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<th>Inspection Date: 02/05/2018</th>
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<td>Year of ADT 30: 2014</td>
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<td>Skew 34: 50</td>
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<tr>
<td>Inspector Name: WAGNERK</td>
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</tr>
</tbody>
</table>
**Concrete Deck**

- **Element Inspection Report**
- **Description**: Re Concrete Deck
- **Unit**: sq. ft
- **Total Qty**: 12900
- **% in 1 Qty St**: 79%
- **Qty. St. 1**: 10293
- **% in 2 Qty St**: 21%
- **Qty. St. 2**: 2700
- **% in 3 Qty St**: 0%
- **Qty. St. 3**: 0
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

Concrete. Hairline transverse and map cracking with light efflorescence at various locations in all spans. Light scaling with light efflorescence on overhangs at Pier 2 and Pier 5 for approximately 10 sq ft total. Surface: 4 inches of asphalt with chip seal on deck. Gravel along edges of curbs.

**Wearing Surfaces**

- **Element**: 510/1
- **Unit**: sq. ft
- **Total Qty**: 11700
- **% in 1 Qty St**: 74%
- **Qty. St. 1**: 8709
- **% in 2 Qty St**: 0%
- **Qty. St. 2**: 0
- **% in 3 Qty St**: 26%
- **Qty. St. 3**: 3000
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

Shallow large area map cracks in asphalt.

**Efflorescence/Rust Staining**

- **Element**: 1120/1
- **Unit**: sq. ft
- **Total Qty**: 2700
- **% in 1 Qty St**: 0%
- **Qty. St. 1**: 0
- **% in 2 Qty St**: 100%
- **Qty. St. 2**: 2700
- **% in 3 Qty St**: 0%
- **Qty. St. 3**: 0
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

See Element 12 comments.

**Steel Opn Girder/Beam**

- **Element**: 107/1
- **Unit**: ft
- **Total Qty**: 1945
- **% in 1 Qty St**: 51%
- **Qty. St. 1**: 987
- **% in 2 Qty St**: 49%
- **Qty. St. 2**: 950
- **% in 3 Qty St**: 0%
- **Qty. St. 3**: 8
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

Riveted steel plate girders in spans 2, 3 and 4 and wide flange beams in spans 1 and 5 with angle cross frame diaphragms. Light R1 rusting at ends of girders under open expansion devices. R2 rusting, less than 10% section loss, in top flange of Girders A and E. Light R1 rusting on ends of webs and along bottom flanges, approximately 5 foot each way) of Girders 1A and 1E and 4A and 4E at ends. Light R1 rusting. Girders A and E at P2 and P5. R1 rusting near Pier 2 at bottom of Girders 1D and 1E at diaphragm.

**Steel Protective Coating**

- **Element**: 515/1
- **Unit**: sq. ft
- **Total Qty**: 1945
- **% in 1 Qty St**: 58%
- **Qty. St. 1**: 1137
- **% in 2 Qty St**: 41%
- **Qty. St. 2**: 800
- **% in 3 Qty St**: 0%
- **Qty. St. 3**: 8
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

Light R1 bleeding through paint on exterior girders.

**Corrosion**

- **Element**: 1000/1
- **Unit**: ft
- **Total Qty**: 958
- **% in 1 Qty St**: 99%
- **Qty. St. 1**: 950
- **% in 2 Qty St**: 1%
- **Qty. St. 2**: 8
- **% in 3 Qty St**: 0%
- **Qty. St. 3**: 0
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

See Element 107 comments.

**Stl Pin Pin/Han both**

- **Element**: 161/1
- **Unit**: each
- **Total Qty**: 10
- **% in 1 Qty St**: 60%
- **Qty. St. 1**: 6
- **% in 2 Qty St**: 40%
- **Qty. St. 2**: 4
- **% in 3 Qty St**: 0%
- **Qty. St. 3**: 0
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

Pins through girder webs at Pier 2 and Pier 5. R1 rust at exterior pins. See ultrasonic pin inspection report from 8/7/2017.

**Steel Protective Coating**

- **Element**: 515/1
- **Unit**: sq. ft
- **Total Qty**: 10
- **% in 1 Qty St**: 60%
- **Qty. St. 1**: 6
- **% in 2 Qty St**: 40%
- **Qty. St. 2**: 4
- **% in 3 Qty St**: 0%
- **Qty. St. 3**: 0
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

See Element 161 comments.

**Corrosion**

- **Element**: 1000/1
- **Unit**: each
- **Total Qty**: 4
- **% in 1 Qty St**: 0%
- **Qty. St. 1**: 4
- **% in 2 Qty St**: 100%
- **Qty. St. 2**: 4
- **% in 3 Qty St**: 0%
- **Qty. St. 3**: 0
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

See Element 161 comments.

**Re Conc Pier Wall**

- **Element**: 210/1
- **Unit**: ft
- **Total Qty**: 208
- **% in 1 Qty St**: 83%
- **Qty. St. 1**: 172
- **% in 2 Qty St**: 10%
- **Qty. St. 2**: 20
- **% in 3 Qty St**: 8%
- **Qty. St. 3**: 16
- **% in 4 Qty St**: 0%
- **Qty. St. 4**: 0

