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GUARDRAIL AND GUARDRAIL TRANSITIONS AT BRIDGE APPROACHES (TRAILING END OPPOSITE HAND) DETAIL J

GUARDRAIL ATTACHMENT AT BRIDGE ENDS DETAIL N

GUARDRAIL LOCATION AT CURB & GUTTER SECTIONS DETAIL L

SHOULDER WIDENING WHERE GUARDRAIL IS INSTALLED DETAIL K

REFLECTOR SPACING DETAIL M

GENERAL NOTES
1. The illustrated limits for guardrail installation are standard requirements, one panel equals 0.5 ft.
2. Specifications shown are typical. The root is that 62.5 ft. of not be available approaching critical hazard.
3. Post spacing shall be 62.5 ft. except that a reduced spacing of 50 ft. shall be used at bridge approaches (See Notes 1). All hazards where the face of guardrail where placed in less than 50 ft. of a 2° or greater radius may be omitted. The spacing shall also be provided for the length of the hazard plus one panel of approach rail.
4. Straight rail sections may be used for all rights of 25 ft. or greater. For radii less than 25 ft. the rail must be fabricated to fit.
5. For specifications of materials refer to standard specifications.
6. Design load of rail equals 50,000 pounds in tension.
7. In order to use conventional guardrail, guardrail will be required where fill slopes exceed 0.5 percent where AASHTO grades are less than 8 percent, or where Euclid grades or Fill grades where the approach grade is less than 6 percent. In this case, a fill of native material may be required to achieve an overall grade equal to the approach grade.
8. Undressed timber shall be permitted for 6" x 6" x 14" nominal treated timber block. A 5" x 5" x 14" nominal treated timber block shall be permitted for 14" section of the steel post. The 14" nominal treated timber block shall be a length of the steel post plus 3 ft. The 14" nominal treated timber block shall be trimmed by the engineer. The engineer may trim the block to ensure proper fit and shall provide sufficient length to fit the block.
9. Where guardrail is constructed for street barricades or at locations where the road is to be paved, the anchorages shall be provided at the discretion of the Engineer.
10. Where necessary to enclose or to close understand houses shall be provided at the discretion of the Engineer.
11. All component parts shall be included in the contract and price for guardrail.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION PHYSICAL DESIGN
GUARDRAIL CONSTRUCTION

<table>
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<tr>
<th>Date:</th>
<th>Project:</th>
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<tbody>
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<td>11-16-78</td>
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ADJACENT TO UNPAVED SHOULDER

ADJACENT TO SHOULDER PAVEMENT

ADJACENT TO SHOULDER GUTTER

DETAIL OF GUARDRAIL PAVEMENT

NOTE 1: Soil Stabilization - Cost of soil stabilization to be included in the cost of Shoulder Paving (See Special Provision).

NOTE 2: ADJACENT TO SHOULDER PAVEMENT - Shoulder pavement where shoulder gutter is present and/or adjacent to the shoulder pavement or shoulder gutter to be included in the cost of Shoulder Paving, unless otherwise noted.

6" x 4" STEEL POST

NOTE: Type "C" Steel shall consist of clean, free from paint or other coating material, 6" long unless otherwise noted.

S.H.E. STEEL WASHERS

ONE-PIECE ANCHOR PLATE (ALTERNATE)

NOTE: This back-up plate is placed behind rail elements and is separated from typical post with steel anchor blocks only.
STEEL GUARDRAIL POST MOUNTING TO EXISTING APPROACH SLAB

SPECIAL CONCRETE AND STEEL GUARDRAIL POSTS

CONSTRUCTION OF OTHER STRUCTURES PREVARIES NORMAL POST INSTALLATION. WHEN WOOD POSTS ARE SELECTED AS ALTERNATIVES THE POST INSTALLATION FOR THE ABOVE CONDITIONS WILL BE STEEL.

GUARDRAIL ATTACHMENT AT END POST ON EXISTING BRIDGES

FOR APPROACH AND TRAVELING ENDS OF TWO-WAY BRIDGES AND APPROACH ENDS OF ONE WAY BRIDGES GUARDRAIL OR TRAVELING END OF ONE WAY BRIDGE CAN BY MOUNTED DIRECTLY IN END POST Recess.

SPECIAL SAFETY PIPE RAIL

FOR LOCATIONS USE BY SUBSTANTIAL NUMBERS OF PEDESTRIANS, CYCLISTS OR FISHERMEN
**CONCRETE MEDIAN BARRIER TERMINAL**

*(To be used only as a Temporary Barrier Terminal or where located 30' from edge of approach lane. See Detail II.)*

**GENERAL NOTES:**

1. Cost of installation of all conduits and utility accessories, reinforcing steel and reflector markers shall be included in the contract unit price for Concrete Barrier Walls.

2. Terminal Barrier Notes for Design Speeds greater than 45 m.p.h.:
   a. Terminated in a wide median section outside recovery area of the approach traffic. See Detail II.
   b. Terminated from a shielded location.
   c. Terminated by the use of an impact attenuation system.
   d. Terminated in conjunction with a suitably designed transition to another type median barrier that can be introduced more safely.

3. Expansion joints in wall required only at bridge ends and/or at locations where wall is an integral part of the approach. See Detail II.

4. Expansion joints in conduits shall be required only at the expansion joints in the wall.

5. When the barrier wall is installed adjacent to the roadway the top 1/2 of the subgrade shall be compacted to at least 100% of the density as defined in the AASHTO T-99 specifications.

6. Cost-in-place barrier wall normally will be in continuous pour without transverse contraction joints.

7. Cost-in-place sections with a length < 40' shall be joined to adjacent sections by doweling. See Detail II on sheet 2 of 3.

8. Precast construction is allowed as an alternative to cost-in-place construction.
   a. Section lengths will not be < 20' in length.
   b. Bedding of the precast sections shall be facilitated by the use of sand-cement grout or equal method to ensure uniform bearing.
   c. Reinforcement may be required for handling stresses.
   d. See detail C on sheet 2 of 3 for transverse joint details.

**TYPICAL BARRIER WALL SECTION**

NARROW MEDIAN INSTALLATION ADJACENT TO PAVEMENT

*Use 8' top, 2'-2" base when 10'-0" lights are installed within barrier wall line.*

For Concrete Median Barrier Wall details at Piers, Highway Lighting and Guardrail Connections, See Sheet 2 of 3.

For Median Barrier and "Special" Barrier Wall inlet details see sheet 3 of 3.
**Detail D**

**Precast Barrier Transverse Joints**

- Cost of Double "in" wall, Fill, Cap and transition to be paid for as concrete barrier wall, L.F.

- "L" Total Transition - Symmetrical at Pier Approaches

- "M" Barrier Wall

- Standard Barrier Wall

**Concrete Median Barrier Wall**

- NOTE: Cost of Double "in" wall, Fill, Concrete Cap and Transitions to be paid for under Concrete Barrier Wall - Roadway 3 per lin ft. as indicated.

**Section A-A**

- Plan View

**Section B-B**

- Elevation View

**Guardsrail Connection to Std. Concrete Barrier Wall**

- Symmetrical about \( \frac{1}{2} \) for unidirectional flow - Approach End of Wall

- Symmetrical about \( \frac{1}{2} \) for unidirectional flow - Trailling End of Wall

- Clear Min Hpd.

- Strut

- 4 Galvanized \( \frac{1}{4} \)" bolts, nuts and 1\( \frac{1}{4} \)" O.D. Washer in formed holes. Cut bolts off flush with nuts.

- Special End Shoe

- Trailling End of Wall

- 8" #5 Bars -6" Long

- Strut

- Std. Barrier Wall

**Guardsrail Details**

- Bend to obtain 1 1/2" clearance at barrier wall footing

- Anchor Bolt - Top 6" Galvanized

- Roadway or Shoulder Pavement

- Bend to obtain 1 1/2" clearance

- 1" x 1/2" P.V.C. (for 5/8" ground rod)

- Roadway or Shoulder Pavement

- Bend to obtain 1 1/2" clearance

- 1" x 1/2" P.V.C. (for 5/8" ground rod)

- Roadway or Shoulder Pavement

**Section**

- 12" Light Pole

- 5/8" X 16" Ground rod

- Recess Seat for 1 1/2" Base

- Median Barrier Wall with 8" Tor 2'-9" Base

**Notes**

- Bolt circle: 8" pole -1/4", 10" pole -15"

- Ref to Highway Lighting Plans for size of Conduit

- Payment for the 30" b concrete column including reinforcing steel, anchor bolts and accessories shall be included in the contract unit price for Lighting Pole complete, high-

- way Lighting

**Florida Department of Transportation**

**Detail Drawing**

**MEDIAN BARRIER DETAILS**

**DRAWING NO.**

**REVISIONS**

**INITIALS**

**DEPUTY DESIGN ENGINEER**

**STATE DESIGN ENGINEER**

**ROADWAY'S**

**ENGINEER**

**APPROVED**

**FLORIDA DEPARTMENT OF TRANSPORTATION**

**SCALE**
NOTE: At the option of the contractor, Standard Rail Fittings may be used where welded connections are shown.

After the nuts have been tightened the anchor bolt threads shall be nicked or the nut shall be spot welded to the bolt.

Bolts, nuts and washers shall be hot dip galv. to conform to requirements of A.S.T.M. Spec. A-153. Steel Nicks and Welds shall be repaired in accordance with Section 562, Standard Specifications.

Aluminum Weld Filler Alloy 5556 or 4043.

Level with slot elevation

Flow lines of pipes to match gutter elevations.

METHOD OF DRAINING SHALLOW DITCHES

BACK OF SIDEWALK

To be constructed at locations as directed by the engineer.

YARD DRAIN ITEM INCLUDES:

1. 6"x6"x12" Cone. Tee 4' Long
2. Double 4" Cast Iron Pipe

At the option of the contractor, Standard Rail Fittings may be used where welded connections are shown.

NOTE: Cost of plugs and caps to be included in bid price for 15" Cone. Pipe.
Note: Set reflector plates on right hand curb of bridge ends as shown. Plates to be furnished by D.O.T. and installed by the contractor. Cost of installing plates to be included in the contract unit price for concrete ditch pavement (3" thick).

Note: Spillway to terminate as directed by the engineer.


depress approach slab

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

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<th>QUANTITY</th>
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*Quantity shown above includes pavement for 10 ft. "Length of Slope." For each additional foot of slope length add 0.349 sq. yds.*
For sodding around endwall see detail on Index No. GRC-D.

**Table of Dimensions and Quantities**

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<td>7'-6&quot;</td>
<td>5.6 Cu. Yd.</td>
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<tr>
<td>30° to 45°</td>
<td>9'-0&quot;</td>
<td>6.0 &quot;</td>
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<tr>
<td>45° to 50°</td>
<td>9'-0&quot;</td>
<td>6.2 &quot;</td>
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Note: Collar may be formed by any feasible method approved by the Engineer.

**Details for L-Type Endwalls**

Note: Reinforcing steel to be included in Contract Unit Price for Concrete.

**Details for Straight Type Endwalls**

Note: Reinforcing steel to be included in Contract Unit Price for Concrete.
TABLE OF DIMENSIONS AND QUANTITIES

<table>
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<th>SKEW A</th>
<th>L</th>
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<td>6'-0&quot;</td>
<td>5.0 Cu. Yd.</td>
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<tr>
<td>15° to 30°</td>
<td>9'-0&quot;</td>
<td>7.5 Cu. Yd.</td>
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<tr>
<td>30° to 45°</td>
<td>9'-6&quot;</td>
<td>7.5 Cu. Yd.</td>
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Note:

1. Reinforced steel to be included in Contract Unit Price for Concrete.
2. As an alternate to the endwalls shown the contractor may construct endwalls in accordance with Index No. DCE-01.
3. For sodding around endwall see detail on Index No. GRC-01.

