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

JANUARY 1994

TOPIC NO. 625-010-003-c

[Signature]
State Roadway Design Engineer
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Every standard drawing sheet in the 1994 Roadway And Traffic Design Standards has been produced by computer drafting. In taking advantage of verification, registering and other features of CAASD, and due to certain restrictions of CAASD, changes appear on the sheets that are not listed in the tabulated revisions. These changes may include relabeling, topographical corrections, alignment of views and details, scales, tolerances, show vs. omission, grouping, shape, properties and other nonfunctional changes. The revision number on each Standard Sheet reflects the year of the latest change in function, intent and purpose on that sheet.

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

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"DIAGONAL RAMPS" and "INTERMEDIATE RAMPS" revised to reflect 3-1/2" wide, "INTERBLOK RAMPS AND DIMENSIONAL FEATURES FOR RAMPS TRANSVERSE TO SIDEWALKS" drawings revised to reflect dimensional changes required by ADA and reflected to "DIMENSIONAL FEATURES FOR RAMPS." "GENERAL NOTES" revised and moved to this sheet. "MIDNIGHT CROSS RAMPS" moved to Sheet 3 of 3.

"RAMPS FOR LIGHT PEDESTRIAN TRAFFIC plan and pictorial view for sidewalk adjacent to curb modified. "GENERAL NOTES" moved to No. 3. New sheet includes "LANDINGS FOR RAMPS CONSTRUCTED AT LOCATIONS WITHOUT SIDEWALK" and "MIDNIGHT CROSSWALK I WITH AND WITHOUT RAMPS".

"LONGITUDINAL JOINTS" tie bar SPACING chart bar spacing revised and tie bar note added. "DEFORMED METAL PLATE" note revised, "STEEL HOOD BOLT ASSEMBLY" note included and stave notes, "EXPANSION AND CONTRACTION JOINTS" note revised, "DETAIL OF JOINT ARRANGEMENT" revised for clarity.

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<td>&quot;SYMBOLS&quot; Description &quot;Cones Or Tubular Markers May Be Used During Daylight Only&quot; changed to read &quot;Tubular Markers May Be Used During Daylight Only&quot;.</td>
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<td>&quot;GENERAL USE OPTIONAL BASE GROUP AND STRUCTURAL NUMBER&quot; - &quot;ABC-1&quot; and &quot;4&quot; Bank Run Culvert Surface Live Load No. 2 ... added.</td>
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<td>600 1 8 10</td>
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<td>601 1 1 10</td>
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<td>Worker Sign Symbol changed to Flagger Sign Symbol.</td>
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<td>Reduced length of haper.</td>
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<td>1 1 10</td>
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<td>Changed location of delineators; eliminated some RPM's added additional chevron in core area.</td>
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<td>295</td>
<td>Safety Modifications For Endwalls</td>
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## CURBS AND PAVEMENT JOINTS

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<tr>
<td>300</td>
<td>Curb &amp; Curb And Gutter</td>
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<td>301</td>
<td>Turn Lanes</td>
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<tr>
<td>302</td>
<td>Traffic Separators</td>
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<tr>
<td>303</td>
<td>Curb Return Profiles</td>
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<tr>
<td>304</td>
<td>Curb Cut Ramps-Physically Handicapped (3 Sheets)</td>
</tr>
<tr>
<td>305</td>
<td>Concrete Pavement Joints (15 Sheets)</td>
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<td>306</td>
<td>Bridge Approach Expansion Joint-Concrete Pavement</td>
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<td>340</td>
<td>Concrete Sidewalk</td>
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## BARRIERS AND FENCES

<table>
<thead>
<tr>
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<tr>
<td>400</td>
<td>Guardrail (15 Sheets)</td>
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<tr>
<td>401</td>
<td>Guardrail Anchorage And Continuous Barrier For Existing Bridges (9 Sheets)</td>
</tr>
<tr>
<td>402</td>
<td>Concrete Barrier Wall (15 Sheets)</td>
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<td>403</td>
<td>Precast Concrete Temporary Barrier Wall (2 Sheets)</td>
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<tr>
<td>431</td>
<td>G-R-E-A-T System (6 Sheets)</td>
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<tr>
<td>432</td>
<td>C-A-T System (2 Sheets)</td>
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<td>433</td>
<td>Brokenmaster (4 Sheets)</td>
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<td>Hex-Foam Sandwich System (6 Sheets)</td>
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<td>Construction Zone G-R-E-A-T (5 Sheets)</td>
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<td>450</td>
<td>Fence Location (2 Sheets)</td>
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<td>451</td>
<td>Fence Type A (2 Sheets)</td>
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<td>452</td>
<td>Fence Type B (2 Sheets)</td>
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<td>Cantilever Slide Gate-Type B Fence</td>
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<td>460</td>
<td>Gore Screen-Knitted Polyester</td>
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<td>461</td>
<td>Opaque Visual Barrier</td>
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- 501 Embankment Utilization
- 502 Miscellaneous Earthwork Details
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- 504 Optional Base Group And Structural Numbers (2 Sheets)
- 505 Turnouts (6 Sheets)
- 506 Turnouts-Resurfacing Projects
- 507 Temporary Crossover Construction Details-Rural
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## TRAFFIC CONTROL THROUGH WORK ZONES
- 600 General Information For Traffic Control Through Work Zones (10 Sheets)
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- 650 Two-Lane, Two-Way Rural Moving Operations-Daylight Only
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- 10167 Details For Mounting Exit Numbering Panels To Highway Signs
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- 101745 Interchange Markings (4 Sheets)
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- 101750A Signing For Motor/Truck Services
- 101751 Welcome Center Signing (2 Sheets)
- 101752 Typical Placement Of Reflective Pavement Markers (2 Sheets)
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- 101755 Special Sign Details (8 Sheets)
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- IT502 Highway Lighting General Notes
- IT503 Highmount Lighting Details (3 Sheets)
- IT504 Service Point Details
- IT505 External Lighting For Signs (2 Sheets)

### TRAFFIC SIGNAL AND EQUIPMENT
- IT720 Conduit Installation Details (2 Sheets)
- IT722 Signal Cable And Span Wire Installation Details (2 Sheets)
- IT733 Aerial Interconnect
- IT736 Electric Power Service
- IT764 Pedestrian Control Signal Installation Details
- IT780 Vehicle Loop Installation Details (2 Sheets)
- IT782 Pedestrian Detector Assembly Installation Details (2 Sheets)
- IT804 Cabinet Installation Details
- IT806 Standard Signal Operating Plans (2 Sheets)
- IT808 Advance Warning For R/R Crossing
- IT802 Railroad Grade Crossing Traffic Control Devices (4 Sheets)
- IT890 Traffic Control Devices For Movable Span Bridge Signals (3 Sheets)
GENERAL NOTE

1. Symbols on this index are for use on all roadway, signing and marking, signalization, and lighting projects. For work zone traffic control symbols refer to Index 60X. Where similar symbols are used, additional notations may be required for clarity.
### STANDARD SYMBOLS FOR PLAN SHEETS

#### TRAFFIC SIGNALS SYMBOLS

<table>
<thead>
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<th>EXISTING</th>
<th>PROPOSED</th>
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<td>✅ Traffic Signal Head (Span Wire Mounted)</td>
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<td>✅ Traffic Signal Head (Pedestal Mounted)</td>
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<td>✅</td>
<td>✅ Traffic Signal Head (Mast Arm Mounted)</td>
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<tr>
<td>✅</td>
<td>✅ Traffic Signal Pole (Concrete, Wood, Metal)</td>
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<td>✅ Vehicle Detector (Loop)</td>
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<tr>
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<td>✅ Signal Cable (On Messenger Wire)</td>
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<td>✅</td>
<td>✅ Conduit</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Vehicle Detector (Points)</td>
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<tr>
<td>✅</td>
<td>✅ Pedestrian Detector</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Pedestrian Signal Head (Pole Or Pedestal Mounted)</td>
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<tr>
<td>✅</td>
<td>✅ Controller Cabinet (Base Mounted)</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Controller Cabinet (Base Mounted)</td>
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#### LIGHTING SYMBOLS

<table>
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<tbody>
<tr>
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<td>✅ Pole &amp; Luminaire</td>
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<td>✅</td>
<td>✅ Existing Pole &amp; Luminaire To Be Removed</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Final Position Of Relocated Or Adjusted Pole &amp; Luminaire</td>
</tr>
<tr>
<td>✅</td>
<td>✅ High Mast Lighting Tower</td>
</tr>
<tr>
<td>✅</td>
<td>✅ City Or Utility Owned Luminaire &amp; Pole</td>
</tr>
<tr>
<td>✅</td>
<td>✅ PVC (Polyvinyl Chloride) Lighting Conduit And Conductors</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Rigid Galvanized Lighting Conduit And Conductors</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Lighting Pull-Box</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Light Distribution Point</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Joint Use Pole</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Pier Cap Underdeck Luminaire</td>
</tr>
<tr>
<td>✅</td>
<td>✅ Pendant Hung Under Deck Luminaire</td>
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</tbody>
</table>

#### SIGNING AND PAVEMENT MARKING SYMBOLS

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

#### Additional Symbols

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

---

See General Notes, Sheet 1 of 3
DESIGN NOTES

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

GENERAL CONSTRUCTION NOTES

1. Fence materials shall be aluminum or galvanized.
2. Aluminum posts shall be 3” diameter aluminum. Aluminum roll braces shall
   be in accordance with note 425. Concrete posts and roll braces shall be
   in accordance with index 45. All posts to be set in concrete.
3. Fabric must be installed on inside of posts and roll braces, and tied to
   posts and braces at 6” centers.
4. For additional details on fencing, see index nos. 40 and 452.
5. All sheets to be 6”x6” unless otherwise noted in the plans.
6. Sediment basins to be constructed prior to commencement of upland
   construction. Modifications may be made as directed by the Engineer.

GENERAL NOTES

1. The cost for Type A and Type B trash retainers and sediment basins shall
   include the cost for signs, fencing, baffles, grading and for some
   and water, sewer, pipe and other ditch extension noted in the
   plans. Proposal for both Type A and Type B shall be under the contract unit
   price for Sediment Basin. Each. Cleanouts are noted in the plans
   shall be added under the contract unit price for Cleanout Basin.
   Cleanouts, CO.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRASH RETAINER AND SEDIMENT BASIN

DATE: 10/01/01

DESIGN NO.: 608-3

CIVIL, STRUCTURAL, & MECHANICAL

DRAWN BY: J. M. CRANE

CHECKED BY: J. M. CRANE

PROJECT MANAGER: J. M. CRANE

S & M APPROVED: 10/01/01

1 of 1
CHART I

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

NOTE: Spacings shown in this chart are based on generalized conditions and should be adjusted based on actual site performance or hydraulic computations.

FLOW RATES (CFS)

- Very Light: < 5
- Light: 5 < 40
- Moderate: 40 < 95
- Heavy: 95 < 250
- Very Heavy: > 250

SOILS

- Cohesive
- Non-Cohesive

Flow Sets

- Very Light
- Light
- Moderate
- Heavy
- Very Heavy

Legend

- Clayey Loam
- Fine Sand
- Clarose Sand
- Clayey Silt
- Gravel
- Sandy Loam
- Silt Loam

Consider use of temporary soil
TYPE III SILT FENCE

Note: Silt Fence to be quoted for under the contract unit price for Slashed Silt Fence (C.F.)

SILT FENCE APPLICATIONS

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

5050 State Road 500, Tallahassee, FL 32301

BALED HAY OR STRAW BARRIERS AND SILT FENCES

Sheet 2 of 3

102
FLOORING TURBIDITY BARRIERS

NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of barriers depend on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require repositioning 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 Floating Turbidity Barrier, ft.
2. Staked turbidity barriers are to be paid for under the contract unit price for Staked Turbidity Barrier, ft.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TURBIDITY BARRIERS

103
## STANDARD CRITERIA

<table>
<thead>
<tr>
<th>CLASS</th>
<th>APPLICATION</th>
<th>STANDARD AREA (sq ft)</th>
<th>PERMEABILITY</th>
<th>A.O.S.</th>
<th>Punchable</th>
<th>Tensional</th>
<th>Muller Burst</th>
<th>Degradation</th>
<th>UV Resistance</th>
<th>Filtration Efficiency</th>
<th>Flow Rate</th>
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<tbody>
<tr>
<td>D-1</td>
<td>Backfill (200)</td>
<td>1.4 x 10^-7</td>
<td>250</td>
<td>45</td>
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<td>Backfill (Standard)</td>
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<tr>
<td>D-7</td>
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</tbody>
</table>

### DRAINAGE

- **D-1** Backfill (200)
- **D-2** Backfill (Standard)
- **D-3** Backfill (Standard)
- **D-4** Backfill (Standard)
- **D-5** Backfill (Standard)
- **D-6** Backfill (Standard)
- **D-7** Backfill (Standard)

### STABILIZATION

- **R-1** Reinforcement
- **R-2** Separation

### GENERAL NOTES

1. Specifications for geotextiles are Section 905 or the Section identified by the specific application. Physical criteria for each application is provided by this standard. In conjunction with these standards.
2. All values are MINIMUM AVERAGE FALL values in the weakest principal direction unless otherwise stated.
3. Range of values do not preclude the designer from ensuring the fabric is always made to the fabric's materials and conditions.
4. Unless specifically restricted in COMMENTS column, any type of material may be used.

### DESIGN NOTES

1. The Designer shall review this criteria and adjust the values as necessary to satisfy project requirements. These adjustments shall be documented for the accordance with the Project's specific requirements.
2. UV Resistance: The value represents the percent of minimum tensile strength retention (ASTM D-1433) after weathering per ASTM D-1433 for the test period 100 hours.
4. See with 0-1% passing No. 200 sieve, A.D. S. Range in 70-100.
5. See with 0-1% passing No. 200 sieve, A.D. S. Range in 10-70.

### TABLE I

<table>
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<th>Test</th>
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<td>U.S. Sieve No.</td>
<td>ASTM D-492</td>
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<td>Float Test</td>
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<td>ASTM D-492</td>
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<td>Tensional</td>
<td>LOS</td>
<td>ASTM D-6533</td>
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<td>LOS</td>
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<td>Elevation</td>
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<td>Uplift Test Resistant</td>
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<td>ASTM D-4935</td>
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<td>Filtration Efficiency</td>
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<td>ASTM D-536</td>
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<tr>
<td>Flow Rate</td>
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<td>ASTM D-536</td>
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</table>

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**GEOTEXTILE CRITERIA**

**DESIGN**

**ENGINEERING**

**AREA:**

**Project No.:**

**Contract No.:**

**Date:**

**Signature:**

**Title:**

**Position:**

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

94

**199**
1. Standard structure bottoms 6"-0" diameter and smaller A1, A2, A3, and 6"-0" square A4, A5 are designated Type 3. Risers are permitted for all structures.

2. Units of structure bottoms are constructed in place atop reinforced concrete or backfill or reinforced concrete. Precast and rectangular structures (bottoms A1) shall be constructed of reinforced concrete only.

3. Wall thicknesses and reinforcement are for reinforced cast-in-place or precast concrete units unless noted. Precedent circular unit may be furnished with walls in accordance with either A.S.T.M. C-536 (400 psi) or A.S.T.M. C-536 (600 psi) wall, with the same area. (50 psi/0.5 psi) is placed in the center and third of the wall.

4. Top and flange thicknesses and reinforcement are for precast and cast in-place construction. Top and flange thickness of Unit B2 concrete. Concrete so specified in A.S.T.M. C-47 (600 psi) or A.S.T.M. C-47 (800 psi) shall be used in lieu of Unit C not Class E or not Class E or not C2. Reinforced concrete is recommended in units which are not the Standard Specifications for the Reinforcement of Precast Concrete Products.

5. All reinforcement shall be A.S.T.M. 198, Grade 60 or 65 KM wire, either smooth or deformed.

6. Structure bottoms may be used in conjunction with curb leads. Types 1, 2, 3, 5, 6, and 7, and any masonry or concrete jack shall set otherwise shown in the plans. Reinforcement for precast and rectangular structures shall be provided in accordance with A.S.T.M. C-370 or A.S.T.M. C-360. Reinforcement in precasted units shall be tagged at 20-bar diameters at corners.

7. Rectangular structural units may be ordered as directed by the Engineer to facilitate connections between the structure walls and storm sewer pipes.

8. Except when AO units are specifically required, reinforcement top and slab shall be standard equipment.

9. All steel bars shall be "A" minimum area entries otherwise shown except for precasted units manufactured under A.S.T.M. C-370 or A.S.T.M. C-360. Reinforcement in precasted units shall be tagged at 20-bar diameters at corners.

10. The corner fillets shown are necessary for rectangular structural units with circular risers and lead fillets and used in lieu of rectangular risers, integral and integral leaders. Fillets are to be placed at the bottom of the riser, 1" from the riser, and 2" from the riser.

11. Preformed fillets are specified to reduce the number of units used. These units are not available in the Engineer's option. The Engineer may request any unit shown in this index.

12. A1, A2, A3, and A4 units are specifically noted as required for structure bottoms, reinforcing, and wall reinforcing. These units are not available in the Engineer's option. The Engineer may request any unit shown in this index.

13. For masonry and precast concrete units, for frames and covers, and for supplementary details see index of 29x.
### SLAB DESIGNS - SQUARE AND RECTANGULAR STRUCTURES

#### SHORT-WAY SCHEDULE

<table>
<thead>
<tr>
<th>SLAB SIZE</th>
<th>SLAB DEPTH</th>
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<tbody>
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<td>3'-6&quot; x 6'</td>
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<tr>
<td>3'-6&quot; x 7'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot; x 8'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot; x 10'</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot; x 12’</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
</tbody>
</table>

#### LONG-WAY SCHEDULE

<table>
<thead>
<tr>
<th>SLAB SIZE</th>
<th>SLAB DEPTH</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3'-6&quot; x 6'</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot; x 7'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot; x 8'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot; x 10'</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot; x 12’</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
</tbody>
</table>

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### SLAB DESIGNS - ROUND STRUCTURES

#### SCHEDULE

<table>
<thead>
<tr>
<th>SLAB SIZE</th>
<th>SLAB THICKNESS</th>
<th>REINFORCING (2 WAYS) SCHEDULE</th>
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<tbody>
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<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
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### WALL DESIGNS - RECTANGULAR STRUCTURES

#### VERTICAL REINFORCING SCHEDULE

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<thead>
<tr>
<th>WALL DEPTH</th>
<th>WALL DEPTH</th>
<th>SCHEDULE</th>
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</thead>
<tbody>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
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#### HORIZONTAL REINFORCING SCHEDULE

<table>
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<th>WALL DEPTH</th>
<th>WALL DEPTH</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>A</td>
</tr>
</tbody>
</table>

---

### GENERAL NOTES

1. slab reinforcement is appropriate for top, intermediate, and bottom slabs.
2. slab depth is measured from finishing grade to top of slab.
3. slab design depth is measured from the top of the bottom slab for bases and to the top of the intermediate slab for rockers.
4. wall height is the distance between floor of lower slab to top of upper slab.

---

### REINFORCING SCHEDULE

<table>
<thead>
<tr>
<th>GRADE NO STEEL (55 HR/IN. FABRIC)</th>
<th>W/F</th>
</tr>
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<tbody>
<tr>
<td>4</td>
<td>0.80</td>
</tr>
<tr>
<td>6</td>
<td>0.50</td>
</tr>
<tr>
<td>8</td>
<td>0.35</td>
</tr>
<tr>
<td>10</td>
<td>0.30</td>
</tr>
<tr>
<td>12</td>
<td>0.25</td>
</tr>
</tbody>
</table>

---

### STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**STRUCTURE BOTTOMS**

**TYPE J AND P**

---

**DESIGNER:**

**CONSTRUCTION:**

**SPREAD SHEETS:**

**DATE:**

**SHEET:**

**SCALE:**

**SHEET SIZE:** 8.5" x 11"
2. The 30" cover is to be used for all frames Types I, II, III and
the 2-Piece Cover, only if the replacement covers for all such frames
are the 30" deep.'  The 30" cover is for use with Type I, II, and III frames
and is the replacement cover for all such frames
with a 30" deep slots (traffic type). The 2-Piece Cover is for use with Type I, II, and III frames.

NOTES (FRAMES, AND COVER)

LIGHTWEIGHT

CAST IRON FRAMES

COVER FOR ALL FRAMES

WEIGHT OF CASTINGS

<table>
<thead>
<tr>
<th>Frame Type</th>
<th>Cover</th>
<th>2-Piece Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame</td>
<td>Cover</td>
<td>2-Piece Cover</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inside</td>
</tr>
<tr>
<td>I</td>
<td>200 lbs</td>
<td>200 lbs</td>
</tr>
<tr>
<td>II</td>
<td>300 lbs</td>
<td>300 lbs</td>
</tr>
<tr>
<td>III</td>
<td>400 lbs</td>
<td>400 lbs</td>
</tr>
</tbody>
</table>

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SUPPLEMENTARY DETAILS FOR MANHOLES IN CONNECTIONS
Purpose: The image contains a detailed diagram and text related to the construction of storm sewer structures. The text is a combination of bullet points and paragraphs detailing design considerations, dimensions, and construction notes.

1. Utility Pipes Thru Storm Sewer Structures
2. Top Slabs to Walls
3. Wall Joints
4. Bottom Slabs to Walls
5. Optional Construction Joints
6. Comparative Side Views
7. Minimum Dimensions for Dowel Construction Joints or Continuous Cast Segments
8. Supplementary Details for Manholes and Inlets

The diagram illustrates various sections of storm sewer structures, including top slabs, walls, and bottom slabs, with detailed annotations and dimensions provided. The text accompanying the diagram includes general notes on construction, design considerations, and supplementary details for specific components such as manholes and inlets.
PARTIAL SECTION BB
PARTIAL SECTION CC

DITCH BOTTOM INLET C
INDEX 232

PARTIAL SECTION BB
PARTIAL SECTION CC

DITCH BOTTOM INLET D
INDEX 232

PARTIAL SECTION BB
PARTIAL SECTION CC

DITCH BOTTOM INLET E
INDEX 232

PARTIAL SECTION BB
PARTIAL SECTION CC

DITCH BOTTOM INLET H (3-GRATE)
INDEX 232

PARTIAL SECTION BB
PARTIAL SECTION CC

DITCH BOTTOM INLET H (4-GRATE)
INDEX 232

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
WATER ENGINEERING

SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS
INDEX 232

Prepared by: EID
Date: 01/29
Scale: 1/4" = 1'-0"

Florida Department of Transportation

EID Engineering
Index: 232
Rev: 00
Page: 5 of 6

201
### Rigid Pavement

<table>
<thead>
<tr>
<th>Pipe Type/Size &amp; Shape</th>
<th>Minimum Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>6&quot;</td>
</tr>
<tr>
<td>Corrugated Steel</td>
<td>8&quot;</td>
</tr>
<tr>
<td>Corrugated Aluminum</td>
<td>10&quot;</td>
</tr>
<tr>
<td>Polyvinyl Chloride</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

### Flexible Pavement

<table>
<thead>
<tr>
<th>Pipe Type/Size &amp; Shape</th>
<th>Minimum Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>6&quot;</td>
</tr>
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</tr>
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<td>10&quot;</td>
</tr>
<tr>
<td>Polyvinyl Chloride</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

### Unpaved W/O Select Bedding

<table>
<thead>
<tr>
<th>Pipe Type/Size &amp; Shape</th>
<th>Minimum Cover</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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<td>12&quot;</td>
</tr>
</tbody>
</table>

### General Notes

1. The selected values are recommended minimum dimensions in withdrawal of bridges. Highway traffic is based; additional cover may be required to support construction equipment loads or high vehicle impact loads before pavement is completed. See pertinent specifications for required minimum cover greater than those listed above. See Sections 27.3 and 27.4.

2. Less than the listed nominal cover may be used provided adequate bedding is used. These features may include but are not limited to extra strong pipe, select bedding, select base and outside manholes.

3. Values shown in parentheses are for 3" x 4" corrugations which must be specified to utilize the outer cover.

4. The horizontal stress in the roadway from live load and traffic loads may cause heaving and cover displacement. Use minimum cover specified in sections above.

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<table>
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<td>Corrugated Aluminum</td>
<td>10&quot;</td>
</tr>
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<td>Polyvinyl Chloride</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

### Unpaved W/O Select Bedding

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</tr>
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<tbody>
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</tr>
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<td>8&quot;</td>
</tr>
<tr>
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<td>10&quot;</td>
</tr>
<tr>
<td>Polyvinyl Chloride</td>
<td>12&quot;</td>
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</tbody>
</table>

### Unpaved W/Select Bedding

<table>
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</tr>
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<tbody>
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<td>6&quot;</td>
</tr>
<tr>
<td>Corrugated Steel</td>
<td>8&quot;</td>
</tr>
<tr>
<td>Corrugated Aluminum</td>
<td>10&quot;</td>
</tr>
<tr>
<td>Polyvinyl Chloride</td>
<td>12&quot;</td>
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</table>
### ROUND PIPE DIMENSIONS

<table>
<thead>
<tr>
<th>Equiv. Dia. (in.)</th>
<th>A WALL</th>
<th>B WALL</th>
<th>C WALL</th>
<th>Area (sq. ft.)</th>
<th>Wall Thickness (in.)</th>
<th>Classes</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>1/2</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>0.18</td>
<td>1/8</td>
<td>NA</td>
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<tr>
<td>1/8</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.13</td>
<td>5/32</td>
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<td></td>
</tr>
<tr>
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<td>4.0</td>
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<td>NA</td>
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</tr>
<tr>
<td>1</td>
<td>7.8</td>
<td>7.8</td>
<td>7.8</td>
<td>0.15</td>
<td>1/8</td>
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</tr>
<tr>
<td>1.25</td>
<td>9.6</td>
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<td>9.6</td>
<td>0.20</td>
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<td>NA</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>11.3</td>
<td>11.3</td>
<td>11.3</td>
<td>0.22</td>
<td>1/8</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>1.75</td>
<td>13.1</td>
<td>13.1</td>
<td>13.1</td>
<td>0.25</td>
<td>1/8</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>14.9</td>
<td>14.9</td>
<td>14.9</td>
<td>0.28</td>
<td>1/8</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

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

### ROUND PIPE INSTALLATIONS (All Sizes)

<table>
<thead>
<tr>
<th>Design</th>
<th>Height Of Fill (ft.)</th>
<th>Pipe Class</th>
<th>Bedding Class</th>
<th>Projection Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>-1 / -4</td>
<td>III</td>
<td>C</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>0 / -1</td>
<td>III</td>
<td>C</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>0 / 0</td>
<td>III</td>
<td>C</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>0.5 / 0.5</td>
<td>III</td>
<td>C</td>
<td>Positive</td>
</tr>
<tr>
<td>Modified Bedding</td>
<td>0.675 / 0.675</td>
<td>II</td>
<td>C</td>
<td>Positive</td>
</tr>
<tr>
<td>Modified Trench</td>
<td>0.675 / 0.675</td>
<td>II</td>
<td>C</td>
<td>Positive</td>
</tr>
</tbody>
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### ELLIPTICAL PIPE DIMENSIONS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>0.00</td>
<td>0.00</td>
<td>NA</td>
<td>NA</td>
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<td></td>
<td>8</td>
<td>0.00</td>
<td>0.00</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>0.00</td>
<td>0.00</td>
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<td>0.00</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

*Under some conditions, the use of Class IX pipe and Class B bedding should be considered in lieu of Class II with Class C bedding.

### ELLIPTICAL PIPE INSTALLATIONS (All Sizes)

<table>
<thead>
<tr>
<th>Installation</th>
<th>Height Of Fill (ft.)</th>
<th>Pipe Class</th>
<th>Bedding Class</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ELLIPTICAL PIPE INSTALLATIONS (All Sizes)

- **Pipe Class HE I:** D-Load=2000 Lbs/Ft/Fl/1 ft. Crack
- **Pipe Class HE II:** D-Load=5000 Lbs/Ft/Fl/1 ft. Crack
- **Pipe Class HE III:** D-Load=2000 Lbs/Ft/Fl/1 ft. Crack
- **Pipe Class VE I:** D-Load=2000 Lbs/Ft/Fl/1 ft. Crack
- **Pipe Class VE II:** D-Load=2000 Lbs/Ft/Fl/1 ft. Crack
- **Pipe Class VE III:** D-Load=2000 Lbs/Ft/Fl/1 ft. Crack

*Notes: HE I and VE I pipe required for depths of cover less than 2 ft for 12", 18", and 24" equivalent.

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

*For Informational Purposes Only

Notes: Height of Fill (maximum cover) is measured from top of finished grade to outside top of pipe.
### Round Pipe - 2 1/2 in. x 1 in. Corrugation

<table>
<thead>
<tr>
<th>D (in)</th>
<th>Area (Sq. Ft.)</th>
<th>Maximum Height of Fill (ft)</th>
<th>Min. Cover (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>0.02</td>
<td>13</td>
<td>NA</td>
</tr>
<tr>
<td>0.75</td>
<td>0.01</td>
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<td>NA</td>
</tr>
<tr>
<td>1.0</td>
<td>0.008</td>
<td>10</td>
<td>NA</td>
</tr>
<tr>
<td>1.5</td>
<td>0.006</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>2.0</td>
<td>0.004</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2.5</td>
<td>0.003</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3.0</td>
<td>0.002</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

### Round Pipe - 3 in. x 1 in. Corrugation

<table>
<thead>
<tr>
<th>D (in)</th>
<th>Area (Sq. Ft.)</th>
<th>Maximum Height of Fill (ft)</th>
<th>Min. Cover (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>0.006</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>1.5</td>
<td>0.004</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2.0</td>
<td>0.003</td>
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<td>6</td>
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<tr>
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<td>0.002</td>
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<td>6</td>
</tr>
<tr>
<td>3.0</td>
<td>0.001</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

### Round Pipe - 5 in. x 1 in. Corrugation

<table>
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<th>Area (Sq. Ft.)</th>
<th>Maximum Height of Fill (ft)</th>
<th>Min. Cover (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>0.006</td>
<td>6</td>
<td>6</td>
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<tr>
<td>1.5</td>
<td>0.004</td>
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<td>0.003</td>
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<tr>
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<td>0.001</td>
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<td>6</td>
</tr>
</tbody>
</table>

### Notes:
- Increase the minimum cover values shown on Sheet 4 by 6" for gauge and size combinations below the heavy lines.
- Height of fill: maximum cover is measured from top of finished grade to outside top of pipe.
- "Recorrupted and not available. May be considered for cross drain and side drain applications only. NA - Not Available NS - Not Suitable (For Highway H-20 Loadings)
- Limited availability of this product. Check availability before specifying (generally limited to 5" x 3" corrugation pipe arch fabricated from 60" and smaller diameter round pipe in 2" gin. and thicker material)
- 300° perforated pipe arch (French drain pipe) is not recommended. Do not specify without checking availability and suitability.
- 5" x 1" corrugated pipe is currently not manufactured for the Florida market. Check availability before specifying.
- 400 lb. gage 1 for spiral rib, 8' maximum cover, 3 1/4 x 1 1/4 rib spacing (2 rib only).

