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STANDARD SYMBOLS FOR KEY MAPS

- HIGHWAY WITH FULL CONTROL OF ACCESS
- CONTROLLED ACCESS HIGHWAY WITH FRONTAGE ROADS
- INTERCHANGE
- PROPOSED CONTROLLED ACCESS HIGHWAY
- DIVIDED HIGHWAY
- PAVED ROAD—HIGH TYPE
- BITUMINOUS ROAD—MEDIUM AND LOW TYPE
- GRAVEL OR STONE ROAD
- SOIL SURFACED ROAD
- GRADED AND DRAINED ROAD
- UNIMPROVED ROAD
- PRIMITIVE ROAD
- IMPASSABLE ROAD
- PRIVATE ROAD
- DISTANCE BETWEEN POINTS
- STREETS IN INSET AREAS OR DELIMITED URBAN COMPACT AREAS
- EXTENSION OF LOCAL ROADS WITHIN CITY LIMITS
- FEDERAL AID INTERSTATE HIGHWAY
- FEDERAL AID PRIMARY HIGHWAY
- FEDERAL AID SECONDARY HIGHWAY
- NATIONAL FOREST ROAD
- INTERSTATE HIGHWAY
- U.S. NUMBERED HIGHWAY
- STATE HIGHWAY
- RAILROAD
- ABANDONED RAILROAD OR LOGGING TRAM
- RAILROAD STATION OR PREPAY STATION
- GRADE CROSSING
- RAILROAD ABOVE
- RAILROAD BELOW
- AIRPORT, COMPLETE FACILITIES
- AIRPORT, LIMITED FACILITIES
- LANDING AREA OR STRIP
- RUNWAYS
- CANAL OR DRAINAGE DITCH
- NARROW STREAM
- WIDE STREAM
- WIDE STREAM WITH DAM
- DAM WITH ROAD
- LAKE, RESERVOIR OR POND
- LAKE, RESERVOIR OR POND WITH DAM
- INTERMITTENT POND
- MARSH
- SWAMP
- HIGHWAY BRIDGE
- HIGHWAY GRADE SEPARATION
- PEDESTRIAN UNDERPASS OR OVERPASS
- STATE BOUNDARY LINE
- COUNTY BOUNDARY LINE
- CIVIL TOWNSHIP BOUNDARY
- FORBES PURCHASE LINE
- LAND SECTION LINE
- SURVEY BY OTHERS
- NATIONAL OR STATE PARK BOUNDARY
- NATIONAL OR STATE FOREST BOUNDARY
- SCHOOL
- COMMUNITY HALL
- POST OFFICE
- POLICE SCHOOL
- GARBAGE DUMP
- AUTO JUNKYARD
- SANITARY FILL
- SEWAGE DISPOSAL PLANT
- POWER PLANT
- POWER SUBSTATION
- RADIO OR TV CONTROL TOWER
- RADAR STATION
- ANIMAL SHELTER
- LOCKED GATE OR FENCE
- DIRECTIONAL ARROW
- TRIANGULATION STATION WITH NAME
- LOCATION OF SYMBOL
- LOCATION OF INSET BOUNDARY WITHIN MAP
- STATE CAPITAL
- OTHER CITY OR VILLAGE
- CORPORATE LIMITS
- DELIMITED URBAN COMPACT AREA BOUNDARY
- PICNIC GROUND
- BATHING BEACH-SWIMMING POOL
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- TOURIST COURT OR MOTEL
- CAMP OR LODGE
- SMALL STATE PARK
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- COUNTY PARK
- WAYSIDE PARK
- BOAT RAMP
- FIRE CONTROL HEADQUARTERS
- LOOKOUT TOWER
- FISH HATCHERY (POND)
- GAME CHECKING STATION
- PISTOL RANGE
- GOLF COURSE
- COUNTRY CLUB
- FIRE STATION
- RACE COURSE, SPEEDWAY
- DOG TRACK, RODEO ARENA
- RECREATION AREA-HISTORIC SITE
- DWELLING
- GROUP OF DWELLINGS
- SEASONAL DWELLING
- SEASONAL DWELLINGS CLOSELY SPACED
- CHURCH
- CEMETERY
- CHURCH AND CEMETERY
- BUSINESS
- GAUGING OR SMALL PUMPING STATION
- DAIRY
# Standard Symbols for Plan Sheets

## Traffic Signals Symbols

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## Sign/ing and Pavement Marking Symbols

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**State of Florida Department of Transportation**

**Engineer:** [Signature]

---

**Standard Symbols**

- [Signature]

---

**Date:** 5/12

**Scale:** 1/8" = 1'-0"
TEMPORARY SLOPE DRAIN

SLOPE DRAIN APPLICATION

SOD FLUME (SODDING OVERLAPPED)
GENERAL DESIGN NOTES
1. Basins should be as deep as practical with a minimum depth of 2.0 feet.
2. In Type A, the weir shall be located as far from the embank as practical. On steep dikes, grades two or more feet may be required. Intermediate weirs shall be constructed without sliding boards.
3. In Type B, the 6" PVC pipe shall be constructed unless shown otherwise in the plans.

GENERAL CONSTRUCTION NOTES
1. Fence materials shall be aluminum or concrete units.
2. Aluminum posts shall be 5" diameter minimum. Aluminum rail braces shall be in accordance with Index 452. Concrete posts and rail braces shall be in accordance with 452. All 2000's to be cast in concrete.
3. Fabric shall be installed in rows of paving and rail braces, and tied to posts and braces at 6" centers.
4. For additional details on fencing, see Index 452 and 452.
5. All work should be done in close agreement with plans and specifications.
6. Sediment basins to be constructed prior to commencement of final construction. Maintenance and clean out to be by the Contractor until acceptance by Engineer.
FLOATING SILT BARRIERS

LEGEND
- Site Line
- Dredge Area
- Mooring Buoy Anchor
- Anchor
- Barrier Movement Due to Current Action

NOTES:
1. Number and spacing of anchors dependent on current velocity.
2. Deployment of barrier must be planned to allow for accessible construction operations.
3. Migration may require repositioning barrier during construction operations.
4. The above applications indicate Type 1 Floating Silt Barrier; other applications are shown. However, for complete work, Type 2 Floating Silt Barrier may be used. For additional information see Standard Specifications.

FLOATING SILT BARRIER APPLICATIONS
PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

BALES BACKED BY FENCE

DITCH INSTALLATIONS AT DRAINAGE STRUCTURES

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

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

BARRIERS FOR FILL SLOPES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DESIGN

BALED HAY OR STRAW BARRIERS
SHOULDER AND SLOPE TREATMENT IN SAG VERTICAL CURVES
**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".

**Channelization**

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

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

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

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

**Ladder Bars**

Use for box heights over 8'-0".

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

Note: Multiple grates to be chained together.

All covers to be rock graded to frames or Foundation blocks or graded on裸 rounds with epoxy coated steel [2] inches of black epoxy.

**Cover for All Frame**

For Manholes 40 Shown on Index Book

**Cast Iron Frames and Cover**

**Type I**

For Manholes 44 Shown on Index Book
TEMPORARY SUBGRADE DRAINS

UTILITY PIPES THRU STORM SEWER STRUCTURES

OPTIMAL CONSTRUCTION JOINTS

1. Any type joint may be used in conjunction with any other type joint.
2. Bolt weld and joint construction is permitted in conjunction with any.
3. All grouted joints are to have a minimum thickness of 1.0".
4. Keyways are to be a maximum of 1/4" deep.
5. Joint dowels are to be 3.5 bars, 12" long with a minimum of 6 bars per joint evenly spaced.
6. Minimum cover as reinforcing bars is [5/8].

