lane and adjoining auxiliary lane^Δ;
 - (i) Median travel lane and adjoining center lane^Δ;
 - (j) Median travel lane and adjoining auxiliary and center lanes^Δ;

^Δ See Sheet 2.

If the work area is confined to an auxiliary lane the work area shall be barricaded and the RIGHT LANE CLOSED AHEAD signs replaced by ROAD WORK AHEAD signs and the merge left symbol signs eliminated.
- For work operations, that require only a single lane closure of 60 minutes or less see Index No. 612.
- When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
- When work is performed in the median lane or the median and adjoining center lanes the barricading plans are inverted and LEFT LANE CLOSED AHEAD and merge right symbol signs shall be substituted for the RIGHT LANE CLOSED AHEAD and merge left symbol signs.

If work is confined to the median auxiliary lane the work area shall be barricaded and the LEFT LANE CLOSED AHEAD signs replaced by ROAD WORK AHEAD signs and the merge right symbol signs eliminated.
- The first two warning signs, each side, shall have an 18"x 18" (min.) orange flag and a Type B light attached and operating at all times.

Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.

(Continued)

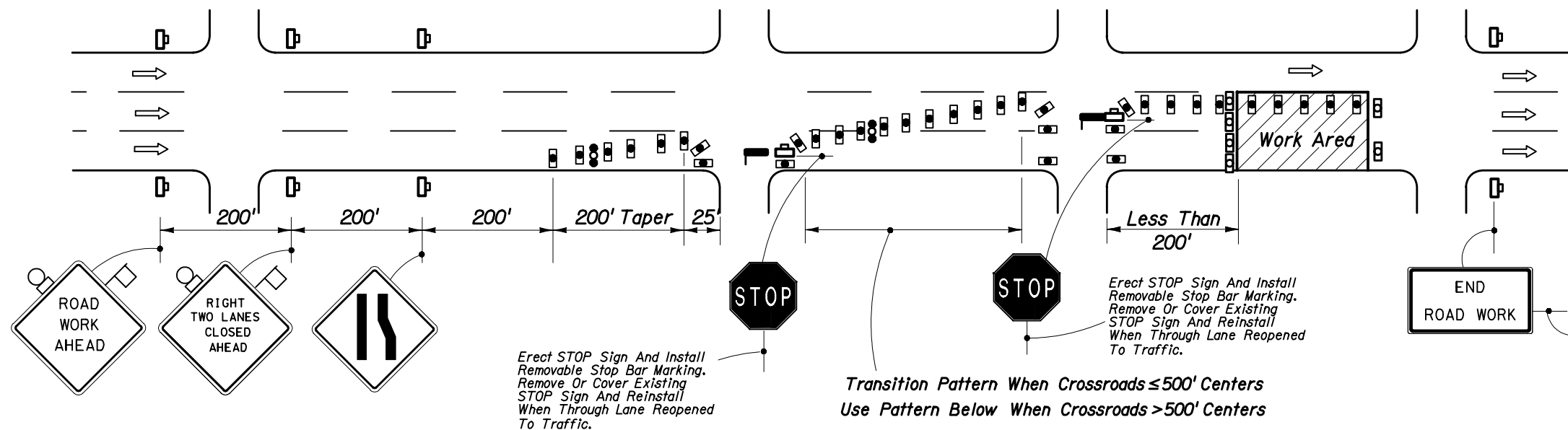
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel
- Stop Bar

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE ONE-WAY OR MULTILANE DIVIDED WITH NON-TRAVERSABLE MEDIAN • URBAN DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By <i>Jameal D. Mill</i>	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
			04	1 of 2 625



Erect STOP Sign And Install Removable Stop Bar Marking. Remove Or Cover Existing STOP Sign And Reinstall When Through Lane Reopened To Traffic.

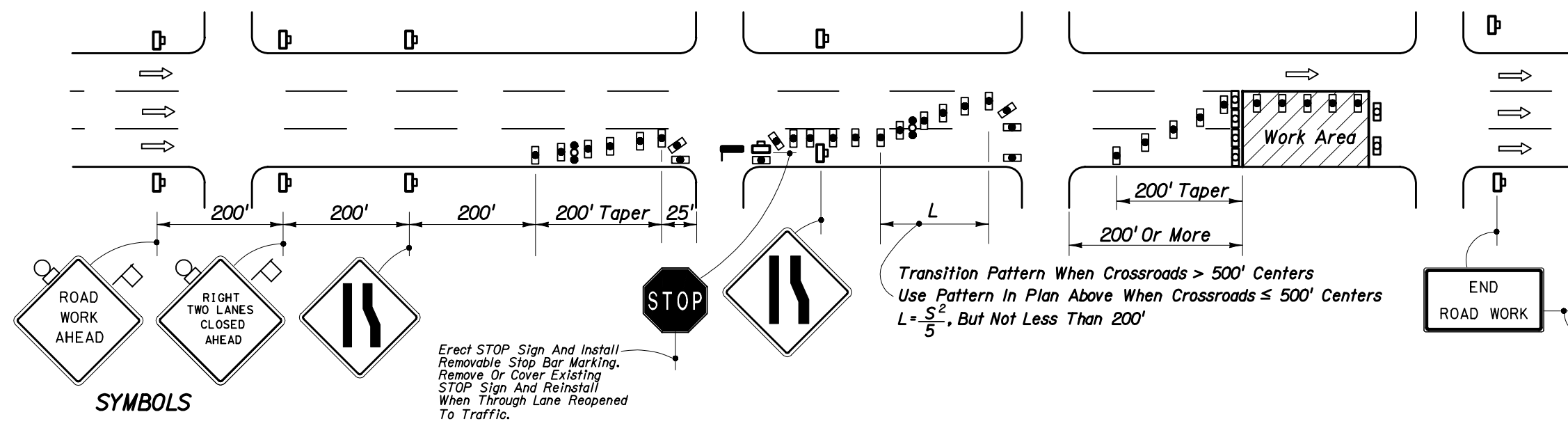
Transition Pattern When Crossroads $\leq 500'$ Centers
Use Pattern Below When Crossroads $> 500'$ Centers

Erect STOP Sign And Install Removable Stop Bar Marking. Remove Or Cover Existing STOP Sign And Reinstall When Through Lane Reopened To Traffic.

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Signs To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE AND CENTER TRAVEL LANES OR THE MEDIAN AND CENTER TRAVEL LANES, WITH OR WITHOUT CLOSURE OF ADJOINING AUXILIARY LANES, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.



Erect STOP Sign And Install Removable Stop Bar Marking. Remove Or Cover Existing STOP Sign And Reinstall When Through Lane Reopened To Traffic.

Transition Pattern When Crossroads $> 500'$ Centers
Use Pattern In Plan Above When Crossroads $\leq 500'$ Centers
 $L = \frac{S^2}{5}$, But Not Less Than 200'

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Signs To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE AND CENTER TRAVEL LANES OR THE MEDIAN AND CENTER TRAVEL LANES, WITH OR WITHOUT CLOSURE OF ADJOINING AUXILIARY LANES, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS

- Work Area
- Sign With 18"x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel
- Stop Bar

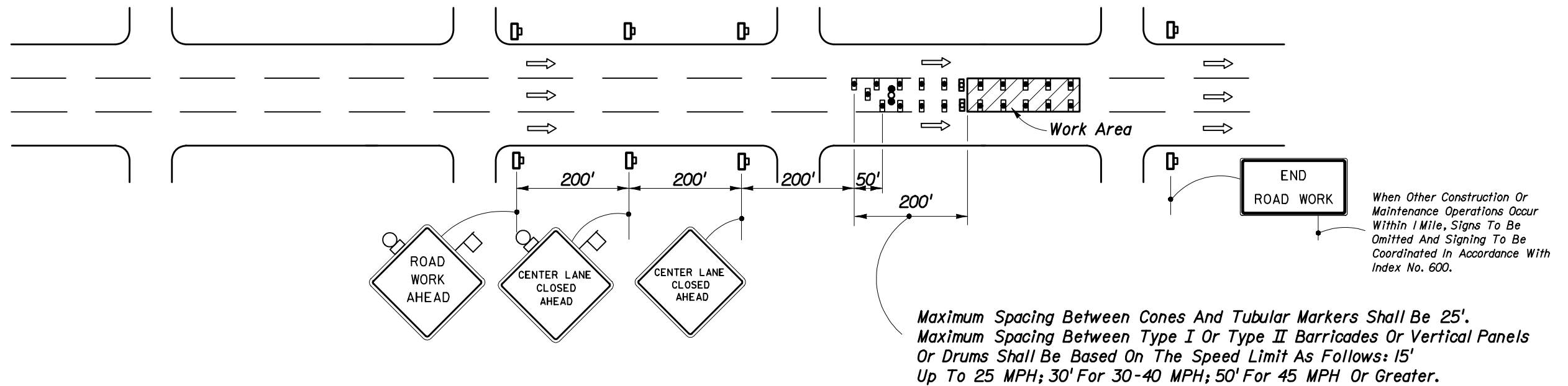
GENERAL NOTES (CONT.)

7. All signs shall be post mounted if closure time exceeds 12 hours.
8. Within the lateral transitions, the maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater. Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' centers for Type I or Type II barricades or vertical panels or drums for 250', thereafter, cones or tubular markers at 50' centers and Type I or Type II barricades or vertical panels or drums at 100' centers.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE ONE-WAY OR MULTILANE DIVIDED WITH NON-TRAVERSABLE MEDIAN • URBAN DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	04	2 of 2	625



GENERAL NOTES

1. All vehicles, equipment, workers and their activities are prohibited at all times from the lane areas reserved for traffic.
2. Work operations shall be confined to one center travel lane, leaving the adjacent travel lanes open to traffic.
3. For work operations of 60 minutes or less, see Index No. 612.
4. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
5. The first two warning signs, each side, shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.
6. All signs shall be post mounted if the closure time exceeds 12 hours.
7. Advance warning arrow panel is required for both day and night operations.
8. Channelizing devices are to be spaced with cones or tubular markers at 25' centers; Type I or Type II barricades or vertical panels or drums at 50' centers for the first 250'; thereafter, cones or tubular markers at 50' centers and Type I or Type II barricades or vertical panels or drums at 100' centers.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

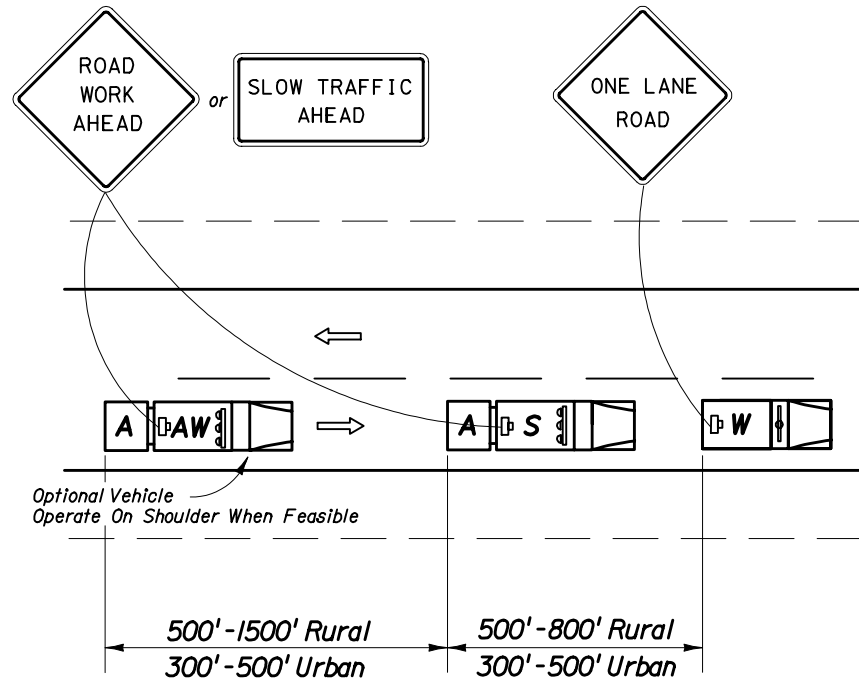
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE CENTER LANE.

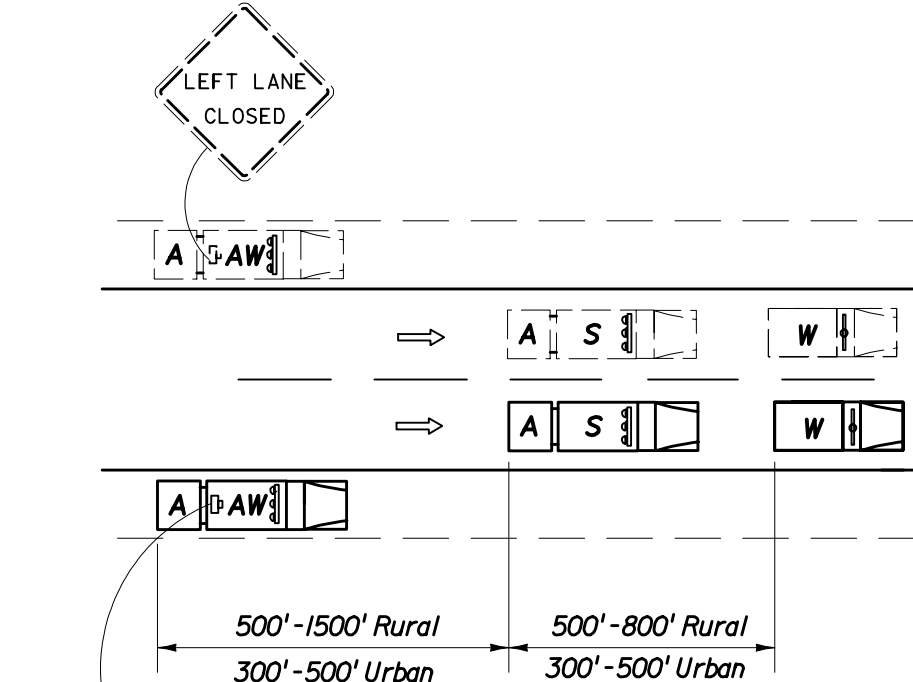
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel

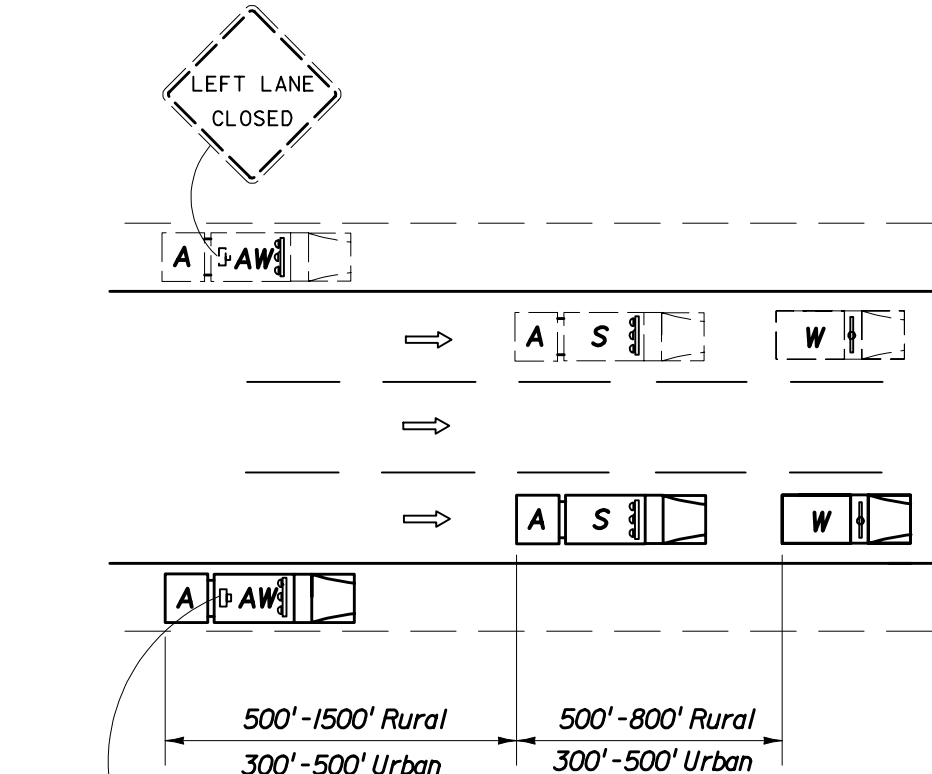
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
TRAFFIC CONTROL THROUGH WORK ZONES					
MULTILANE ONE-WAY OR MULTILANE DIVIDED WITH NON-TRAVERSABLE MEDIAN • URBAN DAY OR NIGHT OPERATIONS					
Names	Dates	Approved By			
Designed By	12/87	Roadway Design Engineer			
Drawn By	12/87	Revision	Sheet No.	Index No.	
Checked By	12/87	04	1 of 1	626	



**ADVANCE WARNING ARROW
PANEL MODE • CAUTION**



**ADVANCE WARNING ARROW
PANEL MODE • MOVE/MERGE LEFT [RIGHT]**



**ADVANCE WARNING ARROW
PANEL MODE • MOVE/MERGE LEFT [RIGHT]**

1. Shadow and Advance Warning Vehicle shall display rotating/strobe lights.
2. The Advance Warning Vehicle (Optional) may be used at the direction of the Engineer. If an Advance Warning Vehicle is operated within the travel way, an approved Truck Mounted Attenuator will be required on the Advance Warning Vehicle but not required on the Shadow Vehicle. The Advance Warning Arrow Panel and Warning Sign are required on both the Advance Warning and Shadow Vehicles.

Where adequate shoulder width is not available, the advance warning vehicle may drive in the lane.

Where adequate shoulder width is not available, the advance warning vehicle may drive in the lane.

GENERAL NOTES

1. These illustrations are representative of general conditions.
2. The intensity of light and position of panels shall be as specified in Index 600.
3. Vehicle-mounted signs shall be mounted with the bottom of the sign at a minimum height of 48 inches above the pavement. Sign legends shall be covered or turned from view when work is not in progress.
4. If the work vehicle speed exceeds the minimum legal speed limit on limited access facilities and one half the posted speed limit on other facilities the engineer in charge may delete requirements for shadow vehicle and attenuators. The work vehicle will be required to have an advance warning arrow panel and sign message.

SYMBOLS

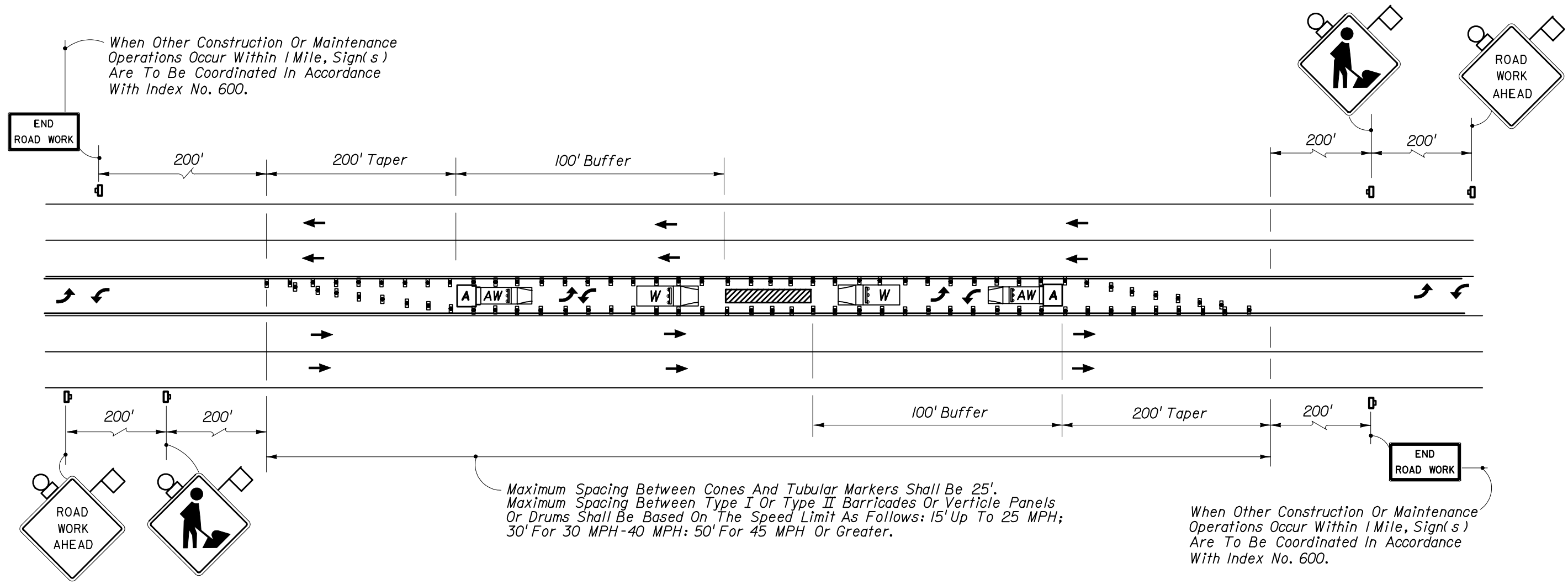
- Work Vehicle With Rotating/Strobe Lights
- Shadow (S) Or Advance Warning (AW) Vehicle with Advance Warning Arrow Panel and Sign Message
- Truck Mounted Attenuator (TMA)
- Lane Identification And Direction Of Traffic

TYPICAL APPLICATIONS

- Striping
- RPM Placement
- Vegetation Control

**CONDITIONS
MOVING OPERATION**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MOVING OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	<i>Samuel D. Mill</i> Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
			04	1 of 1 627



GENERAL NOTES

1. Work operations shall be confined to two way left turn lane, leaving the adjacent lanes open to traffic.
2. The first two warning signs, each side, shall have an 18" x 18" (min.) Orange Flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations, Type B Lights and Orange Flags are not Required.
3. Advance Warning Vehicle will have an Advanced Warning Arrow Panel in the Warning Mode.
4. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
5. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
6. For general TCZ requirements and additional information, refer to Index No. 600.

TYPICAL APPLICATIONS

Pavement Repair
Utility Work

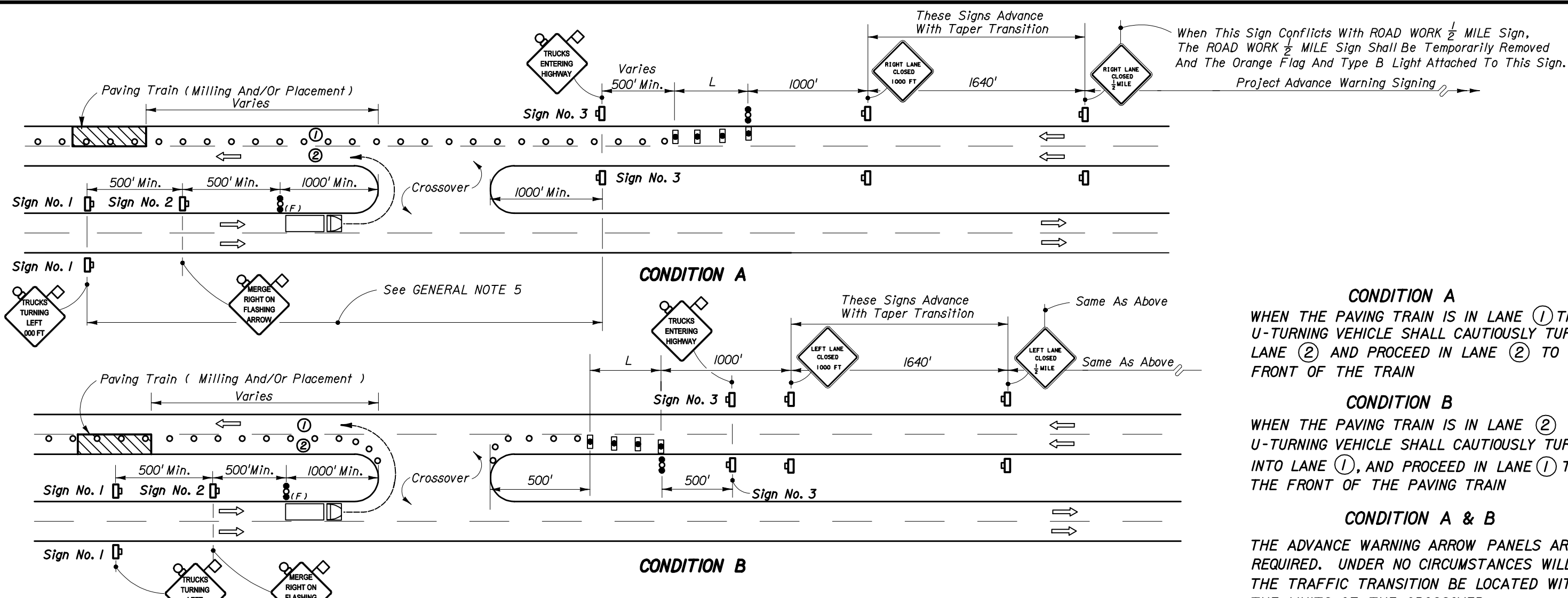
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ARE BEING CONDUCTED IN THE TWO WAY LEFT TURN LANE.

SYMBOLS

- Work Area
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign
- Work Vehicle With Flashing Beacon (optional)
- Advance Warning Vehicle Equipped With Advance Warning Arrow Panel And Truck Mounted Attenuator
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO WAY LEFT TURN LANE CLOSURE				
Designed By	Names	Dates	Approved By	
Drawn By			Roadway Design Engineer	
Checked By			Revision 04	Sheet No. 1 of 1
				Index No. 628



CONDITION A
 WHEN THE PAVING TRAIN IS IN LANE ① THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ② AND PROCEED IN LANE ② TO THE FRONT OF THE TRAIN

CONDITION B
 WHEN THE PAVING TRAIN IS IN LANE ② THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ①, AND PROCEED IN LANE ① TO THE FRONT OF THE PAVING TRAIN

CONDITION A & B
 THE ADVANCE WARNING ARROW PANELS ARE REQUIRED. UNDER NO CIRCUMSTANCES WILL THE TRAFFIC TRANSITION BE LOCATED WITHIN THE LIMITS OF THE CROSSOVER

TRAFFIC TRANSITION AREA UPSTREAM FROM CROSSOVER

CASE I

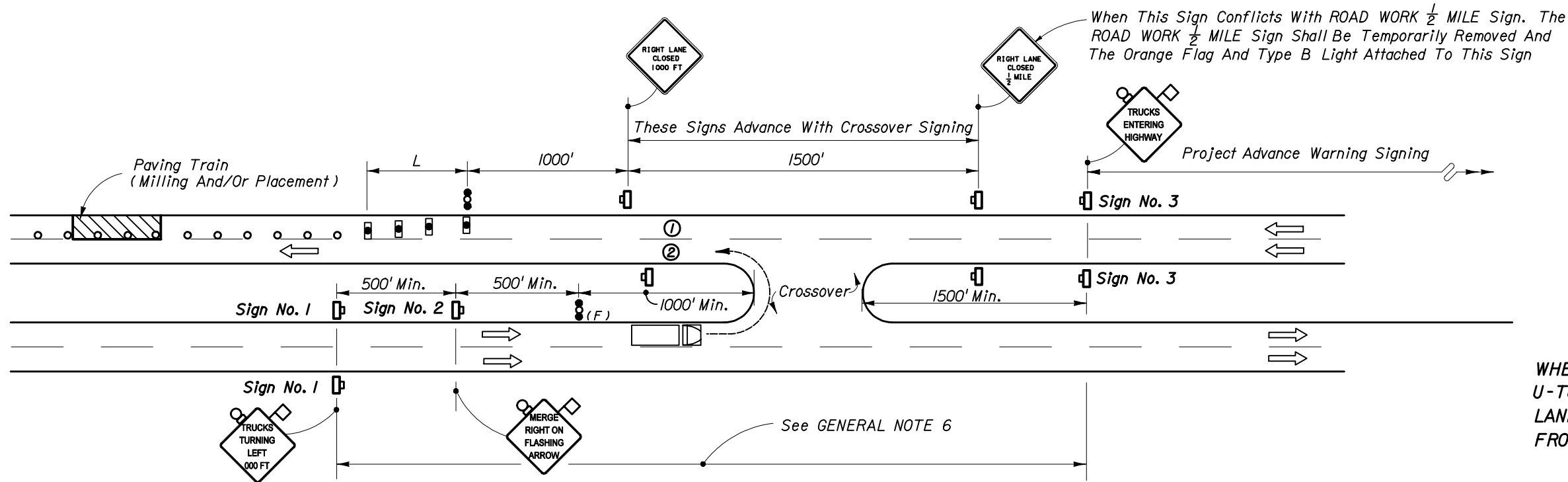
GENERAL NOTES

- When crossovers do not exist, the contractor will construct temporary crossovers in accordance with Index No. 631.
- $L =$ Length of taper in feet:
 = WS for speeds ≥ 45 mph
 = $\frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 $W =$ Width of lateral transition in feet.
 $S =$ Posted speed limit (mph).
- Within the lateral transitions, the maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater. Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' for Type I or Type II barricades or vertical panels or drums.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- For Case I, Condition A, when the median width is too narrow for trucks to make turns into Lane No. 2, Sign Nos. 1, 2, 3 and the Flagger Actuated Advance Warning Arrow Panel shall be moved ahead to a crossover in advance of the paving lane taper. Project advance warning signs (not shown) shall be located in advance of the relocated Sign No. 3.
- For Case II, Conditions A & B, when the median width is too narrow for trucks to make turns into Lane No. 2, Sign Nos. 1, 2, 3 and the Flagger Actuated Advance Warning Arrow Panel shall be moved ahead to a crossover in advance of the 'RIGHT LANE CLOSED 1/2 MILE' sign. Project advance warning signs (not shown) shall be located in advance of the relocated Sign No. 3.

SYMBOLS

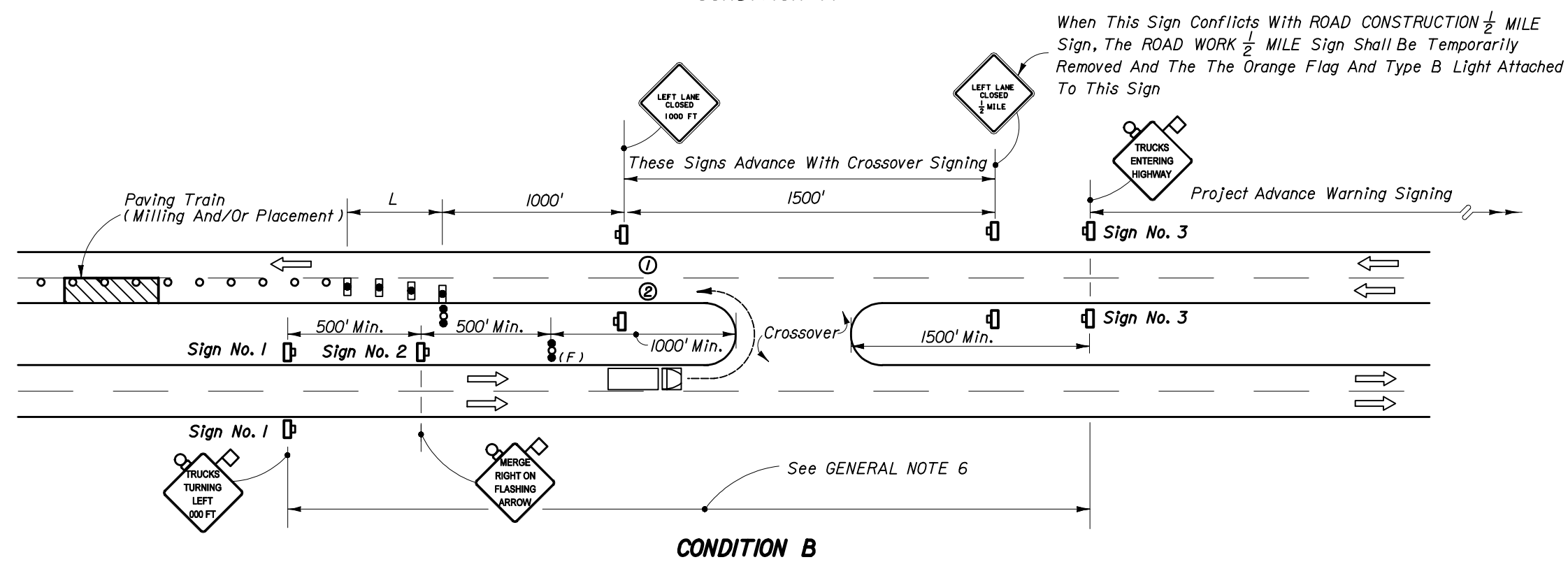
- Work Area
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- 60" x 60" Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Advance Warning Arrow Panel - Type C (48" x 96")
- Advance Warning Arrow Panel - Type C (48" x 96") Trailer Mounted And Actuated By Flagger Upon Approach Of The Work Vehicle
- Work Vehicle
- Lane Number

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
CROSSOVER FOR PAVING TRAIN OPERATIONS • RURAL				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
			04	1 of 2 630



CONDITION A

CONDITION A
 WHEN THE PAVING TRAIN IS IN LANE ① THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ② AND PROCEED IN LANE ② TO THE FRONT OF THE TRAIN



CONDITION B

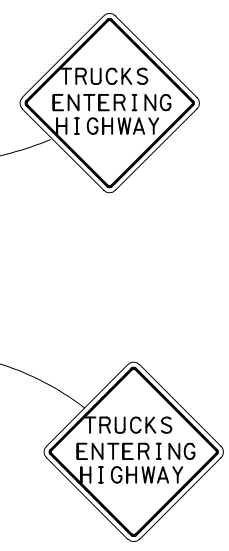
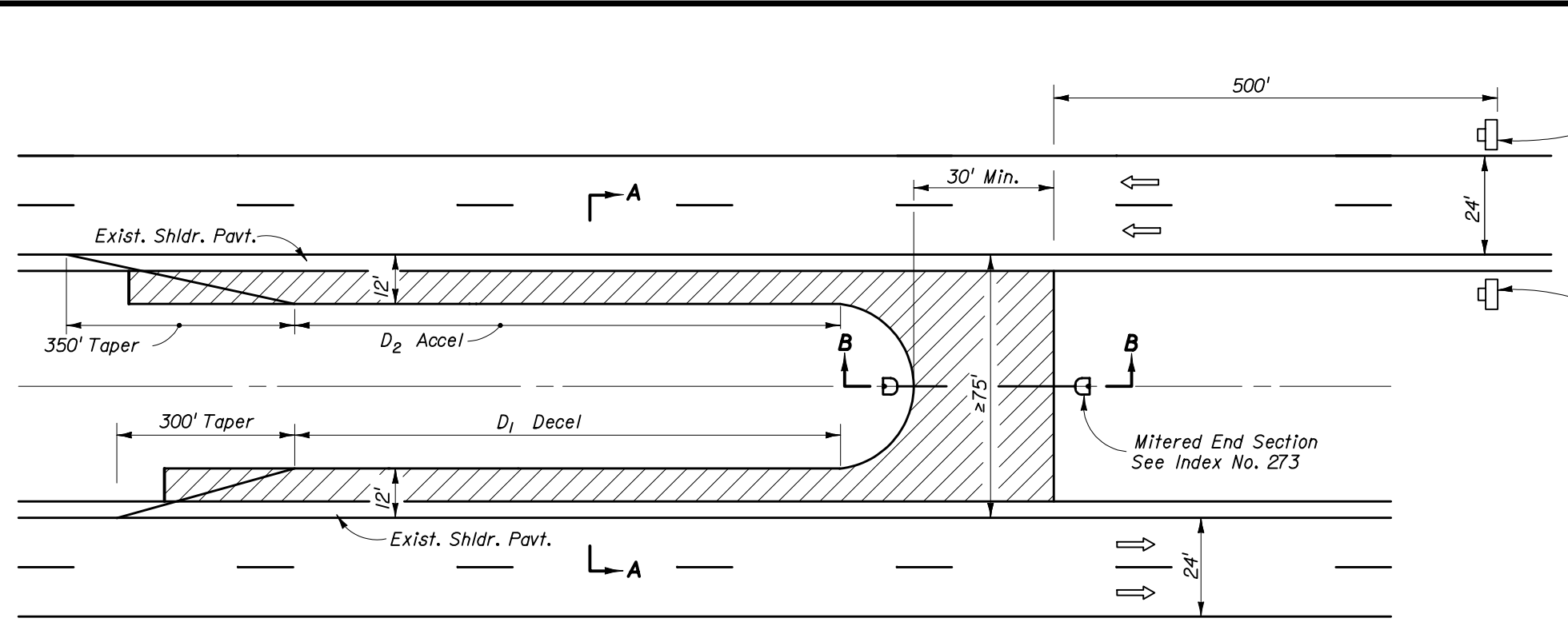
CONDITION B
 WHEN THE PAVING TRAIN IS IN LANE ② THE U-TURNING VEHICLE SHALL TURN INTO LANE ①, CAUTIOUSLY MERGE INTO LANE ① AND PROCEED TO THE FRONT OF THE PAVING TRAIN

CONDITION A & B
 THE ADVANCE WARNING ARROW PANEL IS REQUIRED. UNDER NO CIRCUMSTANCES WILL THE TRAFFIC TRANSITION BE LOCATED WITHIN THE LIMITS OF THE CROSSOVER

TRAFFIC TRANSITION AREA DOWNSTREAM FROM CROSSOVER
CASE II

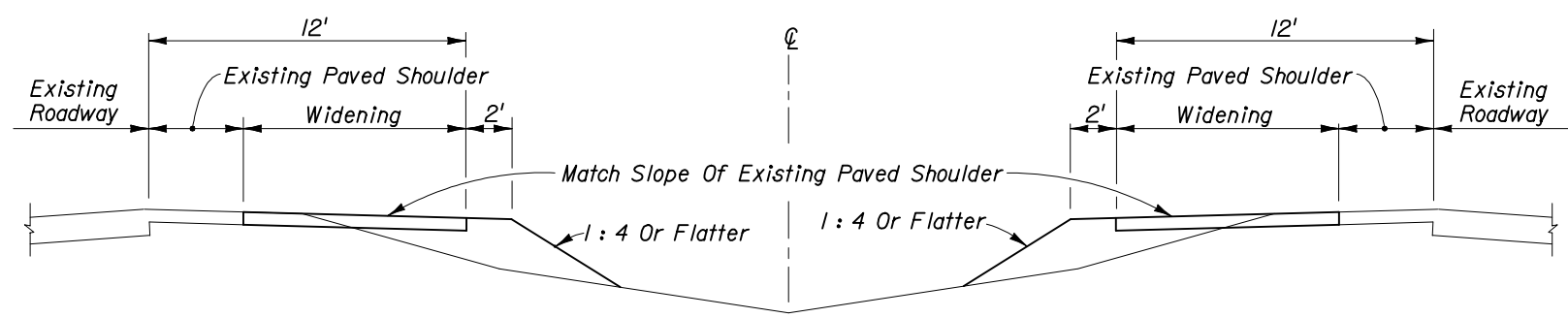
Note: See Sheet 1 of 2 For General Notes, Sign No. Details, And Conditions.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
CROSSOVER FOR PAVING TRAIN OPERATIONS • RURAL				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No.
			04	2 of 2
				Index No.
				630

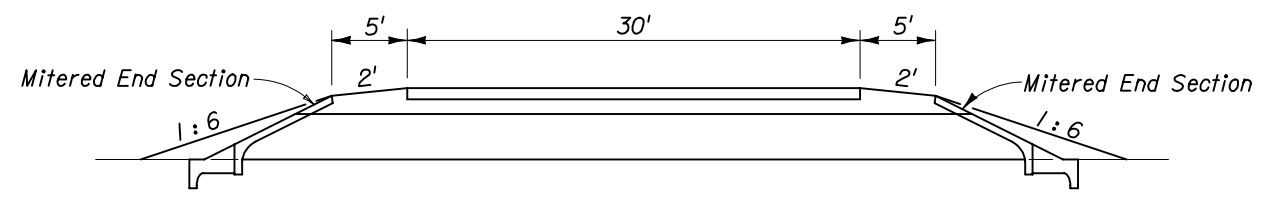


LENGTH OF ACCESS LANES (Ft.)		
Grade	D ₁	D ₂
2% or less	590'	1540'
3 to 4% Upgrade	530'	2310'
3 to 4% Downgrade	710'	925'

PLAN



SECTION AA



SECTION BB

GENERAL NOTES

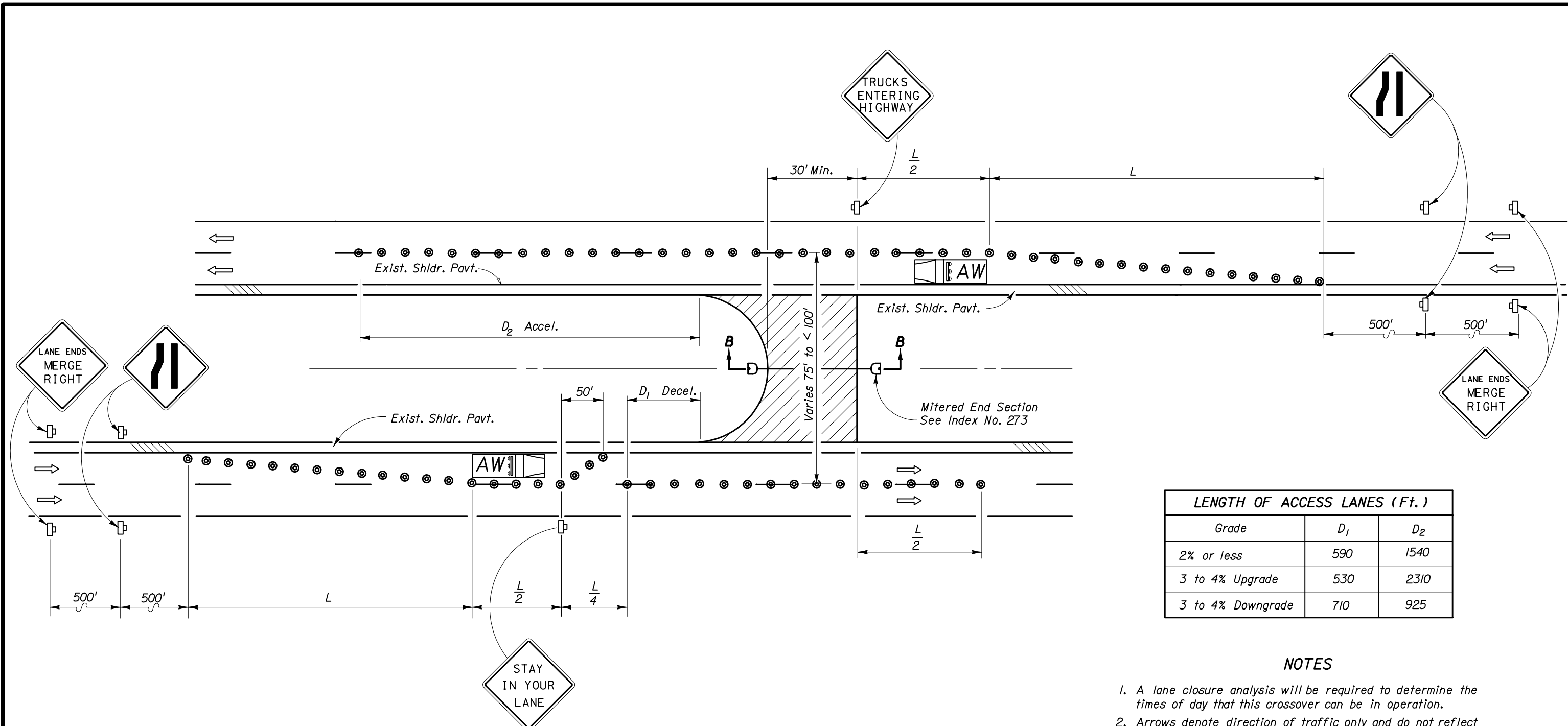
1. Temporary median crossovers shall be within the project limits and shall not be used for transporting materials to or from any other project. The acceleration-deceleration surfaces shall be paved. RAP material is acceptable for crossing surfacing.
2. Temporary median crossovers shall be located only in areas having adequate sight distance. On limited access facilities temporary median crossovers shall not be located within 1.5 miles of interchanges nor within 2000 ft. of acceleration-deceleration lanes at rest areas, other access openings or other highway service areas.
3. For paving train operations at permanent crossovers, see Index No. 630.
4. All traffic control devices are to be removed when crossover will not be in use for one hour or longer.
5. Trailer mounted advance warning panel may be used in lieu of advance warning vehicle.
6. When a crossover is no longer needed, all temporary construction shall be immediately removed and the area restored to its original condition.
7. Cost of construction, maintenance, removal and restoration work related to temporary crossovers shall be included in the contract unit price for Maintenance of Traffic, LS.

SYMBOLS

Work Zone Sign

TEMPORARY CROSSOVER FOR MEDIAN WIDTHS ≥ 75'

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TEMPORARY CROSSOVER				
Names	Dates	Approved By <i>James D. Mill</i>		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	631



LENGTH OF ACCESS LANES (Ft.)		
Grade	D_1	D_2
2% or less	590	1540
3 to 4% Upgrade	530	2310
3 to 4% Downgrade	710	925

NOTES

1. A lane closure analysis will be required to determine the times of day that this crossover can be in operation.
2. Arrows denote direction of traffic only and do not reflect pavement markings.

SYMBOLS

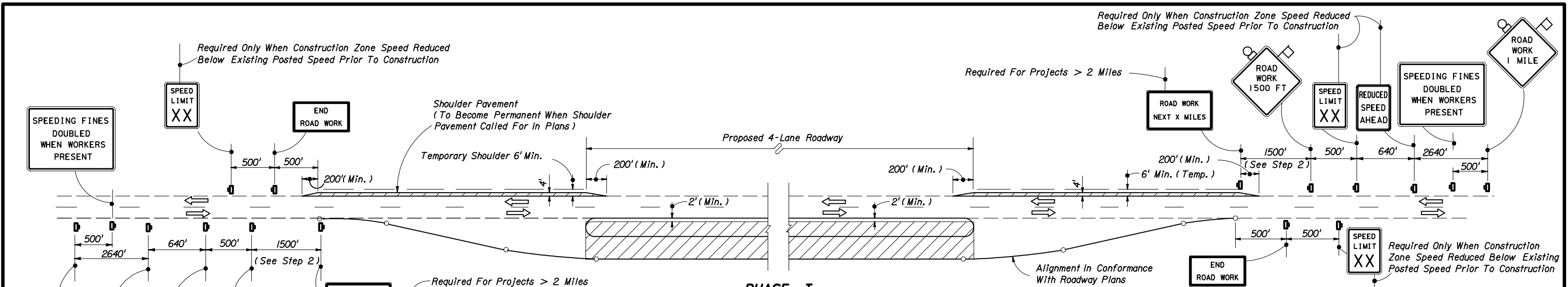
- Work Area, Hazard Or Work Phase (Any Pattern Within A Boundary)
- Work Zone Sign
- Cone Or Tubular Marker
- Advance Warning Vehicle

Maximum Spacing Between Cones And Tubular Markers Shall Be 25'

L (Min.) = WS
 S = Existing Posted Speed (MPH)

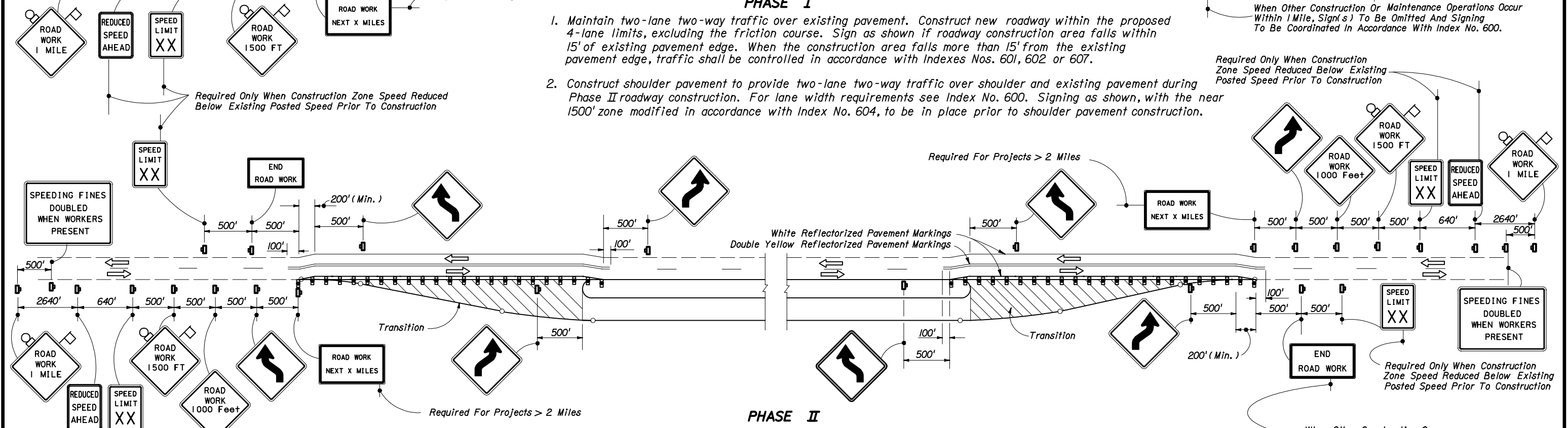
TEMPORARY CROSSOVER FOR MEDIAN WIDTHS FROM 50' TO <75'

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TEMPORARY CROSSOVER				
Designed By	Names	Dates	Approved By	
Drawn By			Roadway Design Engineer	
Checked By			Revision	Sheet No. Index No.
			00	2 of 2 631



PHASE I

1. Maintain two-lane two-way traffic over existing pavement. Construct new roadway within the proposed 4-lane limits, excluding the friction course. Sign as shown if roadway construction area falls within 15' of existing pavement edge. When the construction area falls more than 15' from the existing pavement edge, traffic shall be controlled in accordance with Indexes Nos. 601, 602 or 607.
2. Construct shoulder pavement to provide two-lane two-way traffic over shoulder and existing pavement during Phase II roadway construction. For lane width requirements see Index No. 600. Signing as shown, with the near 1500' zone modified in accordance with Index No. 604, to be in place prior to shoulder pavement construction.



PHASE II

1. Remove existing pavement marking, in areas of diversion and re-mark as shown, install warning devices and re-sign as shown. Traffic to be controlled in accordance with Index No. 606. For lane width requirements see Index No. 600.
2. Route through traffic to temporary and existing pavement.
3. Construct transitions, excluding friction course.

SYMBOLS

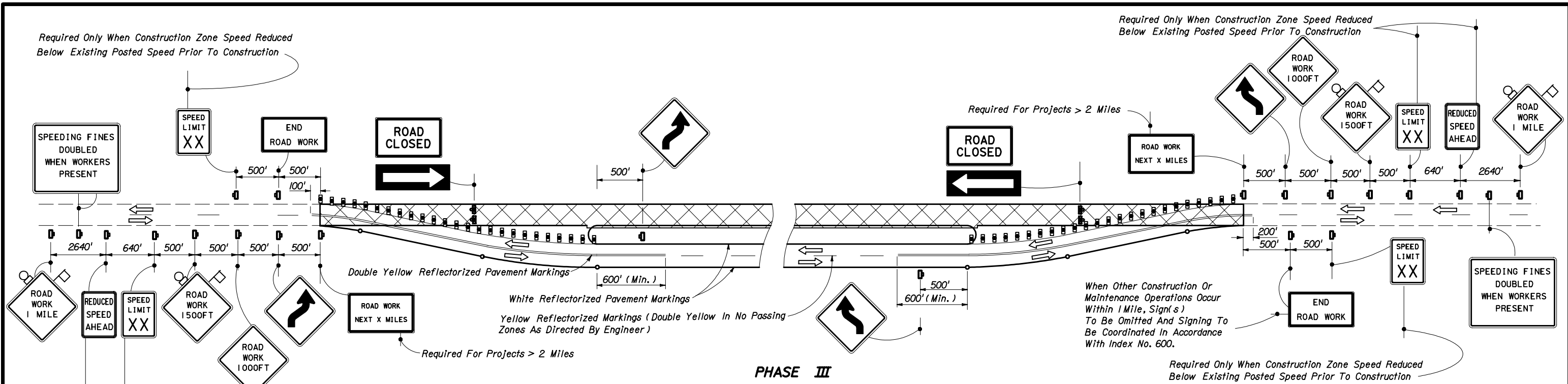
- ◊ Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- ▣ Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
- ▣ Work Zone Sign

LEGEND

- ▨ Phase I Construction
- ▩ Phase II Construction
- ▧ Phase III Construction

Note: See Sheet 2 for General Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
CONVERTING TWO LANES TO FOUR LANES DIVIDED • RURAL				
Names	Dates	Approved By <i>Samuel D. Mill</i>		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	1 of 2	640



PHASE III

1. Remove temporary marking from the existing pavement and temporary shoulder pavement. Mark pavement, install warning devices and re-sign as shown. Traffic to be controlled in accordance with Index No. 606. For lane width requirements see Index No. 600.
2. Route through traffic to newly constructed roadway.
3. Resurface or reconstruct existing pavement including required shoulder pavement and friction course.

PHASE IV

1. Reroute through traffic as shown in Phase II. Signing to be as shown in Phase II.
2. Construct friction course over pavement constructed in Phases I and II.

GENERAL NOTES

1. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
2. Existing signs and pavement markings that conflict with construction signing and marking shall be obliterated or removed.
3. Lane widths for maintenance of two-way traffic should desirably be equal to lane widths of the existing facility, but lanes shall be not less than 10' in width. When one-lane one-way operations are necessary, a minimum width of 12' shall be maintained and traffic controlled in accordance with Indexes Nos. 603 604 606 and 607. Minimum width for the temporary shoulders is 6'.
4. Within the lateral transitions, the maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30'-40 MPH; 50' for 45 MPH or greater.

The maximum spacing between warning devices used for delineation between the travel way and construction area to be 50' for Type I or Type II barricades or vertical panels or drums.
5. Warning devices shall be in conformance with 'Dropoffs In Work Zones' Index No. 600.
6. For speed sign applications, see 'Regulatory Speed In Work Zones' Index No. 600.
7. For reflectorized raised pavement marker applications, see 'Pavement Markers' Index No. 600 and Index No. 17352.
8. Additional barricades, signing lighting or other traffic controls shall be provided for limited work areas in accordance with other applicable TCZ Indexes.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
12. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
13. For general TCZ requirements and additional information refer to Index No. 600.

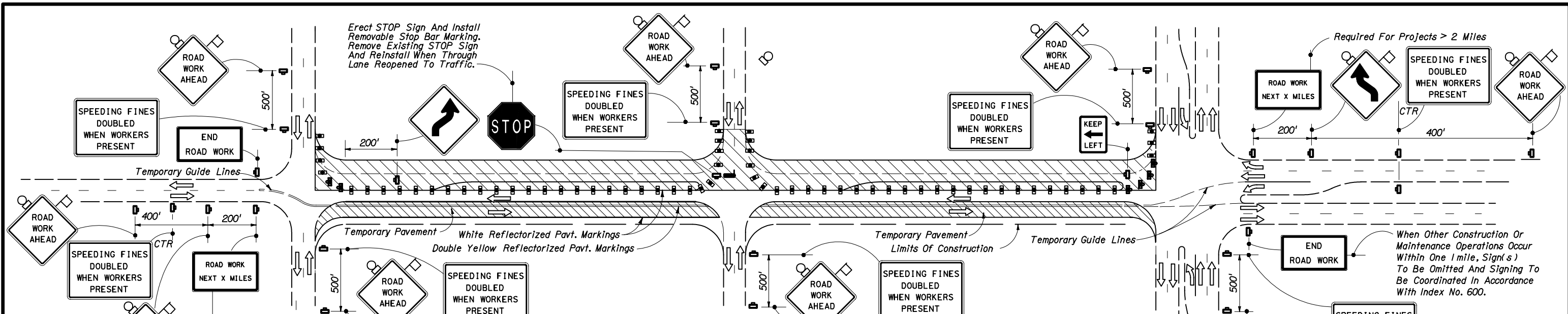
SYMBOLS

- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Type III Barricade (With Flashing Light)
- Work Zone Sign

LEGEND

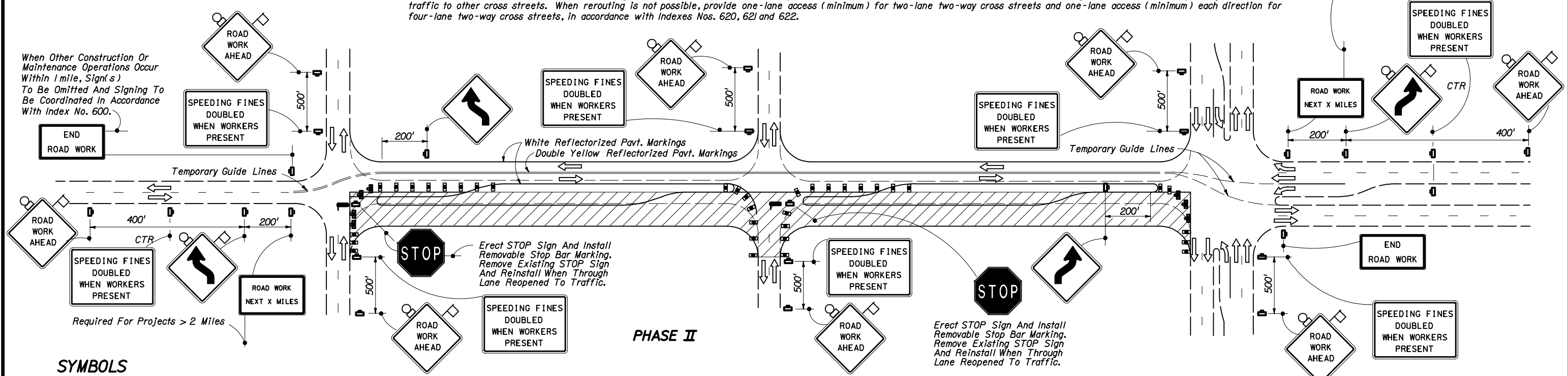
- Phase I Construction
- Phase II Construction
- Phase III Construction

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
CONVERTING TWO LANES TO FOUR LANES DIVIDED • RURAL				
Designed By	Names	Dates	Approved By	
Drawn By			Roadway Design Engineer	
Checked By	Revision	Sheet No.	Index No.	
	04	2 of 2	640	



PHASE I

1. Maintain two-lane two-way traffic along existing facility. Install construction signing.
2. Remark existing pavement to facilitate temporary pavement construction. For lane width requirements see Index No. 600.
3. Construct temporary pavement of sufficient width to accommodate two-lane two-way traffic on the temporary pavement and a portion of the existing pavement during Phase I roadway construction. When two-lane two-way traffic can not be maintained during temporary pavement construction one-lane operations shall be maintained in accordance with Index No. 621. Channelizing devices shall be in conformance with 'Dropoffs in Work Zones' of Index No. 600.
4. Mark the pavement in accordance with the Phase I diagram. Reroute through traffic to the temporary pavement and a portion of the existing pavement. For lane width requirements see Index No. 600.
5. Construct two lanes of the proposed roadway, excluding the friction course. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Indexes Nos. 620, 621 and 622. Barricading shall be in conformance with 'Dropoffs in Work Zones', Index No. 600. When work extends through an intersection, temporarily reroute the cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane access (minimum) each direction for four-lane two-way cross streets, in accordance with Indexes Nos. 620, 621 and 622.



PHASE II

1. Sign and mark Phase I pavement in accordance with the Phase II diagram. For lane width requirements see Index No. 600.
2. Reroute through traffic to Phase I pavement.
3. Complete all Phase II construction, including the friction course. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Indexes Nos. 620, 621 and 622. Channelizing devices shall be in conformance with 'Dropoffs in Work Zones' of Index No. 600. When work extends through an intersection, temporarily reroute cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane access (minimum) each direction for four-lane two-way cross streets, in accordance with Indexes Nos. 620, 621 and 622.

SYMBOLS

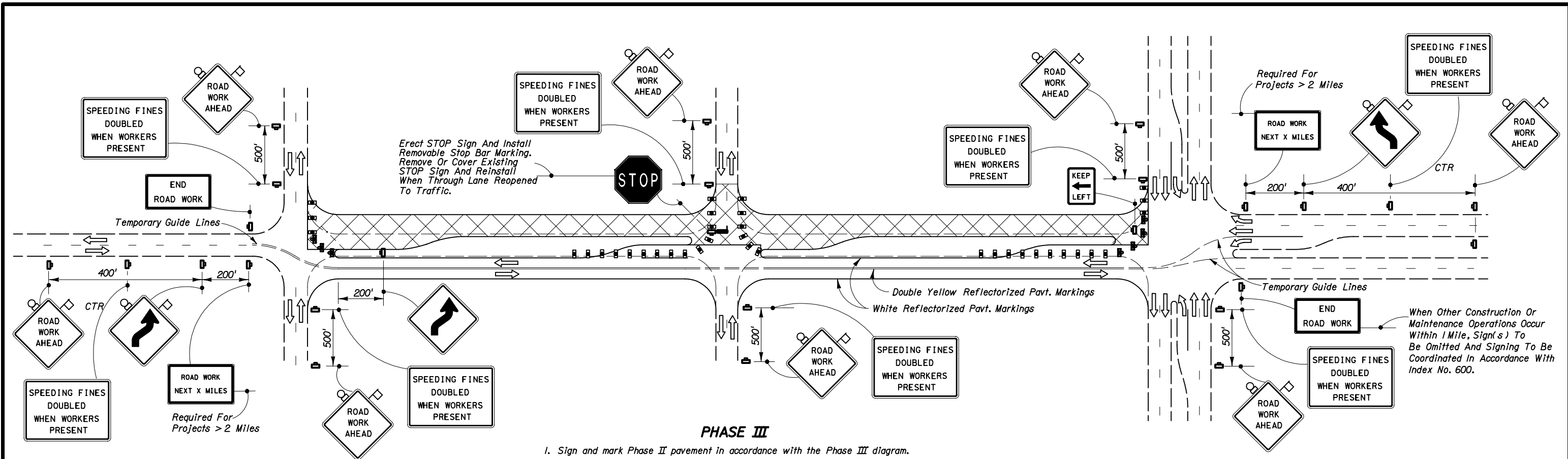
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
- Type III Barricade (With Flashing Light)
- Work Zone Sign
- Stop Bar

LEGEND

- Phase I Construction
- Phase II Construction
- Phase III Construction

See Sheet 2 for General Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
CONVERTING TWO LANES TO FOUR LANES DIVIDED • URBAN				
Designed By	Names	Dates	Approved By	
Drawn By		08/79	Roadway Design Engineer	
Checked By		08/79	Revision	Sheet No.
			04	1 of 2
				Index No. 641



PHASE III

1. Sign and mark Phase II pavement in accordance with the Phase III diagram.
2. Reroute through traffic to Phase II pavement.
3. Construct friction course over Phase I pavement. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Indexes Nos. 620, 621 or 622. When work extends through an intersection, temporarily reroute cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane access (minimum) each direction for four-lane two-way cross streets.

GENERAL NOTES

1. All signing, pavement marking, barricades and warning lights necessary for maintenance of traffic shall conform to Index No. 600.
2. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
3. Lane widths for maintenance of two-way traffic should desirably be equal to lane widths of the existing facility, but lanes shall not be less than 10' in width. When one-lane one-way operations are necessary, a minimum width of 12' should be maintained and traffic controlled in accordance with Indexes Nos. 620, 621 or 622.
4. At signalized intersections, signals shall be directed or relocated as required to the center of relocated lanes.
5. For reflectORIZED raised pavement marker application see Index No. 600 and Index No. 17352.
6. Additional barricades, signing, lighting or other traffic controls for limited work areas shall be provided in accordance with other applicable TCZ Indexes as conditions warrant in each phase.
7. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. For general TCZ requirements and additional information refer to Index No. 600.

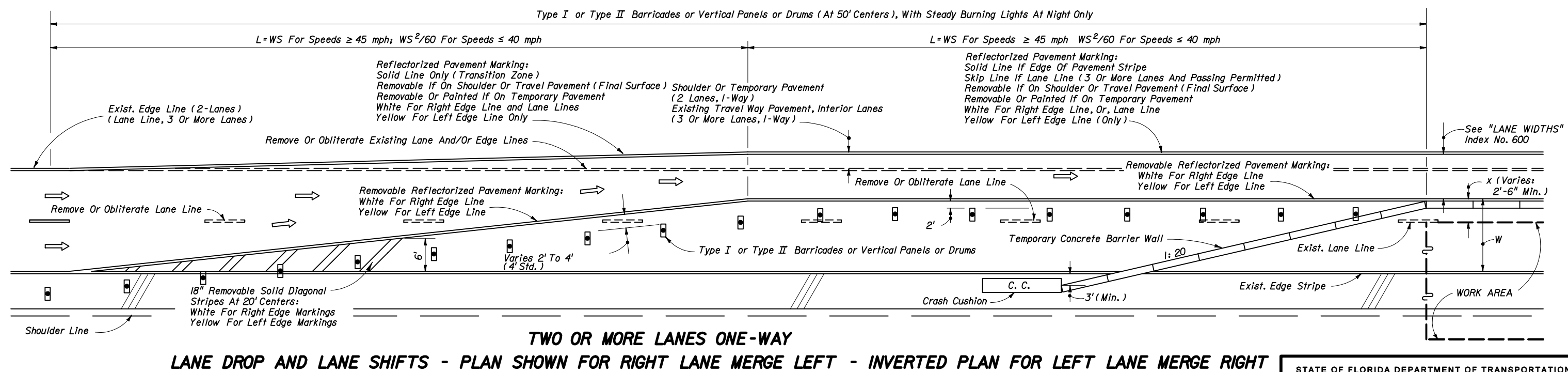
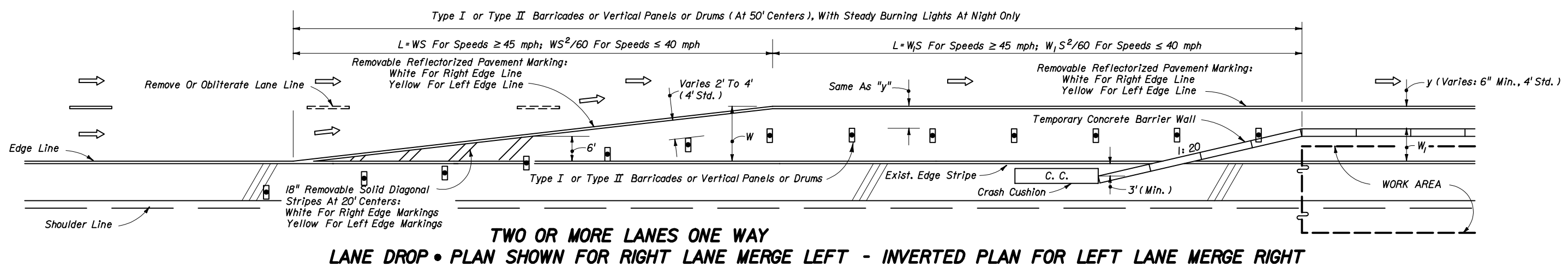
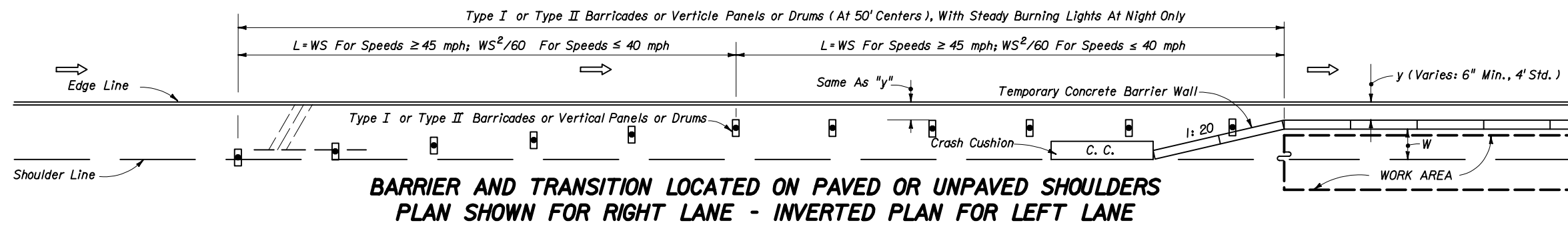
SYMBOLS

- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Tubular Markers May Be Used During Daylight Only.
- Type III Barricade (With Flashing Light)
- Work Zone Sign
- Stop Bar

LEGEND

- Phase I Construction
- Phase II Construction
- Phase III Construction

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
CONVERTING TWO LANES TO FOUR LANES DIVIDED • URBAN				
Designed By	Names	Dates	Approved By <i>James D. Mill</i>	
Drawn By		08/79	Roadway Design Engineer	
Checked By		08/79	Revision	Sheet No. Index No.
			04	2 of 2 641



GENERAL NOTES

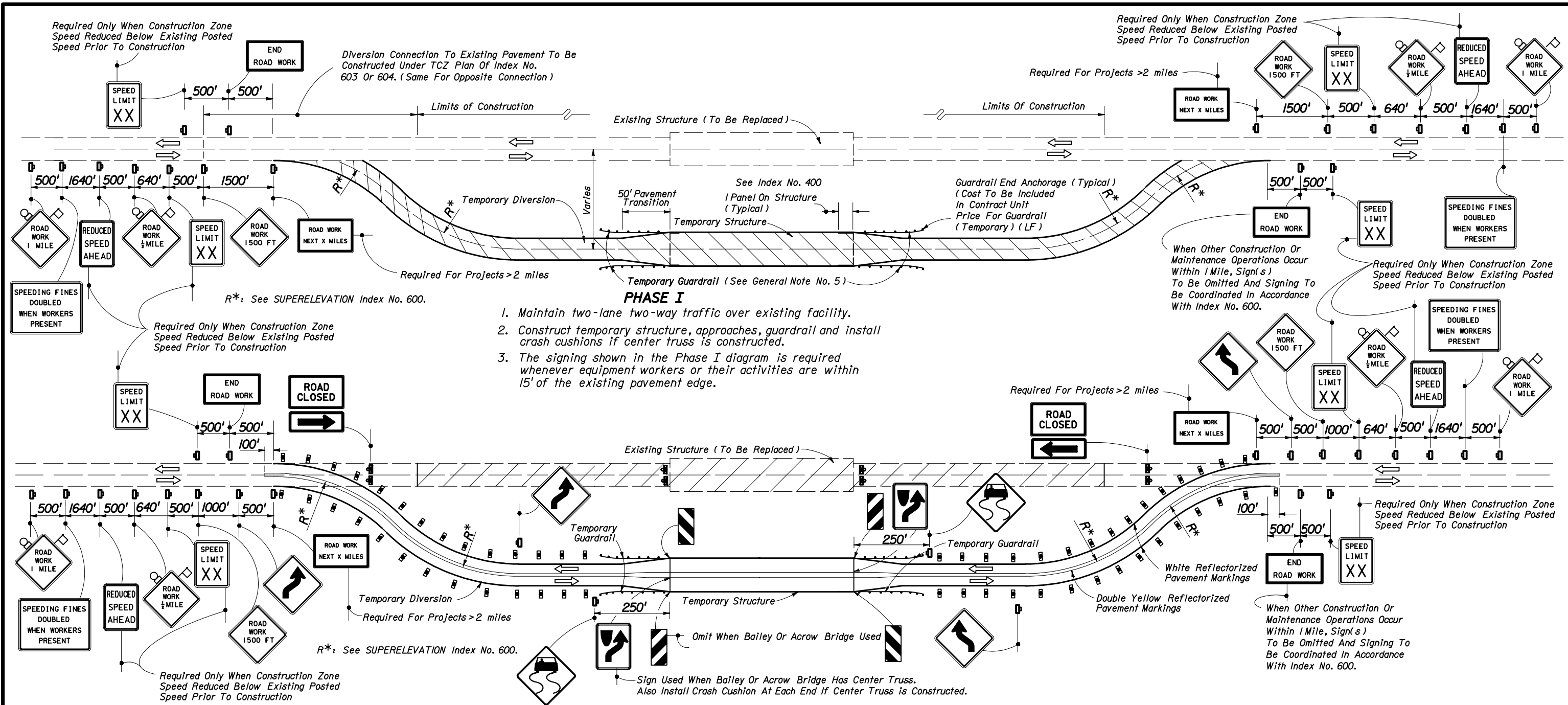
1. Arrows denote direction of traffic only and do not reflect pavement markings.
2. For signing information see the Plans, Specifications, MUTCD and other TCZ Standards.
3. Where W=width of lateral transition in feet, S=posted speed limit.

TRANSITIONS FOR TEMPORARY CONCRETE BARRIER WALL ON FREEWAY FACILITIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**TRANSITIONS FOR TEMPORARY
CONCRETE BARRIER WALL ON
FREEWAY FACILITIES**

Names	Dates	Approved By			
Designed By	4/89	<i>James D. Mill</i> Roadway Design Engineer	Revision	Sheet No.	Index No.
Drawn By	4/89		04	1 of 1	642
Checked By	4/89				



- SYMBOLS**
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
 - Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
 - Type III Barricade (With Flashing Light)
 - Work Zone Sign

- PHASE I**
1. Maintain two-lane two-way traffic over existing facility.
 2. Construct temporary structure, approaches, guardrail and install crash cushions if center truss is constructed.
 3. The signing shown in the Phase I diagram is required whenever equipment workers or their activities are within 15' of the existing pavement edge.

- PHASE II**
1. Re-sign and mark as shown in Phase II plan.
 2. Reroute traffic to diversion and maintain two-way traffic on diversion. Install Type III barricades.
 3. Construct proposed structure and reconstruct or resurface existing approaches.

PHASE III (See Sheet 2 of 2)
GENERAL NOTES (See Sheet 2 of 2)

LEGEND

	Phase I
	Phase II


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
TRAFFIC CONTROL THROUGH WORK ZONES					
TWO-LANE, TWO-WAY • RURAL STRUCTURE REPLACEMENT					
Designed By	Names	Dates	Approved By		
Drawn By		08/79		Roadway Design Engineer	
Checked By	Revision	08/79	04	Sheet No.	Index No.
				1 of 2	650

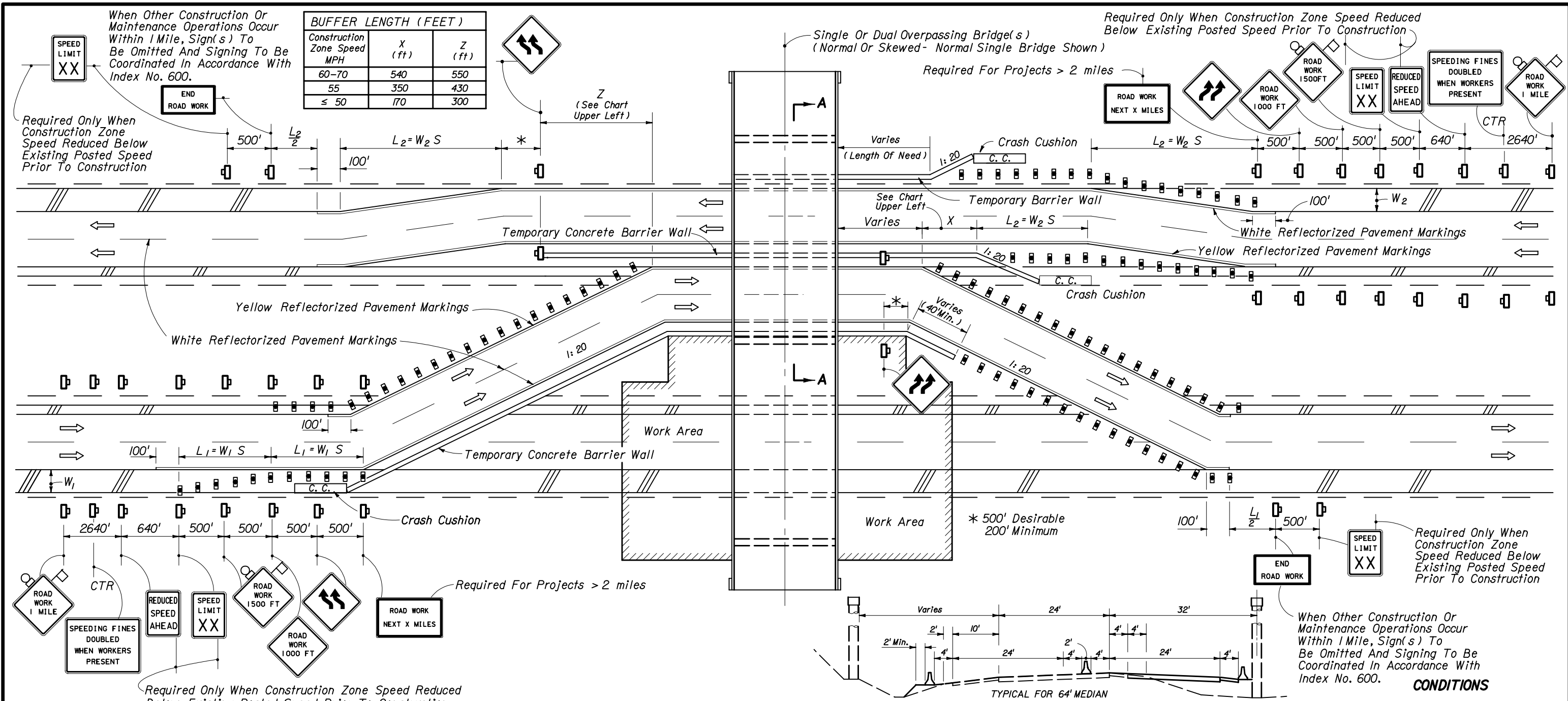
PHASE III

1. Reroute traffic to final alignment and maintain two-way traffic.
2. Remove all temporary construction items.

GENERAL NOTES

1. All signing, pavement marking, barricades and warning lights necessary for maintenance of traffic shall conform to Index No. 600.
2. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
3. For speed sign applications see Index No. 600.
4. For lane width requirements see Index No. 600. When one-way one-lane operations are necessary, a minimum width of 12' shall be maintained and traffic controlled in accordance with Indexes Nos. 603, 604, 606, 607 or 608. Minimum width for the diversion shoulders is 6'.
5. Method of attaching temporary guardrail to the diversion structure to be approved by the Engineer. Cost of temporary guardrail systems, including end anchorage assemblies, transitions and attachment to temporary structures, are to be included in the contract unit price for Guardrail (Temporary) LF.
6. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
7. Only temporary crash cushions approved by the Department shall be used unless specified devices called for in the plans.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. Where the temporary structure is not required the diversion may be constructed in accordance with Index No. 609, unless otherwise stipulated in the plans.
11. For reflective raised pavement marker application see Index No. 600 and Index No. 17352.
12. For general TCZ requirements and additional information refer to Index No. 600.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL STRUCTURE REPLACEMENT				
	Names	Dates	Approved By	
Designed By		08/79	 Roadway Design Engineer	
Drawn By		08/87	Revision	Sheet No. Index No.
Checked By		08/79	04	2 of 2 650



BUFFER LENGTH (FEET)		
Construction Zone Speed MPH	X (ft)	Z (ft)
60-70	540	550
55	350	430
≤ 50	170	300

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Required For Projects > 2 miles

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

- SYMBOLS**
- Work Area
 - Sign With 18" x 18" (Min.) Orange Flag And Type B Light
 - Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
 - Work Zone Sign

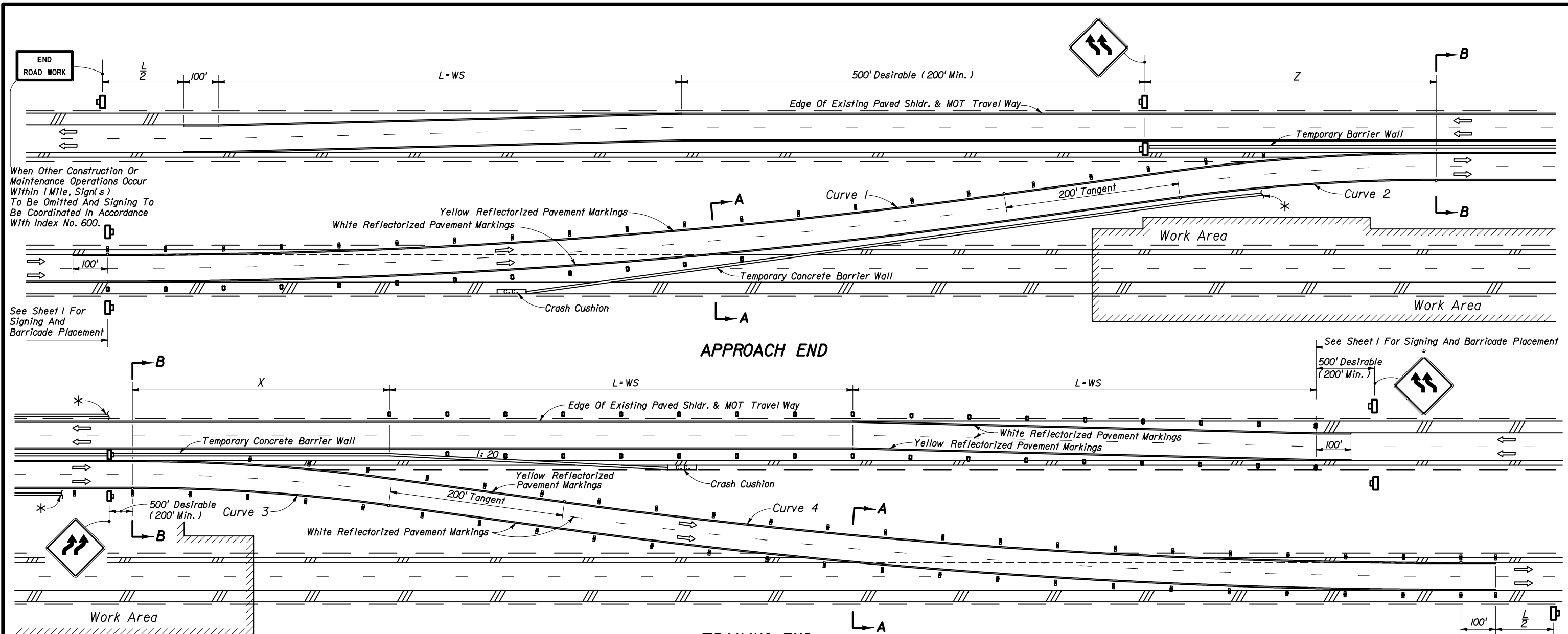
- GENERAL NOTES**
- All vehicles, equipment, workers and their activities are restricted at all times to one side of the highway.
 - The first two warning signs, each side, shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 - All signs shall be post mounted.
 - S = Posted speed limit (mph).
 - Within the lateral transitions, the maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater. Barricades, vertical panels, and drums shall not be intermixed in lateral transitions.
 - For speed sign applications see 'Regulatory Speed in Work Zones' Index No. 600.

- All existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and new pavement markings used for marking edge lines and lane lines.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When side roads, cross roads or interchanges are located within the limits for work zone traffic control additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF ONE ROADWAY AND THE OPPOSING ROADWAY IS CONVERTED TO TEMPORARY TWO-WAY TRAVEL BY WAY OF CROSSOVERS

TYPICAL FOR 64' MEDIAN SECTION AA

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED MAINTENANCE AND CONSTRUCTION				
Designed By	Names	Dates	Approved By	
Drawn By		10/89		
Checked By		10/89	Revision	Sheet No.
			00	1 of 2
				Index No.
				651



When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

See Sheet 1 For Signing And Barricade Placement

See Sheet 1 For Signing And Barricade Placement

* Length of barrier wall needed for protection of work area and/or other hazards to be shown in the plans. For complimentary information on barrier walls and work area see Sheet 1. See Index No. 600 for clear zone requirements.

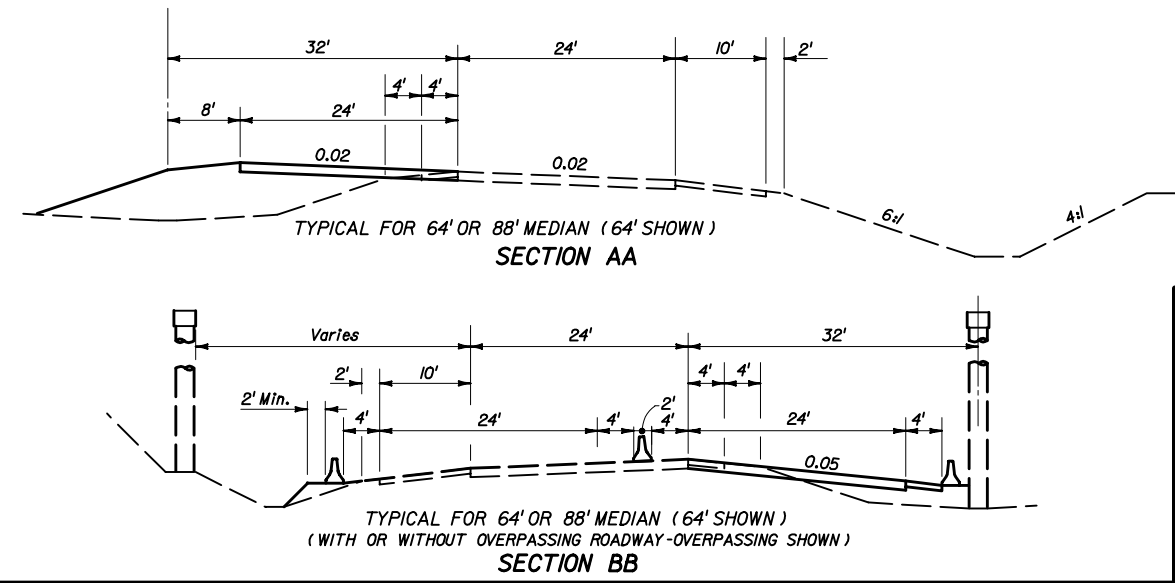
When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

TRAILING END CURVILINEAR ALIGNMENT CROSSOVER

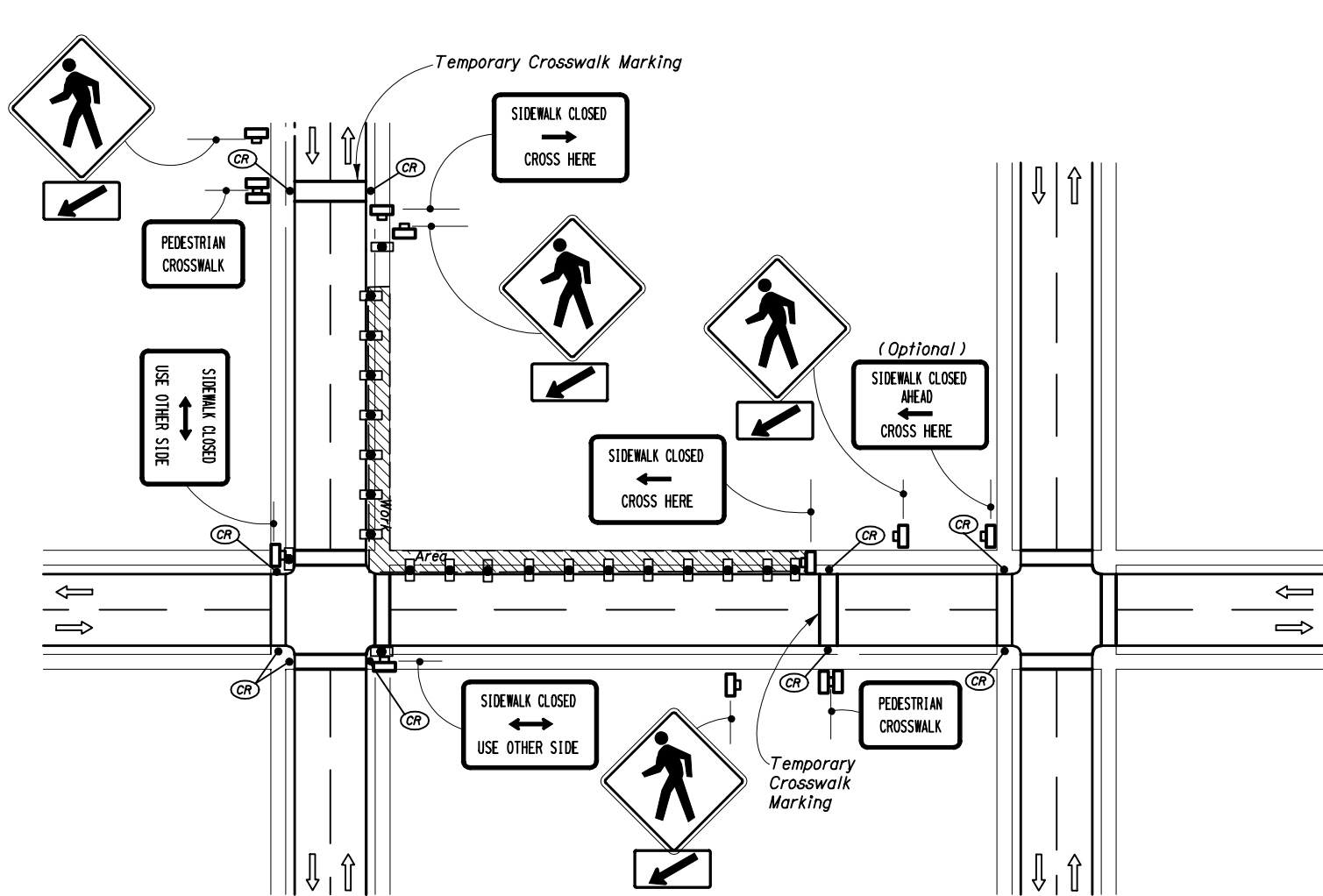
Construction Zone Speed MPH	BUFFER LENGTH (ft)			
	64' Median		88' Median	
	X	Z	X	Z
70	607	588	582	545
65	581	562	552	514
60	562	543	531	492
55	337	369	330	350
50	201	286	200	276
45	115	164	115	163
40	104	149	104	148
35	91	134	91	132
30	78	118	78	115

Construction Zone Speed MPH	MINIMUM RADII FOR NORMAL CROSS SLOPES	
	Minimum Radius (ft) R	
	Curves 1 & 4	Curves 2 & 3
70	22,918 (0° 15')	4,584 (1° 15')
65	22,918 (0° 15')	3,820 (1° 30')
60	22,918 (0° 15')	3,274 (1° 45')
55	11,459 (0° 30')	2,546 (2° 15')
50	11,459 (0° 30')	2,292 (2° 30')
45	1,080 (5° 18')	700 (8° 11')
40	830 (6° 54')	550 (10° 25')
35	620 (9° 14')	410 (13° 58')
30	450 (12° 44')	285 (20° 06')

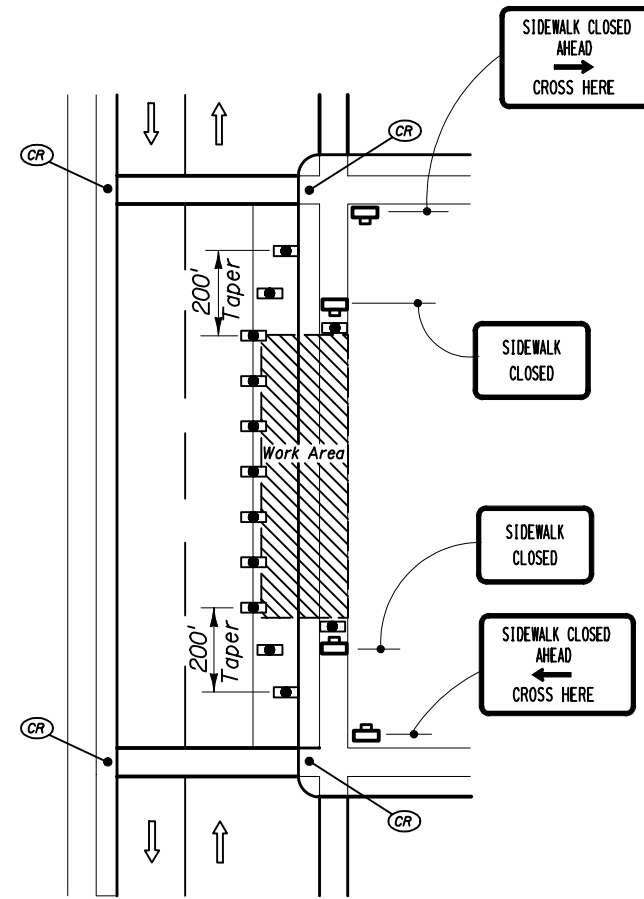
NOTE: Diversions with speeds of 50 mph or greater are considered high speed facilities; curvature and superelevation criteria for open highway conditions apply.



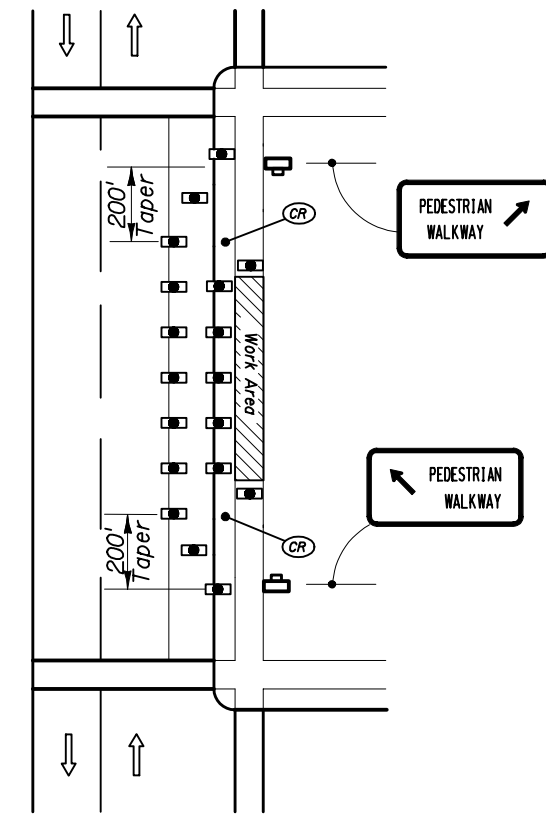
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED MAINTENANCE AND CONSTRUCTION				
Names	Dates	Approved By		
Designed By		Samuel D. Hill Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 2	651



CORNER SIDEWALK CLOSURE WITH TEMPORARY CROSSWALKS



MID-BLOCK SIDEWALK CLOSURE



MID-BLOCK SIDEWALK CLOSURE WITH TEMPORARY WALKWAY

GENERAL NOTES

- Arrows denote direction of traffic only and do not reflect pavement markings.
- Only the signs controlling pedestrian flows are shown. Other work zone signs will be needed to control traffic on the streets.
- For spacing of traffic control devices and general TCZ requirements refer to Index No. 600. Maximum spacing between barricades, vertical panels, drums or tubular markers shall not be greater than 25'.
- Street lighting should be considered.
- For nighttime closures use Type A flashing warning lights on barricades supporting signs and closing sidewalks. Use Type C steady-burn lights on channelizing devices separating the work area from vehicular traffic.
- Pedestrian traffic signal display controlling closed crosswalks shall be covered or deactivated.
- Post Mounted Signs located near or adjacent to a sidewalk shall have a 7' minimum clearance from the bottom of sign to the sidewalk.

- When construction activities involve sidewalks on both sides of the street, efforts should be made to stage the construction so that both sidewalks are not out of service at the same time.
- In the event that sidewalks on both sides of the street are closed, then pedestrians shall be guided around the construction zone.
- Temporary walkways shall be a minimum of 4' wide with a maximum 0.02 cross slope and a maximum 0.05 running slope between ramps. Temporary walkways less than 5' in width shall provide for a 5' x 5' passing space at intervals not to exceed 200'. Temporary ramps shall meet the requirements for curb ramps specified in Index No. 304, General Notes 1 through 7. Temporary walkway surfaces and ramps shall be stable, firm, slip resistant, and kept free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials, etc.
- Temporary ramps and temporary crosswalk markings shall be removed with reopening of the sidewalk, unless otherwise noted in the plans. All work and materials associated with constructing temporary curb ramps and temporary crosswalk markings, removal and disposal of temporary curb ramps and temporary crosswalk markings, and restoration to original condition shall be paid for as Maintenance of Traffic, Lump Sum.

TYPICAL APPLICATIONS

Sidewalk Repair
Pavement Widening
Utility Work

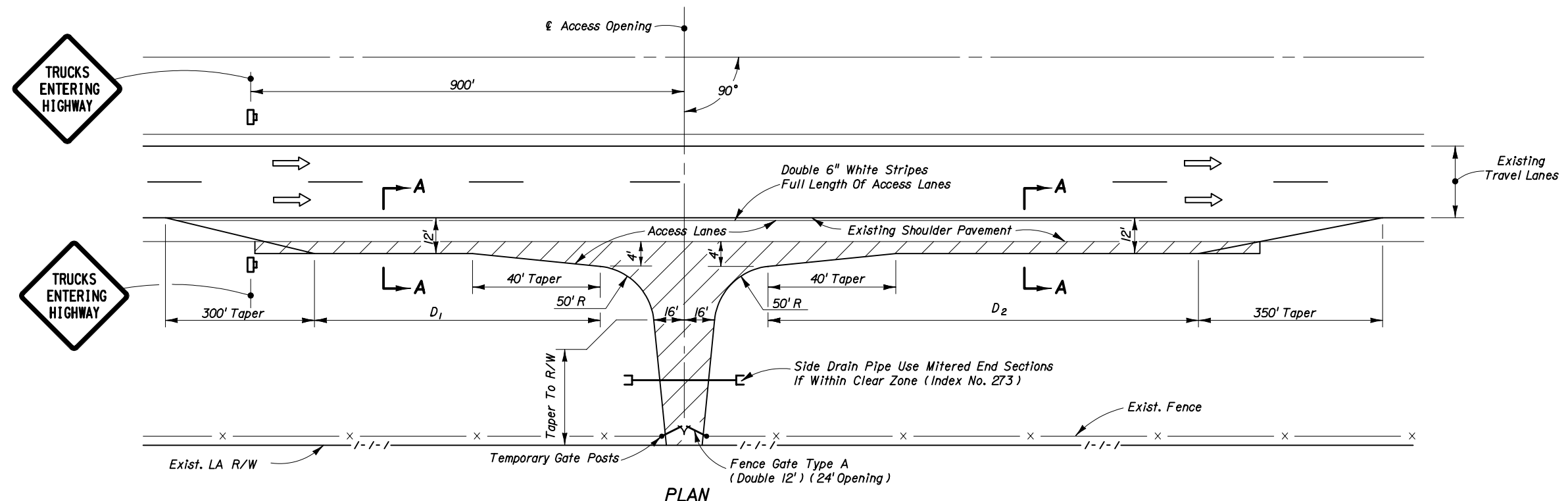
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCROACH ON THE SIDEWALK FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS

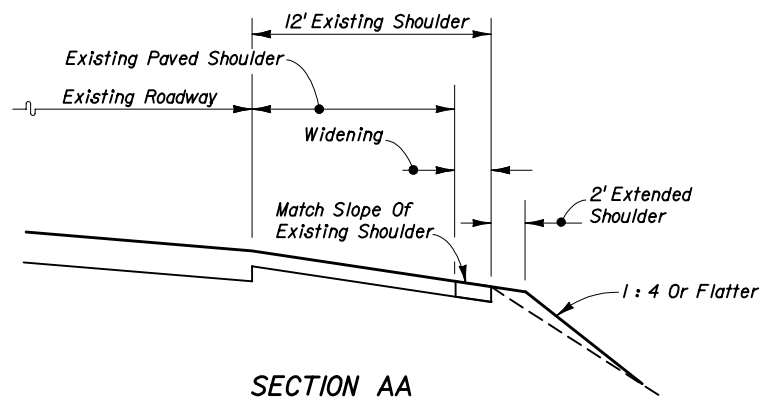
- Work Area
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign
- Required locations for either temporary or permanent curb ramps.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS				
Designed By		Dates	Approved By	
Drawn By		7/93	Revision	Sheet No. Index No.
Checked By		7/93	04	1 of 1 660



PLAN

LENGTH OF ACCESS LANES (Ft)		
Grade	D ₁	D ₂
2% or less	590	1540
3 to 4% Upgrade	530	2310
3 to 4% Downgrade	710	925



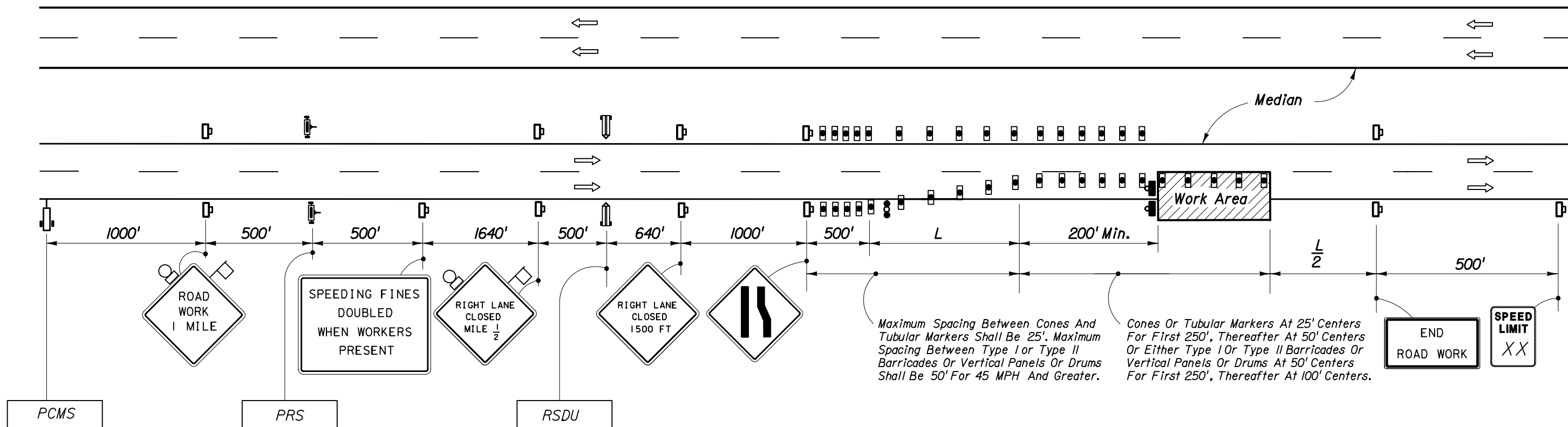
SECTION AA

SYMBOLS
 Work Zone Sign

GENERAL NOTES

- Access openings across limited access right of way and use of this Index are prohibited unless specifically permitted in the Contract Plans or Special Provisions. When permitted in the Contract Plans or Special Provisions and prior to construction of any opening, the Contractor must submit, in writing, a request identifying specific locations for approval by the Engineer.
- No more than two (2) access openings will be allowed on each project.
- Access openings shall be located only in areas having adequate sight distance and shall not be located within 1.5 miles of interchanges nor within 2000 ft. of acceleration-deceleration lanes at rest areas, other access openings or other highway service areas.
- Access openings shall not be constructed directly opposite temporary median crossovers nor within 2000 ft. of temporary median crossovers.
- Access openings shall be within the project limits and shall not be used for transporting materials to or from any other project. The acceleration-deceleration surfaces shall be paved. RAP material is acceptable for driveway surfacing.
- Any Motorist Aid Call Boxes affected by the temporary access openings shall be relocated outside the limits of access lanes and remain in use during construction. Upon removal of access lanes, call boxes shall be returned to their previous location. Temporary relocation and restoration of call boxes shall be at the contractors expense.
- Access openings in the limited access fence shall have gates which are to be locked during non-work hours or periods when the access is not in active use.
- The contractor shall take all precautions necessary to insure against entrance by livestock or unauthorized persons or vehicles.
- The contractor shall not vary from the plan detail without approval of the Engineer.
- Gates shall be removed and access opening locations shall be restored to pre-construction condition immediately upon completion of activities utilizing the materials being transported through the openings whether or not the project is completed.
- Failure to comply with any provision of the access opening plan shall be cause for terminating use of all openings. Upon notification by the Engineer, the contractor shall cease hauling and begin restoration of affected areas. Under this condition expense of removal, restoration and of additional hauling distances shall be borne by the contractor.
- No guardrail or barrier wall will be removed for access openings.
- Construction and removal of the access and restoring the area to pre-construction condition shall be included in the cost of Maintenance Of Traffic, LS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL THROUGH WORK ZONES				
LIMITED ACCESS RIGHT OF WAY TEMPORARY OPENING				
Names	Dates	Approved By		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	665



Note:
PCMS to be used when
HAR is used. See Note II.

FHP Law Enforcement Officer
(Patrol The Active Work Area
On 15 To 20 Minute Intervals)

SYMBOLS

- Work Area
- Sign With 18"x 18" (Min.)
Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel
Or Drum (With Steady Burning Light At Night Only)
(Tubular Markers May Be Used During Daylight Only.
Cones May Be Used -See Index No. 600).
- Type I, Type II Or Type III Barricade Or
Vertical Panel Or Drum (With Flashing Light)
- Work Zone Sign
- Advance Warning Arrow Panel
- (1) PCMS= Portable Changeable(Variable) Message Sign (When
Called For In Plans)
- (1) HAR= Highway Advisory Radio (When Called For In Plans)
- (2) PRS= Portable Regulatory Sign- Speed Limit When Flashing
- (2) RSU= Radar Speed Display Unit
- (1) LEO= Law Enforcement with Flashing Lights and Radar Paid As:
FHP (Contract) (Do Not Bid)

PCMS Display

Message 1: TUNE TO XXX AM
Message 2: FOR CONST INFO

GENERAL NOTES

- I. Work operations shall be confined to one traffic lane, leaving the lanes open to traffic.
2. All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
3. The first two warning signs, each side, shall have a 18"x 18" (min.) orange flag and a Type B light attached and operating at all times.
4. All signs shall be post mounted if the closure time exceeds 12 hours.
5. When work is performed in the median lane on divided highways the barricading plan is inverted and left lane closed and lane reduction signs substituted for the right lane closed and lane reduction signs.
6. L (min.) = Length of taper in feet:
= WS for speeds ≥ 45 mph
Where:
 W = Width of lateral transition in feet
 S = Posted speed limit (mph)
7. Arrows denote direction of traffic only and do not reflect pavement markings.
8. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
9. When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
10. For general TCZ requirements and additional information refer to Index No. 600.

- II. Highway Advisory Radio may be considered as a supplement to the Motorist Awareness System.

The following operating parameters must be adhered to when using a Highway Advisory Radio:

- A. Daytime construction periods only.
- B. Per CFR 90.242 (a) (5) the transmitting site of the HAR is restricted to the immediate vicinity of the following specified areas:
Air, Train, Bus Transportation Terminals, Public Parks, Historical Sites, Bridges and Tunnels.
Any Intersection of the following Federal Interstate Highway with any other Interstate, Federal, State, or Local Highway: I-4, I-10, I-75, I-275, I-95 and I-295.

CONDITIONS

1. The MAS is intended for use on rural high-speed high volume highways, which have lane closures with no more than two lanes open to traffic, and when the active work zone is less than one mile in length.
2. The MAS should be considered on projects where the likelihood of excessive speeds in the work area needs to be controlled.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL THROUGH WORK ZONES

MOTORIST AWARENESS SYSTEM

Names	Dates	Approved By		
Designed By				
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	1 of 1	670

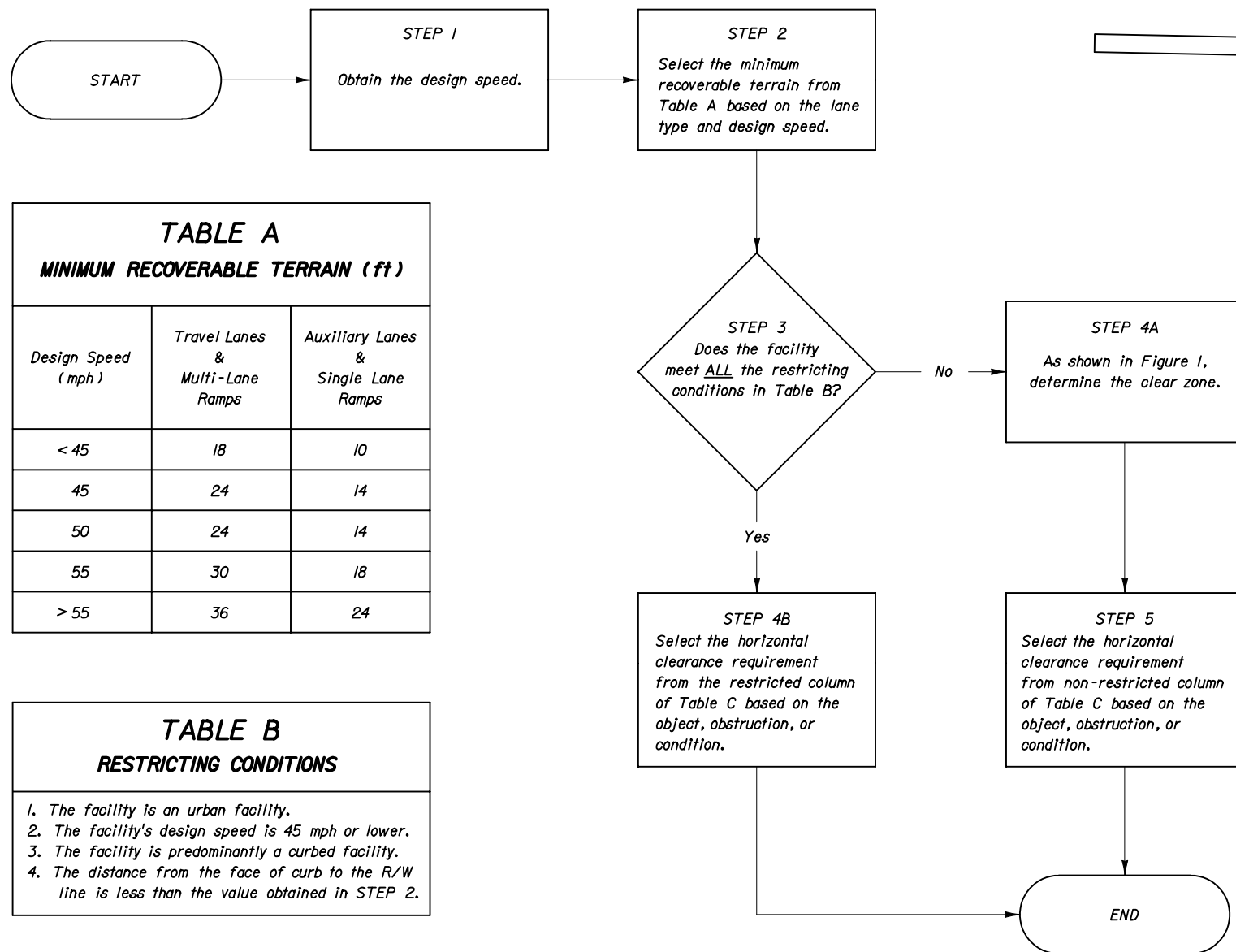
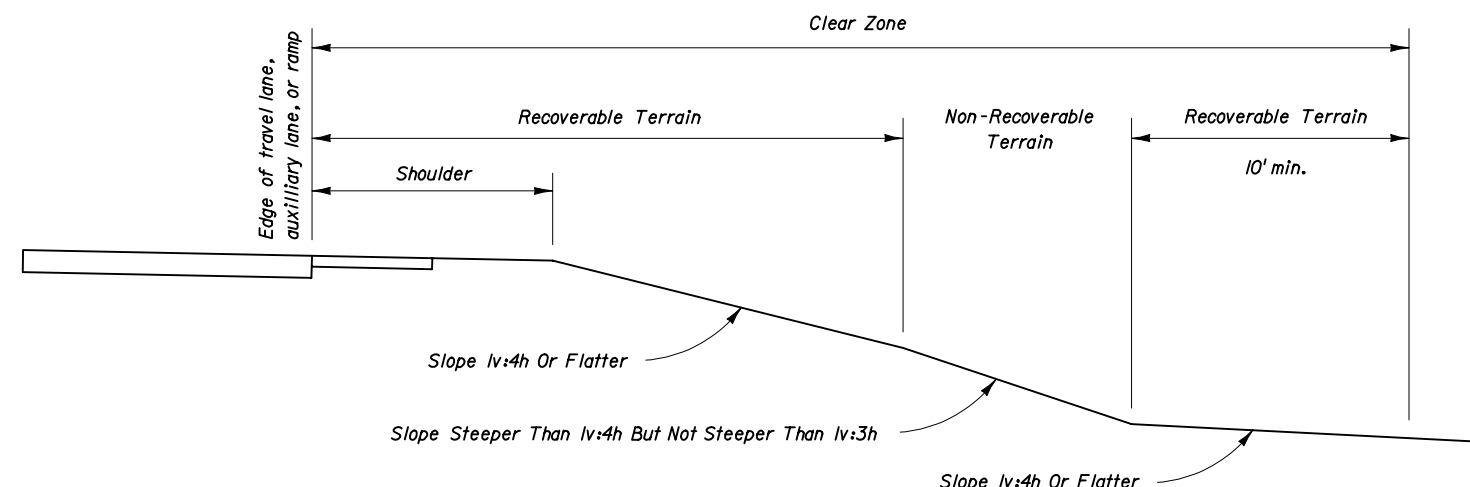


TABLE A
MINIMUM RECOVERABLE TERRAIN (ft)

Design Speed (mph)	Travel Lanes & Multi-Lane Ramps	Auxiliary Lanes & Single Lane Ramps
< 45	18	10
45	24	14
50	24	14
55	30	18
> 55	36	24

TABLE B
RESTRICTING CONDITIONS

- The facility is an urban facility.
- The facility's design speed is 45 mph or lower.
- The facility is predominantly a curbed facility.
- The distance from the face of curb to the R/W line is less than the value obtained in STEP 2.



Clear Zone is the relatively flat unobstructed area that is to be provided for safe use by errant vehicles, and must be wide enough so that the sum of all the recoverable terrain within is equal to or greater than the value obtained in STEP 2. Recoverable terrain provided beyond non-recoverable terrain must be a minimum of 10 feet. Areas beyond non-traversable and hazardous terrain cannot be used as recoverable or non-recoverable terrain.

Roadside Terrain includes all surfaces along the roadway other than travel lanes, auxiliary lanes, and ramps. For the purpose of establishing clear zones and horizontal clearance requirements, roadside terrain is defined as recoverable, non-recoverable, non-traversable, and hazardous as follows:

- Recoverable when it is safely traversable and on a slope that is 1v:4h or flatter.
- Non-recoverable when it is safely traversable and on a slope that is steeper than 1v:4h but not steeper than 1v:3h.
- Non-traversable when it is not safely traversable or on a slope that is steeper than 1v:3h.
- Hazardous when a slope is steeper than 1v:3h and deeper than 6 feet as shown in Figure 2.

Horizontal Clearance Requirements are shown in Table C and are the required offsets to an object from a specified point on the roadway.

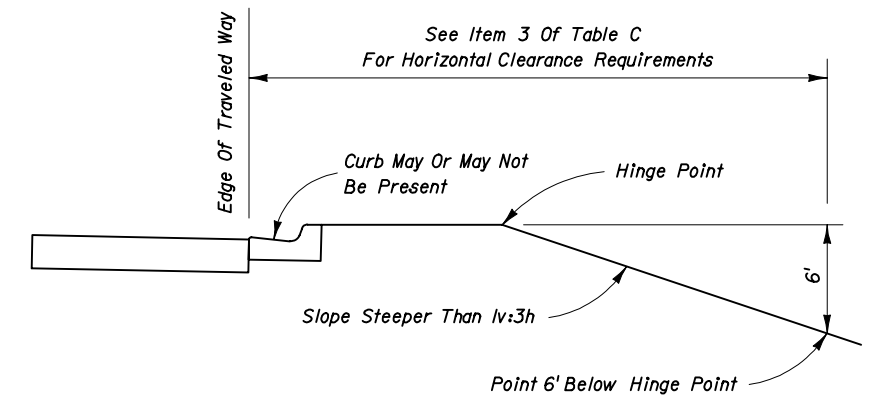
ROADSIDE TERRAIN
FIGURE 1

PROCESS FOR DETERMINING HORIZONTAL CLEARANCE REQUIREMENTS AND CLEAR ZONES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROADSIDE OFFSETS				
	Names	Dates	Approved By <i>[Signature]</i>	
Designed By	TRB	12/02	Roadway Design Engineer	
Drawn By	SBC	12/02	Revision	Sheet No. Index No.
Checked By			04	1 of 2 700

TABLE C

	Item No.	OBJECTS, OBSTRUCTIONS OR CONDITIONS	HORIZONTAL CLEARANCE REQUIREMENTS	
			Restricted	Non-Restricted
GENERAL	1	Above ground fixed hazards: All roadside objects, obstructions or conditions other than those listed below that exceed 4 inches in height and pose a hazard to errant vehicles and vehicle occupants.	Locate as close to the Right Of Way as practical and not less than 4 feet from face of curb.	Locate outside the clear zone as close to the Right Of Way as practical.
ROADWAY	2	All FDOT approved guardrails, crash cushions, permanent or temporary concrete barriers, and guardrail end terminals.	Locate as shown in the Design Standards.	Locate as shown in the Design Standards.
	3	Drop-off hazards: Any point along a roadside slope steeper than 1v:3h that is deeper than 6 feet below the hinge point. See Figure 2.	Locate the point that is 6 feet below the hinge point no less than 22 feet from the traveled way.	Treat as roadside slopes in accordance with Design Standard 400.
	4	Mailboxes not shown in Design Standard 532.	Not to be used.	Not to be used.
	5	Mailboxes shown in Design Standard 532.	Locate in accordance with Design Standard 532.	Locate in accordance with Design Standard 532.
	6	Trees expected to become greater than 4 inches in diameter measured 6 inches above the ground.	Outside roadways: Locate no less than 4 feet from face of curb in accordance with Design Standard 546. Inside medians: Locate no less than 6 feet from the edge of traffic lane and in accordance with Design Standard 546.	Locate outside the clear zone as close to the Right Of Way as practical and in accordance with Design Standard 546.
	7	Trees not expected to become greater than 4 inches in diameter measured 6 inches above the ground.	Locate in accordance with Design Standard 546.	Locate in accordance with Design Standard 546.
	8	Canals behind guardrail.	Locate no less than 5 feet from the back of the guardrail post.	Locate no less than 5 feet from the back of the guardrail post.
	9	Canals without guardrail.	Locate as close to the Right Of Way as practical and not less than 40 feet from the traveled way.	Design speeds of 50 mph and greater: Locate as close to the Right Of Way as practical and not less than 60 feet from the traveled way. Design speeds less than 50 mph: Locate as close to the Right Of Way as practical and not less than 50 feet from the traveled way.
	DRAINAGE	10	Culvert wing wall, endwall, retaining walls and flared end sections less than 6 feet deep.	Locate no less than 4 feet from face of curb.
11		Culvert wing wall, endwall, retaining walls and flared end sections 6 feet and greater in depth.	Treat as drop-off hazard; See Item No. 3.	Treat as drop-off hazard; See Item No. 3.
12		Mitered end sections.	Locate as shown in Design Standards 272 and 273.	Locate as shown in Design Standards.
TRAFFIC CONTROL DEVICES	13	Frangible sign supports.	Locate no less than 4 feet from face of curb and in accordance with Design Standard 17302.	Locate in accordance with Design Standard 17302.
	14	Overhead sign supports and other non-frangible signs.	Locate no less than 4 feet from face of curb.	Locate outside the clear zone.
	15	Signal controller cabinets, signal poles, strain poles and mast arms.	Locate no less than 4 feet from face of curb and not in medians.	Locate outside the clear zone and not in medians.
LIGHTING	16	Conventional lighting (frangible and non-frangible).	Locate no less than 4 feet from face of curb and not in medians.	Locate 20 feet from travel lanes or 14 feet from auxiliary lanes. Not in medians. May be clear zone width when the clear zone is less than 20 feet.
	17	Highmast lighting.	Not applicable.	Locate outside the clear zone.
STRUCTURES	18	Bridge piers and abutments: Above ground vertical structures.	Locate not less than 16 feet from edge of travel lane.	Locate outside the clear zone.
UTILITIES	19	Fire hydrants with bases no higher than 4 inches above the ground.	Locate not less than 2 feet from face of curb.	Locate as close to the Right Of Way as practical.
	20	Utility installations: All above ground fixed objects.	Locate as close to the Right Of Way as practical and not less than 4 feet from face of curb and not in medians.	Locate outside the clear zone as close to the Right Of Way as practical and not in medians and not within limited access facilities. May be placed 4 feet behind the back of shields that have been justified for other reasons.
RAILROADS	21	Railroad crossing traffic control devices.	Locate in accordance with Design Standard 17882.	Locate in accordance with Design Standard 17882.



DROP-OFF HAZARDS

FIGURE 2

GENERAL NOTES

- When sidewalks are present, an unobstructed sidewalk width of at least 4 feet must be provided.
- When site specific conditions prohibit meeting the horizontal clearance requirements in TABLE C, the object, obstruction or condition must be mitigated, possibly by shielding. Otherwise, the Plans Preparation Manual, Volume 1, Chapters 2, 4, 21 and 25, or Chapters 5 and 9 of the Utility Accommodation Manual must be researched to determine viable alternatives. The minimum requirements in these manuals can only be reduced when a Design Variation or Design Exception has been approved in accordance with Chapter 23 of the Plans Preparation Manual, Volume 1 or a Utility Exception has been approved in accordance with Chapter 13 of the Utility Accommodation Manual.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROADSIDE OFFSETS				
Designed By	TRB	12/02	Approved By <i>[Signature]</i> Roadway Design Engineer	
Drawn By	SBC	12/02	Revision	Sheet No. Index No.
Checked By			04	2 of 2 700

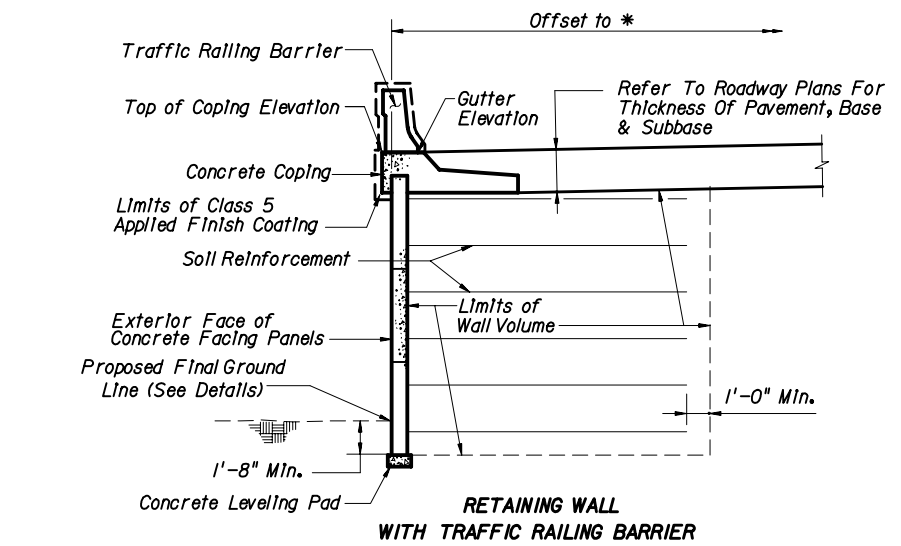
NOTES

- Walls shall be constructed in accordance with Section 548 and the wall suppliers instructions.
- Retaining Walls and all cast-in-place appurtenances, i.e., coping, traffic railing barriers, sidewalk parapets, light pilasters, integral sign foundations, etc., shall be paid for at the contract unit price per square feet of retaining wall under, Retaining Wall System (Permanent), Retaining Wall System (Temporary). Payment shall be based on plan quantities.
- The related cost of installation of drainage structures (only structures affected by wall) shall be included in the unit cost for retaining wall, Pay Item Retaining Wall System (Permanent), or Retaining Wall System (Temporary).
- All exposed surfaces of cast-in-place concrete shall receive a Class 5 Applied Finish Coating in accordance with Construction Specifications Section 400. Refer to Typical Wall Sections and the following notes for limits of applied finish:
 - The inside, backside and top of Traffic Railing Barriers and Pedestrian/Bicycle Railing Barriers.
 - Exposed surfaces of coping on top of retaining wall.
- Other coatings, colors or textures shall be applied as required by the Contract Documents.
- Piles within the wall volume shall be driven prior to construction of the retaining wall. The portion of the pile within the wall volume shall be wrapped with polyethylene sheeting in accordance with Section 459.
- A structural extension of the connection of the wall panel to the soil reinforcement shall be used whenever necessary to avoid the cutting or excessive skewing (greater than 15 degrees) of the soil reinforcements around obstructions (i.e., piles, pipes, etc.).
- For wall systems utilizing footings, the top of footing elevation is the same elevation as top of leveling pad.
- Steps in leveling pads shall occur at panel interfaces. Panels shall not cantilever past the end of the leveling pad.
- No cutting of soil reinforcement grids allowed unless shown on shop drawings and approved by the Engineer.

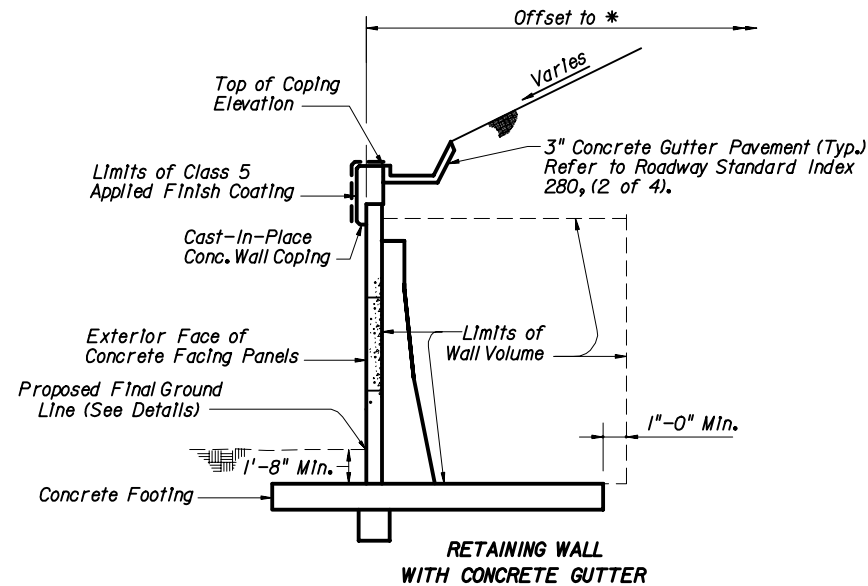
SHOP DRAWING REQUIREMENTS

The successful bidder shall submit the final design of the wall for review as shop drawings. The Shop Drawings shall include detailed design computations and all details, dimensions and quantities necessary to construct the wall. The design and fully detailed plans shall be prepared to Department standards current at time of bid and shall include, but not be limited to, presentation of required information as follows:

- Provide an elevation view of the wall indicating elevations at top of wall at begin and end wall stations, at all breaks in vertical alignment and at whole stations and 30 foot increments. Show elevations at top of leveling pad, bottom of footings, locations of all steps in leveling pad, panel designations, and length, size and designation of soil reinforcement in elevation view. Indicate location of the proposed final ground line.
- Provide a plan view detailing the horizontal alignment and offsets from the horizontal control line(s) to the exterior face of the wall.
- Show in the plan and elevation all utilities, sign supports, light pole pilasters, drainage structures, drainage pipes, etc. that affect the walls. Locate on the plan all piles within the wall volume including those for future widening as shown on Foundation Layout drawings.
- Provide general notes and design parameters on the shop drawings, including design soil characteristics, minimum factors of safety, allowable material stresses and all other pertinent notes required for the construction of the walls. Provide the allowable and maximum actual bearing pressure for each wall height increment.
- Show the limits of the wall volume.
- Show all details of each concrete panel, slip joint and all other concrete elements incorporated in the wall, including reinforcing bar size and spacing, reinforcing bar bending details and details of all embedments.
- Show all details of leveling pads and footings, including steps in leveling pads.
- Show all details for construction of wall around obstructions. Show details for placement of soil reinforcement at acute corners and at interface with temporary walls.



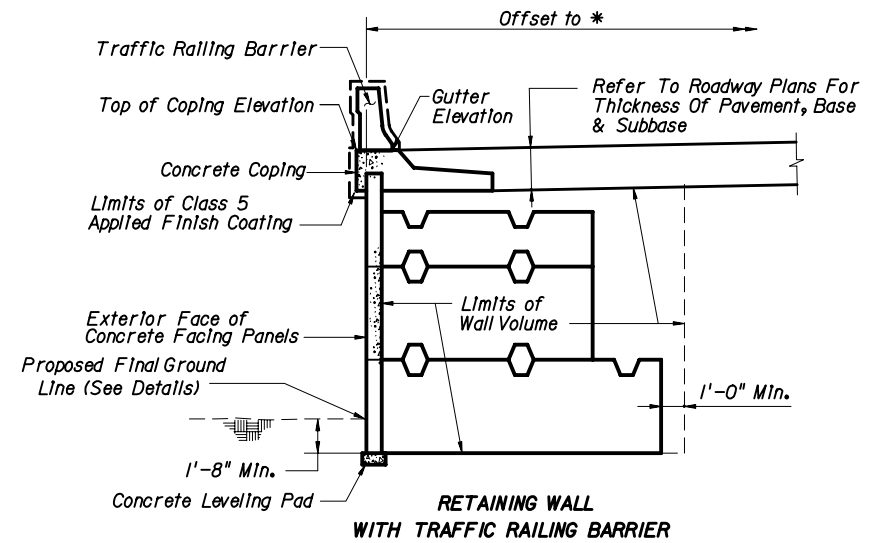
TYPICAL WALL SECTION - MSE SYSTEM (N.T.S.)



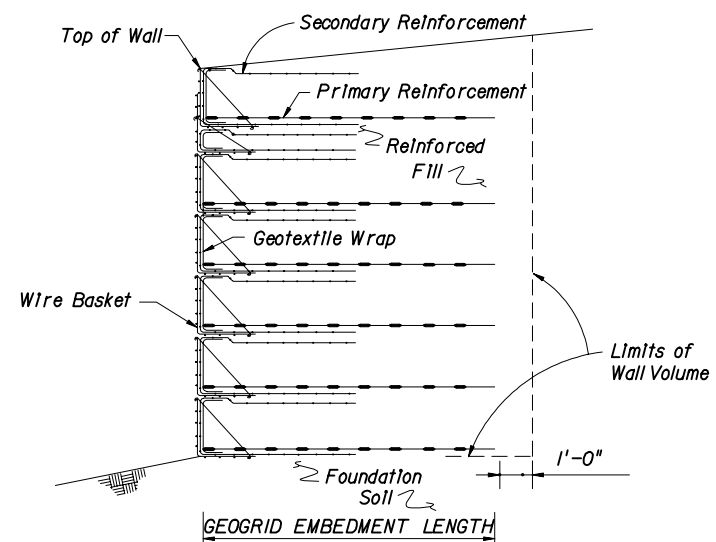
TYPICAL WALL SECTION - COUNTERFORT SYSTEM (N.T.S.)

* Insert control line designation i.e. C, B, etc.

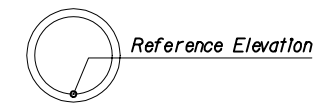
- Show all details addressing conflicts between soil reinforcement, concrete facing panels and embedments in the wall volume. Provide full details of connections of barriers, coping, sign supports, light pole pilasters, acute corners, etc.
- Show all details where walls of different types intersect/influence one another.
- Provide fully detailed design calculations for each wall height increment utilized in the shop drawings. The submitted plans and design calculations shall be signed and sealed by a Professional Engineer registered in the State of Florida.



TYPICAL WALL SECTION - CONCRETE STEM SYSTEM (N.T.S.)



TEMPORARY WALL - TYPICAL CROSS-SECTION (N.T.S.)



NOTE: See Roadway plans for complete drainage details.

DRAINAGE PIPE DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM GENERAL NOTES				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By RVR	11-98	State Structures Design Engineer		
Drawn By JSP	11-98	Revision	Sheet No.	Index No.
Checked By DEK	11-98	00	1 of 1	5000

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FOSTER • GEOTECHNICAL
A Division of L. B. Foster Company

6455 OLD PEACHTREE ROAD
NORCROSS, GA 30071
Telephone: (770) 446-3000
Fax: (770) 242-7493

GENERAL NOTES

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE REINFORCED EARTH VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE CONTRACTING AGENCY'S TECHNICAL SPECIFICATIONS FOR RETAINED EARTH WALLS.

2. FACTORS OF SAFETY

OVERTURNING 2.0
INTERNAL PULLOUT 1.5 (ALLOW DEFORMATION 3/4")
OVERALL STABILITY 1.5
SLIDING 1.5
BEARING 2.5

SOIL REINFORCEMENT MESH 0.47 Fy AT END OF DESIGN LIFE

3. SOIL CHARACTERISTICS ASSUMED FOR DESIGN:

SOIL PARAMETERS:

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF ϕ , C AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS.

4. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF OTHERS TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.

5. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED EARTH VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.

REINFORCING ELEMENTS

6. REINFORCING MESH ELEMENTS SHALL BE SHOP FABRICATED FROM COLD DRAWN STEEL ROD CONFORMING TO THE MINIMUM REQUIREMENTS OF ASTM A-82 AND SHALL BE WELDED AT THE JUNCTIONS BETWEEN LONGITUDINAL AND TRANSVERSE WIRES IN ACCORDANCE WITH ASTM A-185. GALVANIZATION SHALL BE APPLIED AFTER MESH FABRICATION AND SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF ASTM A-123.

LOOP EMBEDS SHALL BE FABRICATED FROM COLD DRAWN STEEL ROD CONFORMING TO ASTM A-510 OR ASTM A-82. LOOP EMBEDS SHALL BE WELDED IN ACCORDANCE WITH ASTM A-185. LOOP EMBEDS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM B-633.

DESIGN:

7. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, THE WALL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

WALL CONSTRUCTION

8A. (SQUARE PANELS) RETAINED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 5.0' EACH TO MATCH DESIRED WALL ALIGNMENT.

8B. (HEX PANELS) RETAINED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 4.33' EACH TO MATCH DESIRED WALL ALIGNMENT.

9. FOR LOCATION AND ALIGNMENT OF RETAINED EARTH WALLS. SEE RETAINING WALL CONTROL PLANS.

10. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.

11. IF PILES ARE LOCATED WITHIN REINFORCED SOIL VOLUME. THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE REINFORCED EARTH WALL UNLESS A METHOD TO PROTECT THE STRUCTURE WHICH IS ACCEPTABLE TO THE ENGINEER AND FOSTER GEOTECHNICAL COMPANY AND IS PROPOSED AND APPROVED IN WRITING.

12. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 TO A LEVEL OF 2" (+/-) ABOVE THE TIE MESH EMBEDDED IN THE PANELS. INSTALLATION OF REINFORCING MESH SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.

13. WALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 548.

14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS BEHIND RETAINED EARTH PANELS. PRIOR TO PLACEMENT OF THE TOP LAYER OF REINFORCING MESH, INDIVIDUAL REINFORCING MESH MAY BE SKEWED TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER (NO CUTTING OF SOIL REINFORCEMENT GRIDS ALLOWED UNLESS SHOWN ON SHOP DRAWINGS AND APPROVED BY THE ENGINEER). ANY DAMAGE DONE TO THE REINFORCING MESH DUE TO THE INSTALLATION OF THE GUARDRAIL SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

15. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN REINFORCED SOIL VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING MESH AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN.

16. TOP PANELS BENEATH CAST-IN-PLACE COPING SHALL HAVE #4 BARS PROTRUDING FROM THEIR TOP EDGE.

17. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO FOSTER GEOTECHNICAL CONSTRUCTION MANUAL.

18. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING MESH DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPER ELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

19. NOMINAL MESH LENGTHS

THE REINFORCING MESH LENGTH SHOWN ON THE PLANS, MEASURED FROM BACK FACE OF PANEL ARE THE NOMINAL LENGTHS REQUIRED BY CALCULATION. THE ACTUAL FABRICATED MESH LENGTHS ARE OFTEN LONGER (UP TO 6") DUE TO MANUFACTURING TOLERANCES. THE REQUIRED HORIZONTAL LIMIT OF GRANULAR BACKFILL IS EQUAL TO THE NOMINAL MESH LENGTH. ADDITIONAL GRANULAR BACKFILL BEYOND THE NOMINAL MESH LENGTH IS NOT REQUIRED BY CALCULATION.

20. REINFORCED BACKFILL QUANTITY

THE REINFORCED BACKFILL QUANTITY INDICATED BY FOSTER GEOTECHNICAL IS CALCULATED BY MULTIPLYING THE NOMINAL MESH LENGTHS SHOWN ON THE PLANS BY THEIR TRIBUTARY WALL SURFACE AREA AND CONVERTING THE RESULT TO A NEATER CUBIC METER QUANTITY. THIS INFORMATION IS FURNISHED FOR THE CONTRACTOR'S INFORMATION ONLY AND IS NOT INTENDED TO PRESENT THE ACTUAL QUANTITIES REQUIRED TO COMPLETE THE WORK. THE CONTRACTOR MUST CALCULATE HIS OWN EXCAVATION AND BACKFILL QUANTITIES BASED UPON THE SPECIFIC CONDITIONS OF THE PROJECT.

21. PANEL FINISH

THE PRECAST PANELS FOR THIS PROJECT SHALL BE A PLAIN STEEL FORM FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINED EARTH CONTROL PLANS.

22. NOTE TO CONTRACTORS

ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY FOSTER GEOTECHNICAL

- PRECAST PANELS
- REINFORCING MESH
- LOOP EMBED
- HDPE BEARING PAD (NOMINAL 4.0 MELT / .950 DENSITY)
- NON-WOVEN FILTER CLOTH AND ADHESIVE (FOR PANEL JOINTS ONLY) (WEBTECH-TERRATEX NO. 4 OR EQUAL)

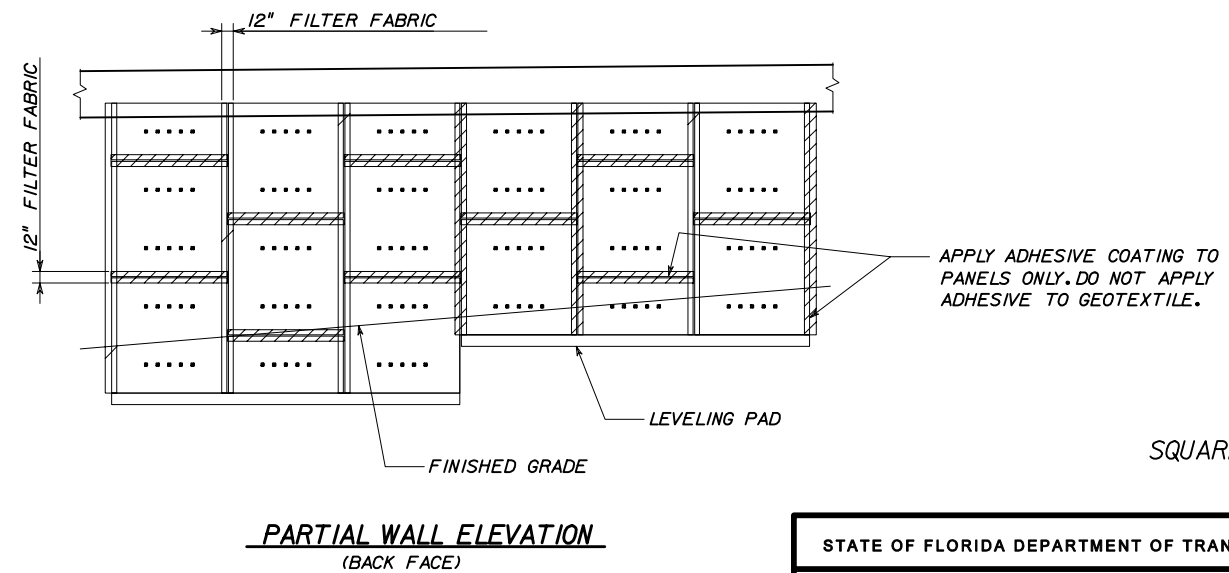
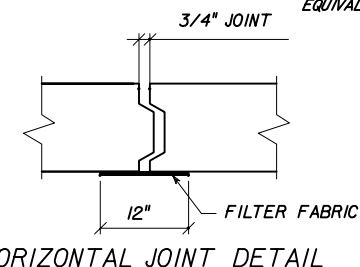
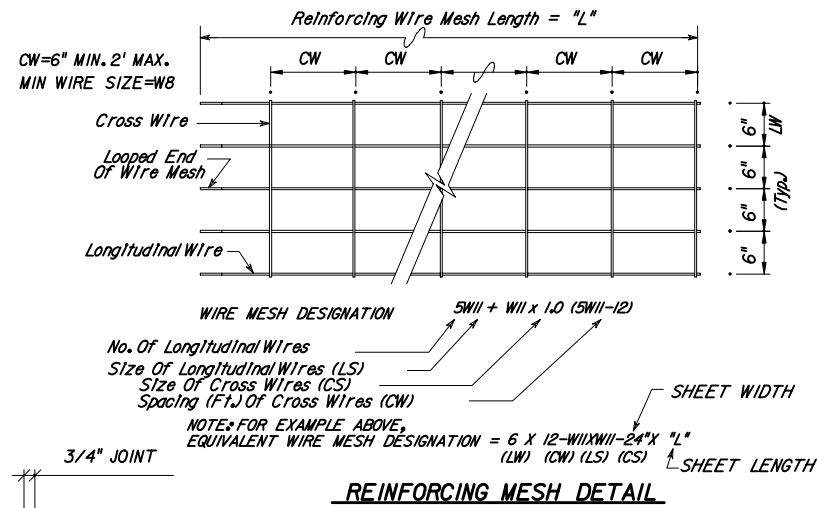
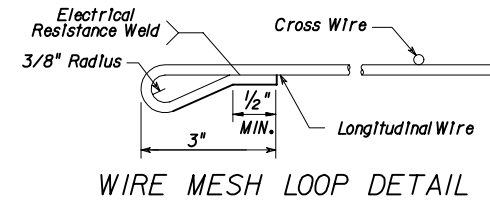
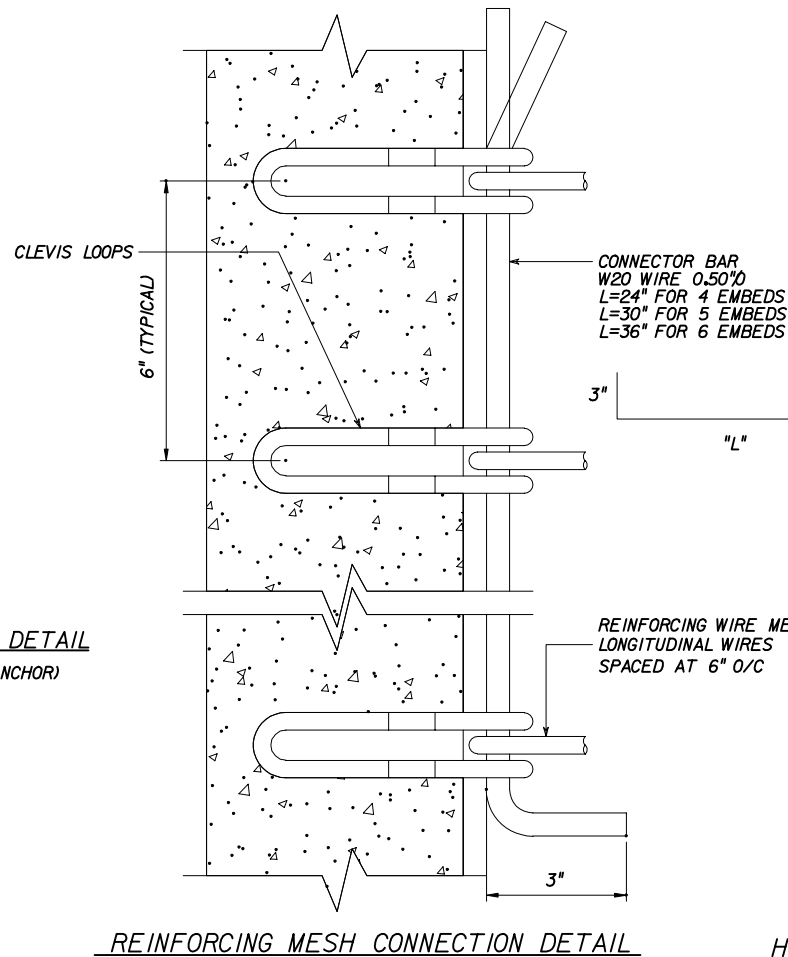
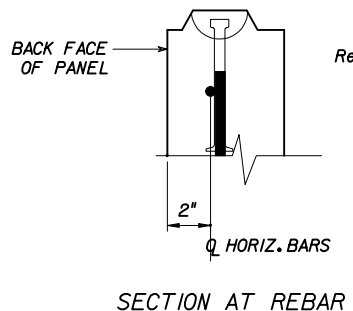
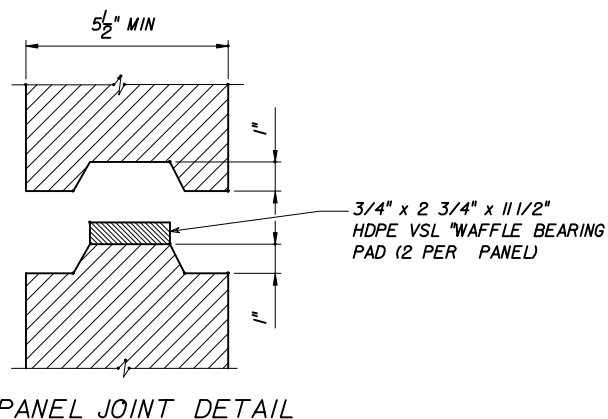
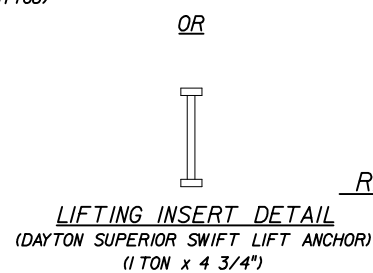
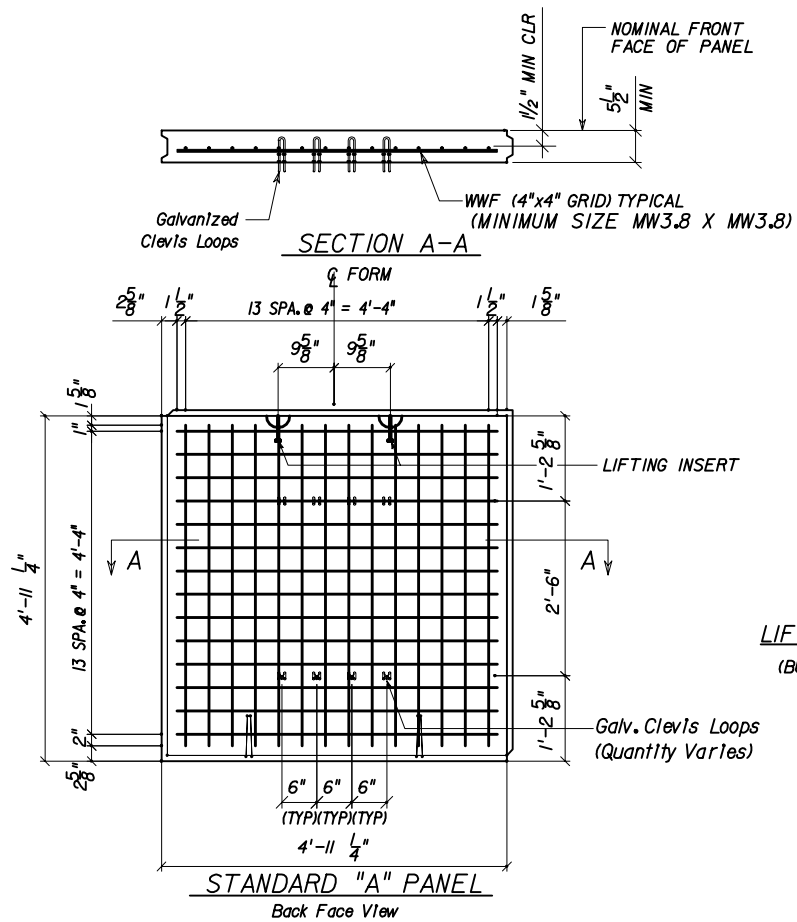
ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTION CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED / INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

23. FOSTER GEOTECHNICAL SUPPLIES PRECAST CONCRETE FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF RETAINED EARTH WALLS DETAILED HEREIN. THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY FOSTER GEOTECHNICAL IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE. PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.

SQUARE / HEX PANELS

THIS SYSTEM SHALL BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS ONLY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
	Names	Dates	Approved By <i>W. V. [Signature]</i>	
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No. Index No.
Checked By	GEO	11/98	00	1 of 12 5005

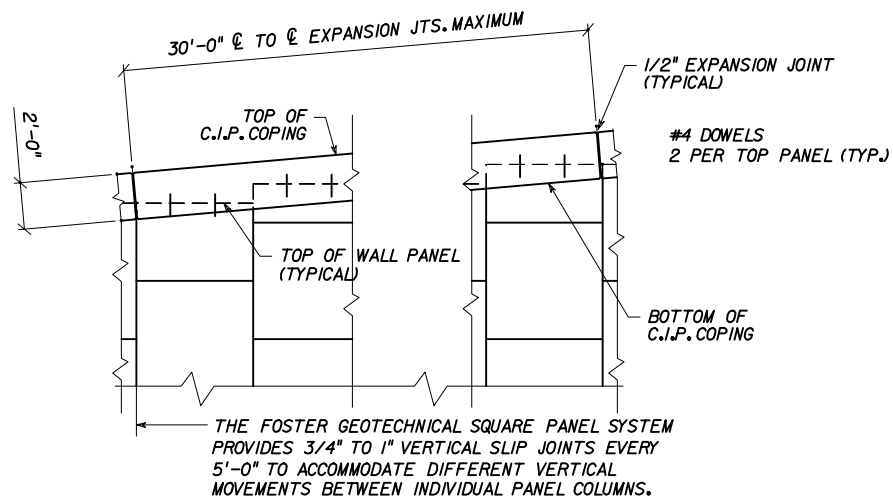


CLEVIS LOOP DETAIL

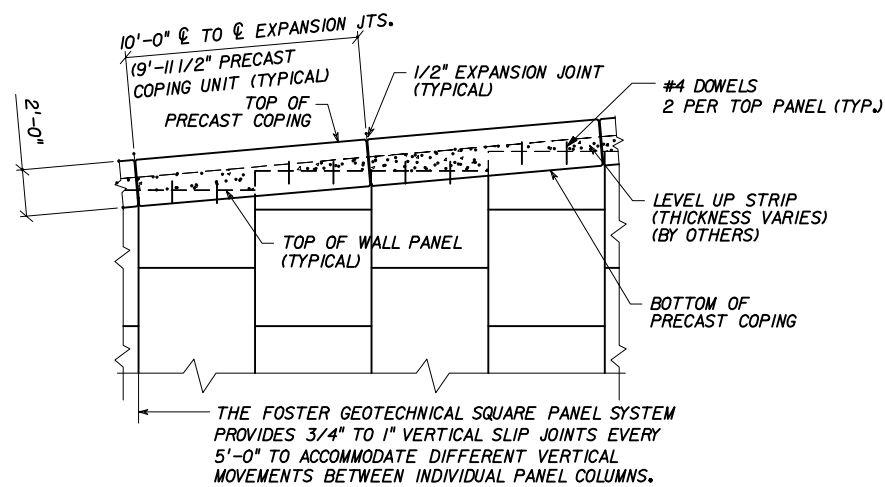
SQUARE PANELS

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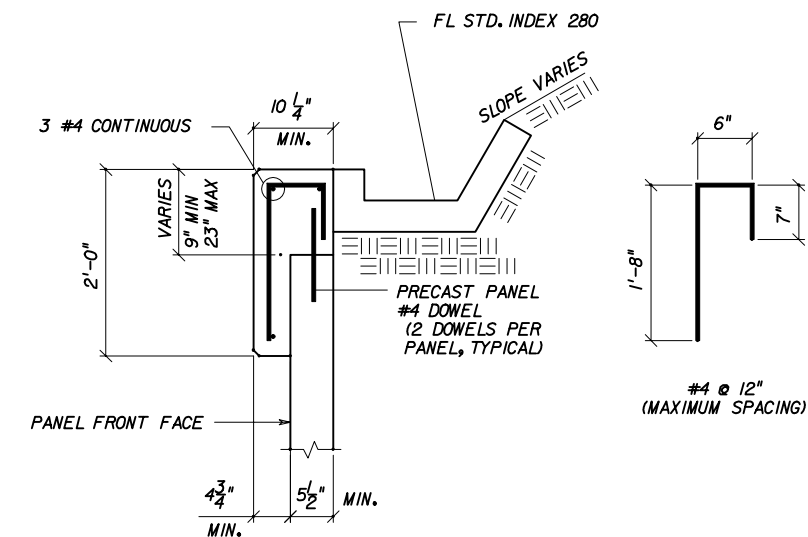
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Names	Dates	Approved By		
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	2 of 12
				Index No. 5005



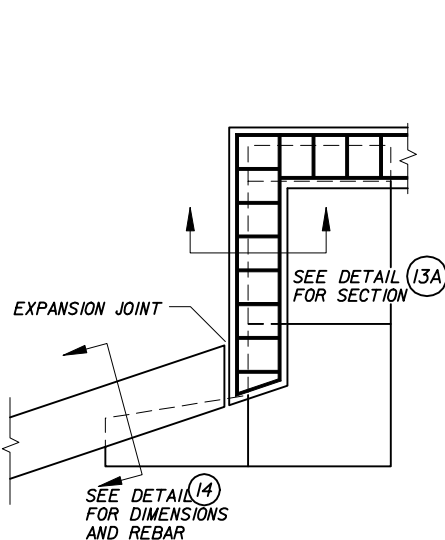
14A PARTIAL ELEVATION C.I.P. COPING
(SQUARE PANELS SHOWN, HEX PANELS SIMILAR)



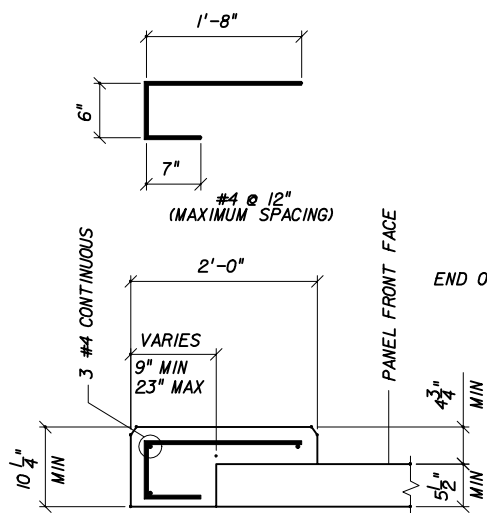
20A PARTIAL ELEVATION PRECAST COPING
(SQUARE PANELS SHOWN, HEX PANELS SIMILAR)



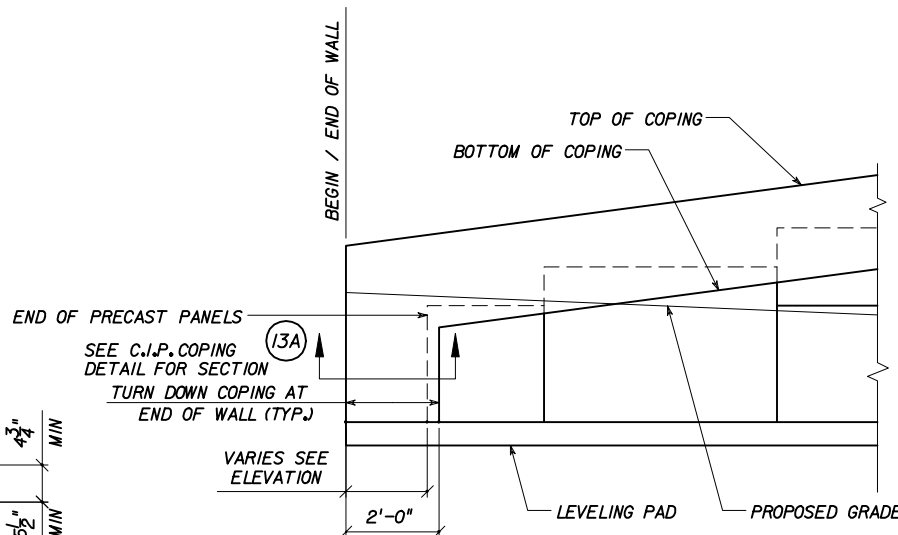
14 C.I.P. COPING W/ DITCH
(2" MIN. COVER TYP.)



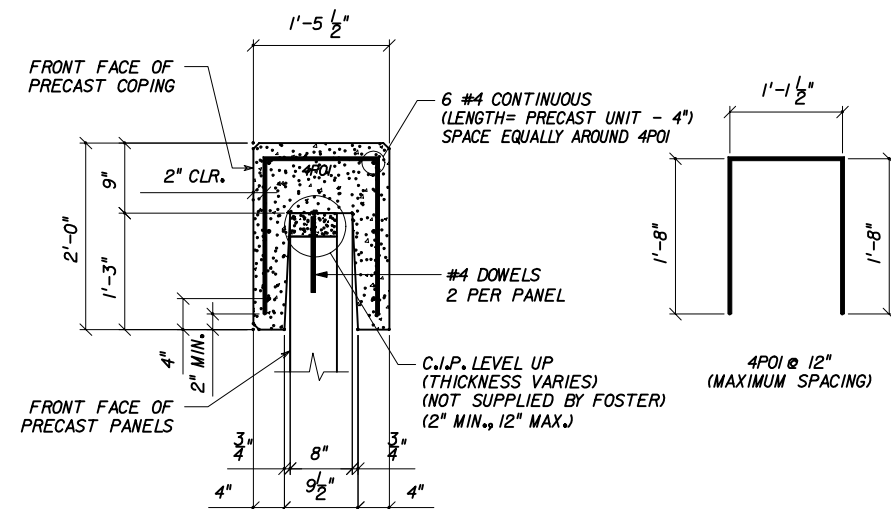
13 VERTICAL COPING (C.I.P.)
(SQUARE PANELS SHOWN, HEX PANELS SIMILAR)



13A VERTICAL COPING (C.I.P.) SECTION
(2" MIN. COVER TYP.)



15 COPING ENCLOSURE (C.I.P.)
(SQUARE PANELS SHOWN, HEX PANELS SIMILAR)



20 TYPE H PRECAST COPING
(STANDARD PRECAST COPING)

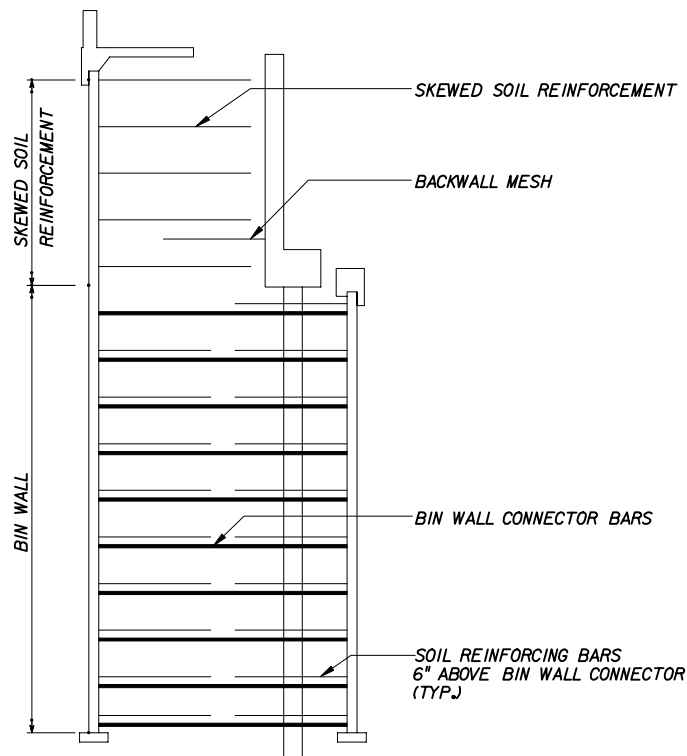
SQUARE / HEX PANELS

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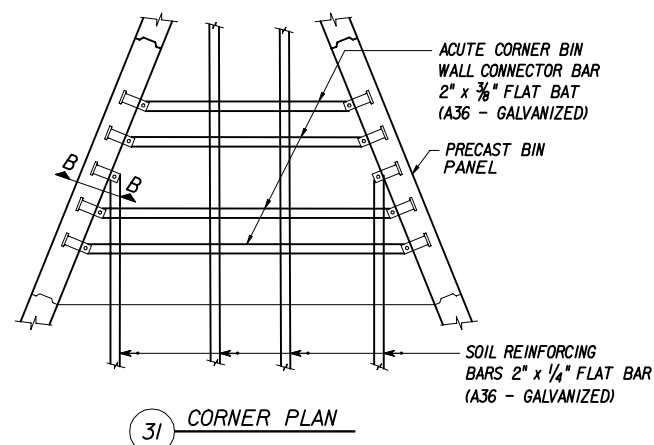
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
FOSTER GEOTECHNICAL RETAINED
EARTH WALL**

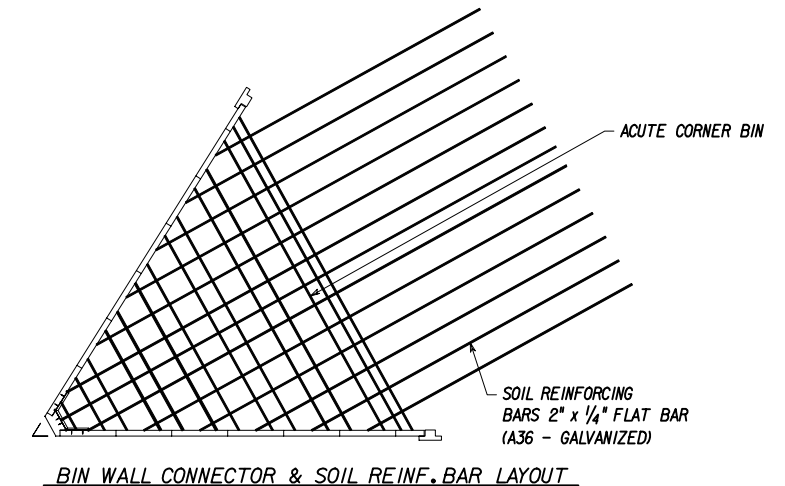
Names	Dates	Approved By
Designed By	TCNA 11/98	 State Structures Design Engineer
Drawn By	CAD 11/98	
Checked By	GEO 11/98	
Revision	00	
Sheet No.	3 of 12	Index No.
		5005



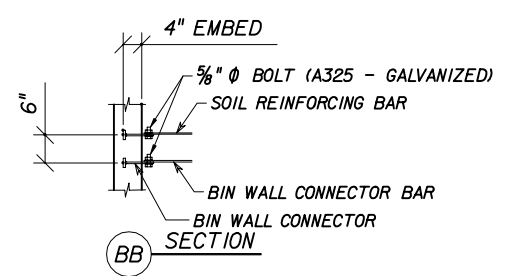
CC TYPICAL SECTION @ BIN WALL



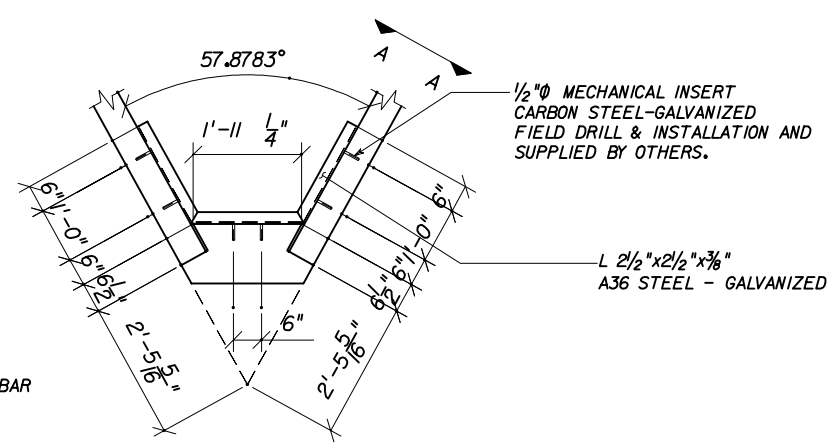
31 CORNER PLAN



BIN WALL CONNECTOR & SOIL REINF. BAR LAYOUT

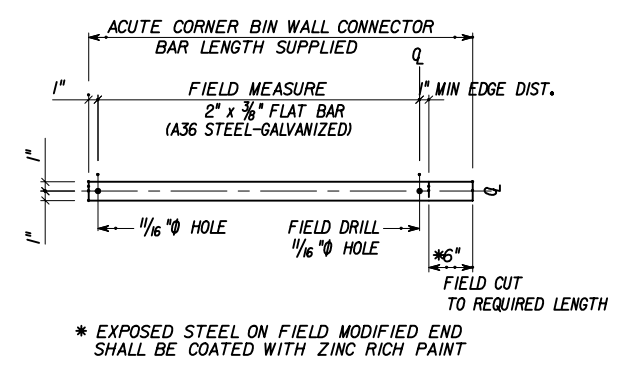


BB SECTION

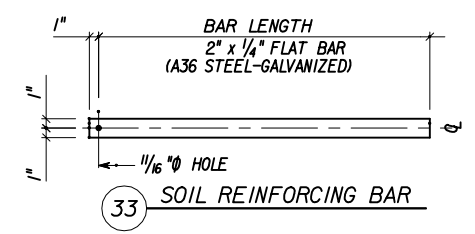


NOTES: BRACKETS TYPICALLY LOCATED IN THE CORNER BETWEEN BIN WALL CONNECTOR & SOIL REINFORCING BAR ELEVATION
BIN WALL CONNECTOR BARS & SOIL REINF. BARS NOT SHOWN

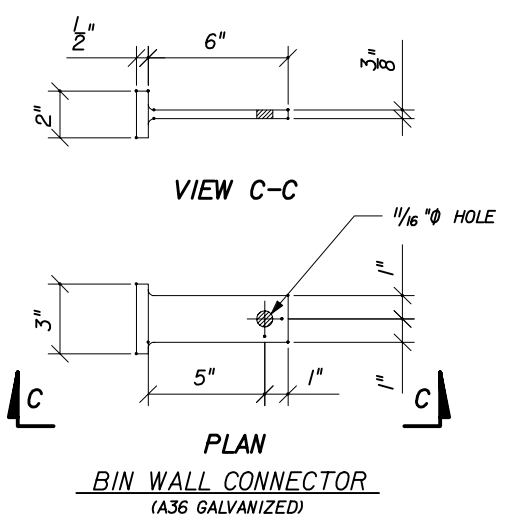
30 ANGLE BRACKET DETAIL



32 BIN WALL CONNECTOR BAR



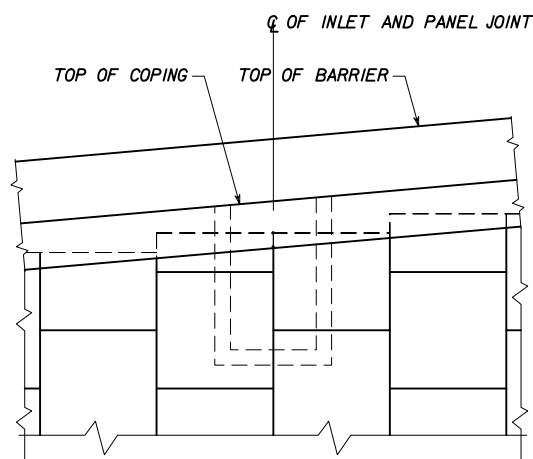
33 SOIL REINFORCING BAR



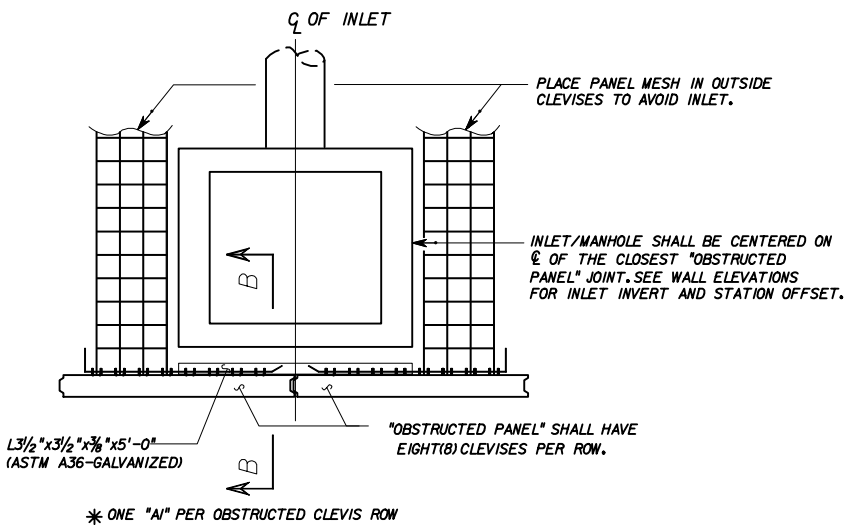
SQUARE / HEX PANELS

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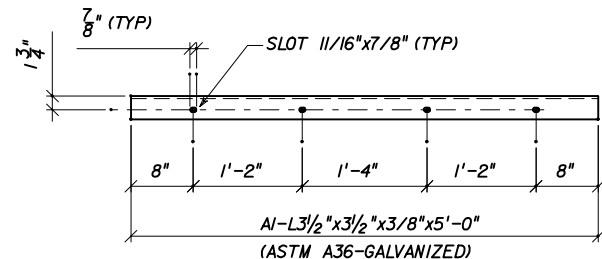
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	Dates	11/98	Approved By
Drawn By	CAD	Revision	11/98	State Structures Design Engineer
Checked By	GEO	Sheet No.	00	Index No.
			4 of 12	5005



65 PARTIAL ELEVATION WALL @ DRAINAGE INLET



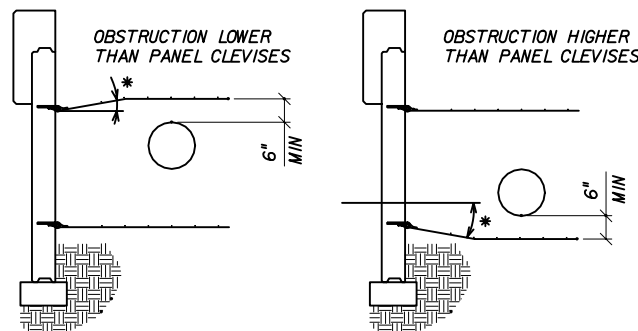
65A OBSTRUCTION DETAIL (VERTICAL)
INLETS ≤ 5'-0" (TYP.)



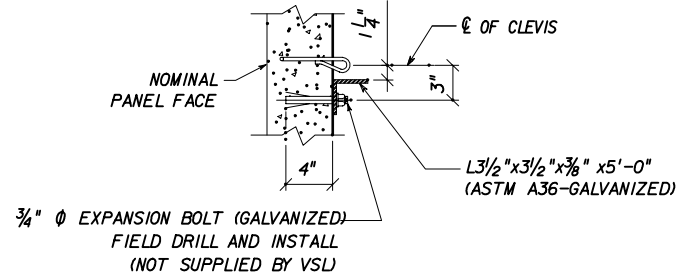
65B OBSTRUCTED PANEL CONNECTOR (AI)
(ASTM A36 ANGLE - GALVANIZED)

VERTICAL OBSTRUCTION NOTES

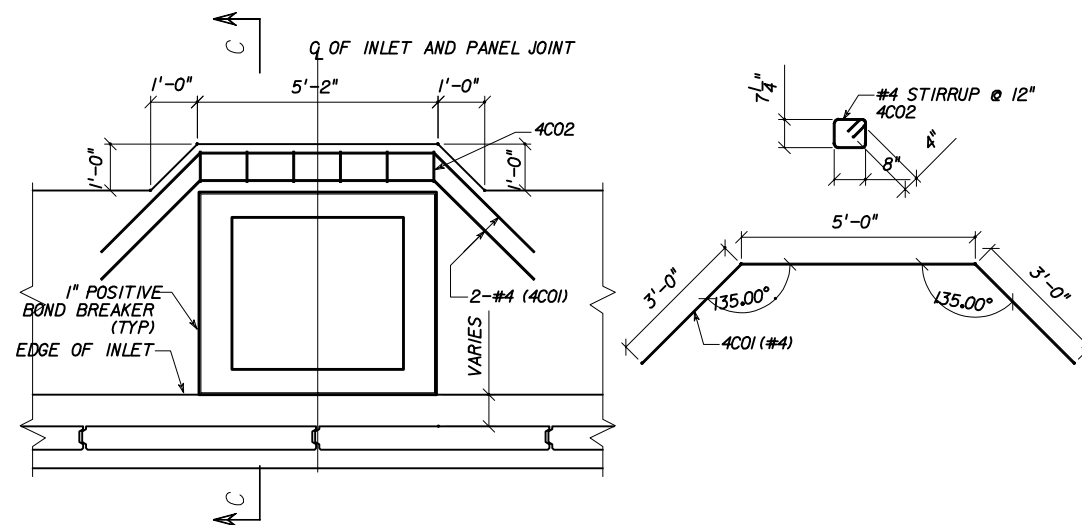
OBSTRUCTION SHALL BE CONSTRUCTED BEFORE WALL INSTALLATION.
FIELD CUT AND SKEW MESH AROUND OBSTRUCTION AS REQUIRED. THESE AREAS WILL BE CLEARLY INDICATED ON THE RETAINED EARTH SHOP DRAWINGS AND APPROVED BY THE ENGINEER OF RECORD.
CUT MESH/DAMAGED GALV. SHALL BE COATED WITH ZINC RICH PAINT.
NO CUTTING OF SOIL REINFORCEMENT GRIDS ALLOWED UNLESS SHOWN ON SHOP DRAWINGS AND APPROVED BY THE ENGINEER



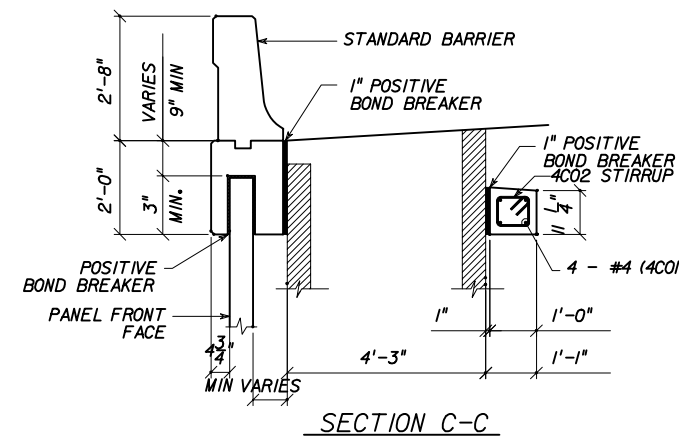
61 OBSTRUCTION (HORIZONTAL)
* 15 DEGREES MAX BEND



65C CONNECTOR INSTALLATION DETAIL
(SECTION B-B)



66 PARTIAL PLAN - JUNCTION SLAB AROUND INLET
(REBAR NOT SUPPLIED BY FOSTER GEOTECHNICAL)



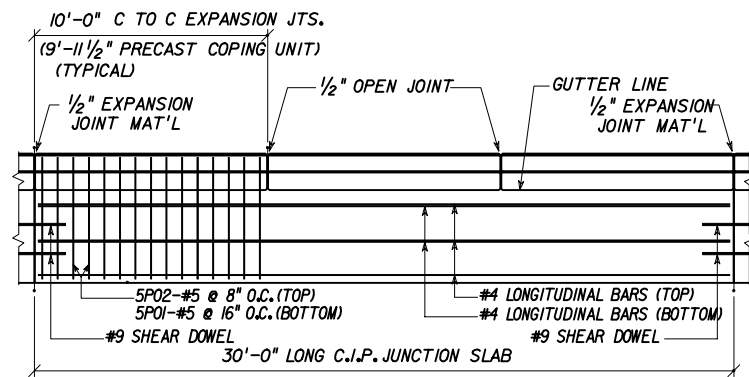
SECTION C-C

SQUARE / HEX PANELS

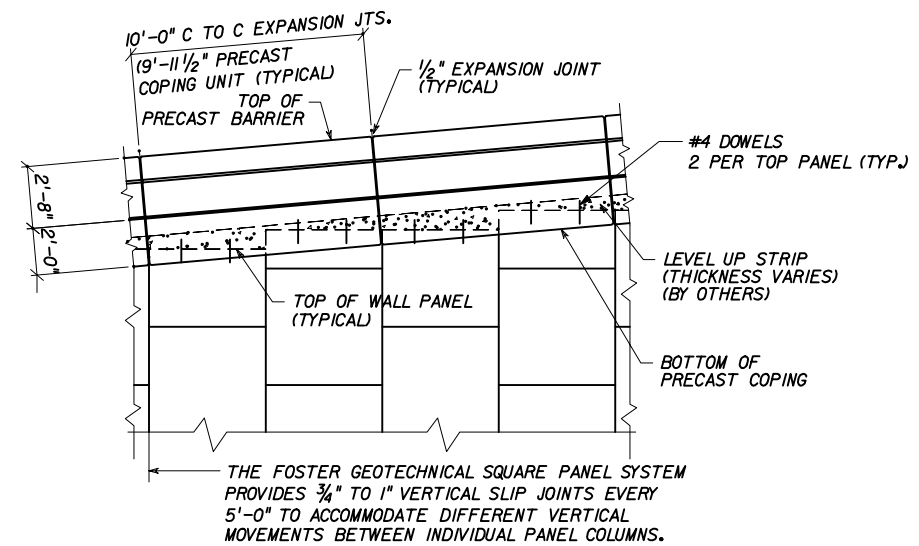
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
RETAINING WALL SYSTEM
FOSTER GEOTECHNICAL RETAINED EARTH WALL

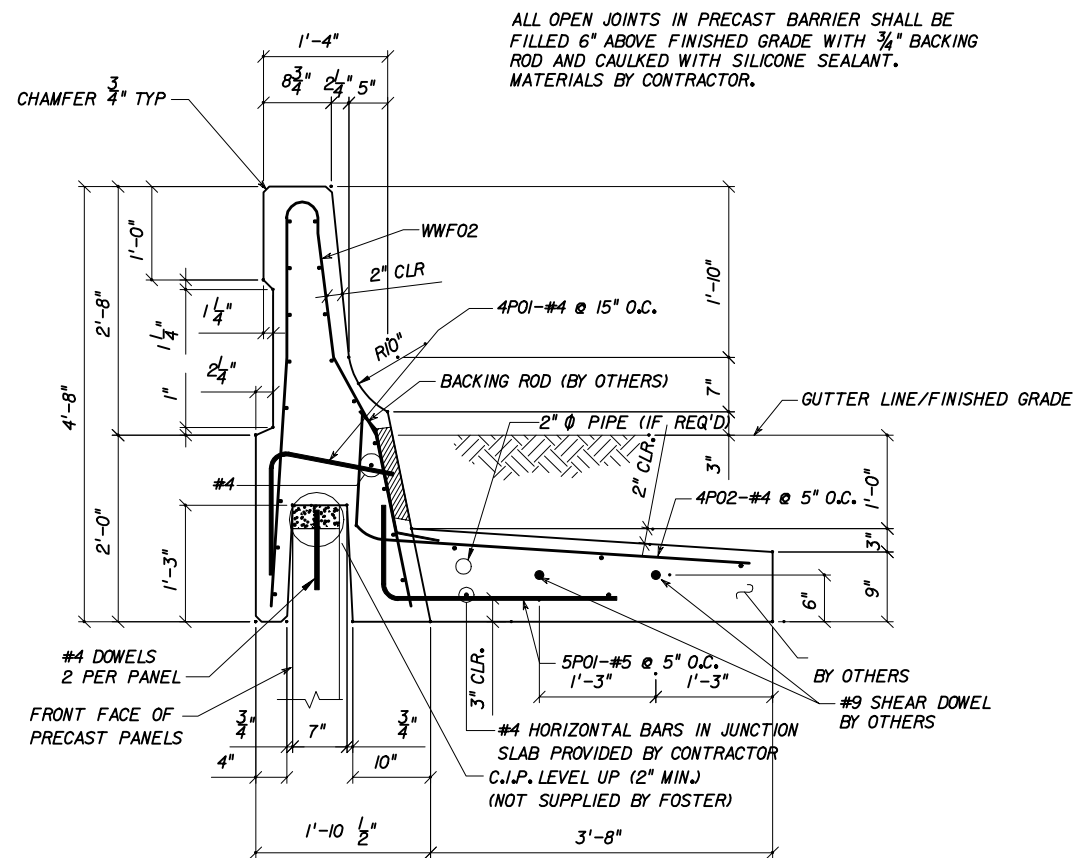
Names	Dates	Approved By		
Designed By	TCNA 11/98	[Signature] State Structures Design Engineer		
Drawn By	CAD 11/98			
Checked By	GEO 11/98	Revision	Sheet No.	Index No.
		00	5 of 12	5005



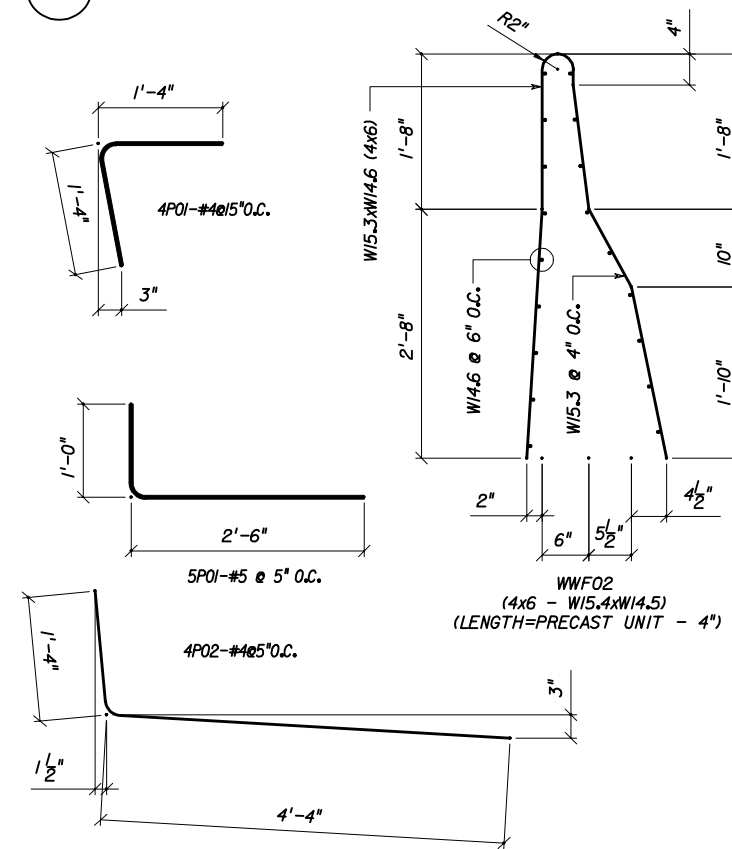
24A PLAN VIEW - PRECAST TRAFFIC BARRIER
(HORIZONTAL BARS IN JUNCTION SLAB & #9 SHEAR DOWELS, NOT BY VSL)



24B PARTIAL ELEVATION PRECAST BARRIER



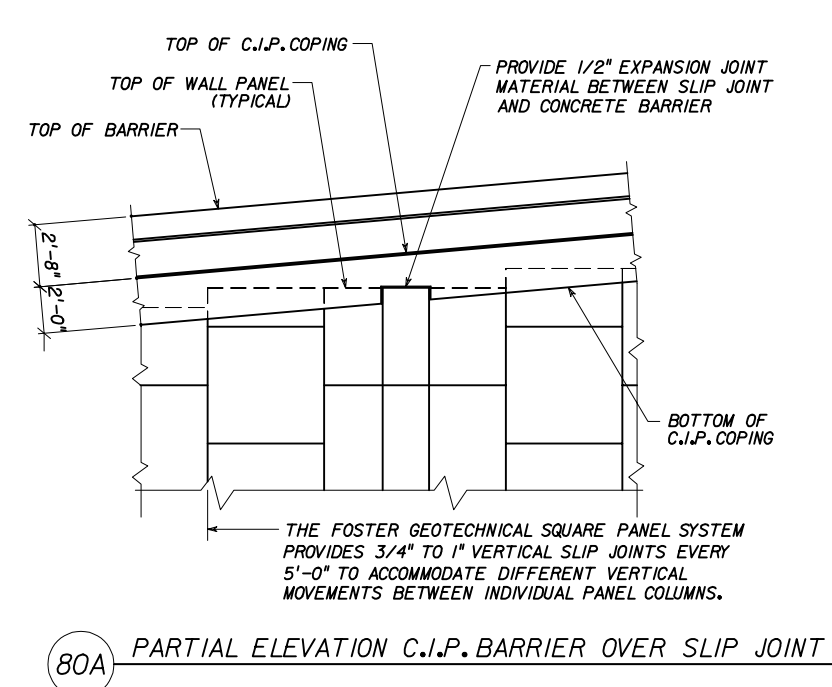
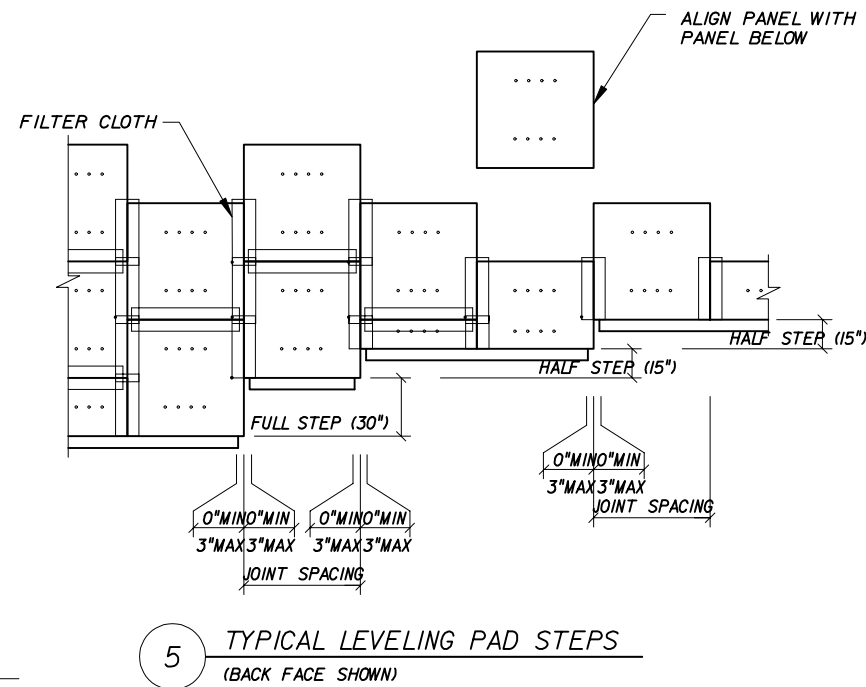
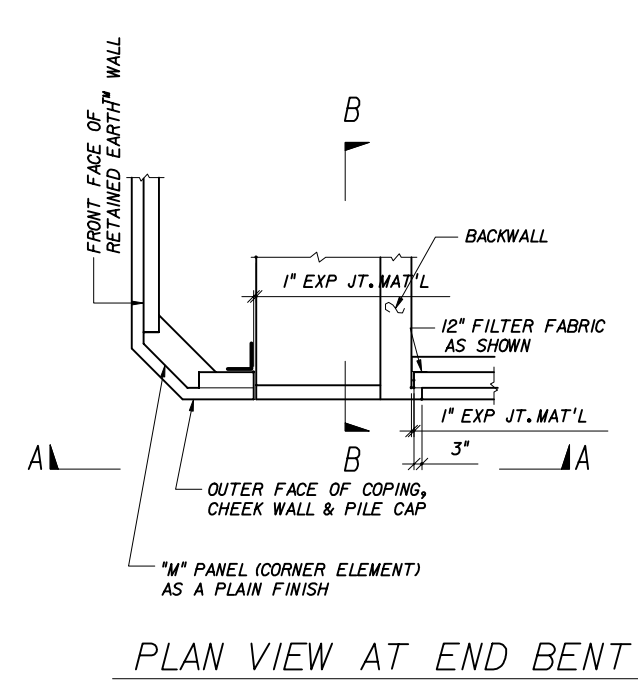
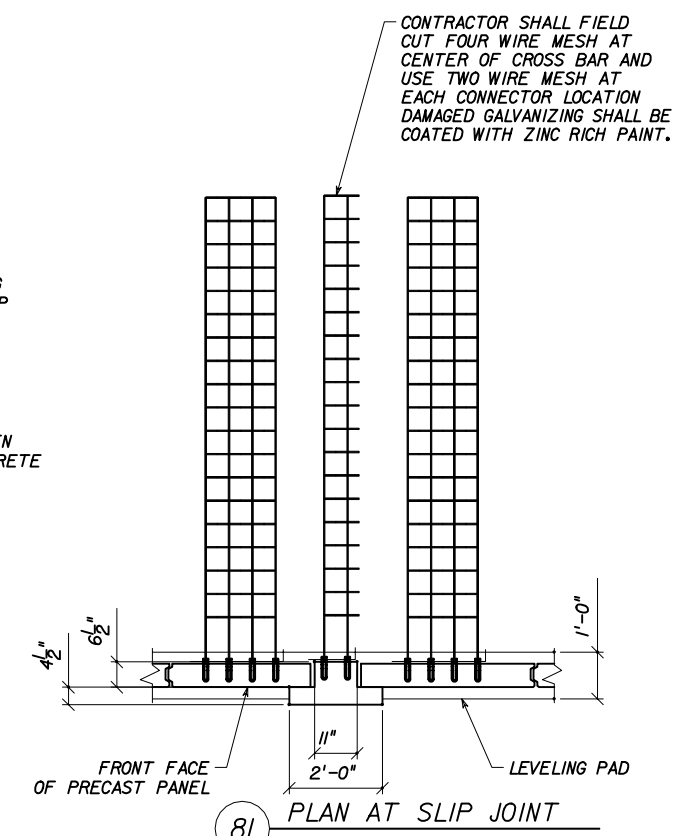
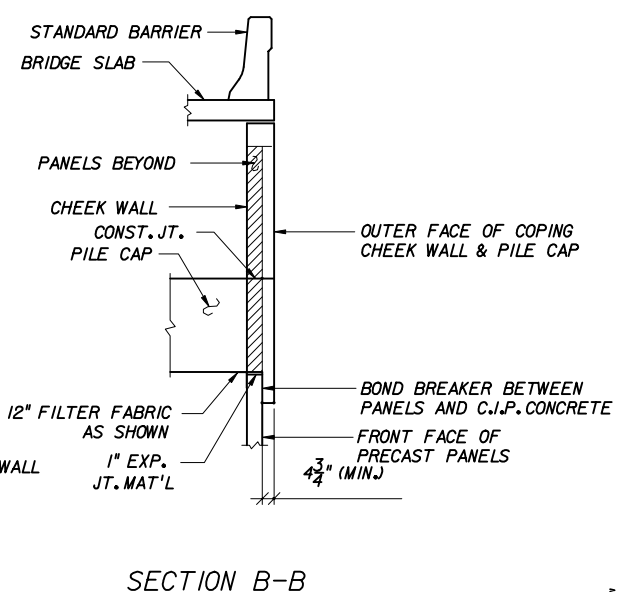
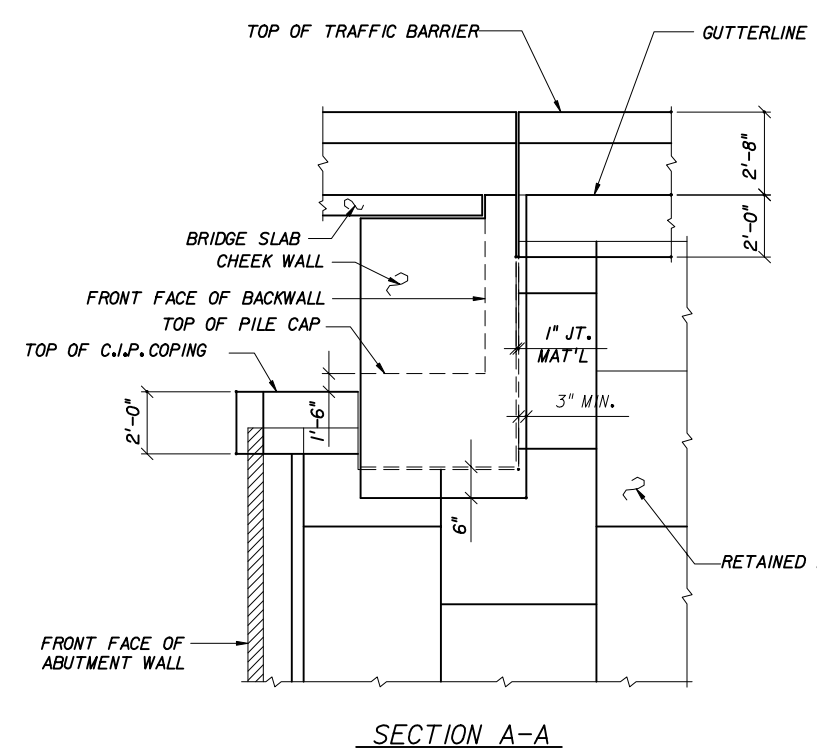
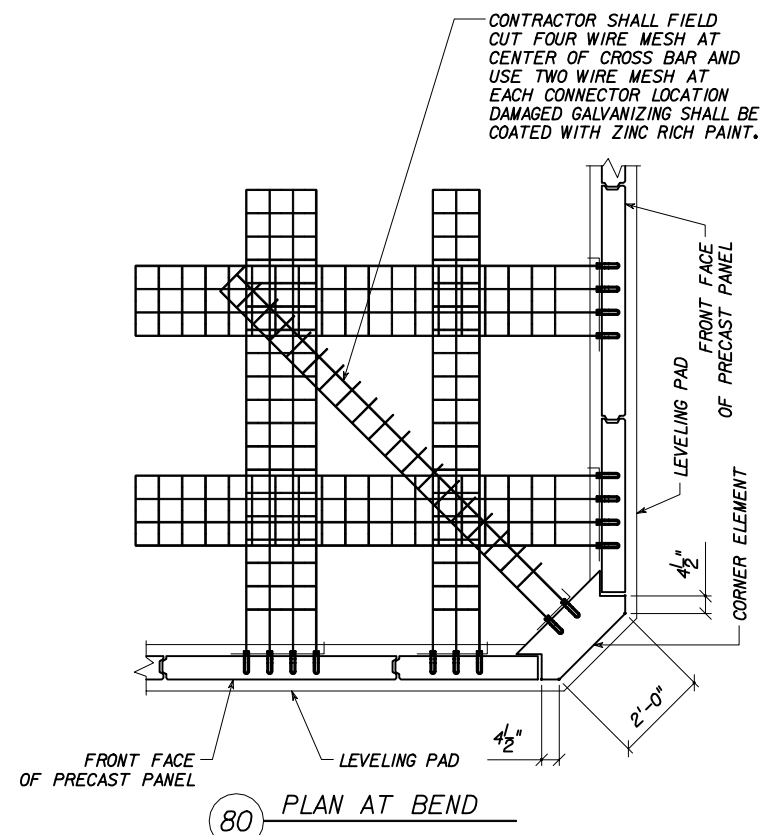
24 TYPE HTB_ PRECAST BARRIER W/COPING & JUNCTION SLAB
U.S. PATENT NO. 4,494,892



SQUARE / HEX PANELS

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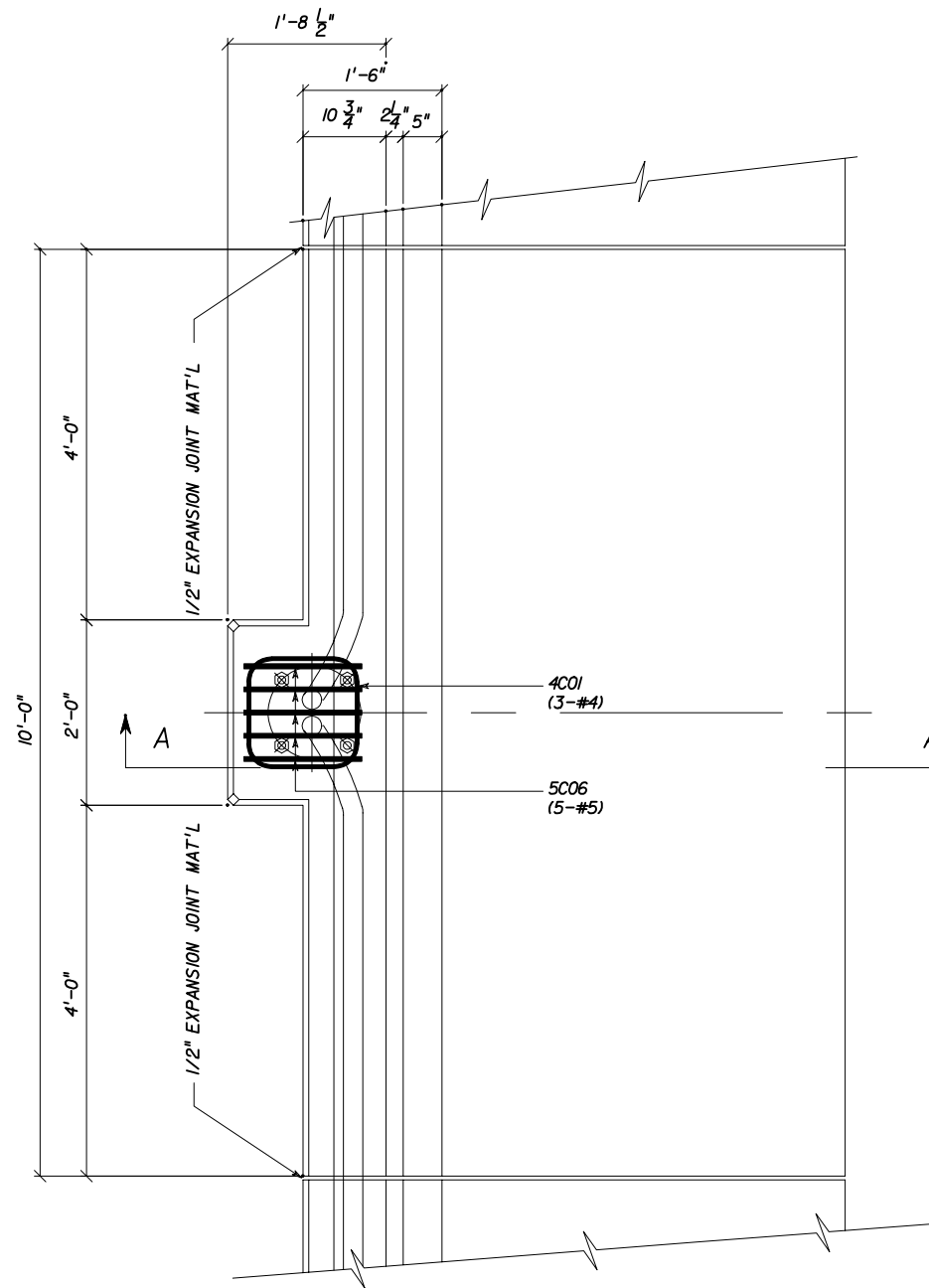
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	6 of 12
				Index No. 5005



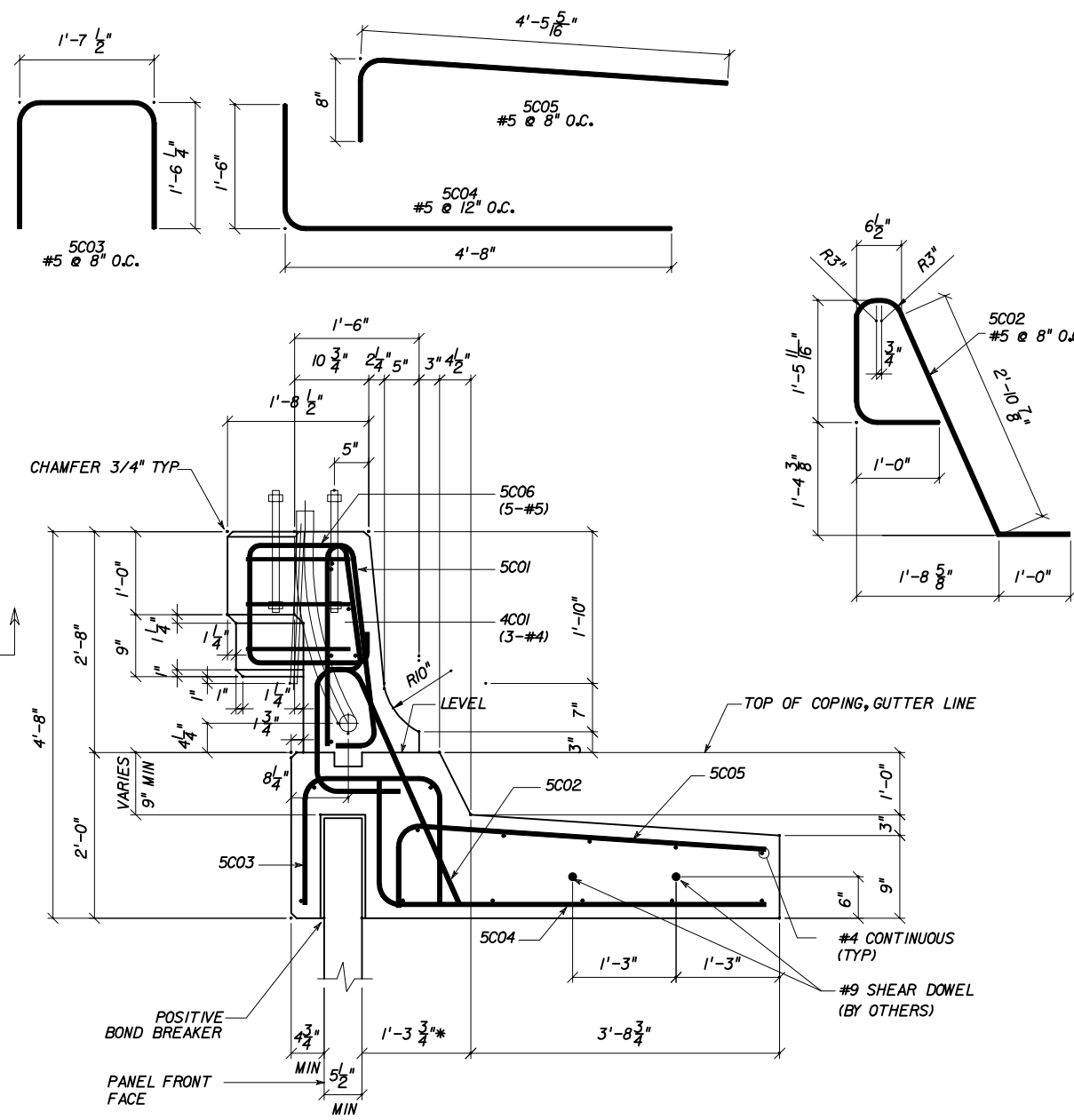
SQUARE PANELS

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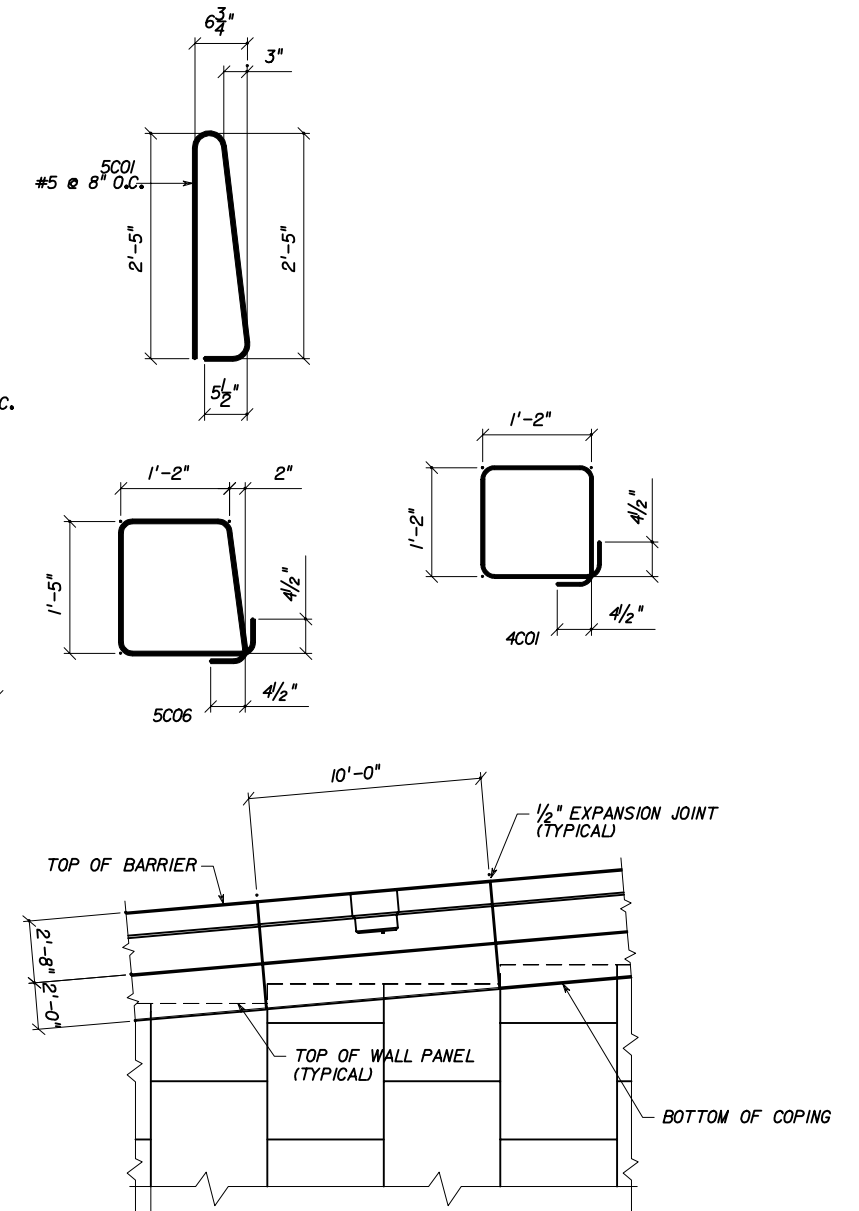
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	7 of 12
				Index No. 5005



29 CAST IN PLACE LIGHT POLE
 (ALL REBAR BY OTHERS)
 (LIGHT POLE/BARRIER COPING)



SECTION A-A
 (SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS)



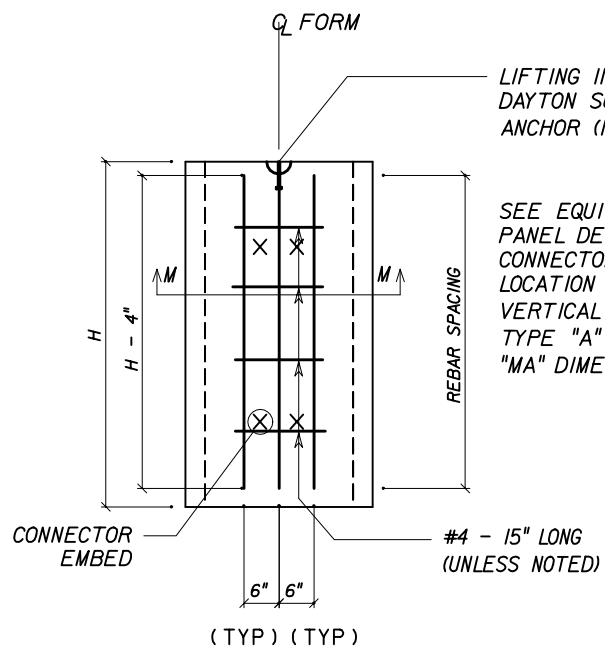
29A PARTIAL ELEVATION AT LIGHT POLE

THE FOSTER GEOTECHNICAL SQUARE PANEL SYSTEM PROVIDES 3/4" TO 1" VERTICAL SLIP JOINTS EVERY 5'-0" TO ACCOMMODATE DIFFERENT VERTICAL MOVEMENTS BETWEEN INDIVIDUAL PANEL COLUMNS.

SQUARE / HEX PANELS

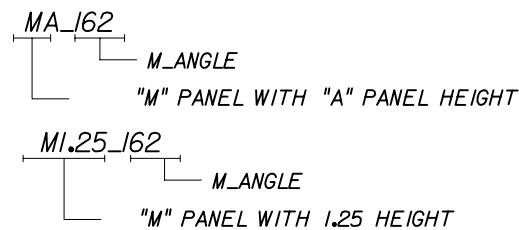
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	Dates	11/98	Approved By
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	8 of 12
				Index No. 5005

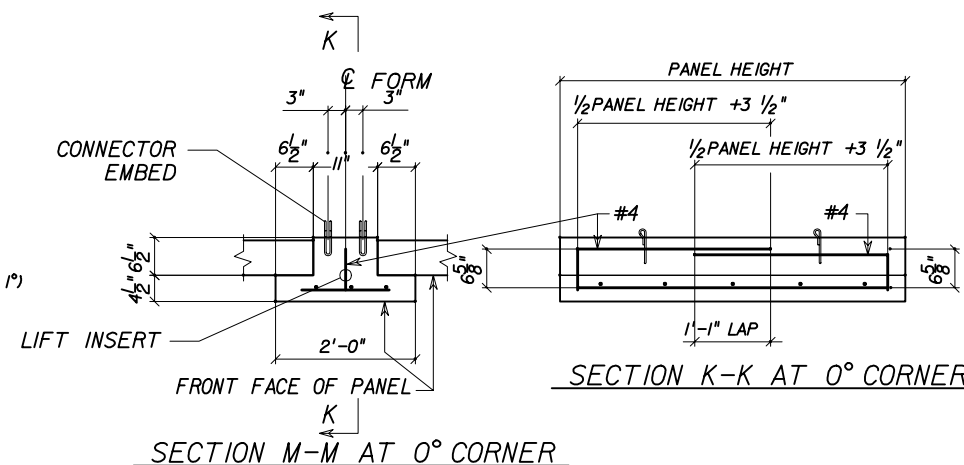
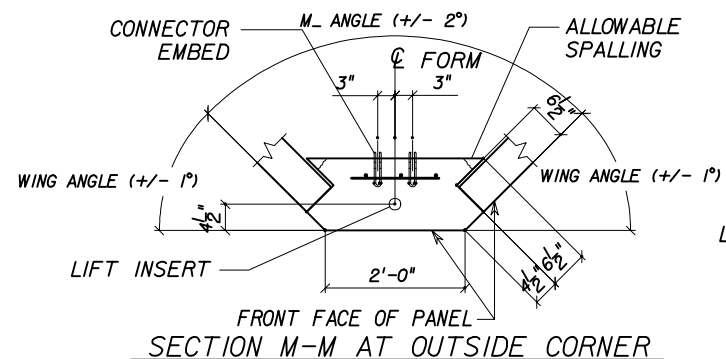
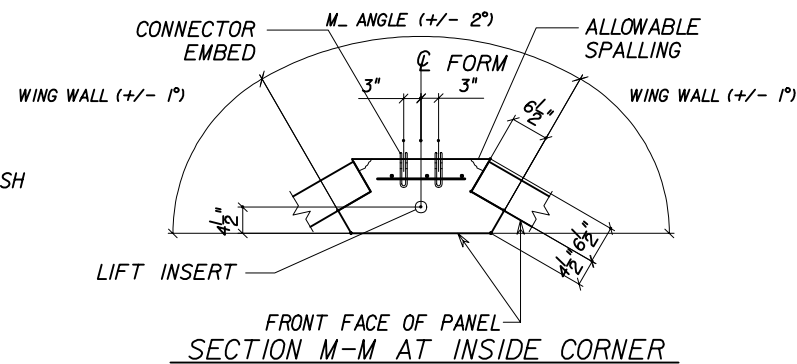


M TYPE M REBAR
"M" PANELS SHALL HAVE AN PLAIN SURFACE FINISH

PANEL AREAS	
PANEL NAME	SQ. FT.
MA	13.75
MD	11.46
MD2	9.7
MC2	6.55
MD4	4.58
MB6	10.31
MB2	6.88
MB4	3.44



TYPICAL PANEL DESIGNATION

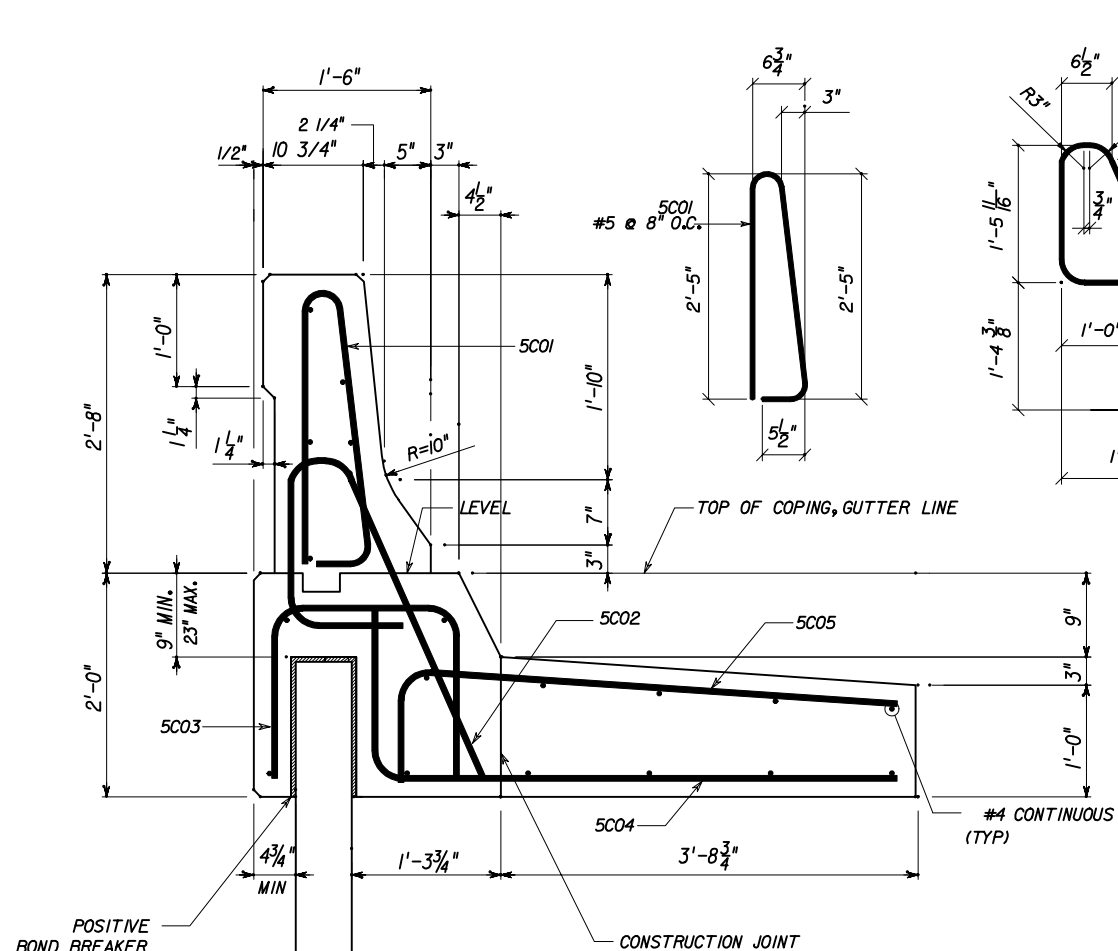


- PANEL REINFORCEMENT NOTES:
1. PANELS ARE SHOWN BACK FACE.
 2. RIGHT END PANELS ARE OPPOSITE TO LEFT END.
 3. DIMENSIONS ARE TO FORM INSIDE BACK FACE.
 4. VERTICAL REINFORCEMENT SHALL HAVE 2" MINIMUM COVER TO THE BACK FACE.
 5. HORIZONTAL REINFORCEMENT SHALL HAVE 1 1/2" MINIMUM COVER TO THE BACK FACE.
 6. ALL REINFORCEMENT SHALL HAVE 2" MINIMUM COVER TO THE SIDES.
 7. REINFORCEMENT LABELS INDICATE BAR SIZE AND LENGTH. EXAMPLE: 454 IS A #4 BAR 54" LONG.
 8. REINFORCEMENT SHALL BE GRADE 60.
 9. EQUIVALENT WELDED WIRE FABRIC MAY BE USED.
 10. SEE RETAINED EARTH™ PRECASTING SPECIFICATIONS FOR CONCRETE REQUIREMENTS.
 11. VSL RETAINED EARTH™ IS PROTECTED UNDER PATENT 4,725,770.
 12. ALL PANELS TO USE .276" Ø CLEVIS LOOPS, EXCEPT PANELS WITH A "Q" SUFFIX WHICH REQUIRE .374" Ø CLEVIS LOOPS.
 13. ALL "M" PANEL (CORNER ELEMENTS) SHALL HAVE A PLAIN FINISH.

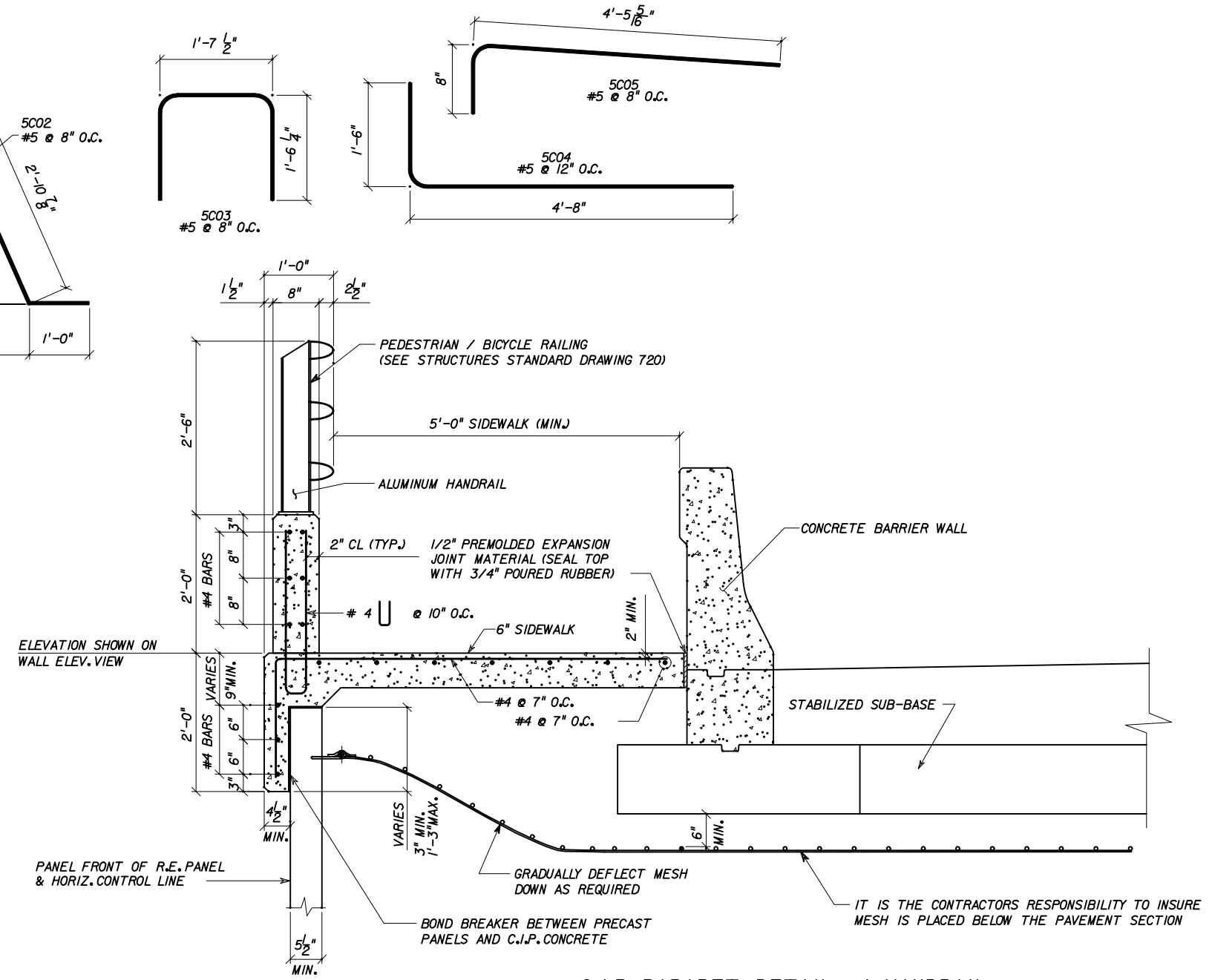
SQUARE / HEX PANELS

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Names	Dates	Approved By		
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	9 of 12
				5005



- NOTES:**
1. PROVIDE A POSITIVE BOND BREAKER BETWEEN C.I.P. CONCRETE AND PRECAST PANELS.
 2. ONE HALF INCH (1/2") JOINT TO BE PLACED EVERY SIXTH PANEL JOINT.
 3. SEE STRUCTURES STANDARD DRAWING 700 FOR ADDITIONAL 700 AND DETAILS.



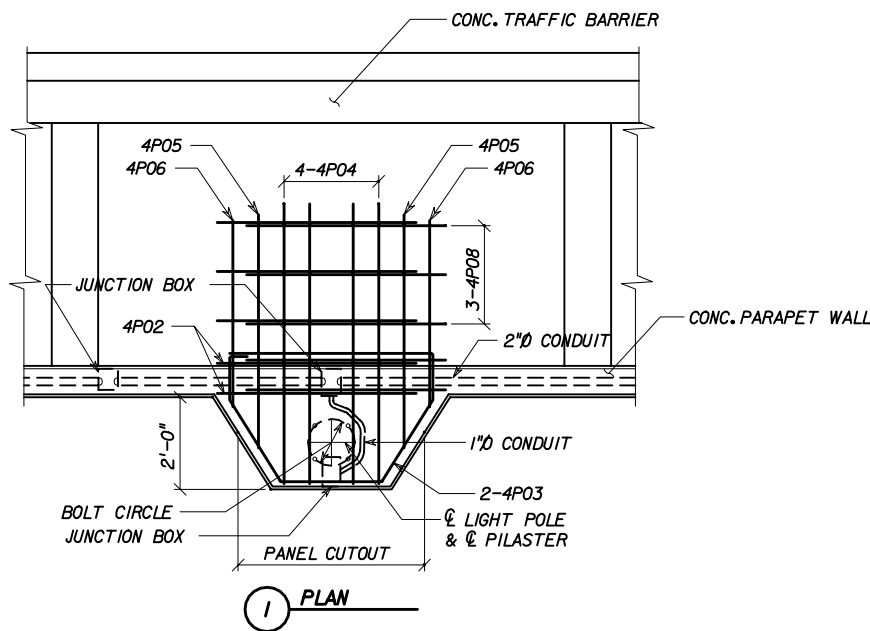
C.I.P. PARAPET DETAIL w/ HANDRAIL

6B C.I.P. BARRIER W/ COPING & JUNCTION SLAB STEEL

SQUARE / HEX PANELS

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NOTES:

1. ADDITIONAL CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTER SHALL MEET THE SAME REQUIREMENTS AS THAT OF THE PARAPET WALL.

2. TOP OF PILASTER SHALL BE FINISHED TO A TRUE LEVEL AREA.

3. LIGHT POLE PILASTER IS DESIGNED TO RESIST WORKING LOADS (IN ANY DIRECTION) FROM THE LIGHT POLE APPLIED AT THE TOP OF THE PILASTER AS FOLLOWS:

- LONGITUDINAL MOMENT = 30,000 FT. POUNDS
- TRANSVERSE MOMENT = 6,000 FT. POUNDS
- LONGITUDINAL SHEAR = 1,000 POUNDS
- TRANSVERSE SHEAR = 200 POUNDS
- TORSION = 3,000 FT. POUNDS
- AXIAL = 400 POUNDS

IF THE LIGHT POLE PROVIDED APPLIES LOADS THAT ARE IN EXCESS OF THOSE SHOWN ABOVE, THE CONTRACTOR SHALL REDESIGN THE PILASTER AND SUBMIT HIS DESIGN TO THE DEPARTMENT FOR REVIEW. THE CONTRACTOR'S REDESIGN SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA, AND QUALIFIED TO PERFORM THE WORK.

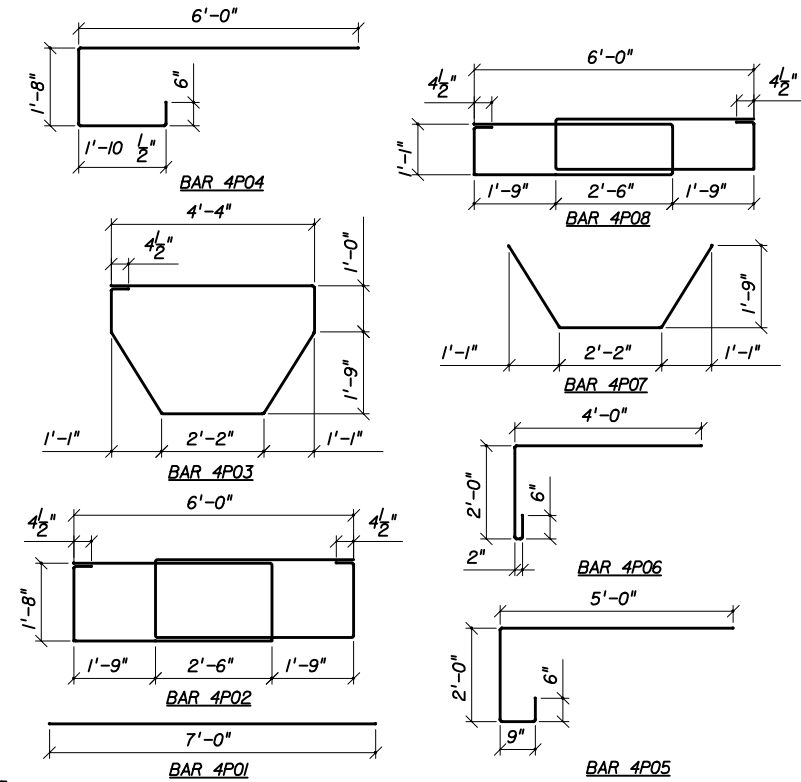
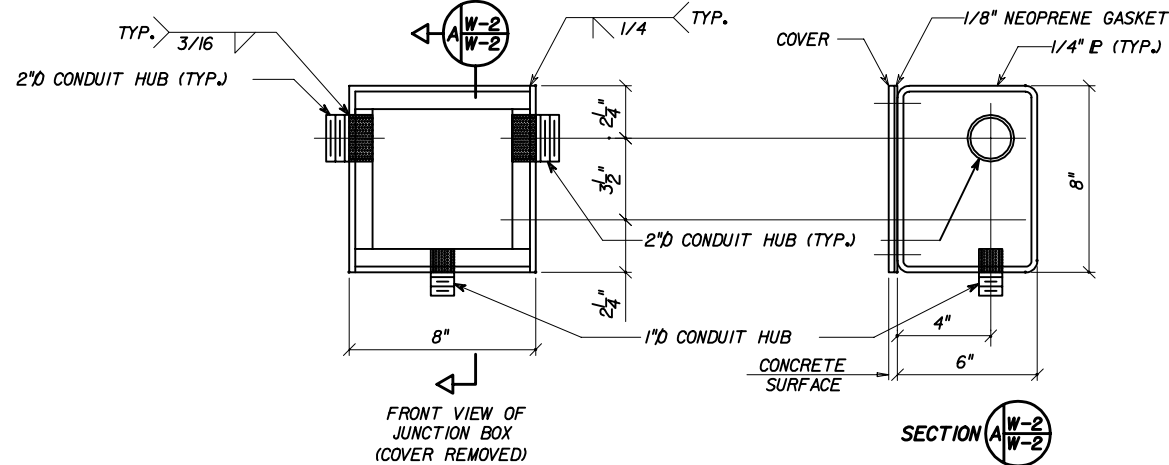
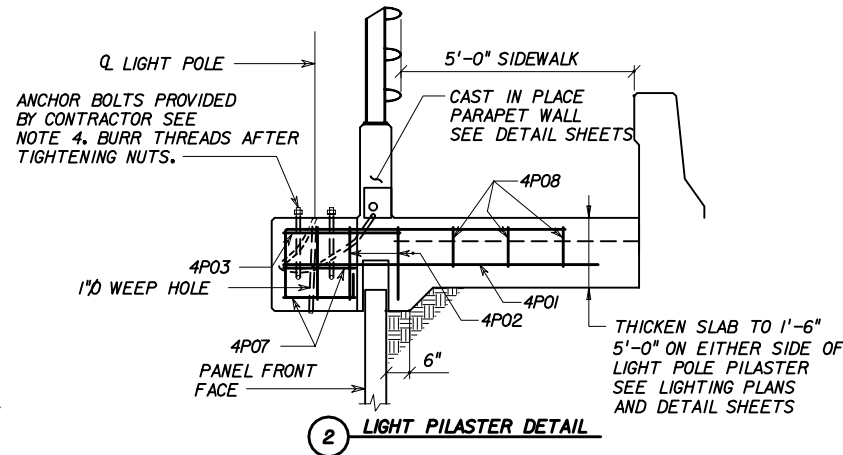
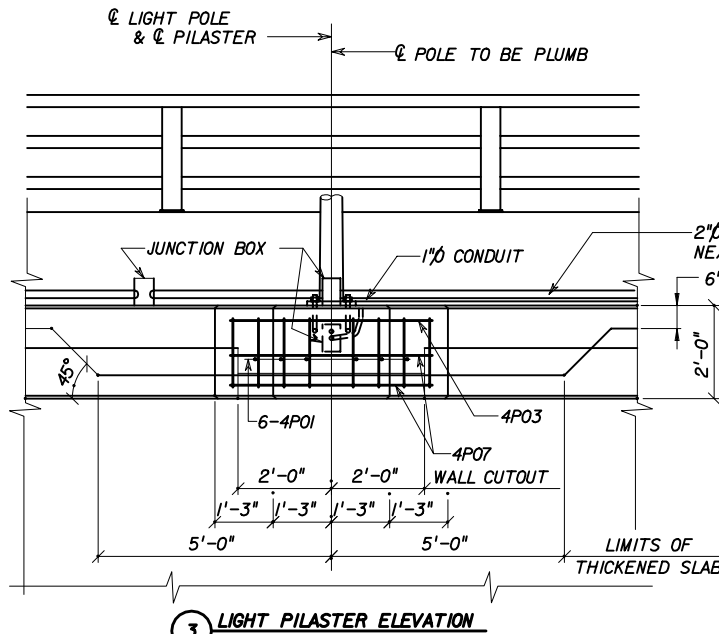
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND THAT FIT THE REINFORCING CAGE. CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHALL BE SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT FOR REVIEW AND APPROVAL SHOWING THAT THESE REQUIREMENTS HAVE BEEN MET PRIOR TO CONSTRUCTION.

5. STEEL FOR JUNCTION BOXES SHALL CONFORM WITH ASTM-A36. THE BOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. IN LIEU OF STEEL BOXES THE CONTRACTOR MAY SUBMIT FOR APPROVAL MOLDED P.V.C. BOXES (SCHEDULE 80).

6. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL OR SCHEDULE 80 P.V.C.

7. THE COST OF ANCHOR BOLTS SHALL BE INCLUDED IN THE BID PRICE FOR LIGHT POLES.

8. PAYMENT: THE COST OF ALL LABOR, CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTERS AND ALL CONDUITS, EXPANSION COUPLINGS, JUNCTION BOXES AND MISCELLANEOUS HARDWARE REQUIRED FOR COMPLETION OF THE ELECTRICAL INSTALLATION WITHIN THE LIMITS SHOWN ON THIS SHEET SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR THE MSE WALLS.



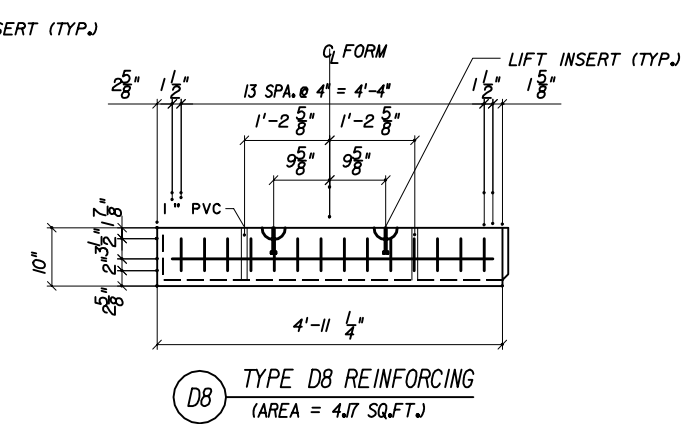
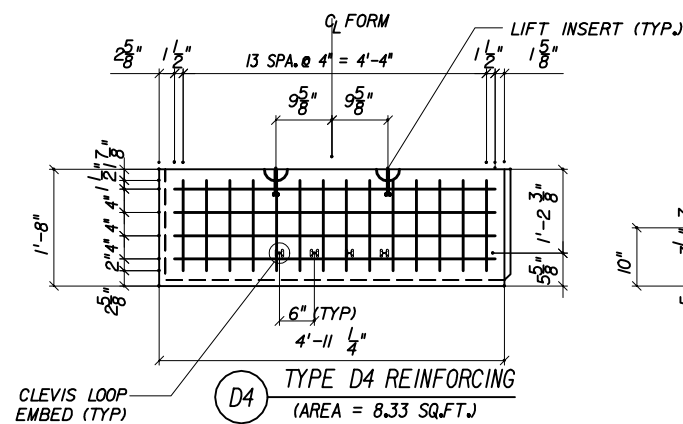
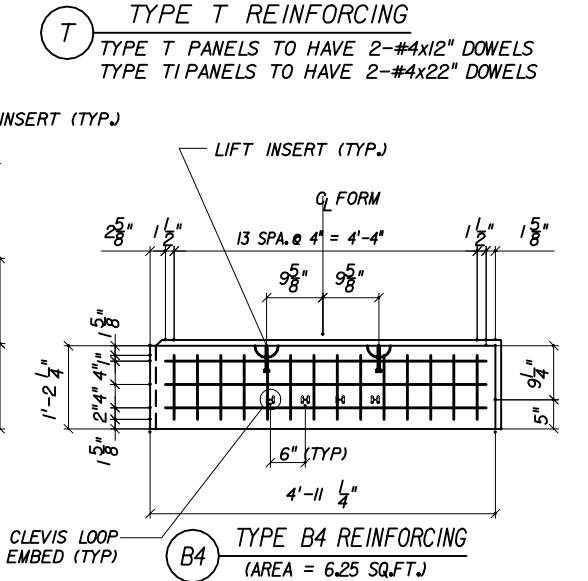
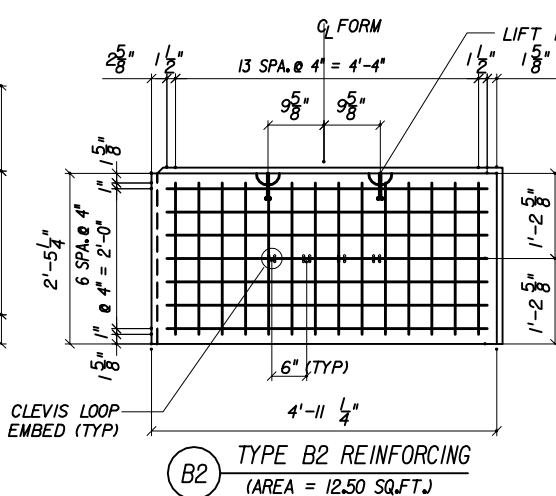
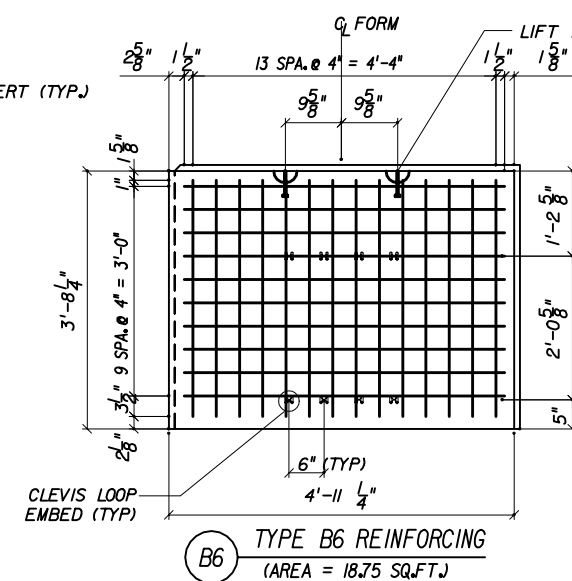
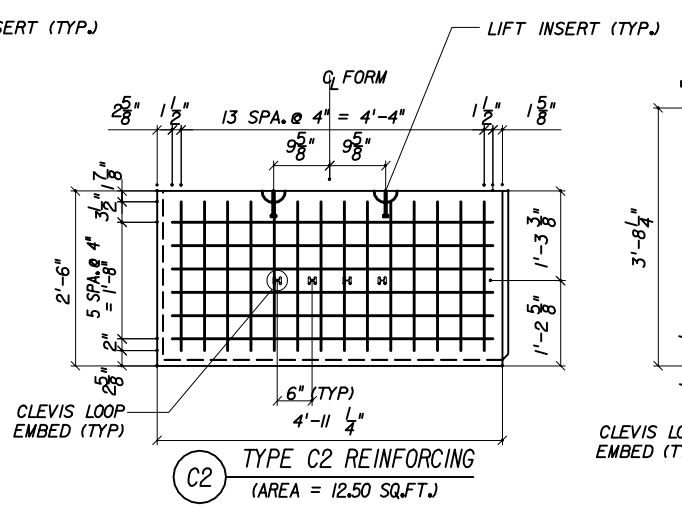
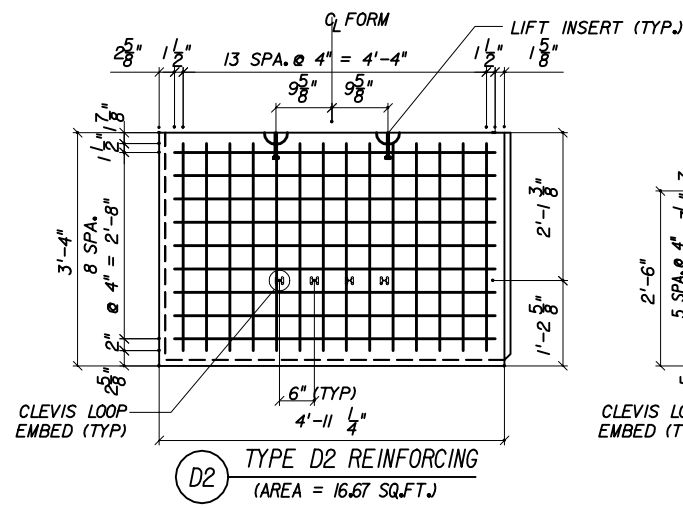
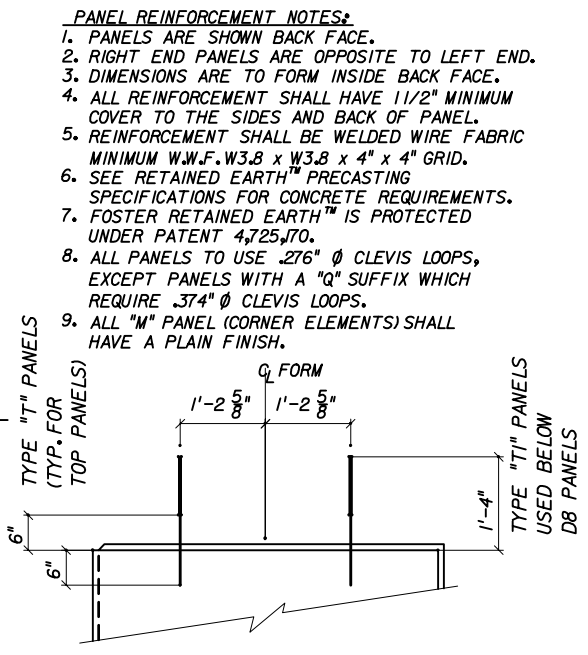
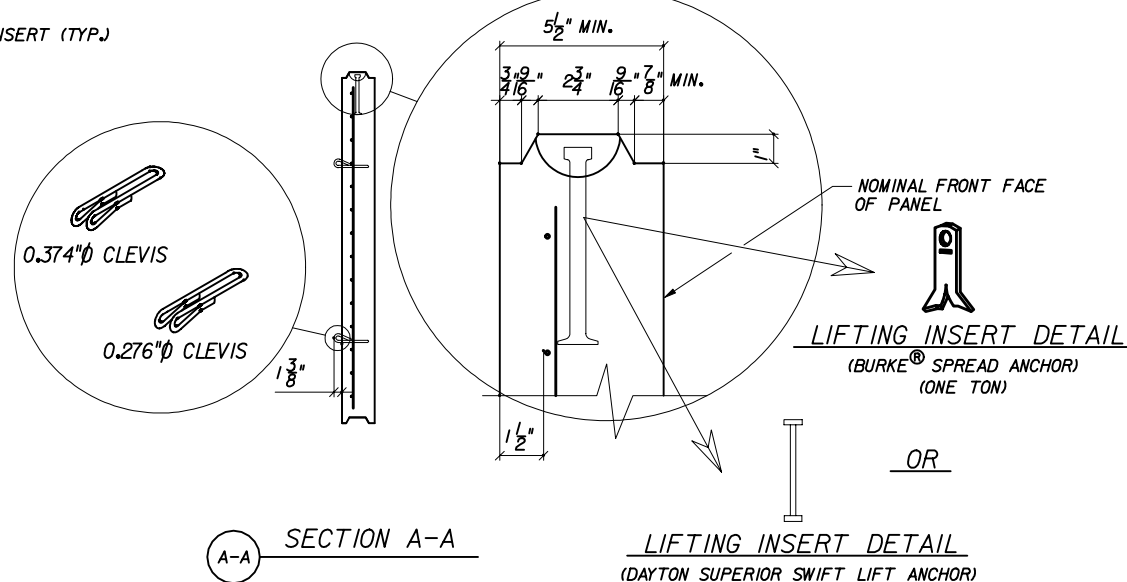
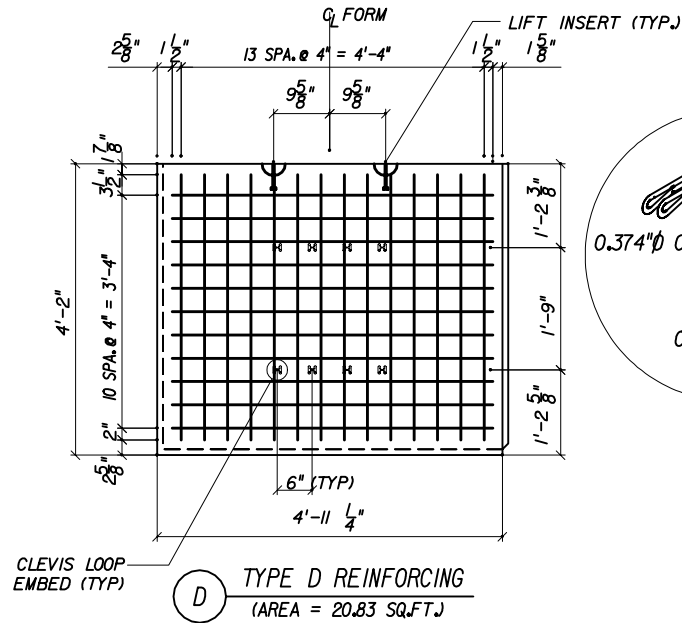
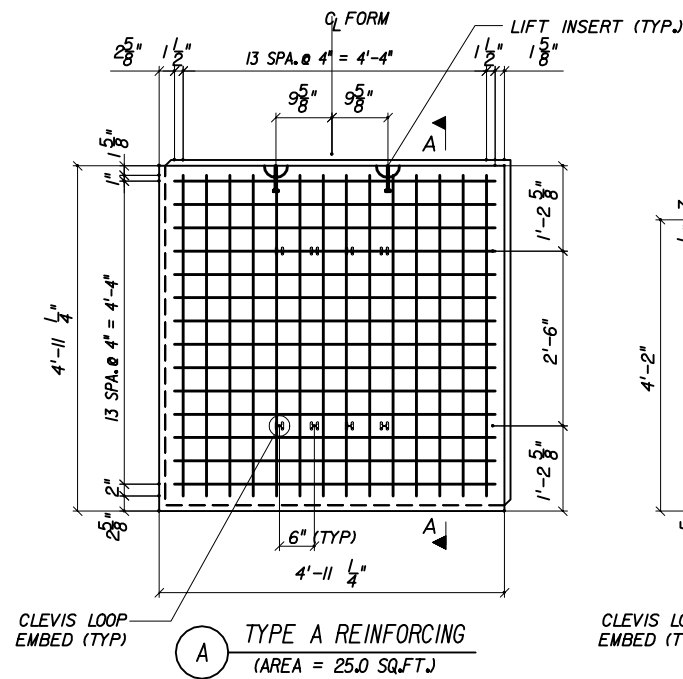
BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
4P01	#4	6	7'-0"
4P02	#4	2	24'-5"
4P03	#4	1	13'-1"
4P04	#4	4	10'-0 1/2"
4P05	#4	2	8'-3"
4P06	#4	2	6'-8"
4P07	#4	2	6'-4"
4P08	#4	3	22'-1"

4 BAR BENDING DETAIL

SQUARE / HEX PANELS

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RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	Dates	11/98	Approved By
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	11 of 12
				Index No. 5005



SQUARE PANELS

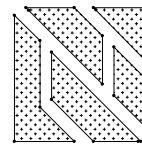
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Names	Dates	Approved By <i>[Signature]</i>		
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	12 of 12
				5005

STANDARD DETAILS FOR 3" CONCRETE COVER

T-WALL® RETAINING WALL SYSTEM

DESIGNER



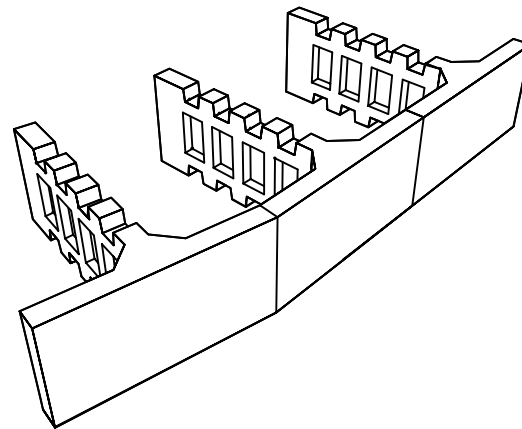
THE NEEL COMPANY

8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER

OLDCASTLE PRECAST, INC

5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428



MISCELLANEOUS NOTES:

1. DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VA 22152
PH: (703) 913-7858
FX: (703) 913-7859
2. PRECASTER:
OLDCASTLE PRECAST INC.
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428
3. MATERIALS SUPPLIED BY PRECASTER:
-PRECAST T-WALL UNITS
-PRECAST SHEAR KEYS
-HORIZONTAL JOINT MATERIAL
-VERTICAL JOINT MATERIAL AND ADHESIVE
-SHEAR KEY JOINT MATERIAL

DESIGN NOTES:

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE RETAINING WALL VOLUME, METHODS OF CONSTRUCTION, AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO SPEC SECTION 548 - RETAINING WALL SYSTEMS.
2. SOIL PARAMETERS:
-SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUE OF ϕ , C AND GAMMA SHALL BE PROVIDED IN THE SHOP DRAWINGS
3. FACTORS OF SAFETY:
-OVERTURNING - 2.0
-SLIDING - 1.5
-INTERNAL PULLOUT - 1.5
-BEARING CAPACITY - 2.5
-OVERALL STABILITY - 1.5
4. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE NEEL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN, INCLUDING FOUNDATION AND SLOPE STABILITY, IS THE RESPONSIBILITY OF OTHERS.
5. PANELS WITH CANTILEVERED (EXTENDED) FACE SHALL ONLY BE USED TO AVOID OBSTRUCTIONS AS APPROVED ON THE SHOP DRAWINGS.

MATERIALS NOTES:

1. PRECAST CONCRETE:
-PRECAST T-WALL UNITS - PER SPEC SECTION 548
-PRECAST SHEAR KEYS - PER SPEC SECTION 548
2. C.I.P. CONCRETE:
-C.I.P. LEVELING PAD - PER SPEC SECTION 548
-OTHER C.I.P. CONCRETE - PER SPEC SECTION 548
3. REINFORCING STEEL:
-PER SPEC SECTION 548
4. JOINT MATERIAL:
-HORIZONTAL JOINT FILLER:
-1/2" x 4" x 5'-0"
-PREFORMED EPDM
-DUROMETER: 80 - 90
-VERTICAL JOINT COVER:
-TENSAR DC4205 OR EQUAL
-12" WIDE x HEIGHT OF JOINT
-GEOCOMPOSITE MEETING REQUIREMENTS OF SPEC SECTION 548
-SHEAR KEY WRAP:
-1/4" x 8" x 24"
-AVI ASTRO-FOAM AF-250
5. BACKFILL:
-PER SPEC SECTION 548

CONSTRUCTION NOTES:

1. ALL CONSTRUCTION PROCEDURES SHALL COMPLY WITH SPEC SECTION 548 AND THE "T-WALL CONSTRUCTION MANUAL" (PROVIDED BY THE NEEL COMPANY OR OLDCASTLE PRECAST, INC). IN THE EVENT OF A DISCREPANCY BETWEEN THE SPEC AND THE "T-WALL CONSTRUCTION MANUAL", THE SPEC SHALL CONTROL.
2. FOR LOCATION AND ALIGNMENT OF T-WALL STRUCTURE, SEE RETAINING WALL CONTROL PLANS.
3. T-WALL STRUCTURES ON CURVES SHALL BE BUILT IN CHORDS AS SHOWN IN THE T-WALL DESIGN DRAWINGS.
4. IF MANHOLES OR DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN IN THE T-WALL DESIGN DRAWINGS.
5. IF PILES ARE LOCATED WITHIN THE RETAINING WALL VOLUME, THEY SHALL BE DRIVEN BEFORE CONSTRUCTION OF THE T-WALL STRUCTURE.
6. T-WALL UNITS SHALL BE PLACED ONE ROW AT A TIME, AND BACKFILLED BEFORE PLACEMENT OF THE NEXT ROW.
7. IF A STRUCTURE EXCEEDS 20' IN HEIGHT, THE FINISH GRADE AT THE FACE OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS 20' IN HEIGHT.
8. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING STORM WATER DRAINAGE IN THE VICINITY OF THE WALL DURING CONSTRUCTION. STORMWATER RUNOFF SHALL BE COLLECTED AND DISCHARGED AWAY FROM THE WALL AND THE RETAINING WALL VOLUME.

THIS SYSTEM SHALL NOT BE USED FOR WALLS WITH ACUTE INTERIOR CORNERS IN SALT WATER ENVIRONMENTS.

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)

Names	Dates	Approved By			
Designed By	JMC	10/01/98	 State Structures Design Engineer		
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By	JMC	10/01/98	04	1 of 20	5010

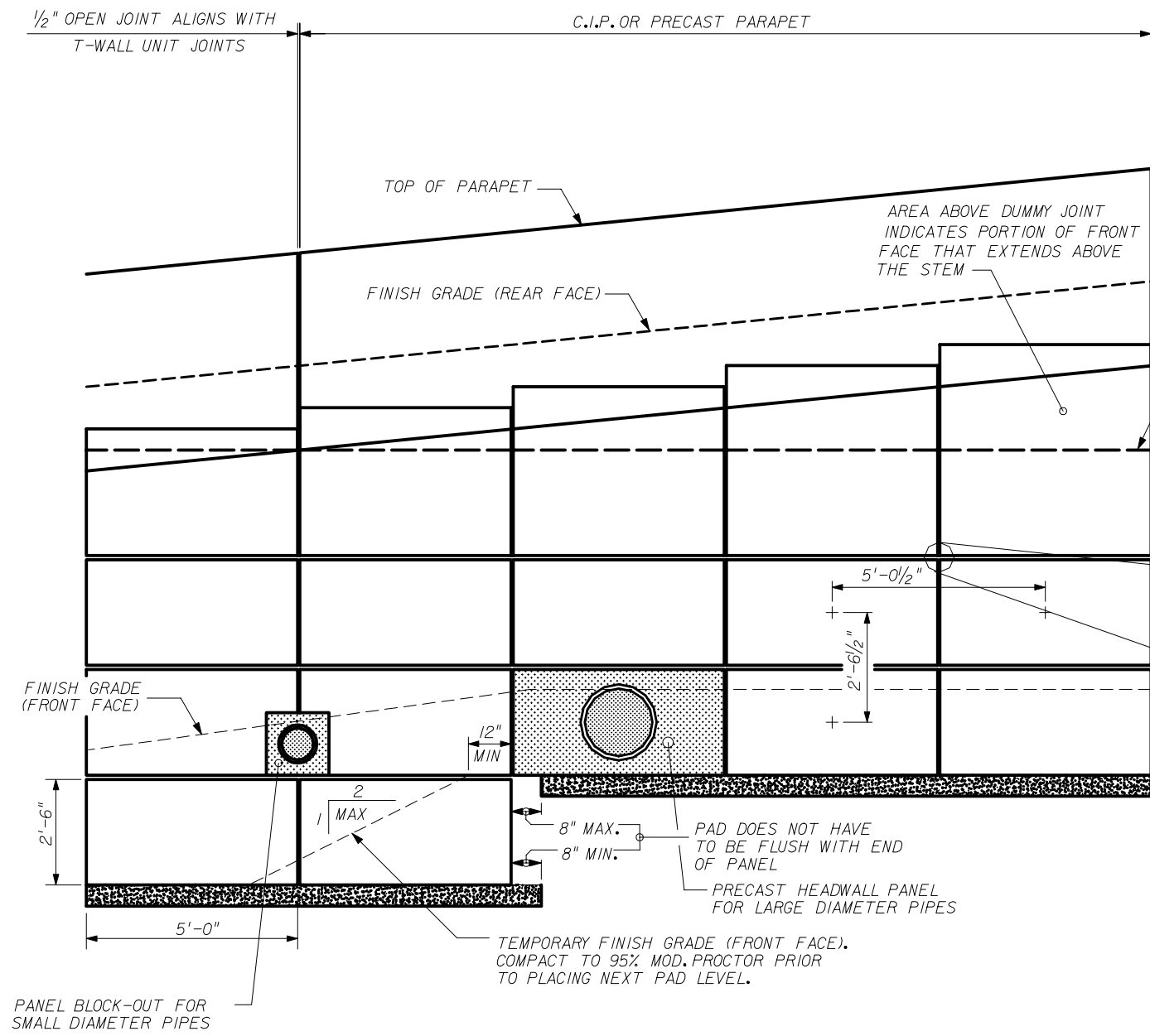


THE NEEL COMPANY

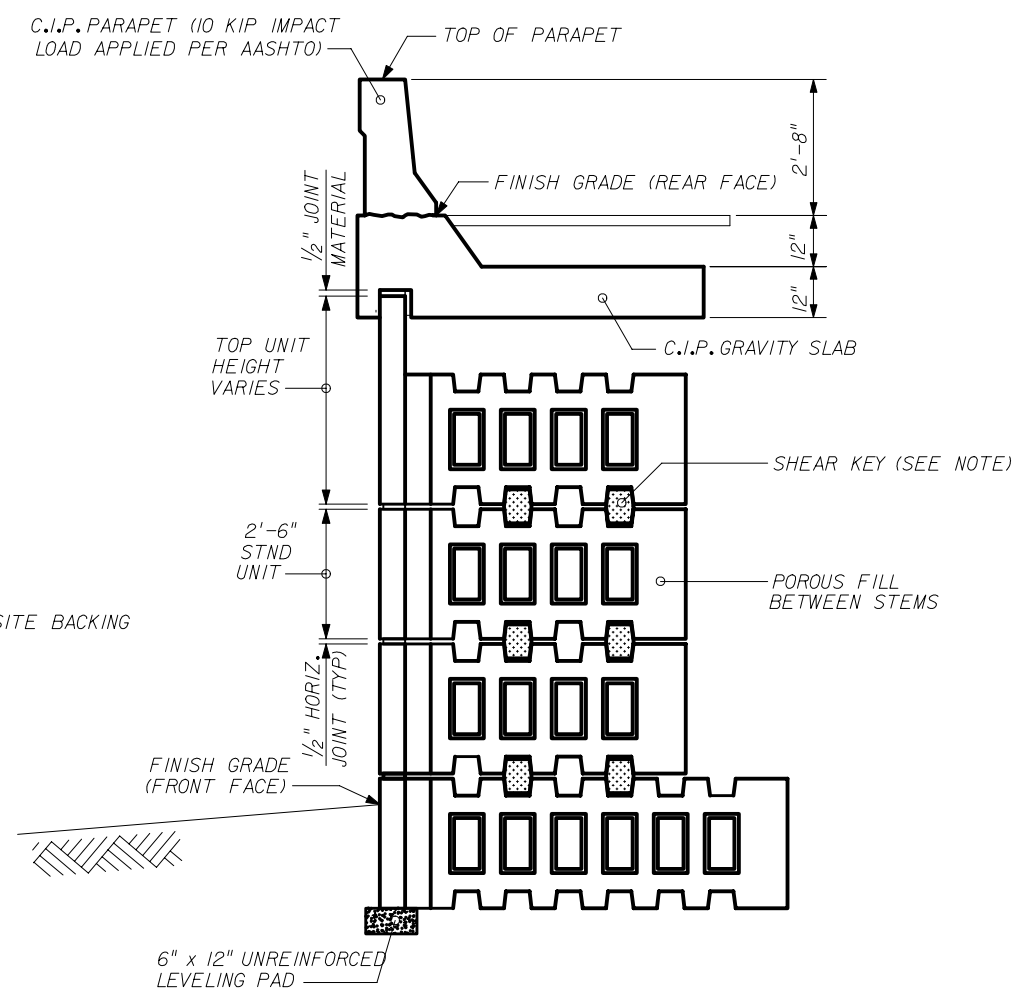
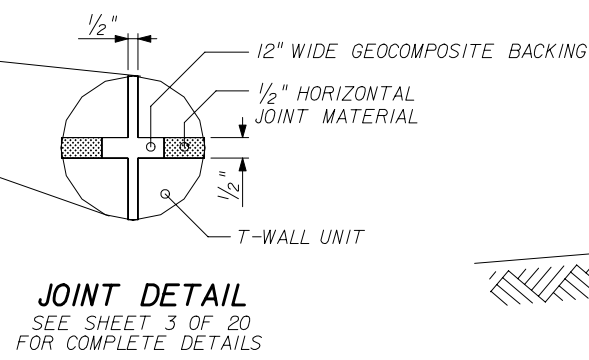
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PH: (703) 913-7858
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OLDCASTLE PRECAST, INC

5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428



PART ELEVATION SHOWING TYPICAL DETAILS
(NO SCALE)



SECTION SHOWING TYPICAL DETAILS
(NOT ALL DETAILS APPLY TO EACH WALL)

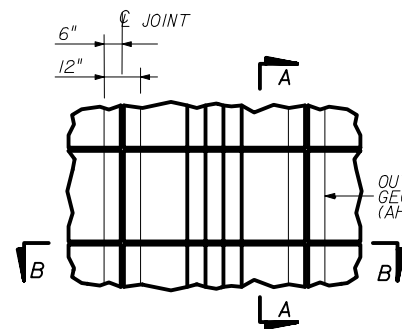
NOTE: ALL EXTENDED FACE TOP UNITS REQUIRE A MINIMUM OF TWO SHEAR KEYS. ALL OTHER UNITS ARE AS SHOWN BELOW:

- TOP UNITS - 2 SHEAR KEYS
- 6' STEM - 2 SHEAR KEYS
- 8' STEM - 2 SHEAR KEYS
- 10' STEM - 2 SHEAR KEYS
- 12' STEM - 2 SHEAR KEYS
- 14' STEM - 3 SHEAR KEYS
- 16' STEM - 3 SHEAR KEYS

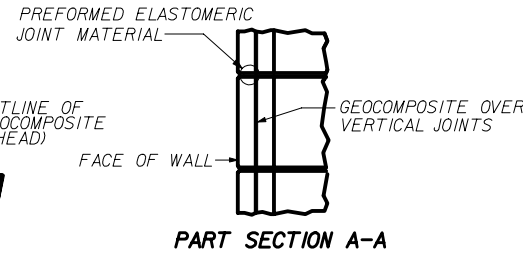
THE NEEL COMPANY
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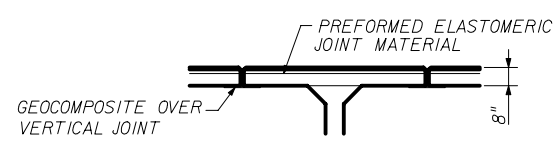
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By JMC	10/01/98	State Structures Design Engineer		
Drawn By CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By JMC	10/01/98	04	2 of 20	5010



PART ELEVATION - REAR FACE



PART SECTION A-A

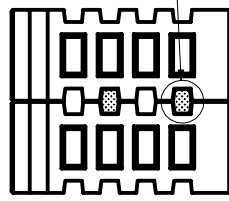


PART SECTION B-B

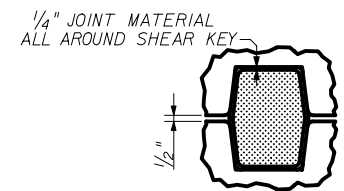
- NOTES:
- HORIZONTAL JOINT:
1/2" x 4" x 5'-0" PREFORMED ELASTOMERIC JOINT MATERIAL
 - VERTICAL JOINT:
1/2" SPACE
12" WIDE GEOCOMPOSITE BACKING, CENTERED ABOUT JOINT CENTERLINE.

JOINT MATERIAL DETAILS

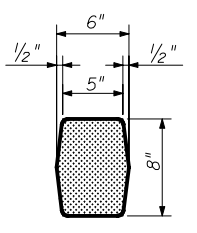
SHEAR KEY WRAPPED IN JOINT MATERIAL. SEE DETAILS THIS SHEET.



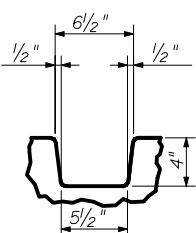
PART SECTION



SHEAR KEY / JOINT MATERIAL ARRANGEMENT



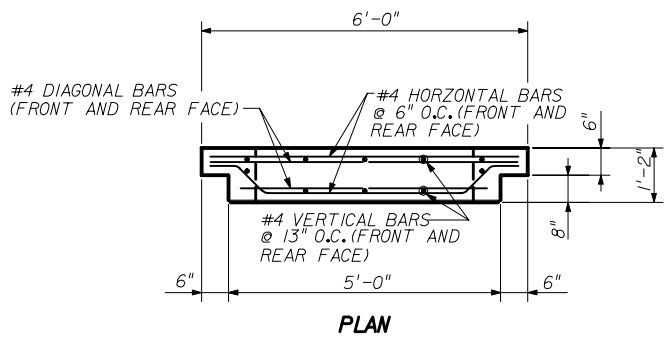
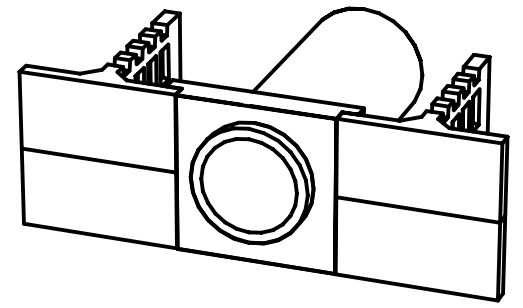
SHEAR KEY DIMENSIONS



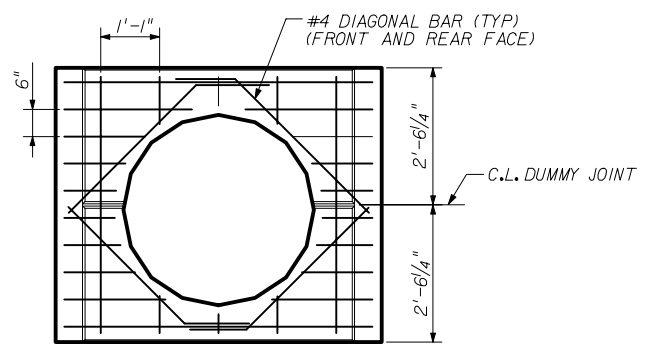
SHEAR KEY BLOCKOUT DIM'S

- NOTES:
- SHEAR KEY JOINT MATERIAL:
MINIMUM OF ONE 1/4" x 8" x 24" PIECE OF AVI ASTRO-FOAM AF-250 PER SHEAR KEY.
 - JOINT MATERIAL MAY BE ADDED OR REMOVED TO AID IN SHIMMING AND ALIGNING, HOWEVER SHEAR KEY MUST FIT SNUG IN THE SHEAR KEY BLOCKOUT WHEN UNIT IS IN ITS FINAL POSITION.
 - MINIMUM OF 2 SHEAR KEYS REQUIRED PER UNIT. SEE NOTES ON SHEET 2 OF 20, 'TYPICAL DETAILS (1)'

SHEAR KEY DETAILS



PLAN



ELEVATION (FRONT FACE)
PRECAST HEADWALL PANEL
FOR LARGE DIAMETER PIPES

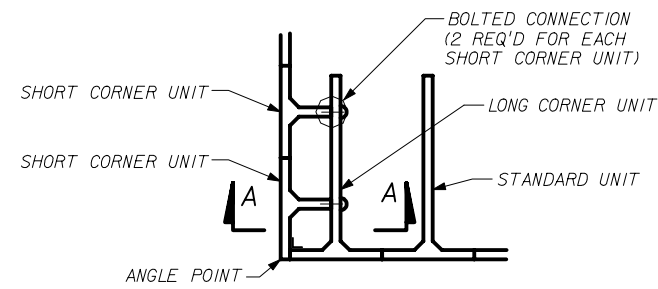
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)

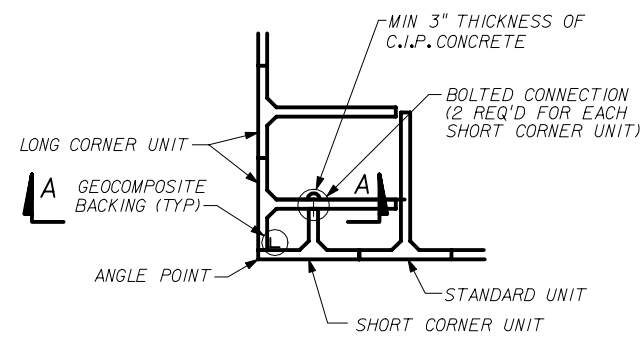
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By JMC	10/01/98	State Structures Design Engineer		
Drawn By CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By JMC	10/01/98	04	3 of 20	5010

THE NEEL COMPANY
8528 O'FRATORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

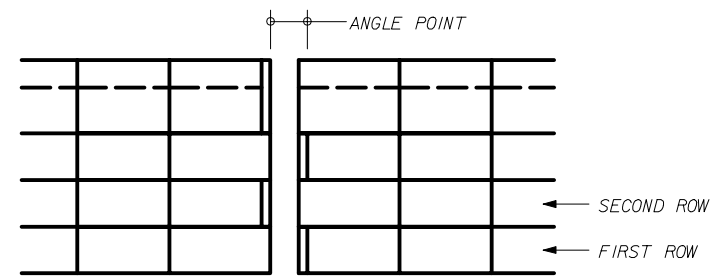
OLDCASTLE PRECAST, INC.
5995 SOUTHEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428



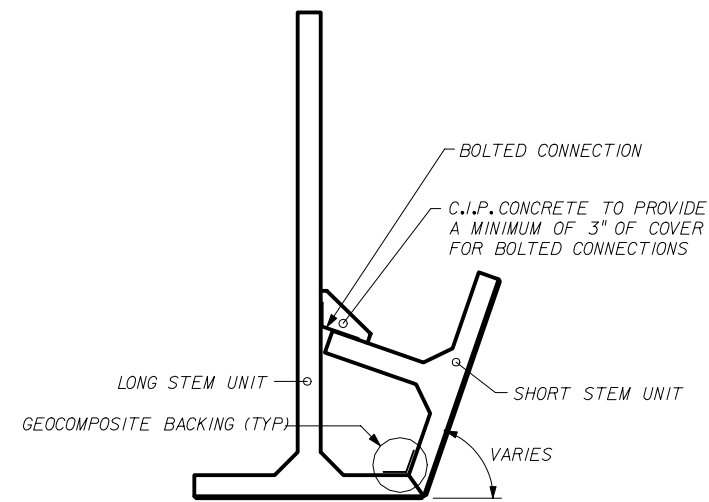
PART PLAN - FIRST ROW



PART PLAN - SECOND ROW

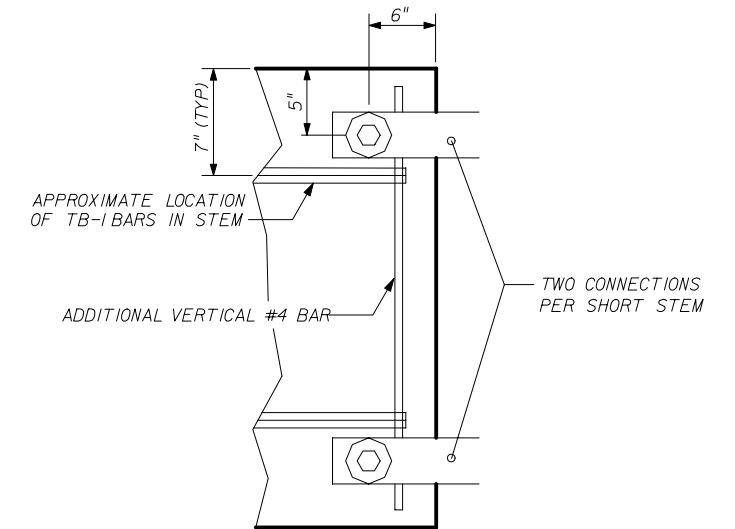


PART ELEVATION

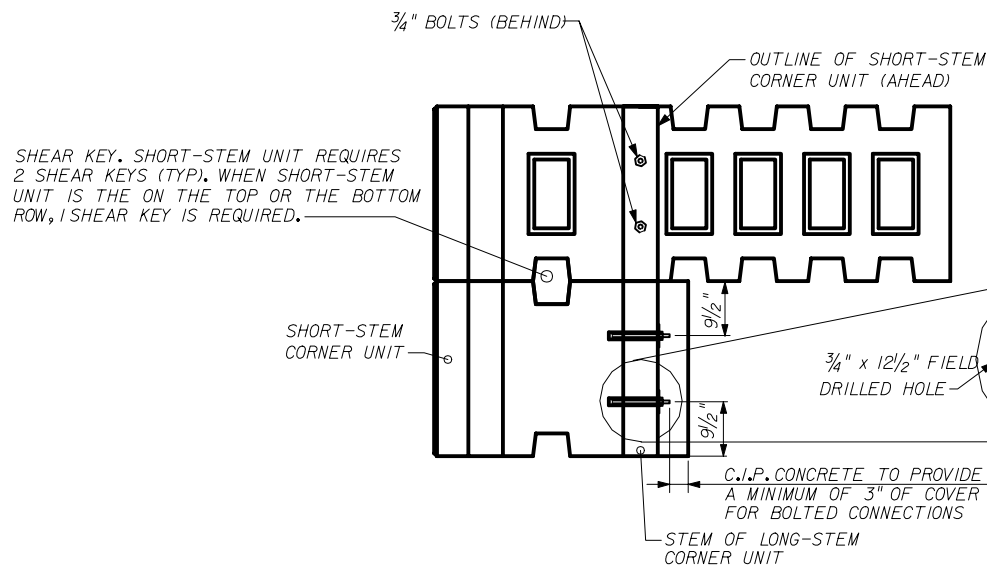


PART PLAN - ANGLE > 90°

SHORT AND LONG STEMS ALTERNATE PER 90° CORNER DETAIL

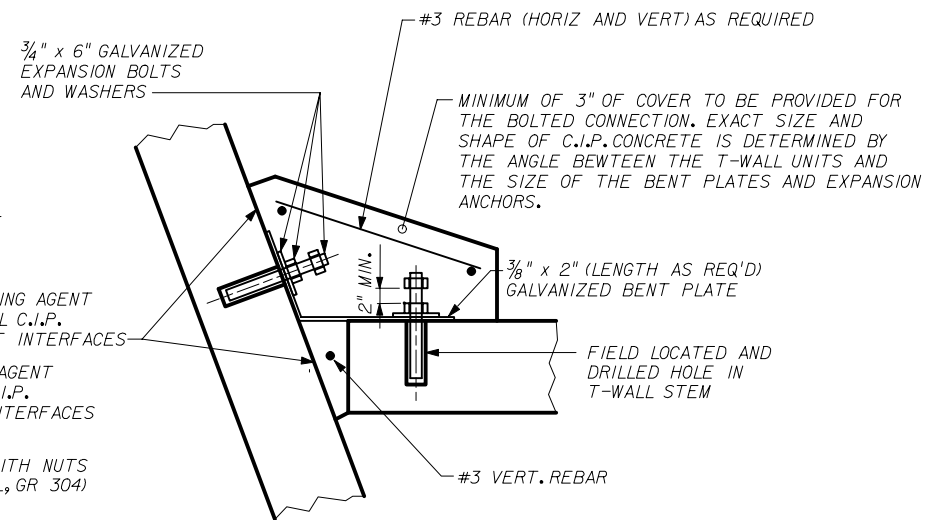


VIEW B-B



TYPICAL CORNER UNIT ARRANGEMENT

STEM LENGTHS VARY - SEE SPECIFIC ELEVATIONS FOR PROPER UNITS
NO SCALE



TYPICAL BOLTED CONNECTION FOR ANGLE POINTS

TYPICAL ANGLE POINT DETAIL

NO SCALE



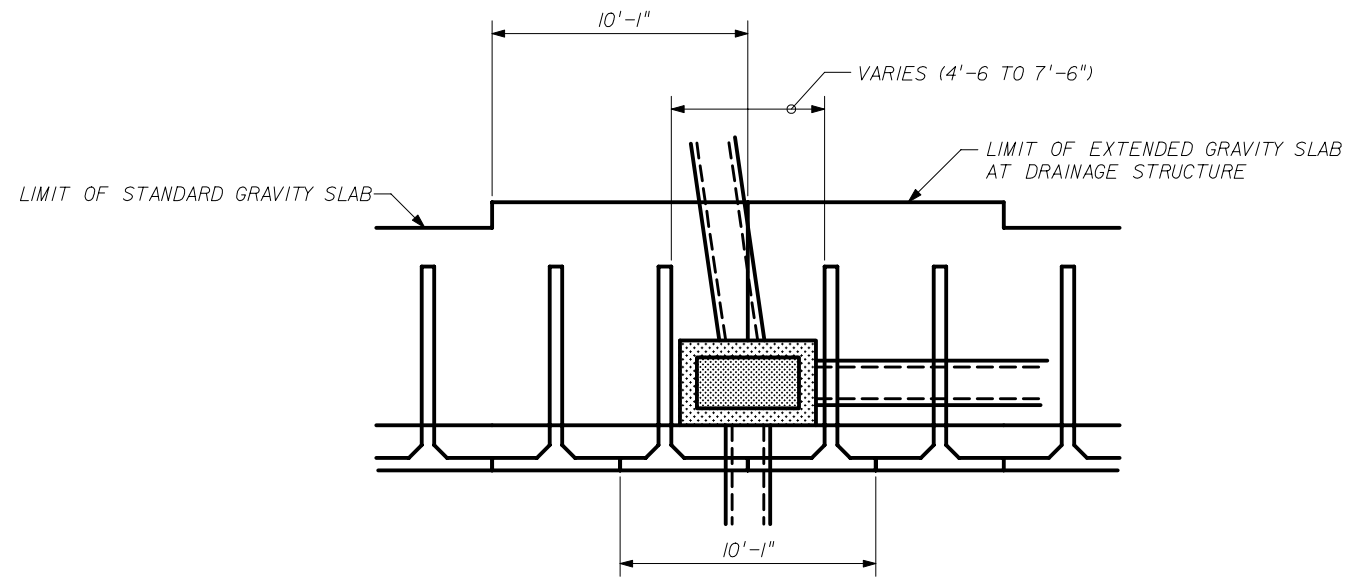
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FX: (703) 913-7859

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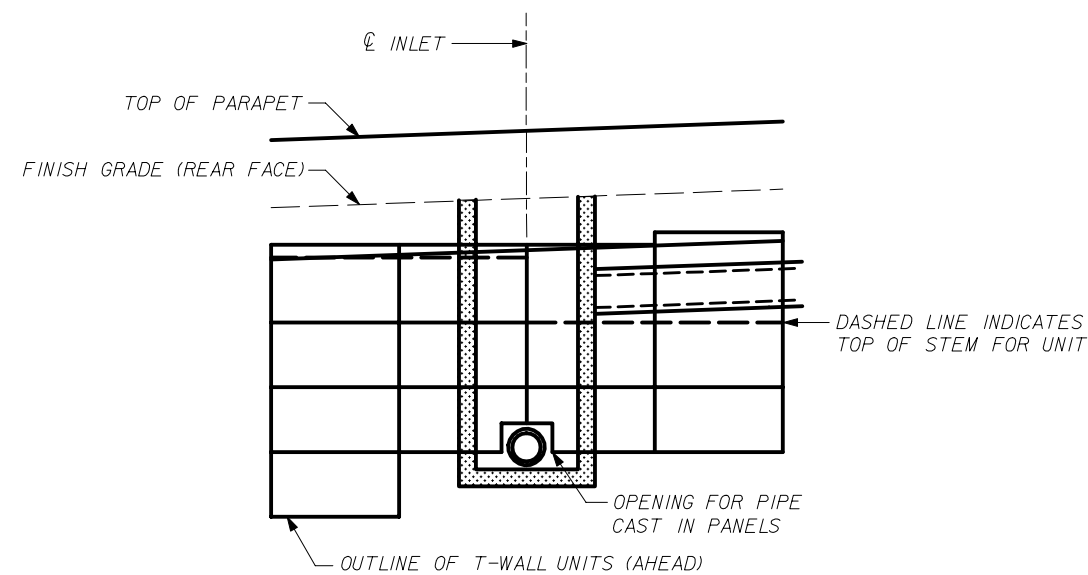
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)**

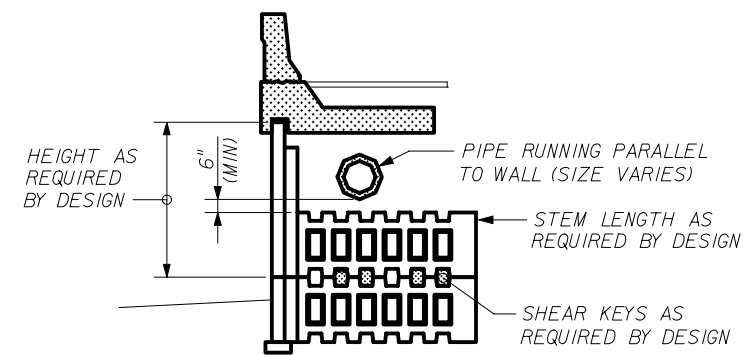
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Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	4 of 20
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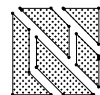
PART PLAN



PART ELEVATION (FRONT FACE)



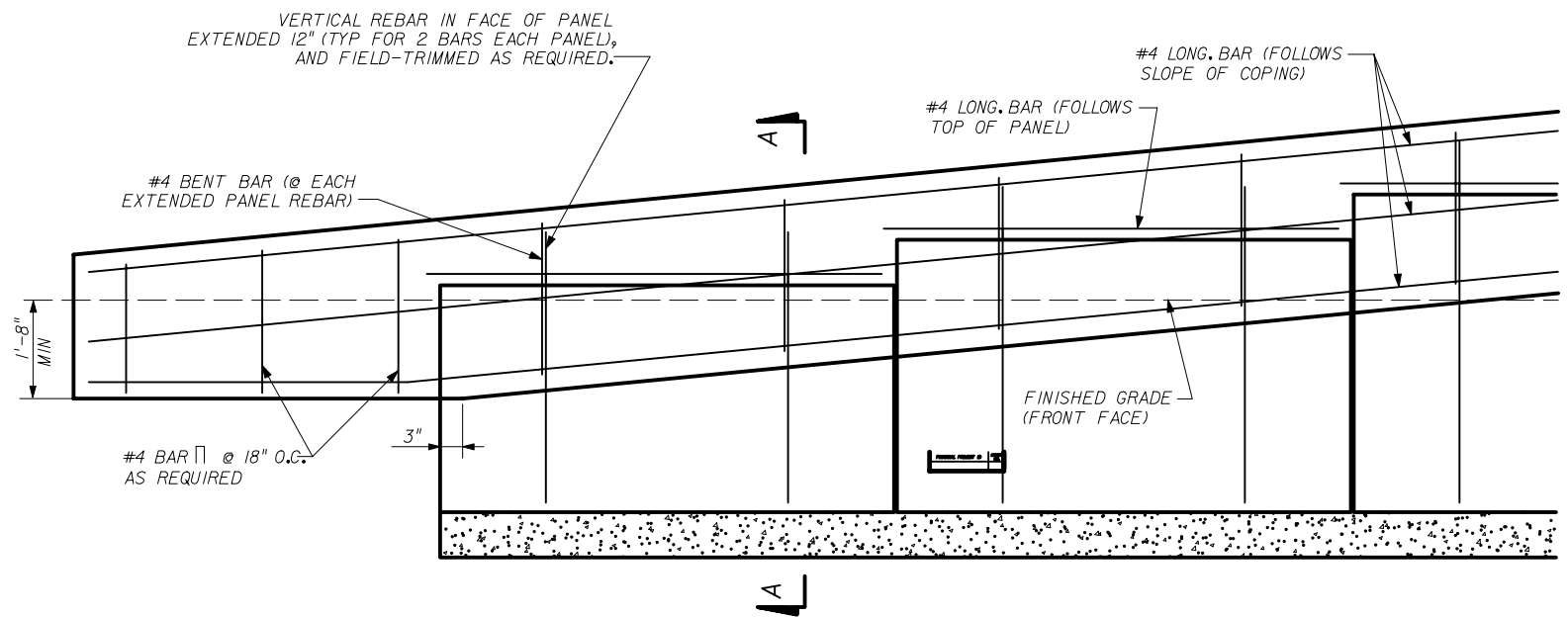
SECTION
(SHOWING PIPE PARALLEL TO WALL)



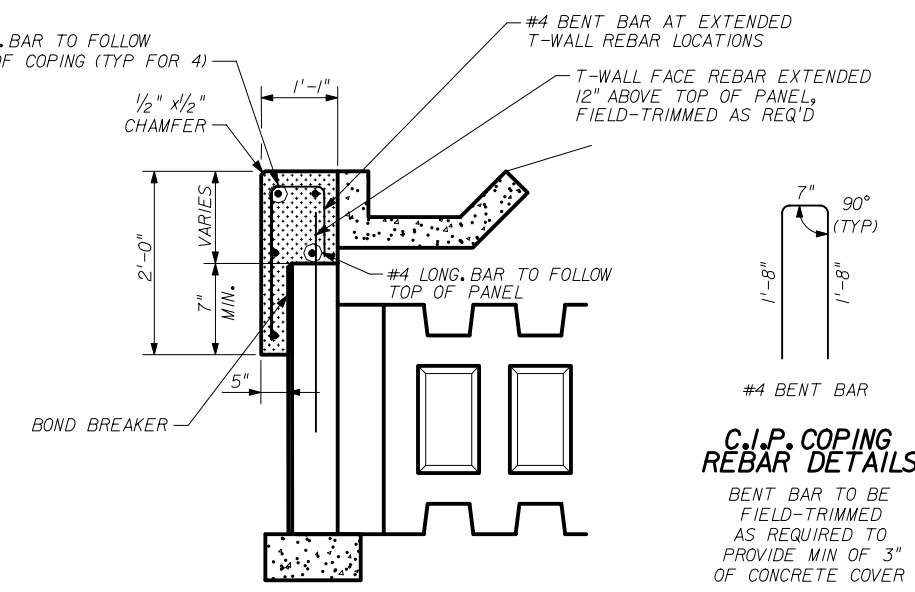
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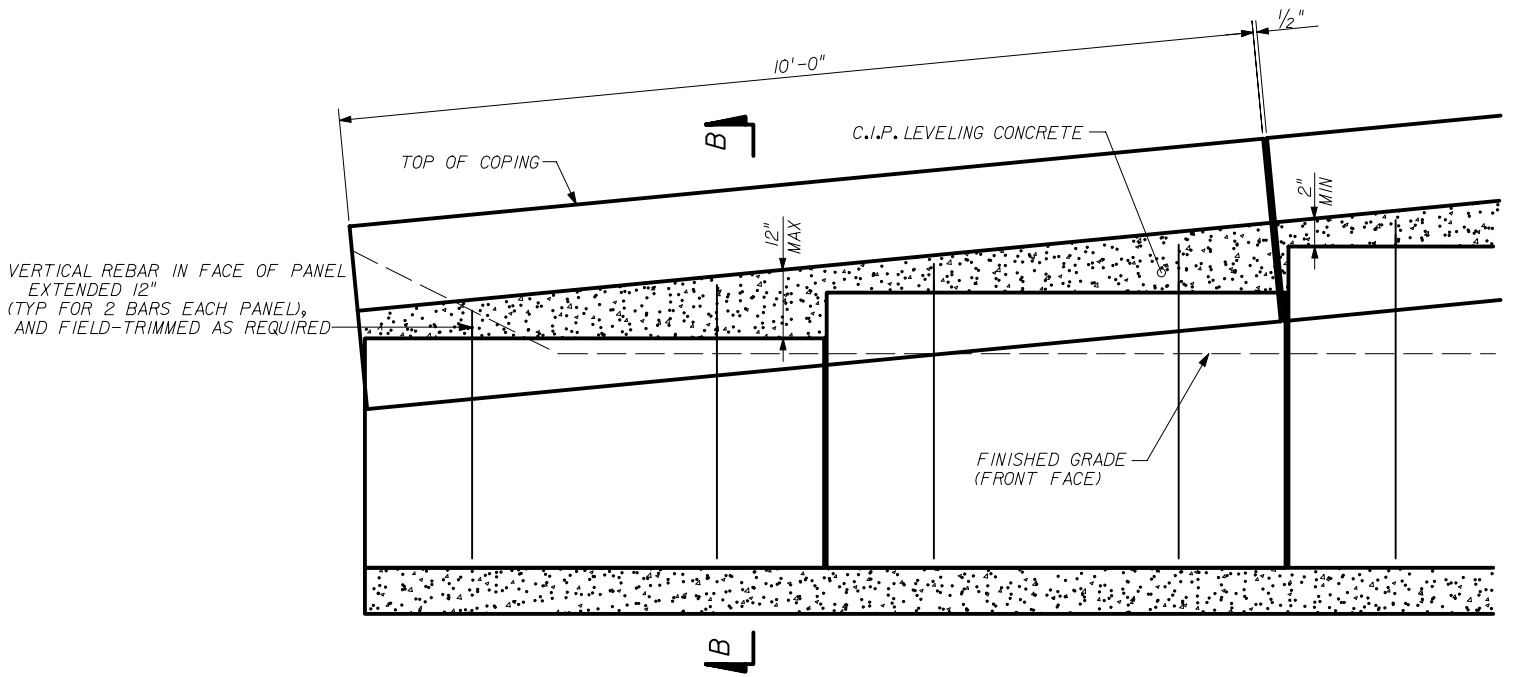
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
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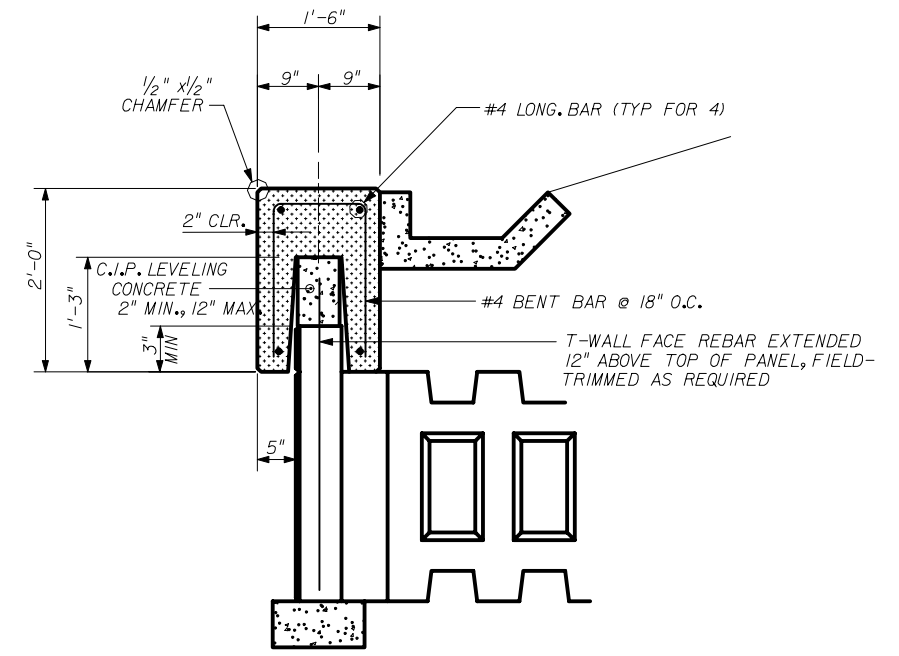
C.I.P. COPING TREATMENT AT BEGINNING/END OF WALLS



SECTION A-A
C.I.P. COPING



PRECAST COPING - PART ELEVATION

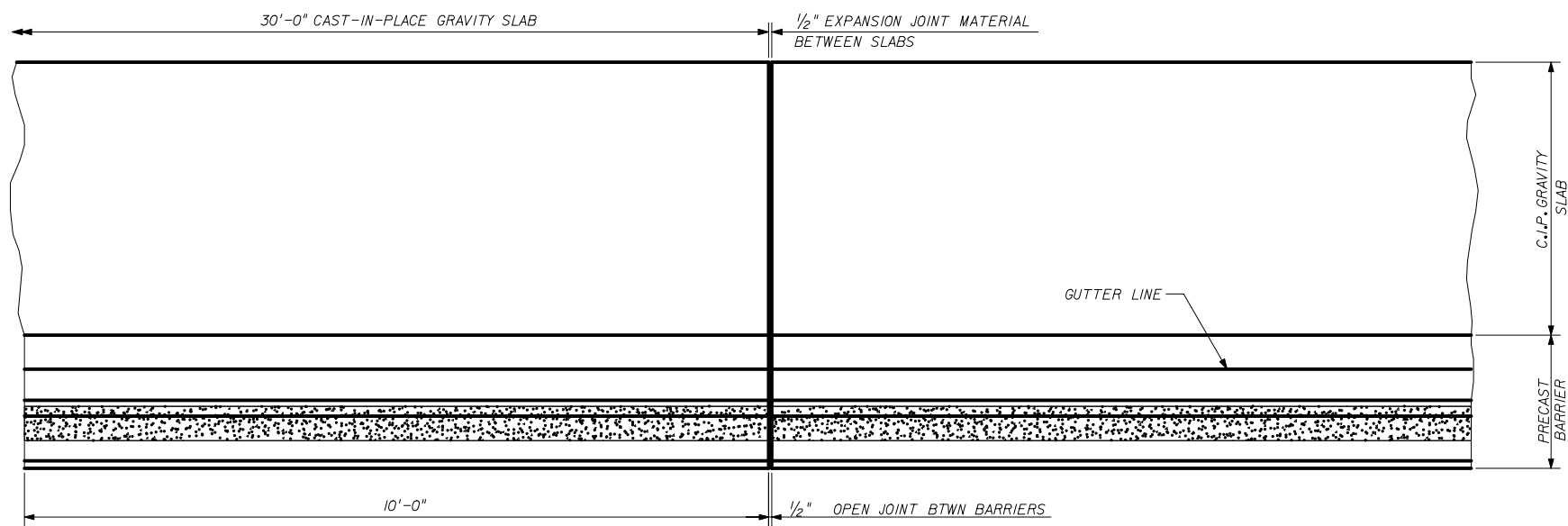


SECTION B-B
PRECAST COPING

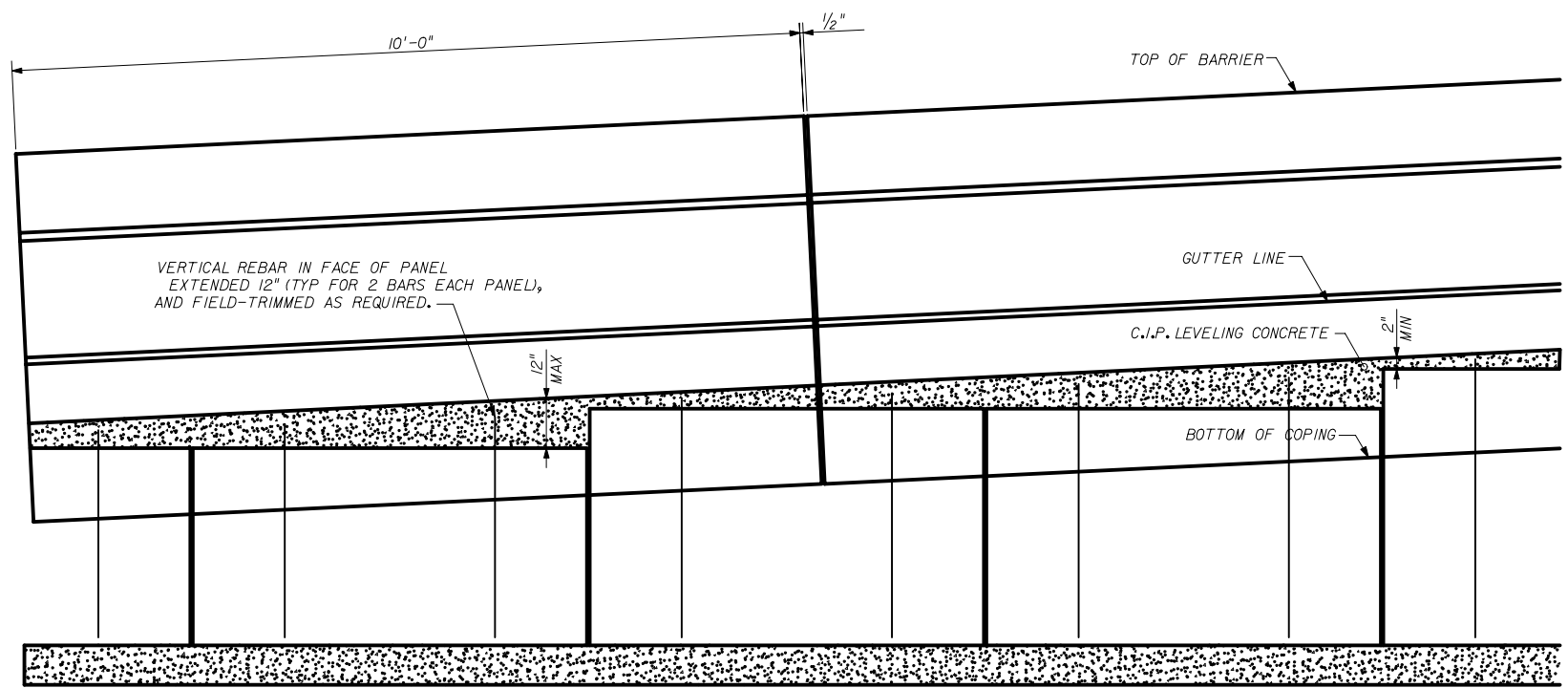
THE NEEL COMPANY
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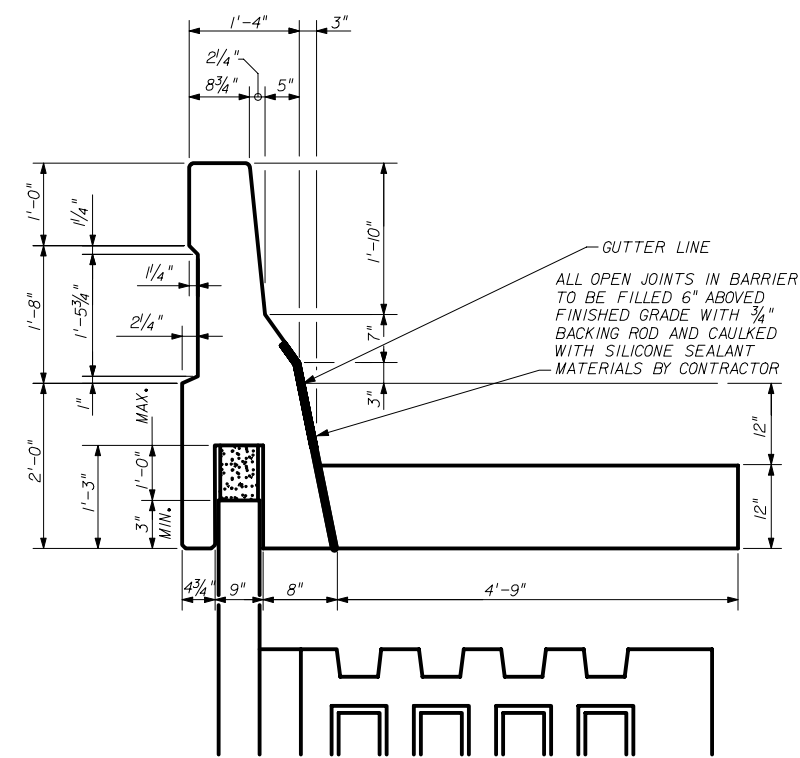
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
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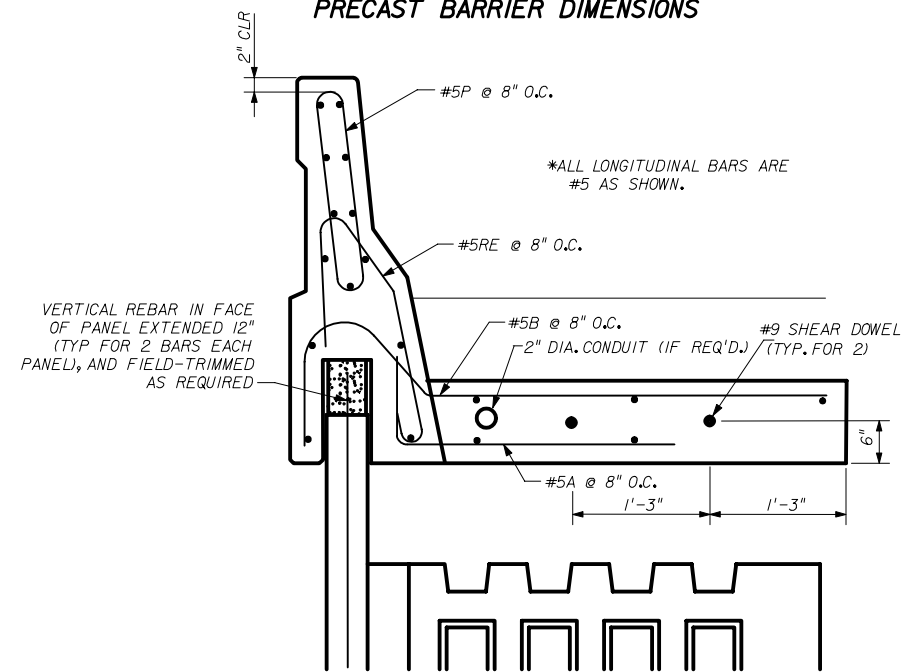
PART PLAN - PRECAST BARRIER



PART ELEVATION - PRECAST BARRIER



PRECAST BARRIER DIMENSIONS



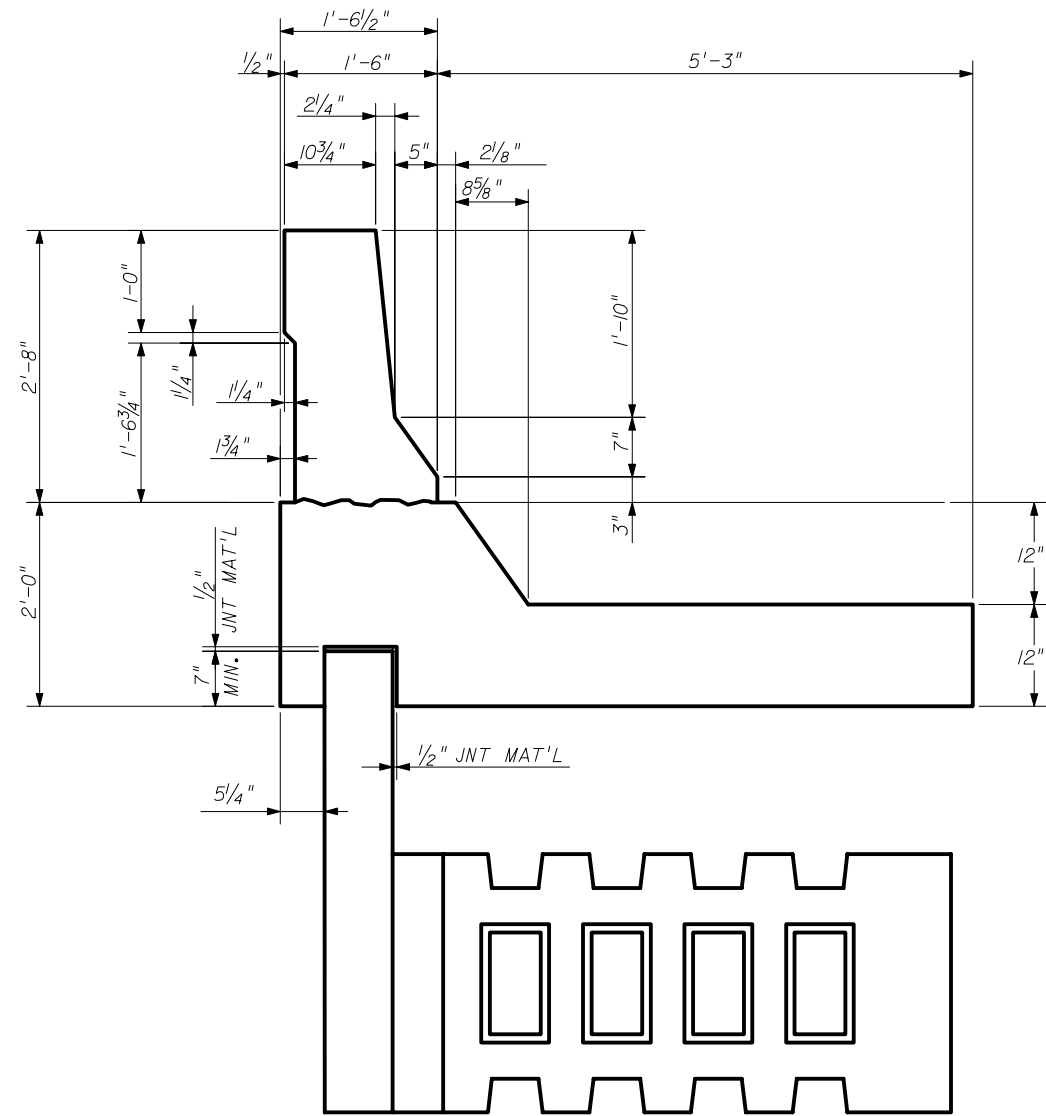
PRECAST BARRIER REBAR



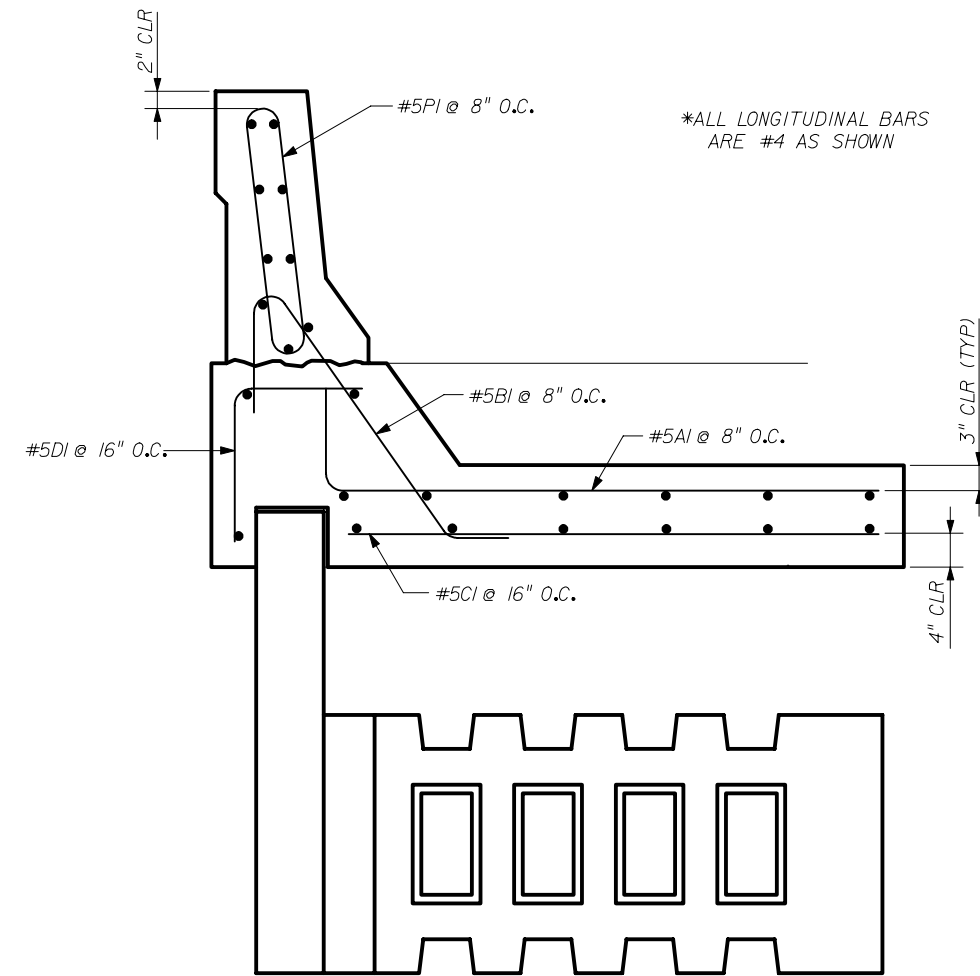
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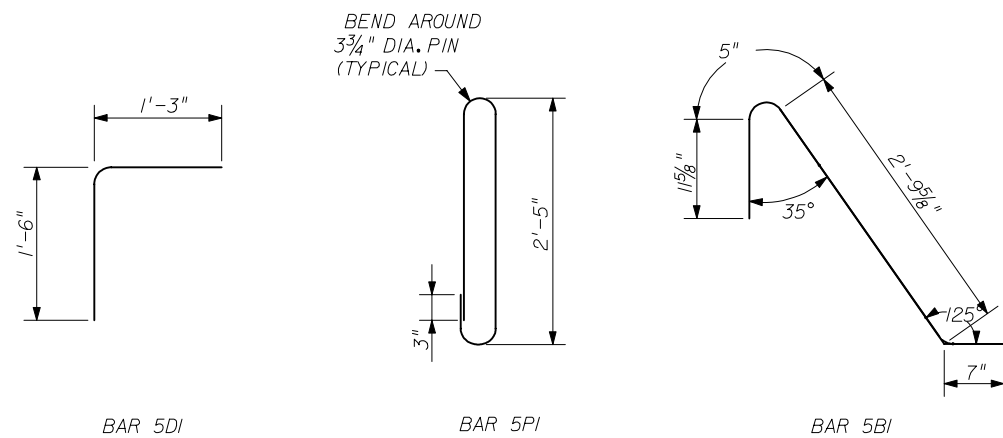
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
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Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98		
Checked By	JMC	10/01/98	Revision	Sheet No.
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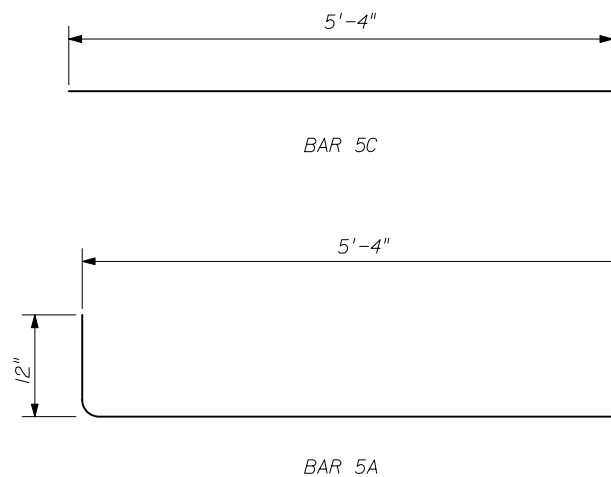
C.I.P. BARRIER AND C.I.P. JUNCTION SLAB DIMENSIONS



C.I.P. BARRIER AND C.I.P. JUNCTION SLAB REBAR



C.I.P. BARRIER REBAR DETAILS



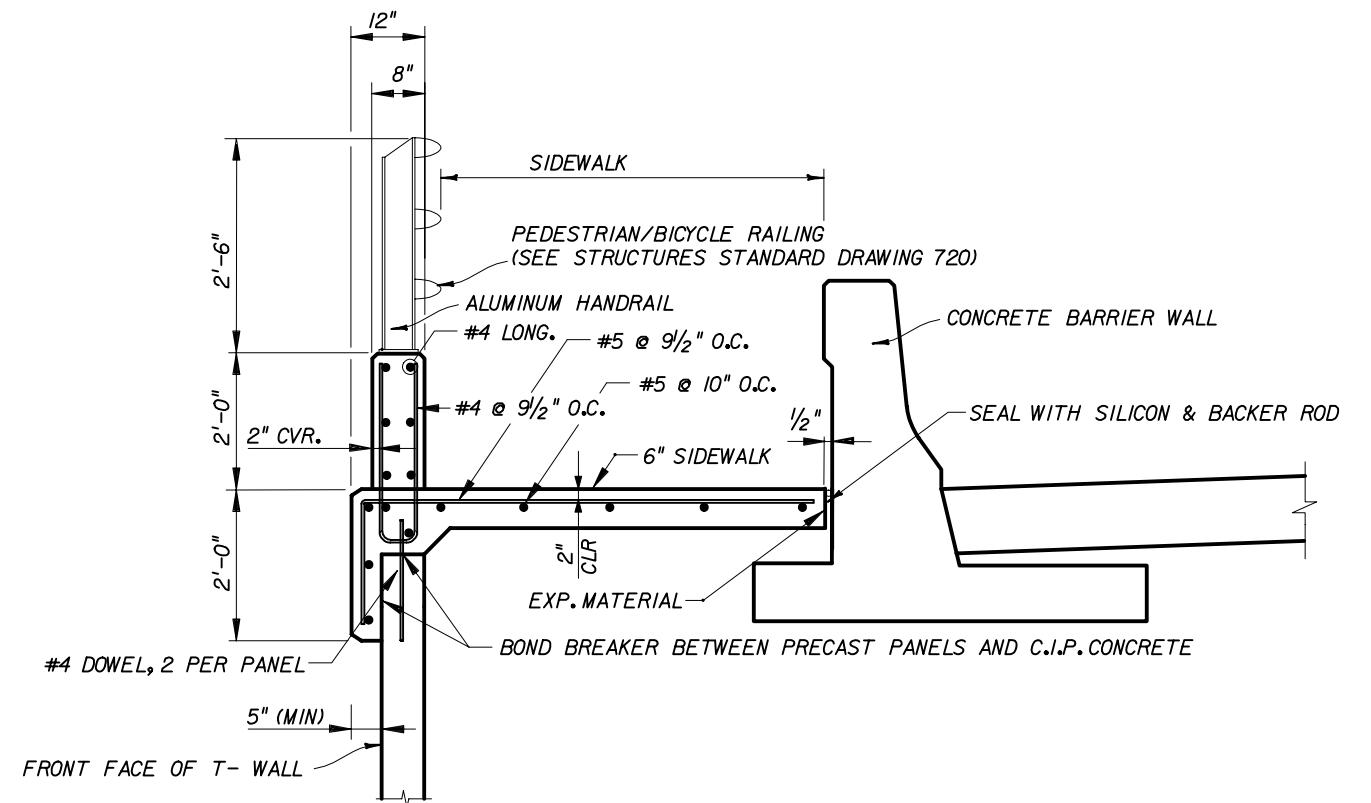
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (3" COVER)

Names		Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer		
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.
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C.I.P. PARAPET DETAIL W/ HANDRAIL



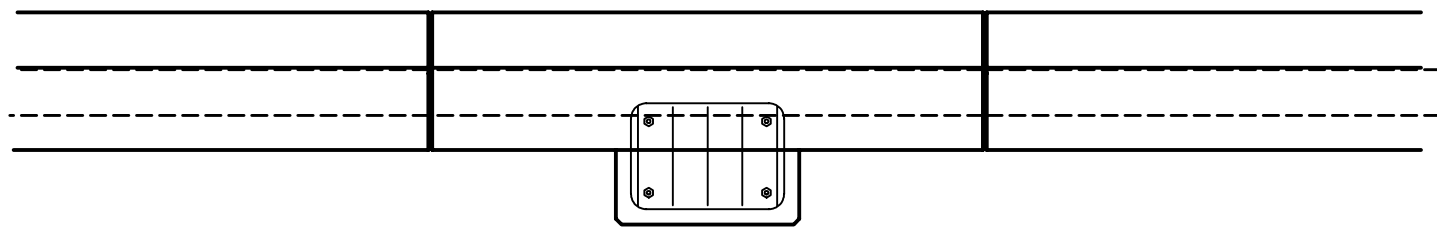
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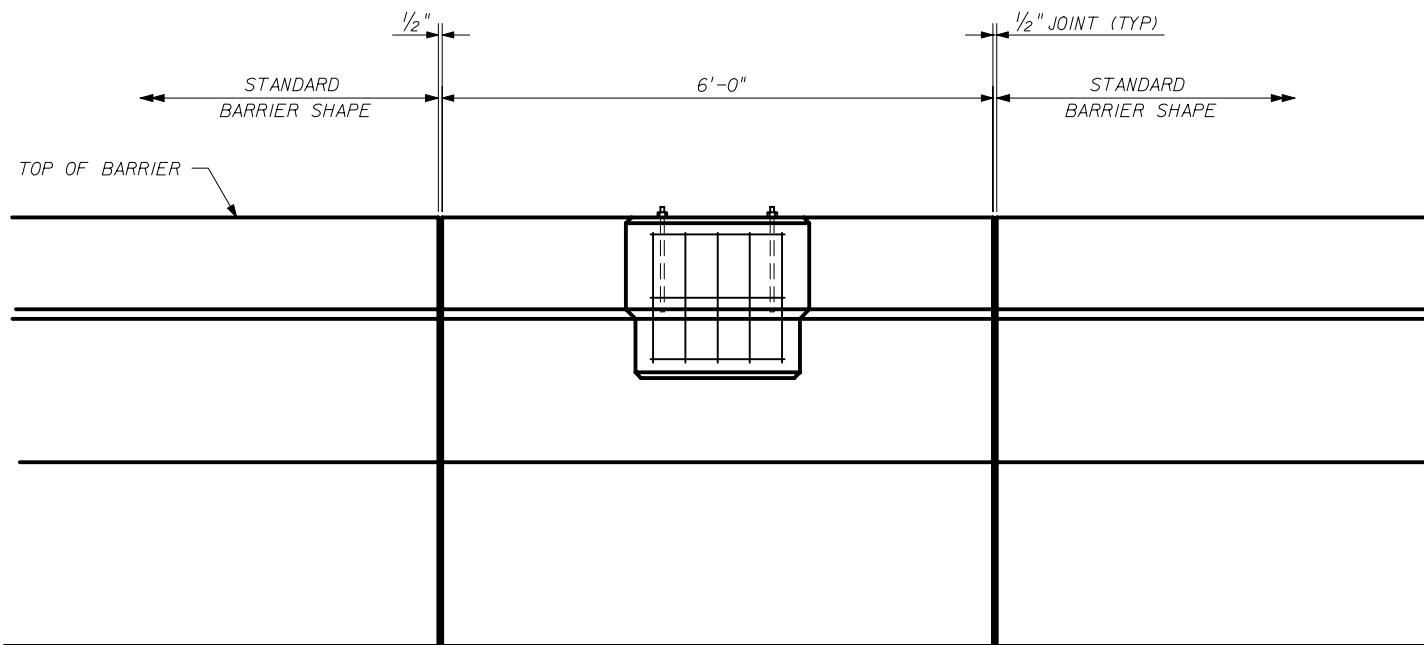
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (3" COVER)

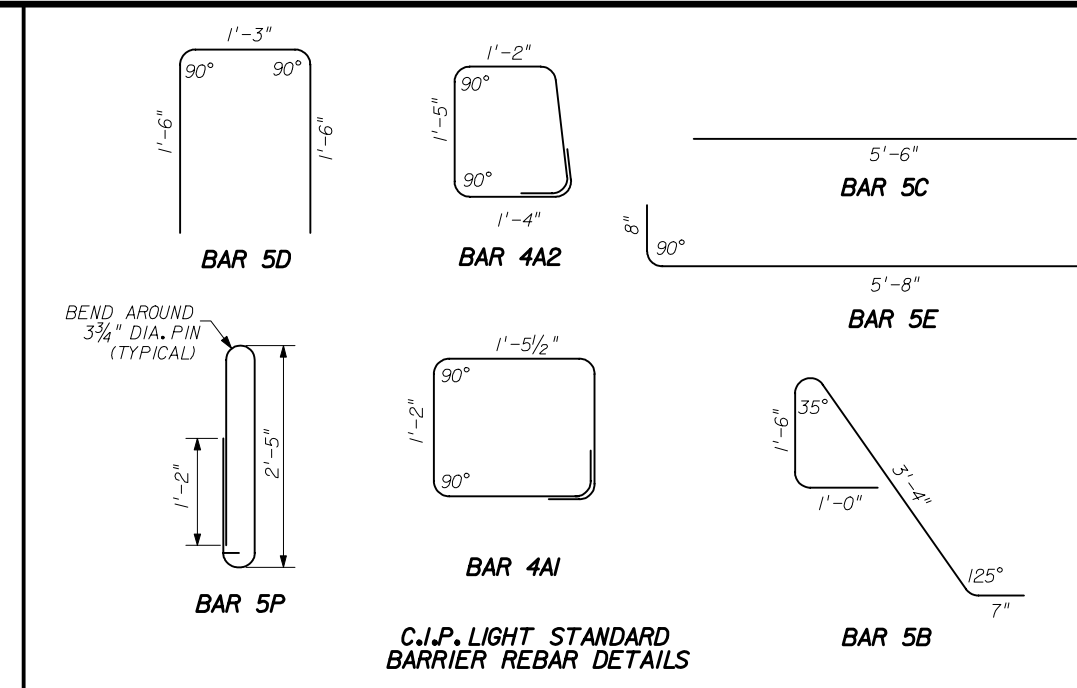
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Designed By	JMC		10/01/98	State Structures Design Engineer		
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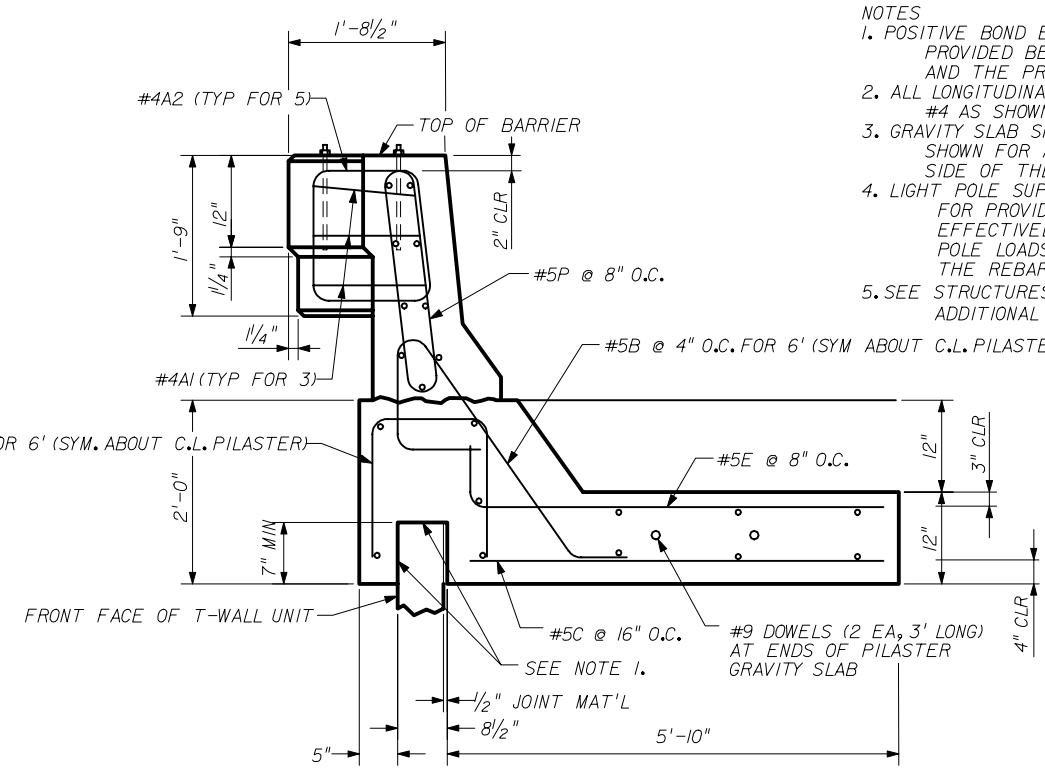
C.I.P. LIGHT STANDARD BARRIER - PART PLAN WITH REBAR
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)



C.I.P. LIGHT STANDARD BARRIER - PART ELEVATION
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)



C.I.P. LIGHT STANDARD BARRIER REBAR DETAILS



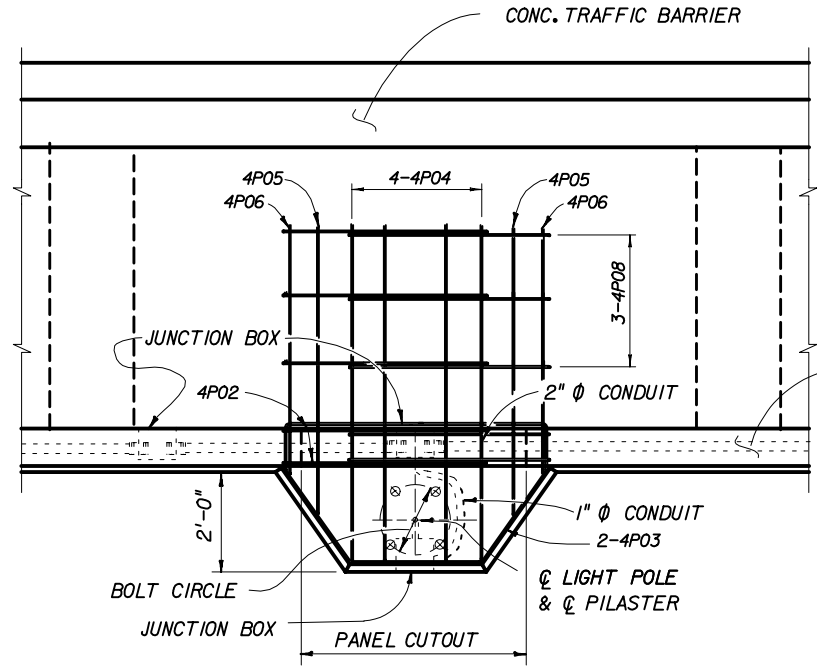
C.I.P. LIGHT STANDARD BARRIER - PART SECTION WITH REBAR

- NOTES
1. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN THE C.I.P. CONC. AND THE PRECAST PANEL.
 2. ALL LONGITUDINAL BARS ARE #4 AS SHOWN.
 3. GRAVITY SLAB SHALL HAVE DIMENSIONS SHOWN FOR A MIN. LENGTH OF 10'-0" EITHER SIDE OF THE LIGHT STANDARD BARRIER.
 4. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REBAR CAGE.
 5. SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS.

