DESIGNER NOTES

GENERAL:

The details shown in these BD-SG sheets are to be used as a guide only. They shall be reviewed and approved by the designers. The location of details, etc., the materials of construction, sizes and types of connections shall be modified as required.

DESIGNERS SHALL PROVIDE A WORKSHEET OF ALL FRAGMENT CRITICAL MEMBERS WITH THE CONTRACT PLANS.

DESIGNERS SHALL DESIGNATE TENSION AREAS OF ALL FRAGMENT CRITICAL MEMBERS WITH THE CONTRACT PLANS.

STATEMENT OF CONNECTORS AS APPROPRIATE TO THE FRAGMENT CRITICAL MEMBERS SHALL BE PROVIDED.

State of the Art Engineering, Inc.

Engineer: [Name]

DESIGNER AND GENERAL NOTES

END DIAPHRAGMS:

A "P" section is typically used in end diaphragms. However, a modified "P" shape may be used. For use as an end diaphragm, the bottom flange from the point of perpendicular to the right side of the connection. To improve access through the diaphragm, the location of the diaphragm may be considered.

For details of connections at integral abutments, see BD-SG1E.

For details of diaphragms at integral abutments, see BD-SG1E.

Intermediate diaphragms:

INTERMEDIATE DIAPHRAGMS:

In the plans, all intermediate diaphragms shall be placed as follows:

- For details of diaphragms and end diaphragms, see BD-SG1E.
- For details of diaphragms at integral abutments, see BD-SG1E.
- For details of connections at integral abutments, see BD-SG1E.

For structures where a diaphragm shall be supported by the structure, the diaphragm shall be placed as shown or as specified by the designer.

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Intermediate diaphragms shall be placed as shown or as specified by the designer.

CURVED COLUMNS:

In plan, all intermediate diaphragms on curved structures shall be placed in line and parallel to the beam or girder closest to the center of the group.

Vertical columns shall be placed as shown or as specified by the designer.

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**INTERMEDIATE DIAPHRAGM-TYPE 1**

- Beam depth less than 40".
- MC, W-shape, or C channel section.
- Level.
- Use "typical welded connection details".

**INTERMEDIATE DIAPHRAGM-TYPE 2**

- C.G. of member.
- Top struts to be used in fascia bays only.
- See "typical welded connection details".

**INTERMEDIATE DIAPHRAGM-TYPE 3**

- C.G. of member.
- Top struts to be used in fascia bays only.
- See "typical welded connection details".

**CENTER GUSSET PLATE**

- See note 4.
- Use shim plate if necessary.

**TYPICAL WELDED CONNECTION DETAILS**

- See note 6.
- Connection details.
Girder sections - Skews less than or equal to 30°

Girder sections - Skews over 30°

Notes:
- C.P.G.W. = Complete penetration groove weld
- M.B. = Mill to bear

Designer note:
For Girder Sections, connection plates shall be tight fit to gusset plate or bottom flange, see "Clipping Detail," for Intermediate stiffener or connection plate to gusset on opposite side.
FRAMING PLAN
(CONTINUOUS SPANS)

FRAMING PLAN
(SINGLE SPAN)
PARTIAL FRAMING PLAN
OF STRAIGHT GIRDER SKEWS > 20°

PARTIAL FRAMING PLAN
OF STRAIGHT GIRDER SKEWS > 20°

CURVED BRIDGE SCHEMATIC LAYOUT
STRAIGHT GIRDER SKEWS > 20°

DESIGNER NOTES:
PLEASE NOTE THAT IN THE SCHEMATIC DRAWING THE E OF BEARINGS WAS NOT REPRESENTED. IF SKewed SUBSTRUCTURES ARE NOT RADIAL, THE DESIGNER SHOULD PROVIDE LOCAL TANGENT AZIMUTHS OF STATION LINE/PIER INTERSECTIONS, WHEN SUBSTRUCTURES ARE NOT RADIAL. SIMILARLY THE ALTITUDE AZIMUTH FOR DESIGNING AND LOCATING SPLICES.