MINIMUM DIMENSIONS FOR BOX AND RISER SEGMENTS

COMPARATIVE SIDE VIEWS (SEGMENTS OF EQUAL DIAMETERS)

GENERAL NOTES

1. For non-circular precise drainage structures, refer to the respective steel-cast pipe guidelines provided.
3. Specifications of tap joints are effective for the reinforcing series (Cas9450-03), providing the width and length of the joint is not less than the width of the space or the space of the cross wall.
4. Wire mesh can continue around the box wall spaced at a distance of not less than the spacing of the cross wall for the specified joint (Cas9450-03).
**GENERAL NOTES**

1. This inlet is used in Traffic Separators Types 1 and 2 that are located in medians constructed with Curbs. Types A, B, and C. Use of this inlet on through traffic sides of the separator is not permitted in medians with Curbs. Types A and B. Locate inlet outside of pedestrian cross traffic.

2. No. 4 reinforcing bars 12" centers unless otherwise noted.

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

4. For supplementary details see Index No. 201.

5. Maximum recommended pipe sizes are 30° angular and 36° transverse. For larger pipes, a J-9 Bottom may be substituted.
GENERAL NOTES

1. This inlet is to be used only in Traffic Separators Types III and V that are located in medians constructed with Curb Types D and F.
Use of this inlet on the through traffic side of the separator should be avoided in medians constructed with Curb Type D (Curb Inlets Types 9 or 10 are recommended). Locate inlet outside of pedestrian cross traffic.

2. No. 4 reinforcing bars 12" centers unless otherwise noted.

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

4. For supplemental details see Index 20H.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION}

CURB INLET

TYPE 8

DRAWN:    DATED:

CHECKED:   APPROVED:

DESIGNER:   DRAWER:

ENGINEER:   CHECKER:

(1 of 1)
FRAME AND GRATE

LONGITUDINAL SECTION

TOP VIEW

TOP SLABS

GENERAL NOTES

1. This unit is specifically designed for locations with light to moderate flow where right of way does not permit the use of tiered Four Ribbed Curb Inlet Type J, as well as on city streets. The curb grate is suitable for pedestrian and bicycle traffic.

2. The Curb and Gutter Type F, Gutter Shoe, and Gutter Type F, Gutter Shoe with a diameter of 12 in. (300 mm) shall be used in the center of the curb where the curb is not serviceable.

3. For all applications, the curb grate shall be located directly above the bottom edge of the grate frame.

4. For bottom Type B applications, top slab openings shall be placed such that 2 edges of the top slab shall be located above the centerline of the grate.

5. For bottom Type C applications, the top slab shall be located directly above the bottom edge of the grate frame.

6. For bottom Type B applications, the top slab shall be located directly above the bottom edge of the grate frame.

7. The curb may be extended with one to six courses of brick.

8. The grate detail shown is shown in Figure 5.20. The grate shall be designed in accordance with ASTM A 48. Grates shall be reversible, right or left.
GENERAL NOTES
1. All exposed edges and corners shall be squared to (1/2") radius.
2. For supplementary details see table in this section.
3. This view was designed for moderate duty, except in areas subject to freeze which utilize concrete for drainage and if subject to pedestrian and/or traffic loads.
4. Where abnormal "C" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
5. Grate and lip of structure shall be true to grade shown on plans.

STEEL GRATING DETAIL
The required for inlet.
5/8" Steel Grating.
Made from 1/2" x 1/2".
Intermediate bars 1/4" x 1/4".
Steel Grating: Manufactured by Design, Florida Steel LOS ANGELES.
NOTE: All ThroughSteel bars are 1/2" x 3/16".

STEEL INLET
Type V

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
KEW INDESIGN

GUTTER INLET
Type V

Plan
Section BB
Section AA

Note: Cutoff and bond bars set of way of pipe when necessary. Bent to clear over 1/2".

Note: Steel Grating, use Detail
Steel Grating as shown in plan.

Construction Joint Information

Precast shown for clarity. See notes for size and location.

Intermediate Bars

Black Bars

Bar 1/2" x 1/2"
GENERAL NOTES

1. COST OF DITCH PAVING TO BE INCLUDED IN COST OF INLET.
2. REINFORCING-1 4 BARS AT 12" CENTERS BOTH WAYS; 2" CLEARANCE TO INSIDE FACE.
3. FOR SUPPLEMENTARY DETAILS SEE INDEX NO. 202
4. CUT AND BEND BARS OUT OF WAY OF PIPE WHEN NECESSARY; BARS TO CLEAR PIPE BY 180°.
5. WHERE NATURAL FLOOR AND CANY WALLS DOWN TO SATISFACTORY FOUNDATION, BACKFILL TO PL. WITH CLEAR SAND.
6. THIS INLET HAS BEEN DESIGNED FOR SITES WHERE EARTHWORK, MEDIAN, OR OTHER AREAS SUBJECT TO HEAVY WEAR, LONG WHERE DEBRIS MAY BE A PROBLEM. MORE THAN 1 1/2" THICK BARS IT IS NOT FOR USE IN AREAS SUBJECT TO PEDESTRIAN AND/or CYCLIST TRAFFIC.
7. RECOMMEND 26' PIPE AS MINIMUM SIZE FOR CONCRETE PIPE; FOR LARGER PIPE, J-B INLET SHOULD BE CONSIDERED.
8. WHEN ALTERNATE B GRADE IS SPECIFIED IN PLANS, THE GRADE IS TO BE MARKED IN CONCRETE AFTER PAVING.
9. SODDING TO BE ADDED UNDER CONTRACT OUT PRICE FOR SODDING PV

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

DITCH BOTTOM INLET
TYPE B

2 REQUIRED PER INLET
5' Border, Florida Steel, Weing, Reinforced Grate (US Foundry, flr equal)
Main Bars: 5 x 1/2' Intermediate Bars: 1/2 x 1/8' Reinforcing Bars
W x flr (or equal)
SODDING AND PAVEMENT FOR INLETS WITHOUT SLOTS AND INLETS WITH NON-TRaversABLE SLOTS

NON-TRaversABLE SLOTS

SECTION AA

SECTION BB

PAVEMENT AND SODDING QUANTITIES

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TRAVERSABLE SLOTS

DITCH BOTTOM INLETS TYPES C,D,E,B,H
1. Cost of Ditch Paving to be included in cost of inlet.
2. Reinforcing - #4 bars at 12" centers both ways with 2" clearance to inside face.
3. Where material unsatisfactory for foundation is encountered at F-L, elevation omit floor and carry walls down to satisfactory foundation. Backfill to F-L with clean sand.
4. Direction of ¾" x 5" main bars to be in same direction as predominant flow.
5. Chamfer exposed edges. (¾" Chamfer)
6. Cut and bend bars out of way of pipe when necessary; Bars to clear pipe by ½".
7. For supplemental details, see Index 201.
8. Recommended maximum pipe sizes are for concrete pipe. Check larger sizes for fit. For larger pipe, a J-J inlet should be considered (see detail above).
9. This inlet is designed for ditches, medians or other areas subject to heavy wheel loads, where only light debris is expected and pedestrian traffic is anticipated. It is not for use in areas subject to bicycle traffic.
10. When alternate D grates is specified in plans, the grate is to be hot dipped galvanized after fabrication.
11. Sodding to be paid for under contract unit price for Sodding, SY.
### Table of Construction Data and Estimated Quantities for Round Pipe Culvert Endwalls

