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<td>2 of 5</td>
<td>Added CRSP and revised A.M.</td>
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<tr>
<td>02</td>
<td>3 of 3</td>
<td>Added &quot;STRAP, STRAP-REV and revised 1/2&quot;</td>
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<tr>
<td>02</td>
<td>3 of 3</td>
<td>Added &quot;Welding Boundary, Top Balast, Rail Fencing, Floating Traffic Barrier, &quot;Staked Traffic Barrier&quot; symbols.</td>
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<td>02</td>
<td>3 of 3</td>
<td>Controller Cabinet revised to &quot;Pole Mounted&quot;.</td>
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<td>02</td>
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<td>Revised site nomenclature. Added GENERAL NOTES:</td>
</tr>
<tr>
<td>04</td>
<td>3 of 4</td>
<td>Added 2' High Fence.</td>
</tr>
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<td>04</td>
<td>3 of 4</td>
<td>Added &quot;SHOULDER AND SLUMP TREATMENT FOR SUPERLATIVE ROADWAYS&quot; - &quot;Radius of Curve = Greater&quot; revised to be &quot;less&quot;.</td>
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<td>04</td>
<td>3 of 4</td>
<td>New index.</td>
</tr>
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<td>09</td>
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<td>STANDARD CRITERIA: &quot;Type A-2&quot;. Site index reference changed.</td>
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<td>200</td>
<td>6 of 6</td>
<td>GENERAL NOTES: &quot;Note N-6 revised.</td>
</tr>
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<td>6 of 6</td>
<td>COVER FOR ALL FRAMES&quot; identification on list revised.</td>
</tr>
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<td>6 of 6</td>
<td>Changed width of Solich Barley with high.</td>
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<td>200</td>
<td>6 of 6</td>
<td>Sheet placement revised.</td>
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<tr>
<td>205</td>
<td>4 of 4</td>
<td>Revised ROUND PIPE INSTALLATIONS Table.</td>
</tr>
<tr>
<td>21</td>
<td>6 of 6</td>
<td>SECTION A &amp; SECTION GG - Modified all theoretical gutter line.</td>
</tr>
<tr>
<td>220</td>
<td>6 of 6</td>
<td>GENERAL NOTES: &quot;Note N-1 revised.</td>
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<td>&quot;Teal&quot; revised. Bar C, D, E, F, G, H.</td>
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<td>VITCH FENCING Table: Removed &quot;High Rigby (Concrete Blocks).&quot;</td>
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<td>&quot;WELT TYPE C&quot; REFINED &quot;Revised high sides and sidewall joints.</td>
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<td>&quot;FRENCH DRAIN SYSTEM - STANDARD CROSS SECTION&quot; - &quot;Enlarged&quot; - Title revised to read &quot;WINDWALL CROSS SECTION&quot; - &quot;Enlarged&quot;.</td>
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<td>286</td>
<td>2 of 3</td>
<td>&quot;UNIQUE&quot; &quot;Type Z&quot; &amp; &quot;E&quot; - Revised.</td>
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<td>287</td>
<td>5 of 3</td>
<td>&quot;NEW CONSTRUCTION&quot; - Added limits of Special Select Soil.</td>
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<td>287</td>
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<td>&quot;NEW CONSTRUCTION&quot; - Added limits of Special Select Soil.</td>
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<td>Changed slope width from 2'00 to 2'00.</td>
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<td>5 of 3</td>
<td>&quot;ADDED TYPE RA CURB &amp; GUTTER.</td>
</tr>
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<td>5 of 5</td>
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<td>5 of 5</td>
<td>New sheet.</td>
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<td>5 of 5</td>
<td>&quot;SODWAUX WITH UTILITY STRAP&quot; and &quot;SODWAUX WITHOUT UTILITY STRAP&quot; - Sidewalks in return revised to reflect public sidewalk surf and pavement modifications, index No. 304.</td>
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<td>&quot;SODWAUX WITH UTILITY STRAP&quot; and &quot;SODWAUX WITHOUT UTILITY STRAP&quot; - Sidewalks in return revised to reflect public sidewalk surf and pavement modifications, index No. 304.</td>
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<td>GENERAL NOTES - Revised Note No. 1 - &quot;Combined&quot; and added Notes Nos. 46, 89 and 96.</td>
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Revisions
Roadway And Traffic Design Standards
1996

Index Number
Sheet Number
Description

1003
2 of 2
Col. Size 8.8 Mix K F.

17302
1 of 1
Curb Cut Ramp references changed to "Public Sidewalk Curb Ramps."

17344
1 of 6
Case No. 9 description revised.

5-8 of 8
T.O. of MEDIAN—Revised to 16.6 in MEDIAN and 10.0 in MEDIAN—Revised to 10.2 in MEDIAN. All lighting values for design speed of 20, 30, and 40, mph driving. "Notes for Sheets 3, 4, 5, 6, & Note No. 2 Revised. Median Cut and Shoulder Pavement Shoulder Pavement Showing F" under all three items.

17345
1 of 4
On the top detail Maintenance Col. Ramp with 137mm Typical will change to 14.5m Typical L.

1972
2 of 3
Intermediate material noted added.

17346
1 of 6
Mounting Details and Section 2 Detail revised.

3 of 3
"Widened Taper note revised. Similer to MEDIAN Bas dented to roof fascia detail.

1 of 2
"General Notes—Notes A No. 1, 2 modified. Note No. 3 added. Note No. 5 general detail expanded. Ground Covers height detail expanded. Tracel—ground cover detail expanded. Note 7 added Typical. Design Notes—Note No. 5 revised.

2 of 2
GETTING SABAL PALM ESTATE TREE SPACING—RECESSION CHART ADDED.

1460
1 of 2
Curb Cut Ramp references changed to "Public Sidewalk Curb Ramps."

2 of 2
Curb Cut Ramp references changed to "Public Sidewalk Curb Ramps."

5 of 6
Final Planting requirements for MEDIAN and MEDIAN BASE—Revised note under details. Revised dimensions on pavement arrows left turned.

3 of 9
Curb Cut Ramp references changed to "Public Sidewalk Curb Ramps."

5 of 9
Curb Cut Ramp references changed to "Public Sidewalk Curb Ramps."

2 of 3
Whitel ine showing "A" elevation 100.0 changed to 01.0.

5 of 9
Curb Cut Ramp references changed to "Public Sidewalk Curb Ramps."

600 Series
All sign legends for signs with "CONSTRUCTION" in the legend and reference to these signs have been changed to "ROAD WORK" signs.

1 of 8
"PREFACE"—the second paragraph revised.

10 of 10
"DEFINITIONS—Maginotory Speed and "Detour" definitions revised.

4 of 10
"ROADSIDE BARRIERS—Revised. CLEAR ZONE WIDTHS—Revised.

5 of 10
"CHART C—Dimension 'B' revised.

7 of 10
"COMINGLING AND LIGHTING DEVICE NOTES—Added Note No. 0. "Advance Warning Panels Model" data configuration added.

9 of 10
"NOT 1. Sign added to sheet."

2 of 9
Detour Sign removed.

601
1 of 6
General Notes—Note No. 8 revised.

602
2 of 2
Detour Sign removed.

603
1 of 2
General Notes—Note No. 5 revised. Detour Sign removed.

604
1 of 6
General Notes—Note No. 4 revised.

605
2 of 2
General Notes—Note No. 5 revised.

606
2 of 2
L-forms revised.

625
2 of 2
General Notes—Note No. 2 revised.

640
2 of 2
Detour Sign removed.

650
2 of 2

651
2 of 2
L-forms revised. Detour Sign removed.

700
1 of 2
Sheet numbers transferred to "Roadway Plan Preparation Manual."

1953
1 of 3
Completely revised. Reduced from 4 sheets to 3 sheets.

1980
1 of 3
Note—changed.

3 of 2
Specification changed to 1806.

3 of 5
Note—added.

1981
1 of 2
"SOP BASE DATA"—chart revised. Revised Note No. 4.

1982
2 of 2
Col. Size 8.8 Mix K F. footing revised.

1983
2 of 2
Col. Size 8.8 Mix K F. footing revised.

1984
2 of 2
Col. Size 8.8 Mix K F. footing revised.
### ABBREVIATIONS AND SYMBOLS
- **001**: Standard Abbreviations (2 Sheets)
- **002**: Standard Symbols (3 Sheets)

### EROSION CONTROL AND WATER QUALITY
- **100**: Temporary Slope Drain And Sediment Fence
- **101**: Storm Drain And Sediment Basins
- **102**: Bated Hay Or Straw Barriers And Silt Fences (3 Sheets)
- **103**: Turbulence Barriers
- **104**: Erosion Control Details For Permanent Construction
- **105**: Sediment Sock And Reclaiming On Existing Facilities
- **106**: Soil-Stabilizing Prevention Device Type A

### DRAINAGE
- **199**: Geosynthetic Criteria
- **200**: Structure Bottoms-Types J And P (2 Sheets)
- **201**: Supplementary Details For Manholes And Inlets (6 Sheets)
- **205**: Cover Height (4 Sheets)
- **209**: Curb Inlet And Gutter inlet Application Guide
- **210**: Curb Inlet Type-I (1, 2, 3, and 4)
- **211**: Curb Inlet Types 5, 6, 7, 8 (2 Sheets)
- **212**: Curb Inlet Type 7
- **213**: Curb Inlet Type 8
- **214**: Curb Inlet Top-10 Type 9
- **215**: Curb Inlet Type 10
- **217**: Median Barrier Inlet Types 1, 2, and 3
- **218**: Barrier Wall Inlet (2 Sheets)
- **219**: Barrier Wall-Up-Congress Barrier Wall (Rigid) (C & G) (2 Sheets)
- **220**: Gutter Inlet Type 5
- **221**: Gutter Inlet Type 6
- **222**: Gutter Inlet Type 7
- **226**: Curb Bottom And Median Inlet Application Guide
- **227**: Curb Bottom Inlet Type A
- **228**: Curb Bottom Inlet Type B
- **229**: Curb Bottom Inlets Types C, D, E, F, H, I (4 Sheets)
- **233**: Curb Bottom Inlets Types F, E, G
- **234**: Curb Bottom Inlet Type J
- **235**: Curb Bottom Inlet Type K
- **245**: Underdrain Inspection Box
- **249**: Pipe End Treatment Application Guide
- **250**: Straight Concrete Endwalls-Single And Multiple Pipe (2 Sheets)
- **254**: Straight Concrete Endwalls-Single And Double 1000 Pipe (2 Sheets)
- **255**: Straight Concrete Endwalls-Single And Double 1000 Pipe (2 Sheets)
- **256**: Straight Concrete Endwall-Single 1000 Pipe
- **258**: Straight Concretes-Sodium-Cement Endwalls
- **260**: U-Type Concrete Endwalls With Grooves 375 To 750 Pipe
- **261**: U-Type Concrete Endwalls-Baffles And Graft Optimal 375 To 750 Pipe (3 Sheets)
- **264**: U-Type Concrete Endwall-Energy Diverter-750 To 750 Pipe
- **266**: Winged Concrete Endwalls-Single Round Pipe
- **268**: U-Type Sodium-Cement Endwalls
- **270**: Flared End Section
- **272**: Cross Drain Walled End Section (6 Sheets)
- **273**: Side Drain Walled End Section (6 Sheets)
- **280**: Miscellaneous Drainage Details (4 Sheets)

### DRAINAGE (CONT.)
- **281**: Ditch Pavement And Sediment (2 Sheets)
- **282**: Back Of Sidewalk Drainage
- **283**: Median Opening Flume
- **284**: Concrete Sidewalks (2 Sheets)
- **285**: French Drain (2 Sheets)
- **286**: Underdrain
- **287**: Edgedrain (3 Sheets)
- **289**: Concrete Box Culvert (5 Sheets)
- **293**: Safety Modifications For Inlets In Box Culverts
- **295**: Safety Modifications For Endwalls

### CURBS AND PAVEMENT JOINTS
- **300**: Curb & Gutter Joint
- **301**: Turn Lanes
- **302**: Curb Return Profiles
- **304**: Public Sidewalk Curb Ramps (5 Sheets)
- **305**: Concrete Pavement Joints (5 Sheets)
- **306**: Bridge Approach Expansion Joint-Concrete Pavement
- **307**: Utility Cut
- **310**: Concrete Sidewalk

### BARRIERS AND FENCES
- **400**: Guardrail (20 Sheets)
- **401**: Guardrail-Anchorages And Continuous Barrier For Existing Bridges (9 Sheets)
- **403**: Concrete Barrier Wall (6 Sheets)
- **404**: Prestressed Concrete Temporary Barrier Wall (3 Sheets)
- **405**: Temporary Water Filled Barriers (5 Sheets)
- **413**: C-A-E-A-T System (6 Sheets)
- **414**: C-A-T System (2 Sheets)
- **433**: Bridgehwor (4 Sheets)
- **438**: H-V-F System (6 Sheets)
- **439**: Dragontail (2 Sheets)
- **449**: Construction Zone (G-L-E-A-T (5 Sheets)
- **450**: Fence Location (2 Sheets)
- **451**: Fence Type A (2 Sheets)
- **452**: Fence Type B (2 Sheets)
- **453**: Contilever Sliding Gate-Type B Fence
- **450**: Gate Screen-Knitted Polyester
- **460**: Opti-View Visual Barrier

### GENERAL
- **500**: Removal Of Organic And Plastic Material (2 Sheets)
- **505**: Embankment Utilization (3 Sheets)
- **506**: Miscellaneous Earthwork Details
- **510**: Super Elevated (3 Sheets)
- **511**: Super Elevated-Urban Highways And Streets (3 Sheets)
- **513**: Flexible Pavement-Layer Thickness For Structural Courses
- **514**: Optional Base Group And Structural Numbers (2 Sheets)
- **515**: Turnouts (6 Sheets)
- **516**: Turnouts-Resurfacing Projects
TABLE OF CONTENTS
ROADWAY AND TRAFFIC DESIGN STANDARDS

GENERAL (CONT.)
507 Temporary Crossover-Construction Details-Rural
518 Rumble Strips (2 Sheets)
520 Aluminum Pipe Handrails, Gravity walls and Steps (2 Sheets)
525 Ramp Terminals (5 Sheets)
526 Roadway Transitions (8 Sheets)
530 Rest Area Equipment (3 Sheets)
532 Mailboxes (3 Sheets)
535 Tractor Crossings
540 Settlement Plates
546 Landscaping Back Of Guardrail Application
546 Sight Distance At Intersections (2 Sheets)
560 Railroad Crossings (2 Sheets)

TRAFFIC CONTROL THROUGH WORK ZONES
600 General Information For Traffic Control Through Work Zones (50 Sheets)
610 Two-Lane, Two-Way Rural Road Or Night Operations
620 Two-Lane, Two-Way Rural Road Or Night Operations
625 Two-Lane, Two-Way Rural Operations One Daylight Period or Less
626 Two-Lane, Two-Way Rural Operations One Daylight Period or More
627 Two-Lane, Two-Way Rural Moving Operations One Daylight Period or More
628 Two-Lane, Two-Way Rural Moving Operations One Daylight Period or More
629 Two-Lane, Two-Way Rural Moving Operations One Daylight Period or More
625 Two-Lane, Two-Way Rural Divided Rural Road Or Night Operations
627 Two-Lane, Two-Way Urban Road Or Night Operations
630 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
632 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
633 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
634 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
635 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
636 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
637 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
638 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
639 Two-Lane, Two-Way Urban Divided Or Undivided Day Or Night Operations
640 Converting Two-Lanes To Four-Lanes Divided Rural (2 Sheets)
641 Converting Two-Lanes To Four-Lanes Divided Urban (2 Sheets)
650 Two-Lane, Two-Way Rural Structure Replacement (2 Sheets)
651 Multilane Divided Maintenance And Construction (2 Sheets)
660 Pedestrian Control For Closure Of Sidewalks

SIGNING AND MARKINGS
9535 Standard Roadside Sign Break-Away Past Details (3 Sheets)
9537 Aluminum & Steel Overtake Sign Structures, Details Of Sign Faces & Truck Connection
9650 Single Column Ground Signs Sign Profile & Identification Numbers (5 Sheets)
9651 Single Column Ground Signs (100 km/h) (2 Sheets)
9652 Single Column Ground Signs (150 km/h) (2 Sheets)
9653 Single Column Ground Signs (30 km/h) (2 Sheets)
9654 Single Column Ground Signs (45 km/h) (2 Sheets)
9655 Single Column Ground Signs (All Wind Zones) (2 Sheets)
1347 Mounting Exit Numbering Poles To Highway Signs
1347 Mounting Exit Numbering Poles To Highway Signs
1329 Typical Sections For Placement Of Sign & Multi-Column Signs
1328 Typical Signing For Truck Weigh & Inspection Stations
1344 School Signs & Markings (6 Sheets)
1345 Interchange Markings (4 Sheets)
1346 Special Working Areas (9 Sheets)
1349 Traffic Controls For Street Terminations
1350 Signing For Motorist Services
1351 Warning Center Signing (2 Sheets)
1352 Typical Placement Of Reflective Pavement Markers (2 Sheets)
1353 Markings For Alternation Systems
1355 Special Sign Details (40 Sheets)
1356 Spill Wall Mounted Sign Details (2 Sheets)
1357 Bridge Weight Restrictions
1359 Rural Narrow Bridge Treatment

ROADWAY LIGHTING
1750 Conventional Pole Details
1751 Highway Lighting General Notes
1752 Highway Lighting Details (13 Sheets)
1753 Roadway Lighting Details
1754 Service Point Details
1755 External Lighting For Signs (Mercury Vapor) (2 Sheets)

TRAFFIC SIGNAL AND EQUIPMENT
1771 Conduit Installation Details (2 Sheets)
1777 Signal Cable And Span Wire Installation Details (2 Sheets)
1773 Cabled Interconnected
1776 Electric Power Service
1776 Power Service
1778 Pedestrian Control Signal Installation Details
1781 Vehicle Loop Installation (2 Sheets)
1784 Pedestrian Detector Assembly Installation Details (2 Sheets)
1784 Pedestrian Detector Assembly Installation Details (2 Sheets)
1784 Pedestrian Detector Installation Details
1787 Standard Signal Operating Plans (2 Sheets)
1788 Advance Warning For R/R Crossing
1788 Advance Warning For R/R Crossing
1788 Railroad Grade Crossing Traffic Control Devices (4 Sheets)
1790 Traffic Control Devices For Railroad Crossing (3 Sheets)

DESIGN CRITERIA
700 Design Elements Related To Highway Safety
### STANDARD SYMBOLS FOR PLAN SHEETS

#### GENERAL SYMBOLS

- **State Line**
- **County Line**
- **Township Line**
- **Section Line**
- **City Line**
- **Base Or Survey Line**
- **Right-Of-Way**
- **Easement Line**
- **Limited Access Line**
- **Fence Line**
- **National Or State Park Or Forest**
- **Railroad (Drainage Maps)**
- **Railroad (Detail Plans)**
- **Fence (Limited Access)**
- **Bridge**
- **Pipe Culvert-Water End Section**
- **Pipe Culvert-Strait Endwall**
- **Pipe Culvert-U-Type Endwall**
- **Pipe Culvert-Median Drain**
- **Pipe Culvert-Other End Treatments**
- **Storm Sewer**
- **Inlet**
- **Manhole**
- **Tied Longitudinal Joint**
- **Keyed Longitudinal Joint**
- **Dowel Transverse Expansion Joint**
- **Dowel Transverse Contraction Joint**
- **Transverse Contraction Joint Without Dovels**
- **Survey Reference Point**
- **LAHONIZA**
- **Triangulation Station**
- **Bench Mark**
- **Point Of Intersection**
- **North Arrow**
- **Edges Of Existing Pavement And Sidewalk**
- **Guardrail**

#### BASE LINE
- **Property Line**
- **Approximate**
- **Round Or Diameter**
- **Curb**
- **Curb And Gutter**
- **Water Well, Spring**
- **Levee**
- **Railroad Mile Post**
- **Gate**
- **Pump Island**
- **Storage Tank (Surface)**
- **Storage Tank (Underground)**
- **Mine Or Quarry**
- **Barrow Pit**
- **Church**
- **Store**
- **Residence**
- **Barn**
- **School**
- **Hay Bales**
- **Silf Fence**
- **Floating Turbulence Barrier**
- **Staked Turbulence Barrier**
- **Stream**
- **Shore Line**
- **March**
- **Wetland Boundary**
- **Hedge**
- **Trees**
- **Edge Of wooded Area**
- **Shrubbery**
- **Grove Or Orchard**
- **Definition Of Skew For Cross Drains And Barrels Of Concrete Box Culverts**
- **Concrete**
- **Wood**
- **Rate Of Superelevation**

#### EXISTING

#### PROPOSED

- **Power Pole**
- **Overhead Electric**
- **Telephone Pole**
- **Overhead Telephone Pole**
- **Overhead Telephone Cable**
- **Overhead Cable Television**
- **Combination Pole**
- **Guy Wire And Anchor Pin**
- **Buried Electric**
- **Buried Electric Duct**
- **Buried Telephone Duct**
- **Buried Telephone Cable**
- **Underground Cable Television**
- **Tower**
- **Light Pole**
- **Gas Main**
- **Water Main**
- **Sanitary Sewer**
- **Manhole**
- **Water Meter**
- **Valve**
- **Fire Hydrant**

---

See General Note Sheet 14.01.03

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MANUAL

S. L. 002

S. L. 002
CHART I

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

FLOW RATES (m³/min.)

<table>
<thead>
<tr>
<th>Type</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Light</td>
<td>&lt;8</td>
</tr>
<tr>
<td>Light</td>
<td>&gt;8</td>
</tr>
<tr>
<td>Moderate</td>
<td>&gt;16</td>
</tr>
<tr>
<td>Heavy</td>
<td>&gt;24</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>&gt;40</td>
</tr>
</tbody>
</table>

LEGEND

SOLs
- Cohesive Non-Cohesive
- Fine Loam Fine Sand
- Clay Sands Course Sand
- Chalk Gravel
- Harpies Sandy Loam
- Silt Loam

Spawning (in Meters)

Vertical Spacing (in Meters)
PARTIAL INLET  
COMPLETED INLET  
DITCH BOTTOM INLET  

PROTECTION AROUND INLETS OR SIMILAR STRUCTURES  

ANCHOR BOLTS WITH 2 STAKES PER BALE  

BARRELS BACKED BY FENCE  

LIMITS OF CONSTRUCTION  
Silt Barrier  
Side Ditch  
Ditch Barrels Inter  
Ditch Barrier  

ditch Installations at drainage structures  

ELEVATION  
TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF SLOPE  

GENERAL NOTES  
1. Stakes shall be 20 x 40 x 1/2 or 21/2 x 1/2 wood. Stakes of other material or shape providing equivalent strength may be used if approved by the Engineer. Stakes other than wood shall be reviewed upon completion of the project.
TYPE III SILT FENCE
To be used at most locations

TYPE IV SILT FENCE
To be used where large sediment loads are anticipated. Suggested use is where fill slope is 1:2 or steeper and length of slopes exceed 9 meters. Avoid use where the delineated water may back into travel lanes or off the right of way.

SILT FENCE APPLICATIONS
Notes: Silt Fence to be sold for under the contract unit price for Shaded Silt Fence (MS).

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

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

Approved By: (Signature) Date: (Date)
Prepared By: (Signature) Date: (Date)
Engineer: (Signature) Date: (Date)

02 3 of 3
TURBIDITY BARRIER APPLICATIONS

LEGEND

- Pipe Locations
- Drainage Or Fill Area
- Wasting Basin With Anchor
- Anchor
- Barrier Movement Due To Current Action

NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of barriers depends on current velocities.
3. Deployment of barrier around pipe locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 04 of the Standard Specifications.

GENERAL NOTES
1. Floating turbidity barriers are to be paid for under the contract unit price for Turbidity Barrier Floating, ft.
2. Staked turbidity barriers are to be paid for under the contract unit price for Turbidity Barrier Stakes, ft.
1. All materials, including aggregate, shall be of the quality and grade specified.

2. The aggregate size shall be as described in Section 321.13.1.9.1.1.

3. The aggregate must be approved by the Engineer.

4. All materials shall be placed and compacted in accordance with the specifications.

5. The aggregate must be compacted in accordance with the specifications.

6. All materials, including aggregate, shall be of the quality and grade specified.

7. All materials, including aggregate, shall be of the quality and grade specified.

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106. All materials, including aggregate, shall be of the quality and grade specified.
# STANDARD CRITERIA

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<th>CLASS</th>
<th>APPLICATION DESCRIPTION</th>
<th>STANDARD INDEX NO.</th>
<th>PERMEABILITY</th>
<th>A.D.S. Range (Dia.)</th>
<th>GRAB TENSILE STRENGTH</th>
<th>PUNCTURE</th>
<th>TRAPRO-STAL YEAR</th>
<th>WILLEN BURST</th>
<th>ELUVATION</th>
<th>SEAM STRENGTH</th>
<th>RESISTANCE (W/mil)</th>
<th>FILTRATION EFFICIENCY</th>
<th>FLOW RATE (L/mil)</th>
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<td>Development (Special)</td>
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<td>220</td>
<td>3.400</td>
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<td>460</td>
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<td>460</td>
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<td>0.200</td>
<td>80</td>
<td>800</td>
<td>80</td>
<td>500</td>
</tr>
</tbody>
</table>

**TABLE 1**

**GENERAL NOTES**

1. Specifications for geotextiles are Section 508 of the Section identified by the specific application. Physical criteria for each application is provided by this standard, in conjunction with these criteria.

2. All values are MINIMUM AVERAGE Roll values in the weakest principal direction unless otherwise stated.

3. Range of values do not preclude the responsibility to design the fabrics to the limits materials and conditions.

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

**DESIGN NOTES**

1. The designer should follow this criteria and adjust the values as necessary to satisfy project requirements. These adjustments shall be noted in the plans or contained in the project special provisions.

2. **L x W Permeability** The above represents the percent of maximum rolling strength retained ASTM D 4505 after weathering per ASTM D 4505 for the test period hour.

3. **A.D.S. Design Grid.**

4. **STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**TYPICAL SPECIFICATIONS**

**GEOTEXTILE CRITERIA**
1. Standard structure beams 125 GMS are diameter and smaller (Art. A) and 150 GMS are larger (Art. B). Larger standard structure beams are designated Types T. Beams are permitted for all structures.

2. Notes of circular structures (Alternate A) constructed in place may be the same except for reinforcement requirements. Prestressed rectangular structures (Alternate B) shall be constructed of reinforced concrete only.

3. Wall thickness and reinforcement are for Alternate A are 2 inches for columns, 3 inches for beams, and 4 inches for walls. Wall thickness and reinforcement are for Alternate B are 0.5 inches for columns, 1 inch for beams, and 1 inch for walls. Wall thickness and reinforcement are for Alternate C are 0.5 inches for columns, 1 inch for beams, and 1 inch for walls.

4. Top and floor slab reinforcement is for Alternate A are 0.5 inches for columns, 1 inch for beams, and 1 inch for walls. Top and floor slab reinforcement is for Alternate B are 0.5 inches for columns, 1 inch for beams, and 1 inch for walls. Top and floor slab reinforcement is for Alternate C are 0.5 inches for columns, 1 inch for beams, and 1 inch for walls.

5. All reinforcement shown in rectangular structures is for Alternate A are 0.5 inches for columns, 1 inch for beams, and 1 inch for walls. All reinforcement shown in rectangular structures is for Alternate B are 0.5 inches for columns, 1 inch for beams, and 1 inch for walls. All reinforcement shown in rectangular structures is for Alternate C are 0.5 inches for columns, 1 inch for beams, and 1 inch for walls.

6. Structure beams may be used in conjunction with curb invert pipe Types C. 3, 5, 7, and 9, and curb invert pipe Types D and E. C350 is the standard concrete used for all structures, unless otherwise shown in the plan or other standard drawings. Art. B structures shall be constructed of reinforced concrete only.

7. Rectangular structures may be reinforced as directed by the Engineer in order to facilitate connections between the structure walls and slabs, or between slabs, or between slabs and slabs.

8. Except when all beams are specifically required, reinforcement top and slab shall be straight embedment.

9. All steel bars used in rectangular structures shall be spaced at a maximum of 12 inches apart, except for rectangular structures with a span of 12 inches or less, where a maximum of 18 inches apart shall be used. Steel bars shall be spaced at a maximum of 12 inches apart, except for rectangular structures with a span of 12 inches or less, where a maximum of 18 inches apart shall be used.

10. The distance shown in rectangular structures shall be considered as the minimum distance that shall be used. The distance shown in rectangular structures shall be considered as the minimum distance that shall be used. The distance shown in rectangular structures shall be considered as the minimum distance that shall be used.

11. Structural details shall be shown as required, and all structural details shall be shown as required, and all structural details shall be shown as required.

12. Structures with a span of 25 inches or less shall be designed for a maximum load of 200 pounds per square foot, except for structures with a span of 25 inches or less, where a maximum load of 100 pounds per square foot shall be used. Structures with a span of 25 inches or less shall be designed for a maximum load of 200 pounds per square foot, except for structures with a span of 25 inches or less, where a maximum load of 100 pounds per square foot shall be used. Structures with a span of 25 inches or less shall be designed for a maximum load of 200 pounds per square foot, except for structures with a span of 25 inches or less, where a maximum load of 100 pounds per square foot shall be used.

13. For supplementary details, and for supplementary details, and for supplementary details, see index No. 200.
### Slab Designs - Square and Rectangular Structures

#### Short-Way

<table>
<thead>
<tr>
<th>Slab Depth ((\leq 0.06) or Unlimited)</th>
<th>Slab Thickness ((\leq 1.60) or Unlimited)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 - 0.30</td>
<td>0.80 - 0.15</td>
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<tr>
<td>0.40 - 0.65</td>
<td>0.60 - 0.20</td>
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<td>0.70 - 0.95</td>
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<td>1.00 - 1.20</td>
<td>0.20 - 0.30</td>
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<td>1.30 - 1.50</td>
<td>0.10 - 0.40</td>
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<tr>
<td>1.60 - 1.80</td>
<td>0.05 - 0.45</td>
</tr>
</tbody>
</table>

**General Notes**

1. Slab reinforcement is appropriate for top, intermediate, and bottom slabs.
2. Slab thickness is measured from finished grade to top of slab.
3. Reinforcement depth is measured to the top of the primary slab for beams and to the top of the intermediate slab for columns.
4. Wall height is the distance between top of lower slab to bottom of upper slab.
5. Sizes shown in parentheses () is the nominal size as shown on the plans.

### Slab Designs - Round Structures

### Wall Designs - Rectangular Structures

#### Vertical Reinforcing

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>SCHEDULE</th>
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<td>0.05 - 0.10</td>
<td>0.20 - 0.30</td>
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<tr>
<td>0.15 - 0.40</td>
<td>0.40 - 0.50</td>
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<td>0.50 - 0.80</td>
<td>0.60 - 0.90</td>
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#### Horizontal Reinforcing

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<th>Wall Thickness</th>
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<td>0.05 - 0.15</td>
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<td>0.20 - 0.40</td>
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<td>0.50 - 0.80</td>
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### Reinforcing Schedule

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<th>Schedule</th>
<th>400 Mpa Steel</th>
<th>450 Mpa Wire Fabric</th>
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<td>A</td>
<td>700</td>
<td>1200</td>
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<tr>
<td>B</td>
<td>520</td>
<td>200</td>
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<tr>
<td>C</td>
<td>370</td>
<td>300</td>
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**State of Florida Department of Transportation**

**Structure Bottoms**

Type J and P

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*This document contains information on slab designs and reinforcing schedules for square and rectangular structures, as well as wall designs and reinforcing schedules. The general notes provide guidelines for measuring slab thickness and reinforcement depth.*
NOTES FOR THIN-WALL PRECAST OPTIONS

1. The details on Sheets 4, 5, 6, and 7 are approved for present linear construction up to depths of 4.5 m. These limits can be exceeded with art. "C" Battens. Pages 800. Cost in-place construction must adhere to the limits contained on the referenced index.

2. The dimensions and reinforcement changes or other modifications are indicated. For all other dimensions and details, the referenced index drawings apply. When these precast units are used in conjunction with art. "B" Structure Battens, Index 200, the linear dimensions of an art. "B" Batten can be adjusted to reflect these lining interior dimensions.

3. Connectors which exceed the requirements of ASTM C-496 shall be used for structures constructed to these details.

4. Reinforcement can be either deformed bar reinforcement or welded wire fabric. Bar reinforcement in excess of 200 MPa may be used. However, only two grades are recognized: 200 MPa and 400 MPa. Welded wire fabric, including deformed or welded wire fabrics, will be recognized as having a design strength of 400 MPa. The area of reinforcement required may be increased in accordance with the Equivalent Steel Area Table provided. For bars and sections not given, the steel area required can be determined by the following equations:

   \[
   \text{Equival. Steel Area (cm}^2\text{) = \frac{400 \times \text{Strength Class (MPa))}}{\text{Design Stress MPa}}
   \]

   In no case shall welded fabric with widths smaller than 45cm or spacings greater than 200 mm be permitted. Bar reinforcement shall have the minimum yield stress and grade of steel as either the number 400 or number 611 grade bars or as an equivalent direct in accordance with the above equation. Spacings shall be less than two (2) times the bar thickness with a maximum spacing of 300 mm or three (3) times the bar thickness, with a maximum spacing of 450 mm.

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**EQUIVALENT STEEL AREA TABLE**

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<thead>
<tr>
<th>Strength Class</th>
<th>Bar Size &amp; Spacing</th>
<th>Reinforcing Bar</th>
<th>Equivalent 400 MPa Reinforcing Bar</th>
<th>Equivalent 400 MPa Welded Wire Fabric</th>
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<td>75 mm @ 220 Ccem</td>
<td>95 mm @ 220 Ccem</td>
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**SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS**

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**MATERIAL SPECIFICATIONS**

No. 3048

Page 4 of 6

[Diagram of Ditch Bottom Inlet Type B, Partial Sections AA and BB]
## Rigid Pavement

### Concrete

<table>
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<th>Minimum Cover (cm)</th>
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### Compacted Steel

<table>
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<tbody>
<tr>
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### Compacted Aluminum

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### Polyvinyl Chloride

<table>
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## Flexible Pavement

### Concrete

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<tr>
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### Compacted Steel

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### Compacted Aluminum

<table>
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### Polyvinyl Chloride

<table>
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</thead>
<tbody>
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<tr>
<td>450 &amp; Larger Round &amp; Elastic</td>
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## Unpaved W/O Select Bedding

### Concrete

<table>
<thead>
<tr>
<th>Minimum Cover (cm)</th>
<th>Concrete</th>
<th>All-Round &amp; Elastic</th>
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<tr>
<td>450 &amp; Larger Round &amp; Elastic</td>
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### Compacted Steel

<table>
<thead>
<tr>
<th>Minimum Cover (cm)</th>
<th>Compacted Steel</th>
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</thead>
<tbody>
<tr>
<td>375 &amp; 400 Round &amp; Elastic</td>
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<td>375</td>
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<tr>
<td>450 &amp; Larger Round &amp; Elastic</td>
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### Compacted Aluminum

<table>
<thead>
<tr>
<th>Minimum Cover (cm)</th>
<th>Compacted Aluminum</th>
<th>All-Round &amp; Elastic</th>
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</tr>
</thead>
<tbody>
<tr>
<td>375 &amp; 400 Round &amp; Elastic</td>
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<tr>
<td>450 &amp; Larger Round &amp; Elastic</td>
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<table>
<thead>
<tr>
<th>Minimum Cover (cm)</th>
<th>Polyvinyl Chloride</th>
<th>All-Round &amp; Elastic</th>
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<tbody>
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<td>375 &amp; 400 Round &amp; Elastic</td>
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<tr>
<td>450 &amp; Larger Round &amp; Elastic</td>
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## Unpaved With Select Bedding

### Concrete

<table>
<thead>
<tr>
<th>Minimum Cover (cm)</th>
<th>Concrete</th>
<th>All-Round &amp; Elastic</th>
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<tbody>
<tr>
<td>375 &amp; 400 Round &amp; Elastic</td>
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<table>
<thead>
<tr>
<th>Minimum Cover (cm)</th>
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<td>450 &amp; Larger Round &amp; Elastic</td>
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</tr>
</tbody>
</table>

---

### General Notes

1. The indicated values are recommended minimum dimensions to withstand uncontrolled highway traffic loads. Additional cover may be required to support construction equipment loads or highway traffic loads before pavement is completed. Some size thickness combinations may result in minimum cover greater than those listed above. See Sheets 2, 3, 4, 5, and 6 for additional guidance.