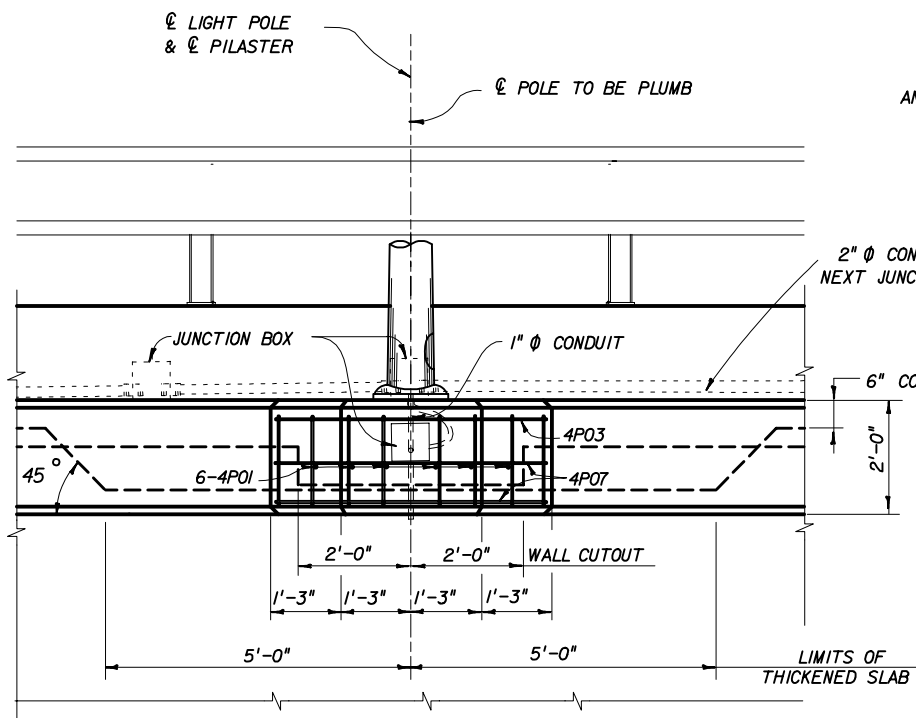
THE NEEL COMPANY
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
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PLAN



LIGHT PILASTER DETAIL

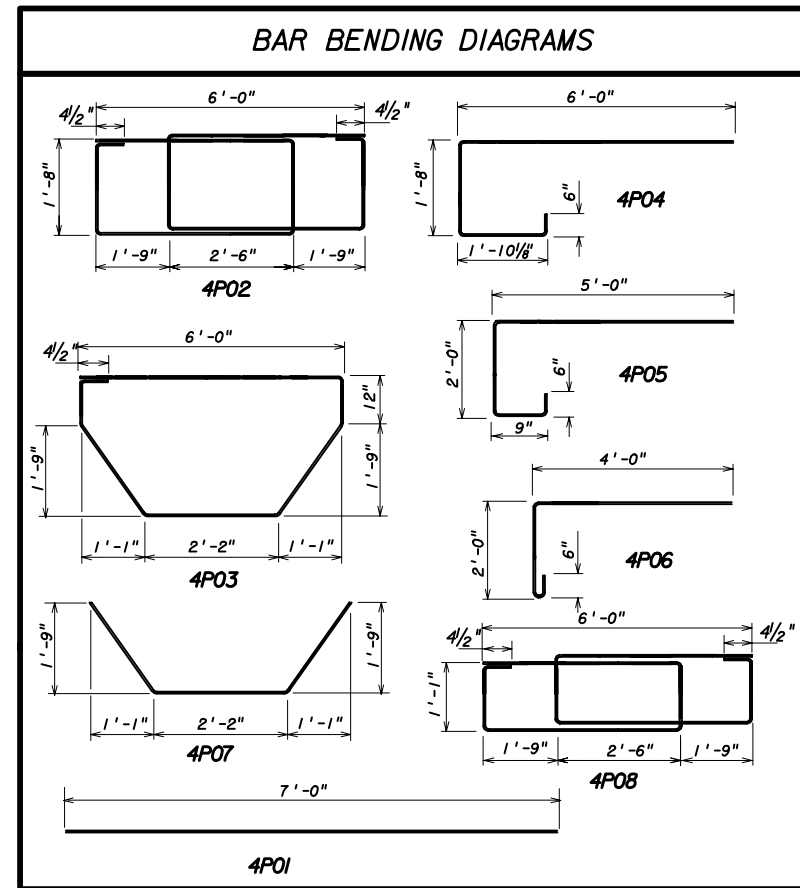
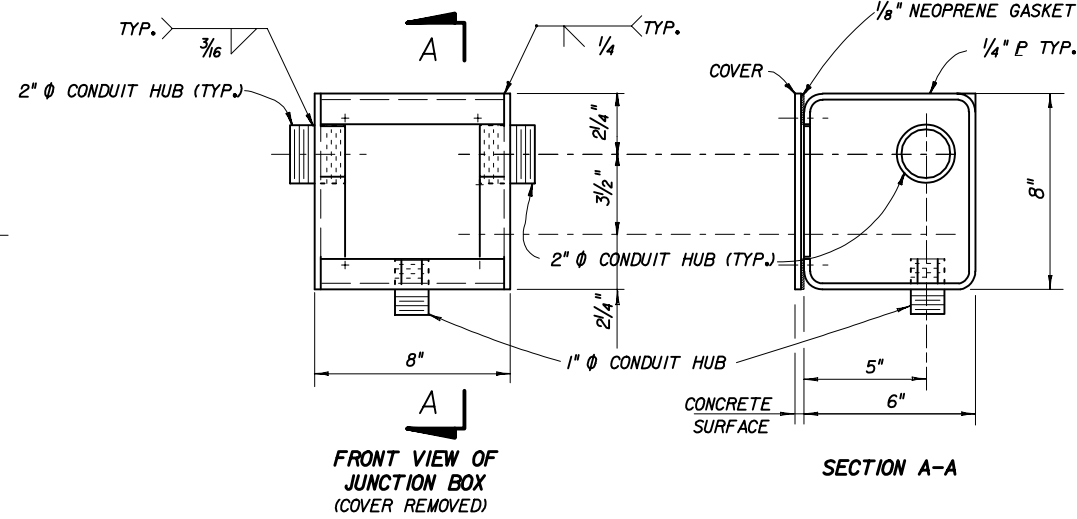
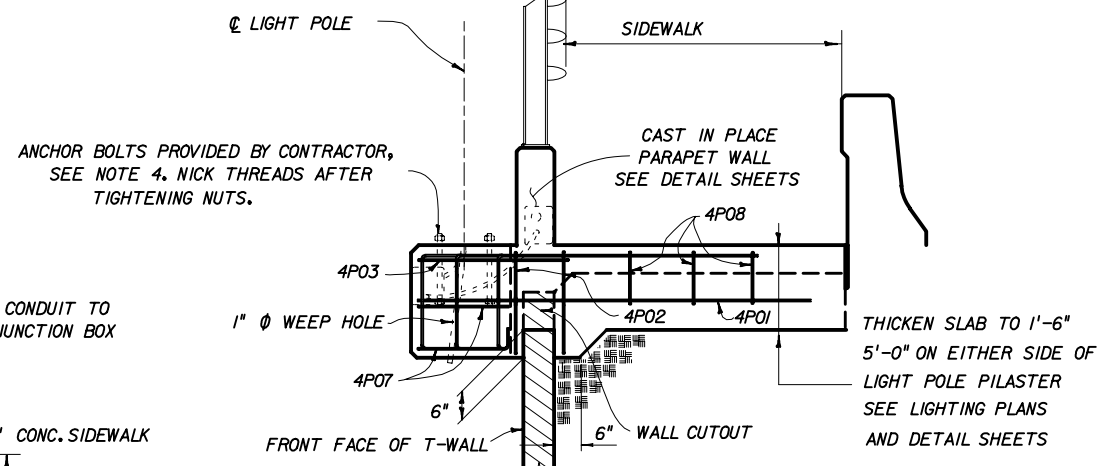
NOTES

- ADDITIONAL CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTER SHALL MEET THE SAME REQUIREMENTS AS THAT OF THE PARAPET WALL.
- TOP OF PILASTER SHALL BE FINISHED TO A TRULY LEVEL AREA.
- LIGHT POLE PILASTER IS DESIGNED TO RESIST WORKING LOADS (IN ANY DIRECTION) FROM THE LIGHT POLE APPLIED AT THE TOP OF THE PILASTER AS FOLLOWS:

LONGITUDINAL MOMENT	=	30,000 FT. POUND
TRANSVERSE MOMENT	=	6,000 FT. POUND
LONGITUDINAL SHEAR	=	1,000 POUND
TRANSVERSE SHEAR	=	200 POUND
TORSION	=	3,000 FT. POUNDS
AXIAL	=	400 POUNDS

IF THE LIGHT POLE PROVIDED APPLIES LOADS THAT ARE IN EXCESS OF THOSE SHOWN ABOVE, THE CONTRACTOR SHALL REDESIGN THE PILASTER AND SUBMIT HIS DESIGN TO THE DEPARTMENT FOR REVIEW. THE CONTRACTOR'S REDESIGN SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA, AND QUALIFIED TO PERFORM THE WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND THAT FIT THE REINFORCING CAGE. CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHALL BE SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT FOR REVIEW AND APPROVAL SHOWING THAT THESE REQUIREMENTS HAVE BEEN MET PRIOR TO CONSTRUCTION.

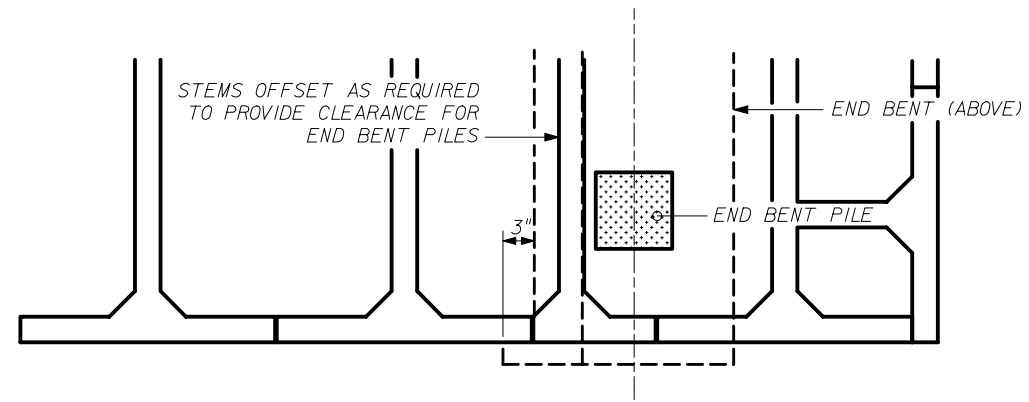
- STEEL FOR JUNCTION BOXES SHALL CONFORM WITH ASTM-A36. THE BOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. IN LIEU OF STEEL BOXES THE CONTRACTOR MAY SUBMIT FOR APPROVAL MOLDED P.V.C. BOXES (SCHEDULE 80).
- ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL OR SCHEDULE 80 P.V.C.
- THE COST OF ANCHOR BOLTS SHALL BE INCLUDED IN THE BID PRICE FOR LIGHT POLES.
- PAYMENT: THE COST OF ALL LABOR, CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTERS AND ALL CONDUITS. EXPANSION COUPLINGS, JUNCTION BOXES AND MISCELLANEOUS HARDWARE REQUIRED FOR COMPLETION OF THE ELECTRICAL INSTALLATION WITHIN THE LIMITS SHOWN ON THIS SHEET, SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR THE MSE WALLS.



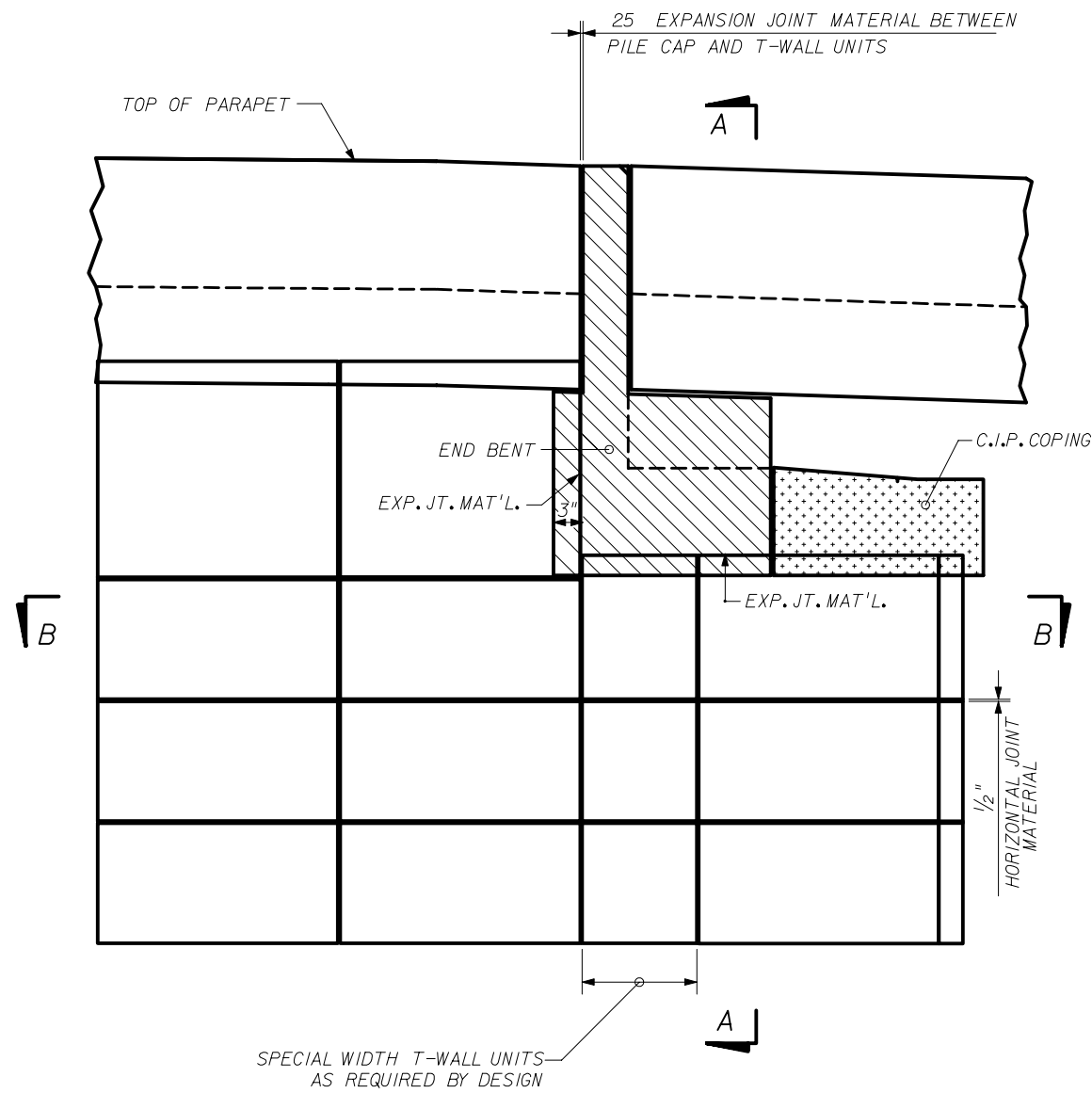
BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
4P01	4	6	7'-0"
4P02	4	2	24'-5"
4P03	4	1	14'-9"
4P04	4	4	9'-8"
4P05	4	2	7'-11"
4P06	4	2	6'-2"
4P07	4	2	6'-4"
4P08	4	3	22'-1"

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)

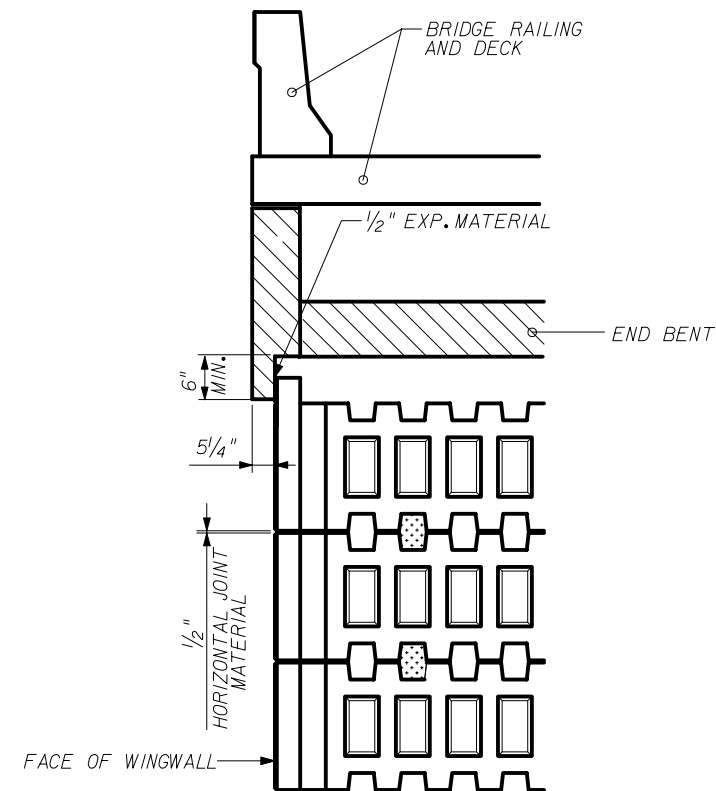
Names	Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98		
Checked By	JMC	10/01/98		
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SECTION B-B
STEM / END BENT PILE INTERFACE



PART ELEVATION SHOWING
WINGWALL / END BENT INTERFACE



SECTION A-A
SECTION THRU PILE CAP

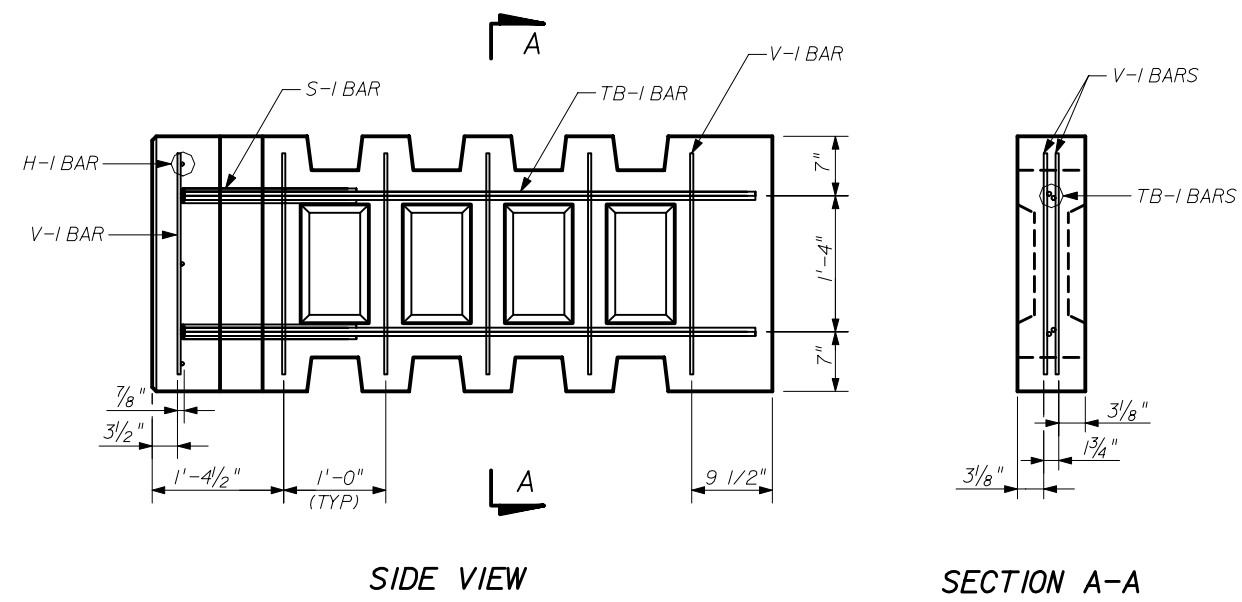
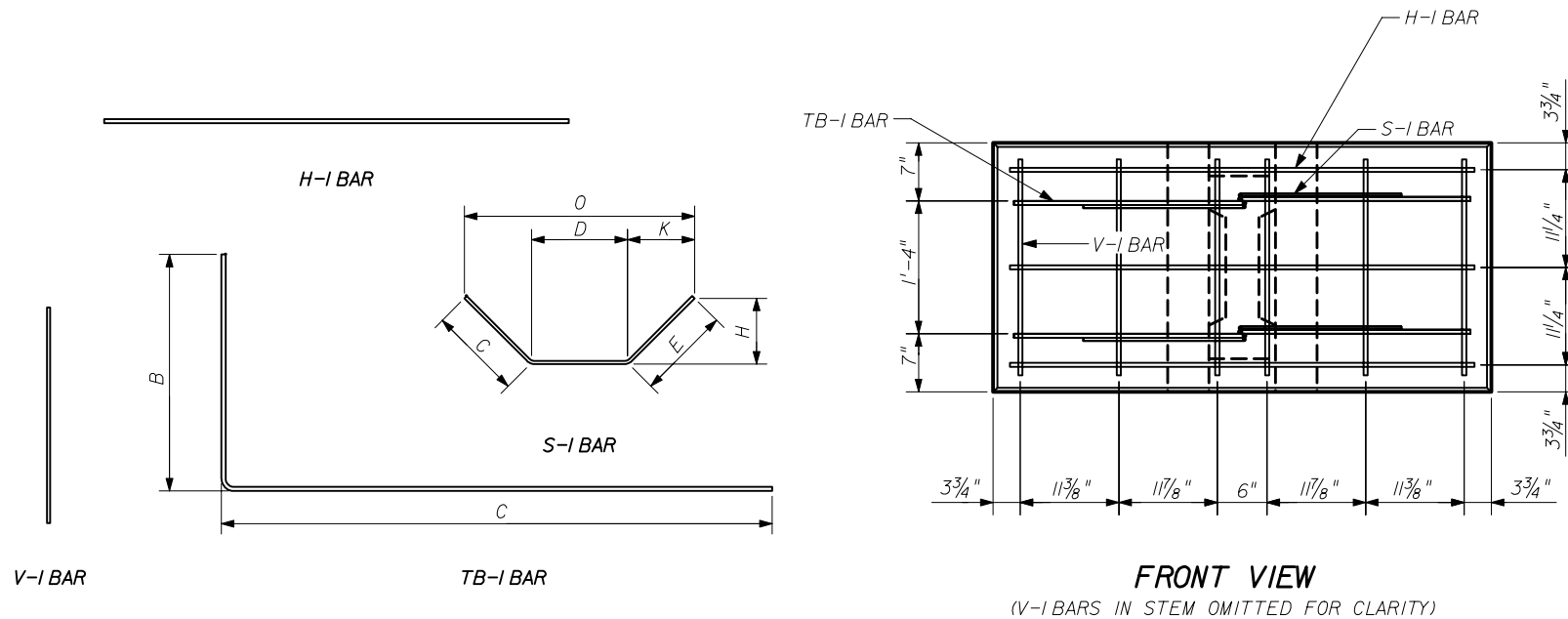


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Drawn By	CCA	10-98			
Checked By	JMC	10-98	Revision	Sheet No.	Index No.
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FRONT VIEW
(V-I BARS IN STEM OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A

REBAR SCHEDULE - 2.5 x 5.0 x 04 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	12	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 06 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	16	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 08 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	20	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 10 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	24	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	11'-8 1/2"	2'-3 1/2"	9'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 12 STD UNIT

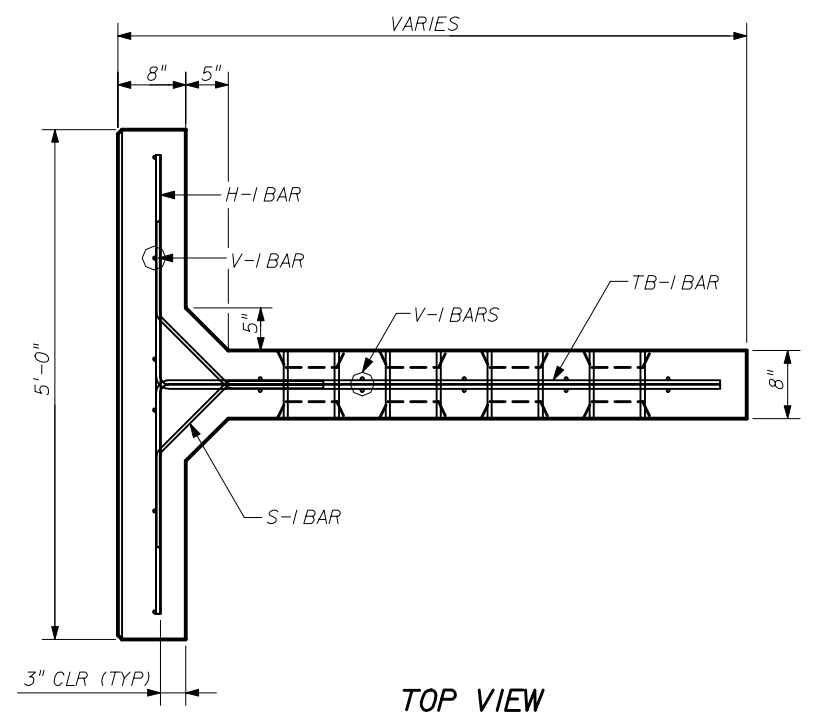
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	26	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	13'-8 1/2"	2'-3 1/2"	11'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 14 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	32	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	15'-8 1/2"	2'-3 1/2"	13'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 16 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	36	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	17'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	



TOP VIEW
REINFORCING STEEL - STANDARD UNITS

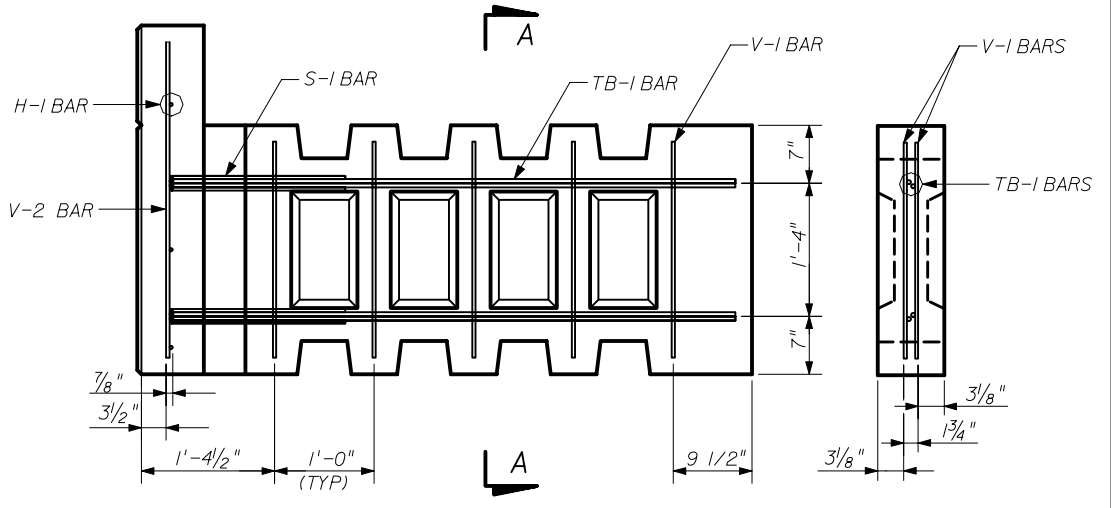
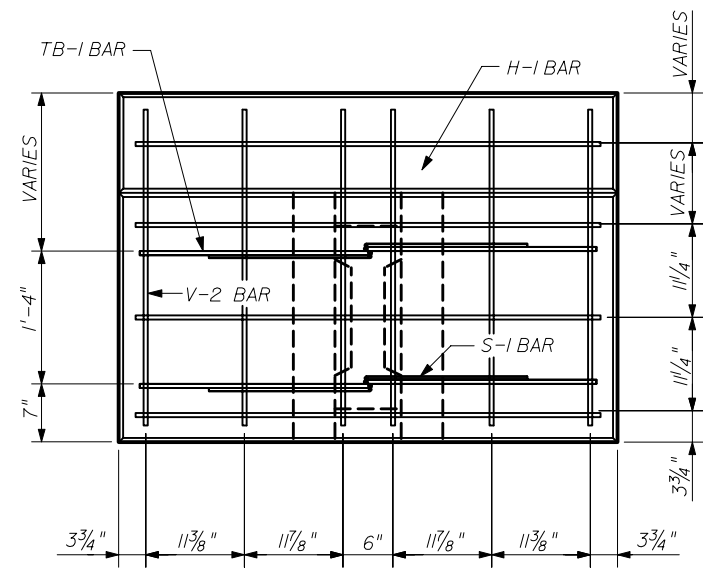
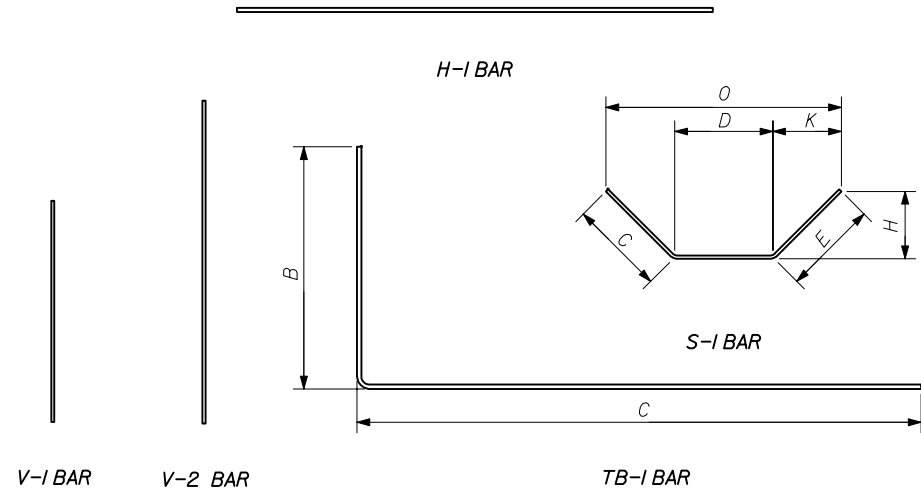
NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER



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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Designed By	JMC	10/01/98	Approved By	<i>[Signature]</i>
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	13 of 20
				5010



FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A

REBAR SCHEDULE - 3.0 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	4	4	-	4'-6"								-	
V-1	6	3	-	2'-0"								-	
V-2	6	5	-	2'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 3.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	4	4	-	4'-6"								-	
V-1	10	3	-	2'-0"								-	
V-2	6	5	-	2'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 3.5 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	
V-1	6	3	-	2'-0"								-	
V-2	6	5	-	3'-0"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

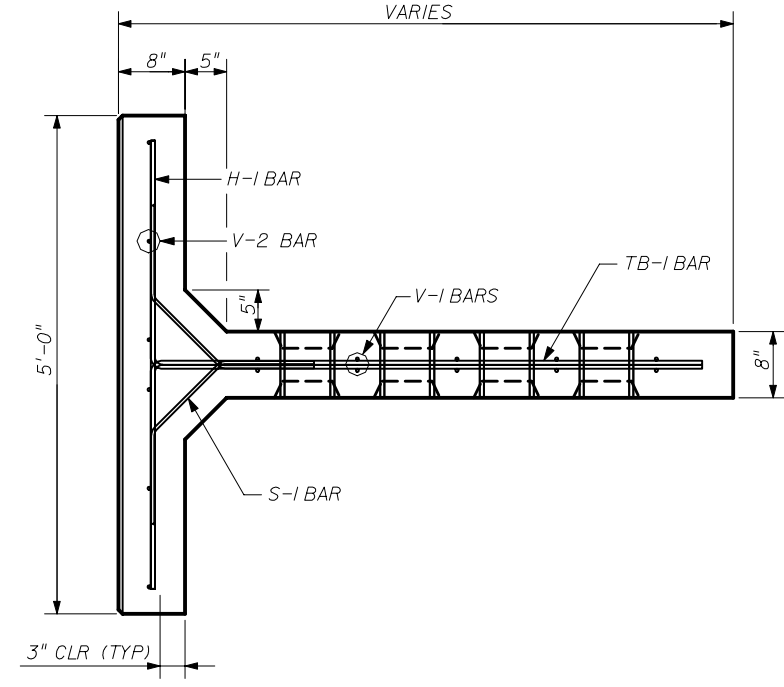
REBAR SCHEDULE - 3.5 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	
V-1	10	3	-	2'-0"								-	
V-2	6	5	-	3'-0"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 4.0 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	
V-1	6	3	-	2'-0"								-	
V-2	6	5	-	3'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 4.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	
V-1	10	3	-	2'-0"								-	
V-2	6	5	-	3'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 4.5 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	6	3	-	2'-0"								-	
V-2	6	5	-	4'-0"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	10	3	-	2'-0"								-	
V-2	6	5	-	4'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	



TOP VIEW
REINFORCING STEEL - TOP UNITS (I)

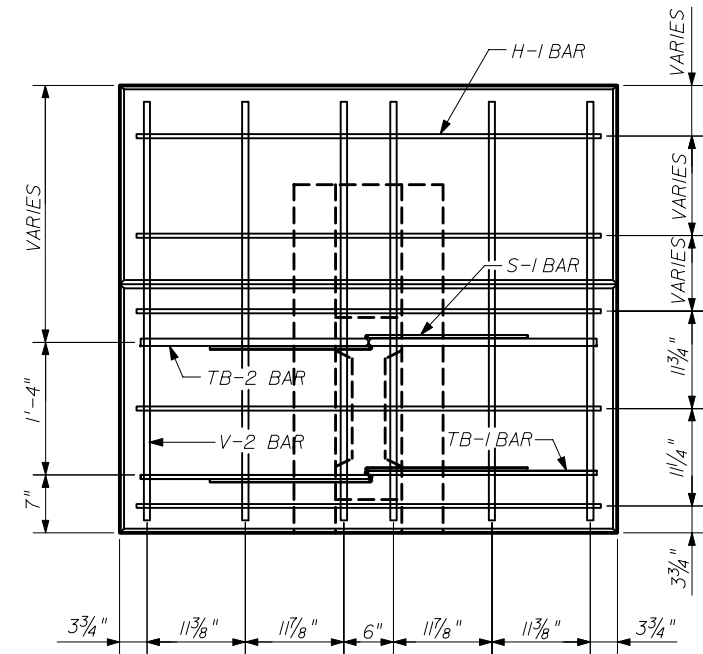
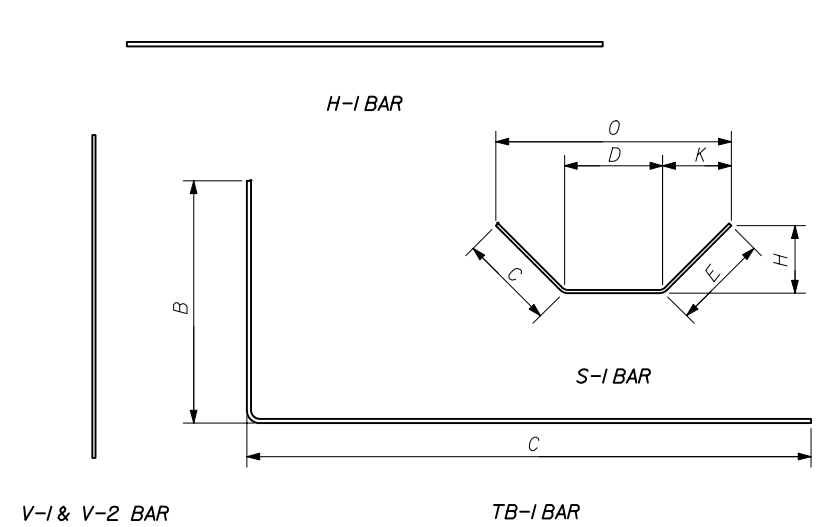
NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER



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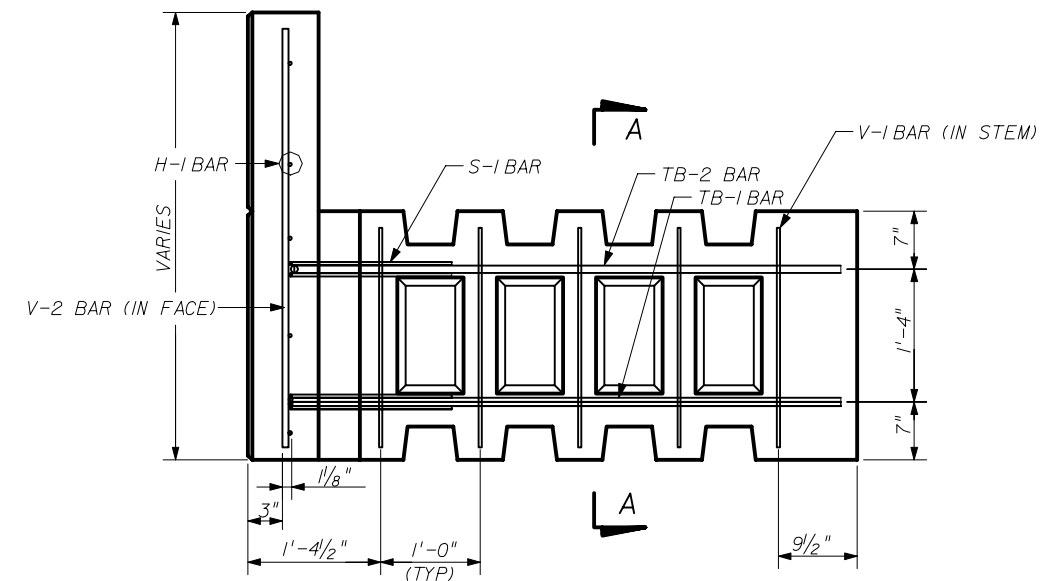
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98		
Checked By	JMC	10/01/98	Revision	Sheet No.
			04	14 of 20
				Index No.
				5010

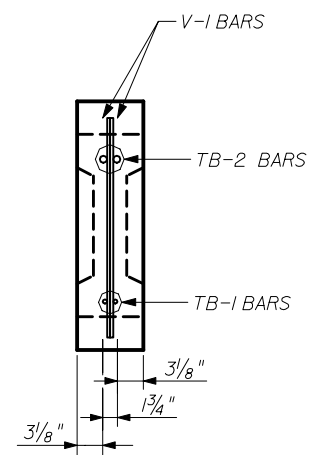


FRONT VIEW

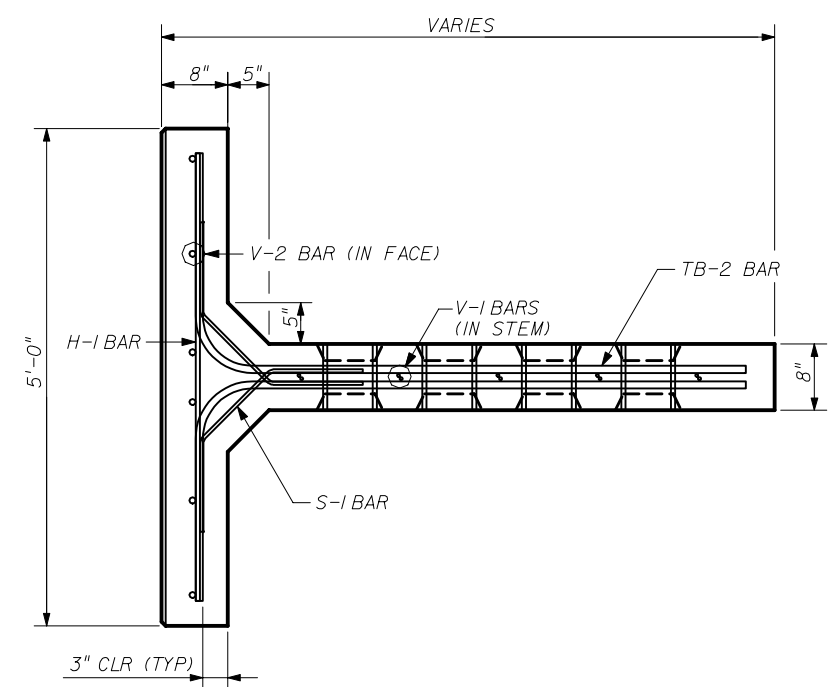
(V-1 BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW

REINFORCING STEEL - TOP UNITS (II)

REBAR SCHEDULE - 5.5 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	5'-0"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 6.0 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	5'-6"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 6.5 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	6'-0"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 7.0 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	6'-6"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

THESE UNITS WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

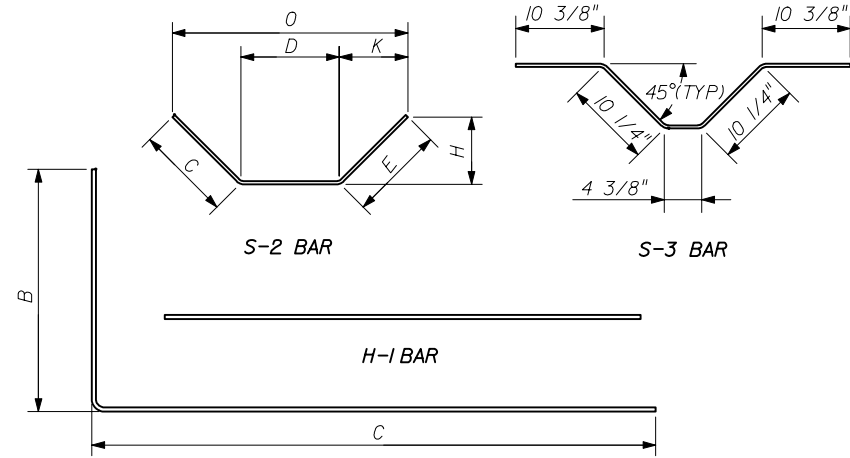
THE NEEL COMPANY
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (3" COVER)**

Names	Dates	Approved By		
Designed By	JMC 10/01/98	[Signature]		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	State Structures Design Engineer		
		Revision	Sheet No.	Index No.
		04	15 of 20	5010



V-1, V-2 & V-3 BAR

TB-1 BAR

REBAR SCHEDULE - 7.5 x 5.0 x 10 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	18	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	6'-0"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	8	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 8.0 x 5.0 x 10 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	18	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	6'-6"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	9	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

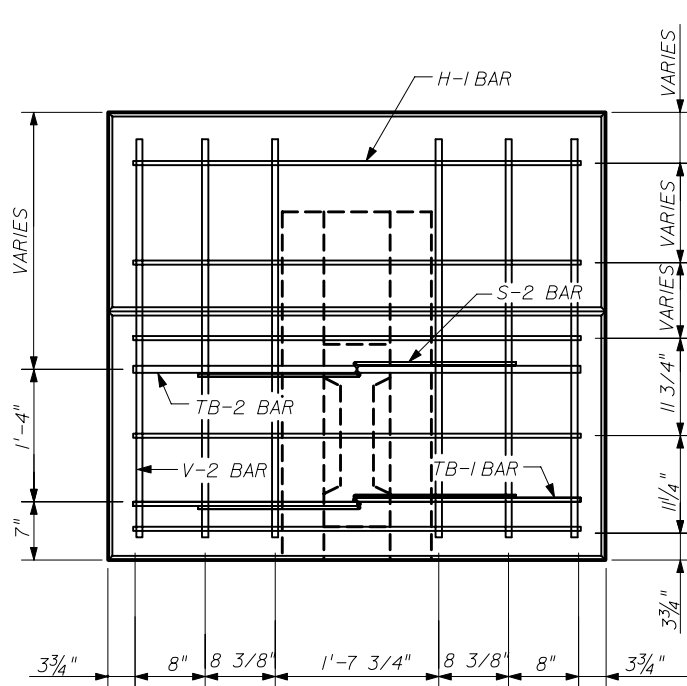
REBAR SCHEDULE - 8.5 x 5.0 x 10 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	18	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	7'-0"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	10	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 9.0 x 5.0 x 12 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	22	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	7'-6"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	11	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

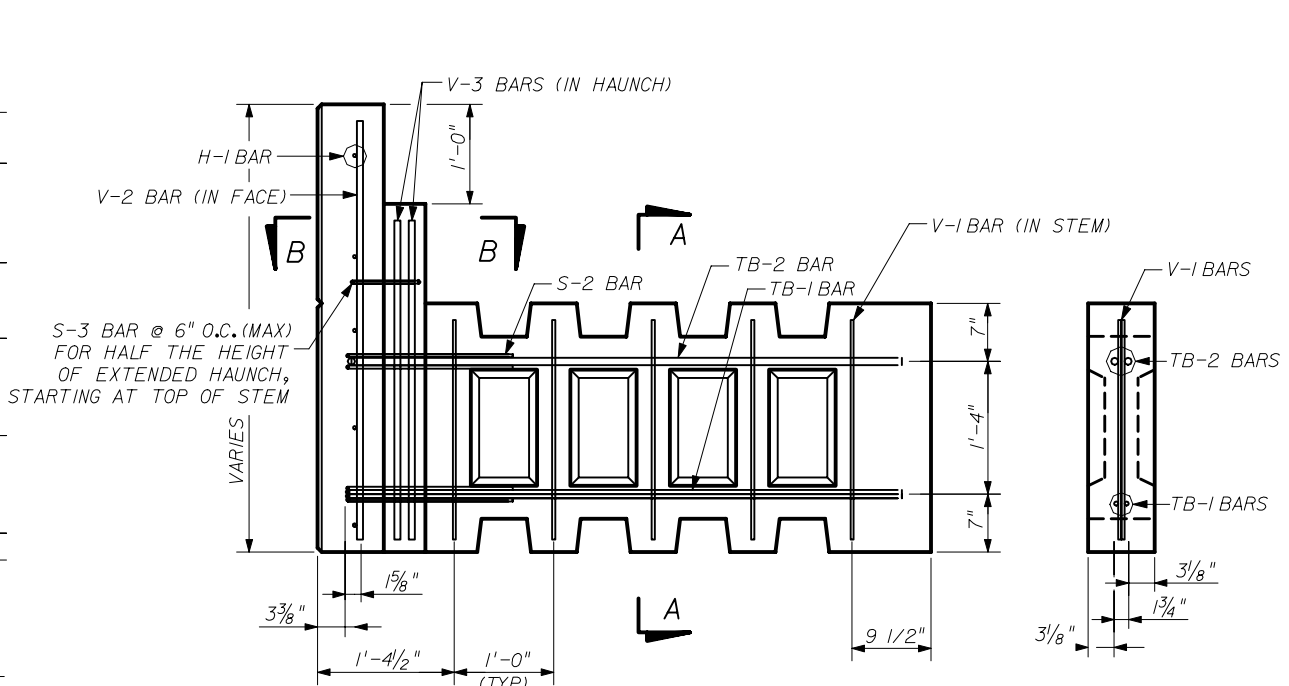
REBAR SCHEDULE - 9.5 x 5.0 x 12 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	22	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	8'-0"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	12	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 10.0 x 5.0 x 12 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	22	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	8'-6"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	13	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 10.5 x 5.0 x 12 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	22	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	9'-0"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	14	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

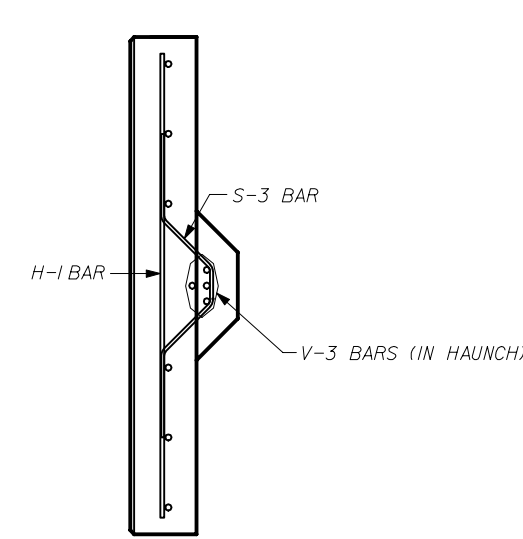


FRONT VIEW
(V-1 BARS IN STEM AND V-3 BARS IN HAUNCH OMITTED FOR CLARITY)

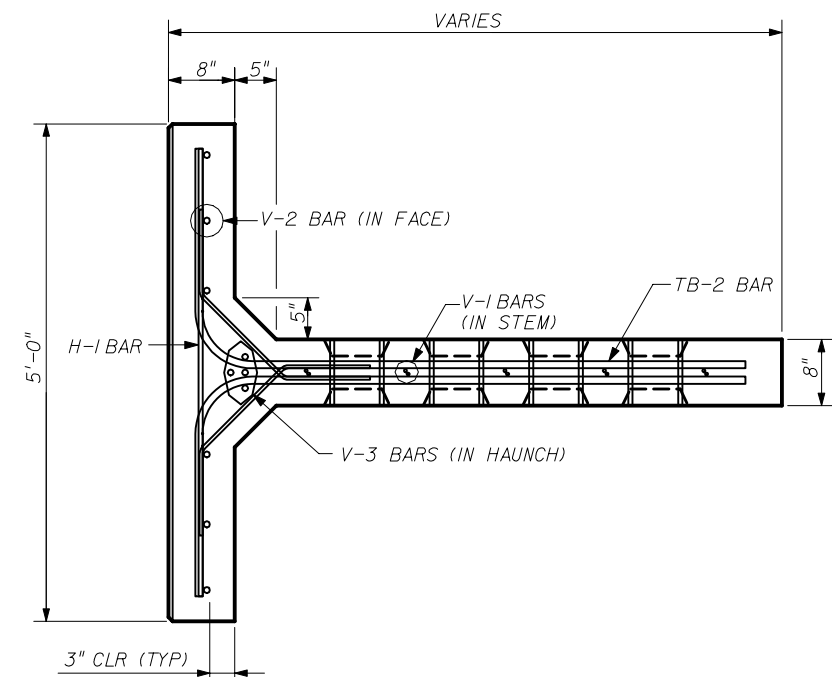


SIDE VIEW

SECTION A-A



SECTION B-B



TOP VIEW
S-3 BARS IN EXTENDED HAUNCH OMITTED FOR CLARITY

1. ALL UNITS ON THIS SHEET WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

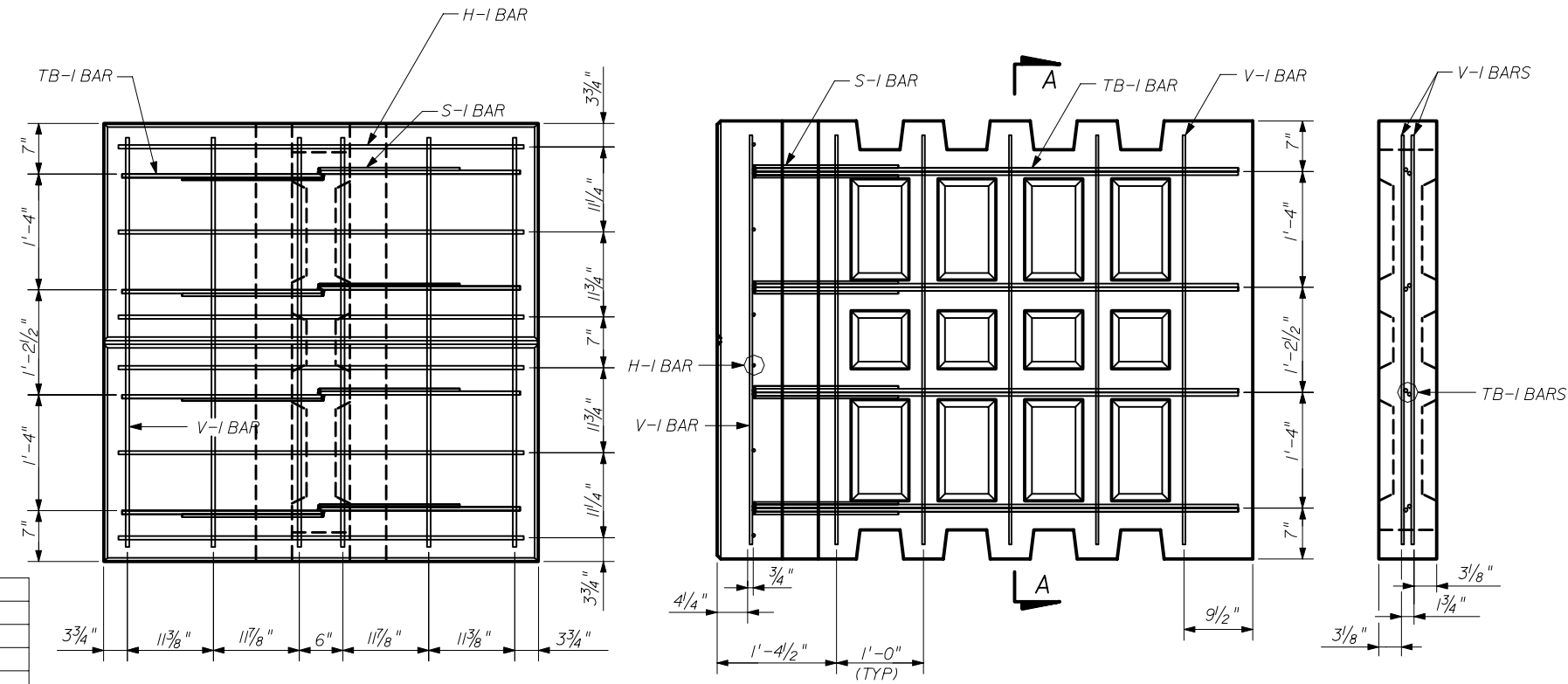
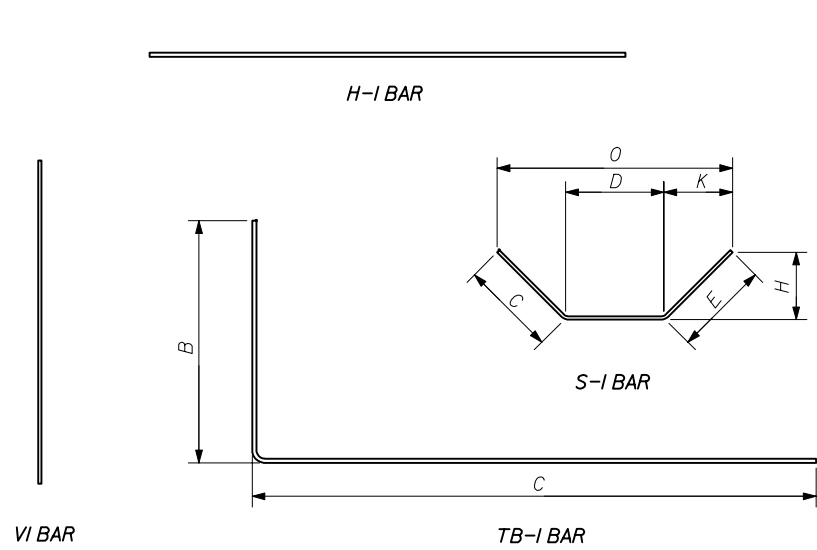
REINFORCING STEEL - TOP UNITS (III)

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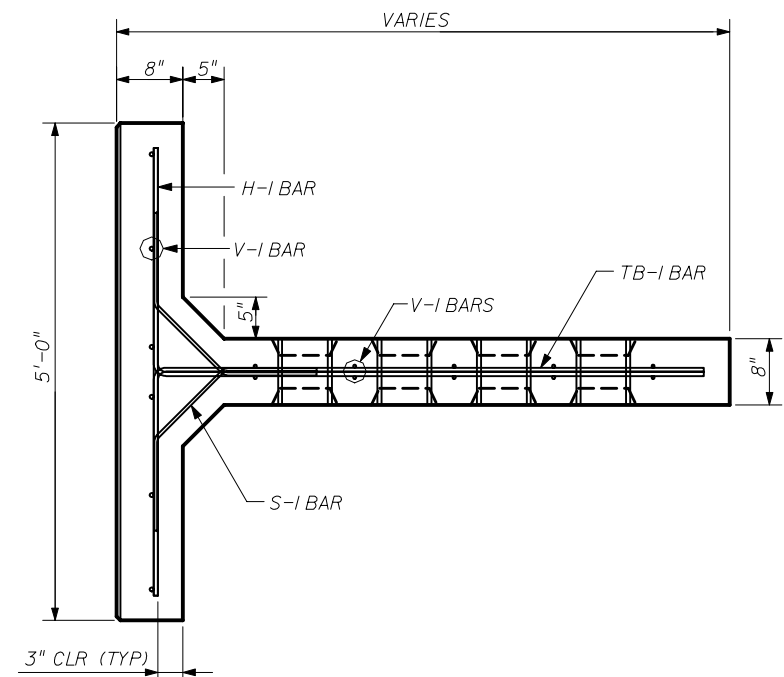
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FX: (904) 768-8428

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98		
Checked By	JMC	10/01/98		
Revision	04	Sheet No.	16 of 20	Index No.
				5010



FRONT VIEW
(V-I BARS IN STEM OMITTED FOR CLARITY)



TOP VIEW
REINFORCING STEEL - DOUBLE UNITS

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

REBAR SCHEDULE - 5.0 x 5.0 x 04 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	12	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 06 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	16	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 08 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	20	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 10 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	24	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	11'-8 1/2"	2'-3 1/2"	9'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 12 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	26	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	13'-8 1/2"	2'-3 1/2"	11'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 14 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	32	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	15'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 16 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	36	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	17'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	

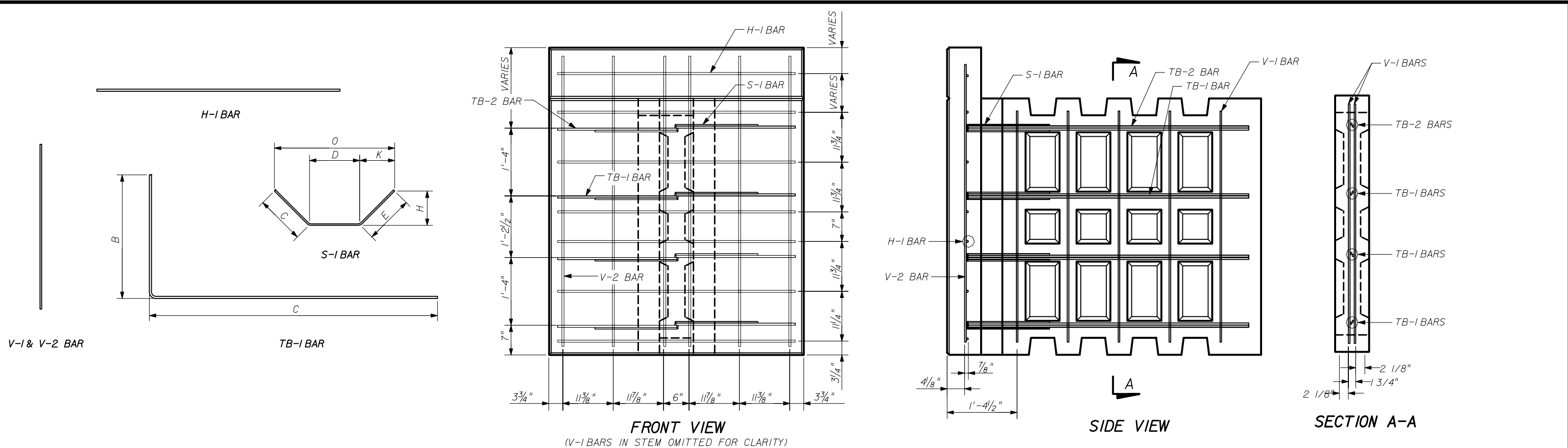
THE NEEL COMPANY
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OLDCASTLE PRECAST, INC.
5995 SOUTEL DR.
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)**

Names	Dates	Approved By		
Designed By	JMC 10/01/98	[Signature]		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	State Structures Design Engineer		
		Revision	Sheet No.	Index No.
		04	17 of 20	5010



FRONT VIEW
(V-I BARS IN STEM OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A

REBAR SCHEDULE - 5.5 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	5'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 6.0 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	5'-6"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 6.5 x 5.0 x 06 DBL TOP UNIT

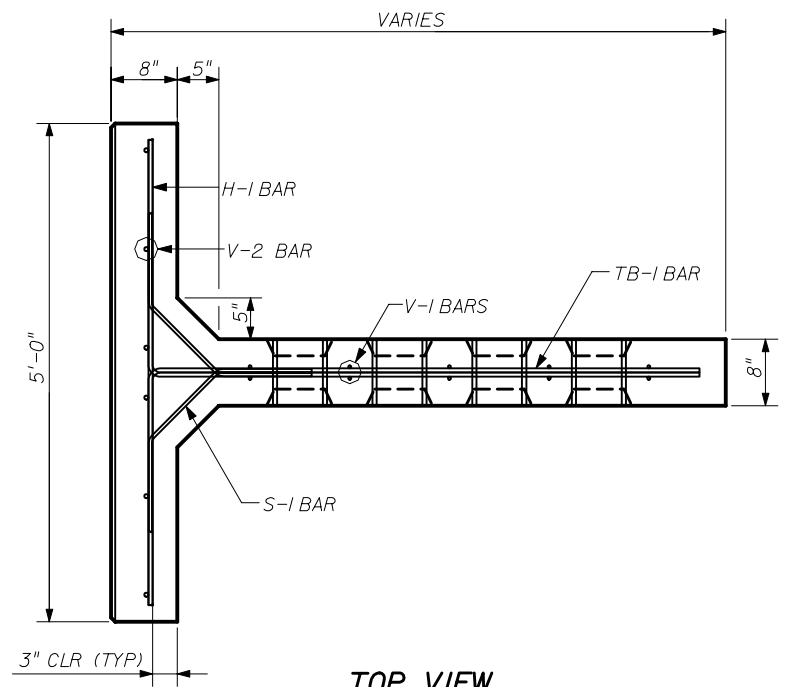
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	6'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 7.0 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	6'-6"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 7.5 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	7'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	



TOP VIEW
REINFORCING STEEL - DOUBLE TOP UNITS (I)

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

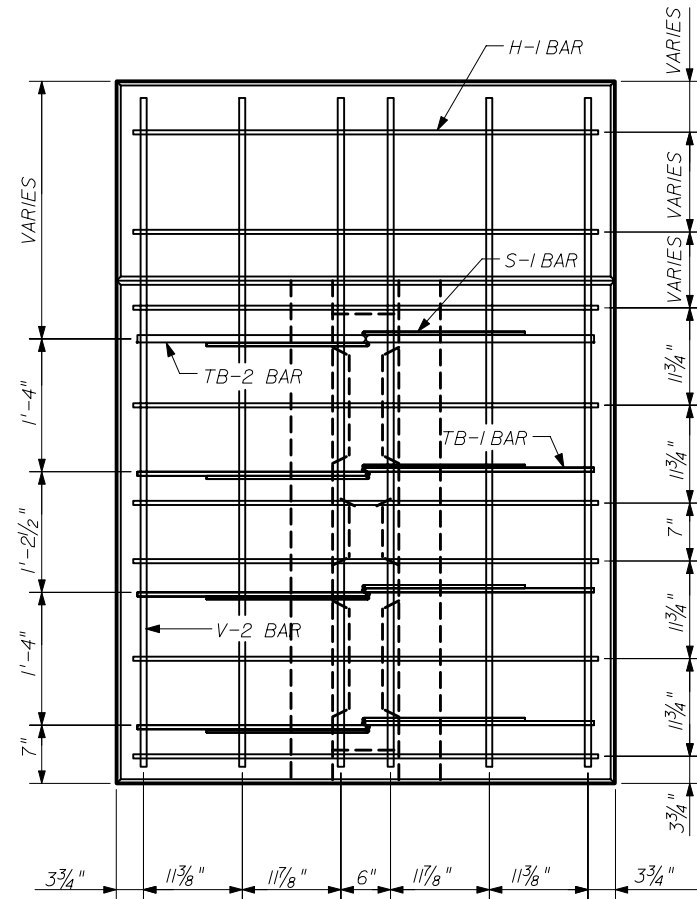
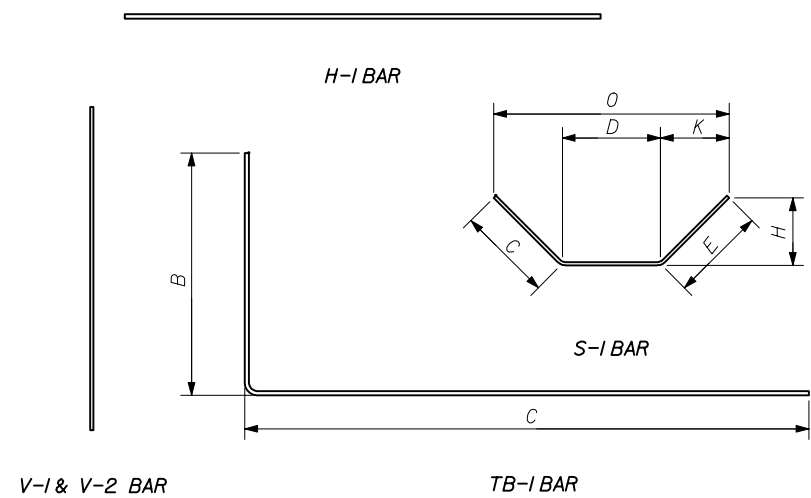
THE NEEL COMPANY
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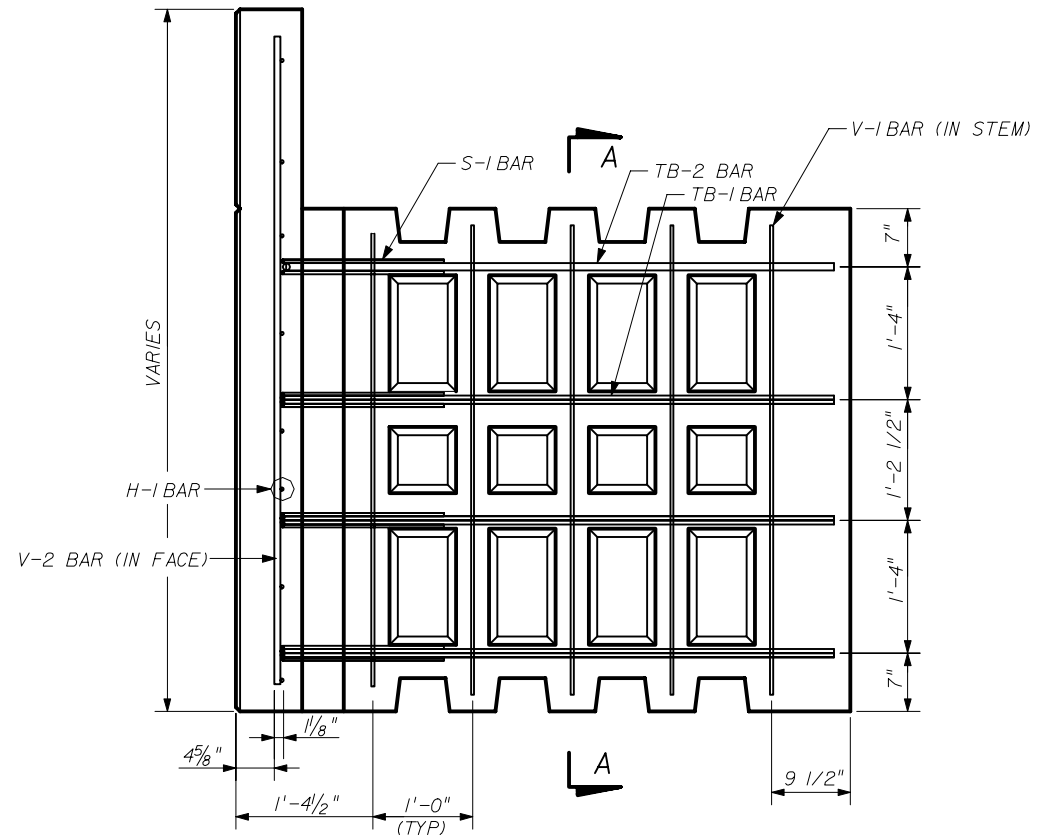
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)**

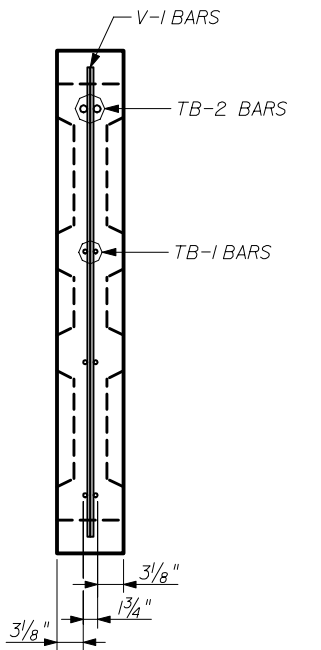
Names	Dates	Approved By
Designed By: JMC	10/01/98	[Signature]
Drawn By: CAA	10/01/98	
Checked By: JMC	10/01/98	Revision: 04
		Sheet No.: 18 of 20
		Index No.: 5010



FRONT VIEW
(V-1 BARS IN OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A

REBAR SCHEDULE - 8.0 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	9	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	7'-6"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 8.5 x 5.0 x 08 DBL TOP UNIT

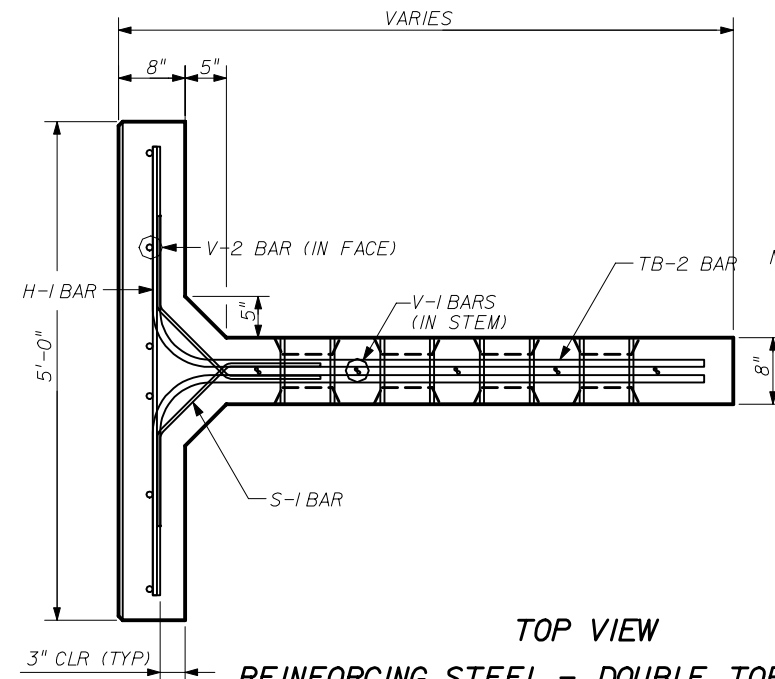
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	9	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	8'-0"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 9.0 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	10	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	8'-6"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 9.5 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	10	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	9'-0"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	



TOP VIEW
REINFORCING STEEL - DOUBLE TOP UNITS (II)

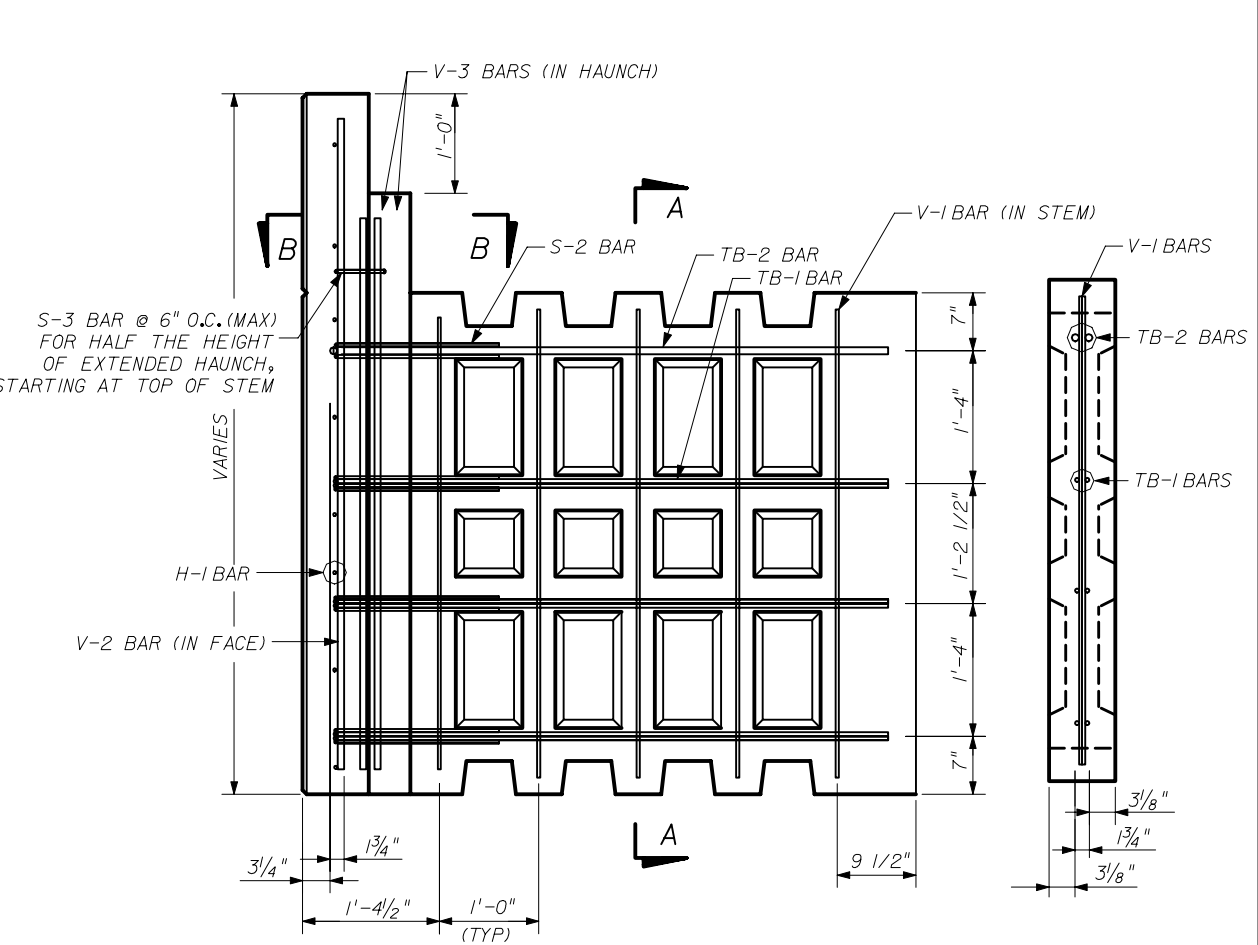
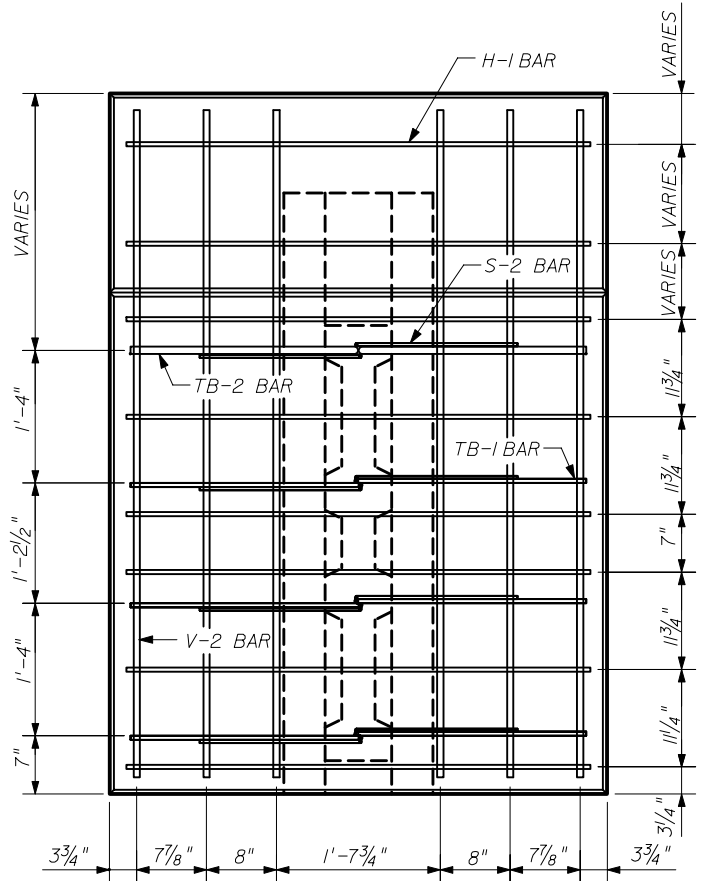
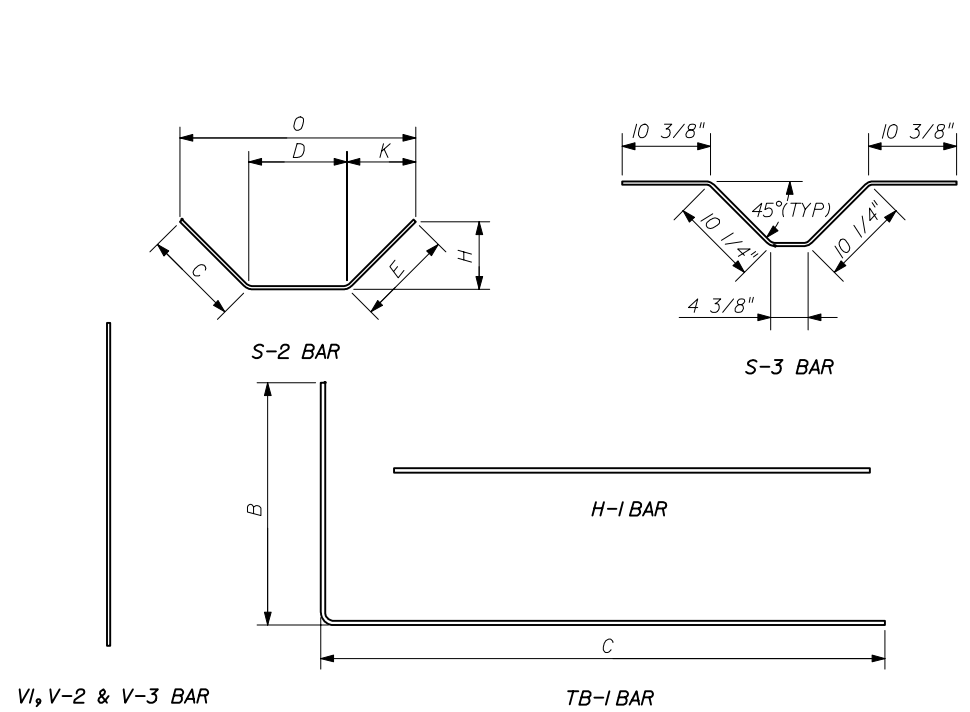
NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

THESE TWO UNITS WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

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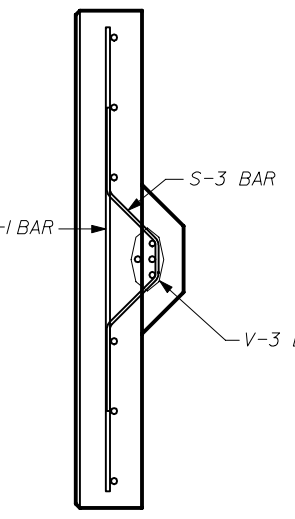
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By JMC	10/01/98	State Structures Design Engineer		
Drawn By CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By JMC	10/01/98	04	19 of 20	5010



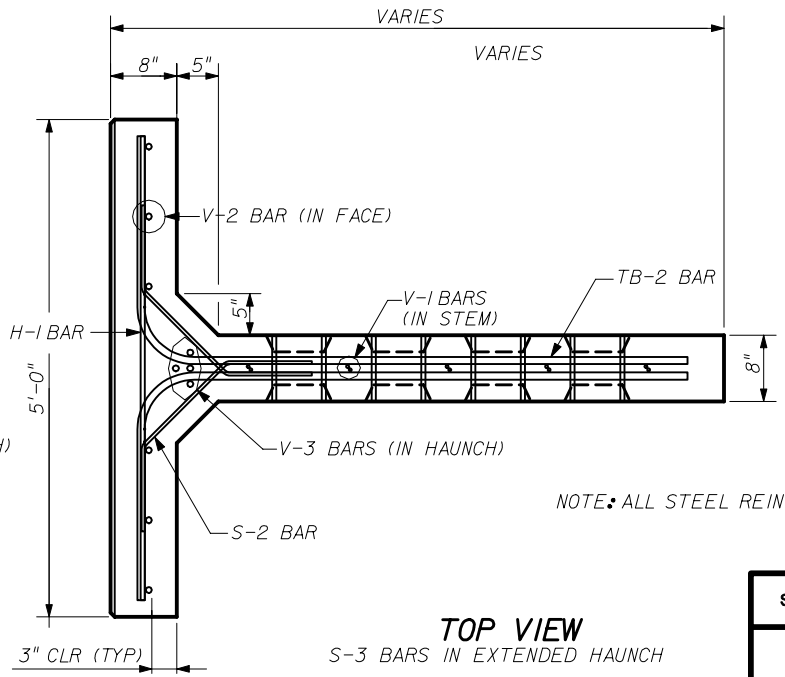
FRONT VIEW
(V-1 BARS IN STEM AND V-3 BARS IN HAUNCH OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A



SECTION B-B



TOP VIEW
S-3 BARS IN EXTENDED HAUNCH OMITTED FOR CLARITY

REINFORCING STEEL - DOUBLE TOP UNITS (III)

1. ALL UNITS ON THIS SHEET WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

REBAR SCHEDULE - 10.0 x 5.0 x 10 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	11	4	-	4'-6"								-	
V-1	18	3	-	4'-6"								-	
V-2	6	6	-	9'-6"								-	
V-3	4	6	-	8'-6"								-	
S-2	8	3	3	2'-10"	10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"		45	
S-3	8	3	3	3'-3 5/8"								-	SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 10.5 x 5.0 x 10 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	11	4	-	4'-6"								-	
V-1	18	3	-	4'-6"								-	
V-2	6	6	-	10'-0"								-	
V-3	4	6	-	9'-0"								-	
S-2	8	3	3	2'-10"	10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"		45	
S-3	9	3	3	3'-3 5/8"								-	SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 11.0 x 5.0 x 10 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	12	4	-	4'-6"								-	
V-1	18	3	-	4'-6"								-	
V-2	6	6	-	10'-6"								-	
V-3	4	6	-	9'-6"								-	
S-2	8	3	3	2'-10"	10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"		45	
S-3	10	3	3	3'-3 5/8"								-	SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 11.5 x 5.0 x 10 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	12	4	-	4'-6"								-	
V-1	18	3	-	4'-6"								-	
V-2	6	6	-	11'-0"								-	
V-3	4	6	-	10'-0"								-	
S-2	8	3	3	2'-10"	10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"		45	
S-3	11	3	3	3'-3 5/8"								-	SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

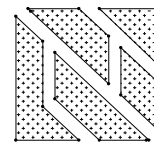
**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)**

Names	Dates	Approved By		
Designed By	JMC 10/01/98	W. V. [Signature] State Structures Design Engineer		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	Revision	Sheet No.	Index No.
		04	20 of 20	5010

STANDARD DETAILS
FOR 2" CONCRETE COVER

T-WALL®
RETAINING WALL SYSTEM

DESIGNER



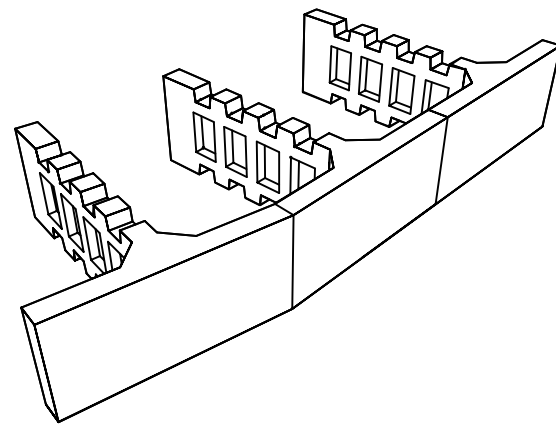
THE NEEL COMPANY

8328-D TRAFORD LANE
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PRECASTER

OLDCASTLE PRECAST, INC

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MISCELLANEOUS NOTES:

- DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VA 22152
PH: (703) 913-7858
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- PRECASTER:
OLDCASTLE PRECAST INC.
5995 SOUDEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428
- MATERIALS SUPPLIED BY PRECASTER:
-PRECAST T-WALL UNITS
-PRECAST SHEAR KEYS
-HORIZONTAL JOINT MATERIAL
-VERTICAL JOINT MATERIAL AND ADHESIVE
-SHEAR KEY JOINT MATERIAL

DESIGN NOTES:

- DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE RETAINING WALL VOLUME, METHODS OF CONSTRUCTION, AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO SPEC SECTION 548 - RETAINING WALL SYSTEMS.
- SOIL PARAMETERS:
-SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUE OF ϕ , c AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS
- FACTORS OF SAFETY:
-OVERTURNING - 2.0
-SLIDING - 1.5
-INTERNAL PULLOUT - 1.5
-BEARING CAPACITY - 2.5
-OVERALL STABILITY - 1.5
- THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE NEEL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN, INCLUDING FOUNDATION AND SLOPE STABILITY, IS THE RESPONSIBILITY OF OTHERS.
- PANELS WITH CANTILEVERED (EXTENDED) FACE SHALL ONLY BE USED TO AVOID OBSTRUCTIONS AS APPROVED ON THE SHOP DRAWINGS.

MATERIALS NOTES:

- PRECAST CONCRETE:
-PRECAST T-WALL UNITS - PER SPEC SECTION 548
-PRECAST SHEAR KEYS - PER SPEC SECTION 548
- C.I.P. CONCRETE:
-C.I.P. LEVELING PAD - PER SPEC SECTION 548
-OTHER C.I.P. CONCRETE - PER SPEC SECTION 548
- REINFORCING STEEL:
-PER SPEC SECTION 548
- JOINT MATERIAL:
-HORIZONTAL JOINT FILLER:
-1/2" x 4" x 5'-0"
-PREFORMED EPDM
-DUROMETER: 80 - 90
-VERTICAL JOINT COVER:
-TENSAR DC4205 OR EQUAL
-12" WIDE x HEIGHT OF JOINT
-GEOCOMPOSITE MEETING REQUIREMENTS OF SPEC SECTION 548
-SHEAR KEY WRAP:
-1/4" x 8" x 24"
-AVI ASTRO-FOAM AF-250
- BACKFILL:
-PER SPEC SECTION 548

CONSTRUCTION NOTES:

- ALL CONSTRUCTION PROCEDURES SHALL COMPLY WITH SPEC SECTION 548 AND THE "T-WALL CONSTRUCTION MANUAL" (PROVIDED BY THE NEEL COMPANY OR OLDCASTLE PRECAST, INC). IN THE EVENT OF A DISCREPANCY BETWEEN THE SPEC AND THE "T-WALL CONSTRUCTION MANUAL", THE SPEC SHALL CONTROL.
- FOR LOCATION AND ALIGNMENT OF T-WALL STRUCTURE, SEE RETAINING WALL CONTROL PLANS.
- T-WALL STRUCTURES ON CURVES SHALL BE BUILT IN CHORDS AS SHOWN IN THE T-WALL DESIGN DRAWINGS.
- IF MANHOLES OR DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN IN THE T-WALL DESIGN DRAWINGS.
- IF PILES ARE LOCATED WITHIN THE RETAINING WALL VOLUME, THEY SHALL BE DRIVEN BEFORE CONSTRUCTION OF THE T-WALL STRUCTURE.
- T-WALL UNITS SHALL BE PLACED ONE ROW AT A TIME, AND BACKFILLED BEFORE PLACEMENT OF THE NEXT ROW.
- IF A STRUCTURE EXCEEDS 20' IN HEIGHT, THE FINISH GRADE AT THE FACE OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS 20' IN HEIGHT.
- THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING STORM WATER DRAINAGE IN THE VICINITY OF THE WALL DURING CONSTRUCTION. STORMWATER RUNOFF SHALL BE COLLECTED AND DISCHARGED AWAY FROM THE WALL AND THE RETAINING WALL VOLUME.

DESIGNER:



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PRECASTER:

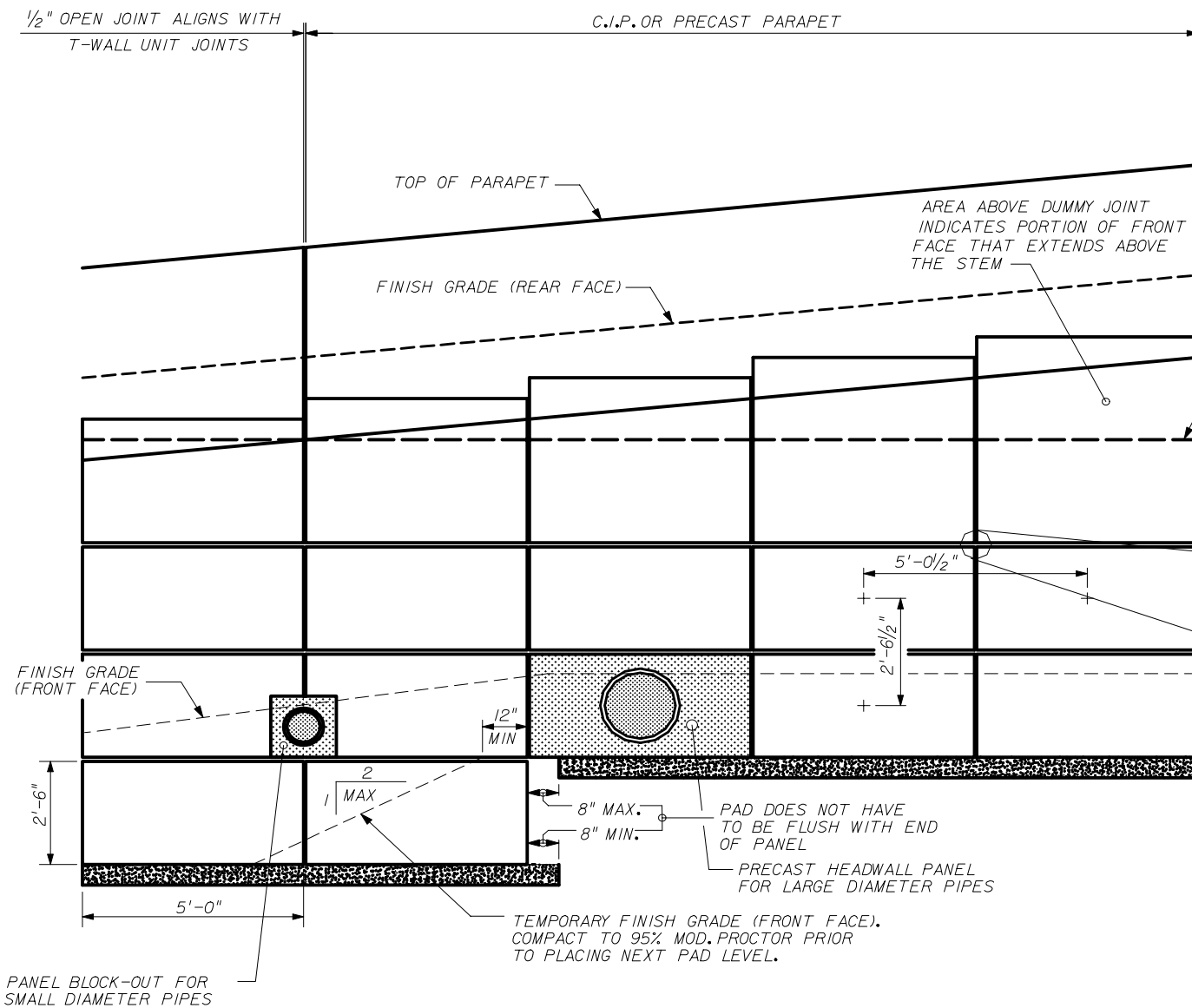
OLDCASTLE PRECAST, INC
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THIS SYSTEM SHALL BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS.

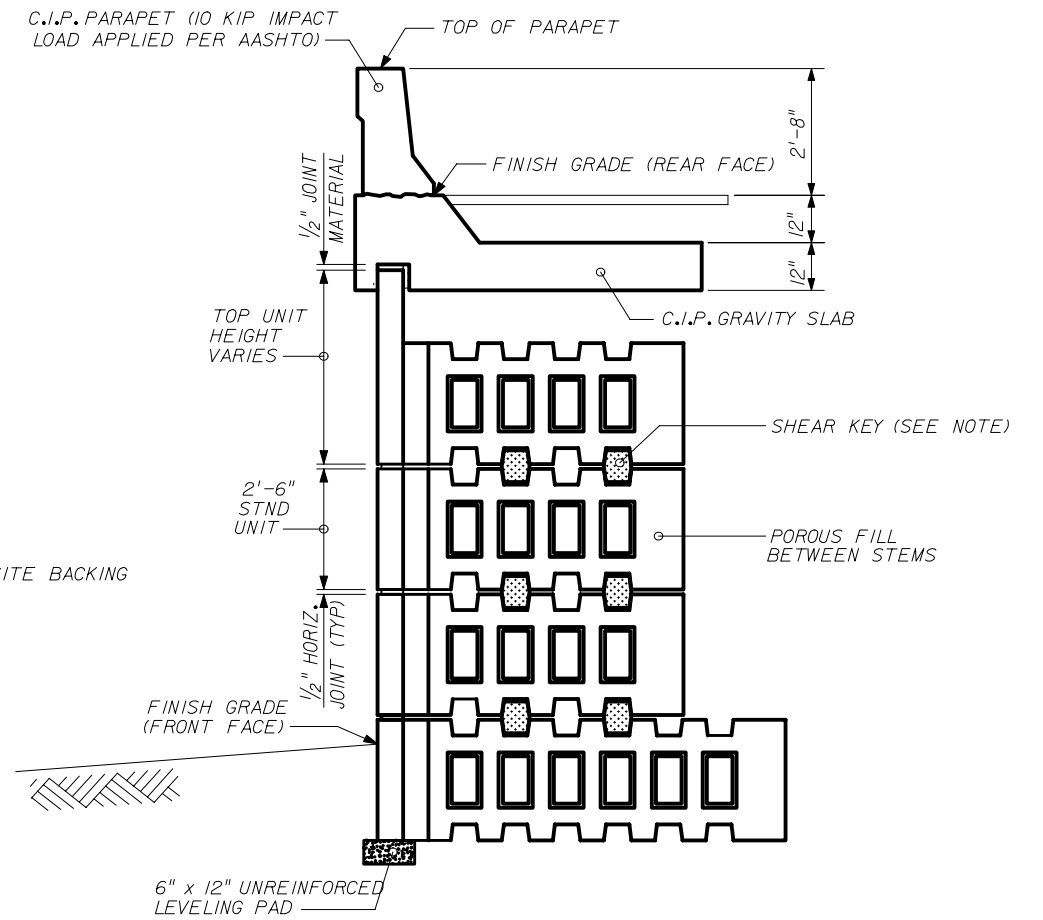
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)

Names		Dates		Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer			
Drawn By	CAA	10/01/98				
Checked By	JMC	10/01/98				
Revision		Sheet No.		Index No.		
04		1 of 21		5011		



PART ELEVATION SHOWING TYPICAL DETAILS
(NO SCALE)



SECTION SHOWING TYPICAL DETAILS
(NOT ALL DETAILS APPLY TO EACH WALL)

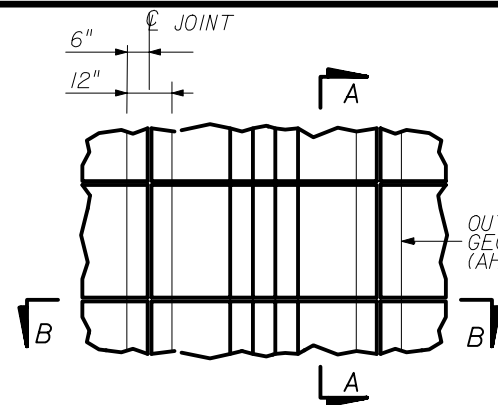
NOTE: ALL EXTENDED FACE TOP UNITS REQUIRE A MINIMUM OF TWO SHEAR KEYS. ALL OTHER UNITS ARE AS SHOWN BELOW:

- TOP UNITS - 2 SHEAR KEYS
- 6' STEM - 2 SHEAR KEYS
- 8' STEM - 2 SHEAR KEYS
- 10' STEM - 2 SHEAR KEYS
- 12' STEM - 2 SHEAR KEYS
- 14' STEM - 3 SHEAR KEYS
- 16' STEM - 3 SHEAR KEYS

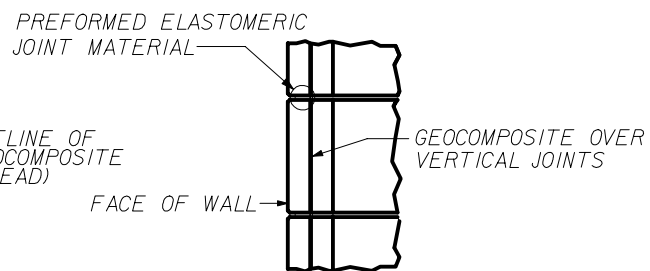
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 1703 913-7858
FX: 1703 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUFEL DR.
JACKSONVILLE, FL 32219
PH: 1904 768-7081
FX: 1904 768-8428

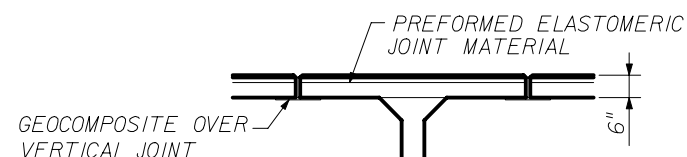
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By JMC	10/01/98	State Structures Design Engineer		
Drawn By CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By JMC	10/01/98	04	2 of 21	5011



PART ELEVATION - REAR FACE



PART SECTION A-A

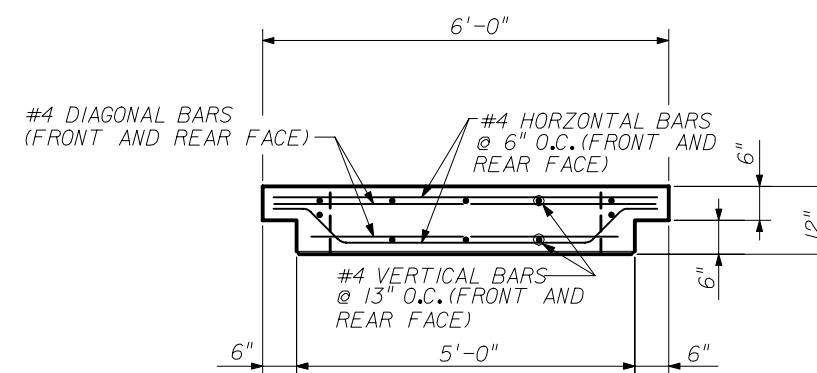
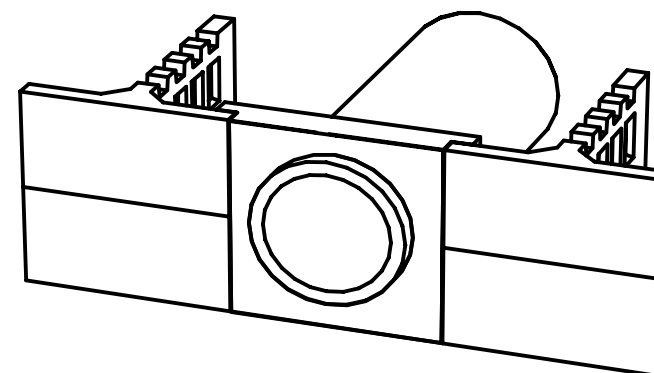


PART SECTION B-B

JOINT MATERIAL DETAILS

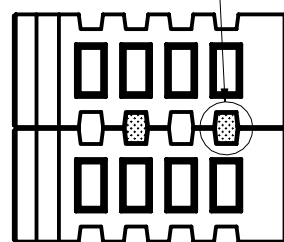
NOTES:

1. HORIZONTAL JOINT:
1/2" x 4" x 5'-0" PREFORMED ELASTOMERIC JOINT MATERIAL
2. VERTICAL JOINT:
1/2" SPACE
12" WIDE GEOCOMPOSITE BACKING, CENTERED ABOUT JOINT CENTERLINE.



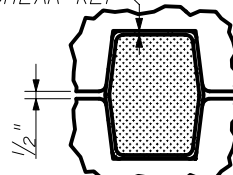
PLAN

SHEAR KEY WRAPPED IN JOINT MATERIAL. SEE DETAILS THIS SHEET.

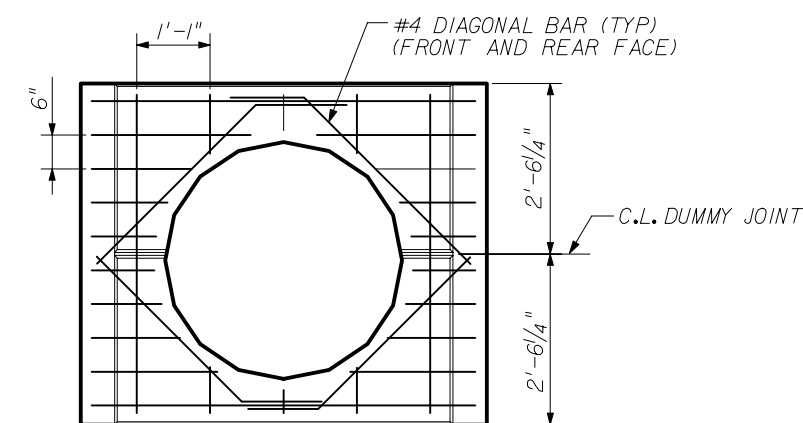


PART SECTION

1/4" JOINT MATERIAL ALL AROUND SHEAR KEY



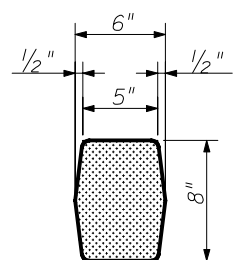
SHEAR KEY / JOINT MATERIAL ARRANGEMENT



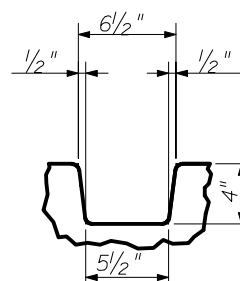
ELEVATION (FRONT FACE)
PRECAST HEADWALL PANEL FOR LARGE DIAMETER PIPES

NOTES:

1. SHEAR KEY JOINT MATERIAL:
MINIMUM OF ONE 1/4" x 8" x 24" PIECE OF AVI ASTRO-FOAM AF-250 PER SHEAR KEY.
2. JOINT MATERIAL MAY BE ADDED OR REMOVED TO AID IN SHIMMING AND ALIGNING, HOWEVER SHEAR KEY MUST FIT SNUG IN THE SHEAR KEY BLOCKOUT WHEN UNIT IS IN ITS FINAL POSITION.
3. MINIMUM OF 2 SHEAR KEYS REQUIRED PER UNIT. SEE NOTES ON SHEET 2 OF 21, 'TYPICAL DETAILS (1)'.



SHEAR KEY DIMENSIONS



SHEAR KEY BLOCKOUT DIM'S

SHEAR KEY DETAILS

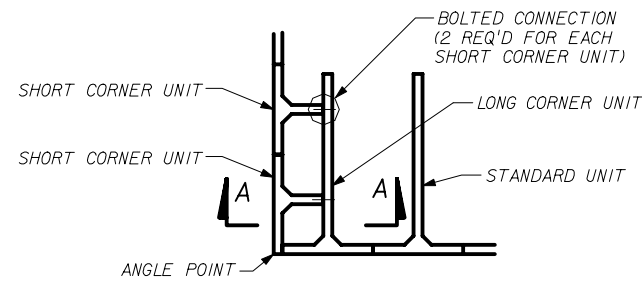
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

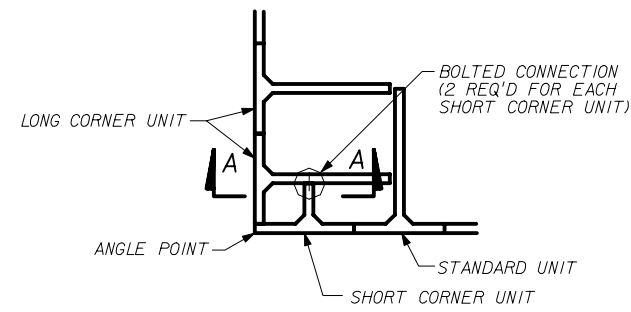
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)

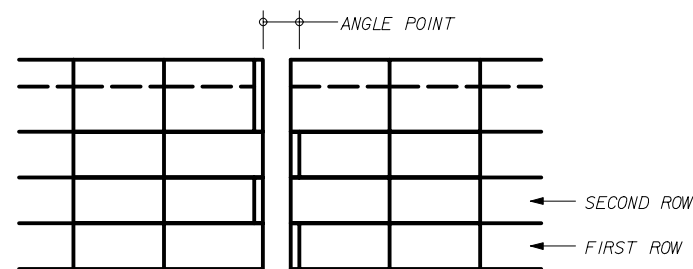
Names	Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98		
Checked By	JMC	10/01/98		
Revision	04	3 of 21		



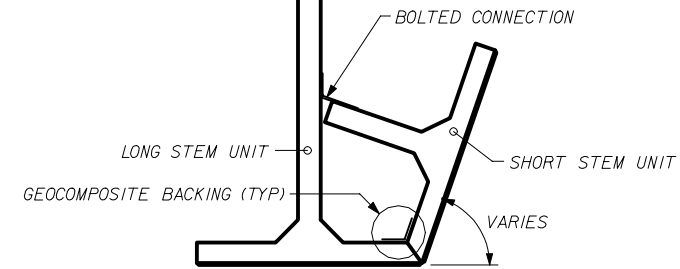
PART PLAN - FIRST ROW



PART PLAN - SECOND ROW

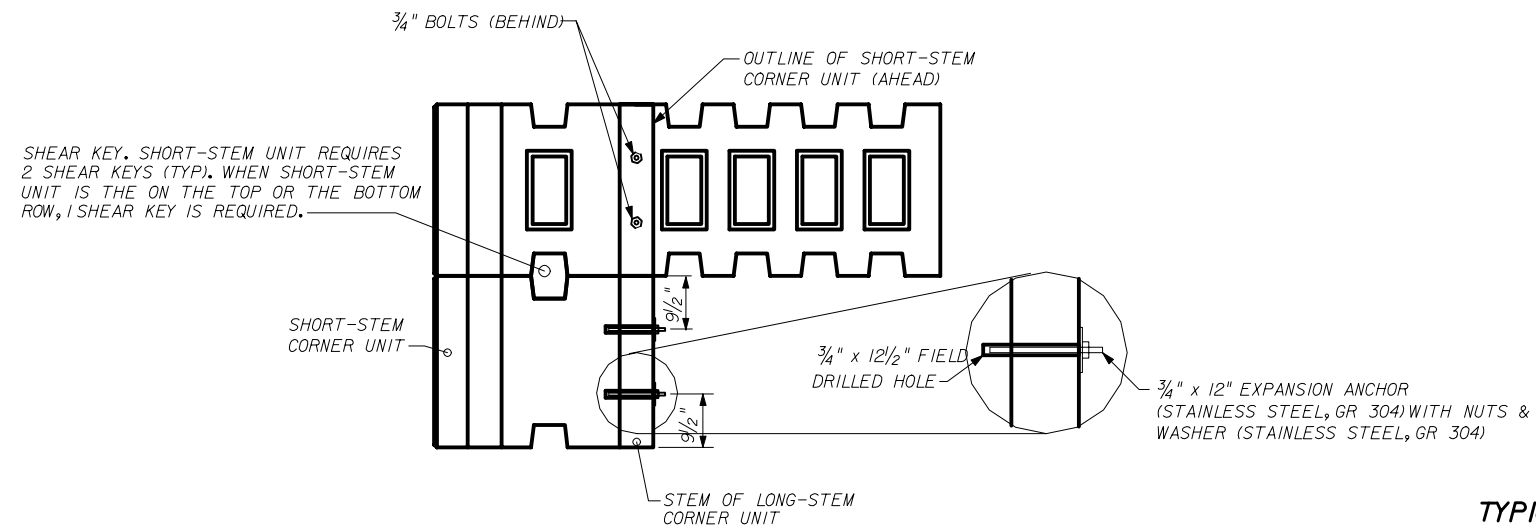


PART ELEVATION

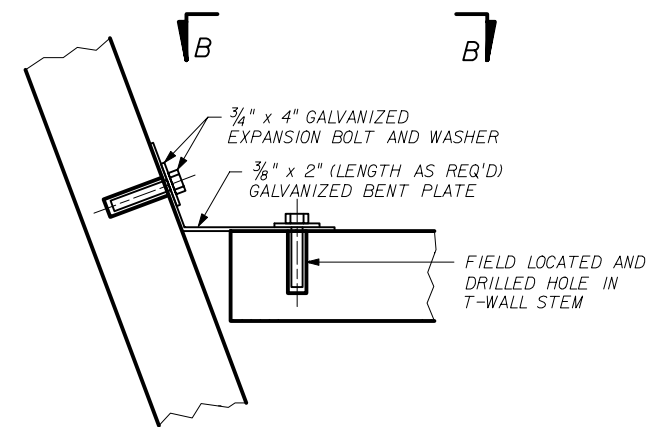


PART PLAN - ANGLE > 90°

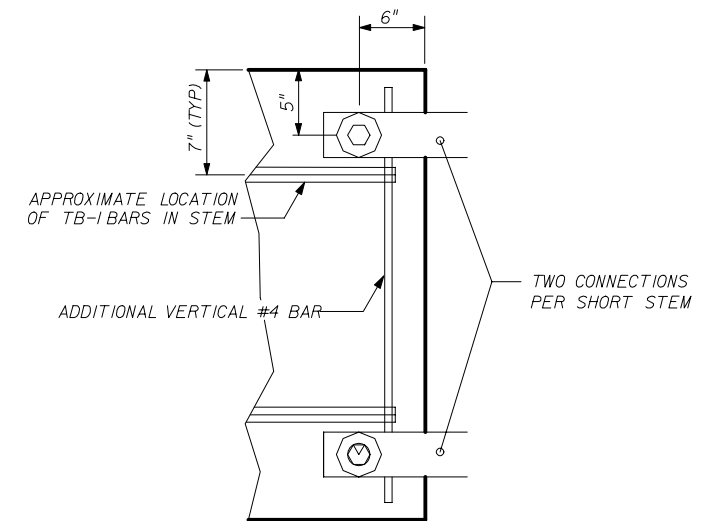
SHORT AND LONG STEMS ALTERNATE PER 90° CORNER DETAIL



TYPICAL CORNER UNIT ARRANGEMENT
STEM LENGTHS VARY - SEE SPECIFIC ELEVATIONS FOR PROPER UNITS
NO SCALE



TYPICAL BOLTED CONNECTION FOR ANGLE POINTS > 90°



VIEW B-B


TYPICAL ANGLE POINT DETAIL
NO SCALE

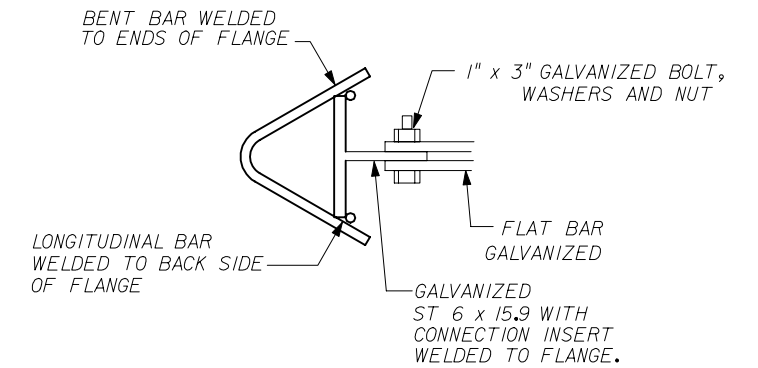
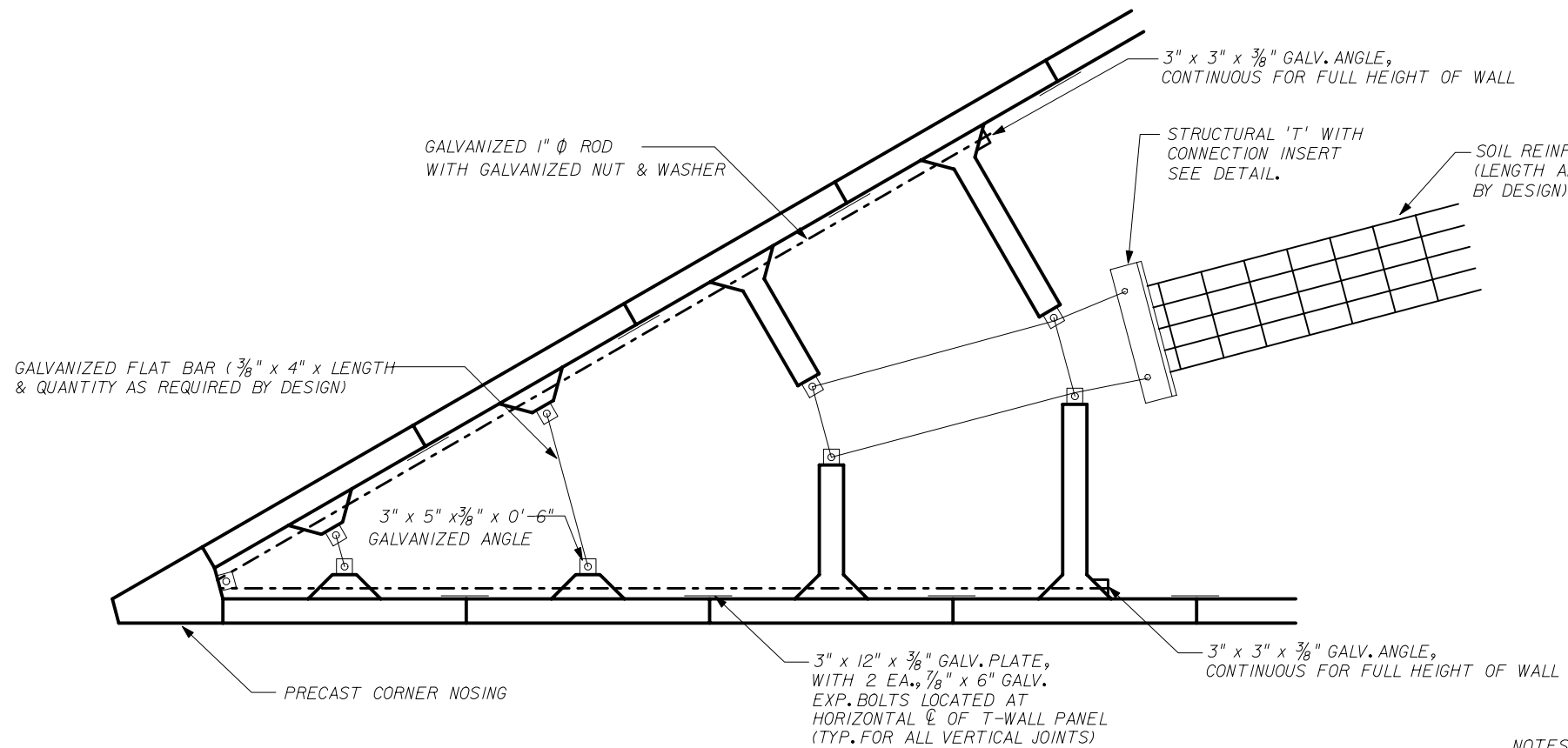
DESIGNER:
 **THE NEEL COMPANY**
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

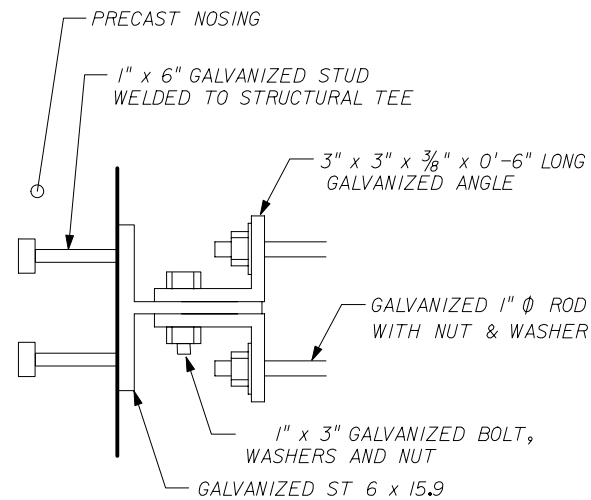
RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)

Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	4 of 21
				5011



SOIL GRID CONNECTION DETAIL
SEVERE ACUTE CORNERS

PART PLAN
SEVERE ACUTE ANGLE DETAIL
ANGLE 45° OR LESS



ROD/NOSING CONNECTION DETAIL


NOTES:

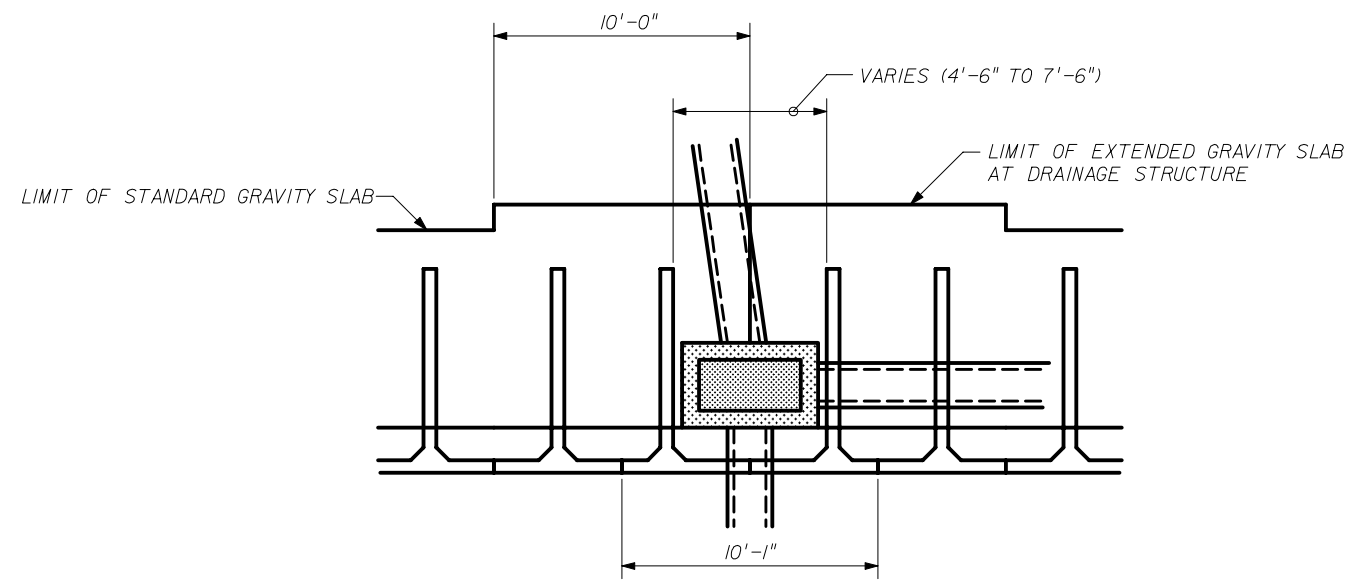
1. SOIL GRID TO BE DESIGNED FOR PULLOUT & TENSION. QUANTITY AND LENGTH OF GRIDS TO BE AS REQUIRED BY DESIGN.
2. CONNECTION INSERT:
 - PER SPEC SECTION 548
 - WIIWIRE
 - WELDED PER ASTM A185 PRIOR TO GALVANIZATION
3. LOCKING BAR:
 - PER SPEC SECTION 548
4. SOIL REINFORCEMENT GRIDS:
 - PER SPEC SECTION 548
 - WIIWELDED WIRE GRIDS:
 - 5 LONGITUDINAL WIRES @ 6" O.C., LENGTH AS REQUIRED BY DESIGN
 - 24" LONG TRANSVERSE BARS AT 6" OR 12" O.C., AS REQUIRED BY DESIGN
 - SOIL GRID LENGTHS SHOWN ON T-WALL DESIGN DRAWINGS ARE NOMINAL LENGTHS AS REQUIRED BY DESIGN CALCULATIONS. DUE TO MANUFACTURING TOLERANCES, ACTUAL GRID LENGTHS MAY BE LONGER.

DESIGNER:

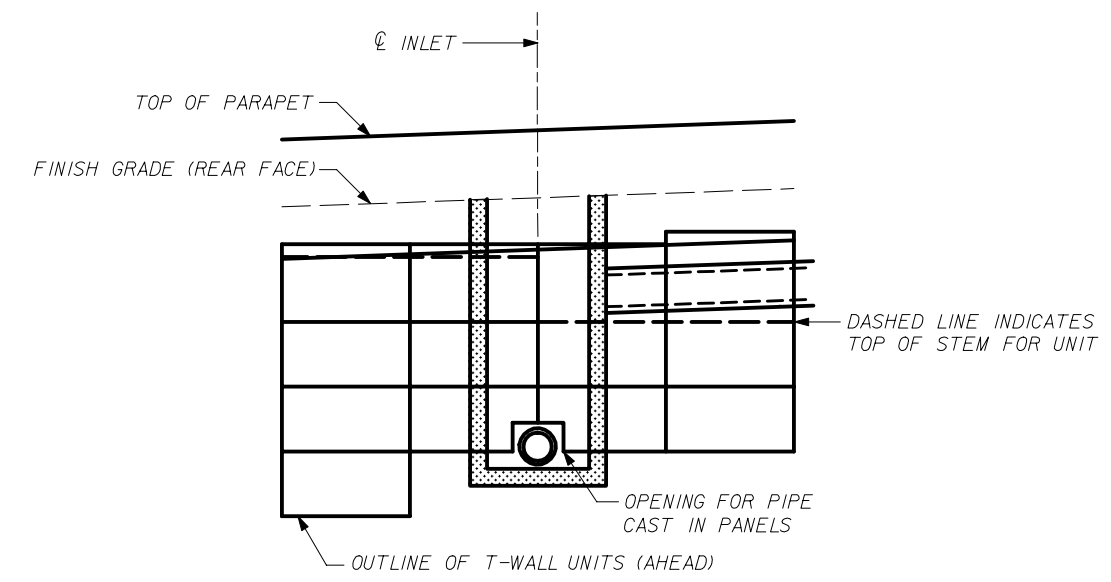
THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
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PRECASTER:
OLDCASTLE PRECAST, INC
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 JACKSONVILLE, FL 32219
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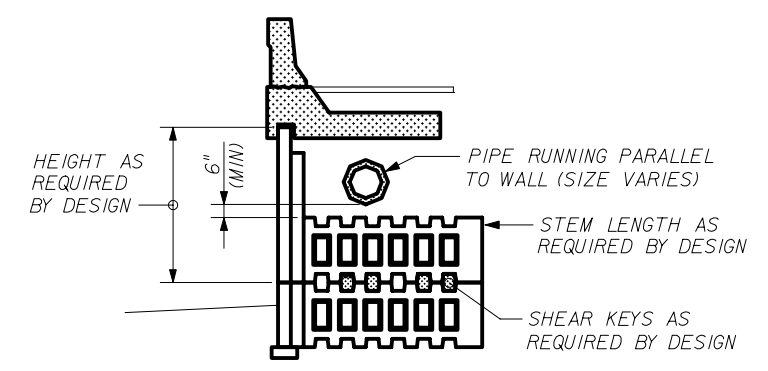
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	5 of 21
				Index No. 5011



PART PLAN



PART ELEVATION (FRONT FACE)



SECTION
(SHOWING PIPE PARALLEL TO WALL)


DESIGNER:

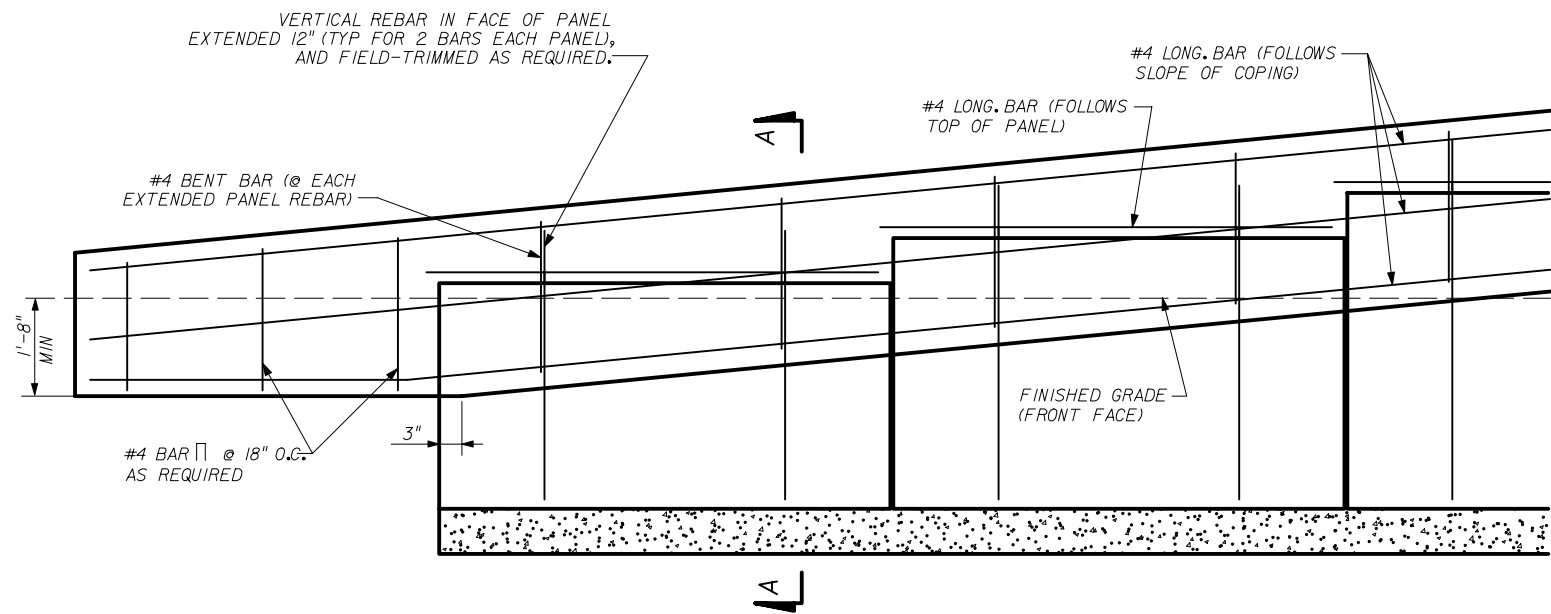
THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC.
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 JACKSONVILLE, FL 32219
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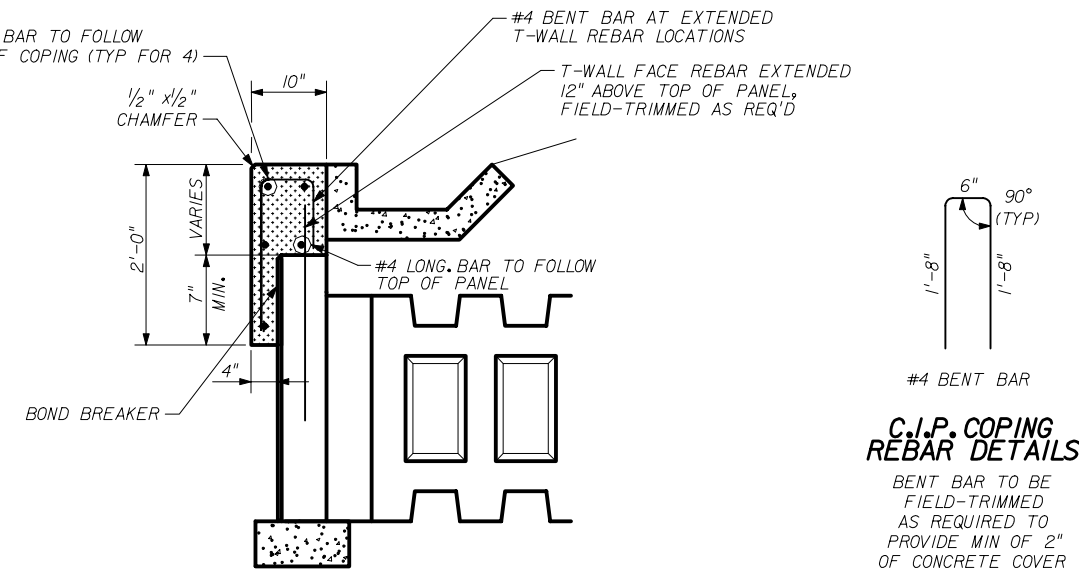
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (2" COVER)**

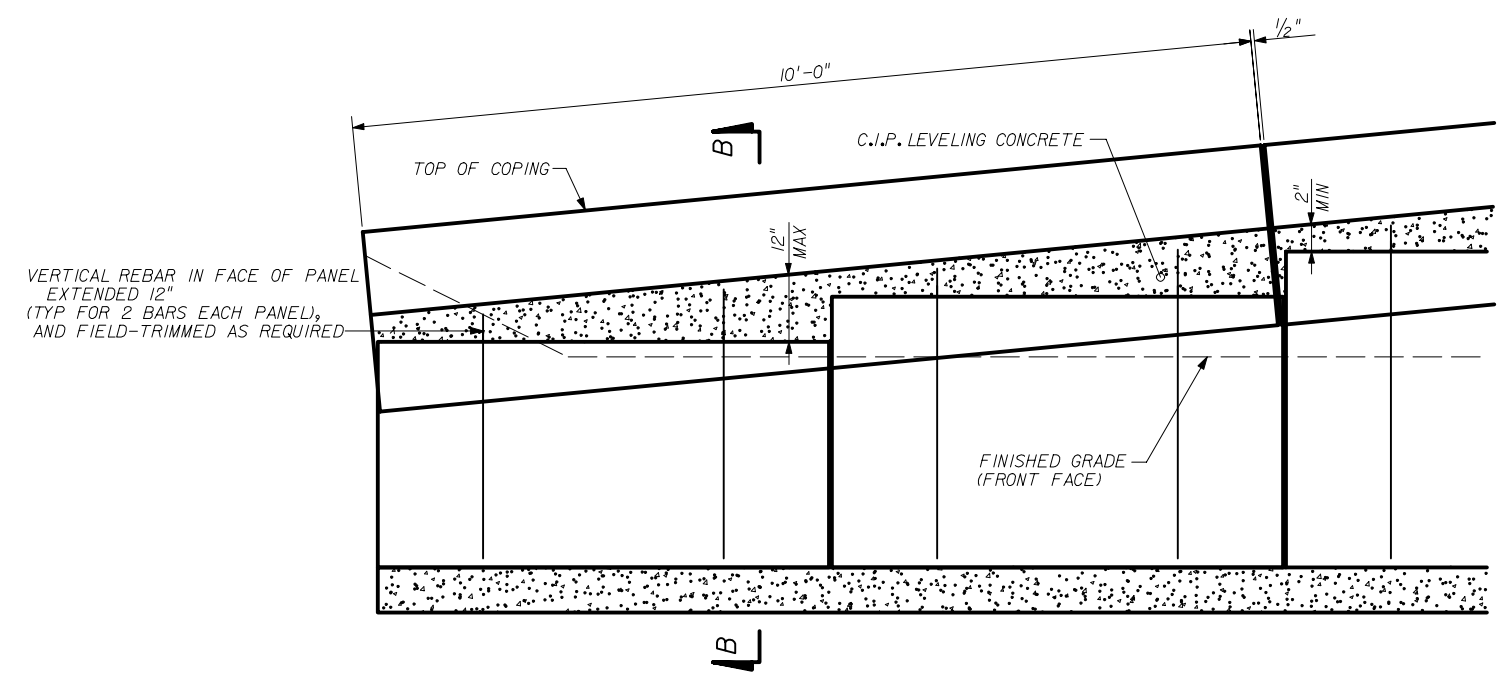
	Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer		
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By	JMC	10/01/98	04	6 of 21	5011



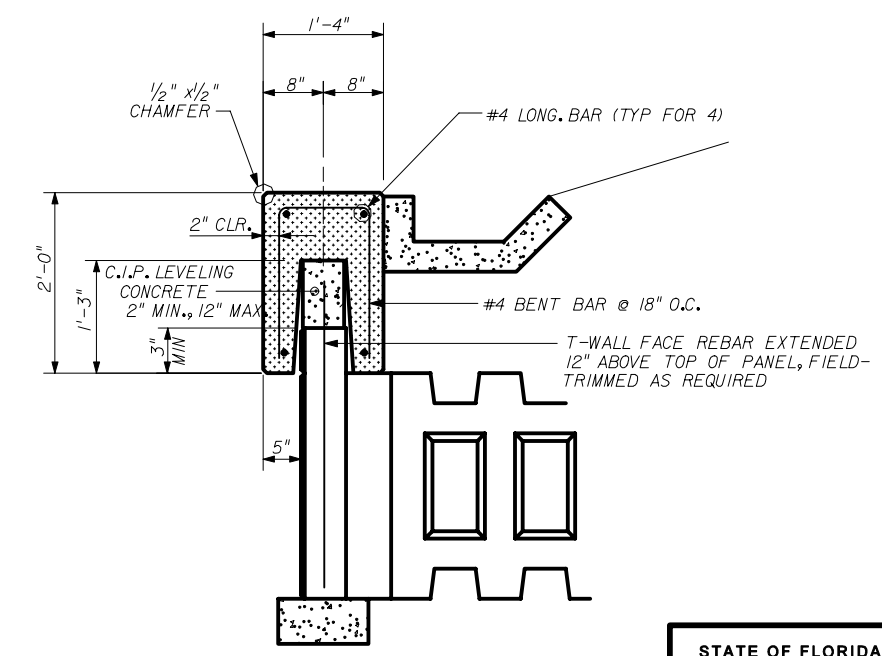
C.I.P. COPING TREATMENT AT BEGINNING/END OF WALLS



SECTION A-A
C.I.P. COPING



PRECAST COPING - PART ELEVATION



SECTION B-B
PRECAST COPING


DESIGNER:

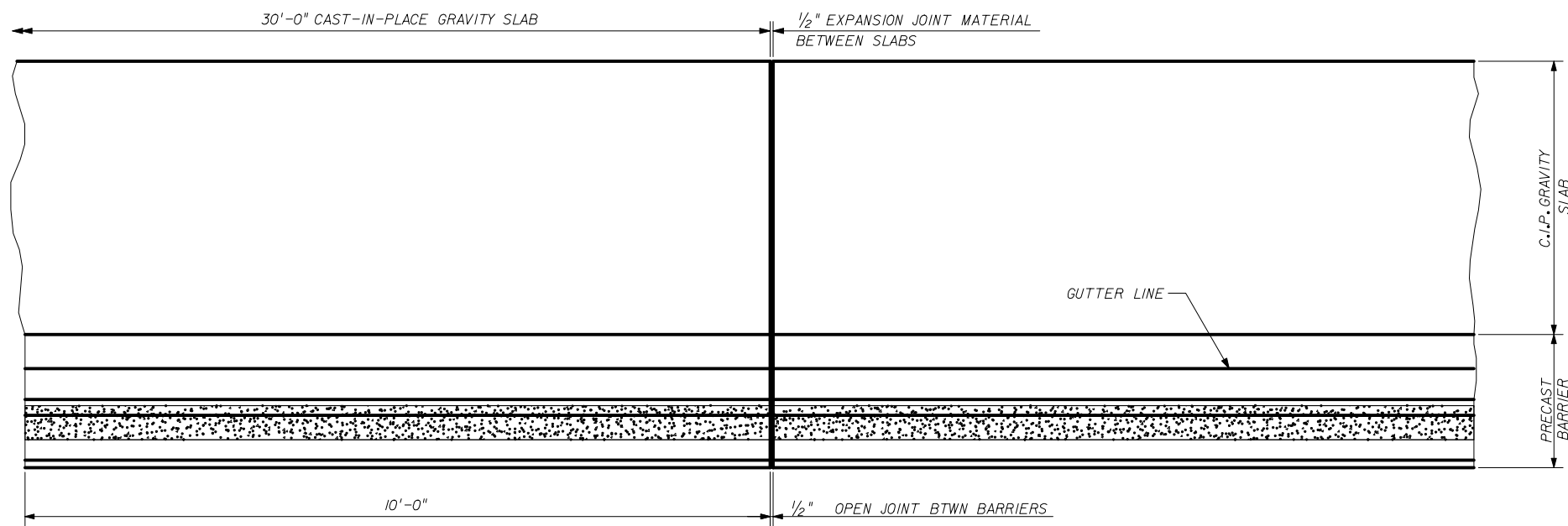
THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
 5995 SOUTHEL DR.
 JACKSONVILLE, FL 32219
 PH: (904) 768-7081
 FX: (904) 768-8428

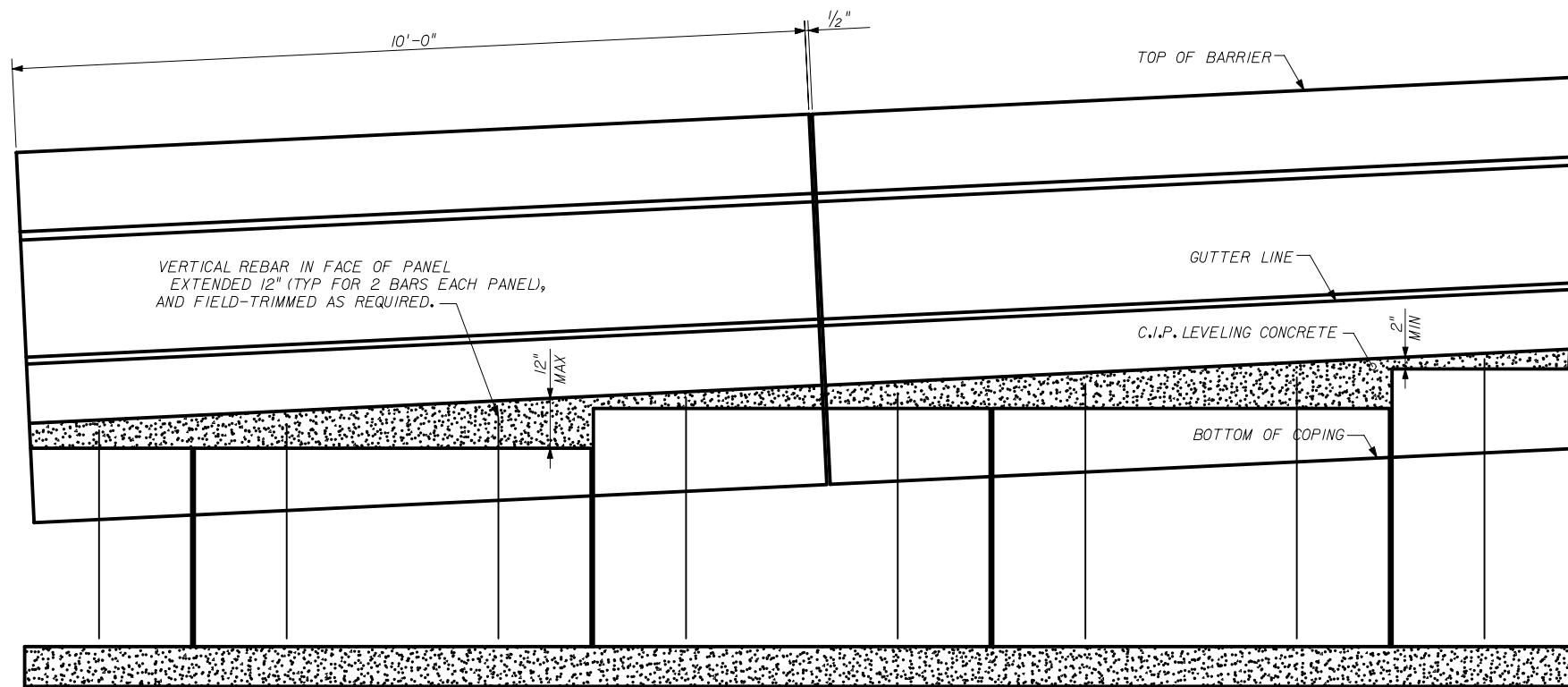
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (2" COVER)

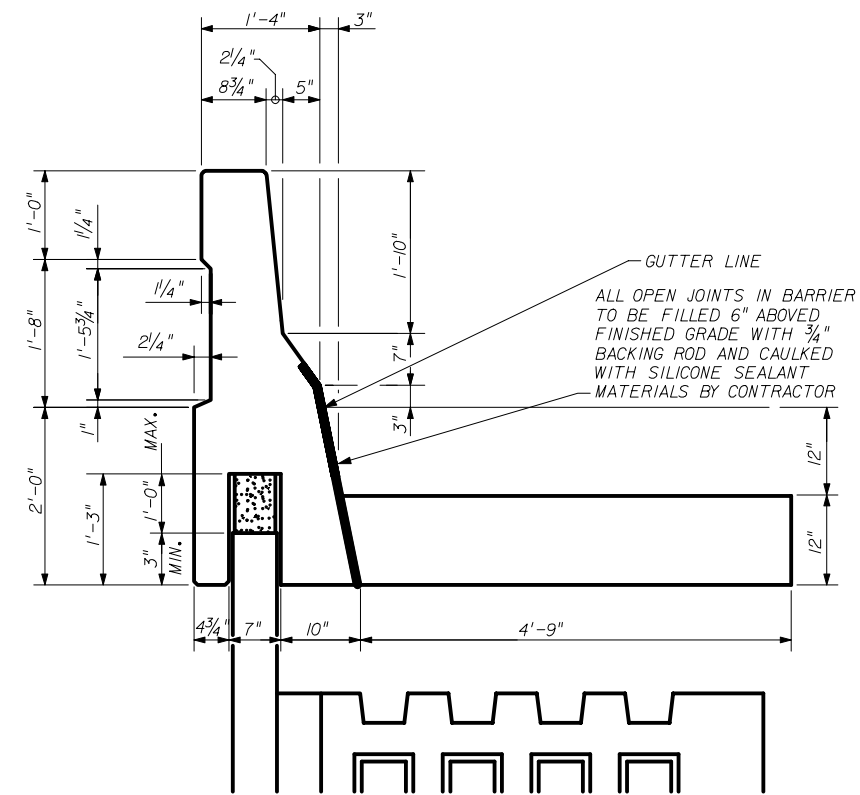
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	7 of 21
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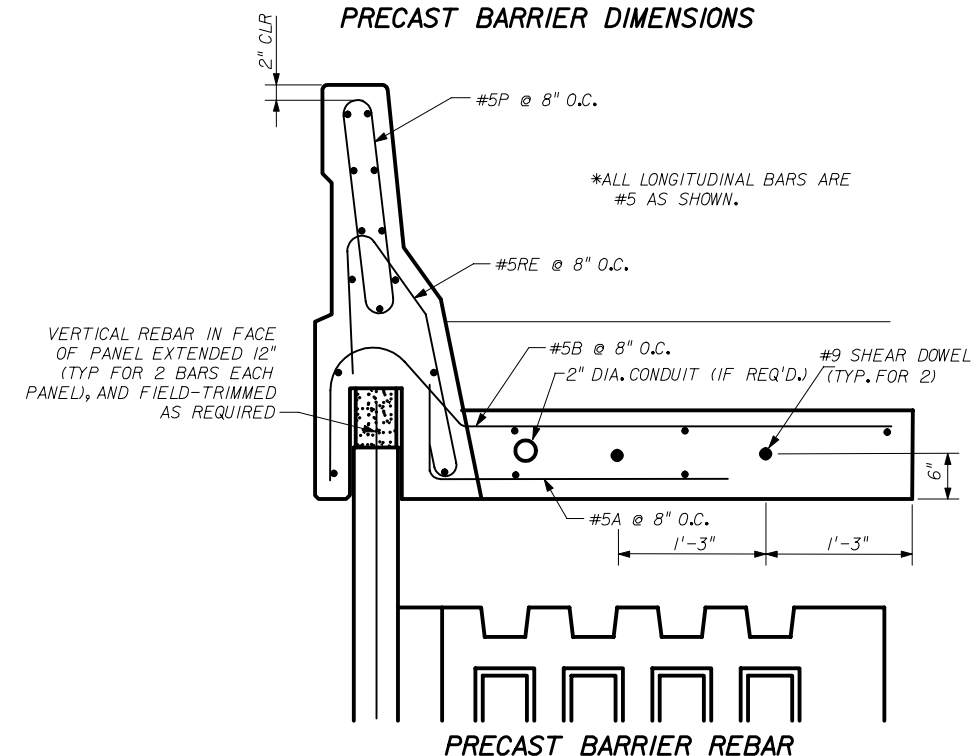
PART PLAN - PRECAST BARRIER



PART ELEVATION - PRECAST BARRIER



PRECAST BARRIER DIMENSIONS




PRECAST BARRIER REBAR

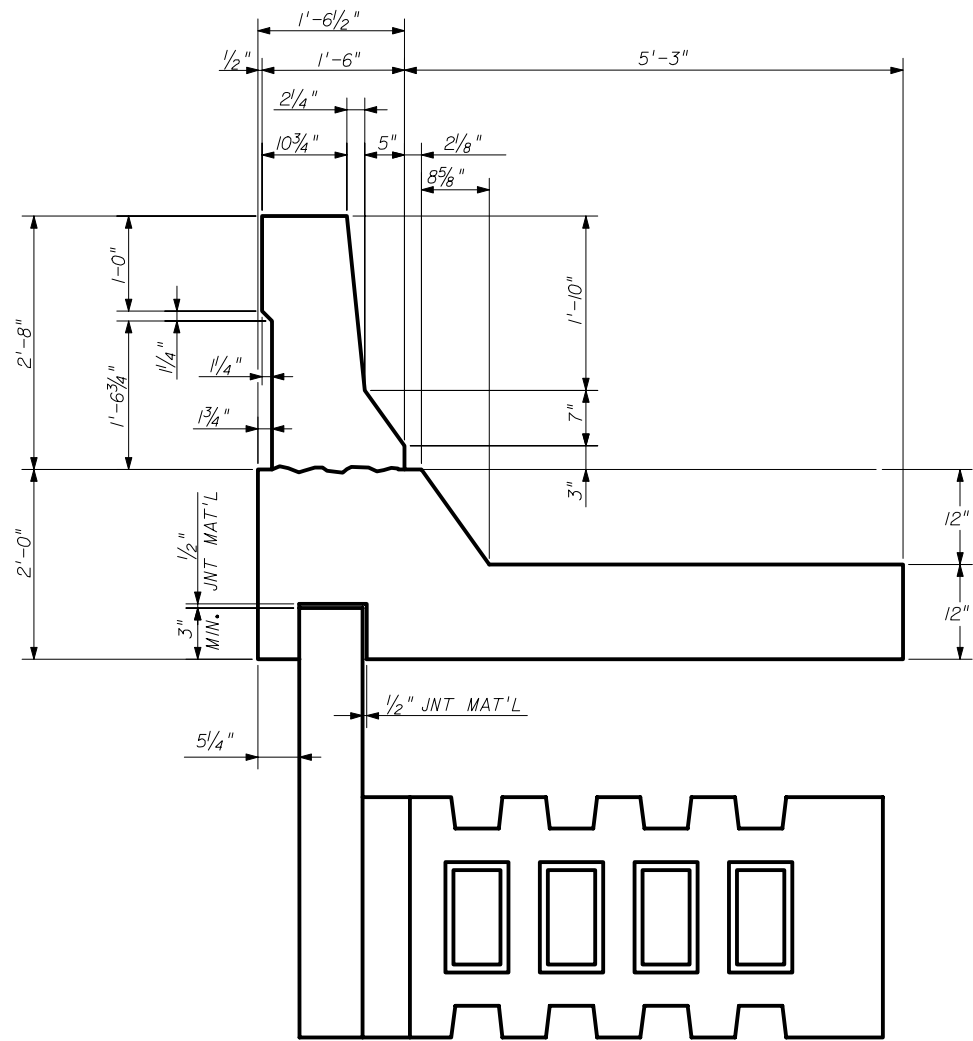
DESIGNER:
 **THE NEEL COMPANY**
 8328-O TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC.
 5995 SOUTEL DR.
 JACKSONVILLE, FL 32219
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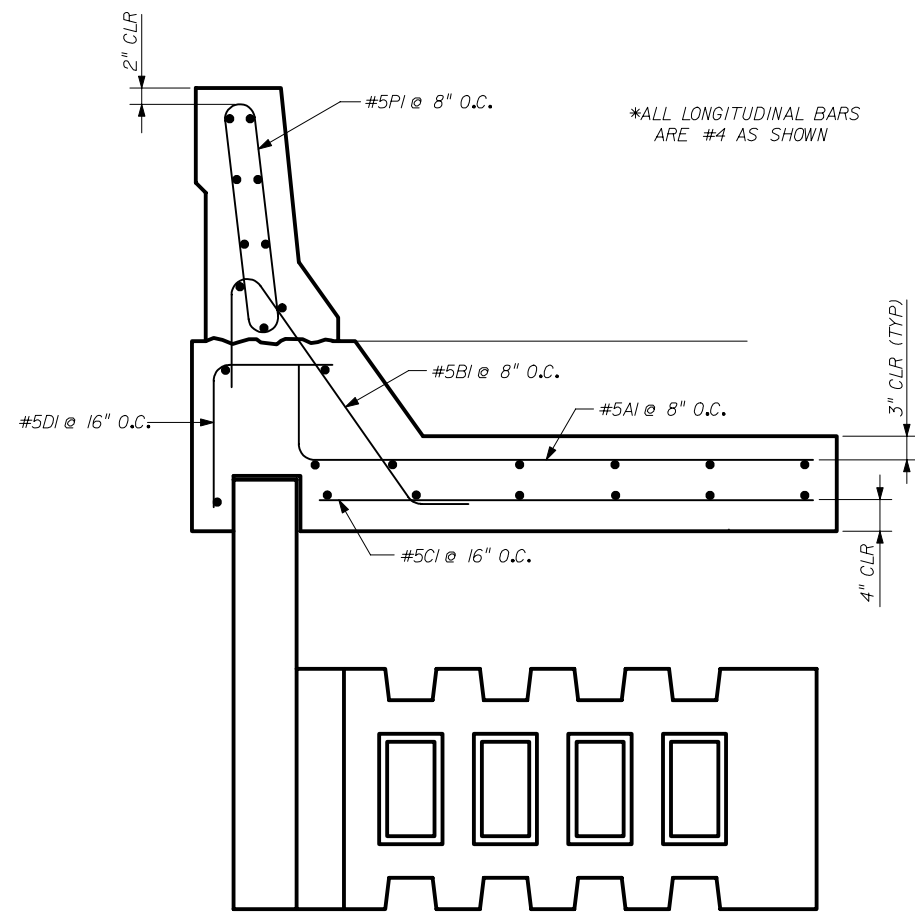
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (2" COVER)**

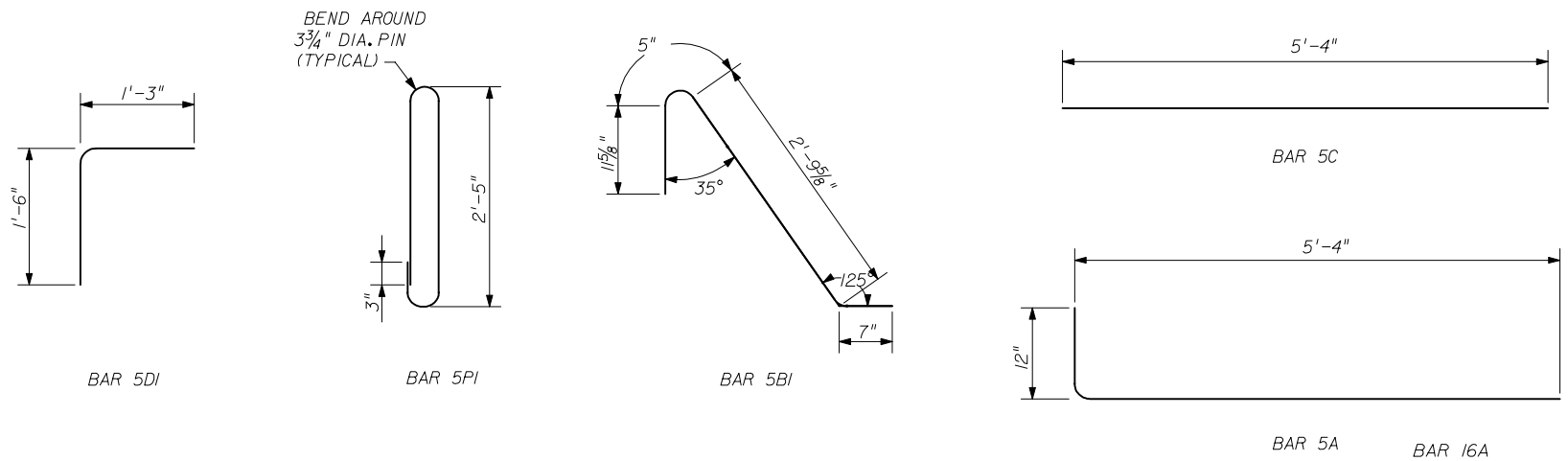
Names		Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer		
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By	JMC	10/01/98	04	8 of 21	5011



C.I.P. BARRIER AND C.I.P. JUNCTION SLAB DIMENSIONS




C.I.P. BARRIER AND C.I.P. JUNCTION SLAB REBAR

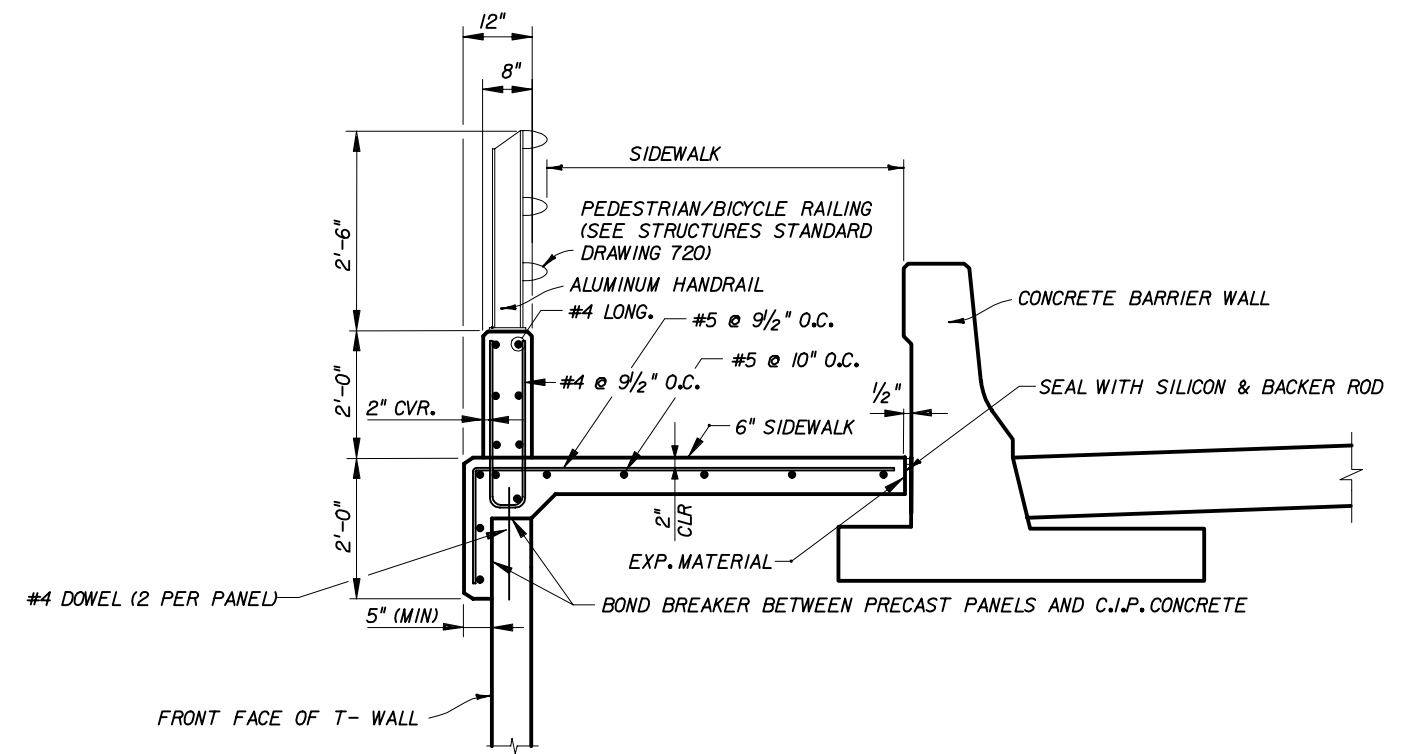


C.I.P. BARRIER REBAR DETAILS

DESIGNER:
 **THE NEEL COMPANY**
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
 5995 SOUTHEL DR.
 JACKSONVILLE, FL 32219
 PH: (904) 768-7081
 FX: (904) 768-8428

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	9 of 21
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C.I.P. PARAPET DETAIL W/ HANDRAIL

DESIGNER:



THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
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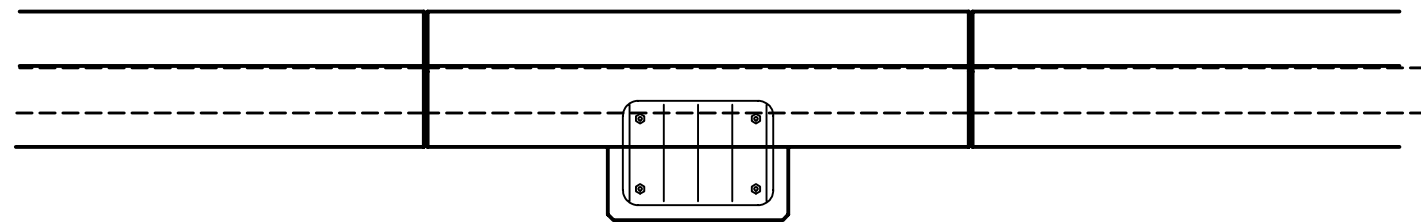
PRECASTER:

OLDCASTLE PRECAST, INC
 5995 SOUTEL DR.
 JACKSONVILLE, FL 32219
 PH: (904) 768-7081
 FX: (904) 768-8428

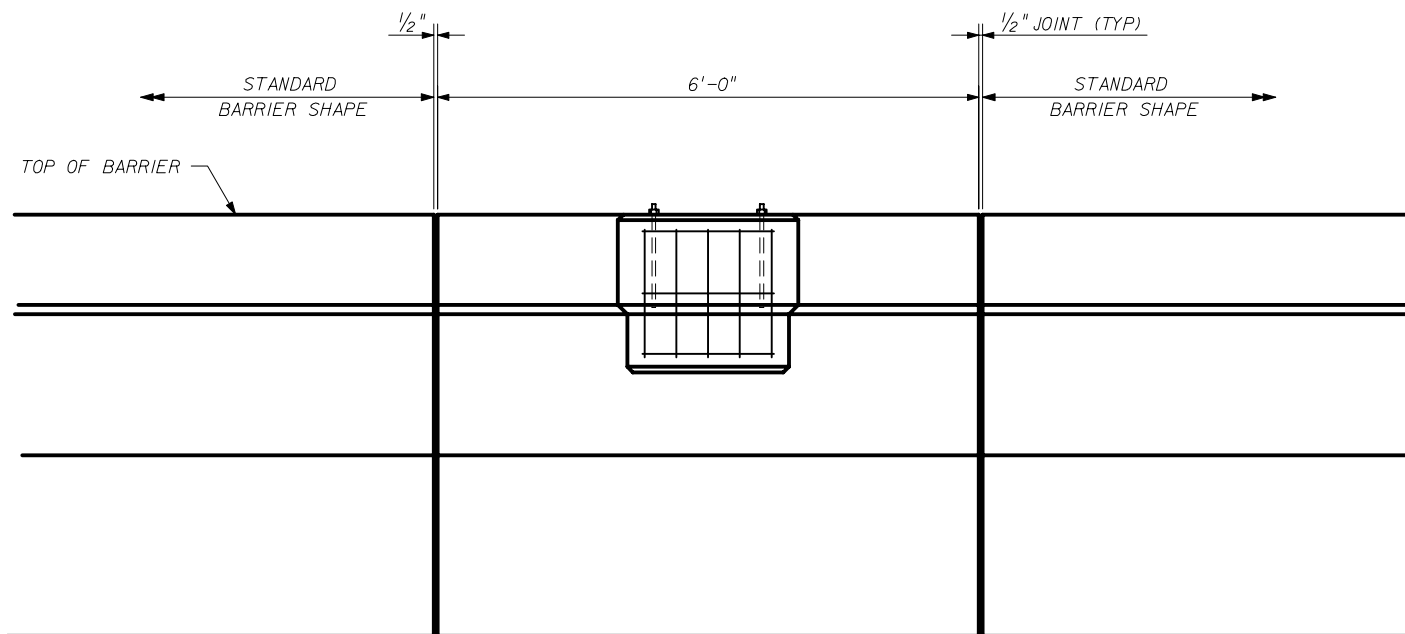
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (2" COVER)**

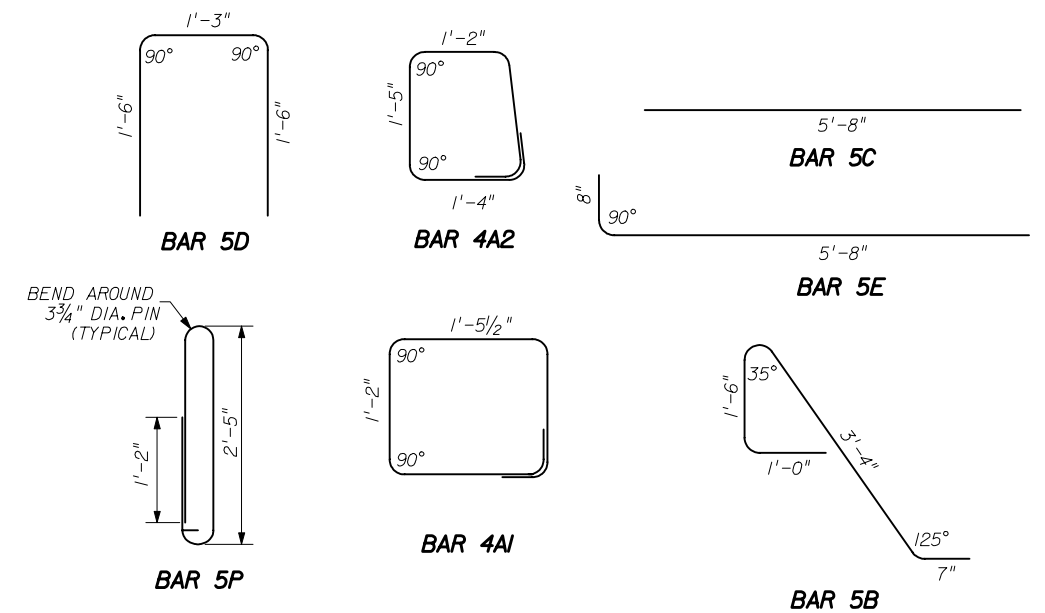
Names		Dates		Approved By	
Designed By	JMC	10/01/98	 State Structures Design Engineer		
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By	JMC	10/01/98	04	10 of 21	5011



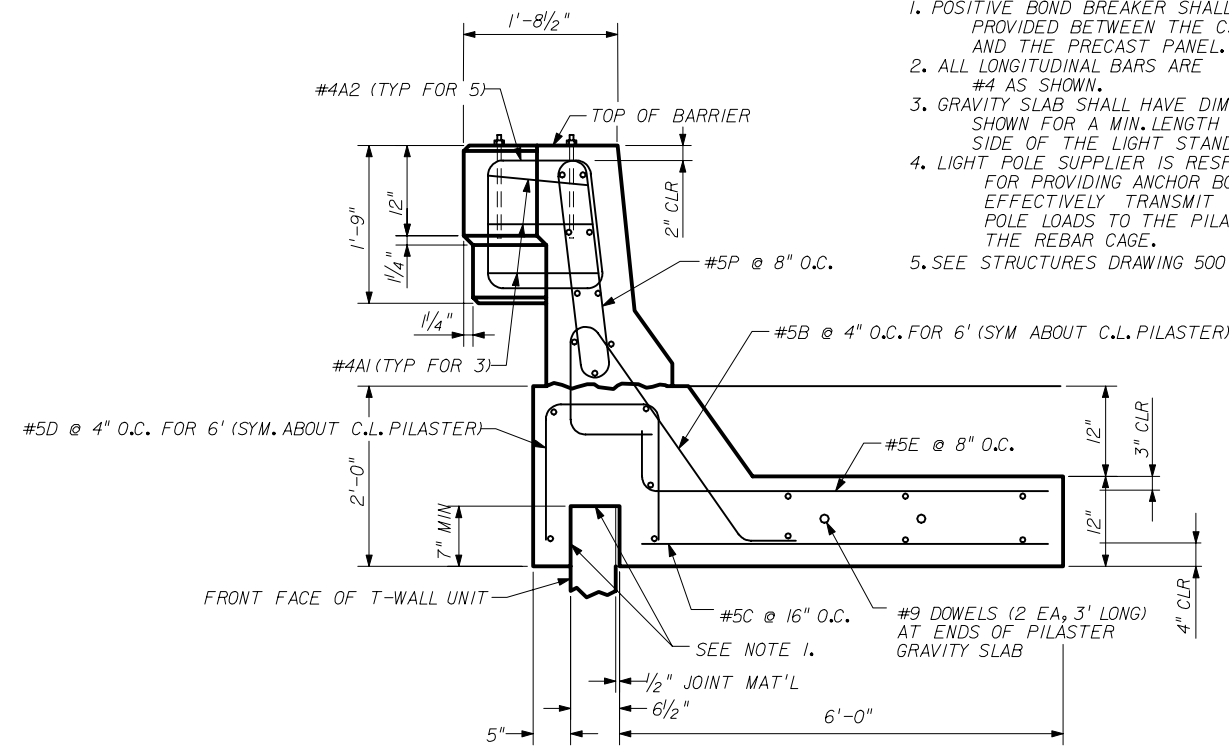
C.I.P. LIGHT STANDARD BARRIER - PART PLAN WITH REBAR
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)



C.I.P. LIGHT STANDARD BARRIER - PART ELEVATION
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)



C.I.P. LIGHT STANDARD BARRIER REBAR DETAILS




C.I.P. LIGHT STANDARD BARRIER - PART SECTION WITH REBAR

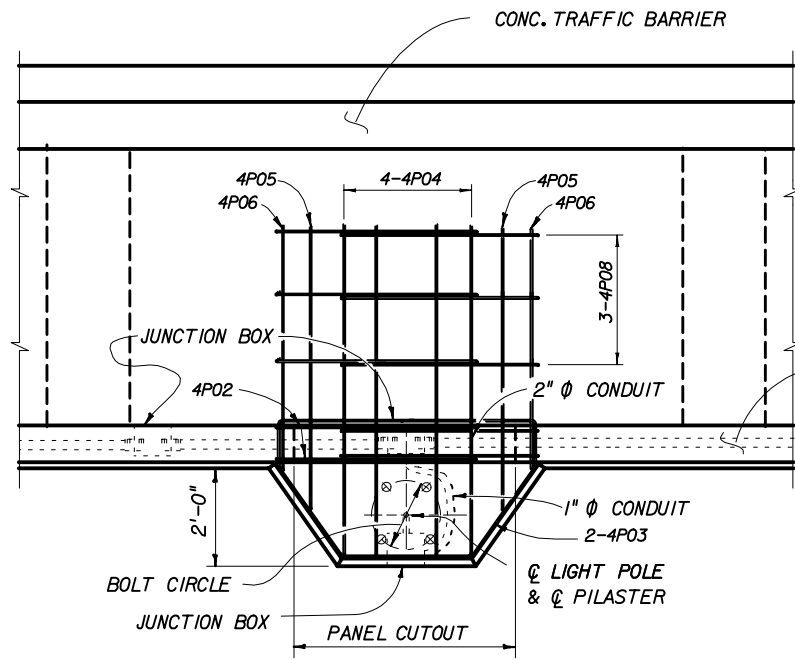
- NOTES
1. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN THE C.I.P. CONC. AND THE PRECAST PANEL.
 2. ALL LONGITUDINAL BARS ARE #4 AS SHOWN.
 3. GRAVITY SLAB SHALL HAVE DIMENSIONS SHOWN FOR A MIN. LENGTH OF 10'-0" EITHER SIDE OF THE LIGHT STANDARD BARRIER.
 4. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REBAR CAGE.
 5. SEE STRUCTURES DRAWING 500 FOR ADDITIONAL DETAILS.

DESIGNER:

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OLDCASTLE PRECAST, INC
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 JACKSONVILLE, FL 32219
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	11 of 21
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NOTES

- ADDITIONAL CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTER SHALL MEET THE SAME REQUIREMENTS AS THAT OF THE PARAPET WALL.
- TOP OF PILASTER SHALL BE FINISHED TO A TRULY LEVEL AREA.
- LIGHT POLE PILASTER IS DESIGNED TO RESIST WORKING LOADS (IN ANY DIRECTION) FROM THE LIGHT POLE APPLIED AT THE TOP OF THE PILASTER AS FOLLOWS:

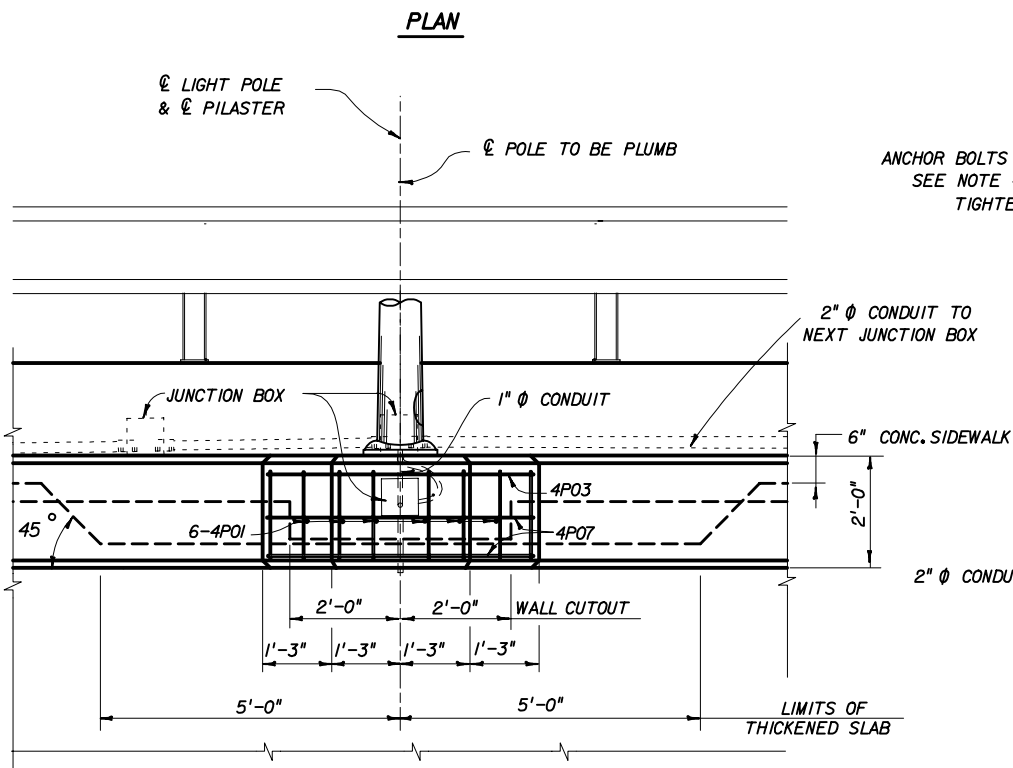
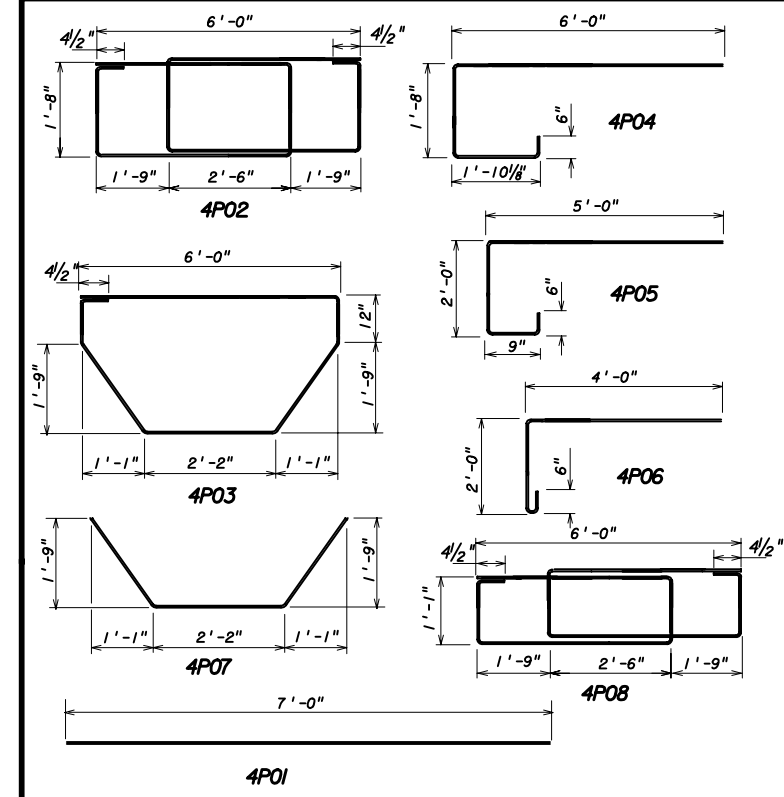
LONGITUDINAL MOMENT	=	30,000 FT. POUND
TRANSVERSE MOMENT	=	6,000 FT. POUND
LONGITUDINAL SHEAR	=	1,000 POUND
TRANSVERSE SHEAR	=	200 POUND
TORSION	=	3,000 FT. POUNDS
AXIAL	=	400 POUNDS

IF THE LIGHT POLE PROVIDED APPLIES LOADS THAT ARE IN EXCESS OF THOSE SHOWN ABOVE, THE CONTRACTOR SHALL REDESIGN THE PILASTER AND SUBMIT HIS DESIGN TO THE DEPARTMENT FOR REVIEW. THE CONTRACTOR'S REDESIGN SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA, AND QUALIFIED TO PERFORM THE WORK.

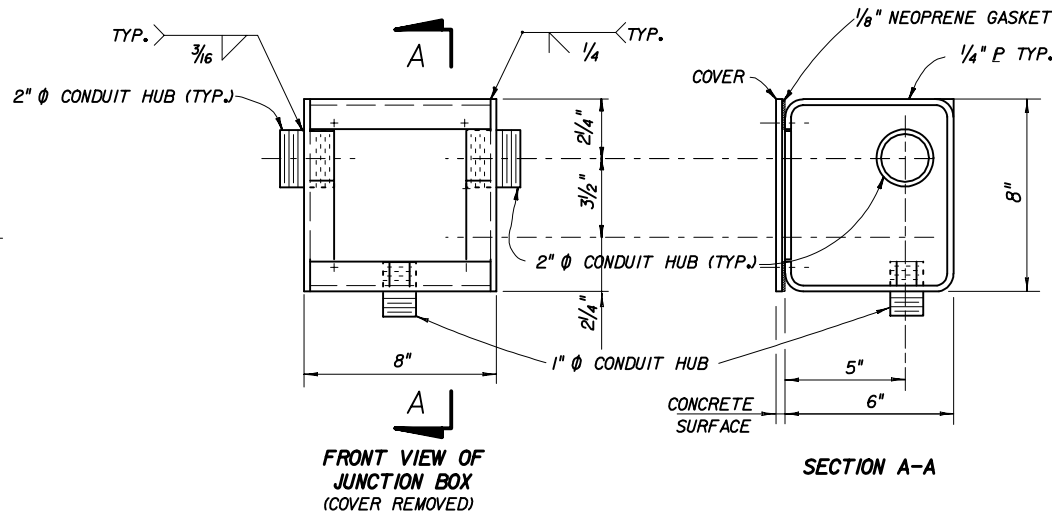
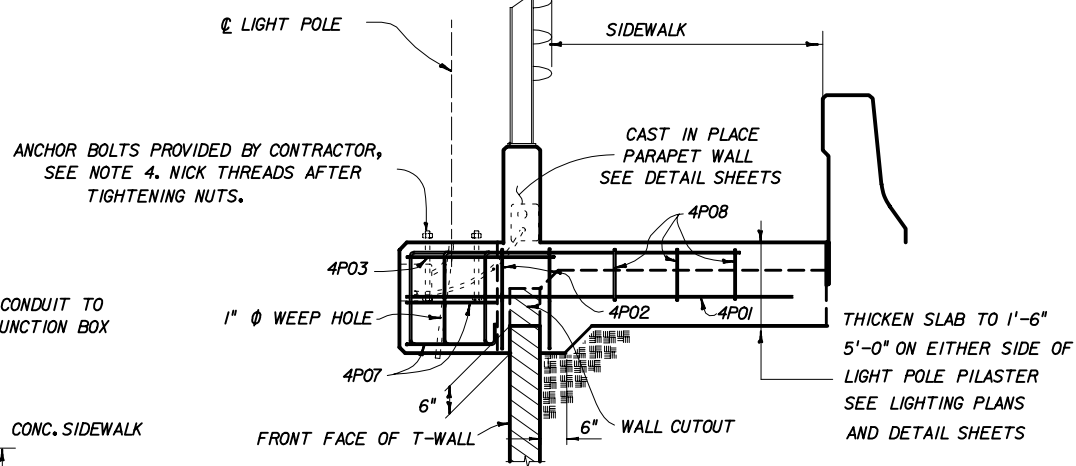
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND THAT FIT THE REINFORCING CAGE. CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHALL BE SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT FOR REVIEW AND APPROVAL SHOWING THAT THESE REQUIREMENTS HAVE BEEN MET PRIOR TO CONSTRUCTION.

- STEEL FOR JUNCTION BOXES SHALL CONFORM WITH ASTM-A36. THE BOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. IN LIEU OF STEEL BOXES THE CONTRACTOR MAY SUBMIT FOR APPROVAL MOLDED P.V.C. BOXES (SCHEDULE 80).
- ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL OR SCHEDULE 80 P.V.C.
- THE COST OF ANCHOR BOLTS SHALL BE INCLUDED IN THE BID PRICE FOR LIGHT POLES.
- PAYMENT: THE COST OF ALL LABOR, CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTERS AND ALL CONDUITS, EXPANSION COUPLINGS, JUNCTION BOXES AND MISCELLANEOUS HARDWARE REQUIRED FOR COMPLETION OF THE ELECTRICAL INSTALLATION WITHIN THE LIMITS SHOWN ON THIS SHEET, SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR THE MSE WALLS.

BAR BENDING DIAGRAMS



LIGHT PILASTER DETAIL



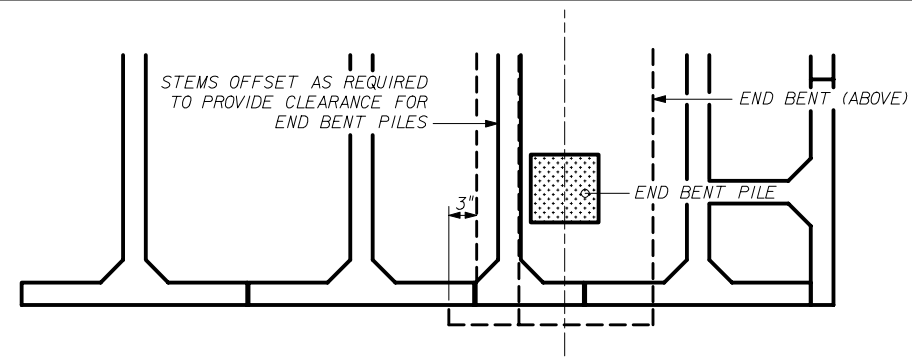
BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
4P01	4	6	7'-0"
4P02	4	2	24'-5"
4P03	4	1	14'-9"
4P04	4	4	9'-8"
4P05	4	2	7'-11"
4P06	4	2	6'-2"
4P07	4	2	6'-4"
4P08	4	3	22'-1"

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
**RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (2" COVER)**

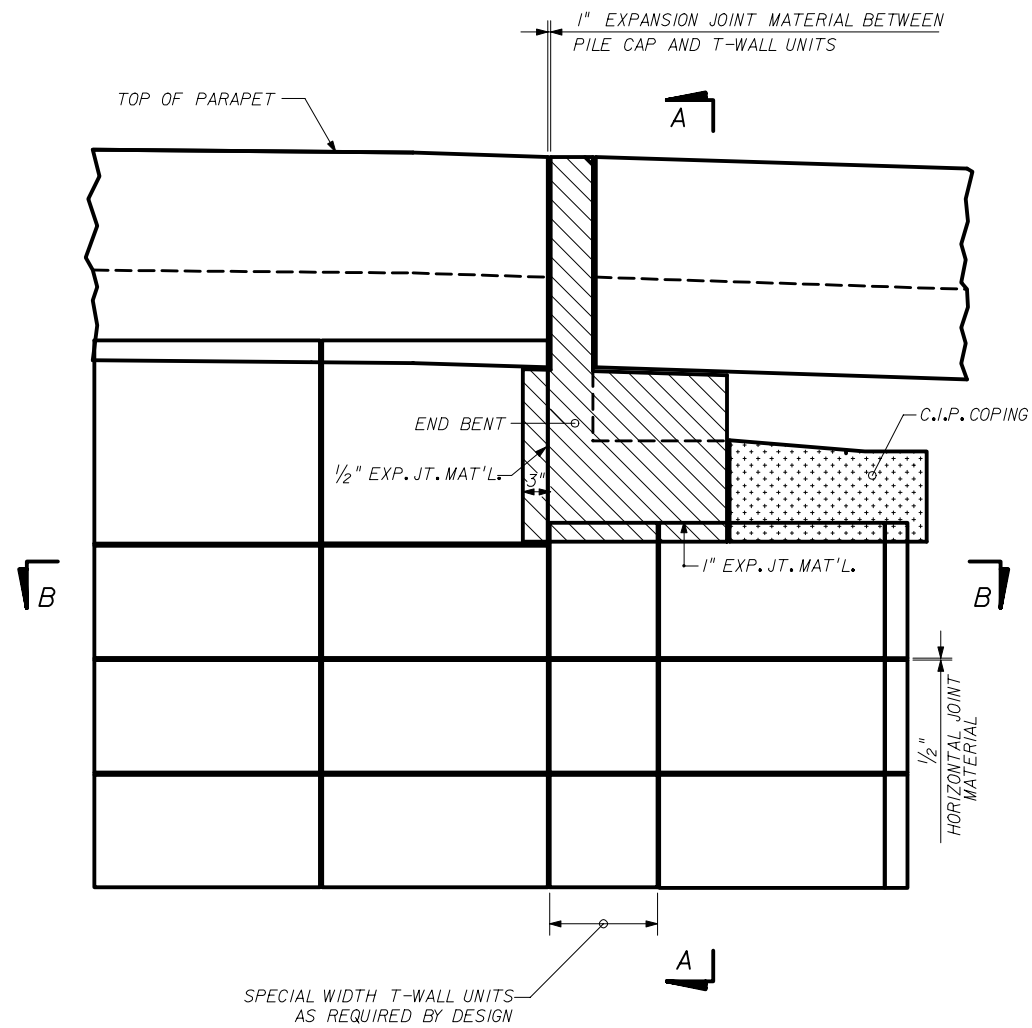
Names	Dates	Approved By			
Designed By	JMC 10/01/98	 State Structures Design Engineer			
Drawn By	CAA 10/01/98				
Checked By	JMC 10/01/98				
Revision	04				Sheet No.

DESIGNER:
THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

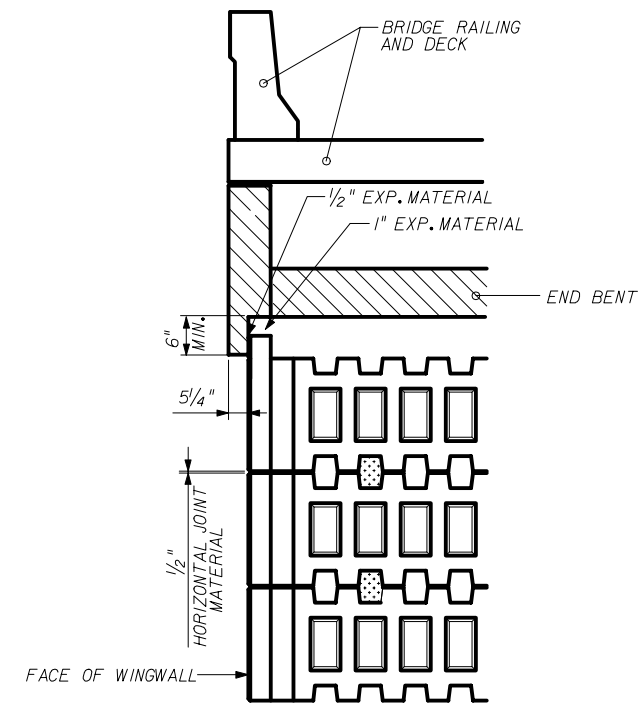
PRECASTER:
OLDCASTLE PRECAST, INC.
 5995 SOUTEL DR.
 JACKSONVILLE, FL 32219
 PH: (904) 768-7081
 FX: (904) 768-8428



SECTION B-B
STEM / END BENT PILE INTERFACE



PART ELEVATION SHOWING
WINGWALL / END BENT INTERFACE

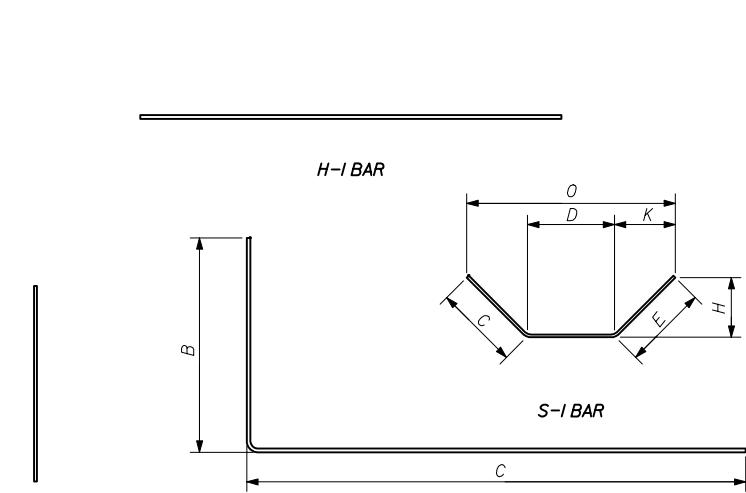


SECTION A-A
SECTION THRU PILE CAP

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
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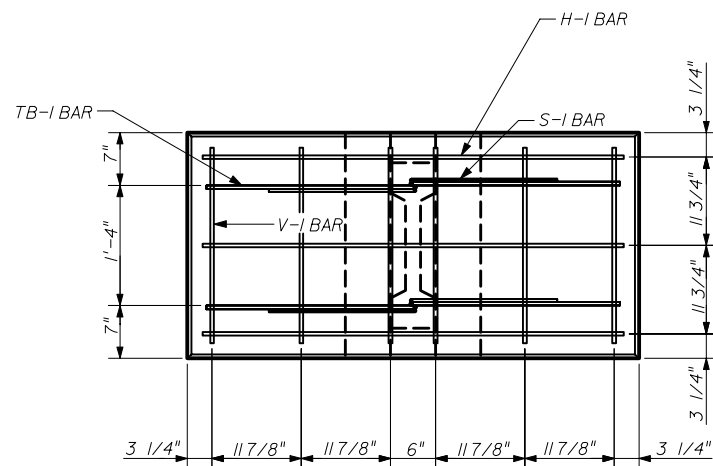
PRECASTER:
OLDCASTLE PRECAST, INC.
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No. Index No.
Checked By	JMC	10/01/98	04	13 of 21 5011



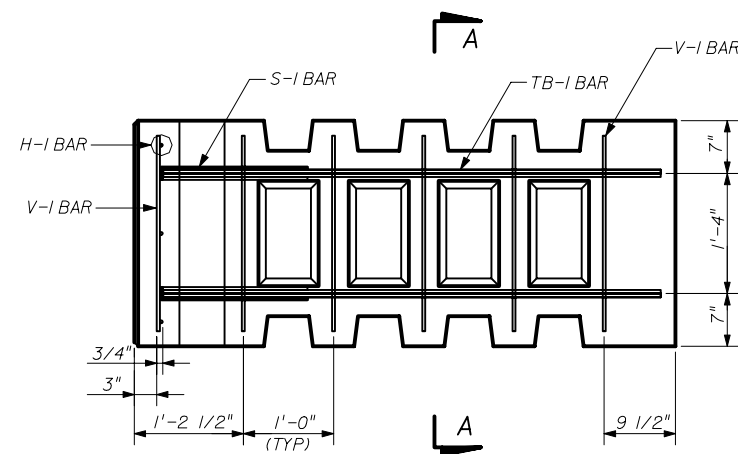
V-I BAR

TB-I BAR

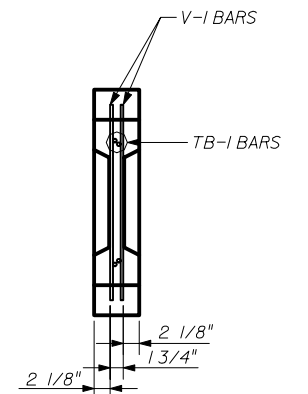


FRONT VIEW

(V-I BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A

REBAR SCHEDULE - 2.5 x 5.0 x 04 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	12	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 06 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	16	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 08 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	20	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 10 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	24	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	11'-8 1/2"	2'-3 1/2"	9'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 12 STD UNIT

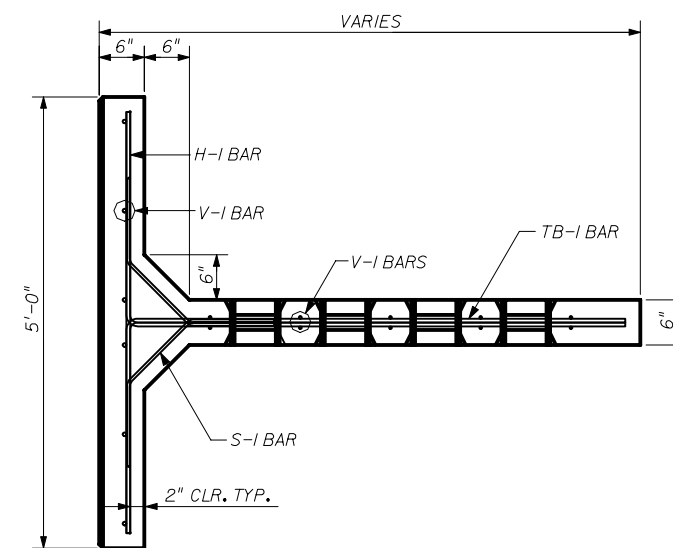
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	26	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	13'-8 1/2"	2'-3 1/2"	11'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 14 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	32	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	15'-8 1/2"	2'-3 1/2"	13'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 16 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	36	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	17'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	



TOP VIEW


REINFORCING STEEL - STANDARD UNITS

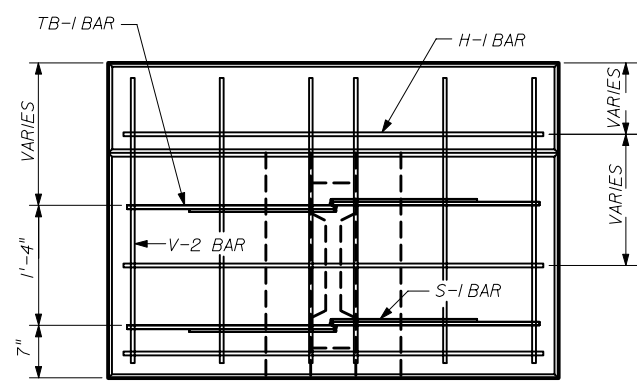
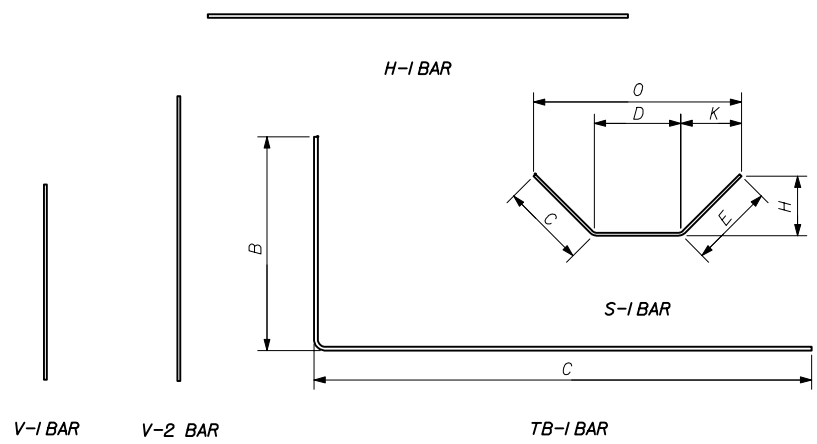
DESIGNER:

THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
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 FX: (703) 913-7859

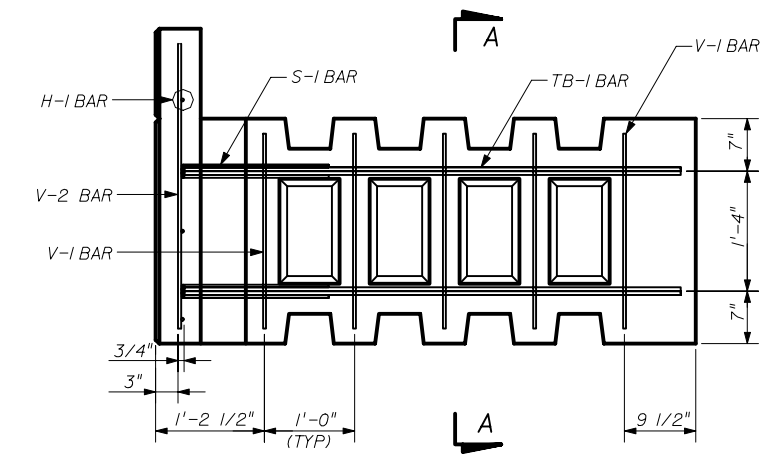
PRECASTER:
OLDCASTLE PRECAST, INC
 5995 SOUTEL DR.
 JACKSONVILLE, FL 32219
 PH: (904) 768-7081
 FX: (904) 768-8428

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

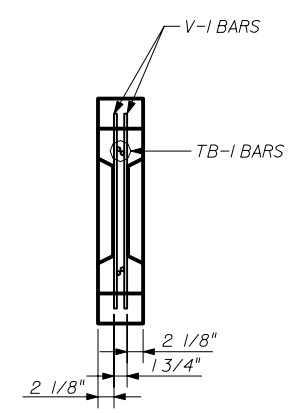
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	14 of 21
			Index No.	5011



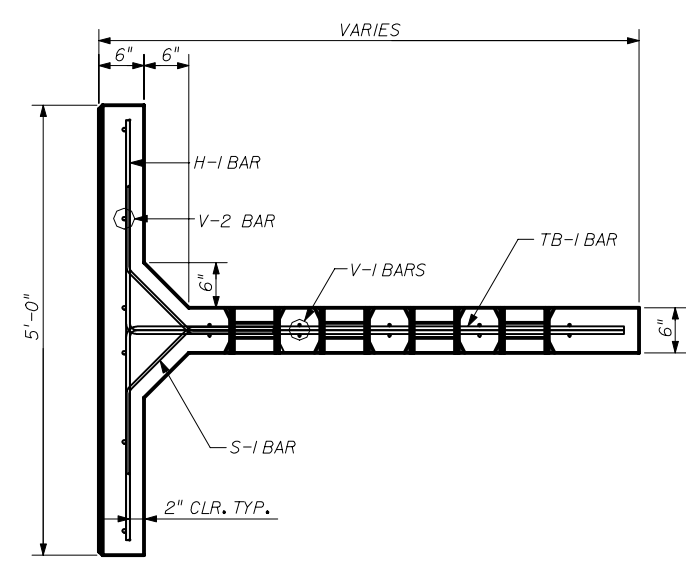
FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW
REINFORCING STEEL - TOP UNITS (I)

REBAR SCHEDULE - 3.0 x 5.0 x 04 TOP UNIT														
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS	
H-1	4	4	-	4'-6"								-		
V-1	6	3	-	2'-0"								-		
V-2	6	5	-	2'-6"								-		
S-1	4	3	3	2'-9 1/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45		
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90		

REBAR SCHEDULE - 3.0 x 5.0 x 06 TOP UNIT														
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS	
H-1	4	4	-	4'-6"								-		
V-1	10	3	-	2'-0"								-		
V-2	6	5	-	2'-6"								-		
S-1	4	3	3	2'-9 1/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45		
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90		

REBAR SCHEDULE - 3.5 x 5.0 x 04 TOP UNIT														
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS	
H-1	5	4	-	4'-6"								-		
V-1	6	3	-	2'-0"								-		
V-2	6	5	-	3'-0"								-		
S-1	4	3	3	2'-9 1/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45		
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90		

REBAR SCHEDULE - 3.5 x 5.0 x 06 TOP UNIT														
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS	
H-1	5	4	-	4'-6"								-		
V-1	10	3	-	2'-0"								-		
V-2	6	5	-	3'-0"								-		
S-1	4	3	3	2'-9 1/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45		
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90		

REBAR SCHEDULE - 4.0 x 5.0 x 04 TOP UNIT														
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS	
H-1	5	4	-	4'-6"								-		
V-1	6	3	-	2'-0"								-		
V-2	6	5	-	3'-6"								-		
S-1	4	3	3	2'-9 1/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45		
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90		

REBAR SCHEDULE - 4.0 x 5.0 x 06 TOP UNIT														
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS	
H-1	5	4	-	4'-6"								-		
V-1	10	3	-	2'-0"								-		
V-2	6	5	-	3'-6"								-		
S-1	4	3	3	2'-9 1/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45		
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90		

REBAR SCHEDULE - 4.5 x 5.0 x 06 TOP UNIT														
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS	
H-1	6	4	-	4'-6"								-		
V-1	6	3	-	2'-0"								-		
V-2	6	5	-	4'-0"								-		
S-1	4	3	3	2'-9 1/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45		
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90		

REBAR SCHEDULE - 5.0 x 5.0 x 06 TOP UNIT														
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS	
H-1	6	4	-	4'-6"								-		
V-1	10	3	-	2'-0"								-		
V-2	6	5	-	4'-6"								-		
S-1	4	3	3	2'-9 1/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45		
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90		

DESIGNER:
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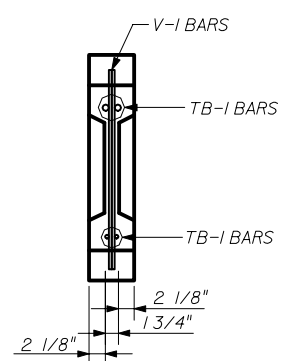
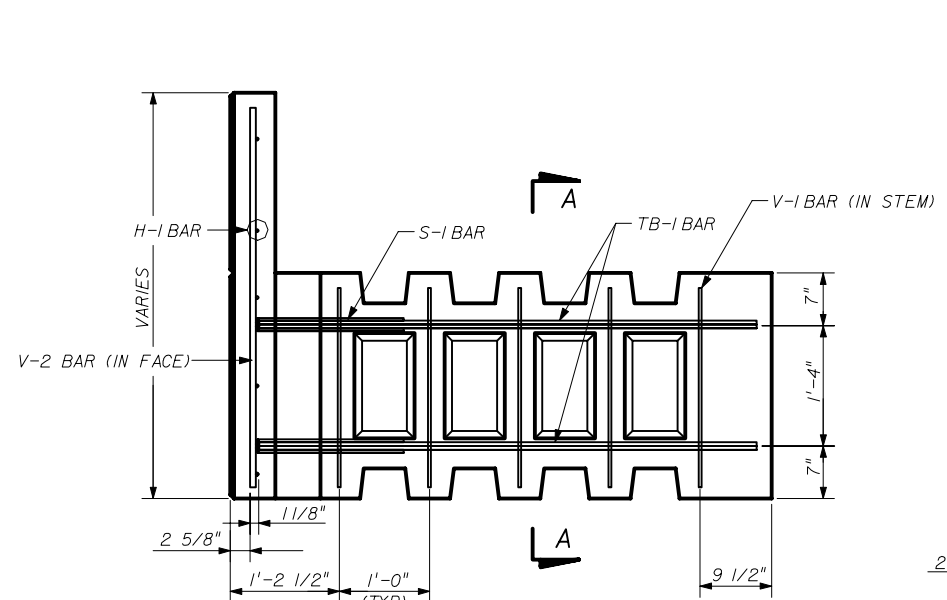
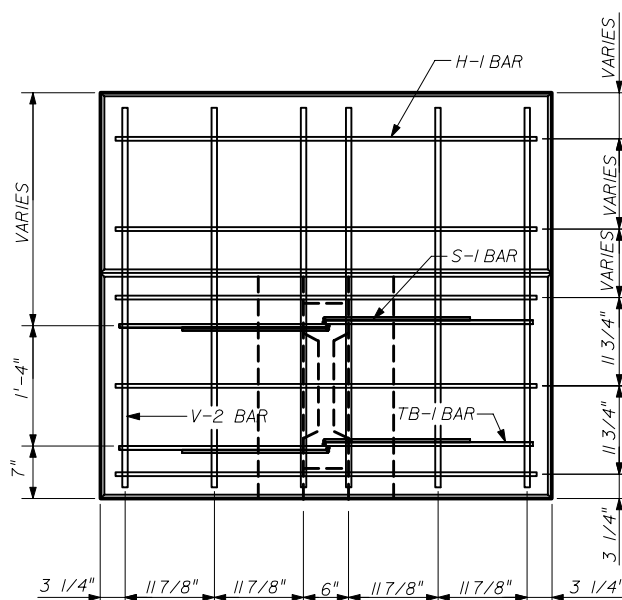
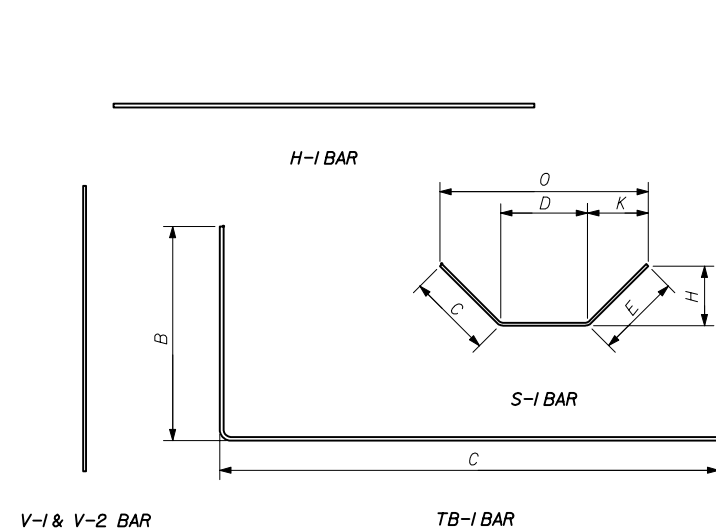
PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUDEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)**

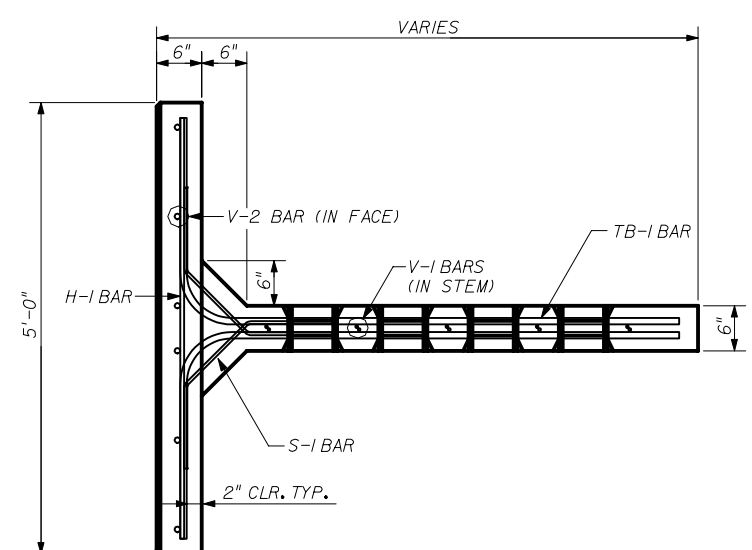
Names	Dates	Approved By
Designed By JMC	10/01/98	 State Structures Design Engineer
Drawn By CAA	10/01/98	
Checked By JMC	10/01/98	
Revision	Sheet No.	Index No.
04	15 of 21	5011



FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A



TOP VIEW
REINFORCING STEEL -TOP UNITS (II)

THESE UNITS WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

REBAR SCHEDULE - 5.5 x 5.0 x 08 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	5'-0"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 6.0 x 5.0 x 08 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	5'-6"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 6.5 x 5.0 x 08 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	6'-0"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

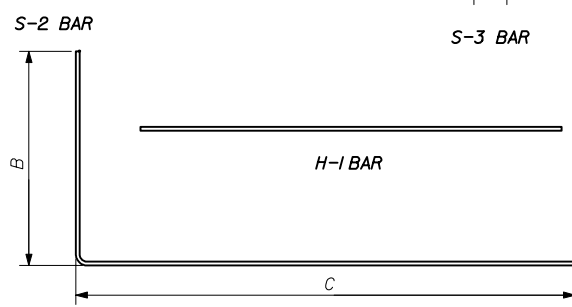
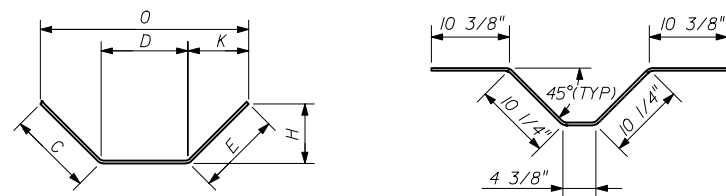
REBAR SCHEDULE - 7.0 x 5.0 x 08 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	6'-6"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
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PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUDEL DR.
JACKSONVILLE, FL 32219
PH: 1904 768-7081
FX: 1904 768-8428

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98		
Checked By	JMC	10/01/98	Revision	Sheet No.
			04	16 of 21
				Index No.
				5011



V-1, V-2 & V-3 BAR

TB-1 BAR

REBAR SCHEDULE - 7.5 x 5.0 x 10 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	18	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	6'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	8	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 8.0 x 5.0 x 10 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	18	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	6'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	9	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 8.5 x 5.0 x 10 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	18	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	7'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	10	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 9.0 x 5.0 x 12 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	22	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	7'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	11	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 9.5 x 5.0 x 12 TOP UNIT

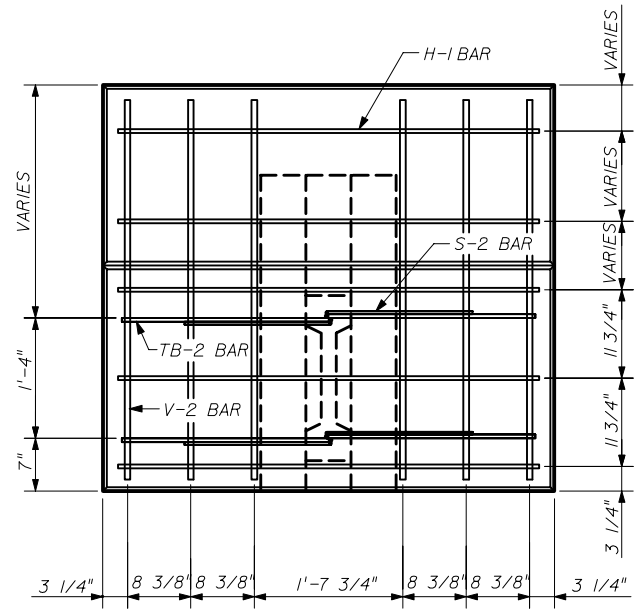
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	22	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	8'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	12	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 10.0 x 5.0 x 12 TOP UNIT

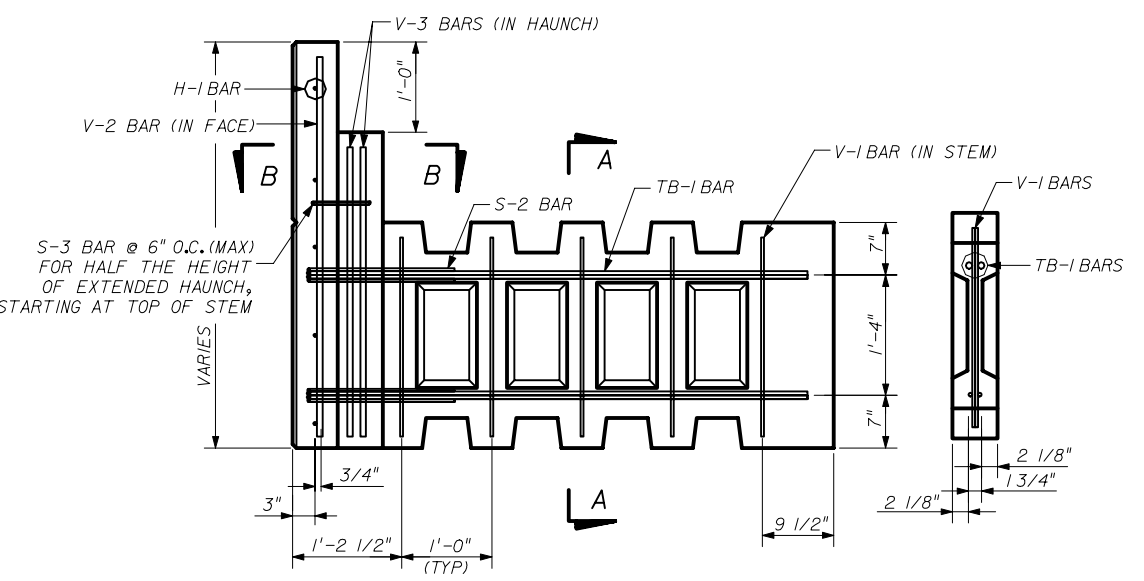
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	22	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	8'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	13	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 10.5 x 5.0 x 12 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	22	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	9'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	14	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

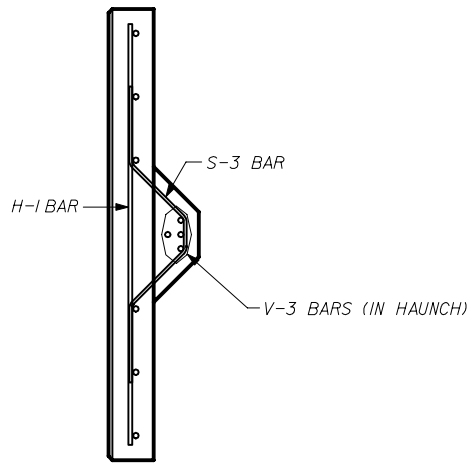


FRONT VIEW
(V-1 BARS IN STEM AND V-3 BARS IN HAUNCH OMITTED FOR CLARITY)

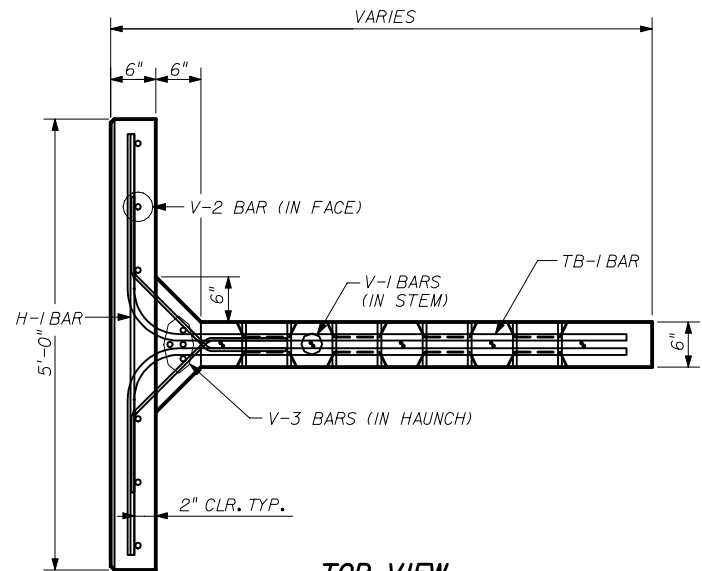


SIDE VIEW

SECTION A-A



SECTION B-B



TOP VIEW
S-3 BARS IN EXTENDED HAUNCH 1. ALL UNITS ON THIS SHEET WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

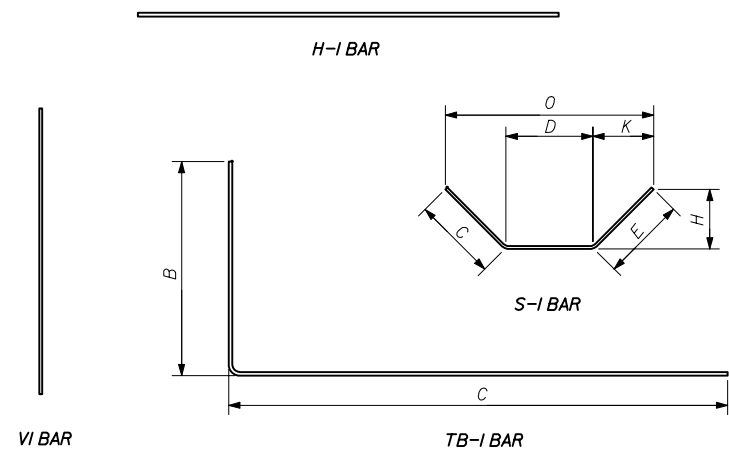
REINFORCING STEEL - TOP UNITS (III)

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>W.V. [Signature]</i>		
Designed By JMC	10/01/98	State Structures Design Engineer		
Drawn By CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By JMC	10/01/98	04	17 of 21	5011



REBAR SCHEDULE - 5.0 x 5.0 x 04 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	12	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 06 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	16	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 08 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	20	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 10 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	24	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	11'-8 1/2"	2'-3 1/2"	9'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 12 DBL UNIT

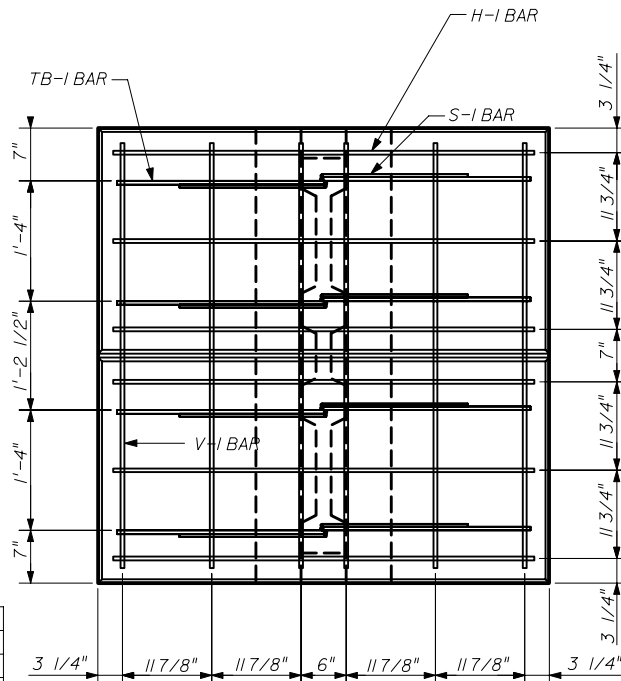
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	26	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	13'-8 1/2"	2'-3 1/2"	11'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 14 DBL UNIT

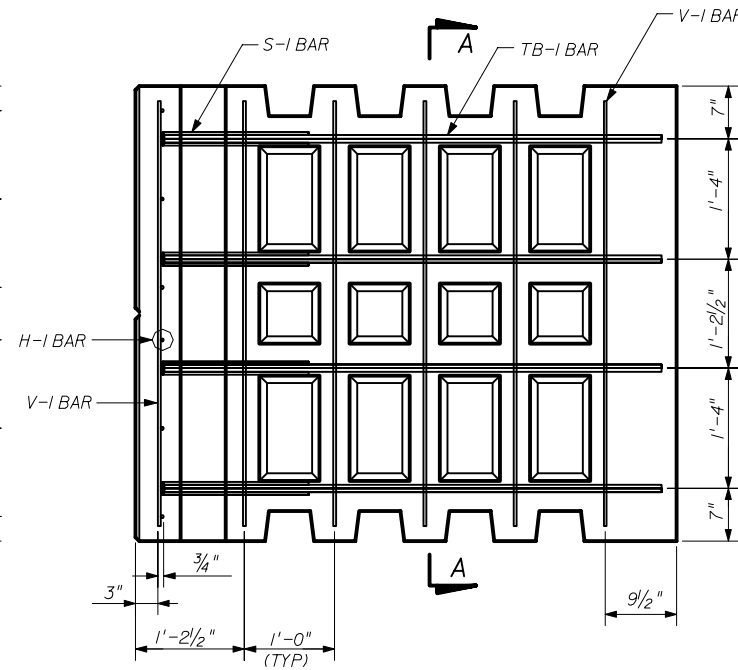
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	32	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	15'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 16 DBL UNIT

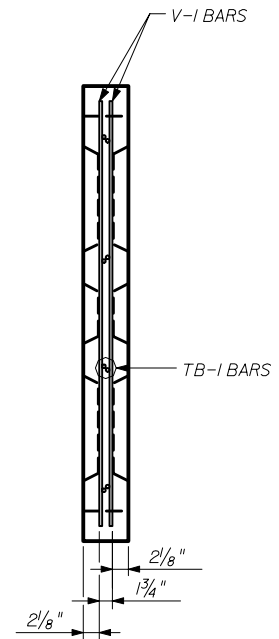
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	36	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	17'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	



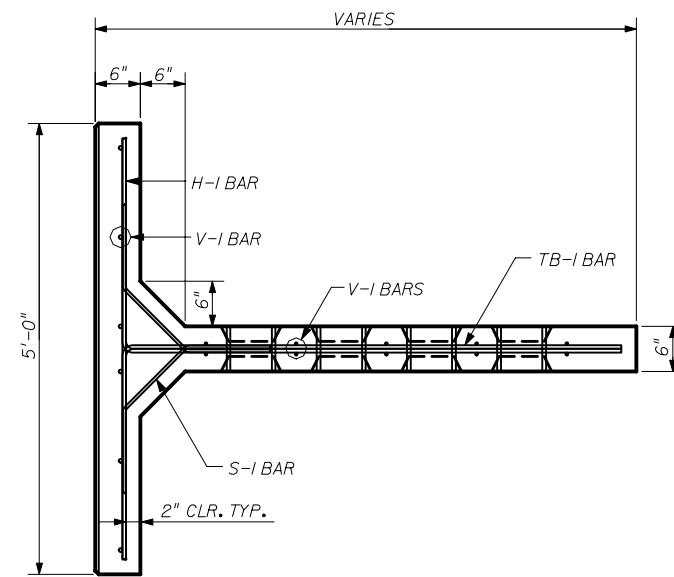
FRONT VIEW
(V-I BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW
REINFORCING STEEL -DOUBLE UNITS

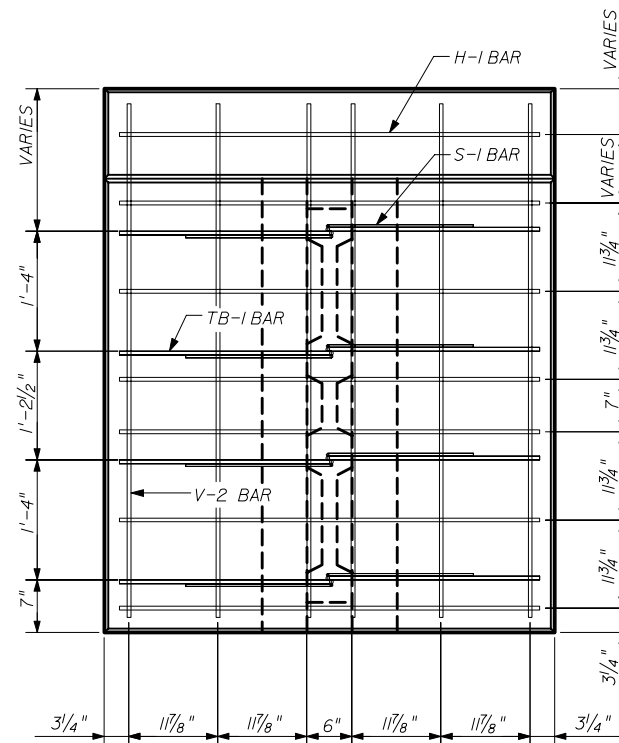
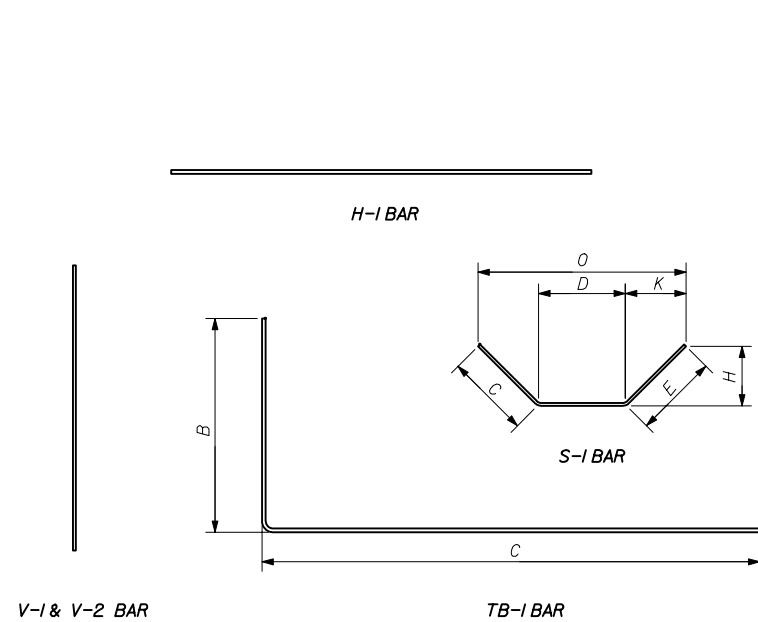
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

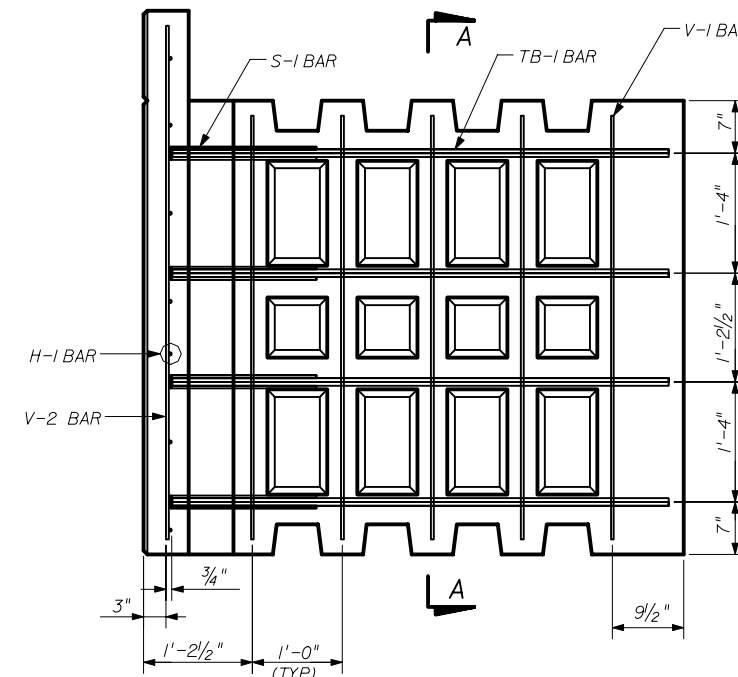
NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)**

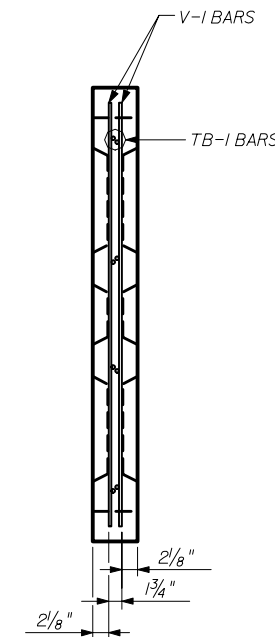
Names	Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98		
Checked By	JMC	10/01/98		
Revision	04	18 of 21		



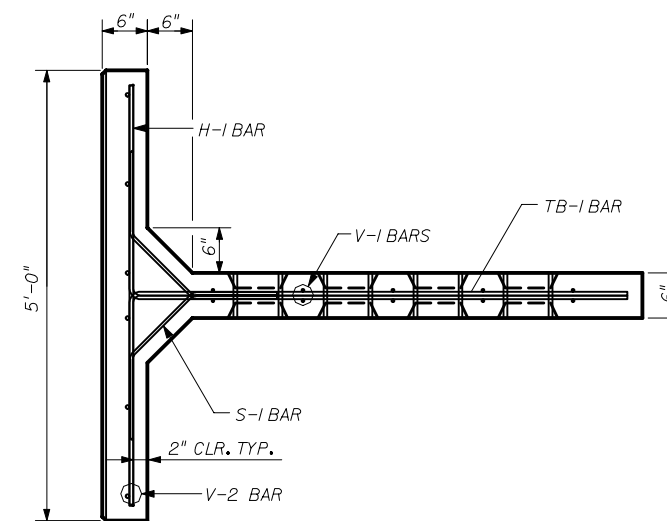
FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW
REINFORCING STEEL - DOUBLE TOP UNITS (I)

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

REBAR SCHEDULE - 5.5 x 5.0 x 06 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	5'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 6.0 x 5.0 x 06 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	5'-6"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 6.5 x 5.0 x 06 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	6'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

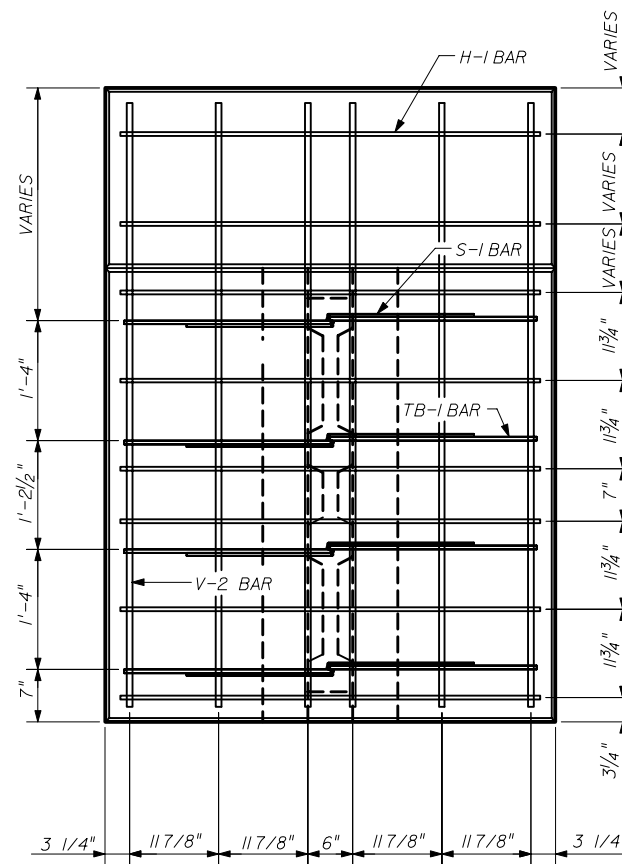
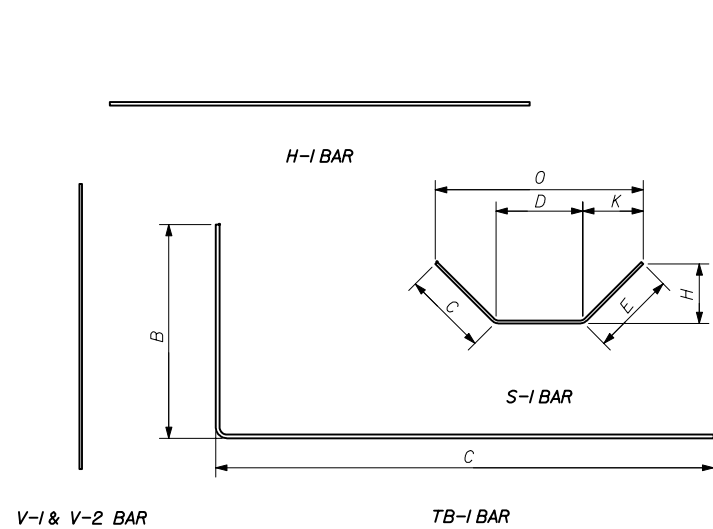
REBAR SCHEDULE - 7.0 x 5.0 x 06 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	6'-6"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 7.5 x 5.0 x 06 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	7'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

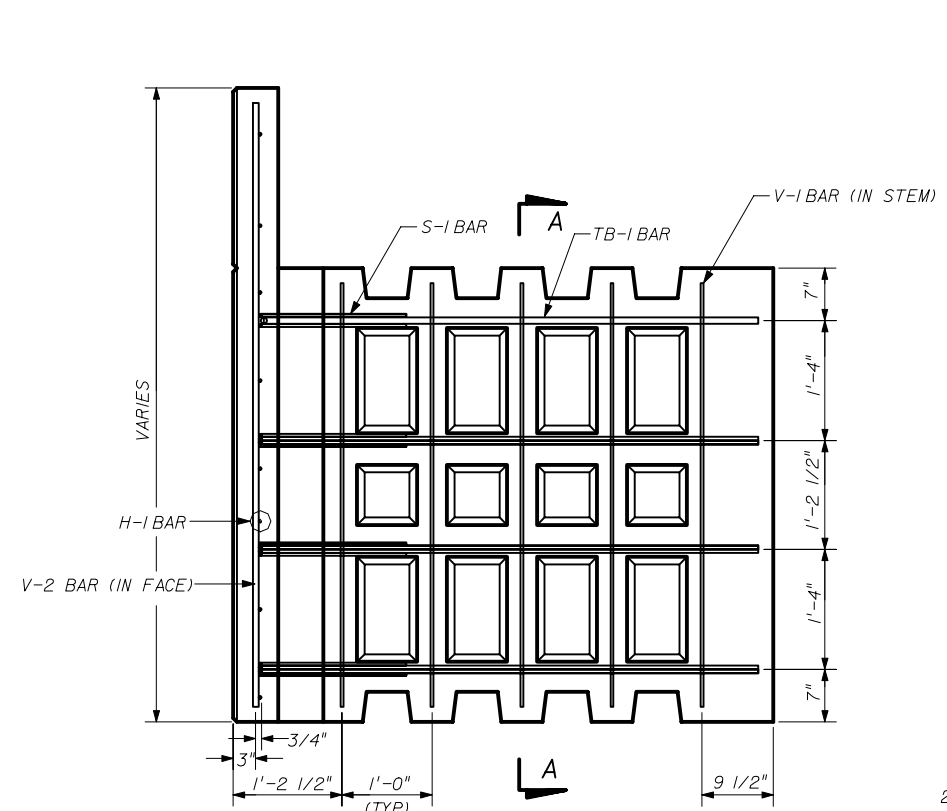
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUHEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

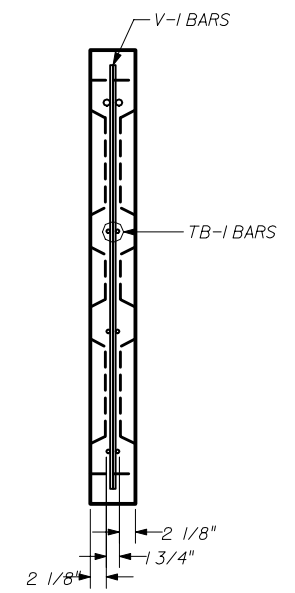
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By		
Designed By	JMC	10/01/98	W. J. [Signature]	
Drawn By	CAA	10/01/98	State Structures Design Engineer	
Checked By	JMC	10/01/98	Revision	Sheet No. Index No.
			04	19 of 21 5011



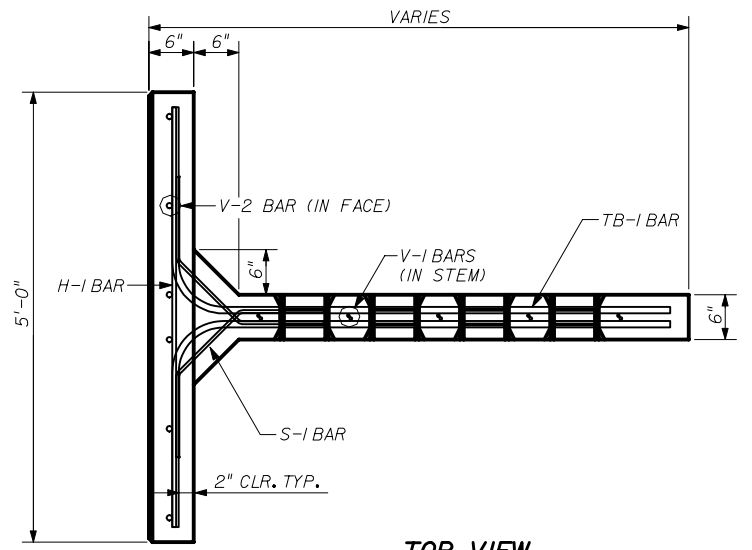
FRONT VIEW
(V-1 BARS IN OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW
REINFORCING STEEL - DOUBLE TOP UNITS (II)

REBAR SCHEDULE - 8.0 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	9	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	7'-6"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 8.5 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	9	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	8'-0"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 9.0 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	10	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	8'-6"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 9.5 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	10	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	9'-0"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

THESE TWO UNITS WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

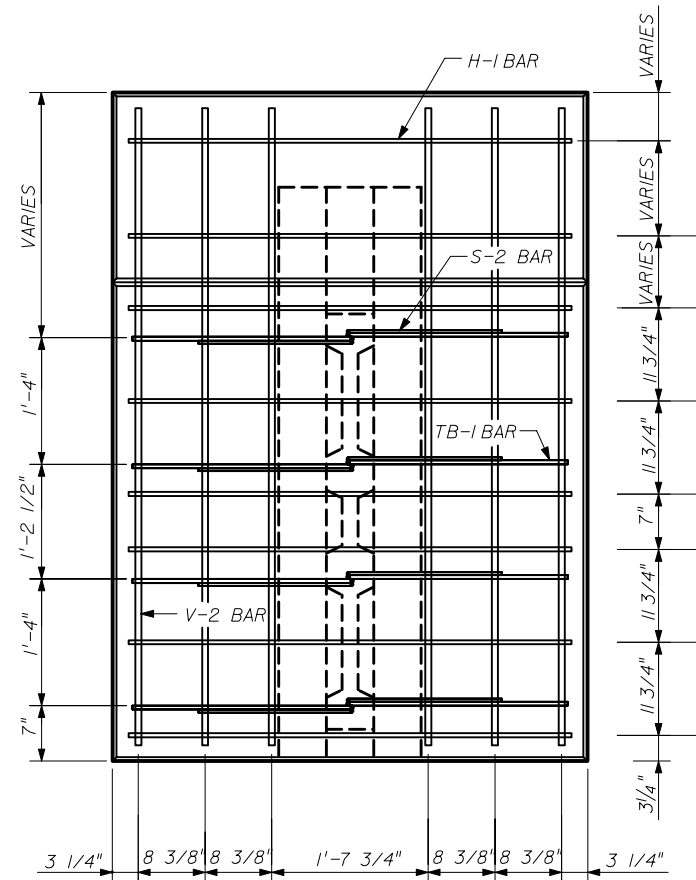
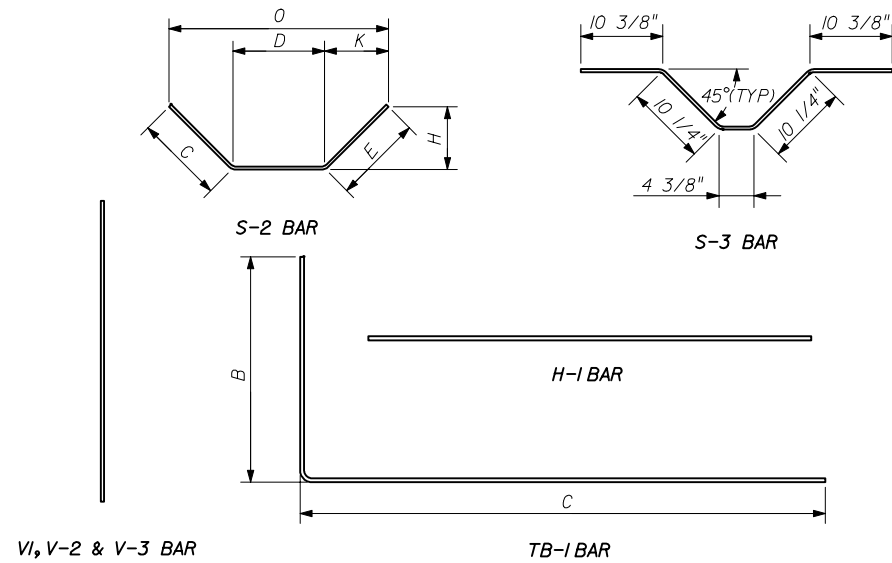
PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUDEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

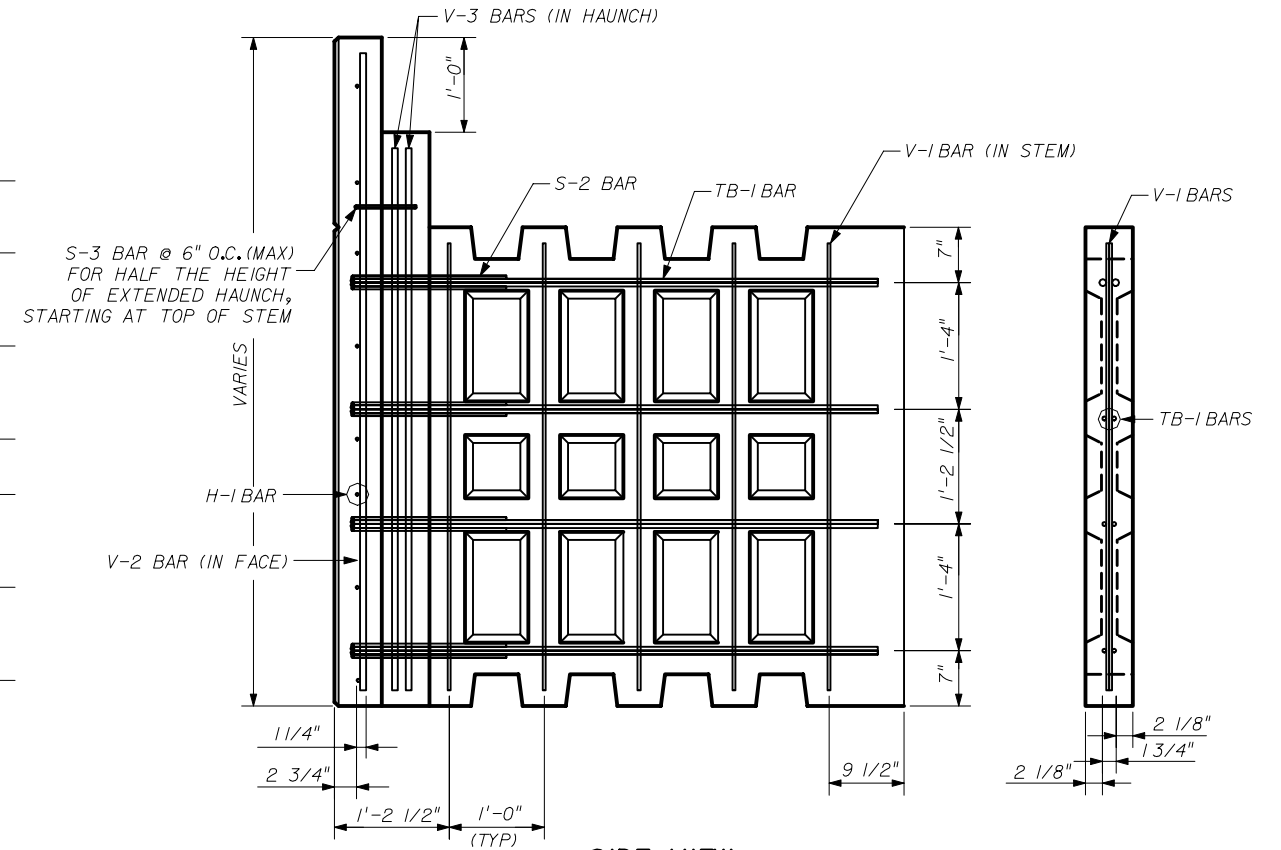
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)**

Names	Dates	Approved By
Designed By JMC	10/10/98	<i>[Signature]</i> State Structures Design Engineer
Drawn By CAA	10/10/98	
Checked By JMC	10/10/98	
Revision	Sheet No.	
04	20 of 21	5011

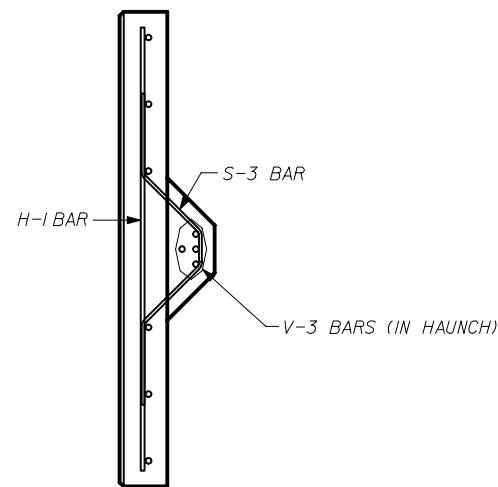


FRONT VIEW
(V-1 BARS IN STEM AND V-3 BARS IN HAUNCH OMITTED FOR CLARITY)

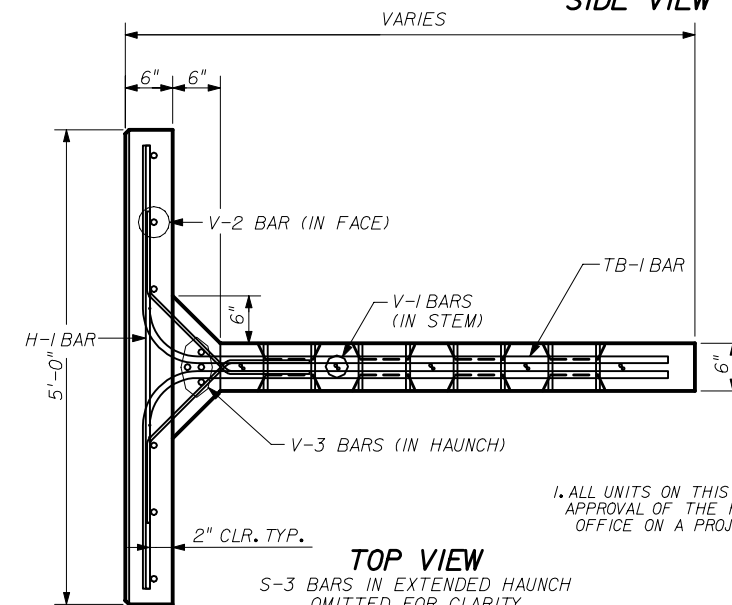


SIDE VIEW

SECTION A-A



SECTION B-B



TOP VIEW
S-3 BARS IN EXTENDED HAUNCH OMITTED FOR CLARITY
REINFORCING STEEL - DOUBLE TOP UNITS (III)

1. ALL UNITS ON THIS SHEET WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

REBAR SCHEDULE - 10.0 x 5.0 x 10 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	11	4	-	4'-6"									
V-1	18	3	-	4'-6"									
V-2	6	6	-	9'-6"									
V-3	4	6	-	8'-6"									
S-2	8	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	8	3	3	3'-3 5/8"									SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 1/8"						90	

REBAR SCHEDULE - 10.5 x 5.0 x 10 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	11	4	-	4'-6"									
V-1	18	3	-	4'-6"									
V-2	6	6	-	10'-0"									
V-3	4	6	-	9'-0"									
S-2	8	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	9	3	3	3'-3 5/8"									SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 1/8"						90	

REBAR SCHEDULE - 11.0 x 5.0 x 10 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	12	4	-	4'-6"									
V-1	18	3	-	4'-6"									
V-2	6	6	-	10'-6"									
V-3	4	6	-	9'-6"									
S-2	8	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	10	3	3	3'-3 5/8"									SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 1/8"						90	

REBAR SCHEDULE - 11.5 x 5.0 x 10 DBL TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	12	4	-	4'-6"									
V-1	18	3	-	4'-6"									
V-2	6	6	-	11'-0"									
V-3	4	6	-	10'-0"									
S-2	8	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	11	3	3	3'-3 5/8"									SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 1/8"						90	

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

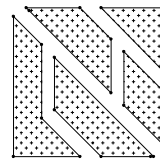
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)

Names	Dates	Approved By			
Designed By	JMC	10/01/98	 State Structures Design Engineer		
Drawn By	CAA	10/01/98			
Checked By	JMC	10/01/98			
Revision	04	21 of 21			

STANDARD DETAILS

ISOGRID® M.S.E. WALL SYSTEM

DESIGNER



THE NEEL COMPANY

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LEGEND

	PANEL WITH ONE SOIL REINFORCEMENT GRID		HORIZONTAL HALF-PANEL WITH ONE SOIL REINFORCEMENT GRID	
	PANEL WITH TWO SOIL REINFORCEMENT GRIDS		VERTICAL HALF-PANEL WITH ONE SOIL REINFORCEMENT GRID	
	PANEL WITH THREE SOIL REINFORCEMENT GRIDS		TL/BR & TR/BL QUARTER PANELS WITH ONE SOIL REINFORCEMENT GRID	
	PANEL WITH FOUR SOIL REINFORCEMENT GRIDS		SPECIAL HEIGHT PANELS (X-1 THRU X-5) WITH ONE SOIL REINFORCEMENT GRID	

DENOTES LIMITS OF DIFFERENT LENGTHS OF SOIL REINF. GRIDS

DESIGNER:



THE NEEL COMPANY

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THIS SYSTEM SHALL BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS ONLY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID

Names		Dates		Approved By	
Designed By	JMC	10/01/98	 State Structures Design Engineer		
Drawn By	CAA	10/01/98			
Checked By	JMC	10/01/98	Revision	Sheet No.	Index No.
			04	1 of 20	5012

MISCELLANEOUS NOTES:

1. DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VA 22152
PH: (703) 913-7858
FX: (703) 913-7859
2. PRECASTER:
OLDCASTLE PRECAST INC.
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428
3. MATERIALS SUPPLIED BY PRECASTER:
-PRECAST ISOGRID PANELS
-GALVANIZED SOIL REINFORCEMENT GRID
-GALVANIZED GRID LOCKING BAR
-DIAGONAL JOINT MATERIAL AND ADHESIVE
-VERTICAL JOINT MATERIAL

DESIGN NOTES:

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE RETAINING WALL VOLUME, METHODS OF CONSTRUCTION, AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO SPEC SECTION 548 - RETAINING WALL SYSTEMS.
2. SOIL PARAMETERS:
-SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUE OF ϕ , c AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS
3. FACTORS OF SAFETY:
-OVERTURNING - 2.0
-SLIDING - 1.5
-INTERNAL PULLOUT - 1.5 (ALLOWABLE DEFORMATION 0.75")
-SOIL REINFORCEMENT GRID - 0.47 Fy AT END OF DESIGN LIFE
-BEARING CAPACITY - 2.5
-OVERALL STABILITY - 1.5
4. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL DESIGN DRAWINGS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE OWNER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
5. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE NEEL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY, IS THE RESPONSIBILITY OF OTHERS

MATERIALS NOTES:

1. PRECAST CONCRETE:
-PRECAST ISOGRID PANELS - PER SPEC SECTION 548
-ARCHITECTURAL FINISH SHALL BE PLAIN STEEL FORM FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINING WALL CONTROL PLANS.
2. C.I.P. CONCRETE:
-C.I.P. LEVELING PAD - PER SPEC SECTION 548
-OTHER C.I.P. CONCRETE - PER SPEC SECTION 548
3. REINFORCING STEEL:
-PER SPEC SECTION 548
-6" x 6" WELDED GRID, D8 x D8 WIRE
OR
-#3 REBAR @ 6" O.C. EACH WAY
-WELDED PER ASTM A497 PRIOR TO GALVANIZATION
4. CONNECTION INSERT:
-PER SPEC SECTION 548
-WII WIRE
-WELDED PER ASTM A185 PRIOR TO GALVANIZATION
5. LOCKING BAR:
-PER SPEC SECTION 548
6. SOIL REINFORCEMENT GRIDS:
-PER SPEC SECTION 548
-WII WELDED WIRE GRIDS:
-5 LONGITUDINAL WIRES @ 6" O.C., LENGTH AS REQUIRED BY DESIGN
-2' LONG TRANSVERSE BARS AT 6" OR 12" O.C., AS REQUIRED BY DESIGN
-SOIL GRID LENGTHS SHOWN ON ISOGRID DESIGN DRAWINGS ARE NOMINAL LENGTHS AS REQUIRED BY DESIGN CALCULATIONS. DUE TO MANUFACTURING TOLERANCES, ACTUAL GRID LENGTHS MAY BE LONGER.
7. JOINT MATERIAL:
-DIAGONAL JOINT FILLER:
-1/2" x 4" x 4'-2"
-PREFORMED EPDM
-DUROMETER: 80 - 90
-DIAGONAL JOINT BACKING:
-MIRAFIL40N OR EQUAL
-12" WIDE x LENGTH OF JOINT
-GEOTEXTILE MEETING REQUIREMENTS OF SPEC SECTION 548
-WEEPHOLE COVER:
-TENSAR DC4205 OR EQUAL
-6" x 6 1/2" (MIN)
-GEOCOMPOSITE MEETING REQUIREMENTS OF SPEC SECTION 548
8. BACKFILL:
-PER SPEC SECTION 548

CONSTRUCTION NOTES:

1. ALL CONSTRUCTION PROCEDURES SHALL COMPLY WITH SPEC SECTION 548-8 AND THE "ISOGRID CONSTRUCTION MANUAL" (PROVIDED BY THE NEEL COMPANY OR OLDCASTLE PRECAST, INC). IN THE EVENT OF A DISCREPANCY BETWEEN THE SPEC AND THE "ISOGRID CONSTRUCTION MANUAL", THE SPEC SHALL CONTROL.
2. FOR LOCATION AND ALIGNMENT OF ISOGRID STRUCTURE, SEE RETAINING WALL CONTROL PLANS.
3. ISOGRID STRUCTURES ON CURVES SHALL BE BUILT IN CHORDS AS SHOWN IN THE ISOGRID DESIGN DRAWINGS.
4. IF MANHOLES OR DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN IN THE ISOGRID DESIGN DRAWINGS.
5. IF PILES ARE LOCATED WITHIN THE RETAINING WALL VOLUME, THEY SHALL BE DRIVEN BEFORE CONSTRUCTION OF THE ISOGRID STRUCTURE UNLESS A METHOD TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE NEEL COMPANY, IS SUBMITTED AND APPROVED IN WRITING.
6. IF A STRUCTURE EXCEEDS 20' IN HEIGHT, THE FINISH GRADE AT THE FACE OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS 20' IN HEIGHT.
7. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN THE RETAINING WALL VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING GRIDS AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
8. TOP PANELS ON WALLS WITH CAST-IN PLACE COPING SHALL HAVE #4 REBAR PROTRUDING FROM THEIR TOP EDGE.
9. BACKFILL MATERIAL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS FOR MSE WALLS TO A LEVEL OF APPROXIMATELY 2" ABOVE THE CONNECTION INSERT EMBEDDED IN THE PANELS. INSTALLATION OF THE SOIL REINFORCEMENT SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
10. COMPACTION AND OPERATION EQUIPMENT SHALL BE KEPT A MINIMUM DISTANCE OF 3' FROM THE BACK FACE OF THE ISOGRID PANELS. COMPACTION WITHIN 3' OF THE ISOGRID PANEL SHALL BE 90% OF AASHTO T-180.
11. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING GRIDS DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPERATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPERELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.
12. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING STORM WATER DRAINAGE IN THE VICINITY OF THE WALL DURING CONSTRUCTION. STORMWATER RUNOFF SHALL BE COLLECTED AND DISCHARGED AWAY FROM THE WALL AND THE RETAINING WALL VOLUME.

DESIGNER:



THE NEEL COMPANY

8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
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PRECASTER:

OLDCASTLE PRECAST, INC

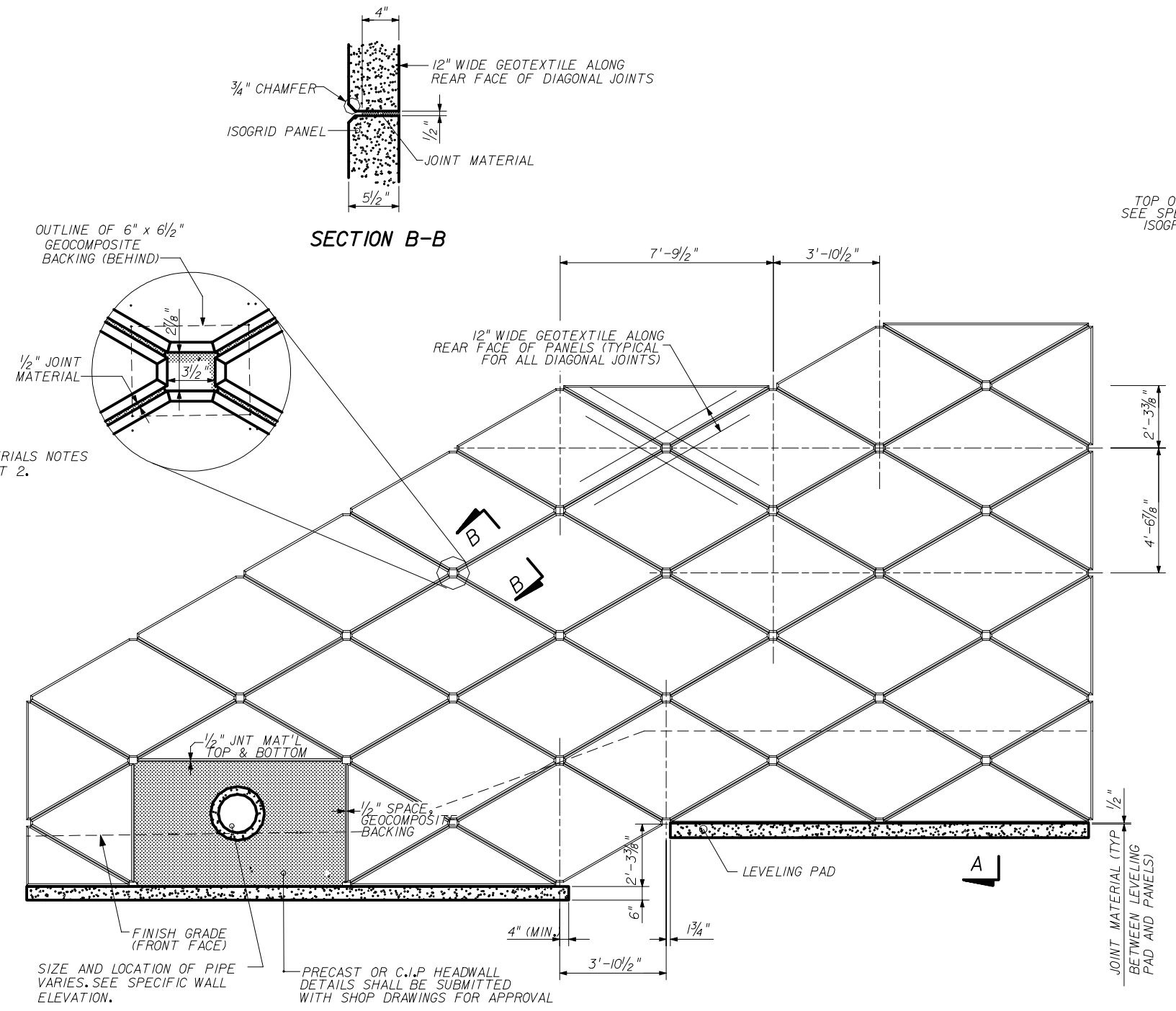
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
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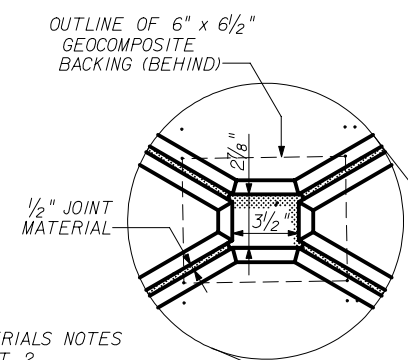
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID**

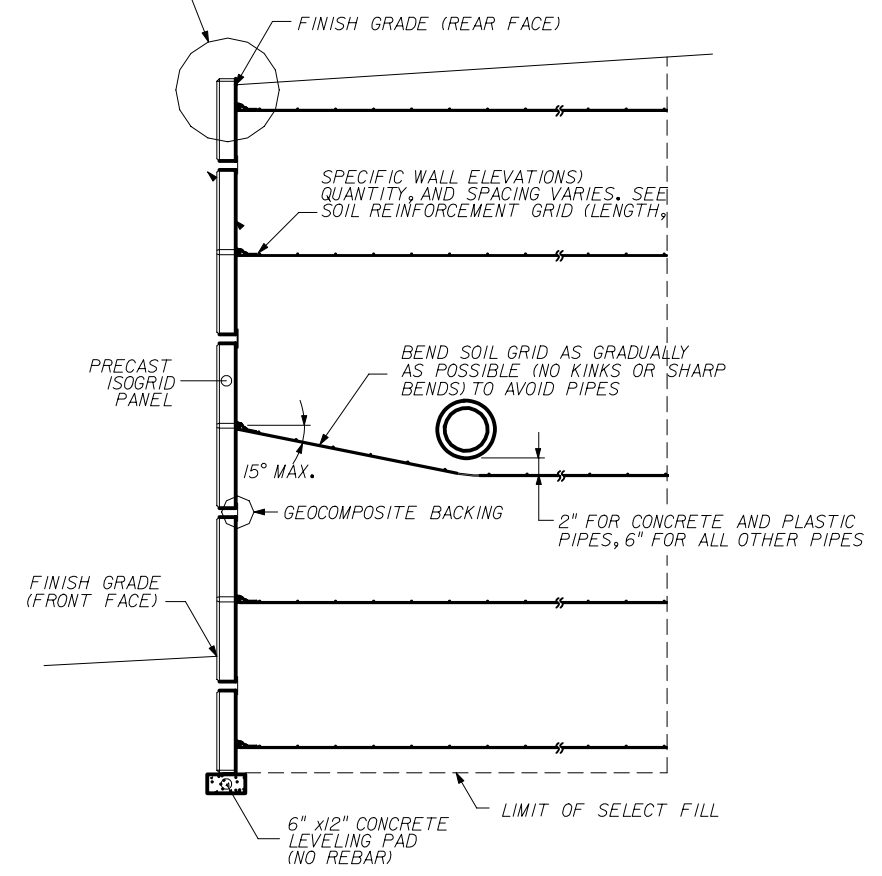
Names		Dates		Approved By <i>[Signature]</i>		
Designed By	JMC	10/01/98				
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.	
Checked By	JMC	10/01/98	04	2 of 20	5012	



NOTE: FOR MATERIALS NOTES SEE SHEET 2.



TOP OF WALL TREATMENT VARIES. SEE SPECIFIC WALL ELEVATIONS AND ISOGRID STANDARD DRAWINGS FOR DETAILS




SECTION A-A SHOWING TYPICAL DETAILS

ELEVATION (FRONT FACE) SHOWING TYPICAL DETAILS

DESIGNER:

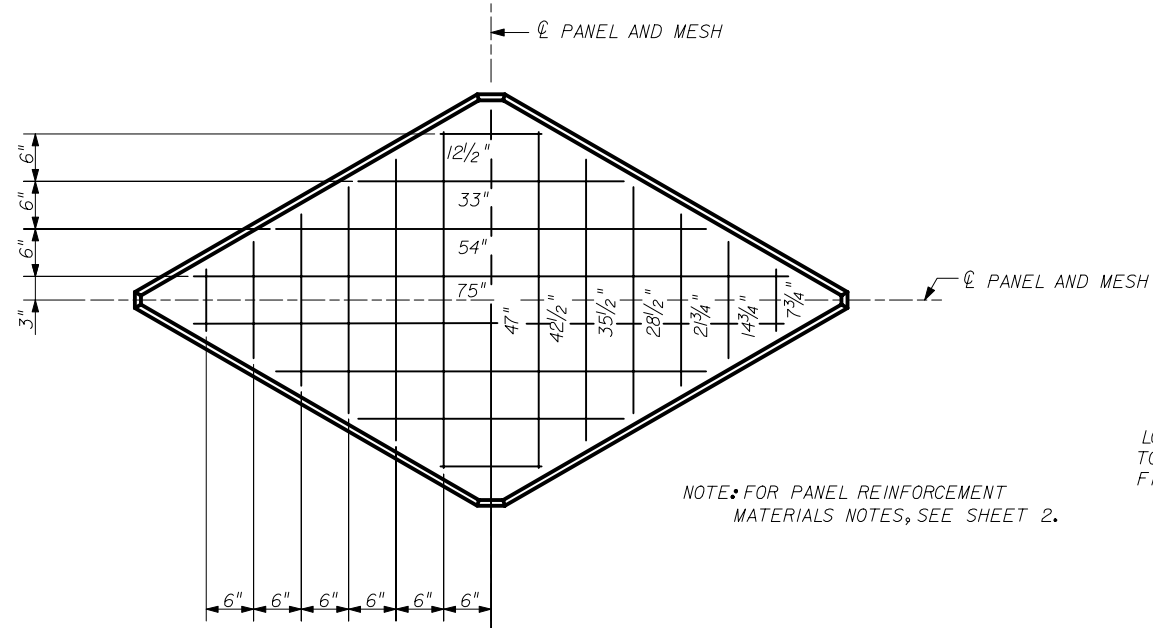
THE NEEL COMPANY
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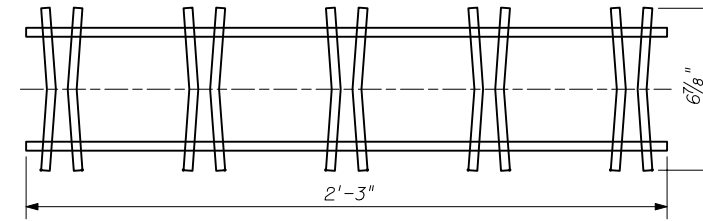
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By 		
Designed By	JMC	03/01/98	State Structures Design Engineer	
Drawn By	CAA	03/01/98	Revision	Sheet No. Index No.
Checked By	JMC	03/01/98	04	3 of 20 5012

NOTE:

PANEL IS HANDLED BY LIFTING DEVICE THAT ATTACHES TO CONNECTION INSERT



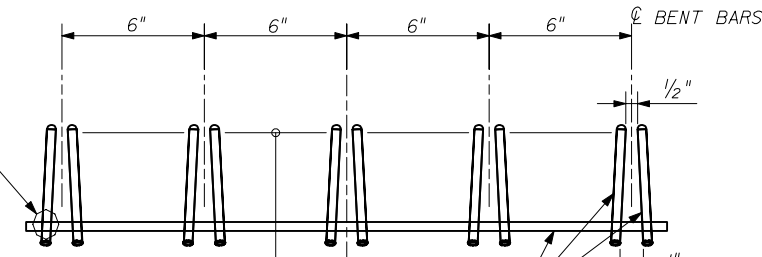
NOTE: FOR PANEL REINFORCEMENT MATERIALS NOTES, SEE SHEET 2.



TOP VIEW

NOTE: FOR CONNECTION INSERT MATERIALS NOTES, SEE SHEET 2.

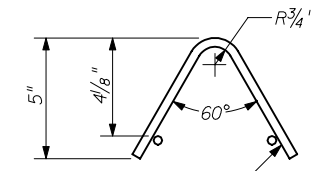
LONGITUDINAL WIRES TO BE WELDED TO BENT WIRES WHILE HELD IN A JIG FIXTURE (PRIOR TO GALVANIZATION).



SIDE VIEW

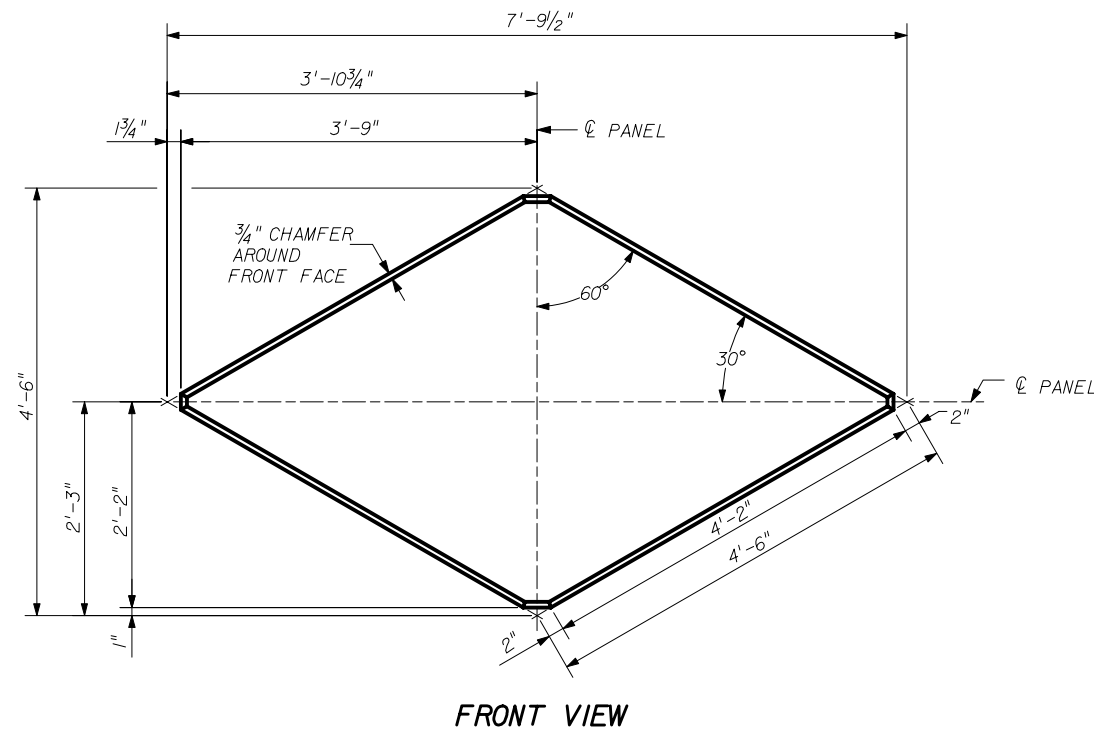
INSIDE OF EACH BEND MUST BE WITHIN 1/16" (*) OF INSIDE OF ALL OTHER BENDS TO ASSURE PROPER BEARING UPON LOCKING BAR.

WIRE SIZE TO BE EQUAL TO SOIL REINFORCEMENT GRID WIRE SIZE

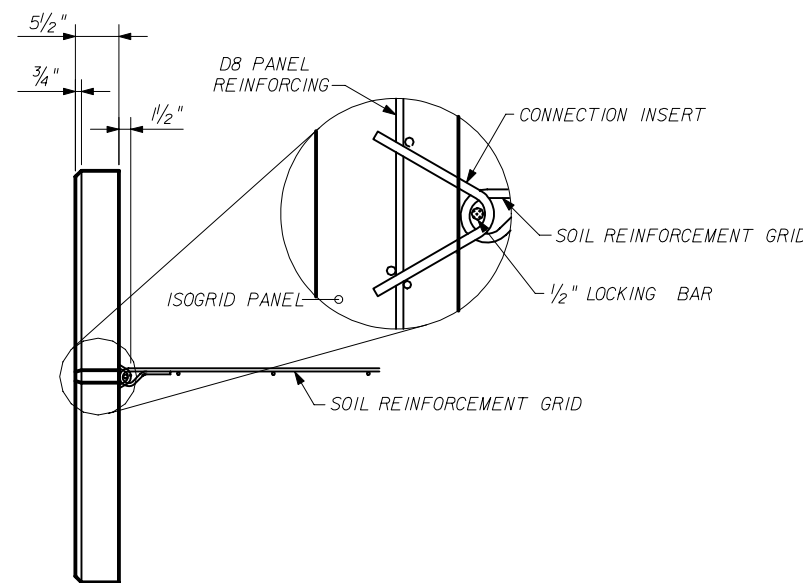


END VIEW

WELDED WIRE MESH PANEL REINFORCEMENT



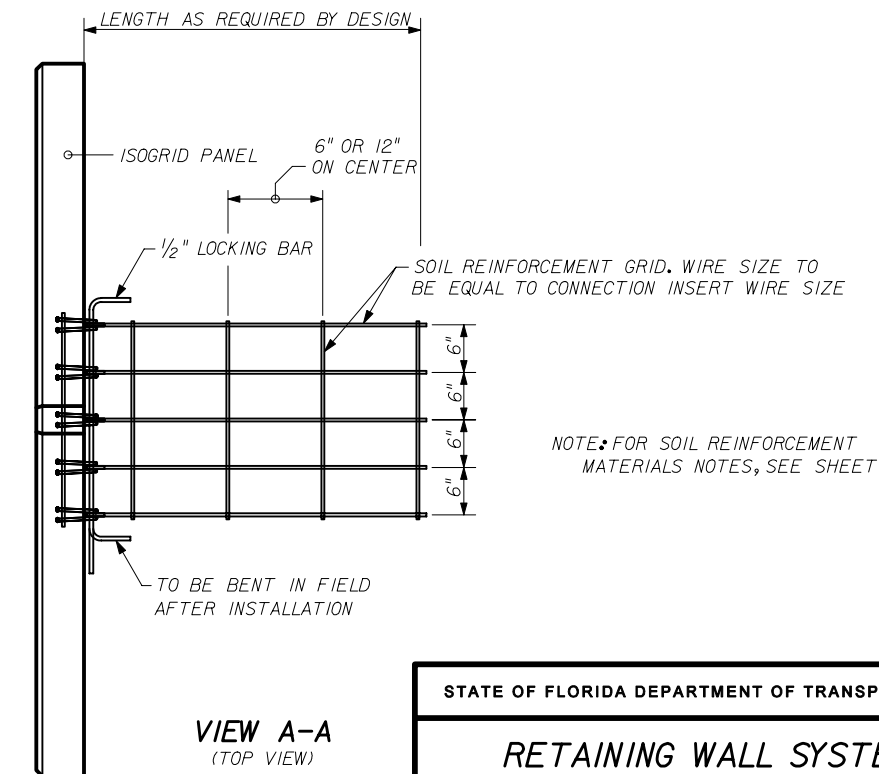
FRONT VIEW



SIDE VIEW

FULL-SIZE PANEL TYPICAL DIMENSIONS

CONNECTION INSERT




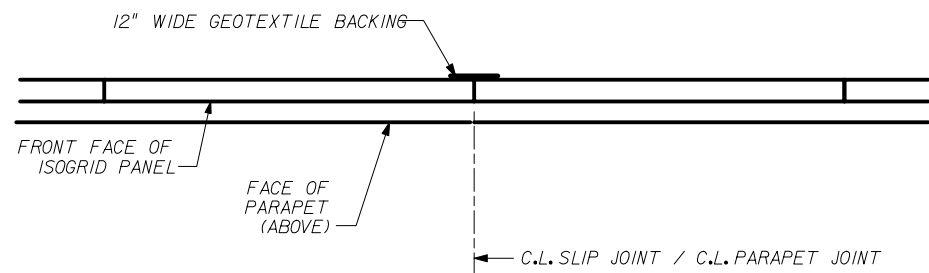
VIEW A-A (TOP VIEW)

NOTE: FOR SOIL REINFORCEMENT MATERIALS NOTES, SEE SHEET 2.