Concrete. Vertical hairline to 1/8 inch wide near center of all piers. Scaling and cracks with delamination at top under cap on both faces of P5. A few areas of minor random hairline cracks at piers. All piers have 1/16 inch deep scale below the high waterline on the upstream nose. Hairline map cracks on downstream ends of piers. Pier 2: 0.05 inch crack near center almost full height. 2 ft x 1 ft x 1/2 inch deep spall with exposed rebar near bottom on south face. Pier 3: 2.5 foot section of exposed and corroded steel located 8 foot downstream from the upstream nose in the cold joint. The pier has one large spall with associated 1 inch deep scale, 6 feet above waterline. The area measures 4 foot x 6 foot x 1 inch with two horizontal reinforcing bars exposed. Pier 4: 1/16 inch wide vertical crack at the centerline of the pier wall on the east and west faces that extend from the waterline up 3 feet. (2) spalls measuring 5 inch diameter and one inch deep with one piece of exposed vertical steel in each, located above and below the cold joint. Pier 5: Approximately 8 sq ft spall and area of delamination on north face near downstream end, just below cap with exposed rebar. Horizontal crack below cap on both faces for 10 ft from nose with associated delamination. Vertical crack, 0.060 inch wide at top, full height in Pier 5, 24 feet from downstream end. Could not verify everything during 2014 or 2016 - No access under Spans 2, 3, or 4. Water stained at Piers 2 and 5. See Underwater Inspection Report dated 9/13/2016.
<table>
<thead>
<tr>
<th>Element</th>
<th>Condition</th>
<th>Sign</th>
<th>Percentage</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1080/1</td>
<td>Delamination/Spall/Patched</td>
<td>ft 26</td>
<td>0% 0 54% 14 46% 12 0% 0</td>
<td>See Element 210 comments.</td>
</tr>
<tr>
<td>1090/1</td>
<td>Exposed Rebar</td>
<td>ft 6</td>
<td>0% 0 100% 6 0% 0 0% 0</td>
<td>See Element 210 comments.</td>
</tr>
<tr>
<td>1130/1</td>
<td>Cracking (RC and Other)</td>
<td>ft 4</td>
<td>0% 0 0% 0 100% 4 0% 0</td>
<td>See Element 210 comments.</td>
</tr>
<tr>
<td>215/1</td>
<td>Re Conc Abutment</td>
<td>ft 104</td>
<td>94% 98 2% 2 4% 4 0% 0</td>
<td>Concrete. (2) vertical cracks approximately .030 inches at south abutment (A1) and minor hairline cracks at various locations at both abutments. Delamination and deteriorated concrete exist below Bearings A and B at north abutment (A6). See Element 215 comments.</td>
</tr>
<tr>
<td>1080/1</td>
<td>Delamination/Spall/Patched</td>
<td>ft 4</td>
<td>0% 0 0% 0 100% 4 0% 0</td>
<td>See Element 215 comments.</td>
</tr>
<tr>
<td>1130/1</td>
<td>Cracking (RC and Other)</td>
<td>ft 2</td>
<td>0% 0 100% 2 0% 0 0% 0</td>
<td>See Element 215 comments.</td>
</tr>
<tr>
<td>234/1</td>
<td>Re Conc Pier Cap</td>
<td>ft 208</td>
<td>88% 184 2% 4 10% 20 0% 0</td>
<td>Concrete. (1) vertical crack at all pier caps that extend into pier wall. Scaling near ends of Piers 2, 3 and 5. Reinforcing exposed on Pier 5 at north face of east end and on Pier 2 at south face of west end. See Element 234 comments.</td>
</tr>
<tr>
<td>1080/1</td>
<td>Delamination/Spall/Patched</td>
<td>ft 16</td>
<td>0% 0 0% 0 100% 16 0% 0</td>
<td>See Element 234 comments.</td>
</tr>
<tr>
<td>1090/1</td>
<td>Exposed Rebar</td>
<td>ft 4</td>
<td>0% 0 100% 4 0% 0 0% 0</td>
<td>See Element 234 comments.</td>
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<tr>
<td>1130/1</td>
<td>Cracking (RC and Other)</td>
<td>ft 4</td>
<td>0% 0 0% 0 100% 4 0% 0</td>
<td>See Element 234 comments.</td>
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<tr>
<td>304/1</td>
<td>Open Expansion Joint</td>
<td>ft 104</td>
<td>0% 0 0% 0 100% 104 0% 0</td>
<td>At each abutment covered with asphalt. Asphalt cracked, heaving and breaking up. See Element 304 comments.</td>
</tr>
<tr>
<td>2360/1</td>
<td>Adjacent Deck or Header</td>
<td>ft 104</td>
<td>0% 0 0% 0 100% 104 0% 0</td>
<td>See Element 304 comments.</td>
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<tr>
<td>311/1</td>
<td>Moveable Bearing</td>
<td>each 30</td>
<td>87% 26 13% 4 0% 0 0% 0</td>
<td>At piers and abutments. Light R1 rusting, dirty, especially at exterior girders. Bearings at P4 are not at similar degrees of rotation.</td>
</tr>
<tr>
<td>515/1</td>
<td>Steel Protective Coating</td>
<td>sq.ft 30</td>
<td>87% 26 13% 4 0% 0 0% 0</td>
<td>Paint peeling.</td>
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<td>Structure ID: MESA-G.8-39.1</td>
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<td><strong>Routine Inspection</strong></td>
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<td>2220/1 Alignment</td>
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<td>0% 0</td>
<td>100% 4</td>
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<td>See Element 311 comments.</td>
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<tr>
<td>331/1 Re Conc Bridge Railing</td>
<td>ft 778</td>
<td>84% 656</td>
<td>11% 85</td>
<td>5% 37</td>
<td>Concrete Dog House type rail. Spalls with exposed rebar at various locations. Light spalling at various locations. Rails in Span 1 have sags, west rail more significant (appears to be as-built condition).</td>
</tr>
<tr>
<td>1080/1 Delamination/Spall/Patched</td>
<td>ft 85</td>
<td>0% 0</td>
<td>100% 85</td>
<td>0% 0</td>
<td>See Element 331 comments.</td>
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<tr>
<td>1090/1 Exposed Rebar</td>
<td>ft 37</td>
<td>0% 0</td>
<td>100% 37</td>
<td>0% 0</td>
<td>See Element 331 comments.</td>
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<tr>
<td>9308/1 Constr Non Exp Jt</td>
<td>(LF) 1</td>
<td>100% 1</td>
<td>0% 0</td>
<td>0% 0</td>
<td>At Piers 2 and 5. Material falling out with water stains visible from below. Asphalt is cracked above both joints.</td>
</tr>
<tr>
<td>9325/1 Slope Prot/Berms</td>
<td>(EA) 2</td>
<td>50% 1</td>
<td>50% 1</td>
<td>0% 0</td>
<td>Cobble and boulder lined banks. Most riprap at north abutment (A6) has washed away; cobbles and river rock in place.</td>
</tr>
<tr>
<td>9326/1 Bridge Wingwalls</td>
<td>(EA) 4</td>
<td>100% 4</td>
<td>0% 0</td>
<td>0% 0</td>
<td>Concrete, flared. Random hairline cracks. Areas of scale/shallow spalling on southeast wingwall.</td>
</tr>
<tr>
<td>9338/1 Conc Curbs/SW</td>
<td>(LF) 778</td>
<td>0% 0</td>
<td>100% 778</td>
<td>0% 0</td>
<td>Concrete curb. Spalls and S3 scaling on traffic face and scaling on top at various locations.</td>
</tr>
<tr>
<td>9501/1 Channel Cond</td>
<td>(EA) 1</td>
<td>100% 1</td>
<td>0% 0</td>
<td>0% 0</td>
<td>Cobbles, gravel and sand. Well aligned.</td>
</tr>
<tr>
<td>9504/1 BankCond</td>
<td>(EA) 1</td>
<td>100% 1</td>
<td>0% 0</td>
<td>0% 0</td>
<td>Moderate slopes upstream and downstream. Lined with trees and brush.</td>
</tr>
<tr>
<td>9505/1 Debris Smart Flag</td>
<td>(EA) 1</td>
<td>100% 1</td>
<td>0% 0</td>
<td>0% 0</td>
<td>Trees growing beneath and into structure in Span 1.</td>
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<tr>
<td>9510/1 Waterway Adequ.</td>
<td>(EA) 1</td>
<td>100% 1</td>
<td>0% 0</td>
<td>0% 0</td>
<td>No evidence of recent overtopping. Water has been on upstream end of pier caps as evidenced by water stains.</td>
</tr>
<tr>
<td>9520/1 AppRdAlign</td>
<td>(EA) 1</td>
<td>100% 1</td>
<td>0% 0</td>
<td>0% 0</td>
<td>Gentle horizontal curve at south, intersection at US6 at north end with Stop sign. Steep shoulders at northeast, northwest and southeast. Asphalt at ends of deck is cracked, sealed and shoved in wheel lines.</td>
</tr>
<tr>
<td>9530/1 Approach Guardrail A</td>
<td>(EA) 1</td>
<td>100% 1</td>
<td>0% 0</td>
<td>0% 0</td>
<td>Cables on timber posts at southeast, southwest and northeast. Too short, not attached to bridge rails, no end treatments. NO rail at southeast, southwest and northwest.</td>
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<tr>
<td>9600/1 Genl Remarks</td>
<td>(EA) 1</td>
<td>100% 1</td>
<td>0% 0</td>
<td>0% 0</td>
<td>Bridge requires posting of 24 Tons, 37 Tons, 34 Tons, but was posted 22 Tons, 33 Tons, 31 Tons at both approaches at the time of 2018 inspection. Signed No Jumping From Bridge. (2) steel utility conduits between Girders D and E.</td>
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## Maintenance Activity Summary

<table>
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<tr>
<th>MMS Activity</th>
<th>Description</th>
<th>Recommended</th>
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<td>302.01</td>
<td>Misc-Install Sign</td>
<td>2/18/2014</td>
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<td>2018</td>
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<td>Install Type 3 object markers all corners.</td>
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<tr>
<td>302.02</td>
<td>Misc-Repair/Replace Util or Sgn</td>
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<td>2022</td>
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<td>County may wish to revise posting signs to 24T/37T/34T.</td>
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<tr>
<td>306.04</td>
<td>Bridge Rail-Replace</td>
<td>1/28/2002</td>
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<td>2020</td>
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<td>Install bridge rails to meet current AASHTO/CDOT standards.</td>
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</tr>
<tr>
<td>306.05</td>
<td>Approach Railing</td>
<td>2/2/2012</td>
<td>1</td>
<td>2019</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Install transitions, approach rails and rail ends to meet current AASHTO/CDOT standards.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>353.03</td>
<td>Substructure-Patch spalls</td>
<td>3/25/2008</td>
<td>1</td>
<td>2023</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove loose concrete from spalls and delaminations in substructure, clean and protect all exposed reinforcing steel. Patch with adequate material.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>353.08</td>
<td>Deck-Seal</td>
<td>3/25/2008</td>
<td>1</td>
<td>2026</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seal cracks in deck overlay.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
355.01  Paint-Structural  3/25/2008  1  2026
Clean and paint superstructure steel below joints at Pier 2 and Pier 5. Spot paint girders as needed.

364.01  Joints-Replace  3/25/2008  1  2023
Remove/replace joints at both abutments with adequately sized plug joints. Remove material and asphalt from joints at P2 and P5, replace with plug joints.

Bridge Notes

Ultrasonic pin inspection (Special Inspection) on 8/7/2017 by SEH, Inc. and ISI with assistance from CDOT A40 crew, Tom Tatalaski and Josh Dunbar, and using WZTC traffic control. Special inspection on 2/1/2012 for ultrasonic inspection of pins.

Inspection Notes

Date:  2/5/2018
Time:  3:40 PM  Temp:  57 degrees  Weather:  Cloudy, calm
Routine Inspection
Colorado Department of Transportation
Structure Inspection and Inventory Report (English Units)

Highway Number (ON) 5D: 00000 V
Mile Post (ON) 11: 0.000 mi

Scope:
- NBI
- Element
- Underwater
- Fracture Critical
- Other

Type: Regular NBI

Team Leader Inspection Check-off:
- FCM's
- Posting Signs
- Essential Repair Verification
- Vertical Clearance
- Stream Bed Profile

Inspection Team: SEH

Inspection Date: 02/05/2018

Inspector: Unknown

Inspector (Team Leader): KURT WAGNER
WINGWALLS:
16" THICK C.I.P. CONCRETE
(LENGTH & ANGLE ON PLAN)

DECK:
33'-5" O-O DECK   (52'-0" O/O SKEW)
30'-1" CURB-CURB

APPROACH RAILS:
CABLE ON TIMBER POSTS
(AT SE & SW)

BRIDGE RAILINGS:
CONC. "DOGHOUSE" TYPE RAIL

DECK:
4" ASPHALT ON
9" CONC. DECK

GIRDERS:
(5) WF 35 15/16"x
12" (.855" TO 1.95"
FLG., .670" WEB)
(W36 X 82)

DIAPHRAGMS:
STL. ANGLE
FRAMES @
1/4 POINTS

SECTIONS
LOOKING NORTH

PLAN

GAS PIPE
CONDUIT

3'-0 1/2"

4 1/2" GAS PIPE

4 SPACES @ 7'-5"+ - 23'-11 3/4"

1'-8"

33'-5" 0-0 DECK 1 (52'-0" 0/SKEW)

30'-1" CURB-CURB

2'-0"

1'-5"

4 SPACES @ 7'-5"+ - 23'-11 3/4"

1'-8"

1'-5"
ABUTMENTS:
(5) ROLLER BEARINGS ON
CAST-IN-PLACE CONCRETE

PIERS:
ROCKER BEARINGS W/ PINS ON
3' DEEP x 4' WIDE CONC. CAP
ON CAST-IN-PLACE CONC.

