CONCRETE CURB

502(04)

* 3" Hot Mix Asphalt + 1/4" (nom.) High Performance Waterproofing Membrane

1'-7" CURB WITH BITUMINOUS WEARING SURFACE *

Bituminous Wearing Surface *

1'-8" Curb

Level

1" V - groove

3/4" x 1-1/4"

~ CURB WITH BITUMINOUS WEARING SURFACE ~

* 3" Hot Mix Asphalt + 1/4" (nom.) High Performance Waterproofing Membrane

~ GUTTER DETAIL FOR BITUMINOUS W.S. ~

High Performance Waterproofing Membrane

1" φ drain (See Subsection 502.17 of the Standard Specifications)

CONCRETE CURB

502(04)
-- CURB WITH CONCRETE WEARING SURFACE --

-- CURB WITH INTEGRAL WEARING SURFACE --

CONCRETE CURB
502(05)
CONCRETE SIDEWALK ON BRIDGES

502(06)

~ WITH STEEL BRIDGE RAILING ~

~ WITH PERMANENT CONCRETE BARRIER ~
~ 2 - BAR TRAFFIC RAILING ~

~ 3 - BAR TRAFFIC / BICYCLE RAILING ~
(4 - Bar Traffic / Bicycle Railing similar)

~ 4 - BAR TRAFFIC / PEDESTRIAN RAILING ~

STEEL BRIDGE RAILING
507(01)
~ 2 - BAR TRAFFIC RAILING ~

Concrete Transition Barrier (Typ.)

~ 3 - BAR TRAFFIC / BICYCLE RAILING ~
(4 - Bar Traffic / Bicycle Railing similar)

~ 4 - BAR TRAFFIC / PEDESTRIAN RAILING ~

* Including Rail Bar Cap (Typ.)

STEEL BRIDGE RAILING
507(02)
~ TYPICAL RAILING ELEVATION ~

2 - Bar Traffic Railing is shown. Other railing configurations are similar.
Rail Bars:
TS 8x4x5/16 (1)
TS 4x4x1/4 (1)

~ TYPICAL RAILING SECTION ~
(2 - Bar Traffic Railing)

STEEL BRIDGE RAILING
507(04)
Rail Bars:
TS 8x4x5/6 (1)
TS 4x4x1/4 (2)

~ TYPICAL RAILING SECTION ~
(3 - Bar Traffic / Bicycle Railing)

STEEL BRIDGE RAILING
507(05)
Rail Bars:
TS 8x4x5/6 (1)
TS 4x4x1/4 (3)

~ TYPICAL RAILING SECTION ~
(4 - Bar Traffic / Bicycle Railing)

STEEL BRIDGE RAILING
507(06)
Rail Bars:
TS 8x4x5/16 (1)
TS 4x4x1/4 (3)

~ TYPICAL RAILING SECTION ~
(4 - Bar Traffic / Pedestrian Railing)

STEEL BRIDGE RAILING
507(07)
~ POST & BASE PLATE PLAN ~

~ ANCHOR PLATE PLAN ~

STEEL BRIDGE RAILING

507(08)
STEEL BRIDGE RAILING

~ RAIL POST ANCHORAGE ~

Note: Match corner radius of rail bar

Note: Match corner radius of rail bar

~ RAIL BAR CAP ~
~ POST - TO - BASE WELD DETAIL ~

~ RAIL BAR SPLICE SECTION ~
* Weld nuts to plate before assembling splice tube

~ RAIL BAR EXPANSION JOINT SECTION ~
For details not shown, see "Rail Bar Splice Section"

STEEL BRIDGE RAILING
507(10)
-- OPTIONAL RAIL BAR SPLICE SECTION --
(Details Typical for both rail bars)

STEEL BRIDGE RAILING
507(11)
~ RAIL BAR SPLICE & EXPANSION JOINT DETAIL ~
(Bottom View)

SPLICE & EXPANSION JOINT TABLE

<table>
<thead>
<tr>
<th></th>
<th>&quot;T&quot;</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
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<td>≤ 4&quot;</td>
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<td>2&quot;</td>
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<td>1'-8&quot;</td>
<td>3/4&quot;</td>
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<tr>
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<td>&gt; 6 1/2&quot; ≤ 9&quot;</td>
<td>6 1/2&quot;</td>
<td>3 1/2&quot;</td>
<td>9&quot; *</td>
<td>2'-4&quot;</td>
<td>5&quot;</td>
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<tr>
<td>&gt; 9&quot; ≤ 13&quot;</td>
<td>8 1/2&quot;</td>
<td>4 1/2&quot;</td>
<td>11&quot; *</td>
<td>2'-10&quot;</td>
<td>7&quot;</td>
<td></td>
</tr>
</tbody>
</table>

