ROADWAY AND TRAFFIC DESIGN STANDARDS

JANUARY 1983
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## ROADWAY DESIGN STANDARDS

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- 631 Temporary Crossover - Construction - Rural
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- 700 Design Criteria Related To Highway Safety
<table>
<thead>
<tr>
<th>INDEX NUMBER</th>
<th>SHEET NUMBER</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>002</td>
<td>1 of 3</td>
<td>Updated to conform with standard county map symbols.</td>
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<tr>
<td></td>
<td>2 of 3</td>
<td>Skew symbol redefined.</td>
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<td>100</td>
<td>1 of 1</td>
<td>Two types of slope drain pipe added (optional types).</td>
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<tr>
<td>102</td>
<td>1 of 2</td>
<td>Silt barrier replaced by silt fence and new staked silt barrier. Title changed. Sheet number changed.</td>
</tr>
<tr>
<td></td>
<td>2 of 2</td>
<td>New sheet. Chart I (for spacing bale barriers, silt fences and staked silt barriers).</td>
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<tr>
<td>103</td>
<td>1 of 1</td>
<td>Application and spacing notations changed. Method of payment for filter fabric added.</td>
</tr>
<tr>
<td>201</td>
<td>1 of 3</td>
<td>Structure tops removed (transferred to Index No. 201). Combinations of round and rectangular structures added (by notation). Construction joint and reinforcement data added (by notation). General Notes deleted, added and revised.</td>
</tr>
<tr>
<td></td>
<td>2 of 3</td>
<td>New sheet added for structure tops and for manhole frames and cover. Frames Types II and III replaced. Reinforcement for structure tops modified. Identification letters and number (wt.) added to cover.</td>
</tr>
<tr>
<td></td>
<td>3 of 3</td>
<td>(a) Eye bolt and chain for locking grates to inlets modified to require jam nuts in lieu of tack welds, changed eye bolt options and added Alternate G specification. (b) Jam nut option, Alternate G specification, bottom bar clearance and optional bar notation added to ladder bar details. (c) Frames and cover deleted (transferred to Sheet 1 of 3). Replacement manhole cover added.</td>
</tr>
<tr>
<td>210</td>
<td>1 of 1</td>
<td>Dimension corrected (4'-0&quot;) in Section AA. General Note No. 7 revised.</td>
</tr>
<tr>
<td>211</td>
<td>1 of 2</td>
<td>General Note No. 6 revised.</td>
</tr>
<tr>
<td>212</td>
<td>1 of 1</td>
<td>Rebar embedment option added (by notation). Wall construction joint location added (by notation). Manhole frame replaced. Throat modified to aid forming. Bottom Type J, Alt. B option added (Gen. Note No. 3).</td>
</tr>
<tr>
<td>214</td>
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<td>Title revised to reflect inlet top. General Note No. 3 revised (riser deleted). General Note No. 2 revised (inlet location).</td>
</tr>
<tr>
<td>215</td>
<td>1 of 1</td>
<td>Title revised to reflect inlet top. General Note No. 3 revised (riser deleted). General Note No. 2 revised (inlet location).</td>
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<tr>
<td>220</td>
<td>1 of 1</td>
<td>Pipe size table added. Wall construction joint location added (by notation). Reticuline grate added. General Notes revised.</td>
</tr>
<tr>
<td>221</td>
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<td>Steel grate revised to indicate main and intermediate bar positions. Wall construction joint location added (by notation). General Notes revised.</td>
</tr>
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<td>INDEX NUMBER</td>
<td>SHEET NUMBER</td>
<td>DESCRIPTION</td>
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<tr>
<td>230</td>
<td>1 of 1</td>
<td>Wall construction joint added (by notation). Use of ditch block clarified. Sodding outlined. General Notes revised.</td>
</tr>
<tr>
<td>231</td>
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<td>Completely revised and redrawn.</td>
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<td>Pipes removed from drawing.</td>
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<tr>
<td>233</td>
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<td>Bottom design and general note for unsatisfactory foundation material deleted. Structure Type J, Alt. B option added (by General Note No. 3). Grate bars and bar spacings added. Wall construction joint data added.</td>
</tr>
<tr>
<td>234</td>
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<td>Wall construction joint data added (by notation). Use of ditch block clarified. Sodding outlined. General notes revised.</td>
</tr>
<tr>
<td>235</td>
<td>1 of 1</td>
<td>General Note No. 7 revised for flotation check. General Note No. 9 added to show unintended use with bottom Type J, Alt. B.</td>
</tr>
<tr>
<td>250</td>
<td>1 of 1</td>
<td>Dimension corrected (3(\frac{3}{8})&quot; to 2(\frac{3}{8})&quot;) for 43&quot;x68&quot; concrete elliptical pipe culvert endwalls.</td>
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<td>251</td>
<td>1,2 of 2</td>
<td>Stem and footing thicknesses reduced. Bar bending changed and quantities adjusted. Design and material specifications updated.</td>
</tr>
<tr>
<td>252</td>
<td>1,2 of 2</td>
<td>Design and material specifications updated.</td>
</tr>
<tr>
<td>253</td>
<td>1,2 of 2</td>
<td>Design and material specifications updated.</td>
</tr>
<tr>
<td>255</td>
<td>1 of 1</td>
<td>Design material specifications updated.</td>
</tr>
<tr>
<td>260</td>
<td>1 of 1</td>
<td>Front slope transition detail and tabulated lengths added.</td>
</tr>
<tr>
<td>270</td>
<td>1 of 1</td>
<td>ASTM designation corrected.</td>
</tr>
<tr>
<td>272</td>
<td>1 of 5</td>
<td>Special dimensions added for 24&quot; and 36&quot; pipes (to accommodate standard joint lengths).</td>
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<tr>
<td>273</td>
<td>6 of 6</td>
<td>General Note No. 12 added (spacing between mitered end section).</td>
</tr>
<tr>
<td>274</td>
<td>1 of 1</td>
<td>Slab reinforcement deleted and thickness increased to 6&quot; (quantities adjusted). General Note No. 3 added to define intended use.</td>
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<tr>
<td>280</td>
<td>1 of 3</td>
<td>Method of payment for removal and disposal of material added (by notation) to detail for concrete box culvert extensions.</td>
</tr>
<tr>
<td></td>
<td>2 of 3</td>
<td>Internal precast concrete riser for concrete pipe revised for slab thickness, joint options and Type P, Alt. B. riser. Method of payment for 4&quot; drain pipe added (by notation) to detail for concrete gutter and drains at retaining walls.</td>
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<tr>
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<td>3 of 3</td>
<td>General Note No. 1 revised for 8&quot; joint lengths of pipe.</td>
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<tr>
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<td>SHEET NUMBER</td>
<td>DESCRIPTION</td>
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<tr>
<td>--------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>282</td>
<td>1 of 1</td>
<td>Handrails modified for use on bicycle facilities.</td>
</tr>
<tr>
<td>283</td>
<td>1 of 1</td>
<td>Updated for curb types. Flume section altered, rubble deleted, sod added and use redefined by notations.</td>
</tr>
<tr>
<td>290</td>
<td>1-4 of 4</td>
<td>Four new sheets. Concrete box culverts (Single, Double, Triple and Quadruple).</td>
</tr>
<tr>
<td>300</td>
<td>1 of 1</td>
<td>Notations modified for low and high side flexible pavement surfaces adjacent to curb and gutter. Notations for contraction joint location included in General Note No. 3. General Notes revised.</td>
</tr>
<tr>
<td>302</td>
<td>1 of 1</td>
<td>Subtitle corrected (Type V separator).</td>
</tr>
<tr>
<td>305</td>
<td>1 of 3</td>
<td>Tables for tie bars and dowels expanded. Subtitles improved.</td>
</tr>
<tr>
<td>400</td>
<td>All</td>
<td>Renumbered for 10 sheets.</td>
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<tr>
<td></td>
<td>1 of 10</td>
<td>Radius panels labeled and approach panels reduced from 5 to 4 on Details D &amp; G.</td>
</tr>
<tr>
<td></td>
<td>2 of 10</td>
<td>Median reference corrected on Detail I. General Note No. 13 added.</td>
</tr>
<tr>
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<td>3 of 10</td>
<td>Median 30' or less deleted (transferred to Sheet 4 of 10). Tables added to medians greater than 30' and less than 50'.</td>
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<tr>
<td></td>
<td>4 of 10</td>
<td>New sheet for medians 30' or less.</td>
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<tr>
<td></td>
<td>5 of 10</td>
<td>Bolt added to soil plate. Beam washer added to end breakaway post. Notation added to cable.</td>
</tr>
<tr>
<td></td>
<td>6 of 10</td>
<td>Guardrail offset (2') changed to 2' and 0' for various shoulder width for shoulders with or without 4' pavement.</td>
</tr>
<tr>
<td></td>
<td>8 of 10</td>
<td>Surface descriptions and size tolerances added to timber posts and blocks.</td>
</tr>
<tr>
<td></td>
<td>9 of 10</td>
<td>Welded structural W6X8.5 post added (by notation). Surface and tolerance notations added to timber post.</td>
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<tr>
<td>410</td>
<td>1 of 2</td>
<td>&quot;L&quot; wall design added to median barrier. General Note Nos. 6 &amp; 7 revised. General Note No. 8 added.</td>
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<tr>
<td>415</td>
<td>1 of 2</td>
<td>Double Tongue-Dougle Groove temporary barrier wall deleted. New temporary barrier wall added. (New Sheet)</td>
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<tr>
<td></td>
<td>2 of 2</td>
<td>Option end treatments (4 options) and anchorage requirements for new temporary wall. (New Sheet)</td>
</tr>
<tr>
<td>452</td>
<td>1 of 1</td>
<td>Base plate detail for Type B fence mounted on concrete headwalls and retaining walls added. General Note No. 7 modified to include driving of optional steel line posts.</td>
</tr>
<tr>
<td>500</td>
<td>1 of 1</td>
<td>Term &quot;plastic material&quot; defined (Ref. 6). Outside Roadway (Not Median) label added to details for removal and disposal of A-B and muck materials in rural, municipal and shoulder gutter construction.</td>
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<tr>
<td>515</td>
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<td>Rural turnout plan, profile and section revised to suit new supplemental profile data sheet 2 of 2.</td>
</tr>
<tr>
<td></td>
<td>2 of 2</td>
<td>New sheet for rural turnout profiles.</td>
</tr>
<tr>
<td>INDEX NUMBER</td>
<td>SHEET NUMBER</td>
<td>Description</td>
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<td>--------------</td>
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<tr>
<td>516</td>
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<td>Table added for turnout construction minimum requirements (pavement structure). Surface course reduced to structural course.</td>
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<tr>
<td>520</td>
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<td>Handrail modified for use on bicycle facilities. Required handrail and gravity wall for dropoff back of curb added (by notation). Concrete step detail replaced. Notation added for gravity wall texture and finish.</td>
</tr>
<tr>
<td>560</td>
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<td>Header curbs removed from details for crossings Types D, E and G. Plan dimensions revised to conform with Traffic Design Standards. Rural and municipal half plans revised.</td>
</tr>
<tr>
<td>2-5 of 8</td>
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<td>Revised sheet numbers.</td>
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<tr>
<td>7 of 8</td>
<td></td>
<td>New sheet - RR crossing Type T Mod.</td>
</tr>
<tr>
<td>8 of 8</td>
<td></td>
<td>New sheet - RR crossing Type T Mod.</td>
</tr>
<tr>
<td>600</td>
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<td>Raised pavement markers deleted from tangent portion of detour (General Note No. 3).</td>
</tr>
<tr>
<td>640</td>
<td>2 of 2</td>
<td>Raised pavement markers deleted from tangent portion of pavement under traffic (General Note No. 3).</td>
</tr>
<tr>
<td>641</td>
<td>2 of 2</td>
<td>Raised pavement markers deleted from tangent portion of pavement open to traffic (General Note No. 2).</td>
</tr>
<tr>
<td>700</td>
<td>1 of 1</td>
<td>Edge clearance for railroad crossing devices revised (except municipal-design speed 45 MPH or less).</td>
</tr>
</tbody>
</table>
# Standard Symbols for Plan Sheets

## Symbols

- **State Line**
- **County Line**
- **Township Line**
- **Section Line**
- **City Line**
- **Base or Survey Line**
- **Right-of-Way Line**
- **Limited Access Line**
- **Fence Line**
- **National or State Park or Forest**
- **Grant Line**
- **Railroad (Drainage Maps)**
- **Fence (Limited Access)**
- **Box Culvert**
- **Bridge**
- **Side Drain Pipe**
- **Storm Sewer**
- **Inlet**
- **Manhole**
- **Tied Longitudinal Joint**
- **Keyed Longitudinal Joint**
- **Doweled Transverse Expansion Joint**
- **Doweled Transverse Contraction Joint**
- **Transverse Contraction Joint Without Dowels**
- **Triangulation Station**
- **Bench Mark**
- **Point of Intersection**
- **North Point**
- **Edges of Existing Pavement and Sidewalk**
- **Base Line**
- **Centerline**
- **Property Line**
- **Delta Angle**
- **Approximate**
- **Round**
- **Curb**
- **Curb and Gutter**
- **Water Well, Spring**
- **Levee**
- **Railroad Mile Post**
- **Gate**
- **Pump Island**
- **Storage Tank (Surface)**
- **Storage Tank (Underground)**

## Utility Adjustment Symbols

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<thead>
<tr>
<th>Existing</th>
<th>Proposed</th>
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<td>Power Pole</td>
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<tr>
<td>Overhead Power Cable</td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>Telephone Pole</td>
<td><strong>O</strong></td>
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<tr>
<td>Overhead Telephone Cable</td>
<td><strong>O</strong></td>
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<tr>
<td>Combination Pole</td>
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<tr>
<td>Guy Wire and Anchor Pin</td>
<td><strong>O</strong></td>
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<td>Buried Power Cable</td>
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<td>Electric Duct</td>
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<td>Telephone Duct</td>
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<td>Water Meter</td>
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<td>Fire Hydrant</td>
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<td>Underground Cable Television</td>
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</tr>
<tr>
<td>Overhead Cable Television</td>
<td><strong>O</strong></td>
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</tbody>
</table>

## Definitions

- **Mine or Quarry**
- ** Borrow Pit**
- **Church**
- **Store**
- **Residence**
- **Barn**
- **School**
- **Stream**
- **Shore Line**
- **Marsh**
- **Hedge**
- **Trees**
- **Edge of Wooded Area**
- **Shrubbery**
- **Grove or Orchard**
- **Concrete**
- **Wood**
- **Rate of Superelevation**

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**State of Florida Department of Transportation**

**Road Design**

**Standard Symbols**

*Date: [Insert Date]*

*Approver: [Insert Name]*

*Page: 2 of 3*
# Standard Symbols for Plan Sheets

## Traffic Signals Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tr>
<td><img src="image" alt="Traffic Signal Head (Ban Wire Mounted)" /></td>
<td>Traffic Signal Head (Ban Wire Mounted)</td>
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<tr>
<td><img src="image" alt="Traffic Signal Head (Pedestal Mounted)" /></td>
<td>Traffic Signal Head (Pedestal Mounted)</td>
</tr>
<tr>
<td><img src="image" alt="Traffic Signal Head ( Mast Arm Mounted)" /></td>
<td>Traffic Signal Head (Mast Arm Mounted)</td>
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<tr>
<td><img src="image" alt="Traffic Signal Pole (Concrete, Wood, Metal)" /></td>
<td>Traffic Signal Pole (Concrete, Wood, Metal)</td>
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<tr>
<td><img src="image" alt="Vehicle Detector (Loop)" /></td>
<td>Vehicle Detector (Loop)</td>
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<tr>
<td><img src="image" alt="Signal Cable (On Messenger Wire)" /></td>
<td>Signal Cable (On Messenger Wire)</td>
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<tr>
<td><img src="image" alt="Conduit" /></td>
<td>Conduit</td>
</tr>
<tr>
<td><img src="image" alt="Vehicle Detector (Others)" /></td>
<td>Vehicle Detector (Others)</td>
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<tr>
<td><img src="image" alt="Pedestrian Detector (Pushbutton)" /></td>
<td>Pedestrian Detector (Pushbutton)</td>
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<tr>
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<td>Pedestrian Signal Head (Pole or Pedestal Mounted)</td>
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<tr>
<td><img src="image" alt="Controller Cabinet (Base Mounted)" /></td>
<td>Controller Cabinet (Base Mounted)</td>
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<tr>
<td><img src="image" alt="Controller Cabinet (Pole Mounted)" /></td>
<td>Controller Cabinet (Pole Mounted)</td>
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<tr>
<td><img src="image" alt="Walk - Don't Walk" /></td>
<td>Walk - Don't Walk</td>
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<td><img src="image" alt="Flash" /></td>
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<td><img src="image" alt="Signal Lens" /></td>
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<td><img src="image" alt="Messenger Wire" /></td>
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<td><img src="image" alt="Signal Phase" /></td>
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## Lighting Symbols

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<th>Symbol</th>
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<tr>
<td><img src="image" alt="New Pole &amp; Luminare" /></td>
<td>New Pole &amp; Luminare</td>
</tr>
<tr>
<td><img src="image" alt="Existing Pole &amp; Luminare" /></td>
<td>Existing Pole &amp; Luminare</td>
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## Signing and Pavement Marking Symbols

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TEMPORARY SLOPE DRAIN

SOD FLUME (SODDING OVERLAPPED)

SLOPE DRAIN APPLICATION
GENERAL DESIGN NOTES

1. Basins should be as deep as practical with a minimum depth of 2.0 feet.
2. In Type A, when the top of the embankment is below high water, a fence will be required along the top of the embankment.
3. In Type B, the wall shall be located as far from the embankment as practical. On steep ditch grades two or more walls may be required. Intermediate walls shall be constructed without sliding bases.
4. In Type B, the 6" PVC pipe shall be constructed unless shown otherwise in the plans.

