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### Symbols

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

### Utility Adjustment Symbols

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

### Definition of Skew

- **Concrete**
- **Wood**
- **Rate of Superelevation**
# Standard Symbols for Plan Sheets

### Traffic Symbols

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<th>Proposed</th>
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<td>(Pole Mounted)</td>
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<td>Existing Pole &amp; Luminaire</td>
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<td>Existing Pole &amp; Luminaire to be Removed</td>
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<td>Concrete Lighting Pull-Box</td>
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<td><img src="image60.png" alt="Diagram" /></td>
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### Signing and Pavement Marking Symbols

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<td>Traffic Sign (Post Mounted)</td>
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<td>Sign Item Number</td>
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<td><img src="image74.png" alt="Diagram" /></td>
<td>Traffic Flow Arrow</td>
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SLOPE DRAIN APPLICATION

TEMPORARY SLOPE DRAIN

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TEMPORARY SLOPE DRAIN AND SOD FLUME

SOD FLUME - SODDING (OVERLAPPED)
GENERAL DESIGN NOTES

1. Bays should be as deep as practicable with a minimum depth of 2.0 feet.
2. In Type A, when the top of embankment is below high water, fence will be required along the top of the embankment.
3. In Type B, the weir shall be located as far from the embankment as practicable. On steep ditches two or more weirs may be required. Interim weirs shall be constructed without shining beams.
4. In Type B, the 6" PVC pipe shall be constructed unless shown otherwise in the plans.

GENERAL CONSTRUCTION NOTES

1. Fence materials shall be aluminum or concrete only.
2. Aluminized posts shall be 3" diameter minimum. Aluminum rail braces shall be in accordance with Index 452. Concrete posts and rail braces shall be in accordance with Index 451. All posts to be set in concrete.
3. Fabric shall be installed to inside of posts and rail braces, and tied to posts and braces at 6" centers.
4. For additional details on fencing, see Index Nos. 451 and 452.
5. All bored piles to be 1½" unless detailed otherwise in the plans.
6. Sediment basins to be constructed prior to commencement of second construction. Maintenance and clean out to be by the Contractor until acceptance of project by the Engineer.
FLOATING SILT BARRIERS

NOTES:
1. Number and spacing of barriers depend on current velocity.
2. Spreadment of barrier should not exceed 0.10 miles.
3. Adjustment may require removing barrier during construction operations.
4. The above applications indicate Type 2 Floating Silt Barrier. Other distances are shown, however, if conditions warrant, Type 2 Floating Silt Barrier may be used. For additional information see Standard Specifications.

FLOATING SILT BARRIER APPLICATIONS
PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

BALES BACKED BY FENCE

DITCH INSTALLATIONS AT DRAINAGE STRUCTURES

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

ANCHOR BOLTS WITH 2-2"x2"x 4" STAKES PER BALE

BARRIERS FOR FILL SLOPES

ELEVATION
TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE FILL

ANCHOR BOLTS WITH 2-2"x2"x 4" STAKES PER BALE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

BALED HAY OR STRAW BARRIERS
SHOULDER AND SLOPE TREATMENT FOR SUPERELEVATED ROADWAYS

GENERAL NOTES
1. For sodding adjacent to ditches and or shoulders, see Index No. 260.
2. All front slopes steeper than 4:1 are to be sodded.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

EROSION CONTROL DETAILS FOR PERMANENT CONSTRUCTION

Sheet Size: 11" x 17"
Scale: 1/2" = 1'-0"
DETAIl OF BOTTOM CONSTRUCTION
WHEN INLET SERVES AS MANHOLE

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

DETAIl OF CHANNELIZATION

Note: Channelization required of all drainage structures with two or more pipes.

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

ALTERNATE LOCATION OF PIPE IN STRUCTURE
WHEN PREFABRICATED FLOOR SLAB IS USED

COMPLETE FLOW CHANNEL IS REQUIRED WHEN THERE IS FLOW THROUGH THE STRUCTURE

DETAIl OF EYE BOLT AND CHAIN
FOR LOCKING GRATES TO INLETS

Note: One required per inlet grate.

DETAIl OF LADDER BARS

Use for box heights over 10'-0".

FRAME AND COVER DETAILS

Note: Tack Weld all Covers to Frames (3 places) as directed by the Engineer.

TYPE I FRAME
FOR MANHOLES
AS SHOWN ON INDEX 200

TYPE II FRAME
CAST IRON
For Type 1, 2, 3 & 4 Inlets

TYPE III FRAME
For Type 7 & 8 Inlets

SUPPLEMENTARY DETAILS FOR
MANHOLES AND INLETS
GENERAL NOTES:
1. The finished grade and shape of the inlet tops are to conform with the finished cross slope and grade of the proposed sidewalk.
   Another method shall be used.
2. When tops are to be constructed to a curve, refer to plans to determine the radius and, where necessary, modify the inlet details accordingly. Bend steel where necessary.
3. All steel in thrusts shall have 1/2" minimum cover unless otherwise shown. Inlet thrusts shall be either prestressed or seamless steels.
4. The rear wall portion of thrust types 1, 2, 3 & 4 may be constructed with 1/2". Check plans for the plan required.
5. Only round concrete support post will be acceptable.
6. For supplemental details see index, Rev. 3.
7. These inlet tops were designed to be used with curb A-2.5 and Type B curb. Limits outside of pavement cross walks if possible.
8. For inlet barriers see index Rev. 2.

CURB INLET TOPS
TYPES 1, 2, 3 & 4

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

Curt Wilson

CURB INLET TOPS
TYPES 1, 2, 3 & 4

INLET THROAT TYPE 1
Symmetrical about B

INLET THROAT TYPE 2
Symmetrical about B

INLET THROAT TYPE 3
Symmetrical about B

SECTION A-A FOR INLETS TYPE 1, 2, 3 & 4

INLET TOP MODIFICATION
FOR TYPE "B" CURB

SLAB NURSING DETAILS
INLETS 1, 2, 3 & 4
CAST IRON COVER AND GALVANIZED STEEL FRAME
GALVANIZED STEEL COVER AND FRAME

ALTERNATE G DETAIL

CAST IRON COVER

ANCHOR DETAIL
PUBLIC WORKS DEPARTMENT OF TRANSPORTATION

GUTTER INLET

GENERAL NOTES:
1. All required edges and corners shall be boxed by 3/8" radius.
2. All supplementary details see index no. 201.
3. All work shall be done in accordance with the specifications and plans subject to any changes written in their specifications.
4. Where alternate "C" auger is specified in plans, the same as to be but equal made after fabrication.
5. Grade and toe of structure shall be level to grade shown on plans.

SECTION B-9

NOTE: Cut and bend bars out of each of the same 
NOTE: Produced Steel Bars are 
1/2" & 1-1/8" Clear.

SECTION B-9

NOTE: Cut and bend bars out of each of the same 
NOTE: Produced Steel Bars are 
1/2" & 1-1/8" Clear.

GUTTER INLET TYPE V

FOR TYPES 1-1/8" DIAM. AND UNDER

STEEL GRADE: Detail

THE REQUIRES PER INLET

1-1/8" Steel Decking
Main Bar 1-1/8"
Intermediate Bar 10/16" Hot-dip Galvanized Bars 10/16"

STEEL DECKING: MANUFACTURED BY"..." FOR FUTURE USE ONLY.

