**Vertival Face Parapet 'A'**

- **Approved:** Bill Oliva
- **Date:** 7-19

### Bill of Bars

<table>
<thead>
<tr>
<th>Size</th>
<th>Width</th>
<th>Length</th>
<th>No.</th>
<th>Req'd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R501</td>
<td>4 1/2</td>
<td>2'</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>S501</td>
<td>4 1/2</td>
<td>2'</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>R502</td>
<td>4 1/2</td>
<td>2'</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>S502</td>
<td>4 1/2</td>
<td>2'</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

### Note

When parapets are poured continuously, one side of joints shall be coated with zinc or plastic plate cut as shown in "V" groove. If construction joints in parapets are used at the deflection joint, 4'-0" each, they shall be separated by a piece of 2" V-groove. Non-staining gray non-bituminous joint sealer shall be supplied. Bar adjacent to the paving notch on type A is not used.

### End of notes

<table>
<thead>
<tr>
<th>R501</th>
<th>R502</th>
<th>S501</th>
<th>S502</th>
</tr>
</thead>
<tbody>
<tr>
<td>1'-5&quot;</td>
<td>1'-6&quot;</td>
<td>2'-0&quot;</td>
<td>2'-8&quot;</td>
</tr>
</tbody>
</table>

### Section D

- **View showing outside face of parapet & reinforcement.**
- **View of anchor assembly.**

### Section E

- **Details of deflection joints in parapet - similar to that shown in this area.**

### Details of Anchor Assembly

- **Recommended rebar at 2'-0" long.**

### Designer Note

- **Recommended rebar at 2'-0" long.**

### Approval

- **Approved by:** Bill Oliva
- **Date:** 7-19

### Standards

- **Standard 30.07**

### Notes

- **None.**
- **None.**

### Additional Details

- **All vertical bars #5 bars at abutments.**
- **All vertical bars #5 bars at abutments.**

### Additional Information

- **All vertical bars #5 bars at abutments.**
- **All vertical bars #5 bars at abutments.**

### Additional Notes

- **All vertical bars #5 bars at abutments.**
- **All vertical bars #5 bars at abutments.**

### Reference

- **See "General Plan" sheet.**
SEE STANDARD 30.07 FOR:
- DEFLECTION JOINT DETAILS AND NOTES
- BEAM GUARD ANCHOR ASSEMBLY DETAILS
- SIDEWALK REINFORCEMENT AND DETAILS

SECTION THRU PARAPET ON BRIDGE

RAILING TYPE '3T'

DESIGNER NOTES
SEE STANDARD 30.09 FOR ADDITIONAL RAILING DETAILS
- GENERAL PLAN
- GENERAL DESCRIPTION
- DETAIL FOR ADJUST LOCATIONS OF BARS TO ALLOW POST SPANS

END POST DETAIL
- Closure piece on steel guard rail of parapet and guardrail

INSIDE ELEVATION
- Optimal construction joints in the parapets may be used
- Run bars extending through the joint to uniform a uniform joint spacing of bond, name plate, and guardrail

COMBINATION RAILING TYPE '3T'

BUREAU OF STRUCTURES

STANDARD 30.08

Bill Oliva

1-19
NOTES

1. POST BASE PLATES SHALL BE SIMILAR TO THOSE SHOWN IN DETAIL "A-A".

2. ALL JOINTS IN CONCRETE PARAPET ARE TO BE VERTICAL.

3. CORRECT ALIGNMENT OF ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

4. STEEL ITEMS SHOWN.

5. COMBINATION RAILING TYPE '3T' DETAILS

LEGEND

1. BASE PLATE 6 x 6 x 1/2 x 10/32" SHIPPED W/ 5/16" SLEEVES FOR RAIL POSTS SHOWN. GOURSAL TO NO. 4. AS SHOWN, ITEMS SHOWN TO BE ASSEMBLED TO LONG SIDE OF POST.

2. STRUCTURAL:TUBING 2 x 2 x 1/4" POSTS, PLATE 1/4" THICK. PROVE "SLIDING FIT".

3. STRUCTURAL:TUBING 2 x 2 x 1/4" RAILS, WITH 5/16" HOLE (FRONT AND BACK) FOR BOLT NO. 3. WELD TO NO. 4.

4. STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATE NO. 1, WHERE SHIMMING IS NEEDED TO ALIGN RAILING. SET NORMAL TO GRADE. MIN. SHIM AS REQ'D. TO ALIGN RAILING. SET NORMAL TO GRADE.

5. STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATE NO. 1, WHERE SHIMMING IS NEEDED TO ALIGN RAILING. SET NORMAL TO GRADE. MIN. SHIM AS REQ'D. TO ALIGN RAILING. SET NORMAL TO GRADE.

6. ALTERNATIVE ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE ANCHORS. stainless steel Shims shall conform to section 502.22 of the standard specifications.

7. STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATE NO. 1, WHERE SHIMMING IS NEEDED TO ALIGN RAILING. SET NORMAL TO GRADE. MIN. SHIM AS REQ'D. TO ALIGN RAILING. SET NORMAL TO GRADE.

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**Designer Notes**

Combination railings type C1-C6 may also be used as a traffic barrier, mounted in the median strip. Types C1-C3 may also be used as a pedestrian railing, 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"x‰". When used on a bridge, and the sidewalk, for this pedestrian railing, 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 30.17 for additional railing details.

A minimum joint width is recommended to accommodate the post end transition and provide a joint spacing of 8'-0". Joint design is to be determined by the engineer of record and the contractor.
INSIDE ELEVATION

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE OPENED TO A MINIMUM JOINT SPACING OF 3'-5".  LAP LONGITUDINAL BARS AT PARAPETS MAY BE USED.  RUN BAR REINFORCEMENT THE MINIMUM REQUIRED IN THIS LOCATION.

SECTION A

PLAN

END OF MEDIAN

APPROACH MEDIAN

MEDIAN AREA

OUTSIDE ELEVATION

SECTION THRU PARAPET ON BRIDGE

BILL OF BARS

FOR ABUTMENT PARAPETS

<table>
<thead>
<tr>
<th>BAR</th>
<th>RADIUS</th>
<th>GROUP</th>
<th>LENGTH</th>
<th>LOCATION</th>
</tr>
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<tbody>
<tr>
<td>R501</td>
<td>1 5 9°</td>
<td>2</td>
<td>8&quot;</td>
<td>R501</td>
</tr>
<tr>
<td>R502</td>
<td>1 5 9°</td>
<td>2</td>
<td>8&quot;</td>
<td>R502</td>
</tr>
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<td>S8</td>
<td>1 186°</td>
<td>4</td>
<td>6&quot;</td>
<td>S8</td>
</tr>
</tbody>
</table>

WEIGHT = 512 LBS./FT.
AREA = 3.41 FT.

STANDARD 30.20

SLOPED FACE PARAPET 'S1F'

APPROVED: Bill Oliva
DATE: 1-18

CONSTRUCTION JOINT - STRIKE OFF AS SHOWN.
A MEDIAN FILLER IN LIES ON A TYPICAL 3" MINIMUM JOINT CLEARANCE TO THE PARAPET TOP OR TYPE MEDIAN AREA.

CONCRETE BARRIER IS 51" HIGH OVER THE TOP OF THE PARAPET, ATTACHED TO THE TOP OF THE PARAPET.

SEE STD. 12.01.
THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 2 (TL-2).

TO 32 INCHES. OVER 1" SHALL BE CUT OFF. REPAIR END OF BOLT BY PAINTING WITH ZINC RICH PRIMER.

TOPS OF RAIL POSTS AND TOP OF THE RAIL SPLICE PLATE KERF SHALL BE SEALED WITH ROOFING CEMENT OR IN CONTACT WITH WOOD. WHEN THE SIZE AND STRENGTH OF THE HEAD ARE SUFFICIENT TO DEVELOP CONNECTION, UNLESS NOTED, MALLEABLE IRON WASHERS SHALL BE PROVIDED UNDER BOLT HEADS AND UNDER NUTS THAT ARE OTHERWISE PROTECTED FROM DIRECT EXPOSURE TO WEATHER.

ALL CUTS, BORE HOLES, AND DAMAGE SHALL BE IMMEDIATELY TREATED WITH WOOD PRESERVATIVE IN ACCORDANCE WITH AASHTO M133 AND STANDARD SPECIFICATIONS. TREATMENT WITH PRESERVATIVES. 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 TREATED WITH WOOD PRESERVATIVE IN ACCORDANCE WITH AASHTO M133 AND STANDARD SPECIFICATIONS. IN CONTACT WITH WOOD. WHEN THE SIZE AND STRENGTH OF THE HEAD ARE SUFFICIENT TO DEVELOP CONNECTION, UNLESS NOTED, MALLEABLE IRON WASHERS SHALL BE PROVIDED UNDER BOLT HEADS AND UNDER NUTS THAT ARE OTHERWISE PROTECTED FROM DIRECT EXPOSURE TO WEATHER.

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FULL STEEL COMPONENTS AND FASTENERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111 OR M232.

MINIMUM TABULATED VALUES ARE NO LESS THAN THE FOLLOWING:

E = 1,500,000 LB/IN²

b = 1.350 LB/IN²

FULL STEEL COMPONENTS AND FASTENERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111 OR M232.

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MINIMUM TABULATED VALUES ARE NO LESS THAN THE FOLLOWING:

