**REINFORCEMENT FOR 42° SBR-1 TRANSITION MOUNTED ON BRIDGE OR APPROACH SLAB**

<table>
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<tr>
<th>MARK</th>
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**BENDING DIAGRAMS**

1. **MARK**: X, Y, YB, Y601, Y602, Y603, Y604, Y605, Y606
2. **LENGTH**: 10'-0" (10 ft), 6'-0" (6 ft), 4'-0" (4 ft)
3. **TYPE**: STR (Steel), GFRP (Glass Fiber Reinforced Polymer)
4. **MATERIAL**: STEEL

**REINFORCED CONCRETE DECK**

- **ON STEEL OR PRESTRESSED**
- **CONCRETE I-BEAMS/GIRDERS**

**LEGEND**

- E.S. = EACH SIDE
- F.S. = FAR SIDE
- N.S. = NEAR SIDE

**NOTES**

1. FOR ALL SINGLE SLOPE CONCRETE BRIDGE RAILINGS INCLUDING THE 42° TRANSITIONS, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING WEIGHTS.
2. FOR BRIDGE TERMINAL ASSEMBLY, SEE STD. CONSTR. DWGS. MGS-3.1 AND MGS-3.2.
3. FOR SAWCUT PERIMETER LENGTH, SEE DETAIL A ON SHEET 45.
4. FOR BRIDGE TERMINAL ASSEMBLY, SEE STD. CONSTR. DWGS. MGS-3.1 AND MGS-3.2.
5. SEE APPROPRIATE STANDARD BRIDGE DRAWING FOR ABUTMENT DETAILS.
6. USE GLASS FIBER REINFORCED POLYMER (GFRP) FOR ALL HORIZONTAL X602 BARS AND STIFFENING BARS (Y503, Y504, Y505 & Y506 BARS).
7. USE GLASS FIBER REINFORCED POLYMER (GFRP) FOR ALL HORIZONTAL X602 BARS AND STIFFENING BARS (Y503, Y504, Y505 & Y506 BARS).
8. TIE Y504 & Y505 STIFFENING BARS AT EACH HORIZONTAL BAY, TIE Y506 & Y505 STIFFENING BARS AT EACH VERTICAL BAY, PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO 14'-0" TRANSITIONS, DO NOT SLIPFORM STIFFENING BARS AT EACH HORIZONTAL BAY.
9. Y602 BAR MAY BE PROVIDED AS EPOXY COATED STEEL REINFORCEMENT IF A GFRP FABRICATED SHAPE IS NOT AVAILABLE.
NOTES:
1. FOR ALL SINGLE SLOPE CONCRETE BRIDGE RAILINGS INCLUDING THE 42° SBR-1 TRANSITIONS, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING MOUNTS.
2. SEE APPROPRIATE STANDARD BRIDGE DRAWINGS FOR ADJUSTMENT DETAILS.
3. FOR BRIDGE TERMINAL ASSEMBLY, SEE STD. CONSTR. SMES, MGS-2-1 AND MGS-3-2.
4. FOR BENT TERMINAL EMBLEMS, SEE DETAIL A ON SHEET 10-20.
5. FOR DEFLECTION JOINT DETAILS AND ADDITIONAL NOTES, SEE SHEET 10-20.
6. THE HORIZONTAL LEGS OF THE Y602 BARSare intended to lap below the transverse deck structure in the deck. The spacing may be adjusted the minimum distance necessary to avoid interference with the transverse deck reinforcement.
7. USE GLASS FIBER REINFORCED POLYMER (GFRP) FOR ALL HORIZONTAL X602 BARS AND STIFFENING BARS (Y503, Y504, Y505 & Y506 BARS).
8. TIE Y603 & Y606 STIFFENING BARS AT EACH NORMAL HORIZONTAL BARS TIE Y604 & Y605 STIFFENING BARS AT EACH HORIZONTAL PLATE STIFFENING BARS IN ALL SAWCUT PANELS 10°-4° AND GREATER. DO NOT ADD STIFFENING BARS TO 42° SBR-1 TRANSITIONS, DO NOT SLIPSTUFF UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
9. Y602 BAR MAY BE PROVIDED AS EPOXY-COATED STEEL REINFORCEMENT IF A GFRP FABRICATED SHAPE IS NOT AVAILABLE.