FOR TYPES 3-1/8" DIAM. AND LARGER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GUTTER INLET

TYPE V

<table>
<thead>
<tr>
<th>No.</th>
<th>Code</th>
<th>Description</th>
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[Signature]
GENERAL NOTES:

1. COST OF DITCH PAVING TO BE INCLUDED IN COST OF INLET.
2. REINFORCING-W#4 BARS AT 1/2" CENTERS BOTH WAYS 2" CLEARANCE TO INSIDE FACE.
3. FOR SUPPLEMENTARY DETAILS SEE INDEX NO 201.
4. CUT AND BEND BARS OUT OF WAY OF PIPE WHEN NECESSARY; BARS TO BE WELDED IN PLACE.
5. WHERE MATERIAL UNSATISFACTORY FOR FOUNDATION IS ENCOUNTERED AT FL, FL. FILL FLOOR AND CARRY WALLS DOWN TO SATISFACTORY FOUNDATION. BACKFILL TO FL. WITH CLEAR SAND.
6. THIS INLET WAS DESIGNED FOR DITCHES, MEDIANS, OR OTHER AREAS SUBJECT TO HEAVY DLW LOADS WHERE DEBRIS MAY BE A PROBLEM (FOR MORE THAN 7 GPS YEAR), AND FOR USE IN AREAS SUBJECT TO REGISTRAIY AND/OR
7. RECOMMEND USING AS MAXIMUM SIZE FOR CONCRETE PIPE. FOR LARGER PIPE, 2" OF INLET SHOULD BE CONSIDERED.
8. WHEN ALTERNATE "D" GRADE IS CLASSIFIED IN PLAN, THE GRADE IS TO BE USED.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH BOTTOM INLET

TYPE B

PAVING DETAIL FOR ALL INLETS

Typical Ditch Block

For All Inlets Except Tap Inlets

Steel Grating Detail

Two Required Per Inlet

6" Barred, Forging, Steel, Uniform, Structural, Flexible, U.S. Foundry. for Equal

Main Bars 5/8", Intermediate Bars 1/2" x 1/2" Welded Bars 1/2" x 1/2" (or equal)
PVDMINATE FLOW

3"-4" Expansion Joint

PLAN

Recommended Maximum Pipe Sizes: See Notes 4 & 8.
3 1/4" Well - 24"
4 1/2" Well - 28"

"J-J" DETAIL

NOTES:
- For areas of "J" bottom, see Index 200 14(A) B vinyl.
- "J" top to be oriented as required by Note 4.

GENERAL NOTES
1. Cost of Ditch Paving to be included in cost of inlet.
2. Reinforcing - #4 4 bars at 12" centers both ways with 3" clearance to inside face.
3. Where material unsatisfactory for foundation is encountered at FL elevation omit floor and carry walls down to satisfactory foundation, backfill to FL with clean sand.
4. Direction of 1/4" x 5/8" Main bars to be in some direction as predominant flow.
5. Chamfer exposed edges. (1/8" Chamfer)
6. Cut and bend bars out of way of pipe when necessary. Bars to clear pipe by 1/8".
7. For supplemental details, see Index 201.
8. Recommended maximum pipe sizes are for concrete pipe. Check larger sizes for fit. For larger pipe, a "J-J" inlet should be considered (see detail above).
9. This inlet is designed for ditches, medians or other areas subject to heavy wheel loads, where only light debris is expected and pedestrian traffic is anticipated. It is not for use in areas subject to bicycle traffic.
10. When alternate 3" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.

SECTION B-B

SECTION A-A

STEEL GRATING DETAIL

Note: Two required per inlet.
Main Bars: 2 1/4" (Nitched for cross bars)
Cross Bars: 1/4" (Continuously welded at main bar notches).
Main Bars and Cross Bars flush on top.

TYPICAL DITCH BLOCK

For all inlets except jog inlets

SECTION C-C

SECTION D-D

PREDOMINATE FLOW

Ditch Bottom

10""
GENERAL NOTES

1. Cost of ditch paving, anti-vortex wall, grate, concrete, reinforcing steel and fence enclosure to be included in the cost of inlet.

2. Inlet and anti-vortex wall to be Class I Concrete.

3. Rebar - No. 4 bars at 12" centers both ways, 3/4" clearance to inside face and bottom of inlet. Bend top and corner bars to clear anchor holes.

4. Channel section C 5 x 6 may be used as an alternative for the C x 5.4 channel.

5. Channel and bar steel to be ASTM A500 welding steel. Grating exposed to salt water shall be ASTM A 572, Grade 50, and galvanized in accordance with Section 390.7 of the Standard Specifications, and be designated in the plans as Alternate G.

6. Fence enclosure shall be Type "B" Fence (Index No. 482). Chain link fabric, posts, wire ties, hardware, and miscellaneous fittings shall be aluminum alloy. All posts to be set in concrete. A minimum of 10 posts required. Corner and approach side posts to be 3" nominal.

7. Inlet length (L) shall be set by the designer for the greater of either culvert requirement or inlet pool not to exceed 12' depth.

8. This inlet is to be used at locations having high flow rates, usually where an endwall could not be utilized without hazardous intake.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DITCH BOTTOM INLET

TYPE K
DETAiLS OF CAST iRON GRATiNG

TYPE C
Straight Bars 2" x 1/4"
Rake Bar 1/4" x 1/8"
Approx. Weight 100 Lbs

TYPE D
Straight Bars 2" x 1/4"
Rake Bar 1/4" x 1/8"
Approx. Weight 100 Lbs

TYPE E
Straight Bars 2" x 1/8"
Rake Bar 1/8" x 1/8"
Approx. Weight 100 Lbs

TYPE H
Straight Bars 2" x 1/8"
Rake Bar 1/8" x 1/8"
Approx. Weight 100 Lbs

DETAiLS OF STEEL GRATiNG

TYPE C

TYPE D

TYPE E

TYPE H

GENERAL NOTES:

1. REVELED EDGES: All exposed covers and edges to be chased up 3/4".

2. FOUNDATION MATERIAL: When material unsatisfactory for foundation is encountered at FL, EL, and FL and carry with down to satisfactory foundation (backfill to FL with clean sand).

3. CAST iRON: manufactured under Florida Department of Transportation Specifications.


5. STRUCTURES: These structures are not to be placed in areas subject to heavy wheel loads.

6. DETAILS: For supplementary details see Standard No. 700.

7. PIPE SIZES: Recommended maximum pipe sizes given are for concrete pipe. Larger than recommended sizes must be checked for load capacities.

8. USE: When used without drains, drains & other uses shall be provided for each outlet in conduit where drain is not available. Grates shall be protected against overflow conditions by safety elements.

9. When alternate "5" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
### Table of Construction Data and Estimated Quantities for Round Pipe Culvert Endwalls

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PIPE</th>
<th>AREA OF OPENING</th>
<th>CONSTRUCTION DATA</th>
<th>DIMENSIONS</th>
<th>ONE PIPE</th>
<th>TWO PIPE</th>
<th>THREE PIPE</th>
<th>FOUR PIPE</th>
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### Table of Construction Data and Estimated Quantities for Metallic Pipe Culvert Endwalls

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<th>QUANTITIES IN ONE ENDWALL</th>
<th>EQUIV RISE</th>
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<td>B</td>
<td>C</td>
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### Table of Construction Data and Estimated Quantities for Concrete Elliptical Pipe Culvert Endwalls

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### General Notes
1. Reinforcing steel grade 40 or 60. Cost of bars shall be included in the contract unit price for concrete.
2. For sodding around endwall see detail on Index No. 281.
3. Provide 30' transition from endwall to ditch slopes where sideslopes on outfall ditches are flatter than 1:1.