2. Less than the indicated minimum cover may be used provided adequate setoff is detailed in the plans. These features may include but are not limited to extra strength, select bedding, select bedding, asphaltic concrete, and asphaltic concrete under flexible pavements.

---

### ASPHALTIC CONCRETE BASE

<table>
<thead>
<tr>
<th>Minimum Cover (cm)</th>
<th>ASPHALTIC CONCRETE BASE</th>
<th>All-Round &amp; Elastic</th>
<th>225</th>
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<tbody>
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### EXTRA BASE FOR CROSS CULVERTS UNDER FLEXIBLE PAVEMENTS

<table>
<thead>
<tr>
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<th>EXTRA BASE FOR CROSS CULVERTS UNDER FLEXIBLE PAVEMENTS</th>
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### Cover Height

<table>
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<tr>
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### Round Pipe Dimensions

<table>
<thead>
<tr>
<th>Equivalent Diameter (in)</th>
<th>Area (in²)</th>
<th>Wall Thickness (in)</th>
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</thead>
<tbody>
<tr>
<td>350</td>
<td>0.07</td>
<td>44</td>
</tr>
<tr>
<td>450</td>
<td>0.17</td>
<td>50</td>
</tr>
<tr>
<td>600</td>
<td>0.29</td>
<td>63</td>
</tr>
<tr>
<td>750</td>
<td>0.46</td>
<td>69</td>
</tr>
<tr>
<td>900</td>
<td>0.66</td>
<td>76</td>
</tr>
<tr>
<td>1050</td>
<td>0.89</td>
<td>88</td>
</tr>
<tr>
<td>1200</td>
<td>1.17</td>
<td>100</td>
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<tr>
<td>1500</td>
<td>1.48</td>
<td>133</td>
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<tr>
<td>1800</td>
<td>1.83</td>
<td>156</td>
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<tr>
<td>2000</td>
<td>2.21</td>
<td>183</td>
</tr>
<tr>
<td>2400</td>
<td>2.65</td>
<td>215</td>
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<tr>
<td>2750</td>
<td>3.08</td>
<td>254</td>
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<tr>
<td>3000</td>
<td>3.58</td>
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*For Informational Purposes Only Do Not Specify Wall Thickness Option B Wall is Industry Standard

### Round Pipe Installations

<table>
<thead>
<tr>
<th>Pipe Diameter (in)</th>
<th>Class S</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
<th>Class V</th>
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<tbody>
<tr>
<td>300-750</td>
<td>2.75*</td>
<td>4.00</td>
<td>5.25</td>
<td>6.00</td>
<td>6.75</td>
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<tr>
<td>900-1350</td>
<td>2.50</td>
<td>3.75</td>
<td>4.75</td>
<td>5.75</td>
<td>6.75</td>
<td>7.50</td>
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<tr>
<td>1500-2400</td>
<td>2.00</td>
<td>3.25</td>
<td>4.50</td>
<td>5.50</td>
<td>6.50</td>
<td>7.50</td>
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</tbody>
</table>

*For Pipe Class S with diameters of 500 to 750 mm, the minimum height of fill measured from top of finished grade to outside top of pipe is 0.9 m. *Notes: At the option of the pipe supplier or the contractor, a Pipe Class with greater strength may be substituted for the Pipe Class designated in the plans.

### Elliptical Pipe Dimensions

<table>
<thead>
<tr>
<th>Nominal Dimensions</th>
<th>Equiv. Dia (in)</th>
<th>Wall Thickness (in)</th>
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<tbody>
<tr>
<td>Rise Span (in)</td>
<td>Pipe Span (in)</td>
<td>Rise Span (in)</td>
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<td>(12+15+18)</td>
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<tr>
<td></td>
<td>(12+15+18)</td>
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<td>(12+15+18)</td>
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<td>(12+15+18)</td>
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*Notes: HE III and VE III pipe required for depths of cover less than 0.6 ft. For 375, 450 and 600 equivalent.

### Elliptical Pipe Installations (All Sizes)

<table>
<thead>
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<th>Installation</th>
<th>Height OF Fill</th>
<th>Pipe Class</th>
<th>Beading Class</th>
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<tbody>
<tr>
<td>Horizontal</td>
<td>0.3-1.0*</td>
<td>HE II</td>
<td>C</td>
</tr>
<tr>
<td>Vertical</td>
<td>0.5-1.0*</td>
<td>VE II</td>
<td>C</td>
</tr>
</tbody>
</table>

*Notes: HE III and VE III pipe required for depths of cover less than 0.6 ft. For 375, 450 and 600 equivalent.

### Maximum Cover for Reinforced Concrete Round and Elliptical

<table>
<thead>
<tr>
<th>State of Florida Department of Transportation</th>
<th>Road Design</th>
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<tbody>
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<td>Cover Height</td>
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<table>
<thead>
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<th>Road Design</th>
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<tbody>
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</table>
### Round Pipe - 67 x 13 Corrugation

<table>
<thead>
<tr>
<th>G (lb/ft³)</th>
<th>Area (in²)</th>
<th>Thickness (in)</th>
<th>Min. Cover (in)</th>
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<tbody>
<tr>
<td>300</td>
<td>0.07</td>
<td>30.5%</td>
<td>NA</td>
</tr>
<tr>
<td>375</td>
<td>0.1</td>
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<tr>
<td>450</td>
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</tr>
<tr>
<td>525</td>
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<tr>
<td>600</td>
<td>0.23</td>
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<td>NA</td>
</tr>
<tr>
<td>750</td>
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### Round Pipe - 75 x 25 Corrugation

<table>
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<th>Area (in²)</th>
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<th>Min. Cover (in)</th>
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</thead>
<tbody>
<tr>
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<td>0.06</td>
<td>30.5%</td>
<td>NA</td>
</tr>
<tr>
<td>375</td>
<td>0.08</td>
<td>29.7%</td>
<td>NA</td>
</tr>
<tr>
<td>450</td>
<td>0.14</td>
<td>28.9%</td>
<td>NA</td>
</tr>
<tr>
<td>525</td>
<td>0.17</td>
<td>28.0%</td>
<td>NA</td>
</tr>
<tr>
<td>600</td>
<td>0.19</td>
<td>26.9%</td>
<td>NA</td>
</tr>
<tr>
<td>750</td>
<td>0.23</td>
<td>25.2%</td>
<td>NA</td>
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</table>

### Round Pipe - 125 x 25 Corrugation

<table>
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<th>G (lb/ft³)</th>
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<tbody>
<tr>
<td>300</td>
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<td>30.5%</td>
<td>NA</td>
</tr>
<tr>
<td>375</td>
<td>0.08</td>
<td>29.7%</td>
<td>NA</td>
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<tr>
<td>450</td>
<td>0.14</td>
<td>28.9%</td>
<td>NA</td>
</tr>
<tr>
<td>525</td>
<td>0.17</td>
<td>28.0%</td>
<td>NA</td>
</tr>
<tr>
<td>600</td>
<td>0.19</td>
<td>26.9%</td>
<td>NA</td>
</tr>
<tr>
<td>750</td>
<td>0.23</td>
<td>25.2%</td>
<td>NA</td>
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</tbody>
</table>

### Round Pipe - 75 x 25 Corrugation

<table>
<thead>
<tr>
<th>G (lb/ft³)</th>
<th>Area (in²)</th>
<th>Thickness (in)</th>
<th>Min. Cover (in)</th>
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<tbody>
<tr>
<td>300</td>
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<td>28.9%</td>
<td>NA</td>
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<tr>
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<td>0.17</td>
<td>28.0%</td>
<td>NA</td>
</tr>
<tr>
<td>600</td>
<td>0.19</td>
<td>26.9%</td>
<td>NA</td>
</tr>
<tr>
<td>750</td>
<td>0.23</td>
<td>25.2%</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Maximum Cover for Corrugated Steel Pipe Round and Pipe Arch

<table>
<thead>
<tr>
<th>Span (ft)</th>
<th>R.H.</th>
<th>Min. Corner Pressure (lb/ft²)</th>
<th>Min. Cover (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.12</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.12</td>
<td>0.15</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.25</td>
<td>0.18</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.5</td>
<td>0.22</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1</td>
<td>0.26</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>0.28</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Notes:
- Increase the minimum cover values shown in Sheet 1 of 4 by 15 mm for gage and size combinations below the heavy lines.
- Height of Fill (maximum cover) is measured from top of finished grade to outside top of pipe.
- *Corrugated end not available. May be provided for cross drain and side drain applications only.*
- NA - Not Available
- WS - Not Suitable (For Highway H-20 Loadings)
- Limited availability of this product. Check availability before specifying (generally limited to 75 mm x 25 mm corrugation pipe and fabricated from 1500 smaller diameter round pipe in 12 ga. and thicker material).
- 360° perforated pipe arch (French drain pipe) is not recommended. Do not specify without checking suitability and availability.
- 125 mm x 25 mm corrugated pipe is currently not manufactured for the Florida market. Check availability before specifying.
- 2.77 mm (1/16 gage) for spiral rib, 2.4 mm (maximum cover, 19 mm x 25 mm x 252 mm rib spacing (2 rib) only.

### Maximum Corrugated Steel Pipe Round and Pipe Arch

<table>
<thead>
<tr>
<th>Span (ft)</th>
<th>R.H.</th>
<th>Min. Corner Pressure (lb/ft²)</th>
<th>Min. Cover (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>375</td>
<td>0.02</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>450</td>
<td>0.03</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>525</td>
<td>0.04</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>600</td>
<td>0.05</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>750</td>
<td>0.07</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Maximum Cover for Corrugated Steel Pipe Round and Pipe Arch

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**ROAD DESIGN**

**COVER HEIGHT**

- 19 mm x 25 mm x 252 mm Only.
### ROUND PIPE - 67 x 13 CORRUGATION

<table>
<thead>
<tr>
<th>D (mm)</th>
<th>Area (mm²)</th>
<th>( \frac{D}{B} )</th>
<th>Sheet Thickness in mm (IPS)</th>
<th>Maximum Height of Fill (m)</th>
<th>Min. Cover (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>0.02</td>
<td>2.74</td>
<td>NA</td>
<td>1.254</td>
<td>2.19</td>
</tr>
<tr>
<td>450</td>
<td>0.07</td>
<td>2.05</td>
<td>NA</td>
<td>1.820</td>
<td>2.57</td>
</tr>
<tr>
<td>600</td>
<td>0.19</td>
<td>1.58</td>
<td>NA</td>
<td>2.524</td>
<td>3.03</td>
</tr>
<tr>
<td>750</td>
<td>0.27</td>
<td>1.42</td>
<td>0.01</td>
<td>3.214</td>
<td>3.55</td>
</tr>
<tr>
<td>900</td>
<td>0.36</td>
<td>1.31</td>
<td>0.01</td>
<td>3.914</td>
<td>4.06</td>
</tr>
</tbody>
</table>

### ROUND PIPE - 75 x 25 CORRUGATION

<table>
<thead>
<tr>
<th>D (mm)</th>
<th>Area (mm²)</th>
<th>( \frac{D}{B} )</th>
<th>Sheet Thickness in mm (IPS)</th>
<th>Maximum Height of Fill (m)</th>
<th>Min. Cover (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>0.10</td>
<td>2.54</td>
<td>NA</td>
<td>1.254</td>
<td>2.19</td>
</tr>
<tr>
<td>450</td>
<td>0.17</td>
<td>2.05</td>
<td>NA</td>
<td>1.820</td>
<td>2.57</td>
</tr>
<tr>
<td>600</td>
<td>0.29</td>
<td>1.90</td>
<td>NA</td>
<td>2.524</td>
<td>3.03</td>
</tr>
<tr>
<td>750</td>
<td>0.42</td>
<td>1.76</td>
<td>0.01</td>
<td>3.214</td>
<td>3.55</td>
</tr>
<tr>
<td>900</td>
<td>0.56</td>
<td>1.64</td>
<td>0.01</td>
<td>3.914</td>
<td>4.06</td>
</tr>
</tbody>
</table>

### PIPE ARCH - 67 x 13 CORRUGATION

<table>
<thead>
<tr>
<th>Span (m)</th>
<th>Rise (mm)</th>
<th>Equiv. Round Pipe</th>
<th>Area (mm²)</th>
<th>Minimum Shear Required (kip)</th>
<th>Maximum Corner Pressure-kip/ft²</th>
<th>Maximum Height of Fill (m)</th>
<th>Min. Cover (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>360</td>
<td>450</td>
<td>0.5</td>
<td>1.524</td>
<td>2.19</td>
<td>0.05</td>
<td>2.05</td>
</tr>
<tr>
<td>600</td>
<td>600</td>
<td>900</td>
<td>0.14</td>
<td>1.904</td>
<td>2.57</td>
<td>0.08</td>
<td>2.57</td>
</tr>
<tr>
<td>800</td>
<td>800</td>
<td>1200</td>
<td>0.23</td>
<td>2.667</td>
<td>3.03</td>
<td>0.04</td>
<td>3.03</td>
</tr>
<tr>
<td>1000</td>
<td>1000</td>
<td>1600</td>
<td>0.37</td>
<td>3.429</td>
<td>3.55</td>
<td>0.03</td>
<td>3.55</td>
</tr>
</tbody>
</table>

### PIPE ARCH - 75 x 25 CORRUGATION

<table>
<thead>
<tr>
<th>Span (m)</th>
<th>Rise (mm)</th>
<th>Equiv. Round Pipe</th>
<th>Area (mm²)</th>
<th>Minimum Shear Required (kip)</th>
<th>Maximum Corner Pressure-kip/ft²</th>
<th>Maximum Height of Fill (m)</th>
<th>Min. Cover (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>360</td>
<td>450</td>
<td>0.5</td>
<td>1.524</td>
<td>2.19</td>
<td>0.05</td>
<td>2.05</td>
</tr>
<tr>
<td>600</td>
<td>600</td>
<td>900</td>
<td>0.14</td>
<td>1.904</td>
<td>2.57</td>
<td>0.08</td>
<td>2.57</td>
</tr>
<tr>
<td>800</td>
<td>800</td>
<td>1200</td>
<td>0.23</td>
<td>2.667</td>
<td>3.03</td>
<td>0.04</td>
<td>3.03</td>
</tr>
<tr>
<td>1000</td>
<td>1000</td>
<td>1600</td>
<td>0.37</td>
<td>3.429</td>
<td>3.55</td>
<td>0.03</td>
<td>3.55</td>
</tr>
</tbody>
</table>

### PIPE ARCH - SPIRAL RIB RSPACING (19 x 19 IB)

<table>
<thead>
<tr>
<th>Span (m)</th>
<th>Rise (mm)</th>
<th>Equiv. Round Pipe</th>
<th>Area (mm²)</th>
<th>Minimum Shear Required</th>
<th>Maximum Corner Pressure-kip/ft²</th>
<th>Maximum Height of Fill (m)</th>
<th>Min. Cover (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>450</td>
<td>450</td>
<td>900</td>
<td>0.15</td>
<td>1.524</td>
<td>2.19</td>
<td>0.05</td>
<td>2.05</td>
</tr>
<tr>
<td>600</td>
<td>600</td>
<td>1200</td>
<td>0.23</td>
<td>2.667</td>
<td>3.03</td>
<td>0.04</td>
<td>3.03</td>
</tr>
</tbody>
</table>

### MAXIMUM COVER FOR CORRUGATED ALUMINUM ALLOY ROUND PIPE AND PIPE ARCH

<table>
<thead>
<tr>
<th>STATE OF FLORIDA TRANSPORTATION DEPARTMENT</th>
<th>ROUNCED PIPE AND PIPE ARCH</th>
<th>COVER HEIGHT</th>
</tr>
</thead>
</table>

- **Notes:**
  - Increase the minimum cover values shown on Sheet 1 of 4 by 20 mm for gage and size combinations below the heavy lines.
  - Height of fill (minimum cover) is determined from top of finished grade to outside top of pipe.
  - NA - Not Available
  - NS - Not Suitable (For Highway Bridges Only)

- **Design Review:** Recommended for specific applications. The review should identify any special handling, construction, fabrication procedures, and construction and installation restrictions which may be required. The specification of the next higher subclass in this review is not appropriate. The review performed by the designer does not release the contractor from analyzing and taking any necessary precautions required to protect partially or completely unconstructed pipe from the environment used during construction.

- **Limited availability:** of this product. Check availability before specifying.
- **Non-porous pipe:** (French drain pipe) is not recommended in the pipe work above. Do not specify without checking both for suitability and availability.
- **This pipe and gage combination shall be produced during inspection per manufacturer’s recommendations.**
- **Use of this size and gage combination must be approved by the State Drainage Engineer.**

- **Special instruction required:** Refer to ADAAS Standard Specifications for Highway Bridges or ASTM B88-96 and manufacturer’s recommendations.
<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>INLET TYPE</th>
<th>CURB/GUTTER</th>
<th>GRADE CONSIDERATION</th>
<th>HYDRAULIC INTAKE (l/s)</th>
<th>BICYCLE SAFE / PEDESTRIAN SAFE</th>
<th>UTILITY LOCATION FROM CURB</th>
<th>PIPE SIZE WITH STANDARD BOTTOMS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>210</td>
<td>E &amp; F</td>
<td>Continuous</td>
<td>0.015</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>750 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>211</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>0.05</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>750 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>212</td>
<td>E &amp; F</td>
<td>Continuous</td>
<td>0.04</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>750 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>213</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>0.03</td>
<td>Yes / Limited</td>
<td>Inside</td>
<td>750 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>214</td>
<td>E &amp; F</td>
<td>Continuous</td>
<td>0.008</td>
<td>Yes / Yes</td>
<td>Outside</td>
<td>750 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>215</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>0.12</td>
<td>No / No</td>
<td>NA</td>
<td>750 mm 750 mm Transverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>216</td>
<td>Median Barrier Wall</td>
<td>Continuous</td>
<td>0.13</td>
<td>No / Yes</td>
<td>NA</td>
<td>750 mm Transverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>217</td>
<td>Median Barrier Wall</td>
<td>Sag</td>
<td>0.14</td>
<td>No / No</td>
<td>NA</td>
<td>750 mm Transverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>218</td>
<td>Median Barrier Wall</td>
<td>Double Inlet</td>
<td>0.13</td>
<td>No / Yes</td>
<td>NA</td>
<td>750 mm Transverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>219</td>
<td>Median Barrier Wall</td>
<td>Double Inlet</td>
<td>0.14</td>
<td>No / Yes</td>
<td>NA</td>
<td>750 mm Transverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>220</td>
<td>Median Barrier Wall</td>
<td>Double Inlet</td>
<td>0.14</td>
<td>No / Yes</td>
<td>NA</td>
<td>750 mm Transverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>221</td>
<td>Shoulder</td>
<td>Continuous</td>
<td>0.15</td>
<td>No / Yes</td>
<td>NA</td>
<td>750 mm Transverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>222</td>
<td>Shoulder</td>
<td>Sag</td>
<td>0.15</td>
<td>Yes / Yes</td>
<td>NA</td>
<td>750 mm Transverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>223</td>
<td>Shoulder</td>
<td>Continuous</td>
<td>0.15</td>
<td>No / Yes</td>
<td>NA</td>
<td>750 mm Transverse</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Hydraulic intake values do not represent hydraulic capacity but are shown to compare inlets based on a 0.3% longitudinal slope, 0.15 max slope and a 90% efficiency factor. For other conditions, the owner should be adjusted for specific flow or drainals. Sag intake value is based on finishing the embankment over an embankment, where spread is rather than hydraulic intake may dictate level selection or placement. Full design data and additional information to include in "Study of Stormwater Inlet Committee" by University of South Florida.

2. Curb inlets and transitions should be located outside pavement crosswalk areas, preferably upgrade from these locations.

3. Double throat inlets are usually not warranted unless the minor flow is in excess of 75 meters.

4. Median Barrier Inlets, Types I, E, 3, 4, 5 & Shoulder Inlet Type 5 can be made bicycle safe by specifying the following guidelines.

5. Pipe sizes are similar, Class II, A Wall concrete pipe. Elevation pipe and corrugated pipe are to be checked for fit in accordance with Index No. 201. Metropolitan sizes should be reviewed using 68 mm x 15 mm corrugation up to 750 mm and 76 mm x 25 mm corrugation for larger sizes.
GENERAL NOTES

1. This Inlet to be used in conjunction with Concrete Barrier Wall, PIGGIE I Curb & Gutter, Index No. 410.

2. All Concrete Barrier Wall reinforcing steel shall be in accordance with Index No. 400.

3. Barrier wall shall be Class II concrete, finished in accordance with Index No. 400.

4. A 4 in. 450 mm dia. 65 mm diameter and shall be constructed at the level centerline when the inlet is located in a curb sump.

5. For flexure in the pipe, see Index No. 201, 202 and 400.

6. Recommended minimum pipe sizes are 400 mm longitudinal and 750 mm transverse. For larger pipe, see Index No. 250.

7. Grates shall be fabricated with Kwikline bars or with either 60 mm 2 3/8 in. or 73 mm 2 1/2 in. wide cross bars and full-depth bars as desired.

8. When Alternate G grate is specified in plans, the grate is to be left in place unpainted after fabrication.

9. For any item or for parts of the structure shown, the concrete barriers or the curb and gutter after the time when slab withdrawal of the invert pipe or to top of slurry.

10. Inlets to be paid for under the contract unit price for Inlets: Barrier Wall, Curb & Gutter I, L.A.

BARRIER WALL INLET

SECTION CC

PLAN

SECTION AA

SECTION FF & GG

SECTION HH

SECTION JJ

PICTORIAL VIEW

BENDING DIAGRAM

INSET A

SECTION BB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

FROM DESIGN

CONCRETE BARRIER WALL (PIGGIE I C & G)
OPTIONAL STEEL GRATES

CROSS BAR OPTIONS

CROSS BAR

SECTION KK

INSET B

 SECTION EE

INSET C

RETI-CULINE

BARRIER WALL INLET
CONCRETE BARRIER WALL (PGB1/C & G)
GENERAL NOTES

1. This inlet is designed for Milestone, American, or other areas subject to heavy wheeled trucks, minimum standards and subject to pedestrian and/or bicycle traffic.

2. When alternate "A" grate is specified in plans, the grate is to be hot-dipped galvanized after fabrication.

3. Reinforcing - 1/4" bars at 4" o.c. both ways. Cut all bars bars out of way of pipe to clear pipe 20.

4. All exposed edges and corners shall be flared to 6 mm radius.

5. Recommended maximum pipe sizes shown are for concrete pipes.

6. For supplementary details see Index No. 200.

OPTIONAL BAR SPACING

STEEL GRATE
TWO REQUIRED PER INLET

125 mm Steel Grate
Whole Bars 125 mm x 6 mm
Intermediate Bars 40 mm x 6 mm
Perforated Bars 25 mm x 5 mm

Steel Grade: Manufactured by Borton, Florida Steel, U.S. Foundry
Inc., Plant City, Borton 15" Corrugated.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

GUTTER INLET
TYPE V

Approved By: [Signature]
# APPLICATION GUIDELINES FOR DITCH BOTTOM AND MEDIAN INLETS

<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>TYPE</th>
<th>LOCATION</th>
<th>CAPACITY (m³/s)</th>
<th>SAFETY</th>
<th>DEBRIS TOLERANCE</th>
<th>PIPE SIZE LIMITATION</th>
<th>OTHER DESIGN CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>GRAITE ONLY</td>
<td>GRAITE WITH SINGLE STD. SLOT</td>
<td>GRAITE WITH SINGLE TRAY SLOT</td>
<td>TRAFFIC</td>
<td>PEDESTRIAN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FLOW CONDITION</td>
<td>FLOW CONDITION</td>
<td>FLOW CONDITION</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>230</td>
<td>A</td>
<td>Limited Access Facilities</td>
<td>12</td>
<td>7</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>231</td>
<td>B</td>
<td>Limited Access Facilities</td>
<td>27</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>232</td>
<td>C</td>
<td>*Outside CZ</td>
<td>9</td>
<td>7</td>
<td>19</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>233</td>
<td>D</td>
<td>*Outside CZ</td>
<td>24</td>
<td>10</td>
<td>46</td>
<td>9</td>
<td>34</td>
</tr>
<tr>
<td>234</td>
<td>E</td>
<td>*Outside CZ</td>
<td>17</td>
<td>10</td>
<td>32</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>235</td>
<td>H</td>
<td>Outside CZ</td>
<td>9</td>
<td>12</td>
<td>4</td>
<td>24</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Inside CZ</td>
<td>15</td>
<td>9</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>Inside CZ</td>
<td>39</td>
<td>12</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>Inside CZ</td>
<td>15</td>
<td>7</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>Outside CZ</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

1. All inlets must be selected to satisfy hydraulic suitability, with proper consideration given to safety and economics.
2. CZ denotes clear zone, formerly CRA, denoting clear recovery area.
3. Alternate C. grates should be specified when in salt water environment.
4. Inlets without slots or inlets with traversable slots maybe located within the clear zone, Inlets C, D and E. capacity and debris tolerance maybe increased by the addition of a slot. Slotted inlets located within roadway clear zones and in access areas to pedestrians should have traversable slots. Traversable slots are not adaptable to Inlet Type T.
5. Special ditch blocks require plan details.
6. Pipe size limitations are based on Circular Class III, B. Well, Concrete Pipe. Elliptical pipe and corrugated pipe are to be checked for fit in accordance with Index No. 20x; metal pipe sizes should be reviewed using 67 mm x 15 mm corrugation up through 750 mm and 75 mm x 25 mm corrugation for larger sizes.
7. The capacity values shown are approximate as guides to assist in selecting operating performance. Inlets are assumed to be in a sag condition. Inlet control is assumed. The Designer must verify the outlet conditions and design assumptions before accepting the capacity values shown. Outlet constraints are likely to control pipe size by the following:

- Flow Condition A - Orifice Flow Condition
  1. Grates are 50% blocked with 75 mm of water depth above the grate.
  2. Slots are 25% blocked.
  3. Orifice Equation

- Flow Condition B - Weir Flow Conditions
  1. A 75 mm head above the top of the inlet is assumed.
  2. The effective weir length is assumed to be equal to the inlet perimeter with no deduction for the grate or debris.
  3. For Inlets with slots, the effective head for the side of the inlet with the slot is 3/16 mm for standard 300 mm slats and 250 mm for traversable slots. The slot is assumed to be 25% blocked. In some instances the flow will be in orifice conditions into the slot.

Debris buildup may occur on Type B fencing.
TRAVESELABLE SLOTS

Pavement and sodding quantities for traversable slots

<table>
<thead>
<tr>
<th>Letter</th>
<th>Slope Std</th>
<th>Double Std</th>
<th>Single Std</th>
<th>Double Std</th>
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<td>c</td>
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<tr>
<td>d</td>
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<td>0.94</td>
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<tr>
<td>e</td>
<td>4.0%</td>
<td>0.70</td>
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

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

2 of 4
GENERAL NOTES

1. These inlets are designed for use in driveways, medians, paved areas, or other areas subject to heavy wheel loads where debris is minimal and is subject to pedestrian and bicycle traffic.

2. When alternate G grate is specified in plans, the grate is to be used in lieu of grate specified.

3. These grates may be used with All-B structure bottoms, Index 200. The list and prices will be included in the contract unit price for Inlets 107, 108, Type F with 301-C Body/Steel I, LA.

4. For supplemental details (Type F only), see Index 200.

PAVEMENT AND SODDING

TYPE F

Notes: 1. Pavement and/or sod to be used only where called for in the plans.
2. Cost of paving to be included in cost of inlets.
# Application Guidelines for Pipe End Treatments

<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>DESCRIPTION</th>
<th>APPLICATION</th>
<th>PIPE SIZE (in.) CROSSRAIN SIDERAIN MEDIUM</th>
<th>HYDRAULIC PERFORMANCE</th>
<th>X_p</th>
<th>APPLICATION</th>
<th>TOLIANT</th>
<th>PERMITTED LOCATION</th>
<th>GRADE SAFE</th>
<th>ECONOMIC RATING</th>
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<tr>
<td>250</td>
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<td>No</td>
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<td>Yes</td>
<td>Very Good</td>
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<td>Yes</td>
<td>Very Good</td>
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<td>273</td>
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<td>No</td>
<td>Yes</td>
<td>Fair</td>
<td>0.5</td>
<td>Yes</td>
<td>Good</td>
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</tbody>
</table>

1. All end treatments must be selected to satisfy hydraulic capabilities with proper consideration given to safety and economics.
2. C2 denotes clear zone, formerly CFA denoting clear recovery area.
3. Grates should not be placed on outlet end unless positive debris protection is provided at inlet end.
4. Additional rates concerning application restrictions may be shown in individual indexes.
5. Economic ratings are based on statewide average costs.
6. End treatments with a K_p of 0.5 or greater should be used only in areas of low design velocities and negligible debris.
7. Pipe sizes are circular. Class D & B work concrete pipe, Elevation pipe and corrugated pipe are to be checked for fit in accordance with Index No. 225. Vertical size should be reviewed using 67 mm x 32 mm corrugation up to 750 mm and 75 mm x 32 mm corrugation for larger sizes.
ENDWALL DIMENSIONS (EXCLUSIVE OF MULTIPLE PIPE SPACING)

NORMAL PIPE

SKewed PIPE

LEGEND
- Pipe Shoe
- Center Tx Center Pipe Spacing
- Centerline To Centerline Dimension At Face Of Headwall

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

1. Embankment may be cast-in-place or precast construction. Cast-in-place embankment shall conform to details on this index. Design specifications AASHTO (688), Prestressed construction which adheres to this index, including all additional reinforcement required for bending which shall be determined by the Contractor or engineer, does not require additional approvals. Deviations from this index, for precast units, shall require the approval of the State Division Engineer prior to construction. For precast construction, see Index No. 203 for opening and bonding details.

2. Prestressed screen shall be either 400 kips or 450 kips.

3. Concrete shall be Class B except where meeting the requirements of ASTM C 496 (27 PSF kips) may be used in lieu of Class B Concrete in prestress units manufactured in plants which are under the Standard Operating Procedures for the inspection of prestress drainage products.

4. Cut-and-cover shall be either slotted or corrugated panels or concrete wall lined with corrugated steel.

5. Metal pipe shall be galvanized coated on all surfaces in contact with concrete and 300 mm beyond the boundary of contact. Any suitable butyllic material may be field applied.

6. Cast-in-place bends shall be in accordance with Index No. 126 and paid for under the standard unit price for Cast-in-place Bends. Cast-in-place sections shall include the accessories provided in the index. Concrete and reinforcing steel shall be paid for under the standard unit prices for Cast-in-Place Bends, A3 and Reinforced Sheet Pile, A5.

7. All exposed edges and corners to be chipped 20 mm unless otherwise shown.

8. Concrete units are 100% precast.
### Dimensions and Quantities for One U-Endwall

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Diam (in)</th>
<th>L (ft)</th>
<th>H (ft)</th>
<th>W (ft)</th>
<th>P (lb)</th>
<th>Q (lb)</th>
<th>R (lb)</th>
<th>Bar W</th>
<th>Bar R</th>
<th>Concrete Class</th>
<th>Resist. Steel Kg</th>
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### Dimensions and Quantities for One U-Endwall

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Diam (in)</th>
<th>L (ft)</th>
<th>H (ft)</th>
<th>W (ft)</th>
<th>P (lb)</th>
<th>Q (lb)</th>
<th>R (lb)</th>
<th>Concrete Class</th>
<th>Resist. Steel Kg</th>
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<td>600</td>
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<td>710</td>
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<td>4.50</td>
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<td>4.50</td>
<td>2.50</td>
<td>1.55</td>
<td>50</td>
</tr>
</tbody>
</table>

### General Notes
1. Baffles to be constructed only when called for in plans.
2. When steel grating is required an endwall see Sheet 3 or 3 for details.
3. All reinforcing fillet bars with 50 mm clearance except as noted.
4. All angles, channels and bars shall be ASTM A 36, A 441, A 325 or A 588, 425 MPa steel, and galvanized in accordance with Section 966-7 of the Standard Specifications.
5. Cover section C 75-65B may be substituted for C 400-6 channels.
6. Precautions of this endwall will be reinforced. Precast units shall conform to the dimensions shown in accordance with approved shop drawings. Request for shop drawings should be directed to the State Drainage Engineer, Site Index No. 285 for opening and grading details.
7. Concrete meeting the requirements of ASTM C 496 (175 MPa) may be used in lieu of Class I concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
8. Bidding shall be in accordance with Index No. 285, and paid for under the contract unit price for Section 55B.
9. Endwall to be payed for under the contract unit price for Class 1 Endwall is 55B and 55C. Street Drains, LAG. Cost of grates to be paid for under the contract unit price for Tofonda Drains, LAG. Price quantity. Cost of galvanized elbows and nuts to be included in the bid price for the grates.
ENDWALLS WITH AND WITHOUT BAFFLES FOR 1:3, 1:4 AND 1:6 SLOPES
GENERAL NOTES

1. Flared and section sleeves conform to the requirements of ASTM C-78 with the exception that dimensions and reinforcement shall be as prescribed in the table below. Dimensional requirements may consist of either one or two coats of steel. The manufacturer shall submit proof of compliance for Flared end sections having dimensions other than those above shall be submitted for approval to the State Discharge Engineer.

2. Connections between the Flared and section and the pipe sleeve may be any of the following types unless otherwise shown on the plans.
   a. Joints meeting the requirements of Section 94A:15 of the Standard Specification (U Ring Gasket). Flared and section joint dimensions and tolerances shall be identical as those used in the pipe gasket joint. When pipe sleeve and Flared and section manufacturers are different, the compatibility of joint designs shall be certified to by the manufacturer of the Flared and section.
   b. Joints sealed with all-weather plastic gaskets.
      The gaskets shall meet the requirements of Section 94D of the Standard Specification and the minimum gasket shall be as specified for equivalent sizes of spiral type pipe.
   c. Reinforced concrete jackets, as detailed on this drawing.
      Cost of the reinforced concrete jacket to be included in the contract unit price for the Flared and section.
      Weather and corrosion resistant pipe is to be used for the pipe sleeve, the pipe shall be corrosion resistant as to the jacketed area as specified in index No. 289. Jacketing to be included in the contract unit price for the pipe sleeve. Concrete jacket shall be as specified as Index No. 289. Cost of concrete and reinforcement shall be included in the contract unit price for the pipe sleeve.

3. The wall sleeves shall be constructed when shown on the plans or of materials designated by the Engineer. These walls are to be as detailed in Sections 1. Concrete and cast for under the contract unit price of these. Reinforcing steel to be included in cost of the wall.

4. On shown pipe sleeves the Flared and section sleeves shall be placed in line with the pipe sleeve. Side shells shall be treated as required for the Flared and sections.

5. Flared End Sections to be paid for under the contract unit price for Flared End Section Concrete, I.E. Sealing shall be in accordance with index No. 289, and paid for under the contract unit price for Sealing, I.E.

DESIGN NOTES

1. Flared end sections are intended for use outside the clear zone on median drain and cross drain installations, except that Flared end sections for pipe sizes 300 mm and 375 mm are permitted in the clear zone. When the slope intersection occurs, these Flared end sections may be located with the current piping as close as 1.8 m beyond the outside edge of the shoulder.