REINFORCEMENT FOR 42° SBR-1 TRANSITION MOUNTED ON BRIDGE

LEGEND
E.S. = EACH SIDE
F.S. = FAR SIDE
N.S. = NEAR SIDE

MATERIAL

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<th>BAR</th>
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</tr>
<tr>
<td>Y602</td>
<td>2'-0&quot;</td>
<td>STR</td>
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</tbody>
</table>

BENDING DIAGRAMS

1. FOR ALL SINGLE SLOPE CONCRETE BRIDGE RAILINGS INCLUDING THE 42° SBR-1 TRANSITIONS, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING MOUNTS.
2. SEE APPROPRIATE STANDARD BRIDGE DRAWINGS FOR ADJUSTMENT DETAILS.
3. FOR BRIDGE TERMINAL ASSEMBLY, SEE STD. CONSTR. SMES, MGS-2-1 AND MGS-3-2.
4. FOR BENT TERMINAL EMBLEMS, SEE DETAIL A ON SHEET 10-20.
5. FOR DEFLECTION JOINT DETAILS AND ADDITIONAL NOTES, SEE SHEET 10-20.
6. THE HORIZONTAL LEGS OF THE Y602 BARSare intended to lap below the transverse deck structure in the deck. The spacing may be adjusted the minimum distance necessary to avoid interference with the transverse deck reinforcement.
7. USE GLASS FIBER REINFORCED POLYMER (GFRP) FOR ALL HORIZONTAL X602 BARS AND STIFFENING BARS (Y503, Y504, Y505 & Y506 BARS).
8. TIE Y603 & Y606 STIFFENING BARS AT EACH NORMAL HORIZONTAL BARS TIE Y604 & Y605 STIFFENING BARS AT EACH HORIZONTAL PLATE STIFFENING BARS IN ALL SAWCUT PANELS 10°-4° AND GREATER. DO NOT ADD STIFFENING BARS TO 42° SBR-1 TRANSITIONS, DO NOT SLIPSTUFF UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
9. Y602 BAR MAY BE PROVIDED AS EPOXY-COATED STEEL REINFORCEMENT IF A GFRP FABRICATED SHAPE IS NOT AVAILABLE.
SECTION A-A
DETAIL AT DEFLECTION JOINTS
FOR SINGLE SLOPE CONCRETE BRIDGE RAILING

SECTION B-B
REINFORCED CONCRETE DECK ON STEEL, OR PRESTRESSED CONCRETE I-BEAMS/GIRDERS SHOWN

NOTES:
1. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATIONS OF DEFLECTION JOINTS.
2. DEFLECTION JOINT SPACING SHALL BE 10'-0" EXCEPT FOR THE LAST JOINT SPACING ADJACENT TO EITHER A 14'-0" TRANSITION OR AN OPEN JOINT. EXCEPTION PANELS MAY VARY IN LENGTH BETWEEN 10'-0" AND 15'-0".
3. PAYMENT FOR GLASS FIBER REINFORCED POLYMER (GFRP) STIFFENING REINFORCEMENT SHALL BE INCLUDED WITH CONTRACT PRICE FOR ITEM 509 - NO.
4. LIMITS OF SAWCUT IS SHOWN IN DETAIL A, SHEET 45. THE 4" SAWCUT DEPTH SHOWN IN DETAIL A IS THE MINIMUM REQUIRED. HOWEVER, THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT.

FOR CONVENTIONALLY FORMED CONSTRUCTION:
REMOVE THE FORMS BEFORE APPLYING LOAD TO THE PARAPET. AS SOON AS THE FORMS ARE REMOVED, PERFORM 4-INCH SAWCUT AS SHOWN IN DETAIL A, SHEET 45. THE 1/4 INCH 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. USE AN EDGE GUIDE, FENCE, OR JIG TO ENSURE THAT THE CUT IS STRAIGHT, TRUE, AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 1/4 INCH.

