EXISTING RAILING SYSTEM (CONFIGURATION VARIES)

ELEVATION OF STEEL RAIL (ON BRIDGE) NOT TO SCALE

SECTION A-A NOT TO SCALE

SECTION B-B NOT TO SCALE

ELEVATION OF STEEL RAIL (AT END POST) NOT TO SCALE

ELEVATION OF THRU GIRDER (ON BRIDGE) NOT TO SCALE

ELEVATION OF THRU GIRDER (AT END SUPPORT) NOT TO SCALE

NOTES:
1. A RAILING EXPANSION SPLICE IS REQUIRED IN ANY POST SPACING THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT.
2. RAIL TUBES SHALL BE IN CONFORMANCE WITH N.Y.S. STANDARD SPECIFICATIONS MATERIAL SPECIFICATION 710-23.
3. ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
4. ALL AREAS WHERE THE ZINC COATING IS DAMAGED DURING INSTALLATION, INCLUDING FIELD DRILLED HOLES, SHALL BE REPAIRED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
5. ALL NUTS SHALL HAVE A SPRING LOCK WASHER.
6. FOR BOX BEAM TRANSITION DETAILS, SEE BD-RU6E.

DETAILS ON THE DRAWINGS LABELED AS "NOT TO SCALE" ARE INTENTIONALLY DRAWN NOT TO SCALE FOR VISUAL CLARITY. ALL OTHER DETAILS, FOR WHICH NO SCALE IS SHOWN, ARE DRAWN PROPORTIONAL AND ARE FULLY DIMENSIONED.

DESIGNER:
THESE UPGRADE DETAILS ARE ADEQUATE FOR A TL-2 (PL-1) SERVICE LEVEL. DESIGNER IS RESPONSIBLE FOR CHECKING ADEQUACY OF POST ANCHORAGE AND DECK SLAB DETAILS.

"A" - WHEN THERE IS NO SIDEWALK THIS DIMENSION IS RESTRICTED TO A MAXIMUM OF 9" (6" IS DESIRABLE). IF THIS DIMENSION EXCEEDS 9" WHEN USING A 8" BLOCKOUT, A NEW POST SYSTEM MAY BE USED. THE DESIGNER IS RESPONSIBLE FOR MODIFYING THE BLOCKOUT ATTACHMENT DETAILS TO FIT THE SPECIFIC EXISTING RAILING SYSTEM.

REVIEWED
ORIGINAL SIGNED BY GEORGE A. CHRISTIAN, P.E.

ISSUED UNDER EB 08-002 EFFECTIVE WITH THE LETTING OF 1/08/09

ISSUED 5/01/08
REVISED STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
OFFICE OF STRUCTURES
DEPUTY CHIEF ENGINEER (STRUCTURES)
APPROVED:
BRIDGE RAILING UPGRADE
SINGLE BOX BEAM
BD-RU2E

SEE PLAN AND ELEVATION
OF BOTTOM RAIL BELOW

EXISTING RAILING
6" x 6.5": B
2" Dia. Campaign Bolts (Typ.)

SECTION D-D
NOT TO SCALE

PLAN
BOTTOM RAIL END SECTION

DETAIL "A"
NOT TO SCALE

END SECTION CUT DETAIL

NOTES:
1. RAIL TUBES SHALL BE IN CONFORMANCE WITH N.Y.S.
   STANDARD SPECIFICATIONS SUBSECTION 710-23.
2. ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH
   N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
   ALL AREAS WHERE THE ZINC COATING IS DAMAGED DURING
   INSTALLATION, INCLUDING FIELD DRILLED HOLES, SHALL BE
   REPAIRED IN ACCORDANCE WITH N.Y.S. STANDARD
   SPECIFICATIONS SUBSECTION 719-01.
3. FOR RAILING EXPANSION SPLICE DETAILS SEE BD-RS8E.
4. FOR BOX BEAM TRANSITION DETAILS SEE BD-RU6E.
5. FOR RAILING FIXED SPLICE DETAILS SEE BD-RS8E.
ELEVATION OF STEEL RAIL (ON BRIDGE) NOT TO SCALE