DETAILS FOR L-TYPE ENDWALLS

TABLE OF DIMENSIONS AND QUANTITIES

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<tr>
<td>30° to 45°</td>
<td>9'-6&quot;</td>
<td>7.5 Cu. Yd.</td>
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Note:

1. Reinforced steel to be included in Contract Unit Price for Concrete.
### SCHEDULE OF BELL REINFORCEMENT

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All circumferential gasket located above this line within 1/2% is defined as bell reinforcement.

### DETAIL OF BELL & SPIGOT CONCRETE PIPE JOINT

- Using Round Rubber Gasket

### SECION THRU RECESS "V" GROOVE TO FORM INSCRIBED FIGURES

The number is to be placed in the center of the top surface of all BRIDGE CULVERT headwalls.

Mark Painted figures 3" in height as approved by the Engineer may be used in lieu of figures formed by "V" grooves.

"V" grooves shall be formed per the Engineer.

### TOP VIEW OF HEADWALL SHOWING BRIDGE CULVERT NUMBER LOCATION

For Bridge Number see Key Way

### MISCELLANEOUS DRAINAGE DETAILS

- FLORIDA DEPARTMENT OF TRANSPORTATION
- MISCELLANEOUS DRAINAGE DETAILS
- Date: 3/15/81
- Approved by: Engineer
- Drawn by: Engineer
- Scale: 3" = 1'-0"
Provide approximately a minimum of 0.20% grade on gutter, slightly warping the surface of the median pavement if necessary, within limits in the median curb or curb and gutter. Construct a drainage flume or flumes at the point or points of low grade. See details.

LOCATION set by the Engineer during construction.

Drains--Provide approximately a minimum of 0.20% grade on gutter, slightly warping the surface of the median pavement if necessary, within limits in the median curb or curb and gutter. Construct a drainage flume or flumes at the point or points of low grade. See details.

Construct ditch to drain to the proposed drainage system.

Drains--Provide approximately a minimum of 0.20% grade on gutter, slightly warping the surface of the median pavement if necessary, within limits in the median curb or curb and gutter. Construct a drainage flume or flumes at the point or points of low grade. See details.

Construct ditch to drain to the proposed drainage system.

SECTION A-A

SECTION B-B

(May drain from any point as established by the Engineer)

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 superheaved sections of new 4-lane divided highways. Location of low point or 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 minimum. Plans for median openings are 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.
INLET THROAT TYPE 1

See Slab Reinforcing Details this Sheet.

INLET THROAT TYPE 2

See Slab Reinforcing Details this Sheet.

ENGINEER

DESIGN

Roadway

Curb

LIMITS OF THROAT CONSTRUCTION

To be used for R. B. C., D. B. and

To be used for C. & G.

4'-0" DIAMETER

5'-0" CONCRETE

Support Post

5'-0" Concrete or 8" Brick

8" Bars 8" O.C. Both Ways.

4'-0" Diameter

SLAB REINFORCING DETAILS

INLETS 1, 2, 3 & 4

TABLE OF VARIOUS DIMENSIONS

<table>
<thead>
<tr>
<th>Dimension</th>
<th>3'-6&quot;</th>
<th>4'-0&quot;</th>
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<tr>
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<tr>
<td>8&quot; Bars</td>
<td>8&quot; O.C.</td>
<td>Both Ways.</td>
</tr>
</tbody>
</table>

GENERAL NOTES

1. The finished grade and size of the inlet are to conform with the finished cross slope and grade of the proposed roadway and parking.

2. When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly.

3. All steel in thresholds shall have 1/8" minimum cover unless otherwise shown.

4. The rear wall of throat Types 1, 2, 3 & 4 may be constructed with brick. Details for the slab required.

5. Reinforcing plans shall be acceptable.

6. For supplement details see no. 000-01.

7. These inlet throats were designed for use with old curb & gutter and Type E curb

8. For curb bottoms see Curb & Gutter No. 000-01.

9. Reinforcing details are to be constructed on a curve, refer to the

10. Traffic shall be limited to the intended purpose, and/or parkway.

11. Bend steel when necessary.

12. Reinforcement shall be either cast-in-place or precast concrete.

13. All steel in throats shall be symmetrical about E.

14. For supplemental details see no. 000-01.

15. These inlet throats were designed for use with curb & gutter and Type E curb

16. Reinforcement shall be either cast-in-place or precast concrete.

17. All steel in throats shall be symmetrical about E.

18. For supplemental details see no. 000-01.
GENERAL NOTES:

1. The finished grade and slope of the inlet tops are to conform with the finished cross slope and grade of the intersected sidewalk.

2. When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly.

3. All steel in throats shall have the minimum cover unless otherwise shown.

4. The cover plates shown for rectangular throats (Type E) are necessary only when throats are to be used in conjunction with circular inlet boxes or when used in isolation with rectangular inlet boxes.

5. See Index (D) for supplementary details.

6. These inlet throats were designed for use with curb B shown for Type B curb and Type E curb. Locate outside of pedestrian cross traffic if possible.

7. For inlet bottoms see Index no. DSB-01.

8. Tack weld cover to frame in 6 places.

9. All steel used for frame and cover shall meet the requirements of ASTM A-36.

10. Alternate Type E Cover is specified in plans. Steel cover to be hot dip galvanized after fabrication. All exposed joints to be sealed with below ground sealer.

SOLID STEEL COVER DETAIL

INLET TOP MODIFICATION FOR TYPE "E" CURB
TO BE PAID FOR AS INLET

ELEVATION

SECTION "B-B"

CONSTRUCTION JOINT PERMITTED

SECTION "A-A"

CONSTRUCTION JOINT PERMITTED

DETAIL

REINFORCING STEEL DIAGRAM

TOP SLAB OF INLET

NOTES:
1. NO REINFORCING BARS 1/2" CENTERS UNLESS OTHERWISE NOTED.
2. CUT AND BEND BARS OUT OF WAY OF PIPES WHEN NECESSARY, BARS TO CLEAR PIPE BY 1'-6".
3. FOR SUPPLEMENTAL DETAILS SEE INDEX NO. DSD-01.
4. THIS INLET WAS DESIGNED FOR USE WITH TYPE D MEAN CURB OR TYPE 33 3/4" TRAFFIC SEPARATOR, LOCATE OUTSIDE OF PEDESTRIAN CROSS TRAFFIC.

REVISIONS

FHWA APPROVED 5-1-75
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION
CURB INLET - TYPE "B"
GENERAL NOTES
1. Cost of ditch paving to be included in cost of inlet.
2. Reinforcing: No. 4 bars at each 12" center both ways, 2" clearance to inside face.
3. Inlet to be used only where flow thru grate is less than 7 c.f.s.
4. Where material unsatisfactory for foundation is encountered at F.L. Elev. omit floor and carry walls down to satisfactory foundation. Backfill to F.L. with clean sand.
5. Direction of 3/4" x 3/8" bars to be in same direction as predominant flow.
6. Chamfer exposed edges. (3/4" chamfer.)
7. Cut and bend bars out of way of pipe when necessary. Bars to clear pipe by 3/4".
8. For supplemental detail, see index DS0-01.
9. Recommended maximum pipe sizes are for concrete pipe. Check larger sizes for fit for larger pipe. Type "B" inlet or J-A inlet (see detail above) should be considered.
10. This inlet was designed for ditches, medians, or other areas subject to heavy wheel loads where debris may be a problem. It is not for use in areas subject to pedestrian and/or bicycle traffic.
11. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
1. Cost of ditch paving to be included in cost of inlet.
2. Reinforcing—8 bars at 12" centers both ways 2" clearance to inside face.
3. For supplementary details see Index No. 10-22-01.
4. Cut and bend bars out of way of pipe when necessary, bars to clear pipe by 1/16".
5. Where material unsatisfactory for foundation is encountered, do not carry walls down to satisfactory foundation, backfill with clear sand.
6. This inlet has been designed for ditches, medians, or other areas subject to heavy wheeled loads where debris may be a problem.
7. For more than 7 CF's thru grate, it is not for use in areas subject to pedestrian and bicycle traffic.
8. Recommend 16" pipe as maximum size for concrete pipe. For larger pipe, "J" block should be considered.
9. When alternate "J" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.

**Paving Detail for All Inlets**

**Typical Ditch Block**

For all inlets except sag inlets

**Steel Grating Detail**

Two required per inlet

5" border, Florida Steel, mining, diamond, Reinforced, or equal

Welded bars 6 x 1/2, intermediate bars 1/2 x 1/2, Reinforced bars

4 1/2 x 4 1/2, 0.120, 5 1/2 x 5 1/2, 0.129

**General Notes**

- Cost of ditch paving to be included in cost of inlet.
- Reinforcing—8 bars at 12" centers both ways 2" clearance to inside face.
- For supplementary details see Index No. 10-22-01.
- Cut and bend bars out of way of pipe when necessary, bars to clear pipe by 1/16".
- Where material unsatisfactory for foundation is encountered, do not carry walls down to satisfactory foundation, backfill with clear sand.
- This inlet has been designed for ditches, medians, or other areas subject to heavy wheeled loads where debris may be a problem.
- For more than 7 CF's thru grate, it is not for use in areas subject to pedestrian and bicycle traffic.
- Recommend 16" pipe as maximum size for concrete pipe. For larger pipe, "J" block should be considered.
- When alternate "J" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
Recommended Maximum Pipe Sizes:

- **Type A**: 6" O.D. max. - 82" Pipe
- **Type B**: 8" O.D. max. - 108" Pipe
- **Type C**: 10" O.D. max. - 132" Pipe
- **Type D**: 12" O.D. max. - 156" Pipe
- **Type E**: 14" O.D. max. - 180" Pipe
- **Type F**: 16" O.D. max. - 204" Pipe
- **Type G**: 18" O.D. max. - 228" Pipe
- **Type H**: 20" O.D. max. - 252" Pipe

**Notes:**
- Types A and B to be used only when openings are required in one side of wall. Cast iron grates not permitted.

**General Notes:**
1. **Beveled Edges**: All exposed corners and edges to be chamfered 3/4".
2. **Foundation Material**: Where material unsatisfactory for foundation is encountered at Fl. El., use reinforced concrete or fill with satisfactory foundation. Backfill to Fl. with cast soil.
3. **Cast Iron**: In accordance with Florida Department of Transportation Specifications.
4. **Steel Grating**: Manufactured by Borden, Florida Steel, Rinaldi, General or equal.
5. **Structures**: These structures are not to be placed in areas subject to heavy wheel loads.
6. **Details**: For supplementary data see Standard Index DSD-01.
7. **Pipe Sizes**: Recommended minimum pipe sizes given are for concrete pipe. Larger than recommended sizes must be checked for stability.
8. **Uses**: When used without seals, all struts must be subject to infrequent traffic loads which develop a maximum load equal to the pipe weight. Where objects are a problem, ends should be sealed controlled by safety criteria.
9. **Steel Grating**: Type C grates are specified in plan. The grate is to be hot dip galvanized after fabrication.
GENERAL NOTES

1. Cost of Ditch Paving to be included in cost of inlet.
2. Reinforcing - NYA 4 bars at 12" centers both ways with 2" 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" Main bars to be in some direction as predominant flow.
5. Chamfer exposed edges. (1/2" Chamfer)
6. Cut and bend bars out of way of pipe when necessary; Bars to clear pipe by 1 1/2".
7. For supplemental details, see Index DSD-01.
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 was designed for ditches, medians, or other areas subject to heavy wheel loads where debris may be a problem and pedestrian traffic is anticipated. It is not for use in areas subject to bicycle traffic.
10. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.

