This Traffic Railing Retrofit has been structurally evaluated to be equivalent or greater in strength to a design which has been successfully crash tested in accordance with NCHRP Report 350 TL-4 criteria.

CONCRETE: Concrete for Transition Blocks and Curbs shall be Class II (Bridge Deck).

REINFORCING STEEL: Reinforcing steel shall be ASTM A615, Grade 60.

THREE-BEAM GUARDRAIL: Steel Three-Beam Elements shall meet the requirements for Class B (3D Gauge) Guardrail of AASHTO M 180, Type II (Zinc coated). The minimum panel length for Three-Beam Elements shall be 12'-6". Field drilled holes for Post connections shall be 32 by 2½ slotted holes.

GUARDRAIL BOLTS: Guardrail bolts, nuts and washers shall be in accordance with AASHTO M180.

GUARDRAIL POSTS AND BASE PLATES: Posts and Base Plates shall be in accordance with ASTM A36 or ASTM A109 Grade 36.

ANCHOR BOLTS, NUTS AND WASHERS: Adhesive-Bonded Anchors and Anchor Bolts shall be fully threaded in accordance with ASTM F1554 Grade 105 or ASTM A193 Grade B7. At the Contractor’s option, Anchor Bolts for through bolting may be in accordance with ASTM A449. All Nuts shall be single self-locking hex nuts and in accordance with ASTM A563 or ASTM A194. Flat Washers shall be in accordance with ASTM F436 and Plate Washers (for long slotted holes only) shall be in accordance with ASTM A36 or ASTM A109 Grade 36. After the nuts have been snug tightened, the anchor bolt threads shall be distorted to prevent removal of the nuts. Distorted threads and the exposed trimmed ends of anchors shall be coated with a galvanizing compound in accordance with the Specifications.

COATINGS: All Nuts, Bolts, Anchors, Washers, Guardrail Posts, Anchor Plates and Base Plates shall be hot-dip galvanized in accordance with the Specifications. Guardrail Post Assemblies shall be hot-dip galvanized after fabrication.

ADHESIVE-BONDED ANCHORS AND DOWELS: Adhesive Bonding Material Systems for Anchors and Dowels shall comply with Specification Section 937 and be installed in accordance with Specification Section 416. The field testing proof loads required by Specification Section 416 shall be 15,000 lbs. for 3/8" of anchor bolts; 55,000 lbs. for the 3/4" anchor bolts with 13" embedment; and 30,000 lbs. for the 1½" 0" anchor bolts with 9" embedment.

BRIDGES ON CURVED ALIGNMENTS: The details presented in these Indexes are shown for bridges on tangent alignments. Details for bridges on horizontally curved alignments are similar.

POST SPACING: Posts shall be located along the length of the bridge at typical 6'-3" or 3'-12" spaces. Utilize the Modified Post Spacing at Intermediate Deck Joints Details as required to clear deck joints. Establish post spacing along the bridge and Roadway Guardrail Transition beginning with the Key Post. The variable post spacings located near begin and end bridge may be utilized to optimize the typical post spacing. Variable lengths of guardrail overlap are also permitted to optimize the typical post spacing. Symmetry of post spacing is not necessary.

THREE-BEAM EXPANSION SECTION: Three-Beam Expansion Sections shall be installed at locations shown in the Plans. Install nuts for splice bolts finger-tight at 2½ slots in three beam expansion sections. Nuts shall fully engage bolts with a minimum of one bolt thread extending beyond the nuts. Distort the first thread on the outside of the nut to prevent loosening. Tighten guardrail bolts in 3½ slots at guardrail post(s) that lie between the slotted expansion splice and bridge deck joint so that the bolt heads are in full contact with three-beam elements, but not so tight as to impede movement due to expansion.

PAYMENT: Payment will be made under Metal Traffic Railing (Thrie-Beam Retrofit) which shall include all materials and labor required to fabricate and install the barrier and lapped guardrail where necessary to maintain post spacing. Transition Blocks and Curbs, Bridge Name Plate and Barrier Delineators and Installation of Elevation Markers, where required, will not be paid for directly but shall be considered as incidental work.
PARTIAL ELEVATION OF INSIDE FACE OF RAILING
MODIFIED POST SPACING AT INTERMEDIATE DECK JOINTS DETAIL
FOR INDEX 460-471, 460-475 & 460-476

1'-6" Min. for non skewed joints. See Skew Detail
for treatment at skewed joints.

