ROADWAY AND TRAFFIC DESIGN STANDARDS
FOR DESIGN, CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS
FOR STREETS AND HIGHWAYS ON STATE MAINTAINED SYSTEMS
JANUARY 1992

TOPIC NO. 625-010-003- b

[Signature]
State Roadway Design Engineer
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Every standard drawing sheet in the 1982 Roadway And Traffic Design Standards has been produced by Computer drafting.

In taking advantage of verification, registering and other features of CAD, and due to certain restrictions of CAD, changes appear on the sheets that are not listed in the tabulated Revisions. These changes may include reformatting, typographical corrections, alignment of views and details, scale, rotation, skew, abbreviation, grouping, shape, proportion and other nonfunctional changes. All page item numbers have been deleted from the 1982 Standards. Their deletions are considered nonfunctional changes and are not tabulated below. The revision no. on each Standard Sheet reflects the year of the latest change in function, intent and purpose on that sheet.

Revisions to the standards that reflect function, intent and purpose are tabulated below.

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<tr>
<th>INDEX NUMBER</th>
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<tr>
<td>001</td>
<td>1 of 1</td>
<td>Completely revised to include customary used abbreviations.</td>
</tr>
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<td>002</td>
<td>1 of 3</td>
<td>'GENERAL NOTE' added.</td>
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<tr>
<td>007</td>
<td>1 of 2</td>
<td>Revised sheet reformatted, added symbols for pipe culverts, mitered end sections, straight endwall, U-type endwall, median drain and other end treatments; added symbol for quadrangle, deleted side drain pipe, changed 'north point' to 'north arrow', expanded 'round to read 'round or diameter', changed 'overhead power cable' and 'buried power cable' to 'overhead electric' and 'buried electric', added reference to General Notes.</td>
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<tr>
<td>010</td>
<td>2 of 3</td>
<td>Revised sheet reformatted, added symbol for traffic island head (most arm mounted, delegated signal item number; removed new from 'pole &amp; luminaire'); high mast lighting tower and 'joint use pole'; revised 'high mast lighting tower' symbol, removed 'concrete from lighting cut box'; 'waterproofing lighting cut box' and symbols, revised 'under deck lighting fixture' to read 'pier cap under deck luminaire', added 'pendant hanger under deck luminaire' and symbol, revised pavement arrow and added standard arrow; revised symbols for stop bars and traffic signs (both post mounted and overhead), added reference to General Notes.</td>
</tr>
<tr>
<td>041</td>
<td>2 of 1</td>
<td>'TYPE I', 'TYPE VI', 'Type Heavy-Non-Cohesive And Very Heavy-Cohesive' curve and references deleted. 'Paved Ditch' curve and references deleted.</td>
</tr>
<tr>
<td>050</td>
<td>1 of 1</td>
<td>Table 'SEEDING RATES FOR NEW SHOULDERS AND SLOPES', seeding dates revised.</td>
</tr>
<tr>
<td>051</td>
<td>1 of 1</td>
<td>General Notes No. 4 and 5 revised, table 'SEEDING RATES', seeding dates revised.</td>
</tr>
<tr>
<td>052</td>
<td>1 of 1</td>
<td>New Sheet 'GEOTEXTILE CRITERIA'.</td>
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<tr>
<td>120</td>
<td>1 of 2</td>
<td>Sheet reformatted, Structure bottoms redesigned, 'SPECIAL TOP SLAB' and 'SLAB TO WALL DETAILS FOR PRECAST ALTERNATE' added, 'GENERAL NOTES' renumbered, new note No. 1.</td>
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<tr>
<td>200</td>
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<td>New Sheet</td>
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</table>

- Sheet reformatted, 'STRUCTURE TOPS' TYPE 7-T (TRAFFIC) (H-20)' and 'TYPE 8' moved to Sheet 2; 'TYPE 8-MT (NON-TRAFFIC)' deleted, 2-Piece Cover added, '5-0' dimension added to Types I, II and III Frames; 'GENERAL NOTES' No. 2, 3, 4 and 5 moved to Sheet 2, Note No. 1 deleted, Note No. 6 renumbered, COVER FOR ALL FRAMES added 'Ribs (Optional)' and logo. |
- Sheet reformatted, 'STRUCTURE TOPS' TYPE 7-T (TRAFFIC) (H-20)' and 'TYPE 8' added from Sheet 1; 'PRECAST CONCENTRIC AND ECCENTRIC CONE' added; 'GENERAL NOTES' added from Sheet 1; 'LADDER BARS FOR STRUCTURES OVER 111' IN DEPTH' deleted; 'DRAINAGE STRUCTURE INVERT' added note. |
- 'NOTES FOR THIN-WALL PRECAST OPTIONS' Notes 1 and 2 revised; 'EQUIVALENT STEEL AREA TABLE' Revised Grade 40 Reinforcing bar sizes. |
- 'GENERAL NOTES' note no. 4 revised; 'FLEXIBLE PAVEMENT', UNPAVED W/O SELECT BEDDING and 'UNPAVED WITH SELECT BEDDING' revised to include Spiral Rib Pipe Arch values. |
- 'GENERAL NOTES' note no. 4 added, Table 'PIPE ARCH: 2½ x 1' CORRUGATION revised to include 'PIPE ARCH SPIRAL RIB: 2½ x 1½ x 1½ RIB SPACING' and 'PIPE ARCH SPIRAL RIB: 2½ x 1½ x 1½ RIB SPACING'. |
- 'GENERAL NOTES' note No. 5 and 6 added, Table 'PIPE ARCH: 2½ x 1' CORRUGATION revised to include 'PIPE ARCH SPIRAL RIB: 2½ x 1½ x 1½ RIB SPACING' and 'PIPE ARCH SPIRAL RIB: 2½ x 1½ x 1½ RIB SPACING'; Table 'ROUND PIPE: SPIRAL RIB' added. |
- 'APPLICATION GUIDELINE TO CURB INLETS AND GUTTER INLETS' INDEX 249.1 and 266.1 'TYPE CURB/GUTTER' added. |
- 'GENERAL NOTES' Note 3 revised (deleted reference to Type J Bottoms). |
- 'GENERAL NOTES' Note 3 revised (deleted reference to Type J Bottoms). |
- 'GENERAL NOTES' Note 6 Revised; 'TOP SLABS' Deleted reference to Type J Bottoms. |
- 'GENERAL NOTES' Note 6 Revised; 'TOP SLABS' Deleted reference to Type J Bottoms. |
- 'SECTION B8: SECTION (INLETS TYPES 3, 4 & 5) NON-SYMMETRICAL SECTION SHOWN' Deleted reference to Type J Bottoms. |
- 'INLET WITH STRUCTURE BOTTOM' Deleted reference to Type J Bottoms. |
- 'GENERAL NOTES' Note 6 revised (deleted reference to Type J Bottoms). |
- 'INLET WITH STRUCTURE BOTTOM' Deleted reference to Type J Bottoms; 'RECOMMENDED MAXIMUM PIPE SIZES' Deleted reference to Type J Bottoms. |
- 'OPTIONAL BAR SPACING' detail added; 'INLET WITH STRUCTURE BOTTOM' Deleted reference to Type J Bottoms; 'GENERAL NOTES' Added recommended pipe size. |
- 'GENERAL NOTES' Note 4 revised. |
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<tr>
<td>230</td>
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<td>&quot;INLET WITH STRUCTURE BOTTOM&quot; Deleted reference to Type J Bottoms. &quot;RECOMMENDED MAXIMUM PIPE SIZES&quot; Deleted reference to Type J Bottoms.</td>
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<td>&quot;INLET WITH STRUCTURE BOTTOM&quot; Deleted reference to Type J Bottoms. &quot;RECOMMENDED MAXIMUM PIPE SIZES&quot; Deleted reference to Type J Bottoms.</td>
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<td>&quot;STRUCTURE BOTTOM FOR INLETS TYPE C, D &amp; E&quot; Deleted reference to Type J Bottoms.</td>
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<td>&quot;GENERAL NOTES&quot; Note 33 revised (deleted reference to Type J Bottoms).</td>
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<td>234</td>
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<td>&quot;STEEL GRATING&quot; Added detail &quot;INLET WITH STRUCTURE BOTTOM&quot; Deleted reference to Type J Bottoms.</td>
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<td>235</td>
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<td>&quot;GENERAL NOTES&quot; Note 33 revised (deleted reference to Type J Bottoms).</td>
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<td>236</td>
<td>1 of 2</td>
<td>Redesigned to meet &quot;AASHTO 1989&quot; Specifications.</td>
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<td>Redesigned to meet &quot;AASHTO 1989&quot; Specifications.</td>
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<td>Redesigned to meet &quot;AASHTO 1989&quot; Specifications.</td>
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<td>Redesigned to meet &quot;AASHTO 1989&quot; Specifications.</td>
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<td>Redesigned to meet &quot;AASHTO 1989&quot; Specifications.</td>
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<td>239</td>
<td>1 of 1</td>
<td>&quot;GENERAL NOTES&quot; Notes 3 and 4 revised.</td>
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<td>240</td>
<td>1 of 6</td>
<td>&quot;DIMENSIONS AND QUANTITIES&quot; Replaced Table &quot;3&quot; CONCRETE SLAB (CY) with &quot;3½&quot; CONCRETE SLAB (CY).</td>
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<td></td>
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<td>&quot;DIMENSIONS AND QUANTITIES&quot; Replaced Table &quot;3&quot; CONCRETE SLAB (CY) with &quot;3½&quot; CONCRETE SLAB (CY).</td>
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<td>&quot;DIMENSIONS AND QUANTITIES&quot; Replaced Table &quot;3&quot; CONCRETE SLAB (CY) with &quot;3½&quot; CONCRETE SLAB (CY).</td>
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<td>&quot;DIMENSIONS AND QUANTITIES&quot; Replaced Table &quot;3&quot; CONCRETE SLAB (CY) with &quot;3½&quot; CONCRETE SLAB (CY).</td>
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<td>&quot;DIMENSIONS AND QUANTITIES&quot; Replaced Table &quot;3½&quot; CONCRETE SLAB (CY) with &quot;3&quot; CONCRETE SLAB (CY).</td>
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<td>273</td>
<td>1-4 of 6</td>
<td>&quot;DIMENSIONS AND QUANTITIES&quot; Revised concrete and soffit quantities; All Drawings revised to include concrete apron.</td>
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<td>&quot;PERMISSIBLE PAVEMENT MODIFICATION&quot; deleted for &quot;CLASS I TRAFFIC&quot;. Revised diagram to include concrete apron, revised slope notations; &quot;DITCH TRANSITION&quot; Revised diagram to include concrete apron.</td>
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<td>&quot;DETAIL OF BELL &amp; SPIGOT CONCRETE PIPE JOINT USING RUBBER GASKET&quot; added; &quot;FILTER FABRIC JACKET&quot; added; &quot;ELIPTICAL CONCRETE PIPE JOINTS&quot; revised; &quot;INLETS, MANHOLE OR JUNCTION BOXES ON INTEGRAL PRECAST CONCRETE RISER FOR CONCRETE PIPE and &quot;GUARD AT PIPE ENDS&quot; moved to Sheet 2.</td>
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<td>&quot;INLETS, MANHOLE OR JUNCTION BOXES ON INTEGRAL PRECAST CONCRETE RISER FOR CONCRETE PIPE and &quot;GUARD AT PIPE ENDS&quot; added; Reference to Type P Bottoms deleted.</td>
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<td>282</td>
<td>4 of 4</td>
<td>&quot;FRANGIBLE BASE&quot; detail added.</td>
</tr>
<tr>
<td></td>
<td>1 of 2</td>
<td>Sheet reformatted.</td>
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<td>&quot;LONITUDINAL SECTION&quot; Revised limits to be paid for as French Drain.</td>
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<td>286</td>
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<td>&quot;ELIPTICAL PIPE&quot; and &quot;ROUND PIPE&quot; &quot;Slot Cut&quot; dimensions revised.</td>
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<td>300</td>
<td>1 of 1</td>
<td>&quot;GENERAL NOTES&quot; Note 10 revised (added Type III, deleted Type II); &quot;UPPER LIMIT&quot; and &quot;LOWER LIMIT&quot; and &quot;TYPE I&quot; revised No. 9 Course Aggregate to No. 5.7.</td>
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<td>301</td>
<td>1 of 1</td>
<td>Deleted General Notes No. 1 and 2. &quot;CURB AND GUTTER ADJACENT TO FLEXIBLE PAVEMENT&quot; revised drawing and notations, revised heading to read &quot;CURB AND GUTTER AND TYPE A CURB ADJACENT TO FLEXIBLE PAVEMENT&quot;; MEDIAN CURB AND GUTTER ENDS; revised to read &quot;CURB AND GUTTER ENDS&quot; and revised drawings; &quot;EXPANSION JOINT BETWEEN GUTTER AND CONCRETE PAVEMENT&quot; added notation directing joint seal usage on both high and low sides of pavers; &quot;CONCRETE CURB AND GUTTER added Note&quot;; &quot;DROP CURB added Note&quot;; &quot;CONCRETE CURB added Note&quot;; &quot;TYPE A&quot; added notation.</td>
</tr>
<tr>
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<td>Sheet completely revised, (old Sheet 2 of 2 deleted).</td>
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<tr>
<td></td>
<td>2 of 2</td>
<td>&quot;GENERAL NOTE&quot; No. 6 is expanded; &quot;OPTIONAL RAMP CURB&quot; revised to read &quot;RAMP CURB OPTION&quot;; &quot;RAMPS FOR LINEAR PEDESTRIAN TRAFFIC&quot; mild block &quot;PLAN VIEW&quot; transition dimension and maximum slope rate added.</td>
</tr>
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<td></td>
<td>1 of 5</td>
<td>Reformatted sheet; added heading &quot;LONITUDINAL JOINTS&quot;; &quot;LONITUDINAL CONSTRUCTION JOINT&quot; revised; added heading &quot;TRANSVERSE JOINT&quot; and revised notation; chart &quot;TIE BAR SPACING WITH MAXIMUM DISTANCE TO FREE EDGE&quot; added; notation added.</td>
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<td>&quot;DETAIL OF JOINT ARRANGEMENT&quot;; &quot;TYPICAL SECTION FOR MULTI-LANE CONSTRUCTION&quot; deleted; &quot;GENERAL NOTES&quot; revised to &quot;NOTES&quot;; revised Notes No. 1 and No. 3; added heading &quot;STEEL HOOK BOLT ASSEMBLY&quot;; &quot;ALTERNATE KEYWAY AND HOOK BAR&quot; revised to read &quot;ALTERNATE KEYWAY AND HOOK BOLT&quot;; &quot;DETAIL OF JOINT ARRANGEMENT&quot; joint layout at &quot;T&quot; INTERSECTIONS or OFFSET INTERSECTIONS revised to read &quot;JOINT LAYOUT AT &quot;I&quot; INTERSECTIONS&quot;.</td>
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<td>New Sheet &quot;JOINT LAYOUT AT ENTRANCE AND EXIT RAMP TERMINALS&quot;.</td>
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1992

INDEX NUMBER | SHEET NUMBER | DESCRIPTION | INDEX NUMBER | SHEET NUMBER | DESCRIPTION
---|---|---|---|---|---
300 1 of 1 | Sheet title revised to read 'BRIDGE APPROACH EXPANSION JOINT-CONCRETE PAVEMENT'; Sheet is reformatted; 'DESIGN NOTES' added; 'GENERAL NOTES' completely revised; Subtitles revised; 'REINFORCING STEEL' chart number and length of 'O' Bars revised.
400 1 of 14 | 'LENGTH OF ADVANCEMENT' diagram revised for clarity 'Length Of Advancement chart note modified and relocated below diagram.
2 of 14 | 'GUARDRAIL APPLICATION FOR ROADSIDEx HAZARDS, 'DIVIDED ROADWAY-DETAIL B' and 'UNDIVIDED ROADWAY-DETAIL C' on '2 Panels' approach hazard have been revised to read 'Varies 1 to Panels Min. V'.
3 of 14 | 'DETAIL W' RADIAL PANELS ADJASNING BRIDGE 'ID' RADIAL PANEL' and 'ID5 RADIAL PANEL' idea dimension corrected to 51'.
4 of 14 | Subtitles expanded; 'GUARDRAIL APPLICATIONS FOR MEDIANS 50 FEET OR GREATER' guardrail lengths on chart revised.
5 of 14 | Subtitles expanded.
6 of 14 | Subtitles expanded; reformatted sheets; consolidated legends; revised reference numbers on diagrams as necessary to conform with consolidated legends.
7 of 14 | 'TIMBER BREAKAWAY POST' note deleted; 'STANDARD FLARE-DETAIL P' last sentence in 'Notes' revised.
8 of 14 | 'GUARDRAIL LOCATION-DETAIL K' rubrail payment note added to table 'Notes'.
9 of 14 | 'DETAIL Q PLAN' Revised curb & gutter alignment from tangent to parabolic flare; 'SECTION BB' and 'SECTION CC' revised to reflect curb & gutter alignment.
10 of 14 | 'DETAIL J' subheading revised, shoulder line and misc asphalt, pavement added, slope protection notations and sketches added.
11 of 14 | 'LOCATION AT CURB & GUTTER SECTIONS-DETAIL L' added '7 maximum speed 45 MPH' to Type 1' curb section; 'END ANCHORAGE TYPE II-DETAIL P' removed, 'Galvanized from 1/2 to 1/4 Pipe Sleave'; ADHESIVE REFLECTORS-DETAIL M revised; REFLECTOR NOTES No 3 and 4.
12 of 14 | 'SPECIAL STEEL GUARDRAIL POST FOR MOUNTING GUARDRAIL ON EXISTING APPROACH SLABS' 'SIDE VIEW' diameter of anchor bolt corrected to 5'.
14 of 14 | 'BEAM WASHER' added subheading 'RECTANGULAR PLATE WASHER'; 'BUTTON HEAD BOLT' added thread length notation to chart; 'BACK-UP PLATE' revised to read 'BEAM BACK-UP PLATE', revised 'Notes'.
400 9 of 9 | 'SCHEME 29' reinforcement replaced, deepened foot of wall.
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<td>450</td>
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<td>Sheet redrawn for clarity; &quot;FENCING TERMINALS AT BOX CULVERTS'; 2'-6&quot; min. offset from 4'-6&quot; box revised to 2'-2&quot;; min. offset from inside edge of wall; &quot;FENCING TERMINALS AT BRIDGE ENDS (ROADWAY)&quot; notation added to &quot;PLAN&quot; detailing the anchoring of barbed wire line end of bridge</td>
<td>5/5</td>
<td>1-3 of 4</td>
<td>Completely revised to reflect Administrative Rules 14-96 and 14-97, 4 of 4</td>
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<tr>
<td>2 of 2</td>
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<td>Graphic clarifications in all views; &quot;FENCING TERMINALS AT RURAL INTERCHANGES&quot; subheading defined.</td>
<td>5/6</td>
<td>1 of 1</td>
<td>QUANTITIES FOR ONE TURNOUT (SY) chart revised to read &quot;AREAS FOR ONE 5' DEEP TURNOUT (SY)&quot;; &quot;TURNOUT PAVEMENT STRUCTURAL MINIMUM REQUIREMENTS&quot; revised in read PAVEMENT STRUCTURE FOR 5' DEEP TURNOUTS revised; other revision to reflect Administrative Rules 14-96 and 14-97.</td>
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<td>'GENERAL NOTES' Note Nos. 2 and 9 (Class 2 zinc coating changed to Class 3 zinc coating), Note No. 13 revised.</td>
<td>5/8</td>
<td>1 of 1</td>
<td>'INSET' revised to &quot;INSET 8&quot; and modified to reflect shoulder installation only; 'INSET A' added to reflect roadway installation only.</td>
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<td>452</td>
<td>1 of 2</td>
<td>'GENERAL NOTES' Note Nos. 4-1(A-1), 4-9(B-1), 4-12(C-1) changed ASTM A120 to ASTM F202, 4-1(A-1), 4-9(B-1), 4-12(C-1) deleted Spec Subsection 566-S-15, added ASTM F254; 4-9(B-1); ASTM F254; 4-9(B-1), 4-9(B-1), 4-10(L-13) restored for concor; Note No. 8 changed 310° to 350°; &quot;TYPE ZZ VINYCOATED FABRIC&quot; second column &quot;Aluminum Coating&quot; deleted.</td>
<td>5/20</td>
<td>1 of 1</td>
<td>'GRAVITY WALL' Note No. 3 deleted, wall height expressed as 'Height (Exposed Face)'; slope line and '1'-2'-0.5' notation added behind wall, deleted wall joint note and revised drawing to indicate maximum wall spacing; ALUMINUM PIPE HANDRAIL ON GRAVITY WALL revised; 'ALUMINUM PIPE HANDRAIL', base plate, and anchors modified from 4 barn to 2 barn elements. Note No. 2 expanded to include requirements for anchor bolts, Note No. 3 added for payment, notation added permitting &quot;Adhesive Anchors&quot;, revised &quot;DR&quot; dropoff notation, added &quot;MOUNT ON GRAVITY WALL SHOWN TO TYPICAL SECTION AT POST&quot;; CONCRETE STEPS added Notes No. 4 and 5 for payment.</td>
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<td>1 of 1</td>
<td>'GENERAL NOTES' Note No. 5 is expanded to include 'manhole construction'.</td>
<td>5/25</td>
<td>1 of 5</td>
<td>Deleted references to concrete pavement joints. Degree of curve updated from 8°20' to 8°20'.</td>
</tr>
<tr>
<td>500</td>
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<td>Sheet retitled, 'REMOVAL OF MUCK' and 'GENERAL NOTES' retained on this sheet, plastic material information transferred to new Sheet 2 of 2. Utilization of materials transferred to Index No. 505. Miscellaneous details transfer to new Index No. 506.</td>
<td>5/2</td>
<td>2 of 5</td>
<td>Deleted references to concrete pavement joints. 'GENERAL NOTES' completely revised.</td>
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<td></td>
<td>REMOVAL OF PLASTIC MATERIALS transferred to this sheet.</td>
<td>5/3</td>
<td>3 of 5</td>
<td>Deleted references to concrete pavement joints. Degree of curve updated from 8°20' to 8°20'.</td>
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<td>'GENERAL NOTES' restructured; 'DESIGN NOTES' deleted; the utilization of Select (S), Plastic (P), and Sige Plastic (PM) classified as Muck is limited to outer embankment slopes; Muck (M) restricted to topsoil use.</td>
<td>5/4</td>
<td>1 of 2</td>
<td>'LEFT TURN CONTROL' revised left turn to conform to Index No. 301.</td>
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<td>New Index 'WISCELENOUS EARTHWORK DETAILS' (data transferred from Index No. 500).</td>
<td>5/5</td>
<td>2 of 8</td>
<td>Sheet revised to conform with index 301.</td>
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<td>510</td>
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<td>Sheet reformatted for better grouping of details, tables, charts and text; super elevation for 0'15 to 2'00' curves revised to conform to AASHO 2'-LANE, 4'-LANE OR 6'-LANE PAVEMENT, NO MEDIAN.' Rotation notation removed.</td>
<td>5/6</td>
<td>2 of 8</td>
<td>Sheet revised to conform with index 301.</td>
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<td>'GENERAL NOTES' Note No. 8 revised.</td>
<td>5/7</td>
<td>1 of 3</td>
<td>'GENERAL NOTE' Note No. 5 expanded to allow mailbox to be placed back of sidewalk.</td>
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<td>'SPECIAL APPLICATION SUPERELEVATION RATES' notation is expanded for clarity.</td>
<td>5/8</td>
<td>1 of 1</td>
<td>'GENERAL NOTES' Notes 4C and 5 revised, Note No. 7 added; &quot;WINDOW DETAIL&quot; distance from slant line datum to top of ground cover reduced from 3' to 1', dimension 3.75' corrected to 3.5'; 'LEGEND' added.</td>
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<td>'LAYER THICKNESS FOR ASPHALT CONCRETE STRUCTURAL COURSES' chart 'TYPE S-I WITH TYPE S-I TOP LAYER' corrected to read 'TYPE S-I WITH TYPE S-I TOP LAYER', 'DESIGN NOTES' replaced.</td>
<td>5/9</td>
<td>1 of 10</td>
<td>'CONTENTS' added 'CHANNELIZING AND LIGHTING DEVICE CONSISTENCY}; 'CLEAR ZONE'; 'PREFACE' added note describing requirements of Index No. 600; 'SYMBOLS' description revised.</td>
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<td>514</td>
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<td>Index 514 divided into two sheets: specified optional bases divided 'GENERAL USE BASE GROUPS AND STRUCTURAL NUMBERS' retained on this sheet and 'GENERAL NOTES' added; Composite Limerock-Asphalt Base deleted; Composite Bases identified and structural numbers revised.</td>
<td>5/10</td>
<td>2 of 10</td>
<td>'REGULATORY SPEED IN WORK ZONES' next to last paragraph deleted (&quot;Regulatory Speed&quot; and 'Reduce Speed Ahead&quot;&quot;)...).</td>
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<td>New sheet; specified optional bases moved to this sheet and designated 'LIMITED USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS'.</td>
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<td>'WARNING LIGHTS' payment deleted; 'CHANNELIZING AND LIGHTING DEVICE CONSISTENCY' Section added; 'REFLECTORIZED RAISED PAVEMENT MARKERS' revised to comply with spec change; 'SIGN COVERING AND INTERMITTENT WORK STOPPAGE SIGNING' paragraph revised.</td>
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<td>VARIABLE MESSAGE SIGN: 1 paragraph added; ROADSIDE BARRIERS Index No. revised; ABOVE GROUND HAZARD paragraph revised; CLEAR ZONE WIDTH paragraph and chart added.</td>
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<td>'NOTES' No. 2; 'e. Tubular Marker' added, No. 3 'c. Temporary Curb . . . ' added, No. 5 A. and B. revised.</td>
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<td>'TUBULAR MARKER' notation added; 'TYPE III BARRICADE' one warning light deleted; 'CHANNELIZING AND LIGHTING DEVICE NOTES' Nos. 3 and 4 revised, No. 7 Deleted, No. 8 added.</td>
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<td>'WOT 1', 'WOT 2' and 'WOT 3' details and notations added; GM 3B 'B/W' changed to 'B/Y'.</td>
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<td>New Sheet 'TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS IN LIEU OF TEMPORARY TAPE OR PAINT IN WORK ZONES'.</td>
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<td>Maximum Spacing and 'Cones At 25 Center's notations revised; 'SYMBOLS' 'Type I, Type II Or Type III Barricade Or Drum' and 'Type I Or Type II Barricade Or Drum' revised; 'GENERAL NOTES' No. 6 revised, No. 9 deleted.</td>
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<td>'Cones At 25 Centers' notation revised; Varies See General Note 2 revised to '500'; 'SYMBOLS' 'Type I Or Type II Barricades, Cone Or Drum' revised; 'GENERAL NOTES' No. 6 revised.</td>
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<td>'SYMBOLS' 'Type I Or Type II Barricades Or Vertical Panel Or Drum' added; 'GENERAL NOTES' No. 9 deleted; 'SIGNAL MOUNT DETAILS' 'SPAN WIRE SIGNALS' 8' Min.' revised to read 'Clear Zone'.</td>
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<td>'SYMBOLS' 'Type I Or Type II Barricade Or Drum' revised; 'GENERAL NOTES' No. 3 and 5 revised; 'Speed Limit' sign and notation added to either end of detail; 'Cones At 25 Centers' notation revised.</td>
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<td>&quot;SYMBOLS&quot;:&quot;Type I Or Type II Barricade Or Drum&quot; revised; &quot;GENERAL NOTES&quot; No. 8 revised, No. 9 deleted.</td>
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<td>&quot;SYMBOLS&quot;:&quot;Type I Or Type II Barricade Or Drum&quot; revised; &quot;GENERAL NOTES&quot; No. 5 and 8 revised; ‘Maximum Spacing Between Devices’ notation added.</td>
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<td>&quot;GENERAL NOTES&quot; No. 5 added.</td>
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<td>&quot;SYMBOLS&quot;:&quot;Type I Or Type II Barricade Or Drum&quot; revised; ‘PHASE I &amp; II’ ‘Speed Limit’ sign and notation added to either end of views.</td>
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<td>&quot;SYMBOLS&quot;:&quot;Type I Or Type II Barricade Or Drum&quot; revised; ‘PHASE I &amp; II’ ‘Speed Limit’ sign and notation added to either end of views; ‘Temporary Crash Cushion’ symbol and notation deleted; ‘Advisory Speed Plate’ deleted.</td>
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<td>New sheet added ‘CURVILINEAR ALIGNMENT CROSSOVER’.</td>
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<td>‘CLEAR ZONE (CZ)’ Deleted ‘Minimum’ in columns 2, 3 &amp; 5 and redesignated ‘Desirable’ to ‘Standard’ in columns 2, 3, 4 &amp; 5.</td>
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<td>‘SWELL Notes in columns 2, 3, 4 &amp; 5 revised.</td>
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<td>‘TREES’ revised to ‘6’ in column 1 1/2 second sentence revised in column 2.</td>
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<td>‘Clear Zone Footnotes’ Notes 1 and 2 revised; Notes 4 and 6 deleted and labeled ‘Vacant’ and Note 10 added.</td>
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<td>‘TABLE I’ heading added; ‘Step 2’ revised; Deleted 6’ column from 30, 35 and 40 Vmph; Deleted 14’ column from 60, 65 and 70 Vmph; Deleted 18’ column from 50 Vmph; Added 0’ column to 55 Vmph.</td>
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<td>ABBREVIATIONS AND SYMBOLS</td>
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<td>001 Standard Abbreviations</td>
<td>260 U-Type Concrete Endwalls With Grates: 15° To 30° Pipe</td>
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<td>002 Standard Symbols (3 Sheets)</td>
<td>261 U-Type Concrete Endwalls-Boffles And Grate Optional: 15° To 30° Pipe (3 Sheets)</td>
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<td>EROSION CONTROL AND WATER QUALITY</td>
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<td>003 Temporary Slope Drain And Sod Flume</td>
<td>266 Winged Concrete Endwalls-Single Round Pipe</td>
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<td>011 Trash Retainer And Sediment Basin</td>
<td>268 U-Type Sand-Cement Endwalls</td>
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<td>012 Bailed Hay Or Straw Barriers And Silt Fences (3 Sheets)</td>
<td>270 Flared End Section</td>
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<td>013 Turbulent Barriers</td>
<td>272 Cross Drain Wittered End Section (6 Sheets)</td>
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<td>014 Erosion Control For Permanent Construction</td>
<td>273 Slde Drain Wittered End Section (6 Sheets)</td>
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<td>015 Shoulder Sodding And Reworking On Existing Facilities</td>
<td>280 Miscellaneous Drainage Details (4 Sheets)</td>
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<td>281 Ditch Pavement And Saddling (2 Sheets)</td>
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<td>199 Geotextile Criteria</td>
<td>282 Back Of Sidewalk Drainage</td>
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<td>200 Structure Bottoms-Type J And P (2 Sheets)</td>
<td>283 Median Opening Flume</td>
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<td>201 Supplementary Details For Manholes And Inlets (6 Sheets)</td>
<td>284 Concrete Spillways (2 Sheets)</td>
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<td>285 French Drain (2 Sheets)</td>
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<td>209 Curb Inlet And Gutter Inlet Application Guide</td>
<td>286 Underdrain And Edgdrain (2 Sheets)</td>
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<td>210 Curb Inlet Tops-Types 1, 2, 3 And 4</td>
<td>290 Concrete Box Culverts-Single, Double, Triple And Quadruple Barrels (5 Sheets)</td>
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<td>211 Curb Inlet Tops-Types 5 and 6 (2 Sheets)</td>
<td>293 Safety Modifications For Inlets In Box Culverts</td>
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<td>213 Curb Inlet-Type 7</td>
<td>295 Safety Modifications For Endwalls</td>
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<td>CURBS AND PAVEMENT JOINTS</td>
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<td>300 Curb &amp; Curb And Gutter</td>
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<td>301 Median Storage Lanes</td>
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<td>302 Traffic Separators</td>
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<td>304 Curb Cut Ramps (2 Sheets)</td>
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<td>305 Concrete Pavement Joints (5 Sheets)</td>
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<td>306 Bridge Approach Expansion Joint-Concrete Pavement</td>
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<td>400 Guardrail (4 Sheets)</td>
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<td>231 Ditch Bottom Inlet-Type B</td>
<td>401 Guardrail Anchorage And Continuous Barrier For Existing Bridges (9 Sheets)</td>
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<td>402 Concrete Barrier Wall (4 Sheets)</td>
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<td>233 Ditch Bottom Inlets-Types F And G</td>
<td>403 Precast Concrete Temporary Barrier Wall (2 Sheets)</td>
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<td>431 G-R-E-A-T System (6 Sheets)</td>
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<td>432 C-A-T System (2 Sheets)</td>
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<td>433 Brakemaster (4 Sheets)</td>
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<td>438 Dragnet (2 Sheets)</td>
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<td>250 Straight Concrete Endwalls-Single And Multiple Pipe (2 Sheets)</td>
<td>439 Construction Zone G-R-E-A-T (4 Sheets)</td>
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<td>251 Straight Concrete Endwalls-Single And Double 60° Pipe (2 Sheets)</td>
<td>450 Fence Location (2 Sheets)</td>
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<td>451 Fence Type A (2 Sheets)</td>
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<td>253 Straight Concrete Endwalls-Single And Double 72° Pipe (2 Sheets)</td>
<td>452 Fence Type B (2 Sheets)</td>
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<tr>
<td>255 Straight Concrete Endwall-Single B4° Pipe</td>
<td>453 Cantilever Slide Gate-Type B Fence</td>
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<tr>
<td>256 Straight Sand-Cement Endwalls</td>
<td>460 Giare Screen</td>
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<td>4992</td>
<td>Opaque Visual Barrier</td>
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</table>
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- 500 Removal Of Muck And Plastic Material (2 Sheets)
- 505 Embankment Utilization
- 506 Miscellaneous Earthwork Details
- 510 Super-elevation (2 Sheets)
- 515 Super-elevation-Municipal Construction (2 Sheets)
- 513 Flexible Pavement-Layer Thickness For Structural Courses
- 514 Optional Base Groups And Structural Numbers (2 Sheets)
- 515 Turnouts (4 Sheets)
- 516 Turnouts-Resurfacing Projects
- 517 Temporary Crossover-Construction Details-Rural
- 518 Rumble Strips
- 520 Walls, Handrails And Steps
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- 526 Roadway Transitions (8 Sheets)
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- 540 Settlement Plate
- 545 Landscaping-Back Of Guardian Application
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### TRAFFIC CONTROL THROUGH WORK ZONES

#### TRAFFIC CONTROL THROUGH WORK ZONES (CONT.)
- 620 Two-Lane, Two-Way Urban Day Or Night Operations
- 621 Two-Lane, Two-Way Urban Day Or Night Operations
- 622 Multilane, Two-Way Urban Divided Or Undivided Day Or Night Operations
- 623 Multilane, Two-Way Urban Divided Or Undivided Day Or Night Operations (2 Sheets)
- 624 Multilane, Divided With Traversable Median Or Undivided, Urban Day Or Night Operations
- 625 Multilane One-Way Or Multilane Divided With Non-Traversable Median Urban Day Or Night Operations (2 Sheets)
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- 700 Design Criteria Related To Highway Safety (2 Sheets)
# STANDARD SYMBOLS FOR PLAN SHEETS

## TRAFFIC SIGNALS SYMBOLS

<table>
<thead>
<tr>
<th>Existing</th>
<th>Proposed</th>
</tr>
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<tbody>
<tr>
<td><img src="image1" alt="Symbol" /></td>
<td>Traffic Signal Head (Span Wire Mounted)</td>
</tr>
<tr>
<td><img src="image2" alt="Symbol" /></td>
<td>Traffic Signal Head (Pedestal Mounted)</td>
</tr>
<tr>
<td><img src="image3" alt="Symbol" /></td>
<td>Traffic Signal Head (Mast Arm Mounted)</td>
</tr>
<tr>
<td><img src="image4" alt="Symbol" /></td>
<td>Traffic Signal Pole (Concrete, Wood, Metal)</td>
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<tr>
<td><img src="image5" alt="Symbol" /></td>
<td>Vehicle Detector (Loop)</td>
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<tr>
<td><img src="image6" alt="Symbol" /></td>
<td>Signal Cable (On Messenger Wire)</td>
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<tr>
<td><img src="image7" alt="Symbol" /></td>
<td>Conduit</td>
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<tr>
<td><img src="image8" alt="Symbol" /></td>
<td>Pedestrian Detector</td>
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<tr>
<td><img src="image9" alt="Symbol" /></td>
<td>Pedestrian Signal Head (Pole Or Pedestal Mounted)</td>
</tr>
<tr>
<td><img src="image10" alt="Symbol" /></td>
<td>Controller Cabinet (Base Mounted)</td>
</tr>
</tbody>
</table>

### EXISTING

- Walk - Don't Walk
- Flashing Don't Walk
- Signal Face Number
- Signal Lens
- Programmed Signal Head
- Messenger Wire
- Pole Tabulation Cross Reference
- Pole Tabulation Cross Reference (Joint Use Pole)
- Signal Phase

### PROPOSED

- Pole & Luminaire
- Existent 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 Under Deck Luminaire

## LIGHTING SYMBOLS

### EXISTING

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

## SIGNING AND PAVEMENT MARKING SYMBOLS

- See General Notes, Sheet 1 of 3

---

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**TRAFFIC SIGNALS SYMBOLS**

**STANDARD SYMBOLS**
Temporary Slope Drain

Slope Drain Application

Sod Flume (Sodding Overlapped)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
TEMPORARY SLOPE DRAIN
AND SOD FLUME

Designer

Drawn By

Approved By

Scale: 1" = 50' R

Note: All dimensions are approximate and should be verified on site.
INTENDED FOR USE WHEN THE STORM SEWER OUTFALLS ADJACENT TO A SHAPE LINE

**TYPE A**

**DESIGN NOTES**
1. Basins should be placed at a distance with a minimum depth of 2.0 feet.
2. In Type A, when the top of embankment below the water, fence shall be required along the top of the embankment.
3. In Section AA, the wall shall be placed as far from the embankment as possible.
4. In Section BB, the 6" PVC pipe shall be constructed unless shown otherwise in the plans.