2. Reinforced concrete jackets shall be used at locations where high velocities and/or high erosive soils may cause disintegrating. 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.

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

5. Toe walls are not required where flow pattern is provided, except when disintegrating would occur if the stream pattern should fail.
### Dimensions and Quantities

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>D x A</th>
<th>B x C</th>
<th>E</th>
<th>R</th>
<th>Single</th>
<th>Double</th>
<th>Triple</th>
<th>Quant.</th>
<th>Single</th>
<th>Double</th>
<th>Triple</th>
<th>Quant.</th>
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**Concrete Slab:** 75 mm or 155 mm Thick, Reinforced with EPS 0.25% 300x300 Weldable Mesh.

**Concrete Slab:** 75 mm or 155 mm Thick, Reinforced with EPS 0.25% 300x300 Weldable Mesh.

**Shell Oil Drain:** Single Pipe:
- C:
- D:
- A:
- B:
- E:
- R:

**Section:**
- V:
- E:
- F:
- G:
- H:
- I:
- J:

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

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<th>Slab</th>
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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>N</th>
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<th>125 mm GDWING</th>
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</table>

**Note:** See Sheet 5 of 6 for 75 mm slab quantities.

---

### Cross Drain Mitered End Section

**Top View - Single Pipe**

- Concrete slab, 75 mm or 135 mm thick, reinforced with WAF 150 x 150 x W4K x W4K.

**Top View - Multiple Pipe**

- Concrete slab, 75 mm or 135 mm thick, reinforced with WAF 150 x 150 x W4K x W4K.

**Notes:**
- See Sheet 6 for details and notes.

---

**Section**

- Pipe to be ordered under Unit Price for Mitered End Section 1.

---

**State of Florida Department of Transportation**

**Cross Drain Mitered End Section**

**Single and Multiple Elliptical Concrete Pipe**

---

**Approvals:**

- Approved by [Signature]

---

**Dimensions & Quantities**

- Table includes dimensions for various slabs and pipes, with columns for different diameters and thicknesses.

---

**Diagram:**

- Shows top views of single and multiple pipes with concrete slabs, with notes on reinforcement and additional details.
| D     | SINGLE PIPE | DOUBLE PIPE | TRIPLE PIPE | QUAD. PIPE | SINGLE PIPE | DOUBLE PIPE | TRIPLE PIPE | QUAD. PIPE | SINGLE PIPE | DOUBLE PIPE | TRIPLE PIPE | QUAD. PIPE | SINGLE PIPE | DOUBLE PIPE | TRIPLE PIPE | QUAD. PIPE | SINGLE PIPE | DOUBLE PIPE | TRIPLE PIPE | QUAD. PIPE |
|-------|-------------|-------------|-------------|------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|------------|
| 375   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 400   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 425   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 450   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 475   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 500   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 525   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 550   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 575   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 600   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 625   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 650   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 675   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 700   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 750   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 800   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |
| 850   | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       | 0.27        | 0.54        | 0.70        | 0.70       |

### ELLIPTICAL CONCRETE

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### CROSS DRAIN

**MITERED END SECTION**

---

*State of Florida Department of Transportation*

*Engineer*

*Design*
GENERAL NOTES

1. Mitered and sections for pipe sizes 375 mm, 400 mm and 600 mm round or equivalent pipe such as elliptical pipe are permitted within the clear zone. When the cross-sectional area permits, the mitered and section may be located with the centerline between slopes as 2:1 in beyond the outside edge of the shoulder.

2. Slope and ditch transitions shall be used when the normal roadway slope must be flattened to place and section outside clear zone. See detail 3.

3. The reinforced concrete slab shall be constructed for all sizes of cross drain pipes and cast in place with Class I concrete. Slab shall be 150 mm thick unless 75 mm thickness allowed for in place.

4. Concrete pipe used in the assembly of mitered and sections shall be sensitive lengths to avoid excessive connections.

5. Corrugated metal pipe galvanization that is damaged during handling and installing for mitered end section shall be required.

6. The portion of corrugated metal pipe in direct contact with the concrete slab shall be bitumen coated prior to placing of the concrete.

7. Unless otherwise designated in the plan, concrete pipe mitered end 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 steel pipe mitered and sections may be used with any type of cross drain pipe except steel pipe. When bitumen coated metal pipe is specified for cross drain pipe, mitered end sections shall be constructed with bitumen pipe or concrete pipe.

8. When the mitered and section pipe is dissimilar to the cross drain pipe, a concrete jacket shall be constructed in accordance with Standard 280.

9. When existing multiple cross drain pipes are spaced other than the dimensions shown in this detail, or have non-parallel axes, or have non-uniform sections, the mitered and section will be constructed either separately as single pipe mitered and sections or alternatively 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.

10. The cost of all pipe, flanges, reinforcing, connectors, anchors, concrete, templates, jackets, and coupling bands shall be included in the cost for the mitered and section. Slabbing shall be paid for separately under the contract unit price of Slabbing, WG.

11. Mitered bent and sections shall be paid for under the contract unit price for Mitered End Section 0201.01, based on each independent pipe end. Mitered and sections used for demarcation/retention basin outlets are to be paid for under the contract unit price for Mitered End Section 1901.01, CA.

SPECIAL DETAILS AND NOTES

CONCRETE PIPE CONNECTOR

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

Bolt diameters shall be 2" for 375 mm to 900 mm pipe, 3" for 935 mm to 1000 mm pipe.

Two connections required per joint, located 60° rigid and 90° of bottom center of pipe.

Bolt holes in pipe shell are to be drilled.

ANCHOR DETAIL

Achors required for CMP only.

Anchors, washers and nuts to be galvanized steel.

Bend anchor where required to center in concrete slab. Damaged surfaces to be replaced after bending. Anchors are to be spaced a distance equal to 1/4d diameter (d = 1.43 corrugations). Place the anchors on the outside edge of corrugation.

Fasten anchors to plate with bolts. All bolts are to be driven or anchored burning not permitted.
DIMENSIONS & QUANTITIES

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| Single Pipe Double Pipe Triple Pipe Single Pipe Double Pipe Triple Pipe Single Pipe Double Pipe Triple Pipe |
|---|---|---|---|---|---|---|---|---|
| Concrete | Concrete | Concrete | Concrete | Concrete | Concrete | Concrete | Concrete | Concrete |
| 410 | 0.40 | 0.69 | 0.38 | 0.40 | 0.69 | 0.38 | 0.40 | 0.69 | 0.38 |
| 410 | 0.49 | 0.76 | 0.46 | 0.49 | 0.76 | 0.46 | 0.49 | 0.76 | 0.46 |
| 410 | 0.62 | 0.77 | 0.55 | 0.62 | 0.77 | 0.55 | 0.62 | 0.77 | 0.55 |
| 410 | 0.75 | 0.77 | 0.64 | 0.75 | 0.77 | 0.64 | 0.75 | 0.77 | 0.64 |
| 410 | 0.84 | 0.77 | 0.73 | 0.84 | 0.77 | 0.73 | 0.84 | 0.77 | 0.73 |
| 410 | 0.94 | 0.77 | 0.84 | 0.94 | 0.77 | 0.84 | 0.94 | 0.77 | 0.84 |
| 410 | 1.01 | 0.77 | 1.02 | 1.01 | 0.77 | 1.02 | 1.01 | 0.77 | 1.02 |
| 410 | 1.07 | 0.77 | 1.15 | 1.07 | 0.77 | 1.15 | 1.07 | 0.77 | 1.15 |

REMARKS

These sizes are restricted to inlet and outlet treatment for water management systems or similar applications.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
MUTCD CONSTRUCTION MANUAL
SIDES DRAIN
MITERED END SECTION
SINGLE AND MULTIPLE ROUND CORRUGATED METAL PIPE

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

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### Notes:
- See Sheets 5 and 6 for details and general notes.
- Concrete Slab, 75 mm thick, reinforced with WMT (90 x 150) W-440/A.
GENERAL NOTES

1. Unless otherwise designated in the plans, concrete pipe, relieved and sections may be used with any type of side drain pipe, corrugated steel pipe, relieved and sections may be used with any type of side drain pipe, except aluminum pipe, and corrugated aluminum relieved and sections may be used with any type of side drain pipe except steel pipe. When stainless steel relieved pipe is specified for side drain pipe, relieved and sections shall be constructed with like pipe or concrete pipe. When the relieved and section pipe is dissimilar to the side drain pipe, a concrete jacket shall be constructed in accordance with Index No. 280.

2. Concrete pipe used in the assembly of relieved and sections shall be of sufficient lengths to avoid excessive connections.

3. Corrugated metal pipe having that is damaged during handling and perforating for relieved and section shall be repaired.

4. Such portion of corrugated metal pipe in direct contact with the concrete sides shall be biologically coated prior to placing the concrete.

5. Corrugated polyethylene pipe (CPE) for side drain application of 375 mm, 450 mm or 600 mm diameter shall utilize either corrugated metal or concrete relieved and sections. When used in conjunction with corrugated metal relieved and sections, connection shall be by either a formed metal bend specifically designed to join CPE pipe and metal pipe or other coupling approved by the State Drainage Engineer. When used in conjunction with a concrete relieved and section, connection shall be by concrete jacket constructed in accordance with Index No. 280.

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

7. In addition to the requirements of Section 430-4, side drain curvets shall comply with the cover requirements shown on Index No. 205.

8. The reinforced concrete section shall be constructed for all sizes of side drain pipe and cart in place with Class I concrete.

9. Round pipe size 750 mm or greater, pipe with a size 900 mm x 660 mm or greater and elliptical pipe 490 mm x 770 mm or greater shall be curved unless excepted in the plans. Smaller sizes of pipe shall be curved only when called for in plans. The lower grade on trilling downstream ends on divided highways shall be centred.

10. Grates are to be fashioned from steel ASTM A 53, Grade B, pipe. The lower grade on all traffic approaches ends shall be Schedule 80 and all remaining grates shall be Schedule 40. Grates subject to salt, brine and corrosive environments may be fabricated from galvanized pipe, with base metal exposed during fabrication repaired as specified in Section 562, Standard Specifications; or, fabricated from black pipe and left ungalvanized after fabrication in accordance with ASTM A 42.

11. Grates subject to salt water or highly corrosive environments shall be hot-dipped galvanized after fabrication in accordance with ASTM A 42.

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

13. The project engineer shall consult the District Drainage Engineer for possible alternate treatment prior to constructing side drain relieved and sections where the minimum spacing of 3.0 m will not result between the toe points of the relieved and sections.

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

DESIGN NOTES

1. In atypical hydraulic loadings, 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 450 mm of cover and grades in excess of 1% will require such an evaluation (General Note 9).

2. The design engineer shall determine highly corrosive locations and specify in the plans when the grates shall be hot-dipped galvanized after fabrication (General Note 9).

3. The design engineer shall determine and designate in the plans which alternate types of relieved and sections will not be permitted. The restriction shall be based on corrosive or structural requirements.
NOTE: The computerized print for reinforcing steel does not include the additional lengths needed for extension and overlaps or connections to the transverse reinforcement in the interior walls of double, triple, and quadruple existing concrete box culverts. The cost for additional extensions and overlaps or connections to the transverse reinforcement in the interior walls of existing concrete box culverts shall be included in the cost for constructing the tie-in.

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

MISCELLANEOUS DRAINAGE DETAILS
The plan for the bridge culvert includes the following details:

**BRIDGE CULVERT NUMBER LOCATION**

- **PLAN INLET TYPE A GRAVE**
  - Three IMS Bars @ 95 Cts.
  - Normal Slab Thickness
  - Additional Concrete Required Only When
    - Normal Slab Thickness
  - IMS unless otherwise shown in Plans.

- **PLAN INLET TYPE B GRAVE**
  - Three IMS Bars @ 95 Cts.
  - Normal Slab Thickness
  - Additional Concrete Required Only When
    - Normal Slab Thickness
  - IMS unless otherwise shown in Plans.

**ASPHALTIC CONCRETE BASE**

- The Contractor shall furnish and install coarse aggregate on filter fabric. The coarse aggregate shall be placed in 150 mm lifts and compacted sufficiently to be firm and unyielding. The coarse aggregate shall be gravel or stone meeting the requirements of Standard Specification 4050-01, Table 4-01-01 and 4-01-02. The filter fabric shall be Type 0-1 (See value 299). The cost of furnishing and installing the coarse aggregate and filter fabric shall be included in the cost of the Box Culvert.

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

- Extra base is required when cross box culverts are located on facilities subject to high speed traffic (>80 mph) or high traffic volumes (>3000 AADT) and the cover is within the range specified in the notation above.
### Ditch Pavement

#### Dimensions

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#### Notes

- All weep holes to be 75 x 900 rectangles or 60 or 900 sq in. (nominal area = 0.04 ft² x 300 x 300 = 110 ft²) of No. 6 aggregate to be placed under each hole. 0.20 ft of rippled mesh (10% opening) shall be placed between the aggregate and the concrete. Cost of material, aggregate, and rippled mesh shall be included in the unit cost of ditch pavement.

#### Paved Ditch End Treatment

When the ditch end is paved, the end of the pavement shall be shaped as shown in the diagram. The end of the pavement shall be protected with a 300 ft x 1 ft strip of sheet metal. The end of the pavement shall be protected with a 300 ft x 1 ft strip of sheet metal.

#### 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 7.5 ft. Joints must be continuous, or alternatively directed by the Engineer.
3. Grading joints may be either formed or construction joint is not required. No open joints shall be permitted.
4. Expansion joints with 1 in. wide prefabricated joint filler shall be constructed at all grades, embankments, and joints of retainer walls more than 600 ft.
5. The end of the paved ditch shall be shaped as shown in the diagram. The end of the pavement shall be protected with a 300 ft x 1 ft strip of sheet metal.
6. In concrete ditch pavement, sheet metal shall be used as shown in the diagram. A tongue is not required when used as a drainage structure.
7. When directed by the Engineer, weep hole spacing may be reduced to 6 ft maximum.
8. For function of R/W ditch side ditch, sheeting of paving to be 300 ft x 1 ft minimum.
9. For ditch pavements requiring filter fabric, the fabric shall be placed between the aggregate and the concrete. Cost of material, aggregate, and rippled mesh shall be included in the unit cost of ditch pavement.
SOADDING QUANTITIES (m²)

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<td>1</td>
<td>2</td>
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<td>4</td>
</tr>
<tr>
<td>1:6</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>ALL SLOPES</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- **U - TYPE ENDWALL INDEX 250**
- **U - TYPE ENDWALL INDEX 266**
- **U - TYPE ENDWALL INDEX 270**
- **STRAGHT ENDWALL INDEX 250**
- **FLARED END SECTION INDEX 270**
- **WINGED ENDWALLS INDEX 266**

**SOADDING**

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**DITCH PAVEMENT & SOADDING**

**SOADDING**

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

**GEOTEXTILE PLACEMENT AT CONCRETE STRUCTURE**

**SODDEN**

**1/1 ENDWALL WITH BUFFERS**
Provide approximately a minimum of 0.25% grade on gutter, slightly sloping the surface of the roadway pavement. Where necessary, within limits of the median, curb or curb and gutter. Construct a drainage flume or flumes at the point of highest or lowest grade. See details.

SECTION AA

Provide smooth section
Watch existing grade

Prop. Part.

Section AA

SECTION BB

Crown line (Exit Part.) or Lane Line of Superwrounded Part. (Exit Part. or New 4-lane Part.)

Prop. Part.

Runoff

Watch surfaces

Prop. West End, Wave Surface if necessary to Drain to Prop. Flume.

E Pubic Rte. or Crossover

Runoff

Provide approximately a minimum of 0.25% grade on gutter, slightly sloping the surface of the roadway pavement. Where necessary, within limits of the median, curb or curb and gutter. Construct a drainage flume or flumes at the point of highest or lowest grade. See details.

MF FOR TYPE A Carb
GFI FOR TYPES E & F Curves
GF FOR TYPES A & E Curves
GB FOR TYPE F Carb

SECTION CC

VID For Types A Carb

Watch surfaces

3% For Type A Carb


MEDIAN OPENING FLUME

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 superwrounded sections of new 4-lane divided highways. Dates above are illustrative only. Cost of flumes to be determined by Engineer. For Design and Construction, see Section 1.5 Wide Road unless otherwise.

2. Flumes to be located in low point of median and at other points as designated in the plans. The locations may be adjusted by the Engineer during construction.
Note: Set reflector plates on right hand curb of bridge ends as shown. Placed to be
furnished by T.O.S.T. and located by the contractor. Cost of locating plates to
be included in proposal. (15 mm blacktop pavement is 15 mm thick.)

SECTION AA

Note: Spillway to terminate as directed by the engineer.

SECTION BB

SECTION CC

GENERAL NOTES

1. This detail not recommended for grades greater than 0.5% or discharges exceeding 0.80 c.f.s.

ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Ditch Pavement (175 mm Thick)</td>
<td>ft²</td>
<td>9.09</td>
</tr>
</tbody>
</table>

*Quantity shown above includes pavement for 2.0 m "Length of Slope". For each additional meter of slope length add 0.90 ft².*
1. Spillway to be paved as shoulder gutter.

2. If spillway extends into a shallow or negative slope, the crest should be modified as necessary.

DETAIL OF CONC. SPILLWAY AT END OF SHOULDER GUTTER

(TO BE USED WHERE INLETS, PIPES & ENDWALLS ARE IMPRACTICAL)
SLOTTED PIPE OPTIONS

OPTION A - ROUND PIPE

OPTION B - ROUND OR ELLIPTICAL PIPE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

FRENCH DRAIN
**Design Notes for Underdrain**

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

2. Type I underdrain is intended for minimum water removal conditions. Type II underdrain is intended for moderate water removal conditions. Where reaction conditions may create channeling, to the use of an inert material or seepage underdrain fabric may be necessary.

3. Type II underdrain is intended for moderate water removal conditions. Where reaction conditions may create channeling, to the use of an inert material or seepage underdrain fabric may be necessary.

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

5. Type III underdrain is intended for use in defective locations and other conditions which require fine material. Type III is recommended and Type III should be used only when Type III is inappropriate. The standard fine aggregate specified for Type III underdrain is approved to 1500-grain per square inch requirements of Chapter 10-050, A.E.C.

6. The designer should evaluate whether a filter fabric envelope is required around underdrain Types I and III. When fabric is specified in the plans, fabric shall be specified in the plans. Fabric is to be paid for separately.

---

**General Notes for Underdrain**

1. The underdrain pipe shall be either 60-mm smooth or 105-mm corrugated tubing unless otherwise shown in the plans. The size to be furnished will be based on the surface internal channel diameter of a pipe with a smooth interior wall. Except when prohibited by the plans, the specified provisions or their equivalent, shall be used in the plans.

2. The designer should be aware of the requirements of Section 902-4 of the Standard Specifications.

3. Course aggregate shall be gravel or stone meeting the requirements of Section 902-3 or 902-3, respectively. The gradation shall meet Section 906-3 Grades 4, 4A, 5, 5A, or 5B stone unless restricted in the plans.

4. Underdrain Type I, II, and III shall be in accordance with Section 480.

5. Filter fabric shall be Type II or I of Section 480.

6. When corrugated polyethylene tubing with brass or 360% perforations is used in conjunction with fine aggregate, a filter fabric meeting Section 480-3 is required.

7. For standard section details, see Index No. 900. Special sections require section details in the plans.

8. All filter fabric joints shall overlap a minimum of 300 millimeters.

9. Underdrain outlet pipe shall be constructed in accordance with the outlet pipe details and general notes for Edgework, Index No. 287. Outlet pipes are to be 600-mm diameter unless smaller pipe sizes are specified in the plans.

---

**Typical Underdrain Sections**

- **Type I**
- **Type II**
- **Type III**
- **Type IV**
- **Type IV A**
- **Type IV B**

---

**State of Florida Department of Transportation Road Division**

**Underdrain**

**Scale 1/1**

**Drawing Number**

**Drawing Date**

**Drawing Sheet**

**Rev Number**

**Drawing Sheet**

**Rev Number**

**Drawn By**

**Checked By**

**Approved By**

**Scale 1/1**
SAFETY MODIFICATION FOR INLETS IN BOX CULVERTS
SHOWING LOCATION OF INLETS ON RETURN

TYPICAL RETURN PROFILES

NOTE:
Profile grades should be established that will allow inlets to be located outside the return whenever practical. Inlets should be located to avoid conflict with pedestrian movement. Special care must be exercised to prevent conflict with public sidewalk curbed ramps for the disabled. For information on public sidewalk curbed ramps refer to Index No. 204.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

CURB RETURN PROFILES

N 1-1

D M 1-1
DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE NOT RESTRICTED BY RIGHT OF WAY

* For back of sidewalk curb or buffer transition and for ramp and sidewalk curb options see Sheet 4.
DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE RESTRICTED BY RIGHT OF WAY

* For BACK OF SIDEWALK CURB OR BUFFER TRANSITION AND FOR RAMP AND SIDEWALK CURB OPTIONS SEE SHEET A.
DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS FOR LINEAR PEDESTRIAN TRAFFIC

MONOLITHIC CAST CURB
SEPARATELY CAST CURB
RAMP AND SIDEWALK CURB OPTIONS

BACK OF SIDEWALK CURB OR BUFFER TRANSITION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

PUBLIC SIDEWALK CURB RAMPS
LANDINGS FOR RAMPs WITHIN PUBLIC RIGHT OF WAY CONSTRUCTed AT LOCATIONS WHERE FUTURE SIDEWALKs ARE PROPOSED, WHERE STABLE SURFACES OTHER THAN SIDEWALKs ARE PART OF A CONTINUOUS PASSAGE OR WHERE A CURB FALLS ALONG THE CIRCULATION PATH TO PEDESTRIAN ROUTES ON ADJACENT SITES.
CONCRETE-CONCRETE JOINTS

**Backer Rod Bond Breaker**

<table>
<thead>
<tr>
<th>Joint</th>
<th>Backer Rod Bond Breaker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sealing Bead Thickness</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>

Notes: Dimensions w will be shown in the plans or associated by the Engineer based on field conditions. Dimension d will be constructed so that the shape factor 0.9 will be maintained by a minimum value of 2 and a maximum value of 4.

**Tape Bond Breaker**

<table>
<thead>
<tr>
<th>Joint</th>
<th>Tape Bond Breaker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Joint Section Material To Be As Specified In The Plans</td>
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</tbody>
</table>

**Prefabricated Elastomeric Compression Seal**

<table>
<thead>
<tr>
<th>Joint</th>
<th>Prefabricated Elastomeric Compression Seal</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Joint Section Material To Be As Specified In The Plans</td>
</tr>
</tbody>
</table>

**Concrete-Pavement Joints**

**Backer Rod Bond Breaker**

<table>
<thead>
<tr>
<th>Joint</th>
<th>Backer Rod Bond Breaker</th>
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<tbody>
<tr>
<td></td>
<td>Sealing Bead Thickness</td>
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<td>18</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>

Notes: Dimensions w will be shown in the plans or associated by the Engineer based on field conditions. Dimension d will be constructed so that the shape factor 0.9 will be maintained by a minimum value of 2 and a maximum value of 4.

**Concrete-Asphalt Shoulder Joints**

**Joint Seal Dimensions**
CONTRACTION ASSEMBLY

EXPANSION ASSEMBLY

Note:
Proprietary contraction and expansion assemblies may be used. Products shall be introduced to the State Construction Office in accordance with section 10.1 of the Product Evaluation Procedure.
NOTE: After the concrete has set to the extent that the keyway will retain its shape, the hex bolt and plastic insert shall be removed. The resulting cavity shall be filled with grout or concrete immediately prior to placing of concrete in the adjacent lane.

ALTERNATE KEYWAY AND HOOK BOLT

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

STEEL HOOK BOLT ASSEMBLY

NOTES:
1. Longitudinal joints will not be required for single lane pavement 4.2 m or less in width. For entrance and exit ramp joint details, see sheet 5 of 5.
2. When pavement width necessitates five or more longitudinal joints which would normally be five joints, one of more joints shall be keyed. No joint shall be tied to the edge of a joint adjacent to a keyed joint including the rigid shoulders.
3. Arrangement of longitudinal joints are to be as directed by the Engineer.
4. All members, meter boxes and other projections into the pavement shall be boxed-in with 15 cm preferred expansion joint materials.

DETAIL OF JOINT ARRANGEMENT
2-THRU LANES WITH SINGLE LANE ENTRANCE RAMP

ENTRANCE TAPER WITH AUXILIARY LANE

ENTRANCE RAMP WITH ADDED LANE

EXIT TAPER WITH AUXILIARY LANE

2-THRU LANES WITH SINGLE LANE EXIT RAMP

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

JOINT LAYOUT AT ENTRANCE AND EXIT RAMP TERMINALS

Note: On single lane ramps, longitudinal joint to be constructed along centerline of ramp.
**Expansion Joints** shall be constructed parallel to the existing Transverse Pavement Joints or Rehabilitation Projects, and Perpendicular to the Standard Transverse Pavement Joints shown in the Plans for New Construction.

**PLAN**

**WITH ROD SHOULDER PAVEMENT**

**WITH GRASSED SHOULDER OR FLEXIBLE SHOULDER PAVEMENT**

**REINFORCING STEEL**

**OPTIONAL SEALS**

**SECTION AA**

**EXPANSION JOINT**

**DETAIL SHOWING SHEET METAL STRIP**

**DESIGN NOTES**

1. For rehabilitation projects, the designer shall indicate in the plans the number of slabs to be removed, the location of the expansion joints to be reconstructed or relocated, and the location of expansion joints.

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

**GENERAL NOTES**

1. The centerline of roadway and centerline of bridge does not necessarily coincide. Prior to placement of the expansion joint, the centerline of the roadway pavement shall be established.

2. For information on other types of concrete pavement joints see Index No. 305.

3. Pay quantity for expansion joint is the length of joint to be constructed across the roadway and shoulder pavements, measured at right angles to the centerline of the roadway.

   Payment for expansion joint shall be full compensation for joint construction, including reinforced concrete slabs, sheet metal strip, and compression seal, but not including roadway pavement reconstruction associated with joint replacement or reconfiguration.

   Expansion joints to be paced for under the contract unit price for Bridge Approach Expansion Joint, etc.

**JOINT DIMENSIONS**

**COMPRESSION SEAL DETAIL**
CONCRETE SIDEWALK FOR CURBED ROADWAYS
GUARDRAIL APPLICATION FOR ROADSIDE HAZARDS

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

UNDIVIDED ROADWAY - DETAIL H

Note: See General Notes No. 1, 2, 4, 15, and 17. See Details J and K for connections to bridges.

For approach end anchorages assemblies see end anchorage assemblies types MELT: S.R. 295, E.T. 2000 and BEST.

DIVIDED ROADWAY - DETAIL I

GUARDRAIL APPLICATIONS FOR BRIDGES WITH FULL WIDTH SHOULDERS

UNDIVIDED ROADWAY - DETAIL S

Note: See General Notes No. 1, 2, 4, 15, and 17. See Details J and K for connections to bridges.

For approach end anchorages assemblies see end anchorage assemblies types MELT: S.R. 295, E.T. 2000 and BEST.

DIVIDED ROADWAY - DETAIL T
**GUARDRAIL APPROACH TREATMENT FOR CURB AND GUTTER**

**DETAIL Q**

- **PLAN**
  - Sidewalk (Voraks)
  - 50 mm Misc. Asphalt

- **SECTION CC**
  - Sidewalk (Voraks)
  - 50 mm Misc. Asphalt

- **SECTION BB**
  - Sidewalk (Voraks)
  - 50 mm Misc. Asphalt

- **SECTION AA**
  - Sidewalk (Voraks)
  - 50 mm Misc. Asphalt

---

**Notes:**

- Safety pipe roll required when back of steel guardrail posts 1.2 m or less from rear edge of pedestrian way or bikeway and post spin treatment required when back of timber post 1.2 m or less from rear edge of pedestrian way or bikeway. See "Special Safety Pipe Roll".

- Curb flare shell follow guardrail flare, see "END ANCHORAGE ASSEMBLY TYPE MELT" and "END ANCHORAGE ASSEMBLY TYPE SRT-350" for additional guardrail flare information.
CONCRETE ANCHOR BLOCK OPTION

CABLE ANCHOR OPTION

END ANCHORAGE ASSEMBLY TYPE II

1. Unless specified in the plans, the contractor can supply either the cable anchor option or the concrete anchor block option.

2. These anchors are to be paid for under the contract unit price for Guardrail End Anchorage Assembly Type II LA.
PLAN

MODIFIED ECCENTRIC LOADER TERMINAL (MELT)

ELEVATION

FLAT PLATE LAYOUT

BUFFERED END SECTION

STEEL STRUT AND YOKE ASSEMBLY

MODIFIED ECCENTRIC LOADER TERMINAL NOTES

1. See General Notes for application.

2. If the plans specify an end anchorage assembly type MELT/ST, 350, the contractor has the option to construct either the MELT or the ST-350 assembly. If the plans call for the ST-350, substitution with the MELT will not be permitted. Any substitution between the MELT and ST-350 will not be eligible for VDOT consideration.

3. The MELT and anchorage is to be paid for under the contract unit price for Guardrail End Anchorage Assembly MELT/ST-350, 4A, and shall be full compensation for furnishing and installing fabricated Diaphragm Plate, Special End Shoe, Base Anchor Plate, Cabot Assembly, Pipe Sleeves, 2 Steel Plates, 2 Steel Tubes, Bearing Plates, 4-CRT Trimmer Posts, 2 Short Trimmer Breakaway Posts, 2 Diaphragm Plates, Steel Strut and Yoke Assembly, Steel Angle, Retractor/Sheathing, and the necessary hardware.
END ANCHORAGE ASSEMBLY TYPE ET-2000
END ANCHORAGE ASSEMBLY TYPE SRT-350
### GENERAL NOTES

1. Whether an existing bridge handrail is to remain in place, be retained or be replaced, is a determination that must be made independently of any information contained in this Index.

2. The schemes on this Index are not to be used for new bridge construction, bridge widening, bridge barrier wall or handrail replacement, i.e., for existing bridges that have wing walls for guardrail connection that conform with configurations shown in current roadway design standards and Bridge Design Standards.

3. The schemes on this Index are divided into two general categories, representing curved and uncurved roadway approaches. A scheme selection guide is provided under “Additional Notes” for curved and uncurved roadway approaches. Approach side with curbs or with walls with raised safety rails will be designed as raised curb barriers.

4. Existing bridge features shown in these schemes are only configurations shown. The principle key to scheme selection is bridge curb or sidewalk with sidewalk control is to bridge face of curb, except for certain traffic conditions.

5. Details that are specific to the schemes and features that are indicated on Index No. 400 have been purposely drawn to produce clarity and simplicity in the schemes, and to enable proper location and positioning of the exchange and connecting guardrail.

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

7. For undivided two-way bridges “trailing end,” as used in this Index, is in relation to the direction of travel near main traffic, but it is always considered as an approach for operating same traffic.

8. All construction of guardrail special and shown to operator exchange posts, parapet and wall shall have a 2.0 x 2.0 x 2.000-gallon steel tank for 30 mm diameter guardrail and either forms or formed sheet rolled up. Tank shall have a nominal depth equal to the thickness of the concrete exchange plus 40 mm. When traffic belts will accommodate existing bridge rails, 25 mm diameter plain or cast iron and steel guardrail may be used in accordance with manufacturer’s recommendations.

9. Unless otherwise noted for in the porous exposed concrete surfaces shall be a Class 3 Surfacing Mix (AGA 5) Applied “In-Place” Cast-in-Apposition with Sections 8-10 and 400 respecting the Municipal Standards.

### DESIGN NOTES

1. The details in this Index are intended to be used for existing bridges that have end and approach job configurations constructed under former Department standards and not intended to include decorative architectural elements nor suited to bridges with changed decorative architectural elements, i.e., changes to the approach.

2. The schemes provide the designer with a convenient method of selecting standardized information on the bridge. In the selection and installation of schemes the designer must review existing bridge curbs, sidewalk and approach road conditions, particularly the condition of medians and shoulders. Special attention must be directed to the presence or absence of curbed approaches at each independent end of the bridge.

3. Each portion of the bridge that requires a guardrail connection should be labeled individually by scheme number, and where continuous barrier is required on bridges the scheme number is labeled as shown in the Index. Where continuous guardrail is selected for, bridge and exchange assemblies will be specified, but, when continuous concrete safety barrier is selected for, one lane bridge and exchange assemblies will be labeled on the plans.

4. The scheme selection guide below is to be used as a quick reference for determining exchange and barrier details that are applicable to specific conditions for existing bridges. When appropriate, specific details are to be used in lieu of schemes or in supplement of bridge scheme details, in selecting scheme the width of curb, safety rail and side of the road.

### SCHEME SELECTION GUIDE (NUMBERS)

#### WITH ROADSIDE CURBS APPROACHING BRIDGES

<table>
<thead>
<tr>
<th>ONE-WAY BRIDGES</th>
<th>TWO-WAY BRIDGES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APPROACH END</strong></td>
<td><strong>APPROACH END</strong></td>
</tr>
<tr>
<td>Handrail Curb</td>
<td>3, 4, 6</td>
</tr>
<tr>
<td>Normal Curb</td>
<td>2, 3, 4, 5, 6, 7, 13, 14, 15, 16, 17, 18</td>
</tr>
<tr>
<td>Wire Safety Curb</td>
<td>1, 2, 4, 6, 8, 10, 14, 15, 16, 17, 18</td>
</tr>
<tr>
<td>Steel Curb</td>
<td>1, 4</td>
</tr>
</tbody>
</table>

#### WITHOUT ROADSIDE CURBS APPROACHING BRIDGES

<table>
<thead>
<tr>
<th>ONE-WAY BRIDGES</th>
<th>TWO-WAY BRIDGES</th>
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</tr>
<tr>
<td>Steel Curb</td>
<td>1, 4</td>
</tr>
</tbody>
</table>
BRIDGE WITHOUT APPROACHING ROADWAY CURB

APPLICATIONS
SAFETY CURB MOW TO 200 MIL WIDE
POLE AND DISCONTINUOUS BEAM MACHING
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES

CAST IN PLACE PANELS

APPLICATIONS
SAFETY CURB MOW TO 200 MIL WIDE
POLE AND DISCONTINUOUS BEAM MACHING
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES

CAST IN PLACE CONCRETE PANEL

CONCRETE SAFETY BARRIER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PROJECT DESIGN

GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES

REVISION NO.

DRAFT DATED

ENGINEERED BY:

ARCHITECT:

DRAWN BY:

CHECKED BY:

APPROVED BY:

17-11-08

7 of 9

401
LIGHT POLE MOUNTING IN MEDIAN BARRIER WALL

JUNCTION BOX - ELECTRICAL

1. Junction boxes are to be fabricated from steel conforming to ASTM A36 and be not shaped or gashed after fabrication. All threads shall be continuously welded and ground smooth. A neoprene gasket shall be attached to the box to provide a weather tight cover. The cover screws shall be fully galvanized.

2. Remove excess concrete while green and bend form chokers.

3. J oint box concrete and conduit lines are to be sealed to the specification and point of the barrier wall. There is to be no separate compensation for the box. Flows of installation unless specifically stated for in the plans.

JUNCTION BOX NOTES
CANTILEVER WALL

L-WALL

**See Bending Diagram On Sheet S.**
All reinforcement is per bars.

REINFORCING STEEL MODIFICATIONS
AT BARRIER WALL INLETS (INDEX NO. 28)

PLAIN CONCRETE BARRIER WALL (SHOULDER)

REINFORCED CONCRETE BARRIER WALL (SHOULDER)
BENDING DIAGRAMS

NOTE: All reinforcement CW bars.
Minimum span length for this wall is 6 m.
All to be cast in place for the contract unit price
for Barrier Wall Concrete (Rigid-Construction), $/m.