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<tr>
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<th>DIMENSIONS</th>
<th>CONSTRUCTION DATA</th>
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### Table of Construction Data and Estimated Quantities for Metal 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 260.
3. Slopes where adjacent to surficial ditches and flatter than 1:5:1.
GENERAL NOTES

DESIGN SPECIFICATIONS: A.A.S.H.O., 973
CHAMFER: All exposed edges and corners to be chamfered 3/8" unless otherwise shown
REINFORCING STEEL: Grade 40 or 60
SODDING: See Index 2B1

BILL OF REINFORCING STEEL

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<th>SIZE</th>
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<th>LENGTH</th>
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<td>D</td>
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<td>#8 4</td>
<td>1 8</td>
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BENDING DIAGRAMS

NOTE: All bar dimensions are cut to cut

ESTIMATED QUANTITIES

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<th>QUANTITY</th>
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TYPICAL SECTION THRU ENDWALL

FIELD BEND

DOWEL E

GENERAL NOTES

DESIGN SPECIFICATIONS: A.A.S.H.O., 973
CHAMFER: All exposed edges and corners to be chamfered 3/8" unless otherwise shown
REINFORCING STEEL: Grade 40 or 60
SODDING: See Index 2B1
GENERAL NOTES
1. Baffles to be constructed only at locations specified in the plans.
2. When Steel Grating is required on endwall see sheet No. 2 for mounting details.
3. For Sodding around endwall see index No. 286.
4. Reinforcements - No. 4 bars 1' clearance except as noted.

TABLE OF DIMENSIONS AND QUANTITIES FOR BARRIES
SECTION AA

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL WITH BARRIES FOR 2:1 SLOPE
SECTION AA

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL WITH BARRIES FOR 4:1 AND 6:1 SLOPES
AND WITHOUT BARRIES FOR 2:1 SLOPE

WORK ORDER 1504
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRATE OPTIONAL IS TO 30" PIPE
MOUNTING FOR STEEL GRATE

GENERAL NOTES:
1. Cost of grating is to be paid for all endwall grates for round, prestressed quantity.
2. All angle, channel, and bar steel to be A 36.3. A-36 bar, weathering steel, A-572, grade 50 or 50.1, noted in general notes.
3. Endwalls, channel, and bar steel to be A 36.3. A-36 bar. Weathering steel, A-572, grade 50 or 50.1, noted in general notes.
4. Where indicated, all material to match circular, channel, and bar steel to be A 36.3. A-36 bar. Weathering steel, A-572, grade 50 or 50.1, noted in general notes.
5. Endwall, channel, and bar steel to be A 36.3. A-36 bar. Weathering steel, A-572, grade 50 or 50.1, noted in general notes.

STEEL GRATE

SHEET NO. 1 OF 1

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

U-TYPE CONCRETE ENDMALLS
BAFFLES AND GRATE Optional
15" TO 30" PIPE

INSTRUCTIONS FOR INCLUSION:

1. Endwall elements and/or endwall shall be used in the concrete for incorporation into the endwall if one of the following conditions exist:
   A. The endwall area is to exceed 30% of the endwall area.
   B. The endwall area is to exceed 30% of the endwall area.
   C. The endwall area is to exceed 30% of the endwall area.
   D. The endwall area is to exceed 30% of the endwall area.

2. Steel grate to be used only where indicated on plans and not in endwalls and/or endwalls having either 9.1 or 9.1 rites of grade.

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRADE

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<th>SHEET</th>
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NOTE: All dimensions are in inches.
### TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES
##### PIPE CULVERT ENDWALLS WITH U-TYPE WINGS

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### TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES
##### PIPE CULVERT ENDWALLS WITH WING WINGS

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**Note:**
- Check all exposed edges K/A.
- Provide good foundation under pipe using concrete of natural conditions are very bad.
- Where tie rods are required the cost of same shall be included in the unit price bid for Concrete.
- For mastic around outlets see Index No. 266.

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**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**ROAD DEES**

**WINGED CONCRETE ENDWALLS**

**SINGLE ROUND PIPE**
DETAILS FOR SINGLE METAL PIPE ARCH CULVERTS

NOTE: For Multiple Metal Pipe Arch Culvert Spacing between Pipe Centers X

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U-TYPE SAND-CEMENT ENDWALLS

STATE OF MONTANA DEPARTMENT OF TRANSPORTATION
PROJECT NO. 2023-01
U-TYPE CULVERTS
GENERAL NOTES

1. Flared end sections shall conform to the requirements of ASTM 76, with the exception that dimensions and reinforcement shall be as prescribed in the table above. Compensatory 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 shall be submitted for approval by the Engineer of Drainage.

2. Connections between the flared and section and the pipe culvert may be any of the following types unless otherwise shown on the plans:
   a. Joints meeting the requirements of Section 941-1.5 of the Standard Specifications.
      The manufacturer of the flared and 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 gaskets.
      The gaskets shall meet the requirements of Section 941-2 of the Standard Specifications and the minimum sizes 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 used in the pipe, the jacket shall be bituminous coated as specified on Index 280. 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 at locations designated by the Engineer. Toe walls are to be cost and paid for under the contract unit price for Toe Wall Concrete (Concrete Blocks) specified on Index 280.
   e. Siding shall be placed about the flared end section in accordance with Index 281, and paid for under the contract unit price for Spacing and Edge Protection.

DESIGN NOTES

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

2. Reinforced concrete jackets shall be used at all locations where high velocities and/or highly erosive soils may cause disengagement. 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 pavement is provided, except when disengagement would occur if the ditch pavement should fail.
### Dimensions & Quantities

|------|--------|---|---|---|---|---|---|---|-------------|-------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|--------------|

### Notes
- Beveled Or Round Corners

### Section

**TOP VIEW - SINGLE PIPE**

Concrete Slab, 3" Thick, Reinforced
With WWF6X6-W/4WX/4

**TOP VIEW - MULTIPLE PIPE**

Note: See Sheet 5 For Details And Notes.
1. The cost of all pipe, reinforcing connectors, anchors and concrete shall be included in the contract unit price for mitered end sections, each. Seeding not included.

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

3. Concrete pipe used in the assembly of mitered end 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. That portion of corrugated metal pipe in direct contact with the concrete slab shall be bituminous coated prior to placing of the concrete.

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

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

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

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

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

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

Bolt diameters shall be 3/8" for 16" to 36" pipe and 5/8" for 42" to 72" pipe.

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

Bolt holes in pipe shell shall be to be drilled.

ANCHOR DETAIL

All anchors required for CMP only.

Anchor, washer and nuts to be galvanized steel.

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

Flat washers to be placed on inside wall of pipe.
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### Concrete (Cu. Yds.)