**GENERAL CONSTRUCTION NOTES**
1. Fence materials shall be aluminum or similar.
2. Aluminum posts shall be 1" diameter minimum. Aluminum roll covers shall be in accordance with Index 450. Concrete posts shall not be used in accordance with Index 450. All posts shall be set in concrete.
3. Fabric shall be installed to provide for stems and roll covers, and fixed to posts and braced at 6" intervals.
4. Additional details on fencing, see Index Nos. 450 and 452.
5. All basis slopes to be 1:3 unless detailed otherwise in the plans.
6. Sediment basins to be constructed prior to commencement of aerial construction. Maintenance and check out to be by the Contractor with acceptance of project by the Engineer.

**TYPE B**

**GENERAL NOTES**
1. The cost for Type A and Type B trash retainer and sediment basins shall include the cost for piping, fencing, baffles, plumbing and for work unless otherwise noted. The omission of project cost shall be made in the plans. Payment for both Type A and Type B shall be under the contract unit price for Sediment Basin, each. Contract shall be paid for in the plans. Payment for both Type A and Type B shall be under the contract unit price for Sediment Basin, each.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DRAINAGE AND RETENTION SYSTEMS

TRASH RETAINER AND
SEDIMENT BASIN

IN DEPTH
NOTE: Spacings shown in this chart are based on general conditions and should be adjusted based on actual site performance of hydraulic conditions.

FLOW RATES (CFS)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Rate (CFS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Light</td>
<td>≤ 5</td>
</tr>
<tr>
<td>Light</td>
<td>&gt; 5 ≤ 10</td>
</tr>
<tr>
<td>Moderate</td>
<td>&gt; 10 ≤ 15</td>
</tr>
<tr>
<td>Heavy</td>
<td>&gt; 15 ≤ 25</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>&gt; 25 ≤ 40</td>
</tr>
</tbody>
</table>

LEGEND
Flow Solids

COHESIVE

Non-Cohesive

Firm Loam Fine Sand
Clay Sands Course Sand
Clay Gravels
Mudstones Sandy Loam
Sandstone Silty Loam

SOILS

50 150 250 350
Spacings (in Feet)

5 7

Consider Use of Temporary Set

1

CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III SILT FENCES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
BALED HAY OR STRAW
BARRIERS AND SILT FENCES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
BALED HAY OR STRAW
BARRIERS AND SILT FENCES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
BALED HAY OR STRAW
BARRIERS AND SILT FENCES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
BALED HAY OR STRAW
BARRIERS AND SILT FENCES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
BALED HAY OR STRAW
BARRIERS AND SILT FENCES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
BALED HAY OR STRAW
BARRIERS AND SILT FENCES
ELEVATION

SECTION

Note: Silt Fence to be placed under the contract unit price for Shaked Silt Fence (LF).

TYPE III SILT FENCE

Note: Specifying for Type III Silt Fence to be used in accordance with Drawings Sheet 3 and other manifestations of drainage structures Sheet 2 of 3.

SILT FENCE APPLICATIONS

Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.
FLOATING TURBIDITY BARRIERS

LEGEND

- Pile Locations
- Drops Of Fish Area
- Loading Bays With 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 depend on current velocities.
3. Deployment of barrier around site locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 04 of the Standard Specifications.

TURBIDITY BARRIER APPLICATIONS

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.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TURBIDITY BARRIERS

TURBIDITY BARRIER APPLICATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TURBIDITY BARRIERS

TURBIDITY BARRIER APPLICATIONS
SHOULDER AND SLOPE TREATMENT IN SAG CURVES

SECTION AA (Symmetrical About A)

TRANSVERSE SECTION

SECTION BB (Symmetrical About B)

SHOULDER AND SLOPE TREATMENT FOR SUPERELEVATED ROADWAYS

SEEDING RATES (Lbs/Acre) FOR NEW SHOULDER SLOPE TREATMENT

<table>
<thead>
<tr>
<th>ZONE I</th>
<th>ZONE II</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE OF SEED</td>
<td>COASTAL</td>
</tr>
<tr>
<td>PERMANENT GRASS</td>
<td></td>
</tr>
<tr>
<td>Uncultured Bermudagrass</td>
<td>20</td>
</tr>
<tr>
<td>Bermuda Grass Or Paspalum</td>
<td>80</td>
</tr>
<tr>
<td>QUICK GROWING</td>
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</tr>
<tr>
<td>Brown Top Winter</td>
<td>20</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>20</td>
</tr>
</tbody>
</table>

TOTAL POUNDS PER ACRE: 40 40 40 40 40 40 40 40

Note: The seeding rates shown in this table apply only when seed is spread by an approved mechanical spreader meeting the requirements of Section 370 and 577 of the Standard Specifications.

GENERAL NOTES:
1. Erosion control details are applicable to new construction, reconstruction and rehabilitation projects.
2. For seeding adjacent to ditches and at roadways, see Index No. 221.
3. All flirtzips should be at least 3 feet wide to be effective.

SHOULDER POINT

4 Point Shoulder (Shoulder Point 90°)

ASPHALT MULCH

SHOULDER POINT

4 Point Shoulder (Shoulder Point 90°)

ASPHALT MULCH

SHOULDER POINT

SHOULDER POINT
STANDARD CRITERIA

<table>
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<tr>
<th>CLASS</th>
<th>APPLICATION DESCRIPTION</th>
<th>STANDARD INDEX No.</th>
<th>PERMEABILITY</th>
<th>A.O.S. Range</th>
<th>TCI Tear Strength</th>
<th>Puncture</th>
<th>TRAPEZOIDAL TEAR</th>
<th>MEYLEN BURST</th>
<th>ELONGATION</th>
<th>SEAM STRENGTH</th>
<th>UV RESISTANCE</th>
<th>COMMENTS</th>
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<tr>
<td>D-1</td>
<td>Railroad Trench Cuts 1 &amp; 2</td>
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<td>40-70</td>
<td>250</td>
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<td>50</td>
<td>500</td>
<td>50</td>
<td>30</td>
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<td>80</td>
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<td>D-2</td>
<td>Track Facade Stones</td>
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<td>50</td>
<td>350</td>
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<td>400</td>
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<td>30</td>
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<td>80</td>
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<td>180</td>
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<td>80</td>
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<td>30</td>
<td>180</td>
<td>50</td>
<td>400</td>
<td>80</td>
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<td>400</td>
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<td>180</td>
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<td>Stem Silt Fence</td>
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<td>60-90</td>
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<td>180</td>
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<td>40</td>
<td>80</td>
<td>80</td>
<td>500</td>
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<tr>
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<td>Foil Silt Curtain</td>
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<td>60-90</td>
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<td>400</td>
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<td>R-1</td>
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<td>50</td>
<td>400</td>
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<tr>
<td>R-2</td>
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<td>50</td>
<td>400</td>
<td>80</td>
<td>80</td>
<td>180</td>
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(1) Type refers to FDOT class and application.

TABLE 1

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<th>Unit</th>
<th>Test Method</th>
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<tr>
<td>Permeability</td>
<td>Asm.460</td>
<td>ASTM D-4785</td>
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<td>AGS</td>
<td>U.S. Silt No.</td>
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<td>LBS</td>
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<td>LBS</td>
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<td>Muller Burst</td>
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<td>Elongation</td>
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<tr>
<td>UV Vapor Resistance</td>
<td>%</td>
<td>ASTM D-4355</td>
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</table>

GENERAL NOTES

1. Specifications for geosynthetics are Section 958 of the Section identified by the specific application. Proptectives for non-applications is provided by this standard, in conjunction with these sections.

2. All values are minimum average 10% values in the weakest principal direction unless otherwise stated.

3. Range of values does not preclude the responsibility to design the fabric to the initial materials and conditions.

4. Unless specifically restricted in COMMENTS column, any type of material may be used.

DESIGN NOTES

1. The Designer shall review this cath and adjust the values as necessary to satisfy project requirements. These adjustments shall be carried for in the plans or combined in the project specific projects.

2. U.V. Resistance: The value represents the percent of maximum tensile strength retained (ASTM D-4653). After weathering per ASTM D-4355 for the test period for 1000 h.

3. Test values are field values. The values listed above are for testing purposes.

4. The Designer shall review this cath and adjust the values as necessary to satisfy project requirements. These adjustments shall be carried for in the plans or combined in the project specific projects.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
WORK DESIGN

GEOTEXTILE CRITERIA
### Slab Designs - Square and Rectangular Structures

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<th>Short-Way</th>
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<tbody>
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<td>Slab Depth</td>
<td>Schedule</td>
</tr>
<tr>
<td>7&quot;x5½&quot;x8&quot;</td>
<td>C</td>
</tr>
<tr>
<td>7½&quot;x5½&quot;x8&quot;</td>
<td>C</td>
</tr>
<tr>
<td>8&quot;x5½&quot;x8&quot;</td>
<td>C</td>
</tr>
<tr>
<td>8½&quot;x5½&quot;x8&quot;</td>
<td>C</td>
</tr>
<tr>
<td>9&quot;x5½&quot;x8&quot;</td>
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<td>12&quot;x5½&quot;x8&quot;</td>
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</tr>
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### Slab Designs - Round Structures

<table>
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<tr>
<th>Short-Way</th>
<th>Long-Way</th>
</tr>
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<tbody>
<tr>
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<td>C</td>
</tr>
<tr>
<td>9½&quot;x9½&quot;</td>
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### Wall Designs - Rectangular Structures

<table>
<thead>
<tr>
<th>Vertical Reinforcing</th>
<th>Horizontal Reinforcing</th>
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<tbody>
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<td>Wall Depth</td>
<td>Schedule</td>
</tr>
<tr>
<td>3½&quot;x6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>4&quot;x6&quot;</td>
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<td>4½&quot;x6½&quot;</td>
<td>A</td>
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<td>5&quot;x7&quot;</td>
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</tr>
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<td>5½&quot;x7½&quot;</td>
<td>A</td>
</tr>
<tr>
<td>6&quot;x8&quot;</td>
<td>A</td>
</tr>
</tbody>
</table>

### General Notes
1. Slab reinforcement is appropriate for top, intermediate, and bottom slabs.
2. Slab depth is measured from finished grade to top of slab.
3. Wall design depth is measured to the top of the bottom slab for bays and to the top of the intermediate slab for risers.
4. Wall height is the distance between top of lower slab to bottom of upper slab.

### Reinforcing Schedule

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Grade</th>
<th>Steel</th>
<th>No. of Steel</th>
<th>Fabric</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>0.01</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>0.02</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>0.03</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>E</td>
<td>0.04</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>F</td>
<td>0.05</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>G</td>
<td>0.06</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
NOTES FOR THIN-WALL PRECAST OPTIONS

1. The details on Sheets 4, 5 & 6 are optional for prestressed concrete up to depths of 8'. These details can be used with All "B" Bottoms, index 200. Cast-in-place construction must adhere to the details contained in the referenced indexes.

2. Only the dimensions and reinforcement changes of other modifications are illustrated. For all other dimensions and details, the referenced index drawings apply. When these prestressed units are used in conjunction with All "B" Structure Bottoms, index 200, the interior dimensions of an All "B" Bottom can be adjusted to reflect these invert interior dimensions.

3. Concrete which meets the requirements of ASTM C-492 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 bar grades are recognized. Grade 40 and Grade 60. Welded wire fabric, including prestressed welded wire fabric, will be recognized as having a design strength of 60 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 equation:

\[
A_{SW} = A_{SW} \left( \frac{P_{SW}}{P_{SW,60}} \right)
\]

In no case will fabric with wires smaller than 0.125" or spacings greater than 8" be permitted. For reinforcement shown as 4" or 6" or 8" or 10" or more, the number in inches must be replaced by the approximate equivalent in Kentucky units of 2.5" or more. For reinforcement shown as less than or equal to 4" or 6" or 8" or 10", the number must be replaced by the approximate equivalent in Kentucky units of 1.25" or 2.5" or 3.75" or 5.00".

<table>
<thead>
<tr>
<th>GRADE 40</th>
<th>EQUIVALENT GRADE 60</th>
<th>EQUIVALENT 60 KSI WELDED WIRE FABRIC</th>
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<tbody>
<tr>
<td>Reinforcing Bar</td>
<td>Steel Area</td>
<td>Reinforcing Bar</td>
</tr>
<tr>
<td>Bar Size &amp; Spacing</td>
<td>ft²</td>
<td>Bar Size &amp; Spacing</td>
</tr>
<tr>
<td>4&quot; 6&quot;</td>
<td>0.90</td>
<td>4&quot; 6&quot;</td>
</tr>
<tr>
<td>6&quot; 8&quot;</td>
<td>0.60</td>
<td>6&quot; 8&quot;</td>
</tr>
<tr>
<td>8&quot; 10&quot;</td>
<td>0.40</td>
<td>8&quot; 10&quot;</td>
</tr>
<tr>
<td>10&quot; 12&quot;</td>
<td>0.20</td>
<td>10&quot; 12&quot;</td>
</tr>
</tbody>
</table>

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TO: Bill Gonzales
FROM: 4 of 6

SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS
MEDIAN BARRIER INLET TYPES 1 & 2

PARTIAL SECTION AA

PARTIAL SECTION BB

INDEX 217

MEDIAN BARRIER INLET TYPES 3, 4, & 5

PARTIAL SECTION AA

PARTIAL SECTION BB

INDEX 219

BARRIER WALL (RIGID) (C & G)
### ROUND PIPE INSTALLATIONS (All Sizes)

**Design**
- **Standard**
- **Modified Bedding**
- **Modified Trench**

### ELLIPICAL PIPE DIMENSIONS

**Nominal Dimensions**
- **Horizontal**
- **Vertical**

### ROUND PIPE DIMENSIONS

<table>
<thead>
<tr>
<th>Equivalent Dia. (In.)</th>
<th>Area (Sq. Ft.)</th>
<th>Wall Thickness (In.)*</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>A WALL</td>
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</tr>
<tr>
<td>12</td>
<td>1.8</td>
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<td>3</td>
</tr>
<tr>
<td>30</td>
<td>4.2</td>
<td>3.5</td>
</tr>
<tr>
<td>36</td>
<td>7.1</td>
<td>4.4</td>
</tr>
<tr>
<td>42</td>
<td>9.6</td>
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<td>48</td>
<td>12.6</td>
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<td>4.3</td>
</tr>
<tr>
<td>60</td>
<td>19.6</td>
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<td>66</td>
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<td>5.9</td>
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<td>72</td>
<td>28.5</td>
<td>6</td>
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<tr>
<td>78</td>
<td>32.3</td>
<td>6.4</td>
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<tr>
<td>84</td>
<td>35.5</td>
<td>7</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>7</td>
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<td>96</td>
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<td>102</td>
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<td>108</td>
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<td>114</td>
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<tr>
<td>120</td>
<td>78.5</td>
<td>9</td>
</tr>
</tbody>
</table>

*For informational purposes only. Do not specify Wall Thickness. Option B: Wall is industry standard.

### ELLIPICAL PIPE INSTALLATIONS (All Sizes)

**Nominal Dimensions**
- **Horizontal**
- **Vertical**

*Note: HE III and VE III pipe required for depths of cover less than 2' for 25°, 30°, and 45° equivalent.*

### MAXIMUM COVER FOR REINFORCED CONCRETE PIPE ROUND AND ELLIPICAL

**Cover Height**

<table>
<thead>
<tr>
<th>State of Oregon Department of Transportation</th>
<th>Pipe Design</th>
</tr>
</thead>
</table>

**For Informational Purposes Only**

**Note:** Height of fill (maximum cover) is measured from top of finished grade to outside top of pipe.
### Round Pipe - 2 4" x 1 1/2" Corrugation

<table>
<thead>
<tr>
<th>D (in)</th>
<th>Area (Sq.Ft)</th>
<th>Maximum Height of Fill (Ft)</th>
<th>Maximum Cover (Ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.092</td>
<td>0.069</td>
<td>1.19</td>
</tr>
<tr>
<td>4</td>
<td>0.179</td>
<td>0.070</td>
<td>1.19</td>
</tr>
<tr>
<td>5</td>
<td>0.257</td>
<td>0.079</td>
<td>1.19</td>
</tr>
<tr>
<td>6</td>
<td>0.345</td>
<td>0.082</td>
<td>1.19</td>
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<tr>
<td>7</td>
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<td>0.088</td>
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<tr>
<td>8</td>
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<td>0.096</td>
<td>1.19</td>
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</tbody>
</table>

### Round Pipe - 3" x 1" Corrugation

<table>
<thead>
<tr>
<th>D (in)</th>
<th>Area (Sq.Ft)</th>
<th>Maximum Height of Fill (Ft)</th>
<th>Maximum Cover (Ft)</th>
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<tbody>
<tr>
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<td>0.069</td>
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<tr>
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<td>0.257</td>
<td>0.079</td>
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<tr>
<td>6</td>
<td>0.345</td>
<td>0.082</td>
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<tr>
<td>8</td>
<td>0.521</td>
<td>0.096</td>
<td>1.19</td>
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</tbody>
</table>

### Round Pipe - Spiral Rib

<table>
<thead>
<tr>
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<th>Maximum Height of Fill (Ft)</th>
<th>Maximum Cover (Ft)</th>
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</thead>
<tbody>
<tr>
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<td>0.069</td>
<td>1.19</td>
</tr>
<tr>
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<td>0.179</td>
<td>0.070</td>
<td>1.19</td>
</tr>
<tr>
<td>5</td>
<td>0.257</td>
<td>0.079</td>
<td>1.19</td>
</tr>
<tr>
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<td>0.345</td>
<td>0.082</td>
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</tr>
<tr>
<td>8</td>
<td>0.521</td>
<td>0.096</td>
<td>1.19</td>
</tr>
</tbody>
</table>

### Pipe Arch - 2 4" x 1 1/2" Corrugation

<table>
<thead>
<tr>
<th>Span (ft)</th>
<th>Rise (ft)</th>
<th>Equivalent Round Pipe</th>
<th>Area (Sq.Ft)</th>
<th>Maximum Shear Required (lb/in)</th>
<th>Maximum Corner Pressure (lb/sq.ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>10</td>
<td>0.092</td>
<td>0.069</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>25</td>
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<td>20</td>
<td>20</td>
<td>0.257</td>
<td>0.079</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>25</td>
<td>0.345</td>
<td>0.082</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>30</td>
<td>0.433</td>
<td>0.088</td>
<td>1.19</td>
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</tbody>
</table>

### Pipe Arch - 3" x 1" Corrugation

<table>
<thead>
<tr>
<th>Span (ft)</th>
<th>Rise (ft)</th>
<th>Equivalent Round Pipe</th>
<th>Area (Sq.Ft)</th>
<th>Maximum Shear Required (lb/in)</th>
<th>Maximum Corner Pressure (lb/sq.ft)</th>
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<tr>
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<td>20</td>
<td>20</td>
<td>0.257</td>
<td>0.079</td>
<td>1.19</td>
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<tr>
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<td>0.082</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>30</td>
<td>0.433</td>
<td>0.088</td>
<td>1.19</td>
<td></td>
</tr>
</tbody>
</table>

### Corrugated Aluminum Alloy Round Pipe and Pipe Arch

- **Notes:**
  - 1. Increase the minimum cover values shown on Sheet 1 of 4 by 6" for pipe and cover combinations below the heavy line.
  - 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 W-20 Cables)

- **Design Review:**
  - The review should be done by the designer or another registered professional engineer.

- **Manufacturers' Recommendations:**
  - This design is based on test results and should be used with caution.

- **Special Imposition Requirements:**
  - Special imposition restrictions required by manufacturers may restrict: special piping, special requirements, and maximum pressure to be used in accordance with manufacturers' recommendations.

- **Reduced Cover:**
  - Reduced cover may be applied for specific projects. Consult manufacturers for specific recommendations.

- **JSS HDG:**
  - JSS HDG is a special grade of galvanized steel pipe that is recommended for projects requiring a higher level of corrosion resistance.

- **JSP HDG:**
  - JSP HDG is a special grade of galvanized steel pipe with a higher degree of protection against corrosion than standard HDG.

- **Cover Height:**
  - See Sheet 1 of 4.
## Application Guidelines to Curb Inlets and Gutter Inlets

<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>INLET TYPE</th>
<th>TYPE CURB/GUTTER</th>
<th>GRADE CONSIDERATION</th>
<th>HYDRAULIC INTAKE (CFS)</th>
<th>BICYCLE SAFETY PEDESTRIAN SAFE</th>
<th>UTILITY LOCATION FROM CURB</th>
<th>MAXIMUM PIPE SIZE WITH STANDARD BOTTOMS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>E &amp; F</td>
<td>Continuous</td>
<td>4.1</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>30&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>9.0</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>30&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>E &amp; F</td>
<td>Continuous</td>
<td>1.9</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>30&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>203</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>6.5</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>30&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>204</td>
<td>E &amp; F</td>
<td>Continuous</td>
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<td>Yes / Limited</td>
<td>Outside</td>
<td>30&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>205</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>7.5</td>
<td>Yes / Limited</td>
<td>Outside</td>
<td>30&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>210</td>
<td>Separator I &amp; II</td>
<td>Continuous or Sag</td>
<td>4.4</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>24&quot; Longitudinal 30&quot; Transverse</td>
<td></td>
<td></td>
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<tr>
<td>211</td>
<td>Separator III &amp; IV</td>
<td>Continuous or Sag</td>
<td>4.4</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>24&quot; Longitudinal 30&quot; Transverse</td>
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<td></td>
</tr>
<tr>
<td>212</td>
<td>D &amp; F</td>
<td>Continuous or Sag</td>
<td>0.5</td>
<td>Yes / Yes</td>
<td>Outside</td>
<td>30&quot;</td>
<td>To be used only where flows are right or moderate and P/W does not permit the use of threaded curb inlets. Valves to be directed to major flow direction.</td>
<td></td>
</tr>
<tr>
<td>213</td>
<td>D &amp; F</td>
<td>Continuous or Sag</td>
<td>0.3</td>
<td>Yes / Yes</td>
<td>Outside</td>
<td>30&quot;</td>
<td>To be used only where flows are right and P/W does not permit the use of threaded curb inlets.</td>
<td></td>
</tr>
<tr>
<td>214</td>
<td>Median Barrier Wall</td>
<td>Continuous</td>
<td>4.0</td>
<td>No / Yes</td>
<td>NA</td>
<td>15&quot; Longitudinal 30&quot; Transverse</td>
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<tr>
<td>215</td>
<td>Median Barrier Wall</td>
<td>Sag</td>
<td>5.0</td>
<td>No / No</td>
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<td>15&quot; Longitudinal 30&quot; Transverse</td>
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<tr>
<td>216</td>
<td>Median Barrier Wall</td>
<td>Double Inlet Continuous</td>
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<td>Median Barrier Wall</td>
<td>Double Inlet Sag</td>
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<td>No / Yes</td>
<td>NA</td>
<td>42&quot; Longitudinal 30&quot; Transverse</td>
<td></td>
<td></td>
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<tr>
<td>218</td>
<td>Barrior Wall</td>
<td>Continuous or Sag</td>
<td>5.2</td>
<td>Yes / Yes</td>
<td>NA</td>
<td>30&quot;</td>
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</tr>
<tr>
<td>219</td>
<td>Shoulder</td>
<td>Continuous</td>
<td>4.0</td>
<td>No / Yes</td>
<td>NA</td>
<td>30&quot; Transverse</td>
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<tr>
<td>220</td>
<td>Valley</td>
<td>Continuous or Sag</td>
<td>5.0</td>
<td>Yes</td>
<td>NA</td>
<td>30&quot; Transverse</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Hydraulic intake values do not represent hydraulic capacity but are shown to compare inlets based on a 0.2% perpendicular slope. 20% clogging rate and 90% efficiency factor. For other conditions the values shown should be adjusted for slopes flow or clogging conditions. Sag inlet intake values are based on highest the outside lane or shoulders, where clogged rather than hydraulic. Intake may require inlet selection or spacing. Full design data and additional information is available in "A Study of Stormwater Flow Capacities" by U.S.F., and the Department of Natural Resources Manual Vol. 2, Chapter 9E and Vol. 3, Chapter 6.

2. Curb Inlets and catchpans should be isolated outside pedestrian cross walk areas, preferably upgraded from these locations.

3. Double inlet inlets are usually not warranted unless the minor flow is in excess of 150 feet or involves a diameter of 3.5 cm or greater.

4. Median Barrier inlets Types 1, 2, 3, 4, 5, & Shoulder Inlet Type 5 can be used only to be made safe for bicycle use by specifying the required grooves.

5. Pipe sizes are shown. Sizes 30", 50" and 7 1/4" are to be specified for fill in accordance with Index No. 201. Smaller pipe sizes should be reviewed using: $F = 1.5$ for 50" and 7 1/4" corrugations for larger sizes. 

---

**Curb Inlet & Gutter Inlet Application Guide**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Rev.</th>
<th>Sheet</th>
<th>Title</th>
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<td>1</td>
<td>1</td>
<td>Curb Inlet &amp; Gutter Inlet Application Guide</td>
</tr>
</tbody>
</table>
GENERAL NOTES

1. The finished grade and shape of the inlet tops are to conform with the finished cross slope and grade of the proposed roadside/curb drainage system.

2. When inlets are to be fabricated on a curve refer to the plans to determine the radius, and where necessary, modify the inlet detail accordingly, based on what is required.

3. All reinforcing steel shall have 1/4" minimum cover unless otherwise shown. Inlet tops shall be either cast-in-place or prestressed concrete.

4. Precasting of this inlet top will be permitted. Prestressed units shall conform to the dimensions shown or in accordance with approved shop drawings. Precast unit drawings approved shall be directed to the State Drainage Engineer.

5. Concrete meeting the requirements of A.S.T.M. C 494 (4,000 P.S.I.) may be used in lieu of Class I concrete for prestressed units, manufactured in plants which are under the Standard Operating Procedures for the inspection of prestressed concrete products.

6. The corner fillets shown for rectangular threats are necessary only where threats are made in conjunction with circular inlet bottoms or when used on shoe with rectangular inlet bolts.

7. For inlet bottoms see Index No. 200.

8. These inlet tops are designed for use with standard curb and gutter Type 2 and Type 7. Locate outside of pavement crosswalks where practical.

9. See Index 202 for supplementary details.

10. All steel used for frame and cover shall meet the requirements of A.S.T.M. A-36.

11. Either cast iron covers or steel covers may be used, iron covers shall be Class No. 30 castings in accordance with A.S.T.M. A-48.

12. When Alternate "C" Cover is specified in plans either the cast iron cover or galvanized steel frame or the hot galvanized steel cover and frame shall be used. Covers are to be graded in accordance with the grading symbol shown on sheet 2 of 2, in lieu of rack welding.

13. Inlet to be used for under the contract unit price for Inlets (Curb Type ...), Fines.

Curb Inlet Tops

Types 5 & 6

Sketches Showing Frame Seat and Throat Recess

State of Florida Department of Transportation
Road Design

SHEET 2 OF 2

CURB INLET TOPS

Types 5 & 6

Dimensions

1/4" Scale

Sheet 00

Scale

Inches

Designed by

Reviewed by

Approved by

Printed by

10/02

1 of 2

21
OPTIONAL STEEL GRATES

INSET A
- Inset Grate with Extended Endbar to Front of Wall

INSET B
- Cross Bar Options
  - Welded
  - Electroformed

INSET C
- Inset Grate with Bar Stubs and Stems of Wall

SECTION EE
- Vertical Grid with Intermediate Bars
  - Horizontal Bars
  - Bearing Bars

SECTION KK
- Cross Section

PLAN
- Main Bars 5 x 1
- Cross Bars - Either Welded or Electroformed

STAR SYSTEM
- State of Florida Department of Transportation
- Motor Vehicle Design

BARRIER WALL INLET
CONCRETE BARRIER WALL (RIGID C & D)
### Recommended Maximum Pipe Sizes

<table>
<thead>
<tr>
<th>Inlet Inside Width</th>
<th>Pipe Size</th>
</tr>
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<tbody>
<tr>
<td>2&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>4&quot;</td>
<td>48&quot;</td>
</tr>
<tr>
<td>6&quot;</td>
<td>60&quot;</td>
</tr>
</tbody>
</table>

Notes: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 200. For slotted pipe see below detail right and Index No. 200.

### General Notes

1. This inlet with parallel bar grate shall be used for all paved areas; inlets at curbs and other depressed concrete facilities subject to heavy vehicular loading should be selected from the next higher size. Grates with wide span opening, are unsuitable. On depressed areas facilities with designated major access and on all other facilities, including areas overpassing crushed stone highways, the flat plate grate shall be used.

2. Reinforcing steel on No. 4 bars at 1/2" centers both ways with 2" clearance to inside of wall andtrzym bars to be cut or bent for 1/2 minimum clearance around pipe.

3. All exposed edges and corners shall be rounded to 1" radius.

4. When Alternate "G" grate is specified in plans, the grate shall be hot dip galvanized after fabrication.

5. For supplementary detail see Index No. 200 and 201.

### Gutter Inlet Type S

#### Steel Grate

![Diagram of Gutter Inlet Type S]

**Note:** All A. & B. Structure below this. See Index No. 200

**Inlet with Structure Bottom**

#### General Information

- **Section BB**
- **Section AA**
- **Section DD**
- **Section CC**
- **Section EE**
- **Section FF**

---

**State of Florida Department of Transportation**

**Engineer:**

**Preparer:**

**Scale:**

**Sheet:**

**Drawn:**

**Approved:**

**Revised:**

**Date:**

**Designation:**

**Notice:**

**Issued:**

**220**
GENERAL NOTES

1. This inlet is designed for village streets, railways, or other areas subject to heavy wheel loads, minimum details and subject to pedestrian and/or bicycle traffic.

2. When alternate 10" grate is specified in plans, the grate is to be not slip-dipped or galvanized after fabrication.

3. Reinforcement - No. 6 bars at 6" o.c., both ways. Cut or bend bars out of way of pipe to clear pipe 11/2".

4. All exposed edges and corners shall be rounded to 3/8" radius.

5. Recommended minimum pipe sizes shown are for concrete pipe.

6. For supplementary details see Index No. 23.

PLAN

SECTION AA
Recommended Minimum Pipe Sizes:
2"-6" wall - 24" size
4"-0" wall - 36" size

SECTION BB

STEELE GRATE
TWO REQUIRED PER INLET
Wash Bars 5" x 4 3/8"
Intermediate bars 1/2" x 3/8"
Reinforcing bars 1/2" x 3/8"

Steel grate: Manufactured by Barlow, Fishtail Steel, U.S. Flowery Irving, Pennsylvania, Division of Equit."
### APPLICATION GUIDELINES FOR DITCH BOTTOM AND MEDIAN INLETS

<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>TYPE LOCATION</th>
<th>CAPACITY (CFS)</th>
<th>SAFETY</th>
<th>DEBRIS TOLERANCE</th>
<th>PIPE SIZE LIMITATION</th>
<th>OTHER DESIGN CONSIDERATIONS</th>
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<tr>
<td></td>
<td></td>
<td>GRADE ONLY</td>
<td>GRADE WITH SINGLE STD. SLOT</td>
<td>GRADE WITH SINGLE TRAP SLOT</td>
<td>TRAFFIC</td>
<td>PEDESTRIAN</td>
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<td></td>
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<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
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<tr>
<td>230</td>
<td>Limited Access Facilities</td>
<td>7</td>
<td>4</td>
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<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>231</td>
<td>*Outside CZ</td>
<td>6</td>
<td>6</td>
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<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>232</td>
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<td>4</td>
<td>8</td>
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<td>7</td>
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<tr>
<td></td>
<td>*Outside CZ</td>
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<td></td>
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<td>6</td>
<td>19</td>
<td>13</td>
<td>14</td>
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<tr>
<td></td>
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<td>7</td>
<td>24</td>
<td>14</td>
<td>NA</td>
</tr>
<tr>
<td>233</td>
<td>Inside CZ</td>
<td>9</td>
<td>5</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Inside CZ</td>
<td>23</td>
<td>7</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>234</td>
<td>Inside CZ</td>
<td>9</td>
<td>4</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>235</td>
<td>Outside CZ</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

1. All inlets must be selected to satisfy hydraulic acceptability, with proper consideration given to safety and economics.
2. CZ denotes clear zone, formerly CRA denoting clear recovery area.
3. Alternative grade should be specified when in salt water environment.
4. Inlets without slots or inlets with traversable slots may be located within the clear zone, inlets C, D, and E capacity and debris tolerance may be increased by the addition of a slot. Slotted inlets located within roadway clear zones and in areas accessible to pedestrians shall have traversable slots. Traversable slots are not adaptable to Inlet Type F.
5. Special ditch blocks require plan details.
6. Pipe size limitations are based on circular Class III, B Wall, Concrete Pipe. Elliptical pipe and corrugated pipe are to be checked for fit in accordance with Index No. 20A, metric pipe sizes should be rounded up to the nearest 3" and 3" x 4" corrugation for larger sizes.
7. The capacity values shown are approximate and are intended as a guide to assist in describing relative performance. Inlets are assumed to be in a sag condition (No Bypass Flow). The effects of vortex flow have not been considered. Inlet control is assumed. The designer must verify the outlet conditions and design assumptions before accepting the capacity values shown; outlet constraints are likely to control with minimum pipe sizes.

---

**Flow Condition A - Gravel Flow Conditions**

1. Grates are 50% blocked with 3" of water depth above the grate.
2. Slots are 25% blocked.
3. Gravel Flow Equation: Q = 0.67 A \( \sqrt{F} \)

**Flow Condition B - Weir Flow Conditions**

1. A 3" head above the top of the inlet is assumed.
2. The effective weir length is assumed to be equal to the inlet perimeter with no deduction for the grate or debris.
3. For inlets with slits, the effective head for the side of the inlet with the slit is 0.5" for standard 0.5" slits and 0.0" for traversable slits. The slit is assumed to be 25% blocked. In some instances the flow will be in gravel flow conditions into the slot.
4. Weir Equations: Q = 3.0 \( \sqrt{F} \)

---

**See Note 1**

---

**See Note 2**

---

**DITCH BOTTOM AND MEDIAN INLET APPLICATION GUIDE**

---

**See Note 3**

---

**See Note 4**
SODDING, PAVEMENT AND DITCH BLOCK

SECTION AA

SECTION BB

SECTION DD

GENERAL NOTES:
1. Notice: Shop is required for use only on that portion of arched access facilities not subject to pavement and all or
began structures.
2. Interior designed for bridges, culverts, or other areas subject to heavy wheeled loads, where deck may be a problem, and
must have lower than 7 ½ ft or more.
3. Rearranging steel No. 4 bars of 9% centers pitch away
with 2° clearance is not to equal to, not to exceed, not to exceed.
4. When alternative gage established in the plan, the gates are to be non-aligned without additional fabrication.
5. Gage being to be included in cost of item. Estimate to be paid for under the contract unit for Sodding, Tone.
6. For supplementary details see Index No. 209.
INLETS

GENERAL NOTES
1. These inlets are suitable for trapezoidal and rectangular sections and are to be used in streets, sidewalks and other areas subject to infrequent traffic crossings but are not to be shaped in areas subject to heavy vehicular traffic.