QUANTITIES (For Spanning Purposes Only)
C.W. Concrete 5.75 $/m
Reinforcing Steel 24 $/kg

REINFORCED CONCRETE BARRIER WALL (RETAINING)
Two-Way Traffic (Undivided)

Bridge End Hazard

One-Way Traffic

Bridge End Hazard

Two-Way Traffic (Undivided)

One-Way Traffic

HAZARD 1.2 m OR LESS FROM FACE OF CURB

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • CURB AND GUTTER WITH UTILITY STRIP
TWO-WAY TRAFFIC (UNDIVIDED)

ONE-WAY TRAFFIC

BRIDGE END HAZARD

Hazard 1.2 m or less from face of curb

Concrete Barrier Wall (Rigid) (Curb & Gutter) • Curb and Gutter without Utility Strip
TWO-WAY TRAFFIC (OPPOSING LANE APPROACH)

ONE-WAY TRAFFIC (TRAILING END)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENTS
SHOULDER BARRIER WALL AT ABOVE GROUND RIGID HAZARDS
WHEN GUARDRAIL OFFSET FROM HAZARD LESS THAN 0.9 METERS
GUARDRAIL CONNECTION TO CONCRETE BARRIER WALLS

STANDARD GUARDRAIL APPROACH TO SHOULDER BARRIER

STANDARD TIMBER OFFSET BLOCKS • FIELD TRIMMED FOR USE AT SECTIONS AA & CC

CONCRETE BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

GUARDRAIL CONNECTION TO CONCRETE BARRIER WALLS

NOTES:
1. The illustration dimensions and segment details shown for median concrete barrier walls apply to shoulder concrete barrier walls.
2. For barrier wall trailing end guardrail connections for one-way lanes, see Sheet B.
3. Where shown, it is necessary to FR-nest below the centerline surface shall be
   materialized in accordance with index No. 400.
4. Steel guardrail post may be substituted for timber posts when guardrail using steel
   posts comply to the intensification section, however, when the C-A-T System
   contains FR-nesting, FR-nesting shall be used.
5. The nestless beam shall be turned to blanks and pairs of posts numbers 11, 13, and 15.
6. For additional guardrail information refer to Index No. 400. For additional crash
   evaluation/retaining rail information refer to Index Nos. 425 and 433.
END TREATMENT FOR PRECAST OR CAST-IN-PLACE WALLS

NOTES

1. Where masking is necessary to fit nested beam, the masked surface shall be metalized in accordance with index No. 400.

2. The nested beam shall not be bolted to the posts and blocks at post numbers 11, 13, and 15.

3. For additional waffle slabs, see Sheet D5.

4. For additional guardrail information refer to Index No. 400.

GUARDRAIL CONNECTION TO TRAPEZOIDAL BARRIER WALL
**TRITON BARRIER SYSTEM**

**TRITON BARRIER SECTION**

**SUPPLEMENTAL GENERAL NOTES FOR THE TRITON BARRIER**

1. The system presented on this standard drawing (index) under the label TRITON BARRIER is a proprietary design by Energy Absorption Systems, Inc. and is marketed under the trade name TRITON BARRIER.

2. This index provides the general graphics and information necessary to identify specific components of the TRITON BARRIER and their incorporation as a whole system for Department standard applications.

3. The TRITON BARRIER system can be installed as a fixed barrier system or as a flexible system, with Department regulatory and permanent barrier systems, exclusive of other proprietary water-filled barrier systems.

4. Connections between the TRITON BARRIER and other barrier systems shall be as shown in the TRITON BARRIER TRANSITION HARDWARE ASSEMBLY. Variations from these connections shall be as detailed in the plans or as otherwise specified by the manufacturer.

5. The TRITON BARRIER section or sections are not to be used as pedestrian road closure barriers, whether permanent, removable, filled or unfilled.

6. Sections shall be installed in alternating white and yellow painted safety orange colors.

7. The TRITON BARRIER system shall be paid for under the contract unit price for Barrier (Temporary) (Water Filled). If applicable, the unit price for the TRITON BARRIER shall be in accordance with this index, with the plans and with the manufacturer's standard drawings, plans and specifications. The cost for the TRITON BARRIER system shall be included in the bid.

**SUPPLEMENTAL DESIGN NOTES AND GUIDELINES FOR THE TRITON BARRIER**

1. The Temporary system can be used for work zone speeds of 70 km/h or less. Transition hardware can be used in areas where speeds are limited to 70 km/h or less.

2. When the approach end of a TRITON BARRIER system is located within the clear zone and approach lanes are 70 km/h or less, the TRITON BARRIER can serve as its own crashworthy and treatment by allowing water partial frame, raised section and by enclosing the connecting pin on the raised end. For all other speeds either for the end section(s) and studied or extended the system with slight only if so desired.

**GENERAL NOTES**

1. This standard drawing (index) presents proprietary temporary water-filled barrier designs and is produced by the Florida Department of Transportation solely for use by the Department and its suppliers.

2. Any system presented on this index may be used as a temporary barrier. In traffic control work zones and other Department permitted traffic control zones, but not as a substitute for a permanent barrier.

3. All systems shall be approved and installed in accordance with the manufacturer's detailed drawing, procedures, and specifications. However, installation will not change the ratings shown on this index, except when otherwise detailed in the plans or approved by shop drawings or approved by the Engineer.

4. Water-filled barrier systems are to be used only as longitudinal systems. A longitudinal system may include expanding water space barriers within the speed limits specified for the application shown on this index, except when specifically specified for and detailed in the plans, or for specific applications of nontransitional sections which are specified on this index.

5. Water-filled barrier systems are to be used on surfaces with cross slopes exceeding 0.5% (3 in 30), including the surface within the design deflection space defined after the barrier.

6. Water-filled barrier systems shall be used to grass (shaper than 5%, nor placed over surface irregularities that cause vertical deflection exceeding 1:20 between connected sections.

7. Water-filled barrier systems are not to be used on grasses (shaper than 5%, nor placed over surface irregularities that cause vertical deflection exceeding 1:20 between connected sections.

8. Water-filled barrier systems shall be used on grasses (shaper than 5%, nor placed over surface irregularities that cause vertical deflection exceeding 1:20 between connected sections.

9. Water-filled barrier systems are not to be used on grasses (shaper than 5%, nor placed over surface irregularities that cause vertical deflection exceeding 1:20 between connected sections.

10. Temporary water-filled barriers are to be used for the contract unit price for Barrier (Temporary) (Water Filled). For additional payment information see the supplemental guidelines for temporary barriers.

**DESIGN NOTES**

1. The TRITON and GUARDINER water-filled barriers are considered by the Florida Highway Administration to be temporary traffic barriers and may be used as such toward compliance with the percentage of innovative barrier requirement for the total median barrier on Federal Aid Projects.
SYSTEM LENGTHS FOR UNI-DIRECTIONAL OR BIDIRECTIONAL TRAFFIC

DETERMINING THE IMPACT ANGLE CURVE TO APPLY

Except where the plans call for the use of a certain impact angle curve, or where a critical impact angle is anticipated by site specific conditions, the impact angle curve to be used in determining impact severity will be selected on the following basis:

Barrier Location

| Parallels to tangent roadway | 5° |
| Parallels to and on the inside of roadway curve | 5° |
| Standard line shift or drop (\(L_0\) = \(L_{20}\)) | 10° |
| Parallels to and on the outside of roadway curve | 5° |
| Approach Fored and section on outside of roadway curve | 5° |
| Approach Fored and section on approach tangent roadway | 10° |

Graph Curve

\[ \theta = \begin{cases} 
5° & \text{Parallel to tangent roadway} \\
5° & \text{Parallel to and on the inside of roadway curve} \\
10° & \text{Parallel to and on the outside of roadway curve} \\
10° & \text{Approach Fored and section on outside of roadway curve} \\
10° & \text{Approach Fored and section on approach tangent roadway} \\
15° & \text{Other cases (e.g., \(L_0 = L_{20}\))} 
\end{cases} \]

\[ \theta = \begin{cases} 
5° & \text{Parallels to tangent roadway} \\
5° & \text{Parallels to and on the inside of roadway curve} \\
10° & \text{Standard line shift or drop (\(L_0 = L_{20}\))} \\
5° & \text{Parallels to and on the outside of roadway curve} \\
5° & \text{Approach Fored and section on outside of roadway curve} \\
10° & \text{Approach Fored and section on approach tangent roadway} \\
\end{cases} \]

VELOCITY (km/h)

IMPACT SEVERITY DETERMINATION FOR VEHICLES

\(2000 \text{ kg IMPACTING SINGLE ROW TRITON SYSTEM} \)

IMPACT SEVERITY AND LATERAL DEFLECTION DISTANCES

TRITON BARRIER SYSTEM LENGTHS AND DEFLECTIONS

TEMPORARY WATER FILLED BARRIERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION HARD SELECTION

COPA APPROVED 84 2 of 5
SUPPLEMENTAL GENERAL NOTES FOR THE GUARDIAN BARRIER

1. The barrier units presented on this standard drawing (Figure 1 and the label GUARDIAN are proprietary designs by Safety Barrier Systems and are marketed under the trade name GUARDIAN Safety Barrier.

2. This index provides general schematics and information necessary to fabricate the water filled polyurethane segmented barrier module and the anchor frame and base connections, but does not identify the incorporation of the modules and frame connections into a whole system. Any use of the GUARDIAN must be in accordance with the details on the plans, or by shop drawing approval or by the Engineer in absence of plan details.

3. The GUARDIAN module can be used only on highways with operating speeds 80 mph or less and only where the "GUARDIAN 350 highway kit" is incorporated throughout the system to use.

4. The GUARDIAN modules can be used only in a standard lane system, i.e., not connected to other types of barrier systems.

5. The GUARDIAN can be used only as a longitudinal barrier on the State maintained highway system. Any longitudinal system must have a minimum of eleven (11) longitudinal connection modules (20 ft.) in advance of and following the length of need. In no case can the longitudinal-run of barrier be less than 33 modules (660 ft.).

The approach end of the GUARDIAN must either extend to the outer limit of the clear zone, be extended by a crash cushion, or, begin behind but not connected to another barrier or shielding feature.

6. The portion of any GUARDIAN system located within the length of need must be on a slope of not exceeding 1:30, and placed to provide a deflection distance between the system and hazard of two meters (2.0 m) minimum.

7. The GUARDIAN barrier system shall be bid for under the contract unit price for Barrier (Temporary / Water Filled), k.u., and shall be full compensation for furnishing and installing GUARDIAN barrier in accordance with this index, with the plans and with the manufacturers detailed drawings, procedures and specifications. Any Crashworthy and Terminal, crash barrier or other additional required for use of the GUARDIAN barrier will not be included in the contract unit price for the barrier unless the inclusion is noted for in the plans.

SUPPLEMENTAL DESIGN NOTES FOR THE GUARDIAN BARRIER

1. At time of publication of this standard to crash test data was available to provide a crashworthy and terminal design using the barrier module only the requirement for eighteen (18) longitudinal connection modules protecting and following the length of need, based on available crash test data.

2. Systems included in any maintenance of traffic plan will require detailed location and placement information.

3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the GUARDIAN barrier, and until such alternatives are validated, the GUARDIAN barrier need not be bid against other proprietary items.
INDEX OF SHEETS

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

GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name G-R-E-A-T. pel for Guard Rail Energy Absorbing Terminus. Any infringement on the rights of the designer shall be the sole responsibility of the user.

2. This standard drawing is prepared by the Florida Department of Transportation for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to detail and identify the components of the G-R-E-A-T System and their integration into a whole barrier system.

3. This standard drawing is insufficient for plan details for the G-R-E-A-T, installed as a free standing system or integrated in conjunction with concrete barrier walls and other fixed barrier systems, and procedures are required to provide drafting accuracy unless the plans otherwise call for such submittals.

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

5. The G-R-E-A-T is available in 600, 800, and 900 mm widths. Each of these widths may be specified to any of the four backup assemblies shown in this index. The four backup assemblies are to be utilized as follows:
   - 1) Concrete wall backup assemblies.
   - 2) Tension strut backup assemblies.
   - 3) Wide flange backup assemblies.
   - 4) Independent systems.

6. Only the G-R-E-A-T with 8 ft. (2400 mm) carriages should be used in all bays and the race section.

7. Concrete foundations and backup blocks shall be constructed with 20.80 mph compressive strength concrete.

8. The G-R-E-A-T shall be constructed on cross slopes 1:4 or flatter.

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

10. A Type I object marker shall be placed on the race cover in accordance with index No. 9155.

DESIGN NOTES AND GUIDELINES

1. The G-R-E-A-T System is designed to sustain automobiles and other objects and to retard automobiles from sideslips. The G-R-E-A-T is designed to withstand normal fixed barriers or the ends of other fixed barrier systems. The number of bays to be used in a specific unit shall be determined by the design speed, except where the Engineer determines that weather is more important. The unit width will be determined by the width of the object to be obstructed or by the operating barrier speed. The backup assembly for a specific G-R-E-A-T shall be determined by either the unit standing free of the object to be obstructed or the barrier system it is to which it is connected.

2. The G-R-E-A-T is a repositionable system that is particularly suitable to shielding hazards subject to high speed traffic, high volume traffic, and/or traffic with a history of frequent excess vehicle departures from the roadway or the potential exists for such departures. The G-R-E-A-T system is not suited to shielding a wide hazard. The G-R-E-A-T system is particularly suited to shielding hazards where the approach speed is 70 mph, and is particularly suited to sections where the terminal must be placed close to the road.

3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the G-R-E-A-T, and until such alternatives are approved, the G-R-E-A-T need not be bid against other proprietary items.
### CONCRETE BACKUP WALL ASSEMBLY

#### NOTES
1. For the number of bags required see Table 1.
2. See Transition Assembly Features for guardrail connections.
3. For design information see the General Notes.

#### Reinforcement
- **Beam Panel**: Required.
- **Diaphragm Panel**: Optional.
- **Gusset Panel**: Required.

#### Assembly Table

<table>
<thead>
<tr>
<th>NO. OF BAGS</th>
<th>A (mm)</th>
<th>B (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>722</td>
<td>834</td>
</tr>
<tr>
<td>2</td>
<td>1,715</td>
<td>1,904</td>
</tr>
<tr>
<td>3</td>
<td>3,324</td>
<td>3,866</td>
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<tr>
<td>4</td>
<td>4,580</td>
<td>4,737</td>
</tr>
<tr>
<td>5</td>
<td>5,460</td>
<td>5,640</td>
</tr>
<tr>
<td>6</td>
<td>6,100</td>
<td>6,250</td>
</tr>
<tr>
<td>7</td>
<td>6,708</td>
<td>6,900</td>
</tr>
<tr>
<td>8</td>
<td>7,210</td>
<td>7,350</td>
</tr>
<tr>
<td>9</td>
<td>7,660</td>
<td>7,800</td>
</tr>
</tbody>
</table>

*Note: Depth measurements are to be in accordance with the manufacturer's fabrication drawings and specifications.*

#### Foundation
- **Reinforcement**: Required.
- **Footings**: Optional.

#### Plan
- **Arrows**: Labeled for direction.
- **Dimensions**: Clearly marked.

#### Unit Plan
- **Label**: A
- **Notes**: Cables required for units.

#### Unit Elevation
- **Label**: A
- **Dimensions**: Clearly marked.
- **Details**: Gussets and footings.

#### Wall Details
- **Reinforcement**: Required.
- **Diaphragm**: Optional.

#### Side View
- **Arrows**: Labeled for direction.
- **Dimensions**: Clearly marked.

#### Section AA
- **Arrows**: Labeled for direction.
- **Dimensions**: Clearly marked.

#### General Notes
- For design information see the General Notes.

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**State of Florida Department of Transportation**

**G-R-E-A-T System**

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[Image of drawings and tables related to the concrete backup wall assembly with specific measurements and requirements.]
**ASSEMBLY LENGTHS**

<table>
<thead>
<tr>
<th>No. of Bays</th>
<th>L (in)</th>
<th>Lg (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.37</td>
<td>0.37</td>
</tr>
<tr>
<td>2</td>
<td>2.56</td>
<td>2.13</td>
</tr>
<tr>
<td>3</td>
<td>3.86</td>
<td>3.22</td>
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<tr>
<td>4</td>
<td>5.28</td>
<td>4.39</td>
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<tr>
<td>5</td>
<td>6.70</td>
<td>5.58</td>
</tr>
<tr>
<td>6</td>
<td>8.23</td>
<td>6.86</td>
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<td>7</td>
<td>9.89</td>
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<td>8</td>
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<td>9.72</td>
</tr>
<tr>
<td>9</td>
<td>13.57</td>
<td>11.29</td>
</tr>
</tbody>
</table>

Note: Distances shown are to be in accordance with the manufacturer's installation drawings and specifications.

---

**TENSION STRUT BACKUP ASSEMBLY**

1. For the number of bays required see Table, Sheet 1.
2. See Transition Assembly Features for guardrail connections.
3. For design information see the General Notes.
**ASSEMBLY LENGTHS**

<table>
<thead>
<tr>
<th>No. of Bays</th>
<th>L (ft.)</th>
<th>L (m)</th>
<th>Foundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.75</td>
<td>0.53</td>
<td>0.52</td>
</tr>
<tr>
<td>2</td>
<td>3.51</td>
<td>1.05</td>
<td>1.05</td>
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<td>4</td>
<td>7.02</td>
<td>2.10</td>
<td>2.10</td>
</tr>
<tr>
<td>8</td>
<td>14.04</td>
<td>4.28</td>
<td>4.28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A (ft.)</th>
<th>B (ft.)</th>
<th>C (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>305</td>
<td>608</td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>305</td>
<td>635</td>
<td></td>
</tr>
<tr>
<td>320</td>
<td>635</td>
<td>1260</td>
<td></td>
</tr>
</tbody>
</table>

Note: Bolt longitudinal spacing to be in accordance with the manufacturer's installation drawings and specifications.

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**PLAN**

- **FOUNTAIN**
  - 16M Highline Bar 1000 Long

---

**SECTION AA**

**SECTION BB**

**SIDE VIEW**

**SECTION CC**

**UNIT PLAN**

**UNIT ELEVATION**

**NOTES**

1. For the number of bays required see Table, Sheet 1.
2. See Transition Assembly Features for grouted connections.
3. For design information see the General Notes.

**WIDE FLANGE BACKUP ASSEMBLY**
TRANSITION ASSEMBLIES FOR G-R-E-A-T CONNECTIONS TO GUARDRAIL

1. For additional information see the General Notes and backup assembly details.
BIDIRECTIONAL SYSTEM

GENERAL NOTES
1. The energy absorbing system represented on this standard drawing is a proprietary design of an independent manufacturer. Any arrangement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department of Transportation for use by the Department and its agencies. This standard drawing provides the general information and graphical elements for the identification and application of the BrakeMaster system and their incorporation into the applicable standard drawings.
3. This standard drawing is sufficient for plan details for the BrakeMaster system installed in connection with standard single and double faced guardrail systems, and to provide the requirement for shop drawings standards unless the plans otherwise specify for such an application.
4. The BrakeMaster system shall be assembled and installed in accordance with the manufacturer’s detailed drawings, procedures and specifications.
5. The BrakeMaster system shall be constructed only as proposed in the standard drawings.
6. The BrakeMaster system shall be located closer than 3.5 meters to any traffic lane.
7. The (2) end section represented on this drawing applies to connections with single or double faced guardrail, where the BrakeMaster system is installed in conjunction with safety shaped or verti-cal face guardrail works or other rigid structures, a special transition guardrail section between the brake master and wall or structure shall be as detailed on the index No. 400 or as approved by shop drawings.
8. All hardware components shall meet the gaging requirements for guardrail, index No. 400.
9. A Type I object shall not be placed on the breakaway zone in accordance with index No. 400.
10. The BrakeMaster system will be sold for the contract unit price for separate Alternator Vehicular (BrakeMaster) each.

DESIGN NOTES AND GUIDELINES
1. The BrakeMaster system is designed to stop automobile over-run vehicles and to retain automobiles from side impact when requiring a speed up to and including 80 km/h. The BrakeMaster will not be a significant design for speeds over 80 km/h. Any adjustment to its design will not be certified except as authorized by the manufacturer.
2. The BrakeMaster system is specifically designed to shield both narrow sidewalks and the ends of other fixed barriers located in low frequency impact areas. The BrakeMaster system is not intended for use in high frequency impact areas where there is a history of high frequency vehicle accidents from the roadway or the potential exists for such accidents. The BrakeMaster system is not a rehabilitation design and therefore requires complete replacement after being subjected to an end-on or a side vehicular impact. Deflected side rail elements of the BrakeMaster will be substandard and are to be replaced immediately. Deflected end elements are not to be refurbished for reuse. When replacing an impacted BrakeMaster system, the manufacturer shall not be required to review the above criteria. After vehicle impact an impacted BrakeMaster system shall be fabricated and shall be the sole responsibility for the impacted BrakeMaster system shall be the manufacturer's responsibility.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the BrakeMaster, and until such alternatives are available, the BrakeMaster shall not be bid against other proprietary items.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

BRAKEMASTER
ANCHOR ASSEMBLY, EMBEDDED BRS

ANCHOR ASSEMBLY, DPA BRS

DIAPHRAGM, BRS

BRAKE/CABLE REPLACEMENT

Note: This assembly is driven into 503 mm Ø 152 mm deep pile hole by drive cap furnished.

Cable Replacement Required When Cable Service Exposed. See "Design Notes and Guidelines", Note No. 3, for Additional Information.
Diagonal Braced Backup Assembly

Backup Assembly
Pull-out Cable
Restraint Cable
Staycable
First Cable Anchor
Min. 28 Mpa P.C. Concrete
Min. 28 Mpa P.C. Concrete

PLAN - UNIDIRECTIONAL UNIT (6 BAY UNIT SHOWN)

PLAN - UNIDIRECTIONAL UNIT (6 BAY UNIT SHOWN)

Backup Assembly
Pull-out Cable
Restraint Cable
Outline Of Concrete Pad

Backup Assembly
Pull-out Cable
Restraint Cable
Outline Of Concrete Pad

PLAN - UNIDIRECTIONAL UNIT (6 BAY UNIT SHOWN)

Outline Of Concrete Pad

Diagonal Braced Backup Assembly

Backup Assembly
Pull-out Cable
Restraint Cable
Outline Of Concrete Pad

Backup Assembly
Pull-out Cable
Restraint Cable
Outline Of Concrete Pad

Supplemental Dimensions

<table>
<thead>
<tr>
<th>No. of Bays</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Bays</td>
<td>2.546</td>
<td>0.047</td>
<td>0.006</td>
<td>0.006</td>
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<tr>
<td>5 Bays</td>
<td>3.432</td>
<td>0.053</td>
<td>0.009</td>
<td>0.009</td>
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<tr>
<td>6 Bays</td>
<td>4.316</td>
<td>0.059</td>
<td>0.011</td>
<td>0.011</td>
</tr>
<tr>
<td>7 Bays</td>
<td>5.004</td>
<td>0.064</td>
<td>0.013</td>
<td>0.013</td>
</tr>
<tr>
<td>8 Bays</td>
<td>5.675</td>
<td>0.069</td>
<td>0.015</td>
<td>0.015</td>
</tr>
<tr>
<td>10 Bays</td>
<td>8.433</td>
<td>0.075</td>
<td>0.018</td>
<td>0.018</td>
</tr>
</tbody>
</table>

*2 diagonal support braces are required on narrow and medium width systems.
3 diagonal support braces are required on wide systems (C1 - 2.386).
GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by Energy Absorbing Systems, Inc. and marketed under the trade name G-R-E-A-T™, short for Construction View Guard Rail Energy Absorbing Terminal. Any infringement on the rights of the designer shall be the sole responsibility of the user.

2. This standard drawing is produced by the Florida Department of Transportation for use by the Department and its assignees. This standard drawing provides the general graphics and interpretation necessary to field identify component parts of the G-R-E-A-T™ System (G-R-E-A-T™) and their incorporation into a whole system.

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

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

5. The standard widths for the 3 bay and 6 bay G-R-E-A-T™ are 600 mm and 900 mm.

6. Connection between the G-R-E-A-T™ and guardrail shall be as shown in the Transition Assembly Features in Index No. 450. For concrete barrier walls with unidirectional traffic, there is no connection between the G-R-E-A-T™ and the wall. The G-R-E-A-T™ shall have the same height as the wall, but a gap not to exceed 200 mm is allowed. For concrete barrier walls with bidirectional traffic, the transition shall pass over the "Fusion Shot Metal Assembly Insert" thereby being the only connection between the G-R-E-A-T™ and the guardrail. Variations from the connection described above shall be as detailed in the plans or as prescribed by the manufacturer.

7. Only the G-R-E-A-T™ 3"-Framed 2 and 3"-Framed 3 shall be used in all bays and the nose section.

8. The G-R-E-A-T™ shall be constructed on cross plates in 40 or 50 frames.

9. All metallic components shall meet the qualifying requirements for guardrail, Index No. 400.

10. A Type I (Object) barrier shall be placed on the nose upper in accordance with Index No. 353.

11. Chemical bolt anchors (6-3 anchors) are supplied with each G-R-E-A-T™ unit purchase. For units that are removed and require reset, each anchor shall be reset. For units that are removed and require reset, the user shall reset the unit with manufacturer supplied new #6-3 anchors.

12. The G-R-E-A-T™ units that have been impacted by vehicles shall be removed and replaced in serviceable design condition and replaced, when necesario. Units with distorted anchors can be repositioned with undistorted anchors. Units with distorted anchors shall be replaced by the manufacturer after consultation with the consultant. Units with distorted anchors shall be replaced by the manufacturer.

13. The G-R-E-A-T™ manufacturer's "Dragtime Mile Marker System" is not a part of this standard. Any use of the APA System will require shop drawing approval.

14. Quantity for payment is based on each independent separation as indicated in the plans or as directed by the Engineer. The cost for functional, decorative, and structural features as shown on this index shall be included in the cost for the G-R-E-A-T™ system. The G-R-E-A-T™ System shall be paid for under the contract unit price for Vehicular Impact Attenuation Type I (Temporary) (G-R-E-A-T™), L0, or when the G-R-E-A-T™ System is used as an option in accordance with index No. 453 will be paid for under the contract unit price for Vehicular Impact Attenuator Type I (Temporary) Index No. 453 Option L0.

DESIGN NOTES AND GUIDELINES

1. The G-R-E-A-T™ System (G-R-E-A-T™) is designed to minimize automobile and on transit and to reduce automobile and transit accidents.

2. The G-R-E-A-T™ is designed to absorb live kinematic energy from the kinetic energy of the vehicle or transit vehicle at the point of contact.

3. Currently the Department does not recognize other proprietary items as being equally suitable alternaties to the G-R-E-A-T™ and until such alternaties are available, the G-R-E-A-T™ System shall not be used against other proprietary items.
FOUNDATION PAD & MISCELLANEOUS ASPHALT PAVEMENT

MP-3 LONGBOLT ANCHOR SYSTEM

FLEXIBLE FOUNDATIONS

ANCHOR PIN SYSTEM
BRACE AND POST  BRACE TO BRACE ON LINE  BRACE TO BRACE AT CORNER
FASTENER FOR CONCRETE POST AND BRACES

FASTENER FOR TIMBER POST AND BRACE

ALTERNATE CONCRETE POSTS AND BRACES

SPLICES
GENERAL NOTES

1. The opaque visual barrier is intended to function as a visual screen, and is not intended to retain vehicular impact loads nor to resist, control, or redirect vehicles or cargo. The barrier is designed to withstand zone wire loading and strikes by light traffic and, designed to yield in exceptional strikes by vehicles or cargo, and to contain ruptured segments of the screen when peeling to such strikes.

2. When the opaque visual barrier is constructed as an existing barrier wall, decks shall be 600 mm in length, embedded 200 mm into the barrier wall and set with an approved striping panel. Interstitial ties shall be dimensioned to a depth of 6 mm below the top of the dowels unless greater depth is required to accept manufactured grill grates.

When the opaque visual barrier is constructed in conjunction with project concrete barrier walls, decks may be set as described above. In either the drilled or preferred ties or, please at the barrier wall to cast. For dowels that are placed when the wall is cast, the dowel shall be 650 mm in length and embedded to a depth of 300 mm.

3. For both double and single faced concrete barrier walls the opaque visual barrier is to be flashed in the center of the top of the wall.

For single faced barrier walls that are constructed around other vertical structures, the opaque visual barrier shall be flashed at the top of each wall and be carried over to the other side.

For steel-reinforced barrier walls that follow differential profiles, the opaque visual barrier shall be constructed atop the wall with the proper elevation, unless conditions dictate otherwise. Laterally translating or not overlaps for opaque visual barriers that alternate between steel walls shall be detailed in the plans.

For double faced barrier walls that are slotted when connecting to separated bridges, the opaque visual barrier shall be constructed atop the approach side barrier wall, unless differential profiles dictate placing the opaque visual barrier on the departure side barrier wall.

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

4. In lieu of the reinforcement shown the Contractor may substitute welded wire fabric equal to or better than that shown, as approved by the Engineer. Details shall be submitted with requests for submittal.

5. The Contractor may construct continuous precast concrete segments in lieu of the cast-in-place opaque screen when approved by the Engineer. Panel design and method for anchorage to the barrier wall shall be detailed by shop drawings when requesting the Engineers approval.

The Contractor may construct the opaque screen independently with the barrier wall; however, the screen design shall be modified so as to cause the wall to be dynamically active from strikes on the screen, see design considerations in With No. 250.

6. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 307 of the Standard Specifications, unless other finishes are called for in the plans. The surfaces shall have a Class 3 Aggregate Finish Coating in accordance with Section 402 only when called for in the plans.

7. Payment for opaque visual barrier shall be full compensation for concrete, reinforcement, decks, flashing, placement, drizzling, grouting, testing, moisture and wind induced reheats, and shall be paid for under the contract unit price for Opaque Visual Barrier (Concrete) (600 mm height) ft.
REMOVAL OF ORGANIC MATERIAL

GENERAL NOTES

1. All details shown in this Index for removal of organic and plastic materials apply unless otherwise shown on the plans.

2. Utilization of excavated materials shall be in accordance with index No. 506.

3. Where organic or plastic material is underrun, backfill shall be made of suitable material in accordance with index No. 505, unless otherwise shown on the plans.

4. The term "Plastic Material" used in this index in conjunction with removal of plastic soil is defined under soil classifications for Plastic (P) and High Plastic (PH) in index No. 505.

5. The term "Organic Material" as used in this index is defined as any soil which has an average organic content greater than five (5.0) percent, or as individual organic content test result which exceeds seven (7.0) percent, or as material shall be removed on this index and the plans, unless otherwise directed otherwise by the District Geotechnical Engineer.

6. The normal depth of side slopes shall be 6.0 ft below the shoulder point except in special cases.

7. In municipal areas, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain filter material will all extend above the bottom of the stabilized section of the subgrade. Gradation of the filter material will conform to FDOT specifications. Minimum grade on underdrain slope shall be 0.25.

8. See Index No. 506 for miscellaneous earthwork details.

IN RURAL CONSTRUCTION

REMOVAL OF ORGANIC MATERIAL

GENERAL NOTES

1. All details shown in this Index for removal of organic and plastic materials apply unless otherwise shown on the plans.

2. Utilization of excavated materials shall be in accordance with index No. 506.

3. Where organic or plastic material is underrun, backfill shall be made of suitable material in accordance with index No. 505, unless otherwise shown on the plans.

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6. The normal depth of side slopes shall be 6.0 ft below the shoulder point except in special cases.

7. In municipal areas, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain filter material will all extend above the bottom of the stabilized section of the subgrade. Gradation of the filter material will conform to FDOT specifications. Minimum grade on underdrain slope shall be 0.25.

8. See Index No. 506 for miscellaneous earthwork details.

IN URBAN CONSTRUCTION

REMOVAL OF ORGANIC MATERIAL

GENERAL NOTES

1. All details shown in this Index for removal of organic and plastic materials apply unless otherwise shown on the plans.

2. Utilization of excavated materials shall be in accordance with index No. 506.

3. Where organic or plastic material is underrun, backfill shall be made of suitable material in accordance with index No. 505, unless otherwise shown on the plans.

4. The term "Plastic Material" used in this index in conjunction with removal of plastic soil is defined under soil classifications for Plastic (P) and High Plastic (PH) in index No. 505.

5. The term "Organic Material" as used in this index is defined as any soil which has an average organic content greater than five (5.0) percent, or as individual organic content test result which exceeds seven (7.0) percent, or as material shall be removed on this index and the plans, unless otherwise directed otherwise by the District Geotechnical Engineer.

6. The normal depth of side slopes shall be 6.0 ft below the shoulder point except in special cases.

7. In municipal areas, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain filter material will all extend above the bottom of the stabilized section of the subgrade. Gradation of the filter material will conform to FDOT specifications. Minimum grade on underdrain slope shall be 0.25.

8. See Index No. 506 for miscellaneous earthwork details.

DESIGN NOTES

1. All areas where organic material or other soft soil deposits pertain to such depth that removal is impractical, the construction of a geosynthetic foundation over these soils should be considered.

2. The Engineer of Record should request assistance from the District Geotechnical Engineer and solicit geosynthetic foundation designs from geosynthetic manufacturers when pursuing geosynthetic alternatives.

3. The contractor should take into consideration the possibility of varying widths to the outside, and width narrowing is anticipated especially in the plans the limits of removal of organic and plastic materials necessary to accommodate anticipated narrowing.
REMOVAL OF PLASTIC MATERIAL

Notes: For GENERAL NOTES see Sheet L.
DIVIDED ROADWAYS

UNDIVIDED ROADWAY

Symbol: S
Description: Soil Classification (AASHTO M:357)
- S: Silt
- P: Plastic
- H: High Plastic
- M: Muck

Classification Table:
- S: A-1, A-3, A-2, A-4
- M: A-2

Classification listed left to right in order of preference.

DESIGN NOTE
1. Concrete pavement is to be placed over 40 cm of Asphalt Treated Pervious Base (ATPB) or Cement Treated Pervious Base (CTPB) as specified in the plans. This will be placed on an asphaltic surface layer using 20 cm of Type S-50 Structural Course. This will be placed on a working platform using 30 cm of Type S Stabilization.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
EMBANKMENT UTILIZATION

RIGID PAVEMENT - ALTERNATE #2

For wet conditions this dimension may be reduced to 600 cm, see index No. 500.
REMOVAL OF EXCESS BASE MATERIAL

NOTES
1. All material in the shaded area is excess base to be removed.
2. The cost for removal of excess base material shall be included in the contract unit price for base.
3. Payment for base shall be calculated using normal width.

MEDIAN STABILIZING DETAILS

NOTES
1. When the median has curb or gutter, stabilize 0.5 m back of curb.
2. When the median has shoulder with no curb or curb and gutter, stabilize to normal shoulder width.
3. See the details above for stabilizing requirements of crossroads.
4. Stabilize entire area under all-plain traffic islands.
5. Stabilize full width under all-traffic separators.
6. Stabilized material as defined in index No. 50. For major collectors and local facilities the depth of stabiized material thickness may be reduced from 0.5 m to 0.45 m.
SUPERELEVATION RATES (e) FOR RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS

$e_{\text{max}} = 0.10$

CHARTED VALUES

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$e_{\text{max}} = 0.10$

SUPERELEVATION FOR RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS
B-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN
SUPERELEVATION RATES (e) FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS
\( e_{\text{max}} = 0.05 \)

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**CHARTED VALUES**

**GENERAL NOTES**

1. Maximum rate of super-elevation for urban highways and high-speed urban streets shall be 0.05.

2. Super-elevation shall be obtained by rotating the plane successively about the base points of the section until the plane has attained a slope equal to that required by the chart. Should the rotation reverse the entire section and further super-elevation be required, the remaining portion of the plane shall be at the low edge of the inside travel lane.