E = 1,500,000 LB/IN²

b = 1.350 LB/IN²
**LEGEND**

1. 6 x 6-in. (6 x 6-in.) horizontal slotted holes on each side of post for bolt nos. 5 and 6 at top two rails. Use same holes for top rail at bottom.
2. Place 3 x 6-in. (3 x 6-in.) slotted holes for anchoring bolts.
3. 1 1/2-in. dia. #6 bars with holes in top and bottom, 3 1/2-in. minimum washer at 1 1/2-in. dia. bars.
4. 1 1/2-in. dia. A325 bolt with hex nut and spring lock washer (1 required at rail to post locations shown).
5. Use 1 1/4-in. dia. A325 round head bolt with A325 washer under bolt head.
6. Use 1/2-in. x 10-in. x 1'-2-in. anchor plate (galvanized) with 1/4-in. dia. holes for bolt no. 3. Weld to no. 1 as shown. Slots parallel to short side of plate.
7. Use 1 1/4-in. x 10-in. x 1'-2-in. anchor plate (galvanized) with 1/4-in. dia. holes for bolt no. 3. Weld to no. 1 as shown. Slots parallel to short side of plate.
8. Use 1/2-in. dia. holes for bolt no. 6 in top. bolts no. 3.
9. Use 1-in. dia. washers and A325 slotted round head bolt with A325 washer (1 required at rail to post locations shown). Use 1 1/2-in. dia. washers and spring lock washer (1 required at rail to post locations shown).
10. Use 1 1/4-in. dia. holes for bolt no. 6 at top two rails. Use 1/2-in. dia. holes for bolt no. 6 at bottom.

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

**BUREAU OF STRUCTURES**

**APPROVED:**

**Bill Oliva**

**DATE:** 1-18

**STANDARD 30.29**
FOR WING LOCATIONS.

"GENERAL PLAN" SHT.
FOR THREE BEAM.  SEE OF ANCHOR ASSEMBLY

1'-8"
2'-6"
2'-0"
9 "
1'-9 "

BAR MARK

ATTACHED TO THE TOP OF THE PARAPET.

SECTION A
SECTION B
SECTION C

NOTE: FOR SECTIONS A, B & C ONLY
THE PARAPET TERMINATING ON A DECK IS SHOWN.

BILL OF BARS
FOR ARMATURE PARAPETS

<table>
<thead>
<tr>
<th>BAR</th>
<th>#</th>
<th>LENGTH</th>
</tr>
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<tbody>
<tr>
<td>R501</td>
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<tr>
<td>R507</td>
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</table>

SPANS @ 8"

PLAN

INSIDE ELEVATION

INSIDE ELEVATION

OUTSIDE ELEVATION

SECTION THRU PARAPET ON BRIDGE

SINGLE SLOPE PARAPET 32SS

STANDARD 30.30

BUREAU OF STRUCTURES

APPROVED

Bill Oliva

DATE: 7-19
'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

A TO THE PAVING NOTCH ON TYPE

BENCHMARK (WHEN SUPPLIED). AVOID PLACING

ROADWAY OPENING OR 2" min. for expansion joint.

STANDARD 30.33

SINGLE SLOPE PARAPET 56SS

BILL OF BARS

FOR ABUTMENT PARAPETS

<table>
<thead>
<tr>
<th>BAR MARK</th>
<th>DIA.</th>
<th>A.D.</th>
<th>LENGTH</th>
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1'-5" @ 1'-6"

PARAPET BAR ON BRIDGE.

DESIGNER NOTES

THE 56SS PARAPET IS ONLY TO BE USED IF A "TYPE S" SINGLE SLOPE CONCRETE ROADWAY BARREER ALLOWS THE END OF THE 56SS PARAPET.

USE A 1'-0" WING WIDTH FOR WINGS PARALLEL TO THE ROADWAY.

WING STEEL BEFORE WING IS POURED.

R501 TO THE PAVIN NOTCH ON TYPE

WEIGHT = 774 LB/FT

AREA = 5.16 SF

WING STEEL BEFORE WING IS POURED.

R501 BARS TO BE TIED TO

OR B.F. ABUT.

end of wing

s5_ @ 8"

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USE.

PLAN

INSIDE ELEVATION

OUTSIDE ELEVATION

SECTION A

SECTION THRU PARAPET ON BRIDGE

DESIGNER MAY ELECT TO USE A R501 BILL OF BARS IN LIEU OF A S5_ BAR ADJACENT TO THE TOP OF THE PARAPET.

CONJ. JOINT - STRIKE OFF AS SHOWN.

R502 @ 8"

R503 @ 8"

R501 @ 8"

R502 @ 8"

R501 @ 1'-0"

1'-2"

4'-8"

1'-5"

1'-6"

3'

39" 15.5" 5" 21.5"

15.5" 6.5" 5" 21.5"

15.5" 6.5" 5" 21.5"

15.5" 6.5" 5" 21.5"

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15.5" 6.5" 5" 21.5"

15.5" 6.5" 5" 21.5"

Approved: Bill Oliva

Date: 1-19

STANDARD 30.33

BUREAU OF
STRUCTURES
TO ATTACH TO THE TOP OF THE PARAPET.

BELOW A RAIL OR FENCE SYSTEM THAT IS
BENCHMARK (WHEN SUPPLIED). AVOID PLACING

DESIGNER NOTES

SEE STANDARD 30.34 FOR DETAILS OF 32SS PARAPET ON BRIDGE.

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

FOR APPROACH SLAB INFORMATION.

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.11

FOR APPROACH SLAB INFORMATION.

AS ALWAYS, SEE STANDARD 12.2 FOR ALL DETAILS.

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

SINGLE SLOPE PARAPET
32SS WITH STRUCTURAL APPROACH SLAB

STANDARD 30.34

Bill Oliva
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