### Straight Concrete Endwalls

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<th>COURSE</th>
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**Figure Descriptions:**
- **Concrete Endwalls for Round Pipe Culverts**
- **Concrete Endwalls for Metallic Pipe Arch Culverts and Concrete Elliptical Pipe Culverts**

**Diagrams:**
- **Front Elevation**
- **Plan**
- **Multiple Pipes**

**Sections:**
- **Plan**
- **Multiple Pipes**

**Tables:**
- **Table of Construction Data and Estimated Quantities for Round Pipe Culvert Endwalls**
- **Table of Construction Data and Estimated Quantities for Metallic Pipe Culvert Endwalls**
- **Table of Construction Data and Estimated Quantities for Concrete Elliptical Pipe Culvert Endwalls**
PLAN
(SHOWING BARS IN FOOTING)

NOTE: For bending arrow notation and bend radius see Sheet No. 001.

SECTION A-A

HALF ELEVATION
(SHOWING BARS IN BACK FACE OF WALL)

HALF ELEVATION
(SHOWING BARS IN FRONT FACE OF WALL)

GENERAL NOTES
DESIGN SPECIFICATION A-9704, VETS
CHAMFER ALL EXPOSED EDGES AND CORNERS
TO BE CHAMFERED ANY WELLS OTHERWISE NOTED
REINFORCING STEEL: GRADE 40 OR 60

BENDING DIAGRAMS

NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT

ESTIMATED QUANTITIES

ITEM
CONCRETE, CLASS 2
REINFORCING STEEL

UNIT
CU. YD.
LB.

QUANTITY

BILL OF REINFORCING STEEL

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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

STRAIGHT CONCRETE ENDWALL
SINGLE 66" CONCRETE PIPE

Drawing No.: 6-54
Issued By: T.C.
Rev.: 0

Drawn by: J.M. Watanabe
Approved by: J.M. Watanabe

Firm A. Rev. 0: 3/20/70
Rev. 1 of 1: 252
Table of Dimensions and Quantities for One U-Endwall (Section A-A)

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<th>K</th>
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<th>Jr</th>
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<th>C</th>
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<td>4.4</td>
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</table>

Notes: General concrete and reinforcing steel quantities in this table include baffle quantities.

General Notes
1. Baffles to be constructed only at locations specified in the plans.
2. When steel grating is required on endwall see sheet No. 2 for mounting details.
3. For lodging around endwall see index No. 2B1.
4. Reinforcing - No. 4 bars 2" clearance except as noted.

Plan: Details of U-Endwall with or without baffles for 4:1 and 6:1 slopes and without baffles for 2:1 slope.
MOUNTING DETAILS FOR STEEL GRATING

STEEL GRATING USE CRITERIA:
A. Shielded headwall and/or endwall, if used in pour concrete, when in the
B. Shielded headwall and/or endwall, if used in pour concrete, when in the
C. Shielded headwall and/or endwall, if used in pour concrete, when in the
D. Steel grating to be used only where called for in plans and
E. Steel grating to be used only where called for in plans and

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRATE

<table>
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<tr>
<th>Table No.</th>
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<th>Quantity</th>
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<tr>
<td>1.1</td>
<td>Endwall</td>
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</table>

GENERAL NOTES:
1. Cost of grating to be paid for each grate per pound, regardless of type.
2. Use of balanced bolts and nuts to be included in bid price for grating.
3. All steel, channel, and bar steel to be A36 or A992 weathering steel.
4. Grating will be supplied in 10" x 10" sections, bars to be A500 or A992 grade.
5. Grating sections C550.25 may be substituted for C550.24 channels.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
Paving Design

U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRATE OPTIONAL
15" TO 30" PIPE
**Table of Dimensions and Estimated Quantities**

**Concrete Endwall with U-Type Wings**

<table>
<thead>
<tr>
<th>Opening</th>
<th>Dimensions</th>
<th>Quantities in One Endwall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wall</td>
<td>Steel</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>H</td>
</tr>
<tr>
<td>10'</td>
<td>1.5</td>
<td>0.5</td>
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<tr>
<td>15'</td>
<td>1.5</td>
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<tr>
<td>24'</td>
<td>1.5</td>
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<tr>
<td>30'</td>
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<tr>
<td>42'</td>
<td>1.5</td>
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<tr>
<td>60'</td>
<td>1.5</td>
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</table>

**Concrete Endwall with 45° Wings**

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<th>Quantities in One Endwall</th>
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</thead>
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<td>10'</td>
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<td>0.5</td>
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<td>24'</td>
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<td>42'</td>
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</tr>
<tr>
<td>60'</td>
<td>1.5</td>
<td>0.5</td>
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</table>

**Note:**
- Cheater all exposed edges 1/4".
- Provide good foundation under pipe using concrete; all materials to be ordered and paid for separately. These materials shall be included in the unit price bid for Concrete.
- For adding around endwalls see Index No. C68.

---

**Winged Concrete Endwalls**

**Single Round Pipe**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

<table>
<thead>
<tr>
<th>Number</th>
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**Signatures:**

- Approved by [Signature]
- Issued by [Signature]

**File Number:**

- 1/1-266
GENERAL NOTES

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

2. Connections between the flared end section and the pipe culvert may be of any of the following types unless otherwise shown on the plans.
   a. Joints meeting the requirements of Section 941-15 of the Standard Specifications.
   b. Joints sealed with preformed plastic gaskets.
   c. Reinforced concrete jackets, as detailed on this drawing.

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

4. Sodding shall be placed about the flared end section in accordance with Index 281, and paid for under the contract unit price for Sodding.

5. On-bowed pipe culverts the flared end sections shall be placed in line with the pipe culvert. Side slopes shall be warped on required to fill the flared end sections.

DESIGN NOTES

1. Flared end sections are intended for use outside the clear recovery areas on median drain and cross drain installations.

2. Flared end sections are not intended for side drain installations.

3. Reinforced concrete jackets shall be used at all locations where high velocities and/or highly erosive soils may cause piping. These locations will be shown on the plans.

4. Tie walls shall be used wherever the anticipated velocity of discharge and soil type are such that erosion action would occur. Tie walls are not required where ditch pavement is provided, except what piping would occur if the ditch pavement should fail.
### Dimensions and Quantities

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<th>C</th>
<th>E</th>
<th>F</th>
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Concrete Slab 3" Thick, Reinforced with 6"x6"
RV/RO Welded Wire Fabric.

**TOP VIEW - SINGLE PIPE**

Concrete Slab 3" Thick, Reinforced with 6"x6"
RV/RO Welded Wire Fabric.

**TOP VIEW - MULTIPLE PIPE**

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**CROSS DRAIN**

**MITERED END SECTION**

**SINGLE AND MULTIPLE ROUND CONCRETE PIPE**

**NOTE:** See Sheet 4 for Details and Notes

Paid For As
Cross Drain Pipe Culvert

E... (Pipe to be included under unit price for Mitered End Section)

**SECTION**

272
### Dimensions and Quantities

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</tbody>
</table>

**Concrete Slab**: 3" thick, reinforced with 6" x 6" @ 10/10 welded wire fabric.

---

**Top View - Single Pipe**

**Top View - Multiple Pipe**

---

**Note**: See Sheet 4 for details and notes.
GENERAL NOTES

1. The cost of all pipe (i.e., reinforcing, connectors, anchors and concrete) shall be included in the contract unit price for mitered end sections, each. Soldering not included.

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

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

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

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

6. Unless otherwise designated in the plans, concrete pipe mitered and sections may be used with any type of cross drain pipe, corrugated steel pipe mitered and sections may be used with any type of cross drain pipe except aluminum pipe; and, corrugated aluminum mitered and sections may be used with any type of cross drain pipe except steel pipe. When bituminous coated metal pipe is specified for cross drain pipe, mitered and sections shall be constructed with like pipe or concrete pipe.