Existing Railing System - Configuration Varies

EXISTING RAILING SYSTEM CONFIGURATION VARIATES

EXISTING RAILING SYSTEM CONFIGURATION VARIATES

ELEVATION OF STEEL RAIL (ON BRIDGE) NOT TO SCALE

VIEW G-G

SECTION F-F

NOT TO SCALE

NOT TO SCALE

THREE BEAM UPGRADE DETAILS

NOT TO SCALE

NOT TO SCALE

NOT TO SCALE

NOT TO SCALE

NOT TO SCALE

NOT TO SCALE

DETAILS ON THE DRAWINGS LABELED AS "NOT TO SCALE" ARE INTENTIONALLY DRAWN NOT TO SCALE FOR VISUAL CLARITY. ALL OTHER DETAILS, FOR WHICH NO SCALE IS SHOWN, ARE DRAWN PROPORTIONAL AND ARE FULLY DIMENSIONED.

NOTES:
1. A RAILING EXPANSION SPLICE IS REQUIRED IN ANY POST SPACING THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT.
2. RAIL TUBES SHALL BE IN CONFORMANCE WITH N.Y.S. STANDARD SPECIFICATIONS MATERIAL SPECIFICATION 710-23.
3. ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01. ALL AREAS WHERE THE ZINC COATING IS DAMAGED DURING INSTALLATION, INCLUDING FIELD DRILLED HOLES, SHALL BE REPAIRED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
4. ALL NUTS SHALL HAVE A SPRING LOCK WASHER.
5. FOR BOX BEAM TRANSITION DETAILS, SEE BD-RS4E.
6. FOR THRIE BEAM TRANSITION DETAILS, SEE BD-RC17E AND BD-RC18E.
7. FOR SECTION C-C, SEE BD-RU1E.
8. DESIGNER NOTES:
   DOUBLE BOX BEAM UPGRADE DETAILS ARE ADEQUATE FOR A TL-4 (PL-2) SERVICE LEVEL.
   SINGLE BOX BEAM UPGRADE DETAILS ARE ADEQUATE FOR A TL-2 (PL-1) SERVICE LEVEL.
   THRIE BEAM UPGRADE DETAILS ARE ADEQUATE FOR A TL-2 (PL-1) SERVICE LEVEL.
   DESIGNER IS RESPONSIBLE FOR CHECKING ADEQUACY OF POST ANCHORAGE AND DECK SLAB DETAILS.

"A" - WHEN THERE IS NO SIDEWALK THIS DIMENSION IS RESTRICTED TO A MAXIMUM OF 9" (6" IS DESIRABLE). IF THIS DIMENSION EXCEEDS 9" WHEN USING A 8" BLOCKOUT, A NEW POST SYSTEM MAY BE USED. THE DESIGNER IS RESPONSIBLE FOR MODIFYING BLOCKOUT ATTACHMENT DETAILS TO FIT THE SPECIFIC EXISTING RAILING SYSTEM.
SINGLE BOX BEAM RAILING UPGRADE

<table>
<thead>
<tr>
<th>TRUSS RAIL SPAN LENGTHS</th>
<th>SPICE TUBE &amp; FILL PLATE SIDES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rail Tube Sections</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1. A RAILING EXPANSION SPICE IS REQUIRED IN ANY POST SPACING THAT CONTAINS A SUPERSTRUCTURE EXPANSION JAMB.
2. RAIL TUBES SHALL BE IN CONFORMITY WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
3. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
4. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
5. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
6. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
7. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
8. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
9. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
10. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
11. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
12. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
13. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
14. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
15. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
16. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
17. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
18. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
19. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
20. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
21. ALL HOLES SHALL BE FILLED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.

DOUBLE BOX BEAM TRUSS RAILING UPGRADE
**FREE STANDING BRIDGE RAILING ON TRUSS BRIDGE**

**BOTTOM RAIL TERMINATION DETAILS**
(SINGLE RAIL UPGRADE)

- **NOTES:**
  1. A RAILING EXPANSION SPLICE IS REQUIRED IN ANY POST SPACING THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT.
  2. RAIL TUBES SHALL BE IN CONFORMANCE WITH N.Y.S. STANDARD SPECIFICATIONS MATERIAL SPECIFICATION 710-23.
  3. ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
  4. ALL AREAS WHERE THE ZINC COATING IS DAMAGED DURING INSTALLATION, INCLUDING FIELD DRILLED HOLES, SHALL BE REPAIRED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
  5. ALL NUTS SHALL HAVE A SPRING LOCK WASHER.
  6. FOR TWO RAIL WITH BRUSH CURB TRANSITION DETAILS, SEE BD-RS4E.
  7. FOR SINGLE BOX BEAM UPGRADE TRANSITION DETAILS, SEE BD-RU6E.

**DESIGNER:**
"A" - WHEN THERE IS NO SIDEWALK THIS DIMENSION IS RESTRICTED TO A MAXIMUM OF 9" (6" IS DESIRABLE). IF THIS DIMENSION EXCEEDS 9" WHEN USING A 8" BLOCKOUT, A NEW POST SYSTEM MAY BE USED. THE DESIGNER IS RESPONSIBLE FOR MODIFYING BLOCKOUT ATTACHMENT DETAILS TO FIT THE SPECIFIC EXISTING RAILING SYSTEM.

**NOTE:**
USE STEEL BRIDGE RAILING (TWO RAIL - BRUSH CURB). FOR MORE DETAILS, SEE BD-RS1E.

**FOR DETAILS, SEE BOTTOM RAIL PLAN AND ELEVATION ON BD-RU2E.**

**NOTE:**
POSTS MAY HAVE TO BE MOVED EITHER SIDE OF TRUSS MEMBER TO ACCEPT THE BASE PLATE.

**DETAILS ON THE DRAWINGS LABELED AS "NOT TO SCALE" ARE INTENTIONALLY DRAWN NOT TO SCALE FOR VISUAL CLARITY. ALL OTHER DETAILS, FOR WHICH NO SCALE IS SHOWN, ARE DRAWN PROPORTIONAL AND ARE FULLY DIMENSIONED.
REVISED
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
OFFICE OF STRUCTURES
DEPUTY CHIEF ENGINEER (STRUCTURES)
APPROVED:
SINGLE BOX BEAM UPGRADE
TRANSITION DETAILS

NOTE:
1. A RAILING EXPANSION SPLICE IS REQUIRED IN ANY POST SPACING THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT.
2. RAIL TUBES SHALL BE IN CONFORMANCE WITH N.Y.S. STANDARD SPECIFICATIONS MATERIAL SPECIFICATION 710-23.
3. ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
4. ALL NUTS SHALL HAVE A SPRING LOCK WASHER.
5. THE COST OF THE POST, SPLICE TUBE AND RAIL FOR THE LOWER TUBE FLARE SECTION IS INCLUDED IN THE PRICE BID FOR THE TRANSITION ITEM.
6. PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE BOX BEAM RAILS, SPLICE TUBES AND FILL PLATES.
7. SEE TYPICAL RAIL TO POST CONNECTION DETAIL ON CURRENT HIGHWAY STANDARD SHEET TITLED "BOX BEAM GUIDE RAIL".
8. FOR ADDITIONAL DETAILS OF HEAVY POST AND TRANSITION POSTS SEE BD-RC4E.
9. FOR CURB AND SHOULDER TREATMENT DETAILS SEE CURRENT STANDARD SHEET TITLED "CONCRETE BARRIER TRANSITION TO HIGHWAY BOX BEAM SHOULDER TREATMENT".
10. FOR RAILING SPLICE DETAIL AT TURN BACK IN LOWER TRANSITION GUIDE RAIL SEE BD-RC4E.
11. FOR RAILING SPLICE ASSEMBLY DETAILS SEE BD-RS7E & BD-RS8E.