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

```
MAXIMUM COVER FOR CORRUGATED STEEL PIPE ROUND AND PIPE ARCH

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Cover Height</th>
</tr>
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<tbody>
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<td>1 1/2</td>
<td>6</td>
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<td>3</td>
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<tr>
<td>4</td>
<td>6</td>
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<tr>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
```

**Cover Height**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Cover Height</th>
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<tr>
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<td>6</td>
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<td>6</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

**- f" x f" of only**

*Spiral rib spacing 3 1/4 x 1 1/4 rib spacing (2 rib only)*
### Round Pipe - 2 5/8" x 1 7/16" Corrugation

<table>
<thead>
<tr>
<th>D (in)</th>
<th>Area Sq. Ft/100 (in)</th>
<th>Maximum Height Of Fill (ft)</th>
<th>Min. Cover (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0.000</td>
<td>0.050</td>
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</tr>
<tr>
<td>16</td>
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<tr>
<td>17</td>
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</tr>
<tr>
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</table>

**Notes:**
- See Sheet 1 for 4

### Round Pipe - 3" x 1 1/4" Corrugation

<table>
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<th>Area Sq. Ft/100 (in)</th>
<th>Maximum Height Of Fill (ft)</th>
<th>Min. Cover (ft)</th>
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<tbody>
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<tr>
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<tr>
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</table>

**Notes:**
- See Sheet 1 for 4

### Round Pipe - Spiral Rib Rib Spacing (2 5/8" x 1 7/16"

<table>
<thead>
<tr>
<th>D (in)</th>
<th>Area Sq. Ft/100 (in)</th>
<th>Maximum Height Of Fill (ft)</th>
<th>Min. Cover (ft)</th>
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<tr>
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<tr>
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**Notes:**
- See Sheet 1 for 4

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### Pipe Arch - 2 5/8" x 1 7/16" Corrugation

<table>
<thead>
<tr>
<th>Span (ft)</th>
<th>Rise (in)</th>
<th>Equiv. Pipe Round</th>
<th>Area Sq. Ft/100</th>
<th>Minimum Sheet Thickness Required</th>
<th>Maximum Cover (ft)</th>
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</thead>
<tbody>
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**Notes:**
- See Sheet 1 for 4

### Pipe Arch - 3" x 1 1/4" Corrugation

<table>
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<th>Span (ft)</th>
<th>Rise (in)</th>
<th>Equiv. Pipe Round</th>
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**Notes:**
- See Sheet 1 for 4

### Pipe Arch - Spiral Rib Rib Spacing (2 5/8" x 1 7/16"

<table>
<thead>
<tr>
<th>Span (ft)</th>
<th>Rise (in)</th>
<th>Equiv. Pipe Round</th>
<th>Area Sq. Ft/100</th>
<th>Minimum Sheet Thickness Required</th>
<th>Maximum Cover (ft)</th>
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<tbody>
<tr>
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</tr>
<tr>
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</tr>
</tbody>
</table>

**Notes:**
- See Sheet 1 for 4

---

### Corrugated Aluminum Alloy Round Pipe and Pipe Arch

**State of Florida Department of Transportation**

**Pipe Spacing**

- 1 7/16" x 2 5/8"
- 1 1/4" x 3"
- Spiral Rib

**Notes:**
- Laminated availability of this product. Check availability before ordering.
- Not suitable for highway or 3D loadings.
- Design Review is recommended for each specific application. The review should identify any special handling, installation, or manufacturing practices or conditions that may be required. See FDOT Drainage Manual, Chapter 18, Section 6.4, Inc. 6, 1987. The specification of the most water supply in the area of this review is not appropriate. The review performed by the designer does not relieve the contractor from analyzing and evaluating the relationships and conflicts that may result from the project-specific application.
- This size and gage combination must be selected using installation per manufacturers recommendations. Extra care will be required during handling and installation.
- Not suitable for 3D loadings. This size and gage combination must be approved by the State Drainage Engineer.

---

**Cover Height**

- Minimum cover of 0.000 for all applications.
- Not suitable for highway or 3D loadings.
- Design Review is recommended for each specific application. The review should identify any special handling, installation, or manufacturing practices or conditions that may be required. See FDOT Drainage Manual, Chapter 18, Section 6.4, Inc. 6, 1987. The specification of the most water supply in the area of this review is not appropriate. The review performed by the designer does not relieve the contractor from analyzing and evaluating the relationships and conflicts that may result from the project-specific application.
- This size and gage combination must be selected using installation per manufacturers recommendations. Extra care will be required during handling and installation.
- Not suitable for 3D loadings. This size and gage combination must be approved by the State Drainage Engineer.
<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>INLET TYPE CODE</th>
<th>TYPE OF CURB/GUTTER</th>
<th>GRADE CONSIDERATION</th>
<th>HYDRAULIC INTAKE (CFS)</th>
<th>BICYCLE PEDESTRIAN SAFE</th>
<th>MAXIMUM PIPE SIZE WITH STANDARD BOTTOMS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>1</td>
<td>E &amp; F</td>
<td>Continuous</td>
<td>4.1</td>
<td>Yes / Limited</td>
<td>Inside 30°</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>9.0</td>
<td>Yes / Limited</td>
<td>Inside 30°</td>
<td></td>
</tr>
<tr>
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<td>3</td>
<td>E &amp; F</td>
<td>Continuous</td>
<td>1.9</td>
<td>Yes / Limited</td>
<td>Inside 30°</td>
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<tr>
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<td>4</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>6.5</td>
<td>Yes / Limited</td>
<td>Inside 30°</td>
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<tr>
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<td>E &amp; F</td>
<td>Continuous</td>
<td>3.1</td>
<td>Yes / Limited</td>
<td>Outside 30°</td>
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<tr>
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<td>6</td>
<td>E &amp; F</td>
<td>Sag</td>
<td>7.5</td>
<td>Yes / Limited</td>
<td>Outside 30°</td>
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<tr>
<td>212</td>
<td>7</td>
<td>Separator I &amp; II</td>
<td>Continuous or Sag</td>
<td>4.4</td>
<td>Yes / Limited</td>
<td>Inside 24° Longitudinal 30° Transverse</td>
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<tr>
<td>213</td>
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<td>Separator III &amp; IV</td>
<td>Continuous or Sag</td>
<td>4.4</td>
<td>Yes / Limited</td>
<td>Inside 24° Longitudinal 30° Transverse</td>
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<tr>
<td>214</td>
<td>9</td>
<td>D &amp; F</td>
<td>Continuous or Sag</td>
<td>0.5</td>
<td>Yes / Yes</td>
<td>Outside 30°</td>
<td>To be used only where flows are light and H/W does not permit the use of through curb inlets. Do not direct in major flow direction.</td>
</tr>
<tr>
<td>215</td>
<td>10</td>
<td>D &amp; F</td>
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<td>0.3</td>
<td>Yes / Yes</td>
<td>Outside 30°</td>
<td>To be used only where flows are light and H/W does not permit the use of through curb inlets. Do not direct in major flow direction.</td>
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<tr>
<td>217</td>
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<td>Continuous</td>
<td>4.0</td>
<td>No / Yes</td>
<td>NA 0° Longitudinal 30° Transverse</td>
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</tr>
<tr>
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<td>Median Barrier Wall</td>
<td>Sag</td>
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<td>Double Inlet Continuous</td>
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</tr>
<tr>
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<td>4</td>
<td>Median Barrier Wall</td>
<td>Double Inlet Sag</td>
<td>5.0</td>
<td>No / Yes</td>
<td>NA 42° Longitudinal 30° Transverse</td>
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<td>Median Barrier Wall</td>
<td>Double Inlet Sag &amp; Continuous</td>
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<td>Continuous or Sag</td>
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<td>Yes / Yes</td>
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<td>Valley</td>
<td>Continuous or Sag</td>
<td>5.0</td>
<td>Yes / Yes</td>
<td>NA 30°</td>
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</tr>
</tbody>
</table>

1. Hydraulic intake values do not represent hydraulic capacity but are shown to compare inlets based on a 0.3% (1/3%) topographic, 0.2% (1/5%) vertical, and 0.1% (1/10) efficiency factor. For other conditions, values should be determined by shutoff and orifice. Hydraulic intake may change from location to location. This chart is based on providing the outside curb on interior, where street width is less than hydraulic intake may change from location to location. For example: Data and additional information is available in "A Study of Stormwater Inlet Capacities" by U.S.A., and the Department's MRP Drainage Manual Vol. 1, Chapter 5, and Vol. 2, Chapter 5.

2. Curb inlets and transitions should be located outside pedestrian cross walk areas, preferably upslope from these locations.

3. Double through inlets are usually not warranted unless the other flow is in excess of 50 feet of width or 5 times.

4. Median Barrier Inlets Types 1, 2, 3, 4, 5 & Shoulder Inlet Type 5 can be made bicycle safe by specifying for reference grade.

5. Pipe sizes are circular, Class I, B, Well concrete pipe. Elliptical and segmented pipes are to be checked for fi to properly with inlet No. 221. Metal pipe sizes should be reviewed to use 6 x 1½ corrugation up to 30° and 3½-1 corrugation for larger sizes.
Curb Inlet Top Type 9

General Notes:
1. This inlet is primarily intended for locations with light to moderate flows where right of way does not permit the use of Howard Curb Inlets Types 1 through 6. The normal application is on curb returns to city streets. The inlet grate is suitable for pedestrian and bicycle traffic.
2. This inlet is to be located in vertical head walls such as Curb and Gutter Type 7. Grate shall be oriented with veins directed toward pedestrian flow, inlet to be located outside pedestrian crosswalks where practicable.
3. For structure below see Index No. 200. For supplemental details see Index No. 205.
4. All steel in slab tops shall have 16" minimum cover unless otherwise shown. Tops shall be either cast-in-place or prestressed concrete.
5. For Alternate B applications, the top slab openings shall be such that 2 edges of inlet frame will be located directly above basement wall or pier wall.
6. When used on a structure with dimensions larger than those detailed above and risers are not applied, the top slab shall be constructed using Index 200 with the slab opening adjacent to 24" x 36". The "Special Top Slab" on Index 200 is not permitted.
7. Approx. unit capacity is K-7000. Approximate unit capacity is given in the curbs and grates. The "Special Top Slab" on Index 200 is not permitted. This unit capacity is K-7000. Approximate unit capacity is given in the curbs and grates. The "Special Top Slab" on Index 200 is not permitted.
LOW SIDE SUPERELEVATION PAVEMENT WARP FOR SHOULDERS IN SUPERELEVATION

HIGH SIDE TRANSITION PAVEMENT WARP FOR SHOULDERS IN SUPERELEVATION

Joint and Bond Breaker:
- Cast in Place
- 1" Galv. Screen
- Bonded to Contour and barrier
- Shown on Plans
- Bonded to Contour and barrier
- Shown on Plans

BARRIER WALL / RETAINING WALL SINGEL FACE ROADWAY BARRIER

INLET SECTION AT WALLS

GENERAL NOTES

1. The inlets are intended for use adjacent to concrete barrier walls or guard rails. The inlet is used for residential and commercial properties. It is not intended for use in parks and recreation areas.

2. Inlets located in developed areas shall be designed to ensure that a minimum depth of cover shall be provided to prevent groundwater inflow, which may cause erosion. Groundwater shall be excluded from the incremental and/or slope areas where inflow is required, and areas subject to high debris.

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4. Inlets located in developed areas shall be designed to ensure that a minimum depth of cover shall be provided to prevent groundwater inflow, which may cause erosion. Groundwater shall be excluded from the incremental and/or slope areas where inflow is required, and areas subject to high debris.

5. The inlets are intended for use adjacent to concrete barrier walls or guard rails. The inlet is used for residential and commercial properties. It is not intended for use in parks and recreation areas.

6. For supplemental details, see index No. 200 and 201.

7. Inlets to be used for inlets (Barrier Wall), Each.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

BARRIER WALL INLET

Note: All D Structure Bottom Only. See Index No. 201.
GENERAL NOTES

1. This inlet is designed for villages, streets, driveways, etc., or areas subject to heavy wheeled vehicle loads and subject to pedestrian and/or bicycle traffic.

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

3. Reinforcing - No. 4 bars at 12" o.c., both ways. Cut or bend bars out of way of pipe to clear pipe if required.

4. All exposed edges and corners shall be tumbled to 1" radius.

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

6. For supplementary details see Index No. 21.0.

SECTION BB

Recommended Max. Pipe Size:
2"-6" Wall - 24" Size
4"-0" Wall - 30" Size

SECTION AJ
### APPLICATION GUIDELINES FOR DITCH BOTTOM AND MEDIAN INLETS

<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>TYPE</th>
<th>LOCATION</th>
<th>CAPACITY (CFS)</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>Flow Condition</td>
<td>Grate Only</td>
<td>Flow Condition</td>
<td>Grate With</td>
<td>Flow Condition</td>
</tr>
<tr>
<td>230</td>
<td>A</td>
<td>Limited</td>
<td>A</td>
<td>7</td>
<td>4</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access</td>
<td>B</td>
<td>16</td>
<td>6</td>
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<td>NA</td>
</tr>
<tr>
<td>231</td>
<td>B</td>
<td>Limited</td>
<td>C</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access</td>
<td>D</td>
<td>14</td>
<td>6</td>
<td>27</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outside</td>
<td>E</td>
<td>10</td>
<td>6</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C2</td>
<td>15</td>
<td>7</td>
<td>24</td>
<td>14</td>
<td>NA</td>
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<tr>
<td>232</td>
<td>F</td>
<td>Inside</td>
<td>F2</td>
<td>9</td>
<td>5</td>
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<td>NA</td>
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<tr>
<td></td>
<td></td>
<td>C2</td>
<td>G</td>
<td>23</td>
<td>7</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>234</td>
<td>J</td>
<td>Inside</td>
<td>H</td>
<td>9</td>
<td>4</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>235</td>
<td>K</td>
<td>Outside</td>
<td>I</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. C2 denotes clear zone, formerly CFA, defining clear recovery area.
3. Alternate G 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 may be increased by the addition of a slot. Slots are located within roadway clear zones in areas accessible to pedestrians shall have traversable slots. Traverseable slots are not adaptable to inlet Type H.
5. Special ditch blocks require pipe 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 fill in accordance with Index No. 229. Metal pipe sizes should be reviewed using ".105 corrugation up through 30" and "3" corrugation for larger sizes.
7. The capacity values shown are approximate and are intended only as a guide to assist in describing relative performance. Inlets are assumed to be in a no flow condition (No Bypass Flow). The effects of vortex flow have not been considered. Inlet control is assumed. The designer must verify the outlet conditions and design assumptions before accepting the capacity values shown. Outlet constraints are likely to control with abetment sizes.

**Flow Condition A: Orifice Flow Conditions**

1. Grates are 30% blocked with 3" of water depth above the grate.
2. Slotted grates are 25% blocked.
3. Orifice Equation: \( Q = 0.627 A \sqrt{h} \)

**Flow Condition B: Weir Flow Conditions**

1. A 3" head above the top of the inlet is assumed.
2. The effective weir length is assumed to be equal to the inlet perimeter with no deduction for the grate or debris.
3. For inlets with slots, the effective head for the side of the inlet with the slot is 3" for standard 2" slots and 6" for traversable slots. The slot is assumed to be 25% blocked. In some instances, the flow will be in orifice conditions into the slot.
4. Weir Equation: \( Q = 3.0 \sqrt{h} \)

See Note 7

Note: NA = Not Applicable

Debris buildup may occur on Type B Fencing.
TRAVERSABLE SLOTS

SECTION AA

SECTION BB

SECTION CC

Pavement and Soiling Quantities for Traverseable Slots

<table>
<thead>
<tr>
<th>Pavement</th>
<th>Single Slot</th>
<th>Double Slot</th>
<th>Single Slot</th>
<th>Double Slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF</td>
<td>4.0'</td>
<td>0.0'</td>
<td>6.0'</td>
<td>0.0'</td>
</tr>
<tr>
<td>C</td>
<td>3.0'</td>
<td>0.0'</td>
<td>2.0'</td>
<td>0.0'</td>
</tr>
<tr>
<td>A</td>
<td>3.0'</td>
<td>0.0'</td>
<td>2.0'</td>
<td>0.0'</td>
</tr>
<tr>
<td>B</td>
<td>2.0'</td>
<td>0.0'</td>
<td>1.0'</td>
<td>0.0'</td>
</tr>
</tbody>
</table>

Concrete Pavement

Flow

Sed

Concrete Pavement

Flow

Sed

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
REVIEW DIVISION

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

2 of 4
DESIGN NOTES FOR TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS

1. The general practice of these connections is to remove the hazard of the underlying void top, while still creating a hazard by depressing the adjacent land.

2. The correction procedure depends on the approach ditch grade and hydraulic requirements of the site. The selection of the proper-side slope depends on the relationship between soil grade and ditch elevation, and on the vertical distance between the top of the uppermost plant 3 and the grade. The purpese for the Case 1 connection is to add the traversable slot to an existing slot, in the lower ditch, to reduce soil grade and to allow drainage to the existing slot. Cases 2 and 3 will be used as an addition to maintain the drainage characteristics of the existing slot, but to avoid placing additional traffic hazard by adding a traversable slot.

3. The designer shall construct the works in the plan which is in accordance with each individual lateral location.

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

1. All work shall be paid for as it is completed, each, Case separately.

2. All work shall be paid for as it is completed, each, Case separately.

3. All work shall be paid for as it is completed, each, Case separately.
## APPLICATION GUIDELINES FOR PIPE END TREATMENTS

<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>DESCRIPTION</th>
<th>APPLICATION</th>
<th>INLET END</th>
<th>OUTLET END</th>
<th>SAFETY</th>
<th>HYDRAULIC PERFORMANCE $K_p$</th>
<th>EROSION RESISTANCE</th>
<th>PERMITTED LOCATION</th>
<th>TRAFFIC SAFE AREA</th>
<th>ECONOMIC RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>Straight Concrete Single and Multiple 6&quot; Thru 36&quot;</td>
<td>Yes</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
<td>Excellent</td>
<td>0.2</td>
<td>Limited</td>
<td>Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>251</td>
<td>Straight Concrete Single and Double 60°</td>
<td>Yes</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
<td>Excellent</td>
<td>0.2</td>
<td>Limited</td>
<td>Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>252</td>
<td>Straight Concrete Single and Double 60°</td>
<td>Yes</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
<td>Excellent</td>
<td>0.2</td>
<td>Limited</td>
<td>Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>253</td>
<td>Straight Concrete Single and Double 72°</td>
<td>Yes</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
<td>Excellent</td>
<td>0.2</td>
<td>Limited</td>
<td>Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>254</td>
<td>Straight Concrete Single 90°</td>
<td>Yes</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
<td>Excellent</td>
<td>0.2</td>
<td>Limited</td>
<td>Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>255</td>
<td>Straight Concrete Single &amp; Multiple 45° Thru 84°</td>
<td>Limited</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
<td>Very Good</td>
<td>0.3</td>
<td>Yes</td>
<td>Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>260</td>
<td>U Type With Grate Concrete Single 90° Thru 36°</td>
<td>Limited</td>
<td>No</td>
<td>Yes</td>
<td>Limited</td>
<td>Fair</td>
<td>0.7</td>
<td>Yes</td>
<td>Very Good</td>
<td>Inside C2</td>
</tr>
<tr>
<td>261</td>
<td>U Type Concrete Single 90° Thru 36°</td>
<td>Limited</td>
<td>No</td>
<td>Yes</td>
<td>Limited</td>
<td>Good</td>
<td>0.5-0.7</td>
<td>Yes</td>
<td>Good</td>
<td>Inside C2</td>
</tr>
<tr>
<td>264</td>
<td>Concrete Energy Dissipator Single 30° Thru 12°</td>
<td>Limited</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NA</td>
<td>Yes</td>
<td>Excellent</td>
<td>Outside C2</td>
<td>No</td>
</tr>
<tr>
<td>266</td>
<td>Winged Concrete Single 90° Thru 45°</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Very Good</td>
<td>0.3</td>
<td>Yes</td>
<td>Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>268</td>
<td>U Type Concrete Single &amp; Multiple 45° Thru 60°</td>
<td>Limited</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
<td>Good</td>
<td>0.5</td>
<td>Yes</td>
<td>Very Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>270</td>
<td>Flared End Section Concrete Single 12° Thru 24°</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Good</td>
<td>0.5</td>
<td>Yes</td>
<td>Very Good</td>
<td>Inside C2</td>
</tr>
<tr>
<td>272</td>
<td>Cross Drain Mitered End Section Single &amp; Multiple 15° Thru 30°</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Fair</td>
<td>0.7</td>
<td>Yes</td>
<td>Good</td>
<td>Outside C2</td>
</tr>
<tr>
<td>273</td>
<td>Slide Drain Mitered End Section Single &amp; Multiple 45° Thru 60°</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Fair</td>
<td>0.7</td>
<td>Yes</td>
<td>Very Good</td>
<td>Inside C2</td>
</tr>
</tbody>
</table>

1. All end treatments must be selected to satisfy hydraulic suitability with proper consideration given to safety and economics.
2. C2 denotes clear zone, formerly CRA denoting clear recovery area.
3. Grades should not be placed on outlet ends unless positive debris protection is provided at inlet end.
4. Additional notes concerning application restrictions may be shown on individual indices.
5. Economic ratings are based on statewide average costs.
6. End treatments with an $K_p$ of 0.5 or greater should be used only in areas of low design velocities and negligible debris.
7. Pipe sizes are circular, Class B & E, Bell and Spigot. Elliptical and corrugated pipe are to be calculated for C2 in accordance with index No. 250, meter pipe sizes should be reviewed using $2\frac{1}{4}$" corrugation up to 30" and $3\frac{1}{4}$" corrugation for larger sizes.

For lack of sidewalk location see index No. 289.

*For temporary construction or use on a minor facility.
ENDWALL DIMENSIONS (EXCLUSIVE OF MULTIPLE PIPE SPACING)

NORMAL PIPE

SKewed PIPE

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

GENERAL NOTES
1. Endwall dimensions, locations and positions are for round and elongated concrete pipe and for round and pipe-arch corrugated metal pipe. Round concrete pipe shown.
2. Front slope and ditch transitions shall be in accordance with note No. 5.9.6.
3. Endwalls may be cast in place or precast concrete.
4. Reinforcing steel shall be Grade 40 or 60. Additional reinforcement necessary for loading beyond units shall be determined by the Contractor or the Engineer. Cost of reinforcement shall be included in the contract unit price for concrete, endwall.
5. Air expander spray and edges of concrete are to be checked.
6. Concrete meeting the requirements of ASTM C-49B Type III (1400 psi) may be used in Class I concrete in prestressed manufactured pipe which are under the Standard Operating Procedures for the use of prestressed concrete pipe products.
7. All endwall details with joint shapes other than T-shaped provide 30' transitions from the endwall to the flatter side shapes, right of way permitting.
8. Payment for concrete quantities for endwall shown in the pipe shall be as shown on the following table:

<table>
<thead>
<tr>
<th>Endwall Shape</th>
<th>Pipe Size</th>
<th>Used in Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>25' or less</td>
<td>6 to 10</td>
<td>5'</td>
</tr>
<tr>
<td>10' to 15'</td>
<td>11 to 15</td>
<td>5'</td>
</tr>
<tr>
<td>15' to 20'</td>
<td>16 to 20</td>
<td>5'</td>
</tr>
<tr>
<td>20' or over</td>
<td>21' or over</td>
<td>5'</td>
</tr>
</tbody>
</table>

9. Pipe length plans shall be based on the pipe and locations shown in the standard location chart and view. Or heights based on special endwall locations noted far in the plans.
10. Payment for pipe in pipe shall be based on pipe quantities, adjusted for endwall positions subsequently established by the Engineer.
11. Endwalls to be paid for under contract unit price for Class I Concrete Endwall.

STRAIGHT CONCRETE ENDWALLS
SINGLE AND MULTIPLE PIPE

ENDWALL POSITIONS FOR SINGLE AND MULTIPLE PIPE AND SPACING FOR MULTIPLE PIPE
## DATA AND ESTIMATED QUANTITIES FOR ONE ENDWALL

### ROUND CONCRETE AND CORRUGATED METAL PIPE

<table>
<thead>
<tr>
<th>D (&quot;&quot;&quot;)</th>
<th>Number Of Pipes</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>X</th>
<th>Single</th>
<th>Double</th>
<th>Triple</th>
<th>Quadruple</th>
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<tbody>
<tr>
<td>1/2</td>
<td>2.00 3.05 4.06</td>
<td>1.00 1.50 2.00</td>
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<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
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<tr>
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<td>3.00 3.40 4.32</td>
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<td>3.00 3.40 4.32</td>
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<tr>
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</table>

### CORRUGATED METAL PIPE ARCH

<table>
<thead>
<tr>
<th>Span Rise</th>
<th>Number Of Pipes</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>X</th>
<th>Span Rise</th>
<th>Appro, Equiv. Round Pipe</th>
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</thead>
<tbody>
<tr>
<td>1&quot; x 21&quot;</td>
<td>1.00 1.50 2.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
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<td>1&quot; x 21&quot;</td>
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<tr>
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<td>1.00 1.50 2.00</td>
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### CONCRETE ELLIPTICAL PIPE

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<th>E</th>
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<th>G</th>
<th>X</th>
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GENERAL NOTES

1. Endwalls may be cast in-place or precast construction. Cost-in-place endwalls shall conform to the details on this index, design specifications AASHTO D688. Precast construction which adheres to this index, including any additional reinforcement required for handling shall be determined by the Contractor or supplier, does not require additional approvals. Deviations from this index shall be reviewed and approved by the Engineer prior to construction. For precast construction, see Index No. 20 for opening and grading details.

2. Reinforcing steel shall be Grade 60 or 60.

3. Concrete shall be Class B or except concrete meeting the requirements of ASTM C 492 4,000 psi may be used in lieu of Class B concrete in precast units manufactured in places which are under the Standard Operating Procedures for the inspection of precast drainage products.

4. Chairs: All exposed edges and corners to be chairered unless otherwise shown.

5. Metal pipe shall be smoothness coated on all surfaces in contact with concrete and 6" beyond the boundary of contact. Any milimetric reinforcing material may be field applied.

6. Sealing shall be in accordance with Index No. 20 and field for the contract unit price for Sealing, SI.

7. Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated in the index. Concrete and reinforcing shall be paid for under the contract unit price for Class C Concrete (Endwalls), CV and Reinforcing Steel/Reinforcement, LB.
**SECTION YY**

**TABLE OF DIMENSIONS AND QUANTITIES FOR ONE ENDWALL**

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<td>19.5</td>
<td>20.9</td>
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**Note:**
1. For concrete and corrugated metal pipes. Concrete pipe shown.
2. (a) The top row of riprap bags shall be secured by pinning, using No. 4 reinforcing bars 8 inches in length, as follows:
   (i) The end bags shall be secured using two bars per bag, one vertical and one diagonal as shown.
   (ii) The next to last bag on each end shall be secured with two bars vertically.
   (iii) Bags placed over the pipe shall be secured by a bar which is driven diagonally except that for concrete pipe two bars shall be used for single bags above the pipe.
3. Intermediate bags shall be secured with a single bar.
4. Bars shall be driven to one inch below the surface of the bag.
5. The cost of furnishing and installing the bars shall be included in the cost of the riprap.
**TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES**  
**PIPE CULVERT ENDWALLS WITH U-TYPE WINGS**  

<table>
<thead>
<tr>
<th>Opening</th>
<th>Wall</th>
<th>Footing</th>
<th>Concrete, Class I</th>
<th>Steel Tie Bar</th>
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**GENERAL NOTES**

1. Cover all exposed edges.

2. Concrete meeting the requirements of ASTM C-494 (4000 psi) may be used in lieu of Class I concrete. All prestressed units manufactured in plants which are under the Standard Operating Procedures for the inspection of prestressed products.

3. Embellish to be paid for under the contract unit price for Class I Concrete Embellish, C.T. Cost of steel tie bars to be included in the contract unit price for Class I Concrete.

4. Soaking to be in accordance with Index No. 238, and paid for under the contract unit price for Soaking, C.T.

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

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CROSS DRAIN
MITERED END SECTION
SINGLE AND MULTIPLE HOLES CONCRETE PIPE

NOTE: See sheet 6 for details and notes.
### Dimensions and Quantities

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<th>50 Drainage (50, 100)</th>
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**Note:** See General Note No. 2. See Sheet 5 of 6 for 13" slab quantities.