3. Crown is to be removed in the auxiliary lane to the outside of the curve only when the adjoining travel lane requires positive super-elevation.

4. In construction, plant vertical curves shall be placed at an angular profile breaks within the limits of the super-elevation transition.

5. The variable super-elevation transition length \( 'L'' \) shall have a minimum value of 0.0 m for design speeds under 60 km/h and 23.6 m for design speeds of 60 km/h or greater.

6. Roadway sections having lane arrangements different from those shown, but composed of a series of planes, shall be super-elevated in a similar manner.

7. For super-elevation of lower speed urban streets, see the PDSI "Manual of Uniform Minimum Standards for Design, Construction and Maintenance of Streets and Highways."

**SUPERELEVATION FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS**

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

*5th Edition*

**URBAN HIGHWAYS AND STREETS**

*State Road Design Criteria*
TWO LANCES EACH DIRECTION

TWO LANCES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANE

Note: The sections and profiles shown are examples of superelevation transitions. Similar schemes should be used for roadways having other sections.

EXAMPLE SUPERELEVATION SECTIONS AND PROFILES
FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS
<table>
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* Denotes multiple combinations available. Combination selected must be consistent with the General Notes shown below and the total number of layers shown by (*) used.

**GENERAL NOTES**

1. For combinations not shown in the table, the thickness must be consistent with the following thickness ranges:
   - Type S-1: Minimum 50 mm, Maximum 120 mm
   - Type S-2: Minimum 30 mm, Maximum 90 mm
   - Type S-3: Minimum 20 mm, Maximum 50 mm

2. In addition to the minimum and maximum thickness requirements, the following restrictions are placed on the respective material when used as a structural course:
   - S-1: May not be used in the 1st layer of courses over 50 mm thick, nor in the 1st layer of courses over 50 mm thick on an unlined access facility.
   - S-2: May not be used in the final (top) structural layer.
   - S-3: Limited to the final (top) structural layer, one layer only.

   Above restrictions do not apply to overpass and underpass.

3. When specifying types S-1 or S-2, equivalent 50 mm thickness shall be considered 76 kg. /m² (saturated equivalent for each 10 mm thickness).

4. The designer should consider stage construction for course thicknesses greater than 120 mm.

5. When construction includes the paving of adjacent shoulders (≤1.5 m wide), the layer thickness for the upper pavement layer and shoulder shall be the same and placed in a single pass.

6. See Design Notes.

**DESIGN NOTES**

It is desirable that the top layer of the roadway pavement and the adjacent shoulder structural course be constructed to one pass. The following apply when 1.5 m or less shoulder paving is not considered:

1. If alternate friction courses are not to be shown on the typical section, use the following:

   - **ROADWAY COURSE THICKNESS (mm)***
     - **SHOULDER**
       - **Type S-1**
         - 30 w/ any FC
         - 40 w/ any FC
         - 50 w/ FC-3
         - 65 w/ FC-2
         - 65 w/ FC-3

   *The increased thickness is required to ensure a 10 mm thickness of Type S-2 on the shoulder under the open-gritted friction course and to meet the requirements of the MOL/MDOT criteria of this Index.

2. If alternate friction courses are to be shown on the typical section, use one of the following combinations:

   - **ROADWAY COURSE THICKNESS (mm)***
     - **SHOULDER**
       - **Type S-1**
         - 30 w/ FC-3
         - 40 w/ FC-2
         - 50 w/ FC-3
         - 60 w/ FC-2
         - 65 w/ FC-3

   - **SHOULDER, Type S-2**
     - 60 w/ FC-1
     - 90 w/ FC-2

3. Layer Thickness For FC-2 is 15 mm, Layer Thickness For FC-3 is 25 mm.
GENERAL NOTES

1. On new construction and complete reconstruction projects where an entirely new base is to be built, the design engineer may specify just the Base Group and any of the unrestricted General Use Optional Bases shown in that Base Group may be used. Note, however, that some thick granular bases are limited to widening which prevents their general use.

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

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

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

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

GENERAL USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS

LEGEND

* For granular base, the construction of both the subbase and ABC-3 will be paid for under the contract unit price for Optional Base. Granular bases include Limecrete, Coated Coquina, Shell Rock, Bank Run Shell and Graded Aggregate Base of MFR 400. The base thickness shown is ABC-3. All subbase thicknesses are 100 mm. The base structural number shown is for the composite base.

△ Base Group 1 Based on minimum practical thicknesses.

☐ Restricted to non-Limited Access shoulder base construction.
GENERAL NOTES

[Text content]

SKETCH ILLUSTRATING DEFINITIONS

[Diagram and text content]

For additional information refer to FDOT Rules Chapters 14-56 and 14-87.

SUMMARY OF GEOMETRIC REQUIREMENTS FOR TURNOUTS

[Table and text content]
SIDEWALK ADJACENT TO CURB
SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE
SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE

DRIVEWAY SECTIONS ON CURBED FACILITIES WITH SIDEWALKS
MODIFICATIONS OF 'ADVERSE' AND 'MARGINAL' APPLICATIONS

ADVERSE* AND MARGINAL* SECTIONS MODIFIED TO ACHIEVE GENERAL* APPLICATION

ADVERSE* SECTIONS MODIFIED TO ACHIEVE MARGINAL* APPLICATION

*See DESIGN NOTES FOR URBAN FLARED TURNOUTS On Sheet 2.
A Maximum With Attribute Up To 90 With A Finding Of Interchangeability.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TURNOOUTS

MODIFICATIONS TO ADVERSE AND MARGINAL SECTIONS

SIDEWALK ADJACENT TO CURB
SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE
SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE
RECOMMENDED TURNOUT PROFILE
TRANSITION LENGTHS (L) (m)

ROADWAY PAVEMENT SLOPES AND SLOPES OF ABUTTING RURAL TURNOUT SURFACES (GJ)

SUPERELEVATION SECTIONS

PROFILES AND STORMWATER RUNOFF NOTES

1. Turnouts shall either direct water to flow on or across the roadway pavement, or cause water ponding or seepage within the State right of way. On all rural turnouts, the transition L (L) between the roadway shall be sloped or crowned to direct stormwater runoff to the residential ditch, culvert, fence or other appropriate runoff control device shall be constructed to prevent the roadway from eroding or becoming saturated. The shoulder of the roadway shall be protected by a suitable treatment.

2. The Option 1 profile is intended for locations where roadway, turnout taper and auxiliary lane stormwater runoff volumes are relatively small. The Option 2 profile is intended for locations where runoff volumes are relatively small and where there is no possibility of ditch flooding.

URBAN TURNOUT PROFILES

DEFINITIONS

G = Grade (%)  
L = Transition (See Tabled Lengths)
A = 4% - Transition Not Required
A > 4% - Straight Or Rounded Transition Required

RURAL TURNOUT PROFILES

DEFINITIONS

G = Grade (%)  
L = Transition (See Tabled Lengths)
A = 4% - Transition Not Required
A > 4% - Straight Or Rounded Transition Required

LENGTHS (L) (m)

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RECOMMENDED TURNOUT PROFILE

TURNOUTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

FLORIDA EXPRESSWAY AUTHORITIES

TURNOUTS

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6 of 6
GENERAL 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. Crossovers to be constructed where sight distance is inadequate in both directions as directed by the Engineer.

3. Cost of all construction, maintenance, removal and restoration work required to temporary crossovers shall be included in the contract unit price for Maintenance of Traffic (MOT).
STRUCTURES WITH LESS THAN FULL WIDTH SHOULDERS

INSET A

PLAN • ONE-WAY

PLAN • TWO-WAY

RAISED RUMBLE STRIP SETS

GENERAL NOTES FOR RAISED RUMBLE STRIPS

1. Raised rumble strips shall be constructed on all paved shoulders approaching structures with less than full roadway widths, including paved shoulders.

2. Raised rumble strips at intersections shall be constructed only when specified in the plans.

3. When any portion of a curve falls within the limit of rumble strips shown in these details, additional rumble strip sets spaced at 500 ft centers shall be constructed throughout the remainder of the approaching curve.

4. Raised rumble strip shall be placed for the correct unit price for Rumble Strip sets. Such item and payment shall be full indemnification for all work done in Rumble Strip sets.

5. Rumble strips shall be graded for per set without any adjustment due to width of pavement resulting the strips or length of strips.
LIMITED ACCESS FACILITIES

SHOULDER GROUND-IN RUMBLE STRIP PLACEMENT

GENERAL NOTES FOR SHOULDER GROUND-IN RUMBLE STRIPS

1. Ground-in rumble strips shall be constructed on freeway and other limited access
   facilities only, and only when so rated for in the plans.

2. The skip array is the standard array. The continuous array shall be constructed in
   advance of bridge areas for a distance of 300 m, or back to the gore recovery
   area for non-cable guardrail bridges, and constructed at other specified locations
   as called for in the plans.

3. Ground-in rumble strips are to be constructed in accordance with Section 546 of
   the Specifications.

4. When friction course extends more than 0.5 m beyond the edge of the outer traffic
   lane, the extended friction course shall be bleeded off back to the 0.5 m line, prior
   to rumble strip grading.

5. Both arrays shall be bid under the contract unit price for Rumble Strips (Ground-
   in). Sub-price and payment shall be full compensation for any work and materials
   required.

DESIGN NOTE

1. The rumble strips described on this sheet are intended for use on flexible pavement
   roadways. When constructing ground-in rumble strip on rigid pavements, a
counterpart strip shall be located closer than 150 cm from any pavement
   joint. When specifying ground-in rumble strips on existing rigid shoulders
   their location and array shall be detailed in the plans.

2. These width and type of application shall be used whenever approved in writing
   by the State Roadway Design Engineer. Approval will be considered only with
   sufficient documented justification for variance from this standard.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RUMBLE STRIPS

SHOULDER GROUND-IN RUMBLE STRIPS

LOCATION ALONG SHOULDER (FLEXIBLE PAVEMENT)
GRAVITY WALL NOTES

1. Gravity walls constructed of cast-in-place reinforced concrete retaining walls, except walls of precast concrete designs, shall have the same face texture and finish as the reinforced concrete retaining wall.

2. Cost of reinforcing steel, fasteners, finish, and joint seal to be included in the contract unit price for Class I Concrete (Finishing Width, 48).
THREE THRU LANES APPROACH AUXILIARY LANE

EXIT TERMINALS

TWO-LANE RAMPS

SECTION WHEN SHOULDER GUTTER USED
SECTION AA
4-LANE UNDIVIDED WITH OPTIONAL LANE

GENERAL NOTE
1. For pavement markings refer to Index No. IT-46.

ROADWAY TRANSITIONS

INTERSECTION TURNS AND STORAGE
FLARED & PAINTED LEFT Turns FOR 2-LANE 2-WAY ROADWAYS
CONNECTING FLARE WITH PAVED SHOULDERS TO EXISTING ROADWAY WITHOUT PAVED SHOULDERS

CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING SYMMETRICAL FLARE WITHOUT PAVED SHOULDERS.

CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING ASYMMETRICAL FLARE WITHOUT PAVED SHOULDERS.

CONNECTING SIMILAR WIDTH PAVEMENTS

CONNECTING DIFFERENT WIDTH PAVEMENTS

FLARED - PAVED SHOULDERS

PAVED SHOULDER TREATMENT AT TRANSITIONS AND CONNECTIONS
**NOTES FOR SHEETS 5 THRU 8**

1. The transition geometry shown on sheets 5 thru 8 are applicable to tangent alignments and median widths shown. The geometries of these sections are associated with the standard subordinated spacing for side roads, but in any case will require modification to accommodate sitelisted location, railroads and/or divided side roads, oblique side roads, crossover widths, storage and speed change lane requirements, design speeds up to 90 km/h, and other related features. The match lines are cut lines where the transitions may be moved back to approach roadways and ahead on departing roadways to accommodate intermediate access connections, storage lanes and other related features.

2. Approach lane departures (4.5') are suitable for design speeds up to 90 km/h, interior curves (R=145.0') are suitable for normal crown for design speeds up to 80 km/h. Merging curves (R=350.0') will require superelevation.
LEFT ROADWAY CENTERED ON THRU ROADWAY

FOUR LANE TO TWO LANE TRANSITION
ROADWAY TRANSITIONS

RIGHT ROADWAY CENTERED ON APPROACH ROADWAY
TWO LANE TO FOUR LANE TRANSITION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

* This value can be increased in order to make this transitional geometry fit between mile markers, see note one sheet 5.
NOTES

FLOOR

150 mm Mauer, Concrete Slab
w/WMF 60 mm x 150 mm W-6-A-W H.4
450 mm x 450 mm Strip Flooring At Slab
Perimeter & Interior Posts.
Hardek & Brown Finish Slab Surface.

STRUCTURE

Posts: 200 mm x 200 mm PT
Beams: 150 mm x 150 mm PT
Bar Railing: 60 mm x 100 mm PT As Described.
Wire Mesh: 50 mm x 100 mm As Described.

ROOF

75 mm 7x6 Wood Decking.
Type II Heavy-Duty Organic Felt
1 1/2" Asphalt (Satin) 124 mil Black
Standing Seam Metal Roof (24 Ga. Steel)
On Reinforced Concrete Slab w/ 800 lb/ft2.
Structure, Decking & Roofing Shall
Withstand 50 MPH Wind Load.

BUILDING CODE

Pavilions Shall Be Constructed According
To The Requirements Of The Appropriate Sections
Of Applicable "Standard Building Code" Or "South

PICNIC PAVILIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

REST AREA EQUIPMENT

APPROVED BY

530
KEYNOTES

03300-A Class II Concrete Slab
03300-B 150 mm x 600 mm W4 x 4 W4
03300-C 6 Mil Vapor Barrier
03300-D 50 mm Peter Cont. (T2 Required)
03300-E 600 mm x 600 mm Drop Floating
03300-F 450 mm x 450 mm Drop Floating
03300-G 150 mm Min Comp Sand Fill
03300-H 50 x 450 mm Peter (T4 Required)
05000-A 10 mm Galv. Steel Plate
05000-B 14 mm Galv. Steel Plate
05000-C Post Base
05000-D 14 mm Ø Bolt, Washer & Nut (Typ)
05000-E 19 mm Ø Oslants, Washer & Nut
For Cross Brace Bars
05000-F 14 mm Ø Steel Rod w/Turnbuckle
06300-A 75 mm x 150 mm T&G Wood Decking
06300-B 100 mm x 55 mm PT Wood Frame
06300-C 200 mm x 200 mm PT Wood Post
06300-D 50 mm x 150 mm PT Wood Fascia
06300-E 25 mm x 250 mm PT Wood Fascia
06300-F 15 mm Wood Shing

07401-A Standing Seam Metal Roof
07401-B Type II Asphalt-Saturated Organic Felt

1.270 g/m² 1 (Commonly Called No. 30)

Alternate Material Note:
These structures are shown with timber frames and decking. Alternate materials i.e., aluminum, steel, etc., may be used when approved by the Engineer.

PICNIC PAVILIONS
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
DESIGN

REST AREA EQUIPMENT
GENERAL NOTES

5. Mailboxes shall be located on the right-hand side of the roadway in the direction of the delivery route, except on one-way roads and streets where they may be placed on the left-hand side.

Mailboxes on rural highways shall be set with the roadside face of the box offset from the edge of the traveled way a minimum distance of the greater of the following:
(a) Shoulder width plus 200 to 300 mm.
(b) 3.0 m for ADT over 10,000 veh.
3.0 m for ADT 600 to 10,000 veh.
1.8 m for ADT under 600 veh.
1.8 m for low speed and ADT under 100 veh.

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

Mailboxes on curbed highways, roads and streets shall be set with the face of the box between 150 mm and 300 mm back of the face of curb. If the sidewalk adjoins the curb or if an unusual condition exists which makes it difficult or impractical to install boxes at the curb, the Contractor with concurrence of the local school authority may be permitted to install all mailboxes on the back edge of the sidewalk where they can be served by the carrier from the sidewalk.

Mailboxes shall be set with the bottom of the box between 1.0 m and 1.8 m above the milk stop surface, unless the U.S. Postal Service establishes other height restrictions.

No more than two mailboxes may be mounted on a support structure unless the support structure and mailbox arrangements have been shown to be safe by crash testing and approved by the State Design Engineer, Roadways.

4. Mailboxes shall be metal construction only, in traditional style only, and only in Size 1 as prescribed by the Domestic Mail Manual of the U.S. Postal Service (DMW).

Mailbox production standards, lists of approved manufacturers and suppliers of mailboxes, design approval and guidance may be obtained by writing to the Rural Delivery Division, Delivery Service Department, Operations Group, USPS Headquarters, Washington, DC 20200.

5. Mailboxes shall be located on the right-hand side of the roadway in the direction of the delivery route, except on one-way roads and streets where they may be placed on the left-hand side.

Mailboxes on rural highways shall be set with the roadside face of the box offset from the edge of the traveled way a minimum distance of the greater of the following:
(a) Shoulder width plus 200 to 300 mm.
(b) 3.0 m for ADT over 10,000 veh.
3.0 m for ADT 600 to 10,000 veh.
1.8 m for ADT under 600 veh.
1.8 m for low speed and ADT under 100 veh.

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

Mailboxes on curbed highways, roads and streets shall be set with the face of the box between 150 mm and 300 mm back of the face of curb. If the sidewalk adjoins the curb or if an unusual condition exists which makes it difficult or impractical to install boxes at the curb, the Contractor with concurrence of the local school authority may be permitted to install all mailboxes on the back edge of the sidewalk where they can be served by the carrier from the sidewalk.

Mailboxes shall be set with the bottom of the box between 1.0 m and 1.8 m above the milk stop surface, unless the U.S. Postal Service establishes other height restrictions.

No more than two mailboxes may be mounted on a support structure unless the support structure and mailbox arrangements have been shown to be safe by crash testing and approved by the State Design Engineer, Roadways.

Neighborhood Delivery and Collection Box Units (NDCBU) are a specialized multiple mailbox installation that must be located outside the highway and street clear zones. The location of NDCBUs is the sole responsibility of the Postmaster for the delivery route under consideration.

Lightweight newspaper receptacles may be mounted below the mailbox on the side of the support post in conformance with the USPS Domestic Mail Manual. The mail person shall be responsible for newspaper receptacle installation and maintenance.

9. Wood and steel support posts for both single and double mailbox mountings shall be embedded no more than 600 mm into the ground.

Concrete, block, brick, stone or other rigid foundation structure or encapsulation, either above or below the sidewalk grade, will not be permitted for mailboxes on rural highways. On urban roads and streets where mailbox support posts are set within rigid pavement back of curb, the support posts shall be separated from the pavement by a minimum of 25 mm of expansion material.

Support posts shall not be fitted nor installed with surface mount base plates.

10. At driveway entrances mailboxes shall be placed on the far side of the driveway in the direction of the delivery route.

At intersecting roads mailboxes shall be located 30.0 m or more from the centerline of the intersecting road on the far side in the direction of the delivery route, with the distance increased to 60.0 m when the route volume exceeds 400 vehicles per day.

11. Wood support posts shall be in conformance with the refinered and dimensional requirements of Section 592 and the treatment requirements of Section 995 of the Standard Specifications.

Steel support posts shall have an external finish equal to or better than two coats of weather resistant, air dried or baked, paint or enamel. Surfaced to be cleaned of all loose scale prior to finishing. The Postal Service prefers that posts be painted white, but other colors may be used when approved by the Engineer. When galvanized posts are used painting is not required.

Mounting brackets, plates, platforms, shelves and accessory hardware surface finishes are to be suited to support post finish.

12. Mailboxes shall be paid for under the contract unit price for Mailboxes, each. Payment shall be full compensation for boxes, posts and accessory items essential for installation in accordance with this standard, erection, adjustments to suit construction needs and, for identification letters and numbers. Payment shall be limited to one mailbox per patron address whether the mailbox is new, reused, salvaged, reset or relocated. Payment shall be per mailbox regardless of the number of mailboxes per support or grouping arrangement.

The above compensation shall include any work and cost incurred by the contractor for removal and disposal of existing mailboxes.

There shall be no payment participation for NDCBU furnishing, assembly, installation, resetting or relocation.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PO BOX 11125 TALLAHASSEE, FL 32302-1125

MAILBOXES
GENERAL NOTES

1. The purpose of shrubs in areas back of guardrail is to minimize road maintenance in these areas.
2. Shrubs are to be planted approximately 1.5 m back from guardrail posts and hazards. Narrow plant areas are to have at least one row of shrubs, as directed by the Engineer.
3. Shrubs are to be planted approximately 0.5 m on centers in rows with 1.5 m spacings.
4. Shrubs are to be staked in successive rows to create a zig-zag pattern between any two rows.
5. Shrubs shall be specified in the plans by Landscape Material Master File Item List numbers.
6. Only one variety of shrub shall be planted within any given contiguous area and no shrub variety is to be repeated within a distance of 4.6 m.
7. When guardrail painting is discontinued in conjunction with shrub planting, replacement shall be in accordance with Section 339 of the Standard Specifications.
8. For line of steep sight limits see Index No. 546.
**Perception Diagram**

Setting Sabal Palm (State Tree) Spacing

**Pictorial**

Origin of Clear Sight Line and Property Corner Clips

**Pictorial**

Window Detail

**Pictorial**

Channelized Directional Median Openings

**Legend**

- [] Areas Free of Sight Obstructions
STEEL PROTECTION PLATES INSTALLED AT EACH END OF CROSSING

SECTION AA

HEAVY DUTY - FULL DEPTH RUBBER CROSSING
TYPE R FULL DEPTH

NOTES:
1. The crossings shown on this sheet are NOT to be used for multiple track crossings within zones for an existing or anticipated future rail line. Zone lengths are shorter sheets.
2. Crossings as shown on this sheet may be used for single track crossings within the zones on the sheet unless engineering or safety considerations dictate otherwise.
3. For spacing is critical, they shall be spaced in accordance with the manufacturer specifications.
4. Details shown are for straight track installations. Materials are also available for curved track installations.
5. For additional details, materials required and installation procedures refer to the manufacturer specifications.

TYPES R RUBBER & R FULL DEPTH RUBBER
PREFACE

All projects and works on highways, roads and streets shall have a traffic control plan. All work shall be executed under the established plan and Department approved procedures. This index contains information specific to the Federal and State guidelines and standards for the preparation of traffic control plans and for the execution of traffic control in work zones, for construction and maintenance operations and utility work on highways, roads and streets.

Index 600 provides Department policy and standards. Changes are only to be made through Department approved procedures. Indexes 660 thru 660 provide typical application for various situations. Modification can be made to these indexes as long as the changes comply with the MUTCD and Department standards.

The sign spacings shown on the indexes are typically recommended distances. These distances may be increased or decreased based on field conditions, in order to avoid conflicts or to improve site specific traffic controls.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

The Florida Department of Transportation has adopted the "Manual On Uniform Traffic Control Devices For Streets And Highways" (MUTCD) and subsequent revisions and addendums, as published by the U.S. Department of Transportation, Federal Highway Administration, for mandatory use on the State Maintained Highway System whenever there exists the need for construction, maintenance operations or utility work.

ABBREVIATIONS

Abbreviations assigned to the 600-series Roadway Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:

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

SYMBOLS

The symbols shown are found in the Traffic Control Zone Cell Library (TCZCel) on the CAD system. Symbols assigned to the 600 series Roadway Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:

- Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light
  - Drum
  - Type I Or Type II Barricade Or Vertical Panel Or Drum
  - Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)
  - Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
  - Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
  - Cone Or Tubular Marker
  - Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
  - Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)
  - Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Steady Burning Light)
  - Type III Barricade
  - Type III Barricade (With Flashing Light)
  - Type III Barricade (With Steady Burning Light)
  - Work Zone Sign
  - Flagger
  - Traffic Signal
  - Advance Warning Arrow Panel
  - Portable Signal
  - Attenuator
  - Stop Bar
  - Work Vehicle With Flashing Beacon
  - Shadow (S) Or Advance Warning (AW) Vehicle With Advance Warning Arrow Panel And Warning Sign.
  - Truck Mounted Attenuator (TMA)
  - Orange Flag For TCZ Signs
  - Type B Light For TCZ Signs
REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCPs) for all projects must include specific regulatory speeds for each phase of work. This can either be the posted speed or a reduced speed. The speed shall be noted in the TCPs; this includes indicating the existing speed if no reduction is to be made. Regulatory speeds are to be uniformly established through each phase.

In general, the regulatory speed should be established to route vehicles safely through the work zone as close to normal highway speed as possible. On limited access facilities the posted speed for work zones should not be reduced below 55 mph. On other facilities the regulatory speed should not be reduced more than 20 mph. Reduced speeds may apply initially to allow the minimum statutory speed for the class of facility. This reduction is to be done in 10 mph increments by 100 feet per meter increments.

Temporary regulatory speed signs shall be removed as soon as the conditions requiring the reduced speed no longer exist. Once the work zone regulatory speeds are removed, the regulatory speed existing prior to construction will be immediately restored, and any effect unless new speed limit signs are provided for in the plans.

On projects with interspersed work activities speed reduction signs should be placed in proximity to those activities which merit a reduced speed, and not "blanketed" for the entire project. At the departure of such activities, the normal highway speed should be posted to give the motorist notice that normal speed can be resumed.

If the existing regulatory speed is to be used, consideration should be given to supplementing the existing signs when the construction work zone is between existing regulatory speed signs. For projects where the reduced speed conditions exist for greater than 1/6 kilometers in rural areas (non- interstate) and on rural or urban interstate, additional regulatory speed signs are to be placed at no more than 1/6 kilometer intervals. Engineering judgement should be used in placement of these signs beyond ramp entrances and beyond major intersections are examples of proper placement. In such cases, regulatory speed signs are to be placed at a maximum of 3000 feet apart.

When field conditions warrant speed reductions greater than those shown in the TCP the contractor may submit to the project engineer for approval by the Department, a signed and sealed study to justify the need for further reducing the posted speed, or, the engineer may request the District Traffic Operations Engineer (DTOE) to investigate the need. It will not be necessary for the DTOE to issue regulations for regulatory speed signs due to the revised provisions of F.S. 366.045(2)1(b). Advisory speed signs will be used at the option of the Field Engineer for temporary use while processing a request to change the speed. Advisory speed signs cannot be used alone but must be placed below the construction warning sign for which the advisory speed is required.

For additional information refer to the FDOT Roadway Plans Preparation Manual, Volume I, Chapter 10.

ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING

Adjoining work zones may not have sufficient spacing for standard placement of signs and other traffic control devices in their advance warning areas or in some cases other areas within their control zones. Where such restraints or conflicts occur or are likely to occur, one of the following methods will be employed to isolate conflicts and prevent conditions that could lead to misunderstanding on the part of the travelling public as to the intended travel way by the traffic control procedure approach explained.

(a) For scheduled projects the engineer in responsible charge of project design will resolve anticipated work zone conflicts during the development of the project traffic control plan. Projects on unimproved roads may not result in the reduced speed previously described.

(b) Unanticipated conflicts arising between adjoining in progress highway construction projects will be resolved by the Resident Engineer for projects under his residency, and, by the District Traffic Engineering for in progress projects under adjoining residencies.

(c) The District Maintenance Engineer will resolve anticipated and occurring conflicts under the following work zone conditions.

1. Within scheduled maintenance operations.

2. Between scheduled maintenance operations, maintenance construction, permitted works and/or in progress highway construction projects.

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

INTERSECTING ROAD SIGNING AND SIGNALS

Signage for the control of traffic entering and leaving work zones by way of intersecting highways, roads and streets should be used to make drivers aware of work zone conditions. Under no condition shall the sign structure or lighting be selected to cause the signal to conflict or upset the normal traffic pattern. In such cases, it may be necessary to select other methods of signal control.

Existing traffic signal operations that require modification in order to comply with work zone traffic control shall be included in the TCP and be approved by the District Traffic Operations Engineer. The need for temporary signal changes or other methods of actuation shall be determined by the District Traffic Operations Engineer and the designer and included in the TCP.
CHANNELIZING AND LIGHTING DEVICES

Channelizing and lighting devices for work zone traffic control shall be as prescribed in Part III of the MUTCD, subject to supplemental review and approval by the office of Construction.

Primary work zone traffic control devices are shown on Sheet 7 of 10 for the purpose of ready identification. Specifications for the devices are under the authority of the office of Construction. Approved devices are listed on the Departments Qualified Product List.

DROPOFFS IN WORK ZONES

Acceptable warning and barrier devices for traffic control of dropoffs in work zones are detailed on Sheet 5 of 10. Unless otherwise specified in the plans, the contractor may use any of the barrier types including optional shoulder treatment. Bottoms of shoulders shall be guaranteed with Champ Sum WOT.

WARNING LIGHTS

Warning lights shall be in accordance with Section 66-5 of the MUTCD except for the application limitations and methods of payment stipulated below:

Flagging
Type A: Low intensity Flashing Flagging Warning lights are to be mounted on barricades, drums, vertical panels or advance warning signs except as noted below, and are intended to continuously warn drivers that they are approaching or proceeding in a hazardous area. Flashing lights shall not be used to delineate the intended path of travel, and shall not be placed with markings that will form a continuous line to the driver's eye. Type A lights will be used to mark obstructions that are located adjacent to or in the intended travel way. Type A lights shall not be used in conjunction with the first advance warning sign or the second such sign when used.

Type B: High intensity Flashing Flagging Warning lights shall be mounted on the first advanced warning sign and on the first and second advanced warning sign where two or more signs are used, this applies to all approaches to any work zone.

Steep & Burn
Type C: Steep & Burn lights are to be mounted on barricades, drums, concrete barriers or vertical panels and used in combination with the devices to delineate the traveled way on lane closures, detour curves and other similar conditions. Steep & Burn lights are intended to be placed in a line to delineate the traveled way through and around obstructions in the transition, buffer, work and termination areas of the traffic control zone. Their intended purpose is not for warning drivers that they are approaching or proceeding through a hazardous area.

SIGHT DISTANCE TO DELINEATION DEVICES

Transition tapes should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve), the taper should begin well in advance of the view obstruction. The beginning of tapes should not be hidden behind curvess.

CHANNELIZING AND LIGHTING DEVICE CONSISTENCY

Barricades, vertical panels, cones, tubular markers and drums shall not be intersected within either the lateral transition or within the tangential alignment.

PEDESTRIANS AND BICYCLISTS

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

NIGHTTIME FLAGGING

Nighttime Flagging will require proper illumination of the Flagger. A well-lit flagging station and/or a reflectorized panel or reflectorized flag, plus a flashlight, lantern or other lighted signal that will display a red warning light shall be provided.

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

The flagger must be clearly visible to approaching traffic for a distance sufficient to permit proper response by the motorist to the flagging instructions, and to permit traffic to reduce speed or to stop as required before entering the work site. Flaggers shall be positioned to maintain maximum color contrast between the flagger's reflective garments and equipment and the work area background.

REFLECTORIZED RAISED PAVEMENT MARKERS

Class A or B R.P.M.'s shall be installed on the travel lanes of transitions, crossovers and detours and on the shoulders of areas within the work zone. The spacing shall be 12.0 meters on tangent sections and 6.0 meters on transitions, crossovers and crossovers. It shall be the contractors responsibility to replace damaged or missing R.P.M.'s. This cost shall be included in the cost of the temporary R.P.M's. Approved R.P.M's are listed on the Departments Qualified Product List.

SIGN COVERING AND INTERMITTENT WORK STOPPAGE SIGNING

Existing signs that conflict with temporary work zone sign(s) shall be removed or covered as approved by the engineer. Traffic control signs that require covers when no work is being performed in a work zone area shall be fully covered with a durable opaque sheet material. Plastic film and woven fabric including burlap will not be permitted. Covering of only the legend or symbol will not be permitted. Reflective coverings will not be permitted. Hinged signs designed to cover when folded and sign blanks will be permitted.

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

REMOVING PAVEMENT MARKINGS

Existing pavement markings that conflict with temporary work zone delimitation shall be removed by any method approved by the Engineer, where operations exceed one daylight period, however, painting over existing pavement markings will not be permitted. Full pavement width overlays of either asphalt concrete Type III, or FC-3 is a positive means to achieve obliteration.

SUPERELEVATION

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

<table>
<thead>
<tr>
<th>MINIMUM RADIUS FOR</th>
<th>NORMAL CROSSES SLOPES</th>
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<tbody>
<tr>
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<td>DESIGN MAGNITUDES</td>
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<td>90</td>
<td>10.0</td>
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<tr>
<td>Super-elev. when</td>
<td>6.0</td>
</tr>
</tbody>
</table>

LANE WIDTHS

Lane widths of through roadways shall be maintained through work zone travel ways wherever practical. The minimum widths for work zone travel lanes shall be as follows: 3.3 meters for interstate with at least one 3.6 meter lane provided each direction, unless formally excepted by the Federal Highway Administration 3.3 meters for freeways and 3.0 meters for all other facilities.

LENGTH OF CONSTRUCTION SIGN

The length of road work sign (G02-1) bearing the legend ROAD WORK NEXT MILES is required for all projects of more than 3.2 kilometers in length. The sign shall be located at the beginning points.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD CONTROL THROUGH WORK ZONES

GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES
END ROAD WORK SIGNS

The END ROAD WORK sign (G20-2) should be erected approximately 150 meters beyond the end of a construction or maintenance project, unless other distance called for in the plans. Where other Construction or Maintenance Operations occur within 1.6 kilometers this sign should be omitted and signing coordinated in accordance with index No. 600, ADJACENT AND/OR OVERLAPPING WORK ZONE SIGNING.

DETOURS

Detours should be signed clearly over their entire length so that motorists can easily determine how to return to the original roadway. The W-4R, WDT-2, and WDT-3 warning signs are to be used for the advanced warning for a lane shift. A diversion should be signed as a lane shift.

VARIABLE MESSAGE SIGNS (VMS)

The use of VMS can be used to:
1. Supplement standard signing in construction/maintenance work zones.
2. Reinforce static advance warning messages.
3. Provide motorists with updated guidance information.

The message should be visible and legible at a minimum distance of 270.0 meters. All messages should be cycled so that two message cycles are displayed to a driver while approaching the sign from 270.0 meters at 55 mph.

VMS should be placed approx. 150.0 to 240.0 meters in advance of the work zone conflicts or 0.4 to 3.2 kilometers in advance of complex traffic control schemes which require new and/or unusual traffic maneuvers.

If VMS are to be used at night, the intensity of the flashers shall be reduced during darkness when lower intensities are desirable.

For additional information refer to the FDOT Roadway Plans Preparation Manual, Volume I, Chapter 10.

ROADSIDE BARRIERS

When connecting temporary concrete barrier wall to guardrail the connection shall be made in accordance with index No. 400. All guardrail end anchorages to be Included in the cost of Temporary Guardrail.

ABOVE GROUND HAZARD

Above ground hazards (see definitions) are to be considered work areas during working hours and treated with appropriate work zone traffic control procedures. During non working hours, all objects, materials and equipment that constitute an above ground hazard must be stored/placed outside the travel way and clear zone or be shielded by a barrier or crash cushion.

For above ground hazards within a work zone the clear zone required should be based on the regulatory speed posted during construction.

CONSTRUCTION SIGN SUPPORTS

All post mounted construction signs shall be installed on either round aluminum or steel channel post as specified in the table below.

