GENERAL NOTES

CONSTRUCTION SPECIFICATIONS:
Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", Current Edition and Supplements as amended. Construct GRS abutments and walls in accordance with Developmental Specification Section 549.

DESIGN SPECIFICATIONS:

DEFINITION OF VARIABLES

\( a_s \) = Set back distance between back of facing element and beam seat
\( b \) = Base length of reinforcement
\( b_B \) = Bearing width for bridge beam seat
\( b_d \) = Length of bearing bed reinforcement
\( \beta_{RSF} \) = Width of RSF
\( D_b \) = Depth of beam seat
\( D_c \) = Clear space from top of wall to bottom of superstructure
\( D_d \) = Depth of bearing bed
\( D_{RSF} \) = Depth of RSF below bottom of wall elevation
\( D_{GRS-GAB} \) = Depth of GRS-GAB transition
\( h_b \) = Height of road base (equals height of superstructure and pavement thickness)
\( H \) = GRS Design Height
\( L \) = Length of GRS Backfill Reinforcement
\( L_p \) = Abutment width
\( L_{tz} \) = Bearing width for bridge beam seat
\( S \) = Minimum distance from guardrail \( \xi \) to back of CMU
\( X_{RSF} \) = Width of RSF in front of the abutment and wingwall wall face
\( \theta_a \), \( \theta_c \) = Wingwall angle

ABBREVIATIONS

AOS = Apparent Opening Size
\( B_B \) = Width of the bridge
\( B_{CMU} \) = Width of CMU = 7\"'
\( CMU \) = Concrete masonry unit
\( d_{max} \) = Maximum particle diameter in GRS backfill
\( FFGW \) = Front Face of GRS Wall
\( GAB \) = Graded Aggregate Base
\( GRS \) = Geosynthetic Reinforced Soil
\( H_{block} \) = Height of CMU = 7\"
\( IBS \) = Integrated Bridge System
\( L \) = Length of GRS Backfill Reinforcement
\( L_{GAB} \) = Length of CMU = 15\"
\( RSF \) = Reinforced soil foundation
\( T_{ult} \) = Design Standards Index 501 Ultimate Tensile Strength
\( T_{2\%} \) = Design Standards Index 501 2% Strain Tensile Strength

NOTES:

1. CMU blocks are running bond, including corners, so there are no vertical joints greater than one CMU course height.

2. Remove backfill and geotextile from hollow core of the top 3 courses of CMUs and corner CMUs, insert #4 bars, and fill with concrete.

3. Wingwalls are folded out for elevation view.

LEGEND:

- Hollow, textured CMU filled with concrete and rebar
- Hollow, textured CMU filled with GRS backfill
- Solid, smooth-faced CMU
- Graded Aggregate Base (GAB)
1. Remove backfill and geotextile from hollow core of the top 3 courses of CMUs and all corner CMUs, insert #4 Bars, and fill with concrete.

2. Strike CMU concrete fill flush with top of CMUs under bridge girders, slope to drain.

3. On the top course of CMUs create a CIP coping a minimum of ¾-inch thick.

4. Provide Solid CMU Blocks behind riprap.

5. Short term back slope ratio per OSHA Safety Regulations (29CFR, Part 1926, Subpart P, excavation). Shoring may be required if the short term back slope will be open more than 30 days or if the required short term back slope ratio specified cannot be obtained.

6. Extend Integrated Approach layers past 1:1 Control Line as shown.

7. Before constructing each wrapped geosynthetic layer cover exposed geosynthetic with 1 to 2 inches of aggregate backfill.

8. Wall control drawings based on plumb wall facing. With the approval of the Engineer, segmental retaining wall unit facing blocks may be substituted for solid and hollow CMU facing blocks in accordance with Developmental Specification Section 549. Contractor's Specialty Engineer must submit shop drawings depicting revised RSF elevations for approval.

9. If segmental retaining wall unit facing blocks require battered erection, Contractor's Specialty Engineer must submit shop drawings depicting revised bottom wall course locations for approval.
SECTION B-B

Cross References: See Sheet 3 for Notes.
REFLECTIVE RAILING MARKER SPACING

<table>
<thead>
<tr>
<th>Distance Edge of Travel Lane to Face of Railing</th>
<th>Spacing (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 4</td>
<td>80</td>
</tr>
<tr>
<td>4 to 8</td>
<td>80</td>
</tr>
<tr>
<td>&gt; than 8</td>
<td>None Required</td>
</tr>
</tbody>
</table>

CROSS REFERENCE:
For Section A-A, View B-B and Detail "A", see Sheet 6. For Detail "B", see Sheet 8.