When the mitered and section pipe is dissimilar to the cross drain pipe, a concrete jacket shall be constructed in accordance with Standard No. 26.0.

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

8. Slope and ditch transitions shall be used when the normal roadway slope must be flattened to place and section outside clear recovery area. See detail left.

9. Cross Drain — Mitered End Sections only to be used outside of clear recovery area.

SLOPE AND DITCH TRANSITIONS (Plan View)

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

Bolt diameters shall be 1/4" for 0.5" to 0.6" pipe and 1/2" for 1.2" to 1.7" pipe.

Two connectors required per joint, located 60° right and left of bottom center of pipe.

Bolt holes in pipe shell are to be drilled.

CONCRETE PIPE CONNECTOR DETAIL

ANCHOR DETAIL

Anchors required for CMP only.

Anchor, washer and nuts to be galvanized steel.

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

Flat washers to be placed on inside wall of pipe.
### Dimensions & Quantities

| Span | M & | G | E | F | A | B | C | X | Pipe | N | W | Sodding (Cu Yds.) | Concrete (Cu Yds.) | Extra | Single | Double | Triple | Quadruple | Single | Double | Triple | Quadruple | Single | Double | Triple | Quadruple | Single | Double | Triple | Quadruple |
|------|-----|---|---|---|---|---|---|---|------|----|---|-------|-----------|-------|--------|--------|--------|--------|----------|--------|--------|--------|--------|----------|--------|--------|--------|--------|
| 27'  | 36' | 45' | 54' | 63' | 72' | 81' | 90' | 99' |      | 108|  40 |  50 |  60 |  70 |  80 |  90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 |
| 27'  | 36' | 45' | 54' | 63' | 72' | 81' | 90' | 99' |      |    |  20 |  30 |  40 |  50 |  60 |  70 |  80 |  90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 |
| 27'  | 36' | 45' | 54' | 63' | 72' | 81' | 90' | 99' |      |    |  15 |  25 |  35 |  45 |  55 |  65 |  75 |  85 |  95 | 105 | 115 | 125 | 135 | 145 | 155 | 165 | 175 | 185 | 195 | 205 | 215 | 225 | 235 | 245 | 255 | 265 | 275 |

**Adjustments:**

- Concrete Side 3" Thick, Reinforced with 6" x 6" KOHO Welded Wire Fabric.
- Sodding 2" Thick, Reinforced with 6" x 6" KOHO Welded Wire Fabric.
- Note: See Sheet 4 for Details and Sheet 5 for Notes.
FASTENER UNIT
FOR ALL SIZES OF SINGLE AND MULTIPLE DRAIN PIPE

Drain Pipe: x x L L

Concrete Pipe (Round)

CONCRETE PIPE (Round)

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

Grate Size (Dia. 6 and 9" OD)

Bolt Length

2 1/4" x 3" 5/8"
2 1/4" x 3" 5/8" 3/4"
2 1/4" x 3" 5/8" 1"

Corrugated Metal Pipe (Arch)

For 4" x 3" bolts are required for the plates.

For 7/8" pipe Arch sizes.

Anchor Detail

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

Bolt diameters shall be 7/8" for 12" to 36" pipe and 1/2" for 42" to 60" pipe.

Two connectors are required per joint, located 60° right and left of bottom center of pipe.

Bolt holes in pipe shell are to be drilled.

Anchor Detail

Side Drain

Mitered End Section

Details for Concrete & Corrugated Metal Pipe

Approved by:

Dr. [Signature]

State of Florida Department of Transportation

End Sizes

Sheet 6
**GENERAL NOTES**

1. Mitered and sections shall be paid for as mitered end section, each, based on each independent pipe end.
2. The cost of all pipe(s), grates, fasteners, reinforcing, connectors, anchors and concrete shall be included in the contract unit price for mitered end section, each. Sodding not included.
3. The reinforced concrete slab shall be constructed for all sizes of side drain pipe and cost in place with Class I concrete.
4. Round pipe size 30" or greater and pipe-arch size 35" x 24" or greater shall be graded unless excepted in the plans. Smaller sizes of pipe shall be graded only when called for in the plans.
5. Grates are to be fabricated from galvanized steel ASTM A 53, Grade B, pipe. The lower grate on all traffic approach ends shall be Schedule 80 and all remaining grates shall be Schedule 40.
6. Base metal exposed during fabrication shall be removed as specified in Section 562, Standard Specifications. Grates subject to salt water or highly corrosive environment shall be hot-dipped galvanized after fabrication in accordance with ASTM A 623.
7. Concrete pipe used in the assembly of mitered end sections shall be of selective lengths to avoid excessive connections.
8. Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered end section shall be repaired.
9. There is no portion of corrugated metal pipe in direct contact with the concrete slab shall be blemished coated prior to placing of the concrete.
10. Unless otherwise designated in the plans, concrete pipe mitered end sections may be used with any type of side drain pipe, corrugated steel pipe mitered and sections may be used with any type of side drain pipe except aluminum pipe, and corrugated aluminum mitered sections may be used with any type of side drain pipe except steel pipe. When blemished coated metal pipe is specified for side drain pipe, mitered and sections shall be constructed with pipe or concrete pipe. Blemished coated pipe mitered end sections, constructed in accordance with the details shown for corrugated metal pipe (including anchor bolts, open, etc.) shall be used with any type of 24" x 24" side drain pipe.
11. When the mitered end section pipe is dissimilar to the side drain pipe, a concrete jacket shall be constructed in accordance with Standard Index 280.
12. When existing multiple side drain pipes are spaced other than the dimensions shown in this detail, or have non-parallel axes, or have non-uniform sections, the mitered end sections will be constructed either separately or single pipe mitered end sections or collectively as multiple pipe end sections as directed by the Engineer; however, mitered end sections will be paid for each, based on each independent pipe end.
13. Ditch transitions shall be used on all grades in excess of 3% as directed by the Engineer.
14. Elliptical concrete pipe mitered and sections shall be constructed using appropriate mitered and section details for round concrete pipe and corrugated metal pipe arch, sheets 1, 3, 4 and 5.

**DESIGN NOTES**

1. In critical hydraulic locations, grates shall not be used until potential debris transport has been evaluated by the drainage engineer and appropriate adjustments made. Ditch grades in excess of 3% or pipe with less than 1.5' of cover and grades in excess of 1% will require such an evaluation (General Note 41).
2. The design engineer shall determine highly corrosive locations and specify in the plans when the graters shall be hot-dipped galvanized after fabrication (General Note 21).
3. The design engineer shall determine and designate in the plans which alternate types of mitered and section will not be permitted. The restriction shall be based on corrosive or structural requirements.
### SODDING QUANTITIES

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Index 250</th>
<th>Index 266</th>
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<tbody>
<tr>
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<td>60&quot;</td>
<td>82.62 SY</td>
<td>100.03 SY</td>
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Note: These quantities are for one pipe.

### SODDING QUANTITIES

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<th>Index 270</th>
</tr>
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<tr>
<td>42&quot;</td>
<td>25.74 SY</td>
<td>33.74 SY</td>
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</table>

Note: Quantity for 21 is for endwall with baffles.

**STRAIGHT ENDWALLS**

*NOTE: All straight endwalls except index 250 will require sodding as shown in this drawing. Quantities for each particular case to be determined by the designer.*
Provide approximately a minimum of 0.20% grade on gutter, slightly warping the surface of the median pavement if necessary, within limits of the median curb or curb and gutter. Construct a drainage flume or flumes at the point or points of low grade. See details.