Post Spacing as measured to:
- Intermediate Post Bolts
- Thrie-Beam Guardrail Post Bolts

11" Min. Index 460-471 & 460-476; 1'-2" Min. Index 460-475 for non skewed joints. See Skew Detail for treatment at skewed joints.

PARTIAL PLAN
INTERMEDIATE JOINT SKEW DETAIL

1'-6" Min. Index 460-471 & 460-476; 1'-2" Min. Index 460-475 for non skewed joints. See Skew Detail for treatment at skewed joints.

Thrie-Beam Guardrail Post Assembly
Guardrail Post Assembly

Exitng Curb

Intermediate Deck Joint

Existing Bridge Coping

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
MODIFIED POST SPACING AT INTERMEDIATE DECK JOINTS DETAIL
FOR INDEX 460-472, 460-473 & 460-474

1'-6" Min. for non skewed joints. See Skew Detail
for treatment at skewed joints.

Post Spacing as measured to:
- Intermediate Post Bolts
- Thrie-Beam Guardrail Post Bolts

11" Min. Index 460-471 & 460-476; 1'-2" Min. Index 460-475 for non skewed joints. See Skew Detail for treatment at skewed joints.

THRIE-BEAM EXPANSION SECTION

1'-6" Min. Index 460-471 & 460-476; 1'-2" Min. Index 460-475 for non skewed joints. See Skew Detail for treatment at skewed joints.

Asphalt Overlay

Existing Curb

Shift Guardrail Post Assembly to clear Deck Joint

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
MODIFIED POST SPACING AT INTERMEDIATE DECK JOINTS DETAIL
FOR INDEX 460-472, 460-473 & 460-474

1'-6" Min. for non skewed joints. See Skew Detail
for treatment at skewed joints.

Post Spacing as measured to:
- Intermediate Post Bolts
- Thrie-Beam Guardrail Post Bolts

11" Min. Index 460-471 & 460-476; 1'-2" Min. Index 460-475 for non skewed joints. See Skew Detail for treatment at skewed joints.
Guardrail - (Thrie-Beam Retrofit) Typical Details & Notes

DESCRIPTION:

GUIDEPLATE DETAIL

OFFSET BLOCK DETAIL

IDEAS BUOY BLOCK DETAIL

THREE-BEAM GUARDRAIL SPlice

Note: All Three Beam Panels shall be lapped in the direction of adjacent traffic. At the Contractor’s option, laps may be extended. Field drill holes in trailing Three Beam Guardrail Panel as required.

Note: The Anchor Plate and Plate Washer are applicable only to 1½" Anchor Bolts that are to be thru-bolted for Index 460-471 & 460-476.

APPLICATION

Length

1½"

Full Length

Rail Splice Bolt, Post Bolt for Index 460-471, 460-473 & 460-476

Varies (8" Min.)

4" Min.

Post Bolt for Index 460-471, 460-473, 460-474, 460-475 & 460-476

TYPICAL SECTION THRU THREE-BEAM GUARDRAIL (EXPANSION SECTION SIMILAR)

1½" MODIFIED HEAVY HEX NUT (RECESS NUT)

1½" Ø Anchor Bolts with Plate Washers (Typ.)

1½" x 3½" Long Slotted Holes for Anchor Bolts with Plate Washers (Typ.)

1½" Ø Holes for 1½" Anchor Bolts

1½" Ø Holes for 1½" Anchor Bolts

Anchor Bolts

1½" Ø Holes for 1½" Anchor Bolts

1½" Ø Holes for 1½" Anchor Bolts

ANCHOR PLATE DETAIL

PLATE WASHER DETAIL

OFFSET BLOCK NOTES:

1. Offset blocks shall be timber or Approved Alternate. Uniformity of block size and alignment of guardrail shall be maintained along length of reticulat.

2. Post bolt holes in offset blocks to be centered (± 1/8")

3. Timber offset blocks shall be dressed on all four sides (S4S).

4. Block assemblies for Special Offset Blocks can be made up of 2 or 3 Special or Standard Offset Blocks, field dressed as required.

Note: Dim. A is equal to the exposed curb height. For location of Dim. A see Index 460-471 thru 460-476, Sheet 1.

Note: Dim. A is equal to the exposed curb height. For location of Dim. A see Index 460-471 thru 460-476, Sheet 1.