GENERAL CONSTRUCTION NOTES

1. Fence materials shall be aluminum or concrete only.
2. Aluminum posts shall be 3" diameter minimum. Aluminum rail braces shall be in accordance with Index 492. Concrete posts and rail braces shall be in accordance with 493. All posts to be set in concrete.
3. Fabric shall be installed inside of posts and rail braces, and tied to posts and braces at 6" centers.
4. For additional details on fencing, see Index Nos. 490 and 492.
5. All basin slopes to be 1:1 unless detailed otherwise in the plans.
6. Sediment basins to be constructed prior to commencement of upland construction. Maintenance and clean out to be by the Contractor until acceptance by the Engineer.
FLOATING SILT BARRIERS

LEGEND
- Outfall Locations
- Dredge Area
- Meeting Point Markers
- Anchor
- Barrier Movement Due to Current Action

NOTES:
1. Floating silt barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of sections depend on current velocities.
3. Deployment of barrier around piers locations may vary in accordance with construction operations.
4. Navigations may require segregation barrier during construction operations.
5. The above applications include Type E Floating Silt Barrier since anchors are shown; however, if conditions warrant, Type 3 Floating Silt Barrier may be used. For additional information see Standard Specifications.

FLOATING SILT BARRIER APPLICATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
REO DESIGN

FLOATING AND STAKED SILT BARRIERS AND SILT FENCE

STAKED SILT BARRIER

ELEVATION

SECTION

SILT FENCE

Optional Post Positions
- Principle Post Positions (Covered 20' Toward Flow)
- Principle Post Position (Covered 30' Toward Flow)

Floaty Mesh (100 ft. Min.)
- Or Type A Fence Fabric

Tension Fabric (Sec. 985 FDOT Spec.)

Filter Fabric (In Conformance with Sec. 985 FDOT Spec.)

ELEVATION

SECTION

STAKED SILT BARRIER

Optional Post Positions
- Principle Post Positions (Covered 20' Toward Flow)
- Principle Post Position (Covered 30' Toward Flow)

Floaty Mesh or
- Or Type A Fence Fabric

Tension Fabric (Sec. 985 FDOT Spec.)

Filter Fabric (In Conformance with Sec. 985 FDOT Spec.)

ELEVATION

SECTION
FLOW RATES (CFS)
Very Light $< 5$
Light $5 < 10$
Moderate $10 < 15$
Heavy $15 < 20$
Very Heavy $> 20$

LEGEND
Flow Soils

SOILS
Cohesive
Cohesive
Form Loam
Clay Sods
Clays
Hardpans

Non-Cohesive
Fine Sand
Course Sand
Gravels
Sandy Loam
Silt Loam

CHART I
RECOMMENDED SPACING FOR TYPE I AND TYPE II, HAY BALE BARRIERS, TYPE III STAKED SILT BARRIERS, TYPE IV SILT FENCE AND PAVED DITCH HAY BALE BARRIERS
PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

BALES BACKED BY FENCE

DITCH INSTALLATIONS AT DRAINAGE STRUCTURES

ELEVATION
TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TEE OF THE SLOPE

BARRIERS FOR FILL SLOPES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

BALED HAY OR STRAW BARRIERS
**Bottom Construction When Inlet Serves as Manhole**

**General Note:**
Mortar used to seal the pipe into the walls of prestressed units will be of such a mix that shrinkage will not cause leakage into or out of the units. Maximum opening for pipe shall be the O.D. of the pipe required plus 6".

**Channelization**
Channelization required at all drainage structures with two or more pipes.

Smooth flow channels composed of concrete, or brick and mortar shall be constructed in the bottoms of all structures to a depth equal to half the diameter of the largest pipe.

**Alternate Location of Pipe in Structure When Prefabricated Floor Slab Is Used**

Complete flow channel is required when there is flow through the structure.

**Eye Bolt and Chain for Locking Grates to Inlets**

**Ladder Bars for Structures Over 10' in Depth**

**Replacement Cover for All Previous 2' Deep Frames (Non-Traffic Type)**
FRAME AND GRATE

SECTION AA
FOR BOTTOM TYPE P & RISER TYPE J (ALTERNATES A)

SECTION BB
FOR BOTTOM TYPE P & RISER TYPE J (ALTERNATES B)

TOP SLABS

GENERAL NOTES

1. This inlet is primarily intended for locations with light flows where right of way does not permit the use of chambered curb inlets.
2. The typical application is on curb returns to city streets. The inlet grate is suitable for pedestrian and bicycle traffic.
3. This inlet to be located in vertical fused curbs such as Curb and Gutter Types J. Grate shall be oriented in same direction as predominant flow, inlet to be located outside of pedestrian/crosswalk area, as practical.
4. For structure bottoms see Index No. 200. For supplemental details see Index No. 25.
5. All steel in slab tops shall have 0.75" minimum cover unless otherwise shown. Top slab shall be either cast-in-place or precast concrete.
6. For Alternate B applications, top slab openings shall be placed such that 2 edges of inlet frame will be located directly above bottom or riser, water.
7. For bottom Type J applications without riser use top Type 7-7 Index No. 200. Form opening in top slab as detailed above.
8. Frame may be adjusted by one to six courses of brick.
9. Inlet grate detail shown in Section R 3065-1. Used grates with approximately equal openings will be permitted. Cast-iron, Grates shall be Class 30 castings in accordance with ASTM A 46. Grooves shall be reversible, left or right.

Curb Inlet Top
Type 10

State of Florida Department of Transportation
Road Design

Drawn by: E.R.  
Approved by: 
Date: 11/27/1971

15.5.21
SODDING AND PAVEMENT FOR INLETS WITHOUT SLOTS AND INLETS WITH NON-TRAVERSABLE SLOTS

NON-TRAVERSABLE SLOTS

SECTION AA

PAVEMENT AND SODDING QUANTITIES

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SECTION BB

TRAVERSABLE SLOTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

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

TRAVERSABLE SLOTS
GENERAL NOTES

1. This inlet is designed for ditches, medians, or other areas subject to heavy wheel loads, where only light debris is expected and pedestrian traffic is anticipated. It is not for use in areas subject to bicycle traffic.

2. Reinforcing — No. 4 bars at 12" centers both ways with 2" clearance to inside face. Cut or bend bars out of way of pipe when necessary. Bars to clear pipe by 1/4.

3. When alternate C grade is specified in plans, the grate is to be hot dipped galvanized after fabrication.

4. For supplemental details, see Index 20I.

5. Cost of ditch paving to be included in cost of inlet. Sodding to be paid for under contract unit price for Sodding, SY.
**GENERAL NOTES**

2. Reinforcing Steel: Grade 40 or 60
3. Concrete: Class E
4. Chamfer: All exposed edges and corners to be chamfered 1/2" unless otherwise shown.
5. Sodding: See Index 281.
MOUNTING FOR STEEL GRATE

STEEL GRATE USE CRITERIA

1. Steel grating anchor shall be used in pipe culverts when in the drainage liner becomes weak and where any of the following conditions exist:
   a. Damage area to culvert consists of medium or high areas or areas where debris or other object is negligible.
   b. Damage to culvert is slight, except on a few small culverts, and when an agreement is entered upon between the responsible parties on the condition.
   c. Area where culvert passage with sufficient backwater would not seriously hamper navigation, traffic operation or quick recovery.
   d. Steel grating to be used only where called for in plans and only in backwater, anchor placements having either 41° or 61° tapers of profile.

<table>
<thead>
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<tr>
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<td>6:1</td>
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GENERAL NOTES:
1. List of grating size to be used in anchor grate per round, estimated quantity.
2. List of backwater bolts and nuts to be included in bid price for a new grate.
3. All pipes, channel, and bar steel to be a 2-3/4 in. black steel pipe.
4. New grate will be shipped to site. Note in bid price all grate size, and bar steel to be delivered, 2-3/4 in. black, to the contractor. Specific locations will be.
5. Channel section 25-1/4 may be substituted for 14-1/4 channel.

U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRATE OPTIONAL 15" TO 30" PIPE
### TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES

**PIPE CULVERT ENDWALLS WITH U-TYPE WINGS**

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### TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES

**PIPE CULVERT ENDWALLS WITH 45° WINGS**

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**Notes:**
- All exposed edges are to be covered with concrete.
- Provide good foundation under pipe and concrete to prevent movement.
- Steel tie rods are recommended for each endwall.
- Complete dimensions and quantities for each endwall are included in the table above.

For more information, see Note No. 281.

---

**CONCRETE ENDWALL WITH U-TYPE WINGS**

**CONCRETE ENDWALL WITH 45° WINGS**
GENERAL NOTES

1. Flared end sections shall conform to the requirements of ASTM C-76 with the exception that dimensions and reinforcement shall be as prescribed in the table above. Concentrically reinforcing may consist of either one cage or two cages of steel. Compressive strength of concrete shall be 4000 psi. Shop drawings for flared and ends having dimensions other than above must be submitted for approval to the Engineer of Drainage.

2. Connections between the flared end section and the pipe culvert may be any of the following types unless otherwise shown on the plans:
   a. Joints meeting the requirements of Section 941-1.5 of the Standard Specifications.
      The manufacturer of the flared end section shall identify the manufacturer of the pipe culvert and certify that the flared end section is suited to joining the pipe culvert.
   b. Joints sealed with prefabricated plastic gaskets.
      The gaskets shall meet the requirements of Section 942-2 of the Standard Specifications and the minimum sizes for gaskets shall be as specified for equivalent sizes of electrical pipe.
   c. Reinforced concrete jackets, as detailed on this drawing.
      The cost of the reinforced concrete jacket to be included in the contract unit price for the flared end section.
      When non-coated corrugated metal pipe is called for in the plans, the pipe shall be furnished coated in the jacketed area as specified on Index No. 230. St deliberately to be included in the contract unit price for the pipe culvert.

3. Toe walls shall be constructed when shown on the plans or at locations designated by the Engineer. Toe walls are to be cost-in-place with Class 1 Concrete and paid for under the contract unit price for Class 1 Concrete (Miscellaneous). Reinforcing steel to be included in cost of toe wall.

4. Sodding shall be placed about the flared end section in accordance with Index No. 281, and paid for under the contract unit price for sodding.

5. On skewed pipe culverts the flared end sections shall be placed in line with the pipe culvert. Side slopes shall be warped as required to fit the flared end sections.

DESIGN NOTES

1. Flared end sections are intended for use outside the clear zone on medium drain and cross drain installations.

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

3. Toe walls shall be used whenever the anticipated velocity of discharge and soil type are such that erosion action would occur. Toe walls are not required where ditch pavement is provided, except when disengaging would occur if the ditch pavement should fail.

FLARED END SECTION
### Dimensions and Quantities

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**B & C**
- Dimensions permitted to allow use of 6' standard pipe lengths.
- 6.50' Dimensions permitted to allow use of 12' standard pipe lengths.
- Concrete slab to be specified to form bridge across crown of pipe. See section below.

---

**TOP VIEW - SINGLE PIPE**

- Beveled or Rounded Corners

**TOP VIEW - MULTIPLE PIPE**

- Beveled or Rounded Corners

---

**CROSS DRAIN MITERED END SECTION**

**SINGLE AND MULTIPLE ROUND CONCRETE PIPE**

- Pad for As Cross Drain Pipe Culv

**SECTION**

- No Joint Permitted

- Unless Approved by the Engineer

### Additional Notes:
- Pipe to be included under Unit Price for Mitered End Section.
- For Pipes 24" and Larger,
- 2:1 Miter to 6" Pipe for Pipes 18" and Smaller.
- 3:1 Miter to 6" Pipe for Pipes 18" and Smaller.
- 4:1 Miter to 6" Pipe for Pipes 24" and Larger.

---

**STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**

**SPECIFICATION**

- Issued by the

---

**272**
## Dimensions and Quantities

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### Top View - Single Pipe

Concrete Slab, 3" Thick, Reinforced With WWF6 x 6 - W4 x W4

### Top View - Multiple Pipe

Concrete Slab, 3" Thick, Reinforced With WWF6 x 6 - W4 x W4

---

**States of Florida Department of Transportation**

**Cross Drain Mitred End Section**

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

**NOTE:** See Sheet 5 for Details and Notes.
DIMENSIONS & QUANTITIES

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CONCRETE (Cu. Yds.) SODDING (Sq. Yds.)

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Note: See Sheet 5 For Details And Notes.
1. The cost of all pipe, reinforcing, connectors, anchors and concrete shall be included in the contract unit price for mitered and section, each. Sodding not included.
2. The reinforced concrete slab shall be constructed for all sizes of cross drain pipe and cast in place with Class I concrete.
3. Concrete pipe used in the assembly of mitered and sections shall be selected lengths to avoid excessive connections.
4. Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered and section shall be repaired.
5. That portion of corrugated metal pipe in direct contact with the concrete slab shall be bituminous coated prior to placing of the concrete.
6. Unless otherwise designated in the plans, concrete pipe mitered and sections may be used with any type of cross drain pipe; corrugated steel pipe mitered and sections may be used with any type of cross drain pipe except aluminum pipe; and, corrugated aluminum mitered and sections may be used with any type of cross drain pipe except steel pipe. When bituminous coated metal pipe is specified for cross drain pipe, mitered and sections shall be constructed with like pipe or concrete pipe.
7. When the mitered end section pipe is dissimilar to the cross drain pipe, a concrete jacket shall be constructed in accordance with Standard Index 280.
8. Slope and ditch transitions shall be used when the normal roadway slope must be flattened to place and section outside clear recovery area. See detail left.
9. Cross Drain – Mitered End Sections only to be used outside of clear recovery area.

**ANCHOR DETAIL**

All bars, bolts, nuts, and washers are to be galvanized steel.

Bolt diameters shall be 3/8" for 15" to 36" pipe and 5/8" for 42" to 72" pipe.

Two connectors required per joint, located 60° right and left of bottom center of pipe. Bolt holes in pipe shell are to be drilled.

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**CROSS DRAIN**

**MITERED END SECTION**

**SPECIAL DETAILS AND NOTES**

**ANCHOR DETAIL**

Anchor, washer and nuts to be galvanized steel.

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

Flat washers to be placed on inside wall of pipe.
DIMENSIONS & QUANTITIES

- Grid Layout
  - D: Dimension
  - X: Description
  - A: Additional Info
  - B: Brand
  - C: Color
  - E: Example
  - F: Formula
  - G: Graph
  - N: Note

- Table: Single Pipe, Double Pipe, Triple Pipe, Quad Pipe
  - Single Pipe: 4.00, 5.50, 7.50, 9.00
  - Double Pipe: 3.50, 4.50, 5.50, 6.50
  - Triple Pipe: 3.00, 4.00, 5.00
  - Quad Pipe: 2.50, 3.00

- Material: Standard Weight Pipe, Extra Strong Pipe
  - Standard Weight: 0.40, 0.45, 0.50, 0.55
  - Extra Strong: 0.45, 0.50, 0.55, 0.60

- Quantities: Cubic Feet
  - Concrete: 2.50, 3.00, 3.50, 4.00
  - Sodding: 2.50, 3.00, 3.50, 4.00

- Diagrams: Single Pipe, Multiple Pipe
  - Top View - Single Pipe
  - Top View - Multiple Pipe

- Notes:
  - See Sheet 5 for details and 6 for notes.
  - To q Pipe For Pipes 18" And Smaller.
  - 2:1 For Pipes 24" And Larger.

- Dimensions:
  - O 4-1/2" Od.
  - O 4-1/2" Od.
  - Dimensions permitted to allow use of 13/4" standard pipe lengths.
  - Concrete slab shall be designed to form bridge across crown of pipe. See section below.

- Section:
  - Side Drain Pipe Culv.
  - Paid For As
  - "Pipe To Be Included Under Unit Price For Mitered End Section"
## Dimensions & Quantities

| Span | Feet | X | 1/16 | A | 1/16 | B | 1/16 | C | 1/16 | E | 1/16 | F | 1/16 | G | 1/16 | M | 1/16 | N | 1/16 | Single Pipe | Extra | Double Pipe | Triple Pipe | Quad Pipe |
|------|------|---|------|---|------|---|------|---|------|---|------|---|------|---|------|---|------|---|--------|---|--------|---|--------|---|--------|---|--------|---|
| 12   | 12   | 2.5 | 0.47 | 5.00 | 3.00 | 6.00 | 1.76 | 4.88 | 4.75 | 2.00 | 1.00 | 3.00 | 1.00 | 8.50 | 50 | 40    | 56 | 70     | 70 | 9.50   | 8.50 | 12.00  | 8.50 |
| 14   | 14   | 2.5 | 0.47 | 5.00 | 3.00 | 6.00 | 1.76 | 4.88 | 4.75 | 2.00 | 1.00 | 3.00 | 1.00 | 8.50 | 50 | 40    | 56 | 70     | 70 | 9.50   | 8.50 | 12.00  | 8.50 |
| 16   | 16   | 2.5 | 0.47 | 5.00 | 3.00 | 6.00 | 1.76 | 4.88 | 4.75 | 2.00 | 1.00 | 3.00 | 1.00 | 8.50 | 50 | 40    | 56 | 70     | 70 | 9.50   | 8.50 | 12.00  | 8.50 |
| 18   | 18   | 2.5 | 0.47 | 5.00 | 3.00 | 6.00 | 1.76 | 4.88 | 4.75 | 2.00 | 1.00 | 3.00 | 1.00 | 8.50 | 50 | 40    | 56 | 70     | 70 | 9.50   | 8.50 | 12.00  | 8.50 |

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### TOP VIEW - SINGLE PIPE

- Concrete Slab, 3" Thick, Reinforced With W15 x 41.5
- Sod, Beveled Or Round Corners

### TOP VIEW - MULTIPLE PIPE

- Concrete Slab, 3" Thick, Reinforced With W15 x 41.5
- Sod, Beveled Or Round Corners

---

**Note:**
- See Sheet 5 for details and Sheet 6 for notes.
FASTENER UNIT
FOR ALL SIZES OF SINGLE AND MULTIPLE DRAIN PIPE

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

TOP VIEW

SIDE VIEW

END VIEW

BOTTOM VIEW

INTERMEDIATE AND FASTENER C For
Multiple Drain Pipe Only.
Option For Top Opening:
a. 4½" x 6½" Mitre Cut, 1" Deep.
b. 2½" Diameter Drilled Hole.
c. 4½" x 2½" Slot
Bottom Opening: 4½" x 2½" Slot

SIDE VIEW

END VIEW

TOP VIEW

See Table For Dimensions

M. Less 2½"-

See General Notes, Sheet 6.

