GENERAL NOTES

1. The illustrations for guardrail applications are standard configurations, adjustments are to be made as required by site and local design for function, economy, and service life.

2. The beginning of guardrail need shall be at the greatest of the upstream distances from the hazard, as determined from Figures 1 and 2, and other application details of this Index.

3. One Panel (i.e., panel length) equals 12'-6". Guardrail shall be constructed with rail elements 12'-6" in length except where 25'-0" elements are called for by this or other standards or specifically called for in the plans.

4. All guardrail panels, end sections, and special end shoes shall be lapped in the direction of adjacent traffic.

5. Flared end anchorage assemblies providing offset are the standard and treatments for single face free standing guardrail approach ends. Parallel end anchorage assemblies for guardrail approach treatments will be constructed only when restraints prevent construction of flared end anchorage.

6. Flared end anchorage assemblies shall be of the type called for in the plans. If the plans call for end anchorage assembly "parallel" and do not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved flared assembly provided in this Index or identified on the Qualified Products List (QPL), subject to the conditions identified in the approved index drawings, or QPL drawings if applicable.

7. Where necessary to enhance or modify Class I guardrail offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. Permissible post and offset block combinations are tabulated on Sheet 15.

8. Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in Type II assemblies located in the approach clear zones.

9. The guardrail to bridge connections contained in this Index are for bridges with Test Level 4 traffic railing barriers.

10. The W-beam guardrail system in this Index is the standard system to be used on the State Highway System where a W-beam with rubrail is used.

11. Thrie-beam guardrail panels shall be used in guardrail transitions to bridge traffic railing barriers, to concrete and certain crash cushions and as a continuous barrier when called for in the plans.

12. Single face median guardrail for bridges located on divided roadways shall be constructed the same as outer roadway guardrail under the following conditions:

(a) Wide medians where approach end anchor is located outside of opposing roadway clear zone,

(b) Medians of uniform width that are occupied by other transportation and joint use facilities,

(c) Medians of uniform or variable widths with independent vertical alignments not suitable to normal median guardrail installations.

13. Straight rail sections may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shap-beam) to fit.

14. Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in Type II assemblies located in the approach clear zones.

15. Corrugated sheet steel beams, end shoes, and sections and back-up plates shall conform to the current requirements of AASHTO M180, Class A, Type (b) (zinc) coating. All other metallic components, hardware and accessories shall be in conformance with the appropriate current AASHTO requirements.

16. Steel offset blocks other than modified thrie-beam offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. Permissible post and offset block combinations are tabulated on Sheet 15.

17. Where necessary to enhance or modify Class I guardrail offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. Permissible post and offset block combinations are tabulated on Sheet 15.

18. Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using finger or stilt posts. Repair within a run of guardrail with existing concrete posts can be made with either steel orgalvanized steel end bars. Replacement in kind of damaged concrete posts, in replacement of like concrete posts, is to be made at the time the work is performed.

19. Substitutions between thrie-beam guardrail and concrete barrier wall are not eligible for VECF consideration.

20. On roadways designated for reverse laneing, all downstream ends of guardrail that are not shielded or that are not described in detail in this Index shall be marked with Type 3 Object Markers except where there is a trail end guardrail. Object markers to be installed facing reverse laneing traffic. The cost of the object marker shall be included in the cost of the guardrail.
The flared end anchorage with 4' nose offset is shown in the diagram above, however, the diagram applies to other configurations that may occur at the beginning of length of need, such as, other flare designs, upstream returns, and, other upstream deflected, tangent and curvilinear conditions.

Equation Variables:

- **D**: Distance in feet from near edge of the near approach traffic lane to either (a) the back of hazard, when the hazard is located inside the clear zone or horizontal clearance or (b) the clear zone or horizontal clearance outer limit, when the hazard extends to or goes beyond the clear zone or horizontal clearance limits. For left side hazards on two-way undivided facilities, D is measured from the inside edge of the near approach traffic lane (see Figure 2).