ELEVATION
LOOKING WEST
STREAMBED HISTORY

<table>
<thead>
<tr>
<th>0</th>
<th>30</th>
<th>60</th>
<th>102</th>
<th>145</th>
<th>193</th>
<th>240</th>
<th>282</th>
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<td>13.0</td>
<td>18.6</td>
<td>23</td>
<td>23.0</td>
<td>23.0</td>
<td>21.5</td>
<td>23.0</td>
<td>20.0</td>
<td>17.0</td>
<td>15.3</td>
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<tr>
<td>2014</td>
<td>12.9</td>
<td>18.6</td>
<td>22.9</td>
<td>25.5</td>
<td>25.0</td>
<td>22.9</td>
<td>25.1</td>
<td>21.4</td>
<td>17.6</td>
<td>15.3</td>
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<tr>
<td>2016</td>
<td>13.0</td>
<td>17.3</td>
<td>21.8</td>
<td>24.6</td>
<td>23.6</td>
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<td>24.9</td>
<td>21.0</td>
<td>17.1</td>
<td>15.0</td>
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<tr>
<td>2018</td>
<td>13.2</td>
<td>19.0</td>
<td>21.7</td>
<td>27.2</td>
<td>25.2</td>
<td>24.4</td>
<td>24.9</td>
<td>23.6</td>
<td>17.2</td>
<td>15.5</td>
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PERFORMED BY: KW/MC

STRUCTURE NUMBER: MESA-G.8-39.1

INSPECTION DATE: 2/5/2018
<table>
<thead>
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<td>Inventory</td>
<td>20.5</td>
<td>21.1</td>
<td>16.5</td>
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<td>Operating</td>
<td>34.2</td>
<td>35.3</td>
<td>27.6</td>
<td>36.8</td>
<td>42.2</td>
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<tr>
<td>Type 3 truck</td>
<td>41.0</td>
<td>31.4</td>
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<td>38.9</td>
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<td>64.6</td>
<td>48.1</td>
<td>37.6</td>
<td>44.6</td>
<td>51.1</td>
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<tr>
<td>Type 3-2 truck</td>
<td>64.6</td>
<td>44.6</td>
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<td>43.6</td>
<td>49.7</td>
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<tr>
<td>Type SU4 truck (27T)</td>
<td>31.3</td>
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<td>38.9</td>
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<tr>
<td>Type SU5 truck (31T)</td>
<td>32.9</td>
<td>25.7</td>
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<tr>
<td>Type SU6 truck (35T)</td>
<td>33.0</td>
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<td>35.5</td>
<td>40.5</td>
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<tr>
<td>Type SU7 truck (39T)</td>
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<td>26.5</td>
<td>36.3</td>
<td>41.5</td>
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<tr>
<td>NRL (40T)</td>
<td>71.6</td>
<td>33.5</td>
<td>26.2</td>
<td>36.2</td>
<td>41.1</td>
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<tr>
<td>EV2 (28.75T)</td>
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<td>33.0</td>
<td>32.9</td>
<td>34.4</td>
<td>50.8</td>
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<tr>
<td>EV3 (43T)</td>
<td>42.2</td>
<td>32.2</td>
<td>32.0</td>
<td>34.6</td>
<td>50.4</td>
</tr>
<tr>
<td>Permit Truck (96T)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Lane D.F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modified Tandem (50T)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Lane D.F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments:
- 3 1/2" asphalt on 9" reinforced concrete deck, F'c=2.50ksi, Fy=33ksi
- Approach Spans (1 & 5) - (5) W36x182 steel girders spaced at 7'-6" spanning 60'-0", Fy= 30ksi
- Main Spans (2-4) - (5) Continuous riveted steel girders spaced at 7'-6" spanning 85'-0" - 95'-0" - 85'-0", Fy= 30ksi
- Out-Out Width 33'-6", Traveled Way 30'-0"

PLEASE POST AS SHOWN
SU4 24T, SU5 25T, SU6 25T, SU7 26T, EV2 22T, EV3 32T

Rated by: Matthew Henderson, EIT
Date: 7/13/2017
Checked by: John Butt, PE
Date: 9/19/2017
Bridge ID  MESA-G.8-39.1  MESA-G.8-39.1
NBI Structure ID (8): MESA-G.8-39.1
Description:

Description
Location: Mesa Co
Total Length: 389.00 (ft)
Facility Carried: CR G.8
Route Number: G.8
Feature Intersected: Colorado River
Mi Post: (mi)
Units: US Customary
Year Built: 1937
Recent ADTT:
District:
County:
Owner:
National Highway System:
Functional Class:
Global Reference Point
X Coordinate: 0.000 (ft)
Y Coordinate: 0.000 (ft)
Elevation: (ft)
Longitude: (Degrees)
Latitude: (Degrees)

Materials

Structural Steel
Name: 1905 to 1936
Description: Built 1905 to 1936 - steel unknown
Specified minimum yield strength (Fy): 30.000 (ksi)
Specified minimum tensile strength (Fu): 60.000 (ksi)
Coefficient of thermal expansion: 0.0000065000 (1/F)
Density: 0.4900 (kcf)
Modulus of elasticity (E): 29000.00 (ksi)

Concrete
Name: Class A
Description:
Specified compressive strength at 28 days (f'c): 2.500 (ksi)
Initial specified compressive strength (f'ci): 2.500 (ksi)
Coefficient of thermal expansion: 0.0000060000 (1/F)
Density (for dead loads): 0.150 (kcf)
Density (for modulus of elasticity): 0.145 (kcf)
Std Modulus of elasticity (Ec): 2880.95 (ksi)
LRFD Modulus of elasticity (Ec): 3413.80 (ksi)
Poisson's ratio: 0.200
Modulus of rupture: 0.379 (ksi)
Shear factor: 1.000
Composition of concrete: Normal
Std Initial modulus of elasticity (Eci): 2880.95 (ksi)
LRFD Initial modulus of elasticity (Eci): 3413.80 (ksi)
Splitting tensile strength (fct): 

No rebar materials.

No prestressing strand materials.

No timber materials.

**Beam Shapes**

**Steel Shapes**

**Steel Angles**

Name: L 4x3x0.3125
Description: L 4x3x0.3125 Imported from AISC Tables (1994)
Angle size 1: 4.0000 (in)
Angle size 2: 3.0000 (in)
Thickness: 0.3125 (in)
k: 
Xyy: 0.7590 (in)
Yxx: 1.2600 (in)
tan(tetha): 
Cross sectional Area (A): 2.090 (in^2)
Nominal load: 7.200 (lb/ft)
Moment of Inertia Ixx: 3.380 (in^4)
Moment of Inertia Iyy: 1.650 (in^4)
Rzz: 0.6470 (in)
No steel channels.

**Steel I Shapes**

Name: W 36x182
Description: W 36x182 Imported from AISC Tables (1994)
Depth (d): 36.3300 (in)
Flange width (bf): 12.0750 (in)
Flange thickness (tf): 1.1800 (in)
Web thickness (tw): 0.7250 (in)
k: 2.1250 (in)
k1: (in)
Cross sectional area: 53.600 (in^2)
Nominal load: 182.000 (lb/ft)
Ixx: 11300.000 (in^4)
Iyy: 347.000 (in^4)
Zx: 718.000 (in^3)
Zy: 90.700 (in^3)
Nominal Depth: 36.0000 (in)
Type: W Shape
No steel structural tee shapes.

**Prestressed Shapes**

No prestressed shapes.

**Timber Shapes**

No timber shapes.

**Appurtenances**

**Parapets**

Name: Concrete Curb

Description:

<table>
<thead>
<tr>
<th>X1:</th>
<th>20.0000 (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X2:</td>
<td>1.0000 (in)</td>
</tr>
<tr>
<td>X3:</td>
<td>0.0000 (in)</td>
</tr>
<tr>
<td>Y1:</td>
<td>0.0000 (in)</td>
</tr>
<tr>
<td>Y2:</td>
<td>0.0000 (in)</td>
</tr>
<tr>
<td>Y3:</td>
<td>0.0000 (in)</td>
</tr>
<tr>
<td>Y4:</td>
<td>6.0000 (in)</td>
</tr>
</tbody>
</table>

Distance to Center of Gravity of Load: (in)
Additional Load: (kip/ft)
Concrete Density: 0.1500 (kcf)

No concrete medians.
No concrete generics.

**Railings**

Name: Concrete Dog House Barrie

Description:

Effective Wind Height: 26.0000 (in)
Railing Load: 0.200 (kip/ft)
Distance From Edge to Centroid: 7.0000 (in)
Width: 14.0000 (in)
**Impact**

*Standard Impact Factor*

*Type:* Standard - AASHTO

*LRFD Dynamic Load Allowance*

Fatigue and fracture limit states: 15.0 (%)  
All other limit states: 33.0 (%)  

**Factors**

No LFD Factors specified.

No LRFD Factors specified.

No Bridge Alternatives defined.

---

**Superstructure Definition**  
**Spans 1 & 5**

**Definition**

<table>
<thead>
<tr>
<th>Units</th>
<th>US Customary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of spans</td>
<td>1</td>
</tr>
<tr>
<td>Number of girders</td>
<td>5</td>
</tr>
</tbody>
</table>

**Length**

<table>
<thead>
<tr>
<th>Span (ft)</th>
<th>60.0000</th>
</tr>
</thead>
</table>

**Frame Structure Simplified Definition:**

Support Frame Connection  
1  
2  

**Girder Spacing Display Type:** Perpendicular  
**Average Humidity:** (%)  

**Analysis**

**Default Library Factors**

**Factor Override**

**Analysis Module**

**Analysis Method:** ASD  
**Analysis Module:**  
**Analysis Module Component:**  
**Properties:**

**Analysis Method:** LFD  
**Analysis Module:**  
**Analysis Module Component:**  
**Properties:**

**Analysis Method:** LRFD  
**Analysis Module:**  
**Analysis Module Component:**  
**Properties:**
Properties:

Analysis Method: LRFR
Analysis Module: 
Analysis Module Component: 
Properties:

Analysis Method: Distribution Factors
Analysis Module: 
Analysis Module Component: 
Properties:

Default rating method: LFD

**Impact**

*Standard Impact Factor*

Type: Standard - AASHTO

*LRFD Dynamic Load Allowance*

Fatigue and fracture limit states: 15.0 (%)  
All other limit states: 33.0 (%)  