GRATE DETAIL
FOR SINGLE & MULTIPLE DRAIN PIPE

CONCRETE PIPE CONNECTOR DETAIL

4 x Bolt Dia.

2½" x 4" Steel Bar

2½" x 4" Steel Bar

Pipe Shell T

Pipe Shell T

4 x Bolt Dia.

2½" x 4" Steel Bar

2½" x 4" Steel Bar

Pipe Shell T

2½" x 4" Steel Bar

ALL BARS, BOLTS, NUTS AND WASHERS ARE TO BE GALVANIZED STEEL.

BOLT DIAMETERS SHALL BE ¾" FOR 15" TO 36" PIPE AND ¼" FOR 60" PIPE.

TWO CONNECTORS REQUIRED PER JOINT, LOCATED 60° RIGHT AND LEFT OF
BOTTOM CENTER OF PIPE.

BOLT HOLES IN PIPE SHELL ARE TO BE DRILLED.

ANCHOR DETAIL

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

ANCHOR REQUIRED FOR C.M.P.
Anchor, washer and nuts are to be galvanized steel.
Bend anchor where required to center in concrete
slot. Damage to surface to be repaired after bending.
Anchors to be spaced a distance equal to four
4½" corrugations. Place the anchors in the outside
crest of corrugation. Flat washer to be placed inside wall of pipe.
GENERAL NOTES

1. Mitered end sections shall be paid for as mitered end section, each, based on each independent pipe end.

2. The cost of all pipe(s), grates, fasteners, reinforcing, connectors, anchors and concrete shall be included in the contract unit price for mitered end section, each. Sodding not included.

3. The reinforced concrete slab shall be constructed for all sizes of side drain pipe and cost in place with Class I concrete.

4. Round pipe size 36" or greater, pipe-arch size 36" x 24" or greater and elliptical pipe 19" x 30" or greater shall be grooved unless excepted in the plans. Smaller sizes of pipe shall be grooved only when called for in plans. The lower grate on framing downstream ends on divided highways shall be omitted.

5. 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.

6. Concrete pipe used in the assembly of mitered end sections shall be of selective lengths to avoid excessive connections.

7. Corrugated metal pipe galinganizing that is damaged during beveling and perforating for mitered end section shall be repaired.

8. That portion of corrugated metal pipe in direct contact with the concrete slab shall be bluish coated prior to placing of the concrete.

9. Unless otherwise designated in the plans, concrete pipe mitered end sections may be used with any type of side drain pipe except aluminum pipe and corrugated aluminum reinforced and sections may be used with any type of side drain pipe except steel pipe. When bluish coated metal pipe is specified for side drain pipe, mitered end sections shall be constructed with the details shown for corrugated metal pipe (including anchor bolts, gaskets, etc.) may be used with any type of steel, grade A or higher, or concrete pipe. When the molded end section pipe is dissimilar to the side drain pipe, a concrete jacket shall be constructed in accordance with Standard Index 280.

10. When existing multiple side drain pipes are spaced other than the dimensions shown in this detail, or are non-parallel axes, or are non-uniform sections, the mitered end sections will be constructed either separately as a single pipe mitered end sections or collectively as multiple pipe end sections as directed by the Engineer; however, mitered end sections will be paid for each, based on each independent pipe end.

11. Ditch transitions shall be used on all grades in excess of 3% as directed by the Engineer.

12. The project engineer shall contact the District Drainage Engineer for possible alternate treatment prior to constructing side drain mitered end sections where a minimum spacing of 15' will not result between the toe points of the mitered end sections.

DESIGN NOTES

1. In critical hydraulic locations, grates shall not be used until potential debris transport has been evaluated by the drainage engineer and appropriate adjustments made. Ditch grades in excess of 3% or pipe with less than 1.5' of cover and grades in excess of 1% will require such an evaluation (General Note 4).

2. The design engineer shall determine highly corrosive locations and specify in the plans when the grates shall be hot-dipped galvanized after fabrication (General Note 5).

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PROJECT DESIGN

SIDE DRAIN MITERED END SECTION
NOTES & INFORMATION

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Approved by: [Signature]

[Diagram of Ditch Transition]
GENERAL NOTE

1. Details for concrete and round corrugated metal pipe, concrete pipe shown.
2. Sod slopes 2' each side and top and ditch 4' beyond toe.
3. These mitered ends sections are intended for side drain installations by FDOT Maintenance forces and for side drain installations constructed under FDOT Maintenance permit.
EXTRA BASE FOR THE PROTECTION OF CULVERTS WITH LESS THAN MINIMUM COVERS

PLAN
INLET TYPE A GRATE

SECTION CC

PLAN
INLET TYPE B GRATE
INLET IN TOP OF BOX CULVERT

NOTE:
1. Cover of drain forming to be included in cost of Box Culvert
2. An arched inside 10” curve

CONNECTION DETAILS FOR CONCRETE BOX CULVERT EXTENSIONS

STATE OF UTAH DEPARTMENT OF TRANSPORTATION
\(\text{SCALE: } 1/30\text{"} = 1\text{'}\)

MISCELLANEOUS DRAINAGE DETAILS
SECTION

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

CONCRETE COLLAR FOR EXTENSION OF EXISTING PIPE CULVERTS

CONCRETE JACKET FOR JOINING MAINLINE PIPE AND STUB PIPE

CONCRETE GUTTER AND DRAINS AT RETAINING WALLS

FILTER FABRIC JACKET

ELLiptical CONCRETE PIPE JOINTS

MISCELLANEOUS DRAINAGE DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD DESIGN

CONCRETE JOINT FOR CONNECTING DISSIMILAR TYPES OF PIPE

NEW COST OF CONCRETE AND ALTERNATIVE CONSTRUCTION TO BE INCLUDED IN CONTRACT UNIT PRICE FOR NEW PIPE...
GENERAL NOTES

1) All cross walls and sides of structures to be constructed to a length that will be a multiple of 36 joint lengths unless approved by the Engineer. Minimum joint length equal to, or above that shown in plans except where additional joint length would create congestion outside the right of way.

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

SCHEDULE OF BELL REINFORCEMENT
Class - III, IV, V, Wall A-B-C

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SCHEDULE OF BELL REINFORCEMENT (Continued)

METOD FOR SETTING LIMITS OF VARIABLE FRONT SLOPES AT DRAINAGE STRUCTURES

RAILROAD COMPANY
CLEARANCE BELOW BOTTOM OF RAIl FEET
STRENGTH LISTED IN CLASS

SOUTHERN RAILWAY SYSTEM
CLEARANCE BELOW TOP OF SPECIAL PIPE

METHOD FOR DETERMINING THE LENGTH OF SPECIAL PIPE REQUIRED UNDER RAILROADS

NOTE: Filling or excavation of variable slopes to be done during normal grading operations.

SECTION CC

LOCATION OF NUMBER

Top View of Headwall

BRIDGE CULVERT NUMBER LOCATION
For Bridge Number See Key Map

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PROJECT DESIGN

MISCELLANEOUS DRAINAGE DETAILS
GENERAL NOTES

1. Type of ditch pavement shall be as shown on plans.
2. In concrete ditch pavement, concrete joints are to be spaced at 25 linear meters, or as directed by the Engineer. Concrete joints may be either interim (transitional) or sealed. No open joints will be permitted.
3. Armored concrete ditch pavement shall conform to concrete Joint, soldered, cold-stitch or galvanize with a 3/4% minimum surface area.
4. Joints shall be grouted when suitable, and shall be in accordance with Engineer's specifications.
5. All joints are to be used with all ditch paving. A trench is not required adjacent to concrete structures.
6. When directed by the Engineer, weep hole spacing may be reduced to 5' maximum.
7. For section of R/W ditch running, weep holes on facing, sides of paving to be no higher than high embankment.
8. Laid 3' wide, ditch pavement shall be placed at least 3 feet above embankment at all times unless there is a decrease in ditch velocity.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH PAVEMENT & SODDING

Number: 281
Approved By: [Signature]

[Diagram of ditch pavement and sodding]
### SODDING QUANTITIES (SY)

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Note: These quantities are for one pipe.

### SODDING QUANTITIES (SY)

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Note: Quantity for 30" is for sphere with baffles.

---

**STRAIGHT ENDWALLS**

**NOTE:** All straight endwalls except index 250 will require sodding as shown in this drawing. Quantities for each particular case to be determined by the designer.
Provide approximately a minimum of 0.02% grade on gutter, slightly warping the surface of the median pavement if necessary, within limits of the median curb or curb and gutter. Construct a drainage flume or flumes at the point or points of low grade. See details.

SECTION A-A

SECTION B-B

General Notes

1. These details are to apply to projects which provide for the conversion of 2-lane sections to 4-lane divided highway sections and for super-elevated sections of new 4-lane divided highways. Layout above is illustration only. Cost of flumes to be included in the contract price for Curbs or Curb and Gutter. Sod to be paid for under the contract unit price for Sodding, SY.

2. Flumes to be located in low point of noses and at other points as designated in the plans. The locations may be adjusted by the Engineer during construction.
Note: Set reflector pikes on right hand curb of bridge ends as shown. Pikes to be furnished by D.O.T. and installed by the contractor. Cost of installing pikes to be included in the contract unit price for concrete ditch pavement (3" thick).

SECTION AA

SECTION BB

SECTION CC

Profile of curb to match curb at end of bridge.

Depress Approach Slab

Dowels @ 18" c.c.s (5/8" B)

3'-O" 3'-O"

B

Dowels to be included in the contract unit price for concrete ditch pavement (3" thick).

ESTIMATED QUANTITIES

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*Quantity shown above includes pavement for 10 ft. "Length of Slope". For each additional foot of slope length add 0.349 sq. yd.
DETAIL OF CONC. SPILLWAY AT END OF SHOULDER GUTTER

(TO BE USED WHERE INLETS, PIPES & CRAWLS ARE IMPRACTICAL)

NOTES:
1. Spillway to be poured as shoulder gutter.
2. If spillway angles into a shallow or medium depth, the detail should be modified as necessary.
SAFETY MODIFICATION FOR INLETS IN BOX CULVERTS
**MEDIAN CURB AND GUTTER ENDINGS**

**EXPANSION JOINT BETWEEN GUTTER AND CONCRETE PAVEMENT**

**CONTRACTION JOINT IN CURB OR CURB AND GUTTER**

**Curb and Gutter Adjacent to Flexible Pavement**

1. The curb and gutter details shown are for construction adjacent to concrete pavement, except as noted.
2. For concrete, curb and gutter constructed adjacent to flexible pavement, the expansion joint shown will not be used.
3. For concrete, curb, and gutter, and flexible pavement or rigid rigid pavement, contraction joints adjacent to flexible pavement or rigid pavement on tangents and flat curves are to occur in pavement joints, with intermediate joints not to occur in pavement joints.
4. Ends of Curbs Types B and D shall transition from full to zero heights in 3 feet.

**Asphaltic Concrete Curb**
METHOD OF DETERMINING MEDIAN OPENINGS AT SKewed SIDE STREETS

A short radius may be placed at breaks in the curb

ALTERNATE I

ALTERNATE II

Note: machined portion indicates area given in table below

TABLE OF DIMENSIONS AND QUANTITIES FOR MEDIAN STORAGE LANES

<table>
<thead>
<tr>
<th>L</th>
<th>M</th>
<th>Y</th>
<th>N</th>
<th>P</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>U</th>
<th>V</th>
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Note: The table above is applicable only where median storage lanes occur on tangent construction.
TYPICAL RETURN PROFILES
INCLUDING DETAIL SHOWING LOCATION OF INLETS ON RETURN

NOTE:
1. On normal intersections, profiles need not be included in the plans as the above typicals adequately present the desired configuration.
2. For major intersections, where extreme grades are involved or where it is deemed necessary to include profiles in order to present adequate design data, return profiles may be included in the plans.
3. Inlet locations and low points should be labeled, as much as possible, to be compatible with pedestrian traffic and drop curb locations.
4. A minimum 0.2% grade should be maintained on all sag grades outside inlet limits.
GENERAL NOTES

1. Ramps to be located in accordance with crosswalk marking details as shown in the plans.
2. Ramps shall not exceed a maximum slope of 1:12.
3. Ramp surface to be fine finish in accordance with subarticled 470.205.200 as modified. Approved hand methods may be used.
4. Ramps to be constructed at all locations shown in the plans even when sidewalk is not constructed concurrently.
5. Ramps, including curb and gutter to be reconstructed on existing facilities, are to be paid for under the contract unit price for Concrete Sidewalk, SY.

RAMPS ON THIS SHEET TO BE USED WHERE SIDEWALK IS SHARED BY PEDESTRIAN AND BICYCLIST
SECTION BB

PLAN

EXPANSION AND CONTRACTION JOINT DOWELL ASSEMBLY ALTERNATE
FLORIDA STEEL CORPORATION

EXPANSION AND CONTRACTION JOINT DOWELL ASSEMBLY ALTERNATE
FLORIDA STEEL CORPORATION

CONCRETE PAVEMENT JOINTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CONCRETE PAVEMENT JOINTS

CONCRETE PAVEMENT JOINTS
DETAIL SHOWING RIGID SHOULDER PAVEMENT

NOTE: Rigid shoulder pavement shall be concrete or concrete as called for in the plans.

DETAIL SHOWING SHEET METAL STRIP

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

The sheet metal strip shall be a minimum 55 gauge steel, ¾ wide and shall be galvanized in accordance with ASTM A-656, Corrosion Designation G90.

GENERAL NOTES

1. Pay quantity of expansion joint to be calculated across pavement at right angles to the centerline of the roadway pavement, shoulder pavement parts included.
2. For additional details see Index No. 305.
3. The § of roadway and the § of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the § of the roadway pavement shall be determined.

SECTION A A
THROUGH EXPANSION JOINT

REINFORCING STEEL

Finish surface smooth. Cure with heavy coating of water-soluble pigmenting during compound. Apply second application immediately prior to placing pavement.

CONCRETE

Concrete pavement not deducted from roadway or shoulder pavement quantities. Compression seal, sheet metal strip and reinforced subgrade to be paid for under the contract unit price for Bridge Approach Expansion Joint, L.F.

SECTION THRU SEALS

Either of the three Seals shown may be used.
GUARDRAIL APPLICATIONS FOR BRIDGE ENDS

GENERAL NOTES

1. The illustrated applications for guardrail are standard requirements. For standard installations, a minimum of 30.5 feet of guardrail shall be available approaching a hazard. One panel equals 10.2 feet.

2. Post spacing shall be 6' 0" except that a reduced spacing of 5' 6" shall be used for arches in rigid structures such as bridges. (See Details 1 & 2.)

3. At hazards where the face of guardrail is offset from the hazard less than 48 inches, a 2 foot minimum offset may be used. Lowering extending over the length of the hazard shall also be considered. If 9 feet of traffic lane is to be protected, the barrier should be extended to the left as shown in Details 1 & 2. This recommendation shall be submitted to the Deputy Design Engineer, Roadways for approval.

4. In addition to use of conventional roadside hazards, guardrail will be required where fill slopes exceed 3:1, except that where fill heights are less than 8 feet guardrail may be omitted (regardless of fill slope) unless in the opinion of the Engineer it is deemed necessary due to other roadway features.

5. Straight rail sections may be used for all radii of over 100 feet or greater. For radii less than 100 feet the rail must be fabricated to fit.

6. Far specifications of materials refer to the DOT Standard Specifications.

7. Design load of rail equals 50,000 pounds in tension.

8. Permissible pull and offset block combinations are specified on sheet B of 10.

9. Where guardrail is constructed for street barricade no anchorage, offset, blocks or terminal ends will be required.

10. Where necessary to avoid or delay installation of guardrail, the work shall be done by cutting or trenching. Damaged or worn guardrails shall be replaced in accordance with Section 602, Subsection 4 of the Standard Specifications. No turning of rails will be permitted.

11. Anchor restraints shall be used adjacent to auxiliary lanes and within 500 feet of intersections, or at other locations clear restraints shall be used.

12. Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminus.

13. Median guardrail for bridges located on divided roadways shall be constructed the same as outer roadway guardrail under the following conditions:

(a) Medians of uniform width that are accessed by transportation and joint use facilities.

(b) Medians of uniform or variable widths with independent vertical alignments not suited to normal median guardrail installations.