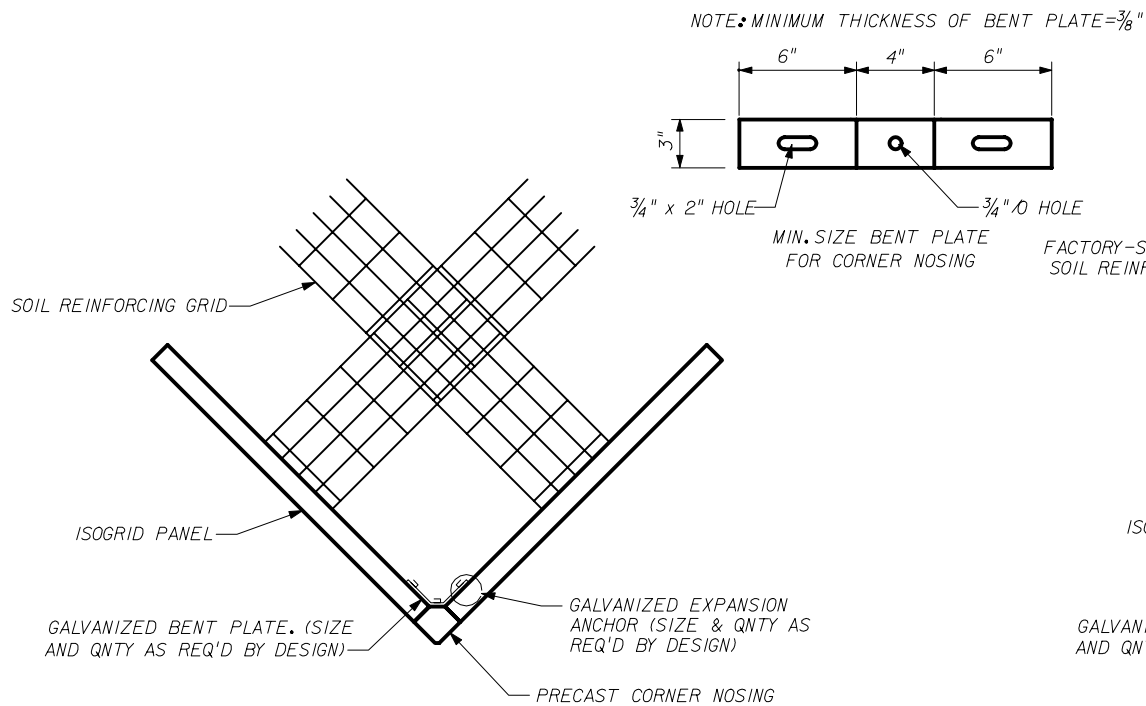
DESIGNER:
 **THE NEEL COMPANY**
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
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PRECASTER:
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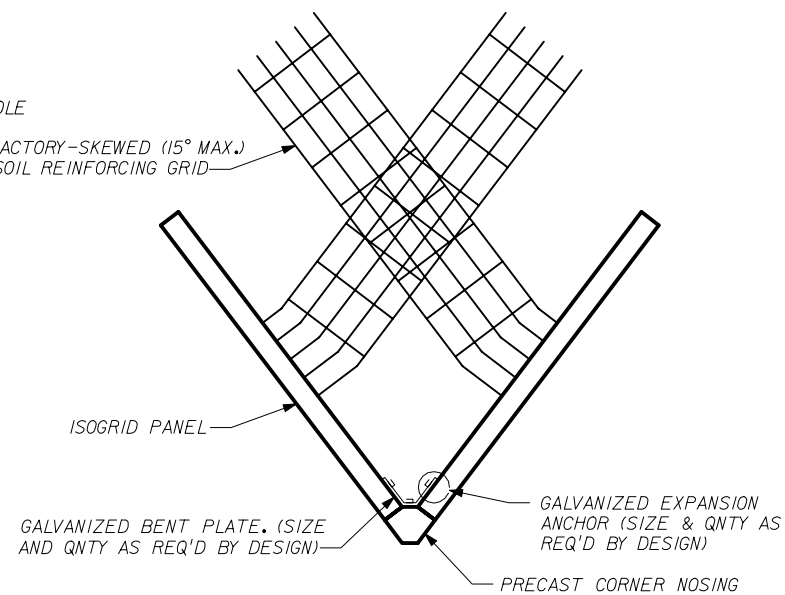
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM				
THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No. Index No.
Checked By	JMC	10/01/98	04	4 of 20 5012



**PART PLAN
SLIP JOINT DETAIL**

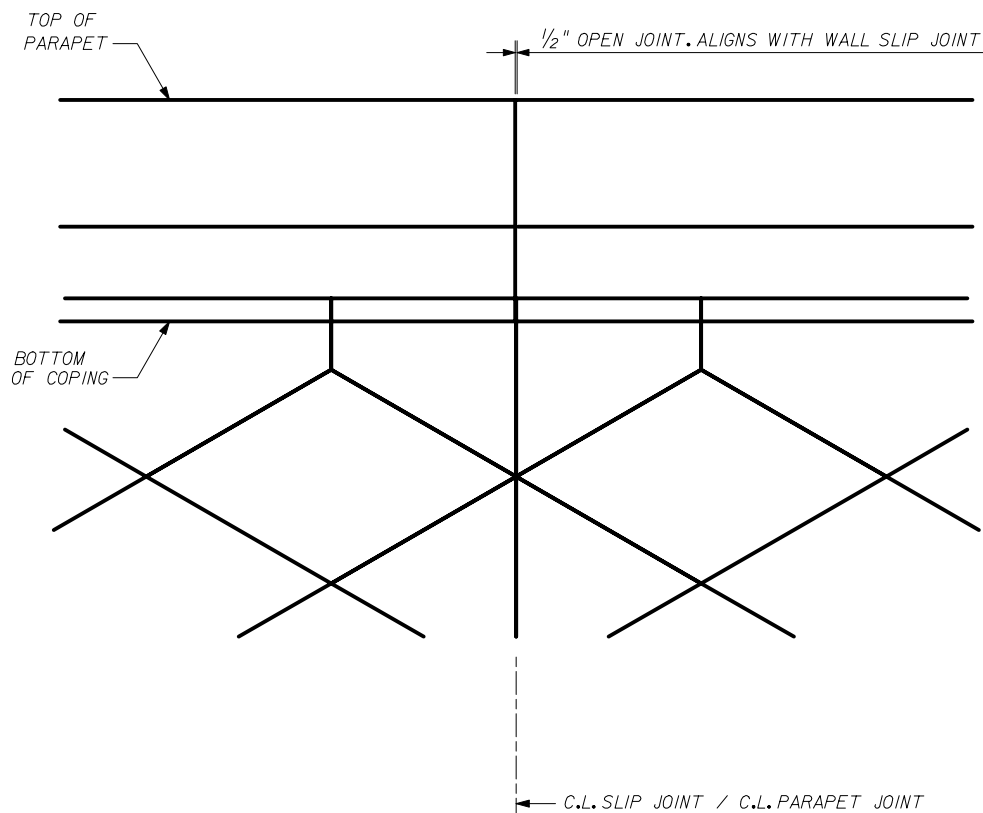


**PART PLAN
STD CORNER DETAIL**

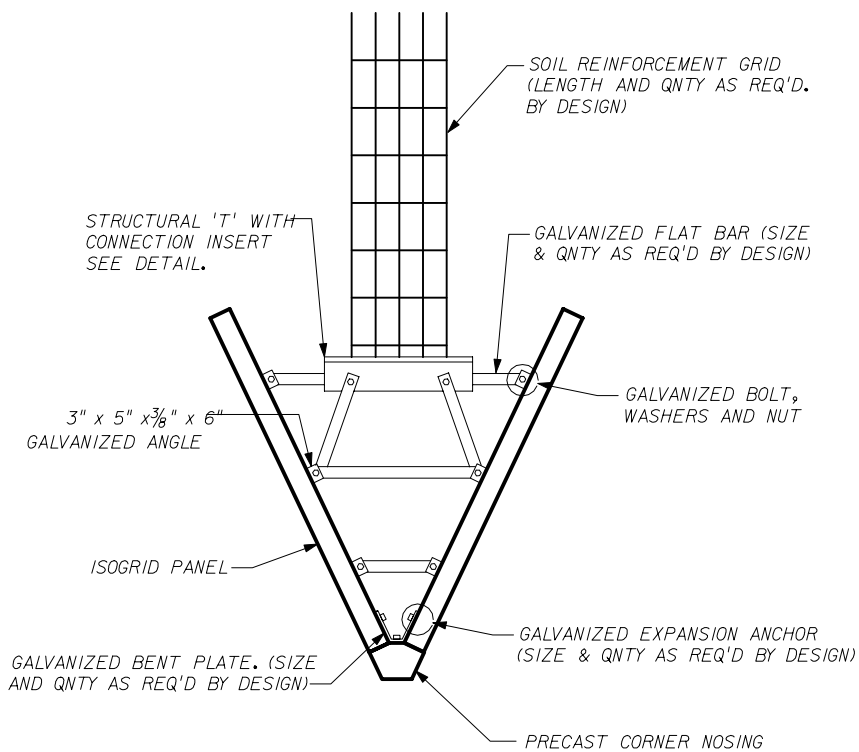


**PART PLAN
MILD (65° MIN.) ACUTE CORNER DETAIL**

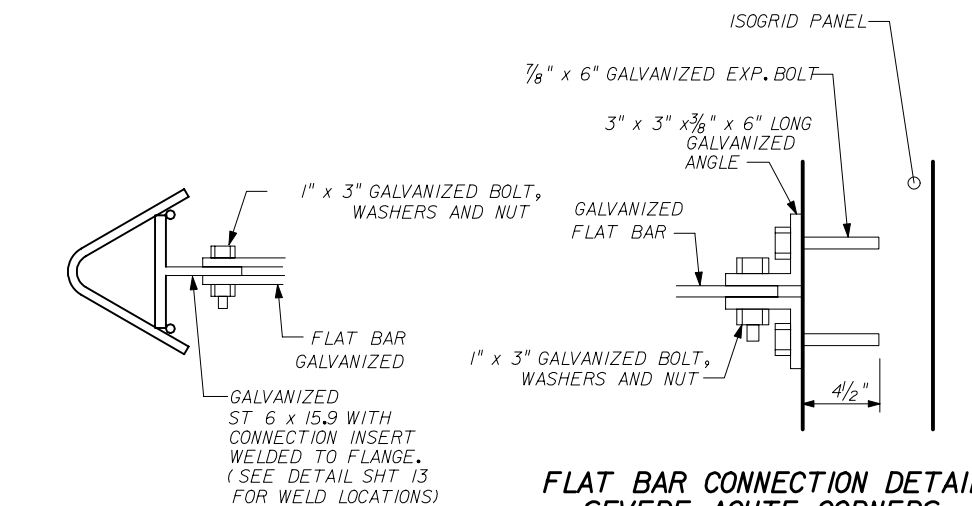
APPLIES UNTIL GRID CONFLICTS
WITH ADJACENT PANELS



**PART ELEVATION
SLIP JOINT DETAIL**



**PART PLAN
SEVERE ACUTE CORNER DETAIL**



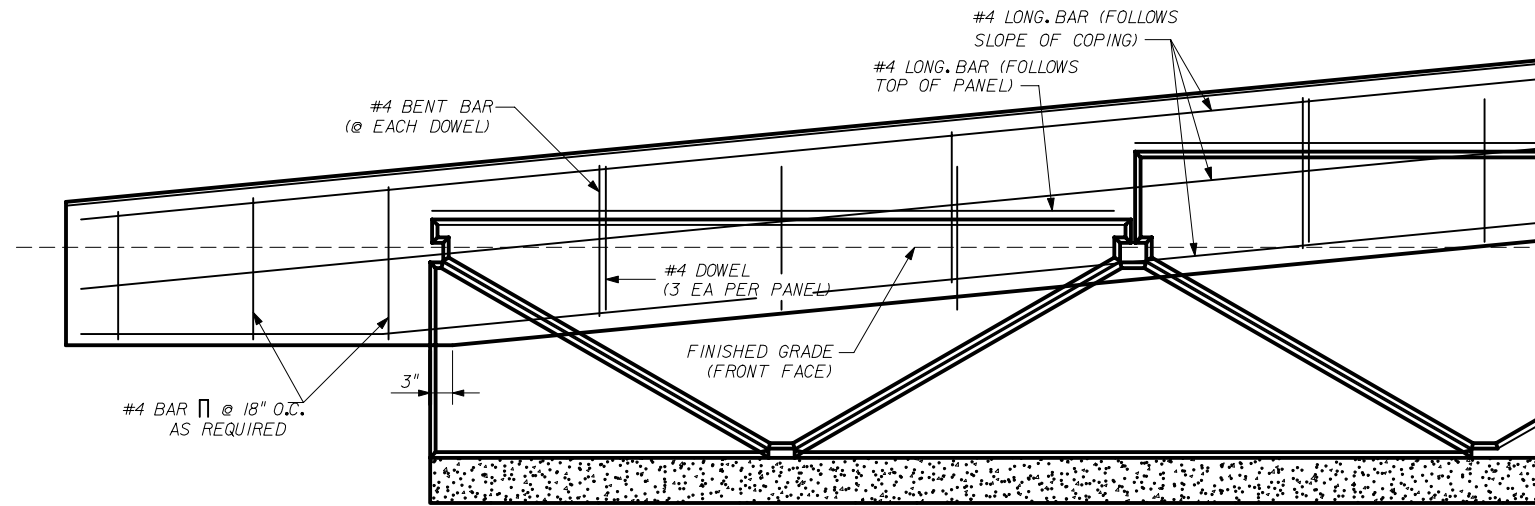
**SOIL GRID CONNECTION DETAIL
SEVERE ACUTE CORNERS**

**FLAT BAR CONNECTION DETAIL
SEVERE ACUTE CORNERS**

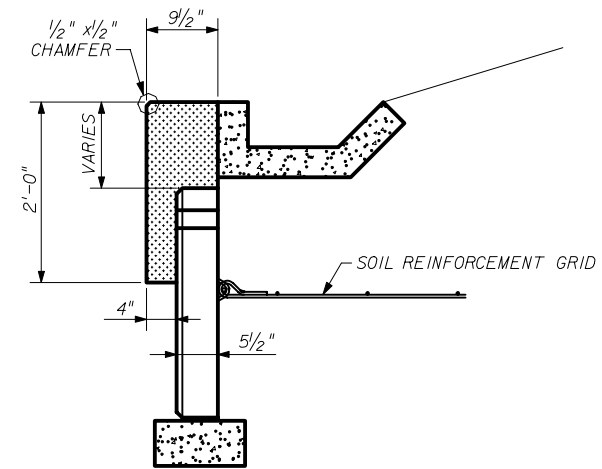
DESIGNER:
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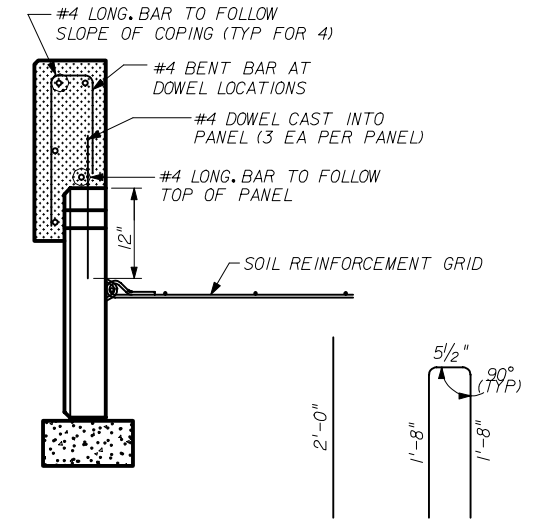
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	5 of 20
				5012



C.I.P. COPING TREATMENT AT BEGINNING/END OF WALLS



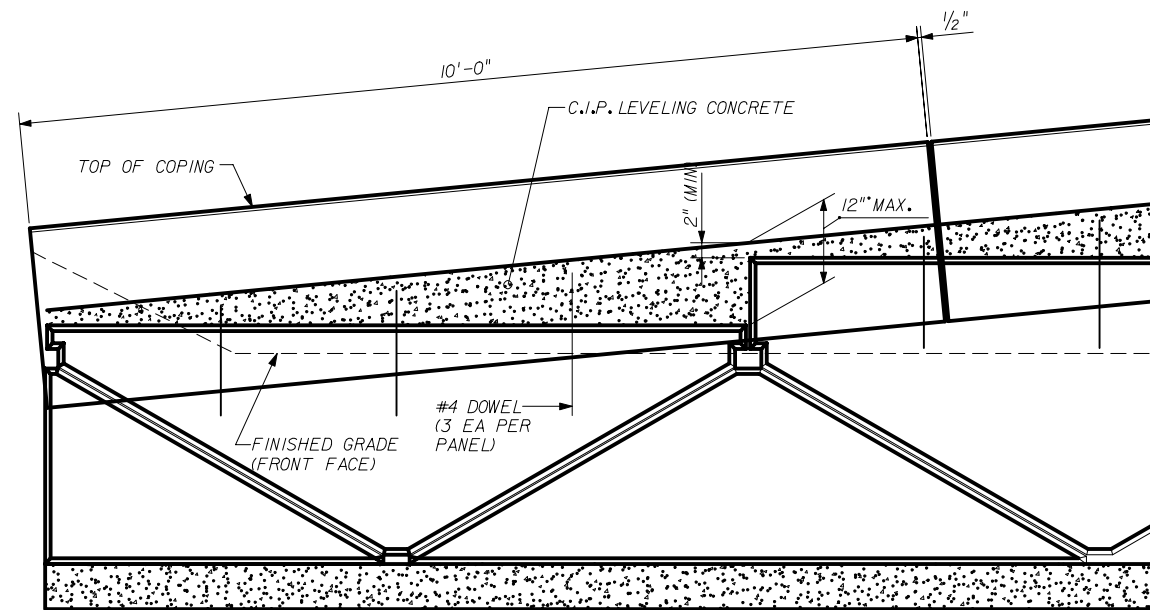
C.I.P. COPING DIMENSIONS



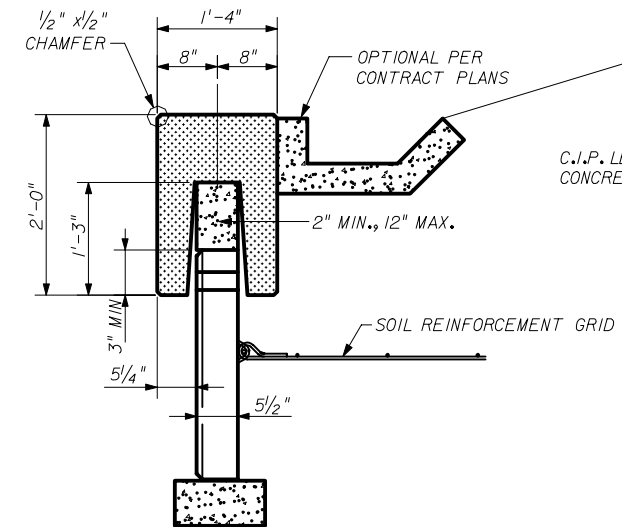
C.I.P. COPING REBAR

#4 DOWEL #4 BENT BAR

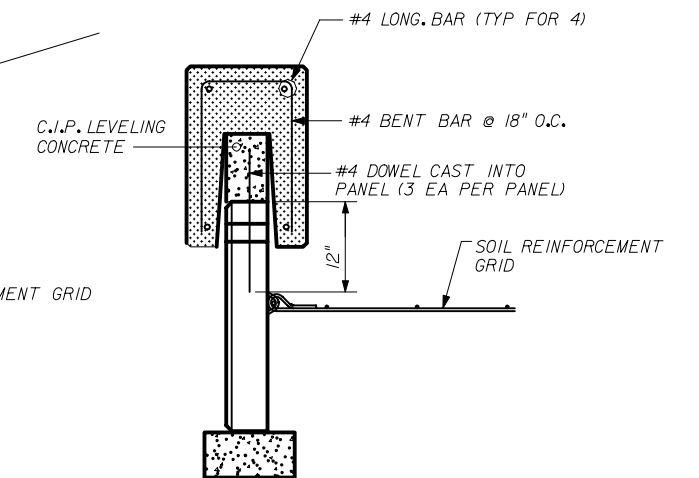
C.I.P. COPING REBAR DETAILS
BENT BAR AND DOWEL TO BE FIELD-TRIMMED AS REQUIRED TO PROVIDE MIN OF 2" OF CONCRETE COVER



PRECAST COPING - PART ELEVATION



PRECAST COPING DIMENSIONS



PRECAST COPING REBAR

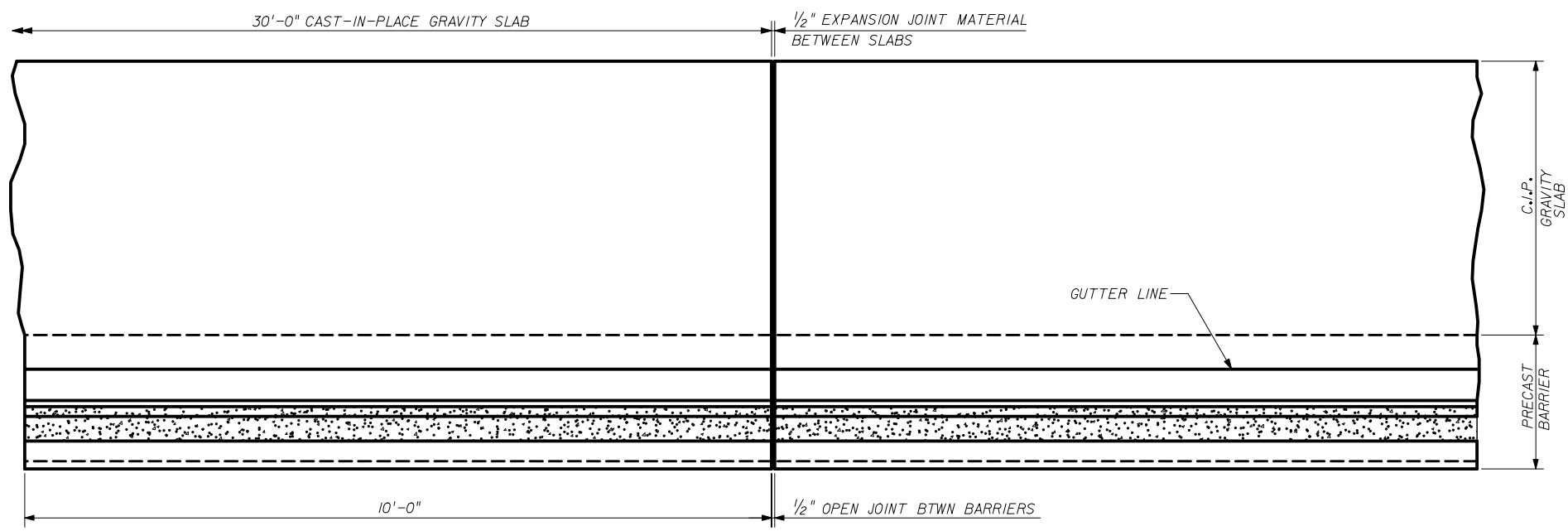
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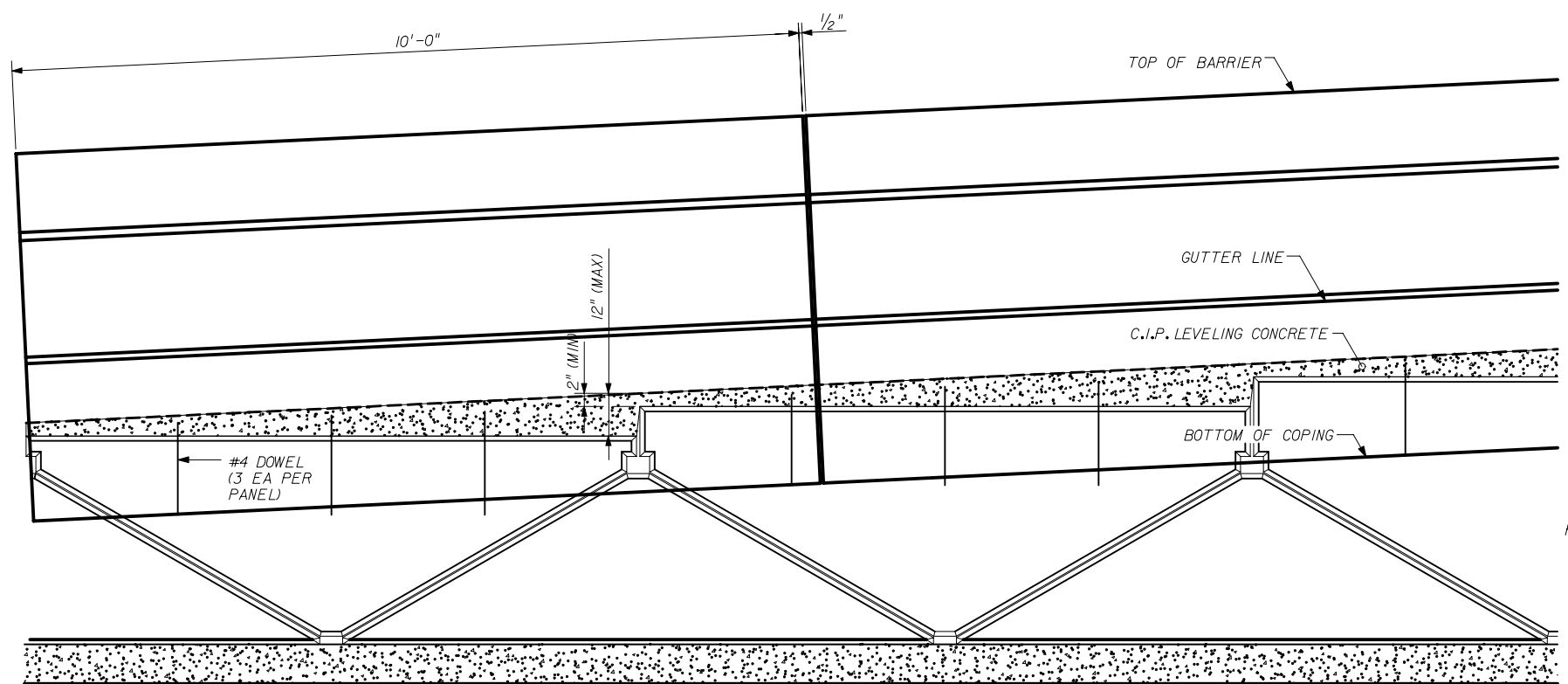
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID

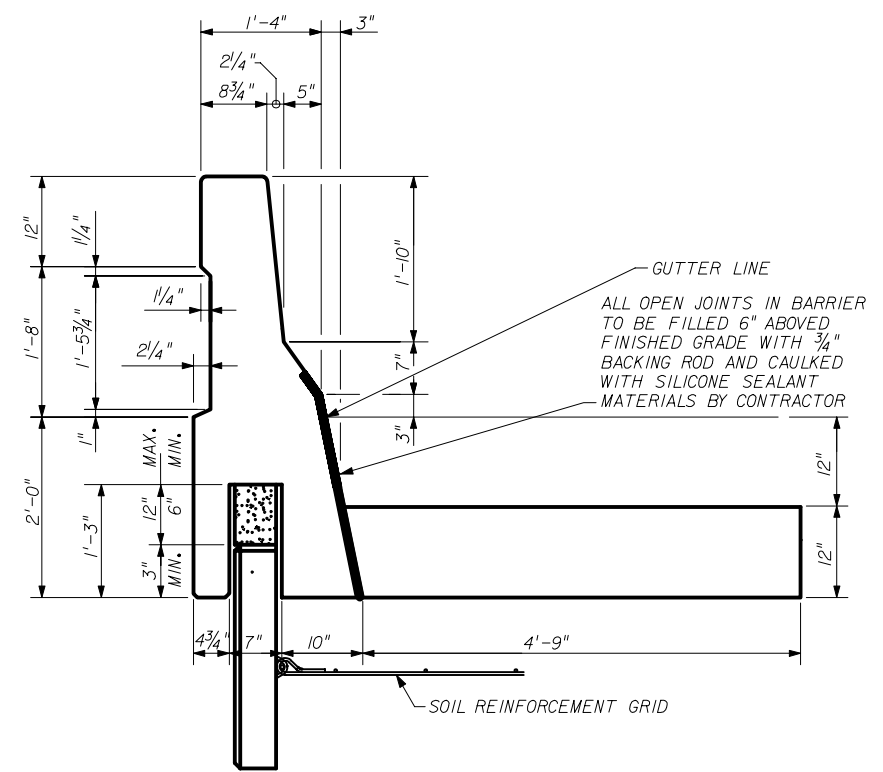
Names		Dates	Approved By <i>W. J. [Signature]</i>		
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Checked By	JMC	10/01/98	04	6 of 20	5012



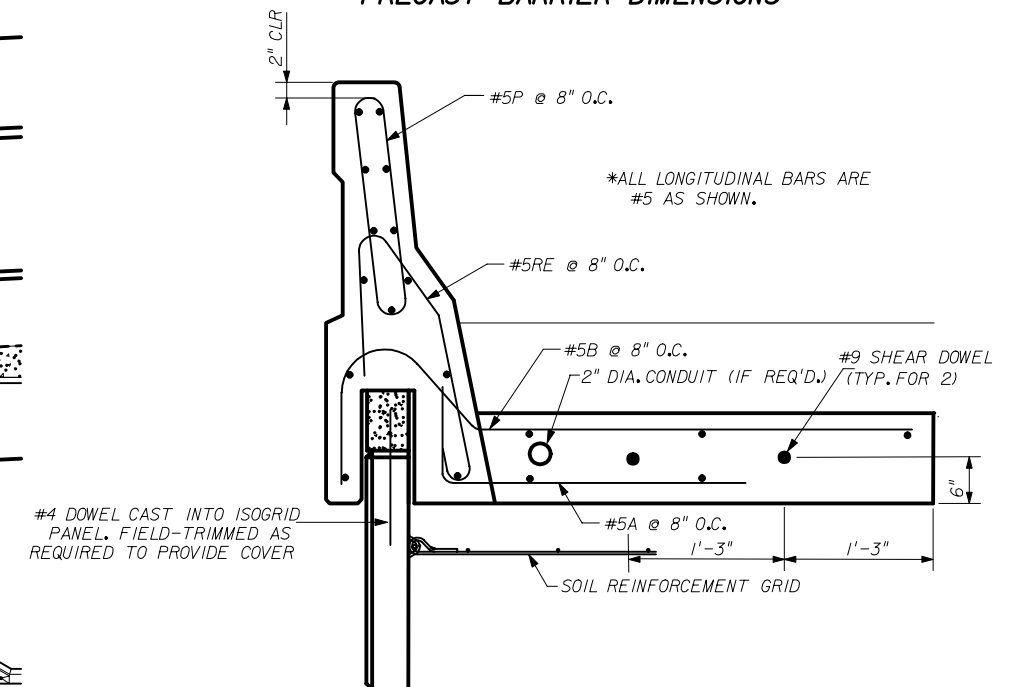
PART PLAN - PRECAST BARRIER



PART ELEVATION - PRECAST BARRIER




PRECAST BARRIER DIMENSIONS

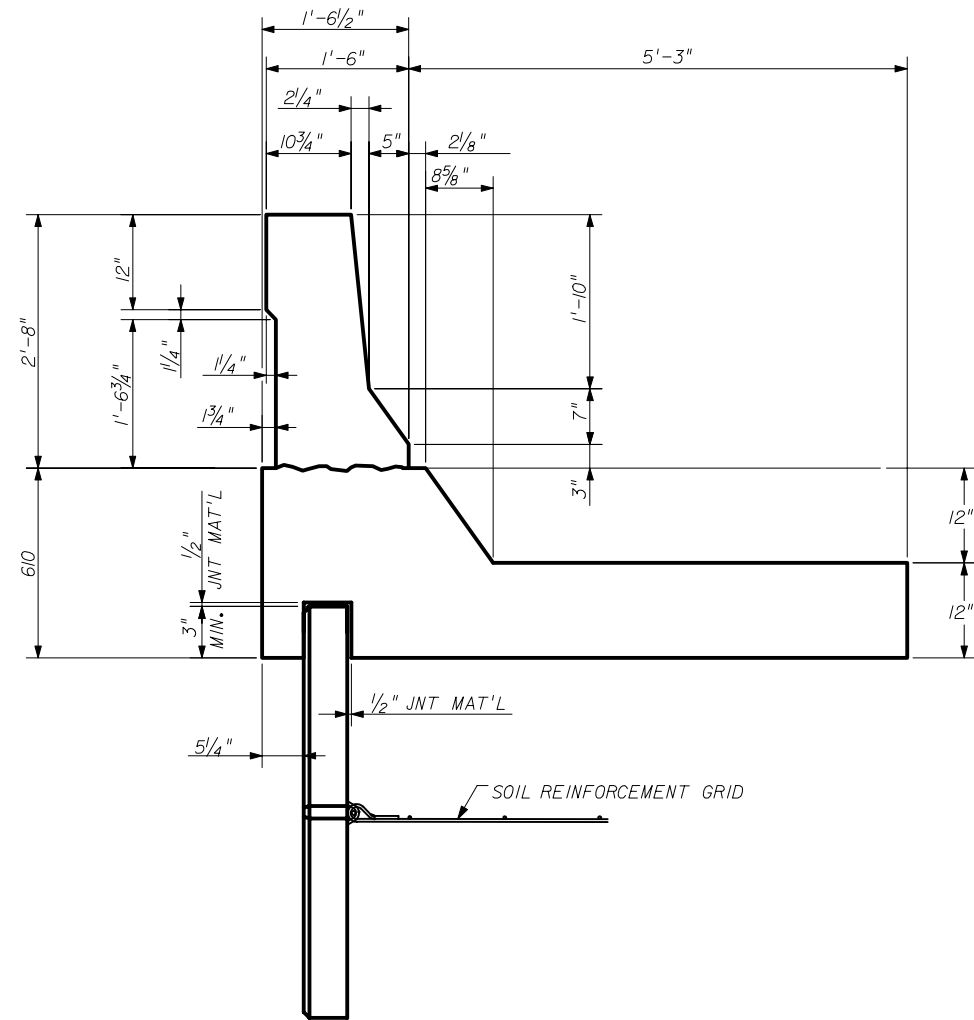


PRECAST BARRIER REBAR

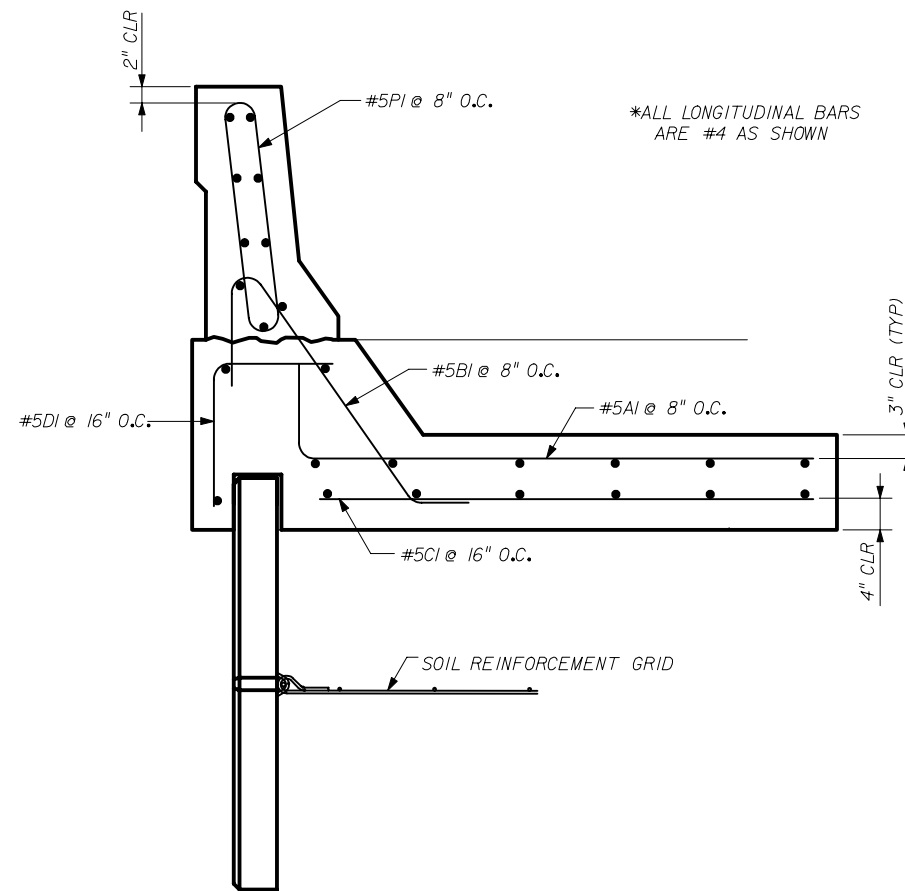
DESIGNER:
 THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
 OLDCASTLE PRECAST, INC.
 5995 SOUTEL DR.
 JACKSONVILLE, FL 32219
 PH: (904) 768-7081
 FX: (904) 768-8428

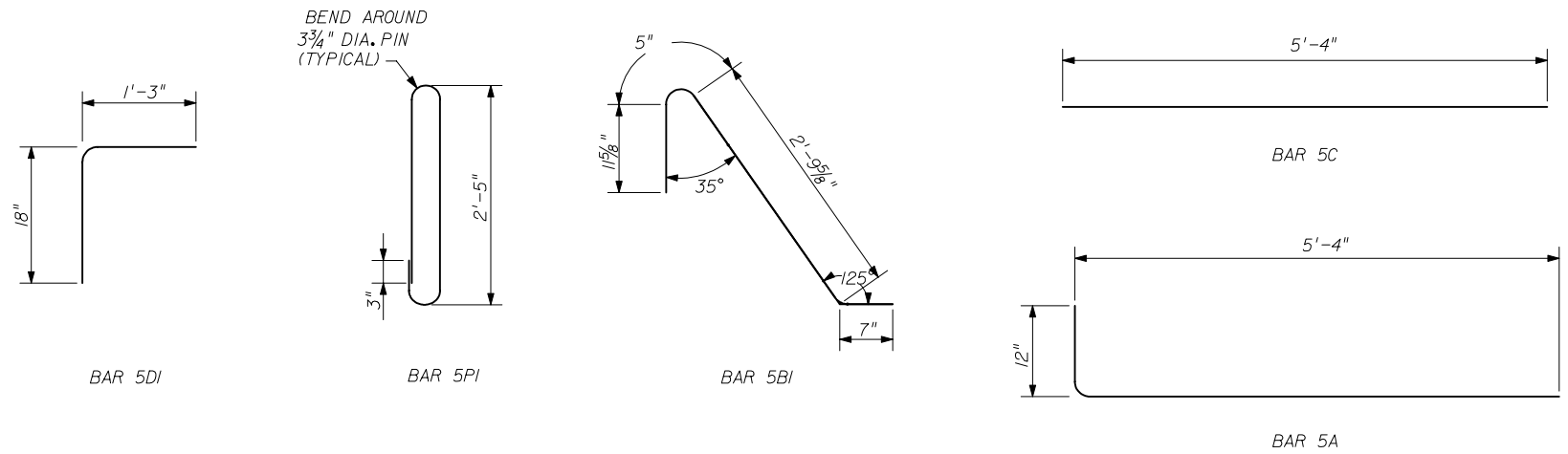
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM				
THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By 		
Designed By JMC	10/01/98	State Structures Design Engineer		
Drawn By CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By JMC	10/01/98	04	7 of 20	5012



C.I.P. BARRIER AND C.I.P. JUNCTION SLAB DIMENSIONS




C.I.P. BARRIER AND C.I.P. JUNCTION SLAB REBAR

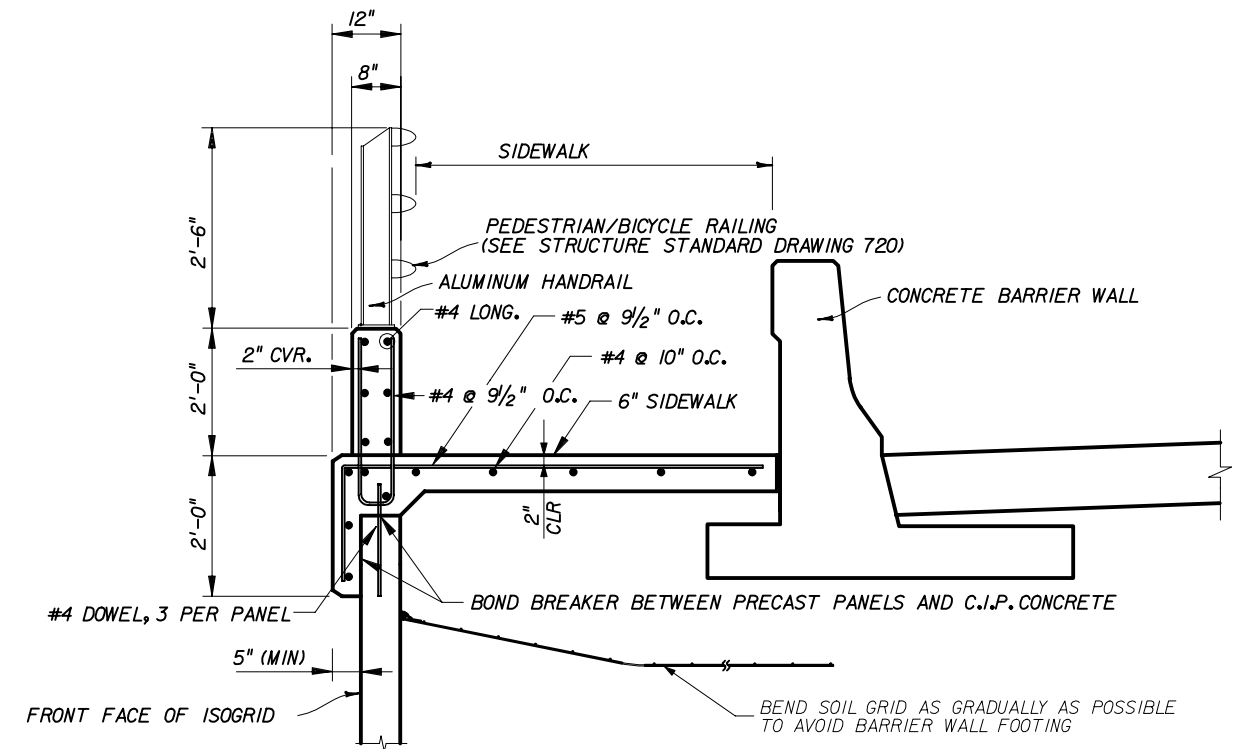


C.I.P. BARRIER REBAR DETAILS

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 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
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Names	Dates	Approved By 		
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C.I.P. PARAPET DETAIL W/ HANDRAIL

DESIGNER:



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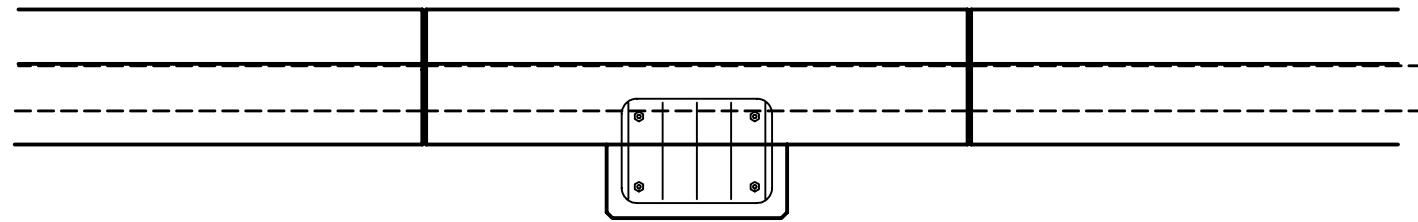
PRECASTER:

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 5995 SOUTEL DR.
 JACKSONVILLE, FL 32219
 PH: (904) 768-7081
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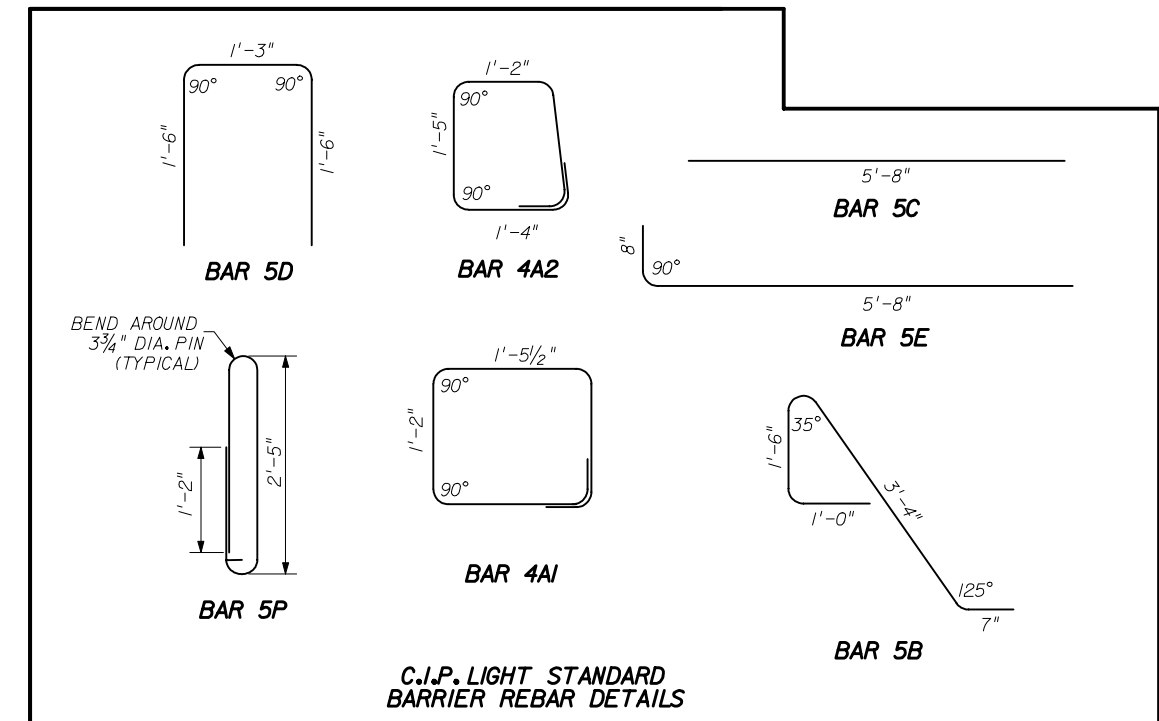
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
 THE NEEL COMPANY ISOGRID

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Designed By	JMC	10/01/98	State Structures Design Engineer			
Drawn By	CAA	10/01/98				
Checked By	JMC	10/01/98	Revision	Sheet No.	Index No.	
			04	9 of 20	5012	

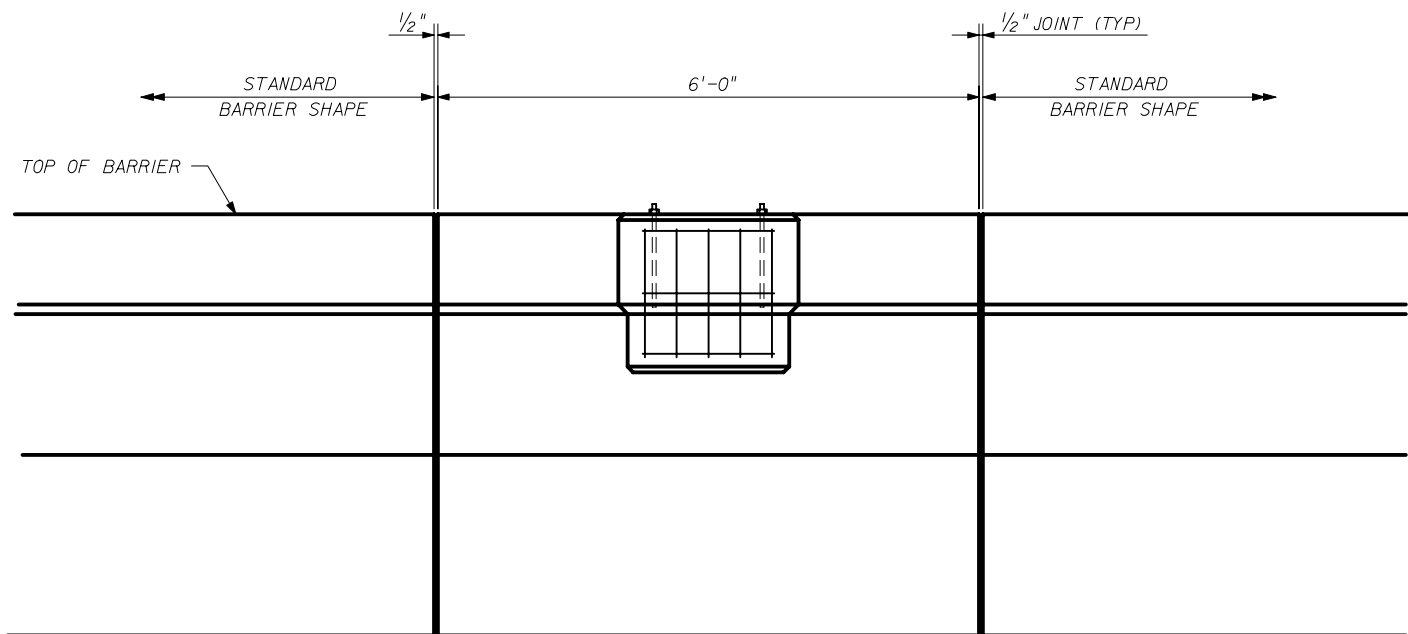


C.I.P. LIGHT STANDARD BARRIER - PART PLAN WITH REBAR
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)

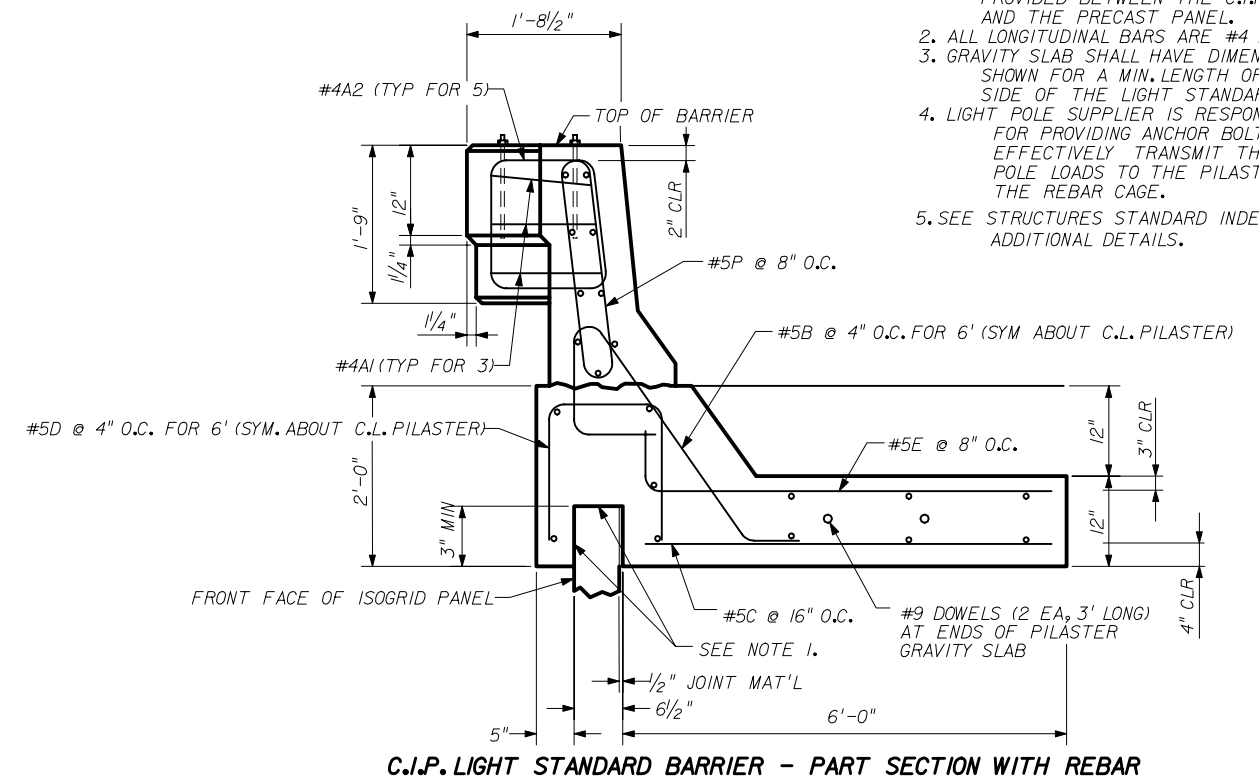


C.I.P. LIGHT STANDARD BARRIER REBAR DETAILS

- NOTES
1. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN THE C.I.P. CONC. AND THE PRECAST PANEL.
 2. ALL LONGITUDINAL BARS ARE #4 AS SHOWN.
 3. GRAVITY SLAB SHALL HAVE DIMENSIONS SHOWN FOR A MIN. LENGTH OF 10'-0" EITHER SIDE OF THE LIGHT STANDARD BARRIER.
 4. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REBAR CAGE.
 5. SEE STRUCTURES STANDARD INDEX 500 FOR ADDITIONAL DETAILS.



C.I.P. LIGHT STANDARD BARRIER - PART ELEVATION
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)



C.I.P. LIGHT STANDARD BARRIER - PART SECTION WITH REBAR


DESIGNER:

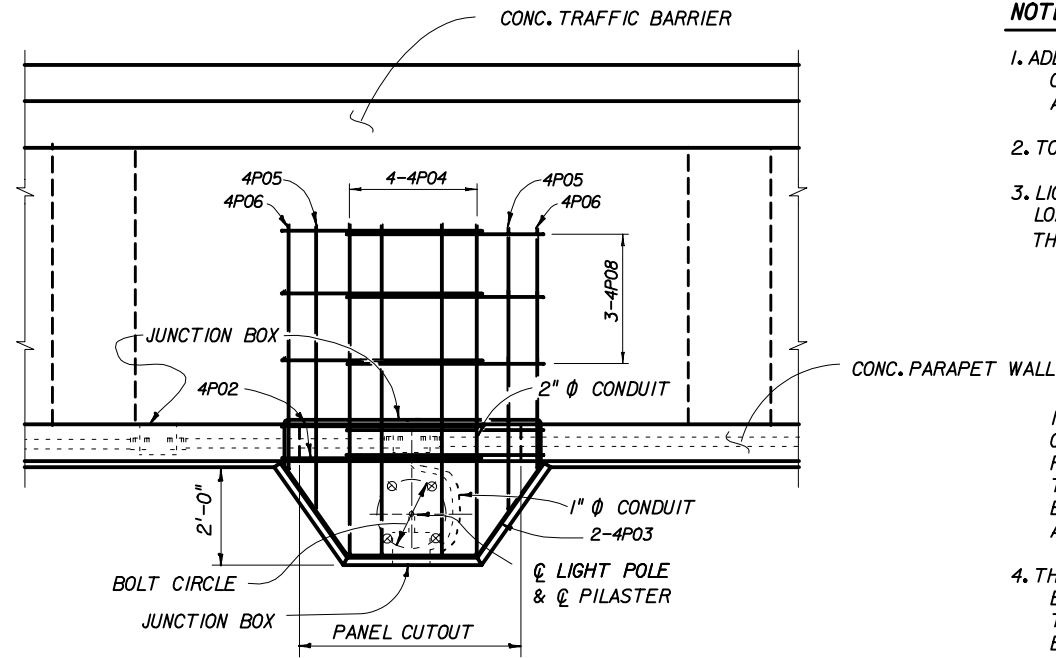
THE NEEL COMPANY
 8328-D TRAFORD LANE
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 PH: 17031 913-7858
 FX: 17031 913-7859

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 PH: 19041 768-7081
 FX: 19041 768-8428

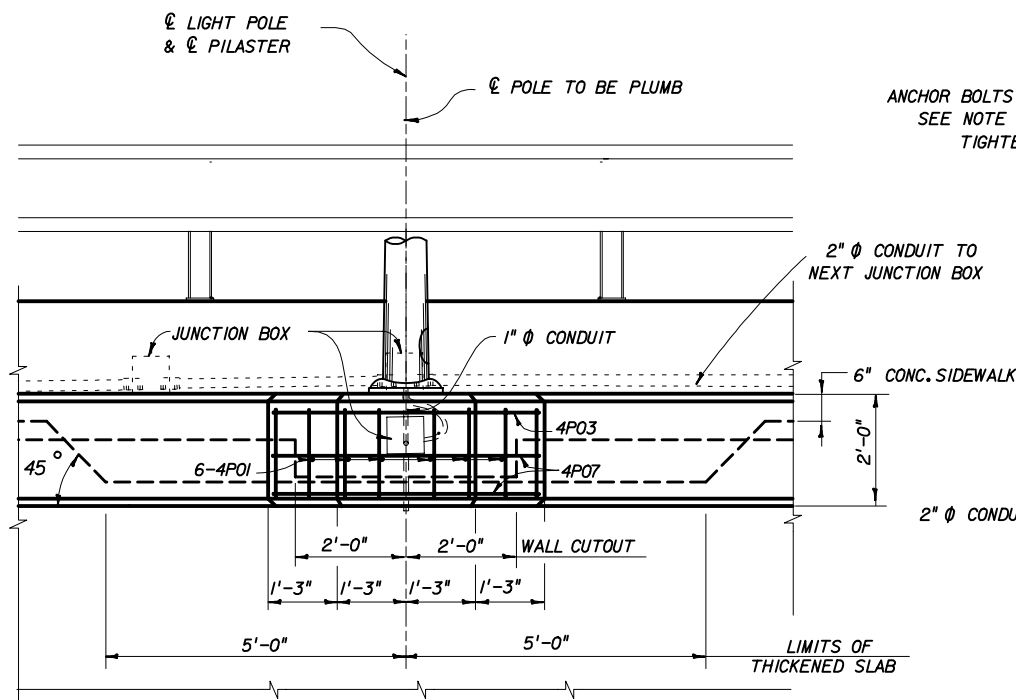
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
 THE NEEL COMPANY ISOGRID

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Revision	Sheet No.	Index No.
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PLAN



LIGHT PILASTER DETAIL

NOTES

1. ADDITIONAL CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTER SHALL MEET THE SAME REQUIREMENTS AS THAT OF THE PARAPET WALL.

2. TOP OF PILASTER SHALL BE FINISHED TO A TRULY LEVEL AREA.

3. LIGHT POLE PILASTER IS DESIGNED TO RESIST WORKING LOADS (IN ANY DIRECTION) FROM THE LIGHT POLE APPLIED AT THE TOP OF THE PILASTER AS FOLLOWS:

LONGITUDINAL MOMENT	=	30,000 FT. POUND
TRANSVERSE MOMENT	=	6,000 FT. POUND
LONGITUDINAL SHEAR	=	1,000 POUND
TRANSVERSE SHEAR	=	200 POUND
TORSION	=	3,000 FT. POUNDS
AXIAL	=	400 POUNDS

IF THE LIGHT POLE PROVIDED APPLIES LOADS THAT ARE IN EXCESS OF THOSE SHOWN ABOVE, THE CONTRACTOR SHALL REDESIGN THE PILASTER AND SUBMIT HIS DESIGN TO THE DEPARTMENT FOR REVIEW. THE CONTRACTOR'S REDESIGN SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA, AND QUALIFIED TO PERFORM THE WORK.

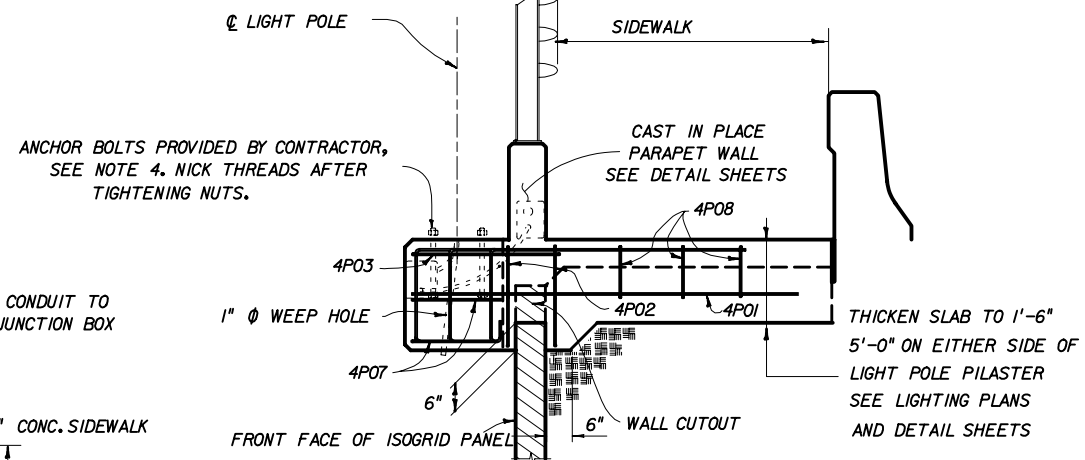
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND THAT FIT THE REINFORCING CAGE. CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHALL BE SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT FOR REVIEW AND APPROVAL SHOWING THAT THESE REQUIREMENTS HAVE BEEN MET PRIOR TO CONSTRUCTION.

5. STEEL FOR JUNCTION BOXES SHALL CONFORM WITH ASTM-A36. THE BOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. IN LIEU OF STEEL BOXES THE CONTRACTOR MAY SUBMIT FOR APPROVAL MOLDED P.V.C. BOXES (SCHEDULE 80).

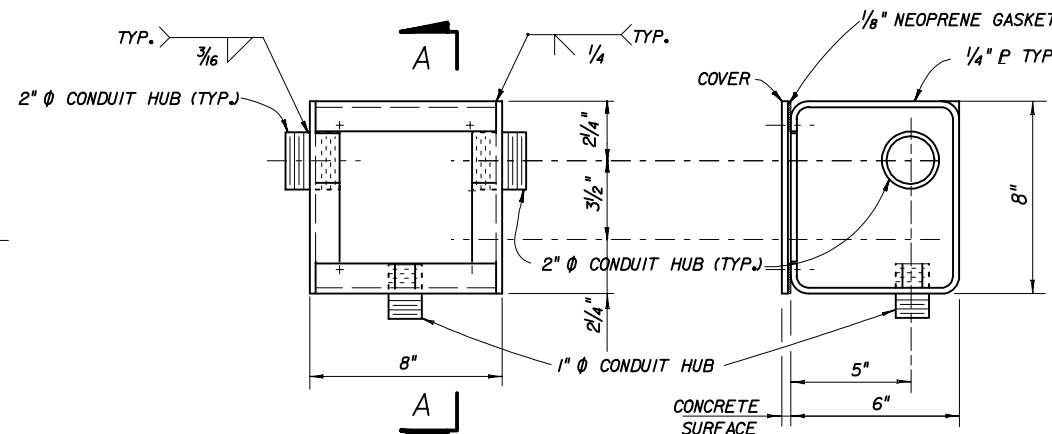
6. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL OR SCHEDULE 80 P.V.C.

7. THE COST OF ANCHOR BOLTS SHALL BE INCLUDED IN THE BID PRICE FOR LIGHT POLES.

8. PAYMENT: THE COST OF ALL LABOR, CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTERS AND ALL CONDUITS, EXPANSION COUPLINGS, JUNCTION BOXES AND MISCELLANEOUS HARDWARE REQUIRED FOR COMPLETION OF THE ELECTRICAL INSTALLATION WITHIN THE LIMITS SHOWN ON THIS SHEET, SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR THE MSE WALLS.

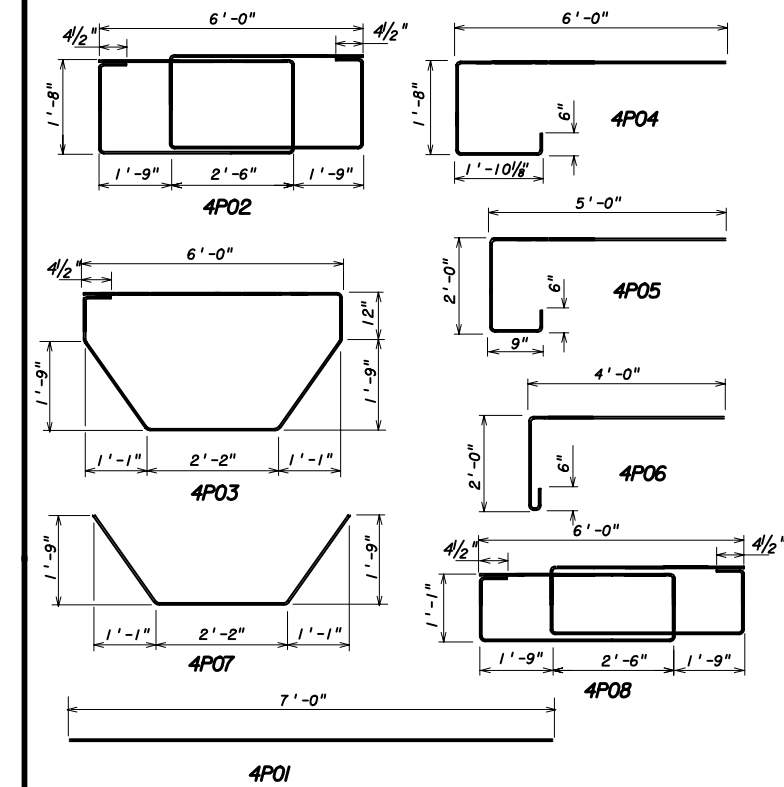


FRONT VIEW OF JUNCTION BOX (COVER REMOVED)



SECTION A-A


BAR BENDING DIAGRAMS

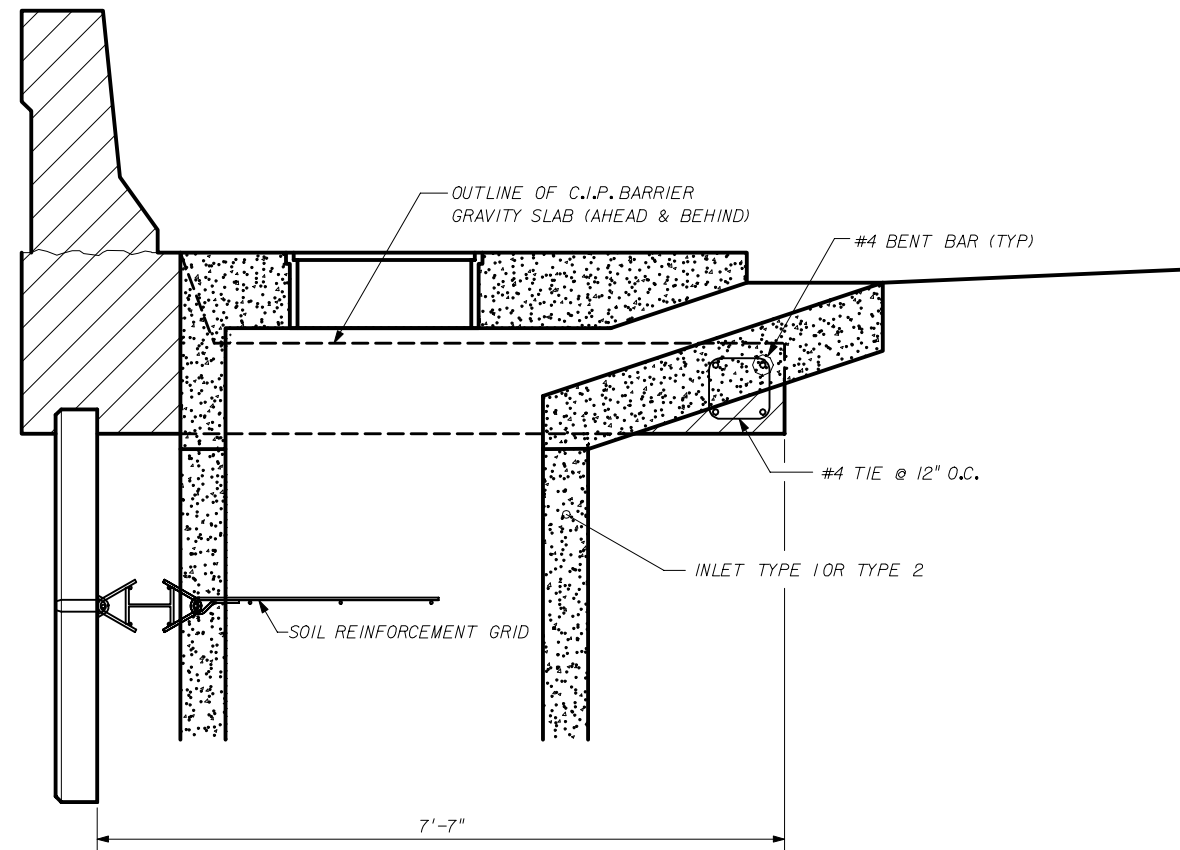


BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
4P01	4	6	7'-0"
4P02	4	2	24'-5"
4P03	4	1	14'-9"
4P04	4	4	9'-8"
4P05	4	2	7'-11"
4P06	4	2	6'-2"
4P07	4	2	6'-4"
4P08	4	3	22'-1"

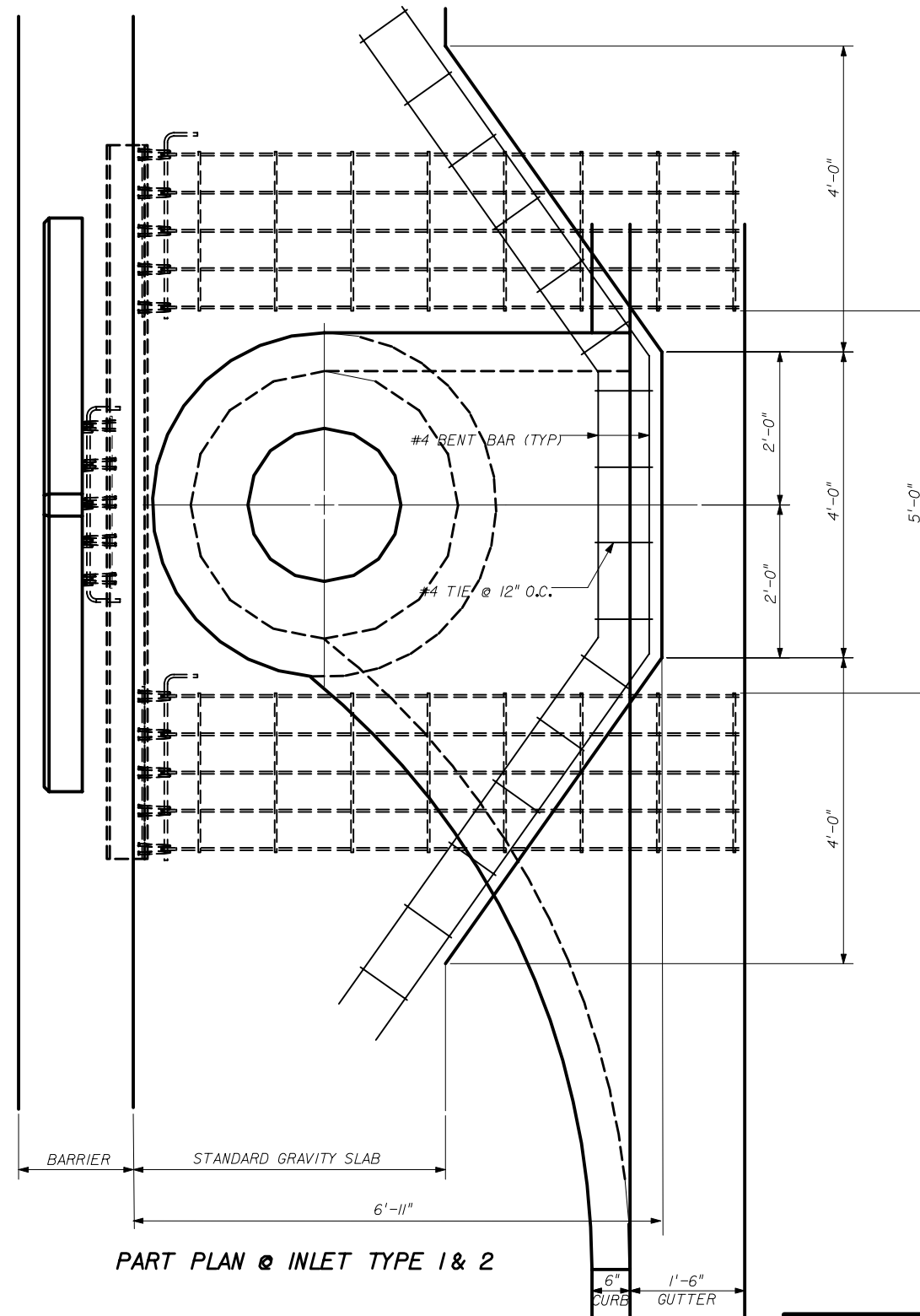
DESIGNER:
 THE NEEL COMPANY
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 SPRINGFIELD, VIRGINIA 22152
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 FX: (703) 913-7859

PRECASTER:
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 FX: (904) 768-8428

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
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PART SECTION @ INLET TYPE 1 & 2
 NOTE: GRID RELOCATION HARDWARE, SEE SHEET 13 OF 20 FOR DETAILS



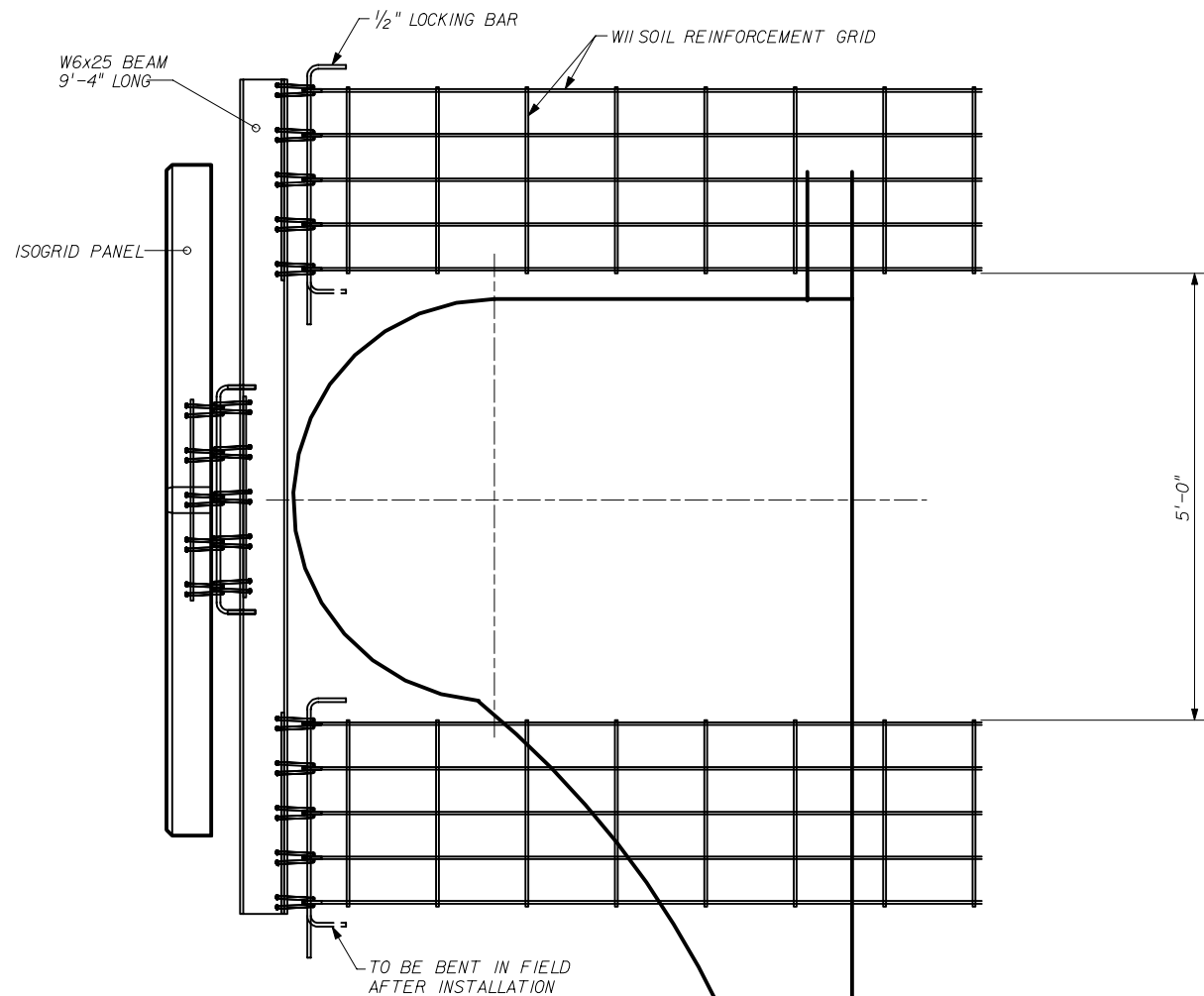
PART PLAN @ INLET TYPE 1 & 2

GRAVITY SLAB AT INLET TYPE 1 & 2

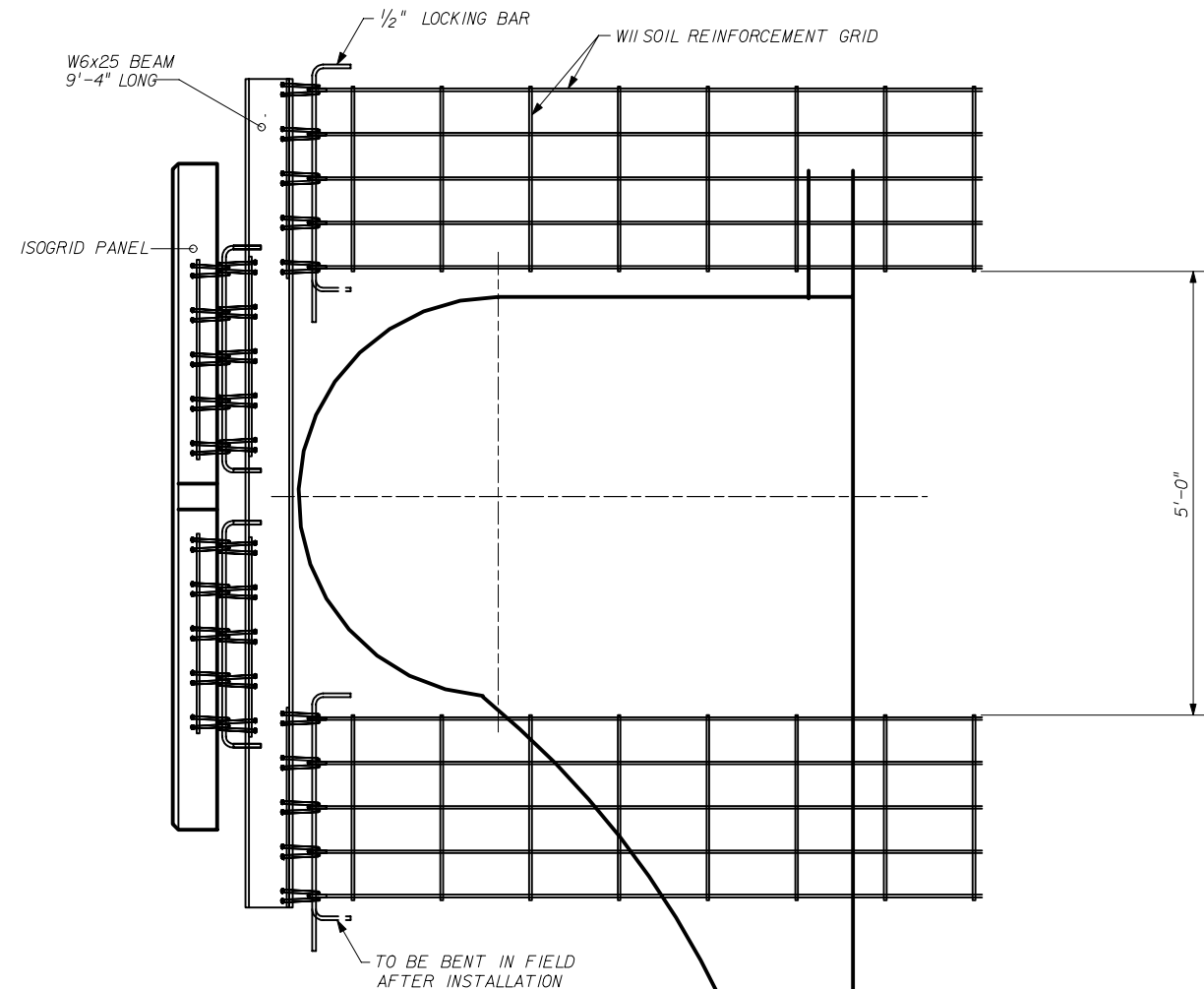
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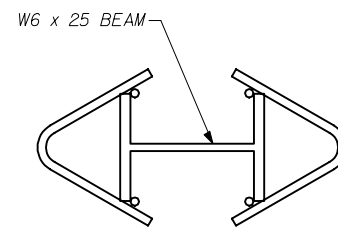
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
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				5012



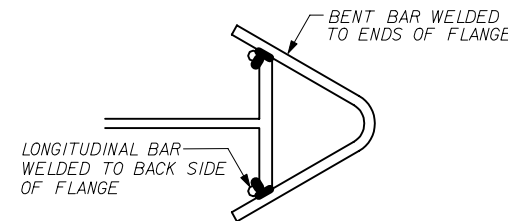
SOIL GRID RELOCATION HARDWARE FOR SINGLE GRID PANEL
(2 ea. REQUIRED)



SOIL GRID RELOCATION HARDWARE FOR DOUBLE GRID PANEL
(3 ea. REQUIRED)



SECTION THRU BEAM
(NO SCALE)



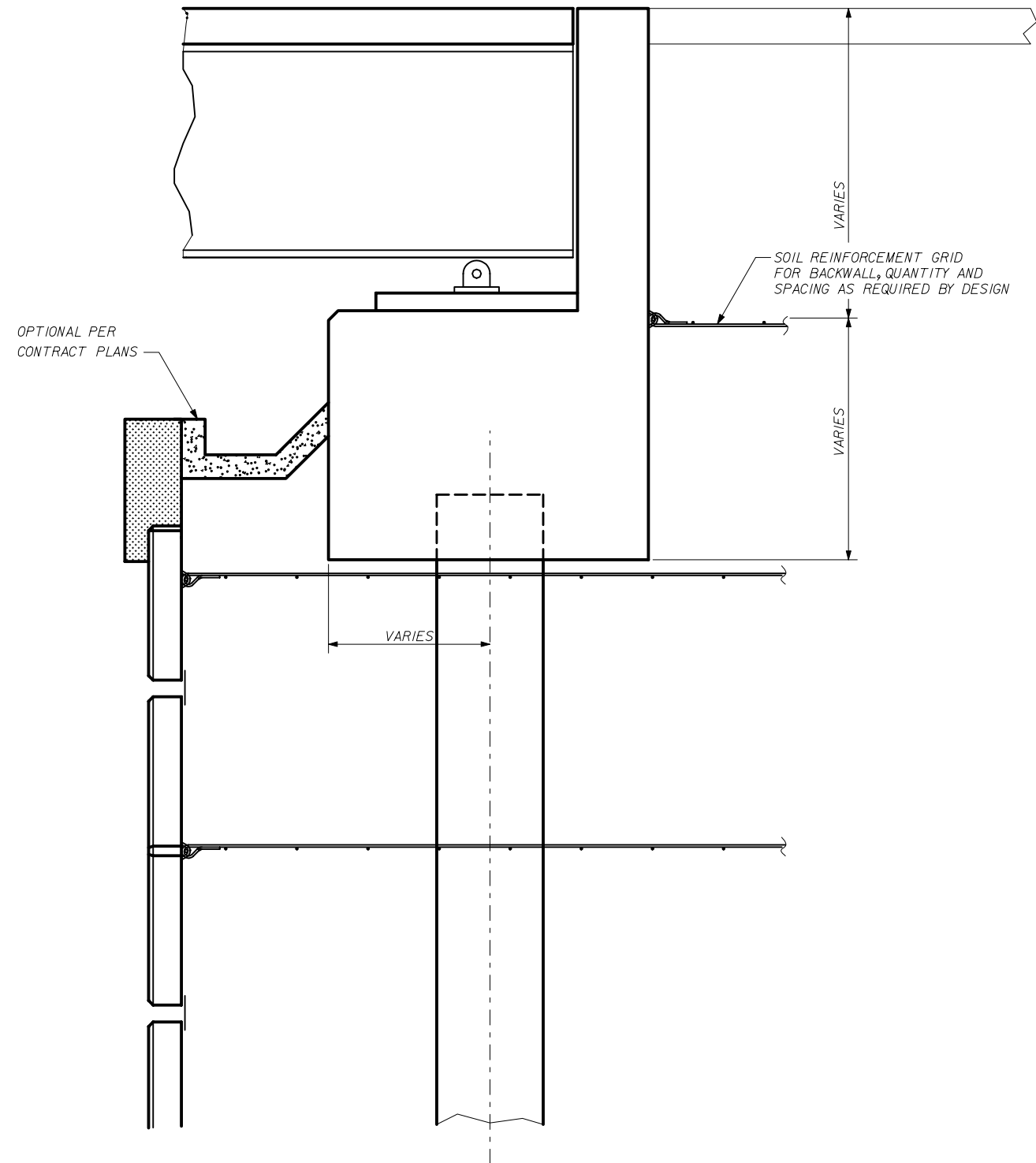
- NOTES:**
- WELDING:**
 - *CONNECTION INSERTS TO BE WELDED TO W6 x 25 BEAM.
 - GALVANIZATION:**
 - *AFTER FABRICATION, BEAM/INSERT ASSEMBLY TO BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 (AASHTO M111-80)

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Checked By JMC	10/01/98	04	13 of 20	5012

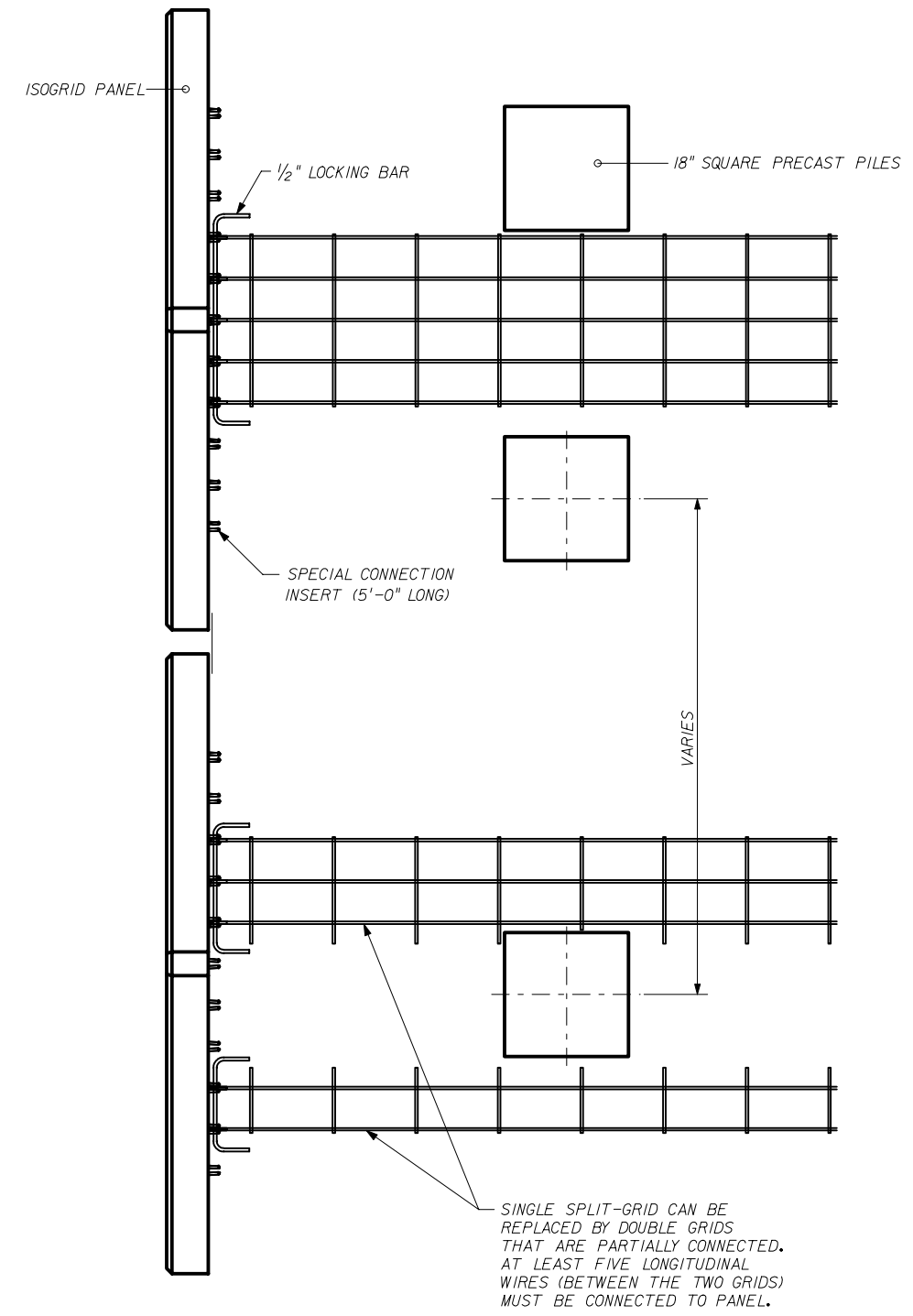
DESIGNER:

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SECTION THRU ABUTMENT




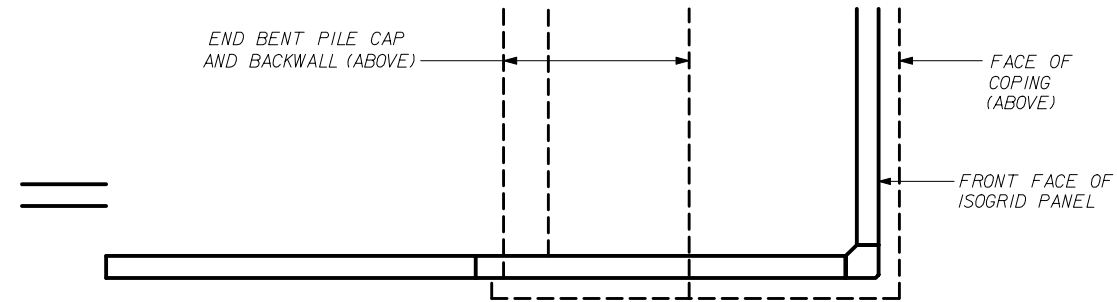
PLAN VIEW OF GRID/PILE ARRANGEMENT

DESIGNER:

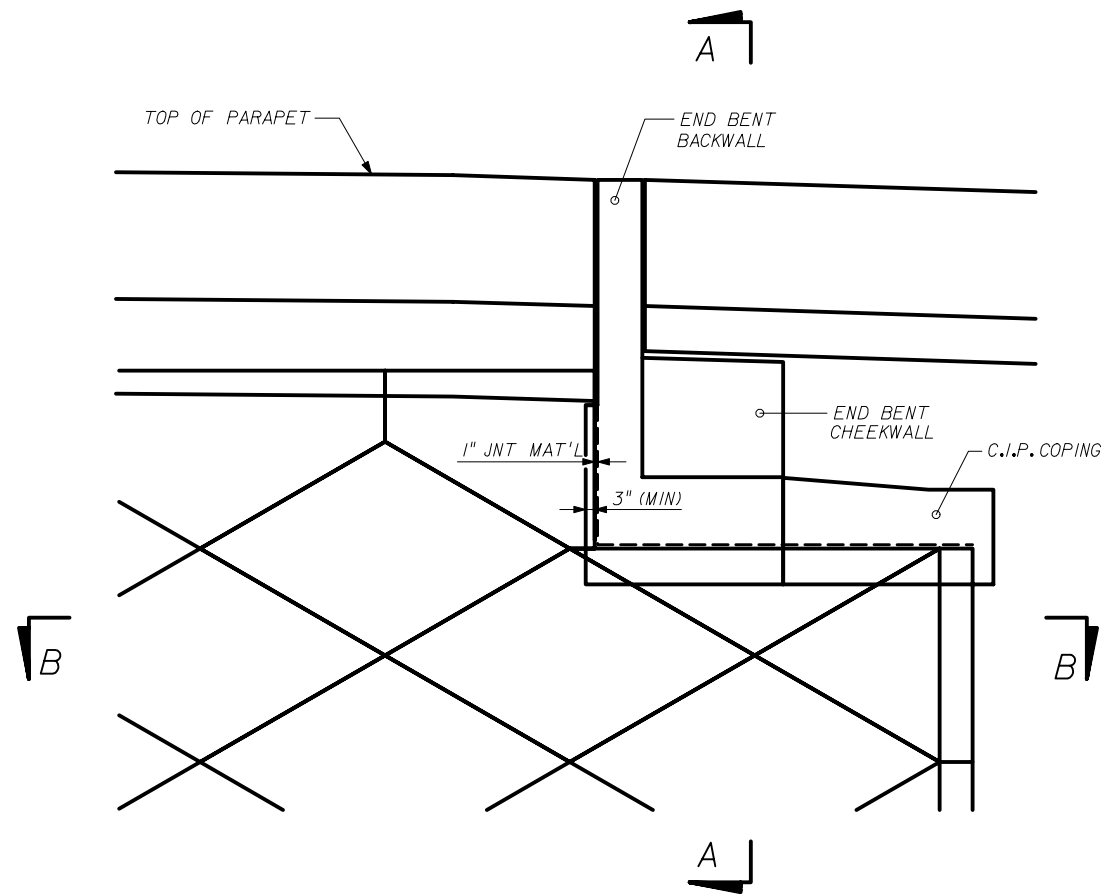
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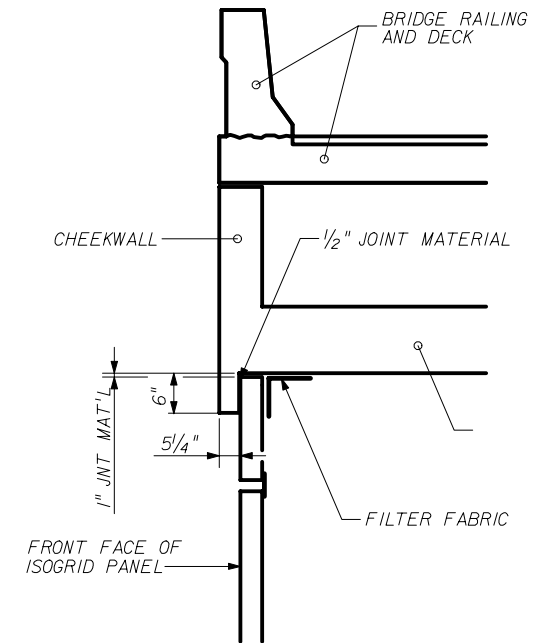
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THE NEEL COMPANY ISOGRID				
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SECTION B-B
STEM / END BENT PILE INTERFACE



PART ELEVATION SHOWING
WINGWALL / END BENT INTERFACE




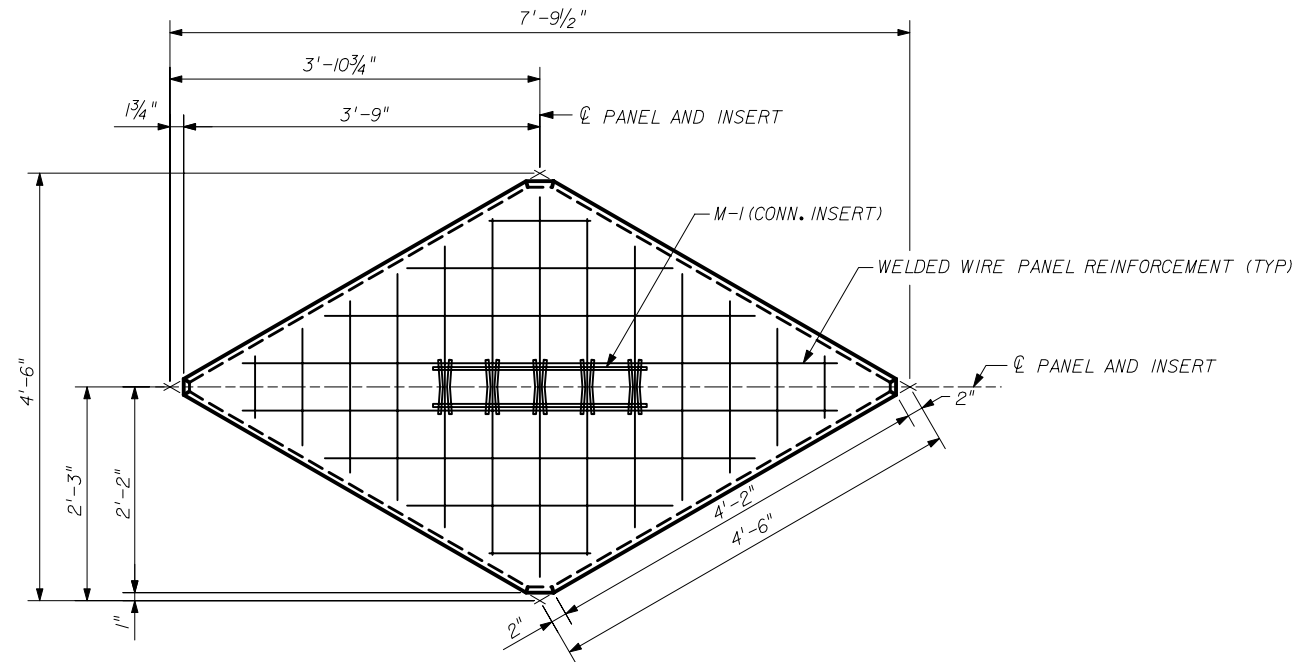
SECTION A-A
SECTION THRU PILE CAP

DESIGNER:

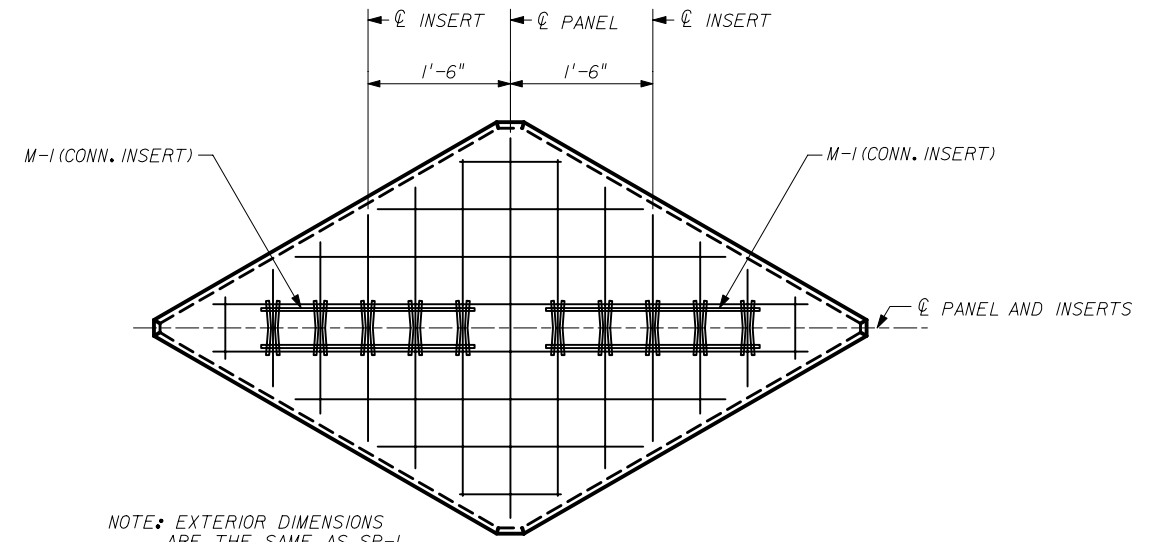
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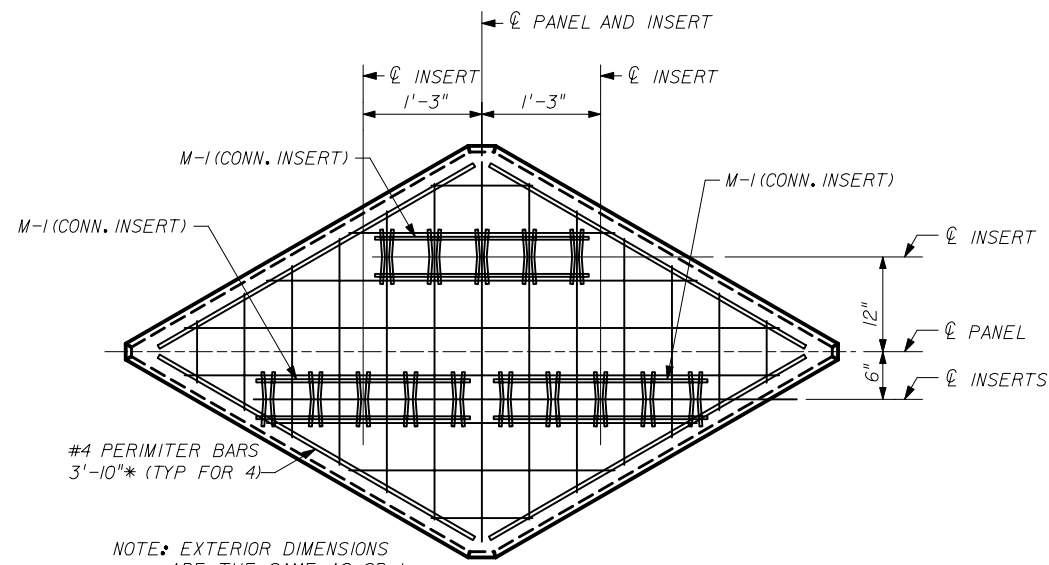


SP-1
FULL-SIZE PANEL - ONE GRID
ELEVATION (REAR FACE)



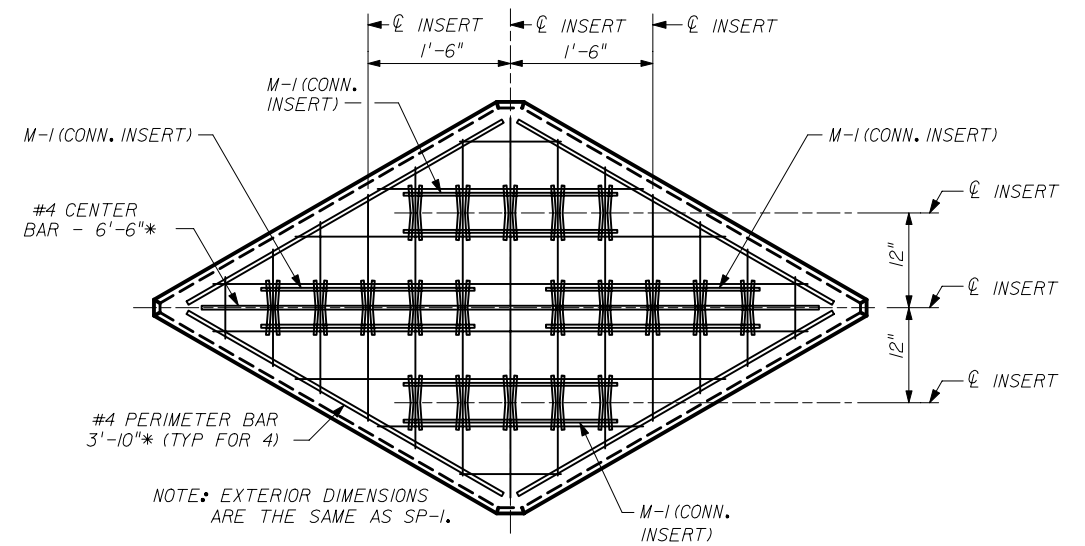
NOTE: EXTERIOR DIMENSIONS
ARE THE SAME AS SP-1.

SP-2
FULL-SIZE PANEL - TWO GRIDS
ELEVATION (REAR FACE)



NOTE: EXTERIOR DIMENSIONS
ARE THE SAME AS SP-1.

SP-3
FULL-SIZE PANEL - THREE GRIDS
ELEVATION (REAR FACE)



NOTE: EXTERIOR DIMENSIONS
ARE THE SAME AS SP-1.

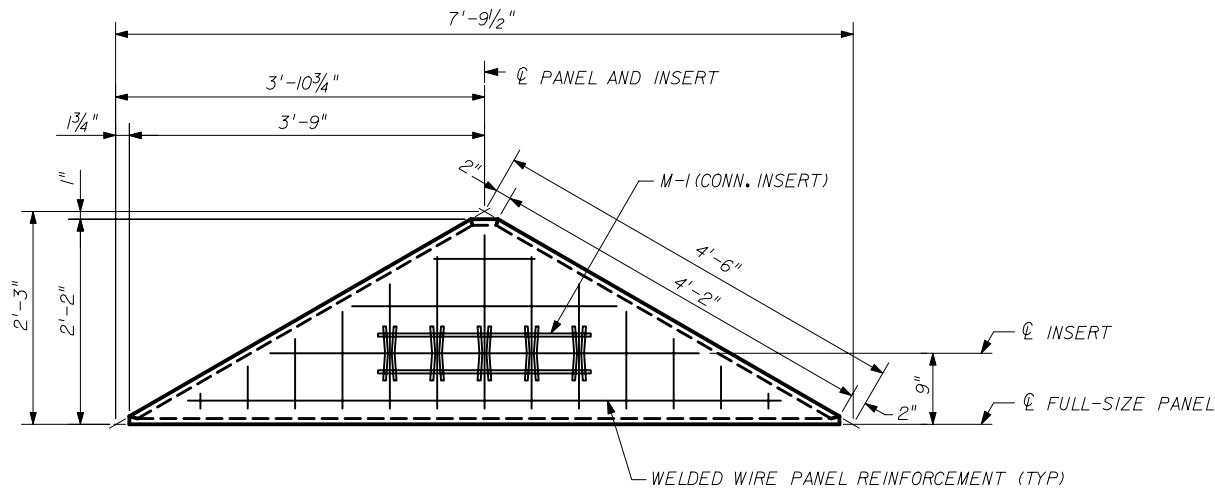
SP-4
FULL-SIZE PANEL - FOUR GRIDS
ELEVATION (REAR FACE)

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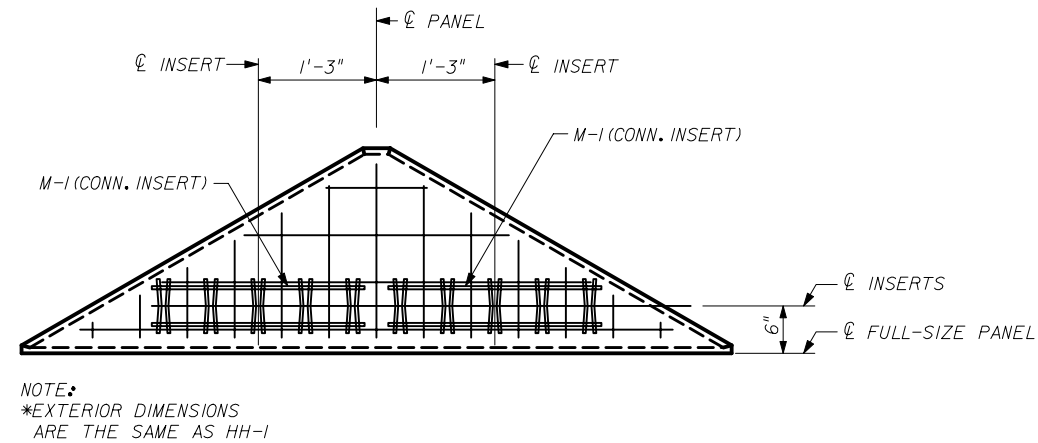
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NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

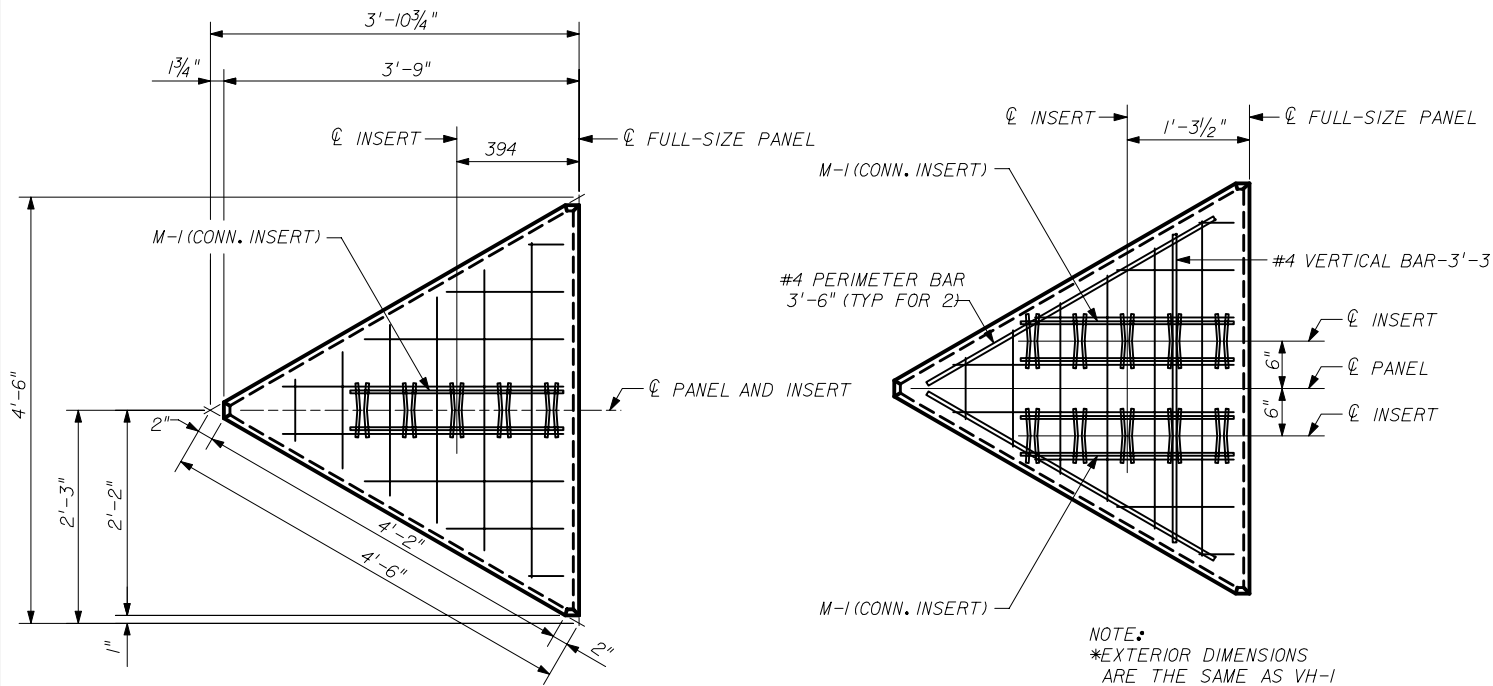
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				5012



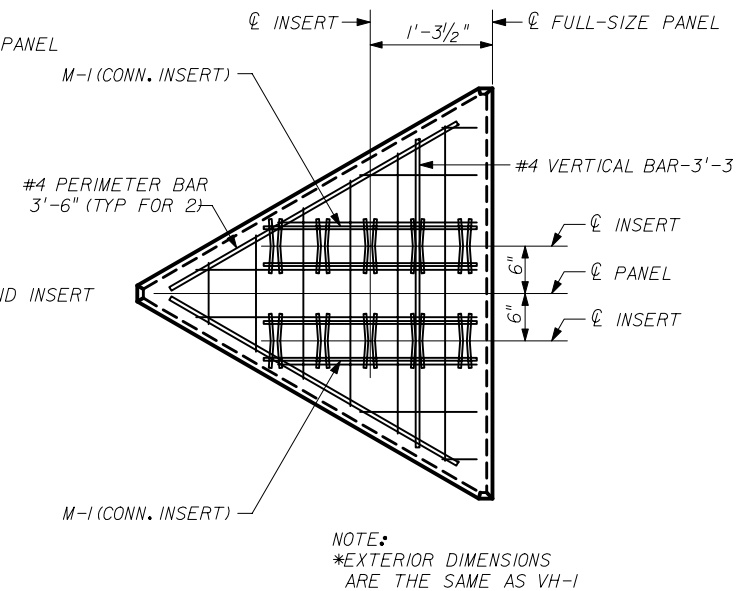
HH-1
HORIZ.-HALF PANEL - ONE GRID
ELEVATION (REAR FACE)



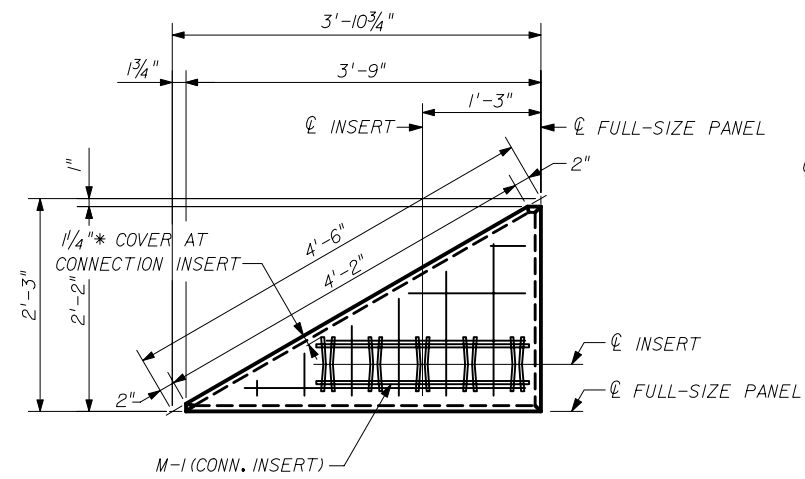
HH-2
HORIZ.-HALF PANEL - TWO GRIDS
ELEVATION (REAR FACE)



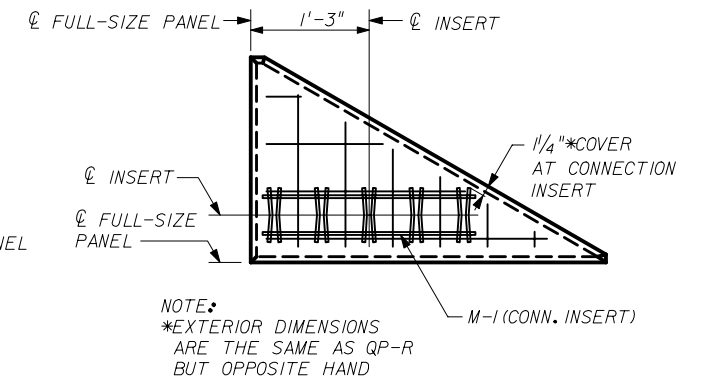
VH-1
VERT.-HALF PANEL - ONE GRID
ELEVATION (REAR FACE)



VH-2
VERT.-HALF PANEL - TWO GRIDS
ELEVATION (REAR FACE)



QP-R
TOP RIGHT / BOTTOM LEFT
QUARTER PANEL - ONE GRID
ELEVATION (REAR FACE)



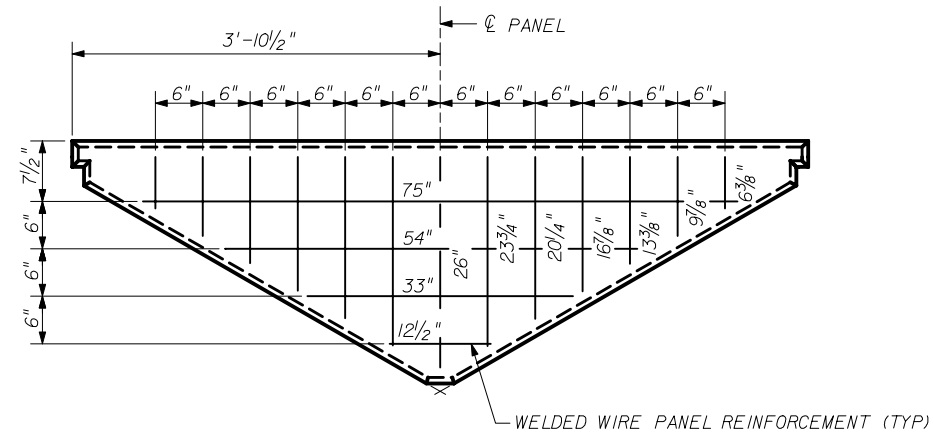
QP-L
TOP LEFT / BOTTOM RIGHT
QUARTER PANEL - ONE GRID
ELEVATION (REAR FACE)

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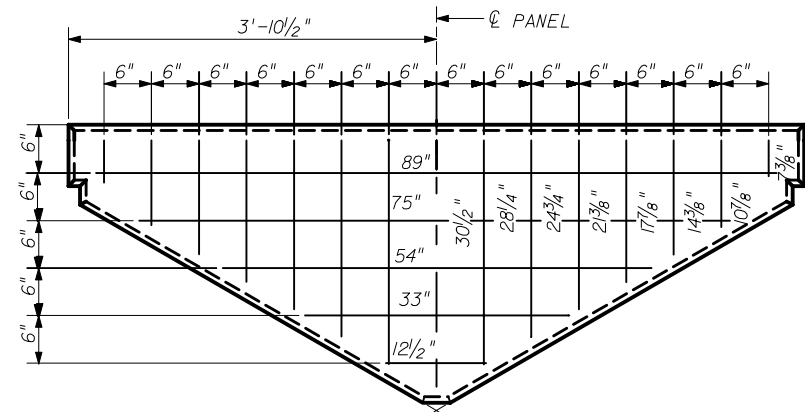
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NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

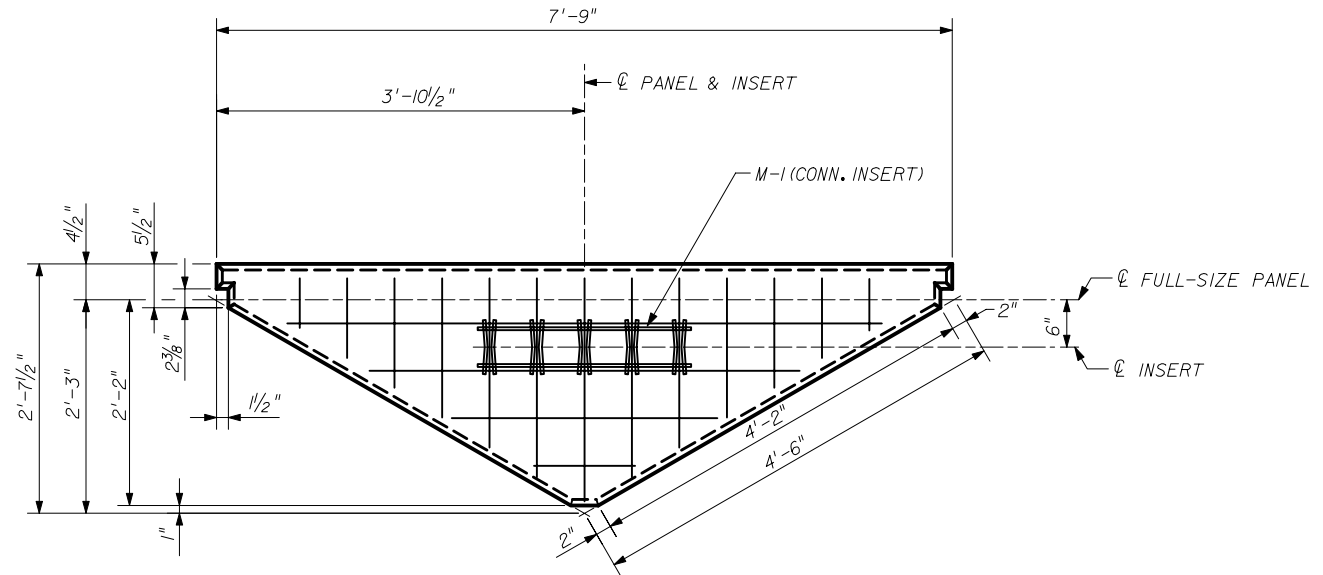
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	03/20/98	Revision	Sheet No. Index No.
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**WELDED WIRE MESH PANEL REINFORCEMENT - X-1 PANEL
ELEVATION (REAR FACE)**

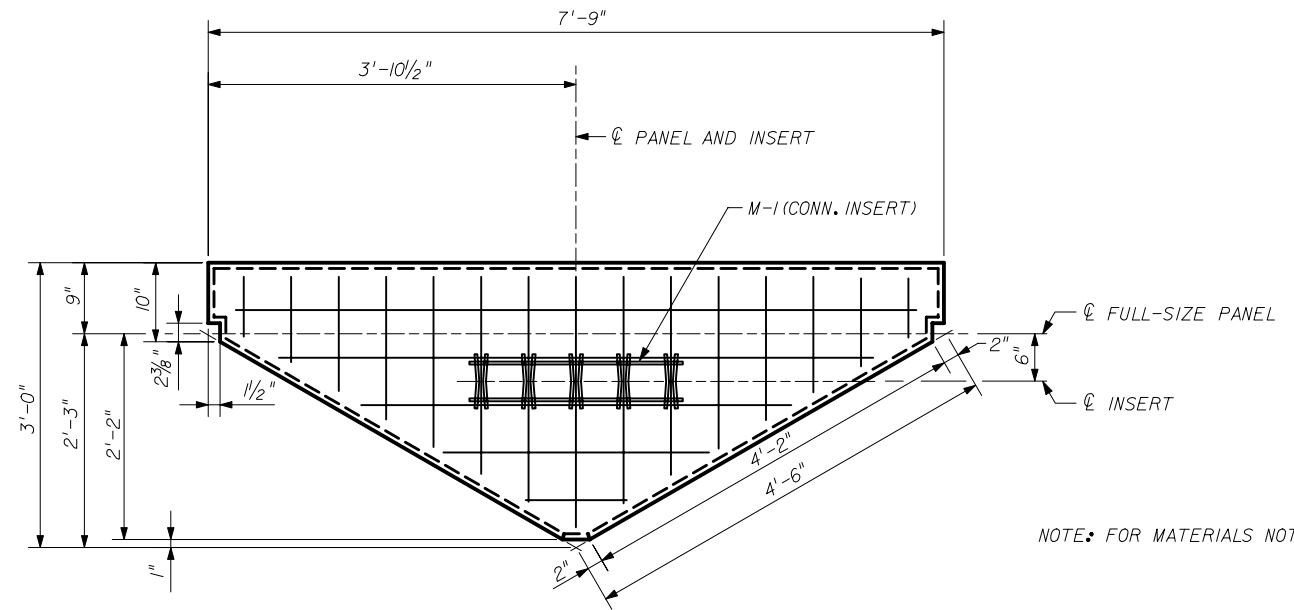


**WELDED WIRE MESH PANEL REINFORCEMENT - X-2 PANEL
ELEVATION (REAR FACE)**



**X-1
4 1/2" RISER - ONE GRID**

ELEVATION (REAR FACE)



**X-2
9" RISER PANEL - ONE GRID
ELEVATION (REAR FACE)**


NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

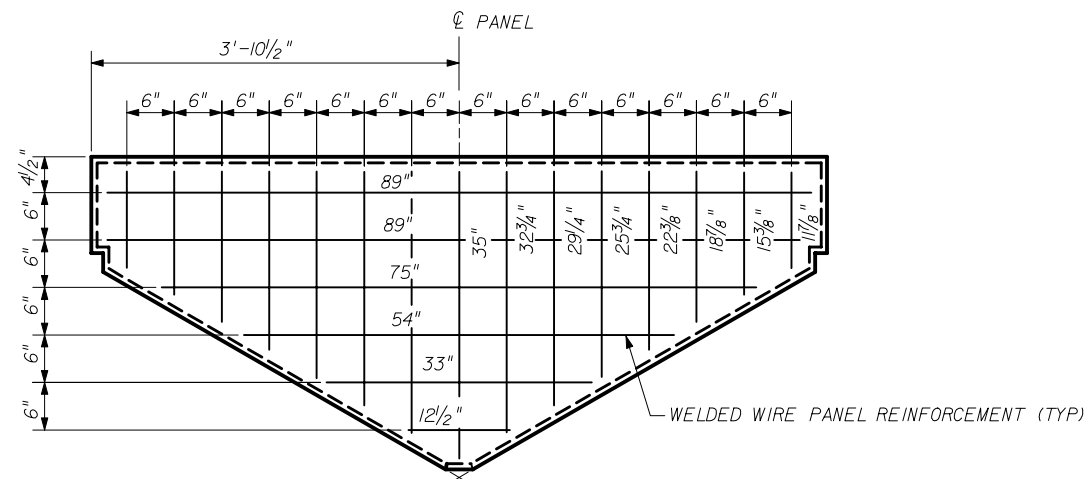
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PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
FX: (904) 768-8428

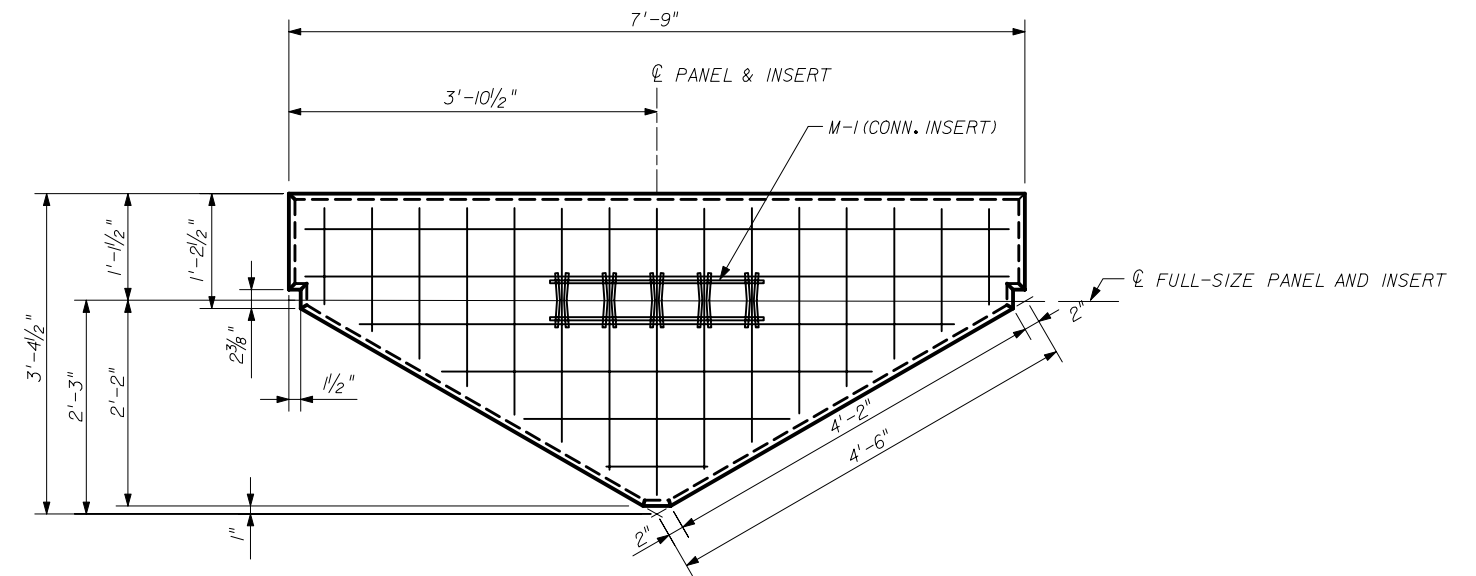
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID**

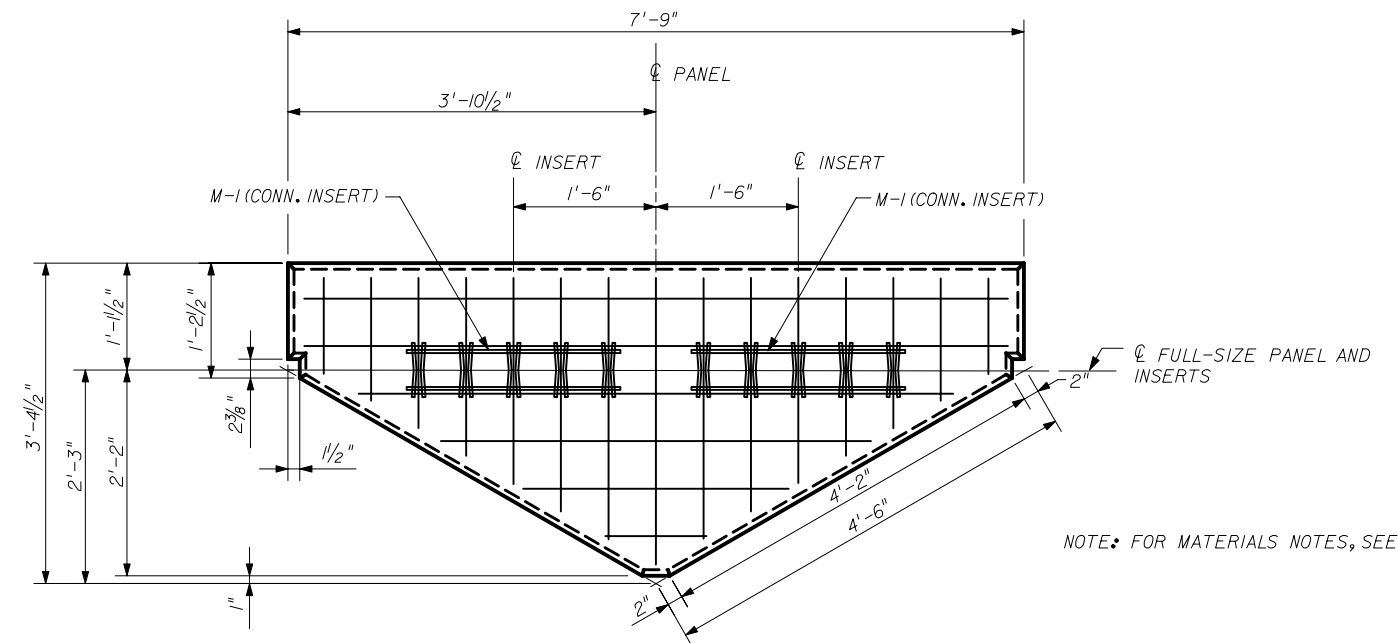
Names		Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer		
Drawn By	CAA	10/01/98			
Checked By	JMC	10/01/98	Revision	Sheet No.	Index No.
			04	18 of 20	5012



WELDED WIRE MESH PANEL REINFORCEMENT - X-3 AND X-3(2) PANELS
ELEVATION (REAR FACE)



X-3
13 1/2" RISER - ONE GRID
ELEVATION (REAR FACE)



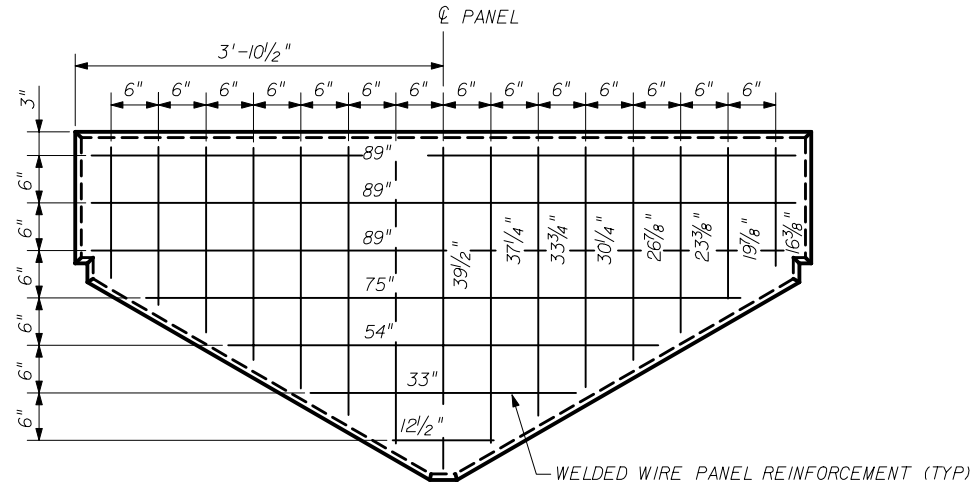
X-3 (2)
13 1/2" RISER - TWO GRIDS
ELEVATION (REAR FACE)

NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

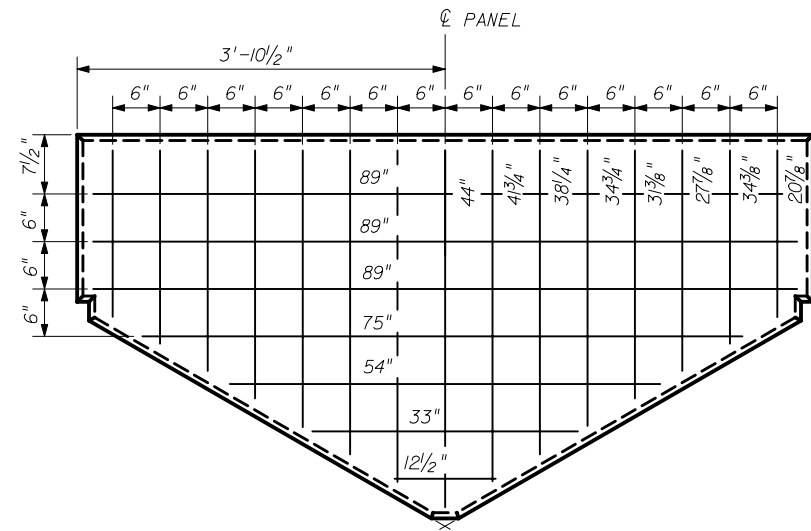
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
5995 SOUTEL DR.
JACKSONVILLE, FL 32219
PH: (904) 768-7081
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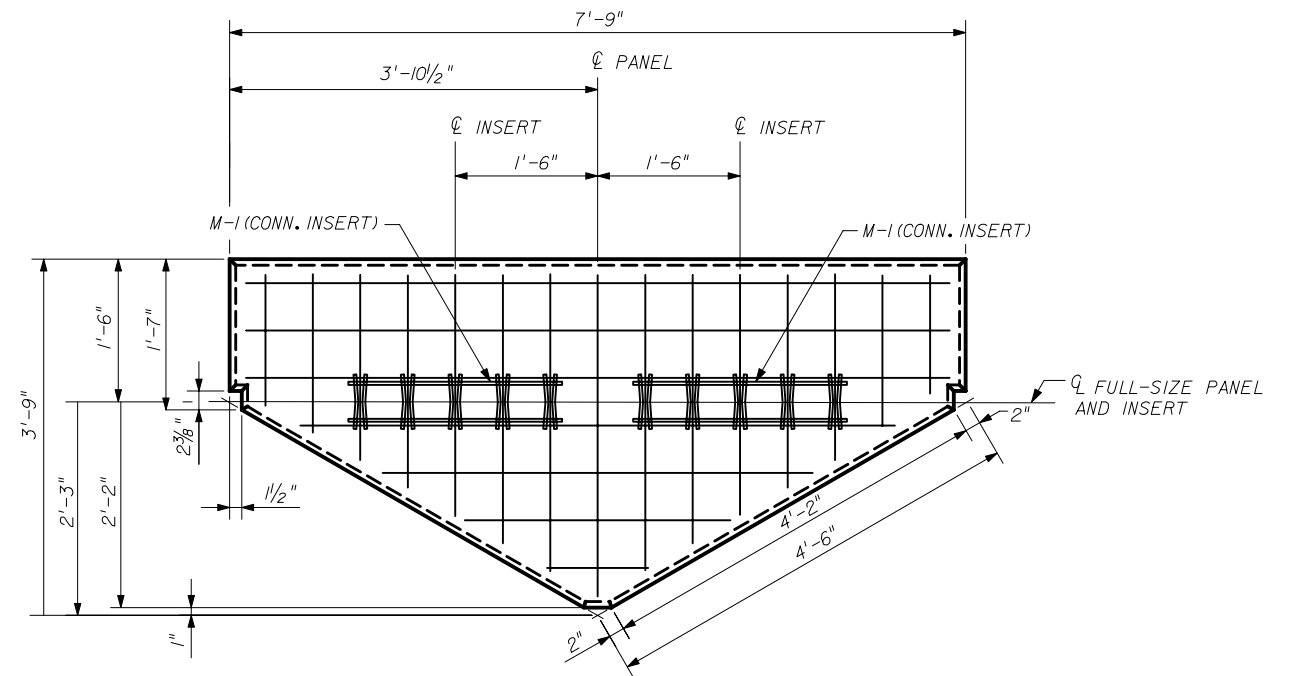
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	19 of 20
				5012



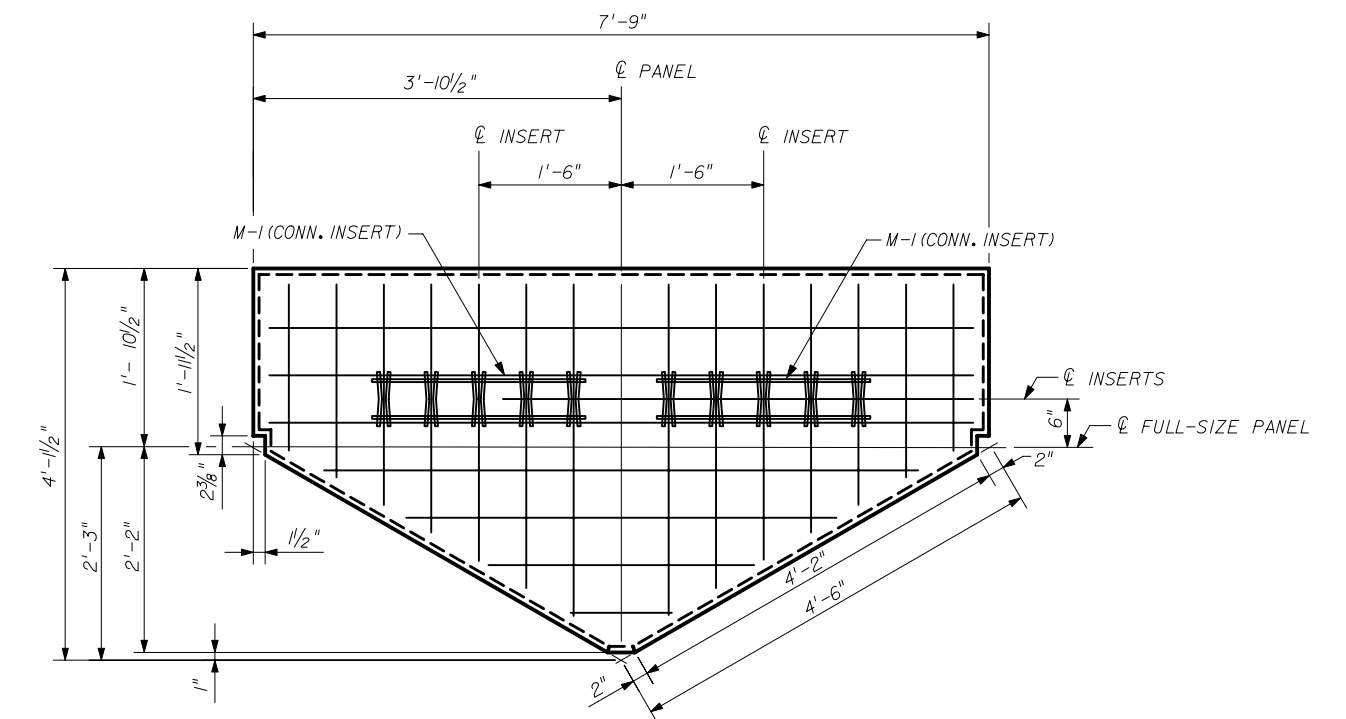
WELDED WIRE MESH PANEL REINFORCEMENT - X-4 PANEL
ELEVATION (REAR FACE)



WELDED WIRE MESH PANEL REINFORCEMENT - X-5 PANEL
ELEVATION (REAR FACE)



X-4
18" RISER - TWO GRIDS
ELEVATION (REAR FACE)




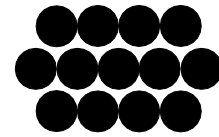
X-5
22 1/2" RISER - TWO GRIDS
ELEVATION (REAR FACE)

DESIGNER:
 THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
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PRECASTER:
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NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	04	20 of 20
				5012



TAI

The Reinforced Earth Company

8614 WESTWOOD CENTER DRIVE SUITE 1100, VIENNA VIRGINIA 22182 (703) 821-1175

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE REINFORCED EARTH VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE CONTRACTING AGENCY'S TECHNICAL SPECIFICATIONS (SECTION 548) FOR REINFORCED EARTH WALLS
2. SOIL PARAMETERS:
SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE (ϕ), COHESION (c) AND TOTAL UNIT WEIGHT (γ) SHALL BE PROVIDED IN THE SHOP DRAWINGS.
3. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE OWNER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED EARTH VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.
5. REINFORCING STRIPS FOR REINFORCED EARTH WALLS SHALL BE 1 3/32" WIDE AND 9/32" THICK, AND SHALL CONFORM TO THE PHYSICAL AND MECHANICAL PROPERTIES OF ASTM A-572 GRADE 65. GALVANIZATION SHALL BE APPLIED IN ACCORDANCE WITH ASTM A-123.
6. THE MINIMUM FACTORS OF SAFETY REQUIRED FOR DESIGN
OVERTURNING = 2.0
SLIDING = 1.5
INTERNAL PULLOUT = 1.5
(ALLOWABLE DEFORMATION = 0.75 INCH)
BEARING CAPACITY = 2.5
OVERALL STABILITY = 1.5
STEEL SOIL REINFORCEMENT = 0.55F_y AT END OF DESIGN LIFE AND 0.50 F_u AT NET SECTION OF BOLTED CONNECTION
MAXIMUM PULLOUT FACTOR f* (FOR SAND) = 1.5
(FOR LIMEROCK) = 2.0

WALL CONSTRUCTION

7. REINFORCED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 4'-11" EACH TO MATCH DESIRED WALL ALIGNMENT.
8. FOR LOCATION AND ALIGNMENT OF REINFORCED EARTH WALLS, SEE RETAINING WALL CONTROL PLANS.
9. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.
10. IF PILES ARE LOCATED WITHIN THE REINFORCED EARTH VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE REINFORCED EARTH WALL UNLESS A METHOD TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE REINFORCED EARTH COMPANY, AND IS PROPOSED AND APPROVED IN WRITING.

11. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SEC 548 TO A LEVEL OF 2" ± ABOVE THE TIE STRIPS EMBEDDED IN THE PANELS. INSTALLATION OF REINFORCING STRIPS SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
12. IF STRUCTURES IN EXCESS OF 20' IN HEIGHT OCCUR, THE FINISHED GRADE IN FRONT OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS A HEIGHT OF 20'. FINISHED GRADE BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
13. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS BEHIND THE REINFORCED EARTH PANELS PRIOR TO PLACEMENT OF THE TOP LAYER OF REINFORCING STRIPS. INDIVIDUAL STRIPS MAY BE SKEWED UP TO 15° TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER. ANY DAMAGE DONE TO THE REINFORCING STRIPS DUE TO THE INSTALLATION OF THE GUARDRAIL SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
14. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN THE REINFORCED EARTH VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING STRIPS AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN.
15. TOP PANELS BENEATH COPING SHALL HAVE #4 DOWELS PROTRUDING FROM THEIR TOP EDGE.
16. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO THE REINFORCED EARTH CONSTRUCTION MANUAL.
17. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING STRIPS DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPERELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

18. NOMINAL STRIP LENGTHS
THE REINFORCING STRIP LENGTHS SHOWN ON THE PLANS, MEASURED FROM BACK FACE OF PANEL, ARE THE NOMINAL LENGTHS REQUIRED BY CALCULATION. THE ACTUAL FABRICATED STRIP LENGTHS ARE OFTEN LONGER (UP TO 6") DUE TO MANUFACTURING TOLERANCES. THE REQUIRED HORIZONTAL LIMIT OF GRANULAR BACKFILL IS EQUAL TO THE NOMINAL STRIP LENGTH.
19. PANEL FINISH
THE PRECAST PANELS FOR THIS PROJECT SHALL HAVE A PLAIN STEEL FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINING WALL CONTROL PLANS.

20. NOTE TO CONTRACTORS

ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY THE REINFORCED EARTH COMPANY:

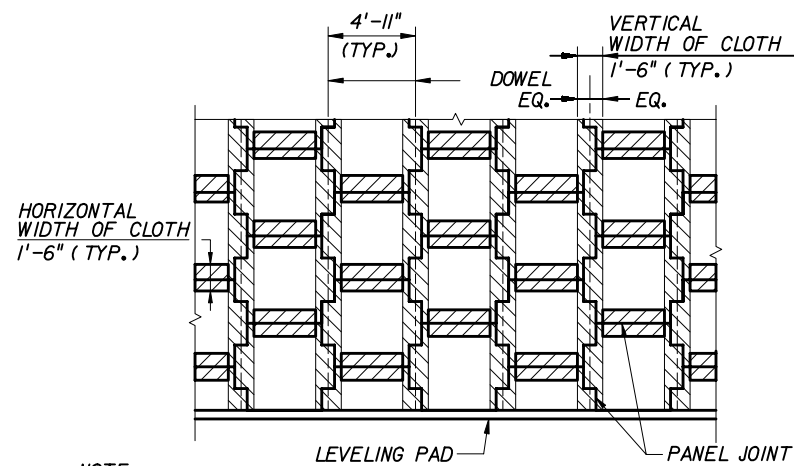
- PRECAST CONCRETE FACING PANELS
- REINFORCING STRIPS
- BOLT SETS (FOR ATTACHING PANELS TO THE REINFORCING STRIPS)
- BEARING BLOCKS
- RUBBER SHIMS
- FILTER CLOTH AND ADHESIVE (FOR PANEL JOINTS ONLY)

ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTION CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED/INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

21. THE REINFORCED EARTH COMPANY SUPPLIES PRECAST CONCRETE FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF THE REINFORCED EARTH® RETAINING WALLS DETAILED HEREIN. THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY THE REINFORCED EARTH COMPANY IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE, PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA. COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.
22. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE REINFORCED EARTH COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.
23. THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO THE INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY
24. THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO THE REINFORCED EARTH COMPANY, AND IS BEING FURNISHED FOR THE USE IN CONNECTION WITH FDOT PROJECTS ONLY, AND THE INFORMATION CONTAINED HEREIN IS NOT TO BE TRANSMITTED TO ANY OTHER ORGANIZATION UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE REINFORCED EARTH COMPANY. THE REINFORCED EARTH COMPANY IS EXCLUSIVE LICENSEE IN THE UNITED STATES UNDER PATENTS ISSUED TO HENRY VIDAL, AND THE FURNISHING OF THIS DRAWING DOES NOT CONSTITUTE AN EXPRESSED OR IMPLIED LICENSE UNDER THE VIDAL PATENTS.

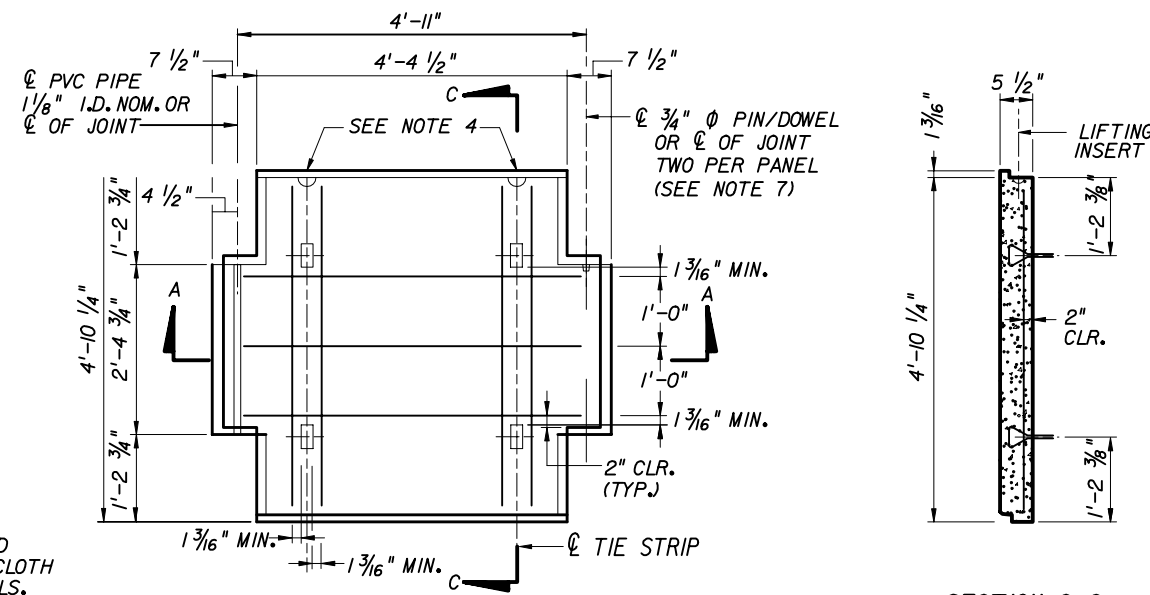
THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
	Names	Dates	Approved By <i>W. J. [Signature]</i>	
Designed By			State Structures Design Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			00	1 of 14 5015

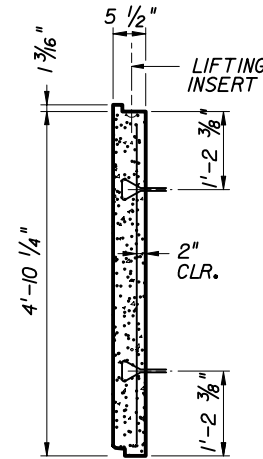


NOTE:
STRIPS OF FILTER CLOTH SHALL BE PLACED ON BACK FACE OF PANEL, OVER PANEL JOINTS. FILTER CLOTH SHALL BE ADHERED TO BACK FACE OF PANELS USING AN ADHESIVE COMPOUND SUPPLIED BY THE REINFORCED EARTH COMPANY. ADHESIVE SHALL BE APPLIED TO PANEL THEN FILTER CLOTH (CARTHAGE MILLS TYPE FX-40HS OR EQUAL) SHALL BE APPLIED TO PANELS.

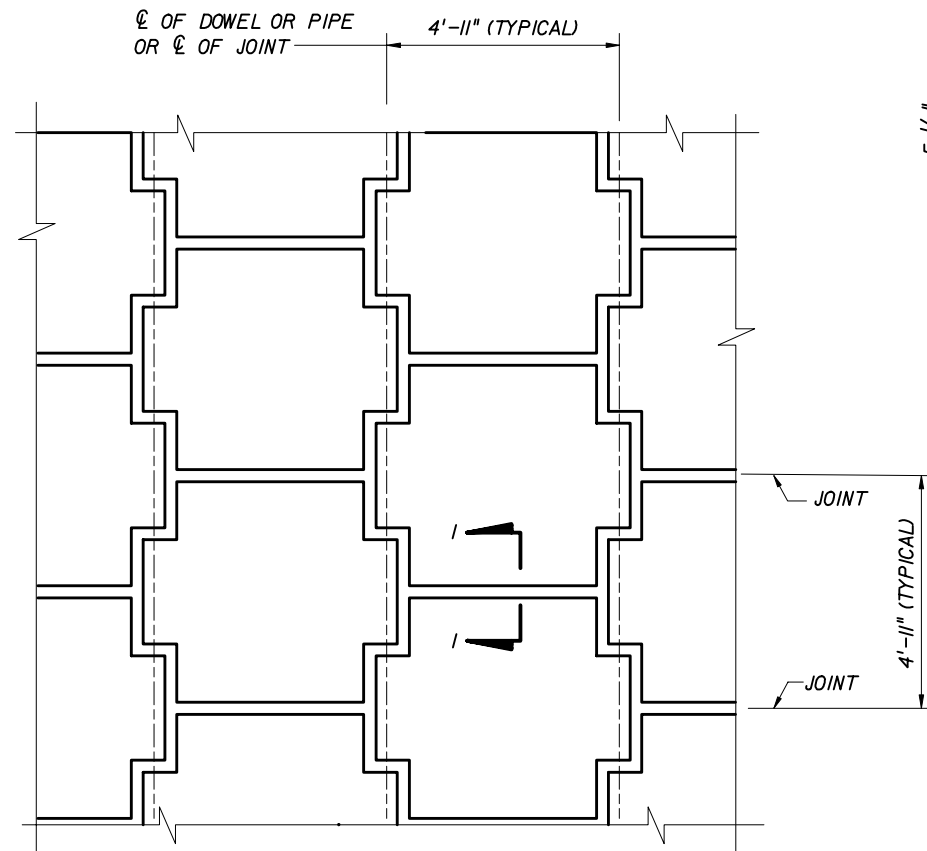
**FILTER CLOTH DETAIL
PARTIAL ELEVATION - BACK FACE**



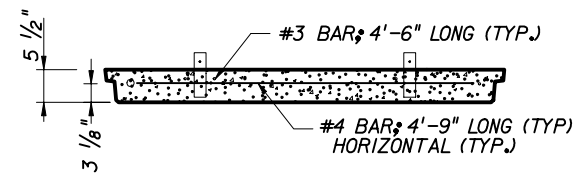
**PANEL TYPE "A"
WITH R4 REINFORCEMENT
FRONT VIEW**



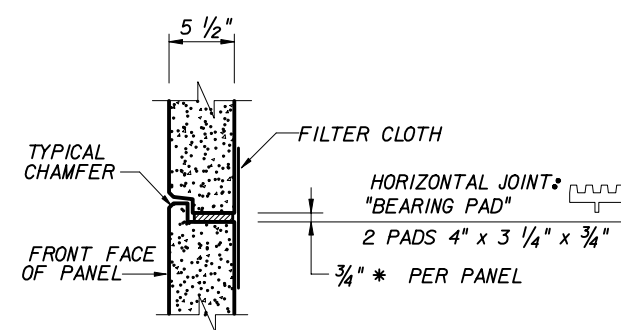
SECTION C-C



**TYPICAL PANEL LAYOUT
PARTIAL ELEVATION - FRONT FACE**



SECTION A-A



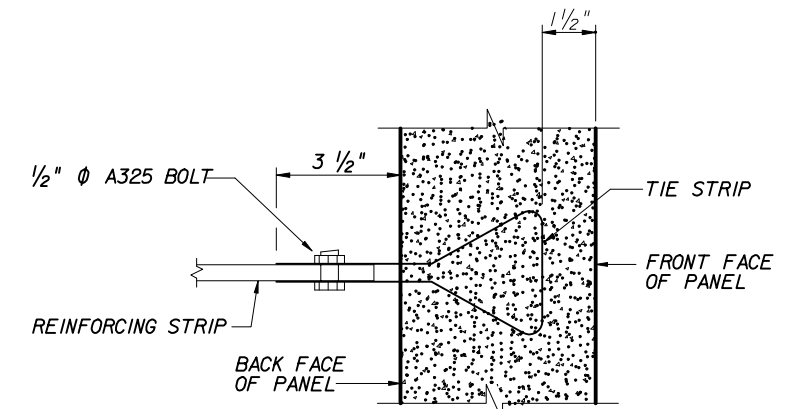
SECTION I-I

PANEL THICKNESS	REINFORCEMENT DESIGNATION	* PANEL REINFORCEMENT (IN ²)	MAXIMUM ALLOWABLE HORIZONTAL STRESS AT FACING (KPA)
5 1/2"	R4	0.44 VERTICAL 0.58 HORIZONTAL	1.19
	R6	0.66 VERTICAL 0.78 HORIZONTAL	1.46
	R7	1.18 VERTICAL 1.78 HORIZONTAL	2.58

* TOTAL AREA OF STEEL REQUIRED PER "TYPE A" PANEL.

NOTES:

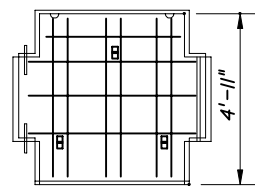
1. REINFORCING STEEL TO BE A615 GRADE 60.
2. 3/8" x 3/8" CHAMFER SHALL BE PROVIDED ON ALL EXPOSED EDGES (FRONT FACE ONLY).
3. ALL PANEL TYPES AND OTHER RELATED ELEMENTS WILL BE DETAILED ON SHOP DRAWINGS.
4. ALL PANELS SHALL HAVE TWO LIFTING INSERTS OF ONE TON CAPACITY EACH.
5. PANEL DESIGN THICKNESS IS 5 1/2". THICKNESS OF CONCRETE MUST INCREASE TO ACCOMMODATE ANY ARCHITECTURAL SURFACE FINISH THAT MAY BE SPECIFIED.
6. ACTUAL PANEL REINFORCEMENT FOR ALL PANEL TYPES ON THIS PROJECT IS DESIGNATED ABOVE. R4 ILLUSTRATED FOR INFORMATION ONLY.
7. EACH 3/4" Ø DOWEL SHALL HAVE A TYP. LENGTH OF 10". DOWELS MAY BE GALVANIZED STEEL OR PVC ROD. A SINGLE FULL LENGTH DOWEL MAY BE USED AT THE DISCRETION OF THE MANUFACTURER.



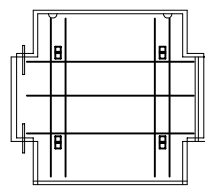
CONNECTION DETAIL

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM PANELS

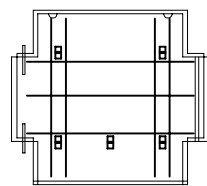
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 14	5015



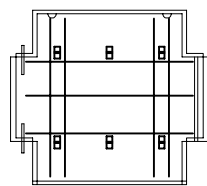
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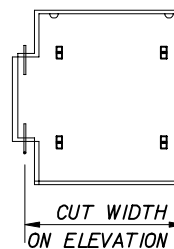
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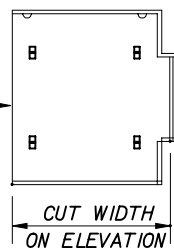
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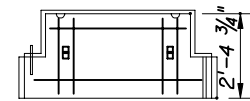
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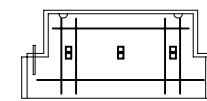
AL-4-R4



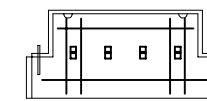
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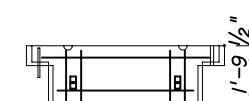
B-2-R4



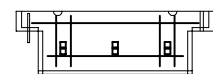
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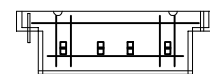
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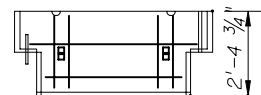
C-2-R4



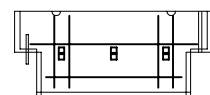
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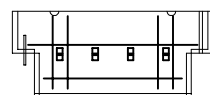
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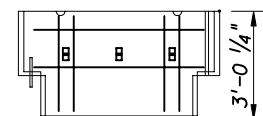
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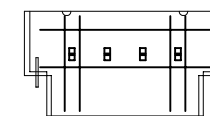
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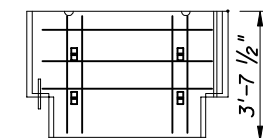
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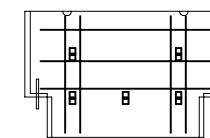
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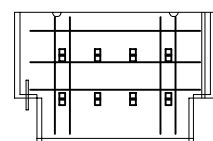
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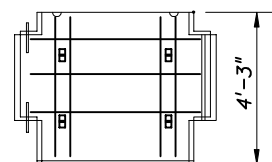
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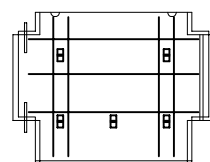
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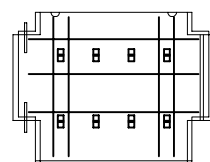
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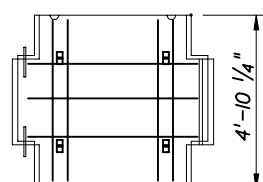
G-4-R4



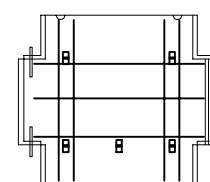
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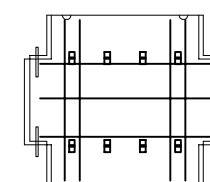
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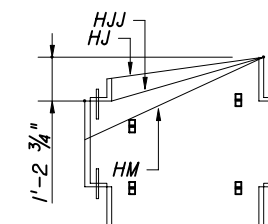
H-4-R4



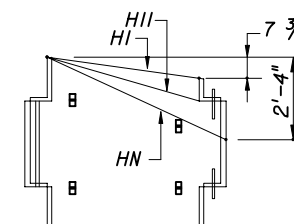
H-5-R4



H-8-R4

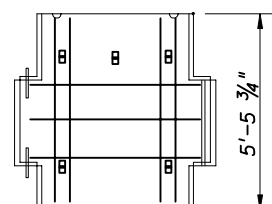


HJ-4-R4

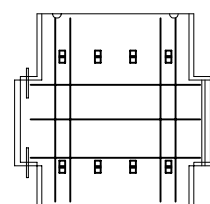


HI-4-R4

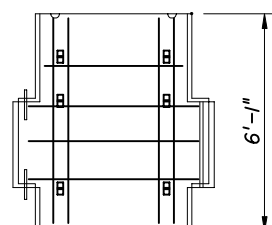
SLOPED TOP PANELS
"H" PANEL USED FOR ILLUSTRATION ONLY.



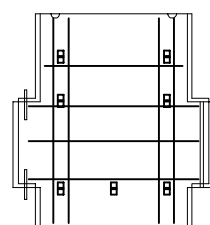
K-5-R4



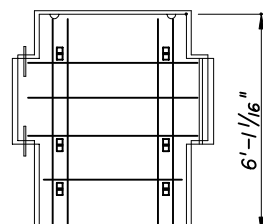
K-8-R4



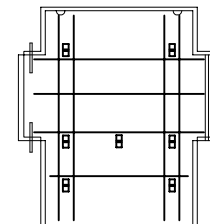
L-6-R4



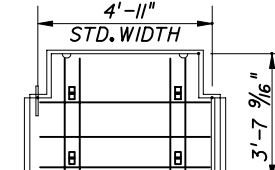
L-7-R4



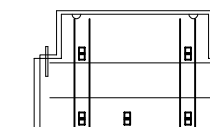
P-6-R4



P-7-R4



Q-4-R4



Q-5-R4

ALL PANELS ARE SHOWN BACK FACE VIEW

□ TIE STRIP LOCATION

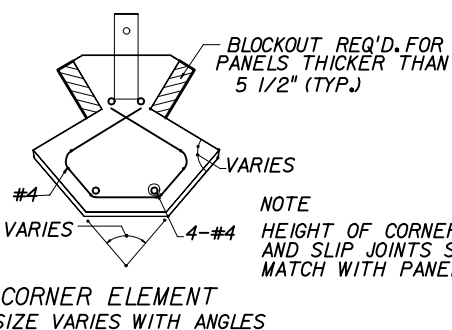
R4 VERTICAL BARS ARE #3 AS SHOWN
R5 HORIZONTAL BARS ARE #4 AS SHOWN

R6 VERTICAL BARS ARE 6-#3
R7 HORIZONTAL BARS ARE 4-#4

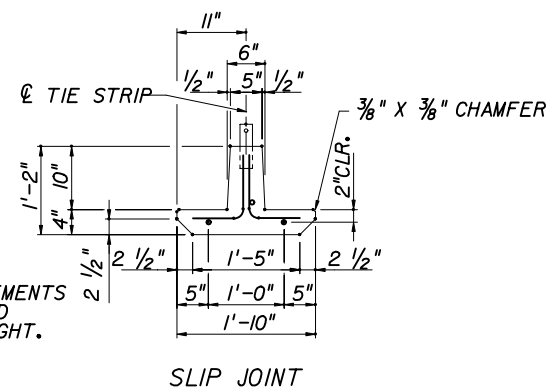
R7 VERTICAL BARS ARE 6-#4
R8 HORIZONTAL BARS ARE 4-#6

SEE PANEL TPE "A" WITH R4 REINFORCEMENT
ON SHEET TITLED "PANEL DETAILS" FOR TYPICAL
REINFORCEMENT SPACING

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR
MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM PANELS



NOTE
HEIGHT OF CORNER ELEMENTS
AND SLIP JOINTS SHOULD
MATCH WITH PANEL HEIGHT.

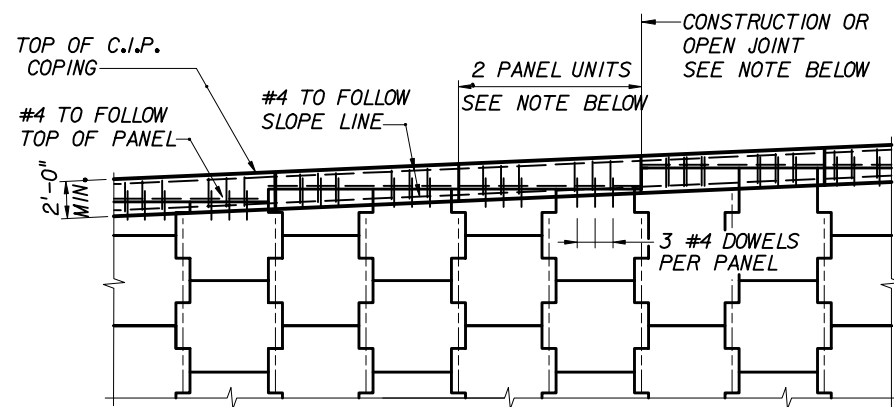


SLIP JOINT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

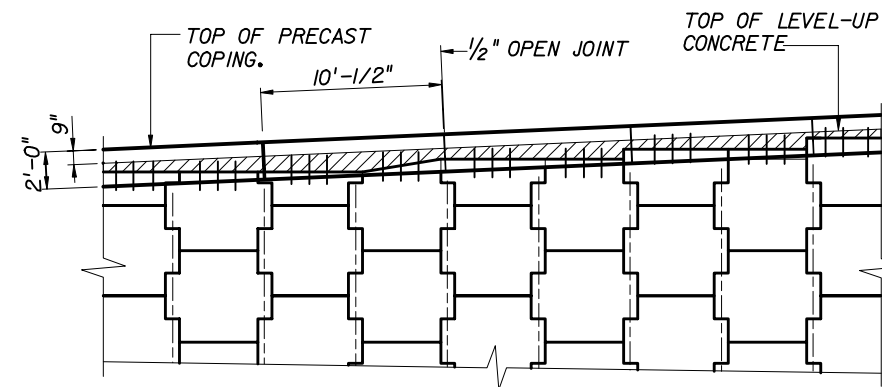
Designed By	Names	Dates	Approved By
Drawn By			W. J. [Signature]
Checked By	Revision	Sheet No.	Index No.
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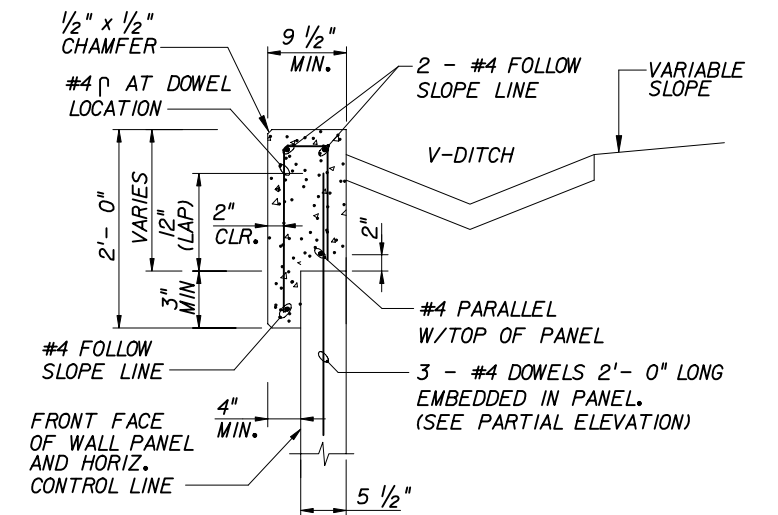
C.I.P. COPING - PARTIAL ELEVATION

NOTE:

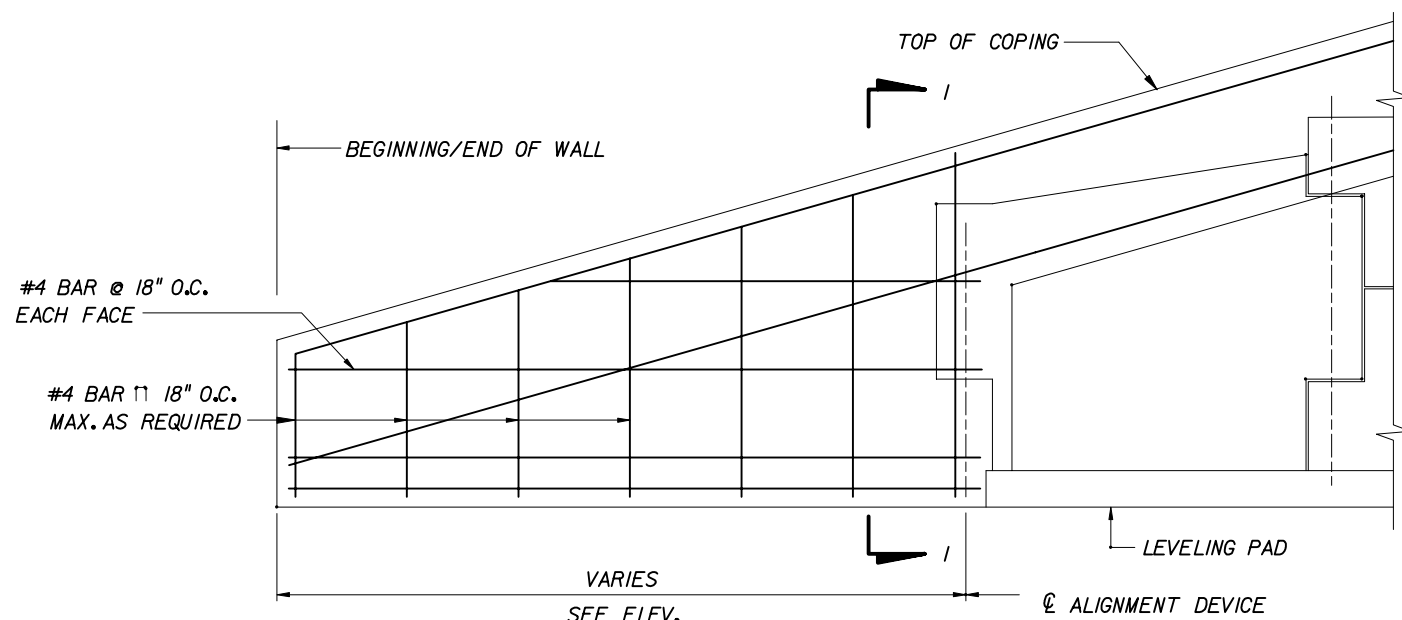
1/2-INCH OPEN JOINTS IN COPING SHALL BE AT 6 PANEL INTERVALS AND COINCIDE APPROXIMATELY WITH ϕ OF ALIGNMENT PINS. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE JOINTS. CONSTRUCTION JOINTS IN BETWEEN THE OPEN JOINTS SHALL BE PROVIDED AT 2 PANELS INTERVALS.



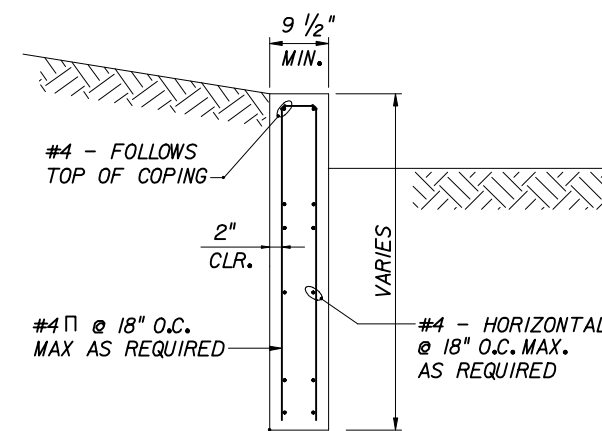
PRECAST COPING PARTIAL ELEVATION



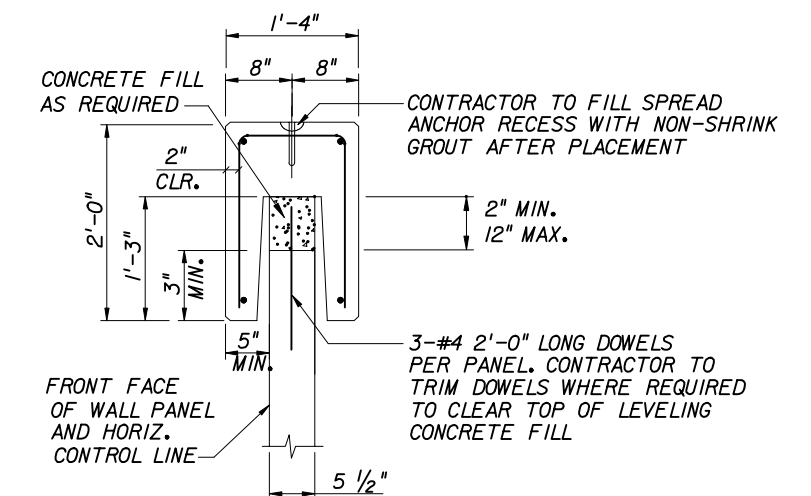
C.I.P. CONC. COPING W/DITCH



COPING ENCLOSURE DETAIL



SECTION A-A



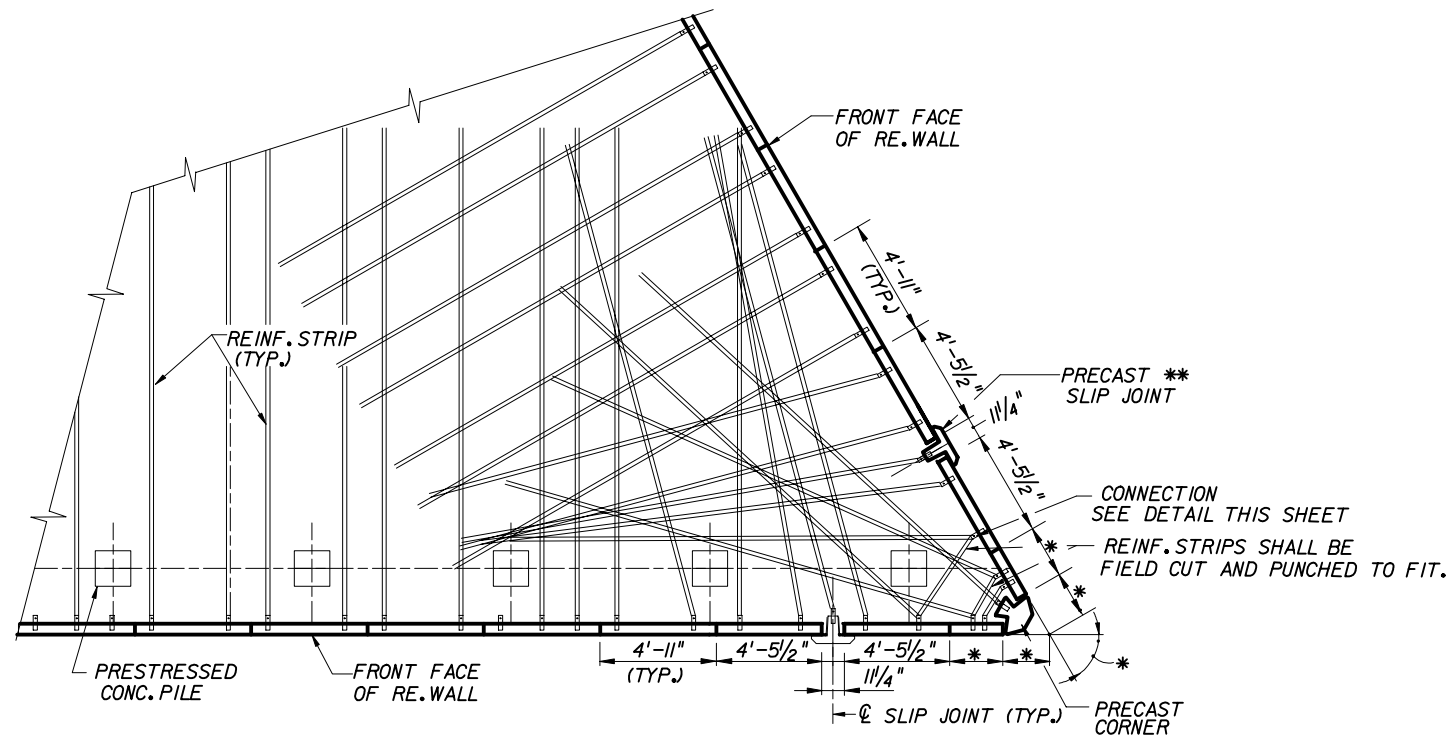
PRECAST COPING SECTION

NOTE:

STANDARD COPING UNIT IS 10' LONG WITH SQUARE ENDS.

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

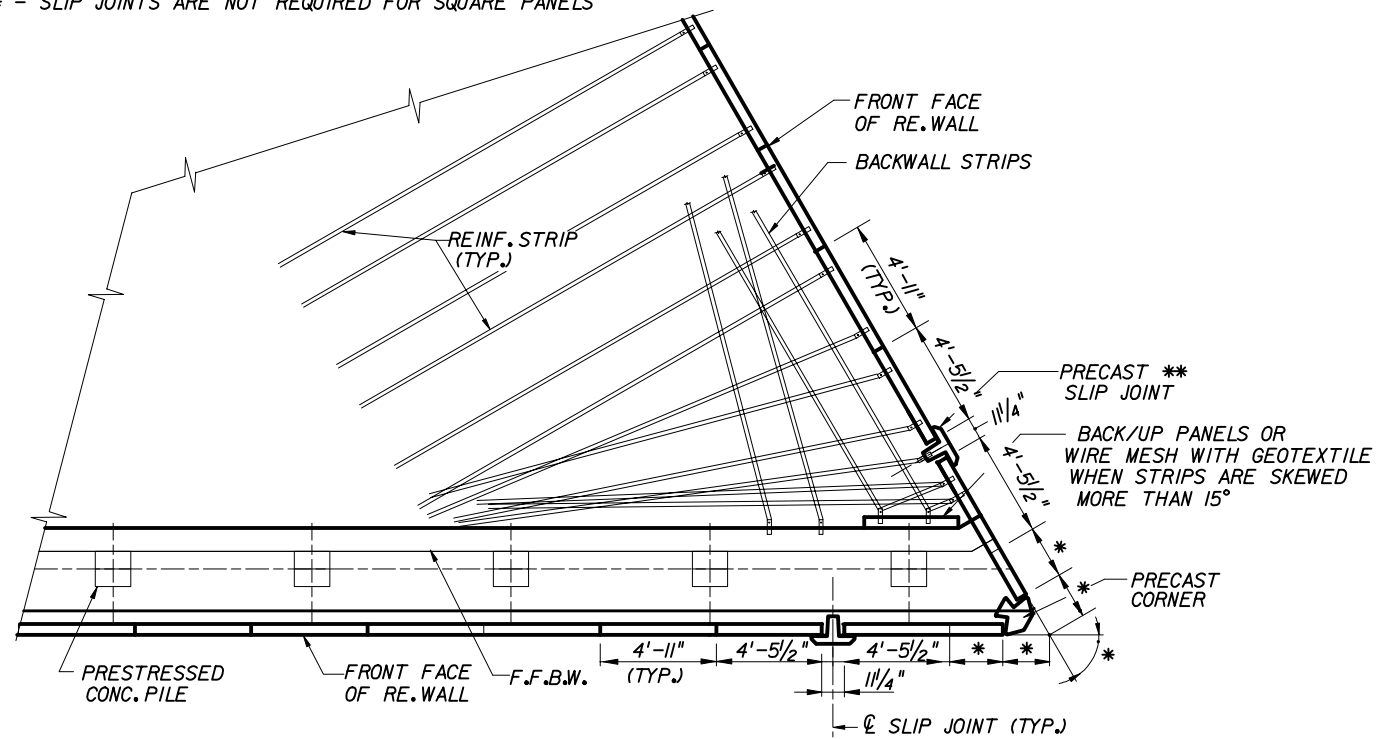
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
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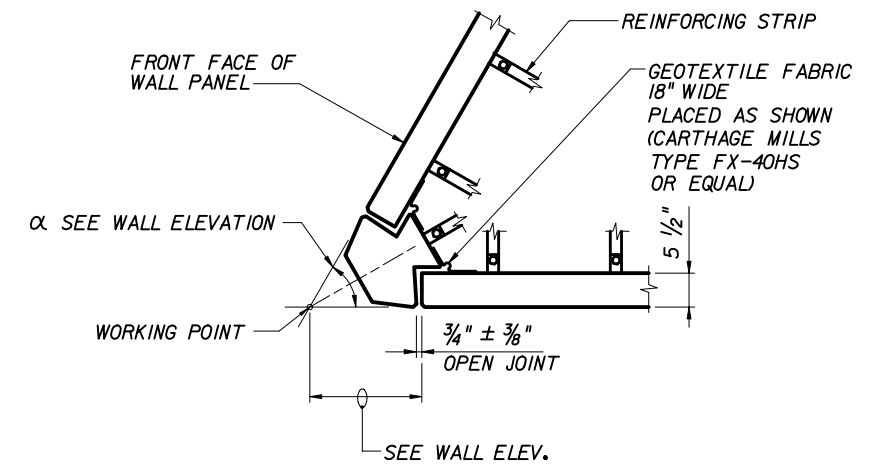
EXAMPLE ACUTE CORNER - SKEWED STRIPS UNDER PILE CAP

NOTE:

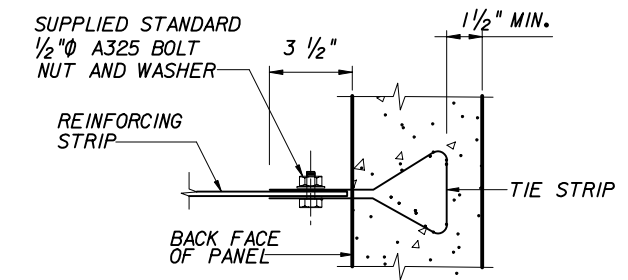
- * - DIMENSION OR ANGLE VARIES, SEE WALL ELEVATION
- ** - SLIP JOINTS ARE NOT REQUIRED FOR SQUARE PANELS



EXAMPLE ACUTE CORNER - SKEWED STRIPS AT ABUTMENT LEVEL



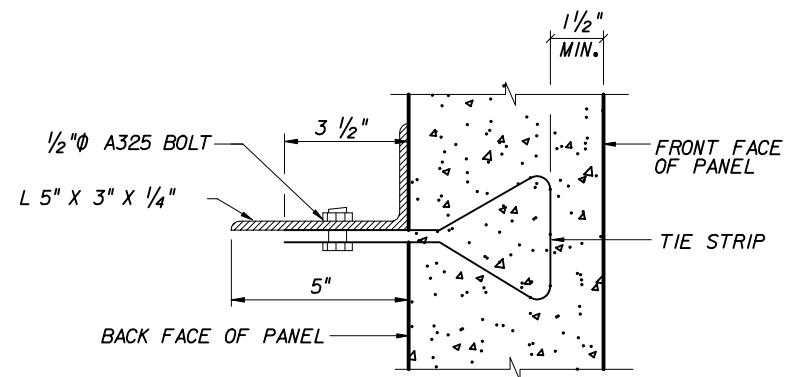
ACUTE CORNER ELEMENT DETAIL



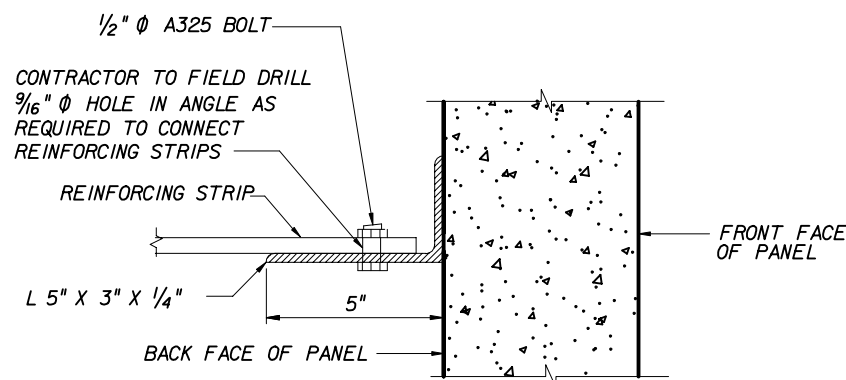
CONNECTION DETAIL

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

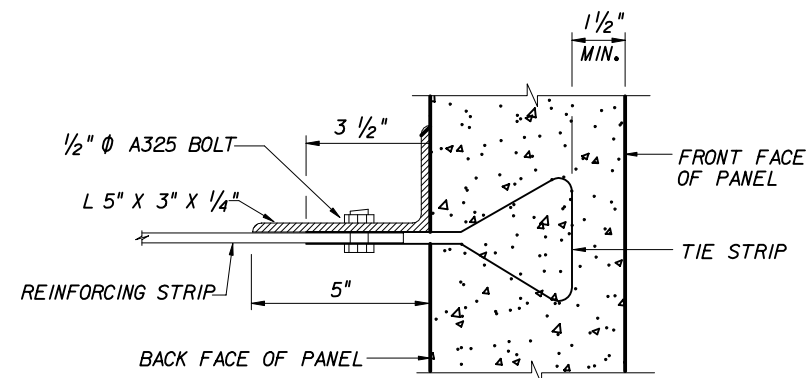
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Designed By	Names	Dates	Approved By <i>W. J. [Signature]</i>	
Drawn By			Revision	Sheet No. Index No.
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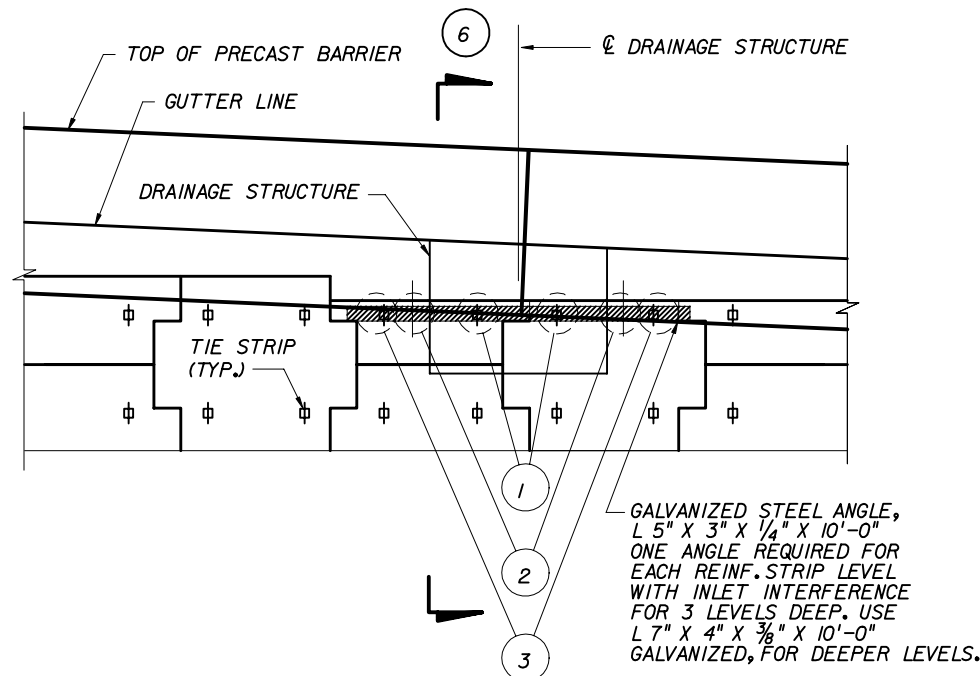
1 CONNECTION DETAIL
ANGLE BOLTED TO TIE STRIP



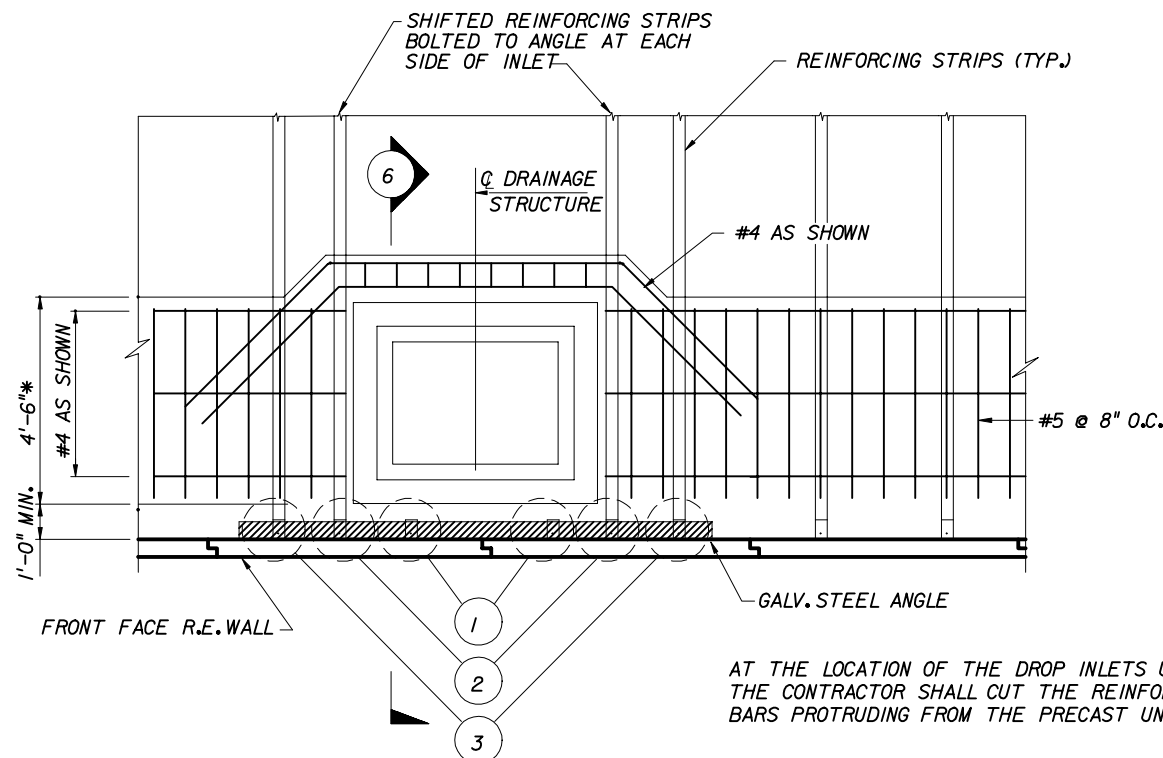
2 CONNECTION DETAIL
SHIFTED REINF. STRIP BOLTED TO ANGLE



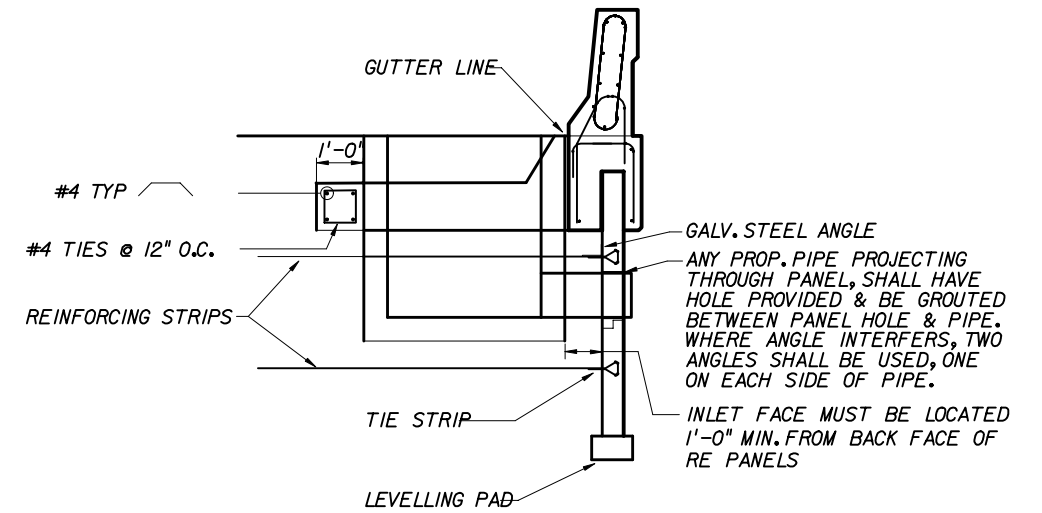
3 CONNECTION DETAIL
ANGLE BOLTED TO TIE STRIP WITH REINF. STRIP



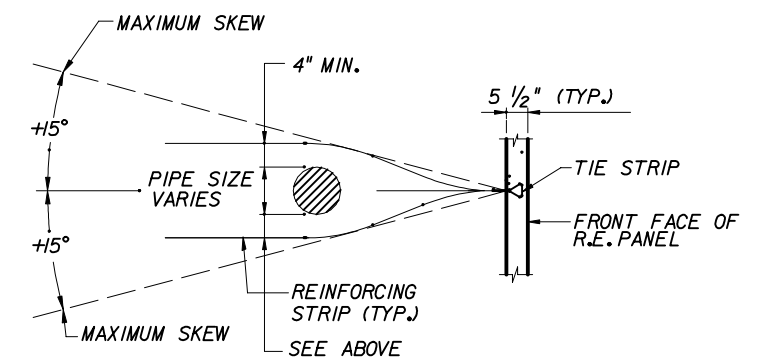
4 PARTIAL ELEVATION



5 PARTIAL PLAN



6 SECTION AT INLET



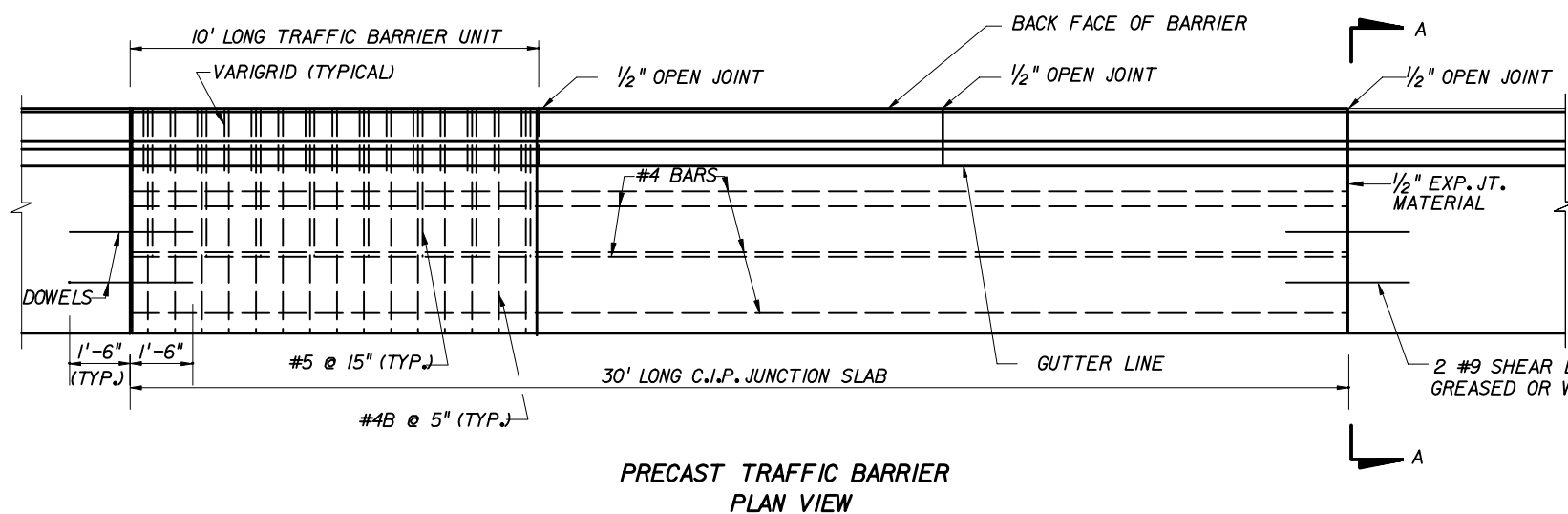
7 TYPICAL STRIP BENDING DETAIL AT
ANY PROPOSED & EXISTING PIPES

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MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

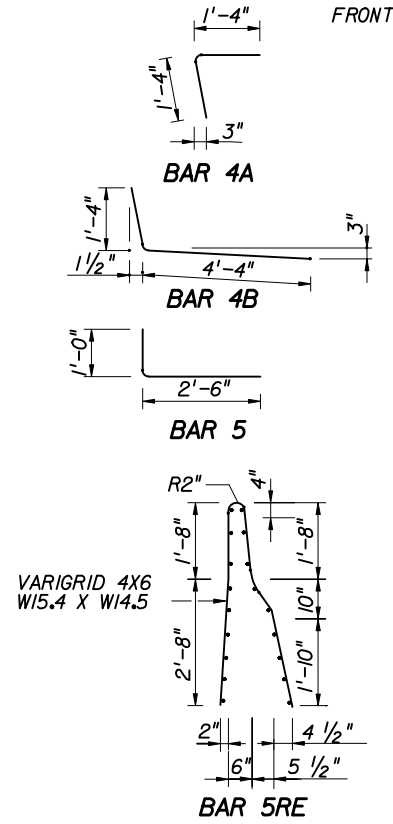
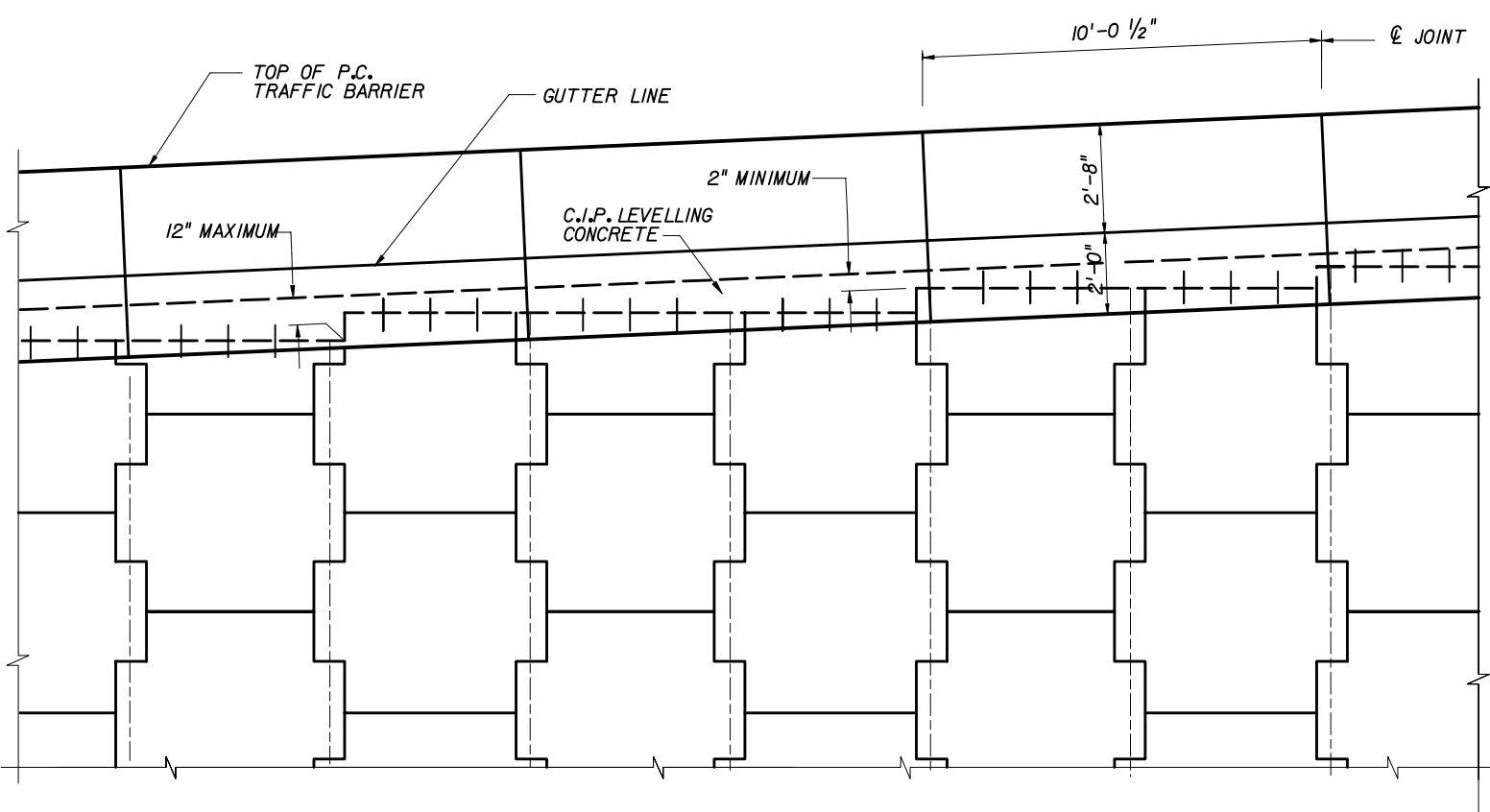
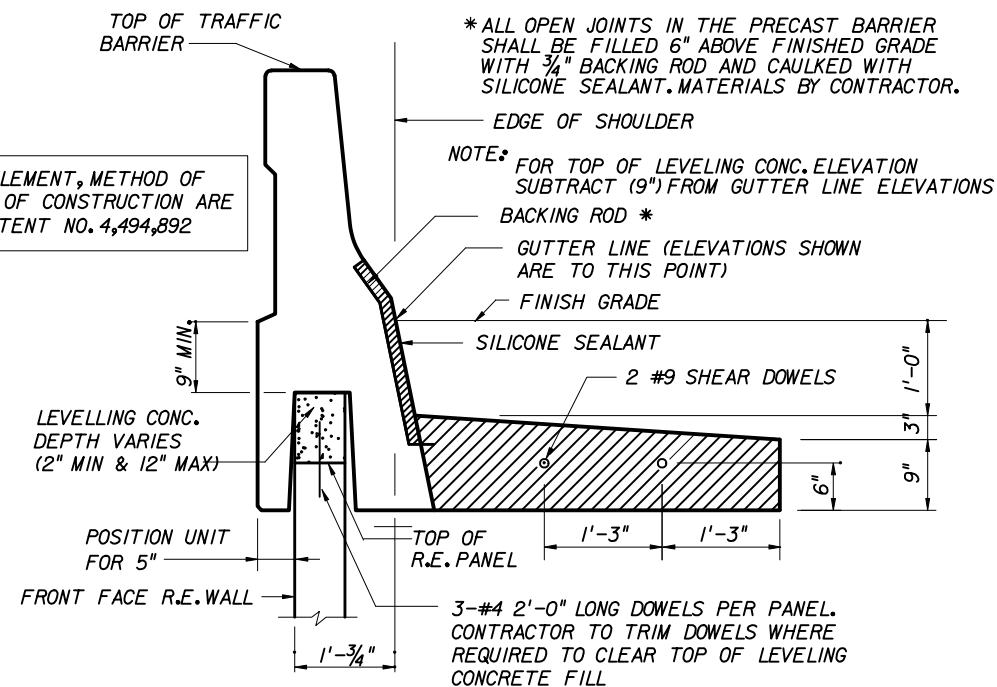
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
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AT THE LOCATION OF THE DROP INLETS UNITS,
THE CONTRACTOR SHALL CUT THE REINFORCEMENT
BARS PROTRUDING FROM THE PRECAST UNIT.

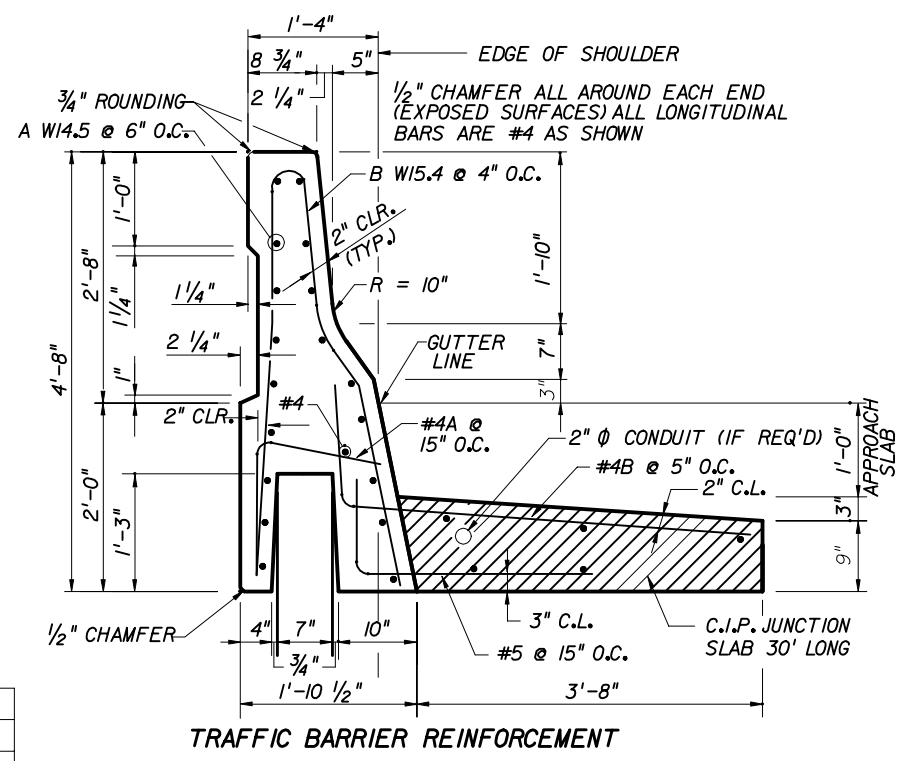
NOTE: BEND TO BE AS GRADUAL AS POSSIBLE.



TRAFFIC BARRIER ELEMENT, METHOD OF SUPPORT AND METHOD OF CONSTRUCTION ARE COVERED BY U.S. PATENT NO. 4,494,892



MARK	QUANTITY	REMARKS
5	8	3'-6" LONG
A	VARIGRID	W14.5 @ 6" O.C.
B	VARIGRID	W15.4 @ 4" O.C.
4A	8	2'-8" LONG
4B	24	5'-8" LONG



PRECAST TRAFFIC BARRIER PARTIAL ELEVATION

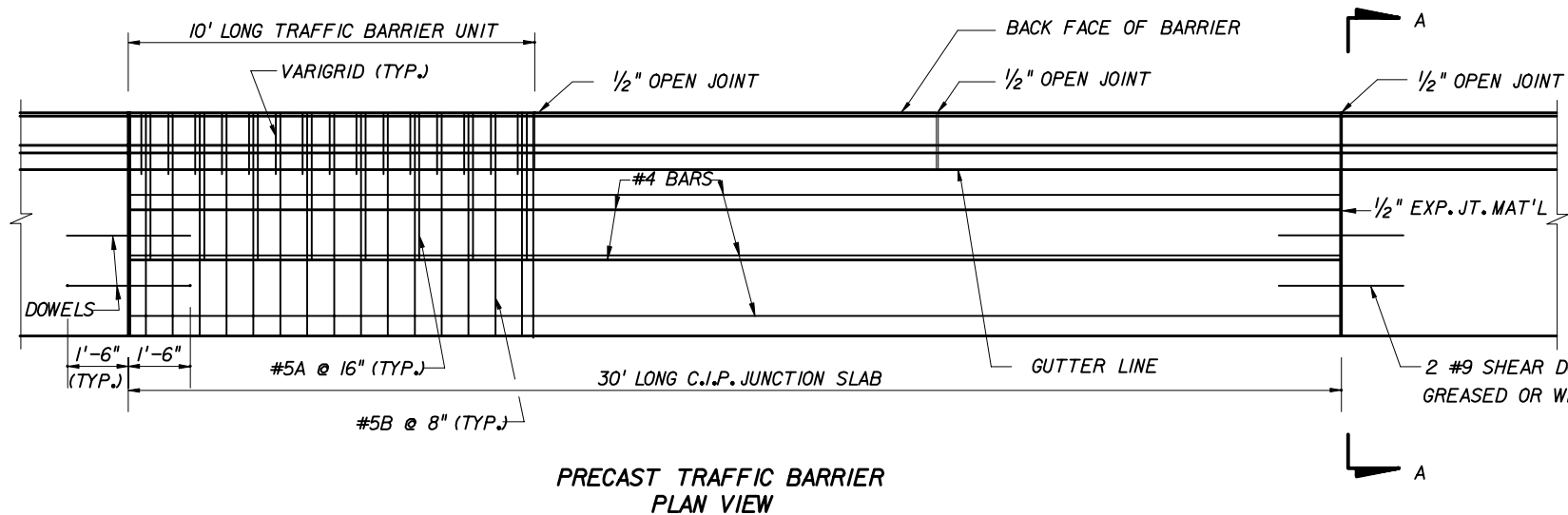
TRAFFIC BARRIER REINFORCEMENT

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

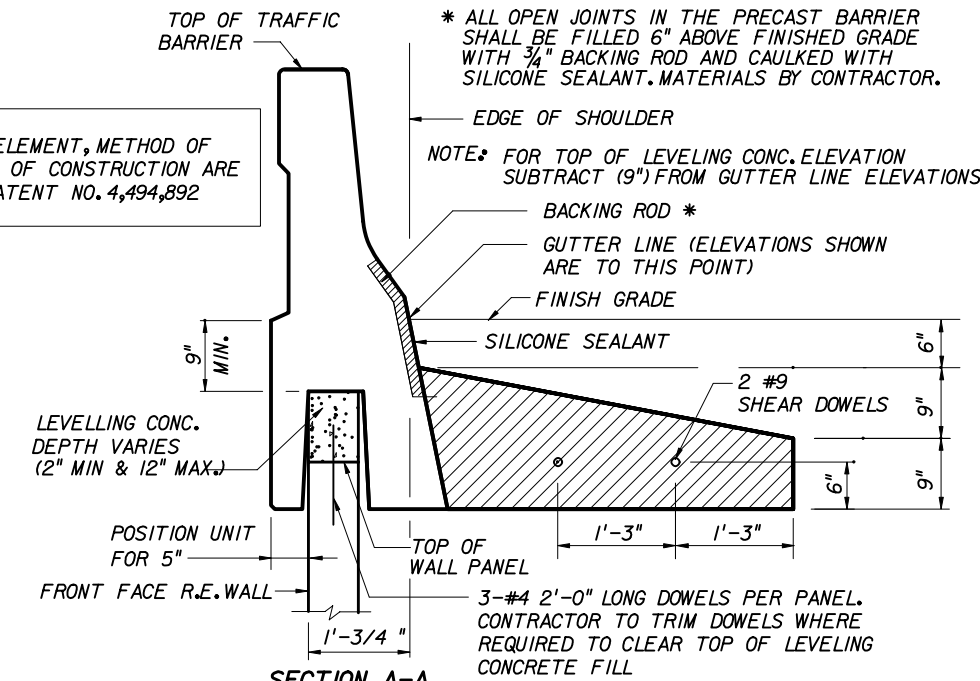
**RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL**

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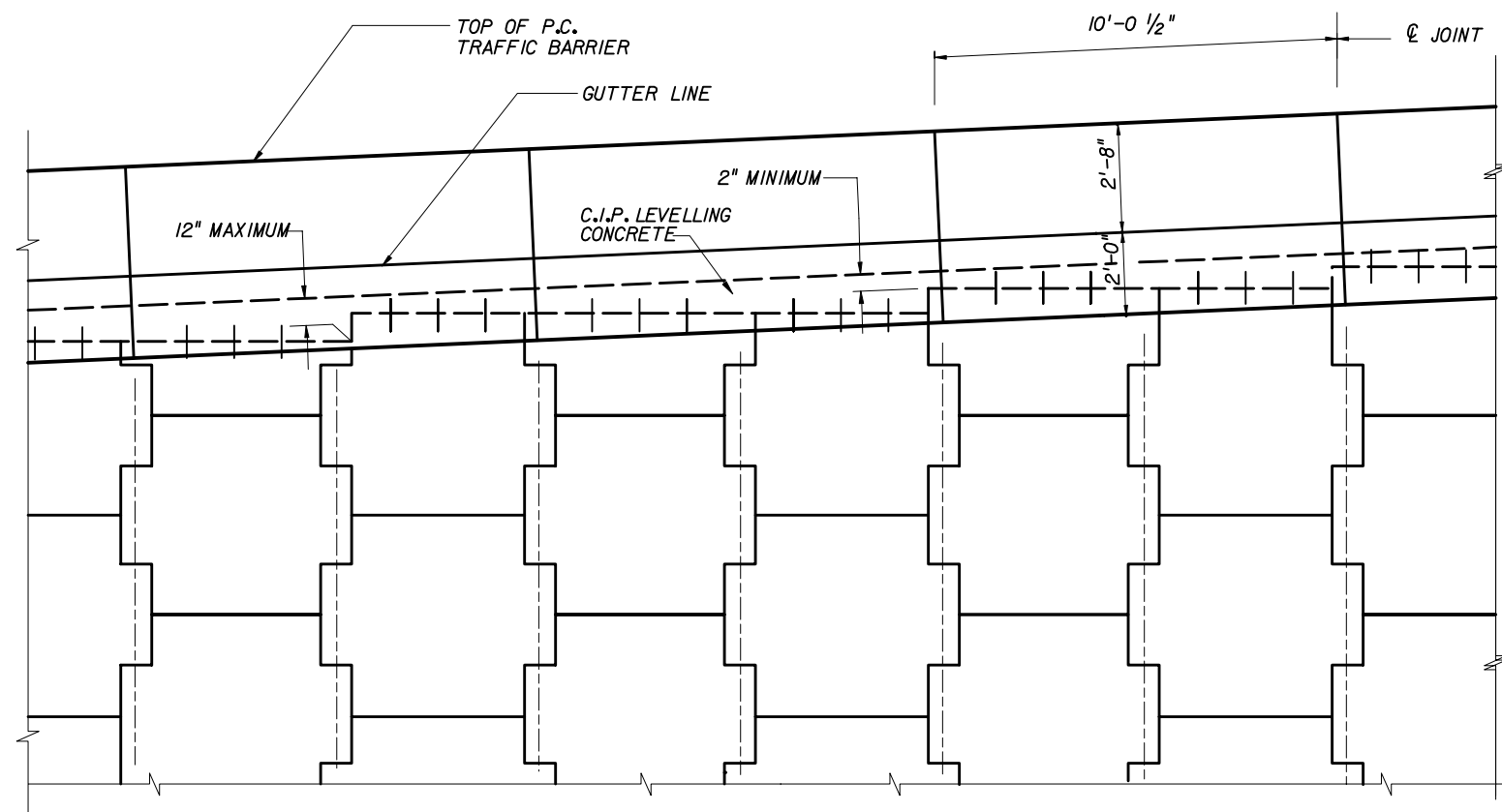


PRECAST TRAFFIC BARRIER
PLAN VIEW

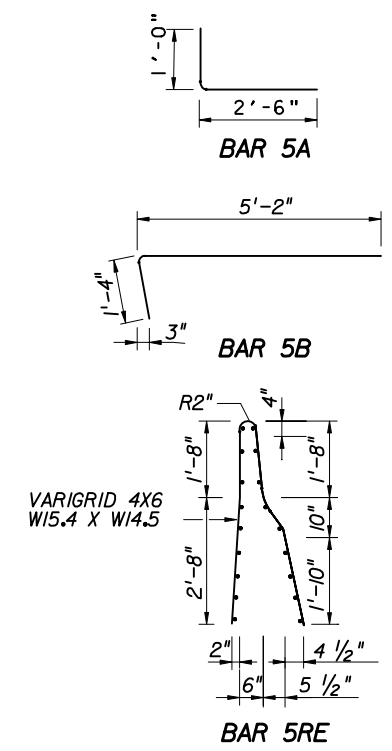
TRAFFIC BARRIER ELEMENT, METHOD OF SUPPORT AND METHOD OF CONSTRUCTION ARE COVERED BY U.S. PATENT NO. 4,494,892



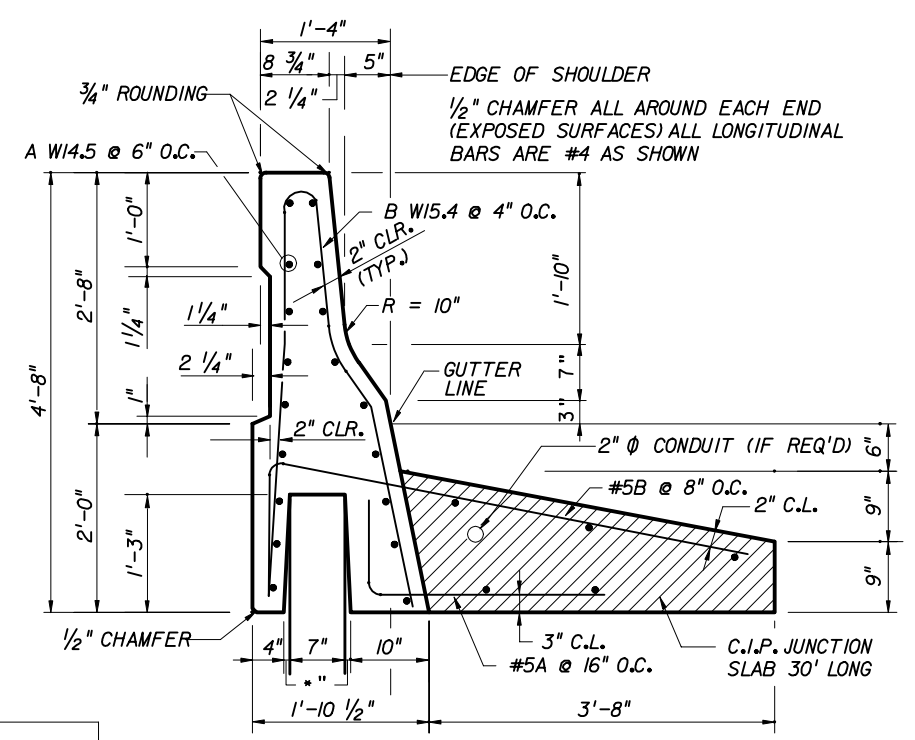
SECTION A-A



PRECAST TRAFFIC BARRIER
PARTIAL ELEVATION



MARK	QUANTITY	REMARKS
5A	8	3'-6" LONG
5B	15	6'-6" LONG
A	VARIGRID	W14.5 @ 6" O.C.
B	VARIGRID	W15.4 @ 4" O.C.



TRAFFIC BARRIER REINFORCEMENT

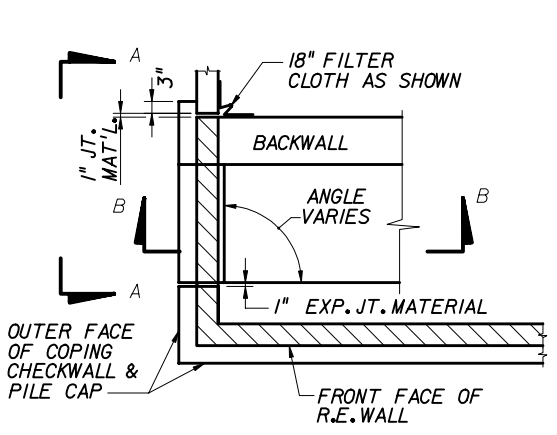
THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

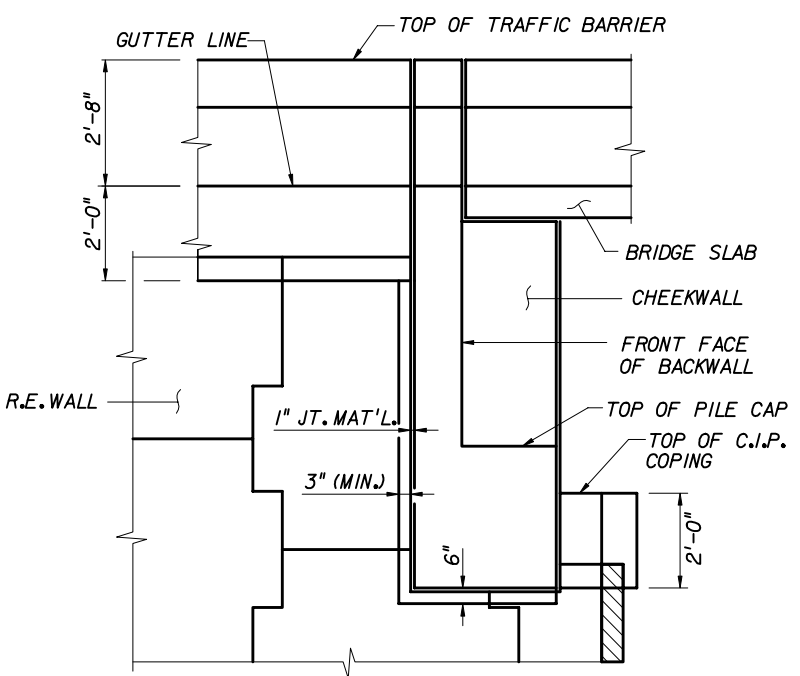
**RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL**

Names	Dates	Approved By
Designed By		<i>[Signature]</i> State Structures Design Engineer
Drawn By		Revision
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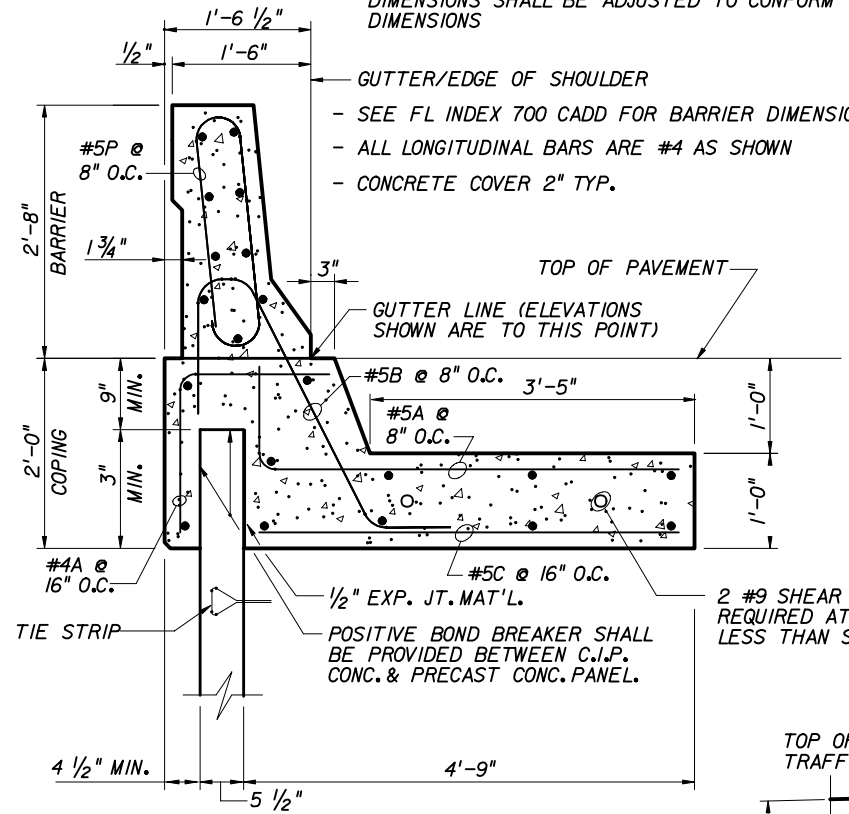
NOTE:
IF SHORT C.I.P. BARRIER SECTIONS ARE TO BE CONSTRUCTED ADJACENT TO PRECAST BARRIER SECTIONS, THEN THIS SECTION'S DIMENSIONS SHALL BE ADJUSTED TO CONFORM TO THE PRECAST DIMENSIONS



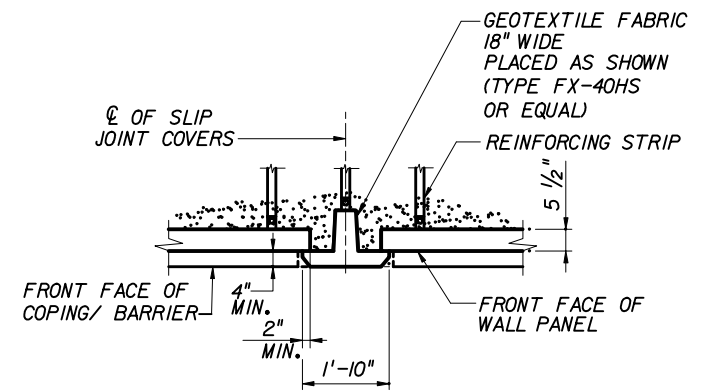
PLAN VIEW @ BEND (TYP.)



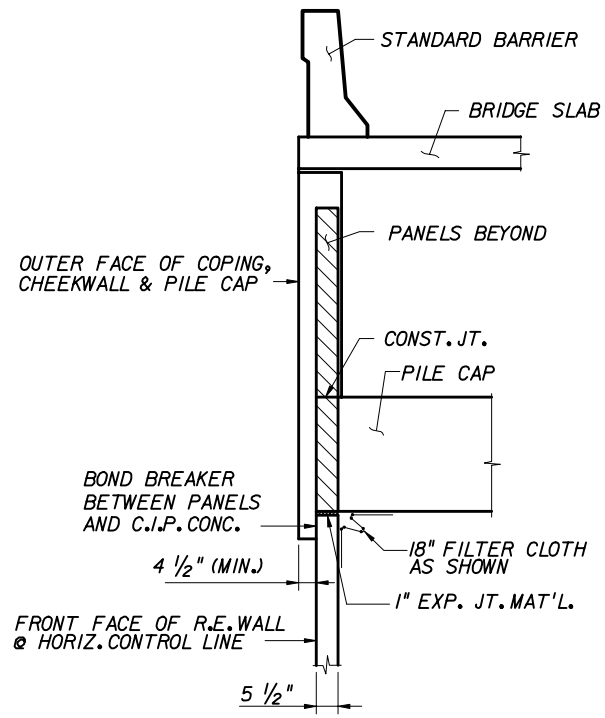
SECTION A-A



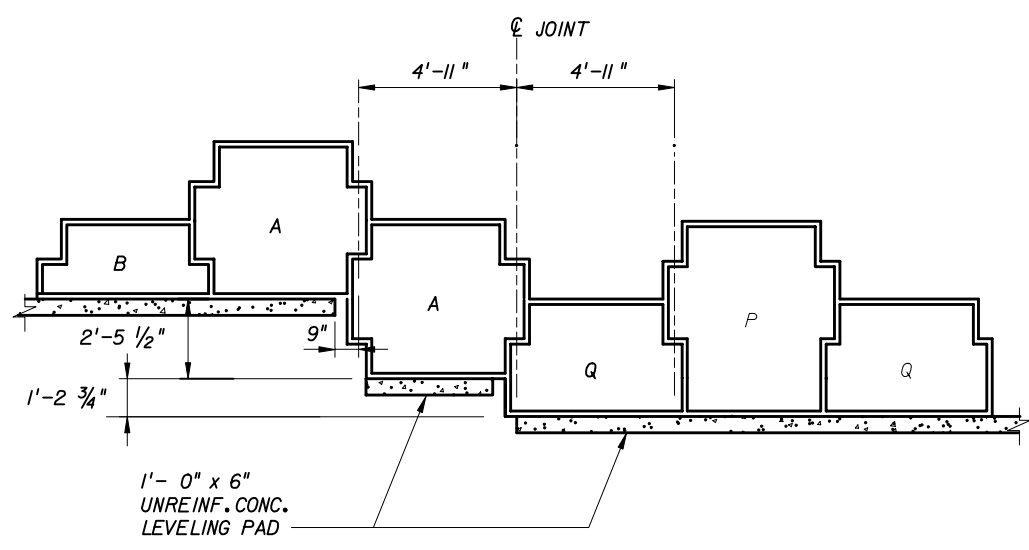
C.I.P. CONC. TRAFFIC BARRIER



SLIP JOINT COVER DETAIL

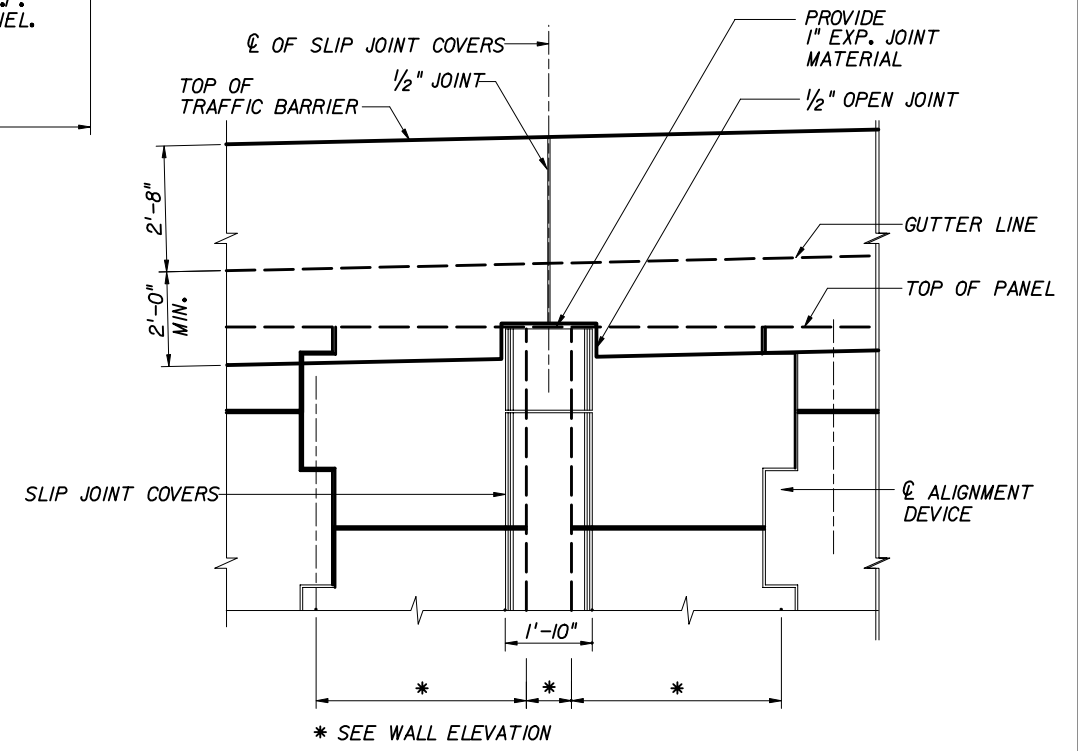


SECTION B-B



TYPICAL LEVELING PAD STEP DETAIL

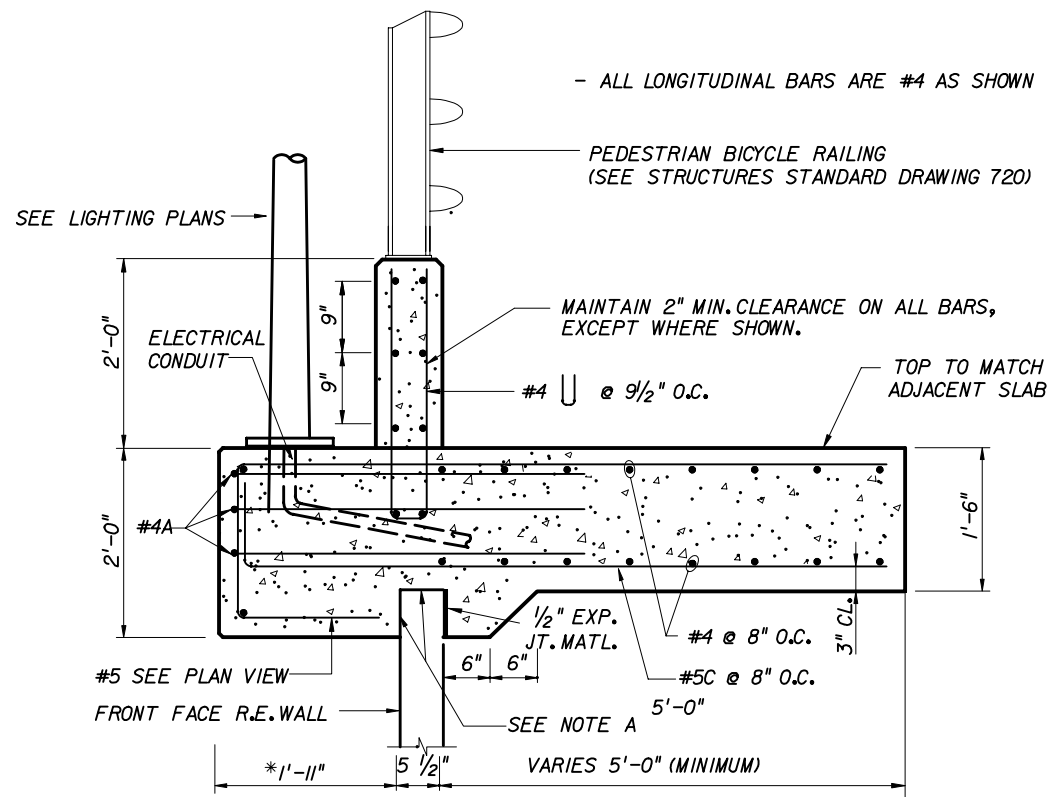
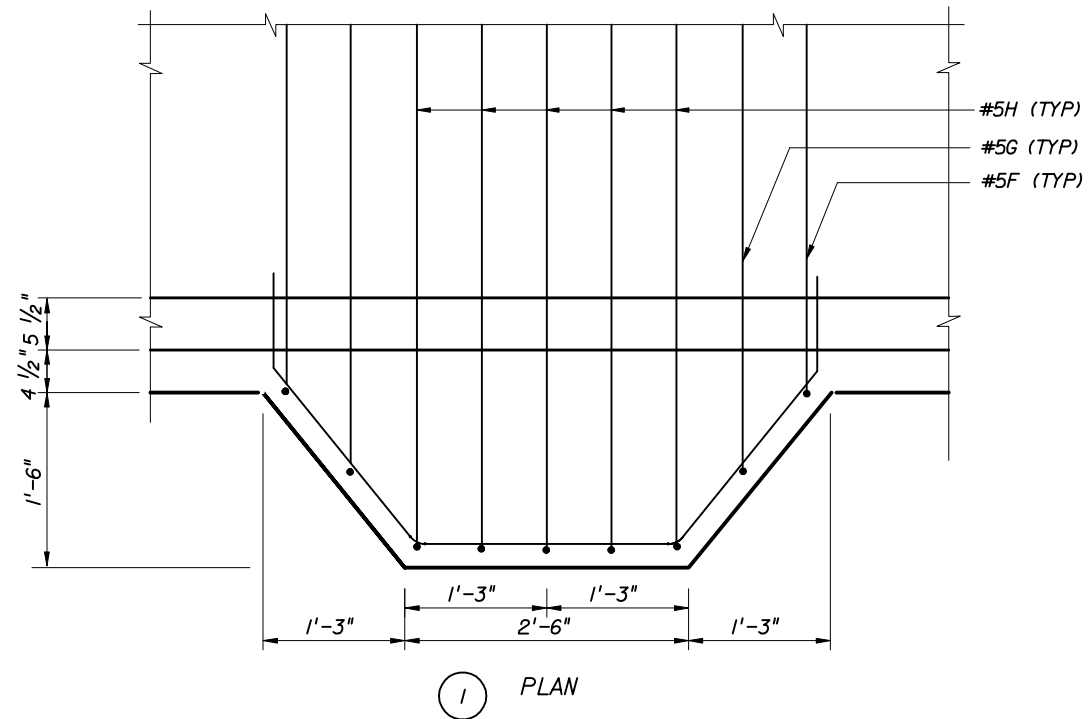
(LEVELING PAD DIMENSIONS ARE THE SAME FOR BOTH CRUCIFORM AND SQUARE PANELS, SEE WALL ELEVATIONS FOR PANEL TYPES AT STEPS)



C.I.P. TRAFFIC BARRIER OVER SLIP JOINT COVER

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
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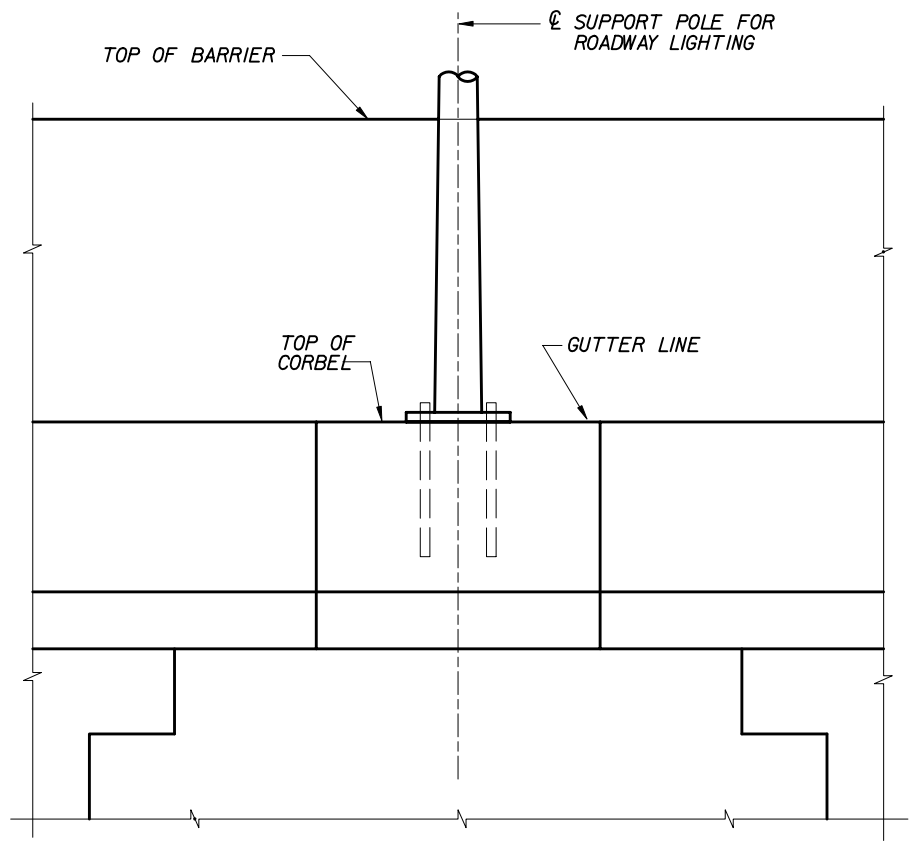
NOTE A:
POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN C.J.P. CONCRETE AND CONCRETE PANEL

NOTE B:
THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR ONE PRECAST UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE

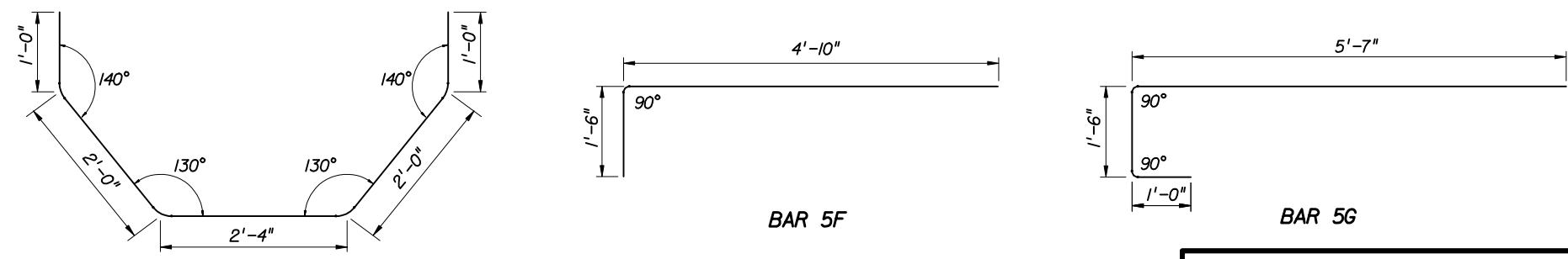
NOTE C:
2 - #9 SHEAR DOWELS - 3'-0" LONG REFER TO PRECAST BARRIER SHEET

NOTE D:
LIGHT POLE MANUFACTURER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.

NOTE E:
SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS.



REBAR SCHEDULE	
MARK	QTY.
4A	3
5C	8
5F	2
5G	2
5H	5
4U	6

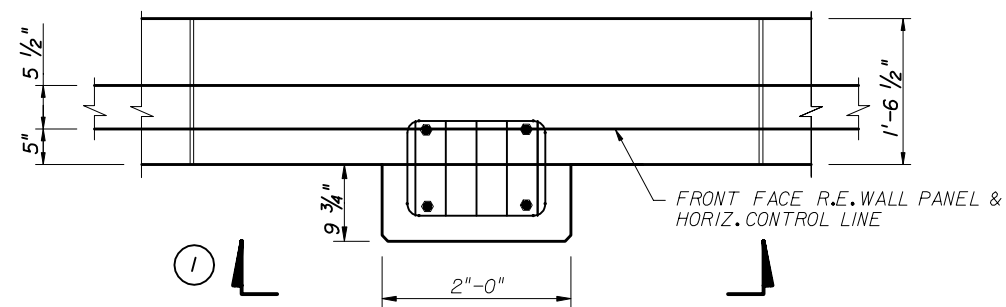


THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

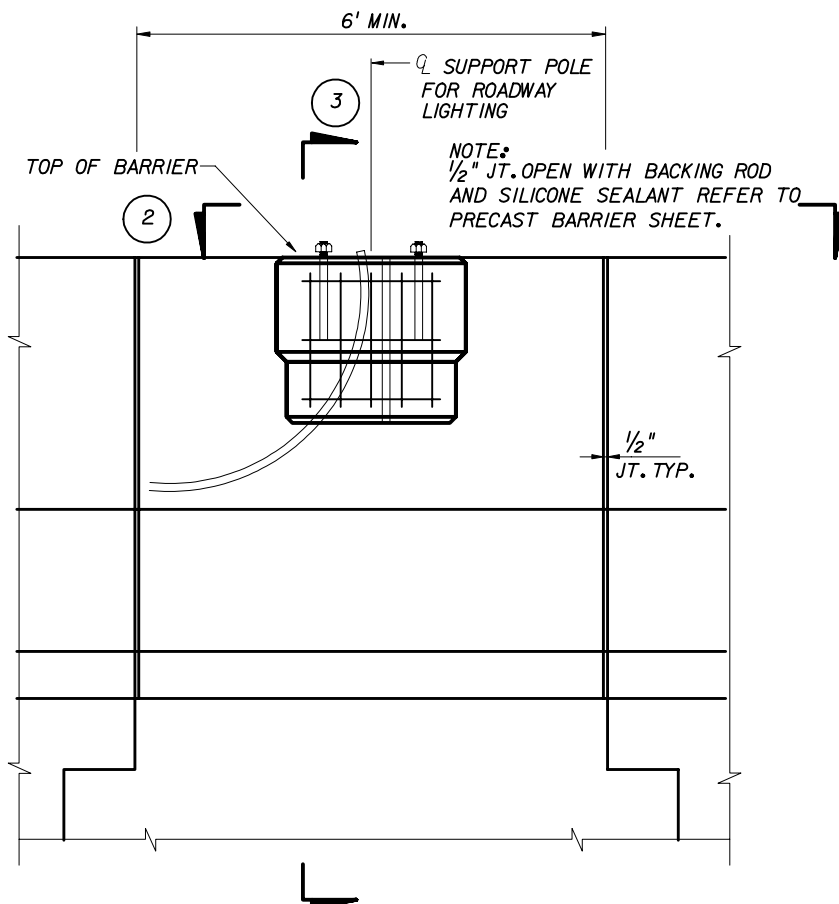
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL**

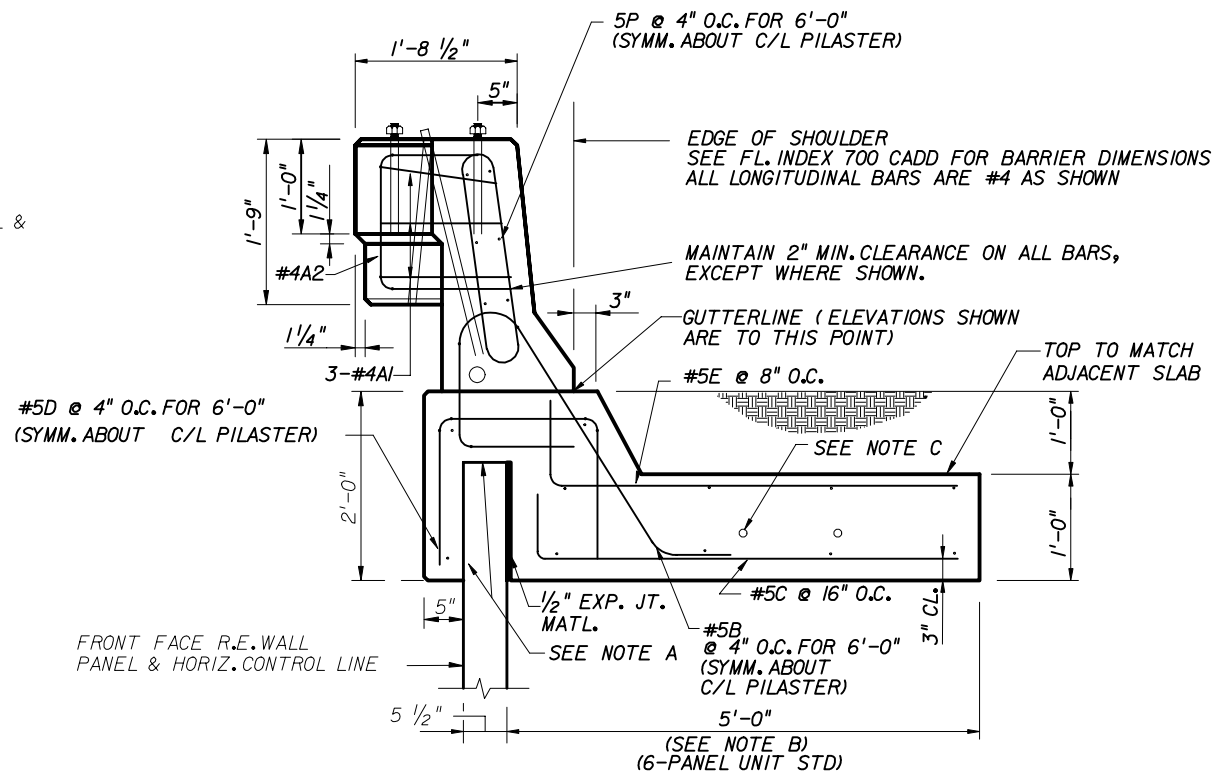
Designed By	Names	Dates	Approved By	<i>[Signature]</i>
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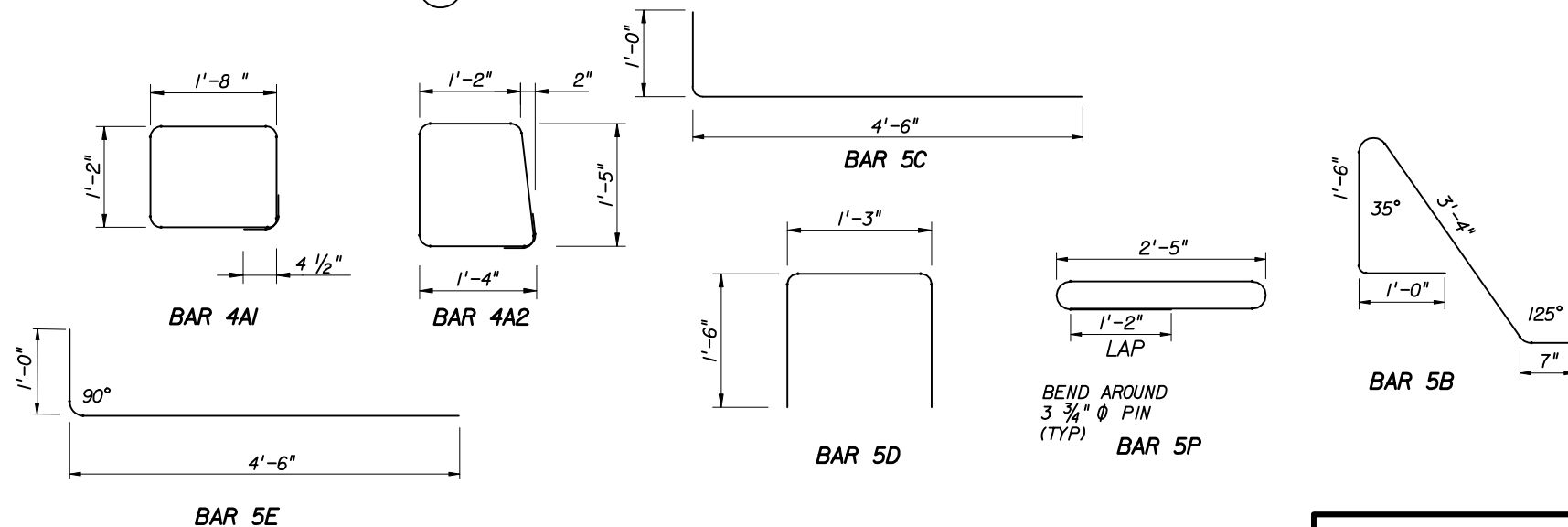
2 PLAN



1 PARTIAL ELEVATION



3 BARRIER DETAIL @ LIGHT POLE



4 BAR BENDING DETAILS

NOTES:

- A. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN CAST IN PLACE CONC. AND PRECAST CONC. PANEL.
- B. THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR ONE PRECAST UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE.
- C. 2 - #9 SHEAR DOWELS - 3'-0" LONG REFER TO PRECAST BARRIER SHEET
- D. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.
- E. SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS.

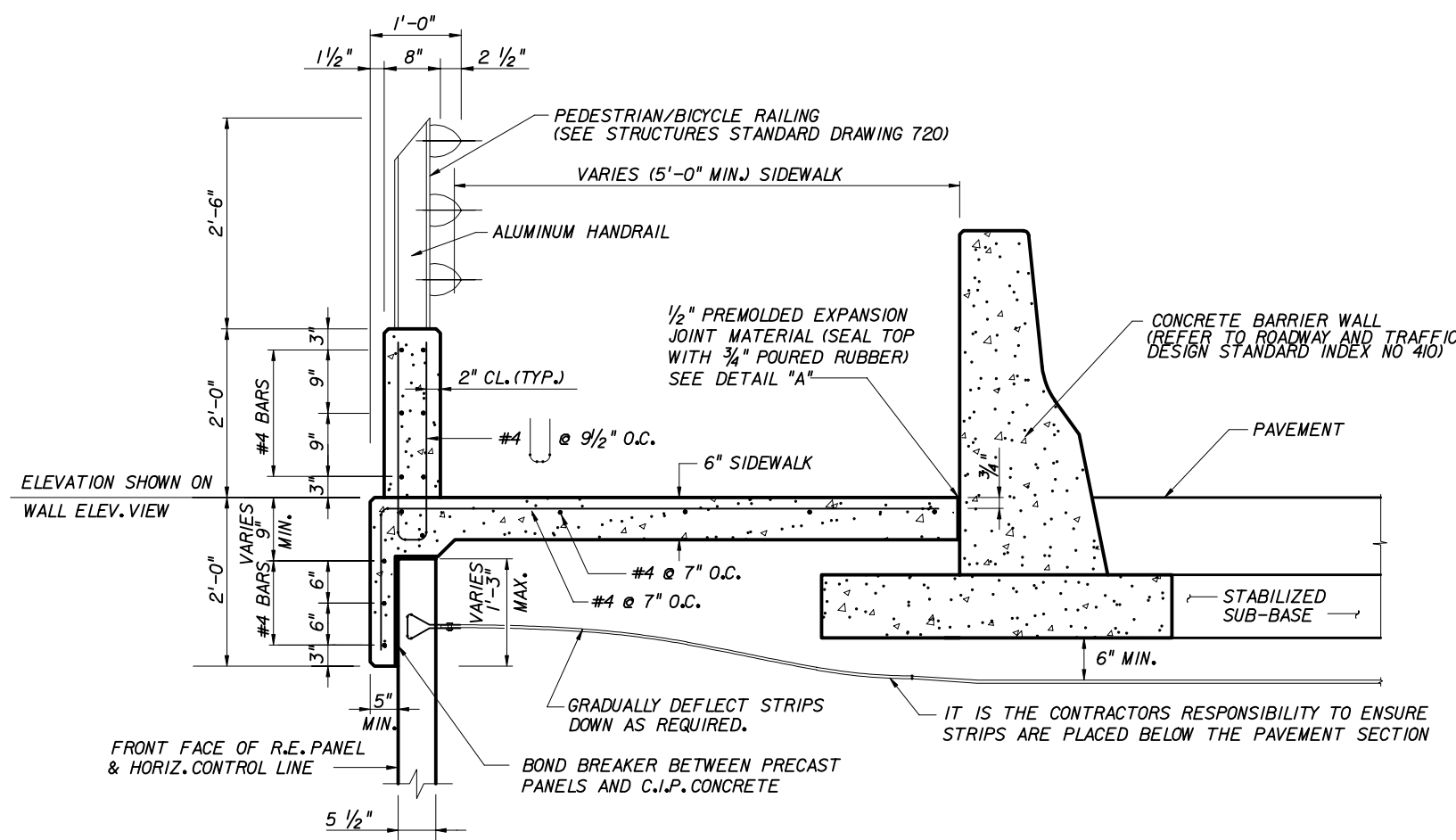
REBAR SCHEDULE	
MARK	QTY.
4A1	3
4A2	5
5B	18
5C	4
5D	18
5E	9
5P	18

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

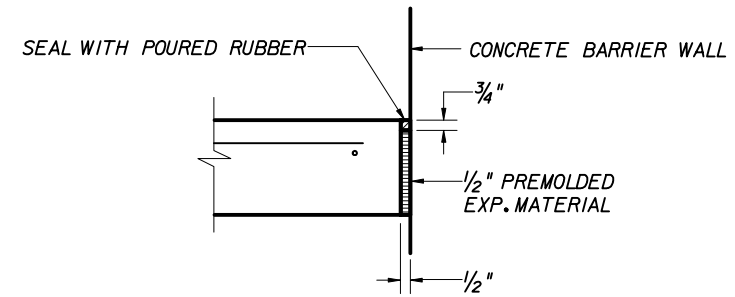
**RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL**

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Checked By				
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THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS



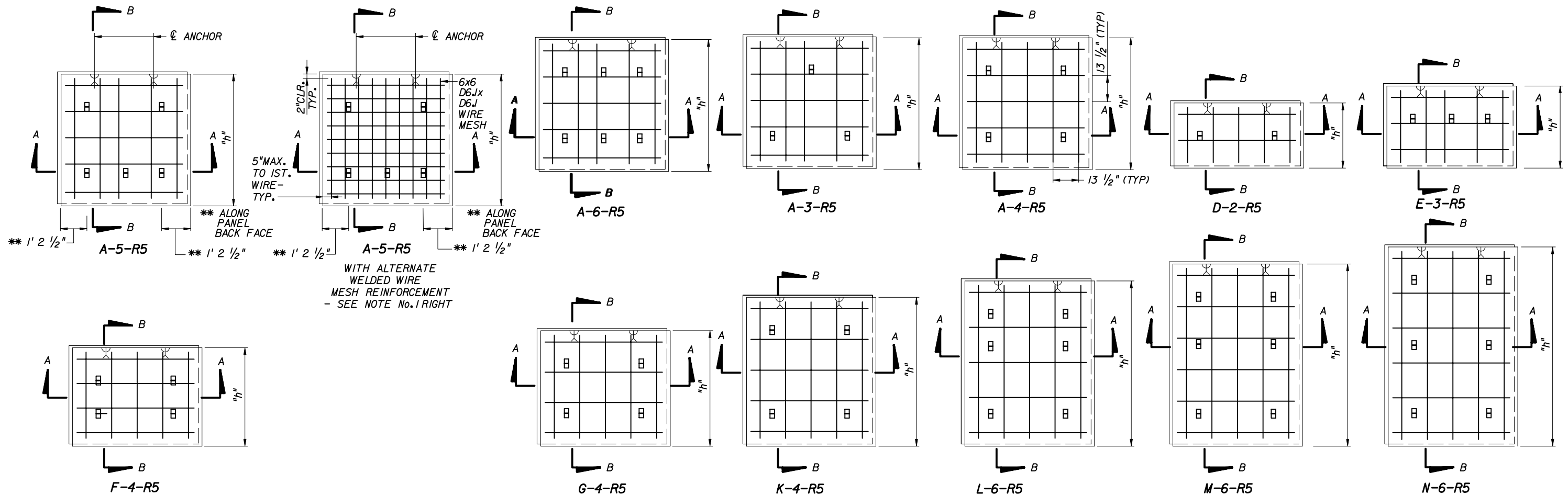
C.I.P. PARAPET DETAIL w/ HANDRAIL



DETAIL "A"

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
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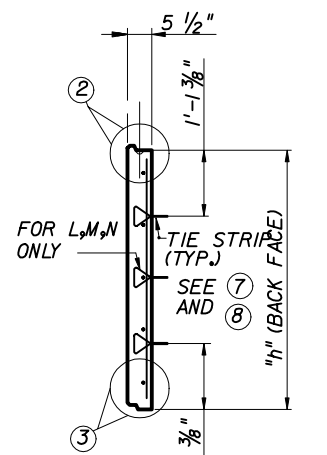


WITH ALTERNATE WELDED WIRE MESH REINFORCEMENT - SEE NOTE No. 1 RIGHT

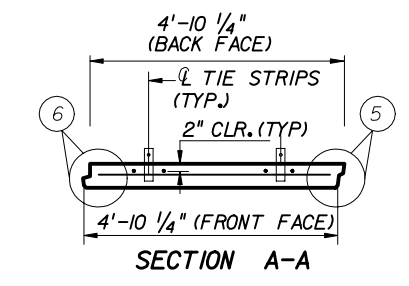
TYPICAL PANELS

NOTES:

1. REINFORCING STEEL TO BE A615, GRADE 60. DEFORMED WELDED WIRE MESH (ASTM A497) MAY BE SUBSTITUTED FOR REBARS. DEFORMED WELDED MESH REQUIREMENTS FOR PANEL "A" IS SHOWN IN THIS SHEET. MESH FOR OTHER PANEL TYPES SHALL BE DETERMINED BASED ON PANEL SHAPE MESH STYLE, AND MINIMUM EDGE CLEAR DISTANCES SHOWN ON THIS SHEET.
2. 1/2" x 1/2" CHAMFER SHALL BE PROVIDED ON ALL EXPOSED EDGES (FRONT FACE ONLY).
3. ALL PANEL TYPES AND OTHER RELATED ELEMENTS WILL BE DETAILED ON PANEL SHOP DRAWINGS.
4. ALL PANELS SHALL HAVE TWO 1 TON ANCHORS.
5. PANEL DESIGN THICKNESS IS 5 1/2" THICKNESS OF CONCRETE MUST INCREASE TO ACCOMMODATE ANY ARCHITECTURAL SURFACE FINISH THAT MAY BE SPECIFIED.
6. ACTUAL LOCATION OF REBARS WILL BE ADJUSTED TO ACCOMMODATE PANEL CASTING. MINIMUM 1 3/16" CLEARANCE IS REQUIRED BETWEEN REBARS & TIE-STRIPS.



SECTION B-B



SECTION A-A


PANEL TYPE	"h"
A	4'-10 1/4"
D	2'-4 3/4"
E	3'-0 1/4"
F	3'-7 1/2"
G	4'-3"
K	5'-5 3/4"
L	6'-1"
M	6'-8 1/2"
N	7'-4"

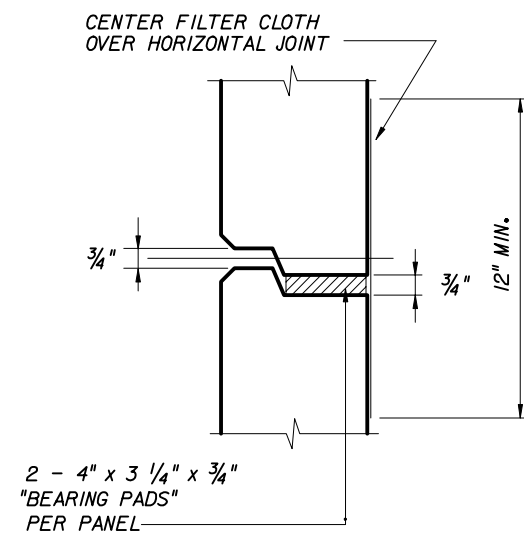
NOTE: CONCRETE COVER ON ALL REINFORCEMENT TO BE 2" MIN.

PANEL THICKNESS	REINFORCEMENT DESIGNATION	PANEL REINFORCEMENT A ₅	MAXIMUM ALLOWABLE HORIZONTAL STRESS AT FACING (KSF)
5 1/2" (MIN.)	R5	5-#3 VERTICAL 5-#3 HORIZONTAL	1.9
		ALTERNATE 6 x 6 D6J x D6J	
	R7	7-#3 VERTICAL 6-#3 HORIZONTAL	1.78
		ALTERNATE 6 x 6 D8.5 x D8.5	

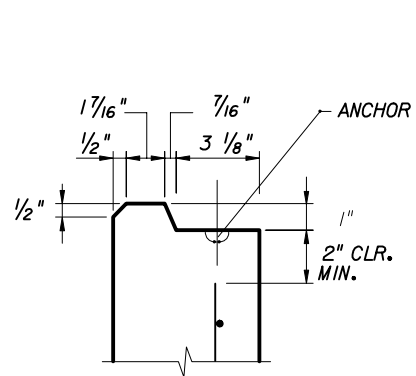
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

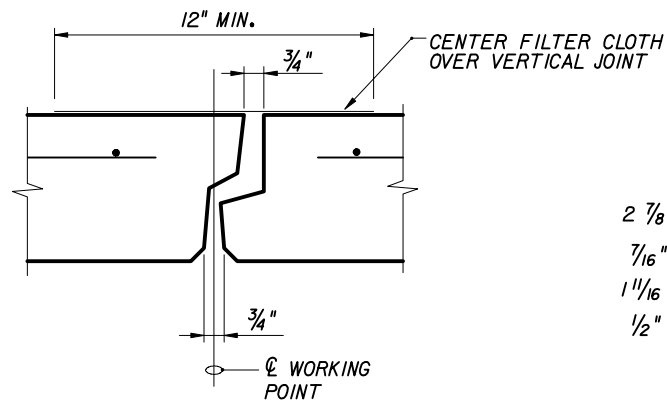
Names	Dates	Approved By		
Designed By			Revision	Sheet No.
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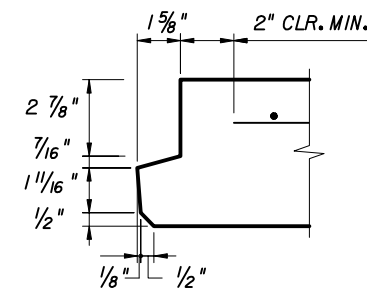
1 HORIZONTAL JOINT



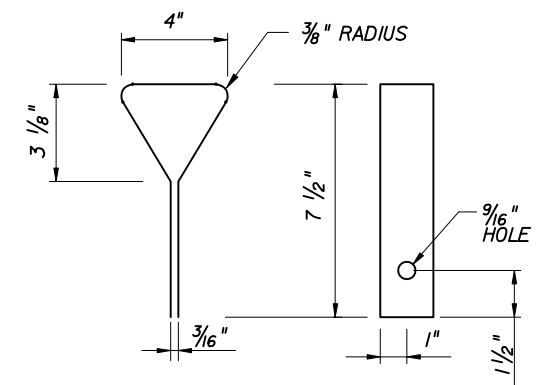
2 SECTION @ PANEL TOP



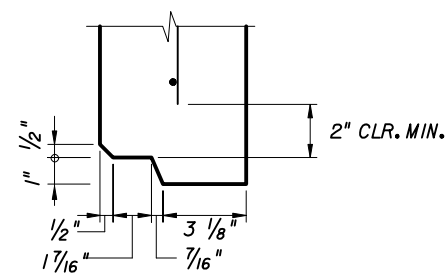
4 VERTICAL JOINT



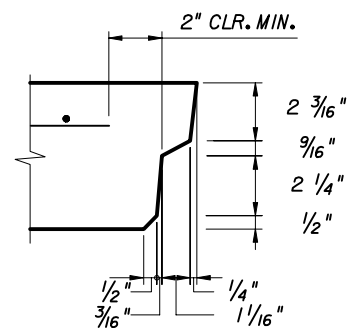
6 SECTION @ PANEL LEFT SIDE



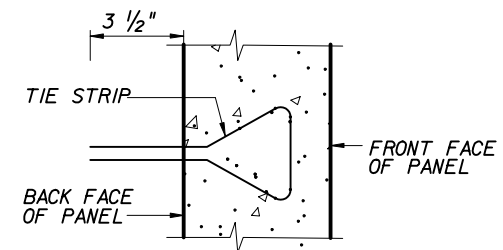
8 TIE STRIP DETAIL



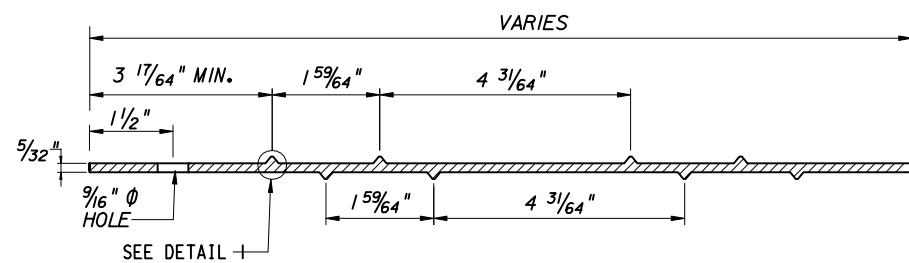
3 SECTION @ PANEL BOTTOM



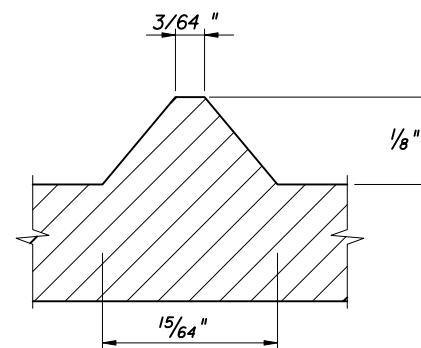
5 SECTION @ PANEL RIGHT SIDE



7 PARTIAL SECTION @ TIE STRIP



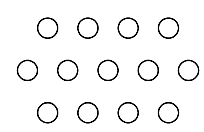
REINFORCING STRIP DETAIL



DETAIL I

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	14 of 14	5015



TAI

The Reinforced Earth Company

8614 WESTWOOD CENTER DRIVE SUITE 1100, VIENNA, VIRGINIA 22182 (703) 821-1175

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL BEHIND THE PRECAST TECHWALL, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE SPECIFICATIONS FOR TECHWALL.
2. SOIL PARAMETERS:
SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF ϕ , c AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS.
3. THE MAXIMUM APPLIED BEARING PRESSURE AT THE TOE OF THE TECHWALL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE OWNER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE CAST-IN-PLACE FOOTING, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.
5. THE MINIMUM FACTORS OF SAFETY REQUIRED FOR DESIGN
OVERTURNING = 2.0
SLIDING = 1.5
BEARING CAPACITY = 2.5
OVERALL STABILITY = 1.5
REINFORCING STEEL DESIGN SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND FDOT DESIGN GUIDELINES NO. 625-020-150B.

WALL CONSTRUCTION

6. FOR LOCATION AND ALIGNMENT OF TECHWALL, SEE RETAINING WALL CONTROL PLANS
7. TECHWALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 8.00' EACH TO MATCH DESIRED WALL ALIGNMENT.
8. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.
9. IF PILES ARE LOCATED WITHIN THE TECHWALL RETAINED VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE TECHWALL UNLESS A METHOD IS USED TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE REINFORCED EARTH COMPANY, AND IS PROPOSED AND APPROVED IN WRITING.

10. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 OF THE FLORIDA DOT SPECIFICATIONS.
11. IF STRUCTURES IN EXCESS OF 20' IN HEIGHT OCCUR, THE FINISHED GRADE IN FRONT OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS A HEIGHT OF 20'. FINISHED GRADE BACKFILL SHALL BE COMPACTED TO 95% OF ASSHTO T-180, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
12. TECHWALL PANELS TO BE FINISHED WITH COPING SHALL HAVE #4 DOWELS PROTRUDING FROM THEIR TOP EDGE.
13. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO THE REINFORCED EARTH CONSTRUCTION MANUAL FOR TECHWALL.
14. IF UNDERDRAIN IS SHOWN, THE FLOWLINE AND OUTLETS SHALL BE AS PER THE CONTRACT PLANS.

MATERIALS NOTES

15. PANEL FINISH
THE PRECAST PANELS FOR THIS PROJECT SHALL HAVE A PLAIN STEEL FORM FINISH UNLESS OTHERWISE SPECIFIED IN THE CONTROL PLANS.
16. ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY THE REINFORCED EARTH COMPANY:

- PRECAST CONCRETE FACING PANELS
- GEOCOMPOSITE TERRADRAIN 101 OR EQUIVALENT (FOR PANEL JOINTS ONLY)
- LIFTING HARDWARE FOR HANDLING PRECAST PANELS. (ON LOAN BASIS)
- PANEL LEVELLING BOLTS AND PLATES.

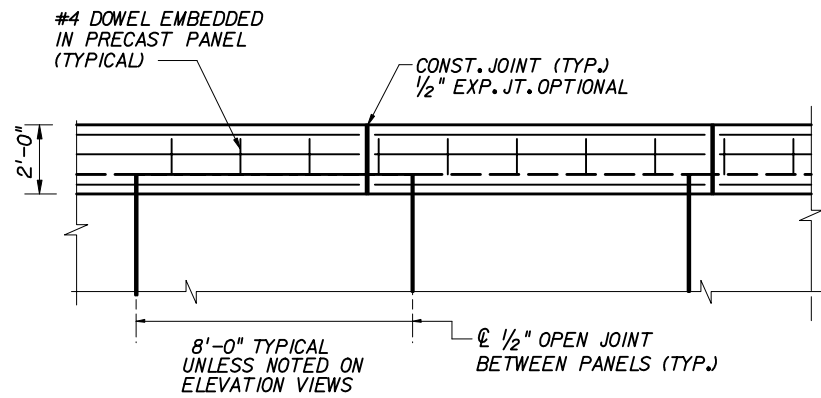
ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTION CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED/INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, SUPPLY, AND INSTALLATION OF A TEMPORARY FALSEWORK SUPPORT SYSTEM TO ADEQUATELY BRACE THE ASSEMBLED PRECAST WALL UNITS UNTIL THE CONCRETE FOOTING HAS BEEN POURED AND ADEQUATELY CURED ACCORDING TO THE REINFORCED EARTH COMPANY SPECIFICATIONS. PLANS FOR THE TEMPORARY FALSEWORK SUPPORT SYSTEM SHOWING DIMENSIONS, SUPPORT POINTS, MEMBER SIZES, CONNECTIONS AND MATERIAL SPECIFICATIONS SHALL BE SUBMITTED TO THE REINFORCED EARTH COMPANY PRIOR TO WALL ERECTION. NOTWITHSTANDING ITS' REVIEW OF THE TEMPORARY FALSEWORK SUPPORT SYSTEM, THE REINFORCED EARTH COMPANY SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE OR LOSS CAUSED BY ANY DEFECT IN THE DESIGN AND/OR CONSTRUCTION OF THE TEMPORARY FALSEWORK SUPPORT SYSTEM. THRUST BLOCKS OR REACTION ASSEMBLIES SHALL BE OF SUFFICIENT SIZE SO THAT THE APPLIED SOIL PRESSURE DOES NOT EXCEED THE ALLOWABLE SOIL PRESSURE OR PRODUCE DETRIMENTAL DEFORMATIONS IN THE RESULTING POSITIONING OF THE ASSEMBLED PRECAST WALL UNITS.
18. CONCRETE COVER
- CAST-IN-PLACE
4" CLEAR ON REBAR FOR CONCRETE CAST AGAINST EARTH.
3" CLEAR ON REBAR FOR ALL OTHER C.I.P. CONCRETE UNLESS NOTED OTHERWISE.
- PRECAST CONCRETE
ALL REBARS IN PRECAST CONCRETE SHALL HAVE 2" MINIMUM CONCRETE COVER.
19. CONCRETE FOR PRECAST PANELS WILL BE PROVIDED BY THE REINFORCED EARTH COMPANY'S MANUFACTURING PLANT IN ACCORDANCE WITH SECTION 346 OF THE FLORIDA DOT SPECIFICATIONS.
20. THE REINFORCED EARTH COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.
21. THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO THE INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY
22. THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO THE REINFORCED EARTH COMPANY, AND IS BEING FURNISHED FOR THE USE IN CONNECTION WITH FDOT PROJECTS ONLY, AND THE INFORMATION CONTAINED HEREIN IS NOT TO BE TRANSMITTED TO ANY OTHER ORGANIZATION UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE REINFORCED EARTH COMPANY. THE REINFORCED EARTH COMPANY IS EXCLUSIVE LICENSEE IN THE UNITED STATES UNDER PATENTS ISSUED TO HENRY VIDAL, AND THE FURNISHING OF THIS DRAWING DOES NOT CONSTITUTE AN EXPRESSED OR IMPLIED LICENSE UNDER THE VIDAL PATENTS.

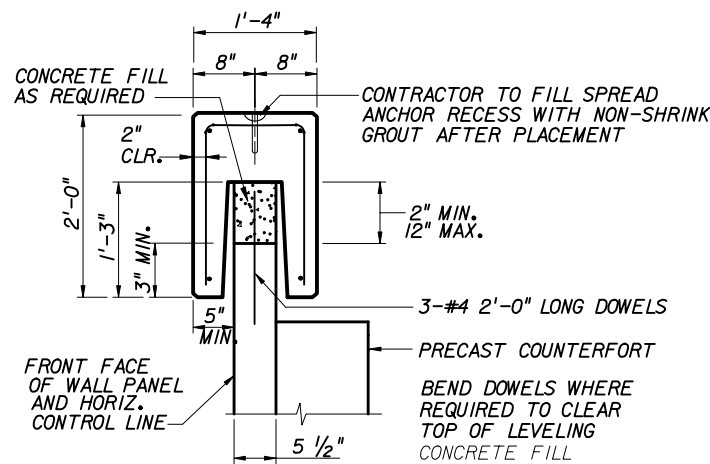
THIS SYSTEM SHALL NOT BE USED IN ACUTE ANGLE SMALLER THAN 60°

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TECHWALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Designed By	Names	Dates	Approved By <i>W. V. Vidal</i>	
Drawn By			State Structures Design Engineer	
Checked By			Revision	Sheet No. Index No.
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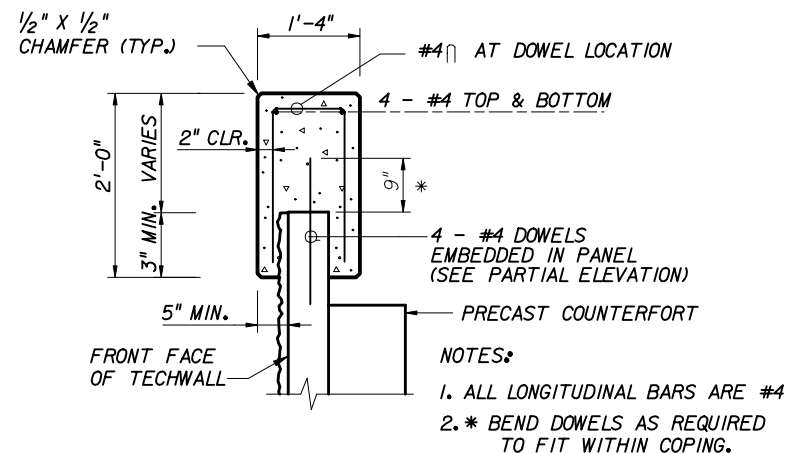


PRECAST COPING - PARTIAL ELEVATION

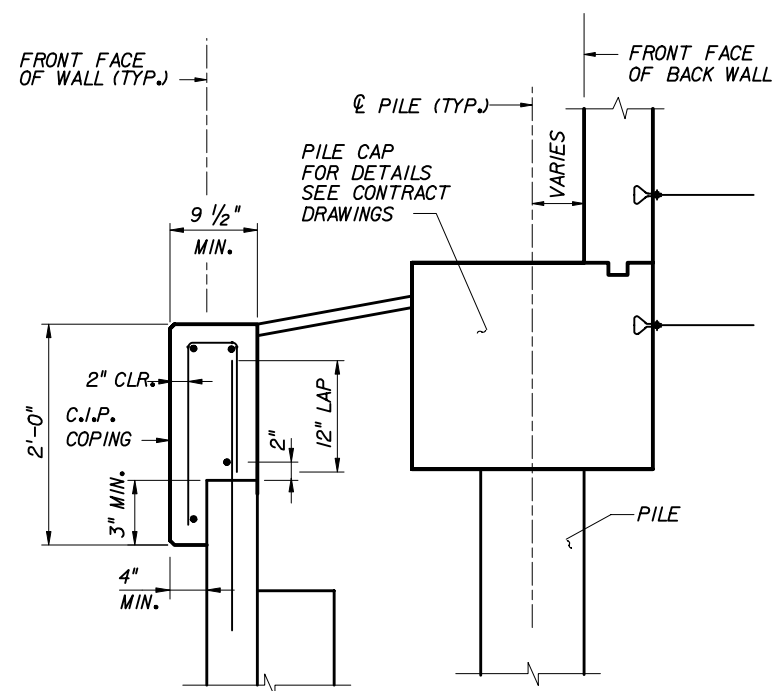


PRECAST COPING SECTION

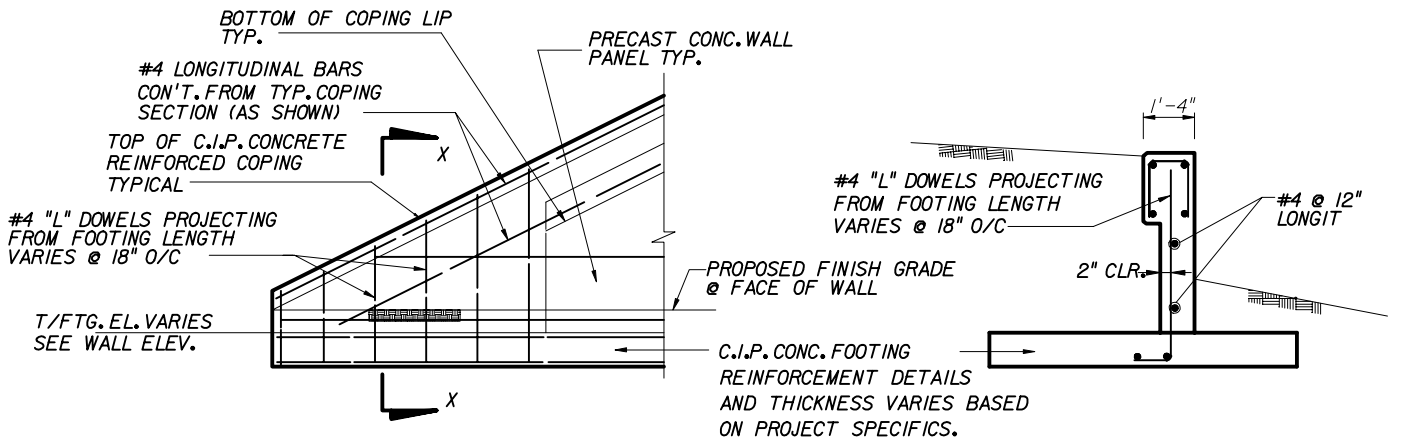
NOTE:
STANDARD COPING UNIT IS 10'-0" LONG WITH SQUARE ENDS.



**C.I.P. CONC. COPING DETAIL
(TO MATCH ADJACENT PRECAST COPING)**

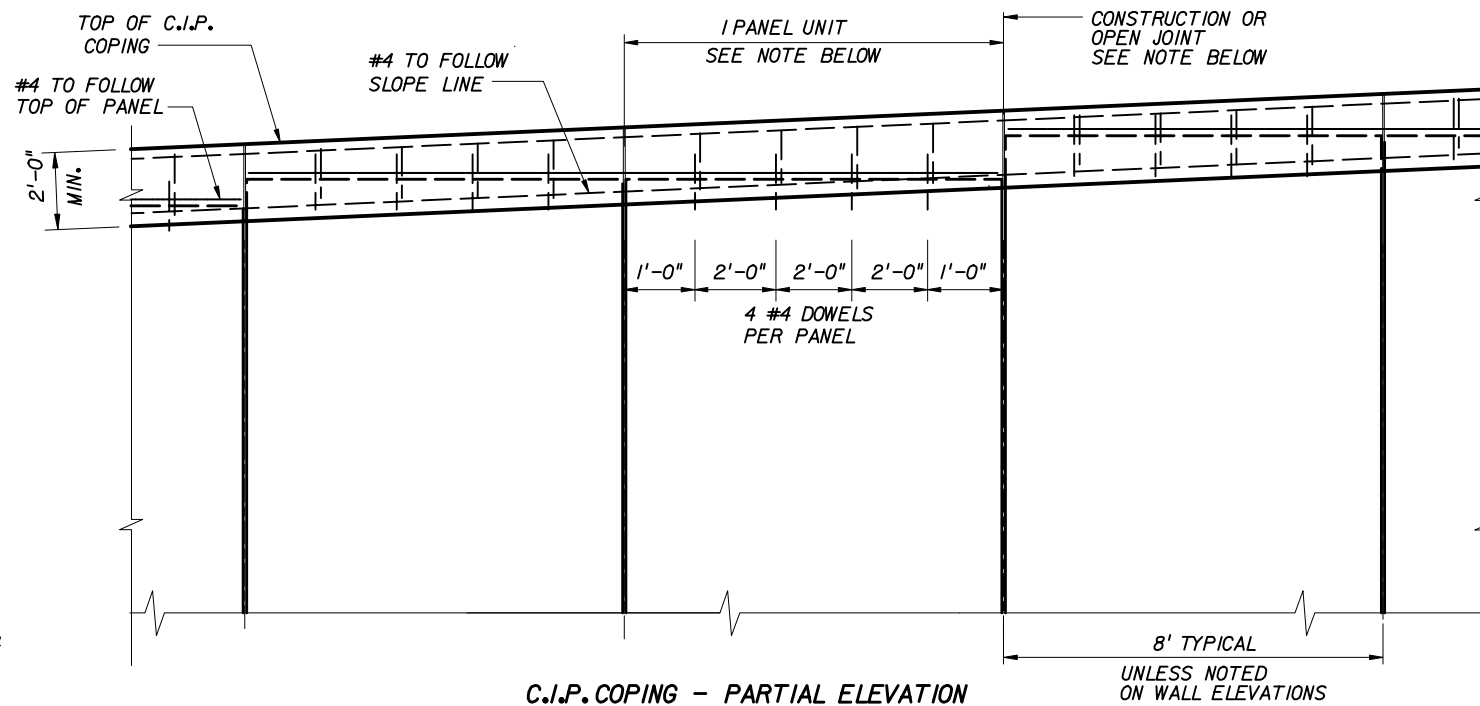


WALL LOCATION SECTION

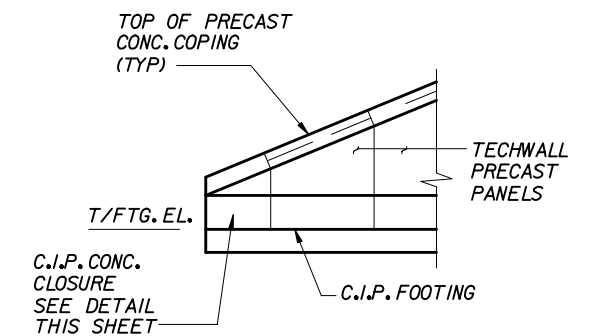


C.I.P. CLOSURE - PARTIAL ELEVATION

**SECTION X-X
SECTION THRU C.I.P. END**



C.I.P. COPING - PARTIAL ELEVATION

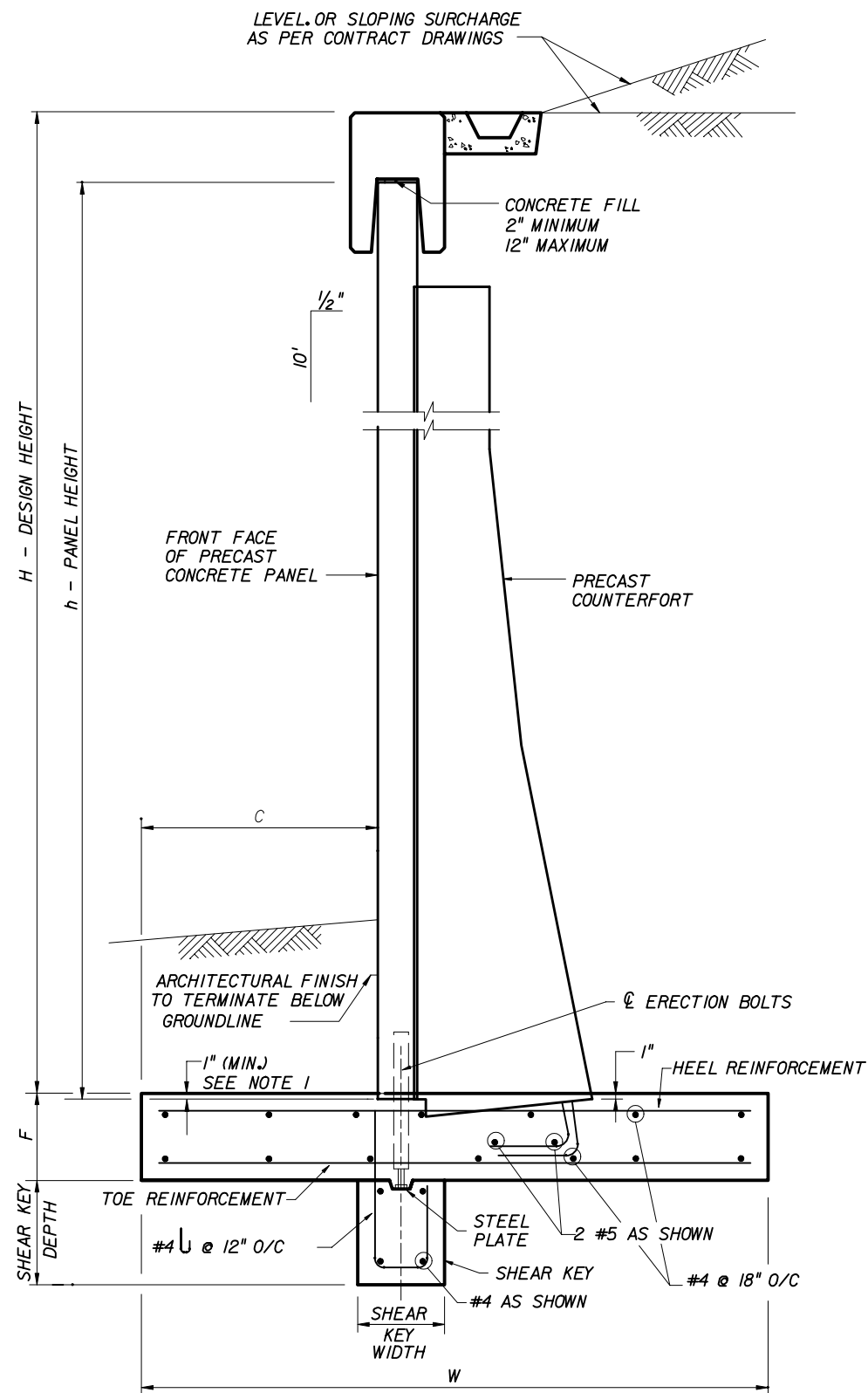


**PARTIAL ELEVATION
C.I.P. CONCRETE CLOSURE**

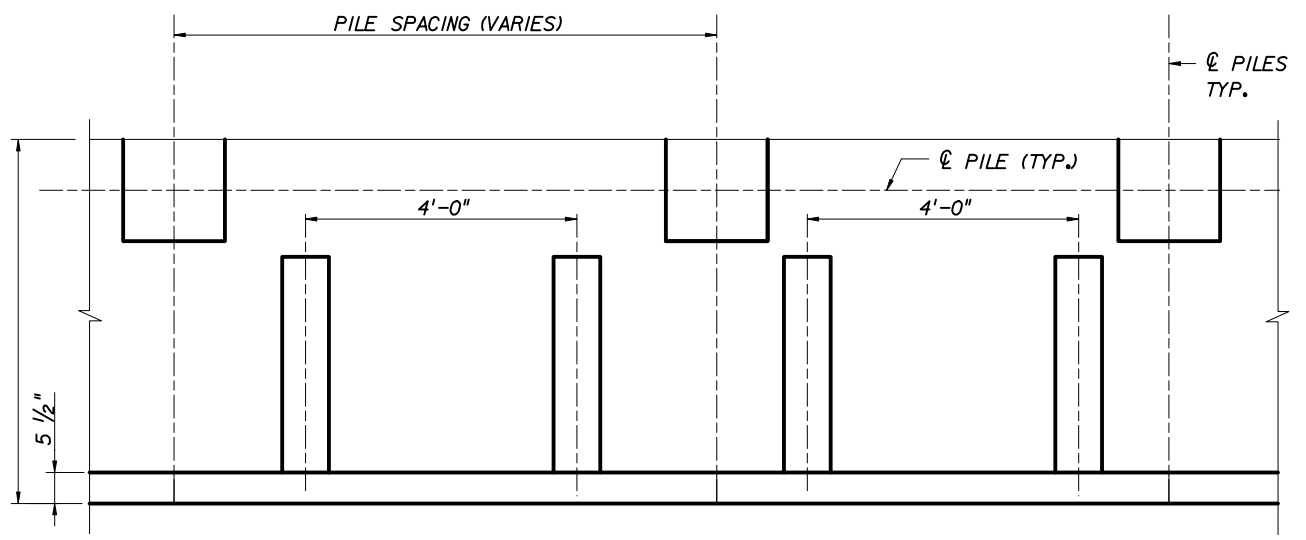
NOTE:
1/2" OPEN JOINTS IN COPING SHALL BE AT 4 PANEL INTERVALS AND COINCIDE APPROXIMATELY WITH PANEL JOINTS. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE JOINTS. CONSTRUCTION JOINTS IN BETWEEN THE OPEN JOINTS SHALL BE PROVIDED AT EVERY PANEL JOINT.

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TECHWALL

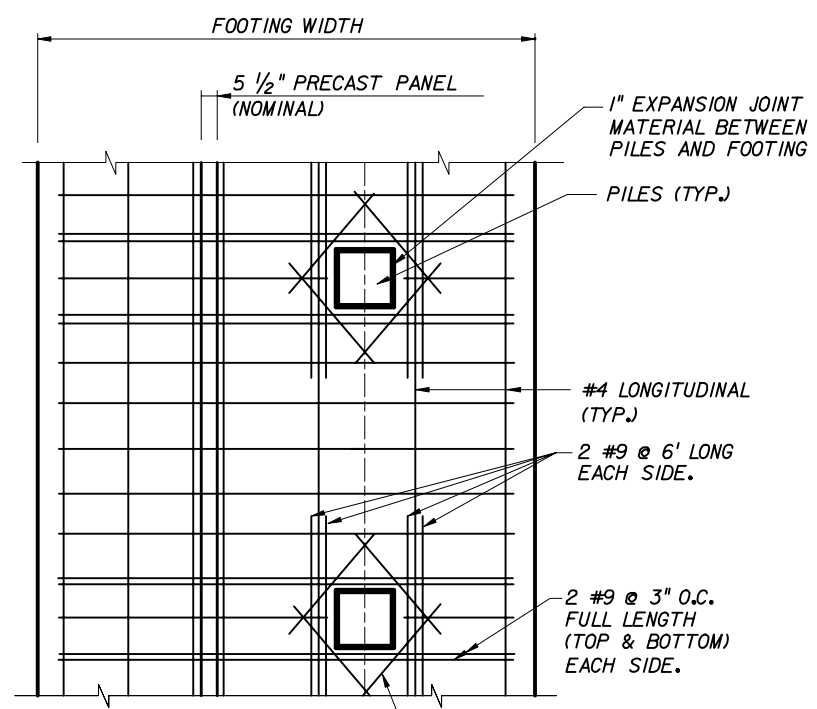
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Structures Design Engineer		
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TYPICAL SECTION THRU WALL



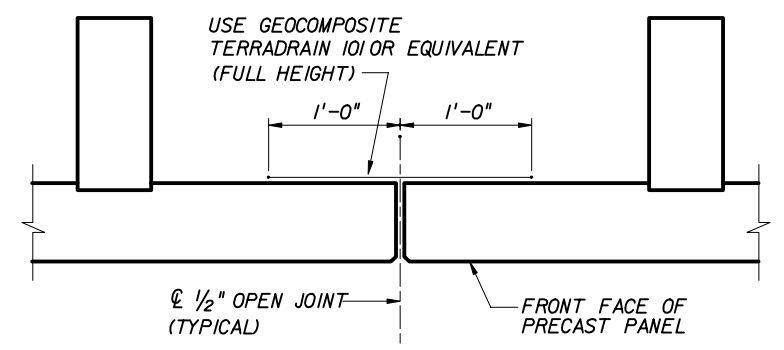
LAYOUT PRECAST PANEL W/COUNTERFORTS RELATED TO PILE LAYOUT



NOTE:
TOE REINFORCEMENT NOT SHOWN FOR CLARITY

PLAN-FOOTING AT ABUTMENT PILES

C, F, H, W AND THE REINFORCEMENT DETAILS ARE DETERMINED BY PROJECT SPECIFICS.



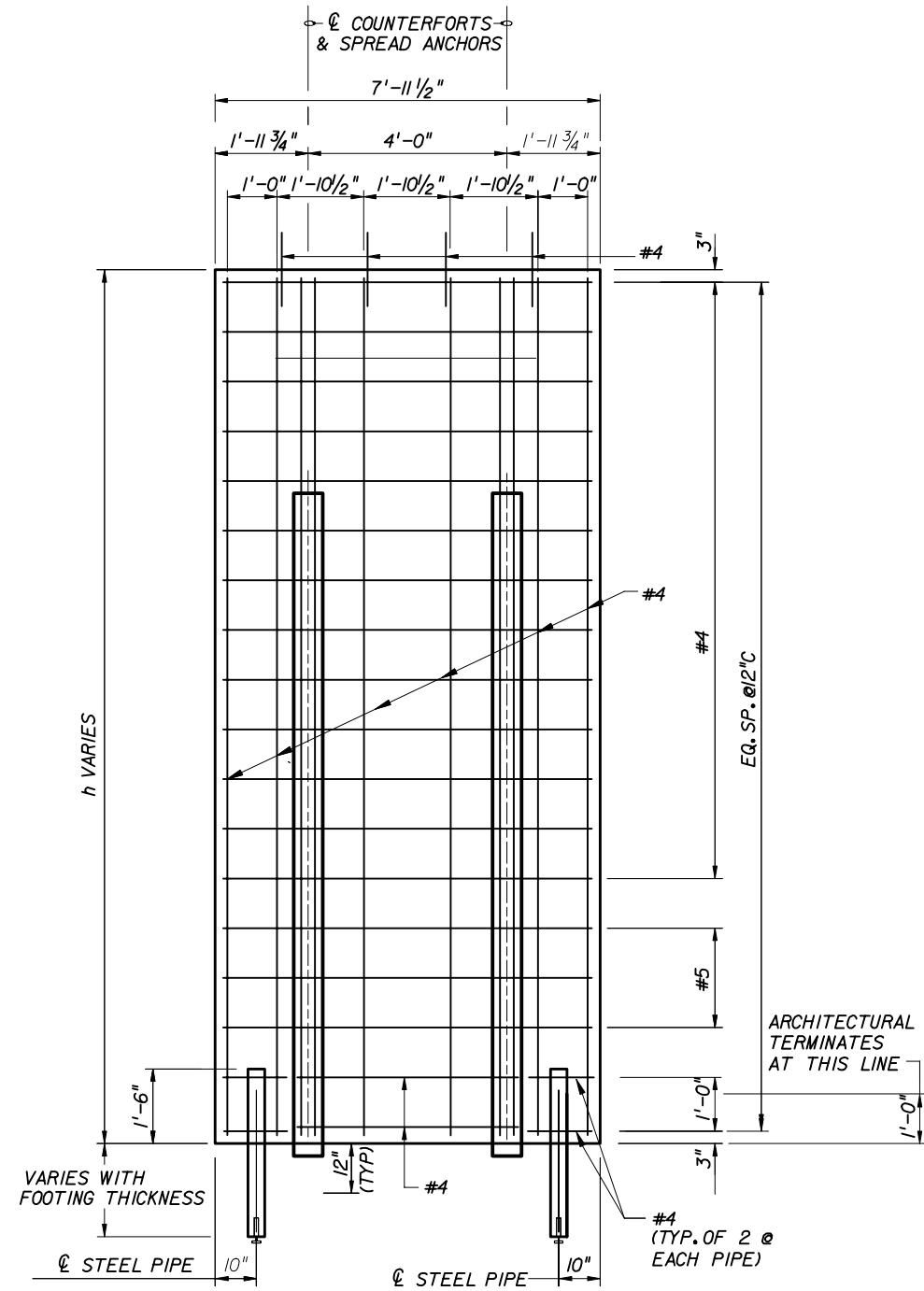
JOINT DETAIL

NOTES:

1. THE BOTTOM EDGE OF THE ASSEMBLED PRECAST PANEL SHALL BE COVERED BY 1" MINIMUM OF CAST-IN-PLACE FOOTING CONCRETE.
2. PRECAST WALL UNITS SHALL BE INSTALLED AT BATTER OF 1/2" PER 10' UNLESS OTHERWISE SHOWN ON CONSTRUCTION DRAWINGS.
3. FOR PANEL HEIGHTS OF 6.0' OR LESS COUNTERFORTS ARE NOT REQUIRED. PANELS WITHOUT COUNTERFORTS SHALL BE 8" THICK (NOMINAL). DETAILS WILL BE SHOWN ON CASTING DRAWINGS.

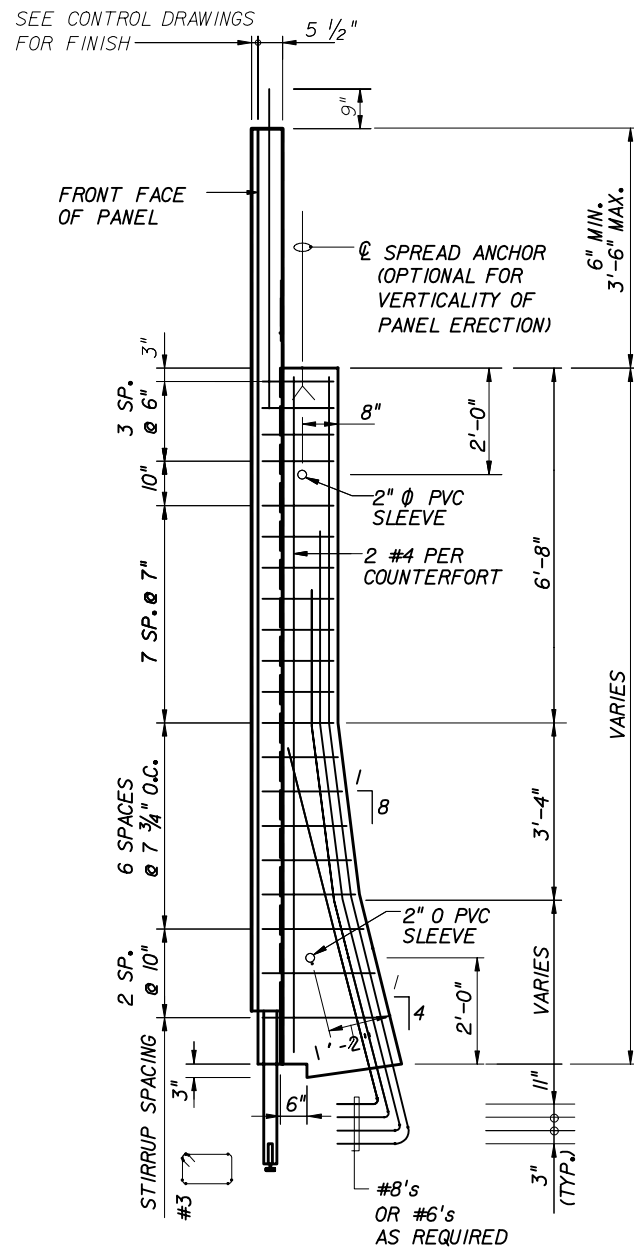
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TECHWALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By			State Structures Design Engineer	
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PANEL ELEVATION

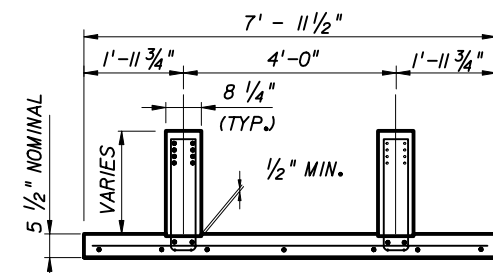
(REINFORCEMENT DETAILS MAY VARY WITH PROJECT SPECIFICS.)



COUNTERFORT - SIDE ELEVATION

(REINFORCEMENT DETAILS MAY VARY WITH PROJECT SPECIFICS.)

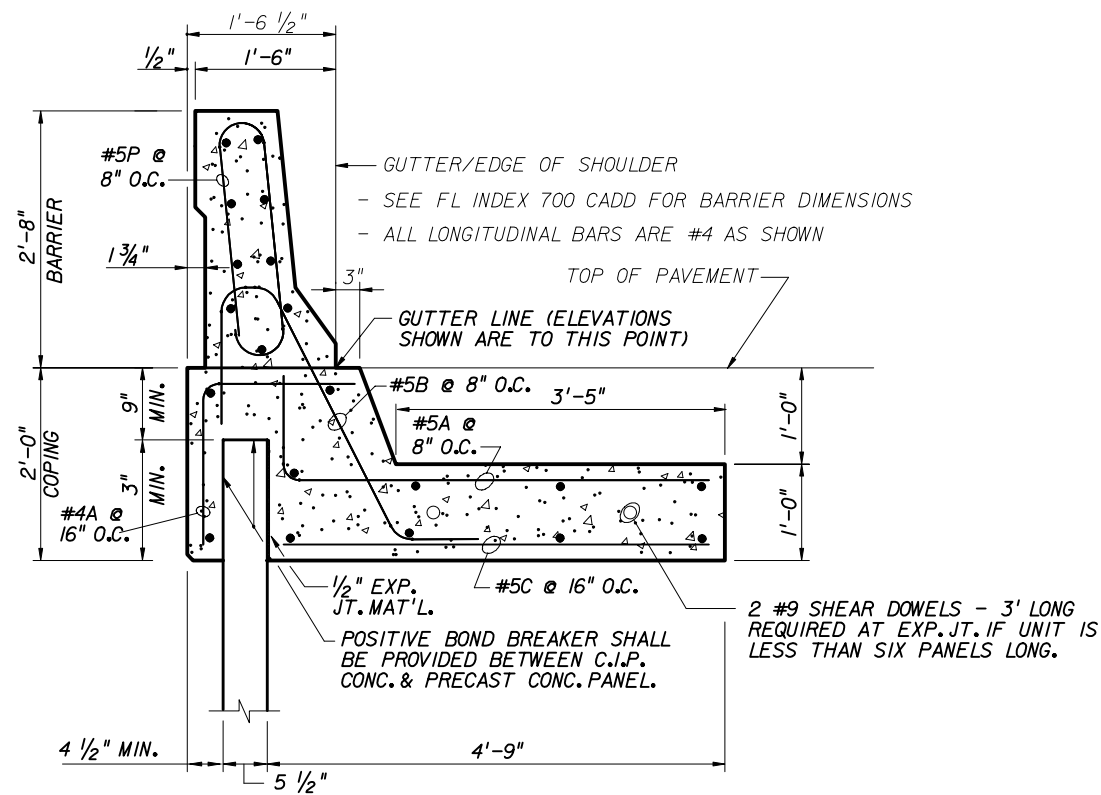
LIST OF MATERIALS	
CONCRETE PANEL FACING (CY)	VARIES
COUNTERFORT, EACH (CY)	VARIES
TOTAL (CY)	VARIES
TOTAL PANEL WT. (LB)	VARIES
2" I.D. X 1'-0" PVC SLEEVE	4
SPREAD ANCHORS	2



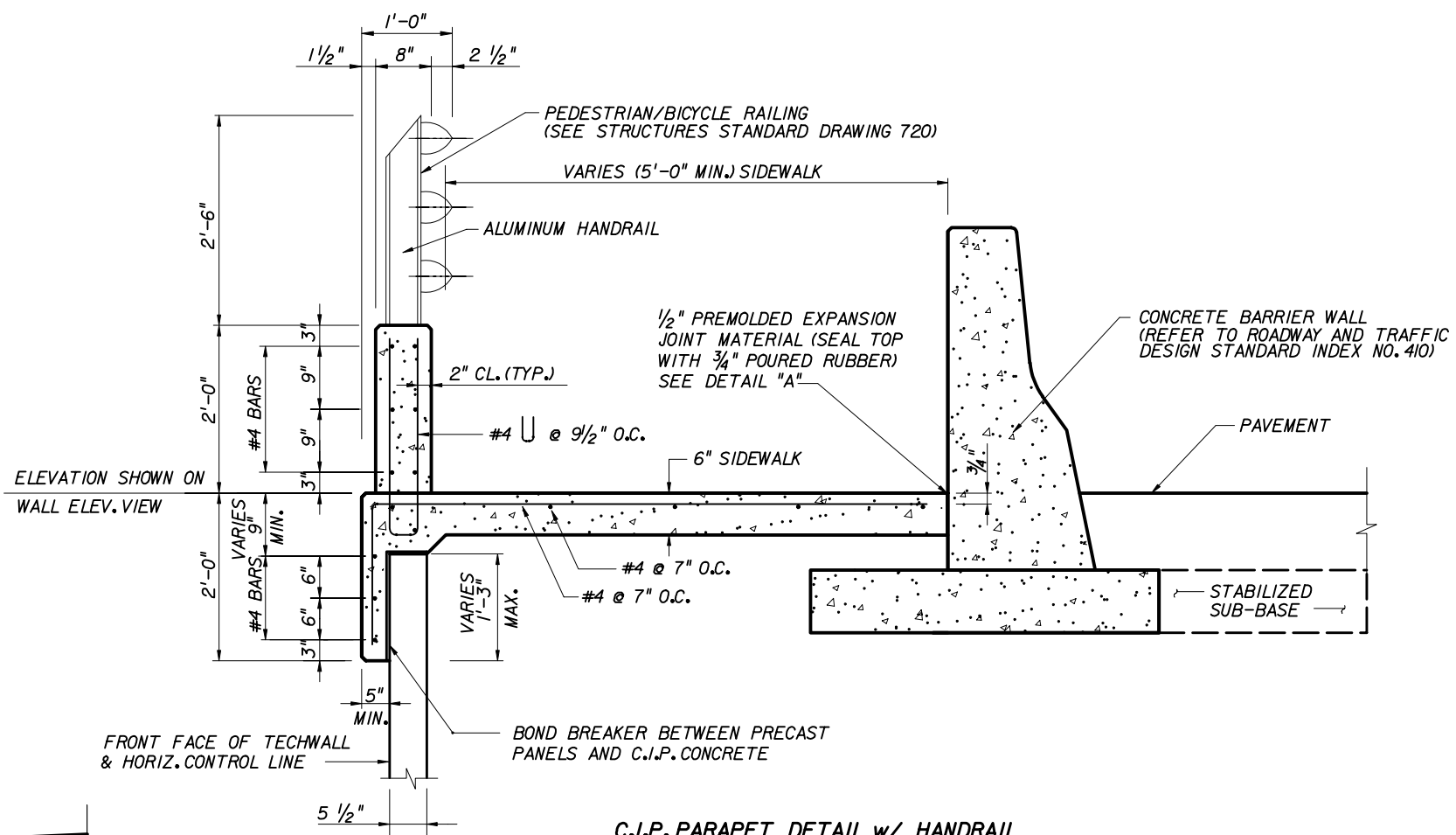
PANEL SECTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
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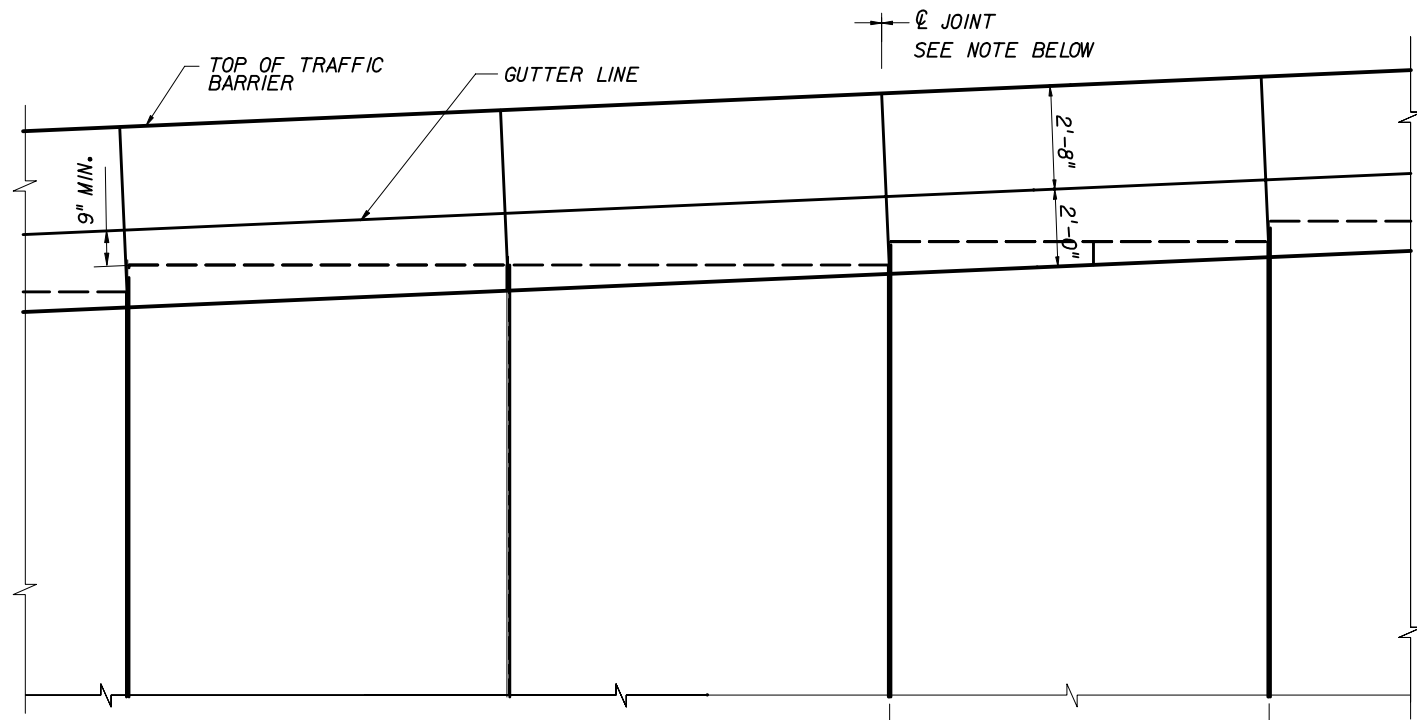
THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TECHWALL



C.I.P. CONC. TRAFFIC BARRIER



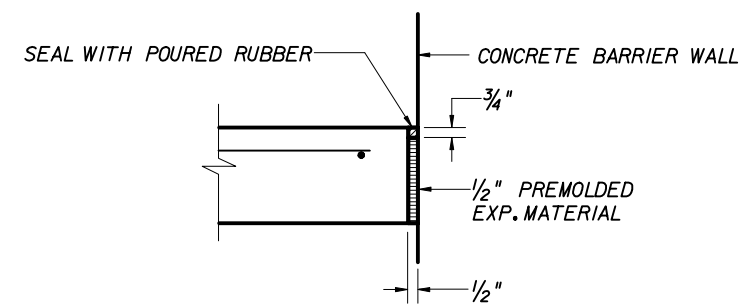
C.I.P. PARAPET DETAIL w/ HANDRAIL



C.I.P. TRAFFIC BARRIER PARTIAL ELEVATION

8'-0" TYPICAL
UNLESS NOTED ON
WALL ELEVATIONS

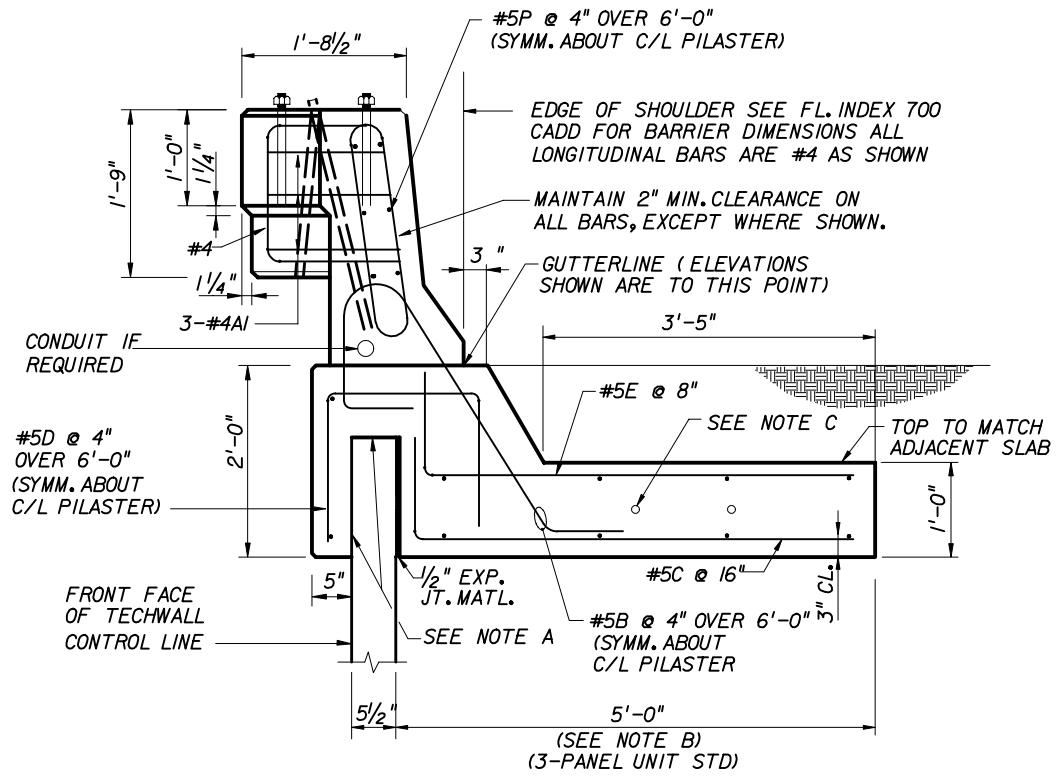
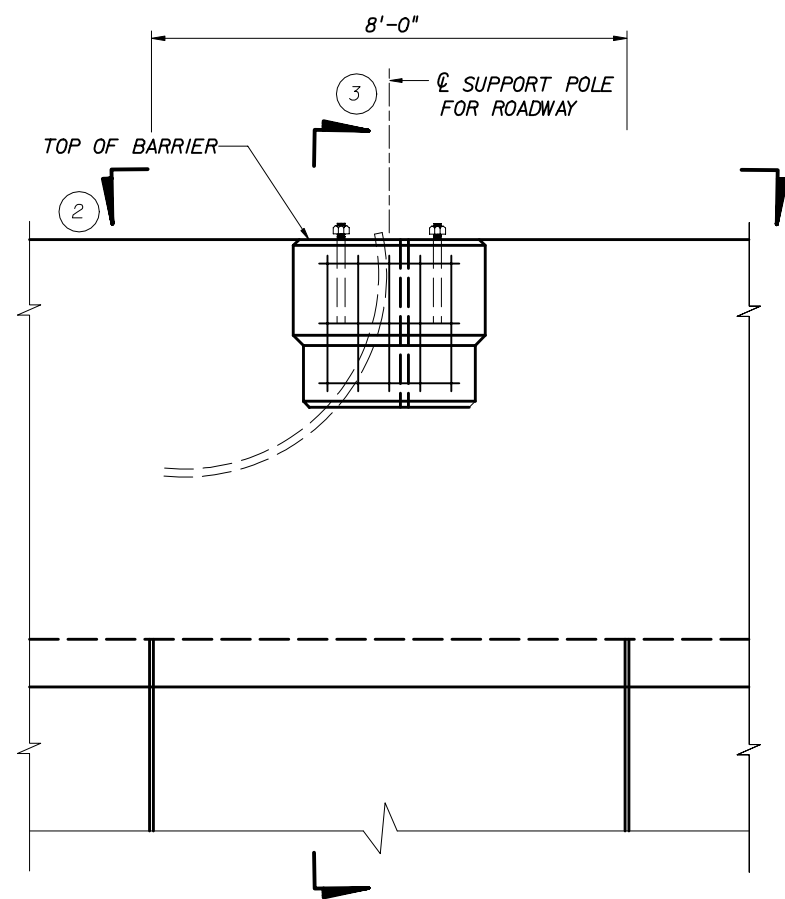
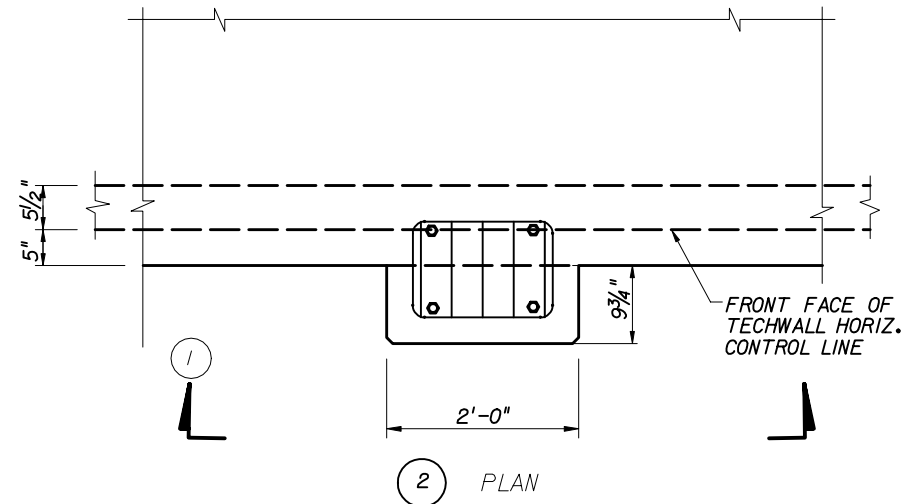
NOTE:
1/2-INCH OPEN JOINTS IN COPING SHALL BE AT 4 PANEL INTERVALS AND COINCIDE APPROXIMATELY WITH PANEL JOINTS. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE JOINTS. CONSTRUCTION JOINTS IN BETWEEN THE OPEN JOINTS SHALL BE PROVIDED AT EVERY PANEL JOINT.



DETAIL "A"

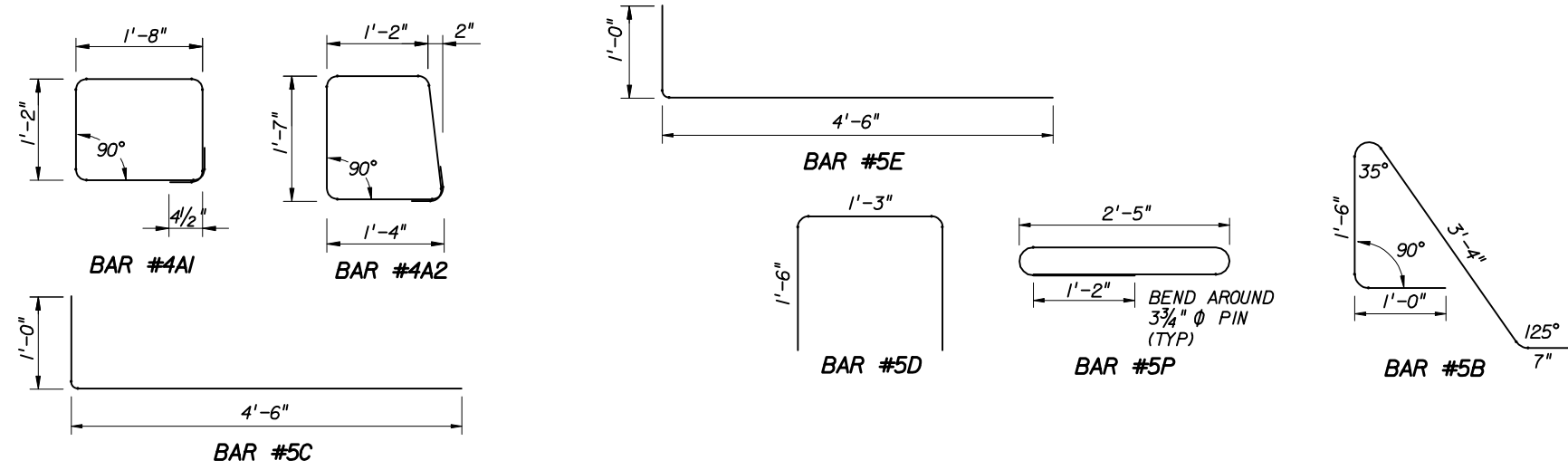
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TECHWALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
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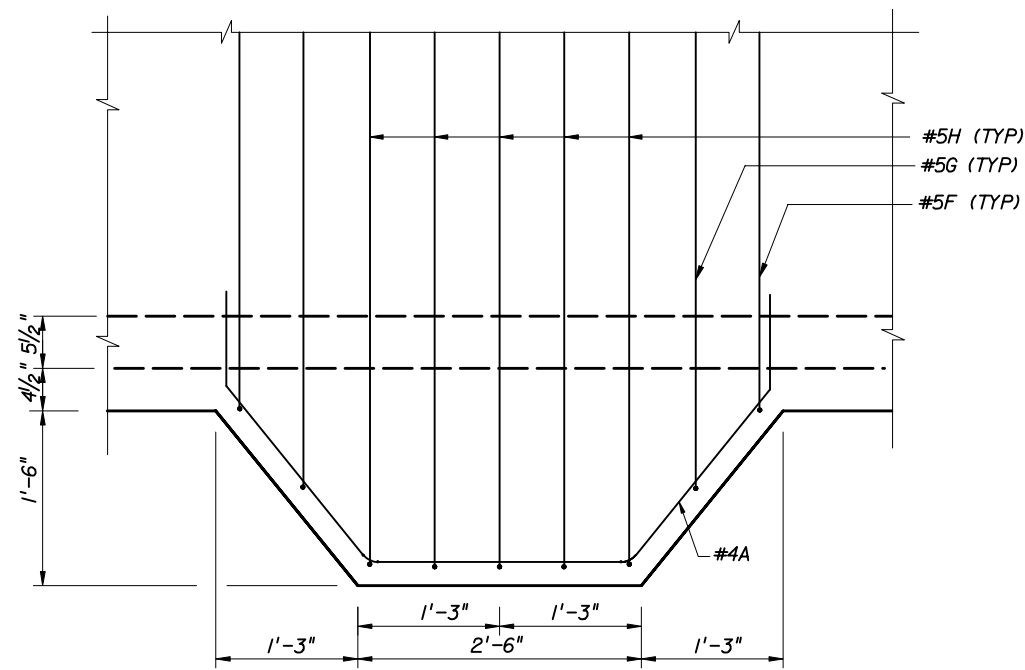
- NOTES:
- A. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN CAST IN PLACE CONC. AND PRECAST CONC. PANEL.
 - B. THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR ONE PRECAST UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE
 - C. 2 - #9 SHEAR DOWELS - 3'-0" LONG
 - D. LIGHTPOLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHTPOLE LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.
 - E. SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS.

REBAR SCHEDULE	
MARK	QTY.
#4A1	3
#4A2	5
#5B	18
#5C	4
#5D	18
#5E	9
#5P	18

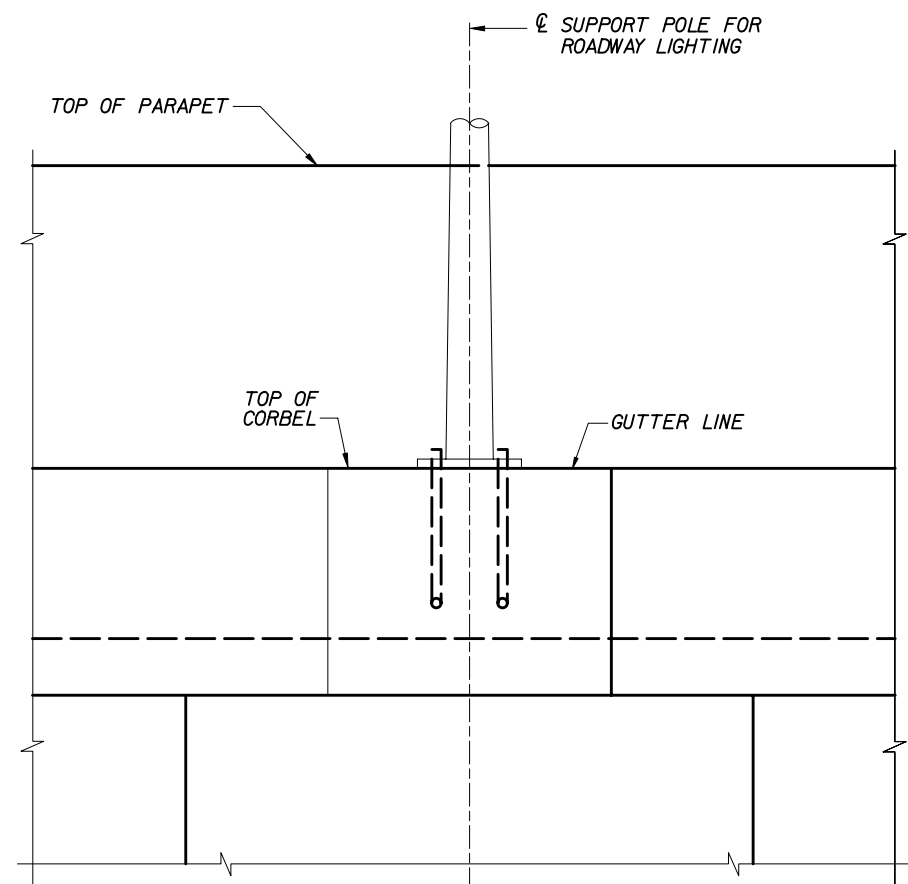


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TECHWALL

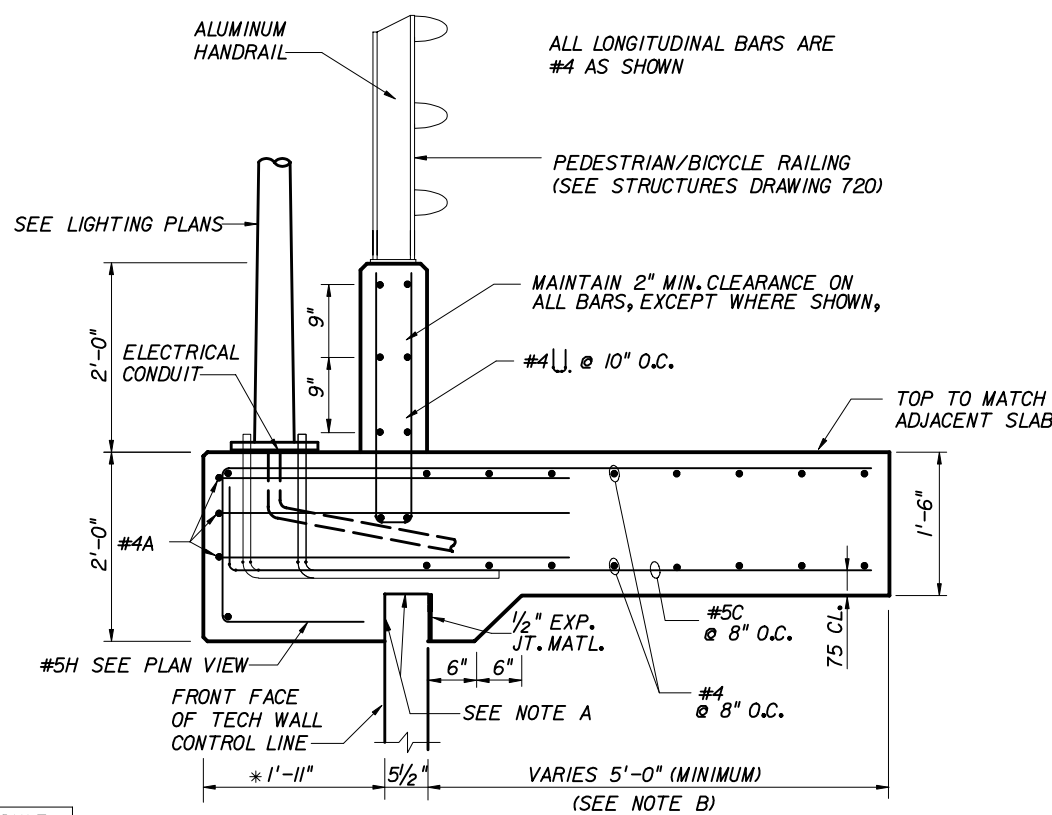
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
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1 PLAN



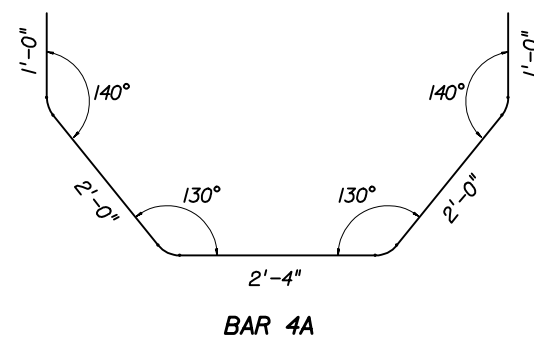
3 PARTIAL ELEVATION



* DIMENSION MAY VARY AS REQUIRED FOR LIGHT POLE BASE PLATE.

2 BARRIER DETAIL @ LIGHT POLE

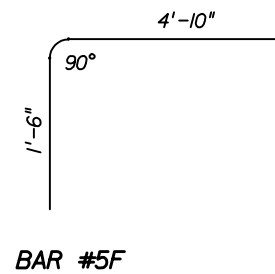
REBAR SCHEDULE	
MARK	QTY.
#4A	3
#5C	8
#5F	2
#5G	2
#5H	5
#4U	6



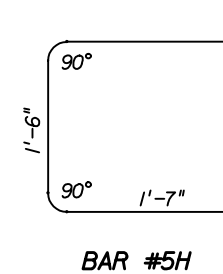
BAR 4A



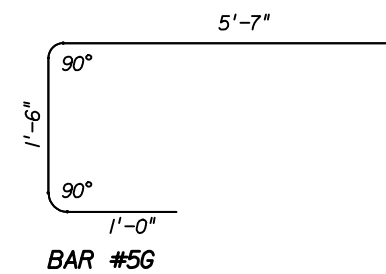
BAR #5C



BAR #5F

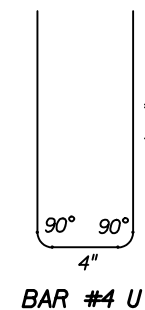


BAR #5H



BAR #5G

4 BAR BENDING DETAILS



BAR #4 U

NOTE A: POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN CAST IN PLACE CONC. AND PRECAST CONC. PANEL.