STATE PROJ. NO. 99-000755

PREDOMINATE FLOW

SECTION B-B

PLAN

Recommended Maximum Pipe Sizes (See Notes 4 & 6)
2"-1/2" Wall - 54" 4'-0" Wall - 36"

STEEL GRATING DETAIL

Note: Two required per inlet
Main Bar 6" x 1/2" (Notched for cross bars)
Cross Bar 3" x 1/2" (Continuously welded at main bar notches)
Main Bar and Cross Bars flash on top.

SECTION A-A

SECTION C-C

SECTION D-D

TYPICAL DITCH BLOCK

For all inlets except eye inlets

"J-J" DETAIL

NOTES:

2" top to be oriented as required by Note 4.

FLORIDA DEPARTMENT OF TRANSPORTATION

Road Design Section

DITCH BOTTOM INLET-TYPE "J"

REVISIONS

INITIAL DATES

Approved by:

W.J.R.

1 OF 1

DD/05
**PLAN (WITHOUT GRATE)**

**SECTION A-A**

**SECTION B-B**

**SECTION C-C**

**DETAIL OF SHOULDER GUTTER SECTION D-D**

**SHOULDER GUTTER TRANSITION AT INLET TYPE "S"**

**GUTTER SECTION AT INLET**

**STEEL GRATING DETAIL**

**GENERAL NOTES**

1. This inlet was designed for shoulder gutters subject to heavy wheel loads on sections where bicycle traffic is not anticipated (i.e., limited access, rural sections). Also may be used in locations where the wide opening in the "A" and "B" inlets are unacceptable.

2. All reinforcing steel bars are 1/2" @ 12" centers.

3. Cut and bend bars out of way of pipe when necessary. Bars to clear pipe by 1 1/2".

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

5. Recommended maximum pipe sizes based on concrete pipe: Section A-A, 36" pipe; Section B-B, 24" pipe. Larger pipe sizes may be used but should be checked for fit as "S" detail is recommended for larger pipe sizes.

6. For supplementary details see index numbers DSO-01 and DSB-01.

7. Grate and top of structure shall be true to grade shown on plans.

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

**FHWA APPROVED: 5-1-75**

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

**GUTTER INLET-TYPE'S**

**NOTE FOR DETAILS OF "J" BOX SEE INDEX NUMBER DSB-01**
GENERAL NOTES

1. WALLS OF VARIOUS STRUCTURES, SUCH AS SQUARE OR CIRCULAR CONCRETE, MAY BE CONSTRUCTED EITHER IN PLACE OR PRECAST UNITS.

2. WALLS, INCLUDING MANHOLE AND JUNCTION BOX TYPES, SHALL BE CHECKED FOR FLOTATION BY DESIGNER OF PROJECT.

3. JOINTS BETWEEN WALLS AND STRUCTURES SHALL BE CHECKED FOR CORRECT INSTALLATION.

4. STRUCTURES WITH EXISTING OVER 18" WALLS TO BE CHECKED FOR FLOTATION BY DESIGNER OF PROJECT.

5. STRUCTURES WITH EXISTING OVER 18" WALLS TO BE CHECKED FOR FLOTATION BY DESIGNER OF PROJECT.

6. STRUCTURES WITH EXISTING OVER 18" WALLS TO BE CHECKED FOR FLOTATION BY DESIGNER OF PROJECT.

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13. STRUCTURES WITH EXISTING OVER 18" WALLS TO BE CHECKED FOR FLOTATION BY DESIGNER OF PROJECT.

14. STRUCTURES WITH EXISTING OVER 18" WALLS TO BE CHECKED FOR FLOTATION BY DESIGNER OF PROJECT.
Channel to be formed with either half-pipe and mortar or brick and mortar.

SECTION X-X

SECTION Y-Y

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 at all drainage structures with two or more pipes.

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

DETAIL OF EYE BOLT AND CHAIN
FOR LOCKING GRATES TO INLETS

Note: One required per inlet grate.

COVER FOR ALL FRAMES
(WHEEL LOADS H-20)

DETAIL OF LADDER BARS
Use for box heights over 10'-0".

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

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
SUPPLEMENTARY DETAILS FOR MANHOLE & INLET STRUCTURES

FRAME AND COVER DETAILS

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

Min. clearance between obstruction and flow line of outlet pipe, also normal flow channel is not to be constructed when obstruction is below outlet pipe. Normal flow channel is not to be constructed when obstruction is below outlet pipe.

- For structure type see plans.

TYPE II

Steel or Cast Iron Fit Stainless Steel Joint

Continuous Weld (Water-Tight)

NOTE: For structure type see plans.

DESIGNER'S NOTE: "Super" conflict manholes shall not be used unless the system is hydraulically designed to take in account the head loss generated if the sump is completely blocked. "Super" conflict manholes must be larger than those normally provided.

DETAIL SHOWING PIPE CONSTRUCTION THRU STORM SEWER STRUCTURES

NOTES:
1. Any type joint may be used in conjunction with any other type joint.
2. All grouted joints are to have a maximum thickness of 1".
3. Keyways are to be a minimum of 1/2" deep.
4. Joints shall be #4 bars, 15" long with a minimum of 6 bars per joint evenly spaced.
5. Minimum cover on reinforcing bars is 1 1/4".

OPTIONAL CONSTRUCTION JOINTS

DITCH PAVEMENT PAD FOR STANDARD DITCH BOTTOM INLETS

ALTERNATE A

Remove riprap and place concrete plug in pipe just prior to placing base material. Fill hole in subgrade and compact.

ALTERNATE B

DETAIL OF TEMPORARY SUBGRADE DRAINS (Optional with Contractor)

NOTE: For all manhole, inlet, and junction box structures, the mortar to seal the pipe into the walls of the precision 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 max. req'd. O.D.

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For estimating purposes only:

1. Cost of ditch pavement pad to be included in cost of inlet.
2. Ditch pavement pad to be used only where shown on the plans.
**STATE ROAD DEPARTMENT OF FLORIDA**

**ROADWAY PLANS DEPARTMENT**

**SAFETY MODIFICATION**

**SAFETY MODIFICATION FOR OPENING IN BOX CULVERTS**

**NOTE:** These modifications will be made only on Projects now under construction. Do not use this Index for Projects being designed.

**PROPOSED DITCH MODIFICATIONS WHERE GRATE HAS SET 0.5' ABOVE DITCH ELEV.**

**PROPOSED INLET MODIFICATION WHERE GRATE WAS SET 0.5' ABOVE THE DITCH.**

**MEDIAN INLET DESIGN AS SHOWN ON THE PLANS.**

**MEDIAN INLET DESIGN AS SHOWN ON THE PLANS.**

**SAFETY MODIFICATION FOR MEDIAN INLETS.**

**DETAIL OF MEDIAN ENDWALL**

(MODIFICATION OF DETAILS SHOWN ON INDEX DORS)

ROADS: 1.0" C."-11

Class 1 Concrete 10% Cu. Vol., Cast of Steel to be included in price for Concrete

**SECTION A-A**

**SECTION B-B**

**PLAN**

**END VIEW**

**DETAIL OF MEDIAN ENDWALL**

Note: 199" minimum clearance on all reinforcing bars.

All reinforcing bars 3/4" bars and an 1/2" at tie.

**SCALE**

1/4" = 1'-0"
Note: This modification will be required where Type E Curb & Gutter is constructed adjacent to the inlet.
TABLE OF CONSTRUCTION DATA AND ESTIMATED QUANTITIES FOR ROUND PIPE CULVERT ENDWALLS

<table>
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<th>CONSTRUCTION DATA</th>
<th>QUANTITIES IN ONE ENDWALL</th>
<th>QUANTITIES OF CLASS I CONCRETE ELLIPTICAL PIPE CULVERT ENDWALLS</th>
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TABLE OF CONSTRUCTION DATA AND ESTIMATED QUANTITIES FOR METAL PIPE ARCH CULVERT ENDWALLS

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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. GRC 01.
3. Provide 2' transition from endwall to ditch slope where side slopes on surfacing ditches are flatter than 1:2:1.

FLORIDA DEPARTMENT OF TRANSPORTATION

CONCRETE ENDWALLS

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REVISIONS
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**TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES**

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

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Note:
- Chamfer all exposed edges 3/4".
- Provide good foundation under pipes using concrete, if natural conditions are very bad.
- Where tie rods are required the cost of same shall be included in the unit price but for concrete.

**TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES**

**PIPE CULVERT ENDWALLS WITH 45° WINGS**

<table>
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<tr>
<th>Opening</th>
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## Table of Dimensions and Quantities for One U-Endwall

### Section A-A

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Note: All dimensions are given to cut box clearance except as noted."
MOUNTING DETAILS FOR STEEL GRATING

STEEL GRATING USE CRITERIA

1. U-TYPE ENDMALL AND/OR ENDMALL TO BE USED ON PIPE CULVERTS WHERE IN THE
   ALLOWABLE CLEAR RECOMMENDED HIGH AND LOW END OF THE FOLLOWING CONDITIONS
   A. CHANNEL AREA TO FOLLOW CONSISTS OF MEDIUM TO HIGH AREAS OR
     AREAS WHERE DESIGN ANGLE GRAY IS MEASURABLE
   B. CHANNEL 5 TO FOLLOW BEAN SHORT FROM OR IN WHICH ALL DESIGNATED CHANNEL
     THAT BEANS TRANSPORT IS NOT CONSIDERED A MAJOR PROBLEM
   C. CHANNEL IS ANCHORED ON ANY INFRARED GAGES TO FHR LEGAL ENTRANCE
     (EXAMPLE: ANCHORAGE BOLTS) OR SLIP CONNECTORS (EXAMPLE: ANCHORAGE BOLTS)
   D. CHANNEL WHERE CHANNEL DIAMETER WITH RESPECT TO COLD WATER SHOULD NOT
     CAUSE NEED FOR SMALL DIAMETER ENTRANCE, TRAFFIC ENDANSERMENT, TRAFFIC OPERATION OR
     UNEVEN PROPERTY

2. STEEL GRATING TO BE USED ONLY WHERE CALLED FOR IN PLANS AND
   SITE OR NEUTRAL AND/OR ENDMALLS HAVING EITHER 011 OR 011 NOTED ON QUOTE

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRADE

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<tr>
<th>GRADE</th>
<th>LENGTH (IN)</th>
<th>BOLT SIZE</th>
<th>X-BOLT</th>
<th>Y-BOLT</th>
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<th>Y-BOLT</th>
<th>C-REBAR</th>
<th>D-REBAR</th>
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<td>14</td>
<td>6.4</td>
<td>6.4</td>
<td>7.7</td>
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GENERAL NOTES:
1. OUT OF GUTTER TO BE USED FOR ALL ENDMALL CULVERT PER POUND
2. OUT OF GUTTER BOLTS AND NUTS TO BE INCLUDED IN ORANGE FLOW ON ENDMALL BOLTS
3. ALL ANGLE, CHANNEL AND BAR STEEL TO BE A 3.5 TON A588 WEATHERING STEEL
4. Channel section C3 354 may be used as an alternate for C3 40 Channel
GENERAL NOTES

1. Flared end sections shall conform to the requirements of ASTM T6 with the exception that dimensions and reinforcement shall be as described in the note above. Circumferential reinforcement may consist of either one cage or two cages of steel. Compressive strength of concrete shall be 4000 psi. Shop drawings for flared and 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 the following types unless otherwise shown on the plans:
   a. Joints meeting the requirements of Section 941-1.5 of the Standard Specifications. The manufacturer of the flared end section shall identify the manufacturer of the pipe culvert and certify that the flared end section is suited to joining the pipe culvert.
   b. Joints sealed with preformed plastic gaskets. The gaskets shall meet the requirements of Section 942-2 of the Standard Specifications and the minimum size for gaskets shall be as that specified for equivalent sizes of elliptical pipe.
   c. Reinforced concrete jackets, as detailed on this drawing. Cost of the reinforced concrete jacket to be included in the contract unit price for the flared end section. When non-coated corrugated metal pipe is called for in the plans, the pipe shall be bituminous coated in the jacketed area as specified on the Standard Specifications. Bituminous coating to be included in the contract unit price for the pipe culvert.
   d. Toe walls shall be constructed when shown on the plans or at locations designated by the Engineer. Toe walls are to be cast in place with Class I Concrete and paid for under the contract unit price for Class I Concrete (Miscellaneous) with steel to be erected in cost of toe wall.
   e. Sodding shall be placed about the flared end section in accordance with Index GRC-01, and paid for under the contract unit price for Sodding.