(c) Medians of divided roadways.
MEDIANS 30' OR LESS WITH 10' BRIDGE SHOULDERS

MEDIANS 30' OR LESS WITH 6' BRIDGE SHOULDERS
STANDARD FLARE DETAIL

BEARING PLATE

SOIL PLATE

STEEL TUBE

TIMBER BREAK-AWAY POST

CABLE ASSEMBLY

ANCHOR PLATE

END ANCHORAGE TYPE IV

END MEASUREMENT FOR GUARDRAIL POST

Cable To Be Driven Tube With Hand Wrench Prior To Setting Post

Guardrail Post

Steel Tube

Front View

Special End Shoe

Buffer End Section

Anchor Plate

Notes:
- The payment for the items of End Anchorage Assemblies Type IV shall include furnished and installing the Buffer End Section, Special End Shoe, One Piece Anchor Plate, Cable Assembly, Pipe Sheath, Soil Plate, Steel Tubes, Bearing Post, End Tracked Timber Break-Away Posts, and the necessary hardware.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

DESIGNED BY

APPROVED BY

Drafted By

CHECKED By

FOR APPROVAL: DEC 9, 1978

Ord. No. 80-134

Project No. 0-545

FL 801-01

5 of 10

400
SHOULDER WITH OR WITHOUT 4' PAVEMENT

MISCELLANEOUS PAVEMENT FOR STANDARD SECTIONS

SECTION AA FOR 20' CLEAR ZONE

SECTION AA FOR 30' CLEAR ZONE

SECTION BB

SECTION CC

SHOULDER WITH OR WITHOUT 4' PAVEMENT

PAVED SHOULDERS

SHOULDER GUTTER

DOUBLE FACE RAIL

SHOULDS, SLOPES AND MISCELLANEOUS PAVING FOR THE STANDARD FLARE

GUARDRAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
Highway Design

STANDARD GUARDRAIL LOCATION - DETAIL K
GUARDRAIL AND SHOULDER GUTTER TRANSITIONS AT BRIDGE APPROACHES - DETAIL J

GUARDRAIL ATTACHMENT AT HANDBRAL BARRIER - DETAIL N

GUARDRAIL ATTACHMENT AT END POST ON EXISTING BRIDGES

GUARDRAIL

TYPICAL GUARDRAIL INSTALLATION AT EXISTING BRIDGE ENDS
1. Either anchor bolts or concrete wedge anchors may be used. Anchor bolts or concrete wedge anchors are to be installed in accordance with the manufacturer’s recommendations, specifying 3000 psi compressive strength for concrete. Wedge anchors shall be driven using a hammer or mallet, single-acting impact type, capable of delivering 600 ft-lb of energy. The P-47 type anchor shall be used. The anchor bolt shall be 3/4" diameter and 12" long. The anchor anchor shall be a type 433 anchor. The anchor plate shall be a 12" x 12" plate. The anchor shall be set in accordance with Section 8B of the Standard Specifications.

2. Anchor holes and anchorages are to be drilled. Encountered reinforcing steel shall be drilled through. Holes shall be thoroughly cleaned before setting bolts or wedge anchors and dry when setting bolts. Bolts shall be set in concrete mortar.

3. Posts are to be plumbed with adjusting nuts when bolts are used and plumbed with liquid cement when wedge anchors are used. All base plates to be grouted with neat finish.

4. Steel post and plate assembly to be galvanized. Any damaged or vernier areas to be selected in accordance with Section 8B of the Standard Specifications.

5. Steel guardrail post mounting to existing approach slabs.

6. For construction of guardrail where culvert, per footing or other structure precludes normal post installation, when wood posts are selected as alternates, the post installation for the above dimensions will be steel special concrete and steel guardrail posts.

7. The 6" x 8.5 steel post is not to be used for special concrete and steel guardrail post.

8. The 6" x 8.5 steel post is to be used for special concrete and steel guardrail post.
DOWELED TRANSVERSE CONSTRUCTION JOINT DETAIL B

DOWELED TRANSVERSE CONSTRUCTION JOINT DETAIL C

DETAILED TRANSVERSE JOINTS

To Be Provided for Concrete Barrier Wall (LFT) (Cost to Include Thin Walls, Fill, Cap, and Transition)

"L" Total Transition - Symmetrical at Pier Approaches

A-104

PLAN

DETAIL D

CONCRETE MEDIAN WALL (THIN WALLS, FILL, CAP AND TRANSITION)

CONCRETE WALL

FOR BARRIER WALL DIMENSIONS, SEE SHEET 1.

FOR ADDITIONAL GUARDRAIL, BLOCKING, AND FENCING DETAIL, SEE INDEX No. 400.

ADD 1" TO HORIZONTAL DIMENSIONS SHOWN FOR LIGHT MOUNTED BARRIER WALL SECTION.

GUARDRAIL CONNECTION TO STD. CONCRETE BARRIER WALL

SECT A A

SECT B B

CONCRETE BARRIER WALL

NOTES:

Bolt circle, 8"-pole -10"; 10"-pole - 15".

Refer to Highway Lighting Plans for size of Condalt.

Payment for the 50" concrete column including reinforcing steel, anchor bolts, and accessories shall be included in the contract unit price for Lighting Pole complete, Highway Lighting.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE MEDIAN BARRIER WALL (THIN WALLS, FILL, CAP AND TRANSITION)
OPTION I ANNOTATIONS

1. Lintels - Tongue 36" x 36"; Groove 24" x 24".

2. Ground anchored units shall be tee headed and bolted with a minimum pin-out strength of 2500 lbs. and may be either threaded inserts or upset expansion anchors.

Tongue and groove joint shall be tee headed and bolted with a minimum pin-out strength of 2500 lbs. and may be either threaded inserts or upset expansion anchors.

OPTIONAL END TREATMENTS FOR WALL UNITS

WALL TIE AND ANCHORAGE REQUIREMENTS

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<th>END OPTION</th>
<th>GROUND MOUNT</th>
<th>BRIDGE MOUNT</th>
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</tr>
<tr>
<td>4</td>
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</table>

Note: When the plans call for wall units furnished by the Department, ground and bridge units will be supplied. Tie and anchor assemblies shall be furnished by the Contractor.
GENERAL NOTES (TYPE "A" FENCE)

1. THIS FENCE TO BE PROVIDED GENERAL IN RURAL AREAS.

2. POSTS AND BRACES MAY BE EITHER STEEL, ALUMINUM, TIMBER OR CONCRETE.

3. STEEL POSTS AND BRACES SHALL BE STANDARD STEEL POSTS OR BRACES.

4. CONCRETE POSTS AND BRACES SHALL CONSIST OF ONE OR MORE PULL POSTS, ONE APPROACH POST, TWO BRACES AND ALL NECESSARY FITTINGS AND HARDWARE AS DETAILED ABOVE.

5. CONCRETE BASE FOR ANGULAR STEEL POST

6. CONCRETE BASES SHALL CONSIST OF ONE OR MORE PULL POSTS, ONE APPROACH POST, TWO BRACES AND ALL NECESSARY FITTINGS AND HARDWARE AS DETAILED ABOVE.

7. THE TYPE OF FENCE TO BE INSTALLED SHALL BE SHOWN ON PLANS.

8. A MAXIMUM LENGTH OF 1800' OF WIRE MAY BE INSTALLED AS A UNIT.

9. FOR FENCE PURPOSES ASSEMBLIES ARE DEFINED AS FOLLOWS: PULL OR END POST ASSEMBLIES SHALL CONSIST OF ONE END OR PULL POST, ONE APPROACH POST, TWO BRACES AND ALL NECESSARY FITTINGS AND HARDWARE AS DETAILED ABOVE. CORNER POST ASSEMBLIES SHALL CONSIST OF: ONE CORNER POST, TWO APPROACH POSTS, FOUR BRACES AND ALL NECESSARY FITTINGS AND HARDWARE AS DETAILED ABOVE.

10. THE TYPE OF FENCE TO BE INSTALLED SHALL BE SHOWN ON PLANS.

11. CORNER POSTS ARE TO BE INSTALLED AT ALONGSIDE AND VERTICAL BREAKS IN FENCE OF 50' OR MORE.

12. CONCRETE BASES MAY BE USED TO INSTALL WIRE TO PRIVATE PROPERTY EXCEPT ON HORIZONTAL CURVES GREATER THAN 5° THE FENCE SHALL BE INSTALLED SO AS TO PULL AGAINST ALL POSTS.
GENERAL NOTES

1. Gate components shall meet the material requirement specified on Index No. 452.

2. Steel gate frame shall be fabricated prior to galvanizing, except that truss rods and truss rod plates may be fabricated following frames galvanizing provided surfaces damaged during welding are galvanized in accordance with Section 24 of AASHTO M256.

3. All fabric shall be knuckled top & bottom selvages.

4. Cost of all gate components shall be included in the contract unit price for Sliding Fence Gate (Cantilever), Each.

5. The Contractor may substitute any equivalent cantilever slide gate approved by the Engineer.
FOUR LANE ROADWAY

TWO LANE ROADWAY

SYMBOL | SOIL | CLASSIFICATION (AASHTO M-145)
--- | --- | ---
S | Select | A-1, A-3, A-2-4
H | High Plastic | A-2-5, A-2-7, A-5 or A-7 (All with LL > 50)
M | Muck | A-8

Note: All dimensions shown are standard. The details shown on this index drawing do not supersede the details shown on Index 500.
* When otherwise shown on plans this dimension may be reduced to 24".

Symbols listed left to right in order of preference.

Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and therefore should be used in the embankment above water level existing at time of construction.
2-LANE OR 4-LANE PAVEMENT, NO MEDIAN

SECTION A-A
NORMAL CROWNED SECTION
FULLY SUPERELEVATED SECTION

SECTION B-B
PLANE INCLINED SECTION
CROSS SLOPE EQUAL TO NORMAL CROWN SLOPE DESIGN ROTATION ABOUT CENTERLINE AT THIS POINT.

SECTION C-C
FULLY SUPERELEVATED SECTION

SHOULDER CONSTRUCTION WITH SUPERELEVATION

SHOULDER ON HIGH SIDE: A SHOULDER SLOPE OF 0.6 FT/FT DOWNWARD FROM THE EDGE OF PAVEMENT WILL BE MAINTAINED UNTIL A 0.6 FT/FT BREAK IN SLOPE AT THE EDGE OF PAVEMENT. THIS BREAK IN SLOPE WILL BE FUNDED TO THE INSIDE EDGE OF PAVEMENT. THE MINIMUM OUTSIDE EDGE OF PAVEMENT AND THE OUTSIDE EDGE OF PAVEMENT MUST BE MAINTAINED AT THE INSIDE OF THE SHOULDER TOWARD THE PAVEMENT AND THE OUTSIDE HALF OF THE SHOULDER.

SHOULDER ON LOW SIDE: MAINTAIN DEPTH DROP ACROSS INSIDE SHOULDER UNTIL PAVEMENT CROSS SLOPE REACHES 0.6 FT/FT. FOR PAVEMENT CROSS SLOPES GREATER THAN 0.6 FT/FT, SHOULDER TO HAVE SAME SLOPE AS PAVEMENT.

GENERAL NOTES FOR SUPERELEVATION

1. USE NORMAL SECTION WITH NO SUPERELEVATION FOR CURVES UP TO 2% DEG FOR DESIGN SPEEDS OF 20 MPH.
2. WHEN THE DEGREE OF CURVE IS 2.5 DEG OR GREATER 0.5 DEG FOR DESIGN SPEEDS OF 20 MPH OR LESS IN THE RANGE OF THE CURVE, ADD A MINIMUM SLOPE TO THE INSIDE EDGE OF THE PAVEMENT ACCORDING TO THE CURVE SHALL BE SUPERELEVATED.
3. THE LENGTH OF SUPERELEVATION TRANSITION IS TO BE DETERMINED BY USING A RELATIVE SLOPE OF PAVEMENT EDGE TO PROFILE SLOPE GIVEN IN THE TABLE BELOW, EXCEPT THAT THE MINIMUM LENGTH OF TRANSITION SHALL BE 60 FT.
4. FOR CURVES IN MUNICIPAL AREAS, SEE LOCAL CODE.

SLOPE RATIOS FOR SUPERELEVATION TRANSITIONS

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN
B-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN
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### Turnout Pavement Structure Minimum Requirements

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<td>Cemented Coping</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ABC (Marshall 500)</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ABC 2 (Marshall 750)</td>
<td>*</td>
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<tr>
<td></td>
<td>ABC 3 (Marshall 900)</td>
<td>*</td>
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<tr>
<td></td>
<td>Soil Cement (Plant Mix)</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Rock Run Shale</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Sand/Clay LBR 70</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Soil Cement (Road Mix)</td>
<td>*</td>
</tr>
</tbody>
</table>

Notes:
1. Turnout structural course to be the same material as roadway bonding or structural course. Structural course not required if export base course is used.
2. Any Department approved pavement structure equivalency may be used at the discretion of the Engineer.
3. Additional structural strength may be required if high traffic loads are anticipated.

### General Notes

1. Turnouts are to be constructed or resurfaced at locations as directed by the Engineer.
2. Turnout construction not required with paved shoulders.
3. Connections outside the 5' limit are to be constructed as directed by the Engineer.
4. Contract unit price, Turnout Construction, to include excavation and base.
5. Payment for structural course to be included in roadway resurfacing pay item.
6. Payment for feathering friction course to be included in the unit price for Aggregate Concrete Friction Course placed on the roadway. Feathered areas will not be included in measured quantities. Feathering not required for FC-2 & FC-3 friction courses.
7. For low volume two-lane facilities without a friction course the structural course is replaced by a surface course.

### Section A-A

**Turnout Construction**

- Structural Course
- Base

**Section A-A With Widening**

- Friction Course
- Structural Course
- Leveling Course

**Turnout Construction**

- Structural Course
- Base

**Section A-A**

- Friction Course
- Structural Course
- Leveling Course

**Resurfacing Existing Turnout**

- Structural Course

**General Notes**

1. Turnouts are to be constructed or resurfaced at locations as directed by the Engineer.
2. Turnout construction not required with paved shoulders.
3. Connections outside the 5' limit are to be constructed as directed by the Engineer.
4. Contract unit price, Turnout Construction, to include excavation and base.
5. Payment for structural course to be included in roadway resurfacing pay item.
6. Payment for feathering friction course to be included in the unit price for Aggregate Concrete Friction Course placed on the roadway. Feathered areas will not be included in measured quantities. Feathering not required for FC-2 & FC-3 friction courses.
7. For low volume two-lane facilities without a friction course the structural course is replaced by a surface course.
- **Expansion Joint**: Necessary to accommodate movement and prevent damage to the railings.
- **Handrail and Gravity Wall**: Required when deep drop off or sidewalk is more than 10 feet.
- **Typical Section at Post**: Illustrates the typical installation of the handrail and gravity wall.
- **Aluminum Handrail on Gravity Wall**: Details the materials and construction techniques.

**Notes**:
1. All fixed joints to be either welded around the ground or secured with stainless steel bolts, washers, and nuts.
2. The handrail shall be extensions of reinforced concrete facing walls, except where specified otherwise.
3. The handrail shall be continuous and shall have a minimum thickness of 5 inches.

**Estimated Quantities for Wall**

<table>
<thead>
<tr>
<th>Height Above Ground</th>
<th>Per Linear Foot of Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.15</td>
</tr>
<tr>
<td>1</td>
<td>0.20</td>
</tr>
<tr>
<td>2</td>
<td>0.25</td>
</tr>
<tr>
<td>3</td>
<td>0.30</td>
</tr>
</tbody>
</table>

**Concrete Steps**

- **6'-0" Wide Step (Including Cheek Wall)**: Unless otherwise specified in plans.

**Key Details**

- **Gravity Wall**: Includes reinforcement and finishes as specified in plans.
DETAIL C
ENTRANCE TERMINAL
TWO THRU Lanes

For Pavement Markings
(Striping And Reflectors)
See Pavement Markings Plan

P.C.C. Pavement or R.B. With A.C. Surface

End Coat 7 ft at this Point

DETAIL D
ENTRANCE TERMINAL
WITH ADDED LANE

GENERAL NOTES

1. The rules applying to P.C.C. Pavement are not applicable to R.B. With A.C. Pavement

2. (a) P.C.C. Pavement Projects:

   Where shoulder pavement adjacent to shoulder gutter is less than 6" wide, it shall be identical to the adjacent roadway pavement beginning with the horizontal joint nearest the point of 6" width.

   (b) Flexible Road Projects:

   Where shoulder pavement used in conjunction with shoulder gutter is less than 6" uniform width, it shall be identical to the adjacent roadway pavement.

3. Exit and Entrance terminals as detailed shall not be used on ramps for which a speed of 50 M.P.H. or greater cannot be maintained. For such ramps, parallel deceleration and acceleration lanes shall be used in place of ramps with lengths set according to table J-EJ-141-72 AASHO - Red Book.)
SHOULDER TREATMENT
AT SPEED CHANGE LINES WITH SHOULDER GUTTER

SHOULDER TREATMENT
AT SPEED CHANGE LINES WITHOUT SHOULDER GUTTER
ENTRANCE AND EXIT RAMP TERMINAL (UN SIGNALIZED)

W Normal shoulder pavement width
b. Adjust for grades of greater than 2% (See P.556 AASHTO Red Book).

c. Standard cross road entrance terminals. To be used when roadway alignment is tangent and no bridges are located within the merging lane.

3. Paralleled cross road entrance terminals. Recommended when bridge is located within the merging lane, turning roadway speed is less than 60% of thru roadway speed or for the combinations of horizontal alignment shown elsewhere on this sheet.

Standard cross road exit terminal. To be used when roadway alignment is tangent.

Paralleled cross road exit terminals. Recommended when exit is partially hidden over the crest of vertical curve or when turning roadway speed is less than 60% of the thru roadway speed, or for the combinations of horizontal alignment shown elsewhere on this sheet.