- **d**: Distance in feet from the near edge of the near approach traffic lane to the face of guardrail at its intersection with the departure line. For left side hazards on two-way undivided facilities, d is measured from the inside edge of the near approach traffic lane (see Figure 2).

For flared and parallel end anchorage assemblies the beginning length of need is to be set at the center of post #3. That is, the departure line must intersect the face of the rail at post #3.

For flared end anchorage assemblies the offset distance "d" will equal the normal guardrail offset measured from the face of the guardrail to the edge of the near approach travel lane plus 1'-2" for 45 mph or less and 1'-9 1/4" for greater than 45 mph.

**LENGTH OF ADVANCEMENT - FIGURE 1**
For description of the dimensions $D$, $d$, and $X$, see Length of Advancement - Figure 1. For additional shoulder guardrail information, see Details B and C.

LOCATING TERMINALS ON SHOULDER GUARDRAILS - FIGURE 2
GUARDRAIL APPLICATION FOR ROADSIDE HAZARDS

UNDIVIDED ROADWAY - DETAIL C

DIVIDED ROADWAY - DETAIL B

GUARDRAIL APPLICATION FOR NARROW MEDIAN AND GORE HAZARDS

OPPOSING TRAFFIC - DETAIL D

ONE-WAY TRAFFIC - DETAIL G

GUARDRAIL APPLICATION FOR ROADSIDE HAZARDS

See Details D & G:
See General Notes Nos. 1, 2, 3, 4, 5, 6, 7 and 8.

Notes For Details B & C:
See General Notes Nos. 1, 2, 3, 4, 5, 7 and 14.

For hazards that require shielding and are located back of curb see other sheets of this index, and where rigid barrier is required see Index No. 410.

See Details K and L for guardrail offsets.

For end anchorage assemblies see sheets elsewhere in this Index and the plans.

End Anchorage Type ~ with buffer end section when located outside of opposing clear zone, crash cushion required when inside clear zone, see Sheet B and General Note No. 14.

Taper Rate: 1:10 for design speeds 45 mph, 1:15 for design speeds 50 mph.

This Guardrail Configuration Applies Where End Anchorage Assemblies Cannot be Located Outside Of The Opposing Roadway Clear Zone.

For hazards that require shielding and are located back of curb see other sheets of this index, and where rigid barrier is required see Index No. 410.
GUARDRAIL APPLICATIONS FOR BRIDGES WITH FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING FULL LENGTH OF APPROACH SLAB
UNDIVIDED ROADWAY - DETAIL H

**GUARDRAIL APPLICATIONS FOR BRIDGES WITH FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH**

Guardrail not required except where slope steeper than 1:3 or other hazards are present.

Installation for bridge end hazard only for shoulder gutter.

Approach Slab

Bridge Rail Projection

Wing Post

Approach Slab

End Anchorage Type

Projection of Normal

For median Guardrail see Sheets 9 & 10 and General Note 12

Notes for Details S & T:

See General Notes Nos. 1, 2, 3, 4, 5, 6, 8, and 9. See Index No. 402 for approach connections to bridges.

Sheets elsewhere in this Index and the plans.

Shoulder gutter in itself does not require the installation of guardrail.

UNDIVIDED ROADWAY - DETAIL S

DIVIDED ROADWAY - DETAIL T

**GUARDRAIL APPLICATIONS FOR BRIDGES WITH LESS THAN FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH**

Guardrail not required except where slope steeper than 1:3 or other hazards are present.

Installation for bridge end hazard only for shoulder gutter.

Approach Slab

Bridge Rail Projection

Wing Post

Approach Slab

End Anchorage Type

Projection of Normal

For median Guardrail see Sheets 9 & 10 and General Note 12

Notes for Details S & T:

See General Notes Nos. 1, 2, 3, 4, 5, 6, 8, and 9. See Index No. 402 for approach connections to bridges.