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

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

DESIGN NOTES

1. Flared end sections are intended for use outside the clear recovery area on median drain and cross drain installations. Flared and sections are not intended for side drain installations.

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

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

PLAN
SHOWING BARS IN FOOTING

HALF ELEVATION
SHOWING BARS IN FRONT FACE OF WALL

HALF ELEVATION
SHOWING BARS IN BACK FACE OF WALL

- GENERAL NOTES -

DESIGN SPECIFICATIONS: A.A.S.H.O., 1973
CHAMFER: All exposed edges and corners to be chamfered 32 unless otherwise shown
REINFORCING STEEL: Grade 40 or 60

BILL OF REINFORCING STEEL

<table>
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<th>ITEM</th>
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<th>QUANTITY</th>
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<td>Cu. Yd.</td>
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FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS
SECTION 2-19-74

- NOTE: All bar dimensions are cut to cut
NOTE: All Bar dimensions are out-to-out.
PLAN
SHOWING BARS IN FOOTING

HALF ELEVATION A
SHOWING BARS IN FRONT FACE OF WALL

HALF ELEVATION B
SHOWING BARS IN BACK FACE OF WALL

GENERAL NOTES
CHAMFER: All exposed edges and corners to be chamfered 3/4" unless otherwise shown.
REINFORCING STEEL: Grade 40 or 60.

NOTE: All bar dimensions are out to out.

BILL OF REINFORCING STEEL

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<tr>
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<tr>
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<tr>
<td>Reinforcing Steel</td>
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BENDING DIAGRAMS

NOTE: All bar dimensions are out to out.

ESTIMATED QUANTITIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION
STANDARD ENDWALL FOR 79" x 49" CMP ARCH

NOTE: For coding around endwall, see detail on Index No. GRC-01.
**BILL OF REINFORCING STEEL**

**GENERAL NOTES**

- DESIGN SPECIFICATIONS: AASHTO - 1973
- REINFORCING STEEL: 40° F-50 S
- STRESSES: F = 60,000 F = 1,000
- CHANGES: All changes are to be classified unless otherwise noted.

**CONCRETE CLASS**: E

**UNIT**: 

**DESCRIPTION**: reinforcing steel

**UNIT QUANTITY**: lbs.

**TOTAL**: 660 lbs.

---

**GENERAL NOTES**

- All bar dimensions are out to get.
- For odd dimensions, see detail on Index No. 660-61.

---

**BENDING DIAGRAMS**

**SIZES**

**ITEM**

- 3-14" Staggered
- 1-12" Plain
- 3-9" Staggered
- 2-8" Plain
- 2-6" Plain
- 2-4" Plain
- 3-10" Plain

---

**PLAN**

- Showing bars in footing

---

**SECTION A-A**

- Showing bars in front face of wall

---

**HALF ELEVATION**

- Showing bars in back face of wall

---

**TYPICAL SECTION**

- Thru endwall

---

**GENERAL NOTES**

- Bars above 15'-6" height.
- All bars are bent as indicated.

---

**FLOIDA DEPARTMENT OF TRANSPORTATION**

**PLAN NO.**

**SECTION**

**APPROVED**

FHWA

**CONCRETE CLASS**

- E

---

**GENERAL NOTES**

- For odd dimensions, see detail on Index No. 660-61.

---

**BILL OF REINFORCING STEEL**

**GENERAL NOTES**

- DESIGN SPECIFICATIONS: AASHTO - 1973
- REINFORCING STEEL: 40° F-50 S
- STRESSES: F = 60,000 F = 1,000
- CHANGES: All changes are to be classified unless otherwise noted.

**CONCRETE CLASS**: E

**UNIT**: 

**DESCRIPTION**: reinforcing steel

**UNIT QUANTITY**: lbs.

**TOTAL**: 660 lbs.

---

**GENERAL NOTES**

- All bar dimensions are out to get.
- For odd dimensions, see detail on Index No. 660-61.

---

**BENDING DIAGRAMS**

**SIZES**

**ITEM**

- 3-14" Staggered
- 1-12" Plain
- 3-9" Staggered
- 2-8" Plain
- 2-6" Plain
- 2-4" Plain
- 3-10" Plain

---

**PLAN**

- Showing bars in footing

---

**SECTION A-A**

- Showing bars in front face of wall

---

**HALF ELEVATION**

- Showing bars in back face of wall

---

**TYPICAL SECTION**

- Thru endwall

---

**GENERAL NOTES**

- Bars above 15'-6" height.
- All bars are bent as indicated.

---

**FLOIDA DEPARTMENT OF TRANSPORTATION**

**PLAN NO.**

**SECTION**

**APPROVED**

FHWA

**CONCRETE CLASS**

- E

---

**GENERAL NOTES**

- For odd dimensions, see detail on Index No. 660-61.
GENERAL NOTES

1. This endwall is to be used only in the clear recovery area for the drainage of medians and other areas having low flow velocities and negligible debris.
2. Reinforcing Steel: All bars are size #2. Spacings shown are center to center. Laps to be 12" minimum. Clear above #2 level as noted.
3. Bars welded to #2 (Special locations will be designated in plans). All bars are ASTM A 588 weathering steel. If exposed to salt water, (Specific locations will be designated in plans) grate to be fabricated from ASTM A 572, Grade 50, then galvanized.
4. Endwall to be paid for per each. Payment shall include cost of concrete, reinforcing, grate, and accessories. Quantities shown are for estimating purposes only.
5. Soil slopes 5' each side and above endwall. Sodding to be paid for under contract unit price for sodding.
6. Precast of this endwall will be permitted. Precast units shall conform to the dimensions shown in addition to the General Notes. Request for shop drawing approval shall be directed to the D.O.T. Engineer of Drainage.
7. Concrete meeting the requirements of ASTM C 476 (4,000 PS.I.) may be used in lieu of Class I concrete for preset units.

TABLE OF DIMENSIONS AND QUANTITIES

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<thead>
<tr>
<th>Pipe Size</th>
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<td>#2</td>
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TOTAL SODDING (Sq. Yds.)

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## Dimensions & Quantities

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**Concrete Slab, 3" Thick, Reinforced with 6"x6" 10/10 Welded Wire Fabric.**

**Concrete Slab, 3" Thick, Reinforced with 6"x6" 10/10 Welded Wire Fabric.**

**Note:** See Sheet 4 for Details and Sheet 5 for Notes.
GENERAL NOTES

1. 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.

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

3. Round pipe size 30" or greater and pipe-arch size 35" x 24" or greater shall be grated unless excepted in the plans. Smaller sizes of pipe shall be grated only when called for in the plans.

4. The lower grate on trailing downstream ends on divided highways shall be omitted.

5. Base metal exposed during fabrication shall be protected 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-123.

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

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

8. Round pipe mitered end sections may be used with any type of side drain pipe, mitered end sections shall be constructed in accordance with the details shown for corrugated metal pipe (including anchor bolts, grates, etc.) may be used with any type of 12", 18", or 24" side drain pipe.

9. When the mitered end section pipe is dissimilar to the side drain pipe, a concrete jacket shall be constructed in accordance with Standard Index D-69.

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

DESIGN NOTES

1. In critical hydraulic locations, grates shall not be used unless 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 2).

2. The design engineer shall determine highly corrosive locations and specify in the plans when the grates shall be hot-dipped galvanized after fabrication (General Note 4).

3. The design engineer shall determine and designate in the plans which alternate types of mitered end section will not be permitted. The restriction shall be based on corrosive or structural requirements.
**Details for concrete and round corrugated metal pipe, concrete pipe shown.**

1. Sod slopes 2' each side and top and ditch 4' beyond toe.

GENERAL NOTE

**Estimated Quantities & Dimensions**

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<th>Pipe Size</th>
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**Estimated Quantities & Dimensions**

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**GENERAL NOTE**

1. Sod slopes 2' each side and top and ditch 4' beyond toe.


3. Reinforced Concrete Slope Pavement 3" Thick, 6"x6" 10/10 Welded Wire Fabric; 2' Wide Sides and Top.
### DIMENSIONS AND QUANTITIES

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<thead>
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**Concrete Slab, 3" Thick, Reinforced with 6" x 6"**

10/10 Welded Wire Fabric.

**TOP VIEW - SINGLE PIPE**

**TOP VIEW - MULTIPLE PIPE**

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**CROSS SECTION - Mitered End Section**

**SINGLE AND MULTIPLE CORRUGATED METAL PIPE ARCH**

**SHEET 3**

**NOTE:** See Sheet 4 for Details and Notes.
GENERAL NOTES

1. The cost of all pipe(s), reinforcing, connectors, anchors and concrete shall be included in the contract unit price for mitered and section, each. Sodding not included.
2. The reinforced concrete slab shall be constructed for all sizes of cross drain pipe and cost 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 and section shall be repaired.
5. Steel pipe used in direct contact with the concrete slab shall be bituminous coated prior to placing of the concrete.
6. Steel pipe used in the assembly of mitered and sections shall be used with any type of cross drain pipe.
7. That portion of corrugated metal pipe in direct contact with the concrete slab shall be constructed with like pipe or concrete pipe.
8. When the mitered and section pipe is dissimilar to the cross drain pipe, a concrete jacket shall be constructed in accordance with Standard Index DM-01.
9. Cross Drain - Mitered End Sections only to be used outside of clear recovery area.

SLOPE AND DITCH TRANSITIONS (Plan View)

ANCHOR DETAIL

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

Concrete pipe connectors detail.

ANCHOR DETAIL

Anchors required for CMP only.
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 corrugations. Place the anchors in the outside crest of corrugation.

Flat washers to be placed on inside well of pipe.

CONCRETE PIPE CONNECTOR DETAIL

Flattened Shape

Edge of Shoulder

Normal Shape

Length of Transition

10 ft

Flattened Shape

Normal Shape

Length of Transition

10 ft
### TABLE OF DIMENSIONS

<table>
<thead>
<tr>
<th>SIZE OF PIPE</th>
<th>H</th>
<th>T</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>X</th>
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<th>TWO PIPE CULVERTS</th>
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### FRONT ELEVATION

- **SECTION Y-Y**
- **SECTION Z-Z**

**TABLE OF DIMENSIONS**

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<tr>
<th>QUANTITIES FOR ONE ENDWALL</th>
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</table>

**SAND-CEMENT ENDWALLS FOR PIPE CULVERTS**

- Florida Department of Transportation
- Roadway Plans Section
- FHWA Approved: Z
- Florida Department of Transportation

Page 1 of 2
Spacing between centers of pipes for multiple pipe culverts.