- Single Pipe
- Double Pipe
- Triple Pipe
- Quad Pipe

### Sodding (Sq. Yds.)

- Single Pipe
- Double Pipe
- Triple Pipe
- Quad Pipe

---

**Concrete Slab, 3" Thick, Reinforced With WF6x6-W14xW14**

**TOP VIEW - SINGLE PIPE**

**TOP VIEW - MULTIPLE PIPE**

**Note:**

See Sheet 5 for details and Sheet 6 for notes.

---

*Slope:*

To Span Line For Pipe Arch 26'x20' And Smaller

2:1 For Pipe Arch 36'x24' And Larger

**STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION**

**DESIGN**

**SIDE DRAIN**

**MITERED END SECTION**

**SINGLE AND MULTIPLE CORRUGATED METAL PIPE-WALL**

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*Sidewalk Pipe Culv.*

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**Note:**
- See Sheet 5 for details and Sheet 6 for notes.
- To major axis for Pipes 24" x 36" and smaller.
- 2:1 for Pipes 29" x 45" and larger.

**Figures:**
- Top View - Single Pipe
- Top View - Multiple Pipe

**Materials:**
- Concrete Slab, 3" Thick, Reinforced with WRF66: W 6 x 4 W 4

**B. Section:**
- Concrete Pipe, Grates, Connectors, Saddle, and Gasket
- No Pipe Joint Permitted
- Unless Approved by the Engineer
- "R" Pipe to Be Included Under Unit Price For Mitered End Section
GENERAL NOTES

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

2. The cost of all piles, grates, stormers, reinforcing, connectors, anchors, and concrete shall be included in the contract unit price for mitered end section, each. Sealing not included.

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

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

5. Grates are to be fabricated from steel ASTM A 53, Grade B, type. The lower grate on all traffic approach ends shall be Schedule 80 and all remaining grates shall be Schedule 40.

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

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

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

9. Unless otherwise designated in the plans, concrete pipe mitered end sections may be used with any type of side drain pipe, corrugated steel pipe mitered end sections may be used with any type of side drain pipe, and corrugated aluminum mitered end sections may be used with any type of side drain pipe except steel pipe. When aluminum coated metal pipe is specified for side drain pipe, mitered end sections shall be constructed with pipe or concrete pipe. Bimetallic fiber pipe mitered and sections constructed in accordance with the details shown for corrugated metal pipe including anther bolts, apron, etc. may be used with any type of 12", 18", or 24" side drain pipe.

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

11. Ditch transitions shall be used on all grades in excess of 5% as directed by the Engineer.

DESIGN NOTES

1. In critical hydraulic locations, grates shall not be used until potential debris transport has been evaluated by the drainage engineer and appropriate adjustments made. Ditch grades in excess of 5% or pipe with less than 1.5' of cover and grades in excess of 1% will require such an evaluation (General Note 4).

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

1. Details for concrete and round corrugated metal pipe, concrete pipe shown.

2. Sod slopes 2" each side and top and ditch 4" beyond toe.
EXTRA BASE FOR THE PROTECTION OF CULVERTS WITH LESS THAN MINIMUM COVERS

SECTION BB

PLAN

INLET TYPE A GRATE

SECTION CC

PLAN

INLET TYPE B GRATE

INLET IN TOP OF BOX CULVERT

NOTE:
1. Cast of Steel Grating to be included in cost of Box Culvert
2. All material to be 17-500 gage
CONCRETE COLLAR FOR EXTENSION OF EXISTING PIPE CULVERTS

Note: Spikey end to be placed in existing endwell regardless of direction of flow.

SECTION

Reinforced sides are required when inlet or outlet spread is less than 40 in.

INLETS OR MANHOLES ON INTEGRAL PRECAST CONCRETE RISER FOR CONCRETE PIPE

CONCRETE JACKET

FILTER FABRIC JACKET

ELLiptical concrete pipe joints
Cost of concrete jacket and filter fabric jacket to be included in cost of Elliptical Concrete Pipe Culverts.

CONCRETE COLLAR FOR JOINING MAINLINE PIPE AND STUB PIPE

Note: Cost of Masonry to be included in Contract Unit Price for New Pipe.

CONCRETE JACKET FOR CONNECTING DISSIMILAR TYPES OF PIPE

Note: Cost of Concrete and Stucco Coating to be included in Contract Unit Price for New Pipe.

GUARD AT PIPE ENDS

Notes: Guards to be constructed only at locations specified in detail plans.
Cost of guard battens, nuts and sleeves to be included in the contract unit price for concrete.

CONCRETE GUTTER AND DRAINS AT RETAINING WALLS

MISCELLANEOUS DRAINAGE DETAILS

Dr. L. 2 of 3 298
GENERAL NOTES

All cross drain and side ditch pipe structures to be constructed to a length that will be a multiple of 4' joint lengths furnished to the nearest multiple inch equal to, or above that shown in plan except when additional length would require construction outside the right of way.

SCHEDULE OF BELL REINFORCEMENT

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

RAILROAD COMPANY

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SOUTHERN RAILWAY SYSTEM

PRODUCTS OF FARMSink, IN. ( tall ever of 1.010.0)

METHOD FOR DETERMINING THE LENGTH OF SPECIAL PIPE REQUIRED UNDER RAILROADS

Bridge Culvert

BRIDGE CULVERT NUMBER LOCATION

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**Note:** These quantities are for one pipe.

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### SODDING QUANTITIES (SY)

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**Note:** Quantity for 2 1/2 is for endwall with outlets.
Provide appropriate a minimum of 0.20% grade on gutter, slope equally to the surface of the median pavement if necessary, within limits of the median curb or curb and gutter. Construct a drainage pipe or drains at the points or parts of low grade. See details.

Prop. Post. or Curb

Drains

Construct ditch to drain to the proposed drainage system.

Location set by the Engineer during construction.

Prop. Post. for curve if necessary to drain to prop. drainage system.

Match existing grade.

Crown Line (Exit)

Drains

Slope to approximately match that of exit point - min. 0.02'/ft., max. breakover 0.05'/ft.

Pavement for speed change and storage lane.

SECTION A-A

Prop. Post. to exit.

Median

Provide smooth section.

Match existing grade.

SECTION B-B

May be on tangent curves, or at road. Details to be modified for location.

5'

Necessary rubble gutter by State Forces.

SECTION C-C

FLUME DETAIL

MEDIAN OPENING FLUME

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 superwide sections of new 4-lane divided highways. Location of low point of pavement 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 to conform to details plans. Layout above is illustration only. Cost of flumes to be included in the contract price for Median Curb or Curb and Gutter.
Note: Set reflector plates on right-hand curb of bridge 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).

Section AA

Profile of curb to match curb at end of bridge.