TRAFFIC RAILING NOTES

This railing has been structurally evaluated to be equivalent or greater in strength to other safety shape railings which have been crash tested to NCHRP Report 350 TL-4 Criteria.

CONCRETE AND REINFORCING STEEL: See Structures Plans General Notes.

GUARDRAIL: For Guardrail connection details see Index Nos. D6003 and D6004.

SUPERELEVATED BRIDGES: At the option of the Contractor the Traffic Railing on super-elevated bridges may be constructed perpendicular to the roadway surface.

PEDESTRIAN AND BICYCLE RAILING: See Index Nos. 817 and 822 for Notes, Details and post spacings for Traffic Railings with Aluminum Pedestrian / Bicycle Bullet Railings.

V-GROOVES: Construct ½ V-Grooves plumb. Space V-Grooves equally between ½ Open Joints and/or Deck Joints.

NAME, DATE AND BRIDGE NUMBER: The Name and Bridge Number shall be placed on the Traffic Railing so as to be seen on the driver’s right side when approaching the bridge. The Date shall be placed on the driver’s left side when approaching the bridge. The Name shall be as shown in the General Notes in the Structures Plans. The Date shall be the year the bridge is completed. Black plastic letters and figures 3” in height may be used, as approved by the Engineer, in lieu of the letters and figures formed by ½ V-Grooves. V-Grooves shall be formed by preformed letters and figures.

REFLECTIVE RAILING MARKERS: Reflective Railing Markers shall meet Specification Section 993. Install markers on top of the Traffic Railing from the face on the traffic side at the spacing shown in the table above. Reflector color (white or yellow) shall match the color of the near edgeline. The cost of the reflective markers shall be included in the Contract Unit Price for the Traffic Railing.

JOINTS: See Plans, Superstructure Sheets for actual dimensions and joint orientation. Provide open Railing Joints at Deck Expansion Joint locations matching the dimensions of the Deck Joint. For treatment of Railings on skewed bridges see Sheet No. 7.

Provide ½ Intermediate Open Joints at Superstructure supports where slab is continuous.

TRAFFIC RAILING DETAILS (32” F SHAPE)
For locations of Section A-A and View B-B see Sheet 5.

**NOTES:**
- Rotate Bars 5V in Railing End Transition to maintain cover. Begin placing Railing Bars 5P and 5V at Begin or End Bridge to ensure correct placement of guardrail bolt holes. If required, adjustments to the bar spacing for Bars 5P and 5V shall be made away from Begin or End Bridge.

**CROSS REFERENCE:**
For locations of Section A-A and View B-B see Sheet 5.
PARTIAL PLAN VIEW OF SKewed BRIDGE DECK WITH SIDEWALK, 
F SHAPE TRAFFIC RAILING AND PEDESTRIAN/BICYCLE RAILING
INDEX NO. 820, 825 OR 826, OTHER TRAFFIC RAILINGS SIMILAR

NOTES:
1) Concrete Parapet reinforcement is not affected by skew angle, see Index No. 820 for details.
2) Parapet expansion joint shall match the deck expansion joint which shall be turned perpendicular 
or radial to the gutter line. See Structures Plans, Superstructure Sheets for details.
3) Traffic Railing reinforcement vertical Bars SV & SP may be shifted up to 1" (Max) and rotated 
   up to 15 degrees as required to allow proper placement. Bars SV adjacent to expansion joints shall 
   be field adjusted to maintain clearance and spacing, extra Bars SV will be required. Bars SV bottom horizontal 
   portion shall be cut so as to maintain maximum bottom horizontal length of bar to each vertical leg being placed, 
   the remainder of bar shall be discarded. Cut Bars SV may be rotated to maintain clearance.
4) Railing ends at deck expansion joints shall follow the deck joint with allowances for joint movement. Expansion 
   joint at the inside face of parapet shall be turned perpendicular or radial to this line. See Structures Plans, 
   Parapet or Bend Sheets for details.
5) ½" Intermediate Open Joints and ⅛" V-Grooves in railing and parapet shall be placed perpendicular or radial to 
   the gutter line or inside face of parapet line. See Structures Plans, Superstructure Sheets for locations.
6) At begin or end Bridge extend deck at the railing ends 3' (gutter side or back face 
   of railing as required) as shown to provide a base for casting of the railing.