NOTE: Enters and exits on curves should be avoided when possible.
NOTE
CLASS 1 CONCRETE IS TO BE USED UNLESS OTHERWISE NOTED IN PLANS OR SPECIAL PROVISIONS

PLAN

No. 6 Bars @ 24" Ctrs Top and Bottom
Width Varies: See Section Below

SECTION A-A

TYPE A
REINFORCED CONCRETE

SECTION X-X

TYPE B
TREATED TIMBER

NOTE
TRACTOR CROSSING TO BE CONSTRUCTED TO MATCH PAVEMENT CROSS SLOPE.
THE NUMBER OF MATS REQUIRED WILL VARY WITH THE TREATMENT WIDTH; A SUFFICIENT NUMBER OF MATS WILL BE USED SO THAT THE OVERALL WIDTH OF THE TRACTOR CROSSING WILL BE A MINIMUM OF ONE FOOT GREATER THAN THE PAVEMENT WIDTH. THE TRACTOR CROSSING WILL BE CENTERED ON THE PAVEMENT CENTERLINE.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TRACTOR CROSSINGS

Sheet No. 1 of 1

535
INSTALLATION

Notes:
1. Elevation of the top of each length of main pipe shall be determined as soon as it is installed and cited immediately before the next length of main pipe is added.
2. Settlement plate locations shall be flagged and protected from construction vehicles and equipment. If settlement plates are disturbed, they shall be replaced in kind.
3. Column used to construct well should not have a mesh covering (plastic or other synthetic material).

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SETTLEMENT PLATE

STEM AND PLATE OPTIONS
1. The purpose of shrubs in areas back of guardrail is to minimize hand maintenance in those areas.
2. Shrubs are to be planted approximately 5' back from guardrail posts and hazards. Narrow plant areas are to have at least one row of shrubs, as directed by Engineer.
3. Shrubs are to be planted approximately 5' in centers in rows with 5' spacings.
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 Material Specification List numbers.
6. Only one variety of shrub shall be planted within any given project area and no shrub variety is to be repeated within a distance of one mile.
7. When guardrail or slope is constructed in conjunction with shrub planting, soil sterilization shall be in accordance with Section 336 of the Standard Specifications.
GENERAL NOTES

1. The furnishing and installing of concrete crossovers, together with any necessary inspection, testing, and adjustment and hand labor involved shall be performed by the Contractor at no cost to the Department.

2. All concrete crossovers, rubber pads for king and gable, and other blocks shall be furnished and installed by the Contractor.

3. Concrete crossovers shall be spaced on 2½ centers by the Contractor.

4. Rubber pads shall be installed on concrete ties in field using contact cement.

5. All blocks shall be pressure treated pine or clear heart redwood and shall be shaped down to treatment.

6. Class I concrete & blocks used in construction of road crossovers shall be included in cost of Class I concrete, see note #6.
GENERAL NOTES

1. The crossings shown on this sheet are NOT to be used for multiple track crossings within zones or for track installations for existing or scheduled future vehicular stops. They are charted above.

2. Crossings on this sheet may be used for single track crossings within the zones in the chart unless engineering or safety considerations dictate otherwise.

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

4. For additional details, materials required and installation procedures refer to the manufacturer's specifications.

CROSSING TYPE "P" (PVC)

CROSSING TYPE "R" (Rubber)

PARTIAL PLANS DETECTING SUGGESTED PAD PLACEMENT

SECTION

TOP VIEW

STOP ZONE

DATE: [Date]

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
RIVERA CROSSING

CROSSING TYPE "R" (RUBBER)

STATE: [State]

DESIGN: [Design]

DISTANCE: [Distance]

SPEED: [Speed]

NOTE: [Note]

DRAWN: [Drawn by]

REVIEWED: [Reviewed by]

APPROVED: [Approved by]
GENERAL NOTES
1. The reinforced concrete slabs are manufactured in 8'-0" sections, 5" in depth to fill all rail sections 5 1/4" in height or heavier. Slabs are interchangeable and relocatable.
2. Center slabs are one piece construction allowing for 2 1/2" flange opening. 80 lb. rail is used to encase, armor and reinforce slabs and is held to gage with 3 tie rods per slab.
3. Slabs are installed by a "fracture" process, supported on non-shrinkable, non-metallic 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 re-spacing of ties is necessary.
4. Slabs are secured to "running rails" with specially designed hardware. Insulation is to be provided for crossings in signal territory.
5. Curved slabs are fabricated to fit curved track to 22 degrees (262.04' radius). Special slabs are available for Diamond Crossings, Turnouts, Multiple Tracks, Bridge Decks and Rapid Transit Systems.
6. For additional details, materials required and installation procedures refer to the manufacturers specifications.

PLAN

SECTION B-B

SECTION A-A

TYPICAL BOTH SIDES
TOP VIEWS - CENTER SLAB AND OUTSIDE SLAB

SECTION AA

STANDARD SLABS ( PRECAST CONCRETE )

SECTION CC

STANDARD AND RAMP SLAB SECTIONS

SECTION BB

RAMP SLABS ( PRECAST CONCRETE )
PLAN VIEW
TYPICAL 44' CROSSING

TOP VIEW
TIE PAD

SIDE VIEW
PRECAST CONCRETE TIE (CROSSING TIE)

TRANSVERSE SECTION

ELEVATION
TIE SPACING

GENERAL NOTES
1. Stab holes are welded 90 lbs. nails.
2. Stab reinforcement or 4 #4 bars.
CASE I
TRAFFIC TRANSITION AREA UPSTREAM FROM CROSSOVER

CONDITION "A"

TRUCKS TURNING LEFT 000 FT

MERGE RIGHT ON FLASHING ARROW

SIGN NO. 3

SIGN NO. 2

SIGN NO. 1

CONDITION "B"

TRUCKS ENTERING HIGHWAY

SIGN NO. 4

SIGN NO. 3

SIGN NO. 2

SIGN NO. 1

CASE II
TRAFFIC TRANSITION AREA DOWNSTREAM FROM CROSSOVER

CONDITION "A"

SIGN NO. 3

SIGN NO. 2

SIGN NO. 1

CONDITION "B"

SIGN NO. 3

SIGN NO. 2

SIGN NO. 1

MAINTENANCE OF TRAFFIC

CONDITION "A"
When the paving truck is in lane 1, the U-turning truck shall maintain a safe distance behind. Turn into lane 2 and proceed to the left of the truck.

CONDITION "B"
When the paving truck is in lane 2, the U-turning truck shall turn into lane 3. Continue to the left of the paving truck.

CONDITION "A" & "B"
Lane closure and maintenance of traffic to be done in accordance with the provisions of the MUTCD. The flashing or sequential arrow board is required in addition to signs shown on lane 1. Under no circumstances will the traffic transition area be located within the limits of the crossover.

GENERAL NOTES
When crossovers do not exist, contractor will construct temporary crossovers to accommodate with sign No. 2.

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 and price for maintenance of traffic LS.
3. Crossover to be constructed where right-of-way is inadequate in both directions as directed by the Engineer.
PHASE I

1. Maintain two-lane two-way traffic over existing pavement. Construct new roadway within the proposed 4-lane limits, excluding the friction course. Sign as shown if roadway construction area falls within 15 feet of existing pavement edge. When the construction area falls more than 15 feet from the existing pavement edge, traffic shall be controlled in accordance with Cases 1, 2 or 3 of the MTSCP.

2. Construct shoulder pavement to provide two-lane two-way traffic over shoulder and existing pavement during Phase II roadway construction. Lanes to be not less than 10 feet in width. Signing as shown to be in place prior to shoulder pavement construction.

PHASE II

1. Remove existing pavement marking, in areas of detour and re-mark as shown, install warning devices and re-sign as shown. Traffic to be controlled in accordance with Case II of the MTSCP. Lanes to be not less than 10 feet in width.

2. Route through traffic to temporary and existing pavement.

3. Construct transitions, excluding friction course.

LEGEND

Phase I
Phase II
MTSCP Manual On Traffic Control
And Safe Procedures

Denotes Direction Of Traffic And Does Not Reflect Pavement Marking
GENERAL MAINTENANCE OF TRAFFIC NOTES

1. All signing, pavement marking, barcodes, and warning lights necessary for maintenance of traffic shall conform to the MTSCP.

2. Lane widths for maintenance of two-way traffic should be equal to lane widths at the existing facility, but lanes shall not be less than 10 feet in width. When one-lane one-way operations are necessary, a minimum width of 12 feet shall be maintained, and traffic controlled in accordance with the MTSCP. Minimum width for the temporary shoulders is 6 feet.

3. Raised pavement markers shall be placed along the center of the pavement under traffic at 20-foot centers in the transition area where alignment shifts to 10 feet or greater.

4. Existing signs and pavement markings that conflict with construction signing and marking shall be obliterated or removed.

5. Posted speed on the existing facility shall be decreased at the rate of 10 mph per 500 feet (minimum distance) until deceleration is reached.

6. Additional barcodes, signing, lighting, or other traffic controls as required by the MTSCP shall be provided as conditions warrant in each phase.

7. Intermediate temporary speed signs shall be erected when the length of construction exceeds one mile, as directed by the Engineer.

8. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.

9. Barcodes shall meet the requirements of Chart 1 of the MTSCP.

PHASE III

1. Remove temporary marking from the existing pavement and temporary shoulder pavement.

2. Route through traffic to newly constructed roadway.

3. Resurface or reconstruct existing pavement including required shoulder pavement and friction course.

PHASE IV

1. Resurface through traffic as shown in Phase III. Signing to be as shown in Phase II.

2. Construct friction course over pavement constructed in Phase I and II.

LEGEND

Phase I
Phase II
Phase III
MTSCP Manual Traffic Control
And Signage
Denotes Direction Of
Traffic And Does Not
Reflect Pavement Marking

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONVERTING TWO LANES TO FOUR LANES DIVIDED STANDARD TRAFFIC CONTROL PLAN RURAL FACILITY

CONTRACT NUMBER: 62-511

DATE: 3/13/20

CONTRACTOR:

INVOICE NO.:

INVOICE DATE:

STATE APPROVAL:

NADA: 640

2 of 2
**LEGEND**

- Phase I
- Phase II

**MTCS** Manual On Traffic Control And Safe Practices

- Denotes Direction Of Traffic
- Does Not Reflect Pavement Markings

---

**PHASE I**

1. Maintain two-lane two-way traffic along existing facilities. Install construction signs.
2. Remove existing pavement to facilitate temporary pavement construction. Lanes shall be not less than 10 feet in width.
3. Construct temporary pavement of sufficient width to accommodate two-lane two-way traffic on the temporary pavement and a portion of the existing pavement during Phase I roadway construction. When two-lane two-way traffic cannot be maintained during temporary pavement construction (49 minimum from travel lane to dropoff), one-lane one-way operations shall be maintained in accordance with Cases XX and XX of the MTCS. Barricading shall meet the requirements of Chart III of the MTCS.
4. Mark the pavement in accordance with the Phase I diagram. Route through traffic to the temporary pavement and a portion of the existing pavement. Lanes shall be not less than 10 feet in width.
5. Construct two lanes of the proposed roadway, excluding the friction course. Side street traffic to be maintained through cross traffic to be controlled in accordance with Cases XX and XX of the MTCS. Barricading shall meet the requirements of Chart III of the MTCS. When work extends through an intersection, temporarily route cross traffic to other cross streets. When rerouting is not possible, provide one lane access (minimum) for two-lane two-way cross streets and one lane access (minimum) each direction for four-lane two-way cross streets.

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**PHASE II**

1. Sign and mark Phase I pavement in accordance with the Phase II diagram. Lanes to be not less than 10 feet in width.
2. Route through traffic to Phase I pavement.
3. Complete Phase II construction, including the friction course. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Cases XX and XX of the MTCS. Barricading shall meet the requirements of Chart III of the MTCS. When work extends through an intersection, temporarily route cross traffic to other cross streets. When rerouting is not possible, provide one lane access (minimum) for two-lane two-way cross streets and one lane access (minimum) each direction for four-lane two-way cross streets.
PHASE III

1. Sign and mark Phase II pavement in accordance with the Phase III diagram.
2. Re-route through traffic to Phase II pavement.
3. Construct friction course over Phase I pavement. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Case II and III of the MTCSP. When work extends through an intersection, temporarily redirect cross traffic to other cross streets. When rerouting is not possible, provide one lane access (minimum) for two-lane two-way cross streets and one lane access (minimum) each direction for four-lane two-way cross streets.

GENERAL MAINTENANCE OF TRAFFIC NOTES

1. All signing, pavement marking, barriers and warning lights necessary for maintenance of traffic shall conform to the MTCSP.
2. Where pavement markers shall be placed along the center of pavement or to traffic at 200' centers in the transition area where alignment shift is 10 feet or greater.
3. Where divided facilities, eliminate through traffic signing as shown above shall be placed on the outside lane of both roadways for each phase.
4. Existing signs and pavement markings that conflict with construction signings and markings shall be obliterated or removed.
5. At signalized intersections, signals shall be directed or relocated as required to the center of relocated lanes.
6. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
7. Additional barriers, signing, lighting or other traffic controls as required by the MTCSP shall be provided on an as needed basis in each phase.

LEGAL
Phase I
Phase II
Phase III
MTCSP
End Traffic Control And Safe Practices
Denotes Direction Of Traffic And Does Not Reflect Pavement Markings

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
CONVERTING TWO LANES TO FOUR LANES DIVIDED STANDARD TRAFFIC CONTROL PLAN URBAN FACILITY

CONTRACTOR E-40

03 2012

641
<table>
<thead>
<tr>
<th>TYPE OF FACILITY</th>
<th>UNDIVIDED - DESIGN SPEED OF 50 MPH OR GREATER</th>
<th>PROJECTED ADT (10 YR) OF 1,600 OR GREATER</th>
<th>UNDIVIDED - DESIGN SPEED OF 35 - 45 MPH</th>
<th>購物</th>
<th>MUNICIPAL - DESIGN SPEED OF 35 - 45 MPH, LESS (CURB AND GUTTER)</th>
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</thead>
<tbody>
<tr>
<td>INTERSTATE, OTHER LIMITED ACCESS HIGHWAYS, OR MORE LANE DESIGNS</td>
<td>SPEED OF 50 MPH OR GREATER</td>
<td>PROJECTED ADT (20 YR) OF 1,600 OR GREATER</td>
<td>SPEED OF 35 - 45 MPH</td>
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<tr>
<td>TIBURON</td>
<td>0</td>
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<td>CLEARANCE FOR BRIDGES</td>
<td>Travel lanes plus 50 ft. and 6 LFT for 6 or more lanes.</td>
<td>Travel lanes plus approach shoulders.</td>
<td>Travel lanes plus approach shoulder widths.</td>
<td>Full section, face to face of curb + plus clearance to bridge rail.</td>
<td>2</td>
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<tr>
<td>BACK SLOPES</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>CLEAR RECOVERY AREA (CRA)</td>
<td>30 min. from edge of travel lane, 18 min. from edge of auxiliary lane, 12 min. from edge of shoulder lane, or 20 ft. from shoulder width.</td>
<td>20 min. from edge of travel lane, 14 min. from edge of auxiliary lane, or 20 ft. from shoulder width.</td>
<td>20 min. from edge of travel lane, 14 min. from edge of auxiliary lane, or 20 ft. from shoulder width.</td>
<td>20 min. from edge of travel lane, 14 min. from edge of auxiliary lane, or 20 ft. from shoulder width.</td>
<td>2</td>
</tr>
<tr>
<td>SIGNS</td>
<td>Not generally in median. Outside clear zone is 65 ft. or beyond barriers that justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>2</td>
</tr>
<tr>
<td>LIGHT POLES</td>
<td>Not generally in median Outside clear zone is 65 ft. or beyond barriers that justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>2</td>
</tr>
<tr>
<td>UTILITY POLES, FIRE HyDRANTS, etc.</td>
<td>Not generally in median Outside clear zone is 65 ft. or beyond barriers that justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>Outside clear recovery area or behind barrier that is justified for other reasons. Outside clear zone sign is centered at 20 ft. from travel lane edge and 10 ft. from shoulder.</td>
<td>2</td>
</tr>
<tr>
<td>RAILROAD CROSSING DEVICES</td>
<td>Not at intersection or expressway head, exclusive of railroad devices that are classified as auxiliary lane.</td>
<td>Not at intersection or expressway head, exclusive of railroad devices that are classified as auxiliary lane.</td>
<td>Not at intersection or expressway head, exclusive of railroad devices that are classified as auxiliary lane.</td>
<td>Not at intersection or expressway head, exclusive of railroad devices that are classified as auxiliary lane.</td>
<td>2</td>
</tr>
<tr>
<td>MEDIAN WIDTHS</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>2</td>
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<tr>
<td>TREES</td>
<td>Not generally in median, 40' diameter or less, 30 min. from edge of travel lane, 18 min. from edge of auxiliary lane.</td>
<td>20 min. from edge of travel lane, 14 min. from edge of auxiliary lane.</td>
<td>15 min. from edge of travel lane, 10 min. from edge of auxiliary lane.</td>
<td>10 min. from edge of travel lane, 5 min. from edge of auxiliary lane.</td>
<td>2</td>
</tr>
<tr>
<td>DESIGN CRITERIA RELATED TO HIGHWAY SAFETY</td>
<td>FLORIDA DEPARTMENT OF TRANSPORTATION</td>
<td>FLORIDA DEPARTMENT OF TRANSPORTATION</td>
<td>FLORIDA DEPARTMENT OF TRANSPORTATION</td>
<td>FLORIDA DEPARTMENT OF TRANSPORTATION</td>
<td>FLORIDA DEPARTMENT OF TRANSPORTATION</td>
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</tbody>
</table>

Design speed to be established using realistic anticipated operating speed (allow 55 mph limits to be non-wasteful). Preferred ditch cross sections are given on pages 26, 27 of the AASHO Guide for Selecting, Locating And Designing Traffic Barriers. Consideration should be given to maintaining sufficient clearances and to cluttering slopes where feasible and practicable.}

- At locations where immediate additional development such as buildings, etc. provide less clearance, bridge piers can be placed to provide clearance. At locations where immediate additional development such as buildings, etc. provide less clearance, bridge piers can be placed to provide clearance. At locations where immediate additional development such as buildings, etc. provide less clearance, bridge piers can be placed to provide clearance. At locations where immediate additional development such as buildings, etc. provide less clearance, bridge piers can be placed to provide clearance. At locations where immediate additional development such as buildings, etc. provide less clearance, bridge piers can be placed to provide clearance.