SECTION BB

Depress Approach Slab

SECTION CC

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

Estimated Quantities

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<th>Unit</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.
DETAIL OF CONC. SPILLWAY AT END OF SHOULDER GUTTER

(TO BE USED WHERE INLETS, PIPES & EMBANKMENTS ARE IMPOSSIBLE)
SAFETY MODIFICATION FOR INLETS IN BOX CULVERTS
LONGITUDINAL SECTION (NOSE)  
TRANSVERSE SECTION  

**OPTION I**  

**TYPE I CONCRETE TRAFFIC SEPARATOR**  

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<td>For 6&quot; Separator</td>
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<tr>
<td>1&quot; Expansion Joint</td>
<td>(Perforated Filer &amp; Hot Routed Seal)</td>
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LONGITUDINAL SECTION (NOSE)  
TRANSVERSE SECTION  

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</tr>
<tr>
<td>1&quot; Expansion Joint</td>
<td>(Perforated Filter &amp; Hot Routed Seal)</td>
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</table>

NOTES  
1. Separators Types I and II are to be used with flexible pavement. Separators Types III and IV are to be used with rigid pavement.  
2. Either Option I or Option II may be used for Types I and II separators except when a specific option is called for in the plans.  
3. Separators having widths other than 4", 6", or 8" shall be detailed in the plans as special separators and paid for as the contract unit price for either Concrete Traffic Separator (Option I) or Flexible (Type I) IV.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION  
ROAD DESIGN  

TRAFFIC SEPARATORS  

<table>
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<th>Note</th>
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<tr>
<td>3</td>
<td>3.5&quot; Flange</td>
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TYPICAL RETURN PROFILES
INCLUDING DETAIL SHOWING LOCATION OF INLETS ON RETURN

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

1. Ramps to be located in accordance with crosswalk marking details as shown in the plans.

2. Ramps shall not exceed a maximum slope of 1:12.

3. Ramps surface to be fine finish in accordance with subarticle 400-15-2.5 as modified. Approved hard methods may be used.

4. Ramps to be constructed at all locations shown in the plans even when sidewalk is not constructed concurrently.

5. Ramps, including curb and gutter to be reconstructed on existing facilities, are to be paid for under the contract unit price for Concrete Sidewalk, SY.

RAMP ON THIS SHEET TO BE USED WHERE SIDEWALK IS SHARED BY PEDESTRIAN AND BICYCLIST
EXPANSION AND CONTRACTION JOINTS DOWEL ASSEMBLY
THE DAYTON SURE GRIP AND SHORE COMPANY

EXPANSION AND CONTRACTION JOINT DOWEL ASSEMBLY ALTERNATE
FLORIDA STEEL CORPORATION

SECTION AA
Note: Expansion assembly is illustrated. For contraction assembly omit expansion joint members, center splash bars, filter support wire, support tie bars, and dowel bar sleeves.

SECTION BB

EXPANSION AND CONTRACTION JOINTS DOWEL ASSEMBLY
CONCRETE PAVEMENT JOINTS
DETAIL SHOWING RIGID SHOULDER PAVEMENT

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

DETAIL SHOWING SHEET METAL STRIP

NOTE: Immediately prior to placing the seal, the joint shall be thoroughly cleaned of all foreign 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, 2" wide and 1/16" thick. It shall be galvanized in accordance with ASTM A 526, Corrugated Iron Sheet (G90).

GENERAL NOTES

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

SECTION A - A THROUGH EXPANSION JOINT

REINFORCING STEEL

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

SECTION THRU SEALS

Either of the three Seals shown may be used.
GUARDRAIL APPLICATION FOR ROADSIDE HAZARDS

OPPOSING TRAFFIC - DETAIL D

GUARDRAIL APPLICATION FOR MEDIAN AND GORE HAZARDS
UNDIVIDED ROADWAY - DETAIL H

DIVIDED ROADWAY - DETAIL I

GUARDRAIL APPLICATIONS FOR BRIDGE ENDS

GENERAL NOTES

1. The specified applications for guardrail are standard requirements. For sloping intersections a minimum of 62 5 feet of guardrail shall be provided across all hazards. One panel equals 2.5 feet.

2. Post spacing shall be 6.5 feet (except that a reduced spacing of 3.75 feet shall be used for approach to rigid structures such as bridges. (See Details J.)

3. All hazards where the face of guardrail is offset from the traveled way less than the desirable 0.5 feet minimum, a 0.5 foot minimum offset may be used with reduced spacing amounting over the length of the hazard with one panel of approach rail. For an offset less than 0.5 feet, a special detail should be submitted to the Quality Design Engineer, forthwith for approval.

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

5. Straight run guardrails may be used on all radii of 350 feet or greater. For radii less than 350 feet the run must be divided to 350 feet.

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

7. Design load of rail equals 10,000 pounds in tension.

8. Permeable post and offset block combinations are included on page 7 of 9.

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

10. Where necessary to bridge or site additional holes to prevent guardrail, the work will be done by drilling or masonry. Damaged guardrail guardrail will be maintained in accordance with Sections 505 and 507 of the Standard Specifications. No running of holes will be permitted.

11. Amber reflectors shall be used adjacent to auxiliary lanes not within 200 feet of intersections, in all other locations clear reflectors shall be used.

12. Cross currents may be required in lieu of or in conjunction with guardrail at intersections where space does not permit development of sufficient guardrail length, offset or crosswidth at terminals.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

GUARDRAIL
**STANDARD FLARE DETAIL P**

**BEARING PLATE**

**SOIL PLATE**

**STEEL TUBE**

**TIMBER BREAK-AWAY POST**

**END ANCHORAGE TYPE IV**

*Note: For the items of End Anchorage Assemblies Type IV, all must include furcating and anchoring the Buffer End Section, Bearing Plate, One-Piece Anchor Plate, Cable Assembly, Pipe Sleeves, Soil Plates, Steel Tubes, Bearing Plates, and Tapered Timber Break-Away Posts, and the necessary hardware.*

**GUARDRAIL**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

DESIGN REVIEW

| ORDER NO. | DATE | SHEET NO. | SHEET
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GUARDRAIL AND SHOULDER GUTTER TRANSITIONS AT BRIDGE APPROACHES - DETAIL J

GUARDRAIL ATTACHMENT AT HANDRAIL BARRIER - DETAIL N

GUARDRAIL ATTACHMENT AT END POST ON EXISTING BRIDGES

INSTALLATION - CASE I AND CASE II

ANCHOR POST - CASE I

TYPICAL GUARDRAIL INSTALLATION AT EXISTING BRIDGE ENDS
NOTES: (STEEL POST)

1. Anchor bolts or concrete wedge anchors may be used. Anchor bolts are to be installed in accordance with the manufacturer's recommendations, assuming 3000 psi compressive strength for concrete. Wedge anchors shall also meet the following requirements: (6) tensile strength (25,000 psi) (5) tensile strength of steel (7) yield strength of steel (8) bond strength (9) pullout resistance. Anchor bolts (4) each (other structures) 7800 lbs. each (5) each have an encapsulated zinc coating, Type 1 zinc, applied in accordance with ASTM A-154. The coated bolts, nuts and washers shall be chromate treated after coating in a water solution containing 0.2% sodium dichromate (3.0 lbs per 100 lbs. water). Anchor bolts are to be drilled. Encouraged reinforcing steel shall be threaded through holes shall be thoroughly cleaned before setting bolts or wedge anchors and dry when setting bolts. Bolts shall be set in epoxy mortar.

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

4. Steel post and plate assemblies to be galvanized. Any damaged galvanized areas to be metalized in accordance with Section 902 of NA Standard Specifications.

STEEL GUARDRAIL POST MOUNTING TO EXISTING APPROACH SLABS

CONCRETE POST
STANDARD TIMBER, CONCRETE AND STEEL GUARDRAIL POSTS

SPECIAL CONCRETE AND STEEL GUARDRAIL POSTS

GUARDRAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

DESIGNED BY: Date: 8/9 400

CONTRACT NO.: 62-0 150-14/40

E Blocks: 14/40

F/EAW: Approved 8/9/190
CONCRETE MEDIAN BARRIER TERMINAL FOR NARROW MEDIAN
Design Speed 45 M.P.H. or Less

**GENERAL NOTES:**

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

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 A Lt.
   b. Terminated from a stabilized location.
   c. Terminal protection by the use of an impact attenuator 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 walls are an integral part of existing or proposed concrete slab to match an existing or proposed expansion joint.