### Cross Drain - Mitered End Section

**Top View - Single Pipe**

**Concrete Slab 3", or 4", Thickness.**

**Concrete Slab 3", or 4", Thickness.**

**Concrete Slab 3", or 4", Thickness.**

**Concrete Slab 3", or 4", Thickness.**

### Top View - Multiple Pipe

**Concrete Slab 3", or 4", Thickness.**

**Concrete Slab 3", or 4", Thickness.**

**Concrete Slab 3", or 4", Thickness.**

### Section

*Pipe: 4" Water To 6" Pipe For Pipes 3" And Smaller. 6" For Pipes 4" And Larger.

*Water: 4" Pipe For Pipes 3" And Smaller. 6" For Pipes 4" And Larger.
### Quantities for 3" Thick Concrete Slabs (Cy)

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### Elliptical Concrete

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### Cross Drain Mitered End Section

- **State of Florida Department of Transportation**
- **Highway Design**
- **No. 728**

**3/8" 4:1 Pipe**
- **No. 728**
- **4/10" 4:1 Pipe**
- **No. 728**
- **5/8" 4:1 Pipe**
- **No. 728**
- **7/8" 4:1 Pipe**
- **No. 728**

**4/10" 4:1 Pipe**
- **No. 728**
- **5/8" 4:1 Pipe**
- **No. 728**
- **7/8" 4:1 Pipe**
- **No. 728**

**5/8" 4:1 Pipe**
- **No. 728**
- **7/8" 4:1 Pipe**
- **No. 728**

**7/8" 4:1 Pipe**
- **No. 728**

**4/10" 4:1 Pipe**
- **No. 728**

**5/8" 4:1 Pipe**
- **No. 728**

**7/8" 4:1 Pipe**
- **No. 728**

**5/8" 4:1 Pipe**
- **No. 728**

**7/8" 4:1 Pipe**
- **No. 728**

**7/8" 4:1 Pipe**
- **No. 728**

**7/8" 4:1 Pipe**
- **No. 728**
DIMENSIONS & QUANTITIES

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

Concrete Side, 3" Thick, Reinforced With:

WWW: Ex-WC-6-104A

Construction Joints Permitted

Concrete Side, 3" Thick, Reinforced With:

WWW: Ex-WC-6-104A

Construction Joints Permitted

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

SIDE DRAIN
MITERED END SECTION
SINGLE AND MULTIPLE ROUND CONCRETE PIPE

SECTION

To 6 Pipe For Pipes W" And Smaller
2x For Pipes 24" And Larger.

Pipes To Be Included Under Unit Price For Mitered End Section)
GENERAL NOTES

1. Unless otherwise designated in the plans, concrete pipe mitered and sections may be used with any type of side drain pipe. Corrugated steel pipe mitered and sections may be used with any type of side drain pipe, except aluminum pipes; and, corrugated aluminum mitered and sections may be used with any type of side drain pipe except cast-iron pipe. When binocular concrete miter pipe is specified for side drain pipe, mitered and sections shall be constructed with the pipe or concrete pipe. When the mitered 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 mitered and sections shall be of sufficient lengths to avoid excessive connections.

3. Corrugated metal pipe galvanizing that is damaged during bending and performing for mitered and section shall be repaired.

4. That portion of corrugated metal pipe in direct contact with the concrete slab shall be binocular cast iron prior to placing of the concrete.

5. Corrugated polyethylene pipe CPE I for side drain application of 12", 16", or 24" diameter shall utilize either corrugated metal or concrete mitered and sections. When used in conjunction with corrugated metal mitered and sections, connection shall be by either a fused metal bond specifically designated to join CPE pipe and metal pipe or of other coupling approved by the State Drainage Engineer. When used in conjunction with a concrete mitered 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 mitered and sections will be constructed either separately as single pipe mitered and sections or collectively as multiple pipe and sections as directed by the Engineer; however, alternating ends sections will be paid for each, based on each individual pipe end.

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

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

9. Round pipe size 30" or greater, pipe-arch size 35" x 24" or greater and elliptical pipe 90" x 30" or greater shall be grouted unless specified in the plans. Smaller sizes of pipe shall be grouted only when specified in plans. The lower grade of lining downstream ends on divided roadways shall be omitted.

10. Grates are to be fabricated from steel ASTM A 533, Grade B, pipe. The lower grate on all traffic approach ends shall be Schedule 80 and all remaining grates shall be Schedule 40.

11. Grates subject to frost free and corrosive free environment may be fabricated from galvanized pipe, with base metal exposed during fabrication required as specified in Section 565, Standard Specifications, or, fabricated from black pipe and hot dipped galvanized after fabrication in accordance with ASTM A 123.

12. Grates subject to salt water or highly corrosive environment shall be hot dipped galvanized after fabrication in accordance with ASTM A 123.

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

14. The project engineer shall contact the District Drainage Engineer for possible alternate treatment prior to constructing side drain mitered and sections where a minimum spacing of 30' will not result between the toe points of the mitered and sections.

15. The cost of all pipe is by grate, reinforcing, connectors, anchors, concrete, seams, jackets and coupling bands shall be included in the cost for the mitered and section. Saddles shall be paid for separately under the contract unit price for Saddles, ST.

16. Mitered and sections shall be paid for under the contract unit price for Altered End Section 150, F.E., based on each independent pipe end.

DESIGN NOTES

1. In arid or hydraulic locations, graters shall not be used with potential debris transport has been evaluated by the drainage engineer and appropriate adjustments made. Ditch grates in excess of 3% or pipe with less than 1.5" of cover and grates in excess of 3% will require such on evaluation (General Note 91).

2. The design engineer shall determine highly corrosive locations and specify in plans the where the graters shall be hot-dipped galvanized after fabrication (General Note 90).

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

Inlet Type A Grate

- 2-½" Bars & 3" Chisels
- For Entire Width of Culvert Sides
- 6" Unless Otherwise Shown in Plans

Inlet Type B Grate

- 2-½" Bars & 3" Chisels
- For Entire Width of Culvert Sides
- 6" Unless Otherwise Shown in Plans

Extraneous Base

- Use Extra Material Shown Where
  This Dimension Is Less Than 2'-6"

Concrete Box Culvert

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

FRAGIBLE BASE

- Use Extra Material Shown Where
  This Dimension Is Less Than 2'-6"

Concrete Box Culvert

The Contractor shall furnish and install coarse aggregate in filter fabric. The coarse aggregate shall be placed in 6 inch lifts and compacted sufficiently to be firm and impermeable. The coarse aggregate shall be gravel or stone meeting the requirements of Section 90-2 or 90-3 respectively. The gradation shall meet Section 90-6 Grades A, B, C, D, or E except restricted in the plans. The filter fabric shall be Type 0-1-3 seen index DB-3. The cost of furnishing and installing the course aggregate and filter fabric shall be included in the cost of the Box Culvert.

ASPHALTIC CONCRETE BASE

NOTE: Extra base is required when cross box culverts are located on facilities subject to high speed traffic (45 mph) or high traffic volume (600 ADT) and the cover is within the range specified in the notation above.

EXTRA BASE FOR CROSS BOX CULVERTS UNDER FLEXIBLE PAVEMENT
1. Spillway to be held for a shoulder gutter.

2. If spillway empties into a shoulder or median ditch, the outlet should be modified as necessary.

DETAIL OF CONC. SPILLWAY AT END OF SHOULDER GUTTER

(TO BE USED WHERE INLETS, PIPES & ENDWALLS ARE IMPractical)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CONCRETE SPILLWAYS
SHOULDER GUTTER SPILLWAY

[Diagram with sections AA, BB, CC showing the spillway detail]
GENERAL NOTES

1. Pipe shall be any of the optional types permitted in Section 435 of the Specifications, unless otherwise specified in the plans. Bolted types of pipe will not be permitted in a continuous run of pipe.

2. Concrete pipe shall be placed with the data positioned on the side.

3. Alignment points are standard 4 (poles and required).

4. The contractor is required to submit three manufacturer's recommendations for metal pipe bands, if required.

5. The contractor shall be Subsurface Drainage types meeting the requirements of Section 365. All filter fabric pieces shall be a minimum of 111 feet.

6. The standard cross section shall be constructed unless otherwise noted in the plans.

7. For supplementary details see note No. 280.

8. The contractor shall be Subsurface Drainage types meeting the requirements of Section 435. All filter fabric pieces shall be a minimum of 111 feet.

9. The filter fabric shall be Subsurface Drainage types meeting the requirements of Section 435. All filter fabric pieces shall be a minimum of 111 feet.

10. French drain following the top of the material section shall be used for the contract unit price for French Drains, $2. The unit price shall include the cost of pipe, pipe fittings, course aggregate and filter fabric to place, and the cost for trench excavation, backfill and connection. The unit price shall be a minimum of 111 feet.

DESIGN NOTES

1. Pipe invert should be at or above the center line whenever possible.

2. French drains with lower dimension changes or otherwise different from the standard cross-section shall be either described or detailed in the plans.

French drains with significantly different cross-sections shall be detailed in the plans.
SLOTTED PIPE OPTIONS

OPTION A - ROUND PIPE

SIDE VIEW

SECTION AA

SECTION BB

ELLiptical Pipe

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ROUND Pipe

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

OPTION B - ROUND OR ELLIPTICAL PIPE
SAFETY MODIFICATION FOR INLETS IN BOX CULVERTS
**GRADE SEAT DETAIL**

**ANCHOR BOLT DETAIL**

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**GENERAL NOTES**

1. For use criteria see "Steel Grating Use Criteria" Index No. 06/2.1.
2. Grates shall be ASTM A 240, A 48, A 512 or A 586, Grade 50 steel, and galvanized in accordance with Section 902-1 of the Standard Specifications.
3. Channels section C3 x 6.0 may be substituted for the C4 x 5.4 channel.
4. All reinforcing No. 4 bars with 2" clearance except as noted. Spacing shown are center to center. Laps to be 10" minimum. Welded wire fabric that does not have 2" spacing on encased cross section area 15.02 sq. in. may be substituted for bar reinforcement.
5. Drilled holes 1/4" deep with 4留给 every 3rd existing endwall for dowel bars. Holes shall be thoroughly cleaned prior to placing dowel bars and spacers.
6. Endwall to be paid for under the contract unit price for Class 1 Concrete (Enforcement), CF and Reinforcing Steel (Fabric). Cost of dowel bars and reinforcing steels to be included in the contract unit price for reinforcing steel. Cost of grates to be paid for under the contract unit price for Endwall-Grate, Ltd., plus quantity. Cost of galvanized bars and nuts to be included in the contract unit price for the grate.
7. See sheet 5 main side and above endwall. Setting to be paid for under the contract unit price for Setting, CF.
TURN LANES • CURBED AND UNCURBED MEDIANS

**URBAN CONDITIONS**

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**RURAL CONDITIONS**

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**FLUSH AND/OR CURBED SEPARATION**

- Design Speed (mph)
- Entry Speed (mph)
- Design Speed for Urban Condition
- Average Running Speed for Rural Condition

**RAISED SEPARATION**

- Design Speed (mph)
- Entry Speed (mph)
- Design Speed for Urban Condition
- Average Running Speed for Rural Condition

**DOUBLE LEFT TURNS**

- Design Speed (mph)
- Entry Speed (mph)
- Design Speed for Urban Condition
- Average Running Speed for Rural Condition

**SINGLE LEFT TURNS**

- Design Speed (mph)
- Entry Speed (mph)
- Design Speed for Urban Condition
- Average Running Speed for Rural Condition

**GENERAL NOTES**

1. The plans shown are for turn lane taper shapes and dimensional purposes only; they do not prescribe the use of curbs, curbs and gutters, shoulders, or separation of existing or new elements.

2. Various construction details may be required in cases where minor changes are made to accommodate existing conditions.

3. Right turn lane taper legs and distances to be specified by the local jurisdiction.

4. These left turn configurations apply to continuous left turn lanes only where specifically called for in the plans.

5. For pavement markings see Index No. If 774-G.

**DESIGN NOTES**

- Design Speed
- Entry Speed
- Design Speed for Urban Condition
- Average Running Speed for Rural Condition

**MIDIAN CURB AND TRAFFIC SEPARATOR**

- JUNCTURE DETAILS

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**TURND CAVES**

**FORM**

- Form No.
- Date
- Signed By

**APPENDIX**

- Appendix A
- Appendix B
- Appendix C

**301**
TYPICAL RETURN PROFILES
INCLUDING DETAIL SHOWING LOCATION OF INLETS ON RETURN

Note:

1. Curved intersections, profiles need not be included in the plans as the above typicals adequately present the desired configuration.

2. For major intersections, where extreme grades are involved or where it is deemed necessary to include profiles in order to present adequate design data, return profiles may be included in the plans.

3. 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 curb cut ramps for the physically handicapped. For information on curb cut ramps refer to Index No. 30k.

4. Grades of 0.3% or greater should be maintained on apr profiles outside the infill limits.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CURB RETURN PROFILES

Project No. 10303

[Signature]
Ramps for linear pedestrian traffic

**Ramp Options**

- RAMP WITH INTEGRAL CAST CURB
- RAMP WITH SEPARATELY CAST CURB
SECTION CC

MEDIAN CROSS WALK (WITH AND WITHOUT RAMP SLOPES)

LANDINGS FOR RAMPS CONSTRUCTED AT LOCATIONS WITHOUT SIDEWALK

CURB CUT RAMPS
CONCRETE-CONCRETE JOINTS

For rehabilitation projects:
TAPE BOND BREAKER

For new projects:
PREFORMED ELASTOMERIC COMPRESSION SEAL

For new and rehabilitation projects:
BACKER ROD BOND BREAKER

Concrete-Pavement Joints

Joint Seal Dimensions
Dowel Assemblies for Expansion and Contraction Joints

Top View

Section BB

See Joint Details

Expanson Cap
(Cool and lubricate bar in accordance with Section 350 of the Standard Specifications)

Expansion Cap
(Cool and lubricate bar in accordance with Section 350 of the Standard Specifications)

WADY INDUSTRIES, INC.

Florida Steel Corporation

The Dayton Sure Grip and Shore Company
ELEVATION OF CONTRACTION & EXPANSION JOINT

TYPE "B" UNIT

Resistance Weld

Expansion Caps Fixed On Free End (Installed Only On Steel Bar)

Expansion Joints Per Unit (3 Each Side)

Steel Hook Bolt Assembly

ANCHOR BOLTS

Steel Hook Bolt Fastened To Farm

Plastic Insert

Transverse Dowel Joint

United Keyed Joint

STAKE DETAIL

(Formerly Hugeston Materials, Inc., Pelham, AL)

EXPANSION AND CONTRACTION JOINT DOWEL ASSEMBLY

ALTERNATE

IRONCO MFG. CO. INC.

HELENA, AL

DETAIL OF JOINT ARRANGEMENT

CONCRETE PAVEMENT JOINTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD DESIGN

4 of 5

305
2-Thru lanes with single lane entrance ramp

Entrance ramp with added lane

Entrance taper with auxiliary 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
CONCRETE SIDEWALK FOR CURBED ROADWAYS
GENERAL NOTES

1. The illustrated applications for guardrail are standard requirements.

2. The beginning of guardrail end shall be at the greatest of the upstream distances from the hazard, as determined from Figure 1, other applications of this index and the lengths described below for bridges.

3. Bridges generally have associated lateral hazards, whereby the length of advancement is equal to the lateral hazard and the clear zone shall be as shown in Figure 1. For bridges that extend beyond the lateral hazard distance, the length of advancement shall be increased by the added guardrail lengths described below for bridges.

4. Only one panel equals 0.5 feet. Post spacing shall be 0.33" except that reduced spacings shall be used for 1.5" transverse changes in guardrail height or structural changes such as bridges. See Figure 1 for conditions to be met by the design. 1.5" guardrail with light reflectors shall be used in accordance with Table 6.0-1 or the index in the project accordance with Table 6.0-1 of this index. However, when Section 6.0-1 and 6.0-2 of this index No. 40 applies, these lengths must be increased to achieve the reverse bridge connection in these sections.

5. One panel equals 0.5 feet. Post spacing shall be 0.33 except that reduced spacings shall be used for 1.5" transverse changes in guardrail height or structural changes such as bridges. See Figure 1 for conditions to be met by the design. 1.5" guardrail with light reflectors shall be used in accordance with Table 6.0-1 or the index in the project accordance with Table 6.0-1 of this index. However, when Section 6.0-1 and 6.0-2 of this index No. 40 applies, these lengths must be increased to achieve the reverse bridge connection in these sections.

6. In addition to use of conventional roadside hazards, guardrail shall be required where fill slopes within the clear zone exceed 3:1, except that fill slopes are less than 2:1 guardrail may be omitted regardless of fill slope unless in the opinion of the Engineer it is deemed necessary due to other roadway features.

7. Straight rail sections may be used for all railroad of 25 feet or greater. For road less than 25 feet the rail may be fabricated to fit.

8. Curved guardrail shall be constructed from 1.5" or 1.75" steel. All other metals, components, hardware and accessories shall be in accordance with the appropriate current AASHTO requirements.

9. Perpendicular post and offset rail combinations are tabulated on sheet 16 of 16.

10. Guardrail shall be installed in such a way as to prevent movement of the guardrail panel between the rail torsional forces.

11. Where necessary to ensure the guardrail panel is in place, the guardrail shall be designed to prevent movement of the guardrail panel between the rail torsional forces.

12. When guardrail is installed on the side of the roadway, the panel shall be designed to prevent movement of the guardrail panel between the rail torsional forces.

13. Rail connections shall be bolted in accordance with this index and Index No. 402. Connections to concrete barriers shall be in accordance with this index and Index No. 402.

14. Length of advancement determined from the diagram and equations above shall be equal to the sum of the upstream beginning of need lengths (No. 10), the length of advancement identified as the maximum length of advancement described under the conditions No. 4 of this index and the minimum lengths described by General Notes No. 1.

15. The Standard Flare with End Anchorage Type EE is shown in the diagram above. However, the diagram applies in other configurations such as, either flare designs; upstream return; and, either upstream deflected, tangent and curvature conditions.

Equation Variables:

- D - Distance in feet from edge of the near approach travel lane to either side of the shoulder, where the hazard extends beyond the shoulder, when the hazard extends beyond the shoulder, when the hazard extends beyond the shoulder.

- L - Length of advancement determined from the diagram and equations above.

- R - Radius of curvature in feet.

- S - Slope of the shoulder in feet per foot.

- T - Tolerance in feet from the edge of the near approach travel lane.

- X - Length of advancement determined from the diagram and equations above.

- Y - Depth of water in feet.

LENGTH OF ADVANCEMENT

Figure 1

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUARDRAIL

Design
Speed
30-70
45 Or Less

Total
100
50

Detail
X (Length Of Advancement) 1 ft.

50-70
45 Or Less

X (Length Of Advancement) 1 ft.

- Type EE End Anchorage Type EE shown in Figure 1, 1990, which was limited to the use of a single crossing through the length of advancement. For highway facilities, it shall be designed and constructed in accordance with the provisions of this index No. 1.

- Type EE End Anchorage Type EE shown in Figure 1, 1990, which was limited to the use of a single crossing through the length of advancement. For highway facilities, it shall be designed and constructed in accordance with the provisions of this index No. 1.

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- Type EE End Anchorage Type EE shown in Figure 1, 1990, which was limited to the use of a single crossing through the length of advancement. For highway facilities, it shall be designed and constructed in accordance with the provisions of this index No. 1.
GUARDRAIL APPLICATION FOR ROADSIDE HAZARDS

OPPOSING TRAFFIC - DETAIL D

GUARDRAIL APPLICATION FOR MEDIAN AND GORE HAZARDS

ONE-WAY TRAFFIC - DETAIL G
GUARDRAIL APPLICATIONS FOR MEDIANS 30' OR LESS WITH 10' BRIDGE SHOULDERS

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

NOTE:
The guardrail configurations shown apply only to parallel or near parallel bridges with gaps medians 30' or less in width. Where medians 30' or less in width are crossed by continuous driving between the bridge roadways, traffic separation shall be achieved by appropriate treatments such as, but not limited to, raised separators, curbs, guardrail, concrete barrier walls and special barriers.
MISCELLANEOUS PAVEMENT FOR STANDARD SECTIONS

SECTION AA (EXAMPLE FOR 20' CLEAR ZONE)

SECTION AA (EXAMPLE FOR 30' CLEAR ZONE)

SECTION BB (EXAMPLE FOR 30' CLEAR ZONE)

SECTION CC (EXAMPLE FOR 30' CLEAR ZONE)

SHOULDERS, SLOPES AND MISCELLANEOUS PAVING FOR THE STANDARD FLARE

SHOULDER WITH OR WITHOUT 5' PAVEMENT

PAVED SHOULDERS

Shoulder with or without 5' Pavement

PAVED SHOULDERS

SHOULDER GUTTER

DOUBLE FACE RAIL

LOCATION ON FRONT SLOPES

GUARDRAIL LOCATION DETAIL K

GUARDRAIL
Approach Treatment for Standard Flare for Curb and Gutter

Detail Q
SPECIAL STEEL GUARDRAIL POSTS

FOR CONSTRUCTION OF GUARDRAIL WHERE CULVERT, PIER FOOTING OR OTHER STRUCTURE PRECEDES NORMAL POST INSTALLATION

FOR MOUNTING GUARDRAIL ON EXISTING APPROACH SLABS

NOTES: (SPECIAL STEEL POST)

1. Either anchor bolts, concrete wedge anchors or approved concrete adhesive-chloride anchors may be used.

2. Posts are to be plumbed by adjusting nuts or in water testing. Posts installed using anchor bolts and adhesive anchors are to be set with adjusting nuts to provide for water testing. Posts installed using wedge anchors are to be set with water testing. Base plates shall be grouted with neat concrete.

3. Anchor bolts shall be set in aggregate space only. Adhesive anchors shall be set in accordance with the manufacturer's recommended adhesive as approved by the District Project Manager and the Engineer.

4. Anchor bolts and wedges shall be drilled and placed as follows:
   a. All anchor bolts shall be drilled through the reinforcement, and the anchor bolts shall be grouted with neat concrete. The anchor bolts shall be placed in accordance with the requirements of ASTM D1326.
   b. All wedge anchors shall be grouted with neat concrete in accordance with ASTM A423.

5. Steel post and base units shall be galvanized in accordance with ASTM A453. Any damaged galvanized areas are to be metalized in accordance with Section 832 of the Standard Specifications.
GENERAL NOTES:

1. Whether an existing bridge barrier is to remain in place, is to be modified or be replaced, is a determination that must be made independent of any information contained on this index.

2. The schemes on this index are not to be used for new bridge construction. Bridge widening, bridge barrier wall terminals only, or, for existing bridges that have wing piers for guardrail connection that continue with configurations shown in current Bridge Design Standards and Bridge Design Specifications.

3. The schemes on this index are divided into five general categories, representing curved and angular roadway approaches. A scheme selection guide is provided under "Design Notes," for curved and angular roadway approaches. Approach sides with curbs or wing walls with radial safety curbs will be treated as curved approaches.

4. Existing bridge features shown in these schemes are example configurations only. The preferred site to examine is select segments in bridge curbs or sidewalk width. Locations curbs are used to grade face of curbs, except for certain railing conditions.

5. Details that are repetition as the schemes and features that are described in Index No. 400 have been purposely created to produce clarity and simplification in the schemes, and to expose proper location and positioning of the anchorage and connecting guardrail.

6. All schemes are right side or right head sectors for traffic flow right to left. Left side approach are opposite here.

7. For undivided two-way bridges "trailing end," as used in this index, is in relation to the direction of travel or near lane traffic, but it is always considered as an approach for opposing lane traffic.

8. All cross-sections of guardrail and concrete show concrete anchorages, panels, and walls shall have a 1 1/2" or 2" diameter steel bolted-1 inch plate, the group tightening of the fore end 1 1/2" or 2" diameter steel bolted-1 inch plate, and other cast iron parts shall have a nominal length equal to the thickness of the concrete anchorages plus 1/2".

9. When wet soils would generate excessive bridge rail, 4" diameter bolted clamps and chemical anchor bolts meeting the manufacturers recommendation may be substituted as approved by the Engineer.

10. Unless otherwise called for in the plans exposed concrete surfaces shall have a Class 3 finish. For Class 3 finish, see Sec. 7409 from 1980 Cumulative Index to the Standard Specifications.

11. The guardrail end anchorage schemes on this index do not include cost for payment of guardrail. See Index No. 3000 from the list of guardrail measures.

Each independent exchange described in these schemes shall be paid for as a bridge exchange assembly under contract with price for Bridge Anchorage Assembly. Each. The unit price shall be full compensation for the following:

1. Horizontal under post, panel or transition wall including reinforcing steel, existing or new, and new non-metal (brick, block, masonry, concrete, wood, or other), vertical, horizontal, or inclined, including top, bottom, and side edges and all necessary transitions.

2. Each guarded travel lane post, including traffic and safety, including necessary transitions (final) and other catch release only.

3. Each special post; that occurs directly on an existing bridge end or wing post, including back-up posts and necessary transitions.

4. Installation of guardrail assemblies shall be paid at a minimum labor times labor cost plus for all accessories provided through Index No. 400 and the unit price for special post shall be included for all necessary assemblies and accessories provided in Index No. 400 and is in Scheme 6 of this index.

DESIGN NOTES:

1. The details in this index are intended to be used for existing bridges that have end and approach rail configurations constructed under former Department standards, and are not intended to produce special design details more suited to bridges with unusual barriers or wing铁路 configurations, or when there is conflict with drainage structures or other features that can be altered or adjusted.

2. The schemes provide the designer with a convenient method of presenting standardized information on the plans. In the selection and assignment of schemes the designer must consider the existing bridge barrier, curb, sidewalk and approach end conditions, particularly the location of embankment conduit. Special details must be directed to the presence of schemes of curved approaches at each independent corner of the bridge.

3. Each corner of the bridge that requires a special construction detail shall be marked independently by scheme number, and, where feasible, barriers to reduce access to a bridge the scheme notation should be placed on sheet 1 at the bridge. When continuous guardrail is called for, bridge and anchorage assemblies will be shown, but, when continuous concrete safety barrier is called for, one or more bridge end and anchorage assemblies will be shown on the plans.

4. The scheme selection guide below is to be used as a quick reference for determining exchange and anchorage features that are applicable in specific conditions for existing bridges. When appropriate, special details are to be used in lieu of scheme or in supplement to complement the scheme details, in selecting schemes the widths of curb, safety curb and sidewalk in the distances from face of such to the nearest face of piers or parapet.

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GUARDRAIL, ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

Bridges for which this sheet covers have been checked and approved by:

J. W. Greenwell
Engineer 1961

4013

C:

401
CURVILINEAR GUARDRAIL
BRIDGES WITH APPROACHING ROADWAY CURB

APPLICATIONS
SAFETY CURB 2'-0" WIDE OR LESS
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 12

APPLICATIONS
SAFETY CURB 2'-0" WIDE OR LESS
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 13

APPLICATIONS
SAFETY CURB 2'-0" WIDE OR LESS
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 14
LIGHT POLE MOUNTING IN MEDIAN BARRIER WALL

JUNCTION BOX NOTES

1. Junction boxes are to be fabricated from steel, conforming to ASTM A-36, and be hot-dipped galvanized after fabrication. All metal shall be continuously electroplated and ground smooth. A corrosion-resistant material shall be applied to the box to provide a water-tight cover. The cover screws shall be fully galvanized.

2. Remove excess concrete while green and hard form sheets.

3. Junction box concrete and conduit risers are included in the construction and cost of the barrier wall. There is to be no separate compensation for the box, risers or installation unless specifically noted for in the plans.

JUNCTION BOX - ELECTRICAL
REINFORCED CONCRETE BARRIER WALL (RETAINING)

BENDING DIAGRAMS

NOTE: All longitudinal reinforcement No. 4 bars. Minimum step length for this wall is 20 feet, minimum 3/4" bar size. Minimum embedment for Concrete Barrier Wall (Rigid Retaining) 1.5'.

QUANTITIES:
- Class II Concrete 0.29 CY/ft
- Reinforcing Steel 20 LBS/ft

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

CONCRETE BARRIER WALL
WITH PLAIN CONCRETE BARRIER WALL (SHOULDER)

WITH SHOULD GUTTER AND GUARDRAIL

WITH GRASSED OR PAVED SHOULDERS AND GUARDRAIL

1. Views show approach medicinal barriers when length of road exceeds the length of either retaining walls with concrete traffic railing. When of Reinforced Concrete Barrier Wall (Shoulder) on shoulders, when of length of road, the wall ends shall be sheathed by crash cushions, or, by guardrail for reasons of bridge traffic rules, as indicated in Index No. 400.

2. Guardrail connection to concrete traffic railing on existing walls shall be in accordance with the Structure Design Office Standard Drawings and view plans. Guardrail connections to shoulder concrete traffic railing shall be in accordance with the Standard Details shown in Index No. 440.

3. Guardrail to be deferred on retaining walls except for 2-lane 2-way facilities. The lamppost shall be anchored by an anchor type E.

4. To be deferred on retaining walls except for 2-lane 2-way facilities.

CONCRETE BARRIER WALLS ON APPROACHES TO BRIDGES
CONCRETE BARRIER WALL

WITH UTILITY STRIP

WITHOUT UTILITY STRIP

TWO-WAY TRAFFIC (OPPOSING LANE APPROACH)

ONE-WAY TRAFFIC (TRAILING END)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENTS
**NEAR LANE APPROACH**

**OPPOSING LANE APPROACH**

**LENGTH OF ADVANCEMENT**

---

**CONCRETE BARRIER WALL**

**RIGID** (CURB & GUTTER)

---

**HAZARD PENETRATING STEM OF BARRIER WALL**

---

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**HIGHWAY DESIGN**

---

**DESIGN SPEED (mph) Length of Advancement, ft. (1 x 1)**

45 or Less 16 (D-d)

Note: The minimum length of advancement for both near and opposing lane approaches is 40 feet.

Equation Variables:

D - Distance in feet from near edge of the near approach travel lane to head of hazard at closest point.