CONSULT THE NYSDOT BRIDGE MANUAL FOR DESIGNING AND LOCATING SPLICES.
### Girders

#### Girders Schedule

<table>
<thead>
<tr>
<th>MARK</th>
<th>CORNER CURVATURE LENGTH</th>
<th>SPAN 1.8</th>
<th>SPAN 2.5</th>
<th>SPAN 3.3</th>
<th>SPAN 4.1</th>
<th>TOTAL OF FOUR PLATE</th>
<th>OIL PT OF CONTRAFLANGE</th>
<th>SHEAR CONNECTORS - LENGTH</th>
<th>TOP FLANGE LENGTH</th>
<th>BOTTOM FLANGE LENGTH</th>
<th>FIELD SPLICE ARC DISTANCE</th>
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<tbody>
<tr>
<td>01</td>
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</table>

#### Designer Notes

- Connection plate for curved girders shall be 7% N." min.
- The actual location of the termination of tension zones shall be indicated on the plans, but in no case shall the termination of the tension zone shown be less than 10'-0" from the point of dead load contraflexure.
- For curved girders, connection plate shall be 7% N." min. for concrete decks. See the BD-SS sheets.
- Connection plate shall be tight fit to tension flange. See the BD-CG sheets.

### Curved Girder Elevation

#### Curved Girder Sections

- Bearing stiffener at abutment
- Bearing stiffener at pier
- Intermediate stiffener
- Fascia girder connection
- Interior girder connection

### Notes

- **C.P.G.W.** = Complete Penetration Groove Weld
- Notes shown in these details shall be noted within the girder though unless the attachment of forming devices or other construction aids by welding within the tension zone area shall be prohibited.

#### Terminology

- **Z = STUD SHEAR CONNECTORS - SPACING & ITEM NUMBER**
- **Y = STUD SHEAR CONNECTORS - SPACING & ITEM NUMBER**
- **X = STUD SHEAR CONNECTORS - SPACING & ITEM NUMBER**
- **W = STUD SHEAR CONNECTORS - SPACING & ITEM NUMBER**

### Dimensions

- **S1**
- **S2**
- **S3**
- **FS1**
- **FS2**
- **FS3**

### Connection Plate Specifications

- Interior girder connection plates shall be 7" x †" (min.) for concrete decks. See the BD-SS sheets.
- Connection plate for curved girders shall be 7" x †" (min.) for concrete decks. See the BD-CG sheets.

### Design

- Full fabrication details, see BD-SS sheets.
- Design sheets, see BD-SS sheets.
- For curved girders, connection plate shall be 7% N." min. for concrete decks. See the BD-SS sheets.

### Effective Date

- Original issued under EB-08-002 letting of 05/01/18 effective with the letting of 05/01/18.
PARTIAL FRAMING PLAN
OF CURVED GIRDERS AT SKEWED PIER
(ALL SKEWS)

DIAPHRAGM SPACING

<table>
<thead>
<tr>
<th>GIRDER</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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<tbody>
<tr>
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<tr>
<td>G5</td>
<td></td>
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</table>

DESIGNER NOTES:

CONSIDER SPACING FOR CURVED GIRDERS AND BEARINGS.

PROVIDE COMPLETE INFORMATION.

BEARINGS SHOULD BE ATTACHED TO THE BEARING SPACERS OF AN INTERIOR GIRDER.
CURVED BRIDGE SCHEMATIC LAYOUT

CURVED GIRDER

FASCIA BAY
INTERIOR BAY
FASCIA BAY

4 GIRDER - 3 BAY

FASCIA BAY
INTERIOR BAY
FASCIA BAY

5 GIRDER - 4 BAY

FASCIA BAY
INTERIOR BAY
FASCIA BAY

- INTERIOR BAYS MAY REQUIRE LATERAL BRACING BY DESIGN.
- TO STIFFEN THE STRUCTURE OR TO BRACE A TEMPORARY FASCIA BAY DURING STAGE CONSTRUCTION.