**Structure Framing Plan Details**

*Layout*

<table>
<thead>
<tr>
<th>Support</th>
<th>(Degrees)</th>
<th>1</th>
<th>50.0000</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>50.0000</td>
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<td></td>
</tr>
</tbody>
</table>

Girder Spacing Orientation: Perpendicular

<table>
<thead>
<tr>
<th>Girder Bay</th>
<th>Girder Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>Start (ft)</td>
</tr>
<tr>
<td>1</td>
<td>7.5000</td>
</tr>
<tr>
<td>2</td>
<td>7.5000</td>
</tr>
<tr>
<td>3</td>
<td>7.5000</td>
</tr>
<tr>
<td>4</td>
<td>7.5000</td>
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</tbody>
</table>

**Diaphragms**

*Girder Bay 1*

<table>
<thead>
<tr>
<th>Distance (ft)</th>
<th>Distance (ft)</th>
<th>Diaphragm Spacing (ft)</th>
<th>Number of Spaces</th>
<th>Diaphragm Weight (kip)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.2800</td>
</tr>
<tr>
<td>5.00</td>
<td>13.94</td>
<td>0.00</td>
<td>1</td>
<td>0.2800</td>
</tr>
<tr>
<td>5.00</td>
<td>13.94</td>
<td>16.67</td>
<td>2</td>
<td>0.2800</td>
</tr>
<tr>
<td>60.00</td>
<td>60.00</td>
<td>0.00</td>
<td>1</td>
<td>0.2800</td>
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</table>

*Girder Bay 2*

<table>
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<th>Distance (ft)</th>
<th>Diaphragm Spacing (ft)</th>
<th>Number of Spaces</th>
<th>Diaphragm Weight (kip)</th>
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</thead>
<tbody>
<tr>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.2800</td>
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<tr>
<td>Girder Bay</td>
<td>Distance</td>
<td>Diaphragm Spacing</td>
<td>Number of Spaces</td>
<td>Diaphragm Weight</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
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<td>-----------------</td>
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<td>60.00</td>
<td>60.00</td>
<td>0.00</td>
<td>0.2800</td>
</tr>
</tbody>
</table>

**Structure Typical Section**

**Deck**

- Left start width: 16.75 (ft)
- Left end width: 16.75 (ft)
- Right start width: 16.75 (ft)
- Right end width: 16.75 (ft)
- Left start overhang: 1.75 (ft)
- Left end overhang: 1.75 (ft)

**Deck (Cont'd)**

- Deck concrete: Class A
- Total deck thickness: 9.0000 (in)
- Deck crack control parameter: 3.000 kip/in
- Sustained modular ratio factor: 3.00

**Parapet**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Measured Distance At Start</th>
<th>Distance At End</th>
<th>Front Face Orientation</th>
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<tbody>
<tr>
<td>Concrete ...</td>
<td>Left Ed...</td>
<td>0.00</td>
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</tr>
<tr>
<td>Concrete ...</td>
<td>Right E...</td>
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<td>0.00</td>
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</table>

**Railing**

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<th>Measured Distance At Start</th>
<th>Distance At End</th>
<th>Front Face Orientation</th>
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</thead>
<tbody>
<tr>
<td>Concrete ...</td>
<td>Left Ed...</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Concrete ...</td>
<td>Right E...</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Offset Lane Position**

- Offset Left Start: -15.00 (ft)
- Offset Left End: -15.00 (ft)
- Offset Right Start: 15.00 (ft)
- Offset Right End: 15.00 (ft)

**Wearing Surface**

- Wearing surface material: Asphalt
Description:
Wearing surface thickness: 3.5000 (in)
Wearing surface density: 144.000 (pcf)
Load case: WS

Load Case Description
<table>
<thead>
<tr>
<th>Load Case Name</th>
<th>Description</th>
<th>Stage</th>
<th>Type</th>
<th>Time (Days)</th>
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<tbody>
<tr>
<td>Rail and Curb</td>
<td>Composite (long te...)</td>
<td>D,DC</td>
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<tr>
<td>WS</td>
<td>Composite (long te...)</td>
<td>D,DW</td>
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<td></td>
</tr>
<tr>
<td>Utility</td>
<td>Composite (long te...)</td>
<td>D,DC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Superstructure Loads
DL Distribution
Stage 1 Dead Load Distribution: Tributary Area
Stage 2 Dead Load Distribution: Uniformly to All Girders

Stiffener Definitions
No prestress stress limits.
No prestress properties.
No vertical shear reinforcement definitions.
No horizontal shear reinforcement definitions.

Member G1
Link with: None
Description:

Existing: Exterior Girder 1 & 5 -
Current: Exterior Girder 1 & 5 -
Number of Spans: 1

<table>
<thead>
<tr>
<th>Span Number</th>
<th>Span Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60.000000</td>
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</tbody>
</table>

Support Frame Connection
1
2

Pedestrian load: (lb/ft)

Member Loads

<table>
<thead>
<tr>
<th>Distributed Loads</th>
<th>Distance (ft)</th>
<th>Length (ft)</th>
<th>Start (kip/ft)</th>
<th>End (kip/ft)</th>
<th>Load Case Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.00</td>
<td>60.00</td>
<td>0.050</td>
<td>0.050</td>
<td>Utility</td>
</tr>
</tbody>
</table>
# Member Loads - Settlement

<table>
<thead>
<tr>
<th>Member Loads - Settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Support Number</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

## Support Constraints

### General

<table>
<thead>
<tr>
<th>Support Number</th>
<th>Support Type</th>
<th>X Translation</th>
<th>Y Translation</th>
<th>Z Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pinned</td>
<td>Fixed</td>
<td>Fixed</td>
<td>Free</td>
</tr>
<tr>
<td>2</td>
<td>Roller</td>
<td>Free</td>
<td>Fixed</td>
<td>Free</td>
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</table>

### Elastic

<table>
<thead>
<tr>
<th>Support Number</th>
<th>X Translation</th>
<th>Y Translation</th>
<th>Z Rotation</th>
<th>Override Computed</th>
<th>Z Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(kip/ft)</td>
<td>(kip/ft)</td>
<td>(kip-in/rad)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

## Member Alternative  Exterior Girder 1 & 5

**Description:**

- **Material Type:** Steel
- **Girder Type:** Rolled
- **Member units:** US Customary
- **Girder property input method:** Schedule based

**Left end X:** (in)

**Right end X:** (in)

**Additional Self Load:** (kip/ft)

**Additional Self Load %:** (%)

### Analysis Module

**Analysis Method:** ASD

**Analysis Module:** AASHTO ASD

**Analysis Module Component:**

- **Properties:**
  - **Analysis Method:** LFD
  - **Analysis Module:** AASHTO LFD

### Analysis Module

**Analysis Method:** LRFD

**Analysis Module:** AASHTO LRFD

**Analysis Module Component:**

- **Properties:**
  - **Analysis Method:** LRFR
  - **Analysis Module:** AASHTO LRFR

**Analysis Module Component:**
Properties:

Analysis Method: Distribution Factors
Analysis Module: BrR Dist Fact
Analysis Module Component:

Properties:

Default rating method: LFD

Factors
Factor Override
LRFD:
LFD:
ASD Factors

Inventory Operating

Structural steel
Concrete
PS Concrete Comp.
PS Concrete Tens.
PS Moment Cap.
Reinforcement
Bearing Stiffener
Stirrup
Timber

NA

Default Materials
Structural steel: 1905 to 1936
Deck concrete: Class A
Deck reinforcement:
Welds:
Bolts:

Impact
Standard Impact Factor
Type: Standard - AASHTO

LRFD Dynamic Load Allowance
Fatigue and fracture limit states: 15.0 (%)
All other limit states: 33.0 (%)

Live Load Distribution
Standard

Distribution Factor (Wheels)

<table>
<thead>
<tr>
<th>Lanes</th>
<th>Shear at Loaded</th>
<th>Shear at Supports</th>
<th>Moment</th>
<th>Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lane</td>
<td>1.277</td>
<td>0.733</td>
<td>1.277</td>
<td>0.400</td>
</tr>
<tr>
<td>Multi-Lane</td>
<td>1.277</td>
<td>0.733</td>
<td>1.277</td>
<td>0.800</td>
</tr>
</tbody>
</table>

Girder Profile
Shape
Shape: W 36x182
Distance: 0.00 (ft)
Length: 60.00 (ft)
Material: 1905 to 1936

Deck Profile

Bracing Ranges
Lateral Support
Distance   Length
(ft)   (ft)
0.00   60.00

Bearing Stiffener Locations

Member G2
Link with: None
Description:

Existing: Interior Girder 1 & 5 -
Current: Interior Girder 1 & 5 -
Number of Spans: 1

Span   Span Length
Number (ft)  (ft)
1       60.000000

Support Frame Connection
1
2

Pedestrian load: (lb/ft)

Member Loads

Distributed Loads
Distance   Length   Start   End   Load Case Name
(ft)   (ft)   (kip/ft)   (kip/ft)
0.00   60.00   0.050   0.050   Rail and C...