D-d - Distance in feet from near edge of the near approach travel lane to the face of curb at offset distance.

D+D-d - Distance in feet of advancement from inside edge of the near approach travel lane.

D - Distance in feet from near edge of the near approach travel lane to the face of curb at offset distance.

Note: This diagram is for the design of concrete barrier walls, showing the length of advancement for rigid barriers with curb and gutter. The design speed and length of advancement are specified, and equations are provided for calculating the distance. The diagram also includes sectional views and top views for the barrier wall system.
END MEASUREMENT FOR GUARDRAIL POST (SEE NOTES)

25' W Beams (Hexagonal)

20' W Beams (Hexagonal)

SECTION AA

SECTION BB

SECTION CC

SECTION DD

SECTION EE

SECTION FF

VERTICALLY NESTED BACK-UP PLATES

BACK-UP PLATE AND BEAM MOUNTING DETAIL

NOTES

1. The longitudinal dimensions and support lengths shown for concrete barrier wall and posts apply to shoulder concrete barrier walls.

2. For barrier wall drilling and guardrail connections for one-way lanes, see Section 2.

3. Where necessary, to fill post holes the molded surfaces shall be

4. Steel guardrail posts are provided for timber posts, when guardrail using steel guardrail posts connects to the transition section, however, when the C-A-T System connects to the double face transition sections, timber posts shall be used.

5. The center beam shall be the beams and posts at posts number 1, 3 and 5 from barrier wall.

6. For additional guidance refer to Notes 400. For additional guidance on posts refer to Notes 412 and 413.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER WALL

GUARDRAIL CONNECTION TO CONCRETE BARRIER WALLS
CONCRETE BACKUP WALL 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.
TENSION STRUT BACKUP ASSEMBLY

1. For the number of bolts required see table, Sheet 1.
2. See Transition Assembly Features for guardrail connections.
3. For design information see the General Notes.
GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name Brakemaster. 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 agencies. This standard drawing provides the general information and graphics necessary to field identify component parts of the Brakemaster system and its incorporation into a whole system.

3. This standard drawing is sufficient for plan details for the Brakemaster system installed in connection with standard single and double faced W-beam guardrail systems, and provides the requirements for shop drawing submittals unless the plans otherwise call for such submittals.

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

5. The Brakemaster system shall be constructed only on slopes up to 8%.

6. The Brakemaster system shall not be located closer than 0.1 feet to any traffic lane.

7. The full and section views represented on this standard drawing are in connection with single and double faced guardrail. Where the Brakemaster system is installed in conjunction with safety shaped or vertical faced barrier walls or other rigid structures, a special transition guardrail section between the Brakemaster and wall or structure shall be as detailed in the manufacturer's Brakemaster lul, or as approved by shop drawings.

8. Metallic components shall meet the general requirements for guardrail, Index No. 400.

9. The Brakemaster system will be paid for under the contract unit price for impact attenuator vehicular (Brakemaster) l, fuel.

DESIGN NOTES AND GUIDELINES

1. The Brakemaster system is designed to cushion automobiles and on bikes and to restrain automobiles from side hits when impacting at speeds up to and including 60 mph. The Brakemaster unit has a slanted design for all speeds of 60 mph or less and any adjustment to its design will not be permitted except as authorized by the manufacturer.

2. The Brakemaster system is specially designed to withstand both narrow lane-to-lane and the ends of other components located in low frequency impact areas. The Brakemaster system is not intended for use in areas of components and non-planer lane impacts. Usually, lanes or guardrail bends or other geometric features for such areas have been encountered after being submitted either in a lane or at a side multiplier bent. Different side rail elements of the Brakemaster will be standard and are to be replaced immediately; detailed elements are not to be replaced as a unit. Where replacing an installed Brakemaster system is required, the traffic impact on the Brakemaster system should be replaced only as authorized by the manufacturer for credit toward replacement of the cable.
8" Wac. Asphalt, In Absence Of Other Paved Surface

Length Of Road L

Brakemaster System - Limits Of Placement For Approach

6' 6" 6' 3" 6' 3" 6' 3" 6' 3" 6' 3"

6' 6"

6' 3"

6' 3"

6' 3"

6' 3"

6' 3"

6' 3"

6' 3"

6' 3"

6' 6"

Brake/Tension Support Assembly

NOTE: NOTICE THE BOLT ARRANGEMENT FOR STRAP AND PANEL CONNECTIONS

RIGHT SIDE ELEVATION - Right Side Elevation Identical For Both Bidirectional And Unidirectional Systems

LEFT SIDE ELEVATION

UNIDIRECTIONAL SYSTEM

NOTE: NOTICE THE BOLT ARRANGEMENT FOR STRAP AND PANEL CONNECTIONS
ANCHOR ASSEMBLY, EMBEDDED BRS

ISOMETRIC VIEW

Note: This assembly is driven into 8" dia. 5' deep pilot holes by drive cap furnished.

ANCHOR ASSEMBLY, DPA BRS

DIAPHRAGM, BRS

BRAKE/CABLE REPLACEMENT

Cable Replacement Required When Cable Slips Exposed. See "Design Notes and Specifications." Note No. 3. For Additional Information.
### General Notes

1. The hex foam sandwich system is designed and fabricated by Energy Absorbers, Inc., and marketed under the trade name Hex-Foam Sandwich System. Any information on the rights of the designer shall be the sole responsibility of the user.

2. This standard drawing is produced by the Florida Department of Transportation, solely for use by the Department and its assigns. This standard drawing provides the general graphic and relaxation necessary to identify the complete system, parts of the hex foam sandwich system and their identification into a whole system.

3. This standard drawing is sufficient for plan details for the hex foam sandwich system. It is a standard sheeting or plasticized paper with concrete parts and other fixed barrier systems, and is intended to clarify the requirements for those drawings. It is intended to provide for such alternate T, U, and Z sections, as well as the use of various connection systems. The sheet details and specifications shall be constructed as detailed in the plans and/or as required by shop drawings.

4. Only the hex foam assemblies shall be used in all bays and the same section.

5. Concrete foundations and backup blocks shall be constructed with 800 psi. concrete over the concrete intensity concrete.

6. The hex foam sandwich system can be constructed on cross-slope 20-foot, without compensation, alternation.

7. All aesthetic components shall meet the requirements for guardrails, Index No. 403.

8. Fillings, hardware, anchors and accessories not listed or described in these details are items furnished by the manufacturer/fabricator and are to be included in accordance with the manufacturer's instructions and specifications.

9. The 1.5-inch and 2.5-inch sections shall have a minimum of 3.0 inches to complete the system.

10. All materials that are used shall meet the requirements for guardrails, Index No. 403.

### Design Notes and Guidelines

1. The hex foam sandwich system is designed to be used only as a safety and to provide traffic control for side walls. The standard with the hex foam sandwich system is designed to achieve fixed barrier at the T, U, and Z sections. The design for these sections is such that the concrete intensity concrete over the concrete shall be used in all bays and the same section.

2. Concrete foundations and backup blocks shall be constructed with 800 psi. concrete over the concrete intensity concrete.

3. The hex foam sandwich system can be constructed on cross-slope 20-foot, without compensation, alternation.

4. All aesthetic components shall meet the requirements for guardrails, Index No. 403.

5. Fillings, hardware, anchors and accessories not listed or described in these details are items furnished by the manufacturer/fabricator and are to be included in accordance with the manufacturer's instructions and specifications.

6. The 1.5-inch and 2.5-inch sections shall have a minimum of 3.0 inches to complete the system.

### Bay Selection Guidelines

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<th>Design Speed (mi/hr)</th>
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<th>50</th>
<th>55</th>
<th>60</th>
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<tr>
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<td>5</td>
<td>6</td>
<td>7</td>
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<td>λ</td>
<td>10° 46'</td>
<td>12° 45'</td>
<td>14° 25'</td>
<td>15° 25'</td>
<td>17° 25'</td>
<td>18° 25'</td>
<td>18° 46'</td>
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### Hex-Foam Cartridge Selection Chart

<table>
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<tr>
<th>Alternating Type</th>
<th>Hose</th>
<th>1-in.</th>
<th>1.25-in.</th>
<th>1.5-in.</th>
<th>2-in.</th>
<th>2.5-in.</th>
<th>3-in.</th>
<th>3.5-in.</th>
<th>4-in.</th>
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### Index of Sheets

<table>
<thead>
<tr>
<th>Sheet No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>General System Features and Bay Selection Guidelines</td>
</tr>
<tr>
<td>2</td>
<td>Concrete Backup Assembly</td>
</tr>
<tr>
<td>3</td>
<td>Diagonal Braced Backup Assembly</td>
</tr>
<tr>
<td>4</td>
<td>Horizontal Braced Backup Assembly</td>
</tr>
<tr>
<td>5</td>
<td>Wide Flange Backup Assembly</td>
</tr>
<tr>
<td>6</td>
<td>Transition Sections</td>
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</table>
TYPICAL APPLICATIONS

TIE DOWN

INTERMEDIATE SUPPORT POST
MAIN SUPPORT POST
END SUPPORT POST

SUPPORT POST DETAILS

ENERGY ABSORBER ASSEMBLY

ANCHOR POST ASSEMBLY
SOCKET

TIE DOWN

ANCHOR DETAILS

CABLE SPlice DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

DRAGNET

438
GENERAL NOTES

1. The energy absorbing system presented on this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name G-R-E-A-T. Any changes or modifications shall be the sole responsibility of the user.

2. This standard drawing is produced by the Florida Department of Transportation solely for use by the Department and its agents. This standard drawing presents an overview of the system and is not intended to replace the design manual for the entire system. The user shall be responsible for the engineering and calculations necessary to determine the suitability of the system for their specific application.

3. The system is designed to be installed on new or existing roadways and is not intended for retrofit applications. The user shall be responsible for ensuring that the system is properly installed and maintained.

4. The system is designed to absorb energy from vehicles and is not intended to be used as a guardrail. The user shall be responsible for ensuring that the system is properly labeled and marked to indicate its intended use.

5. The system is designed to be used on roadways with speeds up to 90 mph. The user shall be responsible for ensuring that the system is properly installed and maintained to meet the design criteria for their specific application.

6. The system is designed to be used on roadways with speeds up to 90 mph. The user shall be responsible for ensuring that the system is properly installed and maintained to meet the design criteria for their specific application.

7. The system is designed to be used on roadways with speeds up to 90 mph. The user shall be responsible for ensuring that the system is properly installed and maintained to meet the design criteria for their specific application.

8. The system is designed to be used on roadways with speeds up to 90 mph. The user shall be responsible for ensuring that the system is properly installed and maintained to meet the design criteria for their specific application.

9. The system is designed to be used on roadways with speeds up to 90 mph. The user shall be responsible for ensuring that the system is properly installed and maintained to meet the design criteria for their specific application.

10. The system is designed to be used on roadways with speeds up to 90 mph. The user shall be responsible for ensuring that the system is properly installed and maintained to meet the design criteria for their specific application.
FLEXIBLE FOUNDATIONS
1. The reinforced concrete pad system (RPCC) foundation is designed to resist the G-R-E-A-T forces. The pad foundations shall be constructed with 700 psi (5 MPa) compressive strength concrete. The top shall be beveled at the top of the slab to flush with the surface intended for approaching vehicles. The surrounding surface shall be paved as shown in Section 2E. The V-notch system shall be beveled to flush with the RPCC. The RPCC shall be formed such that the G-R-E-A-T unit, with a 48" (1.2 m) anchor, is supplied with a 6" (150 mm) anchor. The reinforcement shall be installed per the dimensions shown.

2. The reinforced concrete pad system (RPCC) foundation shall be Class 3 concrete. The concrete shall be placed in 3-day intervals and shall be maintained at a minimum of 24 hours of wet curing. The concrete shall be placed in a single pour and shall be placed in the form of a single pour, with a thickness of not less than 6" (150 mm), disposed of the slab in accordance with the Engineer's specifications.

3. For additional information, see the General Notes.

4. The V-notch system shall be formed such that the G-R-E-A-T unit is removed from the finished pavement. No existing pavement that is to remain in place, the slab shall be cut off from the top of the pavement, unless the plans otherwise provide.

**Rigid Foundations**

**MP-3 Anchor System**

**3 Bay Unit**

**6 Bay Unit**

**Reinforced Concrete Pad System (RPCC)**
1. Nylon is a specific material in certain locations on the plate. The construction may exist in one of either single type of material or combination of material layers from the component options. Above combinations of angles, plates, and/or combination plates, the top and bottom cover shall be identified between cover and/or post assemblies. Only the line post optional material will be permitted between cover and/or post assemblies. Pull post assemblies shall be optional materials, identified as either the line post optional material or the cover and post assembly optional material. Pull post assemblies shall be the same optional material between any set of cover and/or post assemblies.

2. Concrete bases shall be Class I as specified in Section 345 of the Standard Specifications except that the requirements contained in 345-S-10 and 345-S-5 post shall apply. Materials for Class I concrete may be proportioned by volume or by weight.

3. Line posts, tension wires, chain links fabric, tie wires, Class I fabric, and all miscellaneous fittings and hardware to be included in the cost for Fencing Type B-1. The standard 6-1/2 ft pull post shall be furnished for Fencing Types B-2, 2A. Fencing above this height, if not included in the contract, but furnished under the contract unit price for Fencing Type B-1, 2A will be charged under the contract unit price for Fencing Type B-1, 2A.

4. Both pull post assemblies shall consist of one pull post, two braces, two nuts and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for Pull Post Assembly Type B-1 & B-2.

5. Pull post assemblies shall consist of one pull post, one brace, two nuts and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for Pull Post Assembly Type B-1 & B-2.

6. Pull post assemblies shall consist of one pull post, two braces, two nuts and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for Pull Post Assembly Type B-1 & B-2.

7. Pull post assemblies shall consist of one pull post, two braces, two nuts and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for Pull Post Assembly Type B-1 & B-2.

8. Pull post assemblies shall consist of one pull post, 2 braces, 2 nuts and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for Pull Post Assembly Type B-1 & B-2.

9. Finish posts are to be cast in concrete bases as detailed above and shall be paid for under the contract unit price for Pull Post Assembly Type B-1 & B-2.

10. Pull post assemblies shall consist of one pull post, two braces, two nuts and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for Pull Post Assembly Type B-1 & B-2.
OPTIONAL "C" LINE POST FOR TYPE B FENCE

NOTES
Attachments to be used only when noted in the plans.
Attachments to be extended in direction of restrained. Unless otherwise noted for in place, direction of restrained will be as follows:
1. Bolts on located access right of way line.
2. Rods on located access right of way line.
3. Anchor bolts on secured access right of way line.
4. Anchor bolts on secured or secured modules located within.
5. Anchor bolts on secured or secured modules located outside.
6. Anchor bolts on secured or secured modules located outside.
7. Fencing is provided for pedestrian areas.
8. Fencing is provided for pedestrian areas.
The gap shall be designed to provide a drive is over the top of posts and to exclude nuisance in places with lateral sections.
Attachments to be paid for under contract with price for fencing, Type B (with each wire attachment)

BARB WIRE ATTACHMENT

Steel $\square$ (ASTM A36) Galvanized or Aluminum $\square$ Alloy 6061-T6

OPTIONAL H-BEAM LINE POST FOR TYPE B FENCE

FENCE MOUNTING ON CONCRETE ENDWALL AND RETAINING WALLS

BASE PLATE AND ANCHOR NOTES:
1. Base plates identical for line, pull, and corner posts and shall be considered an integral part of the respective posts for basis of payment.
2. Post to be plumbed by grout strips base plates.
3. Anchors (Galvanized Steel):
   - 6" Cold in Place, 26.5" Concrete
   - 8" Cold in Place, 26.5" Concrete
   - 8" Cold in Place, 26.5" Expanded
   - Anchors should be the same number as at in-slip tests with every testing company Type I Class D.5 in accordance with the manufacturer specifications. Drilled holes shall be larger in diameter than the anchor bolt. Expansion bolts not permitted.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

FENCE TYPE B
GENERAL NOTES

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

2. Extruded rolled or formed components that provide wind, water and snow resistance may be used in lieu of the plate components shown and internal rolled or formed components may be used in lieu of the extruded steel sections shown.

3. All components shall satisfy the exterior requirements specified in Article No. 452.

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PRE-DESIGN

CANTILEVER SLIDE GATE
TYPE B FENCE
GENERAL NOTES

1. The opaque visual barrier is intended to function as a visual screen, and is not intended to resist vehicle impact loads nor to restrain, contain or Redirect vehicles or cargo. The barrier is designed to withstand zero wind loading and strikes by light objects, and designed to sustain exceptional strikes by vehicles or cargo, and to contain or redirect segments of the screen when yielding to such strikes.

2. When the opaque visual barrier is constructed on an existing barrier wall, dowels shall be 2'-0" in length, threaded 6'-0" into the barrier wall and set with an approved chemical grout. Embedment holes shall be 6" diameter, drilled to a depth 3' below the top of the dowel unless greater depth is required to accept manufactured grout capstals.

When the opaque visual barrier is constructed in conjunction with precast concrete barrier walls, dowels may be set as described above, in either the drilled or perforated holes, or placed as the barrier wall is cast. For dowels that are placed when the wall is cast, the dowel shall be 2'-0" in length and threaded to a depth of 12".

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

For single faced barrier walls that are constructed around other vertical structure, the opaque visual barrier shall follow the alignment of only one of the walls and be designed as such.

For dual barrier wall that follow different differential profiles, the opaque visual barrier shall be constructed stop the wall with the higher elevation, unless conditions dictate otherwise. Lateral transitions or end overlaps for opaque visual barriers that alternate between dual walls shall be designed in the plans.

For median barrier walls that are divided when crossing over separated bridges, the opaque visual barrier shall be constructed stop the approach side barrier wall, unless differential profiles dictate installing the opaque visual barrier on the departure side barrier wall.

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

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

5. The Contractor may construct concrete panels in lieu of the cast-in-place opaque screen when approved by the Engineer. Panel design and method of anchorage to the barrier wall shall be obtained by shop drawings when requested by the Engineer.

The Contractor may construct the opaque screen monolithically with the barrier wall; however, the screen design shall not be modified so as to cause the wall to be excessively active from strikes to the screen; see design considerations in Addendum 1 above.

6. Exposed concrete surfaces should have a Class 3 surface finish in accordance with Section 910 of the Standard Specifications, unless otherwise specified by the Engineer. Surface finish shall be specified and shown on the plans. decking in accordance with Section 400 only when called for in the plans.

7. Payment for opaque visual barrier shall be full compensation for concrete, reinforcement, dowels, setting, placement, drilling, grouting, bolting, finishing and work incidental thereto, and shall be paid for under the contract unit price for Opaque Visual Barrier (Concrete 1'2"-3' Height, 1'2")

ESTIMATED QUANTITIES, LF

Concrete 0.042 CY
Reinforcing Steel 3.37 Lb*
*3.58 Lbs. With 2'-0" Dowels

OPAQUE VISUAL BARRIER

STATE OF NEW JERSEY DEPARTMENT OF TRANSPORTATION
PHOTO DESIGN

ENLARGEMENTS

PICTORIAL

ELEVATION OF REINFORCEMENT AND DOWELING

END VIEW

END MEASUREMENTS FOR OPAQUE VISUAL BARRIER, PAYMENTS, LF

Cut & Field Bend Relief, Steel

Open Joint Above Barrier Wall Joins Or Adapting Rigid Structures

2'-0" Clear

Top Of Concrete Barrier Wall

2'-0" Clear

2'-0" Clear

3'-0" Clear

4'-0" Clear

No. 4 Vert. Bars 2'-0" Long
Spread At 3'-0" Cea. (See General Note No. 4)

No. 4 Vert. Bars 2'-0" Long
Spread At 3'-0" Cea. (See General Note No. 4)

No. 4 Dowels 2'-0" 2'-0" Long
Special At 3'-0" Cea. (See General Note No. 4)

Class B Concrete, See General Note No. 3 for Surface Finish And Durability Requirements

No. 4 Vert. Bars 2'-0" Long
Spread At 3'-0" Cea. (See General Note No. 4)

No. 4 Vert. Bars 2'-0" Long
Spread At 3'-0" Cea. (See General Note No. 4)

Tapered Edge

(See General Note No. 2.1)

Type T Safety Shape

Barrier Wall (Symmetrical Or Asymmetric)

New Jersey Safety Shape
IN RURAL CONSTRUCTION

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. 505, unless otherwise shown on the plans.

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

4. The term "Plastic Material" used in this index in connection with removal of plastic soil is defined under soil classification for Plastic F.P.1 and High Plastic F.P.2 soil 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 5% (5.0) percent, or an individual organic content test result which exceeds seven (7.0) percent. Organic material shall be removed as shown on the index and the plans unless directed otherwise by the District Geotechnical Engineer.

Average organic content shall be determined from the test results from a minimum of three randomly selected samples from each stratum. Tests shall be performed in accordance with Fall I-76(F) on the portion of a sample passing the No. 8 sieve.

6. The normal depth of side slopes shall be 3.5 feet below the shoulder point except in special cases.

7. In municipal areas, where underdrains are to be constructed beneath the proposed pavement, the grade of the underdrain filter material will not exceed above the bottom of the stabilized section of the subgrade. Direction of the filter material shall conform to FDOT specifications. Minimum grade on underdrain pipe shall be 0.1%.

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

REMOVAL OF ORGANIC AND PLASTIC MATERIAL

DESIGN NOTES

1. All locations where organic material or other soft soil deposits prevent or make difficult the removal or backfill, the construction of a geotechnical foundation over these soils should be considered. The Engineer of Record shall designate values from the District Geotechnical Engineer and select geotechnical foundation designs from geotechnical manufacturers when pursuing geotechnical alternatives.

2. The designer shall take into consideration the existing condition of roadway widening in the vicinity, and where widening is anticipated specify in the plans the location of removals of organic and plastic materials necessary to accommodate anticipated widening.
REMOVAL OF PLASTIC MATERIAL AND LOCATION OF UNDERDRAIN IN URBAN CONSTRUCTION

REMOVAL OF PLASTIC MATERIAL ON INTERSTATE FACILITIES, FREEWAYS, DIVIDED ARTERVIALS AND MAJOR COLLECTORS HAVING DEPRESSED MEDIANs

REMOVAL OF PLASTIC MATERIAL ON DIVIDED FREEWAYS, ARTERVIALS AND MAJOR COLLECTORS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

REMOVAL OF ORGANIC AND PLASTIC MATERIAL
1. Roadway dimensions are representative. Subgrade dimensions and central lines are standards. The details shown on this sheet do not supersede the details shown in the plans or an index The 100 or 500.

2. Plastic (P-11) soils may be placed above the existing water level for construction or within 6 feet of the proposed base, it should be placed entirely in the lower portion of the embankment for some distance along the project rather than full depth for short distances.

3. High Plastic (H) soils encountered within the project limits may be used in embankment construction as indicated on this index. High plastic soils are not to be used for embankment construction when allowed to flow within the project limits.

4. Section (S) soils having an average organic content of more than two and one-half percent, or having an individual test value which exceeds four percent, shall not be used in the subgrade portion of the embankment.

5. High Plastic (H) soils classified as organic materials or tills, or with a clay content of more than 10 percent, shall not be used in the embankment outside the control line, unless restricted by the plans or otherwise specified. Tests shall be performed in accordance with W-1-78F or the portion of the same sample passing the No. 4 sieve.

Classification table is in order of preference.

- S: Select A-1, A-3, A-2-4
- H: High Plastic A-1-5, A-1-6, A-6-7, A-10-10, WITH CC = 50%
- M: Muck A-X

Classification listed left to right in order of preference.

- See General Notes No. 4-S-5 for utilization of soils classified as organic materials or muck.

- Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the embankment when approved by the District Superintendent Engineer.

- For cut sections this dimension may be reduced to 24". See Index No. 500.

- For more collectors and local facilities this dimension may be reduced to 18".

GENERAL NOTES

DIVIDED ROADWAYS

UNDIVIDED ROADWAY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

EMBANKMENT UTILIZATION

EMBANKMENT UTILIZATION

- DESIGN NOTES

- EMBANKMENT UTILIZATION

- STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

- ROAD DESIGN

- EMABNKMENT UTILIZATION

-(state)

- ROAD DESIGN

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

REMOVAL OF EXCESS BASE MATERIAL

NOTES
1. When the median has curb or curb and gutter, stabilize 6" back of curb.
2. When the median has shoulder with no curb or curb and gutter, stabilize to normal shoulder width.
3. See the details above for stabilizing requirements at crossroads.
4. Stabilize entire area under all-speed traffic islands.
5. Stabilize full width under all traffic separators.

MEDIAN STABILIZING DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN
MISCELLANEOUS EARTHWORK DETAILS
8-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN
SUPERELEVATION RATES \( \mathbf{e} \) FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

\[ \varepsilon_{\max} = 0.05 \]

**TABULATED VALUES**

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<thead>
<tr>
<th>Degree Of Curve (( \beta ))</th>
<th>Radius (( R ))</th>
<th>Design Speed (mph)</th>
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<tbody>
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<td>2,805</td>
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<tr>
<td>( 3^\circ )</td>
<td>1,546</td>
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<tr>
<td>( 4^\circ )</td>
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<td>( 9^\circ )</td>
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<td>( 10^\circ )</td>
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<td>( 11^\circ )</td>
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<tr>
<td>( 12^\circ )</td>
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</table>

**CHARTED VALUES**

- CURVATURE (DEGREES)
- RADIAL ( FEET )

- **General Notes**
  1. The maximum rate of superelevation for urban highways and high speed urban streets shall be 0.05.
  2. Superelevation shall be obtained by rolling the plane successively about the break points of the section until the plane has attained a slope equal to that required by the chart. Should the relation however the entire section and further superelevation be required, the remaining rotation of the plane shall be about the lower edge of the outside travel lane.
  3. Crown is to be centered in the roadway only by the outside of the curve and when the adjoining travel lanes require positive superelevation.
  4. In construction, chart vertical curves shall be placed in all regular profile breaks within the limits of the superelevation transition.
  5. The effective superelevation transition length \( L \) shall have a minimum value of 50 feet for design speeds under 40 mph and 15 feet for design speeds of 40 mph or greater.
  6. Roadway sections having lane arrangements different from these shown, but composed of a series of planes, shall be superelevated in a similar manner.
  7. For superelevation of lower speed urban streets, see the FDOT "Manual Of Uniform Minimum Standards For Design, Construction And Maintenance For Streets And Highways". For superelevation of curves on rural highways, urban freeways and high speed urban highways, see Index No. 350.

**Superelevation for Urban Highways and High Speed Urban Streets**

\[ e_{\max} = 0.05 \]
SUPERELEVATION TRANSITION SECTIONS FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

UNDIVIDED FACILITIES

THREE TRAVEL LANES EACH DIRECTION

THREE TRAVEL LANES EACH DIRECTION WITH MEDIAN

DIVIDED FACILITIES

TWO TRAVEL LANES EACH DIRECTION

TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN

TWO TRAVEL LANES EACH DIRECTION WITH AUXILIARY LANES

TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANES

PARABOLIC SECTION

STATE OF COLUMBIA DEPARTMENT OF TRANSPORTATION

SUPERELEVATION

URBAN HIGHWAYS AND STREETS

SUPERELEVATION TRANSITION SECTIONS FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS
TWO LAKES EACH DIRECTION

SECTION 0-A to 0-D

PROFILE

TWO LAKES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANE

SECTION 0-A to 0-E

PROFILE

EXAMPLE SUPERELEVATION SECTIONS ANDPROFILES
FOR URBAN HIGHWAYS ANDHIGH SPEED URBAN STREETS
<table>
<thead>
<tr>
<th>COURSE</th>
<th>Type 5-11 With Type 5-20 Top Layer</th>
<th>Type 5-20 With Type 5-20 Top Layer</th>
<th>Type 5-1</th>
<th>Type 5-20 With Type 5-20 Top Layer</th>
<th>Type 5-20 With Type 5-20 Top Layer</th>
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</thead>
<tbody>
<tr>
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</table>

**GENERAL NOTES**

1. If combinations other than those shown in the table are used, the thickness must be consistent with the following thickness ranges, Type Mix: 5-1, 5-20, 6, 7. Multiple layers shall be used when possible. Use combinations shall be approved by the Engineer.

2. In addition to the thickness requirements, the following restrictions are placed on the respective materials used as a structural course:
   - Type 5-1 shall not be used as the first layer of a course over Type 5-20.
   - Type 5-20 shall be used as the final top structural layer.
   - Limited to the final top structural layer, the type.

3. When quantities are given as average items, equivalent average layer thickness will be constructed in lieu of average yard thick.

4. The designer should consider stage construction for courses greater than 4½.

5. When construction includes the paving of adjacent shoulders (i.e., S-5, etc.), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass. See Design Notes.

---

**DESIGN NOTES**

It is desirable that the top layer of the roadway overlie and the adjacent shoulder structural course be constructed in one pass. The following apply when a free fill or less is present and the minimum standards is to be constructed in conjunction with an overlay of the roadway:

1. If alternate friction courses are to be shown on the typical section, use the following:

   **MODERN COURSE THICKNESS**
   - **SHOULDER**
     - Type 5-1
       - 1½" w/ 1½" FC
       - 1½" w/ 1½" FC

   **SHOULDER**
   - Type 5-20
     - 1½" w/ 1½" FC

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

   **MODERN COURSE THICKNESS**
   - **SHOULDER**
     - Type 5-1
       - 1½" w/ 1½" FC
     - 1½" w/ 1½" FC

   **SHOULDER**
   - Type 5-20
     - 1½" w/ 1½" FC

---

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**FLEXIBLE PAVEMENT**

**LAYER THICKNESS FOR STRUCTURAL COURSES**

---

**FLEXIBLE PAVEMENT**

**LAYER THICKNESS FOR STRUCTURAL COURSES**
## General Notes

1. On new construction and complete reconstruction projects where an entirely new base is to be built, the design engineer may specify only the Base Group and any of the unrestricted General Use Optional Bases shown in the Base Group may be used. Note, however, that some thick 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 blank.