**MEDIAN OPENING FLUME**

**SECTION A-A**
- Provide smooth Section
- Match existing grade

**SECTION B-B**
- Min. Slope 0.05'/ft.
- Drainage ditch to drain

**SECTION C-C**
- FLUME DETAIL

**GENERAL NOTES:** These details are to apply to projects which provide for the conversion of 2-lane sections to 4-lane divided highway sections and for superimposed sections of new 4-lane divided highways. Location of low point of points in gutters is to be set by the Engineer during construction and will establish locations of flumes. The number of flumes is to be maintained at a maximum. Plans for median openings to conform to detail plans. Layout above is illustration only. Cost of flumes to be included in the contract price for Median Curb or Curb and Gutter.
Note: Set reflector plates on right hand curb of bridge as shown. Plates to be furnished by contractor. Cost of installing plates to be included in the contract unit price for concrete ditch pavement (3\* thick).

\[\text{SECTION A-A}\]

\[\text{SECTION B-B}\]

\[\text{SECTION C-C}\]

Profile of curb to match curb at end of bridge.

Depress Approach Slab

Dowels E @ 18"ctrs (5/8"Ø)

BRIDGE ——— APPROACH SLAB

\[\text{SECTION ALONG SL OF DRAIN}\]

Note: Spillway to terminate as directed by the engineer.

Toe of slope

Length of Slope

Dowels tube included in the contract unit price for concrete ditch pavement (3\* thick)

\[\text{ESTIMATED QUANTITIES}\]

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<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
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<tbody>
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<td>Concrete Ditch Pavement (3* Thick)</td>
<td>Sq. Yd.</td>
<td>10.87</td>
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*Quantity shown above includes pavement for 10 ft. *Length of Slope.*

For each additional foot of slope length add 0.346 sq yds.
DETAIL OF CONC. SPILLWAY AT END OF SHOULD GUTTER

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

NOTES:
1. Spillway to be placed par as shoulder gutter.
2. If spillway curves into a shelter or medallion, the details should be modified as necessary.
SAFETY MODIFICATION FOR
OPENING IN BOX CULVERTS

NOTE: These modifications will be made only on existing drainage structures.

PROPOSED INLET MODIFICATION WHERE SEATS WAS SET OS ABOVE THE DITCH

MEDIAN INLET DESIGN AS SHOWN ON THE PLANS

SAFETY MODIFICATION FOR
MEDIAN INLETS

PROPOSED DITCH MODIFICATIONS WHERE GRADE WAS SET AS ABOVE DITCH ELEV.
1. Cost of grate to be paid for at 8-pounds Grade per pound, fabricated quantity.
2. Cost of galvanized bolts and nuts to be included in bid price for Endwell Grate.
3. Grate to be ASTM 6 A565 weathering steel. It is required to be used for all grate that is designed in place. Grate to be furnished from ASTM A 572, Grade 50, and galvanized.
4. Reinforcing Steel: All bars are size #4. Spacings shown are center to center. Bars to be #4 Minimum. Clearances to be #4 except as noted. Grade #4 welded wire fabric (two rolls max) having an equivalent cross-sectional area (AISC) may be substituted for bar reinforcement.
5. The cost of dowel bars and epoxy mortar to be included in the bid price for reinforcing steel.
6. Drill 1/2" holes in dowel bars with a rotary drill in existing endwall for dowel bars. Holes shall be thoroughly cleaned prior to placing dowel bars and epoxy.
7. For use criteria see Index 261.
8. Channel section C3 x 6.0 may be substituted for C4 x 5.4 channel.

**DIMENSIONS AND QUANTITIES PER GRATE**

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<th>Slope</th>
<th>Wing Span</th>
<th>Overall Span</th>
<th>Beams</th>
<th>No. of Beams</th>
<th>Beam Spacing</th>
<th>Overall</th>
<th>Weight (lbs)</th>
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**DIMENSIONS AND QUANTITIES PER U-ENDWALL**

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<td>2</td>
<td>6</td>
<td>23</td>
<td>12</td>
<td>62</td>
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**SAFETY MODIFICATIONS FOR ENDWALLS**

[State of Florida Department of Transportation logo]
### MEDIAN STORAGE LANE - ALT. I

- A short radius may be placed at breaks in the curb.
- Curb type A, B, C, D, E, or F.
- Edges of pavement.
- Centerline of traffic separator.
- A 100' radius is allowed for 3 vehicles.
- 80' also when space is available.
- 60' for minor intersections.
- 30' for minor intersections.

### DETAILS OF MEDIAN STORAGE LANE - ALT II

- Adequate horizontal alignment and grade as shown below.
- Limits of A, B, C.
- Traffic separator.
- Limits of D.
- Edge of pavement.
- Type E curbs and gutter.
- Juncture details.
- Median curbs and traffic separators.
- Note: The table above is applicable only where median storage lanes occur on tangent construction.

#### TABLE OF DIMENSIONS AND QUANTITIES FOR MEDIAN STORAGE LANES

<table>
<thead>
<tr>
<th>L</th>
<th>M</th>
<th>R</th>
<th>P</th>
<th>S</th>
<th>U</th>
<th>V</th>
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Note: The table above is applicable only where median storage lanes occur on tangent construction.
DETAILS OF TYPE I CONCRETE TRAFFIC SEPARATOR
NOTE: STABILIZE FULL WIDTH OF TRAFFIC SEPARATOR

DETAILS OF TYPE II CONCRETE TRAFFIC SEPARATOR
NOTE: CONCRETE TRAFFIC SEPARATORS TYPE I AND TYPE II ARE TO BE USED WHEN ADJACENT PAVEMENT IS CONCRETE

DETAILS OF TYPE III CONCRETE TRAFFIC SEPARATOR

DETAILS OF TYPE IV CONCRETE TRAFFIC SEPARATOR

CONSTRUCTION JOINT DETAILS

TRAFFIC SEPARATORS
TYPICAL RETURN PROFILES
INCLUDING DETAIL SHOWING LOCATION OF INLETS ON RETURN

NOTE:
1. On normal intersections, profiles need not be included in the plans as the above typicals adequately present the desired configuration.
2. For major intersections, where severe 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. Return locations and low points should be coincident, as much as possible, to be compatible with pedestrian traffic and drop curb locations.
4. A minimum 0.2% grade should be maintained on all sag grades outside curb limits.
NOTES:
1. The curb cut ramps are to be located as shown on the plans.
2. Curb cut ramps are to be located as shown on the plans.
3. Bases of payment - contract unit price per 50' x 12' of concrete sidewalk.
4. Complete curb cut ramps are to be constructed at all locations shown on plans even when sidewalk is not constructed concurrently.

CURB CUT RAMPS
FACILITY FOR PHYSICALLY HANDICAPPED

Section 8-8

Section AA
GENERAL NOTES
1. The ramp surface shall be finished in accordance with sub article 400-10-25 as modified. Approved hand methods may be used.
2. Curb cut ramps are to be located as shown on the plans.
3. Basis of payment to be the contract unit price per sq yd of Concrete Sidewalk.

THESE RAMPS TO BE USED ONLY WHERE SIDEWALK IS SIGNED AS A BIKE ROUTE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION 
HIGHWAY DESIGN

CURB CUT RAMPS
BIKEWAYS & PHYSICALLY HANDICAPPED

Notes: Code: Approved By: 
Design No: 
Scale: 

SFC: 

2-2012

304
ELEVATION OF CONTRACTION & EXPANSION JOINT TYPE 2S UNIT

ALTERNATE KEYWAY AND TIE BAR

DETAIL FOR STEEL HOOK BOLT ASSEMBLY

NOTE: After the concrete has set to the extent that the property will retain its shape, the tie rod and TIES shall be replaced. The remaining portion of the rod shall be installed immediately prior to placing of concrete in the adjacent lane.