NOTE B: THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR 5' UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE

NOTE C: SEE STRUCTURES DRAWING 500 FOR ADDITIONAL DETAILS

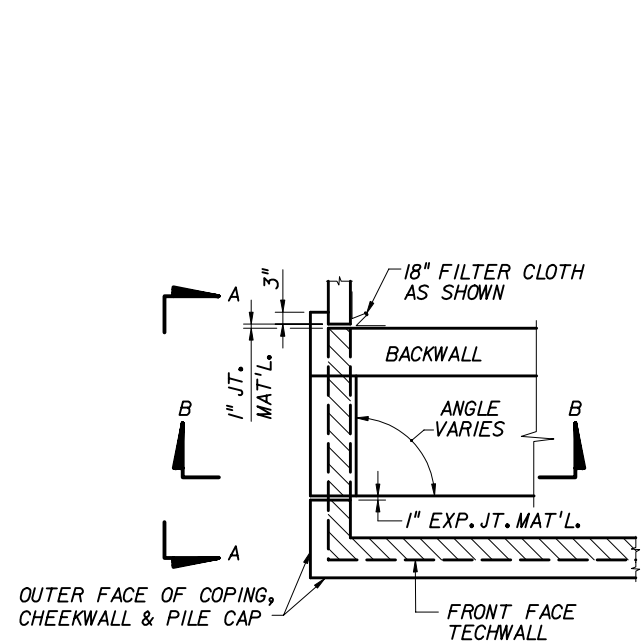
NOTE D: LIGHT POLE MANUFACTURER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TECHWALL

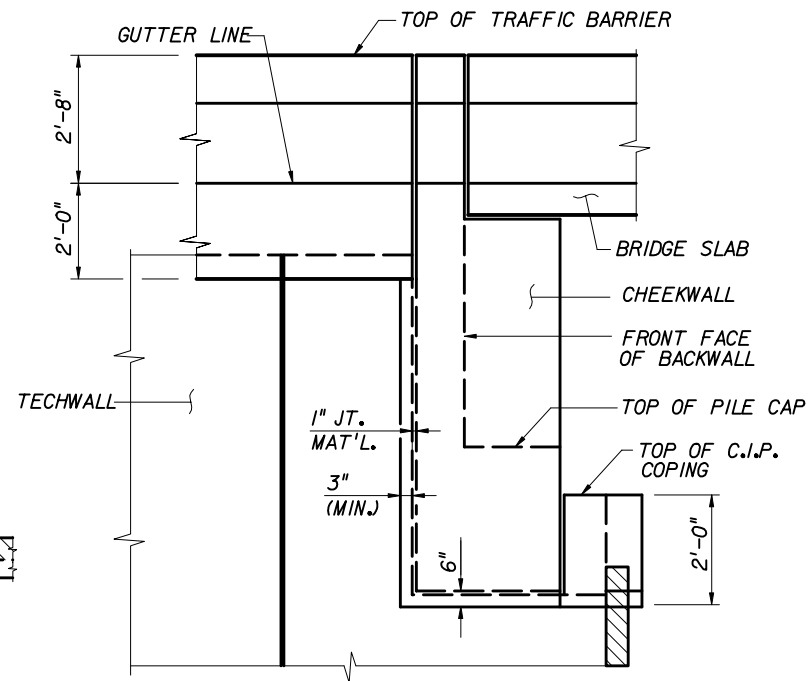
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
TECHWALL

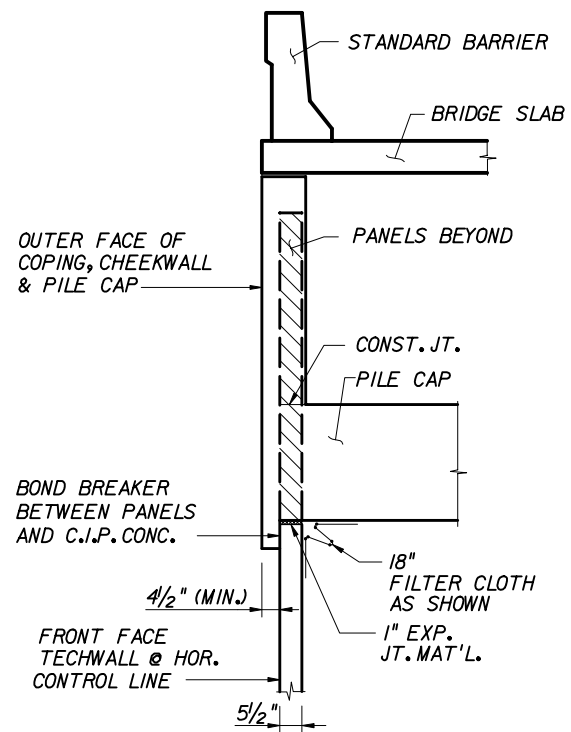
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Designed By		 State Structures Design Engineer		
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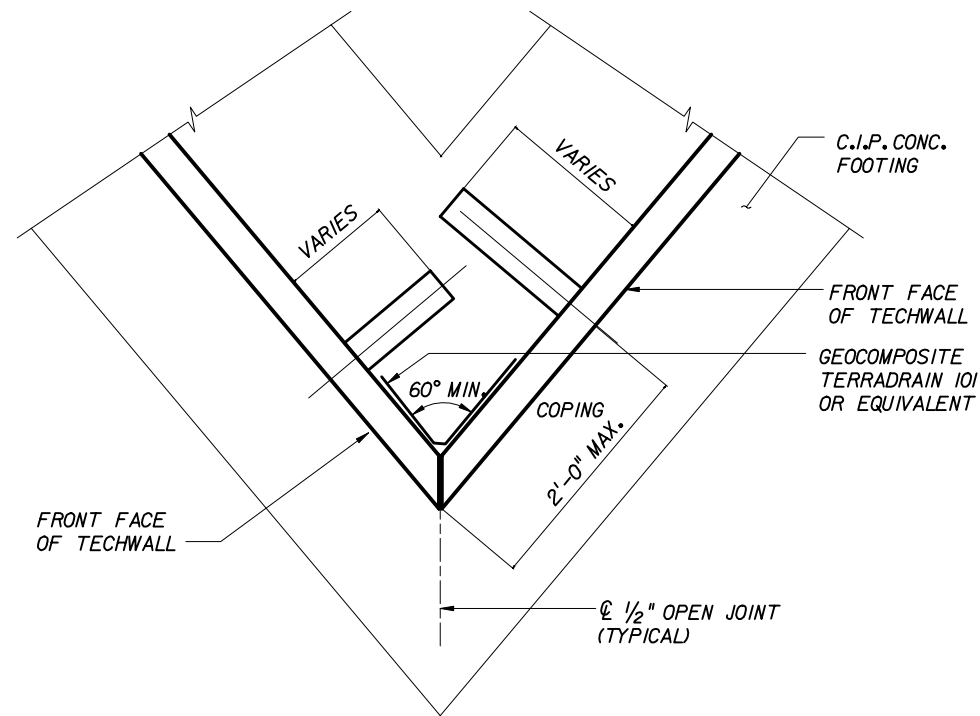
PLAN VIEW @ BEND (TYP.)



SECTION A-A



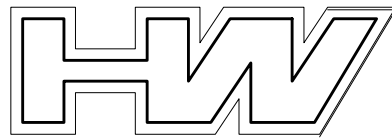
SECTION B-B



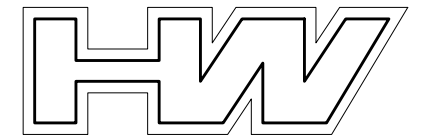
ACUTE CORNER DETAIL

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
 TECHWALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By			State Structures Design Engineer	
Checked By			Revision	Sheet No. Index No.
			00	8 of 8 5016



HILFIKER MSE SQUARE PANEL WALL SYSTEM



GENERAL NOTES

DESIGN CRITERIA

1. THE ATTACHED DETAILS ARE BASED ON THE ASSUMPTIONS THAT THE MATERIAL WITHIN THE REINFORCED VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED COMPONENTS MEET THE GOVERNING AGENCIES SPECIFICATION FOR MECHANICALLY STABILIZED EARTH STRUCTURES

2. MINIMUM DESIGN PARAMETERS

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UNITIZED AT THE SITE. THE VALUE OF THE INTERNAL FRICTION ANGLE, PHI, THE COHESION, C, AND THE UNIT WEIGHT, GAMMA, SHALL BE PROVIDED IN THE SHOP DRAWINGS.

EXTERNAL STABILITY

OVERTURNING ≥ 2.0
SLIDING ≥ 1.5
BEARING PRESSURE ≥ 2.5

OVERALL STABILITY ≥ 1.5

INTERNAL STABILITY

PULLOUT ≥ 1.5
STEEL YIELD STRESS = $0.47 F_y$

SERVICE LIFE = 75 YEARS

LIVE LOAD SURCHARGE = 250 PSF

3. THE MAXIMUM APPLIED BEARING PRESSURE AT THE INTERFACE OF THE FOUNDATION AND SELECT BACKFILL MATERIAL IS SHOWN ON THE PLANS. THE BEARING PRESSURE SHOWN IS THE MAXIMUM FOR THE GIVEN BASE MAT LENGTH. IT IS THE RESPONSIBILITY OF OTHERS TO DETERMINE THAT THE BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.

4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED VOLUME AS DETERMINED BY THE ENGINEER SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL AS DIRECTED BY THE ENGINEER.

5. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, T&B STRUCTURAL SYSTEMS IS RESPONSIBLE FOR THE INTERNAL STABILITY OF THE STRUCTURE. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

WALL CONSTRUCTION

1. WALLS FOUNDED ON CURVES SHALL HAVE THEIR PANELS DIMENSIONED AS A SERIES OF CORDS (AS DIMENSIONED IN SHOP DRAWINGS) IN ORDER TO MATCH THE REQUIRED WALL RADIUS.

2. FOR LOCATION AND ALIGNMENT OF THE MSE STRUCTURES REFERENCE THE RETAINING WALL CONTROL PLANS.

3. IF MANHOLE AND DROP INLETS ARE REQUIRED, THEY SHALL BE LOCATED AS SHOWN ON THE RETAINING WALL ELEVATION DRAWINGS.

4. IF PILES ARE LOCATED WITHIN THE REINFORCED VOLUME THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE WALL UNLESS AN ALTERNATE METHOD IS USED TO ISOLATE THE COLUMNS FROM THE REINFORCED VOLUME AS APPROVED BY THE ENGINEER.

5. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 TO A LEVEL 2" (PLUS OR MINUS) ABOVE THE ELEVATION OF THE SOIL REINFORCING ELEMENT. NO SOIL REINFORCEMENT SHALL BE ATTACHED TO ANY PANEL BEFORE THE BACKFILL IS PLACED AT THE REQUIRED ELEVATION AND IS COMPACTED.

6. STRUCTURES GREATER THAN 20 FEET SHALL HAVE THE FINISHED GRADE PLACED AND COMPACTED AT THE FRONT FACE OF THE STRUCTURE BEFORE THE STRUCTURE HEIGHT EXCEEDS 20 FEET. FINISH GRADE SHALL BE COMPACTED TO 95 % OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ANY GUARDRAIL POSTS PRIOR TO PLACING THE TOP ROW OF SOIL REINFORCEMENT. THE POST SPACING SHALL BE ADJUSTED TO AVOID CONFLICTS WITH THE LONGITUDINAL SOIL REINFORCING WIRE. CUTTING OF THE LONGITUDINAL WIRE SHALL BE ALLOWED ONLY AS DIRECTED BY THE ENGINEER.

8. IF EXISTING OR FUTURE STRUCTURES ARE TO BE PLACED IN THE REINFORCED VOLUME THAT INTERFERE WITH THE PROPER PLACEMENT OF THE SOIL REINFORCEMENT THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR A COURSE OF ACTION.

9. TOP COPING PANELS BENEATH CAST-IN-PLACE COPING SHALL HAVE 1/2" DOWELS PROTRUDING FROM THEIR TOP EDGE.

10. FOR OTHER INFORMATION PERTAINING TO THE CONSTRUCTION OF THE HILFIKER RETAINING WALL PLEASE REFER TO T&B STRUCTURAL SYSTEMS ERECTION MANUAL.

11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DEFLECT THE TOP ROW OF SOIL REINFORCEMENT DOWNWARD SO AS TO NOT CONFLICT WITH ROADWAY MIXING OPERATIONS AND/OR ROADWAY CONSTRUCTION OPERATIONS. ANY SOIL REINFORCING MATERIAL THAT IS DAMAGED SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

MISCELLANEOUS NOTES

1. NOMINAL SOIL REINFORCING GRID LENGTH

THE WELDED WIRE MESH IS MANUFACTURED IN LENGTHS CORRESPONDING TO THE DIMENSION "B" AS GIVEN IN THE RETAINING WALL ELEVATIONS. THE ACTUAL LENGTH FROM THE FRONT FACE OF THE PANEL TO THE TAIL OF THE SOIL REINFORCING GRID IS PLUS 12" THIS ACCOUNTS FOR THE THICKNESS OF THE PANEL AND THE LOCATION OF THE CONNECTION OF THE SOIL REINFORCING MAT WITH THE PANEL ANCHOR. THE FOUNDATION SHALL BE EXCAVATED TO AN EXTENT OF "B" PLUS 12".

2. SELECT BACKFILL QUANTITY

THE REQUIRED VOLUME OF IN-PLACE SELECT BACKFILL IS CALCULATED BY MULTIPLYING THE RETAINING WALL FACE AREA BY THE SOIL REINFORCING LENGTH. THIS IS PERFORMED AT EACH INDIVIDUAL SEGMENT OF WALL FOR EACH CORRESPONDING "B". THE BACKFILL QUANTITY IF GIVEN BY T&B STRUCTURAL SYSTEMS IS AN ESTIMATE ONLY. THE CONTRACTOR IS ULTIMATELY TO DETERMINE THE QUANTITY OF SELECT BACKFILL MATERIAL THAT IS REQUIRED.

3. PANEL FINISH

THE CONCRETE PANELS SHALL HAVE A PLAIN STEEL FORM FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINING WALL CONTROL PLANS.

4. THE FOLLOWING MATERIALS ARE SUPPLIED BY T&B STRUCTURAL SYSTEMS

- PRECAST CONCRETE FACING PANEL
- SOIL REINFORCING GRIDS
- CONNECTION PINS
- 1/2" DIAMETER ALIGNMENT PINS
- 60 DURO 3/4" X 8" BEARING PADS
- SYNTHETIC INDUSTRIES GEOTEX 401NONWOVEN GEOTEXTILE FILTER FABRIC

THIS SYSTEM FOR USE IN MODERATELY OR SLIGHT AGGRESSIVE ENVIRONMENTS ONLY

ANY OTHER MATERIAL REQUIRED TO BUILD THE MSE STRUCTURES ACCORDING TO THE GOVERNING SPECIFICATION SHALL BE SUPPLIED BY THE CONTRACTOR.

5. T&B STRUCTURAL SYSTEM SUPPLIES MECHANICALLY STABILIZED EARTH STRUCTURAL COMPONENTS FOR USE WITH THE HILFIKER RETAINING WALL SYSTEMS FOR THE STRUCTURES DETAILED HEREIN. THE ERECTION MANUAL PROVIDED BY T&B STRUCTURAL SYSTEMS IS A GENERAL GUIDELINE FOR ERECTING THE HILFIKER RETAINING WALL SYSTEM. ALL QUALITY CONTROL PROCEDURES, STAGING PROCEDURES, MATERIAL HANDLING, AND SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE OBLIGATION TO CONSTRUCT THE RETAINING WALL ACCORDING TO THE PROJECT PLANS AND SPECIFICATIONS AND ALL LAWS OF THE GOVERNING STATE.

ENGLISH

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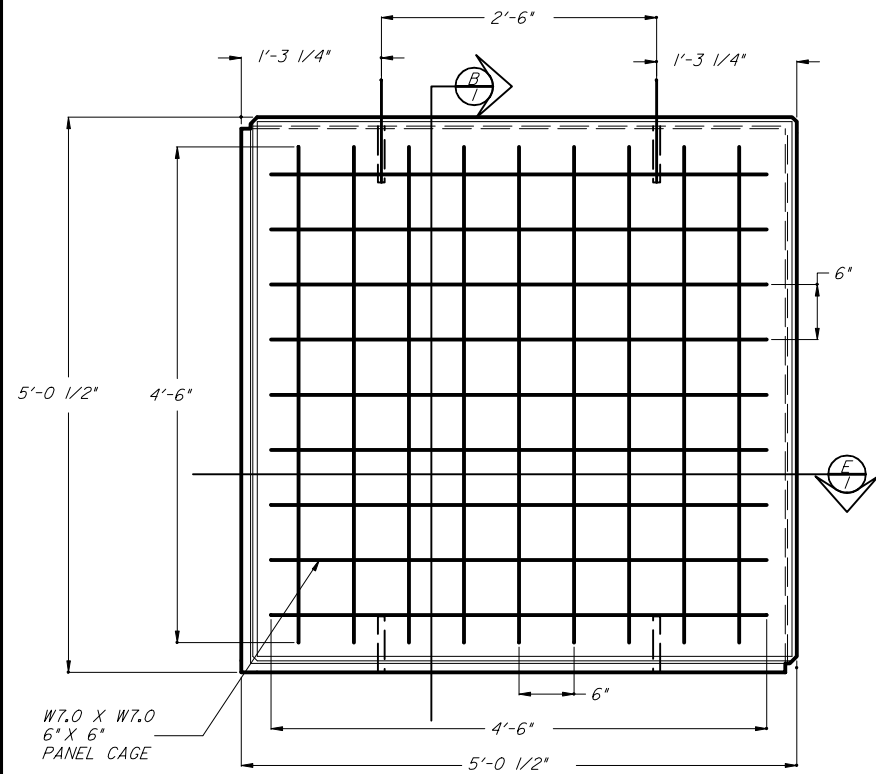
HILFIKER RETAINING WALL SYSTEM



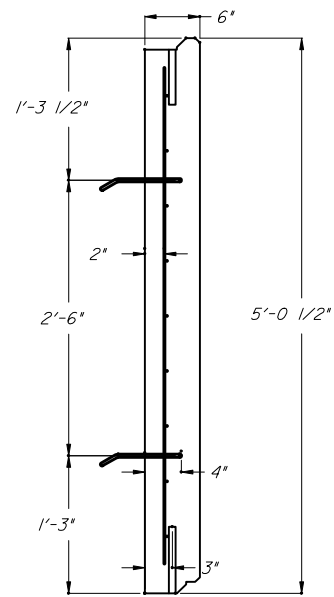
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM HILFIKER SQUARE PANEL

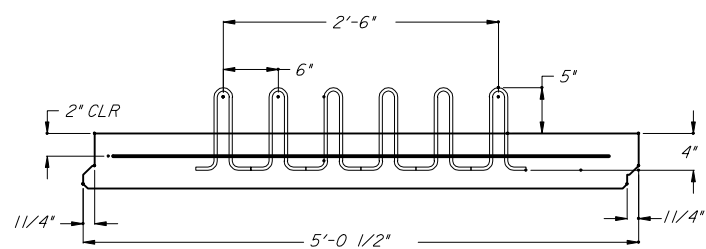
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Drawn By	TPT	Revision	Sheet No.	Index No.
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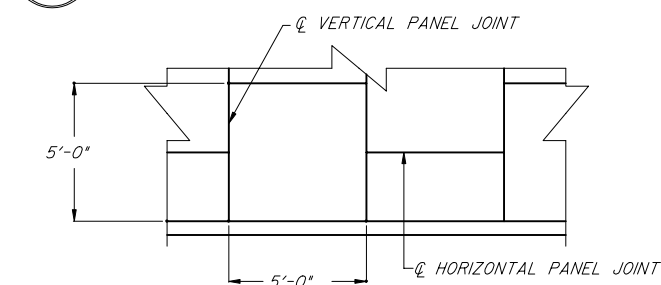
A STANDARD SQUARE PANEL
TYPE G - FRONT FACE



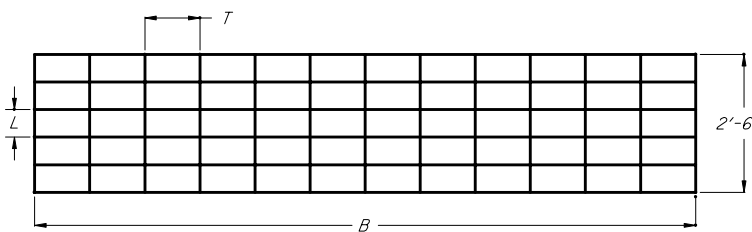
B STANDARD SQUARE PANEL
TYPE G SECTION



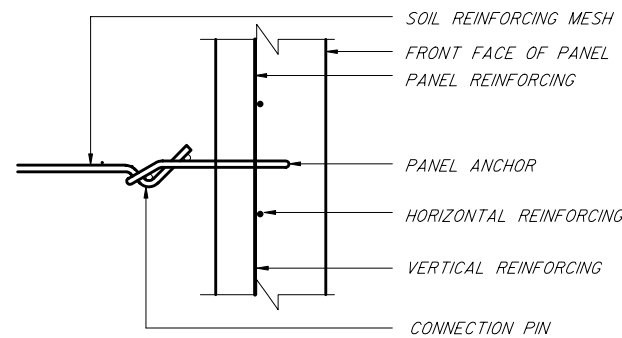
E STANDARD SQUARE PANEL
TYPE B/G



F TYPICAL PANEL LAYOUT
PARTIAL ELEVATION - FRONT FACE

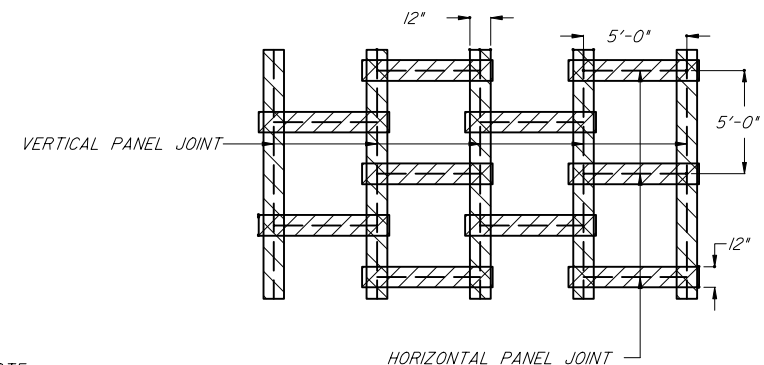


G SOIL REINFORCING ELEMENT
MW45 MINIMUM WIRE SIZE



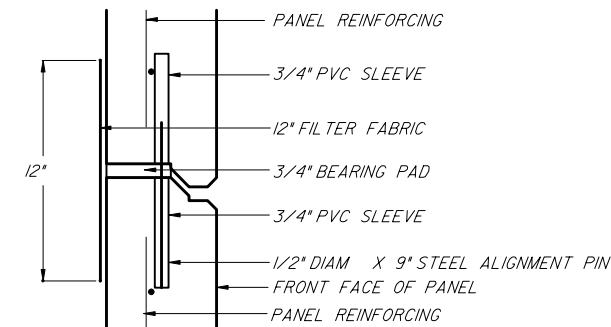
NOTE: ANCHOR SIZE SHALL BE MINIMUM SIZE OF ATTACHED SOIL REINFORCING

H CONNECTION DETAIL - TYP

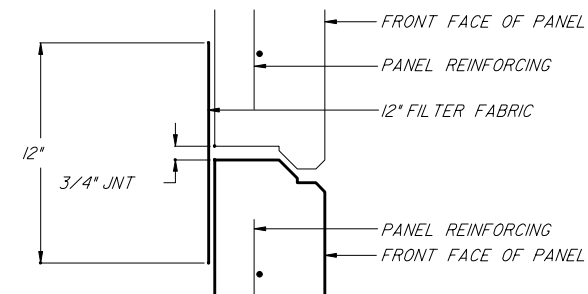


NOTE:
1. FILTER FABRIC SHALL BE PLACED OVER ALL VERTICAL AND HORIZONTAL JOINTS
2. FABRIC SHALL BE ADHERED TO BACK FACE OF PANEL WITH THE USE OF AN APPROVED CONSTRUCTION ADHESIVE
3. MINIMUM OVER LAP OF 12\"/>

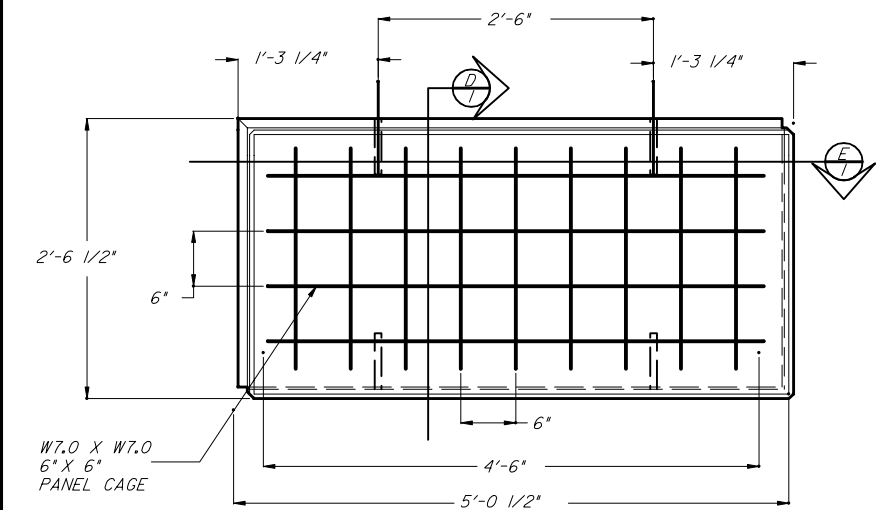
J FILTER CLOTH - JOINT DETAIL
PARTIAL ELEVATION - BACK FACE



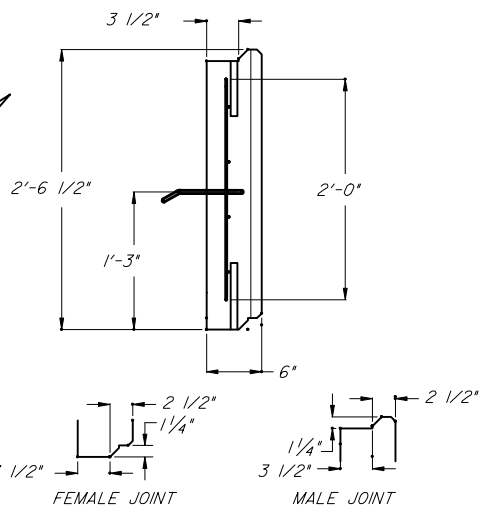
K HORIZONTAL JOINT DETAIL
PARTIAL SECTION



L VERTICAL JOINT DETAIL
PARTIAL SECTION



C STANDARD HALF PANEL
TYPE B - FRONT FACE

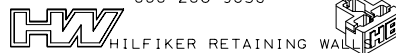


D STANDARD HALF PANEL
TYPE B SECTION

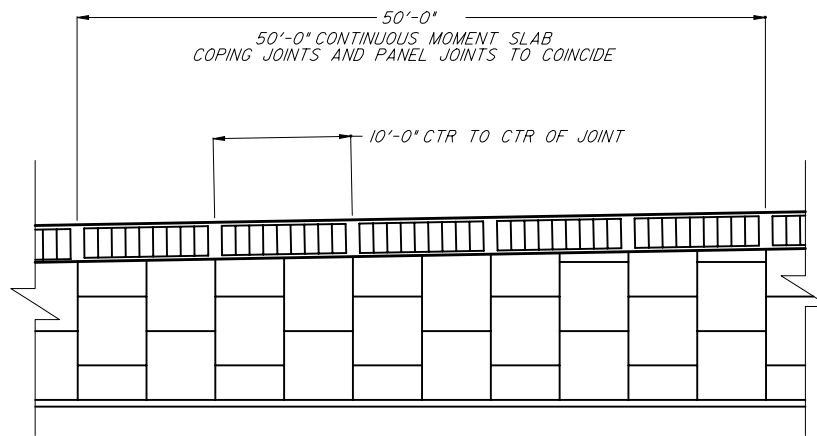
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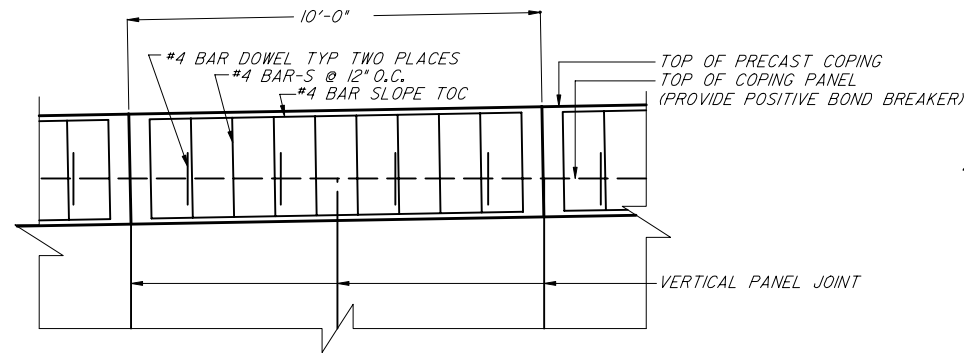
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RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
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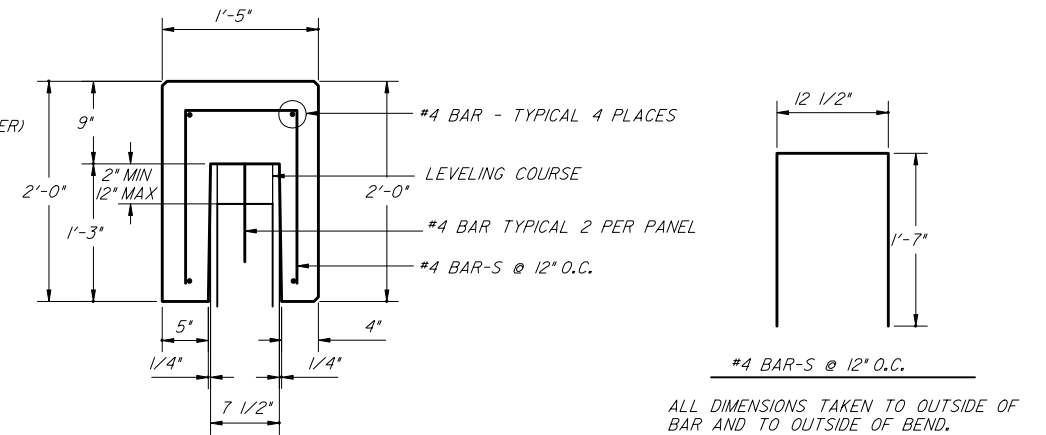


A PRECAST COPING ELEVATION
2



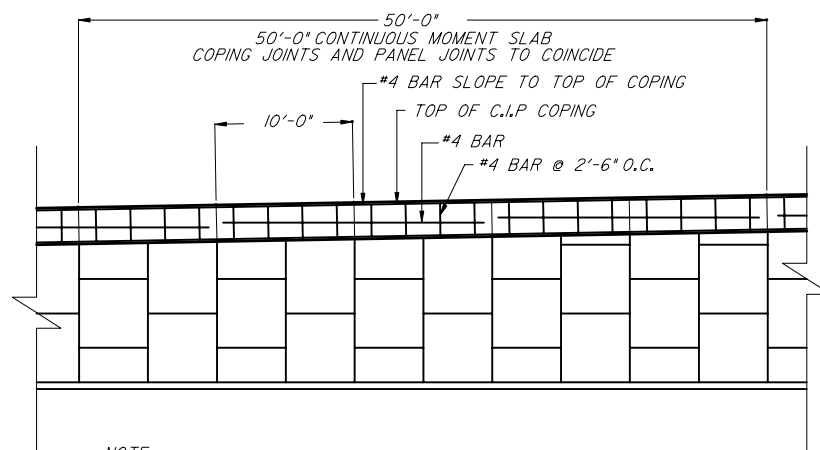
NOTE:
PLACE PRE-CAST COPING SO JOINTS LINE UP WITH COPING PANEL BELOW. USE GROUT TO BRING TOP COPING PANEL TO GRADE.

B PRECAST COPING PARTIAL ELEVATION
2



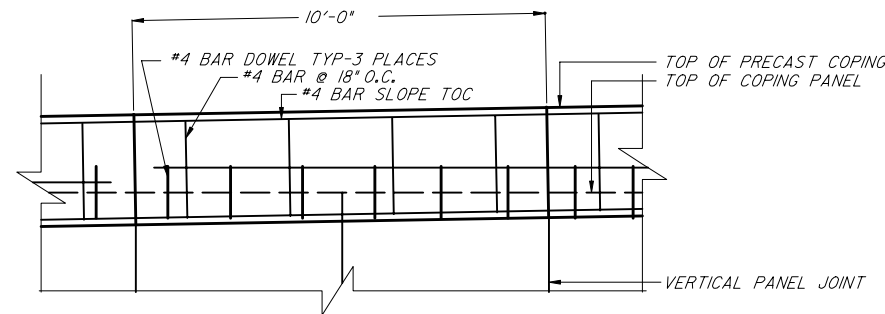
C PRECAST COPING
2

ALL DIMENSIONS TAKEN TO OUTSIDE OF BAR AND TO OUTSIDE OF BEND.



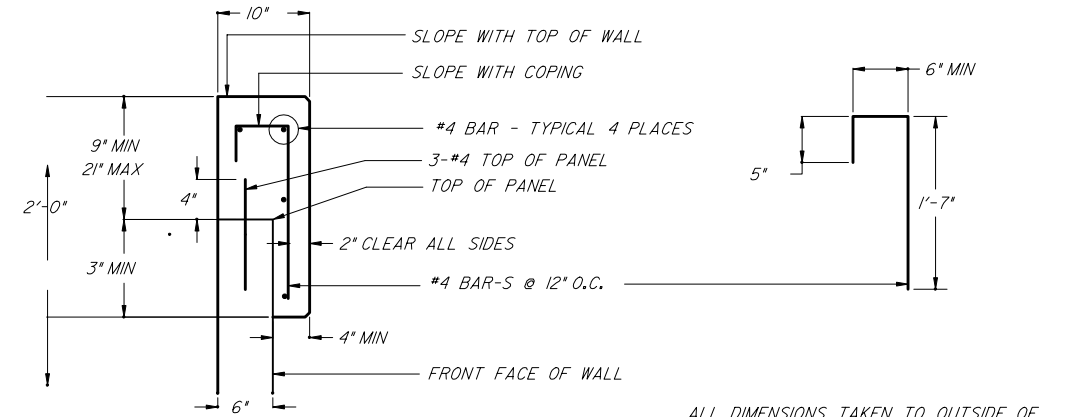
NOTE:
JOINTS TO BE 10' O.C. AND SHALL LINE UP WITH THE PANEL JOINT BELOW

D C.I.P. COPING ELEVATION
2



NOTE:
PLACE PRE-CAST COPING SO JOINTS LINE UP WITH COPING PANEL BELOW. USE GROUT TO BRING TOP COPING PANEL TO GRADE.

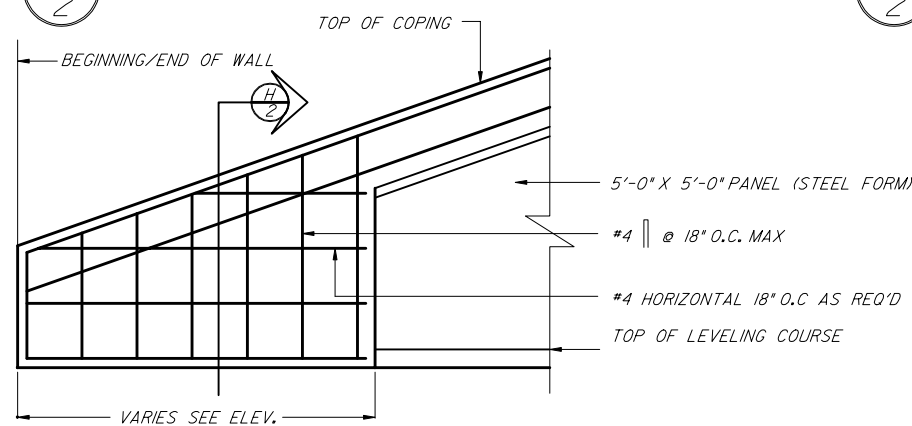
E C.I.P. COPING PARTIAL ELEVATION
2



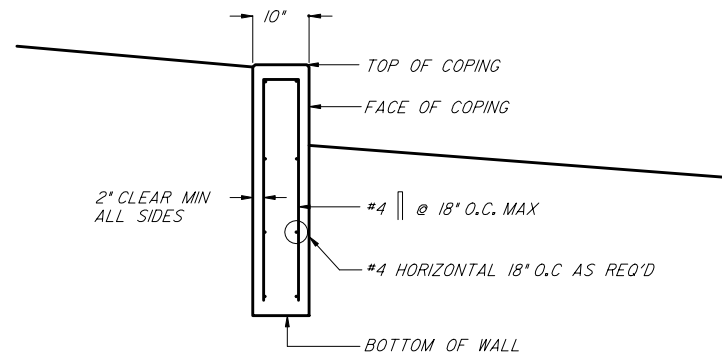
ALL DIMENSIONS AS SHOWN ARE MINIMUMS

F C.I.P. COPING
2

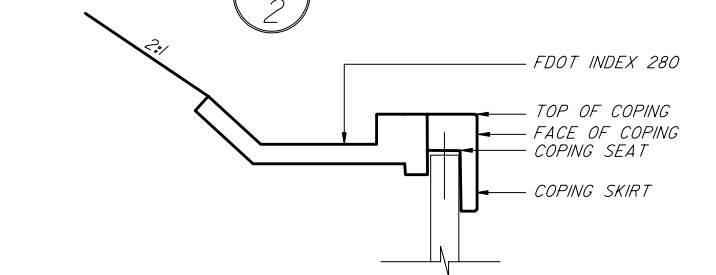
ALL DIMENSIONS TAKEN TO OUTSIDE OF BAR AND TO OUTSIDE OF BEND.



G COPING ENCLOSURE ELEVATION
2



H COPING ENCLOSURE SECTION
2

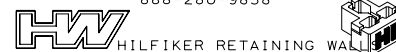


I COPING-DRAINAGE SECTION DETAIL
2

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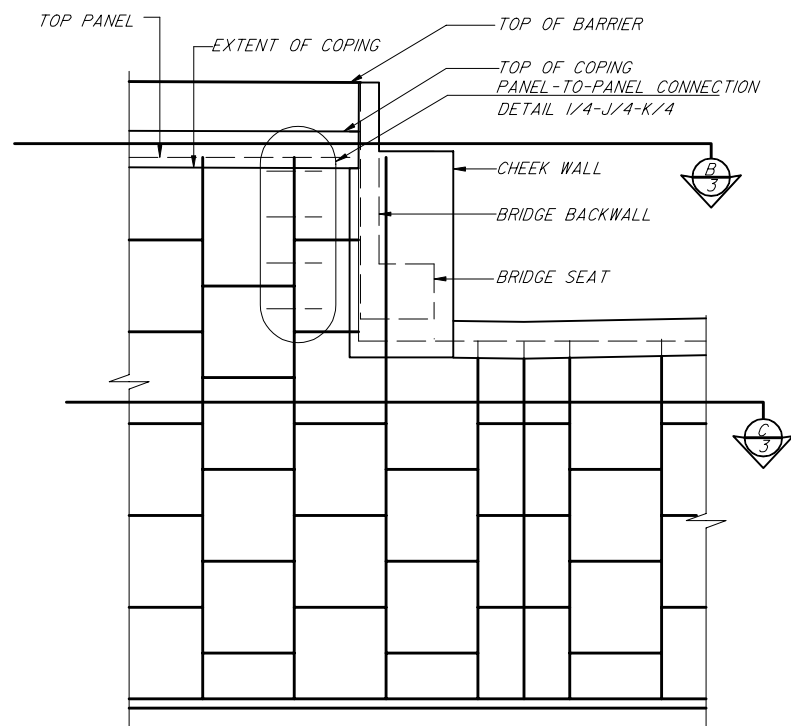
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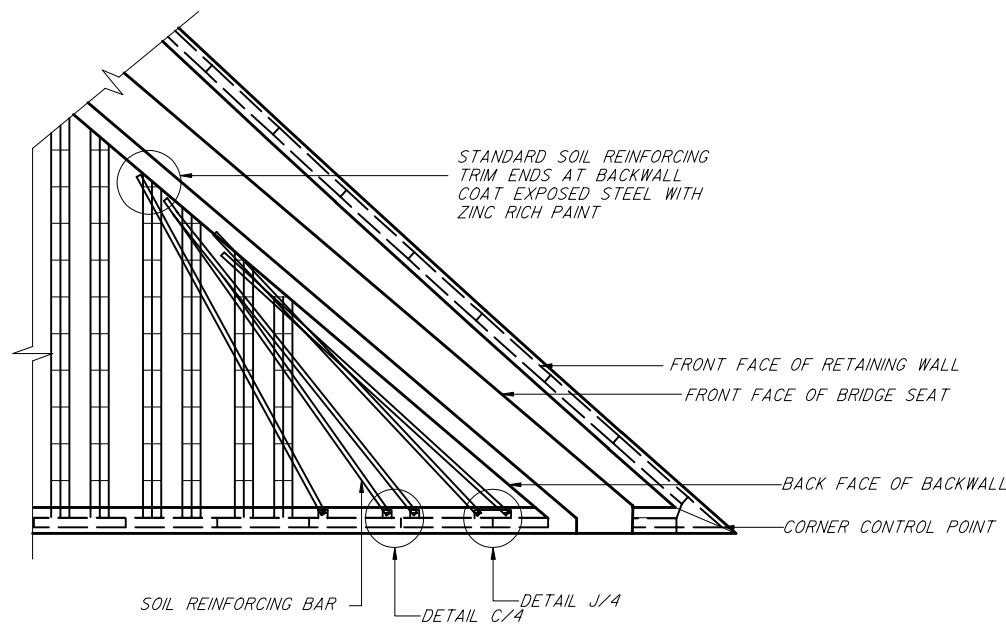
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RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

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Checked By	TBW				
Revision	00				Sheet No.

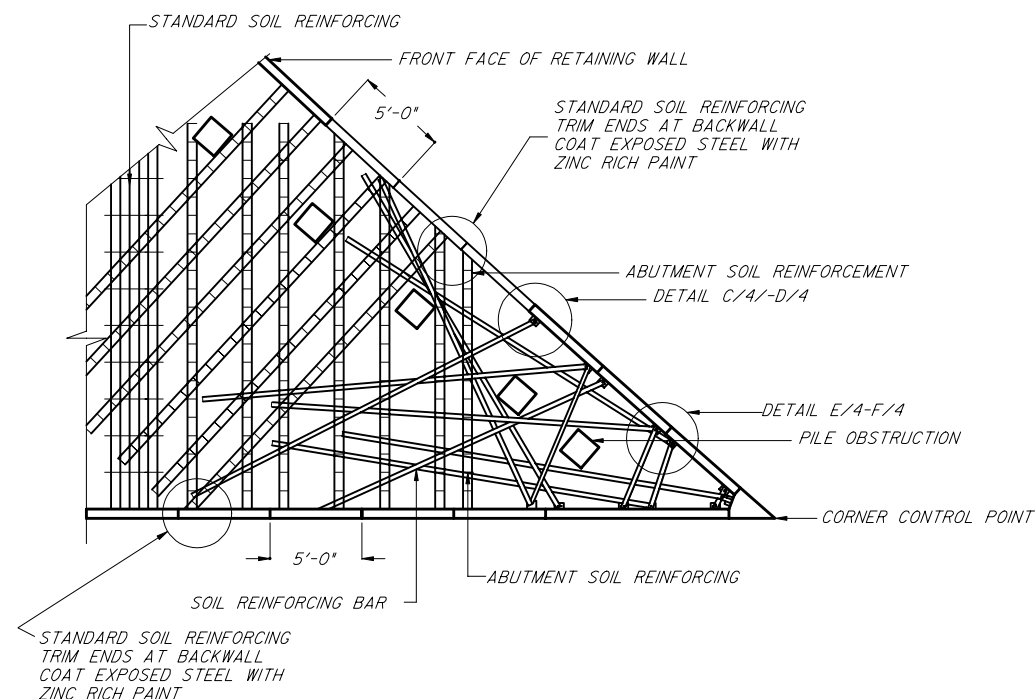


A ELEVATION ACUTE CORNER



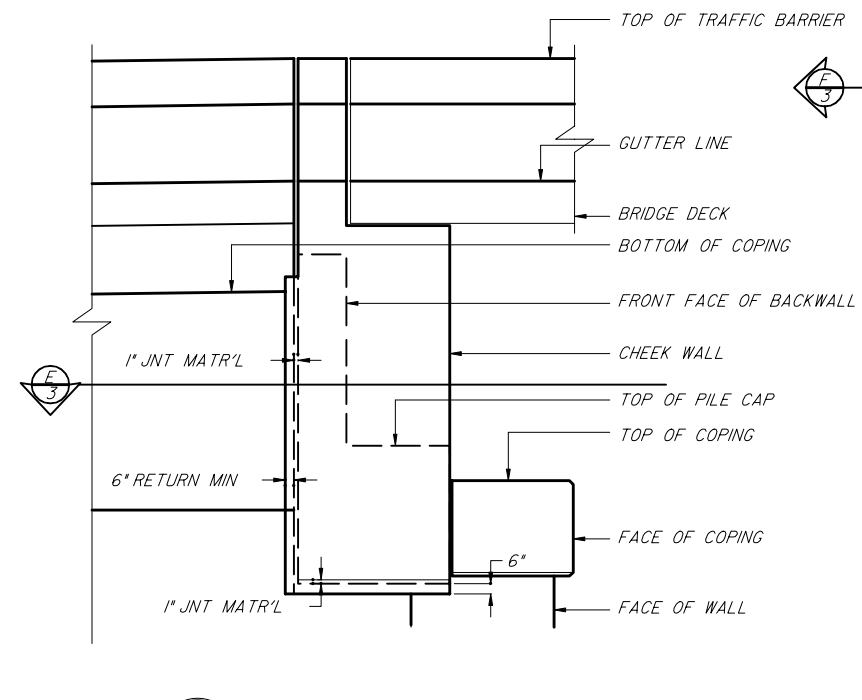
ABUTMENT RETAINING WALL SOIL REINFORCEMENT NOT SHOWN FOR CLARITY
END BENT BACK WALL REINFORCING NOT SHOWN FOR CLARITY

B ACUTE CORNER PLAN SECTION

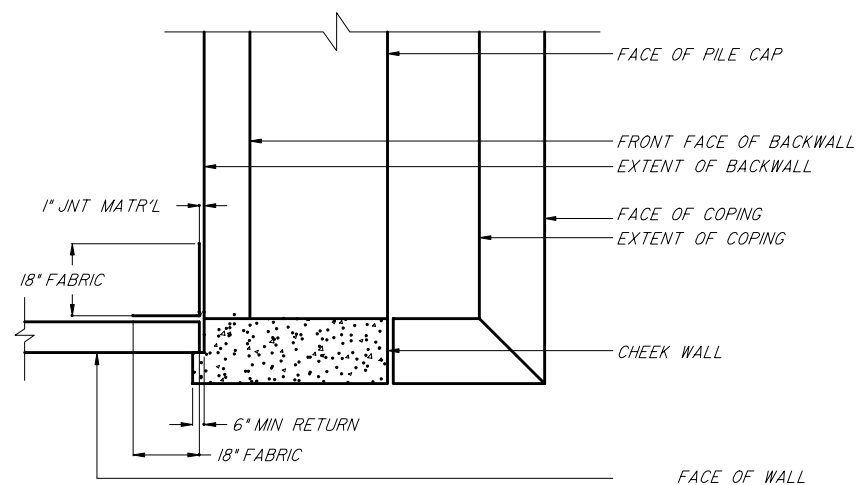


NOTE: REFERENCE DETAIL G/5 FOR ABUTMENT SOIL REINFORCEMENT SHOWN

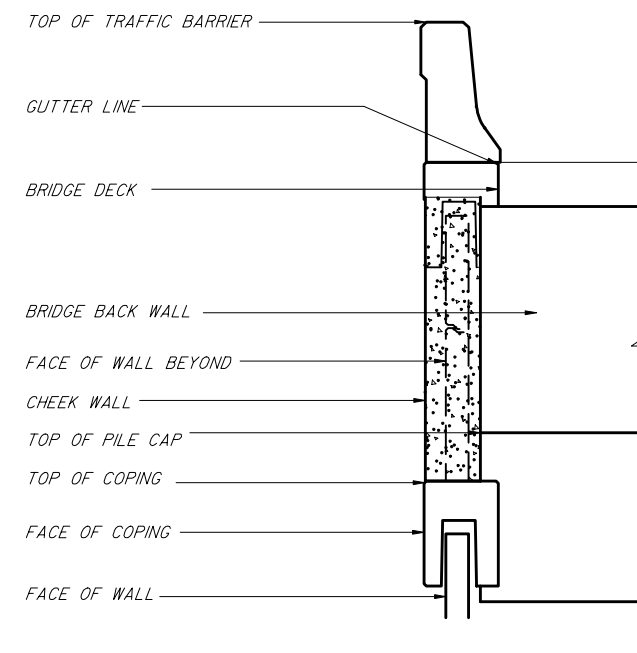
C ACUTE CORNER PLAN SECTION



D ELEVATION AT CHEEK WALL



E PLAN SECTION AT CHEEK WALL

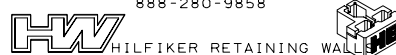


F SECTION AT CHEEK WALL

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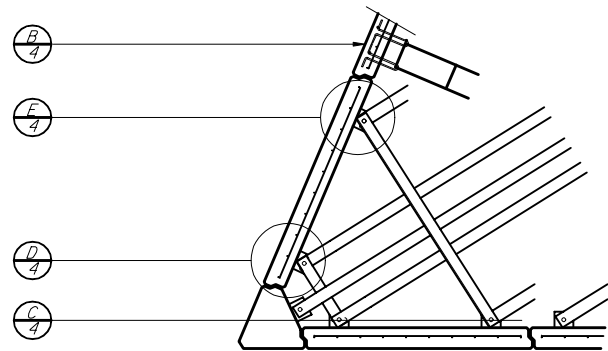
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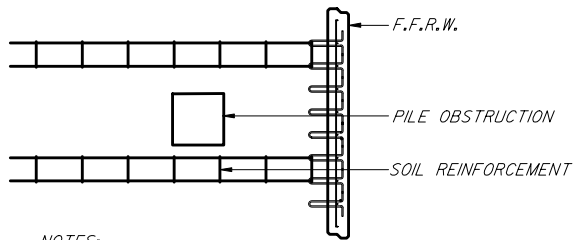
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

Names	Dates	Approved By				
Designed By		 State Structures Design Engineer				
Drawn By	TPT				Revision	Sheet No.
Checked By	TBW				00	4 of 13
						5021

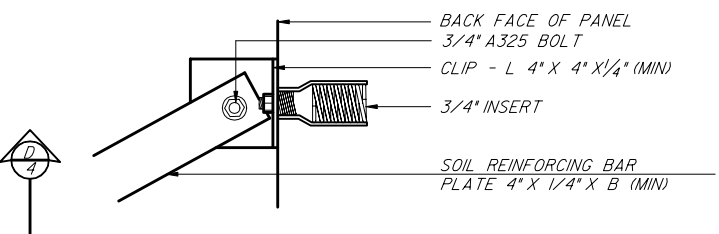


A ACUTE CORNER DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.

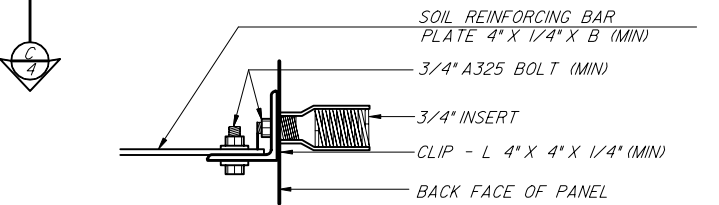


NOTES:
1. SPACE SOIL REINFORCEMENT SO AS TO MISS OBSTRUCTION

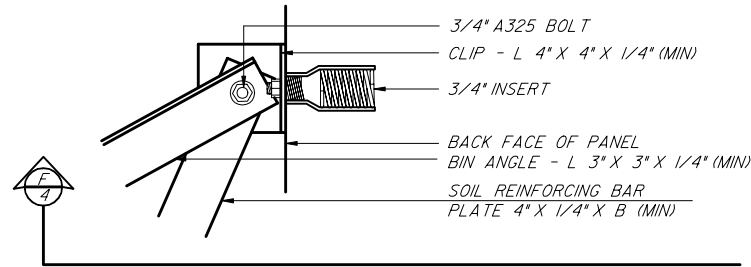
B CONTINUOUS ANCHOR PLAN
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



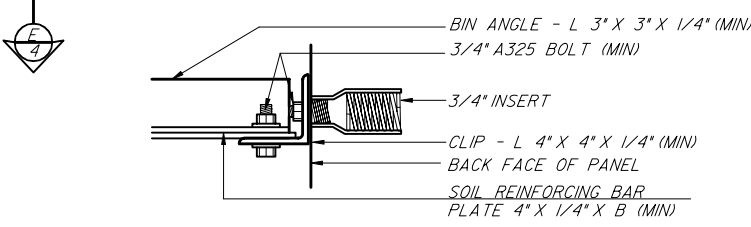
C SOIL REINFORCING BAR PLAN
4



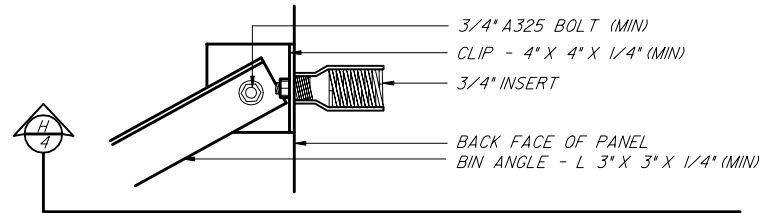
D SOIL REINFORCING BAR DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



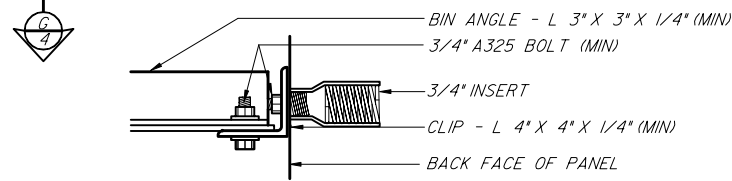
E COMBINATION ANGLE/BAR PLAN
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



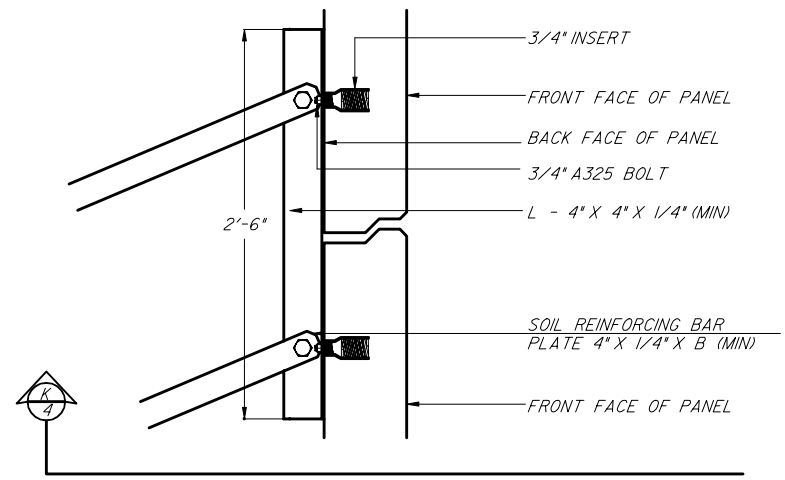
F COMBINATION STRAP/BAR DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



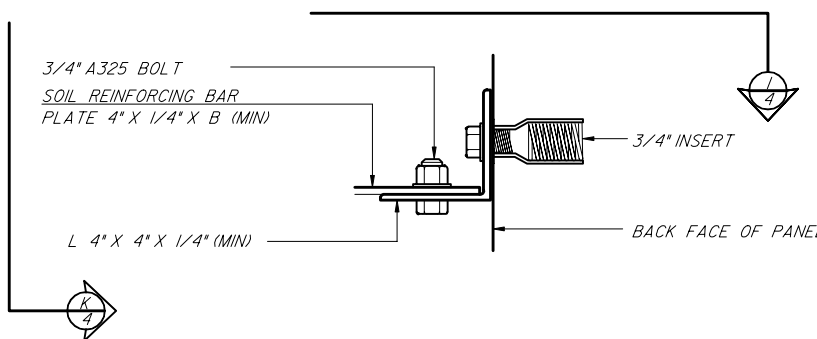
G BIN CLIP PLAN DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



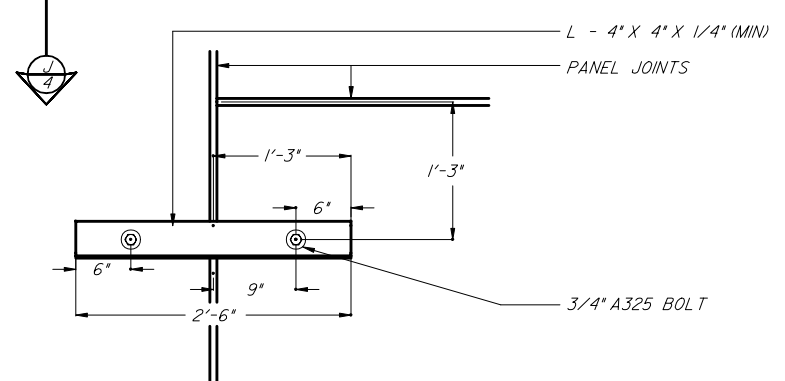
H BIN CLIP SECTION DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



I PANEL-TO-PANEL CONNECTION PLAN
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



J PANEL-TO-PANEL CONNECTION SECTION
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.




K PANEL-TO-PANEL CONNECTION ELEVATION
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.

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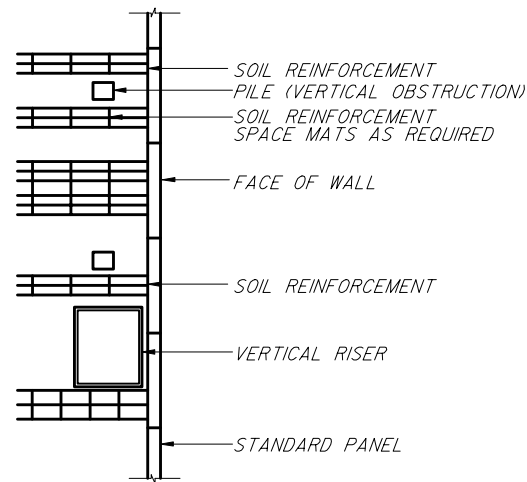
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HURST, TEXAS 76053
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

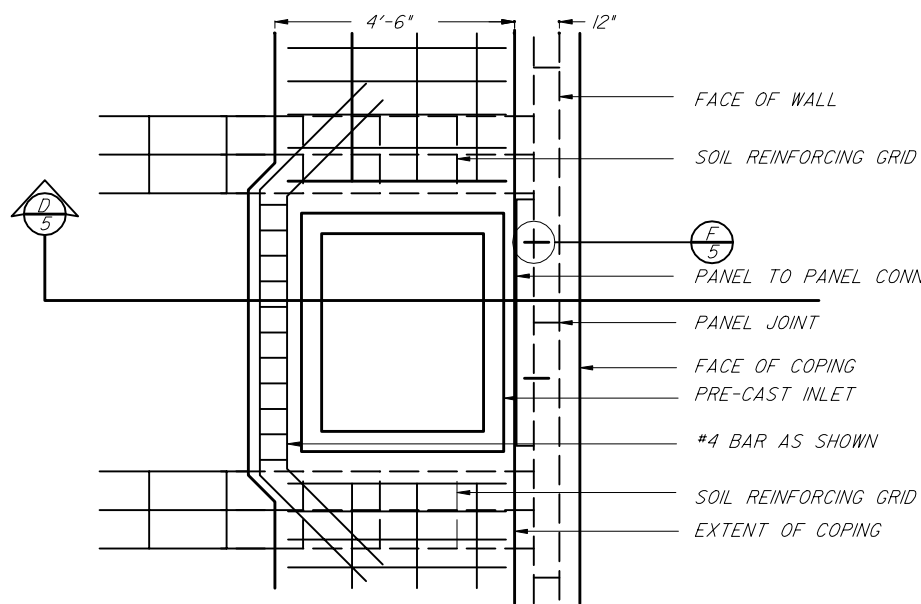
RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

Designed By	Names	Dates	Approved By	State Structures Design Engineer	
Drawn By	TPT		 W. V. [unclear]	Revision	Sheet No.
Checked By	TBW			00	5 of 13



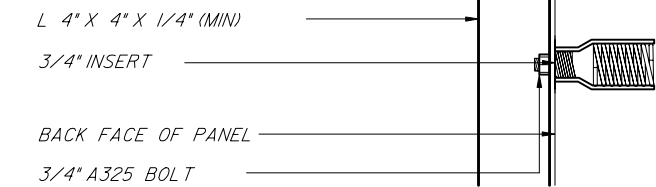
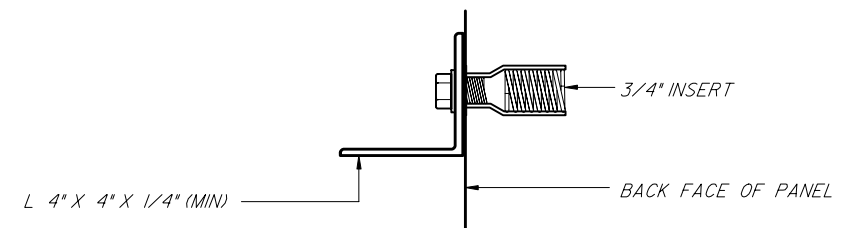
- NOTE:
1. VERTICAL OBSTRUCTIONS REQUIRE SPECIAL DESIGN CONSIDERATIONS
 2. THE DETAIL AS SHOWN IS FOR CONCEPT ONLY AND MAY VARY ON FINAL DESIGN
 3. REFERENCE SPECIAL DESIGN CALCULATIONS FOR DETAILS AND COMPONENT TYPE AND SIZE
 4. OBSTRUCTION SHALL BE INSTALLED BEFORE WALL

A VERTICAL OBSTRUCTION
5

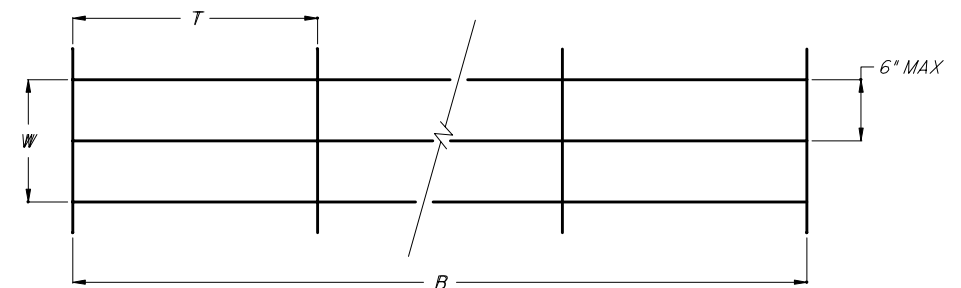


C VERTICAL OBSTRUCTION
5

E PANEL-TO-PANEL CONNECTION DETAIL
5 SECTION



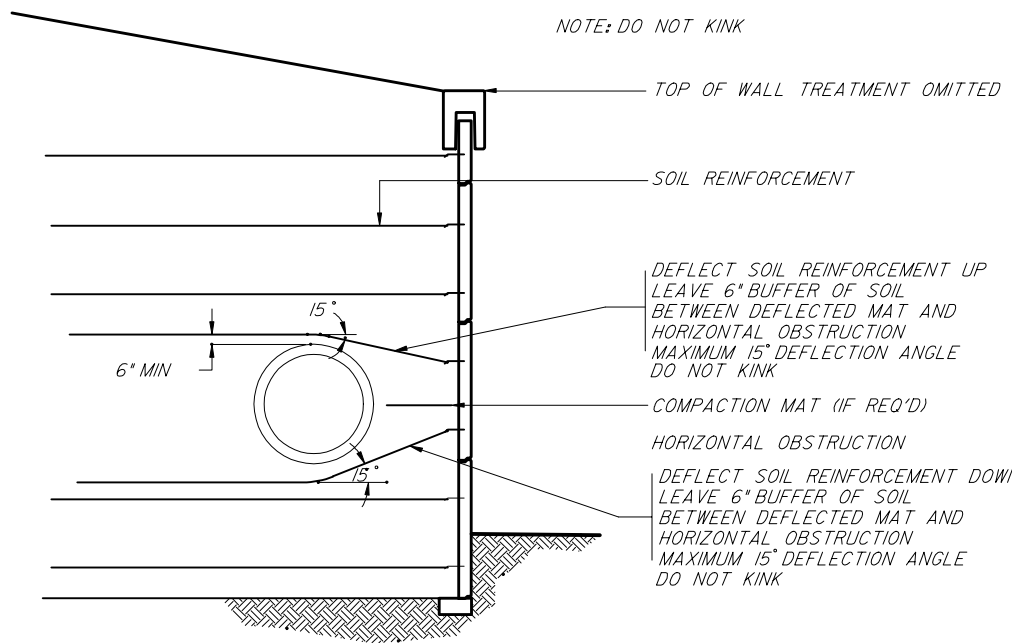
F PANEL-TO-PANEL CONNECTION DETAIL
5 PLAN



B = SOIL REINFORCING LENGTH
T = TRANSVERSE WIRE SPACING (2'-0" MAX)
W = WIDTH OF SOIL REINFORCING ELEMENT

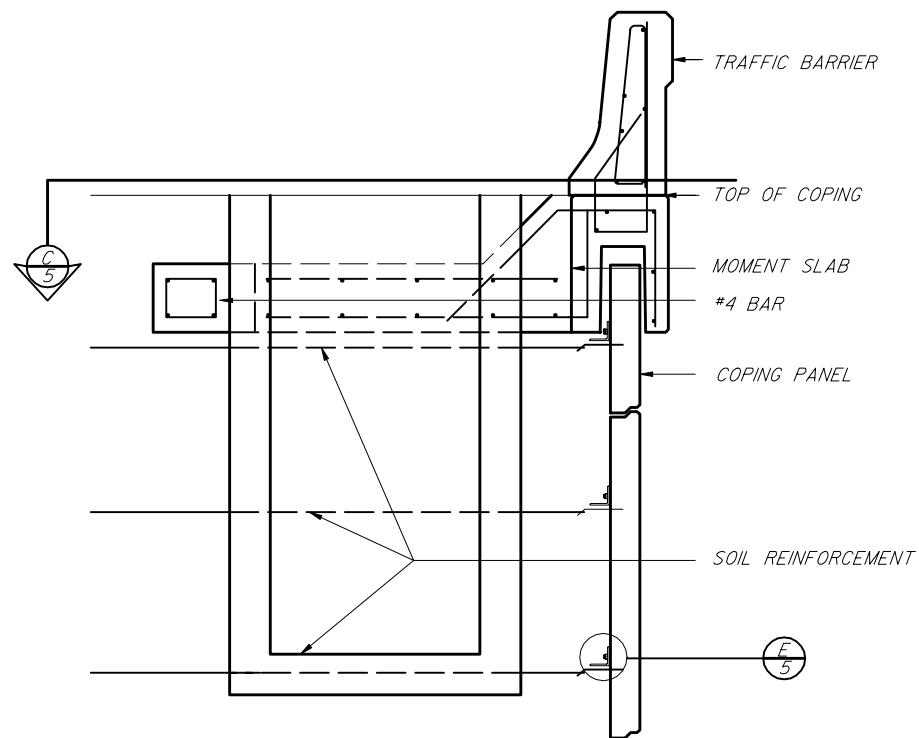
NOTE: THE MAT SHOWN IS USED TO PASS OBSTRUCTIONS AND TYPICALLY IS A WELDED WIRE MESH WITH LARGE DIAMETER WIRES. THE LONGITUDINAL WIRE SHALL BE EQUAL TO OR SMALLER THAN THE PANEL ANCHOR. A MINIMUM OF THREE LONGITUDINAL WIRES IS REQUIRED. THE MINIMUM WIRE SIZE SHALL BE AN W7.0

G OBSTRUCTION SOIL REINFORCING PLAN
5 PLAN



- NOTE:
1. HORIZONTAL OBSTRUCTIONS REQUIRE SPECIAL DESIGN CONSIDERATIONS
 2. THE DETAIL AS SHOWN IS FOR CONCEPT ONLY AND MAY VARY ON FINAL DESIGN
 3. REFERENCE SPECIAL DESIGN CALCULATIONS FOR DETAILS AND COMPONENT TYPE AND SIZE

B HORIZONTAL OBSTRUCTION
5



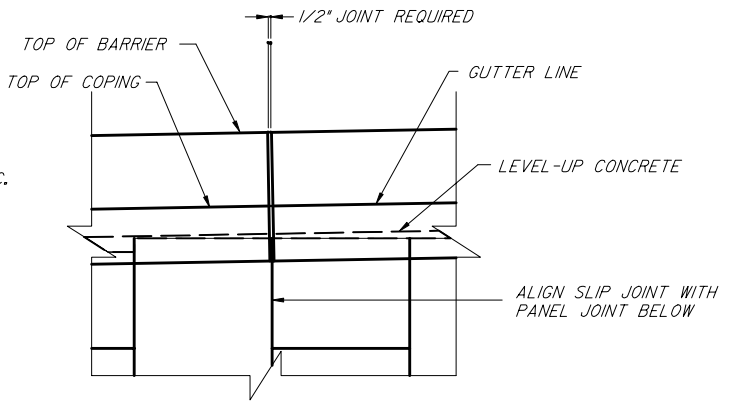
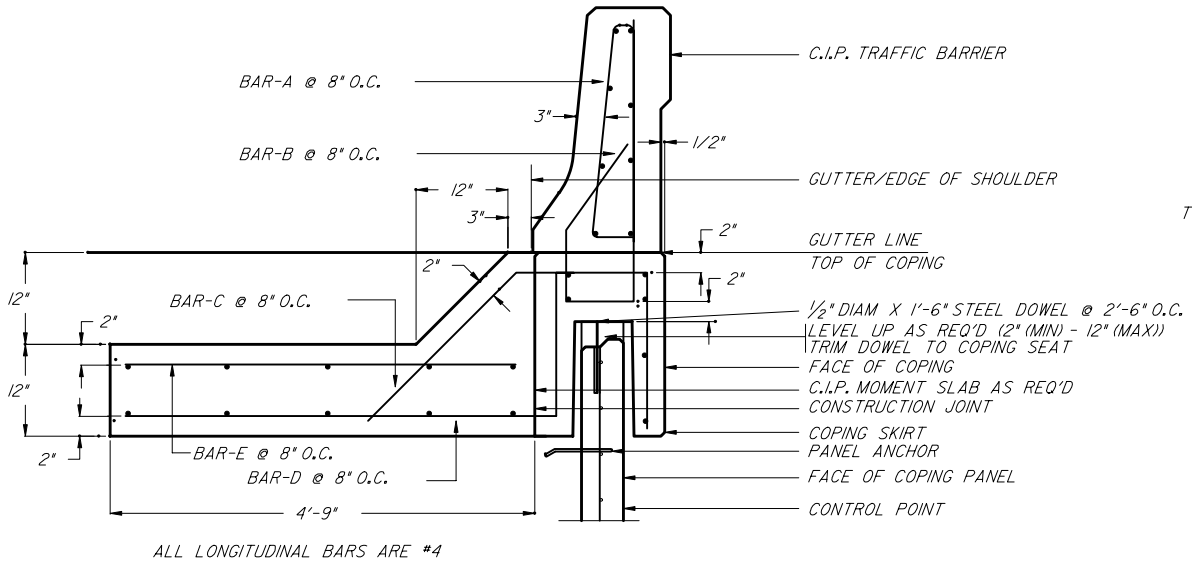
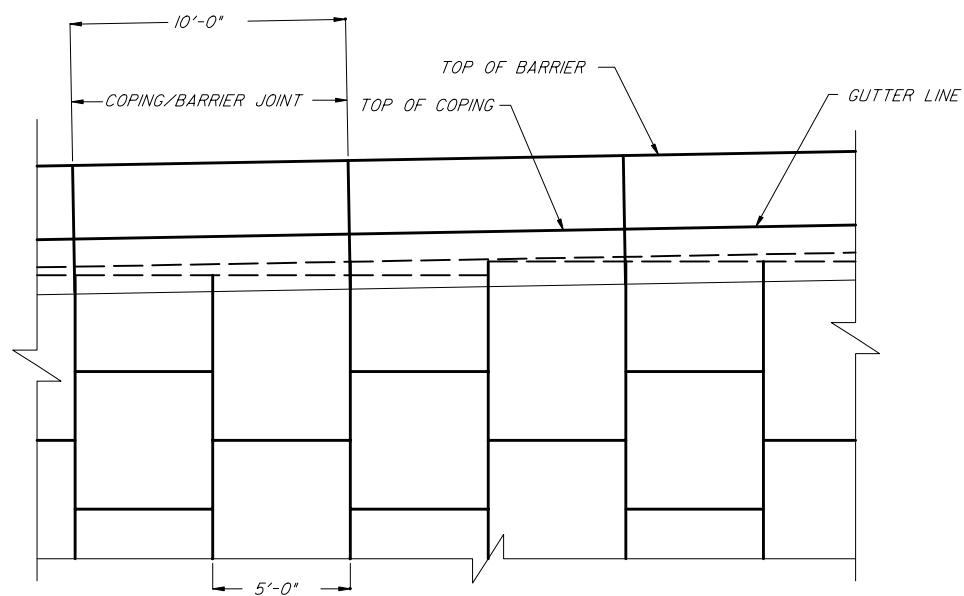
D PANEL-TO-PANEL CONNECTION DETAIL
5

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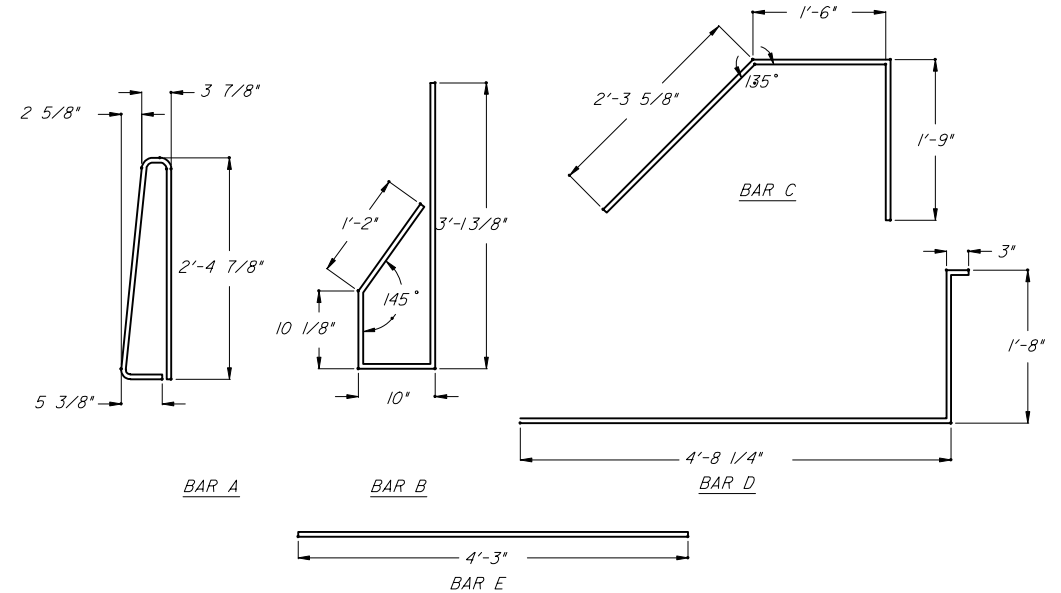
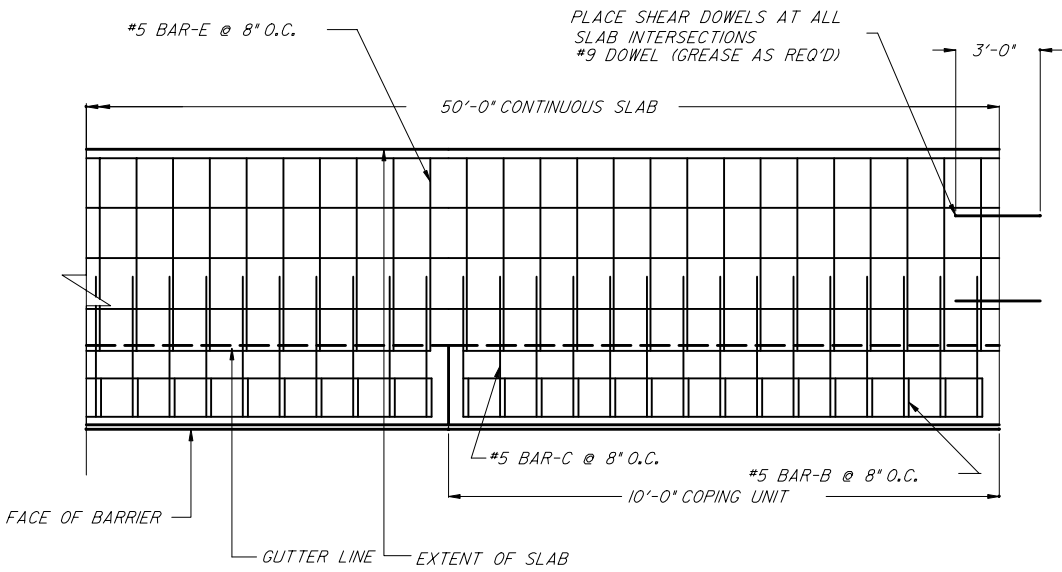
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Designed By	Names	Dates	Approved By <i>W. V. [Signature]</i>	
Drawn By	TPT		Revision	Sheet No. 6 of 13
Checked By	TBW		00	Index No. 5021



A PRECAST COPING WITH C.I.P. BARRIER ELEVATION

C PRECAST COPING WITH C.I.P. BARRIER AND C.I.P. JUNCTION SLAP

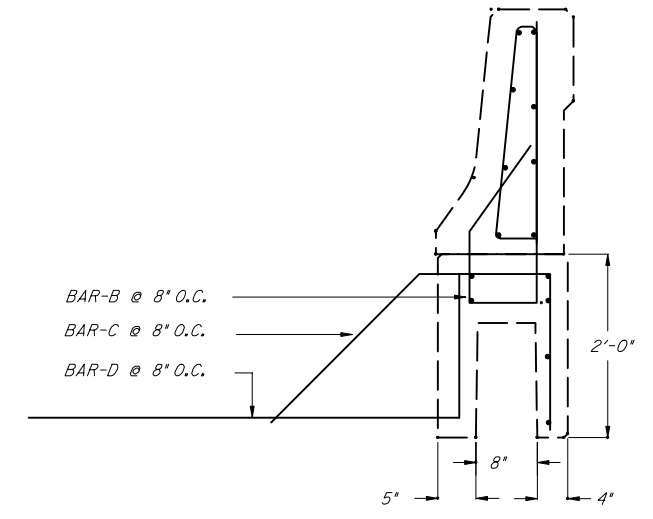
E TRAFFIC BARRIER SLIP JOINT



REBAR SCHEDULE

MARK	SIZE	QTY	LENGTH	BENDING
A	#5	11	AS DETAILED	AS DETAILED
B	#5	11	AS DETAILED	AS DETAILED
C	#5	11	AS DETAILED	AS DETAILED
D	#5	11	AS DETAILED	AS DETAILED

QUANTITIES SHOWN ARE FOR A 10'-0" COPING SECTION



REFERENCE FDOT INDEX 700 FOR BARRIER DIMENSIONS NOT SHOWN

F PRECAST COPING REBAR LAYOUT

B PRECAST COPING WITH C.I.P. BARRIER PLAN

D PRECAST BARRIER/COPING REINFORCING

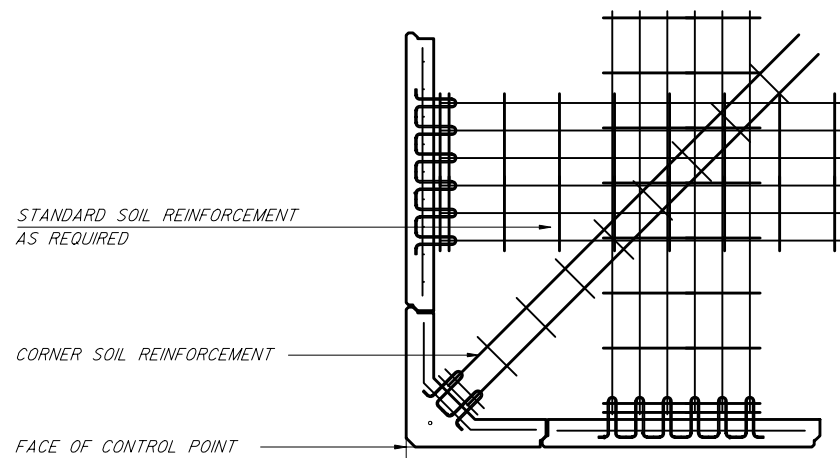
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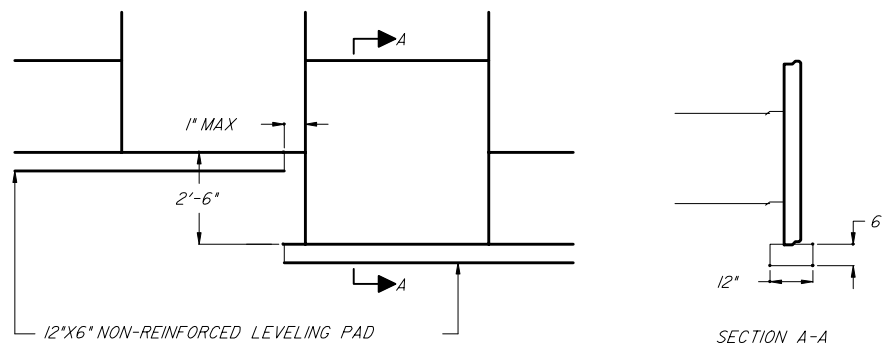
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

Designed By	Names	Dates	Approved By	
Drawn By	TPT		State Structures Design Engineer	
Checked By	TBW		Revision	00
			Sheet No.	7 of 13
			Index No.	5021

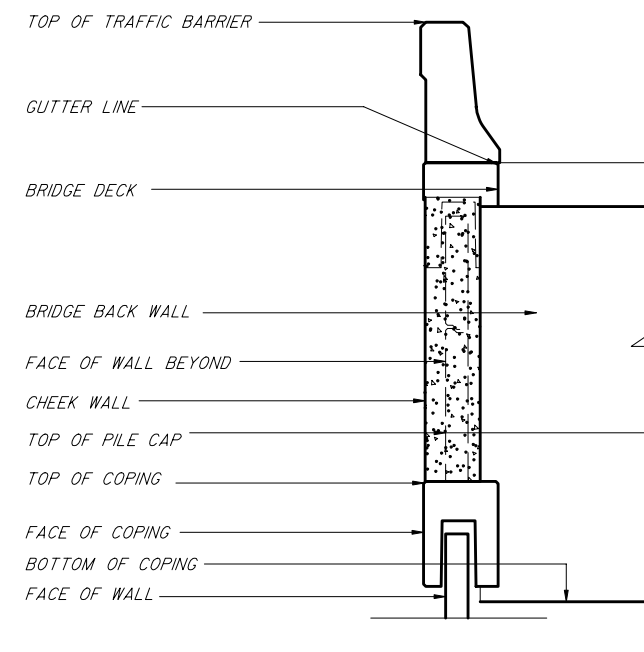


A 90° CORNER PLAN



NOTE: LEVELING COURSE SHALL BE PLACED TO THE ELEVATIONS AS SHOWN ON THE PLANS. TOLERANCE FOR ELEVATIONS SHALL BE PLUS-MINUS 1/8"

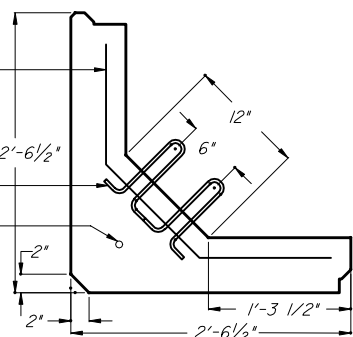
D LEVELING COURSE STEP ELEVATION



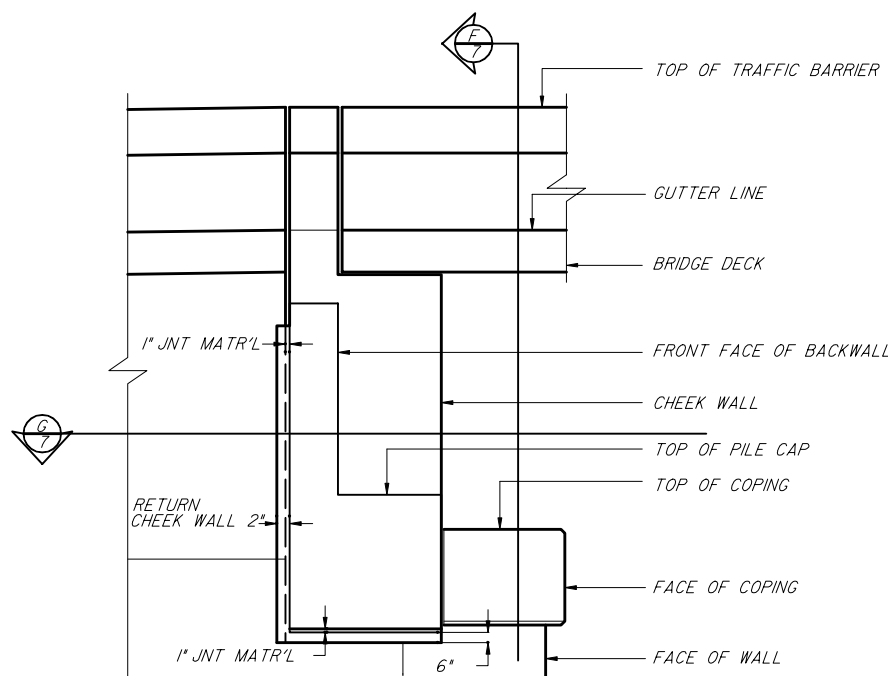
F SECTION AT CHEEK WALL

PANEL REINFORCEMENT
WWF W7.0 X W7.0 - 6" X 6"

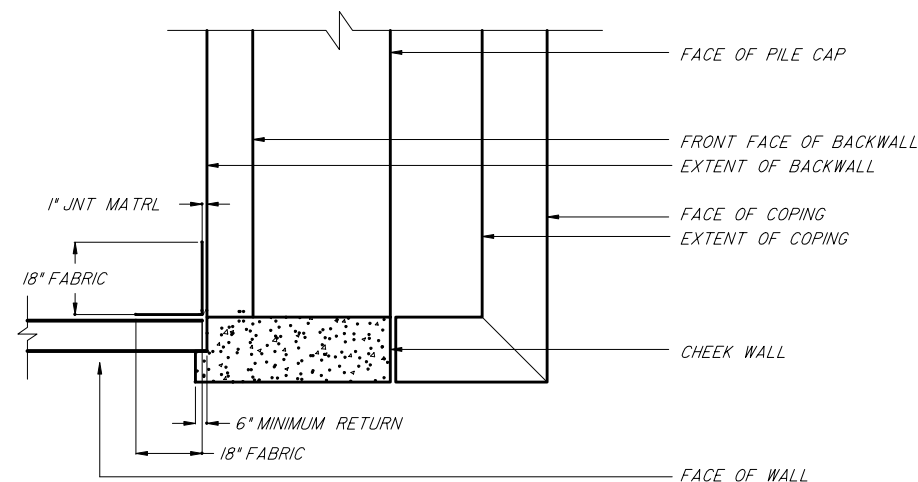
PANEL ANCHOR
1/2" ALIGNMENT HOLE



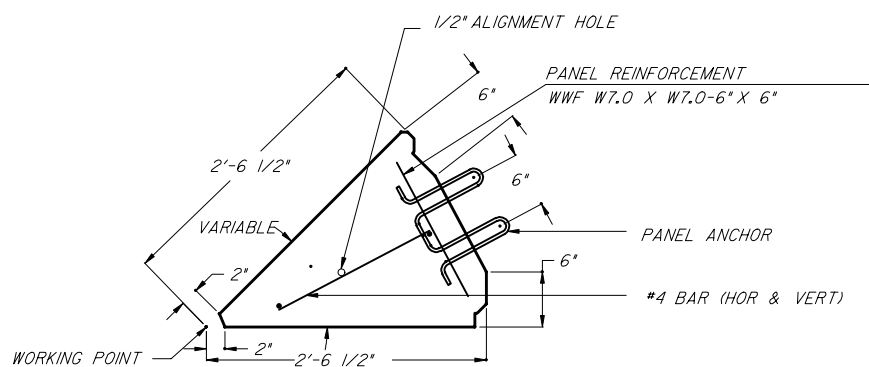
B ABTUSE CORNER PANEL
PANEL ANGLE VARIES FROM 90° TO 180°



E ELEVATION AT CHEEK WALL



G PLAN SECTION AT CHEEK WALL

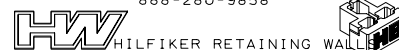


C ADJUSTABLE CORNER PANEL

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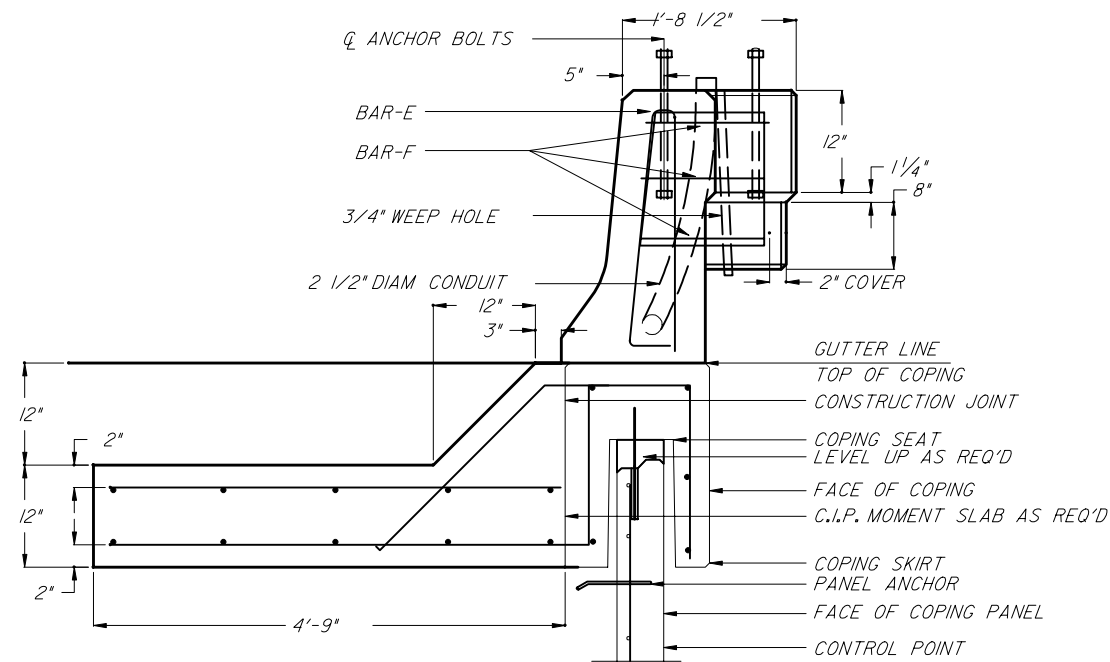
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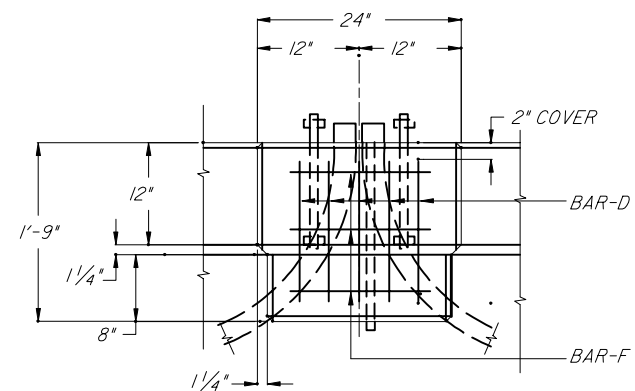
RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	TPT	Revision	Sheet No.	Index No.
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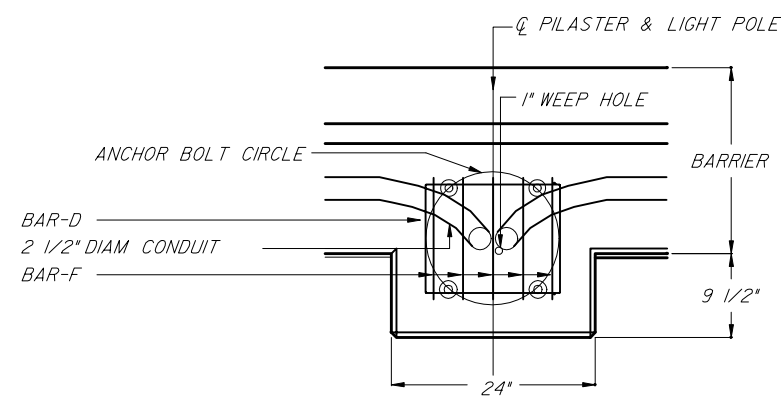
FOR ADDITIONAL DETAILS REFERENCE FDOT LIGHT POLE PILASTER SEE STRUCTURES STANDARD DRAWING 500
FOR JUNCTION SLAB DIMENSIONS AND REINFORCING REFERENCE SHEET HW-6

A PRECAST COPING WITH PILASTER SECTION
8



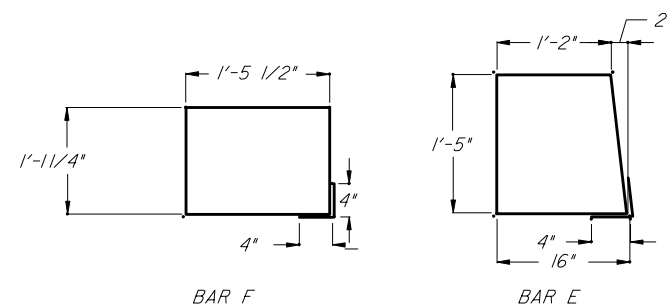
FOR ADDITIONAL DETAILS REFERENCE FDOT LIGHT POLE PILASTER SEE STRUCTURES STANDARD DRAWING 500

C PILASTER ELEVATION
8



FOR ADDITIONAL DETAILS REFERENCE FDOT LIGHT POLE PILASTERS SEE STRUCTURES STANDARD DRAWING 500

B PILASTER PLAN VIEW
8



REBAR SCHEDULE

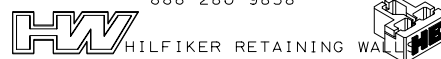
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F	#5	3	AS DETAILED	AS DETAILED

D PILASTER REINFORCING SCHEDULE
8

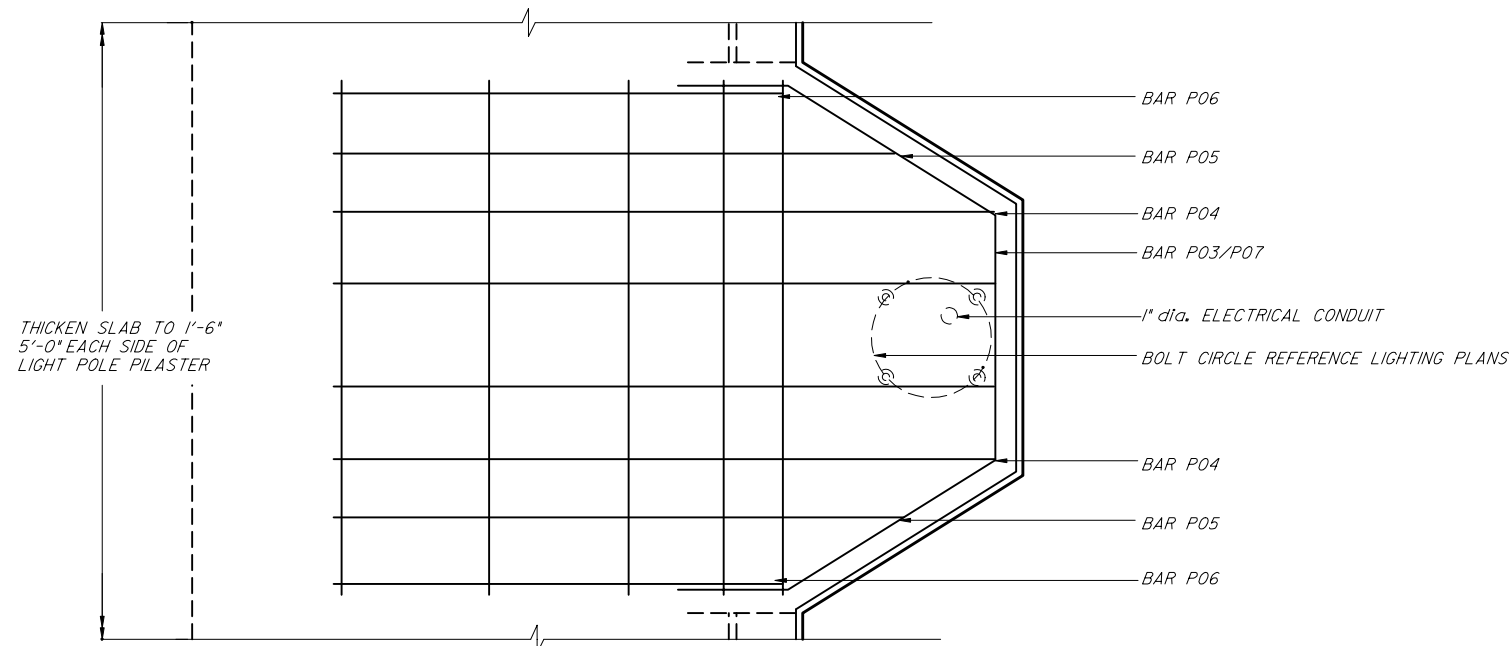
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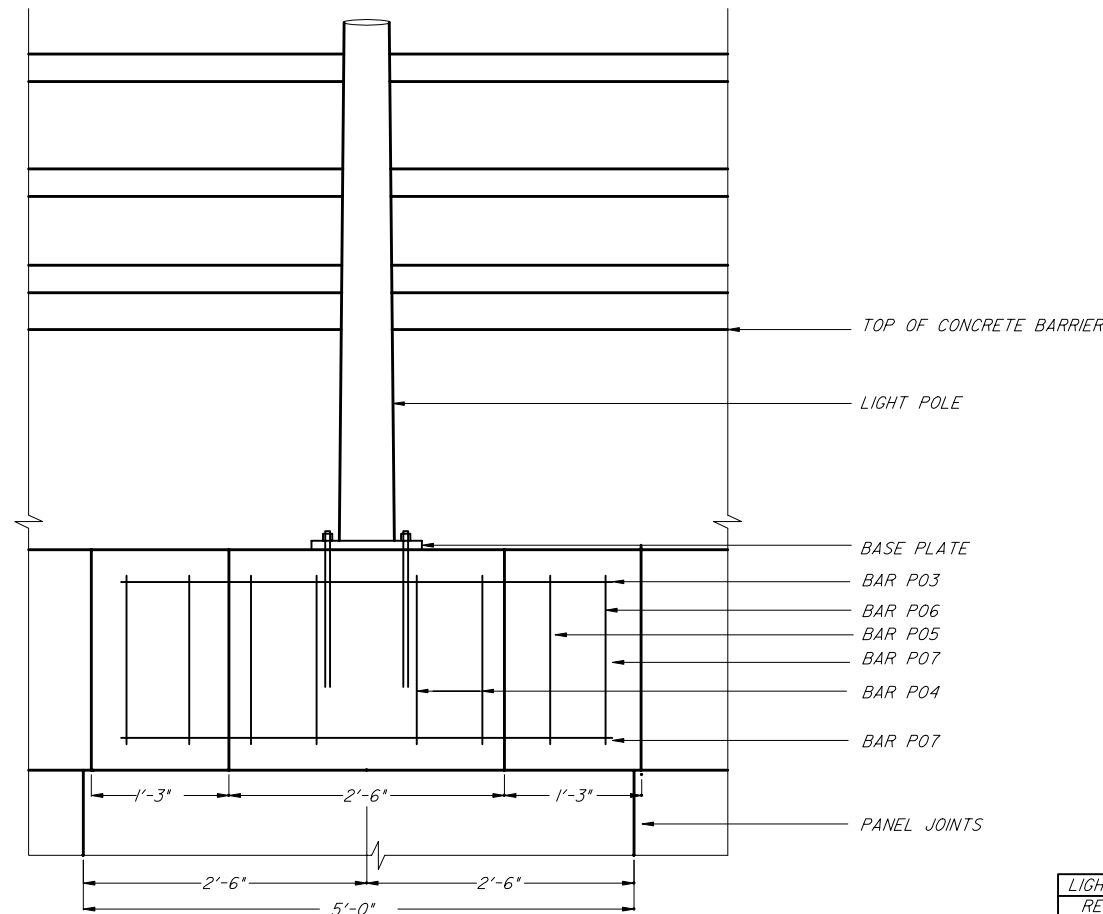


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RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	TPT	Revision	Sheet No.	Index No.
Checked By	TBW	00	9 of 13	5021



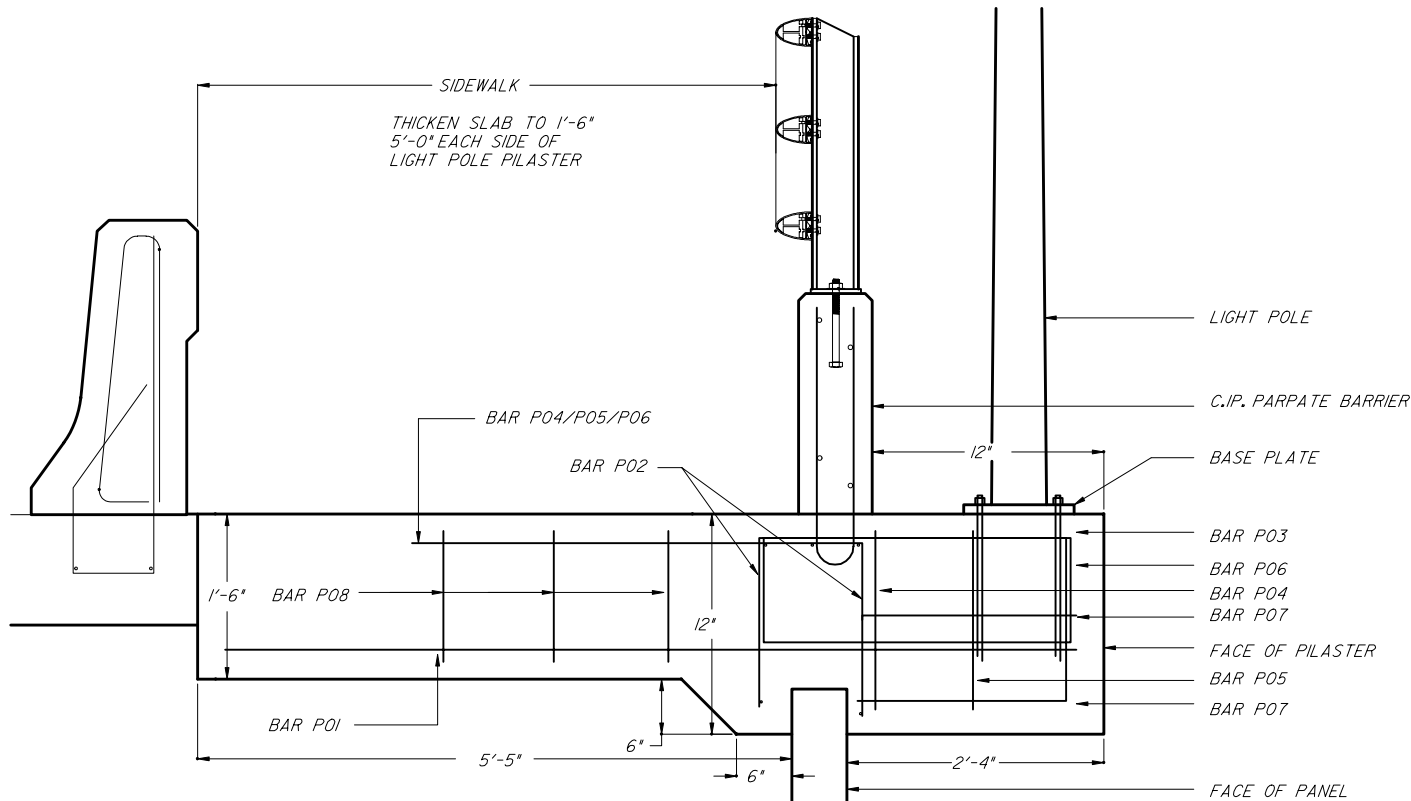
FOR ADDITIONAL DETAILS REFERENCE STRUCTURES STANDARD DRAWING 720

A PLAN BARRIER DETAIL @ LIGHT POLE
 9 HORIZONTAL REINFORCING NOT SHOWN FOR CLARITY

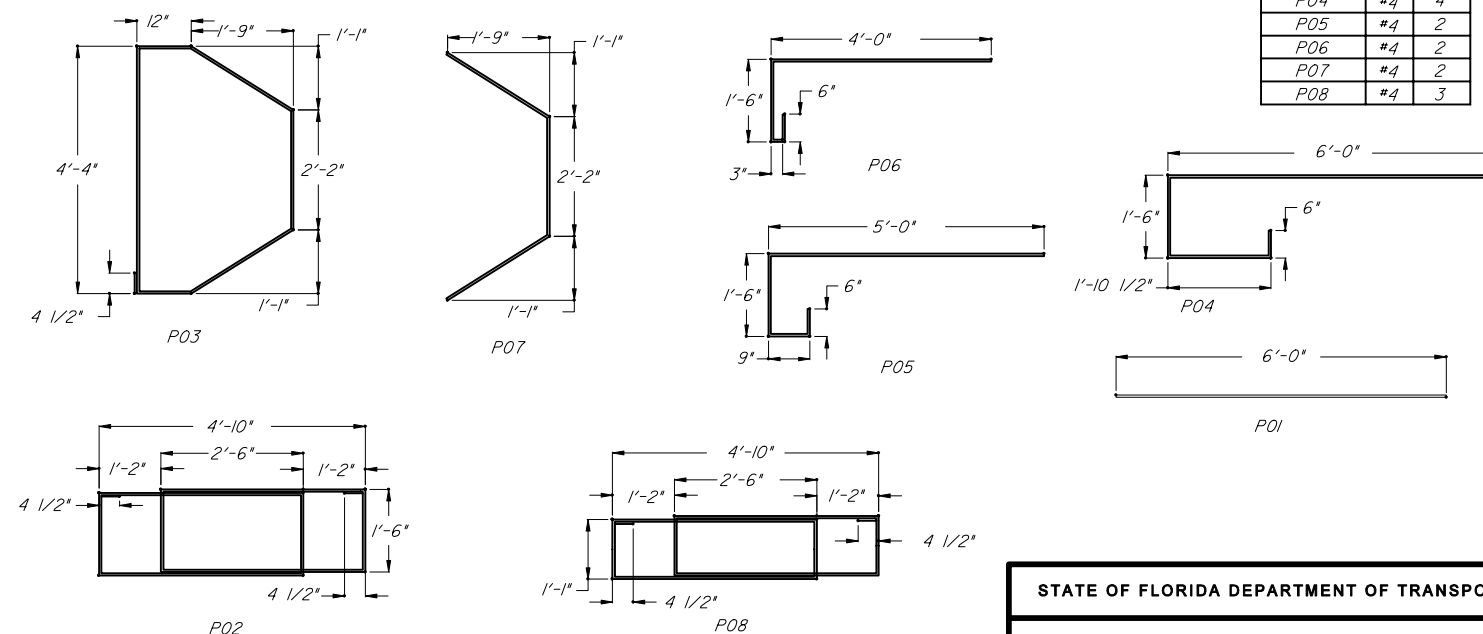


B ELEVATION BARRIER DETAIL @ LIGHT POLE
 9

LIGHT POLE PILASTER REBAR SCHEDULE		
MARK	SIZE	QTY
P01	#4	6
P02	#4	2
P03	#4	1
P04	#4	4
P05	#4	2
P06	#4	2
P07	#4	2
P08	#4	3



C SECTION BARRIER DETAIL @ LIGHT POLE
 9

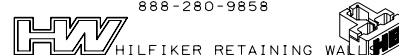


D LIGHT POLE PILASTER REINFORCING DETAIL
 9

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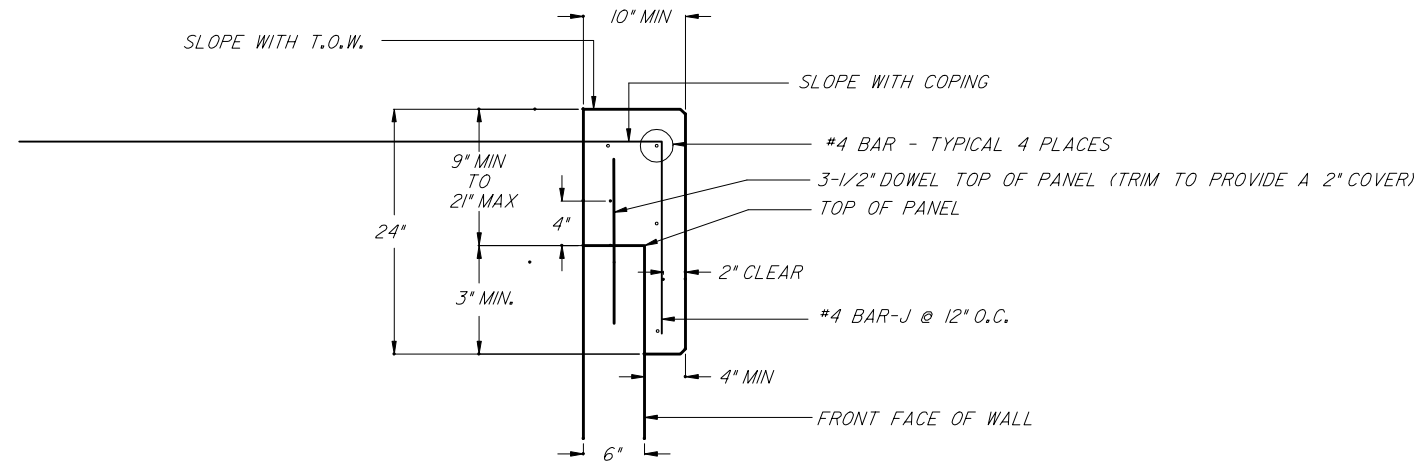
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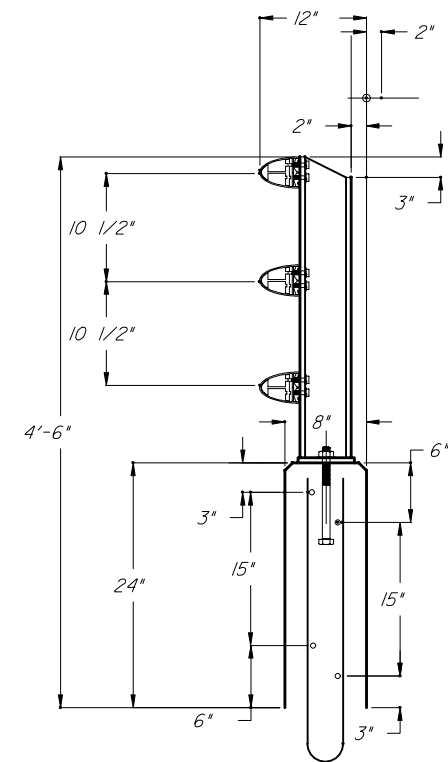
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RETAINING WALL SYSTEM
 HILFIKER SQUARE PANEL

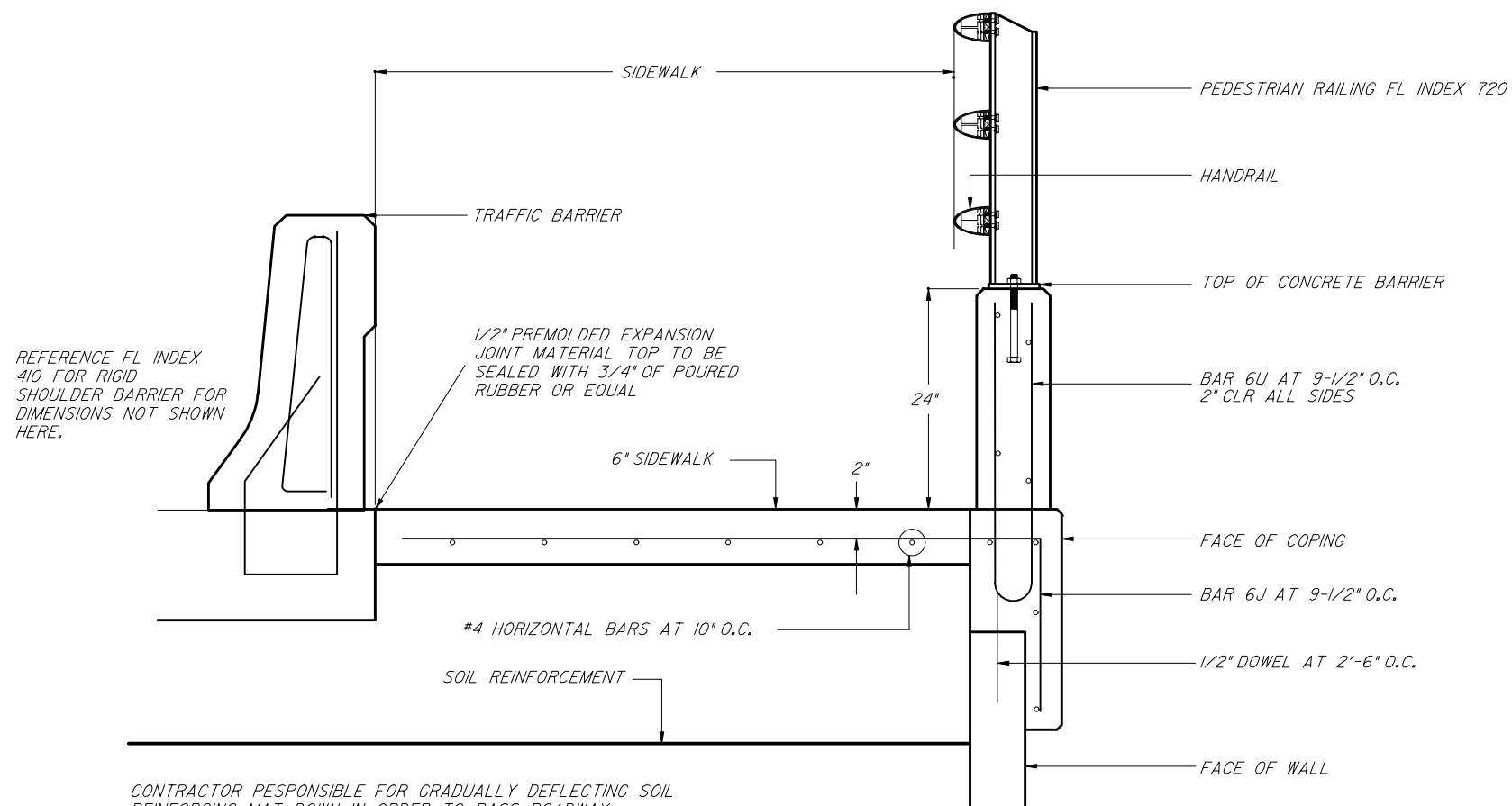
Names	Dates	Approved By			
Designed By		 State Structures Design Engineer			
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Checked By	TBW				
Revision	00				Sheet No.



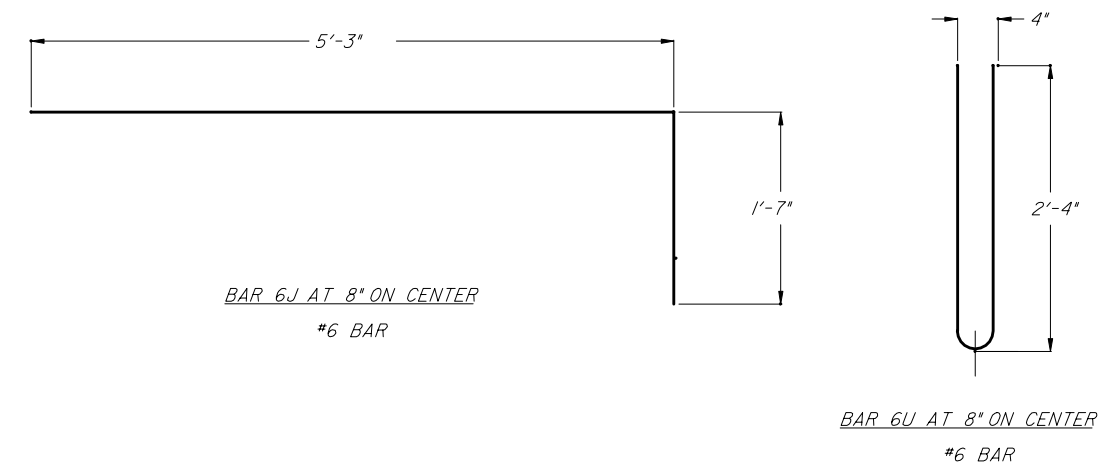
A SECTION C.I.P. PARAPET COPING
 10 HORIZONTAL REINFORCING NOT SHOWN FOR CLARITY



B SECTION C.I.P. PEDESTRIAN BARRIER
 10 REFERENCE STRUCTURES STANDARD DRAWING 720 FOR DETAILS NOT SHOWN



C SECTION C.I.P. BARRIER WITH PEDESTRIAN RAILING
 10

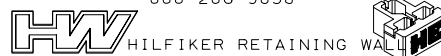


D C.I.P. COPING WITH PEDESTRIAN BARRIER BAR DETAILS
 10

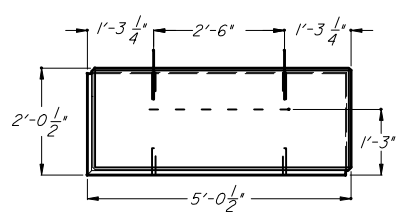
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 HURST, TEXAS 76053
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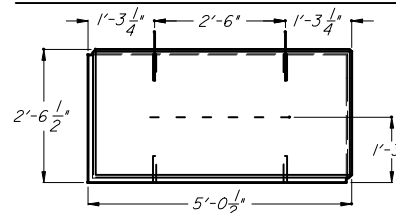


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	TPT	Revision	Sheet No.	Index No.
Checked By	TBW	00	11 of 13	5021



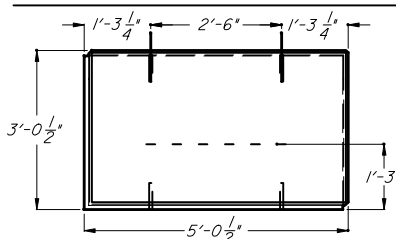
PANEL MATERIAL LIST		
DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE A - 2'-0" PANEL



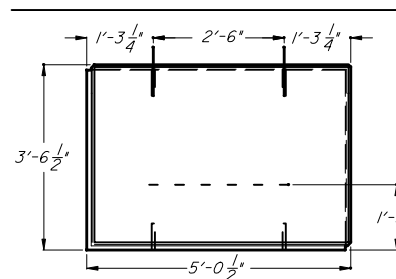
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE B - 2'-6" PANEL



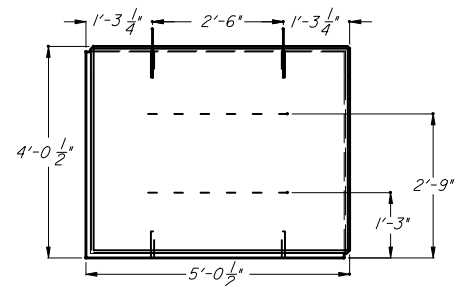
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE C - 3'-0" PANEL



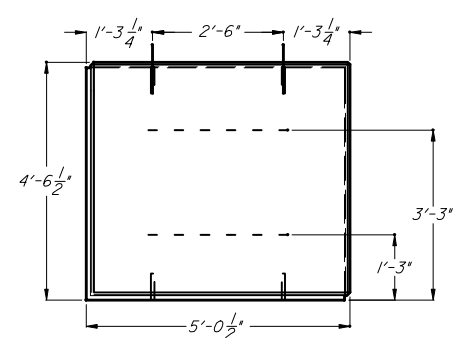
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE D - 3'-6" PANEL



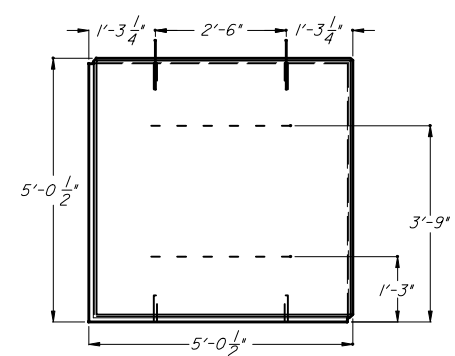
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE E - 4'-0" PANEL



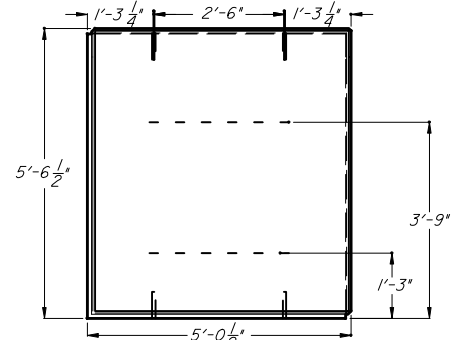
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE F - 4'-6" PANEL



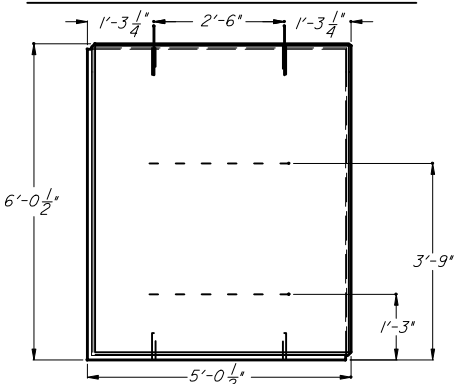
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE G - 5'-0" PANEL



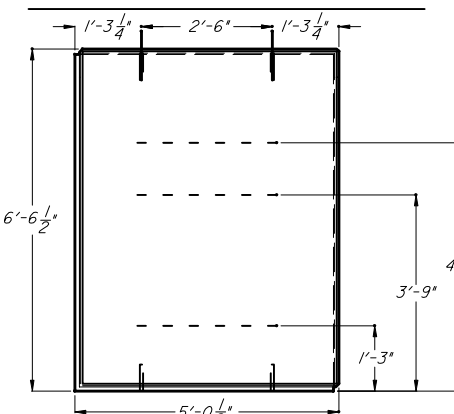
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE H - 5'-6" PANEL



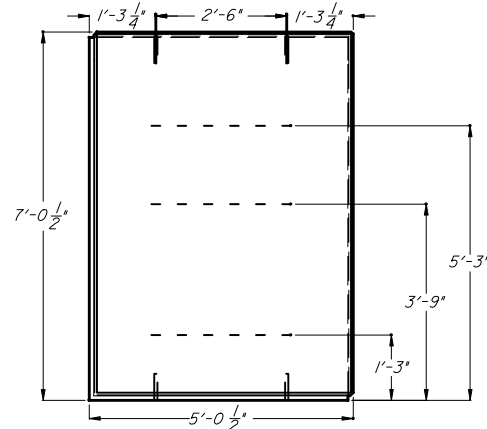
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE J - 6'-0" PANEL



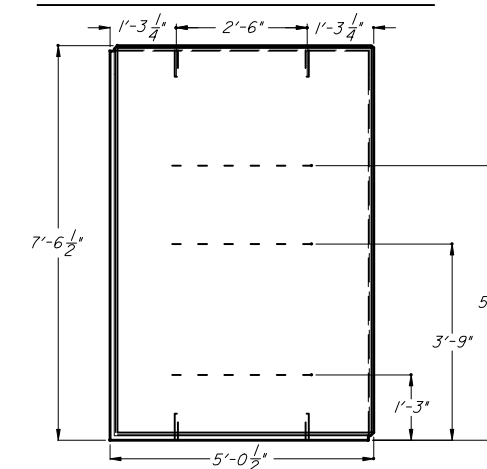
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	3 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE K - 6'-6" PANEL



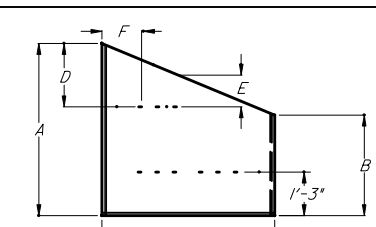
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	3 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE L - 7'-0" PANEL



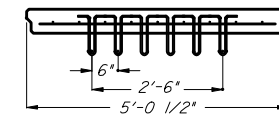
PANEL MATERIAL LIST		
DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE M - 7'-6" PANEL

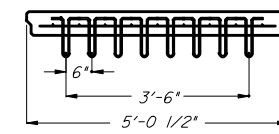


PANEL MATERIAL LIST		
DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	VARIABLE
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

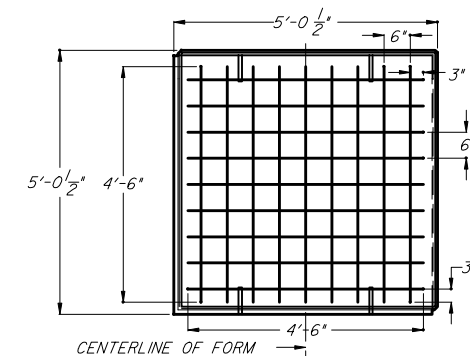
SPECIAL SLOPED PANEL



STANDARD ANCHOR LAYOUT

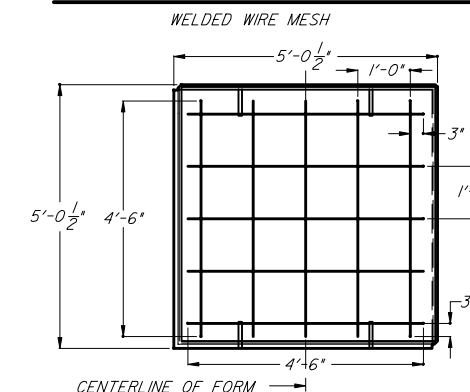


CONTINUOUS ANCHOR LAYOUT



- NOTE:
1. MINIMUM 3" COVER AT ALL EDGES
 2. CENTER MESH IN FORM
 3. WIRE MESH TO BE PLACED ON TOP OF PVC ALIGNMENT SLEEVES.
 4. TRIM AS REQUIRED
 5. MINIMUM W7.0 X W7.0 WWF

PANEL REINFORCING LAYOUT



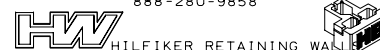
- NOTE:
1. MINIMUM 3" COVER AT ALL EDGES
 2. CENTER REBAR IN FORM
 3. REBAR TO BE PLACED ON TOP OF PVC ALIGNMENT SLEEVES.
 4. TRIM AS REQUIRED
 5. MINIMUM #4 BAR BOTH WAYS
 6. TIE REBAR TOGETHER AT INTERSECTION POINTS

PANEL REINFORCING LAYOUT
OPTIONAL REBAR

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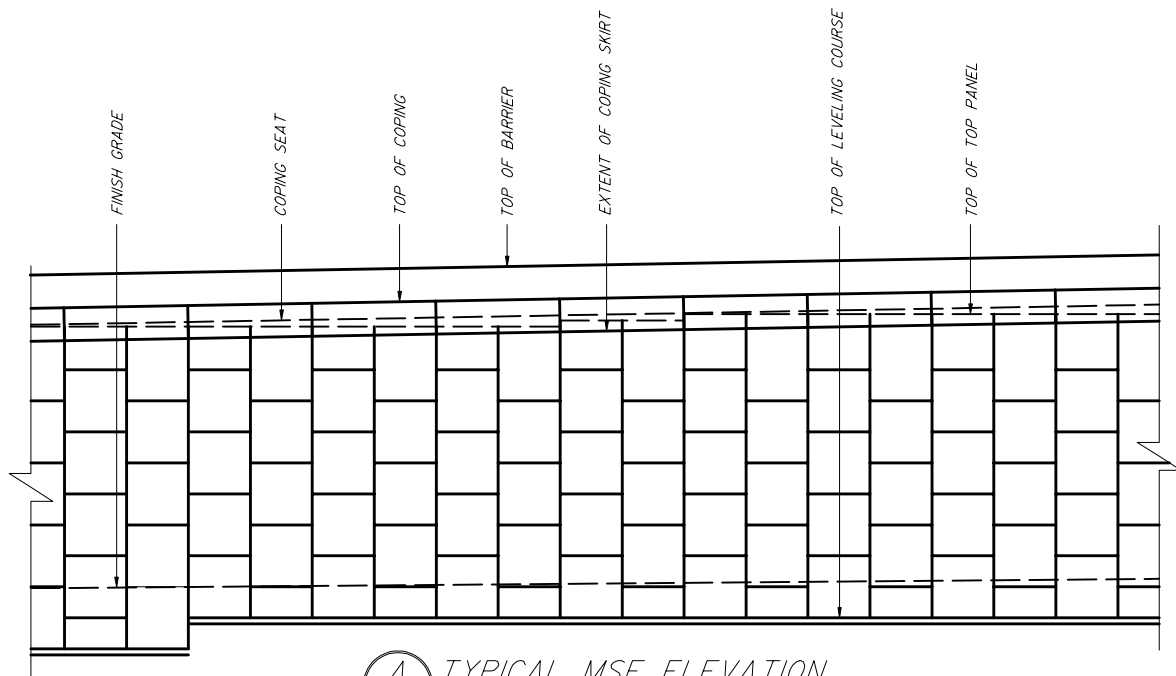
T&B STRUCTURAL SYSTEMS INC.
ENGINEERED STRUCTURES
637 WEST HURST BLVD.
HURST, TEXAS 76053
888-280-9858



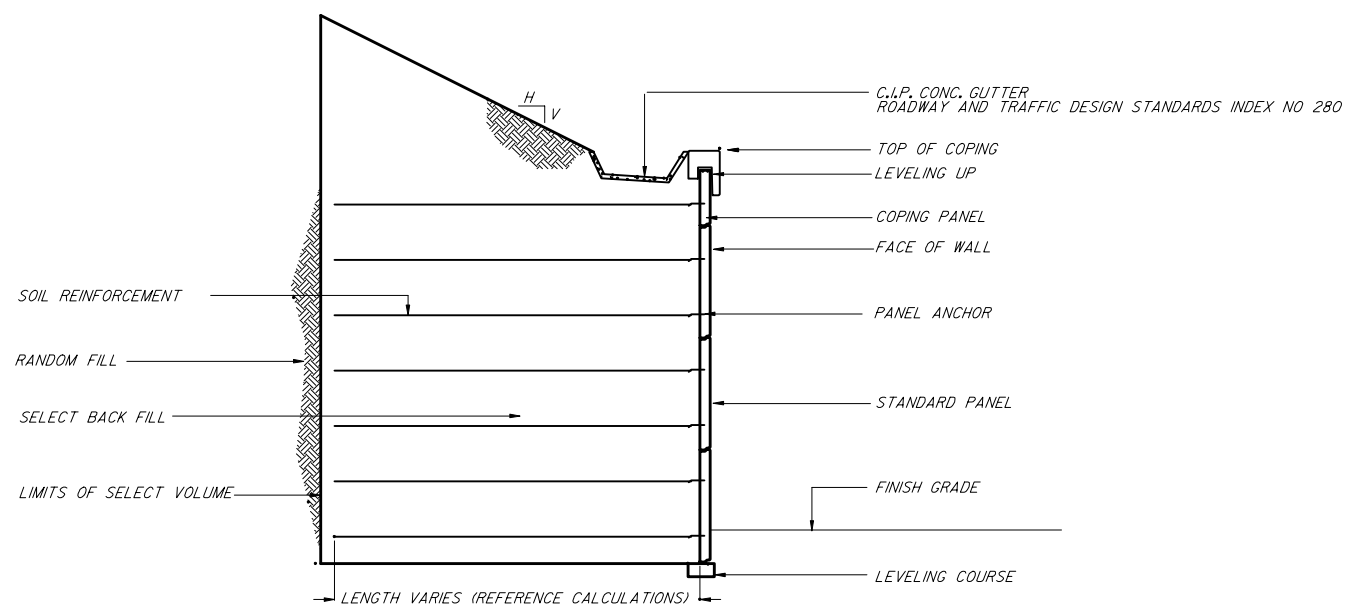
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

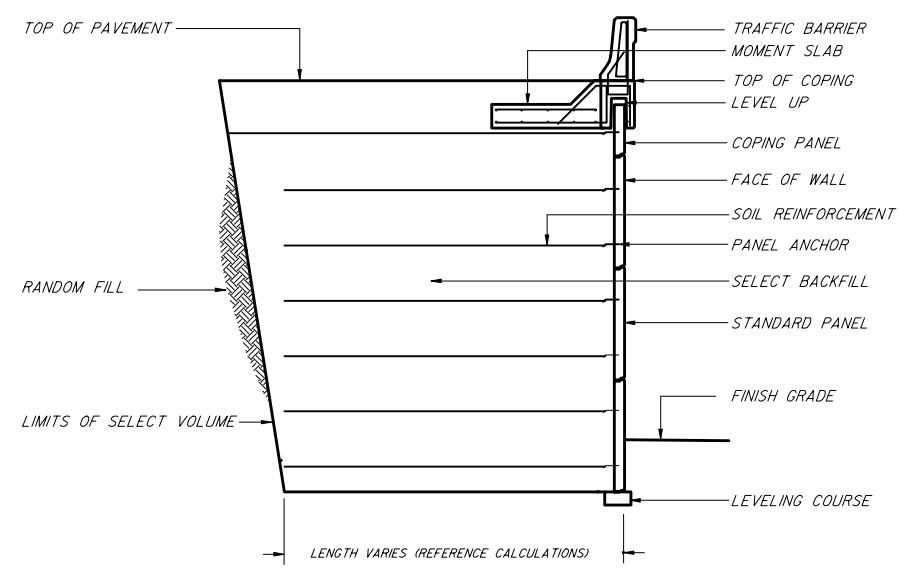
Names	Dates	Approved By			
Designed By		 State Structures Design Engineer			
Drawn By	TPT				
Checked By	TBW				
Revision	00				Sheet No.



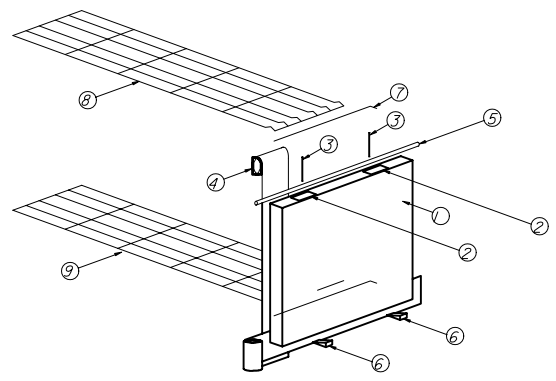
A TYPICAL MSE ELEVATION
12



B TYPICAL MSE SECTION WITH SLOPE
12

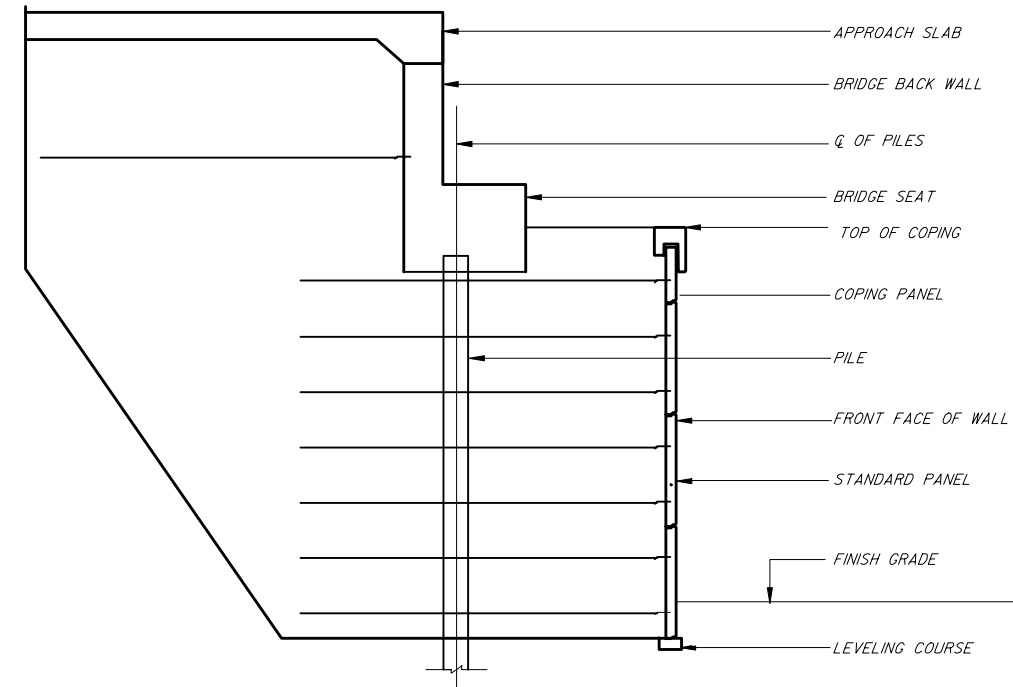


C TYPICAL MSE SECTION WITH BARRIER
12



1. TYPICAL PRE-CAST PANEL WITH CAST IN PLACE ANCHORS
2. 3" X 8" X 3/4" NEOPRENE PAD 2 PER PANEL
3. 1/2" X 8" GALVANIZED STEEL ALIGNMENT PIN
4. 12" FILTER FABRIC
5. 3/4" BACKER ROD (OPTIONAL BY OTHERS)
6. HARD WOOD SHIMS (USE IF NECESSARY)
7. CONNECTION PIN - 1 PER SOIL REINFORCING MAT
8. WELDED WIRE GRID SOIL REINFORCING MAT (AS REQUIRED)
9. WELDED WIRE GRID SOIL REINFORCING MAT (AS REQUIRED)

D TYPICAL MATERIAL ISOMETRIC
12



E TYPICAL MSE SECTION AT ABUTMENT
12

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ENGINEERED STRUCTURES
637 WEST HURST BLVD.
HURST, TEXAS 76053
888-280-9858
HILFIKER RETAINING WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Designed By	Names	Dates	Approved By <i>W. J. [Signature]</i> State Structures Design Engineer	
Drawn By	TPT		Revision	Sheet No. 13 of 13
Checked By	TBW		00	Index No. 5021

**CONSTRUCTION NOTES FOR PLACEMENT OF TENSAR GEOGRIDS AND BACKFILL SOILS
FOR TENSAR PRECAST CONCRETE REINFORCED WALLS
TENSAR MSE RETAINING WALL SYSTEM**

1.0 MATERIALS

1.1 GEOGRID REINFORCING SHALL BE TENSAR BIAxIAL AND UNIAXIAL GEOGRIDS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.

1.2 BODKIN BARS SHALL BE 4/8" x 1/4" HDPE BARS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.

1.3 GEOTEXTILE FABRIC SHALL BE 6 OZ. NON-WOVEN NEEDLE PUNCHED POLYPROPYLENE GEOTEXTILE WITH MINIMUM PERMITIVITY OF 1.0 sec⁻¹.

1.4 TENSAR EARTH TECHNOLOGIES, INC. SHALL PROVIDE TO THE CONTRACTOR THE FOLLOWING MATERIALS ONLY
- PRECAST CONCRETE FACING PANELS
- GEOGRID, ROLL FORM
- GEOGRID CONNECTION DEVICES
- BEARING PADS
- JOINT COVER FABRIC

2.0 TECHNICAL REQUIREMENTS

2.1 FILL MATERIALS SHALL BE PLACED FROM NEAR THE BACK FACE OF THE WALL AND THEN TOWARDS THE TAILS OF THE GEOGRID TO ENSURE TENSIONING.

2.2 FILL SHALL BE COMPACTED AS SPECIFIED IN SECTION 548 OF THE PROJECT SPECIFICATIONS.

2.3 AN APPROVED SET OF SHOP DRAWINGS AND CONTRACT SPECIFICATIONS SHALL BE ON-SITE AT ALL TIMES, DURING CONSTRUCTION OF THE TENSAR RETAINING WALL.

3.0 TENSAR GEOGRID PLACEMENT

3.1 TENSAR GEOGRID SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE SHOP DRAWINGS.

3.2 TENSAR GEOGRID LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS. REINFORCED FILL ZONE LENGTH IS MEASURED FROM THE FRONT FACE OF THE CONCRETE PANEL, EXTENDING TO THE TAIL OF THE GEOGRIDS.

3.2.1 TENSAR GEOGRID REINFORCEMENT SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTH(S). THE BODKIN CONNECTION SHALL NOT BE UTILIZED UNLESS PRE-APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.

3.2.2 IF PRE-APPROVED, TENSAR UNIAXIAL GEOGRIDS MAY BE SPLICED UTILIZING THE BODKIN CONNECTION DETAIL. NO MORE THAN ONE SPLICE SHALL BE ALLOWED IN ANY ONE LENGTH OF REINFORCING.

3.3 PRIOR TO PLACING FILL, THE GEOGRID MATERIALS SHALL BE CONNECTED TO THE PANELS PER PANEL CONNECTION DETAIL (SEE TYPICAL DETAILS) AND PULLED TAUT AND ANCHORED TO REMOVE SLACK IN THE GEOGRIDS.

3.4 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL THICKNESS OF SIX INCHES IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND/OR THE GEOGRID.

3.5 RUBBER-TIRED VEHICLES MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

3.6 TENSAR UNIAXIAL GEOGRID SHALL BE ROLLED OUT WITH THE LONG AXIS OF THE APERTURES (MACHINE DIRECTION) PERPENDICULAR TO THE WALL FACE. TENSAR BIAxIAL GEOGRIDS SHALL BE ROLLED OUT WITH THE MACHINE DIRECTION BAR PARALLEL TO THE WALL FACE.

4.0 CHANGES TO GEOGRID LAYOUT OR PLACEMENT

4.1 NO CHANGES TO THE TENSAR GEOGRID LAYOUT, INCLUDING, BUT NOT LIMITED TO, LENGTH, GEOGRID TYPE, OR ELEVATION, SHALL BE MADE WITHOUT THE EXPRESSED PRIOR WRITTEN CONSENT OF TENSAR EARTH TECHNOLOGIES, INC. DESIGN ENGINEER.

5.0 DRAINAGE

5.1 AT THE END OF EACH WORK DAY, BACKFILL SURFACE SHALL BE GRADED AWAY FROM THE WALL FACE A MINIMUM OF 2 PERCENT SLOPE AND A TEMPORARY SOIL BERM SHALL BE CONSTRUCTED NEAR THE WALL CREST TO PREVENT SURFACE WATER RUNOFF FROM OVERTOPPING THE WALL.

5.2 AT THE END OF EACH WORK DAY, BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH WHEEL ROLLER TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL.

5.3 THE TENSAR WALL HAS BEEN DESIGNED ON THE ASSUMPTION THAT THE REINFORCED FILL MATERIAL SHALL BE FREE OF SUBSURFACE DRAINAGE OF WATER (SEEPAGE).

5.4 THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATER RETENTION AS NEEDED DURING CONSTRUCTION.

6.0 DESIGN PARAMETERS

6.1 SOIL PARAMETERS

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM.

6.1.1 THE CONTRACTOR SHALL VERIFY THAT THE SOIL MATERIALS COMPLY WITH THE DESIGN PARAMETERS AS STATED IN THE CONTROL DRAWINGS.

6.1.1 DESIGN:

THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, THE TENSAR EARTH TECHNOLOGIES, INC. IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

6.2 FACTORS OF SAFETY:

6.2.1 INTERNAL STABILITY:
MAXIMUM GEOGRID DESIGN STRENGTH = 0.19 ULT
MINIMUM FACTOR OF SAFETY FOR GEOGRID PULLOUT = 1.5
MINIMUM FACTOR OF SAFETY FOR SLIDING AT LOWEST GEOGRID = 1.5
SOIL-GEOGRID INTERACTION COEFFICIENT = 0.58 - 0.8
PERCENT COVERAGE OF GEOGRID: (ONE ROLL WIDTH) = 89%

6.2.2 EXTERNAL STABILITY:

MINIMUM FACTOR OF SAFETY FOR SLIDING AT BASE = 1.5
MINIMUM FACTOR OF SAFETY FOR OVERTURNING = 2.0
MINIMUM FACTOR OF SAFETY FOR BEARING = 2.5

(EXTERNAL STABILITY, INCLUDING SLIDING, OVERTURNING, AND BEARING CAPACITY, IS THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR EXTERNAL STABILITY. (SEE NOTES 7.6 & 7.7))

6.2.3 GLOBAL STABILITY:

MINIMUM FACTOR OF SAFETY FOR GLOBAL STABILITY = 1.5

GLOBAL STABILITY IS THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR GLOBAL STABILITY. (SEE NOTES 7.6 & 7.7)

6.3 SURCHARGE LOADING = 250 psf

6.4 HYDROSTATIC DESIGN = NONE

6.5 SEISMIC DESIGN = NONE

6.6 GEOGRID LONG TERM ALLOWABLE DESIGN STRENGTH (LTADS): GEOGRID LTADS SHALL BE 19 PERCENT OF ULTIMATE GEOGRID STRENGTH AS DETERMINED IN ACCORDANCE WITH GEOSYNTHETIC RESEARCH INSTITUTE, (GRI), TEST METHOD GGI-87, SINGLE RIB TEST.

7.0 SPECIAL PROVISIONS

7.1 WALL ELEVATION VIEWS AND LOCATIONS AND GEOMETRY OF EXISTING STRUCTURES MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

7.2 TENSAR EARTH TECHNOLOGIES, INC. ASSUMES NO LIABILITY FOR INTERPRETATION OR VERIFICATION OF SUBSURFACE CONDITIONS, SUITABILITY OF SOIL DESIGN PARAMETERS AND INTERPRETATION OF SUBSURFACE GROUNDWATER CONDITIONS.

7.3 THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND VERIFYING THAT THE ACTUAL SITE CONDITIONS ARE AS DESCRIBED IN SECTION 6.0 PRIOR TO AND DURING CONSTRUCTION. THE ENGINEER SHALL BE ON-SITE TO ASSURE THE PROVISIONS IN THE CONSTRUCTION NOTES ARE FOLLOWED.

7.4 THE SOIL DESIGN PARAMETERS STATED IN SECTION 6.0 SHALL BE VERIFIED BY THE CONTRACTOR. WRITTEN VERIFICATION OF DESIGN PARAMETERS SHALL BE SUBMITTED TO TENSAR EARTH TECHNOLOGIES, INC. PRIOR TO COMMENCING WITH CONSTRUCTION.

7.5 ANY REVISIONS TO DESIGN PARAMETERS STATED IN SECTION 6.0 OR TO THE STRUCTURE GEOMETRY SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

7.6 PER THE MSE RETAINING WALL GENERAL NOTES, TENSAR EARTH TECHNOLOGIES, INC. HAS CONSIDERED INTERNAL STABILITY OF THE RETAINING WALLS ONLY. EXTERNAL AND GLOBAL STABILITY OF THE WALL IS THE RESPONSIBILITY OF OTHERS.

7.7 DIFFERENTIAL SETTLEMENT AND ITS EFFECTS ON THE TENSAR RETAINING WALL SYSTEM SHALL BE THE RESPONSIBILITY OF OTHERS.

7.8 SEE CONTROL DRAWINGS, FDOT STANDARD SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS FOR ADDITIONAL REQUIRED MATERIALS AND METHODS.

7.9 A COPY OF THE TENSAR EARTH TECHNOLOGIES, INC. "ARES RETAINING WALL SYSTEM CONSTRUCTION AND QUALITY CONTROL MANUAL" SHALL BE ON-SITE AT ALL TIMES DURING WALL CONSTRUCTION.

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS AS NOTED IN THESE PLANS

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

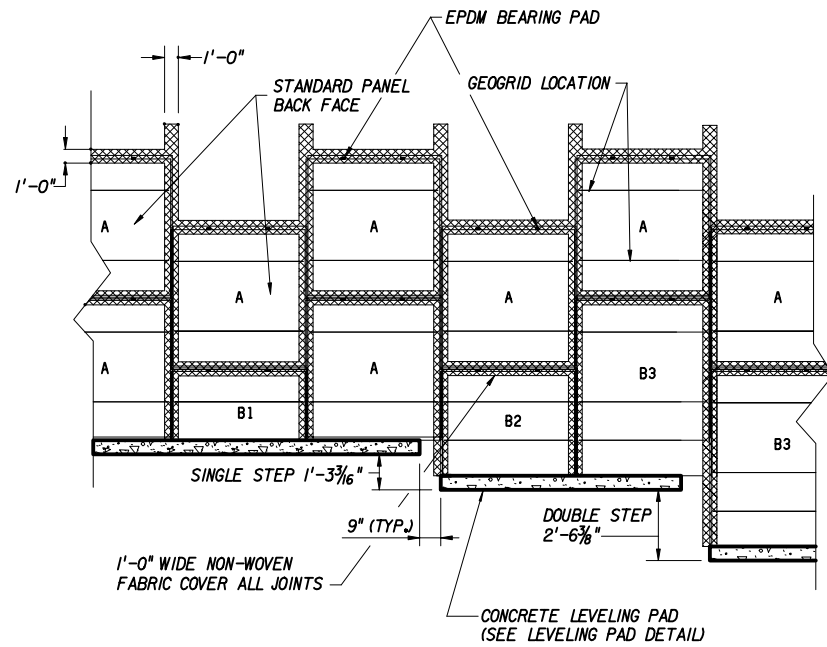
THIS DRAWING, DESIGN NOTES AND ASSOCIATED CALCULATIONS HAVE BEEN PREPARED BY TENSAR EARTH TECHNOLOGIES, INC. FOR PRELIMINARY DESIGN PURPOSES AND SHALL NOT BE USED FOR FINAL DESIGN OR CONSTRUCTION.

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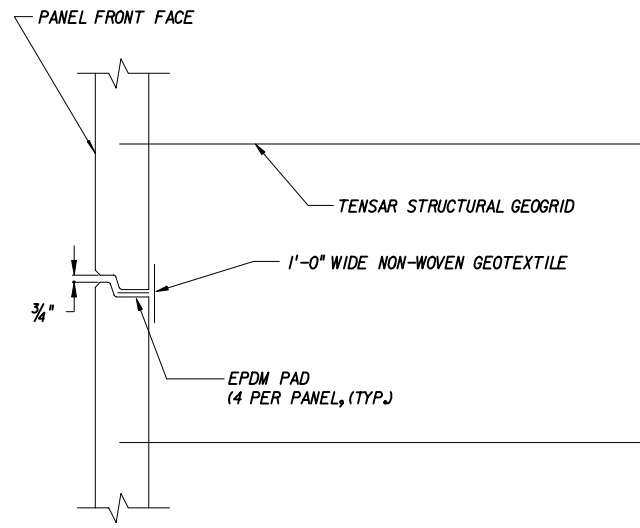
**TENSAR
EARTH TECHNOLOGIES, INC.**
5883 Glenridge Drive
Suite 200
Atlanta, GA 30328
(404) 250-1290



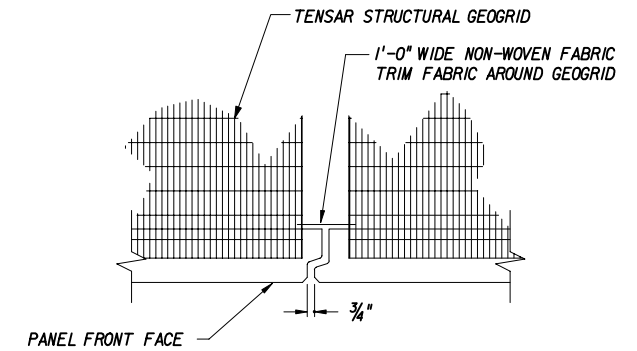
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	BS	3/03	State Structures Design Engineer	
Drawn By	WL	3/03	Revision	Sheet No. Index No.
Checked By	JSB	3/03	04	1 of 17 5025



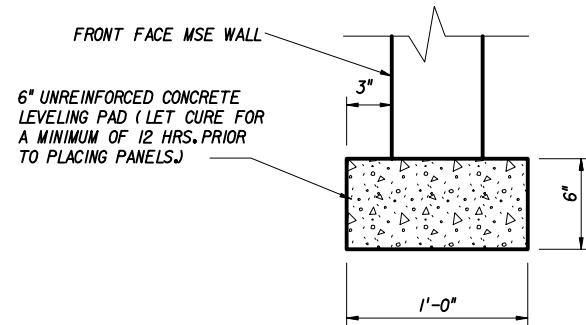
TYPICAL LEVELING PAD STEP AND FABRIC COVERAGE DETAIL
NOT TO SCALE



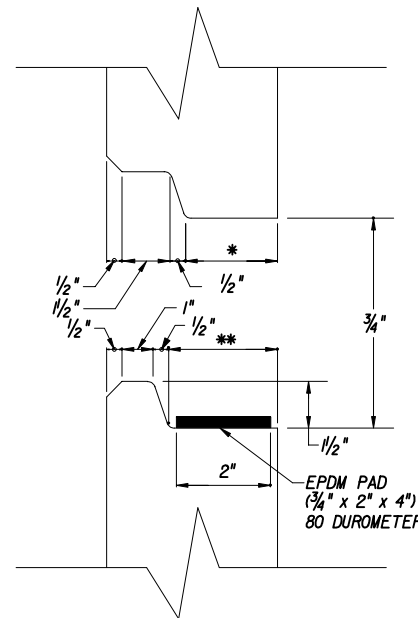
HORIZONTAL JOINT DETAIL
NOT TO SCALE



VERTICAL JOINT DETAIL



LEVELING PAD DETAIL
NOT TO SCALE



PANEL JOINT DETAIL
NOT TO SCALE

- * - 3" FOR MODERATELY & SLIGHTLY AGGRESSIVE ENVIRONMENT
- 4 3/8" FOR EXTREMELY AGGRESSIVE ENVIRONMENT
- ** - 3 1/2" FOR MODERATELY & SLIGHTLY AGGRESSIVE ENVIRONMENT
- 4 1/8" FOR EXTREMELY AGGRESSIVE ENVIRONMENT

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

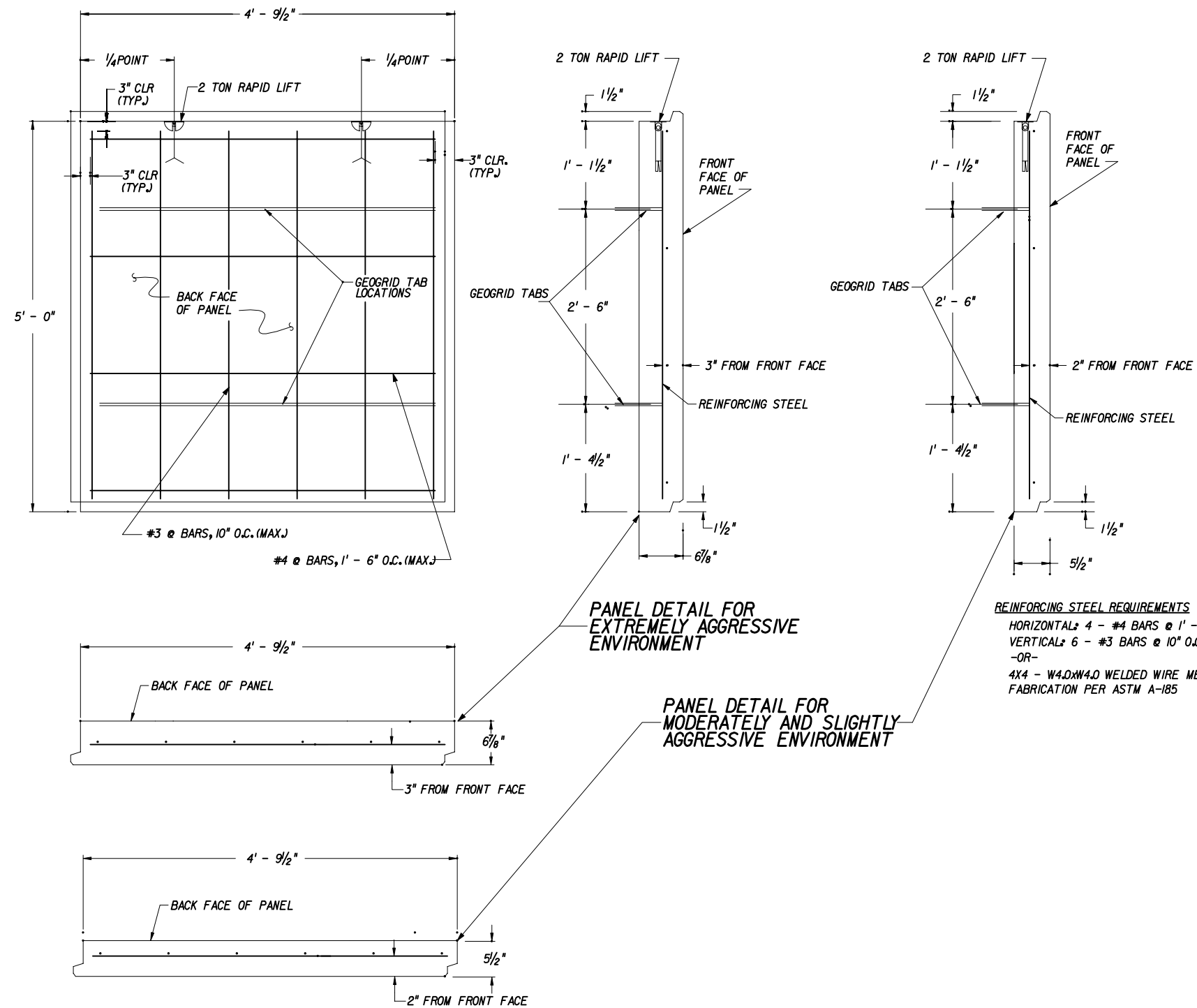
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Suite 200
Atlanta, GA 30328
(404) 250-1290



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
	Names	Dates	Approved By <i>W. J. [Signature]</i>	
Designed By	BS	3/03	State Structures Design Engineer	
Drawn By	JSB	3/03	Revision	Sheet No. Index No.
Checked By	WL	3/03	04	2 of 17 5025



REINFORCING STEEL REQUIREMENTS
 HORIZONTAL: 4 - #4 BARS @ 1' - 6" O.C. (MAX.)
 VERTICAL: 6 - #3 BARS @ 10" O.C. (MAX.)
 -OR-
 4X4 - W4.0XW4.0 WELDED WIRE MESH
 FABRICATION PER ASTM A-185

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

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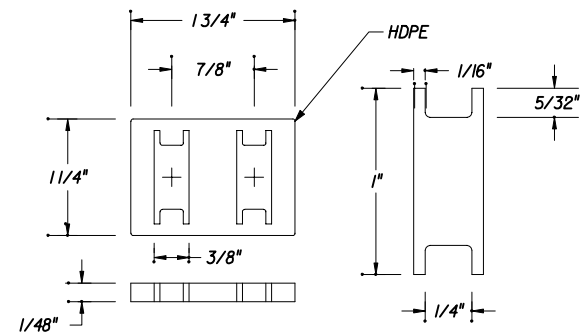
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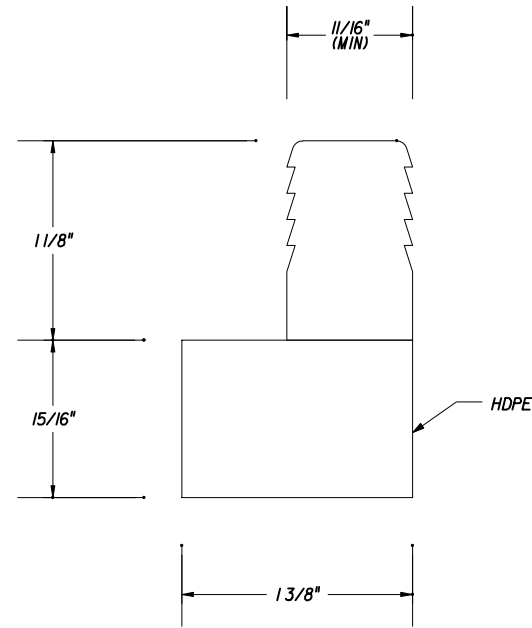
TYPICAL PANEL DETAILS - STANDARD A PANEL

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

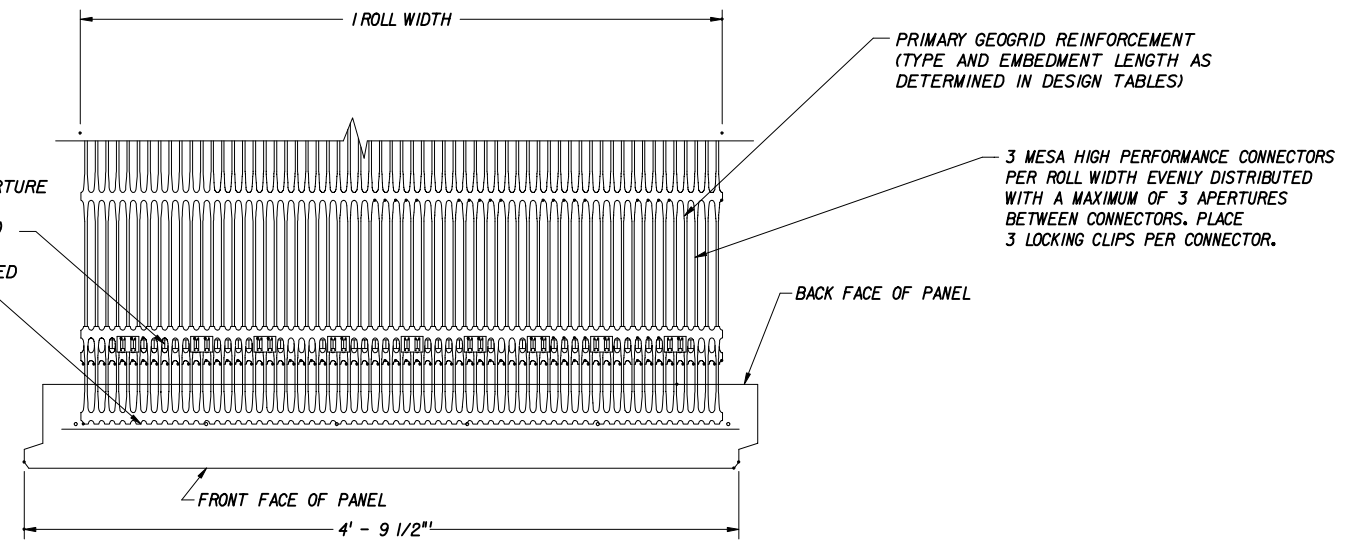
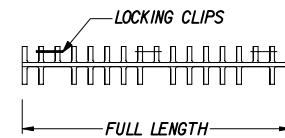
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Designed By	BS	3/03	Approved By <i>[Signature]</i>	
Drawn By	WL	3/03	Revision	Sheet No.
Checked By	JSB	3/03	04	3 of 17
				Index No. 5025



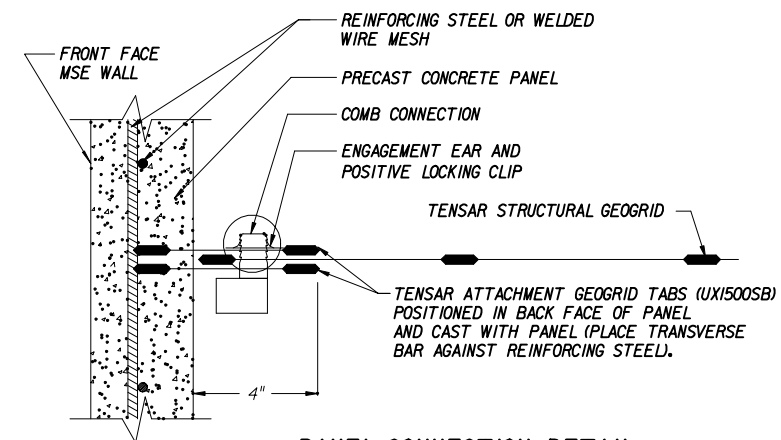
LOCKING CLIP
NOT TO SCALE



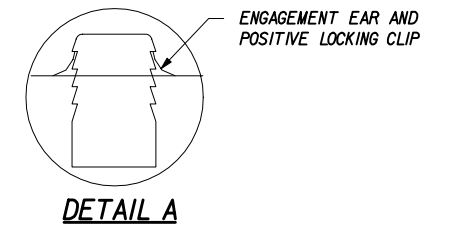
MESA HIGH PERFORMANCE CONNECTOR
NOT TO SCALE



CONNECTION DETAIL PLAN VIEW (89% COVERAGE)
MAXIMUM COVERAGE
NOT TO SCALE



PANEL CONNECTION DETAIL
NOT TO SCALE



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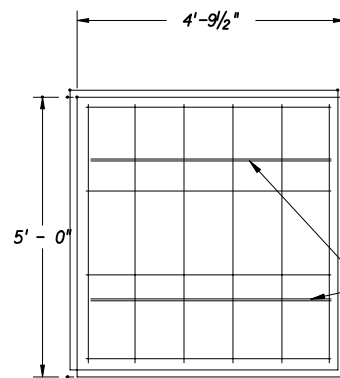
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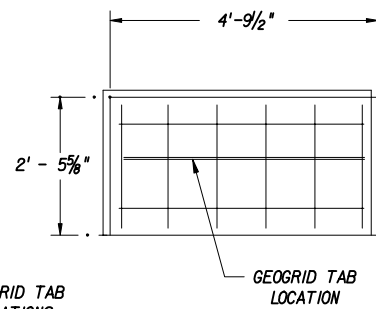
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL

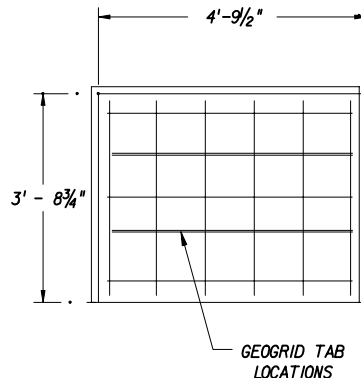
Names	Dates	Approved By			
Designed By	BS	3/03	 State Structures Design Engineer		
Drawn By	WL	3/03			
Checked By	JSB	3/03	Revision	Sheet No.	Index No.
			04	4 of 17	5025



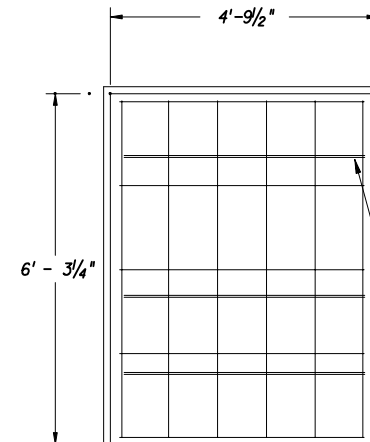
STANDARD A PANEL



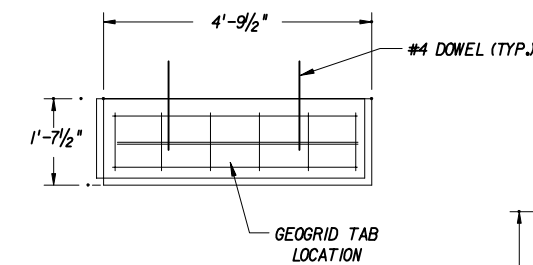
STANDARD B1 PANEL



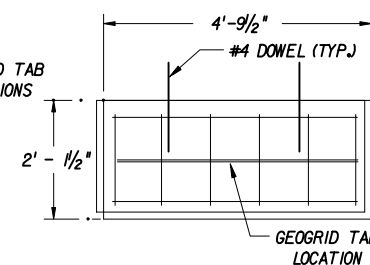
STANDARD B2 PANEL



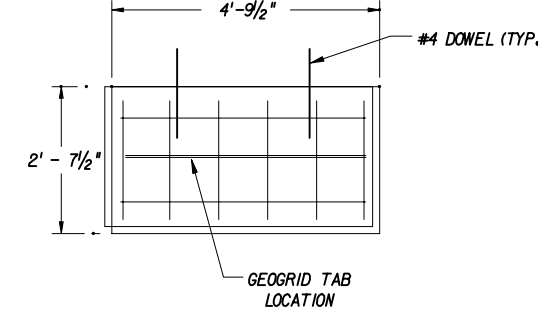
STANDARD B3 PANEL



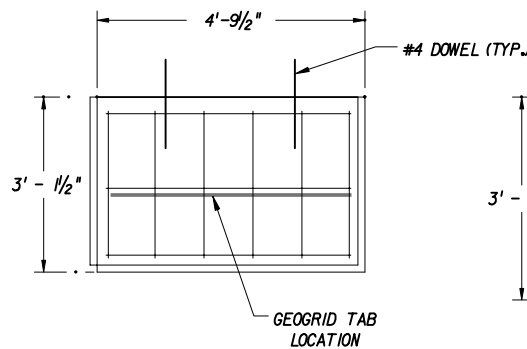
STANDARD T18 PANEL



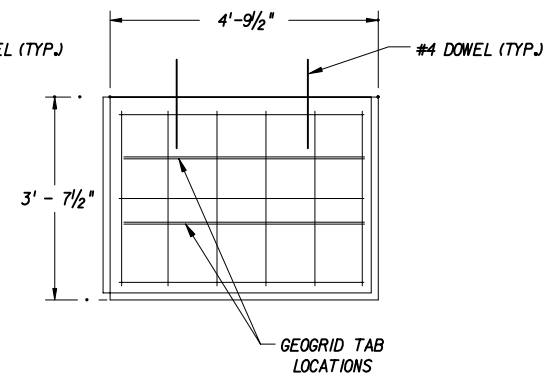
STANDARD T24 PANEL



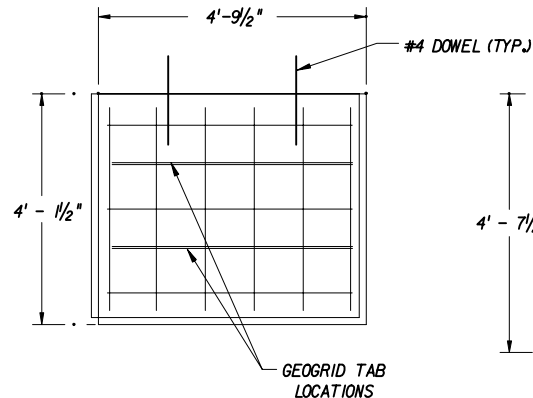
STANDARD T30 PANEL



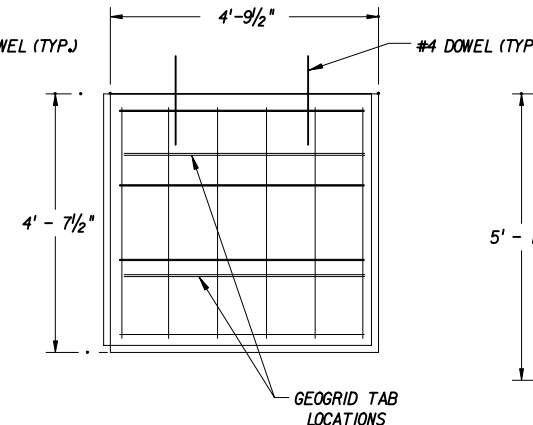
STANDARD T36 PANEL



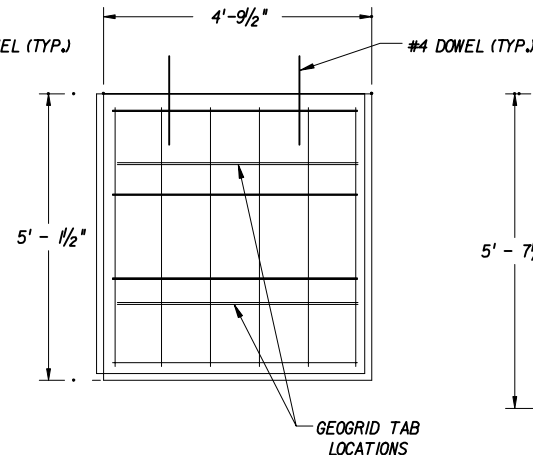
STANDARD T42 PANEL



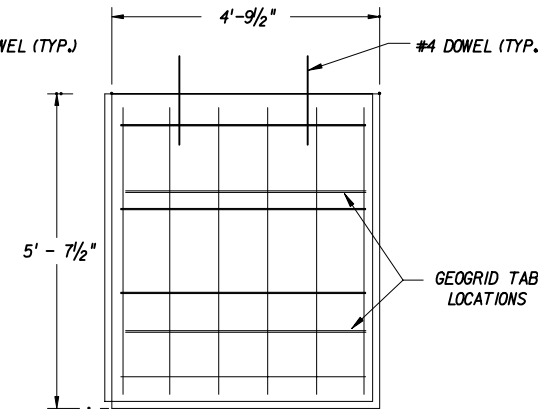
STANDARD T48 PANEL



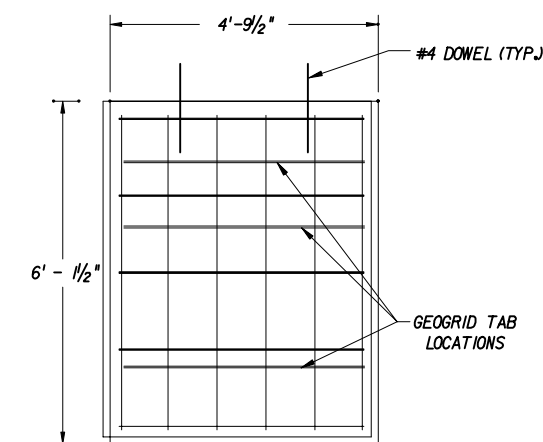
STANDARD T54 PANEL



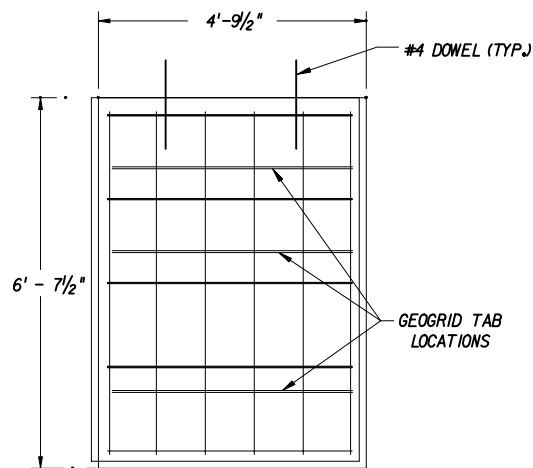
STANDARD T60 PANEL



STANDARD T66 PANEL



STANDARD T72 PANEL



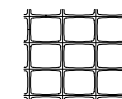
STANDARD T78 PANEL

ALL PANELS ARE SHOWN BACK FACE VIEW

STANDARD STEEL LAYOUT
 REINFORCING STEEL REQUIREMENTS
 HORIZONTAL: #4 BARS (60 KSI) @ 1' - 6" O.C. (MAX.)
 VERTICAL: #3 BARS (60 KSI) @ 10" O.C. (MAX.)
 OR
 STANDARD WWF LAYOUT
 REINFORCING STEEL REQUIREMENTS
 4X4-W4.0XW4.0 WELDED WIRE MESH
 FABRICATION PER ASTM A-185

— GEOGRID TAB LOCATIONS

ALL TOP PANELS WILL HAVE 2 #4 DOWELS
 CAST 6" INTO THE TOP OF EACH PANEL.



THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

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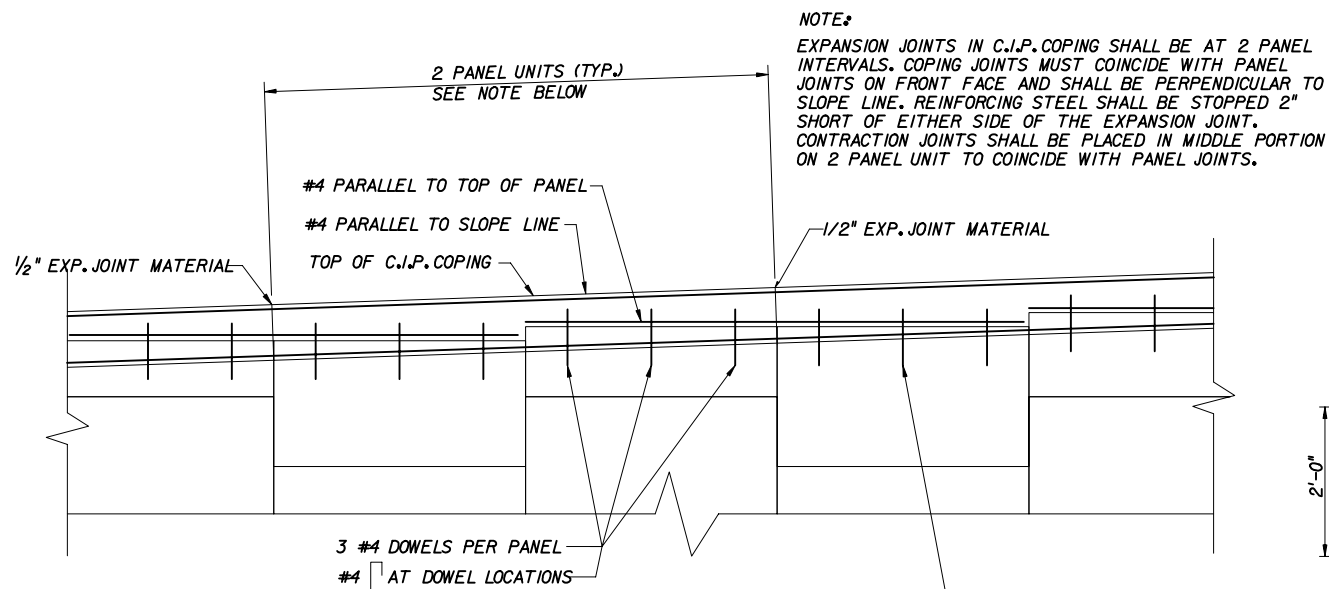
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

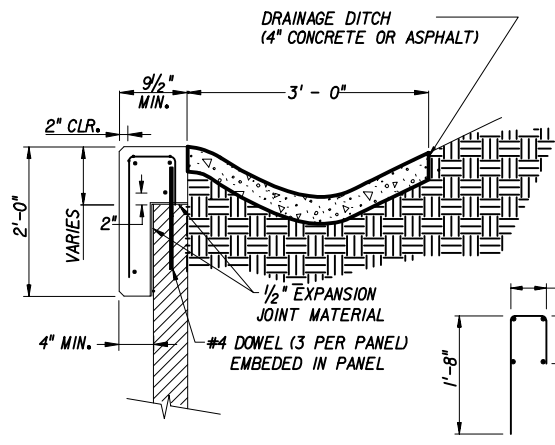
**RETAINING WALL SYSTEM
 TENSAR EARTH TECHNOLOGIES
 MSE RETAINING WALL**

Names	Dates	Approved By				
Designed By	BS	3/03	 State Structures Design Engineer			
Drawn By	WL	3/03			Revision	Sheet No.
Checked By	JSB	3/03			04	5 of 17
			Index No.	5025		

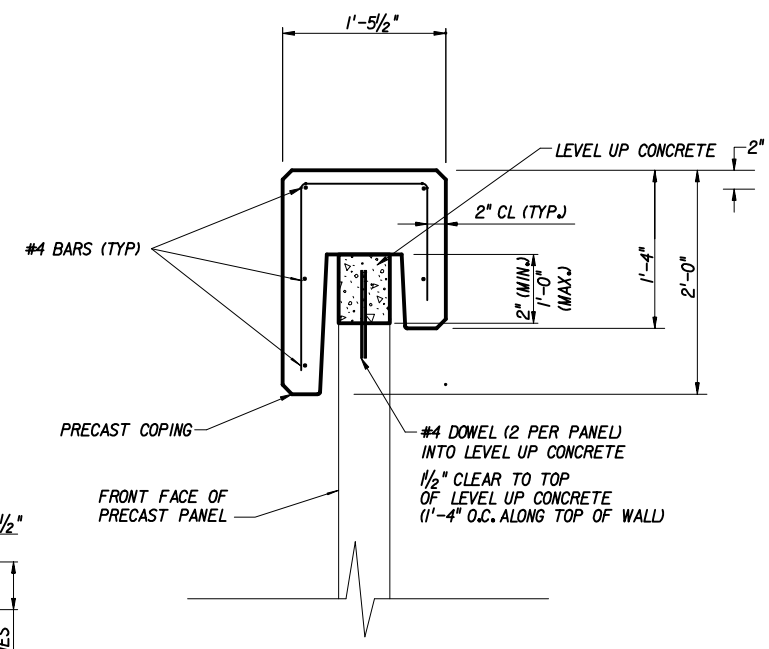


C.I.P. COPING PARTIAL ELEVATION VIEW
NOT TO SCALE

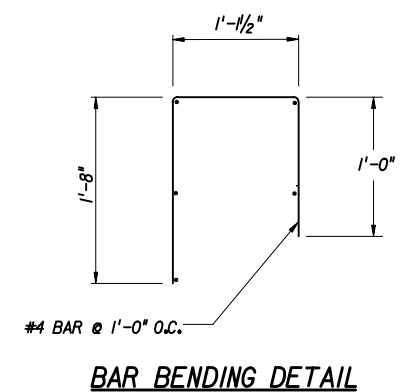
NOTE:
EXPANSION JOINTS IN C.I.P. COPING SHALL BE AT 2 PANEL INTERVALS. COPING JOINTS MUST COINCIDE WITH PANEL JOINTS ON FRONT FACE AND SHALL BE PERPENDICULAR TO SLOPE LINE. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE EXPANSION JOINT. CONTRACTION JOINTS SHALL BE PLACED IN MIDDLE PORTION ON 2 PANEL UNIT TO COINCIDE WITH PANEL JOINTS.



BAR BENDING DETAIL

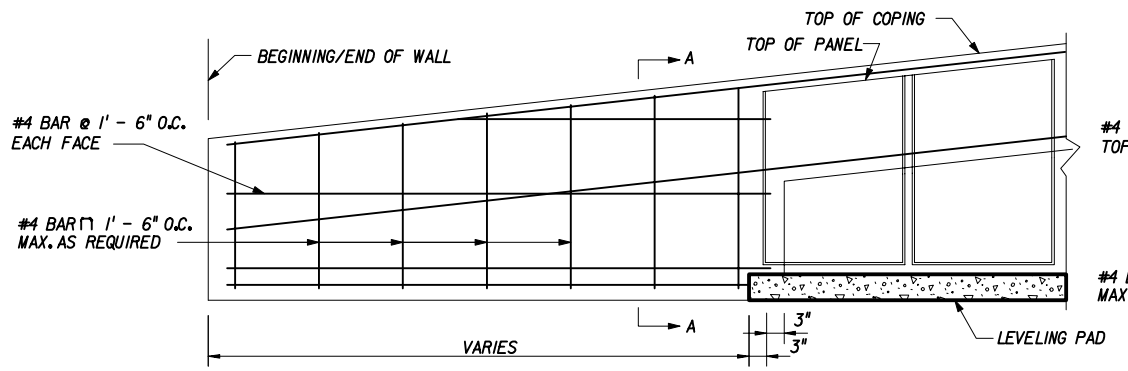


PRECAST COPING SECTION
NOT TO SCALE

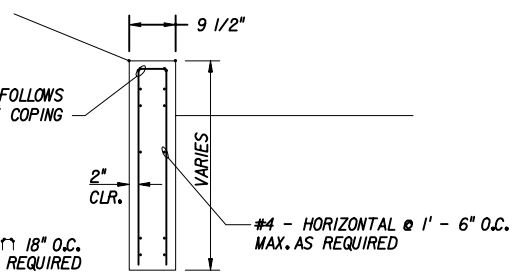


BAR BENDING DETAIL

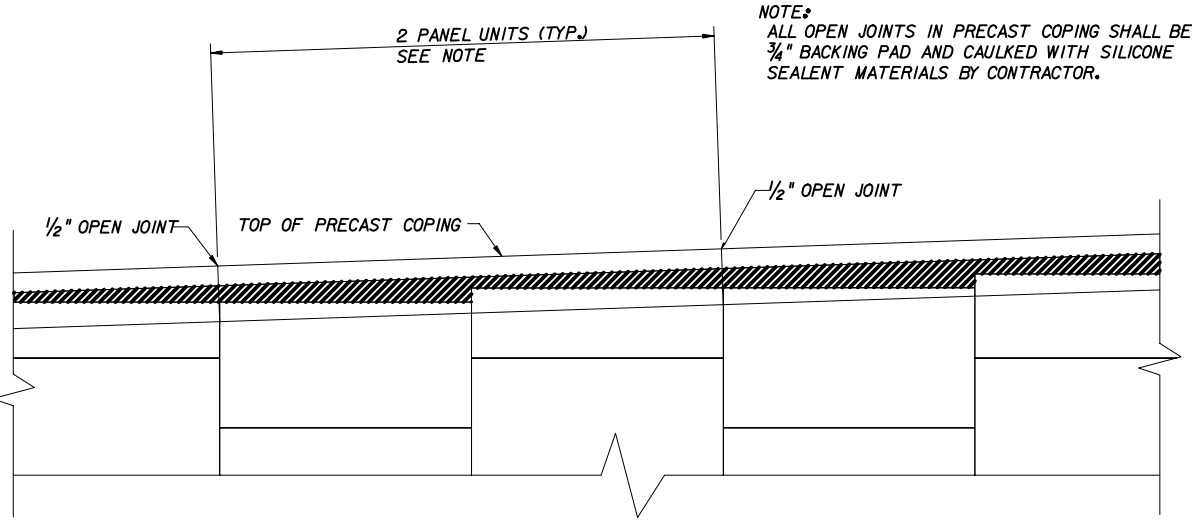
C.I.P. COPING WITH SWALE
NOT TO SCALE



COPING ENCLOSURE DETAIL
NOT TO SCALE



SECTION A-A



PRECAST COPING PARTIAL ELEVATION VIEW
NOT TO SCALE

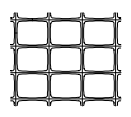
NOTE:
ALL OPEN JOINTS IN PRECAST COPING SHALL BE FILLED WITH 3/4" BACKING PAD AND CAULKED WITH SILICONE SEALANT MATERIALS BY CONTRACTOR.

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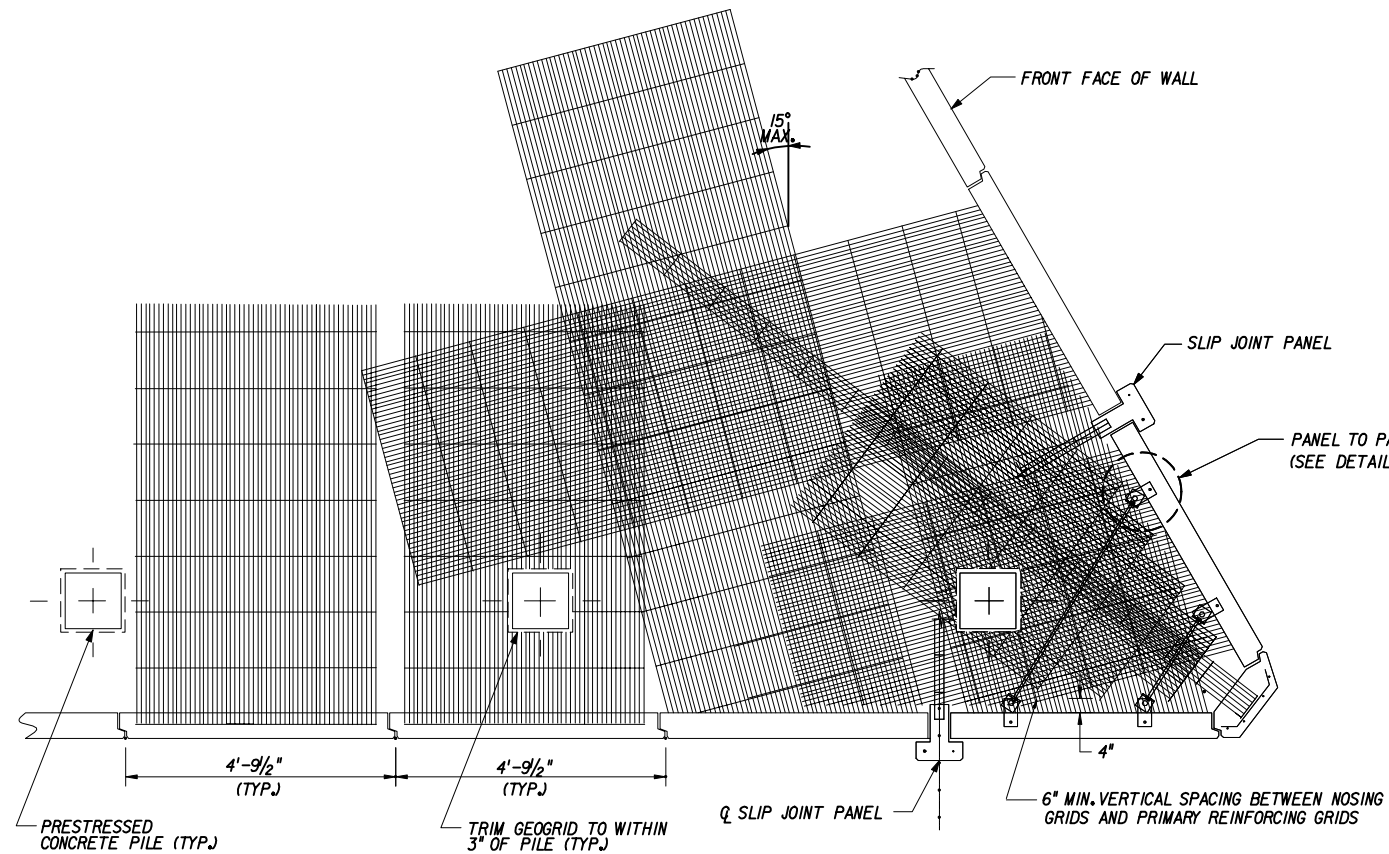
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(404) 250-1290



THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	BS	3/03	State Structures Design Engineer	
Drawn By	WL	3/03	Revision	Sheet No.
Checked By	JSB	3/03	04	6 of 17
				Index No. 5025

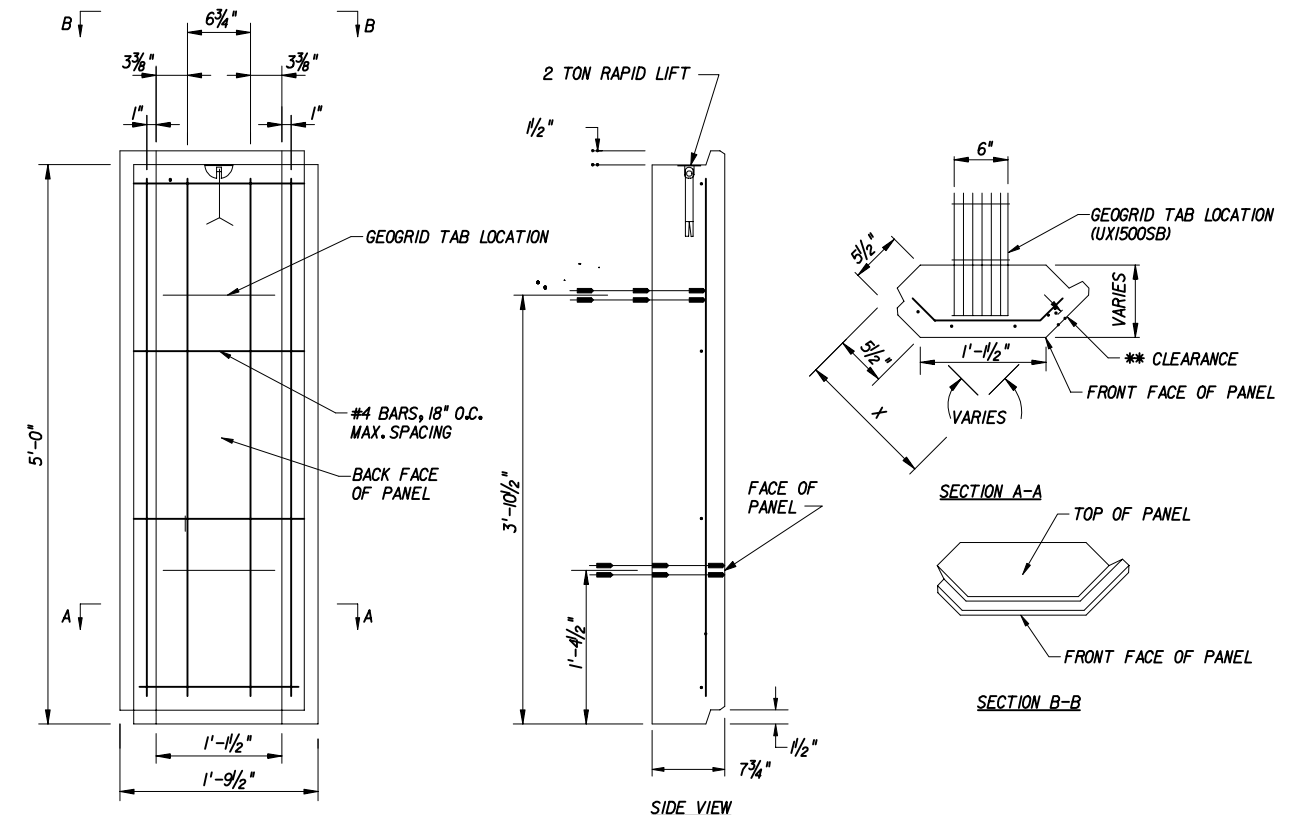


LESS THAN 75° ACUTE CORNER - SKEWED GEOGRID UNDER PILE CAP
 (SEE DETAIL BELOW FOR BIN REINFORCEMENT)

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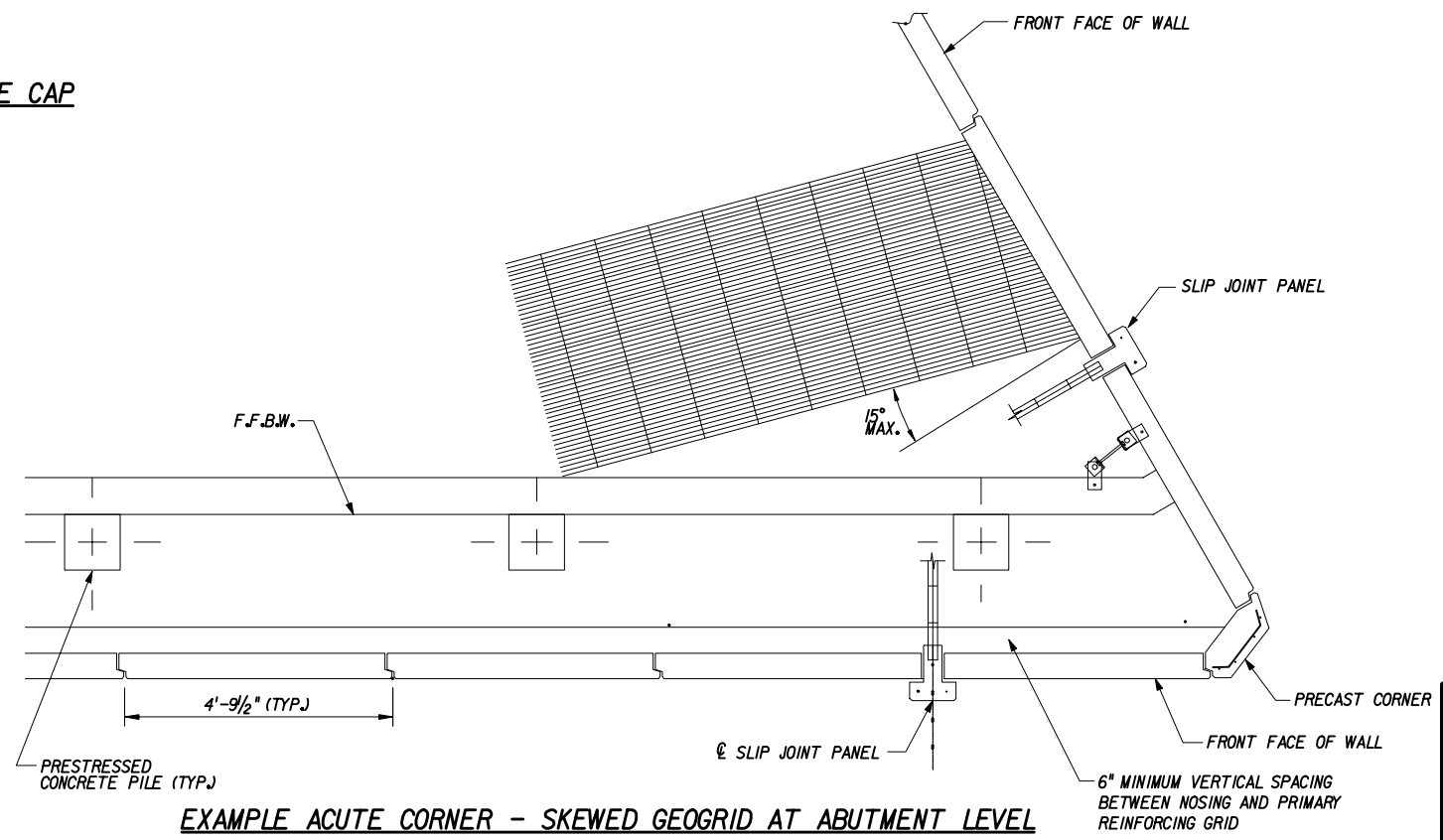
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ACUTE CORNER ELEMENT DETAIL

** VARIES
 3" FOR MARINE ENVIRONMENTS
 2" FOR MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS



EXAMPLE ACUTE CORNER - SKEWED GEOGRID AT ABUTMENT LEVEL

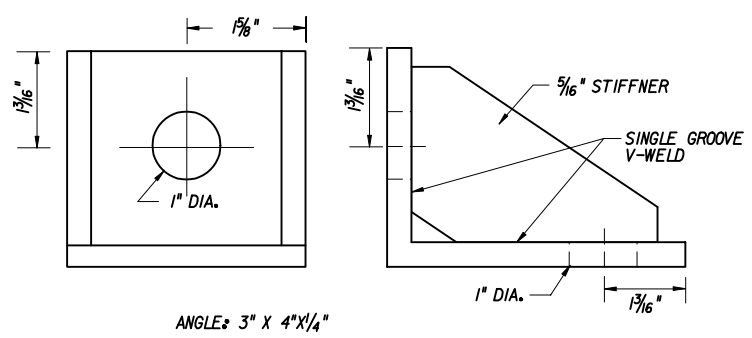
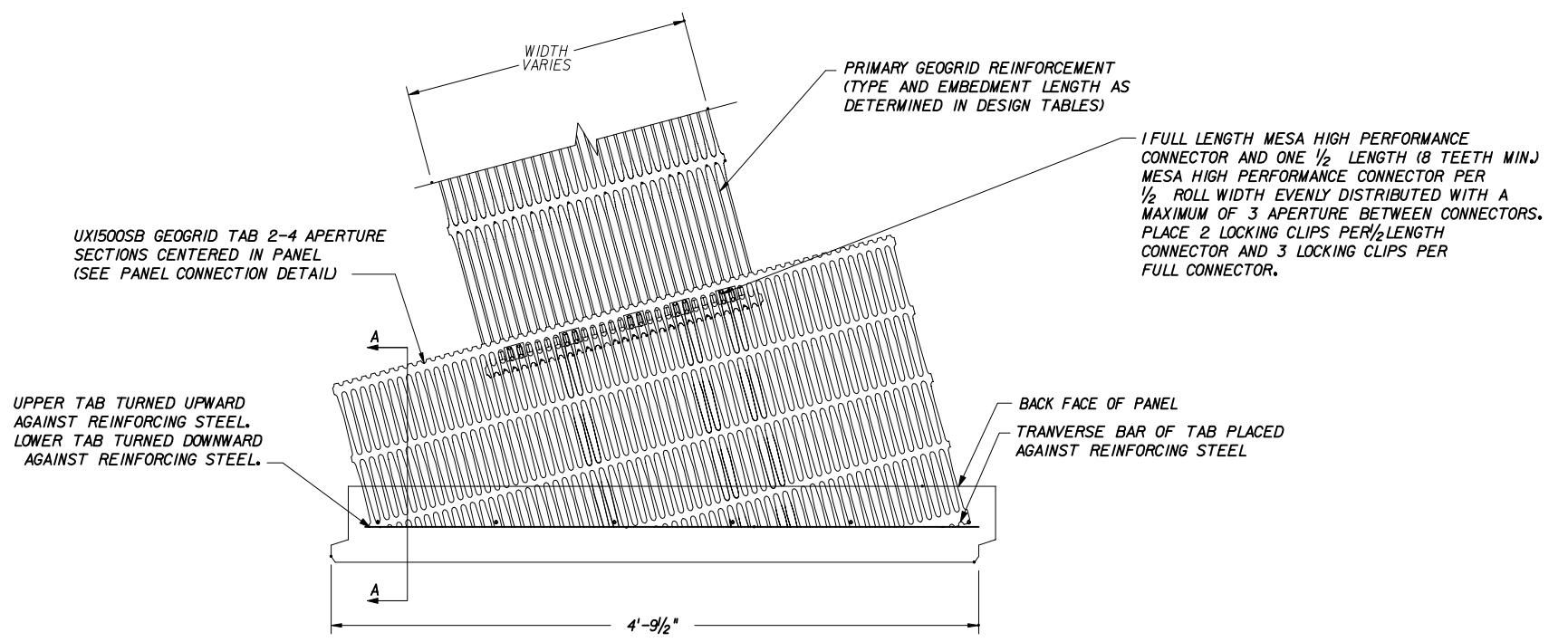
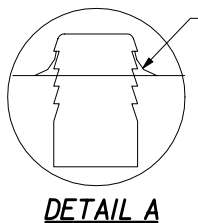
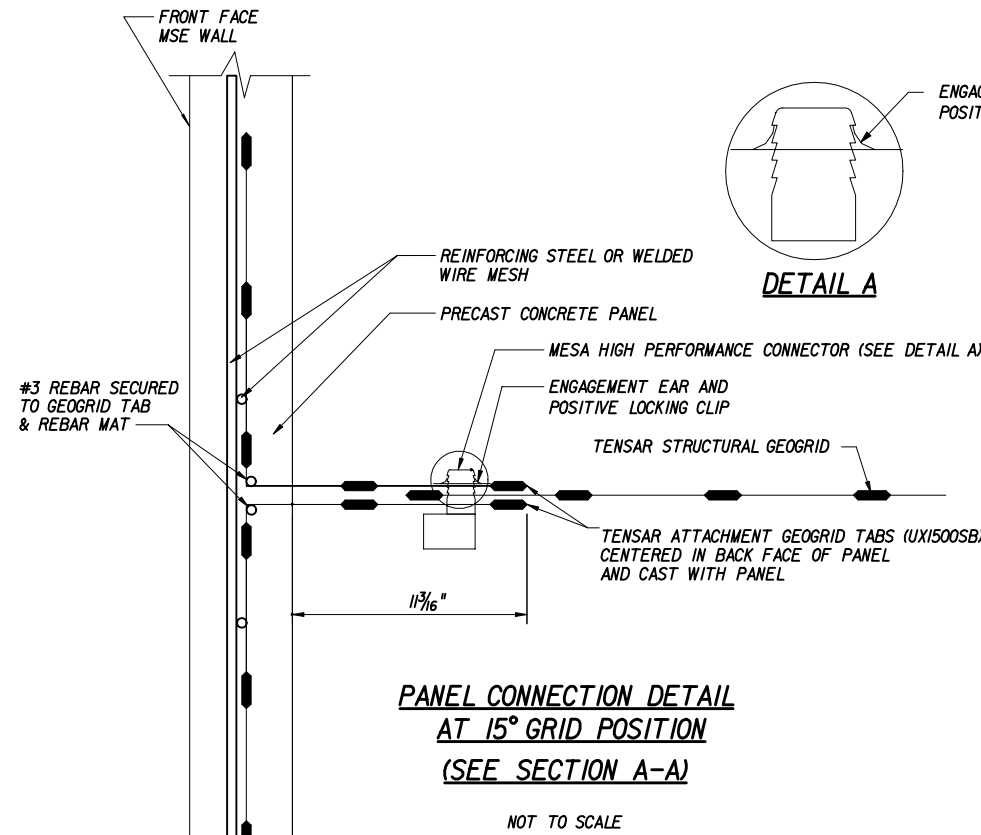
NOT TO SCALE

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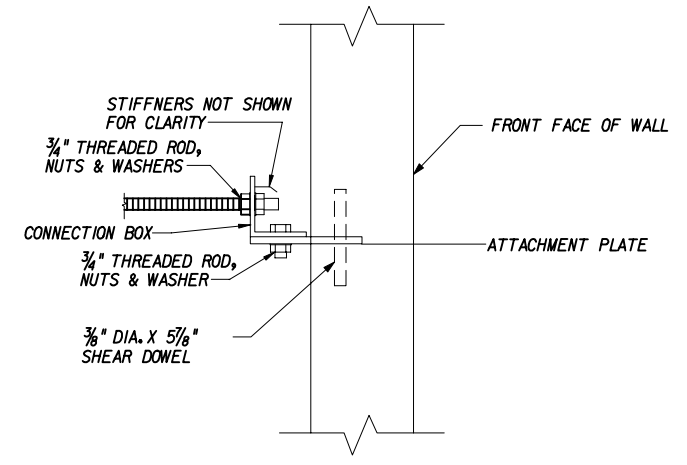
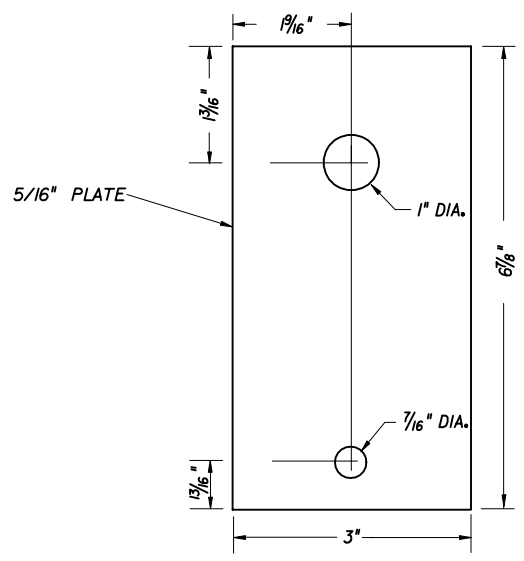


THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Designed By	BS	3/03	Approved By <i>W. V. [Signature]</i>	
Drawn By	WL	3/03	Revision	Sheet No.
Checked By	JSB	3/03	04	7 of 17
				Index No. 5025



CONNECTION BOX



PANEL TO PANEL ATTACHMENT

- FABRICATION ATTACHMENT STEEL NOTES:**
1. ALL FABRICATED STEEL PARTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION FOR MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS.
 2. ALL FABRICATED STEEL PARTS SHALL BE FABRICATED FROM 316 L GRADE STAINLESS STEEL FOR USE IN 100 YR FLOOD PLAIN + 2' (SALT WATER ZONE OF INFLUENCE).
 3. ALL DIMENSIONS ARE MINIMUM REQUIREMENT

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

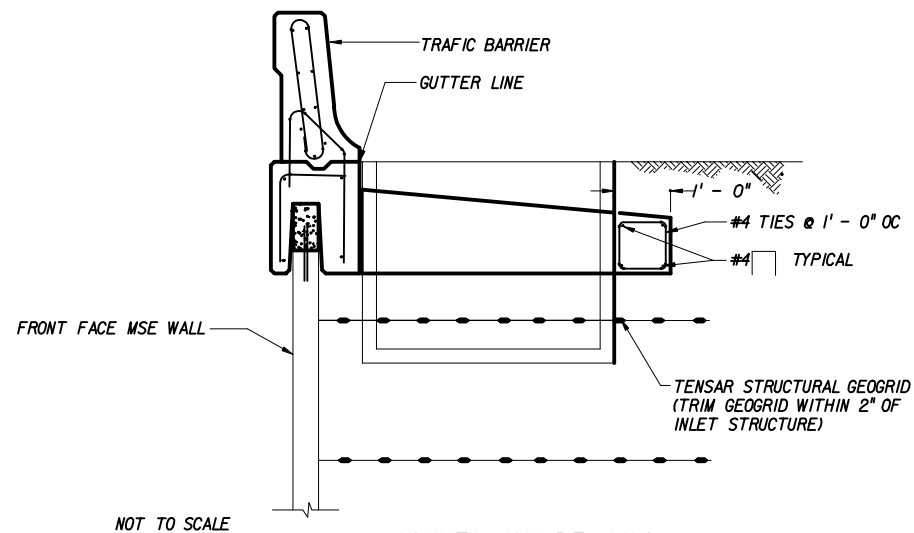
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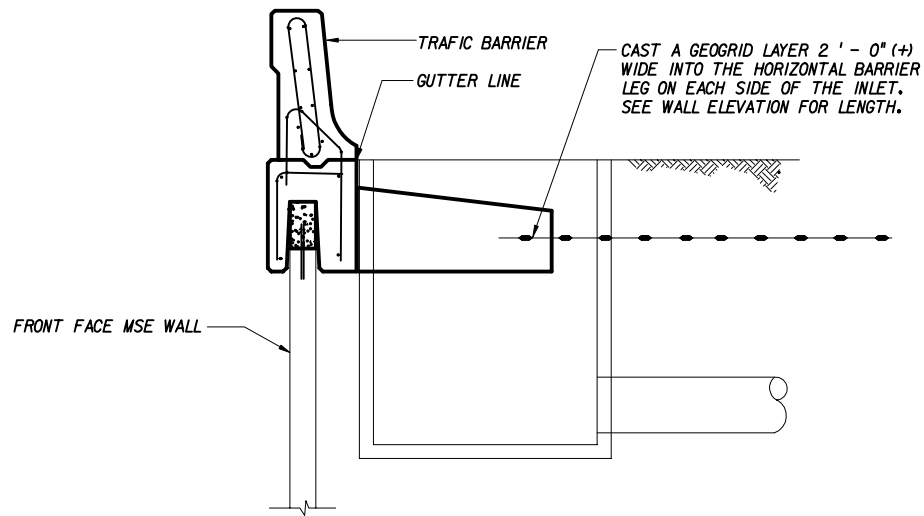
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Designed By	BS	3/03	Approved By <i>W. J. [Signature]</i>	
Drawn By	WL	3/03	Revision	Sheet No. Index No.
Checked By	JSB	3/03	04	8 of 17 5025



CONNECTION DETAILS

SECTION A-A

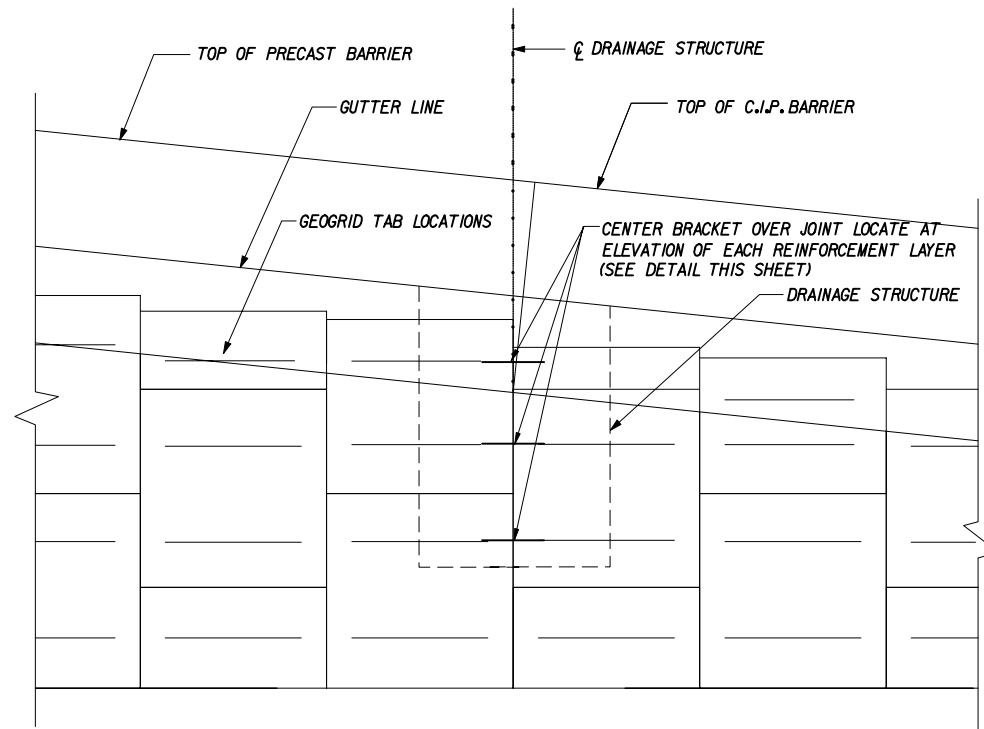
NOT TO SCALE



DETAIL OF TENSAR PANELS @ INLETS

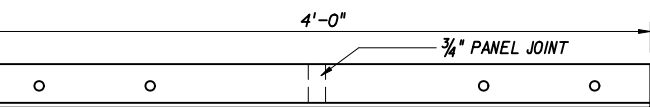
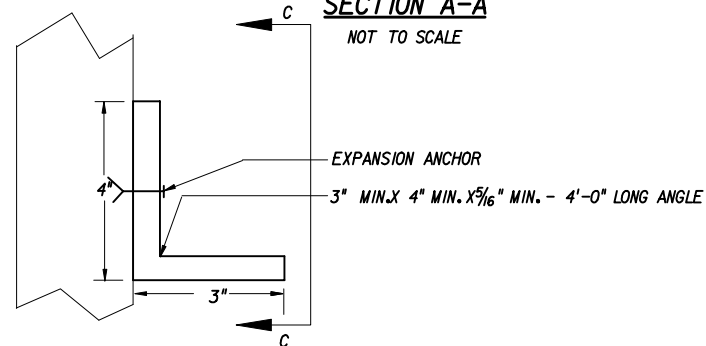
SECTION B-B

NOT TO SCALE

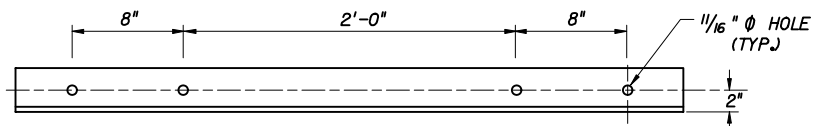


PARTIAL ELEVATION - WALL @ DRAINAGE INLET

NOT TO SCALE



VIEW C-C



CENTER BRACKET OVER JOINT DETAIL

NOT TO SCALE

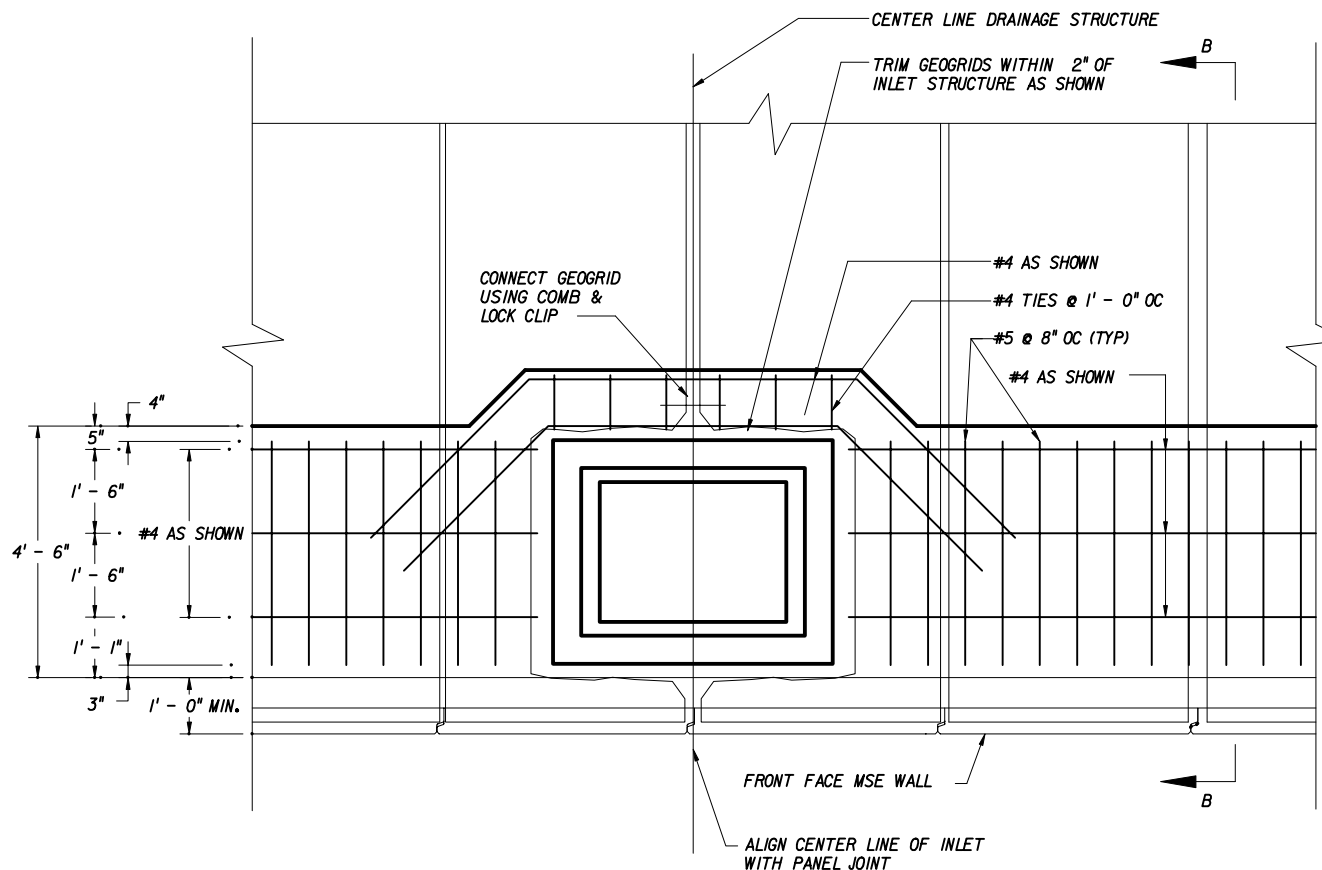
NOTES:

1. ALL FABRICATED STEEL PARTS SHALL BE HOT DIP GALVANAIZED AFTER FABRICATION FOR MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENT
2. ALL FABRICATED STEEL PARTS SHALL BE FABRICATED FROM 316 L GRADE STAINLESS STEEL FOR USE IN 100 YR FLOOD PLAIN + 2' (SALT WATER ZONE OF INFLUENCE)
3. ANCHOR SHALL BE HILTI HSLG RM 10/20 STAINLESS OR APPROVED EQUAL

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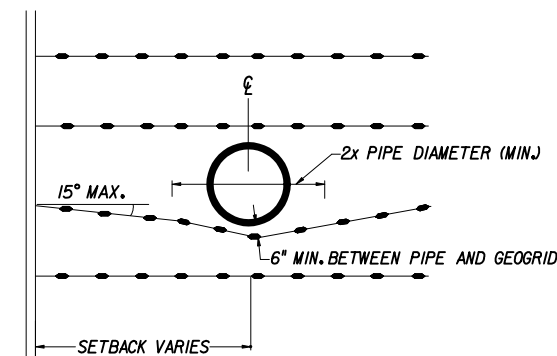
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PARTIAL PLAN - WALL @ DRAINAGE INLET

NOT TO SCALE



TYPICAL OBSTRUCTION AVOIDANCE DETAIL

NOT TO SCALE

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

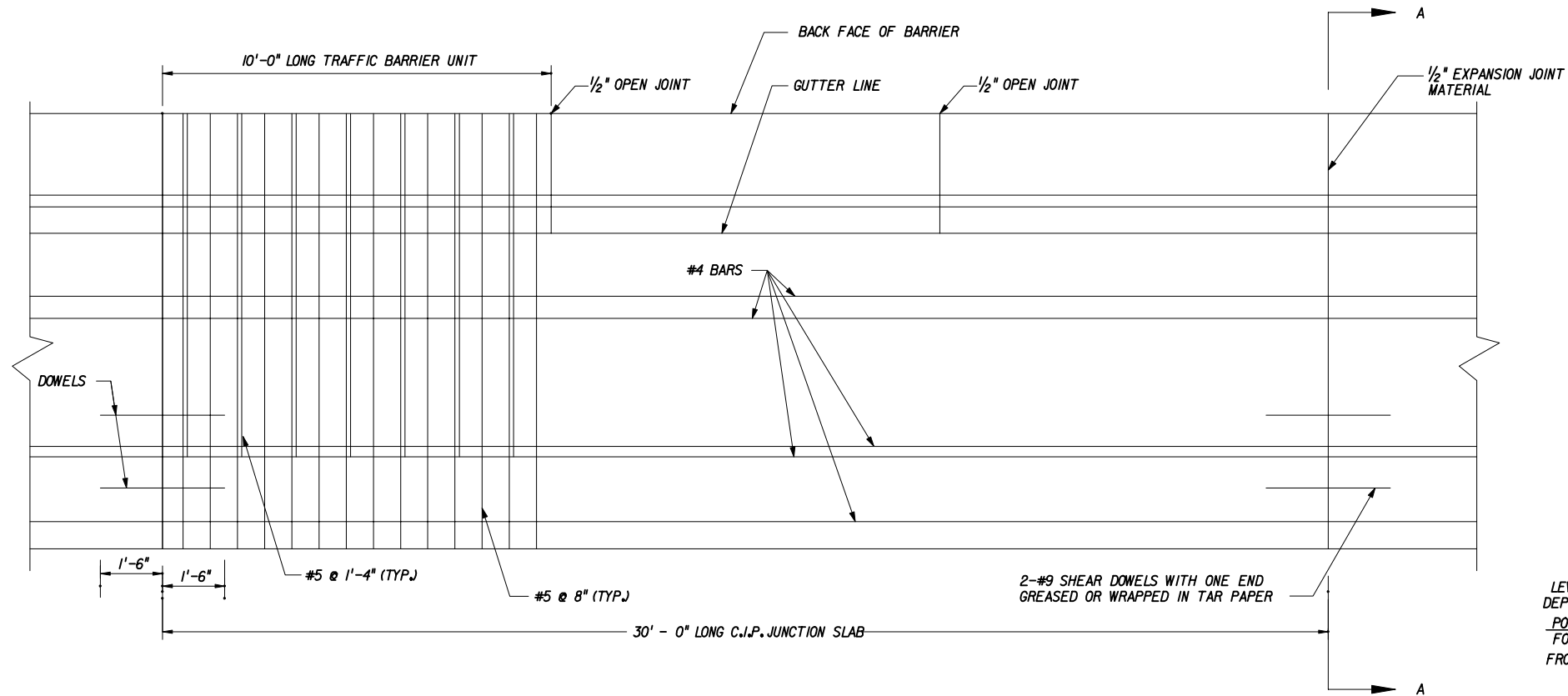
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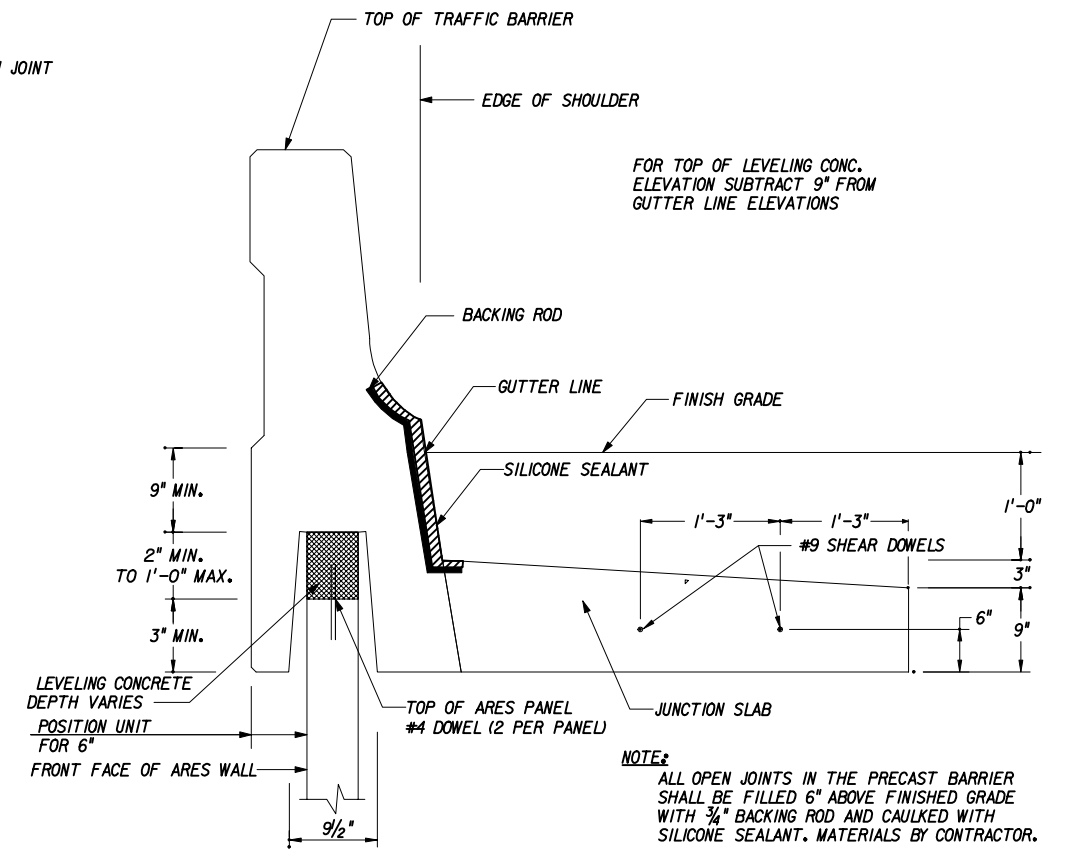
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL**

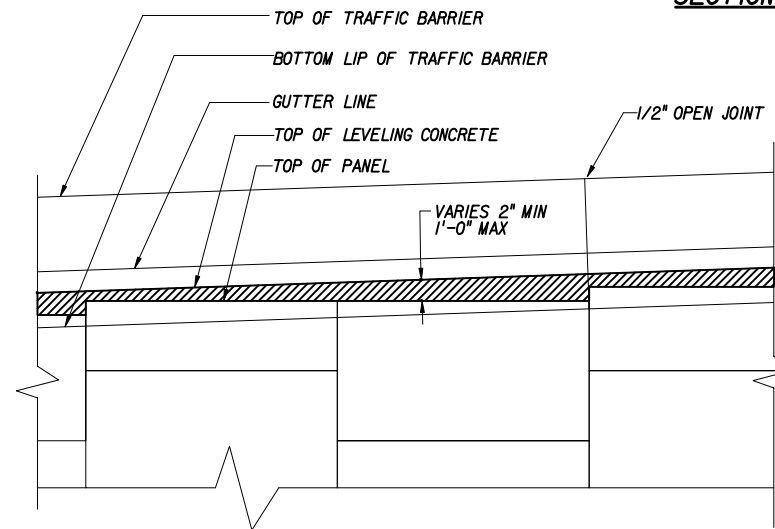
Names	Dates	Approved By		
Designed By	BS	3/03	 State Structures Design Engineer	
Drawn By	WL	3/03		
Checked By	JSB	3/03		
Revision	04	9 of 17	Index No.	5025



PLAN VIEW
PRECAST TRAFFIC BARRIER WITH C.I.P. JUNCTION SLAB
 NOT TO SCALE



SECTION A-A AT PRECAST TRAFFIC BARRIER WITH C.I.P. JUNCTION SLAB
 NOT TO SCALE



PRECAST TRAFFIC BARRIER PARTIAL ELEVATION VIEW
 NOT TO SCALE

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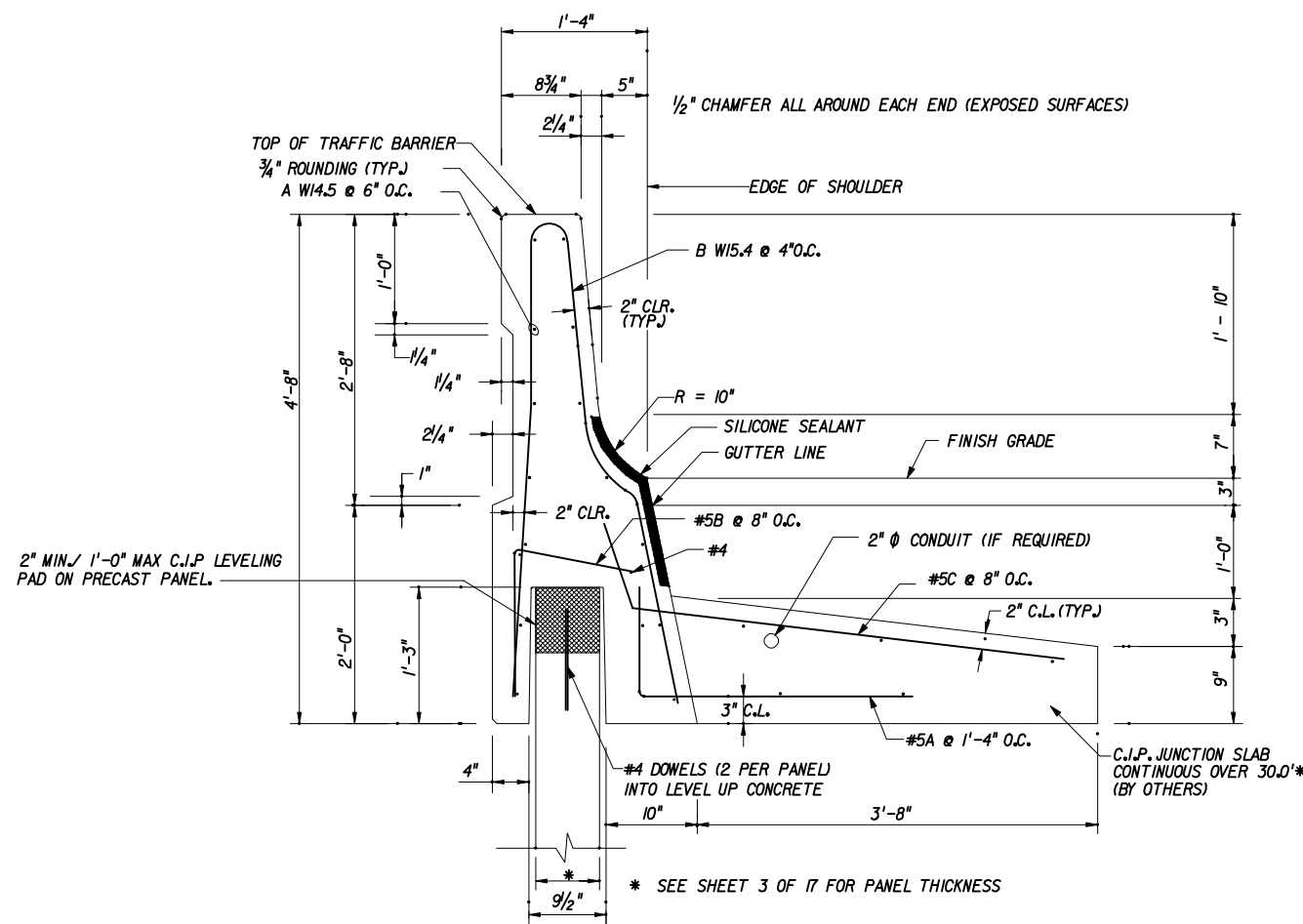
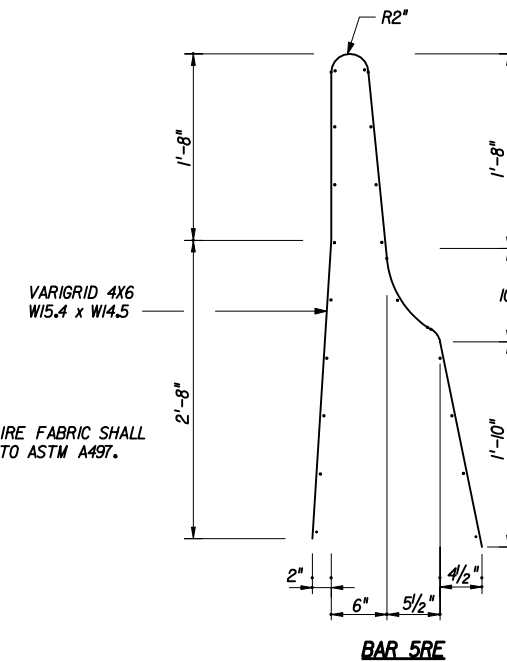
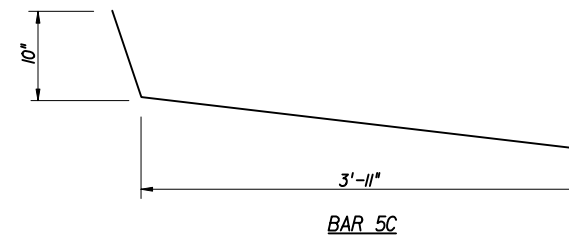
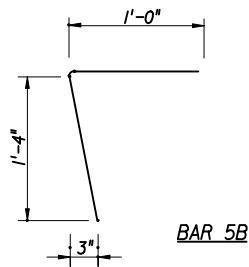
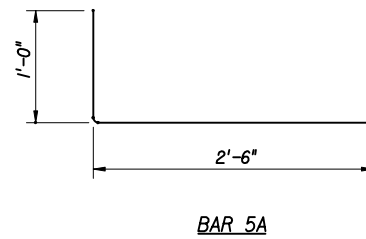
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Designed By	BS	3/03	Approved By <i>[Signature]</i> State Structures Design Engineer	
Drawn By	WL	3/03	Revision	Sheet No. Index No.
Checked By	JSB	3/03	04	10 of 17 5025



NOTES:

- A. 1/2" CHAMFER ALL AROUND EACH FACE (EXPOSED SURFACES)
- B. ALL LONGITUDINAL BARS SHALL BE #4 WITH A MAXIMUM SPACING OF 1'-6" O.C.

MARK	QUANTITY	REMARKS
5A	8	3'-6" LONG
5B	16	2'-4" LONG
5C	16	5'-0" LONG
A	VARIGRID	W14.5 @ 6" O.C.
B	VARIGRID	W15.4 @ 4" O.C.

PRECAST BARRIER - VARIGRID REINFORCEMENT
NOT TO SCALE

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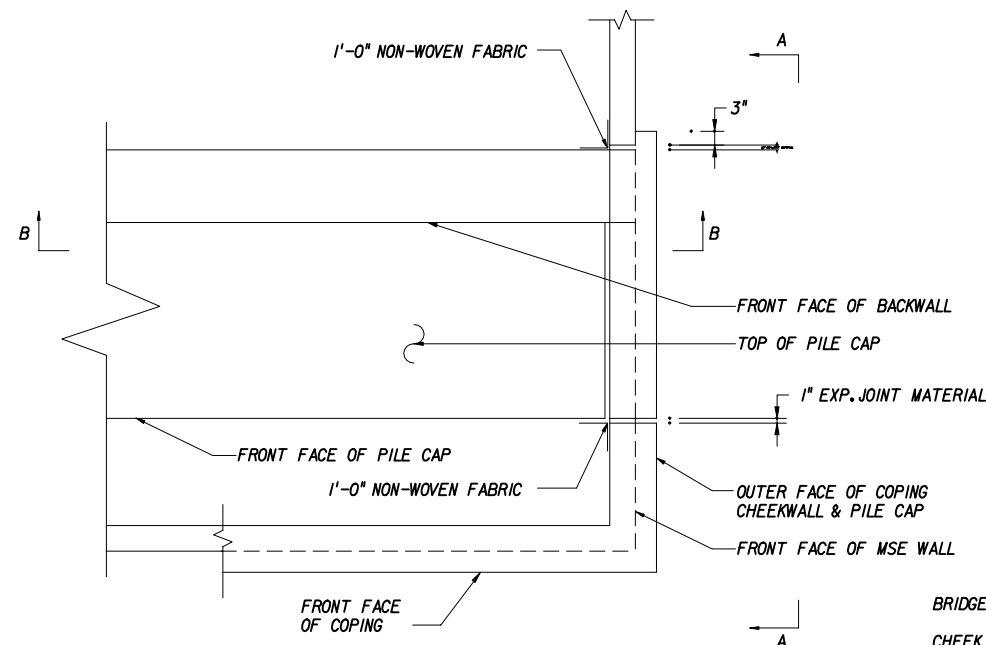
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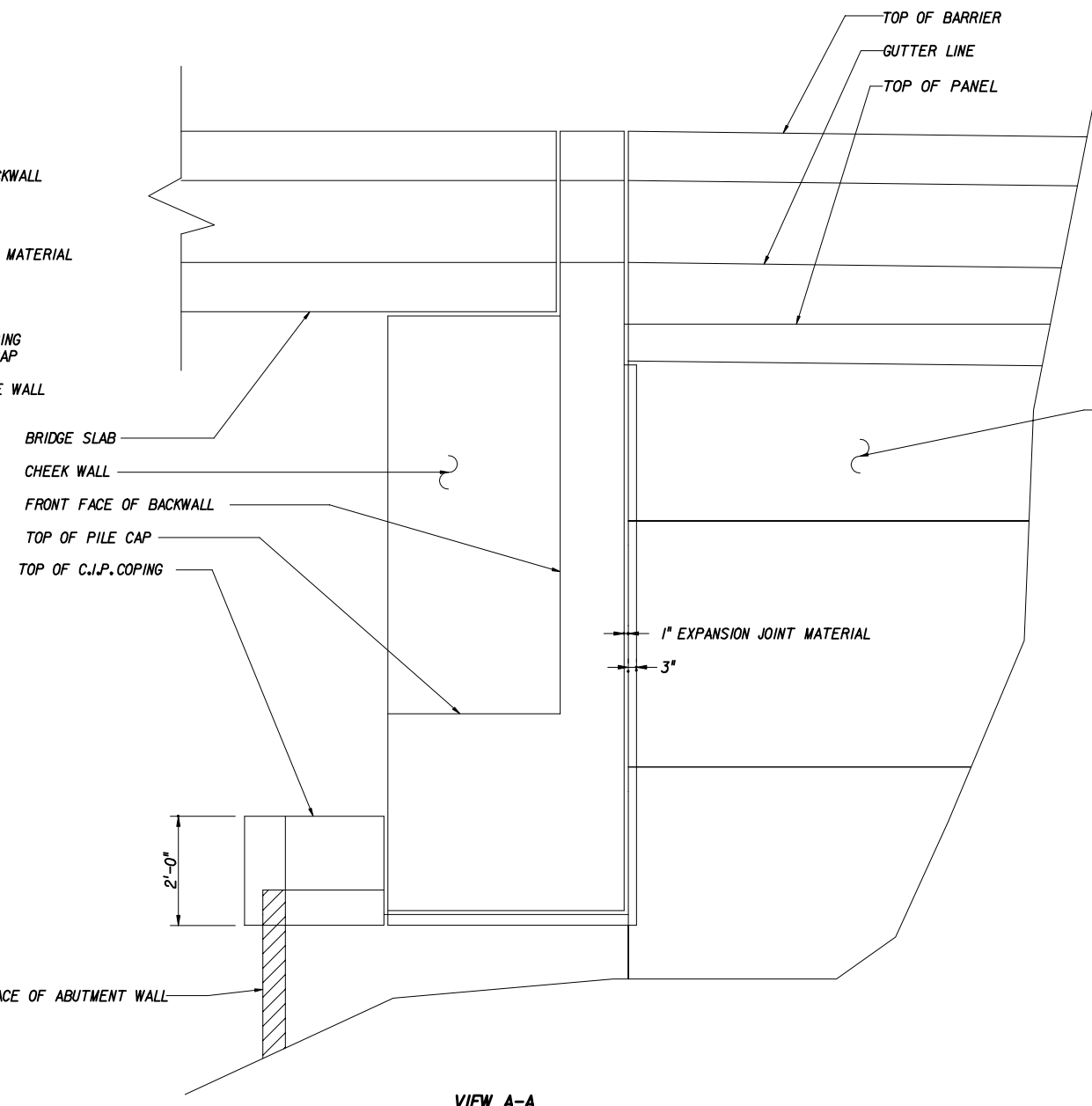


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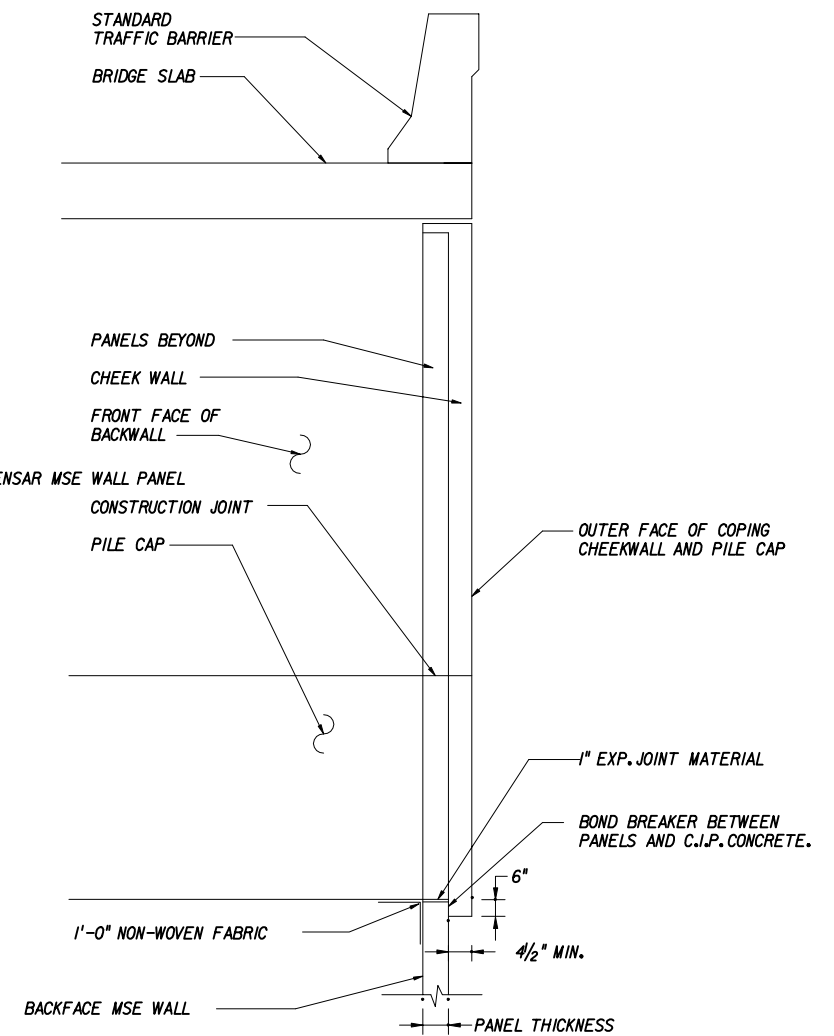
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Names	Dates	Approved By		
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PLAN VIEW @ ENDBENT
NOT TO SCALE



VIEW A-A



SECTION B-B

SECTIONS @ ENDBENT
NOT TO SCALE

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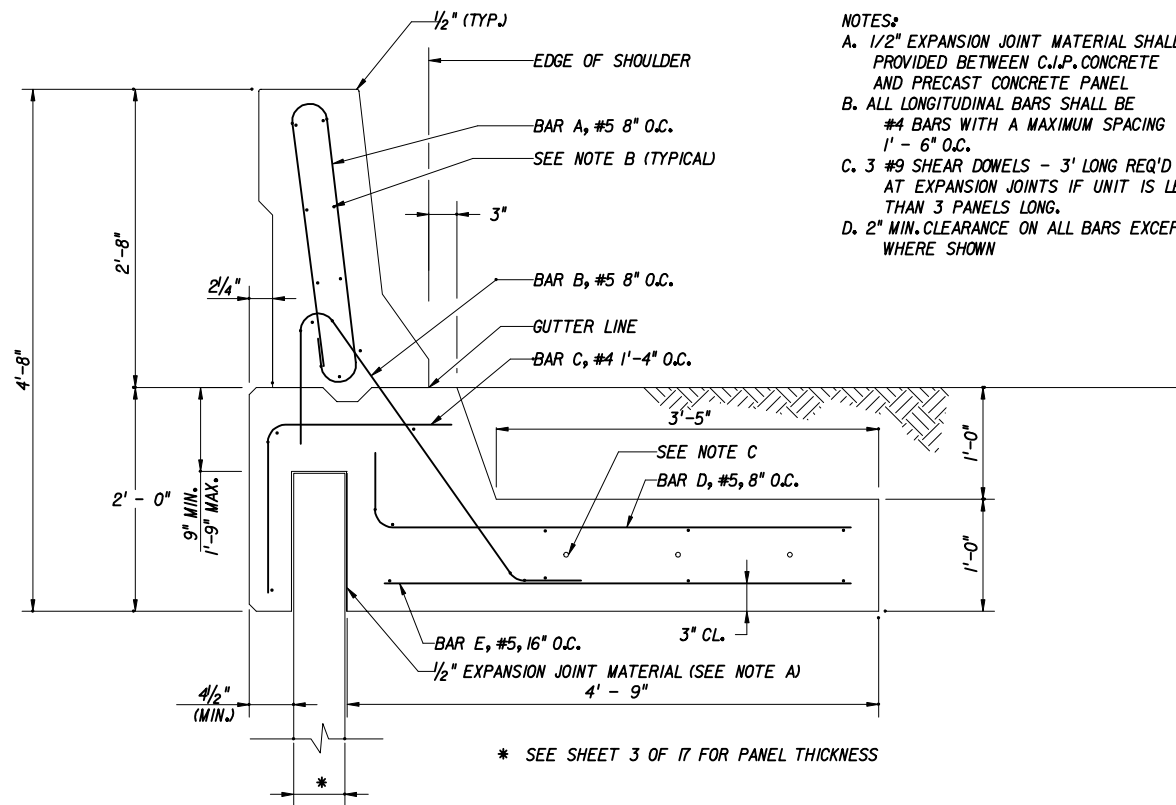


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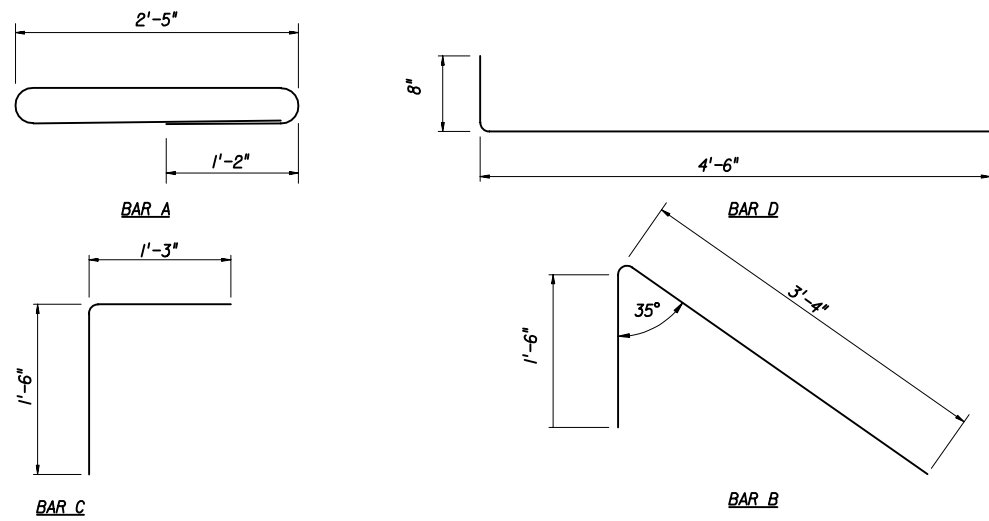
**RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL**

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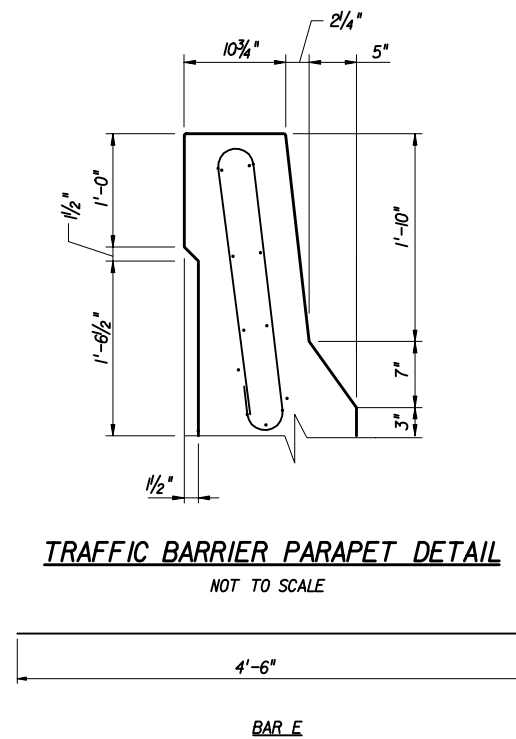


- NOTES:**
- A. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED BETWEEN C.I.P. CONCRETE AND PRECAST CONCRETE PANEL
 - B. ALL LONGITUDINAL BARS SHALL BE #4 BARS WITH A MAXIMUM SPACING 1' - 6" O.C.
 - C. 3 #9 SHEAR DOWELS - 3' LONG REQ'D AT EXPANSION JOINTS IF UNIT IS LESS THAN 3 PANELS LONG.
 - D. 2" MIN. CLEARANCE ON ALL BARS EXCEPT WHERE SHOWN

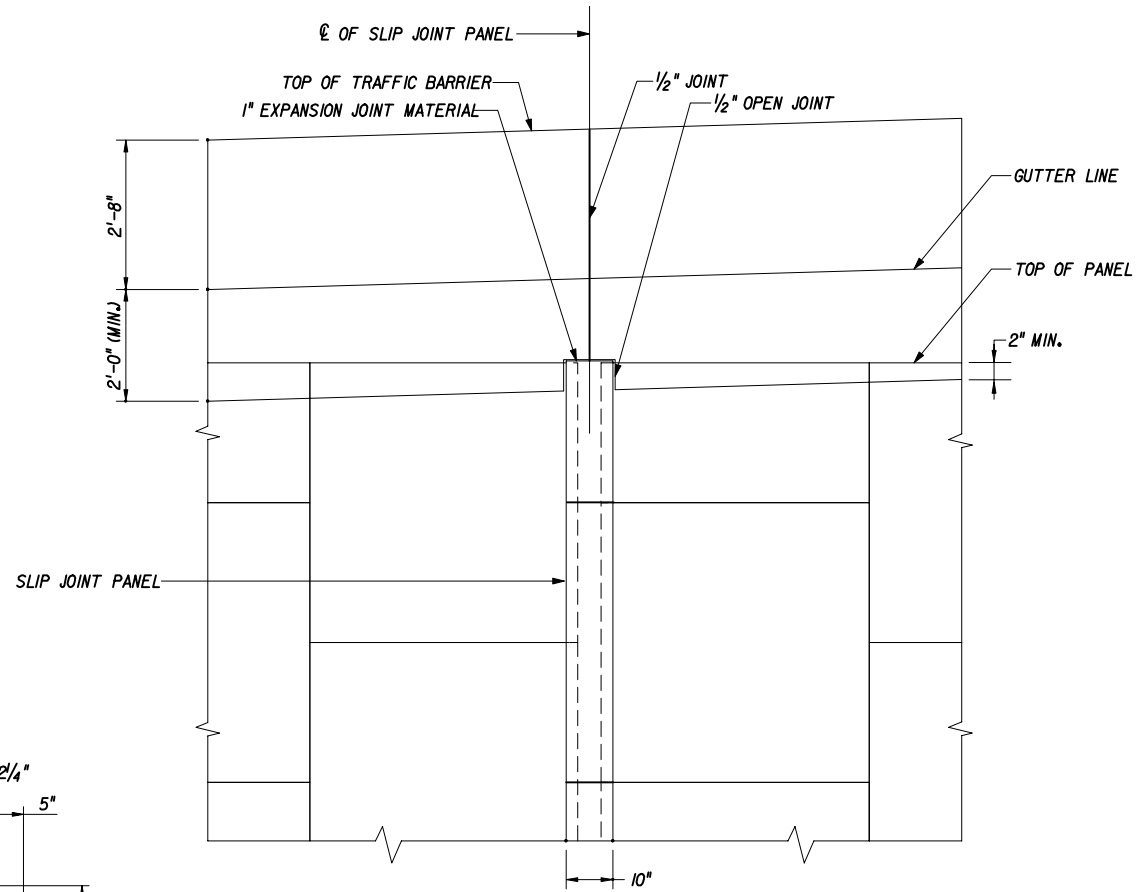
C.I.P. CONCRETE TRAFFIC BARRIER
NOT TO SCALE



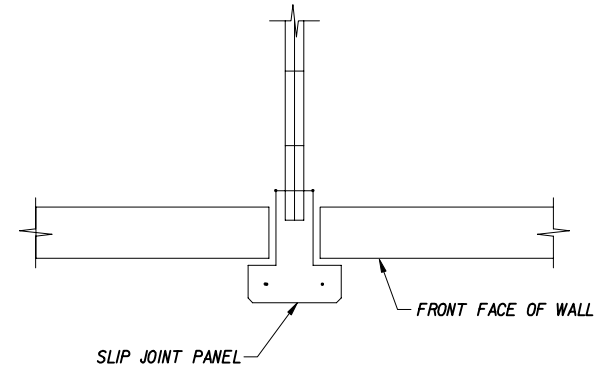
BAR BENDING DETAIL
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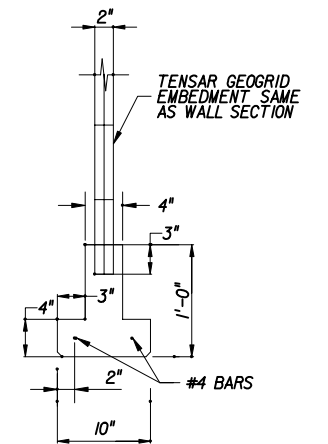
TRAFFIC BARRIER PARAPET DETAIL
NOT TO SCALE



C.I.P. TRAFFIC BARRIER OVER SLIP JOINT PANEL



SLIP JOINT DETAIL
NOT TO SCALE



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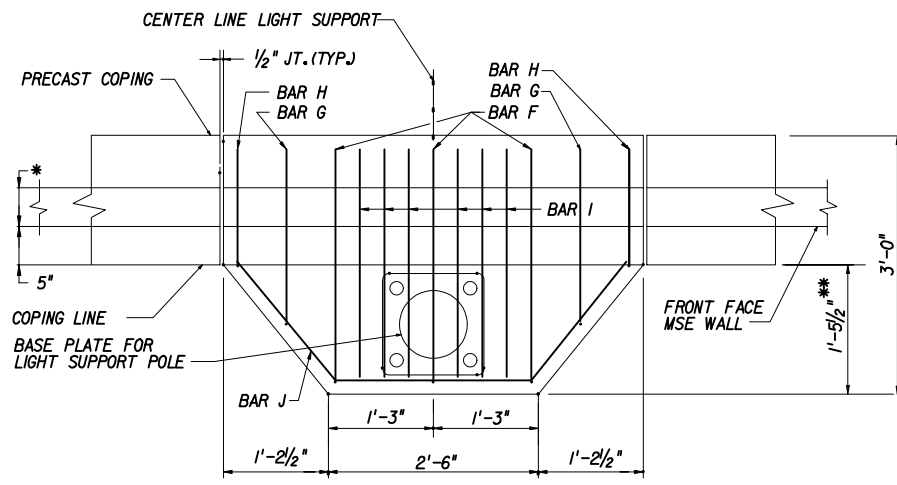
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RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL

Names		Dates		Approved By	
Designed By	BS	3/03	[Signature]		
Drawn By	WL	3/03	Revision	Sheet No.	Index No.
Checked By	JSB	3/03	04	13 of 17	5025

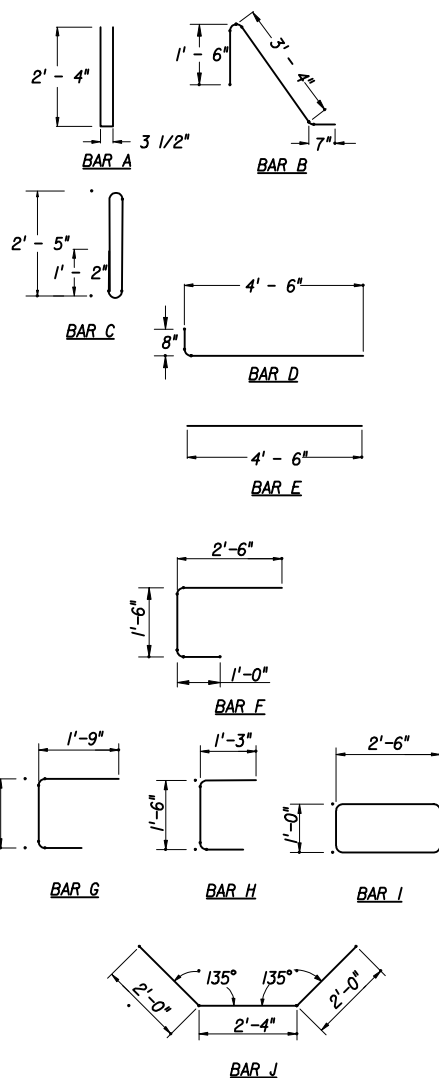


PLAN
NOT TO SCALE

NOTE: REBAR IN BARRIER AND JUNCTION SLAB NOT SHOWN FOR CLARITY

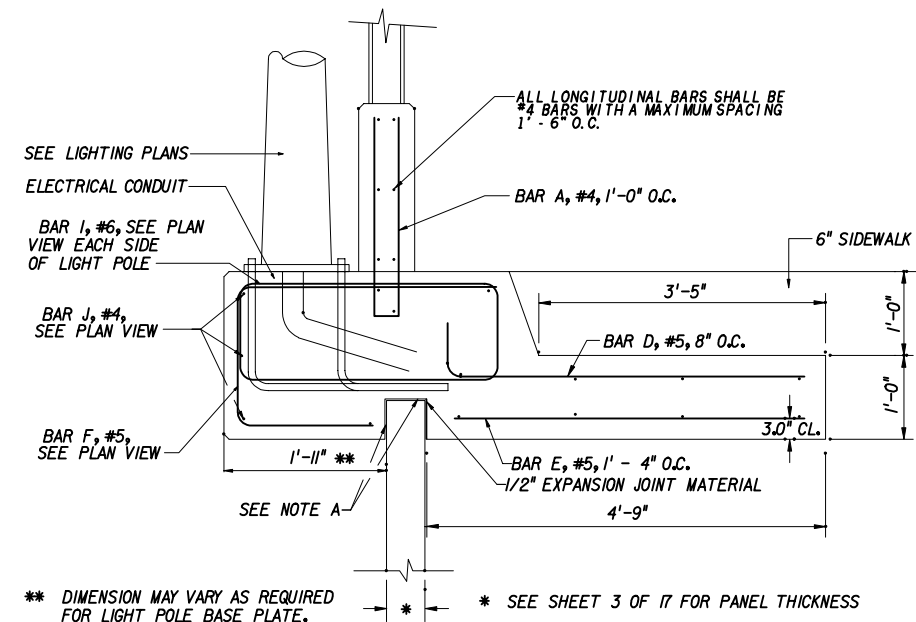
NOTE:

REFER TO LIGHT POLE PILASTER DETAILS IN BRIDGE PLANS FOR NOTES AND ADDITIONAL DETAILS (CONDUIT, JUNCTION BOXES, ETC.)



BAR BENDING DETAIL

NOT TO SCALE

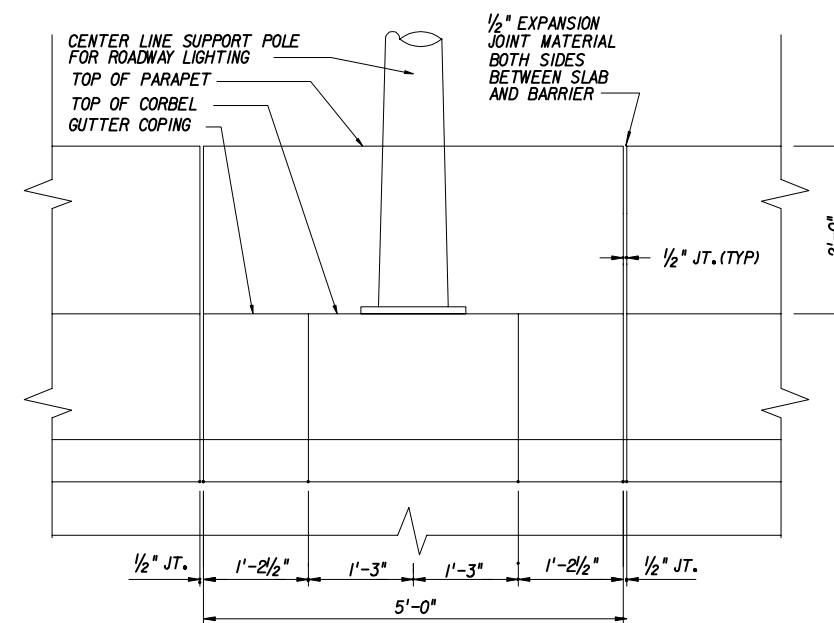


C.I.P. BARRIER AND JUNCTION SLAB DETAIL AT LIGHT POLE

NOT TO SCALE

NOTES:

- A. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED BETWEEN CAST IN PLACE CONCRETE AND PRECAST CONCRETE PANEL.
- B. 3 #9 SHEAR DOWELS - 3' LONG REQUIRED AT EXPANSION JOINT IF UNIT IS LESS THAN 3 PANELS LONG.
- C. MAINTAIN A 2" MIN. CLEARANCE ON ALL BARS, EXCEPT WHERE NOTED OTHERWISE.



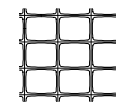
PARTIAL ELEVATION

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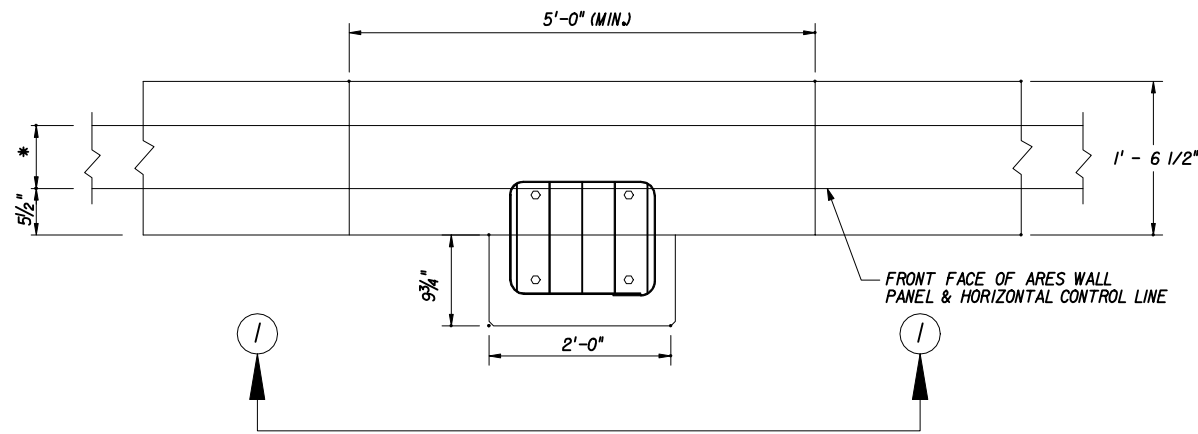
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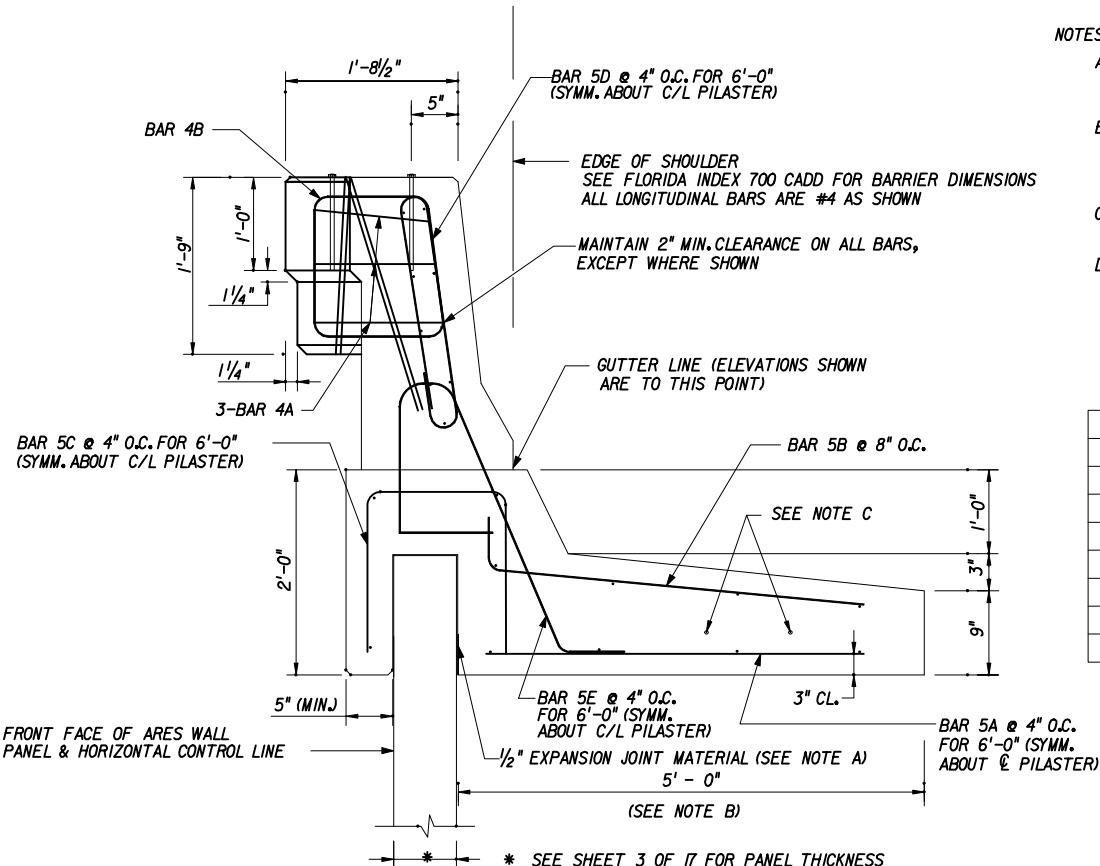


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RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	BS	3/03	State Structures Design Engineer	
Drawn By	WL	3/03	Revision	Sheet No. Index No.
Checked By	JSB	3/03	04	14 of 17 5025



2 PLAN VIEW AT LITE POLE
NOT TO SCALE



3 C.I.P. CONCRETE TRAFFIC BARRIER AT LIGHT PILE
NOT TO SCALE

NOTES:

- A. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN CAST IN PLACE CONCRETE AND PRECAST CONCRETE PANEL.
- B. THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR ONE PRECAST UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE.
- C. 2 - #9 SHEAR DOWELS - 3' - 0" LONG REFER TO PRECAST BARRIER SHEET.
- D. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.

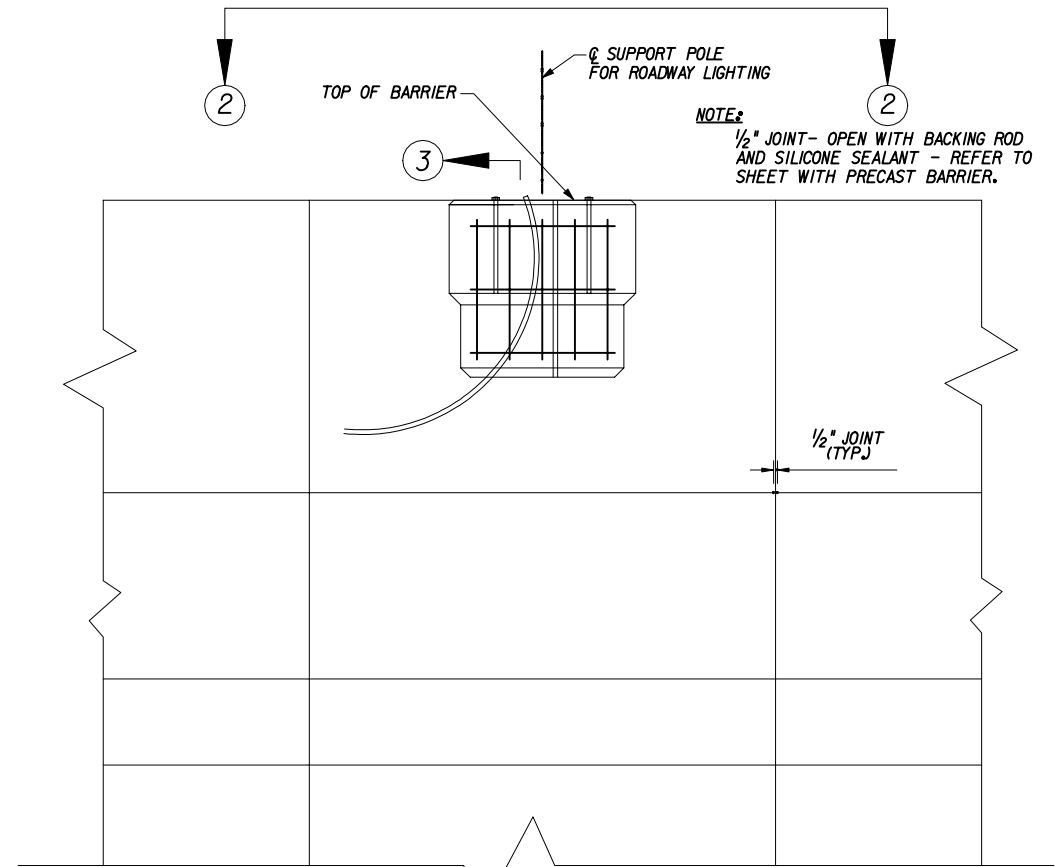
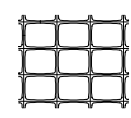
REBAR QUANTITY	
BAR	QTY
4A	3
4B	5
5A	18
5B	9
5C	18
5D	18
5E	18

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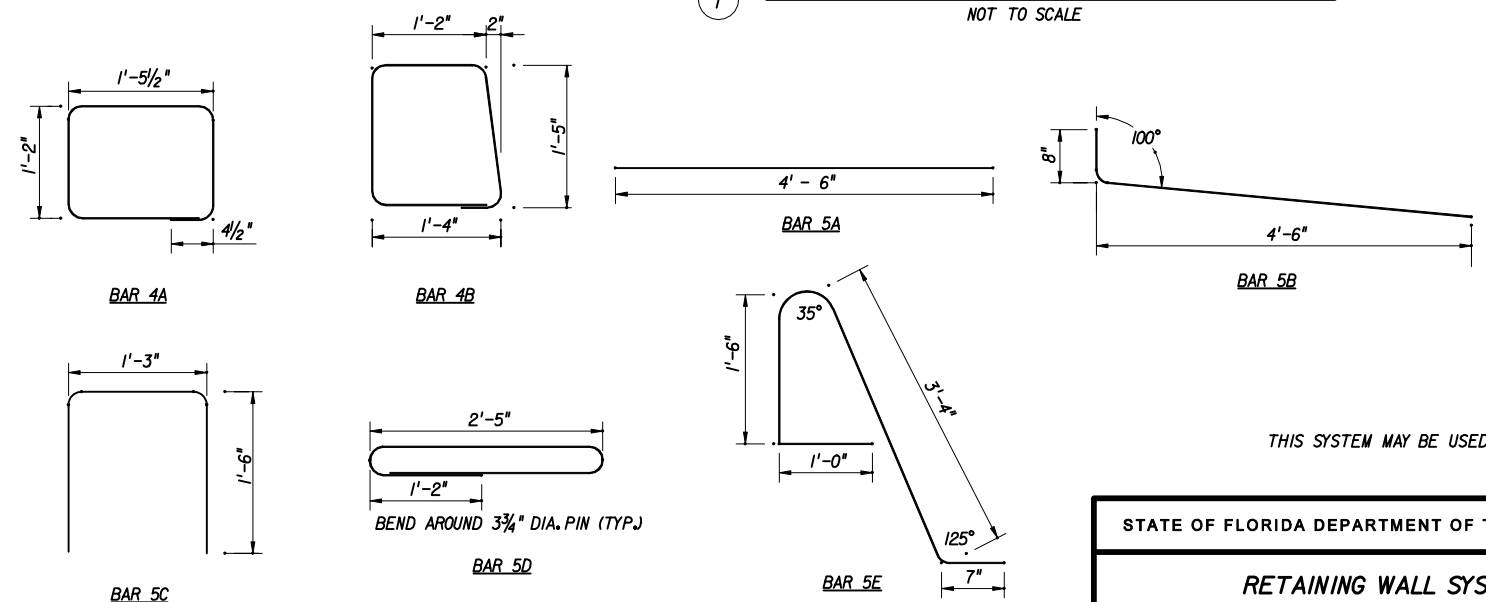
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1 PARTIAL ELEVATION AT LIGHT POLE
NOT TO SCALE



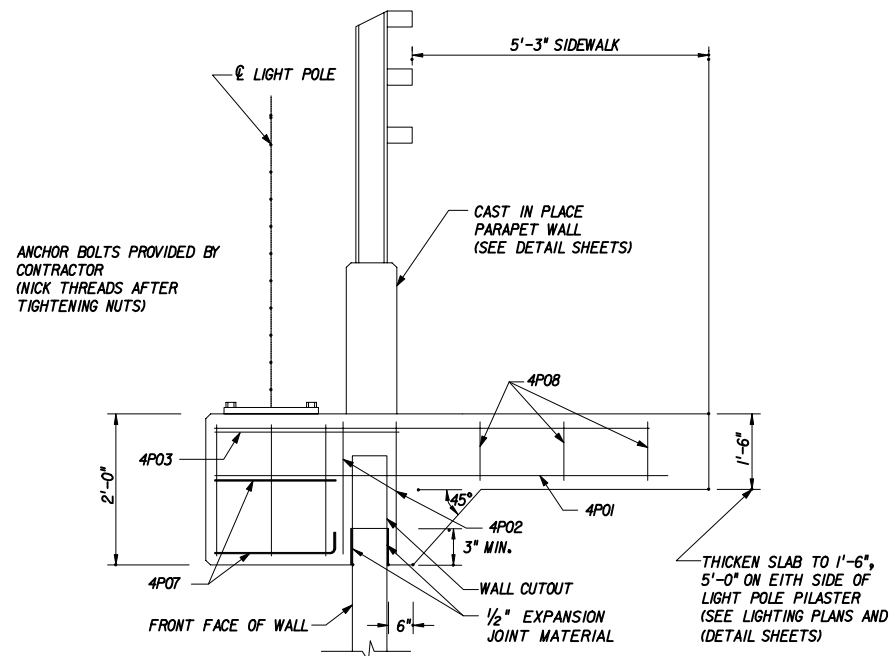
4 BAR BENDING DETAIL
NOT TO SCALE

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS

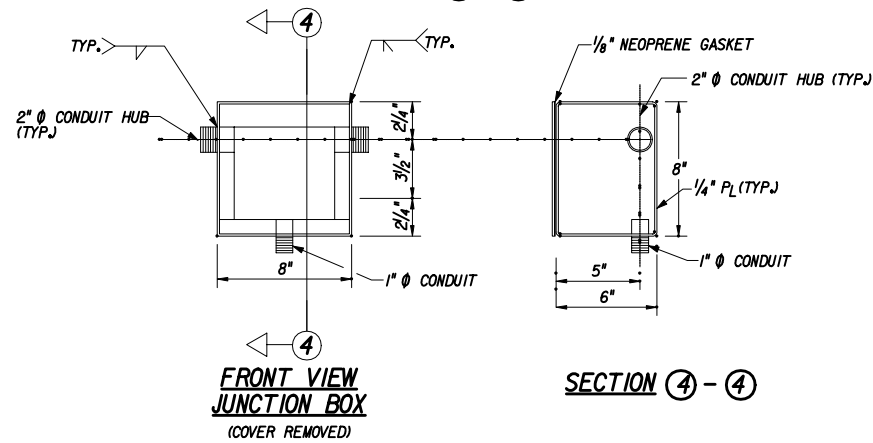
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RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL

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Drawn By	WL	3/03		
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Revision	04	15 of 17		
				5025

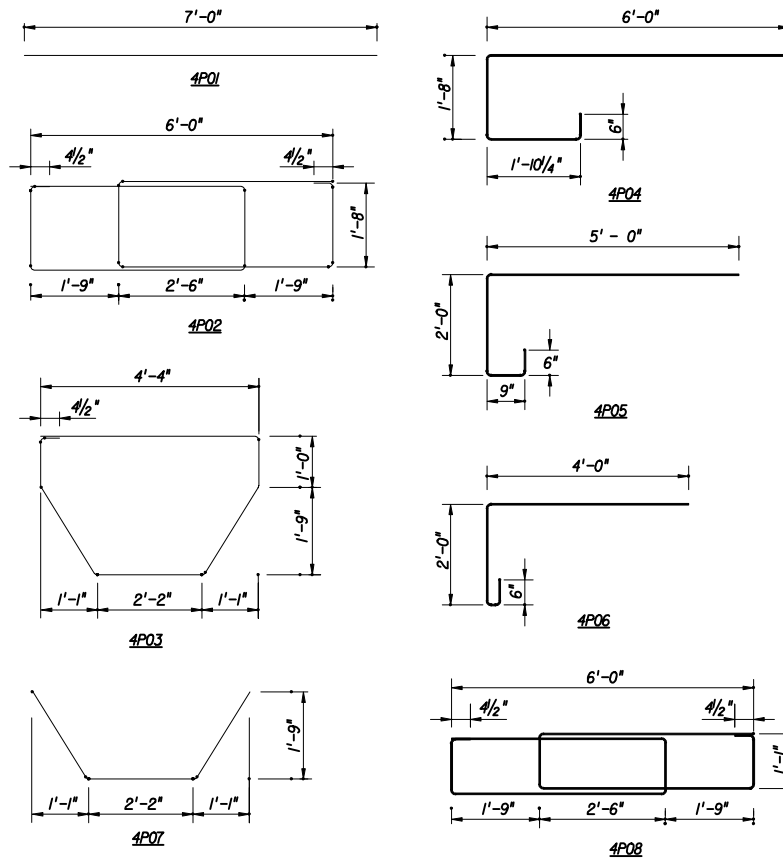


SECTION 3-3



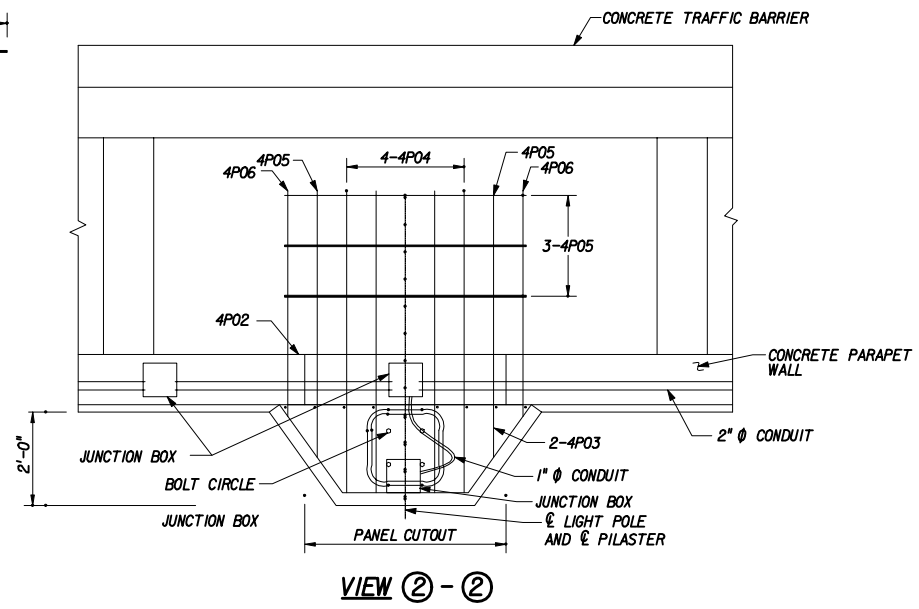
FRONT VIEW JUNCTION BOX (COVER REMOVED)

SECTION 4-4

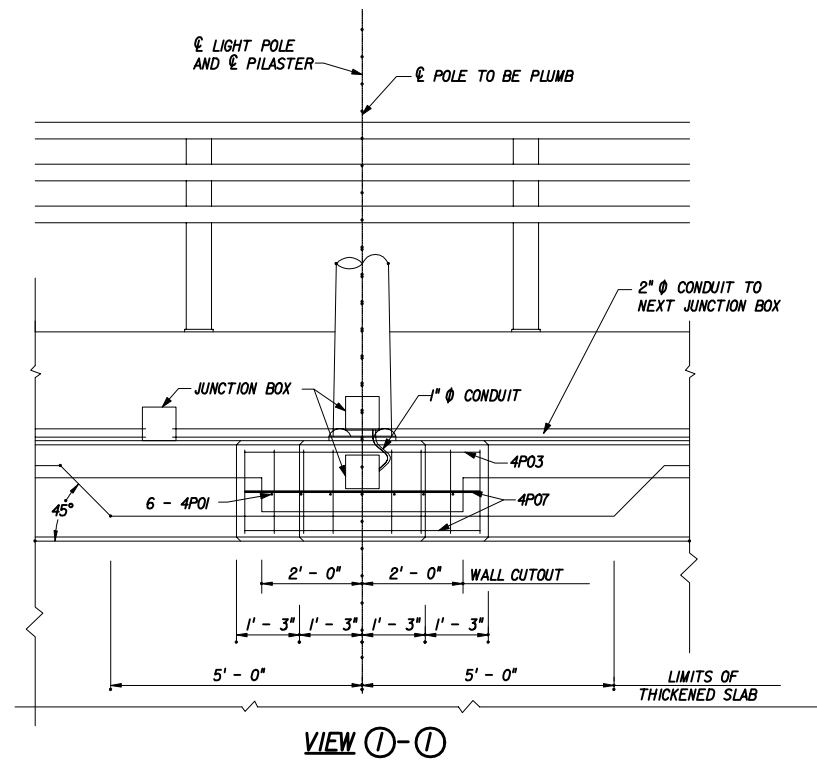


BAR BENDING DIAGRAM

BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQUIRED	LENGTH
4P01	4	6	7'-0"
4P02	4	2	24'-5"
4P03	4	1	14'-9"
4P04	4	4	9'-8"
4P05	4	2	7'-11"
4P07	4	2	6'-2"
4P07	4	2	6'-4"
4P08	4	3	22'-1"



VIEW 2-2



VIEW 1-1

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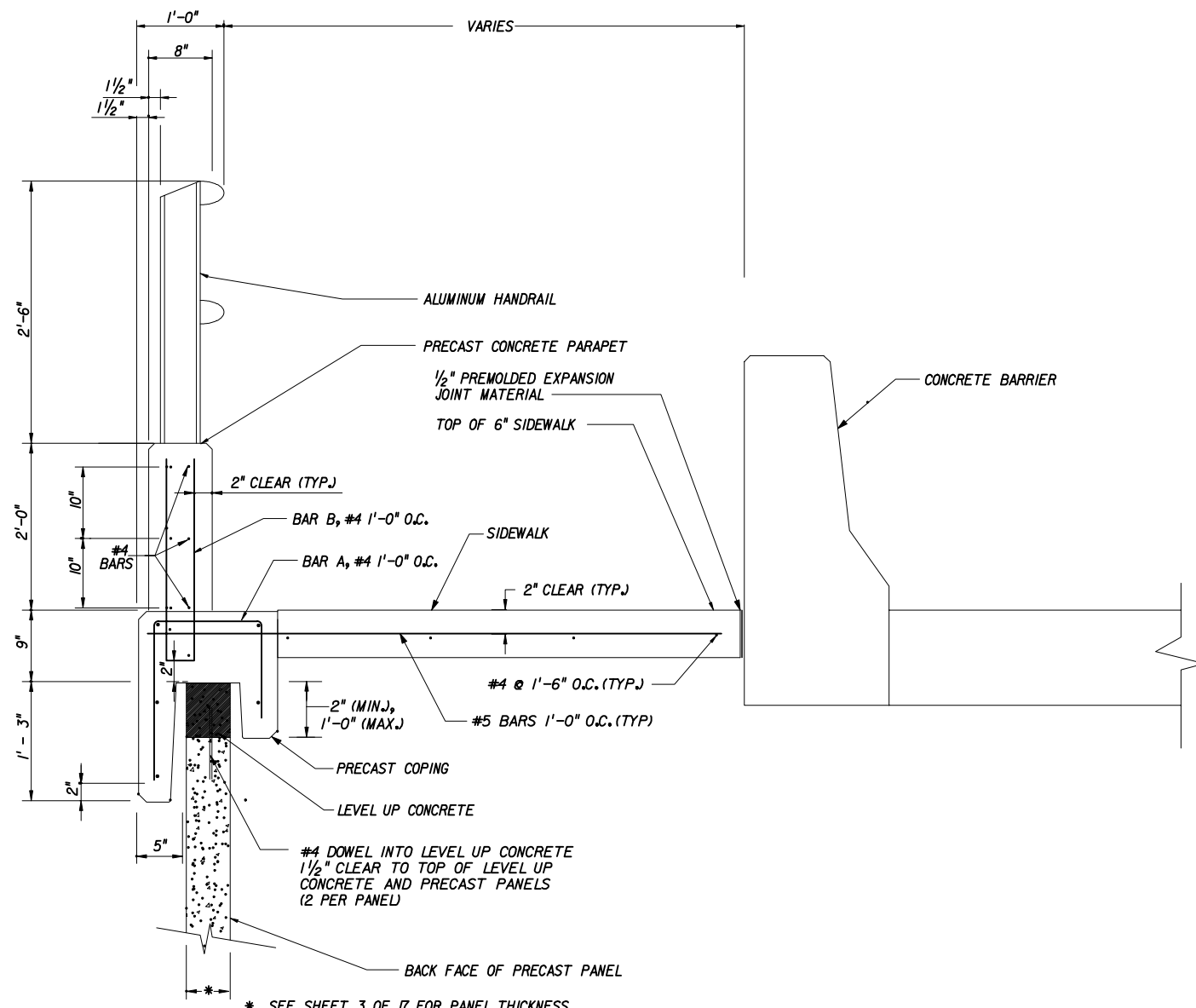


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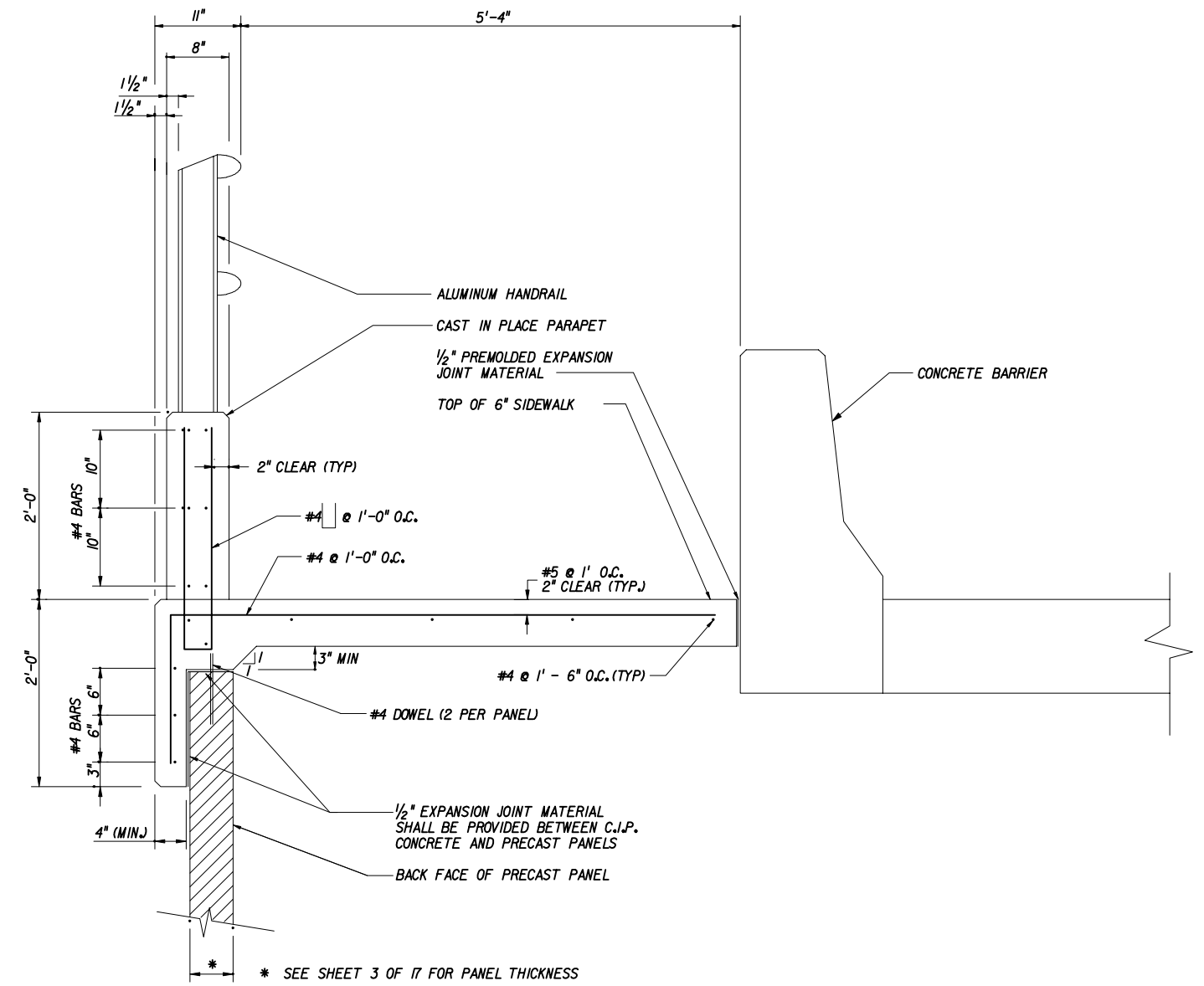
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RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL

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Designed By	BS	3/03	[Signature]	
Drawn By	WL	3/03	Revision	Sheet No.
Checked By	JSB	3/03	04	16 of 17
				Index No. 5025



PRECAST SADDLE WITH C.I.P. PARAPET AND SIDEWALK DETAIL
NOT TO SCALE



C.I.P. PARAPET DETAIL
NOT TO SCALE

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A Division of L. B. Foster Company

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NORCROSS, GA 30071
Telephone: (770) 446-3000
Fax: (770) 242-7493

GENERAL NOTES

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE REINFORCED EARTH VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE CONTRACTING AGENCY'S TECHNICAL SPECIFICATIONS FOR RETAINED EARTH WALLS.

2. FACTORS OF SAFETY

- OVERTURNING 2.0
- INTERNAL PULLOUT 1.5 (ALLOW DEFORMATION 3/4")
- OVERALL STABILITY 1.5
- SLIDING 1.5
- BEARING 2.5

SOIL REINFORCEMENT MESH 0.47 Fy AT END OF DESIGN LIFE

3. SOIL CHARACTERISTICS ASSUMED FOR DESIGN:

SOIL PARAMETERS:

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF ϕ , C AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS.

4. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF OTHERS TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.

5. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED EARTH VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.

WIRE FACING PANELS & REINFORCING ELEMENTS

6. REINFORCING MESH ELEMENTS SHALL BE SHOP FABRICATED FROM COLD DRAWN STEEL ROD CONFORMING TO THE MINIMUM REQUIREMENTS OF ASTM A-82 AND SHALL BE WELDED AT THE JUNCTIONS BETWEEN LONGITUDINAL AND TRANSVERSE WIRES IN ACCORDANCE WITH ASTM A-185. GALVANIZATION SHALL BE APPLIED AFTER MESH FABRICATION AND SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF ASTM A-123.

LOOP EMBEDS SHALL BE FABRICATED FROM COLD DRAWN STEEL ROD CONFORMING TO ASTM A-510 OR ASTM A-82. LOOP EMBEDS SHALL BE WELDED IN ACCORDANCE WITH ASTM A-185. LOOP EMBEDS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM B-633.

DESIGN:

7. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, THE WALL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

WALL CONSTRUCTION

8. RETAINED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 10.0' EACH TO MATCH DESIRED WALL ALIGNMENT.

9. FOR LOCATION AND ALIGNMENT OF RETAINED EARTH WALLS. SEE RETAINING WALL CONTROL PLANS.

10. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.

11. IF PILES ARE LOCATED WITHIN REINFORCED SOIL VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE REINFORCED EARTH WALL UNLESS A METHOD TO PROTECT THE STRUCTURE WHICH IS ACCEPTABLE TO THE ENGINEER AND FOSTER GEOTECHNICAL COMPANY AND IS PROPOSED AND APPROVED IN WRITING.

12. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 TO A LEVEL OF 2" (+/-) ABOVE THE TIE MESH EMBEDDED IN THE PANELS. INSTALLATION OF REINFORCING MESH SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.

13. WALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 548.

14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS BEHIND RETAINED EARTH PANELS. PRIOR TO PLACEMENT OF THE TOP LAYER OF REINFORCING MESH, INDIVIDUAL REINFORCING MESH MAY BE SKEWED TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER (NO CUTTING OF SOIL REINFORCEMENT GRIDS ALLOWED UNLESS SHOWN ON SHOP DRAWINGS AND APPROVED BY THE ENGINEER). ANY DAMAGE DONE TO THE REINFORCING MESH DUE TO THE INSTALLATION OF THE GUARDRAIL SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

15. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN REINFORCED SOIL VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING MESH AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN.

16. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO FOSTER GEOTECHNICAL CONSTRUCTION MANUAL.

17. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING MESH DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPER ELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

18. NOMINAL MESH LENGTHS

THE REINFORCING MESH LENGTH SHOWN ON THE PLANS, MEASURED FROM BACK FACE OF PANEL ARE THE NOMINAL LENGTHS REQUIRED BY CALCULATION. THE ACTUAL FABRICATED MESH LENGTHS ARE OFTEN LONGER (UP TO 6") DUE TO MANUFACTURING TOLERANCES. THE REQUIRED HORIZONTAL LIMIT OF GRANULAR BACKFILL IS EQUAL TO THE NOMINAL MESH LENGTH. ADDITIONAL GRANULAR BACKFILL BEYOND THE NOMINAL MESH LENGTH IS NOT REQUIRED BY CALCULATION.

19. SELECT BACKFILL QUANTITY

THE SELECT BACKFILL QUANTITY INDICATED BY FOSTER GEOTECHNICAL IS CALCULATED BY MULTIPLYING THE NOMINAL MESH LENGTHS SHOWN ON THE PLANS BY THEIR TRIBUTARY WALL SURFACE AREA AND CONVERTING THE RESULT TO A NEATER CUBIC METER QUANTITY. THIS INFORMATION IS FURNISHED FOR THE CONTRACTOR'S INFORMATION ONLY AND IS NOT INTENDED TO PRESENT THE ACTUAL QUANTITIES REQUIRED TO COMPLETE THE WORK. THE CONTRACTOR MUST CALCULATE HIS OWN EXCAVATION AND BACKFILL QUANTITIES BASED UPON THE SPECIFIC CONDITIONS OF THE PROJECT.

20. NOTE TO CONTRACTORS

ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY FOSTER GEOTECHNICAL

- PREFABRICATED FACING PANELS
- REINFORCING MESH
- NON-WOVEN FILTER CLOTH (FOR BEHIND FACING PANELS ONLY) (WEBTECH-TERRATEX N04 OR EQUAL)

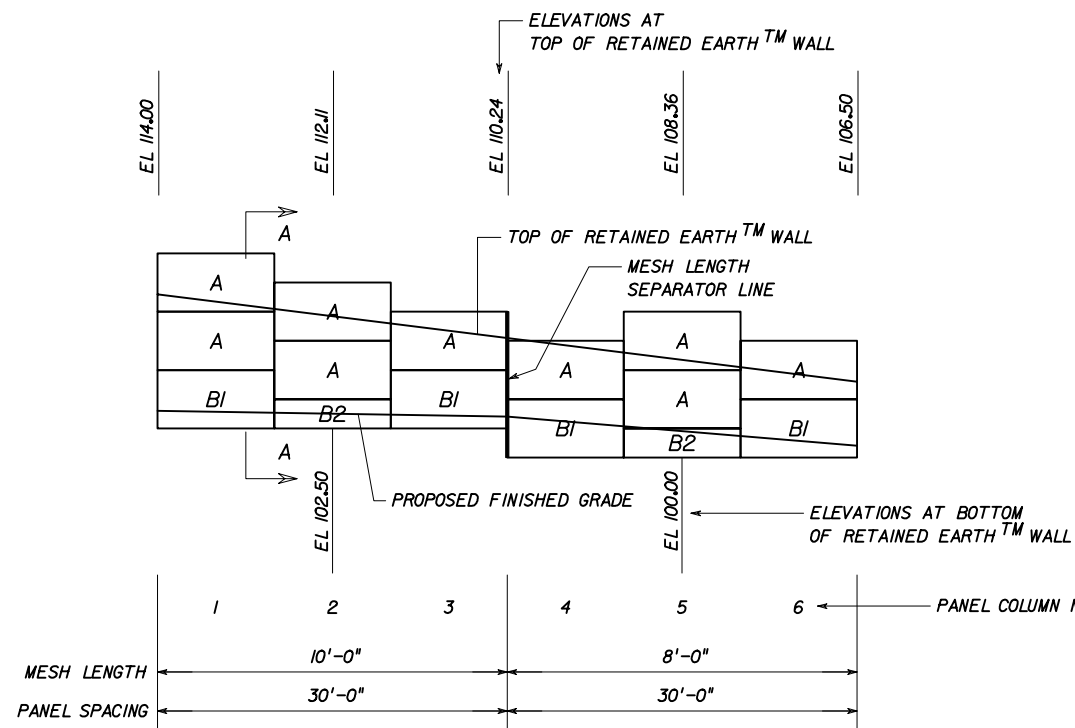
ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTION CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED / INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

21. FOSTER GEOTECHNICAL SUPPLIES PREFABRICATED WIRE FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF RETAINED EARTH WALLS DETAILED HEREIN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY FOSTER GEOTECHNICAL IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE, PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.

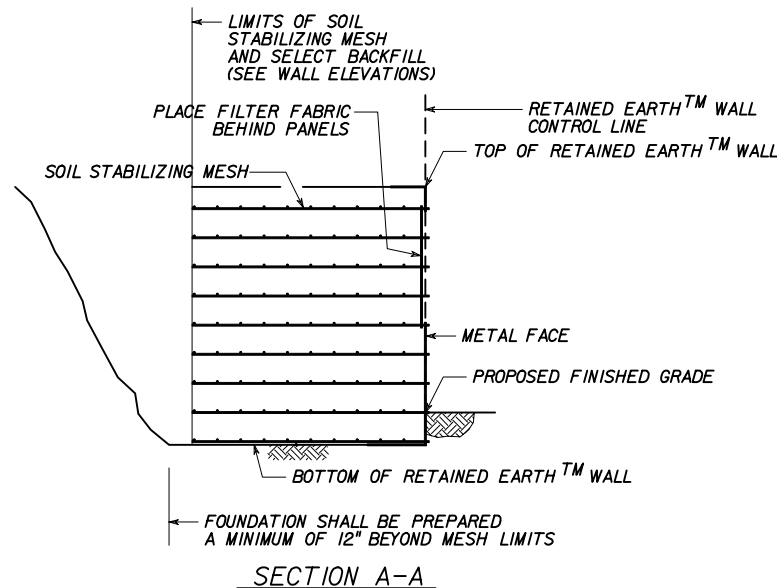
THIS SYSTEM MAY BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS ONLY.

WIRE FACED PANELS

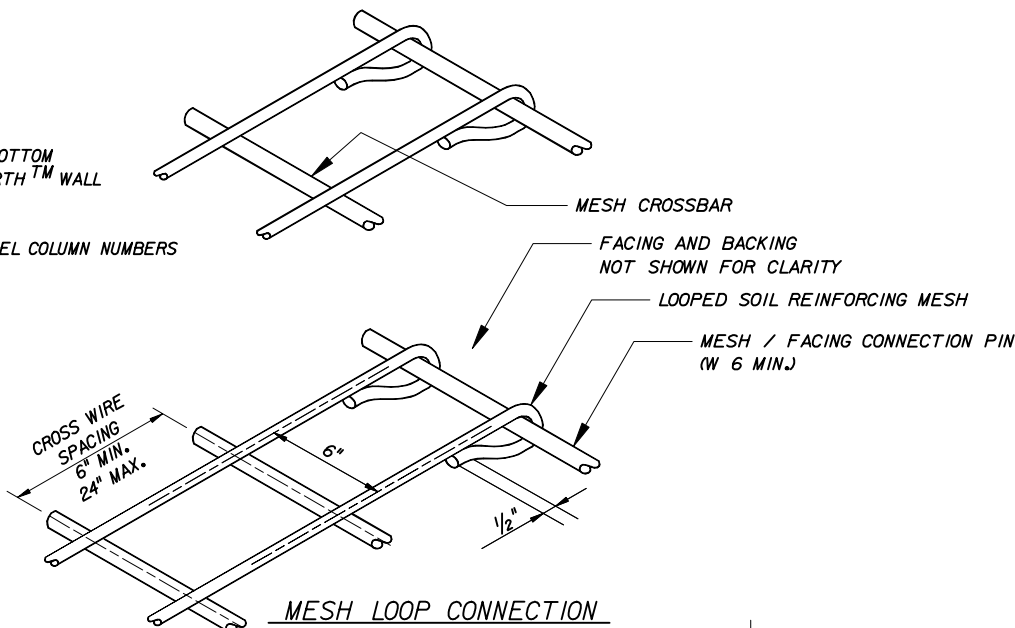
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL WIRE FACE WALL				
	Names	Dates	Approved By <i>W. V. [Signature]</i>	
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No. Index No.
Checked By	GEO	11/98	00	1 of 3 5105



WALL ELEVATION KEY
(FRONT FACE SHOWN)

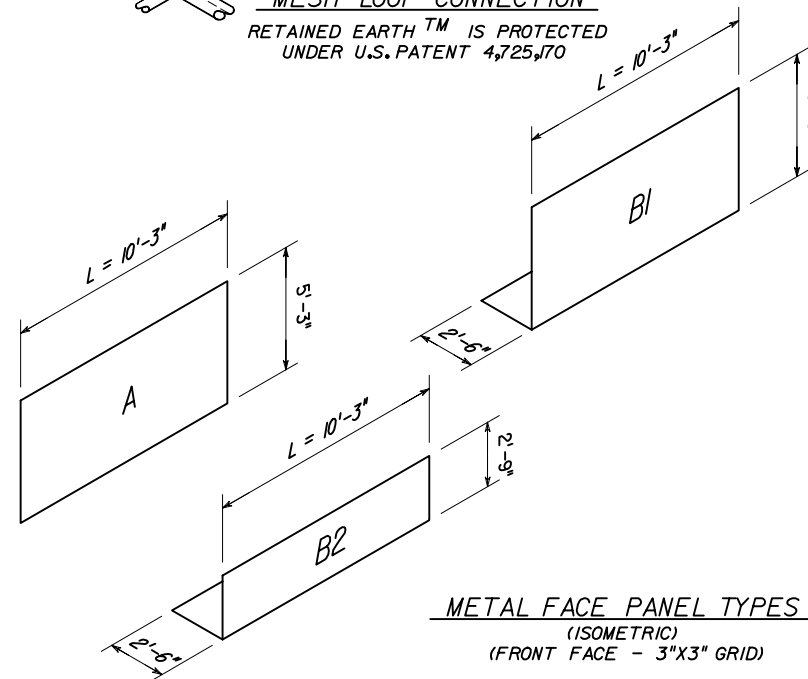


SECTION A-A



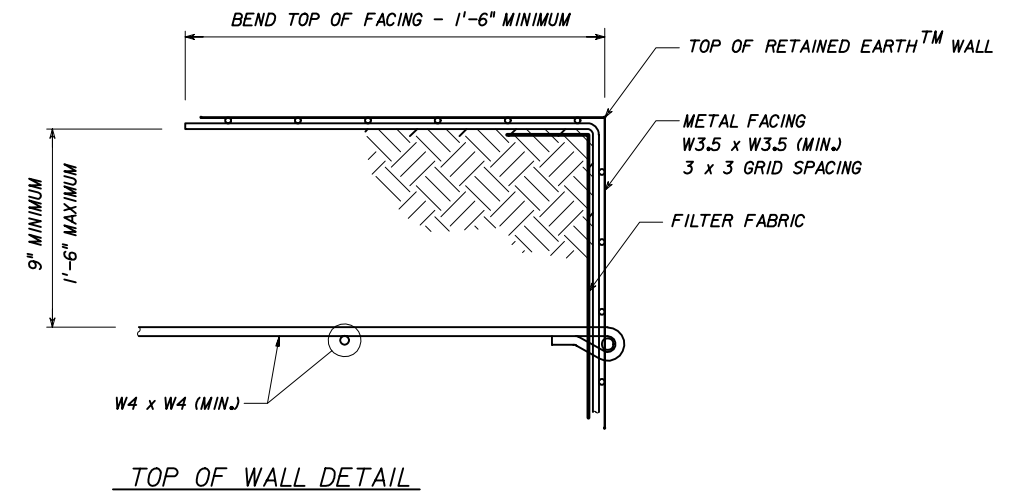
MESH LOOP CONNECTION

RETAINED EARTH™ IS PROTECTED UNDER U.S. PATENT 4,725,170

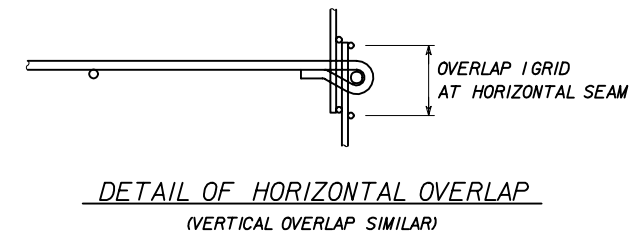


METAL FACE PANEL TYPES

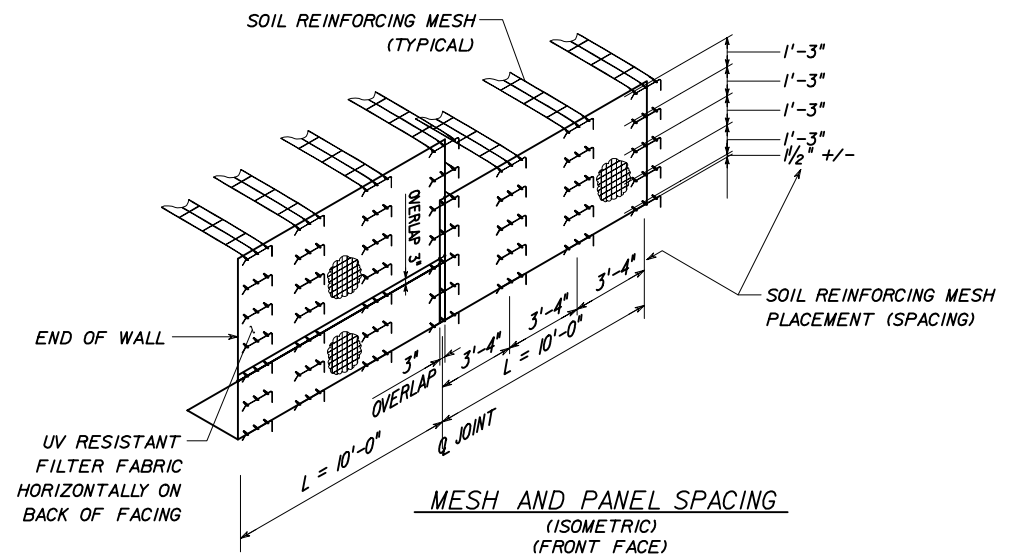
(ISOMETRIC)
(FRONT FACE - 3"X3" GRID)



TOP OF WALL DETAIL



DETAIL OF HORIZONTAL OVERLAP
(VERTICAL OVERLAP SIMILAR)

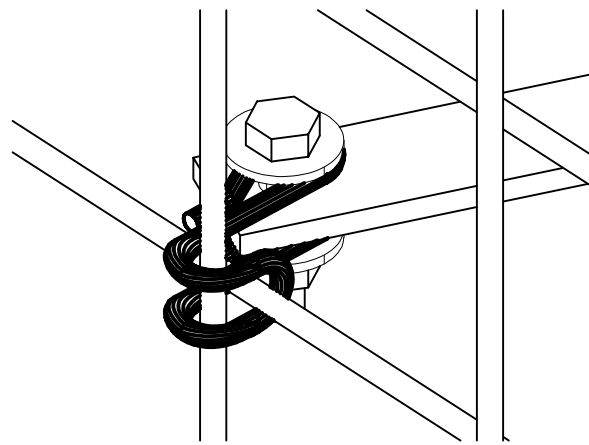


MESH AND PANEL SPACING
(ISOMETRIC)
(FRONT FACE)

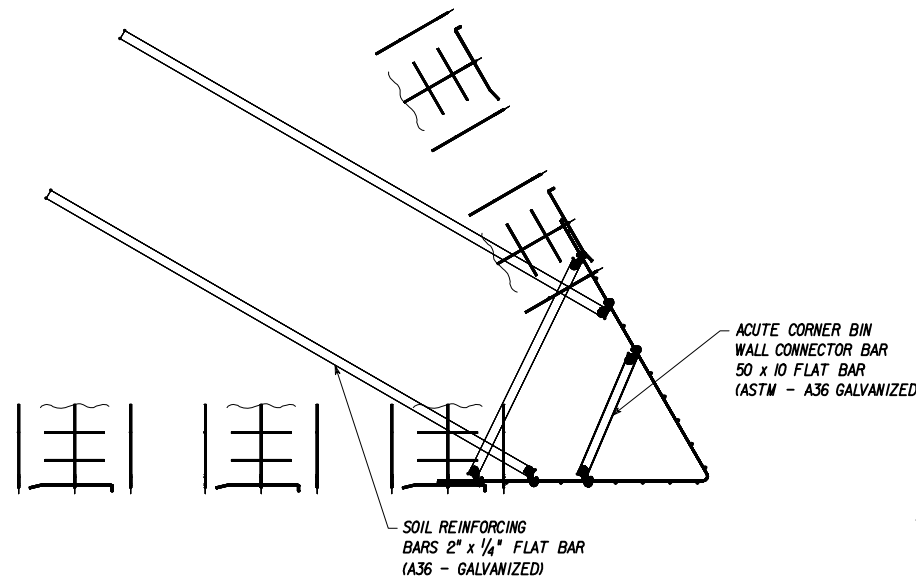
WIRE FACED PANELS

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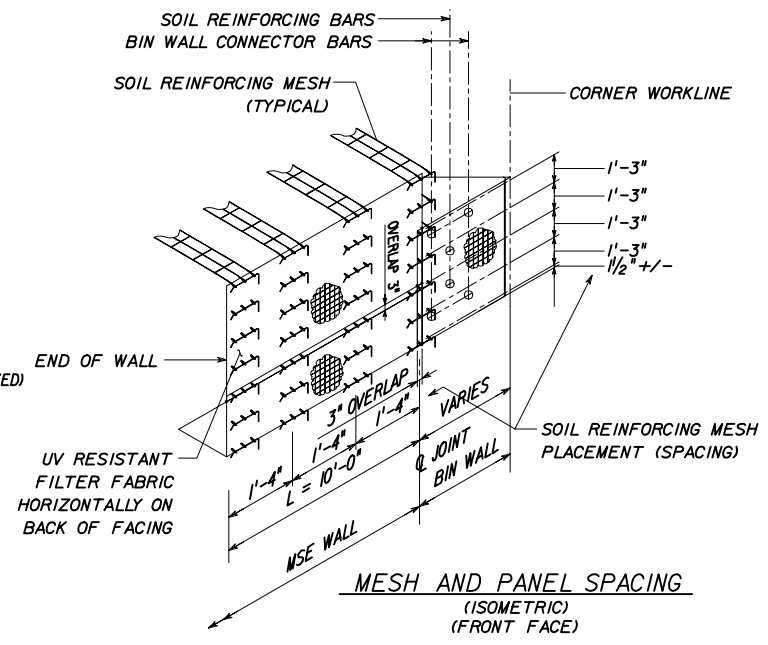
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL WIRE FACE WALL				
Designed By	TCNA	Dates	11/98	Approved By
Drawn By	CAD	Revision	11/98	State Structures Design Engineer
Checked By	GEO	Sheet No.	00	Index No.
			2 of 3	5105



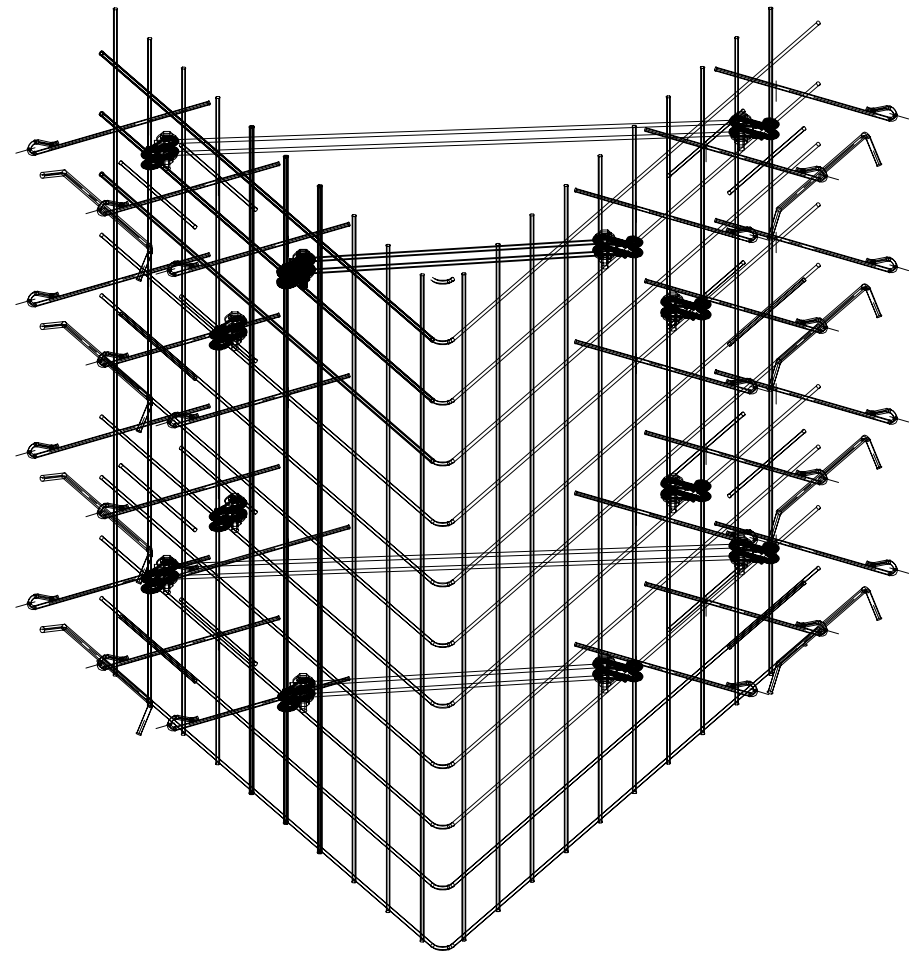
ISOMETRIC VIEW OF CONNECTION



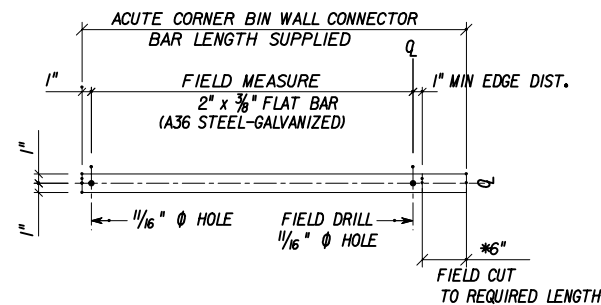
BIN WALL CONNECTOR & SOIL REINF. BAR LAYOUT



MESH AND PANEL SPACING (ISOMETRIC) (FRONT FACE)

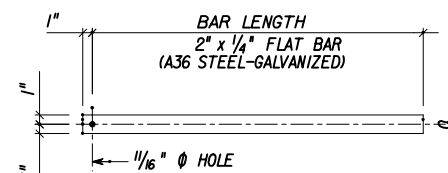


ISOMETRIC VIEW OF BIN WALL

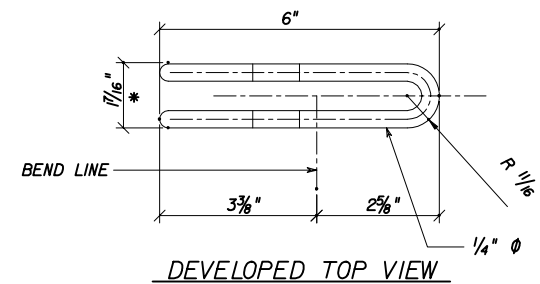


* EXPOSED STEEL ON FIELD MODIFIED END SHALL BE COATED WITH ZINC RICH PAINT

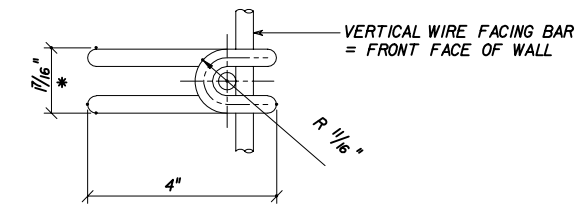
32 BIN WALL CONNECTOR BAR



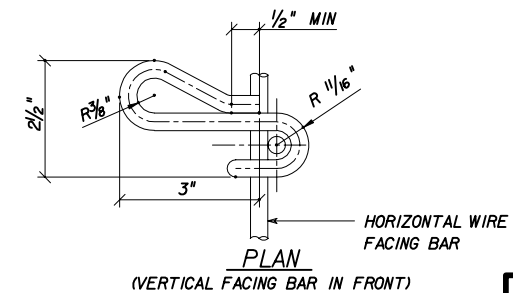
33 SOIL REINFORCING BAR



DEVELOPED TOP VIEW



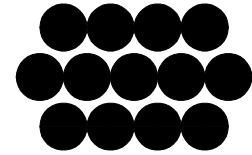
ELEVATION



PLAN (VERTICAL FACING BAR IN FRONT)

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL WIRE FACE WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	3 of 3
				Index No. 5105



The Reinforced Earth Company

8614 Westwood Center Drive Suite 1100, Vienna, Virginia 22182 (703) 821-1175

TERRATREL™

A WIRE FACED MSE WALL SYSTEM

DESIGN CRITERIA

- DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN, BEHIND, AND BENEATH THE REINFORCED VOLUME; METHODS OF CONSTRUCTION; AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO SPECIFICATION SECTION 548.
- SOIL PARAMETERS:
SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE (ϕ), AND COHESION (c), AND TOTAL UNIT WEIGHT (γ) SHALL BE PROVIDED IN THE SHOP DRAWINGS.
- THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE ENGINEER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR A SPECIFIC SITE.
- ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.
- THE MINIMUM FACTORS OF SAFETY REQUIRED FOR DESIGN
OVERTURNING = 2.0
SLIDING = 1.5
INTERNAL PULLOUT = 1.5
(ALLOWABLE DEFORMATION = 0.75 INCH)
BEARING CAPACITY = 2.5
OVERALL STABILITY = 1.5
STEEL SOIL REINFORCEMENT (AT END OF DESIGN LIFE)
= 0.55Fy (FOR HA STRIPS)
= 0.50Fu (AT NET SECTION OF BOLTED CONNECTION)
WIRE FACING (AT END OF DESIGN LIFE) = 0.48Fy
MAXIMUM PULLOUT FACTOR
f* = 1.5 (FOR SAND)
f* = 2.0 (FOR LIMEROCK)

LAYOUT

- FOR LAYOUT OF THE WALLS, SEE RETAINING WALL CONTROL PLANS.