SUPPORTS FOR MAINTENANCE OF TRAFFIC SIGNS

<table>
<thead>
<tr>
<th>SIGN SIZE</th>
<th>SIGN BRACKET</th>
<th>ROUND ALUMINUM</th>
<th>DEPTH IN GROUND</th>
<th>STEEL CHANNEL</th>
<th>DEPTH IN GROUND</th>
</tr>
</thead>
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<tr>
<td>500 x 900</td>
<td>2-1</td>
<td>NPS 2 x 3.6</td>
<td>510</td>
<td>1.15 kg F/M²</td>
<td>900</td>
</tr>
<tr>
<td>600 x 1000</td>
<td>2-1</td>
<td>NPS 2 x 3.6</td>
<td>510</td>
<td>1.15 kg F/M²</td>
<td>900</td>
</tr>
<tr>
<td>500 x 1200</td>
<td>2-1</td>
<td>NPS 2 x 3.6</td>
<td>510</td>
<td>1.15 kg F/M²</td>
<td>900</td>
</tr>
<tr>
<td>500 x 1500</td>
<td>2-1</td>
<td>NPS 2 x 3.6</td>
<td>510</td>
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<td>NPS 2 x 3.6</td>
<td>510</td>
<td>1.15 kg F/M²</td>
<td>900</td>
</tr>
</tbody>
</table>

F/M Indicates Type F or Type M

All sign brackets shall be Type 1. The total number of brackets shall be per post as tabulated, except the "Diamond" sign which shall use two Type 1 brackets per post.

The 1.83 kg/m steel channel shall be installed with approved breakaway bases. Refer to Design Standard #885, Sheet 2 of 2, for round aluminum sign bracket details, and #885 Sheet 1 of 1 for steel channel breakaway bases, and notes.

CLEAR ZONE WIDTHS

The term "clear zone" describes the unobstructed relatively flat area, impacted by construction, extending outward from the edge of the travel way. The table below gives clear zone widths in work zones for medians and roadside conditions other than for roadway camis where roadside camis are present, clear zone widths are to conform to the distances to camis as described in Vol. I, Ch 4, Sec. 4.2 and Exhibit 14-4 of the Plans Preparation Manual.

| WORK ZONE WIDTHS FOR WORK ZONES |
|-------------------|-------------------|-----------------|
| Wkymk | Wkmk | WmK |
| Wkymk | Wkmk | WmK |
| 60-70 | 100-120 | 9.0 |
| 55    | 90     | 7.2 |
| 45-50 | 75-80  | 5.4 |
| 30-40 | 50-60  | 4.2 |
| ALL SPEEDS | CURB & GUTTER | ALL SPEEDS | CURB & GUTTER |
| ALONG OF CURB | 1.8 BEHIND FACE OF CURB |

SIGN MATERIALS

Mesh signs may be used only for Daylight Operations as noted in the standards. Type B Lights and Orange Flags are not required.

Viny signs may be used for Day or Night Operations not to exceed 12 hours except as noted in the standards. Type B Lights and Orange Flags are not required.

All signs shall be mounted if operation exceeds 12 hours except as noted in the standards.

SIGN LEGEND

The legend reading "CONSTRUCTION" is changed to "Work" on the G20-1, W20-1A, W20-1D, W20-1C, W20-1D, W20-1D, W20-1E, W20-1F, and WDT-10 signs. This is the preferred legend, but either legend is acceptable.
TEMPORARY CURB

1. Application: Temporary curb shall not be used on facilities with posted speeds greater than 45 mph and dropoffs greater than 12 inches deep. It shall not be used on Interstates or limited access facilities.

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

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

4. The temporary curb is to be bonded to the existing surface by use of a tack coat, or other means approved by the engineer. It is important that the curb adhere to the base material in order to provide the strength necessary to restrict errant vehicles.

5. Temporary curb is to be paid for under Long Term Maintenance of Traffic (Item 902-13). The design shall include a pay item form to state this fact and include the estimated number of meters to be used. Payment for the curb is to be made in all materials and work necessary to construct (including painting of the curb), maintain and remove the temporary curb. Traffic striping (lane lines only) and warning devices are to be paid for separately. Any damage to existing pavement caused by the removal of existing curb shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of the temporary curb.

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

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

8. If concrete is used to construct the temporary curb, joints must be made every 3.0 meters in order to control cracking.

9. The designer must also consider drainage needs when using temporary curb. If drainage ditches are not frequent enough to allow for water runoff, the designer may need to specify that is used for "drainage only" or at an appropriate spacing based on grades, number of lanes, etc. Typically, a drainage joint would be 300 millimeters wide (4'6") in the curb at 15.0 meter spacings.

10. All openings such as driveways and bus stops lanes, the temporary curb should be transitioned to height from 100 millimeters up to 225 millimeters at a 1:4 slope in order to eliminate a potential hazard at the end points.
CHANNELIZING AND LIGHTING DEVICE NOTES

1. Only approved traffic control devices may be used.
2. The FDOT approval number shall be engraved on the device at a convenient and easily visible location. Where engraving is not practical, a water-resistant type label may be used.
3. The details shown on this sheet are for the following purposes: 1 1/2 For ease of identification and 1/2 to provide information that supplements or supersedes that provided by the MUTCD.
4. The Type III Barricade shall have a unit length of 1.8 meters only. When barricades of greater lengths are required, those lengths shall be in multiples of the 1.8 meter unit. Signs used in conjunction with Type III Barricades shall be mounted above the Barricade and shall not block the reflective area of the Barricade.
5. During hours of darkness, warning lights shall be used on drums, vertical panels, Type I, Type II or Type III barricades.
6. Ballast shall not be placed on top rails or any striped rails or higher than 325 millimeters above the driving surface.
7. For rails less than 900 millimeters long, 100 millimeter stripes shall be used.
8. When used at night, the intensity of the flashers shall be reduced during darkness when lower intensities are desirable.
9. When used at night, cones shall:
   1. Be used only in active work zones, such as milling and resurfacing or other moving operations where cones can be monitored.
   2. Be reflectorized as per the MUTCD.
   3. Be used only with Department approved reflective collars.
10. The spacing of sheeting is not permitted on either channelizing devices or WOT signs.
Note:
The sign shields, symbols, and messages contained on this sheet are provided for ready reference to those signs used in the development of the 600 series Roadway Design Standards and are commonly used in the development of traffic control plans.

For additional signs and sign detail information refer to the STANDARD HIGHWAY SIGNS MANUAL as specified in the MUTCD. Special signs for traffic control plans will be as approved by the State Traffic Plans Engineer.

The sign codes shown on this sheet are for the purpose of identifying shield names found in the Traffic Control Card Library (TC2Z) of the CAID system. The STANDARD HIGHWAY SIGNS MANUAL should be referenced for the official sign codes for use in the development of traffic control plans. See Index No. 255 for MOT sign details.

COLOR CODES
Legend and/or Symbol Background
G-Orange (Reflectorized) R-Red (Reflectorized)
B-Black (Non-Reflectorized) Y-Yellow (Reflectorized)
W-White (Reflectorized) G-Green (Reflectorized)

COMMONLY USED WARNING AND REGULATORY SIGNS IN WORK ZONES
REFLECTIVE PAVEMENT MARKERS

CLASS
A. Permanent Applications in Non-Traffic Areas Or Can Be Used in Work Zone Applications For Traffic And Non-Traffic Areas.
B. Permanent Application In Traffic And Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
D. Work Zone Application Only, For Traffic And Non-Traffic Areas. Maximum spacing 1.5 meters center to center.
E. Temporary Work Zone Application Only, Not Exceeding Five (5) Continuous Days, For Traffic And Non-Traffic Areas. Maximum spacing 0.5 meters center to center.

APPLICATION

NOTES
1. For spacing of CLASS A or B RPWS's to supplement Temporary Tape or Paint, see Index No. 600 sheet 3 of 10.
2. Basic color rules: colorless reflectors replace white lines and amber reflectors replace yellow lines.
3. In work zones, CLASS A,B, or D RPWS's may be used to form lane lines and temporary gore areas. In lieu of tape or paint however, tape or paint must be used in all transition areas in addition to the RPWS's. In short term work zones, where the RPWS's will be used for five (5) days or less, CLASS "E" RPWS may be used to form lane or edge lines.
4. To provide contrast on Concrete Pavement, and light Asphalt, the five (5) colorless RPWS's shall be followed by five Black RPWS's. The spacing between RPWS's shall be 0.75 meters. Black RPWS's will not be required for contrast with Amber RPWS's.

TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS
IN LIEU OF TEMPORARY TAPE OR PAINT IN WORK ZONES

LANE LINE
GENERAL NOTES

1. If the work operation requires that two or more work vehicles cross the 4.5 m zone in any one hour, traffic control will be in conformance with Index No. 602.

2. No special signing is required.

3. Arrows denote direction of traffic only and do not reflect pavement markings.

4. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ indexes.

5. For general TCZ requirements and additional information refer to Index No. 601.

SYMBOLS

Work Area

TYPICAL APPLICATIONS

Landscaping Work
Utility Work
Fencing Work
Cleaning Drainage Structures
Reworking Ditches

CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 4.5 m FROM THE EDGE OF PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION POLICY DESIGN

TRAFFIC CONTROL THROUGH WORK ZONES
TWO-LANE, TWO-WAY RURAL DAY OR NIGHT OPERATIONS

[Signature]

[Stamp]

[Date]

[Page 1 of 1]
Maximum spacing between cones and tubular markers shall be 7.5 m. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows:
- 5.0 m up to 25 MPH
- 10.0 m for 30 MPH - 40 MPH
- 15.0 m for 45 MPH and greater.

**SYMBOLS**
- Work Area
- Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel
- Drum (With Steady Burning Light At Night Only), Tubular Markers May Be Used During Daylight Only. Cones May Be Used During Daylight And As Permitted At Night.
- Work Zone Sign

**GENERAL NOTES**
1. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times one side of the roadway.
2. If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
3. If the work operation encroaches on the through traffic lanes or when four or more work vehicles enter the through traffic lanes in a one hour period a flagger shall be provided and the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs see Index No. 603.
4. The first two warning signs shall have a 450 mm x 450 mm (min.) orange Flag and a Type B light attached and operating at all times. Mesh signs may be used for Daylight Only operations.
5. Type B lights and Orange Flags are not required.
6. The WORKERS legend may be substituted for the symbol sign.
7. All signs shall be placed at the time and the time exceeds 2 hours.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. WORKERS sign to be removed or fully covered when no work is being performed.
11. END CONSTRUCTION signs required only when work exceeds one daylight period.
12. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCS indexes.
13. For general TCS requirements and additional information refer to Index No. 600.

**TYPICAL APPLICATIONS**
- Utility Work
- Culvert Extensions
- Side Slope Work
- Guardrail Work
- Landscaping Work
- Cleaning Drains Structures
- Reworking Ditches
- Sign Installation And Maintenance
- Shoulder Repair

**CONDITIONS**
WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 4.5 M BUT NOT CLOSER THAN 0.6 M TO THE EDGE OF PAVEMENT

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**TWO-LANE, TWO-WAY • RURAL**

**DAY OR NIGHT OPERATIONS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>0.6 m Min.</td>
<td>Work Area</td>
</tr>
<tr>
<td>300.0</td>
<td>Work Area</td>
</tr>
<tr>
<td>150.0</td>
<td>Work Area</td>
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<tr>
<td>4.5</td>
<td>Work Area</td>
</tr>
<tr>
<td>END ROAD WORK</td>
<td>Work Area</td>
</tr>
</tbody>
</table>

| Work Area | 7.5 Meters Centers For First 75.0 Meters | End 15.0 Meters Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 15.0 Meters Centers For First 75.0 Meters Thereafter At 30.0 Meters Centers.

**END ROAD WORK**

**TWO- LANE, TWO-WAY • RURAL**

**DAY OR NIGHT OPERATIONS**

<table>
<thead>
<tr>
<th>Item</th>
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<tr>
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<td>Work Area</td>
</tr>
<tr>
<td>END ROAD WORK</td>
<td>Work Area</td>
</tr>
</tbody>
</table>

| Work Area | 7.5 Meters Centers For First 75.0 Meters | End 15.0 Meters Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 15.0 Meters Centers For First 75.0 Meters Thereafter At 30.0 Meters Centers.
Maximum spacing between cones and tubular markers shall be 7.5 m.

**GENERAL NOTES**

1. Work operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.

2. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the pavement.

3. If the work operation does not exceed 60 minutes, traffic control will be in accordance with Index No. 607.

4. Additional one-way control may be effected by the following means:
   1) Flag operating vehicle (2) Official vehicle (3) Pilot vehicles (4) Traffic signals

   When flaggers are the sole means of one-way control, the flaggers shall be in sight of each other or in direct communication at all times.

5. The following signs shall be used:
   1) Daysigns

6. Mesh signs may be used for (Daylight Only) operations.

7. The FLA GGER legend sign may be substituted for the symbol sign.

8. L (min) = \( \frac{W}{S} \) for speeds 70 km/h

   \( \frac{W}{S} \) for speeds 60 km/h

   Where:
   - \( W \) = Width of lateral transition in meters
   - \( S \) = Posted speed limit (converted to km/h)

9. The ONE LANE ROAD signs are to be fully covered and the FLA GGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.

10. Arrows denote direction of traffic only and do not reflect pavement markings.

11. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.

12. When a side road intersects the highway on which work is being performed, additional traffic control devices shall be created in accordance with other applicable TCC indexes.

13. For general TCC requirements and additional information, refer to Index No. 600.

**SYMBOLS**

- Work Area
- Sign With 450 mm x 450 mm (Min.)
- Orange Flag And Type B Light
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger

**TYPICAL APPLICATIONS**

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work

**CONDITIONS**

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 0.6 m OUTSIDE THE EDGE OF PAVEMENT

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION 3/2013**

**TWO-LANE, TWO-WAY, RURAL OPERATIONS ONE DAYLIGHT PERIOD OR LESS**

**Engineer No:**

**State:**

**Approving Officer:**

**Design:**

**Contract No:**

**Project No:**

**F.R.A. Approved:**

96 1 of 1

**603**
Maximum spacing between cones and tubular markers shall be 7.5 m. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows:
5.0 m up to 25 MPH; 10.0 m for 30 MPH - 40 MPH; 15.0 m for 45 MPH and greater.

SYMBOLS

- Work Area
- Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Tubular Markers May Be Used During Daylight Only. Cones May Be Used During Daylight And As Permitted At Night.
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)
- Work Zone Sign
- Flagger

GENERAL NOTES

1. Construction operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
2. All vehicles, equipment, workers, (except flaggers) and their activities are restricted at all times to one side of the pavement.
3. Additional one way control may be effected by the following means:
   (1) Flag-carrying vehicle
   (2) Official vehicle
   (3) Pilot vehicles
   (4) Traffic signals
   When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
4. The first two warning signs shall have a 450 mm x 450 mm (min.) orange flag and a Type B light attached and operating at all times.
5. The FLAGGER legend sign may be substituted for the symbol sign.
6. All signs shall be post mounted if the closure time exceeds 12 hours.

TYPICAL APPLICATIONS

- Pavement Repair
- Culvert Construction
- Utility Work
- Bridge Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENTRAP THE AREA BETWEEN THE CENTERLINE AND A LINE 0.6 m OUTSIDE THE EDGE OF PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

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

When Other Construction Or Maintenance Operations Occur Within 1.6 Kilometers, Signs (s) To Be Omited And Signing To Be Coordinated In Accordance With Index No. 600.

Cone Or Tubular Markers At 7.5 Meter Centers For First 75.0 Meters Thereafter At 15.0 Meter Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 15.0 Meters Centers For First 75.0 Meters Thereafter At 30.0 Meter Centers.

7. L (min) = \( \frac{W}{5} \) for speeds \( \geq 70 \text{ km/h} \)
   \[ \frac{W}{5} \] for speeds \( \leq 60 \text{ km/h} \)

Where:
- \( W \) = Width of lateral transition in meters,
- \( S \) = Posted speed limit (converted to km/h).

8. The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 605.
11. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCI indexes.
12. For general TCI requirements and additional information refer to Index No. 600.
Maximum spacing between cones and tubular markers shall be 7.5 m. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows:
- 5.0 m up to 25 MPH
- 6.0 m for 30 MPH - 40 MPH
- 15.0 m for 45 MPH and greater.

**TYPICAL APPLICATIONS**
- Shoulder and Slope Work
- Utility Work
- Guardrail Work
- Landscape Work
- Delineator Installation and Maintenance
- Mowing
- Litter Removal

**CONDITIONS**
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE AN INTERMITTENT OR CONTINUOUS MOVING OPERATION ON THE SHOULDER OR SHOULDER AND SLOPES

**GENERAL NOTES**
1. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
2. If the work operation does not exceed 60 minutes, traffic control will be in accordance with Index No. 601.
3. If the work operation encroaches on the through traffic lanes or when four or more work vehicles enter the through traffic lanes in a one hour period flaggers shall be provided, and the advanced FLÄGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLÄGER signs see Index No. 603.
4. The first two warning signs shall have a 450 mm x 450 mm (18 in.) orange flag and a Type B light attached and operating at all times.
5. The WORKERS legend sign may be substituted for the symbol sign.
6. Where work activities within 0.6 meters of the edge of pavement is incidental (e.g., Mowing, Litter Removal), the engineer may devise requirements for cones and signs provided a vehicle with flashing warning lights is present.

**SYMBOLS**
- Work Area
- Sign With 450 mm x 450 mm (Min.) Orange Flag and Type B Light
- Type I Or Type II Barricade Or Vertical Panel
- Orange Flag And Type B Light
- Work Zone Sign

**CONSTRUCTION DEFINITIONS**
- W - Width of shoulder in meters, 2.4 m minimum.
- S - Posted speed limit (converted to km/h).

Where:
- \( L \) - min., \( W \) for speeds \( > 70 \) km/h
- \( W \) - min. for speeds \( \leq 60 \) km/h

\[
L \geq \frac{W}{S}
\]

WHERE:
- \( W \) - Width of shoulder in meters, 2.4 m minimum.
- \( S \) - Posted speed limit (converted to km/h).
GENERAL NOTES

1. All vehicles, equipment, workers except flaggers, and their activities are restricted at all times to one side of the paved thoroughfare.

2. Minimum length of work area is 60.0 meters. Maximum length to be determined by the Engineer, but in no case to exceed the length of one-half (1/2) days operation or 3.2 kilometers whichever is less.

3. If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 600.

4. Additional one-way control may be effected by the following means:
   - 1 Flag carrying vehicle (2) Official vehicle (3) Piloted vehicles (4) Traffic signals

   When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.

   - 1 Flag a 450 mm x 450 mm (Min.) Orange Flag and Type B Light

5. The first two warning signs shall have a 450 mm x 450 mm orange flag and a Type B light attached and operating at all times.

6. Mesh signs may be used for (Daylight Only) operations.

7. Type B Lights and Orange Flags are not required.

8. The FLAGER signs may be substituted for the symbol sign.

9. The ONE LANE ROAD AHEAD and FLAGER signs are to be removed or fully covered when no work is being performed on the highway is open to two-way traffic.

10. Arrows denote direction of traffic only and do not reflect pavement markings.

11. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.

12. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCC indices.

13. For general TCW requirements and additional information, refer to Index No. 600.

SYMBOLS

- Work Area
- Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel
- Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger

TYPICAL APPLICATIONS

- Pavement Repair
- Pavement Surfacing
- Utility Work
- Delineator Maintenance
- Crack Sealing
- Core Boring

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE AN INTERMITTENT OR CONTINUOUS MOVING OPERATION ON THE PAVEMENT WHERE THE AVERAGE SPEED OF MOVEMENT IS LESS THAN 6.4 KILOMETERS PER HOUR

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

MOVING OPERATIONS - RURAL
TWO-LANE TWO-WAY DAYLIGHT ONLY

[Diagram and text continue with additional elements not fully visible in the provided image.]
CONDITIONS

FOR ANY OPERATION THAT ENCROACHES IN THE AREA BETWEEN THE CENTERLINE AND A LINE 0.6 m OUTSIDE THE EDGE OF THE PAVEMENT FOR A PERIOD IN EXCESS OF 15 MINUTES BUT LESS THAN 60 MINUTES.

TYPICAL APPLICATIONS

Marking Patches
Field Patches
String Line
Utility Work
Cleaning Up Debris On Pavement
Pavement Coring And Straight Edging

GENERAL NOTES

1. The maximum length of work area to be determined by the Engineer, but in no case to exceed the length of one-half (1/2) days operation or 3.2 kilometers whichever is less.

2. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the pavement.

3. Additional one way control may be effected by the following means:
   (1) Flag carrying vehicle
   (2) Official vehicle
   (3) Pilot vehicle
   (4) Traffic signals

   When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.

4. The first two warning signs shall have an 450 mm x 450 mm (min.) orange Flag and a Type B Light attached and operating at all times.

5. Wash signs may be used for Daylight Only operations.

6. The FLAPPER legend sign may be substituted for the symbol sign.

7. Arrows denote direction of traffic only and do not reflect pavement markings.

8. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.

9. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCO Indexes.

10. For general TCO requirements and additional information refer to index No. 600.

SYMBOLS

- Work Area
- Warning Sign With 450 mm x 450 mm (Min.) Orange
- Orange Flag and Type B Light
- Type I Or Type II Barricade Or Vertical Panel
- Drum (with steady burning light at night only)
- Tubular Markers May Be Used During Daylight Only, Cones May Be Used During Daylight And As Permitted At Night
- Warning Sign
- Flagger

ROAD WORK 1000 FEET

Maximum Spacing Between Devices Shall
Not Be Greater Than 7.5 m

30.0 M.D.

150.0 M.D.

150.0 M.D.

150.0 M.D.

150.0 M.D.

30.0 M.D.

30.0 M.D.

30.0 M.D.

30.0 M.D.
SYMBOLS

- Work Area
- Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light
- Work Zone Sign
- Traffic Signal
- Type I Or Type II Barricade Or Vertical Panel
  Or Drum (With Steady Burning Light At Night Only).
  Cones May Be Used During Daylight Only.
- Tubular Markers May Be Used During Daylight Only.
- Type III Barricade
- Stop Bar
- Flag
- Portable Signal

General Notes

1. Work operations shall be confined to one traffic lane, except for
   haul road crossings, leaving the opposite lane open to traffic.

2. All vehicles, equipment, workers (except flaggers) and their
   activities are restricted at all times to one side of the pavement,
   except for haul road crossings.

3. The installation and filling of signals shall be approved by the
   District Traffic Operations Engineer prior to signals being placed
   in operation.

4. Flaggers to supplement the signal operator/flagger shall be
   used when needed to assure safe movements between traffic
   and operating equipment, as determined by the Engineer.

5. The first two warning signs shall have a 450 mm x 450 mm (min.)
   orange flag and a type B sign attached and operating at all times.

6. When needed, an additional warning sign may be installed in
   advance of the Road Work Ahead sign. The distance
   between successive signs shall be 1500 meters.

7. The SIGNAL AHEAD legend sign may be substituted for the
   symbol sign.

8. All signs shall be post mounted if the closure time exceeds
   12 hours.

9. SIGNAL AHEAD and EQUIPMENT CROSSING AHEAD signs are to
   be removed or fully covered when no work is being performed
   and the highway is open to two-way traffic. Type III Barricades
   shall be in place to block haul road access when the haul road
   is not in operation and a flagger/sign operator is not on duty,
   except when the haul road is an existing properly marked road.

10. Arrows denote direction of traffic only and do not reflect
    pavement markings.

11. Longitudinal dimensions are to be adjusted to fit field
    conditions. See index No. 600.

12. When a side road intersects the highway on which work is
    being performed additional traffic control devices shall be
    erected in accordance with other applicable TCZ indexes.

13. For general TCZ requirements and additional information
    refer to index No. 600.

14. Span wire signals are to be used only in active work zones,
    where the contractor can monitor signal operation and maintain
    traffic with flaggers in the event of a power failure.

Typical Application

Pavement Repair
Shoulder & Roadside Work
Bridge Work
Box Culvert Work
Drainage Work
Utility Work
Haul Road Crossing

Conditions

Where any vehicle, equipment, workers or their activities will
encroach on one lane or momentarily encroach on both lanes
of a two-lane two-way roadway and traffic signals are needed.
SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

600 mm White ReflectORIZED Preformed
Mat Or Pavement Marking Tape
(Location to Suit Signal Position)

Varies (To Provide Width Needed For Turning Trucks)

0.4 Kilometers Max. See General Note No. 3

Portable Signal

Varies (To Provide Width Needed For Turning Trucks)

0.4 Kilometers Max. See General Note No. 3

SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

600 mm White ReflectORIZED Preformed
Mat Or Pavement Marking Tape
(Location to Suit Signal Position)

Cone Or Tubular Markers At 7.5 m Centers
Type I Or Type II Barricades Or Vertical Panels
Or Drums At 15.0 m Centers

All Transition Barricades Or Tubular Markers
At 7.5 m Centers Max.

SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

600 mm White ReflectORIZED Preformed
Mat Or Pavement Marking Tape
(Location to Suit Signal Position)

Cone Or Tubular Markers At 7.5 m Centers / Type I Or Type II Barricades Or Vertical Panels
Or Drums At 15.0 m Centers

Side Road
See General Note No. 12
SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

600 mm White Reflectorsized Preformed
Mat Or Pavement Marking Tape
(Location To Suit Signal Position)

Side Road
See General Note No. 12

0.4 km Max.
See General Note No. 4

Varies (Win. + Side Road Return Width)

Portable Sign
150.0

30.0 Min.
24.0 Min.
45.0 Max.

Varies
(45.0 Win.)

600 mm White Reflectorsized Preformed
Mat Or Pavement Marking Tape
(Location To Suit Signal Position)

Canes Or Tubular Markers At 7.5 m Centers
Type I Or Type II Barrels Or Vertical Panels
Or Drums At 15.0 m Centers

Signal Operator/Flagger

600 mm White Reflectorsized Preformed
Mat Or Pavement Marking Tape
(Location To Suit Signal Position)

All Transition Barrels Or Vertical Panels
At 7.5 m Centers Max.

SINGLE LANE CLOSURE • SHORT BRIDGES

600 mm White Reflectorsized Preformed
Mat Or Pavement Marking Tape
(Location To Suit Signal Position)

Canes Or Tubular Markers At 7.5 m Centers
Type I Or Type II Barrels Or Vertical Panels
Or Drums At 15.0 m Centers

Span Wire Signal (Not On Bridge)

Span Wire Signal
150.0

150.0 Min.
300.0 Max.

Varies
(22.5 Min.)

Varies
(10.0 Min.)

600 mm White Reflectorsized Preformed
Mat Or Pavement Marking Tape
(Location To Suit Signal Position)

Canes Or Tubular Markers At 7.5 m Centers
Type I Or Type II Barrels Or Vertical Panels
Or Drums At 15.0 m Centers

Lane Closure By Signal Control
Day or Night Operations
GENERAL NOTES

1. If the work operation requires that two or more work vehicles cross the 4.5 m zone in any one hour, traffic control will be in accordance with index No. 622.

2. No special signing is required.

3. This index also applies when work is being performed on a multilane undivided highway.

4. This index also applies to work performed in the median more than 4.5 m from edge of travel way, both roadways.

5. Arrows denote direction of traffic only and do not reflect pavement markings.

6. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.

7. For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Landscaping Work
- Utility Work
- Fencing Work
- Cleaning Drainage Structures
- Reworking Ditches

CONDITIONS

WHERE ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 4.5 m FROM THE EDGE OF PAVEMENT

SYMBOLS

- Work Area
CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENROCATCH THE AREA CLOSER THAN 4.5 m BUT NOT CLOSER THAN 0.6 m TO THE EDGE OF PAVEMENT FOR A PERIOD OF LESS THAN 60 MINUTES

MAXIMUM SPACING BETWEEN CONES TUBULAR MARKERS BE 7.5 M.
MAXIMUM SPACING BETWEEN TYPE I OR TYPE II BARREL ORS OR VERTICAL PANEL OR DRUMS SHALL BE BASED ON THE SPEED LIMIT AS FOLLOWS:
50.0 M. UP TO 25 MPH; 80.0 M. FOR 30 MPH; 40 MPH; 15.0 M. FOR 45 MPH AND GREATER.

GENERAL NOTES
1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
2. If the work operation encroaches on the through traffic lanes or when four or more work vehicles enter the through traffic lanes in a one-hour period, a flagger shall be provided and a FLASHER sign shall be substituted for the WORKERS sign. The flagger shall be positioned at the point of vehicle entry or departure from the work area.
3. This TCP plan also applies to work performance from the middle more than 0.6 meters but less than 0.6 meters from the edge of either pavement.
4. The first two warning signs, each side, shall have a 450 mm x 450 mm flag and a type B flange attached and operating at all times.
5. The WORKERS legend sign may be substituted for the symbol sign.
6. L (min) = 50 for speeds ≥ 70 km/h
   = 3.6 for speeds ≤ 60 km/h
60
Where:
W = Width of lateral transition in meters
S = Posted speed limit (converted to km/h).

SYMBOLS
\[\text{Work Area} \]

\[\text{Sign With 450 mm x 450 mm (Min.) Orange Flag and Type B Flare} \]

\[\text{WARNING LIGHTS} \]

\[\text{Type I Or Type II Barrel Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Tubular Workers May Be Used During Daylight Only, Cones May Be Used During Daylight And As Permitted At Night.} \]

\[\text{Work Zone Sign} \]

CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENROCATCH THE AREA CLOSER THAN 4.5 m BUT NOT CLOSER THAN 0.6 m TO THE EDGE OF PAVEMENT FOR A PERIOD OF 60 MINUTES OR GREATER

TYPICAL APPLICATIONS
Utility Work
Culvert Extensions
Side Slope Work
Guardrail Work
Landscape Work
Cleaning Drainage Structures
Reworking Ditches
Sign Installation And Maintenance
Shoulder Repair

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
MULTILANE DIVIDED OR UNDIVIDED RURAL: DAY OR NIGHT OPERATIONS

MULTILANE DIVIDED OR UNDIVIDED RURAL: DAY OR NIGHT OPERATIONS

MULTILANE DIVIDED OR UNDIVIDED RURAL: DAY OR NIGHT OPERATIONS
CONCLUSIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCroach on the Lane Adjacent to Either Shoulder and the Area 0.6 m OUTSIDE THE EDGE OF PAVEMENT FOR A PERIOD OF 15 MINUTES OR LESS

CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCroach on the Lane Adjacent to Either Shoulder and the Area 0.6 m OUTSIDE THE EDGE OF PAVEMENT FOR A PERIOD OF MORE THAN 15 MINUTES BUT LESS THAN 60 MINUTES

CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCroach on the Lane Adjacent to Either Shoulder and the Area 0.6 m OUTSIDE THE EDGE OF PAVEMENT FOR A PERIOD OF 60 MINUTES OR GREATER

Maximum spacing between cones and tubular markers shall be 7.5 m. Maximum spacing between Type I or Type II Barricades or vertical panels or drums shall be based on the speed limit as follows: 5.0 m up to 25 MPH, 10.0 m for 30 MPH - 40 MPH, 15.0 m for 45 MPH and greater.

GENERAL NOTES
1. Work operations shall be confined to one traffic lane, leaving the adjacent lane open to traffic.
2. All vehicles, equipment, workers, and their activities are restricted at all times to one side of the pavement.
3. The first two warning signs, each side, shall have on 450 mm x 450 mm (Min.) orange flag and a Type B Light attached and operating at all times.
4. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
5. On undivided highways the median signs as shown are to be omitted.
6. When work is performed in the median lane on divided highways the Type II Barricades is (left) and (left) lane closed and lane reduction signage shall be applied for the right lane closed and lane reduction signs. The exception applies to undivided highways with the following exceptions. (a) Work shall be confined within one median lane. (b) Additional barricades, cones, or drums shall be placed along the centerline abutting the work area and across the trailing end of the work area. When an undivided highway occurs across the centerline, so as to encroach on both median lanes, the traveled lane is applied to the approach of both roadways.
7. The RIGHT LANE CLOSED signs are to be removed or fully covered when no work is being performed and the highway is open to traffic.
8. L (min.) = Length of taper meters:
   - W7 = For speeds ≤ 70 km/h
   - W6 = For speeds ≤ 60 km/h
   - W5 = Speed 50 km/h

   Where:
   W = Width of lateral transition in meters

   S = Posted speed (converted to km/h).

9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When work is being performed on a multilane undivided roadway, the signs normally mounted in the median (as shown) shall be omitted.
12. This TCZ plan does not apply when work is being performed in the center lane of a multilane highway. See Index Nos. 660 and 667.
13. A side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ indexes.
14. For general TCZ requirements and additional information, refer to Index No. 600.

SYMBOLS
- Work Area
- Sign With 450 mm x 450 mm (Min.)
- Orange Flag and Type B Light
- Type I or Type II Barricade or Vertical Panel
- Cone or Tubular Marker or Drum
- Work Zone Sign
- Flagger
- Advance Warning Arrow Panel

TYPICAL APPLICATIONS
- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work
- Pavement Curing and Straight Edge

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN
MULTILANE, DIVIDED AND UNDIVIDED RURAL OPERATIONS ONE DAYLIGHT PERIOD OR LESS

96  612  101

[Dimensions and units provided for various elements of the diagram.]
Symbology:
- **Work Area**
- **Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light**
- **Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only)**
- **Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)**
- **Work Zone Sign**
- **Advance Warning Arrow Panel**

General Notes:
1. Work operations shall be confined to one traffic lane, leaving the adjacent lane open to traffic.
2. All vehicles, equipment, workers, and their activities are restricted at all times to one side of the pavement.
3. The first two warning signs, each side, shall have a 450 mm x 450 mm (Min.) orange flag and a Type B light attached and operating at all times.
4. All signs shall be post mounted if the closure time exceeds 12 hours.
5. On undivided highways the median signs as shown are to be omitted.
6. When work is performed in the median lane on divided highways the barricading plan is inverted and left lane closed and lane resection signs substituted for the right lane closed and lane resection signs.
7. Signs and traffic control devices are to be modified in accordance with intermittent work storage details (sheet 2 of 2) when no work is being performed and the highway is open to traffic.
8. L (min.) Length of taper in meters
   - 95 for speeds ≤ 70 km/h
   - 75 for speeds ≤ 80 km/h
   - 60 for speeds ≤ 95 km/h
Where:
- W = Width of lateral transition in meters
- S = Planned speed limit (converted to km/h)
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Conventional dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When work is being performed on a multi-lane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
12. When a side road intersects the highway on which work is being performed, additional traffic control devices shall be erected in accordance with other applicable TEC indexes.
13. For general TEC requirements and additional information refer to Index No. 600.

Typical Applications:
- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work

Conditions:
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDERS AND THE AREA 0.6 m OUTSIDE THE EDGE OF PAVEMENT

Traffic Control Through Work Zones:
MULTILANE, DIVIDED AND UNDIVIDED • RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD

State of Florida Department of Transportation Field Design

<table>
<thead>
<tr>
<th>Date</th>
<th>Project No.</th>
<th>Location</th>
<th>Description</th>
</tr>
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<td>FDOT</td>
<td>Highway 98</td>
<td>Field Design Approvals</td>
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<tbody>
<tr>
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<td>1st Edition</td>
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</table>
DETAIL OF TEMPORARY ASPHALT SEPARATOR

GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the highway.

2. The first two warning signs, each side, shall be equipped with 450 mm x 450 mm orange flag and a Type B light attached and operating at all times.

3. All signs shall be post mounted.

4. TWO-WAY TRAFFIC sign(s) shall be repeated every four tenths (0.4) kilometer, in each direction, throughout the length of the project.

5. 1.8 m/min, 3.6 m/s for speeds ≥ 70 km/h

6. Where the target distance (L) exceeds 75.0 meters, spacing between cones or traffic control markers may be increased to 50.0 meters or spacing between Type I or II bollards or vertical panels or drums may be increased to 50.0 meters within the limits of the target, or post mounted delineators at 15.0 meter centers may be substituted for bollards, vertical panels, cones, tubular markers or drums.

7. All existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and new pavement marking used for marking new edge lines.

8. Arrows denote direction of traffic only and do not reflect pavement markings.

9. Longitudinal dimensions are to be adjusted to fit field conditions. See index No. 600.

10. When side roads, cross roads or interchanges are located within the limits for work zone traffic control, additional traffic control devices shall be erected in accordance with other applicable TCO indexes.