Symmetrical about this line for single pipe culverts.

Note: Wingwalls based on 2:1 slope

Scale: 1" = 3'-0"
Spacing between centers of pipes for Multiple Pipe Culverts

Symmetrical about this line for Single Pipe Culverts

Quantity in one endwall, cu. yds.

<table>
<thead>
<tr>
<th>1 YD.</th>
<th>2 YD.</th>
<th>3 YD.</th>
<th>4 YD.</th>
<th>5 YD.</th>
<th>6 YD.</th>
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<td>42.0</td>
<td>48.6</td>
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</table>

NOTE: Wingwalls based on 2:1 slope

Scale: 1" = 3'-0"

F HWA APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

QUANTITIES BY

EHH 5-12-54

CHECKED BY

W. CL 5-13-54

REVISIONS ROAD NO. PROJECT NO.

DESCRIPTION

CHANGES

INDEX NO.

REDESIGNED BY

DSE-04

DRAWN

REVISED

SUPERVISED

PURCHASED

3-20-75
Spacing between centers of pipes for Multiple Pipe Culverts.

Symmetrical about this line for Single Pipe Culverts.

NOTE: Wingwalls based on 1:1 slope

SCALE: 1" = 5'-0"

QUANTITY IN ONE ENDWALL, GUIODS
OF SAND-CEMENT RIPRAP

<table>
<thead>
<tr>
<th>Pipes</th>
<th>1 Pipe</th>
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END ELEVATION

PLAN

SECTION A--A

END ELEVATION

PLAN

SECTION A--A

END ELEVATION

PLAN

SECTION A--A
Spacings between centers of Pipes for Multiple Pipe Culverts

Spacings between centers of Pipes for Single Pipe Culverts

END ELEVATION

END ELEVATION

PLAN

PLAN

QUANTITY IN ONE ENDWALL, CU. YDS. OF SAND-CEMENT RIPRAP

<table>
<thead>
<tr>
<th>1 PIPE</th>
<th>2 PIPE</th>
<th>3 PIPE</th>
<th>4 PIPE</th>
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<tr>
<td>20.4</td>
<td>45.8</td>
<td>61.2</td>
<td>76.7</td>
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NOTE: Wingwalls based on 2:1 slope

SCALE: 1"=3'-0"

FMWA APPROVED: 3-20-75

PROJECT NO. 74

FISCAL YEAR NO. 74

DJ. Sep, 1974

Department of Transportation
SAND-CEMENT ENDWALLS FOR 108" x 72" G.M. PIPE ARCH

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1. I-8 Culvert
2. I-8 Culvert
3. I-8 Culvert
4. I-8 Culvert

SECTION A-A

= Official Document

Approved by:

E.H.A.

E.H.H.

H.W.

DSE-07

FMWA APPROVED: 3-20-75
Spacing between centers of pipes for Multiple Pipe Culverts

Spacing required for this line for Single Pipe Arch

NOTE: Wingwalls based on 2:1 slope

SCALE: 1" = 3'-0"

QUANTITY IN ONE ENDWALL, CU-YDS
OF SAND-CEMENT RIPRAP
1 PIPE 2 PIPES 3 PIPES 4 PIPES
22.6 20.3 34.0 39.7

END ELEVATION

END ELEVATION

PLAN

PLAN

SECTION A-A

SEC. B-B

SEC. C-C

SEC. D-D

SEC. E-E

FtD. lfoAO
DIY.
FLA.

NOTE: Wingwalls based on 2:1 slope

SCALE: 1" = 3'-0"

QUANTITY IN ONE ENDWALL, CU-YDS
OF SAND-CEMENT RIPRAP
1 PIPE 2 PIPES 3 PIPES 4 PIPES
22.6 20.3 34.0 39.7

END ELEVATION

END ELEVATION

PLAN

PLAN

SECTION A-A

SEC. B-B

SEC. C-C

SEC. D-D

SEC. E-E

FtD. lfoAO
DIY.
FLA.

NOTE: Wingwalls based on 2:1 slope

SCALE: 1" = 3'-0"

QUANTITY IN ONE ENDWALL, CU-YDS
OF SAND-CEMENT RIPRAP
1 PIPE 2 PIPES 3 PIPES 4 PIPES
22.6 20.3 34.0 39.7

END ELEVATION

END ELEVATION

PLAN

PLAN

SECTION A-A

SEC. B-B

SEC. C-C

SEC. D-D

SEC. E-E

FtD. lfoAO
DIY.
FLA.

NOTE: Wingwalls based on 2:1 slope

SCALE: 1" = 3'-0"
NOTE: Wingwalls based on 2:1 slope
SCALE: 1"=3'-0"

QUANTITY IN ONE ENDWALL, CU. YDS.

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<tr>
<th>PIPE</th>
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State Project No.

Quantity in one endwall, cu. yds.

Sand-cement riprap

Endwalls for 54" x 91" C.M. pipe arch

Symmetrical about this line for Single Pipe Culverts

Spacing between centers of pipes for Multiple Pipe Culverts
NOTE: Wingwalls based on 2:1 slope
SCALE: 1" = 3'-0"
METAL NO. I WIDE DETAIL OF GAGE CONCRETE POST ILLUSTRATED. THIS METHOD ALSO APPLIES TO STEEL POST INSTALLATIONS.

BRACE DETAIL OF SAME NO. 7 GAGE.

3" MAXIMUM SPACING FOR LINE POSTS COMPLETELY SET BY DIGGING, CENTER OF SOIL TAMPED SECURED 7 ON ALL POST.

DETAILS OF TYPE "A" FENCE (ILLUSTRATED FOR CONC. POSTS AND BRACES)

GENERAL NOTES FOR ALL FENCE TYPES

1. THIS FENCE TO BE PROVIDED GENERALLY IN RURAL AREAS.
2. POSTS AND BRACES MAY BE EITHER STEEL, ALUMINUM, TIMBER OR CONCRETE.
3. STEEL POSTS AND BRACES SHALL BE STANDARD STEEL POSTS GALVANIZED AT THE RATE OF 2 OZ. PER SQ. FT. TOGETHER WITH NECESSARY HARDWARE AND WIRE CLAMPS AND MEETING THE FOLLOWING REQUIREMENTS:
   (A) LINE POSTS 8' LONG, 1.53 LBS. PER LIN. FT., STUDDED, ANCHOR PLATE ATTACHED, WITH NECESSARY HARDWARE, CLAMPS, ETC.
   (B) APPROACH POSTS 2' X 2' X 2' X 2' ANGLES, 8' LONG, FABRICATED FOR ATTACHING BRACE, WITH NECESSARY HARDWARE, CLAMPS, ETC.
   (C) FULL AND CORNER POSTS 2' X 2' X 2' X 2' ANGLES, 8' LONG, FABRICATED TO ATTACHING SPACE, WITH NECESSARY HARDWARE, CLAMPS, ETC.
   (D) BRACES 2' X 2' X 2' X 2' ANGLES WITH NECESSARY HARDWARE AND FABRICATED FOR ATTACHING TO POST.
   (E) THE FULL, CORNER, APPROACH AND END POSTS ARE TO BE SET IN CONCRETE AS PER DETAIL (ALSO SEE NOTE NO. 6).
4. ALL TIMBER POSTS (EXCEPT CORNER AND PULL POSTS) ARE TO BE MINIMUM 4" DIA. TIMBER CORNER AND PULL POSTS ARE TO BE MINIMUM 5" DIAMETER. LENGTHS OF TIMBER POSTS ARE AS INDICATED ABOVE FOR CONCRETE POSTS.
   (A) SIMPLIES FOR LINE POSTS TO BE 1/2 MAXIMUM LENGTH, APPROACH CORNER AND PULL POSTS, STAPLE EVERY LINE WIRE AT LINE POSTS, STAPLE EVERY LINE WIRE IN TOP HALF AND TIE THE WIRE IN BOTTOM HALF.
   (B) ADEQUATE CONNECTIONS BETWEEN TIMBER POSTS AND BRACES ARE TO BE PROVIDED.
5. WIRE TO BE WRAPPED AROUND END OR SPLICE POSTS ONLY.
6. LONGER POSTS THAN THOSE CALCULATED ABOVE MAY BE REQUIRED BY THE PLANS OR FOR DEEPER INSTALLATIONS.
7. MATERIAL FOR CLASS I CONCRETE FOR FENCE FOOTINGS MAY BE MEASURED BY VOLUMETRIC AND/OR BY WEIGHT. SECTIONS 340-3-10, 245-10 AND 349-11 OF D.O.T. STANDARD SPECIFICATIONS WILL BE DELETED.
8. THE CONTRACTOR, AT HIS OPTION, MAY USE ANY SUITABLE PREFABRICATED OR MIPS-FIXED CONCRETE POST; HOWEVER, APPROVAL BY THE ENGINEER, OF POSTS NOT SHOWN ON THIS DRAWING, WILL BE REQUIRED PRIOR TO CONSTRUCTION OF THE FENCE.
DETAILS OF TYPE "B" FENCE
(ILLUSTRATED FOR STEEL TUBULAR POSTS)

1. THE FENCE TO BE PROVIDED GENERALLY IN URBAN AREAS.

2. LINE POSTS MAY BE ANY OF THE FOLLOWING:
   (A) GALVANIZED STEEL PIPE - 1 1/2" NOMINAL.
   (B) ALUMINUM COATED STEEL PIPE - 1 1/2" NOMINAL.
   (C) GALVANIZED STEEL ALLOY PIPE - 1 1/2" NOMINAL.
   (D) ALUMINUM ALLOY - 1 1/2" DIA. STANDARDS.

3. CORNER, END OR PULL POSTS MAY BE ANY OF THE FOLLOWING:
   (A) GALVANIZED STEEL PIPE - 2" NOMINAL.
   (B) ALUMINUM COATED STEEL ALLOY PIPE - 2" NOMINAL.
   (C) GALVANIZED STEEL ALLOY - 2" NO. 7 GALV.

4. GALVANIZED STEEL, PIPE AND ALUMINUM SHAPES MAY BE ANY OF THE FOLLOWING:
   (A) GALVANIZED STEEL PIPE - 1 1/2"
   (B) ALUMINUM COATED STEEL ALLOY PIPE - 1 1/2"

5. STEEL, PIPE AND ALUMINUM ALLOY FOR CORNER, END OR PULL POSTS SHALL BE DELETED.

6. MATERIAL, FOR CLASS "B" FENCE FENCING SHOWING BARB WIRE AT ATTACHMENT.
GENERAL NOTES

1. All fabric shall be #8 gage 2" mesh knuckled top & bottom selvages.

2. All gate components shall meet the galvanizing requirements specified in Index No. FTB-01.

3. Cast 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.
Provide 3' of 6" drain pipe unless otherwise noted on plans.

Grating Details

Plan

Longitudinal Section

Transverse Section

NOTES

Decking to be welded to sills (6" BL, 2" W).

Sills (6" BL, 2" W) to be welded to 8" W 20#.

Stringers (8" W 20#) to be anchored with 3/8" anchor bolts (4 bolts per stringer).

Steel bridge floor to be "A" type Air Field Grid, as manufactured by Irving Subway Grating Co., Inc., Long Island City, New York (or equal).

Steel flooring shall be given one shop coat of red lead according to manufacturer's specifications and one field coat of graphite paint.

Structural steel beams shall be given one shop coat of red lead and two field coats of cut back asphalt, grade R.C.-70.

Cut back asphalt may be applied by mopping.