CONSTRUCTION

- BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548. INSTALLATION OF REINFORCEMENTS SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
- FOR STRUCTURES IN EXCESS OF 20' IN HEIGHT, THE FINISHED GRADE IN FRONT OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS A HEIGHT OF 20'. FINISHED GRADE BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

CONFLICTING STRUCTURES

- IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON THE WALL ELEVATIONS.
- IF PILES ARE LOCATED WITHIN THE REINFORCED VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE WALL UNLESS A METHOD TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE REINFORCED EARTH COMPANY, IS PROPOSED AND APPROVED IN WRITING.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS WITHIN THE REINFORCED VOLUME. PRIOR TO THE PLACEMENT OF THE TOP LAYERS OF REINFORCEMENTS, INDIVIDUAL REINFORCEMENTS MAY BE SYSTEMATICALLY SHIFTED TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER. ANY DAMAGE DONE TO THE REINFORCEMENTS DUE TO INSTALLATION OF GUARDRAIL POSTS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
- IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS, OR GUARDRAIL POSTS WHICH ARE WITHIN THE REINFORCED VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCEMENTS AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN, UNLESS SHOWN OTHERWISE.
- THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCEMENTS DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY IN SITUATIONS WHERE ROADWAY SUPERELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

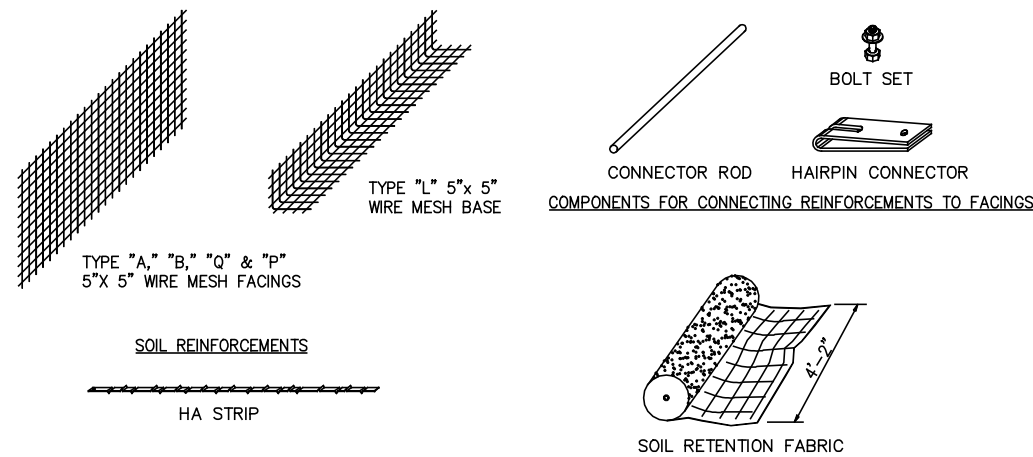
MATERIALS

- ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY THE REINFORCED EARTH COMPANY:
- PREFABRICATED WIRE FACING PANELS
- SOIL REINFORCEMENTS
- HAIRPIN CONNECTORS
- BOLT SETS
- CONNECTOR RODS
- SOIL RETENTION FABRIC
ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR.
- SOIL REINFORCEMENT LENGTHS
THE REINFORCEMENT LENGTHS SHOWN ON THE PLANS ARE MEASURED FROM THE BACK FACE OF THE WIRE FACING PANELS TO THE LIMIT OF THE SELECT BACKFILL MATERIAL, AND ARE THE LENGTHS USED IN THE REINFORCEMENT DESIGN CALCULATIONS.
- THE REINFORCED EARTH COMPANY SUPPLIES FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF THE REINFORCED EARTH® RETAINING WALLS DETAILED HEREIN. THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY THE REINFORCED EARTH COMPANY IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE A PROJECT SPECIFIC ERECTION SEQUENCE, PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA. COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHALL TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.
- THE REINFORCED EARTH COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.
- THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO THE REINFORCED EARTH COMPANY, AND IS BEING FURNISHED FOR THE USE OF THE FLORIDA DEPARTMENT OF TRANSPORTATION ONLY IN CONNECTION WITH FDOT PROJECTS, AND THE INFORMATION CONTAINED HEREIN IS NOT TO BE TRANSMITTED TO ANY OTHER ORGANIZATION UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE REINFORCED EARTH COMPANY. THE REINFORCED EARTH COMPANY IS EXCLUSIVE LICENSEE IN THE UNITED STATES UNDER PATENTS ISSUED TO HENRI VIDAL, AND THE FURNISHING OF THIS DRAWING DOES NOT CONSTITUTE AND EXPRESSED OR IMPLIED LICENSE UNDER THE VIDAL PATENTS.
- THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO THE INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

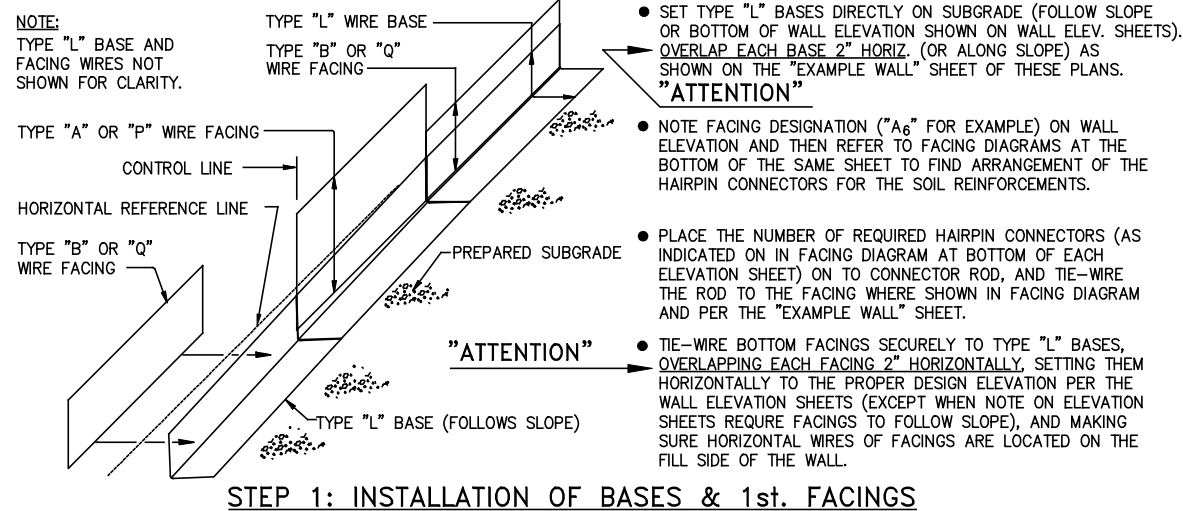
THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY

TERRATREL WIRE WALL

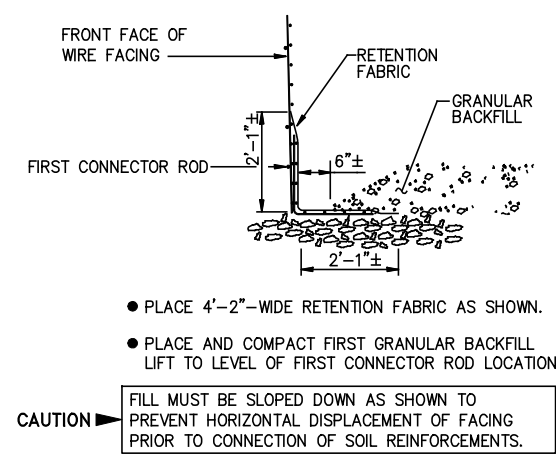
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE REINFORCED EARTH COMPANY TERRATREL WIRE WALL				
Designed By	Names	Dates	Approved By <i>W. J. [Signature]</i>	
Drawn By			State Structures Design Engineer...	
Checked By			Revision	Sheet No. Index No.
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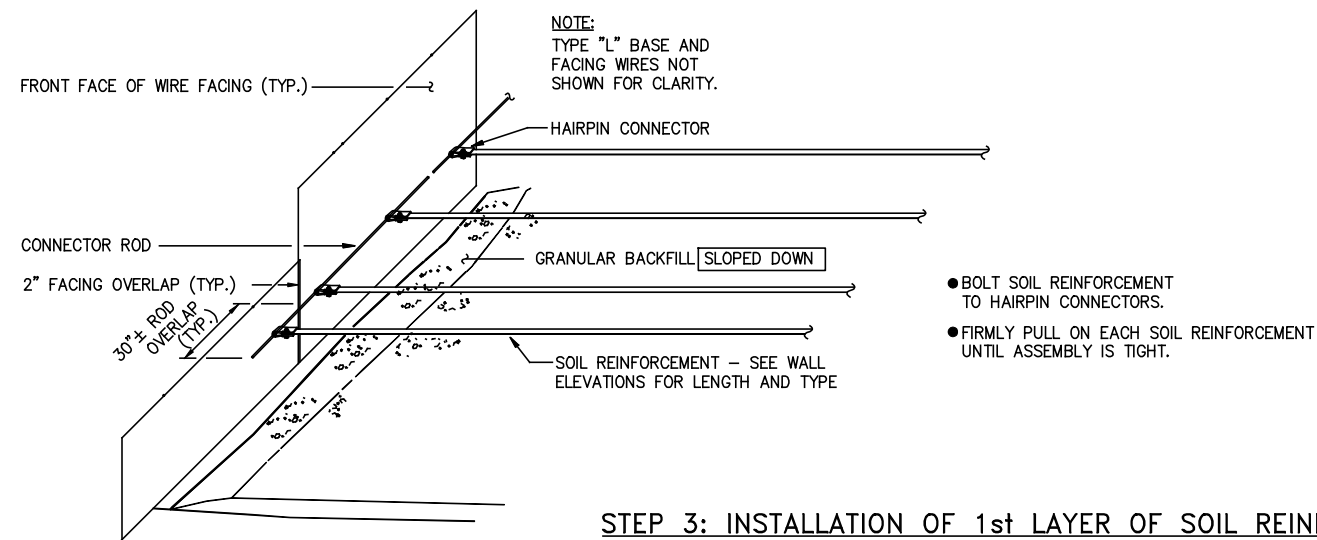
TERRATREL WIRE WALL COMPONENTS



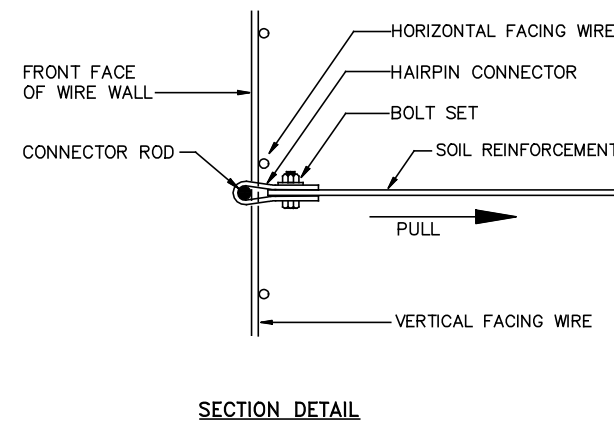
STEP 1: INSTALLATION OF BASES & 1st. FACINGS



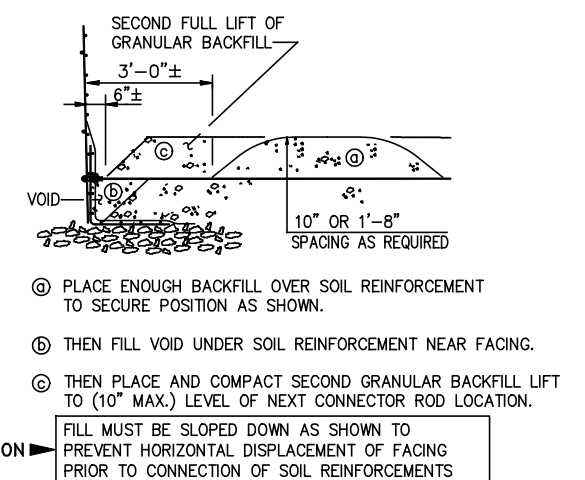
STEP 2: 1st. BACKFILL LIFT



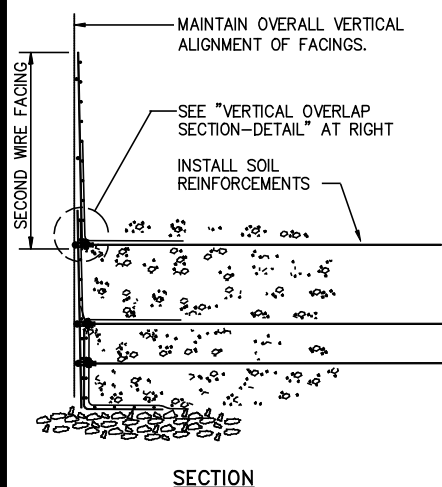
STEP 3: INSTALLATION OF 1st LAYER OF SOIL REINFORCEMENTS



SECTION DETAIL

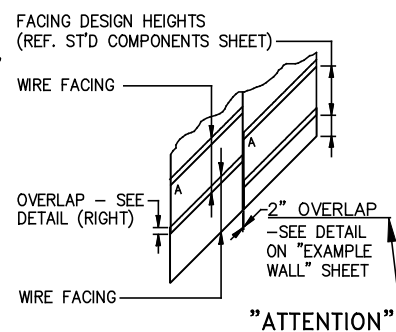


STEP 4: 2nd. BACKFILL LIFT

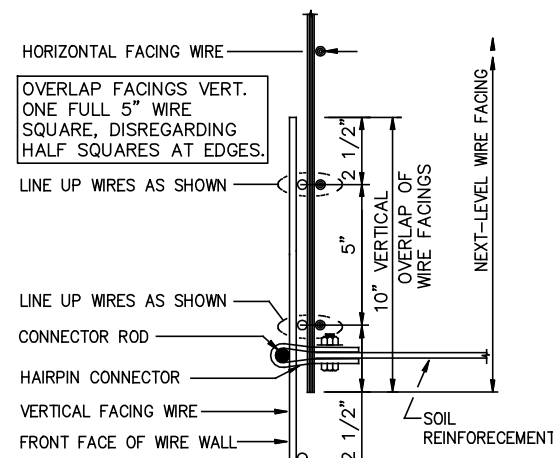


- POSITION SECOND FACING DIRECTLY BEHIND AND OVERLAP LOWER FACING AS SHOWN IN DETAIL (RIGHT). TIE-WIRE THE LOWER PORTION OF SECOND FACING TO ADJACENT FACINGS.
 - PLACE SOIL REINFORCEMENTS AS PER "STEP 3."
 - BACKFILL AS PER "STEP 4a AND 4b."
 - PLACE 4'-2"-WIDE RETENTION FABRIC AS SHOWN IN "STEP 2."
- NOTE: FABRIC MUST ALWAYS BE APPROX. 2'-1" VERTICAL, ALLOWING 5"± OVERLAP ON ADJACENT LAYERS. WHEN WALL ELEVATIONS CALL FOR 10" SPACING BETWEEN SOIL REINFORCEMENTS, FABRIC MUST BE SLIT FOR PENETRATION OF MID-LEVEL SOIL REINFORCEMENTS.
- BACKFILL AS PER "STEP 4c."

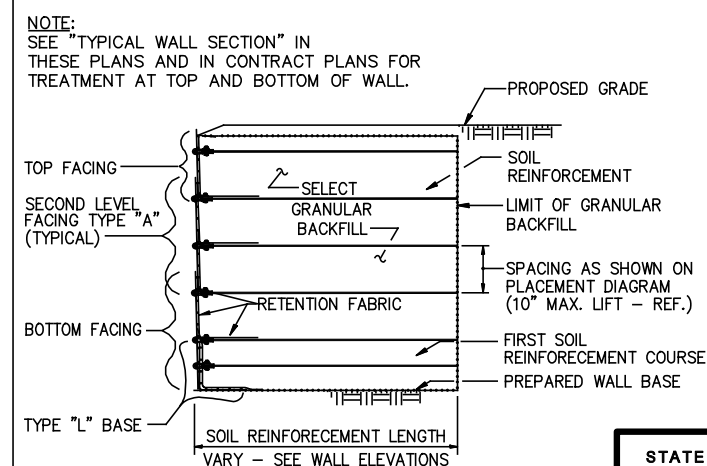
NOTES
STEP 5: INSTALLATION OF 2nd. FACING UNITS



FACING OVERLAP DETAIL



VERTICAL OVERLAP SECTION-DETAIL



REPEAT "STEP 5" UNTIL WALL IS TOPPED OUT AS SHOWN ABOVE.
COMPLETED TERRATREL WALL SECTION

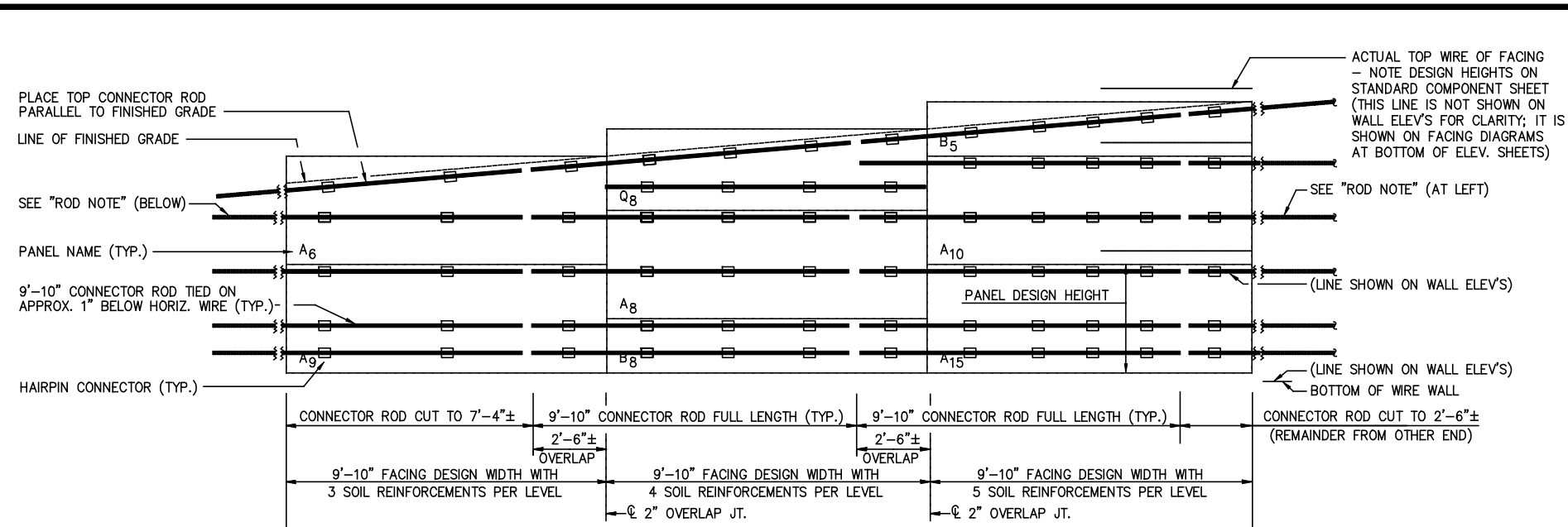
THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY

TERRATREL WIRE WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
THE REINFORCED EARTH COMPANY
TERRATREL WIRE WALL

Designed By	Names	Dates	Approved By	State Structures Design Engineer
Drawn By			Revision	Sheet No.
Checked By			04	2 of 4
				Index No. 5115



ELEVATION - EXAMPLE WALL

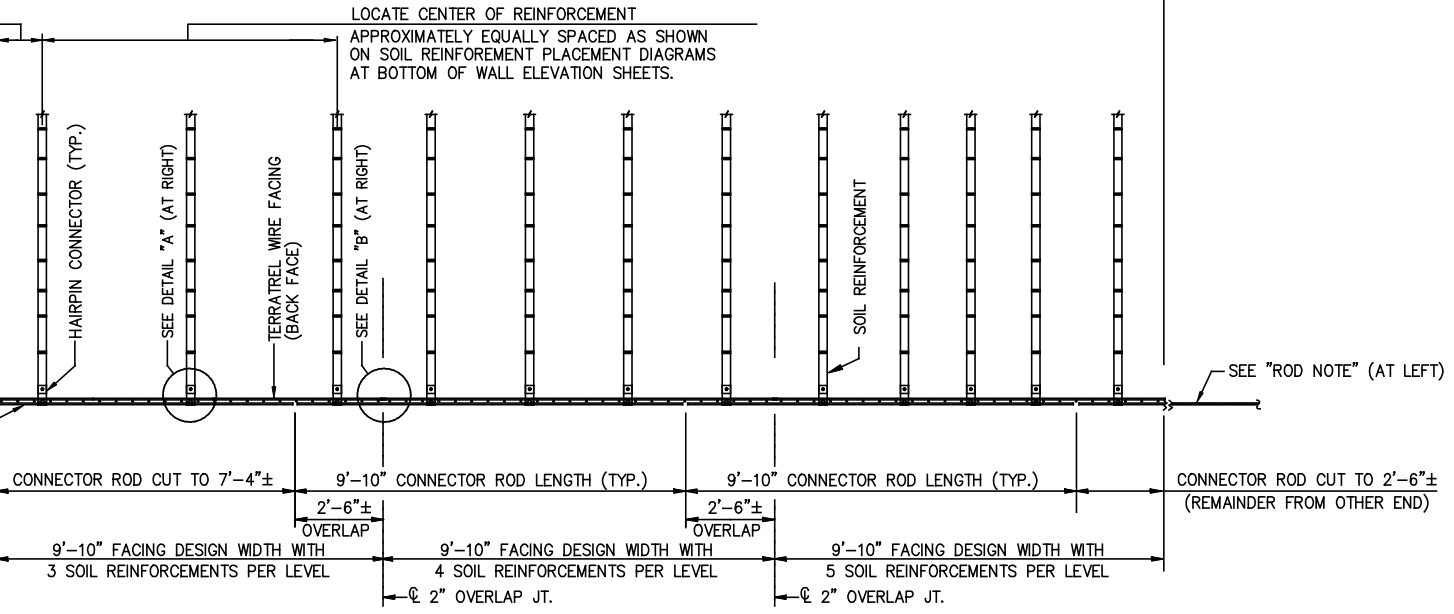
(VERTICAL AND HORIZONTAL WIRES OF FACINGS NOT SHOWN FOR CLARITY)

LOCATE CENTER OF REINFORCEMENT 1'-3" (OR IN CENTER OF THIRD FULL 5"x 5" WIRE SQUARE) FROM END OF HORIZONTAL FACING WIRE (TYPICAL AT ALL WIRE FACING ENDS). SEE REINFORCEMENT PLACEMENT DIAGRAMS AT BOTTOM OF WALL ELEVATION SHEETS.

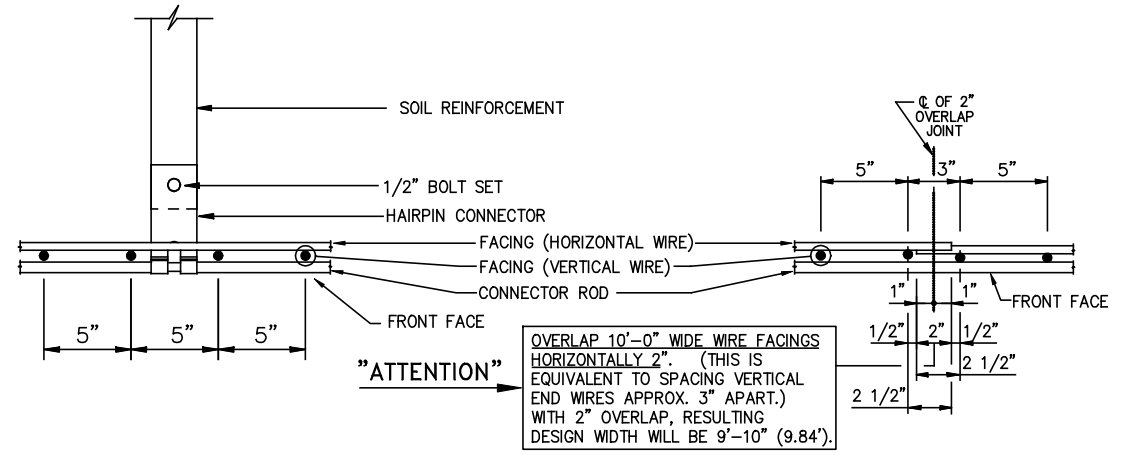
LOCATE CENTER OF REINFORCEMENT APPROXIMATELY EQUALLY SPACED AS SHOWN ON SOIL REINFORCEMENT PLACEMENT DIAGRAMS AT BOTTOM OF WALL ELEVATION SHEETS.

ROD NOTE:
AT END OF WALL, CONNECTOR ROD TO BE CUT TO FIT END OF WIRE FACING (REMAINDER OF ROD MAY BE USED AT OTHER END OF WALL). ALL CUT ROD ENDS TO BE PAINTED WITH GALVANIZING PAINT. TYPICAL.

9'-10" CONNECTOR ROD (TYP.)



PLAN - EXAMPLE WALL

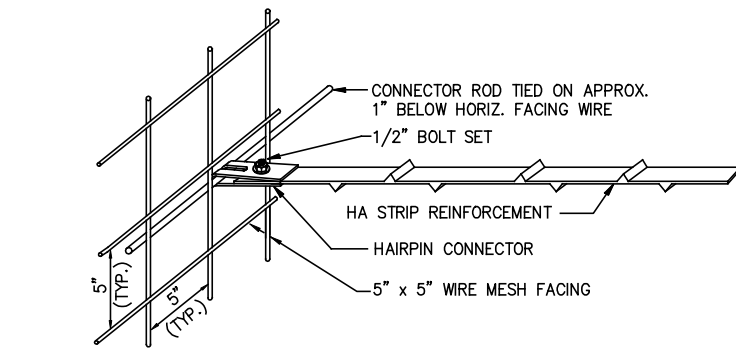


PLAN DETAIL 'A'

SOIL REINFORCEMENT CONNECTION

PLAN DETAIL 'B'

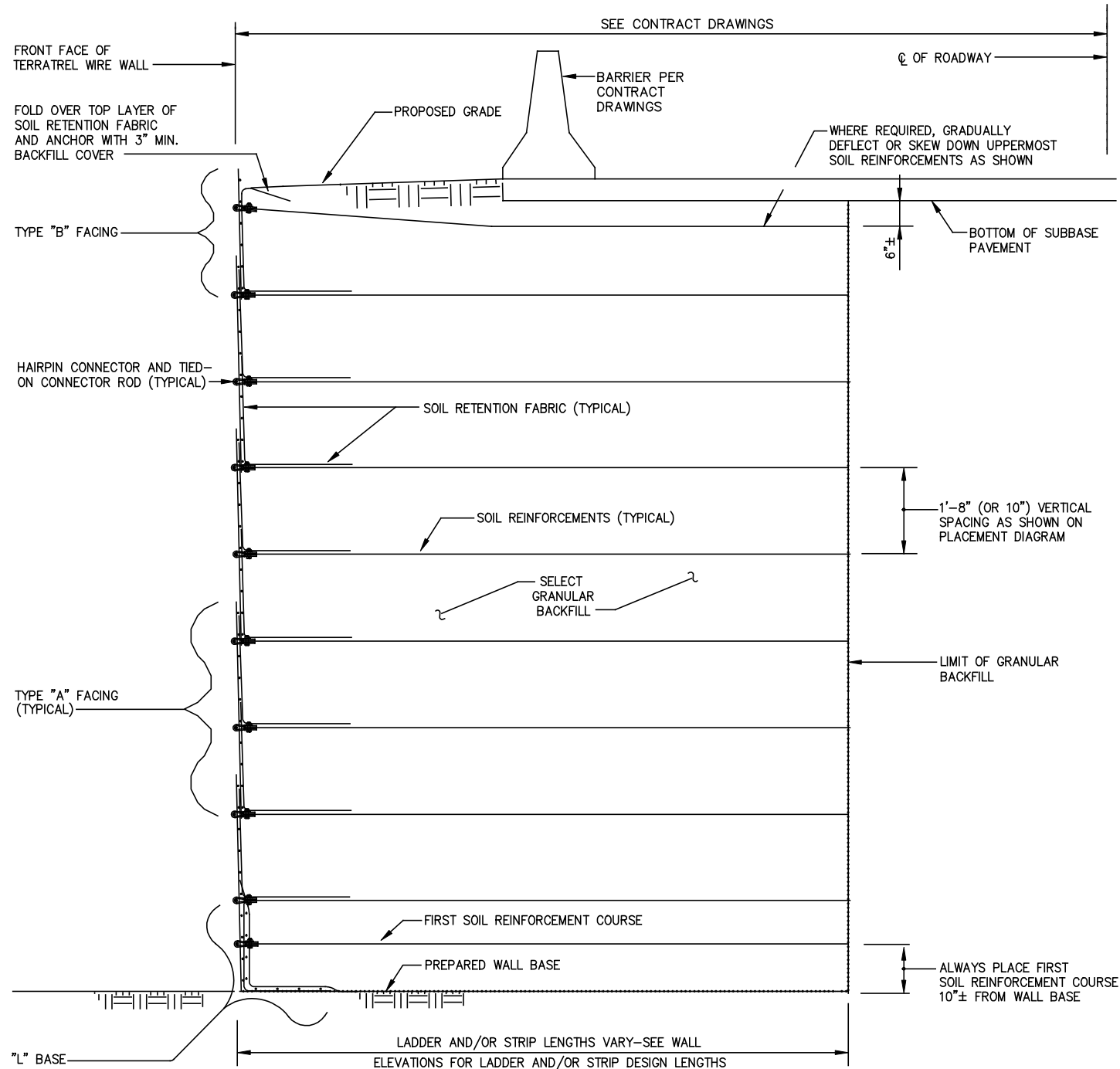
WIRE FACING OVERLAP JOINT



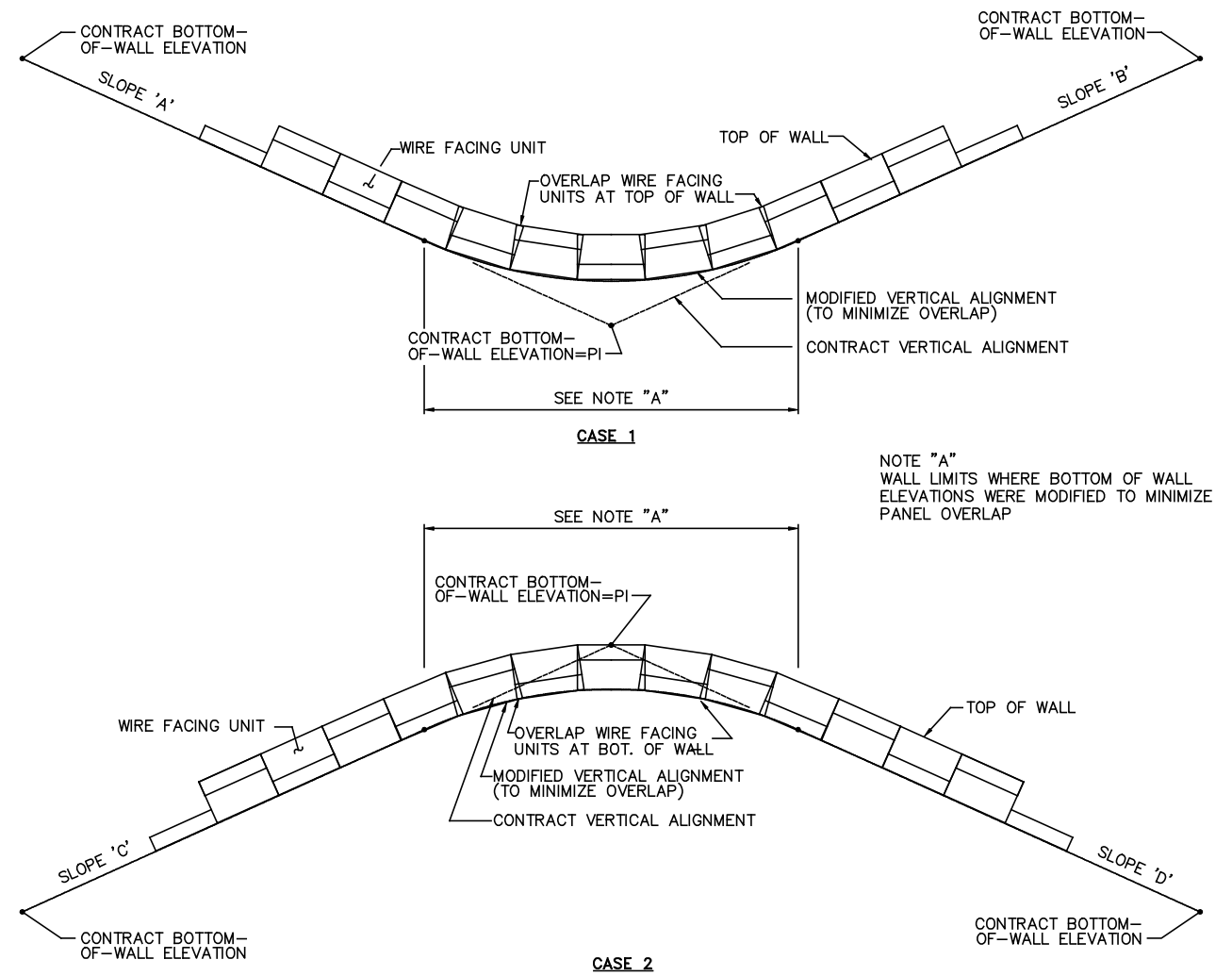
CONNECTION OF HA STRIP TO FACING IN PERSPECTIVE

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TERRATREL WIRE WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
RETAINING WALL SYSTEM THE REINFORCED EARTH COMPANY TERRATREL WIRE WALL					
Names	Dates	Approved By <i>[Signature]</i>			
Designed By		State Structures Design Engineer			
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TYPICAL WIRE WALL SECTION



VERTICAL ALIGNMENT DIAGRAMS

(SLOPES HAVE BEEN SHOWN EXAGGERATED FOR CLARITY)
 ADDING THE CURVES TO THE VERTICAL ALIGNMENT IS OPTIONAL, AND WHEN USED, MAY ELIMINATE OVERLAPPING FOR LOW WALLS WITH SMALL CHANGES IN SLOPE.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM THE REINFORCED EARTH COMPANY TERRATREL WIRE WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	RRD	3/03	State Structures Design Engineer	
Drawn By	RRD	3/03	Revision	Sheet No. Index No.
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THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY

TERRATREL WIRE WALL

T & B STRUCTURAL SYSTEMS

GABION WIRE WALL SYSTEM

GENERAL NOTES

DESIGN CRITERIA

1. THE ATTACHED DETAILS ARE BASED ON THE ASSUMPTIONS THAT THE MATERIAL WITHIN THE REINFORCED VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED COMPONENTS MEET T&B STRUCTURAL SYSTEMS SPECIFICATION FOR MECHANICALLY STABILIZED EARTH STRUCTURES

2. MINIMUM DESIGN PARAMETERS

REFERENCE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF THE INTERNAL FRICTION ANGLE, ϕ , THE COHESION, c , AND THE UNIT WEIGHT, γ , SHALL BE PROVIDED IN THE SHOP DRAWINGS.

EXTERNAL STABILITY

OVERTURNING ≥ 2.0
 SLIDING ≥ 1.5
 BEARING PRESSURE ≥ 2.5

OVERALL STABILITY ≥ 1.5

INTERNAL STABILITY

PULLOUT ≥ 1.5
 STEEL YIELD STRESS = $0.48 F_y$

SERVICE LIFE = GREATER OF 3 YEARS OR DURATION OF CONTRACT

LIVE LOAD SURCHARGE = 250 PSF

3. THE MAXIMUM APPLIED BEARING PRESSURE AT THE INTERFACE OF THE FOUNDATION AND SELECT BACKFILL MATERIAL IS SHOWN IN THE CALCULATIONS. THE BEARING PRESSURE SHOWN IS THE MAXIMUM FOR THE GIVEN BASE MAT LENGTH. IT IS THE RESPONSIBILITY OF OTHERS TO DETERMINE THAT THE BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.

4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED VOLUME AS DETERMINED BY THE ENGINEER SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL AS DIRECTED BY THE ENGINEER.

5. THE DESIGN CONTAINED ON THESE DRAWINGS ARE BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, T&B STRUCTURAL SYSTEMS IS RESPONSIBLE FOR THE INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY, INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

WALL CONSTRUCTION

1. WALLS FOUNDED ON CURVES SHALL HAVE THEIR PANELS DIMENSIONED AS A SERIES OF SHORT CHORDS (AS DIMENSIONED) IN ORDER TO MATCH THE REQUIRED WALL RADIUS.

2. FOR LOCATION AND ALIGNMENT OF THE MSE STRUCTURES REFERENCE THE RETAINING WALL CONTROL PLANS.

3. IF MANHOLE AND DROP INLETS ARE REQUIRED, THEY SHALL BE LOCATED AS SHOWN ON THE RETAINING WALL ELEVATION DRAWINGS.

4. IF PILES ARE LOCATED WITHIN THE REINFORCED VOLUME THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE WALL UNLESS AN ALTERNATE METHOD IS USED TO ISOLATE THE COLUMNS FROM THE REINFORCED VOLUME AS APPROVED BY THE ENGINEER.

5. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 NO SOIL REINFORCEMENT SHALL BE ATTACHED TO ANY PANEL BEFORE THE BACKFILL IS PLACED AT THE REQUIRED ELEVATION AND IS COMPACTED.

6. STRUCTURES GREATER THAN 20 FEET SHALL HAVE THE FINISHED GRADE PLACED AND COMPACTED AT THE FRONT FACE OF THE STRUCTURE BEFORE THE STRUCTURE HEIGHT EXCEEDS 20 FEET. THE FINISH GRADE SHALL BE COMPACTED TO 95 PERCENT OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ANY GUARDRAIL POSTS PRIOR TO PLACING THE TOP ROW OF SOIL REINFORCEMENT. THE POST SPACING SHALL BE ADJUSTED TO AVOID CONFLICTS WITH THE LONGITUDINAL SOIL REINFORCING WIRE. CUTTING OF THE LONGITUDINAL WIRE SHALL BE ALLOWED ONLY AS DIRECTED BY THE ENGINEER.

8. IF EXISTING OR FUTURE STRUCTURES ARE TO BE PLACED IN THE REINFORCED VOLUME THAT INTERFERE WITH THE PROPER PLACEMENT OF THE SOIL REINFORCEMENT THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR A COURSE OF ACTION.

9. THE CAP MAT SHALL BE PLACED AS CLOSE TO THE TOP OF WALL LOCATION AS POSSIBLE THE REMAINING FACE PANEL ABOVE THE CAP MAT MAY BE CUT FREE

10. FOR OTHER INFORMATION PERTAINING TO THE CONSTRUCTION OF THE TBSS RETAINING WALL PLEASE REFER TO T&B STRUCTURAL SYSTEMS ERECTION MANUAL.

11. IT IS THE RESPONSIBILITY OF THE THE CONTRACTOR TO DEFLECT THE TOP CAP MAT OF THE SOIL REINFORCEMENT DOWNWARD SO AS TO NOT CONFLICT WITH ROADWAY MIXING OPERATIONS AND/OR ROADWAY CONSTRUCTION OPERATIONS. ANY SOIL REINFORCING MATERIAL THAT IS DAMAGED SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES

1. NOMINAL SOIL REINFORCING GRID LENGTH

THE WELDED WIRE MESH IS MANUFACTURED IN LENGTHS CORRESPONDING TO THE DIMENSION "B" AS GIVEN IN THE RETAINING WALL ELEVATIONS. THE ACTUAL LENGTH FROM THE FRONT FACE OF THE PANEL TO THE TAIL OF THE SOIL REINFORCING GRID IS PLUS 2"-4" THE FOUNDATION SHALL BE EXCAVATED TO AN EXTENT OF "B" PLUS 6".

2. THE FOLLOWING MATERIALS ARE SUPPLIED BY T&B STRUCTURAL SYSTEMS INC.

- WELDED WIRE FACING PANEL AND SOIL REINFORCING GRID
- BACKING MATS
- CAP MATS
- HOG RINGS AND PLIERS
- NONWOVEN GEOTEXTILE FILTER FABRIC


ANY OTHER MATERIAL REQUIRED TO BUILD THE MSE STRUCTURES ACCORDING TO THE GOVERNING SPECIFICATION SHALL BE SUPPLIED BY THE CONTRACTOR.

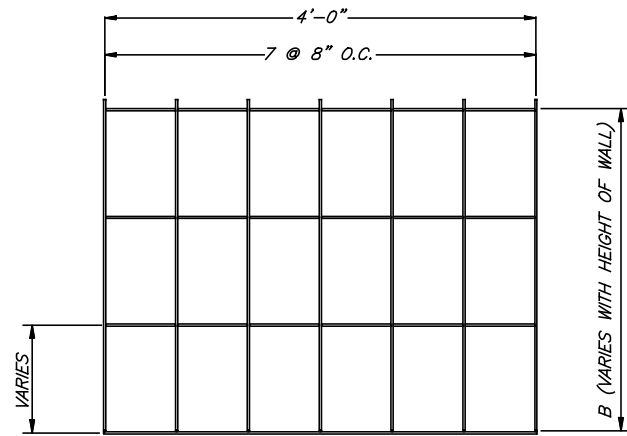
3. T&B STRUCTURAL SYSTEMS INC. SUPPLIES MECHANICALLY STABILIZED EARTH STRUCTURAL COMPONENTS FOR USE WITH THE TBSS WELDED WIRE WALL SYSTEM FOR THE STRUCTURES DETAILED HEREIN. THE ERECTION MANUAL PROVIDED BY T&B STRUCTURAL SYSTEMS IS A GENERAL GUIDELINE FOR ERECTING THE TBSS WELDED WIRE WALL SYSTEM. ALL QUALITY CONTROL PROCEDURES, STAGING PROCEDURES, MATERIAL HANDLING, AND SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE OBLIGATION TO CONSTRUCT THE RETAINING WALL ACCORDING TO THE PROJECT PLANS AND SPECIFICATIONS AND ALL LAWS OF THE GOVERNING STATE.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

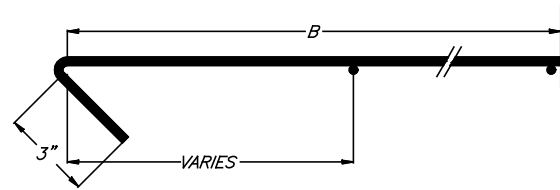
TBSS TEMPORARY GABION WIRE WALL

T&B Structural Systems, Inc.
 637 West Hurst Blvd.
 Hurst, TX 76053
 888-280-9858

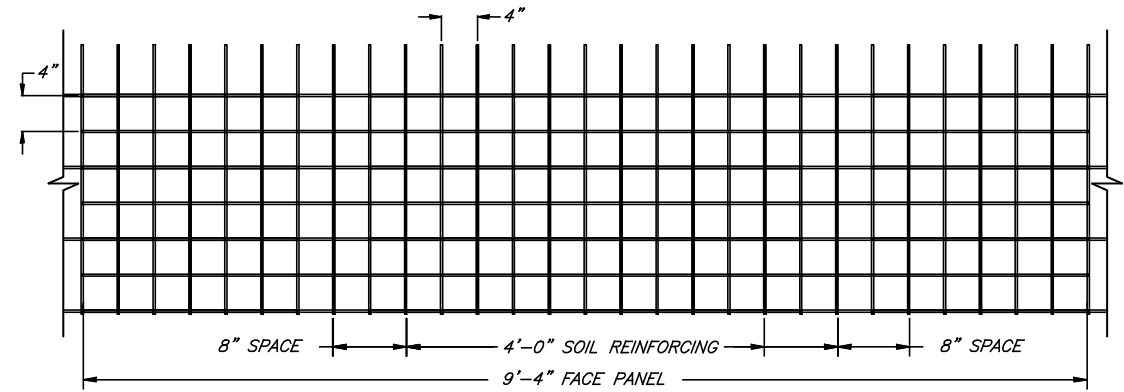
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Designed By		 State Structures Design Engineer		
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Checked By				
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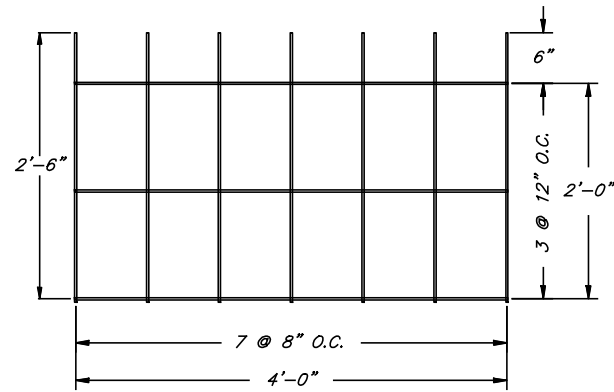
A
2 **PLAN VIEW SOIL REINFORCING**
N.T.S.



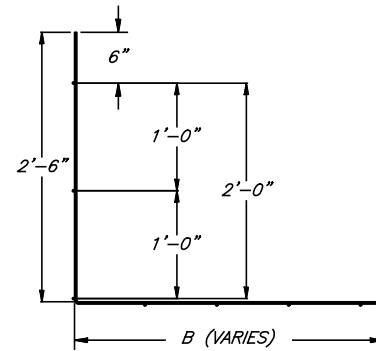
D
2 **SECTION CAP MAT**
N.T.S.



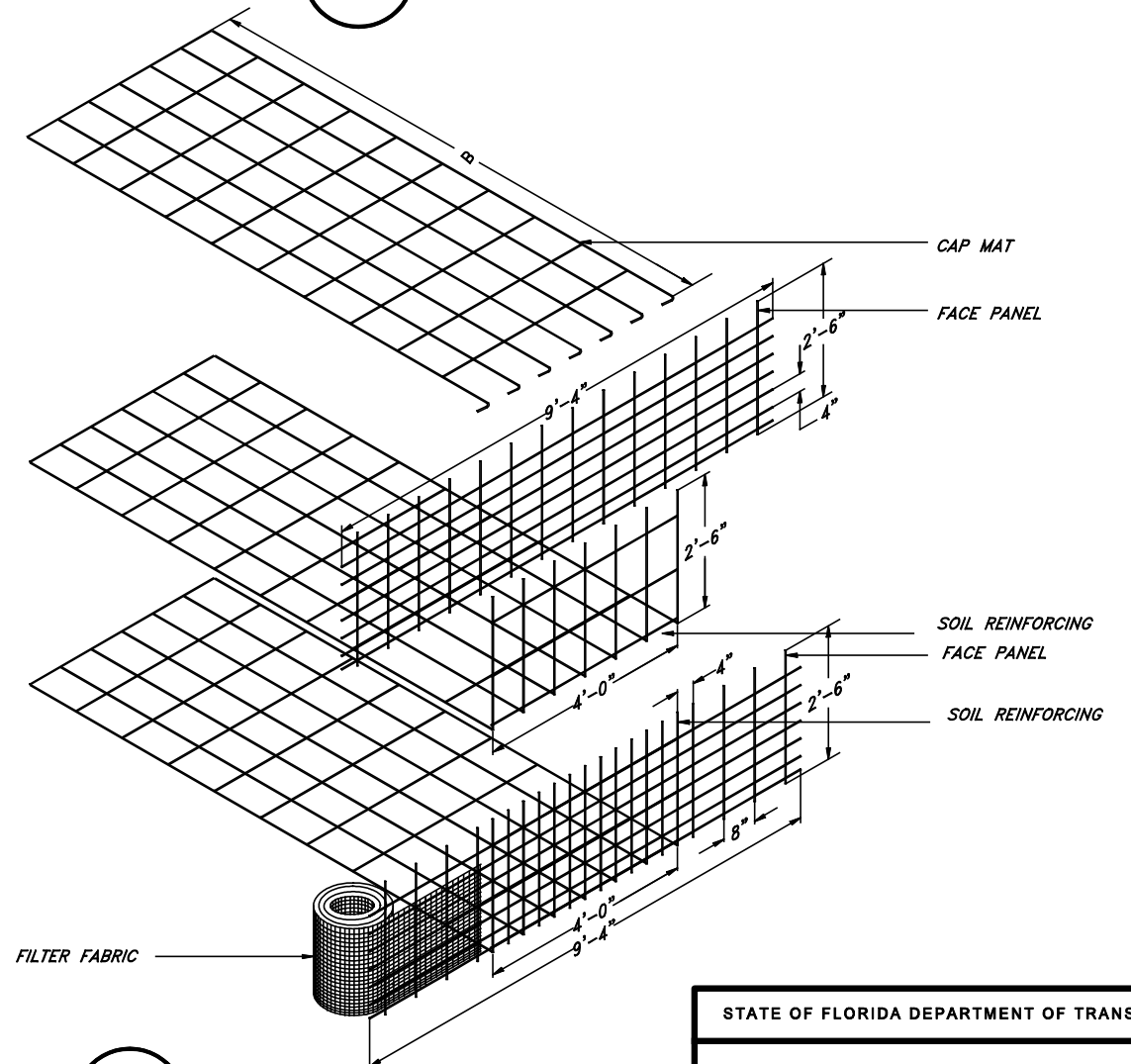
G
2 **ASSEMBLED WALL ELEVATION**
N.T.S.



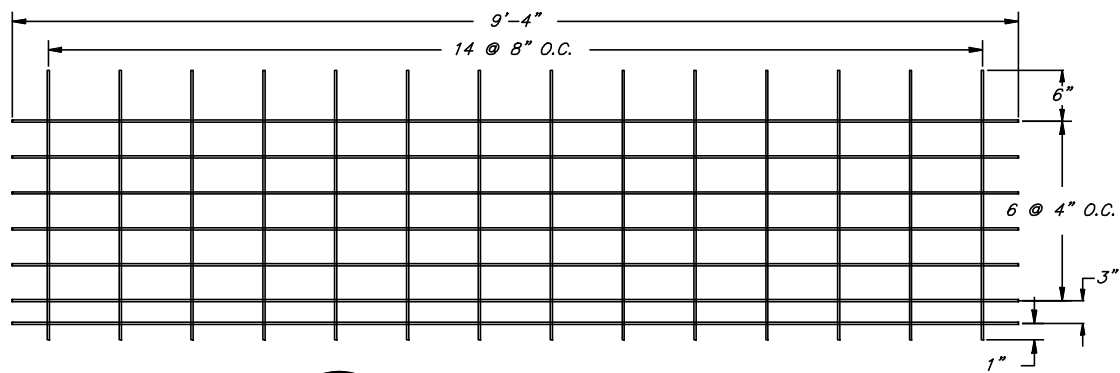
B
2 **ELEVATION SOIL REINFORCING**
N.T.S.



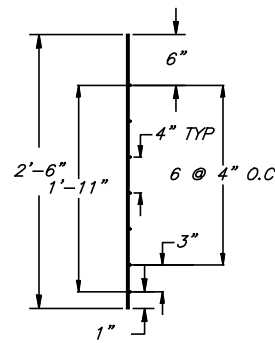
E
2 **SECTION SOIL REINFORCING**
N.T.S.



H
2 **COMPONENT ISOMETRIC**
N.T.S.

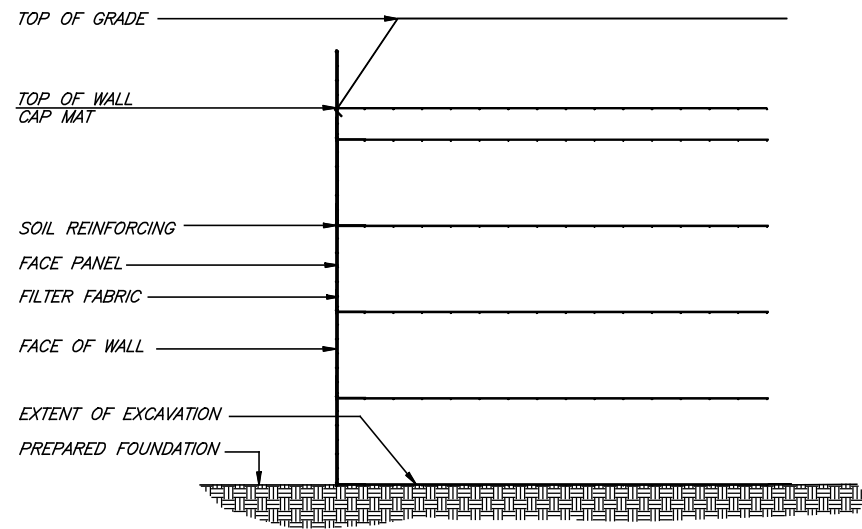


C
2 **ELEVATION FACE PANEL**
MINIMUM WIRE SIZE IS W4.5 BOTH DIRECTIONS

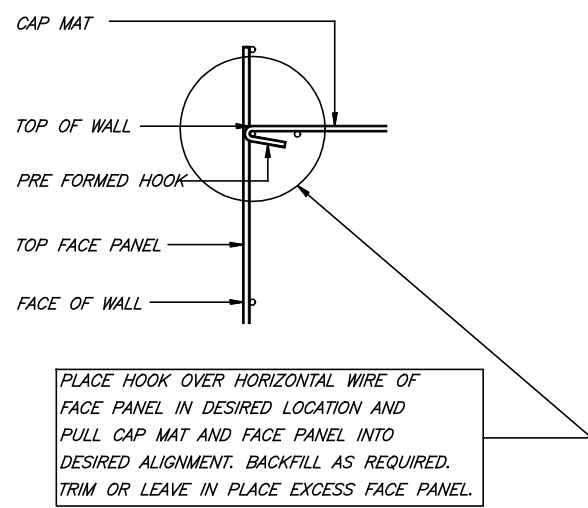


F
2 **SECTION FACE PANEL**
N.T.S.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TBSS TEMPORARY GABION WIRE WALL				
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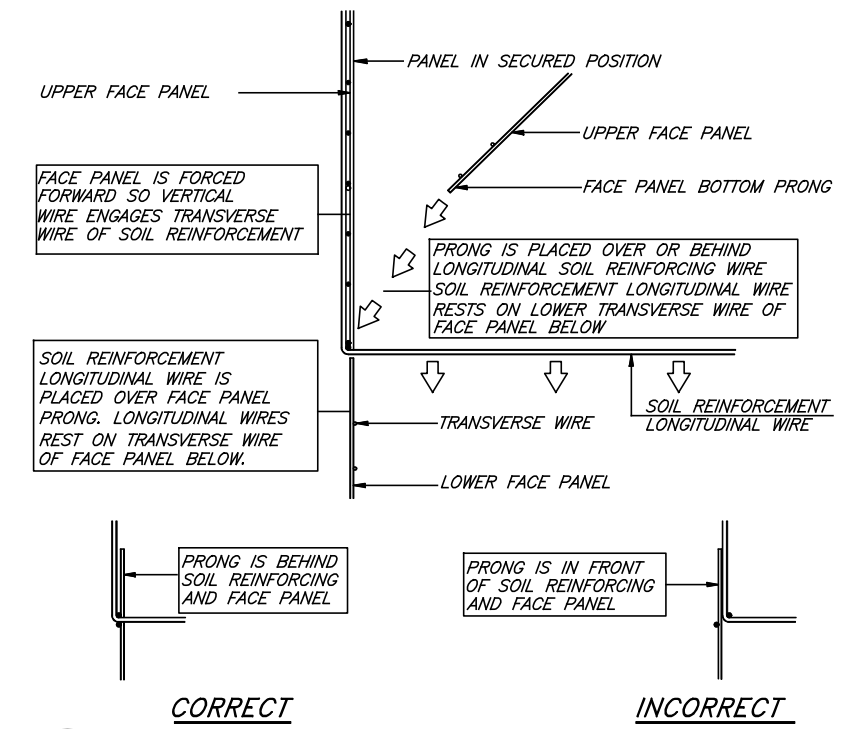


A
3
TYPICAL WELDED WIRE WALL SECTION

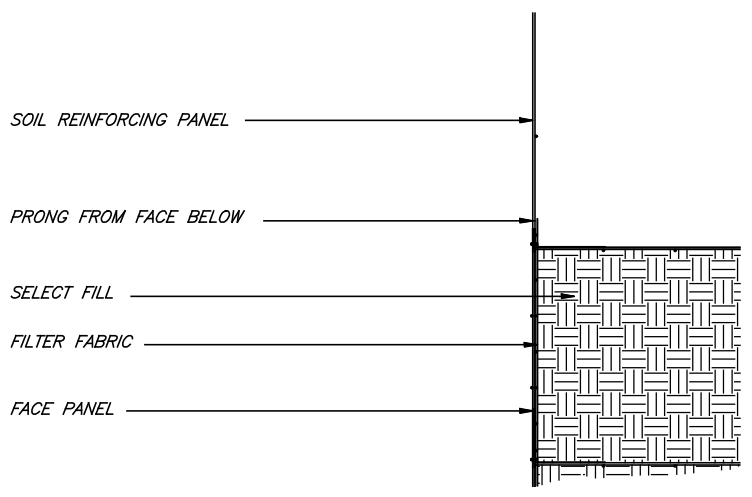


NOTE: PLACE FILTER FABRIC AT DESIRED LOCATION AND SECURE WITH HOG RINGS. TRIM AS REQUIRED.

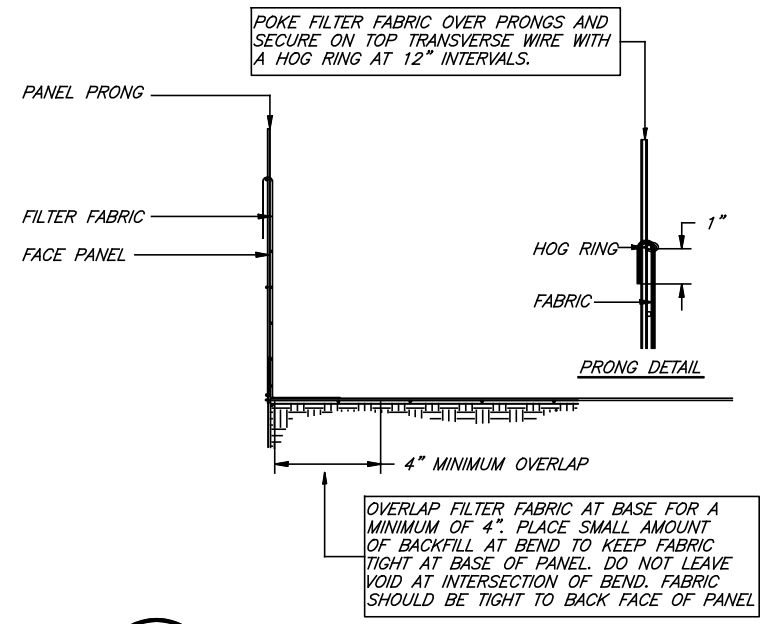
C
3
CAP MAT CONNECTION DETAIL



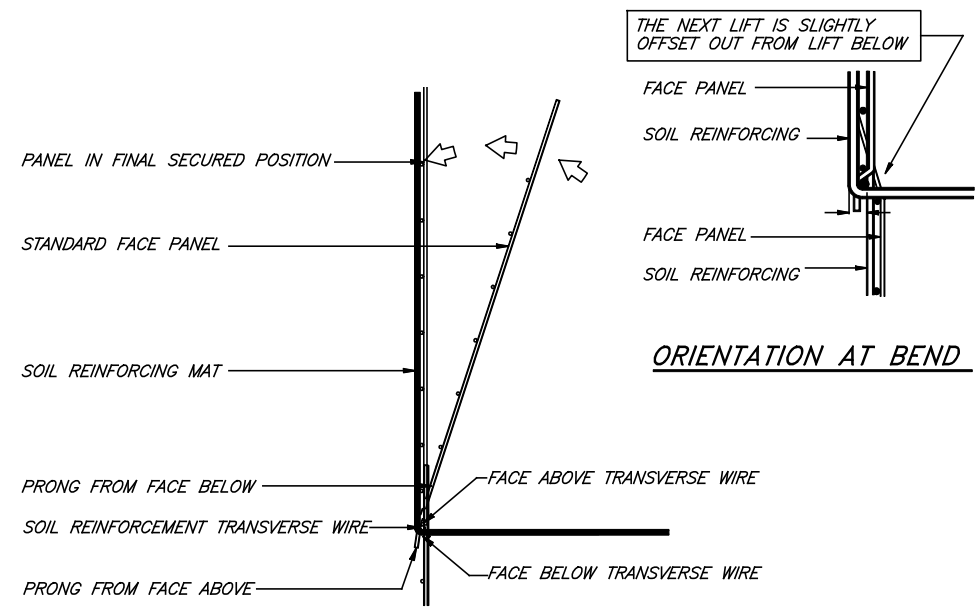
E
3
SOIL REINFORCEMENT CONNECTION SEQUENCE



B
3
WELDED WIRE WALL LIFT SECTION DETAIL



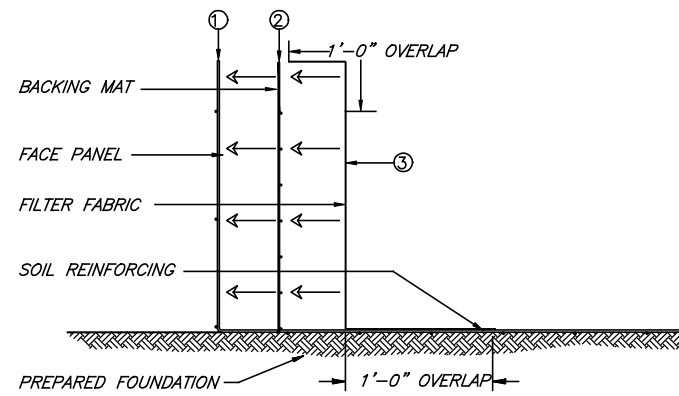
D
3
FILTER FABRIC PLACEMENT DETAIL



F
3
FACE PANEL CONNECTION SEQUENCE

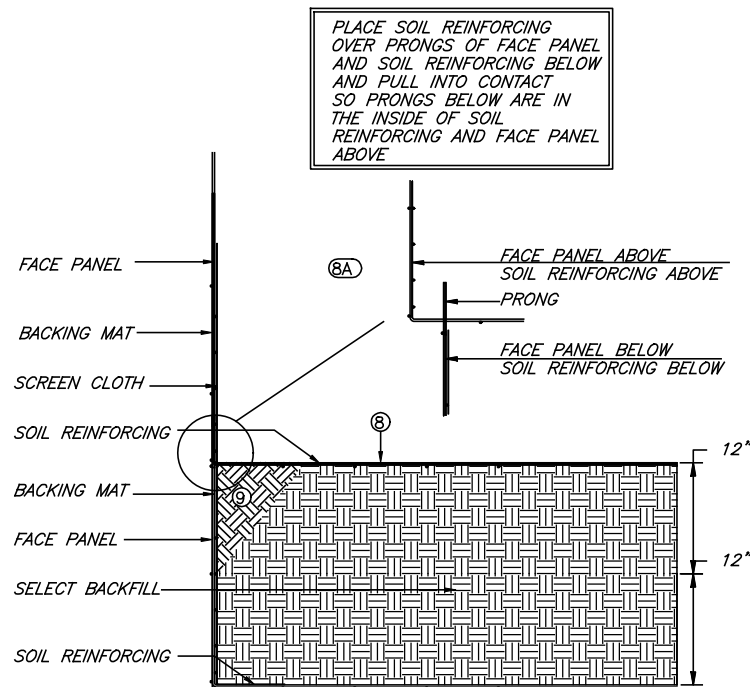
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TBSS TEMPORARY GABION WIRE WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By		State Structures Design Engineer		
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STEP 1 - SOIL REINFORCING PLACEMENT



1. PLACE BOTTOM SOIL REINFORCING GRID ON PREPARED FOUNDATION
2. PLACE BACKING FACE PANEL AT BACK FACE OF SOIL REINFORCING GRID AND SECURE WITH HOG RINGS.
3. PLACE FILTER FABRIC ON BACK FACE OF BACKING FACE PANEL AND SECURE WITH HOG RINGS

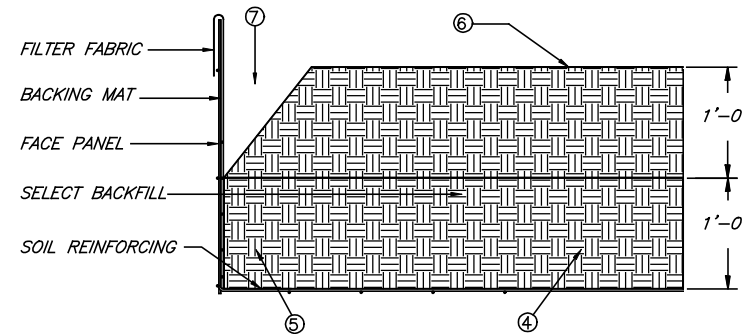
STEP 3 - NEXT SOIL REINFORCING LIFT



8. PLACE NEXT LAYER OF SOIL REINFORCING GRIDS ON COMPACTED FILL AND SECURE TO FACE PANEL WITH HOG RING. PULL WALL FACE INTO ALIGNMENT. (REFERENCE IN DETAIL 8A)
9. PLACE BACKFILL IN VOID BELOW. MOUND ON TOP AND COMPACT

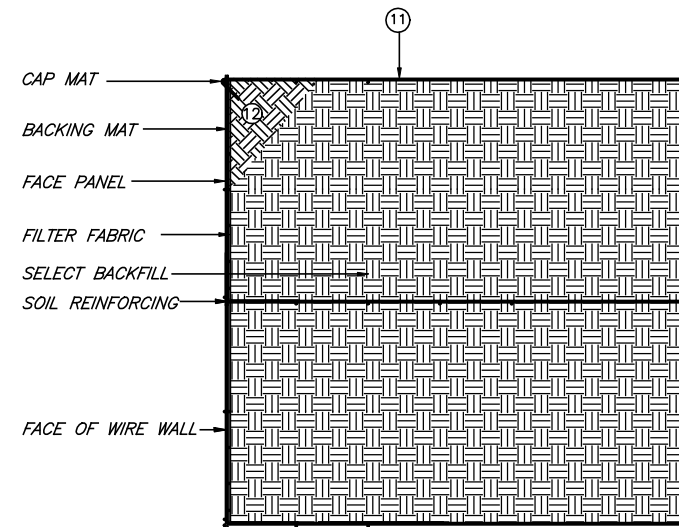
A
4 **ERECTION SEQUENCE STEPS**
RECOMMENDED INSTALLATION PROCEDURE

STEP 2 - BACKFILL PLACEMENT

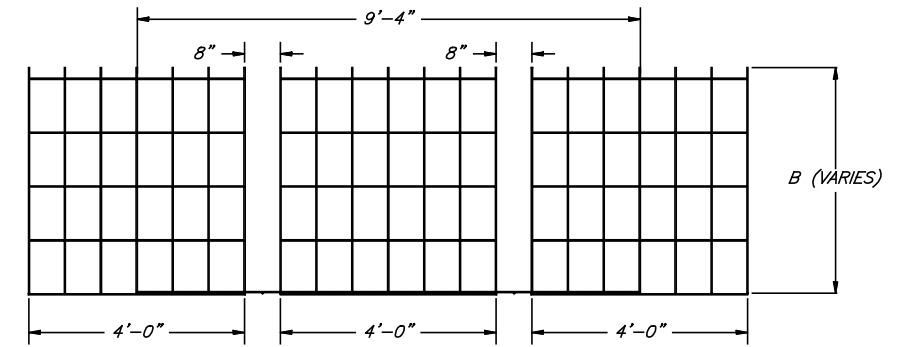


4. PLACE AND COMPACT MAXIMUM OF 1'-0" OF SELECT BACKFILL ON TOP OF SOIL REINFORCING GRID
5. TAKE CARE PLACING MATERIAL AT FACE OF WALL PAYING ATTENTION TO FACING ALIGNMENT.
6. PLACE AND COMPACT 12" OF SELECT BACKFILL TO BRING BACKFILL LEVEL WITH NEXT LIFT ELEVATION
7. LEAVE VOID AT FACE OF WALL UNTIL NEXT SOIL REINFORCING ELEMENT IS PLACED

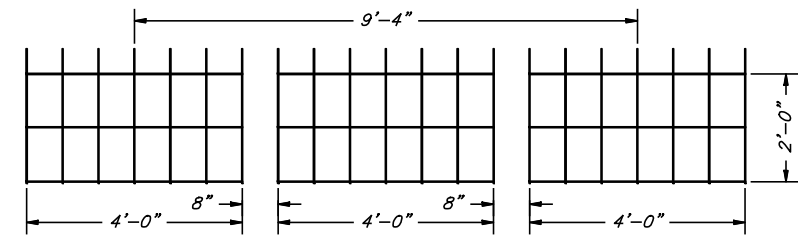
STEP 4 - CAP MAT



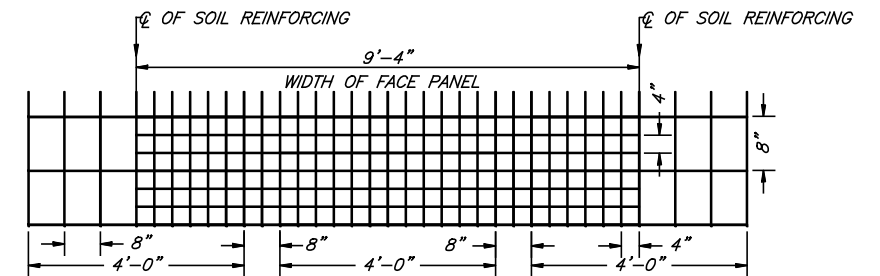
11. PLACE CAP MAT AT TOP OF WALL ELEVATION AND PULL FACE INTO ALIGNMENT
12. PLACE BACKFILL IN VOID BELOW. MOUND ON TOP AND COMPACT



B
4 **PLAN VIEW SOIL REINFORCING**
SOIL REINFORCING LAYOUT



C
4 **ELEVATION FACE PANEL**
SOIL REINFORCING AND FACE PANEL



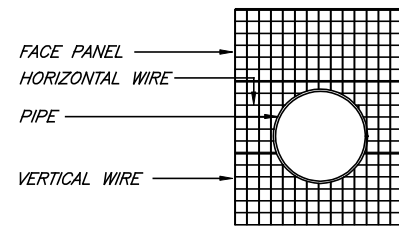
- NOTE:
1. FACE PANEL SHALL BE PLACED SO IT IS AT THE CENTER LINE OF THE SOIL REINFORCING FACING PANEL.
 2. FACE PANEL SHALL BE PLACED AT BACK FACE OF SOIL REINFORCING FACING PANEL IN MANNER THAT VERTICAL AND HORIZONTAL PATTERN MAINTAINS A 4" X 4" APPERANT OPENING AS VIEWED FROM FRONT FACE OF STRUCTURE

D
4 **FACING ELEVATION**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

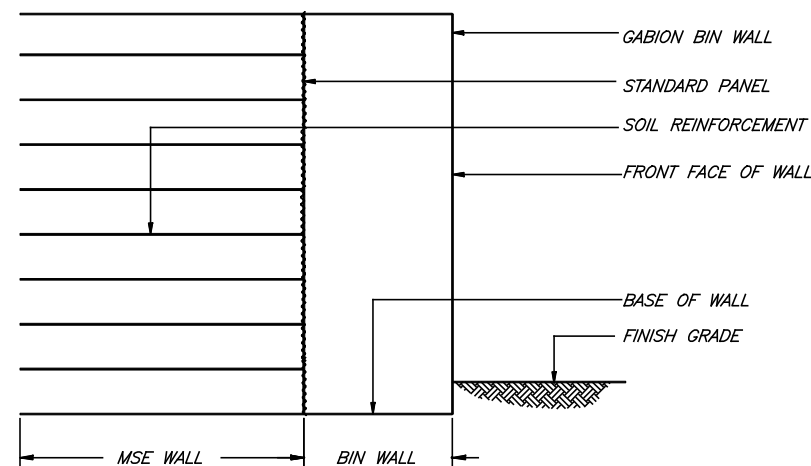
TBSS TEMPORARY GABION WIRE WALL

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Designed By		W. J. [Signature]
Drawn By		State Structures Design Engineer
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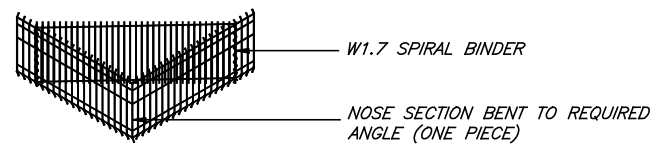


NOTE:
TRIM PROTRUSION AREA FROM FACE PANEL BY CUTTING HORIZONTAL WIRE BETWEEN EACH VERTICAL WIRE. BEND WIRES BACK INTO MSE MASS AND AS CLOSE TO PROTRUSION AS POSSIBLE. APPLY FILTER FABRIC OVER AND AROUND PROTRUSION MAKING SURE FACE PANEL IS COVERED. MAKE SURE THAT ALL GAPS BETWEEN FACE AND PROTRUSION ARE COVERED WITH FILTER FABRIC. IF PROTRUSION INTERFERES WITH SOIL REINFORCING MAT CUT TRANSVERSE WIRES OF MAT AND BEND LONGITUDINAL WIRE TO PASS PROTRUSION AND CONFORM TO THE PROTRUSIONS SHAPE.

A
5 **TYPICAL ELEVATION THROUGH PENETRATION**
RECOMMENDED INSTALLATION PROCEDURE

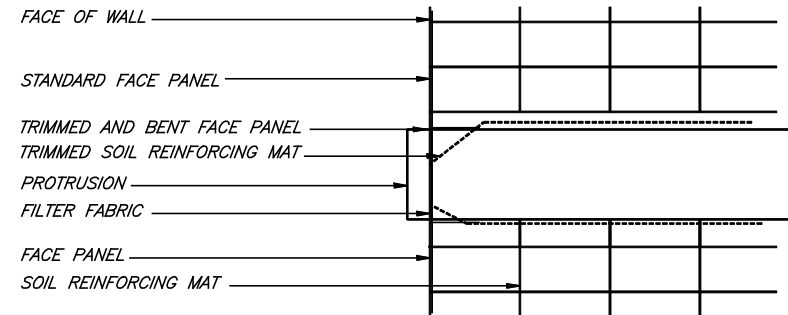


B
5 **TYPICAL SECTION THROUGH BIN**
RECOMMENDED INSTALLATION PROCEDURE



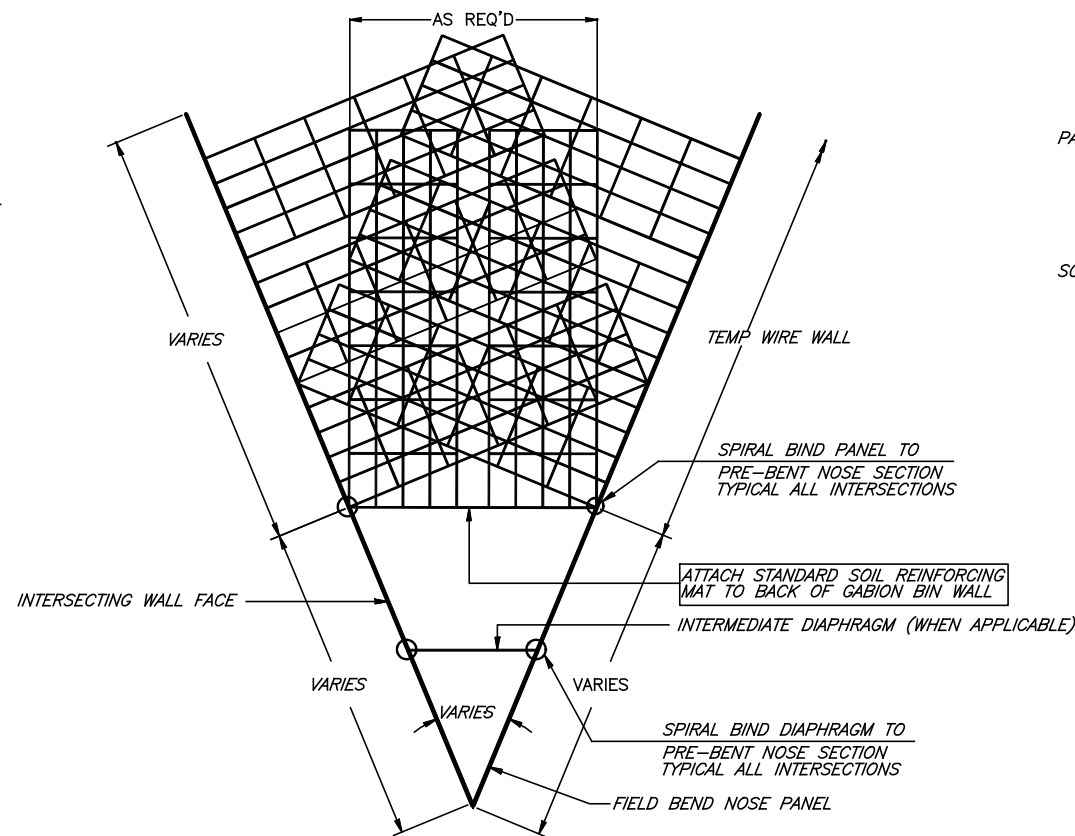
NOTE: 12 GAUGE GALVANIZED STEEL HOG RING MAY BE SUBSTITUTED FOR SPIRAL BINDER. HOG RINGS TO BE ATTACHED AT 3" CENTERS TOP TO BOTTOM.

C
5 **ISOMETRIC OF BIN GABION NOSE SECTION**
RECOMMENDED INSTALLATION PROCEDURE

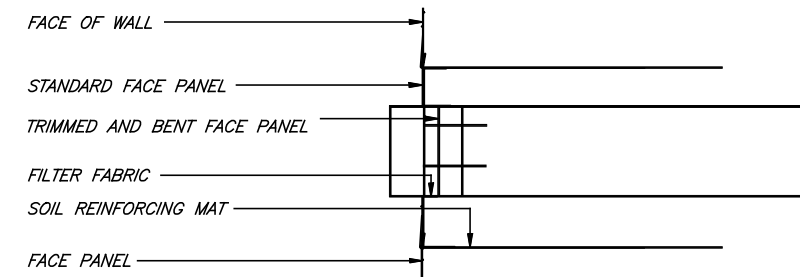


NOTE:
TRIM PROTRUSION AREA FROM FACE PANEL BY CUTTING HORIZONTAL WIRE BETWEEN EACH VERTICAL WIRE. BEND WIRES BACK INTO MSE MASS AND AS CLOSE TO PROTRUSION AS POSSIBLE. APPLY FILTER FABRIC OVER AND AROUND PROTRUSION MAKING SURE FACE PANEL IS COVERED. MAKE SURE THAT ALL GAPS BETWEEN FACE AND PROTRUSION ARE COVERED WITH FILTER FABRIC. IF PROTRUSION INTERFERES WITH SOIL REINFORCING MAT CUT TRANSVERSE WIRES OF MAT AND BEND LONGITUDINAL WIRE TO PASS PROTRUSION AND CONFORM TO THE PROTRUSIONS SHAPE.

D
5 **TYPICAL PLAN VIEW THROUGH PENETRATION**
RECOMMENDED INSTALLATION PROCEDURE

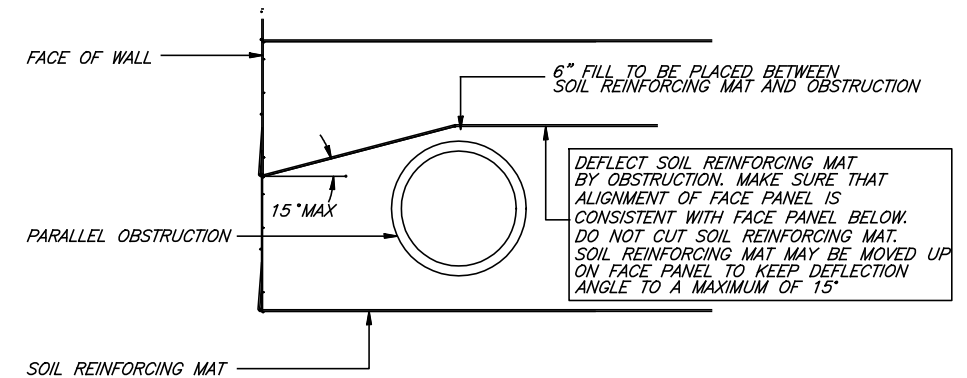


E
5 **TYPICAL PLAN VIEW AT BIN**
RECOMMENDED INSTALLATION PROCEDURE

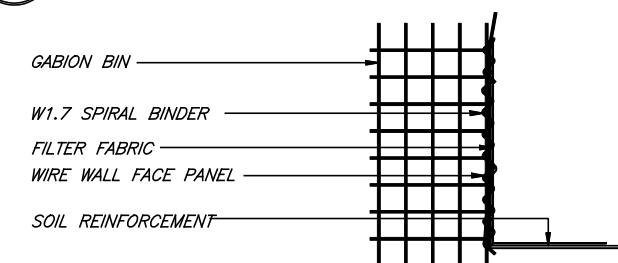


NOTE:
TRIM PROTRUSION AREA FROM FACE PANEL BY CUTTING HORIZONTAL WIRE BETWEEN EACH VERTICAL WIRE. BEND WIRES BACK INTO MSE MASS AND AS CLOSE TO PROTRUSION AS POSSIBLE. APPLY FILTER FABRIC OVER AND AROUND PROTRUSION MAKING SURE FACE PANEL IS COVERED. MAKE SURE THAT ALL GAPS BETWEEN FACE AND PROTRUSION ARE COVERED WITH FILTER FABRIC. IF PROTRUSION INTERFERES WITH SOIL REINFORCING MAT CUT TRANSVERSE WIRES OF MAT AND BEND LONGITUDINAL WIRE TO PASS PROTRUSION AND CONFORM TO THE PROTRUSIONS SHAPE.

F
5 **TYPICAL SECTION THROUGH PENETRATION**
RECOMMENDED INSTALLATION PROCEDURE



G
5 **TYPICAL SECTION AT PARALLEL OBSTRUCTION**
RECOMMENDED INSTALLATION PROCEDURE



NOTE: 12 GAUGE GALVANIZED STEEL HOG RING MAY BE SUBSTITUTED FOR SPIRAL BINDER. HOG RINGS TO BE ATTACHED AT 3" CENTERS

H
5 **TYPICAL SECTION AT GABION SPIRAL TIE**
RECOMMENDED INSTALLATION PROCEDURE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TBSS TEMPORARY GABION WIRE WALL

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CONSTRUCTION NOTES FOR THE PLACEMENT OF TENSAR GEOGRIDS AND BACKFILL SOILS FOR TENSAR WWF TEMPORARY RETAINING WALL

1.0 MATERIALS

1.1 GEOGRID REINFORCING SHALL BE TENSAR UNIAXIAL AND BIAxIAL GEOGRIDS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.

1.2 BODKIN BARS SHALL BE 4/2" x 1/4" HDPE BARS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.

1.2.1 CONNECTION ROD SHALL BE 4'-6" x 3/8"Ø (25% GLASS FILLED HDPE).

1.3 GEOTEXTILE FILTER FABRIC SHALL BE 8 OZ/SY (MIN.) NON-WOVEN, NEEDLE-PUNCHED POLYPROPYLENE WITH MIN. PERMITTIVITY OF 1.0 SEC⁻¹

1.4 WALL FACING

1.4.1 FACING SHALL BE PRE-FABRICATED BLACK STEEL WELDED WIRE FORMS LINED WITH BIAxIAL GEOGRID WRAP OR OPTIONAL MECHANICAL CONNECTION SYSTEM WITHOUT BIAxIAL GEOGRID WRAP. WIRE FORM GEOMETRY SHALL BE AS DETAILED IN THE CONSTRUCTION DRAWINGS.

1.5 TENSAR EARTH TECHNOLOGIES, INC. SHALL PROVIDE TO THE CONTRACTOR THE FOLLOWING MATERIALS ONLY:

WWF FACING FORMS AND STRUTS
FILTER FABRIC
GEOGRID
GEOGRID CONNECTOR, AS APPLICABLE

2.0 TECHNICAL REQUIREMENTS

2.1 FILL MATERIALS SHALL BE PLACED FROM THE BACK OF THE WELDED WIRE FACING FORMS TOWARD THE ENDS OF THE GEOGRID TO ENSURE TENSIONING.

2.2 WELDED WIRE FACING SHALL BE MONITORED FOR DEFORMATION AND COMPLIANCE TO FDOT STANDARD SPECIFICATIONS SECTION 548 DURING FILL PLACEMENT AND COMPACTION. COMPACTION EQUIPMENT AND OPERATION PROCEDURES MAY HAVE TO BE MODIFIED TO PREVENT EXCESSIVE DEFORMATION OF THE FLEXIBLE WELDED WIRE FACING.

2.3 TIE WIRES OR HOG RINGS MAY BE REQUIRED IF WWF FACING MOVES DURING BACKFILL OPERATIONS.

3.0 TENSAR GEOGRID PLACEMENT

3.1 TENSAR GEOGRID SHALL BE PLACED AT THE SAME LOCATIONS AND ELEVATIONS SHOWN ON THE SHOP DRAWINGS.

3.2 TENSAR GEOGRID REINFORCEMENT SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTH(S). BODKIN SPLICE CONNECTION SHALL NOT BE UTILIZED UNLESS PRE-APPROVED BY THE ENGINEER.

3.2.1 IF PRE-APPROVED, TENSAR UNIAXIAL GEOGRIDS MAY BE SPLICED UTILIZING THE BODKIN CONNECTION DETAIL. NO MORE THAN ONE SPLICE SHALL BE ALLOWED IN ANY SINGLE LENGTH OF REINFORCING AND NO SPLICES SHALL BE ALLOWED FOR GEOGRIDS LESS THAN 6 FEET IN LENGTH (EACH). THE BODKIN CONNECTION SHALL NOT BE PLACED LESS THAN 6 FEET BELOW PLANNED FINISHED GRADE, NOR HORIZONTALLY NOR VERTICALLY ADJACENT TO ANOTHER BODKIN CONNECTION.

3.3 PRIOR TO PLACING FILL, THE GEOGRID MATERIALS SHALL BE PLACED TO LAY FLAT AND PULLED TAUT TO REMOVE SLACK IN THE GEOGRIDS.

3.4 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND/OR THE GEOGRID.

3.5 RUBBER-TIRED VEHICLES MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

3.6 TENSAR UNIAXIAL (UX) GEOGRIDS SHALL BE ROLLED OUT WITH THE LONG AXIS OF THE APERTURES (MACHINE DIRECTION) PERPENDICULAR TO THE WELDED WIRE FORM FACE. TENSAR BIAxIAL (BX) GEOGRIDS SHALL BE ROLLED OUT WITH THE MACHINE DIRECTION BAR PARALLEL TO THE WELDED WIRE FORM FACE.

3.6.1 UNIAXIAL (UX) GEOGRIDS SHALL BE CUT NEXT TO THE CROSS MACHINE DIRECTION BAR. UX GEOGRIDS SHALL BE UNROLLED PERPENDICULAR TO THE WALL FACE.

3.6.2 BIAxIAL GEOGRIDS SHALL BE CUT NEXT TO THE MACHINE DIRECTION BAR. BX GEOGRIDS SHALL BE UNROLLED PARALLEL TO THE WALL FACE

3.7 GEOGRIDS SHALL BE CUT AND PLACED SO THAT A TRANSVERSE BAR IS EXTENDED TO THE BACK FACE OF THE WELDED WIRE FORM.

3.8 A MINIMUM OF 3 INCHES OF FILL MATERIAL SHALL BE REQUIRED BETWEEN OVERLAPPING LAYERS OF GEOGRID AS SHOWN ON THE DRAWINGS.

4.0 CHANGES TO REINFORCEMENT LAYOUT OR PLACEMENT

4.1 NO CHANGES TO THE TENSAR GEOGRID LAYOUT, INCLUDING, BUT NOT LIMITED TO, LENGTH, GEOGRID TYPE, OR ELEVATION, SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE TENSAR EARTH TECHNOLOGIES, INC DESIGN ENGINEER.

5.0 DRAINAGE

5.1 THE TENSAR REINFORCED WALL HAS BEEN DESIGNED BASED ON THE ASSUMPTION THAT THE REINFORCED BACKFILL MATERIAL SHALL BE FREE OF SUBSURFACE DRAINAGE OF WATER (SEEPAGE).

6.0 DESIGN PARAMETERS

6.1 SOIL PARAMETERS

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL TO BE UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE, APPARENT COHESION AND UNIT WEIGHT SHALL BE PROVIDED IN THE SHOP DRAWINGS.

6.2 DESIGN

THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, TENSAR EARTH TECHNOLOGIES, INC. IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

6.2.1 FACTORS OF SAFETY:

6.2.1 INTERNAL STABILITY:
MAXIMUM GEOGRID DESIGN STRENGTH = 0.29 ULT
MINIMUM FACTOR OF SAFETY FOR GEOGRID PULLOUT = 1.5
MINIMUM FACTOR OF SAFETY FOR SLIDING AT LOWEST GEOGRID = 1.5
GEOGRID-SOIL INTERACTION COEFFICIENT = 0.8
PERCENT COVERAGE OF GEOGRID = VARIES

6.2.2 EXTERNAL STABILITY:

MINIMUM FACTOR OF SAFETY FOR SLIDING = 1.5
MINIMUM FACTOR FOR SAFETY FOR OVERTURNING = 2.0
EXTERNAL STABILITY IS THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR EXTERNAL STABILITY. (ALSO SEE SECTION 7.5)

6.2.3 GLOBAL STABILITY:

GLOBAL STABILITY IS THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR GLOBAL STABILITY. (ALSO SEE SECTION 7.5)

7.0 SPECIAL PROVISIONS

7.1 WALL ELEVATION VIEWS, LOCATIONS AND GEOMETRY OF EXISTING AND PROPOSED STRUCTURES MUST BE VERIFIED BY THE CONTRACTOR BEFORE DEVELOPING SHOP DRAWINGS.

7.2 TENSAR EARTH TECHNOLOGIES, INC. ASSUMES NO LIABILITY FOR INTERPRETATION OR VERIFICATION OF SUBSURFACE CONDITIONS, SUITABILITY OF SOIL DESIGN PARAMETERS AND INTERPRETATION OF SUBSURFACE GROUNDWATER CONDITIONS.

7.3 ANY REVISIONS TO STATED DESIGN PARAMETERS ON CONTROL DRAWINGS OR STRUCTURE GEOMETRY SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

7.4 THIS DESIGN IS ONLY VALID FOR INTERNAL STABILITY OF THE PROPOSED TENSAR REINFORCED RETAINING WALLS AS SHOWN HEREIN.

7.5 EVALUATION OF BEARING CAPACITY, TOTAL SETTLEMENT, DIFFERENTIAL SETTLEMENT, AND THEIR EFFECTS ON THE TENSAR REINFORCED RETAINING WALL SYSTEM SHALL BE THE RESPONSIBILITY OF OTHERS.

7.6 SEE CONTROL DRAWINGS, FDOT STANDARD SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS FOR ADDITIONAL REQUIRED MATERIALS AND METHODS.

7.7 A COPY OF THE TENSAR EARTH TECHNOLOGIES, INC. TEMPORARY RETAINING WALL SYSTEM INSTALLATION GUIDELINES MUST BE ON SITE AT ALL TIMES DURING WALL CONSTRUCTION.

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

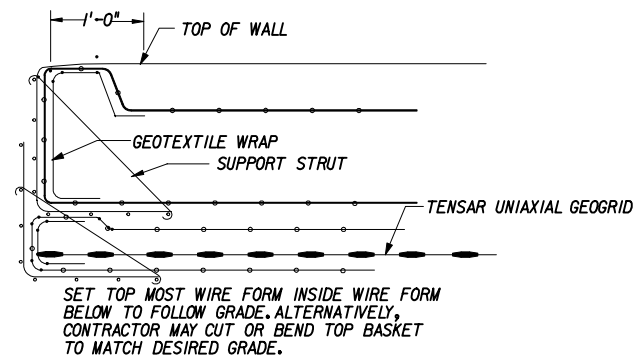
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THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

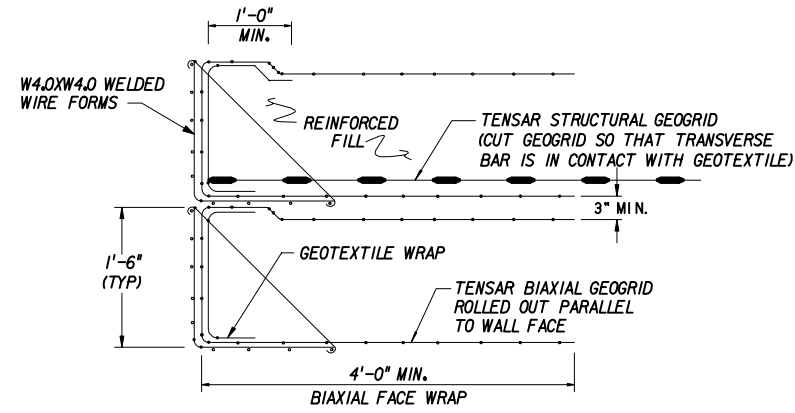
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EARTH TECHNOLOGIES, INC.**
5883 Glenridge Drive
Suite 200
Atlanta, GA 30328
(404) 250-1290



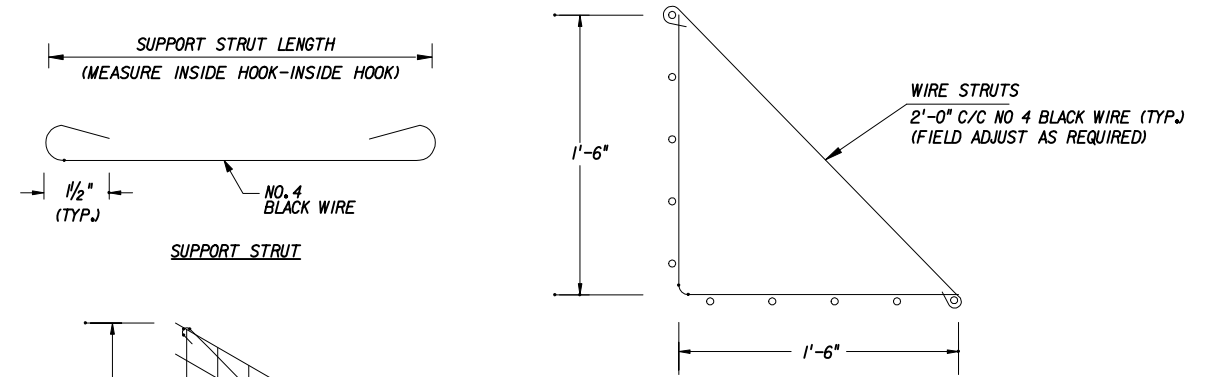
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES TEMPORARY RETAINING WALL					
	Names	Dates	Approved By <i>[Signature]</i>		
Designed By	BS	3/03	State Structures Design Engineer		
Drawn By	WL	3/03	Revision	Sheet No.	Index No.
Checked By	JSB	3/03	04	1 of 4	5125



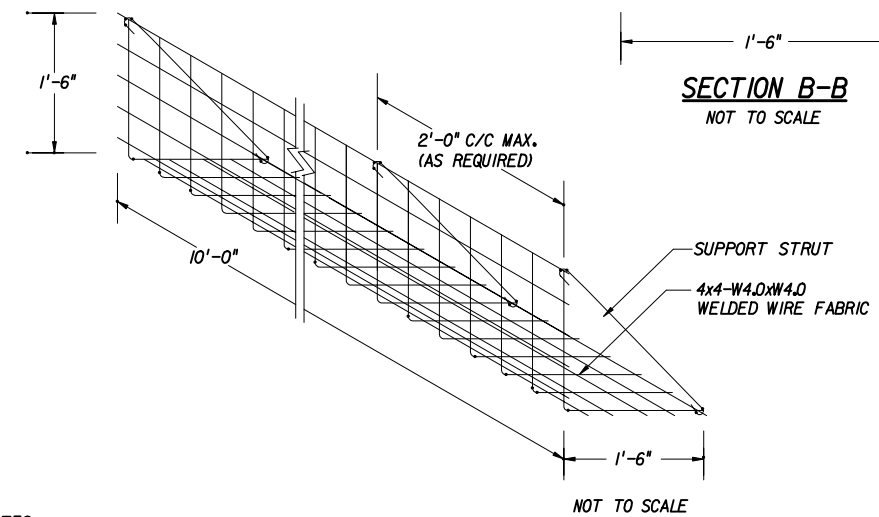
TOP WIRE BASKET DETAIL
NOT TO SCALE



WALL FACE DETAIL
NOT TO SCALE



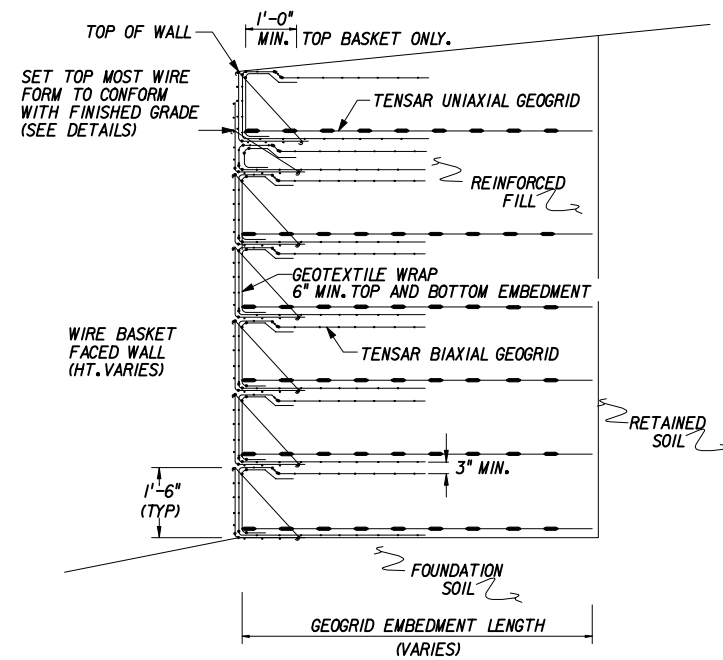
SECTION B-B
NOT TO SCALE



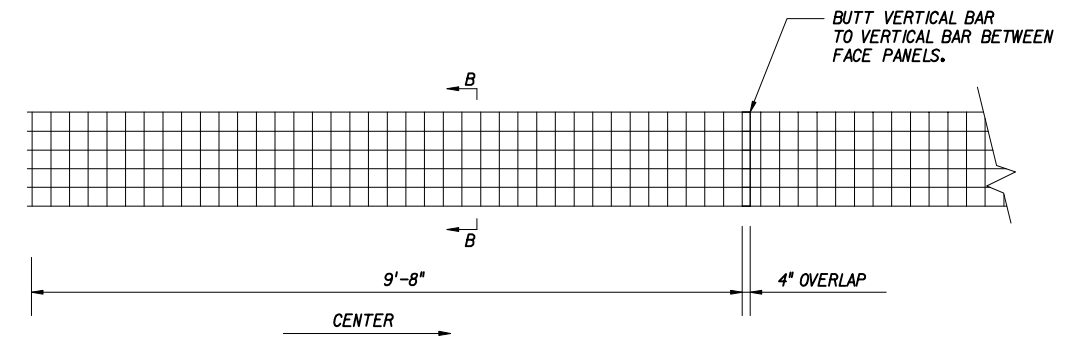
NOT TO SCALE

NOTES:

1. FACING TO CONSIST OF PREFABRICATED WWF 4x4-W4.0xW4.0 FORMS, PER ASTM A497.
2. ALL FORMS AND STRUTS WILL BE FABRICATED WITH NO. 4 BLACK WIRE.
3. OVERALL LENGTH OF WIRE FORMS IS 10'-0". EFFECTIVE CONSTRUCTED WIDTH IS 9'-8" WITH 4" OVER LAPPING AT ENDS.



TYPICAL CROSS-SECTION
NOT TO SCALE



WELDED WIRE FORM DETAIL
FOR BIAxIAL GEOGRID WRAP FACING
NOT TO SCALE

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

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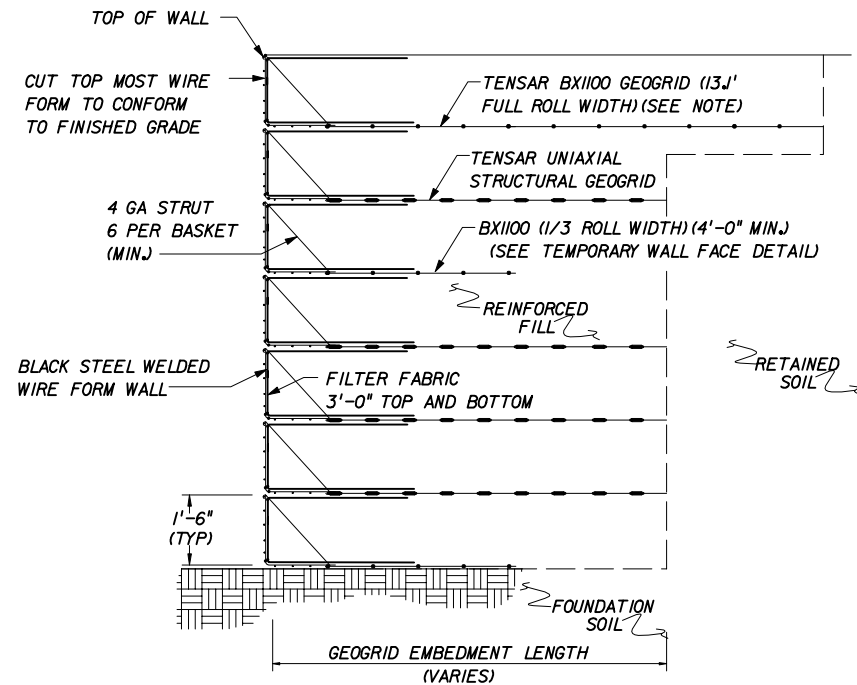
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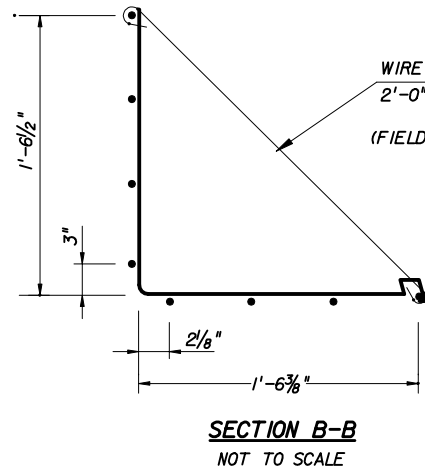
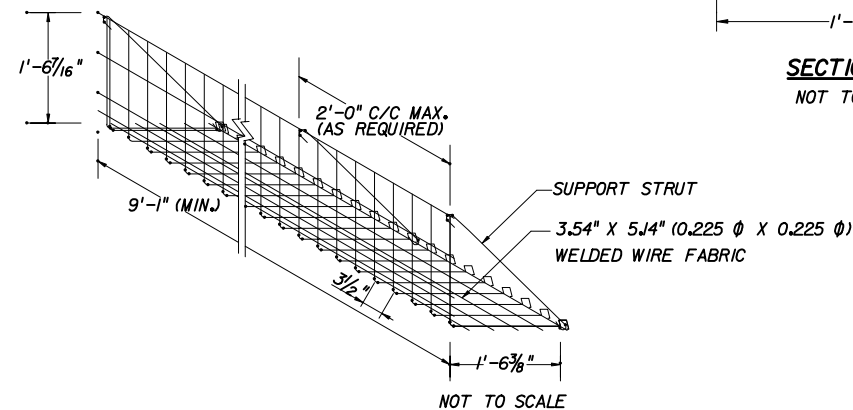
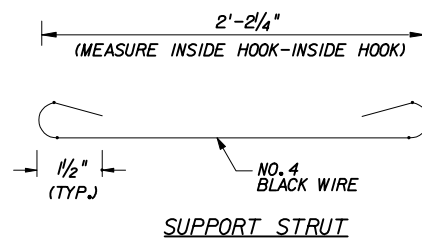
BIAxIAL GEOGRID WRAP FACING

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES TEMPORARY RETAINING WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By BS	3/03	State Structures Design Engineer		
Drawn By WL	3/03	Revision	Sheet No.	Index No.
Checked By JSB	3/03	04	2 of 4	5125

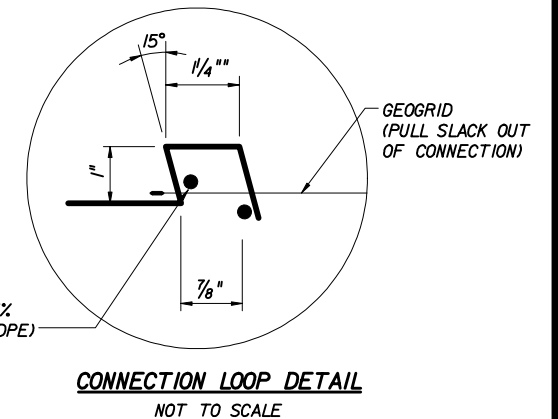


OPTIONAL TYPICAL CROSS-SECTION
NOT TO SCALE

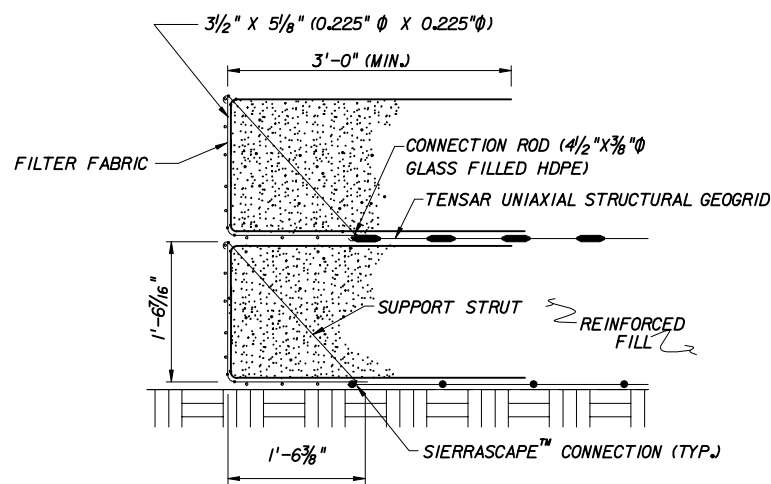
NOTE:
A FULL ROLL OF BX1100 SHOULD BE PLACED IN ALL TOP BASKETS NOT CONTAINING PRIMARY REINFORCEMENT.



SECTION B-B
NOT TO SCALE



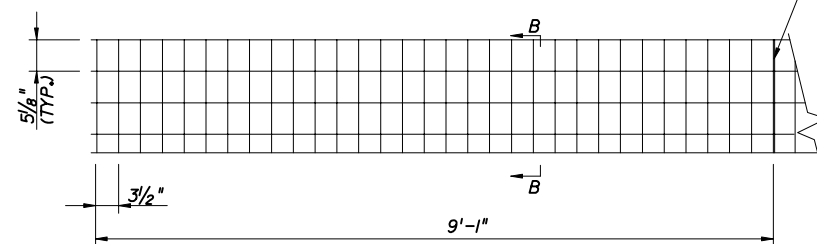
CONNECTION LOOP DETAIL
NOT TO SCALE



OPTIONAL WALL FACE DETAIL
NOT TO SCALE

NOTES:

1. FACING TO CONSIST OF PREFABRICATED WWF 3.56" X 5J4" (0.225Ø X 0.225Ø) FORMS, PER ASTM A497.
2. ALL FORMS AND STRUTS SHALL BE FABRICATED WITH NO. 4 BLACK WIRE.
3. OVERALL LENGTH OF WIRE FORMS IS 9'-1".



OPTIONAL WIRE FORM DETAIL
NOT TO SCALE

THESE DETAILS FOR "OPTIONAL NON-BIAXIAL GEOGRID WRAP WITH MECHANICAL CONNECTION" MAY BE USED IN LIEU OF THE DETAILS FOR "BIAXIAL GEOGRID WRAP FACING".

OPTIONAL MECHANICAL CONNECTION SYSTEM WITHOUT BIAXIAL GEOGRID WRAP

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

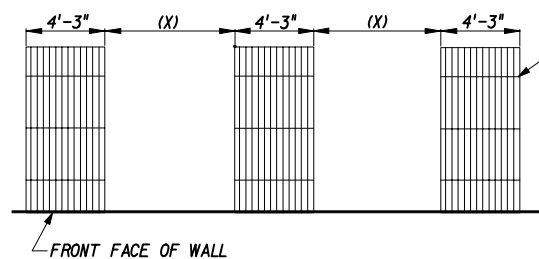
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES TEMPORARY RETAINING WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By BS	3/03	State Structures Design Engineer		
Drawn By WL	3/03	Revision	Sheet No.	Index No.
Checked By JSB	3/03	04	3 of 4	5125

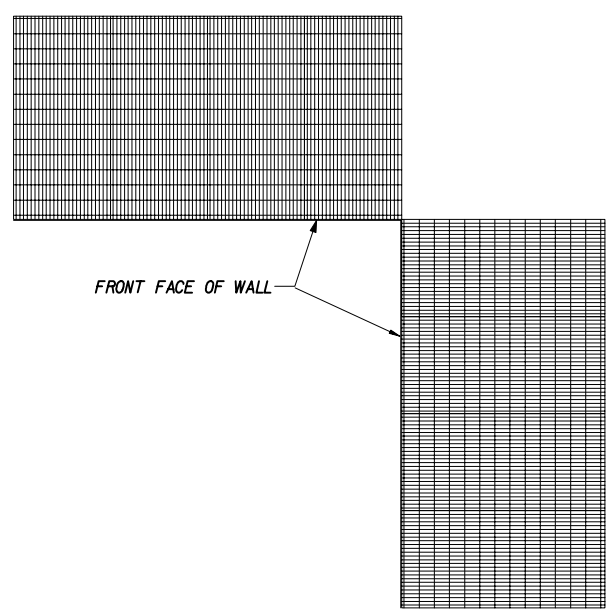


PRIMARY UNIAXIAL GEOGRID

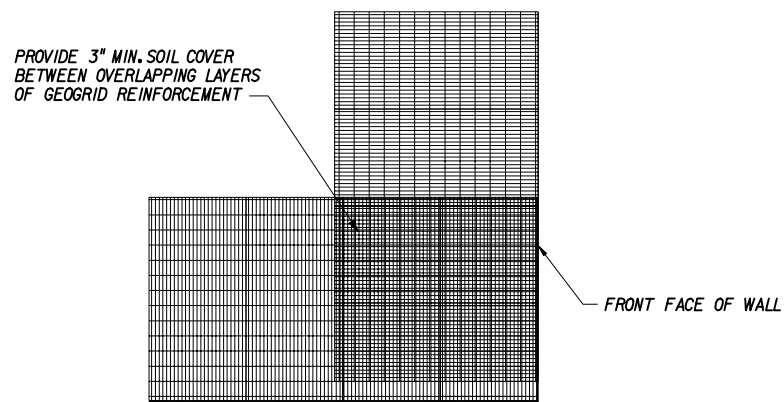
PERCENT COVERAGE	X
100	0
75	1'-5"
56	3'-4"

NOTES:
 LESS THAN 100% COVERAGE MAY ONLY BE USED WITH THE OPTIONAL NON-BIAXIAL GEOGRID WRAP WITH MECHANICAL CONNECTION.
 FOR LESS THAN 100% COVERAGE, PRIMARY REINFORCEMENT SHALL BE CONNECTED TO THE WWF FACING.
 ALTERNATE LAYERS OF UNIAXIAL PRIMARY REINFORCEMENT SHALL BE PLACED IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS PLACED WITH THE CENTERLINE OF THE GEOGRID IN ALIGNMENT WITH THE CENTERLINE OF THE SPACE BELOW.

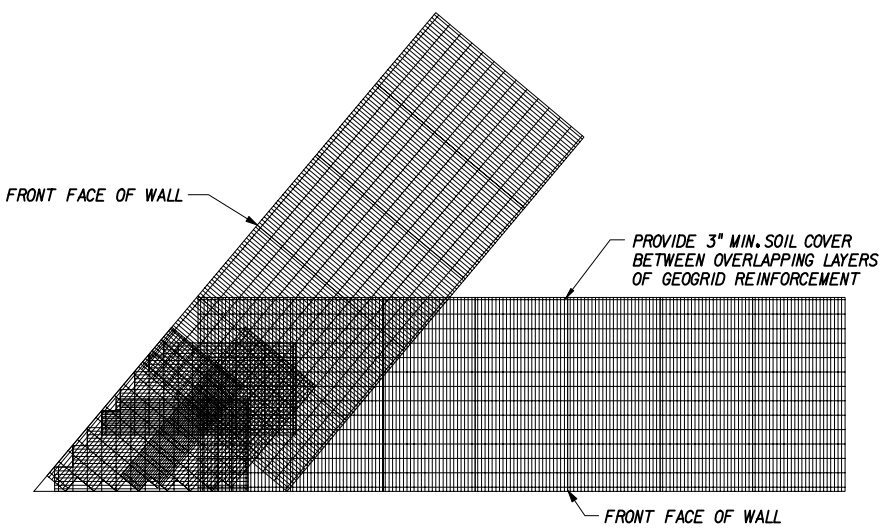
TYPICAL GEOGRID COVERAGE
NOT TO SCALE



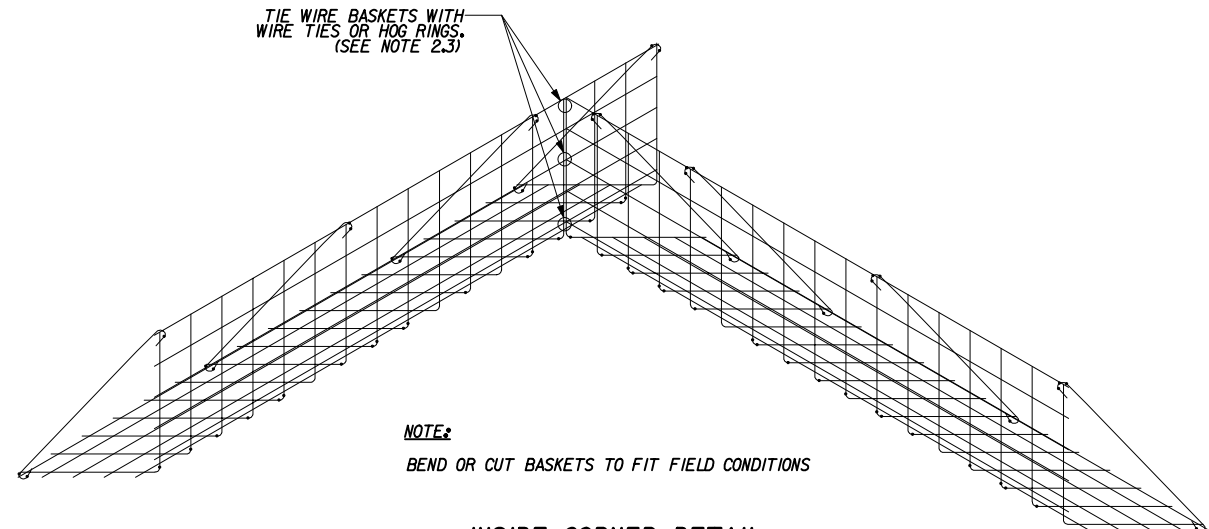
GEOGRID 90° INSIDE CORNER DETAIL
NOT TO SCALE



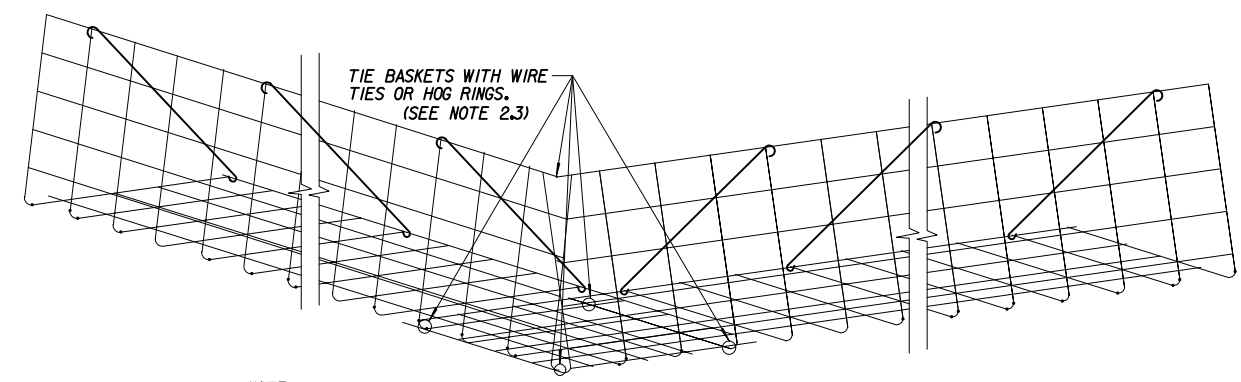
GEOGRID 90° OUTSIDE CORNER DETAIL
NOT TO SCALE



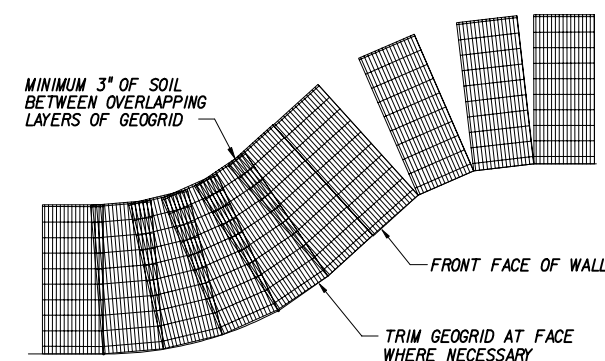
GEOGRID ACUTE CORNER DETAIL
NOT TO SCALE



INSIDE CORNER DETAIL
NOT TO SCALE



OUTSIDE CORNER DETAIL
NOT TO SCALE



GEOGRID PLACEMENT ON CURVES
NOT TO SCALE

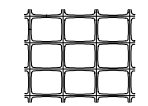
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

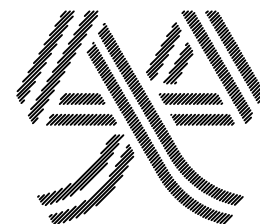
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM				
TENSAR EARTH TECHNOLOGIES				
TEMPORARY RETAINING WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By BS	3/03	State Structures Design Engineer		
Drawn By WL	3/03	Revision	Sheet No.	Index No.
Checked By JSB	3/03	04	4 of 4	5125



TC Mirafi Engineering Services, Inc.

365 SOUTH HOLLAND DRIVE, PENDERGRASS, GA 30567 TEL (706) 693-2226

CONSTRUCTION NOTES FOR THE PLACEMENT OF MIRAFI REINFORCEMENT AND BACKFILL SOILS FOR TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

1.0 DESIGN CRITERIA

1.1 SOIL PARAMETERS:

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUE OF ϕ , c , AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS.

1.2 MINIMUM FACTOR OF SAFETY

1.2.1 EXTERNAL STABILITY

SLIDING	1.5
OVERTURNING	2.0
BEARING CAPACITY	2.5

1.2.2 INTERNAL STABILITY

RUPTURE	1.5
PULLOUT	1.5

1.2.3 GLOBAL STABILITY

1.5

1.2.4 UNIFORM SURCHARGE

250 PSF

1.2.5 HYDROSTATIC FORCES

NONE

1.2.6 SEISMIC FORCES

IN ACCORDANCE WITH AASHTO AND FDOT PLANS PREPARATION MANUAL.

2.0 MATERIALS

2.1 GEOSYNTHETIC REINFORCEMENT AND RETENTION FABRIC, MIRAFI 140N, SHALL BE MANUFACTURED BY TC MIRAFI, PENDERGRASS, GEORGIA.

2.2 REINFORCED BACKFILL SHALL MEET THE REQUIREMENTS IN FLORIDA DOT SPECIFICATIONS - SECTION 548 RETAINING WALL SYSTEMS.

2.3 WALL FACING SHALL BE PRE-FABRICATED STEEL WIRE FORMS COMPOSED OF A MINIMUM W3.5 SIZE STANDARD WIRE WELDED ORTHOGONALLY 4 INCHES ON CENTER. STEEL WIRE FORMS SHALL BE AS DETAILED IN THE DRAWINGS.

2.4 RING FASTENER SHALL BE BLAIR STYLE #3-LOXIT, 10 GAUGE GALVANIZED, MANUFACTURED BY DECKER MANUFACTURING CO. OR EQUIVALENT.

3.0 WALL CONSTRUCTION

3.1 FOR LOCATION AND ALIGNMENT OF REINFORCED SOIL STRUCTURES, SEE RETAINING WALL CONTROL PLANS.

3.2 STEEL WIRE FORMS, REINFORCEMENT, SOIL RETENTION FABRIC, AND COMPACTED FILL SHALL BE PLACED IN SUCCESSIVE LIFTS IN THE SEQUENCE SHOWN IN THE CONSTRUCTION DRAWINGS.

3.3 GEOSYNTHETIC REINFORCEMENT SHALL BE PLACED AT THE ELEVATIONS, LOCATION, TYPE, ORIENTATION, AND TO THE LENGTHS SHOWN ON THE CONSTRUCTION DRAWINGS. THE REINFORCEMENT SHALL BE PLACED IN A MANNER SO AS TO AVOID SLACK OR WRINKLES. PINNING OR STAKES MAY BE REQUIRED TO MAINTAIN WRINKLE-FREE PLACEMENT DURING INSTALLATION.

3.4 AT EACH REINFORCEMENT ELEVATION, BACKFILL SOILS SHALL BE COMPACTED TO A LEVEL SURFACE BEFORE PLACING THE REINFORCEMENT. ALL REINFORCEMENT SHALL BE PLACED NORMAL TO THE FACE OF THE WALL.

3.5 ADJACENT WIRE FORMS SHALL BE CONNECTED ALONG VERTICAL AND HORIZONTAL SEAMS WITH GALVANIZED INTERLOCKING FASTENERS PLACED 8 INCHES ON CENTER.

3.6 BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH FDOT SPECIFICATIONS - SECTION 548.

3.7 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED FOR THE OPERATION OF TRACKED VEHICLES OVER THE REINFORCEMENT. TURNING OF TRACKED VEHICLES SHOULD BE AVOIDED TO PREVENT TRACKS FROM DISPLACING THE FILL AND THE REINFORCEMENT.

3.8 RUBBER Tired VEHICLES MAY PASS OVER THE REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

3.9 TC MIRAFI ENGINEERING SERVICES, INC. IS RESPONSIBLE FOR THE INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY IS THE RESPONSIBILITY OF OTHERS.

TC Mirafi Engineering Services, Inc. 365 SOUTH HOLLAND DRIVE PENDERGRASS, GEORGIA 30567

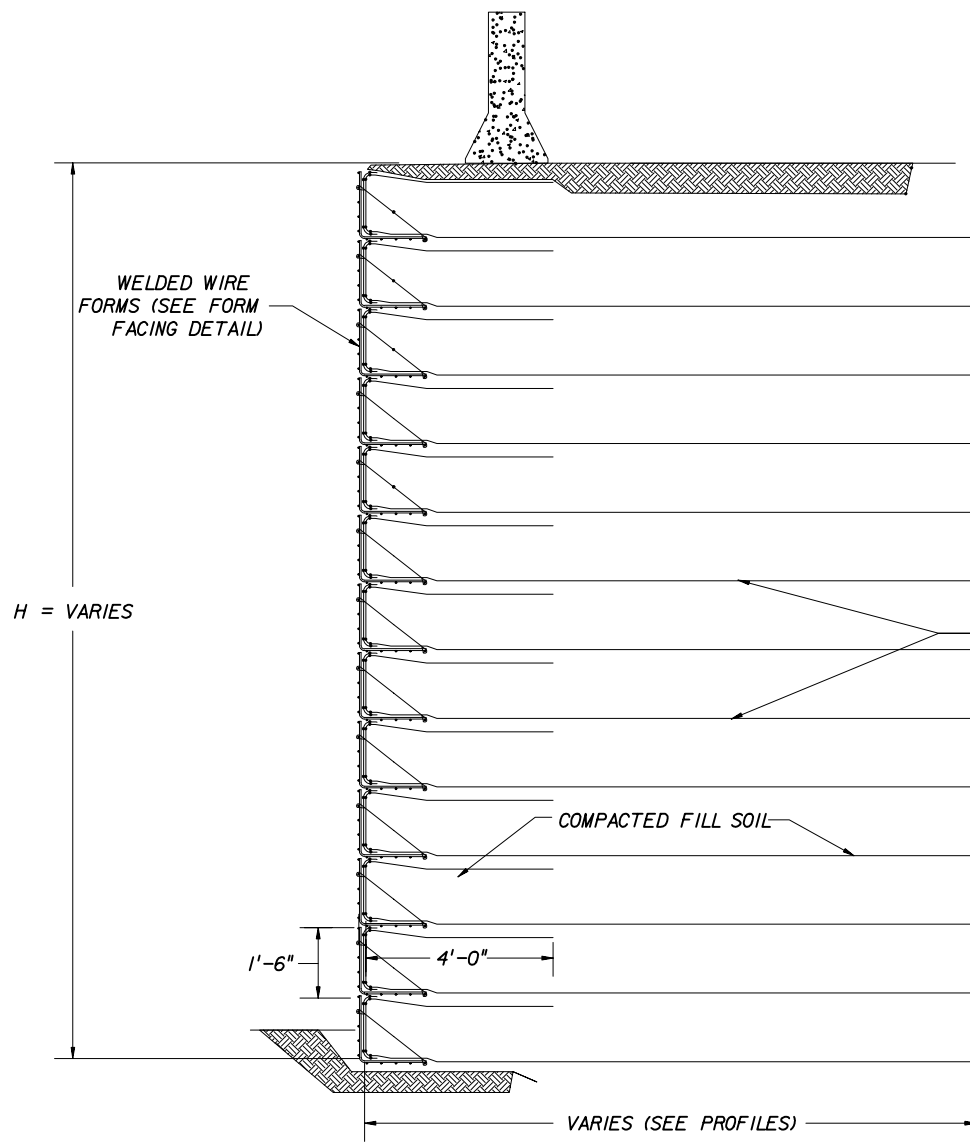


THIS SYSTEM SHALL NOT BE USED FOR ACUTE ANGLE BIN WALLS. THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

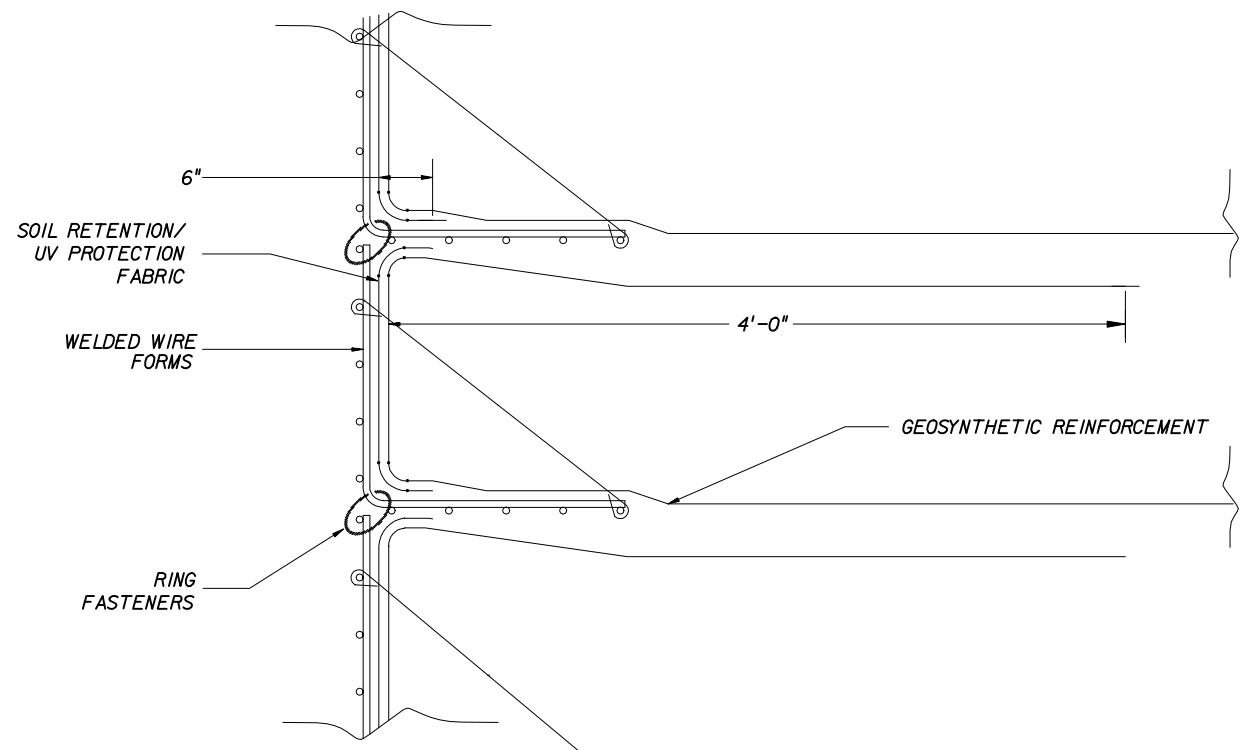
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM TC MIRAFI WIRE FORM TEMPORARY

	Names	Dates	Approved By		
Designed By	NPA	11/5/98	State Structures Design Engineer		
Drawn By	CGA	11/5/98	Revision	Sheet No.	Index No.
Checked By	NPA	11/5/98	00	1 of 4	5130

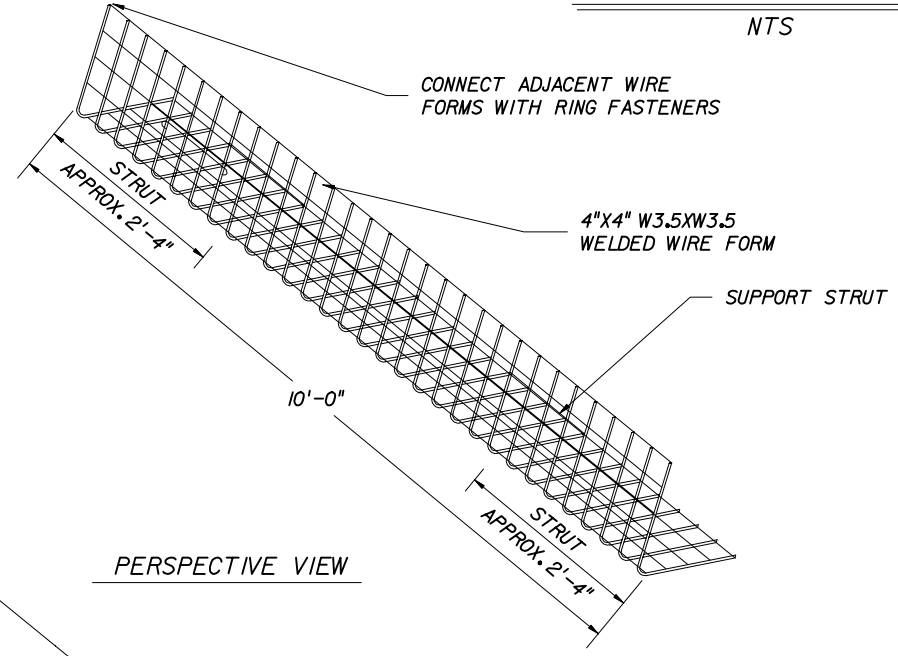


WIRE FORM
TEMPORARY WALL SECTION
NTS

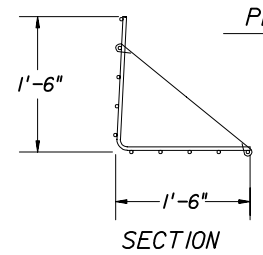


WIRE FORM FACING DETAIL
NTS

MIRAFI GEOSYNTHETIC PRIMARY SOIL
REINFORCEMENT (SEE WALL
PROFILE FOR PLACEMENT DETAILS)

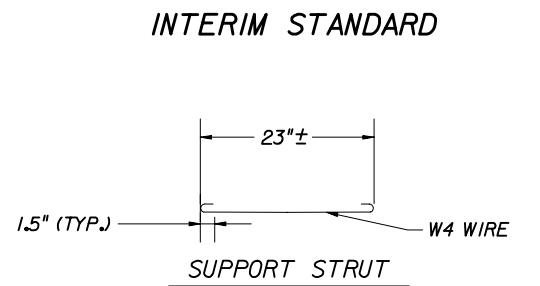


PERSPECTIVE VIEW



SECTION

WELDED WIRE FORM DETAIL
NTS



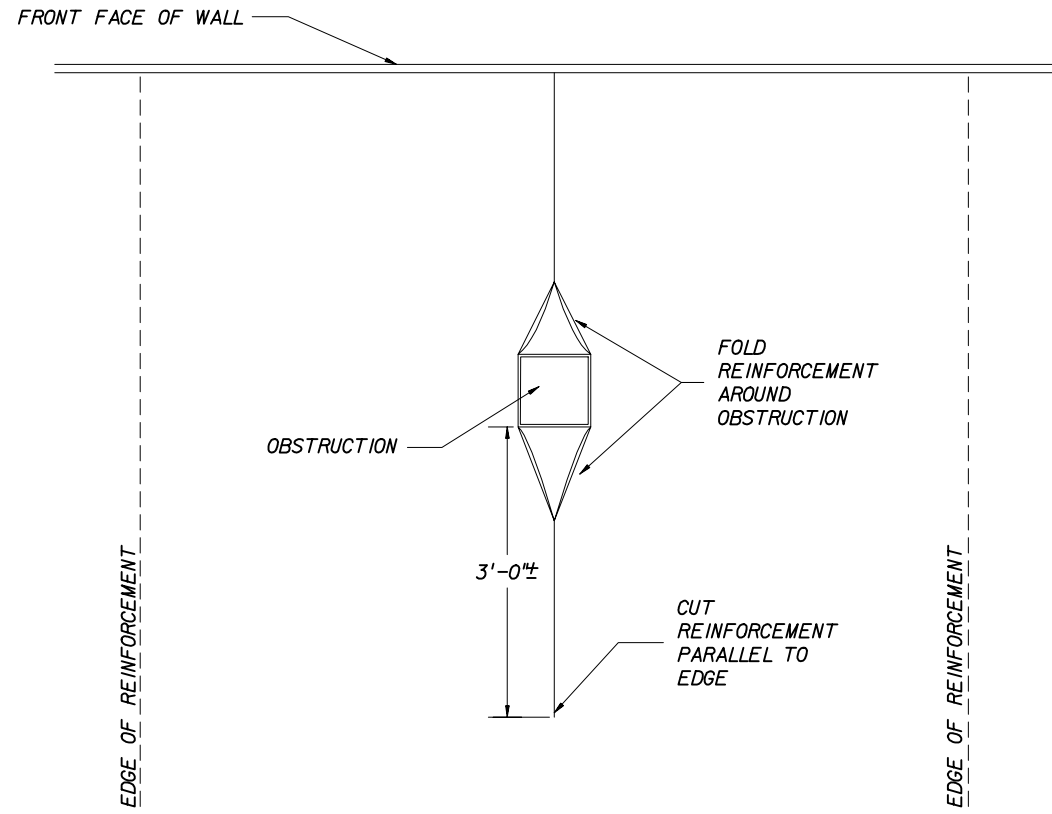
INTERIM STANDARD

TC Mirafi
Engineering
Services, Inc.
365 SOUTH HOLLAND DRIVE
PENDERGRASS, GEORGIA 30567

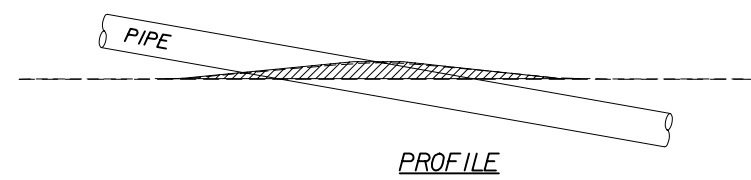
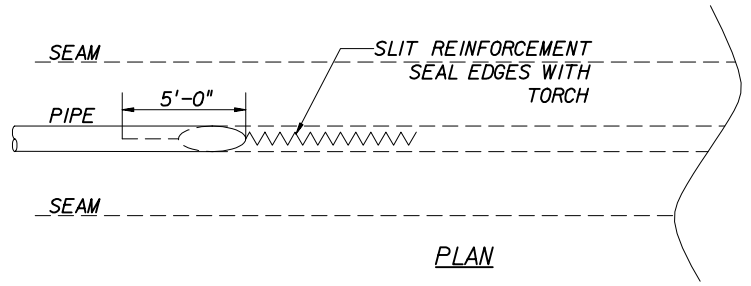


THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TC MIRAFI WIRE FORM TEMPORARY				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	NPA	11/5/98	State Structures Design Engineer	
Drawn By	CGA	11/5/98	Revision	Sheet No.
Checked By	NPA	11/5/98	00	2 of 4
				5130



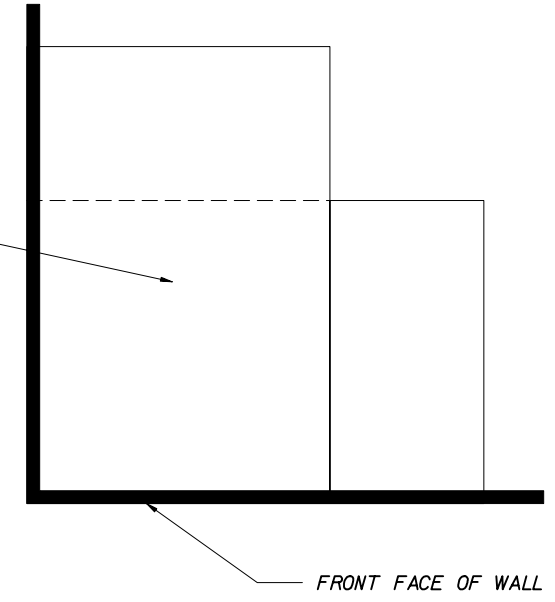
PLACEMENT AROUND OBSTRUCTIONS
NTS



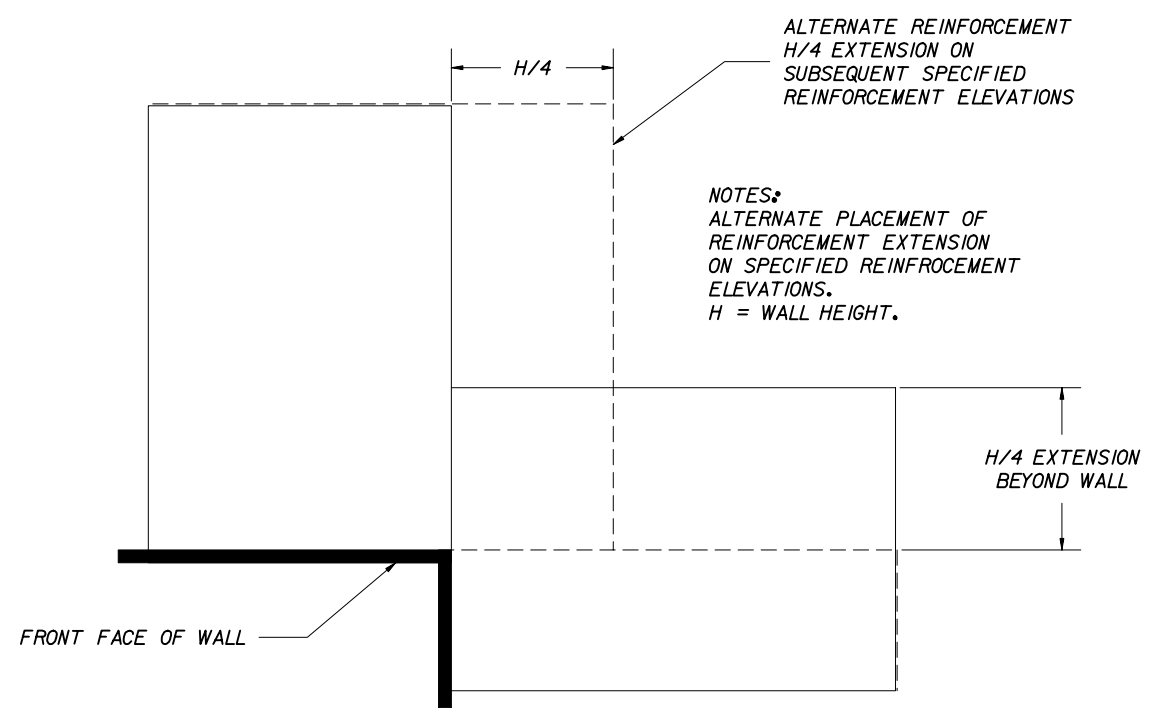
INSTALLATION AROUND PIPE RUNNING PARALLEL TO MACHINE (ROLL) DIRECTION OF REINFORCEMENT
NTS

- o SLIT REINFORCEMENT FROM END CLOSEST TO PIPE TO 6 FEET BEYOND.
- o LAY REINFORCEMENT IN AROUND PIPE.

PROVIDED 6" MIN. OF SOIL BETWEEN OVERLAPPING LAYERS OF REINFORCEMENT FOR PROPER ANCHORAGE.



CONVEX CORNER DETAIL
NTS



CONCAVE CORNER DETAIL
NTS

NOTES:
ALTERNATE PLACEMENT OF REINFORCEMENT EXTENSION ON SPECIFIED REINFORCEMENT ELEVATIONS.
H = WALL HEIGHT.

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PENDERGRASS, GEORGIA 30567

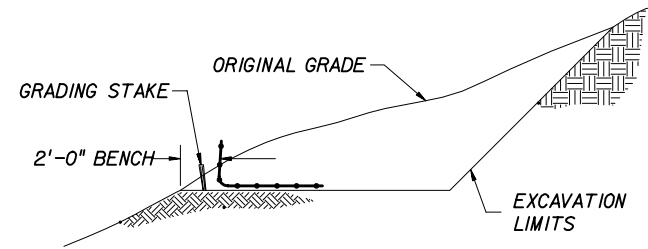


THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RETAINING WALL SYSTEM TC MIRAFI WIRE FORM TEMPORARY				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	NPA	11/5/98	State Structures Design Engineer	
Drawn By	CGA	11/5/98	Revision	Sheet No.
Checked By	NPA	11/5/98	00	3 of 4
				5130

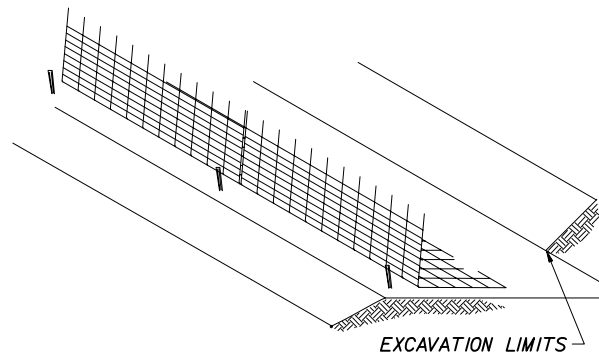
CONSTRUCTION SEQUENCE

- EXCAVATE FOR LEVEL BASE TO A LENGTH ADEQUATE FOR REINFORCEMENT EMBEDMENT.
- SET GRADING STAKES AT A 6 INCHES OFFSET TO FACILITATE PROPER WIRE FORM ALIGNMENT.
- EMBED BOTTOM BASKET 6 INCHES BELOW FINISHED GRADE AT FRONT FACE OF WALL OR AS SHOWN ON WALL PROFILE.



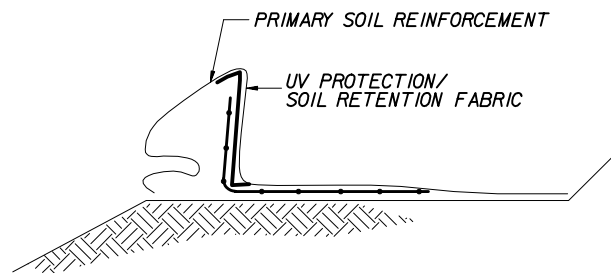
STEP 1

- FOR THE FIRST COURSE OF THE WALL, ALIGN BASKETS WITHOUT SPACES AND ATTACH WITH RING FASTENERS.
- INSTALL STRUTS AT ABOUT 5 FOOT SPACING.



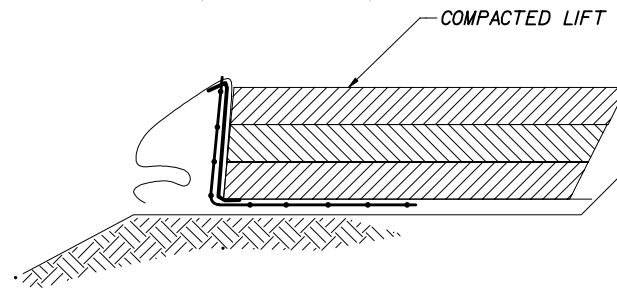
STEP 2

- PLACE UV PROTECTION/SOIL RETENTION FABRIC AT ELEVATIONS AS SHOWN.
- PLACE FACE FABRIC AGAINST WIRE FORM FACE.
- DRAPE FABRIC OVER WIRE FORM ALLOWING FOR THE REQUIRED WRAP EMBEDMENT.



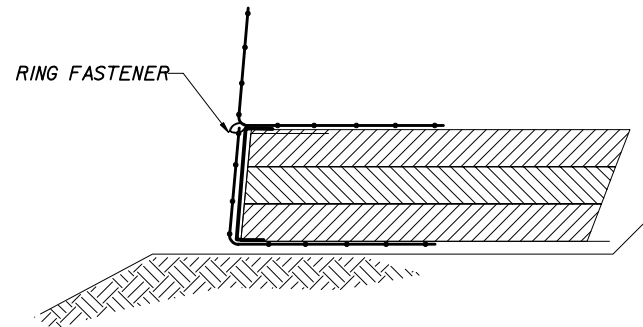
STEP 3

- PLACE BACKFILL SOIL IN 6 INCHES MAXIMUM LIFTS.
- COMPACT SOILS WITHIN 1M OF WIRE FORM USING LIGHT WEIGHT COMPACTION EQUIPMENT.
- COMPACT REMAINING BACKFILL SOILS WITH STANDARD COMPACTION EQUIPMENT TO REQUIRED DENSITY.



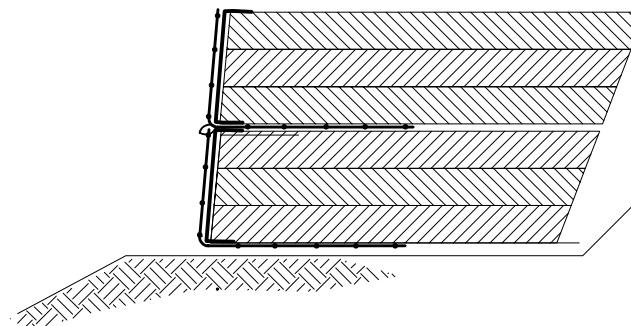
STEP 4

- PULL UV PROTECTION/SOIL RETENTION FABRIC AND PRIMARY REINFORCEMENT OVER COMPACTED FILL AND ANCHOR WITH SOIL.
- PLACE THE NEXT WIRE FORM AGAINST THE LOWER FORM AND ATTACH WITH RING FASTENERS.
- INSTALL STRUTS ON SUCCEEDING LIFT.

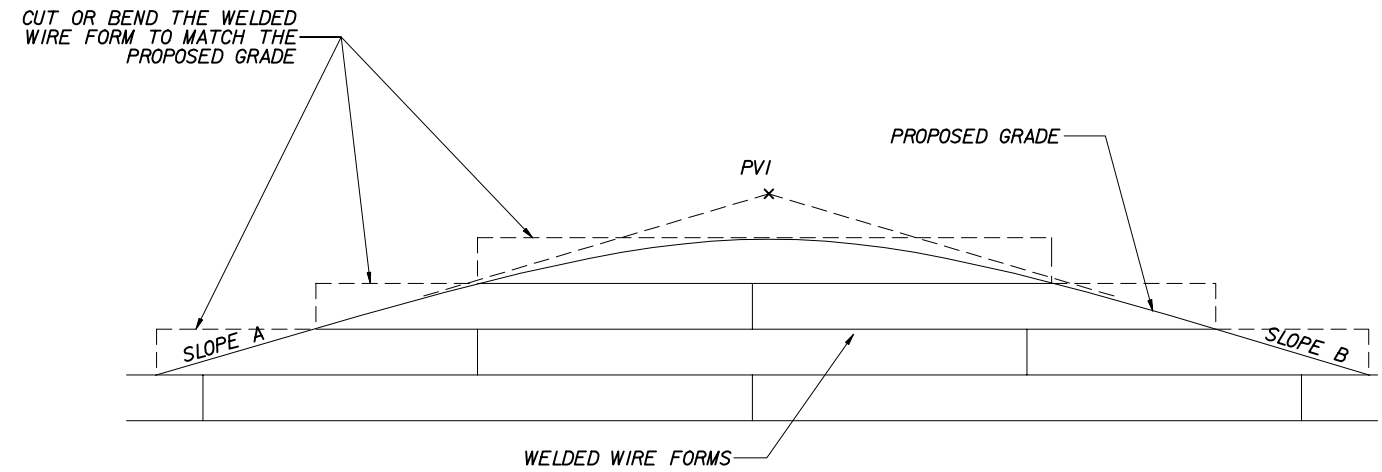


STEP 5

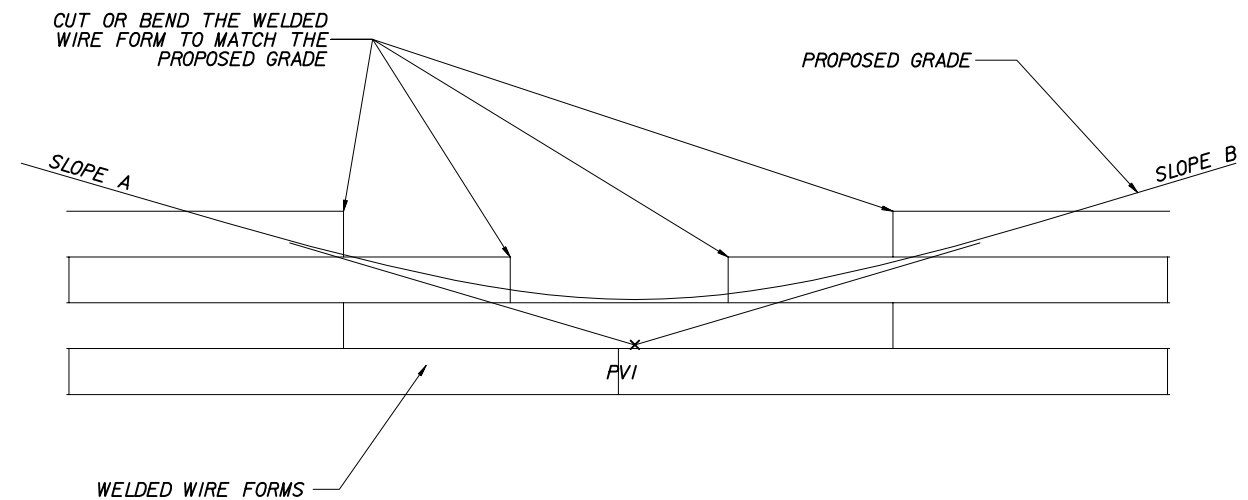
- REPEAT STEPS 2 THRU 5 UNTIL DESIRED HEIGHT OF WALL IS REACHED.



STEP 6



WELDED WIRE FORM ON VERTICAL CREST CURVE
NTS




WELDED WIRE FORM ON VERTICAL SAG CURVE
NTS

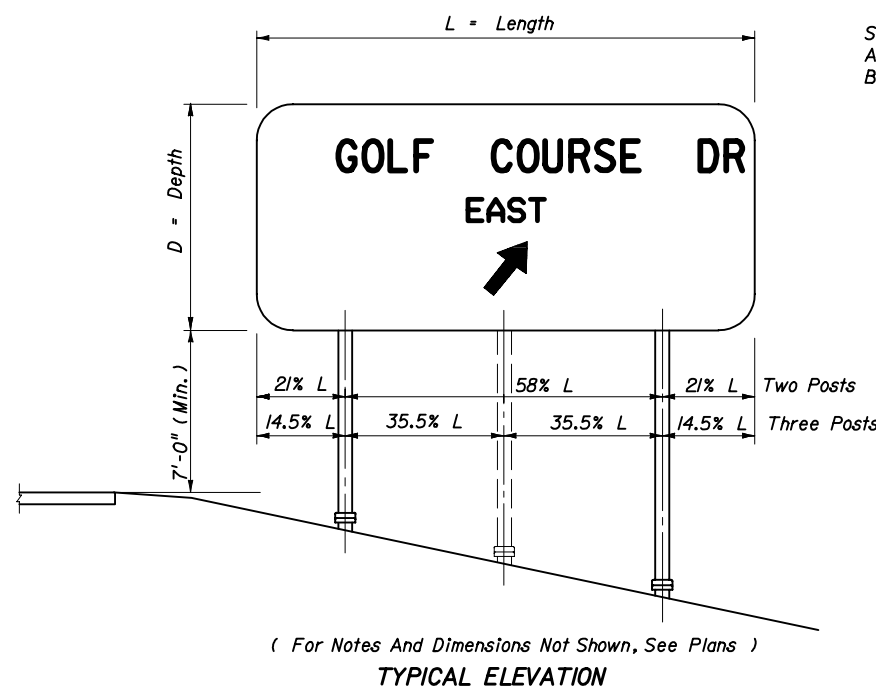
TC Mirafi
Engineering
Services, Inc.
365 SOUTH HOLLAND DRIVE
PENDERGRASS, GEORGIA 30567



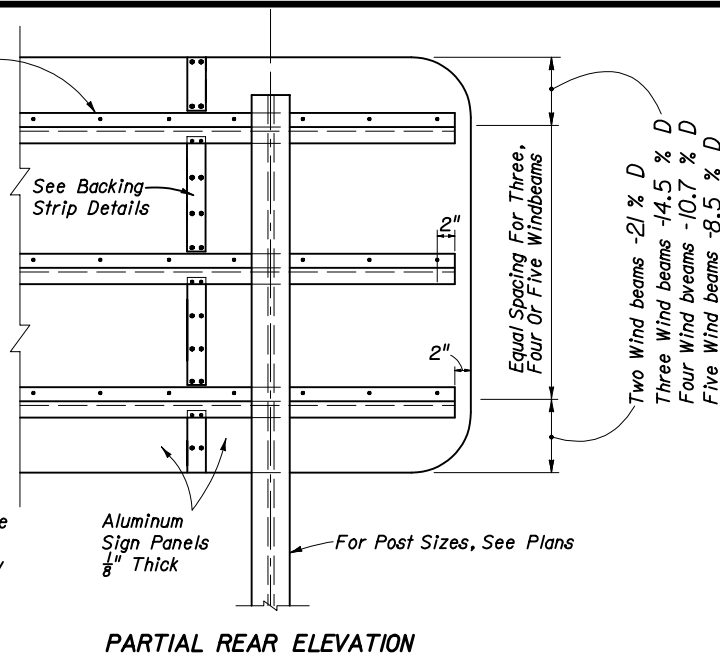
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEM
TC MIRAFI WIRE FORM TEMPORARY

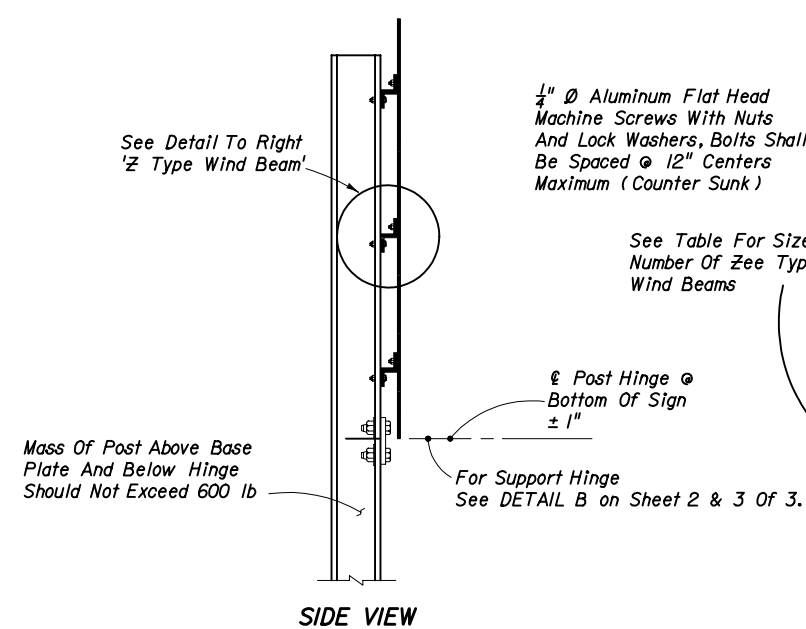
Names	Dates	Approved By		
Designed By	NPA 11/5/98	 State Structures Design Engineer		
Drawn By	CGA 11/5/98			
Checked By	NPA 11/5/98	Revision	Sheet No.	Index No.
		00	4 of 4	5130



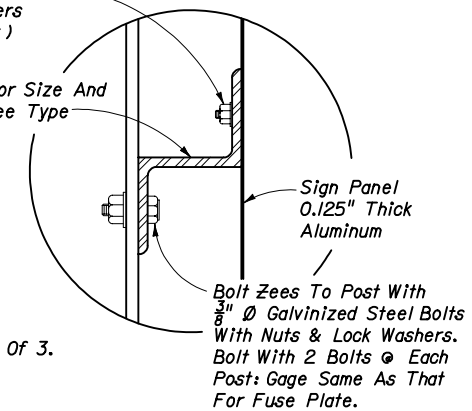
See Tables For Size And Number Of Wind Beams



Note: It shall be the contractor's responsibility to determine the length of the column supports in the field prior to fabrication.



GENERAL NOTES

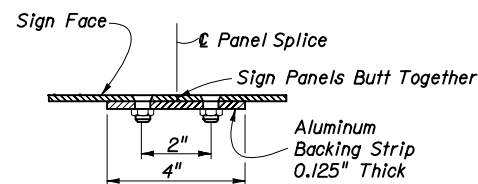


- DESIGN SPECIFICATION** Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals, AASHTO 1994. For welding refer to the latest editions of the AWS Structural Welding Codes for Steel and Aluminum, the AASHTO Standard Specifications for Welding Structural Steel Highway Bridges, and the FDOT Standard Specifications with Supplement.
- DESIGN WIND LOAD** See Design Wind Speeds By County for wind in miles per hour on flat sign area. The allowable working stress shall be increased by 40% for combination dead load and wind load.
- ALUMINUM MATERIALS** All aluminum materials shall meet the requirements of the Aluminum Association's Alloy 6061-T6 and also the following ASTM specifications: Sheets and plates, B209; extruded tube, bars, rods & shapes, B221; and standard structural shapes, B308. Sheets are to be degreased, etched, neutralized and treated with Alodine 1200, Iridite 14-2, Bonderite 721, or equal. No stenciling permitted on sheets. Aluminum welding rods shall meet the requirements of Aluminum Association Alloy No. 5556 filler wire.
- STRUCTURAL STEEL** All structural steel shall meet the requirements of ASTM A709 Grade 36.
- ALUMINUM BOLTS, NUTS, & LOCKWASHERS** Aluminum bolts shall meet the requirements of Aluminum Association Alloy 2024-T4 (ASTM F468). The bolts shall have an anodic coating at least 0.0002" thick and be Chromate sealed. Lock washers shall meet the requirements of Aluminum Association Alloy 7075-T6 (ASTM B221). Nuts shall meet the requirements of Aluminum Association Alloy 6061-T6 or 6262-T9 (ASTM F467).
- STEEL BOLTS, NUTS, & WASHERS** All steel bolts, nuts and washers shall meet the requirements of ASTM A325.
- ALTERNATE MATERIAL** Material meeting the requirements of ASTM B209 or Aluminum Association Alloys 5154-H38 or 5052-H38 may be used for sheet and plate. Material meeting the requirements of Aluminum Association Alloy 6351-T5 and ASTM B221 may be used for extruded bars, rods, shapes and tubes.
- TOLERANCES** All above materials shall be in accordance with the governing ASTM specifications.
- GALVANIZING** All steel shapes, angles, tees, plates, bolts, nuts and washers shall be galvanized in accordance with Standard Specifications 962-7.
- BASE CONNECTION** High strength bolts L₂ in the base connection shall be tightened only to the torque shown in the tables on sheets 2 & 3 of 3. Overtightened base connections will not be accepted.
- FUSE PLATES** All holes in fuse plates shall be drilled. All plate cuts shall, preferably, be saw cuts; however, flame cutting will be permitted provided all edges are ground. Metal projecting beyond the plane of the plate face will not be tolerated.
- SIGN FACE** All sign face corners shall be rounded. See Sign Layout Sheet.
- SHOP DRAWINGS** When ground sign supports are fabricated in accordance with these plans no shop drawings are required. Shop drawings will be required for approval when the column length exceeds the length shown in the plans by more than 2'-0". However, shop drawings for sign panels, messages, lettering and quantities shall be submitted to traffic plans for approval.
- FABRICATOR NOTE** All bolted connections, except L₂ bolts and Zee to Post bolts, shall be high strength bolts. Bolts shall be tightened in the shop following a method approved by the engineer. Tightening shall be to such a degree so as to attain in each bolt the residual tension specified in the tabulation below:
- FOUNDATION** Contractor may use precast foundations in pre-drilled holes a minimum of 12" larger than the foundation indicated on the plans in either wet or dry conditions. The holes shall be clean and without loose material. Temporary casing shall be required if the soil is unstable. The holes shall be filled with flowable concrete after the precast foundation is in place. The cost of flowable concrete, installing and removal of casing shall be included in the unit price of Sign Multi-Post.

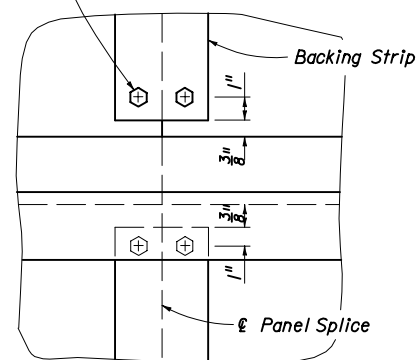
Note: If the sign panels are deeper than 14', a Horizontal Panel Splice is allowed at an interior Z bar support, shop drawings shall be required. Minimum panel section width = 2'-6" .

DESIGN WIND SPEEDS BY COUNTY

- ZONE NO. 1 (60 mph)**
Alachua, Baker, Bay, Bradford, Calhoun, Clay, Columbia, Escambia, Gadsden, Gilchrist, Hamilton, Holmes, Jackson, Jefferson, Lafayette, Lake, Leon, Liberty, Madison, Marion, Okaloosa, Putnam, Santa Rosa, Sumter, Suwannee, Union, Walton and Washington Counties.
- ZONE NO. 2 (70 mph)**
Citrus, Desoto, Dixie, Duval, Flagler, Franklin, Glades, Gulf, Hardee, Hendry, Hernando, Highlands, Hillsborough, Levy, Nassau, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Seminole, St. Johns, Taylor and Wakulla Counties.
- ZONE NO. 3 (80 mph)**
Brevard, Charlotte, Collier, Indian River, Lee, Manatee, Martin, Palm Beach, Sarasota, St. Lucie and Volusia Counties.
- ZONE NO. 4 (90 mph)**
Broward, Dade and Monroe Counties.



Pairs Of 1/4" Ø Aluminum Flat Head Machine Screws With Nuts And Lock Washers Spaced At 1'-0" Centers Maximum



NUMBER OF WIND BEAMS FOR GIVEN DEPTH & WIND					
Wind	No. Beams	Max. Depth	Wind	No. Beams	Max. Depth
60	2	8'-0"	80	2	6'-8"
60	3	13'-4"	80	3	11'-4"
60	4	18'-0"	80	4	15'-4"
60	5	22'-8"	80	5	19'-0"
70	2	7'-0"	90	2	6'-0"
70	3	12'-0"	90	3	10'-4"
70	4	16'-4"	90	4	14'-0"
70	5	20'-8"	90	5	17'-8"

SIZE OF WIND BEAMS		
Size Of Zee*	Length Of Sign (Feet)	
	2 Posts	3 Posts
Z 1.75 x 1.75 x 1.08	0 - 11'-0"	0 - 17'-4"
Z 3 x 2.69 x 2.33	11'-1" - 19'-0"	17'-5" - 29'-6"
Z 3 x 2.69 x 3.38	19'-1" - 20'-8"	29'-7" - 31'-6"

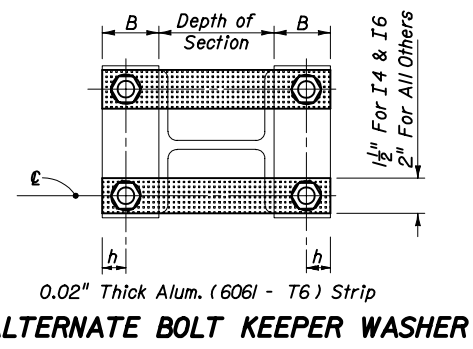
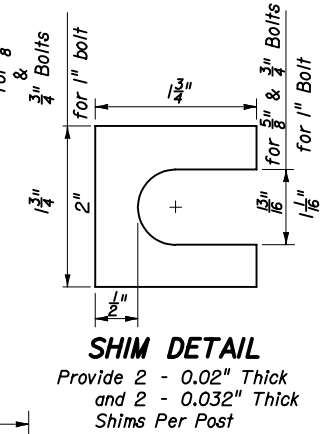
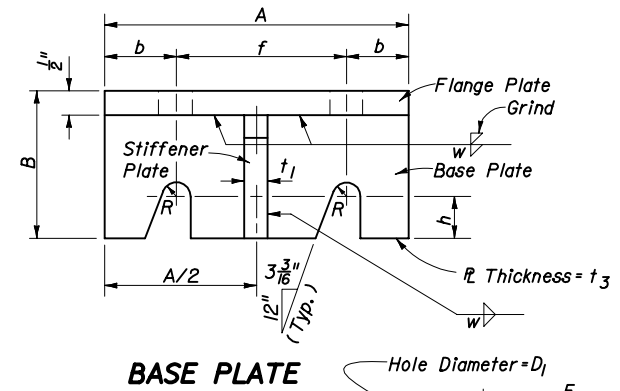
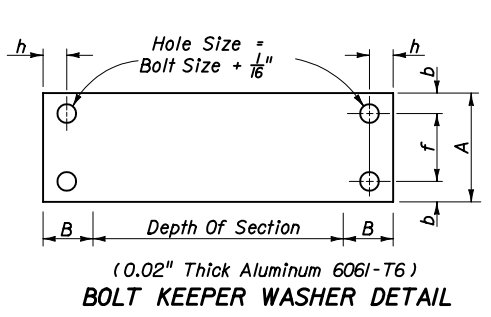
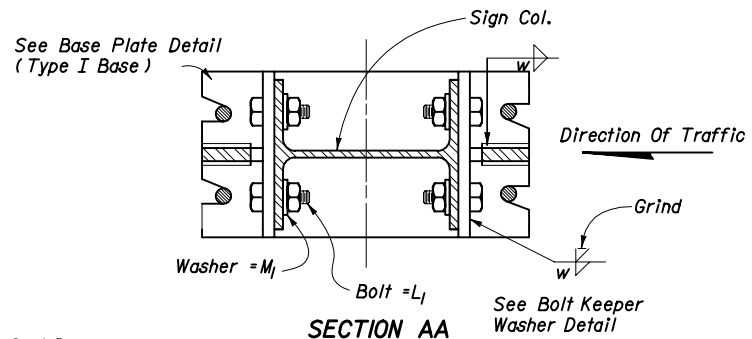
*Note: Zees Are Aluminum - No Steel Equivalent Available
Designation Gives (Member Depth) x (Width) x (lb/ft)

**HIGH STRENGTH BOLTS (A-325)
MINIMUM RESIDUAL TENSION**

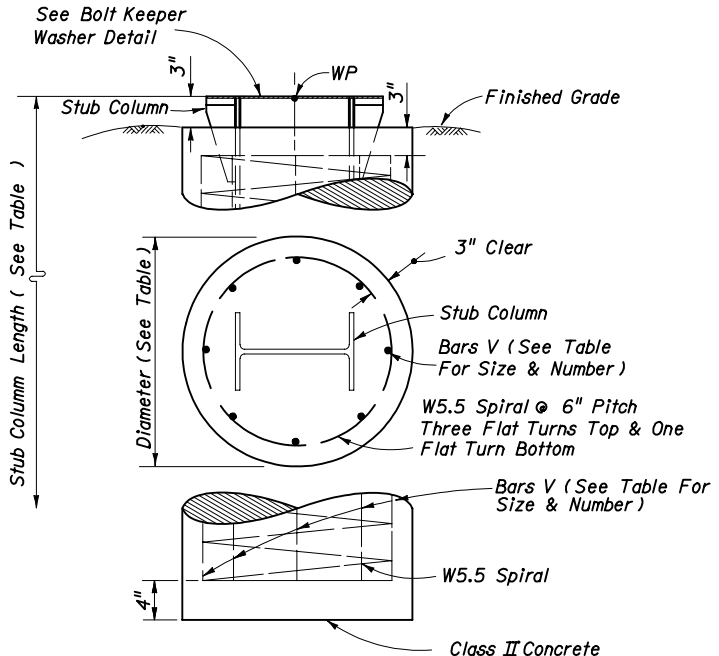
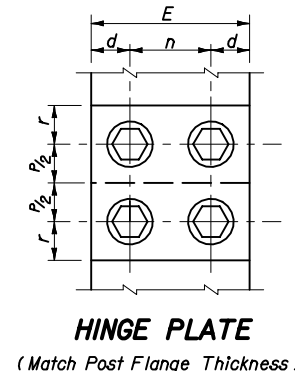
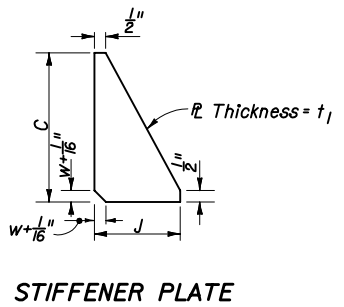
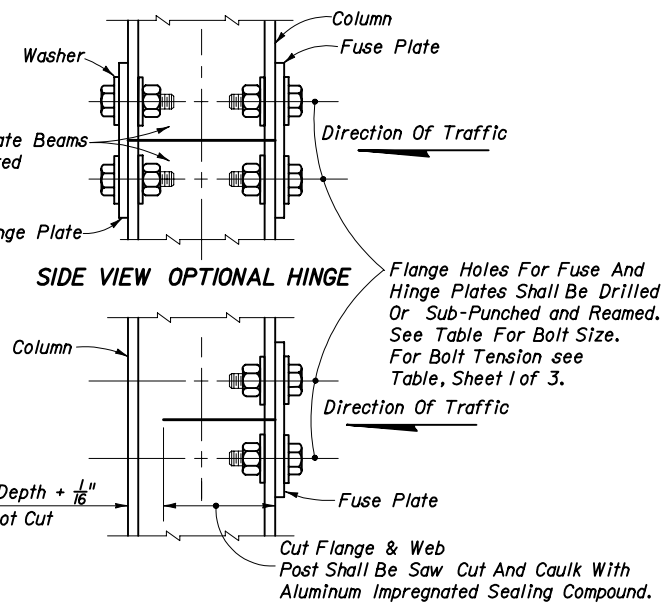
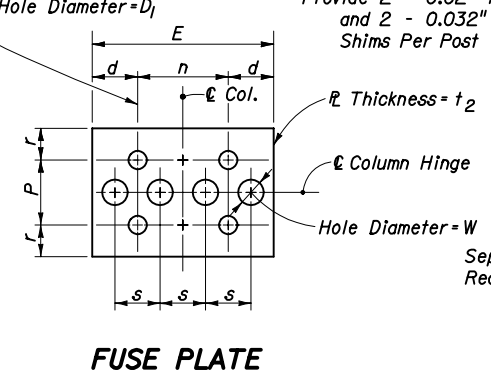
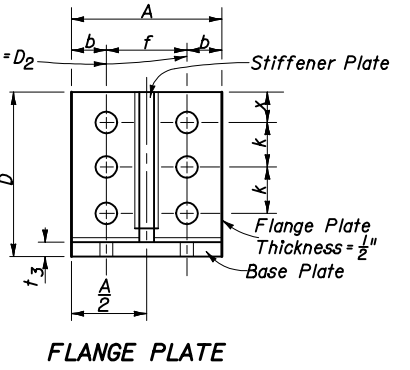
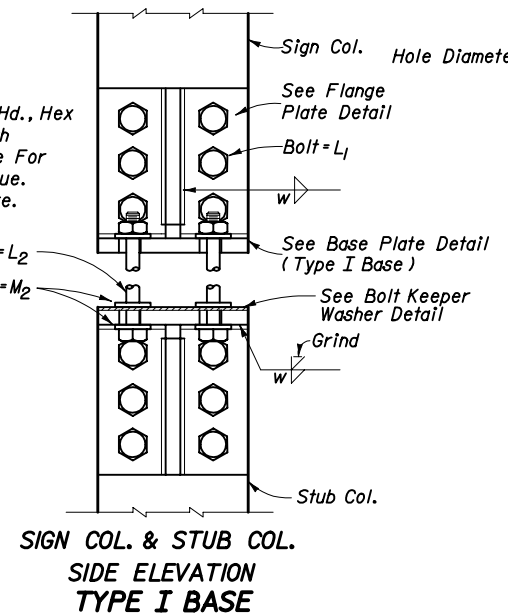
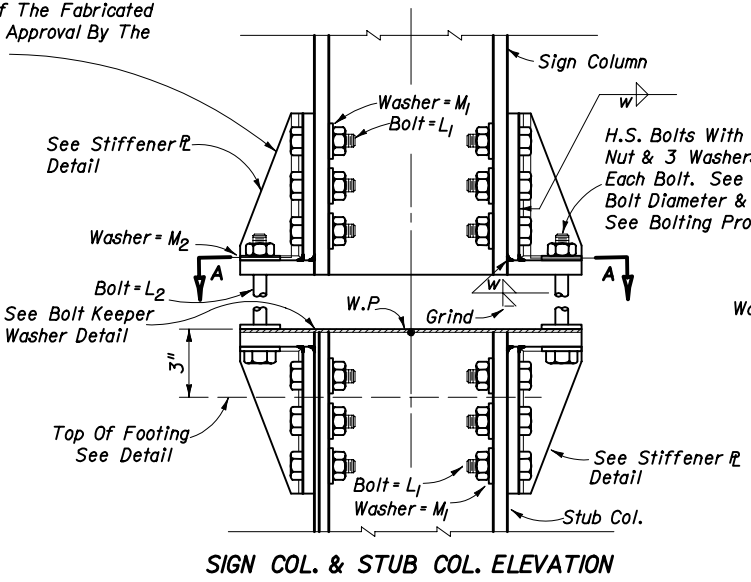
BOLT SIZE	TENSION (lb)
1/4"	19,200
3/8"	28,400
1/2"	39,250
5/8"	51,500
3/4"	56,450
7/8"	71,700

SIGN PANEL AND WIND BEAMS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
STANDARD ROADSIDE SIGN BREAK-AWAY PANEL DETAILS				
Names	Dates	Approved By		
Designed By	RES	11-94	 State Structures Design Engineer	
Drawn By	DDDS	11-94		
Checked By	DER	11-94	Revision	Sheet No.
			04	1 of 3
				9535



An Alternate Cast Base Of Alloy 356 And T6 May Be Submitted For Consideration In Lieu Of The Fabricated Base For Approval By The Engineer.



Section*	BASE CONNECTION DATA TABLE															FUSE (HINGE) PLATE DATA TABLE										FOUNDATION DATA TABLE						
	A	B	C	D	J	L ₁ (Dia.)	Bolt Size (Dia.) & Torque (L ₂) (in-lb)	M ₁	M ₂	D ₂	R	x	b	f	h	k	t ₁	t ₃	w	Bolt Size	E	P	D ₁	d	n	r	s	t ₂	W	Dia.	Depth	Stub Length
I 4x2.79	3 3/8"	2 1/8"	5 1/8"	6 3/8"	2 1/4"	5/8"	Ø 345	1 1/2"	1 1/8"	1 1/8"	3/8"	1 1/4"	1 1/8"	1 1/4"	1 1/8"	1 1/8"	3/8"	3/8"	3/8"	5/8"	3 3/8"	2 3/4"	1 1/8"	1 3/8"	1 3/8"	7/8"	1 1/8"	3/8"	1'-8"	4'-6"	1'-8"	10-#5
I 6x4.03	4 1/8"	2 3/8"	5 1/8"	6 3/8"	2 1/4"	5/8"	Ø 345	1 1/2"	1 1/8"	1 1/8"	3/8"	1 1/4"	1 1/8"	1 1/4"	1 1/8"	1 1/8"	3/8"	3/8"	3/8"	5/8"	4 1/8"	2 3/4"	1 1/8"	1 3/8"	1 3/8"	7/8"	1 1/8"	3/8"	2'-0"	5'-9"	2'-2"	10-#6
I 8x6.18	5 3/8"	2 3/8"	7 1/8"	7 1/8"	2 3/4"	3/4"	Ø 345	1 1/2"	1 1/8"	1 1/8"	3/8"	1 1/4"	1 1/8"	1 1/4"	1 1/8"	1 1/8"	3/8"	3/8"	3/8"	5/8"	5 3/8"	2 3/4"	1 1/8"	1 3/8"	1 3/8"	7/8"	1 1/8"	3/8"	2'-0"	7'-6"	2'-8"	10-#6
I 9x8.36	5 3/8"	3 1/8"	7 1/8"	8 1/8"	2 3/4"	3/4"	Ø 550	1 1/2"	1 1/8"	1 1/8"	3/8"	1 1/4"	1 1/8"	1 1/4"	1 1/8"	1 1/8"	3/8"	3/8"	3/8"	5/8"	5 3/8"	3 1/4"	1 1/8"	1 3/8"	1 3/8"	7/8"	1 1/8"	3/8"	2'-4"	8'-0"	2'-8"	8-#8
I 10x10.3	6"	3 3/8"	8 1/8"	9 1/8"	2 3/4"	1"	Ø 550	2"	1 1/8"	1 1/8"	3/8"	1 1/4"	1 1/8"	1 1/4"	1 1/8"	1 1/8"	3/8"	3/8"	3/8"	5/8"	6"	4 1/4"	1 1/8"	1 3/8"	1 3/8"	7/8"	1 1/8"	3/8"	2'-4"	9'-6"	3'-3"	8-#8
I 12x14.3	7 1/8"	3 3/8"	9 1/8"	10 3/8"	3"	1 1/8"	Ø 690	2 1/4"	2"	1 1/8"	3/8"	1 1/4"	1 1/8"	1 1/4"	1 1/8"	1 1/8"	3/8"	3/8"	3/8"	5/8"	7 1/8"	5 1/4"	1 1/8"	1 3/8"	1 3/8"	7/8"	1 1/8"	3/8"	2'-8"	11'-0"	3'-9"	10-#8

* All Shapes Listed are Aluminum Association I Beams. Designation Gives (Member Depth) x (lb/ft).

PROCEDURE FOR ASSEMBLY OF BASE CONNECTION: FOR BOLTS L₂

1. Assemble post to stub with bolts and with one flat washer on each bolt between plates.
2. Shim as required to plumb post (See Shim Detail).
3. Tighten all bolts the maximum possible with 1'-0" to 1'-3" wrench to bed washers and shims and to clean bolt threads then loosen each bolt in turn and retighten in a systematic order to the prescribed torque (See Table).
4. Burr threads at junction with nut using a center punch to prevent nut loosening.

NOTE:
Sections shown are for installation on right shoulder.
For left shoulder plate slot bevels are opposite hand from that shown.

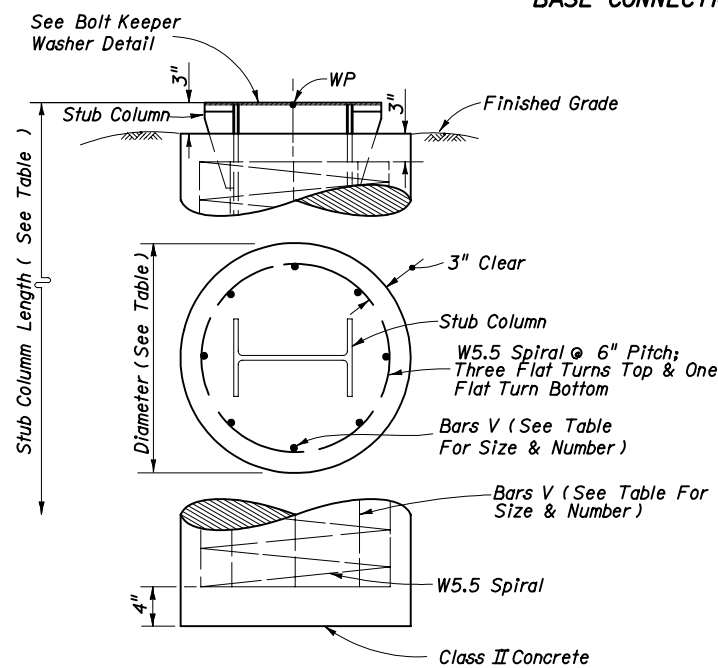
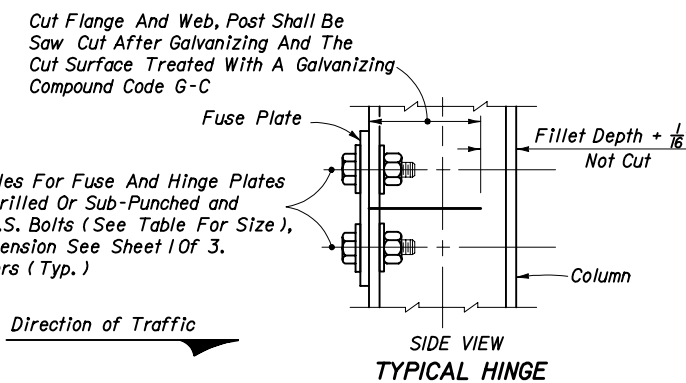
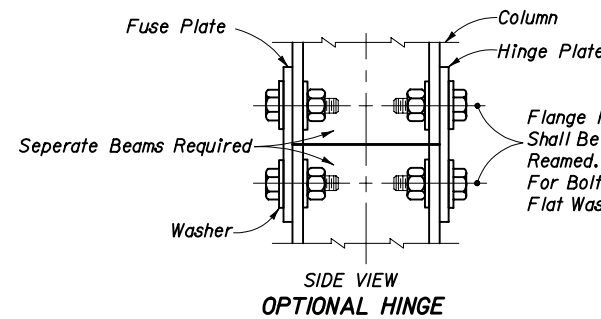
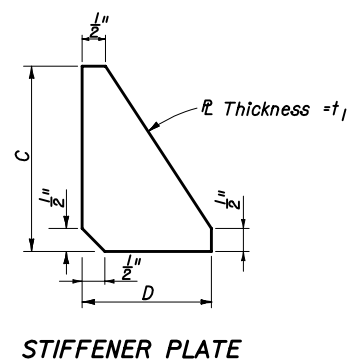
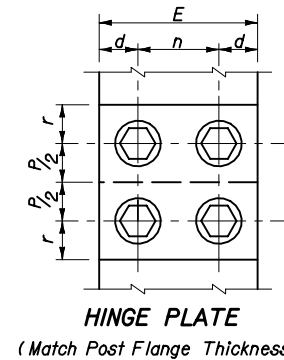
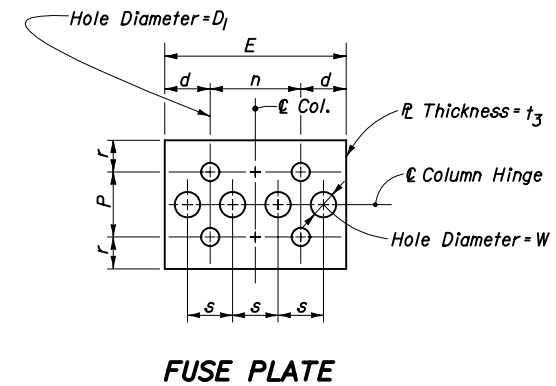
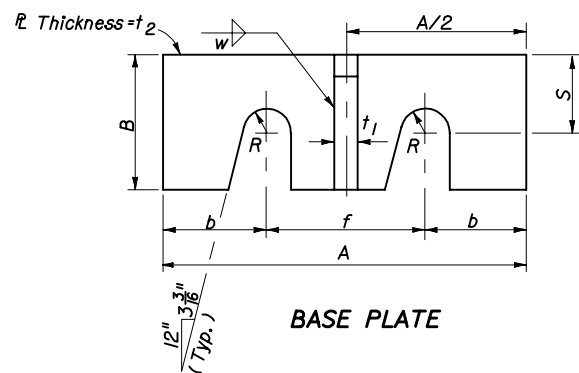
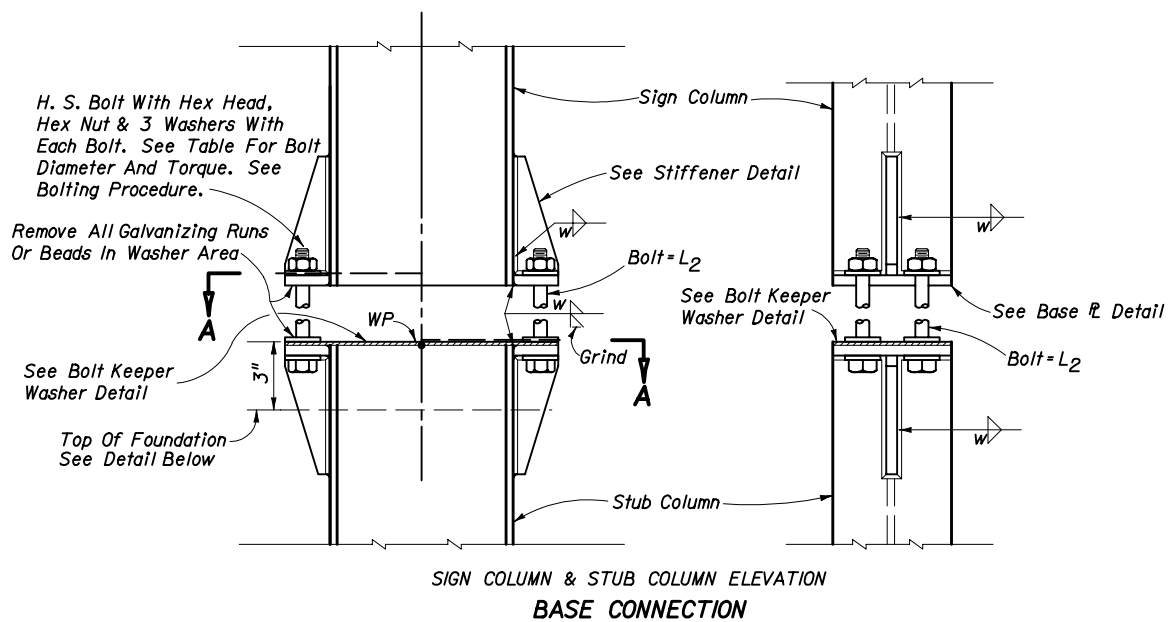
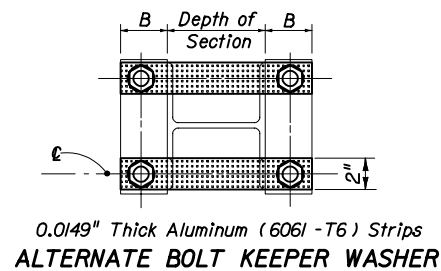
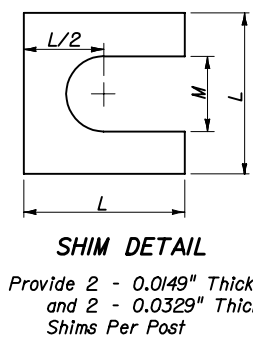
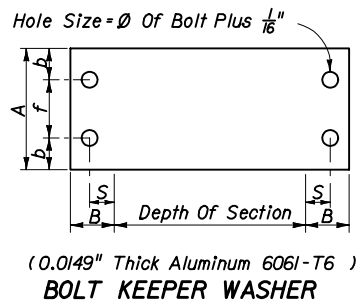
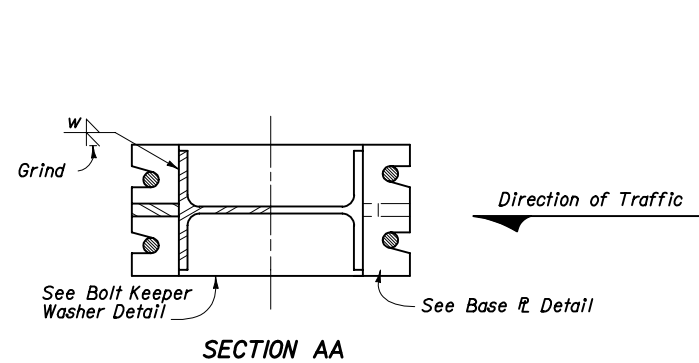
NOTES: To prevent galvanic corrosion, reinforcing steel shall not be in contact with the aluminum stud column.
All reinforcing to be Grade 60.

ALUMINUM POST, BASE, FOUNDATION & FUSE R DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STANDARD ROADSIDE SIGN BREAK-AWAY POST DETAILS

Names	Dates	Approved By		
Designed By	RES	11-94	 State Structures Design Engineer	
Drawn By	SGF	11-94		
Checked By	DER	11-94		
Revision	04	Sheet No.		
		2 of 3	9535	



Section*	BASE CONNECTION DATA											FUSE (HINGE) PLATE DATA										FOUNDATION DATA			SHIM			
	A	B	C	D	Bolt Size (Lp) & Torque (In-lb)	R	b	f	S	t ₁	t ₂	w	Bolt Size	E	P	D ₁	d	n	r	s	t ₃	W	Dia.	Depth	Stub Length	Reinf. Bars V	L	M
W 6x12	4 3/4"	2"	5 1/8"	2"	5/8" Ø 345	3/8"	1 1/8"	2 1/2"	1 3/8"	1 1/2"	1 1/4"	1 1/4"	5/8"	4 1/4"	3"	1 1/8"	1 1/8"	2"	1 3/8"	1"	1 1/8"	1 1/8"	2'-0"	5'-6"	2'-4"	10-#6	1 3/8"	1 1/8"
W 8x18	5 3/4"	2 3/8"	6 1/4"	2 3/8"	3/4" Ø 550	7/16"	1 1/2"	2 3/4"	1 3/8"	1 1/2"	1 1/4"	1 1/4"	1"	5 1/8"	3 3/4"	1 5/8"	1 1/2"	1 3/8"	1 5/8"	3/8"	1 1/8"	1 1/8"	2'-0"	7'-6"	2'-10"	10-#6	1 3/8"	1 1/8"
W 10x22	6 1/2"	2 3/8"	8"	2 3/8"	7/8" Ø 640	1 1/8"	1 3/8"	3"	1 3/8"	1 1/2"	1 1/4"	1 1/4"	1"	6 3/8"	4 1/8"	1 3/4"	1 3/4"	1 1/2"	1 3/8"	1 1/2"	1 1/8"	2'-4"	8'-6"	3'-4"	8-#8	2 1/8"	1 3/8"	
W 10x33	8"	2 3/4"	8"	2 3/4"	1 1/8" Ø 780	5/8"	2"	4"	1 9/16"	1 1/2"	1 1/4"	1 1/4"	1 1/8"	7 1/8"	5 1/8"	1 3/4"	2 1/4"	1 3/4"	2"	1 1/8"	1 1/8"	2'-4"	10'-3"	4'-0"	8-#8	2 3/8"	1 3/8"	
W 12x40	8"	3"	8"	3"	1 1/8" Ø 780	5/8"	2"	4"	1 9/16"	1 1/2"	1 1/4"	1 1/4"	1 1/4"	8 3/8"	5 3/4"	1 3/4"	2 1/4"	1 3/4"	2 1/2"	1 1/2"	1 1/8"	2'-8"	11'-3"	4'-8"	10-#8	2 3/8"	1 3/8"	

* Designations Give (Nominal Depth) x (lb/ft)

PROCEDURE FOR ASSEMBLY OF BASE CONNECTION

1. Assemble post to stub with bolts and with one flat washer on each end bolt between plates.
2. Shim as required to plumb post (see shim detail).
3. Tighten all bolts the maximum possible with 1'-0" to 1'-3" wrench to bed washers and shims and to clean bolt threads then loosen each bolt in turn and retighten in a systematic order to the prescribed torque (see table).
4. Burr threads at junction with nut using a center punch to prevent nut loosening.

NOTE:

Sections shown are for installation on right shoulder. For left shoulder plate slot bevels are opposite hand from that shown.

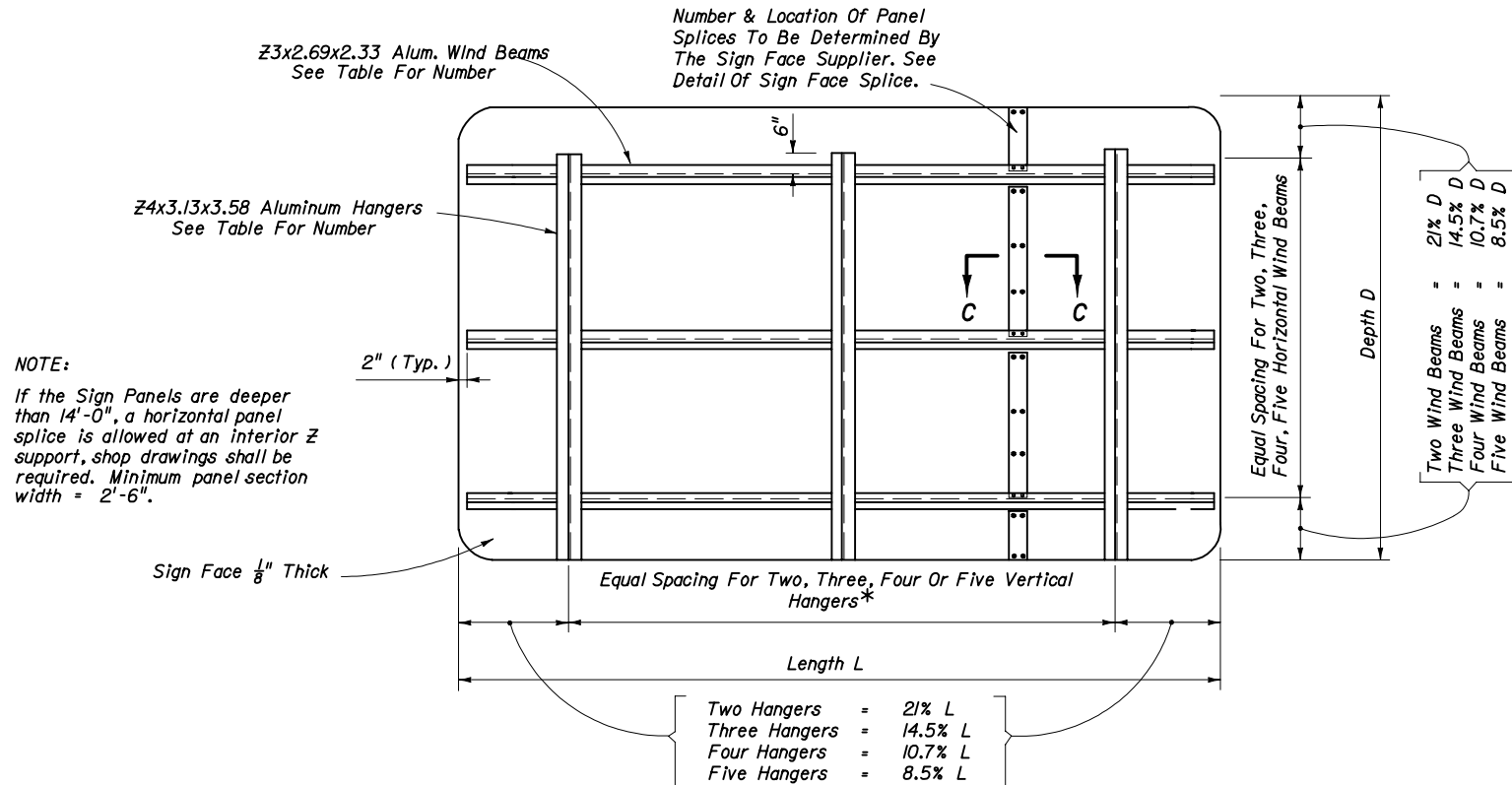
STEEL POST, BASE, FOUNDATION & FUSE & HINGE PLATE DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STANDARD ROADSIDE SIGN BREAK-AWAY POST DETAILS

Names	Dates	Approved By	Index No.	
Designed By	RES 11-94	[Signature]	Sheet No.	9535
Drawn By	SGF 11-94		Revision	3 of 3
Checked By	DER 11-94	04		

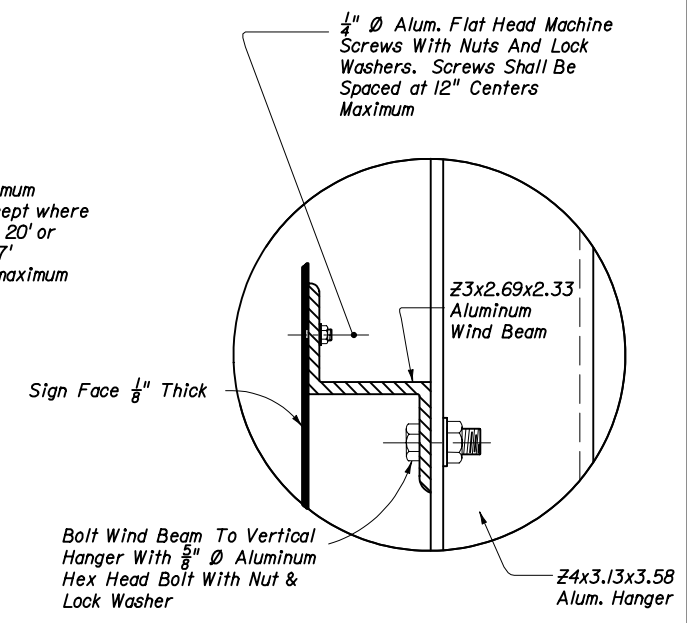
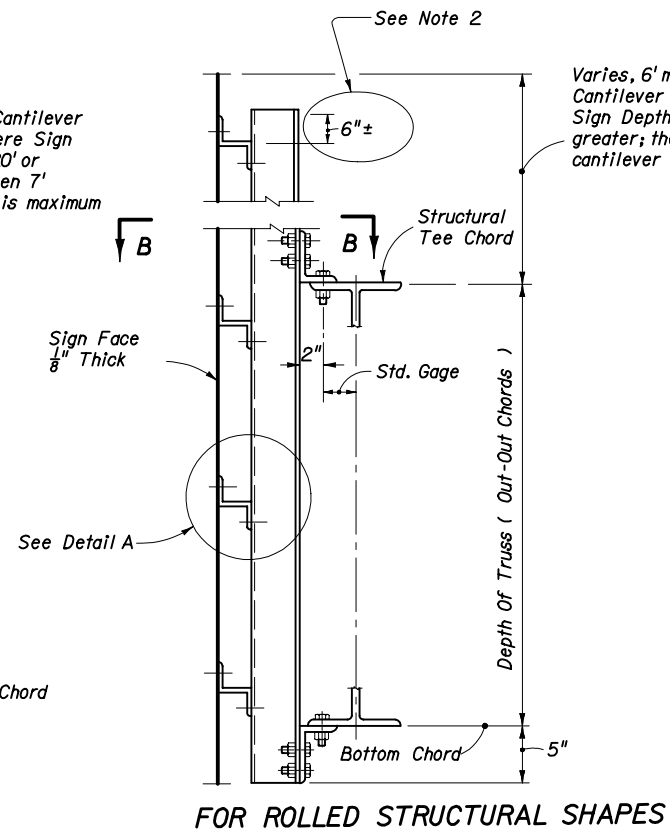
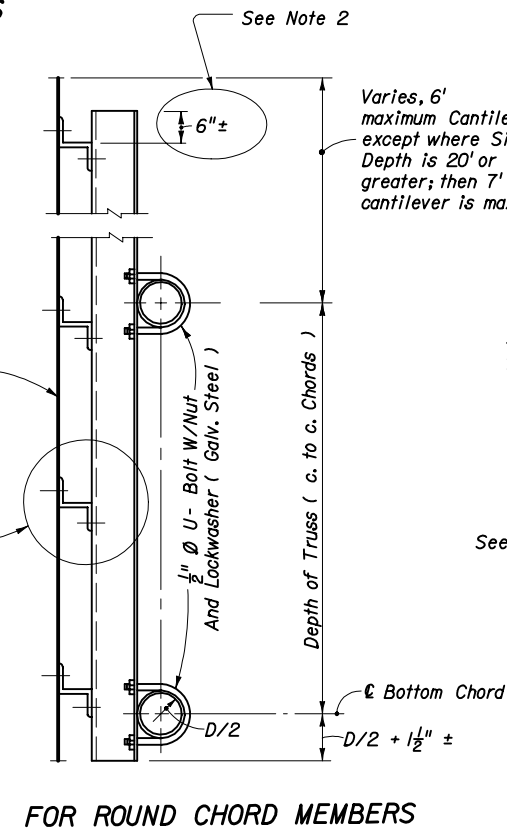
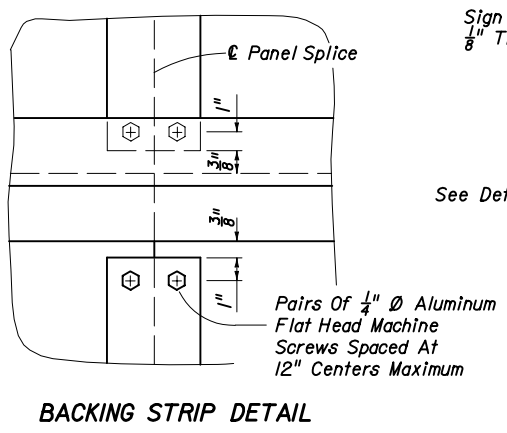
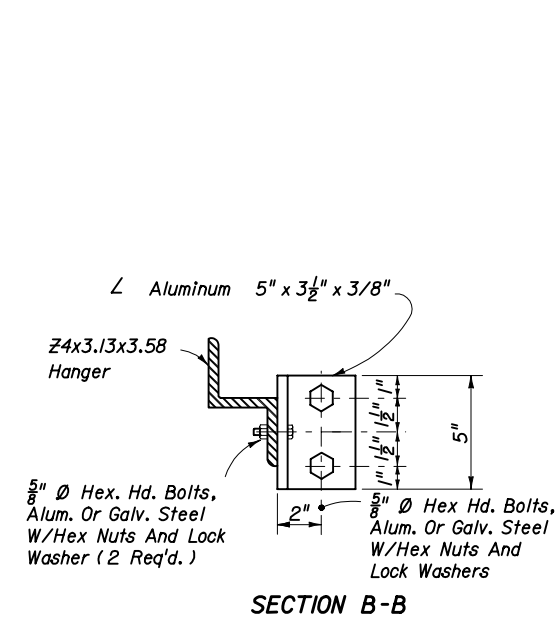
NOTE: All Reinforcing To Be Grade 60.



*Note: Spacing of vertical hangers may be varied slightly or as necessary to clear the truss struts and diagonals at panel points.

TYPICAL SIGN FACE ELEVATION FOR OVERHEAD TRUSS

Wind M.P.H.	No. Beams	Max. Depth	Number Of Z4x3.13x3.58 Vertical Hanger Beams For Sign Length			
			2 Hangers Sign Length	3 Hangers Sign Length	4 Hangers Sign Length	5 Hangers Sign Length
110	2	5'-0"	0'-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
110	3	8'-6"	0'-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
110	4	11'-6"	0'-13'-0"	13'-1"-18'-3"	18'-4"-24'-9"	24'-10"-31'-4"
110	5	14'-0"	0'-13'-0"	13'-1"-18'-3"	18'-4"-24'-9"	24'-10"-31'-4"
100	2	5'-3"	0'-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
100	3	8'-10"	0'-15'-0"	15'-1"-22'-3"	22'-4"-30'-0"	30'-1"-38'-0"
100	4	12'-0"	0'-15'-0"	15'-1"-22'-3"	22'-4"-30'-0"	30'-1"-38'-0"
100	5	15'-0"	0'-11'-7"	11'-8"-16'-4"	16'-5"-22'-2"	22'-3"-28'-0"
90	2	5'-6"	0'-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
90	3	9'-6"	0'-15'-0"	15'-1"-27'-3"	27'-4"-37'-0"	
90	4	12'-9"	0'-15'-0"	15'-1"-27'-3"	27'-4"-37'-0"	
90	5	16'-0"	0'-14'-3"	14'-4"-20'-0"	20'-1"-27'-0"	27'-1"-34'-3"
80	2	6'-0"	0'-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
80	3	10'-0"	0'-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
80	4	14'-0"	0'-15'-0"	15'-1"-25'-9"	25'-10"-34'-10"	



GENERAL NOTES

(1) For "General Notes" covering Material Specifications; see Sheets 1 Of 3, Index 9535.

(2) This dimension shall be adjusted for porcelain enameled sign panel.

(LIGHTING NOT SHOWN)

TYPICAL DETAILS OF SIGN & TRUSS CONNECTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ALUMINUM & STEEL OVERHEAD SIGN STRUCTURES

Names	Dates	Approved By		
Designed By	RES	11/94	State Structures Design Engineer	
Drawn By	DDDS	11/94	Revision	Sheet No.
Checked By	DER	11/94	00	1 of 1
			Index No.	11037

Sign Identification Number	SIGN			TYPE OF SIGN BRACKET				Sign Identification Number	SIGN			TYPE OF SIGN BRACKET				Sign Identification Number	SIGN			TYPE OF SIGN BRACKET			
	PROFILE - SIZE	SQ. FT.	WIND ZONE	60	70	80	90		PROFILE	SIZE	SQ. FT.	60	70	80	90		PROFILE - SIZE	SQ. FT.	WIND ZONE	60	70	80	90
1	24 x 24	1.7	2-I	2-I	2-I	2-I	30	15 x 30	24 x 30	8.1	1-I	1-I	1-I	1-I	55	30 x 24	5.0	2-I	2-I	2-I	2-I		
2	30 x 30	2.7	2-I	2-I	2-I	2-I	31	15 x 21	36 x 30	9.7	1-I	1-I	1-I	1-I	56	36 x 48	5.6	2-II	2-II	2-II	2-II		
3	36 x 36	3.9	2-I	2-I	2-I	2-I	32	15 x 30	36 x 30	10.6	1-I	1-I	1-I	1-I	57	24 x 36	6.0	2-I	2-I	2-I	2-I		
4	48 x 48	6.9	1-II & 1-I	1-II & 1-I	1-II & 1-I	1-II & 1-I	33	12 x 24	24 x 24	8.2	1-I	1-I	1-I	1-I	58	36 x 24	6.0	2-I	2-I	2-I	2-I		
5	60 x 60	10.8	DO NOT USE SINGLE COLUMN				34	24 x 24	15 x 21	9.3	1-I	1-I	1-I	1-I	59	30 x 30	6.3	2-I	2-I	2-I	2-I		
6	36 Ø	7.1	2-I	2-I	2-I	2-I	35	15 x 30	24 x 24	9.2	2-I	2-I	2-I	2-I	60	30 x 30	6.3	2-I	2-I	2-I	3-I		
7	48 Ø	12.6	2-II	2-II	2-II	2-II	36	24 x 24	15 x 21	10.3	1-I	1-I	1-I	1-I	61	36 x 36	6.75	2-I	2-I	2-I	2-I		
8	18 x 18	1.9	2-I	2-I	2-I	2-I	37	15 x 30	24 x 30	13.6	2-I	2-II	2-II	2-II	62	30 x 36	7.5	2-I	2-I	2-I	2-I		
9	24 x 24	3.3	2-I	2-I	2-I	2-I	38	24 x 24	15 x 21	15.2	1-I	1-I	1-I	1-I	63	36 x 30	7.5	2-I	2-I	2-I	2-I		
10	30 x 30	5.2	2-I	2-I	2-I	2-I	39	12 x 24	24 x 24	16.4	2-II	2-II	2-II	2-II	64	24 x 48	8.0	2-II	2-II	2-II	2-II		
11	36 x 36	7.5	2-I	2-I	2-I	2-I	40	24 x 24	15 x 21	19.2	1-I	1-I	1-I	1-I	65	12 x 36	8.2	1-I	1-I	1-I	1-I		
12	48 x 48	13.3	2-II	2-II	2-II	2-II	41	24 x 30	24 x 30	20.4	2-I	2-I	2-I	2-I	66	30 x 30	8.8	2-I	2-I	2-II	2-II		
13	12 x 24	5.4	1-I	1-I	1-I	1-I	42	24 x 24	15 x 21	22.6	1-I	1-I	1-I	1-I	67	30 x 42	8.8	2-I	2-I	2-II	2-II		
14	24 x 24	6.5	2-I	2-I	2-I	2-I	43	15 x 30	24 x 30	25.6	2-II	2-II	2-II	2-II	68	36 x 36	9.0	2-I	2-I	2-I	2-I		
15	15 x 30	6.3	1-I	1-I	1-I	1-I	44	24 x 24	15 x 21		1-I	1-I	1-I	1-I	69	36 x 36	9.0	2-I	2-I	2-I	2-I		
16	24 x 24	7.4	2-I	2-I	2-I	2-I	45	12 x 24	24 x 24		2-II	2-II	2-II	2-II	70	12 x 36	9.3	1-I	1-I	1-I	1-I		
17	15 x 30	10.8	1-I	1-I	1-I	1-I	46	24 x 24	24 x 24		1-I	1-I	1-I	1-I	71	30 x 30	9.3	2-I	2-I	2-I	2-I		
18	36 x 36	12.6	2-I	2-I	2-I	2-I	47	24 x 30	24 x 30		2-I	2-I	2-I	2-I	72	18 x 24	9.3	2-I	2-I	2-I	2-I		
19	15 x 30	16.7	1-I	1-I	1-I	1-I	48	15 x 30	24 x 30		1-I	1-I	1-I	1-I	73	48 x 64	9.9	DO NOT USE SINGLE COLUMN					
20	48 x 48	20.1	2-II	2-II	2-II	2-II	49	24 x 30	24 x 30		2-II	2-II	2-II	2-II	74	30 x 48	10.0	2-II	2-II	2-II	2-II		
21	15 x 30	20.1	DO NOT USE SINGLE COLUMN				50	15 x 30	24 x 30		1-I	1-I	1-I	1-I	75	12 x 36	10.5	1-I	1-I	1-I	1-I		
22	24 x 24	7.6	1-I	1-I	1-I	1-I	51	24 x 30	24 x 30		2-I	2-I	2-I	2-I	76	36 x 36	10.5	2-I	2-I	2-I	2-I		
23	24 x 30	7.6	2-I	2-I	2-I	2-I	52	15 x 21	24 x 24		1-I	1-I	1-I	1-I	77	30 x 54	11.3	DO NOT USE SINGLE COLUMN					
24	15 x 21	7.6	1-I	1-I	1-I	1-I	53	12 x 24	24 x 24		1-I	1-I	1-I	1-I	78	30 x 54	11.3	DO NOT USE SINGLE COLUMN					
25	12 x 24	6.0	1-I	1-I	1-I	1-I	54	12 x 24	24 x 24		2-I	2-I	2-I	2-I	79	30 x 60	12.5	DO NOT USE SINGLE COLUMN					
26	24 x 24	6.2	2-I	2-I	2-I	2-I								80	48 x 48	16.0	2-II	2-II	2-II	2-II			
27	15 x 21	7.1	1-I	1-I	1-I	1-I								81	48 x 48	16.0	2-I	2-I	2-I	2-I			
28	12 x 24	7.0	1-I	1-I	1-I	1-I								82	48 x 48	16.0	1-II	1-II	1-II	1-II			
29	24 x 30	7.2	2-I	2-I	2-I	2-I								83	30 x 78	16.3	DO NOT USE SINGLE COLUMN						
	15 x 21	7.2	1-I	1-I	1-I	1-I								84	30 x 84	17.5	DO NOT USE SINGLE COLUMN						
														85	48 x 54	18.0	DO NOT USE SINGLE COLUMN						
														86	42 x 66	19.3	DO NOT USE SINGLE COLUMN						
														87	60 x 48	20.0	3-II	3-II	3-II	3-II			
														88	66 x 48	22.0	3-II	3-II	3-II	3-II			
														89	60 x 72	30.0	SEE NOTE						
														90	96 x 48	32.0	DO NOT USE SINGLE COLUMN						
														91	24 x 78	13.0	DO NOT USE SINGLE COLUMN						
															36 x 78	19.5	DO NOT USE SINGLE COLUMN						

NOTE:

The Gore Exit Panel (E5-1a) detailed in the Standards Highway Signs Manual 2002 edition, Sign Identification Number 88, can be installed on a single column with the following stipulations:

1. Maximum height to bottom of sign is 14'.
2. Column size is 6" aluminum round tube with 1/4" wall.
3. 3 Type II Brackets required for attachment.
4. For Type II Bracket details, Attachment and General Notes see sheet 3 of 4.
5. Footing shall be 2'-0" Ø x 5'-0" deep.
6. For Slip Base Details, see sheet 4 of 4.

Sign size is in inches unless other wise specified.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
SINGLE COLUMN GROUND SIGNS					
Designed By	RES	10/94	Approved By		
Drawn By	DDDS	10/94	State Structures Design Engineer		
Checked By	DER	11/94	Revision	Sheet No.	Index No.
			04	1 of 4	11860

GENERAL NOTES

GENERAL SPECIFICATIONS : Florida Department of Transportation Standard Specifications for Road and Bridge Construction and Supplements thereto.
 DESIGN SPECIFICATIONS : Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, AASHTO 1994.
 ALUMINUM : Except as noted below, Aluminum Materials shall meet the requirements of Aluminum Association Alloy 6061-T6 (ASTM B209, B221, or B308).

1. Permitted Alternate for Sheets and Plates--- Alloy 5154-H38 (ASTM-B209)

CONCRETE : All concrete shall be Class I (Special), the specified compressive strength at 28 days (f'c) shall be 3 ksi min.

SIGN PANELS : Sign Panels shall be 0.08 inches min. thick Aluminum Plate with all corners rounded. See sign layout sheet. Panels are to be degreased, etched, neutralized and treated with Alodine 1200, Irdine 14-2, Bonderite 721 or equal. No stenciling permitted on panels.

ALUMINUM BOLTS, NUTS & LOCKWASHERS : Aluminum bolts shall meet the requirements of ASTM F468, Alloy 2024-T4. The Bolts shall have an Anodic Coating of at least 0.0002 inches thick and be chromate sealed. Lockwashers shall meet the requirements of Aluminum Association Alloy 7075-T6 (ASTM B221). Nuts shall meet the requirements of ASTM F-467, Alloy 6061-T6 or 6262-T9.

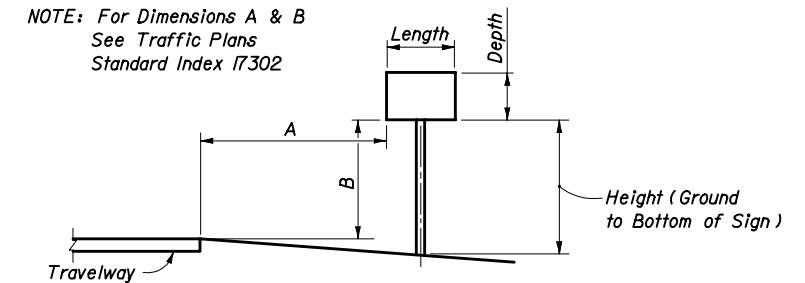
STAINLESS STEEL BOLTS, NUTS AND LOCKWASHERS : Stainless Steel Bolts, Nuts and Lockwashers conforming to ASTM F593 Alloy Group 2 Condition A, CW2, or SH4 may be provided in lieu of Aluminum Bolts, Nuts and Washers.

U-BOLTS, NUTS & LOCKWASHERS : U-Bolts, Nuts and Lockwashers shall meet the requirements of ASTM A307, Grade A and shall be galvanized in accordance with ASTM A153.

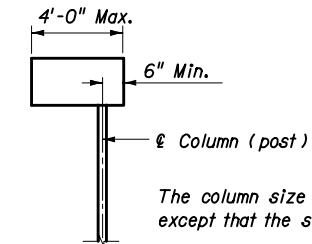
INSTALLING FRANGIBLE COLUMN SUPPORTS : Columns (Posts) may be installed by driving the columns in accordance with index Nos. 11861 thru 11865, or as an alternate method the contractor may set the columns (Posts) to the depth indicated in preformed holes backfilled with suitable material tamped in layers not thicker than 6" to provide adequate compaction.

SHOP DRAWINGS : When Type C ground sign supports are furnished and fabricated in accordance with these plans, shop drawings will NOT be required for approval by the Engineer.

HOW TO USE THIS TABLE : Select the appropriate Sign Profile and Size to determine the Sign Identification Number. If the exact Sign Size of all Components are not listed, select the appropriate profile and larger Component Sizes. This table also gives the Quantity and Type of Sign Brackets required for each Sign for each Wind Zone. Where the Sign Size is given as a Vertical and Horizontal Dimension, the Vertical Dimension (Depth) is given first and the Horizontal Dimension (Length) is given last. For Column Sizes, Heights and Footings see appropriate (Wind Zone or Height =14' Max.) sheets titled "Column Sizes, Column Heights and Footings " Index Numbers 11861 thru 11865. No Shop or Field Splice is allowed in Sign Panels. All Panels shall be furnished in one piece.



TYPICAL SECTION



The column size shall be as tabulated in the Standard except that the size shall not be smaller than 3 1/2" Ø.

Note: All cantilever sign installations shall comply with standard Index 17302. The sign shall be supported by an aluminum round column with concrete footing and breakaway support. All sign brackets shall be Type II.

CANTILEVER SIGN

WIND SPEEDS BY COUNTY

ZONE NO. 1 (60 M.P.H.)

Alachua, Baker, Bay, Bradford, Calhoun, Clay, Columbia, Escambia, Gadsden, Gilchrist, Hamilton, Holmes, Jackson, Jefferson, Lafayette, Lake, Leon, Liberty, Madison, Marion, Okaloosa, Putnam, Santa Rosa, Sumter, Suwannee, Union, Walton and Washington Counties.

ZONE NO. 2 (70 M.P.H.)

Citrus, De Soto, Dixie, Duval, Flagler, Franklin, Glades, Gulf, Hardee, Hendry, Hernando, Highlands, Hillsborough, Levy, Nassau, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Seminole, St. Johns, Taylor and Wakulla Counties.

ZONE NO. 3 (80 M.P.H.)

Brevard, Charlotte, Collier, Indian River, Lee, Manatee, Martin, Palm Beach, Sarasota, St. Lucie and Volusia Counties.

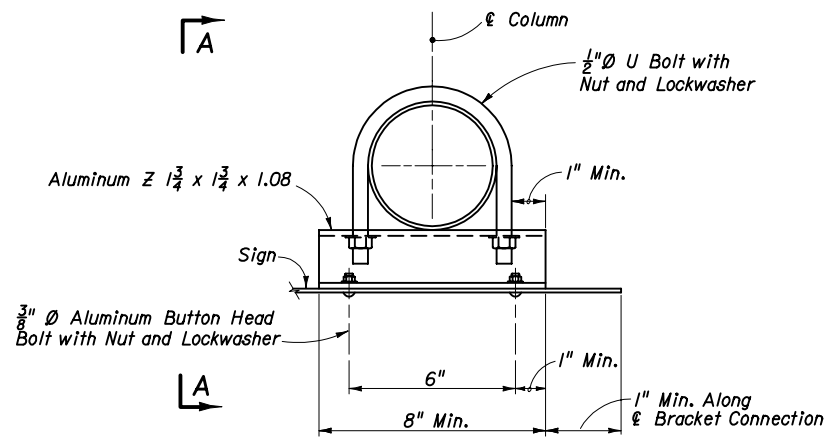
ZONE NO. 4 (90 M.P.H.)

Broward, Dade and Monroe Counties.

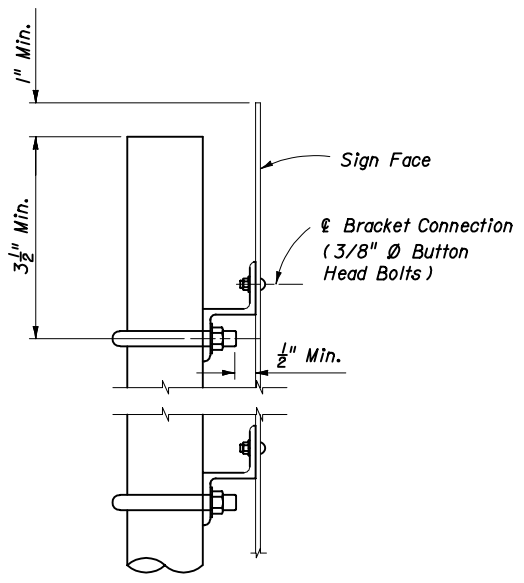
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SINGLE COLUMN GROUND SIGNS

Names	Dates	Approved By <i>[Signature]</i>		
Designed By	RES	10/94	State Structures Design Engineer	
Drawn By	DDDS	10/94	Revision	Sheet No.
Checked By	DER	11/94	04	2 of 4
				Index No. 11860

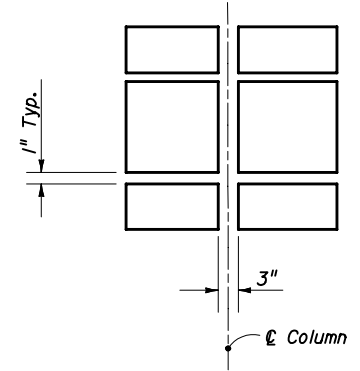


TYPE I BRACKET

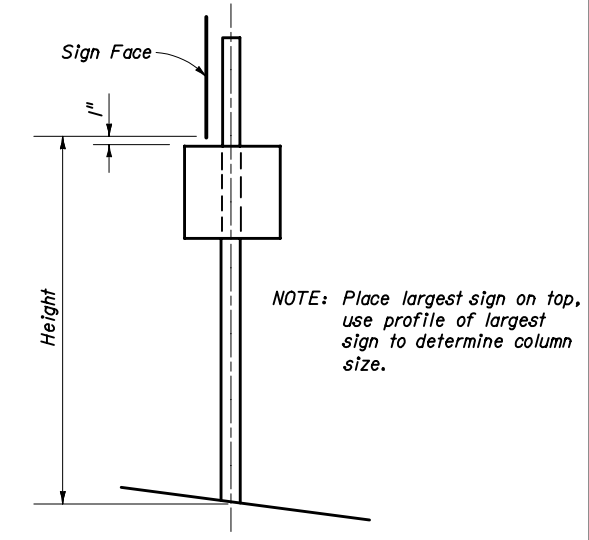


VIEW AA

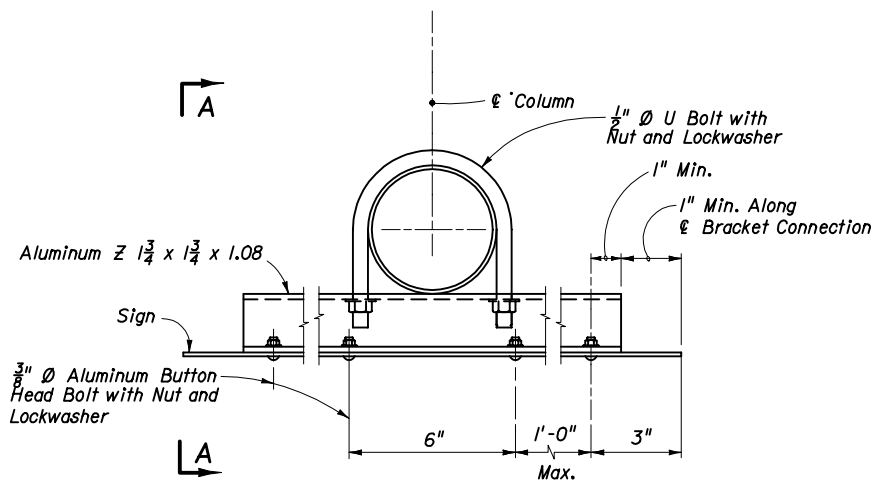
NOTE: Use profile of largest sign and height to bottom of largest sign to determine column size.



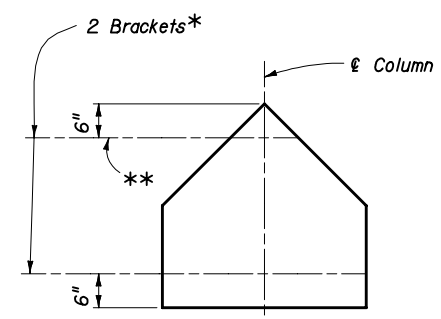
SIGN CLEARANCE



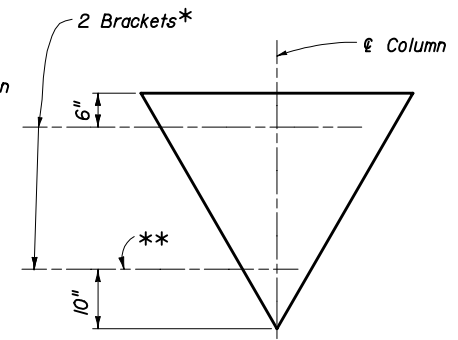
SIGNS AT 90°



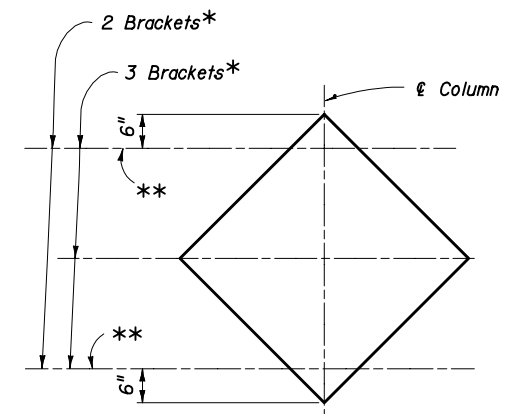
TYPE II BRACKET (SINGLE SIGN)



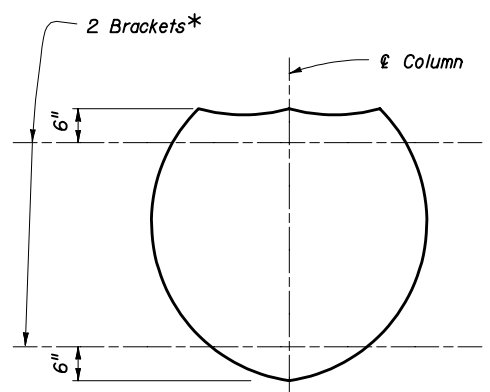
SCHOOL



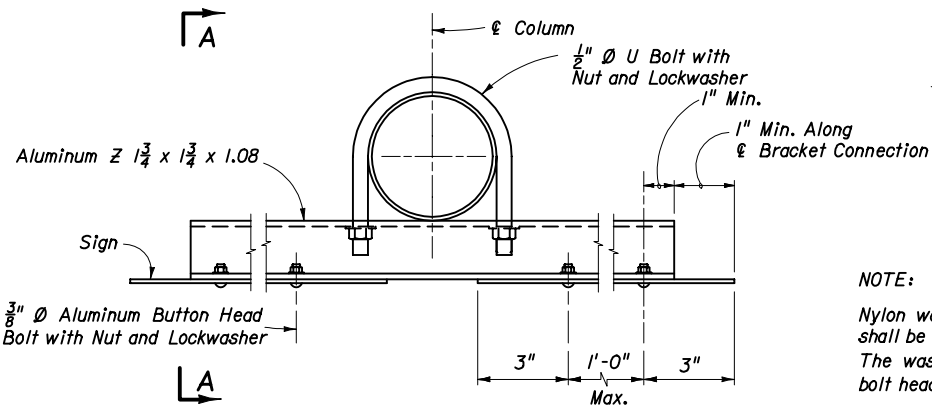
YIELD



DIAMOND



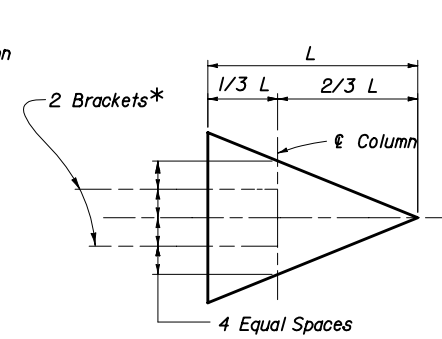
SHIELD



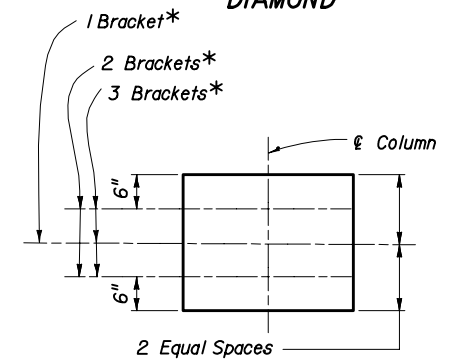
TYPE II BRACKET (DOUBLE SIGNS)

NOTE: $\frac{5}{16}$ " \varnothing Stainless Steel Hex Head Bolts with Flat Washer under Head and Lockwasher under Nut may be used in lieu of $\frac{3}{8}$ " \varnothing Aluminum Button Head Bolts.

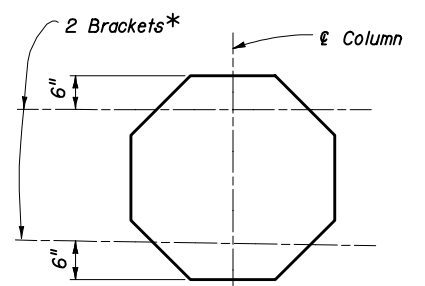
NOTE: Nylon washers provided by the sheeting supplier shall be used on all ground mounted signs. The washers shall be installed under the sign bolt head to protect the sheeting.



PENNANT



RECTANGLE



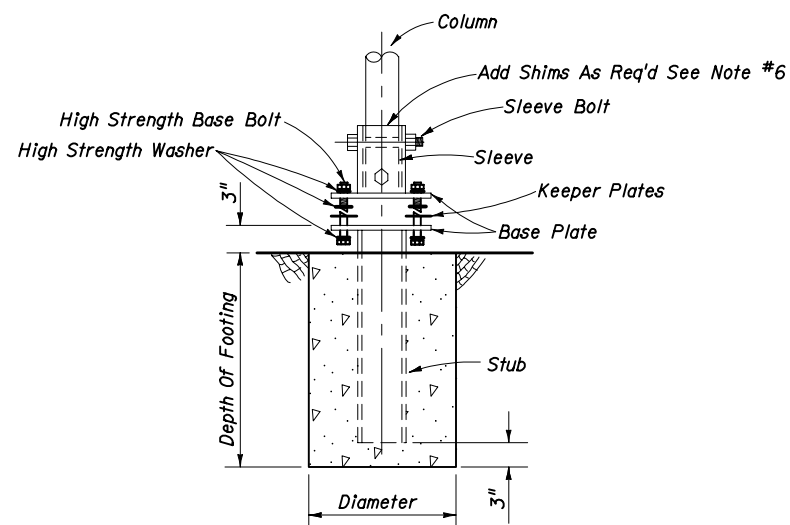
STOP

BRACKET LOCATIONS (SEE VIEW AA)

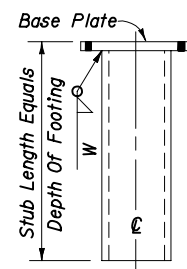
* NOTE: The above Bracket locations apply at the \varnothing of Bracket-Sign Connection ($\frac{3}{8}$ " \varnothing Button Head Bolts). See View AA. The locations also apply at Double Signs configurations. When installing back-to-back signs the topmost bracket location of one of the signs will require adjustment as shown on the above detail.

** NOTE: Use Type I Bracket at the apex location (always).

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SINGLE COLUMN GROUND SIGNS				
Names	Dates	Approved By		
Designed By	RES	10/94	 State Structures Design Engineer	
Drawn By	DDDS	10/94		
Checked By	DER	11/94		
Revision	00	Sheet No.		
		3 of 4	11860	

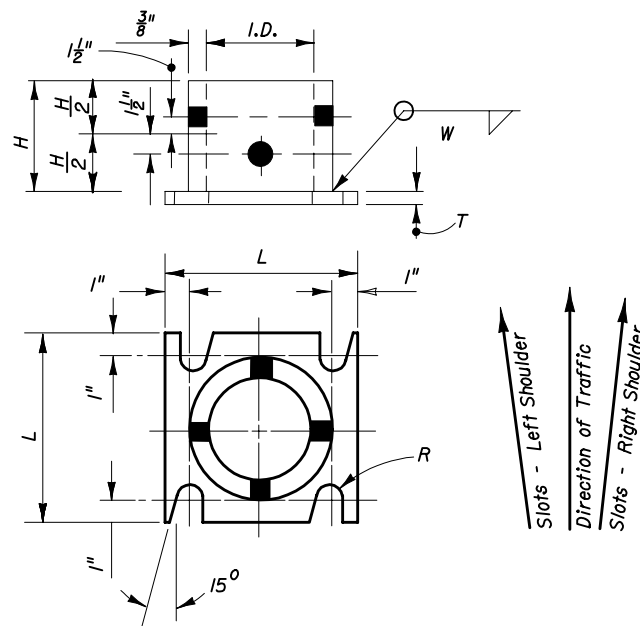


SLIP BASE AND FOOTING DETAIL



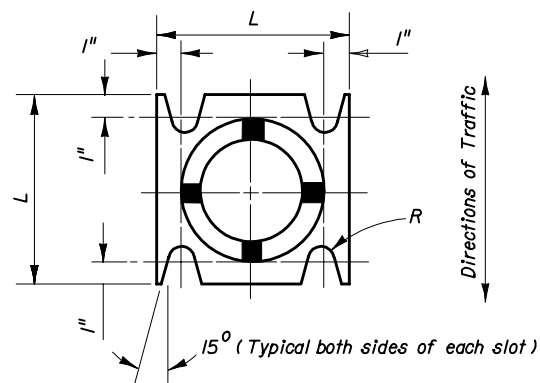
Stub Size Equals Min. Sleeve Size Or Longer

STUB DETAIL



SLEEVE & BASE PLATE DETAILS (SINGLE BEVELED SLOT)

(Right Shoulder Shown)
For Left Shoulder, Plate Slot Bevels are opposite hand from that shown.



SLEEVE & BASE PLATE DETAILS (DOUBLE BEVELED SLOTS)

(Right Shoulder Shown)
For Left Shoulder, Plate Slot Bevels are opposite hand from that shown.

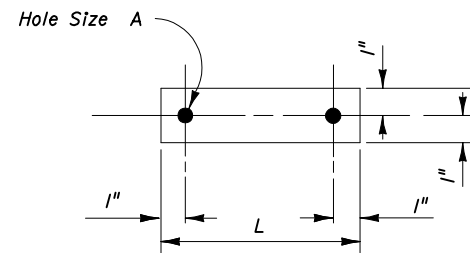
SLIP BASE NOTES :

1. The Inside Diameter (I.D.) of the sleeve shall be no more than $\frac{1}{16}$ " larger than the Outside Diameter (O.D.) of the Column.
2. The sleeve bolts shall be $\frac{1}{2}$ " \varnothing with locknuts. The bolts shall be galvanized steel (ASTM A-307) or Aluminum Association Alloy 2024-T4 or 6061-T6 (ASTM B-211).
3. The base bolts, nuts and washers shall be high strength ASTM A-325 and shall have an electroplated zinc coating SC3, Type II applied in accordance with ASTM B633.
4. An alternate cast base of aluminum alloy 356 and T6 temper in lieu of the fabricated base may be submitted for approval by the Engineer. If a cast base is used the stub will be the same as the column and will be bolted to the casting.
5. Assemble the slip base connection in the following manner :
Connect column to sleeve using two (2) $\frac{1}{2}$ " \varnothing machine bolts.
Assemble top base plate to stub base plate using high strength bolts with three (3) hardened washers per bolt. One (1) washer per bolt and two (2) bolt keeper plates go between the base plates.
Use shim stock as required to plumb the column.
Tighten all bolts the maximum possible with a 12" to 15" wrench to bed the washers and shims and to clear the bolt threads. Loosen each bolt one (1) turn and retighten to the prescribed torque (see table). Bolts shall be tightened with properly calibrated wrenches under the supervision of the project engineer.
Burr threads at junction with nut using a center punch to prevent nut loosening.
6. Use galvanized steel shims to obtain a tight fit between the column face and the sleeve. Place shims in all quadrants between the $\frac{1}{2}$ " \varnothing sleeve bolts. The shim length shall be 1" shorter than the height of the sleeve.
7. Base plates may be either fabrications or castings and may have either single or double beveled slots.
8. Both fabricated and cast base assemblies were impact tested by the Texas Transportation Institute, College Station, TX on February 10, 2003, and both alternate assemblies were determined to be compliant with the performance recommendations of the National Cooperative Highway Research Program (NCHRP) Report 350.

SLIP BASE DETAILS

Note: Unless noted otherwise, all dimensions are in inches

Column Size	Sleeve I.D. (Max)	Sleeve Height H	Weld W	Base Plate		Radius R	Base Bolt		Base Bolt Torque		Hole Size A
				L	T		Size	Length	Ft-lbs	In-lbs	
4 x $\frac{1}{4}$	4 $\frac{1}{16}$	6	$\frac{5}{8}$	8	$\frac{3}{4}$	$\frac{11}{32}$	$\frac{5}{8}$	3	29	355	$\frac{11}{16}$
4 $\frac{1}{2}$ x $\frac{1}{4}$	4 $\frac{9}{16}$	6	$\frac{5}{8}$	8	$\frac{7}{8}$	$\frac{11}{32}$	$\frac{5}{8}$	3 $\frac{1}{4}$	29	355	$\frac{11}{16}$
5 x $\frac{1}{4}$	5 $\frac{1}{16}$	7	$\frac{5}{8}$	8	$\frac{7}{8}$	$\frac{11}{32}$	$\frac{5}{8}$	3 $\frac{1}{4}$	29	355	$\frac{11}{16}$
6 x $\frac{1}{4}$	6 $\frac{1}{16}$	8	$\frac{11}{16}$	9	1	$\frac{7}{16}$	$\frac{3}{4}$	3 $\frac{1}{2}$	48	580	$\frac{13}{16}$
8 x $\frac{5}{16}$	8 $\frac{1}{16}$	10	$\frac{3}{4}$	11	1	$\frac{1}{2}$	$\frac{7}{8}$	3 $\frac{3}{4}$	53	640	$\frac{15}{16}$



0.0149" Thick Alum. Strip-2 Req'd Per Base

BOLT KEEPER DETAIL

COLUMN SIZE, COLUMN HEIGHT & COLUMN FOOTINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SINGLE COLUMN GROUND SIGNS

Names	Dates	Approved By
Designed By DER	10/94	 State Structures Design Engineer
Drawn By DDDS	10/94	
Checked By RES	11/94	
Revision	Sheet No.	Index No.
04	4 of 4	11860

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 1/8	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16			
FOUNDATION	0 x 4-0	0 x 4-3	0 x 4-9	0 x 5-3	2-0 x 3-9	2-0 x 4-0	2-0 x 4-3	2-0 x 4-9	2-0 x 4-9			
Sign Identification Number	HEIGHT (Feet)											
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to		
1	15	15	20	20	25							
2			17	17	22	22	25					
3			13	13	18	18	25					
4			9	9	11	11	18	18	25			
5												
6			9	9	12	12	18	18	25			
7					6	6	12	12	23	23	25	
8	15	15	20	20	25							
9			15	15	20	20	25					
10			12	12	15	15	22	22	25			
11			9	9	12	12	18	18	25			
12							12	12	22	22	25	
13			12	12	14	14	22	22	25			
14					12	12	20	20	25			
15			11	11	13	13	20	20	25			
16			9	9	12	12	18	18	25			
17					9	9	13	13	25			
18						12	12	23	23	25		
19					9	9	18	18	23	23	25	
20												
21			8	8	11	11	17	17	25			
22					11	11	15	15	25			
23			7	7	11	11	16	16	25			
24					10	10	14	14	25			
25			11	11	13	13	20	20	25			
26			10	10	12	12	20	20	25			
27			9	9	12	12	18	18	25			
28			9	9	12	12	18	18	25			
29			9	9	12	12	18	18	25			
30			8	8	12	12	16	16	25			
31			6	6	10	10	14	14	25			
32					8	8	12	12	25			
33			7	7	11	11	16	16	25			
34			6	6	10	10	14	14	25			
35					10	10	14	14	25			
36					9	9	12	12	25			
37						11	11	21	21	25		
38						11	11	20	20	25	25	25
39					9	9	18	18	23	23	25	
40												
41						14	14	18	18	23	23	25
42						12	12	16	16	20	20	25
43												
44	16	16	22	22	25							
45			16	16	21	21	25					
46			16	16	21	21	25					
47			16	16	21	21	25					
48			16	16	21	21	25					
49			14	14	18	18	25					
50			13	13	18	18	25					
51					18	18	25					
52			13	13	17	17	25					

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 1/8	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16				
FOUNDATION	0 x 4-0	0 x 4-3	0 x 4-9	0 x 5-3	2-0 x 3-9	2-0 x 4-0	2-0 x 4-3	2-0 x 4-9	2-0 x 4-9				
Sign Identification Number	HEIGHT (Feet)												
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to			
53			13	13	16	16	24	24	25				
54			13	13	16	16	24	24	25				
55			12	12	15	15	23	23	25				
56			11	11	13	13	21	21	25				
57			11	11	13	13	21	21	25				
58			11	11	13	13	20	20	25				
59			11	11	13	13	20	20	25				
60			10	10	12	12	20	20	25				
61			10	10	13	13	19	19	25				
62			9	9	12	12	17	17	25				
63					12	12	17	17	25				
64			8	8	12	12	17	17	25				
65					11	11	16	16	25				
66					11	11	15	15	25				
67			7	7	11	11	15	15	25				
68					10	10	14	14	25				
69					10	10	14	14	25				
70			6	6	10	10	14	14	25				
71													
72					9	9	14	14	25				
73					9	9	13	13	25				
74													
75					7	7	12	12	24	24	25		
76					7	7	12	12	23	23	25		
77							11	11	23	23	25		
78					7	7	12	12	24	24	25		
79													
80						10	10	19	19	23	23	25	
81						9	9	18	18	23	23	25	
82													
83													
84													
85													
86							15	15	19	19	23	23	25
87							13	13	17	17	21	21	25
88													
89													
90													
91													

The Column Size is O.D. x Wall Thickness in inches.
The Foundation Size is O.D. x Depth in feet & inches.
A zero O.D. means that a concrete foundation is not necessary.

- NOTES**
1. Work this Standard with Standard Index Numbers 11860 and 11865.
 2. To determine column (post) size and footing requirements use the required Sign Identification Number and Sign Height (H), Designs for Heights (H) lower than those listed in the Table are included in Standard Index Number 11865.
 3. Single Column installations are not allowed for heights (H) exceeding the maximum height shown in the Table, and for sign profiles (Sign Identification Numbers) without any design tabulated. In this event, the sign(s) will have to be supported by multiple columns (posts) using breakaway devices. See Standard Index Number 9535.
 4. The Column (Post) material shall be aluminum. The size is given as outside diameter and wall thickness. Columns (posts) larger than 3 1/2" x 1/8" are non-fragile and shall be installed with breakaway supports and will have concrete footings and slip bases.
 5. The foundation size is given as outside diameter and depth.
 - a) Frangible Supports: The Column (Post) shall be driven into the ground to the depth indicated or set into preformed holes to the specified depth with suitable backfill tamped into compacted layers not exceeding 6", or filled with flowable fill or bagged concrete. The cost of the flowable fill or bagged concrete shall be included in the cost of the sign.
 - b) Breakaway Supports: Foundations for Breakaway Supports require concrete. The column support shall be set in a concrete foundation, sized as shown in the table. The first dimension indicates the diameter and the second dimension the depth into the ground. In all cases the ground is to be considered as undisturbed earth, road material, or properly compacted fill.


COLUMN SIZE , COLUMN HEIGHT & COLUMN FOOTINGS				
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SINGLE COLUMN GROUND SIGNS				
60 M.P.H. WIND LOADING	Names	Dates	Approved By	
	Designed By	DER	10/94	<i>[Signature]</i>
	Drawn By	DDDS	10/94	State Structures Design Engineer
	Checked By	RES	11/94	04
	Revision	Sheet No.	Index No.	
		1 of 1	11861	

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 3/16	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16				
FOUNDATION	0 x 4-3	0 x 4-3	0 x 4-9	0 x 6-0	2-0 x 4-0	2-0 x 4-0	2-0 x 4-3	2-0 x 5-0	2-0 x 5-0				
Sign Identification Number	HEIGHT (Feet)												
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to			
1		16	16	20	20	25							
2				17	17	24	24	25					
3				13	13	20	20	25					
4		6	6	9	9	13	13	25					
5													
6				10	10	13	13	25					
7					9	9	17	17	21	21	25		
8		16	16	20	20	25							
9				15	15	22	22	25					
10				12	12	17	17	25					
11				9	9	13	13	25					
12					8	8	16	16	21	21	25		
13				12	12	17	17	25					
14				11	11	15	15	25					
15				12	12	15	15	25					
16				10	10	13	13	25					
17					11	11	20	20	25				
18					10	10	18	18	22	22	25		
19						14	14	17	17	21	21	25	
20													
21		6	6	9	9	13	13	25					
22				7	7	11	11	23	23	25			
23				8	8	12	12	23	23	25			
24					11	11	21	21	25				
25				12	12	16	16	25					
26				11	11	15	15	25					
27				10	10	14	14	25					
28				10	10	14	14	25					
29				10	10	13	13	25					
30				8	8	12	12	24	24	25			
31				7	7	12	12	21	21	25			
32				6	6	11	11	20	20	24	24	25	
33				8	8	12	12	23	23	25			
34				7	7	11	11	21	21	25			
35				7	7	11	11	22	22	25			
36				6	6	11	11	20	20	24	24	25	
37					8	8	16	16	20	20	24	24	25
38					7	7	14	14	19	19	23	23	25
39					6	6	13	13	17	17	21	21	25
40													
41					11	11	14	14	17	17	21	21	25
42					10	10	12	12	15	15	22	22	25
43													
44		17	17	21	21	25							
45				16	16	23	23	25					
46				16	16	23	23	25					
47				16	16	23	23	25					
48				16	16	23	23	25					
49				14	14	21	21	25					
50				14	14	20	20	25					
51				14	14	20	20	25					
52				13	13	20	20	25					

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 3/16	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16					
FOUNDATION	0 x 4-3	0 x 4-3	0 x 4-9	0 x 6-0	2-0 x 4-0	2-0 x 4-0	2-0 x 4-3	2-0 x 5-0	2-0 x 5-0					
Sign Identification Number	HEIGHT (Feet)													
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to				
53				13	13	19	19	25						
54				12	12	18	18	25						
55				12	12	18	18	25						
56			8	8	12	12	17	17	25					
57				12	12	16	16	25						
58				12	12	16	16	25						
59				11	11	15	15	25						
60				11	11	19	19	25						
61				11	11	15	15	25						
62				9	9	13	13	25						
63				9	9	13	13	25						
64				9	9	12	12	24	24	25				
65				8	8	12	12	23	23	25				
66					12	12	23	23	25					
67				7	7	12	12	22	22	25				
68				7	7	12	12	22	22	25				
69				7	7	12	12	22	22	25				
70				6	6	11	11	21	21	25				
71														
72					12	12	21	21	25					
73				6	6	11	11	20	20	24	24	25		
74														
75					10	10	18	18	22	22	25			
76					10	10	18	18	22	22	25			
77					9	9	17	17	22	22	25			
78					10	10	18	18	22	22	25			
79														
80						14	14	18	18	22	22	25		
81						13	13	17	17	21	21	25		
82														
83														
84														
85														
86						11	11	14	14	17	17	25		
87						11	11	12	12	16	16	23	23	25
88														
89														
90														
91														

The Column Size is O.D. x Wall Thickness in inches.
The Foundation Size is O.D. x Depth in feet & inches. A zero O.D. means that a concrete foundation is not necessary.

- NOTES**
1. Work this Standard with Standard Index Numbers 11860 and 11865.
 2. To determine column (post) size and footing requirements use the required Sign Identification Number and Sign Height (H), Designs for Heights (H) lower than those listed in the Table are included in Standard Index Number 11865.
 3. Single Column installations are not allowed for heights (H) exceeding the maximum height shown in the Table, and for sign profiles (Sign Identification Numbers) without any design tabulated. In this event, the sign(s) will have to be supported by multiple columns (posts) using breakaway devices. See Standard Index Number 9535.
 4. The Column (Post) material shall be aluminum. The size is given as outside diameter and wall thickness. Columns (posts) larger than 3 1/2" x 3/16" are non-fragile and shall be installed with breakaway supports and will have concrete footings and slip bases.
 5. The foundation size is given as outside diameter and depth.
 - a) Frangible Supports: The Column (Post) shall be driven into the ground to the depth indicated or set into preformed holes to the specified depth with suitable backfill tamped into compacted layers not exceeding 6", or filled with flowable fill or bagged concrete. The cost of the flowable fill or bagged concrete shall be included in the cost of the sign."
 - b) Breakaway Supports: Foundations for Breakaway Supports require concrete. The column support shall be set in a concrete foundation, sized as shown in the table. The first dimension indicates the diameter and the second dimension the depth into the ground. In all cases the ground is to be considered as undisturbed earth, road material, or properly compacted fill.

COLUMN SIZE , COLUMN HEIGHT & COLUMN FOOTINGS				
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SINGLE COLUMN GROUND SIGNS				
70 M.P.H. WIND LOADING	Names	Dates	Approved By 	
	Designed By	DER	10/94	State Structures Design Engineer
	Drawn By	DDDS	10/94	Revision
	Checked By	RES	11/94	04
			Sheet No.	Index No.
			1 of 1	11862

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16					
FOUNDATION	0 x 4-6	0 x 4-9	0 x 4-9	0 x 6-0	2-0 x 4-0	2-0 x 4-0	2-0 x 4-3	2-0 x 5-0	2-0 x 5-6					
Sign Identification Number	HEIGHT (FT)													
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to				
1		14	14	17	17	24	24	25						
2				14	14	20	20	25						
3					17	17	25							
4			7	7	11	11	21	21	25					
5														
6					12	12	21	21	25					
7					6	6	14	14	17	17	21	21	25	
8				17	17	23	23	25						
9						19	19	25						
10						14	14	25						
11						12	12	21	21	25				
12							13	13	17	17	20	20	25	
13						14	14	25						
14						12	12	23	23	25				
15						12	12	24	24	25				
16						12	12	21	21	25				
17						8	8	16	16	20	20	24	24	25
18							14	14	18	18	22	22	25	
19							11	11	14	14	17	17	25	
20														
21			7	7	11	11	21	21	25					
22						10	10	18	18	23	23	25		
23						11	11	19	19	23	23	25		
24						9	9	17	17	21	21	25		
25							12	12	24	24	25			
26							12	12	23	23	25			
27							12	12	21	21	25			
28							12	12	22	22	25			
29							12	12	21	21	25			
30						11	11	20	20	24	24	25		
31						9	9	17	17	21	21	25		
32						8	8	16	16	20	20	24	24	25
33						11	11	19	19	23	23	25		
34						9	9	17	17	21	21	25		
35						10	10	18	18	22	22	25		
36						8	8	16	16	20	20	24	24	25
37							12	12	16	16	20	20	25	
38							11	11	15	15	18	18	25	
39							11	11	13	13	17	17	25	
40														
41						10	10	11	11	13	13	20	20	25
42							10	10	11	11	18	18	25	
43														
44			15	15	18	18	24	24	25					
45				14	14	20	20	25						
46					20	20	25							
47					20	20	25							
48					19	19	25							
49					18	18	25							
50					17	17	25							
51					17	17	25							
52					17	17	25							

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16					
FOUNDATION	0 x 4-6	0 x 4-9	0 x 4-9	0 x 6-0	2-0 x 4-0	2-0 x 4-0	2-0 x 4-3	2-0 x 5-0	2-0 x 5-6					
Sign Identification Number	HEIGHT (FT)													
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to				
53					16	16	25							
54					15	15	25							
55					14	14	25							
56				9	9	13	13	25						
57					13	13	24	24	25					
58					12	12	24	24	25					
59					12	12	23	23	25					
60					12	12	23	23	25					
61				8	8	13	13	22	22	25				
62					12	12	21	21	25					
63					12	12	21	21	25					
64				6	6	12	12	20	20	24	24	25		
65					11	11	19	19	24	24	25			
66					11	11	19	19	23	23	25			
67					10	10	18	18	22	22	25			
68					10	10	18	18	22	22	25			
69					10	10	18	18	22	22	25			
70					9	9	17	17	21	21	25			
71														
72					9	9	17	17	21	21	25			
73					8	8	16	16	20	20	24	24	25	
74														
75					7	7	14	14	18	18	22	22	25	
76					7	7	14	14	18	18	22	22	25	
77							13	13	17	17	21	21	25	
78					7	7	14	14	18	18	22	22	25	
79														
80						12	12	14	14	17	17	25		
81						11	11	13	13	16	16	24	24	25
82														
83														
84														
85														
86						10	10	11	11	14	14	21	21	25
87							11	11	12	12	19	19	25	
88														
89														
90														
91														

The Column Size is O.D. x Wall Thickness in Inches
The Foundation Size is O.D. x Depth in feet & Inches.
A zero O.D.means that a concrete foundation is not necessary.

- NOTES**
1. Work this Standard with Standard Index Numbers 11860 and 11865.
 2. To determine column (post) size and footing requirements use the required Sign Identification Number and Sign Height (H), Designs for Heights (H) lower than those listed in the Table are included in Standard Index Number 11865.
 3. Single Column installations are not allowed for heights (H) exceeding the maximum height shown in the Table, and for sign profiles (Sign Identification Numbers) without any design tabulated. In this event, the sign(s) will have to be supported by multiple columns (posts) using breakaway devices. See Standard Index Number 9535.
 4. The Column (Post) material shall be aluminum. The size is given as outside diameter and wall thickness. Columns (posts) larger than 3 1/2" x 3/16" are non-fragible and shall be installed with breakaway supports and will have concrete footings and slip bases.
 5. The foundation size is given as outside diameter and depth.
 - a) Frangible Supports: The Column (Post) shall be driven into the ground to the depth indicated or set into preformed holes to the specified depth with suitable backfill tamped into compacted layers not exceeding 6", or filled with flowable fill or bagged concrete. The cost of the flowable fill or bagged concrete shall be included in the cost of the sign."
 - b) Breakaway Supports: Foundations for Breakaway Supports require concrete. The column support shall be set in a concrete foundation, sized as shown in the table. The first dimension indicates the diameter and the second dimension the depth into the ground. In all cases the ground is to be considered as undisturbed earth, road material, or properly compacted fill.

COLUMN SIZE , COLUMN HEIGHT & COLUMN FOOTINGS				
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SINGLE COLUMN GROUND SIGNS				
	Names	Dates	Approved By	
Designed By	DER	10/94		
Drawn By	DDDS	10/94	Revision	Sheet No.
Checked By	RES	11/94	04	1 of 1
				Index No. 11863

80 M.P.H. WIND LOADING

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/8	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16						
FOUNDATION	0 x 4-6	0 x 4-9	0 x 4-9	0 x 6-0	2-0 X 4-0	2-0 X 4-0	2-0 X 4-3	2-0 X 5-0	2-0 X 6-0						
Sign Identification Number	HEIGHT (Feet)														
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to					
1			15	15	20	20	25								
2					17	17	25								
3					14	14	25								
4					10	10	18	18	22	22	25				
5															
6					10	10	18	18	22	22	25				
7							12	12	14	14	18	18	25		
8			14	14	20	20	25								
9					16	16	25								
10					12	12	22	22	25						
11					10	10	17	17	21	21	25				
12					12	12	13	13	17	17	24	24	25		
13					12	12	21	21	25						
14					11	11	19	19	23	23	25				
15					12	12	20	20	24	24	25				
16					10	10	18	18	22	22	25				
17							13	13	16	16	20	20	25		
18							12	12	14	14	18	18	25		
19							10	10	11	11	14	14	21	21	25
20															
21					9	9	17	17	21	21	25				
22					8	8	15	15	19	19	23	23	25		
23					8	8	16	16	19	19	24	24	25		
24					7	7	14	14	18	18	22	22	25		
25					12	12	20	20	24	24	25				
26					11	11	19	19	23	23	25				
27					10	10	18	18	22	22	25				
28					10	10	18	18	22	22	25				
29					10	10	17	17	21	21	25				
30					9	9	16	16	20	20	24	24	25		
31					7	7	14	14	17	17	22	22	25		
32					6	6	13	13	16	16	20	20	25		
33					8	8	16	16	19	19	24	24	25		
34					7	7	14	14	18	18	22	22	25		
35					7	7	14	14	18	18	22	22	25		
36					6	6	13	13	16	16	20	20	25		
37							11	11	13	13	16	16	24	24	25
38							11	11	12	12	15	15	22	22	25
39							10	10	11	11	13	13	20	20	25
40															
41							10	10	11	11	16	16	25		
42									10	10	14	14	25		
43															
44				16	16	21	21	25							
45					17	17	25								
46					17	17	25								
47					16	16	25								
48					16	16	25								
49					15	15	25								
50					14	14	25								
51					14	14	25								
52					14	14	24	24	25						

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/8	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16						
FOUNDATION	0 x 4-6	0 x 4-9	0 x 4-9	0 x 6-0	2-0 X 4-0	2-0 X 4-0	2-0 X 4-3	2-0 X 5-0	2-0 X 6-0						
Sign Identification Number	HEIGHT (Feet)														
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to					
53					13	13	23	23	25						
54					13	13	23	23	25						
55					12	12	22	22	25						
56					12	12	21	21	25						
57					12	12	20	20	24	24	25				
58					12	12	20	20	24	24	25				
59					12	12	20	20	24	24	25				
60					11	11	19	19	23	23	25				
61					11	11	19	19	23	23	25				
62					10	10	17	17	21	21	25				
63					10	10	17	17	21	21	25				
64					9	9	17	17	21	21	25				
65					8	8	16	16	20	20	24	24	25		
66							15	15	19	19	23	23	25		
67					8	8	15	15	19	19	23	23	25		
68					7	7	14	14	18	18	22	22	25		
69					8	8	14	14	18	18	22	22	25		
70					7	7	14	14	18	18	22	22	25		
71															
72							14	14	17	17	21	21	25		
73					6	6	13	13	16	16	20	20	25		
74															
75							12	12	15	15	19	19	25		
76							12	12	15	15	18	18	25		
77							11	11	14	14	17	17	25		
78							12	12	15	15	19	19	25		
79															
80							10	10	12	12	14	14	21	21	25
81							9	9	11	11	13	13	20	20	25
82															
83															
84															
85															
86									10	10	11	11	17	17	25
87											11	11	15	15	25
88															
89															
90															
91															

The Column Size is O.D. x Wall Thickness in inches.

The Foundation Size is O.D. x Depth in feet & inches.
A zero O.D. means that a concrete foundation is not necessary.

NOTES

1. Work this Standard with Standard Index Numbers 11860 and 11865.
2. To determine column (post) size and footing requirements use the required Sign Identification Number and Sign Height (H), Designs for Heights (H) lower than those listed in the Table are included in Standard Index Number 11865.
3. Single Column installations are not allowed for heights (H) exceeding the maximum height shown in the Table, and for sign profiles (Sign Identification Numbers) without any design tabulated. In this event, the sign(s) will have to be supported by multiple columns (posts) using breakaway devices. See Standard Index Number 9535.
4. The Column (Post) material shall be aluminum. The size is given as outside diameter and wall thickness. Columns (posts) larger than 3 1/2" x 3/8" are non-fragile and shall be installed with breakaway supports and will have concrete footings and slip bases.
5. The foundation size is given as outside diameter and depth.
 - a) Frangible Supports: The Column (Post) shall be driven into the ground to the depth indicated or set into preformed holes to the specified depth with suitable backfill tamped into compacted layers not exceeding 6", or filled with flowable fill or bagged concrete. The cost of the flowable fill or bagged concrete shall be included in the cost of the sign.
 - b) Breakaway Supports: Foundations for Breakaway Supports require concrete. The column support shall be set in a concrete foundation, sized as shown in the table. The first dimension indicates the diameter and the second dimension the depth into the ground. In all cases the ground is to be considered as undisturbed earth, road material, or properly compacted fill.

COLUMN SIZE , COLUMN HEIGHT & COLUMN FOOTINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SINGLE COLUMN GROUND SIGNS

90 M.P.H. WIND LOADING	Names	Dates	Approved By		
	Designed By	DER	10/94	State Structures Design Engineer	
	Drawn By	DDDS	10/94	Revision	Sheet No.
	Checked By	RES	11/94	04	1 of 1
					Index No. 11864

COL. SIZE	2x $\frac{5}{8}$	2x $\frac{5}{8}$	2x $\frac{5}{8}$	2 $\frac{1}{2}$ x $\frac{5}{8}$	2 $\frac{1}{2}$ x $\frac{5}{8}$	2 $\frac{1}{2}$ x $\frac{5}{8}$	3x $\frac{5}{8}$	3x $\frac{5}{8}$	3x $\frac{5}{8}$	*	COL. SIZE	2x $\frac{5}{8}$	2x $\frac{5}{8}$	2x $\frac{5}{8}$	2 $\frac{1}{2}$ x $\frac{5}{8}$	2 $\frac{1}{2}$ x $\frac{5}{8}$	2 $\frac{1}{2}$ x $\frac{5}{8}$	3x $\frac{5}{8}$	3x $\frac{5}{8}$	3x $\frac{5}{8}$	*	ALUMINUM ROUND POST
FOUNDATION	0x2-0	0x2-0	0x2-0	0x2-3	0x2-3	0x2-3	0x2-6	0x2-6	0x2-6	*	FOUNDATION	0x2-0	0x2-0	0x2-0	0x2-3	0x2-3	0x2-3	0x2-6	0x2-6	0x2-6	*	STEEL FLANGED CHANNEL POST
COL. SIZE	2.5 #/FT	2.5 #/FT	3.0 #/FT	4.0 #/FT	4.0 #/FT	N/A	N/A	N/A	N/A	*	COL. SIZE	2.5 #/FT	2.5 #/FT	3.0 #/FT	4.0 #/FT	4.0 #/FT	N/A	N/A	N/A	N/A	*	STEEL SQUARE TUBE POST
FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	N/A	N/A	N/A	*	FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	N/A	N/A	N/A	*	STEEL SQUARE TUBE POST
COL. SIZE	W=1 $\frac{1}{2}$	W=1 $\frac{3}{4}$	W=1 $\frac{3}{4}$	W=2	W=2 $\frac{1}{4}$	W=2 $\frac{1}{4}$	W=2 $\frac{1}{4}$	W=2 $\frac{1}{2}$	N/A	*	COL. SIZE	W=1 $\frac{1}{2}$	W=1 $\frac{3}{4}$	W=1 $\frac{3}{4}$	W=2	W=2 $\frac{1}{4}$	W=2 $\frac{1}{4}$	W=2 $\frac{1}{4}$	W=2 $\frac{1}{2}$	N/A	*	STEEL SQUARE TUBE POST
FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	*	FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	*	STEEL SQUARE TUBE POST

Sign Identification Number	HEIGHT (FT)										
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to
1	To 8	8 - 10	10 - 13	13 - 14							
2	To 6	6 - 7	7 - 8	8 - 12	12 - 13	13 - 14					
3	To 6	6 - 7	7 - 9	9 - 11	11 - 12	12 - 13					
4											
5											
6				To 6	6 - 8	8 - 9					
7											
8	To 8	8 - 9	9 - 10	10 - 13	13 - 14						
9	To 7	7 - 8	8 - 11	11 - 12	12 - 13	13 - 14					
10			To 8	8 - 9	9 - 10	10 - 12					
11			To 6	6 - 7	7 - 9						
12											
13			To 8	8 - 9	9 - 11	11 - 12					
14			To 6	6 - 7	7 - 8	8 - 10	10 - 11				
15			To 6	6 - 7	7 - 8	8 - 10					
16			To 6	6 - 7	7 - 9						
17											
18											
19											
20											
21					To 6						
22											
23						To 6					
24											
25			To 6	6 - 7	7 - 9	9 - 11					
26			To 6	6 - 8	8 - 9						
27			To 6	6 - 7	7 - 9						
28			To 6	6 - 7	7 - 9						
29					To 7	7 - 8					
30					To 6	6 - 8					
31					To 6						
32					To 6						
33					To 6	6 - 7					
34					To 6						
35					To 7						
36					To 6						
37											
38											
39											
40											
41											
42											
43											
44	To 9	9 - 10	10 - 13	13 - 14							
45	To 6	6 - 7	7 - 9	9 - 11	11 - 12	12 - 13	13 - 14				
46	To 6	6 - 7	7 - 9	9 - 11	11 - 12	12 - 13	13 - 14				

Sign Identification Number	HEIGHT (FT)										
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to
47	To 6	6 - 7	7 - 9	9 - 11	11 - 12	12 - 13	13 - 14				
48	To 7	7 - 8	8 - 11	11 - 12	12 - 13	13 - 14					
49	To 6	6 - 7	7 - 10	10 - 11	11 - 12	12 - 14					
50											
51	To 6	6 - 7	7 - 9	9 - 11	11 - 12	12 - 14					
52	To 6	6 - 9	9 - 10	10 - 12	12 - 13						
53	To 6	6 - 8	8 - 10	10 - 11	11 - 13						
54	To 8	8 - 9	9 - 11	11 - 12							
55	To 8	8 - 9	9 - 10	10 - 12							
56											
57	To 7	7 - 9	9 - 10								
58	To 6	6 - 7	7 - 9	9 - 11							
59	To 6	6 - 7	7 - 9	9 - 10							
60	To 6	6 - 7	7 - 8	8 - 10							
61	To 6	6 - 8									
62	To 6	6 - 7	7 - 8								
63	To 6	6 - 7	7 - 9								
64											
65	To 6	6 - 8									
66											
67	To 6	6 - 7									
68							To 7				
69							To 7				
70							To 6				
71											
72											
73							To 6				
74											
75											
76											
77											
78											
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81											
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83											
84											
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86											
87											
88											
89											
90											
91											

* Aluminum Round Post dimensions are given in inches. The size is shown as outside diameter times wall thickness.

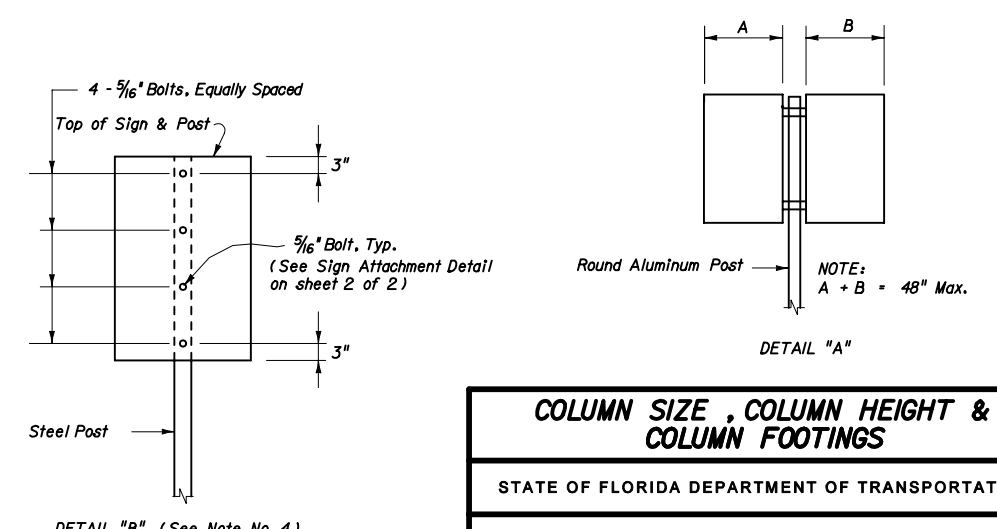
Steel Flanged Channel Post sizes are given in lb/ft. Section definitions and properties are shown on Sheet 2 of 2. (See QPL for approved posts).

Steel Square Tube Post dimensions for "W" are given in inches. The "W" dimension is defined on Section F-F. (See QPL for approved posts).

Foundation dimensions shown are given in feet & inches. The dimension shown is the minimum embedment of the driven post.

NOTES

- This Standard Index 11865 provides designs for driven single post sign installations for implementation at all locations within the State of Florida. The designs adhere to the following criteria:
 - Mounting Height = 14' Maximum
 - Sign(s) Area = 25 sq. ft. Maximum
 - Sign(s) Width: Single = 36" Maximum
Dual = 48" Maximum (See Detail "A")
 - The contractor shall set the posts in preformed holes to the specified depth with suitable backfill tamped in compacted layers not exceeding 6", or filled with flowable fill or bagged concrete. The cost of the flowable fill or bagged concrete shall be included in the cost of the sign. At the contractor's option, steel posts may be driven.
- Designs exceeding above criteria or requiring concrete footings are included on Index 11861 thru 11864.
- Specifications for Aluminum materials, Sign Panel Details, etc. are shown on standard Index 11860. Additional information and details are shown on Index 11861 thru 11864. Therefore, work this Standard Index 11865 with Standard Indices 11860 to 11864.
- Sign Bracket requirements for round aluminum post are shown on Index 11860 (80 mph WIND ZONE). If Flanged Channels or Square Tubes are used, substitute two 5/16" bolts for each Bracket. See Detail "B" and sign Attachment Details.
- All posts shall be installed Plumb.
- Steel for Flanged Channel Posts shall conform with ASTM A499 Grade 60, or ASTM A576 Grade 1080.
- Steel for fabrication of square Tubes shall conform with ASTM A653 or ASTM A570. HOWEVER, STEEL FROM THE FABRICATED SQUARE TUBES MUST MEET A CERTIFIED MINIMUM YIELD STRENGTH OF 55 ksi.
- Steel Flanged Channel Posts with a 4 lb/ft are non-frangible and shall be installed with approved breakaway (frangible) bases. See Detail "C". The base and the sign posts shall be same size and type and the splice shall be 6" long and fastened with two bolts, 4" apart. The bolts shall be wrench-tightened sufficiently to clamp splice assembly tightly together. Bolts shall conform with ASTM A 354 Grade DH or SAE J995 Grade 8. Washers and spacers shall conform with ASTM A307 or A36.
- Steel Flanged Channel Posts with masses of 2.5 lb/ft and 3 lb/ft, all Aluminum Round Posts and all Steel Square Tubes included in this standard are frangible and do not require breakaway (frangible) bases. However, the contractor may mount frangible posts on approved breakaway bases.
- Bolts, Nuts and washers not included in note 8 above, shall conform with ASTM A307.
- Steel Posts shall be selected from the Department's book of Qualified Product List (QPL).
- All steel posts, and hardware shall be galvanized in accordance with ASTM A123 or A153, or AASHTO M181 Grade 2.
- Shop Drawings: If the contractor proposes to utilize sign panel connections and/or breakaway devices not shown in this standard or in the above referenced standards, the Contractor shall submit shop drawings for approval.
- All dimensions are in inches, unless otherwise noted.



DETAIL "B" (See Note No. 4)
SIGN MOUNTING USING CHANNELS OR SQUARE TUBES

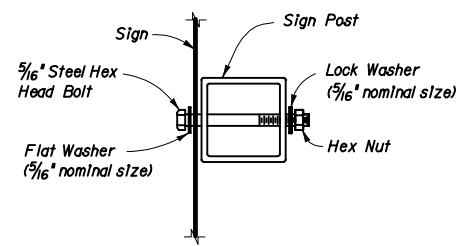
COLUMN SIZE, COLUMN HEIGHT & COLUMN FOOTINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

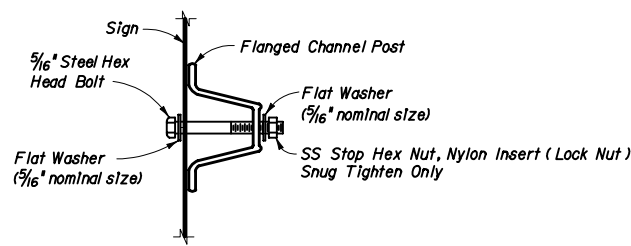
SINGLE COLUMN GROUND SIGNS

Designed By	JMD	4-94	Approved/By	[Signature]	
Drawn By	SJM	4-94	Revision	Sheet No.	Index No.
Checked By	AJG	4-94	04	1 of 2	11865

HEIGHT = 14' MAX.
(ALL WIND ZONES)



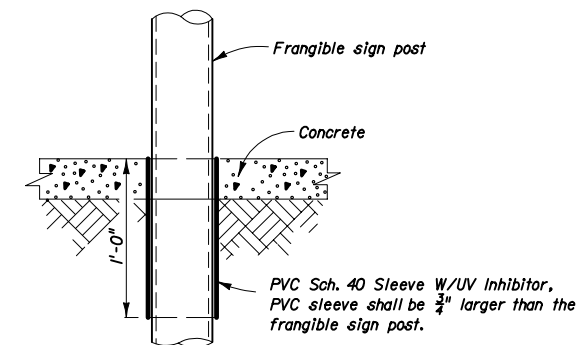
SIGN ATTACHMENT DETAIL



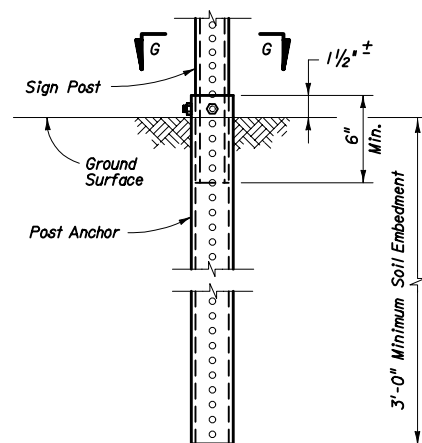
SIGN ATTACHMENT DETAIL

APPROVED STEEL FLANGED CHANNEL POSTS					
lb/ft*	Type	A (in)	B (in)	C (in)	Sx (in ³)
2.50	F	1.562	3.125	1.250	.310
2.50	M	1.500	3.063	1.281	.313
3.00	F	1.750	3.500	1.625	.430
3.00	M	1.875	3.500	1.313	.447
4.00	F	1.750	3.500	1.671	.560
4.00	M	1.938	3.500	1.313	.625

* ± 4%

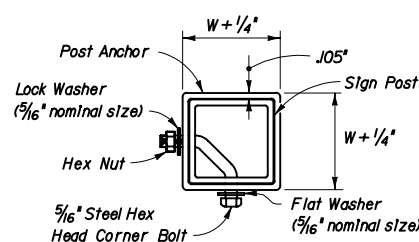


SIGN POST IN CONCRETE
(CROSSOVERS, MEDIANS, & SIDEWALKS)

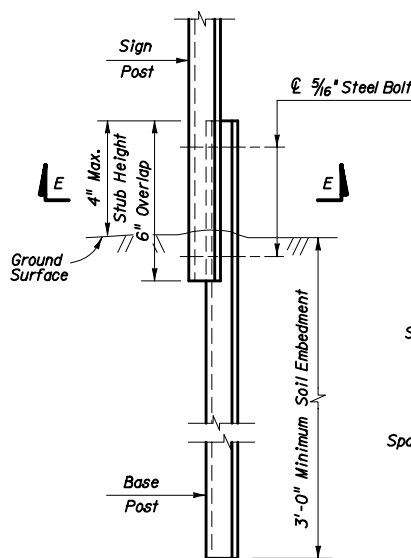


ELEVATION

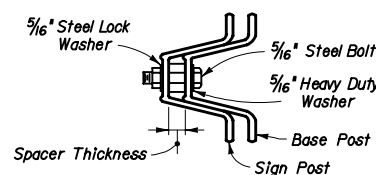
Showing Mounting Using Optional Anchor Tube



SECTION G-G

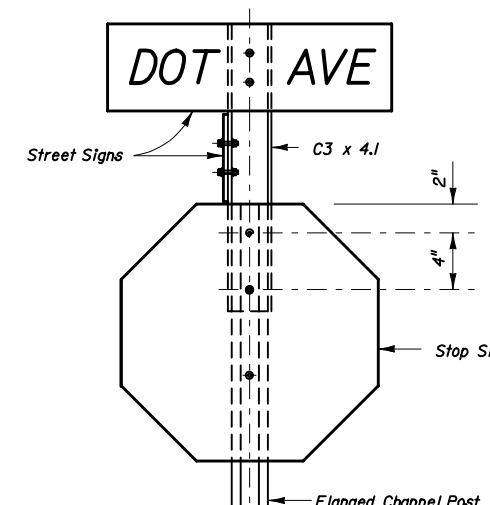


DETAIL "C"
(Approved Frangible Installation)



SECTION E-E

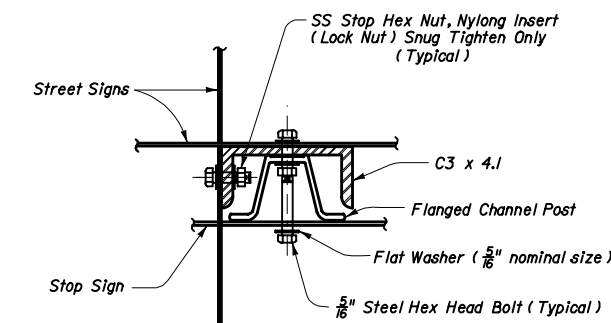
Spacer Thickness shall be as follows:
2.5 lb/ft Type M posts shall use 5/16" spacer.
Other posts shall use 3/8" spacer (or two 5/16").



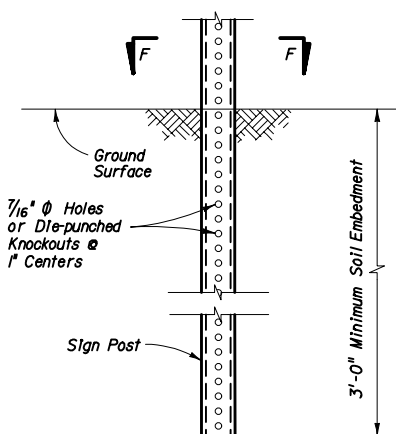
ELEVATION

PERPENDICULAR SIGN ATTACHMENT DETAIL

NOTE: All dimensions are in inches, unless otherwise noted.



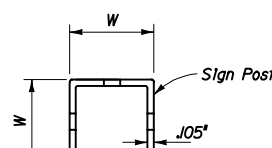
TOP VIEW



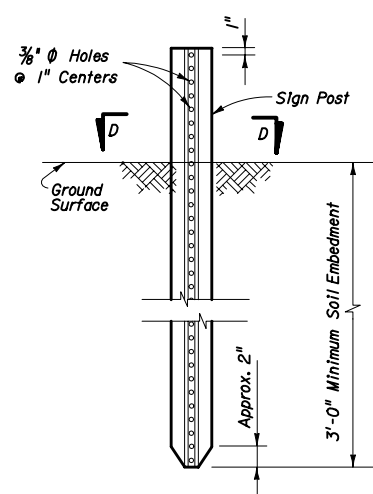
ELEVATION

Showing Mounting Without Anchor Tube

STEEL SQUARE TUBE POST DETAILS

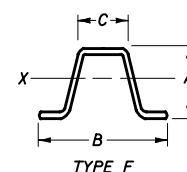


SECTION F-F

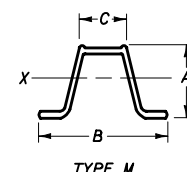


ELEVATION

STEEL FLANGED CHANNEL POST DETAILS



TYPE F



TYPE M

SECTION D-D

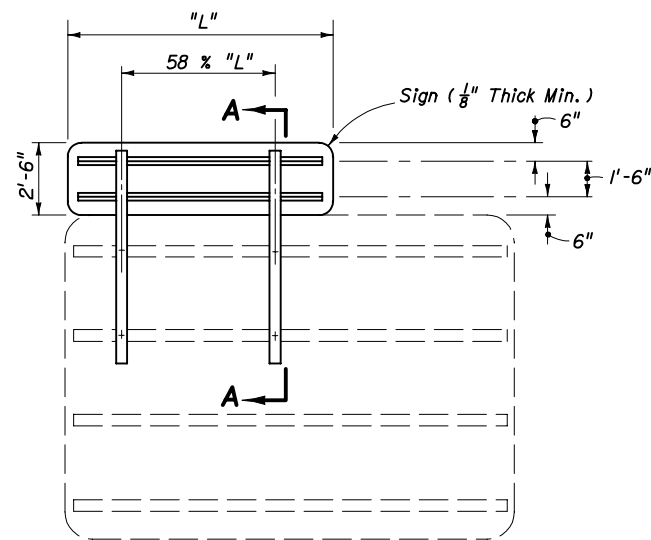
COLUMN SIZE, COLUMN HEIGHT & COLUMN FOOTINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SINGLE COLUMN GROUND SIGNS

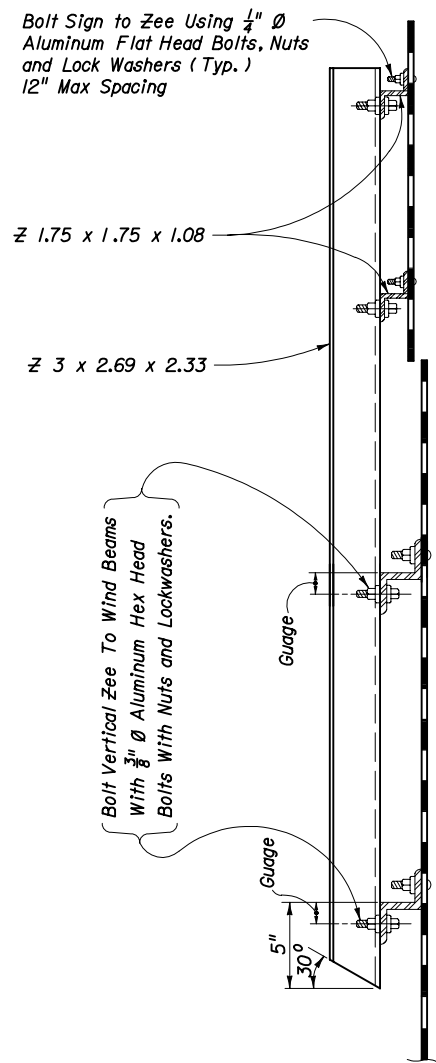
Names	Dates	Approved By		
Designed By	JMD/TJB 6/99	 State Structures Design Engineer		
Drawn By	JP 6/99			
Checked By	TJB 6/99			
Revision	04	Sheet No.	Index No.	
		2 of 2	11865	

HEIGHT = 14' MAX.
(ALL WIND ZONES)



NOTE: Exit numbering panel shall be located to the right side for right exit and to the left for left exit.

Mounting of Exit Numbering Panels To Highway Signs
ELEVATION



SECTION AA

GENERAL NOTES

DESIGN SPECIFICATION: Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, AASHTO 1994.

SHEETS AND PLATES: Material used shall meet the requirements of Aluminum Association Alloy 6061-T6 and ASTM B209. Sheets are to be degreased, etched, neutralized and treated with Alodine 1200, Iridite 14-2 Bonderite 721, or equal. No stenciling permitted on sheets.


MATERIALS: All aluminum materials shall meet the requirements of the Aluminum Association Alloy 6061-T6 and also the following ASTM specifications for the following: Sheets and plates B209; extruded shapes B221 and standard structural shapes B308.

ALUMINUM BOLTS, NUTS & LOCK WASHERS: Aluminum bolts shall meet the requirements of the Aluminum Association Alloy 2024-T4 (ASTM F468). The bolts shall have an anodic coating of at least .0002" thick and be chromate sealed. Lockwashers shall meet the requirement of Aluminum Association Alloy 7075-T6 (ASTM B221). Nuts shall meet the requirement of Aluminum Association Alloy 6262-T9 (ASTM F467) or 6061-T6.

SIGN FACE: All sign face corners shall be rounded. See sign layout sheet for dimension "L" and sign face details. For mounting details refer to Index No. 11037.

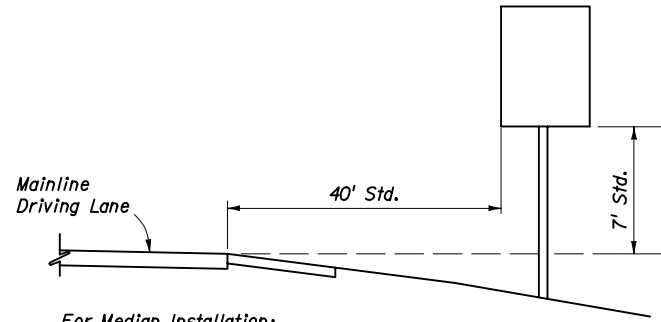
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MOUNTING EXIT NUMBERING PANELS TO HIGHWAY SIGNS

			Approved/By		
Designed By	CK/CWB	7-82	 State Structures Design Engineer		
Drawn By	CWB	7-82			
Checked By	CK	7-82	Revision	Sheet No.	Index No.
			04	1 of 1	13417

CASE I

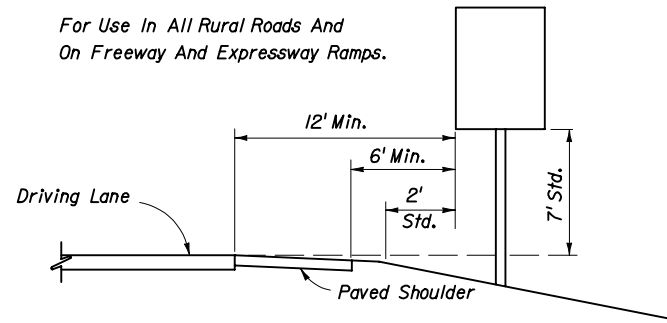
For use on Freeway and Expressway systems for signs on mainline.



For Median Installation:
If Median Width Does Not Allow Std. Offset From Both Roadways, Center Sign In Median.

CASE II

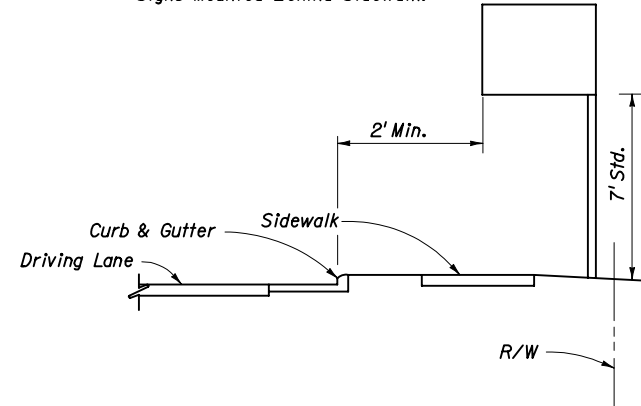
For Use In All Rural Roads And On Freeway And Expressway Ramps.



14' Horizontal Clearance Standard On All Freeway And Expressway Ramps
For Sections Without Paved Shoulder The 6' Min Does Not Apply.

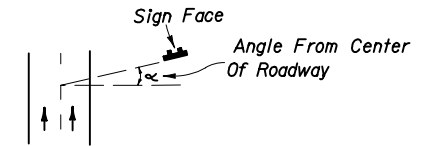
CASE III

For Use On All Roads With Signs Mounted Behind Sidewalk.



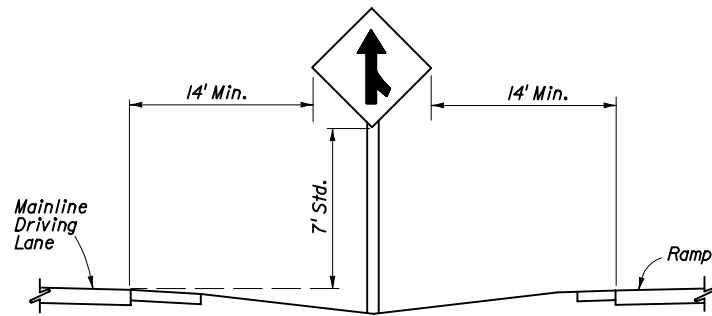
GENERAL NOTES:

1. The typical sections shown hereon serve as a guide for locating the traffic signs required under various roadside conditions. For size and details of sign construction and footing, refer to the appropriate standard index drawing for roadside sign.
2. It shall be the CONTRACTORS responsibility to verify the length of sign supports in the field prior to fabrication.
3. Roadside signs shall be installed at an angle of 1 to 4 degrees away from the traffic flow (see illustration). Shoulder mounted signs shall be rotated counterclockwise and median mounted signs rotated clockwise. Signs on curves shall be mounted as noted above from the perpendicular to the motorist line of sight.



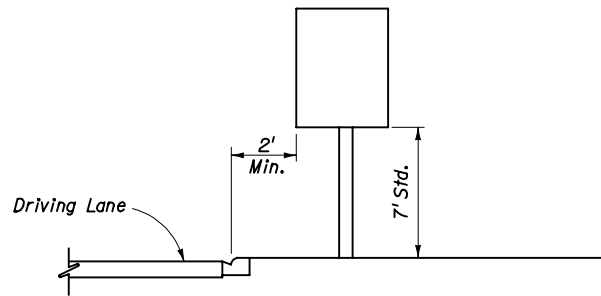
CASE IV (Merge Sign)

For Use On All Rural, Freeway And Expressway Systems.



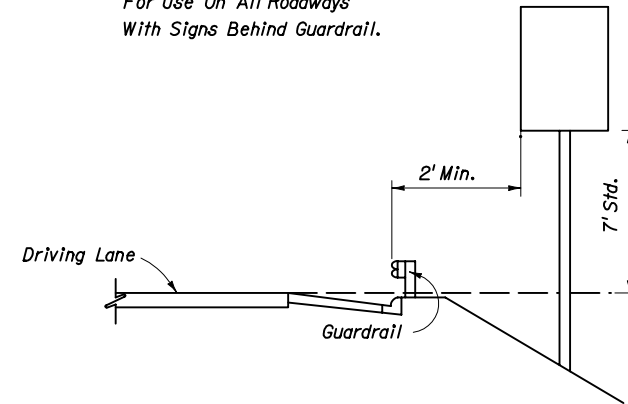
CASE V

For Use In Business Or Residential Areas Only.



CASE VI

For Use On All Roadways With Signs Behind Guardrail.



4. The setback for stop and yield signs may be reduced to 3' minimum from the driving lane if required for visibility in business or residential sections with no curb and speeds of 30 MPH or less.
5. The mounting heights are measured from the bottom of the sign panel to a horizontal line extended from the edge of the driving lane. If the standard heights cannot be met, the minimum heights are as follows:

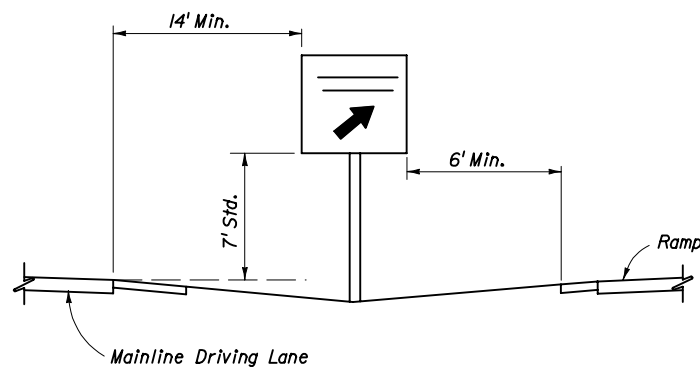
Expressway & Freeway Systems	7'
Other Roadway Systems	
Rural	5'
Urban (including residential with parking and /or pedestrian activity)	7'

If a secondary sign is mounted below the major sign, the major sign shall be at least 8' and the secondary sign at least 5' for expressway & freeway systems and for other systems the height to the secondary sign shall be at least 4' for rural and 6' for urban sections.

6. Sign supports should never be placed in the bottom of ditches where erosion might affect the proper operation of the breakaway feature.

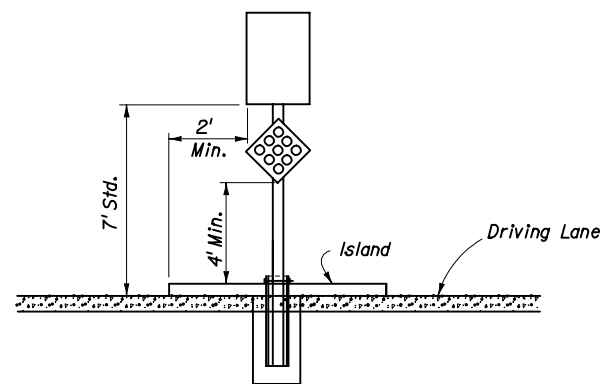
CASE VII (REST AREA & EXIT GORE SIGNS)

For Use On All Freeway And Expressway Systems



CASE VIII

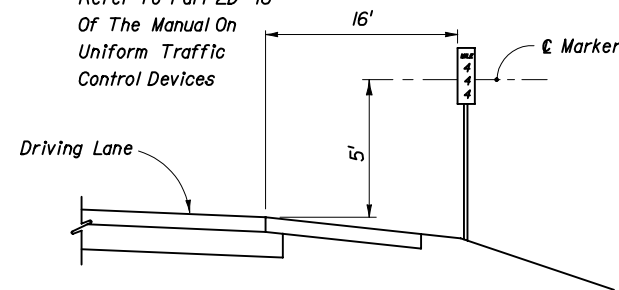
Sign On Island



Center Sign Column On Island

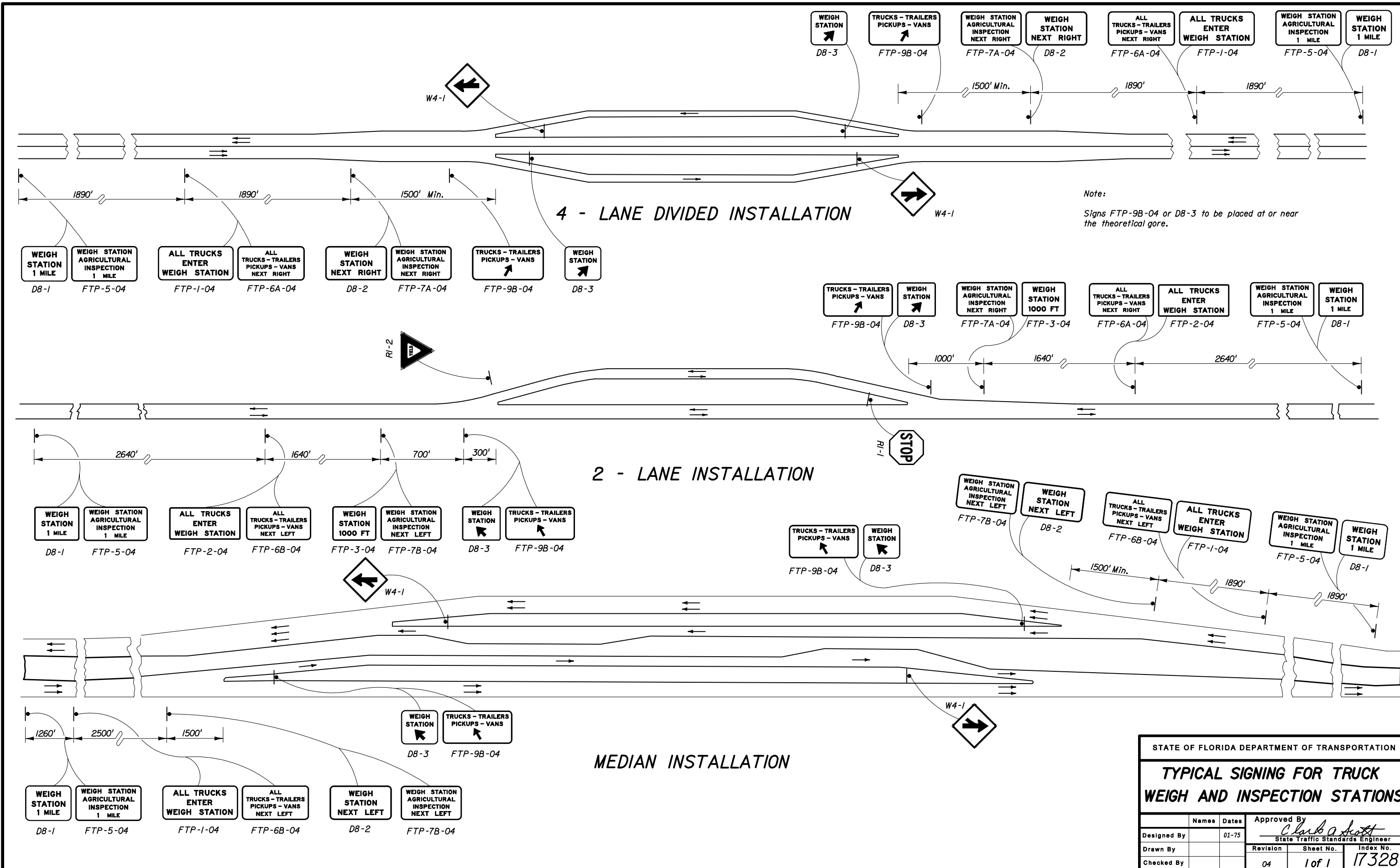
CASE IX (MILE POST MARKER)

For More Information Refer To Part 2D-46 Of The Manual On Uniform Traffic Control Devices



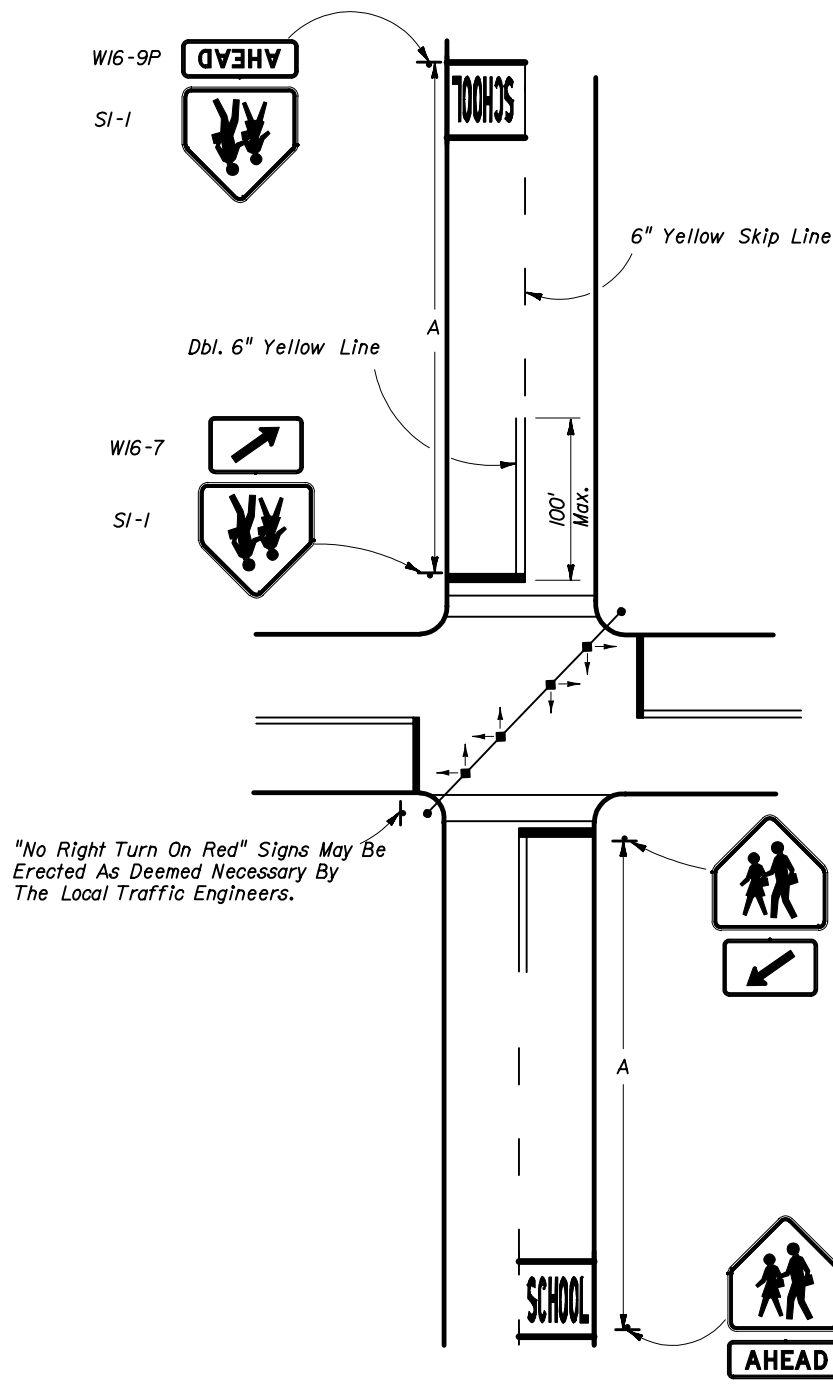
7. Sign supports shall not reduce the accessible route /continuous passage to less than 3' min. clear width as required by the Americans with Disabilities Act (ADA) Accessibility Guidelines.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TYPICAL SECTIONS FOR PLACEMENT OF SINGLE & MULTI-COLUMN SIGNS				
Names	Dates	Approved By		
Designed By	3-75	<i>Clark A. Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	17302



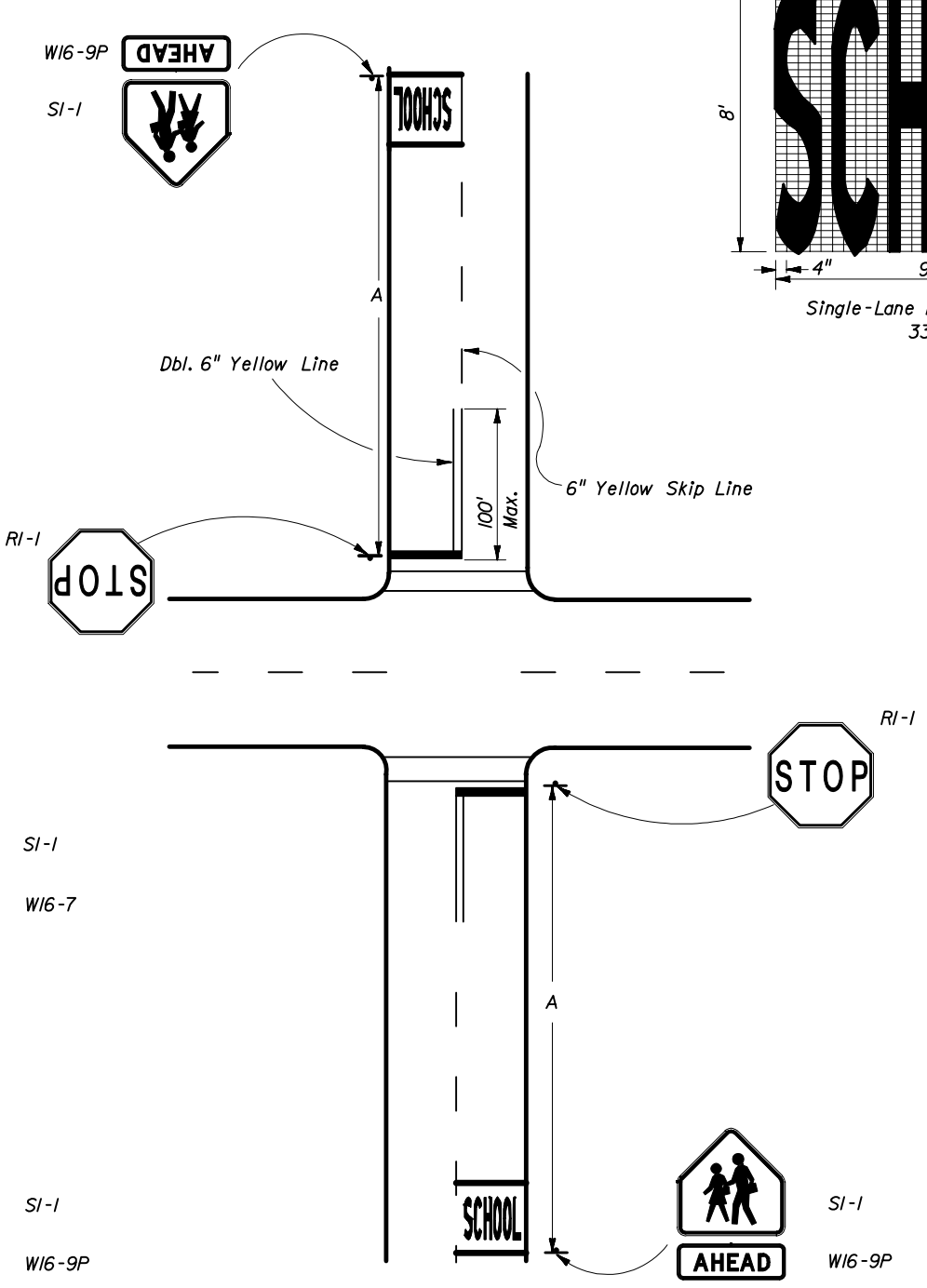
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TYPICAL SIGNING FOR TRUCK WEIGH AND INSPECTION STATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		01-75	<i>Clark A. Scott</i>	
Checked By			Revision	Sheet No. Index No.
			04	1 of 1 17328

Approach Speed (MPH)	Distance A (FT)
25 To 35	200
36 To 45	350
46 To 55	500

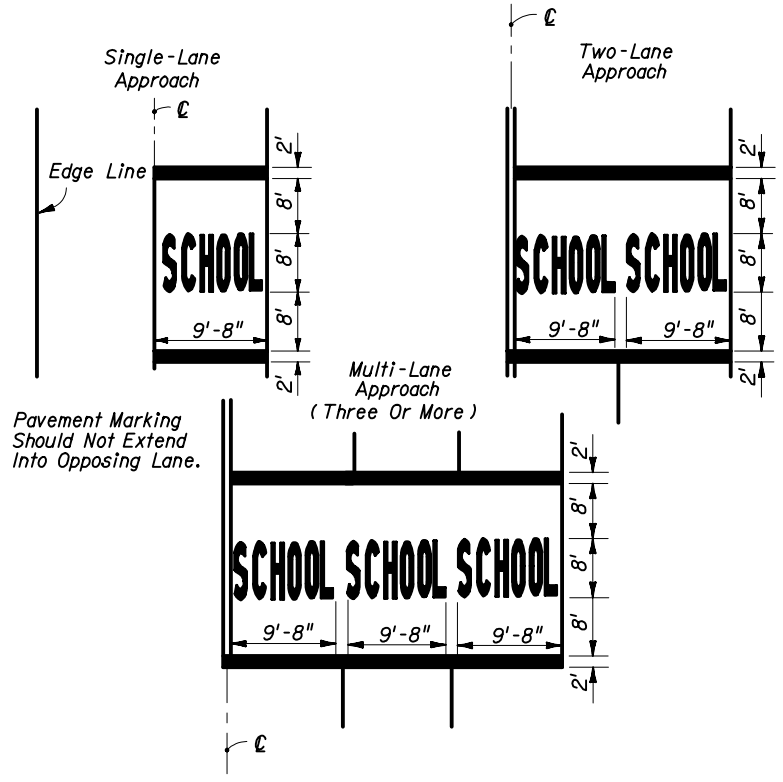
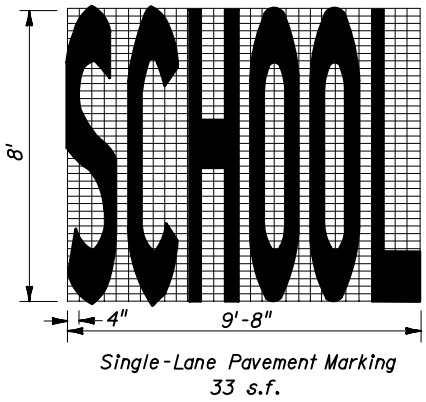


1. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK AT A SIGNALIZED INTERSECTION

Note:
Special speed restrictions are not normally applicable to these two cases.



2. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK AT A STOP CONTROLLED INTERSECTION



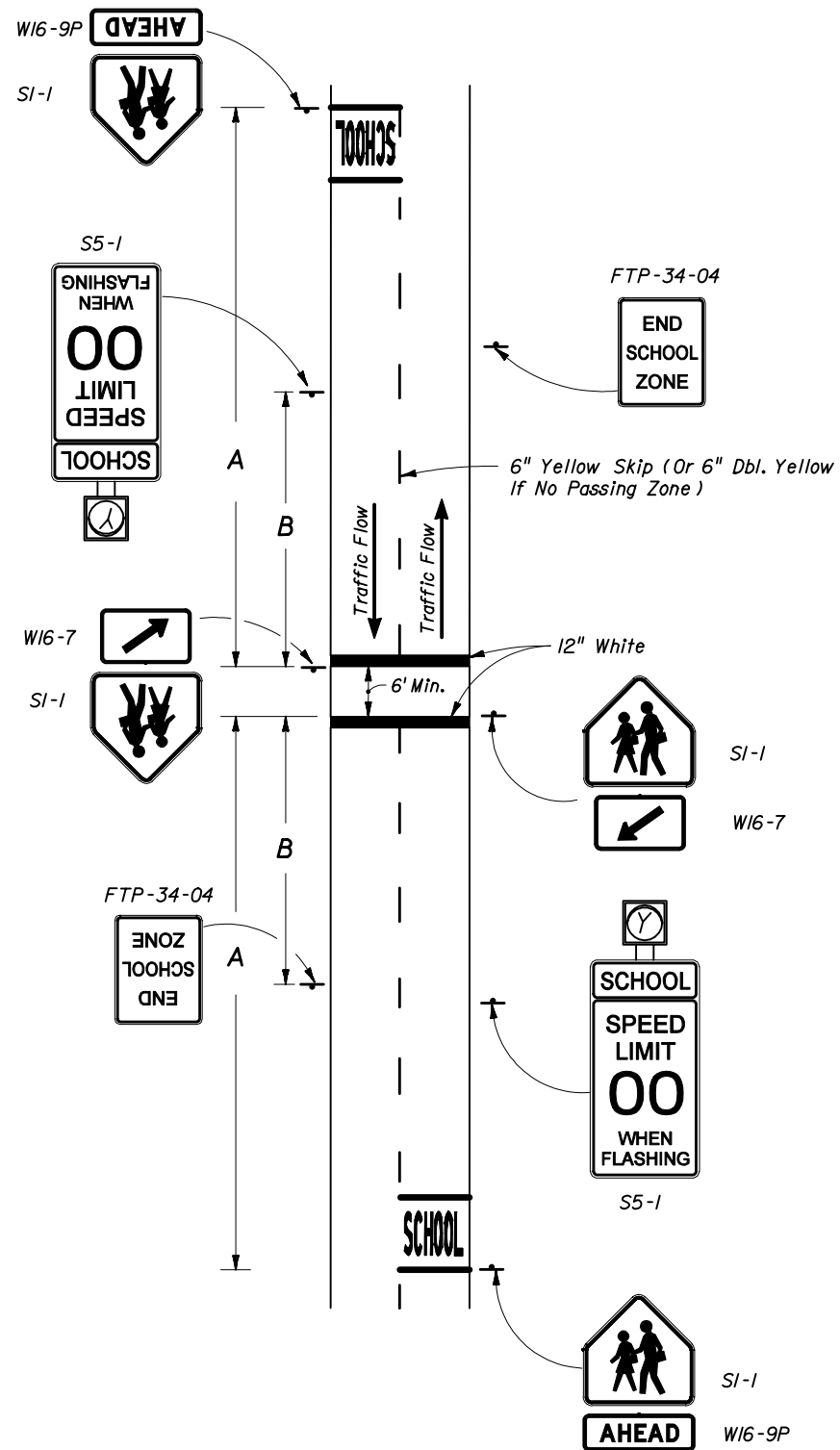
PAVEMENT MARKINGS

Notes:

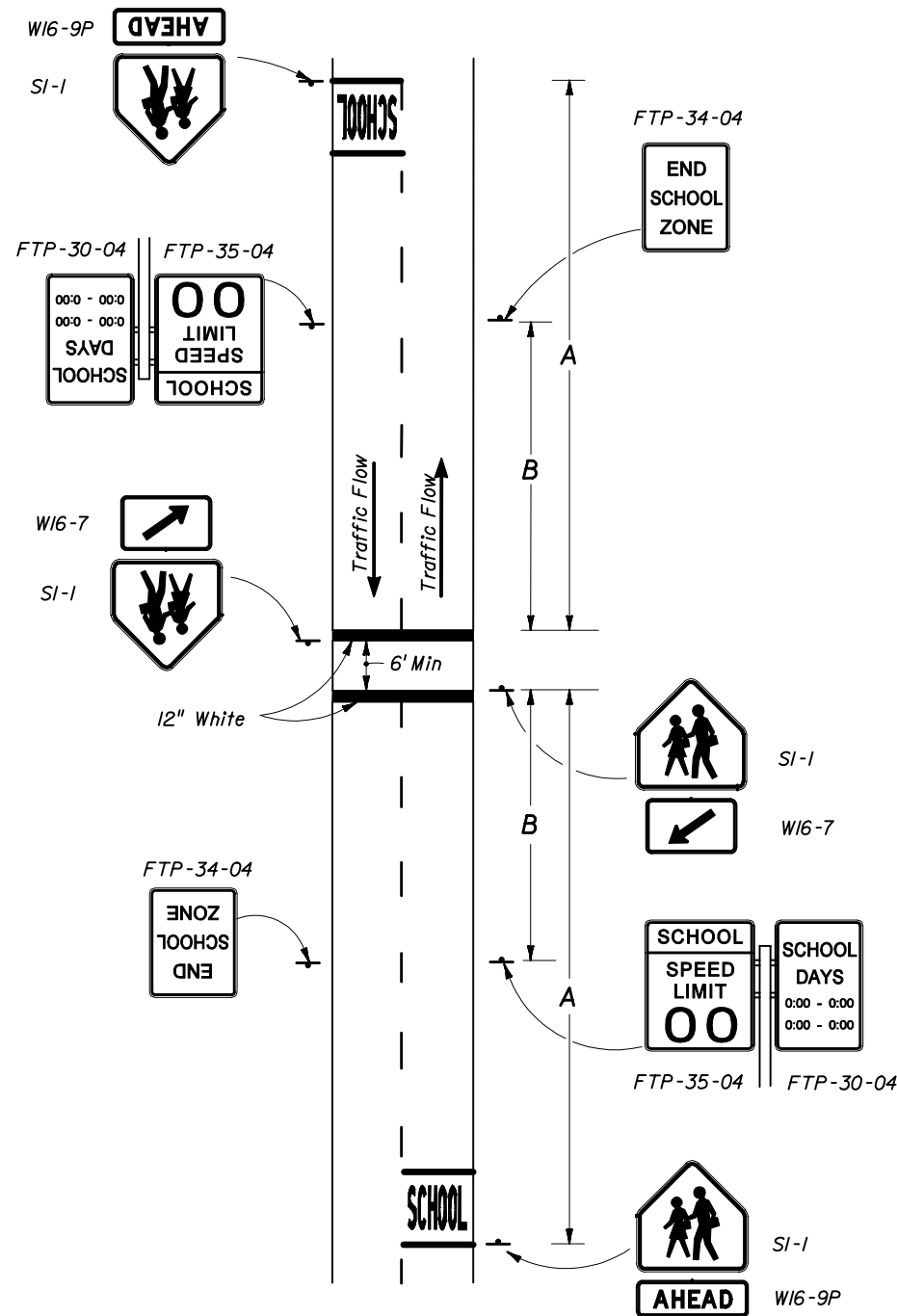
- Signs shall be erected in accordance with Index No. 17302.
- When computing pavement messages quantities do not include transverse lines.
- All school signs shall be reflective.
- School crosswalk width shall be 6' min. 10' std. without public sidewalk curb ramps 10' min. with public sidewalk curb ramps. See Index No. 17346 sheets 2 and 7.
- For signalized intersections or mid-block signalized crossings where flashing beacon speed limit signs (post mounted or overhead) are installed, the minimum distance from the speed limit sign to the stop line shall be 100'. The sign shall not block the view of the signal.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SCHOOL SIGNS & MARKINGS				
Names	Dates	Approved By		
Designed By	7-76	Clark A. Scott State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	7-76	04	1 of 6	17344

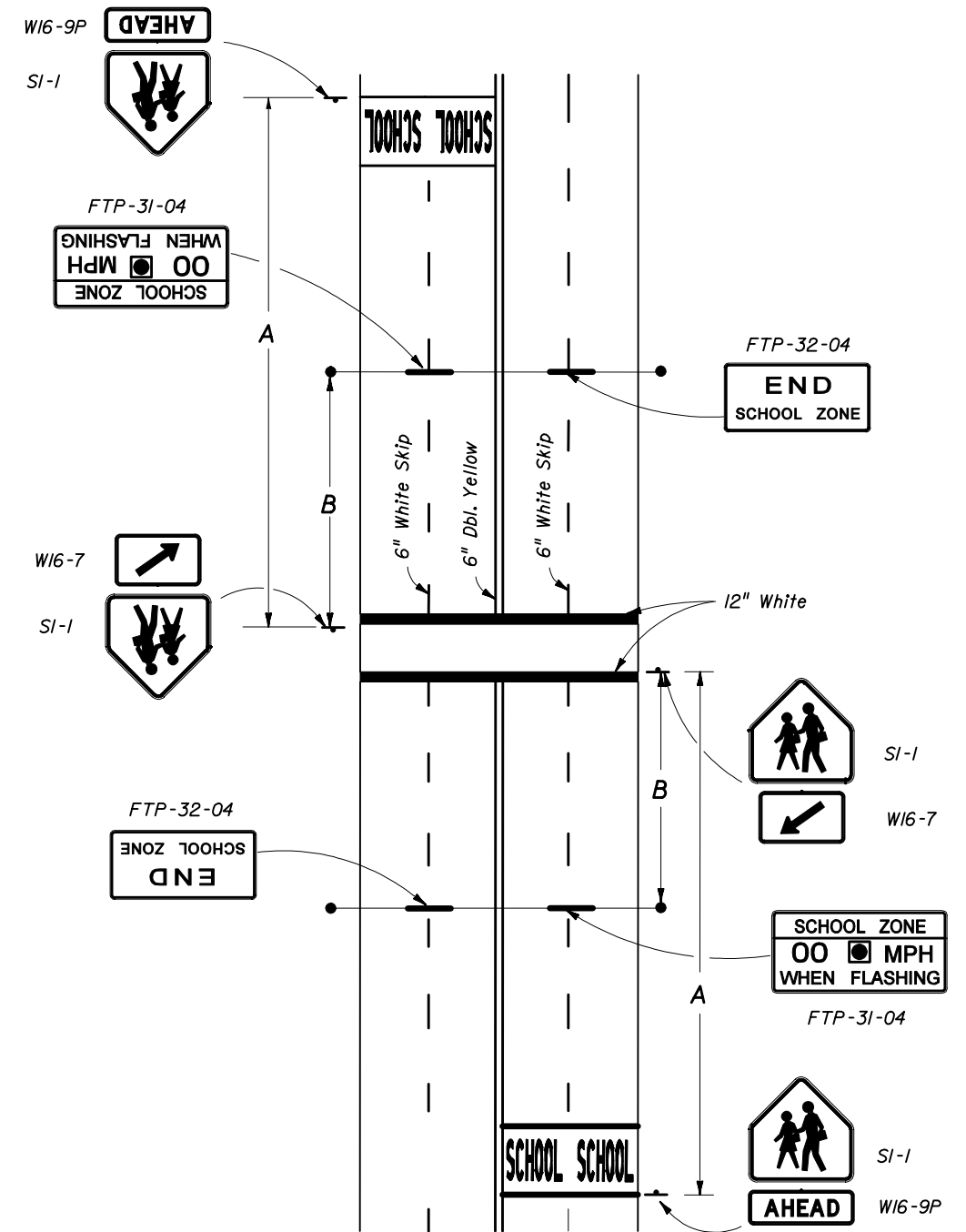
3. TRAFFIC CONTROL DEVICES WITH FLASHING BEACON FOR REDUCED SPEED ZONE AT A SCHOOL CROSSWALK (2 LANES - 2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)



4. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK (NO FLASHING BEACON) (2 LANES - 2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)



5. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS (4 LANES UNDIVIDED - 2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)



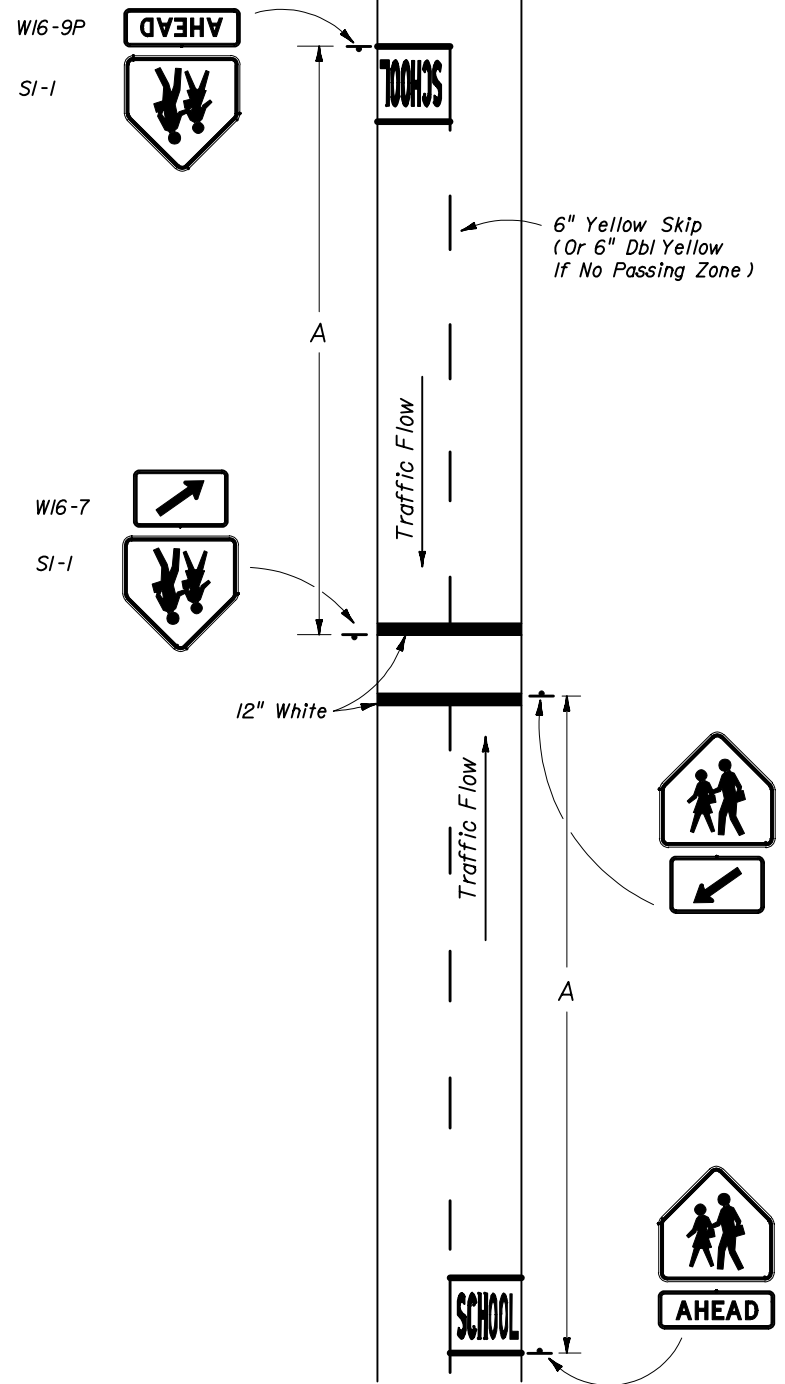
APPROACH SPEED MPH	SUGGESTED DISTANCE IN FEET	
	A	B
25 To 35	200	50
36 To 45	350	65
46 To 55	500	80

School crosswalk width shall be 6' min. 10' std. without public sidewalk curb ramps. 10' min. with public sidewalk curb ramps. See Index No. 17346 sheet 9 of 13.

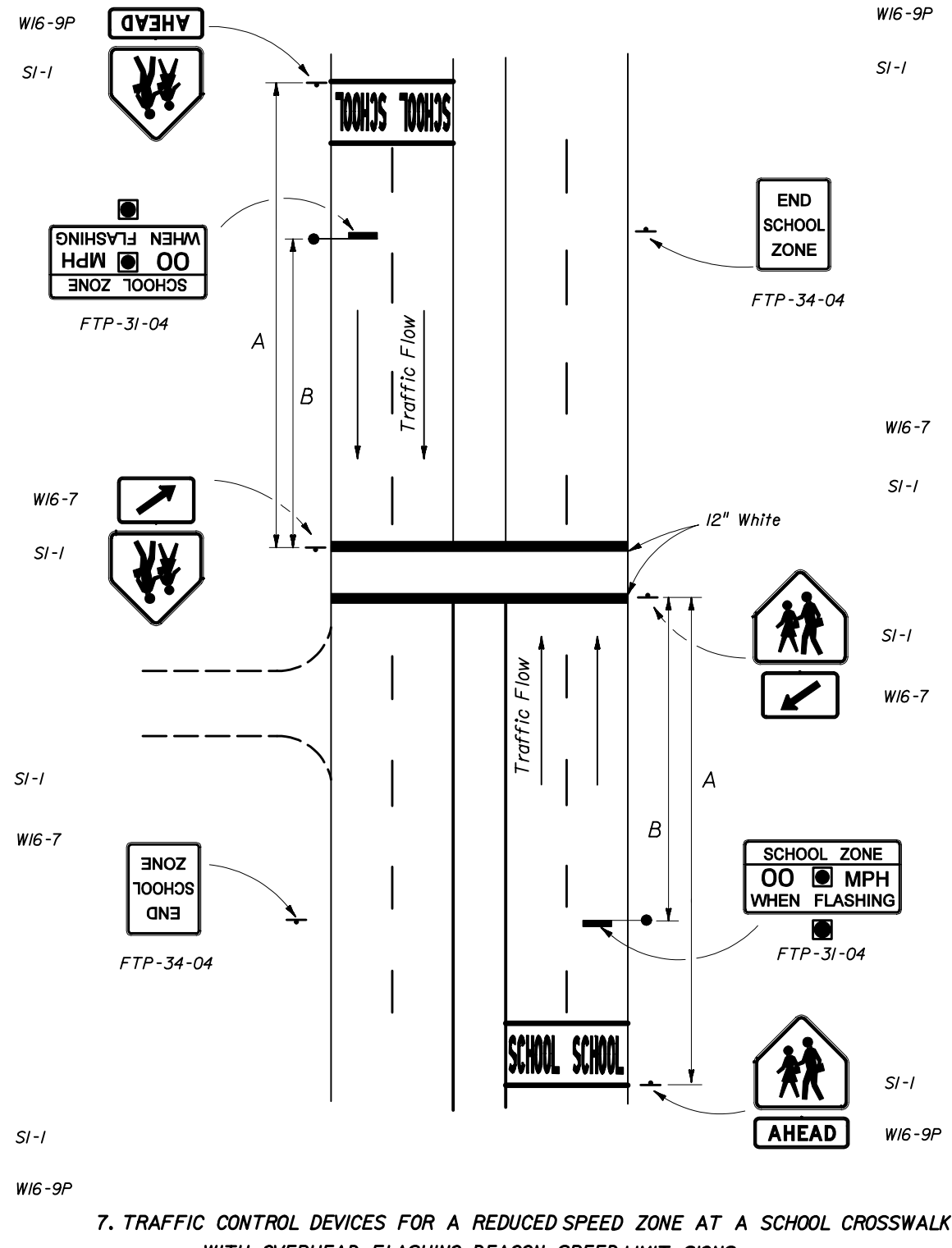
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SCHOOL SIGNS & MARKINGS

Designed By	Names	Dates	Approved By
Drawn By		7-76	<i>Charles A. Scott</i> State Traffic Standards Engineer
Checked By	Revision	7-76	Sheet No. Index No.
	04		2 of 6 17344



6. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK WITHOUT A SPEED REDUCTION (2 LANES - 2 WAY TRAFFIC)

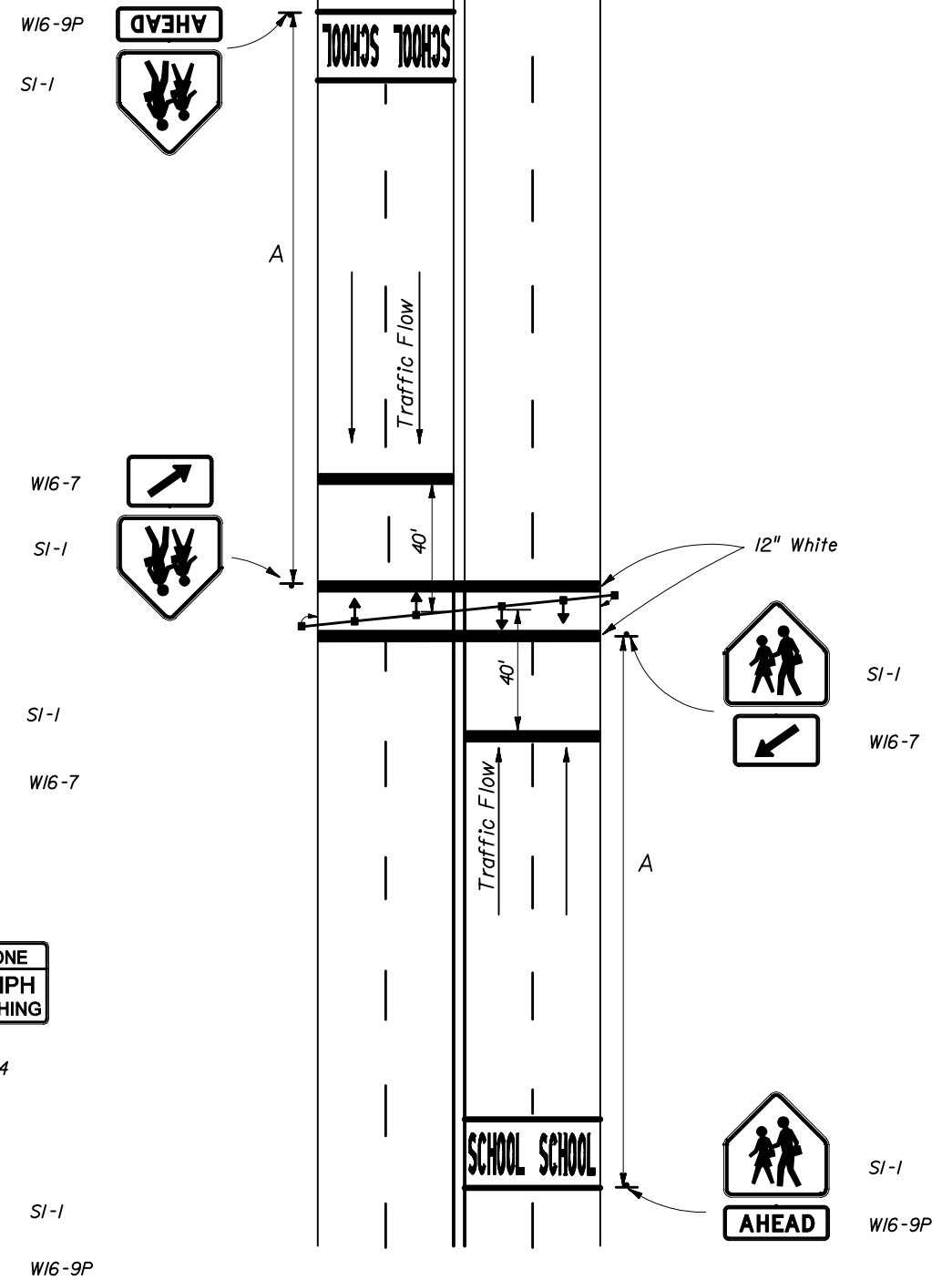


7. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS (4 LANES DIVIDED - 2 WAY TRAFFIC)

APPROACH SPEED MPH	SUGGESTED DISTANCE IN FEET	
	A	B
25 To 35	200	50
36 To 45	350	65
46 To 55	500	80

School crosswalk width shall be 6' min. 10' std. without public sidewalk curb ramps. 10' min. with public sidewalk curb ramps. See Index No. 17346 sheet 9 of 13.

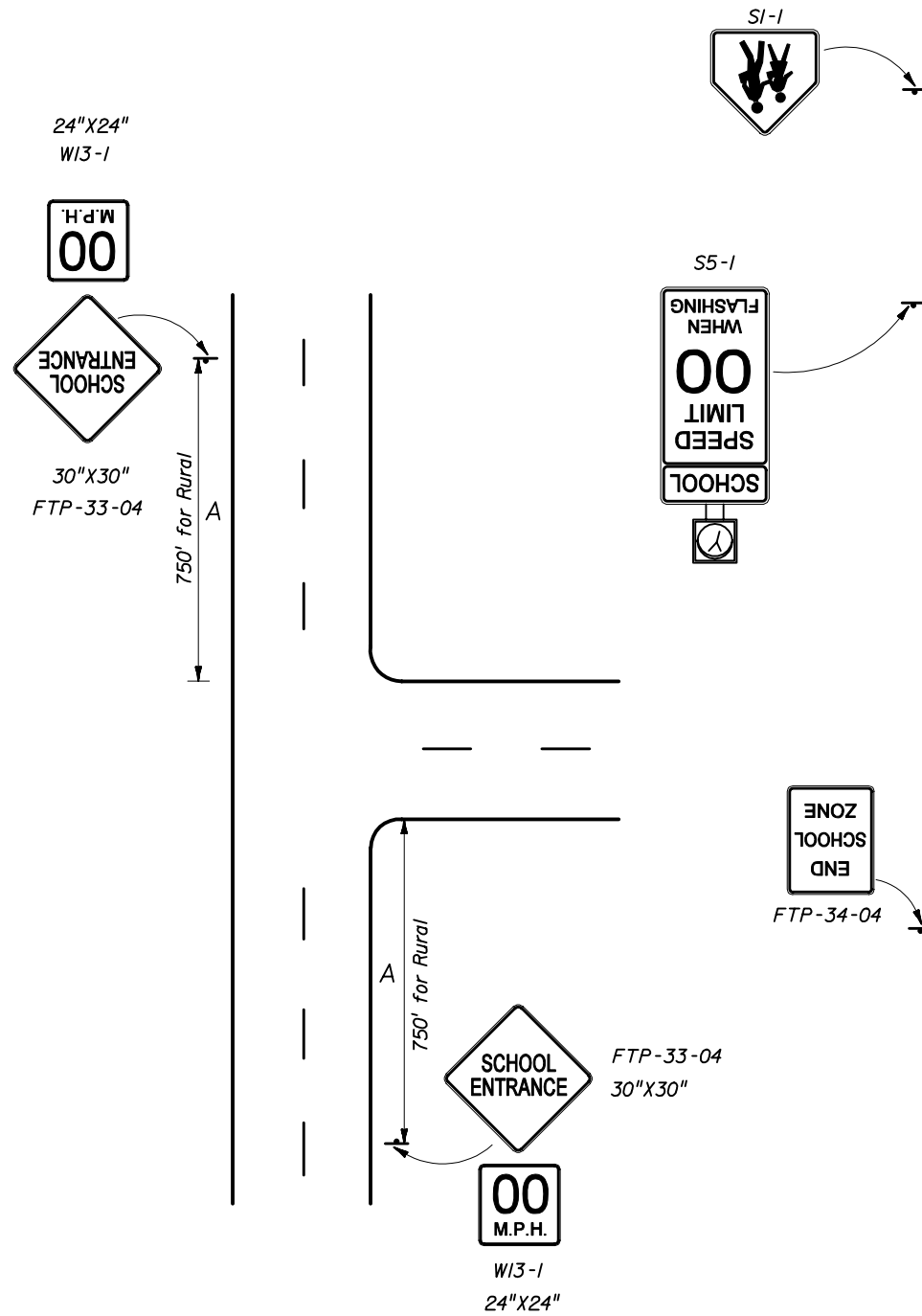
8. TRAFFIC CONTROL DEVICES FOR SIGNALIZED MIDBLOCK SCHOOL CROSSWALK



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

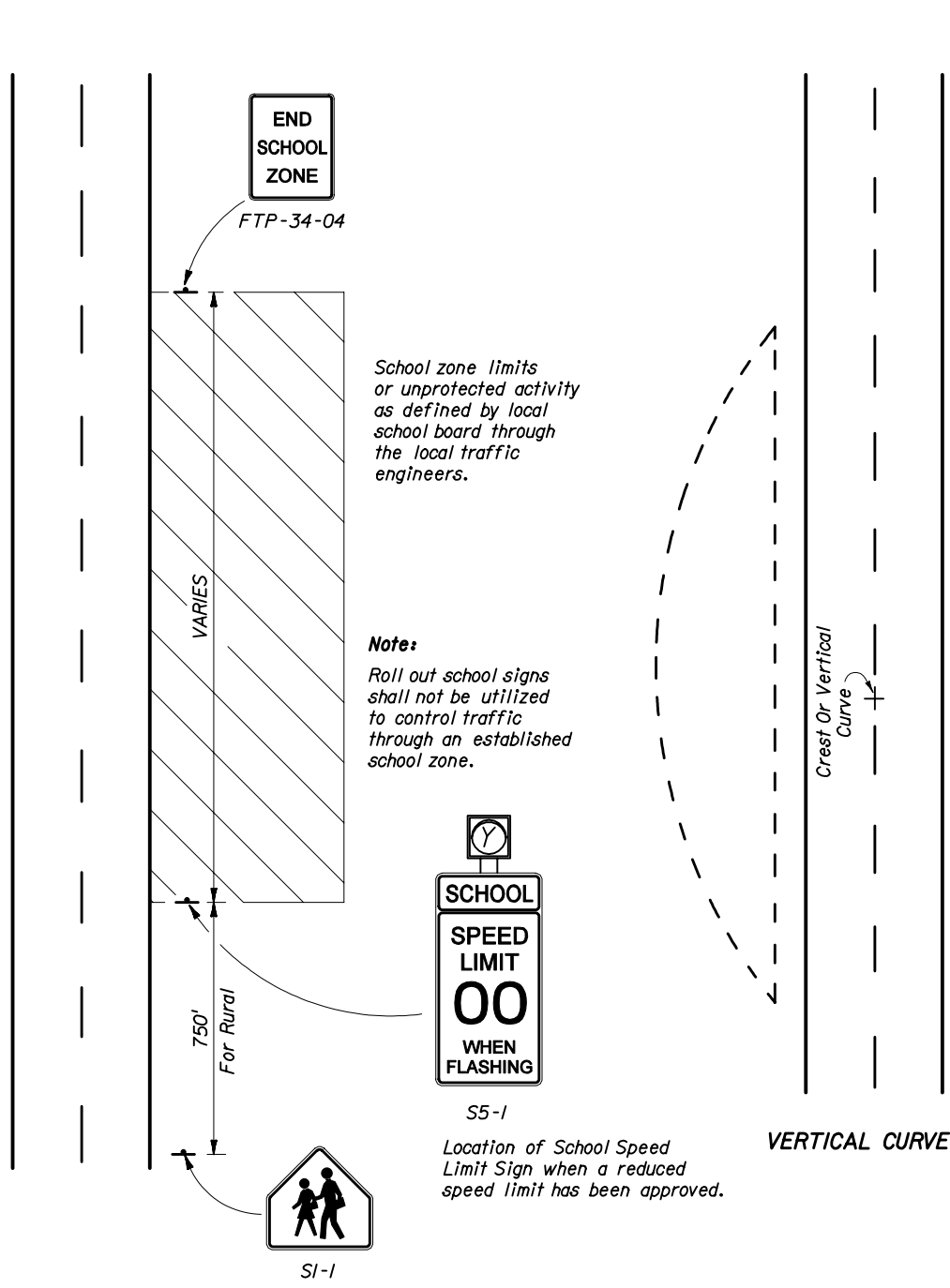
SCHOOL SIGNS & MARKINGS

Designed By	Names	Dates	Approved By
Drawn By		7-76	<i>Clark A. Scott</i> State Traffic Standards Engineer
Checked By	Revision	7-76	Index No.
	04	3 of 6	17344



9. TRAFFIC CONTROL DEVICES AT SCHOOL ENTRANCES WITH LOW VOLUMES OF WALKING STUDENTS

These signs are intended for use only at those few locations where the school entrance is not evident to the motorist, and must be approved in advance by the responsible traffic engineering authority.

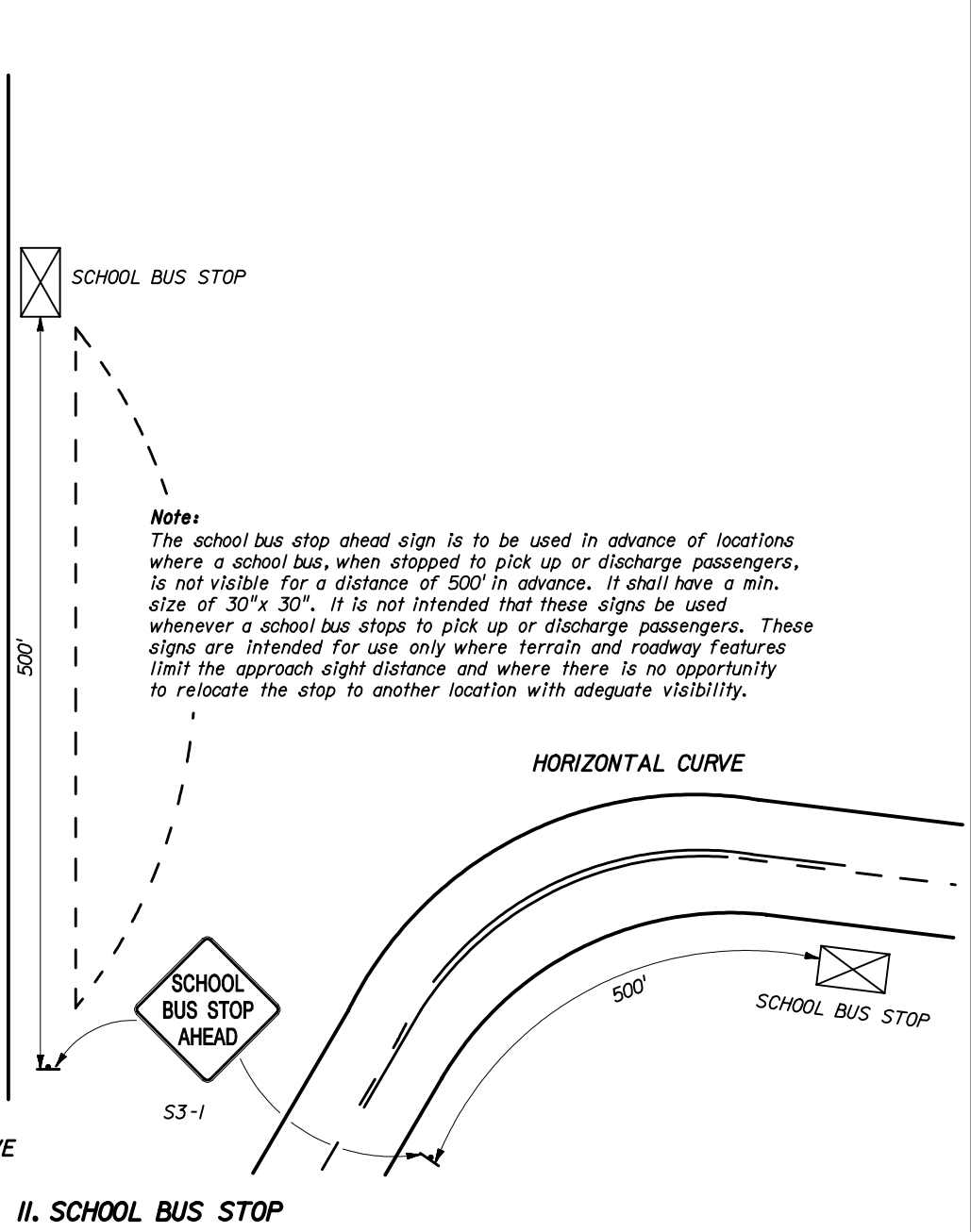


10. TRAFFIC CONTROL DEVICES FOR A TYPICAL SCHOOL ZONE FRONTING THE SCHOOL PROPERTY

School zone limits or unprotected activity as defined by local school board through the local traffic engineers.

Note: Roll out school signs shall not be utilized to control traffic through an established school zone.

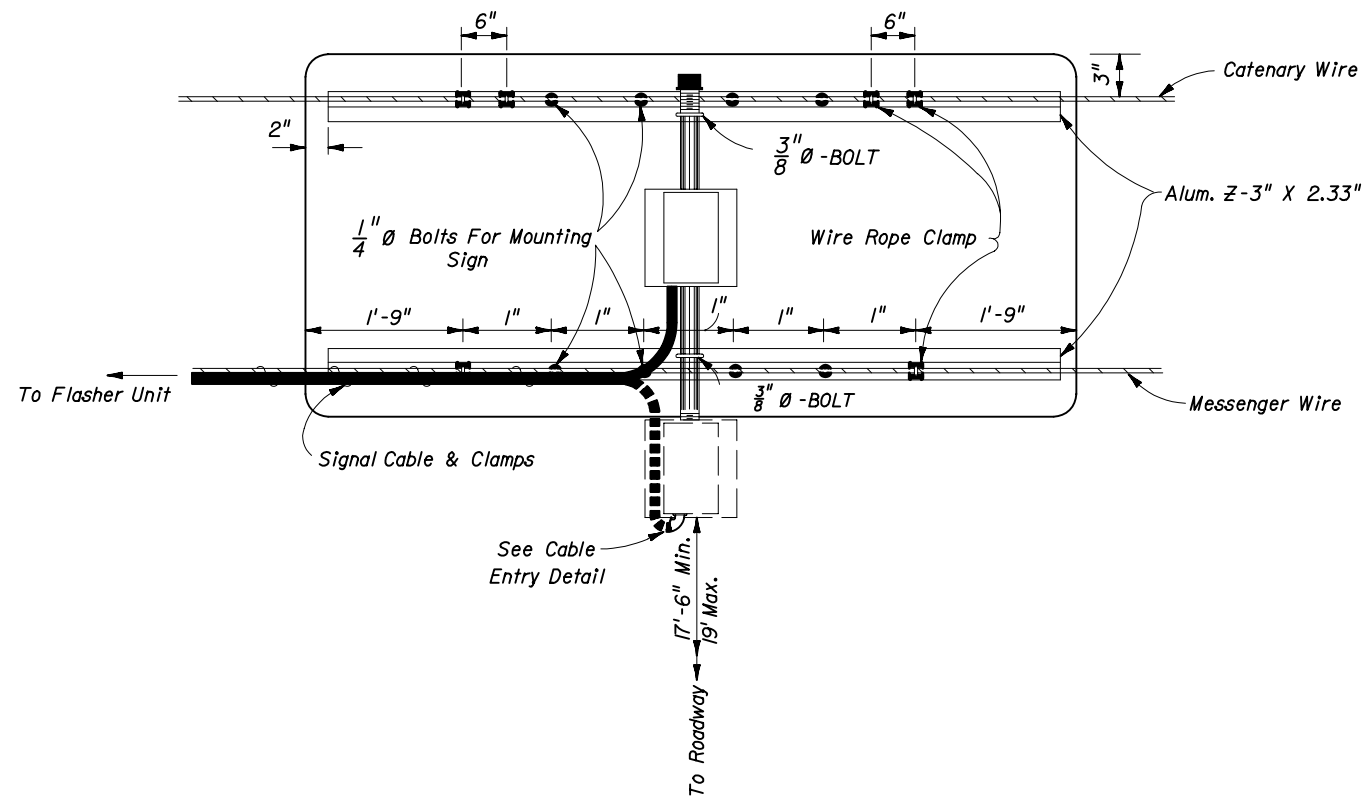
S5-1 Location of School Speed Limit Sign when a reduced speed limit has been approved.



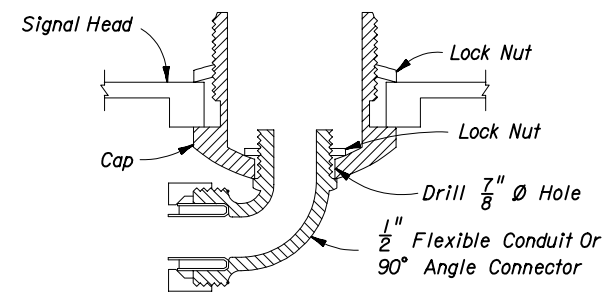
II. SCHOOL BUS STOP

Note: The school bus stop ahead sign is to be used in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 500' in advance. It shall have a min. size of 30"x 30". It is not intended that these signs be used whenever a school bus stops to pick up or discharge passengers. These signs are intended for use only where terrain and roadway features limit the approach sight distance and where there is no opportunity to relocate the stop to another location with adequate visibility.

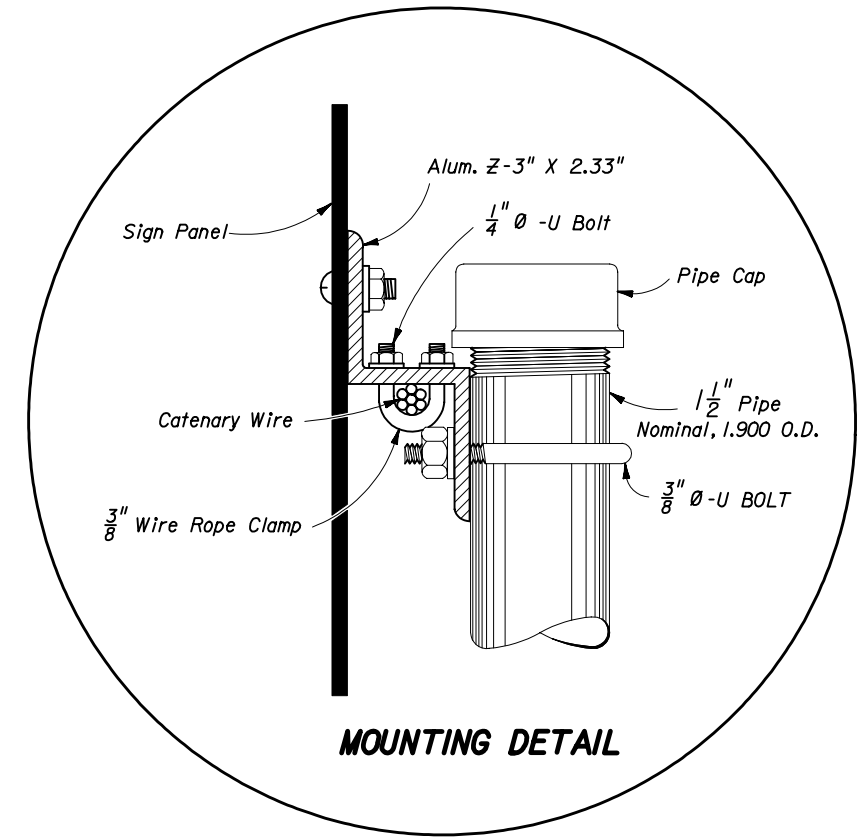
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SCHOOL SIGNS & MARKINGS				
Designed By	Names	Dates	Approved By	
Drawn By			<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By			Revision	Sheet No. Index No.
			04	4 of 6 17344



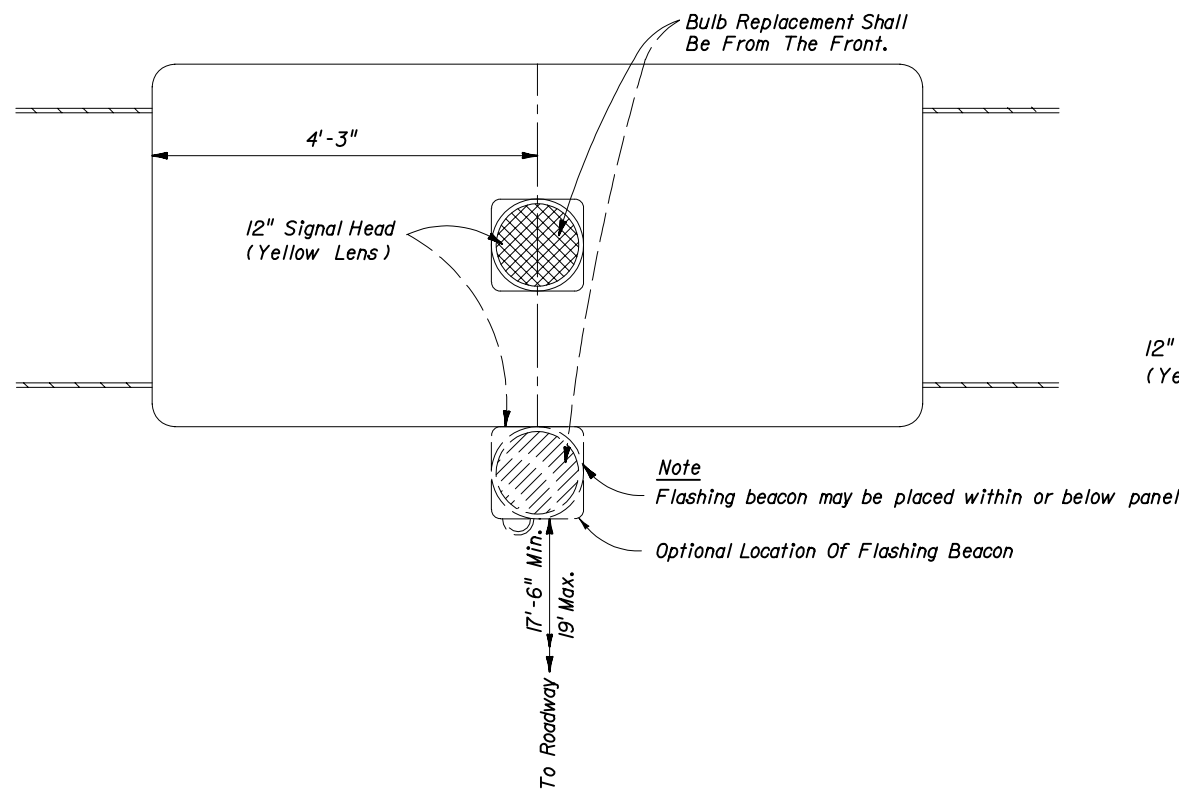
REAR VIEW



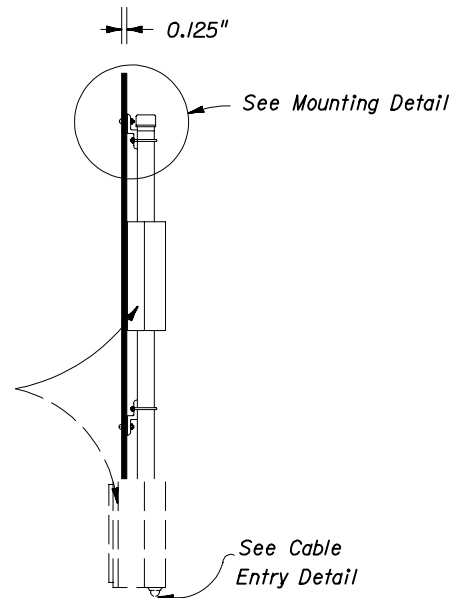
CABLE ENTRY DETAIL



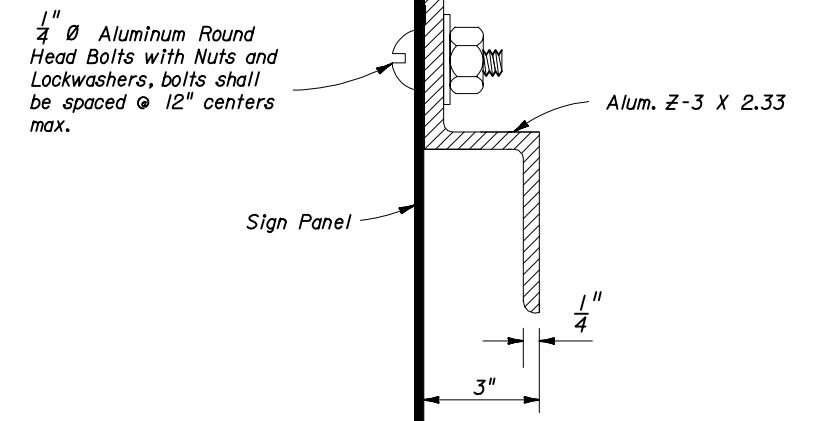
MOUNTING DETAIL



FRONT VIEW



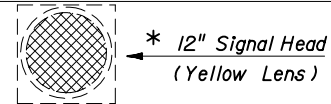
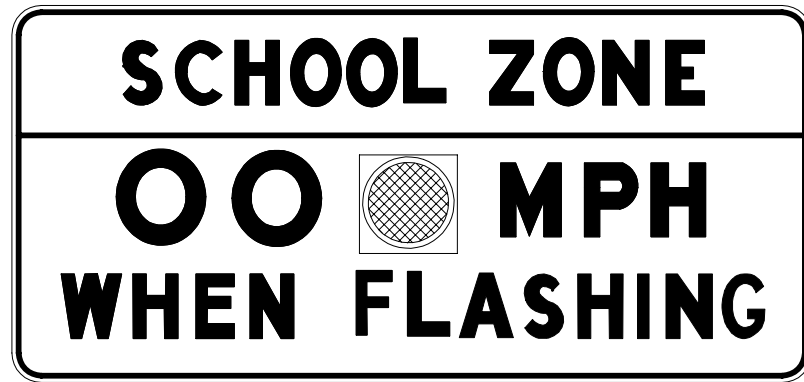
SIDE VIEW



Z SECTION DETAIL

Flasher unit and cabinet to be placed on the strain pole supporting overhead sign assembly or on service pole. The flasher unit not to overhang private property or sidewalk.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SCHOOL SIGNS & MARKINGS				
Designed By		Dates	Approved By	
Drawn By		7-76	<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By		7-76	Revision	Sheet No. Index No.
			04	5 of 6 17344



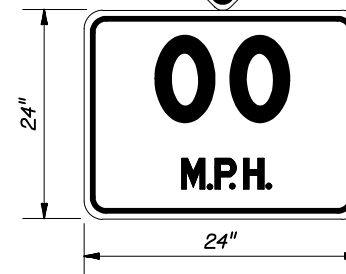
FTP-31-04

OVERHEAD STANDARD

* Flashing Beacon May Be Placed Within Or Below Panel

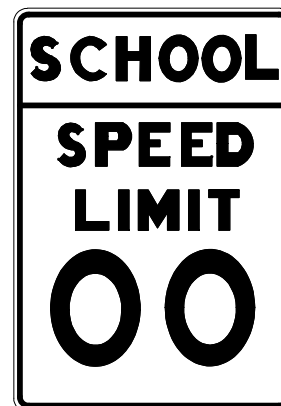


FTP-33-04

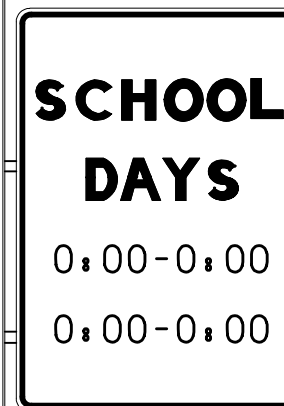


W13-1

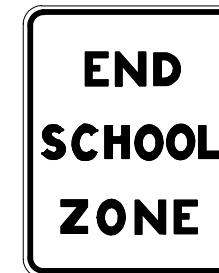
SPEED LIMIT ASSEMBLY



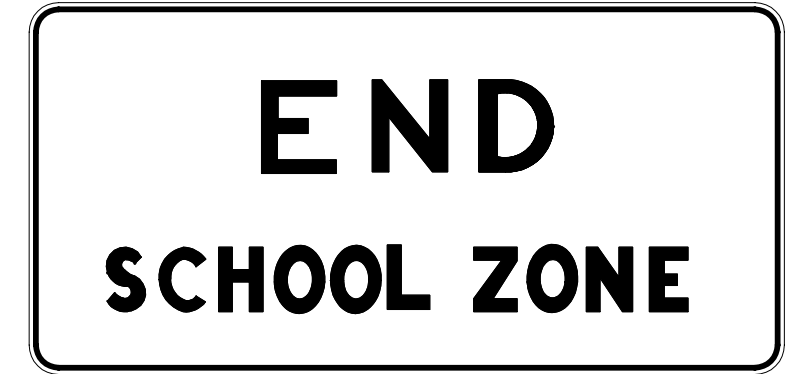
FTP-35-04



FTP-30-04

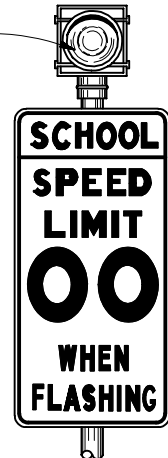


FTP-34-04



FTP-32-04

12" Signal Head (Yellow Lens)



S5-1

Ground Mount Standard

Note:

Existing ground mount school speed limit signs utilizing a single 8" min. size beacon or two 6" min. size beacons inside the sign border are considered meeting the standard. However, replacement or upgrading of these school speed limit signs shall conform to the above standard. Numerical speed limit displayed shall be established by appropriate regulatory authorities.

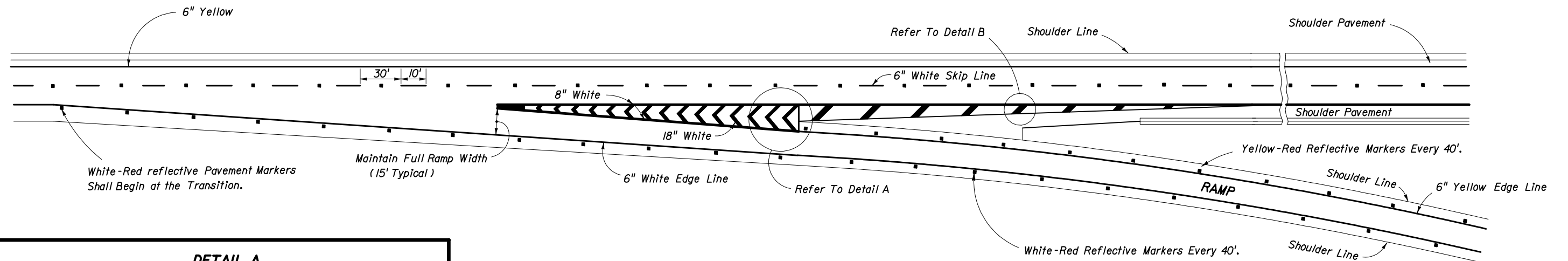
Notes:

1. Standard size signs should be used whenever possible. Minimum sizes may be used only on low volume, low speed (less than 35 m.p.h.) streets. Special sizes should be used on expressway facilities where special emphasis is needed.
2. The value of the actual school zone speed limit shall be determined by the District Traffic Operations Engineer in cooperation with local school superintendents. In no case shall it be less than the 15 m.p.h. min. as set by law.
3. See Index No. 17355 for sign details.

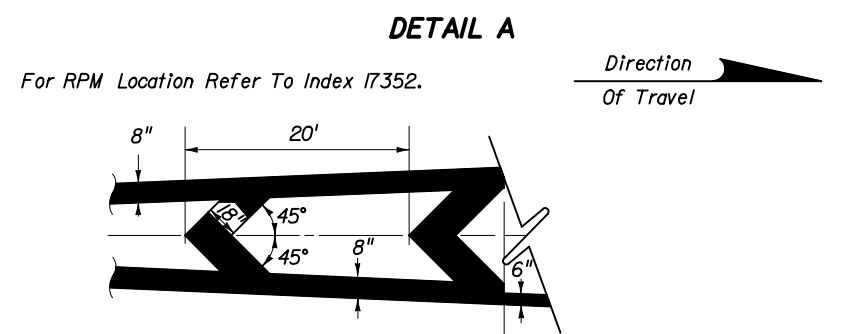
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SCHOOL SIGNS & MARKINGS

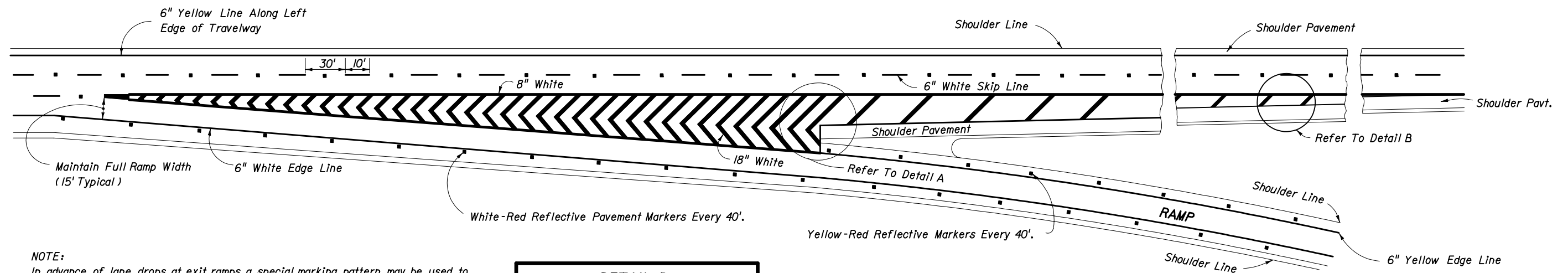
Designed By	Names	Dates	Approved By
Drawn By		7-76	<i>Charles A. Scott</i> State Traffic Standards Engineer
Checked By		7-76	Revision Sheet No. Index No.
			04 6 of 6 17344



NORMAL TAPERED EXIT
(TWO THRU LANES)

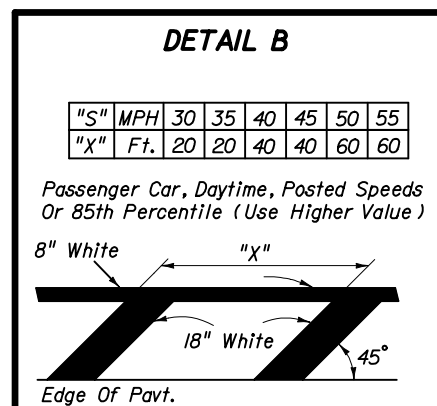


NOTE:
Reflective pavement markers are installed adjacent to the edge line.



NORMAL TAPERED EXIT ONLY
(TWO THRU LANES - THREE APPROACH LANES)

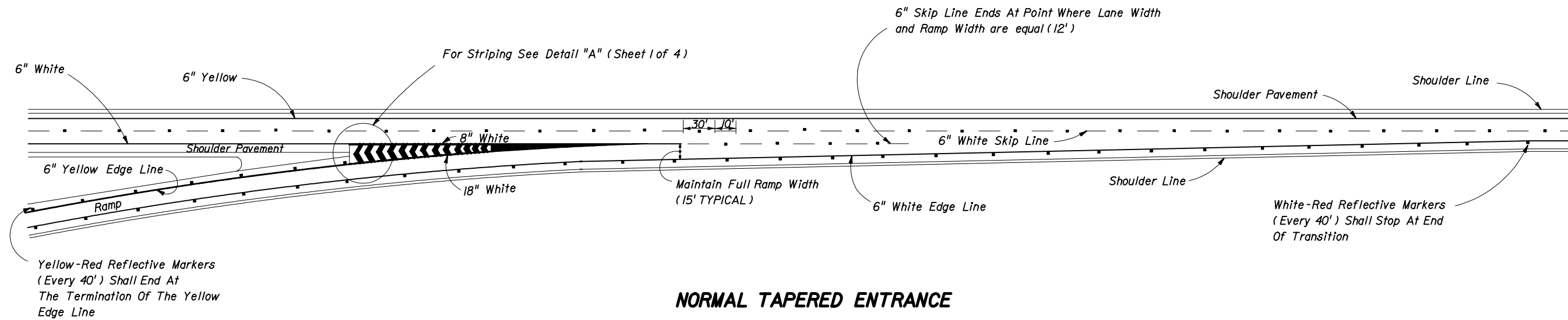
NOTE:
In advance of lane drops at exit ramps a special marking pattern may be used to distinguish the lane drop situation from a normal exiting ramp or auxiliary lane. A typical special marking for lane drops consist of 8" wide by 3' long white stripes separated by 12' gaps. If used, this special marking should begin 1/2 mile in advance of the theoretical gore point. Where last minute lane changes may cause conflicts, an 8" wide solid white channelizing line may be extended 300' upstream from the theoretical gore. (M.U.T.C.D. Section 3B-11).



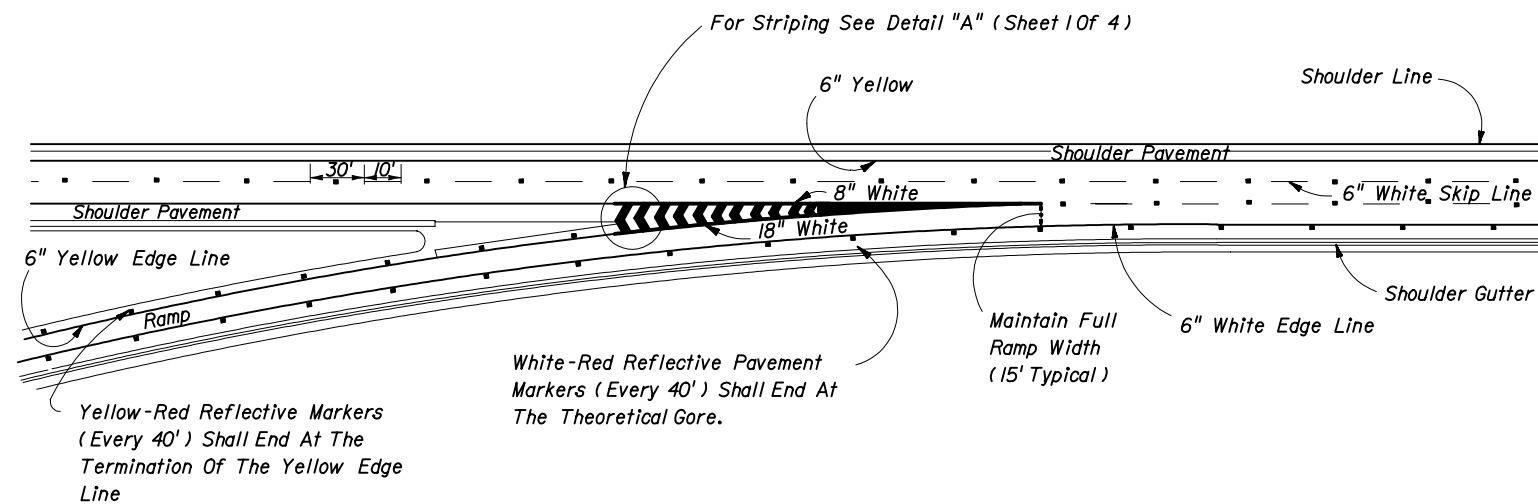
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

INTERCHANGE MARKINGS

Designed By		Dates	9-73	Approved By	<i>Clark A. Scott</i>
Drawn By		Revision		State Traffic Standards Engineer	
Checked By		9-73	04	Sheet No.	1 of 4
				Index No.	17345



NORMAL TAPERED ENTRANCE

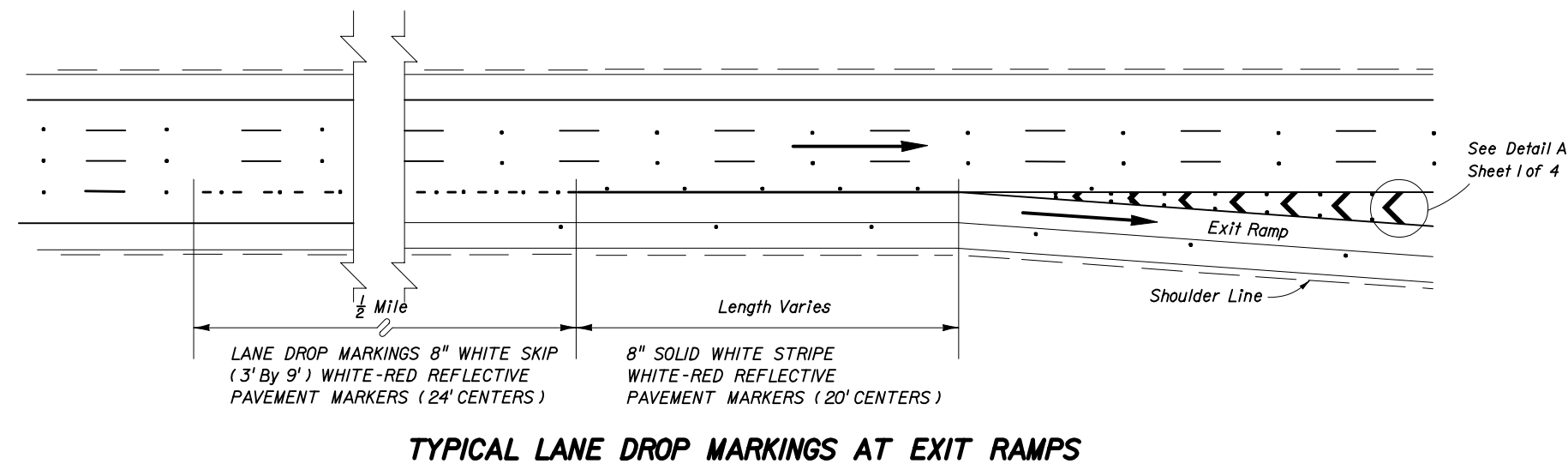
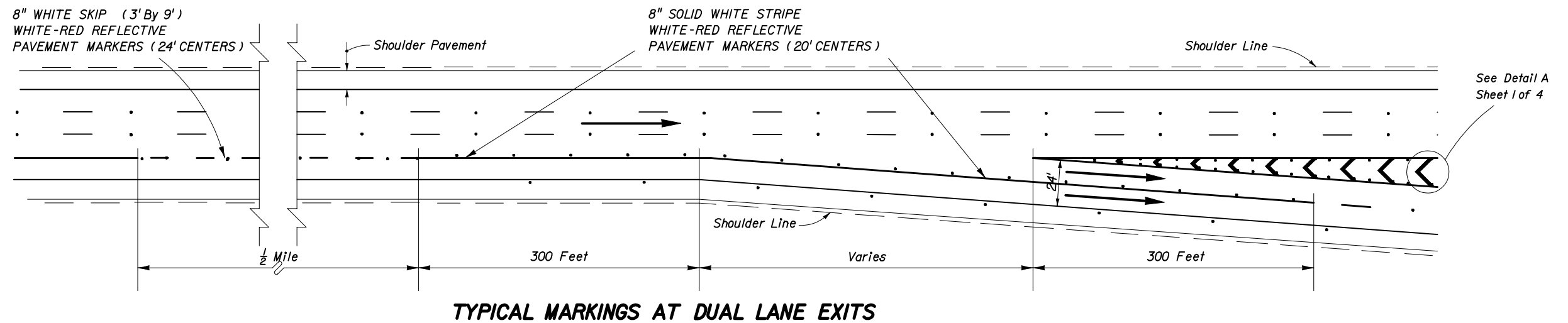
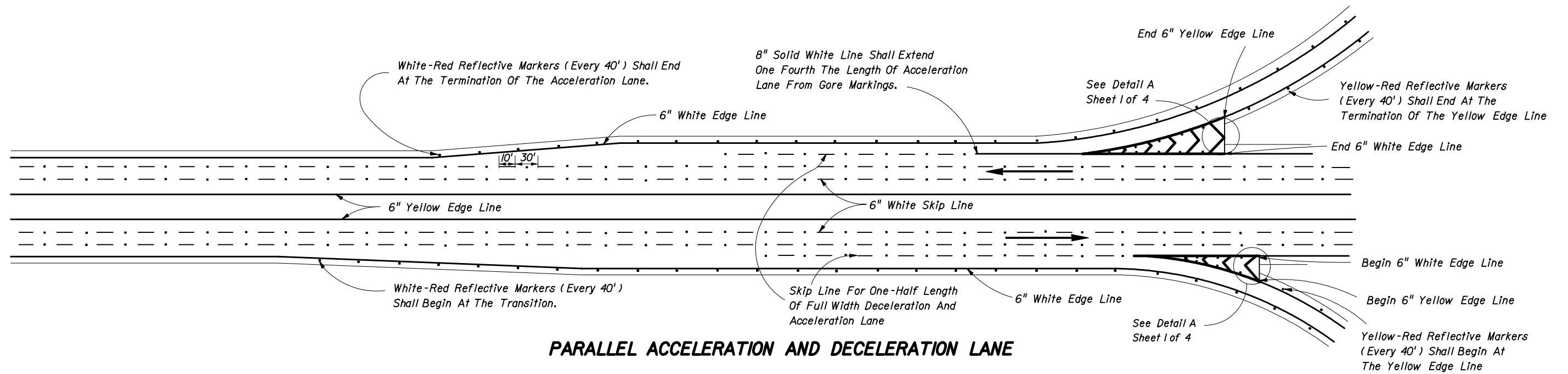


NORMAL TAPERED ENTRANCE WITH ADDED LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

INTERCHANGE MARKINGS

Names		Dates	Approved By		
Designed By		7-73	 State Traffic Standards Engineer		
Drawn By					
Checked By		7-73	Revision	Sheet No.	Index No.
			04	2 of 4	17345

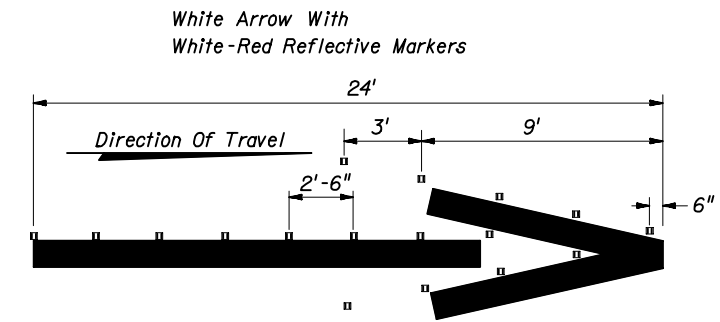
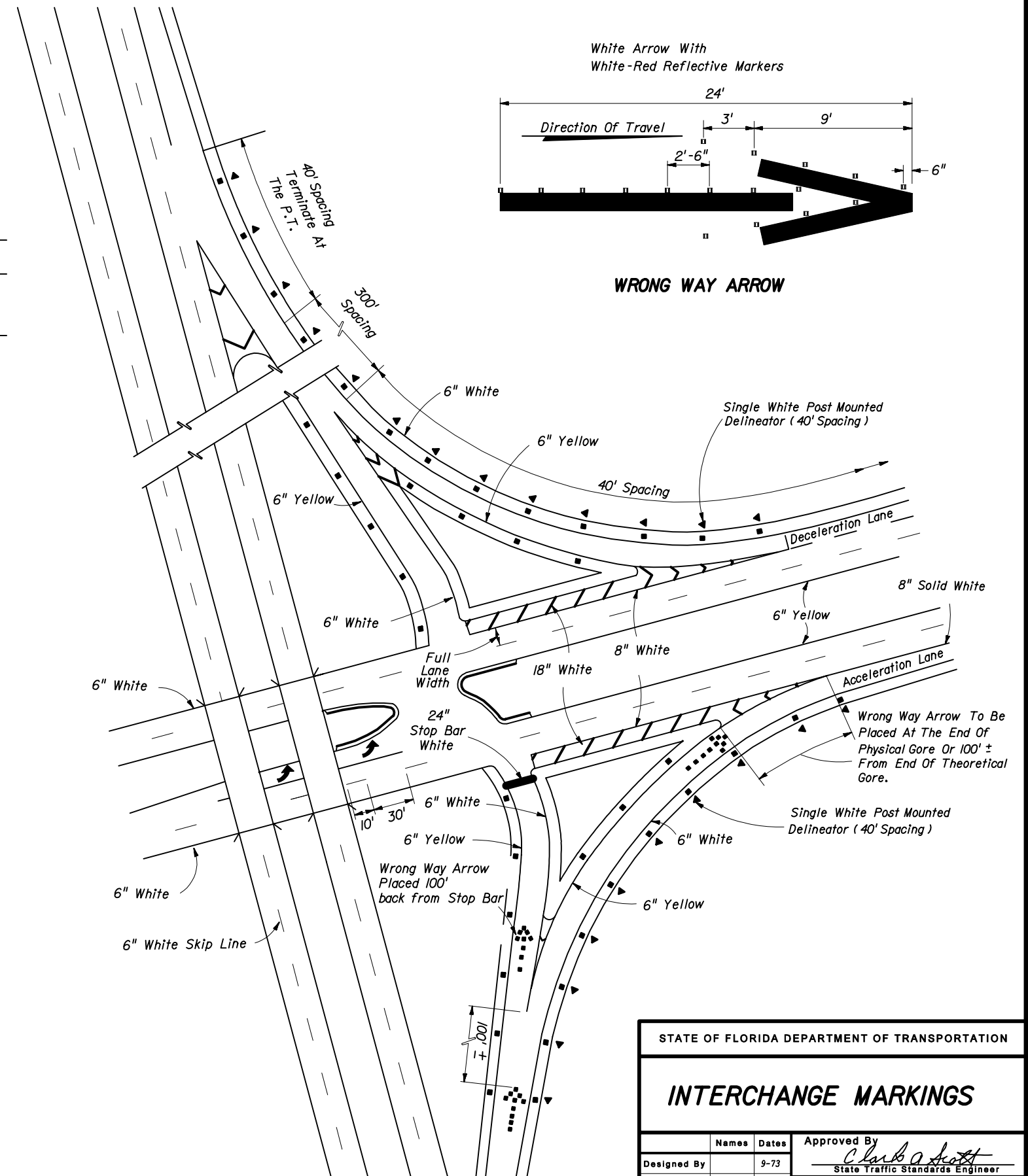
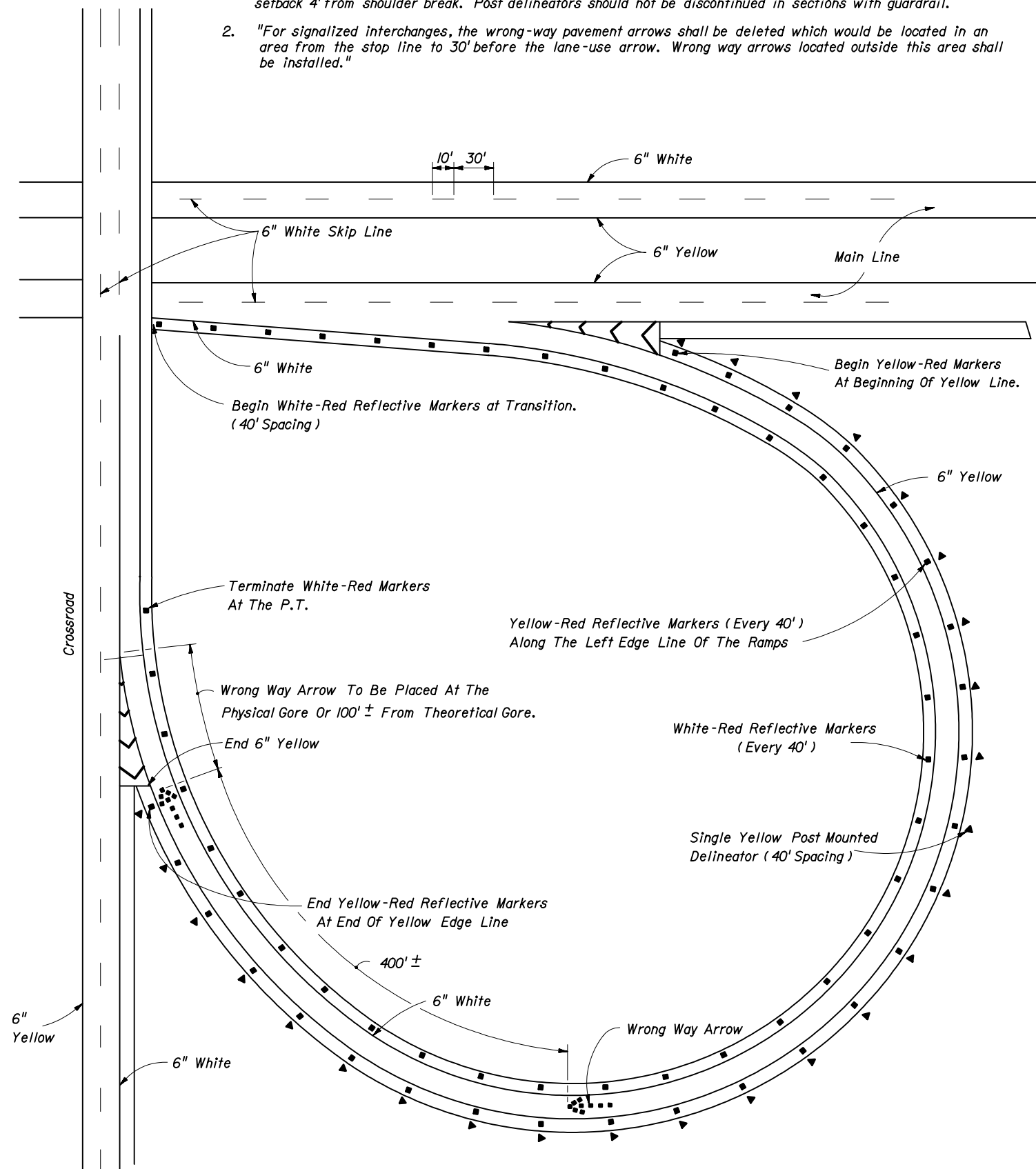


→ Note: Arrows indicate direction of travel and are not shown for pavement marking.

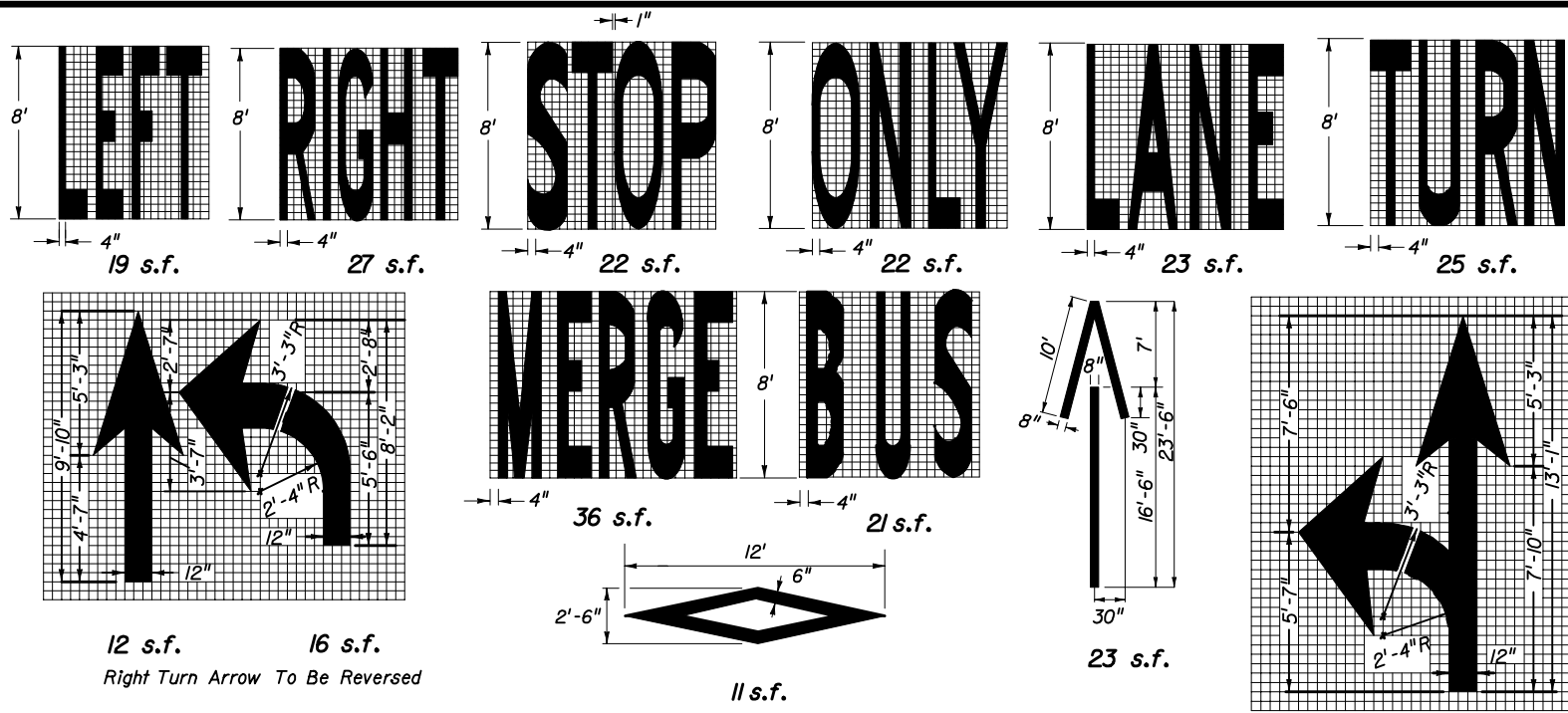
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
INTERCHANGE MARKINGS				
Designed By		Dates	Approved By	
Drawn By		9-73	<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By		9-73	Revision	Sheet No. Index No.
			04	3 of 4 17345

Notes:

1. Post delineators spaced at 40' begin at the P.C. and end at the P.T. of the entrance and terminus of ramps. The spacing on the ramp section between the entrance and terminus shall be 300'. All delineators are to be setback 4' from shoulder break. Post delineators should not be discontinued in sections with guardrail.
2. "For signalized interchanges, the wrong-way pavement arrows shall be deleted which would be located in an area from the stop line to 30' before the lane-use arrow. Wrong way arrows located outside this area shall be installed."



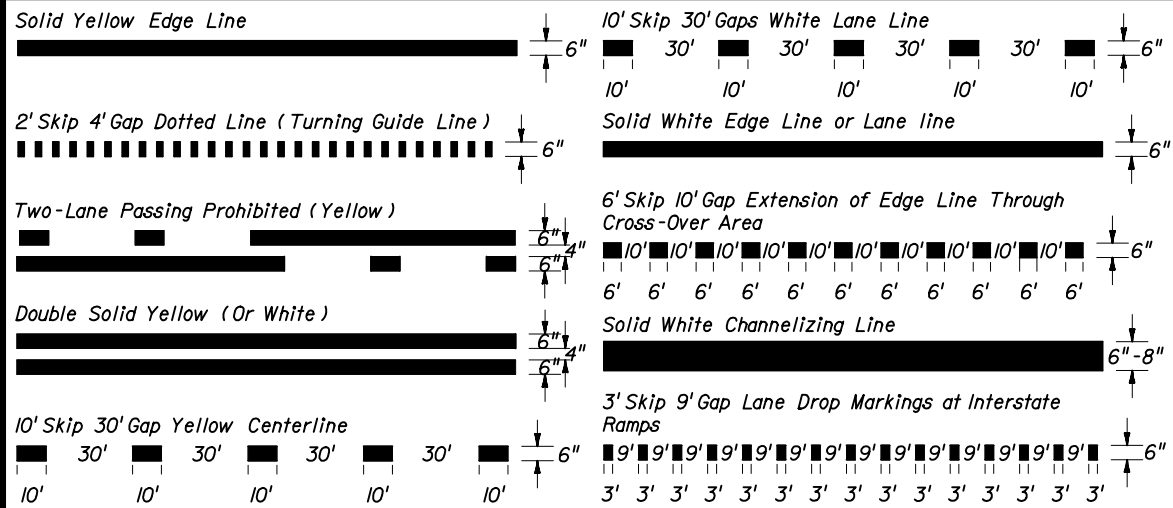
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
INTERCHANGE MARKINGS				
Designed By	Names	Dates	Approved By	
Drawn By			<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By		9-73	Revision	Sheet No.
			04	4 of 4
			Index No.	17345



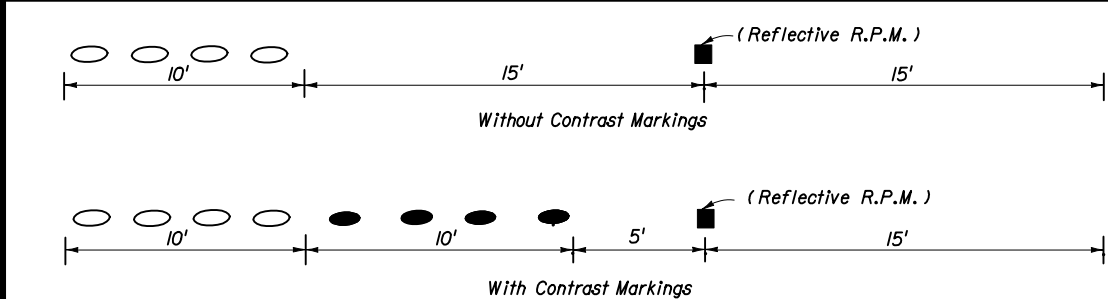
NOTE: When arrow and pavement message are used together, the arrow shall be located down stream of the pavement message and shall be separated from the pavement message by a distance of 25' (Base of the arrow to the base of the message).

DIMENSIONS ARE WITHIN 1" ±

PAVEMENT ARROW AND MESSAGE DETAILS



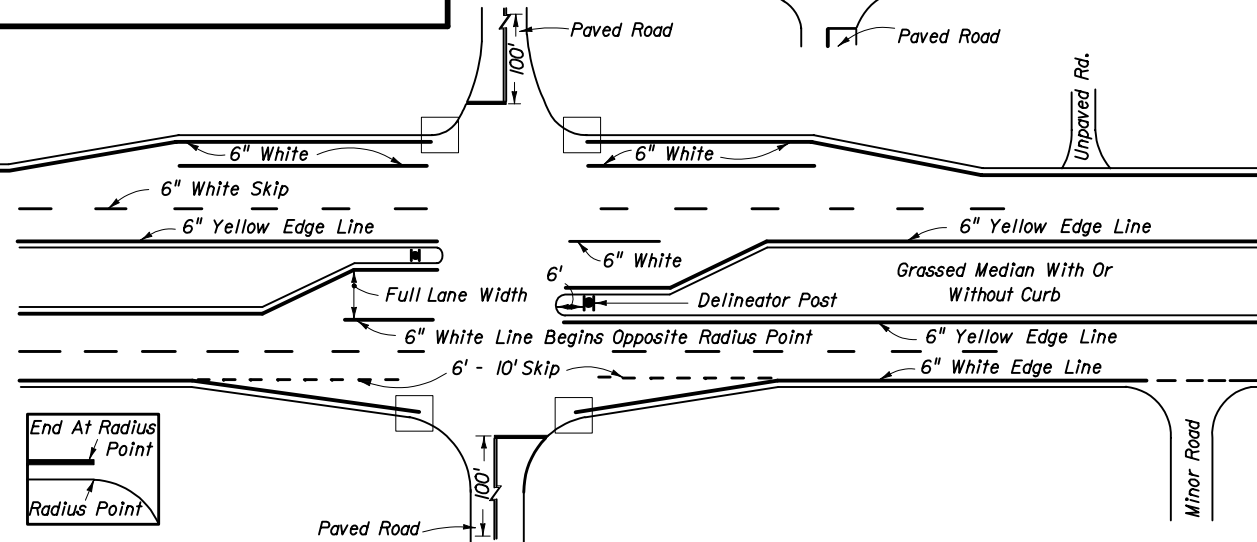
TYPES OF PERMANENT LONGITUDINAL LINES



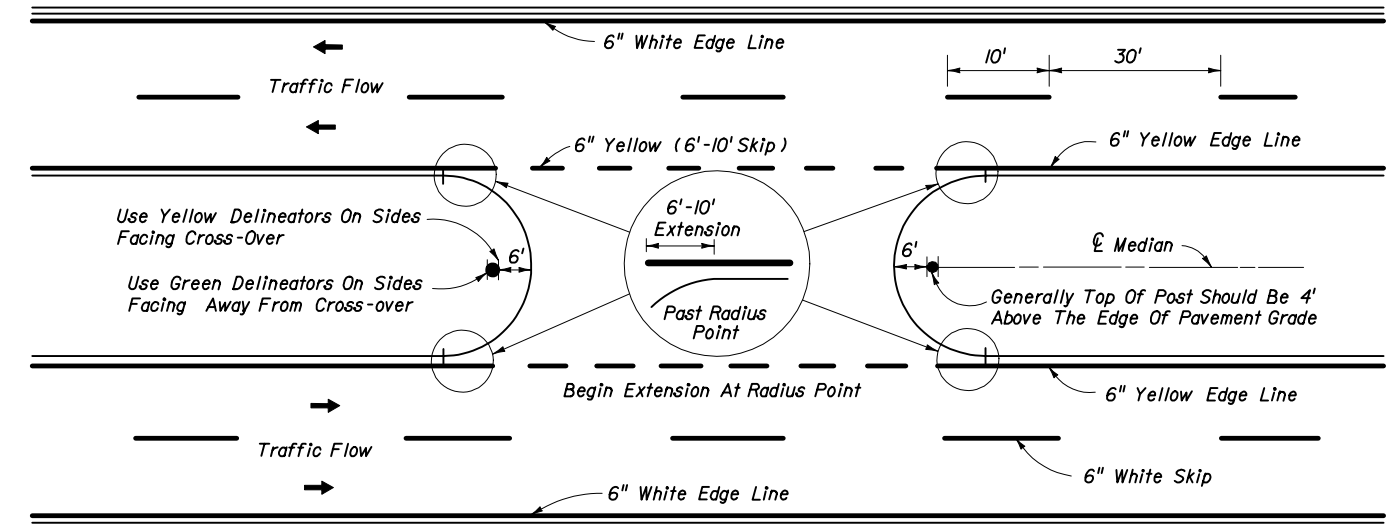
NOTE: Ceramic Markers should not be installed unless specifically called for in the plans. Use is limited to high volume sections with ADT's greater than 50,000 where lane changing is to be discouraged or other areas where channelization is required.

NON-REFLECTIVE CERAMIC PAVEMENT MARKER PLACEMENT

BASIC COLOR RULE
 White lines separate traffic in the same direction.
 Yellow lines separate traffic in opposing directions.
 Yellow dotted lines may be used in special cases.

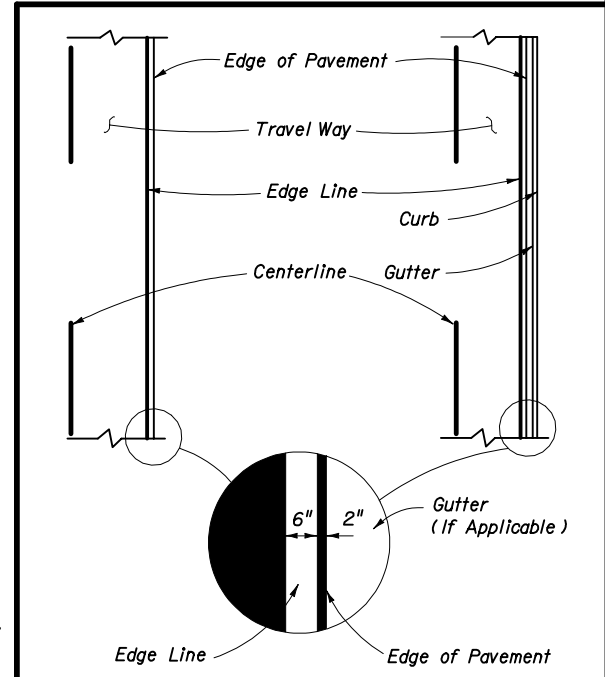


PAVEMENT MARKINGS FOR INTERSECTIONS WITH MAJOR AND MINOR ROADS



PAVEMENT MARKINGS AND DELINEATORS FOR MEDIAN CROSS-OVER

NOTE: Markings applied to median noses shall be yellow in color.

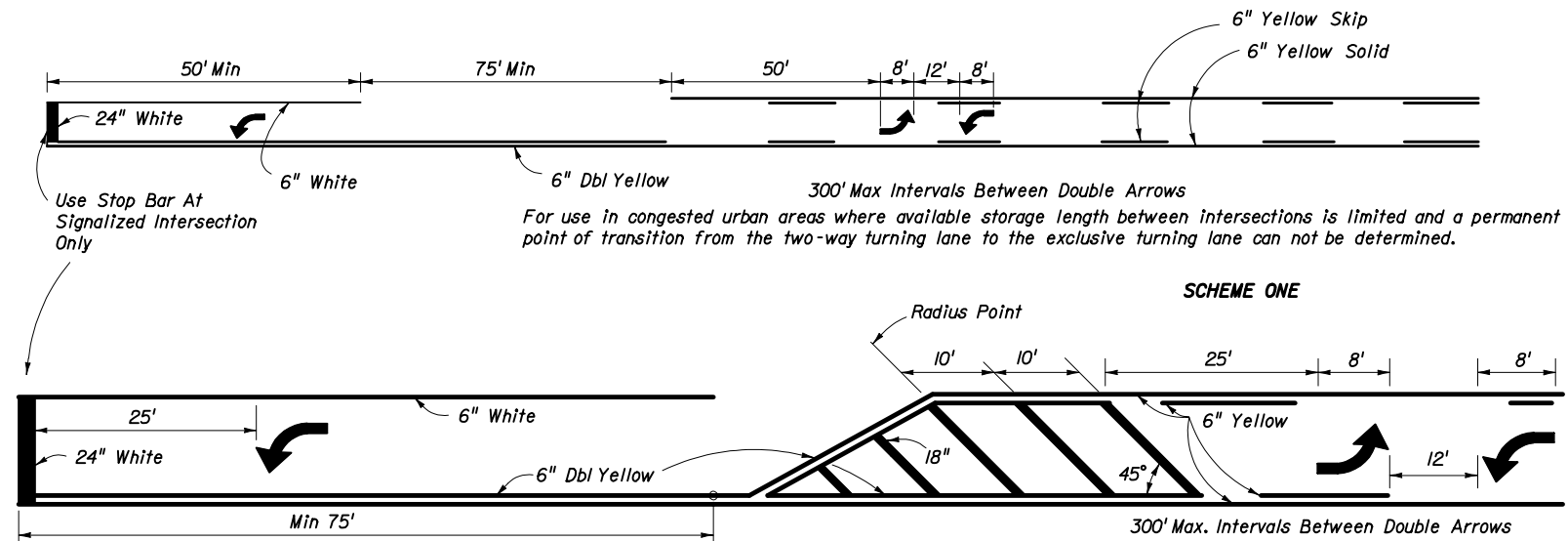


PLACEMENT OF EDGE LINES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

Names	Dates	Approved By		
Designed By	8-78	Clark A. Scott State Traffic Standards Engineer		
Drawn By				
Checked By	8-78	Revision	Sheet No.	Index No.
		04	1 of 13	17346



For use in rural & suburban areas where an adequate storage lane length can be specifically determined.

SCHEME TWO

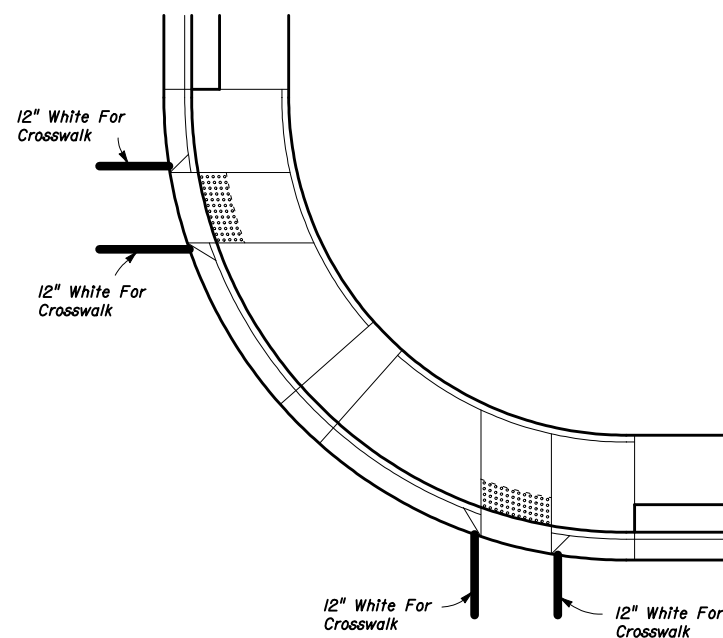
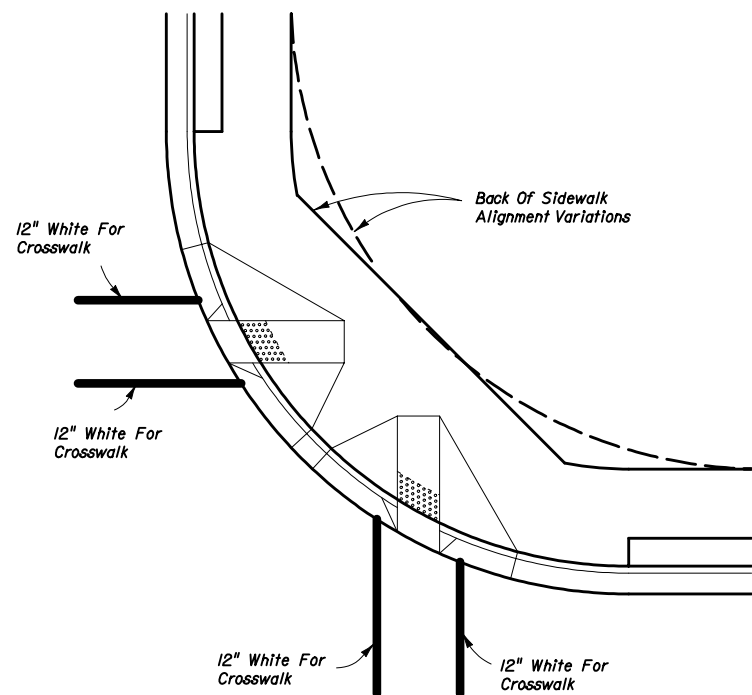
(WITH SINGLE LANE LEFT TURN CHANNELIZATION)
TWO WAY LEFT TURN LANE



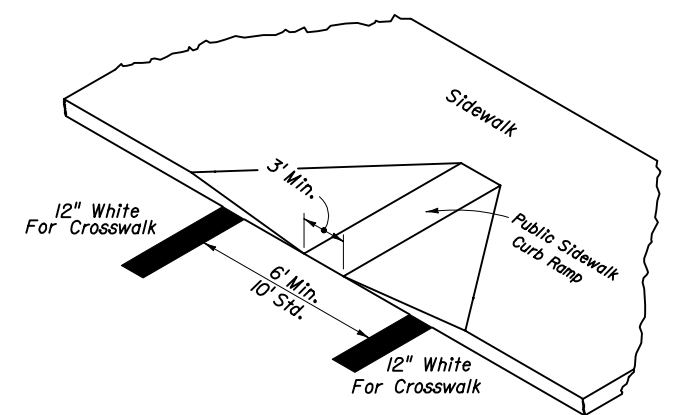
W8-5

Slippery When Wet signs shall be placed in advance of all movable and non-movable steel deck bridges. See Section 2.1 of the Traffic Engineering Manual (Topic Number 750-000-005).

SIGNING FOR MOVEABLE AND NON-MOVEABLE BRIDGES WITH STEEL DECK



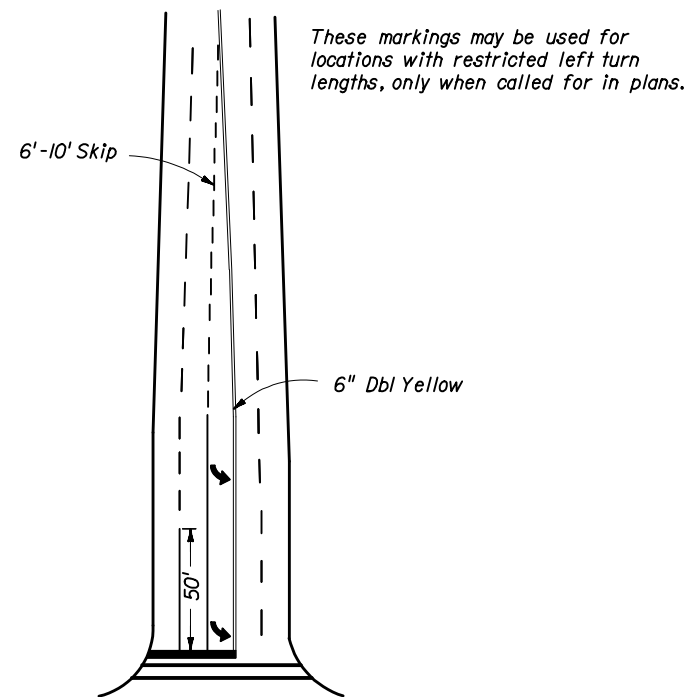
TYPICAL CROSSWALK MARKINGS FOR CURB RAMPS



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

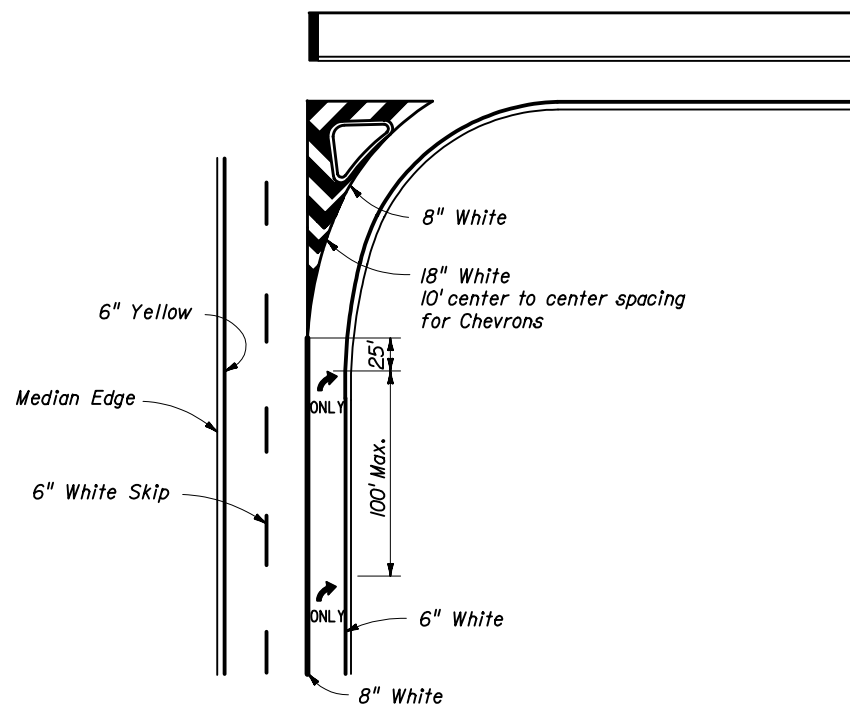
SPECIAL MARKING AREAS

		Names	Dates	Approved By	
Designed By			9-76	 State Traffic Standards Engineer	
Drawn By					
Checked By		9-76	04	Sheet No.	Index No.
				2 of 13	17346

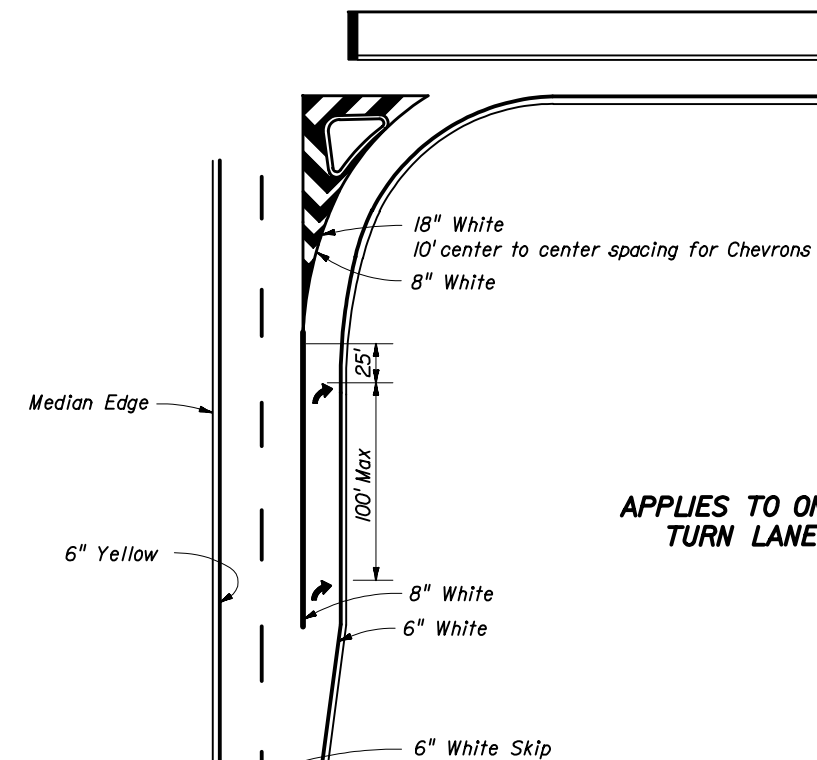


These markings may be used for locations with restricted left turn lengths, only when called for in plans.

RESTRICTED LEFT TURN MARKING



**RIGHT TURN LANE DROP AND ISLAND DETAILS
LEFT TURN LANE DROP IS MIRROR IMAGE**

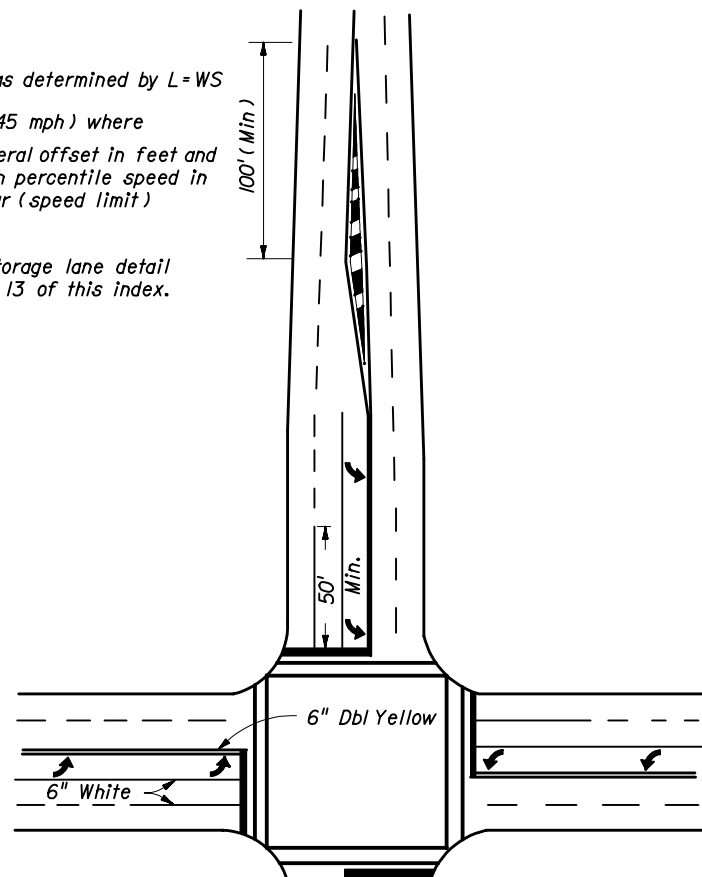


APPLIES TO ONE WAY LEFT TURN LANE ALSO

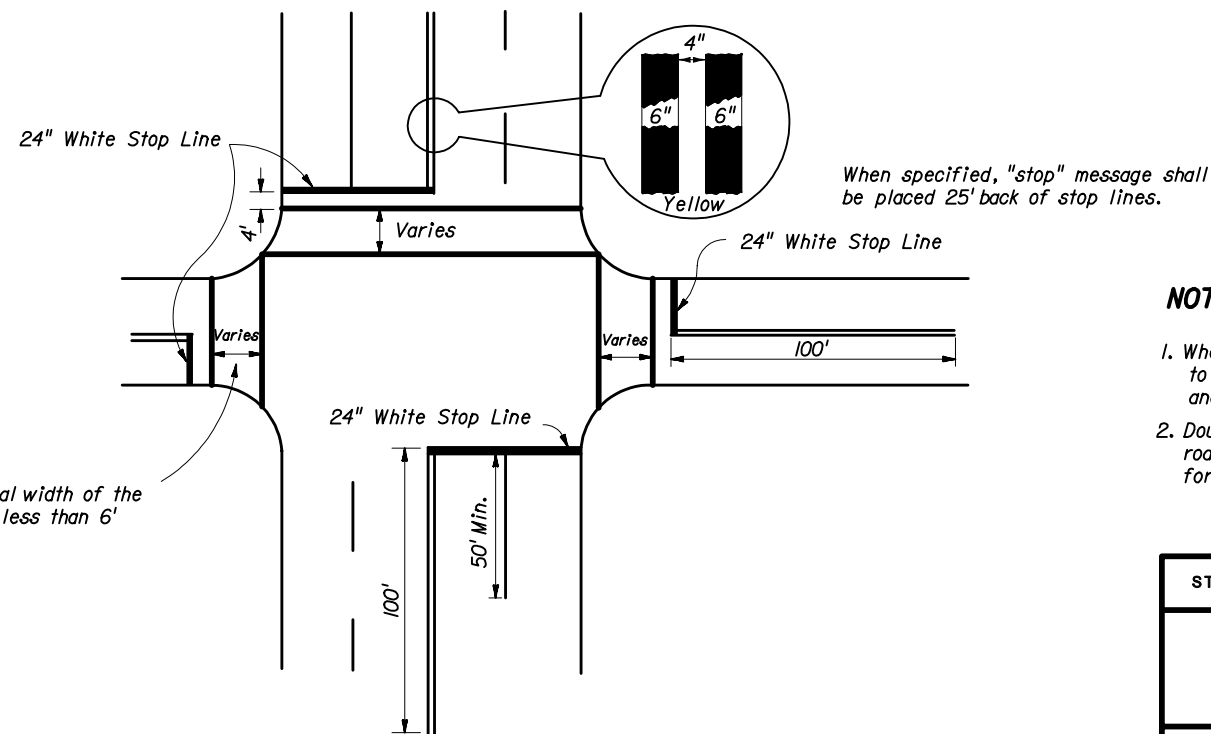
RIGHT TURN LANE AND ISLAND DETAILS

100' Minimum or as determined by $L = WS$
 $(L = \frac{WS^2}{60} < 45 \text{ mph})$ where
 W is the lateral offset in feet and
 S is the 85th percentile speed in miles per hour (speed limit)

For left turn storage lane detail see sheet 2 of 13 of this index.



TYPICAL INTERSECTION 2 THRU LANES PLUS LEFT TURN LANE, WITH CROSSWALK



Width of crosswalk to equal width of the adjacent sidewalk, but not less than 6'

When specified, "stop" message shall be placed 25' back of stop lines.

STOP BARS, CROSSWALKS AND DOUBLE CENTER LINE DETAILS

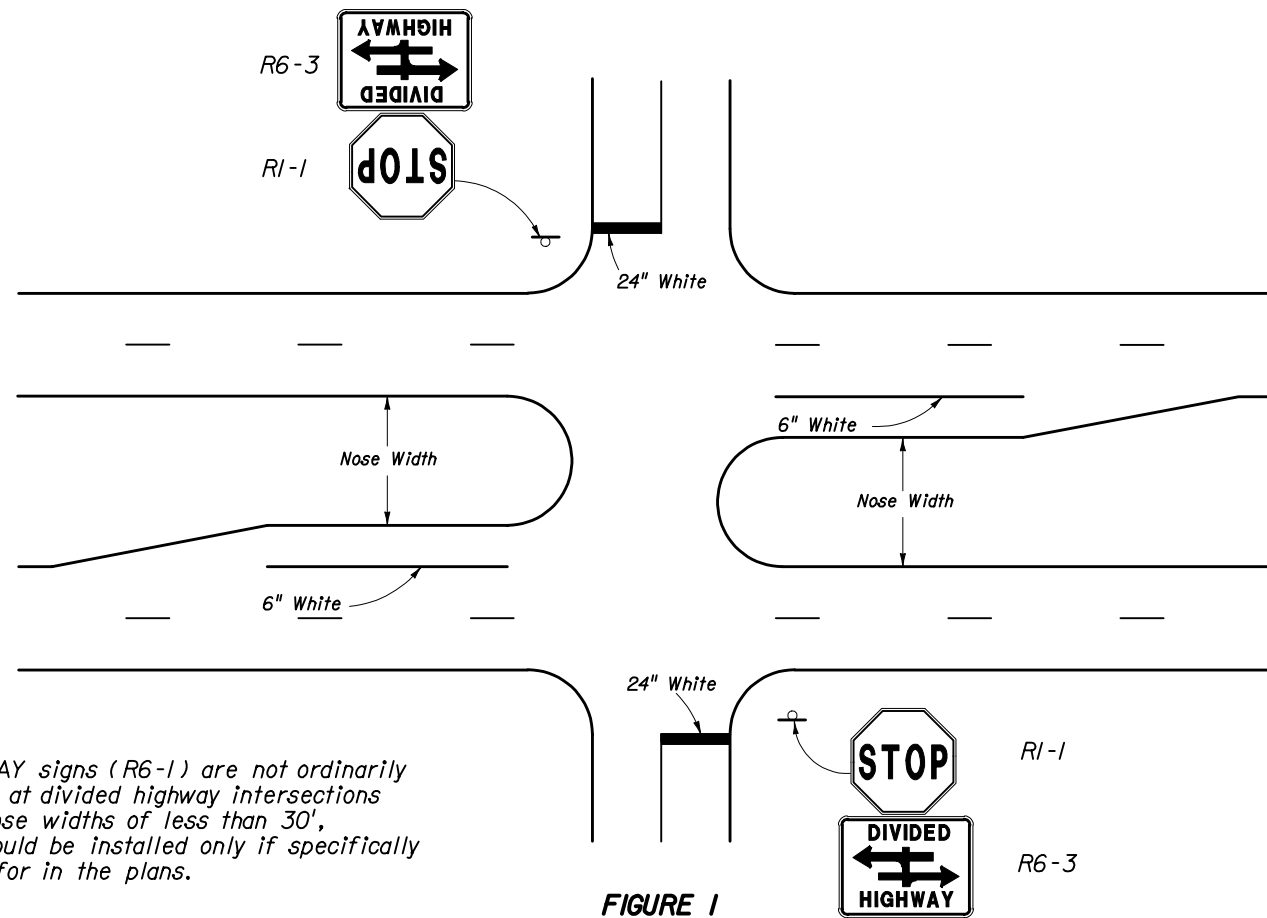
NOTES:

1. When public sidewalk curb ramps are present, refer to sheet 2 of 13 & 7 of 13 of this Index 17346 and Index No. 304 for crosswalk widths.
2. Double yellow longitudinal center lines on all roadway approaches shall be extended back 100' for projects involving intersection improvements only.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

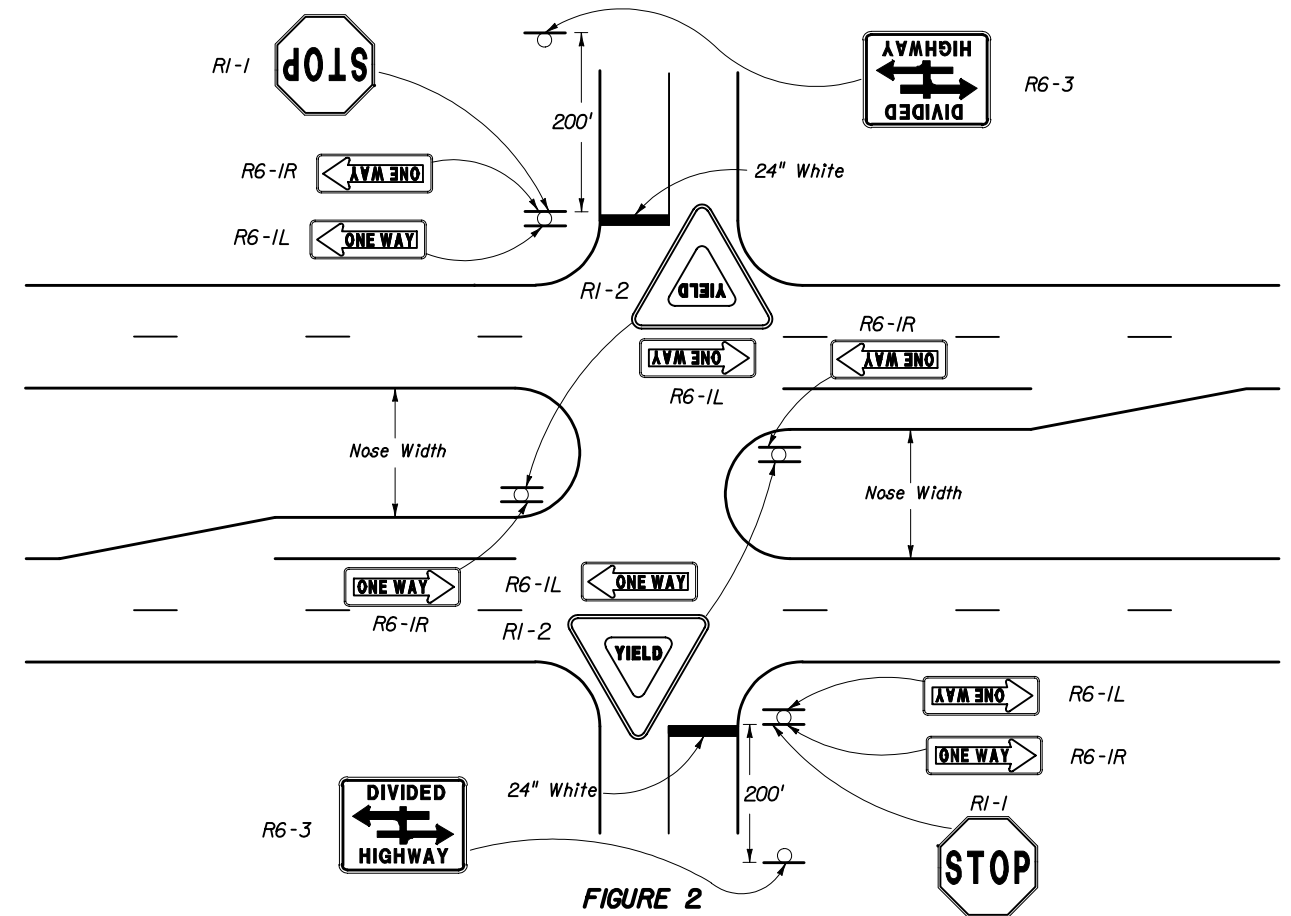
SPECIAL MARKING AREAS

Names	Dates	Approved By		
Designed By	9-76	Clark A. Scott State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	9-76	04	3 of 13	17346



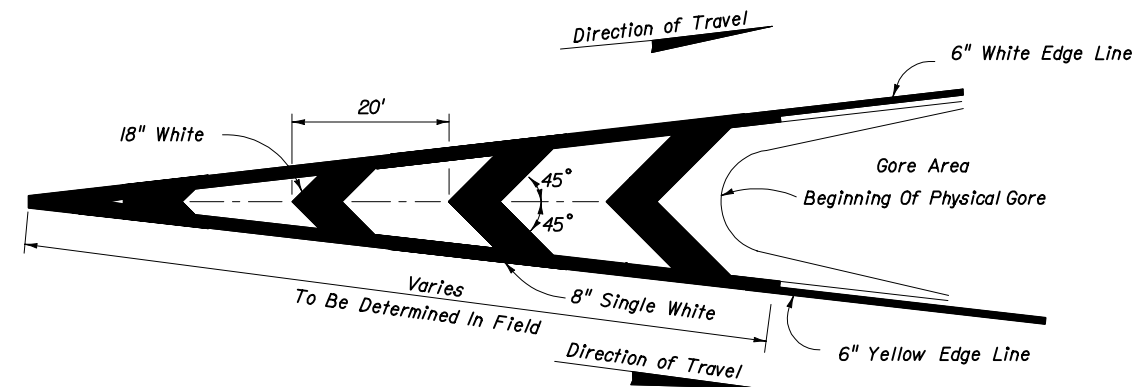
ONE WAY signs (R6-1) are not ordinarily needed at divided highway intersections with nose widths of less than 30', and should be installed only if specifically called for in the plans.

FIGURE 1
NOSE WIDTHS UNDER 30'

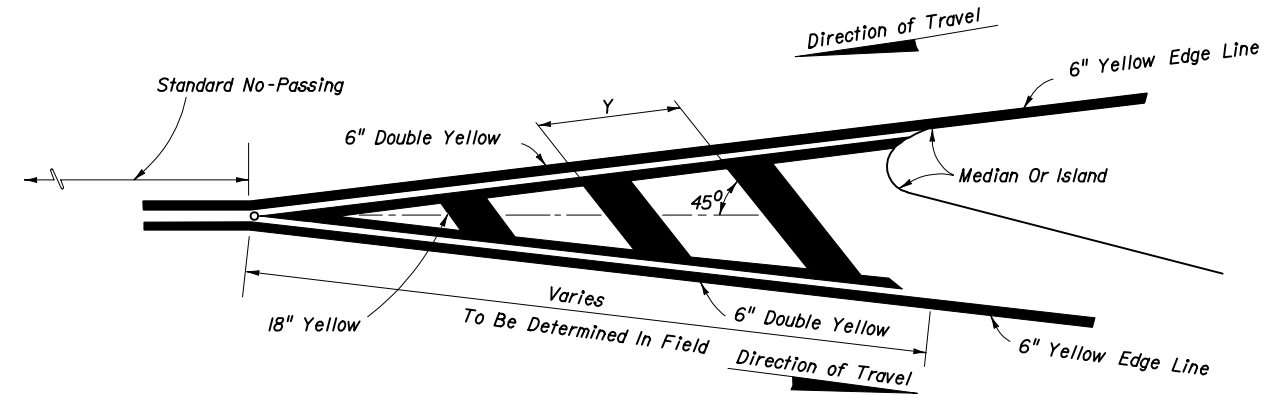


ONE-WAY SIGNS ON DIVIDED HIGHWAY INTERSECTIONS

FIGURE 2
NOSE WIDTHS 30' AND GREATER



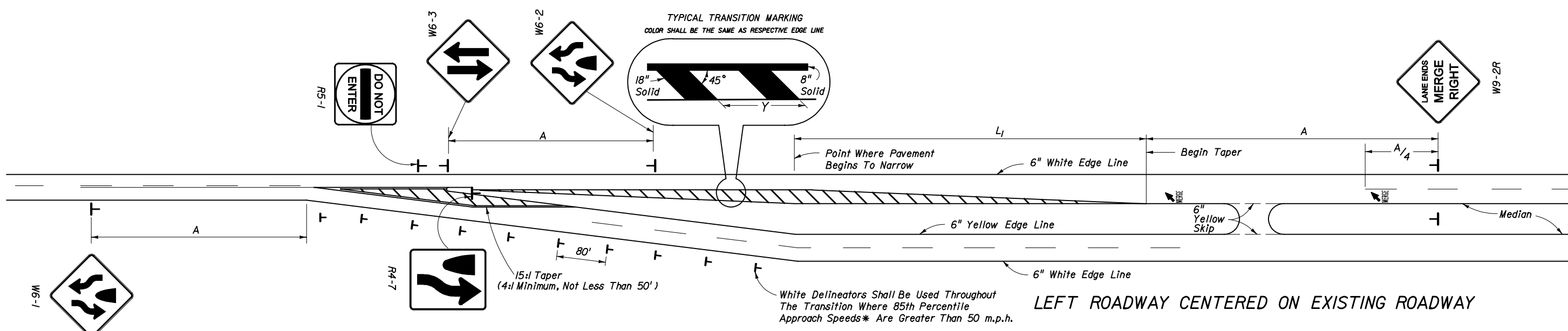
PAVEMENT MARKINGS FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)



PAVEMENT MARKING FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSING DIRECTIONS)

POSTED (DAY) SPEED LIMIT M.P.H.	"y" ft
30 OR LESS	10
35	20
40	20
45	30
50 OR MORE	40

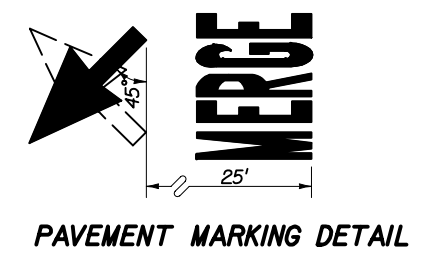
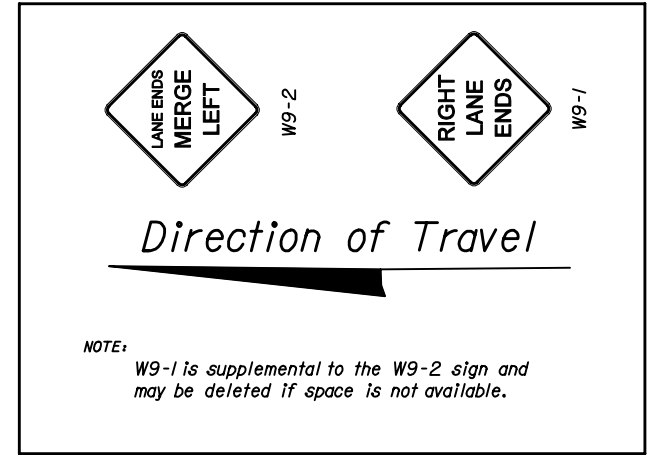
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL MARKING AREAS				
Designed By	Names	Dates	Approved By	
Drawn By		8-78	<i>Charles A. Scott</i> State Traffic Standards Engineer	
Checked By		8-78	Revision	Sheet No. Index No.
			04	4 of 13 17346



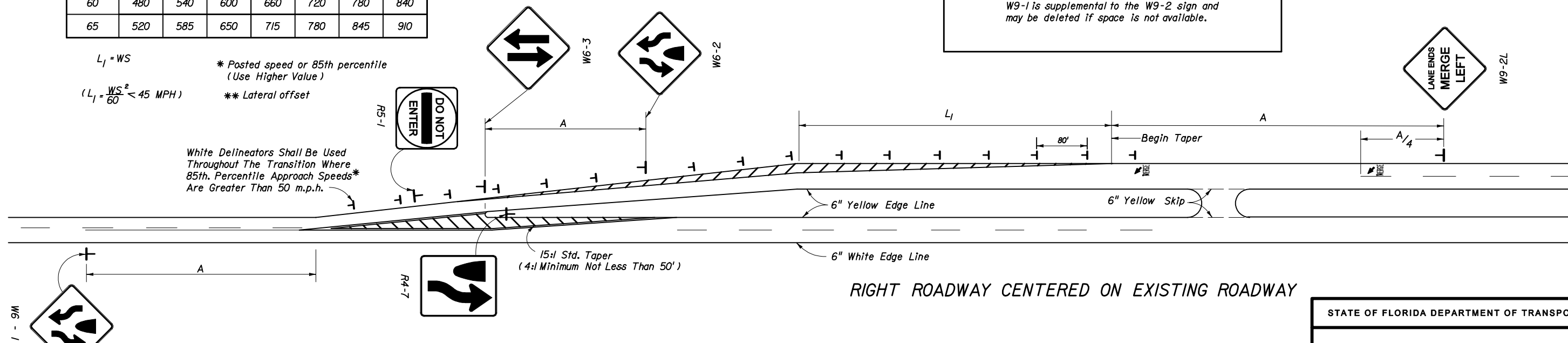
* S	TRANSITION DISTANCE L_1 (FEET)							
	** W	8	9	10	11	12	13	14
30	120	135	150	165	180	195	210	
35	165	185	205	225	245	265	285	
40	215	240	270	295	320	350	375	
45	360	405	450	495	540	585	630	
50	400	450	500	550	600	650	700	
55	440	495	550	605	660	715	770	
60	480	540	600	660	720	780	840	
65	520	585	650	715	780	845	910	

SPEED M.P.H.*	"A" (FT.)
55	700
50	625
45	550
40	475
30	325

POSTED (DAY) SPEED LIMIT M.P.H.	"y" (FT.)
30 OR LESS	10
35	20
40	20
45	30
50 OR MORE	40



$L_1 = WS$
 * Posted speed or 85th percentile (Use Higher Value)
 (** $L_1 = \frac{WS^2}{60} < 45 \text{ MPH}$)
 ** Lateral offset



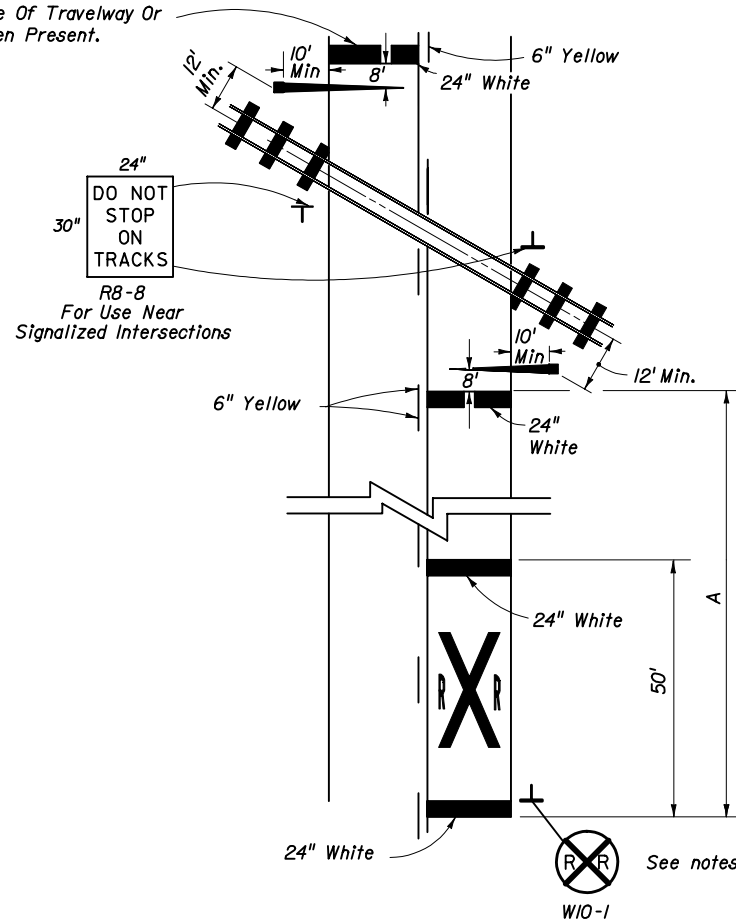
SCHMES FOR TRANSITION - 2 LANE / 4 LANE ROADWAY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

Designed By	Names	Dates	Approved By
Drawn By			<i>Charles A. Scott</i> State Traffic Standards Engineer
Checked By	Revision	Sheet No.	Index No.
	8-78	04	5 of 13 17346

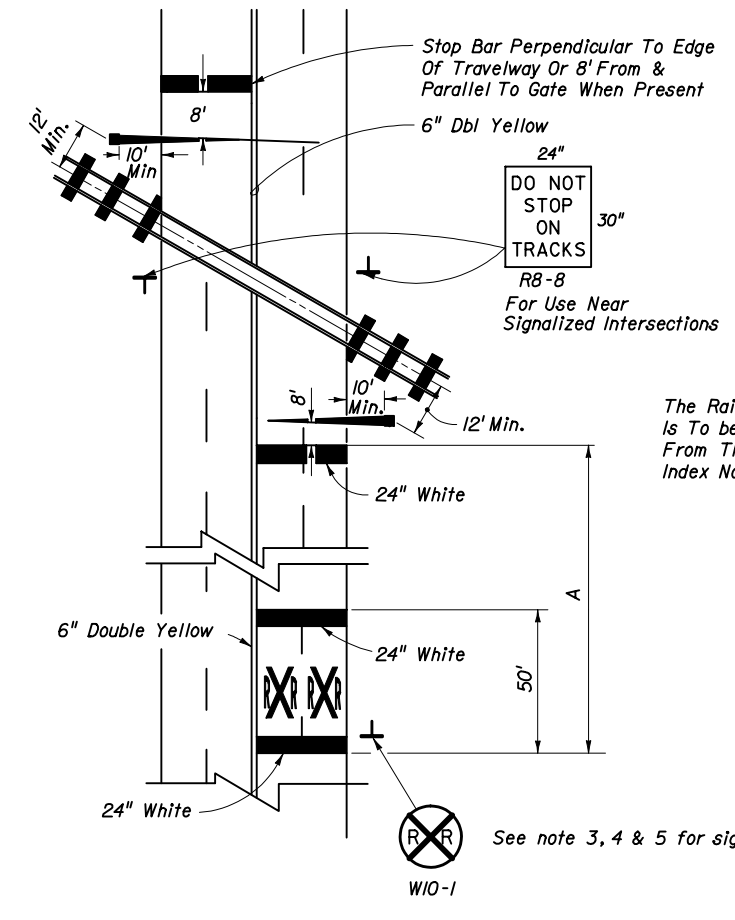
Stop Bar Perpendicular To Edge Of Travelway Or 8' From & Parallel To Gate When Present.



The Railroad Traffic Control Device Is To Be Located A Minimum Of 12' From The Railroad Centerline. See Index No. 17882 For Protection Devices.

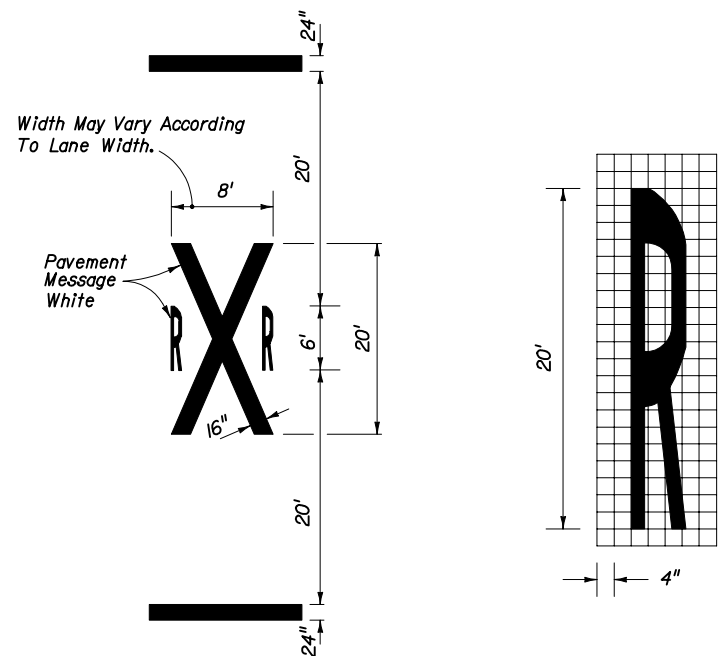
RAILROAD CROSSING AT 2-LANE ROADWAY

Stop Bar Perpendicular To Edge Of Travelway Or 8' From & Parallel To Gate When Present

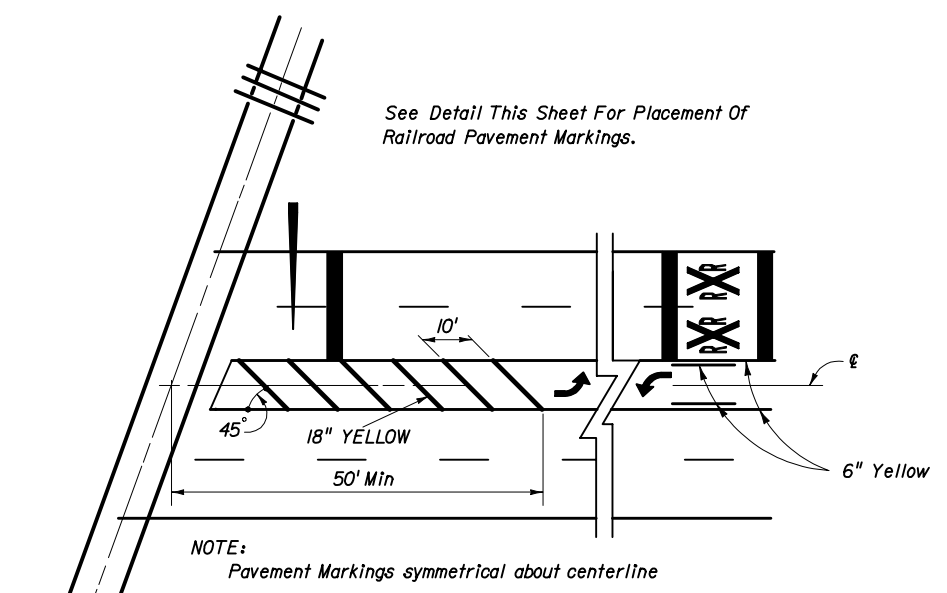


The Railroad Traffic Control Device Is To Be Located A Minimum Of 12' From The Railroad Centerline. See Index No. 17882 For Protection Devices.

RAILROAD CROSSING AT 4-LANE ROADWAY



TYPICAL PAVEMENT MARKINGS FOR R/R CROSSING



PAVEMENT MARKINGS FOR TERMINATION OF TWO WAY LEFT TURN AT R/R CROSSINGS

NOTES:

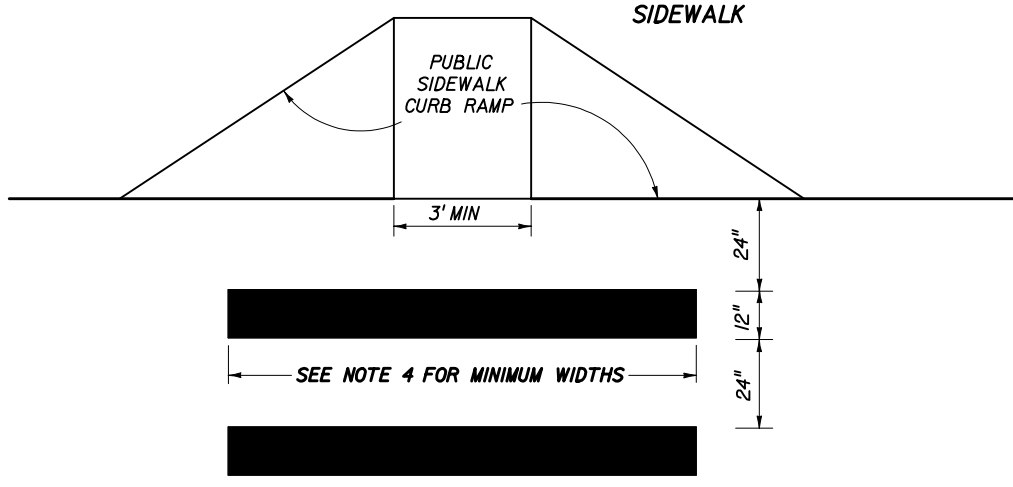
1. When computing pavement messages, quantities do not include transverse lines.
2. When dynamic devices are not present or are to be installed, the crossbuck shall be located at the future location of the RR gate or signal and gate in accordance with Index No. 17882.
3. Placement of sign W10-1 in a 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 & additional pavement message should be used.
4. Recommended location for FTP-61-04 or FTP-62-04 sign, 100' urban & 300' rural in advanced of the crossing.
5. A portion of the pavement marking symbol should be directly opposite the W10-1 sign.

SPEED MPH	A (Ft)
65	650
60	550
55	450
50	375
45	300
40	225
35	150
30	100
Urban	50 Min.

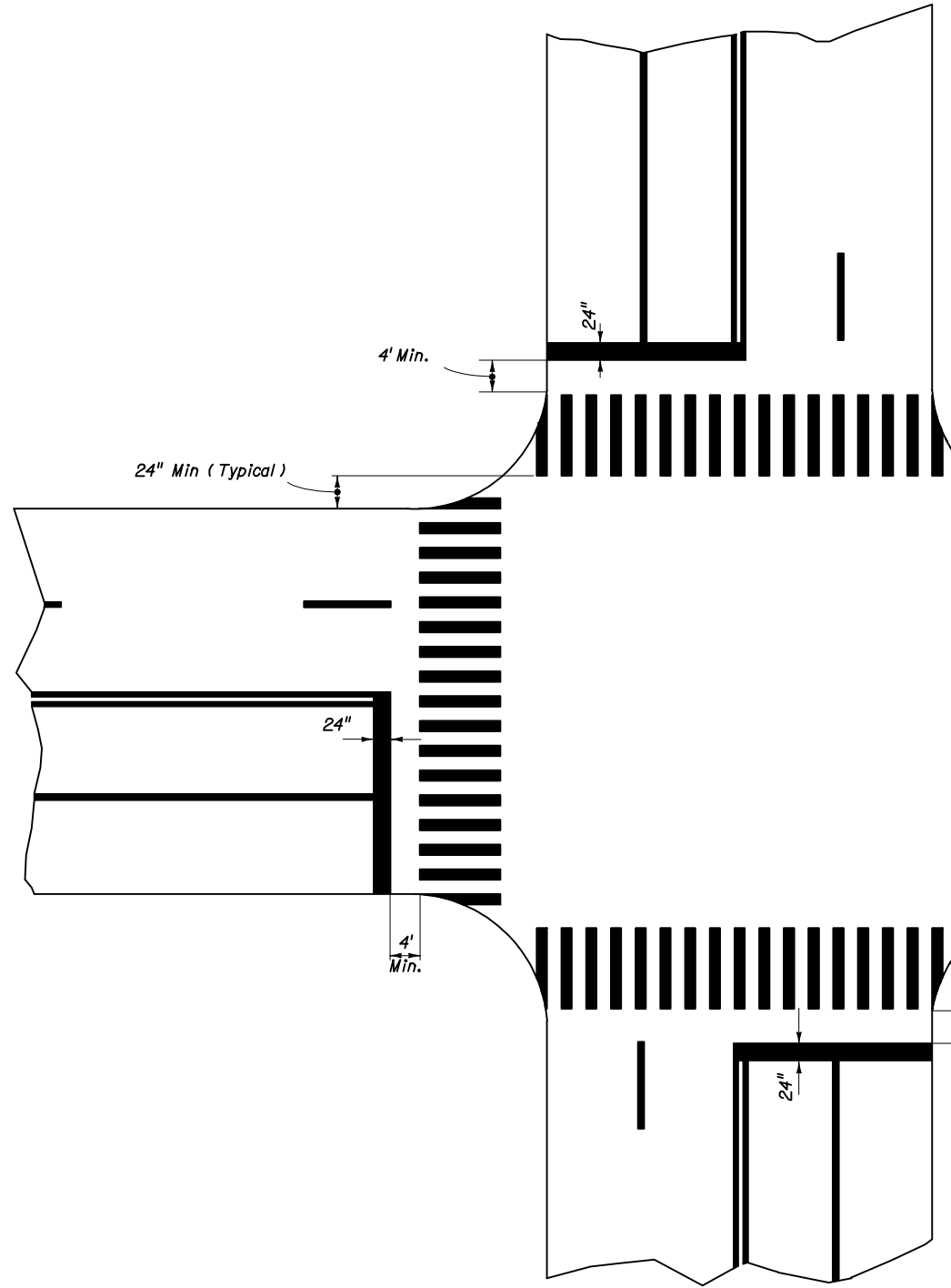
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

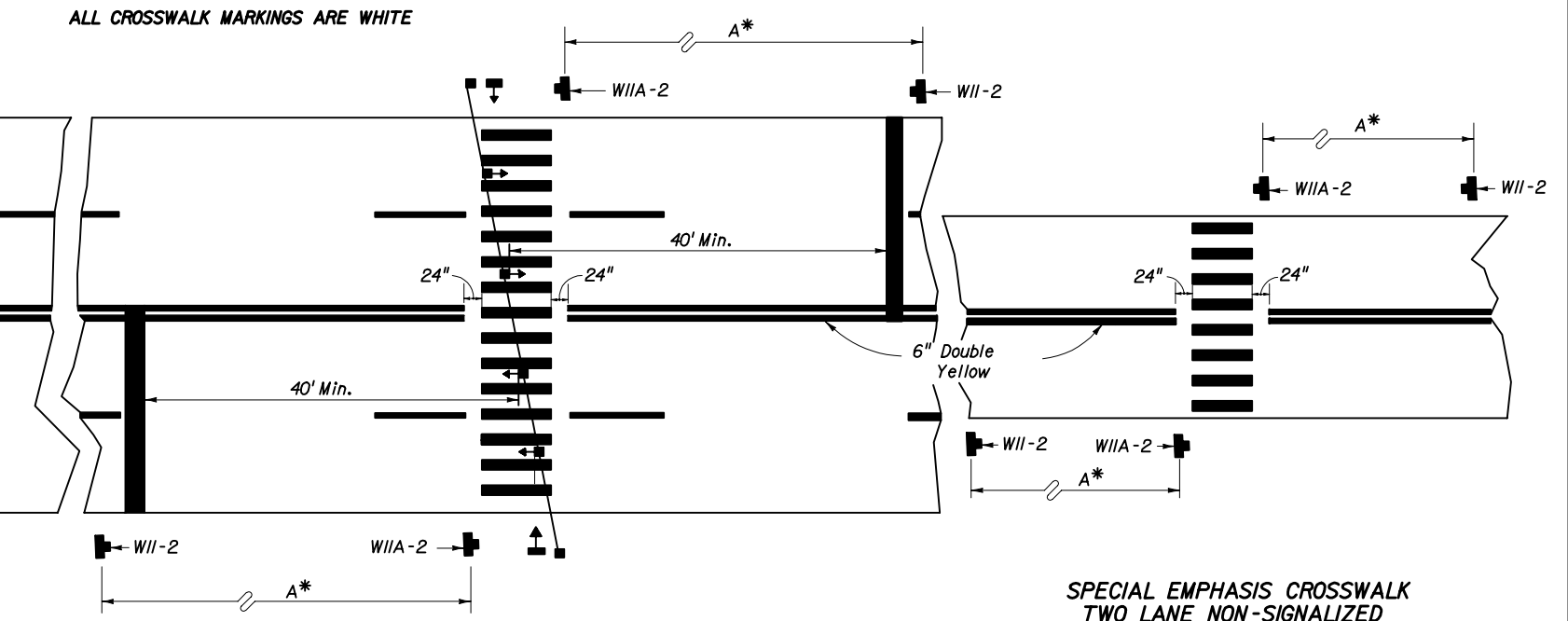
Names	Dates	Approved By		
Designed By	6-76	Charles A. Scott State Traffic Standards Engineer		
Drawn By				
Checked By	6-76	Revision	Sheet No.	Index No.
		04	6 of 13	17346



- GENERAL NOTES**
1. For traffic and pedestrian signal installation, refer to Index No. 17721 through 17890.
 2. For public sidewalk curb ramps, refer to Index No. 304.
 3. For pavement marking and sign installation, refer to Indexes 9535 through 17356.
 4. Crosswalk minimum widths:
Intersection Crosswalk 6'
Mid Block Crosswalk 10'



**SPECIAL EMPHASIS CROSSWALK
SIGNALIZED OR STOP SIGN CONTROLLED INTERSECTION**



**SPECIAL EMPHASIS CROSSWALK
MID BLOCK-SIGNALIZED**

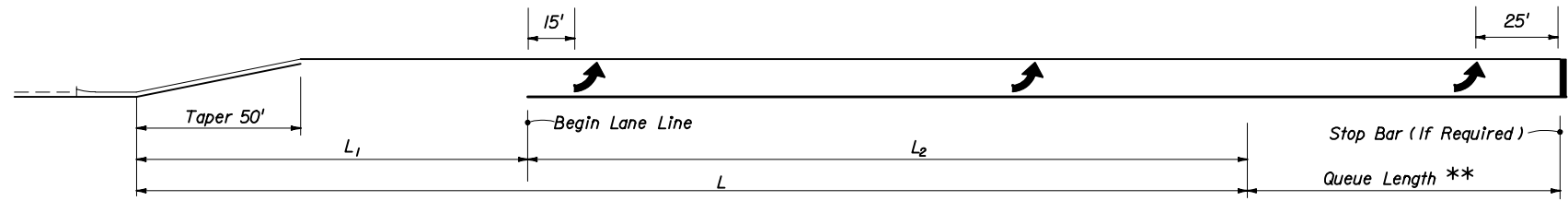
**SPECIAL EMPHASIS CROSSWALK
TWO LANE NON-SIGNALIZED**

APPROACH SPEED MPH	A* SUGGESTED DISTANCE (Ft)
25 To 35	275
36 To 45	350
46 To 55	500

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

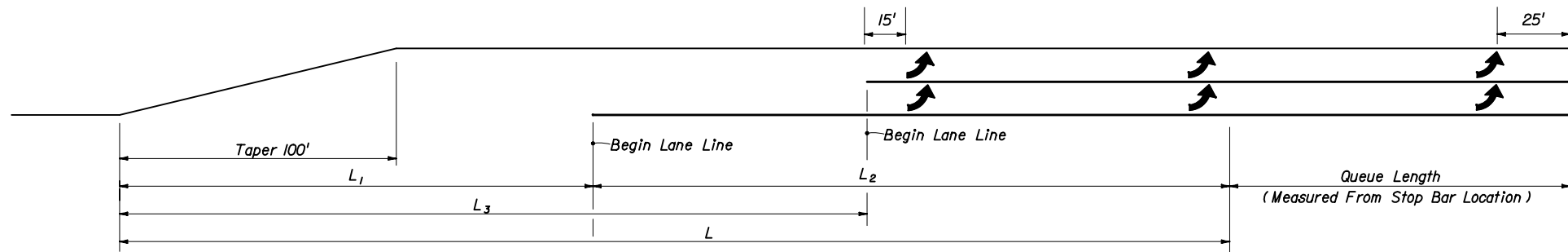
SPECIAL MARKING AREAS

Designed By	Names	Dates	Approved By
Drawn By		3-83	<i>Clark A. Scott</i> State Traffic Standards Engineer
Checked By	Revision	Sheet No.	Index No.
	00	7 of 13	17346

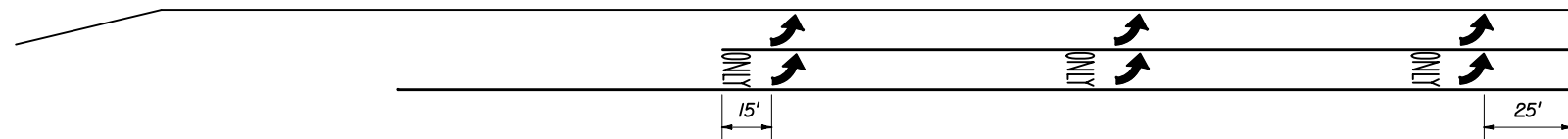


SINGLE LEFT TURNS

** Queue Length Is Measured From The Median Nose Radial Point Or, When A Stop Bar Is Required, From The Stop Bar.

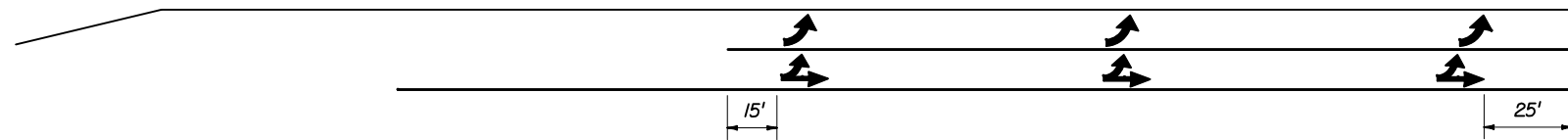


DOUBLE LEFT TURNS



Pavement message ONLY is not required for created (shadowed) turn lanes, single or dual, where the driver must exit the thru lane to enter a turn lane.

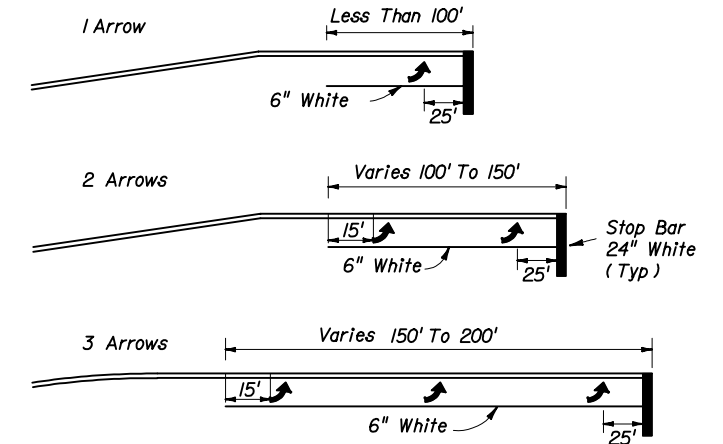
Through Lane Becomes Exclusive Left Turn



Through Lane Becomes Optional Left Turn

DOUBLE LEFT TURN MARKINGS

TURN LANES ◦ CURBED AND UNCURBED MEDIANS							
Design Speed (mph)	Clearance Distance L ₁	URBAN CONDITIONS			RURAL CONDITIONS		
		Brake To Stop Distance L ₂	Total Decel. Distance L	Clearance Distance L ₃	Brake To Stop Distance L ₂	Total Decel. Distance L	Clearance Distance L ₃
35	70'	75'	145'	110'	---	---	---
40	80'	75'	155'	120'	---	---	---
45	85'	100'	185'	135'	---	---	---
50	105'	135'	240'	160'	215'	320'	160'
55	125'	---	---	---	260'	385'	195'
60	145'	---	---	---	310'	455'	230'
65	170'	---	---	---	350'	520'	270'



Arrow should be evenly spaced between first and last arrow. Turn lanes longer than 200' add one arrow for each 100' additional length.

ARROW SPACING

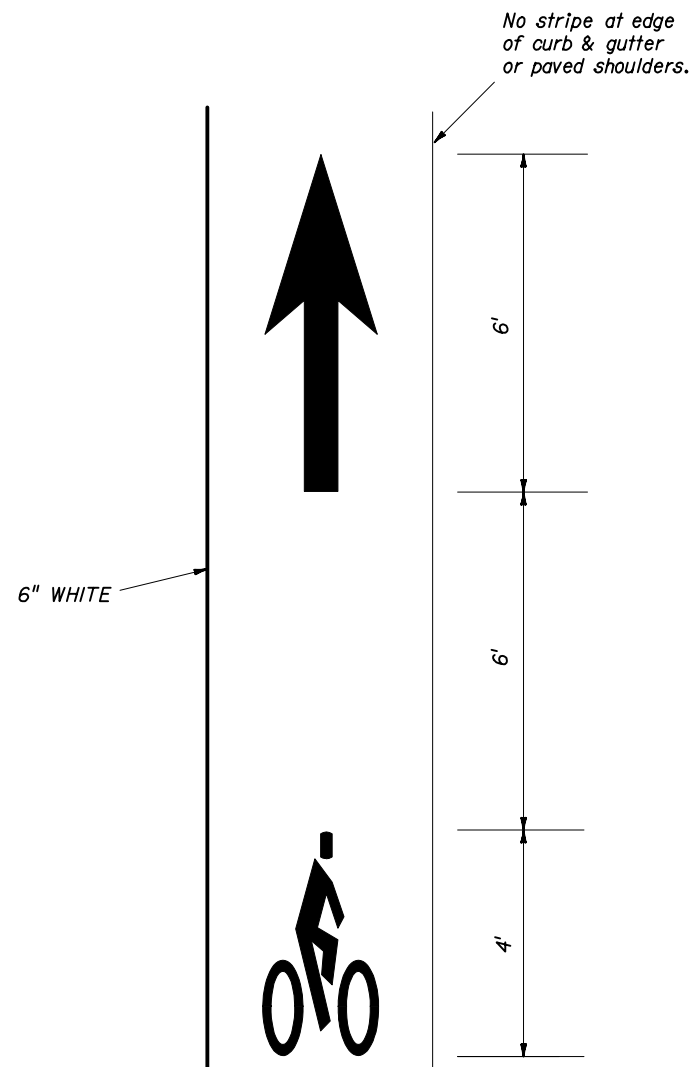
NOTES:

1. The "Begin Lane Line" locations are based on the standard lengths shown in Design Standard 301. These locations must be adjusted on a case by case basis for turn lanes not meeting the standard lengths.
2. Yellow left turn edge marking may be used adjacent to raised curb or grass medians if lane use is not readily apparent to drivers approaching a left turn storage lane.

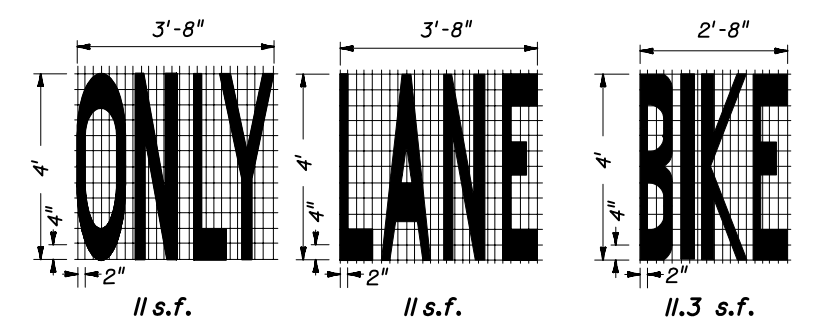
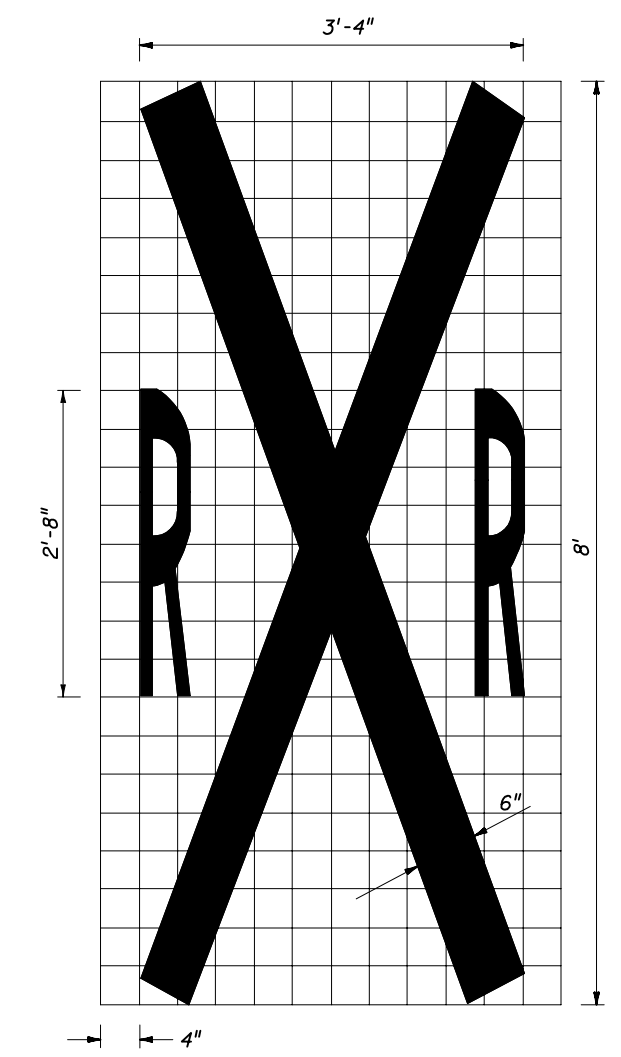
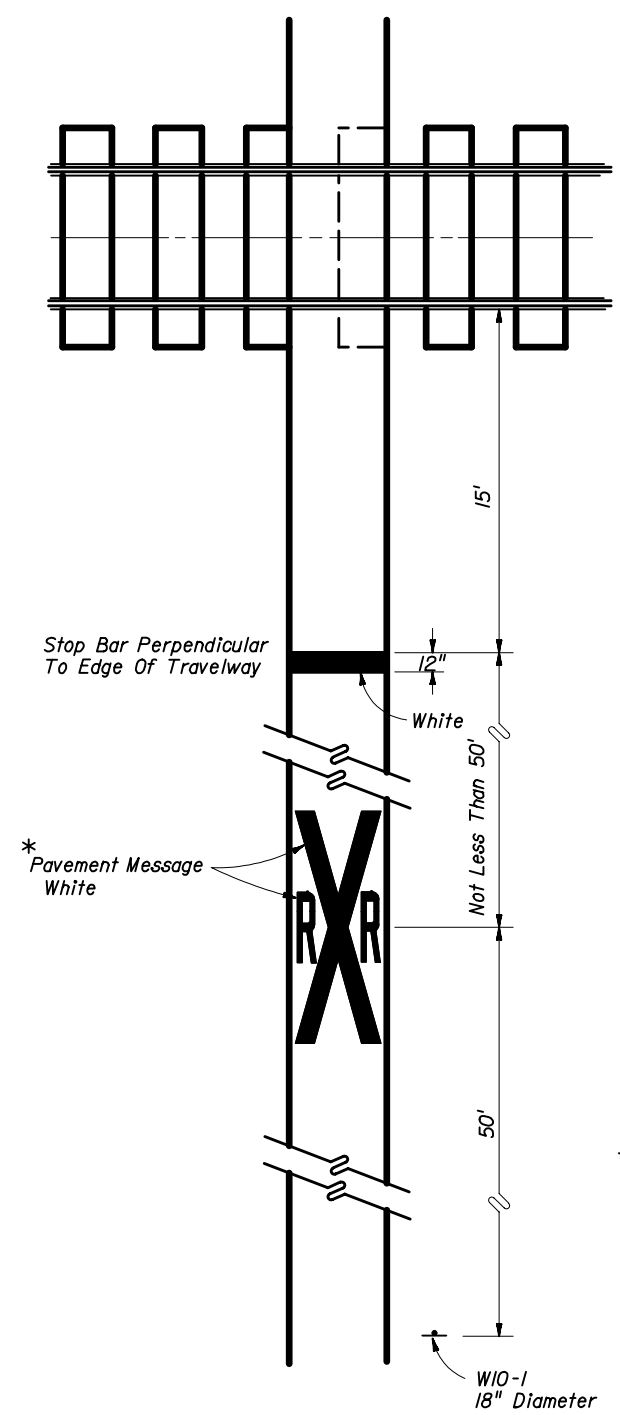
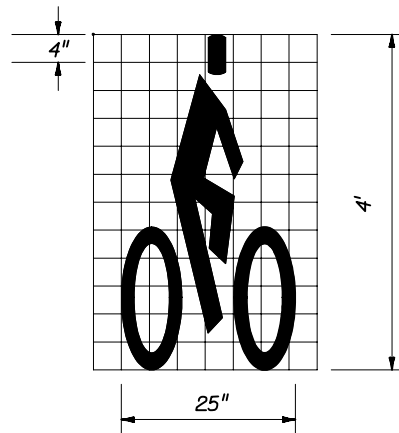
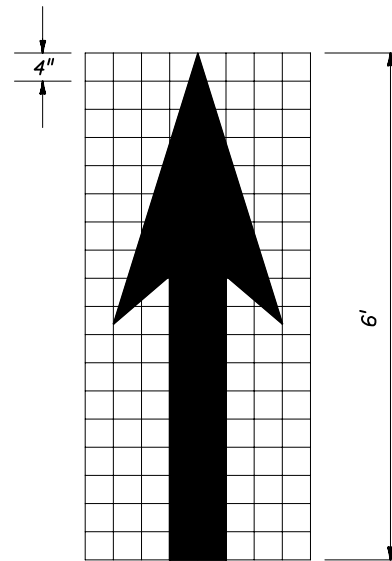
Refer to Design Standard 301 for Roadway Details.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
SPECIAL MARKING AREAS					
Names	Dates	Approved By			
Designed By	CAS	3-02	State Traffic Standards Engineer		
Drawn By	CAS	3-02	Revision	Sheet No.	Index No.
Checked By			02	8 of 13	17346

1. Recommended spacing of symbols: Immediately after intersections and major driveways and at a maximum spacing of 600 feet for urban sections and 1320 feet for rural sections.
2. Raised pavement markings and raised barriers can cause steering difficulties and should not be used to delineate bicycle lanes. All pavement markings and pavement messages shall be white.



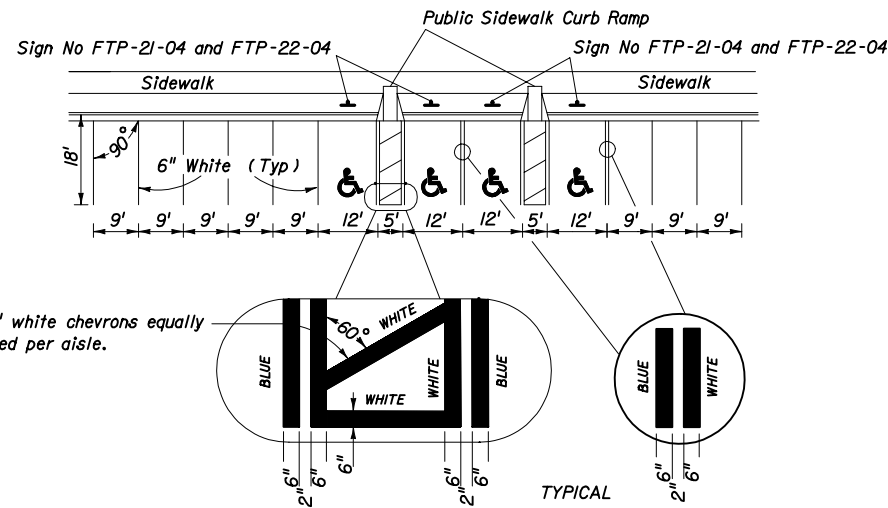
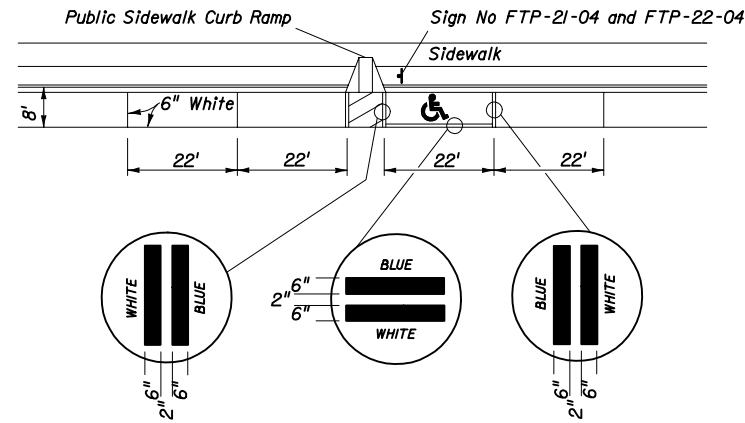
DETAIL OF BIKE LANE MARKINGS



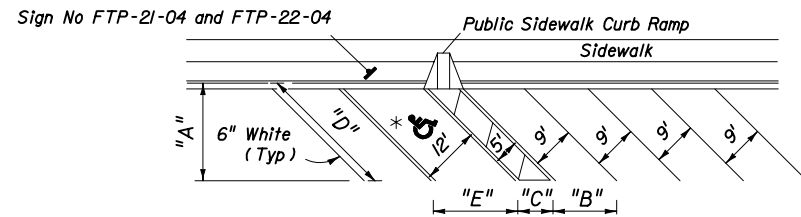
PAVEMENT MESSAGE DETAILS

*NOTE
 3. When used on a bike lane (adjacent to vehicle lane) markings shall be placed adjacent to markings for vehicles & W10-1 sign shall be sized and placed for vehicles.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL MARKING AREAS (BICYCLE)				
Designed By	Names	Dates	Approved By	
Drawn By		8-84	<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By	Revision	Sheet No.	Index No.	
	02	9 of 13	17346	



3-6" white chevrons equally spaced per aisle.

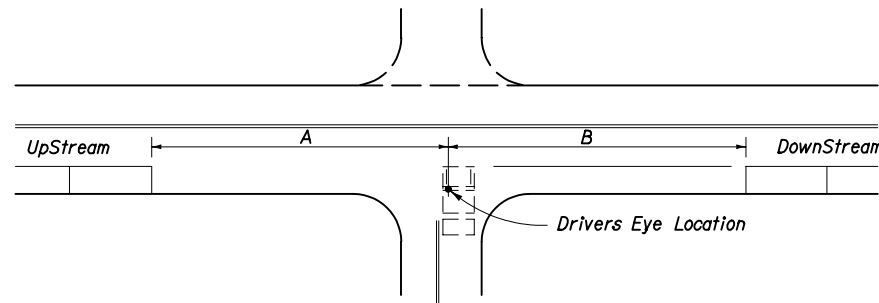


* FOR ACCESSIBLE MARKINGS - SEE ABOVE

"DIMENSIONS"					
∠°	"A"	"B"	"C"	"D"	"E"
45°	19'-1"	12'-9"	7'-0"	27'-0"	17'-0"
60°	20'-1"	10'-5"	5'-9"	23'-2"	13'-10"

- NOTES:
- Dimensions are to the centerline of markings.
 - An Access Aisle is required for each accessible space when angle parking is used.
 - Criteria for pavement markings only, not public sidewalk curb ramp locations. For ramp locations refer to plans.
 - Blue pavement markings shall be tinted to match shade 15180 of Federal Standards 595a.
 - The FTP-22-04 panel shall be mounted below the FTP-21-04 sign.

PAVEMENT MARKING FOR PUBLIC SIDEWALK CURB RAMP IN REST AREAS

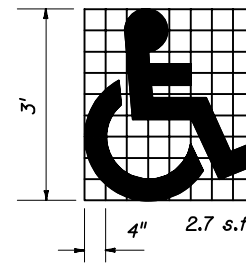
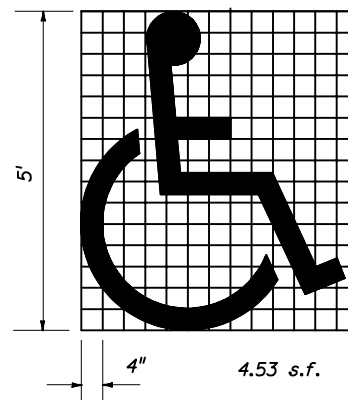


SPEED MPH	UP STREAM (A)	DOWN STREAM (B)	
		2 LANE	4 LANE
0-30	85'	60'	45'
35	100'	70'	50'

NOTES

- Distances measured longitudinally along the street from driver location of entering vehicle to end of parking restriction.
- Distances applicable to intersecting street, major driveways and other driveways to the extent practical.
- For non-signalized intersections, the values above shall be compared with the values for signalized intersections and the maximum restrictions implemented. These restrictions apply to both accessible and non-accessible parking.

MINIMUM PARKING RESTRICTION FOR NON-SIGNALIZED INTERSECTIONS

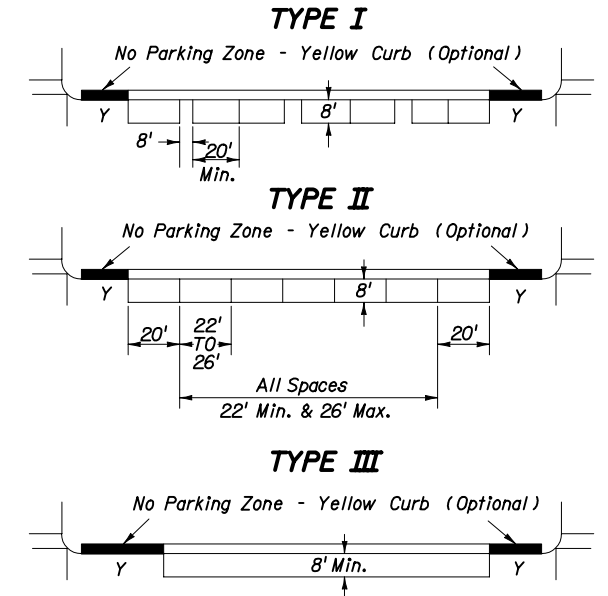


Use of pavement symbol in accessible parking spaces is optional, when used the symbol shall be 3' or 5' high and white in color.

"UNIVERSAL SYMBOL OF ACCESSIBILITY"

GENERAL NOTES (Signalized & Non-signalized)

- For entrances to a one-way street, the downstream restriction may be reduced to 20'.
- Parking shall not be allowed within 20' of a crosswalk.
- All parking lane markings shall be 6" white.
- Parking lane lines shall be broken at driveways.
- Refer to Chapter 316, Fla. statutes, for laws governing parking spaces.
- Where curb and gutter is used, the gutter pan width may be included as part of the minimum width of parking lane, but desirably the lane width should be in addition to that of the gutter pan.



SPEED LIMIT MPH	SIGNALIZED INTERSECTIONS	DISTANCE FROM CURB RADIUS (Y)
0-30	30'	
35	50'	

PARKING RESTRICTION (FT.) FOR SIGNALIZED INTERSECTION

NOTES:

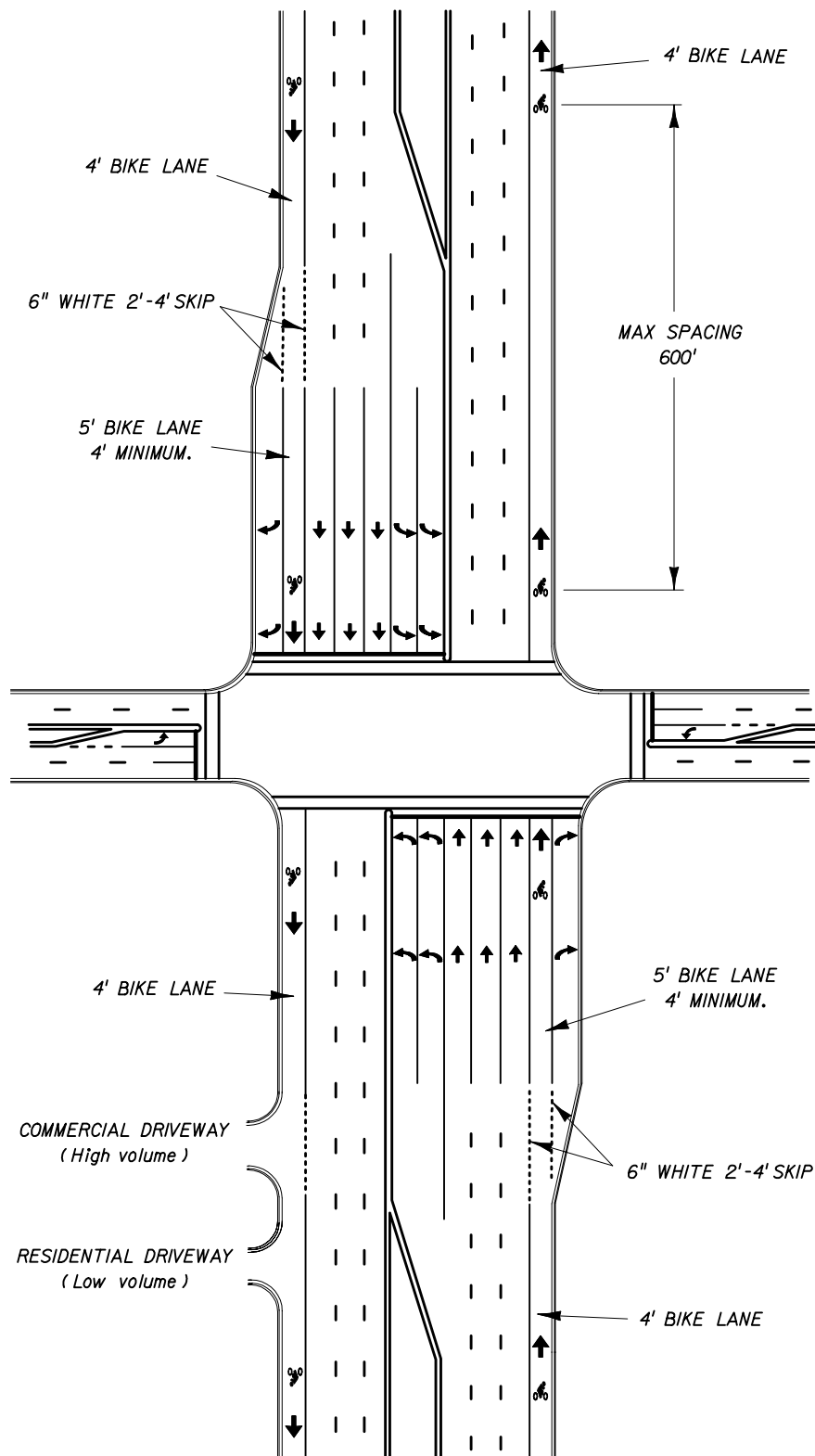
- Parking restrictions measured from curb radius point.
- Restrictions for accessible parking are the same as those applied to non-signalized intersections.

MINIMUM PARKING RESTRICTION FOR SIGNALIZED INTERSECTION

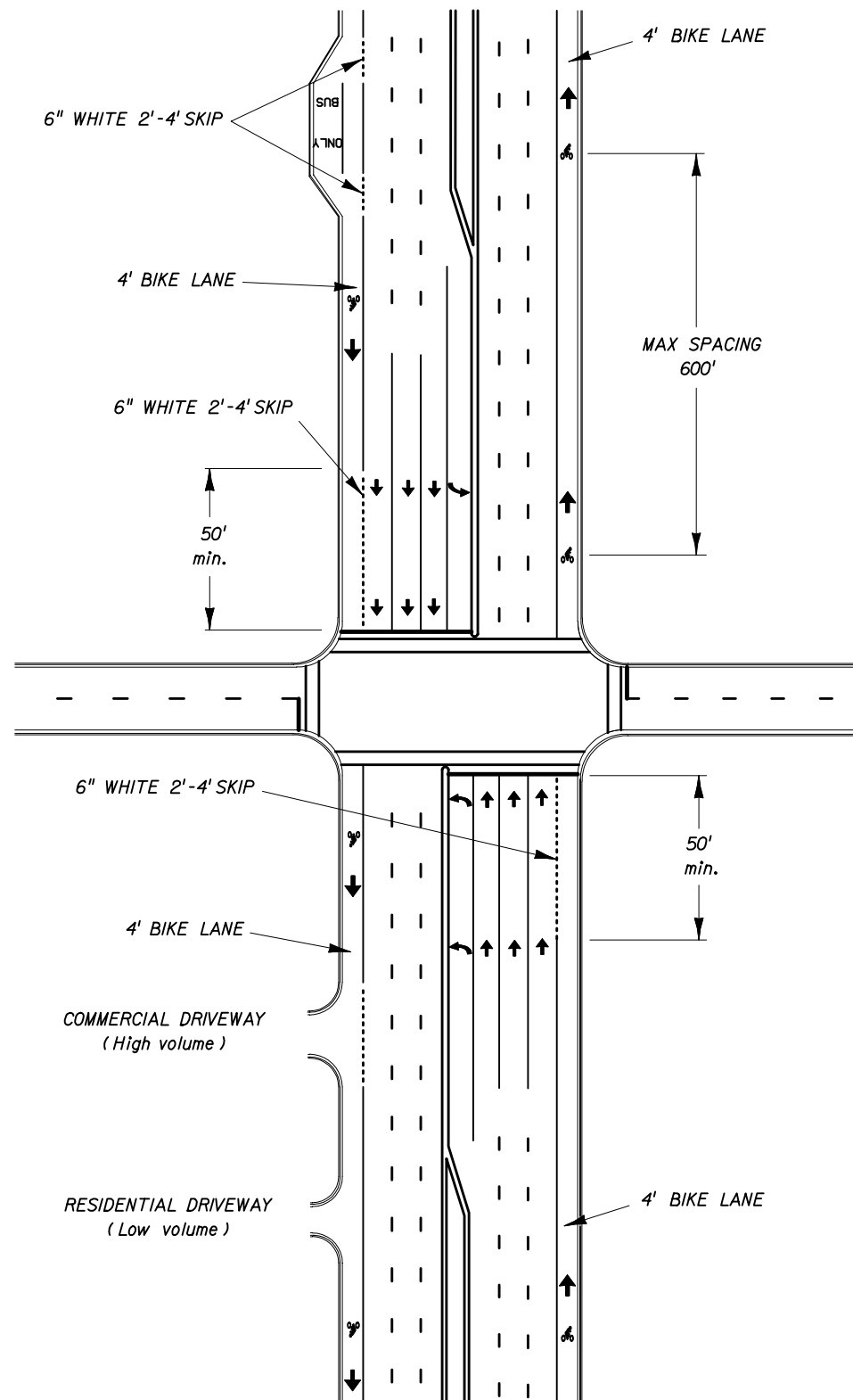
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS (PARKING)

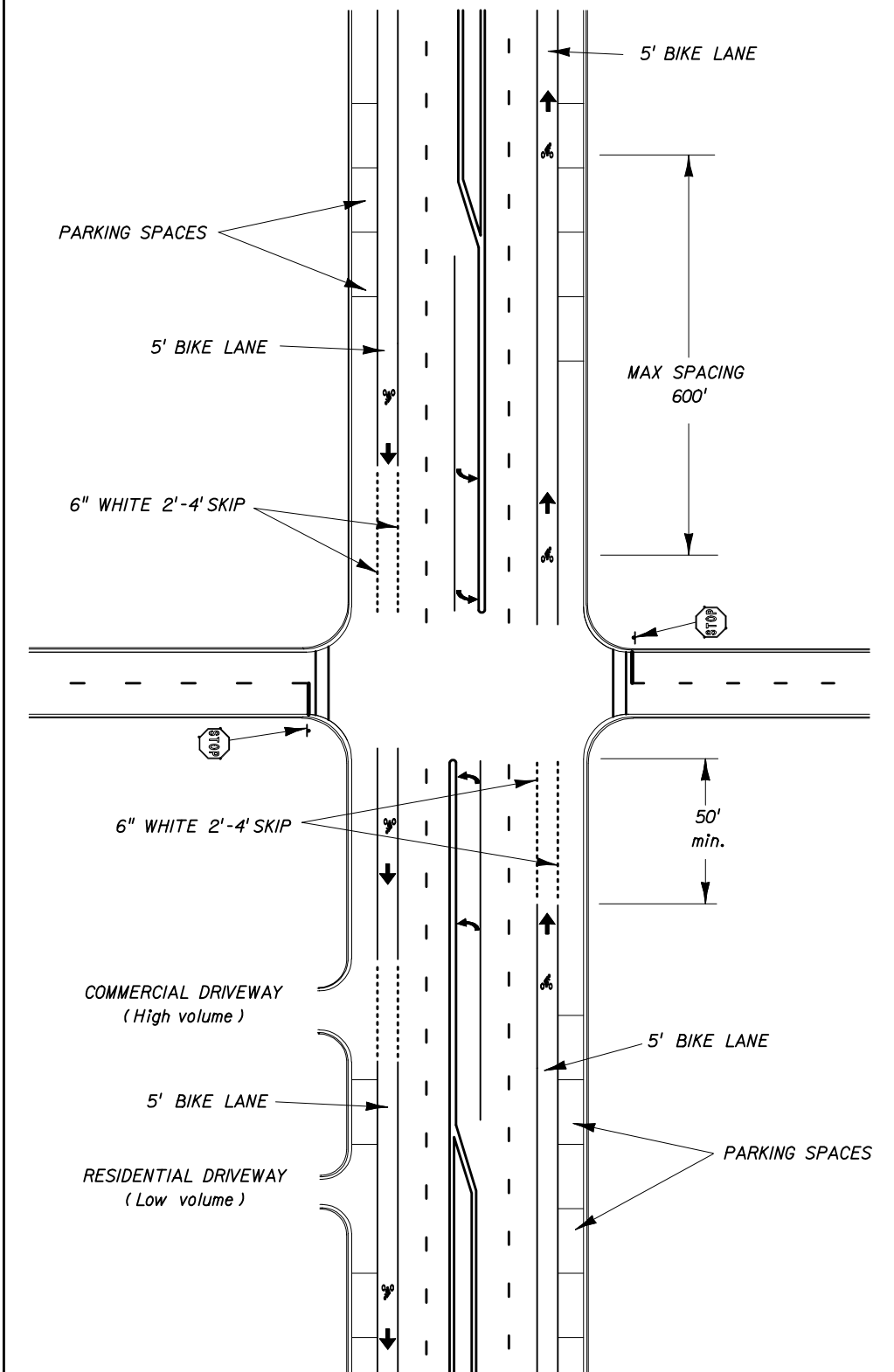
Names	Dates	Approved By		
Designed By	8-86	[Signature]		
Drawn By				
Checked By	8-86	Revision	Sheet No.	Index No.
		04	10 of 13	17346



MAJOR INTERSECTION WITH SEPARATE RIGHT TURN LANE URBAN TYPICAL SECTION (CURB AND GUTTER)



MAJOR INTERSECTION, NO RIGHT TURN LANE PLUS BUSBAY URBAN TYPICAL SECTION (CURB AND GUTTER)



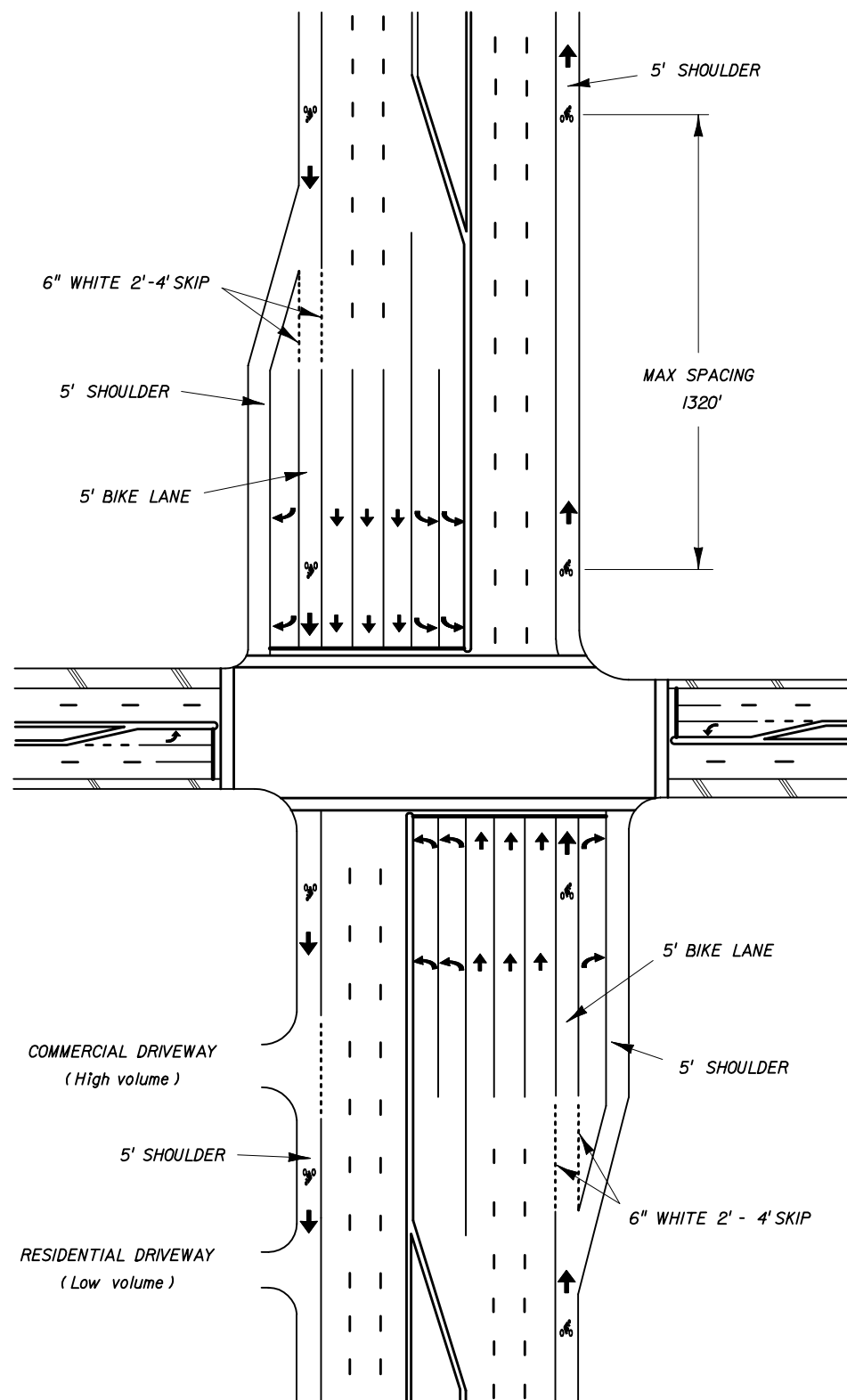
MAJOR WITH LOCAL STREET INTERSECTION, NO RIGHT TURN LANE, ON STREET PARKING URBAN TYPICAL SECTION (CURB AND GUTTER)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

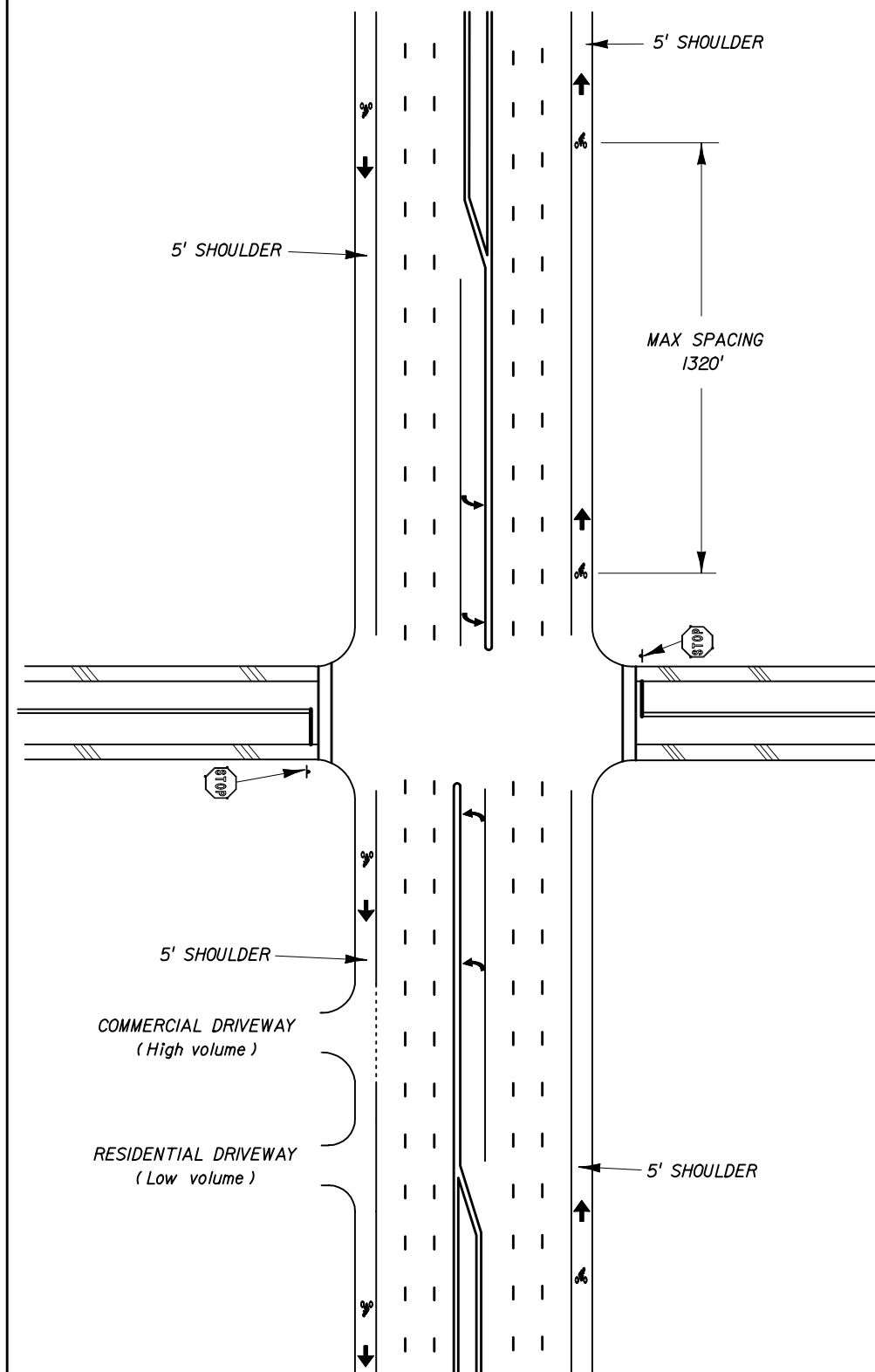
SPECIAL MARKING AREAS (BICYCLE)

Names	Dates	Approved By
Designed By		<i>Clark A. Scott</i> State Traffic Standards Engineer
Drawn By		Revision
Checked By		Sheet No. Index No.

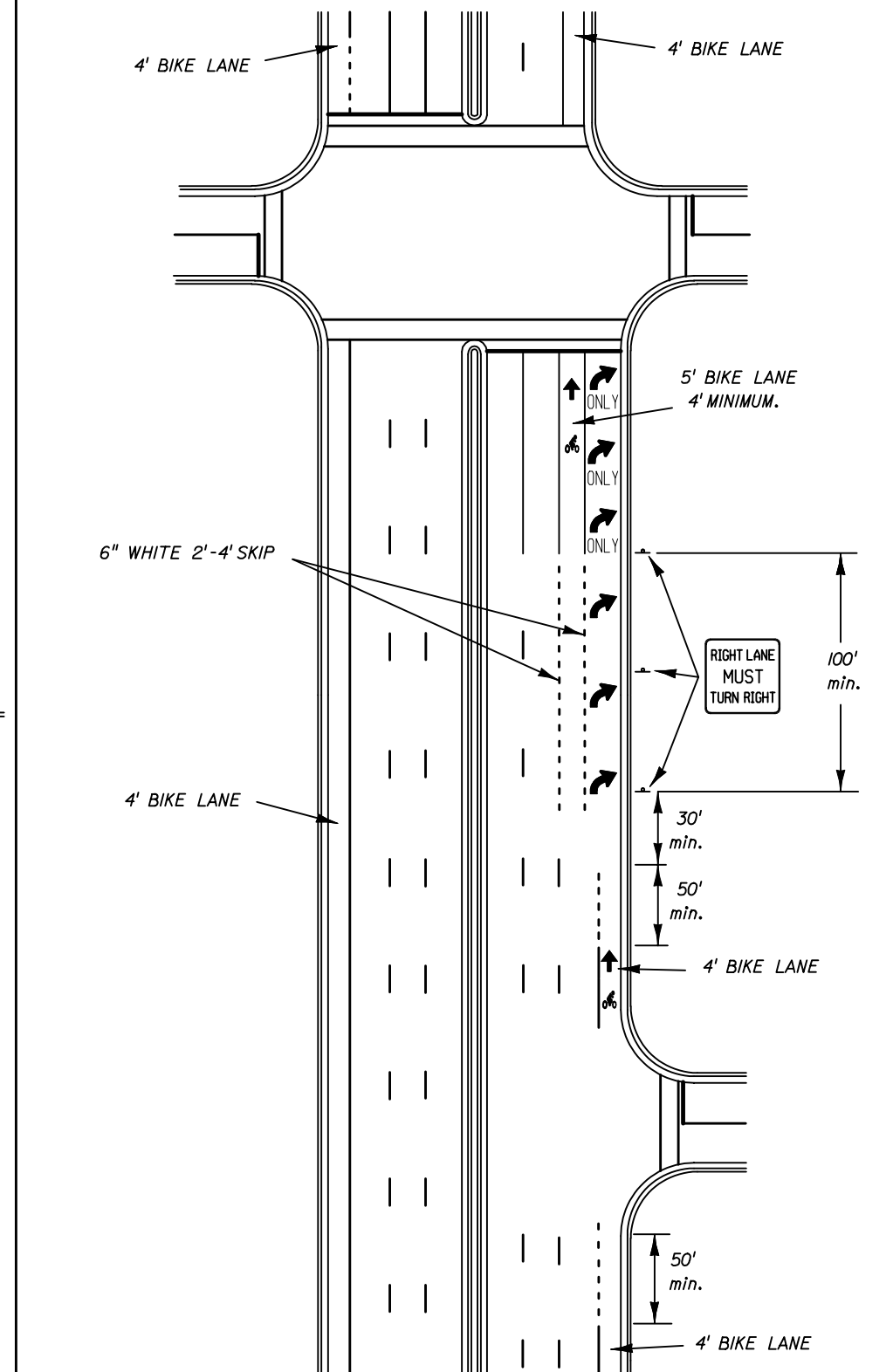
02 11 of 13 17346



MAJOR INTERSECTION WITH DESIGNATED SHOULDER, AND SEPARATE RIGHT TURN LANE RURAL TYPICAL SECTION (PAVED SHOULDER)



MAJOR WITH LOCAL STREET INTERSECTION, DESIGNATED SHOULDER, AND NO RIGHT TURN LANE RURAL TYPICAL SECTION (PAVED SHOULDER)

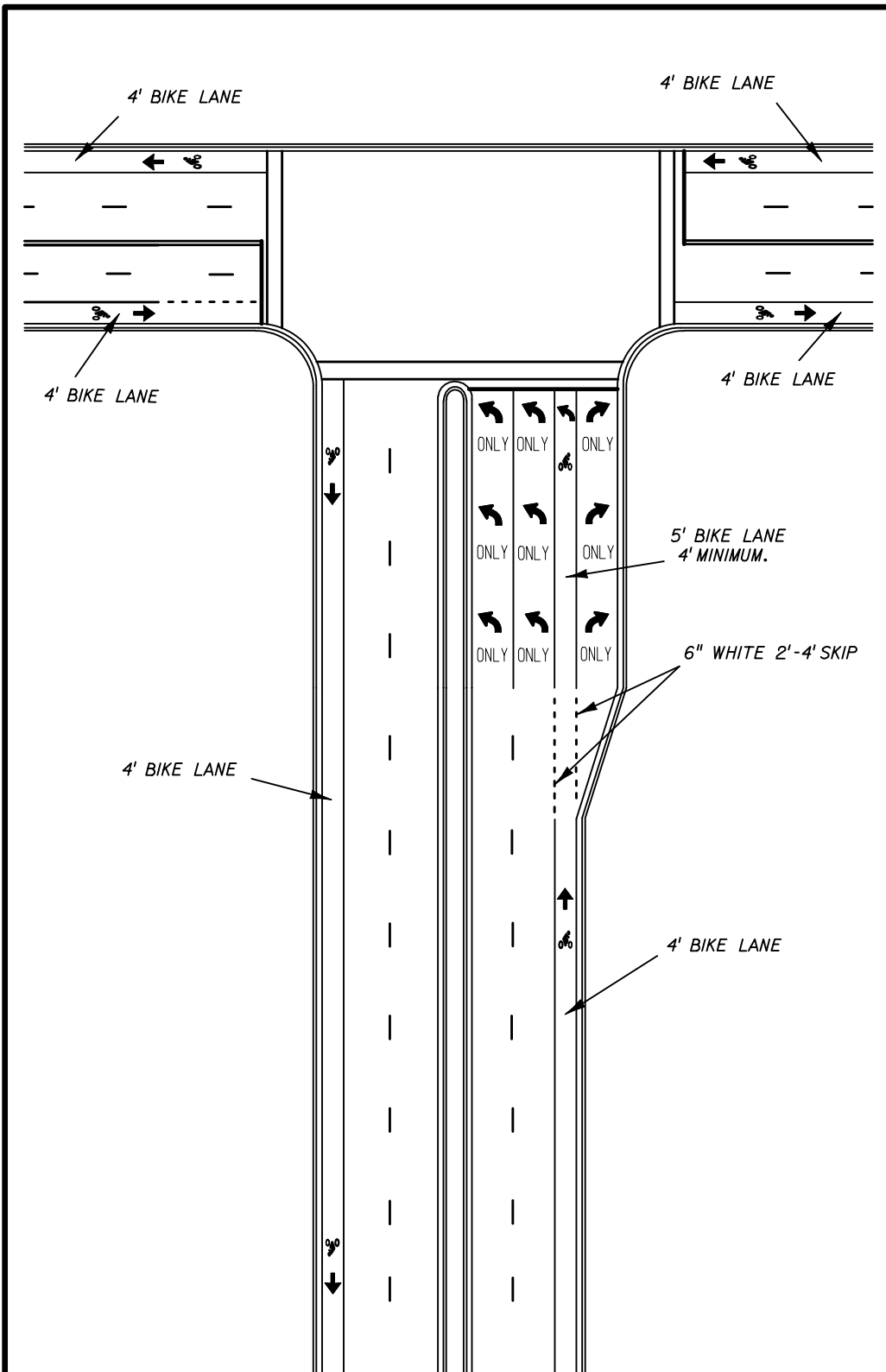


MAJOR INTERSECTION WITH RIGHT TURN DROP LANE AND DESIGNATED OR UNDESIGNATED BIKE LANE URBAN TYPICAL SECTION (CURB AND GUTTER)

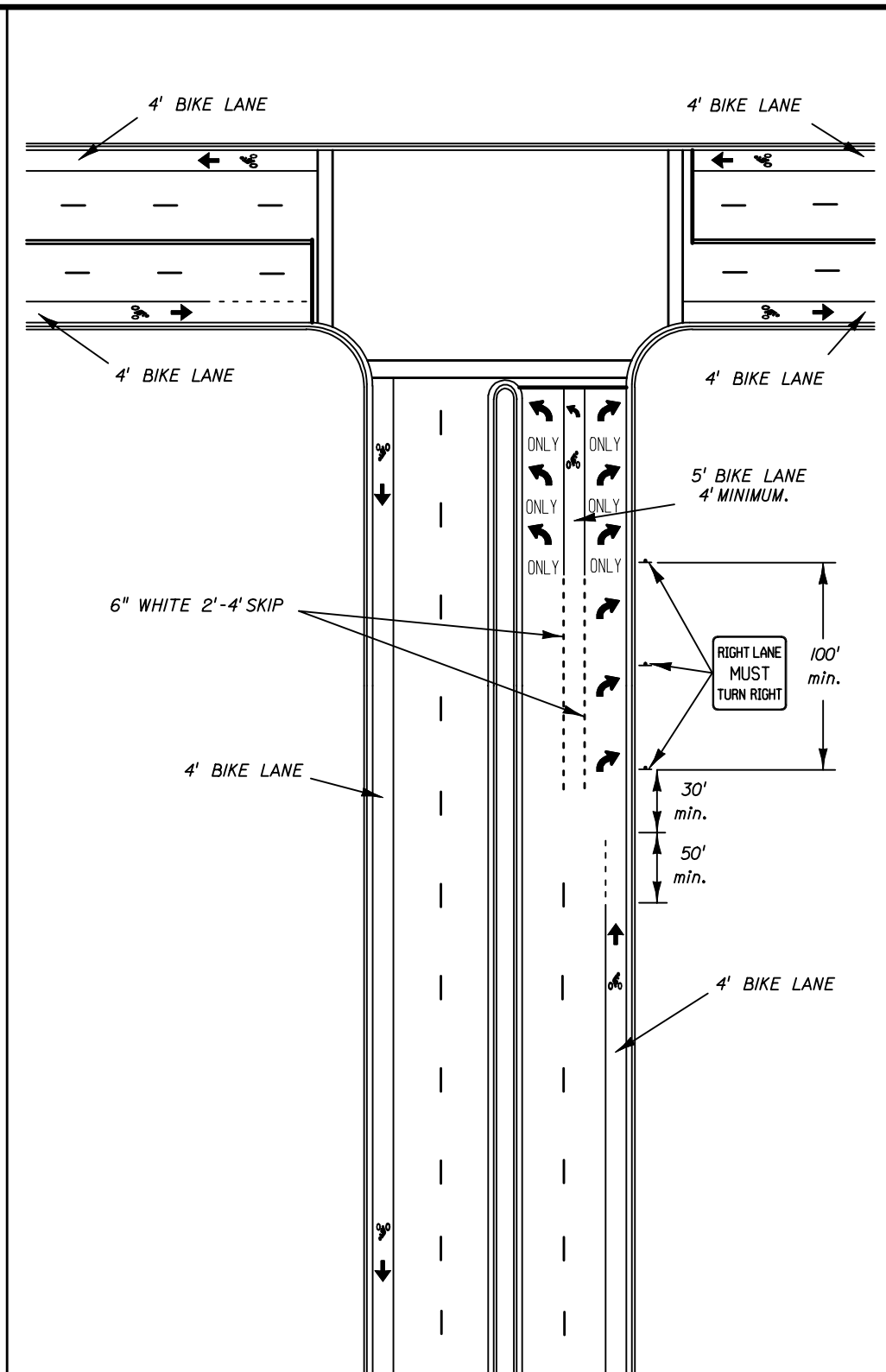
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS (BICYCLE)

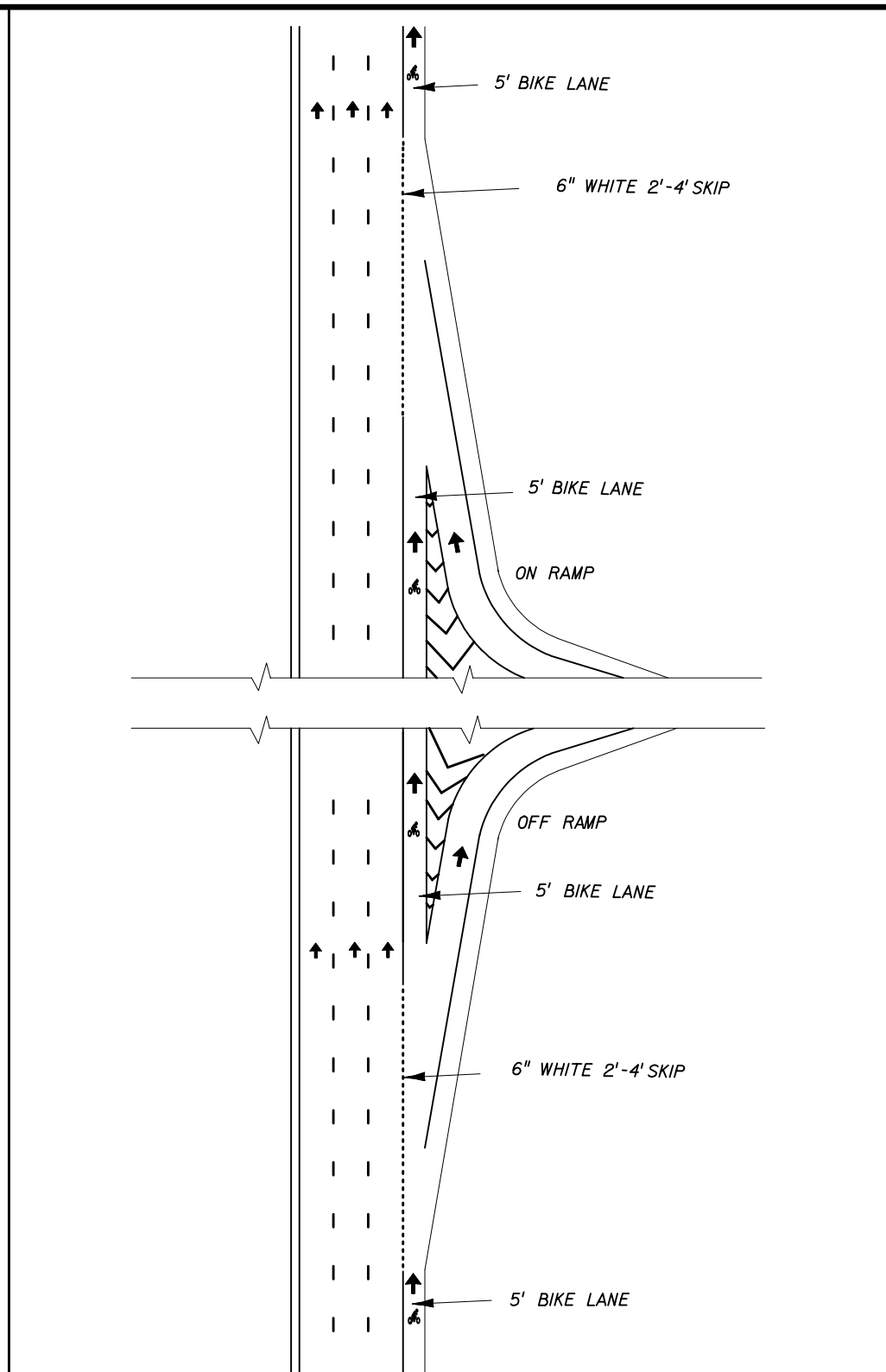
Names	Dates	Approved By
Designed By		<i>Charles A. Smith</i> State Traffic Standards Engineer
Drawn By		Revision Sheet No. Index No.
Checked By		02 12 of 13 17346



"TEE" INTERSECTION WITH SEPARATE RIGHT TURN LANE URBAN TYPICAL SECTION (CURB & GUTTER)



"TEE" INTERSECTION WITH RIGHT TURN DROP LANE URBAN TYPICAL SECTION (CURB & GUTTER)



INTERCHANGE RAMPS RURAL TYPICAL SECTION (PAVED SHOULDER)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS (BICYCLE)

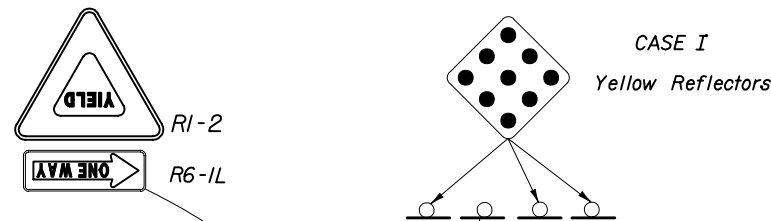
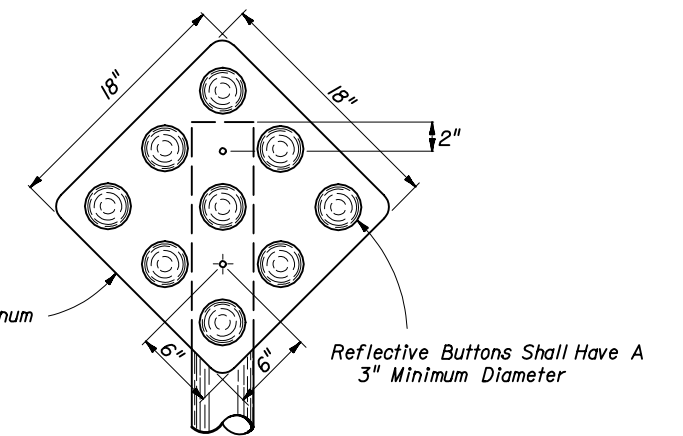
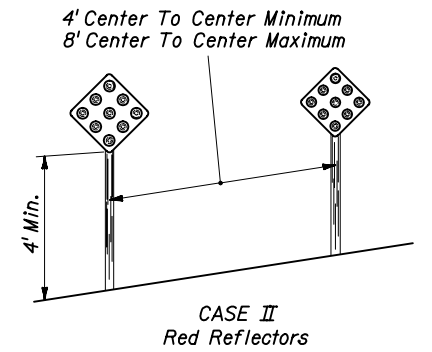
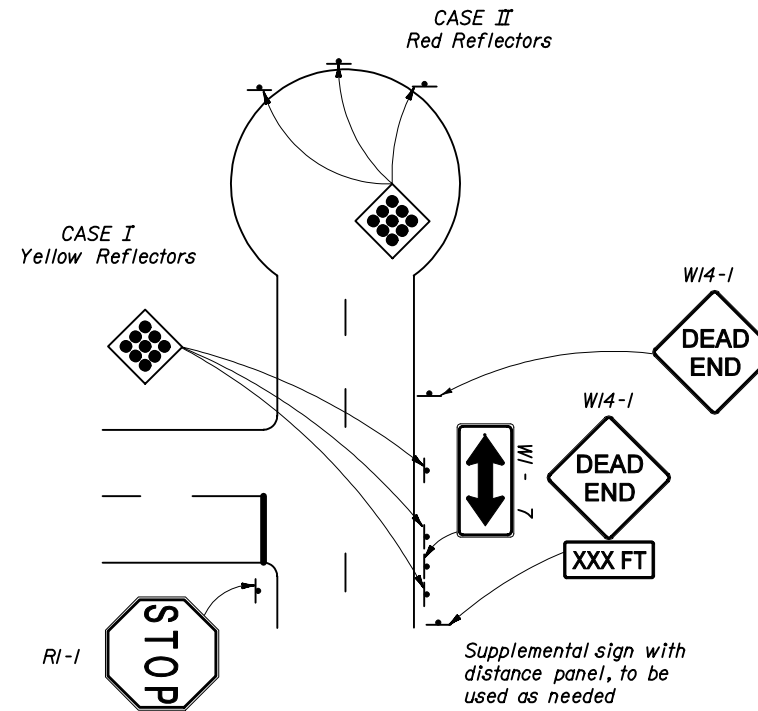
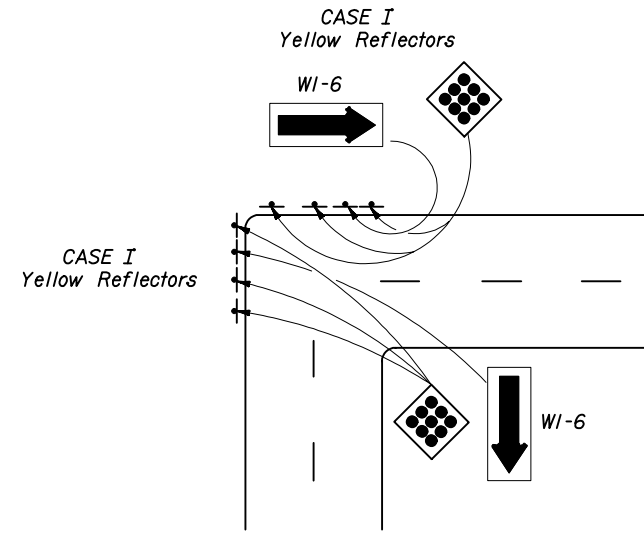
Designed By	Names	Dates	Approved By
Drawn By			<i>Clark A. Scott</i>
Checked By	Revision	Sheet No.	Index No.
	02	13 of 13	17346

CASE I Type I Object Markers shall consist of nine yellow reflectors mounted on a yellow reflective background or consist of a reflective panel of the same size with Type III-A, III-B or III-C yellow sheeting.

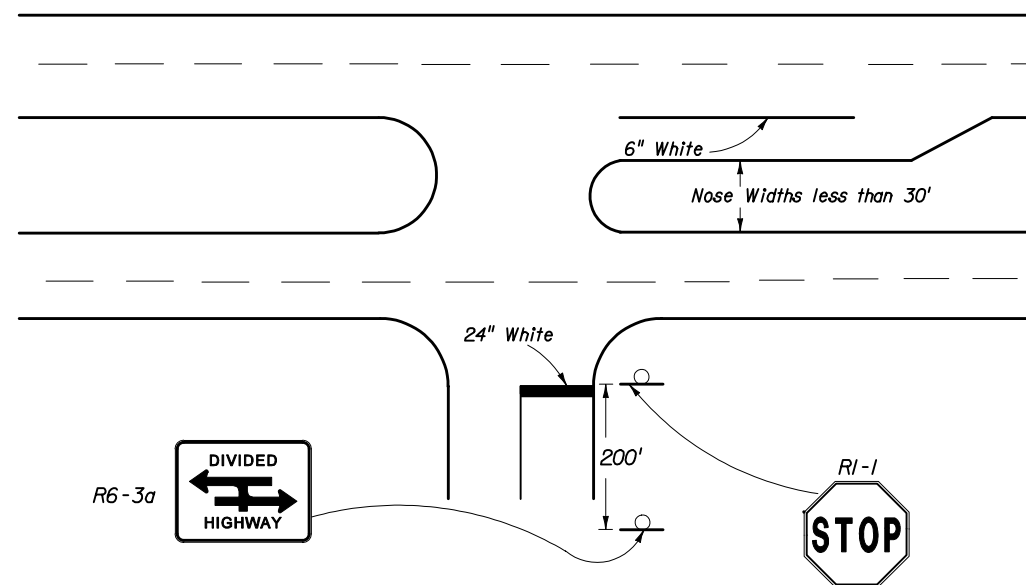
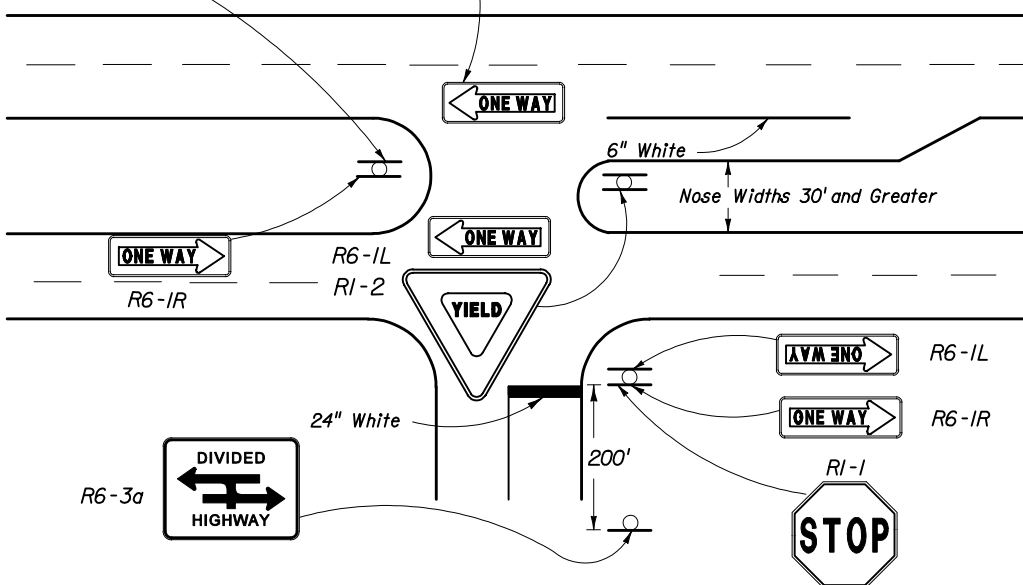
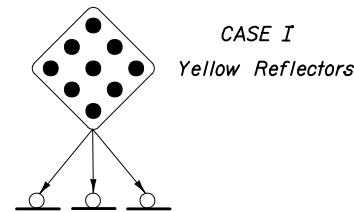
CASE II End of Road Markers shall consist of nine red reflectors mounted on a red reflective background or consist of a reflective panel of the same size with Type III-A, III-B or III-C red sheeting.

NOTES:

1. This index applicable to residential and minor streets only. Major streets to be evaluated on a case by case basis.
2. "T"-intersection-Two-Way arrows and reflectors are optional. The need should be based on a review of each location.
3. For additional details on aluminum round post, steel flanged channel post, sign panel material and bolts, nuts and washers see Index Nos. 11860 and 11865.
4. Case I Installation - The arrow panels and object markers shall be located approximately 20', but not less than 12' from the edge of the travel lane.
5. Dead end sign shall be posted a sufficient advance distance to permit the vehicle operator to avoid the dead end by turning off, if possible, at the nearest intersecting street.
6. For pavement marking see index no. 17346
7. No guardrail is required unless special field conditions require its use.



ONE WAY signs (R6-1) are not ordinarily needed at divided highway intersections with median widths of less than 30', and should be installed only if specifically called for in the plans.



Supports shall be driven 3' into the ground.

2" \emptyset X $\frac{1}{8}$ " Aluminum Round Post or 2.5 #/Ft. Steel Flanged Channel Post.

Aluminum Post: $\frac{3}{8}$ " \emptyset Aluminum Button Head Bolt with Nut and Lockwasher or $\frac{1}{4}$ " \emptyset Stainless Steel Hex Head Bolt with Flat Washer under Head and Lockwasher under Nut.

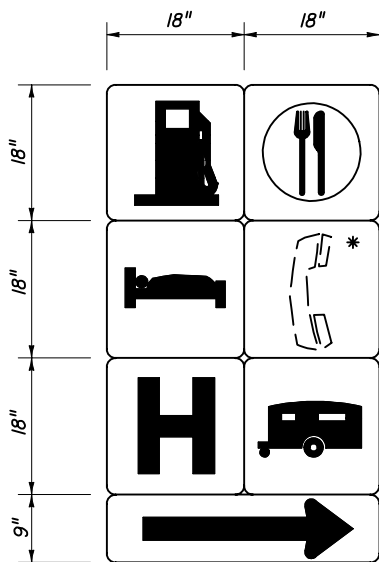
Channel Post: Provide Attachment in Accordance with the "Sign Attachment Detail" on Index No. 11865.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROLS FOR STREET TERMINATIONS				
Names	Dates	Approved By		
Designed By	11 74	<i>C. Clark Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	11 74	02	1 of 1	17349

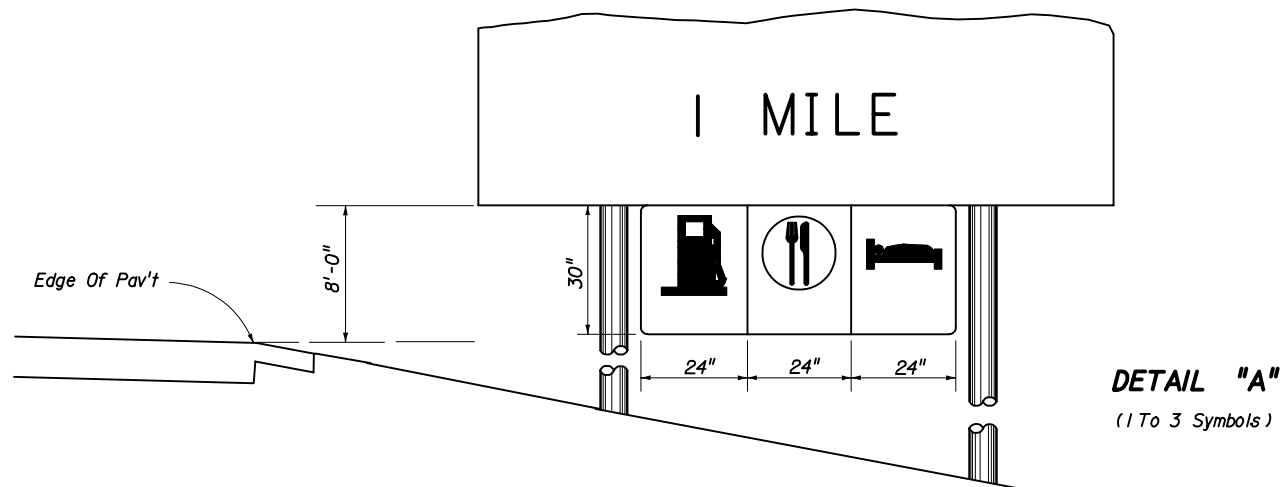
**** Note:**

Two assemblies are required; one for each side of the ramp, showing those services in each particular direction from the ramp terminal.

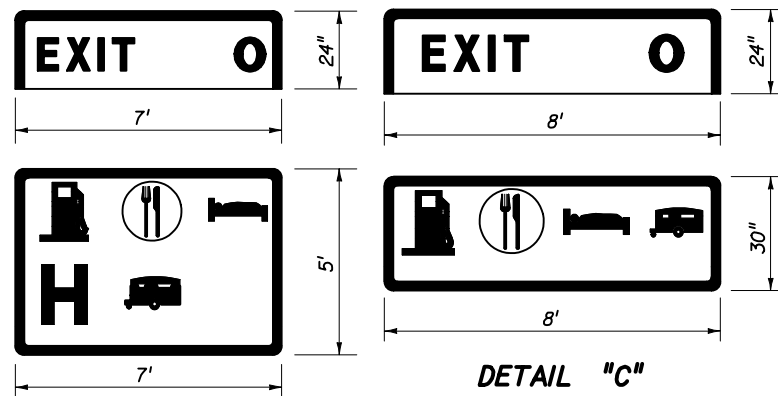
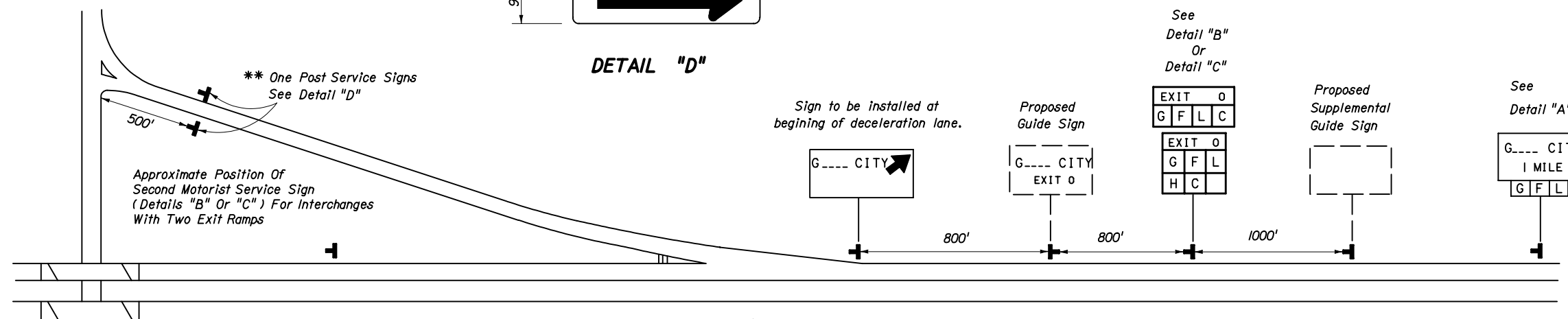
Ramp mounted signs shall be installed to avoid conflict with existing signs and in no case should they be placed within 100' of another sign.



DETAIL "D"



DETAIL "A"
(1 To 3 Symbols)



DETAIL "B"
(4 To 6 Symbols)

DETAIL "C"
(4 Symbols)

NOTE

When approved for attachment to the advance guide signs, up to 3 services may be used for an exit. The symbol signs shall be suspended from the guide sign panel or existing wind beams. Symbol signs are not to be connected to existing sign posts.

The mounting height of the advance guide sign shall be increased, where necessary, to provide 8' between the level of the pavement edge and the bottom of the guide sign, prior to mounting the supplementary panel.

GENERAL NOTES

1 - Only those services meeting criteria established by the Department and approved by the State Traffic Operations Engineer for each interchange shall be shown. Symbol signs for motorist services shall always appear in the following order reading from left to right and top to bottom: Gas, Food, Lodging, Phone*, Hospital, Camping.

* The phone symbol shall not be shown whenever any Gas, Food, Lodging or Camping symbol appears.

2 - Symbols shall appear consecutively on the sign with no positions left blank or reserved for intermediate symbols not currently approved for a particular interchange.

3 - All motorist service signs to have White Legend and Border with Blue Background.

4 - For mounting details see Index 9535 for Type "A" breakaway or Index 11860 for Type "C" Frangibility.

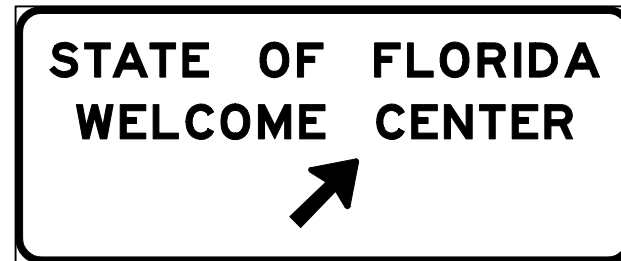
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIGNING FOR MOTORIST SERVICES

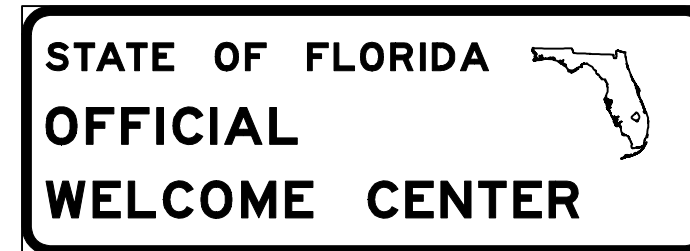
Names	Dates	Approved By		
Designed By	3-76	 State Traffic Standards Engineer		
Drawn By	3-76			
Checked By	3-76	Revision	Sheet No.	Index No.
		00	1 of 1	17350



Sign No. FTP-10-04



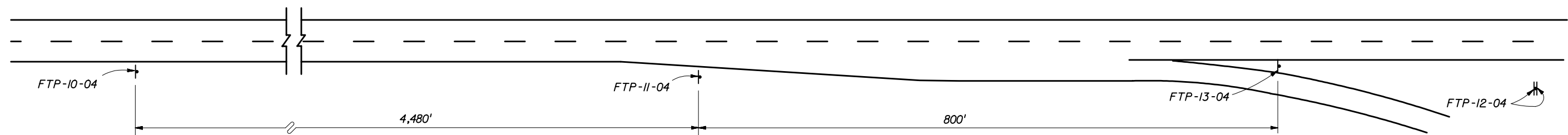
Sign No. FTP-11-04



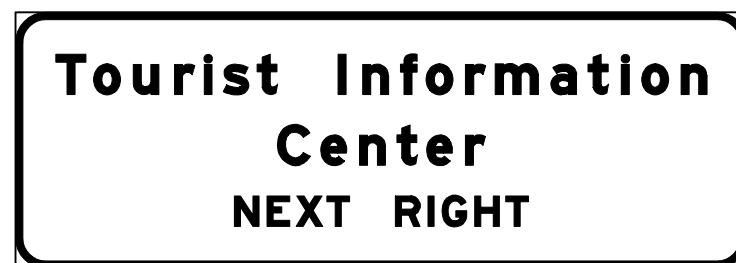
Sign No. FTP-12-04



Sign No. FTP-13-04



Note : Roadway not drawn to scale
Distances shown are adequate for driver communication
but may be altered slightly if conditions require.



Sign No. FTP-14-04

Note: Sign FTP-14-04 shall be used as a supplemental guide sign at interchanges which have a Tourist Information Center approved for such signing (locate half-way between normal guide signs)

Notes :

- (1) Signs and sign structures shall be erected in accordance with the details show on index 9535.
- (2) Sign FTP-12-04 shall be located on the Welcome Center grounds in proximity to the building and as far from the main line roadway as possible (2 signs back to back).
- (3) Sign FTP-10-04, 11-04, 12-04 shall be located on limited access highways only.
- (4) All legend to be Series E.
- (5) See Index 17355 for sign details.

FOR LIMITED ACCESS HIGHWAYS

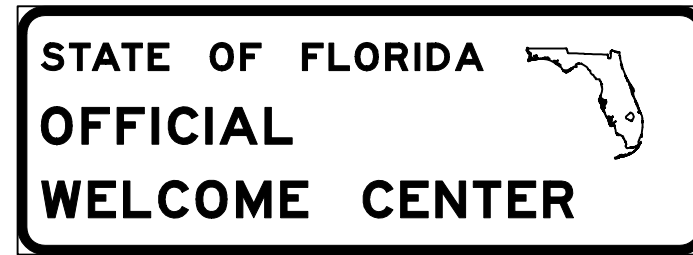
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

WELCOME CENTER SIGNING

	Names	Dates	Approved By		
Designed By		6-75	 State Traffic Standards Engineer		
Drawn By		6-75			
Checked By		6-75	Revision	Sheet No.	Index No.
			04	1 of 2	17351



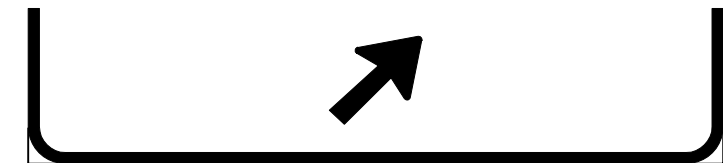
SIGN NO. FTP-15A-04



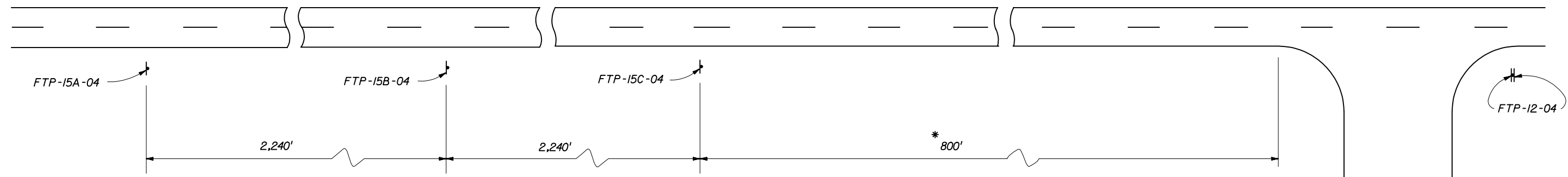
SIGN NO. FTP-12-04



SIGN NO. FTP-15B-04



SIGN NO. FTP-15C-04



* 800' Maximum For Rural Conditions
50' Minimum For Rural Conditions

Notes:

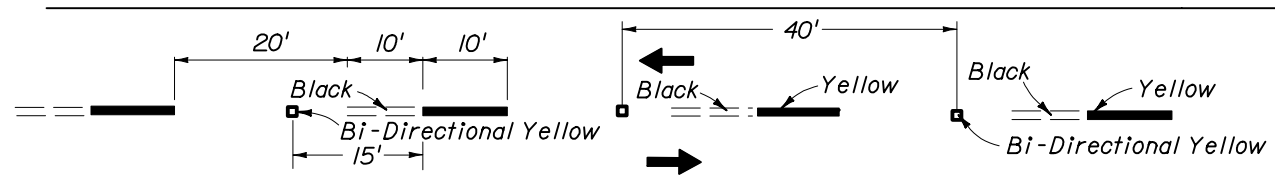
- (1) Signs and sign structures shall be erected in accordance with the details shown on Index 9535.
- (2) Sign FTP-12-04 shall be located on the Welcome Center grounds in proximity to the building and as far from the Mani Line Roadway as possible (2 signs back to back).
- (3) All legend to be Series E.
- (4) One sign FTP-15A-04 or 15B-04 should be used depending on speed, roadside development & geometric conditions.

FOR PRIMARY HIGHWAYS

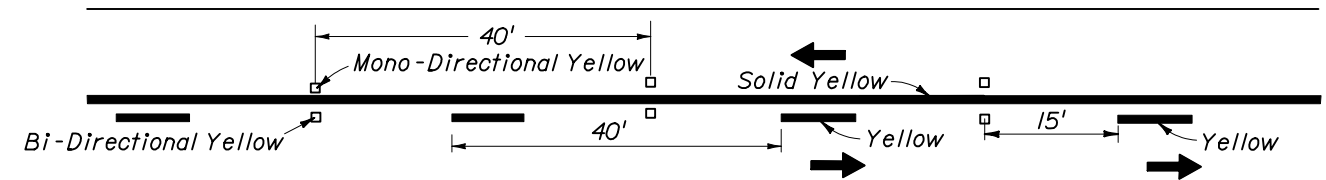
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

WELCOME CENTER SIGNING

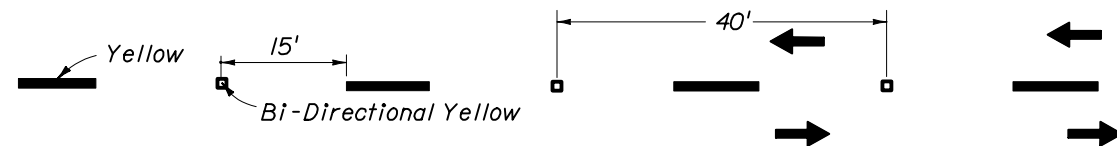
	Names	Dates	Approved By		
Designed By		6-75	 State Traffic Standards Engineer		
Drawn By		6-75			
Checked By		6-75	Revision	Sheet No.	Index No.
			04	2 of 2	17351



ALTERNATING SKIP LINE



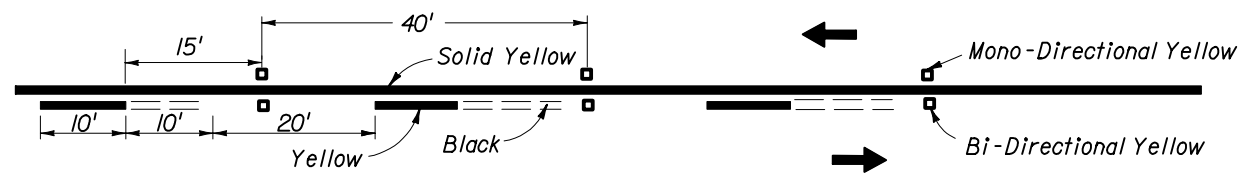
SOLID LINE WITH SKIP



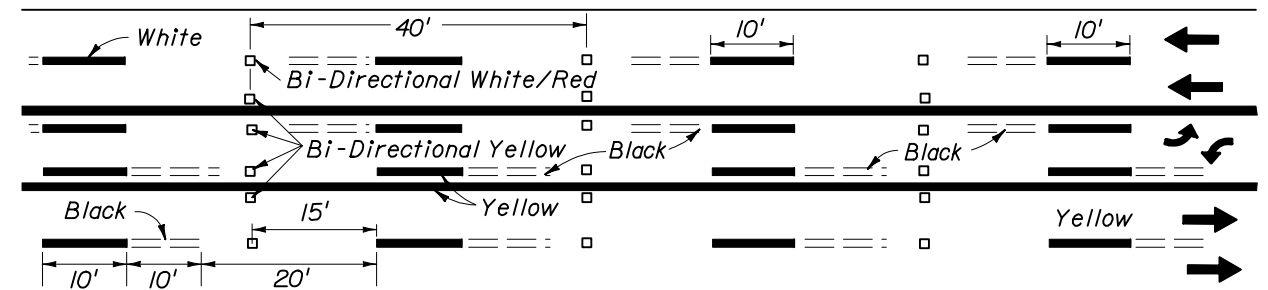
SKIP LINE



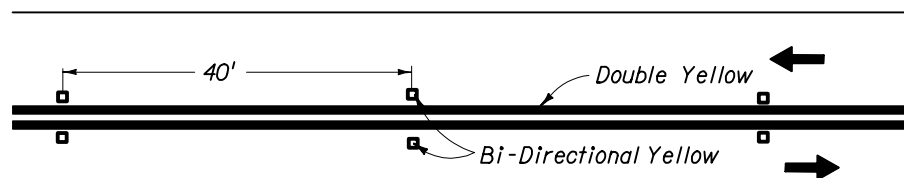
SKIP LINE WITH TWO WAY LEFT TURN LANE



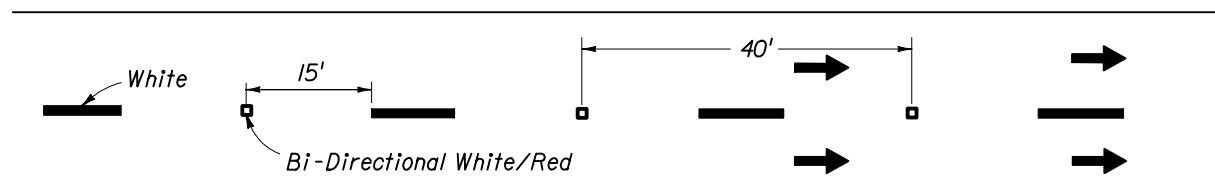
SOLID LINE WITH ALTERNATING SKIP



ALTERNATING SKIP LINE WITH TWO WAY LEFT TURN LANE



DOUBLE SOLID LINE



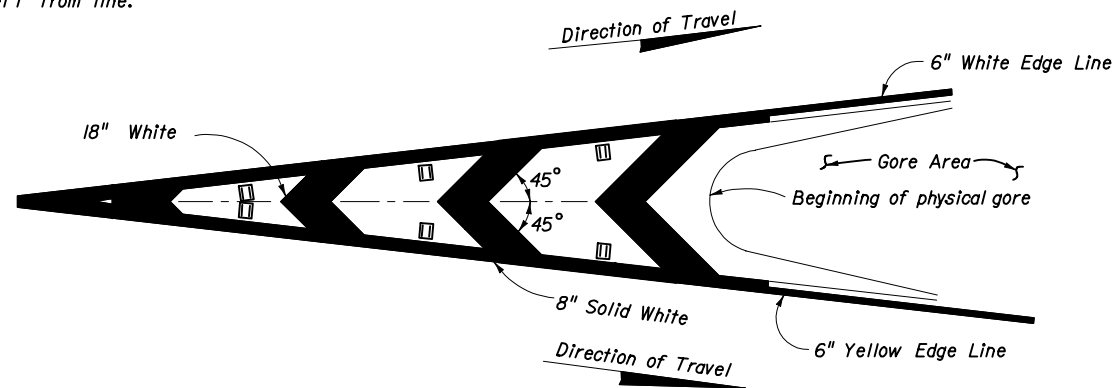
MULTI-LANE

1. Reflective Pavement Markers shall be spaced at 40' on all skip lane lines and skip center lines. This spacing may be reduced to 20' if specifically called for in the plans.
2. The spacing on solid lines and solid/skip combination lines shall be 40'.
3. All R.P.M.s shall be offset 1" from solid lines.
4. These spacings may be reduced for sharp curves if required.
5. All R.P.M.s shall be class "B".

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS				
Names	Dates	Approved By		
Designed By	10-87	 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	10-87	04	1 of 2	17352

NOTE

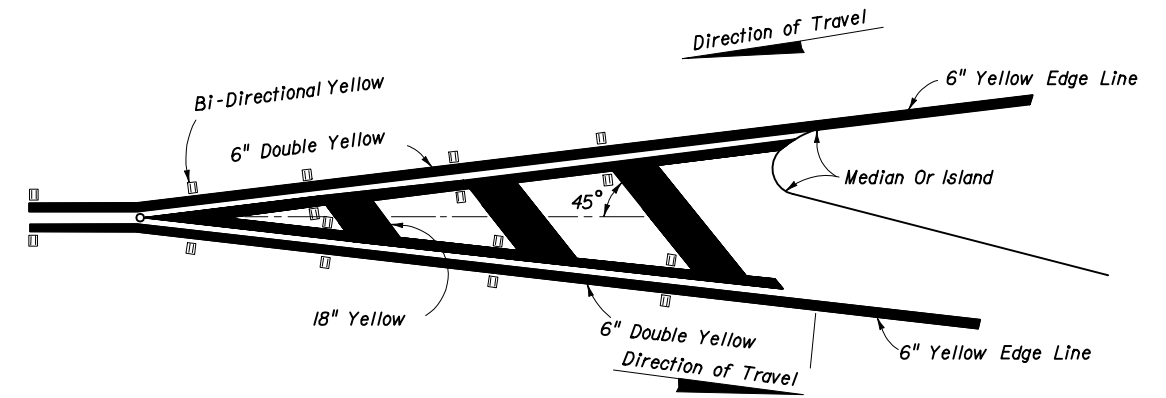
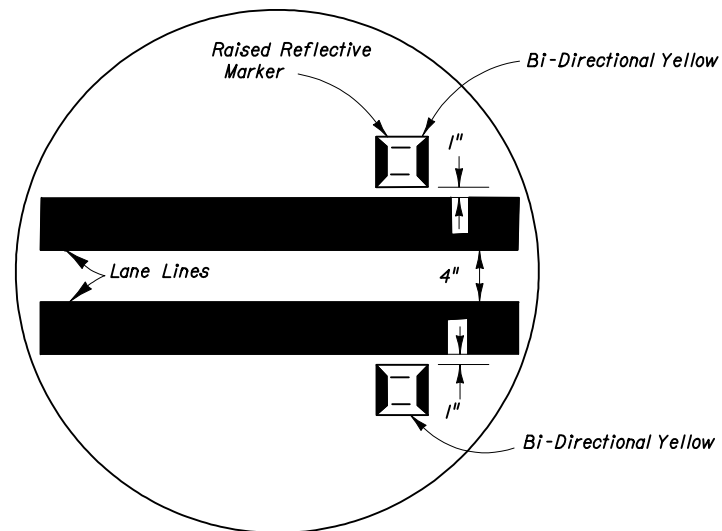
Raised pavement markers shall be set 1" from line.



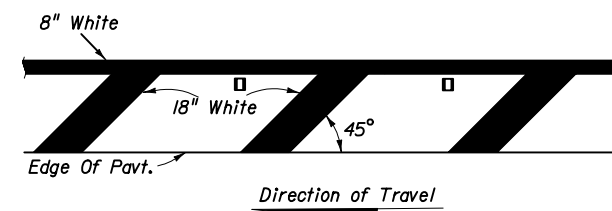
**RPM PLACEMENT FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)**

NOTE

Raised pavement markers (Bi-Directional White/Red) should be used in all gores of this type



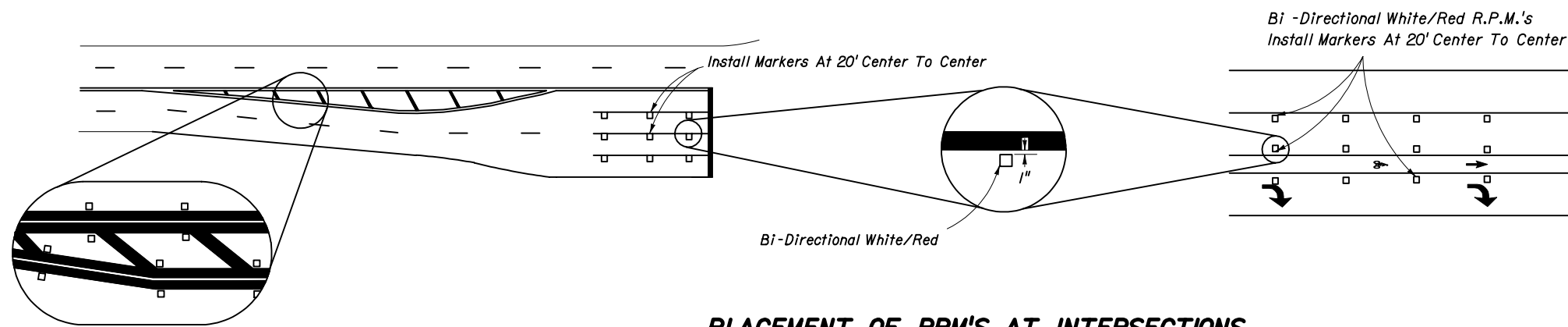
**RPM PLACEMENT FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSITE DIRECTION)**



PLACEMENT OF RPMS ON SHOULDER MARKINGS

For Left Side Of Roadway The Plan Is Opposite Hand And Markings Shall Be Yellow.

For Placement Of RPMS On Ramps See Index 17345.

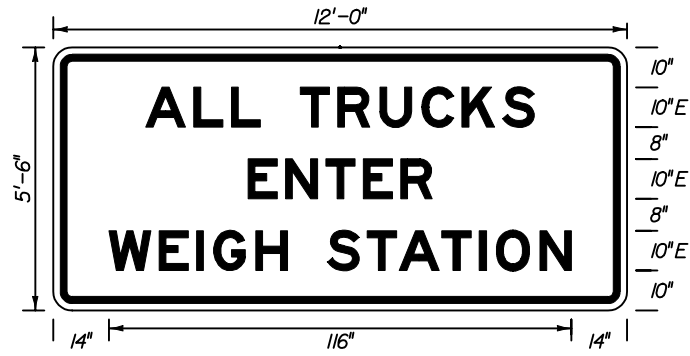


PLACEMENT OF RPM'S AT INTERSECTIONS

Reflective Pavt. Markers To Be Bi-Directional Yellow

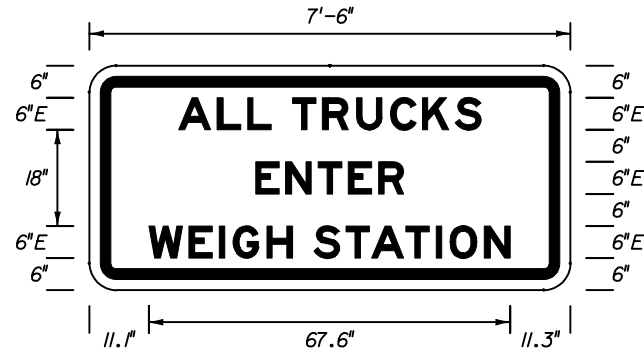
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS				
Designed By	Names	Dates	Approved By	
Drawn By		10-75	<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By		10-75	Revision	Sheet No. Index No.
			04	2 of 2 17352

FREEWAY USE



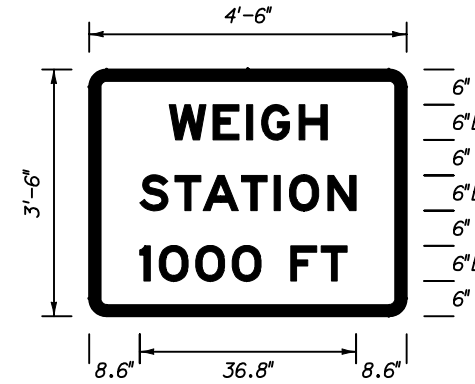
FTP-1-04
12' X 5'-6"
3" Radii 2" Border
10" Series E Legend
White Background
Black Legend & Border

OTHER THAN FREEWAY USE



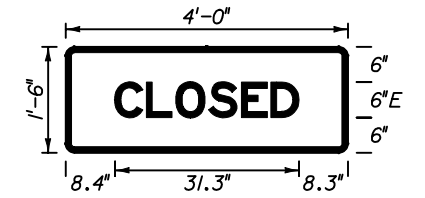
FTP-2-04
7'-6" X 3'-6"
3" Radii 2" Border
6" Series E Legend
White Background
Black Legend & Border

OTHER THAN FREEWAY USE



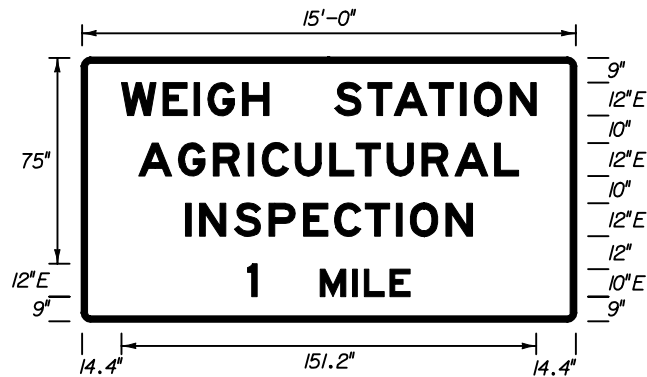
FTP-3-04
4'-6" X 3'-6"
3" Radii 2" Border
6" Series E Legend
Green Background
White Legend & Border

OTHER THAN FREEWAY USE

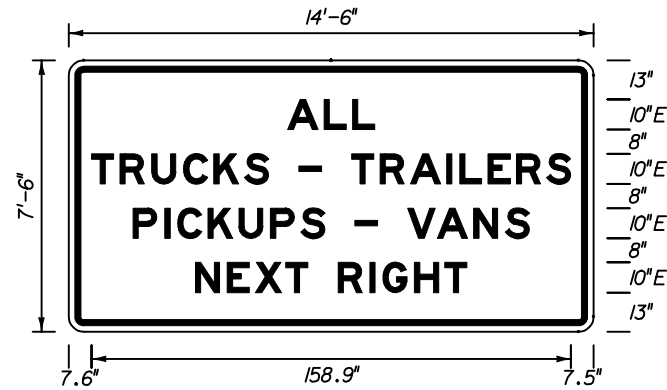


FTP-4-04
4' X 1'-6"
1 1/2" Radii 2" Border
6" Series E Legend
Green Background
White Legend & Border

Note
FTP-4-04 to be
used with FTP-3-04

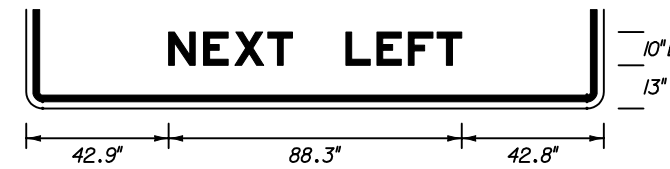


FTP-5-04
15' X 8'
3" Radii 2" Border
Series E Legend
Green Background
White Legend & Border

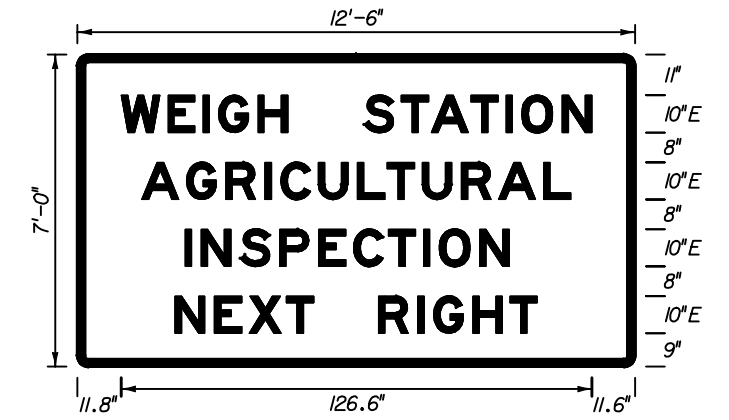


FTP-6A-04
14'-6" X 7'-6"
3" Radii 2" Border
10" Series E Legend
White Background
Black Legend & Border

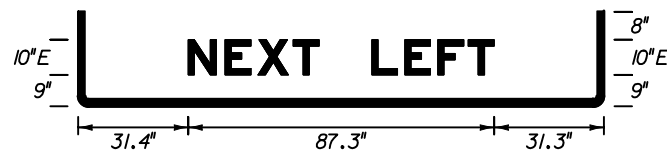
On Interstate Station,
Delete Pickups-Vans,
and reduce Sign height
accordingly.



FTP-6B-04
14'-6" X 7'-6"
3" Radii 2" Border
10" Series E Legend
White Background
Black Legend & Border

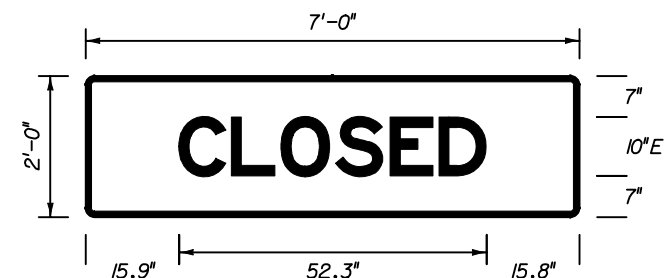


FTP-7A-04
12'-6" X 7'
3" Radii 2" Border
10" Series E Legend
Green Background
White Legend & Border



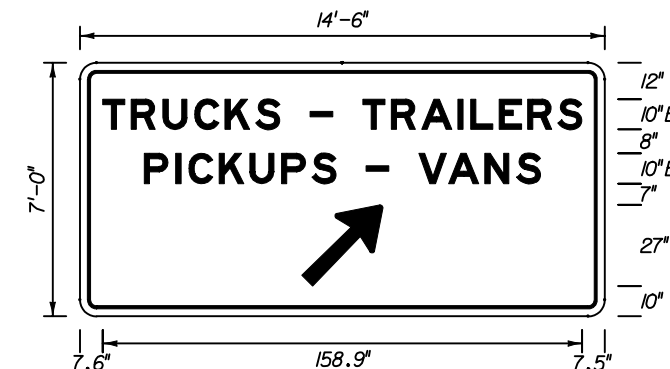
FTP-7B-04
12'-6" X 7'
3" Radii 2" Border
Series E Legend
Green Background
White Legend & Border

FREEWAY USE



FTP-8-04
7' X 2'
1 1/2" Radii 2" Border
10" Series E Legend
Green Background
White Legend & Border

Note
FTP-8-04 to be
used with FTP-7A-04
& FTP-7B-04.




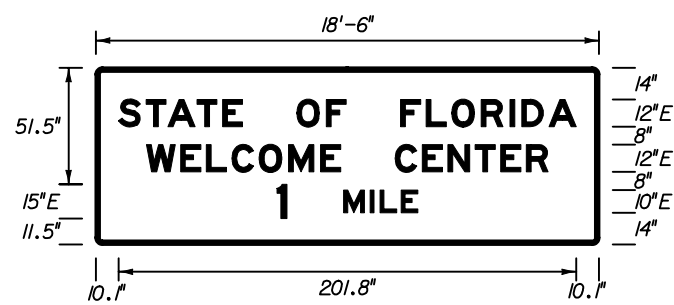
FTP-9A-04
14'-6" X 7'
3" Radii 2" Border
10" Series E Legend
Green Background
White Legend & Border

FTP-9B-04 - RIGHT ARROW
FTP-9C-04 - LEFT ARROW

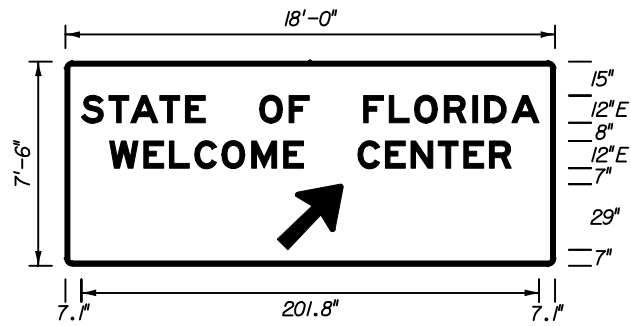
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL SIGN DETAILS

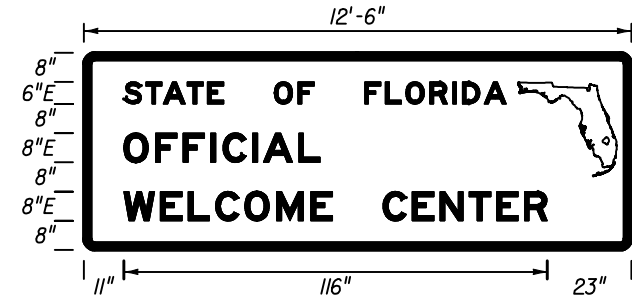
Names		Dates	Approved By	
Designed By			 State Traffic Standards Engineer	
Drawn By			Revision	Sheet No.
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				17355



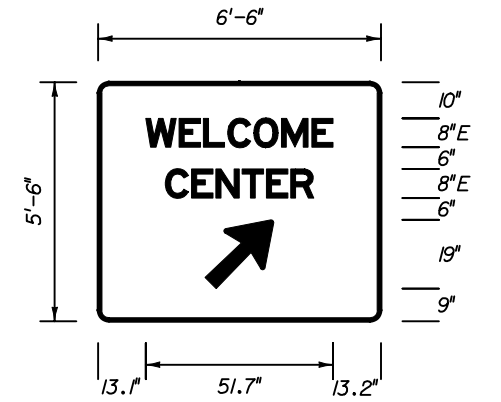
FTP-10-04
18'-6" X 6'-6"
3" Radii 2" Border
Series E Legend
Blue Background
White Legend & Border



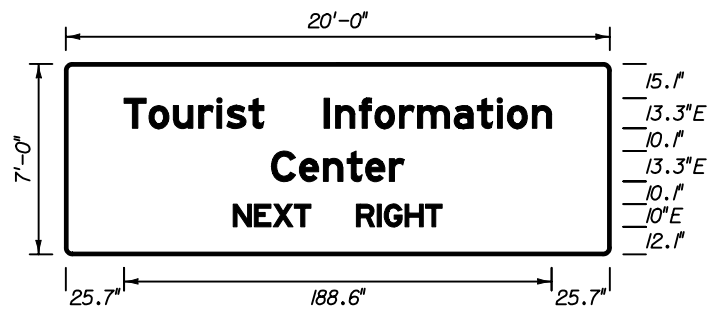
FTP-11-04
18' X 7'-6"
3" Radii 2" Border
Series E Legend
Blue Background
White Legend & Border



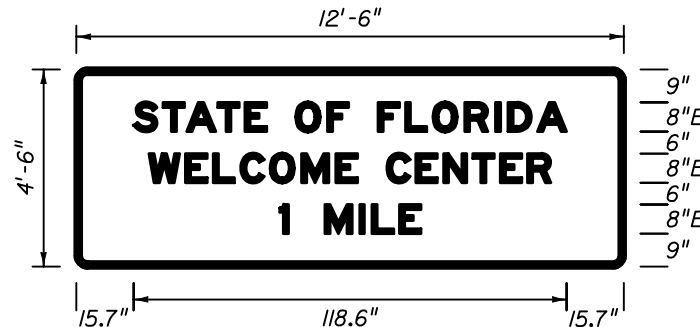
FTP-12-04
12'-6" X 4'-6"
3" Radii 2" Border
Series E Legend
Blue Background
White Legend & Border



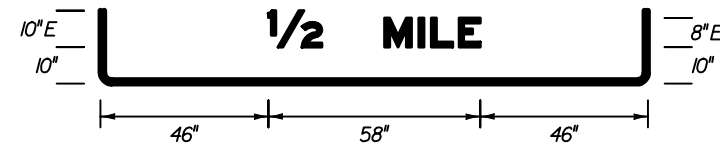
FTP-13-04
6'-6" X 5'-6"
3" Radii 2" Border
8" Series E Legend
Blue Background
White Legend & Border



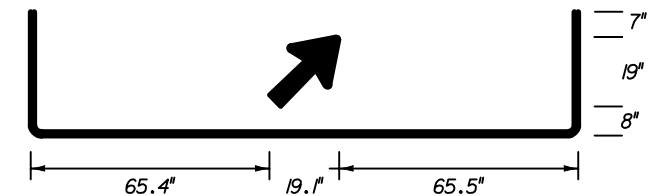
FTP-14-04
20' X 7'
3" Radii 2" Border
Series E Legend
Blue Background
White Legend & Border



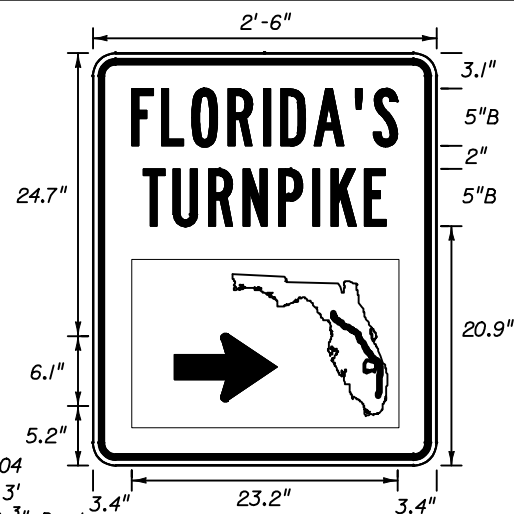
FTP-15A-04
12'-6" X 4'-6"
3" Radii 2" Border
8" Series E Legend
Blue Background
White Legend & Border



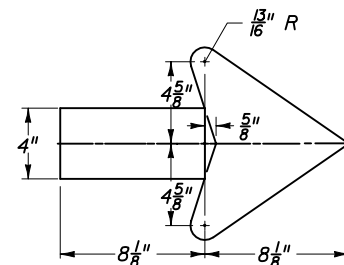
FTP-15B-04
12'-6" X 5'
3" Radii 2" Border
8" Series E Legend
Blue Background
White Legend & Border



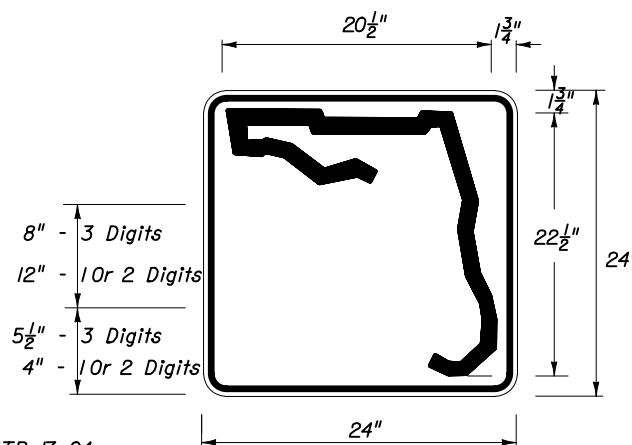
FTP-15C-04
12'-6" X 5'-6"
3" Radii 2" Border
Blue Background
White Legend & Border



FTP-16-04
2'-6" X 3'
1 1/2" Radii 3/4" Border
5" Series B Legend
Green Background
White Legend & Border



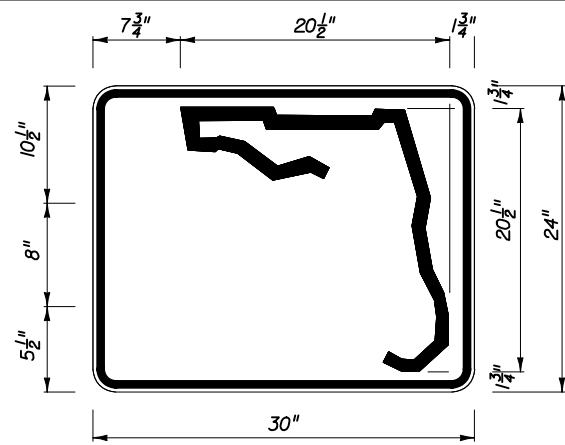
ARROW DETAIL
FOR SIGN FTP-16-04



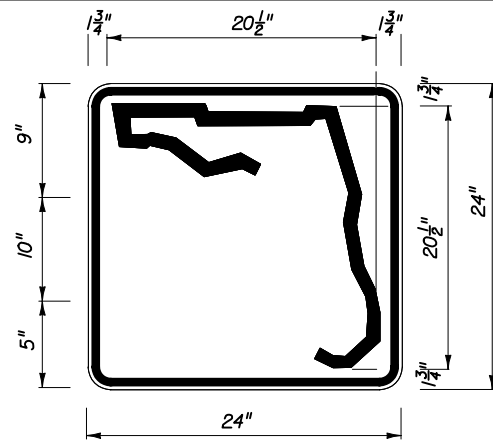
FTP-17-04
2' X 2'
1 1/2" Radii 3/4" Border
White Background
Black Legend & Border

See Sheet 3 of 10
For Additional Details.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS				
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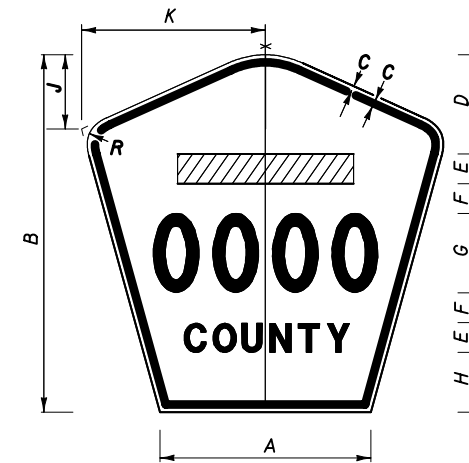


3 or 4 DIGITS



1 or 2 DIGITS

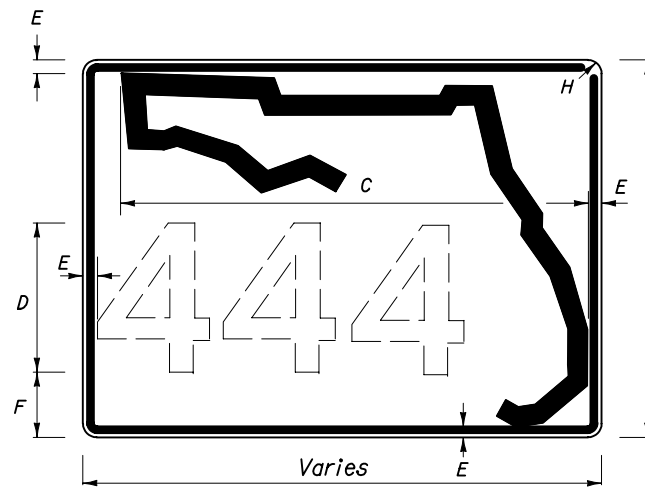
DIGITS	NUMERAL SIZE	SERIES	PANEL SIZE
1-2	10"	D	24" x 24"
3	8"	C	30" x 24"
4	8"	C	30" x 24"



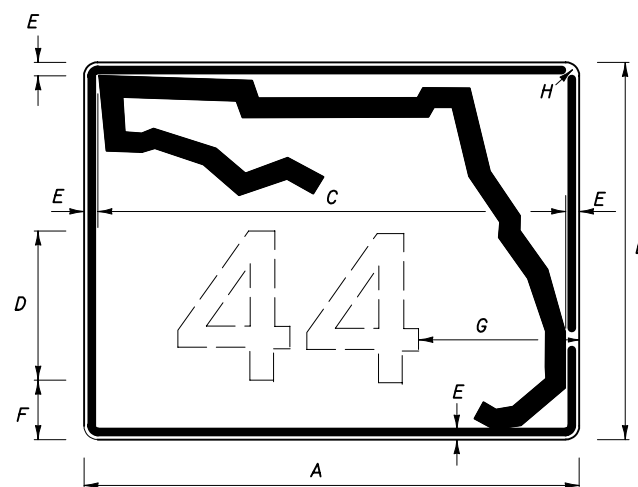
- Notes :
1. All Legend Series "D".
 2. Color: Yellow Legend and Border on Blue Background.
 3. When used on a guide sign, marker must be overlaid on a rectangular Yellow Background as shown in chart. **

INDEPENDENT USE OTHER THAN FREEWAY

SIGN	DIMENSIONS												**
	A	B	C	D	E	F	G	H	J	K	R	S	
4 DIGIT POST MOUNTED	21 1/4"	36"	1/2"	8"	3"	3"	8"	8"	7 1/2"	18 1/2"	1 3/8"	7 1/2"	
2 DIGIT OVERHEAD	21 1/4"	36"	3/4"	8"	3"	3"	12"	4"	7 1/2"	18 1/2"	1 3/8"	7 1/2"	40" x 41"
3 DIGIT OVERHEAD	29 1/4"	36"	3/4"	8"	3"	3"	12"	4"	8"	21 3/8"	2 1/4"	8 1/4"	40" x 44"
4 DIGIT OVERHEAD	36 3/4"	42"	3/4"	11"	3"	3"	12"	7"	10 1/2"	26"	2 1/4"	8 1/2"	42" x 52"



3 OR MORE DIGITS



1 OR 2 DIGITS

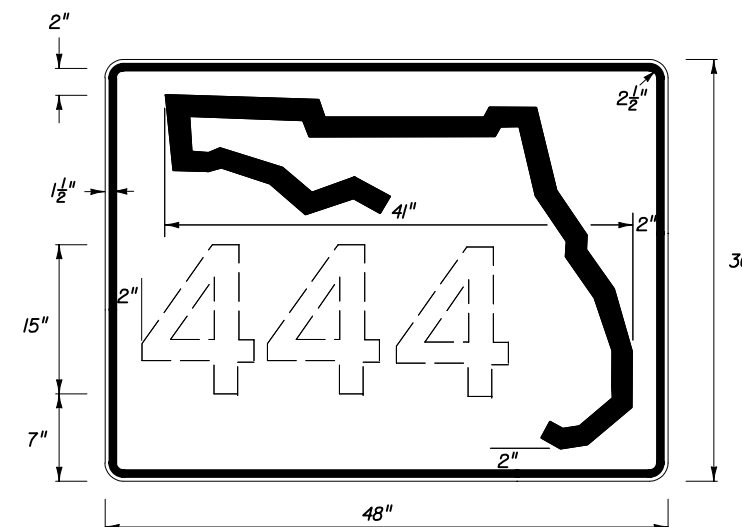
A	B	C	D	E	F	G	H
30"	24"	26"	12"	1 1/4"	2 3/4"	8 1/4"	1 1/4"
36"	30"	32"	15"	1 1/4"	3 1/4"	8 3/4"	1 1/4"
42"	36"	38"	15"	1 1/4"	6 1/4"	11"	1 1/4"

GUIDE SIGN USE

- Notes: 1. Florida marker shall have Black Legend with White Background.
 2. Stroke width of State outline to be 1" for independent use and 1/4" for Guide Sign.
 3. Numbers are series D.