11. For general TCO requirements and additional information refer to index No. 600.

APPLICATIONS

Scheme 1: Restricted Construction Limits
Scheme 2: Unrestricted Construction Limits
Scheme 3: Unrestricted Construction Limits

Where:

Construction Limits Are The Outward Beginning Or Ending Of Lane Reductions

Where:

Unless A Specific Scheme Is Called For In The Plan, Scheme Selection Shall Be At The Contractors Option And As Approved By The Engineer

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF ONE ROADWAY AND THE OPPOSING ROADWAY IS CONVERTED TO TEMPORARY TWO-WAY TRAVEL BY WAY OF CROSSOVERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MULTILANE DIVIDED • RURAL

DAY OR NIGHT OPERATIONS

Reference No. Date Issued Date Revised


604 04/10/84 01/02/84
GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the pavement.
2. The first two warning signs shall have a 450 mm x 450 mm (min.) orange flag and a Type B light attached and operating at all times.
3. All signs, except those required in paved areas, shall be posted mounted if the closure time exceeds 1/2 hours.
4. TWO-WAY TRAFFIC signs shall be repeated every four-tenths (0.4) kilometer, in each direction, through the tangent distance (T).
5. L (min.) = W / T = 40 for speeds ≤ 70 km/h

- W: For speeds ≤ 60 km/h

- W = Width of lateral transition in meters
5: Posted speed limit (converted to km/h).
6. Where the tangent distance (T) exceeds 75.0 meters, spacing between cones or tubular markers may be increased to 75.0 meters or spacing between Type 1 or Type II Barricades or vertical panels or drums may be increased to 50.0 meters within 15 meters of the tangent.

This index does not apply when work is being performed in the midlane (lanes) of a six or more lane highway. Special maintenance of traffic details will be required.

Arrows denote direction of traffic only and do not reflect pavement markings.

Longitudinal dimensions are to be adjusted to fit field conditions. See index No. 600.

When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCI Indexes.

For general TCI requirements and additional information refer to index No. 600.

SYMBOLS

- Work Area
- Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricades Or Vertical Panel
- Or Drum (With Steady Burning Light At Night Only)
- Tubular Markers May Be Used During Daylight Only
- Cones May Be Used During Daylight And As Permitted At Night
- Type III Barricade (With Flashing Light)
- Work Zone Sign
- Advance Warning Arrow Panel

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF THE LANES IN ONE DIRECTION AND A DETOUR IS PROVIDED BY UTILIZING ONE LANE OF THE OPPOSING TRAFFIC LANES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL THROUGH WORK ZONES

MULTILANE UNDIVIDED • RURAL
DAY OR NIGHT OPERATIONS
Maximum spacing between cones and tubular markers shall be 7.5 m. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 5.0 m up to 25 MPH; 10.0 m for 30 MPH; 40 MPH; and 15.0 m for 45 MPH and greater.

**SYMBOLS**

- **Work Area**
  - Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light
  - Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Tubular Markers May Be Used During Daylight Only. Cones May Be Used During Daylight And As Permitted At Night.
  - Work Zone Sign
  - Advance Warning Arrow Panel

**GENERAL NOTES**

1. All vehicles, equipment, workers, and their activities are restricted at all times to one side of the highway.
2. The first two warning signs, each side, shall have a 450 mm x 450 mm (Min.) orange flag and a Type B light attached and operating at all times.
3. Mesh signs may be used for (Daylight Only) operations Type A Lights and Orange Flags are not required.
4. All signs shall be posted mounted if closure time exceeds 2 hours.
5. L (min) = \( \frac{W}{4} \) for speeds > 70 km/h
   \[ \text{L (min)} > \frac{W}{4} \text{ for speeds > 60 km/h} \]
   Where:
   - \( W \) = Width of lateral transition in meters.
   - \( S \) = Posted speed limit (converted to km/h).
6. The LEFT LANE CLOSED and lane reduction signs are to be removed or fully covered when no work is being performed and the inside lane is open to traffic.
7. Advance warning arrow panels are required for both day and right operations. Either the right flashing arrow or the right sequential arrow modes may be used; the caution mode shall not be used.
8. Arrows denote direction of traffic only and do not reflect pavement marking.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ indexes.
11. For work performed-in the outside lane refer to indexes Nos. 612 and 613.
12. For general TCZ requirements and additional information refer to Index No. 600.

**CONDITIONS**

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON ANY PORTION OF THE INSIDE LANE OF A MULTILANE HIGHWAY
SYMBOLS

- Work Area
- Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only), Tubular Markers May Be Used During Daylight Only, Cones May Be Used During Daylight And As Permitted At Night.
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)
- Work Zone Sign
- Flagger
- Stop Bar

GENERAL NOTES

1. All vehicles, equipment, workers except flaggers and their activities are forbidden in lane and intersection areas reserved for traffic.

2. The first two warning signs shall have a 450 mm x 450 mm (Min.) orange flag and a Type B light attached and operating at all times. Reflective signs may be used for daylight only operations. Type B lights and orange flags are not required.

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

4. All signs shall be post mounted if closure time exceeds 2 hours.

5. When vehicles in a parking zone block the line of sight to TCI signs or when TCI signs are not in view due to a normal pedestrian walkway, the signs shall be post-mounted and located in accordance with Index No. 1702.

6. Flaggers shall be located where they can control more than one direction of traffic. Flaggers shall be in sight of each other or in direct communication at all times.

7. Minimum spacing between barricades, vertical panels, cones, tubular markers and drums shall be not greater than 7.5 meters.

8. Arrows denote direction of traffic only and do not reflect pavement markings.

9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.

10. Temporary traffic calming modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.

11. Work performed for a period of 60 minutes or less is to be conducted in accordance with Index No. 607.

12. For general TCI requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES INFRINGE ON THE PAVEMENT REQUIRING THE CLOSURE OF A PORTION OF ONE OR MORE TRAFFIC LANES IN AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

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

DOCUMENT NO.

SIGNED:

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

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

DOCUMENT NO.

SIGNED:
SYMBOLS

- Work Area
- Sign With 450 mm x 450 mm (Min.) Orange Flag and Type B Light
- Type I or Type II Barricade Or Vertical Panel or Drum (With Steady Burning Light At Night Only). Cones may be used during daylight only. Permitted At Night.
- Type I or Type II Barricade Or Vertical Panel or Drum (With Flashing Light At Night Only)
- Work Zone Sign
- Flagger

GENERAL NOTES

1. Work operations shall be confined to one travel lane, leaving the opposing travel lane open to traffic.
2. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the pavement.
3. For work operations of 60 minutes or less see Index No. 601.
4. When vehicles in a parking zone block the line of sight to TCC signs or when TCC signs approach on a no-pedestrian walkway, the signs shall be past mounted and located in accordance with Index No. F330.
5. If work area is confined to an outside auxiliary lane the work area shall be barricaded and the flagger signs replaced by ROAD WORK AHEAD signs. Flaggers are not required.
6. Flaggers shall be in sight of each other or in direct communication at all times.
7. The ROAD CONSTRUCTION AHEAD and FLAGGER signs shall have a 450 mm x 450 mm (Min.) orange flag and a Type B light attached and operating at all times.
8. Mesh signs may be used for (Daylight Only) operations.
9. Type B Lights and Orange Flags are not required.
10. All signs shall be past mounted if the closure time exceeds 12 hours.
11. The maximum spacing between devices shall not be greater than 7.5 meters.
12. Arrows denote direction of traffic only and do not reflect pavement markings.
13. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
14. For general TCC requirements and additional information refer to Index No. 605.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF ONE TRAFFIC LANE, FOR WORK AREA LESS THAN 60.0 m DOWNSTREAM FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.
**SYMBOLS**

- Work Area
- Sign With 450 mm x 450 mm (Min)
- Orange Flag and Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only), Tubular Markers May Be Used During Daylight Only. Cones May Be Used During Daylight And As Permitted At Night.
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel
- Stop Bar

**GENERAL NOTES**

1. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.

2. Work operations shall be confined to either one lane or lane combinations as follows:
   - (a) Outside travel lane
   - (b) Outside auxiliary lane
   - (c) Inside travel lane
   - (d) Inside auxiliary lane
   - (e) Inside travel lane and adjoining auxiliary lane
   - (f) Inside travel lane and adjoining auxiliary lane

3. For work operations of 60 minutes or less see index No. 602.

4. When vehicles in a parking lane block the line of sight to TCZ signs or when TCZ signs are placed on a normal pedestrian walkway, the signs shall be placed and located in accordance with index No. 7102.

5. The first two warning signs shall have a 450 mm x 450 mm (Min) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for daylight only operations. Type B lights and orange flags are not required.

6. All signs shall be post mounted if the closure times exceeds 12 hours.

7. Oval signs are required for divided roadways.

(Continued)

**CONDITIONS**

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENRICOACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE OUTSIDE TRAVEL LANE, AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 60.0 m FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

**TYPICAL APPLICATIONS**

Utility Work
Pavement Repairs
Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
POND design
MULTILANE, TWO-WAY/ URBAN DIVIDED OR UNDIVIDED DAY OR NIGHT OPERATIONS

**Symbols:**
- P: Pavement Work
- D: Divided Work
- U: Urban Work
SYMBOLS

- **Work Area**
- **Sign With 450 mm x 450 mm (Min.)**
- **Orange Flag And Type B Light**
- **Type I Or Type II Barricade Or Vertical Panel**
  - Or Drum (With Steady Burning Light At Night Only)
  - Tubular Markers May Be Used During Daylight Only.
  - Cones May Be Used During Daylight And As Permitted At Night.
- **Tripod Barricade (With Flashing Light)**
- **Step Bar**
- **Advance Warning Arrow Panel**

GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the pavement.
2. For work operations of 60 minutes of less, a daylight only light may be used. For work operations of 60 minutes or more, a multi-beam light shall be used. These lights shall be placed in accordance with Index No. M202.
3. When vehicles in a parking zone block the line of sight to TCB signs or when TCB signs encroach on a normal pedestrian walkway, the signs shall be posted and placed in accordance with Index No. M202.
4. The first two warning signs shall have a 450 mm x 450 mm (Min.) Orange Flag and a Type B Light attached and operating at all times. These signs shall be used for Daylight Only operations. Type B Lights and Orange Flags are not required.
5. All signs shall be posted so that the closure time exceeds 12 hours.
6. Dual signs are required for divided roadways.
7. Channelizing devices are to be spaced with cones or tubular markers at 7.5 meter centers and Type I or Type II barricades or vertical panels or drums of 15.0 meter centers, except in tangential work areas, spacing may be increased to 15.0 meter centers for cones or tubular markers and 30.0 meters for barricades or vertical panels or drums after the first 15.0 meters when approved by the Engineer.
8. Removable reflectorized pavement markings shall be used when closure time exceeds one daylight period.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCB requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF TRAFFIC LANES IN ONE DIRECTION AND THE USE OF ONE OPPOSING TRAFFIC LANE TO MAINTAIN TWO-WAY TRAFFIC, FOR WORK AREA LESS THAN 60.0 m FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

- When other construction or maintenance operations occur within 3 kilometers, signs to be placed and signed to be coordinated in accordance with Index No. 600.

- When other construction or maintenance operations occur within 6 kilometers, signs to be placed and signed to be coordinated in accordance with Index No. 600.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
MULTILANE DIVIDED WITH TRAVERSABLE MEDIAN OR UNDIVIDED • URBAN DAY OR NIGHT OPERATIONS

TAFFA Approach

- Attention
- Brakes
- Alarms
- Sirens
- Flashing Beacons

- Visible
- Audible
- Combination
GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the pavement.

2. Work operations shall be confined to either one lane or a combination of lanes as follows:
   a) Outside travel lane
   b) Outside travel lane and adjoining auxiliary lane
   c) Outside travel lane and adjoining center lane
   d) Inside travel lane and adjoining auxiliary lane
   e) Inside travel lane and adjoining center lane

3. For work operations that require a single lane closure only, at 60 minutes or less see Index No. 605.

4. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be placed mounted and located in accordance with Index No. 1730.

5. When work is performed in the median lane or the median and adjoining center lanes the bollarding signs are installed and LEFT LANE CLOSED AHEAD and merge right symbol signs shall be substituted for the RIGHT LANE CLOSED AHEAD and merge left symbol signs.

6. The first two warning signs, each sign, shall have a 450 mm x 450 mm min., orange flag and a Type B light attached and operating at all times.

TYPICAL APPLICATIONS

Utility Work
Pavement Repair
Structure Adjustments

SYMBOLS

- Work Area
- Advance Warning Arrow Panel
- Stop Bar
- Work Zone Sign
- Type I or Type II Barricade or Vertical Panel Or Drum (With Steady Burning Light At Night Only)
- Type I or Type II Barricade or Vertical Panel Or Drum (With Flashing Light At Night Only)
- ROAD WORK AHEAD
- LEFT LANE CLOSED AHEAD
- RIGHT LANE CLOSED AHEAD
- END ROAD WORK
- STOP
- When Other Construction Or Maintenance Operations Color
  Within 16 Kilometers, Signs To Be Deleted And Signs To Be Replaced As Required To The
  Conditions In Accordance With Index No. 600.
- First STOP Sign and Insert Pavement Markings Shall By Workmen, Remove Or Cover Existing
  STOP Sign And Repainted When Through Lane Reopened To
  Traffic
- When Other Construction Or Maintenance Operations Color
  Within 16 Kilometers, Signs To Be Deleted And Signs To Be Replaced As Required To The
  Conditions In Accordance With Index No. 600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE OR THE MEDIAN TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 60.0 m FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE OR THE MEDIAN TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA 60.0 m OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MULTILANE ONE-WAY OR MULTILANE DIVIDED WITH NON-TRANSVERSABLE MEDIAN • URBAN DAY OR NIGHT OPERATIONS

Trafic Control Through Work Zones
SYMBOLS

Work Area

O Sign With 450 mm x 450 mm (Min.) Orange Flag And Type B Light

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

H Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)

D Work Zone Sign

Advance Warning Arrow Panel

GENERAL NOTES

1. All vehicles, equipment, workers and their activities are prohibited at all times from the lane areas reserved for traffic.

2. Work operations shall be confined to one center travel lane, leaving the adjacent travel lanes open to traffic.

3. For work operations of 60 minutes or less see Index No. 612.

4. When vehicles in a parking zone block the line of sight to TCC signs or when TCC signs encroach on a normal pedestrian walkway, the signs shall be posted mounted and located in accordance with Index No. 732.

5. The first two warning signs, each side, shall have a 450 mm x 450 mm orange flag and a Type B light attached and operating at all times.

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

7. Advance warning arrow panel is required for both day and night operations.

8. Channelizing devices are to be spaced with cones or tubular markers at 7.5 m centers Type I or Type II barricades or vertical panels or drums at 15.0 m centers for the first 75.0 m, thereafter cones or tubular markers at 9.0 m centers and Type I or Type II barricades or vertical panels or drums at 30.0 m centers.

9. Arrows denote direction of traffic only and do not reflect pavement markings.

10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.

II. For general TCC requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

Utility Work
Pavement Repair
Structure Adjustments

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENTRAP ON THE PAVEMENT REQUIRE THE CLOSURE OF THE CENTER LANE.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MULTILANE ONE-WAY OR MULTILANE DIVIDED WITH NON-TRAVERSABLE MEDIAN • URBAN DAY OR NIGHT OPERATIONS

DESIGN ENGINER : C. L. B. LEWIS

APPROVED BY:

ENGINEER: C. L. B. LEWIS

11/21/75

626
MODE • WARNING

MOVING OPERATIONS

GENERAL NOTES
1. These illustrations are representative of general conditions. Conditions differing from those shown shall be treated as directed by the Engineer.
2. The intensity of light and the position of panels shall be as specified in Index No. 600.
3. The Advance Warning Vehicle (Optional) may be used at the direction of the Engineer. If an Advance Warning Vehicle is operated within the travel way, an approved Truck Mounted Attenuator will be required on the Advance Warning Vehicle but not required on the Shadow Vehicle. The Advance Warning Arrow Panel and Warning Sign are required on both the Advance Warning and Shadow Vehicles.
4. For general TCZ requirements and additional information refer to Index No. 600.
5. If the work vehicle speed exceeds the minimum legal speed limit on limited access facilities and one half the posted speed limit on other facilities, the engineer in charge may delete requirements for shadow vehicle and attenuators. The work vehicle will be required to have an advance warning arrow panel and warning sign.

SYMBOLS

W: Work Vehicle With Flashing Beacon
A: Shadow (S) Or Advance Warning (AW) Vehicle
T: Truck Mounted Attenuator (TMA)
→: Lane Identification And Direction Of Traffic

TYPICAL APPLICATIONS
Striping
RPM Placement
Vegetation Control

CONDITIONS
MOVING OPERATION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN
TRAFFIC CONTROL THROUGH WORK ZONES
MOVING OPERATIONS

Page 37 of 107
1994
54
627
CONDITION A

WHEN THE PAVING TRAIN IS IN LANE 1 THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE 2 AND PROCEED IN LANE 2 TO THE FRONT OF THE TRAIN

CONDITION B

WHEN THE PAVING TRAIN IS IN LANE 2 THE U-TURNING VEHICLE SHALL TURN INTO LANE 1, CAUTIOUSLY MERGE INTO LANE 1 AND PROCEED TO THE FRONT OF THE PAVING TRAIN

CONDITION A & B

THE ADVANCE WARNING ARROW PANEL IS REQUIRED. UNDER NO CIRCUMSTANCES WILL THE TRAFFIC TRANSITION BE LOCATED WITHIN THE LIMITS OF THE CROSSEVER

TRAFFIC TRANSITION AREA DOWNSTREAM FROM CROSSOVER

CASE II

Note: See Sheet 1 of 2 For General Notes, Sign No. Details, And Conditions.
PHASE III

1. Remove temporary markings from the existing pavement and temporary shoulder pavement. Work pavement, install warning devices and re-sign as shown. Traffic to be controlled in accordance with Index No. 606. For lane width requirements see Index No. 600.
2. Route through traffic to newly constructed roadway.
3. Resurface or reconstruct existing pavement including required shoulder pavement and friction course.

PHASE II

1. Route traffic as shown in Phase II. Signage to be as shown in Phase II.
2. Construct friction course over pavement constructed in Phases I and II.

GENERAL NOTES

1. The first two warning signs shall have a 450 mm x 450 mm (Min.) orange flag and a Type B light attached and operating at all times.
2. Existing signs and pavement markings that conflict with construction signage and warning shall be removed or rerouted.
3. Lane widths for maintenance of two way traffic should be at least 3.0 meters wide. When one lane or one way operation are necessary a minimum width of 3.6 meters shall be maintained and traffic controlled in accordance with Index Nos. 601, 604, 606 and 607. Minimum width for the temporary shoulders is 1.8 meters.
4. Within the lateral transition, the minimum spacing between cones or tubular markers shall be 1.5 meters. Maximum spacing between Type 1 or Type 2 barricades or vertical panels or drums shall be based on the speed limit as follows: 0.5 meters for 20 mph, 0.625 meters for 30 mph, 0.75 meters for 40 mph, 1.0 meters for 50 mph or greater.
5. Barricades shall be in accordance with "Prohibition Requirement for Drapes" Index No. 600.
6. For speed signs apply speed limit for Index No. 600.
7. For reflectorized orange and Type 1 or Type 2 barricades or vertical panels or drums shall be based on the speed limit as follows: 0.5 meters for 20 mph, 0.625 meters for 30 mph, 0.75 meters for 40 mph, 1.0 meters for 50 mph or greater.
8. Additional barricades, signing, lighting or other traffic controls shall be provided for limited work areas in accordance with other applicable TCE Indexes.
9. Access denial direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions shall be adjusted to fit field conditions. See Index No. 600.
11. When a side road intersects the roadway on which the work is being performed additional traffic control devices shall be erected in accordance with other applicable TCE Indexes.
12. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway during construction.

LEGEND

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
CONVERTING TWO LANES TO FOUR LAMES DIVIDED • RURAL

PHASE I

PHASE II

PHASE III

GEO-ENGINEERING SERVICES
3555 Corporate Parkway, Suite 100
Orlando, FL 32812

713-960-6900

PROJECT NO:
640

DESIGN
Christopher E. Liptak

CIVIL ENGINEER

FINAL DATE:
5/22/2003

TRANSMISSION DATE:
5/22/2003

S 004-2 of 2
SYMBOLS

- **Sign With 450 mm x 450 mm (18 in.)**
  - **Orange Flag And Type B Light**

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

- **Type III Barricade (With Flashing Light)**
- **Work Zone Sign**
- **Stop Bar**

GENERAL NOTES

1. All signs, pavement marking, barricades and warning lights necessary for maintenance of traffic shall conform to Index No. 660.

2. The first two warning signs shall have a 450 mm x 450 mm (18 in.) orange flag and a Type B light attached and operating at all times.

3. Lane widths for maintenance of two-way traffic should be at least the lane widths of the existing facility, but lanes shall not be less than 3.5 meters in width. When one lane one-way operations are necessary, a minimum width of 3.5 meters should be established and traffic maintained in accordance with Index Nos. 620, 621 or 622.

4. At signalized intersections, signals shall be installed or relocated as required to the center of restricted lanes.

5. For reflectorized road signs, painting and other work, see Index No. 600 and Index No. 670.

6. Additional barricades, signing, lighting or other traffic controls for limited work areas shall be provided in accordance with other applicable TCL Indexes as conditions warrant in each phase.

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

8. Arrows denote direction of traffic only and do not reflect pavement markings.

9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.

10. For general TCL requirements and additional information refer to Index No. 600.

PHASE III

- **Required For Projects > 3.2 Kilometers**
- **End Road Work**
- **End Road Work Ahead**

LEGEND

- **Phase I**
- **Phase II**
- **Phase III**

CONVERTING TWO LANES TO FOUR LANES DIVIDED URBAN

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

THROUGH WORK ZONES

8 of 24

FAIRA, NORTH 5:45am
PHASE III
1. Reroute traffic to existing alignment and maintain two-way traffic.
2. Remove all temporary construction items.

GENERAL NOTES
1. All signing, pavement marking, beacons and warning lights necessary for maintenance of traffic shall conform to Index No. 600.
2. The first two warning signs shall have a 450 mm x 450 mm (min.) orange flag and a Type B light attached and operating at all times.
3. For speed sign applications see Index No. 600.
4. For lane width requirements see Index No. 600. When one-way one-lane operations are necessary, a minimum width of 3.6 meters shall be maintained and traffic controlled in accordance with Indexes No. 603, 604, 606, 607 or 608. Minimum width for the detour shoulders is 1.8 meters.
5. Method of attaching temporary guardrail to the detour structure to be approved by the Engineer.
6. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
7. Temporary crash cushions shall be the inertial type in accordance with Index No. 415 or others as called for in the plans.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. Where the temporary structure is not required the detour may be constructed in accordance with Index No. 609, unless otherwise stipulated in the plans.
11. For reflective raised pavement marker application see Index No. 600 and Index No. 7355.
12. For general TCZ requirements and additional information refer to Index No. 600.
**CURVILINEAR ALIGNMENT CROSSOVER**

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<th>BUFFER LENGTH (ft)</th>
<th>MINIMUM RADIUS FOR NORMAL CROSS SLOPES</th>
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**NOTE:** Buffers with speeds of 90 mph or greater are considered high-speed facilities. Curves and superelevation criteria for high-speed conditions apply.

*Length of barrier wall needed for protection of work area and/or other hazards to be shown in the plans. For complimentary information on barrier walls and work area see Sheet 1. See Index No. 606 for clear zone requirements.*
**CORNER SIDEWALK CLOSURE WITH TEMPORARY CROSSWALKS**

**GENERAL NOTES**

1. Arrows denote direction of traffic only and do not reflect pavement markings.
2. Only the signs controlling pedestrian flows are shown. Other work zone signs will be needed to control traffic on the streets.
3. For spacing of traffic control devices and general TCI requirements refer to Index No. 660. Maximum spacing between temporary, temporary portable, drum or tubular markers shall not be greater than 7.5 m.
4. Street lighting should be considered.
5. For nighttime closures use type A flashing warning lights on barricades supporting signs and closing sidewalks. Use type C steady burn lights on channelizing devices separating the work area from vehicular traffic.
6. Pedestrian traffic signal display controlling closed crosswalks shall be covered or deactivated.
7. Temporary walkways shall be a minimum of 1.2 m wide and kept free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials and etc.
8. Post Mounted Signs located near or adjacent to a sidewalk shall have a 0.6 m minimum clearance from the bottom of sign to the sidewalk.
9. When construction activities involve sidewalks on both sides of the street, efforts should be made to stage the construction so that both sidewalks are not out of service at the same time.
10. In the event that sidewalks on both sides of the street are closed, then pedestrians shall be guided around the construction zone.

**TYPICAL APPLICATIONS**

- Sidewalk Repair
- Pavement Widening
- Utility Work

**CONDITIONS**

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCROACH ON THE SIDEWALK FOR A PERIOD OF MORE THAN 60 MINUTES

**PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS**
THE DESIGN ELEMENTS RELATED TO HIGHWAY SAFETY HAVE BEEN DISCONTINUED IN PUBLICATION OF THE 1996 METRIC ROADWAY AND TRAFFIC DESIGN STANDARDS


INDEX NO. 700 SHEET 1 OF 2 (DATED SEPTEMBER, 1994)

EMBANKMENT SLOPE ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2.4
CLEAR WIDTH FOR BRIDGES ___________________________ See "Structures Design Guidelines," Ch. 2
BACK SLOPE ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2.4
CLEAR ZONE (CZ) Urban/Rural
U.S. Highway ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2,1.2
Urban Curb & Gutter ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2,1.1
(Note: CZ Replaced by Horizontal Clearance)
GUARDRAIL LOCATION ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2,1.1
SIGNS ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2,1.1
LIGHT POLES ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2,1.1
UTILITY POLES, FIRE HYDRANTS ETC ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2,1.1
RAILROAD CROSSINGS DEVICES ___________________________ Not covered in PPM. See Indexes Nos. 560, 7346 and 7782.
MEDIAN WIDTHS ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2,2
TREES ___________________________ PPM, Vol. 1, Ch. 2, Sec. 2,2

INDEX NO. 700 SHEET 2 OF 2

The Sheet is Reproduced in The PPM As Table 2.12.2.
DESIGN WIND SPEEDS BY COUNTY

LOCATION NO. 1 (1000 ft)


LOCATION NO. 2 (500 ft)

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**NOTE:** The Code Exit Plan (FTP-3), Index FTS-3, Sheet 3. Sign Identification Number 80, can be licensed as a single column with the following dimensions:

1. Maximum height is 4.2 meters.
2. Column size is 1000 x 1000 x 1200 mm standard round tube with 64 mm wall.
3. 3 Type B brackets required for attachment.
4. For Type B brackets details, Attachment and General Notes see Index No. 80HE.
5. For posting size and Slip joint Details, see Index No. 8067.
GENERAL SPECIFICATIONS: Florida Department of Transportation Standard Specifications for Roads and Bridges Construction (1989) and Supplements thereof.


ALUMINUM: All parts of the aluminum shall meet the requirements of the American Association of Aluminum Alloy 6061-T6 (ASTM B209M, B221M, or B210M).

CONCRETE: All concrete shall be Class 11 Special, the specified compressive strength at 28 days is 2,000 lbs. min.

SHEAR PANELS: All panels shall be 2.5 mm min. 3.2 mm Aluminum Panels with stiffeners excepted for sign and layout steel. Panels are to be engraved, embossed, and finished with AASHTO M699, traffic M-7, Bandera 52104 black. No nibbling permitted on panels.

ALUMINUM BOLTS, NUTS & LOCKWASHERS: Aluminum parts shall meet the requirements of the American Association of Aluminum Alloy 7075-T6 (ASTM B209M).

STAINLESS STEEL BOLTS, NUTS & LOCKWASHERS: Stainless Steel Bolts, Nuts and Lockwashers conforming to AASHTO M6 may be provided in lieu of AASHTO M22.

INSTALLING FERRABLE COLUMNS SUPPORTS: Columns (Posts) may be achieved by driving the columns in accordance with Index No. 1180 Per AASHTO, or as an alternate method, the columns may be specified from the depth indicated in professional scope documents with suitable material tampered to a depth no thicker than 300 mm to provide adequate compaction.

SHOP DRAWINGS: When Type "C" ground sign supports are furnished and fabricated in accordance with these plans, shop drawings shall be submitted for approval by the Engineer.

HOW TO USE THIS TABLE: Select the appropriate Sign Profile and Size to determine the Sign Identification Number. If the exact Sign Size of all Opponents are not listed, select the appropriate profile and larger Component Sizes. This table also gives the Quantity and Type of Sign Brackets required for each Sign for each Wind Zone, Where the Sign Size is given as a Vertical and Horizontal Distance, the vertical dimension.

CANTILEVER SIGN: The column shall be an extension to the Structural member that the sign shall not be greater than 6.5 in. off.

WIND LOADING:

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION RECOMMENDS

SINGLE COLUMN GROUND SIGN DESIGN

By: [Name] Date: [Date]

Engineer [Signature] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]

Prepared by [Name] Date: [Date]
<table>
<thead>
<tr>
<th>Footing</th>
<th>Height (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.0</td>
</tr>
<tr>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>3</td>
<td>4.0</td>
</tr>
<tr>
<td>4</td>
<td>3.0</td>
</tr>
<tr>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td>6</td>
<td>1.0</td>
</tr>
<tr>
<td>7</td>
<td>0.5</td>
</tr>
<tr>
<td>8</td>
<td>0.0</td>
</tr>
</tbody>
</table>

The column size and footings are in in.
<table>
<thead>
<tr>
<th>COL. SIZE</th>
<th>COLUMN HEIGHT</th>
<th>COLUMN FOOTINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
<tr>
<td>2</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
<tr>
<td>3</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
<tr>
<td>4</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
<tr>
<td>5</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
<tr>
<td>6</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
<tr>
<td>7</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
<tr>
<td>8</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
<tr>
<td>9</td>
<td>42.5 x 4.5</td>
<td>45 x 6.3 x 7.5</td>
</tr>
</tbody>
</table>

The Column Size and Footings are as follows:

- **42.5 x 4.5**: Column size with a height of 45 x 6.3 x 7.5.

Note: The table and diagram illustrate the various column sizes and footing dimensions for different loading conditions.
<table>
<thead>
<tr>
<th>HEIGHT (METERS)</th>
<th>MATERIAL</th>
<th>CHAINAGE (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To 0.4</td>
<td>2.4 x 2.6</td>
</tr>
<tr>
<td>3</td>
<td>To 0.8</td>
<td>2.4 x 2.7</td>
</tr>
<tr>
<td>5</td>
<td>To 1.2</td>
<td>2.7 x 2.7</td>
</tr>
<tr>
<td>7</td>
<td>To 1.6</td>
<td>2.7 x 3.3</td>
</tr>
<tr>
<td>9</td>
<td>To 2.0</td>
<td>2.7 x 3.3</td>
</tr>
</tbody>
</table>

**NOTE:**

- This Steelman model is designed for single-span post and sign combinations for implementation at signing sites with the Store of Facts. The design adheres to the following criteria:
  - A: Maximum height = 4.0 m (13.8 ft)
  - B: Maximum height = 6.0 m (19.7 ft)
  - C: Maximum height = 7.3 m (24.0 ft)
  - D: Maximum height = 7.6 m (25.0 ft)
  - E: Maximum height = 8.0 m (26.2 ft)
  - F: Maximum height = 9.0 m (29.5 ft)
  - G: Maximum height = 10.0 m (32.8 ft)
  - H: Maximum height = 12.0 m (39.4 ft)
  - I: Maximum height = 12.5 m (41.0 ft)

- Steel for Flanged Channel Posts and square tubes shall conform to ASTM A495 Grade 4 or ASTM A495 Grade 50.

- All steel parts and members that are designated in accordance with ASTM A495 or ASTM A606 shall be Grade 3.

- Steel for Flanged Channel Posts with a span of 6.0 ft is not required and shall be installed with approved flange expansion plates. See Schedule 2. The edges and the sign posts shall be spliced at the top and the sign posts shall be connected to the top flange using 1/2" matching nuts and bolts. The edges shall be painted right-hexagonal in every glue strike interval. The expansion plates shall be painted with the same color and design and shall be provided with 7/16" sign posts which are no more than 6.0 m (19.7 ft) in length.

- The expansion plates shall be installed with 7/16" sign posts which are no more than 6.0 m (19.7 ft) in length.

- All these parts, members, and members that are designated in accordance with ASTM A495 or ASTM A606 in Grading 3.

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- All these parts, members, and members that are designated in accordance with ASTM A495 or ASTM A606 in Grading 3.
GENERAL NOTES

DESIGN SPECIFICATION: Latest Standard specifications for structural supports for highway signs, culvert pipes, and traffic signal, AASHTO.

SHEETS AND PLATES: Material used shall meet the requirements of Aluminum Association 6061-T6 and ASTM B505. Sheets are to be degreased, etched, neutralized and treated with Aluma 000, in line 142 and 2 Bondocrete 725 or 575. All materials are to be stress relieved on sheets.

MATERIALS: All aluminum materials shall meet the requirements of the Aluminum Association 6061-T6 and also the following ASTM specifications for the following: Sheet and plates 6061, extruded shapes 6061 and standard structural shapes 6005-A6061.

ALUMINUM BOLTS, NUTS & LOCK WASHERS: Aluminum bolts shall meet the requirements of the Aluminum Association 6006-T4 or 6006-T6 (ASTM B209). The bolts shall have an oxide coating of at least 0.002" thick and an ultimate tensile Lockwashers shall meet the requirement of Aluminum Association 7075-T6 or 6006-T6.

SIGN FACE: All sign face covers shall be rounded. See sign layout sheet for dimension "n" and sign face details.

MATERIAL STRESSES: All allowable stresses are in accordance with standard specifications for structural supports for highway signs, culvert pipes, and traffic signals, AASHTO for all materials shown in the plans.

For mounting details refer to Index No. 1037.
3. TRAFFIC CONTROL DEVICES WITH FLASHING BEACON FOR
REDUCED SPEED ZONE AT A SCHOOL CROSSWALK
(2 LANES - 2 WAY TRAFFIC)
(WIDEBLOCK OR ON THRU STREET AT AN INTERSECTION)

4. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE
AT A SCHOOL CROSSWALK (NO FLASHING BEACON)
(2 LANES - 2 WAY TRAFFIC)
(WIDEBLOCK OR ON THRU STREET AT AN INTERSECTION)

5. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL
CROSSWALK WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS
(4 LANES UNDIVIDED - 2 WAY TRAFFIC)
(WIDEBLOCK OR ON THRU STREET AT AN INTERSECTION)

SCHOOL SIGNS & MARKINGS

<table>
<thead>
<tr>
<th>APPROACH SPEED MPH</th>
<th>APPROACH SPEED (kph)</th>
<th>SUGGESTED DISTANCE A</th>
<th>METERS B</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 To 35</td>
<td>40 To 56</td>
<td>60.0</td>
<td>50.0</td>
</tr>
<tr>
<td>36 To 45</td>
<td>64 To 70</td>
<td>100.0</td>
<td>80.0</td>
</tr>
<tr>
<td>46 To 55</td>
<td>74 To 90</td>
<td>150.0</td>
<td>125.0</td>
</tr>
</tbody>
</table>

School crosswalk width shall be 1.8 m. min.
3.0 m. min. if public sidewalk used.
3.0 m. min. with public sidewalk used.
See Table No. 17344 sheet 5 of 8.
9. TRAFFIC CONTROL DEVICES AT SCHOOL ENTRANCES WITH LOW VOLUMES OF WALKING STUDENTS

These signs are intended for use only at those few locations where the school entrance is not evident to the motorists, and must be approved in advance by the responsible traffic engineering authority.

