BENDING DIAGRAMS

PLAN VIEW

6" SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING TYPE B1 WITH SEMI-INTEGRAL ABUTMENT SHOWN INTEGRAL, ABUTMENT AND CAPPED PILE ABUTMENT SIMILAR (FORWARD ABUTMENT SHOWN, REAR ABUTMENT SIMILAR, BUT OPPOSITE HAND)

REINFORCING STEEL LIST

NOTES:
1. FOR 6" SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING WEIGHTS.
2. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATION OF CONTRACTION JOINTS, SPACED AT 20'-0" MAX.
3. CONTRACTION JOINT IS NOT REQUIRED WITHIN THE APPROACH SLAB MEDIAN BARRIER SECTIONS.
4. PLACE #1 EPOXY COATED DOWEL BARS (Y801 BARS), 1" IN DIAM, SPACED AT 45'-1" MAXIMUM, AT STAGGERED LOCATIONS WITHIN THE UNREINFORCED MEDIAN BARRIER.
5. SEE APPROPRIATE STANDARD BRIDGE DRAWING FOR ABUTMENT DETAILS.
6. FOR ROADWAY SINGLE SLOPE BARRIERS, SEE 5TH ROADWAY CONSTR. DWG. RM-4.1 THROUGH RM-4.3 THROUGH RM-4.3.
7. PROVIDE 3' OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
8. FOR GENERAL NOTES, SEE SHEET 1503.
**SECTION A-A**

**PLAN VIEW**

- **57" single slope concrete median bridge railing** (type B1) with typical abutment shown.
- **Reinforced median barrier** (type B).
- **Unreinforced median barrier** (type B).
- **Approach slab**.

**NOTES:**
1. For 57" single slope concrete median bridge railing, project plans shall include plan view, elevation view, sections, reinforcing marks, reinforcing bending diagrams, and reinforcing weights.
2. For the entire length of single slope concrete median bridge railings, project plans shall show the location of contraction joints, spaced at 20'-0" max.
3. Contraction joint is not required within the approach slab median barrier sections.
4. Place #8 epoxy coated dowel bars (Y801 bars), 12" long, spaced at 45" ± 3" max, at staggered locations within the unreinforced median barrier.
5. See appropriate standard bridge drawing for abutment details.
6. For roadway single slope barrier, see STD. ROADWAY CONSTR. DWG. RM-4.3 through RM-5.
7. For general notes, see sheet 55.

**SECTION B-B**

- **Reinforced concrete deck on steel or prestressed concrete I-beams/girders (beams/girders not shown).**

**SECTION C-C**

- **Concrete I-beams/girders (beams/girders not shown).**
- **Concrete I-beams/girders (beams/girders not shown).**

**SECTION D-D**

- **Concrete I-beams/girders (beams/girders not shown).**
- **Concrete I-beams/girders (beams/girders not shown).**

**REINFORCING STEEL LIST**

<table>
<thead>
<tr>
<th>MARK</th>
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<tr>
<td>Y801</td>
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<td>STR</td>
</tr>
<tr>
<td>Y401</td>
<td>2A + 13'-0&quot;</td>
<td>BENT</td>
</tr>
<tr>
<td>Y402</td>
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<td>BENT</td>
</tr>
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<td>Y801</td>
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<td>STR</td>
</tr>
<tr>
<td>Y802</td>
<td>2A + 13'-0&quot;</td>
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**SEE PROJECT PLANS.**
NOTES:
1. FOR 57° SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING WEIGHTS.
2. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATIONS OF DEFLECTION JOINTS.
3. DEFLECTION JOINT IS NOT REQUIRED WITHIN THE APPROACH SLAB MEDIAN BARRIER SECTIONS.
4. SEE APPROPRIATE STANDARD BRIDGE DRAWING FOR ABUTMENT DETAILS.
5. FOR SINGLE SLOPE BARRIER BEYOND THE STRUCTURE ROADWAY BARRIERS, SEE STANDARDS ROADWAY CONSTR. DWG. RM-2.1-3 THROUGH RM-2.1-5.
6. PROVIDE 3" OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LATERAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
7. FOR DEFLECTION JOINT DETAILS AND ADDITIONAL NOTES, SEE SHEET 0.5.

LEGEND:
- E.S. = EACH SIDE
- P.E.J.F. = PREFORMED EXPANSION JOINT FILLER
NOTES:
1. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATIONS OF DEFLECTION JOINTS.
2. DEFLECTION JOINT SPACING SHALL NOT EXCEED 9'-0" ON CENTERS. FOR CONTINUOUS STRUCTURES, THE DEFLECTION JOINTS WITHIN THE VSL LOAD CONTRACTION PLANE (NEGATIVE MOMENT REGIONS) OVER PIER LOCATIONS SHALL BE SPACED NOT LESS THAN 9'-0" NOR MORE THAN 6'-0" ON CENTERS.
3. FOR THE 57" SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING, THE MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR THE AREA OF 57" SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING SHALL BE 1'-0". THE MAXIMUM GAP BETWEEN VERTICAL BARS AT THE MEDIAN BRIDGE RAILING (SEE NOTE 3)

MAXIMUM GAP
10"
6"
MAXIMUM GAP

DESIGN CRITERIA:
57" SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING TYPE B1 MEET THE REQUIREMENTS OF NCHRP 350 TEST LEVEL 3 AND "NASHTO " LAND BRIDGE DESIGN SPECIFICATIONS", 2012.
57" SINGLE SLOPE BACK-TO-BACK CONCRETE MEDIAN BRIDGE RAILINGS MEET THE REQUIREMENTS OF NCHRP 350 TEST LEVEL 5 AND "NASHTO " LAND BRIDGE DESIGN SPECIFICATIONS", 2012.