Member Loads - Settlement
Support Horizontal Vertical Rotational Load Case Name
Number (in) (in) (Radians)
1
2

Support Constraints
General
Support Support
Number Type X Translation Y Translation Z Rotation
<table>
<thead>
<tr>
<th>Number</th>
<th>Support</th>
<th>X Translation</th>
<th>Y Translation</th>
<th>Z Rotation</th>
<th>Override Computed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pinned</td>
<td>Free</td>
<td>Fixed</td>
<td>Fixed</td>
<td>Free</td>
</tr>
<tr>
<td>2</td>
<td>Roller</td>
<td>Free</td>
<td>Fixed</td>
<td>Fixed</td>
<td>Free</td>
</tr>
</tbody>
</table>

**Elastic Support**

<table>
<thead>
<tr>
<th>Number</th>
<th>Z Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<tr>
<td>2</td>
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</tr>
</tbody>
</table>

**Member Alternative Interior Girder 1 & 5**

*Description:*

- **Material Type:** Steel
- **Girder Type:** Rolled
- **Member units:** US Customary
- **Girder property input method:** Schedule based
- **Left end X:** (in)
- **Right end X:** (in)
- **Additional Self Load:** (kip/ft)
- **Additional Self Load %:** (%)

**Analysis Module**

- **Analysis Method:** ASD
- **Analysis Module:** AASHTO ASD
- **Analysis Module Component:** Properties:
  - **Analysis Method:** LFD
  - **Analysis Module:** AASHTO LFD
  - **Analysis Module Component:** Properties:
    - **Analysis Method:** LRFD
    - **Analysis Module:** AASHTO LRFD
    - **Analysis Module Component:** Properties:
      - **Analysis Method:** LRFR
      - **Analysis Module:** AASHTO LRFR
      - **Analysis Module Component:** Properties:
        - **Analysis Method:** Distribution Factors
        - **Analysis Module:** BrR Dist Fact
        - **Analysis Module Component:** Properties:
          - **Default rating method:** LFD

**Factors**

*Factor Override*
LRFD: 
LFD: 
ASD Factors

Inventory Operating

Structural steel
Concrete
PS Concrete Comp.
PS Concrete Tens.
PS Moment Cap.
Reinforcement
Bearing Stiffener
Stirrup
Timber NA

Default Materials
Structural steel: 1905 to 1936
Deck concrete: Class A
Deck reinforcement:
Welds:
Bolts:

Impact
Standard Impact Factor
Type: Standard - AASHTO

LRFD Dynamic Load Allowance
Fatigue and fracture limit states: 15.0 (%)
All other limit states: 33.0 (%)

Live Load Distribution
Standard

Distribution Factor (Wheels)

<table>
<thead>
<tr>
<th>Lanes</th>
<th>Shear at Loaded</th>
<th>Shear Supports</th>
<th>Moment</th>
<th>Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lane</td>
<td>1.071</td>
<td>1.200</td>
<td>1.071</td>
<td>0.400</td>
</tr>
<tr>
<td>Multi-Lane</td>
<td>1.364</td>
<td>1.333</td>
<td>1.364</td>
<td>0.800</td>
</tr>
</tbody>
</table>

Girder Profile

Shape
Shape: W 36x182
Distance: 0.00 (ft)
Length: 60.00 (ft)
Material: 1905 to 1936

Deck Profile

Bracing Ranges
Lateral Support
Distance Length
**Bearing Stiffener Locations**

**Member G3**  
Link with: G2  
Description:

<table>
<thead>
<tr>
<th>Existing:</th>
<th>Current:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Spans:</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Span Number</th>
<th>Span Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60.000000</td>
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</table>

<table>
<thead>
<tr>
<th>Support Frame Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

Pedestrian load: (lb/ft)

**Member G4**  
Link with: G2  
Description:

<table>
<thead>
<tr>
<th>Existing:</th>
<th>Current:</th>
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</thead>
<tbody>
<tr>
<td>Number of Spans:</td>
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</tbody>
</table>

<table>
<thead>
<tr>
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<th>Span Length (ft)</th>
</tr>
</thead>
<tbody>
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<td>60.000000</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Support Frame Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

Pedestrian load: (lb/ft)

**Member G5**  
Link with: G1  
Description:

<table>
<thead>
<tr>
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<th>Current:</th>
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</thead>
<tbody>
<tr>
<td>Number of Spans:</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Span</th>
<th>Span Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Support Frame Connection

Pedestrian load: \( (\text{lb/ft}) \)

**Superstructure Definition**  **Spans 2-4**

<table>
<thead>
<tr>
<th>Definition</th>
<th>Units: US Customary</th>
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<tbody>
<tr>
<td>Number of spans:</td>
<td>3</td>
</tr>
<tr>
<td>Number of girders:</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Span</th>
<th>(ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>85.0000</td>
</tr>
<tr>
<td>2</td>
<td>95.0000</td>
</tr>
<tr>
<td>3</td>
<td>85.0000</td>
</tr>
</tbody>
</table>

**Frame Structure Simplified Definition:**

<table>
<thead>
<tr>
<th>Support</th>
<th>Frame Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Girder Spacing Display Type:** Perpendicular

**Average Humidity:** \( (%) \)

**Analysis**

*Default Library Factors*

*Factor Override*

*Analysis Module*

**Analysis Method:** ASD

**Analysis Module:**
**Analysis Module Component:**

**Properties:**

**Analysis Method:** LFD

**Analysis Module:**
**Analysis Module Component:**

**Properties:**

**Analysis Method:** LRFD

**Analysis Module:**
**Analysis Module Component:**

**Properties:**

**Analysis Method:** LRFR

**Analysis Module:**
**Analysis Module Component:**

**Properties:**
Analysis Method: Distribution Factors
Analysis Module:
Analysis Module Component:
Properties:

Default rating method: LFD

Impact
Standard Impact Factor
Type: Standard - AASHTO
LRFD Dynamic Load Allowance
Fatigue and fracture limit states: 15.0 (%)
All other limit states: 33.0 (%)

Structure Framing Plan Details
Layout

Skew
Support (Degrees)
1 50.0000
2 50.0000
3 50.0000
4 50.0000

Girder Spacing Orientation: Perpendicular

Girder Bay 1

Girder Spacing
Bay Start End (ft) (ft)
1 7.5000 7.5000
2 7.5000 7.5000
3 7.5000 7.5000
4 7.5000 7.5000

Diaphragms
Girder Bay 1

Distance Left Girder Right Girder Spacing Number of Diaphragm Weight (ft) (ft) (kip)
0.00 0.00 0.00 1 0.6500
5.00 13.94 0.00 1 0.3400
5.00 13.94 16.67 4 0.3400
85.00 85.00 0.00 1 0.6500
95.00 103.94 0.00 1 0.3400
95.00 103.94 16.67 4 0.3400
171.00 180.00 0.00 1 0.3400
180.00 180.00 0.00 1 0.6500
185.00 193.94 0.00 1 0.3400
185.00 193.94 16.67 4 0.3400
265.00 265.00 0.00 1 0.6500

Girder Bay 2

Distance Diaphragm Number of Diaphragm
Distance Spacing Spaces Weight (ft) (ft) (kip)
0.00 0.00 0.00 1 0.6500
5.00 13.94 0.00 1 0.3400
5.00 13.94 16.67 4 0.3400
85.00 85.00 0.00 1 0.6500
95.00 103.94 0.00 1 0.3400
95.00 103.94 16.67 4 0.3400
171.00 180.00 0.00 1 0.3400
180.00 180.00 0.00 1 0.6500
185.00 193.94 0.00 1 0.3400
185.00 193.94 16.67 4 0.3400
265.00 265.00 0.00 1 0.6500
<table>
<thead>
<tr>
<th>Girder Bay 3</th>
<th>Distance</th>
<th>Distance</th>
<th>Diaphragm Spacing</th>
<th>Number of Diaphragm Spaces</th>
<th>Weight (kip)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Girder</td>
<td>(ft)</td>
<td>Right Girder</td>
<td>(ft)</td>
<td>Spacing (ft)</td>
<td>Spaces</td>
</tr>
<tr>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.6500</td>
</tr>
<tr>
<td>5.00</td>
<td>13.94</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.3400</td>
</tr>
<tr>
<td>5.00</td>
<td>13.94</td>
<td>16.67</td>
<td>4</td>
<td></td>
<td>0.3400</td>
</tr>
<tr>
<td>85.00</td>
<td>85.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.6500</td>
</tr>
<tr>
<td>95.00</td>
<td>103.94</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.3400</td>
</tr>
<tr>
<td>95.00</td>
<td>103.94</td>
<td>16.67</td>
<td>4</td>
<td></td>
<td>0.3400</td>
</tr>
<tr>
<td>180.00</td>
<td>180.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.6500</td>
</tr>
<tr>
<td>185.00</td>
<td>193.94</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.3400</td>
</tr>
<tr>
<td>185.00</td>
<td>193.94</td>
<td>16.67</td>
<td>4</td>
<td></td>
<td>0.3400</td>
</tr>
<tr>
<td>265.00</td>
<td>265.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.6500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Girder Bay 4</th>
<th>Distance</th>
<th>Distance</th>
<th>Diaphragm Spacing</th>
<th>Number of Diaphragm Spaces</th>
<th>Weight (kip)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Girder</td>
<td>(ft)</td>
<td>Right Girder</td>
<td>(ft)</td>
<td>Spacing (ft)</td>
<td>Spaces</td>
</tr>
<tr>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.6500</td>
</tr>
<tr>
<td>5.00</td>
<td>13.94</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.3400</td>
</tr>
<tr>
<td>5.00</td>
<td>13.94</td>
<td>16.67</td>
<td>4</td>
<td></td>
<td>0.3400</td>
</tr>
<tr>
<td>85.00</td>
<td>85.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.6500</td>
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<tr>
<td>85.00</td>
<td>94.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.3400</td>
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<tr>
<td>95.00</td>
<td>103.94</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.6500</td>
</tr>
<tr>
<td>95.00</td>
<td>103.94</td>
<td>16.67</td>
<td>4</td>
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<td>180.00</td>
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<td>185.00</td>
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<tr>
<td>185.00</td>
<td>193.94</td>
<td>16.67</td>
<td>4</td>
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<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.6500</td>
</tr>
</tbody>
</table>

**Structure Typical Section**

**Deck**
- Left start width: 16.75 (ft)
- Left end width: 16.75 (ft)
- Right start width: 16.75 (ft)
- Right end width: 16.75 (ft)
- Left start overhang: 1.75 (ft)
- Left end overhang: 1.75 (ft)
Deck (Cont'd)

Deck concrete: Class A
Total deck thickness: 9.0000 (in)
Deck crack control parameter: (kip/in)
Sustained modular ratio factor: 3.000