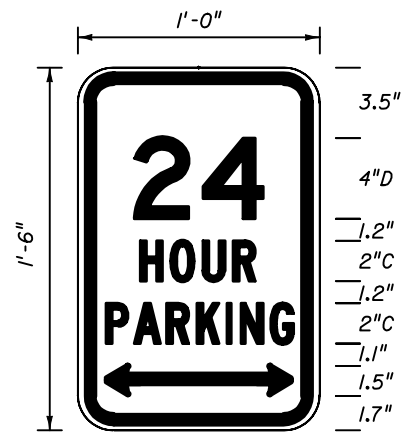
FLORIDA ROUTE MARKER
FTP-17-04

MI-5 COUNTY ROUTE MARKER DETAIL
FTP-18-04

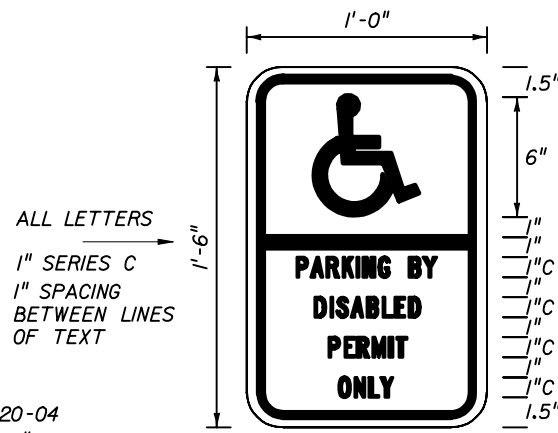


1-3 DIGITS 15" SERIES C
4 DIGITS 12" SERIES C
INDEPENDENT USE FOR FREEWAY

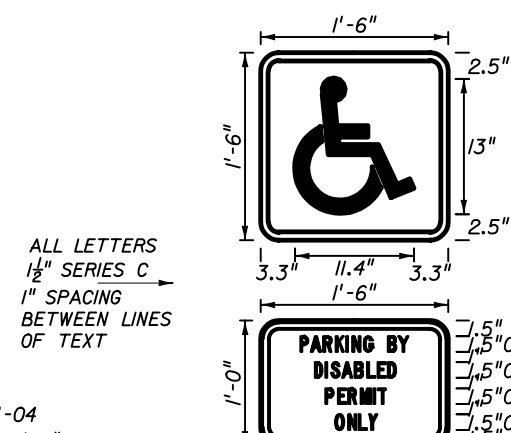
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS				
Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i> State Traffic Standards Engineer		
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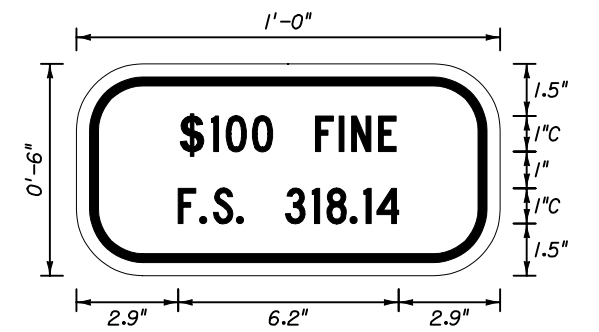
FTP-19-04
1' X 1'-6"
1 1/2" Radii
3/8" Border 3/8" Inset
Top 4" Series D
Bottom 2" Series C
White Background Green Legend & Border



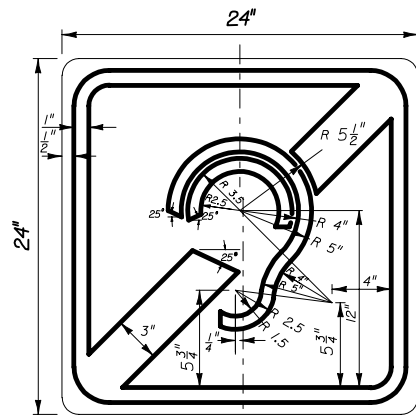
FTP-20-04
1' X 1'-6"
1 1/2" Radii 3/8" Border 3/8" Inset
1" Series C Legend
Color Top Bottom
Background Blue White
Legend and Border White Black



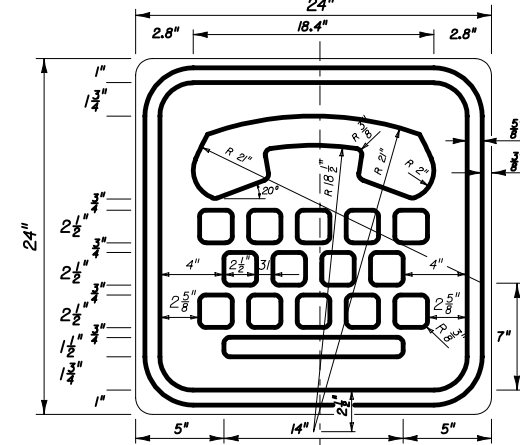
FTP-21-04
1'-6" X 2'-6"
1 1/2" Radii 5/8" Border 3/8" Inset
1 1/2" Series C Legend
Color Top Bottom
Background Blue White
Legend and Border White Black



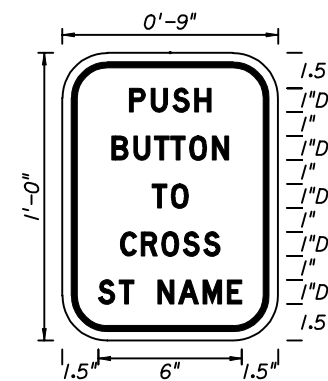
FTP-22-04
1' X 6"
1 1/2" Radii 3/8" Border 3/8" Inset
1" Series C
White Background
Black Legend & Border
Supplemental panel
for the FTP-20-04
and FTP-21-04 signs



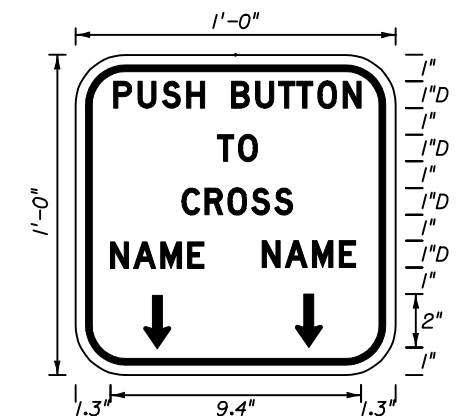
FTP-23-04 INTERNATIONAL SYMBOL OF ACCESS FOR HEARING LOSS
24" X 24"
1 1/2" Radii
Blue Background
White Legend & Border



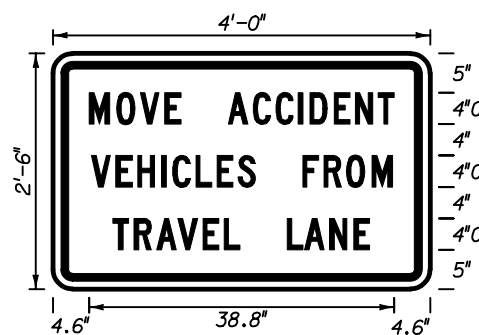
FTP-24-04
2' X 2'
1 1/2" Radii
Blue Background
White Legend & Border



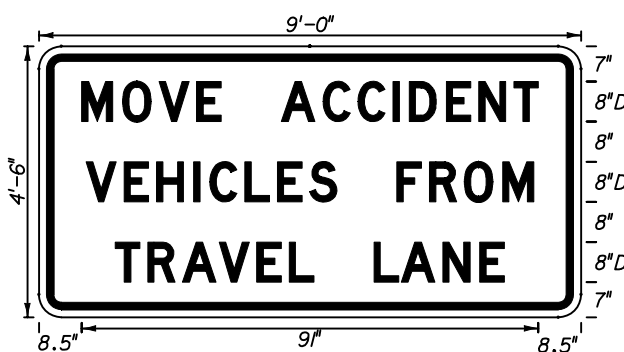
FTP-25-04
9" X 1'
1 1/2" Radii 3/8" Border 3/8" Inset
1" Series D Legend
White Background
Black Legend & Border



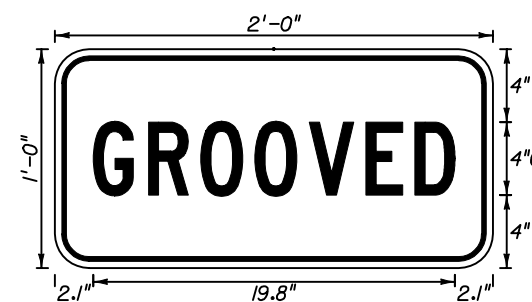
FTP-26-04
1' X 1'
1 1/2" Radii 3/8" Border 3/8" Inset
1" Series D Legend
White Background
Black Legend & Border



FTP-27-04
4' X 2'-6"
2" Radii 3/4" Border
4" Series C Legend
White Background
Black Legend & Border

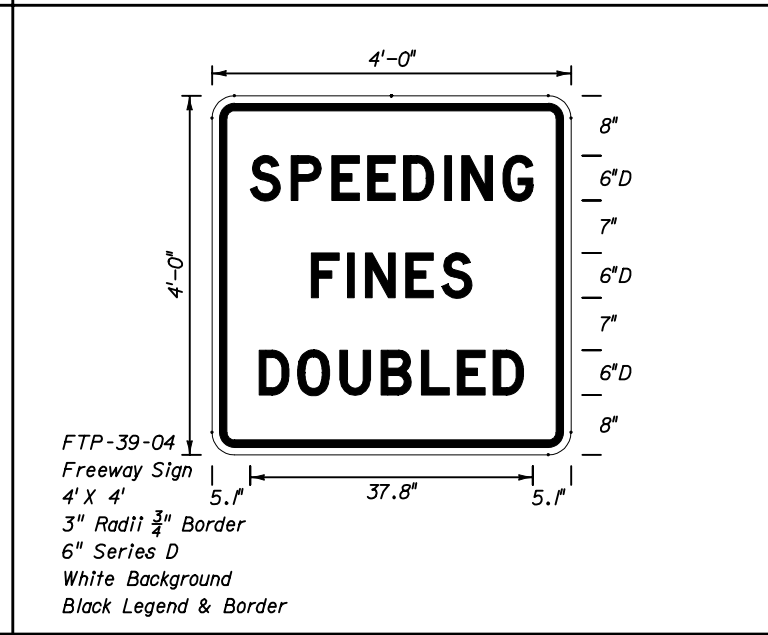
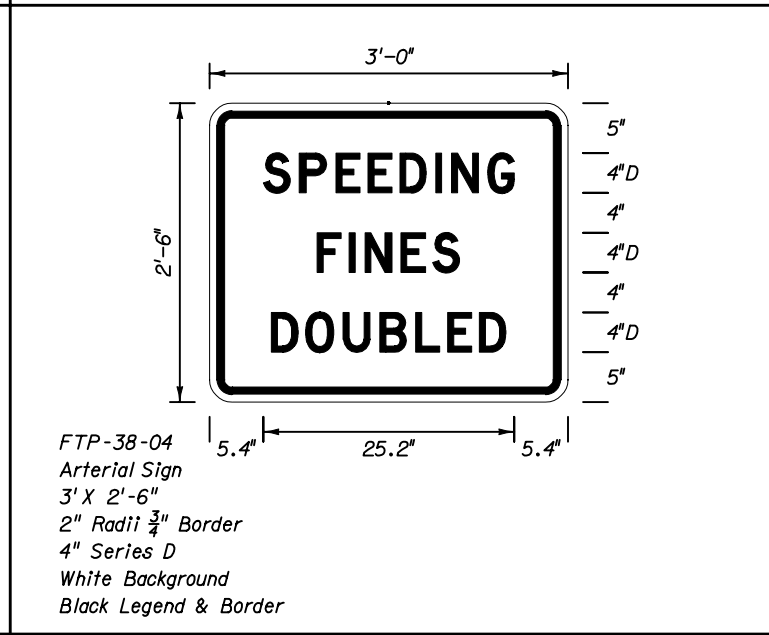
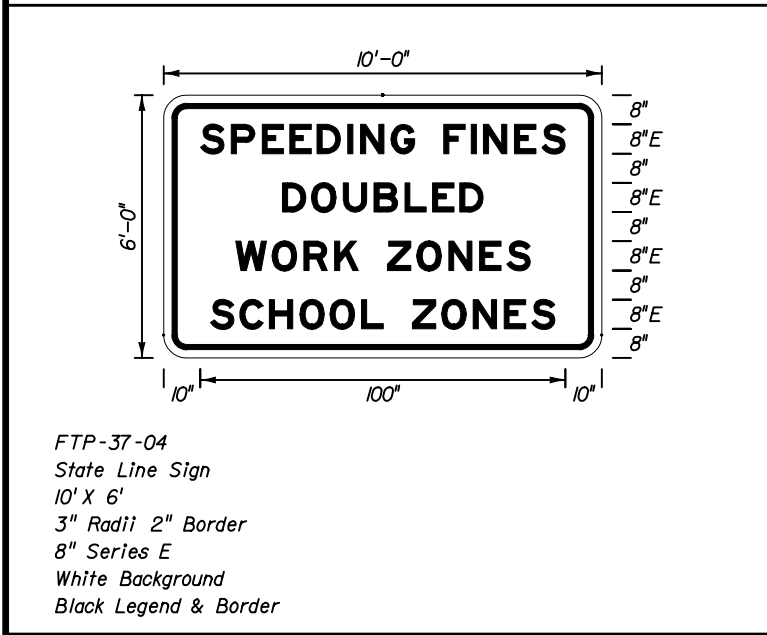
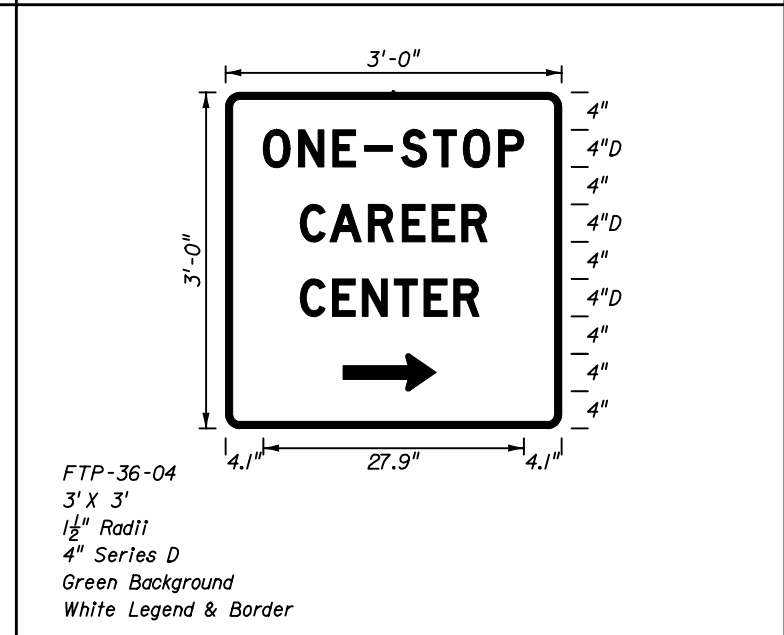
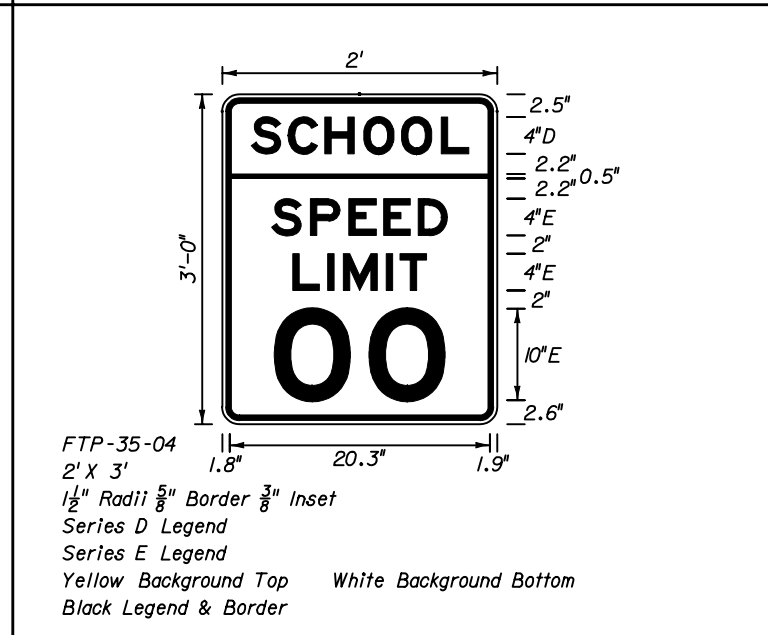
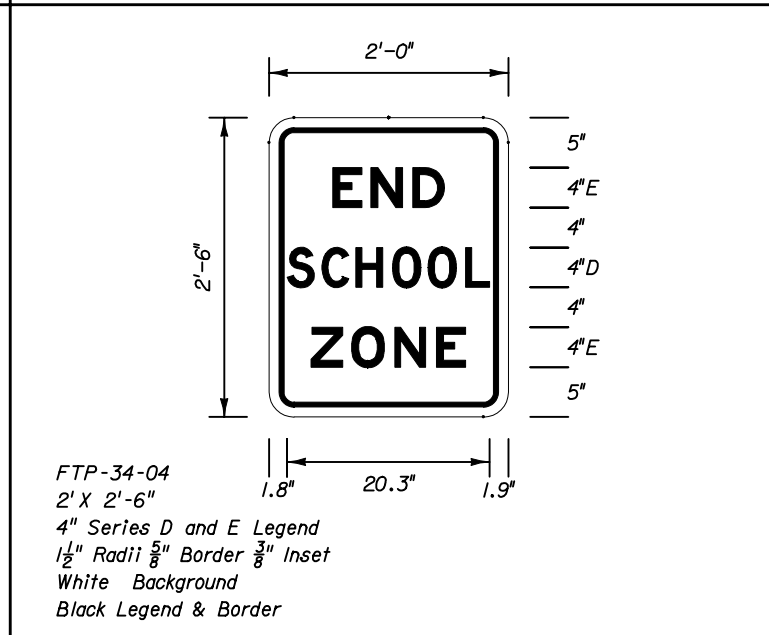
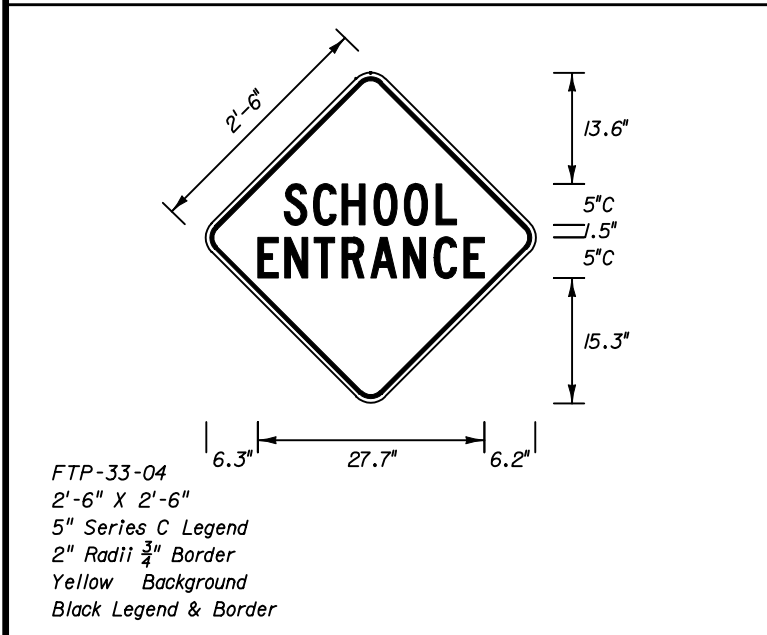
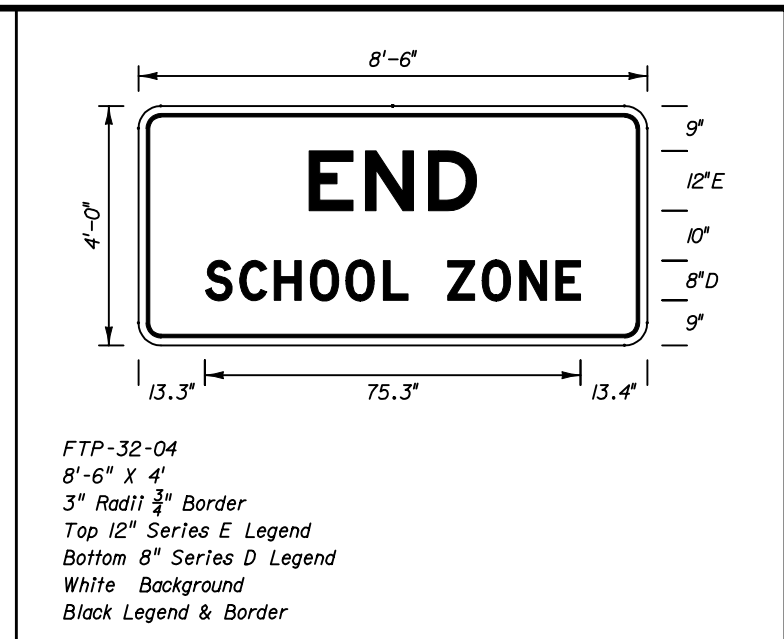
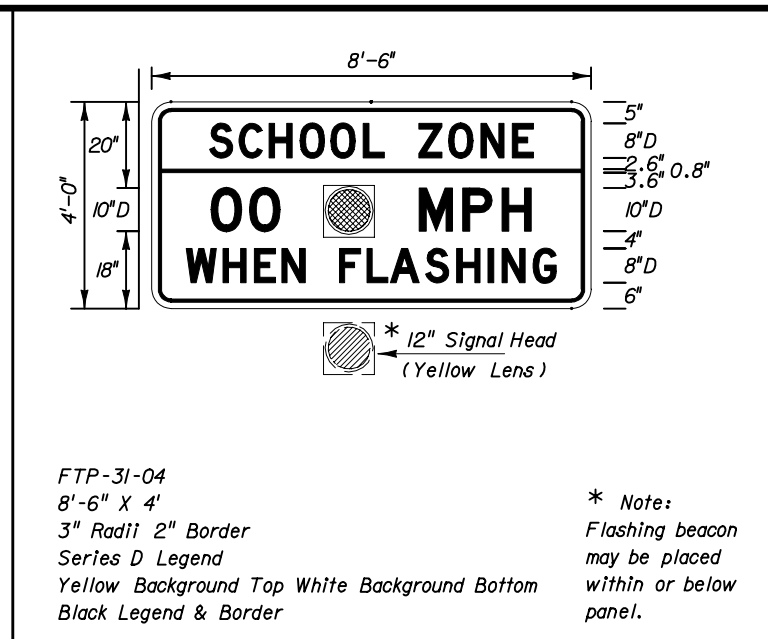
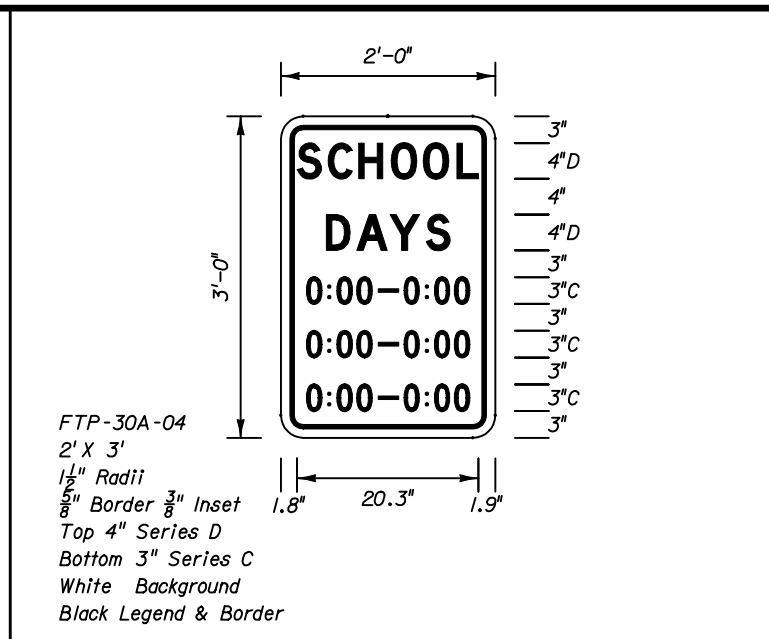
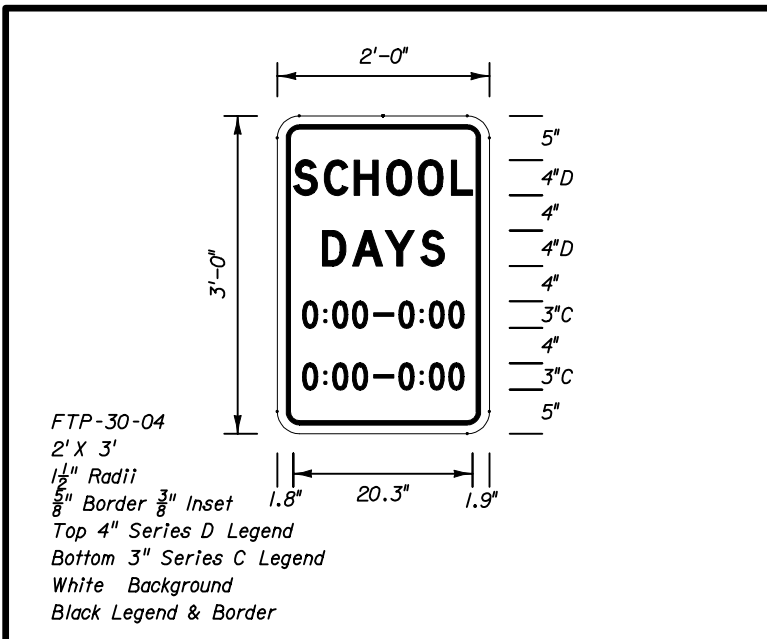


FTP-28-04
9' X 4'-6"
3" Radii 3/4" Border
8" Series D Legend
White Background
Black Legend & Border



FTP-29-04
2' X 1'
1 1/2" Radii 5/8" Border 3/8" Inset
4" Series C Legend
Yellow Background
Black Legend & Border

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS				
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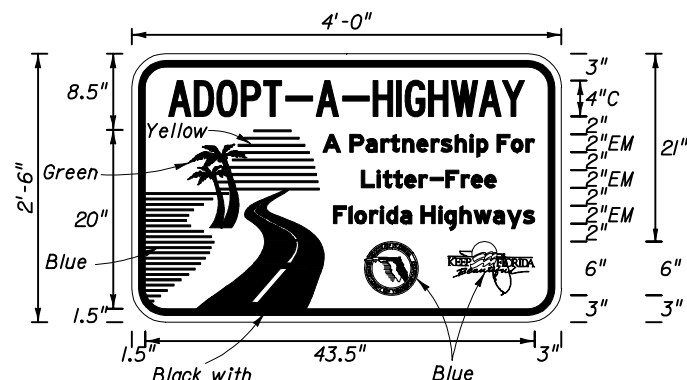
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS				
Designed By	Names	Dates	Approved By <i>Charles A. Scott</i> State Traffic Standards Engineer	
Drawn By			Revision	Sheet No. Index No.
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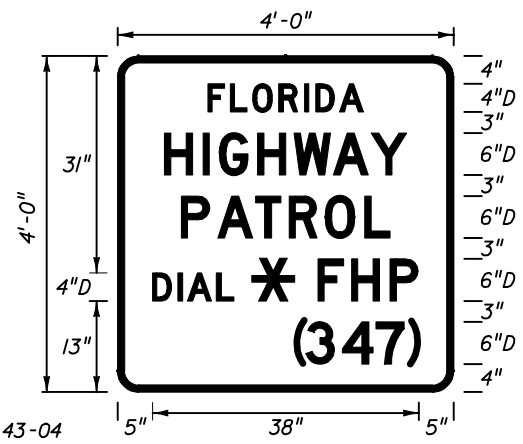
FTP-40-04
3'-6" X 4'
1 1/2" Radii 3/4" Border
3" Series C Legend
6" Series C Legend
White Background
Black Legend & Border



FTP-41-04
2'-6" X 3'
1 1/2" Radii 3/4" Border
2" Series C Legend
4" Series C Legend
White Background
Black Legend & Border



FTP-42-04
4' X 2'-6"
3" Radii
4" Series C Legend
2" Series EM Legend
White Background
Blue Legend & Border



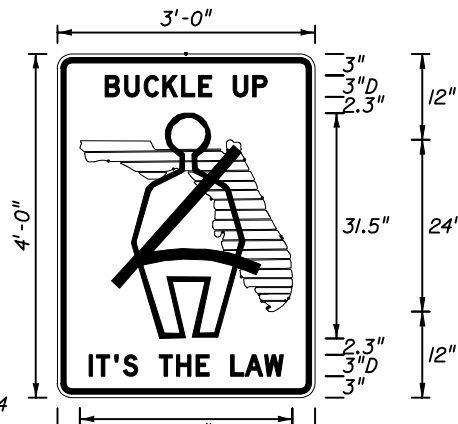
FTP-43-04
4' X 4'
3" Radii 1" Border
Series D Legend
Blue Background
White Legend & Border



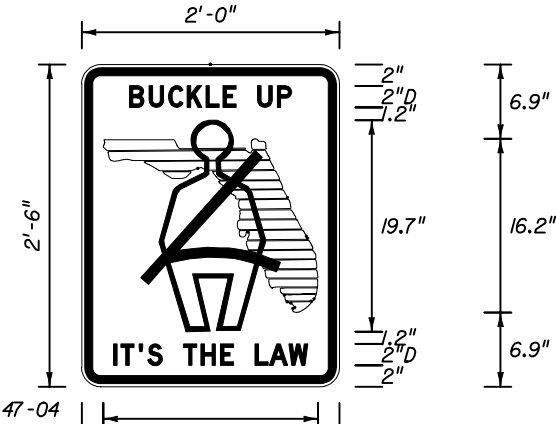
FTP-44-04
9' X 6'
9" Radii 3/4" Border
8" Series D Legend
White Background
Black Legend & Border



FTP-45-04
4' X 3'
1 1/2" Radii 3/4" Border
4" Series C Legend
White Background
Black Legend & Border



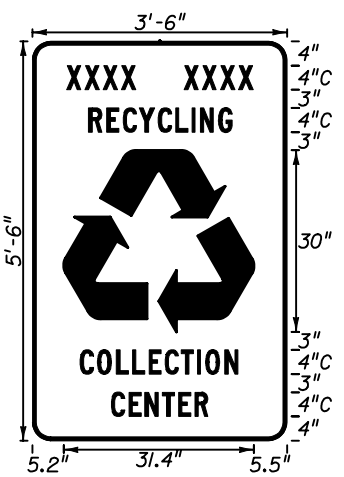
FTP-46-04
3' X 4'
1 1/2" Radii 3/4" Border
3" Series D Legend
White Background
Black Legend, Border & Man Belt Symbol
Florida Shield Green



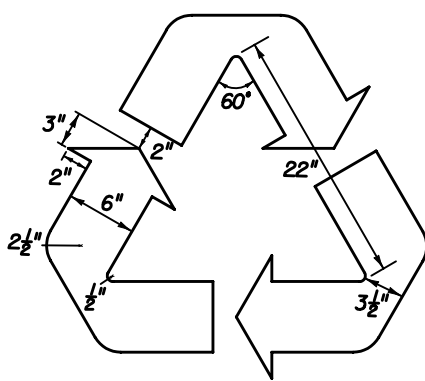
FTP-47-04
2' X 2'-6"
1 1/2" Radii 5/8" Border 3/8" Inset
2" Series D Legend
White Background
Black Legend, Border & Man Belt Symbol
Florida Shield Green



FTP-48-04
3'-6" X 5'
3" Radii
4" Series C Legend
Green Background
White Legend, Border & Symbol

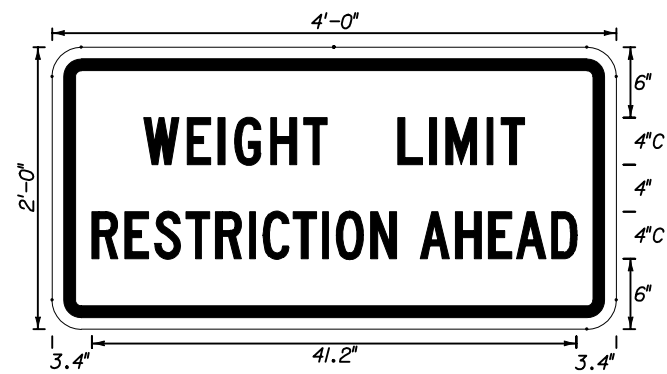


FTP-49-04
3'-6" X 5'-6"
3" Radii
4" Series C Legend
Green Background
White Legend, Border & Symbol
Municipality Name Optional

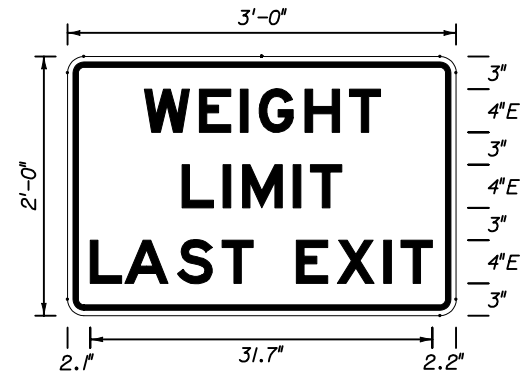


DETAIL for FTP-48-04 and FTP-49-04

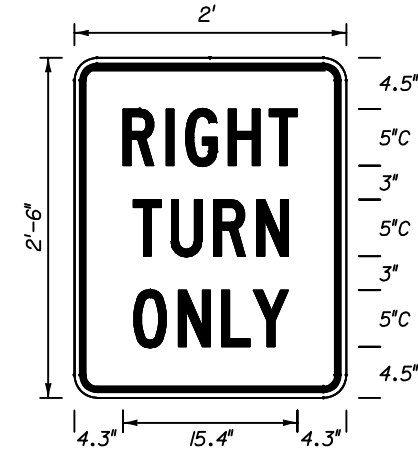
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS				
Designed By	Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Standards Engineer	
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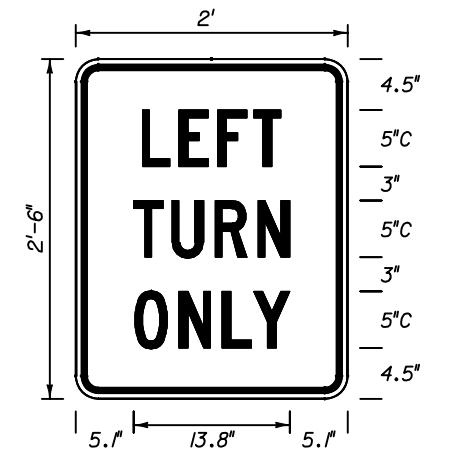
FTP-50-04
4' X 2'
1/2" Radii 3/4" Border
4" Series C Legend
Yellow Background
Black Legend & Border



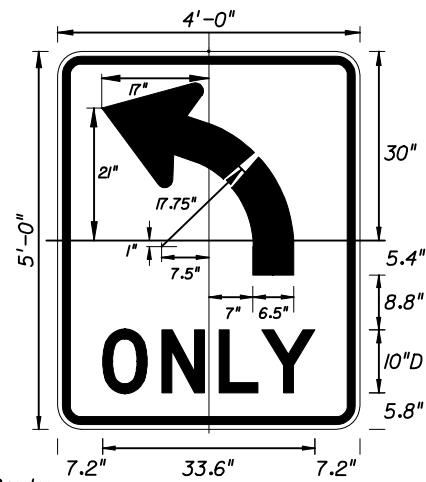
FTP-51-04
3' X 2'
1/2" Radii 3/4" Border
4" Series E Legend
White Background
Black Legend & Border



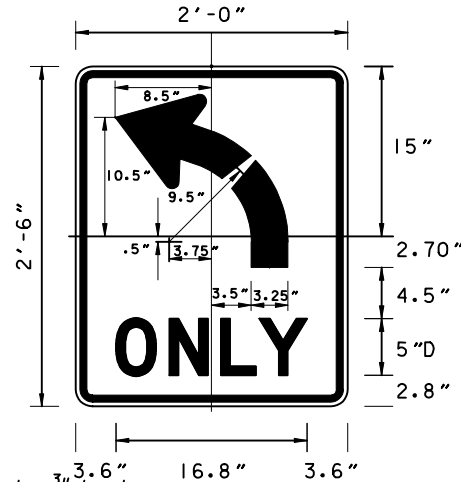
FTP-52-04
2' X 2'-6"
1/2" Radii 5/8" Border 3/8" Inset
5" Series C Legend
White Background
Black Legend & Border



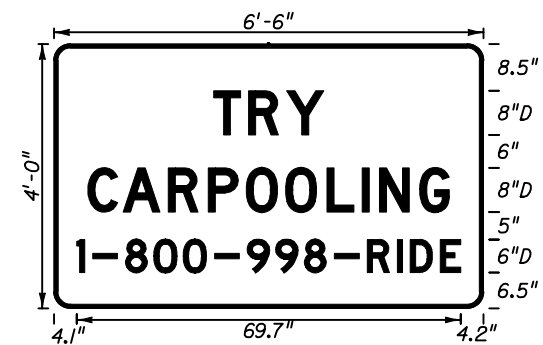
FTP-53-04
2' X 2'-6"
1/2" Radii 5/8" Border 3/8" Inset
5" Series C Legend
White Background
Black Legend & Border



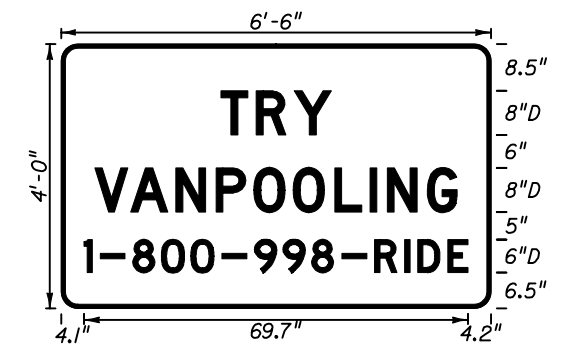
FTP-54-04
4' X 5'
3" Radii 3/4" Border
10" Series D Legend
White Background
Black Legend & Border



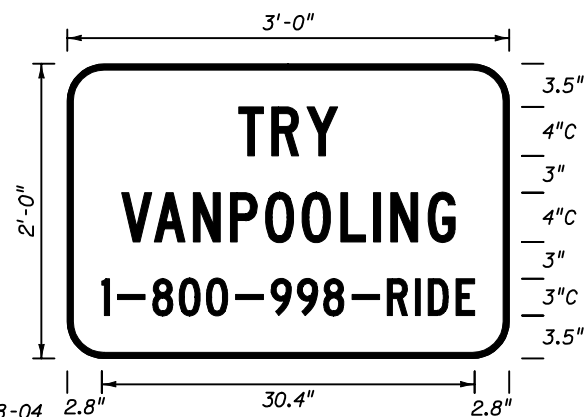
FTP-55-04
2' X 2'-6"
1/4" Radii 5/8" Border 3/8" Inset
5" Series D Legend
White Background
Black Legend & Border



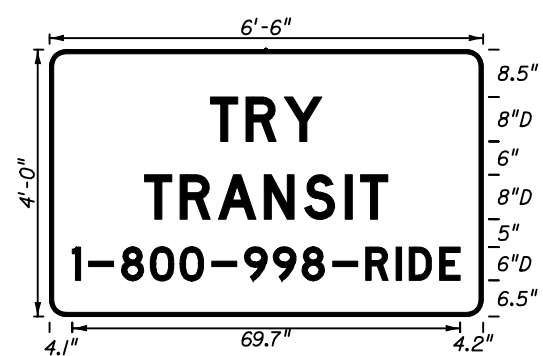
FTP-56-04
6'-6" X 4'
3" Radii
8" Series D Legend
6" Series D Legend
Blue Background
White Legend & Border



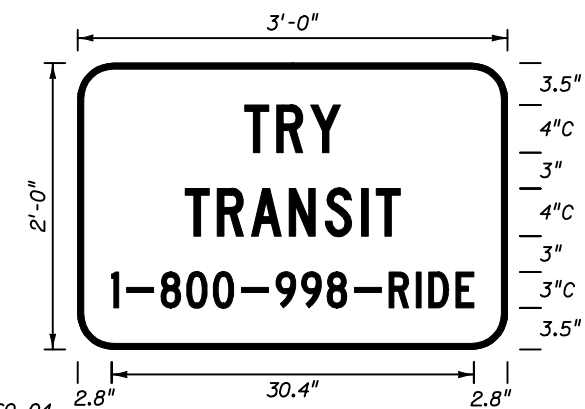
FTP-57-04
6'-6" X 4'
3" Radii
8" Series D Legend
6" Series D Legend
Blue Background
White Legend & Border



FTP-58-04
3' X 2'
3" Radii
4" Series C Legend
3" Series C Legend
Blue Background
White Legend & Border

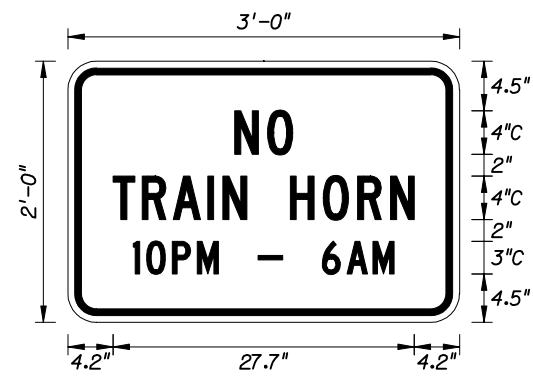


FTP-59-04
6'-6" X 4'
3" Radii
8" Series D Legend
6" Series D Legend
Blue Background
White Legend & Border



FTP-60-04
3' X 2'
3" Radii
4" Series C Legend
3" Series C Legend
Blue Background
White Legend & Border

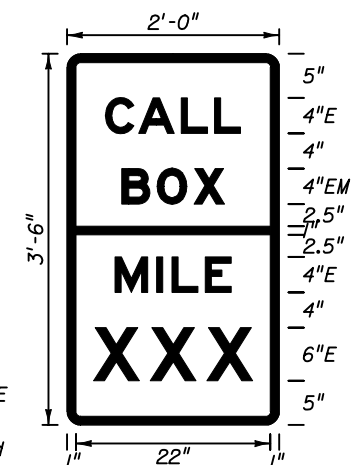
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS				
Names	Dates	Approved By		
Designed By		 State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	7 of 10	17355



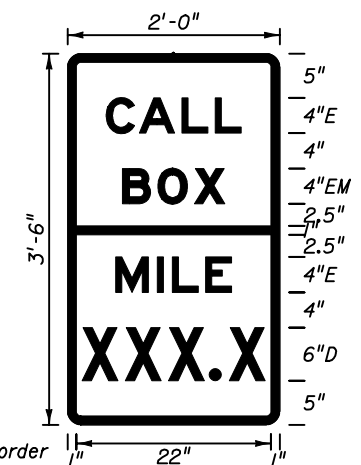
FTP-61-04
3' X 2'
Series C Legend
2" Radii $\frac{3}{4}$ " Border
Yellow Background
Black Legend & Border



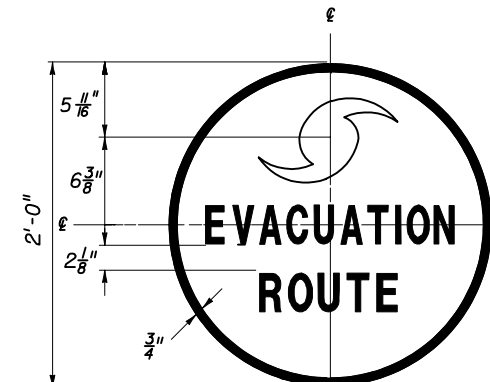
FTP-62-04
3' X 3'
Series C Legend
2" Radii $\frac{3}{4}$ " Border
Yellow Background
Black Legend & Border



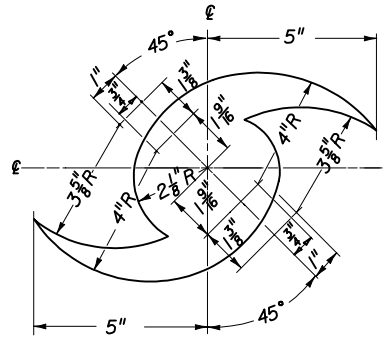
FTP-63-04
2' X 3'-6"
 $\frac{1}{2}$ " Radii
Top 4" Series E
4" Series EM
Blue Background
White Legend & Border
Bottom 4" Series E
6" Series E Green Background
White Legend & Border



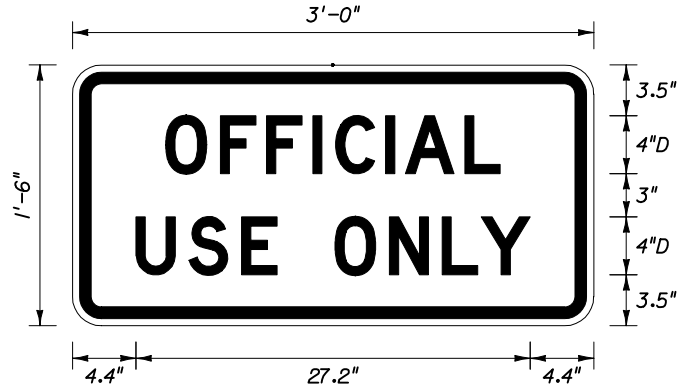
FTP-64-04
2' X 3'-6"
 $\frac{1}{2}$ " Radii
Top 4" Series E
4" Series EM
Blue Background
White Legend & Border
Bottom 4" Series E
6" Series D
Green Background
White Legend & Border



FTP-65-04
2' Diameter
 $\frac{3}{4}$ " Border
3" Series C Legend
Blue Background
White Legend, Border & Symbol



Symbol
DETAIL for FTP-65-04



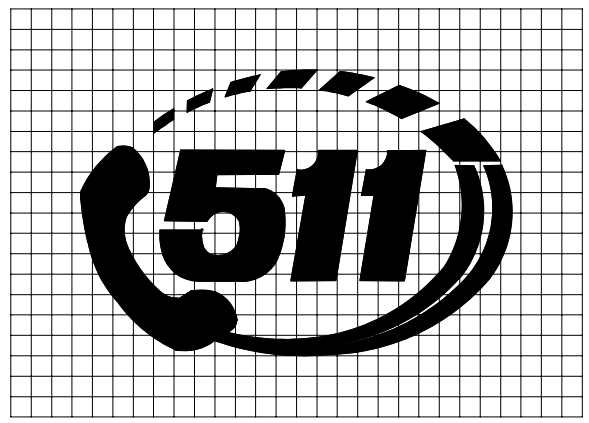
FTP-66-04
3' X 1'-6"
Series D Legend
1.5" Radii $\frac{3}{4}$ " Border
White Background
Black Legend & Border



FTP-67-04
4' X 5'
Series D Legend
3" Radii $\frac{3}{4}$ " Border
Blue Background
White Legend & Border

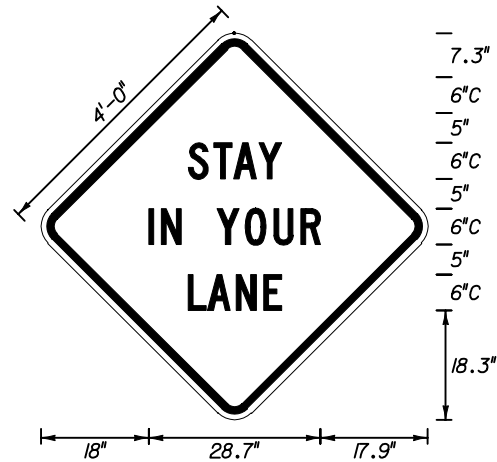


FTP-68-04
3' X 4'
Series D Legend
2.25" Radii $\frac{3}{4}$ " Border
Blue Background
White Legend & Border

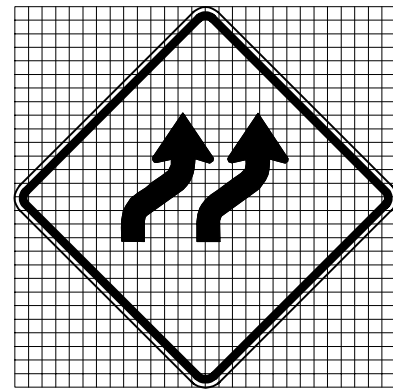


DETAIL for FTP-67 AND FTP-68

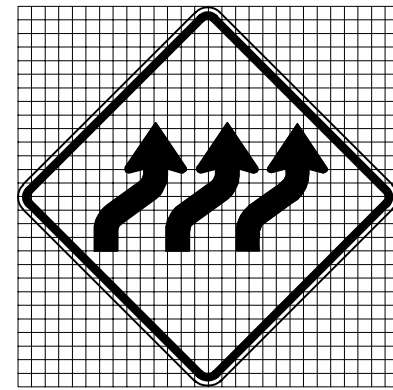
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS				
Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
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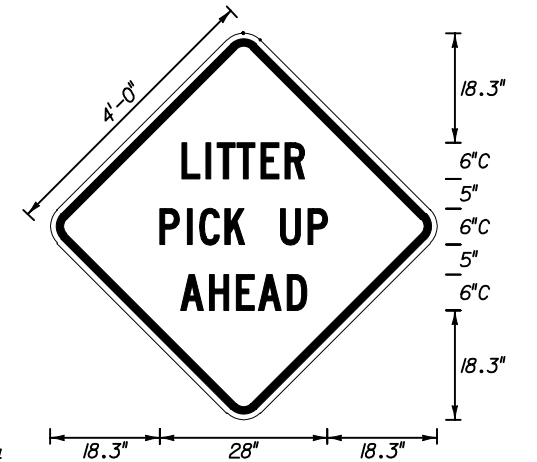
MOT-1-04
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border



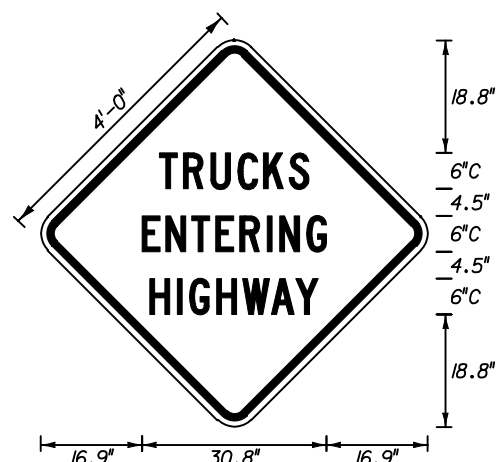
MOT-2-04
4' X 4'
3" Radii $\frac{3}{4}$ " Border
Grid = 2" X 2"
Orange Background
Black Arrows & Border



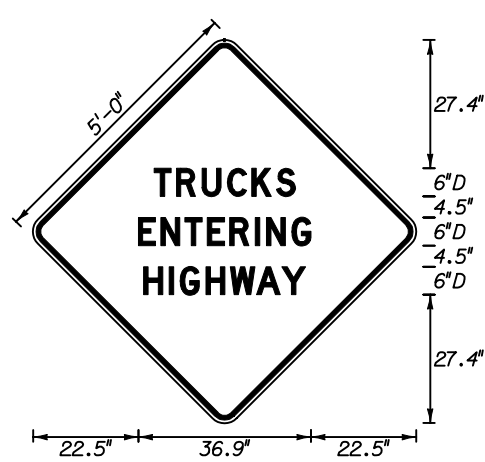
MOT-3-04
4' X 4'
3" Radii $\frac{3}{4}$ " Border
Grid = 2" X 2"
Orange Background
Black Arrows & Border



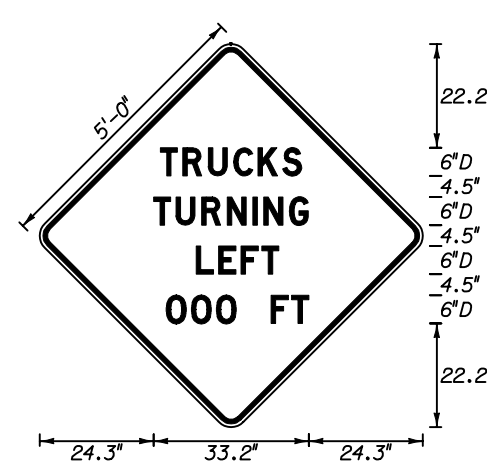
MOT-4-04
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Arrows & Border



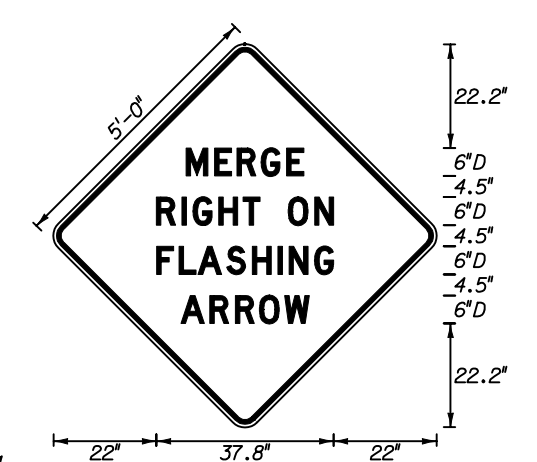
MOT-5-04
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border



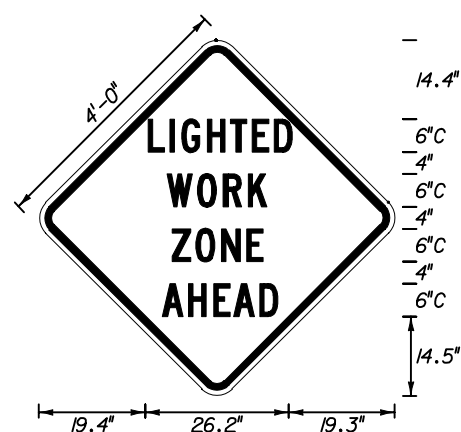
MOT-6-04
5' X 5'
3" Radii 1" Border
6" Series D Legend
Orange Background
Black Legend & Border



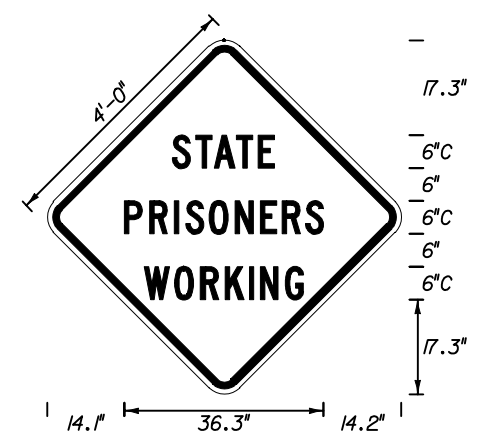
MOT-7-04
5' X 5'
3" Radii 1" Border
6" Series D Legend
Orange Background
Black Legend & Border



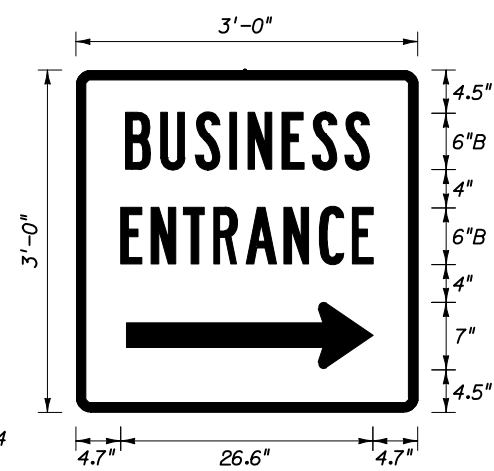
MOT-8-04
5' X 5'
3" Radii 1" Border
6" Series D Legend
Orange Background
Black Legend & Border



MOT-9-04
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border

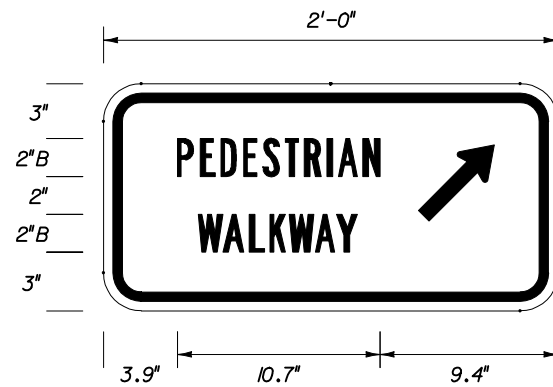


MOT-10-04
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border

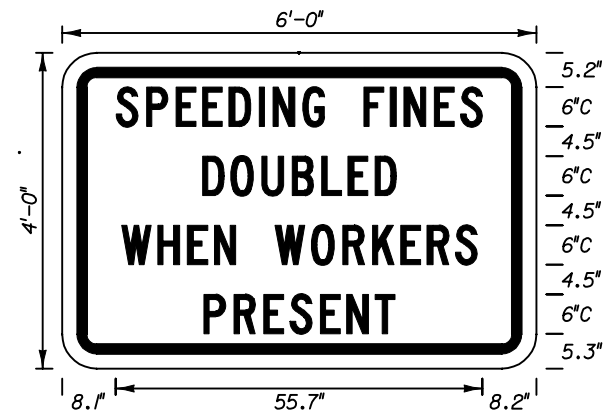


MOT-11-04
3' X 3'
 $1\frac{1}{2}$ " Radii $\frac{3}{4}$ " Border
6" Series B Legend
Blue Background
White Legend & Border

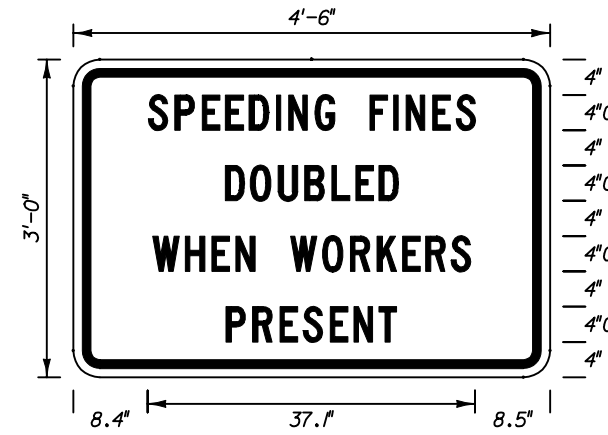
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS (MAINTENANCE OF TRAFFIC)				
Designed By	Names	Dates	Approved By <i>Charles A. Scott</i> State Traffic Standards Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			04	9 of 10 17355



MOT-12-04
 2' X 1'
 1 1/2" Radii 5/8" Border 3/8" Inset
 2" Series B Legend
 White Background
 Black Legend & Border



MOT-13-04
 6' X 4'
 3" Radii 3/4" Border
 6" Series C Legend
 White Background
 Black Legend & Border



MOT-14-04
 4'-6" X 3'
 3" Radii 3/4" Border
 4" Series C Legend
 White Background
 Black Legend & Border

2002 Stds.	2004 Stds.
FTP-1	FTP-52-04
FTP-2	FTP-53-04
FTP-3	* D8-1
FTP-4	FTP-1-04
FTP-5	* D8-2
FTP-6	* D8-3
FTP-7	* D8-1
FTP-8	FTP-2-04
FTP-9	FTP-3-04
FTP-10	* D8-3
FTP-11	FTP-8-04
FTP-12	FTP-4-04
FTP-13	FTP-5-04
FTP-14A	FTP-6A-04
FTP-14B	FTP-6B-04
FTP-15A	FTP-7A-04
FTP-15B	FTP-7B-04
FTP-16	FTP-9A-04
FTP-17	FTP-10-04
FTP-18	FTP-11-04
FTP-19	FTP-12-04
FTP-20	FTP-13-04
FTP-21	FTP-14-04
FTP-22A	FTP-15A-04
FTP-22B	FTP-15B-04
FTP-23	FTP-15C-04
FTP-24	FTP-19-04
FTP-25	FTP-20-04
FTP-26	FTP-21-04
FTP-27	FTP-16-04

2002 Stds.	2004 Stds.
FTP-28	FTP-17-04
FTP-29	FTP-18-04
FTP-30	* R5-10a
FTP-31	* E5-1a
FTP-32	FTP-30-04
FTP-32A	FTP-30A-04
FTP-33	FTP-31-04
FTP-34	FTP-32-04
FTP-35	FTP-33-04
FTP-36	FTP-34-04
FTP-37	* S5-1
FTP-38	DELETED
FTP-38A	FTP-61-04
FTP-38B	FTP-62-04
FTP-39	* W11-11
FTP-39A	DELETED
FTP-40	* W10-5
FTP-40A	DELETED
FTP-41	FTP-29-04
FTP-42	* W8-9
FTP-43	* W8-11
FTP-44	FTP-35-04
FTP-45	* R10-13
FTP-46	FTP-27-04
FTP-46A	FTP-28-04
FTP-47	FTP-25-04
FTP-48	FTP-26-04
FTP-49	* R10-3b
FTP-50	FTP-50-04
FTP-51	* W16-3a

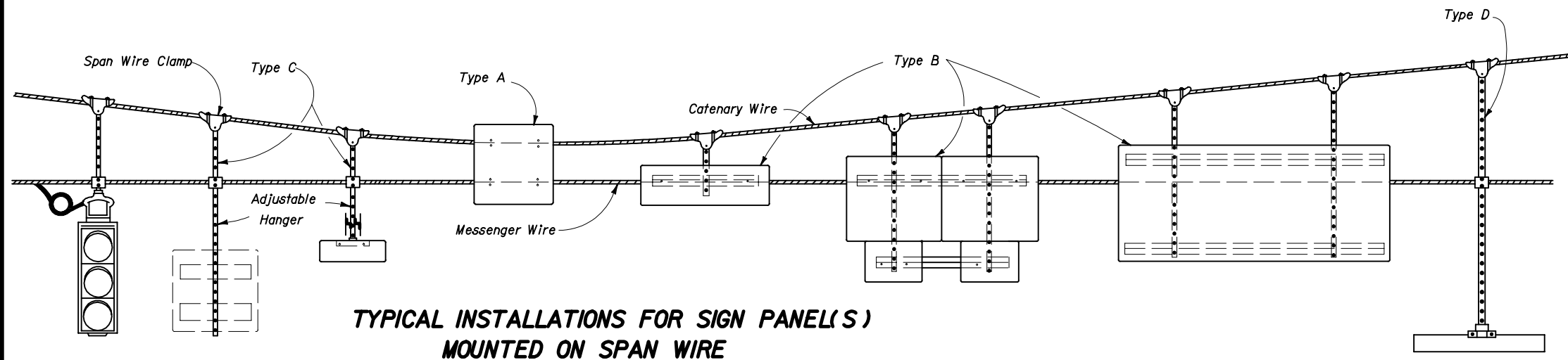
2002 Stds.	2004 Stds.
FTP-52	FTP-51-04
FTP-53	FTP-65-04
FTP-54	* W2-6
FTP-55	FTP-22-04
FTP-56	FTP-39-04
FTP-57	FTP-38-04
FTP-58	FTP-37-04
FTP-59	MOT-11-04
FTP-60	FTP-23-04
FTP-61	FTP-24-04
FTP-62	FTP-43-04
FTP-63	FTP-36-04
FTP-64	FTP-57-04
FTP-65	FTP-58-04
FTP-66	FTP-59-04
FTP-67	FTP-60-04
FTP-68	FTP-56-04
FTP-69	DELETED
FTP-70	FTP-40-04
FTP-71	FTP-41-04
FTP-72	FTP-44-04
FTP-73	FTP-45-04
FTP-74	FTP-63-04
FTP-75	FTP-64-04
FTP-76	FTP-46-04
FTP-77	FTP-47-04
FTP-78	FTP-49-04
FTP-79	FTP-48-04
FTP-80	FTP-42-04
NEW SIGN	FTP-54-04

2002 Stds.	2004 Stds.
NEW SIGN	FTP-55-04
NEW SIGN	FTP-66-04
NEW SIGN	FTP-67-04
NEW SIGN	FTP-68-04

2002 Stds.	2004 Stds.
MOT-1	MOT-1-04
MOT-2	MOT-2-04
MOT-3	MOT-3-04
MOT-4	MOT-4-04
MOT-5	* R9-11
MOT-6	MOT-12-04
MOT-7	* R9-8
MOT-8	* R9-11a
MOT-9	* R9-9
MOT-10	MOT-9-04
MOT-11	MOT-10-04
MOT-12	* W20-5a
MOT-13	* W20-5a
MOT-14	MOT-13-04
MOT-15	MOT-14-04
MOT-16	MOT-5-04
MOT-17	MOT-6-04
MOT-18	MOT-7-04
MOT-19	MOT-8-04
G20-1	* G20-1
W20-1A	* W20-1
W20-1B	* W20-1
W20-1C	* W20-1
W20-1D	* W20-1
W20-1E	* W20-1
W20-1F	* W20-1
FTP-59	MOT-11-04

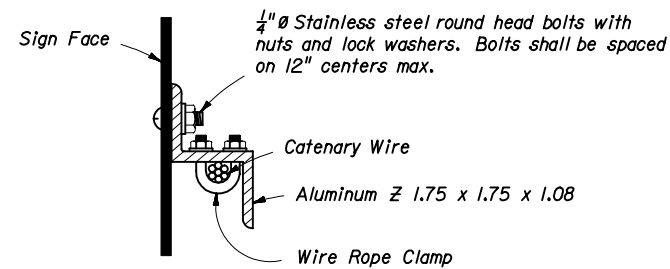
* Detailed In the Standard Highway Signs Manual
 2002 Edition as specified In the MUTCD
 Millennium Edition.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SPECIAL SIGN DETAILS				
(MAINTENANCE OF TRAFFIC)				
Names	Dates	Approved By		
Designed By		<i>C. Kirby Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	10 of 10	17355

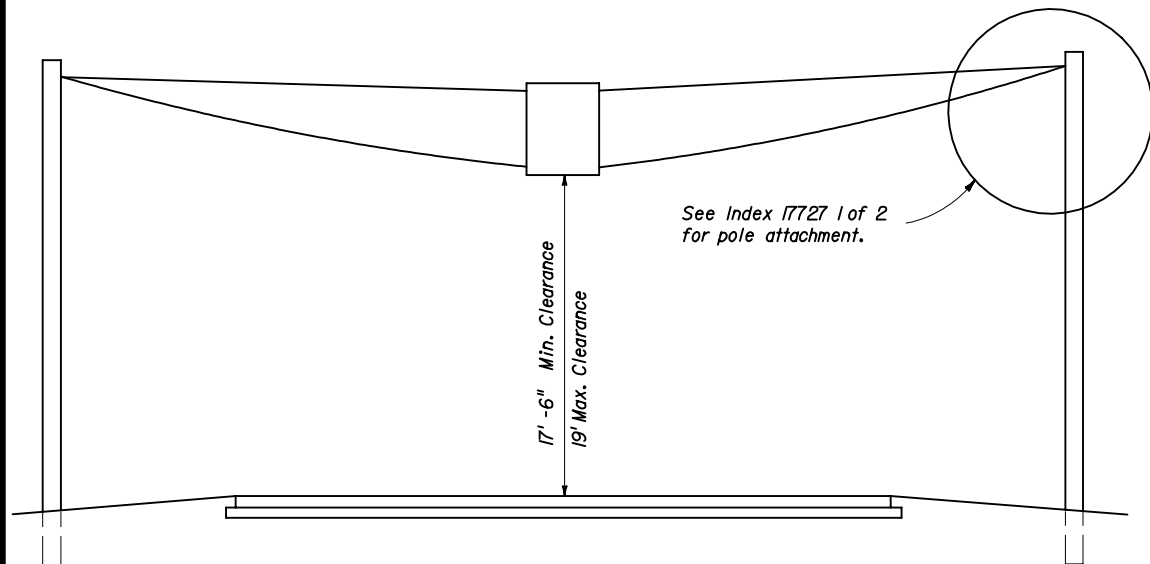


**TYPICAL INSTALLATIONS FOR SIGN PANEL(S)
MOUNTED ON SPAN WIRE**

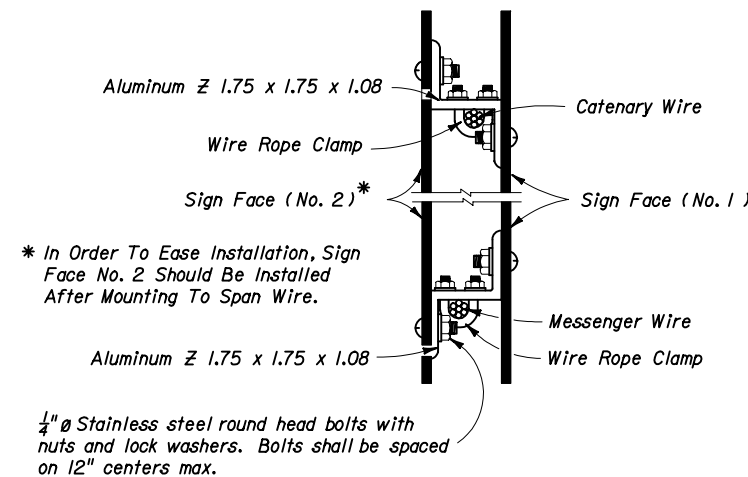
- Notes :
1. Bottom edge of signs shall be approximately at the same elevation.
 2. Span wire installations that support only signs should be provided with a minimum panel weight of 7 PSF.
 3. Type B & C attachments with one hanger shall have wind beams for signs wider than 3½'. The beams shall extend to within 6" of the sign edge.
 4. Type B & C attachments for signs 4' and wider shall have 2 hangers. Signs 7' and wider shall have wind beams that extend to within 6" of the sign edge.
 5. Type D attachments shall be for signs 3½' wide or less.
 6. Sign panels shall meet the requirements of Index 9535.
 7. Refer to section 634 of the Standard Specifications For Road And Bridge Construction.
 8. All bolts, nuts, and washers shall be passivated stainless steel, AISI 300 series, commercial grade, type 316.



SIGN MOUNTING DETAIL

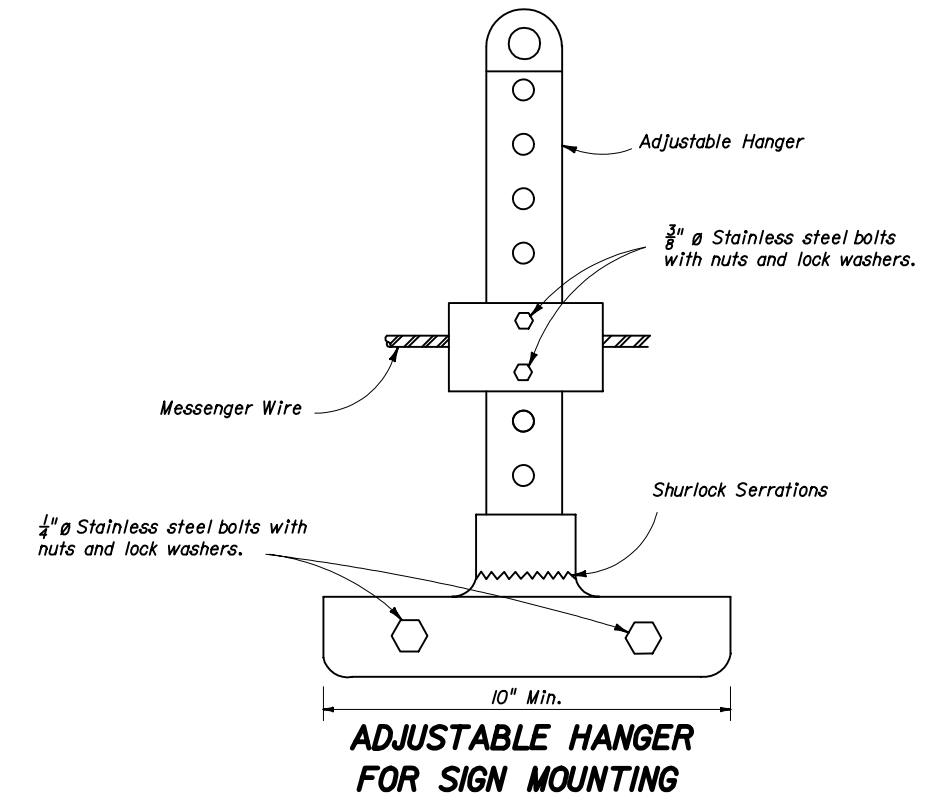


TYPICAL SPAN WIRE INSTALLATION



The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing between bolts of 2".

**DETAIL OF OPPOSING
SIGNS SPAN WIRE MOUNTED**



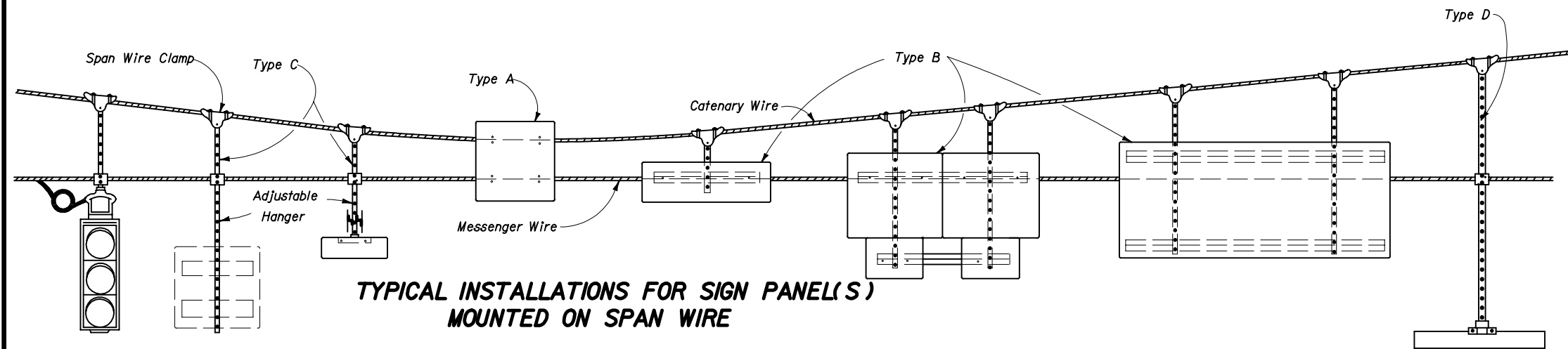
**ADJUSTABLE HANGER
FOR SIGN MOUNTING**

SINGLE POINT ATTACHMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

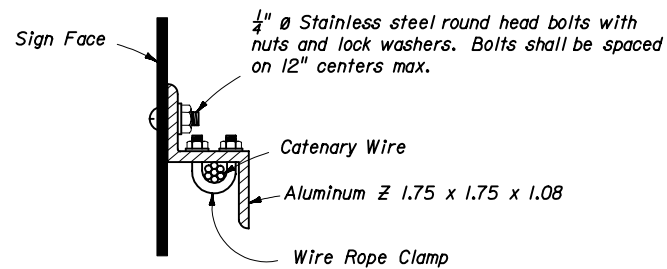
**SPAN WIRE MOUNTED
SIGN DETAILS**

Names	Dates	Approved By		
Designed By		 State Traffic Standards Engineer		
Drawn By				
Checked By				
		Revision	Sheet No.	Index No.
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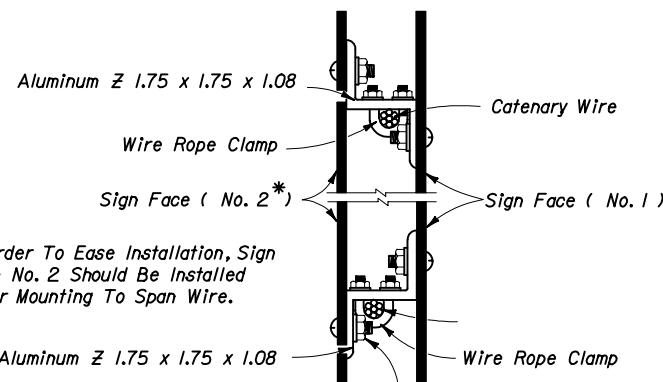


**TYPICAL INSTALLATIONS FOR SIGN PANEL(S)
MOUNTED ON SPAN WIRE**

- Notes :
1. Bottom edge of signs shall be approximately at the same elevation.
 2. Type B & C attachments with one hanger shall have wind beams for signs wider than 3½'. The beams shall extend to within 6" of the sign edge.
 3. Type B & C attachments for signs 4' and wider shall have 2 hangers. Signs 7' and wider shall have wind beams that extend to within 6" of the sign edge.
 4. Type D attachments shall be for signs 3½' wide or less.
 5. Sign panels shall meet the requirements of Index 9535.
 6. Refer to section 634 of the Standard Specifications For Road And Bridge Construction.
 7. All bolts, nuts, and washers shall be passivated stainless steel, AISI 300 series, commercial grade, type 316.



SIGN MOUNTING DETAIL

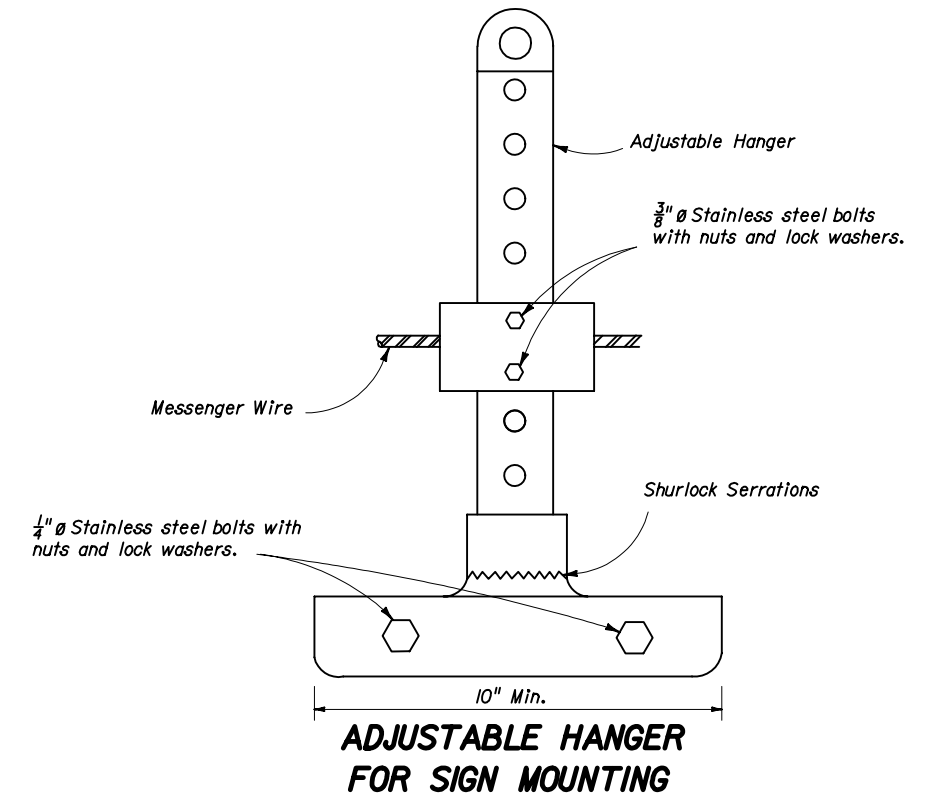


* In Order To Ease Installation, Sign Face No. 2 Should Be Installed After Mounting To Span Wire.

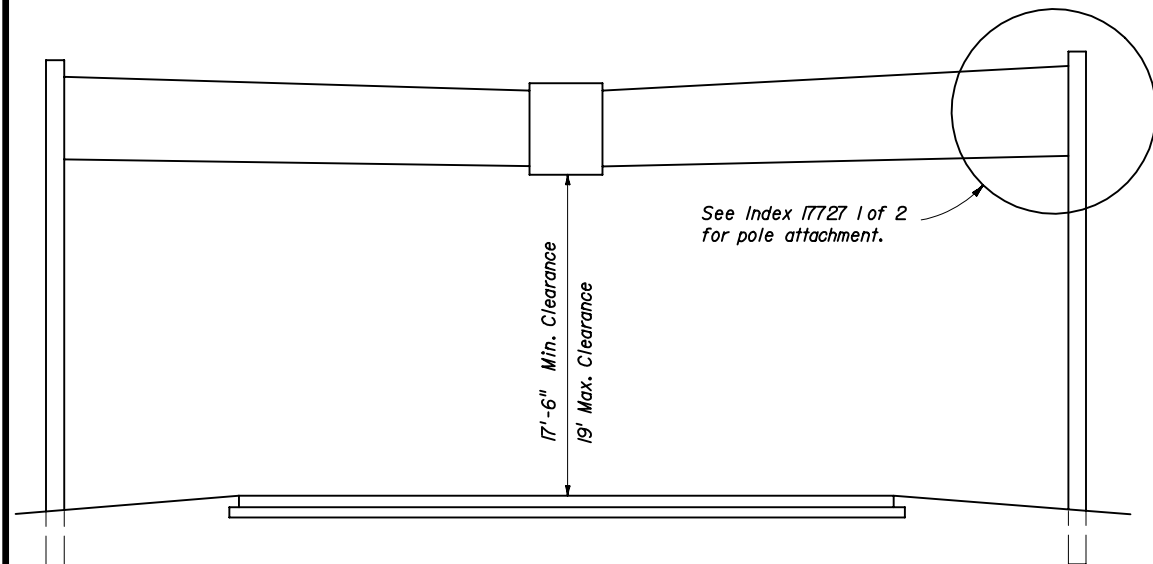
1/4" Ø Stainless steel round head bolts with nuts and lock washers. Bolts shall be spaced on 12" centers max.

The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing between bolts of 2".

**DETAIL OF OPPOSING
SIGNS SPAN WIRE MOUNTED**



**ADJUSTABLE HANGER
FOR SIGN MOUNTING**



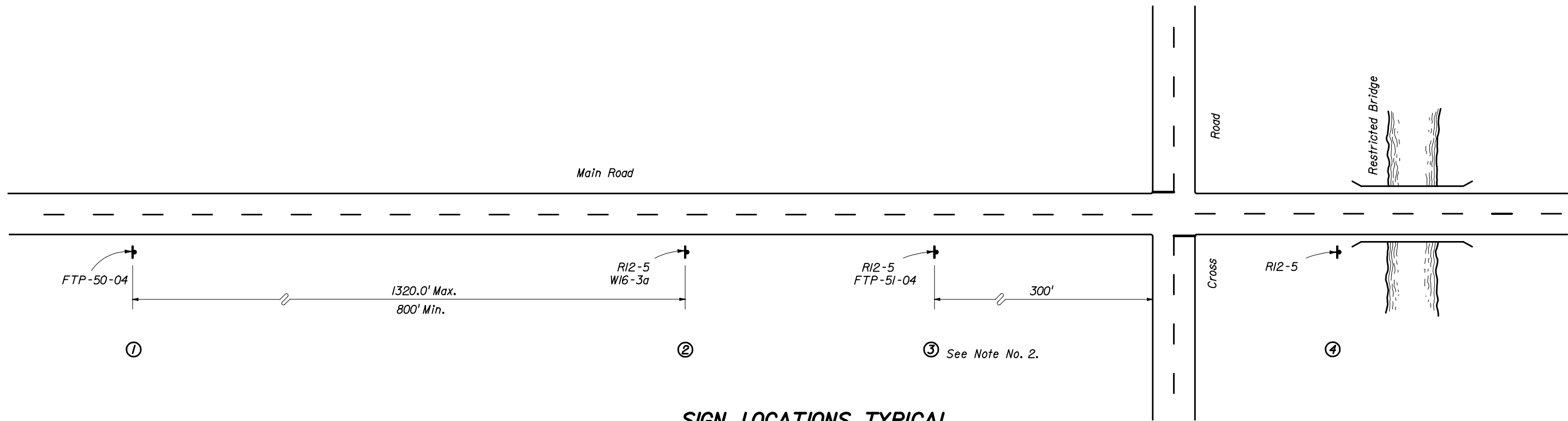
TYPICAL SPAN WIRE INSTALLATION

TWO POINT ATTACHMENT

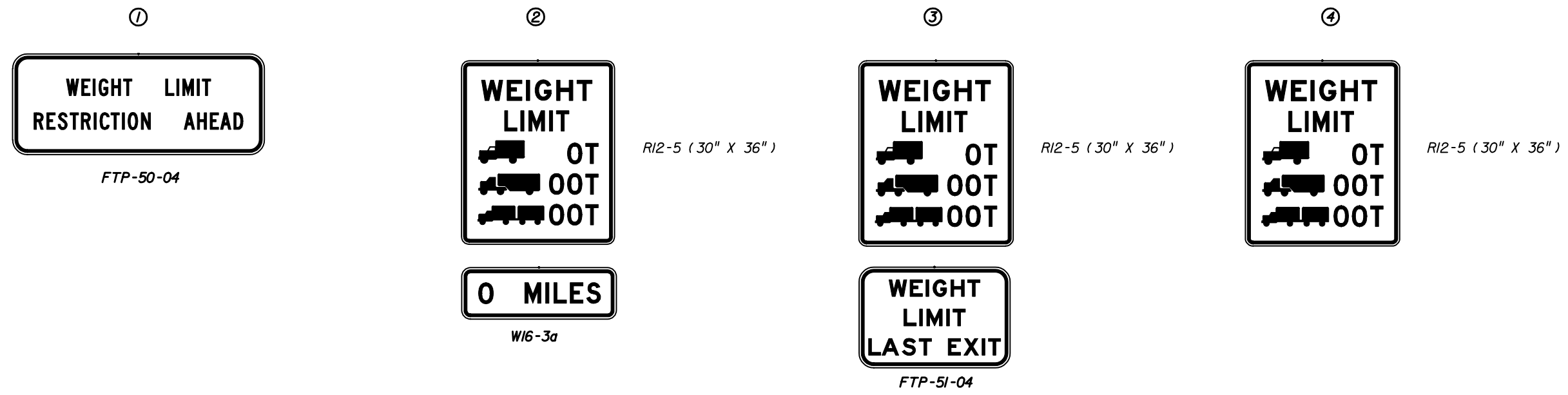
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**SPAN WIRE MOUNTED
SIGN DETAILS**

Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Standards Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	2 of 2	17356
Checked By				

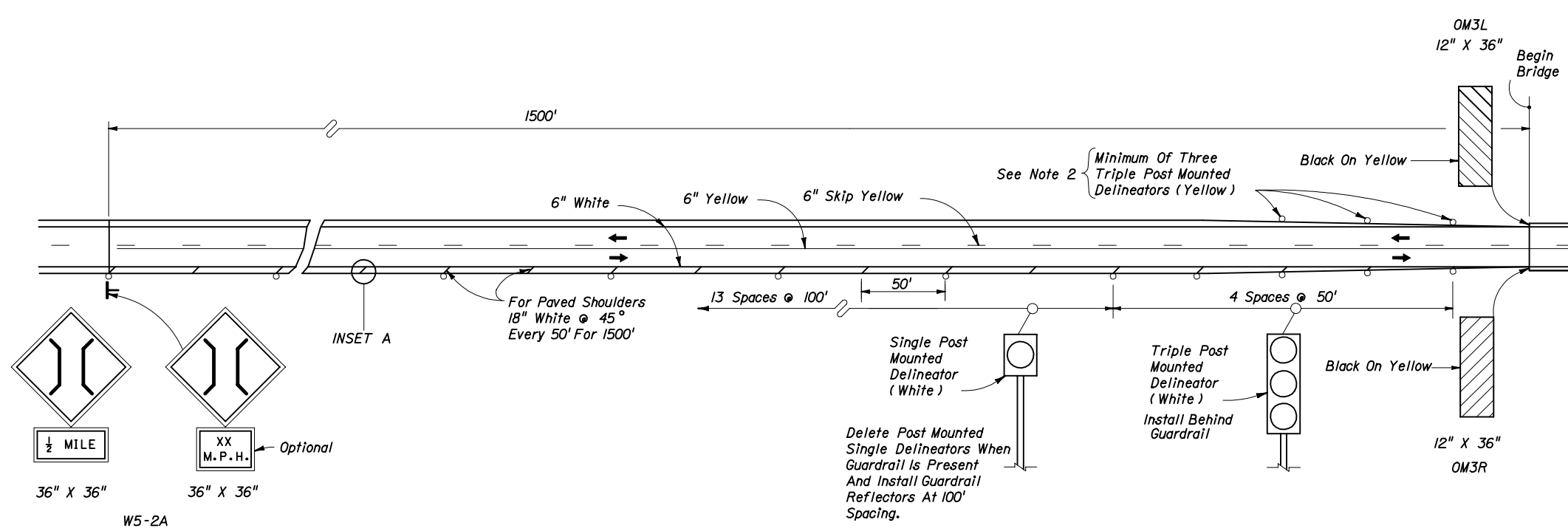


SIGN LOCATIONS TYPICAL

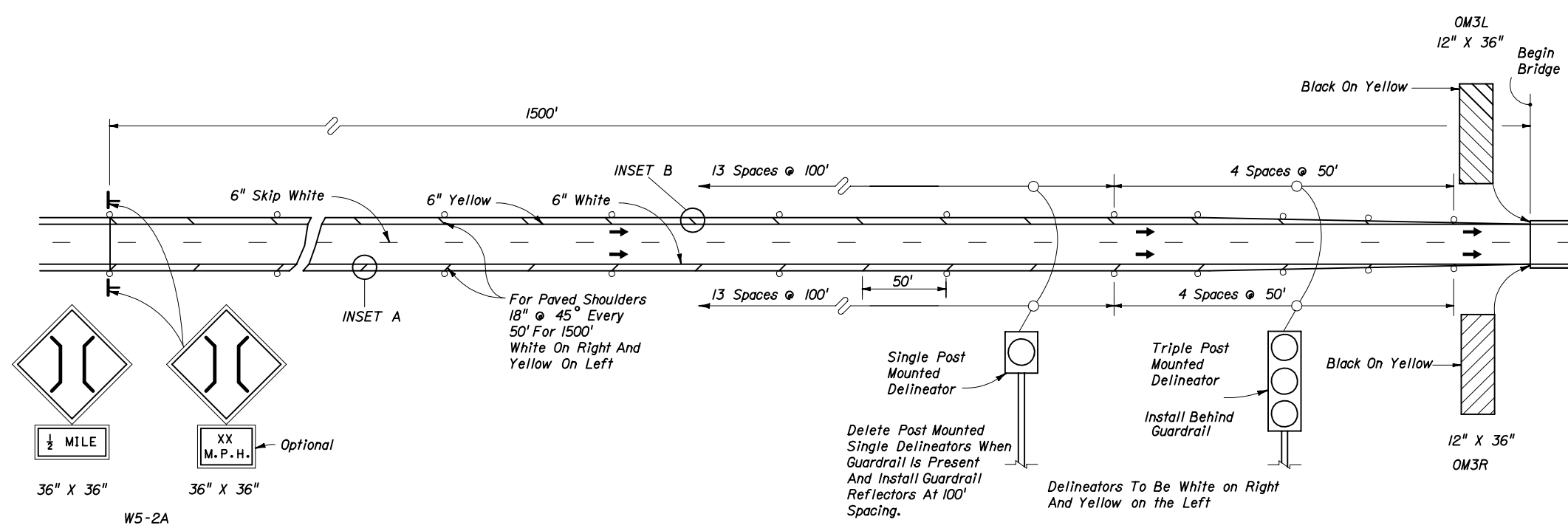


1. See Standard Highway Signs for sign RI2-5 detail.
2. Sign locatin No. 3 may require some field adjustment.
3. The Cross Road is the last detour to route around the restricted bridge.
4. Sign location No. 2 should be established from the Cross Road the following approximate distances; Interstate-1 Mile Non- Interstate-1/2 Mile.
5. See Index I7355 for sign details.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
BRIDGE WEIGHT RESTRICTIONS				
Designed By	Names	Dates	Approved By <i>Charles A. Smith</i> State Traffic Standards Engineer	
Drawn By			Revision	Sheet No. / Index No.
Checked By			04	1 of 1 / 17357



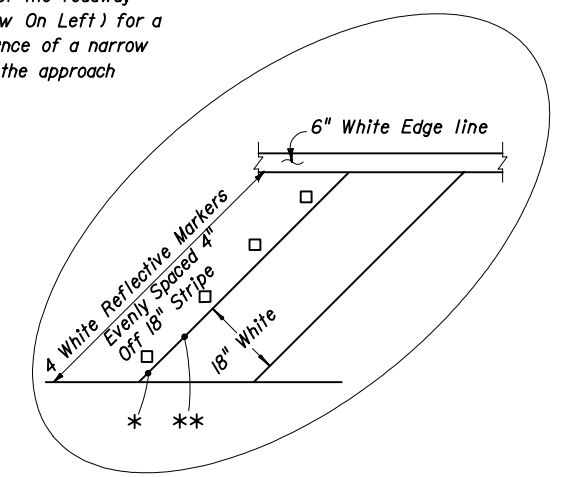
TWO - WAY TRAFFIC



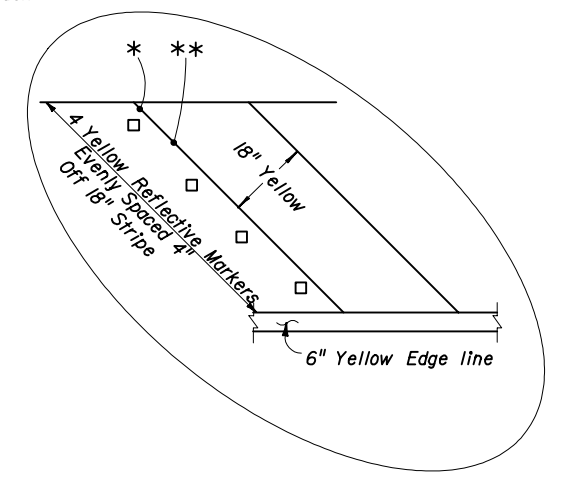
ONE - WAY TRAFFIC

NOTES:

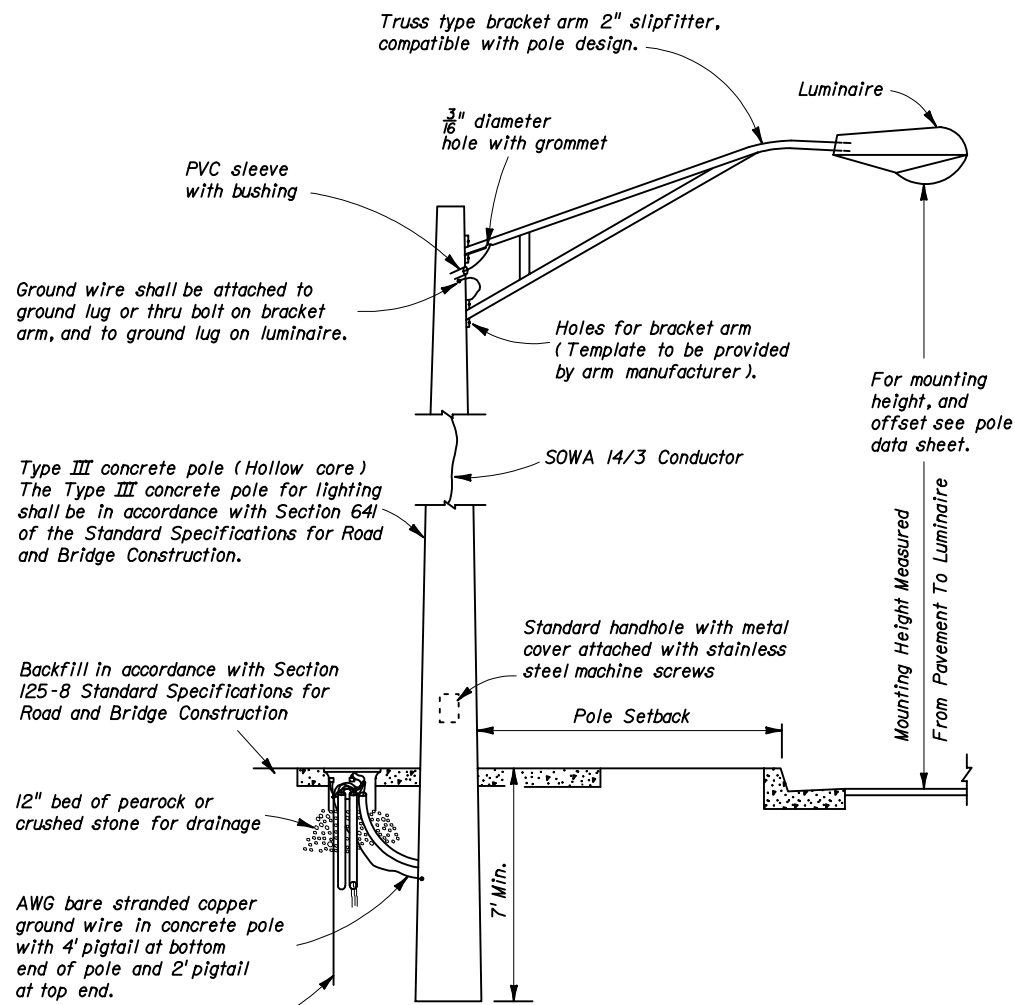
- Bridges should be marked as narrow bridges under the following conditions:
 - For approach roadways with paved shoulders when the bridge width including shoulders is less than the width of the approach roadway including paved shoulders.
 - For approach roadways without paved shoulders when the bridge shoulder width is less than 2'.
- Roadways with two-way traffic:
 - No passing zone should be extended 1500' in advance of narrow bridge.
 - The post mounted delineators shall be installed on both sides of the roadway (White On Right / Yellow On Left) for a distance of 1500' in advance of a narrow bridge if the bridge or the approach is on a curve.
- Delineators on both sides of roadway shall face traffic approaching bridge.
- Delineators to be placed not less than 2' or more than 8' outside the outer edge of pavement.
- The OM-3R & OM-3L mounting height shall be 4' above the roadway edge. The panels may be post mounted at the bridges.
- Highway delineators consist of a reflector, or reflective sheeting. Install units listed on the Qualified Products List.



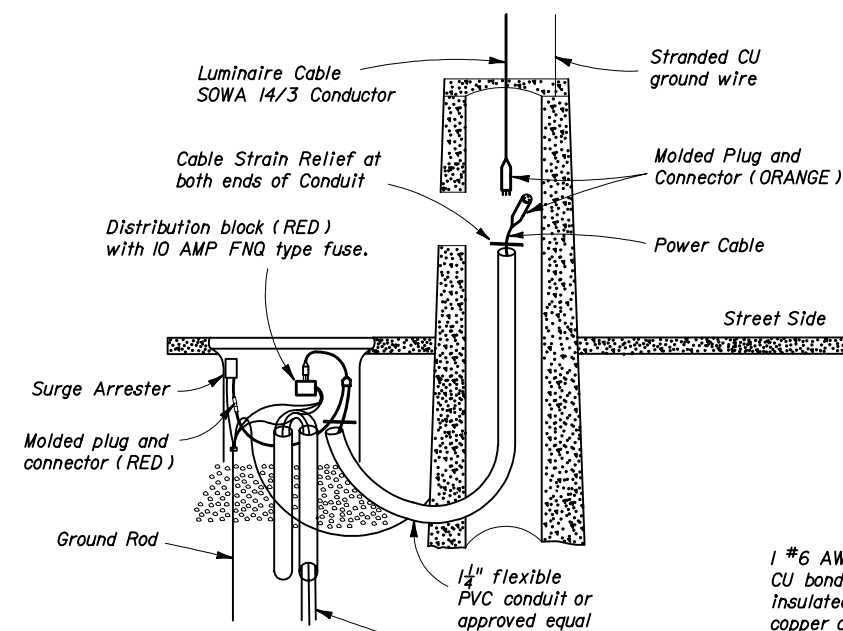
* 1/8 Stripe Length
 ** 1/4 Stripe Length Each



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RURAL NARROW BRIDGE TREATMENT				
Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	1 of 1	17359

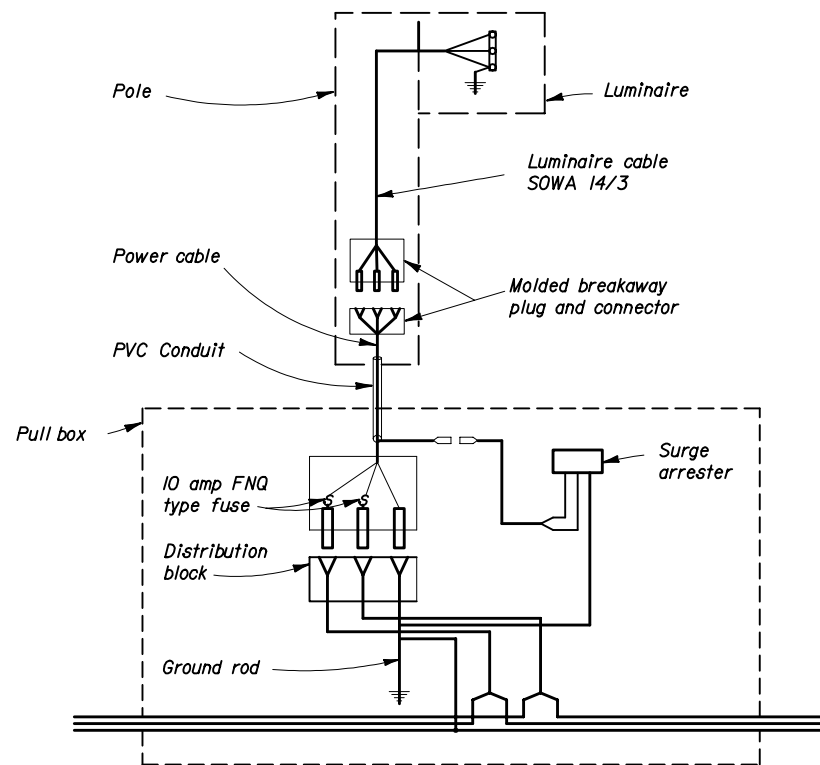


CONCRETE POLE DETAIL

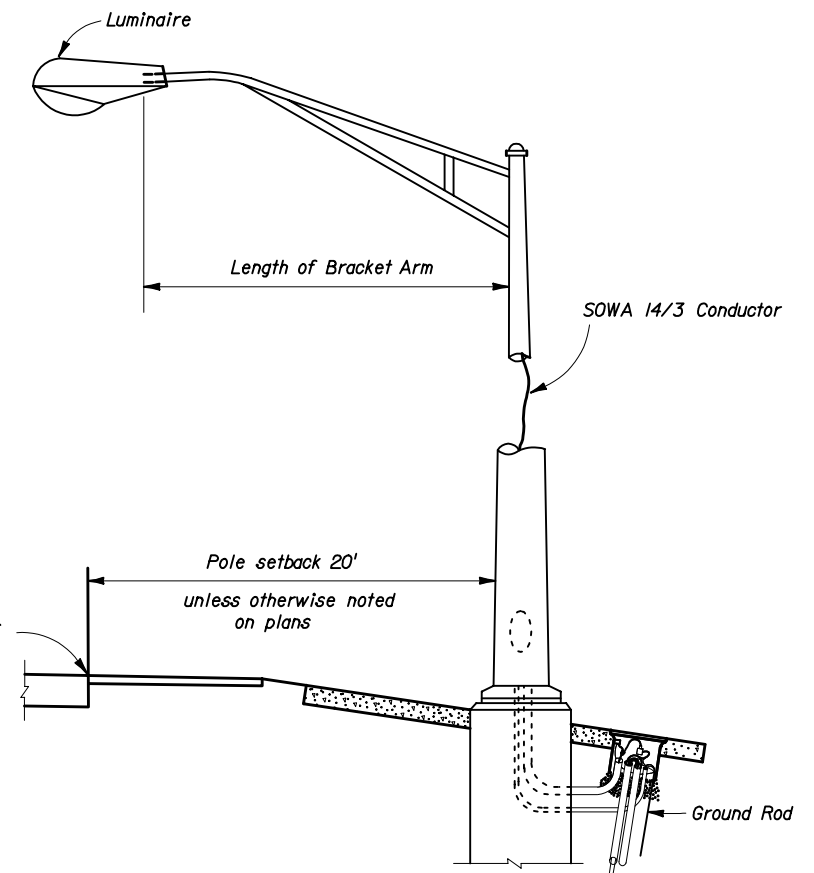


CONCRETE POLE WIRING DETAIL

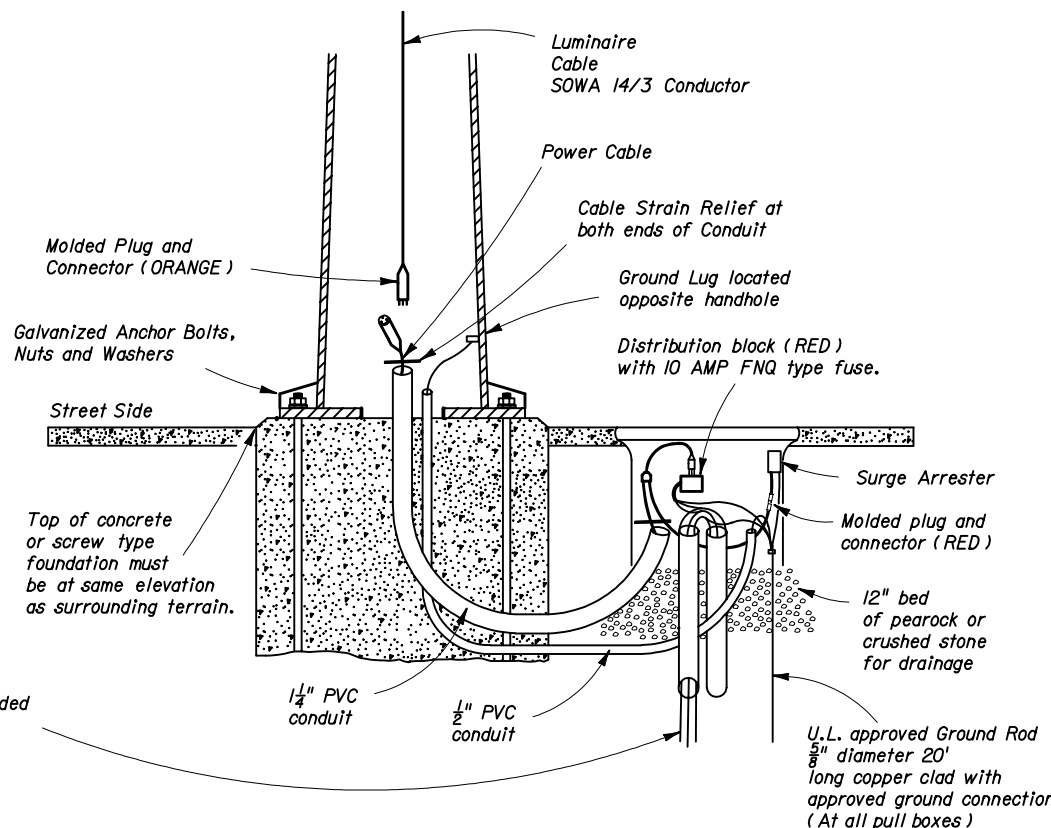
1 #6 AWG insulated (TW Green) stranded CU bond wire connecting all poles, and insulated (THW or THWN) stranded copper circuit conductors in schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plans. (Typical)



WIRING DIAGRAM



METAL POLE DETAIL



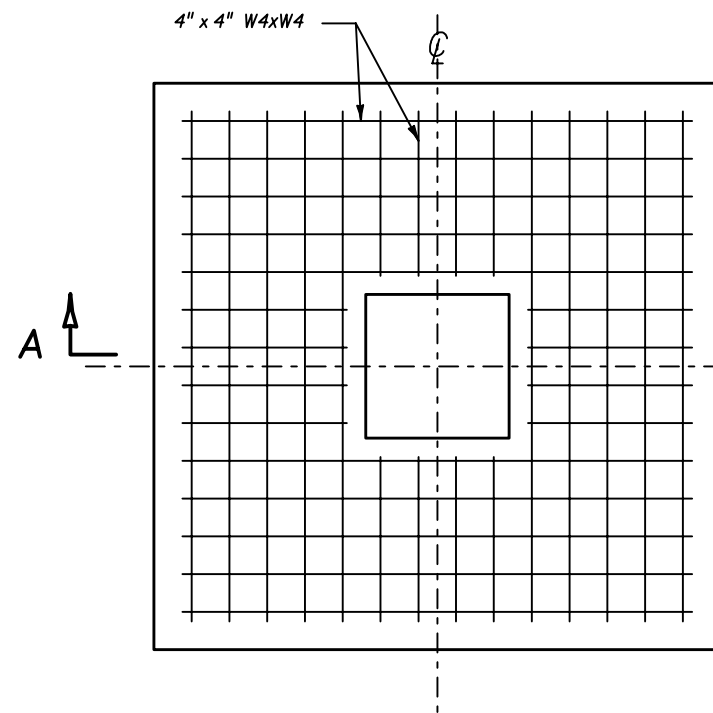
METAL POLE WIRING DETAIL

NOTES:

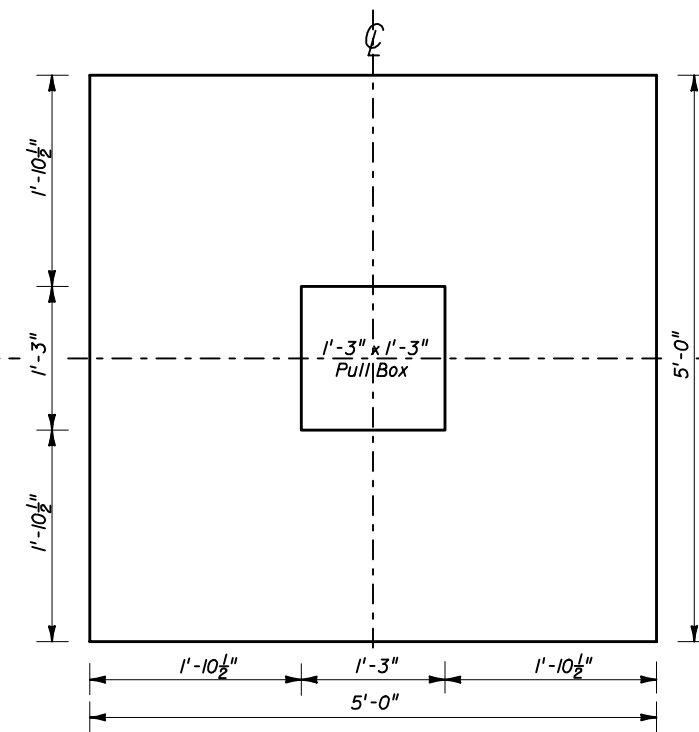
- The Duraline Division of the J.B. Nottingham Company (Duraline) claims exclusive rights to the wiring diagram illustrated in this drawing under U. S. Patent 5,335,160. Any infringement on the rights claimed by Duraline shall be the sole responsibility of the contractor or supplier infringing on the rights of Duraline.
- Barrier wall or bridge mounted poles: The wiring shall be in accordance with Section 992 of the Standard Specifications.

LIGHTING POLE DETAILS

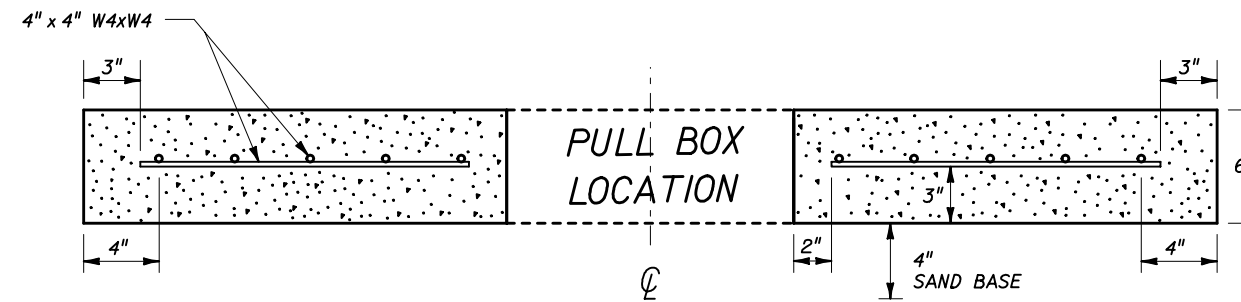
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CONVENTIONAL LIGHTING				
Designed By	Names	Dates	Approved By	
Drawn By			<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By			Revision	Sheet No. Index No.
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REINFORCEMENT LAYOUT



SLAB DIMENSIONS



SECTION A-A

NOTES:

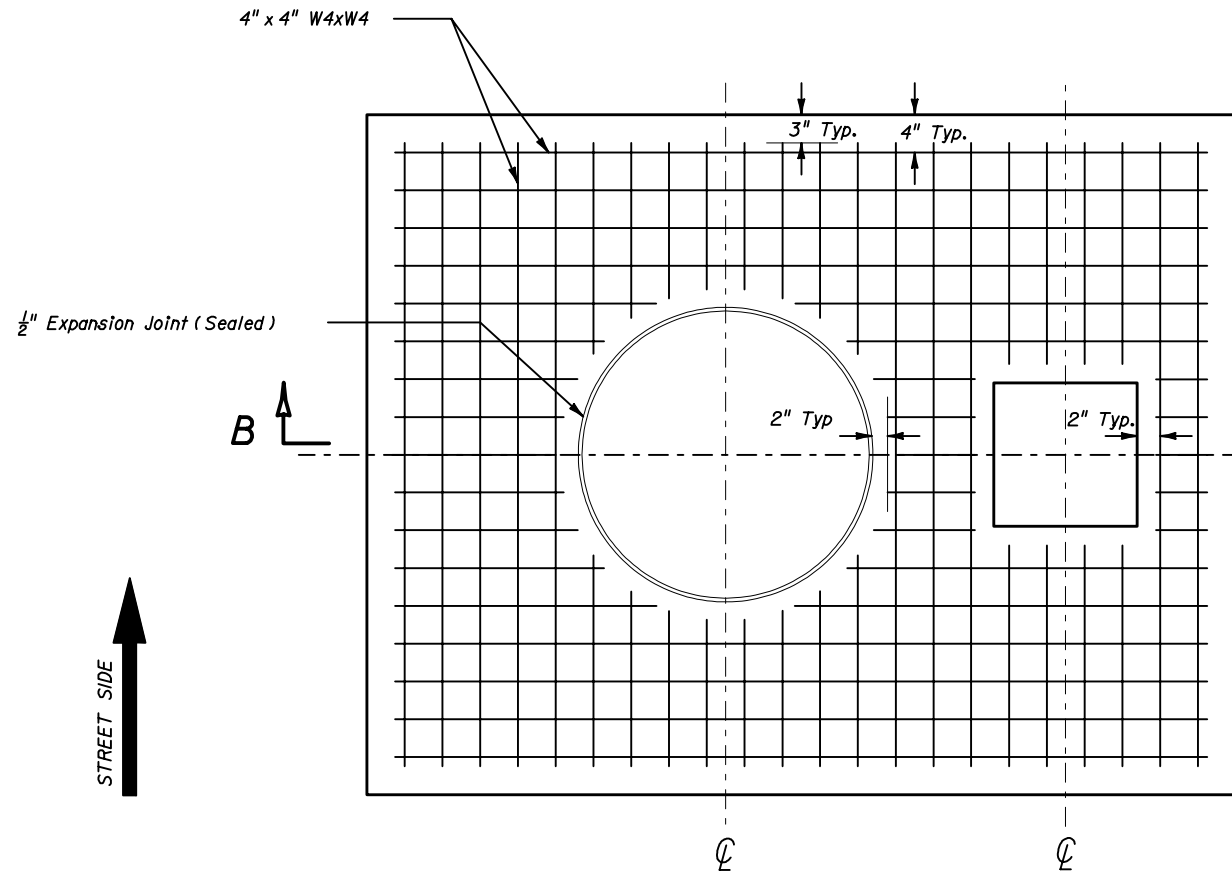
1. Use clean free draining sand < 5% passing No. 200 sieve for base.
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete strength at 28 days shall be $f'c = 3$ ksi
4. Outside edges of slab shall be cast against formwork.
5. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.

LIGHTING GENERAL NOTES AND
SLAB DETAILS FOR PULLBOX LOCATIONS

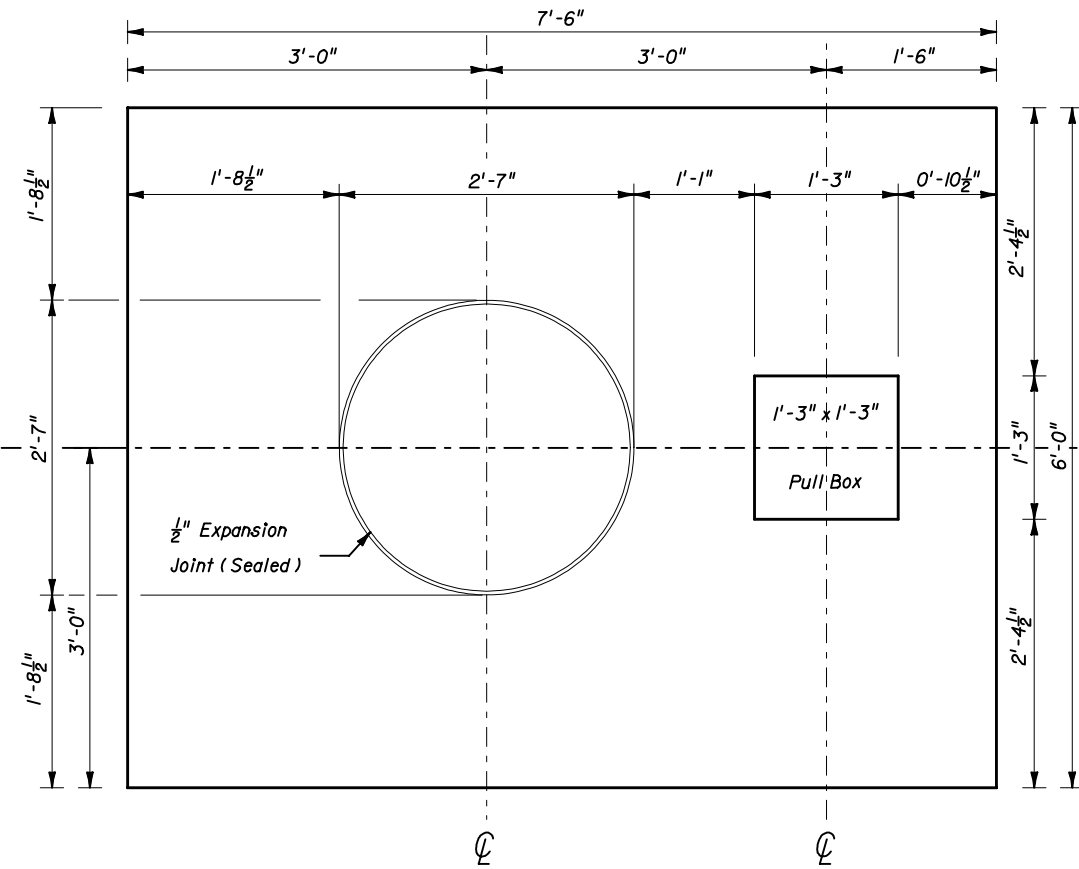
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONVENTIONAL LIGHTING

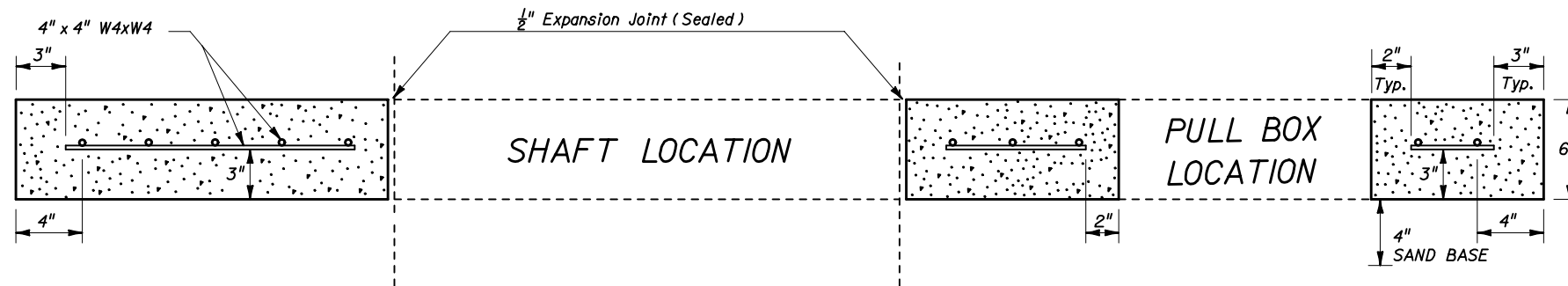
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REINFORCEMENT LAYOUT



SLAB DIMENSIONS



SECTION B-B

NOTES:


1. Use clean free draining sand < 5% passing No. 200 sieve for base (4").
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete strength at 28 days shall be $f'c = 3$ ksi.
4. Outside edges of slab shall be cast against formwork.

5. The $\frac{1}{2}$ " thick expansion joint between shaft and slab shall be sealed with a hot poured elastic joint sealer.
6. Slabs to be placed around all Poles and Pull Boxes in rural locations. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
7. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.

SLAB DETAILS FOR POLE AND PULL BOX LOCATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONVENTIONAL LIGHTING

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- 1) All grounding system connections shall be exothermically welded. This includes all cables, ground electrode and arrays. Do not exothermically bond grounding electrode to grounding electrode. Method of Measurement and Basis of Payment as per Section 620 of the Standard Specifications.
- 2) The contractor shall be responsible for contacting all utility companies prior to any underground work. The utility company will locate and identify their facilities.
- 3) Contractor shall determine the service required date for the power company transformer installation at the pre-construction conference.
- 4) The power company reserves the right to install the riser, switch gear and weatherhead on power company poles at the expense of the contractor. Contact the power company for cost or for authorization for an alternate procedure.
- 5) Any damaged portions of galvanized steel poles and bracket arms shall be painted in accordance with Section 562 of the Standard Specifications.
- 6) Poles and bracket arms shall be designed in accordance with the design criteria, as indicated in the plans and using the applicable equations found in the AASHTO 'Standard Specifications For Structural Supports For Highway Signs, Luminaires And Traffic Signals'. The calculations shall be based on the actual projected area of the luminaire or 3.0 square feet whichever is greater.
- 7) The luminaire manufacturer shall place a permanent tag on the luminaire housing on which is imprinted the following information : Wattage, ballast type, lamp shown on design plans, lamp setting (position of luminaire), IES light distribution with this lamp in the position specified, input voltage and power factor. Luminaire photometric submittals required.
- 8) Before final acceptance, contractor shall provide 2 sets of full size as built plans to the maintaining agency.
- 9) Conduit routing shall be pole to pole, maintaining pole setback distance from edge of pavement. Any cable routing in locations where guardrail is proposed shall be 2' in front of the standard guardrail position.
- 10) Pole positions and conduit routing may be adjusted, as approved by the Engineer, to prevent conflicts with utility and drainage structures not indicated, and prevent guardrail post conflict with underground lighting circuits.
- 11) Where guardrail is constructed, the poles shall be placed a minimum of 4' behind the face of the guardrail.
- 12) Pole foundation installations shall be backfilled to the top of the foundation, compacted to a firm, stable condition approximately equal to that of the adjacent soil. The fill shall conform to existing grade and be fully sodded.
- 13) All splices shall be made in pullboxes or the pole base. No splices shall be made inside the conduit. The wires at pullboxes shall have sufficient length to completely remove connectors to the outside of pullboxes to make connectors accessible for changing fuses and trouble shooting the system.

- 14) Neutral wires to have white insulation. Do not use white or green insulated wires for ungrounded conductors.
- 15) Unless otherwise specified, all cable shall be single conductor, 98 percent conductivity stranded copper, with THW or THWN insulation.
- 16) All exposed or surfaced mounted conduit shall be rigid or intermediate metal. These exposed runs of conduit shall be provided with either expansion joints or flexible metal conduit sections adequate to take care of vibrations and thermal expansions. All metal conduit shall be grounded. Steel conduit shall be hot dipped galvanized.
- 17) All conduit that will remain empty as spares shall be mandrel tested, cleaned inside and both ends capped. Leave the corrosion resistant pull/drag wire and place duct makers, or pullboxes to mark the location of the ends of the conduits.
- 18) Pull boxes shall be located at ends of conduit crossing roadways, and as necessary for the completion of the project.
- 19) These plans represent minimum acceptable criteria. The inspection per these drawings represent the minimum base of acceptance.
- 20) All material, unless otherwise specified, shall be Underwriters Laboratory approved.
- 21) Pull boxes shall meet the requirements of Section 635 of the 'Standard Specifications For Road And Bridge Construction' and Section 635 of the 'Minimum Specifications For Traffic Control Signals And Devices'.
- 22) A pull box shall be installed at each pole location. Pull boxes should be located 2' max from pole unless otherwise directed by the project engineer. Metal pull box covers shall be grounded. See General Requirements Section 635-4 of the Standard Specifications for Road and Bridge Construction.
- 23) At all pull boxes and pole bases, ends of conduit shall be sealed in accordance with Section 630 of the Standard Specifications for Road and Bridge Construction.
- 24) Luminaire shall be supplied with a regulator type ballast mounted on a hinged door or panel. The unit shall swing open to provide access to the ballast assembly by release of captive screws. The electrical connector shall be a quick disconnect plug. The unit shall be easily removed from the luminaire after release of the captive screws and disconnect plug.
- 25) All mounting heights are $\pm 2'-6"$ unless otherwise noted in plans.
- 26) A handhole is required in all poles. Handhole should be located opposite approaching traffic with cover fastened with Stainless Steel Screws. The handhole opening shall be at least 20 square inches.
- 27) The luminaire and arm on JOINT USE POLES shall be grounded.
- 28) Concrete slabs around poles and pull boxes shall be paid for under the contract unit price for Class I Concrete (Miscellaneous); the cost of reinforcing steel fabric shall be included in the price for Class I Concrete (Miscellaneous).

BREAKAWAY FEATURE

All conventional mounting height poles shall be mounted on a frangible metal base or system of breakaway couplings. If couplings are used, one coupling shall be provided for each anchor bolt connection. The only continuous connection of the pole to the foundation at each anchor bolt shall be provided by the couplings. The area between the top of the pole foundation and the base of the pole including the couplings shall be enclosed with a non-structural aluminum skirt.

If a frangible metal base is used, it shall be one piece and be designed to breakaway without the aid of any slipping or sliding surfaces.

The design of the breakaway feature shall be in accordance with the breakaway performance requirements of the AASHTO 'Standard Specifications For Structural Supports For Highway Signs, Luminaires and Traffic Signals'. The contractor (supplier) shall submit copies of test reports as evidence the breakaway feature meets the above specifications and calculations to verify the design will meet the AASHTO wind loading specified in the contract plans. No poles are to be installed prior to approval of submittal data.

Any substantial remains of a breakaway support, when it is broken away, should not project more than 4" as discussed in Section 7 of the above AASHTO specifications, and, Chapter 4, Section 4.2 of the AASHTO 'Roadside Design Guide'.


Poles behind bridge rail or barrier wall mounted, shall be non-frangible.

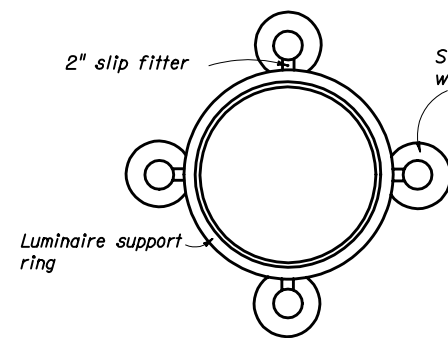
SURGE PROTECTOR SPECIFICATIONS

1. The unit shall withstand a surge current up to 20,000 Amps, and repetitive surges of 200 Amps for a minimum of 10,000 occurrences.
2. The unit shall respond in less than 50 nanoseconds and within this time have a peak clamping voltage better than 1,100 Vrms.
3. The maximum allowable voltage that can pass continuously through the hot leg of the protector must be less than 550 Vrms.
4. The current drain shall be less than 100 microamps.
5. The unit shall be insulated 600 V to ground and shall be weatherproof.
6. The unit shall not allow holdover current or conduction to ground after the surge ends.
7. Protection shall be achieved for both the 480 V and neutral conductors with the surges being passed to ground and NOT to neutral.
8. There shall be no discharge lag in the protection of the 480 V conductor over the neutral conductor.
9. Underwriters Laboratory approval not required.

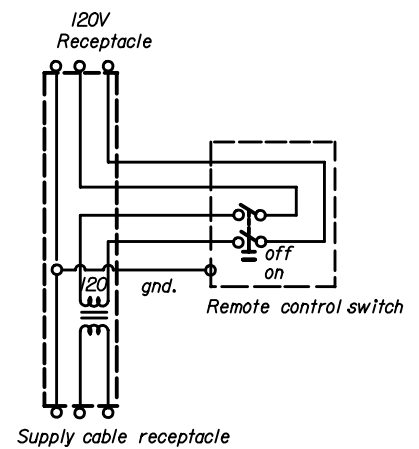
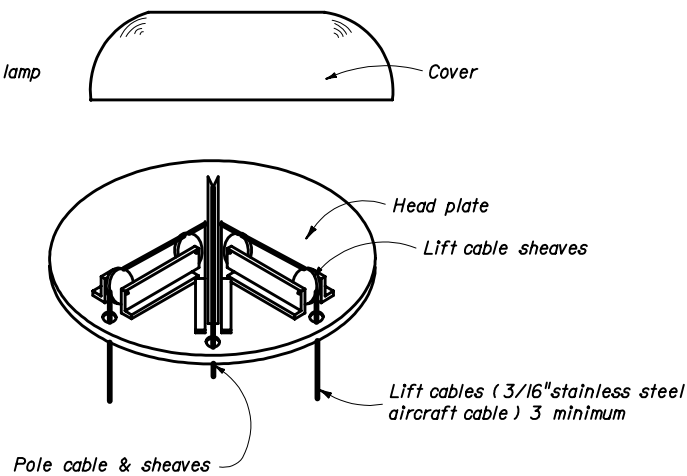
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING GENERAL NOTES

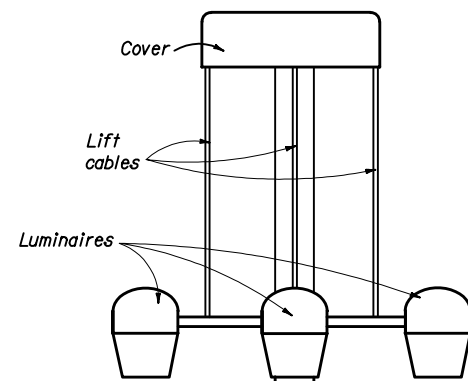
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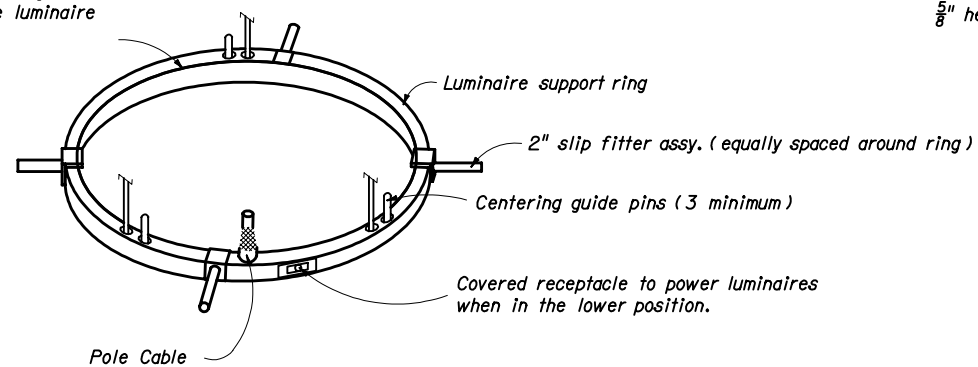
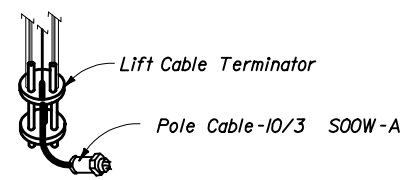
See legend for number of luminaires, lamp wattage and light distribution.



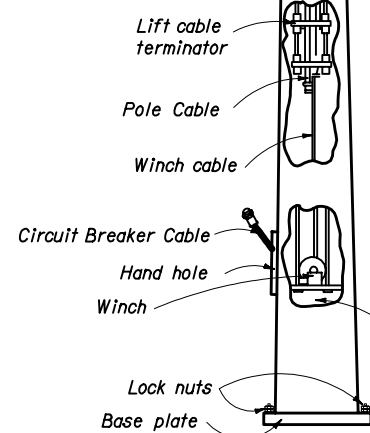
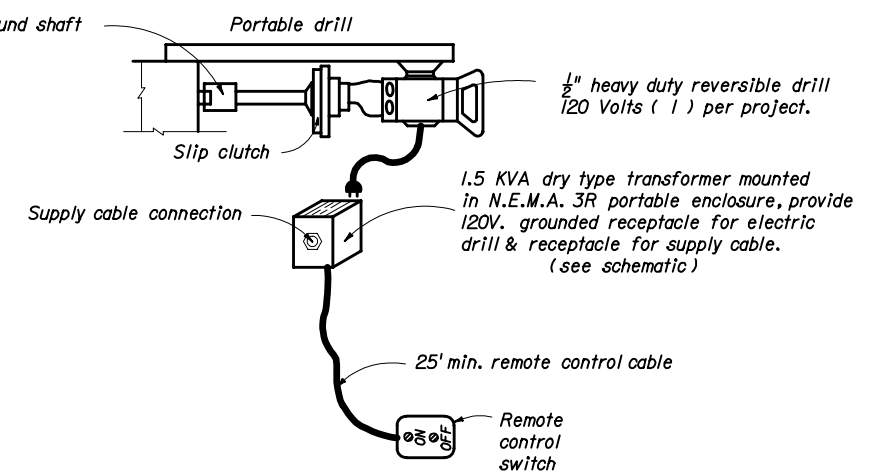
SCHEMATIC OF REMOTE AUXILIARY POWER UNIT



Spring supported centering arms provided to center the luminaire ring.

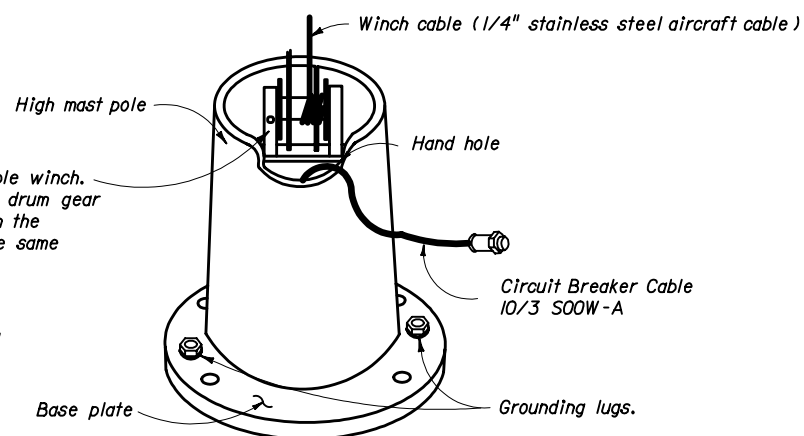


5/8" hex drive 3/4" round shaft



Surge protector shall be located in pole with circuit breaker.

Positive drive reversible winch. The complete enclosed drum gear shall directly mesh with the worm gear train, in the same enclosure.



POLE DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

HIGHMAST LIGHTING

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LUMINAIRE SPECIFICATIONS

The reflector with its aluminum cover shall be firmly attached to a cast ring. This ring shall have keyhole slots in its upper surface such that the reflector/refractor assembly may be readily attached to, or detached from, the luminaire bracket entry and lamp support assembly without completely removing the support bolts.

Each luminaire shall contain an integral auto-regulator type ballast connected for 480 volts input \pm 10% and a power factor of more than 90%. The luminaire ballast shall be enclosed within an aluminum housing which integrally attaches to the luminaire bracket entry and lamp support assembly. It shall be readily removable without removing the luminaire from the bracket arm.

The luminaire shall be attached to the bracket arm by means of a bracket entry and lamp support assembly. The assembly shall include a side entry slipfitter designed for 2" pipe with provision for 3° adjustment for leveling the luminaire. An enclosed terminal block shall be included such that all electrical connections shall be protected from exposure to weather.

All electrical connections shall be made waterproof or be made inside a weather resistant enclosure. All luminaires shall be ANSI/IES light distribution as indicated in plans. Each luminaire shall be labeled with a permanent label which states the type of lamp, voltage input, power input, power factor, ballast type, socket position, ANSI/IES light distribution, and such other catalog information that a complete replacement can be readily ordered.

The contractor's attention is directed to those plan sheets detailing the mounting of luminaires at the pole top. Particular attention is directed to alignment of luminaire light distributions. Special attention must be exercised in the physical alignment of these luminaires to ensure that the approved photometric layout is physically produced at each lighting standard in the field. A marking shall be placed on the external face of the refractor to allow visual inspection of alignment. The marking shall correspond to the 0° axis of the refractor.

FOOTING

The high mast foundations shall be constructed in accordance with the details shown in the plans.

Anchor bolts per manufacturer's Specifications. Submittals shall be supplied to the engineer of record prior to purchase.

One leveling nut, one hold-down nut, and one locking/jam nut shall be supplied per anchor bolt. All small metal parts, (nuts, screws, washers, etc.) shall be rustproofed either by galvanizing per ASTM A153 or by the nature of the material used in their fabrication.

LOWERING SYSTEM SPECIFICATIONS

The lowering system shall consist of the following:

- A. Head frame and cover
- B. Luminaire ring
- C. Cables
- D. Winch
- E. Portable power unit (1 per project)

The head frame unit shall rigidly mate the top of the pole to the head frame platform. The platform with its associated sheaves, etc. shall be covered and raintight. The head frame structure shall be zinc coated steel, attached to the pole by means of a steel slipfitter. Head frame shall encompass six 5" nominal steel cable sheaves grooved to the exact cable diameter, for 180° cable bearing surface. The sheave shall be zinc electroplated to ASTM 164 and dipped in yellow chromate for corrosion resistance. Bearings and cable keepers shall have permanent lubrication. Three (3) stainless steel 7 x 19 aircraft cables of $\frac{3}{16}$ " or greater diameter shall be provided.

The pole cable shall be attached to the luminaire ring with a waterproof connector capable of withstanding the pull of the weight of the pole cable. Where the wire ropes are required to bend over sheaves or over the winch drum, the maximum working stress in the outer fibers of wire rope shall not exceed 20% of the wire rope manufacturer's rated ultimate stress.

Drum design shall cause level wind of wire rope. The power cord shall travel on sheave (s) or a combination of rollers providing a radius for the cord of 6" or larger. Each end of the sheave (s) or rollers shall have a keeper to prevent the cable from jumping out of the roller track.

The head frame shall also include three (3) latching devices to support the luminaire ring assembly when the lowering device is not in operation. The latches shall be actuated by alternate raising and lowering of the hoisting cables. Locking of luminaire ring shall be signaled by indicators visible from ground. All moving parts of the latch mechanism shall be serviceable from the ground. Each of the three latches shall be strong enough, by itself, to support twice the weight of the ring and all the luminaires. Latching mechanisms which depend primarily upon spring operation or contain dissimilar metals are not acceptable. The latching mechanism shall not require adjustment after the original installation.

The luminaire ring shall be constructed of a minimum of 6" x 2" x 7 gauge steel channel galvanized in accordance with ASTM A123 Class "B" steel channel with the appropriate number of 2" steel pipe mounting arms. The luminaire ring shall be prewired with Type "W" or specially reinforced Type "SO" power cable with suitable conductor quantity and size for proper operation and Type "ST" distribution wiring with insulation suitable for at least 105°C. All power cables should be attached to the aluminum weathertight wiring chamber with weathertight cable connectors. A 600 volt terminal block, completely prewired shall be included in the weathertight wiring chamber. A weather-tight twistlock power inlet shall be provided on the luminaire ring to allow testing of the luminaire while in the lowered position. The power inlet shall face away from the pole for easy access.

The ultimate support of the luminaire ring shall not be dependent upon the lowering and raising cables.

The system shall be provided with circuit-breaker switches and twistlock disconnects in the pole base. Raising speed of luminaire ring shall be a minimum of 12' per minute.

The winch shall be a reversible worm gear self locking type with an integral friction drag brake to prevent freespooling. The winch shall be designated for hand operation or for operation by means of a $\frac{1}{2}$ " heavy duty reversing electric drill motor, remote controlled to enable the operator to stand 25' from the pole. Stainless Steel 7 x 19 aircraft cables of $\frac{1}{4}$ " or greater diameter equal to MIL-W-5424 shall be supplied on the winch. The winch shall be provided with keepers above the drum to force the cable away from the ends of the drum for spooling. The drum shall have a wire guard to prevent the cable from coming off.

The winch shall be mounted in such a way that the cable terminator and the riser cable connector may be reached and worked on by a person with his arm through the handhole.

Roller contact spring-loaded centering arms shall be provided to center the luminaire ring while ascending or descending the pole. The rollers for the centering arm shall be made of a water resistant non-marking composition material. All shafts and washers shall be #304 stainless steel. The spring-loading mechanism shall consist of an oil-tempered steel compression spring over an aluminum rod. The rollers shall be in contact with the pole at all times.

POLE SPECIFICATIONS

The pole shaft may be jointed or single piece, polygon or round, high strength steel having a minimum yield strength of 50 ksi. All material shall be single thickness steel plate with no laminations. Steel shall be as specified.

All poles shall be equipped with a reinforced handhole approximately 1' above the base plate. The handhole shall be 10" wide by 20" high minimum. Drilling through the handhole reinforcement or the pole for the attachment of the handhole cover is not allowed. A cover clip to the handhole frame shall be provided.

All poles and hardware will be adequately packed to assure protection to the finish during shipping and handling, poles shall not be shipped pre-assembled.

Drawings shall be provided with the equipment which show assembly sequence, lift point, and recommended erection procedure. A permanent decal or card shall be fixed on the inside of the handhole cover which describes the sequence for lowering the luminaires and the cautions.

The proportioning of weld details and the operation of welding shall be in accordance with the current edition of the AASHTO Standard Specifications for Welding of Structural Steel Highway Bridges, and The Referenced American Welding Society Structural Welding Code.

Shop drill two (2) $\frac{5}{8}$ " diameter holes 180 degrees apart through total thickness of base plate. Tap top of hole for $\frac{5}{8}$ " x $\frac{3}{4}$ " II NC stainless steel hex head bolt.

Finished poles shall have a protective coating of hot galvanizing applied in accordance with ASTM A123.

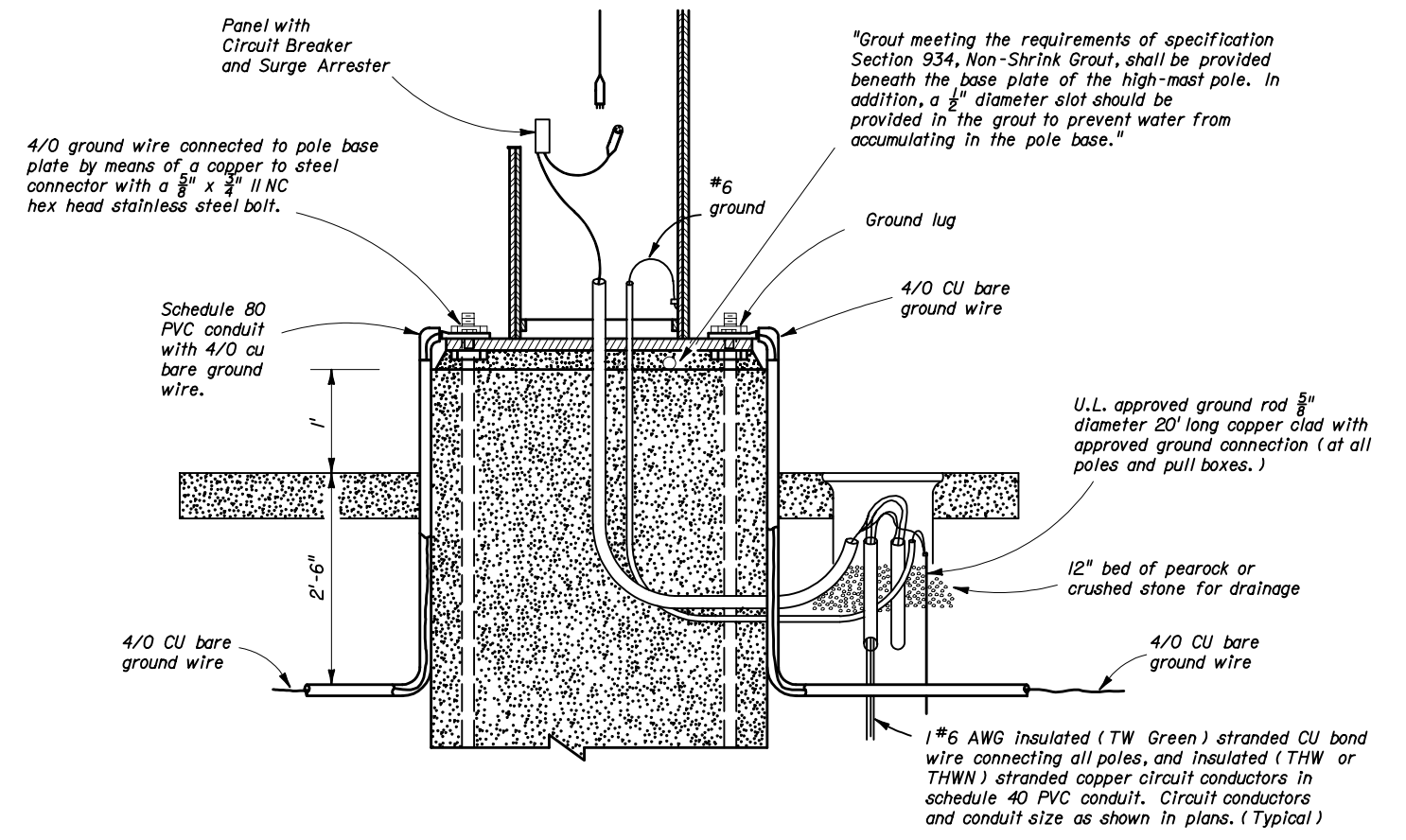
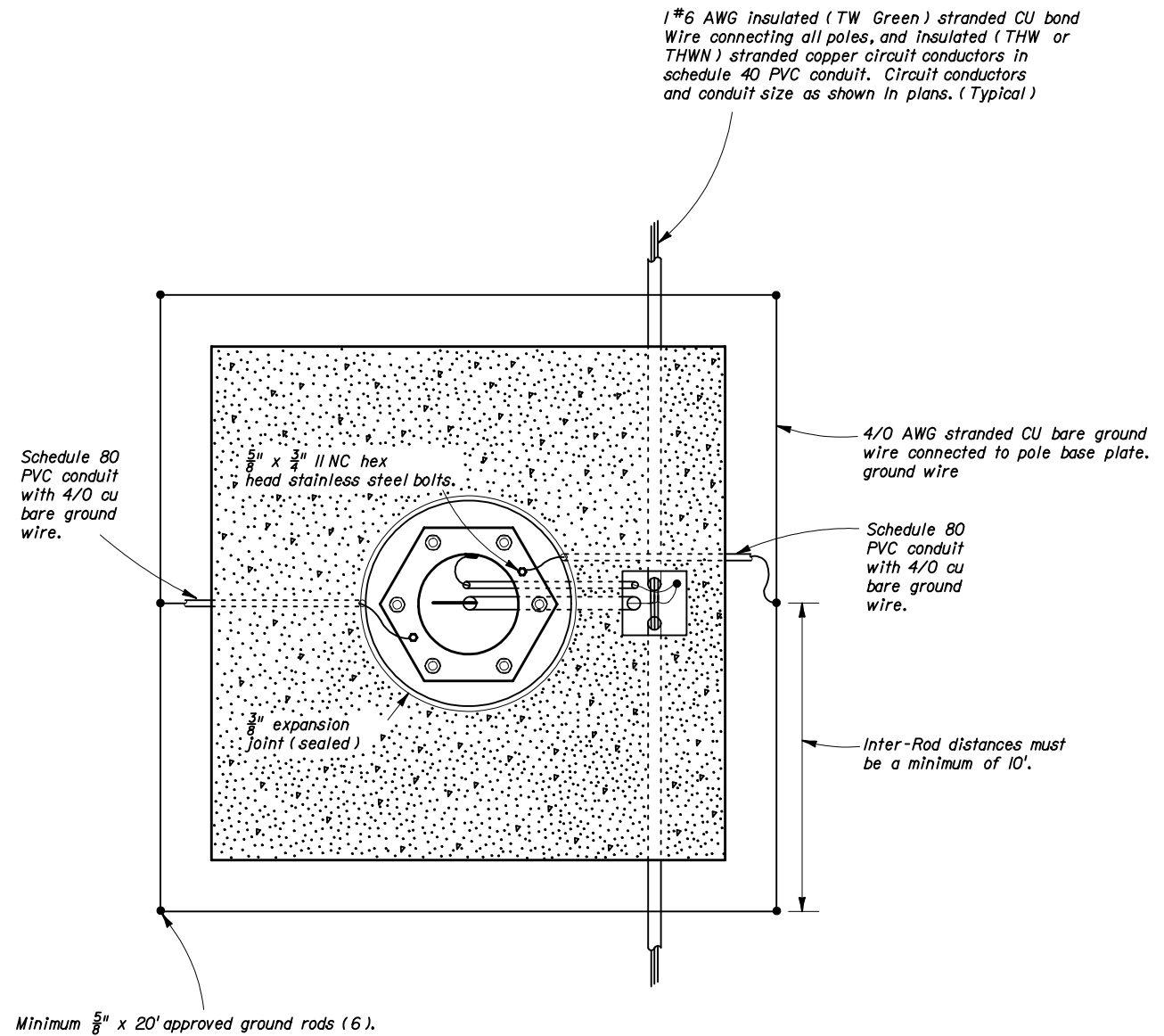
Note : It is the responsibility of the contractor to coordinate the anchor bolt design with foundation design.

ALTERNATE POLE

A spun high mast prestressed concrete pole listed on the Qualified Products List may be substituted for a steel pole with approved shop drawings and calculations. If the concrete pole is provided as a substitute for the steel pole, payment will be made under the items bid for steel poles and associated foundations and plan quantity of these items will be the basis for payment.

NOTES

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HIGHMAST LIGHTING					
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Designed By		8-78	<i>C. L. Scott</i> State Traffic Standards Engineer		
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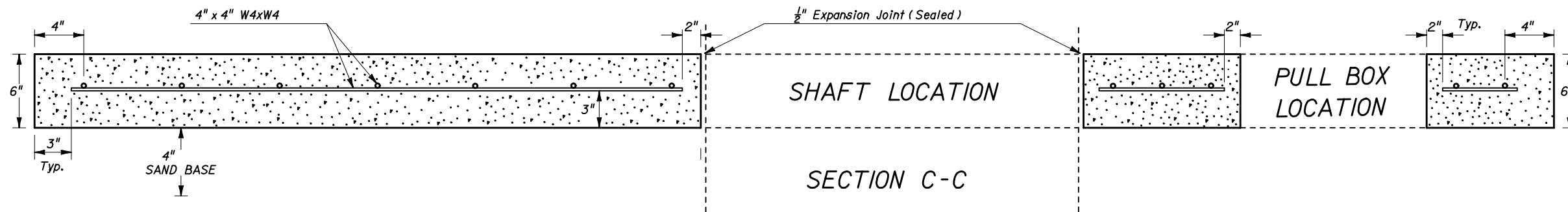
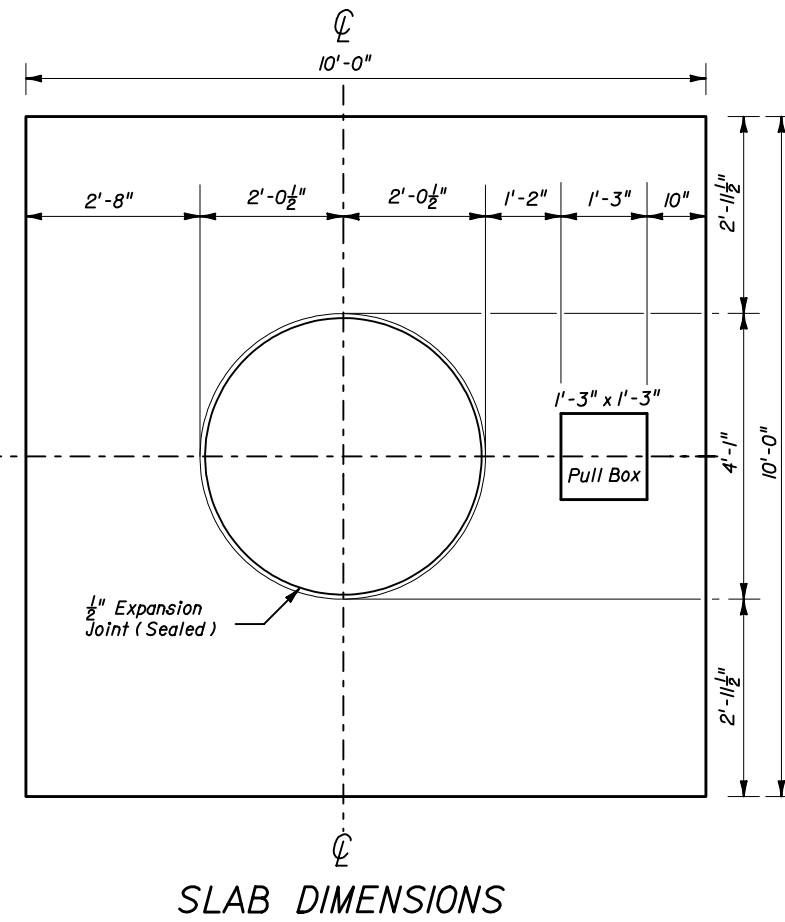
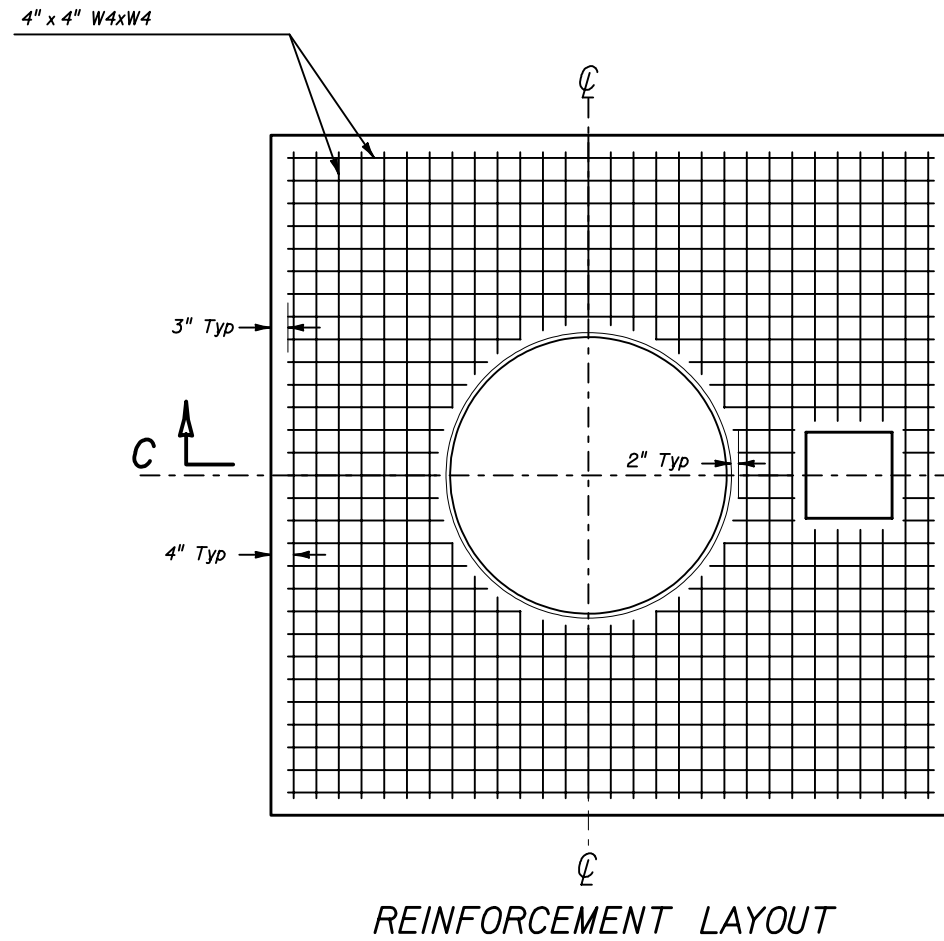


Notes:

1. At all pull boxes and pole bases, ends of conduit shall be sealed in accordance with Section 630 of The Standard Specifications For Road And Bridge Construction.
2. 1# 6 AWG insulated (TW Green) stranded CU bond wire connecting all poles, and insulated (THW or THWN) stranded copper circuit conductors in schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plans. (Typical)
3. Slabs to be placed around all Poles and Pull Boxes.
4. For Pull Boxes between Poles refer to index 17500 sheet 2 of 3.

WIRING DETAILS

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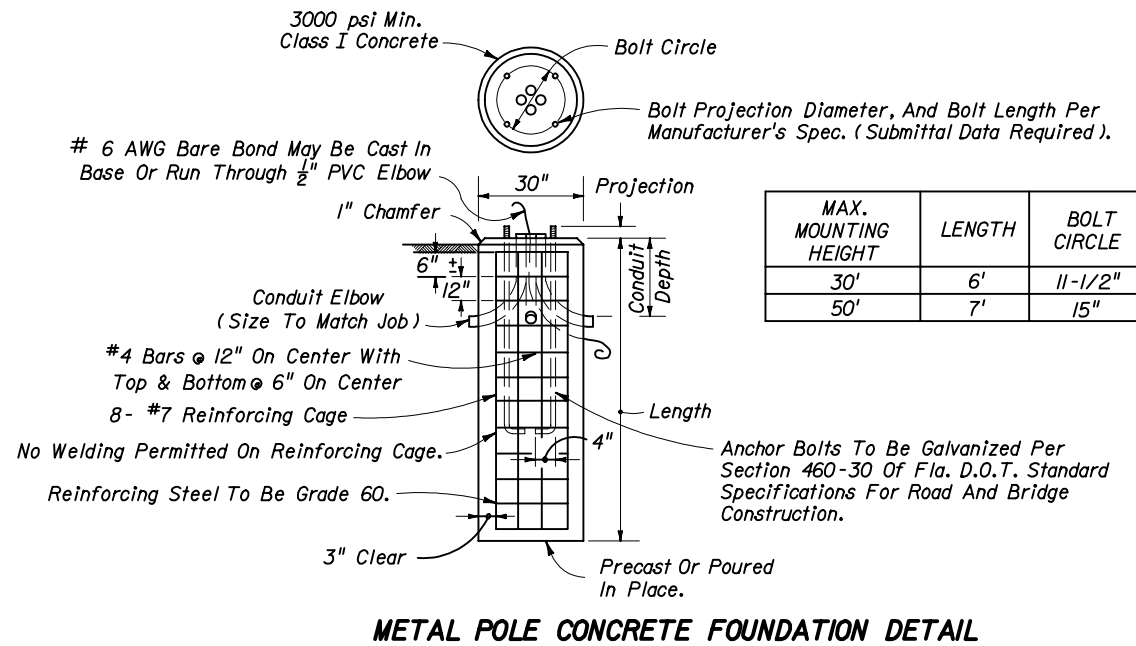
1. Use clean free draining sand < 5% passing No. 200 sieve for base (4").
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete strength at 28 days shall be $f'c=3$ ksi.
4. Outside edges of slab shall be cast against formwork.

5. The 1/2" thick expansion joint between shaft and slab shall be sealed with a hot poured elastic joint sealer.
6. Concrete slabs around poles and pull boxes shall be paid for under the contract unit price for Class I Concrete (Miscellaneous); the cost for reinforcing steel fabric shall be included in the price for Class I Concrete (Miscellaneous).
7. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.

SLAB DETAILS

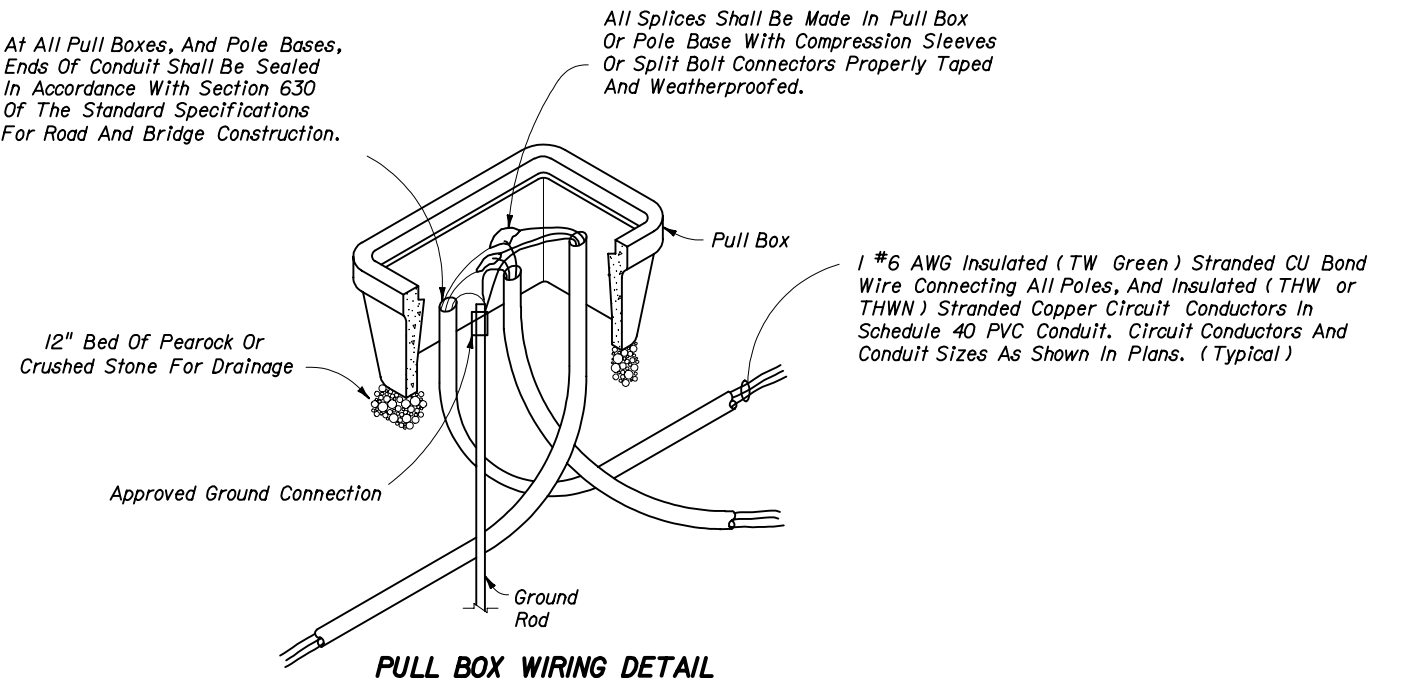
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
HIGHMAST LIGHTING				
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Foundations apply only to slopes of 1:4 or flatter.



At All Pull Boxes, And Pole Bases, Ends Of Conduit Shall Be Sealed In Accordance With Section 630 Of The Standard Specifications For Road And Bridge Construction.

All Splices Shall Be Made In Pull Box Or Pole Base With Compression Sleeves Or Split Bolt Connectors Properly Taped And Weatherproofed.



NOTE

Foundation design 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)

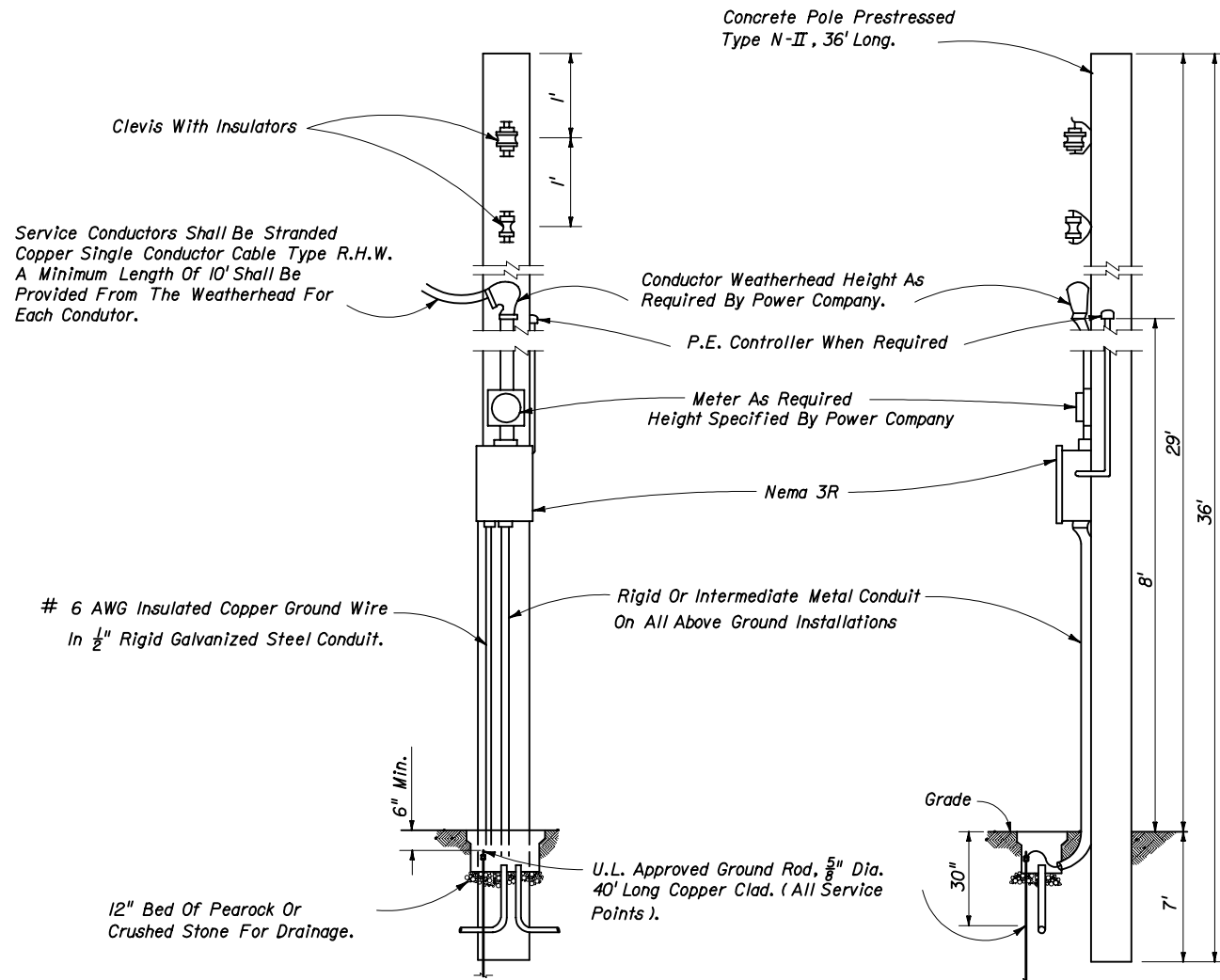
Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, STP borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single 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. In any event, only the soil identification is required.

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ROADWAY LIGHTING DETAILS

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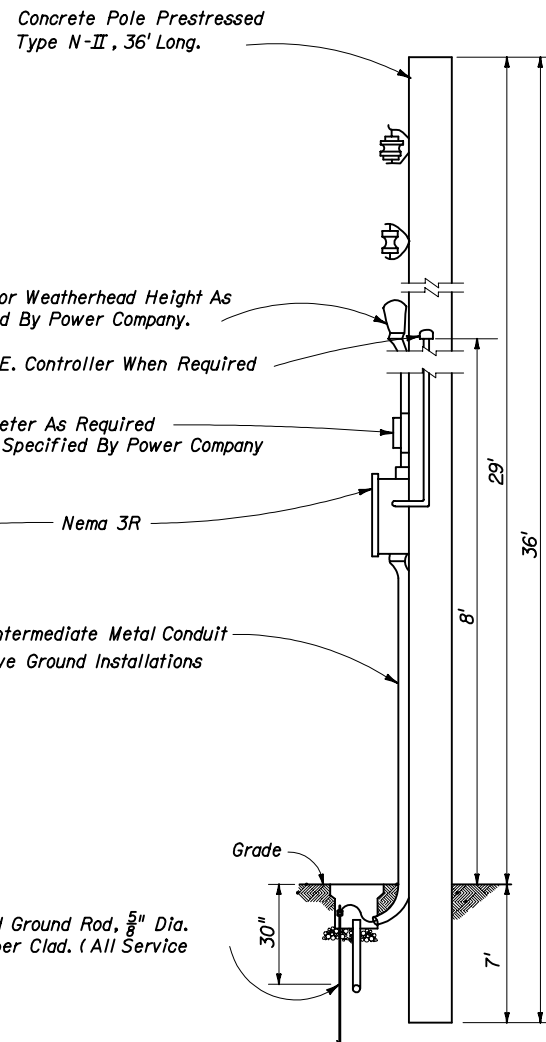
NOTE :
 It shall be the contractors responsibility to provide a complete service assembly as per the plans and service specifications. The service installation shall meet the requirements of the national electric code and applicable local codes. Shop drawings are not required for service equipment, unless noted in the plans.



DETAIL A
AERIAL FEED

Notes:

1. Photo electric control as required.
2. All neutral wires to have white insulation, do not use white or green insulated wires for ungrounded conductors.
3. A pull box is required at each service point.

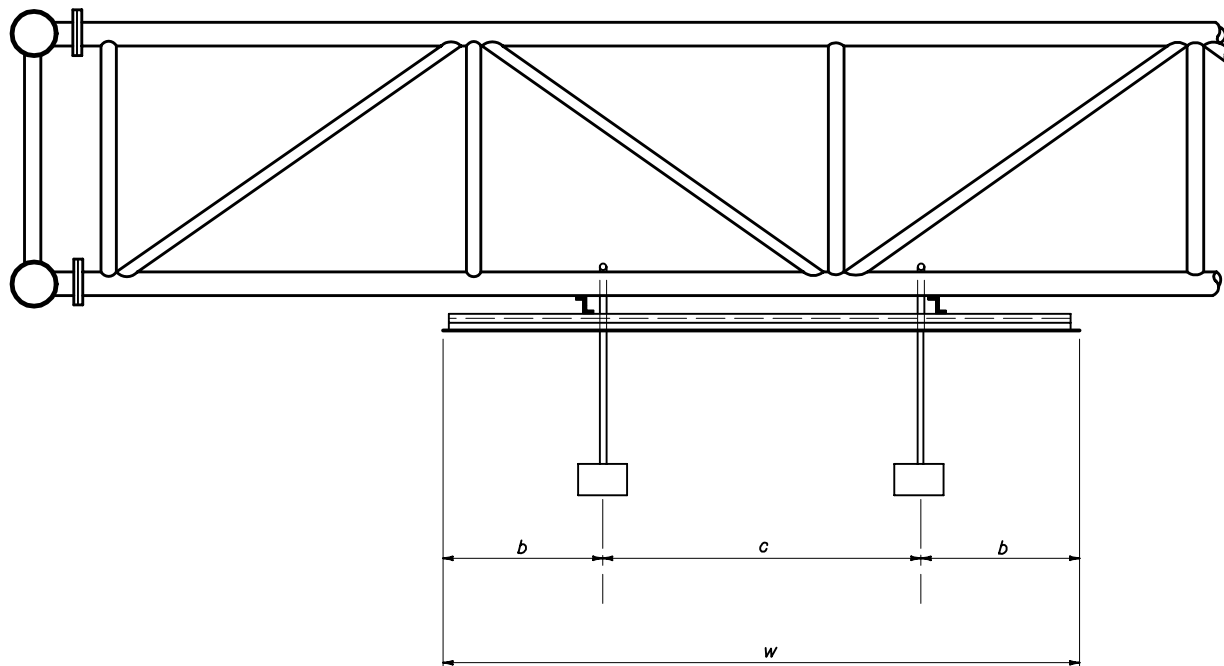


DETAIL B
UNDERGROUND FEED

SERVICE SPECIFICATIONS

1. The enclosure shall be NEMA 3R, pole mounted, rain-tight.
2. The enclosure door shall be lockable by padlock and four keys provided to the maintaining agency. The door shall have a minimum of three hinges and be latchable. No screws to be used to attach door.
3. 480 V minimum rating bolt-in type breakers shall be used.
4. Busbar to be copper coated and have a minimum rating of 100 amps. When main breaker exceeds 100 amps busbar to match breaker amperage.
5. Locate contactor, transformer, and H.O.A. switch inside enclosure. The enclosure to be sized to accommodate as many breakers as called for and all other service equipment.
6. The Enclosure to be rigidly attached to the pole face.
7. A 600 V lightning protector shall be wired inside the enclosure.
8. A main breaker is required in all service panels with 2 or more feeder breakers.
9. All service equipment shall be U.L. approved.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
SERVICE POINT DETAILS				
Designed By	Names	Dates	Approved By	
Drawn By		8-78	<i>Charles A. Smith</i> State Traffic Standards Engineer	
Checked By			Revision	Sheet No. Index No.
			02	1 of 1 17504



SIGN LIGHTING INSTALLATION

Roadway Lighting included in contract:

The power for the sign lighting shall be provided from the roadway lighting circuit. The lighting plans shall indicate the sign location and a pull-box location for connection to the sign lights. The lighting contractor shall install pull-box and loop 2' of lighting circuit conductors in the pull-box for connection by the signing contractor

The signing contractor shall furnish and install luminaires, Nema 3R enclosure, 30 amp breaker, conduit, conductors and all other electrical equipment necessary for connection to the lighting circuit.

Roadway Lighting not included in contract:

The signing plans shall include pay item numbers to furnish and install conduit, conductors, ground rods, pull-boxes and service point equipment. The signing plans shall indicate the location of the service point equipment and circuit runs. The signing contractor shall provide all electrical equipment necessary for connection of the sign lights.

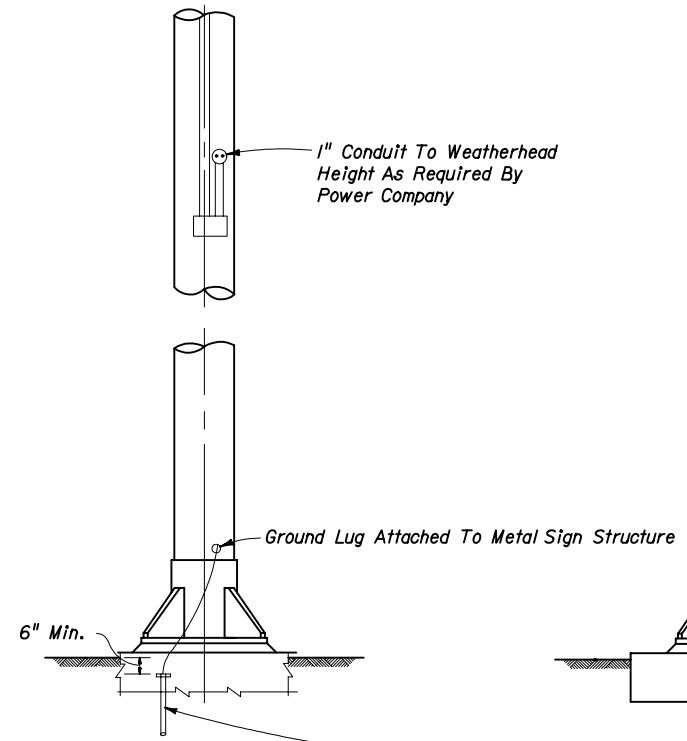
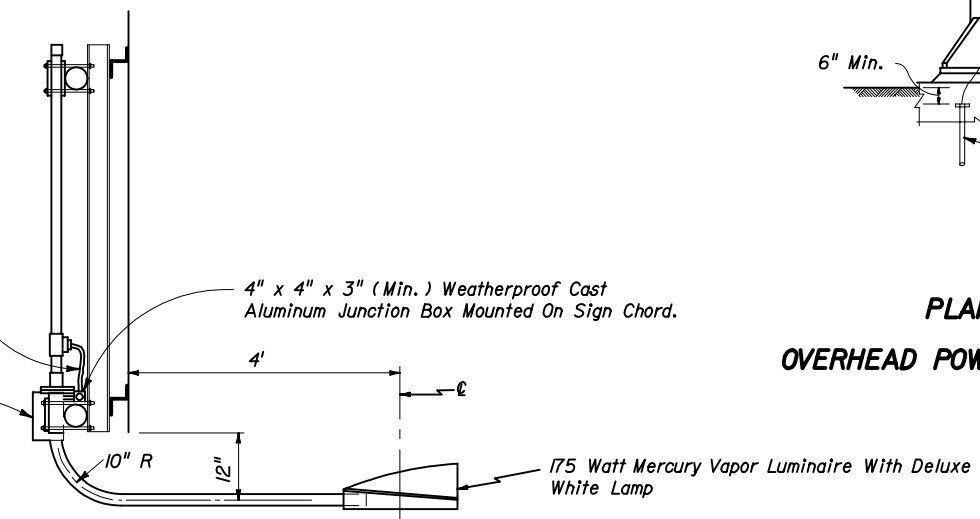
WIDTH OF SIGN FACE	To 10'	To 21'-6"	To 32'-6"	To 43'-4"
NUMBER OF FIXTURES	ONE	TWO	THREE	FOUR
EQUATIONS FOR PLACING FIXTURES ALONG SIGN WIDTH	$W = 2b$ $c = 0$	$W = 2b + c$ $c = 2.2b$	$W = 2b + 2c$ $c = 2.2b$	$W = 2b + 3c$ $c = 2.2b$

PLACEMENT OF SIGN LIGHTS

- 1- Luminaire shall be mounted so the lamp center is 4' in front of the sign face.
- 2- Luminaire shall be mounted so the back of the fixture is placed 1' below the bottom edge of the sign face.
- 3- Luminaires from manufacturers who recommended their fixture be tilted shall be mounted on a bracket which provides this recommended tilt.
- 4- Photometric data for mercury vapor luminaire proposed for sign lighting shall be submitted for approval to the District Lighting Engineer, Florida Department Of Transportation.

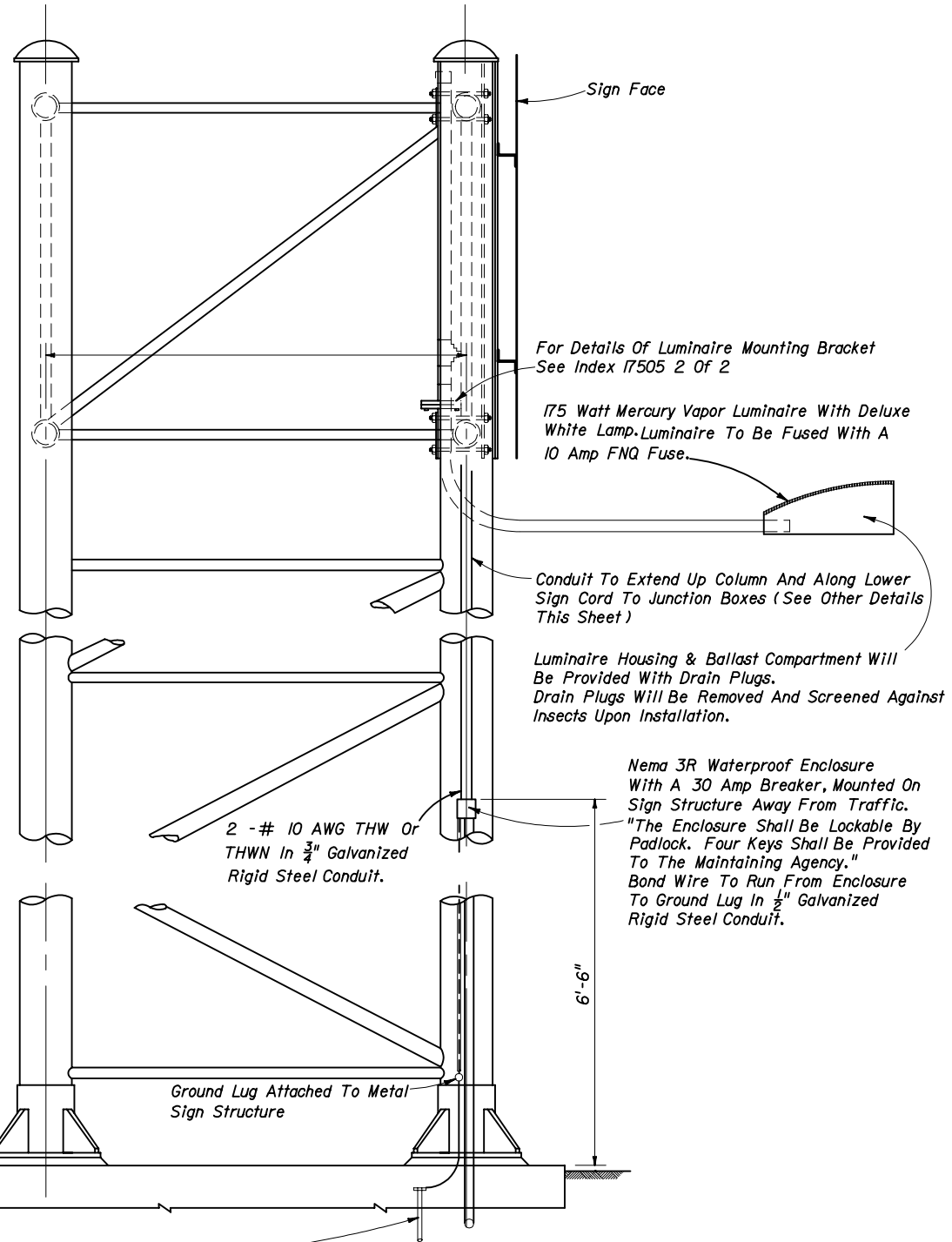
Use 3/4" Liquid Tight Flexible Conduit From Junction Box To Ballast And From Junction Box To Tee In Luminaire Bracket. Conduit Shall Be Of Sufficient Length To Allow Rotation Of Luminaire Bracket 90° In Either Direction.

Ballast Shall Be Mounted To Sign Chord With Stainless Steel Band. Bracket For Ballast To Be Fabricated From Galvanized Steel Plate For Steel Sign Structures And Aluminum Plate For Aluminum Sign Structures. (Submittal Data Required)

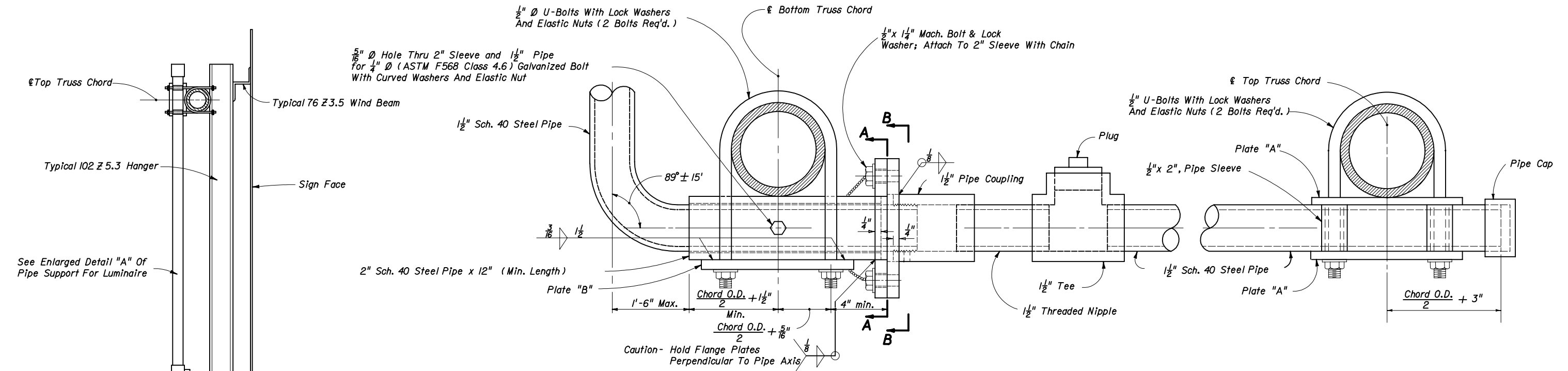


PLAN OVERHEAD POWER SUPPLY

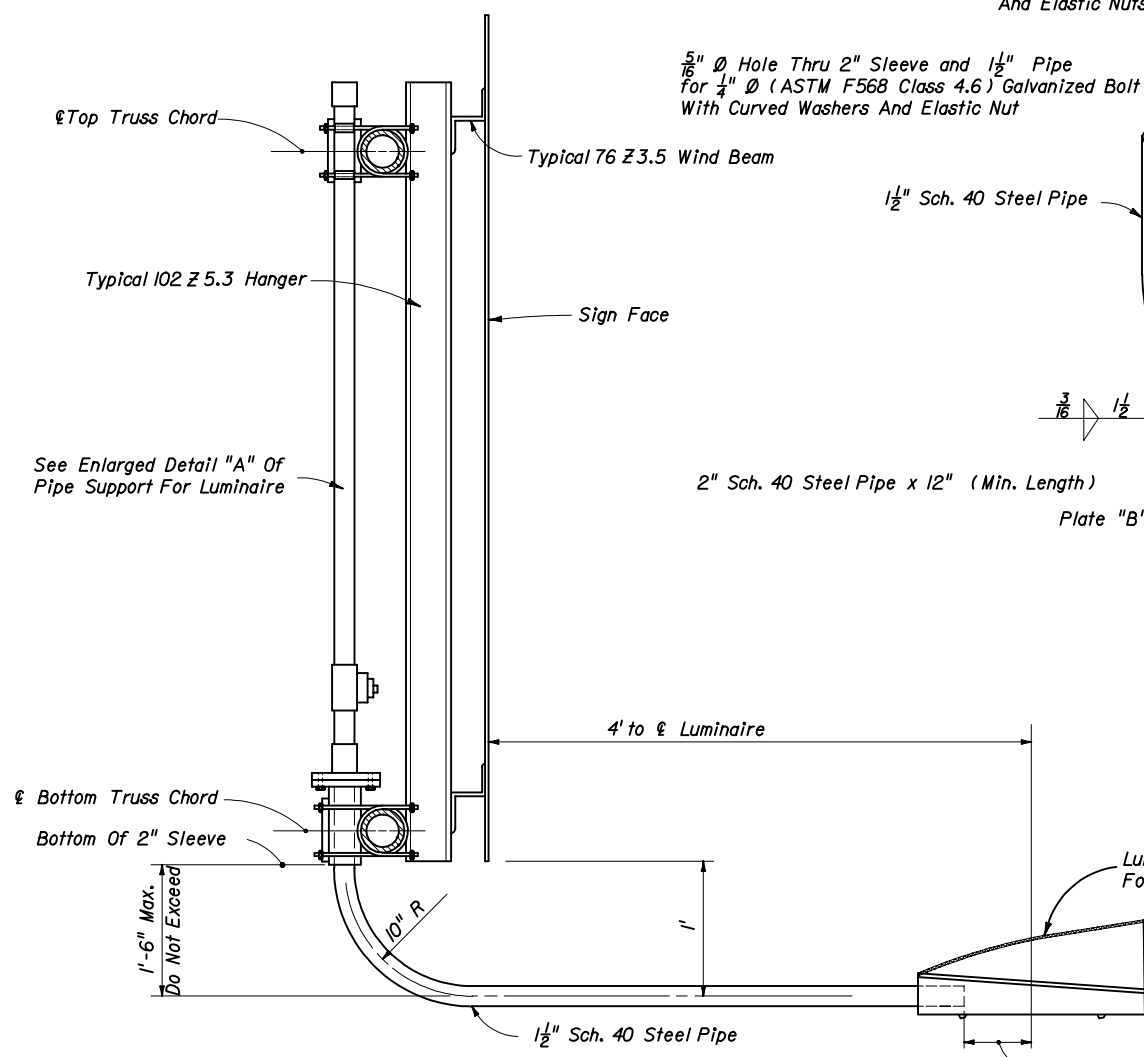
U.L. Approved Ground Rod 5/8" x 20' Copper Clad With Approved Ground Connection To Be Placed In Pull Box For Inspection Purposes. Splices To Be Made With Compression Sleeves Then Properly Insulated & waterproofed



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
EXTERNAL LIGHTING FOR SIGN (MERCURY VAPOR)				
Names	Dates	Approved By		
Designed By		<i>C. Kirk A. Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		02	1 of 2	17505



DETAIL "A"



SECTION THROUGH SIGN SUPPORT AT LUMINAIRE

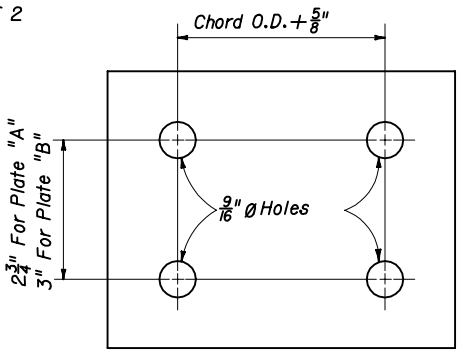
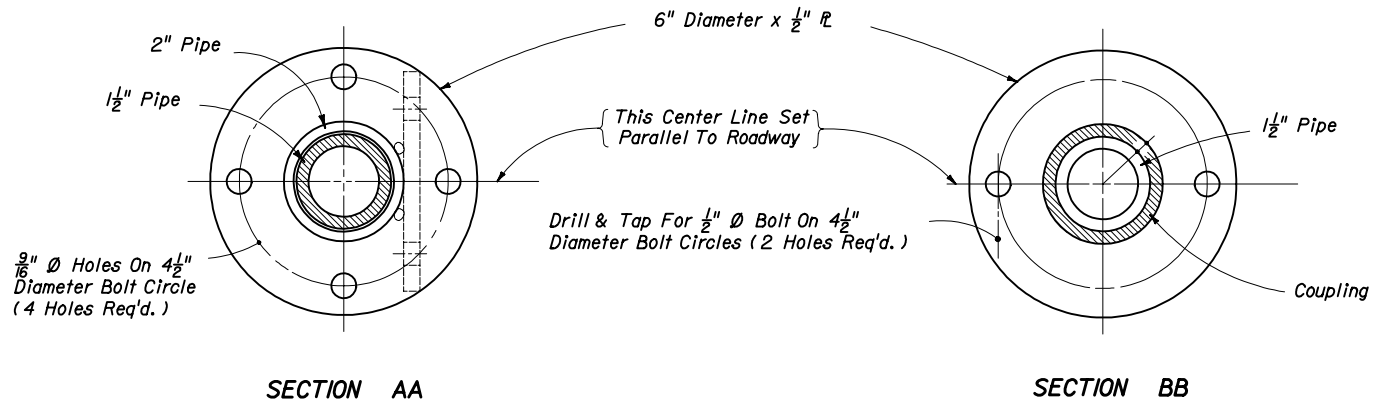


Plate "A": $\frac{1}{4} \times 4\frac{3}{4} \times \text{Chord O.D.} + 2\frac{1}{2}$
 Plate "B": $\frac{3}{8} \times 5 \times \text{Chord O.D.} + 2\frac{1}{2}$

NOTES

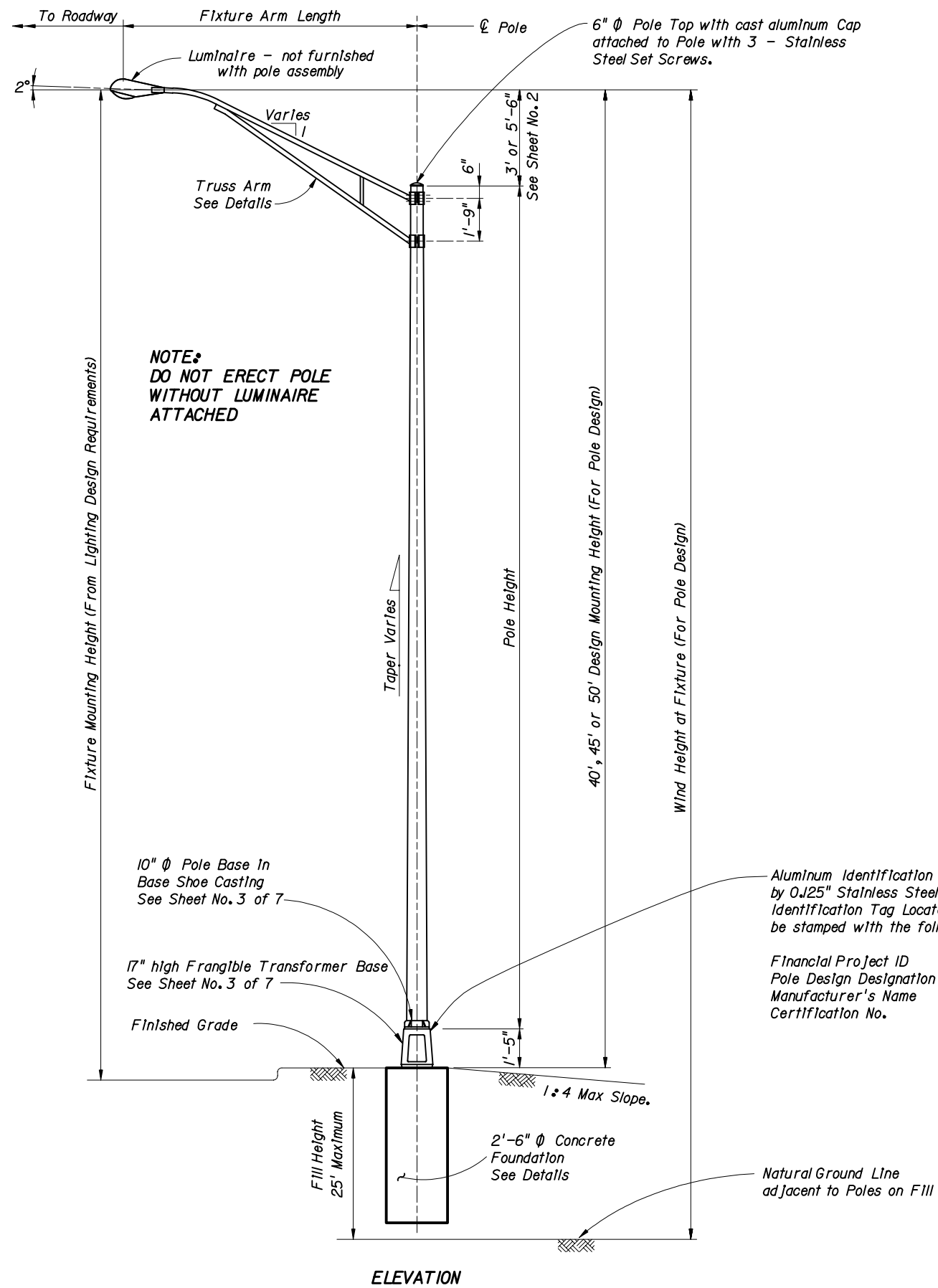
- 1- Dimension "A" to be established by type and make of luminaire to be purchased and used on the project.
- 2- The center lines of both flange plates and the luminaire support arm are to be set parallel to the roadway before the set screw is seated.
- 3- Minor adjustments in the horizontal location of the luminaire support arm along the bottom chord of the truss will be allowed so that the flange plates will clear the truss web members.
- 4- All steel pipe shall meet the strength requirements of ASTM Specification A53 Grade "A" or Grade "B". Steel plates shall meet the requirements of A36 and bolts, nuts and washers shall meet the requirements of ASTM F568 Class 4.6.
- 5- All items shall be hot dip galvanized after fabrication in accordance with the requirements of ASTM A123 and /or A153.
- 6- Luminaire support arm shall be free to rotate in a clockwise or counter clockwise direction. When service or maintenance is required for sign face or vertical face of truss; Support arm shall be capable of being locked in a position 90° from parallel to the roadway for unobstructed working clearance.



SECTION AA

SECTION BB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
EXTERNAL LIGHTING FOR SIGNS (MERCURY VAPOR)				
Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Standards Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	2 of 2	17505
Checked By				



NOTE:
DO NOT ERECT POLE
WITHOUT LUMINAIRE
ATTACHED

ALUMINUM LIGHT POLE NOTES

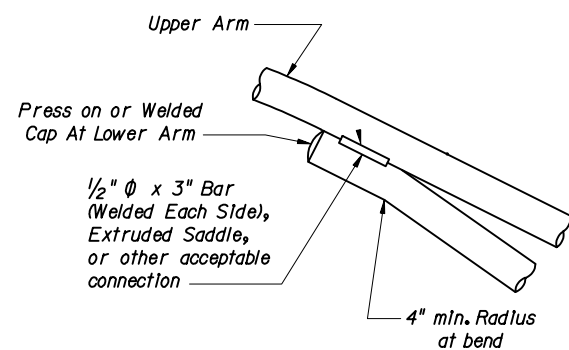
1. Light Pole Materials shall be as follows:
 - Poles → ASTM B221 - ALLOY 6063-T6
 - Arm Tube Extrusions → ASTM B221 - ALLOY 6063-T6
 - Pole Connection Extrusions, Bars and Plates → ASTM B221 - ALLOY 6061-T6
 - Shoe Base Casting → ASTM B26 - ALLOY 356-T6 or ASTM B108 - ALLOY 356-T6
 - Aluminum Caps and Covers → ASTM B26
 - Frangible Transformer Base Casting → ASTM B26 - ALLOY 356-T6 or ASTM B108 - ALLOY 356-T6
 - Weld Metal → ER4043
 - Anchor Bolts → ASTM F1554 Grade 55
 - Shoe Base Connection Bolts → ASTM A325 Type 1
 - Nuts for Connection Bolts and Anchor Bolts → ASTM A563 Grade DH
 - Washers for Connection Bolts and Anchor Bolts → ASTM F436 Type 1
 - Stainless Steel Fasteners and Hardware → A.I.S.I. Grade 304
2. Aluminum alloy 6063 is to be furnished in T4 condition and heat treated in accordance with ASTM B597
3. Shoe Base Connection Bolts, Anchor Bolts, Nuts and Washers shall be galvanized in accordance with ASTM A153. Lock Washers shall galvanized in accordance with ASTM B695 Class 50
4. Foundation concrete shall be Class I (Special) with a minimum 28-day Compressive Strength (f'c) of 3,000 psi for all environmental classifications.
5. Reinforcing Steel shall be ASTM A615-96 Grade 60.
6. A design wind speed of 80 or 100 mph with a 30% gust factor for wind loading on the pole is included in the design.
7. The pole shall be tapered as required to provide a top outside diameter (O.D.) of 6" with a base O.D. of 10". Portions of the shaft near the base shoe and at the arm connections may be held constant at 10" and 6" respectively to simplify fabrication.
8. The pole shall be free of transverse welds except at the base.
9. Poles constructed out of two or more sections with overlapping splices are not permitted.
10. All welding shall conform to American Welding Society Structural Welding Code (Aluminum) ANSI/AWS D1.2 (current edition).
11. See Standard Index No. 17500 for grounding and wiring details.
12. The pole and arms shall be furnished with a 50 grit satin rubbed finish.
13. All designs to be in accordance with the 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.
14. All Light Poles within 5 miles of the coastline shall be equipped with a damping device. Information, details and performance data on the damping device shall be included with the Manufacturer's Qualified Products List (QPL) application.
15. The manufacturer's Qualified Product List (QPL) application shall include test reports certifying that the Arm, Pole and Base Connection components, including the breakaway transformer base, are capable of resisting the forces (axial, shear, torsion, and moment, as applicable) shown in the data tables for the arm and pole.

Aluminum Identification Tag Not to Exceed 2" x 4". Secure to Transformer Base by 0.125" Stainless Steel rivets or screws. Fabricator to provide details for approval. Identification Tag Located on Inside of base visible from door opening. Tag to be stamped with the following information:

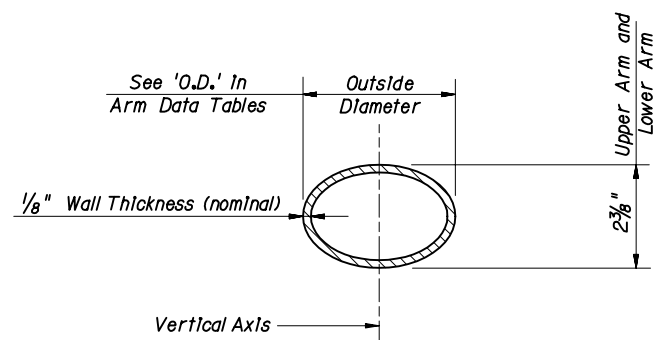
Financial Project ID
Pole Design Designation (i.e. Pole Pay Item Number)
Manufacturer's Name
Certification No.

ELEVATION AND NOTES

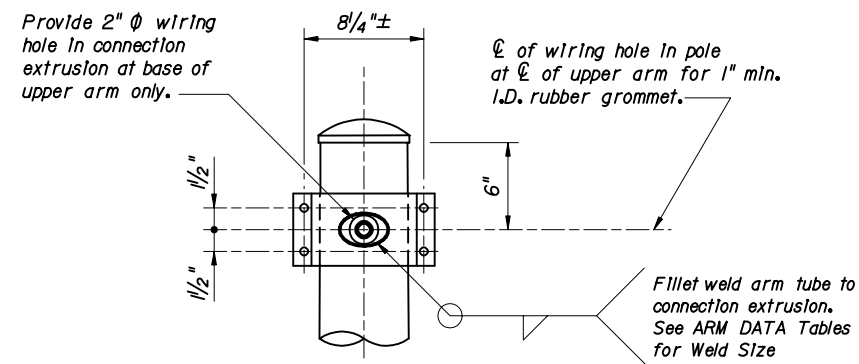
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ALUMINUM LIGHT POLE				
Designed By	AVP	6-01	Approved By	
Drawn By	REB	6-01	Revision	Sheet No.
Checked By	REN	6-01	04	1 of 7
				Index No. 17515



ARM CONNECTION DETAIL



ARM SECTION



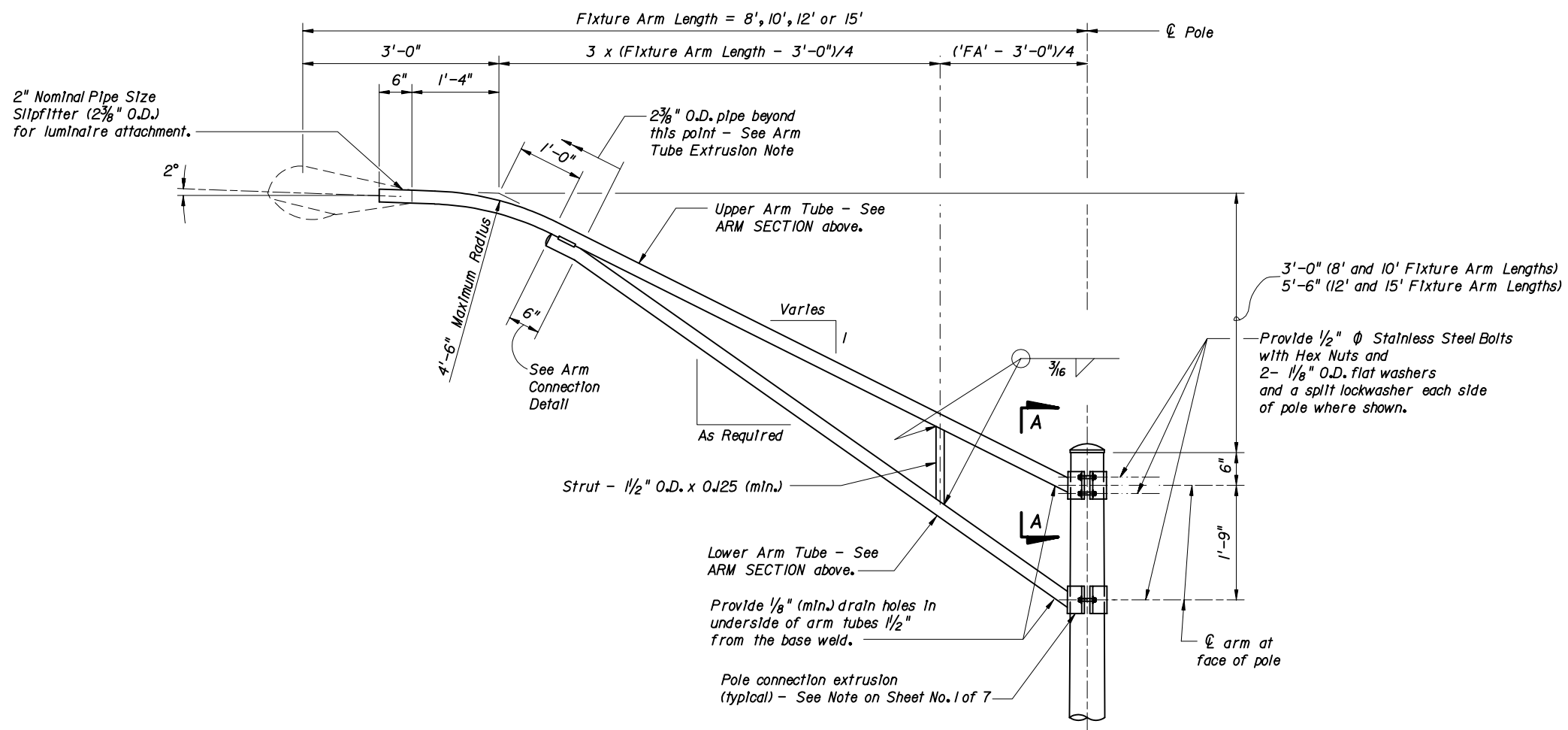
SECTION A-A
(Connection At Lower Arm Similar)

ARM TUBE EXTRUSIONS NOTES:

At the pole connections, provide arm tube extrusions with dimensions as shown in the ARM SECTION and as tabulated in the ARM DATA Tables. Uniformly transition elliptical extrusions to a cylindrical section at the arm connection.

The fabricator may substitute elliptical cross sections other than those tabulated, provided the section properties about the vertical axis and the area of the section equal or exceed that of the required section, and provided the wall thickness is a minimum of 1/8" nominal and within the Aluminum Association Tolerances.

The outside diameter about the minor axis should be held at 2 3/8" at the upper and lower arms.




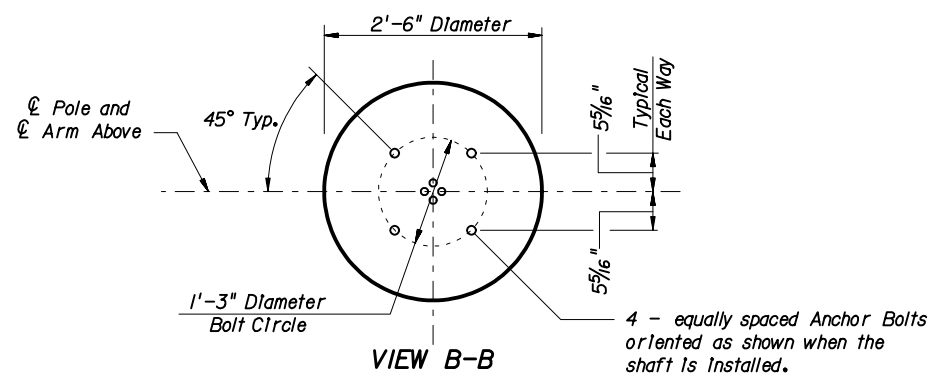
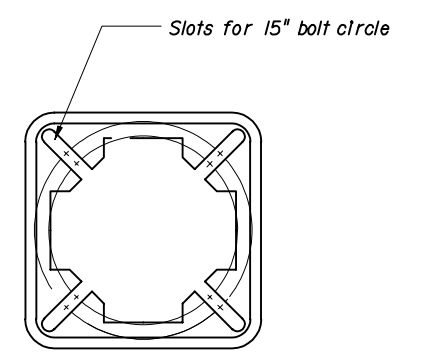
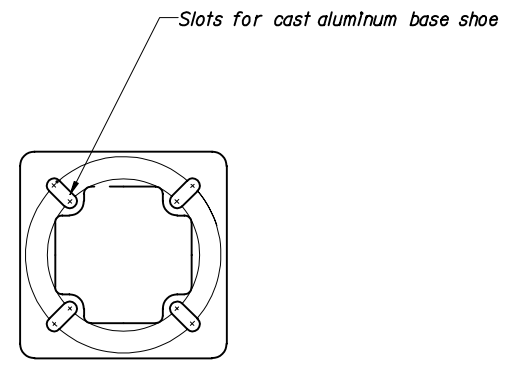
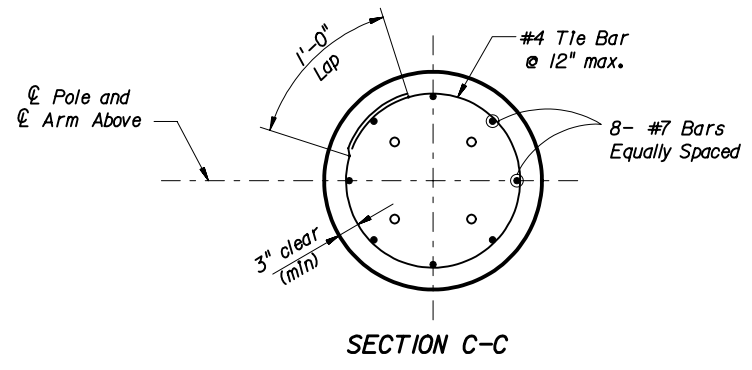
ARM ELEVATION

ARM DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ALUMINUM LIGHT POLE

Names		Dates	Approved By		
Designed By	AVP	6-01	 State Structures Design Engineer		
Drawn By	REB	6-01			
Checked By	REN	6-01	Revision	Sheet No.	Index No.
			04	2 of 7	17515

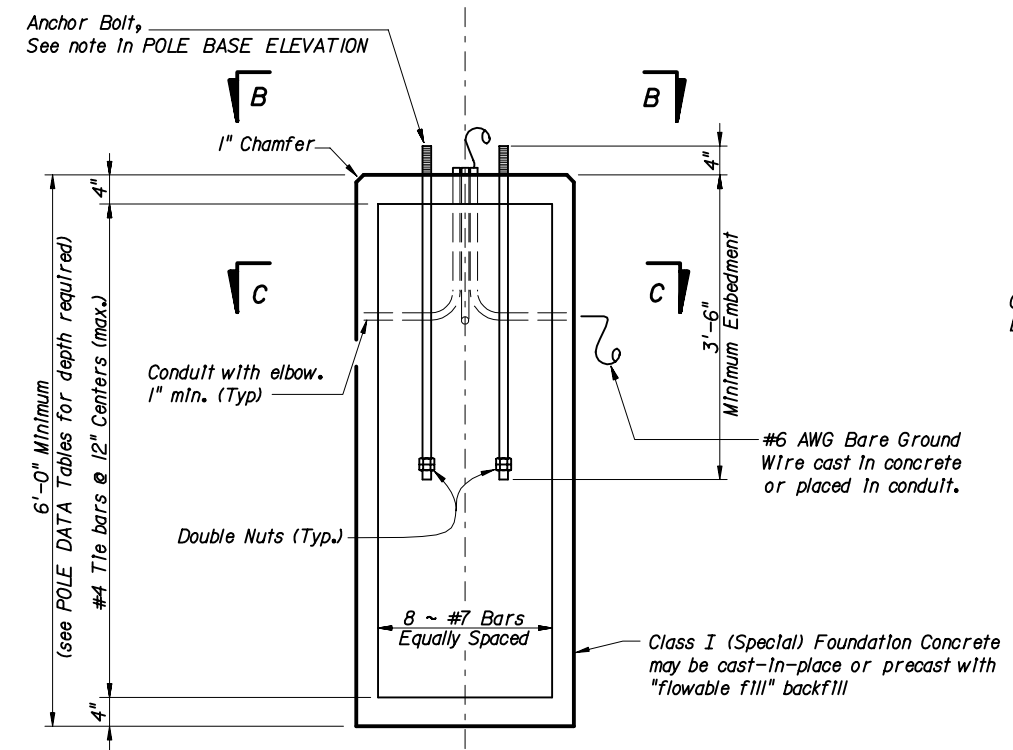


Cast aluminum pressure mounted nut cover - bolted attachment optional

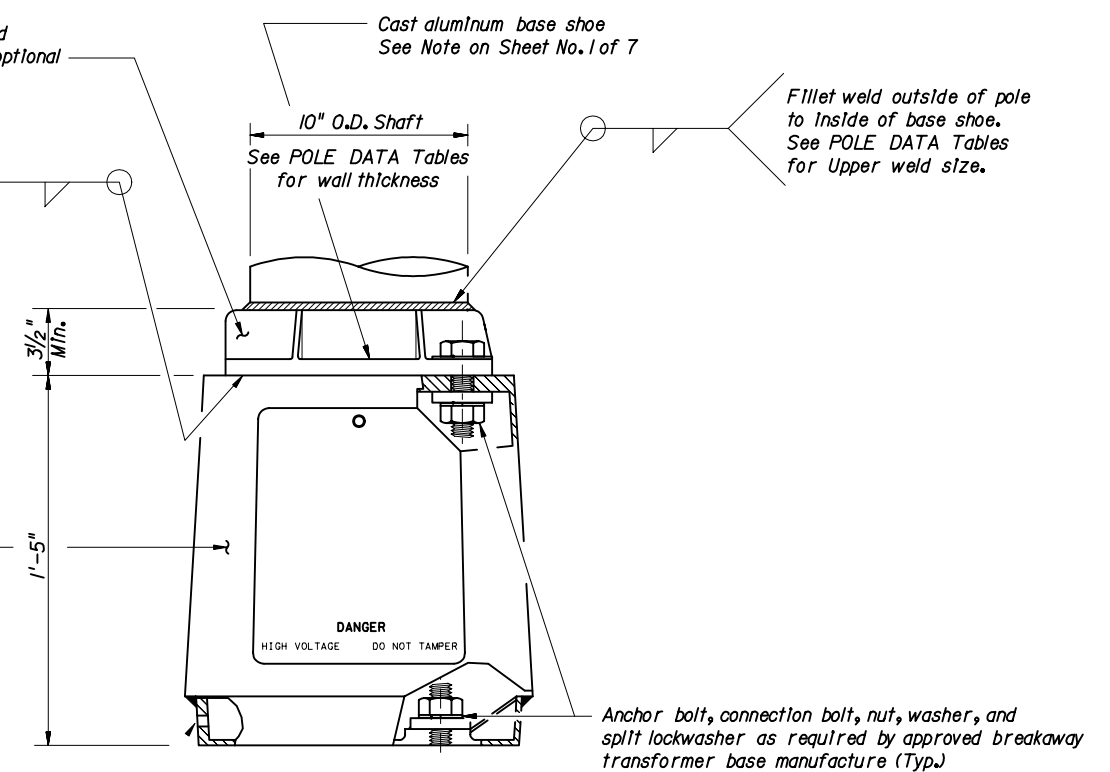
Fillet weld butt of pole to inside of base shoe. See POLE DATA Tables for Lower weld size.

Cast aluminum base shoe See Note on Sheet No. 1 of 7

Fillet weld outside of pole to inside of base shoe. See POLE DATA Tables for Upper weld size.



Cast aluminum breakaway transformer base. See Note on Sheet No. 1 of 7



Anchor bolt, connection bolt, nut, washer, and split lockwasher as required by approved breakaway transformer base manufacture (Typ.)

FOUNDATION NOTES:
 The foundations for Aluminum Light Poles are pre-designed and are 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) for poles on fill ≤ 6 feet.
 Unit Weight = 112 lbs./cu. ft. (assumed dry) for poles on fill > 6 feet.
 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. In any event, only the soil identification is required.

BASE DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ALUMINUM LIGHT POLE				
Designed By	AVP	6-01	Approved By <i>[Signature]</i> State Structures Design Engineer	
Drawn By	REB	6-01	Revision	Sheet No. Index No.
Checked By	REN	6-01	04	3 of 7 17515

8 FT. ARM DATA												
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	UPPER ARM					LOWER ARM				
			O.D. (IN.)	WELD (IN.)	MOMENT (FT.KIP)	SHEAR (KIP)	N * (KIP)	O.D. (IN.)	WELD (IN.)	MOMENT (FT.KIP)	SHEAR (KIP)	N * (KIP)
1	40	80	2.375	0.250	0.392	0.100	0.162	2.375	0.188	0.218	0.056	0.090
2	40	100	3.625	0.250	0.755	0.178	0.212	2.375	0.188	0.152	0.036	0.043
3	45	80	2.375	0.250	0.392	0.100	0.162	2.375	0.188	0.218	0.056	0.090
4	45	100	3.625	0.250	0.755	0.178	0.212	2.375	0.188	0.152	0.036	0.043
5	50	80	2.375	0.250	0.424	0.104	0.162	2.375	0.250	0.236	0.058	0.090
6	50	100	3.625	0.250	0.819	0.186	0.212	2.375	0.188	0.165	0.037	0.043
7	55	100	3.625	0.250	0.857	0.200	0.212	2.375	0.188	0.173	0.040	0.043
8	60	100	3.625	0.250	0.857	0.200	0.212	2.375	0.188	0.173	0.040	0.043
9	65	100	3.625	0.250	0.857	0.200	0.212	2.375	0.188	0.173	0.040	0.043
10	70	100	3.625	0.250	0.857	0.200	0.212	2.375	0.188	0.173	0.040	0.043
11	75	100	3.625	0.250	0.857	0.200	0.212	2.375	0.188	0.173	0.040	0.043

10 FT. ARM DATA												
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	UPPER ARM					LOWER ARM				
			O.D. (IN.)	WELD (IN.)	MOMENT (FT.KIP)	SHEAR (KIP)	N * (KIP)	O.D. (IN.)	WELD (IN.)	MOMENT (FT.KIP)	SHEAR (KIP)	N * (KIP)
1	40	80	3.625	0.188	0.669	0.134	0.269	2.375	0.188	0.150	0.030	0.060
2	40	100	3.625	0.188	0.651	0.118	0.182	3.625	0.188	0.556	0.101	0.155
3	45	80	3.625	0.188	0.669	0.134	0.269	2.375	0.188	0.150	0.030	0.060
4	45	100	3.625	0.188	0.651	0.118	0.182	3.625	0.188	0.556	0.101	0.155
5	50	80	3.625	0.250	0.720	0.138	0.269	2.375	0.188	0.161	0.031	0.060
6	50	100	3.625	0.250	0.703	0.123	0.182	3.625	0.250	0.601	0.105	0.155
7	55	100	3.625	0.250	0.739	0.133	0.182	3.625	0.250	0.632	0.114	0.155
8	60	100	3.625	0.250	0.739	0.133	0.182	3.625	0.250	0.632	0.114	0.155
9	65	100	3.625	0.250	0.739	0.133	0.182	3.625	0.250	0.632	0.114	0.155
10	70	100	3.625	0.250	0.739	0.133	0.182	3.625	0.250	0.632	0.114	0.155
11	75	100	3.625	0.250	0.739	0.133	0.182	3.625	0.250	0.632	0.114	0.155


12 FT. ARM DATA												
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	UPPER ARM					LOWER ARM				
			O.D. (IN.)	WELD (IN.)	MOMENT (FT.KIP)	SHEAR (KIP)	N * (KIP)	O.D. (IN.)	WELD (IN.)	MOMENT (FT.KIP)	SHEAR (KIP)	N * (KIP)
1	40	80	3.625	0.188	0.593	0.099	0.235	3.625	0.188	0.486	0.081	0.192
2	40	100	4.625	0.250	1.150	0.179	0.299	3.625	0.188	0.518	0.081	0.135
3	45	80	3.625	0.188	0.593	0.099	0.235	3.625	0.188	0.486	0.081	0.192
4	45	100	4.625	0.250	1.150	0.179	0.299	3.625	0.188	0.518	0.081	0.135
5	50	80	3.625	0.188	0.634	0.102	0.235	3.625	0.188	0.520	0.084	0.192
6	50	100	4.625	0.250	1.230	0.185	0.299	3.625	0.188	0.554	0.084	0.135
7	55	100	4.625	0.313	1.300	0.201	0.299	3.625	0.250	0.588	0.091	0.135
8	60	100	4.625	0.313	1.300	0.201	0.299	3.625	0.250	0.588	0.091	0.135
9	65	100	4.625	0.313	1.300	0.201	0.299	3.625	0.250	0.588	0.091	0.135
10	70	100	4.625	0.313	1.300	0.201	0.299	3.625	0.250	0.588	0.091	0.135
11	75	100	4.625	0.313	1.300	0.201	0.299	3.625	0.250	0.588	0.091	0.135

15 FT. ARM DATA												
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	UPPER ARM					LOWER ARM				
			O.D. (IN.)	WELD (IN.)	MOMENT (FT.KIP)	SHEAR (KIP)	N * (KIP)	O.D. (IN.)	WELD (IN.)	MOMENT (FT.KIP)	SHEAR (KIP)	N * (KIP)
1	40	80	4.625	0.250	1.02	0.137	0.388	3.625	0.188	0.484	0.065	0.184
2	40	100	4.625	0.250	1.15	0.145	0.293	4.625	0.250	1.170	0.146	0.296
3	45	80	4.625	0.250	1.02	0.137	0.388	3.625	0.188	0.484	0.065	0.184
4	45	100	4.625	0.250	1.15	0.145	0.293	4.625	0.250	1.170	0.146	0.296
5	50	80	4.625	0.250	1.09	0.140	0.388	3.625	0.188	0.514	0.066	0.184
6	50	100	4.625	0.250	1.23	0.149	0.293	4.625	0.313	1.240	0.151	0.296
7	55	100	4.625	0.313	1.31	0.162	0.293	4.625	0.313	1.330	0.164	0.296
8	60	100	4.625	0.313	1.31	0.162	0.293	4.625	0.313	1.330	0.164	0.296
9	65	100	4.625	0.313	1.31	0.162	0.293	4.625	0.313	1.330	0.164	0.296
10	70	100	4.625	0.313	1.31	0.162	0.293	4.625	0.313	1.330	0.164	0.296
11	75	100	4.625	0.313	1.31	0.162	0.293	4.625	0.313	1.330	0.164	0.296

Note:
 All tables were developed assuming the following Luminaire properties:
 Area = 1.5 ft² (Includes wind drag coefficient)
 Weight = 51 pounds

* 'N' equals force normal to face of connection due to axial force in the arm - tension upper arm - compression lower arm.

ARM DATA

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
ALUMINUM LIGHT POLE				
Designed By	AVP	6-01	Approved By 	
Drawn By	REB	6-01	State Structures Design Engineer	
Checked By	REN	6-01	Revision	Sheet No. Index No.
			04	4 of 7 17515

DATA FOR POLE WITH 8 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	40	80	0.156	0.188	0.156	13.5	0.522	0.611	0.227	6
2	40	100	0.156	0.188	0.156	17.6	0.690	0.907	0.229	7
3	45	80	0.156	0.188	0.156	13.8	0.539	0.611	0.227	6
4	45	100	0.156	0.188	0.156	18.0	0.713	0.907	0.229	7
5	50	80	0.156	0.188	0.156	14.3	0.563	0.660	0.227	6
6	50	100	0.156	0.188	0.156	18.6	0.747	0.985	0.229	6
7	55	100	0.156	0.188	0.156	19.7	0.790	1.030	0.229	6
8	60	100	0.188	0.188	0.188	20.1	0.805	1.030	0.261	6
9	65	100	0.188	0.188	0.188	20.4	0.825	1.030	0.261	6

DATA FOR POLE WITH 10 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	40	80	0.156	0.188	0.156	13.7	0.528	0.819	0.233	6
2	40	100	0.156	0.188	0.156	17.8	0.694	1.210	0.236	7
3	45	80	0.156	0.188	0.156	14.0	0.545	0.819	0.233	6
4	45	100	0.156	0.188	0.156	18.2	0.717	1.210	0.236	7
5	50	80	0.156	0.188	0.156	14.5	0.569	0.881	0.233	6
6	50	100	0.156	0.188	0.156	18.8	0.751	1.300	0.236	6
7	55	100	0.188	0.188	0.188	19.9	0.795	1.370	0.268	6
8	60	100	0.188	0.188	0.188	20.3	0.810	1.370	0.268	6
9	65	100	0.188	0.188	0.188	20.6	0.830	1.370	0.268	6

DATA FOR POLE WITH 12 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	40	80	0.156	0.188	0.156	13.1	0.514	1.08	0.232	6
2	40	100	0.156	0.188	0.156	17.9	0.699	1.66	0.235	7
3	45	80	0.156	0.188	0.156	13.4	0.530	1.08	0.232	6
4	45	100	0.156	0.188	0.156	18.2	0.721	1.66	0.235	7
5	50	80	0.156	0.188	0.156	13.8	0.553	1.15	0.232	6
6	50	100	0.156	0.188	0.156	18.9	0.753	1.78	0.235	6
7	55	100	0.188	0.188	0.188	19.9	0.796	1.89	0.265	6
8	60	100	0.188	0.188	0.188	20.4	0.814	1.89	0.265	6
9	65	100	0.188	0.188	0.188	20.7	0.832	1.89	0.265	6

DATA FOR POLE WITH 15 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	40	80	0.156	0.188	0.156	13.9	0.533	1.51	0.242	6
2	40	100	0.156	0.188	0.156	19.1	0.728	2.32	0.246	7
3	45	80	0.156	0.188	0.156	14.2	0.550	1.51	0.242	6
4	45	100	0.188	0.188	0.188	19.4	0.750	2.32	0.276	7
5	50	80	0.156	0.188	0.156	14.6	0.572	1.60	0.242	6
6	50	100	0.188	0.188	0.188	20.1	0.782	2.46	0.276	6
7	55	100	0.188	0.188	0.188	21.3	0.829	2.63	0.276	6
8	60	100	0.188	0.188	0.188	21.7	0.847	2.63	0.276	6
9	65	100	0.188	0.188	0.188	22.0	0.865	2.63	0.276	6

NOTES:

1. Pole wall thicknesses shown in the POLE DATA TABLES are nominals and shall be within the Aluminum Association Tolerances. Thicker walls are permitted and tapered walls may be used provided the minimum Aluminum Association thicknesses are not violated.

2. See sheet 3 of 7 for Foundation Notes.

POLE DATA - 40 FT. MOUNTING HEIGHT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

ALUMINUM LIGHT POLE

Designed By	AVP	6-01	Approved By			
Drawn By	REB	6-01	Revision	Sheet No.	Index No.	
Checked By	REN	6-01	04	5 of 7	17515	

DATA FOR POLE WITH 8 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	45	80	0.156	0.188	0.156	16.6	0.582	0.611	0.249	6
2	45	100	0.188	0.188	0.188	21.5	0.767	0.907	0.288	7
3	50	80	0.156	0.188	0.156	17.2	0.608	0.660	0.249	7
4	50	100	0.188	0.188	0.188	22.4	0.803	0.985	0.288	7
5	55	100	0.250	0.188	0.250	23.6	0.844	1.030	0.359	6
6	60	100	0.250	0.188	0.250	24.2	0.876	1.030	0.359	6
7	65	100	0.250	0.188	0.250	24.6	0.894	1.030	0.359	6
8	70	100	0.250	0.188	0.250	24.9	0.913	1.030	0.359	6

DATA FOR POLE WITH 10 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	45	80	0.156	0.188	0.156	16.9	0.588	0.819	0.255	7
2	45	100	0.188	0.188	0.188	21.8	0.771	1.210	0.294	7
3	50	80	0.156	0.188	0.156	17.5	0.614	0.881	0.255	7
4	50	100	0.250	0.188	0.250	22.6	0.807	1.300	0.366	7
5	55	100	0.250	0.188	0.250	23.9	0.849	1.370	0.366	6
6	60	100	0.250	0.188	0.250	24.4	0.881	1.370	0.366	6
7	65	100	0.250	0.188	0.250	24.8	0.899	1.370	0.366	6
8	70	100	0.250	0.188	0.250	25.2	0.917	1.370	0.366	6

DATA FOR POLE WITH 12 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	45	80	0.156	0.188	0.156	16.2	0.573	1.08	0.255	6
2	45	100	0.188	0.188	0.188	21.9	0.775	1.66	0.291	7
3	50	80	0.156	0.188	0.156	16.7	0.594	1.15	0.255	7
4	50	100	0.250	0.188	0.250	22.7	0.804	1.78	0.358	7
5	55	100	0.250	0.188	0.250	23.9	0.851	1.89	0.358	6
6	60	100	0.250	0.188	0.250	24.5	0.884	1.89	0.358	6
7	65	100	0.250	0.188	0.250	24.9	0.898	1.89	0.358	6
8	70	100	0.250	0.188	0.250	25.2	0.918	1.89	0.358	6

DATA FOR POLE WITH 15 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	45	80	0.156	0.188	0.156	17.1	0.592	1.51	0.264	7
2	45	100	0.250	0.188	0.250	23.2	0.804	2.32	0.370	7
3	50	80	0.156	0.188	0.156	17.6	0.613	1.60	0.264	7
4	50	100	0.250	0.188	0.250	24.0	0.833	2.46	0.370	7
5	55	100	0.250	0.188	0.250	25.4	0.885	2.63	0.370	6
6	60	100	0.250	0.250	0.250	26.0	0.918	2.63	0.370	6
7	65	100	0.250	0.250	0.250	26.4	0.931	2.63	0.370	6
8	70	100	0.250	0.250	0.250	26.7	0.952	2.63	0.370	6

NOTES:

1. Pole wall thicknesses shown in the POLE DATA TABLES are nominals and shall be within the Aluminum Association Tolerances. Thicker walls are permitted and tapered walls may be used provided the minimum Aluminum Association thicknesses are not violated.

2. See sheet 3 of 7 for Foundation Notes.

POLE DATA - 45 FT. MOUNTING HEIGHT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

ALUMINUM LIGHT POLE

Designed By	AVP	6-01	Approved By		
Drawn By	REB	6-01	Revision	Sheet No.	Index No.
Checked By	REN	6-01	04	6 of 7	17515

DATA FOR POLE WITH 8 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	50	80	0.188	0.188	0.188	20.4	0.650	0.660	0.312	7
2	50	100	0.250	0.250	0.250	26.4	0.856	0.985	0.394	8
3	55	100	0.250	0.250	0.250	27.9	0.899	1.030	0.394	8
4	60	100	0.250	0.250	0.250	28.5	0.930	1.030	0.394	6
5	65	100	0.250	0.250	0.250	29.1	0.965	1.030	0.394	6
6	70	100	0.250	0.250	0.250	29.5	0.981	1.030	0.394	6
7	75	100	0.250	0.250	0.250	29.8	0.998	1.030	0.394	6

DATA FOR POLE WITH 10 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	50	80	0.188	0.188	0.188	20.7	0.656	0.881	0.317	7
2	50	100	0.250	0.250	0.250	26.7	0.860	1.300	0.400	8
3	55	100	0.250	0.250	0.250	28.1	0.904	1.370	0.400	8
4	60	100	0.250	0.250	0.250	28.8	0.934	1.370	0.400	6
5	65	100	0.250	0.250	0.250	29.4	0.970	1.370	0.400	6
6	70	100	0.250	0.250	0.250	29.8	0.986	1.370	0.400	6
7	75	100	0.250	0.250	0.250	30.1	1.000	1.370	0.400	6

DATA FOR POLE WITH 12 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	50	80	0.188	0.188	0.188	19.9	0.640	1.15	0.315	7
2	50	100	0.250	0.250	0.250	26.8	0.863	1.78	0.393	8
3	55	100	0.250	0.250	0.250	28.2	0.906	1.89	0.393	8
4	60	100	0.250	0.250	0.250	28.8	0.935	1.89	0.393	6
5	65	100	0.250	0.250	0.250	29.5	0.972	1.89	0.393	6
6	70	100	0.250	0.250	0.250	29.9	0.987	1.89	0.393	6
7	75	100	0.250	0.250	0.250	30.1	1.000	1.89	0.393	6

DATA FOR POLE WITH 15 FT. ARM										
CASE NO.	WIND HEIGHT (FT.)	WIND SPEED (MPH)	POLE WALL (IN.)	UPPER WELD (IN.)	LOWER WELD (IN.)	BASE FORCES				FOUND. DEPTH (FT.)
						MOMENT (FT.KIP)	SHEAR (KIP)	TORSION (FT.KIP)	AXIAL (KIP)	
1	50	80	0.188	0.188	0.188	20.9	0.660	1.60	0.324	7
2	50	100	0.250	0.250	0.250	28.2	0.892	2.46	0.404	8
3	55	100	0.250	0.250	0.250	29.9	0.940	2.63	0.404	8
4	60	100	0.313	0.250	0.313	30.5	0.968	2.63	0.479	6
5	65	100	0.313	0.250	0.313	31.2	1.000	2.63	0.479	6
6	70	100	0.313	0.250	0.313	31.5	1.020	2.63	0.479	6
7	75	100	0.313	0.250	0.313	31.8	1.040	2.63	0.479	6

NOTES:

1. Pole wall thicknesses shown in the POLE DATA TABLES are nominals and shall be within the Aluminum Association Tolerances. Thicker walls are permitted and tapered walls may be used provided the minimum Aluminum Association thicknesses are not violated.

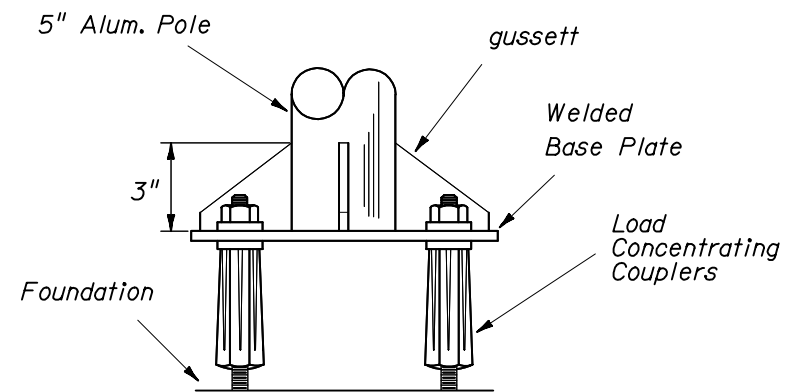
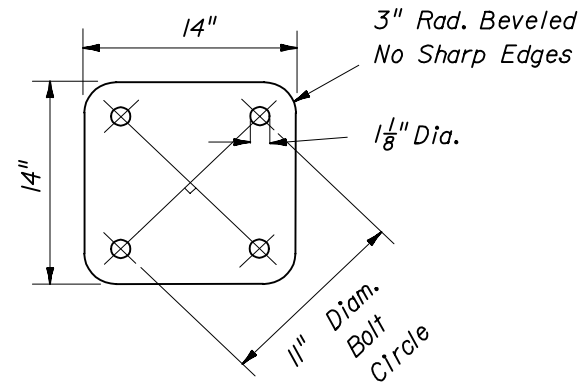
2. See sheet 3 of 7 for Foundation Notes.

POLE DATA - 50 FT. MOUNTING HEIGHT

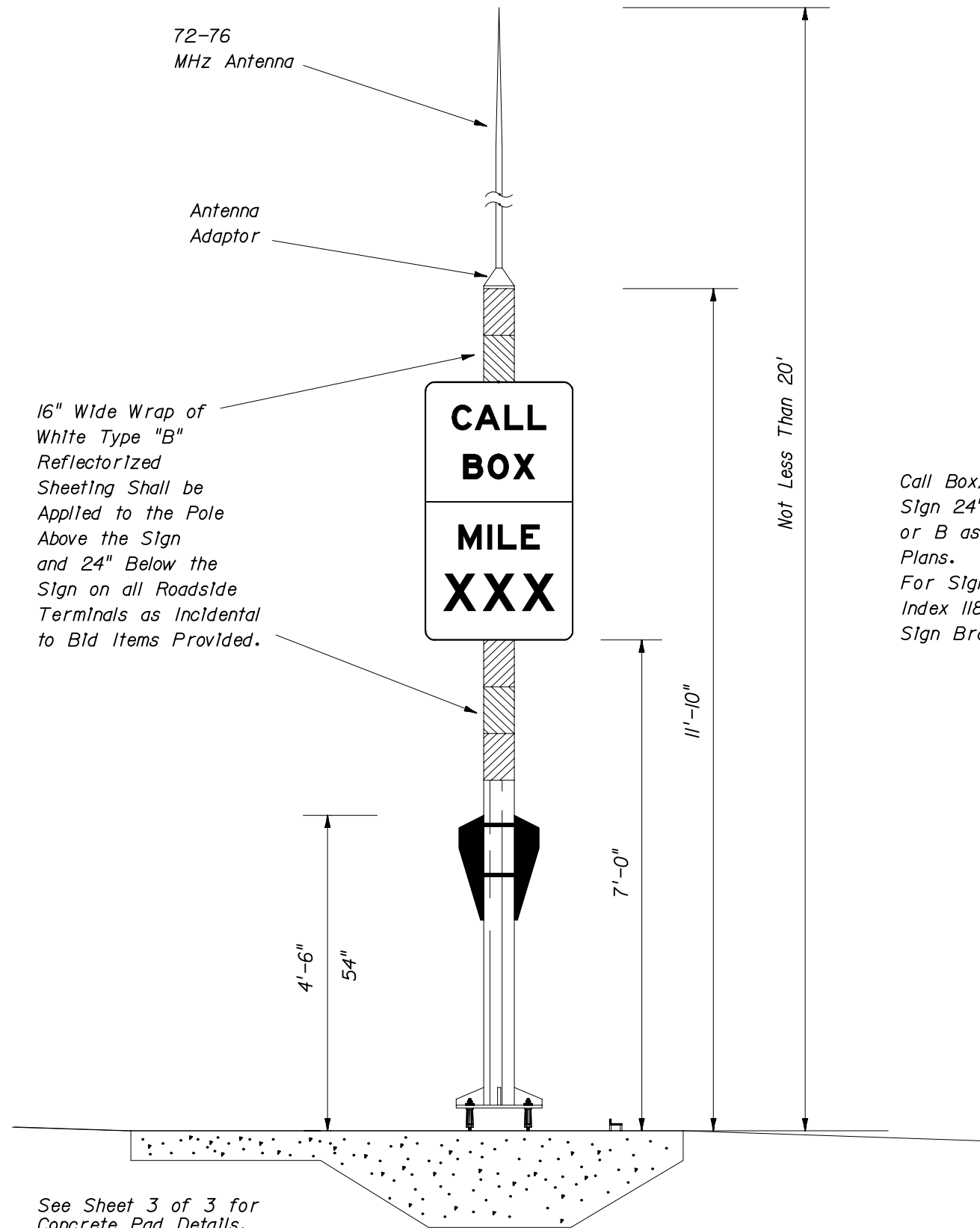
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

ALUMINUM LIGHT POLE

Designed By	AVP	6-01	Approved By		
Drawn By	REB	6-01	State Structures Design Engineer	Revision	Sheet No.
Checked By	REN	6-01	04	7 of 7	17515



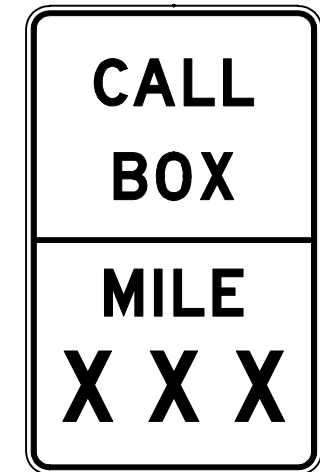
BASE PLATE & BOLT PATTERN



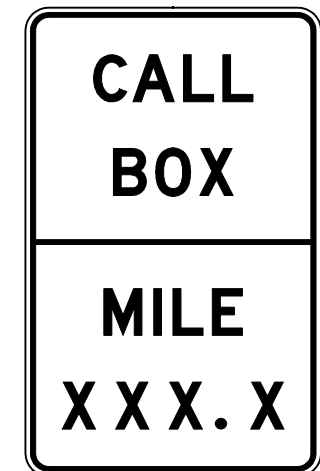
See Sheet 3 of 3 for Concrete Pad Details.

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 II Sign Bracket Details.



FTP-63-04
SIGN A



FTP-64-04
SIGN B

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MOTORIST AID CALL BOX

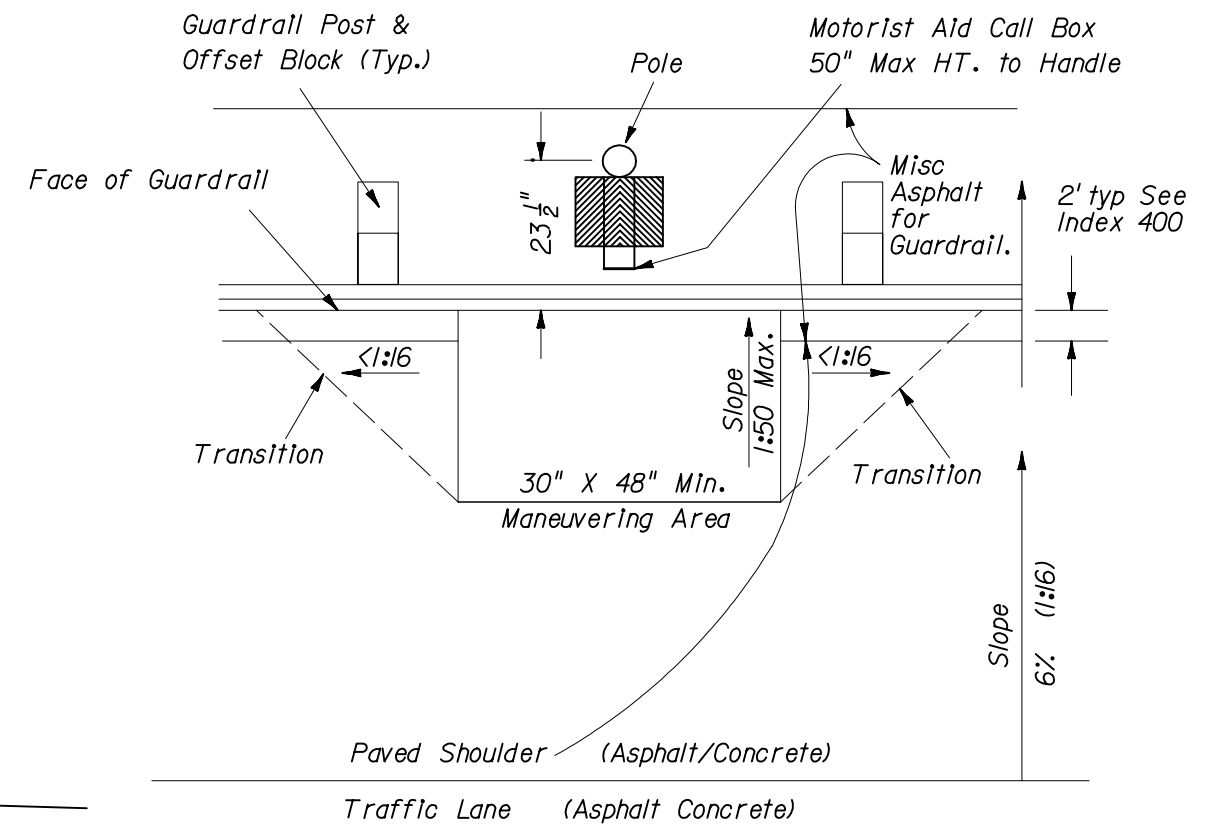
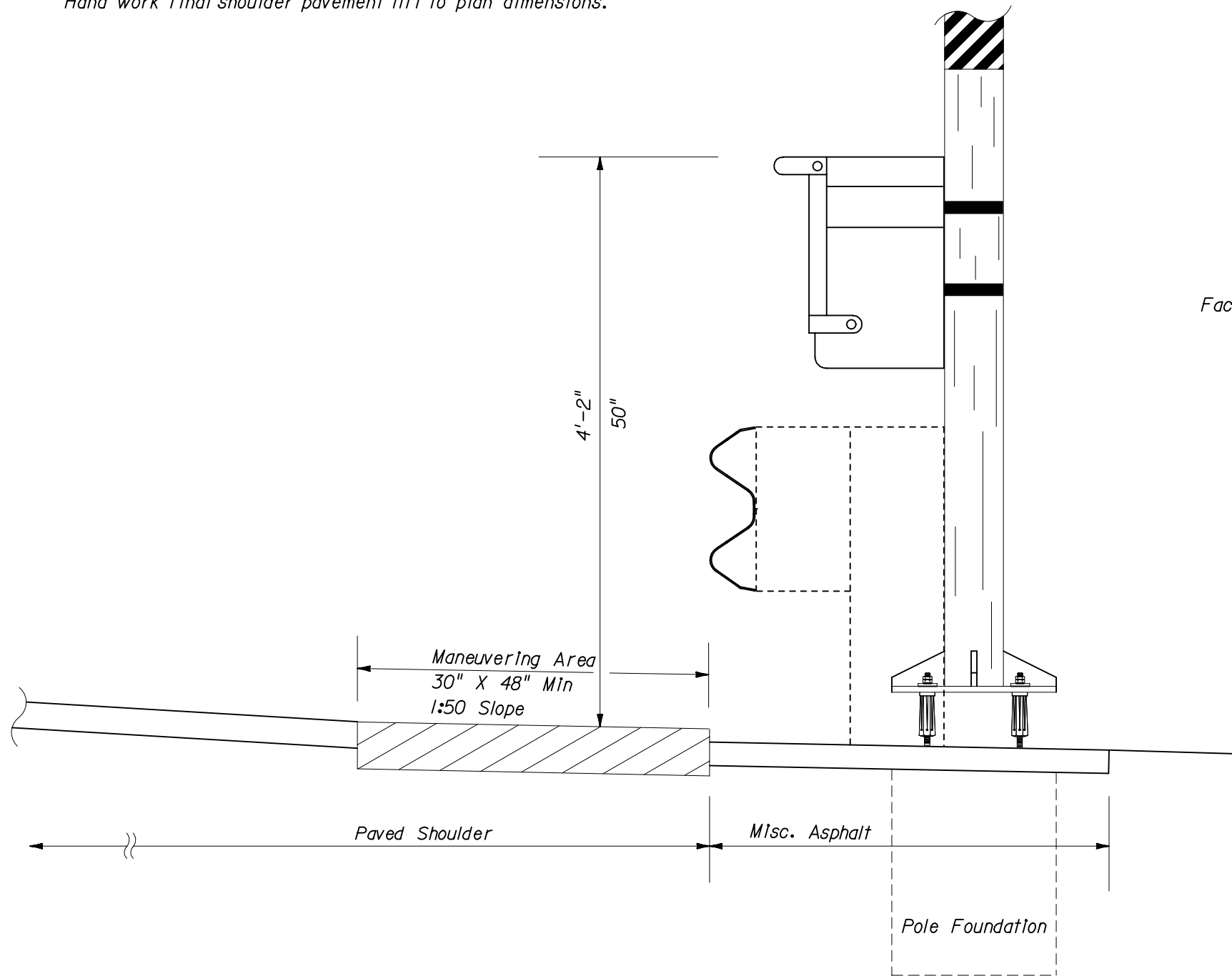
Names	Dates	Approved By		
Designed By		 State Traffic Standards Engineer		
Drawn By				
Checked By				
		Revision	Sheet No.	Index No.
		04	1 of 3	17600

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.

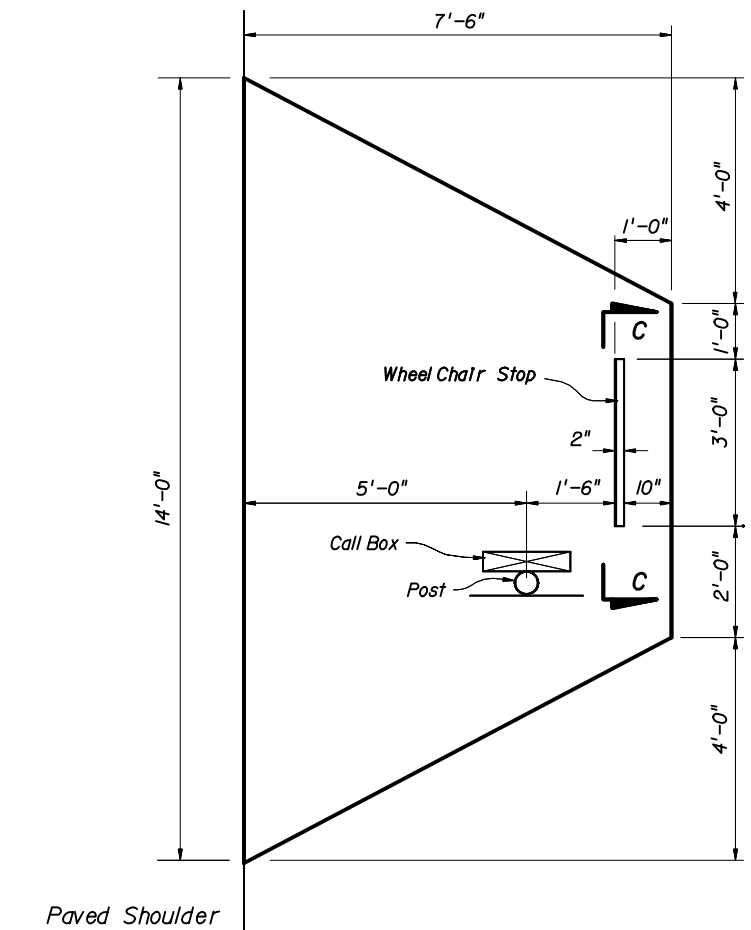


CALL BOX BEHIND GUARDRAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

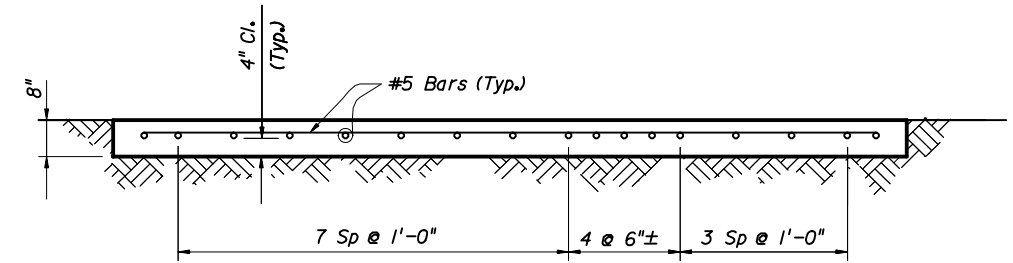
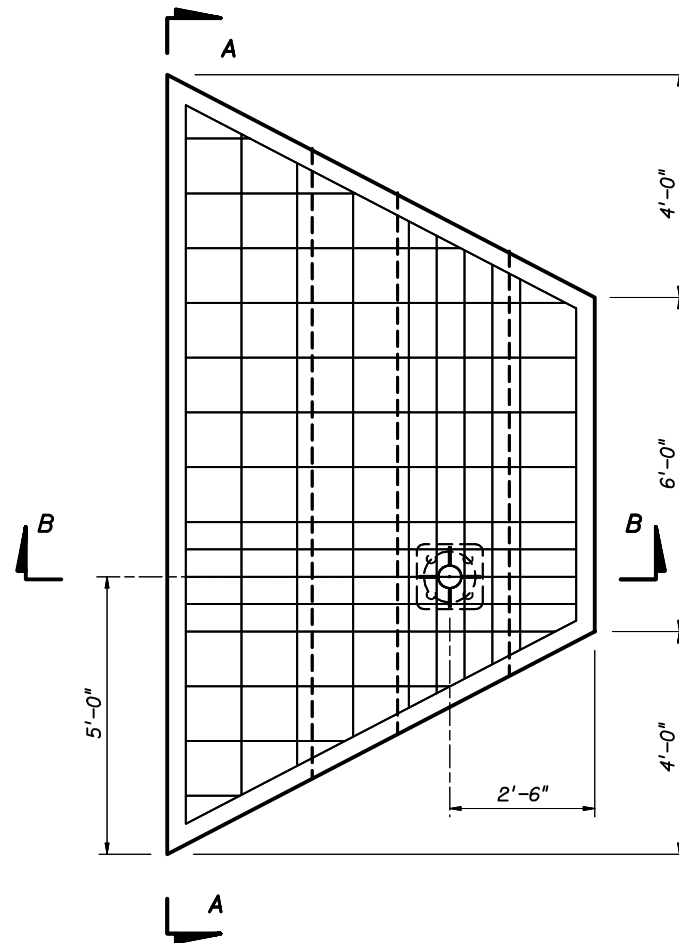
MOTORIST AID CALL BOX

Names	Dates	Approved By
Designed By		<i>Charles A. Smith</i> State Traffic Standards Engineer
Drawn By		Revision Sheet No. Index No.
Checked By		04 2 of 3 17600



PLAN

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



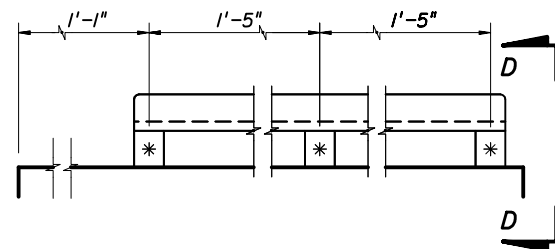
SECTION A-A

MOTORIST AID CALL BOX CONCRETE PAD QUANTITIES

Concrete : 3.5 cy. (each)
Reinforcing Steel : 243 lb (each)

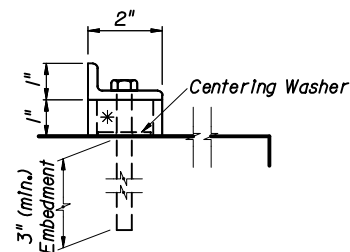
GENERAL NOTES

1. General Specifications: FDOT Standard Specifications for Road and Bridge Construction (Current Edition) and Supplements thereto.
2. Design Specifications: AASHTO Standard Specifications For Highway Bridges (Current Edition and approved revisions thereto).
3. Concrete: Concrete strength shall be Class II ($f'c=3,400$ psi).
4. Reinforcing Steel: Reinforcing Steel shall conform to ASTM A615-96a, Grade 60.
5. Payment : Motorist Aid Call Box Concrete Pads shall be paid for under the contract unit price for Class II Concrete (Miscellaneous), c.y. and shall include all labor, materials, and installation of embedded breakaway device sleeves, and miscellaneous galvanized steel for wheel chair stop and attachments.
6. Breakaway Device shall be paid for under Call Box Assembly.



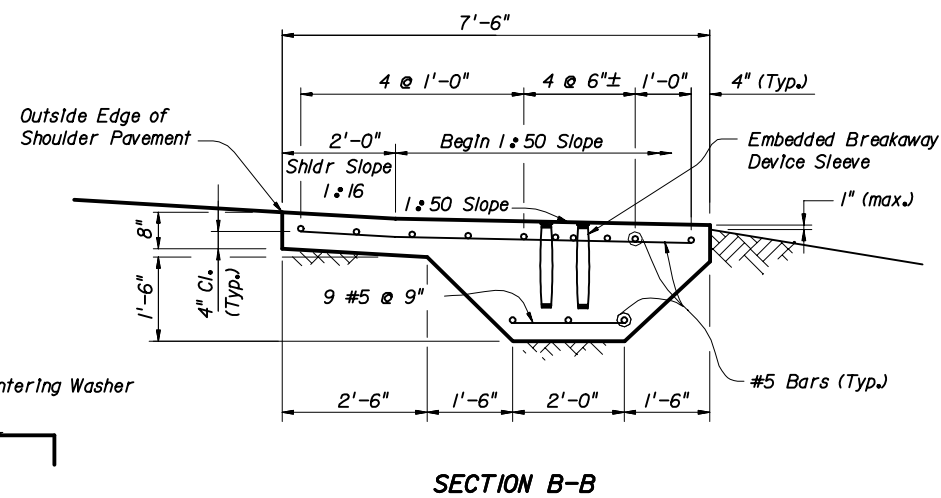
SECTION C-C

2" x 1" x 1/4" Galv. Angle And
3-3/8" Ø x 5" Galvanized Steel Expansion
Anchor Bolt With 3" Min. Embedment



VIEW D-D

* 1 1/2" Ø x 1" High
Galvanized Steel Pipe Spacer




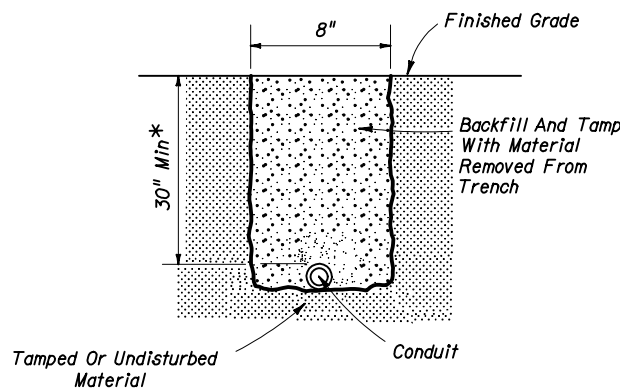
SECTION B-B

WHEEL CHAIR STOP DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MOTORIST AID CALL BOX

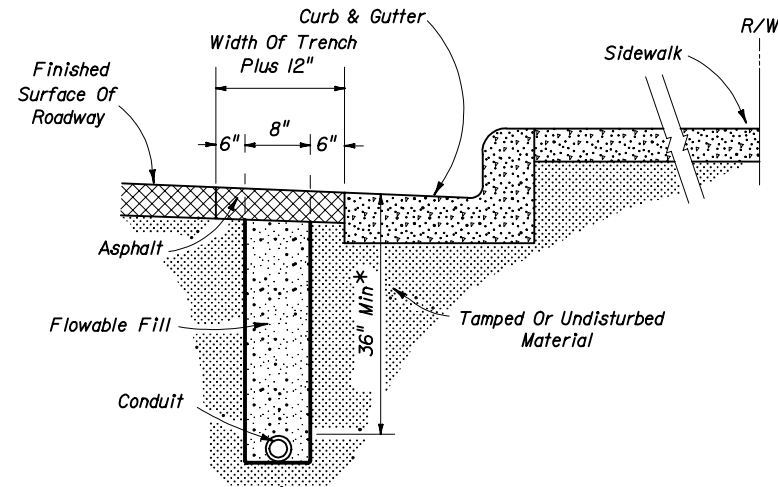
Names	Dates	Approved By		
Designed By	TJB	4-98	 State Structures Design Engineer	
Drawn By	SHW	4-98		
Checked By	TJB	4-98		
Revision	00	Sheet No.	3 of 3	Index No.
				17600



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

FIGURE A

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

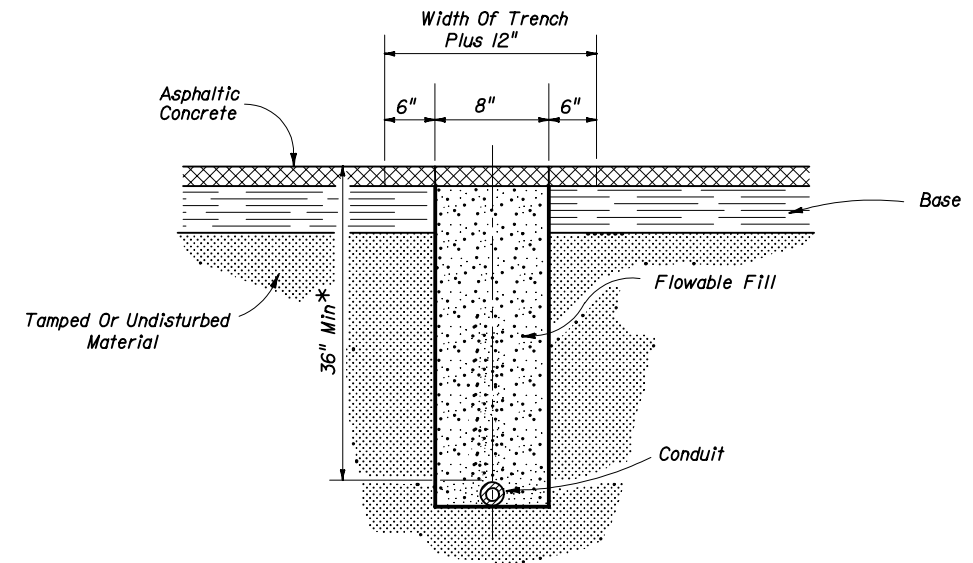


FOR USE IN ASPHALT ROADWAY ADJACENT TO GUTTER WHEN PLACEMENT OUTSIDE OF THE PAVEMENT IS NOT FEASIBLE.

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

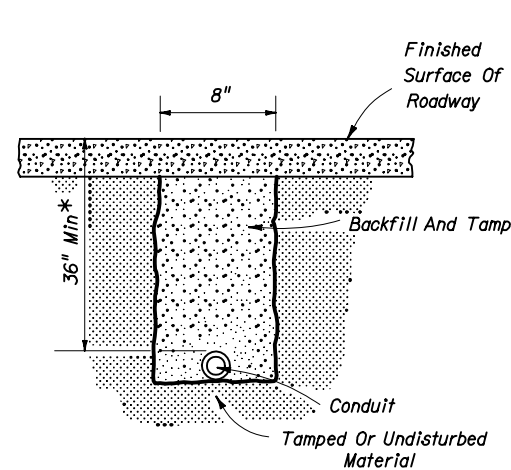


FOR USE IN INSTALLING CONDUIT UNDER EXISTING ASPHALT PAVEMENT NOT ADJACENT TO GUTTER WHEN JACKING IS NOT FEASIBLE

Note:

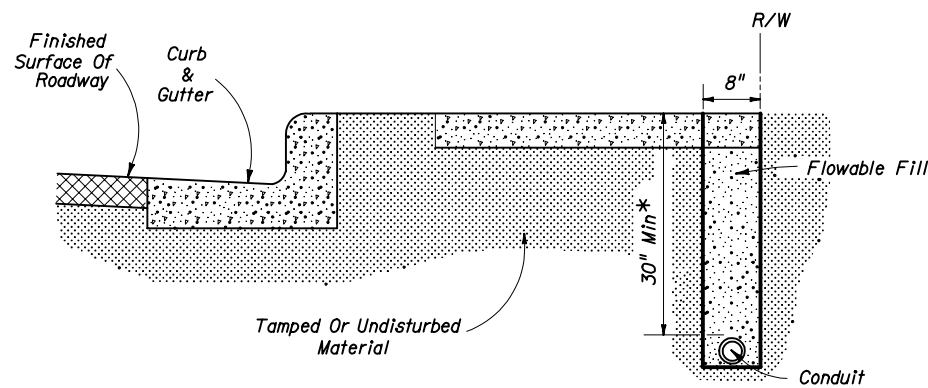
1. Rigid conduit must be used when jacking under existing pavement at 36" minimum depth.
2. Asphalt to be sawcut at the edges of the trench.
3. The removal and replacement of the additional pavement width (6") will not be required when the trench can be constructed without disturbing the asphalt surface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

FIGURE C



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:

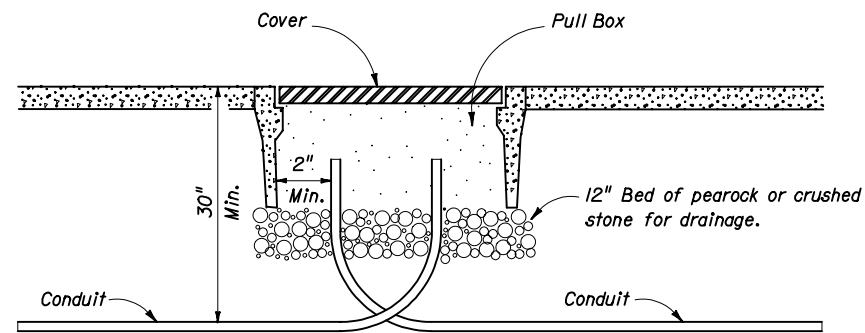
1. Sidewalk patches to match existing joints.
2. Entire sidewalk slab must be replaced when specified in the plans.
3. Backfill and tamp with material from trench except at driveways. At driveways, backfill a length of trench within the driveway entirely with Flowable Fill.

FIGURE E

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONDUIT INSTALLATION DETAILS

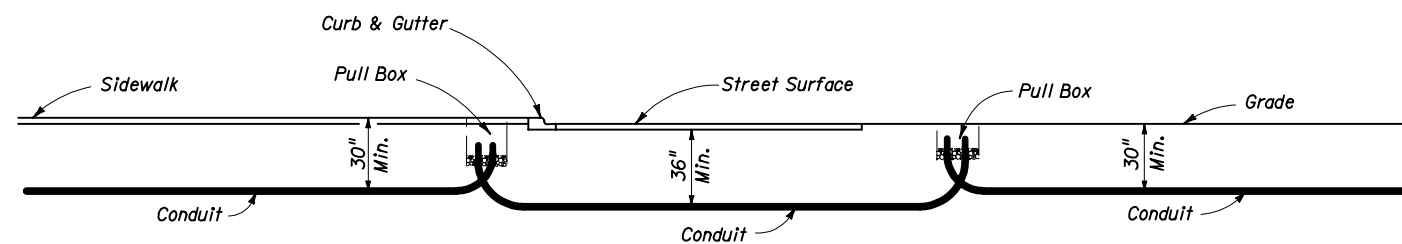
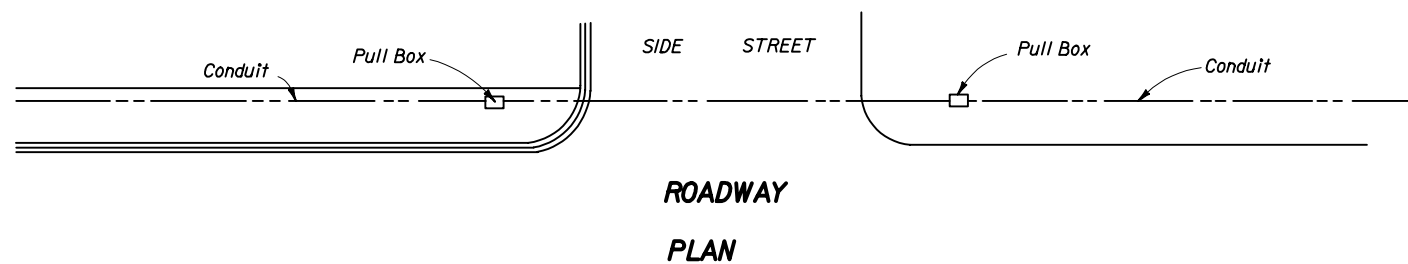
Names	Dates	Approved By		
Designed By	2-75	 State Traffic Standards Engineer		
Drawn By				
Checked By	2-75	00	1 of 2	17721



PULL BOX 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.



UNDER SIDEWALK

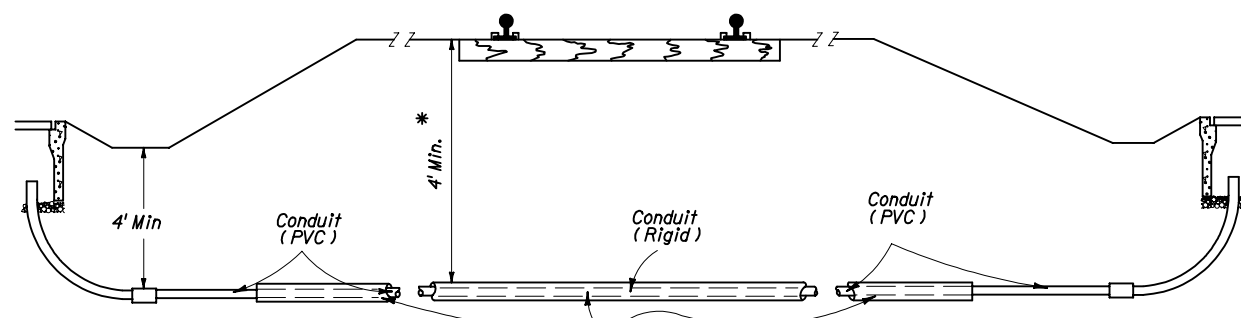
UNDER ROADWAY

UNDER NON-TRAFFIC BEARING SURFACE

SECTION

FIGURE B

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



* Note

Conduit depth to be at R/R requirement but not less 4'.

After jacking, leave rigid conduit as a sleeve extending to R/R right of way limits.

FOR USE UNDER RAILROADS

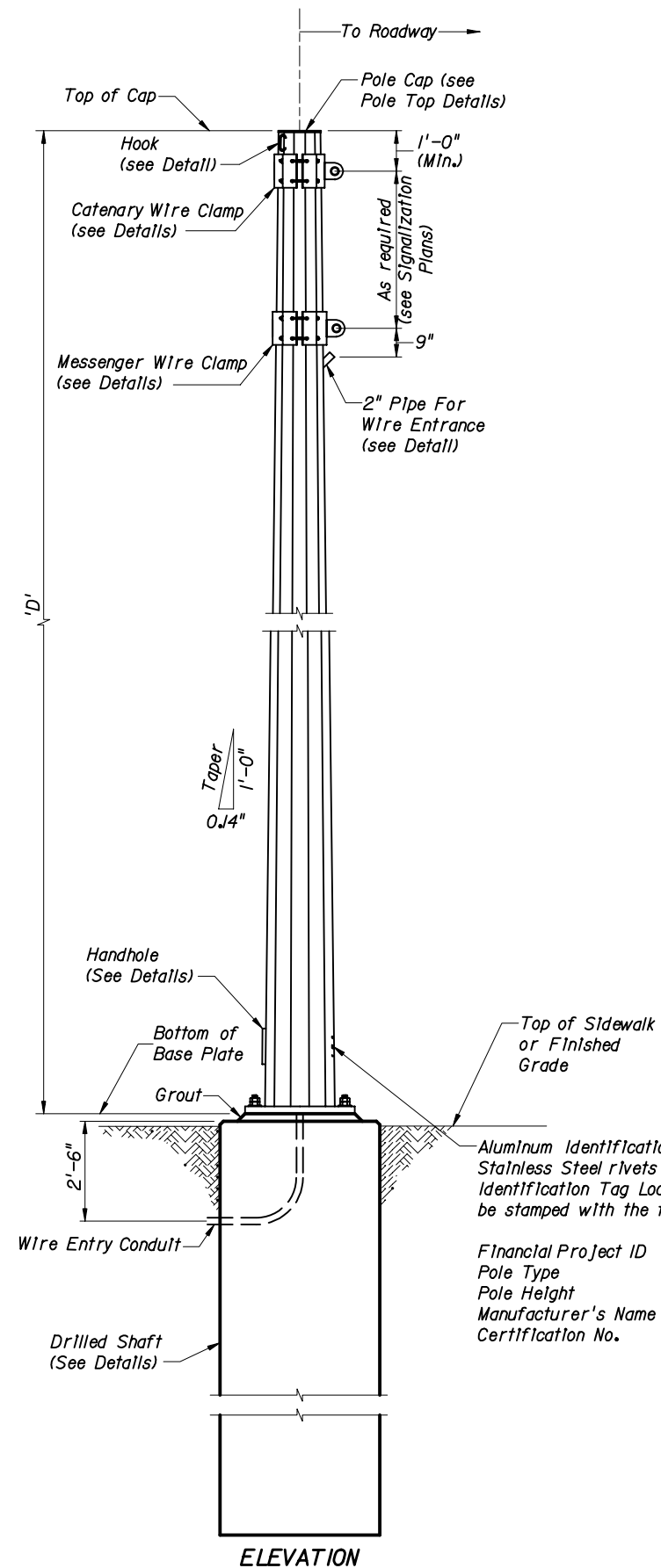
FIGURE C

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONDUIT INSTALLATIONS
DETAILS

Designed By	Names	Dates	Approved By
Drawn By			<i>Clark A. Scott</i> State Traffic Standards Engineer
Checked By			Revision
			Sheet No.
			Index No.

00 2 of 2 17721



SELECTION PROCEDURE

- Determine the required pole height and bending moment at the pole base using a design wind speed in conformance with the "Plans Preparation Manual", Chapter 29, with a 30 percent gust factor.
- Enter the Pole Moment Capacity Table, and determine the required Pole Type and wall thickness.
- Enter the Pole Type and height designation in the signalization Plans for each strain pole.
Example: From design: required height = 23'-6",
base moment = 198.0 kip-ft
From tables use NS-VII-24
- Refer to the Table of Variables for the required pole diameter, base plate and drilled shaft dimensions.

D (ft.)	TYPE OF POLE						
	NS-IV	NS-V	NS-VI	NS-VII	NS-VIII	NS-IX	NS-X
20	33.0	106.0	152.0	210.0	266.0	330.0	390.0
22	36.8	111.2	158.7	218.0	274.9	340.3	401.7
24	40.6	116.4	165.3	226.0	283.9	350.7	413.3
26	44.4	121.6	172.0	234.0	292.8	361.0	425.0
28	48.2	126.8	178.7	242.0	301.7	371.3	436.7
30	52.0	132.0	185.3	250.0	310.7	381.7	448.3
32	55.8	137.2	192.0	258.0	319.6	392.0	460.0
34	59.6	142.4	198.7	266.0	328.5	402.3	471.7
36	63.4	147.6	205.3	274.0	337.5	412.7	483.3
38	67.2	152.8	212.0	282.0	346.4	423.0	495.0
40	71.0	158.0	218.7	290.0	355.3	433.3	506.7
42	74.8	163.2	225.3	298.0	364.3	443.7	518.3
44	78.6	168.4	232.0	306.0	373.2	454.0	530.0
46	82.4	173.6	238.7	314.0	382.1	464.3	541.7
48	86.2	178.8	245.3	322.0	391.1	474.7	553.3
50	90.0	184.0	252.0	330.0	400.0	485.0	565.0

0.239 Inch Wall Thickness
0.313 Inch Wall Thickness

STEEL STRAIN POLE NOTES

- Signal Structure Materials shall be as follows:
 - Poles --> ASTM A1011 Grade 50, 55, 60, or 65 (less than 1/4") or ASTM A572 Grade 50, 55, 60, or 65 (1/4" and over) or ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield)
 - Steel Plates --> ASTM A709 Grade 36
 - Weld Metal --> E70XX
 - Bolts (except Anchor Bolts) --> ASTM A325, Type 1
 - Anchor Bolts --> ASTM F1554 Grade 55
 - Nuts for Anchor Bolts --> ASTM A563 Grade A Heavy Hex
 - Washers for Anchor Bolts --> ASTM F436 Type 1
 - Handhole Frame --> ASTM A709 Grade 36 or ASTM A36
 - Handhole Cover --> ASTM A1011 Grade 50, 55, 60, or 65
 - Aluminum Caps and Covers --> ASTM B26 (319-F)
 - Stainless Steel Screws --> AISI Type 316
- All Steel Items shall be Galvanized as follows:
 - All Nuts, Bolts and Washers --> ASTM A153 Class C or D depending on size
 - All other Steel Items --> ASTM A123
- Concrete shall be Class IV (Drilled Shaft) with a minimum 28-day Compressive Strength (f'c) of 4,000 psi for all environmental classifications.
- Reinforcing Steel shall be ASTM A615-96 Grade 60.
- Grout shall have a minimum 28-day Compressive Strength of 5,000 psi and shall meet the requirements of Section 934. Grout after pole is set and properly plumbed.
- A design wind speed of 100 mph with a 30% gust factor for wind loading on the pole was included in the design.
- The Pole shall be tapered with the diameter changing at a rate of 0.4 Inch per foot.
- Except for anchor bolts, all bolt hole diameters shall be equal to the bolt diameter plus 1/16", prior to galvanizing. Hole diameters for anchor bolts shall not exceed the bolt diameter plus 1/2".
- The foundation for the Strain Pole Structure shall be constructed in accordance with Section 455 of the FDOT Specifications except that no payment for the foundation shall be made under Section 455. The cost of providing the foundation shall be included in the pay item for providing the complete Strain Pole Structure. For foundation design assumptions, refer to the Foundation Notes.
- The pole shall be free of transverse welds except at the base.
- Poles constructed out of two or more sections with overlapping splices are not permitted.
- The strain pole shall not be erected until the foundation concrete has been allowed to cure for a minimum of seven days.
- No field welding on any part of the pole is permitted.
- For clamp spacing, cable sizes and forces, signal and sign mounting locations and details see the Signalization Plans.
- All welding shall conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).
- See Standard Index No. 17727 for grounding detail and span wire installation details.
- Locate handhole 180° from 2 inch wire entrance pipe.
- Paint Steel Strain Poles in accordance with Section 649, Mast Arm Assemblies.

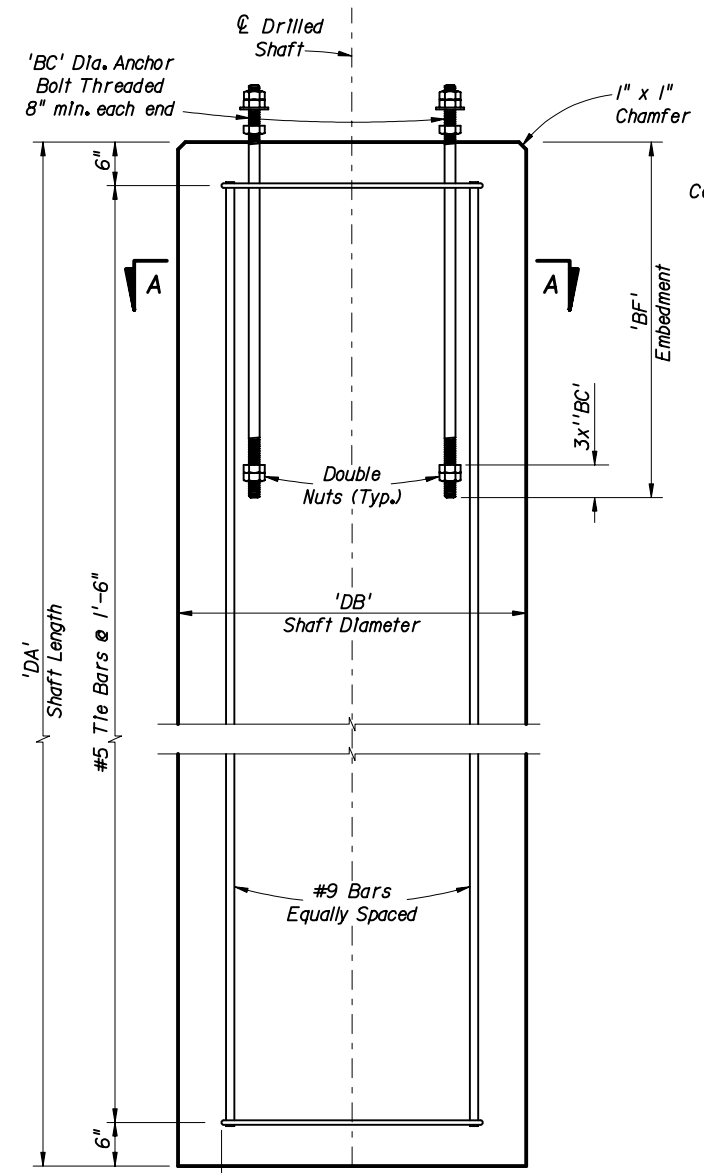
Aluminum Identification Tag Not to Exceed 2" x 4". Secure to Shaft by 0.125" Stainless Steel rivets or screws. Fabricators to provide details for approval. Identification Tag Located on Inside of Pole visible from handhole. Tag to be stamped with the following information:

Financial Project ID
Pole Type
Pole Height
Manufacturer's Name
Certification No.

ELEVATION

ELEVATION AND NOTES

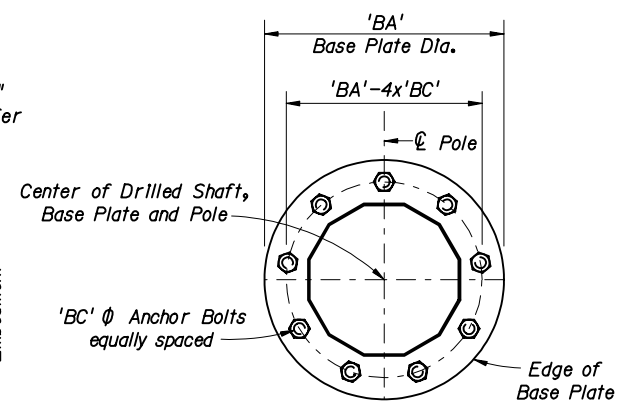
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
STEEL STRAIN POLE				
Designed By	RK	9-00	Approved By <i>[Signature]</i> State Structures Design Engineer	
Drawn By	JMB	9-00	Revision	Sheet No. Index No.
Checked By	DER	9-00	04	1 of 3 17723



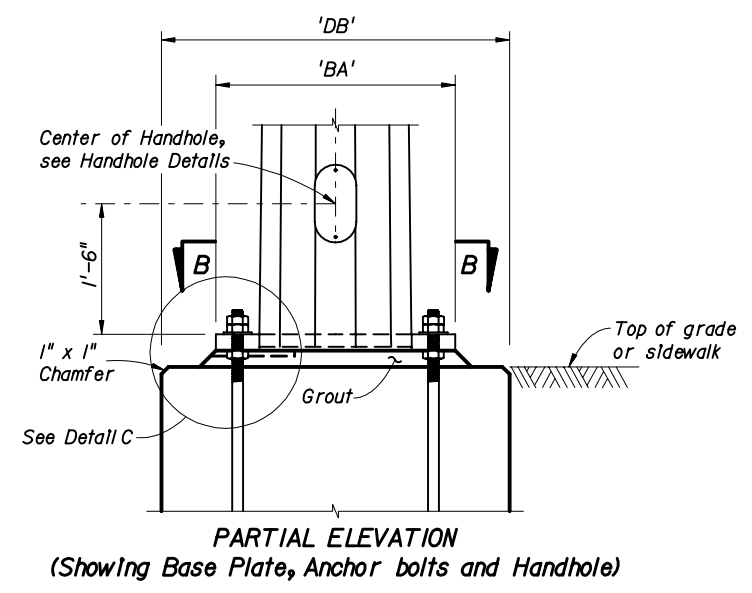
DRILLED SHAFT ELEVATION
(See Table for number of #9 bars.)

FOUNDATION NOTES:
The foundations for Steel Strain Poles are pre-designed and are 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)

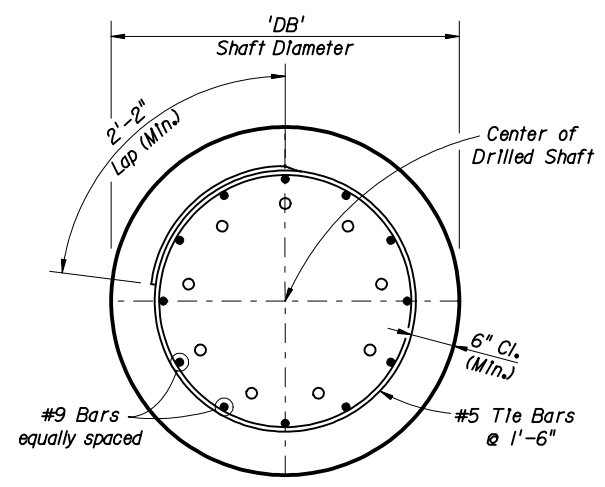
Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, SPT borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single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



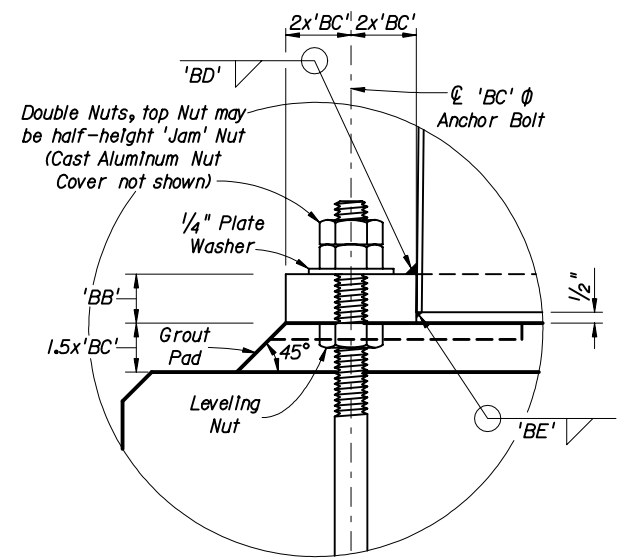
VIEW B-B
NOTE: Number of bolts shown for illustration purposes only. (See Table for actual quantity)



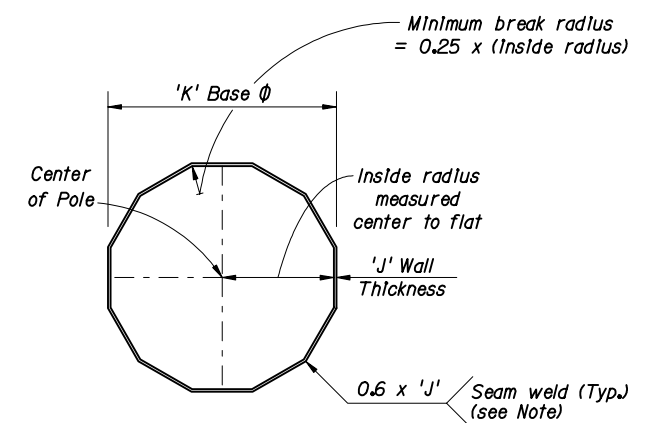
PARTIAL ELEVATION
(Showing Base Plate, Anchor bolts and Handhole)



SECTION A-A



DETAIL C



POLE SECTION

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

POLE TYPE	TABLE OF STRAIN POLE VARIABLES											
	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 #9 bars
NS-IV	J = 0.239	14	6	25	2.125	1.375	0.313	0.188	36	10	3.5	14
NS-V		16	8	27	2.250	1.375	0.375	0.188	47	12.5	3.5	14
NS-VI		18	8	30	2.375	1.500	0.438	0.188	54	14	3.5	14
NS-VII		21	10	33	2.250	1.500	0.375	0.188	49	15	4	19
NS-VIII		23	12	34	2.250	1.375	0.375	0.188	52	16	4	19
NS-IX		25	12	37	2.250	1.500	0.375	0.188	50	16	4.5	23
NS-X		27	12	39	2.375	1.500	0.375	0.188	52	17	4.5	23
NS-V	J = 0.313	16	8	28	2.375	1.500	0.438	0.250	47	12.5	3.5	14
NS-VI		18	10	30	2.375	1.500	0.500	0.250	54	14	3.5	14
NS-VII		21	12	33	2.375	1.500	0.500	0.250	49	15	4	19
NS-VIII		23	12	35	2.500	1.500	0.500	0.250	52	16	4	19
NS-IX		25	12	39	2.625	1.750	0.500	0.250	50	16	4.5	23
NS-X		27	12	41	2.750	1.750	0.500	0.250	52	17	4.5	23

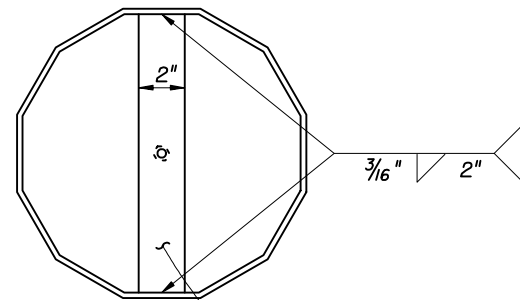
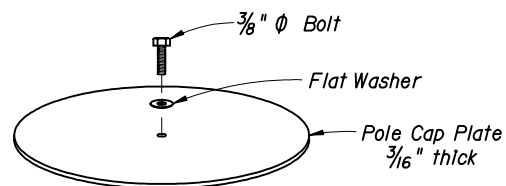
Note: Details shown on this sheet are for 12 sided pole sections. However, sections with more than 12 sides and round sections are permitted, provided the outside diameter and well thickness are not reduced.

BASE DETAILS AND TABLE OF VARIABLES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

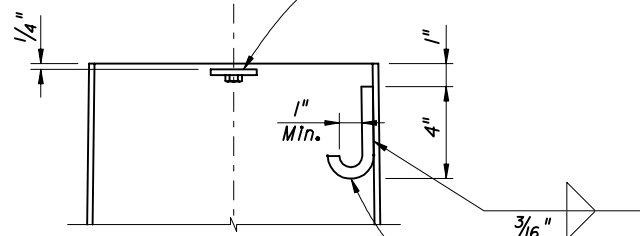
STEEL STRAIN POLE

Names	Dates	Approved By
Designed By: RK	9-00	[Signature] State Structures Design Engineer
Drawn By: JMB	9-00	
Checked By: DER	9-00	
Revision	Sheet No.	Index No.
02	2 of 3	17723



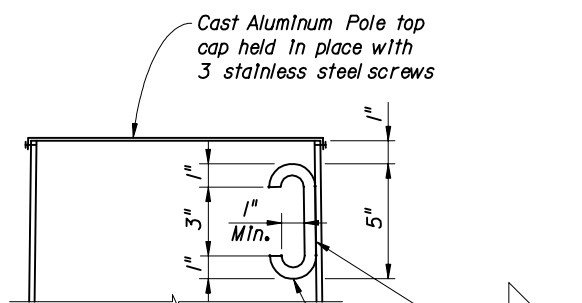
TOP VIEW

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



POLE TOP CUT-AWAY (Option 'a')

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

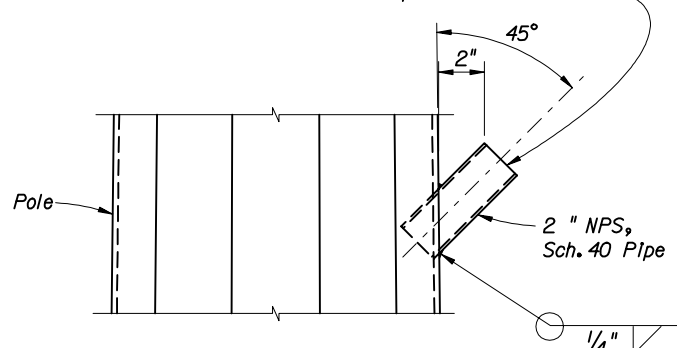


POLE TOP CUT-AWAY (Option 'b')

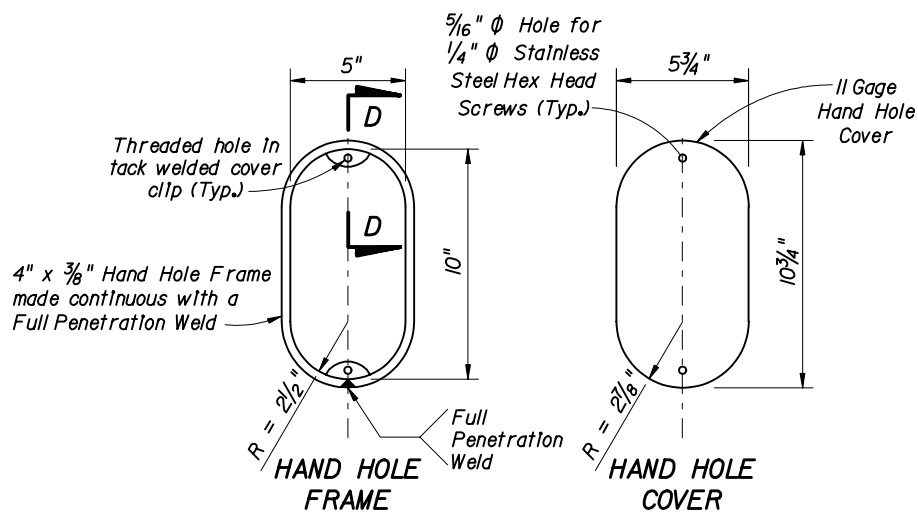
'C' Hook for wiring and lifting, 1/2" ϕ commercial grade hot rolled bar welded to inside of pole.

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.

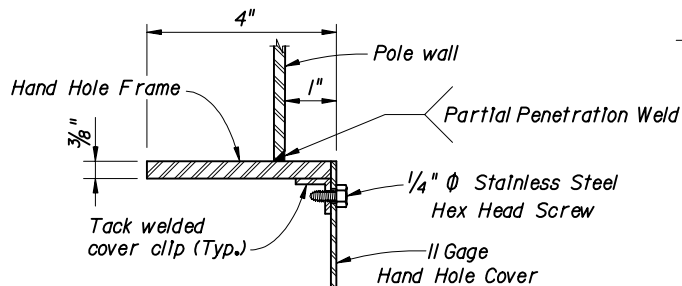


WIRE ENTRANCE DETAILS

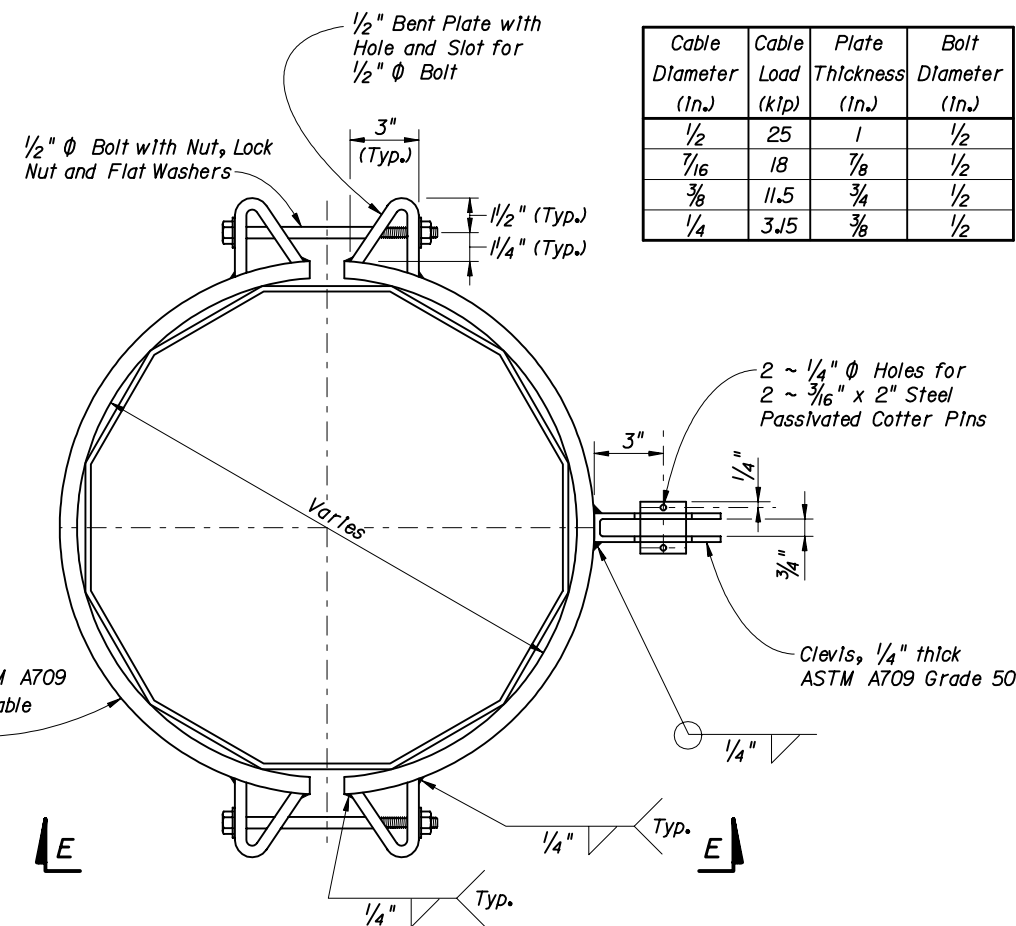


HAND HOLE FRAME

HAND HOLE COVER

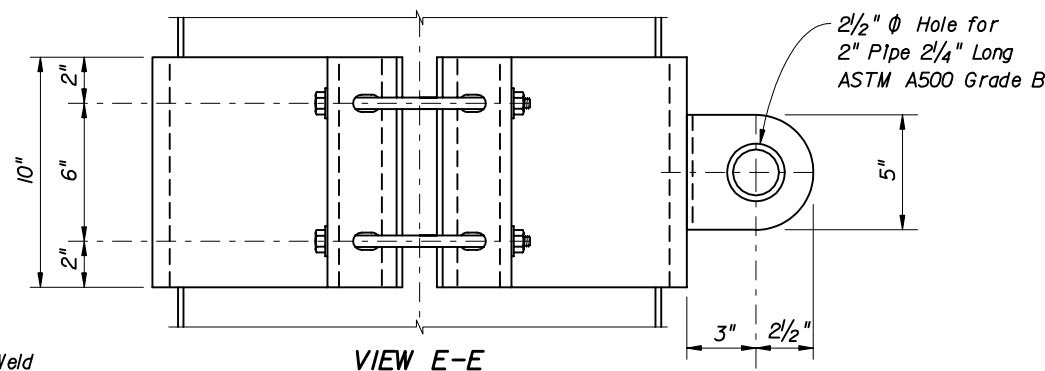


SECTION D-D (thru Hand Hole)



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

Cable Diameter (In.)	Cable Load (kip)	Plate Thickness (In.)	Bolt Diameter (In.)
1/2	25	1	1/2
7/16	18	7/8	1/2
3/8	11.5	3/4	1/2
1/4	3.15	3/8	1/2

ATTACHMENT DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STEEL STRAIN POLE

Names	Dates	Approved By
Designed By: RK	9-00	[Signature]
Drawn By: JMB	9-00	
Checked By: DER	9-00	

Revision	Sheet No.	Index No.
04	3 of 3	17723

NOTES:

Design Poles (Concrete and Steel Poles) in accordance with the 1994 edition of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" and Supplement thereto. For allowable unit stresses, meet the requirements of Section 6.

Place the prestressing symmetrically. Supply a sufficient amount of prestressing to provide a calculated compressive stress of 2.2 ksi for Type N-II and 3 ksi for Type N-III at the top of pole after all losses.

Concrete Strength shall be 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.

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.

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 eye bolt hole for the tether wire, when required, prior to installation.

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.

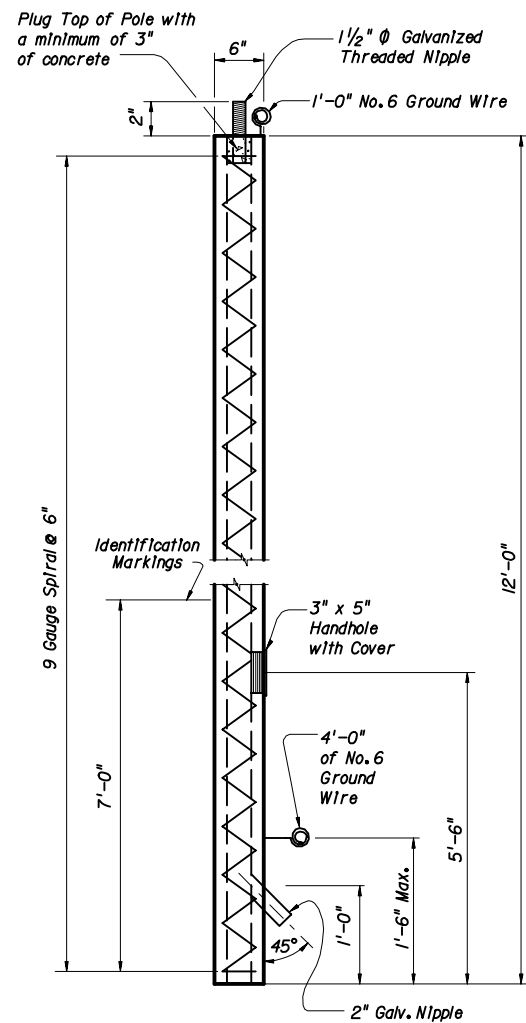
Attach ground wires to the reinforcing steel in the pole as necessary to prevent the ground wire from being displaced during concreting operations.

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.

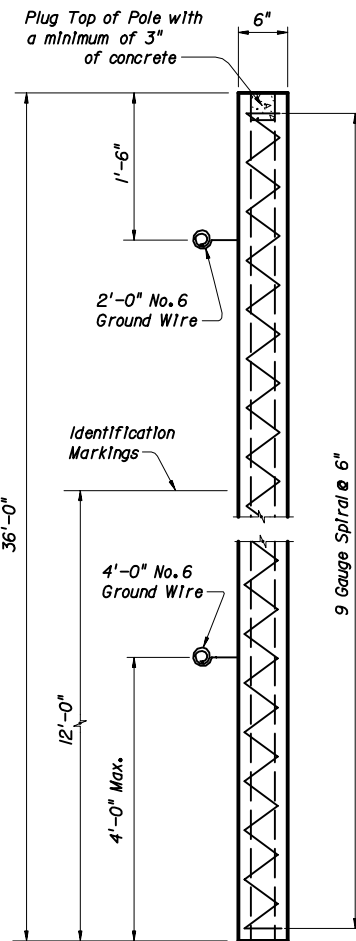
Provide a Class 3 Surface Finish as Specified in 400-15.2.4.

Provide a minimum cover of 1".

Provide all poles with total taper of 0.52 IN/FT.

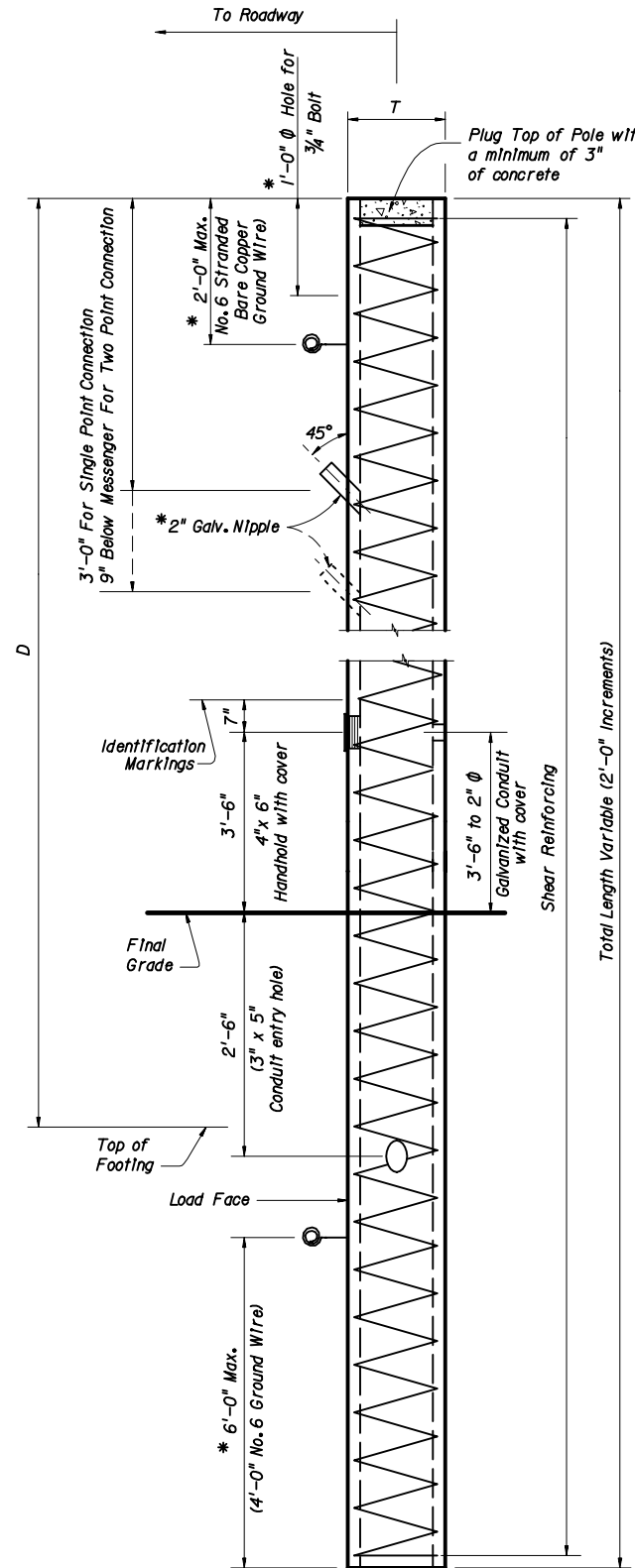
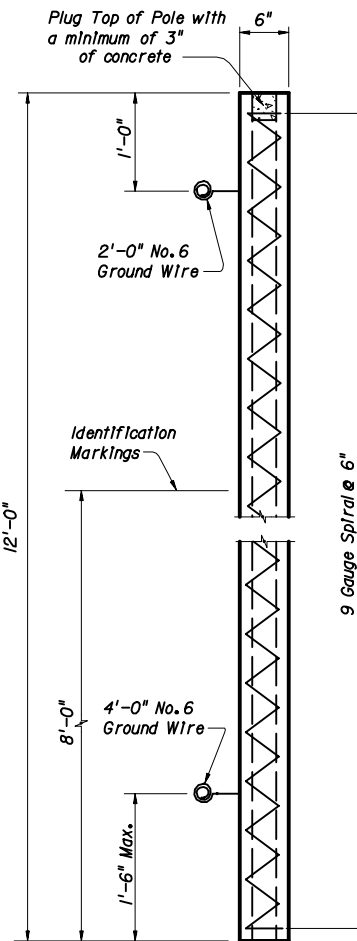


TYPE N-II POLE ON CONCRETE PEDESTAL



SERVICE POLES - TYPE N-II

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



POLE TYPES N-III THROUGH N-VIII

* Do not apply these items to Type N-III. 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 N-III poles used at traffic monitoring sites.

**MINIMUM REQUIRED MOMENT CAPACITY					
D (feet)	TYPE OF POLE				
	N-IV (k-ft)	N-V (k-ft)	N-VI (k-ft)	N-VII (k-ft)	N-VIII (k-ft)
20	33	106	152	210	266
22	37	111	159	218	275
24	41	116	163	226	284
26	44	121	172	234	293
28	48	127	179	242	302
30	52	132	185	250	311
32	56	137	192	258	320
34	60	142	199	266	329
36	63	148	205	274	338
38	67	153	212	282	346
40	71	158	219	290	355
42	75	163	225	298	364
44	79	168	232	306	373
46	82	173	239	314	382
48	86	177	245	322	391
50	90	180	252	330	400

** Service Conditions: Design poles to carry the "Minimum Required Moment Capacity." These moments are based on a dead load plus wind load combinations, therefore obtain the allowable stresses by multiplying those for normal exposure conditions given in Section 6 by the applicable factor from Section 2 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

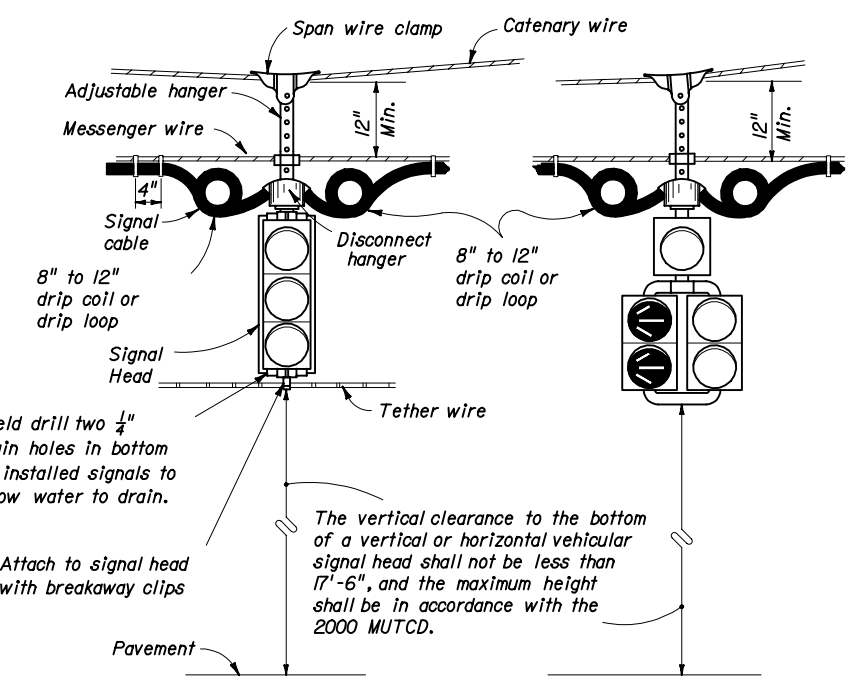
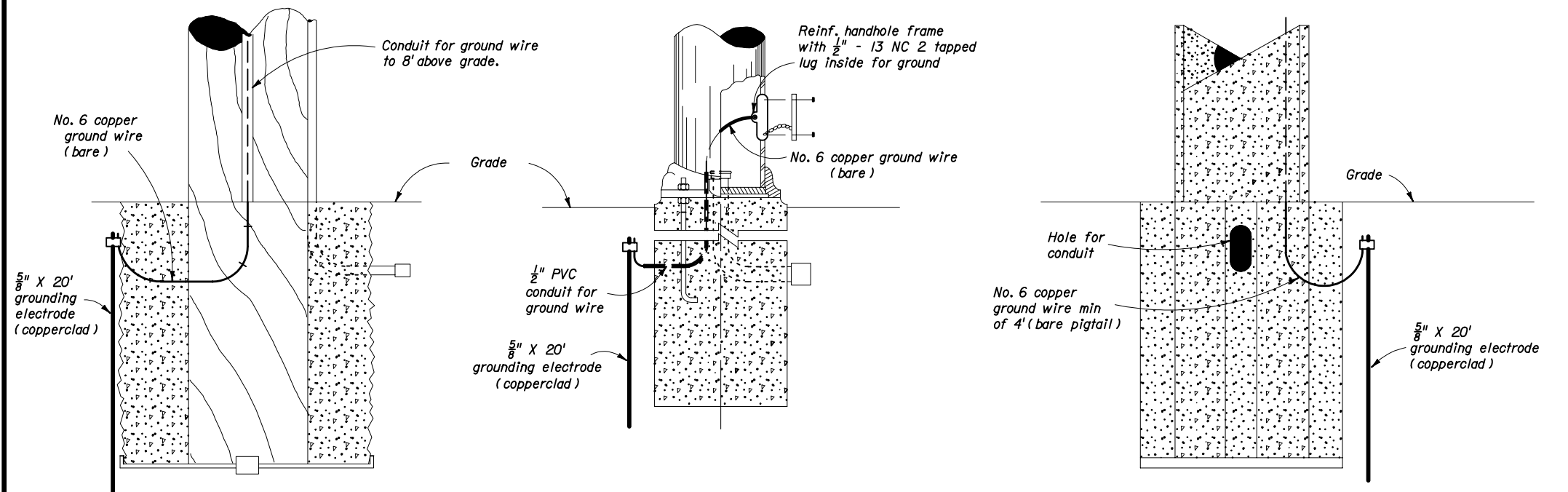
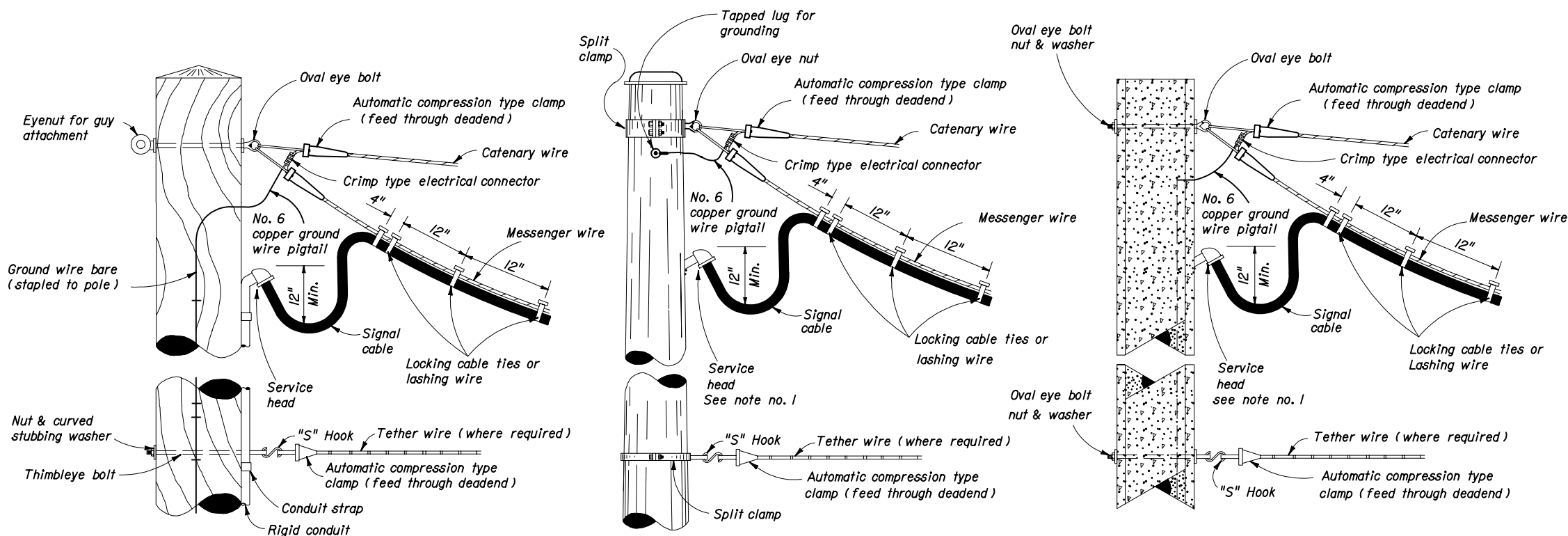
The ultimate moment capacity of each pole shall be a minimum of 1.3 times the "Minimum Required Moment Capacity."

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

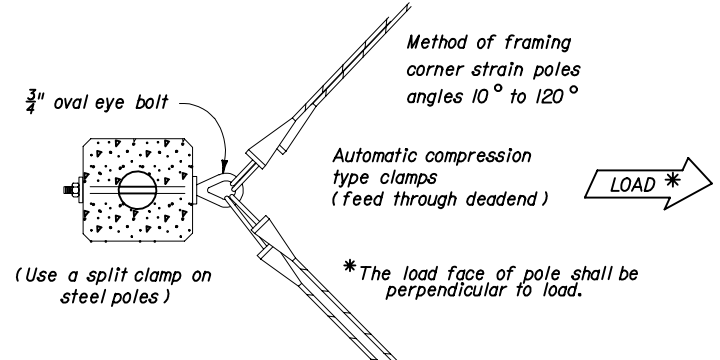
CONCRETE POLES

Names	Dates	Approved By
Designed By: AJG	1-91	[Signature]
Drawn By: JP	10/99	
Checked By: JJB	10/99	
Revision	Sheet No.	Index No.
04	1 of 1	17725



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.

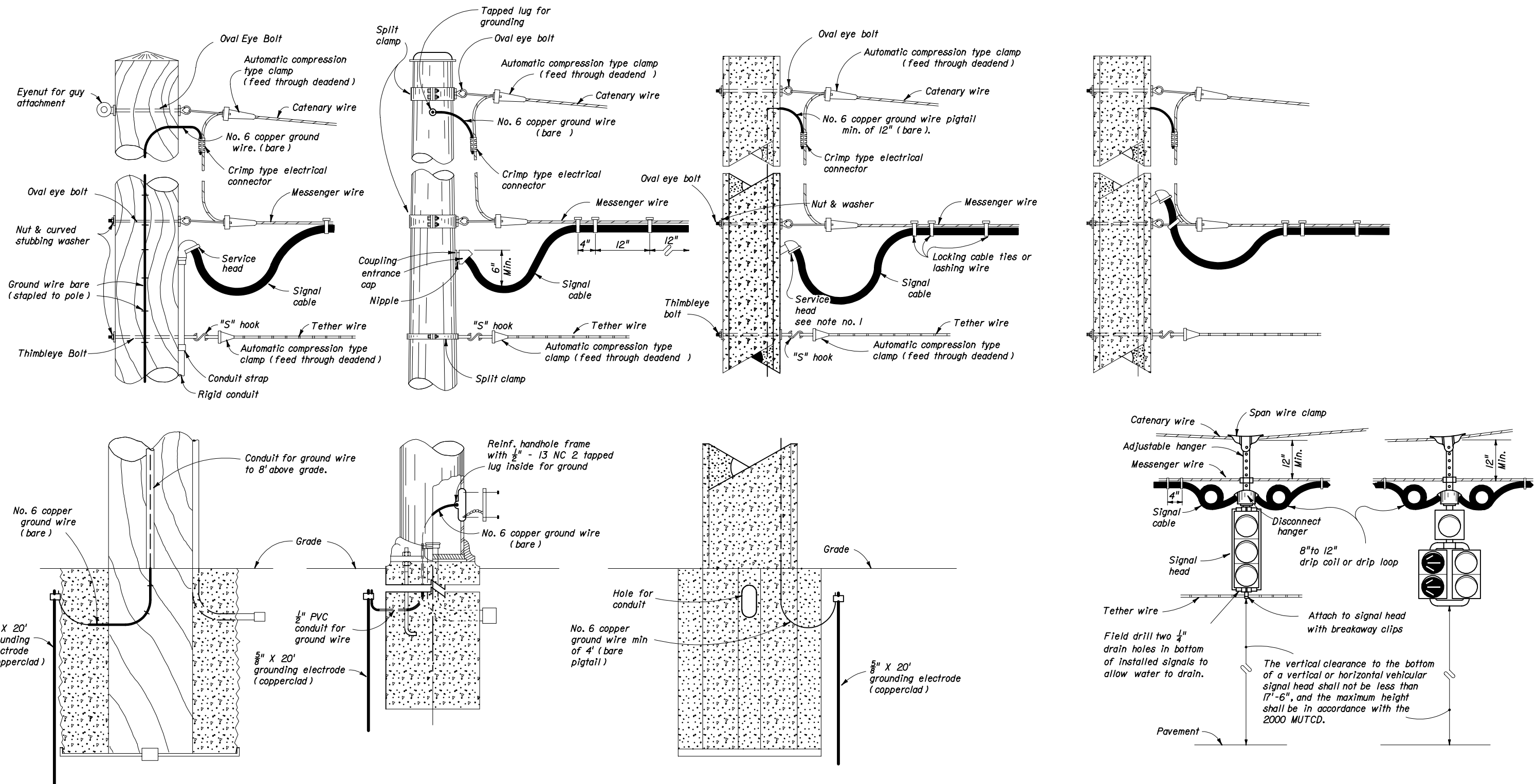


SINGLE POINT ATTACHMENT

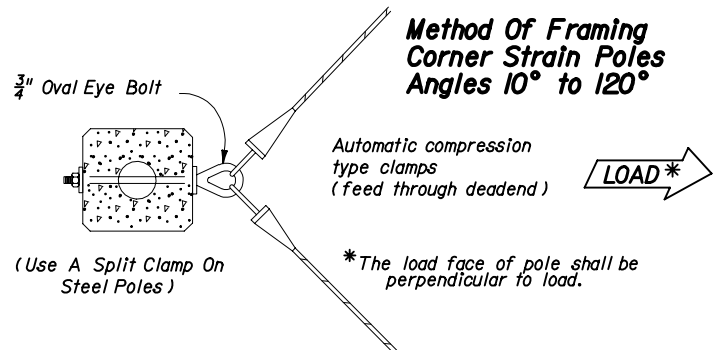
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIGNAL CABLE & SPAN WIRE INSTALLATION DETAILS

Names	Dates	Approved By		
Designed By		 State Traffic Standards Engineer		
Drawn By				
Checked By		Revision	Sheet No.	Index No.
		02	1 of 2	17727



- 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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**SIGNAL CABLE & SPAN WIRE
INSTALLATION DETAILS**

Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		02	2 of 2	17727

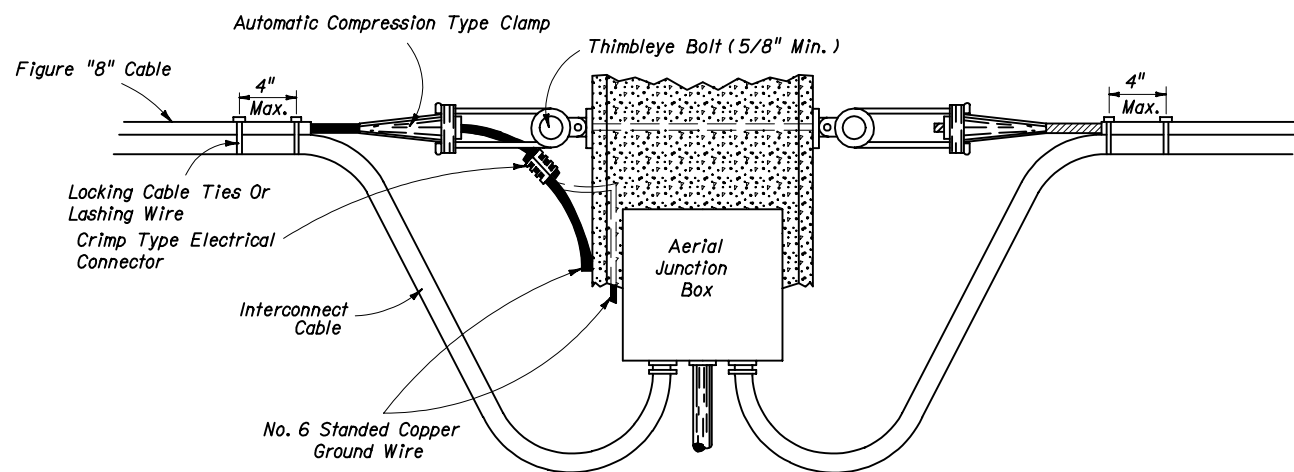


FIGURE A
CABLE DROP AND
TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "8"

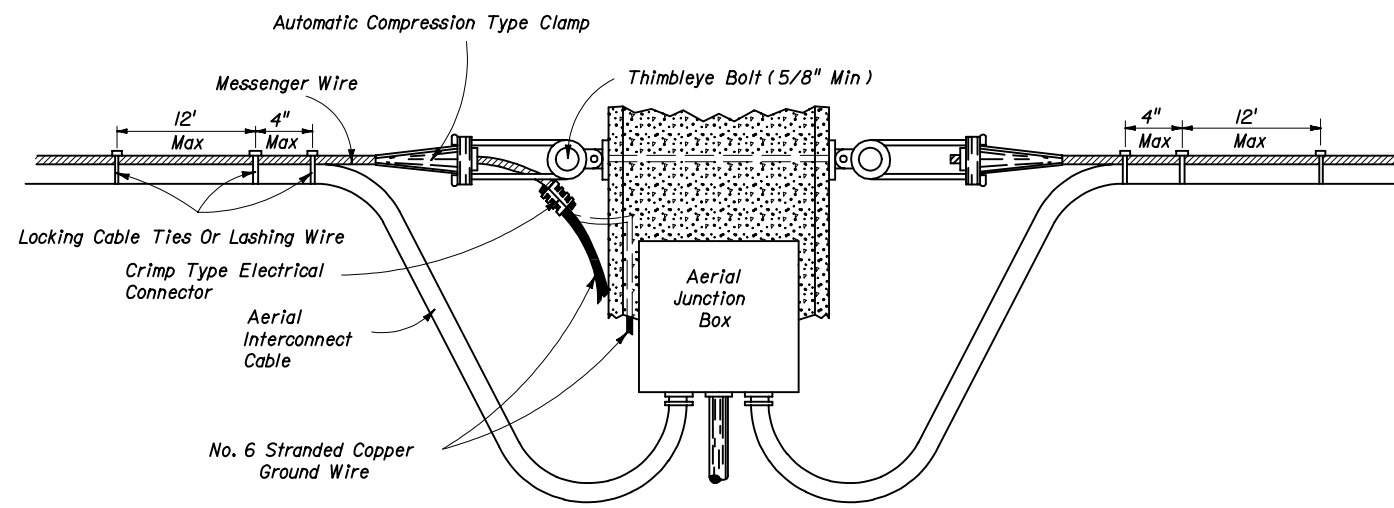


FIGURE B
CABLE DROP AND
TERMINATION DETAIL
AERIAL INTERCONNECT MESSENGER
WIRE WITH CLAMPS

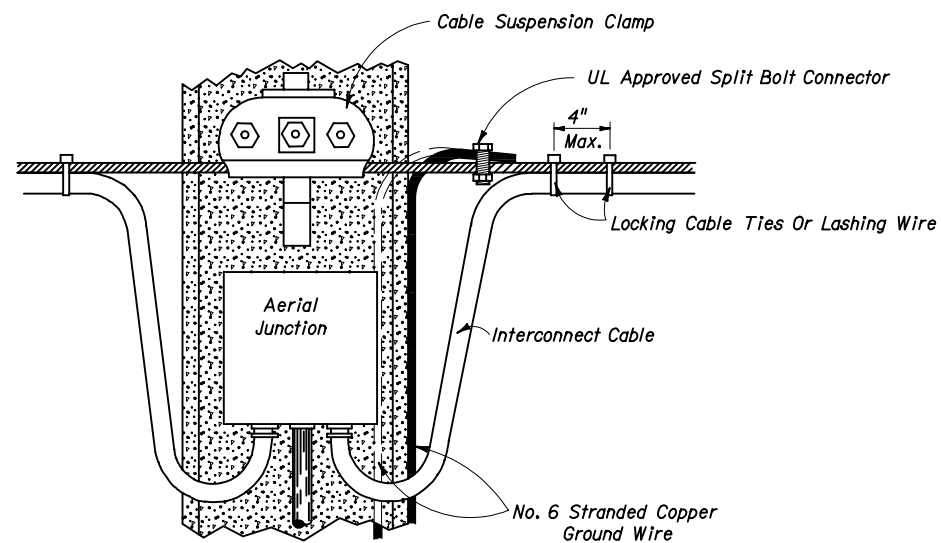


FIGURE C
CABLE DROP DETAIL
AERIAL INTERCONNECT MESSENGER
WIRE WITH CLAMPS

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 $\frac{1}{2}$ " 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.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
AERIAL INTERCONNECT				
Designed By	Names	Dates	Approved By	
Drawn By			<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By			Revision	Sheet No. Index No.
			00	1 of 1 17733

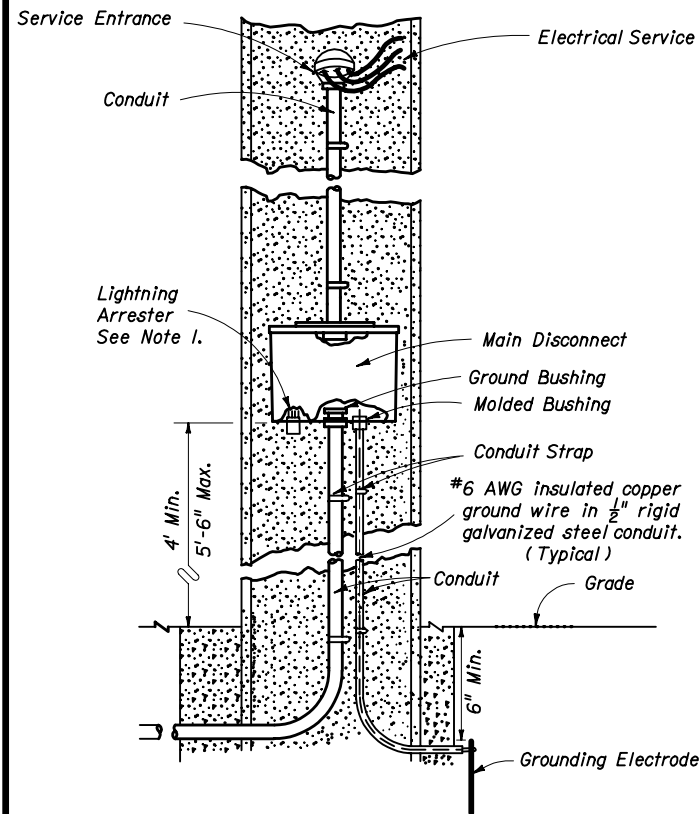
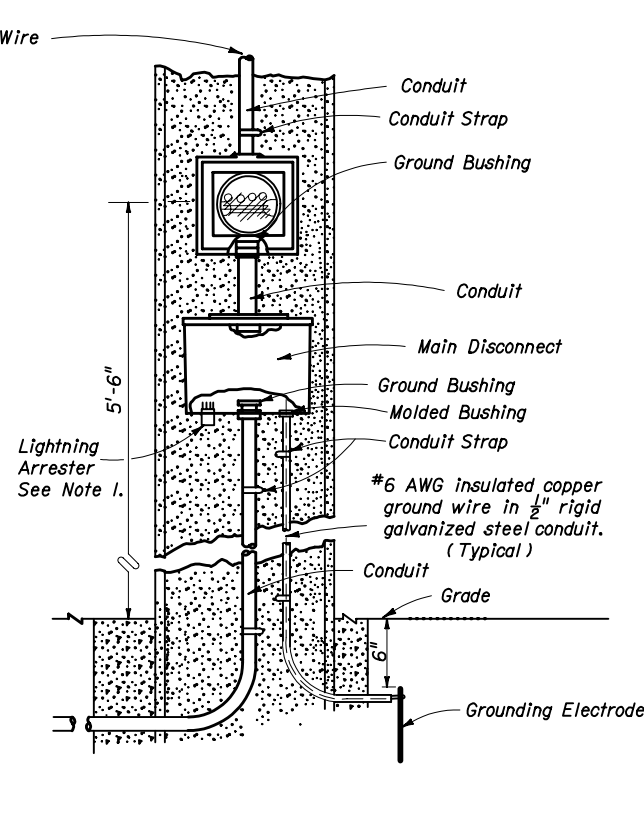
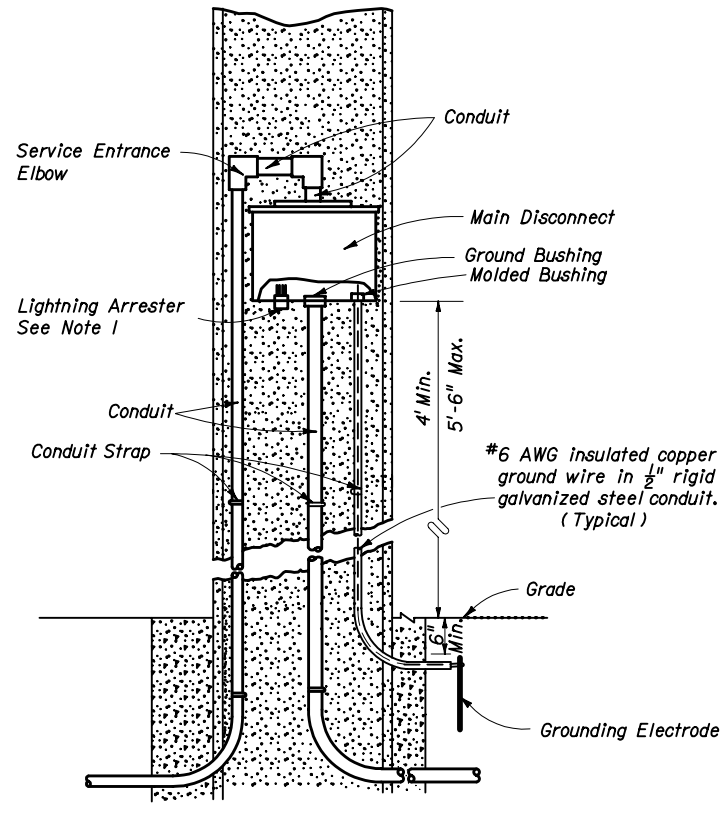


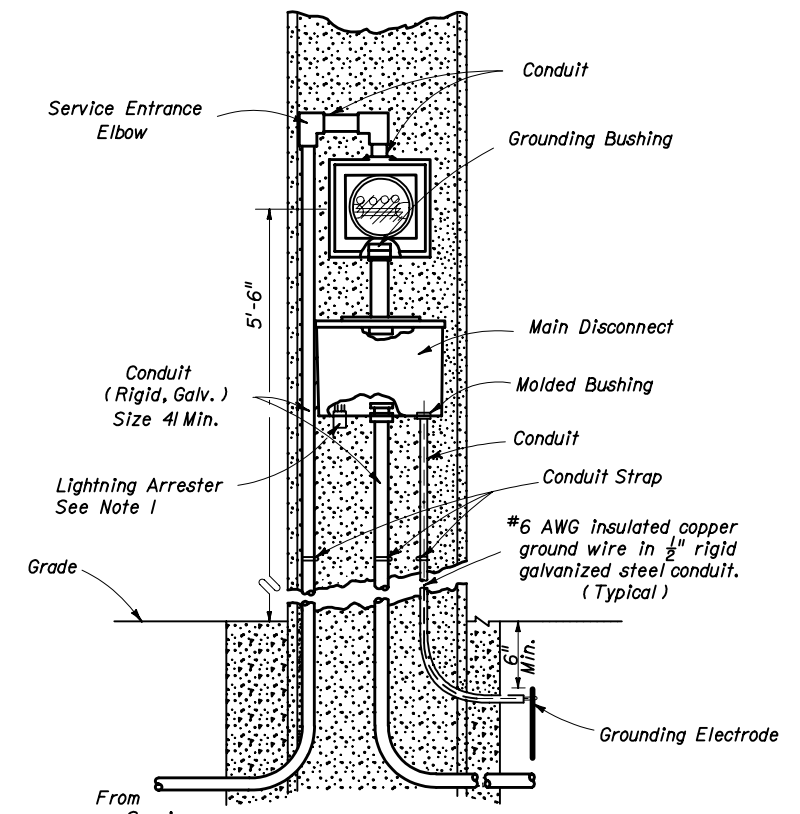
FIGURE A
AERIAL FEED
(NO METER USED)



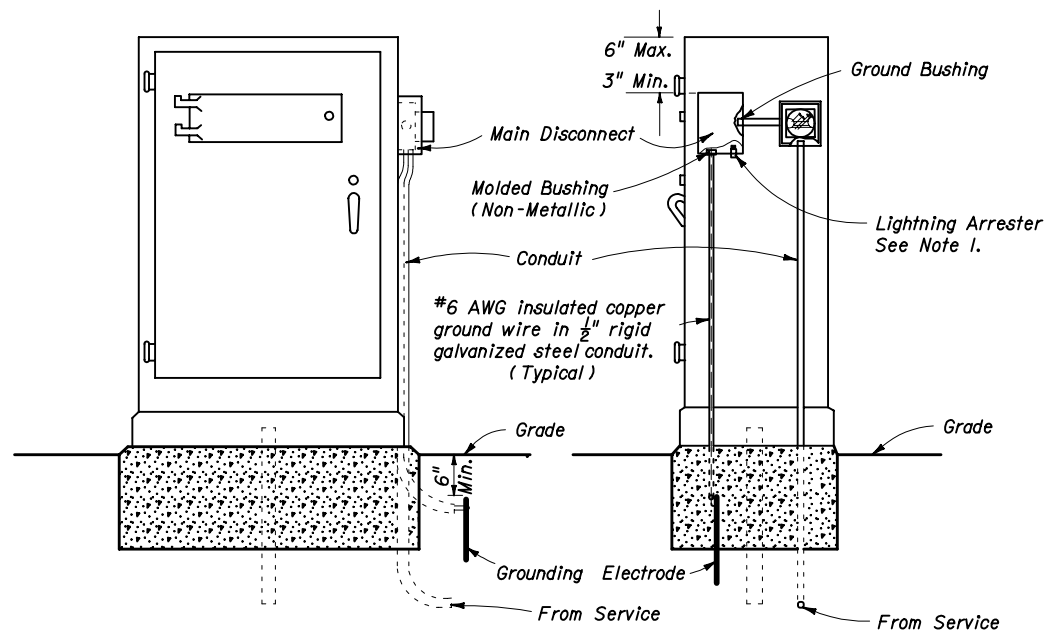
AERIAL FEED
(METER USED)
FIGURE B



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.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ELECTRIC POWER SERVICE

Designed By	Names	Dates	Approved By
Drawn By		9-80	<i>Clark A. Scott</i> State Traffic Standards Engineer
Checked By			Revision
			Sheet No.
			Index No.
		00	1 of 1
			17736

INSTRUCTIONAL NOTES FOR DESIGNERS AND FABRICATORS

1. This Index, 17741, is for use in preparing signalization plans when single arm and double arm mast arm assemblies are required. This standard establishes the requirements of mast arm components listed on the Qualified Products List (QPL). When using components on the QPL, the "Mast Arm Assemblies Design Table", will be the only information required in the Contract Plans, and shop drawings are not required.

2. If a mast arm configuration does not meet the requirements stated below, a special design and shop drawing submittal is required. For Special Designs, Structures Standard Drawing S-1710 must be completed and included in the Contract Plans.

3. The "Standard Mast Arm Assemblies Design Table" on Structures Standard Drawing S-1700 is to be filled out in accordance with the following instructions and examples on Sheet No. 2 of 2 and included in the Contract Plans.

4. The Data for Standard Mast Arm Assemblies are on Index No. 17743. The arm classes are used regardless of single or double arm configurations. The poles are for either single or double arm configurations without luminaires or single arm configurations with luminaires.

5. The standard arm lengths and the signal and sign locations used for design of the arm are shown on the mast arm design loading trees on this sheet. If the same arrangement of signals and signs is used with one or more signals or signs closer to the pole, the standard arm may be used. If the same arrangement is used but one or more signals or signs are further from the pole, or if a different configuration of signals and signs is used, a special design is required.

6. The arm types shall be specified in the "Standard Mast Arm Assemblies Design Table". If the standard arm length is used, no further entries are required under the arm columns. If necessary, a shorter arm length may be obtained by removing length from the arm tip. In this case, enter the actual arm length (FAA) and actual tip diameter (FBA) under the appropriate arm in the "Standard Mast Arm Assemblies Design Table".

7. If a double arm structure is required, both arm types and the angle between the arms (UF) shall be entered in the "Standard Mast Arm Assemblies Design Table". The angle between arms is measured counterclockwise from the first arm and shall be either 90° or 270°. If the angle between the arms is not 90° or 270°, a special design is required.

8. Pole types Q1 thru Q6 and R1 thru R6 may be used with both single arm and double arm structures without luminaires. Pole types Q21 Lum thru Q24 Lum and R21 Lum thru R24 Lum are intended for single arm structures with luminaires. Use the Pole Selection Table to select the pole type to be used with any combination of arm types. The pole, connection plate, base plate variables and drilled shaft variables are shown in the "Pole, Connection and Shaft Design Table" on Index No. 17743.

9. The connection plate variables are constant for all arms used with each pole type. If a double arm structure is used, the same connection plate variables are to be used for each arm.

10. The pole type and arm mounting height (UB) shall be specified in the "Standard Mast Arm Assemblies Design Table". The arm mounting height (UB) shall be between 18' and 22'. A Special Design is required for arm mounting heights greater than 22'. Standard poles Q1 thru Q6 and R1 thru R6 are available in the 24 foot height. If the standard height is used, no further entries are required under the pole information. If necessary, a shorter pole may be obtained by removing height from the pole tip. In this case, enter the actual pole height (UAA) and the actual pole tip diameter (UCA) in the "Standard Mast Arm Assemblies Design Table".

11. Poles Q21 Lum thru Q24 Lum and R21 Lum thru R24 Lum are designed for a luminaire mounted 10 feet off the face of upright at a 40 foot mounting height with a 37.5 foot arm connection height. Luminaire is 2.4 sq. ft. (max) and 45 lbs. (max). Differing arm configurations, pole mounting heights or luminaire will require a Special Pole Design.

12. Component type numbers shall be entered in the Assembly Numbers column using the following format:

Single Arm:
 Arm Type - Pole Type = B# - Q#
 = C# - R#

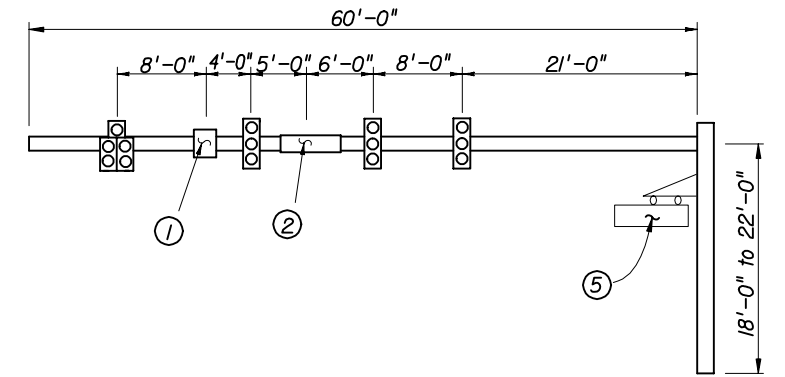
Double Arm:
 First Arm Type - Second Arm Type - Pole Type = B# - B# - Q#
 = C# - C# - R#

13. The foundations for Standard Mast Arm Assemblies are pre-designed and are based upon the following conservative soil criteria which covers the great majority of soil types found in Florida:

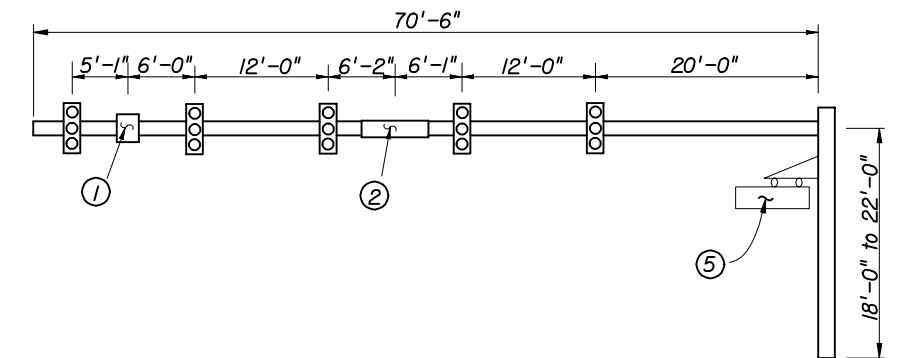
Classification = Cohesionless (Fine Sand)
 Friction Angle = 30 Degrees (30°)
 Unit Weight = 50 lbs./cu. ft. (assumed saturated)

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.

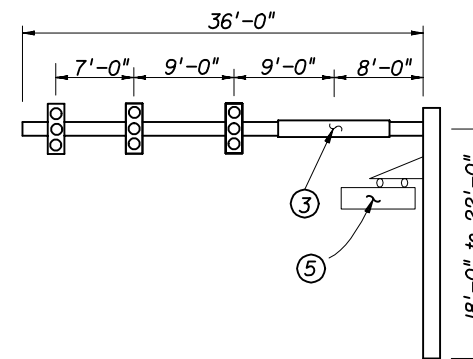
14. Standard Mast Arm Assemblies may be placed on existing foundations with notations to Structures Standard Drawings S-1700 or S-1710 as necessary to implement installation. Anchor installation shall be in accordance with Sections 416 and 937 of the Specifications and in accordance with manufacturer's recommendations. Anchors may be offset from center but must be placed such that all anchors are within the foundation reinforcing cage. Remove existing grout pad. Cut existing Anchor Bolts flush with top of Foundation. Replace damaged or removed portions of Foundation, using epoxy bonding compound as necessary, according to Section 400 of the Specifications. Replace grout pad according to Section 934 of the Specifications.