2. Inlets subject to vehicular traffic should be constructed without access, whereas inlets in areas subject to pedestrian traffic should be constructed with access. Grate types listed within roadway clear zones and in areas accessible to pedestrians should have removable grates. The manufacturer's specifications shall be found in the Type E-6 section. All may be constructed of either or both sexes as shown on plans.

3. Other grates are to be used on all areas where ingate traffic is anticipated. Grates of this type are to be used on all inlets with removable grates. Either cast iron or steel grates may be used on inlets without traffic where drainage is to be anticipated. Either cast iron or steel grates may be used on all inlets with non-removable grates. Subject to the contractor's discretion, these grates may be removed in the future, when necessary to grates is warranted by the existing traffic conditions. All grates generally existing other traffic, or the cost from grate may be used, unless the grate eliminates the particular type.

4. Recommended maximum grate sizes shown are for concrete pipes. Pipe sizes larger than those required must be checked for 75 lbs. per sq. ft. pressure.

5. All hinged areas and edges of concrete are to be chamfered.

6. Placement to be used on inlets without traffic and inlets with non-removable grates only when directed in the plans but required on all inlets without grates. Can be located in sidewalk or pipe for bowls. Sections shown are for information only.

7. Traversable roads constructed in existing basins may be held for on-line ticketing, and steel are to be used for out escapes. These and any other type of replacement grades.

8. Sidewalks to be used on all inlets not located in paved areas and pipe for under connect and pipe for side load.

9. For supplementary details see section No. 20.

STEEL GRATES

NOTICE: Steel Grates Are Required On Inlets With Traversable Stairs And On Inlets Where Bicycle Traffic Is Anticipated.
TRAVERSABLE SLOTS

SECTION AA

SECTION BB

SECTION CC

PAVEMENT AND SODDING QUANTITIES FOR TRAVERSABLE SLOTS

<table>
<thead>
<tr>
<th>Pavement</th>
<th>Single Slot</th>
<th>Double Slot</th>
<th>Single Slot</th>
<th>Double Slot</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>EW L</td>
<td>CW L</td>
<td>SW L</td>
<td>CW L</td>
</tr>
<tr>
<td>C</td>
<td>4.87</td>
<td>0.71</td>
<td>6.15</td>
<td>0.83</td>
</tr>
<tr>
<td>D</td>
<td>0.99</td>
<td>0.01</td>
<td>7.00</td>
<td>1.00</td>
</tr>
<tr>
<td>E</td>
<td>1.88</td>
<td>0.26</td>
<td>7.31</td>
<td>1.00</td>
</tr>
</tbody>
</table>

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

DITCH BOTTOM INLETS
TYPES C, D, E, & H
1. The general purpose of these revisions is to remove the need for the pre-existing inlet face, 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 revision of the approach note depends on the relationship between inlet top and ditch elevation, and, on the vertical clearance between the top of the uppermost point of the inlet and the grade. The purpose for Case 1 conversion is to still the bypass water between the inlet and existing breach. Case 2 conversion is for existing breach and all other transitions are not required. Case 3 will be as applied to ditches with further grades adjusting the inlet. Case 3 will normally be applicable to ditches with weir grades adjusting the inlet where grading of the existing ditch is desirable.

3. The designer should investigate 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 below water level, materials will be required to adjust the inlet (Case 3) and vertical clearance. In other conditions, materials are not required. If the slope is below water level, the designer should adjust the slope (Case 3) for the 25 feet required. Inlet to ditch reconstruction is required when the 25 feet instead of extending below water level, the designer shall provide reassurance to the designer and the engineer that the plans to be taken the 25 feet rise shall be taken over with a part of that reassurance the 25 feet rise. The designer shall provide reassurance that ditch improvement is required for ditch reconstruction with the 25 feet rise and include that improvement under any design. This is independent of the other cases.

When the designer is converting to be dealt with Case 3, the designer shall adjust the inlet case (Case 3 (Deletion)) to the plans. The designer shall determine whether low or other conditions at each individual lase need be dealt with for underdrainage. Case 3 conversion and shall be designed, Type 1 to the plans.

**METHOD OF PAYMENT**

1. Existing water conveyed to traversable slotted face under Case 1, 2 and 3 shall be paid for as inlets, except, where required, in the plans.

2. Where existing ditch reinforcement work within 25 feet of each traversable slotted face conversion, whether required by these details or as a direct result of the conversion, shall be included as a part of the particular case. Reinforcement work shall include excavation of silt or trash materials. No bar equipment is placed, grading, compaction, shaping and sealing and backfilling. Soaking, ditch alignment and underdrainage are not included as part of the ditch, but paid for under separately.

3. Unit payment and settlement shall be in accordance with the provisions in this specification with the Emers on Sheet 2 of the and Sections A.A. BB and CC. In Case 3 and hydro facilities on Sheet 3 of the

4. Unit price and settlement shall be constituted and underdrainage for the conversion, underdrainage shall be paid for under the specified unit price for inlets (Ditch) and Types 1, 2, 3, 4, etc.

Soaking shall be paid for under the contract unit price for Soaking, 5.

Ditch soiling shall be paid for separately from the interior by payment for inlets (Ditch) in the plans. Cost of material shall be paid in the plan.

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

1. These inlets are designed for use in streets, medians, pavement aprons, or other areas subject to heavy wheel loads where access is restricted and is subject to damage from and/or bicycle traffic.

2. When alternate G grates is specified in plans, the grate is to be not dipped withinclevend of top frame.

3. These inlets may be used with any B structure details, index 200. The inlet and bottom combinations are to be priced under the contract unit price for Slotted (ST) Bar.

**PAVEMENT AND SODDING**

**TYPE F**

- Steel Grating: Straight Bars 3" x 2"""" x 2" x 2", Perforated Bars 3/8" x 3/8" x 3/8" x 3/8"

**TYPE G**

- Steel Grating: 5" x 6", Slot Bars 5/8" x 5/8" x 5/8" x 5/8"

**SECTION AA**

- 2" Concrete Pavement
- B. 5/36" x 5/36"
- C. 5/36" x 5/36"

**SECTION BB**

- 4" Concrete Pavement
- 3/8" x 3/8" x 3/8" x 3/8"

**SECTION CC**

- 3/8" x 3/8" x 3/8" x 3/8"
- 3/8" x 3/8" x 3/8" x 3/8"

**SECTION DD**

- 3/8" x 3/8" x 3/8" x 3/8"
<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>TYPE</th>
<th>DESCRIPTION</th>
<th>APPLICATION</th>
<th>PIPE SIZE</th>
<th>CROSSRAIN</th>
<th>SIDEDRAIN</th>
<th>MEDIAN</th>
<th>INLET END</th>
<th>HYDRAULIC PERFORMANCE</th>
<th>Outlet END</th>
<th>PERMITTED GRADE AVAILABLE</th>
<th>EROSION TOLERANT</th>
<th>EROSION LOCATION</th>
<th>SAFETY</th>
<th>TRAFFIC SAFE</th>
<th>ECONOMIC RATING</th>
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</thead>
<tbody>
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<td>0.2</td>
<td>Limited</td>
<td>Good</td>
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<td>For back of sidewalk location see Index No. 282</td>
<td></td>
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<td>Good</td>
<td>Outside C2</td>
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<td>Fair</td>
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<td></td>
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<td>Limited</td>
<td>Yes</td>
<td>Excellent</td>
<td>0.2</td>
<td>Limited</td>
<td>Good</td>
<td>Outside C2</td>
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<td>Fair</td>
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<td>Limited</td>
<td>Yes</td>
<td>Excellent</td>
<td>0.2</td>
<td>Limited</td>
<td>Good</td>
<td>Outside C2</td>
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<td>Good</td>
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<td>Good</td>
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<td>Good</td>
<td>0.5</td>
<td>Yes</td>
<td>Very Good</td>
<td>Outside C2</td>
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<td>Very Good</td>
<td></td>
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<td>Yes</td>
<td>Fair</td>
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<td>Yes</td>
<td>Good</td>
<td>Inside C2</td>
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<td>Yes</td>
<td>Fair</td>
<td>0.7</td>
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<td>Good</td>
<td>Inside C2</td>
<td>No</td>
<td>Good</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. All end treatments must be selected to satisfy hydraulic suitability with proper consideration given to safety and economics.
2. C2 design clear zone, formerly ETA, directing clear recovery area.
3. Grates should not be placed on outlet ends unless positive overt's protection is provided at inlet end.
4. Additional notes concerning application restrictions may be shown as individual indexes.
5. Economic ratings are based on statewide average costs.
6. End treatments with a Ke of 0.5 or greater should be used only in areas of low design velocities and negligible debris.
7. Pipe sizes are shown. Class III B Well, concrete pipe. Caliper pipe and corrugated pipe are to be checked for fill in accordance with Index No. 205; metal pipe sizes should be reviewed using 25 x 2 corrosion up to 30" and 35 x 7 corrosion for larger sizes.
ENDWALL DIMENSIONS (EXCLUSIVE OF MULTIPLE PIPE SPACING)

NORMAL PIPE

SKewed PIPE

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

GENERAL NOTES

1. Endwall dimensions, location and positions are for round and ovaloidal concrete pipe and for round
and pipe-in-pipe corrugated meter pipe. Round concrete pipe shall be shown.

2. Front slope and other transitions shall be in accordance with index No. 280.

3. Endwalls may be cast in place or precast concrete. Reinforcing steel shall be Beams A-40 or A-60. Additional
reinforcement necessary for retaining around 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 smooth-faced.

5. Concrete meeting the requirements of ASTM C-498 (1400 psi) may be used in lieu of Class I concrete
in prestressed concrete pipe joints which are under the Standard Operating Procedures for the
Inspection of Prestressed Pipe products.

6. On smooth-trenches with side slopes flatter than 1:1, provide 20 transitions from the endwall to the Taller
side slope, right of way permitting.

7. For cast-in-place endwalls see index No. 280.

8. Payment for concrete quantities for endwalls 

9. Pipe length plan quantities shall be based on the

10. Payment for pipe in pipe quantities shall be based on

11. Endwalls to be paid for under the contract unit

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SINGLE AND MULTIPLE PIPE

ENDWALLS

STRAIGHT CONCRETE ENDWALLS
### Round Concrete and Corrugated Metal Pipe

#### Open Area

<table>
<thead>
<tr>
<th>D (in)</th>
<th>Opening Area (SF)</th>
<th>Class I Concrete (CY)</th>
<th>Number of Pipes</th>
<th>Number of Pipe and Skew Angle of Pipe</th>
<th>Approx. Equiv. Round Pipe</th>
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#### Corrugated Metal Pipe Arch

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#### Concrete Elliptical Pipe

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Note: Use the guidelines of Section No. 8 for selecting favorable quantities.
GENERAL NOTES

1. Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this sheet. Design specifications AASHTO M-96. Precast construction which adheres to this index, including any additional reinforcement required for freezing shall be submitted by the Contractor or supplier, and require additional approval. 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. 350 for spacing and grouting details.

2. Prestressing steel shall be either Grade 40 or 60.

3. Concrete shall be Class D except concrete meeting the requirements of ASTM C 496 (4000 psi) may be used in lieu of Class D concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the Inspection of Precast Drainage Products.

4. Channels: All exposed edges and corners to be chamfered 1" unless otherwise shown.

5. Slab-pipe shall be dimensioned closed to all surfaces in contact with concrete and 12" beyond the boundary of contact. Any suitable structural material may be field applied.

6. Grouting shall be in accordance with Index No. 281 and paid for under the contract unit price per foot, 59.

7. Basis of payment for either cast-in-place or precast construction shall be the estimated quantities indicated on the Index. Concrete and reinforcing steel shall be paid for under the contract unit price for Class D Concrete (Endwalls) Or and Reinforcing Steel (Pipes) 126.

END notations:

- Cast-in-place endwalls shall conform to the details on this sheet. Design specifications AASHTO M-96.
- Precast construction shall require additional approval from the State Drainage Engineer.
- Prestressing steel shall be either Grade 40 or 60.
- Concrete shall comply with Class D or ASTM C 496 (4000 psi).
- Channels shall be chamfered 1" unless otherwise specified.
- Slab-pipe shall be dimensioned closed to all surfaces in contact with concrete and 12" beyond the boundary.
- Grouting shall be in accordance with Index No. 281 and paid for under the contract unit price per foot.
- Basis of payment for cast-in-place or precast construction shall be estimated quantities indicated on the Index.

SPECIAL REQUIREMENTS:

- Cast-in-place endwalls shall conform to the details on this sheet. Design specifications AASHTO M-96.
- Precast construction shall require additional approval from the State Drainage Engineer.
- Prestressing steel shall be either Grade 40 or 60.
- Concrete shall comply with Class D or ASTM C 496 (4000 psi).
- Channels shall be chamfered 1" unless otherwise specified.
- Slab-pipe shall be dimensioned closed to all surfaces in contact with concrete and 12" beyond the boundary.
- Grouting shall be in accordance with Index No. 281 and paid for under the contract unit price per foot.
- Basis of payment for cast-in-place or precast construction shall be estimated quantities indicated on the Index.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PINE RIDGE

SADDLE CAST CONCRETE ENDCONSTRUCTION

SINGLE AND DOUBLE 66" PIPE
Footing Seal Foams CMP Only

SECTION BB

PLAN
(Showing Bars in Filling)

SECTION AA

HALF ELEVATION
(Showing Bars in Back Face Of Wall)

GENERAL NOTES

1. Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this Index, design specifications AASHTO M65. Precast construction which conforms to this Index, including any additional reinforcement required for needling which shall be determined by the Contractor or supplier, need not require additional approvals. Deviations from this Index, for precast units, shall require the approval of the State Highways Engineer prior to construction. For precast construction, see Index No. 201 for splicing and grouting details.

2. Rebar shall be either Grade 60 or 40.

3. Concrete shall be C30, except concrete meeting the requirements of ASTM C 492 (4000 PSI) may be used in lieu of Class 2 concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.

4. Concrete shall be C30, except concrete meeting the requirements of ASTM C 492 (4000 PSI) may be used in lieu of Class 2 concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.

5. Concrete shall be C30, except concrete meeting the requirements of ASTM C 492 (4000 PSI) may be used in lieu of Class 2 concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.

6. Concrete shall be C30, except concrete meeting the requirements of ASTM C 492 (4000 PSI) may be used in lieu of Class 2 concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.

7. Reinforcing steel shall be in accordance with Index No. 201 and placed for the contract unit price for Reinforcing Steel.

8. Bending Schedule for the contract unit price for Reinforcing Steel.


10. Bending Schedule for the contract unit price for Reinforcing Steel.

BENDING DIAGRAM

NOTES: All dimensions are in ft and in.

ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>B</th>
<th>R/G</th>
<th>QTY</th>
<th>U/G</th>
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 72' PIPE

Design No. B-1400
Project Section No. 256
Plan No. R-10
Sheet No. 2

December 14, 1995

Prepared by: M. J. Morgan
Reviewed by: M. J. Morgan
Approved by: M. J. Morgan

253
### TABLE OF DIMENSIONS AND QUANTITIES FOR ONE ENDWALL

<table>
<thead>
<tr>
<th>SIZE OF PIPE</th>
<th>H</th>
<th>T</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>F</th>
<th>X</th>
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<th>TWO PIPE CULVERTS</th>
<th>THREE PIPE CULVERTS</th>
<th>FOUR PIPE CULVERTS</th>
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<td>L</td>
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<td>8'-9&quot;</td>
<td>1.2</td>
<td>1.2</td>
<td>11'-7&quot;</td>
</tr>
</tbody>
</table>

**Note:**

1. For concrete and corrugated metal pipes, concrete pipe is shown.
2. The top row of riprap bags shall be secured by pinning, using no. 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 side 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.

The cost of furnishing and installing the bars shall be included in the cost of the riprap.

---

**STRAIGHT SAND-CEMENT ENDWALLS**

<table>
<thead>
<tr>
<th>Designed By</th>
<th>Approved By</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN**

258
GENERAL NOTES
1. Baffles to be constructed only when used for in plane.
2. When steel-grating is required on endwall see Sheet 3 or 3 for details.
3. Reinforcing size 4 bars with 2° clearance except as noted.
4. All angles, channels and bars shall be ASTM A 242, A 446, A 572 or A 586, Grade 50 steel, and generalized in accordance with Section 962.7 of the Standard Specifications.
5. Chevron section C 3.6 may be substituted for C 4.8.5, Channel.
6. Preparing of this endwall will be permitted. Present units are to be furnished to the dimensions shown on attached shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer. Use Index No. 20 for opening and grading details.
7. Concrete meeting the requirements of ASTM C 492 (1990) only may be used in lieu of Class I concrete in the form of units manufactured in points which are under the Standard Specifications Procedures for the inspection of precast drainage products.
8. Staking shall be in accordance with Index No. 28R, and paid for under the contract unit price for Staking Item 19.
9. Endwall to be paid for under the contract unit price for Class I Concrete Endwalls | CY and Reinforcing Steel | Fixed/1 Yd. Cost of grades to be paid for under the contract unit price for Endwall Grade UB, plus quantity. Cost of galvanized bolts and nuts to be included in the bid price for the grade.

ENDWALLS FOR 2:1 SLOPES

**DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL**

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**WITH BAFFLES**

**DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL**

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**WITHOUT BAFFLES**
MOUNTING FOR STEEL GRATE

STEEL GRATING USE CRITERIA:

1. Grates to be used on slop queen outlets located within the designated clear areas. Positive anti-sewer shall be provided at all outlets openings. Grates shall not be used where one or more of the following conditions exist:
   A. Drainage area to contain consists of median or infilled areas or areas where water flows onto on street or navigable waterways.
   B. Riprap is located to be sheet flow or in such other conditions that sheet transport is not considered a major problem.
   C. Riprap to contain minor except on an infrequent basis.
   D. 15 to 20 year frequency for example a drainage basin in flat sandy terrain with naturally slow ground water table.
2. Areas whererip rap transmission with resultant bedload erosion will not seriously affect roadway alignment, traffic operation or adjacent property.
3. Steel grating to be used only where called for in plans.

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRATE

<table>
<thead>
<tr>
<th>Type of Grate</th>
<th>Size of Pipe</th>
<th>12' Foot Bar (3.6 m) Lbs.</th>
<th>1' Diameter 5/4 Lbs.</th>
<th>2 Bars 4' 8' 8' Lbs.</th>
<th>Total Weight Lbs.</th>
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
A R R O W  D E S I G N

U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRADE OPTIONAL
6" TO 30" PIPE

DESIGNER CIVIL ENGINEER:

SUCCESS "S" 261
### Dimensions and Quantities for Metal Pipe Arch Culverts

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Quantity of Sand-Cement Riprap in Cu. Yds., for One Endwall</th>
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### Dimensions and Quantities for Round Pipe Culverts

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### U-Type Sand-Cement Endwalls

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GENERAL NOTES
1. Flared and sections shall conform to the requirements of AASHTO A-100 except where otherwise noted. All dimensions shall be in inches. All symbols and abbreviations shall be as herein specified. Unconfined compressive strength of concrete shall be 4000 psi. Shear drawings for flared ends shall be submitted to the State Engineering Branch.

2. Connections between the flared end section and the pipe shall be of the following types unless otherwise specified on the plans:
   a. Joints meeting the requirements of Section 940.1-5 of the Standard Specifications for Highway Bridges.
   b. Joints which utilize the provisions for shear connectors as specified in the Standard Specifications for Highway Bridges.

3. Any wire mesh arrangement which provides a 0.08 square inch area of steel per linear foot shall be considered as reinforcement. The wires shall be spaced a minimum of 2" apart 12" and 24" on centers.

4. Reinforced concrete jackets shall be as specified in the Standard Specifications for Highway Bridges. The reinforcement shall be placed in the contract unit price for the flared end section.

5. All parts of the flared end sections shall be painted with the pipe. All parts shall be painted with the pipe. Paint shall be as specified in the Standard Specifications for Highway Bridges.

DESIGN NOTES
1. Flared end sections are intended for use outside the curve on a section drain and cross drain installations, except that flared end sections for pipe sizes 36" and 48" are permitted within the curve. When the pipe intersection angle is greater than 90°, the pipe shall be reinforced in accordance with Section 940.1-5 of the Standard Specifications for Highway Bridges.

2. Reinforced concrete jackets shall be used at all locations where high velocities and/or highly erosive soils may cause erosion or pipes may fail. These locations are to be shown on the plans.

3. Top wall shall be placed whenever the anticipated velocity of discharge and soil type are such that erosion or pipes may fail. Top wall shall not be required where ditch pavement is provided, except when ditch pavement fails.
### Dimensions and Quantities

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### Cross Drain

**Mitered End Section**

**Single and Multiple Corrugated Metal Pipe-Arch**

**Note:** See Sheet 6 For Details and Notes.
### Dimensions & Quantities

### Quantities for 3" Thick Concrete Slabs (Cy)

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#### Cross Drain Mitered End Section

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### State of Florida Department of Transportation

**CROSS DRAIN**

**MITERED END SECTION**

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**272**
GENERAL NOTES

1. Mitred and sections for pipe sizes 5", 6", and 8" round or equivalent pipe oval or elliptical oval pipe are permitted within the clear zone. When the clear zone intersection permits, the interior and exterior may be located with the interior starting as close as 6" beyond the outside edge of the shoulder.

2. Slop and ditch transitions shall be used when the normal roadway slope must be flattened to plans and section surface clear zone. See details.

3. The reinforced concrete slab shall be constructed for all sizes of cross drain pipe and cast in place with Class 3 concrete. Slabs shall be 5" thick unless 3" thickness are cast for in plans.

4. Concrete pipe used in the assembly of interior and section shall be inspected for voids and perpendicular connections.

5. Concretes shown plan dimensioning is furnished during excavation and forming for reinforced and section shall be notched.

6. Trenches, formations, and pipe shall be之作Linethickened before placing the concrete.

7. Cross-otherwise designated in the plans, concrete pipe mirrered and sections may be used with any type of cross drain pipe. Concrete pipe cross sections shall be constructed with any type of concrete pipe unless otherwise specified. When reinforced concrete slabs are not used in the assembly of cross drain pipe, reinforced ends shall be constructed with reinforced slabs or concrete pipe.

8. When the soil and section pipe is unstable to the cross drain pipe, a concrete jacket shall be constructed in accordance with standard Index 2003.

9. When developing cross drain pipe are spaced other than the dimensions shown in this detail, or have not equalized areas, or have non-uniform sections, the reinforced and section shall be constructed either as single pipe exterior and section or connected as multiple pipe and sections as directed with the Engineer(s). However, reinforced and section shall be placed for each independent pipe end.

10. The use of an air pipe is recommended, ensuring excellent connections with concrete, concrete, sections, and spacers, and flanged ends shall be included in the plan for the interior and section. Scheduling shall be placed for reinforcement under the contract unit price of Standard 24.

11. Mitred and sections shall be paid for under the contract unit price for Mitred End Section C24. Each, based on each individual pipe end. Mitred and sections use for determination/attention shall be paid for under the contract unit price for Mitred End Section C24.

CONCRETE PIPE CONNECTOR

ANCHOR DETAIL

All hems, belts, nuts, and washers are to be galvanized steel. Bolt diameters shall be 1/2" for 5" to 9" pipe and 3/4" for 10" to 12" pipe. Two connectors required per joint. Bolts are to be spaced at 60° right and left of bottom center of pipe. Bolt holes in pipe shall be to be utilized.

ANCHORS required for CWP only.

Anchor, washer, and nuts to be not galvanized steel.

Sand must be required at center of concrete slab. Concrete surfaces shall be required after bending. Anchors are to be spaced at distances, as shown in 1.41. Corrugations. Places anchors in the outside cross of corrugations.

Flat washers to be placed on inside wall of pipe. Washers in the interior end pipe are to be drilled or punched, burning not permitted.
### Dimensions & Quantities

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<th>F</th>
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<th>B</th>
<th>C</th>
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<th>G</th>
<th>R</th>
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**Remarks:**
These sizes are restricted to inlet and outlet treatments for water management systems or similar applications.

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### Diagrams

**Top View - Single Pipe**

**Top View - Multiple Pipe**

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**Section**

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

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**State of Florida Department of Transportation**

**Mitered End Section**

**Single and Multiple Round Corrugated Metal Pipe**

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**Notes:**

*To be used on Pipe 8" and Smaller*

*For Pipe 10" and Larger*

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**Drawings:**

*Drawings for Pipe 8" and Smaller*

*Drawings for Pipe 10" and Larger*
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**Concrete Side, 3" Thick, Reinforced With WBP E64-W440-4.**

**Notes:** See Sheets 5 and 6 for details and general notes.
### Dimensions & Quantities

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

*Stage 1: Mitered End Section for Pipes 24" x 38" and Smaller. Option 2: For Pipes 28" x 45" and Larger.

*Stage 2: Mitered End Section for Pipes 24" x 38" and Smaller. Option 2: For Pipes 28" x 45" and Larger.

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**Concrete Sidewall Reinforcement:**

- Top View - Single Pipe
- Top View - Multiple Pipe

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**SIDE DRAIN MITERED END SECTION**

**SINGLE AND MULTIPLE ELLIPTICAL CONCRETE PIPE**

---

**SECTION**

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F P.S. Bradenton, FL

6/30/2003

EIA-176-A

F.S.A. Approved 01/25/04

Page 4 of 6

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GENERAL NOTES

1. Unless otherwise designated in the plans, concrete pipe, mitered and sections may be used with any type of side drain pipe. Corrugated steel pipe mitered and sections may be used with any type of side drain pipe except aluminum pipe. And, corrugated aluminum, mitered and sections may be used with any type of side drain pipe except steel pipe. When a hubless coated metal pipe is specified for side drain pipe, mitered and 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 and sections shall be of selected lengths to avoid excessive connections.

3. Corrugated metal pipe gasketing that is damaged during bending and perforating for mitered end section shall be repaired.

4. That portion of corrugated metal pipe in direct contact with the concrete side shall be hubless coated prior to placing of the concrete.

5. Corrugated polyethylene pipe (CPE) for side drain application of 10", 16", or 24" diameter shall utilize either corrugated metal or concrete mitered sections.

When used in conjunction with corrugated metal mitered and sections, connection shall be by either a formed metal bend specifically designated to join CPE pipe and metal pipe or other coupling approved by the State Drainage Engineer. When used in conjunction with a concrete mitered section, connection shall be by concrete jacket constructed according to Index No. 280.

6. When existing multiple side drain pipes are spaced other than the distances shown in the details, or have non-parallel axes, or have non-uniform sections, the mitered end sections will be constructed either separately as single pipe mitered and sections or collectively as multiple pipe and 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 bedding and backfill requirements shown on Index No. 280.

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 sizes 30" or greater, pipe-size 35" x 24" or greater and vitrified pipe 19" x 30" or greater shall be gasketed unless excluded in the plans. Smaller sizes in pipe shall be gasketed only when called for in plans. The lower grate on throating downstream ends on divided highways shall be omitted.

10. Grates are to be fabricated from steel ASTM A 53, 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 and corrosive-free environment may be fabricated from galvanized pipe, with base metal exposed during fabrication repainted as specified in Section 562. Standard Specifications or, fabricated from steel pipe and not dipped galvanized after fabrication in accordance with ASTM A 123. Grates subject to salt water or highly corrosive environment shall be not dipped galvanized after fabrication in accordance with ASTM A 123.

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 and sections where a minimum spacing of 30' will not result between the face points of the mitered and sections.

13. The cost of all pipe (1.5), grates, fasteners, reinforcing, connectors, anchors, concrete, securals, jackets and coupling bands shall be included in the cost for the mitered end section. Trenching shall be paid for separately under the contract unit price for Trenching, 3T.

14. Mitered end sections shall be paid for under the contract unit price for Mitered End Section (150), each, based on each independent pipe end.

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.

2. 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 90).

3. The design engineer shall determine highly corrosive locations and specify in the plans when the grates shall be non-dipped galvanized after fabrication (General Note 40).

4. The design engineer shall determine and designate in the plans which alternate types of mitered section will not be permitted. The restriction shall be based on corrosive or structural requirements.
SCHEDULE OF BELL REINFORCEMENT

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Detail of Bell & Spigot Concrete Pipe Joint Using Round Rubber Gasket

**Concrete Jacket**

- Filter Fabric Joint Required
- Double Gasket (Preferred Plastic)

**Preformed Plastic Joint (Before Pull-Up)**

Cost of concrete jacket or filter fabric jacket to be included in cost of elliptical concrete pipe coupling.

**Elliptical Concrete Pipe Joints**

- Overlap Filter
- Filter Fabric Jacket Required

**Concrete Collar for Extension of Existing Pipe Culverts**

**Concrete Collar for Joining Mainline Pipe and Stub Pipe**

MISCELLANEOUS DRAINAGE DETAILS
SECTION BB

- **Normal Slab Thickness**
- **Additional Concrete Required:** Only when:
  - Normal Slab Thickness
  - Is Less Than 8".
- **6"** Unless Otherwise Shown in Plans.
- 3.75 Bars x 3" Cts.
- For Entire Width of Curved Slab.
- 2.5" Shown in Plan.
- Curved Wall.

SECTION CC

- **Normal Slab Thickness**
- **Additional Concrete Required:** Only when:
  - Normal Slab Thickness
  - Is Less Than 8".
- **6"** Unless Otherwise Shown in Plans.
- 3.75 Bars x 3" Cts.
- For Entire Width of Curved Slab.
- 2.5" Shown in Plan.
- Curved Wall.

PLAN

**PLAN INLET TYPE A GRATE**

- **3.75 Bars x 3" Cts.**
- For Entire Width of Curved Slab.
- **Normal Slab Thickness**
- **Additional Concrete Required:** Only when:
  - Normal Slab Thickness
  - Is Less Than 8".
- **6"** Unless Otherwise Shown in Plans.

**PLAN INLET TYPE B GRATE**

**MISCELLANEOUS DRAINAGE DETAILS**

**EXTRA BASE FOR CROSS BOX CULVERTS UNDER FLEXIBLE PAVEMENT**

**FRANGIBLE BASE**

- Use Extra Base When Thiss Dimension is Less Than 0.5".
- Extra Frangible Base Material to be placed for all equivalent square foot areas, except where material is called for on culvert or drainage decks.

**ASPHALTIC CONCRETE BASE**

**NOTE:** Extra base is required when cross box culverts are located on facilities subject to high traffic speeds (>40 mph) or high traffic volumes (>4000 ADT) and the cover is within the range specified in the notation above.

**INLET IN TOP OF BOX CULVERT**

- **INLET TYPE B GRATE**
- **NOTE:**
  - 1. Cost of Steel Grating to be included in cost of Box Culvert.
  - 2. All sheet shall be 1/8" thick.
Provide Approximately 0.33% Grade On Gutter, Slightly Warming The Surface Of The Median Pave 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.

Median Width As Indicated In Detail Plan

Grade To Drain As Shown In The Plan Or Adj usted By The Engineer During Construction

Prop. Plan.

Crown Line (Exit, Plan. Or Lane. Line Of Superimposed Part. (Exit, Plan. Or New Curb Lane.)


SECTION AA

SECTION BB

Flume Detail

GENERAL NOTES

1. These details are to apply to projects while present for the construction of 2- lane sections in 4 - lane divided highway sections and for superimposed sections of new 4- lane divided highway. Unless shown in illustration only. Cost of flumes to be included in the contract price for Curb or Curb and Gutter. See to be paid for under the contract unit price for Second, Sr.

2. Flumes to be located to the right of each of the intersections designated in the sketch. The locations may be adjusted by the Engineer during construction.
GENERAL NOTES

1. This detail not recommended for grades greater than 6.5% or discharges exceeding 0.5 cfs.

ESTIMATED QUANTITIES

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*Quantity shown above includes pavement 6 ft. "Length of Slope". For each additional feet of slope length add 0.34 to yds.*
DETAIL OF CONC. SPILLWAY AT END OF SHOULDER GUTTER

1. Spillway to be left for as shoulder gutter.

2. If spillway empties into a shallow or median ditch, the ditch should be modified as necessary.
DESIGN NOTES FOR UNDERDRAIN

1. The type of underdrain should be selected to meet design water removal rate and soil conditions. Criteria is prescribed in the use of these typical sections since special designs may be required to satisfy specific conditions.

2. Type I underdrain is intended for minimum water removal conditions.

3. Type II underdrain is intended for moderate water removal conditions. Where required conditions may create infiltration design, the use of an inverted filter manifold under the filter fabric is recommended.

4. Type III underdrain is intended for maximum water removal conditions. The filter fabric separation is required between the coarse aggregate or fine aggregate including those described in general notes 2 and 3. Design note 3 applies for reverse conditions.

5. Type IV underdrain is intended for maximum water removal underdrain and edging drain applications.

6. Type II underdrain is intended for use in pavement trenches and other locations where a filter separation is required. Type II underdrain is recommended and Type III should be used only when Type II is inappropriate. The standard filter aggregate specified for Type II underdrain conforms to filter aggregate requirements of Chapter 25, 26, and 27 of A.A.C.

7. The designer should evaluate whether a filter fabric envelope is required around underdrains Types II, III, and IV. When required, fabric should be specified in the plans. Fabric to be paid for separately.

GENERAL NOTES FOR UNDERDRAIN

1. The underdrain pipe shall be either 4" smooth or 5" corrugated tubing unless otherwise shown in the plans. The size to be furnished shall be based on the nominal internal diameter of a pipe with a smooth inner wall. Except when prohibited by the plans, the standard provisions for a pipe with a corrugated inner wall may be provided based on the following sizes: 4" smooth interior equivalent to 5" corrugated interior; 5" smooth interior equivalent to 6" corrugated interior; 6" smooth interior equivalent to 7" corrugated interior; 7" smooth interior equivalent to 8" corrugated interior.

2. Fine aggregate shall be quartz sand meeting the requirements of Sections 902-4 of the Standard Specifications.

3. Course aggregate shall be gravel or stone meeting the requirements of Sections 905-2(a) or 905-2(b) as requiring. The gradation shall meet Section 906-1(b), Grade G, No. 5, No. 5, or No. 5 grade unless otherwise specified in the plans.

4. Underdrain Type II, III, and IV shall be in accordance with Sections 440 and underdrain Type IV (Cementation) in accordance with Section 440.

5. Filter fabric shall be Type I-3, 5, 7, 10, or 11, as specified.

6. Where corrugated polyethylene tubing with fused or welded seams is used in conjunction with fine aggregate, a filter fabric backing meeting Section 904-5 shall be required.

7. For standard location details, see Index S602. Special locations require specific details in the plans.

8. All filter fabric joints shall overlap a minimum of one (1) foot.

9. Underdrain outlet pipes shall be constructed in accordance with the outlet pipe details and general notes for discharge edging drain. Sheet 0 of 2. outlet pipes are 4" diameter unless larger pipe sizes are specified in the plans.

10. Pay for them shall be based on the size of the smooth interior product. The contract unit price for Underdrain is the total unit price for Underdrains, L.F. shall include the following components for each underdrain type as follows:


External filter fabric envelopes, when specified for underdrain Types I, II, III, and IV, shall be paid for separately under the contract unit price for Plastic Filter Fabric. 1 SF.
**Curb and Gutter Construction**

**Future Curb and Gutter Construction**

**PLAN**

- **Section AA**
  - **Valley Gutter**
  - **Curb and Gutter**

**PROFILE**

- **FLARED END**
- **STRAIGHT END**

**Curb and Gutter Endings**

**Curb and Gutter Types E & F**

**Expansion Joint Between Gutter and Concrete Pavement**

**Curb and Gutter and Type A Curb Adjacent to Flexible Pavement**

**General Notes**

1. For use adjacent to concrete or flexible pavement, concrete shown.
2. Expansion joint preferred joint filler and joint seal are required adjacent to concrete pavement only, see diagram right.