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

5. When the barrier is installed adjacent to the pavement the top 12" 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 a 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 B on sheet 2.

8. Precast construction is allowed as an alternate to cost-in-place construction.
   a. Section lengths will not be < 20' in length.
   b. Seeding of the precast sections shall be facilitated by the use of sand-cement grout or equal method to assure uniform bearing.
   c. Reinforcement may be required for handling stresses.
   d. See detail C on sheet 2 for transverse joint details.
DETAILS OF TYPE "A" FENCE
(ILLUSTRATED FOR CONC. POSTS AND BRACES)

FASTENER FOR TIMBER POST AND BRACE

BRACE AND POST  
BRACE TO BRACE ON LINE  
BRACE TO BRACE AT CORNER

FASTENER FOR CONCRETE POSTS AND BRACES

ALTERNATE CONCRETE POSTS AND BRACES

CONCRETE BASE FOR ANGULAR STEEL POST
(PULL, CORNER, END AND APPROACH POSTS)

GENERAL NOTES (TYPE "A" FENCE) CONTINUED

B. FOR ANY SUBBASE ASSEMBLIES, ARE DEFINED AS FOLLOW: ALL OR END POST ASSEMBLIES SHALL CONSIST OF ONE END, OR PULL POST, ONE APPROACH POST, TWO BRACES AND ALL APPORTIONED FITTINGS AND HARDWARE AS DETAILLED ABOVE. CORNER POST ASSEMBLIES SHALL CONSIST OF ONE CORNER POST, TWO APPROACH POSTS, FOUR SPACES AND ALL APPORTIONED FITTINGS AND HARDWARE AS DETAILLED ABOVE.

C. THE TYPE OF POST TO BE INSTALLED SHALL BE SHOWN ON PLANS.

D. PULL POSTS SHALL BE INSTALLED AT APPROXIMATELY 5 FEET EXCEPT THAT THIS MAXIMUM INTERVAL MAY BE ADJUSTED BY THE ENGINEER OR CONSTRUCTORS WHERE THE DEGREE OF INCLINATION IS GREATER THAN 3 DEGREES.

E. CORNER POSTS ARE TO BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BOUNDARIES IN FENCE OF 8FT OR MORE.

F. A MAXIMUM LENGTH OF 1000 FEET MAY BE INSTALLED AS A UNIT.
GENERAL NOTES (TYPE "B" FENCE)

1. **THIS FENCE TO BE PROVIDED GENERALLY IN URBAN AREAS.**

2. **LINE POSTS MAY BE ANY OF THE FOLLOWING:**
   - (A) **GALVANIZED STEEL PIPE** 3" Nominal, (B) **ALUMINUM COATED STEEL PIPE** 3" Nominal, (C) **GALVANIZED STEEL H-BEAM** 1 1/2" x 1" x 1/8" (2) ALUMINUM ALLOY H-Beam 1 1/2" x 1" x 1/8" (2) GALVANIZED STEEL C-CHANNEL 1 1/2" x 1/8" (6) ALUMINUM ALLOY C-CHANNEL 1 1/2" x 1/8" (6)

3. **CORNER END OR FULL POSTS MAY BE ANY OF THE FOLLOWING:**
   - (A) GALVANIZED STEEL PIPE 3" Nominal, (B) ALUMINUM COATED STEEL PIPE 3" Nominal, (C) ALUMINUM ALLOY PIPE 3" Nominal. **NOTE:** Other steel or aluminum shapes for corners or full post assemblies may be used if approved by the engineer.

4. **CHAIN LINK Fabric, Posts, Rail, Gate Frames, Expansion Sleeves, Tie Wires, Tension Wires, and All Miscellaneous Fittings and Hardware Shall Meet the Requirements of Section 360.28, CIDB-B791, Unless Otherwise Noted.**

5. **GENERAL NOTES (CONT.)**

6. **FOR ALL PURPOSES ASSEMBLIES ARE DEFINED AS FOLLOWS:**
   - **Fence Assemblies Shall Consist of One Full or End Post, One Brace, and All Necessary Fittings and Hardware** as Detailed Above. **Corner Post Assemblies Shall Consist of One Corner Post, Two Braces and All Necessary Fittings and Hardware As Detailed Above.**

7. **THE TYPE OF FENCE TO BE INSTALLED SHALL BE SHOWN ON PLANS. FULL POSTS SHALL BE USED AT BREAKS IN VERTICAL GRADING OF 50 OR MORE, OR IN APPROXIMATE 300 LINEAR FEET EXCEPT THAT THE MAXIMUM INTERVAL MAY BE REDUCED BY THE ENGINEER ON CURVATURE WHERE THE DEGREE OF CURVATURE IS GREATER THAN 3 DEGREES.**

8. **CORNER POSTS ARE TO BE INSTALLED AT ALL HORIZONTAL BREAKS IN FENCE OF 15' OR MORE AND AS REQUIRED AT VERTICAL BREAKS OVER 15' AND DETERMINED BY THE ENGINEER.**
GENERAL NOTES

1. Gate components shall meet the material requirements specified on.

2. Steel gate frame shall be fabricated prior to galvanizing, except that truss rods and truss rod plates may be fabricated following frame galvanizing provided surfaces damaged during welding are galvanized in accordance with Section 24 of AASHTO M36.

3. All fabric shall be knuckled top & bottom selvages

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

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

TWO LANE ROADWAY

SYMBOL | SOIL | CLASSIFICATION (AASHTO M-185)
--- | --- | ---
S | Select | A-1, A-3, A-2-4
H | High Plastic | A-2-5, A-2-7, A-5 or A-7 (All with LL>50)
M | Muck | A-6

Note: All dimensions shown are standard. The details shown on this index drawing do not supersede the details shown on the Index 505.

*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-2-6 material are likely to retain excess moisture and may be difficult to dry and therefore should be used at the embankment base water level existing at time of construction.
SUPERELEVATION TRANSITION $L_i$ (VARIES 10° MIN) STRAIGHT LINE TRANSITION OUTSIDE EDGE OF PAVEMENT

OUTSIDE RVT EDGE INNER ROADWAY

CROWN POINT BOTH ROADWAYS

OUTSIDE RVT EDGE OUTER ROADWAY

$L_i = S (D_1 + D_2)
L_2 = S (D_2 - D_1)
L_2 = S (D_0 - D_1)
L_0 = L_2 + L_1
S = SLOPE RATIO

SECTION A-A
NORMAL CROWNED SECTION

SECTION B-B
SUPERELEVATION SECTION LT & RT

SECTION C-C
SUPERELEVATION SECTION LT
PLANE INCLINED SECTION RT

SECTION D-D
PLANE INCLINED SECTION LT
SUPERELEVATION TRANSITION RT

SECTION E-E
SUPERELEVATION TRANSITION LT
FULL SUPERELEVATION RT

SECTION F-F
FULL SUPERELEVATION LT & RT

8-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN
## Layer Thickness for Asphalitic Concrete Structural Courses

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</tbody>
</table>
GENERAL NOTES

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

2. Turnout construction not required with paved shoulders.

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

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

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

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

For side Drain Pipe and Mitered End Section Requirements see Index 5/55.