Bill of Reinforcing Steel

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<th>Unit</th>
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<td>SQ. Ft.</td>
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Estimated Quantities

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<tr>
<td>Steel Bridge Floor</td>
<td>SQ. Ft.</td>
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Finishes Approved: 3-20-75
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

CATILE (GUARD)
TEMPORARY SLOPE DRAIN FOR FILL HEIGHTS GREATER THAN 10' OR ROADWAY GRADES STEEPER THAN 1.5%

GENERAL NOTES
Glass Fiber, Bituminized Fiber, Plastic Sheet, or any other material approved by the Engineer may be used to line the Earth Slope Drain.
Pipe Sock Drains may be used as an alternative.

Where there is no existing Concrete Ditch a similar method may be used to anchor the Pipe Sock Drain into the Earthen or Grassed Ditch.

TEMPORARY SLOPE DRAINS FOR FILL SECTIONS

NOTE: THIS IS A SUGGESTED METHOD ONLY. ANY ALTERNATE SOLUTION MAY BE USED AS APPROVED BY THE PROJECT ENGINEER.
GENERAL DESIGN NOTES

1. THE TYPE "B" RETAINER & BASIN IS DESIGNED TO BE USED ON STORM DITCHES TO PREVENT UNDESIRABLE SEDIMENT DEPOSITS IN THE DITCH. THE TYPE "A" RETAINER SHOULD BE USED ON STORM DITCHES WHERE THE DITCH GRADES ARE FLAT OR STEEP. THE TYPE "C" RETAINER IS INTENDED TO BE USED ON STORM DITCHES WHERE THE DITCH GRADES ARE STEEP. THE TYPE "D" RETAINER IS INTENDED TO BE USED ON STORM DITCHES WHERE THE DITCH GRADES ARE FLAT OR STEEP.

2. THE OIL CEMENT RAP-SILT BASIN IS INTENDED TO PREVENT OIL FROM SPILLING INTO NATURAL WATER BODIES. THE OIL CEMENT RAP-SILT BASIN IS INTENDED TO PREVENT OIL FROM SPILLING INTO NATURAL WATER BODIES. THE OIL CEMENT RAP-SILT BASIN IS INTENDED TO PREVENT OIL FROM SPILLING INTO NATURAL WATER BODIES.

3. THE SILT BASIN IS INTENDED TO PREVENT SEDIMENT FROM SPILLING INTO NATURAL WATER BODIES. THE SILT BASIN IS INTENDED TO PREVENT SEDIMENT FROM SPILLING INTO NATURAL WATER BODIES. THE SILT BASIN IS INTENDED TO PREVENT SEDIMENT FROM SPILLING INTO NATURAL WATER BODIES.

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5. THE MEAN IN TYPE "B" RETAINER SHOULD BE LOCATED AT LEAST 10' FROM THE SURFACE AS PRACTICAL. THE MEAN IN TYPE "A" RETAINER SHOULD BE LOCATED AT LEAST 5' FROM THE SURFACE AS PRACTICAL. THE MEAN IN TYPE "C" RETAINER SHOULD BE LOCATED AT LEAST 5' FROM THE SURFACE AS PRACTICAL. THE MEAN IN TYPE "D" RETAINER SHOULD BE LOCATED AT LEAST 5' FROM THE SURFACE AS PRACTICAL.


7. THE SILT BASIN IS INTENDED TO STOP SEDIMENT FROM SPILLING INTO NATURAL WATER BODIES. THE SILT BASIN IS INTENDED TO STOP SEDIMENT FROM SPILLING INTO NATURAL WATER BODIES. THE SILT BASIN IS INTENDED TO STOP SEDIMENT FROM SPILLING INTO NATURAL WATER BODIES. THE SILT BASIN IS INTENDED TO STOP SEDIMENT FROM SPILLING INTO NATURAL WATER BODIES.

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SUGGESTED SEDIMENT CHECK

General Notes:

1. Width and depth of weir may be varied to fit conditions of site. However, as a general guide it should have a depth between 6 to 12" deep with a width between 3' to 6' wide.

2. Top elevation of check should be set to provide an effective check for silt without causing an objectionable backwater. Depending upon site conditions and the particular season of the year the top elevation will have a wide range. As a general guide a suggested trial height of approximately 1/4 the distance between natural ground and ditch bottom be used unless other criteria controls.

3. Additional spill protection may be provided for slope protection as desired.

4. For use in lateral ditches or side ditches.
DETAIL OF FLOATING SILT BARRIER

SECTION A-A

DETAIL OF STAKED SILT BARRIER

GENERAL NOTES

Silt Barrier to Prevent drifting of Silt caused by discharge of Storm Sewers during Construction, dredging or filling operations.

Exact placement of silt barrier shall be so as to effectively control silt dispersion under the conditions present on a particular project.

The details shown on this sheet are suggested methods only. Alternate solutions and usage of materials may be used as approved by the Engineer.

NOTE:

1/4" tear or make to tape forming an intersection of barrier is securing the silt barrier. Drive Brads through the silt barrier to retain the silt barrier in place. The silt barrier may be secured flat between float frames.

10 Mil. Polyethylene Plastic Sheet or suitable alternate to fit existing conditions, as approved by the Engineer.

WOOD PLUMS (DEPTH VARIES)

DETAIL SHOWING PLACEMENT OF STAKED SILT BARRIER AT EXISTING DITCH LOCATIONS

FLORIDA DEPARTMENT OF TRANSPORTATION

EROSION CONTROL DEVICES

SILT BARRIERS

REVISED

INITIALS

D CB

DRAWING NO.

INDEX NO.

1 OF 1

SEC-D4

FLORIDA DEPARTMENT OF TRANSPORTATION

EROSION CONTROL DEVICES

SILT BARRIERS

REVISIONS

INITIALS

DATE

DRAWING NO.

INDEX NO.

1 OF 1

SEC-D4
Hay or Straw Bales

ROADSIDE OR MEDIAN DITCH

DITCH BOTTOM INLET

CURB AND GUTTER INLETS

TEMPORARY SECTION AROUND INLETS OR SIMILAR STRUCTURES

Note: For use on completed or partially completed structures

POSTS

2"x2" Stakes

ELEVATION

Note: To be used where the natural ground slopes toward the toe of slope.

ELEVATION

Note: To be used where the natural ground slopes away from the toe of slope.

DETAIL OF HAY OR STRAW BALES DAM ON PAVED DITCH

HAY OR STRAW BALES BACKED BY FENCE

ELEVATION

Note: Staking may not be needed in the direction of the Engineer.

HAY OR STRAW BALES

MIXED WITH HAY OR STRAW

5" Max.

2"x2" Stakes

PLAN

Types of Temporary Dams

HAY OR STRAW BALES

Note: For use on completed or partially completed structures

HAY OR STRAW BALE DAMS ON TYPICAL 4 LANE DIVIDED HIGHWAY

Note: Payment to be made under Item 104 - Baled Hay or Straw - Ton

Florida Department of Transportation

Road Design Section

Erosion Control Devices

Revisions

Initials Dates

Drawings No. Index No.

HAY OR HAY OR STRAW STRAW

DAM OR DAM DAM

Date

Drawn

Checked

Approved

State Design Engineer

Deputy Design Engineer
Note: All dimensions shown are standard. The details shown on this Index drawing do not supersede the details shown on Index GRC-01.

When otherwise shown on plans this dimension may be reduced to 24'.

Symbols listed Left to Right in order of preference.

Certain types of A-2-4 materials 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.
Variable front slope

Normal slope

L = Length of Transition

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

SECTION C-C

Use larger value of either:
1. \( L = 10 \times H \) (No maximum)
2. \( L = 10 \times \text{Offset} \) (Maximum \( L = 100' \))

DETAIL FOR SETTING LIMITS OF VARIABLE FRONT SLOPES AT DRAINAGE STRUCTURES WHERE FRONT SLOPES ARE FLATTER THAN NORMAL SLOPES.

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 these typical cross-sections present the desired configuration.

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

3. Inlet locations and outlet points should be located, as much as possible, to be compatible with pedestrian traffic and drop curb location.

4. A minimum 0.2% grade should be maintained on all return grades outside inlet limits.

SODDING QUANTITIES

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Note: These quantities are for one pipe.

ENDWALL - INDEX DCE-01

ENDWALL - INDEX DCE-03

ENDWALL - INDEX DCE-04

SODDING QUANTITIES

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Note: These quantities are for one pipe.
ELEVATION DETAIL OF 5;1 x 14"x 5" ANCHORS

ANCHORS STAGGERED 18" C.T.O.

TWO ANCHORS EACH END CHANNEL

NOTE: 5/8" STUDS MAY BE USED IN LIEU OF ANCHORS.

PRECAST CONCRETE SLAB

All Slab 7'-0" Long and 1'-0" Wide

.detail of railroad crossing type "J"

-flexible base and surface

slab

-LIFING & DOVEL HOLE REED (UP TO 1 1/2" DIA.)

OF WATER PIPE GROOVE (1/16"

-sanders to be shaped prior to treatment

-sanders to be shaped prior to treatment

-plan typical slab

-provide hole in channel to fit pipe sleeve and weld

-provide hole in channel to fit pipe sleeve and weld

-section a-a

-section b-b

-alternate end section

-plan skew crossing

-railroad crossing construction by railroad co.

-section a-a

-plan typical slab

-section b-b

-alternate end section

-details of railroad crossing type "J"
**GENERAL NOTES**

1. The furnishing and installing of concrete crossies, together with all necessary, reinforcing, grouting, adjustment and track alignment work shall be done by the Railroad Company at its own cost to the Contractor.

2. All concrete cross, rubber pads, and wood filler blocks shall be furnished and installed by the Railroad Company.

3. Concrete Crosses shall be spaced on 24" centers by the Railroad Company.

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

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

6. Class I Concrete 13/4 thick ties used in construction by road contractor of Concrete Approach Slabs and for paving between crossings (cost to be included in cost of Class I Concrete; see note No. 6).

---

**PLANT LAYOUT**

- **PLAN**
- **SECTION A-A**
- **ELEVATION**
- **SECTION THRU CROSSING**

**TYPES "C" & "D" SLAB DETAILS**

1. No. 3 @ 4" centers.
2. 1½" expansion joint above concrete.
3. Polyethylene pad.
4. 9/16" bolt.
5. ¼" clearance.
6. Viree 6. For our $1.50 lb. Rall.
7. ¼" expansion joint in field using contact cement.

**DETAIL**

- Reinforcing for Concrete Paving between Parallel Track Crossings
- (Cost of reinforcing to be included in cost of Class I Concrete; see note No. 6)
1. This drawing is based on using 5/8" rail on a tangent section and decking fabricated in sections to fit the corresponding sections of the supporting frame. The depth of the Z bars and channels may be varied to fit other rail sections.

2. The framework units are attached to ties by 5/8" x 6 1/2" log screws, and to Headwall by 5/8" anchor bolts. Double coil spring washers are used with lags 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 flap.

4. Flangeway and outside filler timbers to be rabbetted to assure close fit prior to treatment.

5. Ties to be sawed and spaced 18" C to C.

6. Crossing of any angle can be equipped with units of either 45°, 67° 30' 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 on 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.
GENERAL NOTES

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

2. Center slabs are one piece construction allowing for 2 1/4" flange opening. 80 lb. rail is used to encase, armor and reinforce slabs and is held to gage with 3 tie rods per slab.

3. Slabs are installed by a "drift" 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 "drift" 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 2 1/4 degrees (262.04' radius). Special slabs are available for Diamond Crossings, Turnouts, Multiple Tracks, Bridge Decks and Rapid Transit Systems.