Sheets elsewhere in this Index and the plans.

Shoulder gutter in itself does not require the installation of guardrail.
**Approach Guardrail Treatments for Bridges with Safety Shape Traffic Railing**

**Extending Full Approach Slab Length in Wide Medians with Flush Shoulders**

*Note: For approach and end anchorages, see sheet elsewhere in this index and the plan.*

**When End Terminal is Outside of Opposing Roadway Clear Zone**

**Guardrail Lengths**

<table>
<thead>
<tr>
<th>Speed</th>
<th>Shoulder Width</th>
<th>Taper Rate</th>
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<tr>
<td>45-50</td>
<td>6' Bridge Shoulder</td>
<td>1:15</td>
<td>1500</td>
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<tr>
<td>60-70</td>
<td>6' Bridge Shoulder</td>
<td>1:10</td>
<td>1940</td>
</tr>
</tbody>
</table>

*Widths shown on this table are for roadways with standard width shoulders. Length requirements shall be determined as a site-specific basis for both standard width and narrow bridge shoulders and end anchorages or and end shielding used.*

**When End Terminal Cannot Be Located Outside of Opposing Roadway Clear Zone**

**Approach Guardrail Treatments for Bridges with Safety Shape Traffic Railing**

*2008 FDOT Design Standards*

**Guardrail**
**Approach Guardrail Treatments for Bridges with Safety Shape Traffic Railing**

**Extending Full Approach Slab Length in Narrow Medians with Flush Shoulders**

<table>
<thead>
<tr>
<th>BRIDGE SHOULDER</th>
<th>8' BRIDGE SHOULDER</th>
<th>10' BRIDGE SHOULDER</th>
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<td>MEDIAN WIDTH (Ft.)</td>
<td>PANEL LENGTH (Ft.)*</td>
<td>PANEL LENGTH (Ft.)*</td>
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<tr>
<td><strong>6' BRIDGE SHOULDERS</strong></td>
<td><strong>10' BRIDGE SHOULDERS</strong></td>
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<tr>
<td>24</td>
<td>128.75</td>
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</tbody>
</table>

* Number shown is the minimum number of panels plus a W-Thrie beam transition panel. Single faced guardrails must have a length of five (5) or more panels.

The length shown in this table are based on standard widths for roadway and bridge median shoulders. Length requirements for both standard width and narrow bridge shoulders and end anchorage or end shielding requirements shall be determined on a site specific basis. When crash cushions are required on opposing roadway shoulders, their sizes may be determined by the residual speeds (S') along the runouts from the approach roadway; however, when calculated speeds (S') are less than 30 mph, crash cushions shall be no less in size than for 30 mph, see speed diagram left. The number of panels may be reduced when installing a crash cushion more than 2.5' in width, see * below.

**Sizing Crash Cushions Located on Opposing Roadway Shoulders**

**Medians with 10' Bridge Shoulders**

**Medians with 6' Bridge Shoulders**

**Notes:** The guardrail configurations shown apply only to parallel or near parallel bridges with open medians.
APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING

EXTENDING LESS THAN FULL APPROACH SLAB LENGTH IN WIDE MEDIANs WITH FLUSH SHOULDERS

When the wing post is replaced by bridge traffic railing barrier, reference Detail J and see Index No. 402. Length requirements shall be based on minimum median widths and on relocated connection to the existing wing post.

Lengths are based on median width and are in increments of ten feet.  When the wing post is replaced by bridge traffic railing barrier (see Index No. 402), auxiliary lanes, curved roadways, parallel end anchorage assemblies, skewed crossings and other hazards present.  Lengths are based on standard clear zone widths for travel lanes on tangent roadways, and on approach end anchorage assemblies to shield normal transverse underslope and bridge end hazards.  Lengths may need to be adjusted for intersection location on wing post or bridge traffic railing barrier (see index No. 402). Auxiliary lanes, curved roadways, parallel end anchorage assemblies, skewed crossings and other hazards present.  When the wing post is replaced by bridge traffic railing barrier, reference Detail J and see Index No. 402.