DETAIL OF JOINT ARRANGEMENT

GENERAL NOTES

1. LONGITUDINAL JOINTS WILL NOT BE REQUIRED FOR SINGLE LANE PAVEMENT OR LESS THAN 36 IN.寬
2. WHEN PAVEMENT WIDTH NECESSITATES FIVE OR MORE LONGITUDINAL JOINTS PROVIDE ONE OR MORE UNITED BUT KEYED JOINTS NO JOINT SHALL BE TIED THAT IS MORE THAN TWO LANES FROM A FREE EDGE OR FREE JOINT
3. ARRANGEMENT OF LONGITUDINAL JOINTS NOT SHOWN ON TYPICAL SECTION TO BE AS DIRECTED BY THE ENGINEER
4. ALL MANHOLES, METER BOXES AND OTHER PROJECTIONS INTO THE PAVEMENT SHALL BE BOXED-IN WITH PREFORMED EXPANSION JOINT MATERIAL.
**DETAIL SHOWING RIGID SHOULDER PAVEMENT**

**DETAIL SHOWING SHEET METAL STRIP**

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

The sheet metal strip shall be a minimum 16 gauge steel, 1/4" wide and shall be galvanized in accordance with ASTM A 525, Coating Designation 690.

**GENERAL NOTES**

1. Pay quantity of expansion joint to be calculated across pavements at right angles to the centerline of the roadway pavement.

2. For additional details see Index No. 305.

3. The A of curving and the E of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the E of the roadway pavement shall be determined.

4. When the shoulder pavement is constructed with either concrete or asphalt, the expansion joints shall be continued across the shoulder pavement. See detail for construction in rigid shoulder pavement.

**SECTION A-A THROUGH EXPANSION JOINT**

**COMPRESSION SEAL DETAIL**

**NOTE:** All contacting surfaces between the compression seal and Concrete shall be thoroughly coated with a lubricating adhesive.
GENERAL NOTES

1. The illustrated units for guardrail construction are standard requirements, one panel equals 62.5 ft.

2. Extrusions shown are typical. The intent is that 62.5 ft. of rail be available approaching blind curve.

3. Rail spacing shall be 6.00 ft except that a reduced spacing of 4.50 ft shall be used at bridge approaches (see detail L). No hazards where the face of guardrail is 6.00 ft from road edge for more than 8 ft. Such reduced railing shall also be provided for the length of the blind approach.

4. Guardrail sections may be used for all rail of 12 gauge or greater. For rail less than 12 gauge, the rail must be fabricated to fit.

5. For specifications of materials refer to standard specifications.

6. Design load of rail equals 80,000 pounds in tension.

7. In addition to use of conventional guardrail hazards, guardrail will be required when 1/100th slope exceeds 1.5 percent and where fill heights are less than 8 ft. Guardrail may be required regardless of 1/100th slope when in the opinion of the Engineer the use is deemed necessary due to other roadside features.

8. Guardrail may be used for 6 ft, 6.5 ft, and 8 ft standard metal guardrail. A 6 ft, 6.5 ft, or 8 ft standard metal guardrail shall consist of a 14 gauge section of the steel post will be permitted in an otherwise. The 14 gauge steel section shall be bolted to the otherwise post with one set of (10) bolts on each side of the block, blocks vary with this design rail shall be 22 gauge. The bolt holes in other blocks shall be located 7 in. from the end and centered (7 in.) to the block.

9. Where guardrail is constructed with street barriers or curbs, offset braces or terminal and panels will be required.

10. Where necessary to enlarge or add additional hoists to guardrail system, the work will be done in phases or linear segments of the guardrail.

11. Guardrail shall be installed at maximum practical distance from travel lane center to installation of non-reinforced curb.

12. Minimum 48 inches offset between face of rail and board post are not to be provided. A special detail should be prepared by the Designer and forwarded to the Deputy Design Engineer, Roadway Office for review and approval. If minimum 48 inches offset cannot be provided.

13. Intersections reflectors shall be used adjacent to auxiliary lanes and within 250 feet of intersections of all other locations where reflectors shall be used.

GUARDRAIL ATTACHMENT AT BRIDGE ENDS

GUARDRAIL LOCATION AT CURB & GUTTER SECTIONS

GUARDRAIL AND SHOULDER GUTTER TRANSITIONS AT BRIDGE APPROACHES (TRAILING END OPPOSITE HAND)

GUARDRAIL LOCATION DETAIL K

REFLECTOR SPACING DETAIL M
GENERAL NOTES (TYPE "B" FENCE)
1. THIS FENCE TO BE PROVEN GENERALLY IN URBAN AREAS.
2. LINE POSTS MAY BE ANY OF THE FOLLOWING:
   - GALVANIZED STEEL PIPE - 3" NOMINAL
   - ALUMINUM COATED STEEL PIPE - 3" NOMINAL
   - ALUMINUM ALLOY - 3" NOMINAL
3. CORNER END OR FULL POSTS MAY BE ANY OF THE FOLLOWING:
   - GALVANIZED STEEL PIPE - 3" NOMINAL
   - ALUMINUM COATED STEEL PIPE - 3" NOMINAL
   - ALUMINUM ALLOY - 3" NOMINAL
4. CONCRETE SHALL BE DAMPED WITH 1% "Z" GRADE CONCRETE BRAZING AT ALL POSTS.
5. CHAIN LINK FABRIC POSTS, BULL-DOG FRAME, EXPANSION SLEEVES, TIE MOUNTS, TENNIS RINGS, AND ALL MISCELLANEOUS FITTINGS AND HARDWARE SHALL MEET THE REQUIREMENTS OF ANSI M-88-74 AND M-111 UNLESS OTHERWISE NOTED.
6. MATERIAL FOR CLASS 2 CONCRETE FOR CONCRETE FOOTINGS MAY BE MEASURED BY VOLUMETRIC AND OR BY WEIGHT. SECTIONS 345-31, 345-30 AND 345-60 OF DOT STANDARD SPECIFICATIONS WILL BE DELETED.
7. IN LOCATIONS OF FIRM WELL DRAINED SOIL, THE CONTRACTOR MAY ELECT TO INSTALL "C" LINE POSTS (ONLY) BY DRIVING THE POSTS TO A DEPTH NOT LESS THAN THREE FEET IN LIEU OF USING CONCRETE FOOTINGS.