State of Florida Department of Transportation

TURNOUT CONSTRUCTION

Surface Course (1/4" Thick, Min.) (To be the same material as Resurfacing or Leveling). Surface not required if asphalt mix base is used.

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

SECTION A-A WITH WIDENING

Friction Course
Surface Course
Leveling Course

Existing Base & Surface

5'
Slope to be same as shoulder slope

1' Feathered FC

SECTION A-A

Friction Course
Surface Course
Leveling Course

Existing Base & Surface

5'
Slope to be same as shoulder slope

1' Feathered FC

RESURFACING EXISTING TURNOUT

Surface Course (To be the same material as Resurfacing or Leveling).

Existing Base & Surface

5'
1' Feathered FC

QUANTITIES FOR ONE TURNOUT (Sq Yr.)

<table>
<thead>
<tr>
<th>Drive Width (Ft.)</th>
<th>Intersection Type</th>
<th>Normal</th>
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For side Drain Pipe and Mitered End Section Requirements see Index 5/55.
DETAIL C
ENTRANCE TERMINAL
TWO THRU LANES

GENERAL NOTES
1. The notes 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' in 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, parabolic deceleration and acceleration boxes shall be used in place of the ramps with lengths set according to table J-B.B. J-10 (1975 A.A.S.H.O. Red Book).

DETAIL D
ENTRANCE TERMINAL
WITH ADDED LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RAMP TERMINALS

Sheet: A79/1 V4
Prepared by: F.L.C. W.96
Approved by:
SHOULDER TREATMENT
AT SPEED CHANGE LANES WITH SHOULDER GUTTER

SHOULDER TREATMENT
AT SPEED CHANGE LANES WITHOUT SHOULDER GUTTER
**INSTALLATION**

**NOTES:**
1. Grout of the top of each length of grout pipe shall be determined as soon as it is installed and stop immediately before the next length of grout pipe is added.
2. Settlement plate locations shall be protected from construction activities and equipment. If settlement plates are disturbed, they shall be replaced or reinstated.
3. Galv. used to construct seal should not have a mesh covering (plastic or other synthetic material).
ELEVATION
DETAIL OF 3/8" x 1/8" ANCHORS
ANCHORS STAGGERED 18" C TO C
TWO ANCHORS EACH END CHANNEL
NOTE: 1/2" x 5' STUDS MAY BE USED IN LIEU OF ANCHORS

SECTION

5/16" x 1/8" ANCHORS

PLAN - 90° CROSSING

PLAN - SKEW CROSSING

PRECAST CONCRETE SLABS
ALL SLABS 7'0" LONG AND 36" WIDE

SHEAR KERNER CONCRETE TYPE H SLABS TO BE FUSED TO PRECAST CONCRETE TYPE E SLABS

FLEXIBLE TYPE BASE AND SURFACING
1-1/2" THICK COAT TYPE D-3 PERCP ECC
1-1/2" THICK COAT TYPE E-2 PERCP ECC

SHEAR-RESISTANT TIE CONNECTIONS
TIES MOUNTED ON SHEAR WALLS

NOTES
1. SHEAR TIE AND TIE PLATE IN SHOWN AS STANDARD. OTHERS MAY BE USED
2. TIES MOUNTED TO SHEAR WALLS AT THE NORTHERN AND SOUTHERN ENDS OF THE CROSSING
3. SHEAR KERNER CONCRETE TYPE H SLABS TO BE FUSED TO PRECAST CONCRETE TYPE E SLABS
4. FLEXIBLE TYPE BASE AND SURFACING
5. SUFFICIENT DRAINAGE TO BE PROVIDED TO PREVENT CONSTRUCTION

PLAN TYPICAL SLAB

BEVELED END SECTION

ALTERNATE END SECTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
KID DEIGN

RAILROAD CROSSINGS
TYPE J
This drawing is based on using (1/8") rail on a tangent section and decking fabricated in sections to fit the corresponding extensions of the supporting frame. The depth of the Z bars and channels may be varied to fit other rail sections.

The framework units are attached to ties by (3/8") x 6/12" lag screws, and to headwall by 5/8" anchor bolts. Double-coil spring washers are used with lags to compensate for vertical motion.

The decking is attached to the framework with 5/8" bolts. The heads of the bolts are to be spot welded to the underside of the channel frames.

Proprietary, and outside filler fingers to be rebolted to assure close fit prior to treatment.

Set to be trowel and spaced 6" C to C.

Cresting of any angle can be equipped with units of either 44", 67, 130", or 160".

Decking may be shown or equal (Submit shop drawings for approval by the Engineer).
CROSSING TYPE "P" (POLYETHYLENE)

GENERAL
1. The crossings shown on this sheet are NOT to be used for multiple track crossings within zones for an existing or scheduled future vehicular stop. Zone lengths are charted above.
2. Crossings on this sheet may be used for single track crossings within the zones in the chart unless engineering or safety considerations dictate otherwise.

NOTES
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 manufacturers 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 reparable.

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

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

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

5. Curved slabs are fabricated to fit curved track to 22 degrees (262,04 radius). Special slabs are available for Diamond Crossings, Turnouts, Multiple Tracks, Bridge Decks and Rapid Transit Systems.

6. For additional details, materials required and installation procedures refer to the manufacturers specifications.
PHASE I
1. Maintain two-way two-lane traffic over existing facility.
2. Construct temporary structure, approaches, guardrail and attenuators.
3. The signing shown in the Phase I diagram is required whenever equipment, men or their activities are within 15 feet of the existing pavement edge.

PHASE II
1. Re-sign and mark as shown in Phase II plan.
2. Route traffic to detour and maintain two-way traffic on detour. Traffic control shall be in accordance with the MTCSP. Install class H barriers.
3. Construct proposed structure and reconstruct or resurface existing approaches.

PHASE III
1. Remove traffic to existing alignment and maintain two-way traffic.
2. Remove all temporary construction items.

GENERAL MAINTENANCE OF TRAFFIC NOTES
1. All signing, pavement markings, barriers and warning lights necessary for maintenance of traffic shall conform to the MTCSP.
2. The detour pavement should be constructed of a width equal to the existing pavement, but lines shall be not less than 10 feet wide. When one-way one-lane operations are necessary, a minimum width of 10 feet shall be maintained and traffic controlled in accordance with the MTCSP. Minimum width for the barriers should be 6 feet.
3. Raised pavement markers shall be placed along the center of the detour pavement at 40 foot centers on the longest roadway, and at 20 foot centers through the curve.
4. Existing signs and pavement markings that conflict with construction signs and markings shall be obliterated or removed.
5. Posted speed on the existing facility shall be decreased at the rate of 10 mph per 500 foot (minimum distance) until detour design speed is reached.
6. Method of attaching temporary guardrail to the detour structure to be approved by the Engineer.
7. Presence approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
8. Temporary attenuators shall be the in-line type indicated in Figure T.3 of the MTCSP.