When end terminal is outside of opposing roadway clear zone, the lengths shown on this table are typical for roadways with standard width shoulders and a relocated connection to the existing wing post. When the wing post is replaced by bridge traffic railing barrier, reference Detail J and see index No. 402. Length requirements shall be determined on a site specific basis for both standard shoulder and narrow bridge shoulders and for end anchorage or end skirting use.

Note: For approach and end anchorage assemblies see sheets elsewhere in this index and the plans.

When end terminal cannot be located outside of opposing roadway clear zone, the lengths shown on this table are typical for roadways with standard width shoulders and a relocated connection to the existing wing post. Length requirements shall be determined on a site specific basis for both standard shoulder and narrow bridge shoulders and for end anchorage or end skirting use.
**MEDIAN WITH 10' BRIDGE SHOULDERS**

<table>
<thead>
<tr>
<th>MEDIAN WIDTH (Ft.)</th>
<th>PANELS (No.)</th>
<th>LENGTH (Ft.)</th>
<th>PANELS (No.)</th>
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<td>1.5</td>
<td>12.25</td>
<td>2.5</td>
<td>22.25</td>
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**MEDIAN WITH 6' BRIDGE SHOULDERS**

<table>
<thead>
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<th>MEDIAN WIDTH (Ft.)</th>
<th>PANELS (No.)</th>
<th>LENGTH (Ft.)</th>
<th>PANELS (No.)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>1.5</td>
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<td>2.5</td>
<td>28.25</td>
</tr>
<tr>
<td>28</td>
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<td>16.25</td>
<td>2.5</td>
<td>26.25</td>
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<tr>
<td>26</td>
<td>1.5</td>
<td>14.25</td>
<td>2.5</td>
<td>24.25</td>
</tr>
<tr>
<td>24</td>
<td>1.5</td>
<td>12.25</td>
<td>2.5</td>
<td>22.25</td>
</tr>
</tbody>
</table>

The lengths shown in this table are based on standard widths for roadway and bridge median shoulders. Length requirements for both standard widths and narrow bridge shoulders and end anchorages or end shielding requirements shall be determined on a site-specific basis. When crash cushions are required on opposing roadway shoulders, their sizes may be determined by the residual speeds (S') along the runouts from the approach roadways; however, when calculated speeds (S ')s are less than 30 mph crash cushions shall be no less in size than for 30 mph, per speed diagram left. The number of panels may be reduced when installing a crash cushion more than 2.5' in width, per diagram below.

*Number shown is the minimum number of panels plus a W-Three beam transition panel; single faced guardrail must have a length of five (5) or more panels.

**SIZING CRASH CUSHIONS LOCATED ON OPPOSING ROADWAY SHOULDERS**

- **Approach Guardrail Treatments for Bridges with Safety Shape Traffic Railing**
- **Extending Less Than Full Approach Slab Length in Narrow Medians with Flush Shoulders**

---

*Note: The guardrail configurations shown apply only to parallel or near parallel bridges with open medians.*
Taper.

on intersecting drive or side road adjoins the project.

Radial guardrail to be installed when guardrail required

Guardrail installation limited to roadway right of way
unless otherwise called for in the plans.

LEGEND

1. Edge of travel lane for simple curve turnout.
2. Taper.
3. Pavement return (radius R).
4. Flared end anchorage to be installed except when existing guardrail
   on intersecting drive or side road adjoins the project.
5. Post for locating flare, proximate to PC or PT:
   No. 2 post for Radii 25' or less.
   Between No. 4 and No. 5 posts for Radii 50' or greater.
6. Post for locating flare, proximate to PC or PT:
   No. 3 post for Radii 25' or less.
   Between No. 4 and No. 5 posts for Radii greater than 25'.
7. Expanded shoulder for guardrail.
8. Expanded shoulder for flared guardrail end anchorage.
9. Shoulder to advance guardrail.
10. Flared end anchorage assembly.
11. Radial guardrail to be installed when guardrail required
    on the intersecting drive or side road (radius R).
12. End anchorage Type 2/ (radial return only).
13. Guardrail installation limited to roadway right of way
    unless otherwise called for in the plans.