Parapet

<table>
<thead>
<tr>
<th>Name</th>
<th>Load Case</th>
<th>Measure</th>
<th>Measured</th>
<th>Distance At Start</th>
<th>Distance At End</th>
<th>Front Face</th>
<th>Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>Curb an...</td>
<td>Back</td>
<td>Left Ed...</td>
<td>0.00</td>
<td>0.00</td>
<td>Right</td>
<td>Right</td>
</tr>
<tr>
<td>Concrete</td>
<td>Curb an...</td>
<td>Back</td>
<td>Right E...</td>
<td>0.00</td>
<td>0.00</td>
<td>Left</td>
<td>Left</td>
</tr>
</tbody>
</table>

Railing

<table>
<thead>
<tr>
<th>Name</th>
<th>Load Case</th>
<th>Measure</th>
<th>Measured</th>
<th>Distance At Start</th>
<th>Distance At End</th>
<th>Front Face</th>
<th>Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>Curb an...</td>
<td>Left</td>
<td>Ed...</td>
<td>0.00</td>
<td>0.00</td>
<td>Right</td>
<td>Right</td>
</tr>
<tr>
<td>Concrete</td>
<td>Curb an...</td>
<td>Right</td>
<td>E...</td>
<td>0.00</td>
<td>0.00</td>
<td>Left</td>
<td>Left</td>
</tr>
</tbody>
</table>

Lane Position

Offset Left Start: -15.00 (ft)
Offset Left End: -15.00 (ft)
Offset Right Start: 15.00 (ft)
Offset Right End: 15.00 (ft)

Wearing Surface

Wearing surface material: Asphalt
Wearing surface thickness: 3.5000 (in)
Wearing surface density: 144.000 (pcf)
Load case: WS

Load Case Description

<table>
<thead>
<tr>
<th>Load Case Name</th>
<th>Description</th>
<th>Stage</th>
<th>Type</th>
<th>Time (Days)</th>
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</thead>
<tbody>
<tr>
<td>Curb and Rail</td>
<td></td>
<td></td>
<td></td>
<td>D,DC</td>
</tr>
<tr>
<td>WS</td>
<td>Composite (long te...)</td>
<td>D,DW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility</td>
<td>Composite (long te...)</td>
<td>D,DC</td>
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<td></td>
</tr>
</tbody>
</table>

Superstructure Loads

DL Distribution

Stage 1 Dead Load Distribution: Tributary Area
Stage 2 Dead Load Distribution: Uniformly to All Girders

Stiffener Definitions

Transverse Stiffeners

Name: Trans. Stiffener
Stiffener number: Pair
Angle: L 4x3x0.3125
Short Leg Attachment: TRUE
Vertical Direction: Material: 1905 to 1936
Distance Top Flange: (in)
Distance Bottom Flange: (in)
Bolt:
Number Bolts:
Distance Top Bolt: (in)
Distance Bottom Bolt: (in)
No prestress stress limits.

No prestress properties.

No vertical shear reinforcement definitions.

No horizontal shear reinforcement definitions.

**Member G1**
Link with: None
Description:

Existing: Exterior Girder A&E -
Current: Exterior Girder A&E -
Number of Spans: 3

<table>
<thead>
<tr>
<th>Span Number</th>
<th>Span Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>85.000000</td>
</tr>
<tr>
<td>2</td>
<td>95.000000</td>
</tr>
<tr>
<td>3</td>
<td>85.000000</td>
</tr>
</tbody>
</table>

Support Frame Connection
1
2
3
4

Pedestrian load: (lb/ft)

**Member Loads**

<table>
<thead>
<tr>
<th>Distance (ft)</th>
<th>Length (ft)</th>
<th>Start (kip/ft)</th>
<th>End (kip/ft)</th>
<th>Load Case Name</th>
</tr>
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<tbody>
<tr>
<td>0.00</td>
<td>265.00</td>
<td>0.050</td>
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<td>Utility</td>
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</tbody>
</table>

**Member Loads - Settlement**

<table>
<thead>
<tr>
<th>Support Number</th>
<th>Horizontal (in)</th>
<th>Vertical (in)</th>
<th>Rotational (Radians)</th>
<th>Load Case Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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**Support Constraints**

**General**

<table>
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<th>Y Translation</th>
<th>Z Rotation</th>
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<tr>
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<td>Free</td>
<td>Fixed</td>
<td>Free</td>
</tr>
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<td>Roller</td>
<td>Free</td>
<td>Fixed</td>
<td>Free</td>
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<tr>
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<td>Fixed</td>
<td>Fixed</td>
<td>Free</td>
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<tr>
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<td>Free</td>
<td>Fixed</td>
<td>Free</td>
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**Elastic**

<table>
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<tr>
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<th>X Translation (kip/ft)</th>
<th>Y Translation (kip/ft)</th>
<th>Z Rotation (kip-in/rad)</th>
<th>Override Computed Z Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>2</td>
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</tr>
<tr>
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</tr>
<tr>
<td>4</td>
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<td></td>
</tr>
</tbody>
</table>

**Member Alternative**  
**Exterior Girder A&E**

**Description:**

**Material Type:** Steel  
**Girder Type:** Built-up  
**Member units:** US Customary  
**Girder property input method:** Cross-section based  
**Left end X:** (in)  
**Right end X:** (in)  
**Additional Self Load:** (kip/ft)  
**Additional Self Load %:** (%)  

**Analysis Module**

- **Analysis Method:** LFD  
- **Analysis Module:** AASHTO LFD  

**Analysis Module Component:**

**Properties:**

- **Analysis Method:** LRFD  
- **Analysis Module:** AASHTO LRFD  

**Analysis Module Component:**

**Properties:**

- **Analysis Method:** LRFR  
- **Analysis Module:** AASHTO LRFR  

**Analysis Module Component:**

**Properties:**

- **Analysis Method:** Distribution Factors
Analysis Module: BrR Dist Fact
Analysis Module Component:
Properties:

Default rating method: LFD

Factors
Factor Override
LRFD:  
LFD:  

ASD Factors

Structural steel
Concrete
PS Concrete Comp.
PS Concrete Tens.
PS Moment Cap.
Reinforcement
Bearing Stiffener
Stirrup
Timber  NA

Default Materials
Structural steel: 1905 to 1936
Deck concrete: Class A
Deck reinforcement:
Welds:
Bolts:

Impact
Standard Impact Factor
Type: Standard - AASHTO

LRFD Dynamic Load Allowance
Fatigue and fracture limit states: 15.0 (%)
All other limit states: 33.0 (%)

Live Load Distribution
Standard

<table>
<thead>
<tr>
<th></th>
<th>Distribution Factor (Wheels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes</td>
<td>Shear at Support</td>
</tr>
<tr>
<td>Loaded</td>
<td>Shear</td>
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<tr>
<td>1 Lane</td>
<td>1.277</td>
</tr>
<tr>
<td>Multi-Lane</td>
<td>1.277</td>
</tr>
</tbody>
</table>

Cross Sections

Name: No Cover Plts  Type: Builtup Section
Dimensions
Web: 54.0000 (in) x 0.3750 (in) 1905 to 1936
Top Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.4375 (in)
Vertical Leg Thickness: 0.4375 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bottom Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.4375 (in)
Vertical Leg Thickness: 0.4375 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bolts / Rivets
Hole Size: 0.8125 (in)
Top Number: 1.000
Bottom Number: 1.000

Slab
Actual/Tributary slab: (in) x (in)
Class A
Effective slab (Std): (in) x (in) Class A
Effective slab (LRFD): (in) x (in) Class A
Modular ratio of elasticity (n): 8.000

Haunch
Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: (in)
Haunch width: (in)

Name: Span 2 w/ 1 plt Type: Builtup Section
Dimensions
Web: 54.0000 (in) x 0.3750 (in) 1905 to 1936

Top Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.4375 (in)
Vertical Leg Thickness: 0.4375 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bottom Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.4375 (in)
Vertical Leg Thickness: 0.4375 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bolts / Rivets
Hole Size: 0.8125 (in)
Top Number: 1.000
Bottom Number: 1.000
### Cover Plates

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Slab

- **Actual/Tributary slab:** (in) x (in)
- **Class A Effective slab (Std):** (in) x (in) Class A
- **Effective slab (LRFD):** (in) x (in) Class A
- **Modular ratio of elasticity (n):** 8.000

### Haunch

- **Depth measured from Bottom of Deck to Top of Top Flange**
- **Haunch depth:** (in)
- **Haunch width:** (in)

### Name: At Pier w/ 1 Plt Dimensions

- **Web:** 54.0000 (in) x 0.3750 (in) 1905 to 1936

### Top Angles

- **Horizontal Leg Length:** 5.0000 (in)
- **Vertical Leg Length:** 5.0000 (in)
- **Horizontal Leg Thickness:** 0.4375 (in)
- **Vertical Leg Thickness:** 0.4375 (in)
- **Offset:** 0.2500 (in)
- **Material:** 1905 to 1936

### Bottom Angles

- **Horizontal Leg Length:** 5.0000 (in)
- **Vertical Leg Length:** 5.0000 (in)
- **Horizontal Leg Thickness:** 0.4375 (in)
- **Vertical Leg Thickness:** 0.4375 (in)
- **Offset:** 0.2500 (in)
- **Material:** 1905 to 1936

### Bolts / Rivets

- **Hole Size:** 0.8125 (in)
- **Top Number:** 1.000
- **Bottom Number:** 1.000

### Cover Plates

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>
### Bolt Information

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Width (in)</th>
<th>Side</th>
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</thead>
<tbody>
<tr>
<td>Top</td>
<td></td>
<td>12.0000</td>
<td>0.3750</td>
</tr>
<tr>
<td>Bottom</td>
<td></td>
<td>12.0000</td>
<td>0.3750</td>
</tr>
</tbody>
</table>

### Slab Information

**Actual/Tributary slab:**

- (in) x (in)

**Effective slab (Std):**

- (in) x (in)

**Effective slab (LRFD):**

- (in) x (in)