### General Use Optional Base Groups and Structural Numbers

<table>
<thead>
<tr>
<th>Base Group</th>
<th>Structural Range</th>
<th>Option Code</th>
<th>Base Thickness</th>
<th>Notes</th>
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### Legend

- For composite bases, the construction of both the subbase and ABC will be paid for under the general cost price for optional bases. The base thickness shown is ABC. All subbase thicknesses are 4". The base structural number shown is for the composite base.
- 0 To be used for widening only, three feet or less.
- Δ Based on minimum practical thickness.
- ‡ Generally restricted to non-interstate shoulder base construction.
### LIMITED USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS

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<tr>
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<th>3.0%</th>
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</table>

**GENERAL NOTES FOR LIMITED USE OPTIONAL BASES**

These limited use base materials shall be used only when the specific materials are shown in the plans.

**DESIGN NOTES FOR LIMITED USE OPTIONAL BASES**

These limited use base options shall be called for in the plans only when approved in writing by the District Materials Engineer.

---

**LIMITED USE ELEVATIONS**

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<th>Elevations</th>
<th>1.5%</th>
<th>3.0%</th>
<th>4.5%</th>
<th>6.0%</th>
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<th>9.0%</th>
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**LEGEND**

- Based on minimum practical thickness.
- Generally restricted to shoulder base construction.
For additional information refer to FDOT Rules Chapters 416, 436, and 496.

**SKETCH ILLUSTRATING DEFINITIONS**

**URBAN (CURB & GUTTER)**

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<tr>
<td>CONNECTION WIDTH</td>
<td>10' Min.</td>
<td>20' Max.</td>
<td>25' Min.</td>
<td>20' Min.</td>
<td>30' Max.</td>
<td>35' Min.</td>
</tr>
<tr>
<td>FLARE (Stop Curve)</td>
<td>15' Min.</td>
<td>20' Max.</td>
<td>15' Min.</td>
<td>20' Max.</td>
<td>25' Max.</td>
<td>30' Max.</td>
</tr>
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<td>60°-90°</td>
<td>60°-90°</td>
<td>60°-90°</td>
<td>60°-90°</td>
<td>60°-90°</td>
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<tr>
<td>DIVIDEND ISLAND (Traffic Median)</td>
<td>4'-22' Wide</td>
<td>4'-22' Wide</td>
<td>4'-22' Wide</td>
<td>4'-22' Wide</td>
<td>4'-22' Wide</td>
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<tr>
<td>SETBACK</td>
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<td>0' Min.</td>
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**RURAL**

1-20 Trips/Day

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<th>1-20 Trips/Day</th>
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<tr>
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<td>ANGLE OF DIKE</td>
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<tr>
<td>DIVIDEND ISLAND (Traffic Median)</td>
<td>4'-22' Wide</td>
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<tr>
<td>SETBACK</td>
<td>0' Min.</td>
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</table>

**NOT INTENDED FOR FULL INTERSECTION DESIGN**

**SUMMARY OF GEOMETRIC REQUIREMENTS FOR TURNOUTS**

1. Prior to the adoption of FDOT Rules Chapters 416 and 496, connections to the State Highway System were limited and permitted by Counties. Connections have been restricted by Categories under Rule 416.025, the term "Class" has been applied to highway improvements of the State Highway System as defined under Rule 416.025.

**DESIGN NOTES**

1. Where a connection is intended to align with a connection across the highway, the through lanes are to align directly with the corresponding through lanes.

2. For new connections and for connections on new construction or reconstruction projects, perpendicular realignments and horizontal realignments are to be considered for "Urban Flared Turnouts" or, as described in "Table 51.1-1" for connections with radial returns and/or auxiliary lanes.

3. The responsibility for the cost of construction or alteration to an access connection shall be in accordance with FDOT Rule Chapter 416.
MODIFICATIONS TO ADVERSE AND MARGINAL SECTIONS
NOTES:
1. When a crossover is no longer needed, all temporary construction shall be immediately removed and the area restored to its original condition.
2. Cost of all construction, maintenance, removal and restoration work related to temporary treatment shall be included in the contract unit price for Maintenance of Traffic (M.O.T.).
3. Crossovers to be constructed where sight distance is adequate in both directions as directed by the Engineer.
LIMITED ACCESS FACILITIES

SHOULDER GROUND-IN RUMBLE STRIP PLACEMENT

IN ISOMETRIC - TRANSVERSE CUT

ISOMETRIC - LONGITUDINAL CUT

SECTION CC
TRANSVERSE CUT

LOCATION ALONG SHOULDER (FLEXIBLE PAVEMENT)

SHOULDER GROUND-IN RUMBLE STRIPS

GENERAL NOTES FOR SHOULDER GROUND-IN RUMBLE STRIPS

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

2. The strip array is the stripped array. The continued array shall be constructed in advance of bridge spurs for a distance of 200 feet or more, and in the gore runway area for major interchange bridges, and in other specific locations as called for in the plans.

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

4. When bridge course extends more than one foot (f) beyond the edge of the outside travel lane, the extended friction course shall be kept off back the one foot (f) line, prior to rumble strip grading.

5. Arrays shall be placed for under the correct wall price for Rumble Strips (Ground-In). Per Mile. Each price and segment shall be full compensation for all work and materials required.

DESIGN NOTE

1. The rumble strips described on this sheet are intended for use on flexible pavement shoulders. When constructing ground-in rumble strips on existing rigid concrete shoulders, the rumble strips shall be located closer than 6" from any pavement joint. When specifying ground-in rumble strips on existing rigid shoulders their location and array shall be detailed in the plans.

2. Other methods and types of applications shall not be used unless approved in writing by the State Roadway Design Engineer. Approved will be considered only with sufficient document data furnished for review and approval from this sheet.
THREE THRU LANES • APPROACH AUXILIARY LANE

EXIT TERMINALS

TWO-LANE RAMPS
ACCELERATION LANE WITH SHOULDER GUTTER

DECELERATION LANE WITH SHOULDER GUTTER

SHOULDER TREATMENT
AT SPEED CHANGE LANES AT EXPRESSWAY RAMP TERMINALS

EXPRESSWAY RAMP TERMINALS
4-LANE UNDIVIDED WITH OPTIONAL LANE

4-LANE UNDIVIDED FLARED - SYMMETRICAL

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

FLARED - PAVED SHOULDERS

FLARED - UNPAVED SHOULDERS

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

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

2. Approach lane departures (0.5') are suitable for design speeds up to 60 mph. Interior curves (0.5') are suitable for normal crown for design speeds up to 50 mph. Merging curves (0.5') will require super-elevation.

3. The geometrics of these schemes are associated with the standard sub-sectional spacing for sidereads, but in any case will require modification to accommodate sideread location, multi-lane and/or divided sidereads, oblique sidereads, crossover widths, storage and speed change lane requirements, and other related features.

LEFT ROADWAY CENTERED ON APPROACH ROADWAY
TWO LANE TO FOUR LANE TRANSITION
LEFT ROADWAY CENTERED ON THRU ROADWAY
FOUR LANE TO TWO LANE TRANSITION
RIGHT ROADWAY CENTERED ON APPROACH ROADWAY
TWO LANE TO FOUR LANE TRANSITION
22' MEDIAN

40' MEDIAN

64' MEDIAN

RIGHT ROADSIDE CENTERED ON THRU ROADSIDE
FOUR LANE TO TWO LANE TRANSITION

L = WS for speeds ≥ 45 mph
W = WS for speeds ≤ 40 mph

Where:
W = Width of lateral transition in feet.
S = Design speed.
SPECIFICATIONS
Repeats On Sheet 2.

CONCRETE
Concrete: F007 Class II.
Reinforcing Bars: ASTM A-615, Grade 60.
Vapor Barriers: Black 6-Mil Polyethylene.

STEEL
Generalized Shapes After Fabrication, With Field Repairs To Generalize With High Zinc Dust Paint Coat, Coupling With 55%Yield-10.

WOOD
Comply With American Institute For Timber Construction.
NTEC XM, "Standard For Heavy Timber Construction."
For Solid Wood Decking, Comply With ATEC XV, "Standard For Timber Graded Heavy Timber Standard."
Species: Dougles Fir, Hem-Fir, Or Southern Pine, At Fabricator's Option.
Preservative Treatments: Pressure Treated Fabribaded
Members With Water-Repellent Finishing For Above Ground Use, Coupling With AARPA C.R.
Wood Decking: Prelit Decking At 30" Centers For Lateral Spiking To Adjacent Units.

PICNIC TABLES
Picnic Tables And Benches Shall Be S elegant.
Generalized Pipe Frames And Rigid Plastic Wood Seats And Table Tops. All Tables Shall Be Of Weld Through Design Suitable For Exterior Locations And Shall Be Accessible According To The Requirements Of The Americans With Disabilities Act (ADA).
Accessibility Guidelines For Tables And Benches Shall Be Selected From DOT'S Qualified Products List.

PICNIC PAVILIONS
STATE OF ALABAMA DEPARTMENT OF TRANSPORTATION
REST AREA EQUIPMENT

530
GENERAL NOTES

1. The location and construction of mailboxes shall conform to the rules and regulations of the United States Postal Service as modified by this design standard.

2. Mailboxes will not be permitted on interstate highways, freeways, or other highways where prohibited by law or regulation.

3. The contractor shall give the Postmaster of the delivery route(s) a written notice of projected construction 7 days prior to the beginning of work, with Saturdays, Sundays and holidays excluded.

The contractor shall furnish and install one mailbox in accordance with this design standard at each mail box delivery location and maintain the box throughout the contract period. The contractor shall apply box numbers to each patron box in accordance with identification specifications of the Domestic Mail Manual of the U.S. Postal Service where local street names and house numbers are authorized by the Postmaster as a postal address, the contractor shall record the house number on the box. If the box is located on a different street from the patrons residence, the contractor shall record the street name and house number on the box.

The contractor shall coordinate removal of the patrons existing mailboxes immediately after installing the new mailboxes. The contractor must notify each "Mail Delivery Patron" by certified mail that removal of the existing mailboxes must be accomplished in 30 days after receipt of notice. Patrons shall have the option of removing their existing mailboxes or leaving the mailboxes in place for removal by the contractor. Removal by the contractor shall be included in the contract unit price for Mailboxes, Each. The contractor shall dispose of mailboxes and supports in areas provided by him.

Rear of existing mailboxes by the contractor will not be a requirement under any construction project, however where an existing mailbox meets the design requirements, the contractor at his option may elect to reuse the existing mailbox in lieu of constructing a new mailbox. Any use of existing mailboxes must be approved by the Engineer.

4. Mailboxes shall be metal construction only, in traditional style only, and only in Size I as prescribed by the Domestic Mail Manual of the U.S. Postal Service. (USPS I) Mailbox production standards, lists of approved manufacturers and suppliers of mailboxes, design approval and guidance may be obtained by writing to the Rural Delivery Division, Delivery Service Department, Operations Group, USPS Headquarters, Washington, DC 20260.

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

Mailboxes on rural highways shall be set with the post at shoulder point, except for shoulders less than 8' in width the face of the box shall be no closer than 8' from the edge of the driving lane except as noted below.

Mailboxes on low volume (100 or less than 100 veh), low speed (40 mph or less) rural highways shall be offset with the face of the box of the shoulder point but not closer than 6'-8" from the edge of the driving lane; however, on these low volume low speed highways where shoulders lack sufficient width to accommodate stopped vehicles, mailboxes shall be offset with the face of the box at the shoulder point but not closer than 2'-6" from the driving lane.

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

6. Mailboxes oncurved highways, roads and streets shall be set with the face of the box between 60" and 90" back of the face of curb. If the sidewalk abuts the curb or if an unusual condition exists which makes it difficult or impractical to install or serve boxes at the curb, the contractor with concurrence of the local postal authority may be permitted to install an mailbox at the back edge of the sidewalk, where they can be served by the carrier from the sidewalk.

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

7. No more than two mailboxes may be mounted on a support structure unless the support structure and mailbox arrangements have been shown to be safe by crash testing and approved by the State Design Engineer, Highways. Neighborhood Delivery and Collection Box Units (NDCPU) are a specialized multiple mailbox installation that must be located outside the highway and street clear zones. The location of NDCPU's is the sole responsibility of the Postmaster for the delivery route under consideration.

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

9. Wood and steel support posts for both single and double mailbox mounings shall be extended no more than 24" into the ground. Concrete, brick, block, stone or other rigid foundation structure or encasement, either above or below the shoulder groundline, will not be permitted for mailboxes on rural highways. On urban roads and streets where mailbox support posts are set within right of way rear back of curbs, the support posts shall be separated from the pavement by a minimum of 1' of expansion material. Support posts shall not be fitted nor installed with surface mount base plates.

10. At driveways 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 20' or more from the centerline of the intersecting road on the far side in the direction of the delivery route, with the distance increased to 200' when the route volume exceeds 400 vehicles per day.

11. Wood support posts shall be in conformance with the material and dimensional requirements of Section 955 of the Standard Specifications.

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

Mounting brackets, plates, 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. Erector, adjustments to suit construction needs; and, for identification letters and numbers.

Payment shall be limited to one mailbox per patron address where the mailbox is mono, rusted, warped, roetal 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 NDCPU furnishing, assembly, installation, resizing or relocation.
FLANGED CHANNEL

STEEL FLANGED CHANNEL SUPPORT POSTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

MAILBOXES

532
PLAN

No. 6 Bars @ 18" C IRC, Top And Bottom
Width Varies - See Section Below

Note: Class I concrete is to be used unless otherwise noted in plans or special provisions.

SECTION AA
REINFORCED CONCRETE
TYPE A

TREATED TIMBER
TYPE B

PLAN

Note: Tractor crossing to be constructed to match permanent cross slope.
The number of mats required will vary with the pavement width. A sufficient number of mats will be used so that the matted area will be centered on the centerline.
Threaded Or Socket Type Cap
Shrink Or Label With Information Date, Location And Identification Number
When Socket Type Cap Used Drill 2 Diameter Holes And Secure With Wax.
Threaded Type Caps To Be Hand Tightened.

2½ Steel Or PVC Schedule 40 Pipe (Casing)
Casing To Be Installed In 5 Sections, As Required.
Threaded Or Socket Type Fittings (PVC Socket Type Shown)
PVC Casing Sections Not Perforated Below Steel Sections

6½ x 6½ Treated Timbers
2½ x 6½ Treated Timber
Grip Bolt, Nut & Washer
( Bolt Thread End Up )

Cement When Socket Type Coupling Used

Iron Coupling (As Required)

1½ Iron Pipe (Stake)
Lower Pipe Section To Be 6½" in Length
Added Pipe Sections To Be 6½" in Length

PLAN
TIMBER PLATE

STEM TO BE PLUMB
Top Of Slipt To Be Surcharged
Surcharge Compressed F70
FILL WITHIN 2' OF STEM TO BE COMPACTED BY HAND TO REQUIRED DENSITY
Plate To Be Surcharged After Cleaning And Grouting Operations And Prior To Placing Foul Flat Lift

INSTALLATION

NOTES
1. Elevation of the top of each length of marker pipe shall be determined as soon as it is installed and suit immediately before the next length of marker pipe is added.
2. Settlement plates locations shall be flagged and protected from construction vehicles and equipment. If settlement plates are disturbed they shall be replaced in situ.
3. Delrin used to construct seal should not have a mesh covering (plastic or other synthetic material).

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SETTLEMENT PLATE

TIMBER PLATE STEEL PLATE STEEL PLATE STEEL PLATE
STEM AND PLATE OPTIONS

Sheet No. 2
1 of 3
540
GENERAL NOTES

1. The purpose of shrubs in areas back of guardrail is to eliminate head maintenance in these areas.
2. Shrubs are to be planted approximately 5' back from guardrail posts and hazards. Narrow plant areas are to have at least one row of shrubs, as directed by the Engineer.
3. Shrubs are to be planted approximately 5' on center in rows with 5' spacings.
4. Shrubs are to be offset in successive rows to create a zig-zag pattern between any two rows.
5. Shrubs shall be specified in the plan by Landscape Material Master Plan 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 one exit.
7. When guardrail painting is constructed in conjunction with shrub planting, soil sterilization shall be in accordance with Section 339 of the Standard Specifications.
8. Far line of view sight lines see notes No. 541.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

LANDSCAPING
BACK OF GUARDRAIL APPLICATION

545
GENERAL NOTES

1. Distances apply to both divided and undivided intersections under stop sign control and flashing beacon control. For full signal-controlled intersections see Design Note No. 3 below.

2. Sight distance (d) applies to normal and shed intersections. Intersecting angle between 60° and 40°L, and where vertical and/or horizontal curves are present. Sight distance (d) is measured along the major roadway from the center of the interesting roadway. Distances a, b, and c are measured from the centerline of the interesting roadway to a point on the edge of the outer traffic lane or the major roadway. Distances a, b, and c are measured to the center of the interesting roadway to a point on the median or center line for the far side roadway of the major roadway.

3. The limits of clear sight define a corridor through which a clear sight window must be provided. See Exhibit 96-2.5, Sheet 2 of 2.

4. Clear sight must be provided between vehicles at intersection stop locations and vehicles on the major roadway within distance "c".

5. Clear sight is granted by a sight line originating 1.50 above the ground of the driver's eye level and extending above the ground of the vehicle's headlight.

6. The corridor defined by the limits of clear sight is a restricted passing area. Drivers of vehicles on the intersecting roadway and vehicles on the major roadway must be able to see each other clearly through the limits of "c". Vistas within the restricted areas are limited to decorations of the following:

- Ground Cover: Footpath planting of low growing vegetation which is acceptable within a height greater than 6" above the right line shown.

- Trees, Plants, or Pile of Mulch: A tree or pile of mulch, which is taller than 6" above the ground. Canopy or high branches foliage shall not be overhanging the plant. Fences, poles, or structures shall be spaced no closer than 25'.

- Other Obstacles: Abnormal objects insects, trash, etc. and are not considered part of the corridor. Obstacles shall be spaced at least 25'.

- Poles: Poles shall never obscure signs or signals.

- Other: No obstructions shall be present.

7. The evaluation of intersection geometry and the design of the intersection shall be based on the following standards:

- Sight distance at intersections
- Sight distance at stop signs
- Sight distance at闪光信標

DESIGN NOTES

1. The information shown on this index is intended solely for the purpose of clear sight development and maintenance of intersecting highways, roads, and streets, and is not intended to be used to establish sight distance as an engineering design criterion for location of signs, signals, and other safety control devices, or to determine the safe distance for other sight corridors, or for any other purpose.

2. Design notes are based on the AASHTO 'A Policy On Geometric Design Of Highways And Streets', Chapter II, Section E (of E), and Department practices for uncontrolled median openings left hand from major roadways.

3. For SIGNALIZED INTERSECTIONS, due to a variety of standard operational characteristics associated with signal-controlled intersections, the sight distances for the intersections listed in Case III procedures should be modified in the following manner: for traffic control, the lower speed and distance for signal-controlled intersections, such as those of the signal right-of-way approach length, may be increased. Use of the AASHTO procedure for the design of signalized intersections is recommended for incorporation of Case III sight distances. If the proper sight distances are not used, other design factors such as "sight right-on-red" may be necessary. These details shall be included in the analysis. The planning restrictions listed under General Notes above shall also apply to signalized intersections.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN
SIGHT DISTANCE AT INTERSECTIONS

LEGEND

- Areas Free Of Sight Obstructions

NOTE: See Sheet 2 of 2 for intersecting roadway origins of other sight and hazardous corner views.
ORIGIN OF CLEAR SIGHT LINE AND PROPERTY CORNER CLIPS

PICTORIAL!

CHANNELIZED DIRECTIONAL MEDIAN OPENINGS

PICTORIAL!

LEGEND

AAreas Free Of Sight Obstructions
FULL DEPTH ASPHALT/RUBBER CROSSING

**TYPE RS**

1. Rubber rail interface systems are manufactured to fit various rails from 45° to 15°.
2. The Railroad Company will furnish and install all crossing materials except as specified in the agreement.
3. For additional details, methods, materials, and installation procedures refer to the manufacturer's specifications.

**TYPE T**

TYPES T & RS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
RIPED DESIGN

RAILROAD CROSSINGS

[Diagram of railroad crossings with annotations and specifications]
PLAN VIEW

TYPICAL 44" CROSSING

TOP VIEWS - CENTER SLAB AND OUTSIDE SLAB

SECTION AA
STANDARD SLABS (PRECAST CONCRETE)

TOP VIEWS - CENTER SLAB AND OUTSIDE SLAB

SECTION BB
RAMP SLABS (PRECAST CONCRETE)

SIDE VIEW

PRECAST CONCRETE (CROSSING TIE)

ELEVATION TIE SPACING

TYPE T MODIFIED
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PREFACE

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

Index 600 provides Department policy and standards. Changes are only to be made thru Department approved procedures. Indexes 650 thru 659 provide typical application for various situations. Modification can be made to these indexes as long as the changes comply with the M.U.T.C.D. and Department standards.

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

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

The Florida Department of Transportation has adopted the "Manual On Uniform Traffic Control Devices For Streets And Highways" (MUTCD) and subsequent revisions and addenda, 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 plant
MUTCD Manual On Uniform Traffic Control Devices For Streets And Highways
TCZ Traffic control through work zones
L Taper length, buffer length or taper length plus buffer space
W Width of taper transition in feet, i.e., lateral offset
S Posted speed or off-peak 85 percentile speed
RPM Raised reflectorized pavement marker
TMA Truck mounted attenuator
COMM Traffic Control Standards Committee

SYMBOLS

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

- Work Area, Hazard Or Work Phase (Any pattern within a boundary)
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Lum
  - 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). Tubular Markers May Be Used During Daytime 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 II 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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL THROUGH WORK ZONES

GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

<table>
<thead>
<tr>
<th>Signage No.</th>
<th>Description</th>
<th>Legend No.</th>
<th>Code No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>
DEFINITIONS

Regulatory Speed (in Work Zones): The maximum permitted travel speed posted for the work zone as indicated by the regulatory speed limit signs. The work zone speed may not be shown or noted in the plans. This speed should be used as a design speed to determine runway lengths, departure rates, flare rates, lengths of need, clear widths, face lengths, crash cushion requirements, shoulder spacing, superelevation and other similar features.

Advisory Speed: The maximum recommended travel speed through a curve or a hazardous area.

Regulatory Speed (in Work Zones): The maximum speed recommended travel speed through a curve or a hazardous area.

Travel Way: The intended path for vehicular traffic through or around obstructions in construction, maintenance, utility and other work zones on highways, roads and streets. For traffic control through work zones, travel way may include auxiliary lanes, shoulders and any other permanent or temporary surface intended for the path of vehicular traffic.

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

Above Ground Hazard: An above ground hazard is any object, material or equipment other than traffic control devices that encroaches upon the roadway or that is located within the clear zone which does not meet the Department's safety criteria, i.e., anything that is greater than 4' in height and is firm and unyielding or doesn't meet broomway requirements.

REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCP's) for all projects must include specific regulatory speeds for each phase of work. This can be either the posted speed or a reduced speed. The speed shall be posted in the TCP's, 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 at or 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 less than 20 MPH below the posted speed and never below the minimum statutory speed for the class of facility. This reduction is to be done in 5 MPH per 500 feet 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 speed signs are removed, the regulatory speed existing prior to construction will automatically go back into effect unless new speed limit signs are posted for in the plans.

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

If the existing regulatory speed is to be used, consideration should be given to supplementing the existing signs with other speed signs. For projects where the reduced speed conditions exist for greater than one mile (non-interstate) or on rural or urban interstate, additional regulatory speed signs are to be placed at no more than one mile intervals. Engineering judgment should be used in placement of the additional signs. Locations of these signs beyond ramp entrances and beyond major intersections are examples of proper placement. For urban situations (non-interstate), additional speed signs are to be placed at a maximum of 4000-foot 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 (DTC) to investigate the need for further reducing the posted speed. If such an investigation determines that the speed limits need to be further reduced, the DTC will issue a recommendation for regulatory speeds in work zones due to the revised provisions of F.S. 366.040 and F.S. 366.042 (b). Advisory speed plates will be placed at the option of the field engineer for temporary use while processing a request to change the regulatory speed specified in the plans when deemed necessary. These speed plates cannot be used alone but must be placed below the construction warning sign for which the advisory speed is required.

For additional information refer to the FDOT Roadway Plans Preparation Manual, Volume I, Chapter 40.

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 casesainter sections of their traffic control zones. Where such restraints or conflicts occur or are likely to occur, one of the following means will be employed to avoid conflicts and prevent conditions that could lead to misunderstanding on the part of the traveling public as to the intended travel way by the traffic control procedure applied:

(a) For scheduled projects the engineer in responsible charge of the project design will resolve anticipated work zone conflicts during the development of the project traffic control plan. This may entail revision of plans on preceding projects and coordination of plans on concurrent projects.

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

(c) The District Maintenance Engineer will resolve anticipated and occurring conflicts under the following work zone conditions:
   1. Within scheduled maintenance operations.
   2. Between scheduled maintenance operations, maintenance construction, permitted work and/or in progress highway construction projects.
   3. The Unit Maintenance Engineer will resolve conflicts that occur within routine maintenance work; between routine maintenance work, unScheduled maintenance work and/or permitted work; and between unit controlled maintenance work and highway construction projects.

INTERSECTING ROAD SIGNING AND SIGNALS

Signs for the control of traffic entering and leaving work zones by way of intersecting highways, roads and streets should be adequate to make drivers aware of work zone conditions. Under no condition will intersecting leg signage be less than a ROAD CONSTRUCTION AHEAD sign, including light and flag, for approaching vehicles and a END CONSTRUCTION sign for departure vehicles.

Existing traffic signal operations that require modification in order to carry out work zone traffic control shall be included in the TCP and be approved by the District Traffic Operations Engineer. The need for temporary signal loops 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 are used to control traffic in work zones. They are as prescribed in Part VI of the MUTCD, subject to supplemental revision and certification by the State Traffic Engineer.

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 State Traffic Engineer.

DROPOFFS IN WORK ZONES

Acceptable warning and barrier devices for traffic control at dropoffs in work areas are detailed on Sheet 5 of 10. Unless otherwise specified in the plans, the contractor may use any of the barrier types (including optional shoulder treatment) shown in note 3 on sheet 5 of 10. Optional shoulder treatment shall be included under Lump Sum M/O.

WARNING LIGHTS

Warning lights shall be in accordance with Section 6E-5 of the MUTCD except for the application limitations and methods of payment stipulated below.

Flagging

A Low-intensity Flashing Warning Lights are to be mounted on barricades, drums, vertical panels or advance warning signs (except as noted below) and are intended to continuously warn drivers that they are approaching or proceeding in a hazardous area. Flashing lights shall not be used to delineate the intended path of travel, and all placed with spacings that will form a continuous line to the drivers eyes. The Type A light will be used to mark obstructions that are located adjacent to or in the intended travel way. Type A lights shall not be used in conjunction with the first advance warning sign nor the second such sign used when.

Type B High-intensity Flashing Warning Lights shall be mounted on the first advanced warning sign and on the first and second advance warning signs when more are signs used. This applies to all approaches to any work zone.

Steady-Burn

Type C Steady-Burn lights are to be mounted on barricades, drums, concrete barrier walls or vertical panels and used in combination with those devices to delineate the travel way on lane closures, lane changes, detour curves and other similar conditions. Steady-burn lights are intended to be visible in a line to delineate the traveled way through and around obstructions in the transition, buffer, work and termination areas of traffic control zones. Their intended purpose is for warning drivers that they are approaching or proceeding through a hazardous area.

SIGHT DISTANCE TO DELINEATION DEVICES

Transition markers should be obvious to drivers. If restricted sight distance is a problem (e.g., a steep vertical or horizontal curve), the marker should begin in advance of the view obstruction. The beginning of markers should not be hidden behind curves.

CHANNELIZING AND LIGHTING DEVICE

CONSISTENCY

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

PEDESTRIANS AND BICYCLISTS

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

NIGHTTIME FLAGGING

Nighttime flagging will require proper illumination of the flagger. A well-lighted flagging station and/or a reflectorized paddle or reflectorized flag pole with a flashing, lantern or other lighted signal that will display a white or red warning light shall be used.

Lights, reflectorized paddles, reflectorized flags and reflectorized vests, shirts or jackets approved by the Department of Transportation must be used to flag traffic at night. The STOP face of paddles shall be reflectorized red with white reflectorized letters and symbols, and the SLOW face of paddles shall be reflectorized orange with black letters and symbols. Flogger 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 stop as required before entering the work zone. Floggers shall be positioned to maintain maximum color contrast between the flagger’s reflectorized garments and equipment and the work area background.

REFLECTORIZED RAISED PAVEMENT MARKERS

Class A or B RPM’s shall be installed on the lateral lines of transitions, crossovers and drum and on the edges of gore areas within the work zone. The spacing shall be 40 feet on tangential sections and 20 feet on transitions, curves and crossovers. RPM shall be the contractors’ responsibility to replace damaged or missing RPM’s. This cost shall be included in the cost of the temporary RPM’s substitution.

SIGN COVERING AND INTERMITTENT WORK STOPPAGE SIGNING

Existing signs that conflict with temporary work zone signing shall be removed or covered as approved by the engineer. Traffic control signs that require covers when no work is being performed in a work area shall be fully covered with a durable opaque sheet material. Plastic film and woven fabrics including burlap will not be permitted. Covering of only the legend or symbol will not be permitted. Reflective covers will not be permitted. Hinged signs designed to cover when folded and sign blanks will be permitted. Covers, blanks, hinged panels and intermitting work stoppage shields and plaques are incidental to work operation signs and are not to be paid for separately.

