NOTES:

1. For all single slope concrete bridge railings including the 14°-0' transitions, Project Plans shall include Plan View, Elevation View, Sections, Reinforcing Details, Reinforcing Bending Diagrams, and Reinforcing Quantities.

2. See appropriate standard Bridge Drawing for Reinforcement Details.

3. For Bridge Terminal Assembly, see STD. CONST. DWG. MS1-J and MS5-IE.

4. For Sawcut Detack Length, see Details A on Sheet 45.

5. For Deflection Joint Details and Additional Notes, see Sheet 55.

6. Use Gray Fiber Reinforced Polymer (GFRP) for all horizontal Y503 bars and Sawcut Stiffening Bars (Y402 & Y403 Bars).

7. Tie Y401 & Y402 Stiffening Bars located inside the vertical reinforcement at each horizontal bar. Tie Y401 & Y402 stiffening bars located outside of the vertical reinforcement at each vertical bar.

8. Place Stiffening Bars in all Sawcut Panels 10'-0' and greater. Do not add stiffening bars to 14°-0' transitions. Do not slipform unstiffened Sawcut Panels. Do not omit stiffening bars for conventionally formed construction.

9. X402 Bar may be provided as epoxy coated steel reinforcement if a GFRP fabricated shape is not available.

REINFORCEMENT FOR 36° SBR-1 TRANSITION MOUNTED ON BRIDGE OR APPROACH SLAB

<table>
<thead>
<tr>
<th>MARK</th>
<th>LENGTH</th>
<th>TYPE</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y401</td>
<td>10'-0&quot;</td>
<td>STR</td>
<td>GFRP</td>
</tr>
<tr>
<td>Y402</td>
<td>6'-4&quot;</td>
<td>BENT</td>
<td>STEEL</td>
</tr>
<tr>
<td>Y403</td>
<td>5'-6&quot;</td>
<td>STR</td>
<td>GFRP</td>
</tr>
<tr>
<td>Y501</td>
<td>10'-0&quot;</td>
<td>STR</td>
<td>GFRP</td>
</tr>
<tr>
<td>Y402</td>
<td>4'-7&quot;</td>
<td>BENT</td>
<td>STEEL</td>
</tr>
</tbody>
</table>

BENDING DIAGRAMS

- See Project Plans

FOR BRIDGE TERMINAL ASSEMBLY, SEE STD. CONSTR. DWG. MS1-J AND MS5-IE.

SEE APPROPRIATE STANDARD BRIDGE DRAWING FOR ABUTMENT DETAILS.

FOR SAWCUT PERIMETER LENGTH, SEE DETAIL A ON SHEET 45.

FOR BRIDGE DECK, SEE DETAIL B ON SHEET 45.

FOR DEFLECTION JOINT DETAILS AND ADDITIONAL NOTES, SEE SHEET 55.

FOR BRIDGE DECK, SEE DETAIL C ON SHEET 45.
NOTES:
1. FOR ALL SINGLE SLOPE CONCRETE BRIDGE RAILINGS INCLUDING THE M=0° TRANSITIONS, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING QUANTITIES.
2. SEE APPROPRIATE STANDARD BRIDGE DRAWINGS FOR ADJUSTMENT DETAILS.
3. FOR BRIDGE TERMINAL ASSEMBLY, SEE STD. CONST. SMEL, WC-2.3.4 AND WC-3.2.
4. FOR SAMCUT PERIMETER LENGTH, SEE DETAIL A ON SHEET 07-17-20.
5. FOR REFLECTOR JOINT DETAILS AND ADDITIONAL NOTES, SEE SHEET 10-C.
6. THE HORIZONTAL LEGS OF THE Y505 BARS ARE INTENDED TO LAP WITH THE BOTTOM TRANSVERSE STEEL IN THE DECK. THE SPACING MAY BE ADJUSTED THE MINIMUM DISTANCE NECESSARY TO AVOID INTERFERENCE WITH THE TRANVERSE DECK REINFORCEMENT.
7. USE GLASS FIBER REINFORCED POLYMER (GFRP) FOR ALL HORIZONTAL X401 & Y402 BARS AND STEINFORD BARS (Y501 & Y502 BARS).
8. TIE Y401 & Y402 STEIFENING BARS LOCATED INSIDE THE VERTICAL REINFORCEMENT AT EACH HORIZONTAL BAR. TIE Y501 & Y502 STEINFORD BARS LOCATED OUTSIDE OF THE VERTICAL REINFORCEMENT AT EACH VERTICAL BAR.
9. PLACE STEINFORD BARS IN ALL SAMCUT PANELS M>0° AND GREATER. DO NOT ADD STEINFORD BARS TO M=0° TRANSITIONS. DO NOT ADD UNSTIFIED SAMCUT PANELS. DO NOT OMIT STEINFORD BARS FOR CONVENTIONALLY FORMED CONCRETE.
10. X402 BAR MAY BE PROVIDED AS EPOXY COATED STEEL REINFORCEMENT IF A GFRP FABRICATED SHAPE IS NOT AVAILABLE.
REINFORCEMENT FOR 36° SBR-3 TRANSITION MOUNTED ON APPROACH SLAB