SCHEMATIC LAYOUT - BOTTOM LATERAL SYSTEMS
(CURVED GIRDER ONLY)
### CAMBER TABLE

<table>
<thead>
<tr>
<th>Span</th>
<th>0.1L1</th>
<th>0.2L1</th>
<th>0.3L1</th>
<th>0.4L1</th>
<th>0.5L1</th>
<th>0.6L1</th>
<th>0.7L1</th>
<th>0.8L1</th>
<th>0.9L1</th>
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<tr>
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</tbody>
</table>

### DESIGN LOAD TABLE

<table>
<thead>
<tr>
<th>Unit</th>
<th>Load kips</th>
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</thead>
<tbody>
<tr>
<td>D.P.V. (+)</td>
<td>HL-93(+)</td>
</tr>
<tr>
<td>D.P.V. (-)</td>
<td>HL-93(-)</td>
</tr>
<tr>
<td>S.D.L.</td>
<td></td>
</tr>
<tr>
<td>D.L.</td>
<td></td>
</tr>
<tr>
<td>S.I.P. FORMS</td>
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<tr>
<td>UTILITIES</td>
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<tr>
<td>SIDEWALK</td>
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<tr>
<td>DIAPHRAGMS</td>
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</tr>
<tr>
<td>R S</td>
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<tr>
<td>FUTURE W.S.</td>
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<tr>
<td>RAILING</td>
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</tr>
<tr>
<td>S.E.</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
</tbody>
</table>

### DESIGNER NOTES

1. **LOADS AND MOMENTS ARE EXPRESSED AS UNFACTORED LOADS INTO THE MOMENT AND SHEAR TABLES.**
2. **TOTAL MOMENTS AND SHEARS ARE UNFACTORED.**
3. **MOMENTS ARE EXPRESSED AS Kip-FT.**
4. **SHEARS ARE EXPRESSED AS Kips.**

**EXAMPLE FOR TWO SPAN BRIDGES:**

- **BEG. ABUT.**
- **PIER 1**
- **PIER 2**
- **END. ABUT.**

- For each load and moment, the values are shown as an example for the span 1 girder. Modify the values as required for the actual number of spans.

- Moment & Shear Table:
  - Total Camber:
    - Top of Deflected Girder
    - Total Camber

- Camber Diagram - Single Span

- Camber Diagram - Continuous Spans

- Camber Table - Single Span

- Camber Table - Continuous Spans

**DESIGN LOADS:**

- **TOP**
  - Design Permit Vehicle (D.P.V.)
  - HL-93 (+)
  - HL-93 (-)
  - S.D.L.
  - D.L.
  - S.I.P. Forms
  - Utilities
  - Sidewalk
  - Diaphragms
  - R.S.
  - Future W.S.
  - Railing
  - S.E.
  - Total

**TOTAL = I+II+III+IV (ft.)**

- **TOTAL =**
  - Vertical Curve D.L. (ft.)
  - Concrete D.L. (ft.)
  - Steel D.L. (ft.)
  - Superimposed D.L. (ft.)

**NOTE:**

- The total camber is the sum of all the moments and shears for each girder.

- The values shown in the design load table shall be given to the nearest one thousandth of a foot.
WEB SPLICE DETAIL

SECTION A-A

TOP & BOTTOM FLANGE SPLICE DETAIL

1/4" DIAMETER BOLT ENTERING AND TIGHTENING CLEARANCES

DESIGNER'S NOTES:

CHECK THE MOST RECENT MANUAL FOR DESIGN AND LAYOUT OF SPICES.

PLACE REINFORCED PLATE SIZES IN THE COUNTRY HELD ON THIS SHEET.