SEAL THE PERIMETER OF THE DEFLECTION JOINTS TO A MINIMUM DEPTH OF ONE INCH WITH A POLYURETHANE OR POLYMICRIFIC MATERIAL CONFORMING TO ASTM C920, TYPE S. LEAVE THE BOTTOM 1/2 INCH OF BOTH THE INSIDE AND OUTSIDE FACES OF THE PARAPET UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

FOR TRANSITION SECTION, PLACE A DEFLECTION JOINT AT THE BEGINNING OF THE 14'-0" TRANSITION. DEFLECTION JOINTS ARE NOT REQUIRED WITHIN THE 14'-0" TRANSITION SECTION.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR STANDARD 42" SBR-1 CONCRETE PARAPETS:
The maximum spacing of vertical reinforcing bars for the standard 42" SBR-1 concrete parapet shall be 6", UNLESS NOTED OTHERWISE.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR 42" SBR-1 TRANSITIONS:
The maximum spacing of vertical reinforcing bars for the 42" SBR-1 transition section shall be as shown on sheets 45. THE 4" SAWCUT DEPTH SHOWN IN DETAIL A IS THE MINIMUM REQUIRED. HOWEVER, THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT.

FOR TRANSITION SECTIONS, PLACE A DEFLECTION JOINT AT THE BEGINNING OF THE 14'-0" TRANSITION. DEFLECTION JOINTS ARE NOT REQUIRED WITHIN THE 14'-0" TRANSITION SECTIONS.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS:
If the minimum embedment shown for the vertical reinforcing bars into the bridge deck, approach slab, or parapet wall is not met, the designer shall calculate the required reinforcement according to section 11 of the "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.

DESIGN CRITERIA:
1. DESIGN DATA
   a. CONCRETE - COMPRESSIVE STRENGTH = 43.5 KSI
   b. REINFORCING STEEL - MINIMUM YIELD STRENGTH = 60 KSI
   c. GFRP - MODULUS = 8700 KSI
   d. AREA OF STANDARD 42" SBR-1 CROSS SECTION = 588.0 SQ. IN.
   e. VOLUME OF 42" SBR-1 14'-0" TRANSITION SECTION = 1.82 CU. YD.

DEFLECTION JOINTS FOR CONCRETE PARAPETS:
   For supported construction:
   AS SOON AS CURING OPERATIONS CAN BE INITIATED WITHOUT DAMAGING THE CONCRETE, SAWCUT 1 1/4 INCH DEEP DEFLECTION CONTROL JOINTS ALONG THE PERIMETER OF THE PARAPET.

   AFTER THE CURING PERIOD AND BEFORE APPLYING LOAD TO THE PARAPET, PERFORM 4-INCH SAWCUT AS SHOWN IN DETAIL A, SHEET 45. APPLIED PARAPET LOAD INCLUDES:
   CONSTRUCTION LOADS ON THE DECK EXCLUDING PERSONNEL HAND OPERATED EQUIPMENT AND MANUALLY POWERED VEHICLES; AND VEHICLE TRAFFIC IN THE LANE IMMEDIATELY ADJACENT TO THE PARAPET AFTER REMOVAL OF TRAFFIC CONTROL DEVICES.

   PAYMENT FOR GLASS FIBER REINFORCED POLYMER (GFRP) STIFFENING REINFORCEMENT SHALL BE INCLUDED WITH CONTRACT PRICE FOR ITEM 509 - NO.

MINIMUM EMBEDMENT OF VERTICAL REINFORCING BARS:
   IF THE MINIMUM EMBEDMENT SHOWN FOR THE VERTICAL REINFORCING BARS INTO THE BRIDGE DECK, APPROACH SLAB, OR PARAPET WALL IS NOT MET, THEN THE DESIGNER SHALL CALCULATE THE REQUIRED REINFORCEMENT ACCORDING TO SECTION 11 OF THE "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.

PRESTRESSED CONCRETE I-BEAMS/GIRDERS SHOWN

REINFORCED CONCRETE DECK ON STEEL, OR PRESTRESSED CONCRETE I-BEAMS/GIRDERS SHOWN

CONCRETE I-BEAMS

PRESTRESSED