6. For additional details, materials required and installation procedures refer to the manufacturers specifications.

SECTION A-A

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6. For additional details, materials required and installation procedures refer to the manufacturers specifications.
GENERAL NOTES

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

2. (a) P.C.C. Pavement Projects:
   Where shoulder pavement adjacent to shoulder gutter is less than 6' wide, it shall be identical to the adjacent roadway pavement beginning with the transverse joint nearest the point of 6' width.

(b) Flexible Base Projects:
   Where shoulder pavement used in conjunction with shoulder gutter is less than 6' uniform width, it shall be identical to the adjacent roadway pavement.

3. Exit and Entrance terminals as detailed shall not be used on ramps for which a speed of 50 M.P.H. or greater cannot be maintained. For such ramps, parallel deceleration and acceleration lanes shall be used in place of tapers with lengths set according to Table J-8 R-10 (1975 A.A.S.H.O. Red Book).

DETAIL C
ENTRANCE TERMINAL
TWO THRU LANES

DETAIL D
ENTRANCE TERMINAL
WITH ADDED LANE
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 cross road at all rural type, unsignalized ramp terminals (interstates and expressway interchanges).

N Narrow shoulder pavement width.
W Adjust for grades over 2% (See P-556 AASHO Red Book).

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

2. Standard cross road exit terminals. To be used when roadway alignment is tangent and no bridges are located within the merging tone. Non - tangent merging terminals are recommended when eardrop is located within the merging tone, turning roadway speed is less than 60% of the thru roadway speed or for the combinations of horizontal alignment shown elsewhere on the plan.

3. 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.

NOTE: Entrances and exits on curves should be avoided when possible.

ENTRANCE ON CURVE

For additional detail see drawing ⑦ and footnote ①.

EXIT ON CURVE

For additional detail see drawing ⑧ and footnote ①.

The details shown on this sheet apply to the cross road design of rural type, unsignalized interchanges.

REVISIONS

THE DETAILS SHOWN ON THIS SHEET APPLY TO CROSS ROAD RAMP TERMINALS ONLY.
### UNITS OF MEASURE

#### STANDARD ABBREVIATIONS

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<tr>
<td>Metric Imperial Imperial Imperial Cubic Yards Per Hour</td>
<td>MIIFYH</td>
<td>ISO, SAE</td>
</tr>
</tbody>
</table>

#### AREA OF THE UNITED STATES

- [Area of the United States](https://en.wikipedia.org/wiki/Area_of_the_United_States)
SECTION PAVEMENT SHORT VERTICAL CURVES

- NORMAL CROWNED SECTION ON CURVING ROADWAY IN WHICH CENTERLINE SLOPE IS IMPERSONALIZED AND INCLUDES TRANSITION ABOUT CENTERLINE AT THIS POINT.

- SUPER ELEVATION TRANSITION AS INDICATED BY THE CURVE FOR THE APPROVED DESIGN SPEED.

- LENGTH OF TRANSITION TO BE DETERMINED BY USING A NORMAL SLOPE OF PAVEMENT EDGE TO PROFILE INDEED GIVEN IN THE TABLE BELOW EXCEPT THAT THE MINIMUM LENGTH OF TRANSITION SHOULDN'T BE 0.06 FT.

- FOR CURVES IN MUNICIPAL AREAS, SEE INDOX NO 005-02.

DETAILS OF SHOULDER CONSTRUCTION WITH SUPERELEVATION:

- SHOULDER ON HIGH SIDE: A SHOULDER SLOPE OF 0.07 FT/FEET IS REQUIRED TO THE EDGE OF THE TRANSITION BEYOND THE OUTER CURVE OF THE ROADWAY AT THE CURVE EDGE. SUPERELEVATION WILL BE STEEPER THAN 0.07 FT/FEET, THE SHOULDER SLOPE OR AS INDICATED ON PLANS.

- SHOULDER ON LOW SIDE: MAINTAIN DEPTH DROP ACROSS INSIDE TRANSITION. FULLY SUPERELEVATED CROSS SLOPE REACHES 0.07 FT/FEET AT THE PAVEMENT EDGE IF THE SHOULDER SLOPES STEEPER THAN 0.07 FT/FEET, THE SHOULDER SLOPE OR AS INDICATED ON PLANS.
SUPERELEVATION DETAILS

For 8 LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN
### Standard Symbols for Plan Sheets

#### SYMBOLS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
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<tbody>
<tr>
<td><img src="example.png" alt="Symbol" /></td>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>City Line</td>
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<td><img src="example.png" alt="Symbol" /></td>
<td>Right-of-Way Line</td>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Fence Line</td>
</tr>
<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>National or State Park or Forest Grant Line</td>
</tr>
<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Railroad (Drainage Maps)</td>
</tr>
<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Railroad (Detail Plans)</td>
</tr>
<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Fence (Limited Access)</td>
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<tr>
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<td>Bridge</td>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Tied Longitudinal Joint</td>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Doweled Transverse Expansion Joint</td>
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<tr>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Transverse Contraction Joint Without Dovels</td>
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<tr>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Edges of Existing Pavement and Sidewalk</td>
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<td>Curb</td>
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<td><img src="example.png" alt="Symbol" /></td>
<td>Curb and Gutter</td>
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<td><img src="example.png" alt="Symbol" /></td>
<td>Levee</td>
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<td><img src="example.png" alt="Symbol" /></td>
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<td>Storage Tank (Surface)</td>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Storage Tank (Underground)</td>
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#### SYMBOLS

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<tr>
<th>Symbol</th>
<th>Meaning</th>
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<td><img src="example.png" alt="Symbol" /></td>
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<td>Shrubbery</td>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Grove or Orchard</td>
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<td><img src="example.png" alt="Symbol" /></td>
<td>Definition of Skew</td>
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<td><img src="example.png" alt="Symbol" /></td>
<td>Concrete</td>
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<td><img src="example.png" alt="Symbol" /></td>
<td>Wood</td>
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<td><img src="example.png" alt="Symbol" /></td>
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#### Utility Adjustment Symbols

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<td>Overhead Power Cable</td>
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<td>Telephone Pole</td>
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<td>Combination Pole</td>
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<td>Guy Wire and Anchor Pin</td>
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<td>Buried Power Cable</td>
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<tr>
<td><img src="example.png" alt="Symbol" /></td>
<td>Electric Duct</td>
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<td>Telephone Duct</td>
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<td>Tower</td>
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<td>Water Main</td>
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<td>Sanitary Sewer</td>
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<tr>
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**Standard Symbols for Key Sheets and Plan Sheets**

- **State of Florida Department of Transportation**
- **Road Design Section**
- **FHWA Approved: 3-3-99**

---

**Key Sheets**

- **Initials**
- **Date**
- **Recorded for Approval**

**Plan Sheets**

- **Initials**
- **Date**
- **Check**
- **Leading D**
- **Supervisor D**
- **GSS-01**

---

**Prepared by:**

- **C.R. B.7**
- **Approved by:**
- **C.R. B.7**

**Drawing Type:**

- **Plan**
- **Plan**
- **Plan**

**Sheet:**

- **2 of 3**
- **G83-01**
### Standard Symbols for Plan Sheets

#### Traffic Signals Symbols

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<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td><img src="image1" alt="Symbol" /></td>
<td>Traffic Signal Head (Span Wire Mounted)</td>
</tr>
<tr>
<td><img src="image2" alt="Symbol" /></td>
<td>Traffic Signal Head (Pedestal Mounted)</td>
</tr>
<tr>
<td><img src="image3" alt="Symbol" /></td>
<td>Traffic Signal Head (Mast Arm Mounted)</td>
</tr>
<tr>
<td><img src="image4" alt="Symbol" /></td>
<td>Traffic Signal Pole (Concrete, Wood, Metal)</td>
</tr>
<tr>
<td><img src="image5" alt="Symbol" /></td>
<td>Vehicle Detector (Loop)</td>
</tr>
<tr>
<td><img src="image6" alt="Symbol" /></td>
<td>Signal Cable (On Messenger Wire)</td>
</tr>
<tr>
<td><img src="image7" alt="Symbol" /></td>
<td>Conduit</td>
</tr>
<tr>
<td><img src="image8" alt="Symbol" /></td>
<td>Vehicle Detector (Others)</td>
</tr>
<tr>
<td><img src="image9" alt="Symbol" /></td>
<td>Pedestrian Detector (Pushbutton)</td>
</tr>
<tr>
<td><img src="image10" alt="Symbol" /></td>
<td>Pedestrian Signal Head (Pole or Pedestal Mounted)</td>
</tr>
<tr>
<td><img src="image11" alt="Symbol" /></td>
<td>Controller Cabinet (Base Mounted)</td>
</tr>
<tr>
<td><img src="image12" alt="Symbol" /></td>
<td>Controller Cabinet (Pole Mounted)</td>
</tr>
<tr>
<td><img src="image13" alt="Symbol" /></td>
<td>Walk - Don't Walk</td>
</tr>
<tr>
<td><img src="image14" alt="Symbol" /></td>
<td>Flash</td>
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<td><img src="image15" alt="Symbol" /></td>
<td>Signal Face Number</td>
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<td>Signal Lens</td>
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<td>Programed Signal Head</td>
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<td><img src="image19" alt="Symbol" /></td>
<td>Messenger Wire</td>
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<td>Pole Tabulation Cross Reference</td>
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<td>Pole Tabulation Cross Reference (Joint Use Pole)</td>
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<td><img src="image22" alt="Symbol" /></td>
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#### Lighting Symbols

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<td><img src="image23" alt="Symbol" /></td>
<td>New Pole &amp; Luminare</td>
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<tr>
<td><img src="image24" alt="Symbol" /></td>
<td>Existing Pole &amp; Luminare</td>
</tr>
<tr>
<td><img src="image25" alt="Symbol" /></td>
<td>Existing Pole &amp; Luminare to be Removed</td>
</tr>
<tr>
<td><img src="image26" alt="Symbol" /></td>
<td>Final Position of Relocated or Adjusted Pole &amp; Luminare</td>
</tr>
<tr>
<td><img src="image27" alt="Symbol" /></td>
<td>New High Mast Lighting Tower</td>
</tr>
<tr>
<td><img src="image28" alt="Symbol" /></td>
<td>City or Utility Owned Luminare &amp; Pole</td>
</tr>
<tr>
<td><img src="image29" alt="Symbol" /></td>
<td>PVC (Polyvinyl Chloride) Lighting Conduit and Conductors</td>
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<td><img src="image30" alt="Symbol" /></td>
<td>Rigid Galvanized Lighting Conduit and Conductors</td>
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<td><img src="image31" alt="Symbol" /></td>
<td>Concrete Lighting Pull-Box</td>
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<td><img src="image32" alt="Symbol" /></td>
<td>Waterproof Lighting Pull-Box</td>
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<td><img src="image33" alt="Symbol" /></td>
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<td>Existing Use Pole</td>
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<tr>
<td><img src="image36" alt="Symbol" /></td>
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#### Signing and Pavement Marking Symbols

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<td><img src="image39" alt="Symbol" /></td>
<td>Double Solid Line</td>
</tr>
<tr>
<td><img src="image40" alt="Symbol" /></td>
<td>Skip Line</td>
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<tr>
<td><img src="image41" alt="Symbol" /></td>
<td>Stop Bar</td>
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<tr>
<td><img src="image42" alt="Symbol" /></td>
<td>Traffic Sign (Post Mounted)</td>
</tr>
<tr>
<td><img src="image43" alt="Symbol" /></td>
<td>Traffic Sign (Overhead)</td>
</tr>
<tr>
<td><img src="image44" alt="Symbol" /></td>
<td>Sign Number</td>
</tr>
<tr>
<td><img src="image45" alt="Symbol" /></td>
<td>Sign Item Number</td>
</tr>
<tr>
<td><img src="image46" alt="Symbol" /></td>
<td>Traffic Flow Arrow</td>
</tr>
</tbody>
</table>
Asymmetrical about L.~ Shoulder,

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

Detail of Tractor Crossing, Type A

Reinforced Concrete

Detail of Tractor Crossing, Type B

Treated Timber

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

The number of mats required will vary with the pavement width. A sufficient number of mats will be used so that the overall width of the tractor crossing will be a minimum of one foot greater than the pavement width. The tractor crossing will be centered on the pavement centerline.