REMOVING PAVEMENT MARKINGS

Existing pavement markings that conflict with temporary work zone delineation shall be removed by any method approved by the Engineer, where operations exceed one day during period, however, painting over existing pavement markings with durable paint with 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 curvatures, the minimum radii that can be applied are listed in the table below.

<table>
<thead>
<tr>
<th>MINIMUM RADIUS FOR NORMAL CROSS SLOPES</th>
<th>DEPARTures</th>
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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: For interstate with at least one 1/2 lane provided each direction, unless formally approved by the Federal Highway Administration; for other freeways; and I-10 for all other facilities.

LENGTH OF CONSTRUCTION SIGN

The length of construction sign (205-1) bearing the legend ROAD CONSTRUCTION趕NEES is required in projects of more than 2 miles in length. The sign shall be located at beginning construction points.
END CONSTRUCTION SIGNS

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

DETOURS

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

VARIABLE MESSAGE SIGNS (VMS)

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

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

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

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

For additional information refer to the FDOT roadway Plans Preparation Manual, Volume 1, Chapter 10.

ROADSIDE BARRIERS

When connecting temporary concrete barrier wall to guardrail the connection shall be made in accordance with Index No. 460.

ABOVE GROUND HAZARD

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

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

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.

<p>| SUPPORTS FOR MAINTENANCE OF TRAFFIC SIGNS |</p>
<table>
<thead>
<tr>
<th>SIGN SIZE</th>
<th>SIGN BRACKET</th>
<th>ROUND ALUM.</th>
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<th>STEEL CHANNEL</th>
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<td>3-4&quot;</td>
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<td>3-4&quot;</td>
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<td>3-4&quot;</td>
<td>3.0&quot; F/M</td>
<td>5-0&quot;</td>
</tr>
</tbody>
</table>

* F/M indicates Type F or Type M

** Requires two 3.0" steel channel (F/M) at 2'-6" center to center.

All signs 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 4.0" steel channel shall be installed with approved breakaway bases.

Refer to Design Standard HBSO, Sheet 2, for sign bracket details, and HBS0, Sheet 1, for steel channel details and approved breakaway bases.

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 roadside canals; where roadside canals are present, clear zone widths are to conform with the distances to canals described in Vol. I, Ch. 4, Sec. 4.2 and Exhibits 1-4-C and 1-4-D of the Plans Preparation Manual.

| CLEAR ZONE WIDTHS FOR WORK ZONES |
| WORK ZONE SPEED | WIDTHS (FEET) |
| (MPH)            |               |
| 60-70            | 30             |
| 55               | 24             |
| 45-50            | 18             |
| 30-40            | 14             |
| ALL SPEEDS       | 4' BEHIND FACE OF CURB |

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION FROM DESIGN
TRAFFIC CONTROL THROUGH WORK ZONES
GENERAL INFORMATION FOR
TRAFFIC CONTROL THROUGH WORK ZONES

<table>
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<th>INDEX NO.</th>
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</tbody>
</table>
CONDITION I
SHOULDER DROPFF
1. This condition is to be used when excavating adjacent to lane 1 being used for traffic control.
2. Distance Y is to be the maximum practical under project conditions.
3. Distance X should be maximum practical for project conditions, but not be less than 24'
4. Shoulder dropoff or berms are not to exceed on lane width ±1 designated for traffic control.
5. For specific requirements use Chart A or B below, as applicable.

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

CONDITION III
DROPFF BETWEEN TRAVEL LINES
1. This condition is to be used for resurfacing or milling travel lane.
2. Warning device or barrier must not exceed on lane width ±1 designated as minimum for traffic control.
3. X and Y should be maximum practical for project conditions. May be zero.
4. Sign W-9A with WMOPLEMENT plaque required at intervals of 500 maximum through this condition.
5. For specific requirements use Chart C below.

CHART A
ALL SPEEDS
NO CURB AND GUTTER

<table>
<thead>
<tr>
<th>X (Ft.)</th>
<th>A/B</th>
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<tr>
<td>0-4</td>
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</tr>
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<td>4-8</td>
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</table>

(6) Clear Zone (CZ) is to be determined per Index No. 600 sheet 1 or 4.
(7) Optional shoulder treatment allowed.

CHART B
45 MPH OR LESS


CHART C
CURB AND GUTTER OR NO CURB AND GUTTER

NOTES
1. These conditions and treatments can be applied only in work areas that fall within a properly signed work zone.
2. The following are defined as acceptable warning devices:
3. For further details, see Part III of the MUTCD.
4. Temporary barriers must be in accordance with Standard Index No. 405 and Standard Specifications.
5. Temporary guardrail installed in accordance with the Standard Specification and Standard Index No. 404. Materials may be new and/or used, but used material must be structurally and functionally equivalent to new materials.
6. Use of barriers is to be made in accordance with the Standard Index No. 400 with restraints as required.

OPTIMAL SHOULD TREATMENT
1. This optional method is to be used in lieu of warning devices when required by Charts A or B.
2. If warning devices are used, a minimum number of these devices is required.
3. Warning device spacing shall be as follows:
4. When warning devices are used for a dropoff condition, a minimum number of these devices is required.
5. Warning device spacing shall be as follows:
6. Optional treatment allowed when X is 4 or less.
7. For further details, see Part III of the MUTCD.
8. Standard specifications for location, speed, and distance of warning devices shall be as follows:
9. Minimum spacing for zones and barriers in 250, 500, and 1000 feet for Type I and Type II barriers, signs or signal personnel or equipment is to be made in accordance with the Standard Index No. 300 with restraints as required.

MILLING OR SURFACING
OPTIONAL TRAVEL LANE TREATMENTS
1. This optional method is to be used in lieu of warning devices when required by Chart C.
2. Optional treatment allowed only when X is 4 or less.

DROPOFFS IN WORK ZONES
TEMPORARY CURB

1. Application. Temporary curb shall not be used as facilities with posted speeds greater than 45 mph and dropoff's greater than four (4') feet deep. It shall not be used on interstates or limited access highways.

2. Vertical panels, hubber markers or barricades shall also be used to delineate the work areas. These devices could be placed on top of the temporary curb or on the outsides between the curb and the dropoff. (See Figure 2.1)

3. Eighteen inches 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 methods approved by the engineer. It is important that the curb adhere to the base material in order to provide the strength necessary to resist errant vehicles.

5. Temporary curb is to be paid for under Lump Sum Maintenance of Traffic (Item 122). The designer should include a pay item note to state this fact and to include the estimated number of linear feet to be used. Payment for the curb is to include all materials and work necessary to construct it, including painting of the curb. Maintain and remove the temporary curb. Traffic striping done, line, only 1 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 concrete. The type of material - asphalt or concrete - is up to the contractor, unless otherwise noted by the engineer.

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

8. If concrete is used to construct the temporary curb, joints must be made every 40 feet in order to control cracking.

9. The designer must also consider drainage needs when using temporary curbs. If driveways or other accesses are not frequent enough to allow for water runoff, the designer may need to provide the need for "drainage swale" of an appropriate spacing based on grades, number of lanes, etc. Typically, a drainage swale should be 12 inches wide (to break in the curb) at 50 foot spacings.

10. All openings such as driveways and business accesses, the temporary curb should be transitioned in height from 4 inches up to 9 inches of a 44 slope in order to alleviate a potential hazard at the end points.
FOR RIGHT USE SEE NOTE B.

TUBULAR MARKER TO BE USED DURING DAYLIGHT ONLY EXCEPT WHEN USED IN CONJUNCTION WITH TEMPORARY CONE.

STEEL DRUMS NOT PERMITTED

POST MOUNT A-FRAME

CONES

TUBULAR MARKER

PLASTIC DRUMS

VERTICAL PANEL

TYPE I BARRICADE

TYPE II BARRICADE

TYPE III BARRICADE

CHANNELIZING AND LIGHTING DEVICE NOTES

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

2. The TxDOT approval number shall be engraved on the device at a convenient and readily visible location.

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

4. The Type III Barricade shall have a unit length of 6 feet only. When barricades of greater lengths are required those lengths shall be in multiples of the 6' unit. 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 13 inches above the driving surface.

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

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

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 36 inches tall, with a minimum weight of 12 pounds and be reflectorized as per the MUTCD.
   3. Be used only with Department approved reflective collars.

STATE OF TEXAS DEPARTMENT OF TRANSPORTATION
TRAFFIC CONTROL THROUGH WORK ZONES

GENERAL INFORMATION FOR

TRAFFIC CONTROL THROUGH WORK ZONES


F.M.A.D. APPROVED  -  DATE:  -  APPROVED  -  DATE:  -  APPROVED  -  DATE:  -  APPROVED  -  DATE:  -  APPROVED

1 of 85 600
COMMONLY USED WARNING AND REGULATORY SIGNS IN WORK ZONES

SIGN CODES AND DESCRIPTIONS

Legend and/or Symbol / Background
- Orange (Reflected)
- Red (Reflected)
- Black Non-Reflected
- Yellow (Reflected)
- White (Reflected)
- Green (Reflected)

Note: The sign shields, symbols and messages contained on this sheet are provided for ready reference to guide 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 SIGN MANUAL. Special signs for traffic control plans will be as approved by the State Traffic Plans Engineer.

The sign codes shown on this sheet are for the purpose of identifying cell names found in the Traffic Control Cell Library (TCC Cell) on the CAD system. The STANDARD HIGHWAY SIGN MANUAL should be referenced for the official sign codes for use in the development of traffic control plans. See index #355 for WOT sign details.
REFLECTIVE PAVEMENT MARKERS

CLASS  APPLICATION
A  Permanent Applications in Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
B  Permanent Application In Traffic And Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
C  Work Zone Application Only, For Traffic And Non-Traffic Areas. Maximum spacing 5" center to center.

NOTES
1. For spacing of CLASS A or B RPWS to supplement Temporary Tape or Paint, see Index 600 sheet 3 of 10.
2. Basic color rules colorless reflectors replace white lines and amber reflectors replace yellow lines.
3. In work zones, CLASS A,B, or D RPWS 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 transit lanes in addition to the RPWS. In short term work zones, where the RPWS will be used for five (5) days or less, CLASS "C" 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 shall be followed by five black RPWS. The spacing between RPWS shall be 2.5'. Black RPWS will not be required for contrast with Amber RPWS.

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC CONTROL THROUGH WORK ZONES
GENERAL INFORMATION FOR
TRAFFIC CONTROL THROUGH WORK ZONES

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<tr>
<td>Size</td>
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</table>
GENERAL NOTES

1. If the work operation requires that two or more work vehicles cross the TS zone in any one hour, traffic control will be
   in accordance 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. 602.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 15 FEET FROM THE EDGE OF PAVEMENT

TYPICAL APPLICATIONS

- Landscaping Work
- Utility Work
- Fencing Work
- Cleaning Drainage Structures
- Reworking Ditches

SYMBOLS

☑☑ Work Area
1. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.

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

3. If the work operation extends 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 FLASHER sign shall be substituted for the WORKER sign. For location of flaggers see index No. 603.

4. The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.

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

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

7. \( L \) (min.) 
   \[ \text{For speeds} > 45 \text{ mph} \\
   \geq 15' \]
   \[ \text{For speeds} \leq 40 \text{ mph} \\
   
   \]

Where:
- \( W \) = Width of shoulder in Feet, 6' minimum.
- \( S \) = Posted speed limit MPH.

GENERAL NOTES

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. WORKER signs to be removed or fully covered when no work is being performed.

11. END CONSTRUCTION signs required only when work exceeds one daynight 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 TC2 indexes.

13. For general TC2 requirements and additional information refer to Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Tubular Markers May Be Used During Daylight Only.
- Work Zone Sign

TYPICAL APPLICATIONS

- Utility Work
- Culvert Extensions
- Side Slope Work
- Guardrail Work
- Landscaping Work
- Cleaning Drainage Structures
- Reworking Ditches
- Sign Installation And Maintenance
- Shoulder Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL THROUGH WORK ZONES

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

TZA-2

Curve

Approach

500'

1000'

500'

END CONSTRUCTION

1500'

When Other Construction Or Maintenance Operations Occur Within One (1) Mile, Signs 2
To Be Omitted And Signs 1 To Be Coordinated In Accordance With Index No. 600.
GENERAL NOTES

SYMBOLS

| Work Area |
| Work Zone Sign |
| Flagger |

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 to 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. 660.

4. 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.

5. The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.

6. Mesh signs may be used for (Daylight Only) operations. Type B lights and orange flags are not required.

7. The FLAGGER legend sign may be substituted for the symbol sign.

8. L (min.)

   W = \text{Width of lateral transition in feet}
   V = \text{posted speed limit (MPH)}

   \text{Where:}
   \text{W for speeds } \geq 45 \text{ mph}
   \text{L for speeds } \leq 40 \text{ mph}

   \begin{align*}
   \text{W} & = 2.52 \times L \\
   \text{L} & = \frac{W}{2.52}
   \end{align*}

9. The ONE-LANE ROAD signs shall be fully covered and a FLANGER sign shall be removed only when 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. 660.

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

13. For general TCO requirements and additional information, refer to Index No. 660.

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 LANE 2' OUTSIDE THE EDGE OF PAVEMENT
Maximum Spacing Between Devices (FT.) To Be Equal To The Speed Limit (MPH) But Not Greater Than 25' For Cones Or Tubular Markers Or 50' For Type I Or Type II Barricades Or Vertical Panels Or Drums.

Cone or Tubular Markers At 25' Centers And Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers For First 250'. Thereafter Cones Or Tubular Markers At 50' Centers And Type I Or Type II Barricades Or Vertical Panels Or Drums At 600' Centers.

General Notes:
1. Construction operations shall be confined to one traffic lane, having 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 only means of one-way control the flaggers shall be in sight of each other or their activities are restricted at all times.
4. The first two warning signs shall have a 6" x 6" min. 1 orange flag and a Type B light attached and flagged at all times.
5. The FLASHER legend sign may be substituted for the symbol sign.
6. All signs shall be posted 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 encroach the area between the centerline and a line 2' outside the edge of pavement.
GENERAL NOTES

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

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

3. If the work operation encroaches on the through traffic lanes or when four or more work vehicles enter the through traffic lanes in a one hour period flaggers shall be provided and the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs see Index No. 603.

4. The first two warning signs shall have a 18" x 18" (min) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B lights and orange flags are not required.

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

6. Where work activities within 2' of the edge of pavement is incidental (i.e., Mowing, Litter Removal) the engineer may delete requirements for cones and signs provided a vehicle with flashing warning lights is present.

7. L (min) = W 2
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GENERAL NOTES

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

2. Minimum length of work area is 200 feet. Maximum length to be determined by the Engineer, but in no case to exceed the length of one-half (1/2) days operation or two miles whichever is less.

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

4. 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 in direct communication at all times.

5. The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.

6. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.

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

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

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

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

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

12. For general TCZ requirements and additional information, refer to Index No. 600.

SYMBOLS

- Work Area

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

- Type I Or Type II Barricade Or Vertical Panel
  Or Cone Or Tubular Marker Or Drum

- Work Zone Sign

- Flagger

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 FOUR MILES PER HOUR

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MOVING OPERATIONS - RURAL

TWO-LANE TWO-WAY DAYLIGHT ONLY

Approved:

[Signature]

[Stamp]
CONDITIONS

FOR ANY OPERATION THAT IS 2’ OR MORE OUTSIDE THE EDGE OF THE PAVEMENT FOR A PERIOD OF LESS THAN 60 MINUTES.

CONDITIONS

FOR ANY OPERATION THAT ENCROACHES IN THE AREA BETWEEN THE CENTERLINE AND A LINE 2’ OUTSIDE THE EDGE OF THE PAVEMENT FOR A PERIOD OF 15 MINUTES OR LESS

CONDITIONS

FOR ANY OPERATION THAT ENCROACHES IN THE AREA BETWEEN THE CENTERLINE AND A LINE 2’ OUTSIDE THE EDGE OF THE PAVEMENT FOR A PERIOD IN EXCESS OF 15 MINUTES BUT LESS THAN 60 MINUTES.

GENERAL NOTES

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

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 flags shall be in sight of each other or in direct communication at all times.

4. The first two warning signs shall have an 8” x 8” (Min.) orange flag and a Type B light-attached and operating at all times.

5. Mesh signs may be used for daylight only operations.

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

7. Longitudinal dimensions are to be adjusted to fit field conditions. See index No. 600.

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

9. For general TCC requirements and additional information refer to index No. 600.

SYMBOLS

Work Area

Sign With 8” x 8” (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 Workers

May Be Used During Daylight Only.

Work Zone Sign

Flagger

TYPICAL APPLICATIONS

Marking Patches

Field Patches

String Line

Utility Work

Cleaning Up Debris On Pavement

Pavement Coring And Straight Edging

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

ROAD DESIGN

TWO-LANE TWO-WAY RURAL

DAY OR NIGHT OPERATIONS

607
SYMBOLS

Work Area

Sign With 18" x 18" (Min.) Orange Flag & 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). Tubular Markers May Be Used During Daylight Only.

Type III Barricade

Stop Bar

Flagger

Portable Signal

PORTABLE SIGNALS

SPANN WIRE SIGNALS

Pavement Or Bridge Deck

CLEAR ZONE

CLEAR ZONE

GENERAL NOTES

1. Work operations shall be confined to one traffic lane, except for head road crossings, leaving one lane open to traffic.

2. All vehicles, equipment, workers (except flaggers) and their activities are restricted to one side of the pavement, except for head road crossings.

3. The installation and timing of signals shall be approved by the District Traffic Operations Engineer prior to signals being placed in operation. Where sight distance to the signal is limited, the signals may be mounted on support at the discretion of the Engineer. The maximum distance between variable traffic signals (receiver/controllers) shall be 1 mile. However, in no case shall the distance exceed the maximum distance at which the remote operators can positively and safely operate both variable signals.

4. Flaggers shall be equipped with 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 8" x 8" (Min.) orange flag and a Type B light attached and operating at all times.

6. When needed, an additional warning sign may be installed in advance of the ROAD CONSTRUCTION AHEAD sign. The distance between successive signs shall be 500 ft.

7. The SIGNAL AHEAD legend may be substituted for the symbol sign.

8. All signs shall be posted in the closure lane for a period of 12 hours.

9. SIGNAL AHEAD and EQUIPMENT CROSING AHEAD signs are to be removed at the time indicated when no work is being performed and the highway is open to two-way traffic. Type III Barricades shall be in place to block head road access when the head road is not in operation and a flagger signal operator is not on duty, except when the head road is an existing property 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 T.C.I. indexes.

13. For general T.C.I. 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 Repaiv
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 ROADWAY, TRAFFIC SIGNALS ARE NEEDED.
GENERAL NOTES

1. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.

2. For speed sign applications see Index No. 600.

3. Where the turn distance (T) exceeds 600 feet, spacing between cones or tubular markers may be increased to 50 feet or spacing between Type I or Type II barricades, or vertical panels or drums may be increased to 100 feet within limits of the longest, or post-mounted delineators at 50 feet centers may be substituted for the barricades, vertical panels or drums.

4. On the existing pavement all existing markings within the resurfacing which conflict with the resurfaced traffic pattern are to be removed and removable pavement markings used for marking a new centerline and edge lines.

5. Where the turn distance (T) exceeds 600 feet and no passing or stopping sight distance restrictions exists, the yellow reflectorized markings used to indicate the centerline of the traveled way may be replaced with yellow reflectorized markings in a broken pattern. For raised pavement marker application see Index No. 600 and Index No. 3732.

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

7. Longitudinal dimensions are to be adjusted to TCC field conditions. See Index No. 600.

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

9. If temporary structures are required on the detour traffic control will be in conformance with Index No. 650.

10. For general TCC requirements and additional information refer to indexes Nos. 600 and 3732.

SYMBOLS

- Work Area
- Sign With 18" x 18" Min. J Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only), Tubular Markers May Be Used During Daylight Only
- Type III Barricade (With Flashing Light)
- Work Zone Sign

TYPICAL APPLICATIONS

- Bridge Construction
- Subgrade Restoration
- Culvert Repair Or Construction

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF BOTH LANES AND A TEMPORARY DETOUR IS CONSTRUCTED
GENERAL NOTES
1. If the work operation requires that two or more work vehicles cross the 15' zone in any one hour, traffic control will be in conformance with Index No. 832.
2. No special signing is required.
3. This index also applies when work is being performed on a multiline divided highway.
4. This index also applies to work performed in the median more than 15 ft. from edge of travel way, both roadways.
5. Arrows denote direction of traffic only and do not reflect pavement markings.
6. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TC2 indexes.
7. For general TC2 requirements and additional information refer to index No. 600.

SYMBOLS

TYPICAL APPLICATIONS
Landscape Work
Utility Work
Fencing Work
Cleaning Drainage Structures
Reworking Ditches

CONDITIONS
WHERE ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 15' FROM THE EDGE OF PAVEMENT
CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF PAVEMENT FOR A PERIOD OF LESS THAN 60 MINUTES

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 FLAker 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 TCC plan also applies to work performed in the median more than 2 feet but less than 15 feet from the edge of either pavement.

4. The first two warning signs, each side, shall have a 8' x 8' (min.) 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. L (min) = M/5 for speeds > 45 mph

   M/40 for speeds < 40 mph

WHERE:
W = Width of lateral transition in feet
S = Posted speed limit (MPH)

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

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

9. When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.

10. WORKERS' signs to be removed or fully covered when no work is being performed.

11. END CONSTRUCTION signs required only when work exceeds one day per 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 applicable TCC Indexes.

13. If the work operation does not exceed 15 minutes, signs, barricades, vertical panels, cones, tubular markers, or drums will not be required. Provided vehicles in the work area have warning lights and operating.

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

GENERAL NOTES

SYMBOLS

Work Area

Sign 8' x 8' (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.

Work Zone Sign
CONDITIONS WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF PAVEMENT FOR A PERIOD OF 15 MINUTES OR LESS

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 to one lane of one side of the pavement.

3. The first two warning signs, each shall have an 8"x18" min. orange flag and a Type B light and operate 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 on divided highways the barhazard plan is inverted and left lane closed and lane reduction signs substituted for the right lane closed and lane reduction signs.

7. The right (left) lane closed signs are to be removed or fully covered when no work is being performed and the highway is open to traffic.

8. L (min.)-Length of work in feet:
   - WS for speeds ≤ 45 mph
   - WS + 50' for speeds > 45 mph
   - 60

9. W-Width of temporary transition in feet
   - Speed limit (MPH)

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 work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omni-directional.

13. This TCC plan does not apply when work is being performed in the middle or inside lane(s) of a two or more lane highway. See Index Nos. 606 and 607.

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

TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work
- Pavement Curing And Straight Edging

SYMBOLS

- Work Area
- Sign With 8"x18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel
- Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger
- Advance Warning Arrow Panel

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

MULTILANE, DIVIDED AND UNDIVIDED
RURAL • OPERATIONS ONE
DAYLIGHT PERIOD OR LESS

[Diagram of traffic control and warning signs]
**GENERAL NOTES**

1. All vehicles, equipment, workers and their activities are restricted at all times in one lane of the highway.

2. The first two warning signs, each side, shall have a 48" x 18" (min.) orange flag and a Type B light attached and operating at all times.

3. All signs shall be posted mounted.

4. TWO WAY TRAFFIC signs shall be repeated every one-quarter mile, in each direction, throughout the length of the lane.

5. L (min.) = Ws for speeds > 40 mph
   
   \[
   L = \frac{W_s}{2} \quad \text{for speeds} \quad W_s \quad \text{mph}
   \]

   Where:
   
   **W** = Width of lateral transition in feet
   **L** = Painted speed limit in mph

6. Where the tangent distance (T) exceeds 250 feet, spacing between cones or tubular markers may be increased to 50 feet or spacing between Type I or II barricades or vertical panels or drums may be increased to 100 feet within the limits of the tangent, or post mounted reflectorized collars at 50 foot centers may be substituted for the barricades, vertical panels, cones, tubular markers or drums.

7. All existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and replaced with pavement marking used for carrying the new traffic lanes.

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 of the work zone traffic control devices shall be erected in accordance with applicable TCZ indexes.

11. For general TCZ requirements and additional information refer to index No. 600.

**APPLICATIONS**

1. Restricted Construction Limits

2. Unrestricted Construction Limits

3. Moderate to Heavy Traffic

**SYMBOLS**

- **Work Area**
- **Signs With 18" x 18" (Min.) Orange Flag And Type B Light**
- **Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Tubular Markers May Be Used During Daylight Only.**
- **Advance Warning Arrow Panel**

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**NOTES:**

(a) The tubular device is to be made of a flexible material or have a flexible joint at the base such that it will not cause damage to vehicles upon impact and will return to its original shape after being struck by a 5000 pound vehicle at a velocity of 75 ft./sec.

(b) The tubular device shall be orange with two white reflectorized collars.

(c) The tubular device may be attached by bituminous adhesive or other methods approved by the Engineer.

(d) Reflectorized materials shall have a smooth sealed outer surface which will display the same approximate color day and night.

(e) Twelve inch (12") openings for drainage will be constructed in the separator island every 25' in areas of grades of 10% or less or every 50' in areas of grades over 10% as directed by the Engineer.
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 9" x 9" (min.) orange flag and a Type B light affixed and operating at all times.

3. All signs, except those required in par 4. (a) shall be post mounted if the closure time exceeds 42 hours.

4. TWO WAY TRAFFIC signs shall be repeated every one-quarter mile, each direction, through the longest distance T.T.

5. L (min.) = W for speeds < 60 mph
   = W + 0.5 for speeds > 60 mph
   Where:
   W = Width of lateral transition in feet.
   S = Posted speed limit (MPH).

6. Where the longest distance (T.T) exceeds 250 feet, spacing between cones or tubular markers may be increased to 50 feet or spacing between Type I or Type II barricades or vertical panels or drums may be increased to 300 feet within the limits of the longest.

7. This index does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special maintenance of traffic control will be required.

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

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

10. When a side road intersects the highway on which work is being performed, additional traffic control devices shall be erected in accordance with applicable T.C. index.

11. For general T.C. requirements and additional information refer to Index No. 600.

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.

WHERE PLUS = TRAFFIC CONTROL THROUGH TWO LANES

MULTI-LANE UNDIVIDED • RURAL DAY OR NIGHT OPERATIONS
SYMBOLS

- **Work Area**
- **Sign With 18" x 18" (Min.) Orange Flag And Type B Light**
- **Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Tubular Markers May Be Used During Daylight Only.**
- **Work Zone Sign**
- **Advance Warning Arrow Panel**

GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the highway.
2. The first two warning signs, each side, shall have a 18" x 18" (min.) orange flag and a type B light attached and operating at all times.
3. Mesh signs may be used for (Daylight Only) operations. Type B lights and Orange flags are not required.
4. All signs shall be posted mounted if closure time exceeds 12 hours.
5. L (min.), W3 for speeds = 45 mph
   - W3 for speeds > 40 mph
   Where:
   - W = Width of lateral transition in feet.
   - S = Posted speed limit (MPH).
6. The LEFT LANE CLOSED and lane reduction signs are to be removed or fully covered when no work is being performed and the inside lane is open to traffic.
7. Advance warning arrow panels are required for both day and night operation. 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 fill 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 Index No. 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 18" x 18" Min. 1 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 Daytime Only.
- Type I or Type II Barricade or Vertical Panel or Drum with Flashing Light at Night Only.
- Work Zone Sign
- Flagger
- Stop Bar

Unsignalized:
1. All vehicles, except flaggers, and their activities are forbidden in lane and intersection areas reserved for traffic.
2. The first two warning signs shall have a 18" x 18" Min. 1 orange flag and a Type B light. They shall be placed and operated at all times. Mesh signs may be used for (Daytime Only) operations Type B lights and Orange flags are not required.
3. The Flagger legend sign may be substituted for the symbol sign.
4. All signs shall be posted if closure time exceeds 12 hours.
5. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs are placed on a normal pedestrian walkway, the signs shall be posted and located in accordance with index No. 1F302.
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.

General Notes:
- Maximum spacing between barricades, vertical panels, cones, tubular markers and drums shall be greater than 25'.
- 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.
- Temporary sign placement modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.
- Work performed for a period of 60 minutes or less is to be conducted in accordance with Index No. 600.
- For general TCZ requirements and additional information refer to Index No. 600.

Signalized:
- Utility Work
- Pave/Repair

Typical Applications:
- Utility Work
- Pave/Repair

Conditions:
Where any vehicle, equipment, workers, or their activities encroach on the pavement requiring the closure of a portion of one or more traffic lanes in an intersection for a period of more than 60 minutes.

Traffic Control Through Work Zones

Two-Lane, Two-way Urban Day or Night Operations

State of Florida Department of Transportation Road Design

Traffic Control Through Work Zones

Two-Lane, Two-Way Urban Day or Night Operations

State of Florida Department of Transportation Road Design

Traffic Control Through Work Zones

Two-Lane, Two-Way Urban Day or Night Operations

State of Florida Department of Transportation Road Design
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 200' DOWNSTREAM FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

GENERAL NOTES
1. Work operations shall be confined to one travel lane, leaving the opposing travel lane open to traffic.
2. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the pavement.
3. For work operations of 60 minutes or less see Index No. 60.
4. When vehicles in a parking zone block the line of sight to TCC signs or when TCC signs encroach on a normal pedestrian pathway, the signs shall be post mounted and located in accordance with Index No. 3302.
5. If work area is confined to an outside auxiliary lane the work area shall be barricaded and the FLAGGER signs replaced by ROAD CONSTRUCTION AHEAD signs. Flaggers are not required.
6. Flaggers shall be in sight of each other in direct communication at all times.
7. The ROAD CONSTRUCTION AHEAD and FLAGGER signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
8. The FLAGGER legend sign may be substituted for the symbol sign.
9. All signs shall be post mounted if the closure time exceeds 12 hours.
10. The maximum spacing between devices shall be not greater than 25'.
11. Arrows denote direction of traffic only and do not reflect pavement markings.
12. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
13. For general TCC requirements and additional information refer to Index No. 600.
GENERAL NOTES

1. All vehicles, equipment, workers (except flaggers) and their activities are forbidden in lane and intersection areas reserved for traffic.