TABLE FOR MINIMUM RADIUS FOR NORMAL CROSS SLOPES

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Superscript when needed: 600
PHASE I

1. Maintain two-lane two-way traffic over existing pavement. Construct new roadway within the proposed 4-lane limits, excluding the friction course. Signage shown if roadway construction area falls within 10 feet of existing pavement edge. When the construction zone falls more than 10 feet from the existing pavement edge, traffic shall be controlled in accordance with Cases I, II or III of the MTCS.

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

PHASE II

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

2. Route through traffic to temporary and existing pavement.

3. Construct transitions, excluding friction course.

**LEGEND**

- **Phase I**
- **Phase II**
- **MTCS** Manual of Traffic Control and Safe Practices
- **Denotes Direction Of Traffic And Does Not Reflect Pavement Marking**
- **Reflects Pavement Marking**

CONVERTING TWO Lanes TO FOUR Lanes DIVIDED STANDARD TRAFFIC CONTROL PLAN RURAL FACILITY
GENERAL MAINTENANCE OF TRAFFIC NOTES

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

2. Lane widths for maintenance of two-way traffic should generally be equal to lane widths of the existing facility, but lanes shall be not less than 10 feet in width. Where one-way one-way operations are necessary, a minimum width of 20 feet shall be maintained and traffic should be maintained in accordance with the MTCS. Minimum width for the temporary shoulders is 6 feet.

3. Raised pavement markers shall be placed along the center of the pavement under traffic, or 40 foot centers on the tangent roadway and 20 foot centers through the curve.

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

5. Placed speed on the existing facility shall be decreased at the rate of 10 mph per 500 feet (1 lane width distance) beyond speed is reached.

6. Additional construction signing, lighting or other traffic controls as required by the MTCS shall be provided as conditions warrant or as directed by the Engineer.

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

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

9. Overloading shall meet the requirements of Title 2 of the MTCS.

LEGEND

Phase I
Phase II
Phase III
MTCS P
Manual On Traffic Control
And Safe Practices

Densifies Direction Of
Traffic And Does Not
Reflect Pavement Marking

PHASE I

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

2. Route through traffic to newly constructed roadway.

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

PHASE II

1. Relocate through traffic as shown in Phase I. Signing to be as shown in Phase II.

2. Construct friction course over pavement constructed in Phase I and II.
**LEGEND**
- Phase I
- Phase II
- MTCS-P Manual On Traffic Control
- And Safe Practices
- Denotes Direction Of Traffic
- And Does Not Reflect Pavement
- Markings

**PHASE I**
1. Maintain two-lane two-way traffic along existing facility. Install construction signing.
2. Repairs existing pavement to facilitate temporary pavement construction. Lanes shall be not less than 10 feet in width.
3. Construct temporary pavement of sufficient width to accommodate two-lane two-way traffic on the temporary pavement and a portion of the existing pavement during Phase I roadway construction. When two-lane two-way traffic can not be maintained during temporary pavement construction (4 minimum from travel lane to stop line) one lane one-way operations shall be maintained in accordance with Case 3 of the MTCS-P Barcoding shall meet the requirements of Chart III of the MTCS-P.
4. Mark the pavement in accordance with the Phase I diagram. Route through traffic to the temporary pavement and a portion of the existing pavement. Lanes shall be not less than 10 feet in width.
5. Construct two lanes of the proposed roadway, excluding the friction course. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Case 3 of the MTCS-P Barcoding shall meet the requirements of Chart III of the MTCS-P. When work extends through an intersection, temporarily reroute cross traffic to other streets. When rerouting is not possible, provide one lane access (minimum) for two-lane two-way streets and one lane access (minimum) each direction for four-lane two-way streets.

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

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

**STATE LANE NO. 641**

**Construction AHEAD**

**Recommended Traffic Control Plan**

**Advisory Speed Plate Optional**

**Options Required For Projects > 2 Miles**

**Options For Projects < 2 Miles**
GENERAL MAINTENANCE OF TRAFFIC NOTES

1. All signs, pavement markings, barricades and warning lights necessary for maintenance of traffic shall conform to the MTCSP.
2. Existing raised pavement markers that are properly located shall remain in place. Damaged markers shall be replaced. Markers to be installed shall be placed every 40 feet on tangent roadway and every 20 feet on curves.
3. For divided facility, identical through traffic signing as shown above shall be placed on the outside and median of both roadways for each phase.
4. Existing signs and pavement markings that conflict with construction signings and markings shall be obliterated or removed.
5. At signalized intersections, signals shall be directed or relocated as required to the center of restricted lanes.
6. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
7. Additional barricades, signing, lighting or other traffic control required by the MTCSP shall be provided as conditions warrant in each phase.

LEGEND

Phase I
Phase II
Phase III
MTCSP
Manual On Traffic Control And Safe Practices
Denies Direction Of Traffic And Does Not Reflect Pavement Markings

CONVERTING TWO LANES TO FOUR LANES DIVIDED STANDARD TRAFFIC CONTROL PLAN URBAN FACILITY
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<th>ENHANCEMENT SLOPE</th>
<th>CLEAR WAYS FOR VEHICLES</th>
<th>CLEAR WAYS/RECOVERY (CRU)</th>
<th>BACKSLOPES</th>
<th>SIGNS</th>
<th>LIGHT POLES</th>
<th>RAILROAD CROSSING EQUIPMENT</th>
<th>MEDIAN WIDTH</th>
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<td>(3-0.75) %</td>
<td>Not generally, unless needed for crash, sight, or drainage control</td>
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<td>Spiral</td>
<td>30 min. front edge of travelway, with shoulders (at shoulder width)</td>
<td>Spiral</td>
<td>Spiral</td>
<td>Spiral</td>
</tr>
<tr>
<td>Access-Controlled 20-30 mph (or greater)</td>
<td>(2-0.5) %</td>
<td>Not generally, unless needed for crash, sight, or drainage control</td>
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<td>30 min. front edge of travelway, with shoulders (at shoulder width)</td>
<td>Spiral</td>
<td>Spiral</td>
<td>Spiral</td>
</tr>
<tr>
<td>Access-Controlled 20-30 mph (or greater)</td>
<td>(1-0.25) %</td>
<td>Not generally, unless needed for crash, sight, or drainage control</td>
<td>30 min. front edge of travelway, with shoulders (at shoulder width)</td>
<td>Spiral</td>
<td>30 min. front edge of travelway, with shoulders (at shoulder width)</td>
<td>Spiral</td>
<td>Spiral</td>
<td>Spiral</td>
</tr>
<tr>
<td>Access-Controlled 20-30 mph (or greater)</td>
<td>(0.25 or less) %</td>
<td>Not generally, unless needed for crash, sight, or drainage control</td>
<td>30 min. front edge of travelway, with shoulders (at shoulder width)</td>
<td>Spiral</td>
<td>30 min. front edge of travelway, with shoulders (at shoulder width)</td>
<td>Spiral</td>
<td>Spiral</td>
<td>Spiral</td>
</tr>
</tbody>
</table>

**Design Criteria Related to Highway Safety**

- **Access-Controlled (30+ mph or greater)**: Slight and no more than 0.5%.
- **Access-Controlled (20-30 mph or greater)**: Slight and no more than 0.25%.
- **Access-Controlled (20-30 mph or greater)**: Slight and no more than 0.125%.
- **Access-Controlled (20-30 mph or greater)**: Slight and no more than 0.0625%.

**Median Width:***

- 60 ft. minimum.
- 30 ft. minimum.
- 15 ft. minimum.
- 5 ft. minimum.