**Concrete Curb and Gutter**

**Asphaltic Concrete Curb**

**Contraction Joint in Curb or Curb and Gutter**

**Concrete Bumper Guard**

**Shoal Gutter**

- Notes for use adjacent to concrete or flexible pavement, concrete shown.
- For details, see diagram right.

**State of Florida Department of Transportation**

**Curb & Curb and Gutter**

[Diagram showing various curb and gutter designs and details]
**UNCURBED MEDIANS**

**CURBED MEDIANS**

### TURN LANES • CURBED AND UNCURBED MEDIANS

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<td>70'</td>
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<td>145'</td>
</tr>
</tbody>
</table>

Notes: Right turn lane taper and distances identical to left turn lanes. Queue lengths and deceleration distances are to be maximized for facility conditions. The tabulated deceleration distances are minimum values, except where lesser values are imposed by unrelentable control points.
OPTION I

LONGITUDINAL SECTION (NORTH)

TRANSVERSE SECTION

OPTION II

LONGITUDINAL SECTION (NORTH)

TRANSVERSE SECTION

TYPE I CONCRETE TRAFFIC SEPARATOR

LONGITUDINAL SECTION (NORTH)

TRANSVERSE SECTION

TYPE II CONCRETE TRAFFIC SEPARATOR

LONGITUDINAL SECTION (NORTH)

TRANSVERSE SECTION

TYPE III CONCRETE TRAFFIC SEPARATOR

LONGITUDINAL SECTION (NORTH)

TRANSVERSE SECTION

TYPE IV CONCRETE TRAFFIC SEPARATOR

LONGITUDINAL SECTION (NORTH)

TRANSVERSE SECTION

NOTES

1. Separators Types I and II are to be used with flexible pavement. Separators Types III and IV are to be used with rigid pavement.

2. Either Option I or Option II may be used for Types I and II separators except when a specific option is called for in the plans.

3. Separators having widths other than 4", 6", 8", 10" shall be selected in the plans as special separators and priced under the contract unit price for either Concrete Traffic Separator (Special) or Special (FWA-5).

TRAFFIC SEPARATORS
INTRABLOCK RAMPS AND DIMENSIONAL FEATURES FOR RAMPS TRANSVERSE TO SIDEWALKS

Drip Curb
(Do Existing Facilities Require And
Handicapped Curb & Gutter?)
For Property Site See Figure Note E.
2'-0" Curb Transition

Concrete Sidewalk

MEDIAN CROSS RAMP

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
9035 NW 132nd Terrace
Miami, FL 33186-0351

CURB CUT RAMPS
PHYSICALLY HANDICAPPED

PLAN

SECTION CC

Ramps Should Be Intersect At Centerline Of Medians.
On The 0.02 Rise Where The Roadway Profile Changes
Are Sharp, The Slopes May Intersect Off Centerline.
For Variable Profile Grades Or To Accommodate Other
Construction In The Median, However, Slopes Shall Not
Exceed The 0.01 Rise.

Cross Ramp
(Concrete Sidewalk, E)

Back Of Sidewalk Drop

DIAGONAL RAMPS

CHAPTER 304 
1994 FLORIDA BUILDING CODE

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.04 And Per 0.02.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.01 And Per 0.01.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.02 And Per 0.02.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.03 And Per 0.03.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.04 And Per 0.04.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.05 And Per 0.05.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.06 And Per 0.06.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.07 And Per 0.07.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.08 And Per 0.08.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.09 And Per 0.09.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.10 And Per 0.10.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.11 And Per 0.11.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.12 And Per 0.12.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.13 And Per 0.13.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.14 And Per 0.14.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.15 And Per 0.15.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.16 And Per 0.16.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.17 And Per 0.17.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.18 And Per 0.18.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.19 And Per 0.19.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.20 And Per 0.20.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.21 And Per 0.21.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.22 And Per 0.22.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.23 And Per 0.23.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.24 And Per 0.24.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.25 And Per 0.25.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.26 And Per 0.26.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.27 And Per 0.27.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.28 And Per 0.28.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.29 And Per 0.29.

Back Of Sidewalk Drop Required For Sidewalk Slopes
0.30 And Per 0.30.
1. Curb cut ramps are to be constructed on all curved facilities. Where a curved crosswalk meets a sidewalk, the crosswalk and sidewalk ends shall be either existing to receive new markings and construction.

2. Ramps locations are to be determined with ear to conform with crosswalk marking details as shown in the plans.

3. If a curb ramp is located where pedestrians must walk across the ramp, then it shall have a line showing the minimum slope of the ramps shall be 1:4.1:4.1:4.1:4.

4. Curb ramps with return cuttings which may be used where pedestrians would not normally walk across the ramp.

5. Ramps shall be a concrete surface, finished to a depth not exceeding ½ by use of a ramp or material furnished with an wearing surface of at least 0.003 wire cloth, plain weave, conventional crane, 0.003 expanded metal, or 0.003 expanded metal grating.

6. Ramps to be constructed at all locations shown in the plans even when sidewalk is not constructed concurrently.

7. Ramps to be paid for as follows:
   - Drop curbs to be paid for under the contract unit price for the Drop Curbs: 3.01 or Curb and Gutter Type 1 (Concrete). Existing street furniture removed curb and gutter to be included in the cost of curb and gutter.
   - Ramps to be paid for under the contract unit price for Drop Curbs: 3.01. Existing street furniture removed curb and gutter to be included in the cost of curb and gutter.
   - Ramp bays are to be located in the cost for ramps pay quantity shall be sidewalk area only.
**METAL OR PLASTIC CAPS FOR DOWEL BARS**

**Plain Steel Dowel Bar**

**Bar Support and Spacer**

**Metal or Plastic Cap**

**Plug or Hinge Joint** (Placed below bar diameter)

**Plain Steel Dowel Bar (Cost and Lubricate in Accordance With Section 300 of the Standard Specifications)**

**Top of Pavement**

**Note:** Expansion Joints to be placed approx. 50 ft or street intersections and other locations indicated in plans. **TRANSVERSE EXPANSION JOINT**

**Note:** Plain Steel Dowel Bar (Cost and Lubricate in Accordance With Section 350 of the Standard Specifications). **TRANSVERSE CONTRACTION JOINT, VIBRO CAST METHOD**

**Note:** Plain Steel Dowel Bar (Cost and Lubricate in Accordance With Section 350 of the Standard Specifications). **TRANSVERSE CONTRACTION JOINT, SAWED METHOD**

**Note:** Plain Steel Dowel Bar (Cost and Lubricate in Accordance With Section 350 of the Standard Specifications). **TRANSVERSE Expansion Joint**

**Deflected Metal Plate**

**Note:** Butt Construction Joint to be Used at Discontinuities of Work. **DEFORMED METAL PLATE**

**Note:** Keyed longitudinal joints are required on all concrete pavement 9 ft wide or greater. The keyed joint may be formed by either the metal plate detailed above, by forming shaped timber to the side forms or, by extrusion from slip-form pavers. Alternate keyed shape and tie bar details may be approved by the Engineer. **LONGITUDINAL CONSTRUCTION JOINT**

**Note:** Slabs poured simultaneously. Tie bars may be inserted in the plastic concrete by means approved by the Engineer. **LONGITUDINAL LAME-TIE JOINT**

**Note:** For Joint seal dimensions see Sheet 2 of 5. **LONGITUDINAL JOINTS**

**CONCRETE PAVEMENT JOINTS**

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN**

**Concrete Pavement Joints**

**Transverse Joints**

**Transverse Joints are to be spaced at a maximum of 30 ft. Dowels are required at all Transverse Joints unless otherwise noted in Plans.**
### Concrete - Concrete Joints

<table>
<thead>
<tr>
<th>Joint Width</th>
<th>Sealant bead thickness</th>
<th>Backer rod diameter</th>
<th>Min. Joint Depth</th>
<th>Backer rod placement depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.063</td>
<td>1.5</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>1.5</td>
<td>0.063</td>
<td>2.0</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>0.063</td>
<td>2.0</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>0.063</td>
<td>3.0</td>
<td>18</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Dimension w will be shown in the plans or as specified by the Engineer based on field conditions. Dimension w will be unspecified so that the shape factor f has a minimum value of 2.0 and a maximum value of 10.

### Concrete - Asphalt Shoulder Joints

**For New and Rehabilitation Projects:**
- Either Tape or Backer Rod Bond Breaker Required.
- Shoulder must be repaired if proper joint shape cannot be attained.

### Joint Seal Dimensions

- **Concrete - Concrete Joints:**
- **Concrete - Asphalt Shoulder Joints:**

---

**Backer Rod Bond Breaker (Concrete-Concrete Joints):**

- Saw Cut Or Formed Joint
- Joint Sealant Material To Be As Specified In The Plans
- Tape Bond Breaker

- Saw Cut Or Forming Strip
- $\frac{1}{8}$ to $\frac{1}{4}$ of 12° Clinch, Plain, No. 1, Not Required For Construction Joints Or Existing Joints Or Cracks.

- Preformed Elastomeric Compression Seal

- Joint Width

- Saw Cut Or Forming Strip
- $\frac{1}{8}$ to $\frac{1}{4}$ of 12° Clinch, Plain, No. 1, Not Required For Construction Joints Or Existing Joints Or Cracks.

- Joint Sealant Material To Be As Specified In The Plans
- Backer Rod Bond Breaker

**Concrete - Pavement Joints:**

- **Concrete - Concrete Joints**
- **Concrete - Asphalt Shoulder Joints**

---

**State of Florida Department of Transportation**

**Concrete Pavement Joints**

- Designed by: [Name]
- Drawn by: [Name]
- Revised by: [Name]

---

**Designated: 11/15/00**

**Drawn: 11/15/00**

**Revised: 12/15/00**

**Scale: 1/8" = 1'-0"**

**Sheet: 2 of 5**

**305**
Dowel Assemblies for Expansion and Contraction Joints

**Florida Steel Corporation**

**The Dayton Sure Grip and Shore Company**

**Wady Industries, Inc.**

**Expansion Gap**
- Bolt and lubricate bar in accordance with Section 350 of the Standard Specifications.

**Section BB**
- Top View
- See Joint Details
- Filter Support Wire
- Dowel Bar Sleeve
- Filter Support Tie Bars
- Dowels 12" Centers
- Center Spacer Bar
- Joint Filter

**Section AA**
- Expansion Assembly
- Contraction Assembly
- Dowel Assemblies for Expansion and Contraction Joints

**Expansion and Contraction Assembly**

**Concrete Pavement Joints**

**State of Florida Department of Transportation**

**Road Design**

**FLA-510**

**Lane No.**

**Designated**

**Date**

**To Scale**

**F.P.R.A.**

**Drawing No.**

**Sheet**

**3 of 5**

**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

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

JOINT LAYOUT AT ENTRANCE AND EXIT RAMP TERMINALS

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

**REINFORCING STEEL**

- Concrete Pavement
- Steel Water Strip
- Subbase
- Concrete Pavement
- Steel Water Strip
- Subbase
- Rigid Shoulder Pavement

**SECTION AA**

**OPTIONAL SEALS**

- Polyurethane Compression Seal Installed As Per Manufacturers Specifications.

**NOTES**

1. Expansion joints shall be constructed perpendicular to the existing transverse pavement joints or on new projects, parallel to the standard transverse pavement joints shown in the plans for new construction.

**DESIGN NOTES**

1. For rehabilitation projects, the designer must indicate in the plans the number of slabs to be renewed, the number of expansion joints to be constructed/reconstructed, and the location of expansion joints.

2. Pay quantity of expansion Joint to be consumed across pavement of right angles to the centerline of the roadway pavement. Shoulder pavement joint included.

**GENERAL NOTES**

1. The centerline of roadway and the centerline of bridge do not necessarily align. Prior to the placement of the expansion joint, the centerline of the roadway pavement shall be determined.

2. For information on other types of concrete pavement joints see Index No. 339.

3. 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 subbase, steel 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, Lt.
GUARDRAIL APPLICATION FOR ROADSIDE HAZARDS

DIVIDED ROADWAY - DETAIL B

UNDIVIDED ROADWAY - DETAIL C

OPPOSING TRAFFIC - DETAIL D

ONE-WAY TRAFFIC - DETAIL G

GUARDRAIL APPLICATION FOR MEDIAN AND GORE HAZARDS
GUARDRAIL APPLICATIONS FOR BRIDGES WITH FULL WIDTH SHOULDERS

UNDIVIDED ROADWAY - DETAIL S

GUARDRAIL APPLICATIONS FOR EXISTING BRIDGES WITH LESS THAN FULL WIDTH SHOULDERS

DIVIDED ROADWAY - DETAIL T

Note: See General Notes No. 2, See Details J and N For Connections To Bridges.
GUARDRAIL LENGTH (FEET)

- Lengths are based on desirable clear zone widths for lighter areas on longer roadways, and the lengths of approach needed to avoid normal pedestrian incidents.
- Lengths are increased for curvilinear zones, curved roadways, steep gradients and other hazards present.

GUARDRAIL APPLICATIONS FOR MEDIANS 50 FEET OR GREATER

GUARDRAIL LENGTHS

GUARDRAIL APPLICATIONS FOR MEDIANS GREATER THAN 30' AND LESS THAN 50'
GUARDRAIL APPLICATIONS FOR MEDIANS 30' OR LESS WITH 10' BRIDGE SHOULDERS

GUARDRAIL APPLICATIONS FOR MEDIANS 30' OR LESS WITH 6' BRIDGE SHOULDERS

NOTE:
This guardrail configurations shown apply only to parallel or near parallel bridges with median 30' or less in width. When medians 30' or less in width are closed by continuous fencing between the bridge travel ways, traffic separation shall be attained by appropriate treatments such as, but not limited to, painted medians, curbs, guardrail, concrete barrier walls and special barriers.
**WOOD POSTS**

**STANDARD FLARE-DETAIL P**

---

**BEARING PLATE**

**SOIL PLATE**

**STEEL POSTS**

**End Anchorage Type II**

**Timber Breakaway Posts**

---

**WOOD POSTS**

**STEEL POSTS**

**Steel Plate**

---

**STEEL TUBE**

**TIMBER BREAKAWAY POST**

---

**CABLE ASSEMBLY**

**END ANCHORAGE TYPE IV**

---

**GUARDRAIL**

---

**Notes:**

- All posts in flare except breakaway posts to be standard length posts.
- All posts except breakaway post will have street blocks. For post and street block combinations see Sheet 1 of 4.

The beginning of guardrail need to be determined by Figure 1 (length of approach). Sheet 1 of 4.

---

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

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**400**
Approach Treatment for Standard Flare for Curb and Gutter

Detail Q
ENCASED GUARDRAIL POST

Curb Inlet Type 1

Curb Inlet Type 2

Curb Inlet Type 3

Curb Inlet Type 4

Curb Inlet Type 5

Curb Inlet Type 6

Special Post Locations on Curb Inlets

1. 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.

2. Special posts and their anchorage mounted on curb inlets shall be in accordance with special steel post/anchorage Sheet No. 14, and paid for under the contract unit price for Special Guardrail Post, each.

3. Variations shown for the locations of special posts mounted on inlets are established from standard post spacing described in Section 3060.9 of the State of Florida Highway Design Manual, and assumes a 3% tolerance of standard post spacing from Reeds 1.0. Use of single and double offset blocks on standard posts adjacent to the bridge rail or driveway railing is not recommended.

4. Encased guardrail posts shall be in section to standard timber and steel posts, and be paid for under the contract unit price for Special Guardrail Post, each. Payment shall include cost of face wrap and concrete excavation.

Legend

- Variations in location of Special Post
- Single Offset Block (x 1) on Adjacent Standard Post (s x 1)
- Expected location by using Double Offset Blocks on Adjacent Standard Posts (s x 1)
GENERAL NOTES

1. Whenever an existing bridge handrail is to be removed, be refurbished or be replaced, and a determination that must be made independently of any information contained on this index.

2. The schemes on this index are not to be used for new bridge construction, bridge widening, bridge structure or bridge replacement, or for existing bridges that were wing walls for guardrail connection that conflict with current Roadway Design Standards and Bridge Design Standards.

3. The schemes on this index are divided into two general categories, representing curved and uncurved approaches. A scheme selection guide is provided under "Designer Notes" for curved and uncurved roadway approaches. Approach wall with curbs or wing walls with metal safety rails are treated as curved roadway approaches.

4. Each bridge features shown in these schemes are example configurations only. The principles key to bridge design are bridge size, location, intrinsic geometry, and supporting roadway approach. Close consultation with curbs or wing walls with metal safety rails will be treated as curved roadway approaches.

5. Details that are repetitive on the schemes and features that are detailed on the index are intended to be used as a general guide only, and must be modified by the engineer to meet specific design criteria and standards. Bridge design details should be used as a guide and not be relied upon as the final design.

6. All schemes are right side or left side details for traffic flow right to left. Left side applications are opposite handed.

7. For unclassified two-way bridges in rural areas, as used in this index, it is in relation to the direction of travel on near side traffic, but it is always considered as an approach for opposite lane traffic.

8. All connections of guardrail sections should be to separate anchorage points. Piers and wall for the steel guardrail should be 0.15 of the steel guardrail post spacing. Special guardrail sections should be a minimum length equal to the thickness of the steel guardrail post. The guardrail sections should be of the same length.

9. Unless otherwise specified, the plans exposed concrete surfaces shall have a Class 3 finish and Class 3 Finishing Coating in compliance with Sections 500 and 400 respectively of the Standard Specifications.

10. The guardrail end anchorage scheme shown on this index do not contain cost for payment of guardrail. See Index 400 for cost of guardrail measurements.

11. Each approach wall shall be placed on a concrete beam that is to be designed for the following: a) Each concrete wall is to be designed for the normal load and wind pressure. b) Each guardrail section shall be designed for the normal load and wind pressure.

12. Each approach wall shall be placed on a concrete beam that is to be designed for the normal load and wind pressure. c) Each guardrail section shall be designed for the normal load and wind pressure.

13. Each approach wall shall be placed on a concrete beam that is to be designed for the normal load and wind pressure. d) Each guardrail section shall be designed for the normal load and wind pressure.

14. Each approach wall shall be placed on a concrete beam that is to be designed for the normal load and wind pressure. e) Each guardrail section shall be designed for the normal load and wind pressure.

15. Each approach wall shall be placed on a concrete beam that is to be designed for the normal load and wind pressure. f) Each guardrail section shall be designed for the normal load and wind pressure.

16. Each approach wall shall be placed on a concrete beam that is to be designed for the normal load and wind pressure. g) Each guardrail section shall be designed for the normal load and wind pressure.

17. Each approach wall shall be placed on a concrete beam that is to be designed for the normal load and wind pressure. h) Each guardrail section shall be designed for the normal load and wind pressure.

18. Each approach wall shall be placed on a concrete beam that is to be designed for the normal load and wind pressure. i) Each guardrail section shall be designed for the normal load and wind pressure.

19. Each approach wall shall be placed on a concrete beam that is to be designed for the normal load and wind pressure. j) Each guardrail section shall be designed for the normal load and wind pressure.
BRIDGES WITH APPROACHING ROADWAY CURB

CAST IN PLACE PANELS

SCHEME 5

Applications:
SAFETY CURVE 7'-0" wide, CONCRETE CONTINUOUS BEAM RAILING APPROACH AND TRAVELING END OF ONE-WAY BRIDGES TRAVELING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 6

Applications:
SAFETY CURVE 7'-0" wide, CONCRETE CONTINUOUS BEAM RAILING APPROACH AND TRAVELING END OF TWO-WAY BRIDGES TRAVELING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 7

Applications:
SAFETY CURVE 9'-0" wide, CONCRETE CONTINUOUS BEAM RAILING APPROACH AND TRAVELING END OF TWO-WAY BRIDGES TRAVELING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

CAST IN PLACE PANELS

SCHEME 8

Applications:
SAFETY CURVE 7'-0" wide, CONCRETE CONTINUOUS BEAM RAILING APPROACH AND TRAVELING END OF ONE-WAY BRIDGES TRAVELING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

Note: For Curves Less Than 9'-0" wide, use Cast In Place Panel Only. For Curves Greater Than 9'-0" wide, use Cast In Place Panel and Connection Hardware As Shown In SCHEMES 5, 6, and 7.
CAST IN PLACE TRANSITION WALL

BRIDGE WITH APPROACHING ROADWAY CURB

APPLICATIONS
SAFETY CURVES 6" SPACE OR LESS
CONCRETE PARAPET WITH METAL PIPE RAILING
APPROACH AND TRAILING ENDS OF TWO WAY BRIDGES
APPROACH END OF ONE WAY BRIDGES
APPROACH SLAB FOUNDATION

SCHEME 9

SCHEME 10

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION ENGINEERING

GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES

DESIGNED BY
DISTRIBUTED BY
APPROVED BY

Sheet No.

Scale

Rev.

Approved

4 of 9
GUARDRAIL STEEL TERMINAL POST

Either Special Steel Guardrail Post (index 400) Or Guardrail Terminal Post As Shaded

APPLICATIONS
SAFETY CURB 2'-0" OR LESS IN WIDTH

TRAILING END: SAFETY CURB 3'-0" OR LESS IN WIDTH

APPROACH END: SAFETY CURB 1'-6" TO 2'-0" WIDE

SCHEME 15
STEEL ANCHOR POST AT RADIAL WING WALL

APPLICATIONS
SAFETY CURB 2'-0" OR LESS IN WIDTH

TRAILING END: SAFETY CURB 3'-0" OR LESS IN WIDTH

APPROACH END: SAFETY CURB 1'-6" TO 2'-0" WIDE

SCHEME 16
GUARDRAIL CONTINUOUS ACROSS BRIDGE

END POST WITH SPECIAL END SHOE RECESS

APPLICATIONS
SAFETY CURB 1'-0" TO 3'-0" IN WIDTH

APPROACH END: ONE WAY BRIDGES ONLY

SCHEME 17
CONCRETE ANCHOR POST

BRIDGES WITH APPROACHING ROADWAY CURB
BRIDGE WITHOUT APPROACHING ROADWAY CURB
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
FOCIS DESIGN

BRIDGES WITHOUT APPROACHING ROADWAY CURB

CAST IN PLACE PANELS

APPLICATIONS
SAFETY CURB 8' TO 10' WIDE
CONCRETE CONTINUOUS DECK RAILING
APPLICATION END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

CURVE 9' TO 8' WIDE (A SHOWN)
APPROACH END

CURVE 9' TO 8' WIDE (B SHOWN)
APPROACH END

CURVES GT 9' WIDE (C SHOWN)
APPROACH END

Note: For Approach End Curbs Less Than 9' Wide see SCHHEME 22.

CURB WIDTHS VAR
TRAILING END WHEN OTHER HAZARDS PRESENT

See SCHHEME 2 for Typical Information

CAST IN PLACE PANELS

APPLICATIONS
SAFETY CURB 8' TO 10' WIDE
CONCRETE CONTINUOUS DECK RAILING
APPLICATION END OF ONE-WAY BRIDGES

CURVES GT 9' WIDE
APPROACH END

CURVE 9' TO 8' WIDE
APPROACH END

CURVES GT 9' WIDE
APPROACH END

Note: For Approach End Curves Less Than 9' Wide see SCHHEME 23.

See SCHHEME 2 for Typical Information

CAST IN PLACE PANELS

APPLICATIONS
SAFETY CURB 8' TO 10' WIDE
CONCRETE CONTINUOUS DECK RAILING
APPLICATION END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

CURVE 9' TO 8' WIDE
APPROACH END

CURVE 9' TO 8' WIDE
APPROACH END

CURVE 9' TO 8' WIDE
APPROACH END

Note: For Approach End Curves Less Than 9' Wide see SCHHEME 24.

See SCHHEME 2 for Typical Information

CAST IN PLACE PANELS

APPLICATIONS
SAFETY CURB 8' TO 10' WIDE
CONCRETE CONTINUOUS DECK RAILING
APPLICATION END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

CURVES GT 9' WIDE
APPROACH END

CURVE 9' TO 8' WIDE
APPROACH END

CURVE 9' TO 8' WIDE
APPROACH END

Note: For Approach End Curves Less Than 9' Wide see SCHHEME 25.

See SCHHEME 2 for Typical Information

CAST IN PLACE PANELS

APPLICATIONS
SAFETY CURB 8' TO 10' WIDE
CONCRETE CONTINUOUS DECK RAILING
APPLICATION END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

CURVE 9' TO 8' WIDE
APPROACH END

CURVE 9' TO 8' WIDE
APPROACH END

CURVE 9' TO 8' WIDE
APPROACH END

Note: For Approach End Curves Less Than 9' Wide see SCHHEME 26.

See SCHHEME 2 for Typical Information
Reinforcing Steel: See SCHEME 28.

Note: Scheme compatibility ensures to facilitate reinforcement detailing.

Alignment Controls:
4'-0" Face of Rail To Face of Curb

END VIEW

TOP VIEW

APPLICATIONS
SAFETY CURB WIDER THAN 6'-0" AND UP TO 12'-0"
APPROACH END OF ONE-WAY BRIDGES ONLY

SCHEME 28
CONCRETE ANCHOR POST

APPLICATIONS
SAFETY CURB WIDER THAN 5'-0" AND UP TO 12'-0"
APPROACH END OF ONE-WAY BRIDGES ONLY

SCHEME 29
CONCRETE BRIDGE ANCHORAGE TRANSITION WALL

APPLICATIONS
SAFETY CURB WIDER THAN 5'-0" AND UP TO 12'-0"
APPROACH AND TRAILING END OF TWO-WAY BRIDGES
APPROACH AND TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 30
END POST WITH SPECIAL END SHOE RECESS

Note (Scheme 28):
Portions of existing approach slab curbing, wingwall, shoulder gutter, fixtures and etc. may have to be reapplied or removed.

Transition walls shall be reinforced in accordance with the "Free End Reinforced" detail of Index No. 400 with the reinforced bars spaced as shown in this pictorial. Walls mounted on existing approach slabs shall be anchored into the slabs with the center line of the Relievo reinforcement extending 1'-7" in the slip curing portland cement mortar in accordance with Subsection 400-20 of the Standard Specifications.

Transition walls mounted on soil foundation shall have foundations developed 30" and the walls dropped into the end of the existing bridge in the following manner: Four 1" diameter holes 6" deep shall be drilled in the end post of the existing bridge and No. 6 bars 12" long set in every meter. The beams shall be located as near as practical to the vertical center of the end of the transition wall and equally spaced to provide cover of 3" minimum. The beams shall be covered with a marine grade distemper and then wrapped with an overlay of 1" asphalt felt with the ends clipped.

Approaching guardrail shall have approach post spacings, offset blocks and double H-beams in accordance with Details A, C, D, & E, Index No. 400.

HANDRAIL CURB
APPROACH AND TRAILING END OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES (NOTE: SPECIAL END SHOE TO REMAIN IN THE RECESS ON TRAILING END)
MEDIAN BARRIER WALL FOR SUPERELEVATED SECTIONS OR FOR VARIABLE ROADWAY PROFILE GRADES
LIGHT POLE MOUNTING IN MEDIAN BARRIER WALL

JUNCTION BOX - ELECTRICAL

JUNCTION BOX NOTES

1. Junction boxes are to be fabricated from steel conforming to ASTM A-36 and be hot dipped galvanized after fabrication. All analyses shall be continuous to protect against rust. A separate gasket shall be provided. The cover bolts shall be fully galvanized.

2. Remove excess concrete from the joint from the box or installation unless specifically called for in the plans.

3. Junction box concrete and conduit risers are incidental to the construction of the box or installation unless specifically called for in the plans.

For foundation design and details see Section No. 3503.

For additional information see Index No. 3504.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER WALL

Sheet No. 1001

Project No. 1000

Contract No. 1100

Dated: September 1990

Drawn by: John Doe

Signed by: John Doe

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

410
REINFORCED CONCRETE BARRIER WALL (RETAINING)

NOTE: All longitudinal reinforcement No. 4 bars.

Minimum lap joint length for this wall is 20 feet. 
Weld is to be used for under the corner unit price 
for Concrete Barrier Wall (Right Retaining) 6C.

QUANTITIES: Class B Concrete 0.89 CY/100
Reinforcing Steel 0.0195 LF/100

BENDING DIAGRAMS
WITH PLAIN CONCRETE BARRIER WALL (SHOULDER)

Concrete Traffic Railing On Retaining Wall
Reinforced Concrete Barrier Wall (Shoulder) Communicated.

Bridge Shoulder (See Plans)

Approach Slab

Shoulder Pavement (Same As For Bridge)

2 Panels Min.

Standard Panel

Paved Shoulder (See Plans)

WITH SHOULD GUTTER AND GUARDRAIL

Concrete Traffic Railing On Retaining Wall
Reinforced Concrete Barrier Wall (Shoulder) Communicated.

Bridge Shoulder (See Plans)

Approach Slab

Shoulder Pavement (Same As For Bridge)

2 Panels Min.

Standard Panel

Paved Shoulder (See Plans)

WITH GRASSED OR PAVED SHOULDERS AND GUARDRAIL

Concrete Traffic Railing On Retaining Wall
Reinforced Concrete Barrier Wall (Shoulder) Communicated.

Bridge Shoulder (See Plans)

Approach Slab

Shoulder Pavement (Same As For Bridge)

2 Panels Min.

Standard Panel

Paved Shoulder (See Plans)

CONCRETE BARRIER WALLS ON APPROACHES TO BRIDGES

EITHER REINFORCED CONCRETE BARRIER WALL (SHOULDER) OR RETAINING WALL WITH CONCRETE TRAFFIC RAILING
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

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • CURB AND GUTTER WITH UTILITY STRIP
Two-Way Traffic (Opposing Lane Approach)

One-Way Traffic (Trailing End)

Concrete Barrier Wall (Rigid) (Curb & Gutter) • Transition Segments
WITH OR WITHOUT UTILITY STRIP
NEAT LINE PICTORIAL VIEW

SECTION BB

SECTION AA

NEAT LINE PICTORIAL VIEW

SECTION CC

NOTES:

1. Transition Segments shall be utilized into the end of the Barrier Wall in the following manner:
   - Four 1⁄4" diameter holes 6" deep per 6" centers shall be drilled to the end of the barrier wall for 6" per side and the top of the barrier wall with a 3" x 3" opening extending into the transition segment shall be wrapped with one layer of 15-lb. asphalt felt with the ends overlapped.

2. When Construction Driveway Drains are utilized, the Transition Segment Construction shall be shown as shown to the facing in the following manner:
   - Two 12" x 18" x 6" concrete driveways shall be embedded 3" into the facing. The driveways shall be spaced 18" on centers with the first driveway located 24" from the barrier wall. Driveways may be placed within or adjacent to the roadway.
BARRIER WALL AT SQUARE OR RECTANGULAR SHAPED HAZARD
PARTIAL PLAN

BARRIER WALL AT ROUND PIER
PARTIAL PLAN

NOTES
1. This wall intended for use where at least one end of each wall operable facing bearing against the hazards. If such bearing does not produce the required separation shall be in accordance with the detail for "Reinforced Concrete Barrier Wall" on Sheet 1 Part 1.

2. These walls and their guardrail connections comply with one-way approach and its single ends of two-way facilities on other facilities the wall and structure are to be modified as detailed in the plans.

3. These walls and their guardrail connections comply with one-way approach and its single ends of two-way facilities on other facilities the wall and structure are to be modified as detailed in the plans.

PLAN FOR DESIGN SPEED <50 MPH

PLAN FOR DESIGN SPEED ≥50 MPH

SHOULDER BARRIER WALL AT ABOVE GROUND RIGID HAZARDS
WHEN GUARDRAIL OFFSET FROM HAZARD LESS THAN 3 FEET
INDEX OF SHEETS

SHEET NO. DESCRIPTION
1 General System Features and Bay Selection Guidelines
2 Concrete Backup Wall Assembly
3 Tension Strut Backup Assembly
4 Wide Flange Backup Assembly
5 Concrete Barrier Wall Assembly
6 Transition Assembly Features

GENERAL NOTES
1. The energy absorbing system represented in this standard drawing is a proprietary design by Energy Absorbing Systems, Inc. and marketed under the trade name G-R-E-A-T, short for Guard Rail Energy Absorbing 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 contractors. This standard drawing includes the general graphics and information necessary to test identify component parts of the G-R-E-A-T system (G-R-E-A-T) and their incorporation into a whole system.

3. This standard drawing is sufficient for plan details for the G-R-E-A-T installed as a free standing system or installed in conjunction with concrete barrier walls and other fixed barrier systems, and presumes the requirement for shop drawings submitted unless the plans otherwise call for such submissions.

4. The G-R-E-A-T shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.

5. The G-R-E-A-T is available in 2'-0", 2'-6" and 3'-0" widths. Each of these widths can be matched to any of the four backup assemblies shown in this figure. The four backup assemblies are to be utilized as follows:

(a) Independent systems:
- (1) Concrete backup wall assemblies.
- (2) Tension strut backup assemblies.
- (3) Wide flange backup assemblies.

(b) Non-independent systems:
- (1) Any of the independent systems (a) above with 
  flush end on barrier.

6. Only the G-R-E-A-T non-foam inserts are used in all bays and the nose section.

7. Concrete foundations and backup blocks shall be constructed with 400 psi minimum compressive strength concrete.

8. The G-R-E-A-T shall be constructed on sloped roads and in 25% for Florida.

9. All metallic components shall meet the governing requirements for galvanizing, index No. 400.

10. The G-R-E-A-T System will be paid for under the contract unit price for impact attenuation vehicle (GREAT). Each.

DESIGN NOTES AND GUIDELINES
1. The G-R-E-A-T System (G-R-E-A-T) is designed to sustain vehicular and on-loaded automobiles from impact loads. The G-R-E-A-T is designed to sustain vehicle impact and to resist automobiles from side hits. The G-R-E-A-T is designed to resist side impact and to resist automobiles from side impacts. The number of bays to be used in a specific unit will be determined by the design speed of the roadway and the speed of the impact load. The impact load will be determined by the speed of the impact load, the impact load, and the speed of the impact load. The impact load will be determined by the speed of the impact load, the impact load, and the speed of the impact load.

2. The G-R-E-A-T is a progressive system that is particularly suited to solving hazards subject to high speed traffic, high speed traffic, and traffic with a large number of severe or extreme vehicle impacts from the roadway in the potential exists for such situations. The G-R-E-A-T is not suited to solving hazards of this type.

3. Currently the Department does not recognize other proprietary items as being equally satisfactory alternatives to the G-R-E-A-T, and until such alternatives are available, the G-R-E-A-T need not be bid against other proprietary items.

BAY SELECTION GUIDELINES

<table>
<thead>
<tr>
<th>DESIGN SPEED</th>
<th>50</th>
<th>60</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG. OF BAYS</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>(length)</td>
<td>15'-0&quot;</td>
<td>15'-0&quot;</td>
<td>15'-0&quot;</td>
</tr>
</tbody>
</table>

G-R-E-A-T SYSTEM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD SECURITY

GREAT SYSTEM

CONSTRUCTION DESCRIPTION

1. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

2. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

3. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

4. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

5. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

6. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

7. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

8. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

9. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.

10. "CONSTRUCTION DESCRIPTION" is not defined in the Florida Standard.
### CONCRETE BACKUP WALL ASSEMBLY

#### ASSEMBLY LENGTHS

<table>
<thead>
<tr>
<th>No. of Bays</th>
<th>L (Bays)</th>
<th>L (Foundation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5'-9&quot;</td>
<td>6'-6&quot;</td>
</tr>
<tr>
<td>2</td>
<td>5'-9&quot;</td>
<td>6'-6&quot;</td>
</tr>
<tr>
<td>3</td>
<td>5'-9&quot;</td>
<td>6'-6&quot;</td>
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<tr>
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<tr>
<td>11</td>
<td>7'-0&quot;</td>
<td>7'-6&quot;</td>
</tr>
<tr>
<td>12</td>
<td>7'-0&quot;</td>
<td>7'-6&quot;</td>
</tr>
</tbody>
</table>

Notes: Proceed as written to be in accordance with the manufacturer's installation drawings and specifications.

#### INSET

Any sticking required behind the back up wall shall be constructed in accordance with the rebar set points.

#### NOTES

1. For the number of bays required see table, Sheet I.
2. See Transition Assembly Features for guardrail connections.
3. For design information see the General Notes.
TENSION STRUT BACKUP ASSEMBLY

NOTES
1. For the number of keys required see Table, Sheet 1.
2. See Transition Assembly Features for quadrati connections.
3. For design Information see the General Notes.
**Transitional Assembly Features**

**Double Face Guardrail**

1. The three beam/steel side panel assembly required for all concrete backup, tension strut backup and wide flange backup assembly connections to guardrail, unless otherwise specified in the plans.

2. For additional information see the General Notes and assembly details.

---

**Single Face Guardrail**

Note: Steel or timber posts may be used. Steel posts shown. Single face guardrail connection may be right or left side, as indicated.
GENERAL NOTES

4. The matrix assembly system represented on this standard drawing is a proprietary design by
Corning Abrasive Technologies, Inc. and manufactured under the trade name Brakemaster. Any replacement
of the matrix shown on this drawing must be by the manufacturer of the assembly.

5. This standard drawing is produced by the Florida Department of Transportation solely for use by
the department and its assigns. This standard drawing provides the general information and
instructions necessary to field-install component parts of the Brakemaster system and their incorporation
into a bridge system.

6. This standard drawing is sufficient for plan details for the Brakemaster system installed in connection
with standard single and double faced girders. The Brakemaster system shall be constructed only on a
bridge system that is constructed in accordance with the manufacturers' detailed drawings, procedures, and
specifications.

7. The Brakemaster system shall be assembled and installed in accordance with the manufacturer's
detailed drawings, procedures, and specifications.

8. The Brakemaster system shall be located closer than 1/4 mile from any traffic lane.

9. The matrix assembly system represented on this standard drawing is a proprietary design by
Corning Abrasive Technologies, Inc. and manufactured under the trade name Brakemaster. Any replacement
of the matrix shown on this drawing must be by the manufacturer of the assembly.

10. This standard drawing is produced by the Florida Department of Transportation solely for use by
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into a bridge system.

11. This standard drawing is sufficient for plan details for the Brakemaster system installed in connection
with standard single and double faced girders. The Brakemaster system shall be constructed only on a
bridge system that is constructed in accordance with the manufacturer's detailed drawings, procedures, and
specifications.

12. The Brakemaster system shall be assembled and installed in accordance with the manufacturer's
detailed drawings, procedures, and specifications.

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into a bridge system.

15. This standard drawing is sufficient for plan details for the Brakemaster system installed in connection
with standard single and double faced girders. The Brakemaster system shall be constructed only on a
bridge system that is constructed in accordance with the manufacturer's detailed drawings, procedures, and
specifications.

16. The Brakemaster system shall be assembled and installed in accordance with the manufacturer's
detailed drawings, procedures, and specifications.

17. The matrix assembly system represented on this standard drawing is a proprietary design by
Corning Abrasive Technologies, Inc. and manufactured under the trade name Brakemaster. Any replacement
of the matrix shown on this drawing must be by the manufacturer of the assembly.

18. This standard drawing is produced by the Florida Department of Transportation solely for use by
the department and its assigns. This standard drawing provides the general information and
instructions necessary to field-install component parts of the Brakemaster system and their incorporation
into a bridge system.

19. This standard drawing is sufficient for plan details for the Brakemaster system installed in connection
with standard single and double faced girders. The Brakemaster system shall be constructed only on a
bridge system that is constructed in accordance with the manufacturer's detailed drawings, procedures, and
specifications.

20. The Brakemaster system shall be assembled and installed in accordance with the manufacturer's
detailed drawings, procedures, and specifications.

21. The matrix assembly system represented on this standard drawing is a proprietary design by
Corning Abrasive Technologies, Inc. and manufactured under the trade name Brakemaster. Any replacement
of the matrix shown on this drawing must be by the manufacturer of the assembly.

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the department and its assigns. This standard drawing provides the general information and
instructions necessary to field-install component parts of the Brakemaster system and their incorporation
into a bridge system.

23. This standard drawing is sufficient for plan details for the Brakemaster system installed in connection
with standard single and double faced girders. The Brakemaster system shall be constructed only on a
bridge system that is constructed in accordance with the manufacturer's detailed drawings, procedures, and
specifications.

24. The Brakemaster system shall be assembled and installed in accordance with the manufacturer's
detailed drawings, procedures, and specifications.

25. The matrix assembly system represented on this standard drawing is a proprietary design by
Corning Abrasive Technologies, Inc. and manufactured under the trade name Brakemaster. Any replacement
of the matrix shown on this drawing must be by the manufacturer of the assembly.

26. This standard drawing is produced by the Florida Department of Transportation solely for use by
the department and its assigns. This standard drawing provides the general information and
instructions necessary to field-install component parts of the Brakemaster system and their incorporation
into a bridge system.

27. This standard drawing is sufficient for plan details for the Brakemaster system installed in connection
with standard single and double faced girders. The Brakemaster system shall be constructed only on a
bridge system that is constructed in accordance with the manufacturer's detailed drawings, procedures, and
specifications.

28. The Brakemaster system shall be assembled and installed in accordance with the manufacturer's
detailed drawings, procedures, and specifications.

29. The matrix assembly system represented on this standard drawing is a proprietary design by
Corning Abrasive Technologies, Inc. and manufactured under the trade name Brakemaster. Any replacement
of the matrix shown on this drawing must be by the manufacturer of the assembly.

30. This standard drawing is produced by the Florida Department of Transportation solely for use by
the department and its assigns. This standard drawing provides the general information and
instructions necessary to field-install component parts of the Brakemaster system and their incorporation
into a bridge system.

31. This standard drawing is sufficient for plan details for the Brakemaster system installed in connection
with standard single and double faced girders. The Brakemaster system shall be constructed only on a
bridge system that is constructed in accordance with the manufacturer's detailed drawings, procedures, and
specifications.

32. The Brakemaster system shall be assembled and installed in accordance with the manufacturer's
detailed drawings, procedures, and specifications.
ISOMETRIC VIEW
ANCHOR ASSEMBLY, EMBEDDED BRS

F RONT VIEW
SIDE VIEW
BACK VIEW
ISOMETRIC VIEW
Note: This assembly is driven into 8" dia. 5' deep pilot hole by drive cap furnished.
ANCHOR ASSEMBLY, DPA BRS

DIAPHRAGM, BRS

BRAKE/CABLE REPLACEMENT
Cable Replacement Required When Cable Screws Exposed. See "Design Notes and Guidelines", Note No. 3, for Additional Information.
GENERAL NOTES

1. The energy absorbing system represented in this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name G-R-E-A-TM2, owned by Construction Zone Guard Rail Energy Absorbing 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 subdivisions. This standard drawing provides the general graphic and information necessary to fix and identify components of the G-R-E-A-TM2 System (G-R-E-A-TM2) and their incorporation into a whole system.

3. This standard drawing is sufficient for plan details for the G-R-E-A-TM2 installed as a free standing system or bolted to connection with concrete barrier walls and other fixed barrier systems, and provides the requirement for shop drawing submittals unless the plans otherwise call for such submittals.

4. The G-R-E-A-TM2 unit shall be precast and delivered in accordance with the manufacturer's detailed drawings, procedures and specifications.

5. The standard widths for the 3-bay and 6-bay G-R-E-A-TM2 are 2'-0" and 4'-0".

6. Connection between the G-R-E-A-TM2 and guardrail shall be as shown in the Transition Assembly Features as shown in Index No. 43. For concrete barrier wall with unidirectional traffic there is no connection between the G-R-E-A-TM2 and the wall. The G-R-E-A-TM2 shall be bolted to the end of the wall, but a space shall be allowed of 0" unless otherwise specified. For concrete barrier wall with bidirectional traffic, the "Transition Stud Assembly" shown shall be the only connection between the G-R-E-A-TM2 and the wall.

7. Only the G-R-E-A-TM2 Hex-Fram 9 cartridges shall be used in all bays and the nose section.

8. The G-R-E-A-TM2 unit shall be constructed on cross slopes 0.5% or flatter.

9. All metallic components shall meet the galling requirements for guardrail, Index No. 43.

10. Both steel bolt strands (MP-5 anchors) and anchor pins are supplied with each G-R-E-A-TM2 unit purchased. For units that are resisted and require resin anchorings, the user shall furnish the unit with manufacturer supplied new MP-5 anchors or anchor pins, or, with anchor bolts as approved by the G-R-E-A-TM2 manufacturer.

11. G-R-E-A-TM2 units that have been impacted by vehicles but are to be repaired and resubmitted into service shall have design considerations exchanged when reinstallation is completed. Such reinstallation shall be determined by the manufacturer and subject to prior approval of the Florida Department of Transportation. The manufacturer shall provide new MP-5 anchors or anchor pins that remain undamaged can be reused.

12. The G-R-E-A-TM2 manufacturer's Shoulder Pile Anchor System (SPA system) is not a part of this standard. Any use of the SPA System shall require shop drawing review.

13. The cost for foundations, subgrade preparation and microexpansion joint shown on this index shall be included in the cost for the G-R-E-A-TM2 system. The G-R-E-A-TM2 System will be paid for under the contract unit price for segmented Aluminum (GEAR X TEMPEX) each.

DESIGN NOTES AND GUIDELINES

1. The G-R-E-A-TM2 System (G-R-E-A-TM2) is designed to withstand horizontal and end hits and its resisting horizontal loads from side hits. The G-R-E-A-TM2 is designed to deter narrow fixed hazards or the ends of other fixed barrier systems. The 6 bay unit shall be used for work zone speeds of 50 mph and above and for horizontal 60 mph. The 3-bay unit may be used for work zone speeds of 40 mph or less.

2. The G-R-E-A-TM2 is a retroreflective system that is particularly suited to silhouetting hazards subject to high speed traffic, high speed traffic, and hazardous traffic, and for traffic at the intersection of frequent entry vehicle deactivates (the companies or the access lanes). The G-R-E-A-TM2 is particularly suited to silhouetting hazards where the intersection point is limited, or, if it is particularly suited to silhouetting hazards where the intersection point is located to the traffic lane.

3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the G-R-E-A-TM2 and until such alternatives are available, the G-R-E-A-TM2 need not be bid against other proprietary items.
TENSION STRUT BACKUP ASSEMBLY

UNIT PLAN

UNIT ELEVATION

STRUT AND RAIL PLAN

STRUT AND RAIL ELEVATION

3 BAY UNIT

6 BAY UNIT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION ZONE
G-R-E-A-T

CONTRACT NO. 43
DATE
Rev. 0
SPECIFICATION SHEET NO. 439
State of Florida, Department of Transportation
CONSTRUCTION ZONE
G-R-E-A-T

CONTRACT NO. 43
DATE
Rev. 0
SPECIFICATION SHEET NO. 439
State of Florida, Department of Transportation
FOUNDATION PAD & MISCELLANEOUS ASPHALT PAVEMENT

MP-3 LONGBOLT ANCHOR SYSTEM

FLEXIBLE FOUNDATIONS

ANCHOR PIN SYSTEM
RIGID FOUNDATION NOTES

1. The reinforced portion of the concrete pad (RPCC) foundation is designed to take the G-3-E-A-1/2 type monolithic system. The RPCC foundation shall be constructed with 4000 psi mix concrete with high-strength aggregates. The surrounding surface shall be paved as shown in this view on the 'Trenton Shutters Assembly'. The G-3-E-A-1/2 unit shall be anchored exclusively with the G-3 MP-3 anchor system, supported by the G-3-E-A-1/2 unit, unless another anchor is supported or approved by the G-3-E-A-1/2 manufacturer.

2. The nonreinforced portion of the concrete pad (RPCC) foundation shall be Class 3 concrete, having a minimum compressive strength of 4000 psi. The RPCC foundation shall be constructed with 4000 psi mix concrete with high-strength aggregates. The surrounding surface shall be paved as shown in this view on the 'Trenton Shutters Assembly'. The G-3-E-A-1/2 unit shall be anchored exclusively with the G-3 MP-3 anchor system, supported by the G-3-E-A-1/2 unit, unless another anchor is supported or approved by the G-3-E-A-1/2 manufacturer.

3. For additional information, see the General Notes.

REINFORCED CONCRETE PAD SYSTEM (RPCC)

RIGID FOUNDATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION ZONE
G-R-E-A-T

439
FENCING TERMINALS AT RURAL INTERCHANGES

APPLIES TO ENDS OF CROSROADS AND CROSROAD OVER FREEWAY (BRIDGE OVER CROSROAD SHOWN)

FENCING TERMINALS AT URBAN INTERCHANGES

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 practicable.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION COMMISSION BID DESIGN

FENCE LOCATION

450
BRACE AND POST  BRACE TO BRACE ON LINE  BRACE TO BRACE AT CORNER
FASTENER FOR CONCRETE POST AND BRACES

FASTENER FOR TIMBER POST AND BRACE

CORNER POSTS  END AND PULL POSTS

SPICES

Each horizontal wire to be wrapped around corner, end, and pull posts and tied to same wire. See General Notes 3 and 15. Timber post illustrated. These methods also apply to sheet and concrete post illustrations.

PRESTRESSED POST

PRESTRESSED BRACE

PRECAST POST

PRECAST BRACE

ALTERNATE CONCRETE POSTS AND BRACES

CONCRETE BASE FOR ANGULAR STEEL POST

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

FENCE

TYPE A

TOTAL SHEETS: 2

451
**OPTIONAL "C" LINE POST FOR TYPE B FENCE**

**NOTES**

- Alignment: An extended line of sight of a line.
- Standard line of sight: A line that is aligned with the camera.
- Distance: The distance between two points.
- Time: The time it takes to complete a task.

**FENCE POSITION AT LOCATIONS**

*REFER TO DETAIL PLANS FOR FENCE POSITION AT LOCATIONS WITH FRONTAGE ROADS.*

---

**BARB WIRE ATTACHMENT**

---

**OPTIONAL H-BEAM LINE POST FOR TYPE B FENCE**

---

**TOP VIEW**

BASE PLATE IDENTICAL FOR LINE, END AND CORNER POSTS AND SHALL BE CONSIDERED AN INTEGRAL PART OF THE RESPECTIVE POSTS FOR BARS OF PAYMENT.

FENCE MOUNTING ON CONCRETE ENDWALL AND RETAINING WALLS.
GENERAL NOTES

1. The Contractor may substitute any equivalent equivalent plate gate approved by the Engineer.

2. Cast iron, rolled or formed components that provide equal strength and rigidity may be used in lieu of the steel components.

3. Gates components shall meet or exceed the national requirements specified in Article B, Section 24.

4. All nuts must be knurled top & bottom shoulders.

5. Use of all gate components shall be included in the contract unit price for Sliding Fence Gate & Cantilever Gate, Each.
GENERAL NOTES

1. The opaque visual barrier (OVB) is intended to function as a visual screen, and is not intended to resist vehicle impact loads nor to restrict, contain, or redirect vehicles or traffic. The barrier is designed to eliminate lane marking failure and strikes by light duty vehicles, and is designed to yield to pedestrian strikes by vehicles or larger, and to contain captured segments of the screen when yielding to such strikes.

2. When the opaque visual barrier is constructed on an existing barrier wall, the wall shall be at least 8" in height, extended 6" into the barrier well, and set with an approved chemical grout. Embellishment details shall be designed, sized, and set to minimize the likelihood of the wall being struck by vehicles or larger, and to contain captured segments of the screen when yielding to such strikes.

When the opaque visual barrier is constructed in conjunction with project separate barrier walls, dowels may be set as described above. In either the drilled or preplanted dowel, or placed when the barrier wall is in place. For dowels that are placed when the wall is in place, the dowel shall be 6" long 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 existing infrastructure, the opaque visual barrier shall follow the alignments of any one of the walls and be centered atop that wall.

For multi-lane barrier walls that follow differential profiles, the opaque visual barrier shall be constructed atop the wall with the higher elevation, unless conditions dictate otherwise. Liner transitions and offsets 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 separate bridges, the opaque visual barrier shall be constructed atop the approach side barrier wall, unless different profile layers allow the opaque visual barrier on the departure side barrier wall.

Opaque visual barriers shall be located on opaqued fills between dual barrier walls shall be detailed in the plans.

4. In lieu of the reinforcement shown the Contractor may substitute another material, subject to the satisfaction of the Engineer, and such substitutions shall be submitted with reason for substitution.

5. The Contractor may construct continuous concrete panels in lieu of the cutouts in opaque concrete barrier when approved by the Engineer. Liner assembly and method for anchorage to the barrier wall shall be achieved by shop drawings when requested by the Engineer.

6. Opaque concrete panels shall have a Class 3 surface finish in accordance with Specifications of the Standard Specifications, unless otherwise specified for in the plans. The surfaces shall have a Class 4 sprayed finish in accordance with Specification 405 only when detailed for in the plans.

7. Payment for opaque visual barrier shall be full compensation for concrete, reinforcement, dowels, mixing, placement, finishing, and job-related overhead, and shall be paid for under the contract unit price for Opaque Visual Barrier Concrete: 2' x 3' Height, LF.
IN RURAL CONSTRUCTION

IN MUNICIPAL CONSTRUCTION

REMOVAL OF MUCK

GENERAL NOTES

1. All details shown on this sheet for the removal of muck and plastic material apply unless otherwise shown on the plans.

2. Utilization of relocated materials shall be in accordance with Index No. 505.

3. Where muck or plastic materials are utilized, beneficial use shall be made of suitable materials in accordance with Index No. 505, unless otherwise shown on the plans.

4. The term "Plastic Material" used in this index is in conjunction with removal of plastic materials by definitions under subclauses (a) Plastic (P) and (b) High Plastic (HP) on Index No. 505.

5. The term "Muck" as used on this Index is defined as any material which has an average organic content greater than 15.0 percent, or an individual organic content test result which exceeds seven (7.0) percent. Organic material shall be released as shown on the Index unless directed otherwise by the Engineer.

6. The removal of side-strips shall be 2.5 feet below the shoulder point except as specified.

7. In multipurpose areas, where undertrench is to be constructed beneath the proposed pavement, the grade of the undertrench is to be such that the undertrench fill material will not extend above the bottom of the stabilized sections of the subsurface. Where located in non-plastic or plastic soils the undertrench will be located in accordance with the index "Removal of Plastic Material and Construction of Undertrench in Municipal Construction" as Sheet 2, unless shown otherwise on the plans. Completion of the filter material shall conform to FDOT specifications. Minimum grade of undertrench pipe shall be 0.2%. Gradient.

8. See Index No. 506 for specification and work details.
REMOVAL OF PLASTIC MATERIAL

REMOVAL OF PLASTIC MATERIAL

REMOVAL OF PLASTIC MATERIAL ON INTERSTATE FACILITIES FREEWAYS, DIVIDED PRINCIPAL AND MINOR ARTERIALS AND MAJOR COLLECTORS HAVING DEPRESSED MEDIANS

Note: For GENERAL NOTES see Sheet 1.
FOUR - LANE ROADWAY

TWO - LANE ROADWAY

GENERAL NOTES

1. All dimensions are showners. The details shown on this sheet do not supersede the details shown in the plans or on index sheets 500 or 501.

2. Plastic (P) soils may be placed above the existing water table at the time of construction to a depth of 4 feet of the proposed level, to be sloped uniformly in the lower portion of the embankment for easier excavation.

3. High Plastic (H) soils encountered within the project limits may be used in embankment construction as indicated on this sheet. 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 (0.5%) percent or having an individual value which exceeds four (4) percent, shall not be used in the subgrade portion of the roadbed.

Select S soils (S), or high plastic (H) soils having an average organic content of more than 10 percent, or an organic content individual test result which exceeds seven (7) percent, shall be classified as silt and shall not be used in the portion of embankment below the center line, 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 form a stable 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 subgrade of a particular material. Tests shall be performed in accordance with Florida Highway箭头 as shown on the portion of the sample passing the No. 4 sieve.

5. Highly organic soils, composed primarily of fibrous decaying vegetable matter, often dark brown or black in color with an odor of decay, and sometimes fibrous, shall be designated as mud. Highly organic soils are those which contain particles of highly organic material and may be designated as mud (M).

Highly Organic soils shall not be used within the subgrade or embankment portion of the roadbed, with the exception of mud soils used on top soil as specified in Section 921 of the FDOT Standards Specifications.

DESIGN NOTES

1. The designer shall take into consideration the existing roads and structures and design the embankment to conform to the requirements of the FDOT Standards Specifications.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

EMBANKMENT UTILIZATION

E-2-371

505

FIVE PERIODS OF SERVICE

500

TWO PERIODS OF SERVICE

501

TWO PERIODS OF SERVICE

505
NOTES
1. All base 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. Pounds 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 6" 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 crosswalks.
4. Stabilize entire area under pipeline traffic islands.
5. Stabilize full width under all traffic separators.

MEDIAN STABILIZING DETAILS
SUPERELEVATION TRANSITIONS

2-LANE, 4-LANE OR 6-LANE PAVEMENT, NO MEDIAN

4-LANE OR 6-LANE PAVEMENT WITH MEDIAN

DESIGN SUPERELEVATION RATES FOR RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

NOTE: These details apply to both paved and grassed shoulders. For median shoulders use 0.05 in lieu of 0.06.
Super-elevation transition (L. Varies X 00' Wbl. 1)

Straight line transition outside edge of pavement

Crown point

Outside part edge

Profile grade

Superelevation transition (L. Varies X 00' Wbl. 1)

Straight line transition outside edge of pavement

Crown point

Outside part edge

Profile grade

8 - lane pavement with one lane sloped to median

SECTION A - A
NORMAL CROWNED SECTION

SECTION B - B
SUPERELEVATION SECTION LT. & RT.

SECTION C - C
SUPERELEVATION SECTION LT.
PLANE INCLINED SECTION RT.

SECTION D - D
PLANE INCLINED SECTION LT.
SUPERELEVATION TRANSITON RT.

SECTION E - E
SUPERELEVATION TRANSITON LT.
FULL SUPERELEVATION RT.

SECTION F - F
FULL SUPERELEVATION LT. & RT.
GENERAL NOTES

1. Maximum rate of super elevation in Municipal Construction shall be 0.05.

2. Super elevation shall be obtained by rolling the plane successively about the broad points of the section until the plane has obtained a slope equal to that required. It is recommended that any part of a section and further super elevation be required, the remaining section of the same shall be built on the new edge of the roadway, etc.
**Superelevation Transition 1**

**Example Superelevation Sections and Profiles**

- **Line**
  - A: Inside Travel Lane
  - B: Inside Lane Line
  - C: Inside Median Edge Placement
  - D: Outside Median Edge Placement
  - E: Outside Lane Line
  - F: Outside Travel Lane

- **Superelevation Transition**
  - Normal Section: Variate, See Note Below
  - Super-elevated Section

- **Normal Section**
  - O.B.L.
  - PC or PT of Curve

- **Superelevated Section**
  - O.B.L.

**Special Application Superelevation Rates**

- **D**
  - 30 MPH: 1.00
  - 40 MPH: 1.05
  - 45-50 MPH: 1.10

- **R**
  - 30 MPH: 8.58
  - 40 MPH: 8.12
  - 45-50 MPH: 7.66

Note: The superelevation rates shown above are to be used for general design considerations. It is important to ensure that these rates are adjusted to meet specific site conditions.

**SPECIAL APPLICATION SUPERELEVATION RATES**

**Municipal Construction**

**Example Superelevation Sections and Profiles**

- **Section O-A to O-E**
  - Two lanes each direction

- **Section O-A to O-E**
  - Two lanes each direction with median and auxiliary lane

**State of Florida Department of Transportation**

- **Note:** The sections and profiles shown are examples of superelevation transitions. Similar schemes should be used for roadways having other sections.
### LAYER THICKNESS FOR ASPHALTIC CONCRETE STRUCTURAL COURSES

<table>
<thead>
<tr>
<th>COURSE THICKNESS (INCHES)</th>
<th>LAYER THICKNESS (INCHES)</th>
<th>1st 2nd 3rd 4th</th>
<th>1st 2nd 3rd 4th</th>
<th>1st 2nd 3rd 4th</th>
<th>1st 2nd 3rd 4th</th>
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<th>1st 2nd 3rd 4th</th>
<th>1st 2nd 3rd 4th</th>
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</thead>
<tbody>
<tr>
<td>Type S-2 with Type S-2 Top Layer</td>
<td>Type S-2 Top Layer</td>
<td>Type S-2 Top Layer</td>
<td>Type S-2 Top Layer</td>
<td>Type S-2 Top Layer</td>
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<td>Type S-2 Top Layer</td>
<td>Type S-2 Top Layer</td>
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</tr>
<tr>
<td>Type S-1 with Type S-2 Top Layer</td>
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<td>Type S-1 Top Layer</td>
<td>Type S-1 Top Layer</td>
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<tr>
<td>Type S-11 with Type S-1 Top Layer</td>
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<td>Type S-11 Top Layer</td>
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<td>Type S-11 Top Layer</td>
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<td>Type S-11 Top Layer</td>
<td>Type S-11 Top Layer</td>
<td>Type S-11 Top Layer</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

1. If combinations other than those shown in the table are used, the thickness must be consistent with the following thickness ranges.

   - **Type S-2**: 2", 3" or 4"
   - **Type S-1**: 3", 4", 5", or 6"

   Multiple layers shall be used when possible. Layer combinations shall be as approved by the Engineer.

2. In addition to the Min. Max. Thickness requirements, the following restrictions are placed on the respective materials when used as a structural course.

   - **Type S-2**: 1" max. thickness of fine aggregate over 1/2" thick.
   - **Type S-1**: 1 1/2" max. thickness of fine aggregate over 1 1/2" thick.
   - **Type S-11**: Limited to the first thickness of structural layer, one layer with nothing on top.

3. When quantities are used in tons, equivalent tonnage layer thickness will be determined in inches. (t x 28 = tons/

4. The designer should consider slope conditions for courses thicknesses greater than 4 1/2".

5. When construction includes the paving of adjacent 4’ wide shoulders, the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass using Design Notes.

---

**DESIGN NOTES**

It is desirable that the top course of the superstructure and the adjacent shoulder structural course be constructed in one pass. The following apply when a four-foot shoulder meeting the minimum standards is to be constructed.

- The thicknesses are based on a 0.375 in./ft. roller compaction. A 0.500 in./ft. roller compaction is recommended for use in the structural course and to meet the requirements of the Bituminous Pavement Handbook.

- The shoulder thicknesses are based on a 0.375 in./ft. roller compaction. A 0.500 in./ft. roller compaction is recommended for use in the structural course and to meet the requirements of the Bituminous Pavement Handbook.

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**FLEXIBLE PAVEMENT LAYER THICKNESS FOR STRUCTURAL COURSES**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type S-2</td>
<td>4&quot;</td>
</tr>
<tr>
<td>Type S-1</td>
<td>5&quot;</td>
</tr>
<tr>
<td>Type S-11</td>
<td>6&quot;</td>
</tr>
</tbody>
</table>

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**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**HIGHWAY DESIGN**

**FLEXIBLE PAVEMENT LAYER THICKNESS FOR STRUCTURAL COURSES**

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type S-2</td>
<td>4&quot;</td>
</tr>
<tr>
<td>Type S-1</td>
<td>5&quot;</td>
</tr>
<tr>
<td>Type S-11</td>
<td>6&quot;</td>
</tr>
</tbody>
</table>

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**DESIGN ENGINEER**

**DATE**

**AUTHORITY**

**513**
### 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 thin rock bases are limited to widening which prevents their general use.

2. On any type of widening projects, the base options to be used must be specified by the designer and shown in the plans.

3. Where base options are specified in the plans, only those options may be bid and used.

4. The designer may require the use of a single base option, for instance ABC-3, in a high water condition. This will still be bid as Optional Base.

5. The contractor will indicate the basis for his bid by designating the three digit option code on the bid blank.

---

### General Use Optional Base Groups and Structural Numbers

<table>
<thead>
<tr>
<th>Base Group &amp; Structural Range</th>
<th>ABC-1</th>
<th>ABC-2</th>
<th>ABC-3</th>
<th>ABC-4</th>
<th>ABC-5</th>
<th>ABC-6</th>
<th>ABC-7</th>
<th>ABC-8</th>
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</tbody>
</table>

#### Legend
- **Base Type**: Base Type
- **Base Group & Structural Range**: Unit Structural Number
- **Base Thickness**: Base Thickness
- **Base Structural Number**: Base Structural Number

---

*For composite bases, the construction of both the subbase and ABC, will be paid for under the contract unit price for Optional Base. The subbase thickness shown is ABC. All subbase thicknesses are 6". The base structural number shown is for the composite base.

\(\theta\) To be used for widening only, three feet or less.

\(\phi\) Based on minimum permitted thicknesses.

\(\phi\) Generally restricted to shallow base construction.

** Indicates plant mixed soil placed proportioned by the Brush Base Design Criteria Method per Article 370-3.3.
LIMITED USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS

Note: These base materials may be used on FDOT projects when approved in writing by the District Materials Engineer and shown in the plans.
GENERAL NOTES

1. For definitions and descriptions of access connections "categories" and access "classifications" of highway segments, and for other specified information on access to the State Highway System, refer to FDOT Rules Chapters 6 and 49, "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 major roadway. For this index the term "connect" means a driveway, street or road and their appurtenant islands, pavers, separators, transition layers, auxiliary lanes, roadway, drainage pipes and structures, crossings, culverts, sidewalks, curbs, medians, signing, lighting, pavement markings, required signals, configuration of traffic or other means of access to or from connected access facilities.

3. The turnout requirements set forth in this index do not provide design or maintenance requirements.

4. On Department construction projects all driveways not shown on the plans are to be reconstructed in accordance with these standards, or in conformity with permits issued during the construction project.

5. Driveway shapes shall be sufficient length and size for all vehicular parking, checking, maneuvering, stopping and parking to be carried out comfortably beyond the right of way line. Except for vehicles stopping to enter the highway, the turnout area and driveway within the right of way shall be used only for having vehicles entering or leaving the highway.

6. Connections with expected daily traffic less than 4000, and in urban areas to be constructed as intersecting streets with curb and gutter, and in out-of-areas to be constructed as intersecting roads. The design requirements of this index and those of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.

7. Any connection on a highway having a posted or operating speed over 45 mph shall have radius returns. Any connection requiring or having a specified median opening with left turn storage and served directly by that opening shall have radius returns.

8. Where a connection is attempted to align with a connection across the highway, the through lanes are to be aligned directly with the corresponding through lane. Any connection on a highway having a posted or operating speed over 45 mph shall have radius returns. Any connection requiring or having a specified median opening with left turn storage and served directly by that opening shall have radius returns.

DESIGN NOTES

1. Prior to the adoption of Administrative Rules 49, the definitions of connections to the State Highway System were defined and stated in Rules 430, 431 and 550. Connections have been separated into categories in the State Highway System. This index applies to major roadways in the State Highway System as defined under Rule 49.

OUTLINE

1. Return Radius Point
2. Buffer Area
3. F.B. Line
4. Frontage Line
5. Property Line
6. Structure
7. Street
8. Outside Radius
9. Inside Radius
10. Distance Between Connections
11. Flare

SUMMARY OF GEOMETRIC REQUIREMENTS FOR TURNOUTS

NOT INTENDED FOR FULL INTERSECTION DESIGN
NOTES:
1. When a crossover is no longer needed, all temporary construction shall be immediately removed and the area restored to its original condition.
2. Cost of all construction, maintenance, removal and restoration work related to temporary crossovers shall be included in the contract unit price for Maintenance of Traffic, LS.
3. Crossovers to be constructed where sight distance is adequate in such directions as directed by the Engineer.
Not to scale. Rumble strips may be required for one or more laps of the intersection (see note above for spacing information). Rumble strips shall not be constructed only on the ends specified in the plan. See General Note No. 3.

**Intersections**

**Signalized**

**Flashing Beacon**

**Two-Way Stop**

**Three-Way Stop**

**One-Way**

**Two-Way**

**Structures with Less Than Full Width Shoulders**

**General Notes**

1. Rumble strips shall be constructed of all structures with less than full width shoulders. Rumble strips at intersections shall be constructed only when specified in the plan.

2. Rumble strips are to be constructed in accordance with Section 541 of the Specifications.

3. When any portion of a zone falls within the clear of rumble strips shown in these details, additional rumble strips shall be placed as needed. Such areas shall be constructed beyond those detailed, throughout the approach lengths.

4. Rumble strips shall be paid for under the contract unit price for Rumble Strips, Per Set. Such price and payment shall be full compensation for all work and materials required.

Rumble strips shall be paid for per set without any adjustment due to width of pavement reaching the strips or length of strips.
DETAIL A
TWO THRU LANES

DETAIL B
THREE APPROACH LANES - TWO THRU LANES

FLEXIBLE PAVEMENT THICKNESS TRANSITION

EXIT TERMINALS
SINGLE - LANE RAMPS
THREE THRU LANES - APPROACH AUXILIARY LANE

SECTION WHEN SHOULD GUTTER USED
SECTION AA

EXIT TERMINALS
TWO-LANE RAMPS
ACCELERATION LANE WITH SHOULDER GUTTER

DECELERATION LANE WITH SHOULDER GUTTER

ACCELERATION LANE WITHOUT SHOULDER GUTTER

DECELERATION LANE WITHOUT SHOULDER GUTTER

SHOULDER TREATMENT

AT SPEED CHANGE LANES AT EXPRESSWAY RAMP TERMINALS

EXPRESSWAY RAMP TERMINALS
LEFT SIDE WIDENING

CENTERED WIDENING

RIGHT SIDE WIDENING

FLARED & PAINTED LEFT TURNS FOR 2-LANE 2-WAY ROADWAYS
LANE DIVERGENCE AND CONVERGENCE FOR CENTERED ROADWAYS
CONNECTING DIFFERENT WIDTH PAVEMENTS

FLARED - PAVED SHOULDERS

FLARED - UNPAVED SHOULDERS

SHOULDER AND PAVEMENT EDGE TREATMENT AT TRANSITIONS AND CONNECTIONS
GENERAL NOTES FOR SHEETS 5 THRU 8

1. The transition details as represented on these sheets are intended as guidelines only. The transition lengths, curve data, lane and offset are valid only for tangent alignment and the median widths shown.

2. Approach lane departures (0-5") are suitable for design speeds up to 60 mph. Interior curves (0-5") are suitable for normal crown for design speeds up to 50 mph. Merging curves (0-5") will require super-elevation.

3. The geometries of these schemes are associated with the standard subsections spaced for left-turns, but in any case will require modifications to accommodate left-turn location, multilane and/or divided sections, desire alternate lane-widths, storage and speed change lane requirements, and other related features.

LEFT ROADWAY CENTERED ON APPROACH ROADWAY
TWO LANE TO FOUR LANE TRANSITION
ROADWAY TRANSITIONS

RIGHT ROADWAY CENTERED ON APPROACH ROADWAY

TWO LANE TO FOUR LANE TRANSITION

L = WS for speeds > 40 mph
WS = 2 For speeds <= 40 mph

WHERE:
W = Width of lateral transition in feet,
S = Design speed.
22' MEDIAN

40' MEDIAN

64' MEDIAN

RIGHT ROADWAY CENTERED ON THRU ROADWAY

FOUR LANE TO TWO LANE TRANSITION

L = 85 for speeds > 45 mph
= 76 for speeds ≤ 40 mph

Where:
W = Width of lateral transition in feet.
S = Design speed.
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) a written notice of unified 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-patrol 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 indicate the house number on the box if the box is located on a different street from the patrons residence. The contractor shall install the street name and house number on the box.

   The contractor shall coordinate the removal of the patrons existing mailboxes. Immediately after installing the new mailboxes the contractor must notify each "Mail Delivery Patrol" by Certified Mail that removal of the existing mailboxes must be accomplished in 60 days after receipt of notice. 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 Mailboxes, Each. The Contractor shall dispose of mailboxes and supplies in areas provided by the Engineer.

   Removal of existing mailboxes by the Contractor will not be required under any construction projects; 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 I as prescribed by the Domestic Mail Manual of the U.S. Postal Service (1971).

   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, Oberland 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 post at the shoulder point, except for shoulders less than 9' in width, the face of the box shall be no closer than 8' from the edge of the driving lane except as noted below.

   Mailboxes on rural highways with low volume (400 max.) low speed (40 mph or less) or rural highways shall be offset from the face of the box at the shoulder point but not closer than 6'-8" from the edge of the driving lane however, in low volume low speed highways where shoulders lack sufficient width to accommodate shaped rear corners, mailboxes shall be offset from the face of the box at the shoulder point but not closer than 3'-8" from the driving lane.

   When a mailbox is installed within the limits of guarantee it should be placed behind the guardrail whenever practicable.

   Mailboxes on rural highways, roads, and streets shall be set with the face of the box between 6'6" and 10' 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.

   Mailboxes shall be set with the bottom of the box between 40" and 48" above the mail slip surface, unless the U.S. Postal Service establishes other height restrictions.

   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 and approved by the State Design Engineer, roadways.

   Neighbored 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 post shall be responsible for newspaper receptacle installation and maintenance.

9. Wood and steel support posts for both single and double mailboxes shall be embedded no more than 24" into the ground.

Concrete, brick, block, stone, or other rigid foundation structure or support, either above or below the shoulder groundline, will not be permitted for mailboxes on rural highways. On urban roads and streets where mailboxes support posts are set within right-of-way 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 tilted 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 installed 60' 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.

   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, oil, alkyd or enamel, paint or anodize. Surface(s) shall be cleaned or washed prior to finishing. The Postal Service prefers semi gloss white, but other colors may be used when approved by the Engineer. When galvanized posts are used painting is not required.

Mounting brackets, plates, shoes, and accessories hardware surface finishes are to be painted to support post finish.

11. 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. Excess, adjustments to suit construction needs end, for identification letters and numbers.

   Payment shall be limited to one mailbox per patron address whether the mailbox is new, renewed, replaced, 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.
STEEL FLANGED CHANNEL SUPPORT POSTS

FLANGED CHANNEL

FRONT VIEW
SIDE VIEW
ELEVATION

SINGLE OR COMBINED WOOD/FLANGED CHANNEL OR PIPE POST TYPES SHOWN ON THIS SHEET

POST SPACING

Note: See General Notes for Finish requirements.

STEEL ADAPTER PLATE

TOP VIEW
END VIEW

STEEL BRACKET

TOP VIEW
END VIEW

STEEL SPACER

MAILBOXES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

532
STEEL PIPE AND WOOD SUPPORT POSTS

2" Ø PIPE POST

4" x 4" WOOD POST

2.5" HEX BOLT, 2 WASHERS, LOCKWASHER, NUT (14 Req'd.)

4.5" HEX BOLT, 2 WASHERS, LOCKWASHER, NUT (16 Req'd.)

TOP VIEW
STEEL SHELF

STEEL FRAMING

4" x 4" WOOD POST

2.5" HEX BOLT, 2 WASHERS, LOCKWASHER, NUT (14 Req'd.)

4.5" HEX BOLT, 2 WASHERS, LOCKWASHER, NUT (16 Req'd.)

END VIEW
STEEL PLATFORM

Note: See General Notes for finish requirements

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MAILBOXES
PLAN

SECTION AA

TYPE A
REINFORCED CONCRETE

Note:
Class I concrete to be used unless otherwise noted in plans or specifications.

Note:
Tractor crossing to be constructed to match pavement cross section.

The number of rails required will vary with the pavement width. A sufficient number of rails will be used so that the distance of the tractor crossing will be 1/2 the width of the pavement plus 6 ft. and then the pavement width. The tractor crossing will be centered on the pavement centerline.

STATE OF FLORIDA DEPARTMENT OF TRANSMISSION
Paved Section

TRACTOR CROSSINGS

Drawn By: [Signature]
Approved By: [Signature]
INSTALLATION

NOTES
1. Elevation of the top of each length of timber pile shall be determined as soon as it is installed and also thereafter before the next length of timber pile is installed.
2. Settlement plate locations shall be flagged and protected from construction vehicles and equipment. If settlement plates are disturbed, they should be replaced in kind.
3. Oates used to construct and should not have a mesh covering (plastic or other synthetic material).

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PROM 14231

SETTLEMENT PLATE

STEM AND PLATE OPTIONS

TREES PLATE

STEEL PLATE

PLATE OPTIONS
1. The purpose of shrubs in areas back of guardrail is to eliminate hand entrance in these areas.
2. Shrubs are to be planted approximately 5 feet from guardrail posts and hazards. Narrow plant areas are to have at least one row of shrubs, as directed by the Engineer.
3. Shrubs are to be planted approximately 5 feet centers in rows with 5 feet spacing.
4. Shrubs are to be offset in successive rows to create a zig-zag pattern between any two rows.
5. Shrubs shall be specified in the plans by Landscape Work Unit 180.200 from 58th number.
6. Only one variety of shrub shall be planted within any given configured area and no shrub variety is to be repeated within a distance of one mile.
7. When guardrail painting is discontinued in conjunction with shrub planting, soil stabilization shall be in accordance with Section 310 of the Standard Specifications.
8. For line of clear sight limits see Index No. 546.
2 LANE UNDIVIDED • SIGNALIZED OR STOP SIGN CONTROLLED

MULTILANE UNDIVIDED • SIGNALIZED OR STOP SIGN CONTROLLED

DESIGN NOTES
1. The information shown on this index is intended solely for the purpose ofCROSSROAD
design development and maintenance, and is not
to be used for any other purpose, such as
way, street, drain, or any other purpose.
2. The information shown is for use in conjunction with

3. The information shown is for use in conjunction with

4. The information shown is for use in conjunction with

5. The information shown is for use in conjunction with

6. The information shown is for use in conjunction with

7. The information shown is for use in conjunction with

MULTILANE DIVIDED • SIGNALIZED OR STOP SIGN CONTROLLED

GENERAL NOTES
1. Details are based on the AASHTO "A Policy On Geometric Design Of Highways And Streets", Chapter 12: Cross Section.
2. Details apply to rural and urban highways and streets.
3. Details also include or are shown in the booklet "Chapter 12: Cross Section".
4. Details also include or are shown in the booklet "Chapter 12: Cross Section".
5. Details also include or are shown in the booklet "Chapter 12: Cross Section".
6. Details also include or are shown in the booklet "Chapter 12: Cross Section".
7. Details also include or are shown in the booklet "Chapter 12: Cross Section".

LEGEND

LANDSCAPING AT INTERSECTIONS

The intent of this standard is to provide a window with vertical lighted signs. Above and below the sight line datum, and no horizontal limit defined by the limits of clear sight.
GENERAL NOTES

1. The crossings shown on this sheet are NOT to be used for multiple track crossings within same or existing or scheduled future vehicle stop. Zone lengths are shown below.

2. Crossings on this sheet may be used for single track crossings within the zone by the owner or an independent contractor.

3. Details shown are for straight track installations. Materials are also available for curved track installations.

4. Additional materials, requirements, and specifications refer to the manufacturer's specifications.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RAILROAD CROSSINGS

TYPE P & R
GENERAL NOTES

1. The reinforced concrete slabs are manufactured in 8’-0” sections, 5’-0” in depth to fit all rail sections 5’-6” in height or heavier. Slabs are interchangeable and relocatable.

2. Center slabs are one place construction allowing for 8” Flange opening, 80 lb. rail is used to increase, center and reinforce slabs and to hold to gage with 3 tie rods per slab.

3. Slabs are installed by a "Roll-in" process, supported on non-shrink, non-meltic grout positioned on the ties. Slabs can be placed on wood ties, concrete ties, steel ties, bridge decks or any other type of track support, no readjustment of ties is necessary.

4. Slabs are secured to "Running Rails" with specially designed hardware. Insulation is to be provided for crossing in signal territory.

5. Curved slabs are fabricated to fit curved track to 22 degrees (462.54 radius). Special slabs are available for diamond crossings, turnouts, multiple tracks, bridge decks and rigid transit systems.

6. For additional details, materials required and installation procedures refer to the manufacturer’s specifications.
PLAN VIEW
TYPICAL 44' CROSSING

TOP VIEW
TIE PAD

Note: Material: Reinforced
Thickness: 1' for 12" Hall
4" for 18" Hall

TOP VIEW

SIDE VIEW
PRECAST CONCRETE (CROSSING TIE)

TRANSVERSE SECTION

ELEVATION
TIE SPACING

GENERAL NOTES
1. Slab frame is 2 1/2 galvanized
2. Slab reinforcement at pc.4 bars.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RAILROAD CROSSING
TYPE T MODIFIED

Drawing No. 01-0017
Sheet 8

Approved By:

Intended Use: Preliminary Design

ORLANDO 06/12/16

3 of 8
CONTENTS

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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 600 provides Department policy and standards. Changes are only to be made thru Department approved procedures. Indexes 602 thru 651 provide typical application for various situations. Modification can be made to these indexes as long as the changes comply with the MUTCD, O.D.T., and Department 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 Roadway Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:

TCP Traffic control plan(s)
MUTCD Manual On Uniform Traffic Control Devices For Streets And Highways
TCZ Traffic control through work zones
L Taper length, buffer length or taper length plus buffer space
W Width of taper transition in feet, i.e., lateral offset
S Posted speed or off-peak 85 percentile speed
RPM Raised reflectorized pavement marker
TMA Truck mounted attenuator
COMM Traffic Control Standards Committee

SYMBOLS

The symbols shown are found in the Traffic Control Zone Cell Library (TCZ cell) on the CAD system. Symbols assigned to the 600 series Roadway 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
- Drum
- 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
- 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
- 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
- Attenuator
- 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
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 a design speed to determine runway lengths, departure rates, flare rates, lengths of need, clear widths, shoulder 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 intended path for vehicular traffic through or around obstructions in construction, maintenance, utility and other work zones on highways, roads and streets. For traffic control through work zones, travel way includes auxiliary lanes, shoulders and any other permanent or temporary surface intended for the path of vehicular traffic.

Detour
A temporary travel way that branches from the direct or regular route of travel, to bypass a section of the route which is closed or blocked by construction, major maintenance, roadway damage or a traffic emergency and that rejoins the direct or regular route beyond that section.

Above Ground Hazard
An above ground hazard is any object, material or equipment other than traffic control devices that encroaches upon the travelway 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 breakdown requirements.

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 for the project. The regulatory speed shall be reduced more than 20 MPH below the posted speed and never below the minimum statutory speed for the class of facility. This reduction is to be done in 5/MP increments. Temporarily regulatory speed signs shall be removed as soon as the conditions requiring the reduced speed no longer exist. 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 interspersed 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 motorists 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 one mile in rural areas (non-interstate) and on rural or urban interstate, additional regulatory speed signs are to be placed not more than one mile apart. Engineering judgement should be used in placement of the additional signs. Locating these signs beyond ramp entrances and at major intersections are examples of proper placement. For urban situations (non-interstates), additional speed signs are to be placed at a maximum of 1000 apart.

When field conditions warrant speed reductions greater than those shown in Table 2, 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 speed plans. Issues regulated by the Department include the revised provisions of F.S. 366.0742 (2) 16b). Advisory Speed plates will be used in 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 6.

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 restrictions 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 or to the intended travel way by the traffic control procedure applied.

(a) 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 or precedents and coordination of plans on concurrent projects.

(b) 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.

(c) The District Maintenance Engineer will resolve anticipated and occurring conflicts under the following work zone conditions.
1. Within scheduled maintenance operations.
2. Between scheduled maintenance operations, maintenance construction, permitted works and/or in progress highway construction projects.

(d) The Unit Maintenance Engineer will resolve conflicts that occur within routine maintenance work; between routine maintenance work, unscheduled work and/or permitted works and, between unit controlled maintenance works and highway construction projects.

INTERSECTING ROAD SIGNING AND SIGNALS
Signs for the control of traffic entering and leaving work zones on 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 CONSTRUCTION AHEAD sign, including light and flag, for approaching vehicles and a END CONSTRUCTION sign for departure vehicles.

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. The need for temporary signal stop or other methods of actuation shall be determined by the District Traffic Operations Engineer and the designer and included in the TCP.

GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL THROUGH WORK ZONES

GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES
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 supplementary revision and certification by the office of the State Traffic Engineer.

Primary work zone traffic control devices are shown on Sheet 5 of 9 for the purpose of ready identification. Specifications for the devices are under the authority of the State Traffic Engineer.

DROPoffs IN WORK ZONES

Acceptable warning and barrier devices for traffic control at dropoffs in work areas are detailed on Sheet 5 of 9. Unless otherwise specified in the plans, the contractor may use any of the barrier types (including optional shoulder treatment) shown in note 3 of sheet 5 of 9. The cost of such option shall be included under Lump Sum MTO.

WARNING LIGHTS

Warning lights shall be in accordance with Section 5E-5 of the MUTCD except for the application limitations and methods of payment stipulated below:

Flagging

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 continuously 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 or located next to leading lines on the drivers eye. The Type A light shall 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 advance warning sign and on the first and second advanced warning sign where two or more signs are used, and applies to all approaches to any work zone.

Steep-Burn

Type C Steep-Burn Lights are to be mounted on barricades, drums, concrete barrier walls or vertical panels and used in combination with these devices to delineate the travel way on lane closures, lane changes, detour curriculums or under similar conditions. Steep-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.

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 such taper should not be hidden behind curves.

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.

PEDESTRIANS AND BICYCLISTS

When an existing pedestrian or bicycle way is located within a traffic control work zone, accommodation must be maintained.

NIGHTTIME FLAGGING

Nighttime flagging will require proper illumination of the flagger. A well-lighted flagging jacket and/or reflectorized pad or reflectorized flag plus a flashlight, lantern or other lighted signal that will display a red warning light shall be used.

Lights, reflectorized paddles, reflectorized flags and reflectorized vests, shirts or jackets approved by the Department must be used to flag traffic at night. The STOP face of paddles shall be reflectorized red with white reflectorized letters and border, and the SLOW face shall be reflectorized orange with black letters and border. Flagger vest, shirts or jackets shall be reflectorized orange.

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.

REFLECTORIZED RAISED PAVEMENT MARKERS

Class A or B RPM's shall be installed on the lane lines of transitions, crossovers and the edges of gore areas within the work zone. The spacing shall be 40 feet on tangent sections and 20 feet on transitions, curves and crossovers. It shall be the contractors responsibility to replace damaged or missing RPM's on a daily basis. This cost shall be included in the cost of the temporary RPM's substituted.

SIGN COVERING AND INTERRUPTED WORK STOPPAGE SIGNING

Existing signs that conflict with temporary work zone signing shall be removed or covered according to the procedures below:

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 any legend or symbol will not be permitted. Reflective covers will not be permitted. Hinged signs designed to cover when folded and sign blanks will be permitted.

Covers, blanks, hinged panels and intermittent work stoppage shields and plaques are incidental to work operation signs and are not to be paid for separately.

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 Type III, FC-1 or FC-4 is a positive means to achieve obliteration.

SUPERELEVATION

Horizontal curves constructed in conjunction with work zone traffic control should have the required super-elevation applied to the design radius. Under conditions where normal cross slope controls curvature, the minimum rollover that can be applied are listed in the table below.

<table>
<thead>
<tr>
<th>MINIMUM RADIUS FOR</th>
<th>NORMAL CROSS SLOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS TYPED</td>
<td>MINIMUM RADIUS</td>
</tr>
<tr>
<td>FEET</td>
<td>FEET</td>
</tr>
<tr>
<td>45</td>
<td>450</td>
</tr>
<tr>
<td>40</td>
<td>600</td>
</tr>
<tr>
<td>35</td>
<td>800</td>
</tr>
<tr>
<td>30</td>
<td>1000</td>
</tr>
</tbody>
</table>

LANE WIDTHS

Lane widths of through roadways should be maintained through work zone travel ways whenever practical. The minimum widths for work zone travel lanes shall be as follows: 36 feet for interstate and other truck network highways, with at least one 12' lane provided each direction, unless formally excepted by the Federal Highway Administration; 30 feet for other freeways and 24 foot for all other facilities.

LENGTH OF CONSTRUCTION SIGN

The length of construction sign (150-1) bearing the legend ROAD CONSTRUCTION NEXT MILES is required for all projects of more than 2 miles in length. The sign shall be located at beginning construction points.
END CONSTRUCTION SIGNS

The END CONSTRUCTION sign (G20-2) should be erected approximately 500 feet beyond the end of a construction or maintenance project, unless other distance called for in the plans. Where other Construction or Maintenance Operations occur within one mile, this sign should be omitted and signing coordinated in accordance with Index 600, ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING.

DETOURS

Detours can be located either within the direct or regular route boundary or over highways, roads or streets outside the direct or regular route boundary. Engineering judgment should be used to determine when detour signing is required for minor shift to the direct or regular route.

VARIABLE MESSAGE SIGNS (VMS)

The VMS 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.

The message should be visible and legible at a minimum distance of 900 feet. All messages should be cycled so that two message cycles are displayed to a driver while approaching the sign from 900 feet at 55 mph.

VMS should be placed approx. 500 to 800 ft. in advance of the work zone conflicts or 1/2 to 2 miles in advance of complex traffic control schemes which require new and/or unusual traffic maneuvers.

If VMS 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.

ROADSIDE BARRIERS

When connecting temporary concrete barrier wall to guardrail the connection shall be made in accordance with Index No. 40.

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 travelway 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

The term 'clear zone' describes the unobstructed relatively flat area extending outward from the edge of the travelway. The table below gives clear zone widths for 60 or flatter slopes in work zones for medians and roadside conditions other than for roadside ditches, where roadside ditches are present, clear zone widths are to conform with the distances to canals described in Vol. I, Ch. 4, Sec. 6.2 and Exhibits 1-4-6 and 1-4-10 of the Plans Preparation Manual.

<table>
<thead>
<tr>
<th>WORK ZONE SPEED</th>
<th>WIDTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MPH)</td>
<td>(FEET)</td>
</tr>
<tr>
<td>60-70</td>
<td>30</td>
</tr>
<tr>
<td>55</td>
<td>24</td>
</tr>
<tr>
<td>45-50</td>
<td>18</td>
</tr>
<tr>
<td>30-40</td>
<td>14</td>
</tr>
</tbody>
</table>
DROPFFS IN WORK ZONES

CONDITION I
SHOULDER DROPFF
1. This condition is to be used when excavation adjacent to lane I being used for traffic control.
2. Distance X is to be the maximum practical under project conditions.
3. Distance Y should be the maximum practical for project conditions.
4. Warning devices or barriers are to be extended on lane widths designated as minimum for traffic control.
5. For specific requirements use Chart A or B below, as applicable.

CONDITION II
DROPFF BETWEEN TRAVEL LANE AND SHOULDER
1. This condition is to be used when resurfacing or milling travel lanes and/or adjacent shoulders.
2. Warning device or barrier must not encroach on lane widths designated as minimum for traffic control.
3. X and Y should be the maximum practical for project conditions. May be zero.
4. For specific requirements use Chart A below.

CONDITION III
DROPFF BETWEEN TRAVEL LANE AND CURB
1. This condition is to be used for resurfacing or milling travel lanes.
2. Warning device or barrier must not encroach on lane widths designated as minimum for traffic control.
3. X and Y should be the maximum practical for project conditions. May be zero.
4. Sign No. 104, with INDICATE TRAFFIC shape required at intersections of travel lanes and curbs, or maximum through this conflict area.
5. For specific requirements use Chart C below.

CHART A
ALL SPEEDS
NO CURB AND GUTTER

X (ft.)
D (In.)
A/B

Active
D

Inactive
D

Work Zone
Work Zone

0
1.5
2.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0

A
B

None
None
None
Warning Device

None
None

WARNING

WORK ZONE

CHART B
45 MPH OR LESS
CURB AND GUTTER

X (ft.)
D (In.)
A/B

Active
D

Inactive
D

Work Zone
Work Zone

0
1.5
2.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0

A
B

None
None
None
Warning Device

None
None

WARNING

WORK ZONE

CHART C
ALL SPEEDS
CURB AND GUTTER OR NO CURB AND GUTTER

X (ft.)
D (In.)
A/B

Active
D

Inactive
D

Work Zone
Work Zone

0
1.5
2.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0

A
B

None
None
None
Warning Device

None
None

WARNING

WORK ZONE

NOTES
1. These conditions and treatments can be applied only in work areas that fall within the sight of the operator.
2. All following are defined as acceptable warning devices:
   a. pennant, pennant
   b. Type 1 or Type 2 reflectives
   c. drum
   d. Taper
   e. Taper
   f. Taper
   g. Taper
   h. Taper
   i. Taper
 2. Where barrier is specified either of the types below may be used:
   a. Temporary barrier wall installed in conformance with Standard Specifications.
   b. Temporary barrier installed to meet the Standard Specifications.
   c. Temporary barrier wall installed in conformance with Standard Specifications.
   d. Temporary barrier wall installed in conformance with Standard Specifications.
   e. Temporary barrier wall installed in conformance with Standard Specifications.
   f. Temporary barrier wall installed in conformance with Standard Specifications.
   g. Temporary barrier wall installed in conformance with Standard Specifications.
   h. Temporary barrier wall installed in conformance with Standard Specifications.
   i. Temporary barrier wall installed in conformance with Standard Specifications.
   j. Temporary barrier wall installed in conformance with Standard Specifications.

OPTIONAL SHOULDER TREATMENT
1. This optional method may be used in lieu of warning devices when required by Chart A or B.

OPTIONAL TRAVEL LANE TREATMENTS
1. This optional method may be used in lieu of warning devices when required by Chart C.
2. Optional treatment allowable only when G = 5' or less.
TEMPORARY CURB

1. Application: Temporary curbs shall not be used on facilities with posted speeds greater than 45 mph and dropoffs greater than four (4) feet deep. It shall not be used on interstate or limited access facilities.

2. Vertical panels, tubular markers or bevels shall also be used to delineate the work area. These devices could be placed on top of the temporary curb or on the outside between the curb and the dropoff.

3. Edges of curb shall be provided, as well as painting the line of the curb (white or yellow as appropriate) to further delineate its presence (asphalt curb only). The paint shall be in accordance with the traffic striping specifications, including reflective beads.

4. The temporary curb is to be located in the existing surface by use of a back cut, or other methods approved by the engineer. It is important that the curb adjoins to the base material in order to provide the strength necessary to resist errant vehicles.

5. Temporary curb is to be placed for under lump sum maintenance of Traffic Item 1201-12. The designer should include in a pay item note to start this task and to include the estimated number of linear feet to be used. Payment for the curb is to include all materials and work necessary to construct, including painting of the curb)怀念 abolish and remove the temporary curb. Traffic signing I here lines only, and working devices are to be paid for separately. Any damage to existing pavement caused by the removal of existing curb shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of the temporary curb.

6. The temporary curb is to be constructed of miscellaneous asphalt or cross concrete. The type of material (asphalt or concrete) is up to the contractor, unless otherwise noted by the engineer.

7. The designer must specify, in the plans, which alternate is to be used: alternate 1 or 2. The choice is strictly up to the designer. At this time, there is no preference or guidelines on the use of one versus the other. However, the designer should consider speed, volume, offset space available, dropoff depth, etc. Obviously, increasing the offset between the travel lane and the dropoff will increase safety.

8. If concrete is used to construct the temporary curb, joints must be made every 61 feet in order to control cracking.

9. The designer must also consider drainage needs when using temporary curbs. If driveways or other accesses are not frequent enough to allow for water runoff, the designer may need to specify the need for "drainage sinks" at an appropriate spacing based on grades, number of lanes, etc. Typically, a drainage sink should be 12 inches wide 18 feet into the curb at 30 foot spacings.

10. At openings such as driveways and business accesses, the temporary curb should be transitioned in height from 4 inches up to 5 inches at a 45 degree angle in order to eliminate a potential hazard at the end points.

* 12 inches (or more) is desirable in order to enhance/improve stability. However, it is recognized that there may be cases where 12 inches (or more) is not feasible or obtainable. In those instances, engineering judgment must be used to balance this offset distance with the depth of dropoff, soil type and etc.
CHANNELIZING AND LIGHTING DEVICE NOTES

1. Only approved traffic control devices may be used on public highways, roads and streets.

2. 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.

3. The details shown on this sheet are for the following purposes: (a) For ease of identification and (b) To provide information that supplements or supercedes that provided by the MUTCD.

4. The Type III Barricade shall have a unit length of 6 feet only. When barricades of greater lengths are required those lengths shall be in multiples of the 6' unit.

5. During hours of darkness warning lights shall be used.

6. Ballast shall not be placed on top rails or any striped rails or higher than 13 inches above the driving surface.

7. For rails less than 3 feet long, 4 inch stripes shall be used.

8. When Advance Warning Arrow Panels are used at night, the intensity of the flashers shall be reduced during darkness when lower intensities are desirable.

ADVANCE WARNING ARROW PANELS

PASS LEFT

PASS RIGHT

PASS EITHER SIDE

- Minimum Required Lamps
- Additional Lamps Allowed

CHANNELIZING AND LIGHTING DEVICES
BARRIER AND TRANSITION LOCATED ON PAVED OR UNPAVED SHOULDERS
PLAN SHOWN FOR RIGHT LANE - INVERTED PLAN FOR LEFT LANE

RURAL DIVIDED OR UNDIVIDED - TWO OR MORE LANES EACH WAY
LANE DROP - PLAN SHOWN FOR RIGHT LANE MERGE LEFT - INVERTED PLAN FOR LEFT LANE MERGE RIGHT

RURAL DIVIDED - TWO OR MORE LANES ONE-WAY
LANE DROP AND LANE SHIFTS - PLAN SHOWN FOR RIGHT LANE MERGE LEFT - INVERTED PLAN FOR LEFT LANE MERGE RIGHT

TRANSITION NOTES
1. Barrier wall within the transition areas shall have reflective markers mounted on the travel side of the wall, 6" below the top and on 6' centers.
2. Arrows denote direction of traffic only and do not reflect pavement markings.
3. For signing information see the Plans, Specifications, MUTCD and other FDOT Standards.

TRANSITIONS FOR TEMPORARY CONCRETE BARRIER WALL ON RURAL FACILITIES
REFLECTIVE PAVEMENT MARKERS

CLASS
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.
C. Work Zone Application Only, For Traffic And Non-Traffic Areas.

NOTES
1. For spacing of RPWS to supplement Temporary Tape or Paint, see Index 600 sheet 3 of 10.
2. Basic color rules: colorless reflectors replace white lines and amber reflectors replace yellow lines.
3. In work zones, CLASS A-B, or 0 RPWS may be used to form lane lines, edge lines and temporary gore areas, in lieu of tape or paint. In short term work zones, where the RPWS will be used for five (5) days or less, CLASS "E" RPWS may be used to form lane or edge lines.
4. To provide contrast on Concrete Pavement, the Five (5) colorless RPWS shall be followed by five Block RPWS. The spacing between RPWS shall be 2.5'. Block RPWS will not be required for contrast with Amber RPWS.

TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS
IN LIEU OF TEMPORARY TAPE OR PAINT IN WORK ZONES
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 accordance with Index No. 527.

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 TCP items.

5. For general TCP requirements and additional information refer to Index No. 600.

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 PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

TWO-LANE, TWO-WAY, RURAL
DAY OR NIGHT OPERATIONS

DRAWN BY: A. JACOBS
CHECKED BY: B. COOPER
APPROVED BY: W. HENDRIX

6/30/76
Symptoms:

- Work Area
- Sign with 18" x 18" (min.) Orange Flag or Type B Light
- Type I or Type II Barricade Or Vertical Panel Or Drum (with Steady Burning Light at Night Only), Cones or Tubular Markers May Be Used During Daylight Only.
- Work Zone Sign

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 accordance with Index No. 628.
3. If the work operation continues 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 the advanced FLAGGER sign shall be replaced by the WORKERS sign. Location of flaggers and significant points shall be shown by Index No. 603.
4. The first two warning signs shall have a 6" x 6" (min.) orange flag and a Type B light attached and operating at all times.
5. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
6. The WORKERS legend sign may be substituted for the symbol sign.
7. L (min.) = WS for speeds > 45 mph
   = 1000 for speeds ≤ 45 mph
   Where:
   W = Width of shoulder in feet, B = Minimum 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. WORKERS sign to be removed or fully covered when no work is being performed.
11. END CONSTRUCTION signs required only when work exceeds one daylight period.
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 TCI indexes.
13. For general TCI 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 Driveways
- Sign Installation and Maintenance
- Shoulder Repair

Conditions:

Where any vehicle, equipment, workers or their activities approach the area closer than 15 feet but not closer than 2 to the edge of pavement.
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 pavement.
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 a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
6. Mesh signs may be used for Daylight Only operations Type B Light and Orange Flags are not required.
7. The FLAGGER legend sign may be substituted for the symbol sign.
8. L (min) = \frac{W}{v^2}
   - W = for speeds \leq 45 mph
   - W = for speeds \leq 40 mph

   Where:
   V = Width of lateral transition in feet,
   W = Posted speed limit (MPH),
9. 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.
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.

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 PAVEMENT
SYMBOLS

工 Work Area

工 Sign With 18" x 18" (Min.) Orange Flag And Type B Light

工 Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Cones Or Tubular Markers May Be Used During Daylight Only.

工 Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)

工 Work Zone Sign

工 Flagger

GENERAL NOTES

1. Construction 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 pavement.

3. Additional one-way control may be effected by the following means:
   (1) Flag-carrying vehicle
   (2) Official vehicle
   (3) Flap vehicle
   (4) Flashing lights

   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 a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.

5. The FLASHER legend sign may be substituted for the symbol sign.

6. All signs shall be posted if the closure time exceeds 12 hours.

7. \( L \ (\text{min}) = \frac{W}{S} \) for speeds \( < 45 \) mph
   \[ \text{Where:} \]
   \[ W = \text{Width of lateral transition in feet} \]
   \[ S = \text{ posted speed limit (MPH)} \]

8. The ONE-LANE ROAD signs are to be fully covered and the FLASHER 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 TCE indices.

12. For general TCE 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 ENTRACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TWO-LANE, TWO-WAY • RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD

PREPARED BY: JF

APPROVED: JF

DATE: 9/20/20

204
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 Vertical Panels Or Drums.

Cone Or Tubular Markers At 25' Centers And Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers. For First 50', Thereafter Cones Or Tubular Markers At 50' Centers And Type I Or Type II Barricades Or Vertical Panels Or Drums At 100' Centers.

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 accordance with Index No. 600.
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 10 minute period flaggers shall be provided and the advance Flagging sign shall be substituted for the WORKER sign. For location of flaggers and Flagging signs see Index No. 603.
4. The first two signs shall have a 18" x 18" (min) orange flag and a Type B light attached and operating at all times. Other signs may be used for Daylight Only operations. Type B Lights and Orange Flags are not required.
5. The WORKER legend sign may be substituted for the symbol sign.
6. Where work activities within 2' of the edge of pavement is incidental (i.e. Mowing, Litter Removal) this engineer may delete requirements for cones and signs provided a vehicle with flashing warning lights is present.
7. L (min.) + W+ for speeds ≥ 45 mph
   * W+ for speeds ≤ 40 mph
   Where:
   W = Width of shoulder in feet, B minimum,
   S = Posted speed limit (MPH).
8. Arrows denote direction of traffic only and do not reflect permanent workings.
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.

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

TYPICAL APPLICATIONS

Shoulder & Slope Work
Utility Work
Guardrail Work
Landscape Work
Delineteor Installation And Maintenance
Mowing
Litter Removal

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT,
WORKERS OR THEIR ACTIVITIES
REQUIRE AN INTERMITTENT OR
CONTINUOUS MOVING OPERATION ON
THE SHOULDER OR SHOULDER AND
SLOPES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TWO-LANE, TWO-WAY, RURAL MOVING OPERATIONS-DAYLIGHT ONLY

605
GENERAL NOTES

1. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the pavement.

2. Minimum length of work area is 200 feet. Maximum length to be determined by the Engineer, but in no case to exceed the length of one half (1/2) days operation or two miles whichever is less.

3. If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 60.

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

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. Mesh signs may be used for (1) Daylight Only) operations

7. Type B signs and Orange Flags are not required.

8. 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.

9. Arrows denote direction of traffic only and do not reflect pavement markings.

10. Longitudinal dimensions are to be adjusted to fit traffic conditions. See Index No. 60.

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 TCO Indexes.

12. For general TCO requirements and additional information refer to Index No. 60.

SYMBOLS

- Work Area
- Sign With 18" x 18" (min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel
- Work Zone Cone Or Tubular Marker Or Drum
- Flagger Sign

TYPICAL APPLICATIONS

- Pavement Repair
- Pavement Surfacing
- Utility Work
- Delineator Maintenance
- Crack Sealing
- Core Boring

CONDITIONS

- Pavement is not to be disturbed.
- WORKERS OR THEIR ACTIVITIES REQUIRE AN INTERMITTENT OR CONTINUOUS MOVING OPERATION ON THE PAVEMENT WHERE THE AVERAGE SPEED OF MOVEMENT IS LESS THAN FOUR MILES PER HOUR.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MOVING CONSTRUCTION WORK ZONES

TWO-LANE TWO-WAY DAYLIGHT ONLY
CONDITIONS

FOR ANY OPERATION THAT IS 2' OR MORE OUTSIDE THE EDGE OF THE PAVEMENT 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 PAVEMENT 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 PAVEMENT FOR A PERIOD IN EXCESS OF 15 MINUTES BUT LESS THAN 60 MINUTES.

GENERAL NOTES

1. The maximum length of work area to be determined by the Engineer, but in no case to exceed the length of one-half (½) days operation or two miles whichever is less.

2. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one site of the pavement.

3. 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.

4. Signs shall have an 8" x 18" (min.) orange flag and a Type B light attached and operating at all times.

5. The FLAGGER legend sign may be substituted for the symbol sign.

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 single road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ indices.

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), Cones or Tubular Markers may be used during daylight only.
- Work Zone Sign
- Flagger
GENERAL NOTES

SYMBOLS

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 to one side of the pavement, 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.

4. The maximum distance between portable traffic signals (receiver/controllers) shall be 1/2 mile, however, in no case shall the distance exceed the maximum distance at which the remote operator/translator can positively and safely operate both portable signals.

5. When needed, 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.

6. The first two signs shall have a 18" x 18" (Min.) orange flag and a Type B light attached at operating all times.

7. When needed an additional warning sign may be installed in advance of the ROAD CONSTRUCTION AHEAD sign. The distance between successive signs shall be 500 ft.

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 TCO indexes.

13. For general TCO requirements and additional information refer to Index No. 600.

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.

TYPICAL APPLICATION

Pavement Repair
Shovel & Roadside Work
Bridge Work
Box Culvert Work
Drainage Work
Utility Work
Haul Road Crossing

LANE CLOSURE BY SIGNAL CONTROL
DAY OR NIGHT OPERATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SUPERVISOR

TWO-LANE, TWO-WAY

PROJECT SUPERVISOR

LANE CLOSURE BY SIGNAL CONTROL
DAY OR NIGHT OPERATIONS
SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

SINGLE LANE CLOSURE • SHORT BRIDGES
GENERAL NOTES

1. If the work operation requires that two or more work vehicles cross the island lane in any one hour, traffic control will be in conformance with Index No. 600.

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 ft. 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.

SYMBOLS

WORK AREA

TYPICAL APPLICATIONS

Landscaping Work
Utility Work
Fencing Work
Cleaning Drainage Structures
Rerouting Driveways

CONDITIONS

WHERE ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 15 FT. FROM THE EDGE OF PAVEMENT
CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT,
WORKERS OR THEIR ACTIVITIES
ENCroach THE AREA CLOSER THAN
15' BUT NOT CLOSER THAN 2' TO
THE EDGE OF PAVEMENT FOR A
PERIOD OF LESS THAN 60 MINUTES

Maximum Spacing Between Devices (F.T.) To Be
Equal To The Speed Limit (M.P.H.) But Not Greater
Than 25' For Cones Or Tubular Markers Or 50'
For Type I Or Type II Barricades Or Vertical
Panels Or Drums.

Cones Or Tubular Markers At 25' Centers And
Type I Or Type II Barricades Or Vertical Panels
Or Drums At 50' Centers For 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.

GENERAL NOTES
1. All vehicles, equipment, workers and their activities are restricted
   at all times to one side of the roadway.

2. 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.