DESIGN DATA:
CONCRETE - COMPRESSIVE STRENGTH = 4.5 KSI
REINFORCING STEEL - MINIMUM YIELD STRENGTH = 40 KSI

AREA OF 57" SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING IS SHOWN ON SHEETS D-5 THROUGH D-7.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS:
The maximum spacing of vertical reinforcing bars for the 57" single slope concrete median bridge railing type B1 shall be 9'-0".
The maximum spacing of vertical reinforcing bars for the 57" single slope back-to-back concrete median bridge railing shall be 1'-0".

MINIMUM EMBEDMENT OF VERTICAL REINFORCING BARS:
If the minimum embedment shown for the vertical reinforcing bars into the bridge deck is not met, then the designer shall calculate the required embedment according to Section 13 of the "NASHTO " LAND BRIDGE DESIGN SPECIFICATIONS".

OPTIONAL REINFORCING STEEL:
In lieu of the single vertical bar, the contractor may provide vertical reinforcement in the form of layered bars at the vertical bar spacing and size shown as follows:
A. The steel extending from the deck into the barrier shall be a single bar hooked around the second horizontal parapet (bar above the deck surface at each face and hooked around the longitudinal beam). In the bottom half of the deck,
B. The vertical steel in the barrier above the deck shall be a single bar that closely follows the profile of the parapet. The bar shall be hooked around the first horizontal parapet (bar above the deck surface at each face and hooked around the same concrete cover as the vertical bar shown).

The department will not adjust the total quantity of reinforcing steel to accommodate this optional reinforcement. The department will consider delays resulting from this optional reinforcement as NON-EXCUSABLE DELAYS.

CONTRACTION JOINTS FOR 57" SINGLE SLOPE UNREINFORCED CONCRETE MEDIAN BRIDGE RAILINGS TYPE B1 SHEETS D-5 AND D-6:
SEE: STANDARD HIGHWAY CONSTR. DWG. RM-4.3 THROUGH RM-4.5 FOR NOTES.

DEFLECTION JOINTS FOR 57" SINGLE SLOPE BACK-TO-BACK REINFORCED CONCRETE MEDIAN BRIDGE RAILINGS SHEETS D-8 AND D-9:
FOR SLIPFORMED CONSTRUCTION:
As soon as cutting operations can begin without damaging the concrete, sawcut 1'-0" DEEP deflection control joints at the perimeter of the median bridge railing. After the curing period and before applying load to the median bridge railing, perform 4'-6" SAWCUT AS SHOWN ON DETAIL A. APPLIED BRIDGE RAILING LOAD INCLUDES CONSTRUCTION LOAD ON THE DECK EXCLUDING PERSONNEL, HAND OPERATED EQUIPMENT AND MANUALLY POWERED VEHICLES AND VEHICLE TRAFFIC IN THE LANE IMMEDIATELY ADJACENT TO MEDIAN BRIDGE RAILING AFTER REMOVAL OF TRAFFIC CONTROLS DEVICES.

FOR CONVENTIONALLY FORMED CONSTRUCTION:
Remove the forms before applying load to the median bridge railing. As soon as the forms are removed, perform 4'-0" SAWCUT AS SHOWN IN DETAIL A. THE 1'-0" SAWCUTS ARE NOT REQUIRED.

The contractor has an option to perform full depth sawcut. However, the sawcut shall not be less than 1'-0" from the top of the concrete deck slab.

DEFLECTION JOINTS FOR 57" SINGLE SLOPE BACK-TO-BACK REINFORCED CONCRETE MEDIAN BRIDGE RAILINGS (CONTINUED)
USE AN EDGE GUIDE, FENCE, OR JIG TO ENSURE THAT THE CUT JOINT IS STRAIGHT, TRUE, AND ALIGNED ON ALL FACES OF THE MEDIAN BRIDGE RAILING. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A MINIMUM WIDTH OF 1'-0".

SEAL THE PERIMETER OF THE DEFLECTION JOINTS TO A MINIMUM DEPTH OF ONE INCH WITH A POLYURETHANE OR POLYURETHANE MATERIAL. CONFORMING TO ASTM C920, TYPE 5. LEAVE THE BOTTOM 1'-0" INCH OF BOTH FRONT FACES OF THE MEDIAN BRIDGE RAILINGS UNSEAL TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.
AT EACH DEFLECTION JOINT LOCATION, USE GLASS FIBER REINFORCED POLYMER (GFRP) REINFORCEMENT TO MAINTAIN THE RIGIDITY OF THE CAGE ACROSS THE PROPOSED JOINTS. THE CONTRACTOR HAS THE OPTION TO PERFORM FULL DEPTH SAWCUT. OTHER NON-FERROUS REINFORCEMENT MAY BE PROPOSED FOR USE, SUBJECT TO APPROVAL BY THE ENGINEER.

DEFLECTION JOINT IS NOT REQUIRED WITHIN THE APPROACH SLAB MEDIAN BARRIER SECTIONS.