**Modular ratio of elasticity (n):** 8.000

### Haunch Information

**Haunch depth:**

- (in)

**Haunch width:**

- (in)

### Name: At Pier w/ 2 Plt

**Type:** Builtup Section

### Dimensions

**Web:** 54.0000 (in) x 0.3750 (in) 1905 to 1936

### Top Angles

- Horizontal Leg Length: 5.0000 (in)
- Vertical Leg Length: 5.0000 (in)
- Horizontal Leg Thickness: 0.4375 (in)
- Vertical Leg Thickness: 0.4375 (in)
- Offset: 0.2500 (in)
- Material: 1905 to 1936

### Bottom Angles

- Horizontal Leg Length: 5.0000 (in)
- Vertical Leg Length: 5.0000 (in)
- Horizontal Leg Thickness: 0.4375 (in)
- Vertical Leg Thickness: 0.4375 (in)
- Offset: 0.2500 (in)
- Material: 1905 to 1936

### Bolts / Rivets

- Hole Size: 0.8125 (in)
- Top Number: 1.000
- Bottom Number: 1.000

### Cover Plates

#### Connector Plates

<table>
<thead>
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<th>Type</th>
<th>Material</th>
<th>Width (in)</th>
<th>Side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holes</td>
<td></td>
<td>12.0000</td>
<td>0.3750</td>
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<tr>
<td>Weld</td>
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<td>12.0000</td>
<td>0.3750</td>
</tr>
</tbody>
</table>

### Summary

- **Name:** At Pier w/ 2 Plt
- **Type:** Builtup Section
- **Dimensions:** 54.0000 (in) x 0.3750 (in) 1905 to 1936
- **Top Angles:** 5.0000 (in) x 5.0000 (in) 0.4375 (in) x 0.4375 (in) 0.2500 (in)
- **Bottom Angles:** 5.0000 (in) x 5.0000 (in) 0.4375 (in) x 0.4375 (in) 0.2500 (in)
- **Bolts / Rivets:** 0.8125 (in) 1.000 1.000
- **Cover Plates:** 12.0000 (in) 0.3750 12.0000 (in) 0.3750 12.0000 (in) 0.3750.
Slab
Actual/Tributary slab: (in) x (in)
Class A
Effective slab (Std): (in) x (in) Class A
Effective slab (LRFD): (in) x (in) Class A
Modular ratio of elasticity (n): 8.000
Haunch
Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: (in)
Haunch width: (in)

Cross Section Ranges
Cross Sections
<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>Web</th>
<th>Distance</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Cover ...</td>
<td>No Cover ...</td>
<td>None</td>
<td>0.00</td>
<td>17.00</td>
</tr>
<tr>
<td>Span 2 w/...</td>
<td>Span 2 w/...</td>
<td>None</td>
<td>17.00</td>
<td>34.00</td>
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<td>No Cover ...</td>
<td>No Cover ...</td>
<td>None</td>
<td>51.00</td>
<td>24.50</td>
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<td>7.00</td>
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<td>92.00</td>
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<td>180.00</td>
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Bracing Ranges
Lateral Support
<table>
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<tr>
<td>(ft)</td>
<td>(ft)</td>
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<tr>
<td>0.00</td>
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Stiffener Ranges
Transverse Stiffener Ranges (Location)
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<thead>
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<th>Distance (ft)</th>
<th>Number</th>
<th>Spacing (in)</th>
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<tbody>
<tr>
<td>Trans. Stiffener</td>
<td>0.00</td>
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<td>60.0000</td>
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<tr>
<td>Trans. Stiffener</td>
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<td>18</td>
<td>50.0000</td>
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<tr>
<td>Trans. Stiffener</td>
<td>80.00</td>
<td>1</td>
<td>60.0000</td>
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<tr>
<td>Trans. Stiffener</td>
<td>85.00</td>
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<td>58.5000</td>
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<tr>
<td>Trans. Stiffener</td>
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<td>50.3750</td>
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<td>Trans. Stiffener</td>
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<td>56.0000</td>
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<tr>
<td>Member</td>
<td>G2</td>
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<tr>
<td>---------</td>
<td>---------------------------</td>
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<td>Link with:</td>
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<tr>
<td>Description:</td>
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<td>Existing:</td>
<td>Girder B, 2-4 -</td>
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<tr>
<td>Current:</td>
<td>Girder B, 2-4 -</td>
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### Member Loads - Settlement

<table>
<thead>
<tr>
<th>Support Number</th>
<th>Horizontal (in)</th>
<th>Vertical (in)</th>
<th>Rotational (Radians)</th>
<th>Load Case Name</th>
<th>Load Case Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<td></td>
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</tr>
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<td>4</td>
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### Support Constraints

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<th>Support</th>
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<tbody>
<tr>
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<td>Support</td>
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</tbody>
</table>

### Bearing Stiffener Locations

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<tr>
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<th>50.0000</th>
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<tbody>
<tr>
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<td>56.0000</td>
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<tr>
<td>Trans. Stiffener</td>
<td>166.33</td>
<td>1</td>
<td>55.1250</td>
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<tr>
<td>Trans. Stiffener</td>
<td>170.93</td>
<td>1</td>
<td>50.3750</td>
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<td>Trans. Stiffener</td>
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<td>58.5000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>180.00</td>
<td>1</td>
<td>60.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>185.00</td>
<td>18</td>
<td>50.0000</td>
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<td>Trans. Stiffener</td>
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### Member Loads

#### Distributed Loads

<table>
<thead>
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<th>265.00</th>
<th>Start (kip/ft)</th>
<th>End (kip/ft)</th>
<th>Load Case Name</th>
<th>Load Case Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.00</td>
<td>265.00</td>
<td>0.050</td>
<td>0.050</td>
<td>Curb and R...</td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>Type</td>
<td>X Translation</td>
<td>Y Translation</td>
<td>Z Rotation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------------</td>
<td>---------------</td>
<td>---------------</td>
<td>------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Roller</td>
<td>Free</td>
<td>Fixed</td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Roller</td>
<td>Free</td>
<td>Fixed</td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pinned</td>
<td>Fixed</td>
<td>Fixed</td>
<td>Free</td>
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</tr>
<tr>
<td>4</td>
<td>Roller</td>
<td>Free</td>
<td>Fixed</td>
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</tbody>
</table>

Elastic Support

<table>
<thead>
<tr>
<th>Number</th>
<th>X Translation</th>
<th>Y Translation</th>
<th>Z Rotation</th>
<th>Override Computed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(kip/ft)</td>
<td>(kip/ft)</td>
<td>(kip-in/rad)</td>
<td>Z Rotation</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Member Alternative**  Girder B, 2-4

**Description:**

**Material Type:** Steel

**Girder Type:** Built-up

**Member units:** US Customary

**Girder property input method:** Cross-section based

<table>
<thead>
<tr>
<th>Left end X:</th>
<th>Right end X:</th>
<th>Additional Self Load:</th>
<th>Additional Self Load %:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(in)</td>
<td>(in)</td>
<td>(kip/ft)</td>
<td>(%)</td>
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</tbody>
</table>

**Analysis Module**

**Analysis Method:** ASD

**Analysis Module:** AASHTO ASD

**Analysis Module Component:**

**Properties:**

**Analysis Method:** LFD

**Analysis Module:** AASHTO LFD

**Analysis Module Component:**

**Properties:**

**Analysis Method:** LRFD

**Analysis Module:** AASHTO LRFD

**Analysis Module Component:**

**Properties:**

**Analysis Method:** LRFR

**Analysis Module:** AASHTO LRFR

**Analysis Module Component:**

**Properties:**

**Analysis Method:** Distribution Factors

**Analysis Module:** BrR Dist Fact

**Analysis Module Component:**

**Properties:**
Default rating method: LFD

Factors
Factor Override
LRFD:   LFD:

ASD Factors

Structural steel   Concrete
PS Concrete Comp.  PS Concrete Tens.
PS Moment Cap.     Reinforcement
Bearing Stiffener  Stirrup

Timber   NA

Default Materials
Structural steel:  1905 to 1936
Deck concrete:    Class A
Deck reinforcement:
Welds:             
Bolts:             

Impact
Standard Impact Factor
Type: Standard - AASHTO

LRFD Dynamic Load Allowance
Fatigue and fracture limit states: 15.0 (%)  
All other limit states:  33.0 (%)  

Live Load Distribution
Standard

<table>
<thead>
<tr>
<th>Lanes</th>
<th>Shear at Supports</th>
<th>Moment</th>
<th>Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loaded</td>
<td>1.071</td>
<td>1.200</td>
<td>1.071</td>
</tr>
<tr>
<td>Multi-Lane</td>
<td>1.364</td>
<td>1.333</td>
<td>1.364</td>
</tr>
</tbody>
</table>

Cross Sections

Name: No Cover Plts  Type: Builtup Section
Dimensions
Web: 54.0000 (in) x 0.3750 (in)  1905 to 1936
Top Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length:   5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

**Bottom Angles**
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

**Bolts / Rivets**
Hole Size: 0.7500 (in)
Top Number: 1.000
Bottom Number: 1.000

**Slab**
Actual/Tributary slab: (in) x (in)
Class A
Effective slab (Std): (in) x (in) Class A
Effective slab (LRFD): (in) x (in) Class A
Modular ratio of elasticity (n): 8.000

**Haunch**
Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: (in)
Haunch width: (in)

**Name:** Span 2 w/ 1 Plt  **Type:** Builtup Section

**Dimensions**
Web: 54.0000 (in) x 0.3750 (in) 1905 to 1936

**Top Angles**
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

**Bottom Angles**
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

**Bolts / Rivets**
Hole Size: 0.7500 (in)
Top Number: 1.000
Bottom Number: 1.000

**Cover Plates**

| Connector | Plate Thickness | Material | Width Hole Num Side |
**Type**

<table>
<thead>
<tr>
<th>Holes</th>
<th>Weld</th>
<th>Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolts</td>
<td>1 (Top) 1905 to 1...</td>
<td>12.0000 0.5000</td>
</tr>
<tr>
<td></td>
<td>0.8125</td>
<td>1.000</td>
</tr>
<tr>
<td>Bolts</td>
<td>1 (Bottom) 1905 to 1...</td>
<td>12.0000 0.5000</td>
</tr>
<tr>
<td></td>
<td>0.8125</td>
<td>1.000</td>
</tr>
</tbody>
</table>