GUARDRAIL APPLICATIONS FOR INTERSECTING DRIVES AND SIDE ROADS ON RURAL FACILITIES
GUARDRAIL APPROACH TRANSITION AND CONNECTION FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIERS EXTENDING FULL LENGTH OF APPROACH SLAB

GUARDRAIL TRANSITION NOTE
When shoulder gutter is required, the 25' long dike transition, shown in the PLAN and PICTORIAL above, is required. Double offset blocks are shown for guardrail installations adjacent to shoulder gutter/dike transitions; single offset blocks shall be installed in absence of shoulder gutter. Nested rails shall not be bolted to the blocks and posts at posts (a), (c), and (e). One 16d galvanized nail shall be driven between each post and block, and between double blocks, in order to prevent block rotation, see "16d NAIL FOR PREVENTION OF OFFSET BLOCK ROTATION" this Index.

APPLICATIONS

<table>
<thead>
<tr>
<th>APPLICATIONS</th>
<th>SECTION CC</th>
<th>SECTION DD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Face Guardrail</td>
<td>6&quot; x 6&quot;</td>
<td>6&quot; x 6&quot;</td>
</tr>
<tr>
<td>Double Face Guardrail With Timber Posts</td>
<td>5 3/4&quot; x 3/4&quot;</td>
<td>5 3/4&quot; x 3/4&quot;</td>
</tr>
<tr>
<td>Double Face Guardrail With Steel Posts</td>
<td>5 3/4&quot; x 3/4&quot;</td>
<td>5 3/4&quot; x 3/4&quot;</td>
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</tbody>
</table>

FOR DOUBLE FACE GUARDRAIL CONNECTIONS TO MEDIAN BRIDGE TRAFFIC RAILING BARRIER, SEE INDEX NO. 410 'GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL APPROACH ENDS'.

THREE-BEAM OFFSET BLOCKS FIELD TRIMMED FOR USE AT SECTIONS CC & DD

FOR OTHER FLARE OFFSETS AND PARALLEL ALIGMENTS SEE SHEETS NO. 5, 6, 7 AND 8

SEE INDEX NO. 400 'GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL APPROACH ENDS'.

21" x 12" x 5/8" Thrie-Beam Terminal Connector Plate (Back-Up Plate) and 8" x 8" x 1/2" Special Galvanized Steel Filler Plate (See Below)

7/8" x 15" Long HS Hex Bolts (3 1/2" Min. Thread Length) And Nuts (5 Reqd.) With 2 1/4" OD Plain Round Washers Under Heads And Nuts

SPECIAL GALVANIZED STEEL FILLER PLATE FOR USE AT SECTION BB

SEE INDEX NO. 40, 420, 422, 423, 424, 425, AND 5210 FOR BARRIER END DETAILS

Last Update 07/01/07
SHOULDER INTERFACE BETWEEN ROADWAYS AND BRIDGES

1. These sketches are for showing shoulder interface between roadways and bridges where crossings are normal to other roadways, railroads, and streams. For site-specific conditions and details, see the plans and the FDOT Structures Design Office "Detailing Manual" and "Design Guidelines".

2. Shoulder treatments shown in these sketches are for locations with shoulder gutter; shoulder hinge location will vary for facilities without shoulder gutter.