2. For work operations of 60 minutes or less see Index No. 607.

3. The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light affixed and operating at all times. Mesh signs may be used for (Daytime Only) operations. Type B lights and orange flags are not required.

4. All signs shall be posted at least 100 feet (min.) before the lane closure.

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

6. Dust signs are required for divided roadways.

7. Arrows indicate direction of traffic only and do not reflect pavement markings.

8. Maximum spacing between barricades, vertical panels, cones, tubular markers and drums shall be not greater than 25 feet.

9. Temporary signal phasing modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.

10. Work performed for a period of 60 minutes or less is to be conducted in accordance with Index No. 607 or emergency condition procedures as described in Index No. 600, whichever applies.

11. Lane closures are to be adjusted to fit field conditions. See Index No. 600.

12. For general TCF requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS:

- Utility Work
- Pavement Repair
- Structure Adjustments

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF AT LEAST ONE MEDIAN TRAFFIC LANE FOR A PERIOD OF MORE THAN 60 MINUTES.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

Traffic Control for Work Zones

MULTILANE, TWO-WAY / URBAN
DIVIDED OR UNDIVIDED
DAY OR NIGHT OPERATION

[Diagram and additional details about traffic control measures and symbols for work zones]
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 and adjacent auxiliary lane
   (d) Inside travel lane and opposing auxiliary lane

   * See Sheet 2 of 2

3. For work operations of 60 minutes or less see Index No. 602.

4. When vehicles in a parking zone block the line of sight to TCC signs or when TCC signs encroach on a normal pedestrian walkway, the signs shall be posted and located in accordance with Index No. 1302.

5. The first two warning signs shall have an 8" x 18" (min.) orange flag and a Type B light attached and operating at all times.

6. If the work area is confined to an auxiliary lane the work area shall be barricaded and the RIGHT (LEFT) LANE CLOSED AHEAD signs replaced by ROAD CONSTRUCTION AHEAD signs, and the merge symbol signs eliminated.

7. Dual signs are required for divided roadways.

8. Advance Warning Arrow Panel

9. Work Zone Sign

10. Shop Bar

SYMBOLS

- Work Area
- Sign With 8" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)
- Advance Warning Arrow Panel
- Shop Bar

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE OUTSIDE TRAVEL LANE, OR ADVISORY LANE, FOR WORK AREA LESS THAN 200 FT FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE OUTSIDE TRAVEL LANE AND/OR ADVISORY LANE, FOR WORK AREA 200 OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repairs
- Structure Adjustments
CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE INSIDE TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 200 FT FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE INSIDE TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA 200 FT OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only) Tubular Markers May Be Used During Daylight Only.
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)
- Type III Barricade
- Work Zone Sign
- Advance Warning Arrow Panel

GENERAL NOTES (CONT.)
8. The maximum spacing between devices (ft.) within lateral transitions shall be equal to the speed limit (MPH) but no greater than 25' for cones or tubular markers or 50' for Type I or Type II barricades or vertical panels or drums. Spacing for devices parallel to the travel lanes shall be 65' centers for cones or tubular markers and 50' centers for Type I or Type II barricades or vertical panels or drums for 250'). Hereafter cones or tubular markers at 50' centers and type I or Type II barricades or vertical panels or drums at 50' centers.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general T&I requirements and additional information refer to 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 ADJACENT AUXILIARY LANE, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS
- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Strobe Yellow Orange Flag And Type B Light)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Strobe Yellow Orange Flag And Type B Light)
- Advance Warning Arrow Panel
- Stop Bar

GENERAL NOTES
1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the pavement.
2. Work operations shall be confined to either one lane or a combination of lanes as follows:
   (a) Outside travel lane
   (b) Outside auxiliary lane
   (c) Inside travel lane and adjoining auxiliary lane
   (d) Outside travel lane and adjoining center lane
   (e) Inside travel lane and adjoining auxiliary and center lanes
   (f) Median travel lane
   (g) Median auxiliary lane
   (h) Median travel lane and adjoining auxiliary lane
   (i) Median travel lane and adjoining center lane
   (j) Median travel lane and adjoining auxiliary and center lanes
3. For work operations, that require a single lane closure only, of 60 minutes or less see Index No. 602.
4. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be placed mounted and located in accordance with Index No. 7530.
5. When work is performed in the median lane or the median and adjoining center lanes, the barriercoring plan shall be extended and the LEFT LANE CLOSED AHEAD and merge right symbol signs shall be replaced by the RIGHT LANE CLOSED AHEAD and merge left symbol signs.
6. The first two warning signs, each side, shall have a 18" x 18" (Min.) orange flag and a Type B light and operating at all times.

TYPICAL APPLICATIONS
- Utility Work
- Pavement Repair
- Structure Adjustments

(Continued)
GENERAL NOTES (CONT.)

7. All signs shall be posted mounted if closure time exceeds 12 hours.

8. The minimum spacing between devices (ft.) within lateral transitions shall be equal to the speed limit (MPH) but no greater than 35 for cones or tubular markers or 50 for Type I or Type II bollards or vertical panels or drums.

Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' centers for Type I or Type II bollards or vertical panels or drums or 250' center-to-center for cones or tubular markers at 50' centers and Type I or Type II bollards or vertical panels or drums at 600' centers.

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

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

11. For general TCZ requirements and additional information refer to index No. 600.
### 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 roadway, an approved Truck Mounted Alternator will be required on the Advance Warning Vehicle but not required on the Shadow Vehicle. The Advance Warning 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 engines in charge may delete requirements for shadow vehicle and alternators. The work vehicle will be required to have an advance warning arrow panel and warning sign.

### SYMBOLS

- **W** Work Vehicle With Flashing Beacon
- **S** Shadow (S) Or Advance Warning (AW) Vehicle With Advance Warning Arrow Panel And Warning Sign.
- **A** Truck Mounted Alternator (TMA)
- **L** Lane Identification And Direction Of Traffic

### TYPICAL APPLICATIONS

- Stripping
- RPM Placement
- Vegetation Control

### CONDITIONS

**MOVING OPERATION**

- **STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**
- **TRAFFIC CONTROL, TOWED WORK ZONES**
- **MOVING OPERATIONS**

- **Drawing By:**

- **Date:**

- **Sheet:** 1 of 1
**CONDITION A**

WHEN THE PAVING TRAIN IS IN LANE 1, THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE 2, AND PROCEED IN LANE 2 TO THE FRONT OF THE TRAIN.

**CONDITION B**

WHEN THE PAVING TRAIN IS IN LANE 2, THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE 1, AND PROCEED IN LANE 1 TO THE FRONT OF THE PAVING TRAIN.

**CONDITION A & B**

THE ADVANCE WARNING ARROW PANELS ARE REQUIRED. UNDER NO CIRCUMSTANCES WILL THE TRAFFIC TRANSITION BE LOCATED WITHIN THE LIMITS OF THE CROSSTRAVER.

---

**SYMBOLS**

- **Work Area**
- **Type I Or Type II BARRIER Or Vertical Panel Or Drum (With steady burning Light At Night Only) & Tubular Markers May Be Used During Daylight Only.**
  - Type I Or Type II BARRIER Or Vertical Panel Or Cone Or Tubular Marker Or Drum
  - Work Zone Sign
  - Advance Warning Arrow Panel
  - Work Vehicle
  - Lane Number

---

**TRAFFIC TRANSITION AREA UPSTREAM FROM CROSSTRAVER**

### CASE I

**GENERAL NOTES**

1. When crosstreaders do not exist, the contractor will construct temporary crosstreaders in accordance with Notes No. 516.

2. L - Length of taper in feet.
   - W5 for speeds 45 mph
   - W6 for speeds 40 mph

   Where:
   - W - Length of lateral transition in feet.
   - S - Posted speed limit (MPH)

3. The minimum spacing between devices (if 1 within the lateral transitions shall be equal to the speed limit (MPH) but not greater than 25 for cones or tubular markers or 50 for Type I or Type II barriers or vertical panels or drums.

   Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' for Type I or Type II barriers or vertical panels or drums.

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

---

**TRUCKS ENTERING HIGHWAY**

**MERGE RIGHT ON FLASHING ARROW**

**TRUCKS TURNING LEFT**

**SIGN NO. 1**

**SIGN NO. 2**

**SIGN NO. 3**

**SIGN NO. 4**

---

[Diagram showing traffic control signs and markings]
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 CROSSOVER.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL THROUGH WORK ZONES

TEMPORARY CROSSOVER FOR PAVING TRAIN OPERATIONS - RURAL

CASE II

TRAFFIC TRANSITION AREA DOWNSTREAM FROM CROSSOVER

NOTE: See Sheet 1 of 2 For General Notes, Sign No. Details, And Conditions.
Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

PHASE I

1. Maintain two-lane two-way traffic over existing pavement. Construct new roadway within the proposed 4-lane limits, excluding the friction course. Sign as shown. If roadway construction area falls within 15 ft of existing pavement edge, traffic shall be controlled in accordance with index No. 600, 602 or 603.
2. Construct shoulder pavement to provide two-lane two-way traffic over shoulder and existing pavement during Phase II roadway construction. For lane width requirements see Index 600. Signing as shown, with the near 1500 zone modified in accordance with Index 604, to be in place prior to shoulder pavement construction.

PHASE II

1. Remove existing pavement marking, in areas of detour and re-mark as shown, install warning devices and re-sign as shown. Traffic to be controlled in accordance with Index No. 603. For lane width requirements see Index No. 600.
2. Route through traffic to temporary and existing pavement.
3. Construct transitions, excluding friction course.

SYMBOLS

☐ Sign With 18" x 18" 1 Min. 1 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.
☐ Work Zone Sign

LEGEND

닙 Phase I
nina Phase II
ninin Phase III

Note: See Sheet 2 of 2 for General Notes.

STATE OF NEW JERSEY DEPARTMENT OF TRANSPORTATION PEER REVIEW

CONVERTING TWO LANES TO FOUR LANES DIVIDED RURAL
PHASE III

1. Remove temporary marking from the existing pavement and temporary shoulder pavement. Move pedestrian, 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.

GENERAL NOTES

1. The first two warning signs shall form a 180° x 180° (Min.) Orange Flag and Type B Light attached and operating at all times.

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

3. Lane widths for maintenance of two-way traffic should ideally be equal to lane widths of the existing facility, but may be set less than 20 ft. to provide adequate headway between work zone and traffic outside of construction limits. Minimum lane width at the site shall be maintained and traffic controlled in accordance with Index Nos. 603, 604, 605 and 606. Minimum width for the temporary shoulders is 6 ft. maximum.

4. The maximum spacing between warning devices within transition zones (11) to be equal to the speed limit (11) but not greater than 32 ft. for cones or tubular markers or 50 ft. for Type I or Type II roadblockers or vertical panels or drums. The maximum spacing between warning devices used for delineation between the traveled way and construction area to be 25 ft. for cones or tubular markers and 50 ft. for Type I or Type II roadblockers or vertical panels or drums.

5. Barricade shall be in accordance with "Protection Requirements for Delineators" Index No. 600.

6. For speed sign applications see Index No. 600.

LEGEND

- Phase I
- Phase II
- Phase III

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONVERTING TWO LANES TO FOUR LANE DIVIDED RURAL

TRAFFIC CONTROL THROUGH WORK ZONE

DEP # 1420114

PLAN NO. 1420114

DRAFTED BY: J. C. HILL

CHECKED BY: J. C. HILL

APPROVED BY: J. C. HILL

4-29-87

2 of 2
PHASE III

1. Signs and markings as shown on the drawing in accordance with the Phase III diagram.
2. Direct traffic through traffic to Phase III project.
3. Synchronize traffic signal on Phase I project. This must be maintained throughout the construction period. Temporary traffic signals must be used at intersections to control traffic to Phase III project. When the project is complete, the temporary traffic signal must be removed.

GENERAL NOTES

1. All equipment, lane markings, and traffic control devices shall be installed in accordance with DOT standards.
2. The use of temporary traffic signals at each lane closure point shall be as provided in the various DOT guidelines.
3. Adequate temporary traffic control shall be installed to protect the public during construction.

SYMBOLS

- Sign With 90° x 90° (Min.) Orange Flag and Type B Light
- Type I or Type II Barricade or Vertical Panel or Drum (With Steady Burning Light At Night Only), Tubular Markers May Be Used During Daylight Only.
- Type III Barricade (With Flashing Light)
- Work Zone Sign
- Stop Bar

LEGEND

- Phase I
- Phase II
- Phase III

CONVERTING TWO LANES TO FOUR LANES DIVIDED URBAN

STATE OF MICHIGAN DEPARTMENT OF TRANSPORTATION

CONSTRUCTION OF LANE CONVERSION

REFERENCES:

1. Section 401: Roadway Design
2. Section 402: Traffic Control
3. Section 403: Roadway Markings
4. Section 404: Traffic Signals

PROJECT SECTION:

1. Site Plan
2. Traffic Control Plan
3. Lane Conversion Plan

DATE:

[Signature]

[Date]
PHASE I
1. Maintain two-lane two-way traffic over existing facility.
2. Construct temporary structure, approaches, guardrail and catch basins.
3. The signage shown in the Phase I diagram is required whenever equipment workers or their activities are within 15 feet of the existing pavement edge.

PHASE II
1. Re-sign and mark as shown in Phase II plan.
2. Reroute traffic to detour and maintain two-way traffic on detour. Install Type III Barrioles.
3. Construct proposed structure and reconstruct or resurface existing approaches.

SYMBOLS
- Sign With 18 x 18\" Min. 1 Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum / With Steady Burning Light / At Night Only. Tubular Markers May Be Used During Daylight Only.
- Type III Barricade (With Flashing Light)
- Work Zone Sign

LEGEND
- Phase I
- Phase II

GENERAL NOTES (See Sheet 2 of 2)
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, barriers and warning lights necessary for maintenance of traffic shall conform to Index No. 600.
2. The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
3. 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 42 feet shall be maintained and traffic controlled in accordance with indexes Nos. 603, 604, 605, 607 or 608. Minimum width for the detour shoulders is 6 feet.
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 inerlial type in accordance with Index No. 495 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 site 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. 1752.
12. For general TC2 requirements and additional information refer to Index No. 600.
CORNER SIDEWALK CLOSURE
WITH TEMPORARY CROSSWALKS

GENERAL NOTES

SYMBOLS

1. Arrows denote direction of traffic only and do not reflect
   pedestrian movements.
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 TCZ
   requirements refer to index no. 600. Maximum spacing
   between barricades, vertical panels, drums or tubular markers
   shall not be greater than 25 ft.
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
   areas from vehicular traffic.
6. Pedestrian traffic signal display controlling closed crosswalks
   shall be covered or deactivated.
7. Temporary walkways shall be a minimum of 4 ft. wide
   and kept free of any obstructions and hazards such as
   holes, ditches, mud, construction equipment, stored materials
   and etc.
8. Post Warning Signs located near or adjacent to a sidewalk shall
   have a 7 ft. minimum clearance from the bottom of sign to the
   sidewalk.
9. When construction activities involve sidewalks on both sides of
   the streets, efforts should be made to balance the construction
   such 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 detoured 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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

PEDESTRIAN CONTROL FOR
CLOSURE OF SIDEWALKS

Issued by: 12/4/76
Prepared by: 12/4/76
Drawing No.: 660
Issue No.: 1
Scale: 1/8" = 1'-0"

660
DESIGN CRITERIA RELATED TO HIGHWAY SAFETY

RURAL & URBAN FREEWAYS AND HIGHWAYS: DESIGN SPEEDS OF 40 MPH OR LESS
RURAL HIGHWAYS (other than freeways or highways) and RURAL LOCALS-ALL SPEEDS
RURAL COLLECTORS: DESIGN SPEEDS OF 40 MPH OR LESS AND RURAL LOCALS-ALL SPEEDS
RURAL ARTERIALS & COLLECTORS: DESIGN SPEEDS OF 50-55 MPH WITHOUT CURB AND GUTTER
RURAL ARTERIALS & COLLECTORS: DESIGN SPEEDS OF 55-60 MPH WITHOUT CURB AND GUTTER

Curb & Gutter

- Type of Facility
- Rural & Urban Freeways
- Design Speeds of 40 MPH or Less
- Rural Highways
- Rural Collectors
- Rural Arterials & Collectors

Design Speeds of 50-55 MPH Without Curb and Gutter

- Curb & Gutter
- Design Speeds of 55-60 MPH Without Curb and Gutter

- Clear Widths for Bridges
- Backsoles
- Clear Zone
- Guardrail Location
- Signs
- Light Poles
- Utility Poles, Fire hydrants, etc.
- Merging Crossings
- Median Wavings
- Trees & Billboards

- Design to be ascertained using realistic anticipatory operating speeds. Preferred clear cross sections are shown on pages 1-9 and 3-6 of the "Highway Design Guide", 1988. Conventional standards are recommended, the most specified clearances and other factors shall be considered to determine operating safety, speed or capacity. Design speed and operating safety should be considered in the design of toll roads, expressways, and urban freeways.

- Trees & Billboards: Trees and billboards must be spaced at least 200 feet apart along the length of the road, and no tree may be planted within a distance of 150 feet from a road sign. Billboards must be elevated to a height of 10 feet or more above the road surface and be free of obstructions.

- Median Wavings: Median wavings must be designed to accommodate the maximum number of vehicles expected to use the roadway during peak travel periods. Median wavings should be designed to accommodate emergency access to roadside facilities and should be provided where practical.

- Design Standards: Design standards for rural and urban facilities should be provided.

- Curb & Gutter: Curb and gutter should be provided to accommodate natural drainage and to control flooding.

- Trees & Billboards: Trees and billboards must be designed to accommodate the maximum number of vehicles expected to use the roadway during peak travel periods.

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### TABLE I

#### CLEAR ZONE OF CURVED ALIGNMENT (CZ\textsubscript{c}), FEET

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</table>

#### Design Speed (V mph) and Clear Zone (CZ, Feet)

- Located By Intersect of R\textsubscript{c} = C\textsubscript{c} Extension
- Located By Intersect of R\textsubscript{c} < C\textsubscript{c}

**Step 1.** Select C\textsubscript{2} value from chart on Sheet 1a, B.

**Step 2.** In Table I above, locate the “Design Speed” and "Tanged C\textsubscript{2} values that match the speed and C\textsubscript{2} value from Step 1.

**Step 3.** Move down the "D" column to the degree of curve under consideration, then across the table to the column found under Step 2, to find the C\textsubscript{c} value.
### General Notes

**GENERAL SPECIFICATIONS:** Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Chapter 12 - Supplementary Materials, Section 2.6.

**REGIONAL SPECIFICATIONS:** Standard Specifications for Structural Signage, Florida Department of Transportation, September 2013 (FDDOT).

**COLOR:** The color specified herein is standard T8a-100 for all signs, unless otherwise specified. The color shall be CMYK for signs printed on paper.

**MAKING AND MOUNTING:** All signs shall be made and mounted in accordance with Section 2.6 of the Regional Specifications. All signs shall be mounted in such a manner that the information is clearly visible and legible when viewed from the road.

**MATERIALS:** All signs shall be made of durable materials that are resistant to weathering and vandalism. The materials shall be selected to ensure durability and longevity of the sign.

**MANUFACTURER:** All signs shall be manufactured by reputable sign companies that meet the requirements set forth in these specifications.

**INSTALLATION:** All signs shall be installed in accordance with the Regional Specifications and any additional local guidelines or regulations.

---

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</table>

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### Diagram

- **TYPICAL SECTION:**
  - Shows the cross-sectional view of the sign post and its components.
  - Includes dimensions and material specifications.

- **CANTILEVER SIGN:**
  - Diagram showing the cantilever sign design.
  - Includes details on mounting and structural integrity.

---

### Additional Notes

- **NOTE:** All dimensions are in inches unless otherwise specified. All materials and specifications must comply with the Florida Department of Transportation's standards and guidelines.

- **APPROVAL:** This document is approved by the Florida Department of Transportation.
<table>
<thead>
<tr>
<th>Column Size</th>
<th>Column Height</th>
<th>Column Footings</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 MWP</td>
<td>i of 1</td>
<td>1861</td>
</tr>
</tbody>
</table>

**Notes:**

1. The above table details the various column sizes, heights, and footings for a specific project. The column sizes range from 60 to 1861, with the column height specified as 'i of 1'. The column footings accommodate the loadings and stability requirements of the structure.

2. Each column size is designated with a specific footing type, ensuring proper support and distribution of loads.

3. The table includes necessary specifications for engineering and construction purposes, ensuring compliance with structural standards and regulations.

4. The project details include site-specific requirements, such as soil conditions and jurisdictional codes, influencing the design and selection of column sizes and footings.

5. The table is reviewed and approved by [Name], with the date [Date] and revision [Revision].

**Figure:**

- The figure illustrates the column base details, including sleeve and base plate designs. The base plates are designed to enhance stability and load-bearing capabilities, ensuring the structural integrity of the column system.

- The sleeve and base plate details are crucial for the proper installation and attachment of columns to the foundation, ensuring a secure connection.

**Diagram:**

- The diagram shows the column base details, with specific annotations for each component. The figure includes symbols and notations indicating the materials and dimensions used in the construction process.

- The figure utilizes standard architectural symbols to represent column sizes, footings, and the connections between various structural elements.

---

**SINGLE COLUMN GROUND SIGNS**

- This section details the ground signs associated with the single column, providing information on boundary markers, access points, and other relevant data.

- The ground signs are designed to guide construction workers and ensure compliance with local regulations and safety standards.

---

**References:**

- The table and diagram are based on [Reference], a comprehensive guide on structural engineering and construction practices. The reference material provides detailed specifications and best practices for the design and installation of column systems.
<table>
<thead>
<tr>
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<th>HEIGHT (FT.)</th>
<th>slaip base details</th>
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<td>45</td>
<td>1</td>
<td>12.5 - 14 x 12.5 - 12 x 12.5 - 10</td>
</tr>
<tr>
<td>44</td>
<td>0</td>
<td>12.5 - 14 x 12.5 - 12 x 12.5 - 10</td>
</tr>
</tbody>
</table>

**Base plate details**

- Unless noted otherwise, all dimensions are in inches.

- Column sizes and column footings vary depending on the specific requirements.

- Dimensions provided are for guidance only and should be verified with the latest engineering standards and codes.
ELEVATION

Mounting of Exit Numbering Panels To Highway Signs

NOTE: Exit numbering panel shall be located to the right side for right exits and to the left for left exits.

SECTION A-A

GENERAL NOTES

DESIGN SPECIFICATION: Standard specifications for structural supports for highway signs, barriers and traffic signals.

SHEETS AND PLATES: High-strength steel shall meet the requirements of ASTM Specifications A588, A588 Gr. B or A242, Grades B and A; or equivalent.

MATERIALS: High-strength steel shall meet the requirements of ASTM Specifications A588, A588 Gr. B or A242, Grades B and A; or equivalent.

SIGN FACE: All sign faces shall be rounded. See sign symbol standards for dimension "L" and sign face details.

FOR MOUNTING DETAILS REFER TO DRAWING NO. 4701.4000 6327.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DETAIL FOR MOUNTING EXIT NUMBERING PANELS TO HIGHWAY SIGNS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>Height</td>
</tr>
</tbody>
</table>

*State of Florida Department of Transportation

*Addendum

Amy 6/12/07
I. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSS-WALK AT A SIGNALIZED INTERSECTION

Note: Special speed restrictions are not normally applicable to these two cases.

II. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSS-WALK AT A STOP CONTROLLED INTERSECTION

Example:
- No Right Turn On Red Signs may be erected as deemed necessary by the Local Traffic Engineer.

Pavement Markings:
- Single Line Approach
- Two Line Approach

SCHOOL SIGNS & MARKINGS

State of Florida Department of Transportation
Traffic Design

SCHOOL
SCHOOL
SCHOOL

Stop

STOP
9. TRAFFIC CONTROL DEVICES AT SCHOOL ENTRANCES WHERE THERE ARE LITTLE OR NO WALKING STUDENTS

These signs are intended for use only at those few locations where the school entrance is not widen to the material, and should be approved in advance by the responsible traffic engineering authority.

10. TRAFFIC CONTROL DEVICES FOR A TYPICAL SCHOOL ZONE FRONTING THE SCHOOL PROPERTY

Note: The school bus stop shadel sign is to be used in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 500 ft in advance. It shall have a base circle of 20 ft x 30 ft. It is not intended that these signs be used where a school bus stops to pick up or discharge passengers, where the area is intended for use only where terrain and roadway features make the signs visible for a distance and where there is no opportunity to remove the stop to another location with adequate visibility.
SCHOOL ZONE
00 MPH
WHEN FLASHING

OVERHEAD STANDARD
* Flashing Beacon May Be Placed Within or Below Panel

Notes:
1. Standard size signs should be used whenever possible. Minimum size may be used only on one lane, low speed streets or when 25 mph is the speed limit. Special sizes should be used on approaches facilities where special emphasis is needed.
2. The above standard size speed limit signs shall be approved by the Director, Traffic Operations Division in cooperation with local school authorities. In no case shall it be less than the 15 mph min. as set by law.
3. See index #355 for sign details.

GROUND MOUNT STANDARD

Notes:
Existing ground mount school speed limit signs utilizing a single 6" min. size bearing on low 60 mph side streets unless the signs bear are considered meeting the standards. However, replacement or upgrading of these existing speed limit signs shall conform to the above standard. Numerical speed limit displayed shall be established by appropriate regulatory authorities.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC DESIGN

SCHOOL SIGNS & MARKINGS
NORMAL TAPERED EXIT
(TWO THRU LAKES)

For RPM Location Refer To Index #325.

NOTE
To advance of zone drops of exit ramp a special marking pattern may be used to distinguish the lane drop situation from a normal off-ramp or auxiliary lane. A typical special marking for lane drop consists of 8 inch wide by 3 feet long white stripes separated by 12 feet gaps. If used, this section marking should begin 1 mile in advance of the geometric center point. When not utilized, this marking pattern may be extended 300 feet upstream from the geometric center point. (FLDOT, TSCD, Section 35-11-1)

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

DETAIL A

For RPM Location Refer To Index #325.

NOTE
To advance of zone drops of exit ramp a special marking pattern may be used to distinguish the lane drop situation from a normal off-ramp or auxiliary lane. A typical special marking for lane drop consists of 8 inch wide by 3 feet long white stripes separated by 12 feet gaps. If used, this section marking should begin 1 mile in advance of the geometric center point. When not utilized, this marking pattern may be extended 300 feet upstream from the geometric center point. (FLDOT, TSCD, Section 35-11-1)

DETAIL B

For RPM Location Refer To Index #325.

NOTE
To advance of zone drops of exit ramp a special marking pattern may be used to distinguish the lane drop situation from a normal off-ramp or auxiliary lane. A typical special marking for lane drop consists of 8 inch wide by 3 feet long white stripes separated by 12 feet gaps. If used, this section marking should begin 1 mile in advance of the geometric center point. When not utilized, this marking pattern may be extended 300 feet upstream from the geometric center point. (FLDOT, TSCD, Section 35-11-1)
NORMAL TAPERED ENTRANCE

For Stripping See Detail "A" (Sheet 1 of 1)

Shoulder Line
6" White Edge Line

Shoulder Line
2" Yellow

Shoulder Line
30' Wide Median

Shoulder Line
6" White Edge Line

Shoulder Line
2" Yellow

Shoulder Line
20' Wide Median

Shoulder Line
6" White Edge Line

Colored diamond reflective markers (Every 40 ft.) Shall End At Exit Of The Terrazzo Lane.

NORMA L TAPERED ENTRANCE

WITH ADDED LANE

For Stripping See Detail "A" (Sheet 1 of 1)

Shoulder Line
6" Yellow

Shoulder Line
2" White

Shoulder Line
30' Wide Median

Shoulder Line
6" White Edge Line

Shoulder Line
2" Yellow

Shoulder Line
20' Wide Median

Shoulder Line
6" White Edge Line

Colored red reflective markers (Every 40 ft.) Shall End At Exit Of The Terrazzo Lane.

INTERCHANGE MARKINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

IN

01 00 00

IN

01 00 00

SIGNED BY: 

17345

2 of 4
Note:
Post delineators spaced at 40' bays at the P.C. and end of the P.T. of the entrance and terminal of ramps. The spacing on the ramp section between the entrance and terminal shall be 30'. All delineators are to be installed 4' of from shoulder area. Post delineators should not be discontinued in sections with guardrail.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

INTERCHANGE MARKINGS
**Left Right Stop Only Lane Turn**

Dimensions are - on 1 ft.

**Types of Permanent Longitudinal Lines**

- Yellow Edge Line
- Broken White Line
- Solid White Line
- Double Solid Yellow or White Line

- White or Yellow

**Types of Permanent Transverse Lines**

- Traffic Bar
- Yellow Line
- Solid White Line
- Orange or Yellow

**Plastic Color Paint**

White lines separate lanes in the same direction. Yellow lines separate lanes in the opposite direction. Yellow dotted lines may be used in quadrangles.

**Placement of Edge Lines**

State of Florida Department of Transportation Motorist Design

**Special Marking Areas**

- Pavement Markings for Intersections with Major and Minor Roads

- Edges of Pavement
- Edge Line
- Curb
- Shoulder

**NOTE:**

When markings are applied to median areas they shall be yellow in color.
PAINTED LEFT TURN STORAGE LANE(S) DETAILS
FOR STOP CONTROLLED OR SIGNALIZED INTERSECTIONS

NOTE:
Yellow left turn edge marking may be used adjacent to raised curbs or grass medians if lane use is not readily apparent to drivers approaching a left turn storage lane.

Turn lanes longer than 200 ft. may be created for each 50 ft. additional length.

Arrows should be erected goal between first and last arrow.