T = Total Movement  * = Single Slot

MATERIALS:

Rail bars: ASTM A 500, Grade B
Rail posts, shapes & plates: AASHTO M 270/M 270, Grade 50
Anchor studs, washers & heavy hex nuts: AASHTO M 314, Grade 105
All other bolts & nuts (unless noted): AASHTO A 307, Grade C

STEEL BRIDGE RAILING
507(12)
NOTES:

1. All work and materials shall conform to the provisions of Section 507 - Railings of the Standard Specifications.

2. Tubing shall meet the longitudinal CVN minimum requirements of 15 ft-lb at 0°F or proportional values of sub-size specimens. Testing shall be done in accordance with ASTM A 673. The H frequency shall be used and the material shall be as-rolled.

3. Twenty-five percent of the post-to-base welds in a production lot shall be tested by the Magnetic Particle Method. If rejectable discontinuities are found, another twenty-five percent of that production lot shall be tested. If rejectable discontinuities are found in the second twenty-five percent, all post-to-base welds in that lot shall be tested. Acceptance criteria shall be in accordance with the latest edition of the AWS DI.5 Bridge Welding Code.
4. All exposed cut or sheared edges shall be broken and free of burrs. The inside weld flash of tubing shall be removed at splices and expansion joints.

5. Rail posts shall be set normal to grade unless otherwise shown.

6. Lengths of rail bar shall be attached to a minimum of two rail posts and to at least four posts whenever possible.

7. Rail bar expansion joints shall be provided in any rail bay spanning a superstructure expansion joint. Expansion joint width shall be "X" at 45° F and will be adjusted in the field as directed by the Resident. Refer to detail and table on page 507(12) for dimension "X".

8. All parts shall be galvanized after fabrication in accordance with ASTM A 123, except that hardware shall meet the requirements of either ASTM A 153 or ASTM B 695, Class 50, Type I. Parts except hardware shall be blast-cleaned prior to galvanizing in accordance with SSPC-SP6.

9. Anchor bolts shall be set with a template. Nuts securing the post base plate shall be tightened to a snug fit and given an additional 1/8 turn.

10. Rail bars shall be attached to posts using 3/4" ø ~ ASTM A 307 bolts (5/8" ø ~ ASTM A 325 bolts may be substituted) inserted through the face of the rail bar. Bolts shall be round or dome head and may be rib neck, slotted, wrench head or tension control (TC or twist-off). Holes in posts shall be 1/16" larger than the diameter of the bolt. Holes in rail bars shall be drilled to size as follows:

   Slotted, wrench head or TC bolts: 1/16" larger than bolt diameter
   Rib neck bolts: Size appropriate to accommodate an interference fit

All bolts for fastening the rail bars to the posts shall be 6 inches in length and shall include a flat washer under the nut.

11. Holes in rail bars shall be field-drilled and shall be coated with an approved zinc-rich paint prior to erection.

12. Bolts in expansion joints shall be tightened only to a point that will allow rail movement.

13. The alternate curb projection shown for the curb-mounted railings is intended for use with granite bridge curb.

14. If there is a conflict between these Standard Details and the Design Drawings, the Contractor shall notify the Resident immediately.
CONCRETE TRANSITION BARRIER

(2 - Bar Traffic Railing)

(3 - Bar Traffic / Bicycle Railing)
(4 - Bar Traffic / Bicycle Railing similar)

(4 - Bar Traffic / Pedestrian Railing)
~ TRANSITION BARRIER PLAN ~

Guardrail Anchorage Bolts

Exp. Joint  Bkwll.

~ TRANSITION BARRIER ELEVATION ~

2'-8" Stem  2'-8" Nose

1'-0" Recess

6'-4"

2" (See Note No. 5)

On Curb  On Sidewalk

Guardrail Anchorage

2'-8"  1'-11"

2'-8"  2'-61/2"

3'-9/16"  3'-61/2"

3'-9/16"  2'-8"

2'-9/16"  3'-61/2"

2'-61/2"

CONCRETE TRANSITION BARRIER

526(23)
CONCRETE TRANSITION BARRIER

1/8" Guardrail Anchor Plate

4" Galvanized (Min.)
Type I Bolts only

Typ. 1/8" Projection

~ GUARDRAIL ANCHORAGE SECTION ~

~ GUARDRAIL ANCHOR PLATE ~

CONCRETE TRANSITION BARRIER
526(24)
CONCRETE TRANSITION BARRIER
526(26)
~ SECTION THRU NOSE ~
(2 - Bar Traffic Railing)

CONCRETE TRANSITION BARRIER

526(27)
CONCRETE TRANSITION BARRIER
526(28)
CONCRETE TRANSITION BARRIER
526(32)
CONCRETE TRANSITION BARRIER

526(33)
CONCRETE TRANSITION BARRIER

4 ~ TB600 (2 E.F.)