TOP AND BOTTOM FLANGE SPLICE PLATES DO NOT HAVE TO BE THE SAME, ADJUST THE PLATES AS NECESSARY.

REINFORCED SPLICE MAY BE INSTALLATION CLEARANCES AS RECOMMENDED BY THE AISI MANUAL OF STEEL CONSTRUCTION.

CONSULT THE METALS ENGINEERING UNIT IF THESE CLEARANCES CANNOT BE OBTAINED WITH A LARGE DIAMETER BOLTS.

DETAIL "A"

GEOMETRY CLEARANCES

‡" DIAMETER BOLT ENTERING TOP FLANGE

‡" DIAMETER HOLE FOR BOTTOM FLANGE

NO. FLANGE TO MEET SEALING REQUIREMENTS AS DESCRIBED IN SECTION 203.14 OF THE NYS STEEL CONSTRUCTION MANUAL.

THEIR FLANGE TO MEET SEALING REQUIREMENTS AS DESCRIBED IN SECTION 203.14 OF THE NYS STEEL CONSTRUCTION MANUAL.

BOLTS, NUTS & WASHERS:

IN SECTION 203.14 OF THE NYS STEEL CONSTRUCTION MANUAL SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

U.S. STEEL CORPORATION, THE CONTRACTOR'S EXPENSE. ADDITIONALLY, USE OF A WELDED SPLICE. HOWEVER, ALL COSTS ASSOCIATED WITH SUBJECT TO D.C.E.S. APPROVAL.

SPLICE PLATES SHALL CONSIST OF THE SAME GRADE OF STEEL TO THE CURRENT NEW YORK STATE STEEL CONSTRUCTION MANUAL.

ENGINEER. NO ADDITIONAL COMPENSATION WILL BE MADE TO THE SPLICED PLATES DO NOT HAVE THE MEMBER(S) BEING SPLICED AND THEIR COST INCLUDED IN THE CONTRACTOR FOR RELOCATING THE SPLICE. FABRICATION SHALL CONFORM TO THE D.C.E.S. APPROVAL.

FIELD SPLICE REVISIONS DUE TO LOCATIONS. HOWEVER, RELOCATION REQUESTS MUST BE SUBMITTED TO THE D.C.E.S. FOR APPROVAL.

THE CONTRACTOR HAS THE OPTION OF USING ALTERNATE SPLICE DESIGNS BASED ON THE LOCATIONS INDICATED.

ALL SPLICE PLATES SHALL BE THE SAME. MODIFY THE PLATE TABLE AS THE DESIGNER'S NOTE.

CONSULT THE NYSDOT BRIDGE MANUAL FOR GUIDANCE ON DESIGNING AND LOCATING SPLICES.

CONSULT THE METALS ENGINEERING UNIT FOR GUIDANCE.

NO ADDITIONAL COMPENSATION WILL BE MADE TO THE CONTRACTOR FOR RELocations NOTED OTHERWISE.

BOLTS, NUTS & WASHERS:

BOLTS SHALL BE ASTM F3125, GRADE A325, TYPE 1 (HOT DIPPED GALVANIZED/METALIZED STEEL APPLICATIONS: WASHERS SHALL BE F436, TYPE 3 (PLAIN).

NUTS SHALL BE A563, GRADE DH (PLAIN). OR A194, GRADE 2H (PLAIN OR HOT DIP GALVANIZED).

BOLTS SHALL BE ASTM F3125, GRADE A490, TYPE 3 (PLAIN).

WASHERS SHALL BE F436, TYPE 1 (PLAIN OR HOT DIPPED GALVANIZED).

SPLICE DETAILS

OFFICE OF STRUCTURES

DEPUTY CHIEF ENGINEER

ORIGINAL ISSUED UNDER EB 08-002

LETTING OF 05/01/18

CURRENT ISSUED UNDER EB 17-049

ERRATA

12/29/17

DOE-5G14K

APPROVED: 12/29/17

RICHARD MARCHIONE, P.E.