GENERAL NOTES:
1) Work this Sheet with Traffic Railing, Pedestrian/Bicycle Railing, and Approach Slab Indexes 
as applicable.
2) Partial Plan Views shown are intended as guides only. See Structures Plans, Superstructure 
   and Approach Slab Sheets for skew angles, joint orientation, dimensions and details.
3) Railings on Raised Sidewalks shall be treated similar to the Partial Plan View of Bridge Deck 
   with Traffic Railing.
4) If Welded Wire Reinforcement is used in lieu of conventional reinforcement, placement of the WWR 
   vertical elements shall be similar to those shown above. Clipping of horizontal elements to 
   facilitate placement shall be minimized where possible. When clipping is required, supplement 
   horizontal elements by lap splicing with deformed bars having an equivalent area of steel.

TRAFFIC RAILING DETAILS (32" F SHAPE)
The vertical wires (D30.7) in Piece 1 shall be cut as shown and the gutter side portion bent inward as required to allow placement. The 9" and the 2'-4" vertical dimensions shown for Bar 5V are based on a bridge deck width of 96° to achieve a 6" minimum embedment into the bridge deck. See Structures Plans, Superstructure Sheets.

1. At Intermediate Open Joints, seal the lower 6" portion of the open joint with Pre-cured Silicone Sealant in accordance with Specification Section 932.

2. Apply sealant prior to any Class V finish coating and remove all curing compound and loose material from the surface prior to application of bonding agent.

3. The cost of the Pre-cured Silicone Sealant shall be included in the Contract Unit Price for the Traffic Railing.

Traffic Railing Details (32" F Shape)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>CY/LF</td>
<td>0.164</td>
</tr>
<tr>
<td>Reinforcing Steel</td>
<td>LB/F</td>
<td>27.12</td>
</tr>
</tbody>
</table>

(The above quantities are based on a 2% deck cross slope; railing on low side of deck.)
**Plan**

1. **Plan Details**
   - **18'-9" Guardrail Transition**
   - **Thrie-Beam Transition to W-Beam**

2. **Elevation Details**
   - **Curb Detail**
   - Cast-in-Place or Precast*
   - **Joint Connection**
   - **Thrie-Beam Terminal Connector Plate (Back-Up Plate)**
   - 21"x12"x1/2" Special Galvanized Steel Filler Plate (See Design Standards Index 400) 9/8x15" Long HS Hex Bolts (3/8" Min. Thread Length) And Nuts (5 Req'd.) With 21/2" OD Plain Round Washers Under Heads And Nuts

3. **Sections**
   - **Section A-A**
   - **Section B-B**
   - **Section C-C**
   - **Section D-D**

4. **General Notes:**
   - Concrete curb may be cast-in-place or precast as shown on this sheet. Concrete curb shall be continuous to the seventh post.
   - The post length shall be marked on all 7'-0" long posts by the Manufacturer. The mark shall be located within the top 1 ft. region of the post, at least 2" in height, and visible after installation. Mark steel posts with a stencil before galvanizing.
   - Perform post holes as required by punching only. Preferring post holes by drilling is not permitted.
   - Rail elements shall meet the requirements of Design Standards Index 400 except as modified herein.
   - Unless otherwise shown in the plans, transitions shall be placed with the blocks in front of or directly above the curb edge.
   - The (24) plate washers required at the terminal connector splice are 1-1/2"x3"x1/4" plate washers with a 1/2" x 1" hole.

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For Information Only
Not For Construction Use
Note: 1⁄4 in. steel washer required with splice bolts

**THRIE-BEAM TERMINAL CONNECTOR**
(10 Gauge)

**W-THRIE BEAM TRANSITION SECTION**
(10 Gauge)

*Splice Location: Thrie-Beam - 12 Guardrail Splice Bolts And Recessed Nuts
W-Beam - 8 Guardrail Splice Bolts And Recessed Nuts*