GENERAL NOTES (CONT.)
8. FOR NON PURPOSE ASSEMBLIES ASSEMBLIES ARE DEFINED AS FOLLOW: FULL OR END POST ASSEMBLIES SHALL CONSIST OF ONE FULL OR END POST, ONE BRACE AND ALL NECESSARY FITTINGS AND HARDWARE AS DETAILED ABOVE. CORNER POST ASSEMBLIES SHALL CONSIST OF ONE ASSEMBLY, TWO BRACES AND ALL NECESSARY FITTINGS AND HARDWARE AS DETAILED ABOVE.
9. THE TYPE OF FENCE TO BE INSTALLED SHALL BE SHOWN ON PLANS. FULL POSTS SHALL BE USED AT BREAKS IN VERTICAL POSTS OF 3' OR MORE, OR AT APPROXIMATELY 350 CENTERS EXCEPT THAT THIS MAXIMUM INTERVAL MAY BE REDUCED BY THE ENGINEER ON CURVES WHERE THE DEGREE OF CURVATURE IS GREATER THAN 3 DEGREES.
10. CORNER POSTS ARE TO BE INSTALLED AT ALL HORIZONTAL BREAKS IN FENCE OF 15' OR MORE AND AS REQUIRED AT VERTICAL BREAKS OVER 15' AS DETERMINED BY THE ENGINEER.
GENERAL NOTES

1. All fabric shall be 6 mesh knurled top and bottom selvages.
2. All gate components shall meet the galvanizing requirements specified in Index No. 452.
3. Cost of all gate components shall be included in the contract unit price for Cantilever Slide Gate.
4. The Contractor may substitute any equivalent cantilever slide gate approved by the Engineer.
HALF SECTION SHOWING REMOVAL AND DISPOSAL OF A-B MATERIAL IN RURAL CONSTRUCTION

(Outside Shoulders Only. Plans To Designate Median Treatment)

TYPICAL SECTION SHOWING REMOVAL OF PLASTIC MATERIAL ON INTERSTATE AND PRIMARY SYSTEM HAVING DEPRESSED MEDIAN

TYPICAL SECTIONS FOR REMOVAL OF PLASTIC MATERIAL ON MAJOR PRIMARY SYSTEM ROADS

TYPICAL SECTION SHOWING REMOVAL OF PLASTIC MATERIAL ON SECONDARY AND MINOR PRIMARY SYSTEM ROADS

MISCELLANEOUS DETAILS

GENERAL.NOTES

1. Minimum grade on embankment shall not be 0.5%.
2. Gradation of the fill material shall conform to standard specifications.
3. In rural projects, where embankment is to be constructed between the proposed centerline, the grade of the embankment is to be such that the embankment fill material will not extend above the bottom of the stabilized section of the embankment.
4. All details shown on this sheet for the removal and disposal of unsuitable materials apply unless otherwise shown on the plans.
5. Where plastic material is included, backfill shall be made of suitable material.
7. The normal depth of fill of the embankment for Interstate and major Primary System roads shall be 3.5 ft. below the existing surface except in special cases.
8. On Primary and Secondary highways where plastic material is permitted for use in the embankment, the embankment shall be placed with the existing water level line for all of the embankment for same distance beyond the Project. Other than the fill depth for plastic materials.

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

EXCAVATION, EMBANKMENT & GRADING

500
S = Select  A-1, A-3, A-2-4
H = High Plastic  A-5 or A-7 (both with LL 50)
M = Muck  A-8

Symbols listed left to right in order of preference.

Note: All dimensions shown are standard.
The details shown on this index drawing do not supersede the details shown on Index 800.
When otherwise shown on plans this dimension may be reduced to 24".

Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and therefore should be used in the embankment above water level existing at time of construction.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

EMBANKMENT UTILIZATION

505
2-LANE OR 4-LANE PAVEMENT, NO MEDIAN

4-LANE PAVEMENT WITH MEDIAN

DETAIL OF TRANSITION FROM NORMAL CROWNED SECTION TO SUPERELEVATED SECTION

These transition details are to apply in all cases, except at curves of insufficient length, insufficient tangent length, between curves, P.C.'s or P.A.'s, in which case the details of the transitions are to be included in the detail plans.
SUPERELEVATION TRANSITION $L_1$ (VARIES 100' MIN)
STRAIGHT LINE TRANSITION OUTSIDE EDGE OF PAVEMENT

$S_1$ = Curve

$D_1$

OUTSIDE PART EDGE BOTH ROADWAYS

CROWN POINT BOTH ROADWAYS

$D_2$

$D_3$

$D_4$

$D_5$

$D_6$

$S$ = SLOPE RATIO

SECTION A-A
NORMAL CROWNED SECTION

SECTION B-B
SUPERELEVATION SECTION LT & RT

SECTION C-C
SUPERELEVATION SECTION LT
PLANE INCLINED SECTION RT

SECTION D-D
PLANE INCLINED SECTION LT
SUPERELEVATION TRANSITION RT

SECTION E-E
SUPERELEVATION TRANSITION LT
FULL SUPERELEVATION RT

SECTION F-F
FULL SUPERELEVATION LT & RT

SUPERELEVATION DETAILS
8 LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN
For Side Drain Pipe and MITERED End Section Requirements see Index 515.

For Side Drain Pipe and MITERED End Section Requirements see Index 515.

**SECTION AA WITH WIDENING**

**TURNOUT CONSTRUCTION**

Surface Course (1" Thick, Min.) (To be the same material as Resurfacing or Leveling). Surface not required if asphalt mix base is used.

Base (Any material currently specified by the Department for base or surface course construction; 3" thick for asphalt mixes and 4" thick for other materials.)

**TURNOUT CONSTRUCTION**

Surface Course (1" Thick, Min.) (To be the same material as Resurfacing or Leveling). Surface not required if asphalt mix base is used.

Base (Any material currently specified by the Department for base or surface course construction; 3" thick for asphalt mixes and 4" thick for other materials.)

**SECTION A-A**

**GENERAL NOTES**

1. Turnouts are to be constructed or resurfaced at locations as directed by the Engineer.

2. Turnout construction not required with paved shoulders.

3. Connections outside the 5" limit are to be constructed as directed by the Engineer.

4. Contract unit price, Turnout Construction, to include excavation and base.

5. Payment for surface course to be included in roadway resurfacing pay item.

6. Payment for feathering friction course to be included in the unit price for Asphalt Concrete Friction Course placed on the roadway. Feathered areas will not be included in measured quantities. Feathering not required for FC-2 & FC-3 friction courses.

**TURNOUTS RESURFACING PROJECTS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**TURNOUTS RESURFACING PROJECTS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**TURNOUTS RESURFACING PROJECTS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
SKETCHES INDICATING SHOULDER TREATMENT AT SPEED CHANGE LANES WITH SHOULDER GUTTER

SKETCHES INDICATING SHOULDER TREATMENT AT SPEED CHANGE LANES WITHOUT SHOULDER GUTTER
ENTRANCE AND EXIT RAMP TERMINAL DETAILS

To be used along the ramps of all urban type, multipurpose, ramp terminals (interchanges and expressway interchanges).

- Normal shoulder pavement width
- Adjust for grades of greater than 2% (see P 554 AASHTO Red Book)
- Standard ‘highway’ entrance terminals. To be used when roadway alignment is tangent and no bridges are located within the merging zone.
- Parallel cross road entrance terminals. Recommended when a bridge is located within the merging zone, turning roadway speed is less than 40% of the thru roadway speed or for the combinations of horizontal alignment shown elsewhere on this sheet.
- Parallel cross road exit terminals. Recommended when exit is partially hidden over the crest of vertical curve or when turning roadway speed is less than 60% of the thru roadway speed, or for the combinations of horizontal alignment shown elsewhere on this sheet.

LEFT TURN CONTROL DETAILS

ENTRANCE ON CURVE

For additional detail see drawing and footnote.

EXIT ON CURVE

For additional detail see drawing and footnote.

The details shown on this sheet apply to Cross Road Ramp Terminals ONLY.
**NOTE**
Class I Concrete is to be used unless otherwise noted in plans or special provisions.