Pavement markings only are not recommended for created (shaded) turn lanes. Single or dual, where the driver must cross the turn lane to enter a turn lane.

TYPICAL CROSSWALK MARKINGS FOR CURB CUT RAMPS
REFER TO INDEX NO. 0346 SHEET 9 OF 9.

SPECIAL MARKING AREAS
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

TWO WAY LEFT TURN LANE
(WITH SINGLE LANE LEFT TURN CHANNELIZATION)
RAILROAD CROSSING AT 2-LANE ROADWAY

RAILROAD CROSSING AT 4-LANE ROADWAY

NOTES:

1. When computing permanent messages, quantities do not include transverse fill.

2. When stop devices are not present or are to be installed, the stop sign shall be located at the future location of the RR gate or gates as determined to be necessary for safety.

3. Placement of signs WO-1 is in a residential or business district, where low speeds are prevalent, the WO-1 sign may be placed a minimum distance of 200 feet from the crossing where street intersections occur between the RR pavement markings and the tracks an additional WO-1 sign & additional pavement message shall be used.

4. Recommended location for F-1, PG-360 or PG-300 sign, XXX, urinal & XXX1, rust in advanced of the crossing.

5. A portion of the pavement marking symbol shall be directly opposite the WO-1 sign.

SPECIAL MARKING AREAS

Pavement Markings For Termination
Of Two Way Left Turn At R/R Crossings.

Typical Pavement Markings For R/R Crossings

Width Way Vary According To Lane Width

Pavement Markings:

- White

89 s.f.

* Does not include 24" bars.

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

Pavement Markings For Termination
Of Two Way Left Turn At R/R Crossings.

Typical Pavement Markings For R/R Crossings

Width Way Vary According To Lane Width

Pavement Markings:

- White

89 s.f.

* Does not include 24" bars.

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

Pavement Markings For Termination
Of Two Way Left Turn At R/R Crossings.

Typical Pavement Markings For R/R Crossings

Width Way Vary According To Lane Width

Pavement Markings:

- White

89 s.f.

* Does not include 24" bars.

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

Pavement Markings For Termination
Of Two Way Left Turn At R/R Crossings.

Typical Pavement Markings For R/R Crossings

Width Way Vary According To Lane Width

Pavement Markings:

- White

89 s.f.

* Does not include 24" bars.

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS

Pavement Markings For Termination
Of Two Way Left Turn At R/R Crossings.

Typical Pavement Markings For R/R Crossings

Width Way Vary According To Lane Width

Pavement Markings:

- White

89 s.f.

* Does not include 24" bars.

STATE OF COLORADO DEPARTMENT OF TRANSPORTATION

SPECIAL MARKING AREAS
Recommended spacing of diamond symbols immediately after intersections and major driveways and at a minimum spacing of 600 feet for urban sections and one-quarter mile for rural sections.

NOTE
When used on a bike lane (adjacent to vehicle lane) markings shall be placed adjacent to markings for vehicles & NO-U-Turn sign shall be sized and placed for vehicles.

For wider bike lane, increase angle 3°
GENERAL NOTES: (Signalized & Non-Signalized)
1. For intersections to one way street, the downstream restriction may be reduced to 20 feet.
2. Parking shall not be allowed within 20 feet of a crosswalk.
3. All parking lane markings shall be 8'/white.
4. Parking lane markings shall be broken at driveways.
5. Refer to Chapter 36, Fig. 36.36 Note, for lane
   parking length parking space.
6. Where curb and gutter is used, the gutter lane width
   may be reduced to 10'-6". The reduced lane width is a
   reduction of the travel lane, but in any event the lane
   width should be in addition to that of the
gutter lane.

**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 (FT.) FOR NON-SIGNALIZED INTERSECTION**

**MINIMUM PARKING RESTRICTION FOR NON-SIGNALIZED INTERSECTIONS**

**NOTES:**
1. Distances measured along travel lane from driver location
   of entering vehicles to end of parking restriction.
2. Distances applicable to intersecting street, major driveways and
   other driveways to the extent practicable.
3. For non signalized intersections, the values above shall be applied
   with the values for signalized intersections and the maximum restrictions
   shall be imposed. These restrictions apply to both handicapped and non-
   handicapped parking.

**MINIMUM PARKING RESTRICTION FOR SIGNALIZED INTERSECTION**

**NOTES:**
1. Parking restrictions measured from curb radius point.
2. Restrictions for handicapped parking are the same as
   those applied to non-handicapped intersections.

**PAVEMENT MARKING FOR CURB CUT**
- Ramps in rest areas

**HANDICAPPED PAVEMENT SYMBOL**

**TYPICAL MARKINGS FOR CROSS-WALKS**
- Refer to Index No. R346 2 of 8

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION DESIGN**

**SPECIAL MARKING AREAS (PARKING)**

**FORM**

**Curb Ramp 2 in a**

**Dimensions:**

**Notes:**
- An Access Aisle is required for each handicapped space when angle
  parking is used.
- For use accessible spaces sign no. 1F5-25 and the 8'x8' supplemental
  panel replaces sign no. 1F5-20.
- Criteria for pavement markings only, not curb cut ramp locations. For ramp
  locations refer to Access.
- Blue pavement markings shall be limited to catch sheet 10060 of Federal
  Standards 1060.
GENERAL NOTES

1. Only those services meeting criteria established by the Department and approved by the State Traffic Operations Engineers for each interchange shall be shown. Symbol signs for motorist services shall always appear in the following order reading from left to right and top to bottom: Gas, Food, Lodging, Phone, Hospital, Camping.

2. The above symbol shall not be shown whenever any Gas, Food, Lodging or Highway symbol appears.

3. All motorist services signs to have White Reflective Legend and Border with Blue Reflective Background.

4. Full size drawings of symbol signs are available from Traffic Plans and Standards, Dept. of Transportation, Tallahassee, Fl.

5. For mounting details see Exhibit 9355 for Type "A" or Exhibit 9356 for Type "C" Fragments.

NOTE: When approved for attachment to the guide sign posts, as in 3 services may be used for an exit, the symbol signs shall be separated from the guide sign panel or existing wind loads. Symbol signs are not to be connected to existing sign posts.

The mounting height of the exterior guide sign shall be increased, where necessary, to provide 6 feet clear of the top of the guide sign, the edge and the bottom of the guide sign, prior to mounting the supplementary panel.

SIGNING FOR MOTORIST SERVICES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

[Diagram with various road signs and symbols, including "EXIT", "DETAIL "A"", "DETAIL "D"", "DETAIL "C""]

[Diagram notes and specifications for motorist services signs, including details on placement, height, and distance from existing signs.]
Tourist Information Center
NEXT RIGHT

Note: Sign FTP-28 shall be used as a supplemental guide sign at interchanges which have a Tourist Information Center approved for such signage (locate half way between normal guide signs)

Note: Roadway not drawn to scale
Distances shown are approximate for adequate driver communication but may be altered slightly if field conditions require.

11) Signs and sign structures shall be erected in accordance with the details shown on Index D-29.
12) Sign FTP-19 shall be located on the Welcome Center grounds to proximity to the building and as far from the main line roadways as possible (i.e. sign back to back).
13) Sign FTP-18, 19 shall be located on limited access highways only.
14) Detail of Florida symbol is available on request from Traffic Sign & Standards Office of O.B.T.
15) All legend to be Series C.
16) (Sign No. FTP - 18 To Be Paid For By The Dept. Of Tourism)
17) See Sheet 1735 for sign details.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION HIGHWAY DESIGN
WELCOME CENTER SIGNING FOR LIMITED ACCESS HIGHWAYS

Sheet No: 1735
Date: 12/17/91
Approving Authority: P.O. Box 247
Tallahassee, FL 32302

Page 9 of 10
STATE OF FLORIDA
WELCOME CENTER
1 MILE

SIGN NO. FTP-22A

NOTE:
One sign FTP-22A or 22B should be used depending on speed, roadside development & geometric conditions.

SIGN NO. FTP-22B

STATE OF FLORIDA
OFFICIAL
WELCOME CENTER

SIGN NO. FTP-23

\\\( \frac{1}{2} \) MILE

SIGN NO. FTP-24

NOTE:
Scaling not drawn to scale

80 MPH Maximum For Rural Conditions
50 MPH Maximum For Congested Areas

Notes:
1) Signs and sign structure shall be erected in accordance with the details shown on Index H-20.
2) Sign FTP-19 shall be located on the Welcome Center ground in proximity to the building and as far from the Main Line Pedestrian on possible.
3) Signs shall be located in accordance with the details shown on Index H-20.
4) Detail of Florida symbol is provided on request from Traffic Plans & Standards Office of D.O.T.
5) Signage in this design is based on Title 1.
6) Sign No. FTP-09 to be painted by the Dept. of Tourism.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
WELCOME CENTER SIGNING
FOR PRIMARY HIGHWAYS

Project No.
Project Name

CHALKLAND 19

Date

Report No.

11/24/03

Page 1 of 2

Approval

7/13/03
1. Reflective Pavement Markers shall be spaced at 40 feet on all solid line lines and solid center lines. This spacing may be reduced to 20 feet if specifically called for in the plans.
2. The spacing on solid lines and solid/skip combination lines shall be 40 feet.
3. All R.P.M.s shall be offset 7.5 from solid lines.
4. These spacings may be reduced if required for sharp curves.
5. All R.P.M.s shall be class "B".
NOTE
Raised pavement markers shall be set one (1) inch outside of line.

RPM PLACEMENT FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)

NOTE
Raised pavement markers (Bi-Directional Red and Green) should be used in all cases of this type.

Bi-Directional Amber

PLACEMENT OF RPMs ON SHOULDER MARKINGS
Shoulder Markings for Left Side Of Roadway Shall Be Yellow.
For Placement Of RPMs On Shoulders See Index EPMs.

TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS
TYPICAL INSTALLATIONS FOR SIGN PANEL(S)
MOUNTED ON SPAN WIRE

DETAIL OF SIGN CLAMP

Columnized Wire Rope Clamp
(size as required for wire)

See Index R797 for size for purl attachment.

TYPICAL SPAN WIRE INSTALLATION

The overlapping connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing between bolts of 2".

DETAIL OF OPPOSING SIGNS SPAN WIRE MOUNTED

ADJUSTABLE HANGER FOR SIGN MOUNTING

SPAN WIRE MOUNTED
SIGN DETAILS
SINGLE POINT ATTACHMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

2. Span wire installations that support only signs should be provided with a minimum panel weight of 7 PSF.

3. Type B & C attachments with one hanger shall have wind beams for signs larger than 15 feet. The beams shall extend to within 6" of the sign edge.

4. Type B & C attachments for signs 4 feet wide and wider shall have 2 hangers. Signs 7 feet wide and wider shall have wind beams that extend to within 6" of the sign edge.

5. Type D attachments shall be for signs 5½ feet wide or less.

6. Sign panels shall meet the requirements of hand 9955.

7. Refer to section 3.24 of the Standard Specifications For Road and Bridge Construction.

8. All bolts, nuts, and washers shall be passivated stainless steel. AISI 300 series, commercial grade, type 316.

\[ \text{Adjustable Hanger} \]

- Stainless steel bolts with nuts and lock washers.

- Stainless steel round head bolts with nuts and lock washers. Bolts must be spaced an 6" centers max.
TYPICAL INSTALLATIONS FOR SIGN PANEL(S) MOUNTED ON SPAN WIRE

DETAIL OF SIGN CLAMP

See Index 0720 2 for plate attachment.

DETAIL OF OPPOSING SIGNS SPAN WIRE MOUNTED

- Stainless steel bolts with nuts and lock washers.
- Stainless steel round head bolts with nuts and lock washers.
- Bolt shall be spaced on 12" centers max.

Notes:
1. Bottom edge of signs shall be approximately at the same elevation.
2. Type D & C attachments with one hanger shall have wind beam for signs wider than 3' 6" feet. The beams shall extend to within 6" of the sign edge.
3. Type D & C attachments for signs 4 feet and wider shall have 2 hangers. Signs 7 feet and wider shall have wind beam that extend to within 6" of the sign edge.
4. Type D attachments shall be for signs 3' 6" feet wide or less.
5. Sign panels shall meet the requirements of Index 9535.
6. Refer to section 624 of the Standard Specifications For Road and Bridge Construction.
7. All bolts, nuts, and washers shall be phosphorized stainless steel. AISI 300 series, commercial grade type 306.

ADJUSTABLE HANGER FOR SIGN MOUNTING

SPAN WIRE MOUNTED SIGN DETAILS
TWO POINT ATTACHMENT
NOTE:
1. See Standard Highway Signs dated 09-7 for sign R2-5 details.
2. Sign location No. 3 may require some field adjustment.
3. Signs R2-5, R2-6, & R2-7 shall have a 1/16" edge and 1/16" border with a 1/4" radius.
4. The Cross Road is the last element around the restricted bridge.
5. Sign location No. 2 should be established from the Cross Road for following approach distances:
   - Interstate - 1000 ft. non-trucks, 600 ft. trucks
   - Intrastate - 500 ft. non-trucks, 400 ft. trucks
6. For interstate applications, contact Traffic Plans & Standards - Transportation for sign sizes.
7. See index O355 for sign details.
NOTES:
1. Bridges should be marked as narrow bridges under the following conditions:
   a. For approach roadway with paved shoulders when the bridge width including shoulders is less than the
      width of the approach roadway including paved shoulders.
   b. For approach roadway without paved shoulders when the bridge shoulder width is less than 2'.
2. No posting zone should be extended past the outer edge of pavement.
3. The post mounted delineators shall be installed on both sides of the roadway.
   c. In addition to the following:
4. Delineators on both sides of roadway shall face traffic approaching bridge.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

RURAL NARROW BRIDGE TREATMENT

R.R. 26

NOTE: Delineators To Be Placed Not Less Than 2½ ft Behind The Outer Edge Of Pavement.
LOWER SYSTEM SPECIFICATIONS

The lowering system shall consist of the following:

A. Head lamp cover
B. Luminaria ring
C. Cable
D. Weight
E. Portable power unit/liner project
F. Lower lamp ring
G. Mounting plate with the base of the lamp in the head frame platform.
H. The platform with its associated Brakes, shall be covered with rubber material.
I. The fender shall be made of a steel flange, driven in a 1/2 inch sheet metal plate shown, mounted on the available cable diameter for 1/4 inch bearing surface. The frame shall be in accordance with ASTM D15 and stipulated to resist vibration for corrosion resistance. Bearings and cabledismiss shall have permanent lubrication. Three stainless steel 1/8 x 6 inch aircraft cables of 1/4 inch or greater diameter shall be provided.

The power power cable shall be attached to the luminaria ring with a welder connector capable of withstanding the weight of the pole, a weight of 40. Where the wire can not be reached by welder or over the wire drum, the minimum working stress in the wire should be 1/4 inch of an inch. All components shall be in accordance with ASTM D15 specifications, with stainless steel 1/4 x 6 inch aircraft cables of 1/4 inch or greater diameter shall be provided.

The head frame shall also include three (3) welding devices to support the luminaria ring assembly when the lowering device is in operation. The sticks shall be actuated by alternative lifting and lowering of the head frame. Each stick shall be comprised of two (2) sticks, connected to the head frame, to support the cable from lifting out of the carrier truck.

The head frame shall also include three (3) welding devices to support the luminaria ring assembly when the lowering device is in operation. The sticks shall be actuated by alternative lifting and lowering of the head frame. Each stick shall be comprised of two (2) sticks, connected to the head frame, to support the cable from lifting out of the carrier truck.

The complete assembly shall be in accordance with ASTM D15 specifications.
NOTE: It shall be the Contractor's responsibility to provide a complete Service Assembly as per the Plans and Service Specifications. The Service obstruction shall meet the measurements of the Railroad Electric Code and applicable Local Codes. Shop Drawings are not required for Service Equipment, unless noted in the Plans.

Concrete Pole Pressed Type No. 2, 36" Long

M & E Insulated copper ground wire in rigid galvanized steel conduit.

Rigid or Intermediate Metal Conduit on All Above Ground Installations

Service Conductors shall be Stranded Copper Single Conductor Cable Type R.H.W. A Minimum Length of 40' shall be placed from the Weatherhead for each conductor.

Conductor Weatherhead Height As Required by Power Company.

P.E. Controller When Required

Height Specified by Power Company

Grounding Rod

U.L. Approved Ground Rod...

G.F. No. 10 Long Copper Class A All Service Points

DETAIL "A"
AERIAL FEED

1. Photo electric controls are required.
2. All neutral wires to feed while insulated, do not use white or green insulated wires for ungrounded conductors.
3. A pull box is required at each service point.

SERVICE SPECIFICATIONS

1. The enclosure shall be AREA 3B, pole mounted, non-flammable.
2. The enclosure door shall be tabbeted by polystyrene and four key locks provided by the manufacturer. The door shall have a minimum of three hinges and be self-latching, the screws to be used to attach door.
3. 600 V circuit, rated 100 amp-type breakers shall be used.
4. Busbar to be copper coated and have a minimum radius of 0.500 inches. Each main breaker shall be 150 amp busbar to match breaker enclosure.
5. Locate contactor, transformer, and H.G.A. switch inside enclosure. The enclosure to be sized to accommodate as many breakers as called for and all other service equipment.
6. The enclosure to be rigidly attached to the pole face.
7. A 600 V lightning protector shall be wired inside the enclosure.
8. A main breaker is required in all service panels with 2 or more feeder breakers.
9. All service equipment shall be U.L. approved.

DETAIL "B"
UNDERGROUND FEED

Concrete Pole, Pressed Type No. 2, 36" Long

P.E. Controller When Required

Height Specified by Power Company

Grounding Rod

U.L. Approved Ground Rod...

G.F. No. 10 Long Copper Class A All Service Points

SERVICE POINT DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION PROJECT WIZARD

ARCHITECT

ENGINEER

Drawing No.

Scale

Drawn

Checked

Printed

Date

1 of 1

7504
SIGN LIGHTING INSTALLATION

The roadway lighting controller shall provide a means for sign service entry into a pole base or a pull box installed in the lighting circuit, and loop F of lighting circuit conductors for connection by sign contractor.

The sign contractor shall furnish and install luminaries, remote transformers, 20 Amp Breaker, Conduct, Canopy, and all other electrical equipment necessary for connection to roadway lighting circuit as provided by the roadway lighting contractor.

When roadway lighting circuits are not available the designer shall provide the poles in the panel to furnish and install Conduct, Canopy, Pull Box, and Service Panel Equipment.

Compression type connectors properly taped and waterproof sheath shall be used.

See Roadway Lighting Plans for sign service locations.

PLACEMENT OF SIGN LIGHTS

1. Luminaries shall be mounted so that the lamp center is 4" - 0" in front of the sign face.
2. Luminaries shall be mounted so that the back of the fixture is placed 1" - 0" below the bottom edge of the sign face.
3. Luminaries from manufacturers who recommend their fixtures be bolted must be mounted on a bracket which provides this recommended fit.
4. Photometric data for mercury vapor luminaires proposed for sign lighting shall be submitted for approval to the Lighting Engineer, Florida Department of Transportation.

OVERHEAD POWER SUPPLY

Exterior Lighting For Sign
(Mercury Vapor)
**FIGURE A**
For use in areas not exposed to vehicular traffic and under driveways.

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

---

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

1. Trench not to be open more than 240 ft. in a single construction area to subject to vehicle of pedestrian traffic.
2. Asphalt to be placed and removed to leave soil lines on both sides of the 30" pavement cut.
3. See note 3, Figure C.

---

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

1. Rigid conduit must be used when jacking under existing pavement of 3 ft. minimum depth.
2. Asphalt to be removed at the edges of the trench.
3. The removal and replacement of the additional pavement and cut shall not exceed 1/3 of the cut.
4. Asphalt shall not be disturbed except at driveways and at driveways, backfill is a length of trench within the driveway entirely with Class I concrete.

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

**FIGURE E**
For use in installing conduit under sidewalk.

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN**

**CONDUIT INSTALLATION DETAILS**
FIGURE A

PULL BOX ENTRY OF CONDUIT UNDER SIDEWALKS

Note:
Ends of conduit shall be seated in accordance with section 6.03 of the Standard Specifications for Road and Bridge Construction.

FIGURE B

UNDER SIDEWALK  UNDER ROADWAY  UNDER NON-TRAFFIC BEARING SURFACE

Note:
One run of conduit (behind 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 A/A required, but not less than 6 ft.

State of Florida Department of Transportation
Traffic Design

Conduit Installations Details

Approved by:  
Date:
Notes:

1. With the approval of the resident engineer, the service head holes for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.

2. Lashing wire should normally be used for distances of 30' feet or greater.

3. The strung connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing between bolts of 2".

Signal Cable & Span Wire Installation Details
Single Point Attachment

Signal Cable
Automatic Compression Type Clamp (Feed Through Deadead)

Span Wire Clamp
Catenary Wire

Adjustable Hanger
Catenary Wire

8" to 12" Grip Collar or Grip Loop

Vertical Clearance

Methode Of Framing
Corner Single Plane
Angle 45° to 60°

Automatic Compression Type Clamp (Feed Through Deadead)
SIGNAL CABLE & SPAN WIRE
INSTALLATION DETAILS
TWO POINT ATTACHMENT

Method of Framing Corner Strain Poles
Angles 0° to 22°

Notes:
1. The service head hole for joint use poles may be drilled by the utility company at an angle of 30° but not less than 45° to the face of the pole.
2. Looping wire should normally be used for distances of 10 feet or greater.
3. The overlap connection of adjustable hangers shall not be less than 2 inches with a minimum spacing between bolts of 2 inches.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

Prepared by:

Chad A. East

11727

2 of 3
FIGURE A
CABLE DROP AND TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "B"

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

Notes:
1. The messenger wire of the interconnect cables shall be grounded to the upper ground wire of the pole or to the external wire extending down the pole.
2. When utilizing the external ground wire to the pole, a piece of corrugated conduit shall extend up the pole externally to a point right of 6 feet 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 one 1/8 inch apart except at the point of cable drop or installation where one 1/8 inch shall be placed at the point where the cables separate from the messenger wire and another placed 1/16 inches (not 1 inch) from that tie. When using figure "B" interconnect cable only the locking tie at their interconnection shall be used.
4. If accessible, the external ground wire of the support pole may be used to ground the messenger wire.
5. Locking wire should not be used for distances of 12 feet or greater.

FIGURE C
CABLE DROP DETAIL
AERIAL INTERCONNECT MESSNER WIRE WITH CLAMPS
FIGURE A
AERIAL FEED
(No Meter Used)

FIGURE B
AERIAL FEED
(Meter Used)

FIGURE C
UNDERGROUND FEED
(No Meter Used)

FIGURE D
TYPE "B" UNDERGROUND FEED
(Meter Used)

FIGURE E
UNDERGROUND CABINET MOUNTED
(Meter Used)

NOTES:
1. The lightning arrester can be located on the side or bottom of the
   main disconnect enclosure at the Contractor’s option.
2. Liquidtight flexible conduit is approved for use from the electrical
disconnect to the cabinet when both are installed on the same pole.
Notes:
1. As an option, the contractor will be allowed to install pedestrian signals on concrete piers and the use of field labor will be billed at a rate of $7.50 per hour. No labor will be billed at a rate of $7.50 per hour.

2. Unless driven or pushed in metal plates or bedded shall be thoroughly driven, cleaned of all burrs and covered with two (2) coats of zinc rich paint. As specified in the standard specifications for road and bridge constructions. Transformers or buildings shall be insulated in pipes.

3. Grounding to be in accordance with section 620 of the standard specifications.
CONCRETE PAVEMENT EXPANSION JOINTS

Notes:
1. The "number of turns" indicated at the specified point on the plan refers to the number of pieces of loop wires which are placed in the saw-cut forming the complete loop.
2. Loop types or details not shown to scale.
3. Loop Types I are centered in a single lane except Type E which is centered on two lanes.
4. The number of individual loops in 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 Type 1(C, D) shall be extended past the stop line a minimum of 20 feet. The length of these loops may be extended to a maximum of 80 feet. 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 cable.

LOOP CORNER AND LEAD-IN DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY Maintenance

VEHICLE LOOP INSTALLATION DETAILS

[Header information]
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.

CASE I
POLE PARALLEL TO CURBLINE
ALTERNATE TO FIGURE F

CASE II
POLE DiAGONAL TO CURBLINE

NOTE:
1. See notes if 705 for sign details.
Notes:

1. The number, size and orientation of conductors should be determined by the owner and the designer. Two spare SPVC conductors shall be provided in all boxes. The spares shall exit in the direction of the outer edge of the cabinet box. A pull box and capped with a weather proof fitting. If directions prevent the spare from exiting to the rear, or the rear of the cabinet box, the spare conductor shall exit the box through a conduit connection. All spare conductors will have to be identified by the project engineer. All spare conduit entries shall be capped with a weather proof fitting.

2. Grounding to be in accordance with section 602 of the National Electrical Code.
FIGURE 1

Gate Length Requirements
See Note 6 Sheet 3

General Notes

1. No guardrail is provided for signals, however, some form of impact attenuative device may be specified for certain locations.
2. Guardrails are not required where one or both rails are under 6" above finished shoulder grade.
3. Type of traffic control devices may be one, two, or multiple tracks.
4. Gate signals with counter may be used.
5. Flashing signals are required for all signals.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES

CR-14 sheets 24

9-3-98 B. Small
RAILROAD CROSSING AT TWO (2) LANE ROADWAY

RAILROAD CROSSING AT MUTI-LANE ROADWAY

RELATIVE LOCATION OF CROSSING TRAFFIC CONTROL DEVICES

NOTES:

1. When complying pavement message, quantities do not include transverse lines.

2. Pedestrian sign W1-1 is in a residential or business district, where the speed of travel is 30 mph, the W1-1 may be placed a minimum distance of 20 feet from the crossing. Where street intersection occur between the R and pavement message and the tracks on a called message, and additional pavement message should be used.


4. A portion of the pavement markings symbol should be directly opposite the W1-1. The W1-1 should be of sufficient length such that the distance from the top of the symbol to the inside edge of pavement is a maximum of 4'.

5. Gate Length Requirements:

   For two-way undivided sections:
   The gate should extend to within 4' of the center line. On surfacess, approach the maximum gate length may not reach to within 4' of the center line.
   For three lanes, the distance from the gate to the center line shall be a maximum of 4'.
   For one way or divided sections:
   The gate shall be of sufficient length such that the distance from the gate to the inside edge of pavement is a maximum of 4'.

<table>
<thead>
<tr>
<th>SPEED LIMIT IN MPH</th>
<th>GATE LENGTH IN FT</th>
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<tbody>
<tr>
<td>30</td>
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</tr>
<tr>
<td>40</td>
<td>450</td>
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<td>90</td>
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</tr>
<tr>
<td>100</td>
<td>100</td>
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</tbody>
</table>

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PREPARED BY: R. B. BENDER

RAILROAD CROSSING GRADE CROSSING
TRAFFIC CONTROL DEVICES

F.R.A. Approved: 92 3 of 4 17882
MEDIAN SIGNAL GATES FOR
MULTI LANE UNDIVIDED URBAN SECTIONS

(FOUR OR MORE DRIVING LANES IN ONE DIRECTION, 45 MPH OR LESS)
TYPICAL BRIDGE MOUNTS

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

* Final conditions may require adjustment of this drawing distance.

SEQUENCE CHART

<table>
<thead>
<tr>
<th>SIGNALS &amp; SIGNS</th>
<th>SIGNALS &amp; SIGNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>Type I</td>
</tr>
<tr>
<td>Type II</td>
<td>Type II</td>
</tr>
</tbody>
</table>

LEGEND

TRAFFIC SIGNALS
- Flashing Beacons
- Flashing Red
- Stop Here on Red
- Entrance Gates
- Exit Gates
- Thermoplastic Stop Bar

NOTES:
1. A .66 second signal should be provided to indicate each timing interval to serve as a reminder.
2. "Stop Here on Red" is utilized in Type I operation and "FLASHING SIGNALS" are utilized in Type II operation.
3. The time between beginning of flashing yellow on "Drawbridge Ahead" sign and the clearance of the traffic signal to red, or beginning of flashing red should not be less than the travel time of a passenger car, from the sign location to the stop line, traveling at the 85 percentile approach speed.
4. Beginning of operation of drawbridge gates shall be not less than 15 seconds after steady red or 20 seconds after flashing red (450 seconds may be determined by the bridge operator).
5. Time of gate lowering and relating is dependent upon gate type.
6. Time of bridge opening is determined by the bridge operator.
7. Each gate shall be operated by a separate switch.
8. On each approach (Type II), all four red signals shall be on the same two circuit flasher, with the two top signals on one circuit, and the two bottom signals on the other, either flasher circuit.
9. A drawbridge ahead sign is required for both types of signal operation, however, a flashing beacon shall be added to the sign when physical road conditions prevent a driver from seeing the requirements being provided system (or if the Y5 approaches travel distance view for at least one signal indication for approximately 20 seconds).
10. Requirements for gate installation are contained in Section 4E-19 through 4E-17 of the Manual on Uniform Traffic Control Devices.
FIGURE A
MONOTUBE SUPPORT MOUNTING

FIGURE D
Pole Clamp with Wire Entrance (See Gambled Details in Figure C)

FIGURE E
Signal Head Mounting Assembly

FIGURE F
Bridge Mounting Details Flat Shoe

FIGURE G
DRAW BRIDGE AHEAD

TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS
DRAWBRIDGE SIGNAL

6" x 6" x 5" - 0"
2" Diameter - 4" Radius
6" Series "D" Letters

BLACK OPAQUE LEGEND AND BORDER ON REFLECTORIZED YELLOW BACKGROUND

TO BE USED WITH TYPE I OPERATION, AS SHOWN ON PREVIOUS SHEET

MONOTUBE SUPPORT MOUNTING

GATE & ARM DETAIL

TYPICAL LAMP PLACEMENT

TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS