RAIL POST SHIM DETAIL

NOTE:

ANCHOR PLATE

ANCHORAGE FOR RAIL POSTS

RAIL POST SHIM DETAIL

SLEEVE DETAIL

SECTION A-A

FIELD ERECTION JOINT DETAIL

COMBINATION RAILING

BUREAU OF STRUCTURES

Bill Oliva

STANDARD 3609
Combination railings types C1 - C6 may also be used as a traffic barrier is required between the roadway and pedestrian rail mounted directly to a bridge sidewalk or retaining wall by increasing the railing height to a minimum of 3'-6" and a maximum of 4'-6" and using a minimum post size of 3"x3"x3/16". When used on a bridge, and the sidewalk, for this pedestrian railing, bid item A minimum 12'-0" wing length is recommended to accommodate the rail end transition and provide a post spacing on the wing that will maintain the rail aesthetics.

See standard 30.18 for additional railing details.

Designer Notes:

- Parapet reinforcing bar size and spacing
- Post spacing on the wing that will maintain the rail aesthetics
- Clear space between the top two rails may be increased to a 6" maximum except for "type C1" railing.
- Minimum 12'-0" wing length is recommended to accommodate the rail end transition and provide a post spacing on the wing that will maintain the rail aesthetics.

See standard 30.18 for additional railing details.
**Designer Notes**

The standard accommodates electrical service to light standards mounted on structures, which must be installed for lighting service to be provided. See Section 32.6 for additional information.

*CONDUIT RIGID METALLIC 2-INCH*

*CONDUIT RIGID NONMETALLIC SCHEDULE 40 2-INCH*

*JUNCTION BOXES 18X12X6-INCH*, EACH

*JUNCTION BOXES 18X6X6-INCH*, EACH

**Possible Bid Items:**

- **MANUAL SECTION 32.6 FOR ADDITIONAL INFORMATION.**

**Construction notes:**

- Use a 18" x 12" x 6" junction box when (2) - 2" dia. conduit is used.
- Use a 18" x 12" x 6" junction box when (3) - 2" dia. conduit is used.
- Construction joint strike off as shown.


NOTES:
1. ALL STEEL COMPONENTS AND FASTENERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111 OR M232.
2. ALL CUTS, BORE HOLES, AND DAMAGE SHALL BE IMMEDIATELY TREATED WITH WOOD PRESERVATIVE IN ACCORDANCE WITH TREATMENT GUIDE.
3. WHEN FIELD FABRICATION OF WOOD IS REQUIRED OR IF WOOD IS DAMAGED, TO THE EXTENT POSSIBLE, ALL WOOD SHALL BE CUT, DRILLED, AND COMPLETELY FABRICATED PRIOR TO PRESSURE TREATMENT.
4. DOUGLAS FIR-LARCH. GLULAM AND OTHER SPECIES AND GRADES OF SAWN LUMBER MAY BE USED, PROVIDED THE MINIMUM TABULATED VALUES ARE NOT LESS THAN THE FOLLOWING:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>NO.</th>
<th>SIZE</th>
<th>LENGTH MIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLULAM RAIL</td>
<td>6&quot; x 10&quot;</td>
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<tr>
<td>SPACER BLOCK</td>
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<td>SCUPPER BLOCK</td>
<td>6&quot; x 8&quot;</td>
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<tr>
<td>POISE</td>
<td>6&quot; x 8&quot;</td>
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<td></td>
</tr>
<tr>
<td>CURB</td>
<td>8&quot; x 8&quot;</td>
<td>20 ft</td>
<td></td>
</tr>
<tr>
<td>CURB TRANSITION</td>
<td>8&quot; x 8&quot;</td>
<td>20 ft</td>
<td></td>
</tr>
<tr>
<td>TRANSITION PLATE</td>
<td>8&quot; x 8&quot;</td>
<td>20 ft</td>
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</tr>
</tbody>
</table>

TOTAL WIDTH

THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 2 (TL-2).

TO CONCRETE SLAB DETAILS

Bill Oliva

STANDARD 30.25

TIMBER RAILING ATTACHED TO CONCRETE SLAB DETAILS
SECTION THRU RAILING ON SIDEWALK

"SIDEWALK DETAILS FOR TUBULAR STEEL RAILING TYPE NY4"

**LEGEND**

1. **x 25 with 6 x 6" horizontal slotted holes on each side of post.**
   - Use bolts no. 6 at top and 2 holes for each bolt no. 6 at bottom.
   - Use slotted holes for bolt no. 6 at bottom of post to match slope of roadway.
   - Place post vertical, plate post normal to grade line.

2. Place 1.5" dia. holes in 6 x 6" tubing for anchor bolts.
   - Hole spacing is as shown. Slotted holes file to match size of plate.

3. **6" dia. anchor holes with heaviest set at 25% and 25% minimum.**
   - Washer rail, galvanized, #4 required in post, 1-1/2" washer normal to seat for proper bolt length. Place washer inside post to prevent crushing of tubing when seated.
   - 5/8" dia. holes in plate for anchor bolts, use slotted holes in plate and 1" dia. washers for proper bolt length and positioning.

4. **5 x 3 x 1/8" structural tubing.**
   - Use 1" dia. holes for bolt no. 6 in top of post to seat properly?
   - Place washers on angle to plate no. 1 as shown.
   - Use 1" dia. washers for bolt no. 6 at top of plate.

5. **5 x 3 x 1/8" structural angle.**
   - Attaching to No. 1 and No. 5 as shown.
   - Use 1" dia. holes for bolt no. 6 in top of plate.

6. **6 x 6 x 1/8" structural angle.**
   - Attach to No. 1 and No. 5 as shown.
   - Use 1" dia. holes for bolt no. 6 in top of plate.

**SIDEWALK DETAILS FOR TUBULAR STEEL RAILING TYPE NY4**

**LEGEND**

1. **x 25 with 6 x 6" horizontal slotted holes on each side of post.**
   - Use bolts no. 6 at top and 2 holes for each bolt no. 6 at bottom.
   - Use slotted holes for bolt no. 6 at bottom of post to match slope of roadway.
   - Place post vertical, plate post normal to grade line.

2. Place 1.5" dia. holes in 6 x 6" tubing for anchor bolts.
   - Hole spacing is as shown. Slotted holes file to match size of plate.

3. **6" dia. anchor holes with heaviest set at 25% and 25% minimum.**
   - Washer rail, galvanized, #4 required in post, 1-1/2" washer normal to seat for proper bolt length. Place washer inside post to prevent crushing of tubing when seated.
   - 5/8" dia. holes in plate for anchor bolts, use slotted holes in plate and 1" dia. washers for proper bolt length and positioning.

4. **5 x 3 x 1/8" structural tubing.**
   - Use 1" dia. holes for bolt no. 6 in top of post to seat properly?
   - Place washers on angle to plate no. 1 as shown.
   - Use 1" dia. washers for bolt no. 6 at top of plate.

5. **5 x 3 x 1/8" structural angle.**
   - Attaching to No. 1 and No. 5 as shown.
   - Use 1" dia. holes for bolt no. 6 in top of plate.

6. **6 x 6 x 1/8" structural angle.**
   - Attach to No. 1 and No. 5 as shown.
   - Use 1" dia. holes for bolt no. 6 in top of plate.

**SIDEWALK DETAILS FOR TUBULAR STEEL RAILING TYPE NY4**

**LEGEND**

1. **x 25 with 6 x 6" horizontal slotted holes on each side of post.**
   - Use bolts no. 6 at top and 2 holes for each bolt no. 6 at bottom.
   - Use slotted holes for bolt no. 6 at bottom of post to match slope of roadway.
   - Place post vertical, plate post normal to grade line.

2. Place 1.5" dia. holes in 6 x 6" tubing for anchor bolts.
   - Hole spacing is as shown. Slotted holes file to match size of plate.

3. **6" dia. anchor holes with heaviest set at 25% and 25% minimum.**
   - Washer rail, galvanized, #4 required in post, 1-1/2" washer normal to seat for proper bolt length. Place washer inside post to prevent crushing of tubing when seated.
   - 5/8" dia. holes in plate for anchor bolts, use slotted holes in plate and 1" dia. washers for proper bolt length and positioning.

4. **5 x 3 x 1/8" structural tubing.**
   - Use 1" dia. holes for bolt no. 6 in top of post to seat properly?
   - Place washers on angle to plate no. 1 as shown.
   - Use 1" dia. washers for bolt no. 6 at top of plate.

5. **5 x 3 x 1/8" structural angle.**
   - Attaching to No. 1 and No. 5 as shown.
   - Use 1" dia. holes for bolt no. 6 in top of plate.

6. **6 x 6 x 1/8" structural angle.**
   - Attach to No. 1 and No. 5 as shown.
   - Use 1" dia. holes for bolt no. 6 in top of plate.
INSIDE ELEVATION

ROADWAY OPENING OR 2" X 5" FOR EXPANSION JOINT. USE 1'-0" OPENING WITH FILLER FOR A1 ABUTMENTS.

OUTSIDE ELEVATION

ROADWAY OPENING OR 2" X 5" FOR EXPANSION JOINT. USE 1'-0" OPENING WITH FILLER FOR A1 ABUTMENTS.

SECTION A

SECTION B

SECTION C

BILL OF BARS

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<th>AMOUNT</th>
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</table>

SINGLE SLOPE PARAPET 36SS

STANDARD 30.31

BUREAU OF STRUCTURES

Approved: Bill Oliva

Date: 7-19

STANDARD 30.31
'V' GROOVE.

DEFINE CONST. JOINT WITH A ƒ" - MIN. JOINT SPACING OF 80'-0".
LAP LONGIT. BARS A MIN. OF 1'-9".
RUN BAR REINF. THRU THE JOINT.
IN THE PARAPETS MAY BE USED.

OPTIONAL CONSTRUCTION JOINTS

3"

WING STEEL BEFORE WING IS POURED.
R501 BARS TO BE TIED TO OR B.F. ABUT. END OF WING.

DESIGNER NOTES

THE "56SS" PARAPET IS ONLY TO BE USED IF A "TYPE 56" SINGLE SLOPE CONCRETE ROADWAY BARRIER AIDS THE END OF THE "56SS" PARAPET.
USE A 1'-6" WIDTH FOR WINGS PARALLEL TO THE ROADWAY.

BILL OF BARS
FOR ABUTMENT PARAPETS

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<tr>
<th>BAR</th>
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<th>DIA.</th>
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<td>x</td>
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<td>PARAPET-ABUT.</td>
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STANDARD 30.33

BILL OLIVA

DATE: 1-19
FOR WING LOCATIONS.

"GENERAL PLAN" SHT.

SHELL BEAM. SEE

OF ANCHOR ASSEMBLY

1'-8"

2'-6"

2'-0"

9"

1'-9"

BAR

MARK

C

O

A

T

B E N T

abut.

LENGTH

LOCATION

BILL OF BARS

r501

r502

r503

r504

r505

r506

r507

r508

r509

4'-5

5'-0

2'-9

4'-4

4'-9

4'-10

x

x

x

x

x

x

x

x

abut.

parapet-vert.

parapet-vert.

parapet-vert.

parapet-vert.

parapet-vert.

parapet-vert.

parapet-horiz.

parapet-horiz.

OUTSIDE ELEVATION

INSIDE ELEVATION

PLAN

SECTION A

SECTION B

SECTION C

DESIGNER NOTES

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.12 FOR APPROACH SLAB INFORMATION.

AS AVOID, SEE STANDARD 12.12 FOR AS AVOID DETAILS.

FOR APPROACH SLAB INFORMATION.

SEE STANDARD 30.30 FOR DETAILS OF 32SS PARAPET ON BRIDGE.

A1 ABUT. SHOWN. SEE STANDARD 12.12 FOR A3 ABUT. DETAILS.

FOR APPROACH SLAB INFORMATION.

SEE STANDARD 30.30 FOR DETAILS OF 32SS PARAPET ON BRIDGE.

A3 OR T3 

WITH STRUCTURAL APPROACH SLAB

SINGLE SLOPE PARAPET

32SS WITH STRUCTURAL APPROACH SLAB

DETAILED NOTES

SEE STANDARD 30.30 FOR DETAILS OF 32SS PARAPET ON DRAWING.

AND PROOF BARS TO BE TIED TO STRUCTURAL APPROACH SLAB STEEL

BEFORE STRUCTURAL APPROACH SLAB IS Poured.
FOR WING LOCATIONS.

"GENERAL PLAN" SHT.

FOR THREE BEAM. SEE "GENERAL PLAN" SHT.

BILL OF BARS

<table>
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<tr>
<th>BAR</th>
<th>AMOUNT</th>
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<tr>
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</table>

DESIGNER NOTES

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.12 AND 12.10 FOR APPROACH SLAB INFORMATION.

AS ABUT. SHOWN, SEE STANDARD 12.2 FOR ABUT. DETAILS.

FOR APPROACH SLAB INFORMATION.

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.11

APPROVED

Bill Oliva
DEFINITE JOINT WITH A MIN. JOINT SPACING OF 80'-0".

LAP LONGIT. BARS A MIN. OF 1'-9".

RUN BAR REINF. THRU THE JOINT.

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED.

WEIGHT = 774 LB/FT

AREA = 5.16 SF

DESIGNER NOTES

NOTE: TO BE USED IN A "TYPE 56" SINGLE SLOPE CONCRETE ROADWAY BARRIER ACOORDS THE END OF THE APPRAOCH SLAB.

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.12 FOR APPROACH SLAB INFORMATION.

LIBERTY

SEE STANDARD 12.12 FOR A3 ABUT. DETAILS.

FOR APPROACH SLAB INFORMATION.

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.11 FOR DETAILS OF PARAPET SB 56.

THE "56SS" PARAPET IS ONLY TO BE USED IN "TYPE 56" SINGLE SLOPE CONCRETE ROADWAY BARRIER ACOORDS THE END OF THE APPRAOCH SLAB.

SEE STANDARD 30.33 FOR DETAILS OF "56SS" PARAPET ON BRIDGE.

A1 ABUT. SHOWN. SEE STANDARD 12.12 FOR A3 ABUT. DETAILS.

FOR APPROACH SLAB INFORMATION.

SEE STANDARD 30.33 FOR DETAILS OF "56SS" PARAPET ON BRIDGE.

BILL OF BARS

FOR STRUCTURAL APPROACH SLAB PARAPETS

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<tr>
<th>BAR</th>
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<tr>
<td>R503</td>
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</table>

DESIGNER NOTES

NOTE: TO BE USED IN A "TYPE 56" SINGLE SLOPE CONCRETE ROADWAY BARRIER ACOORDS THE END OF THE APPRAOCH SLAB.

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.12 FOR APPROACH SLAB INFORMATION.

LIBERTY

SEE STANDARD 12.12 FOR A3 ABUT. DETAILS.

FOR APPROACH SLAB INFORMATION.

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.11 FOR DETAILS OF PARAPET SB 56.

THE "56SS" PARAPET IS ONLY TO BE USED IN "TYPE 56" SINGLE SLOPE CONCRETE ROADWAY BARRIER ACOORDS THE END OF THE APPRAOCH SLAB.

SEE STANDARD 30.33 FOR DETAILS OF "56SS" PARAPET ON BRIDGE.

A1 ABUT. SHOWN. SEE STANDARD 12.12 FOR A3 ABUT. DETAILS.

FOR APPROACH SLAB INFORMATION.

SEE STANDARD 30.33 FOR DETAILS OF "56SS" PARAPET ON BRIDGE.