**PLAN**

**SECTION A-A**

**DETAIL OF TRACTOR CROSSING, TYPE A**
REINFORCED CONCRETE

**DETAIL OF TRACTOR CROSSING, TYPE B**
TREATED TIMBER

**TRACTOR CROSSINGS**

<table>
<thead>
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<th>Section</th>
<th>Date</th>
<th>Approved By</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>01/01</td>
<td>Dr. Smith</td>
</tr>
</tbody>
</table>
INSTALLATION

NOTES
1. All pipe shall be thread above grade. Use of a coupling shall be determined at time of installation and shall be immediately below the top of each length of vertical pipe in placed.
2. Settlement plates shall be grouted and protected from environmental conditions and protection of settlement plates are satisfied, they shall be replaced on lead.
GENERAL NOTES

1. The purpose of shrubs in areas back of guardrail is to eliminate weed maintenance in these areas.
2. Shrubs are to be planted approximately 3' back from guardrail posts and hazards. Narrow plant areas are to have a minimum row of shrubs, as directed by the Engineer.
3. Shrubs are to be planted approximately 5' on centers, in rows with 5' spacings.
4. Shrubs are to be offset in successive rows to create a stagger pattern between any two rows.
5. Shrubs shall be specified on the plans by Landscape Material Model # Plant List number.
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 mile.
7. When guardrail going is constructed in conjunction with shrub planting, soil stabilization shall be in accordance with Section 332 of the Standard Specifications.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

SHRUBBERY
BACK OF GUARDRAIL APPLICATION

[Table with columns for Plant Name, Size, Spacing, and other specifications]
PLAN - 90° CROSSING

PRECAST CONCRETE SLABS
ALL SLABS TO BE ATTACHED TO BEAMS

ELEVATION
DETAIL OF 3/4" X 1/2" ANCHORS
ANCHORS STAGGERED 18" C TO C
TWO ANCHORS EACH END CHANNEL
NOTE: 3/4" X 5" STUDS MAY BE USED IN LIEU OF ANCHORS.

SECTION

PLAN TYPICAL SLAB

BEVELED END SECTION

ALTERNATE END SECTION

NOTES:
1. ANCHORS ADJUSTABLE TO GRAY FORM GRADE PER BOX.
2. SADDLE STURM'S PLUGS TO BE IN COMMON SENSE.
3. ALL TIES TO BE SADDLED SIDE TO SIDE.
4. SECTIONS TO BE USED IN CONSTRUCTION OF PRECAST CONCRETE SLABS.
5. TEN(GLY) TREATED SPLINES AND DURASTONE CONCRETE TIES WILL BE FURNISHED AND Installed ON THE MASONRY TO THE REQUIREMENTS OF THE CROSSING. THAT WILL BE CONDITIONED TO THE INSTALLATION OF THE CROSSING ELEMENTS.
6. INSTALLATION OF CROSSING REQUIRES A STABILE SURFACE FOR A MINIMUM OF 2 INCHES BLOW THE BOTTOM END OF THE CROSSING. THE SURFACE SHALL BE CONSIDERED PERMISSIBLE TO SPECIFY FOR THE ADOPTING ROADWAY.

DETAILS OF RAILROAD CROSSING TYPE "J"
1. This drawing is based on using 12" rail on a tangent section and Decking fabricated in sections to fit the corresponding sections of the supporting frame. The depth of the 2 bars and channels may be varied to fit other rail sections.

2. The framework units are assembled to ties by 3/4" X 6 1/2" lag screws, and to headwall by 5/8" anchor bolts. Doublebolt spring washers are used with logs to compensate for vertical motion.

3. The decking is attached to the framework with 5/8" bolts. The head of the bolt is to be spot welded to the underside of the channel flange.

4. Frameway and outside flange timbers to be rabbeded to ensure close fit prior to treatment.

5. Ties to be squared and capped 18" C to C.

6. Crossings at any angle can be equipped with units of either 45°, 67°, 85° or 90°.

7. Decking may be as shown or equal (Submit shop drawings for approval by the Engineer).
**GENERAL NOTES**

1. The crossings shown on this sheet are **NOT** to be used for multiple track crossings within zones for an existing or scheduled future vehicular stop. Zone lengths are charted above.

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

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

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

---

**STOP ZONE**

<table>
<thead>
<tr>
<th>Zone Length (feet)</th>
<th>Speed Limit (MPH)</th>
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</thead>
<tbody>
<tr>
<td>45 - 59</td>
<td>35</td>
</tr>
<tr>
<td>60 - 65</td>
<td>50</td>
</tr>
<tr>
<td>70</td>
<td>60</td>
</tr>
</tbody>
</table>

**PARTIAL SECTION PARALLEL TO RAIL**

**CROSSING TYPE "P"**
(POLYETHYLENE)

**CROSSING TYPE "R"**
(RUBBER)
GENERAL NOTES

1. The reinforced concrete slabs are manufactured in 8'-0" sections, 5" in depth, to fit all rail sections 5'4" in height or higher. Slabs are interchangeable and reusable.

2. Center slabs are one-piece construction allowing for 2-1/2" flange opening. 80 lb. rails are used to encase, armor, and reinforce slabs and is held to gage with 3 tie rods per slab.

3. Slabs are installed by a "float-in" process, supported on non-shrinkable, non-metallic grout positioned on the ties. Slabs can be placed on wood ties, concrete ties, steel ties, bridge decks, or any other type of track support. No re-spacing of ties is necessary.

4. Slabs are secured to "running rails" with specially designed hardware. Insulation is to be provided for crossings in signal territory.

5. Curved slabs are fabricated to fit curved track to 22 degrees (262.04' radius). Special slabs are available for Diamond Crossings, Turnouts, Multiple Tracks, Bridge Decks and Rapid Transit Systems.

6. For additional details, materials and installation procedures refer to the manufacturers' specifications.
GENERAL MAINTENANCE OF TRAFFIC NOTES

1. All signing, pavement markings, barriers, and warning lights necessary for maintenance of traffic shall conform to the MTCSP.

2. The detour pavement should be constructed of width equal to the existing pavement, but lanes shall be not less than 10 feet in width. When one-way operations are necessary, a minimum width of 12 feet shall be maintained and traffic controlled in accordance with the MTCSP. Minimum width for the detour shall be 9 feet.

3. Raised pavement markers shall be placed along the center of the detour pavement at 10 foot centers on the tangent roadway, or 40 foot centers on approaches to the curves and at 20 foot lengths through the curves.

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

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

6. Method of attaching temporary guardrails to the detour structure to be approved by the Engineer.

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

8. Temporary attenuators shall be the inertial type indicated in Figure 7.3 of the MTCSP.

PHASE I

1. Maintain two-way two-lane traffic over existing facility.

2. Construct temporary structure, approaches, guardrail and attenuators.

3. The signing shown in the Phase I diagram is required whenever equipment, men 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. Traffic control shall be in accordance with the MTCSP. Install class H barriers.

3. Construct proposed structure and reconstruct or resurface existing approaches.

PHASE III

1. Reroute traffic to existing alignment and maintain two-way traffic.

2. Remove all temporary construction items.

LEGEND

W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W....W...
NOTES:

1. When a crossover is no longer needed, all temporary construction shall be immediately removed and the area restored to its original condition.

2. Cost of all construction, maintenance, removal and restoration work related to temporary crossovers shall be included in the contract unit price for maintenance of rights.

3. Crossovers to be constructed where sight distance is adequate in both directions.
DETAILS OF ALTERNATE WARNING DEVICES

1. Warning devices are to be made of materials that can withstand impact without damage to the device or the vehicle.

2. Warning devices are to be weighted or fastened to the pavement to prevent movement or tipping under wind loads. Prior to installing warning devices, the Contractor shall obtain Department approval of the method for weighting or fastening.

3. Warning devices other than those shown above may be used, but must have pre-construction approval by the Department.

APPLICATION

This plan to be used when a dropoff in excess of \( \frac{1}{2} \) exists between through lanes that are open to traffic during overnight work stoppage, inclement weather delays or shutdowns for emergencies.