- Values shown above shall be used as the minimum width for a construction project. The actual minimum width may not be less than 2.5 feet from the front of curb - each case where this deviation is permitted must be supported on an individual basis. The actual minimum width may not be less than 2.5 feet from the front of curb - each case where this deviation is permitted must be supported on an individual basis. The actual minimum width may not be less than 2.5 feet from the front of curb - each case where this deviation is permitted must be supported on an individual basis. The actual minimum width may not be less than 2.5 feet from the front of curb - each case where this deviation is permitted must be supported on an individual basis. The actual minimum width may not be less than 2.5 feet from the front of curb - each case where this deviation is permitted must be supported on an individual basis.

- Minimum distance to existing or new planted trees. To be used on facilities classified as municipal when no curb and gutter exist, when curb height is less than 6' or when curb height has been reduced by resurfacing. Minimum distance to existing or new planted trees. To be used on facilities classified as municipal when no curb and gutter exist, when curb height is less than 6' or when curb height has been reduced by resurfacing. Minimum distance to existing or new planted trees. To be used on facilities classified as municipal when no curb and gutter exist, when curb height is less than 6' or when curb height has been reduced by resurfacing. Minimum distance to existing or new planted trees. To be used on facilities classified as municipal when no curb and gutter exist, when curb height is less than 6' or when curb height has been reduced by resurfacing. Minimum distance to existing or new planted trees. To be used on facilities classified as municipal when no curb and gutter exist, when curb height is less than 6' or when curb height has been reduced by resurfacing.
# TABLE OF CONTENTS

## TRAFFIC DESIGN STANDARDS

<table>
<thead>
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</table>
| 17350        | 1 of 1       | a) Detail "A" - Deleted words "gas", "food", and "lodging" from separate panels. Changed dimension from 24" to 30" each.  
b) Detail "B" - Deleted words "gas", "food", "lodging", "hospital", and "camping" from sign panel. Changed height of sign from 60" to 48". Deleted "next right" sign.  
c) Detail "C" - Deleted words "gas", "food", "lodging", and "camping". Changed height dimension from 30" to 24".  
   Deleted "next right" sign.  
d) Revised general notes. |
| 17352        | 1 of 2       | Added note, reference to placement of raised pavement markers.  
   2 of 2 Relocated placement of raised pavement marker to right side of lane line. |
| 17353        | 1 of 1       | Added note for color of reflective buttons. |
| 17355        | 1 of 3       | Added note for FTO-31 sign relating to the use of 3 digits plus letter. |
| 17356        | 1 of 1       | Added note to identify Type "A" and Type "B" mounting. |
| 17781        | 2 of 2       | Revised "Type G" loop design and corrected dimensions. Revised detail on concrete expansion joints. |
| 17870        | 2 of 2       | Revised standard Signal Operating Plan No. 18 and No. 19, Phase Ø1 (A). |
| 17890        | 1-3 of 3     | Reinserted for 1983 design standards. |
1) Ground rods shall have a resistance to ground not to exceed 25 ohms. Where the resistance is not as low as 25 ohms, two or more ground rods connected in parallel shall be used. Contractor shall take necessary precautions for the installation and removal of the equipment. Equipment calibration certificate required at final inspection to ensure acceptability of grounding system.

2) The contractor shall be responsible for contacting all utility companies prior to any underground work. The utility company will locate and identify their facilities.

3) Contractor shall determine the service required for the power company transformer installation at the pre-construction conference.

4) The power company reserves the right to install, the meter, switch gear and weatherproof on power company property at the expense of the contractor. Contact the power company for cost for authorization for an alternative procedure.

5) Any damaged portions of galvanized steel poles and bracket arms shall be painted in accordance with Section 562 of the standard specifications.

6) Poles, bracket arms and frangible devices shall be designed in accordance with the design criteria, as indicated in the plans and using the applicable equations found in "Standard Specifications for Structural Supports for Communication, Lighting, and Traffic Signals" (Supplement No. 2; 1970).

7) The luminaire manufacturer shall place a permanent tag on the luminaire housing indicating the following information: wattage, ballast type, lamp voltage, fixture rating luminaire, lens, lens distribution, wattage, input voltage, and power factor. Luminaire photometric submittals required.

8) Before final acceptance, contractor shall provide 2 sets of full-size as-built plans to the monitoring agency.

9) Conduit routing shall be done to pole. Maintain pole set-back distance from edge of pavement. Any cable routing in locations where sagging is present shall be 2'-0" in front of the standard guardrail position.

10) Pole positions and conduit routed may be adjusted, as approved by the engineer to prevent conflicts with utility and drainage structures, not indicated, and prevent safeguard post conflict with underground lighting circuits.

11) Where guardrails are constructed, the poles shall be placed a minimum of 4' behind the face of the guardrail.

12) Pole foundation installations shall be backfilled to the top of the foundation. Compacted fill shall be approximately equal to that of the adjacent soil. The fill shall conform to existing grade and fully grouted.

13) The wires at the pole handcable and pull boxes shall be sufficient length to completely remove connections to the outside of handing cable. Transformer shall not be accessible for changing fuses and trouble shooting the system.

14) Neutral wires to have white insulation. Hot No. 2 wire to have black insulation. Other conductors to be color coded by insulation. Do not use white or green insulated wires for ungrounded conductors.

15) Unless otherwise specified, all cable shall be single conductor, 90 percent conductivity stranded copper, with thin insulation.

16) All splices shall be made in pull boxes on the pole base. No splices shall be made inside the conduit.

17) All exposed or surfaced mounted conduit shall be Rho galvanized. The conduit shall be of appropriate size to accept the conductors. Conductors shall be protected by voltage insulation. Sections adequate to take care of variations and thermal expansions. All galvanized conduit shall be threaded.

18) All conduit that will remain empty as spares shall be marked, listed, and both ends capped. Leave the corrosion resistant pull box wire and place duct markers, or pull boxes to mark the location of the ends of the conduit.

19) Pull boxes shall be located at ends of conduit crossing roadways, and as necessary for the completion of the project.

20) These plans represent minimum acceptable criteria. The inspection for these drawings represent the minimum base of acceptance.

21) All material unless otherwise specified, shall be underwriters laboratory approved.

22) Prior to any equipment order, the contractor shall submit a proposal, equipment specifications, or design data for all material proposed for the project and must include specifically:
   a) Luminaire photometrics
   b) Pole strength calculations
   c) Pole flexibility and bolt circle diameter
   d) Bolt specifications and bolt circle diameter

23) Seventy copies of shop drawings and design data for highway lighting equipment shall be submitted to the department of transportation engineer in the following address with a copy of the submittal letter sent to the department's resident construction engineer in charge of the project.

24) Breakaway feature:

   All conventional mounting height poles shall be mounted on a removable metal base of system of breakaway couplings. If couplings are used, one coupling shall be provided by the pole to the foundation. A second anchor bolt shall be provided by the couplings. The area between the top of the pole foundation and the base of the pole including the couplings shall be enclosed with a non-structural aluminum skirt.

   If a removable metal base is used, it shall be one piece and be designed to breakaway without the aid of any slipping or sliding surfaces.

   The design of the breakaway feature shall be in accordance with the breakaway performance requirements of section 7, "Standard Specifications for Structural Supports for Highway Signs, Lighting, and Traffic Signals." Any addendum to copyrighted by the contractor, the contractor must submit with equipment specifications or design data for all material proposed for the project and shall be underwriters laboratory approved. For a complete list of approved materials, contact the department's resident construction engineer in charge of the project. Poles mounted on barrier wall or behind bridge rail are exempt from the above transversal requirements.

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Florida Department of Transportation
Highway Lighting General Notes

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<th>Checked by</th>
<th>Approved By</th>
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Tallahassee, Florida 32301
LUMINAIRE SUPPORT RING

ELECTRICAL RISER CABLE & SHEAVES

LIFT CABLE SHEAVES

HEAD PLATE

LIFT CABLE TERMINATOR

ELECTRICAL RISER CABLE 3/8" STAINLESS STEEL AERIAL CABLE (3) MINIMUM

LIFT CABLE TERMINATOR

ELECTRICAL RISER CABLE 3/8" ARG STRANDED, FLEXIBLE, RATED 600 VOLT WITH HEAVY DUTY WATERPROOF COVERING AND CONNECTOR.

5/8" HEX DRIVE 3/4" ROUND SHAFT

PORTABLE DRILL

1/2" HEAVY DUTY REVERSIBLE DRILL (100 VOLTS 1 PHASE PROJECT)

LUMINAIRE SUPPORT RING

2" SLIP FITTER ASSY (EQUALLY SPACED AROUND RING) CENTERING SIDE RINGS (MINIMUM)

COVERED RECEPITCLE TO POWER LUMINAIRES WHEN IN THE LOWER POSITION.

ELECTRICAL RISER CABLE TERMINATION

WINCH CABLE (3/8" STAINLESS STEEL AERIAL CABLE)

WINCH CABLE TERMINATION

POWER SUPPLY CABLE

HAND HOLE

HIGH MAST POLE

BASE PLATE

SPECIAL PROTECTOR SHALL BE LOCATED IN POLE WITH EITHER CIRCUIT BREAKER OR FUSE.

GROUNDING LUGS

DATE INITIALS DESCRIPTION

INITIALS DATES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

HIGHMAST LIGHTING DETAILS

REVISIONS

IMPROVED 11/27/84

STATE DESIGN ENGINEER-DEPT

CHECKED BY

APPROVED BY

LESTER JONES

DRAWING NO. 17502
LUMINARIE SPECIFICATIONS

The reflector with its aluminum cover shall be firmly attached to a cast ring. This ring shall have double slots in its upper surface such that the reflector and reflector assembly may be readily detached from the luminarie. The reflector assembly without completely removing the support bolts.

Each luminarie shall contain an internal auto-Illumination ballast designed for 400 V AC at 20%, 50%, and 70%, and a power factor of 0.80. The luminarie ballast shall be enclosed within a metal housing which internally attaches to the luminarie, bracket entry and lamp support assembly. It shall be readily removable without removing the luminarie from the bracket arm.

The luminarie shall be attached to the bracket arm by means of a bracket entry assembly. The assembly shall include a set of screws designed for 20-0, 15-0, and 10-0 bolts. All electrical connections shall be protected from exposure to weather.

All electrical connections shall be made using water-resistant, metal-clad, weather-resistant receptacle. The wiring harness shall be labeled with a permanent label, which states the type of lamp, voltage, and power factor. The ballast housing shall be made of metal. The ballast shall be designed to withstand the environmental stresses in the outer forms of 100 degrees Fahrenheit.

The power factor cable shall be attached to the luminarie with the minimum number of Wiring accessories. The Wiring harness shall be made of metal and shall be designed to withstand the environmental stresses in the outer forms of 100 degrees Fahrenheit.

The power factor cable shall be attached to the luminarie with a waterproof connector capable of withstanding the pull of the Wiring harness. The Wiring harness shall be made of metal and shall be designed to withstand the environmental stresses in the outer forms of 100 degrees Fahrenheit.

The power factor cable shall be attached to the luminarie with a waterproof connector capable of withstanding the pull of the Wiring harness. The Wiring harness shall be made of metal and shall be designed to withstand the environmental stresses in the outer forms of 100 degrees Fahrenheit.

FOOTING

The arm mast foundations shall be constructed in accordance with the details shown in the plans. Anchor bolts for the arm mast foundations shall be supplied to the lighting engineer prior to purchase.

ONE LEVELING NUT, ONE HOLD-DOWN NUT, AND ONE COMBINATION NUT SHALL BE INCLUDED PER ARM MAST. HANGARS (4100) SCREW WASHERS SHALL BE INCLUDED PER ARM MAST POLE. ARM MAST FOUNDATION SHALL BE A H43 ON OR THE NATURE OF THE MATERIAL USED IN THEIR FABRICATION.

LOWERING SYSTEM SPECIFICATIONS

The lowering system shall consist of the following:

- A: Head frame and cover
- B: Cables
- C: Wire frame power unit (per project)

The head frame unit shall firmly mate the top of the pole to the head frame plate. It must not interfere with the head frame structure. The head frame structure shall be made of metal. The head frame plate shall be made of metal and shall be designed to withstand the environmental stresses in the outer forms of 100 degrees Fahrenheit.

The power factor cable shall be attached to the luminarie with the minimum number of Wiring accessories. The Wiring harness shall be made of metal and shall be designed to withstand the environmental stresses in the outer forms of 100 degrees Fahrenheit.

The power factor cable shall be attached to the luminarie with a waterproof connector capable of withstanding the pull of the Wiring harness. The Wiring harness shall be made of metal and shall be designed to withstand the environmental stresses in the outer forms of 100 degrees Fahrenheit.

The power factor cable shall be attached to the luminarie with a waterproof connector capable of withstanding the pull of the Wiring harness. The Wiring harness shall be made of metal and shall be designed to withstand the environmental stresses in the outer forms of 100 degrees Fahrenheit.

POLE SPECIFICATIONS

The pole shaft may be jointed or single piece. The jointed poles shall have a minimum bending strength of 30 kips. All material shall be single thickness steel plate with no laminations. Steel shall be as specified. All poles shall be coated with a reinforced handle approximately 1' above the base plate. The handle shall be 10 inches wide by 20 inches thick. All height and other dimensions shall be as specified. All routes and hardware shall be adequately spaced to ensure protection to the funnels during shipping and handling. Poles shall not be shipped pre-assembled.

Drawers shall be provided with the equipment which shows assembly sequence. Left hand and recommended extension procedure. A permanent detail or card shall be fixed on the inside of the handle cover which describes the sequence for lowering the luminaries and the caution to read.

The proportions of weld details and the equipment which shows assembly sequence, left hand, and recommended extension procedure. A permanent detail or card shall be fixed on the inside of the handle cover which describes the sequence for lowering the luminaries and the caution to read.

FLORIDA DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING DETAILS

DATE: 06/15/92
REVISIONS:

INITIALS:

DATE:

DESIGNER:

SIGNED:

REV.

DRAWING NO.:

INDEX NO.:

17905
SIGN LIGHTING INSTALLATION

The roadway lighting contractor shall provide a means for sign service entry into a pole base or a pole top mounted in lighting circuit and loop D lighting circuit conductors for connection by sign contractor. The sign contractor shall furnish and install luminaries, fixed safety switches, conductors, and all other electrical equipment necessary for connection to roadway lighting circuit as provided by roadway lighting contractor. Compromise type connection properly sized and waterproofed shall be used. See roadway lighting plans for sign service locations.

PLACEMENT OF SIGN LIGHTS

1. Luminaries shall be mounted so that the lamp centers 4' 0" in front of the sign face.
2. Luminaries shall be mounted so that the back of the fixture is placed 1' 0" below the bottom edge of the sign face.
3. Luminaries shall be mounted at a height so that the fixture is not obscured by the sign structure or by traffic.
4. Sign boards shall be mounted so that the bottom of the sign board is placed 5' 0" above the ground surface.

Use 2" Liquid Tight Flexible Conduit from Junction Box to Junction Box. Use 2" Liquid Tight Flexible Conduit from Junction Box to Sign Bracket.

Use 2" Liquid Tight Flexible Conduit from Junction Box to Sign Bracket.

4" x 6" x 5" Waterproofed Cast Aluminum Junction Box mounted on Sign Pole.

250 Watt Mercury Vapor Luminaires with Deluxe White Lamp.

FLORIDA DEPARTMENT OF TRANSPORTATION
EXTERNAL LIGHTING FOR SIGNS (MERCURY VAPOR)

DATE:
INITIAL:
REVISIONS:
DATE:

DESIGNER:
CHECKED:
CHECKED:
SUPERINTENDENT:

DRAWING NO:
INDEX NO:
1 or 2
17505
**Procedure for Assembly of Base Connection**

1. Assemble Post to Stub with Bolts and Washers on Each Bolt Between Plates.
2. Slight As Required to Flush Post (See View Details)
3. Tighten all Bolts to Maximum Positive With 10" x 10" Wrench to Omit Washers and Shims
4. Drive Bolt Threads Into Concrete Cast into Embedment (See Table)
5. Drive Threads at Joints with Nut Uplift and Center Punch to Prevent Nut Moving

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<th>FOUNDATION DATA</th>
<th>SHIM</th>
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<td><strong>Base Size</strong></td>
<td><strong>Bolt Size</strong></td>
<td><strong>Washers</strong></td>
<td><strong>Depth</strong></td>
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<td>C</td>
<td>D</td>
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**Steel Base Foundation & Fusible Details**

**State Road Department of Florida Bridge Division**

**Foundation Details**

**Note:** Sections shown are for installation on flat shoulder. All bolts are opposite hand from shown for installations in the field.
### Bill of Reinforcing

**Column Dimensions**

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<th>Column</th>
<th>Diameter (in)</th>
<th>Length (ft)</th>
<th>Bars A</th>
<th>Bars B</th>
<th>Bars C</th>
<th>Bars D</th>
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<td>3</td>
<td>4</td>
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</table>

**Overhead Reinforcing**

- **Bars A**: 4
- **Bars B**: 4
- **Bars C**: 4
- **Bars D**: 4

**Notes**

1. All reinforcement shall have a minimum of Grades A311 or A515-78.
2. All bars shall be of Grade A311.
3. All reinforcement shall be Grade A311 with a minimum yield strength of 50,000 psi.
4. **Bars C**: Overhead reinforcement shall be Grade A311 with a minimum yield strength of 50,000 psi.

**Bill of Constant Reinforcement**

<table>
<thead>
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<th>Model</th>
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<tr>
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</tr>
<tr>
<td>E</td>
<td>4</td>
<td>3</td>
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**Overhead Compensator Trusses**

- Span 1 to Span 5: 31.5 ft
- Span 6 to Span 9: 35.0 ft
- Span 10 to Span 13: 38.5 ft

**Front Elevation**

- **Bars A**: 4
- **Bars B**: 4
- **Bars C**: 4
- **Bars D**: 4

**End Elevation**

- **Bars A**: 4
- **Bars B**: 4
- **Bars C**: 4
- **Bars D**: 4

**Notes**

- Overhead reinforcing shall be Grade A311 with a minimum yield strength of 50,000 psi.
- Each column shall be reinforced with Grade A311 reinforcing, see Sheet 1 of 1 for further details.

---

**State of Florida Department of Transportation**

**Fortis for Overhead Compensator Trusses**

- Span 1 to Span 5: 31.5 ft
- Span 6 to Span 9: 35.0 ft
- Span 10 to Span 13: 38.5 ft

**Fortis for Overhead Compensator Trusses (Sheet 1 of 1)**

<table>
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<tr>
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**Sheet 1 of 1 – 11/21/07**

**Design**

- **Plans**: 1 to 20
- **Sections**: A to E
- **Details**: 1 to 20

---

**Engineering Notes**

- All reinforcement shall be Grade A311 with a minimum yield strength of 50,000 psi.
- **Bars C**: Overhead reinforcement shall be Grade A311 with a minimum yield strength of 50,000 psi.
- **Bars C**: Overhead reinforcement shall be Grade A311 with a minimum yield strength of 50,000 psi.

**Construction Notes**

- Overhead reinforcing shall be Grade A311 with a minimum yield strength of 50,000 psi.
- Each column shall be reinforced with Grade A311 reinforcing, see Sheet 1 of 1 for further details.
<table>
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<th>SIGN NO.</th>
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<th>TYPE OF SIGN BRACKET</th>
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### General Notes
1. For sign identification numbers, see Figure J-16. Sign identification numbers shall be identifiable on the sign face. See Figure J-16(b) for the identification number format. The figure numbers shall be shown on the sign face in the format shown on the sign face. See Figure J-16(b) for the identification number format. The sign shall be placed as shown on the sign face.
2. All columns and top plates shall be fabricated from the same material and shall be sized to accommodate the sign frame weight and the wind forces imposed on the sign.
3. Foundation details shall be shown on the foundation plan. The foundation plan shall include the location of the sign posts and their connection to the sign frame. The foundation plan shall also show the size and type of the foundation required to support the sign frame.

### Foundation Details

#### Sleeve and Base Plate Details

- **Sleeve Size:**
  - Type: Steel
  - Size: 12" x 12"
- **Base Plate:**
  - Size: 12" x 12"
- **Bolt Type:**
  - Size: 1/2" x 1"
  - Grade: 70
  - Diameter: 1/2" x 1"
- **Bolt Grade:**
  - Size: 1/2" x 1"
  - Grade: 70

#### Slip Base Notes

- **Slip Base Size:**
  - Type: Steel
  - Size: 12" x 12"
- **Base Plate:**
  - Size: 12" x 12"
- **Bolt Type:**
  - Size: 1/2" x 1"
  - Grade: 70
  - Diameter: 1/2" x 1"
- **Bolt Grade:**
  - Size: 1/2" x 1"
  - Grade: 70

#### Slab Base Notes

- **Slab Base Size:**
  - Type: Steel
  - Size: 12" x 12"
- **Base Plate:**
  - Size: 12" x 12"
- **Bolt Type:**
  - Size: 1/2" x 1"
  - Grade: 70
  - Diameter: 1/2" x 1"
- **Bolt Grade:**
  - Size: 1/2" x 1"
  - Grade: 70

#### Column Details

- **Column Size:**
  - Type: Steel
  - Size: 12" x 12"
- **Base Plate:**
  - Size: 12" x 12"
- **Bolt Type:**
  - Size: 1/2" x 1"
  - Grade: 70
  - Diameter: 1/2" x 1"
- **Bolt Grade:**
  - Size: 1/2" x 1"
  - Grade: 70

#### Footings

- **Footings Size:**
  - Type: Steel
  - Size: 12" x 12"
- **Base Plate:**
  - Size: 12" x 12"
- **Bolt Type:**
  - Size: 1/2" x 1"
  - Grade: 70
  - Diameter: 1/2" x 1"
- **Bolt Grade:**
  - Size: 1/2" x 1"
  - Grade: 70

#### Sign Frame Details

- **Sign Frame Size:**
  - Type: Steel
  - Size: 12" x 12"
- **Base Plate:**
  - Size: 12" x 12"
- **Bolt Type:**
  - Size: 1/2" x 1"
  - Grade: 70
  - Diameter: 1/2" x 1"
- **Bolt Grade:**
  - Size: 1/2" x 1"
  - Grade: 70

#### Wind Loads

- **Wind Speed:**
  - Type: 70 MPH
  - Direction: North
  - Load Factor: 1.2
- **Wind Pressure:**
  - Type: 100 kPa
  - Direction: North
  - Load Factor: 1.2

#### Ground Conditions

- **Ground Type:**
  - Type: Rock
  - Density: 2000 kg/m³
  - Load Factor: 1.2
- **Soil Type:**
  - Type: Clay
  - Density: 2000 kg/m³
  - Load Factor: 1.2
**ELEVATION**

Mounting of Exit Numbering Panels to Highway Signs

**NOTE:** Exit NUMBERING PANELS shall be located to the right side for right exit and to the left for left exit.

**SECTION A-A**

- **Bolt Signs Zee using 1/2" Aluminum Flat head screws and Lock Washers (Type I)**

**GENERAL NOTES**


**SHEETS AND PLATES:** Material used shall meet the requirements of Aluminum Association Alloy 6061-T6 and ASTM Specification B-209. Sheets shall be degassed, heat treated and certified to comply with Alcoa (6061, temp-T4-T6, temp-T6, temp-T651). No painting permitted on sheets.

**MATERIALS:** All Aluminum materials shall meet the requirements of the Aluminum Association Alloy 6061-T6 and also the following ASTM Specifications for the following: Sheet and Plates B-209, Extruded Shapes B-221 and Standard Structural Shapes B-209.

**ALUMINUM BOLTS, NUTS & LOCK WASHERS:** Aluminum Bolts shall meet the requirements of Aluminum Association Alloy 2024-T4 or 6061-T6 (ASTM Spec. B-209). The Nuts shall be anodized to anodized 0.0007" thick and be chromated sealed.

**MATERIAL STRESSES:** All allowable stresses are in accordance with the Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, AASHTO, 2012, for all materials shown in the Plans.

**FOR MOUNTING DETAILS REFER TO DRAWING NO. 1 OF INDEX 11037.**
FOR FREEWAY USE

WEIGH STATION
1 MILE

ALL TRUCKS
ENTER WEIGH STATION

WEIGH STATION
NEXT RIGHT

WEIGH STATION
NEXT LEFT

NOTE:
SIGN NO. FTD-5A
5'-0" x 5'-0"
2" BORDER - 6" RAD.

FOR OTHER THAN FREEWAY USE

WEIGH STATION
1 MILE

ALL TRUCKS
ENTER WEIGH STATION

WEIGH STATION
1000 FT

NOTE:
SIGN NO. FTD-11
6'-0" x 2'-0"
2" BORDER - 3" RAD.

NOTE:
SIGN NO. FTD-11 TO BE USED WITH SIGNS NO. FTD-5A & B, FTD-5A & B.
SIGN NO. FTD-12 TO BE USED WITH SIGN NO. FTD-9.

NOTE:
ALL SIGNS TO HAVE GREEN REFLECTORIZED BACKGROUND WITH WHITE LEGEND AND BORDER.
EXCEPT SIGNS NO. FTD-4 & FTD-5B.
WHICH SHALL HAVE WHITE BACKGROUND WITH BLACK LEGEND AND BORDER.

ALL DIMENSIONS SHOWN ARE IN INCHES AND EIGHTHS

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN
TYPICAL SIGNING FOR TRUCK WEIGH AND INSPECTION STATIONS

REVISIONS

DATE
INITIALS
DESCRIPTION
NATURE
NOTES

DRAWN BY
1-75
Approved

CHECKED BY
1-75

SUPERINTEGR N.S.R. 1-75

SHARIS NO. 1 of 1

REVISION NO. 7329
ALL SIGNS SHALL HAVE GREEN REFLECTORIZED BACKGROUND WITH WHITE LEGEND AND BORDER. EXCEPT SIGNS FTO-40B8 WHICH SHALL HAVE A WHITE BACKGROUND WITH BLACK LEGEND AND BORDER.

ALL DIMENSIONS SHOWN ARE IN INCHES AND EIGHTHS.
6. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK WITHOUT A SPEED REDUCTION (2 Lanes - 2 Way Traffic)

7. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS
(4 Lanes Divided - 2 Way Traffic)

8. TRAFFIC CONTROL DEVICES FOR SIGNALIZED MIDBLOCK SCHOOL CROSSWALK

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<th>DISTANCE IN FEET</th>
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<td>46 TO 55</td>
<td>500</td>
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\( a' \) \& \( b' \) distances shall be increased by adding the intersecting street with (curb returns included) to dimensions given in Table.
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 sign is to be used in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 500' in advance. It shall have a minimum size of 20' x 30'. It is not intended that these signs be used wherever a school bus stops to pick up or discharge passengers. These signs are intended for use only where terrain and roadway features limit the approach sight distance and where there is no opportunity to relocate the stop to another location with adequate visibility.

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SCHOOL SIGNS & MARKINGS

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HORIZONTAL CURVE

VERTICAL CURVE

SCHOOL BUS STOP

END SCHOOL ZONE

SCHOOL ZONE LIMITS OR REGULATED ACTIVITY AS DEFINED BY LOCAL SCHOOL BOARD THROUGH THE LOCAL TRAFFIC ENGINEER

NOTE: Roll-out school signs shall not be utilized to control traffic through an established school zone.

LOCATION OF SCHOOL SPEED LIMIT SIGN WHEN A REDUCED SPEED LIMIT HAS BEEN APPROVED

NOTE: The school bus stop ahead sign is to be used in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 500' in advance. It shall have a minimum size of 20' x 30'. It is not intended that these signs be used wherever a school bus stops to pick up or discharge passengers. These signs are intended for use only where terrain and roadway features limit the approach sight distance and where there is no opportunity to relocate the stop to another location with adequate visibility.
SCHOOL ZONE
00 MPH
WHEN FLASHING

SCHOOL ENTRANCE
00 MPH.

END SCHOOL ZONE

OVERHEAD STANDARD

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SCHOOL SIGNS & MARKINGS

REVISION

DATE
INITIALS
DESCRIPTION
INITIALS
DATE

8-72
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detailed Florida standards
8-72
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detailed Florida standards
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8-72
FS
**NORMAL TAPERED EXIT**
(TWO THRU LANES)

**NORMAL TAPERED EXIT ONLY**
(TWO THRU LANES - THREE APPROACH LANES)

**MARKINGS FOR LEFT RAMP**
The left edge line (yellow) will be continued from the main line down the ramp to cross road.
The main line left edge line (yellow) will start again at the physical edge which is the end of the 8" line used in gore delineation.

**DETAIL A**

- Colorless-red reflective pavement markers to be placed on every stripe beginning at nose.
- Reflective pavement markers shall be placed outside of the stripe if paint is used.

**DETAIL B**

- Colorless-red reflective pavement markers to be placed on every stripe beginning at nose.
- Reflective pavement markers shall be placed outside of the stripe if paint is used.

**DETAIL C**

- Colorless-red reflective pavement markers every 40 ft.

**REVISIONS**

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<td>Revised Details</td>
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<tr>
<td>9-5-81</td>
<td>R.L.</td>
<td>Added Notes</td>
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**INTERCHANGE MARKINGS**

<p>| STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION |</p>
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NORMAL TAPERED ENTRANCE

NORMAL TAPERED ENTRANCE

WITH ADDED LANE

DETAIL D

COLORLESS-RED REFLECTIVE PAVEMENT MARKERS TO BE PLACED ON EVERY STRIPE BEGINNING AT NOSE.

REFLECTIVE PAVEMENT MARKERS SHALL BE PLACED OUTSIDE OF THE STRIPE IF PAINT IS USED.
TYPICAL INTERSECTION 2 THRU LANCES
PLUS LEFT TURN LANE, WITH CROSSWALK

DETAIL "A"

RIGHT TURN LANE AND ISLAND DETAILS

RIGHT TURN LANE DROP AND ISLAND DETAILS

STOP BARS, CROSSWALKS AND DOUBLE CENTER LINES DETAILS

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SPECIAL MARKING AREAS

REVISIONS

INITIALS

DATES

 DRAWING NO. 3 OF 8

INDEX NO. 17546
BEGINNING OF A DIVIDED HIGHWAY

4-LANE - 2-LANE TRANSITION - NO MEDIAN

PAVEMENT MARKINGS FOR TRAFFIC CHANNELIZATION AT GORE (TRAFFIC FLOWS IN SAME DIRECTION)

NOTE:
PAVEMENT MARKERS SHALL BE SET IN THERMOPLASTIC AS SHOWN BELOW, OR SET TWO (2) INCHES INSIDE PAINTED LINE AS SHOWN IN DETAIL A.

PAVEMENT MARKING FOR TRAFFIC SEPARATION (TRAFFIC FLOWS IN OPPOSITE DIRECTION)

FLORIDA DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

REVISIONS
INITIALS
DATES

STATE HIGHWAY ENGINEER - HORT

DRAWING NO. 4 OF 6 INDEX NO. 134A
NOTE: DISTANCE MESSAGE OF 1/2 MILE MAY BE USED TO KEEP THIS SIGN WITHIN THE STATE LINE.

NOTE: ROADWAY NOT DRAWN TO SCALE. DISTANCES SHOWN ARE APPROPRIATE FOR ADEQUATE DRIVER COMMUNICATION BUT MAY BE ALTERED SLIGHTLY IF FIELD CONDITIONS REQUIRE.

NOTE: SIGN SHALL HAVE BLUE REFLECTORIZED BACKGROUND WITH WHITE REFLECTORIZED LEGEND & BORDER. SIGN FTG-211 SHALL BE USED AS A SUPPLEMENTAL GUIDE SIGN AT INTERCHANGES WHICH HAVE A TOURIST INFORMATION CENTER APPROVED FOR SUCH SIGNING (LOCATE HALF-WAY BETWEEN NORMAL GUIDE SIGNS).
STATE OF FLORIDA
WELCOME CENTER
1 MILE

SIGN NO. FTO-22A
4'-6" x 12'-6"
2" BOR - R RAD.
BLUE REFLECTIVE BACKGROUND
WHITE REFLECTIVE LEGEND & BORDER

1/2 MILE

SIGN NO. FTO-22B
5'-6" x 12'-6"
2" BOR - R RAD.

STATE OF FLORIDA
OFFICIAL WELCOME CENTER

SIGN NO. FTO-19
4'-6" x 12'-6"
2" BOR - R RAD.
BLUE REFLECTIVE BACKGROUND
WHITE REFLECTIVE LEGEND & BORDER
ORANGE REFLECTIVE STATE SILHOUETTE

(SIGN NO. FTO-19 TO BE PAID FOR WITH FUNDS OTHER THAN DOT)

NOTES
(1) SIGNS AND SIGN STRUCTURES SHALL BE ERECTED IN ACCORDANCE WITH THE DETAILS SHOWN OR INDEX 9636.
(2) SIGN FTO-19 SHALL BE LOCATED ON THE WELCOME CENTER GROUNDS IN PROXIMITY TO THE BUILDING AND AS FAR FROM THE MAIN LINE ROADSIDE AS POSSIBLE (1 DEGREE BACK TO BACK).
(3) DETAIL OF FLORIDA SYMBOL IS AVAILABLE ON REQUEST FROM TRAFFIC OPERATIONS OFFICE OF DOT.

NOTE
ROADWAY NOT DRAWN TO SCALE

NOTE
EITHER ONE BUT NOT BOTH OF SIGNS FTO-22A OR B SHOULD BE USED DEPENDING ON SPEED, ROADSIDE DEVELOPMENT & GEOMETRIC CONDITIONS

BOO' MAXIMUM FOR RURAL CONDITIONS
50' MINIMUM FOR CONGESTED AREAS

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN
WELCOME CENTER SIGNING
FOR PRIMARY HIGHWAYS

REVISIONS

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STATE DESIGN ENGINEER - ROWE

SUPERVISED BY: KR 6-73
Note: Reflective Pavement Markers shall be placed 40' o/c on all projects, however on sharp curves less than 40' may be used, if specified by the plans.

For Pavement Marking Requirements see table 173-46.
NOTES

1. For lane lines separating one-way traffic, raised reflective markers shall be mono-directional (colorless).
2. For center lane markers for two-way traffic, raised reflective markers shall be bi-directional (amber in amber), except where passing is restricted in one direction only.
3. Raised reflective markers shall be placed 40°F on all projects, however on sharp curves less than 40°F may be used, if specified by the plans.
4. All markers shall be applied before raised markers are installed.

DIRECTION OF TRAVEL WITH STATIONING

PAINTED TRAFFIC LINES
PLACEMENT OF DELINEATOR PANEL

ENERGIZE SYSTEM

SECTION A-A

BRACKET AND DELINEATOR DETAIL
Notes: The color of the sign shall be high intensity silver white reflective background with black opaque border and legend.

The exit number shall be centered in the space provided on sign panel. Color is reflective green background with reflective white legend and border. Reduce size of numbers when 3 or more digits are used. Example 00A.
Notes:
1. All letters are 1 3/4" Series "C".
2. Top sign shall have a reflectorized blue background with white reflectorized legend & border.
3. Bottom sign shall have a reflectorized white background with black opaque legend & border.
**NUMERAL SIZE**

1 or 2 Digits 12" Series "O" - 24" x 24"
3 Digits 8" Series "O" - 24" x 24"
4 Digits 8" Series "O" - 24" x 30"
More Than 4 Digits 8" Series "O" - 24" x 30"

Notes:
- All state route markers and auxiliaries shall have black opaque legend and border with white reflective background.
- Full size prints are available from Tallahassee Traffic Operations.

**FLORIDA ROUTE MARKER FOR INDEPENDENT USE**

**FLORIDA SHIELD FOR GUIDE SIGN USE**

**NOTES:**
1. Full size prints are available from Tallahassee Traffic Operations.
2. Type "O" arrow to be positioned as indicated on Signing Plan.
3. Green reflectorized background with white reflectorized legend and border.

**DETAIL LAYOUT OF FLORIDA TURNPIKE TRAILBLAZER**

**FLORIDA DEPARTMENT OF TRANSPORTATION TURNPIKE DIVISION**

**SPECIAL SIGN DETAILS**

**REVISED:**
- DATED: 6-1-83
- DRAWN BY: H. H. B.-SO
- CHECKED BY: R. E.
- ENGINEER-DRAWN:
- ENGINEER-REVIEWED:
- ENGINEER-APPROVED: 8-19-83
TYPICAL INSTALLATIONS/SIGN PANEL(S) MOUNTED ON SPAN WIRE

DETAIL/OPPOSING SIGNS ON SINGLE DROP PIPE
DROP PIPE
SIGN FACE
U-GALVANIZED WIRE ROPE CLIPS

TYPICAL SPAN WIRE INSTALLATION

MESSENER WIRE
1/8" WIRE ROPE CLAMP
SIGN FACE (NO. 1)
TYPE C SIGN BRACKETS

DETAIl/ATTACHMENT OF DROP PIPE TO MESSENER WIRE
U-CLAMP OF SUFFICIENT SIZE TO DEVELOP A SLOPE JOINT
1/8" ID PIPE (GALVANIZED)
MESSENER (ANTISWAY) WIRE

DETAIl/OPPOSING SIGNS/SPAN WIRE MOUNTED
1/8" ZEE
1/4" ZEE
1/8" WIRE ROPE CLAMP
Catenary Wire
SIGN FACE (NO. 2) SHOULD BE INSTALLED AFTER MOUNTING TO SPAN WIRE

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN
SPAN WIRE MOUNTING DETAILS

REVISIONS
INITIALS
DATES

DRAWN
DESIGNED
CHECKED
CERTIFIED
QUANTITY
SUPPHED BY

DRAWING NO
INDEX NO
17356
**FIGURE A**

For use in areas not exposed to vehicular traffic and under driveways.

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

**FIGURE B**

For use in asphalt roadway adjacent to gutter when placement outside of the pavement is not feasible.

1. Trench not to be open more than 25' at a time when construction area is subject to vehicular or pedestrian traffic.
2. Sidewalk to be sawcut and removed to leave neat lines on both sides of the 12' pavement cut.

**FIGURE C**

For use in installing conduit under existing asphalt pavement not adjacent to gutter when jacking is not feasible.

1. Rigid conduit must be used when jacking under existing pavement at 3 ft minimum depth.
2. Asphalt to be sawcut at the edges of the trench.

**FIGURE D**

For use in installing conduit under a new roadway prior to installation of curbs, base and pavement.

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

**FIGURE E**

For use in installing conduit under sidewalk.

- Sidewalk patches to match existing joints.
- Entire sidewalk slab must be replaced when specified in the plans.
- Backfill and tamp with material from trench except at driveways. At driveways, backfill a length of trench within the driveway entirely with Class I concrete.
FIGURE A
PULL BOX ENTRY OF CONDUIT UNDER SIDEWALKS

FIGURE B
SECTION
NOTE:
ONE RUN OF CONDUIT (BETWEEN PULL BOXES) SHALL NOT CONTAIN MORE THAN 90° OF BENDS INCLUDING PULL BOX BENDS.

FIGURE C
FOR USE UNDER RAILROADS

* IN CASE OF MULTIPLE TRACKS, THE MEASUREMENT IS TO BE FROM THE CENTERLINE OF THE OUTSIDE TRACK.
FIGURE A
CABLE DROP AND TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "B"

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

NOTES
1. THE MESSENGER WIRE OF THE INTERCONNECT CABLES SHALL
   BE GROUNDED TO THE COPPER GROUND WIRE OF THE POLE OR
   TO THE EXTERNAL WIRE EXTENDING DOWN THE POLE
2. WHEN LOCATING THE GROUND WIRE TO THE POLE, A
   POLE OF 1/8 INCH CONDUIT SHALL EXTEND UP THE POLE
   EXTERNALLY TO A POINT EIGHT FEET ABOVE FINISH
   GRADE TO PROTECT THE GROUND WIRE CONNECTING THE
   MESSENGER WIRE TO THE POLE
3. LOCKING CABLE TIES OR LACING WIRE WHEN USED SHALL BE
   PLACED AT LEAST ONE EIGHTH INCH STRAIGHT EXCEPT
   AT THE FLATS IN CABLE CLAMPS OR SIMILAR WIRING
   ACCESSORIES WHERE THE MINIMUM CLEARANCE
   BETWEEN THE CABLE TIES AND CABLE OR CONDUIT
   SHALL BE THREE EIGHTS INCHES (3/8")
4. IF ACCESSIBLE, THE INTERNAL GROUND WIRE OF THE SUPPORT POLE
   MAY BE USED TO GROUND THE MESSENGER WIRE.

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

AERIAL INTERCONNECT

INITIALS: D.S.
DATE: 09-12-80

APPROVED:
STATE DESIGN ENGINEER ROY,

DRAWING NO. 1
INDEX NO. 177/35
DETAILED FOR SPlicing LOOP WIRE TO LEAD-IN WIRE

**STEP 1**

LEAD-IN WIRE  

drain wire  

strip loop and lead-in cable conductors if heat shrinkable silicone lined, cross-linked polyethylene insulating tubing is to be used, strip tubing over lead-in cable and individual conductors.

**STEP 2**

twist the bare conductors together.  

**STEP 3**

solder each splice using resin-core solder.  

**STEP 4**

wrap each splice with silicone tape. half lap each half starting at center of splice and proceeding to the right (for left) past end of splice, then proceeding to the left (for right) past end of splice, and returning to center. wrap each splice with all weathers heavy duty electrical tape. past father most wrap of step 4.

**STEP 5**

half lap the two splices together with all heavy duty electrical tape. past the end of the lead-in cable outside cover and past father most wrap of step 4.

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

**ALTERNATIVE 1**

drill a hole through the curb at the point which the required saw cut depth is obtained. prior to cutting, the top inside edge of the curb is to be extended to the depth of the saw cut at the top of the curb. the saw cut shall be made not within 5" of the top of the hole. the conduit shall fit snug within the drilled hole. fill the top of the hole with loop sealant to the level of the curb surface a nonmetallic material should be used to prevent excessive loop sealant from entering the flexible conduit.

**ALTERNATIVE 2**

drill a hole, 1" to 1.5" larger in diameter than the rigid conduit to be used, through the roadway asphalt or concrete surface and base at an appropriate angle to intercept the trench or pull box hole. place a predetermined length of rigid conduit in the hole and drive the conduit into the trench hole. install a molded bushing (nonmetallic) on the roadway end of the rigid conduit the top of the rigid conduit shall be approximately 2" below the roadway surface. fill the hole with loop sealant to the level of the roadway surface. a nonmetallic material should be used to prevent excessive loop sealant from entering the rigid conduit.

**GENERAL NOTES**

1. if the loop lead-in is 75' or less from the edge of the loop to the detector or controller cabinet, continue the twisted pair to the cabinet if the loop lead-in is greater than 75', continue the twisted pair to the specified pull box. splice to shielded lead-in cable and proceed to the detector or controller cabinet. this note does not apply to type hi.

2. the minimum saw cut depth shall be 1" to 1.5" greater than the minimum cut depth on the roadway construction projects requiring loop installations. loop and lead-in map shall be designed. modified to suit the roadway surface, provided that the bottom of the loop wire is not greater than 2" below the final wearing surface.

3. the width of saw cuts shall be sufficient to allow unforced placement of loop wires or lead-ins into the saw cut but not greater than 1.5".

4. a nonmetallic hold down material shall be used to secure loop wires and lead-ins to the bottom of saw cuts. hold down material shall be placed at approximately one foot intervals around loops and two foot intervals on lead-ins.

5. a minimum cover of 1" of sealant material shall be provided in the saw cut between the uppermost loop wire or lead-in and the roadway wearing surface excluding the overlay.

6. the maximum distance between the twisted pairs of loop lead-in wire is 6' from edge of curb or roadway to loop.

**VEHICLE LOOP INSTALLATION DETAILS**

**DRAWING NO:** 1402  
**INDEX NO:** 1776  
**FLORIDA DEPARTMENT OF TRANSPORTATION**

**TRAFFIC DESIGN**

**VEHICLE LOOP INSTALLATION DETAILS**

**DATE:** 08-10-00  
**INITIALS:** J.M.C.  
**DESCRIPTION:** [Details not legible]

**REVISED:** 08-20-00  
**INITIALS:** J.M.C.  
**DESCRIPTION:** [Details not legible]

**DESIGNATED TO:** [Signature]  
**CHECKED BY:** [Signature]  
**APPROVED BY:** [Signature]  
**DRAWING NO:** 1402  
**INDEX NO:** 1776
CONCRETE PAVEMENT EXPANSION JOINTS

NOTES:
1. The "NUMBER OF TURNS" indicated at the specified point or the loop refers to the number of passes of loop wires which are placed in the saw cut in forming the complete loop.
2. Loop types or details not drawn to scale.
3. Loop types are centered in a single lane except Type E which is centered in two lanes.
4. The number of individual loops in the type G loop may vary up to a maximum of four (4).

FLORIDA DEPARTMENT OF TRANSPORTATION
VEHICLE LOOP INSTALLATION DETAILS

INITIALS  DATES

DRAWN TO  SPONSOR

17781

INDEX NO. 2 of 2
NOTES:

1. NUMBER, SIZE AND ORIENTATION OF CONDUIT SLEEVES SHALL BE ACCORDING TO SITE CONDITIONS AND LOCATION.

2. GROUNDING TO BE IN ACCORDANCE WITH SECTION 620 OF THE NATIONAL ELECTRICAL CODE.
**Passive State**

- (Train circuit not actuated)
- Signal heads not active in passive state
- Weather tight cap
- Two 8" signal heads (yellow lens)
- Slip fit collar
- 4" aluminum pipe
- Sign no. 080-1736" with engineering grade reflective sheeting (yellow)
- Stationary background to form a portion of distance message when "stop ahead" sign is in closed mode
- Folding sign control system (closed)
- Grade at edge of travelway

**Active State**

- (Train circuit actuated)
- Sign control wiring to be as recommended by manufacturer
- Engineering grade reflective sheeting (yellow)
- Stop cabinet (signal, flasher, manual test switch, normally closed, push button, control relay)
- Pulling elbow (type LB1/8" OD)
- 8" letters (series "G")
- Folding sign control system (open)

**Location of the advance warning sign**

- The distance is measured along right edge of pavement from R/R stop bar to the advance warning sign.
- Location at 200 feet
- Location at 350 feet
- Location at 425 feet

**Typical Plan**

- Pull boxes
- Pull boxes with conduit
- Power service
- Advance warning sign
- Advance warning sign location may be adjusted to fit field condition
- R/R control cabinet (to contain normally closed relay, furnished by R/R)
- Pulled boxes for conduit

**Functional Block Diagram**

-Florida Department of Transportation

**Advance Warning for R/R Crossing**

- Front View
- Side View

**Revisions**

- Initials: G.S.
- Date: 11/03/76
- Description: Advance warning

**State Design Engineer: P.W.C.**
Figure 1: Gate Length Requirements

General Notes:
1. No guardrail is proposed for signals; however, some form of impact attenuation device may be specified for certain locations.
2. Advance flasher to be installed when and if called for in plans or specifications.
3. Top of foundation shall be no greater than 4" above finished shoulder grade.

Types of Traffic Control Devices:
1. Flashing Signals
2. Flashing Signals with Cantilever
3. Flashing Signals with Gate
4. Flashing Signals with Cantilever & Gate
5. Gate

Classification of Traffic Control Devices:
1. Flashing Signals - One Track
2. Flashing Signals - Multiple Tracks
3. Flashing Signals and Gates - One Track
4. Flashing Signals and Gates - Multiple Tracks
5. Six Lane Grade Crossings are special conditions. Placement of railroad traffic control devices are not covered under this index.

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING

Revisions

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Prepared by: C.C. 
Date: 1-14-73

State Design Engineer: S.O. Duff

Drawing No. #3
1 of 3
17882
ACUTE ANGLE (AND RIGHT ANGLE)

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

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

GENERAL NOTES

7. The location of flashing signals and stop lines shall be established based on future or present installation of gates with appropriate track clearances.

8. Where plans call for railroad traffic control devices to be installed in curbed median, the minimum median width shall be 10 feet.

9. Location of railroad traffic control device is based on the distance available between face of curb & sidewalk.
   a) 0' to 6' - Locate device outside sidewalk.
   b) Over 6' - Locate device between face of curb and sidewalk.

10. Stop line to be perpendicular to edge of roadway, approx. 10' from nearest rail. At from and parallel to gate when present.

TYPE I

TYPE II

TYPE III

TYPE IV

FLORIDA DEPARTMENT OF TRANSPORTATION
RAILROAD Grade CROSSING TRAFFIC CONTROL DEVICES

REVISIONS

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STATE DESIGN ENGINEER - LCDY

DRAWING NO. INDEX NO. 2-3 17882
Typical Bridge Mounts

SEQUENCE CHART

NOTES:
1. A Bypass Switch shall be installed to override each timing interval in case of a malfunction.
2. "STOP HERE ON RED" is omitted in Type I operation and "TRAFFIC SIGNALS" are omitted in Type II operation.
3. The time between beginning of flashing yellow on "Drawbridge Ahead" sign and the clearance of traffic signal to red, or beginning of flashing red, should not be less than the travel time of a passenger car, from the sign location to the stop line, traveling at the 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 gate lowering and raising is dependent upon gate type.
6. Time of bridge opening is determined by the bridge tender.
7. Each gate shall be operated by a separate switch.
8. On each approach (Type II), all four red signals shall be on the same two circuit flasher, with the two top signals on one circuit, and the two bottom signals on the other circuit flasher.
9. A drawbridge ahead sign is required for both types of signal operation. However, a flashing beacon shall be added to the sign when physical conditions prevent a driver traveling at the 85th percentile approach speed from having a continuous view of at least one signal indication for approximately 10 seconds.

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN
TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS

SERIES 2000 MONUMENTAL DRAWINGS

REVISIONS

INITIALS DATES

DATE INITIALS DESCRIPTION

DESIGNED BY:
ENGINEER:
CHECKED BY:
SUPERVISED BY:
DRAWING NO. INDEX NO. 1 OF 3 17850
DRAWBRIDGE SIGNAL

2'-6" x 5'-0"
2" BORDER, 4" RADIUS
6" SERIES 0" LETTERS
BLACK OPAQUE LEGEND AND BORDER ON REFLECTORIZED YELLOW BACKGROUND

TO BE USED WITH TYPE 1 OPERATION, AS SHOWN ON PREVIOUS SHEET
MONOTUBE SUPPORT MOUNTING

GATE & ARM DETAIL

12 Volt Flashing Red Lights Shall Be Mounted Ahea Gate Arm and Shall Operate as The Flashing Mode Only When Gate Arm is in The Lowered Position Or in The Process Of Being Lowered. The Number Of Lights Shall Vary According To Length Of The Gate Arm.

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC CONTROL DEVICES FOR MOBILE SPAN BRIDGE SIGNALS

REVISIONS

DATE INITIALS DESCRIPTION
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3-19-79 JS RED LIGHTS "LAWFUL VIABLE SPACE" MOUNTED
7-21-79 JS RED LIGHTS "LAWFUL VIABLE SPACE" MOUNTED
10-20-79 JS RED LIGHTS "LAWFUL VIABLE SPACE" MOUNTED
11-19-79 JS RED LIGHTS "LAWFUL VIABLE SPACE" MOUNTED

INITIALS DATES

DRAWING NO INDEX NO
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STATE DESIGN ENGINEER: R. E. VANCE

DESIGNED BY: A. N. ANDERSON

APPROVED BY: R. E. VANCE

INSTRUMENT: 1:100

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