<table>
<thead>
<tr>
<th>MARK</th>
<th>LENGTH</th>
<th>TYPE</th>
<th>MATERIAL</th>
<th>REINFORCEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y501</td>
<td>10'-0&quot;</td>
<td>STR</td>
<td>GFRP</td>
<td>1</td>
</tr>
<tr>
<td>Y502</td>
<td>6'-4&quot;</td>
<td>BENT</td>
<td>GFRP</td>
<td>2</td>
</tr>
<tr>
<td>Y503</td>
<td>5'-7&quot;</td>
<td>STR</td>
<td>GFRP</td>
<td>3</td>
</tr>
<tr>
<td>Y504</td>
<td>5'-7&quot;</td>
<td>STR</td>
<td>GFRP</td>
<td>4</td>
</tr>
<tr>
<td>Y505</td>
<td>10'-0&quot;</td>
<td>STR</td>
<td>GFRP</td>
<td>5</td>
</tr>
</tbody>
</table>

BENDING DIAGRAMS

- 2'-6" (Y503) 2'-6" (Y502)
- 3'-6" (Y501) 3'-6" (Y500)
- 5'-6" (Y505) 5'-6" (Y504)
- 6'-6" (Y502) 6'-6" (Y501)
- 6'-6" (Y500) 6'-6" (Y503)

EMBEDMENT

- 6" at 3'-0" (Y504)
- 6" at 2'-7" (Y503)

Section B-B

Section C-C

Section D-D

Section E-E

NOTES:
1. FOR ALL SINGLE SLOPE CONCRETE BRIDGE RAILINGS INCLUDING THE 14° TRANSITIONS, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCEMENT QUANTITIES.
2. SEE APPROPRIATE STANDARD BRIDGE DRAWING FOR DETAIL A ON SHEET 55.
3. FOR DEFLECTION JOINT DETAILS AND ADDITIONAL NOTES, SEE SHEET 55.
4. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS.
5. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
6. PLACE STIFFENING BARS INSIDE THE VERTICAL REINFORCEMENT AT EACH VERTICAL BAR. TIE Y401 & Y402 STIFFENING BARS LOCATED INSIDE THE VERTICAL REINFORCEMENT AT EACH HORIZONTAL BAR. TIE Y401 & Y402 STIFFENING BARS LOCATED OUTSIDE OF THE VERTICAL REINFORCEMENT AT EACH VERTICAL BAR.
7. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
8. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
9. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
10. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
11. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
12. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
13. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
14. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
15. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
16. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
17. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
18. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
19. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
20. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
21. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
22. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
23. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
24. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
25. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
26. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
27. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
28. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
29. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
30. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
31. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
32. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
33. PLACE STIFFENING BARS IN ALL SAWCUT PANELS 10'-0" AND GREATER. DO NOT ADD STIFFENING BARS TO TRANSITIONS. DO NOT SLIPFORM UNSTIFFENED SAWCUT PANELS. DO NOT OMIT STIFFENING BARS FOR CONVENTIONALLY FORMED CONSTRUCTION.
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. EXCEPTIONS MAY VARY IN LENGTH BETWEEN 10'-0" AND 15'-0".