3. This TCZ plan also applies to work performed in the median more
   than 2 feet out less than 15 feet from the edge of other pavement.

4. 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.
   Wash 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. L (min.) = \frac{W 	imes 245}{40} \text{ mph} for speeds > 45 mph
   \frac{W 	imes 83}{100} \text{ mph} for speeds ≤ 40 mph

   Where:
   W = Width of lateral transition in feet
   S = Posted speed limit (M.P.H.).

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
   i as shown shall be omitted.

10. WORKERS signs to be removed or fully covered when no work
    is being performed.

11. END CONSTRUCTION signs required only when work exceeds
    one daylight period.

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. If the work operation does not exceed 16 minutes; signs,
    barricades, vertical panels, cones, tubular markers, or drums
    will not be required; provided vehicles in the work area have
    warning lights and operating.

14. For general TCZ requirements and additional information
    refer to Index No. 600.

CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT,
WORKERS OR THEIR ACTIVITIES
ENCroach THE AREA CLOSER THAN
15' BUT NOT CLOSER THAN 2' TO
THE EDGE OF PAVEMENT FOR A
PERIOD OF 60 MINUTES OR GREATER

SYMBOLS

TYPICAL APPLICATIONS

Utility Work
Culvert Extensions
Side Slope Work
Guardrail Work
Landscaping Work
Cleaning Drainage Structures
Reworking Ditches
Sign Installation And Maintenance
Shoulder Repair

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MULTILANE DIVIDED OR UNDIVIDED
RURAL • DAY OR NIGHT OPERATIONS
Maximum Spacing Between Devices (FT.) To Be Equal To The Speed Limit (MPH) But Not Greater Than 25' For Cones Or Tubular Markers Or So"'

For Type I Or Type II Barricades Or Vertical Panels Or Drums.

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 pavement.

3. The first two warning signs, each side, shall have a 6" x 6" (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 30 ft. hours.

5. On bidirectional highways, the median signs as shown are to be added.

6. When work is performed on 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 zone applies to undivided highways with the following exceptions: (1) Work shall be confined within and median lane. (2) Additional barricades, cones, or drums shall be placed along the centerline of the work area and across the trailing edge of the work area when work on undivided highways occurs across the centerline so as to approach on both median lanes, the inverted plan is applied to both approaches.

7. Signs and traffic control devices are to be modified in accordance with INTERMITTENT WORK STOPPAGE details (sheet II-22) when no work is being performed and the highway is open to traffic.

8. L (min.) = Length of taper in feet
   - W53 for speeds > 45 mph
   - W54 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 multiline 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) Cones Or Tubular Markers May Be Used During Daylight Only
- 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 LANES ALONGSIDE TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

MULTILANE, DIVIDED AND UNDIVIDED RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD
INTERMITTENT WORK STOPPAGE • RIGHT LANE REOPENED TO TRAFFIC • DAYTIME OR NIGHTTIME

EVEN PAVEMENT

UNEVEN PAVEMENT

Where Other Construction or Maintenance Operations Occur Within One Mile, Signs To Be Omitted and Signing To Be Coordinated in Accordance With Index No. 600

Temporary Pavement Markings Placed Through Work Area And Devices Relocated Laterally 2 to 4 Outside Edge of Pavement

Plaques To Be Covered Or Removed When Work Operation Resumes

Hinged Or Overlay Shields

Signs Covered

Arrow Panel Operation Discontinued And Devices Removed Or Relocated

Hinged Or Overlay Shields

Signs Covered

END CONSTRUCTION

WORK AREA

WORK AREA

END CONSTRUCTION
**PLAN**

**DETAIL OF TEMPORARY ASPHALT SEPARATOR**

**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 a 48" x 48" (min.) orange Flagging and a Type B Light attached and operating at all times.

3. All signs shall be post mounted.

4. TWO-WAY TRAFFIC signs shall be repeated every one quarter (1/4) mile, in each direction, throughout the tangent distance (T).

5. L (min.) WS for speeds x 45 mph + 35' for speeds ≤ 40 mph

   Where:
   - W = Width of lateral transition in feet
   - S = Posted speed (mph)

6. Where the tangent distance (T) exceeds 250 feet, spacing between cones or tubular markers may be increased to 50 feet or spacing between Type I or II Barricades or vertical panels or drums may be increased to 100 feet within the limits of the tangent, or post mounted delineators at 50 foot centers may be substituted for the barricades, vertical panels, cones, tubular markers or drums.

7. 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.

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 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.

11. For general TCZ requirements and additional information refer to Index No. 600.

**APPLICATIONS**

**Scheme 1** Restricted Construction Limits

**Scheme 2** Unrestricted Construction Limits

**Scheme 3** Unrestricted Construction Limits

**Where:**

- Construction Limits Are The Outward Beginning Or Ending Of Lane Reductions
- Unless A Specific Scheme Is Called For In The Plans, Scheme Selection Shall Be At The Contractor's Option And As Approved By The Engineer

**CONDITIONS**

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF ONE ROADWAY AND THE OPPORTUNITY 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**

**Plan No.** 614
GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the pavement.

2. 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.

3. All signs, except those required in painted areas, shall be installed if the closure time exceeds 12 hours.

4. TWO-WAY TRAFFIC signs shall be repeated every one-quarter (1/4) mile, in each direction, through the tangent distance (T).

5. L = width of lateral transition in feet.

6. Where the tangent distance (T) exceeds 250 feet, spacing between cones or tubular markers may be increased to 50 feet or spacing between Type I or Type II barricades or vertical panels or drums may be increased to 60 feet within the limits of the tangent.

7. 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.

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 TCO indexes.

11. For general TCO 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) Cones Or Tubular Markers May Be Used During Daylight Only.
- 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 DETOUR IS PROVIDED BY UTILIZING ONE LANE OF THE OPPOSING TRAFFIC LANES
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). Cones Or Tubular Markers May Be Used During Daylight Only.**
- **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 a 18" x 18" (min.) orange flag and a Type 'B' light attached and operating at all times.
3. 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. L min. 1+ WS for speeds > 45 mph
   - WS² for speeds > 40 mph
   Where:
   - W = Width of lateral transition in feet.
   - S = Posted speed (in MPH).
6. 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.
7. Advance warning arrow panels are required for both day and night operations. Either the left flashing arrow or the right sequential arrow may be used. The caution mode shall not be used.
8. Arrows denote direction of traffic only and do not reflect pavement marking.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. When a single road intersects the highway on which work is being performed, additional traffic control devices shall be erected in accordance with applicable T&CI Indexes.
11. For work performed in the outside lane refer to Indexes No. 60 and 61.
12. For general T&CI 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.
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 a 18" x 18" (min.) orange flag and a Type B light attached at all times. Green signs may be used for (Daylight Only) operations. Type B lights and orange flags are not required.

3. The FLAGGER's 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. 1.3.5.2.

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 barriers, vertical panels, cones, tabular markers and drums shall be no 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 or emergency condition procedures as described in index No. 620, whichever applies.

12. 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 III Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only), Cones Or Tabular Markers May Be Used During Daylight Only.
- Type I Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)
- Work Zone Sign
- Flagger
- Stop Bar

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 LAVES IN AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL THROUGH WORK ZONE

TWO-LANE, TWO-WAY • URBAN DAY OR NIGHT OPERATIONS

[Signature]

[Date]

[Department Name]
**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), Cones Or Tubular Markers May Be Used During Daylight Only.
- Work Zone Sign
- Flagger

**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 are placed on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with index No. 5707.

5. If work area is confined to an outside auxiliary lane the work area shall be bar loaded and the FLAGGER sign replaced by ROAD CONSTRUCTION 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 a 10" x 10" (min.) orange flag and a Type B Light attached and operating at all times. Wash 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.

**TYPICAL APPLICATIONS**

Utility Work
Pavement Repair
Structure Adjustments

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**ROAD DESIGN**

**TRAFFIC CONTROL THROUGH WORK ZONES**

**TWO-LANE, TWO-WAY • URBAN DAY OR NIGHT OPERATIONS**

**BUILDING PERMIT NO:**
**CONTRACTOR:**
**DATE OF COMPLETION:**

[Stamp: Florida Department of Transportation]
[Stamp: State of Florida]

**627**
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. 60B.

3. The first two warning signs shall be 200' x 8' (Min.) orange flag and a Type B light attached and operating at all times.

4. Signs shall be mounted if closure time exceeds 12 hours.

5. The WORKER 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 not be greater than 25'.

9. Temporary sign positioning modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.

10. Work performed for a period of 60 minutes or less is to be conducted in accordance with Index No. 60B or emergency condition procedures as described in Index No. 60A, whichever applies.

11. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.

12. 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 ROAD DESIGN

MULTILANE, TWO-WAY URBAN DIVIDED OR UNDIVIDED DAY OR NIGHT OPERATION
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); Cones Or Tubular Markers May Be Used During Daylight Only.
- 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 to 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 travel lane and adjoining auxiliary lane
   c. Outside travel lane and adjoining auxiliary lane
   d. Inside travel lane
   e. Inside travel lane
   f. Inside travel lane
   g. See Sheet 2 Of 2
3. 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 CONSTRUCTION AHEAD signs and the merge symbol signs eliminated.
4. For work operations of 60 minutes or less see Index No. 610.

TYPICAL APPLICATIONS

Utility Work
Pavement Repairs
Structure Adjustments

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.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
MULTILANE, 2-WAY - URBAN DIVIDED OR UNDIVIDED DAY OR NIGHT OPERATIONS

ENGINEER: W.B. Stepper
DESIGNER: F.R.A. Spessard

92 1 of 2 623
SYMBOLS

<table>
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GENERAL NOTES (CONT.)

8. The maximum spacing between devices (ft.) within lateral transitions shall be equal to the speed limit (MPH) but no greater than 25 for cones or tubular markers or 50 for Type I or Type II barricades. 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’, thereat 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 and do not reflect pavement markings.

10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.

11. For general TCE requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

Utility Work
Pavement Repairs
Structure Adjustments
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.

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), Cones Or Tubular Markers May Be Used During Daylight 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. 605.
3. When vehicles in a parking zone block the line of sight to TC2 signs or when TC2 signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with index No. 1203.
4. 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.
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 cones or tubular markers at 25 centers and Type I or Type II barricades or vertical panels or drums at 50 centers, except in test work areas spacing may be increased to 50 centers for cones or tubular markers and 100 for barricades or vertical panels or drums after the first 240 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 TC2 requirements and additional information refer to index No. 622.

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

Traffic Control

1 of 1
1. All vehicles, equipment, workers, and their activities are restricted at all times to one side of the roadway.

2. Work operations shall be confined to either one lane or a combination of lanes as follows:
   - Inside travel lane
   - Inside auxiliary lane
   - Inside travel lane and adjoining auxiliary lane
   - Inside travel lane and adjoining center lane
   - Inside travel lane and adjoining auxiliary and center lanes
   - Inside travel lane
   - Inside auxiliary lane
   - Inside travel lane and adjoining auxiliary lane
   - Inside travel lane and adjoining center lane
   - Inside travel lane and adjoining auxiliary and center lanes
   - Inside travel lane
   - Inside auxiliary lane
   - Inside travel lane and adjoining auxiliary lane
   - Inside travel lane and adjoining center lane
   - Inside travel lane and adjoining auxiliary and center lanes
   - See Sheet 2 of 2

   If the work area is confined to an auxiliary lane the work area shall be barricaded and the RIGHT LANE CLOSED AHEAD sign replaced by ROAD CONSTRUCTION AHEAD signs and the merge left symbol signs eliminated.

3. For work operations, that require a single lane closure only, of 60 minutes or less see Index No. 620.

4. When vehicles in a parking zone block the line of sight to TCO signs or TCC signs encroach on a normal pedestrian walkway, the signs shall be mounted and spaced in accordance with Index No. 17302.

5. 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 with the LEFT LANE CLOSED HEAD signs replaced by ROAD CONSTRUCTION AHEAD signs and the merge right symbol signs eliminated.

6. The first two warning signs, each site, shall have a 18" x 18" min. I 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.
GENERAL NOTES (CONT.)

7. All signs shall be posted if closure time exceeds 12 hours.

8. The maximum spacing between devices (e.g. within lateral transitions) shall be equal to the speed limit (MPH) but no greater than 25' for cones or tubular markers or 5' for Type I or Type II barricades or vertical panels or drums.

Spacing for devices parallel to the travel lanes shall be 25' for cones or tubular markers and 50' for Type I or Type II barricades or vertical panels or drums. For 25', thereafter cones or tubular markers at 50' centers and Type I or Type II barricades or vertical panels or drums at 200' 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 TC2 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). Cones Or Tubular Markers May Be Used During Daylight Only.**
- **Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)**
- **Work Zone Sign**
- **Advance Warning Arrow Panel**

**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. 602.
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. 11302.
5. 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.
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 30 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 ENTRAP ON THE PAVEMENT REQUIRING THE CLOSURE OF THE CENTER LANE.
**GENERAL NOTES**

1. These illustrations are representative of general conditions. Conditions differing from those shown shall be treated as directed by the Engineer.

2. The intensity of light and the position of panels shall be as specified in Index No. 600.

3. 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.

4. For general TCE requirements and additional information refer to Index No. 600.

5. 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 dictate requirements for shadow vehicle and attenuators. The work vehicle will be required to have an advance warning arrow panel and warning sign.

**SYMBOLES**

- Work Vehicle With Flashing Beacon
- Shadow (S) Or Advance Warning (AW) Vehicle
- With Advance Warning Arrow Panel And Warning Sign
- Truck Mounted Attenuator (TMA)
- Lane Identification And Direction Of Traffic
**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 3, the U-turning vehicle shall cautiously turn into lane 1 and proceed in lane 1 to the front of the 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.

---

**SYMBOLS**

- **Outline Area**: Work Area
- **Solid Arrow**: Work Zone Sign
- **Solid Triangle**: Advance Warning Arrow Panel
- **Open Arrow**: Work Vehicle
- **Open Triangle**: Lane Number

---

**TRAFFIC TRANSITION AREA UPSTREAM FROM CROSSTOWN**

**CASE I**

**GENERAL NOTES**

1. When crossovers do not exist, the contractor will construct temporary crossovers in accordance with Index No. 29.

2. **L**: Length of taper in feet
    - Where: W = Width of lateral transition in feet
      - Where: S = Posted speed limit (MPH)

3. The maximum spacing between devices (P.T.) within the lateral transition shall 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 vertical panels or drums.

4. Arrows denote direction of traffic only and do not reflect pavement markings.

---

**TRUCKS TURNING LEFT 000 FT**

**MERGE RIGHT ON FLASHING ARROW**

**4" x 8" ADVANCE WARNING ARROW PANEL**

**FLASHING OR SEQUENTIAL MODE**

---

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**TEMPORARY CROSSTOWN FOR PAVING TRAIN OPERATIONS**

**RURAL**

---

**PROJECT ADVANCE WARNING SIGNING**

**WHEN THIS SIGN CONTAINS WITH ROAD CONSTRUCTION ¼ MILE SIGN, THE ROAD CONSTRUCTION ¼ MILE SIGN SHALL BE TEMPORARILY REMOVED AND THE ORANGE FLAG AND TYPE B LIGHT ATTACHED TO THIS SIGN**

---

**ADVANCE WARNING ARROW PANEL DETAILS**

- **Scale**: 1:200
- **Material**: 3M Hi-Viz Reflective Sheeting
- **Colors**: Orange/White
- **Dimensions**: 48" x 24"
When This Sign Conflicts With ROAD CONSTRUCTION 1/2 MILE Sign, the ROAD CONSTRUCTION 1/2 MILE Sign Shall Be Temporarily Removed and the Orange Flag and Type B Light Attached To This Sign.

These Signs Advance With Crossover Signage

When the median width is too narrow for trucks to make turns into Lane No. 2, Signs Nos. 1, 2, 3 & 4 shall be moved ahead to a crossover in advance of the RIGHT LANE CLOSED 1/2 MILE sign. Project advance warning signs (not shown upper right) shall be located in advance of the relocated Sign No. 4.

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

When the paving train is in lane 2, the U-turning vehicle shall 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 CROSSTRADE

CASE II

Note: See Sheet 1 of 2 for General Notes, Sign No. Details, and Conditions.
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. 600, for lane width requirements see index No. 500.

2. Route through traffic to newly constructed roadway.

3. Reroute or reconstruct existing pavement including 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 be a 48" x 48" (min.) orange flag and a Type B
   lighted sign operating at least 500 feet.

2. Existing signs and pavement markings that conflict with construction
   signing and marking shall be deleted or removed.

3. Lane widths for maintenance of two-way traffic should generally be equal
   to lane widths of existing facility, but lanes shall be not less than 10
   feet in width. When one lane one-way operations are necessary, a minimum
   width of 12 feet shall be established and traffic contained in accordance
   with indexes No. 600, 625, 600, 800 and 800. Minimum width for the
   temporary shoulders is 6 feet.

4. The maximum spacing between warning devices within street travel lines (P)
   to be equal to the speed limit, but not greater than 200 feet. When no
   double or multiple markers are provided for a Type I or II type II
   terraces or vertical panels or drums.

5. The maximum spacing between warning devices used for delineation between
   the travel way and construction area to be 250 feet or double markers and
   500 feet for Type I or Type II terraces or vertical panels or drums.

6. Barricade shall be in accordance with "Protection Requirement For
   Dignitary" index No. 600.

7. For speed sign applications see index No. 600.

8. For reflectorized raised pavement marker application see index No 600
   and index No. 615.

9. Additional barriers, signing, lighting or other traffic controls shall be
   provided for limited work areas in accordance with other applicable
   TCI indexes.

10. Arrows denote direction of traffic only and do not reflect pavement
    markings.

11. Longitudinal dimensions are to be adjusted to fit field conditions.

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 TCI indexes.

13. Provisions approved by the Engineer shall be made for the removal of
    storm water from the roadway during construction.

14. For general TCI requirements and additional information refer to index
    No. 600.
**PHASE I**

1. Maintain two-lane two-way traffic over existing facility.
2. Construct temporary structure, approaches, guardrail and crash cushions.
3. The signing shown in the Phase I diagram is required whenever equipment workers or their activities are within 15 feet of the existing pavement edge.

**PHASE II**

1. Re-sign and mark as shown in Phase II plan.
2. Remove traffic to detour and maintain two-way traffic on detour. Install Type III barriers.
3. Construct proposed structure and reconstruct or resurface existing approaches.

**PHASE III** (See Sheet 2 of 2)

**GENERAL NOTES** (See Sheet 2 of 2)

**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). Cones Or Tubular Markers May Be Used During Daylight Only.**
- **Type III Barricade (With Flashing Light)**
- **Work Zone Sign**
PHASE III

1. Route traffic to existing alignment and maintain two-way traffic.
2. Remove all temporary construction items.

GENERAL NOTES

1. All signing, pavement marking, barriers and warning lights necessary for maintenance of traffic shall conform to Index No. 660.

2. The first two warning signs shall have a 9" x 18" (min.) orange flag and a Type A 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 feet shall be maintained and traffic controlled in accordance with indexes Nos. 603, 604, 606, 607 or 608.

5. Minimum width for the detour shoulders is 6 feet.

6. Method of attaching temporary guardrail to the detour structure to be approved by the Engineer.

7. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.

8. Temporary crash cushions shall be the inertial type in accordance with Index No. 455 or others as called for in the plans.

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. Where the temporary structure is not required the detour may be constructed in accordance with Index No. 609, unless otherwise stipulated in the plans.

12. For reflective raised pavement marker application see Index No. 600 and Index No. 07350.

13. For general TC2 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), Cones or Tubular Markers May Be Used During Daylight Only.
- Work Zone Sign
- Drum

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 a 18" x 18" (min.) orange flag and a type B light attached and operating at all times.
3. All signs shall be posted.
4. S-Pedestal speed (inch / MPH).
5. The maximum spacing between warning devices within lateral transitions (FT) to be equal to the speed limit (FT) but not greater than 2D for cones or tubular markers or 5D for type I or type II barricades or vertical panels or drums. Barricades, vertical panels, cones, tubular markers and drums shall not be interleaved in lateral transition.
6. For speed sign applications see index No. 600.
7. 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.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to TI field conditions. See index No. 600.
10. When side roads, cross roads or interchanges are located within the limits for work zone traffic control, all traffic control devices shall be erected in accordance with other applicable TCI Indexes.
11. For general TCI requirements and additional information refer to index No. 600.
<table>
<thead>
<tr>
<th>Design Speed (Vi mph)</th>
<th>Clear Zone (CZ, Feets)</th>
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<tbody>
<tr>
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**TABLE I**

CLEAR ZONE OF CURVED ALIGNMENT (CZc), FEET

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<th>Design Speed (Vi mph)</th>
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</table>

**Locate by intersect of Rczc & CZ Extension**

**Step 1. Select CZ value from chart on Sheet 2 of 2.**

**Step 2. In Table I above, locate the "Design Speed" and "Tangent" CZ values that match the speed and CZ value from Step 1.**

**Step 3. Move down the "D" column to the degree of curve under consideration, please circle the value found under Step 2, to find the NZC value.**

**CZc**

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**DESIGN CRITERIA RELATED TO HIGHWAY SAFETY**
<table>
<thead>
<tr>
<th>INDEX NUMBER</th>
<th>SHEET NUMBER</th>
<th>DESCRIPTION</th>
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<tr>
<td>9535</td>
<td>2 of 4</td>
<td>Bolt keeper Washer Detail, and Base Connection Data Table - Bolt Size and Torque, revised.</td>
</tr>
<tr>
<td>9535</td>
<td>4 of 4</td>
<td>Bolt keeper Washer Detail, and Base Connection Data Table - Bolt Size and Torque, revised.</td>
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<td>10037</td>
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<td>1 of 2</td>
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</tr>
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<td>Dimensions revised, Cases rearranged on sheet, General note 5 revised, note 6 added.</td>
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<td>Updated notes and Modified Mounting.</td>
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<td>&quot;C&quot; arrow deleted from FTP 18, &quot;A&quot; arrow deleted from FTP 20.</td>
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<td>&quot;A&quot; arrow deleted from FTP 28.</td>
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<td>Details rearranged to separate the Ensign System from the Great System.</td>
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<td>Arrow notation deleted from FTP 3 notes revised.</td>
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<td>Deleted WOT 1, WOT 2, and WOT 3 added, RIGHT TURN ONLY and LEFT TURN ONLY details and note, revise dimensions on FTP 26.</td>
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<td>Revised arrow detail, relocate title for FTP 27, revise notes.</td>
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<td>Revise dimensions on details.</td>
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<td>New sheet (Single Point Attachment).</td>
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<td>Revised notes, changed to sheet 2 of 2 (Two Point Attachment).</td>
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<td>Revise Concrete Pole Wiring Detail conduct routing and notes.</td>
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<td>Revise Note 22 and Breakaway Feature note.</td>
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<td>Revise notes.</td>
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<td>Cap screw changed to bolt on details, NCZ changed to NC on details, gage and note added.</td>
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<td>Pull Box Detail and notes deleted, conduit routing in pull box wiring detail changed. Conduit length changed to conform depth on Metal Core Concrete Foundation Detail.</td>
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<td>35&quot; pole length changed to 36&quot;, out of ground dimension changed from 28&quot; to 29&quot;.</td>
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<td>Note added.</td>
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<td>Section B 630-3A sealing of conduit ends note revised.</td>
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<td>Note added, dimensions changed on FTP 49.</td>
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<td>Note added to Metal Pole detail.</td>
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<td>SOP 20 added to sheet.</td>
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<td>Note added under Figure 4.</td>
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<td>I037</td>
<td>I7501 General Notes</td>
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<td>I7502 Highmast Lighting Details (3 Sheets)</td>
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<td>I7503 Roadway Lighting Details</td>
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<td>I7504 Service Point Details</td>
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<td>(I770) Conduit Installation Details (2 Sheets)</td>
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<td>(I773) Aerial Interconnect</td>
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<td>(I786) Cabinet Installation Details</td>
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<td>I7507</td>
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<td>(I795) Advance Warning For A/V Crossing</td>
</tr>
<tr>
<td>I7508</td>
<td></td>
<td>(I796) Railroad Grade Crossing Traffic Control Devices (4 Sheets)</td>
</tr>
<tr>
<td>I7509</td>
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<td>(I797) Traffic Control Devices For Moveable Span Bridge Signals (3 Sheets)</td>
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### GENERAL NOTES

**SPECIFICATIONS**
- Field department for transportation standard specifications for signs and design criteria with sections 2 through 11.
- Further information on design criteria is available in the relevant sections of the Standards. For specific requirements, refer to the relevant sections of the Standards.
- All dimensions are in inches unless otherwise noted.
- All materials and colors must comply with the requirements of the relevant sections of the Standards.
- All signs must be of durable materials and constructed to withstand severe weather conditions.
- All signs must be clearly visible and legible from a distance of 200 feet (61 meters).
- All signs must be installed in accordance with the relevant sections of the Standards.
- All signs must be maintained and kept in good condition.
- All signs must be replaced when necessary.
- All signs must be designed and installed in accordance with the relevant sections of the Standards.

**SIGN MATERIALS**
- The design criteria for sign materials are based on durability and visibility.
- All signs must be made of materials that can withstand severe weather conditions.
- All signs must be made of materials that are durable and long-lasting.
- All signs must be made of materials that are resistant to vandalism.

**SIGN COLOURS**
- The design criteria for sign colours are based on visibility and contrast.
- All signs must be made of materials that are easily visible.
- All signs must be made of materials that are bright and easy to see.
- All signs must be made of materials that are easy to maintain.

**SIGN INSTALLATION**
- The design criteria for sign installation are based on safety and visibility.
- All signs must be installed in a manner that ensures safety and visibility.
- All signs must be installed in a manner that ensures ease of maintenance.
- All signs must be installed in a manner that ensures durability.

**SIGN MAINTENANCE**
- The design criteria for sign maintenance are based on durability and visibility.
- All signs must be maintained in a manner that ensures durability and visibility.
- All signs must be maintained in a manner that ensures ease of maintenance.
- All signs must be maintained in a manner that ensures safety.

**SIGN REPLACEMENT**
- The design criteria for sign replacement are based on durability and visibility.
- All signs must be replaced in a manner that ensures durability and visibility.
- All signs must be replaced in a manner that ensures ease of maintenance.
- All signs must be replaced in a manner that ensures safety.

**SIGN STORAGE**
- The design criteria for sign storage are based on durability and visibility.
- All signs must be stored in a manner that ensures durability and visibility.
- All signs must be stored in a manner that ensures ease of maintenance.
- All signs must be stored in a manner that ensures safety.

**SIGN REMOVAL**
- The design criteria for sign removal are based on durability and visibility.
- All signs must be removed in a manner that ensures durability and visibility.
- All signs must be removed in a manner that ensures ease of maintenance.
- All signs must be removed in a manner that ensures safety.

**SIGN INSTALLATION**
- The design criteria for sign installation are based on safety and visibility.
- All signs must be installed in a manner that ensures safety and visibility.
- All signs must be installed in a manner that ensures ease of maintenance.
- All signs must be installed in a manner that ensures durability.

**SIGN MAINTENANCE**
- The design criteria for sign maintenance are based on durability and visibility.
- All signs must be maintained in a manner that ensures durability and visibility.
- All signs must be maintained in a manner that ensures ease of maintenance.
- All signs must be maintained in a manner that ensures safety.

**SIGN REPLACEMENT**
- The design criteria for sign replacement are based on durability and visibility.
- All signs must be replaced in a manner that ensures durability and visibility.
- All signs must be replaced in a manner that ensures ease of maintenance.
- All signs must be replaced in a manner that ensures safety.

**SIGN STORAGE**
- The design criteria for sign storage are based on durability and visibility.
- All signs must be stored in a manner that ensures durability and visibility.
- All signs must be stored in a manner that ensures ease of maintenance.
- All signs must be stored in a manner that ensures safety.

**SIGN REMOVAL**
- The design criteria for sign removal are based on durability and visibility.
- All signs must be removed in a manner that ensures durability and visibility.
- All signs must be removed in a manner that ensures ease of maintenance.
- All signs must be removed in a manner that ensures safety.

**SIGN TYPES**
- The design criteria for sign types are based on visibility and safety.
- All signs must be made of materials that are easy to see.
- All signs must be made of materials that are durable.
- All signs must be made of materials that are resistant to vandalism.

**SIGN HEIGHTS**
- The design criteria for sign heights are based on visibility and safety.
- All signs must be made of materials that are easy to see.
- All signs must be made of materials that are durable.
- All signs must be made of materials that are resistant to vandalism.

**SIGN SIZES**
- The design criteria for sign sizes are based on visibility and safety.
- All signs must be made of materials that are easy to see.
- All signs must be made of materials that are durable.
- All signs must be made of materials that are resistant to vandalism.

**SIGN MOUNTING**
- The design criteria for sign mounting are based on visibility and safety.
- All signs must be made of materials that are easy to see.
- All signs must be made of materials that are durable.
- All signs must be made of materials that are resistant to vandalism.

**SIGN MATERIALS**
- The design criteria for sign materials are based on durability and visibility.
- All signs must be made of materials that are easy to see.
- All signs must be made of materials that are durable.
- All signs must be made of materials that are resistant to vandalism.

**SIGN INSTALLATION**
- The design criteria for sign installation are based on safety and visibility.
- All signs must be installed in a manner that ensures safety and visibility.
- All signs must be installed in a manner that ensures ease of maintenance.
- All signs must be installed in a manner that ensures durability.

**SIGN MAINTENANCE**
- The design criteria for sign maintenance are based on durability and visibility.
- All signs must be maintained in a manner that ensures durability and visibility.
- All signs must be maintained in a manner that ensures ease of maintenance.
- All signs must be maintained in a manner that ensures safety.

**SIGN REPLACEMENT**
- The design criteria for sign replacement are based on durability and visibility.
- All signs must be replaced in a manner that ensures durability and visibility.
- All signs must be replaced in a manner that ensures ease of maintenance.
- All signs must be replaced in a manner that ensures safety.

**SIGN STORAGE**
- The design criteria for sign storage are based on durability and visibility.
- All signs must be stored in a manner that ensures durability and visibility.
- All signs must be stored in a manner that ensures ease of maintenance.
- All signs must be stored in a manner that ensures safety.

**SIGN REMOVAL**
- The design criteria for sign removal are based on durability and visibility.
- All signs must be removed in a manner that ensures durability and visibility.
- All signs must be removed in a manner that ensures ease of maintenance.
- All signs must be removed in a manner that ensures safety.

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ELEVATION
Mounting of Exit Numbering Panels To Highway Signs

NOTE: Exit numbering panel shall be located to the right side for right exit and to the left for left exit.

SECTION A-A

GENERAL NOTES

DESIGN SPECIFICATION: Standard specifications for structural supports for highway signs, luminaire and traffic signals. AASHTO, 2007

MATERIALS: All aluminum materials shall meet the requirements of the Aluminum Association Alloy 6061-T6 and ASTM Specification B-209. Sheets are to be three grades, minimum and treated with Incoloy 2000/530M - T6. Standard for T6061-T6. All sheeting and piping shall be made of Grade 6061-T6. All materials shall meet the requirements of the Aluminum Association Alloy 6061 - T6 and also the following ASTM specifications for the following: Steel and Plates B-209 (Expanded) B-209 and Standard Structural Shapes B-306.

ALUMINUM BELTS, NUTS & LOCKWASHERS - Aluminum belts shall meet the requirements of the Aluminum Association Alloy 6061 - T6 and ASTM (Grade B-206). The belts shall have an average coating of an equal weight percent and be uniformly coated. Lockwashers shall meet the requirement of Aluminum Association Alloy 6061 - T6. ASTM specification B-201. All signs shall meet the requirement of Aluminum Association Alloy 6061 - T6 or 6061 - T6.

SIGN FACE - All sign face covers shall be located. See sign layout sheet for dimension "L" and sign face data...

MATERIAL STRESSES: All allowable stresses are in accordance with standard specifications for structural supports for highway signs, luminaire and traffic signals. AASHTO, 2007.

FOR MOUNTING DETAILS REFER TO DRAWING NO. JDF-1 INDEX X037.
CASE I
For use on Freeway and Expressway systems for signs on medians.

CASE II
For use on All-Rural Roads and On Freeway And Expressway Ramps.

CASE III
For use on All-Roads with Signs Mounted Behind Sign - Wall.

CASE IX (Merge Sign)
For Use On All-Rural, Freeway And Expressway Systems.

CASE V
For Use In Business Or Residential Areas Only.

CASE XI
For Use On All-Roadways with Signs Behind Guardrail.

CASE VII (REST AREA & EXIT GORE SIGNS)
For Use on Freeway And Expressway Systems.

CASE VIII
Sign On Island

CASE IX (MILE POST MARKER)
For More Information Refer To Part 02-46 Of The Minnesota Uniform Traffic Control Devices

GENERAL NOTES:
1. The typical sections shown herein serve as a guide for preparing the traffic signs required under various roadway conditions. For size and design of signs place and location, refer to the Minnesota Standards and Guides for Traffic Sign Design.
2. It shall be the CONTRACTORS' responsibility to verify that the length of sign supports in the field plan of Erection.
3. Roadway signs shall be installed at an angle of 45 to 60 degrees away from the roadway. A traffic sign may be rotated counterclockwise and moved vertically with sign support. All sign supports shall be mounted at a height above the pedestrian to the maximum line of sight.

TYPICAL SECTIONS FOR ONE COLUMN SIGN PLACEMENT

STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
Minnesota Highway Design

TYPICAL SECTIONS FOR ONE COLUMN SIGN PLACEMENT

TYPICAL SECTIONS FOR ONE COLUMN SIGN PLACEMENT
3. TRAFFIC CONTROL DEVICES WITH FLASHING BEACON FOR REDUCED SPEED ZONE AT A SCHOOL CROSS-WALK (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 CROSS-WALK (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 CROSS-WALK WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS (4 LANES UNDIVIDED - 2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)

---

**SCHOOL SIGNS & MARKINGS**

<table>
<thead>
<tr>
<th>APPROACH SPEED LIMIT</th>
<th>SUGGESTED DISTANCE IN FEET</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 TO 35</td>
<td>200</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>35 TO 45</td>
<td>300</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>45 TO 55</td>
<td>500</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

School cross walk width shall be 6 ft. 67 mph, without curb cut ramps, 67 mph, with curb cut ramps, See Index Item 1338.
9. TRAFFIC CONTROL DEVICES AT SCHOOL ENTRANCES WHERE THERE ARE LITTLE OR NO 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

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 ft. in advance. It shall have a sign size of 30" x 30". It is not intended that these signs be used where a school bus stop is to pick up or discharge passengers. These signs are intended for use only at locations where surveys and roadway features limit the approach sight distance and where there is an opportunity to reassign the stop to another location with adequate visibility.
OVERHEAD STANDARD

* Flashing beacon may be placed within or below panel.

NOTES:
1. Standard size signs should be used whenever possible. Minimum size may be used only on low volume, low-speed (less than 25 mph) streets. Special sizes should be used in expressway facilities where special requirements are 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 25 mph. min. as set by law.

SPEED LIMIT ASSEMBLY

SCHOOL ZONE

OO MPH WHEN FLASHING

END SCHOOL ZONE

OO MPH

WHITE REFLECTIVE BACKGROUND WITH BLACK OPACITY LEGEND AND BORDER

YELLOW REFLECTIVE BACKGROUND IN ANY COLOR WITH BLACK OPACITY LEGEND AND BORDER

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION

SCHOOL SIGNS & MARKINGS

District No. 173

Approve by:

Date: 4/16/77

6 of 6
NORMAL TAPERED ENTRANCE

NORMAL TAPERED ENTRANCE
WITH ADDED LANE
PLACEMENT OF REFLECTIVE PAVEMENT MARKERS AND DELINEATOR POSTS FOR ENTRANCE AND EXIT RAMPS

Note:
Post delineators spaced at 40' begin at the P.C. and end of 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 set back 4'-6" from shoulder area.