5 ~ TB650

2 ea. ~ TB501 thru TB505
(1 each E.F.)

2 ~ TB506 (1 E.F.)
(Bend in field)

7 ~ TB550

1-3/4"

9"

6/4"

3"

9"

4" spaces @ 6" = 5'-6"

6"

2" (Note No. 5)

4 ~ additional #5 stirrups

~ TRANSITION BARRIER ELEVATION ~

(4 - Bar Traffic / Pedestrian Railing)
CONCRETE TRANSITION BARRIER

~ SECTION THRU RECESS ~
(4 - Bar Traffic / Pedestrian Railing)

~ SECTION THRU STEM ~
(4 - Bar Traffic / Pedestrian Railing)
~ SECTION THRU NOSE ~
(4 - Bar Traffic / Pedestrian Railing)
**CONCRETE TRANSITION BARRIER**

-- TB550 --

**REINFORCING STEEL SCHEDULE**

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<th>3 - Bar Bike</th>
<th>4 - Bar Bike</th>
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</tbody>
</table>

**Notes:**

The first digit following the letters of the mark indicate the size of the reinforcing bar. (TB500 = bar size #5.) All dimensions are out - to - out of bar.

Quantities given are for one Transition Barrier.
NOTES:

1. All work and materials shall conform to the provisions of Standard Specifications Section 526 - Concrete Barrier.

2. The Contractor is responsible for ensuring that vertical reinforcing bars TB651 and TB652 are installed prior to placement of the curb or sidewalk concrete. Payment for these bars will be considered incidental to Item No. 526.34, Permanent Concrete Transition Barrier.

3. Reinforcing steel shall have a minimum concrete cover of 2 inches.

4. Quantities of reinforcing bars shown are for one transition barrier only.

5. When the Concrete Transition Barrier is cantilevered over an expansion joint, the nose shall be blocked out as shown.

6. Payment for guardrail anchorage will be considered incidental to the transition barrier pay item. Class 8.8.3 bolts shall be used when corrosion-resistant steel guardrail is specified on the approach roadway.

7. Precast Concrete Transition Curb shall meet the requirements of Standard Specifications Section 609 - Curb. The bridge end of the curb shall be saw cut in the field to fit flush against the backwall, as dictated by the bridge skew angle and the profile grade. Where curbing is specified on the adjacent highway, the transition shall be modified accordingly. Payment for transition curb will be considered incidental to the Concrete Transition Barrier pay item.

8. Concrete Transition Barrier is designed for attachment of Bridge Transition Type "1" unless otherwise indicated on the Design Drawings. Refer to Section 606 for details.

9. After installation of the guardrail is complete, upset the threads on the anchor bolts in three (3) places around each bolt, at the junction of the nut and the exposed thread, with a center punch or similar tool.

10. If there is a conflict between these Standard Details and the Design Drawings, the requirements of the Design Drawings shall be followed.

MATERIALS:

Concrete .................................................................................................................Class "LP"
Reinforcing Steel ............................................................................................. AASHTO M 31M/M 31, Grade 60
Spacer Plate ........................................... AASHTO M 270M/M 270, Grade 36 (Galvanized)
Bolts ................................................................. AASHTO M 314, Grade 105 (Galvanized)

CONCRETE TRANSITION BARRIER
526(38)
STANDARD BRIDGE TRANSITION - TYPE "I"

Bridge Transition Type "I"

Type 3 Guardrail

1'-8\(\frac{3}{4}\)"

18'-9"

2 sp. @ 4 sp. @ 1'-6\(\frac{3}{4}\)"

= 6'-3"

1'-6\(\frac{3}{4}\)"

= 9'-4\(\frac{1}{2}\)"

2 sp. @ 4 sp. @ 1'-6\(\frac{3}{4}\)"

3 spaces @ 3'-1\(\frac{1}{2}\)"

= 9'-4\(\frac{1}{2}\)"

3'-2"

7\(\frac{1}{4}\)"

Thrie Beam Section (Doubled Beam)

Precast Transition Curb

Thrie Beam Transition Section

Finished Grade

Thrie Beam Terminal Connector

~ BRIDGE TRANSITION TYPE "I" ~

NOTE: Part designations are shown in "A Guide to Standardized Highway Barrier Hardware" as prepared and approved by the AASHTO - AGC - ARTBA Joint Committee, Task Force 13 Report.
BRIDGE TRANSITION - TYPE "IA"

~ BRIDGE TRANSITION TYPE "IA" ~

NOTE: Part designations are shown in "A Guide to Standardized Highway Barrier Hardware" as prepared and approved by the AASHTO - AGC - ARTBA Joint Committee, Task Force 13 Report.