For Additional Information See Index No. 402

For Additional Information See Sheet 12

SKETCH NOTES

Bridges Over Streams

Bridges Over Railroads

Bridges Over Roads or Railroads

15' 12"

Rubble Protection (Sand-Cement Protection When Specified)

Bridge Traffic Railing Barrier

Rubble Protection (Sand-Cement Protection When Specified)

Limit Of Slope Pavement At Roadway
And Sand-Cement Protection At Railroads

Sand-Cement Protection

Bridge Traffic Railing Barrier

Bridge

Wing Wall

Wing Wall

30' Approach Slab With Bridge Traffic Railing Barrier

30' Approach Slab With Bridge Traffic Railing Barrier

30' Approach Slab With Bridge Traffic Railing Barrier

For Additional Guardrail Information See Sheet 12

Varies (15' Min.)
MISCELLANEOUS PAYING FOR STANDARD GUARDRAIL SECTIONS

SECTION AA (EXAMPLE FOR 20' CLEAR ZONE)

SECTION AA (EXAMPLE FOR 30' CLEAR ZONE)

SECTION BB (EXAMPLE FOR 30' CLEAR ZONE)

SECTION CC (EXAMPLE FOR 30' CLEAR ZONE)

SHOULDER WITH OR WITHOUT 5' PAVEMENT

PAVED SHOULDERS

SHOULDER GUTTER

DOUBLE FACE RAIL

LATERAL PLACEMENT ON FRONT SLOPES (FROM EDGE OF TRAFFIC LANE)

LOCATIONS ON FRONT SLOPES

GUARDRAIL LOCATION-DETAIL K
1. Reflector shall conform to Section 995 of the Standard Specifications.
2. Reflector color (white or yellow) shall conform to the color of the near lane edgeline.
3. Faces of pipe rail, screw, rivet or bracket mounted reflectors shall not be used in lieu of adhesive mounted reflectors.
4. Post mounted reflectors approved on the Qualified Products List may be used by FDOT. Maintenance of reflective films shall be done by installing reflector in a continuous run of existing post mounted reflectors. Adhesive and post mounted reflectors shall not be intermixed in a continuous run of guardrail.
5. The cost for reflectors shall be included in the contract unit price for guardrail.

REFLECTOR MOUNTING

Without or With 2 Structural Shapes

PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS

STEEL MODIFIED THRIE-BEAM

1. Use of post bolts 15" in length with sleeve nuts and washers.
2. Trimming back flush with the face of nut and metalizing or galvanizing after drilling and welding.
3. All holes shall be 1 1/8".
4. Use of washer and nuts (2 reqd.)
5. Round washers under heads and nuts (2 reqd.)
6. Step or offset side of existing post mounted reflectors shall not be intermixed in a continuous run of guardrail.
7. Reflector color (white or yellow) shall conform to the color of the near lane edgeline.
8. Reflector shall conform to Section 995 of the Standard Specifications.

NOTE:

Location of guardrail with offset behind curb and gutter refer to the January 2006 Plans Preparation Manual, Volume 1, Section 4.3.5.
**APPROACH TREATMENT FOR CURB AND GUTTER**

**DETAIL Q**

---

*Note: For Proprietary End Treatments See the Qualified Products List.*

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*Safety pipe rail is required when the back of steel guardrail posts are 4' or less from the near edge of a pedestrian way or bikeway. See 'PEDESTRIAN SAFETY TREATMENTS'.*

---

Curb flare shall follow guardrail flare, see elsewhere in this Index for additional guardrail flare information.

---
FOR REPLACEMENT OF EXISTING W8 x 18 GUARDRAIL POSTS ON APPROACH SLABS AND BRIDGES

Additional strength tests required when mounting three-base guardrail

FOR CONSTRUCTION OF GUARDRAIL WHERE CULVERT, PIER FOOTING OR OTHER STRUCTURE PRECLUDES DRIVEN POST INSTALLATION

NOTES: (SPECIAL STEEL POST)

1. See Index No. 432 for special steel posts required for construction and repair of guardrail transitions to bridge median barrier systems on existing bridges. See Structures Index Nos. 430 through 436 for steel posts required to construct median barrier systems on existing bridges.