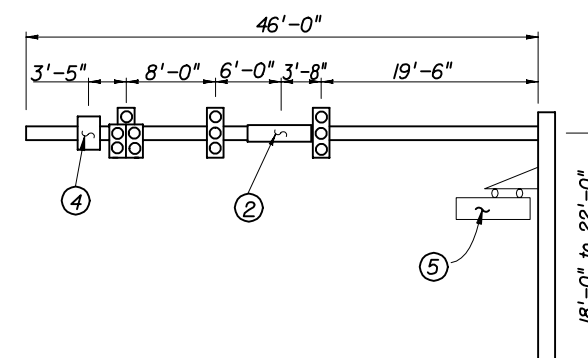
DESIGN LOADING TREE FOR ARM TYPES B5 & C5



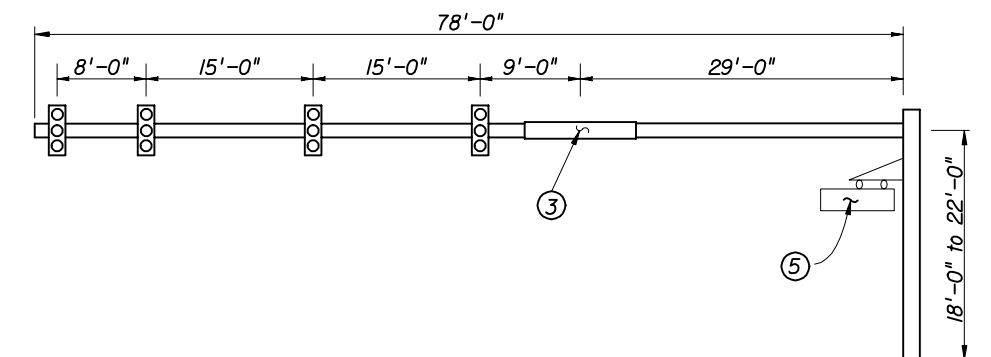
DESIGN LOADING TREE FOR ARM TYPES B6 & C6



DESIGN LOADING TREE FOR ARM TYPES B1, B2, C1 & C2



DESIGN LOADING TREE FOR ARM TYPES B3, B4, C3 & C4



DESIGN LOADING TREE FOR ARM TYPES B7 & C7

NOTES:

1. Standard Mast Arm Assemblies are designed for the following criteria:

Arm Type B - 110 mph Wind Speed with Signal Backplates
 Arm Type C - 90 mph Wind Speed with Signal Backplates
 or 110 mph Wind Speed without Signal Backplates

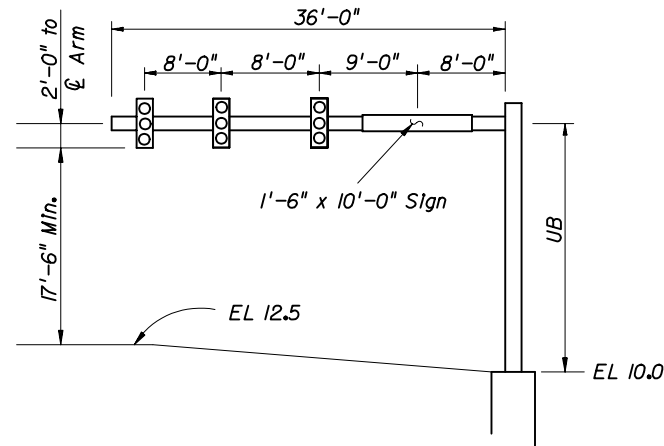
2. Signal Heads are shown mounted vertically; however, heads may be mounted horizontally when so indicated in the plans.

- ① Denotes a 2'-0" x 2'-6" Sign.
- ② Denotes a 1'-6" x 6'-0" Sign.
- ③ Denotes a 1'-6" x 10'-0" Sign.
- ④ Denotes a 2'-0" x 3'-0" Sign.
- ⑤ Denotes a 12 sq. ft. (max), 75 lbs. (max) Internally Illuminated sign on a hinged bracket attached to pole which is acceptable by Contractor Certification provided it meets applicable requirements of Specification Section 699.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
INSTRUCTIONS AND EXAMPLES FOR DESIGNERS AND FABRICATORS OF STANDARD MAST ARM "B" & "C" ASSEMBLIES				
Designed By	CH	6-02	Approved By	<i>[Signature]</i>
Drawn By	CH	6-02	Revision	Sheet No.
Checked By	AVP	6-02	04	1 of 2
				17741

EXAMPLE 1

Single Arm Structure as shown,
90 mph Wind Speed with Signal Backplates.

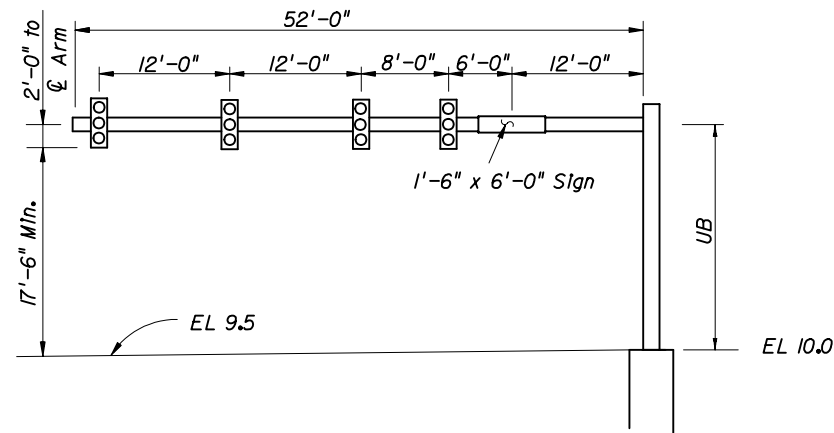


EXAMPLE 1 INSTRUCTIONS

- Select Arm Type**
Compare attachment sizes and locations with design loading trees. In this case, all signals and signs are no farther from the pole than shown in the 36' Arm loading tree. Enter Arm Type C1 in the "Standard Mast Arm Assemblies Design Table" on Structures Standard No. S-1700.
- Select Pole Type**
Use Pole Selection Table (Single Arm) on Index No. 17743 (2 of 2) with Arm Type C1 and select Pole Type 'R1'. Enter Pole Type 'R1' in the "Mast Arm Assemblies Design Table".
- Determine Arm Mounting Height 'UB'**.
 $UB' + 10' = 12.5' + 7.5' (Min) + 2'$
 $UB' = 22.0' Min.$ Use 22'
Enter $UB = 22'-0"$ in the "Standard Mast Arm Assemblies Design Table"
- Enter Assembly Numbers**
C1 - R1
Arm Type - Pole Type

EXAMPLE 2

First Arm Structure as shown, Second Arm same as Example 1
except 110 mph Wind Speed with Signal Backplates.



EXAMPLE 2 INSTRUCTIONS

- Select First Arm Type**
Designate longest arm as First Arm. For a 52' Arm, investigate Arm B5 (Maximum Arm Length = 60') As in Example 1, compare attachment sizes and locations with design loading tree. In this case, all attachments are no larger than and are closer to the pole than shown in the design loading tree. Select and enter Arm Type B5 under the First Arm in the "Standard Mast Arm Assemblies Design Table" on Structures Standard No. S-1700.
- Specify shorter Arm.**
Since the full 60' of Standard Arm 'B5' is not required, provide the required 52' arm by entering an actual length of 28' under 'FAA' for the first Arm ('FAA' + 'FE'-Splice = 28' + 26'-2'=52'). Determine actual tip diameter 'FBA' for Arm shortened by 8'.
 $FBA = FB + (60' - 52')(0.14"/ft)$
 $FBA = 7.96" + 8'(0.14"/ft) = 9.08"$
Enter 9.08" for FBA under First Arm.
- Select Second Arm Type - choose B2.**
- Enter angle between arms as 'UF'** in "Standard Mast Arm Assemblies Design Table". The angle is measured counter-clockwise from the First Arm and must be either 90° or 270°.
- Select Pole Type**
Use Pole Selection Table (Double Arm) on Index No. 17743 (1 of 2) with Arm Types 'B5' and 'B2', and select Pole Type 'Q3'. Enter Pole Type 'Q3' in the "Standard Mast Arm Assemblies Design Table".
- Determine Arm Mounting Height 'UB'**.
 $UB' + 10' = 9.5' + 7.5' (Min) + 2'$
 $UB' = 19.0' Min.$ Use 20'
Enter $UB = 20'-0"$ in the "Standard Mast Arm Assemblies Design Table"
- Specify shorter Pole height.**
This procedure is similar to specifying a shorter Arm. Select actual height of 22' and enter under 'UAA' in the "Mast Arm Assemblies Design Table". Determine actual tip diameter 'UCA' for shortened Type 'Q3' Pole.
 $UCA = 18.64" + (24' - 22')(0.14"/ft) = 18.92"$
Enter 18.92 under "UCA" in the "Standard Mast Arm Assemblies Design Table".
- Enter Assembly Numbers**
B5 - B2 - Q3
First Arm Type - Second Arm Type - Pole Type

STANDARD MAST ARM ASSEMBLIES DESIGN TABLE

STRUCTURE ID NUMBERS	ASSEMBLY NUMBERS (1)	FIRST ARM			SECOND ARM			UF (deg)	POLE				SPECIAL DRILLED SHAFT DATA ⁽⁴⁾			
		ARM TYPE	FAA (ft.) ⁽²⁾	FBA (In.) ⁽²⁾	ARM TYPE	FAA (ft.) ⁽²⁾	FBA (In.) ⁽²⁾		POLE TYPE	UAA (ft.) ⁽³⁾	UB (ft.)	UCA (In.) ⁽³⁾	DA (ft.)	DB (ft.)	RA	RB
Example 1	C1 - R1	C1			.		.	.	R1	.	22
Example 2	B5 - B2 - Q3	B5	28	9.08	B2	.	.	270	Q3	22	20	18.92
.
.
.

TABLE NOTES:

(1) Assembly Number Legend

Single Arm:
Arm Type - Pole Type = B# - Q#
= C# - R#

Double Arm:
First Arm Type - Second Arm Type - Pole Type = B# - B# - Q#
= C# - C# - R#

(2) If an entry appears in columns "FAA" and "FBA", a shorter arm is required. This is obtained by removing length from the arm tip. For these cases the mast arm length shall be shortened from "FA" to "FAA" and the tip diameter shall be increased from "FB" to "FBA".

(3) If an entry appears in columns "UAA" and "UCA", a shorter pole is required. This is obtained by removing length from the pole tip. For these cases the pole height shall be shortened from "UA" to "UAA" and the pole tip diameter shall be increased from "UC" to "UCA".

(4) The foundations for Standard Mast Arm Assemblies are pre-designed and are based upon the following conservative soil criteria which covers the great majority of soil types found in Florida. Only complete the "Special Drilled Shaft Data" information if site conditions dictate drilled shafts with additional foundation capacity.

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

INSTRUCTIONS AND EXAMPLES FOR DESIGNERS AND FABRICATORS OF STANDARD MAST ARM "B" & "C" ASSEMBLIES

Names	Dates	Approved By		
Designed By	CH	6-02	State Structures Design Engineer	
Drawn By	CH	6-02	Revision	Sheet No.
Checked By	AVP	6-02	04	2 of 2
			Index No.	17741

POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE					
Arm Type	B1	B3	B5	B6	B7
Pole Type	Q1 & Q2 Lum	Q2 & Q22 Lum	Q3 & Q23 Lum	Q4 & Q24 Lum	Q6

POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE										
Arm Type	B1 - B1	B3 - B1	B5 - B2	B6 - B2	B4 - B4	B5 - B4	B6 - B4	B5 - B5	B6 - B5	B6 - B6
Pole Type	Q1	Q2	Q3	Q4	Q3	Q4	Q4	Q4	Q4	Q5

Arm 1 is listed first

ARM DESIGN TABLE - ALL CASES														
ARM TYPE	ARM LENGTH	MAST ARM				ARM EXTENSION				ARM CONNECTION & WELDS				
		FA(ft)	FB(In)	FC(In)	FD(In)	FE(ft)	FF(In)	FG(In)	FH(In)	HT(In)	FJ/SJ(In)	FK/SK(In)	FM/SM(In)	FQ/SQ(In)
B1	36'-0"	36	7.96	13	0.793	-	-	-	-	20	25	2.25	0.25	0.313
B2	36'-0"	36	7.96	13	0.793	-	-	-	-	30	36	3	0.25	0.313
B3	46'-0"	36.3	7.92	13	0.793	11.7	12.36	14	0.25	20	25	2.25	0.88	0.438
B4	46'-0"	36.3	7.92	13	0.793	11.7	12.36	14	0.25	30	36	3	0.88	0.438
B5	60'-0"	36	7.96	13	0.793	26	12.36	16	0.313	30	36	3	0.25	0.5
B6	70'-6"	39.4	9.49	15	0.793	33.4	14.36	19	0.313	30	36	3	0.25	0.5
B7	78'-0"	40	8.44	14	0.793	40	13.40	19	0.313	30	36	3	0.25	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)	FO/SO (In)	FP/SP (In)	FR/SR (In)	FS/SS (In)	FT/ST (In)	DA (ft)	DB (ft)	RA	RB
Q1	24	12.64	16	0.313	-	6	30	1.5	1.75	0.313	0.25	36	20	25	0.75	0.438	15.5	1	2	8	0.438	13	3.5	9	14
Q2	24	14.64	18	0.313	-	6	32	1.5	1.75	0.313	0.25	36	20	25	0.75	0.438	15.5	1	2	8	0.438	13	4	9	19
Q3	24	18.64	22	0.313	-	6	38	1.5	2	0.313	0.25	42	30	36	0.75	0.438	21.5	1.25	2.25	12.5	0.438	13	4.5	9	23
Q4	24	21.64	25	0.313	-	6	41	1.5	2	0.313	0.25	42	30	36	0.75	0.438	21.5	1.25	2.25	12.5	0.438	18	4.5	9	23
Q5	24	23.64	27	0.313	-	6	43	1.5	2	0.313	0.25	42	30	36	0.75	0.438	21.5	1.25	2.25	12.5	0.438	19	4.5	9	23
Q6	24	21.64	25	0.313	-	6	41	1.5	2	0.313	0.25	42	30	36	0.75	0.438	16	1.25	2.25	12.5	0.438	16	4.5	9	23
Q21 Lum	39	10.54	16	0.313	37.5	6	30	1.75	1.75	0.313	0.25	36	20	25	0.75	0.438	11.5	1	2	8	0.438	12	3.5	9	14
Q22 Lum	39	12.54	18	0.313	37.5	6	32	1.75	1.75	0.313	0.25	36	20	25	0.75	0.438	12.5	1	2	8	0.438	12	4	9	19
Q23 Lum	39	16.54	22	0.313	37.5	6	38	1.75	2	0.313	0.25	42	30	36	0.75	0.438	14.5	1.25	2.25	12.5	0.438	13	4.5	9	23
Q24 Lum	39	19.54	25	0.313	37.5	6	41	1.75	2	0.313	0.25	42	30	36	0.75	0.438	16	1.25	2.25	12.5	0.438	16	4.5	9	23

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)
40.0	10.0	3.0	0.25	0.50	8.0	0.5	0.75	0.25	0.88	0	37.5

NOTES:

1. Work this Index with Index No. 17745.
2. Standard Mast Arm "B" Assemblies are designed to Loading Trees as Indicated in Index No. 17741 for Design Wind Speed = 110 mph with Signal Backplates.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

COMPONENT DATA FOR STANDARD MAST ARM "B" ASSEMBLIES

Names	Dates	Approved By	Revision	Sheet No.	Index No.
Designed By	CH	6-02			
Drawn By	CH	6-02			
Checked By	AVP	6-02	04	1 of 2	17743

POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE					
Arm Type	C1	C3	C5	C6	C7
Pole Type	R1 & R2 Lum	R2 & R22 Lum	R3 & R23 Lum	R4 & R24 Lum	R6

POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE										
Arm Type	C1 - C1	C3 - C1	C5 - C2	C6 - C2	C4 - C4	C5 - C4	C6 - C4	C5 - C5	C6 - C5	C6 - C6
Pole Type	R1	R2	R3	R4	R3	R4	R4	R4	R4	R5

Arm 1 is listed first

ARM DESIGN TABLE - ALL CASES														
ARM TYPE	ARM LENGTH	MAST ARM				ARM EXTENSION				ARM CONNECTION & WELDS				
		FA(ft)	FB(In)	FC(In)	FD(In)	FE(ft)	FF(In)	FG(In)	FH(In)	HT(In)	FJ/SJ(In)	FK/SK(In)	FM/SM(In)	FQ/SQ(In)
C1	36'-0"	36	5.96	11	0.793	-	-	-	-	20	20	2	0.125	0.25
C2	36'-0"	36	5.96	11	0.793	-	-	-	-	29	29	2.25	0.125	0.25
C3	46'-0"	36.3	5.92	11	0.793	11.7	10.36	12	0.25	20	20	2	0.188	0.375
C4	46'-0"	36.3	5.92	11	0.793	11.7	10.36	12	0.25	29	29	2.25	0.188	0.375
C5	60'-0"	36	5.96	11	0.793	26	10.36	14	0.313	29	29	2.25	0.25	0.438
C6	70'-6"	39.4	5.49	11	0.793	33.1	10.36	15	0.313	29	29	2.25	0.25	0.5
C7	78'-0"	40	6.44	12	0.793	40	11.40	17	0.313	30	30	2.25	0.25	0.5

Arm Camber Angle = 2 degrees


*See Note 3

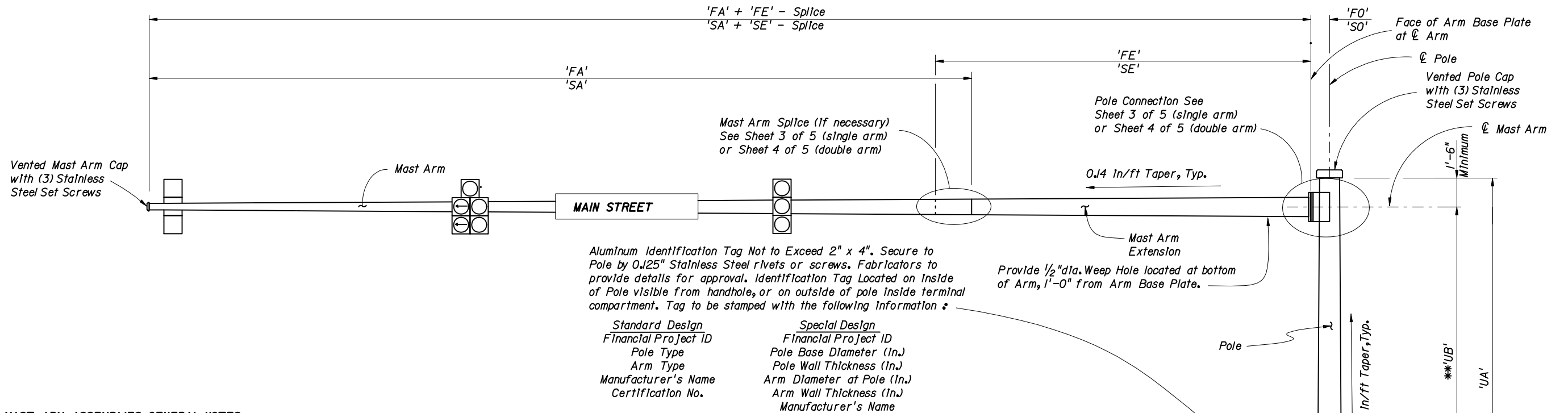
POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM																										
POLE TYPE	UA(ft)	UC(In)	UD(In)	UE(In)	UG(ft)	UPRIGHT BASE CONNECTION						CONNECTION PLATE DATA								DRILLED SHAFT DATA						
						No. Bolts	BA (In)	BB (In)	BC (In)	BD (In)	BE (In)	BF (In)	HT (In)	FJ/SJ (In)	FL/SL (In)	FN/SN (In)	FO/SO (In)	FP/SP (In)	FR/SR (In)	FS/SS (In)	FT/ST (In)	DA (ft)	*DA(D6) (ft)	DB (ft)	RA	RB
R1	24	9.64	13	0.313	-	6	25	1.5	1.5	0.313	0.25	36	20	20	0.5	0.313	13	0.75	1.75	8.5	0.313	15	10	3.5	9	14
R2	24	11.64	15	0.313	-	6	27	1.5	1.5	0.313	0.25	36	20	20	0.5	0.313	13	0.75	1.75	8.5	0.313	15	12	3.5	9	14
R3	24	14.64	18	0.313	-	6	32	1.5	1.75	0.313	0.25	36	29	29	0.5	0.313	17.5	1	1.75	12.5	0.313	15	12	4	9	19
R4	24	17.64	21	0.313	-	6	35	1.5	1.75	0.313	0.25	36	29	29	0.5	0.313	17.5	1	1.75	12.5	0.313	20	16	4	9	19
R5	24	18.64	22	0.313	-	6	36	1.5	1.75	0.313	0.25	36	29	29	0.5	0.313	17.5	1	1.75	12.5	0.313	21	17	4	9	19
R6	24	17.64	21	0.313	-	6	35	1.5	1.75	0.313	0.25	36	30	30	0.5	0.375	14	1.25	1.75	12.5	0.375	18	15	4	9	19
R21 Lum	39	7.54	13	0.313	37.5	6	25	1.75	1.5	0.313	0.25	36	20	20	0.5	0.313	10	0.75	1.75	8.5	0.313	11	11	3.5	9	14
R22 Lum	39	9.54	15	0.313	37.5	6	27	1.75	1.5	0.313	0.25	36	20	20	0.5	0.313	11	0.75	1.75	8.5	0.313	14	12	3.5	9	14
R23 Lum	39	12.54	18	0.313	37.5	6	32	1.75	1.75	0.313	0.25	36	29	29	0.5	0.313	12.5	1	1.75	12.5	0.313	15	12	4	9	19
R24 Lum	39	15.54	21	0.313	37.5	6	35	1.75	1.75	0.313	0.25	36	29	29	0.5	0.313	14	1	1.75	12.5	0.313	17	14	4	9	19

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)
40.0	10.0	3.0	0.125	0.50	8.0	0.5	0.75	0.25	0.188	0	37.5

NOTES:

1. Work this Index with Index No. 17745.
2. Standard Mast Arm "C" Assemblies are designed to Loading Trees as Indicated in Index No. 17741 for either; Design Wind Speed = 90 mph with Signal Backplates or Design Wind Speed = 110 mph without Signal Backplates.
3. DA(D6) Indicates shaft depth for District 6.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
COMPONENT DATA FOR STANDARD MAST ARM "C" ASSEMBLIES				
Names	Dates	Approved By		
Designed By	CH	6-02	 State Structures Design Engineer	
Drawn By	CH	6-02		
Checked By	AVP	6-02	Revision	Sheet No.
			04	2 of 2
				Index No. 17743



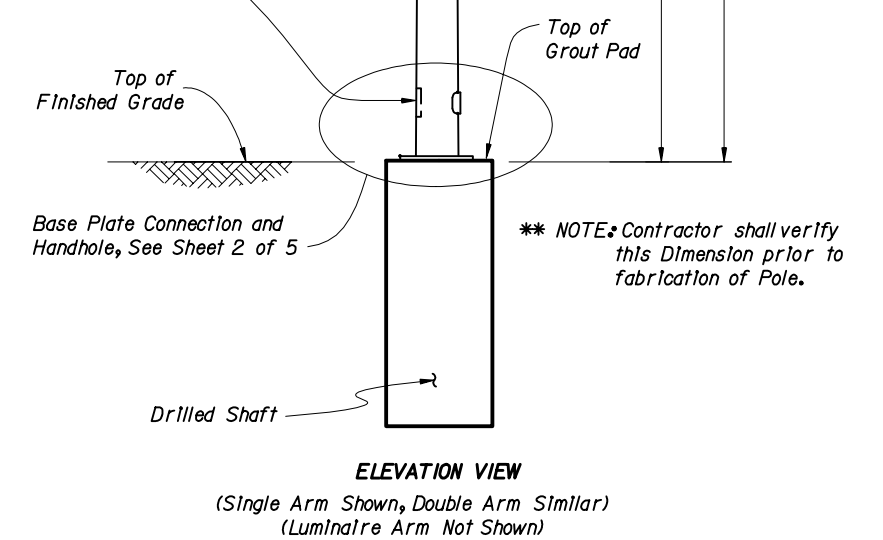
Aluminum Identification Tag Not to Exceed 2" x 4". Secure to Pole by 0.125" Stainless Steel rivets or screws. Fabricators to provide details for approval. Identification Tag Located on Inside of Pole visible from handhole, or on outside of pole inside terminal compartment. Tag to be stamped with the following information:

<i>Standard Design</i>	<i>Special Design</i>
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.)
	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 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)
 - Steel Plates --> ASTM A709 Grade 36 or ASTM A36
 - Weld Metal --> E70XX
 - Bolts (except Anchor Bolts) --> ASTM A325 Type I
 - Anchor Bolts --> ASTM F1554 Grade 55 ksi
 - Nuts for Anchor Bolts --> ASTM A563 Grade A Heavy Hex
 - Washers for Anchor Bolts --> ASTM F436 Type I
 - 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 A615-96, 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) Grout shall have a minimum 28-day compressive strength of 5,000 psi and shall meet the requirements of Section 934.
- 5) All welding shall conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).
- 6) All steel items shall be galvanized as follows:
 - All Nuts, Bolts, Washers and Threaded Bars/Studs --> ASTM A153 Class C or D depending on size
 - All other steel items --> ASTM A123 (Including Pole & Mast Arm)
- 7) 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.
- 8) Except for Anchor Bolts, all bolt hole diameters shall be equal to the bolt diameter plus 1/16", prior to galvanizing. Hole diameters for Anchor Bolts shall not exceed the bolt diameter plus 1/2".

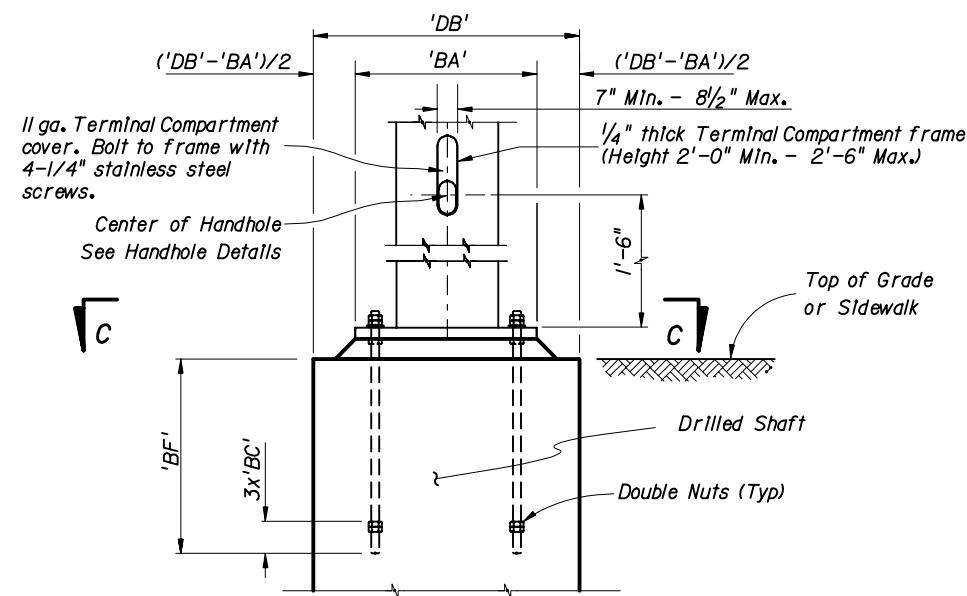
- 9) Sign Panels and Signals attached to the Mast Arm shall be centered in elevation on the arm. Sign Panels shall be aluminum. Wire access holes shall not exceed 1 1/2" in diameter.
- 10) Mast Arms and Poles shall be tapered with the diameter changing at a rate of 0.04 Inch per foot.
- 11) The Pole shall be installed vertically. Camber shall be accounted for in the Mast Arm connection as detailed.
- 12) If a Mast Arm damping device is required by the Engineer, it shall be installed within eight feet of the Mast Arm tip.
- 13) Alternate Designs for Special Mast Arm Assemblies are not allowed.
- 14) Provide "J"-Hook at top of pole for signal cable support.
- 15) Do not erect pole until foundation concrete has cured for a minimum of seven days.
- 16) First and Second Arm Camber Angle = 2°.
- 17) 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.
- 18) Work this Index with Structures Standard Nos. S-1700 and S-1710 as necessary.



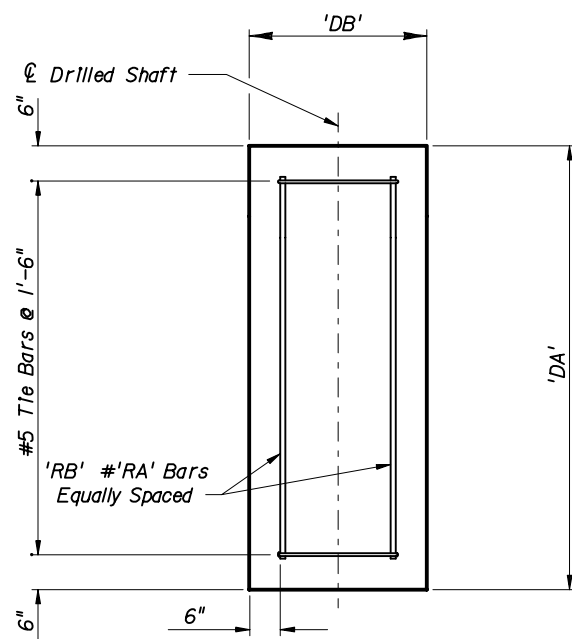
ELEVATION VIEW
(Single Arm Shown, Double Arm Similar)
(Luminaire Arm Not Shown)

TYPICAL ELEVATION AND NOTES

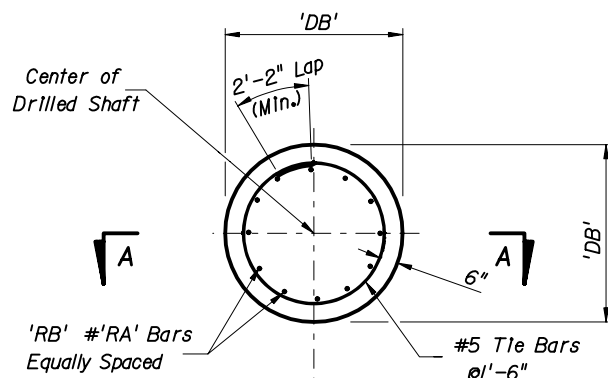
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MAST ARM ASSEMBLIES				
Designed By	CH	6-02	Approved By <i>[Signature]</i> State Structures Design Engineer	
Drawn By	CH	6-02	Revision	Sheet No. Index No.
Checked By	AVP	6-02	04	1 of 5 17745



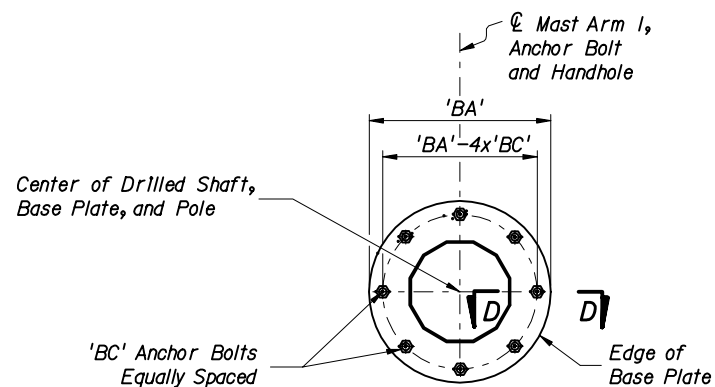
BASE PLATE AND ANCHORAGE ELEVATION
(Reinforcement Not Shown)



SECTION A-A

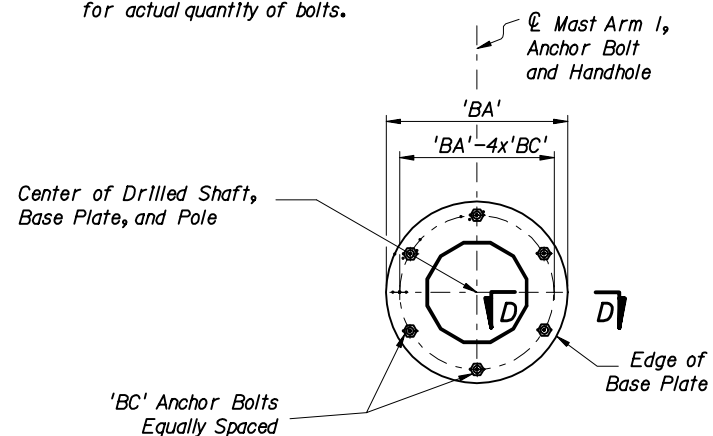


FOUNDATION PLAN
Note: 6" min. cover on Shaft Reinforcement

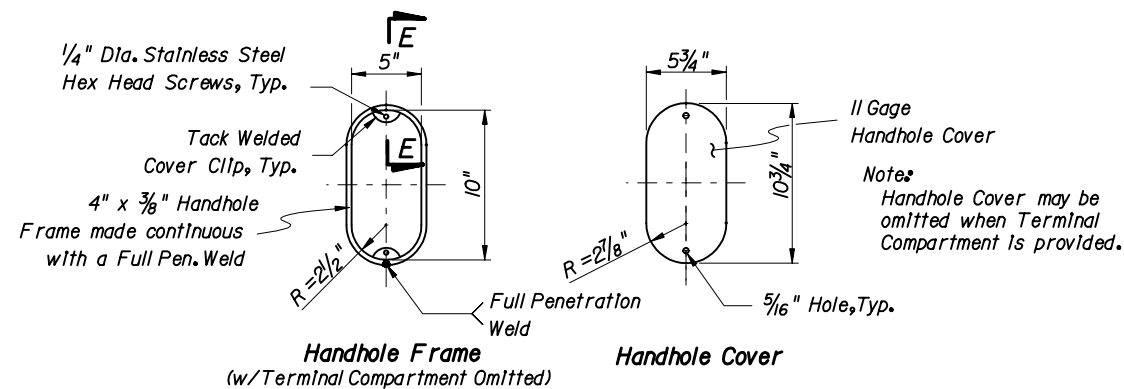


SECTION C-C
(8 Anchor Bolts)

NOTE: See Index Nos. I7742 and I7743 and Structures Standard Drawing S-1710 for actual quantity of bolts.



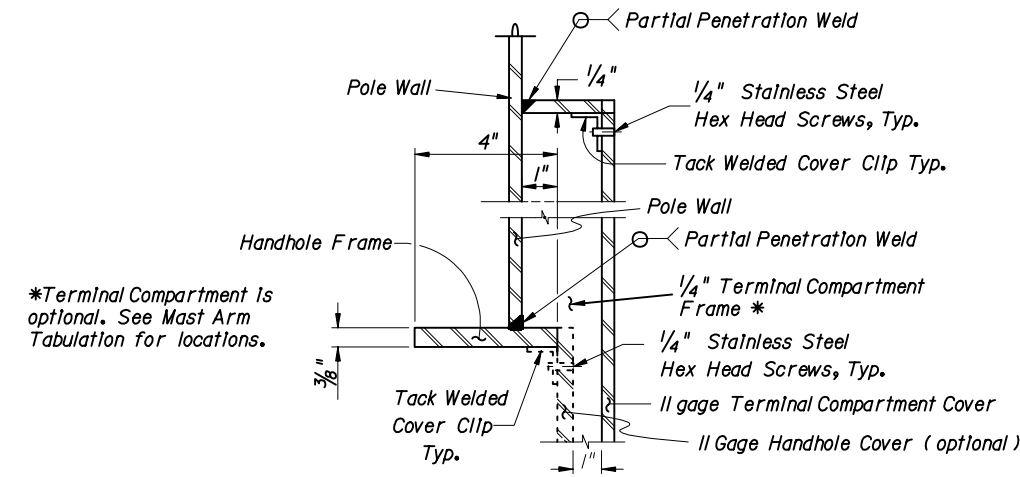
SECTION C-C
(6 Anchor Bolts)



Handhole Frame
(w/ Terminal Compartment Omitted)

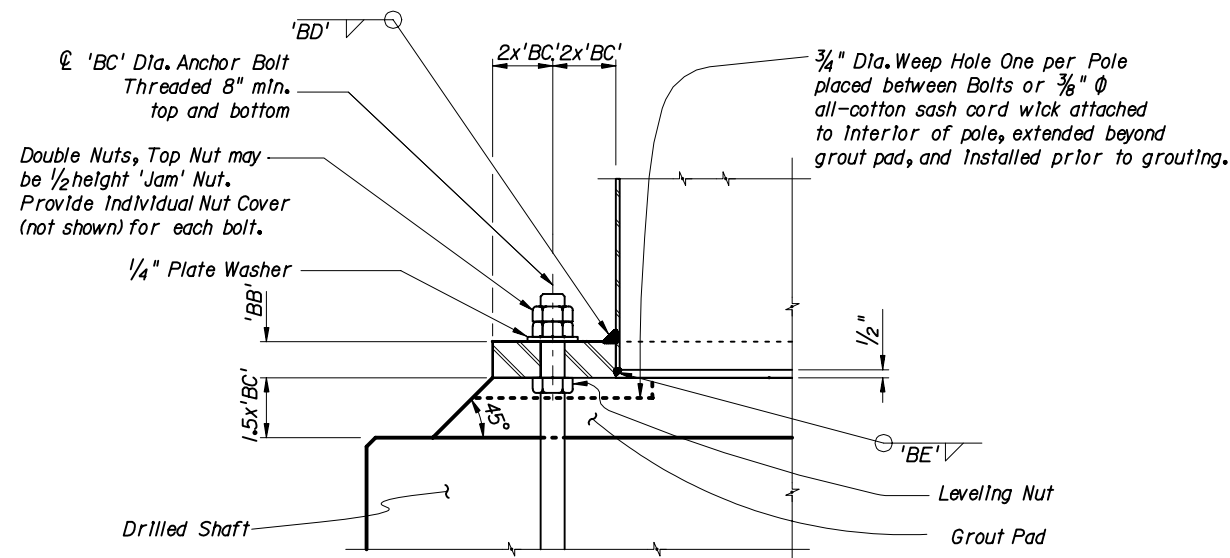
Handhole Cover

Note:
Handhole Cover may be omitted when Terminal Compartment is provided.



SECTION E-E
(thru Handhole & Terminal Compartment)

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



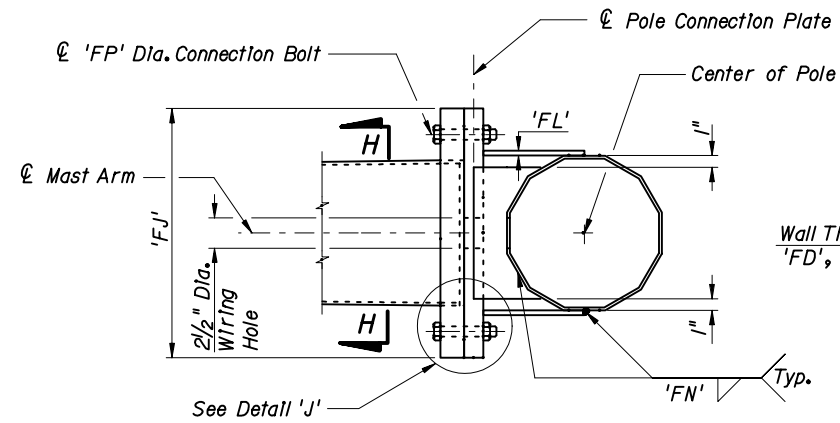
SECTION D-D

TYPICAL FOUNDATION AND BASE PLATE DETAILS

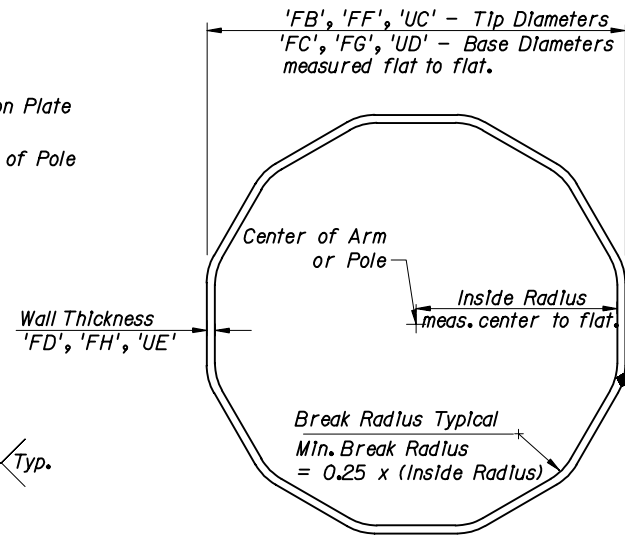
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MAST ARM ASSEMBLIES

Designed By	CH	6-02	Approved By		
Drawn By	CH	6-02	Revision	Sheet No.	Index No.
Checked By	AVP	6-02	04	2 of 5	17745



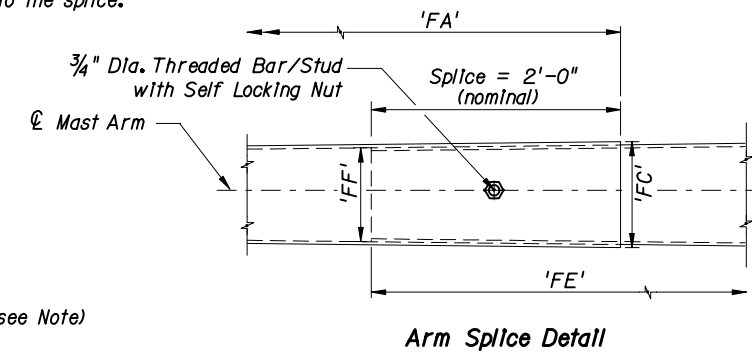
SECTION F-F



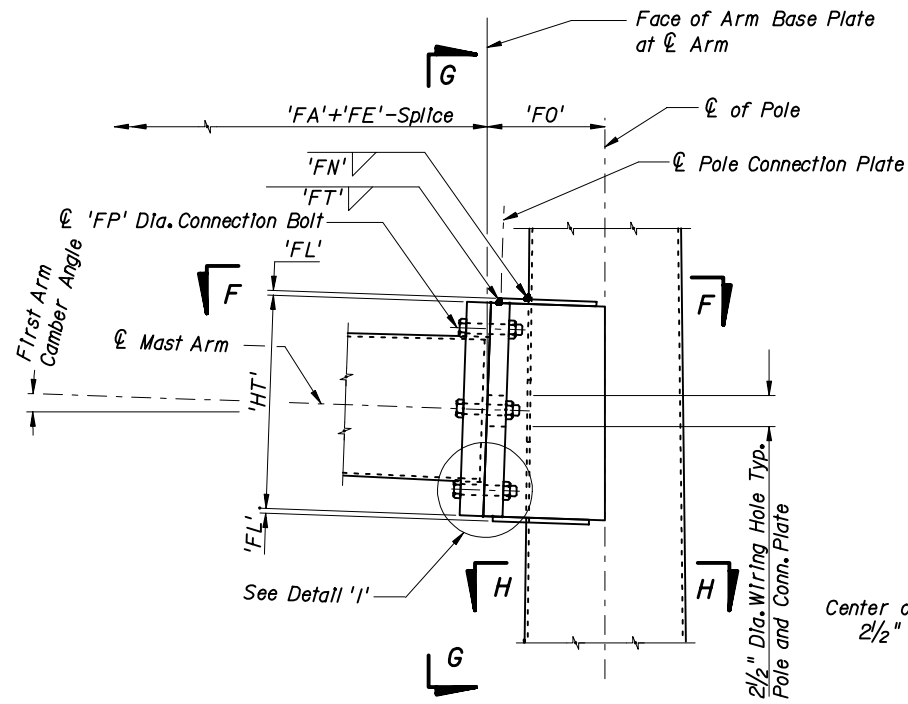
SECTION H-H

NOTE: Longitudinal seam welds within six inches of circumferential welds shall be complete penetration welds. Longitudinal seam welds at telescopic field spllices shall be complete penetration welds for the splice length plus six inches.

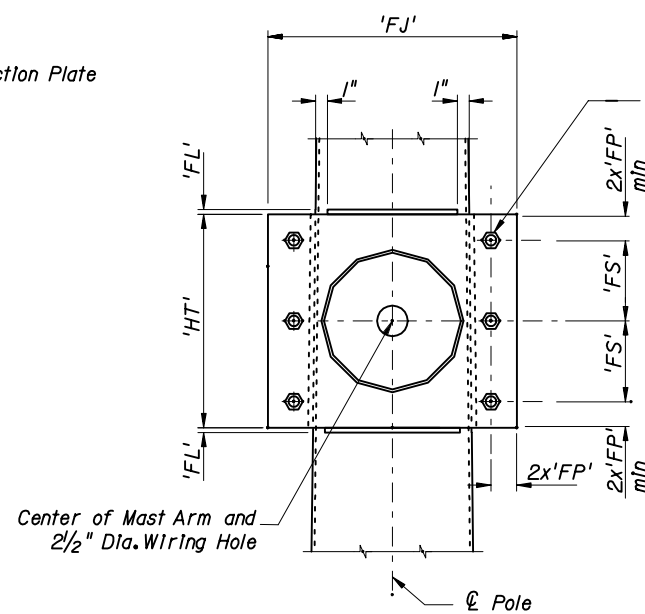
The 'Slip Joint' splice shall be a tight fit with no change in the Mast Arm slope due to the splice.



Arm Splice Detail

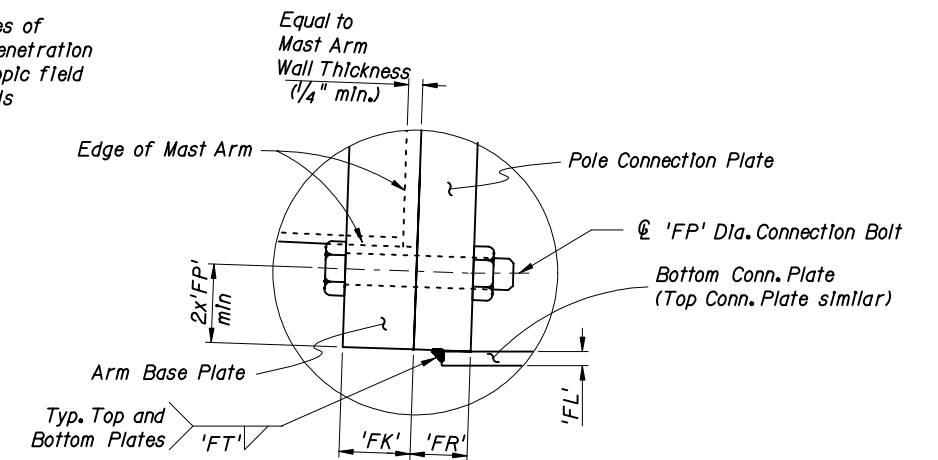


ELEVATION
(Single Arm Connection)

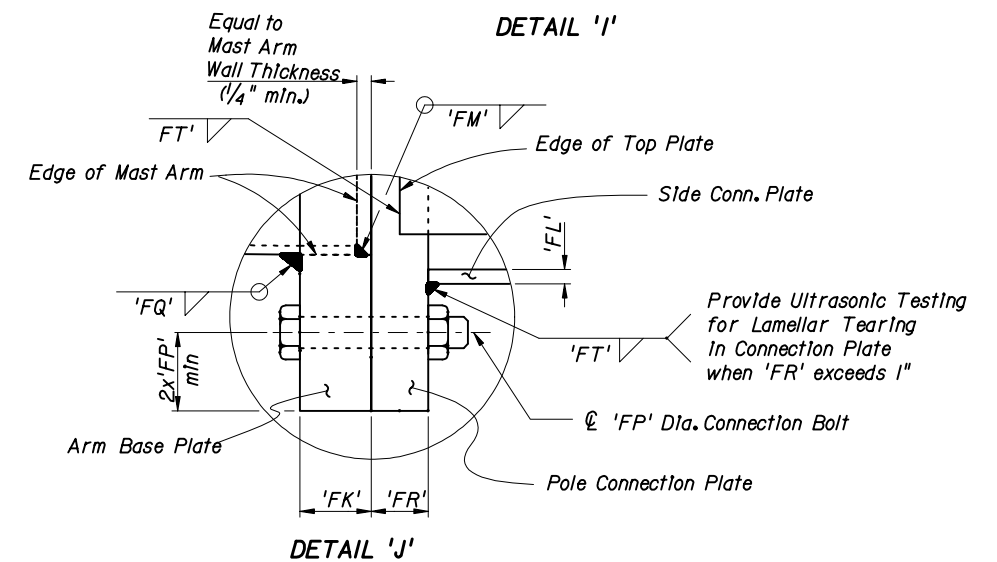


SECTION G-G

Six 'FP' dia. Connection Bolts (may vary for Special Design)



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.

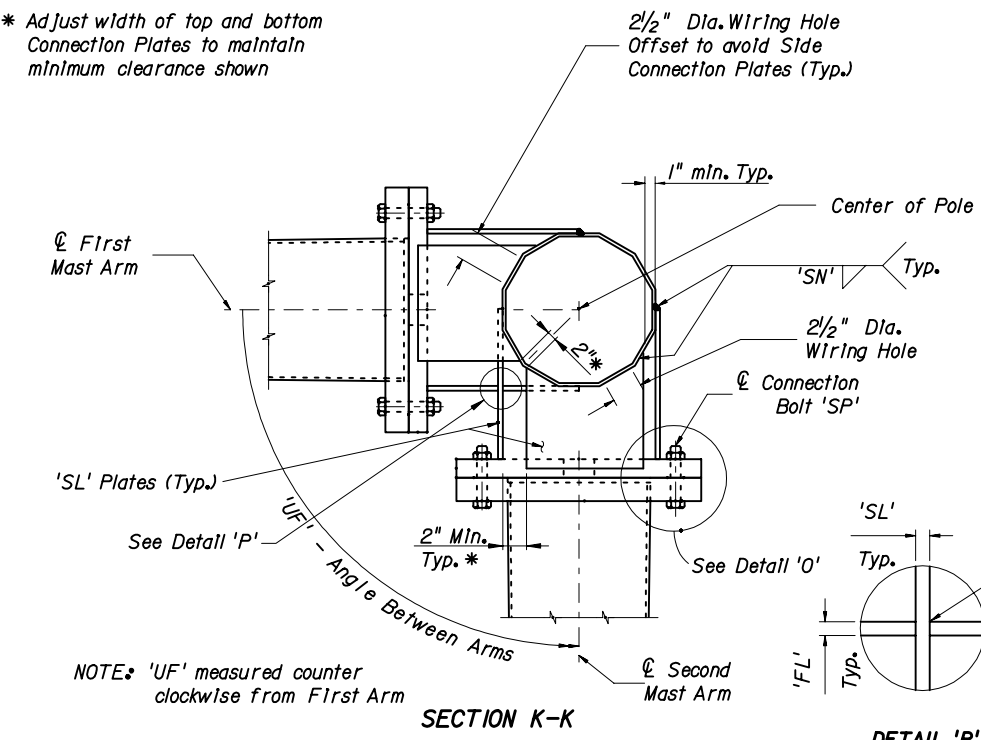
TYPICAL SINGLE ARM CONNECTION DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MAST ARM ASSEMBLIES

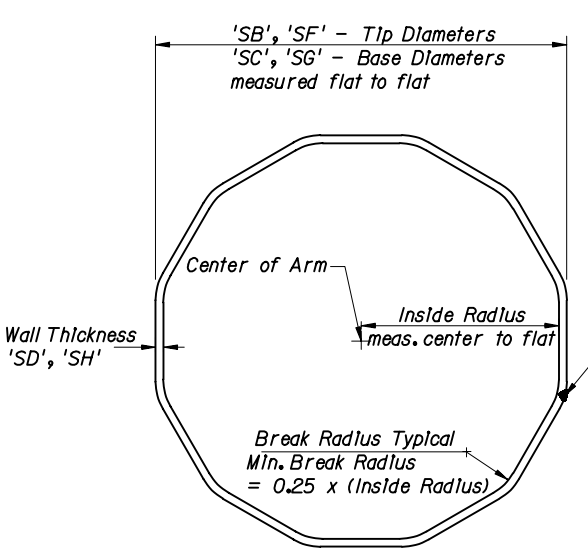
Names	Dates	Approved By		
Designed By	CH	6-02	 State Structures Design Engineer	
Drawn By	CH	6-02		
Checked By	AVP	6-02		
Revision	04	3 of 5	Index No.	17745

* Adjust width of top and bottom Connection Plates to maintain minimum clearance shown

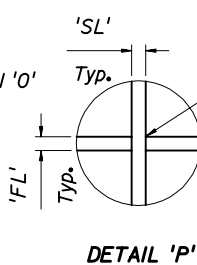


NOTE: 'UF' measured counter clockwise from First Arm

SECTION K-K

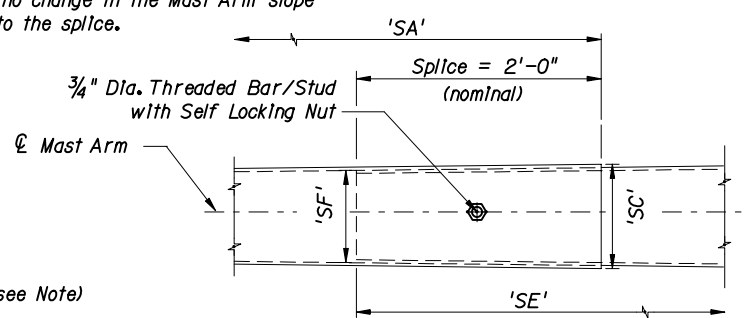


SECTION M-M



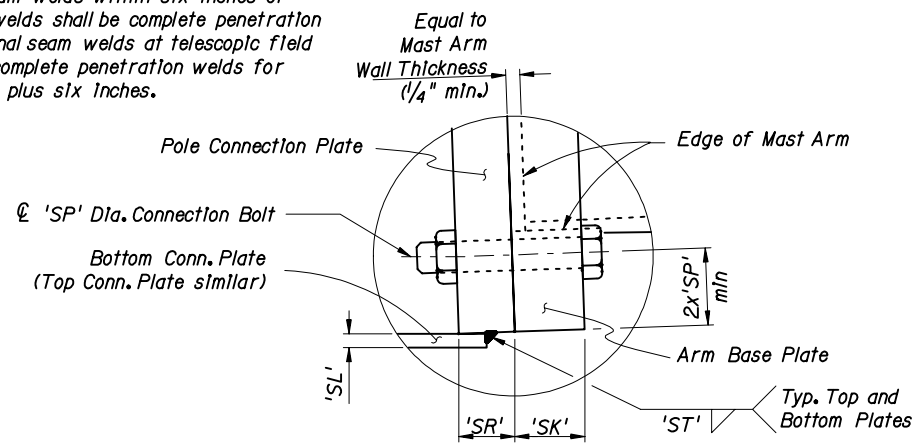
DETAIL 'P'

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



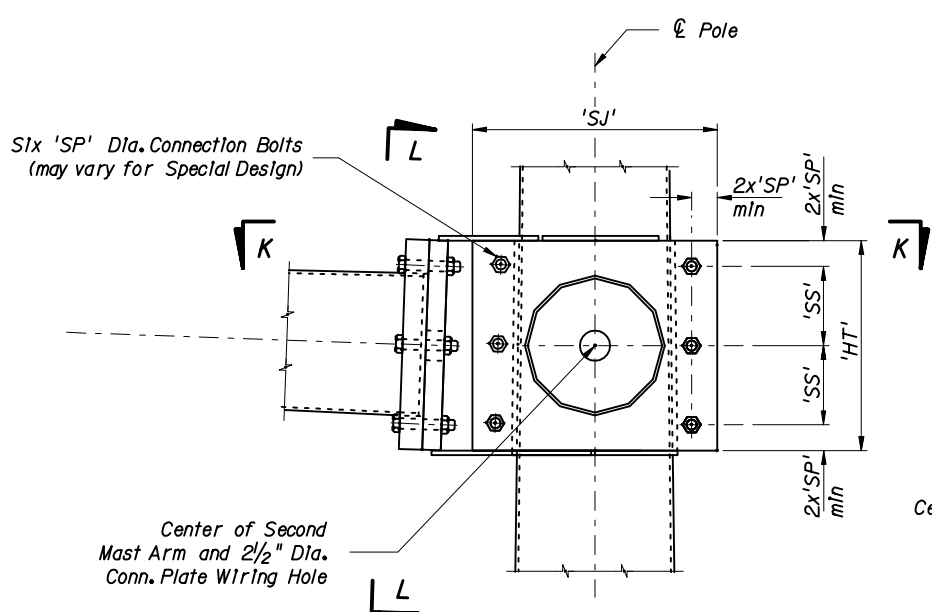
Arm Splice Detail

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.

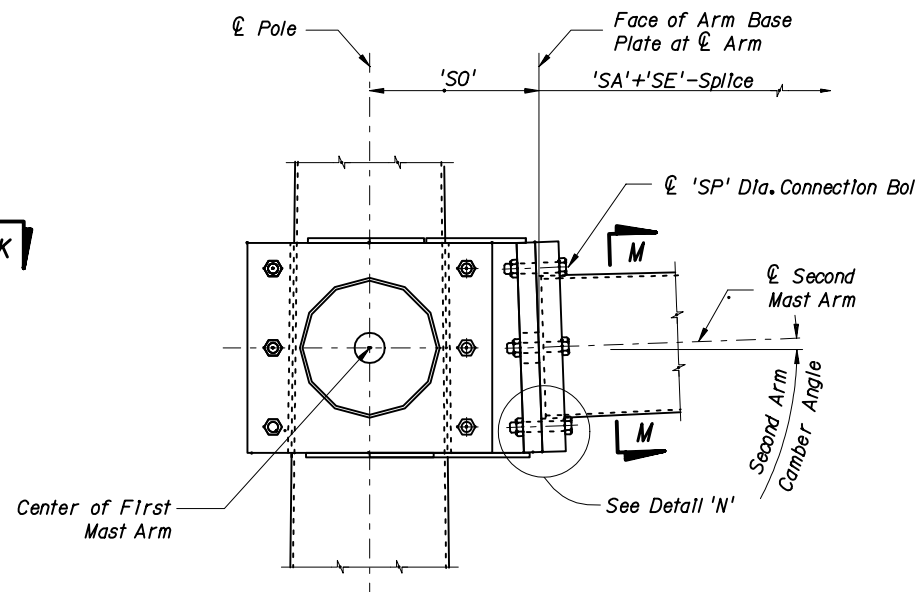


DETAIL 'N'

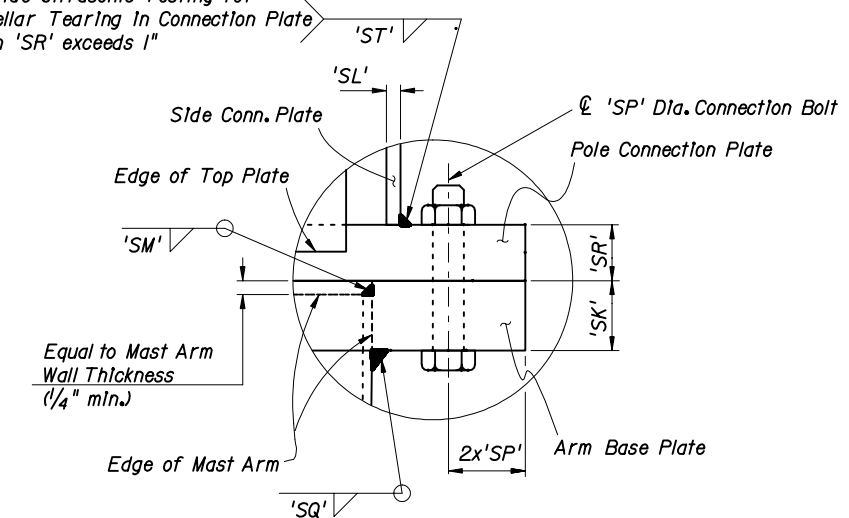
Provide Ultrasonic Testing for Lamellar Tearing in Connection Plate when 'SR' exceeds 1"



ELEVATION (Double Arm Connection)



SECTION L-L

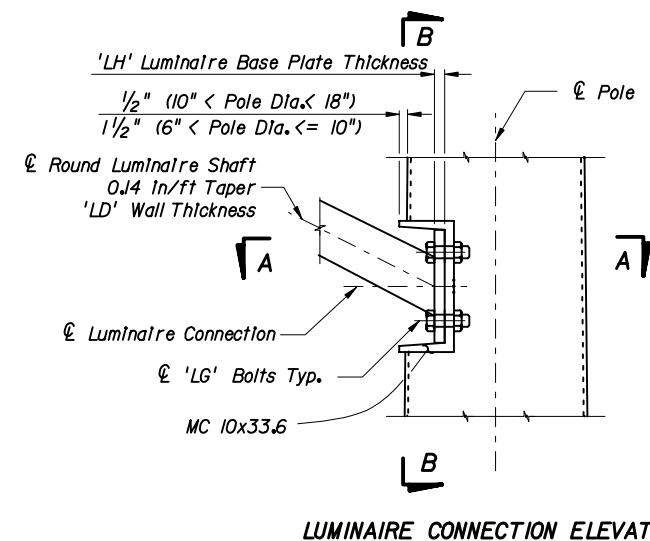
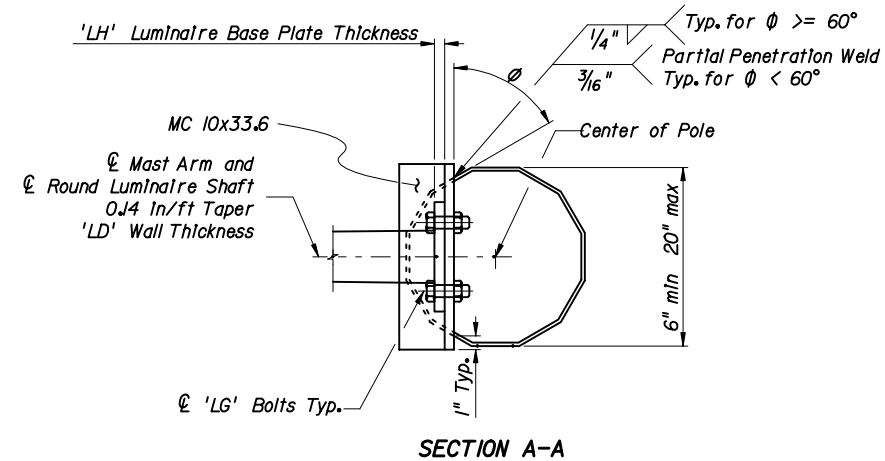


DETAIL 'O'

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

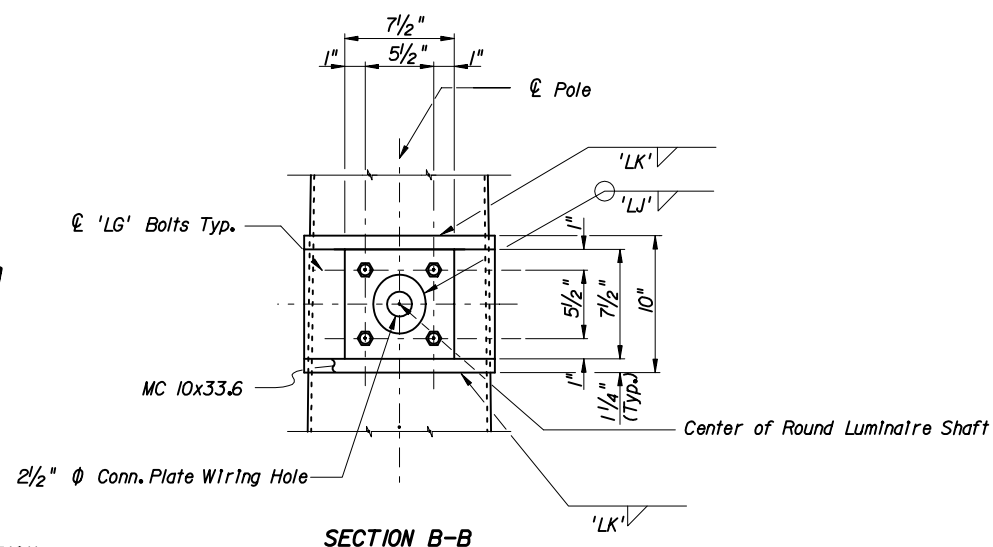
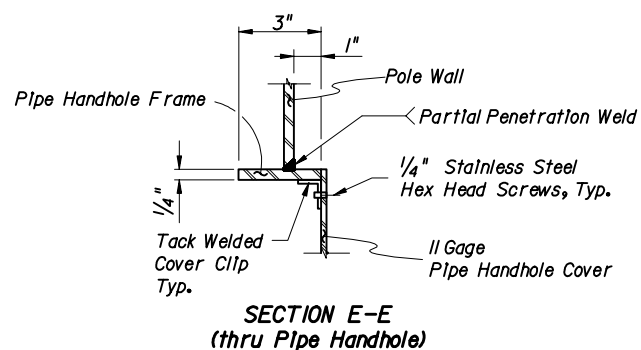
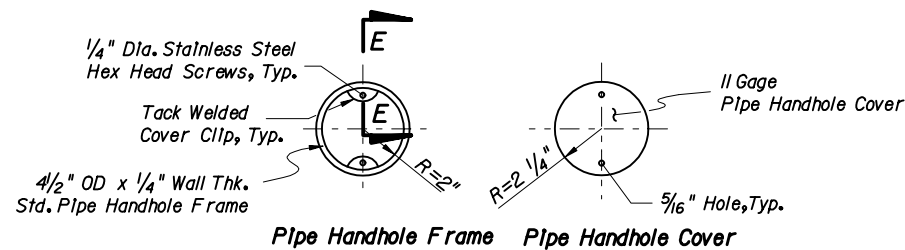
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MAST ARM ASSEMBLIES				
Designed By	CH	6-02	Approved By <i>[Signature]</i> State Structures Design Engineer	
Drawn By	CH	6-02	Revision	Sheet No. Index No.
Checked By	AVP	6-02	04	4 of 5 17745



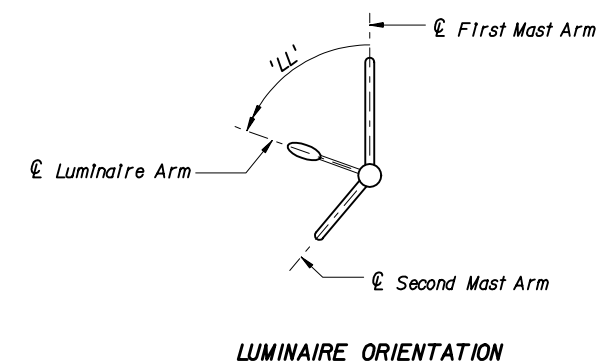
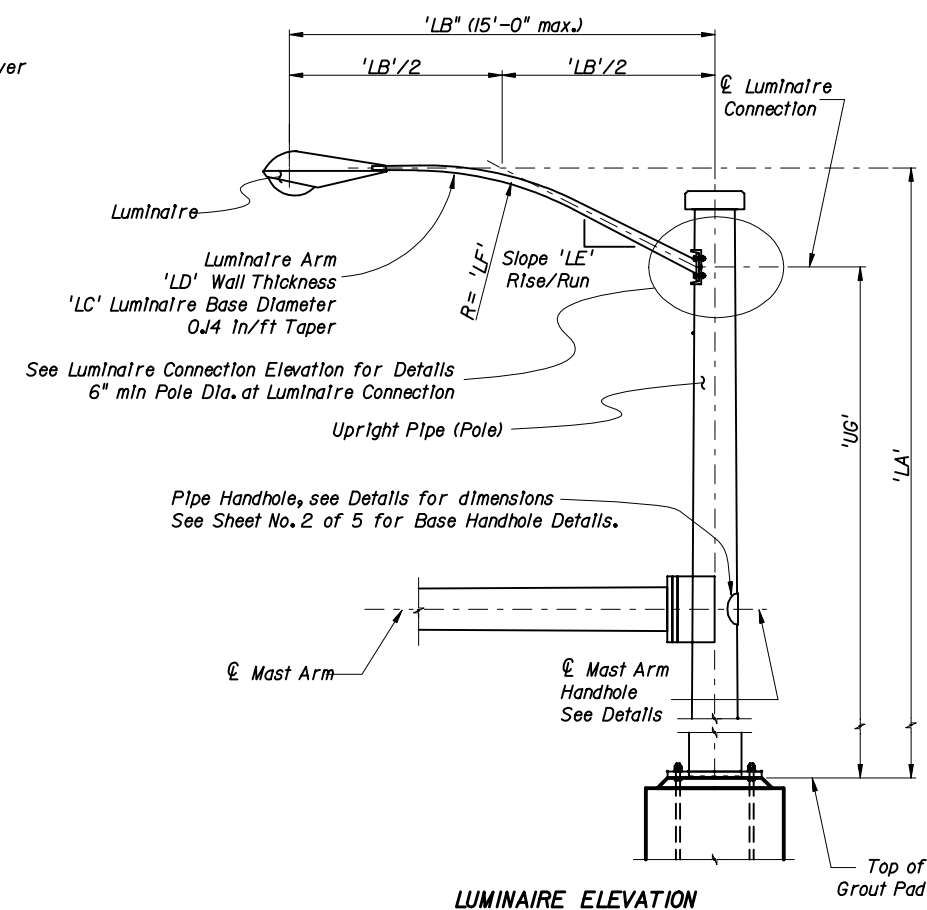
NOTE: The Pole shown on this sheet is a 12 sided section. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced

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.



NOTE: The Fabricator may substitute a 1/2 inch thick bent plate with the same flange width, height, and length as the MC 10x33.6 Channel section.



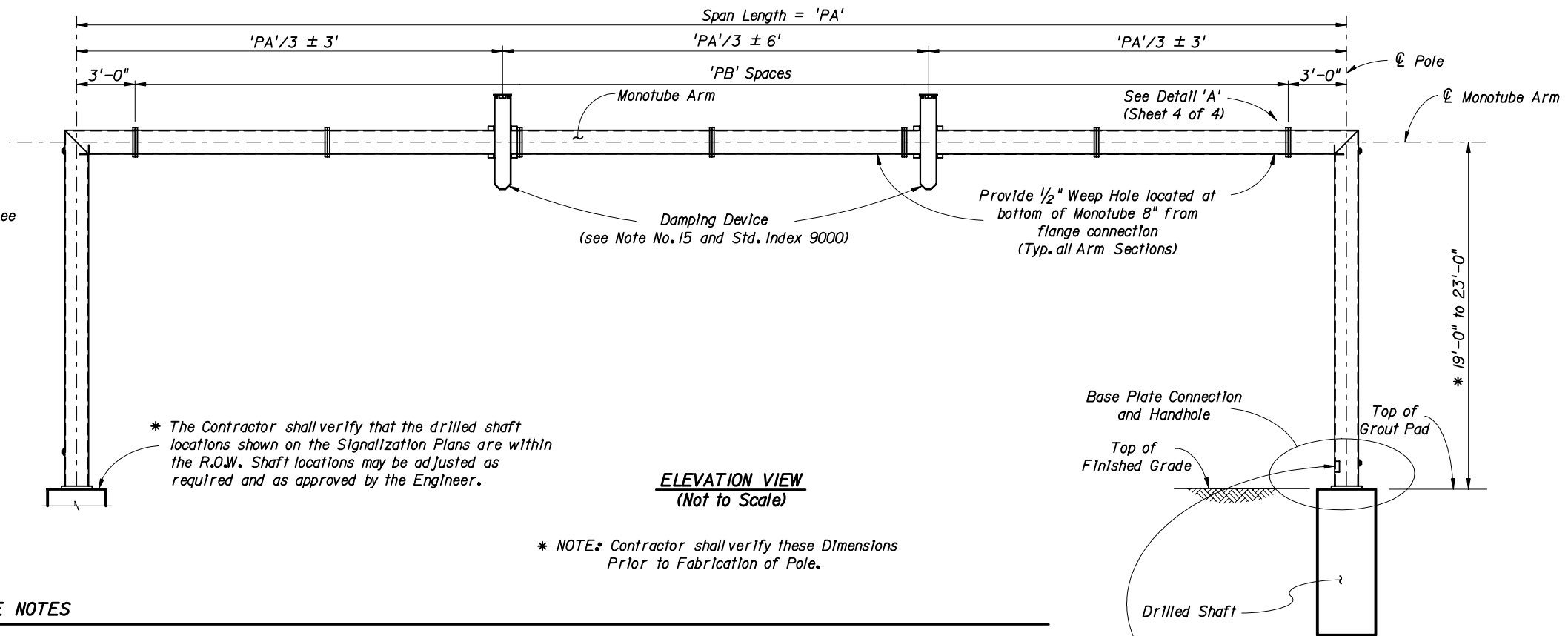
TYPICAL LUMINAIRE ARM AND CONNECTION DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MAST ARM ASSEMBLIES

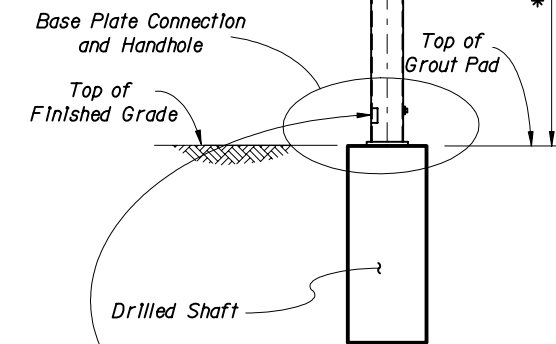
Names	Dates	Approved By		
Designed By	CH	6-02	State Structures Design Engineer	
Drawn By	CH	6-02	Revision	Sheet No. Index No.
Checked By	AVP	6-02	04	5 of 5 17745

Notes: For referenced dimensions see Index 17746 Sheet 4 of 4.



ELEVATION VIEW
(Not to Scale)

* NOTE: Contractor shall verify these Dimensions Prior to Fabrication of Pole.



Aluminum Identification Tag Not to Exceed 2" x 4". Secure to Shaft by 0J25" 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:

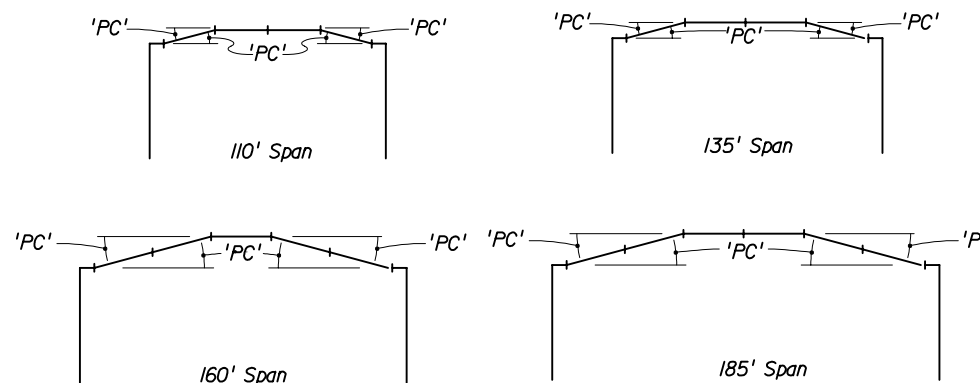
Standard Design
Financial Project ID
Span Length
Manufacturer's Name
Certification No.

Special Design
Financial Project ID
Pole Diameter (In.)
Pole Wall Thickness (In.)
Arm Diameter (In.)
Arm Wall Thickness (In.)
Manufacturer's Name

MONOTUBE SIGNAL STRUCTURE NOTES

- 1) Signal Structure Materials shall be as follows:
 - Poles & Monotube Arm → API-5L-X42 (42 ksi yield) or ASTM A618 Grade II
 - Handhole Frame → ASTM A709 Grade 36
 - Handhole Cover → ASTM A1011, Grade 50, 55, 60, or 65 ksi
 - Steel Plates → ASTM A709 Grade 50
 - Weld Metal → E70XX
 - Bolts (except Anchor Bolts) → ASTM A325 Type I
 - Anchor Bolts → ASTM F1554 Grade 55 ksi
 - Nuts for Anchor Bolts → ASTM A563 Grade A Heavy Hex
 - Washers for Anchor Bolts → ASTM F436 Type I
 - Stainless Steel Screws → AISI Type 316
 - Aluminum Nut Cover → ASTM B26 (319-F)
- 2) Reinforcing Steel shall be ASTM A615-96, 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) Grout shall have a minimum 28-day compressive strength of 5,000 psi and shall meet the requirements of Section 934 of the Specifications. Grout at the base of uprights shall be installed a minimum of 7 days prior to the installation of signals or sign panels.
- 5) All welding shall conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).
- 6) All Steel Items shall be galvanized as follows:
 - All Nuts, Bolts and Washers → ASTM A153 Class C or D depending on size
 - All other steel Items → ASTM A123 (Including Pole & Monotube Arm)
- 7) The Design Wind Speed is 110mph with a 30 percent gust factor.
- 8) Alternate Designs for this Structure are not allowed.
- 9) Except for Anchor Bolts, all bolt hole diameters shall be equal to the bolt diameter plus 1/16", prior to galvanizing. Hole diameters for Anchor Bolts shall not exceed the bolt diameter plus 1/2".

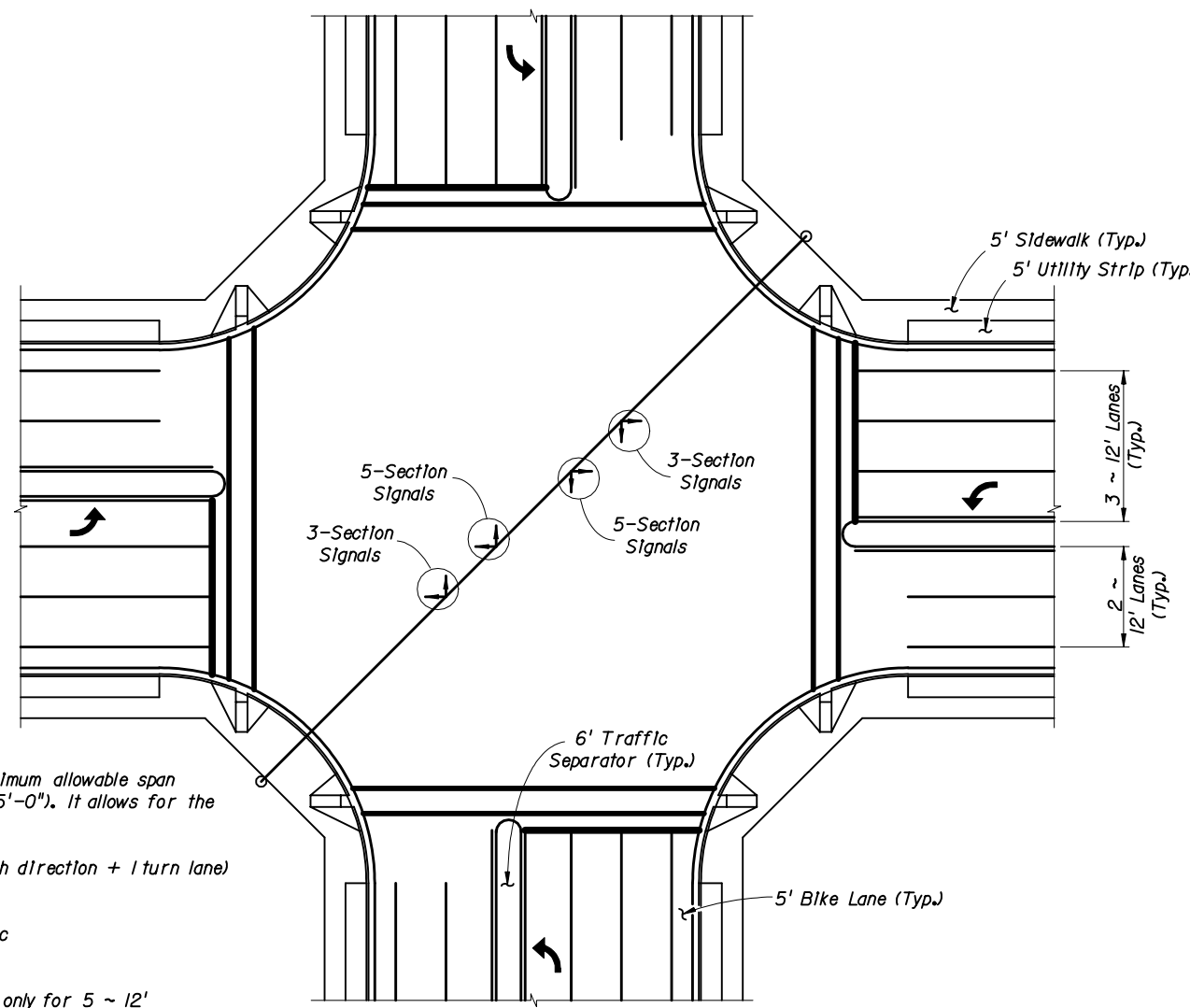
- 10) Sign Panels and Signals attached to the Monotube shall be located as shown on the Traffic Signal Plans. Wire access holes shall not exceed 1 1/2" in diameter.
- 11) The Pole shall be installed vertically. Arm Camber shall be accounted for in the Flange Connections.
- 12) Locate handhole 180° from monotube arm.
- 13) All signals shall be installed vertically.
- 14) Monotube Arm & Poles shall be fabricated from round pipe.
- 15) If damping devices are required by the Engineer, they shall be installed within 3'-0" ± of the third points of the Span Length.
- 16) Each Standard Monotube Signal Structure has been designed for two free swinging internally illuminated street signs, per pole, which are acceptable by Contractor Certification provided they meet the applicable requirements of Specification Section 699, weigh no more than 75 lbs. (each) and are no more than 12 sq. ft in area (each).



CAMBER DETAILS

Notes: Fabricate with rolling camber up.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MONOTUBE SIGNAL STRUCTURE ELEVATION, NOTES AND CAMBER DETAILS				
Designed By	KFS	9-00	Approved By: <i>[Signature]</i> State Structures Design Engineer	
Drawn By	JMB	9-00	Revision	Sheet No. Index No.
Checked By	DER	9-00	04	1 of 4 17746



PLAN VIEW - MONOTUBE DESIGN INTERSECTION

Notes

The signal configuration shown represents the maximum allowable span for which this monotube standard is applicable (185'-0"). It allows for the following components:

- a. 5 ~ 12' traffic lanes (2 thru lanes in each direction + 1 turn lane)
- b. 1 ~ 6' traffic separator
- c. 1 ~ 5' bike lane per direction of traffic
- d. 1 ~ 5' utility strip per direction of traffic
- e. 1 ~ 5' sidewalk per direction of traffic

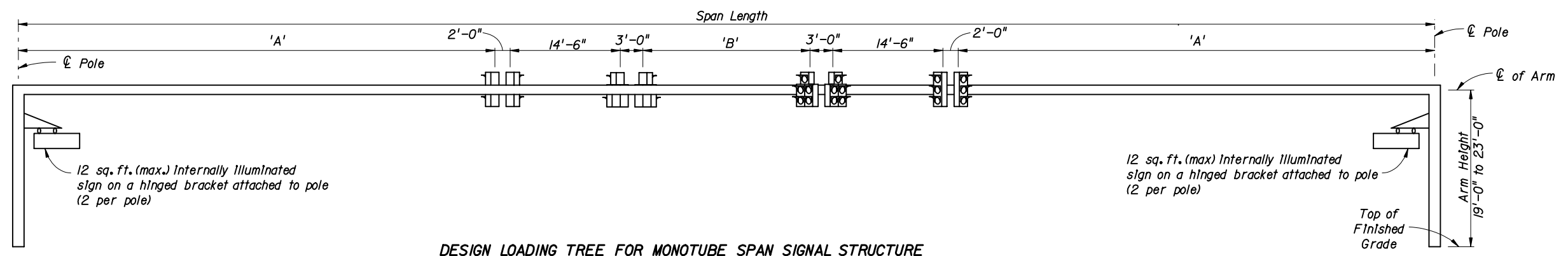
The minimum monotube design span (110'-0") allows only for 5 ~ 12' traffic lanes (item "a" above). It is assumed that for this case there are no traffic separators, bike lanes, utility strips or sidewalks.

INSTRUCTIONAL NOTES:

1. This Index, 17746, is for use in preparing signalization plans when monotube assemblies are required. This standard establishes the requirements of monotube components listed on the Qualified Products List (QPL). When using components on the QPL, the span length and heights of each pole will be the only information required in the Contract Plans, and Shop Drawings are not required.
2. If a monotube configuration does not meet the requirements stated below, a special design and shop drawing submittal is required.
3. Four standard monotube configurations are provided. The standard arm length and the signal locations used for design of the arm are shown on the monotube design loading tree on this sheet. If the same arrangement of signals is used with one or more signals closer to the nearest pole, the standard monotube may be used. If the same arrangement is used but one or more signals are further from the nearest pole, or if a different configuration of signals is used, a special design is required. If any signs are to be attached to the monotube arm, a special design is required.
4. Standard monotube span lengths of 110'-0", 135'-0", 160'-0" and 185'-0" are shown. For other required span lengths with the same configuration of signals in the same locations or closer to the poles, the standard monotube design with the next largest standard span length may be used. The difference in length shall be removed from the center horizontal segment(s) of the span. If a span longer than 185'-0" is to be used, a special design is required.
5. The standard monotube is valid for arm heights between 19' and 23', inclusive. A special design is required for all heights greater than 23'. If an arm height of less than 19' is to be utilized with the same configuration of signals in the same locations or closer to the poles, the standard monotube may be used, provided that minimum required clearances to the roadway are maintained.
6. The foundations for the standard monotube are pre-designed and are 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 of 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.

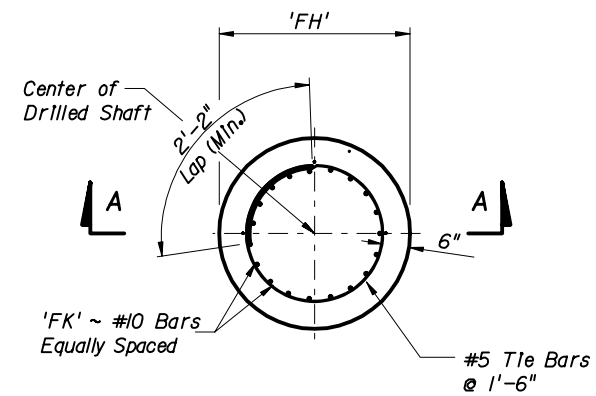


DESIGN LOADING TREE FOR MONOTUBE SPAN SIGNAL STRUCTURE

Note: Signal Backplates on 4 of the 8 signals are included in the design of Standard Arms.

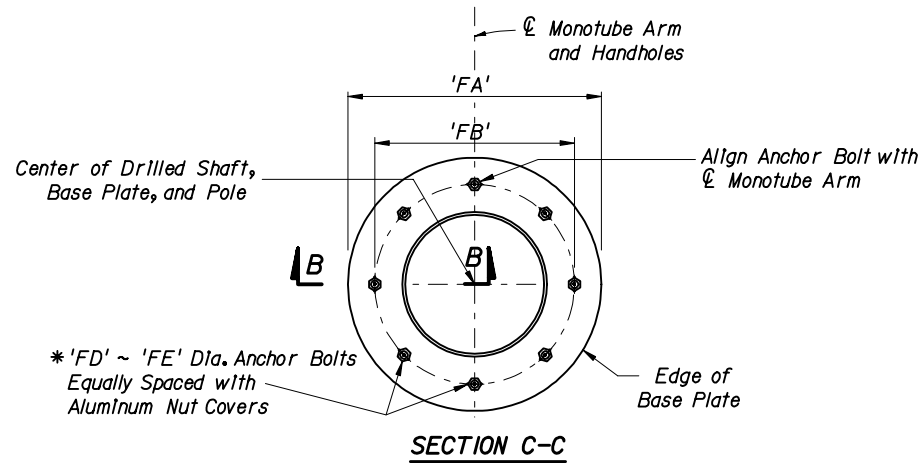
Note: For referenced dimensions see Index 17746 Sheet 4 of 4.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MONOTUBE SIGNAL STRUCTURE DESIGN INTERSECTION AND DESIGN LOAD TREE				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	KFS	9-00	State Structures Design Engineer	
Drawn By	JMB	9-00	Revision	Sheet No. Index No.
Checked By	DER	9-00	02	2 of 4 17746



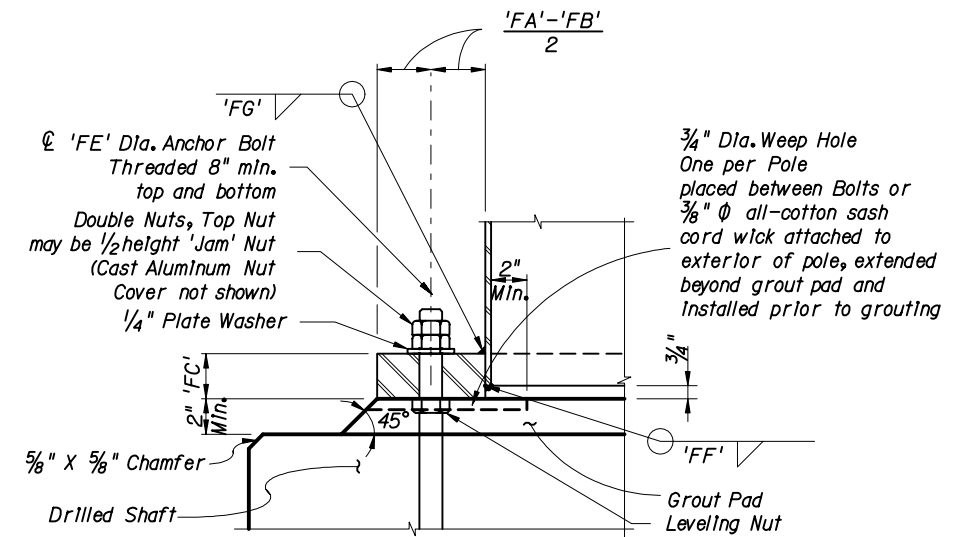
FOUNDATION PLAN

Notes 6" min. cover on Shaft Reinforcement



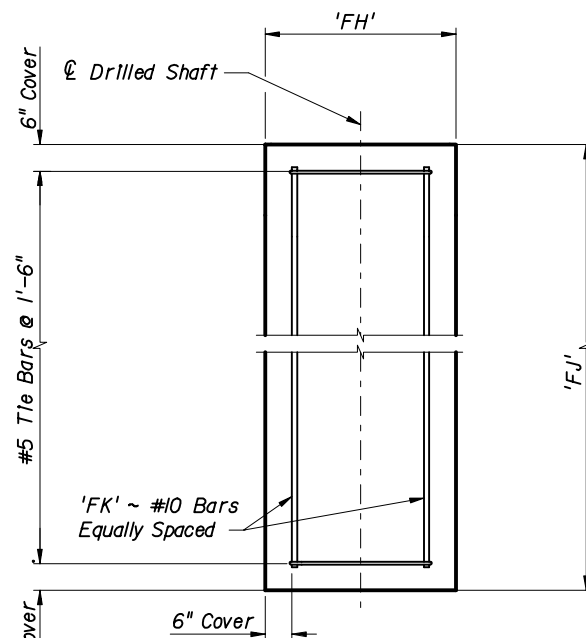
SECTION C-C

Notes Concrete and Reinforcement not shown.
 * Anchor Bolt Group locations may be $\pm 1/2"$ in the direction of the span

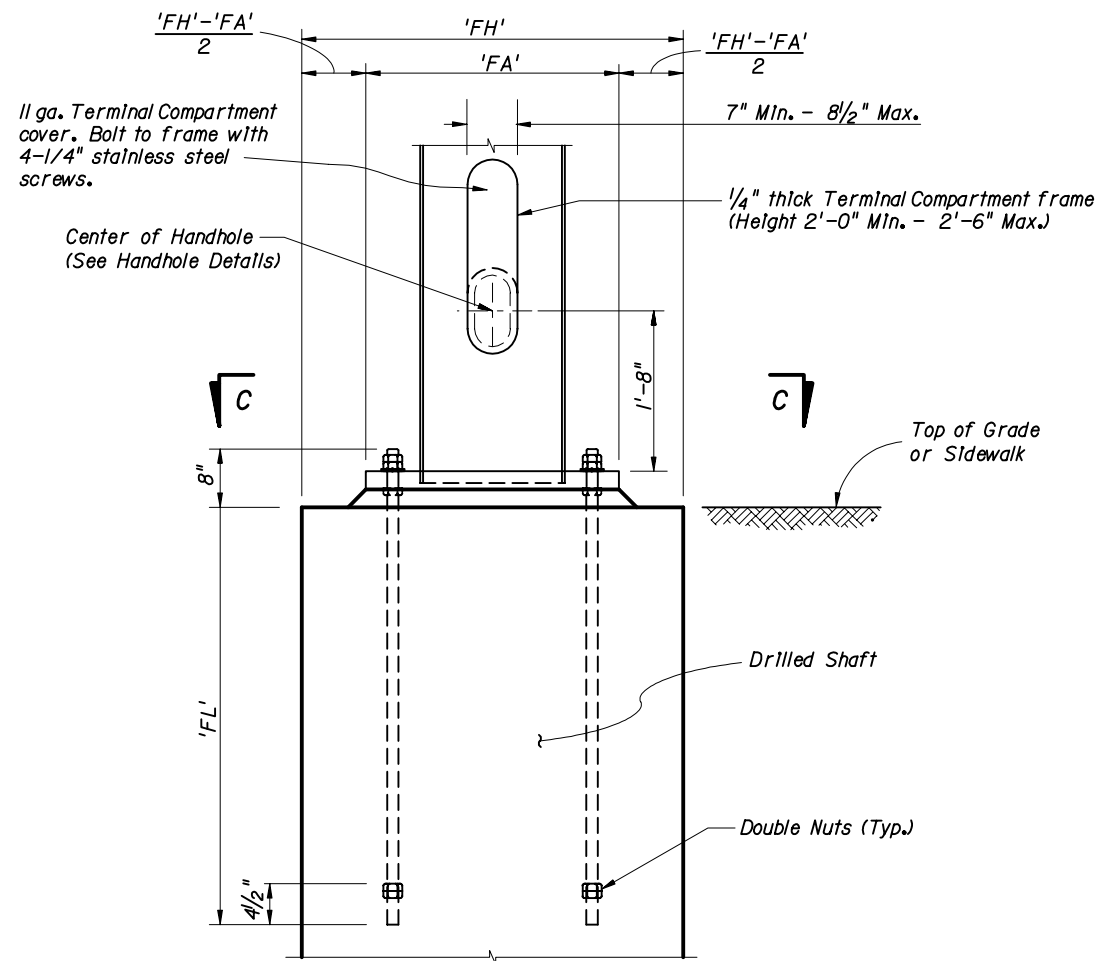


SECTION B-B

Notes For referenced dimensions see Index 17746 Sheet 4 of 4.

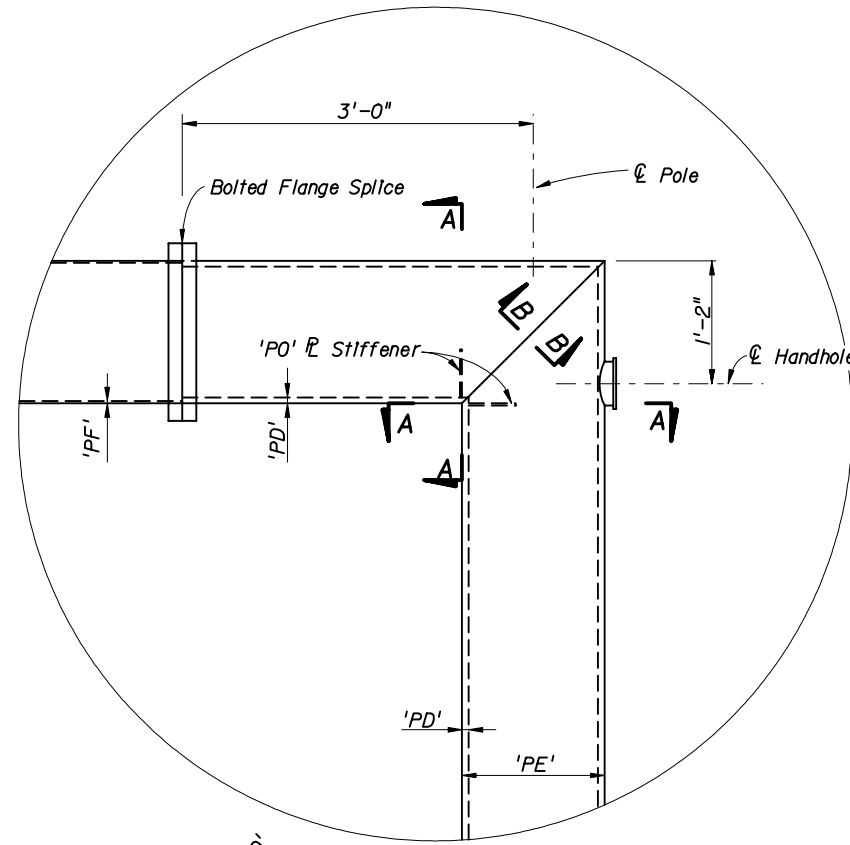


SECTION A-A

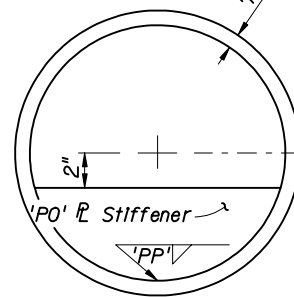


BASE PLATE AND ANCHORAGE ELEVATION

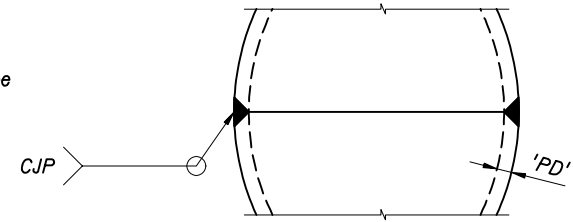
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MONOTUBE SIGNAL STRUCTURE FOUNDATION AND BASE PLATE DETAILS				
Designed By	KFS	9-00	Approved By: <i>[Signature]</i> State Structured Design Engineer	
Drawn By	JMB	9-00	Revision	Sheet No. 3 of 4
Checked By	DER	9-00	02	Index No. 17746



DETAIL 'A'

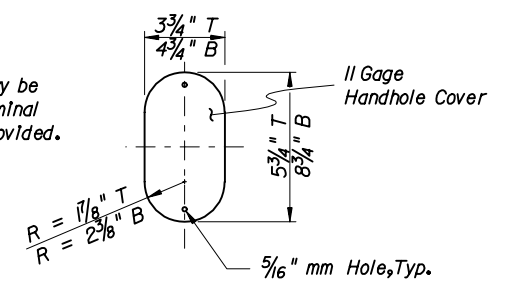


SECTION A-A

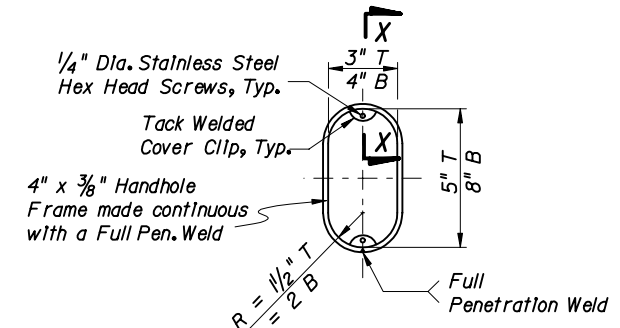


SECTION B-B

Notes:
Handhole Cover may be omitted when Terminal Compartment is provided.

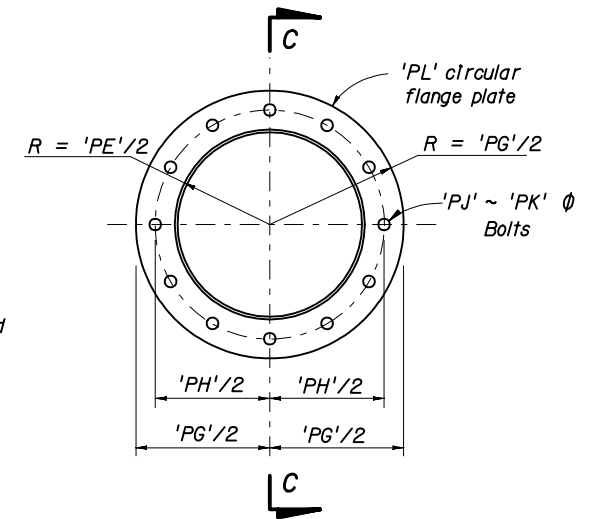


HANDHOLE COVER

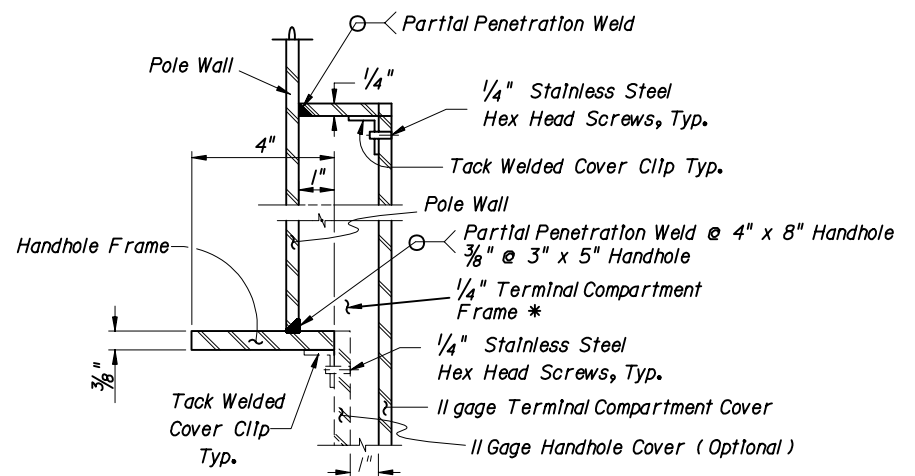


HANDHOLE FRAME
(w/ Terminal Compartment omitted)

T - denotes top 3" x 5" handhole
B - denotes bottom 4" x 8" handhole

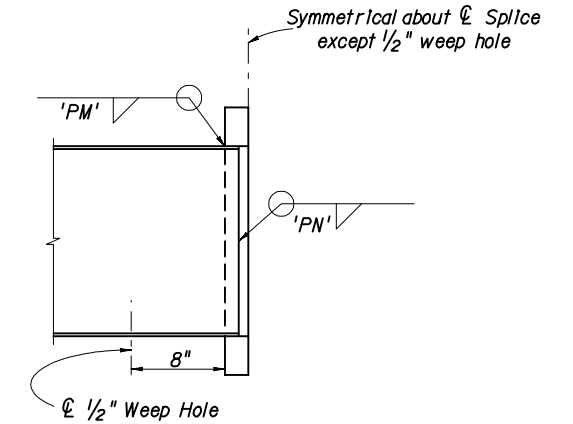


FLANGE SPLICE DETAILS



SECTION E-E
(thru Handhole & Terminal Compartment)

*Terminal Compartment is optional. See Monotube Tabulation for locations.



SECTION C-C

TABLE OF MONOTUBE VARIABLES

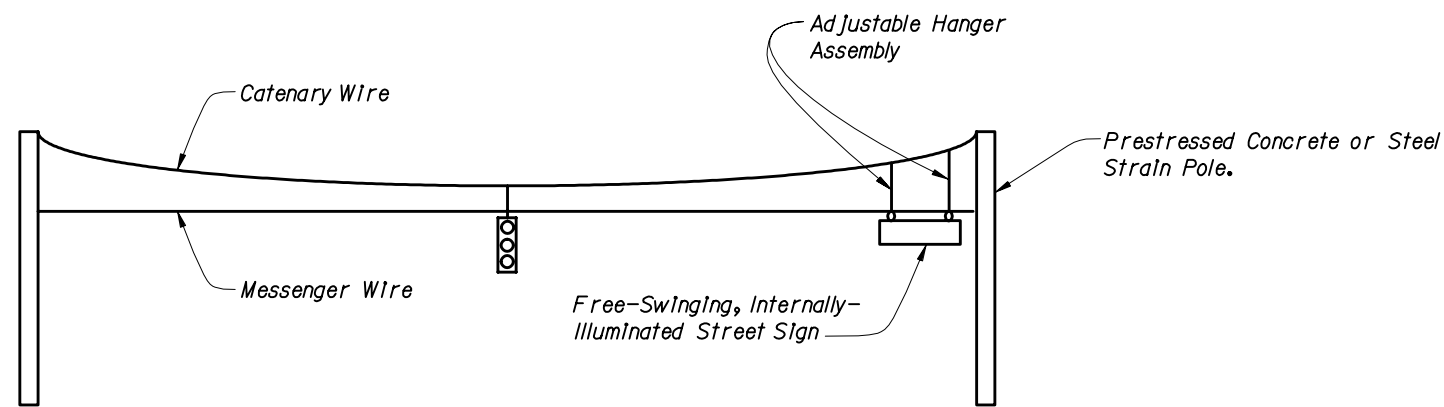
MONOTUBE ARM & POLES														FOUNDATION & BASE PLATE										SIGNAL LAYOUT			
'PA'	'PB'	'PC'	'PD'	'PE'	'PF'	'PG'	'PH'	'PJ'	'PK'	'PL'	'PM'	'PN'	'PO'	'PP'	'FA'	'FB'	'FC'	'FD'	'FE'	'FF'	'FG'	'FH'	'FJ'	'FK'	'FL'	Dim. 'A'	Dim. 'B'
(ft)		(deg)	(In)	(In)	(In)	(In)	(In)		(In)	(In)	(In)	(In)	(In)	(In)	(In)	(In)	(In)		(In)	(In)	(In)	(ft)	(ft)	(In)	(ft)	(ft)	(ft)
110	4	1.5	1.093	14	3/8	21 1/2	17 3/4	8	1 1/4	2 1/4	5/16"	5/16"	1/4"	3/16"	21 1/2	17 3/4	1 7/8	8	1 1/2"	5/16"	5/16"	3	12	10	45	29	13
135	4	1.5	1.031	16	3/8	23 1/2	19 3/4	10	1 1/4	2 1/4	5/16"	5/16"	1/4"	3/16"	23 1/2	19 3/4	2	8	1 1/2"	5/16"	5/16"	3.5	13	12	45	40	16
160	5	1.25	1.156	18	3/8	25 1/2	21 3/4	12	1 1/4	2 1/4	5/16"	5/16"	1/4"	3/16"	25 1/2	21 3/4	2 1/8	8	1 1/2"	5/16"	5/16"	3.5	14	12	45	51	19
185	6	1.75	1.125	22	3/8	29 1/2	25 3/4	14	1 1/4	2 1/4	5/16"	5/16"	1/4"	3/16"	29 1/2	25 3/4	2 1/4	10	1 1/2"	5/16"	5/16"	4	16	16	45	62	22

Notes: For additional variable definitions see Sheets 1 and 3 of 4.

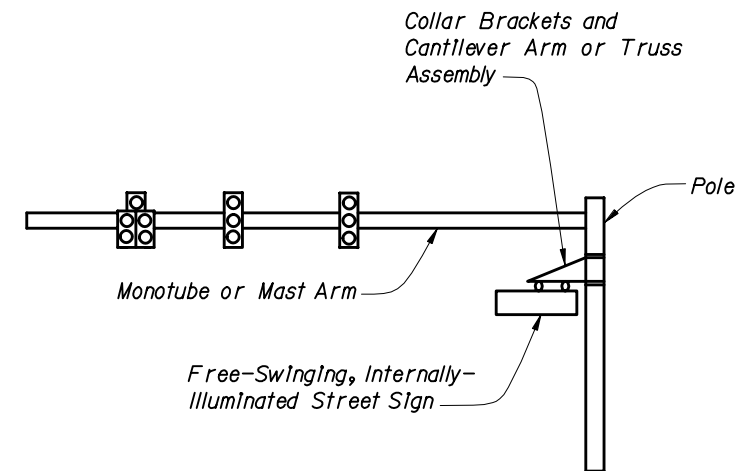
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**MONOTUBE SIGNAL STRUCTURE
ARM CONNECTION DETAILS
& TABLE OF VARIABLES**

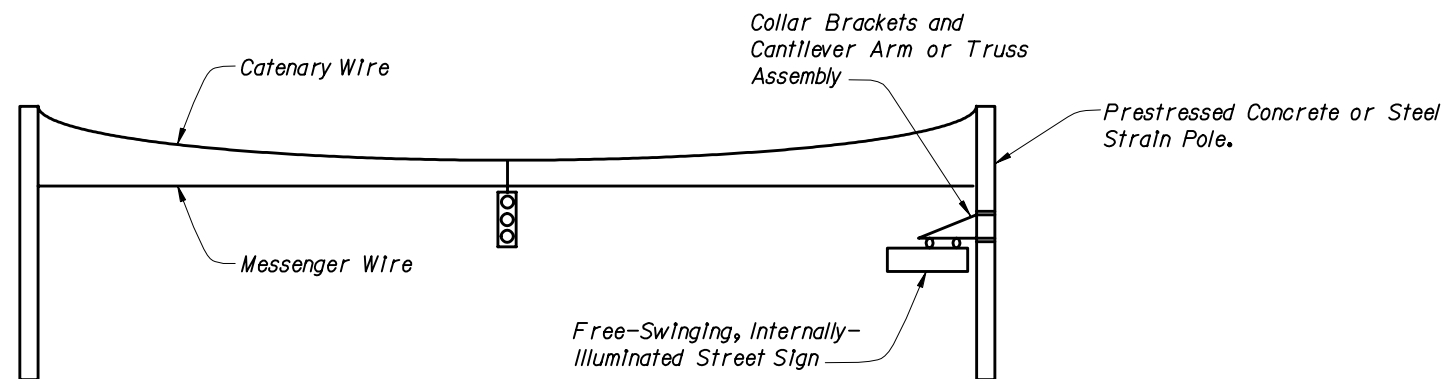
Designed By	KFS	9-00	Approved By <i>[Signature]</i> State Structures Design Engineer
Drawn By	JMB	9-00	
Checked By	DER	9-00	
Revision	04		Sheet No. 4 of 4
Index No.			17746



OPTION 1
(For Span Wire Assembly)



OPTION 3
(For Mast Arm Assembly and Monotube Signal Structure)



OPTION 2
(For Span Wire Assembly)

NOTES:

1. Free-swinging, internally-illuminated street signs shall be installed on signal structures only at one of the optional locations shown on this drawing, unless a special design is completed for the support structure.
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.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
FREE-SWINGING, INTERNALLY-ILLUMINATED STREET SIGN ASSEMBLIES				
	Names	Dates	Approved By	
Designed By	AVP	6-01	 State Structures Design Engineer	
Drawn By	REB	6-01		
Checked By	REN	6-01	Revision	Sheet No.
			02	1 of 1
				17748

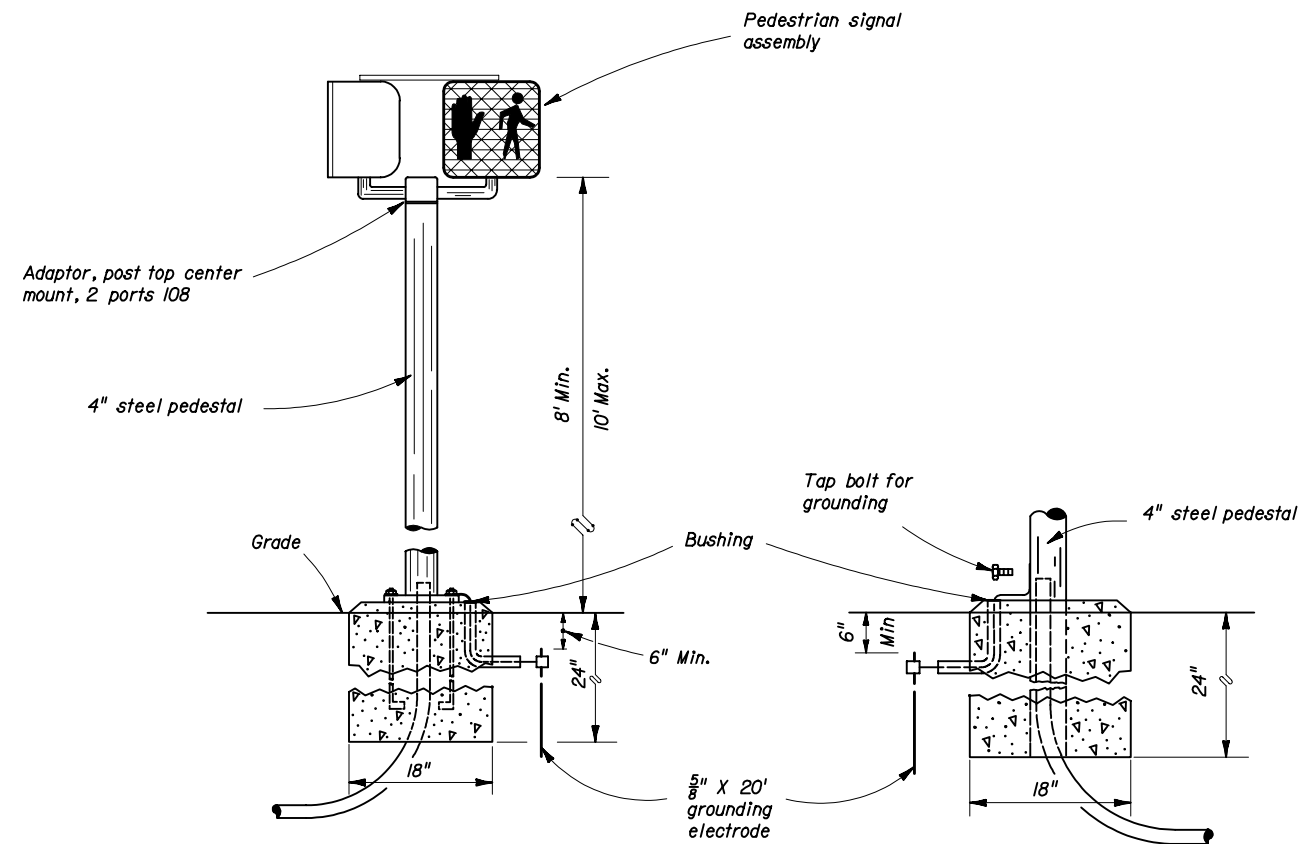


FIGURE A

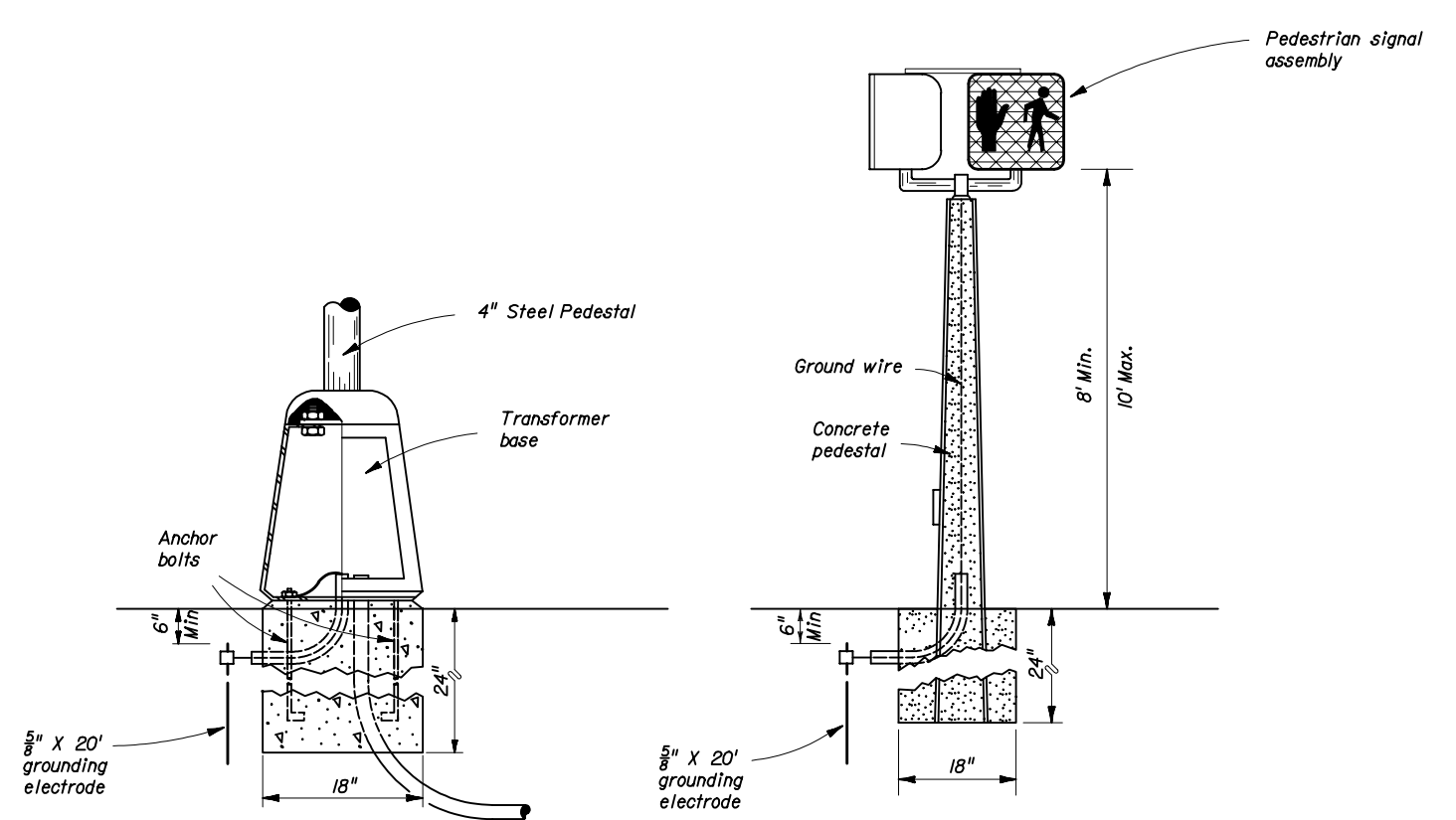


FIGURE B

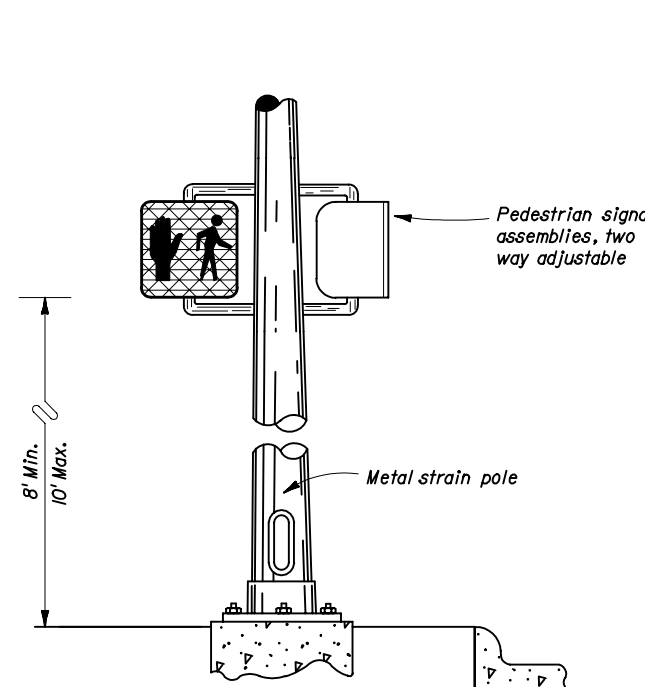


FIGURE C

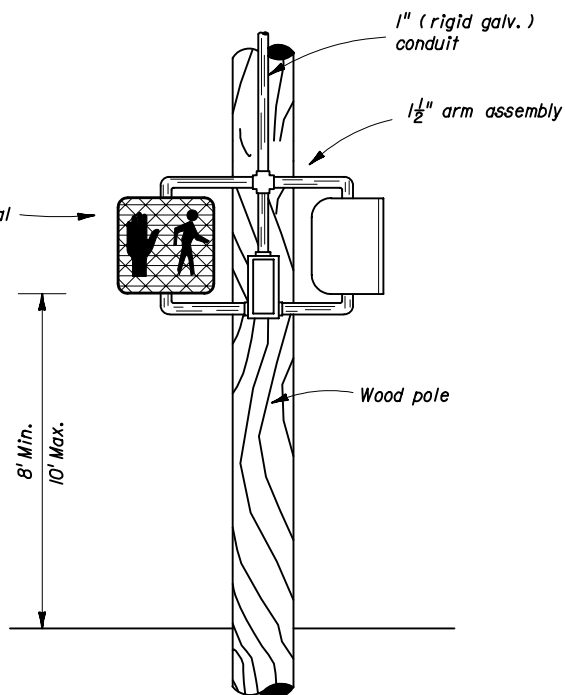


FIGURE D

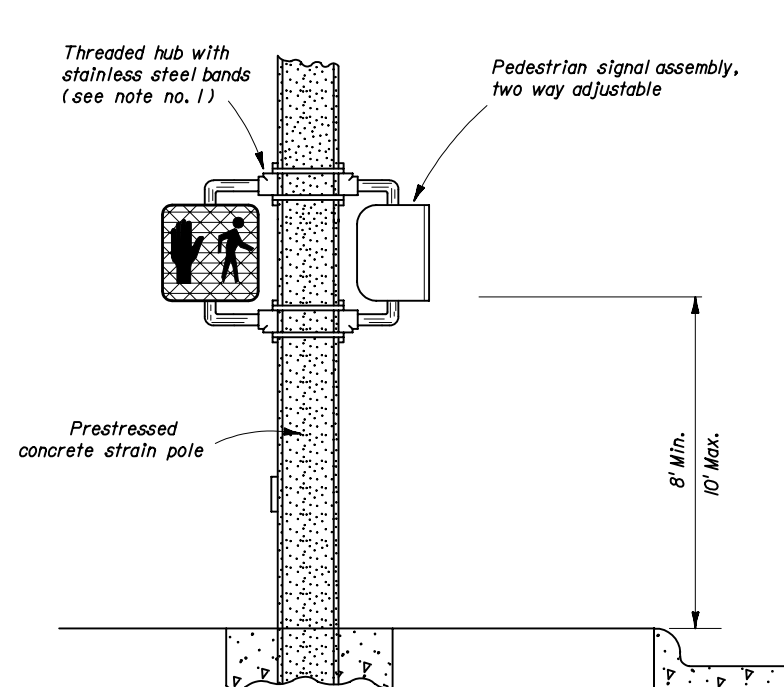


FIGURE E

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.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PEDESTRIAN CONTROL SIGNAL INSTALLATION DETAILS				
Designed By	Names	Dates	Approved By	
Drawn By		9-80	<i>Clark A. Scott</i> State Traffic Standards Engineer	
Checked By	Revision	Sheet No.	Index No.	
	04	1 of 1	17764	

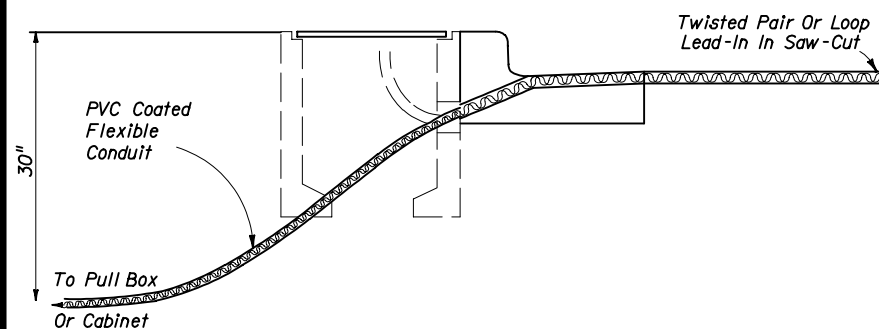
GENERAL NOTES

1. If the loop lead-in is 75' or less from the edge of the loop detector or 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 pull box, splice to shielded lead-in wire and continue to the detector or 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 U.L. 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.

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

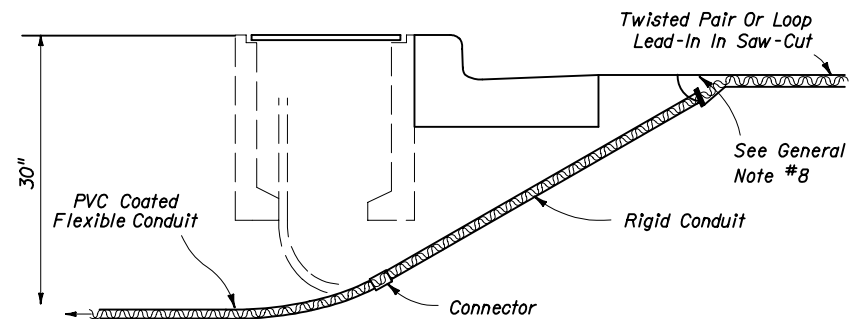
ALTERNATIVE 1

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

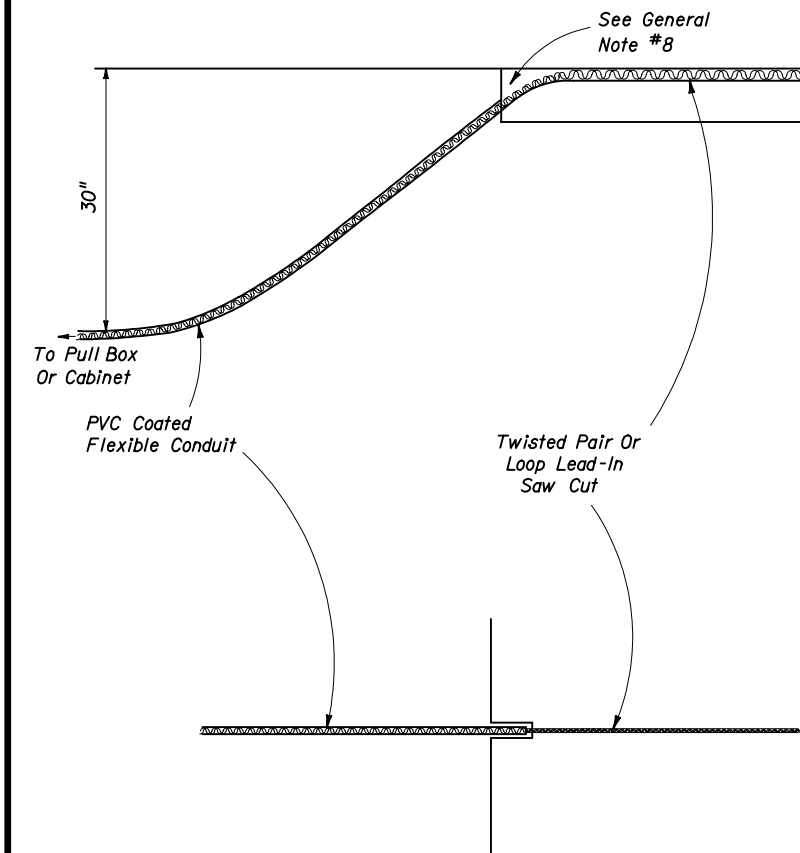
Drill A Hole $\frac{1}{2}$ " To 1" Larger In Diameter Than The Rigid Conduit To Be Used Through The Roadway Asphalt (Or Concrete) Surface And Base At An Appropriate Angle To Intercept The Trench Or Pull Box Hole. Place A Predetermined Length Of Rigid Conduit In The Hole And Drive The Conduit Into The 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 \approx 2" Below The Top Of The Roadway Surface. The Departure Angle Of The Conduit From The Roadway Shall Be 30° To 45°.

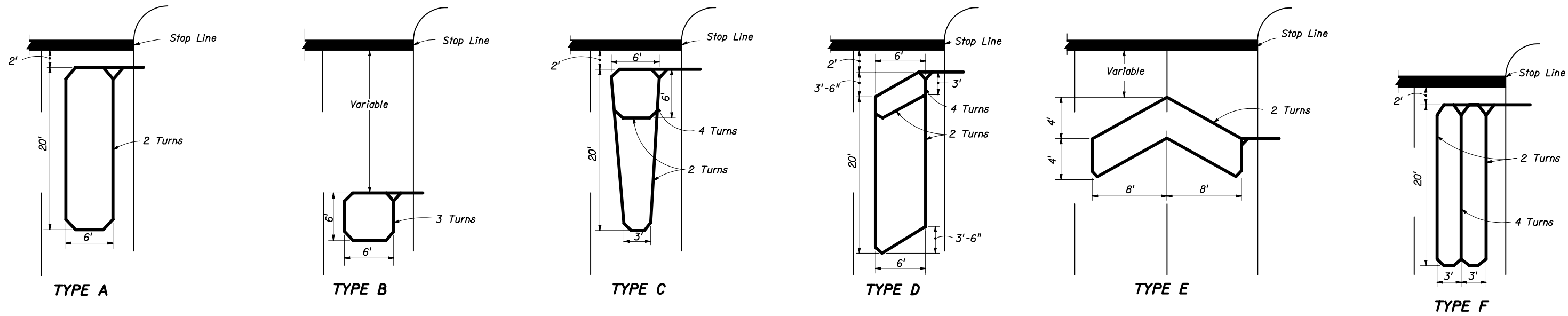


Note
Other alternatives may be approved by the State Traffic Operations Engineer.

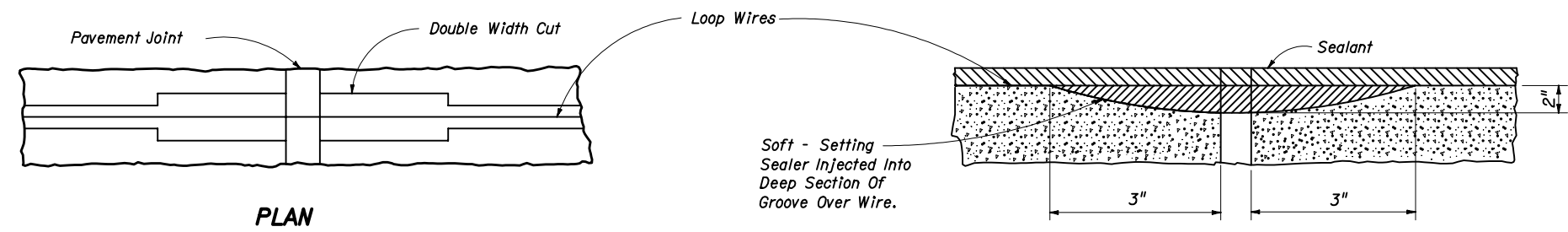
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

VEHICLE LOOP INSTALLATION DETAILS

Names	Dates	Approved By		
Designed By		 State Traffic Standards Engineer		
Drawn By				
Checked By		Revision	Sheet No.	Index No.
		02	1 of 2	17781

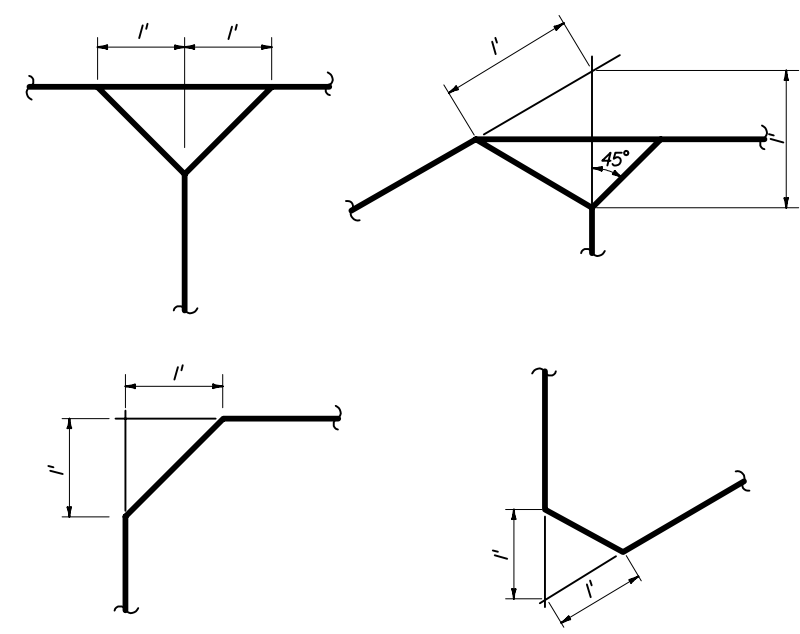
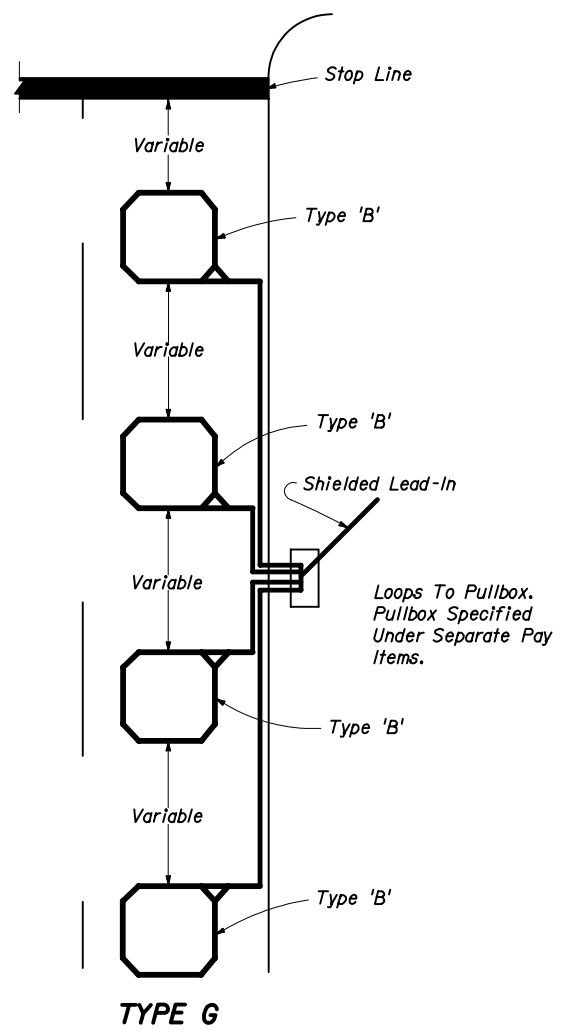


Note: Loop conductors must follow saw-cut to bottom forming slack section at joint.



CONCRETE PAVEMENT EXPANSION JOINTS VERTICAL SECTION

- Notes:
- 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.
 - Loop types or details not drawn to scale.
 - Loop Types are centered in a single lane except Type E which is centered on two lanes.
 - The number of individual loops in the Type G loop may vary up to a maximum of four (4).
 - Lead-in may be connected to either end of loop.
 - 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 the plans.
 - Loop lead-in wires should not be installed in the same pull box with signal power cable.



LOOP CORNER AND LEAD-IN DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
VEHICLE LOOP INSTALLATION DETAILS				
Designed By	Names	Dates	Approved By <i>Clark A. Smith</i> State Traffic Standards Engineer	
Drawn By	Revision	Sheet No.	Index No.	
Checked By	00	2 of 2	17781	

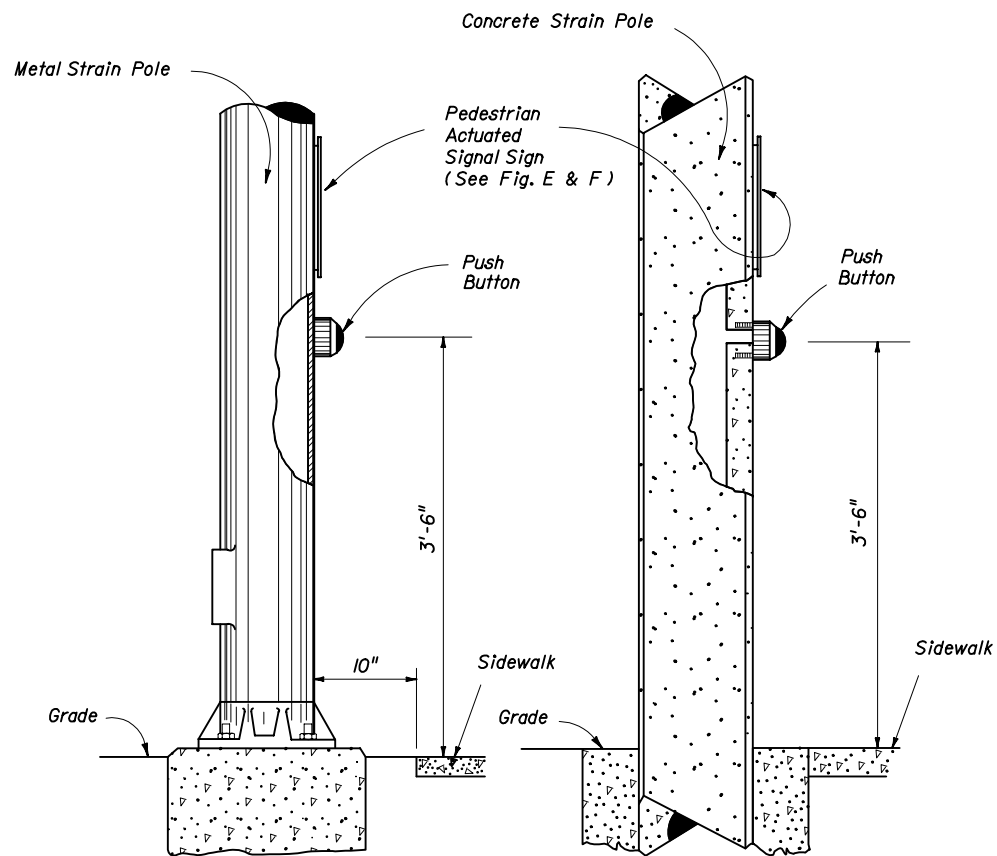


FIGURE A
POLE MOUNTED
DETECTOR STATION

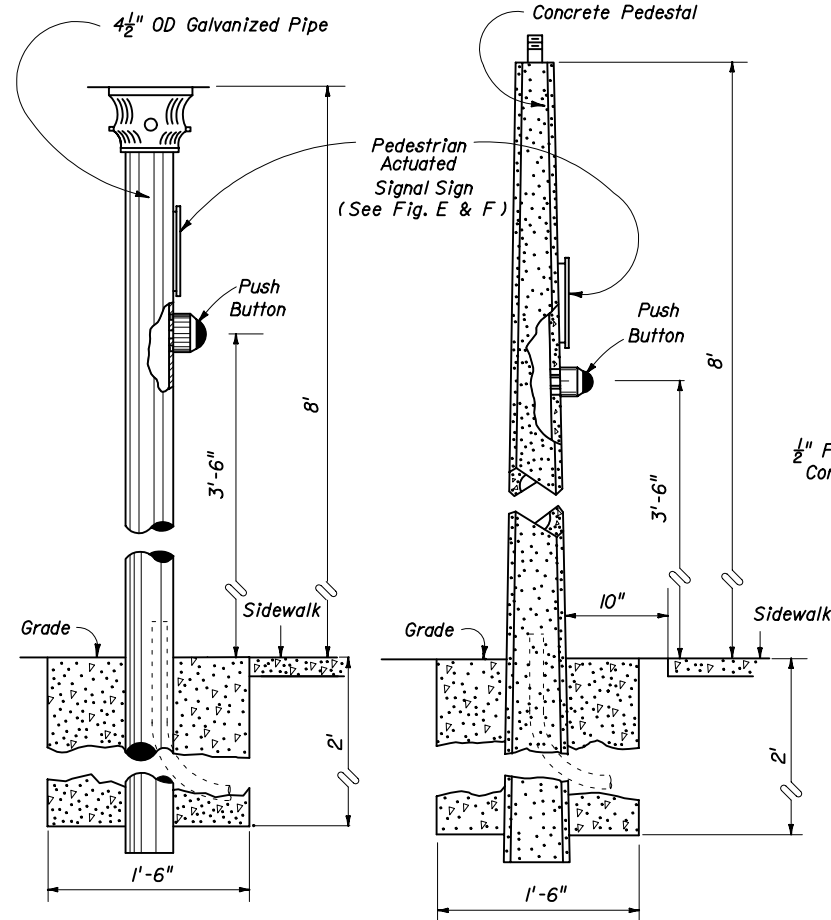


FIGURE B
PEDESTAL STATION
DETECTOR STATION

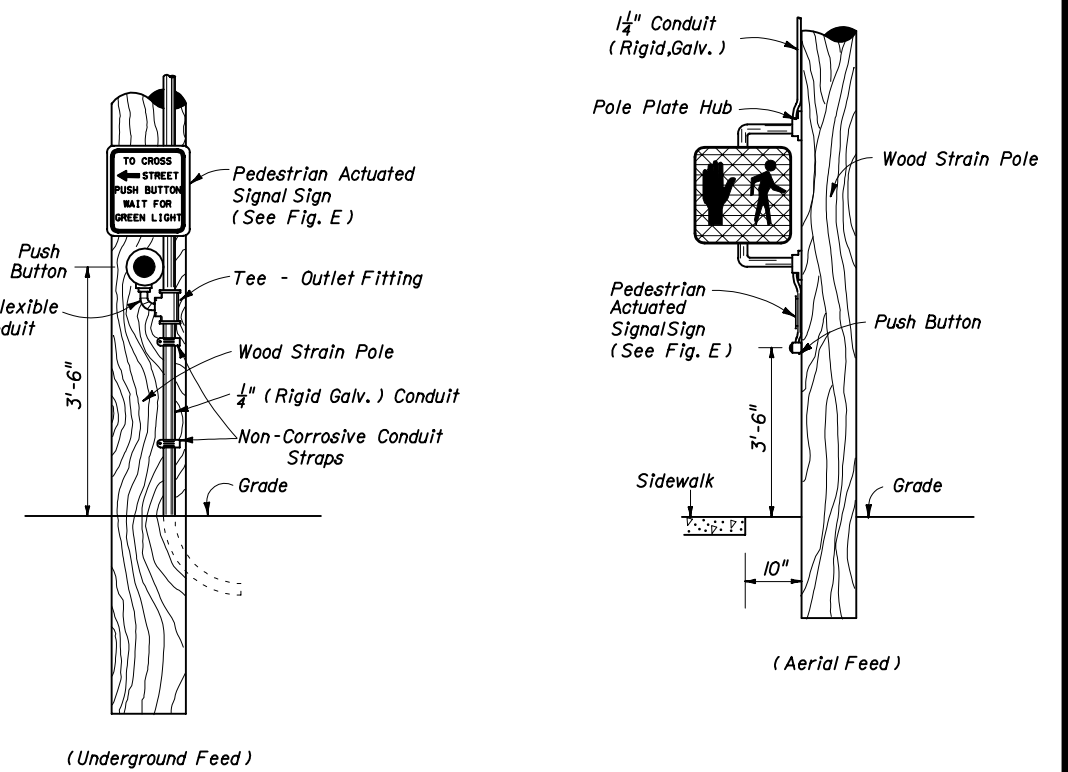


FIGURE C
WOOD POLE MOUNTED
DETECTOR STATION

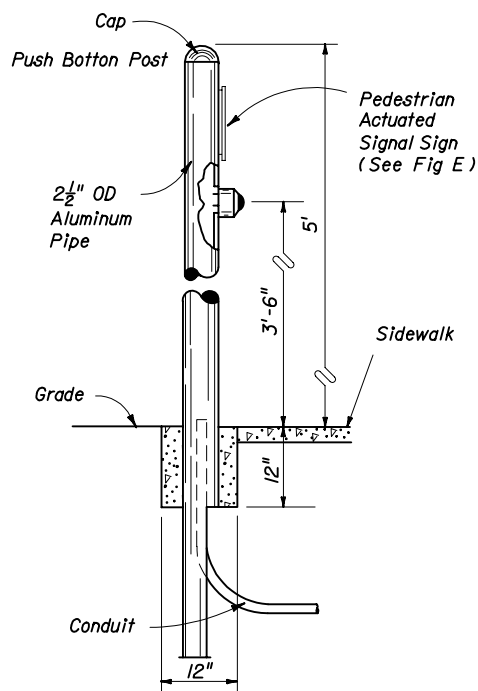


FIGURE D
POST DETECTOR STATION
DETECTOR STATION

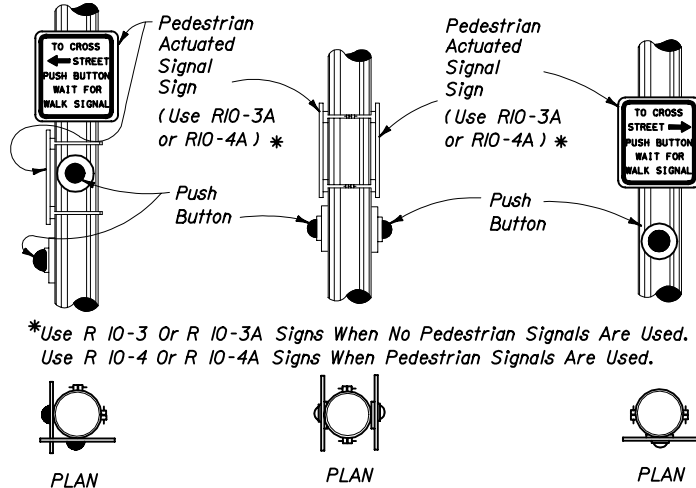


FIGURE E

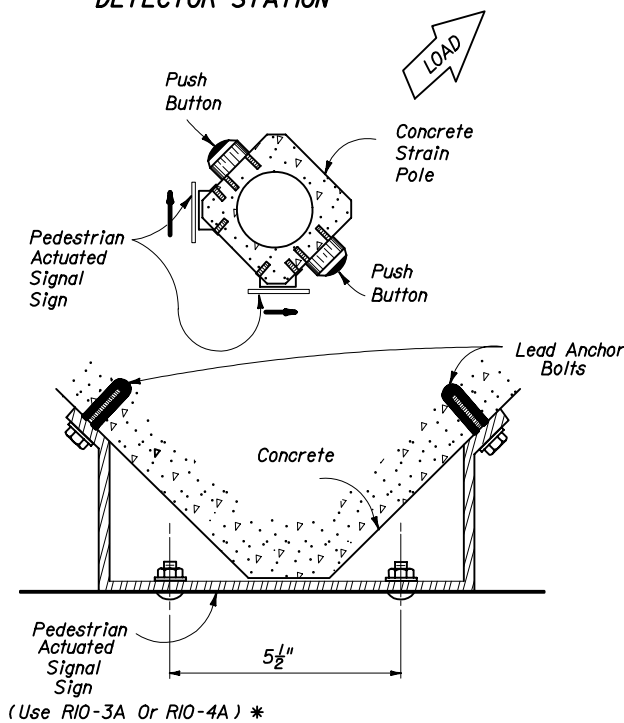
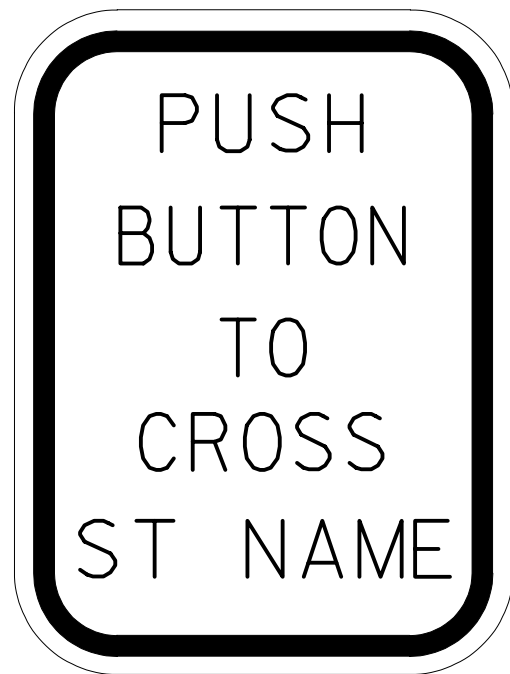


FIGURE F

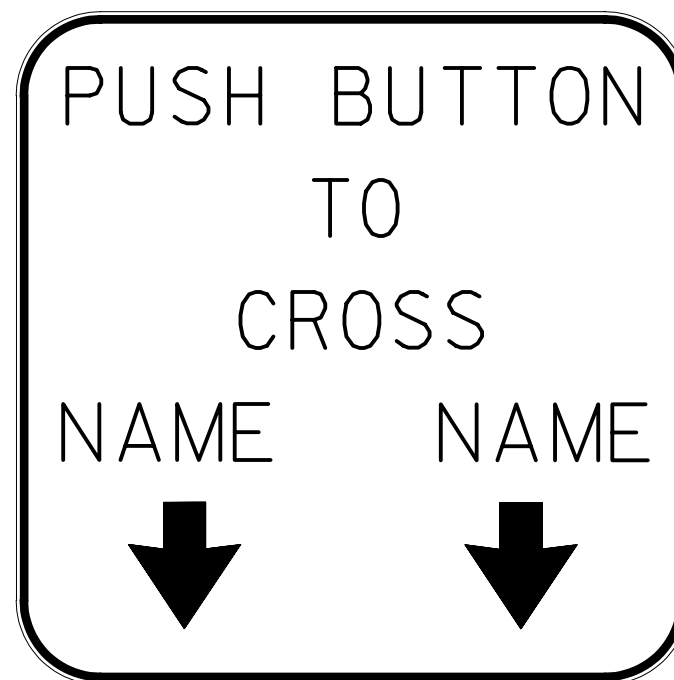
Notes:

- 1 Signs (R10-3A & R10-4A) shall be mounted above detectors, explaining their purpose and use.
- 2 The positioning of pedestrian push button should clearly indicate which cross-walk 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.

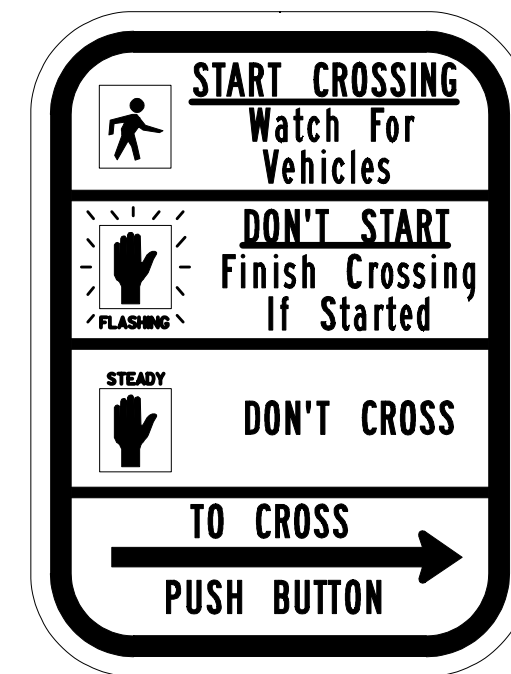
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PEDESTRIAN DETECTOR ASSEMBLY INSTALLATION DETAILS				
Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	1 of 2	17784



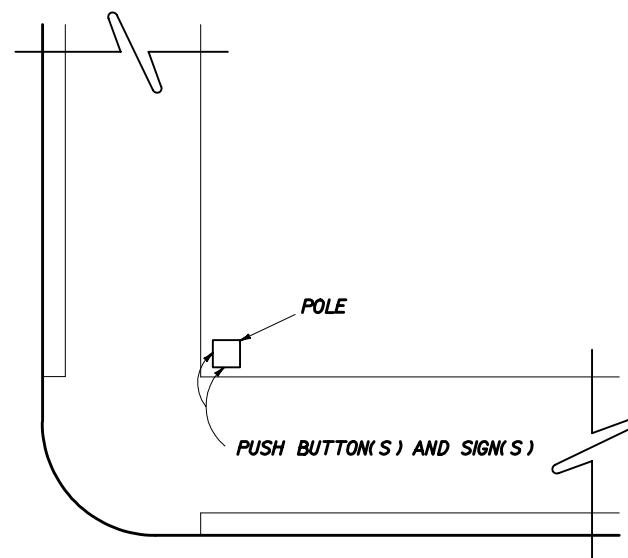
FTP-25-04



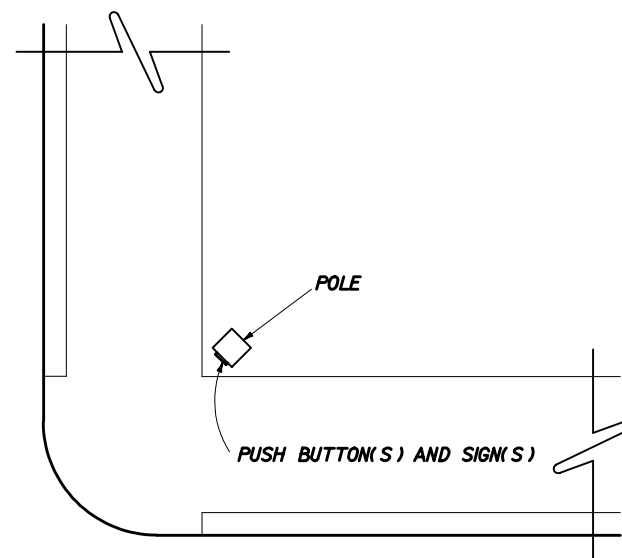
FTP-26-04



RIO-3b

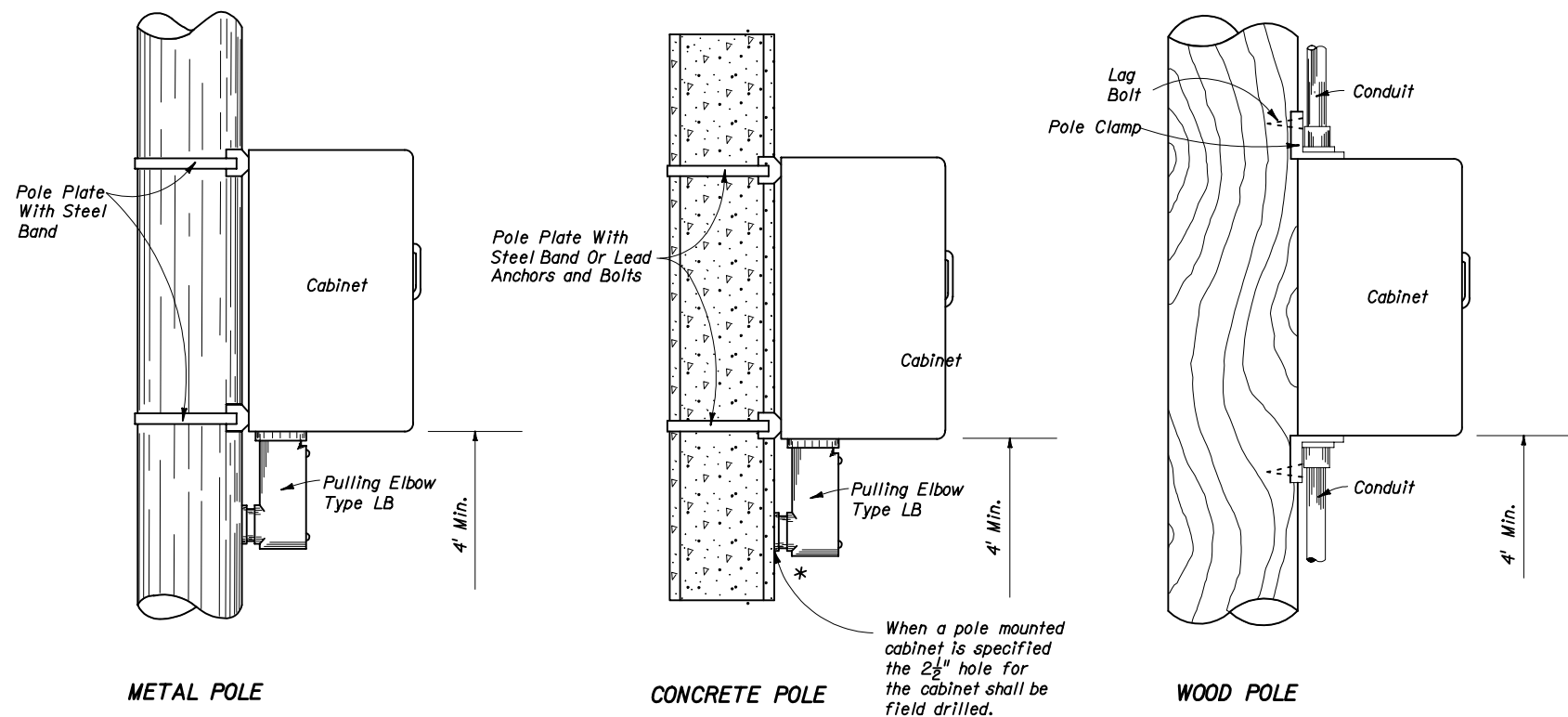


CASE I
POLE PARALLEL TO CURBLINE
ALTERNATE TO FIGURE F



CASE II
POLE DIAGONAL TO CURBLINE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
PEDESTRIAN DETECTOR ASSEMBLY INSTALLATION DETAILS				
Names	Dates	Approved By		
Designed By		 State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	2 of 2	17784



METAL POLE

CONCRETE POLE

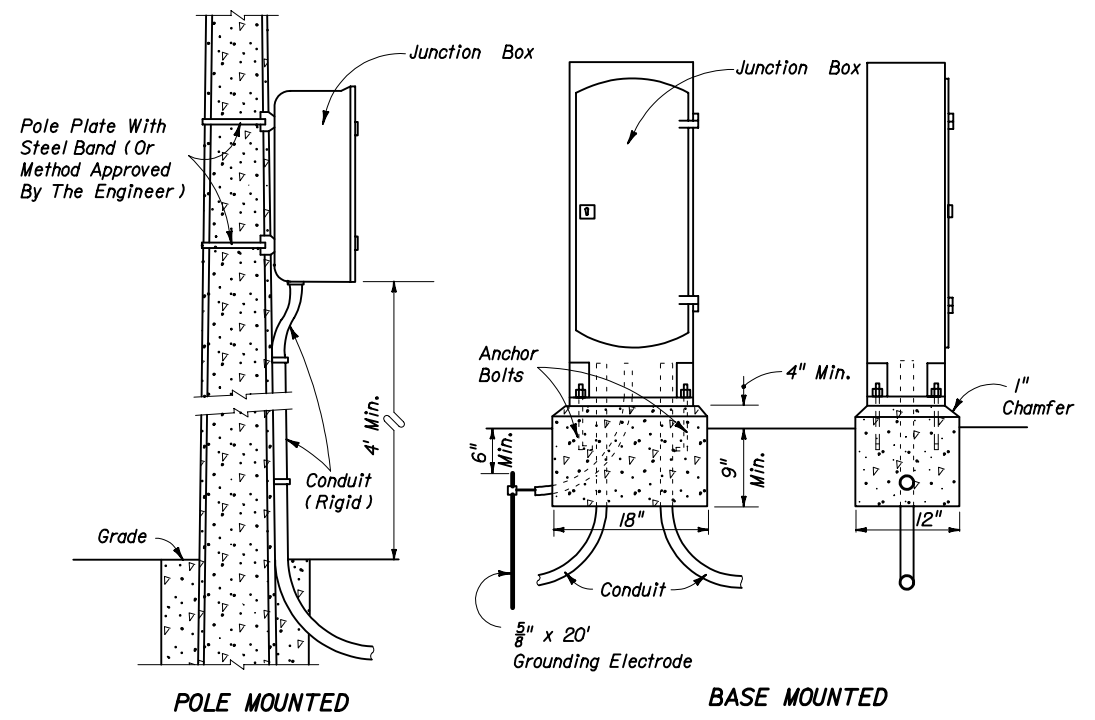
WOOD POLE

POLE MOUNTED CABINET

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

When a pole mounted cabinet is specified the 2 1/2" hole for the cabinet shall be field drilled.

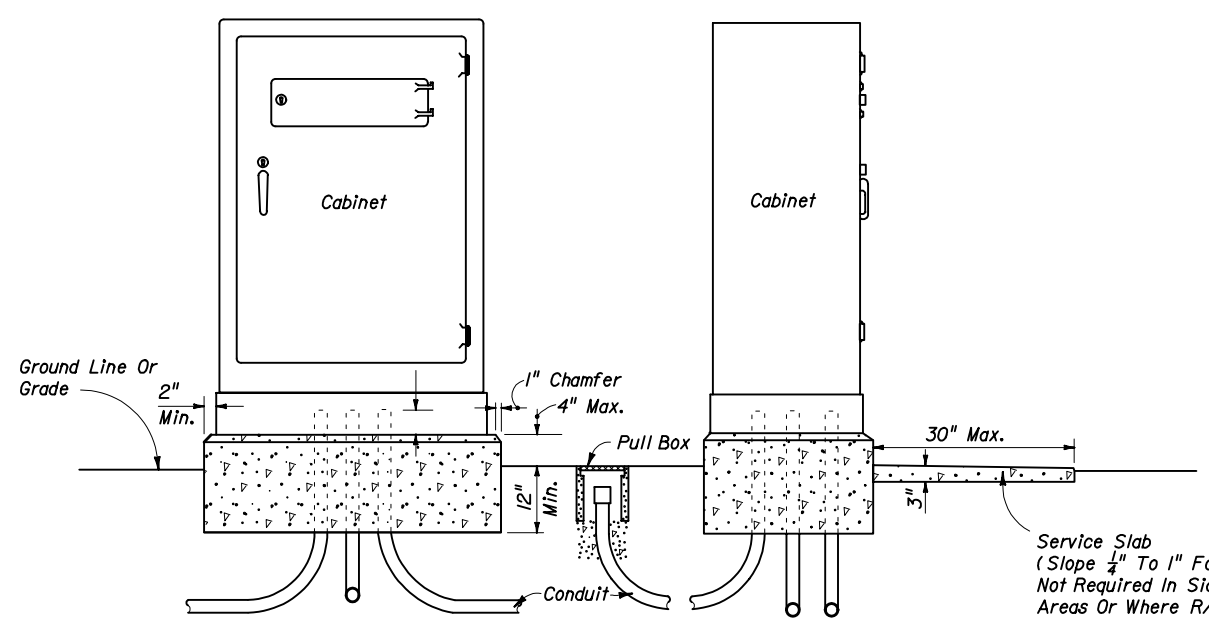
* If holes for cabinet mounting require relocation, original holes shall be filled in with concrete or covered with a non corrosive cover plate.



POLE MOUNTED

BASE MOUNTED

INTERCONNECT JUNCTION BOX

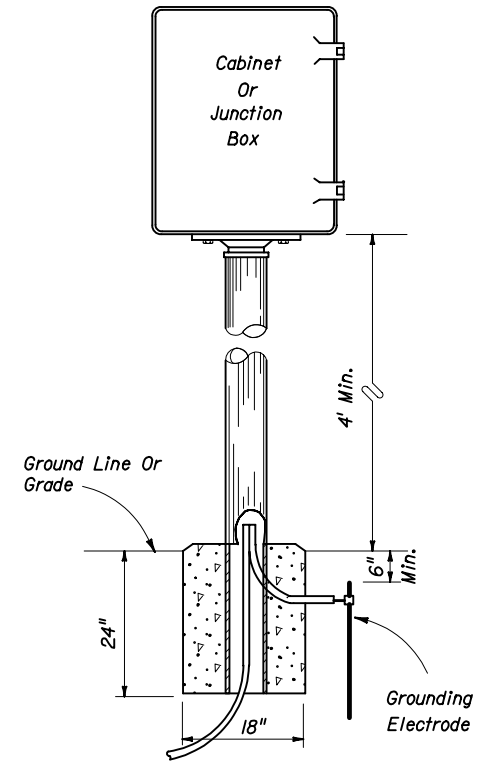


BASE MOUNTED CABINET

Notes:

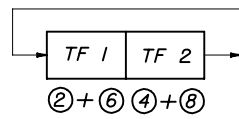
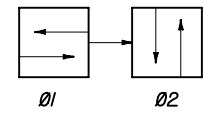
1. The number, size and orientation of conduit sweep will vary according to site condition or locations. Two spare 2" PVC conduits shall be provided in all bases. The spares shall exit in the direction of the center rear of the cabinet base, into a pull box and capped with a weather tight fitting. If 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 weather proof fitting.
2. Meet all grounding requirements of Section 620 of the Standard Specifications.

Service Slab (Slope 1/4" To 1" For Drainage) Not Required In Sidewalk Or Pavement Areas Or Where R/W Is Restricted.

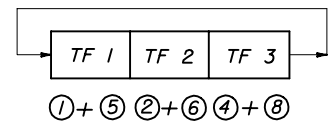
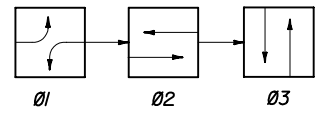


PEDESTAL MOUNTED

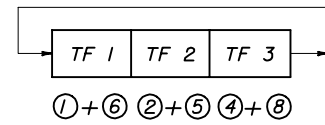
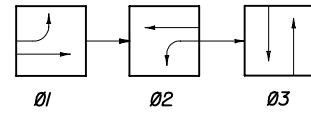
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
CABINET INSTALLATION DETAILS				
Designed By	Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Standards Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			02	1 of 1 17841



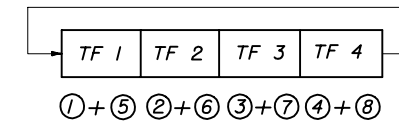
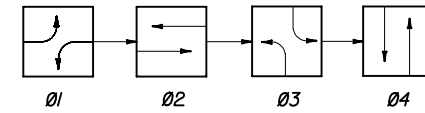
SOP 1



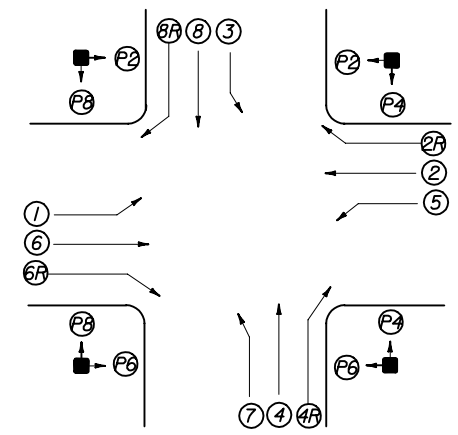
SOP 2



SOP 3

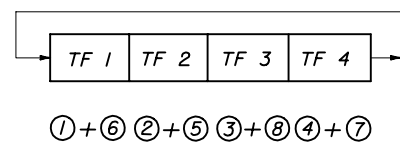
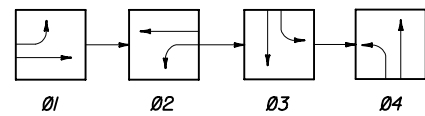


SOP 4

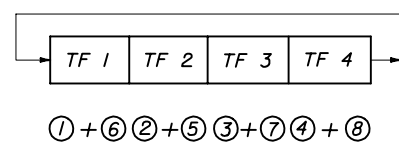
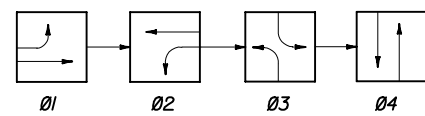


SIGNALIZED INTERSECTION
 Vehicle movements & signal head number assignments are not directionally oriented but shall maintain their relative orientation about the intersection (I.E. movements 7 and 4 are always to the right of movements 1 and 6 etc.)

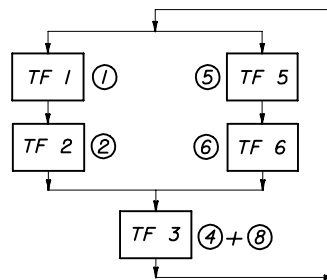
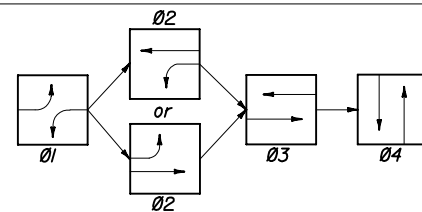
- LEGEND**
- (X) Vehicle Movement Number
 - (P) Pedestrian Movement Number
 - TF Timing Function Number
 - Ø Phase Number
 - ↔ Green Arrow (Left or Right)
 - ↔ Red Arrow
 - ↔ Yellow Arrow



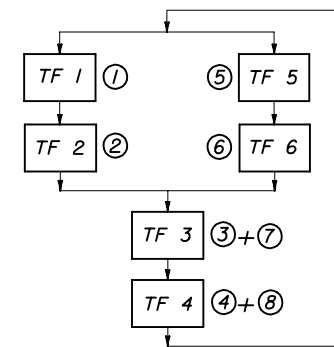
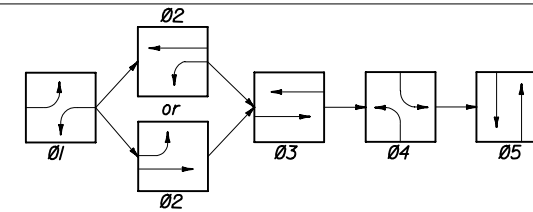
SOP 5



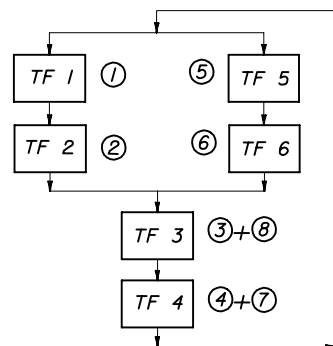
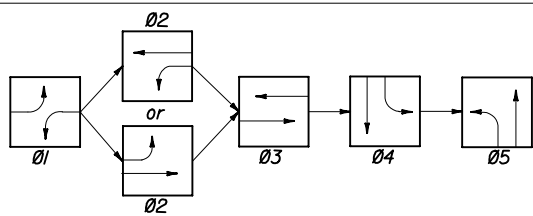
SOP 6



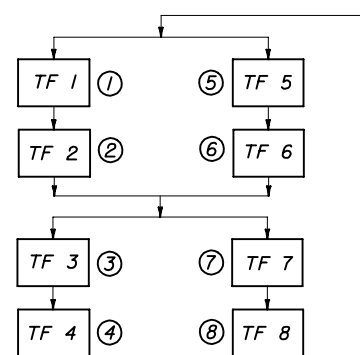
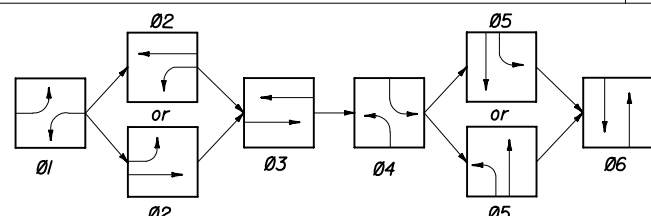
SOP 7



SOP 8



SOP 9



SOP 10

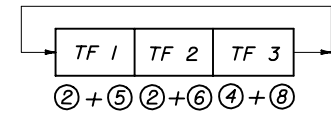
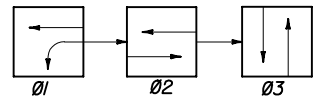
SIGNAL CLEARANCE TABLE
 (Blank Indicates No Clearance Required)

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

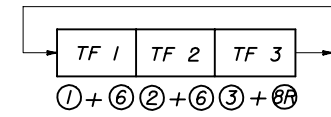
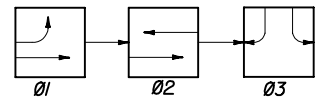
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STANDARD SIGNAL OPERATING PLANS

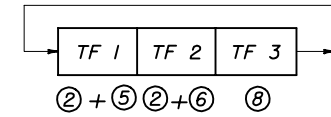
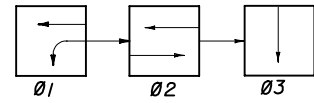
Names	Dates	Approved By
Designed By	4-79	<i>Charles A. Smith</i> State Traffic Standards Engineer
Drawn By		Revision
Checked By		Sheet No. 1 of 2
		Index No. 17870



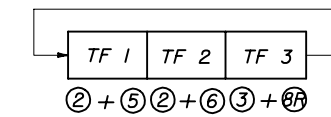
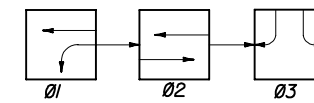
SOP 11



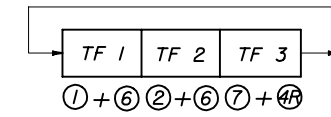
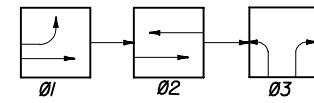
SOP 12



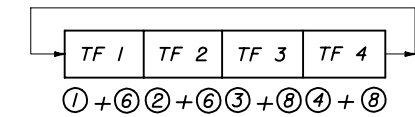
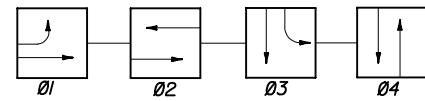
SOP 13
(ONE-WAY STREET INTERSECTION)



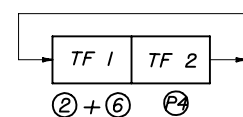
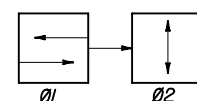
SOP 14
(DIAMOND INTERCHANGE OPERATION)



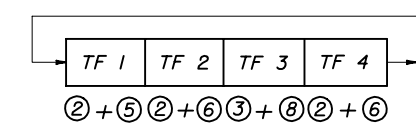
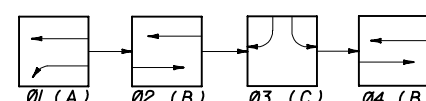
SOP 15
(DIAMOND INTERCHANGE OPERATION)



SOP 16

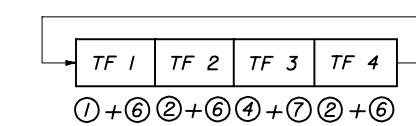
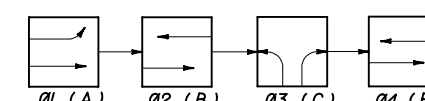


SOP 17
(MID-BLOCK)



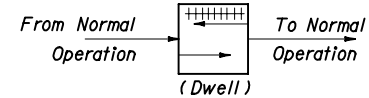
NOTE:
Only Ø2 Or Ø4 Used, Not Both To Obtain
ABC, Or ACB Operation.

SOP 18
(DIAMOND INTERCHANGE OPERATIONS)

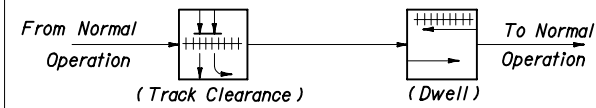


NOTE:
Only Ø2 Or Ø4 Used, Not Both To Obtain
ABC, Or ACB Operation.

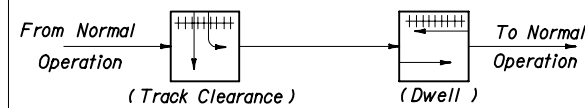
SOP 19
(DIAMOND INTERCHANGE OPERATIONS)



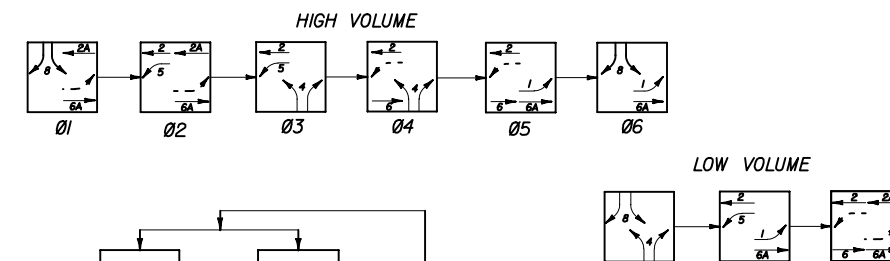
POP 1



POP 2

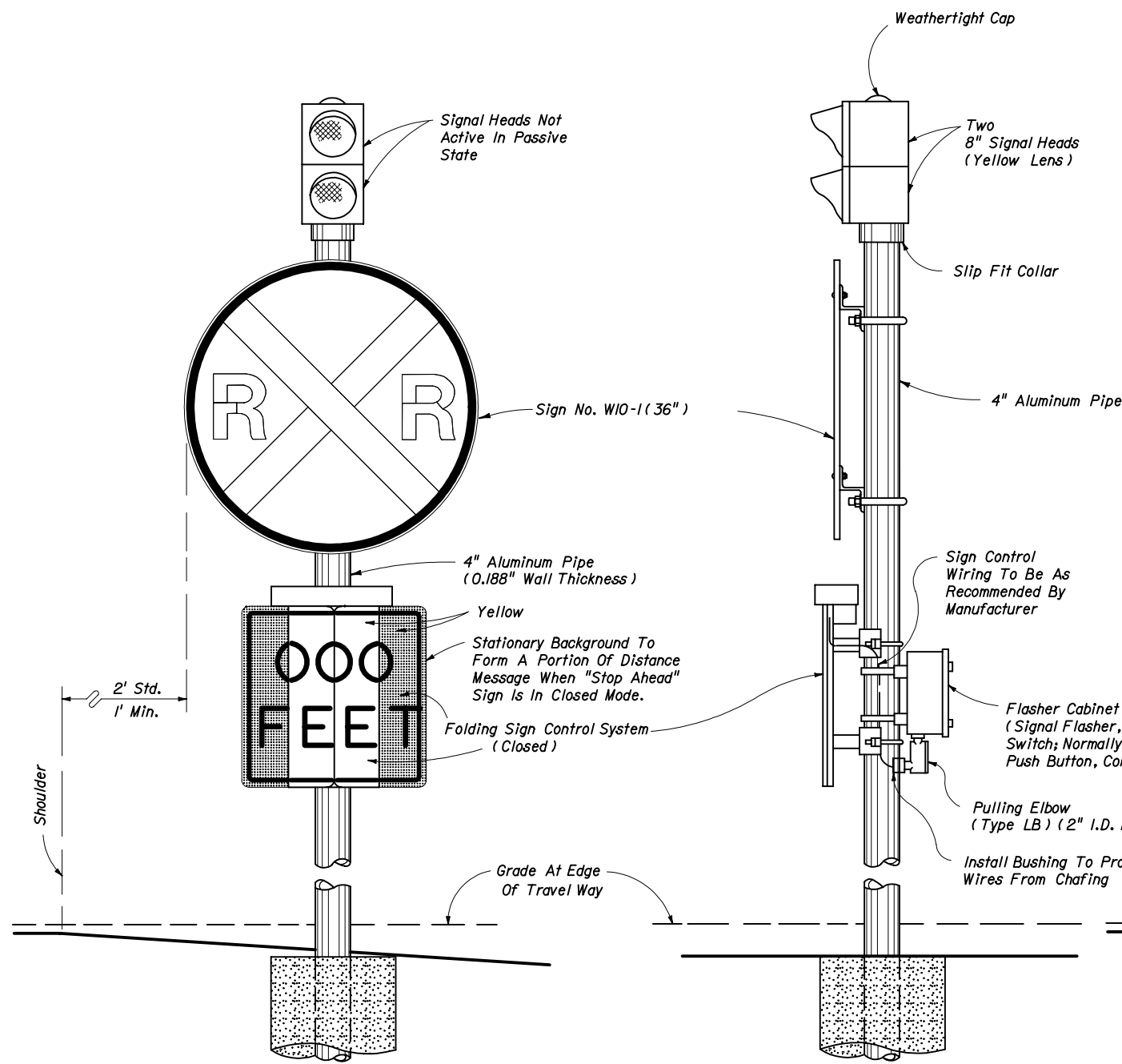


POP 3



SOP 20
(DIAMOND INTERCHANGE OPERATIONS)

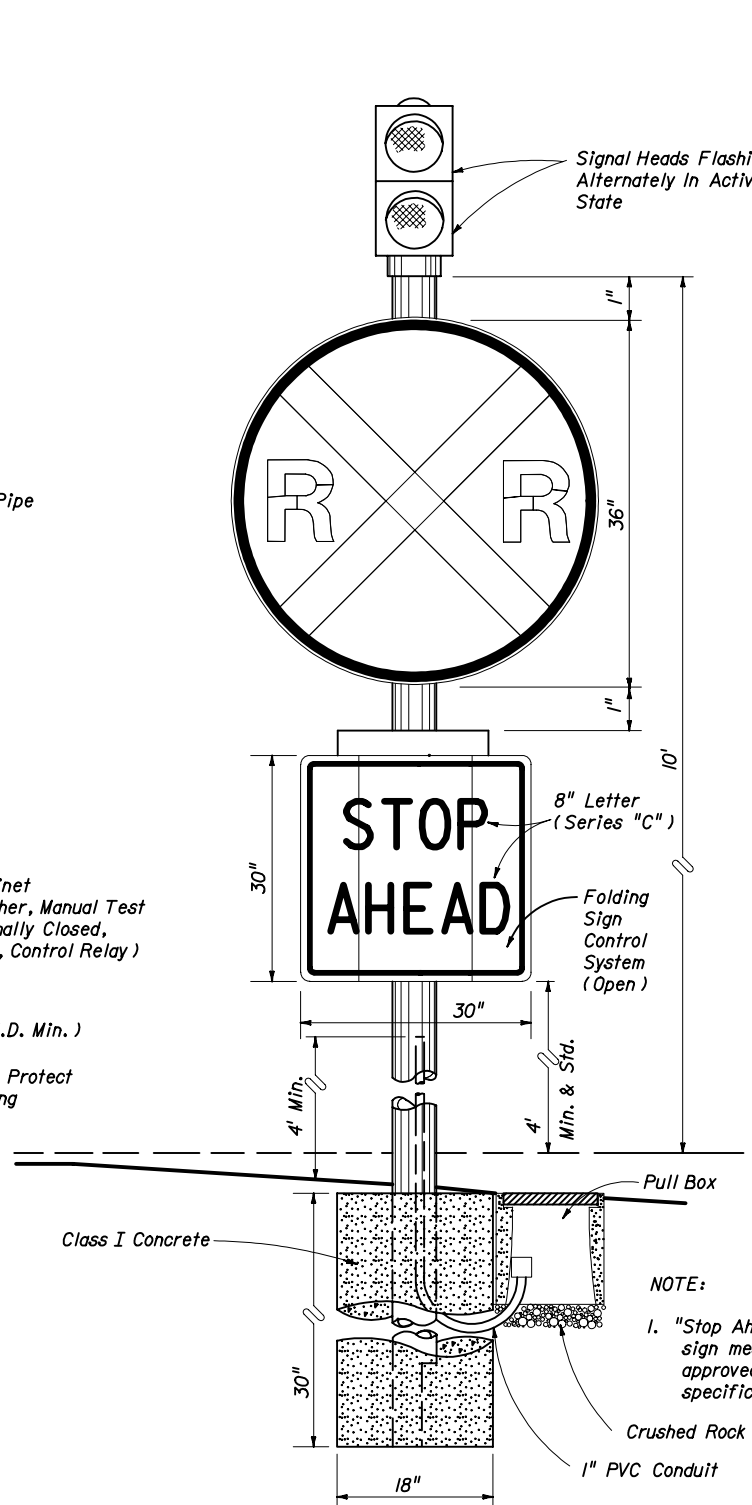
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
STANDARD SIGNAL OPERATING PLANS				
Names	Dates	Approved By		
Designed By	9-79	<i>Clark A. Scott</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 2	17870



FRONT VIEW

SIDE VIEW

PASSIVE STATE
(TRAIN CIRCUIT NOT ACTUATED)



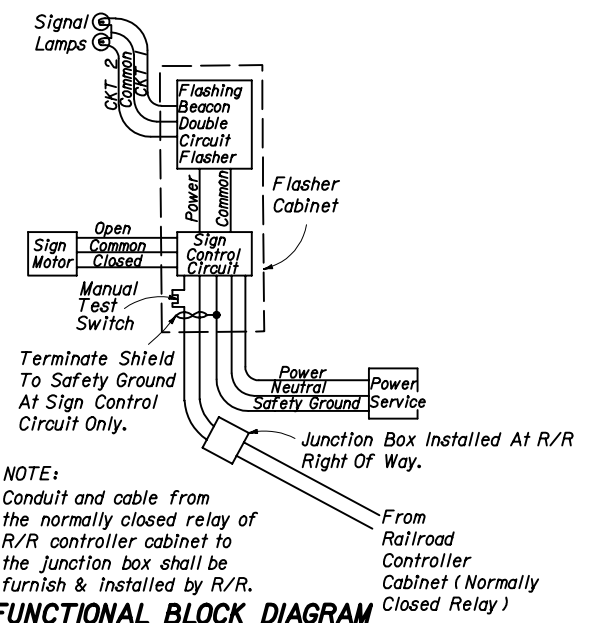
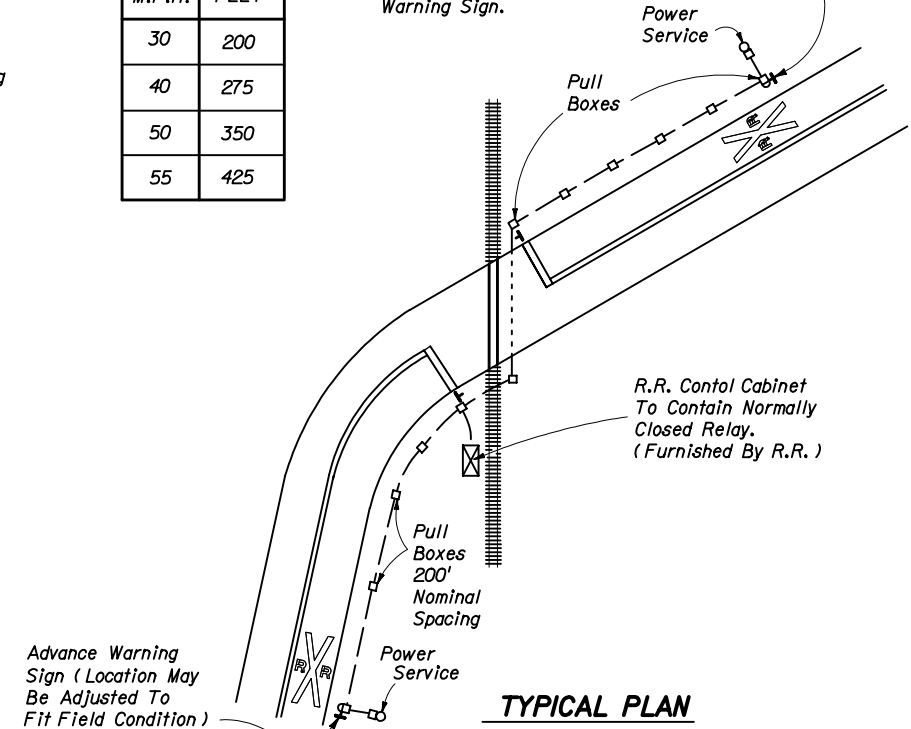
FRONT VIEW

ACTIVE STATE
(TRAIN CIRCUIT ACTUATED)

LOCATION OF THE ADVANCE WARNING SIGN

SPEED M.P.H.	DISTANCE FEET
30	200
40	275
50	350
55	425

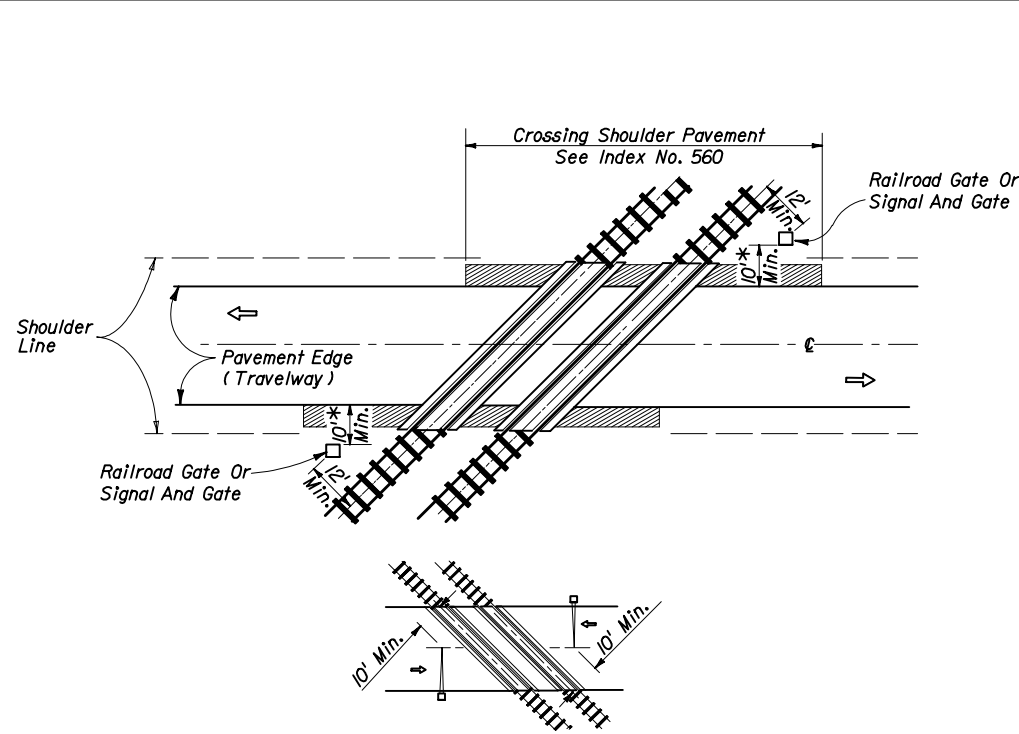
The Distance Is Measured Along Right Edge Of Pavement From R/R Stop Bar To Sign Advance Warning Sign.



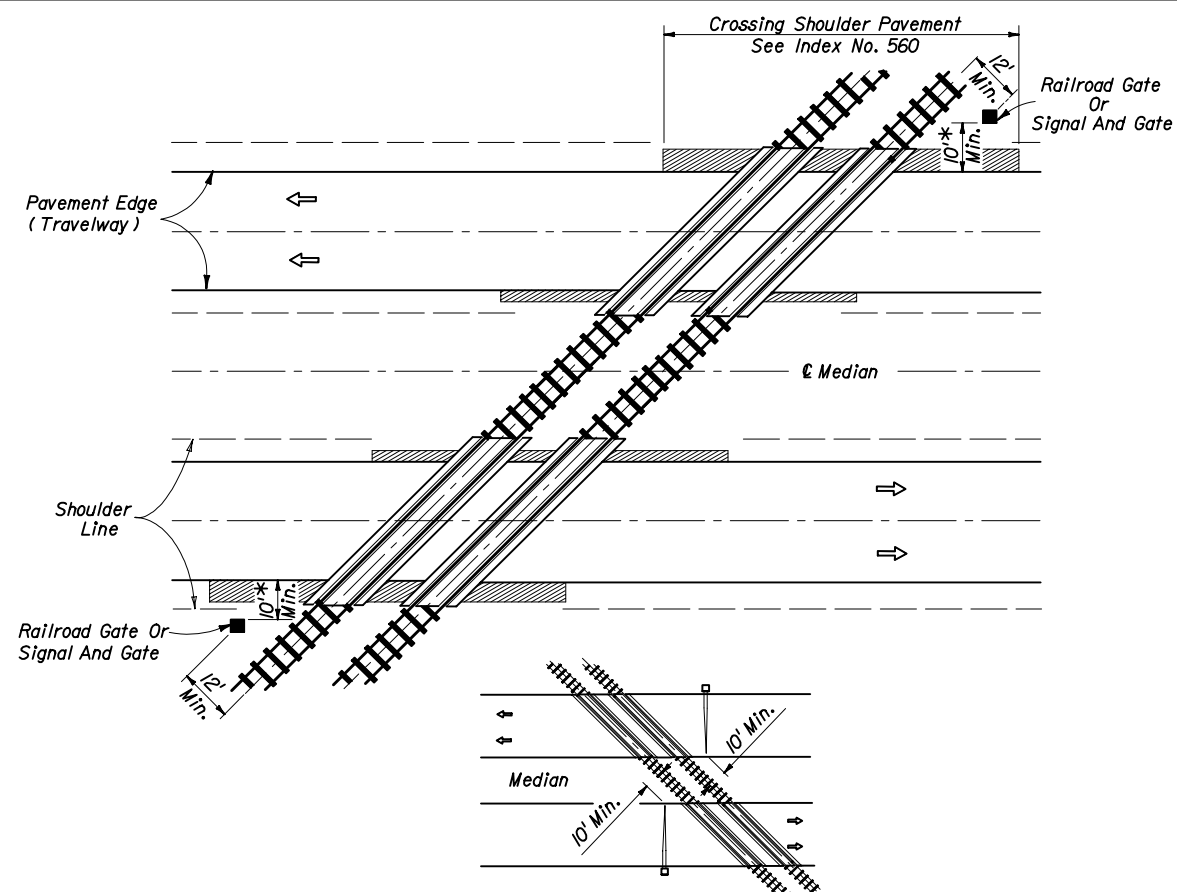
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ADVANCE WARNING FOR R.R. CROSSING

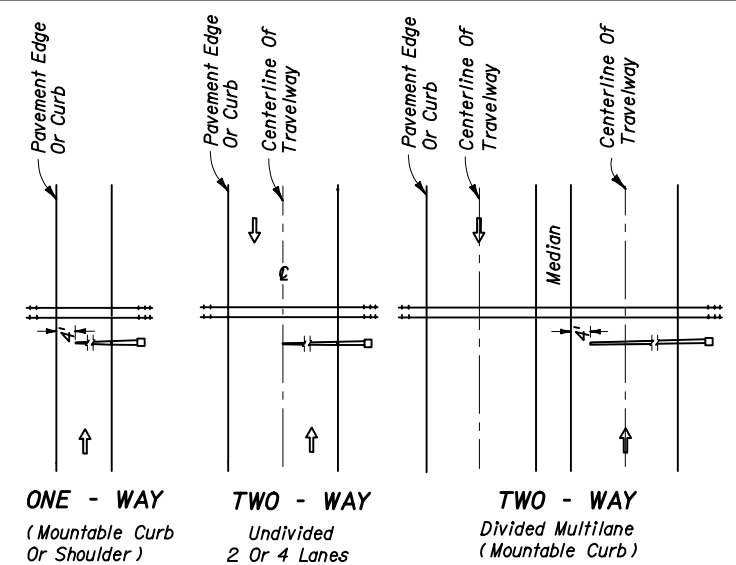
Names	Dates	Approved By		
Designed By	12-75	State Traffic Standards Engineer		
Drawn By				
Checked By	12-75	Revision	Sheet No.	Index No.
		00	1 of 1	17881



**SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 - LANE DESIGN)**

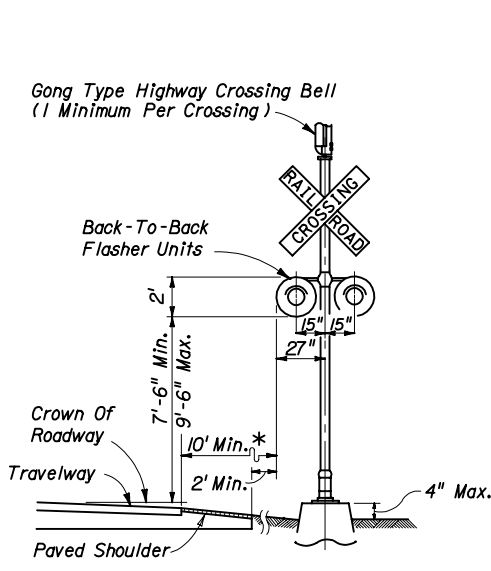


**SIGNAL PLACEMENT AT RAILROAD CROSSING
(4 - LANE DESIGN)**

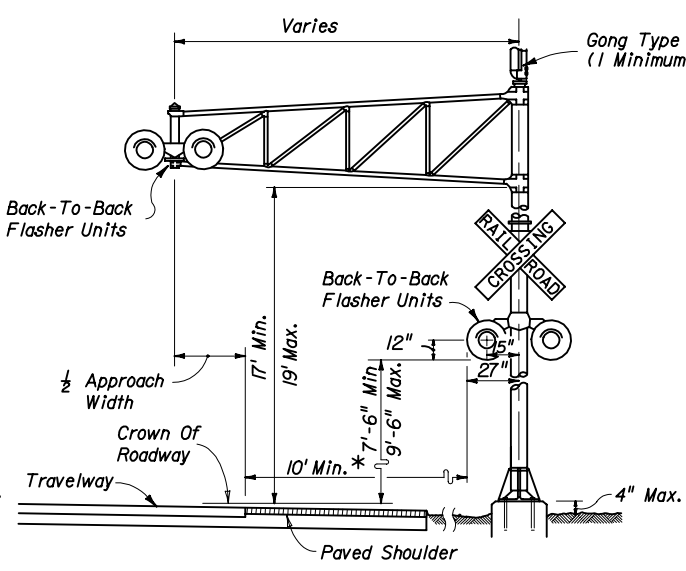


Note :
Arrows denote direction of travel not lane indication

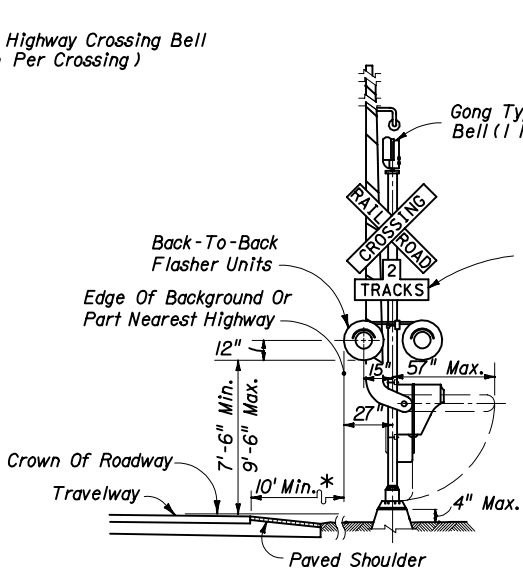
FIGURE 1
Gate Length Requirements
See Note 6 Sheet 3



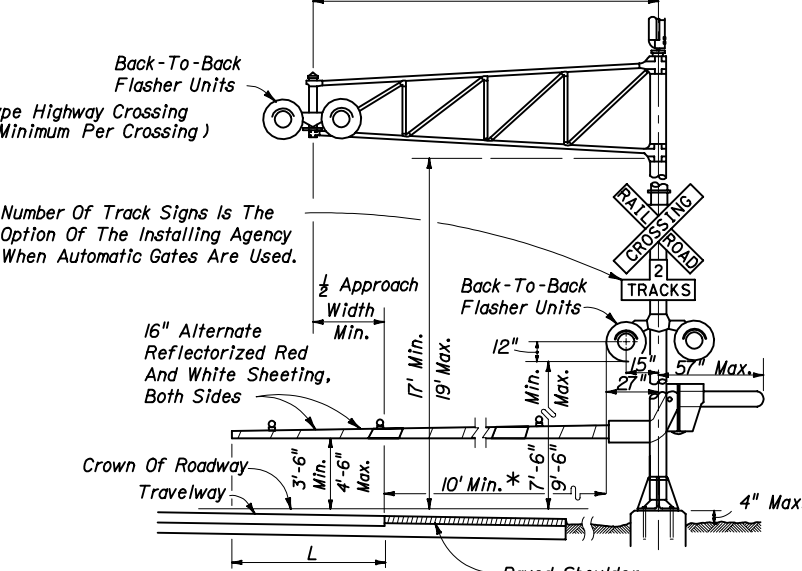
TYPE I



TYPE II



TYPE III



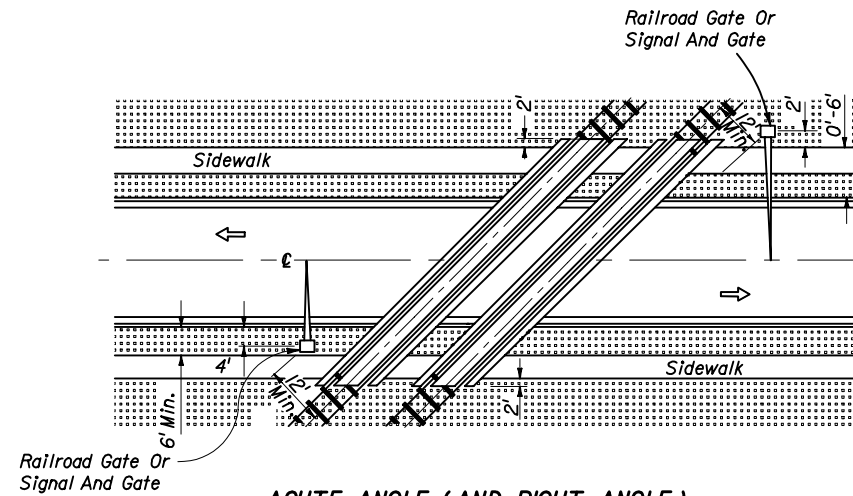
TYPE IV

* When 10' is deemed impracticable 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.

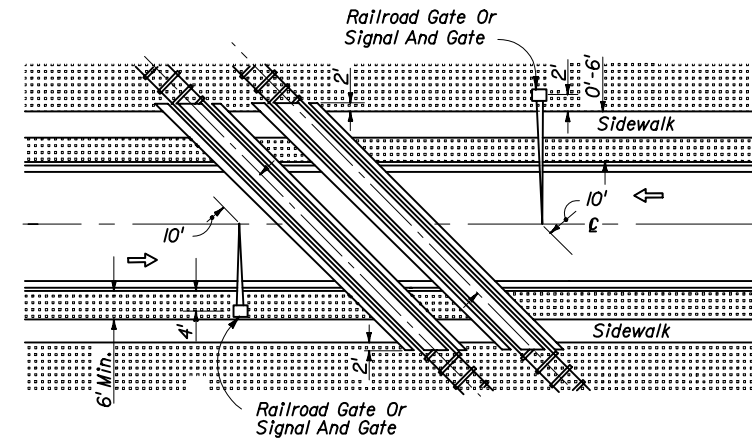
- General Notes**
- No guardrail is proposed for signals; however, some form of impact attenuation device may be specified for certain locations.
 - Advance flasher to be installed when and if called for in plans or specifications.
 - Top of foundation shall be no higher than 4" above finished shoulder grade.
 - 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
 - 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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES				
Names	Dates	Approved By		
Designed By	4-76	<i>Charles A. Smith</i> State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	4-76	00	1 of 4	17882



ACUTE ANGLE (AND RIGHT ANGLE)

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

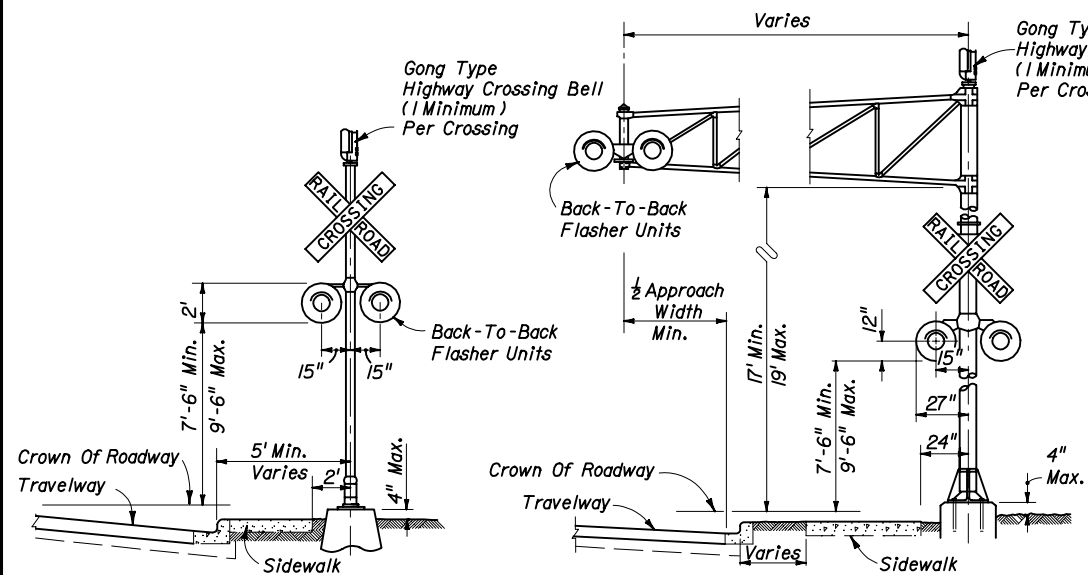


OBTUSE ANGLE

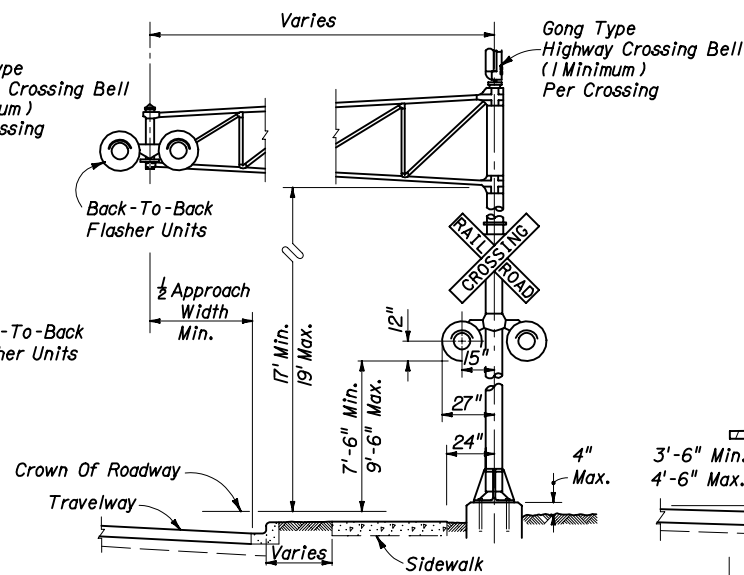
**SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 LANES, CURB & GUTTER)**

GENERAL NOTES

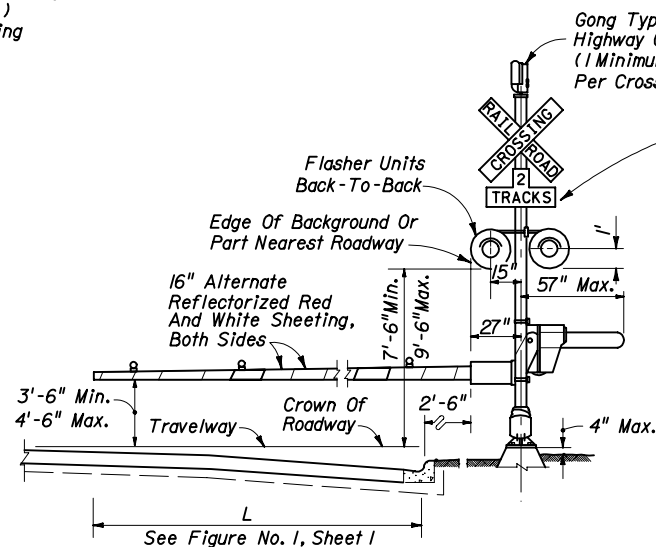
1. The location of flashing signals and stop lines shall be established based on future (or present) installation of gate with appropriate track clearances.
2. Where plans call for railroad traffic control devices to be installed in curbed medians, the minimum median width shall be 12'-6".
3. Location 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.



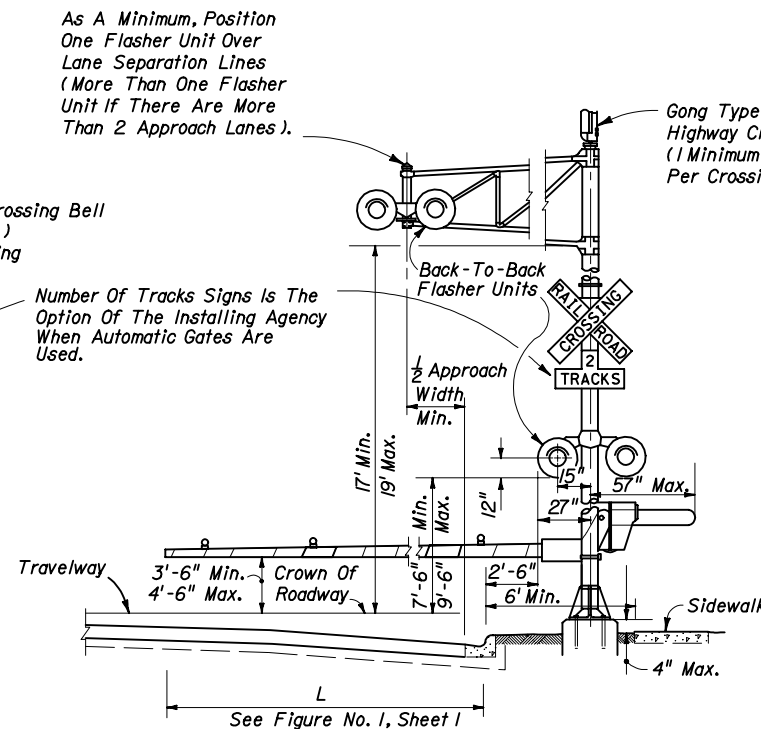
TYPE I



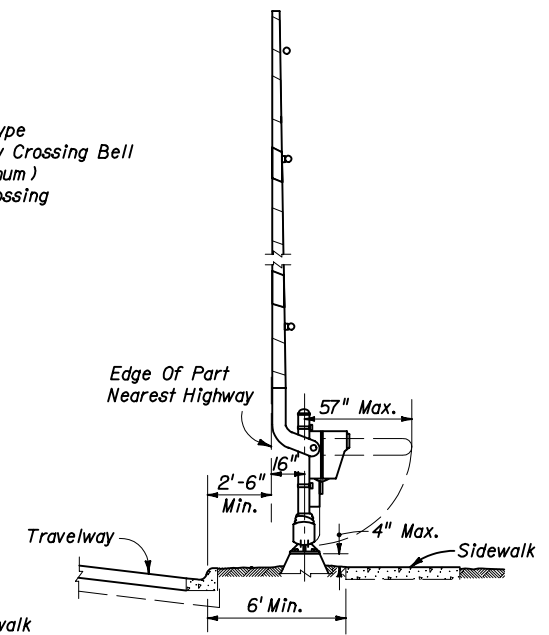
TYPE II



TYPE III




TYPE IV



TYPE V

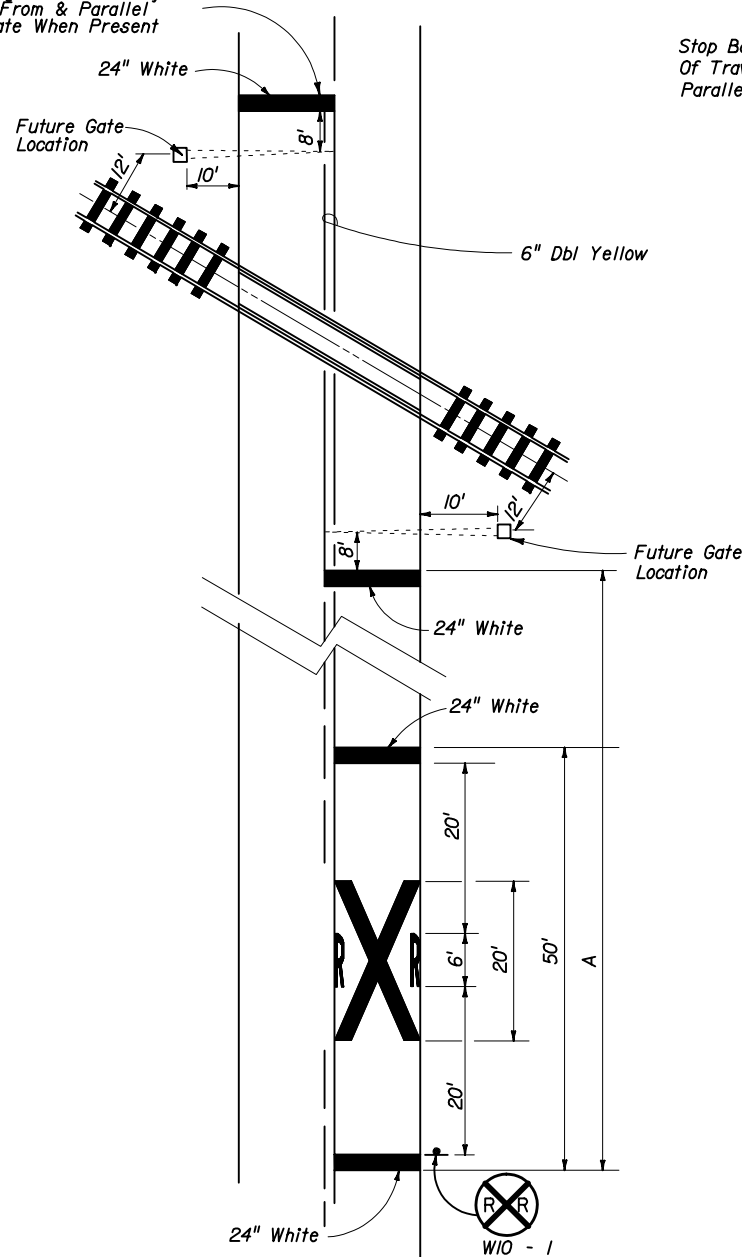
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RAILROAD GRADE CROSSING
TRAFFIC CONTROL DEVICES**

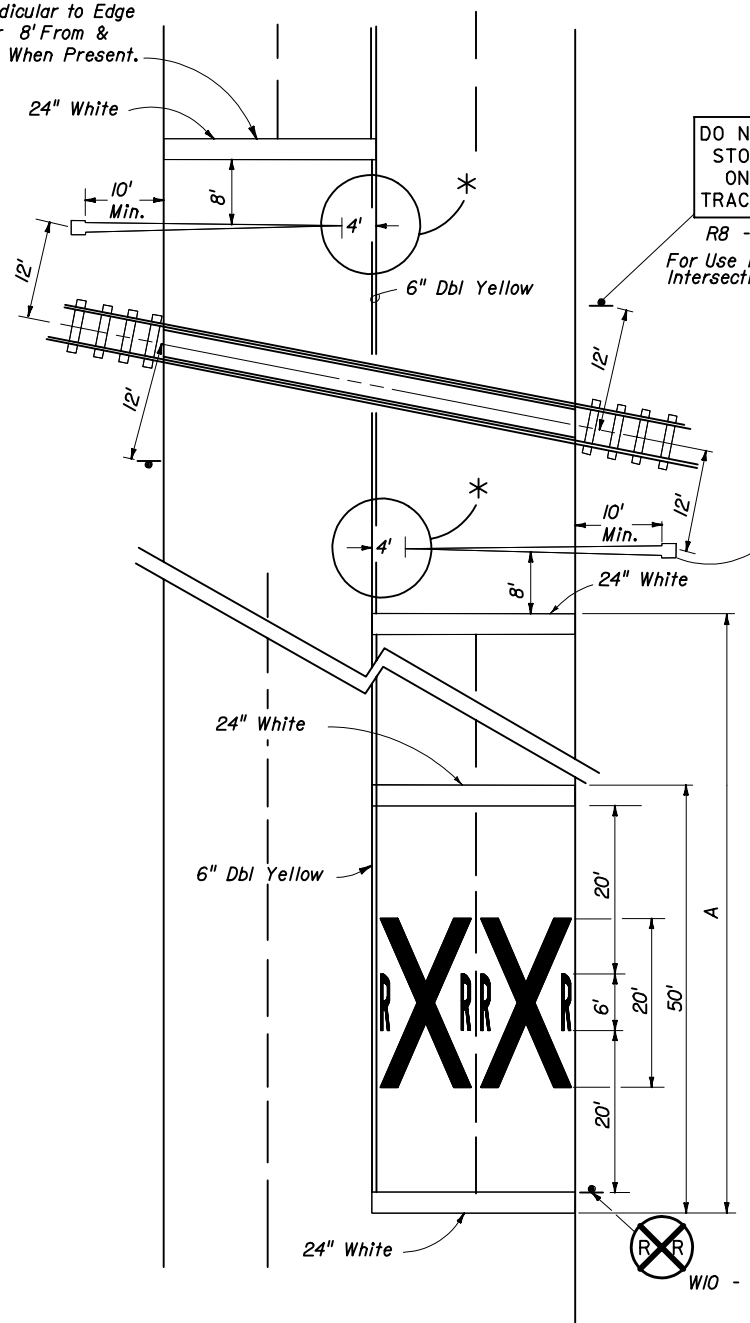
Names	Dates	Approved By		
Designed By	4-76	 State Traffic Standards Engineer		
Drawn By				
Checked By	4-76	Revision	Sheet No.	Index No.
		00	2 of 4	17882

RAILROAD CROSSING AT TWO (2) - LANE ROADWAY

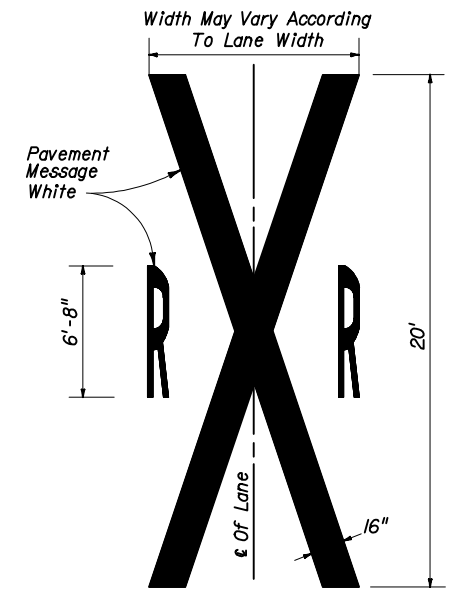
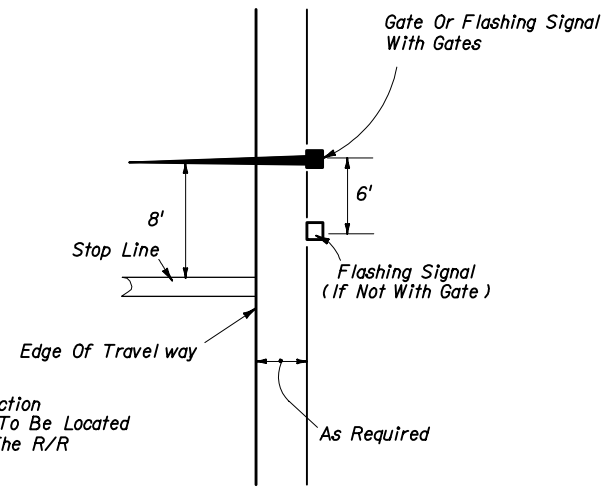
Stop Bar Perpendicular To Edge Of Travel Way Or 8' From & Parallel To Gate When Present



Stop Bar Perpendicular to Edge Of Travel Way Or 8' From & Parallel To Gate When Present.



RELATIVE LOCATION OF CROSSING TRAFFIC CONTROL DEVICES



NOTES:

1. When computing pavement message, quantities do not include transverse 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 R/R 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-61-04 or FTP-62-04 signs, 100' urban and 300' rural. See Index 17355 for sign details.

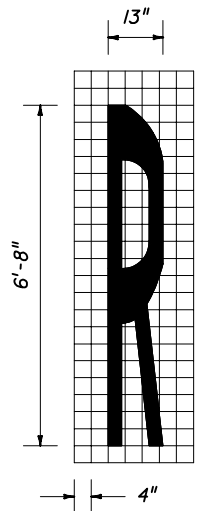
* 5. Gate Length Requirements

For two-way undivided sections:

The gate should extend to within 1' of the center line. On multilane 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'.

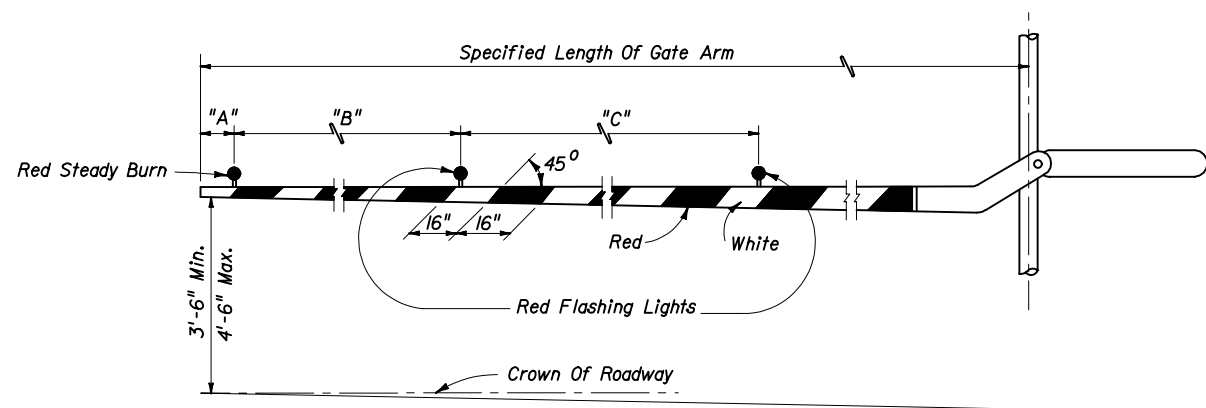
For one-way or divided sections:

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'.



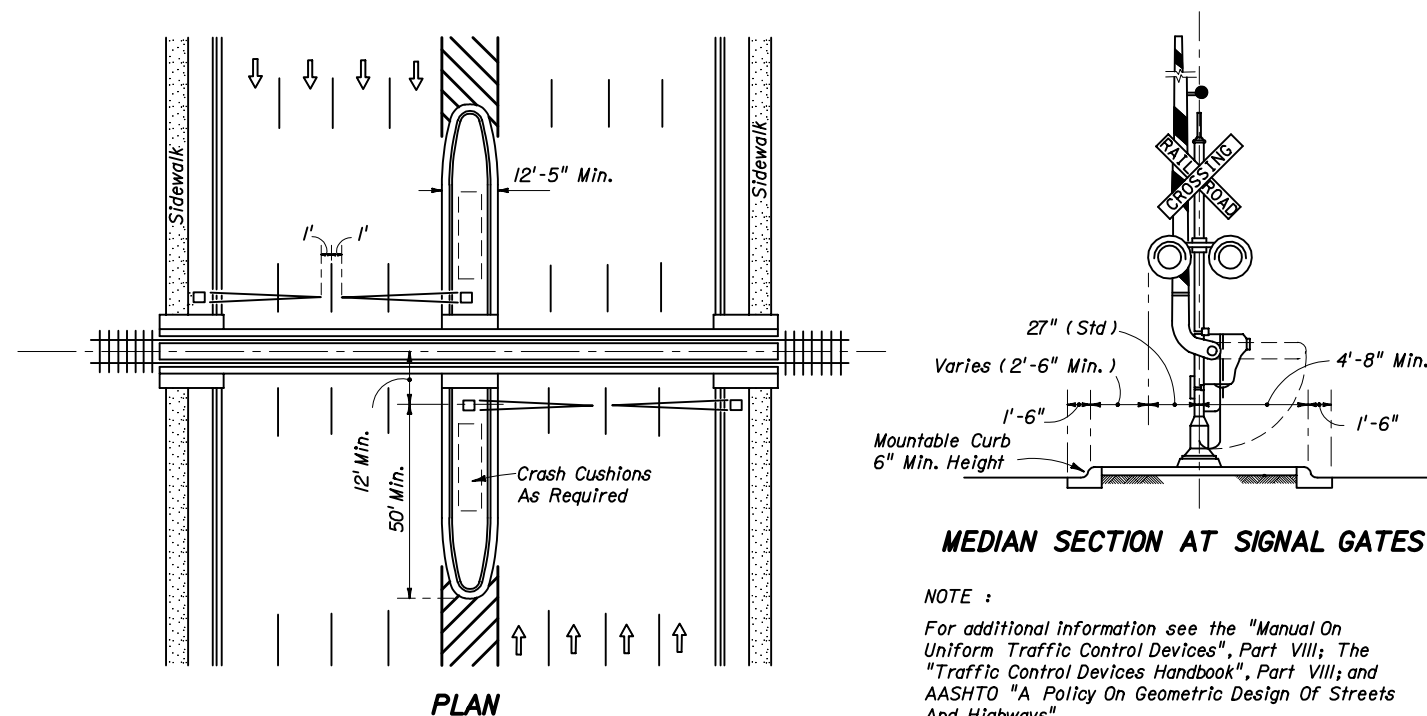
SPEED MPH	"A" IN FT
60	550
55	450
50	375
45	300
40	225
35	150
30	100
URBAN	50 MIN.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES				
Names	Dates	Approved By		
Designed By	10-77	Clark A. Scott State Traffic Standards Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		04	3 of 4	17882



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
MULTI LANE UNDIVIDED URBAN SECTIONS**
(THREE OR MORE DRIVING LANES IN ONE DIRECTION, 45 mph OR LESS)

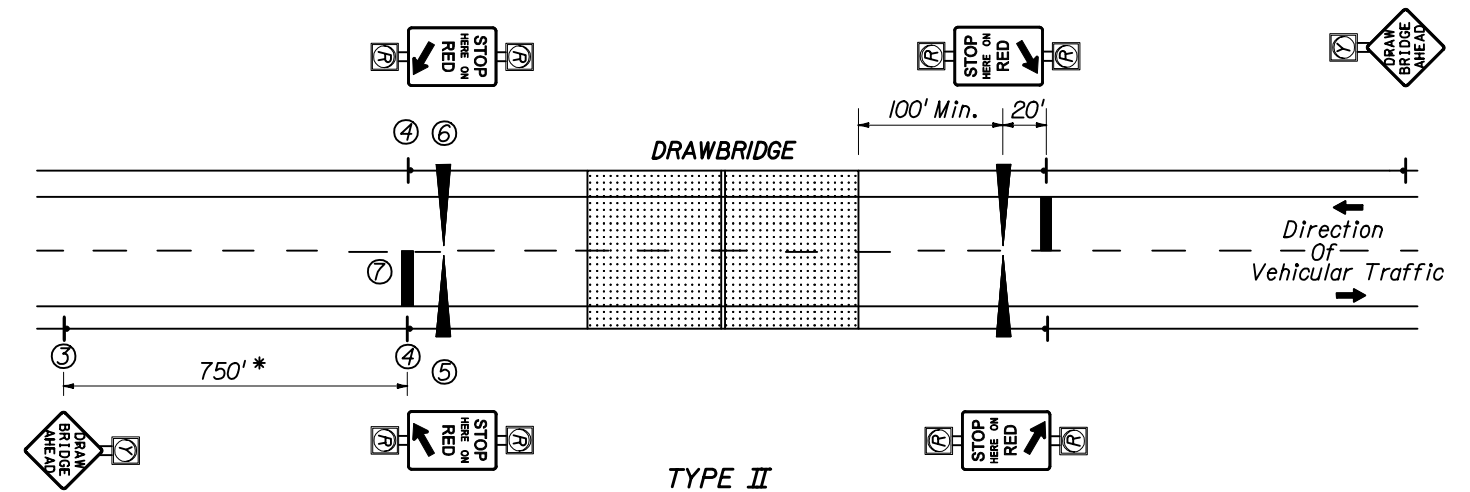
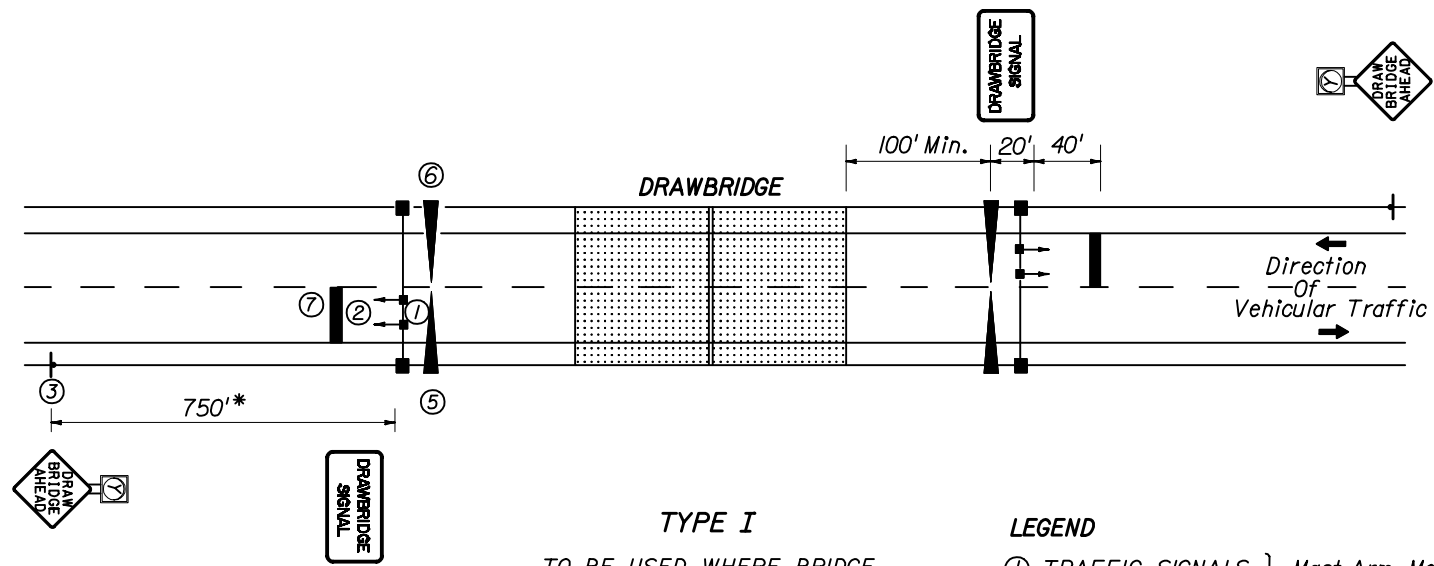
NOTE :
For additional information see the "Manual On Uniform Traffic Control Devices", Part VIII; The "Traffic Control Devices Handbook", Part VIII; and AASHTO "A Policy On Geometric Design Of Streets And Highways".

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**RAILROAD GRADE CROSSING
TRAFFIC CONTROL DEVICES**

Names	Dates	Approved By
Designed By	10-85	<i>Clark A. Scott</i> State Traffic Standards Engineer
Drawn By	10-85	Revision Sheet No. Index No.
Checked By		00 4 of 4 17882

TYPICAL BRIDGE MOUNTS



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

* Field conditions may require adjustment of this standard distance.

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 4E-14 through 4E-17 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 NON-MOVABLE STEEL DECK BRIDGES."

SEQUENCE CHART

SIGNALS & SIGNS	SIGNAL SWITCH	OFF	ON	OFF
	FLASHING BEACON DRAWBRIDGE AHEAD SIGN (See Note 9)	BLANK	FLASHING YELLOW	BLANK
	STOP HERE ON RED (Type II only)	BLANK	FLASHING RED	BLANK
GATES	TRAFFIC SIGNALS (Type I only)	GREEN	YELLOW	RED
	ENTRANCE GATES	RAISED	LOWERED	RAISED
	EXIT GATES		LOWERED	RAISED
TIMING		Variable Time (See Note No.3)	5 Sec. Min. Variable Time (See Note No.4)	Variable Time (See Note No.5)
			Variable Time - Bridge Open (See Note No.6)	Variable Time (See Note No.5)
	Normal Operation	Operation During Bridge Preemption		



W8-5
SLIPPERY WHEN WET SIGN
See Note 11.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS

Designed By		Dates	4-75	Approved By	<i>Charles A. Scott</i>
Drawn By		Revision	4-75	State Traffic Standards Engineer	
Checked By		Sheet No.	04	Index No.	17890

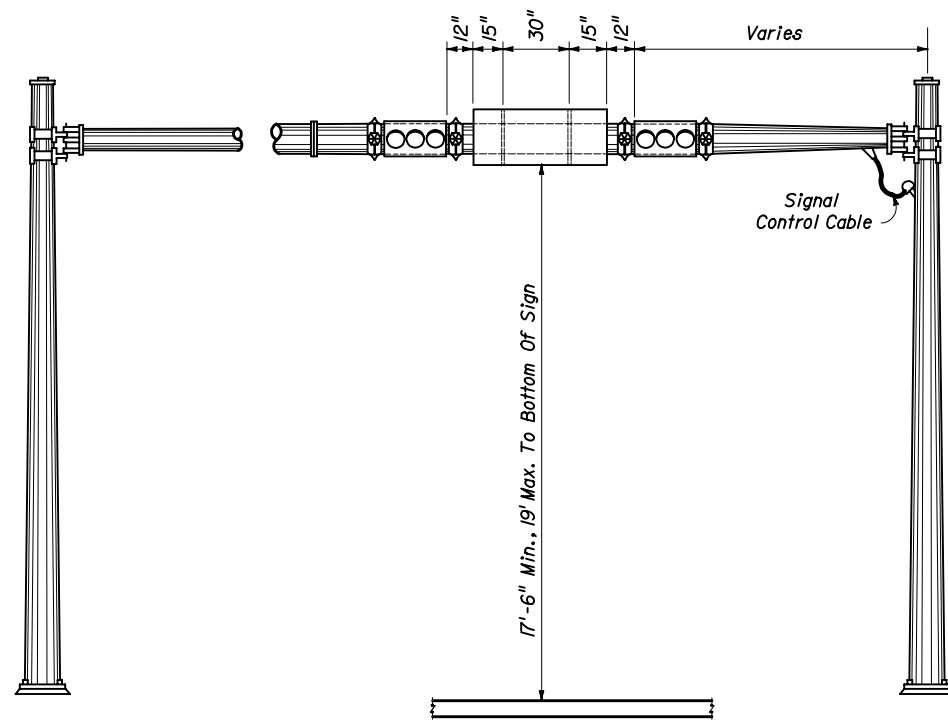


FIGURE - A
MONOTUBE SUPPORT MOUNTING

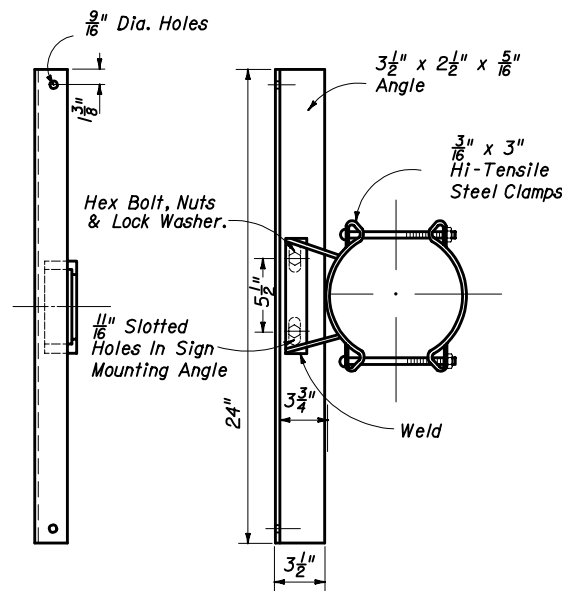


FIGURE - B
SIGN PANEL MOUNTING ASSEMBLY

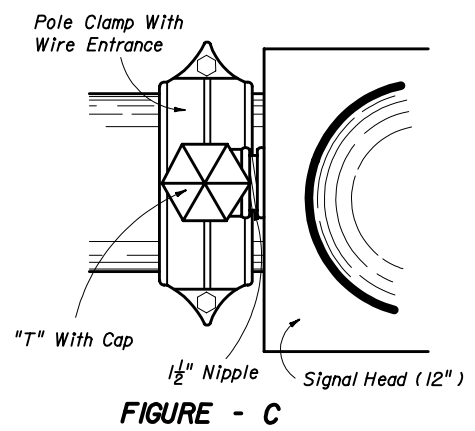


FIGURE - C

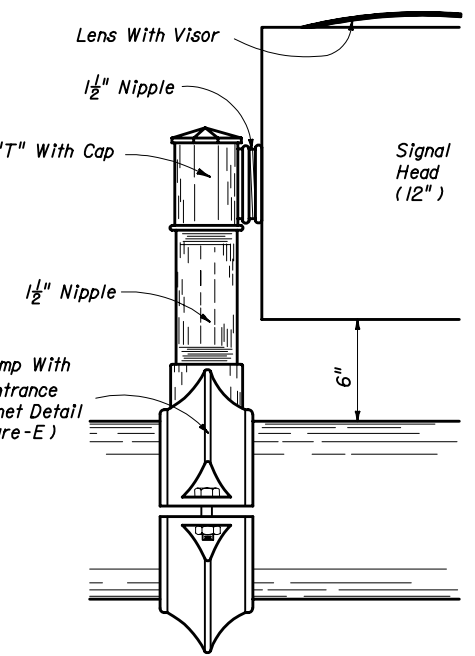


FIGURE - D

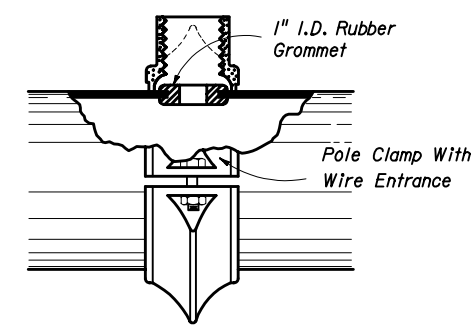


FIGURE - E

SIGNAL HEAD MOUNTING ASSEMBLY

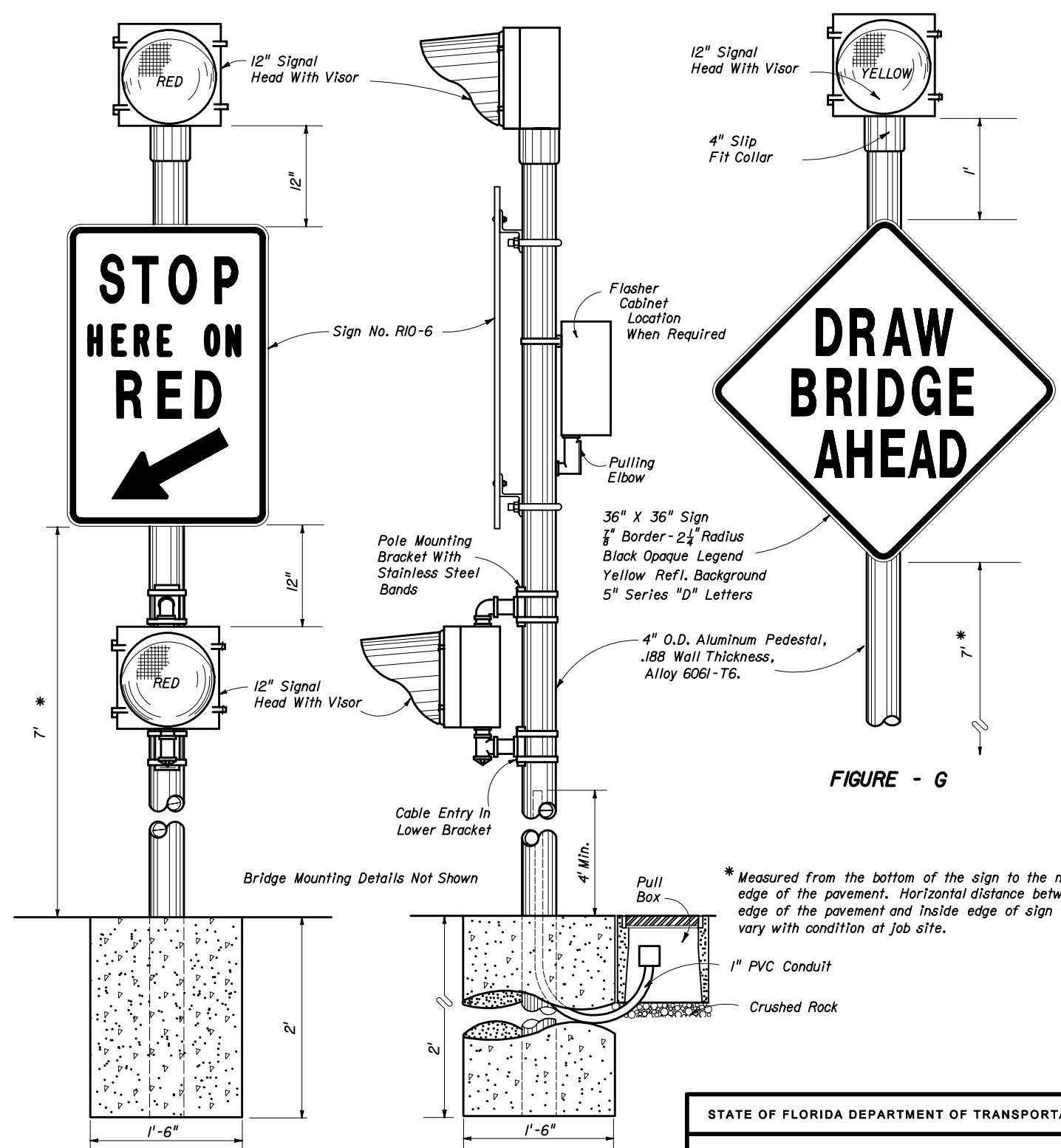
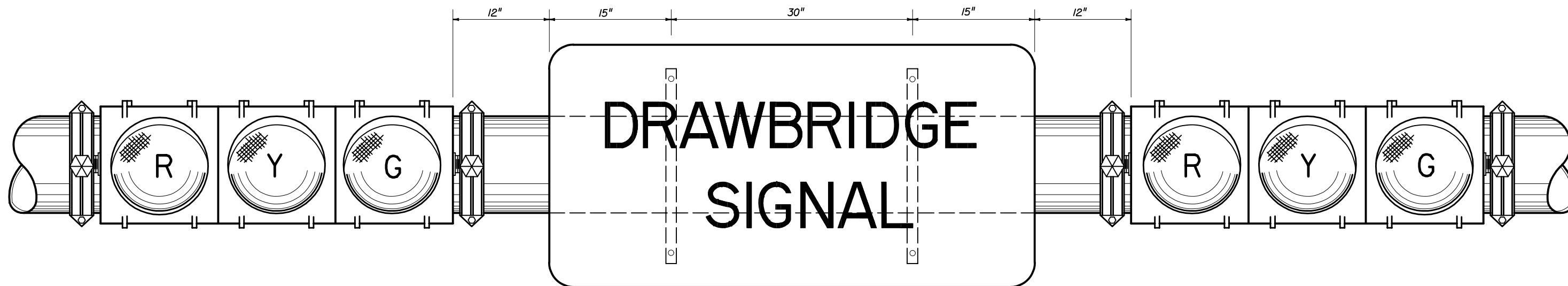


FIGURE - F

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS

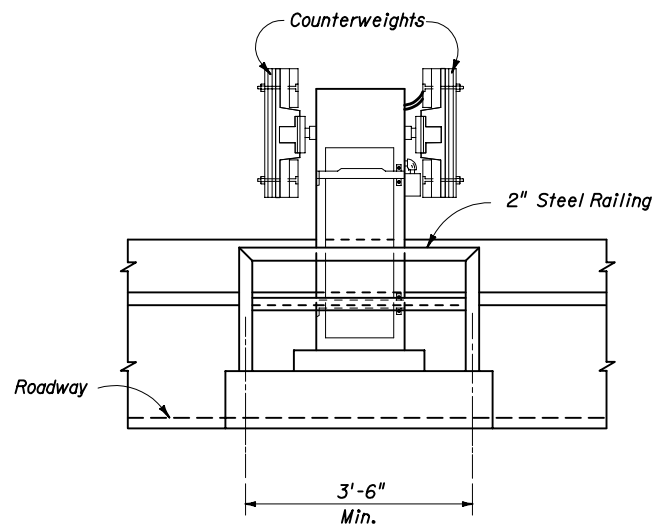
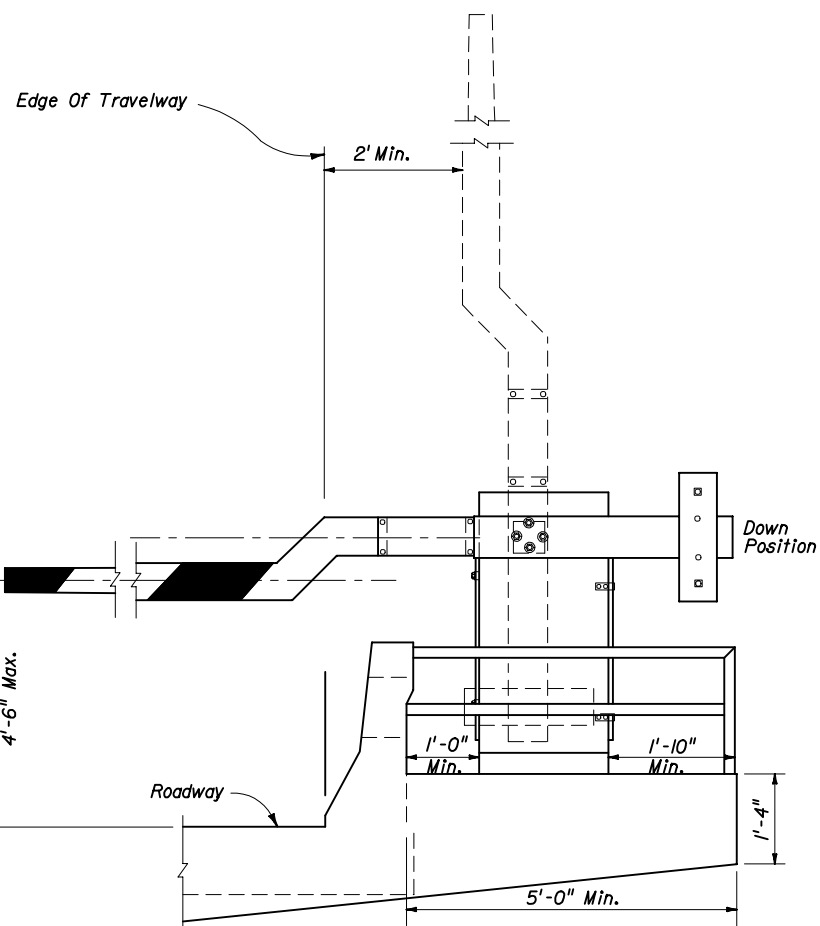
Names	Dates	Approved By		
Designed By	4-75	 State Traffic Standards Engineer		
Drawn By				
Checked By	4-75	Revision	Sheet No.	Index No.
		04	2 of 3	17890



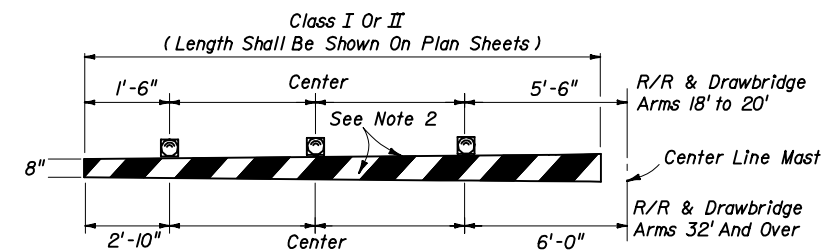
5' x 2'-6"
 2" Border-4" Radius
 6" Series "D" Letters

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



- Note :
- 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.
 - 16" alternate diagonal fully reflectorized red and white stripes.

TYPICAL LAMP PLACEMENT

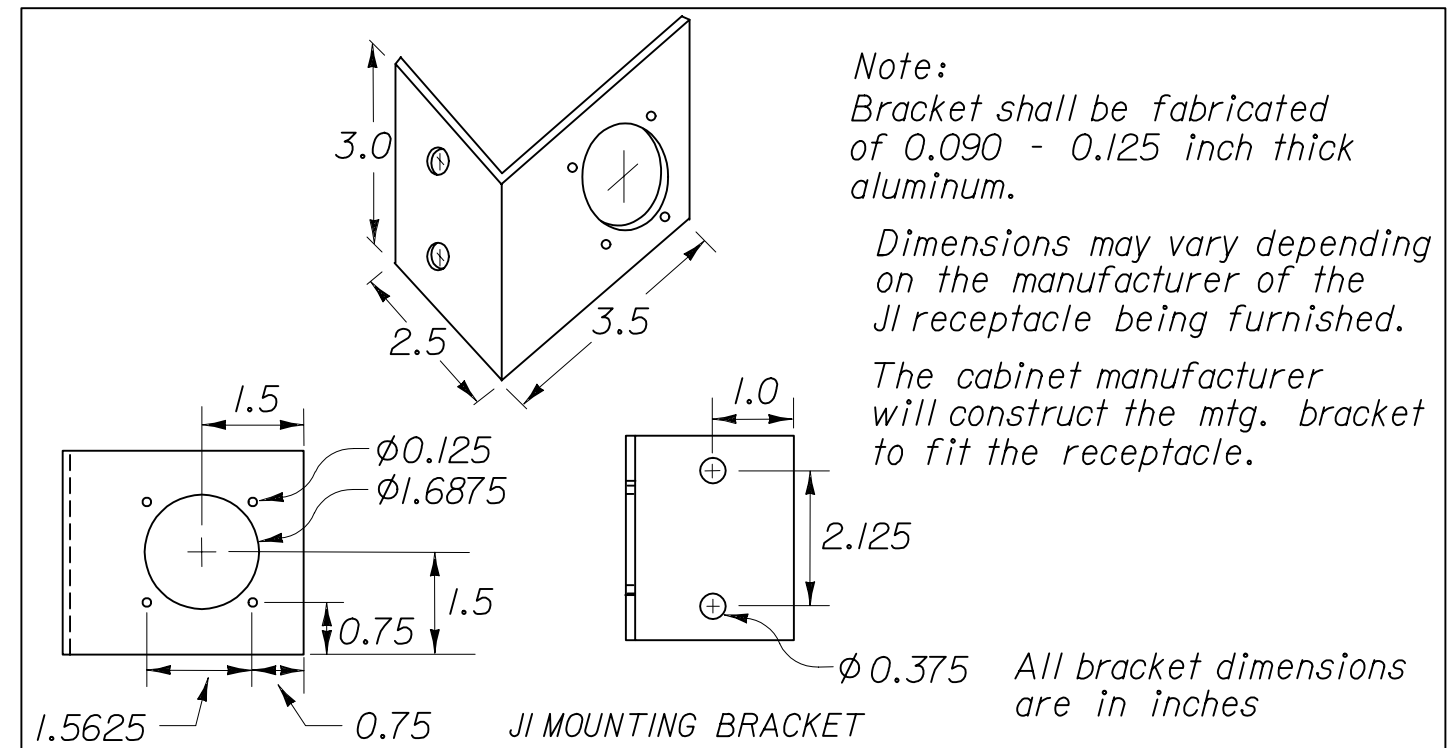
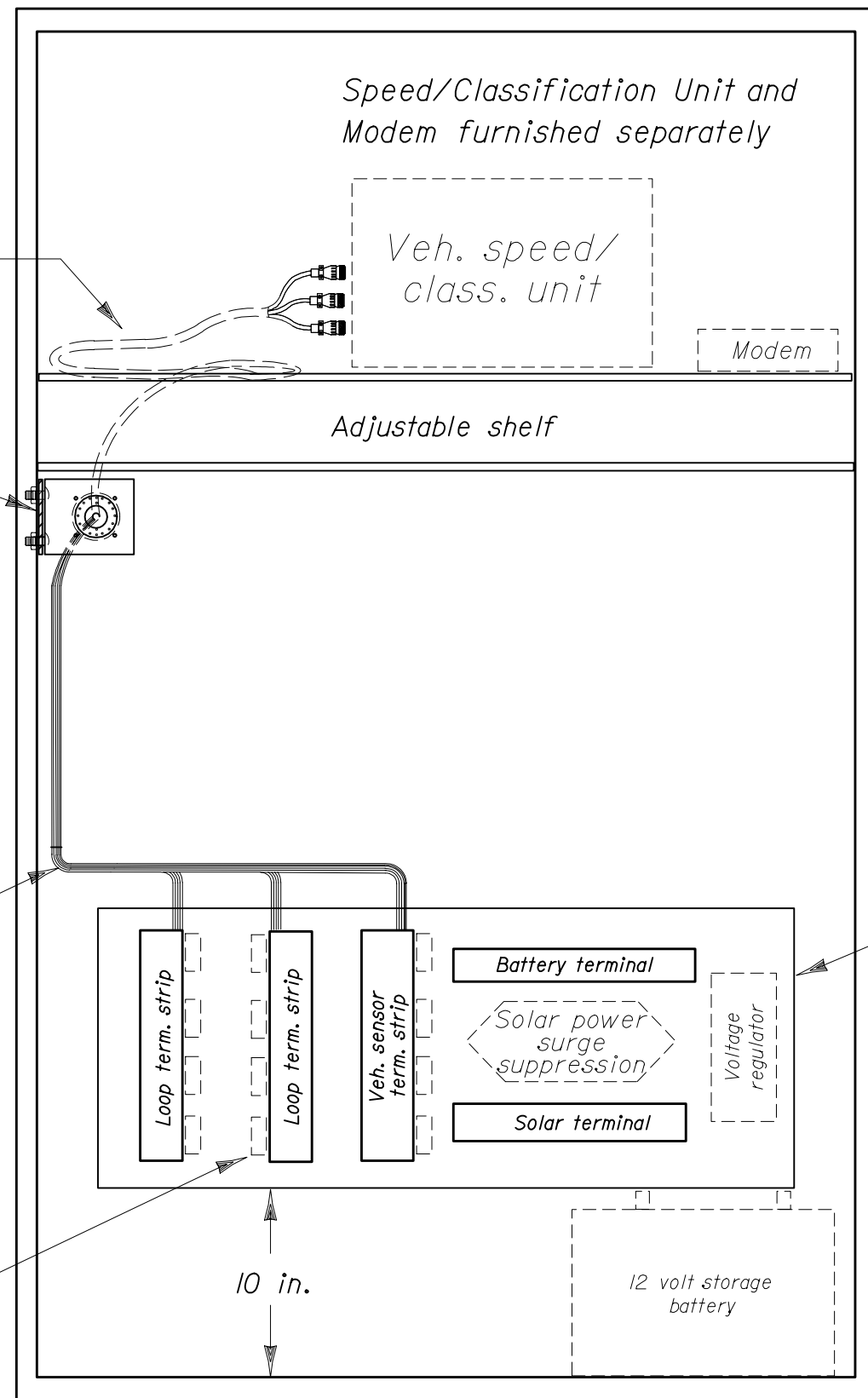
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS				
Designed By	Names	Dates	Approved By <i>Clark A. Smith</i> State Traffic Standards Engineer	
Drawn By			Revision	Sheet No. Index No.
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Equipment Cable, 5 ft. long, furnished separately (ref. sheet no. 4)

J1 recept. with alum. mtg. bracket for lanes 1 to 4

Cabinet cable

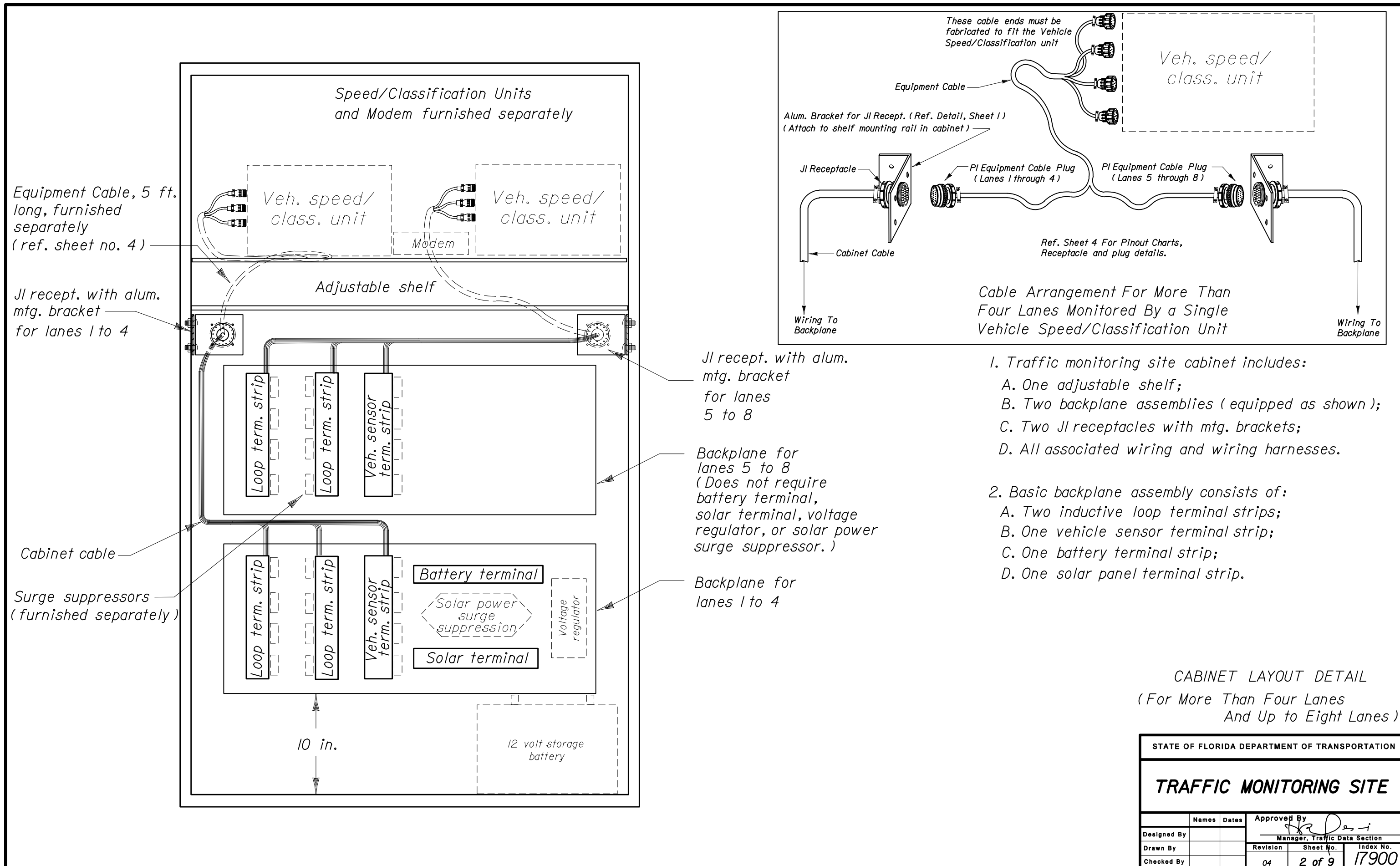
Surge suppressors (furnished separately)



1. Traffic monitoring site cabinet includes:
 - A. One adjustable shelf;
 - B. One backplane ass'y;
 - C. One J1 receptacle with mounting bracket;
 - D. All associated wiring and wiring harnesses.
2. Basic backplane assembly consists of:
 - A. Two inductive loop terminal strips;
 - B. One vehicle sensor terminal strip;
 - C. One battery terminal strip;
 - D. One solar panel terminal strip.

CABINET LAYOUT DETAIL
(For Up To Four Lanes)

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TRAFFIC MONITORING SITE				
Designed By	Names	Dates	Approved By	
Drawn By			Manager, Traffic Data Section	
Checked By			Revision	Index No.
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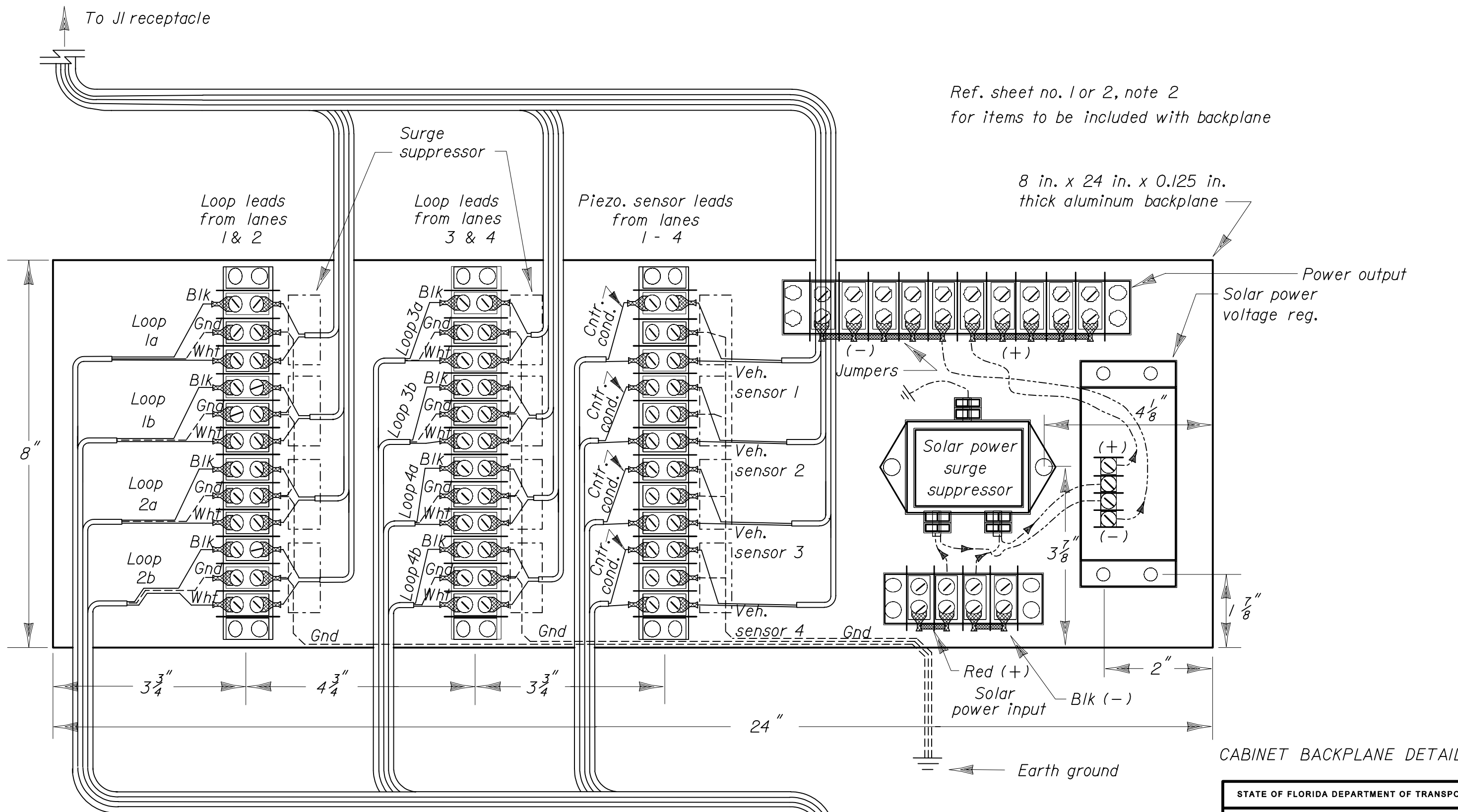


1. Traffic monitoring site cabinet includes:
 - A. One adjustable shelf;
 - B. Two backplane assemblies (equipped as shown);
 - C. Two J1 receptacles with mtg. brackets;
 - D. All associated wiring and wiring harnesses.

2. Basic backplane assembly consists of:
 - A. Two inductive loop terminal strips;
 - B. One vehicle sensor terminal strip;
 - C. One battery terminal strip;
 - D. One solar panel terminal strip.

CABINET LAYOUT DETAIL
(For More Than Four Lanes
And Up to Eight Lanes)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
TRAFFIC MONITORING SITE				
	Names	Dates	Approved By	
Designed By			Manager, Traffic Data Section	
Drawn By			Revision	Sheet No. / Index No.
Checked By			04	2 of 9 / 17900

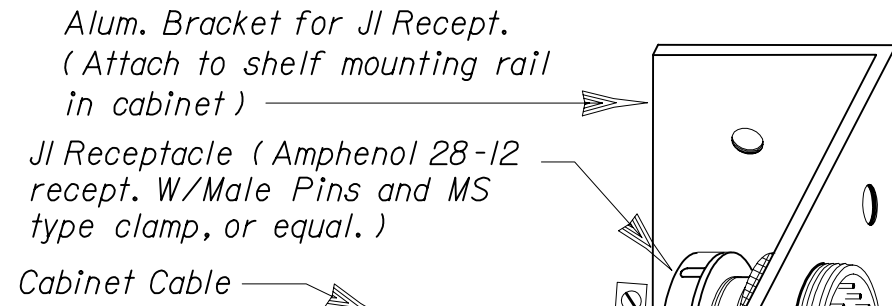


All terminal strip contacts are on 9/16 inch centers (Cinch 142 Series or equal) Use insulated fork wire terminations

Inductive loop lead-in and vehicle sensor leads from roadway

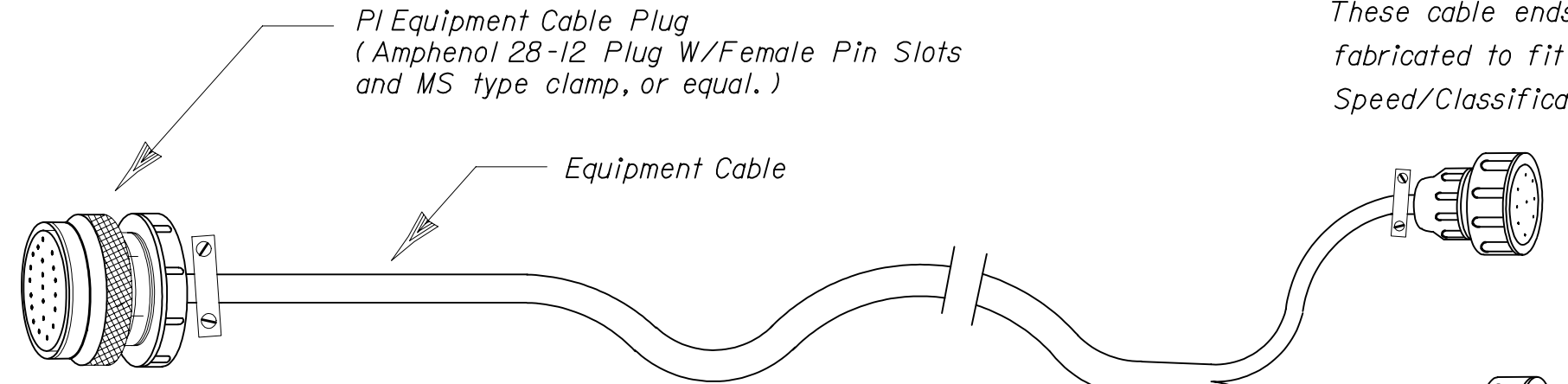
CABINET BACKPLANE DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
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JI Receptacle Pinout	
26 Recessed Male Pins	
A	Loop 1a (5a) yellow
B	Loop 1a (5a) purple
C	Loop 1b (5b) gray
D	Loop 1b (5b) pink
E	Loop 2a (6a) brown
F	Loop 2a (6a) blue
G	Loop 2b (6b) orange
H	Loop 2b (6b) tan
J	Loop 3a (7a) white
K	Loop 3a (7a) green
L	Loop 3b (7b) red
M	Loop 3b (7b) black
N	Gnd
P	Loop 4a (8a) w/yellow
R	Loop 4a (8a) w/purple
S	Loop 4b (8b) w/gray
T	Loop 4b (8b) w/brown
U	Piezo 1(5) (+) w/blue
V	Piezo 1(5) sh w/orange
W	Piezo 2 (6) (+) w/green
X	Piezo 2 (6) sh w/red
Y	Piezo 3 (7) (+) w/black
Z	Piezo 3 (7) sh w/red/blk
a	Piezo 4 (8) (+) red/green
b	Piezo 4 (8) sh red/orange
d	Gnd red/black

Wiring To Backplane



PI Equipment Cable Plug	
26 Female Pin Slots	
A	Loop 1a (5a)
B	Loop 1a (5a)
C	Loop 1b (5b)
D	Loop 1b (5b)
E	Loop 2a (6a)
F	Loop 2a (6a)
G	Loop 2b (6b)
H	Loop 2b (6b)
N	Gnd
J	Loop 3a (7a)
K	Loop 3a (7a)
L	Loop 3b (7b)
M	Loop 3b (7b)
P	Loop 4a (8a)
R	Loop 4a (8a)
S	Loop 4b (8b)
T	Loop 4b (8b)
d	Gnd
U	Piezo 1(5) (+)
V	Piezo 1 sh
W	Piezo 2 (6) (+)
X	Piezo 2 sh
Y	Piezo 3 (7) (+)
Z	Piezo 3 sh
a	Piezo 4 (8) (+)
b	Piezo 4 sh

Connects to electronics unit

NOTE:

The equipment cable can accommodate up to four lanes of inductive loop and vehicle sensor inputs. (Ref. Sheet No. 1 for cabinet layout)

For more than four lanes and up to eight lanes of inputs, the following options are available:

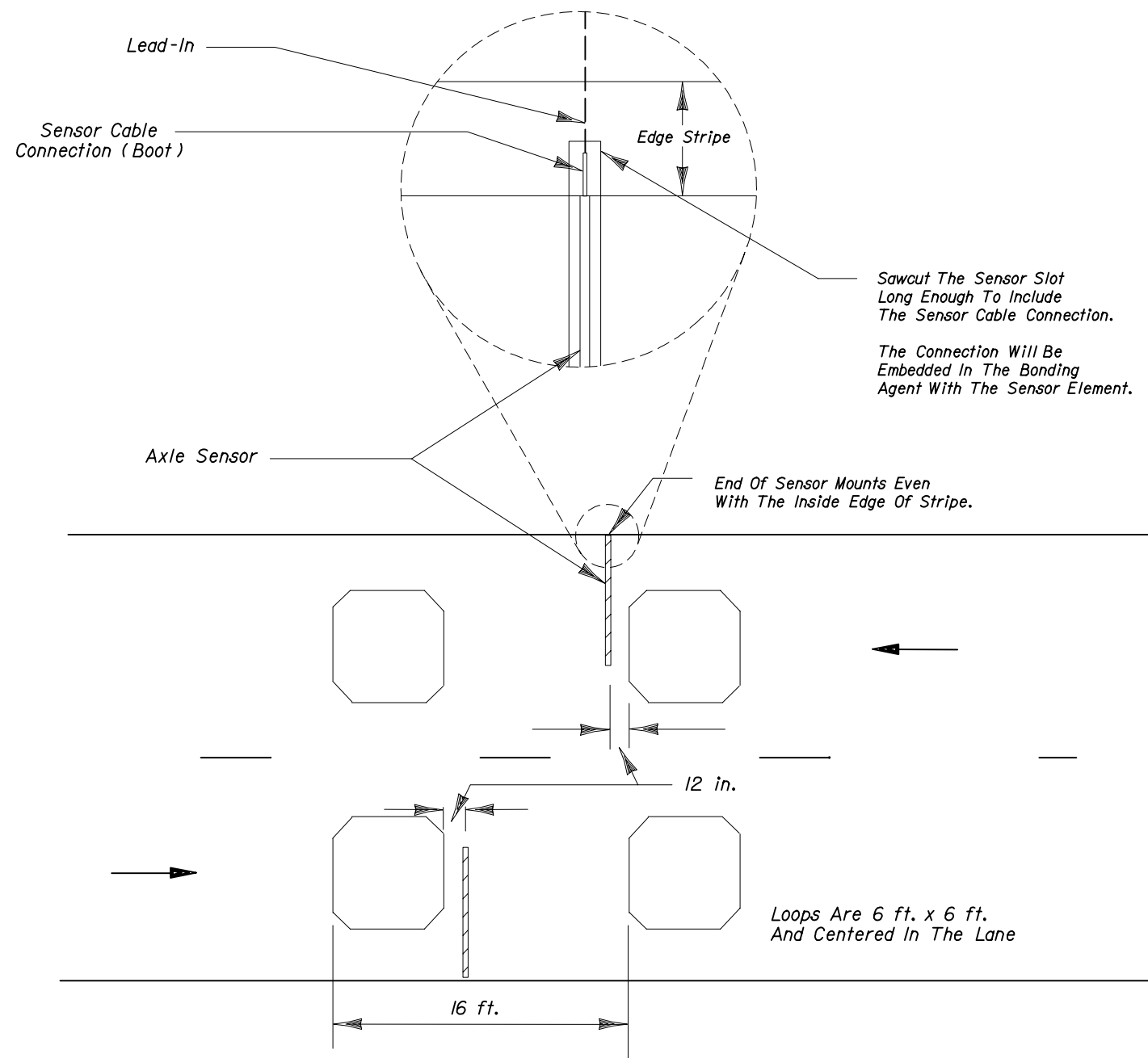
1. A second Vehicle Speed/Class. Unit and separate equipment cable connecting to a second JI receptacle; or
2. A single Vehicle Speed/Class. Unit capable of up to eight lanes of inputs and a single equipment cable with split ends to fit two JI receptacles. (Ref. Sheet 2 detail)

Numbers in parenthesis in the pinout chart identify lane numbers when a second backplane for lanes 5 through 8 is required.

EQUIPMENT CABLE DETAIL

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TRAFFIC MONITORING SITE				
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SPEED/CLASSIFICATION LOOP ASSEMBLY WITH AXLE SENSORS PLACEMENT DETAIL



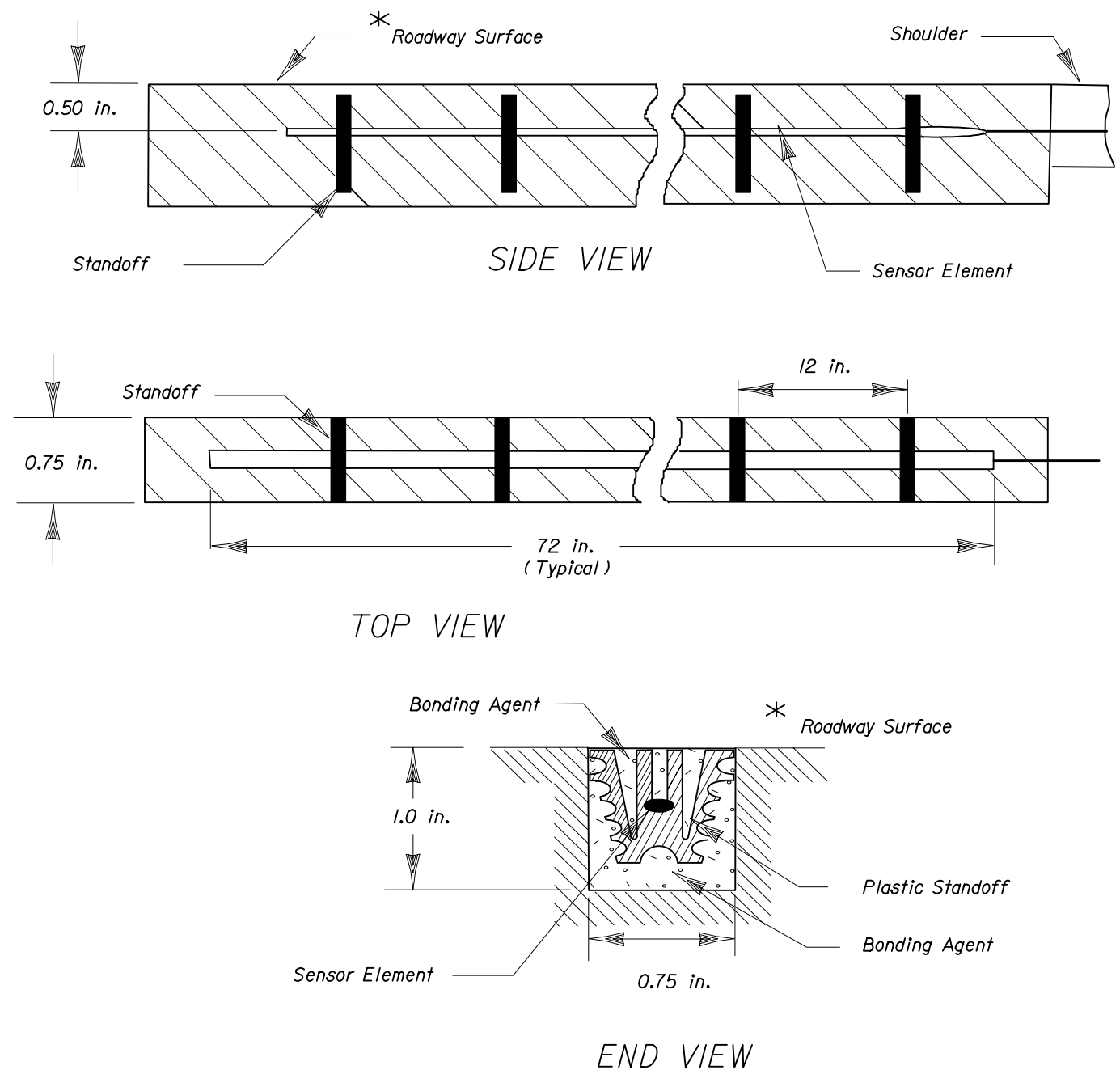
Note:

Loop slots shall be 0.25 inches wide (max.) by 1.5 inches to 2 inches deep. Four turns of #12 AWG, type XHHW stranded copper wire shall be placed in the slot. Backer rod shall be used to hold the loop wire in the bottom of the slot.

Loop leads shall be twisted at the rate of 10 to 12 twists per foot. The twisted pair shall extend to the pull box with three feet of spare length coiled in the pull box.

All leads (inductive loop & vehicle sensor) shall be identified according to the lane numbering convention shown on sheet 8 and 9.

TYPICAL UNENCAPSULATED CLASS II VEHICLE SENSOR



* Some installations may require axle sensors to be placed in the structural course, prior to placement of the friction course.

Note:

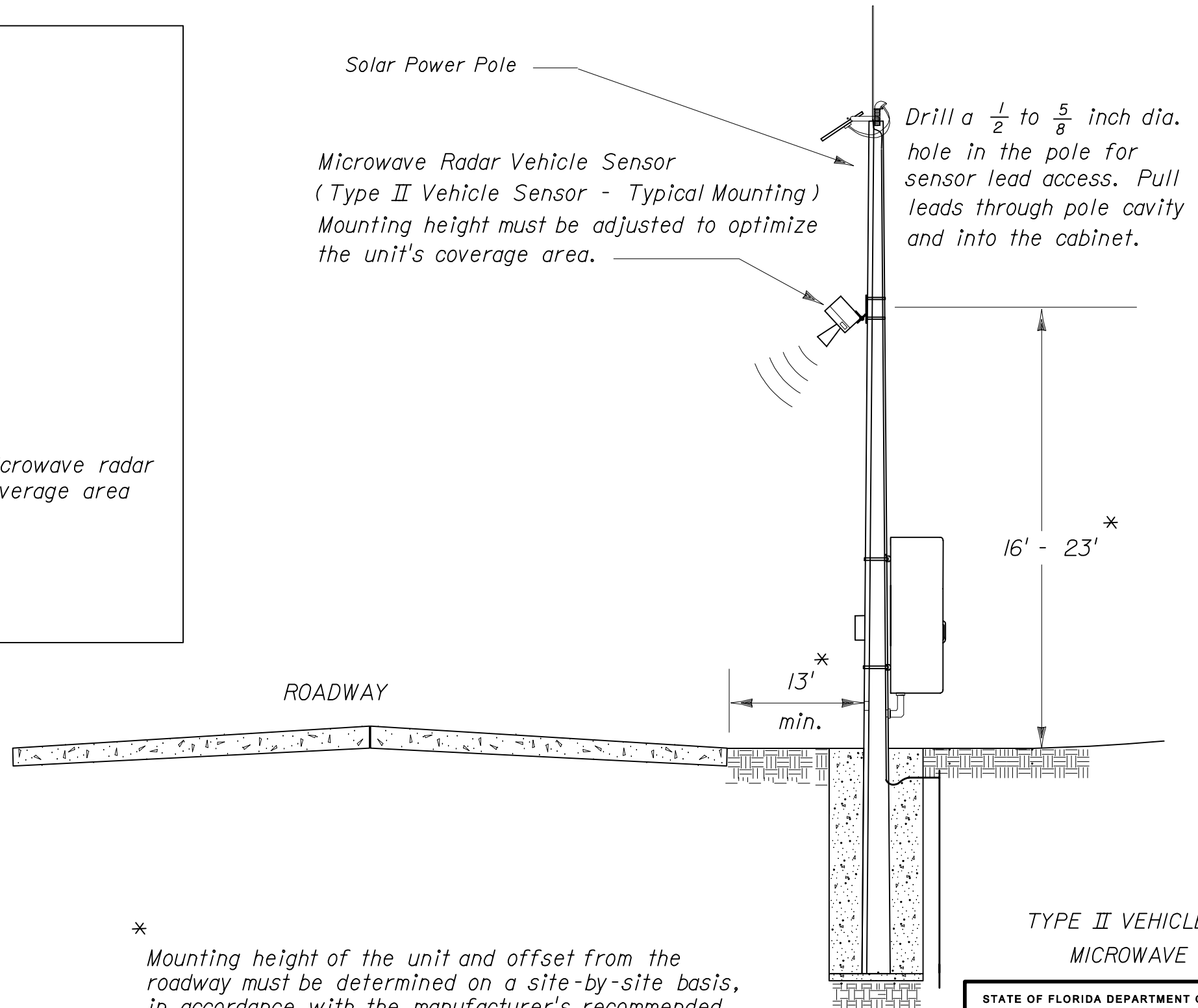
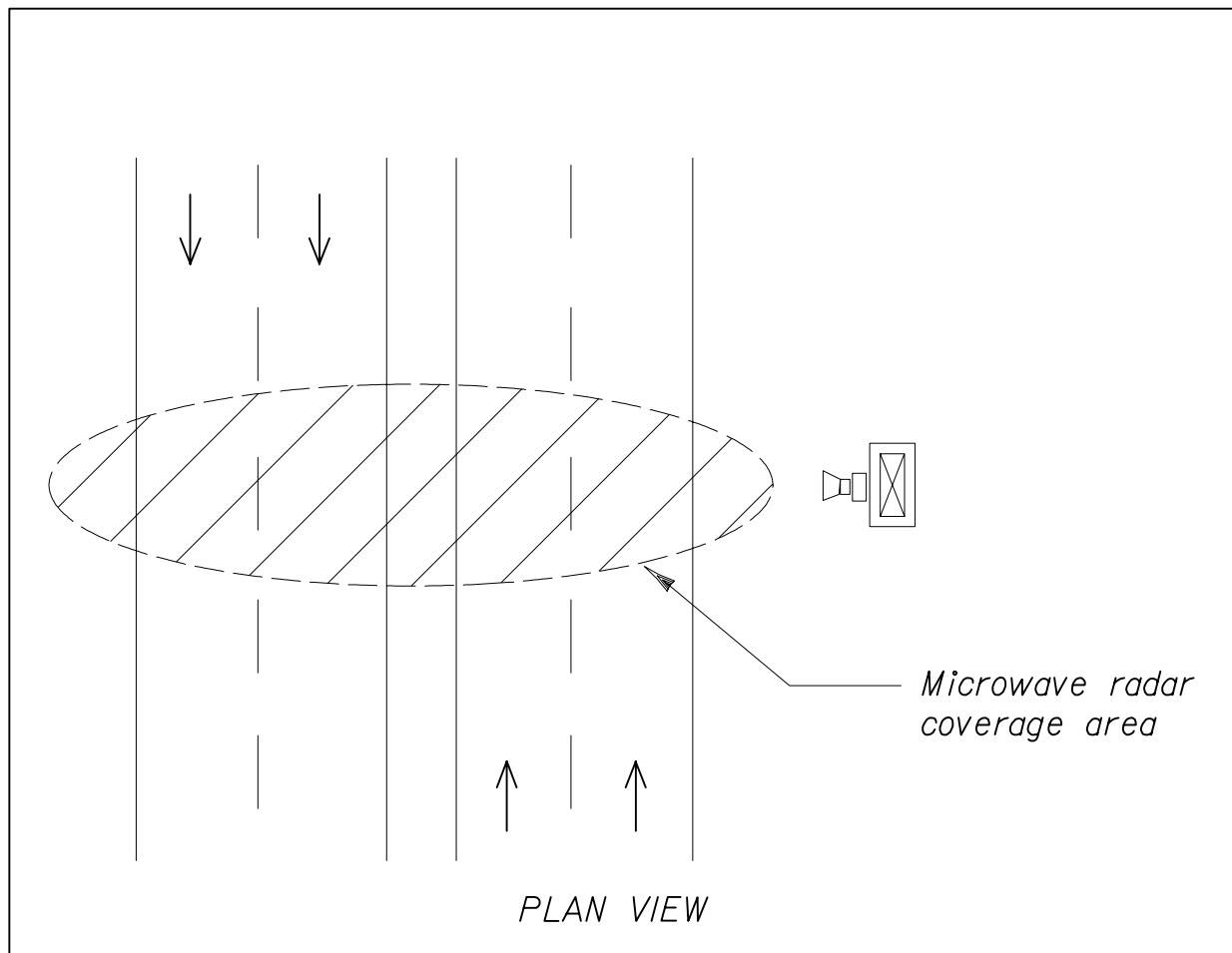
These are typical dimensions. actual dimensions, element cross-sections and standoffs may vary depending on manufacturer and model.

LOOP AND PIEZOELECTRIC VEHICLE SENSOR DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

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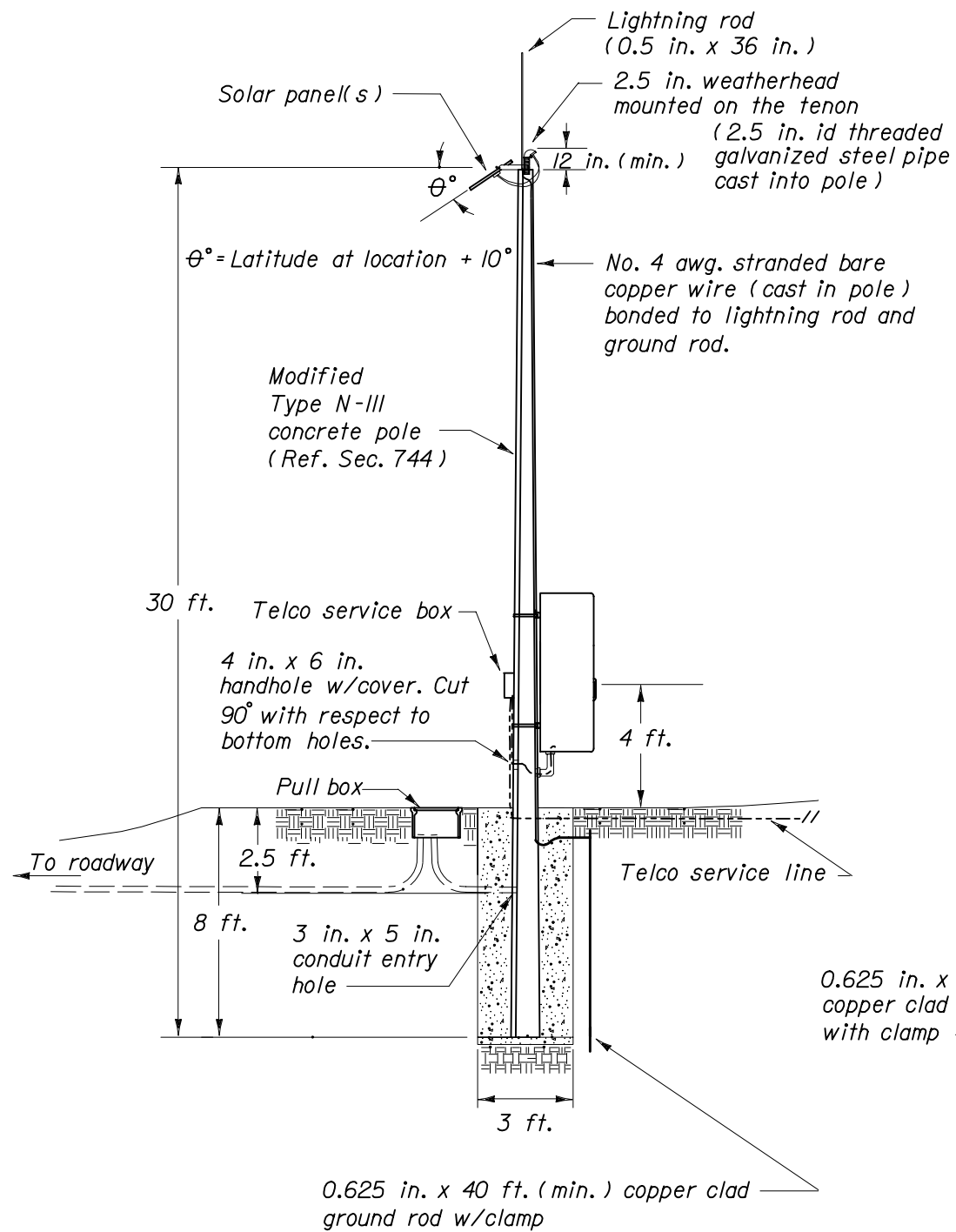


The unit must be capable of detecting up to eight lanes of traffic (in either or both directions) when mounted perpendicular to the roadway.

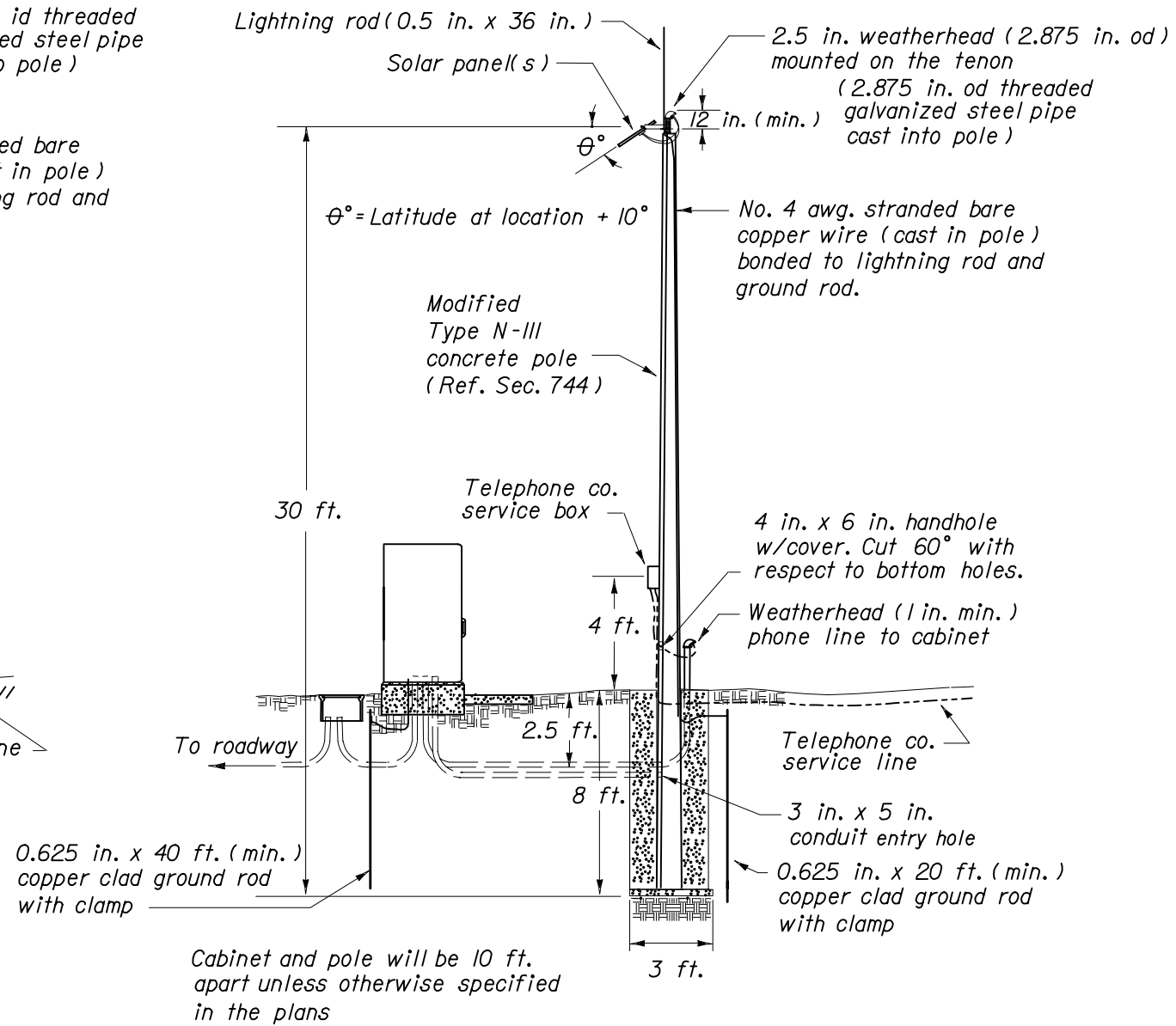
Coverage area of the unit is affected by the roadway geometry: distance from the travel lanes, median type and width, barrier walls, etc.

* Mounting height of the unit and offset from the roadway must be determined on a site-by-site basis, in accordance with the manufacturer's recommended guidelines and existing clear zone requirements.

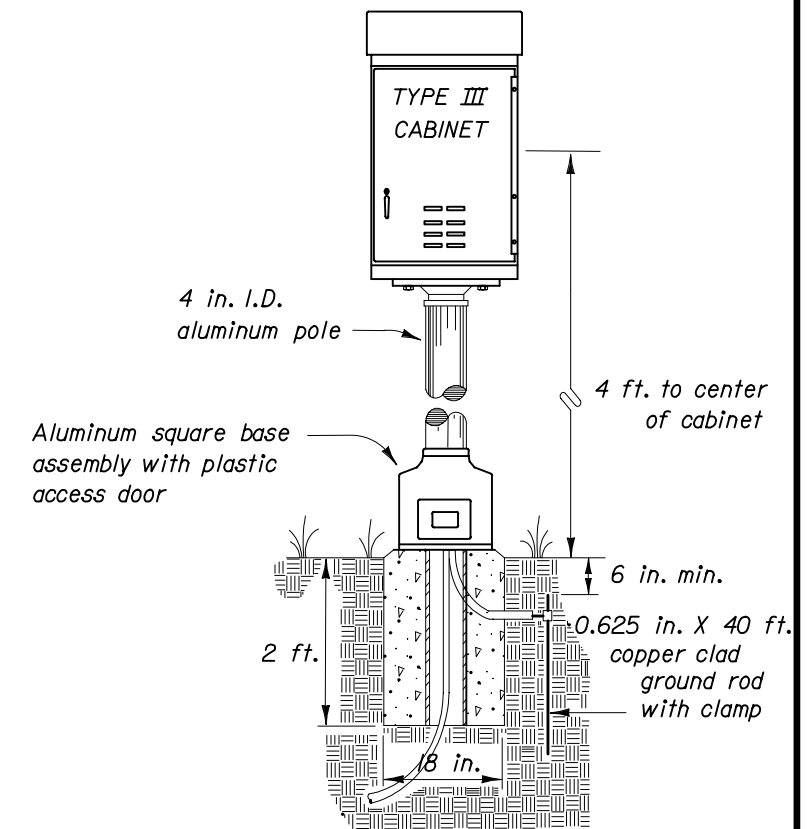
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SOLAR POWER POLE WITH POLE MTD. CABINET



SOLAR POWER POLE WITH BASE MTD. CABINET



PEDESTAL MTD. CABINET

SOLAR POWER POLE DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

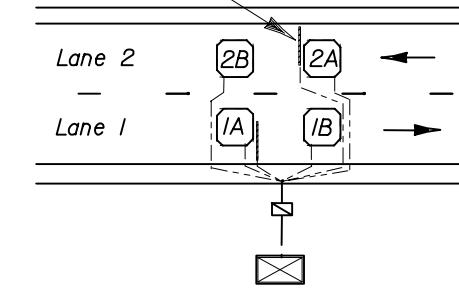
TRAFFIC MONITORING SITE

Names	Dates	Approved By
Designed By		<i>J.R. De-...</i>
Drawn By		Manager, Traffic Data Section
Checked By		Revision Sheet No. Index No.
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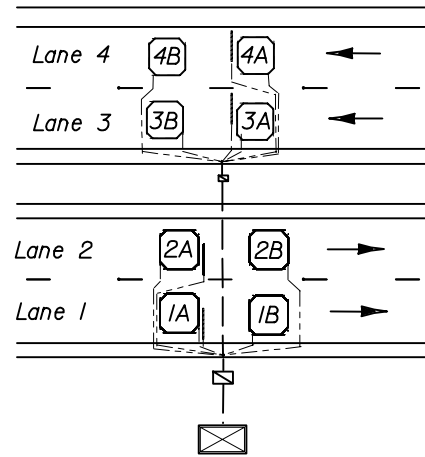
SINGLE CABINET CONFIGURATION

Vehicle sensors will be identified by, and leads marked with, the letters "VS" followed with the lane number.

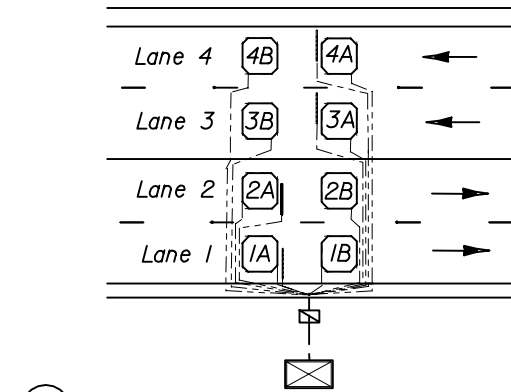
Example: "VS2"



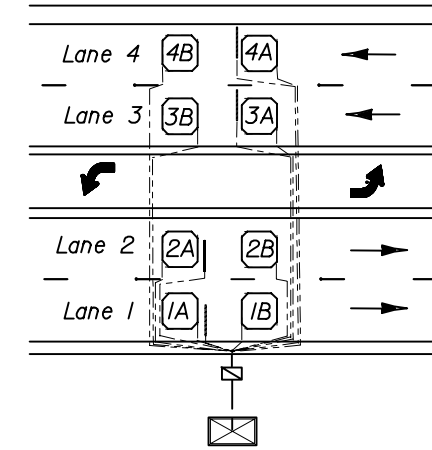
(A) TWO LANE - TWO WAY



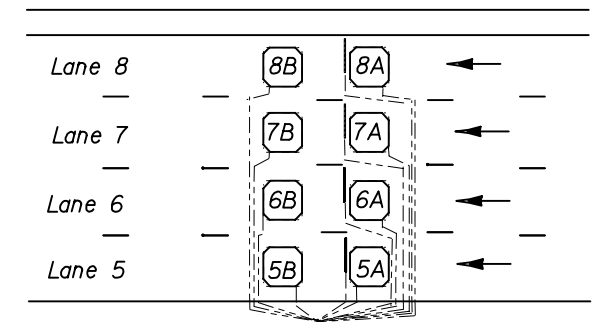
(B) FOUR LANE, DIVIDED - TWO WAY



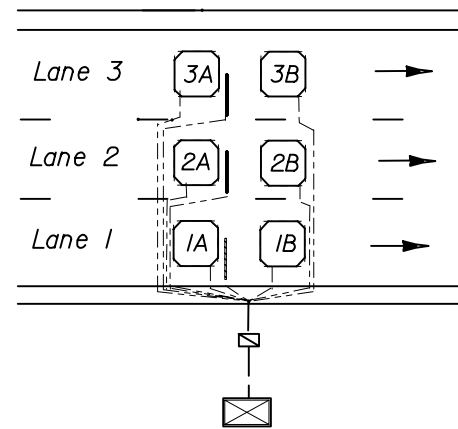
(C) FOUR LANE, UNDIVIDED - TWO WAY



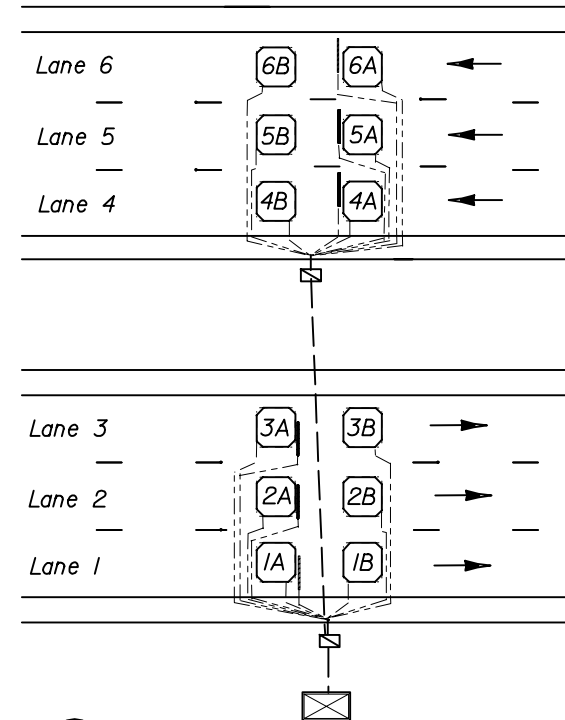
(D) FOUR LANE/CONTINUOUS LEFT TURN LANE



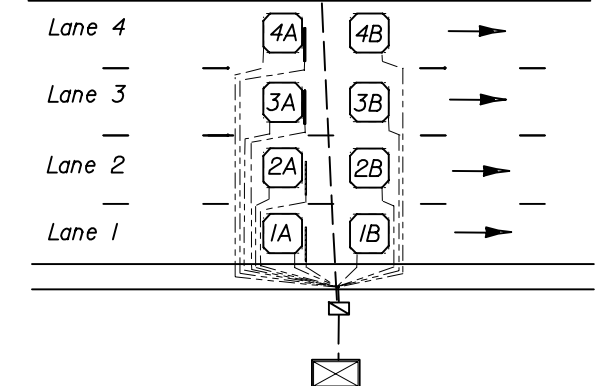
(E) TWO LANE - ONE WAY



(F) THREE LANE - ONE WAY



(G) SIX LANE, DIVIDED - TWO WAY



(H) EIGHT LANE, DIVIDED - TWO WAY

LANE NUMBERING CONVENTION DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

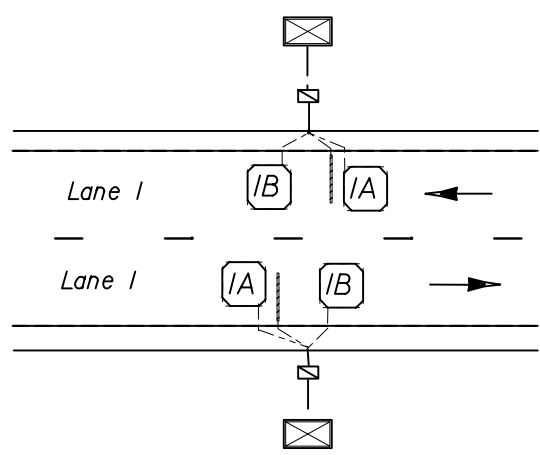
TRAFFIC MONITORING SITE

Names	Dates	Approved By		
Designed By		<i>[Signature]</i>	Manager, Traffic Data Section	
Drawn By		Revision	Sheet No.	Index No.
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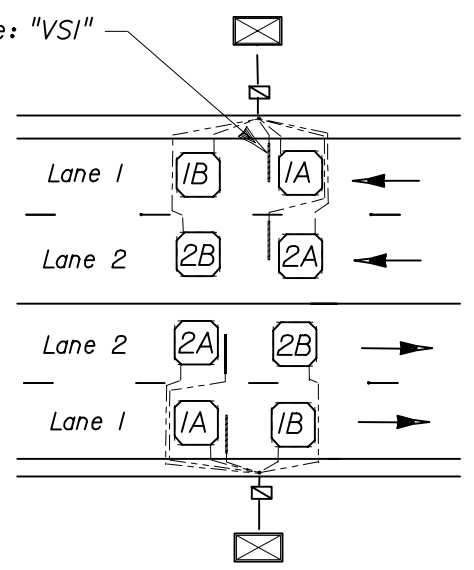
Vehicle sensors will be identified by, and leads marked with, the letters "VS" followed with the lane number.

TWO CABINET CONFIGURATION

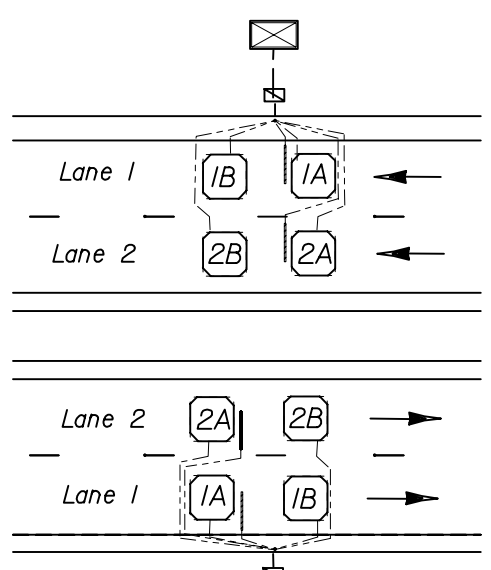
Example: "VS1"



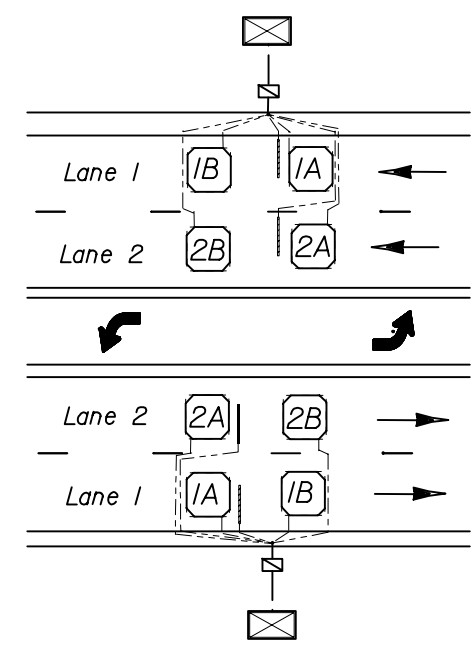
(A) TWO LANE - TWO WAY



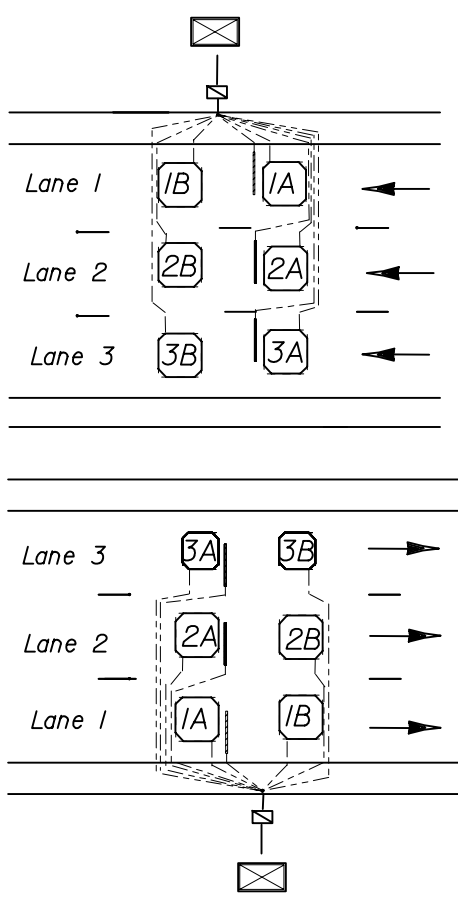
(B) FOUR LANE, UNDIVIDED TWO WAY



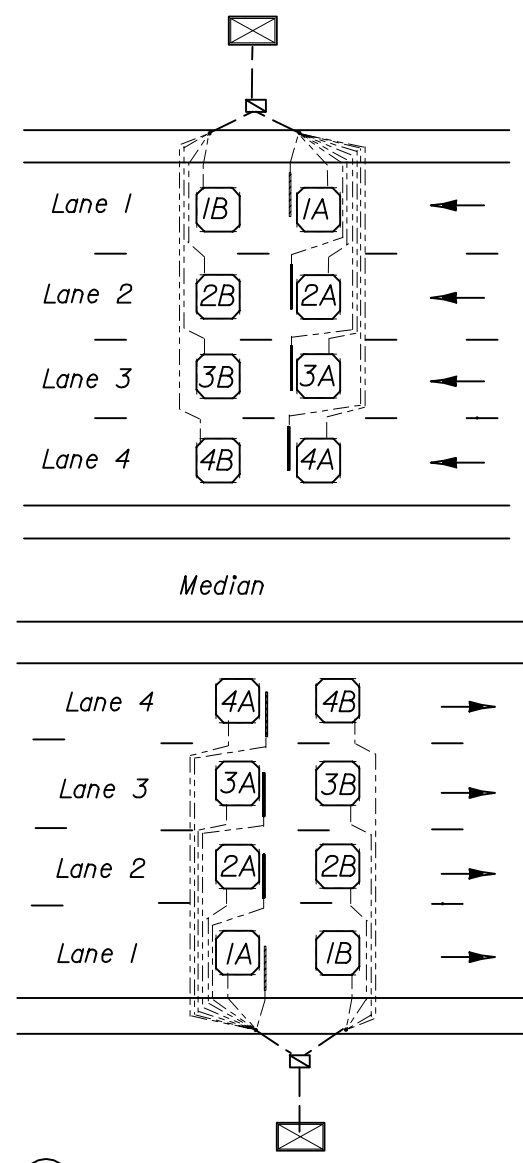
(C) FOUR LANE, DIVIDED - TWO WAY



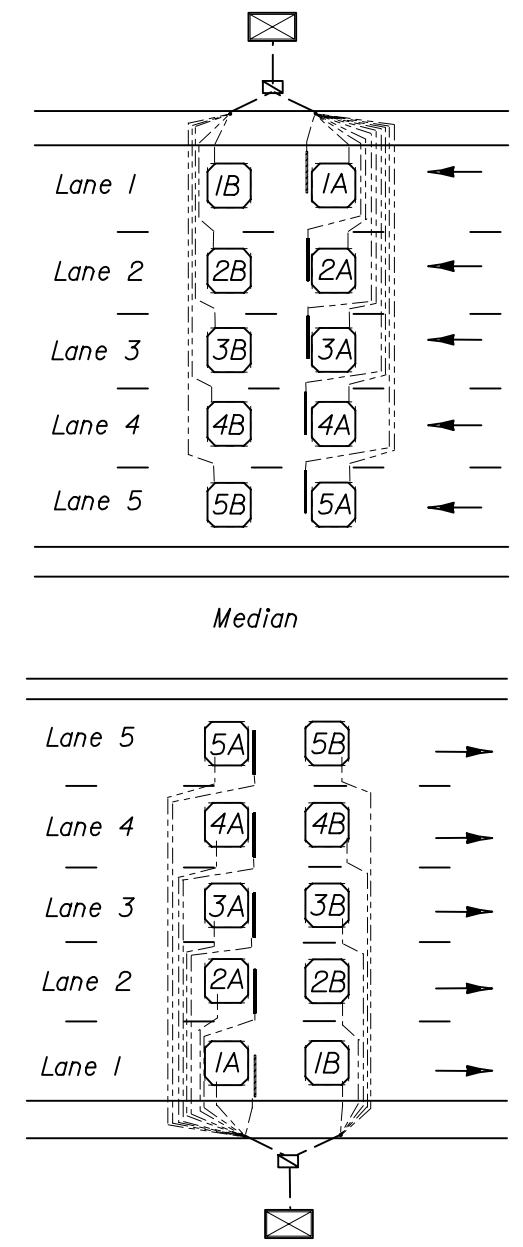
(D) FOUR LANE/CONTINUOUS LEFT TURN LANE



(E) SIX LANE, DIVIDED - TWO WAY



(F) EIGHT LANE, DIVIDED TWO WAY




(G) TEN LANE, DIVIDED TWO WAY

LANE NUMBERING CONVENTION DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC MONITORING SITE

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