DETAILS ON THE DRAWINGS LABELED AS "NOT TO SCALE" ARE INTENTIONALLY DRAWN NOT TO SCALE FOR VISUAL CLARITY. ALL OTHER DETAILS, FOR WHICH NO SCALE IS SHOWN, ARE DRAWN PROPORTIONAL AND ARE FULLY DIMENSIONED.

DESIGNER:
VERIFY EXISTING HIGHWAY RAIL DIMENSIONS TO ENSURE NEW TRANSITION WILL MEET EXISTING HIGHWAY RAIL.

DESIGNER:
The designer shall check the clearance from the superstructure to the end of the first heavy post. This check may require the special post detail, see Section L-L.

NOTE:
1. See designer's note for the details on the drawings labeled as "NOT TO SCALE".
2. The design shall not be altered or modified without the written approval of the engineer of record.
3. Plans are subject to change without notice.

ENGINEER:
HEAVY POSTS TRANSITION TO CONFORM TO NEW TRANSITION POSTS TO MEET EXISTING HIGHWAY RAIL.

PAY LIMIT FOR BOX BEAM GUIDE RAIL IN HIGHWAY ESTIMATE

SHELF ANGLE MAY BE FIELD DRILLED.

NO "4" DIA. BOLTS REQUIRED AT THIS POST ONLY.

THE 7/8" DIA. HOLDS THE SHELF ANGLE MAY BE FIELD DRILLED.

NO 7/8" DIA. BOLTS REQUIRED AT THIS POST ONLY.

2'-3' HIGHWAY MOUNTING HEIGHT
9" MEASURED FROM THE ELEVATION OF THE GROUND AT THE END OF THE FLARED BACK SECTION OF TUBE

THE 1" DIA. HOLE DRILLED IN THE SHELF ANGLE MAY BE FIELD DRILLED.

NO 1 1/2" DIA. BOLTS REQUIRED AT THIS POST ONLY.

2'-3' HIGHWAY MOUNTING HEIGHT

NOTE:
1. A RAILING EXPANSION SPLICE IS REQUIRED IN ANY POST SPACING THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT.
2. RAIL TUBES SHALL BE IN CONFORMANCE WITH N.Y.S. STANDARD SPECIFICATIONS MATERIAL SPECIFICATION 710-23.
3. ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH N.Y.S. STANDARD SPECIFICATIONS SUBSECTION 719-01.
4. ALL NUTS SHALL HAVE A SPRING LOCK WASHER.
5. THE COST OF THE POST, SPLICE TUBE AND RAIL FOR THE LOWER TUBE FLARE SECTION IS INCLUDED IN THE PRICE BID FOR THE TRANSITION ITEM.
6. PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE BOX BEAM RAILS, SPLICE TUBES AND FILL PLATES.
7. SEE TYPICAL RAIL TO POST CONNECTION DETAIL ON CURRENT HIGHWAY STANDARD SHEET TITLED "BOX BEAM GUIDE RAIL".
8. FOR ADDITIONAL DETAILS OF HEAVY POST AND TRANSITION POSTS SEE BD-RC4E.
9. FOR CURB AND SHOULDER TREATMENT DETAILS SEE CURRENT STANDARD SHEET TITLED "CONCRETE BARRIER TRANSITION TO HIGHWAY BOX BEAM SHOULDER TREATMENT".
10. FOR RAILING SPLICE DETAIL AT TURN BACK IN LOWER TRANSITION GUIDE RAIL SEE BD-RC4E.
11. FOR RAILING SPLICE ASSEMBLY DETAILS SEE BD-RS7E & BD-RS8E.

DETAILS ON THE DRAWINGS LABELED AS "NOT TO SCALE" ARE INTENTIONALLY DRAWN NOT TO SCALE FOR VISUAL CLARITY. ALL OTHER DETAILS, FOR WHICH NO SCALE IS SHOWN, ARE DRAWN PROPORTIONAL AND ARE FULLY DIMENSIONED.