10. TRAFFIC CONTROL DEVICES FOR A TYPICAL SCHOOL ZONE FRONTING THE SCHOOL PROPERTY

School zone limits an uncontrolled activity as defined by local school board through the local traffic engineers.

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

Location of School Speed Limit Sign When A Reduced Speed Limit Has Been Approved.

Note: The school bus stop sign is to be used in absence of isolators where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 600.0 ft. In advance. It shall have a minimum size of 750 mm x 750 mm. It is not intended that these signs be used wherever a school bus stop is to pick up or discharge passengers. These signs are intended for use solely 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.
Notes:

1. Standard size signs should be used whenever possible. Where standard signs cannot be used, the following signs or modifications of standard signs may be used:

   a. School Speed Limit assembly for use with speed limit sign.

2. The value of the actual school zone speed limit shall be determined by the District Traffic Operations Engineer in cooperation with school district superintendents. In no case shall it be less than the 15 mph limit or set by law.

3. See page 16, FIG.55 for sign details.

Ground Mount Standard

Notes:

Existing ground mount school speed limit signs fulfilling a single 200 mph min. size標準 or two 100 mph min. signs because inside the school bemoan any consideration meeting the standard. However, replacement or upgrading of these school speed limit signs shall conform to the above standard. Numerical speed limit shall be established by appropriate regulatory authorities.
NORMAL TAPERED ENTRANCE

NORMAL TAPERED ENTRANCE
WITH ADDED LANE
PARALLEL ACCELERATION AND DECELERATION LANE

Wrong Way Arrow

White Arrow With
Conspicuous-Red Reflective Markers
For Arrow details see Index No. IP346
sheet 1 of 8.
TYPICAL INTERSECTION 2 THRU LANES
PLUS LEFT TURN LANE, WITH CROSSWALK

RIGHT TURN LANE DROP AND ISLAND DETAILS
LEFT TURN LANE DROP IS MIRROR IMAGE

NOTES:
1. When public sidewalk curb ramps are present, refer to sheet 2 of 9 & 7 of 9 in this index if 346 and index No. 324 sheet 1 of 2 for
crosswalk widths.
2. Double yellow long/dash center lines on all roadway approach shall
be extended back 30.0 ft for projects involving intersection
improvements only.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
SPECIAL DESIGN
SPECIAL MARKING AREAS

STOP BARS, CROSSWALKS AND DOUBLE CENTER LINE DETAILS
FIGURE 1
MEDIAN WIDTHS UNDER 9.0 m

ONE-WAY SIGNS ON DIVIDED HIGHWAY INTERSECTIONS

FIGURE 2
MEDIAN WIDTHS 9.0 m AND GREATER

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

PAVEMENT MARKING FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSING DIRECTIONS)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SPECIAL MARKING AREAS
TRANSITION DISTANCE $L_i$

<table>
<thead>
<tr>
<th>$L_i$ (m)</th>
<th>2.1</th>
<th>2.4</th>
<th>2.7</th>
<th>3.0</th>
<th>3.3</th>
<th>3.6</th>
<th>3.9</th>
<th>4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>50</td>
<td>45.0</td>
<td>43.0</td>
<td>42.0</td>
<td>41.0</td>
<td>40.0</td>
<td>39.0</td>
<td>38.0</td>
</tr>
<tr>
<td>30</td>
<td>60</td>
<td>55.0</td>
<td>53.0</td>
<td>52.0</td>
<td>51.0</td>
<td>50.0</td>
<td>49.0</td>
<td>48.0</td>
</tr>
<tr>
<td>40</td>
<td>60</td>
<td>55.0</td>
<td>53.0</td>
<td>52.0</td>
<td>51.0</td>
<td>50.0</td>
<td>49.0</td>
<td>48.0</td>
</tr>
<tr>
<td>50</td>
<td>70</td>
<td>65.0</td>
<td>63.0</td>
<td>62.0</td>
<td>61.0</td>
<td>60.0</td>
<td>59.0</td>
<td>58.0</td>
</tr>
<tr>
<td>60</td>
<td>80</td>
<td>75.0</td>
<td>73.0</td>
<td>72.0</td>
<td>71.0</td>
<td>70.0</td>
<td>69.0</td>
<td>68.0</td>
</tr>
<tr>
<td>70</td>
<td>100</td>
<td>95.0</td>
<td>93.0</td>
<td>92.0</td>
<td>91.0</td>
<td>90.0</td>
<td>89.0</td>
<td>88.0</td>
</tr>
</tbody>
</table>

**Post-test speed or 85th percentile**

**Direction of Travel**

**Pavement Marking Detail**

**Traffic Markings**

**State of Florida Department of Transportation**

**Special Marking Areas**

**Schemes for Transition - 2 Lane / 4 Lane Roadway**
RAILROAD CROSSING AT 2-LANE ROADWAY

NOTES:
1. When computing pavement markings, quantities do not include transverse lines.
2. When dynamite devices are not present or are to be included, the crossing shall be located at a minimum distance of 30.0 m from the crossing. Where street intersections occur between the RR gate or signal and gate, the pavement marking and the tracks are to be included.
3. Placement of sign W8-1 in a residential or business district, where low speeds are prevalent, the W8-1 sign may be placed at a minimum distance of 35.0 m from the crossing, where street intersections occur between the RR gate or signal and gate, the pavement marking and the tracks are to be included.
4. Recommended location for FT-7-33 or FT-3 389 sign, 30.0 m urban & 90.0 m rural in advance of the crossing.
5. A portion of the pavement marking symbol should be directly opposite the W8-1 sign.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SPECIAL MARKING AREAS

PAVEMENT MARKINGS FOR TERMINATION OF TWO WAY LEFT TURN AT R/R CROSSINGS

TYPICAL PAVEMENT MARKINGS FOR R/R CROSSING

8.3 m^2

*Does not include 600 mm gaps.

STOP Bar Perpendicular To Edge Of Trackway Or 2.4 m From & Parallel To Gate When Present

ISO White

DO NOT STOP ON TRACKS

ISO Yellow

For Use Near Signaled Intersections

600 White

See notes 3.4 & 5 for sign placement.

RAILROAD CROSSING AT 4-LANE ROADWAY

NOTE:
Pavement Markings symmetrical about centerline

PERMISSIBLE A

60 65.0
55 54.0
50 43.5
45 32.5
40 22.0
30 11.0
20 3.0

180

170

160

150

140

130

100

110

0

W8-1

ISO Yellow

See note 3.4 & 5 for sign placement.

W8-1

ISO Double Yellow

600 White

See Detail This Sheet For Placement Of Pavement Markings.

The Railroad Traffic Control Device
Is To Be Located A Minimum Of 3.6 m
From The Railroad Centerline. See
Index No. FT802 for Protection Devices.

The Railroad Traffic Control Device
Is To Be Located A Minimum Of 3.6 m
From The Railroad Centerline. See
Index No. FT802E For Protection Devices.

600 White

See notes 3.4 & 5 for sign placement.
GENERAL NOTES
1. For entrances to a one way street, the downstream restriction may be reduced to 6.0 m.
2. Parking shall not be allowed within 6.0 m of a crosswalk.
3. All parking zones shall be 150 mm white.
4. Parking zone blocks shall be broken of driveways.
5. Refer to Chapter 36 of the Florida Traffic Control Manual for two governing parking spaces.
6. Wheelchair and gutter are used as the type of the gutter zone, unless otherwise specified.
7. The width of the pedestrian crossing path shall be measured as the maximum width of the gutter zone.

TYPE I
No Parking Zone - Yellow Curb (Optional)

TYPE II
No Parking Zone - Yellow Curb (Optional)

TYPE III
No Parking Zone - Yellow Curb (Optional)

MINIMUM PARKING RESTRICTION FOR SIGNALIZED INTERSECTIONS

NOTES:
1. Parking restrictions are measured from the curb radius point.
2. Restrictions for accessible parking are the same as those applied to non-signalized intersections.

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CASE I: Object Markers shall consist of nine yellow reflectors located on a yellow reflective background or consist of a reflective panel of the same size with Type II A, B or C yellow sheeting.

CASE II: End of Road Markers shall consist of nine red reflectors mounted on a red reflective background or consist of a reflective panel of the same size with Type II A, B or C red sheeting.

NOTES:
1. This figure appl ies to residential and minor streets only. Major streets to be evaluated on a case-by-case basis.
2. For intersection two-way entries and entries are optional. The need should be based on a review of each location.
3. For additional details on aluminum round post, steel flanged channel post, sign panel materials and bolts, nuts and washers see Index Nos. 860D and 861E.
4. Case I instruction - The arrow panels and object markers shall be located approximately 6.0 m, but not less than 3.6 m from the edge of the traveled lane.
5. Sheet and sign shall be placed a sufficient distance to prevent the vehicle operator to perceive the sheet end of turning off, if possible, or the nearest intersecting street.
6. For pavement marking see Index No. 1346.
7. No guardrail is required unless special field conditions require its use.

Supports shall be driven 900 mm into the ground, 50 mm Ø 8-in 3 mm Aluminum Round Post or 3.7 kg/m Carbon Fiber Prestressed Channel Post.
Aluminum Posts 10 mm Ø Aluminum Button Head Bolt with Nut and Lockwasher or 26 mm Ø Stainless Steel Hex Inch Bolt with Flat Washer under Head and Lockwasher under Nut.
Channel Posts. Provide Attachment In Accordance with the "Sign Attachment Details" on Index No. 865.
Note: Roadway not drawn to scale.
Distances shown are adequate for driver communication,
but may be altered slightly if conditions require.

1. Signs and sign structures shall be erected in accordance
   with the details shown on Index 9355.

2. Sign FTP-15 shall be located on the Welcome Center grounds
   in proximity to the building and as far from the main line
   roadway as possible (1/2 sight back is best).


4. All legends to be Series E.

5. See Index 9735 for sign details.

Tourist Information Center
NEXT RIGHT

Sign No. FTP-15

Note: Sign FTP-15 shall be used as a supplemental guide sign at
interchanges which have a Tourist Information Center approved for such
signing (at least half-way between normal guide signs).
STATE OF FLORIDA
WELCOME CENTER
1 MILE

STATE OF FLORIDA
OFFICIAL
WELCOME CENTER

1/2 MILE

SIGN NO. FTP-22A

SIGN NO. FTP-19

SIGN NO. FTP-22B

SIGN NO. FTP-23

FTP - 22A

FTP - 22B

FTP - 23

240.0

672.0

672.0

FTP - 19

Note:
One sign FTP-22A or 22B should be used depending on speed, roadside development & geometric conditions.

Note:
Roadway not drawn to scale.

240.0 m Maximum For Rural Conditions
15.0 m Minimum For Compacted Areas

For Primary Highways

WELCOME CENTER SIGNING

FOR PRIMARY HIGHWAYS
STATE OF FLORIDA DEPARTMENT OF TRAFFIC ENGINEERING

WELCOME CENTER SIGNING

11. Signs and sign structures shall be erected in accordance with the details shown on Index 953.

12. Sign FTP-19 shall be located on the Welcome Center grounds in proximity to the building and as far from the Main Line roadway as possible; 12' sight back to back.

13. All legend to be Series E.
1. Reflective Pavement Markers shall be spaced at 6.0 m on all solid line
   lines and skip center lines. This spacing may be reduced to 6.0 m
   if specifically carried for in the plan.

2. The spacing on solid lines and solid/skip combination lines shall be 6.0 m.

3. All R.P.M.s shall be offset 25 mm from solid lines.

4. These spacings may be reduced for sharp curves if required.

5. All R.P.M.s shall be class "B".
RPM PLACEMENT FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)

NOTE:
Reversal pavement markers (bi-directional red and white) should be used in all gores of this type.

RPM PLACEMENT FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSITE DIRECTION)

Placement of RPMs on Shoulder Markings
Shoulder Markings for Left Side of Roadway Shall Be Yellow.
For Placement of RPMs On Ramps See Index 0.245.

Traffic Lines

Reflective Ppr Markers To Be Bi-Directional Marker.

Installs Markers At 6.0 ft Centers To Centers.

NOTE:
Reversal pavement markers (bi-directional red and white) should be used in all gores of this type.
**ENERZITE SYSTEM**

**TOP VIEW**

**PLACEMENT OF OBJECT MARKER**

**ENGRUM SYSTEM**

**DETAIL A**

**HEX-FOAM SANDWICH SYSTEM**

**SECTION AA**

**GREAT SYSTEM**

**OBJECT MARKER**

**GENERAL NOTES**

1. Cost for Object Marker to be incidental to the cost of Attenuator Systems.
2. Object Marker shall consist of nine yellow reflectors mounted on a yellow reflective background or consist of a reflective pan of the same size with type III-A, III-B or III-C yellow sheeting.
**GUIDE SIGN USE**

Notes:
1. Florida marker shall have Black Legend with White Background.
2. Stroke width of State outline to be 25 mm for Independent use and 32 mm for Guide Sign.

**COUNTY ROUTE MARKER DETAIL**

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**SPECIAL SIGN DETAILS**

**FLORIDA ROUTE MARKER**

**FTP - 28**

**3 OR MORE DIGITS**

**INDEPENDENT USE FOR FREeways**

**3 OR MORE DIGITS**

**INDEPENDENT USE OTHER THAN FREeway**

**DIAMETERS**

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<th>Panel Size (mm)</th>
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**DIMENSIONS**

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**COUNTY ROUTE MARKER DETAIL**

**FTP - 29**

**3 OR MORE DIGITS**

**INDEPENDENT USE OTHER THAN FREeway**

**INDEPENDENT USE FOR FREeway**
### ROAD WORK NEXT X MILES

#### G28-1

**Dimensions in Millimeters**

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**Series C Letters**

G28 × 1500

**Legend and Border**: Black

**Background**: Orange

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### ROAD WORK 500 FEET

#### W28-1A

**Dimensions in Millimeters**

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**Legend and Border**: Black

**Background**: Orange

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### ROAD WORK 1000 FEET

#### W28-1B

**Dimensions in Millimeters**

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**Legend and Border**: Black

**Background**: Orange

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### ROAD WORK 1500 FEET

#### W28-1C

**Dimensions in Millimeters**

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**Legend and Border**: Black

**Background**: Orange

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### ROAD WORK 1/2 MILE

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**Dimensions in Millimeters**

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**Legend and Border**: Black

**Background**: Orange

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### ROAD WORK 1 MILE

#### W28-1E

**Dimensions in Millimeters**

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**Legend and Border**: Black

**Background**: Orange

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### SPECIAL SIGN DETAILS

**Date**: 9/17/35

**City**: 56
TYPICAL INSTALLATIONS FOR SIGN PANEL(S) MOUNTED ON SPAN WIRE

SIGN MOUNTING DETAIL

TYPICAL SPAN WIRE INSTALLATION

NOTE: 1. Bottom edge of signs shall be approximately at the same elevation.

2. Type B & C attachments with one hanger shall have
   wire beam for sign wider than 1.0 m. The beams
   shall extend to within 50 cm of the sign edge.

3. Type B & C attachments for signs 1.5 m and wider
   shall have 2 hangers. Signs 2.0 m and wider shall have
   wire beam that extend to within 50 cm of the sign edge.

4. Type D attachments shall be for signs 2.0 m wide or
   less.

5. Sign panels shall meet the requirements of NRS 438.

6. Refer to section 659 of the Standard Specifications
   for Road and Bridge Construction.

7. All bolts, nuts, and washers shall be polished
   stainless steel, AISI 304 series, commercial grade,
   type 304.

ADJUSTABLE HANGER
FOR SIGN MOUNTING

TWO POINT ATTACHMENT
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SPAN WIRE MOUNTED SIGN DETAILS

DETAIL OF OPPOSING SIGNS SPAN WIRE MOUNTED

The overlapping connection of adjustable hangers shall use a
minimum of 2 bolts with a minimum spacing between bolts of 50 mm.

6 mm Stainless steel bolts with
nuts and lock washers.

250 mm.

Adjustable Hanger

6 mm Stainless steel bolts
with nuts and lock washers.

Messenger Wire

Wire Rope Clamp

Wire Rope Clamp

See Index (FIG 1 of 2)
For pipe attachment.
SIGN LOCATIONS TYPICAL

NOTE:
2. Sign location No. 3 may require some field adjustment.
3. Signs R2-S, R2-5 & R2-5L shall have a 15 mm edge and 10 mm border with a 3 mm line radius.
4. The Cross Road is the last dirt road before the restricted bridge.
5. Sign location No. 2 should be established from the Cross Road to the following appropriate distances:
   - 1/4 kilometer
   - 1/2 kilometer
   - 3/4 kilometer
6. See notes 7355 for sign details.

BRIDGE WEIGHT RESTRICTIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

[Signature]

[Stamp]

[Date] 17357
NOTES:

1. Bridges should be marked as narrow bridges under the following conditions:
   (1) For approaches with paved shoulders when the bridge width including shoulders is less than the
       width of the approach roadway including paved shoulders.
   (2) For approaches without paved shoulders when the bridge
       shoulder width is less than 0.6 m.

2. No passing zone should be extended
   450.0 m in advance of narrow bridge.

3. The post mounted reflectors shall be installed on both sides of the roadway
   (White on Right / Yellow On Left) for a distance of 450.0 m in advance of a narrow
   bridge if the bridge or the approach is on a curve.

4. Reflectors on both sides of roadway shall have traffic approaching bridge.
1. Ground rods shall be driven into the ground to a depth of at least 3 feet. Where the resistance is greater than 35 ohms, two or more ground rods connected in parallel shall be used. Contractors shall have necessary test equipment and current certification required of FPL to ensure grounding of every system. Where system not to exceed 60 ohms, see note 23.

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

3. Contractors shall determine the service required date for the power company transformer installation or the pre-construction conference.

4. The power company reserves the right to install the wires, switch gear and weatherhead on power company poles at the expense of the contractor. Contact the power company for cost or further information for an alternate arrangement.

5. Any damaged portion of a parallelated steel plate and bracket area shall be replaced in accordance with section 916 of the Standard Specifications.

6. Poles and bracket area shall be designed in accordance with the design criteria as outlined in the plans and using the applicable standards found in "Standard Specifications for Structural Supports for Highway Signs, Signals and Traffic Signals" published by A.A.S.H.O. The specifications shall be based on the actual projected area of the houses of 0.02 square feet whenever it is greater.

7. The luminaire manufacturer shall place a permanent tag on the luminaire reading as to be listed by the following information: Wattage, belt type, lamp mounted design, or any additional fittings that may be included in the luminaire. Each luminaire shall be listed with this tag in the position specified, at least 8 feet up front. Luminaires prepared by the manufacturer, unless otherwise specified, shall be placed in the position specified, and in front of the luminaire. The manufacturer shall provide a copy of test reports as evidence the luminaire meets the lamp specifications and qualifications to verify the design will meet the A.A. S. H. O. while testing is done in the standard tests. The luminaire shall meet all standards prior to approval of submittals.

8. Poles behind bridge rail or barrier with mounted, shall be non-reflection.

3. The wires of the pole headroom, and pull boxes shall be hinged up in the pole and pull boxes with sufficient length to properly secure connectors to the outside of the pole, and pull boxes to make connections accessible for changing fuses and trouble shooting the system.

4. Neutral wires to be white, insulation. Do not use white or green insulated wires for ungrounded conductors.

5. Unless otherwise specified, all cable shall be single conductor 200 percent conductive stranded copper, with Triolite or Titanite insulation.

6. All nipples shall be made in pull boxes or the pole base. No nipples shall be made inside the conduct.

7. All exposed or surface mounted conduct shall be right of telephone metal. These exposed runs of conduct shall not be closer than 5 feet or 10 percent of the total conduct sections aggregate to take care of vibrations and thermal expansion. All metal conduct shall be grounded. Steel conduct shall be not dipped galvanized.

8. All conduct that will remain exposed as splices shall be either treated, cleaned inside and made end copper, copper the corrosion resistant non-conductive wire and place dust markers, or a conductor to the location of the ends of the conduct.

9. Pull boxes shall be located at least of conduit crossing roadways, and as necessary for the comparison of the project.

20. These joints represent minimum acceptable criteria. The inspection per these drawings represent the minimum base of acceptance.

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

22. Pull boxes shall meet the requirements of Section 635 of the "Standard Specifications For Highway Road and Bridge Construction" and Section 635 of the "Standard Specifications For Traffic Control Signals and Devices".

23. All ground system connections shall be uninsulated.

24. Highway Lighting General Notes

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC DESIGN

HIGHWAY LIGHTING GENERAL NOTES

BREAKWAY FEATURE

All connections requiring height poles shall be mounted on a triangular metal base or system of breakaway couplings. If breakaway couplings are used, one coupling shall be provided for each 100 feet of connection. The only permitted connection of the pole to the foundation of each other end shall be provided by the couplings. The couplings are located at the opposite end of the pole foundation. The couplings shall be enclosed with a non-conductive aluminum shell.

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

"The design of the breakaway feature shall be in accordance with the breakaway performance requirements of the "Standard Specifications for Structural Supports for Highway Signs, Signals and Traffic Control Signs" published by A.A.S.H.O. The manufacturer shall submit copies of test reports as evidence the breakaway feature meets the above specifications and qualifications to verify the design will meet the A.A.S.H.O. while testing is done in the standard tests. The luminaire shall be tested prior to approval of submittals."

Tests behind bridge rail or barrier with mounted, shall be non-reflection.
LUMINAIRE SPECIFICATIONS

The reflector with its aluminum cover shall be firmly attached to a cast ring. This ring shall have threaded slots in its upper surface such that the reflector-reflector assembly may be readily removed, as desired, from the luminaire bottom entry and top support assembly without completely removing the support bolts.

Each luminaire shall present an integral-rettey regulary shaped type belted connected for 5 amp or 12V, and a power tap of at least 90 percent. The luminaire bottom shall be cast within an efficient reflector which is rigidly attached to the luminaire bottom entry and top support assembly. It shall be readily removable without removing the luminaire from the braceted arm.

The luminaire shall be attached to the braceted arm by means of a bracket entry and deep support assembly. The assembly shall include the deep plate and deep support assembly and the deep support assembly to the luminaire for 3" adjustment for levelling the luminaire. An extended rear end shall be included such that an extended support connections shall be protected from exposure to weather.

All machining operations shall be made weatherproof and made inside to withstand weather resistant exposure. Where the deep end is to be exposed, the deep support assembly for maximum wind stress in the outer frame of the deep plate shall be of welded 90 by 125 millimeters or larger, with all real connection made to be readily weatherproof.

The luminaire is subject to the preservation of all plates and wheels ensuring the mounting of luminaires at the pole top. Parallells potection is required to align luminaire light distribution. Special attention must be exercised in the physical alignment of all luminaires to ensure that there is no effect to the luminaire bottom and also that the reflector is not affected at the lighting standed in the field. A marking shall be placed on the external face of the reflector to allow visual inspection of alignment. The marking shall correspond to the field color of the reflector.

TOWERING SYSTEM SPECIFICATIONS

The lowering system shall consist of the following:

A. Head frame and center bar.
B. Luminaire ring.
C. Cables.
D. Pulleys.
E. Portable power unit (1 per unit).

The head frame shall extend from the top of pole to the head frame platform. The platform with its associated sheaves etc., shall be cast and rustproof. The head frame shall also be cast and rustproof, attached to the pole by means of a steel slip. The head frame shall pass through the 905 millimeters or larger, with the cables sheaves grooved in the head frame cable, for 120 cable bearing surface. The sheave shall be cast and rustproof and be of 120.144 and shall present to the external surface for corrosion resistance. The sheave bearings and cable sheaves shall have separate luminaire. These shall consist of a 7.5 diameter sit for 1200 diameters of 30 or greater shall be provided in all the luminaire manufactured's rated unit stress.

The power-cable shall be attached to the luminaire ring with a weatherproof connector capable of withstanding the weight of the power cable itself, shall be 120 by 125 diameters or larger, with 120 connection made to be readily weatherproof.

Drum design shall consist of 7 of wire rope. The power cable shall be 120 by 7 or more on 905 millimeters of 90, or greater, providing a ratio of 20 to 1 of the wire rope manufacturer's rated unit stress. For the purpose of this section it shall be considered that all wire rope shall be of 120 by 125 diameters or larger.

The head frame shall extend from the top of pole to the head frame platform as in operation. The luminaire shall be subject to severe weather conditions whenever the lighting sheave consists of an 120 by 125 diameters or larger, with the sheave bearings and cable sheaves shall have separate luminaire. These shall consist of a 7.5 diameter sit for 1200 diameters of 30 or greater shall be provided in all the luminaire manufactured's rated unit stress.

The head frame shall include three (3) leveling devices to support the luminaire ring assembly when the lowering device is not in operation. The luminaire shall be subject to severe weather conditions whenever the lighting sheave consists of an 120 by 125 diameters or larger, with the sheave bearings and cable sheaves shall have separate luminaire. These shall consist of a 7.5 diameter sit for 1200 diameters of 30 or greater shall be provided in all the luminaire manufactured's rated unit stress.

The luminaire shall be constructed of a minimum of 7 by 120 millimeters channel galvanized in accordance with ASTM A53 Class B steel channel with the manufacturer of 120 by 125 millimeters or larger, with the sheave bearings and cable sheaves shall have separate luminaire. These shall consist of a 7.5 diameter sit for 1200 diameters of 30 or greater shall be provided in all the luminaire manufactured's rated unit stress.

Note: it is the responsibility of the contractor to coordinate the total design with foundation design.
1/4" AWG insulated (TW Green) stranded Cu bare wire connecting all poles, and insulated 1/2" or 1/4" AWG stranded copper circuit conductor in schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plan. (Typical)

6/0 ground wire connected to pole base joint as per SF-96-15. 
4/0 AWG stranded Cu bare ground wire connected to pole base plate.

Schedule 80 PVC conduit.

Notes:
1. At all pull boxes and pole bases, ends of conduct shall be spaced to ensure with section 630 of the Standard Specifications for Roads and Bridges Construction.

2. 1/4" AWG insulated (TW Green) stranded Cu bare wire connecting all poles, and insulated 1/2" or 1/4" AWG stranded copper circuit conductor in schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plan. (Typical)
Metal Pole Concrete Foundation Detail

Acceptor Bails to be Specified per Section 402-30 of AASHTO Standard Specifications for Road and Bridge Construction dated 1959.

Depth of embedment to be determined per Section 402-30 of AASHTO Standard Specifications for Road and Bridge Construction dated 1959.

All Pull Boxes, and Pipe Bases, Edge of conduit shall be seated in accordance with Section 6.20 of the Standard Specifications for Road and Bridge Construction.

All Sprayed Steel to be made in Pull Box or Pipe Base with compression sleeves or spun bell connectors properly taped and weatherproof.

300 mm of Recess or Crushed Stone For Drainage

Approved Ground Connection

Pull Box Wiring Detail

1/8 to 1/4 inch (1.3 to 3.2 mm) Insulated Cu Bond Wire Connecting All Pulls, and Insulated 1/16 to 1/8 inch (1.6 to 3.2 mm) Stranded Copper Conductors in Schedule 40 PVC Conduit. Circuit Conductors and Conduit Sizes as Shown in Plans (1 Typical)
NOTE:
It shall be the contractors responsibility to provide a complete service assembly as per the plans and service specifications. The service termination shall meet the requirements of the national electric code and applicable local codes. Shop drawings are not required for service equipment, unless noted in the plans.

Concrete Pole, Prestressed Type P-2, 3.6 m Long.

Service Conduits shall be Threading Copper Single Conductors Only Type R.H.W. A Minimum Length of 3.6 m shall be Provided for The Weatherhead For Each Conductor.

Conductor Weatherhead Height As Required by Power Company.

P.E. Controller When Required

Water As Required

Height Specified by Power Company

Concrete Pole, Prestressed Type P-2, 3.6 m Long

R.6 AWG Insulated Copper Ground Wire
In Size 16 Rigid Galvanized Steel Conduit.

Rigid Or Intermediate Metal Conduit
On All Above Ground Installations

1.6 m

Remove 3R

300 mm Bed Of Pearls Or Crushed Stone For Drainage.

U.L. Approved Ground Rod, R-25 (3), 6.0 m Long Copper Coat -All Service Points.

Groun

Cable

service Specifications

DETAIL B

UNDERGROUND FEED

1. The enclosure shall be NEMA 3R, pole mounted, rain tight.

2. The enclosure door shall be tamper proof, held by three hasps and secured to the enclosure by a mechanical lock. The door shall have a minimum of three hinges and be interlocked. An approved lock shall be used to attach door.

3. 480 V minimum rating built-in type breakers shall be used.

4. Breaker to be copper coated and have a minimum rating of 600 amperes. When each breaker exceeds 600 amp breaker to switch breaker, separate.

5. Lockout contactor, transformer, and N.O.A. switch shall be enclosed. The enclosure shall be sealed to accommodate as many breakers as are installed for all other service equipment.

6. The Enclosure to be rigidly attached to the pole face.

7. A 600 V lightning protector shall be wired inside the enclosure.

8. A main breaker is required in all service panels with 2 or more feeder breakers.

9. All service equipment shall be U.L. approved.
FIGURE A

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

Note:
1. Trench not to be open more than 75.0 ft at a time when construction area is subject to vehicular or pedestrian traffic.
2. Trench should be cut to maintain alignment until work is completed.
3. Check local codes for backfill requirements.
4. See notes to Figure C.

FIGURE B

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

Note:
1. A trench not to be open more than 75.0 ft at a time when construction area is subject to vehicular or pedestrian traffic.
2. Trench should be cut to maintain alignment until work is completed.
3. Check local codes for backfill requirements.
4. See notes to Figure C.

FIGURE C

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

Note:
1. Aerial conduit must be used when jacking under existing pavement at 900 mm minimum depth.
2. Trench should be cut to maintain alignment until work is completed.
3. The removal and replacement of the asphalt pavement within 200 mm will not be required when using aerial jacking, with the exception of disturbing the asphalt surface on either side.

FIGURE D

FOR USE INSTALLING CONDUIT UNDER A NEW ROADWAY PRIOR TO INSTALLATION OF CURB, RAS, AND PAVEMENT

Note:
1. Sidewalk portion to match existing joints.
2. Entire sidewalk slab must be replaced when specified in the plan.
3. Backfill and tamp with material from trench except at driveways.
4. Add depth of trench within the driveway entirely with Class 1 concrete.

FIGURE E

FOR USE IN INSTALLING CONDUIT UNDER SIDEWALK

Note:
1. Sidewalk portion to match existing joints.
2. Entire sidewalk slab must be replaced when specified in the plan.
3. Backfill and tamp with material from trench except at driveways.
4. Add depth of trench within the driveway entirely with Class 1 concrete.
FIGURE A

PULL BOX ENTRY OF CONDUIT UNDER SIDEWALKS

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

FIGURE B

ROADWAY

PLAN

UNDER SIDEWALK

UNDER ROADWAY

UNDER NON-TRAFFIC BEARING SURFACE

Note: One run of conduit between pull boxes shall not contain more than 360° of bend including pull box bends.

FIGURE C

FOR USE UNDER RAILROADS

Note: Conduit depth to be at RFL requirement but not less than 3.0 m.

After jacking, leave rigid conduit as a sleeve extending to RFL right of way limits.
FIGURE A
CABLE DROP AND TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "A"

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 utilizing the external ground wire to the pole, a piece of size 6 rigid conduit shall extend up the pole externally to a point 2.4 m above finish grade to protect the ground wire connecting the messenger wire to the ground rod.

3. Locking cable ties or locking wire when used shall be placed no further than 300 mm apart except at the point of cable drop or terminations where one (1) shall be placed at the point where the cables separate from the messenger wire and another placed 100 mm (based on the messenger wire type and size) from this point. When using Figure "B" (interconnect cable only the locking cable ties shall be used).

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

5. Locking wire should normally be used for distances of 3.6 m or greater.
CONCRETE PAVEMENT EXPANSION JOINTS

VERTICAL SECTION

Notes:
1. The "number of turns" indicated at the specified joint on the loop refers to the number of passes of loop wires which are placed in the saw cut forming the concrete loop.
2. Loop types or details not shown to scale.
3. Loop Types are centered in a single lane except Type E which is centered on two lanes.
4. The number of individual loops in the Type G loop may vary up to a maximum of four (4). 
5. Lead-in may be connected to either end of loop.
6. The leading edge of loop Types A,C,D,& F may extend past the stop line a maximum of 5.0 m. The length of these loops may be extended to a maximum of 9.0 m. Each intersection should be individually designed and if the modifications noted above is required it must be noted or detailed in the plans.
7. Loop lead-in wires should not be installed in the same pull box with signal power cables.

LOOP CORNER AND LEAD-IN DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

VEHICLE LOOP INSTALLATION DETAILS

Design by: 
Drawing by:
Reviewed by: 
Check by: 
Drawn: 
Final Plan: 
1-17-81

Sheet No. 1 of 2
17781

DATE: 
CHECKED:
Drawing No: 
Approvel by: 
Revision No: 
1
WHITE BACKGROUND WITH BLACK LEGEND AND BORDER
WALK PLAQUE - WHITE LEGEND ON BLACK BACKGROUND
DON'T WALK PLAQUE - ORANGE LEGEND ON BLACK BACKGROUND
THE INTERNATIONAL SYMBOLS MAY BE USED FOR WALK AND DON'T WALK.

Note: 1. See Index (F355) for sign details.
This diagram illustrates the installation details for various cabinets and junction boxes. The text notes that:

1. The number, size, and orientation of conduit entries shall vary depending upon site conditions or locations. Two separate size 50 PVC conduits shall be provided in all cabinets. All entries shall be made through the sides or top of the cabinets. Conduit boxes, lines, and boxes shall be weatherproof fittings.

2. Grounding to be in accordance with Section 560 of the National Electrical Code.

* Notes for cabinet mounting require additional original notes shall be filled in with concrete or covered with a non-corrosive cover plate.

** Contact for additional details or questions.
GENERAL NOTES

1. The location of flashing signals and stop lines shall be established based on future or present rail traffic volume with appropriate crash elements.

2. Where plans call for railroad traffic control devices, they shall be installed in accordance with the standards of signal design and construction.

3. Location of railroad traffic control devices is based on the distance measured between face of curb or sidewalk.

4. Grade crossing signals shall be perpendicularly to roadway.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DIVISION

RAILROAD GRADE CROSSING
TRAFFIC CONTROL DEVICES

TYPE I

TYPE II

TYPE III

TYPE IV

TYPE V
**RAILROAD GATE ARM LIGHT SPACING**

<table>
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<th>Specified Length Of Gate Arm</th>
<th>Dimension &quot;A&quot;</th>
<th>Dimension &quot;B&quot;</th>
<th>Dimension &quot;C&quot;</th>
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<td>900</td>
<td>1.5</td>
</tr>
<tr>
<td>4.3</td>
<td>600</td>
<td>900</td>
<td>1.5</td>
</tr>
<tr>
<td>4.4-5.39</td>
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<td>1.5</td>
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<td>1.5</td>
</tr>
<tr>
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<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
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<td>1.8</td>
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</tr>
<tr>
<td>14.4 And Over</td>
<td>900</td>
<td>3.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**MEDIAN SIGNAL GATES FOR**

**MULTI LANE UNDIVIDED URBAN SECTIONS**

(FOUR OR MORE DRIVING LANES IN ONE DIRECTION, 45 MPH (70 KM/H) OR LESS)

**NOTE:**
DRAWBRIDGE SIGNAL

750 x 1500
50 mm Border-20 mm Radius
150 mm Series "D" Letters

BLACK OPAQUE LEGEND AND BORDER ON REFLECTORIZED YELLOW BACKGROUND

TO BE USED WITH TYPE I OPERATION, AS SHOWN
ON PREVIOUS SHEET

MONOTUBE SUPPORT MOUNTING

GATE & ARM DETAIL

TYPICAL LAMP PLACEMENT