3. PAYMENT FOR GLASS FIBER REINFORCED POLYMER (GFRP) STIFFENING MAY VARY IN LENGTH BETWEEN 10'-0" AND 15'-0".

4. LIMITS OF SAWCUT IS SHOWN IN DETAIL A, SHEET 4 5 1. THE 1'-0" SAWCUT DEPTH SHOWN IN DETAIL A IS THE MINIMUM REQUIRED. HOWEVER, THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT.

OPTION TO PERFORM FULL DEPTH SAWCUT. SHOWN IN DETAIL A IS THE MINIMUM REQUIRED. HOWEVER, THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT.

GFRP DEFORMED BARS.

REINFORCEMENT SHALL BE INCLUDED WITH CONTRACT PRICE FOR ITEM 509 - NO. PAYMENT FOR GLASS FIBER REINFORCED POLYMER (GFRP) STIFFENING MAY VARY IN LENGTH BETWEEN 10'-0" AND 15'-0".

ADJACENT TO EITHER A 14'-0" TRANSITION OR AN OPEN JOINT. EXCEPTION PANELS.

DEFLECTION JOINT SPACING SHALL BE 10'-0" EXCEPT FOR THE LAST JOINT SPACING ALONG THE PERIMETER OF THE RAILING.

FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATIONS OF DEFLECTION JOINTS.

THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT.

GFRP - C&MS 705.28 (MODULUS = 8700 KSI)

REINFORCING STEEL - MINIMUM YIELD STRENGTH = 60 KSI

CONCRETE - COMPRESSIVE STRENGTH = 4.5 KSI

DESIGN DATA:

CONCRETE - COMPRESSIVE STRENGTH = 4.5 KSI

REINFORCING STEEL - MINIMUM YIELD STRENGTH = 60 KSI

AREA OF STANDARD 36" SBR-3 CROSS SECTION = 524.0 SQ. IN.

VOLUME OF 36" SBR-3 14'-0" TRANSITION SECTION = 1.74 CU. YD.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR STANDARD 36" SBR-3 CONCRETE RAILING:

THE MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR THE STANDARD 36" SBR-3 CONCRETE RAILING SHALL BE 12", UNLESS NOTED OTHERWISE.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR 36" SBR-3 TRANSITIONS:

THE MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR THE 36" SBR-3 TRANSITION SECTION SHALL BE AS SHOWN ON SHEETS 4 5 1, UNLESS NOTED OTHERWISE.

MINIMUM EMBEDMENT OF VERTICAL REINFORCING BARS:

THE MINIMUM EMBEDMENT SHOWS ASSUMES A MINIMUM DECK OVERHANG DEPTH OF 10'" AND A MINIMUM APPROACH SLAB THICKNESS OF 2". IF THE MINIMUM EMBEDMENT FOR THE VERTICAL REINFORCING BARS INTO THE BRIDGE DECK OR APPROACH SLAB IS NOT MET, THEN THE DESIGNER SHALL CALCULATE THE REQUIRED REINFORCEMENT ACCORDING TO SECTION 13 OF THE "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR 36" SBR-3 TRANSITIONS:

THE MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR THE 36" SBR-3 TRANSITION SECTION SHALL BE AS SHOWN ON SHEETS 4 5 1, UNLESS NOTED OTHERWISE.

MINIMUM EMBEDMENT OF VERTICAL REINFORCING BARS:

THE MINIMUM EMBEDMENT SHOWS ASSUMES A MINIMUM DECK OVERHANG DEPTH OF 10'" AND A MINIMUM APPROACH SLAB THICKNESS OF 2". IF THE MINIMUM EMBEDMENT FOR THE VERTICAL REINFORCING BARS INTO THE BRIDGE DECK OR APPROACH SLAB IS NOT MET, THEN THE DESIGNER SHALL CALCULATE THE REQUIRED REINFORCEMENT ACCORDING TO SECTION 13 OF THE "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR STANDARD 36" SBR-3 CONCRETE RAILING:

THE MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR THE STANDARD 36" SBR-3 CONCRETE RAILING SHALL BE 12", UNLESS NOTED OTHERWISE.