Corners exposed to traffic to be chamfered 1/4"
When distance between curb & sidewalk is greater than 5', no curb or gutter shall be required. When distance between curb & sidewalk is 5' or less, curb & gutter construction shall be arranged so as to avoid distortion in sidewalk continuity.

**General Stabilizing Notes**

1. No stabilizing will be required for Paved Turnouts to Private Property.
2. Stabilized material may be required for Graded Turnouts to Private Property as directed by the Engineer in accordance with Section 402-6 of the Standard Specifications.

**Details of Turnout Construction to Private Property and Graded Roads**

- Open joints are to be made by the Engineer during construction.
- Gravel bed and subbase to be the same as adjacent roadway.
- Limits of clearing & grubbing and stabilizing at intersections.
- Limits of clearing & grubbing and stabilizing at intersections.
- Standard profile for turnout.

**General Notes**

1. Note driveways, turnouts, and side drains are to be constructed without compensation to owners. The Department has the right to change or replace driveways, turnouts, or side drains existing at the time of awarding of contracts or the project if desired by the owner. All new or reconstructed driveways, turnouts, and side drains shall conform to the size limits indicated above.
2. In curvilinear sections where the curving property owner desires installation of turnouts, the Department will provide or will allow the construction of a maximum of two 60' turnouts, to any business establishment or parcel of property, with a minimum of 25' of space between them.
3. In urban areas, or at the request of the curving property owner or his assignee, and to the extent that there is sufficient property, the Department will construct or will allow the construction of two entrances (deep curvatures) of sixty feet each, maximum, separated by a minimum of 50 feet of curbing, but curbing shall be required around all corners.
4. In both urban and rural areas, whenever dual driveways are allowed, that portion of the right-of-way between the driveways shall be paved and outside the pavement limits of the highway shall be maintained in a "no-parking area" and shall be suitably defined by such fences, hedges, trees, or other obstructions as are safe and effective.
CURB, CURB AND GUTTER DETAILS

Note: When Curb or Gutter is constructed adjacent to Flexible Pavement, the 1/2" Expansion Joint shown above will not be used.

DETAILS OF CONCRETE CURB

Note: When Curb or Gutter is constructed adjacent to Flexible Pavement, the 1/2" Expansion Joint shown above will not be used.

GENERAL NOTES

1. For Curb and Gutter and Traffic Separator provide 1'-0" contraction joints at 10' centers.
2. All Curb and Gutter Details are shown for construction adjacent to Concrete Pavement, unless otherwise noted.

CONSTRUCTION OF CURB AND GUTTER ADJACENT TO FLEXIBLE PAVEMENT

Note: When Curb and Gutter are constructed adjacent to Flexible Pavement, the Face of the Gutter shall be sloped as shown in this detail.

EXPANSION JOINT BETWEEN GUTTER AND CONCRETE PAVEMENT

Note: When Curb and Gutter are constructed adjacent to Flexible Pavement, the Face at the Top of the Gutter shall be sloped as shown in this detail.

CONSTRUCTION OF CURB AND GUTTER ADJACENT TO FLEXIBLE PAVEMENT

Note: When Curb and Gutter are constructed adjacent to Flexible Pavement, the Face at the Top of the Gutter shall be sloped as shown in this detail.

GENERAL NOTES

1. For Curb and Gutter and Traffic Separator provide 1'-0" contraction joints at 10' centers.
2. All Curb and Gutter Details are shown for construction adjacent to Concrete Pavement, unless otherwise noted.
PLANT
LOCATION TO MATCH CROSS WALK

NOTES:
1. Ramps shall be constructed to conform to Section 326-94 of Florida Department of Transportation Standard Specifications.
2. Ramps shall not exceed a maximum slope of 1:1.
3. Curb cut ramps are to be located as shown on the plans.
4. Complete curb cut ramps are to be constructed at all locations shown on plans even when sidewalk is not constructed concurrently.

CURB CUT RAMP
FACILITY FOR PHYSICALLY HANDICAPPED
**NOTES:**

1. Bars of payment to be linear feet of transverse measure (W) of the complete joint including subslab, asphaltic concrete, portion of pavement slab over the subslab between the pay lines shown in Section AA and all additional excavation.

2. Concrete in subslab to be Class I or Concrete Pavement Class.

3. Portions of bars A which are outside of the indicated pay lines are to be included in the price bid for complete joint.

4. For additional details see Index No. PJ-01.

5. The K of roadway and the K of bridge do not necessarily coincide. Prior to the placement of the roadway pavement, the K of the roadway pavement shall be determined.

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**ROADWAY DESIGN SECTION**

**BRIDGE APPROACH EXPANSION JOINT FOR CONCRETE PAVEMENT**

**PLAN**

To be paid for as P.C.C. Pavement (S.Y.)

Low slump concrete hand finished in a smooth plane

Prime this surface with minimum 1/4" coating of Asphalt Cement

Asphaltic Concrete placed and compacted in layers not to exceed 2" compacted thickness.

**APPROXIMATE QUANTITIES PER FOOT OF TRANSVERSE MEASURE**

**MAIN LINE PAVEMENT DEPTH**

<table>
<thead>
<tr>
<th>Mark</th>
<th>Size</th>
<th>C/C Length</th>
<th>No.</th>
<th>Weight/Ft. Req'd</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5 12&quot;</td>
<td>4'-0&quot;</td>
<td>4.172</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>5 6&quot;</td>
<td>W-4'</td>
<td>3.129</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>4 6&quot;</td>
<td>7'-6&quot;</td>
<td>10.240</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>4 6&quot;</td>
<td>W-4&quot;</td>
<td>16 10.688</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Revised portion of pavement slab has been converted to equivalent design depth of main line pavement.

**SECTION BB**

Subslab slope to be parallel to pavement slope.

**SECTION AA**

Outside edges of slab to be cast against compacted Subgrade without forms. Top slab edge of side away from bridge to be tooled to present a rounded edge.

**APPROXIMATE QUANTITIES**

<table>
<thead>
<tr>
<th>PER FOOT OF TRANSVERSE MEASURE</th>
<th>MAIN LINE PAVEMENT DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu. Yds. Class I Conc.</td>
<td>0.30 0.30</td>
</tr>
<tr>
<td>Lbs. Rein Steel</td>
<td>28.23 28.23</td>
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<tr>
<td>Tons Asphaltic Conc.</td>
<td>0.156 0.173</td>
</tr>
<tr>
<td>Cu. Yds. P.C.C. Pavement</td>
<td>0.26 0.26</td>
</tr>
</tbody>
</table>

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**ROADWAY DESIGN SECTION**

**BRIDGE APPROACH EXPANSION JOINT FOR CONCRETE PAVEMENT**

**NOTES:**

1. Bars of payment to be linear feet of transverse measure (W) of the complete joint including subslab, asphaltic concrete, portion of pavement slab over the subslab between the pay lines shown in Section AA and all additional excavation.

2. Concrete in subslab to be Class I or Concrete Pavement Class.

3. Portions of bars A which are outside of the indicated pay lines are to be included in the price bid for complete joint.

4. For additional details see Index No. PJ-01.

5. The K of roadway and the K of bridge do not necessarily coincide. Prior to the placement of the roadway pavement, the K of the roadway pavement shall be determined.

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NOTE: Immediately prior to placing the seal, the joint shall be thoroughly cleaned of all foreign material. 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-gage steel, 12" wide and shall be galvanized in accordance with ASTM A-526, Coating Designation G 90.

GENERAL NOTES

1. Quantity of expansion joint to be determined by measurement along the entire length of the joint.
2. For additional details see Index No. PI-01.
3. The £ of roadway and the £ of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the £ of the roadway pavement shall be determined.
4. When the shoulder pavement is constructed with either concrete or econcrete the expansion joints and contraction joint shall be continued over the shoulder pavement.

SECTION A-A THROUGH EXPANSION JOINT

Either of the three Seals shown may be used.

SECTION THRU SEALS

Either of the three Seals shown may be used.
**Concrete Paving Joints**

**Concrete Joint Details**

- **Joint Sealant Details**
  - HOT-POURED SEAL
  - TAPE TYPE BOND BREAKER
  - PREFORMED ELASTOMERIC COMPRESSION SEAL

- **Detail of Transverse Expansion Joint**
  - SAWED METHOD
  - Expansion joints to be spaced at 20' intervals. Dowels required only at first five joints adjacent to expansion joints or end of pavement except as otherwise indicated in detail plans.

- **Detail of Transverse Contraction Joint, Vibro Cast Method**
  - Joint to be spaced at 20' intervals. Dowels required only at first five joints adjacent to contraction joints or end of pavement except as otherwise indicated in detail plans.

- **Detail of But Joint Construction Joint**
  - To be used at discontinuities of work.

**Concrete Paveement Joint Layout**

- **Dowel Requirements**
  - Dowel length, thickness, and spacing indicated in detail plans.

- **Max. Spacing for Tie Bars**
  - Provided in detail plans.

**Revisions**

- Initial: 1973
- Revised: 1976
- Supervised by LMF

**State Proj. No.**

- FL-71

**Florida Department of Transportation**

- Road Design Section

---

**Note:** Tie bars may be formed in plastic concrete by means approved by the Engineer.

**Joining Steel Bars**

- Saw Cut - See Joint Sealant Details for Depth & Width
- Initial Saw Cut or Formed Groove
- Width Saw Cut
- Formed Groove

**Plain Steel Dowel Bar**

- (See Layout Detail)
- See Detail for Depth & Width

**Lubricate as per Specifications**

**Metal Plate Option**

- Keyway may be formed by bolting shaped timber to the side form or by extrusion from slip-former. Alternate keyway shape and tie bar details may be approved by the Engineer.

**Approx. 20' to 25% of t1**

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**State Proj. No.**

- FL-71

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**Lubricate as per Specifications**

**Metal Plate Option**

- Keyway may be formed by bolting shaped timber to the side form or by extrusion from slip-former. Alternate keyway shape and tie bar details may be approved by the Engineer.
**Method of Determining Median Openings at Skewed Side Streets**

A short radius may be placed at breaks in the curb.

**Median Storage Lane - Alt. I**

Curb type A, B, D, E, or F.

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

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<thead>
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<th>L</th>
<th>M</th>
<th>TYPE</th>
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<th>P</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>U</th>
<th>V</th>
<th>R²</th>
<th>W</th>
<th>AREA</th>
<th>MTS</th>
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<td>45°</td>
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<td>18°</td>
<td>11°</td>
<td>8°</td>
<td>2°</td>
<td>12&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
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<td>4'</td>
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<td>0</td>
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<td>2°</td>
<td>12&quot;</td>
<td>18&quot;</td>
</tr>
</tbody>
</table>

Note: The table above is applicable only when 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

DETAILS OF TYPE III CONCRETE TRAFFIC SEPARATOR

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

CONSTRUCTION JOINT DETAILS