2. Either anchor bolts, concrete wedge anchors or approved Adhesive-Bonded Anchors for Structural Applications may be used.

   Anchor bolts, wedge anchors and adhesive anchors shall have a minimum tensile strength of 60,000 psi and galvanized in accordance with ASTM A53. (Minimum steel components shall be hot-dipped galvanized steel components plated in accordance with ASTM A653 are not acceptable). Adhesive anchor rods shall be equal in diameter to bolt diameter for anchor bolts. Wedge anchors or to be installed in accordance with the manufacturer’s recommendations, conforming 5,000 psi compressive strength for concrete. Wedge anchor shall also meet the following requirements: (a) tensile load each anchor: approach slabs 14,000 lbs.; other structures 8,000 lbs.

3. Posts are to be plumbed by adjusting nuts or mortar seating. Posts installed using anchor bolts and adhesive anchors are to be set with either mortar seating or by adjusting nuts. Posts installed using anchor bolts are to be set with anchor bolts. Base plates shall be coated with zinc or other suitable coating.

4. Adhesive-Bonded Anchors for Structural Applications steel comply with Section 937 and be installed in accordance with the manufacturer’s instructions. All anchor bolts are to be installed in accordance with the manufacturer’s instructions. All anchor bolts are to be installed in accordance with the manufacturer’s instructions.

5. Anchor holes and recesses shall be drilled, wedge anchor holes to be drilled in accordance with the manufacturer’s instructions. Encountered reinforcing steel shall be drilled through. Holes shall be thouroughly cleaned when setting bolts and anchors and dry when setting wedge anchors.

6. Steel post and base units shall be galvanized in accordance with ASTM A653. Any damaged galvanized areas are to be restoried in accordance with Section 937 of the Standard Specifications.

7. Special steel posts are not to be substituted for any post in a guardrail approach end treatment system.
1. The locations shown for special posts mounted on inlets are to be used as guidelines for positioning the posts and for estimating the number of required posts.

3. Variations shown for the locations of special posts mounted on inlets are established from standard post spacing (15'-3") clearance of standard posts from inlets (15" Min.); use of single and double offset blocks on standard posts adjacent to the inlet, optional; flange mountings and concrete anchor edge distances (12" for grouted and 24" for expansion anchors). The number of posts and their locations may vary by reducing post spacing and adjusting the length of rail panels.

4. Encased guardrail posts shall conform, in section to standard timber and steel posts, and be paid for under the contract unit price for Special Guardrail Post, EA. Payment shall include cost of foam wrap and concrete encasement.

The locations shown for special posts mounted on inlets are to be used as guidelines for positioning the posts and for estimating the number of required posts.
END ANCHORAGE ASSEMBLY TYPE II

CONCRETE ANCHOR BLOCK OPTION

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

2. Type II end anchorages are approved for all speeds and are intended for use on:
   a) Guardrails for single lane free standing guardrail systems.
   b) Approach end anchorages for single lane free standing guardrail systems when end anchorage is located inside the clear zone.
   c) Turnbuckles to be used only for guardrail that is reset vertically. The existing anchor rod (1" or 1 1/4" Dia.) shall be field cut, threaded 4" on each end, and, metalized in accordance with Sections 562 and 971 of the Standard Specifications. The cost for cutting, threading, metalizing and the turnbuckle shall be included in the contract unit price for Reset Guardrail, LF.

The payment for the items of End Anchorage Assembly Type II shall be full compensation for furnishing and installing the Anchor Rod, Anchor Plate, Pipe Sleeve, Anchor Block, either Flared, Rounded or Buffer End Section, and the necessary hardware.