PLACEMENT OF REFLECTIVE PAVEMENT MARKERS AND DELINEATOR POSTS FOR LOOP RAMPS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
INTERCHANGE MARKINGS

PREPARED BY:  
CHECKED BY:

SHEET 5 OF 8  17345
PAVEMENT MARKINGS AND DELINEATORS FOR MEDIAN CROSS-OVER

NOTE: When arrow and pavement messages 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'-0" (5 times the arrow to the base of the message)

PAVEMENT ARROW AND MESSAGE DETAILS

Yellow Edge Line

Dotted Line (Turning Guide Line)

Broken White Centerline

Dotted Yellow Centerline

Solid White Edge Line Or Lane Line

Broken White Edge Line Or Lane Line

Solid White Centerline

Types of Permanent Longitudinal Lines

Without Contrasting Markings

Reflective R.P.M. - 15

With Contrasting Markings

Reflective R.P.M. - 15

NOTES: Ceramic markers should not be installed unless specifically called for in the plans. Use is limited to high volume locations 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

PLACEMENT OF EDGE LINES

SPECIAL MARKING AREAS

PAVEMENT MARKINGS FOR INTERSECTIONS WITH MAJOR AND MINOR ROADS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC DESIGN

Chad G./Chad G.

approved by

90th 17346

1st of 8
NOTE:
Yellow left turn edge marking may be used adjacent to raised curbs or cross sections if line use is not readily apparent to drivers approaching a left turn storage lane.

With each additional 50% of turn lane add one arrow.

Arrow should be evenly spaced between first and last arrow.

PAINTED LEFT TURN STORAGE LANE(S) DETAILS
FOR STOP CONTROLLED OR SIGNALIZED INTERSECTIONS

TYPICAL CROSSWALK MARKINGS FOR CURB OUT RAMPS
REFER TO INDEX NO. P.558

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

TWO WAY LEFT TURN LANE
(WITH SINGLE LANE LEFT TURN CHANNELIZATION)
FIGURE 1
MEDIAN WIDTHS UNDER 30 FEET
ONE-WAY SIGNS ON DIVIDED HIGHWAY INTERSECTIONS
MEDIAN WIDTHS 30 FEET AND GREATER

PAVEMENT MARKINGS FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)

PAVEMENT MARKING FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSITE DIRECTION)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN
SPECIAL MARKING AREAS
RAILROAD CROSSING AT 2-LANE ROADWAY

RAILROAD CROSSING AT 4-LANE ROADWAY

NOTES:

1. When quoting pavement messages, quantities do not include transverse lines.

2. When dynamic devices are not present or are to be institutionalized, the complete shall be located at the future location of the RR gate or signal and gate. In accordance with section 196.

3. Placement of sign WO-1 in a residential or business district, where the speed of the vehicle, the WO-1 sign may be placed a minimum distance of 200 feet from the crossing, where street intersections occur between the RR pavement markers and the tracks or additional WO-1 sign or additional pavement marking shall be used.

4. Recommended location for FFP-50 sign, XPD, urban & 300 ft. rural.

5. A portion of the pavement marking symbol shall be directly opposite the WO-1 Sign.

Pavement Markings For Termination
Of Two Way Left Turn At R/R Crossings.
NOTE:
When used on a bike lane (adjacent to vehicle lane) markings shall be painted adjacent to markings for vehicles & MDU sign shall be sized and placed for vehicles.
STATE OF FLORIDA
WELCOME CENTER

STATE OF FLORIDA
OFFICIAL WELCOME CENTER

STATE OF FLORIDA
WELCOME CENTER

WELCOME CENTER

Tourist Information Center
NEXT RIGHT

Note: Sign steel base Blue Reflective Background with White Reflective Legend & Border. Sign SFT-20 shall be used as a supplementary guide sign or interchange which have a Tourist Information Center approved for such signage to locate travel way between named guide sign.

Note: Note not shown to scale.

Distances shown are approximate for adequate driver communication but may be altered slightly if local conditions require.

Notes:
1. Signs and structures shall be erected in accordance with the details shown on Index 055.
2. Sign SFT-20 shall be located next to the entrance Center grounds in proximity to the building and as far from the main route roadways as possible (or signs here in back).
3. Sign SFT-18, 18 shall be located on limited access highways only.
4. Details of Florida symbols are exclusive of request from Traffic Plans & Standards Office of D.O.T.
5. All legend to be Series C.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION

WELCOME CENTER SIGNING
FOR LIMITED ACCESS HIGHWAYS

Scale: 1/1000 1/1000 1/1000

Drawn By: [Name] Date: [Date]

Engineer: [Name] Date: [Date]

State of FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION

WELCOME CENTER SIGNING
FOR LIMITED ACCESS HIGHWAYS

Scale: 1/1000 1/1000 1/1000

Drawn By: [Name] Date: [Date]

Engineer: [Name] Date: [Date]
1. Reflective Pavement Markers shall be spaced at 40 feet on all skip lane lines and skip center lines. This spacing may be reduced to 20 feet if specifically outlined for in the plans.

2. The spacing on solid lines and solid-skip combination lines shall be 40 feet.

3. All R.P.M.s shall be offset 7 feet from solid lines.

4. These spacements may be reduced if required for sharp curves.

5. All R.P.M.s shall be class "B".
NOTE
Reflective pavement markers should be set one (1) inch outside of gore.

RPM PLACEMENT FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)

NOTE
Reflective pavement markers (Bi-Directional/Red and Colored) should be used in all gases of this type.

RPM PLACEMENT FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSITE DIRECTION)

PLACEMENT OF RPMS ON SHOULDER MARKINGS
Shoulder Marking for Left Side of Roadway Shall Be Yellow.
For Placement of RPMS On Roads See Index 17345.
SPECIAL SIGN DETAILS

COUNTY ROUTE MARKER DETAIL
(3 & 4 DIGIT MARKER)

- Use 0.5" Series "C" for 3 digits and 0.625" Series "C" for 4 digits.

Notes:
1. When used independently the county shield shall have the county name the numeral size may be increased.
2. When used on a guide sign, shield shall be overlaid on a 30" x 40" white Reflective Background.

Color: Yellow Reflective Legend and Border on Blue Reflective Background.

COUNTY ROUTE MARKER DETAIL
(1 & 2 DIGIT MARKER)

- Use 0.5" Series "C" for 1 digit and 0.625" Series "C" for 2 digits.

Notes:
1. Signs for 1 - 4 digits are to be used on guide signs.
2. When used on a guide sign, shield shall be overlaid on a 30" x 40" white Reflective Background.

Color: Yellow Reflective Legend and Border on Blue Reflective Background.

EXIT PANEL
(GORE INSTALLATION)

- Reflective Green Background with Reflective White Legend and Border.

Notes:
1. The exit number shall be centered in the space provided on sign panel.
2. Reduce size of the numbers when 3 or more digits are used. Example: 000A.
Color of Sign Shell be White Reflective Background with Black Opaque Border & Legend.

NOTES
1. Top portion of FTP 25 & 26 shall have a reflective blue background with white reflective symbol and border.
2. Bottom portion shall have a reflective white background with black opaque legend and border.
3. FTP 25 & 26 may be truncated on one side if needed.
4. FTP 25 may be substituted for the FTP 26 in areas where space is limited.
5. Signs are to be mounted at standard height, 7'-0" from pavement to bottom of sign.

SPECIAL SIGN DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL SIGN DETAILS

17355
**NUMERAL SIZE**

1-2 Digits 10" Series "71" - 24" x 24"
2 Digits 6" Series "71" - 24" x 24"
3 Digits 6" Series "71" - 24" x 24"
4 Digits 6" Series "71" - 24" x 24"
More Than 4 Digits 8" Series "71" - 24" x 30"

**Notes:**
1. All plate route markers and auxiliary signs have Black Legend and Border with White Reflective Background.
2. Stroke width of State outline to be 1".

**NOTES:**
1. Florida shield chair has Black Outline Legend with White Reflective Background.
2. Stroke width of State outline is 1/8".

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<td>36&quot;</td>
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<td>36&quot;</td>
<td>45&quot;</td>
<td>44&quot;</td>
<td>15&quot;</td>
<td>2&quot;</td>
<td>7&quot;</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>

**FLORIDA'S TURNPIKE FOR INDEPENDENT USE**

**FTP - 26**

**FLORIDA SHIELD FOR GUIDE SIGN USE**

**ARROW DETAIL FOR SIGN FTP - 27**

**FLORIDA'S TURNPIKE TRAILBLAZER**

**FTP - 27**

**DETAIL LAYOUT OF**

Green Reflective Background with White Reflective Legend and Border.

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**SPECIAL SIGN DETAILS**

**DESIGNER:**

**DRAWN BY:**

**APPROVED BY:**

**CRW-9567**

**1 of 4**
NOTES
1. Educational graphics for FTP 36A, 39 & 40 and all diamond-shaped warning signs will have a Reflective Pavement Background with Black Outline, Legend & Border.
2. For golf cart distressed warning signs, remove the two crosswalk stripes.

EMERGENCY SIGNAL
All Letters 4 Series C
1/8" Border
3 1/2" Radius
FTP - 42

GROOVED
All Letters 4 Series C
1/8" Border
1 1/2" Radius
FTP - 45

UNEVEN PAVEMENT
All Letters 4 Series C
1/8" Border
3 1/2" Radius
FTP - 42

LOW SHOULDER
All Letters 4 Series C
1/8" Border
1 1/2" Radius
FTP - 42

GOLF CART XING
All Letters 4 Series C
1/2" Border
1 1/2" Radius
FTP - 46

LOW VEHICLES MAY DRAG
All Letters 4 Series C
1/8" Border
1 1/2" Radius
FTP - 42

MOVE ACCIDENT VEHICLES FROM TRAVEL LANES
5/16" Border
6" Radius
FTP - 46
White Reflective Background With Black Graphic Legend & Border

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN
SPECIAL SIGN DETAILS

17355
TYPICAL INSTALLATIONS FOR SIGN PANEL(S) MOUNTED ON SPAN WIRE

DETAIL OF SIGN CLAMP

DETAIL OF OPPOSING SIGNS SPAN WIRE MOUNTED

TYPICAL SPAN WIRE INSTALLATION

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 1 PSF.
3. Types B & C attachments with wire hanger shall have 2 wire bands for signs wider than 3\(\frac{1}{2}\) feet. The bands shall extend to within 6" of the sign edge.
4. Types D & E attachments for signs 4 feet and wider shall have 2 hangers. Signs 5 feet and wider shall have 2 wire bands that extend to within 6" of the sign edge.
5. Type D attachments shall be for signs 3\(\frac{1}{2}\) feet wide or more.
6. Sign posts shall meet the requirements of section 9635.
7. Refer to sections 634 & 650 of the Supplemental Specifications to the Standard Specifications for Road and Bridge Construction Traffic Signals.
8. All bolts, nuts, and washers shall be stainless steel, AISI 300 series, commercial grade, type 316.
SIGN LOCATIONS TYPICAL

NOTE:
2. Sign location No. 3 may require some field adjustment.
3. Signs R1P - 40, R1P - 42 & R1P - 45 shall have a 1/4" edge and 3/4" series with a 4" radius.
4. The Cross Road is the last thoroughfare to the restricted bridge.
5. Sign location No. 3 should be established from the Cross Road for the 6500 ft. downstream distance.
6. For requests to reconstruct, contact Traffic Plans & Standards - Traffic Engineering for sign sizes.

SIGN DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
DIVISION DESIGN

BRIDGE WEIGHT RESTRICTIONS
MINIMUM PARKING RESTRICTION FOR NON-SIGNALIZED INTERSECTIONS

NOTES:
1. Distances measured longitudinally along the street from driver location of visualizing vehicle to end of parking restriction.
2. Distances applicable to intersecting street, major driveway and other driveways to the extent practiced.
3. For non-signalized intersections, the value above shall be compared with the value for signalized intersections and the minimum restriction implemented.

MINIMUM PARKING RESTRICTION FOR SIGNALIZED INTERSECTIONS

NOTE:
Parking restriction measured from curb radius point.

MINIMUM PARKING Restriction FOR
信号された交差点

物

NOTE:
Parking restriction measured from curb radius point.

MINIMUM PARKING Restriction FOR
信号された交差点
NOTES:
1. Bridges should be marked as narrow bridges under the following conditions:
   1.1 For approach roadways with paved shoulders when the bridge width
       including shoulders is less than the width of the approach roadway
       including paved shoulders.
   1.2 For approach roadways without paved shoulders when the bridge
       shoulder width is less than 2'.
2. No passing zone should be extended RDS in advance of narrow bridge.
3. The post mounted reflectors shall be installed on both sides of the roadway,
   (White on Right / Yellow on Left) for a distance of 200' in advance of a narrow
   bridge or the approach is on a curve.
4. Reflectors on both sides of roadway shall face traffic approaching bridge.
1) Ground mats shall have a resistance to ground not to exceed 25 ohms, where the resistance is to be determined with two or more ground mats connected in parallel.

2) The contractor shall ensure that the utility company is notified of any underground lines to be cut into or damaged during excavations.

3) The contractor shall determine the service required data for the power company's transformer location at the pre-construction conference.

4) The power company reserves the right to install the filters, switch gear, and weatherproof all power company lines at the expense of the contractor. Contact the power company for cost or for authorization for an alternate procedure.

5) Any damaged portions of insulated steel pipes and associated metal areas shall be painted in accordance with Section 852 of the Standard Specifications.

6) Pole and bracket area shall be designed in accordance with the design criteria, as indicated in the plans and using the acceptable materials found in the Standard Specifications for Structural Supports for Highway Signs, Luminaire and Traffic Signals, published by the AASHTO.

7) The cumulative manufacturer's test reports a permanent tag on the surcharge housing in which is impressed the following information: Capacity, power rating, design pressure, and paint design. The tag shall be placed in the following relationship: 1/2(ES) ft. high from the curb. The test reports shall be submitted to the owner.

8) Before final assignments, the contractor shall provide 2 sets of full-size as-built plans to the monitoring agency.

9) Conducting rayon shall be used, permitting pole setback distance from edge of pavement. Any cable routing in locations where guardrail is proposed shall be 2'- 0" in front of the guardrail's face position.

10) Pole and guardrail shall be approved by the engineer, to prevent conflicts with utility and drainage structures not indicated, and prevent guardrail and conflict with underground lighting circuits.

11) Guardrail systems are proposed, the poles shall be placed a minimum of 4' behind the face of the guardrail.

12) Pole foundation installations shall be limited to the top of the foundation exposed to a firm, stable condition approximately equal to that of the original soil. The fill shall conform to existing grade and be fully compacted.

13) The wires of the pole insulators shall be loose in the pole and pull-up insulators shall be used to prevent any access to the outside of the insulators. Properly sized insulators to make connections accessible for changing fuses and trouble shooting the system shall be used.

14) Neutral wires to be used in pull-up insulators. Do not use white or green insulated wires for ungrounded conductors.

15) Unless otherwise specified, all cable shall be single conductor, 1/8 percent conductivity stranded copper, with Teflon or Teflon insulation.

16) All options shall be made in pull-up or pole bases. No options shall be made inside the box.

17) All exposed or surfaced mounted conduit shall be right or left-hand service. These exposed runs of conduit shall be provided with either expansion joints or flexible metal conduit. Insulation adequate to take care of vibrations and thermal expansion. All metal conduit shall be grounded. Steel conduit shall not be dipped galvanized.

18) All conduit that will remain empty or exposed shall be rendered nonmetallic inside and outside exposed. Leave the corrosion resistant pull-up w/b and place field markers, or pursuant to work the location of the ends of the conduit.

19) Pull boxes shall be located at ends of conduit crossing roadways, and not for obstruction of the design of the project.

20) These plans represent minimum acceptable criteria. The inspection per these drawings represent the minimum base of acceptance.

21) All materials, unless otherwise specified, shall be underwriter's laboratory approved.

22) Pull boxes shall meet the requirements of paper 635 "Standard Specifications for Host and Bridge Construction" and CRT-635A "Evaluation Criteria for Traffic Control Devices".

**BREAKWAY FEATURE**

All conventional mounting methods shall be mounted on a forged metal base or system of breakaway couplings. If couplings are used, a coupling system shall be provided for each meter and connection. The only continuous connection of the pipe to the foundation at each meter and bolt shall be provided by the couplings. The area between the top of the pole foundation and the base of the pole including all couplings shall be enclosed within a non-structural aluminum skirt.

If a flexible metal base is used, it shall be one piece and be designed to breakaway without the aid of any clipping or fitting surfaces.

"The design of the breakaway feature is in accordance with the breakaway performance requirements of the "Standard Specifications for Structures Supports for Highway Signs, Luminaire and Traffic Signals", A.A.S.H.O., 1965. The contractor may, if he desires, use his own design as long as the breakaway feature meets the above specifications and calculations to verify the design will meet the A.A.S.H.O. requirements while loading specified in the contract plans. His plans are to be submitted prior to approval of superinten's site."
LUMINARIE SPECIFICATIONS

The reflector with its aluminum cover shell is firmly attached to a steel ring. This ring shell type keyseat is in its upper surface such that the reflector/fixture/assembly may be readily attached to, or detached from, the luminaire bracket entry and lamp support assembly without removing the support bracket.

Each luminaire shell contains an integral auto-regulator type boost converter for 400 watts input @ 60 Hz and a power factor of more than 90%. The luminarie reflector shell is enclosed within an aluminum housing which integrally attaches to the luminarie bracket entry and lamp support assembly. It shall be readily removable without removing the luminaire from the bracket.

The luminarie shell is secured to the bracket entry by means of a bracket entry and lamp support assembly. The shell assembly includes a split entry shell/fitter designed for 2-1/2 inch pipe with provision for 5" adjustment for leveling the reflector. An included termal block shell is included such that the integral connections shall be protected from the external environment.

All electrical connections shall be made weatherproof or be made using weather-resisting electrical connectors. All electrical receptacles shall be weatherproofed to an external environment.

The contrafeeder armature is directed to these plans sheets showing the mounting of luminaries on the pole top. Particular attention is directed to alignment of luminaries on the pole top. Special attention must be exercised in the placement of these luminaries to ensure that the approved placement is consistent with the climate conditions of the external environment and to ensure that the luminaries are aligned at the external environment.

FOOTING

The high mast foundations shall be in accordance with the details shown in the plans. Anchor bolts per manufacturers Specifications. Submittals shall be supplied to the engineer of record prior to purchase.

One leveling nut, one test nut down, and one locking/jam nut shall be supplied per anchor bolt. All steel parts, nuts, bolts, washers, etc. shall be galvanized either by galvanizing per ASTM A525 or by the use 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. Portable power unit (lifter project)

The head frame shall slide into the top of the pole to the head frame platform. The platform, with its associated sheaves, etc. shall be covered and conical and the front face shall be covered with stainless steel. The head frame shall be attached to the pole by means of a steel slipfitter. A head frame shall be comprised of five 15-inch radius the head frame shall be grooved to the exact cable diameter, for 800 pound bearing surface. The sheave shall be zinc electroplated to ASTM A5 and dipped in yellow zinc for corrosion resistance. Bearings and cable sheave shall be permanently lubricated. These 15-inch diameter 7 x 1600 pounds each of 7 x 1600 pounds shall be installed.

The power cable sheave shall be assembled to a sheave system with a weatherproofed sheave system. At the base of the pole top, the weatherproofed sheave system will support the sheave sheave to the lower sheave shown or over which the sheave runs, the main portion of the sheave system which is the upper sheave. This system shall be the 15" diameter 7 x 1600 pounds each of 7 x 1600 pounds.

Drum design shall be suitably designed to withstand winds. The power cable shall be fed into the sheave system. A combination of cables providing a ratio of 1:3 shall be used to the ratio of 1:3. Each end of the sheave 1:3 or 1:3 shall have a 60-foot cable to the drum of the sheave system.

The head frame system is reserved for the 1:3 ratio sheave system to the head frame system. The sheave system system shall be combined with a rubber or flexible sheave system. The sheave system system shall be combined with a rubber or flexible sheave system. The sheave system system shall be combined with a rubber or flexible sheave system.

The head frame system shall consist of three 1:3 ratios sheave systems to the head frame system. The sheave system system shall be combined with a rubber or flexible sheave system. The sheave system system shall be combined with a rubber or flexible sheave system.

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HIGHESTATION LIGHTING DETAILS

POLY SPECIFICATIONS

The pole shall be a pipe of single-stage, angle, or round highstrength steel having a minimum yield strength of 50,000 psi. All material shall be black and/or galvanized steel with no operations. Stainless steel shall be as specified.

All poles shall be equipped with a reinforced concrete base approximately 1-2 feet in diameter. The base shall be 10-20 inches wide by 20-30 inches high minimum.

All poles and hardware will be strenuously painted to assure protection on the following schedule. A minimum 3/4-inch spindles and or shall be installed on the inside of the spade or any other metal plates.

The painting of the pole shall be in accordance with the American National Standards Institute and the ASME Specifications for Welding of Steel Structures.

Stainless steel shall be used in accordance with the American National Standards Institute and the ASME Specifications for Welding of Steel Structures.

All poles shall have a protective coating of the pole material in addition to any coating designated for field application in accordance with ASWA 423.

Note: In the case of the pole, the designer is responsible for coordinating the material design with foundation design.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DIVISION
11. All Pull Boxes and Pull Boxes, Ends Of Conduit Steel Be Taped In Accordance With Section 630.13 of The Standard Specifications For Roads and Bridges Construction B-799.

12. A No. 6 AWG Cu Bare Stranded Ground / Bond Wire Shall Be Run From the Service Connecting All Poles. The Bond Wire Is To Be ST Directly Above The Conduct.
SCREW TYPE FOUNDATION SPECIFICATIONS

1. The foundation shaft and base plate shall be ASTM A-36 structural steel, or better.
2. The anchor bolts shall be ASTM A-325, or better.
3. All metals shall be sufficiently to withstand 10,000 ft-lbs of torque, applied about the axis of the foundation.
4. The foundation shall have a mandrel in the base plate at least 6" in diameter.
5. The base plate shall be recessed to install the orientation of the shaft candelas.
6. Grouting shall be provided in the bottom of the foundation by means of an opening of at least 3 square inches.
7. The foundation shall be designed for installation using a rigid hand tightening equipment with a slight down pressure.
8. The whole foundation shall be hot dip galvanized after fabrication to ASTM A-153.

METAL POLE CONCRETE FOUNDATION DETAIL

FULL BOX WIRING DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY LIGHTING DETAILS

RODNEY H. CAMPBELL
ENGINEER OF RESEARCH

ROADWAY LIGHTING DETAILS

RODNEY H. CAMPBELL
ENGINEER OF RESEARCH

17503
DETAIL "A"

AERIAL FEED

DETAILED AERIAL FEED

Concrete Pole Precast
Type 8, 30' long.

Service Conductors Shall Be Stranded
Copper Single Conductor Cable, T.W.R., A minimum length of 6' shall be
Provided From The Weatherhead
For Each Conductor.

Conductor Weatherhead Height As
Required By Power Company.

P.E. Controller When Required.

Water As Required
Height Specified By Power Company.

Concrete Pole, Precast
Type 8, 30' long.

Right Or Intermediate Metal Conduct
On All Above Ground Installations.

W & E AWG Insulated copper ground
wire in 8 rigid galvanized steel conduit.

Grip To 15' Of Porous Or Crushed
Stones For Drainage.

U.C. Approved Ground Rods...

Grade

SERVICE SPECIFICATIONS

1. The enclosure shall be NEMA 3R, pole mounted, rain-proof.
2. All neutral wires to have white insulation, do not use white or green insulated
cables for ungrounded conductors.
3. A pull box is required at each service point.

DETAILED UNDERGROUND FEED

P.E. Controller When Required.

Meter As Required
Height Specified By Power Company.

Concrete Pole Precast
Type 8, 30' long.

Right Or Intermediate Metal Conduct
On All Above Ground Installations.

W & E AWG Insulated copper ground
wire in 8 rigid galvanized steel conduit.

Rigging Detail (See Detail No. 1500.)

Ground Clamps For Connecting Pole
Ground, Bare Bond Wire, And Ground
Wires.

NOTES:

1. Pull boxes shall have a minimum of three hinges and be irremovable. No screws to be used to attach door.
2. 400 V minimum rating ON type breakers shall be used.
3. Bushing to be copper coated and have a minimum rating of 150 amps. When bus breaker exceeds 200 amp breaker, bushing to match breaker capacity.
4. Locate transformer, transformer, and M.O.A. switch inside enclosure.
5. 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
TRAFFIC ENGINEERING

SERVICE POINT DETAILS

CHAN

0

601

17504
SIGN LIGHTING INSTALLATION

The roadway lighting contractor shall provide a means for sign service entry into a pole base in a pull box located in the lighting circuit, and flare E of lighting circuit conductors for connection by sign contractor.

The sign contractor shall furnish and install luminaires, Name 39 Enclosure, 30 Amp Breaker, Condenser, and all other electrical equipment necessary for connection to roadway lighting circuit as provided by the roadway lighting contractor.

When roadway lighting circuits are not available the design shall include pay-to-service conduit and services to the to the required lighting equipment to be used. See Roadway Lighting Plan for sign service locations.

PLACEMENT OF SIGN LIGHTS

1. Luminaires shall be mounted so that the lamp center is 4' - 0" in front of the sign face.
2. Luminaires shall be arranged so that the tip of the fixture is placed 1' - 0" below the bottom edge of sign face.
3. Luminaires from manufacturers who recommend that their fixture be covered shall be protected against insects and weather by suitable covers or by service conduit.
4. Photometric data for general use luminaires specified for sign lighting shall be submitted for approval to the Lighting Engineer, Florida Department of Transportation.

Use 1/4" Liquid Tight Flexible Conduit From Junction Box To Base Plate And From Junction Box To Tee In Luminous Bracket. Conduct shall be of Sufficient Length To Allow Rotation Of Luminous Bracket W/ In Either Direction.

GROUND LUG ATTACHED TO METAL SIGN STRUCTURE

SPRING TO BE WOUND WITH COMPRESSION SPRING THEN PROPERLY INSTALLED AND WATERTIGHT.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC SIGNAL DESIGN
EXTERNAL LIGHTING FOR SIGN
(MERCURY VAPOR)

Sheet No. 1
1 of 2
17505
SECTION THROUGH SIGN SUPPORT AT LUMINAIRE

NOTES
1. Dimensions "A" to be established from type and make of luminaire to be purchased and used on the project.
2. The center line of both flange gaskets and the rubber luminaire support are to be parallel to the roadway before the set screws is marked.
3. Minor adjustments in the horizontal center of the luminaire support are along the bottom chord of the truss will be allowed so that the flange gaskets will clear the flange washers.
4. All flange gaskets shall meet the strength requirements or ASTM Specification A 65 Grade "F". Steel flange bolt meet the requirements of A 36 and bolts, nuts and washers shall meet the requirements of ASTM A 45.
5. All thru bolts shall be hot dip galvanized other fabrication in accordance with the requirements of ASTM A 53 and/or A 57.
6. Luminaire support arm shall be free to rotate to a clockwise or counter clockwise direction, when positive 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 undisturbed working clearance.
**FIGURE A**

For use in areas not exposed to vehicular traffic and under driveways.

*Note: We be adjusted in field due to field conditions upon approval of project engineer.*

**FIGURE B**

For use in installation conduit under existing asphalt pavement not adjacent to gutter when jacking is not feasible.

1. Trench not to be open more than 350 ft long.
2. Aspects to be smooth and removed to leave 2 ft each side of the existing pavement.
3. See note 3, Figure C.

**FIGURE C**

For use in installing conduit under existing asphalt pavement not adjacent to gutter when jacking is not feasible.

1. Right conduit must be used when jacking under existing pavement of 3 ft, minimum depth.
2. Aspects to be smooth at the edges of the trench.
3. The removal and replacement of the additional pavement width (2 ft) will not be required.

**FIGURE D**

For use in installing conduit under new roadway prior to installation of curbs, base and pavement.

1. Sidewalk patched to match existing joints.
2. Entire sidewalk area must be replaced when specified in the plans.
3. Backfill and tamp with material from trench except at curbs.

**FIGURE E**

For use in installing conduit under sidewalk.

1. Sidewalk patched to match existing joints.
2. Entire sidewalk area must be replaced when specified in the plans.
3. Backfill and tamp with material from trench except at curbs.
Method Of Framing Corner Strain Points Angles 10° to 120°

1. The service head hole for joint use pole may be drilled by the utility company at an angle of 90°, but not less than 60°, to the face of the pole.
2. Leaking wire should normally be used for distances of 0 feet or greater.
3. The over-threaded connection of adjustable hangers shall use a minimum of 8 parts with a minimum spacing between parts of 2 inches.

SIGNAL CABLE & SPAN WIRE INSTALLATION DETAILS
TWO POINT ATTACHMENT

State of Florida Department of Transportation
Prepared and Designed

Dedicated to the Safety of Everyone Who Uses Our Roads

Signature: [Signature]
Date: [Date]

17727
FIGURE A
CABLE DROP AND TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "A"

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 upper 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 E type coaxial shell extended up the pole extending to the point 1 foot (0.3 meter) from grade to protect the ground wire connecting the messenger wire to the ground wire.

3. Locking cable ties or locking wire when used shall be placed no further than 5 feet (1.5 meters) except at the point of cable drop or branching where at 5' shall be placed at the point where the cables separate from the messenger wire and another placed 4.5' (13.4 meters) from the other end.

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

5. Loosening wire should normally be used for distances of 12 feet or greater.
FIGURE A
AERIAL FEED
(NO METER USED)

FIGURE B
AERIAL FEED
(METER USED)

FIGURE C
UNDERGROUND FEED
(NO METER USED)

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

FIGURE E
UNDERGROUND CABINET MOUNTED
(METER USED)

NOTES:

1. The lightning arrester can be located on the side or bottom of the main disconnect enclosure at the Contractor's option.

2. Light-gauge flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.
FIGURE A

FIGURE B

FIGURE C

FIGURE D

FIGURE E

Notes:
1. As an option, the contractor will be allowed to furnish pedestrian signals on concrete pole and pedestrian with the use of lead credits if two bolts are used per hub. In lieu of the standard steel bands.

2. Holes drilled or punched in metal poles or pedestals shall be thoroughly cleaned, punched or drilled and covered with four (4) inches of the Hub. As directed, the contractor shall be responsible for street lamp fittings, foundations or buildings, and be responsible for these.

3. Grounding to be in accordance with section 602 of the standard specifications.
GENERAL NOTES

1. If the loop lead-in is 750 or less from the edge of the stop to the detector or controller cabinet, continue the twisted pair to the opening. If the loop lead-in is greater than 750, continue the twisted pair to the specified pull box, splice to bundled loop wire, and continue to the detector or controller cabinet.

2. The depth of all saw cuts (except those done on concrete) shall not exceed 2.00 inches less than 1.75 inches with 2.00 inches being staggered. The width of all saw cuts shall be sufficient to allow unobstructed placement of loop wires or lead-in cables into the saw cut.

3. On resurfacing or in new roadway construction projects, the loops and lead-in cables may be installed in the asphalt structural course prior to the placement of the final mill run. Prior to laying the asphalt surface, the loops and lead-in cables shall be placed in a saw cut deep enough to make an individual test of the loop and the lead-in cable by inserting a tester and connecting it to the power source.

4. A separately held down metal bracket shall be used instead of loop wire and lead-in to the bottom of the saw cut. Held down material shall be placed at approximately three-foot intervals on each loop and two-foot intervals on lead-in.

5. The minimum distance between the twisted pair of loop lead-in wires shall be 6" from the lead-in to one foot from the pavement edge or curb.
CONCRETE PAVEMENT EXPANSION JOINTS

Notes:
1. The number of turns indicated at the specified point in the loop refers to the number of courses of loop wires which are placed in the saw-cut forming the complete loop.

2. Loop types A or B are not shown to scale.

3. Loop Types C, D, and E are centered in a single lane except Type E, which is centered on two lanes.

4. The number of individual loops in the Type C loop may vary up to a maximum of four (4).

5. Loop may be connected to either end of loop.

6. The leading edge of loop Types C, D, or E may extend past the stop line a minimum of 10 feet. The width of these loops may be extended to a maximum of 60 feet. Every intersection should be individually designed and it is recommended that the modifications noted above be required it must be noted or specified in the plans.
FTP-49 12" X 12"

WHITE BACKGROUND WITH BLACK LEGEND AND BORDER
WALK PLAQUE - WHITE LEGEND ON BLACK BACKGROUND
DON'T WALK PLAQUE - ORANGE LEGEND ON BLACK BACKGROUND
THE INTERNATIONAL SYMBOLS MAY BE USED FOR WALK AND
DON'T WALK.
ALL LETTERS SHALL BE \( \frac{3}{16} \)" EXCEPT "WALK AND
"DON'T WALK" WHICH SHALL BE \( \frac{3}{32} \)".
Pole Mounted Cabinet

Concrete Pole

Wood Pole

Notes:
1. The number, size, and orientation of conductive swaths with geyers will vary according to site conditions of installation. The upper 50% of conductive swaths shall be provided in all boxes. The spaces shall remain in the directions of the center edge of the cabinet base, into a quill box and capped with a weather-tight fitting. It shall be spaced so that the space conductive from exiting to the rear, as at the rear of the cabinet. This space shall be spaced so that the space conductive will have to be approved by the project engineer. All spaces shall be spaced in accordance with the Standard Specifications.

2. Grounding to be in accordance with section 630 of the Standard Specifications.

State of Florida Department of Transportation
Traffic Engineering

Cabinet Installation Detail

Label: 17B01

Scale: 1:100

Revision: 0

1 of 1
RAILROAD GATE ARM LIGHT SPACING

<table>
<thead>
<tr>
<th>Specified Length Of Gate Arm</th>
<th>Dimension 'A'</th>
<th>Dimension 'B'</th>
<th>Dimension 'C'</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 ft.</td>
<td>6'</td>
<td>30'</td>
<td>6'</td>
</tr>
<tr>
<td>8 ft.</td>
<td>8'</td>
<td>30'</td>
<td>6'</td>
</tr>
<tr>
<td>10 - 12 ft.</td>
<td>10' and 12'</td>
<td>30'</td>
<td>6'</td>
</tr>
<tr>
<td>14 - 16 ft.</td>
<td>14' and 16'</td>
<td>30'</td>
<td>6'</td>
</tr>
<tr>
<td>18 - 20 ft.</td>
<td>18' and 20'</td>
<td>30'</td>
<td>6'</td>
</tr>
<tr>
<td>22 - 24 ft.</td>
<td>22' and 24'</td>
<td>30'</td>
<td>6'</td>
</tr>
<tr>
<td>26 - 28 ft.</td>
<td>26' and 28'</td>
<td>30'</td>
<td>6'</td>
</tr>
<tr>
<td>32 - 34 ft.</td>
<td>32' and 34'</td>
<td>30'</td>
<td>6'</td>
</tr>
<tr>
<td>36 and Over</td>
<td>36'</td>
<td>30'</td>
<td>6'</td>
</tr>
</tbody>
</table>

MEDIAN SECTION AT SIGNAL GATES


MEDIAN SIGNAL GATES FOR MULTI-LANE UNDIVIDED URBAN SECTIONS
(FOUR OR MORE DRIVING LANES IN ONE DIRECTION, 45 MPH OR LESS)
TYPICAL BRIDGE MOUNTS

TO BE USED WHERE BRIDGE OPERATIONS ARE FULL TIME OR DAILY BASIS

SEQUENCE CHART

SIGNALS & SIGNS

LEGEND

GATES

ENTRANCE GATES

EXIT GATES

TIMING

NOTES:

1. A space switch shall be installed to overide each timing interval in case of a malfunction.

2. "STOP HERE ON RED" is utilized in Type I operation and "TRAFFIC SIGNALS" are utilized in Type II operation.

3. The height between the bottom of the "Drawbridge Ahead" sign and the overhang of the traffic signal is 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 85th 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 drawbridge opening is determined 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 red light signals shall be on the same (two lights) flashing, with the two top signals on one circuit, and the two bottom signals on the other flashing 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 present a driver traveling at the 85th approach speed from having continuous view of at least one signal installation for approximately 15 feet.

10. Requirements on gate installation are covered in Section 46-14 through 46-17 of the Municipal Uniform Traffic Control Devices or as revised by OFFICIAL REGULATIONS, volume 20, Part 85.
DRAWBRIDGE SIGNAL

2'-0" x 5'-0"
2" Border - 4" Radius
6" Series "O" 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

TYPICAL LAMP PLACEMENT

NOTE:
1. If unit flashing red light shall be mounted atop 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 according to length of the gate arm.
2. All alternate disposed fully reflectorized reddish white strip.