CONCRETE ANCHOR BLOCK OPTION

1. 1" x 1" x 11/2" Standard Post
2. 12" Post Sleeve
3. Galvanized 4" x 4" x 3/4" Steel Plate
4. Washer And Hex Nut
5. Anchor Rod
6. Anchor Plate
7. Flared End Section
8. Flared Or Rounded End Section
9. Buffer End Section

END ANCHORAGE ASSEMBLY TYPE II

CONCRETE ANCHOR BLOCK OPTION

1. 1" x 1" x 11/2" Standard Post
2. 12" Post Sleeve
3. Galvanized 4" x 4" x 3/4" Steel Plate
4. Washer And Hex Nut
5. Anchor Rod
6. Anchor Plate
7. Flared End Section
8. Flared Or Rounded End Section
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9. Buffer End Section
The MELT is applicable for design speeds up to 45 mph. The MELT is intended for use as an approach end guardrail barrier for shoulder guardrail. Its alignment is a flare from the normal guardrail alignment with an effective length of 37.5' including three standard W-beam panels outside of any standard guardrail, guardrail transitions or other special treatments.

The MELT is produced by the Florida Department of Transportation solely for use by the Department and its contractors. This standard drawing provides the general graphics and information necessary to fabricate the specified parts of the MELT and their incorporation into a whole system.

The first two posts must be short timber breakaway posts with steel foundation tubes and soil plates. Post Nos. 3 thru 6 must be STF inner poles and post No. 7 must be a standard inner pole.

The MELT cannot be used in areas where horizontal clearance requires the use of a handrail.

The MELT shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans, the distributor’s detailed drawings, procedures and specifications and this Index.

The MELT shall not be used in medians where horizontal clearance requires the use of a backrail.

The MELT can not be used in medians where horizontal clearance requires the use of a backrail.

The MELT shall not be used in medians where horizontal clearance requires the use of a backrail.

The MELT shall be used for the correct unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall not be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA.

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CONTROLLED RELEASE RETURN NOTES

1. Controlled release returns are intended for use in openings in continuous guardrail for driveway and side road access when forces and transitions or standard radial returns cannot be applied. See Sheet 1 and 2. For defining the ends of bridge traffic rails and barrier walls where the driveway and side road access is in close proximity to the structure and space does not permit the proper use of approved flared and parallel types of Guardrail End Anchorage Assembly.

2. Controlled release returns are not intended as a substitute or replacement for the appropriate use of approved vehicle impact attenuators.

3. Controlled release returns with either 8', 16' or 24' radii are designed for highway speeds of 45 mph or less. The 32' radius return is to be used only for highway speeds of 45 mph or less.

4. The controlled release return shown shall be considered as a full return based on an intersection angle of 90°. The return can be terminated with the Guardrail End Anchorage Assembly CRT or connected to standard guardrail as shown or as otherwise detailed in the plans.

5. The Guardrail End Anchorage Assembly CRT is to be used only for the controlled release return shown with 8', 16' and 24' radii. Special guardrail pipe and special guardrail pipe attachment are not to be used in the controlled release return.

6. Washers are not to be used between the guardrail beam and the head of the guardrail post. See Sheet 11.

7. Washers are to be used between the guardrail beam and the head of the structure. The surface approaching the controlled release return shall have a transverse slope not exceeding 1:2, and be free of fixed objects. The width beneath the transverse surface is to be based on reasonable vehicles. The return radius and width shall be determined by the appropriate use of approved vehicle impact attenuators.

8. Washing Post Bolt (See Sheet 11). The effective width of the transverse surface is to be based on reasonable vehicles. The return radius and width shall be determined by the appropriate use of approved vehicle impact attenuators.

9. Washers are not to be used between the guardrail beam and the head of the structure. The surface approaching the controlled release return shall have a transverse slope not exceeding 1:2, and be free of fixed objects. The width beneath the transverse surface is to be based on reasonable vehicles. The return radius and width shall be determined by the appropriate use of approved vehicle impact attenuators.
Notes:
1. Typical placement shown. May be constructed at other locations as called for in the plans.
2. Rubberr required on median side or ditch side of barrier.

MOUNTING HEIGHT FOR DOUBLE FACED GUARDRAIL ON MEDIAN SHOULDERS (FREeways)