**Slab**

**Actual/Tributary slab:** (in) x (in)

**Class A**

**Effective slab (Std):** (in) x (in) Class A

**Effective slab (LRFD):** (in) x (in) Class A

**Modular ratio of elasticity (n):** 8.000

**Haunch**

**Depth measured from Bottom of Deck to Top of Top Flange**

**Haunch depth:** (in)

**Haunch width:** (in)

**Name:** At Pier w/ 1 plt  
**Type:** Builtup Section

**Dimensions**

**Web:** 54.0000 (in) x 0.3750 (in) 1905 to 1936

**Top Angles**

- **Horizontal Leg Length:** 5.0000 (in)
- **Vertical Leg Length:** 5.0000 (in)
- **Horizontal Leg Thickness:** 0.5000 (in)
- **Vertical Leg Thickness:** 0.5000 (in)
- **Offset:** 0.2500 (in)
- **Material:** 1905 to 1936

**Bottom Angles**

- **Horizontal Leg Length:** 5.0000 (in)
- **Vertical Leg Length:** 5.0000 (in)
- **Horizontal Leg Thickness:** 0.5000 (in)
- **Vertical Leg Thickness:** 0.5000 (in)
- **Offset:** 0.2500 (in)
- **Material:** 1905 to 1936

**Bolts / Rivets**

- **Hole Size:** 0.7500 (in)
- **Top Number:** 1.000
- **Bottom Number:** 1.000

**Cover Plates**

**Connector Plate Material**

<table>
<thead>
<tr>
<th>Width</th>
<th>Thickness</th>
<th>Hole</th>
<th>Num</th>
<th>Side</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Type**

<table>
<thead>
<tr>
<th>Holes</th>
<th>Weld</th>
<th>Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolts</td>
<td>1 (Top) 1905 to 1...</td>
<td>12.0000 0.4375</td>
</tr>
<tr>
<td></td>
<td>0.8125</td>
<td>1.000</td>
</tr>
<tr>
<td>Bolts</td>
<td>1 (Bottom) 1905 to 1...</td>
<td>12.0000 0.4375</td>
</tr>
<tr>
<td>Slab</td>
<td>Actual/Tributary slab:</td>
<td>0.8125 x 1.000</td>
</tr>
<tr>
<td>------</td>
<td>------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Class A</td>
<td>Effective slab (Std):</td>
<td>(in) x (in)</td>
</tr>
<tr>
<td>Class A</td>
<td>Effective slab (LRFD):</td>
<td>(in) x (in)</td>
</tr>
<tr>
<td>8.000</td>
<td>Modular ratio of elasticity (n):</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Haunch</th>
<th>Depth measured from Bottom of Deck to Top of Top Flange</th>
<th>(in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haunch depth:</td>
<td></td>
<td>(in)</td>
</tr>
<tr>
<td>Haunch width:</td>
<td></td>
<td>(in)</td>
</tr>
</tbody>
</table>

**Name:** At Pier w/ 2 plt  
**Type:** Builtup Section

### Dimensions

**Web:**  
54.0000 (in) x 0.3750 (in)  1905 to 1936

#### Top Angles

| Horizontal Leg Length: | 5.0000 (in) |
| Vertical Leg Length: | 5.0000 (in) |
| Horizontal Leg Thickness: | 0.5000 (in) |
| Vertical Leg Thickness: | 0.5000 (in) |
| Offset: | 0.2500 (in) |
| Material: | 1905 to 1936 |

#### Bottom Angles

| Horizontal Leg Length: | 5.0000 (in) |
| Vertical Leg Length: | 5.0000 (in) |
| Horizontal Leg Thickness: | 0.5000 (in) |
| Vertical Leg Thickness: | 0.5000 (in) |
| Offset: | 0.2500 (in) |
| Material: | 1905 to 1936 |

#### Bolts / Rivets

| Hole Size: | 0.7500 (in) |
| Top Number: | 1.000 |
| Bottom Number: | 1.000 |

#### Cover Plates

<table>
<thead>
<tr>
<th>Type</th>
<th>Plate Thickness End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holes</td>
<td>Material Width</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Holes</th>
<th>Weld</th>
<th>Weld Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolts</td>
<td>1 (Top)</td>
<td>1905 to 1...</td>
<td>12.0000</td>
</tr>
<tr>
<td></td>
<td>0.8125</td>
<td></td>
<td>1.000</td>
</tr>
<tr>
<td>Bolts</td>
<td>2 (Top)</td>
<td>1905 to 1...</td>
<td>12.0000</td>
</tr>
<tr>
<td></td>
<td>0.8125</td>
<td></td>
<td>1.000</td>
</tr>
<tr>
<td>Bolts</td>
<td>1 (Bottom)</td>
<td>1905 to 1...</td>
<td>12.0000</td>
</tr>
<tr>
<td></td>
<td>0.8125</td>
<td></td>
<td>1.000</td>
</tr>
<tr>
<td>Bolts</td>
<td>2 (Bottom)</td>
<td>1905 to 1...</td>
<td>12.0000</td>
</tr>
<tr>
<td></td>
<td>0.8125</td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

### Slab

| Actual/Tributary slab: | (in) x (in) |
Class A

Effective slab (Std): (in) x (in) Class A
Effective slab (LRFD): (in) x (in) Class A
Modular ratio of elasticity (n): 8.000

Haunch

Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: (in)
Haunch width: (in)

Name: Span 3 w/ 1Plt
Type: Builtup Section

Dimensions

Web: 54.0000 (in) x 0.3750 (in) 1905 to 1936

Top Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bottom Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bolts / Rivets
Hole Size: 0.7500 (in)
Top Number: 1.000
Bottom Number: 1.000

Cover Plates
Connector Plate Material Width Thickness Hole Num Side End

Type Holes Weld Weld Size

Bolts
Bolts 1 (Top) 1905 to 1... 12.0000 0.3125

Bolts 1 (Bottom) 1905 to 1... 12.0000 0.3125

Slab
Actual/Tributary slab: (in) x (in)

Class A
Effective slab (Std): (in) x (in) Class A
Effective slab (LRFD): (in) x (in) Class A
Modular ratio of elasticity (n): 8.000

Haunch

Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: (in)
**Haunch width:** (in)

### Cross Section Ranges

<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>Web</th>
<th>Distance</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Cover...</td>
<td>No Cover...</td>
<td>None</td>
<td>0.00</td>
<td>13.00</td>
</tr>
<tr>
<td>Span 2 w/...</td>
<td>Span 2 w/...</td>
<td>None</td>
<td>13.00</td>
<td>54.25</td>
</tr>
<tr>
<td>No Cover...</td>
<td>No Cover...</td>
<td>None</td>
<td>67.25</td>
<td>8.25</td>
</tr>
<tr>
<td>At Pier w...</td>
<td>At Pier w...</td>
<td>None</td>
<td>75.50</td>
<td>4.50</td>
</tr>
<tr>
<td>At Pier w...</td>
<td>At Pier w...</td>
<td>None</td>
<td>80.00</td>
<td>5.00</td>
</tr>
<tr>
<td>At Pier w...</td>
<td>At Pier w...</td>
<td>None</td>
<td>85.00</td>
<td>6.00</td>
</tr>
<tr>
<td>At Pier w...</td>
<td>At Pier w...</td>
<td>None</td>
<td>91.00</td>
<td>4.50</td>
</tr>
<tr>
<td>No Cover...</td>
<td>No Cover...</td>
<td>None</td>
<td>95.50</td>
<td>17.00</td>
</tr>
<tr>
<td>Span 3 w/...</td>
<td>Span 3 w/...</td>
<td>None</td>
<td>112.50</td>
<td>40.00</td>
</tr>
<tr>
<td>No Cover...</td>
<td>No Cover...</td>
<td>None</td>
<td>152.50</td>
<td>17.00</td>
</tr>
<tr>
<td>At Pier w...</td>
<td>At Pier w...</td>
<td>None</td>
<td>169.50</td>
<td>4.50</td>
</tr>
<tr>
<td>At Pier w...</td>
<td>At Pier w...</td>
<td>None</td>
<td>174.00</td>
<td>6.00</td>
</tr>
<tr>
<td>At Pier w...</td>
<td>At Pier w...</td>
<td>None</td>
<td>180.00</td>
<td>5.00</td>
</tr>
<tr>
<td>At Pier w...</td>
<td>At Pier w...</td>
<td>None</td>
<td>185.00</td>
<td>4.50</td>
</tr>
<tr>
<td>No Cover...</td>
<td>No Cover...</td>
<td>None</td>
<td>189.50</td>
<td>8.25</td>
</tr>
<tr>
<td>Span 2 w/...</td>
<td>Span 2 w/...</td>
<td>None</td>
<td>197.75</td>
<td>54.25</td>
</tr>
<tr>
<td>No Cover...</td>
<td>No Cover...</td>
<td>None</td>
<td>252.00</td>
<td>13.00</td>
</tr>
</tbody>
</table>

### Bracing Ranges

#### Lateral Support

<table>
<thead>
<tr>
<th>Distance</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ft)</td>
<td>(ft)</td>
</tr>
<tr>
<td>0.00</td>
<td>265.00</td>
</tr>
</tbody>
</table>

### Stiffener Ranges

#### Transverse Stiffener Ranges (Location)

<table>
<thead>
<tr>
<th>Name</th>
<th>Distance</th>
<th>Number</th>
<th>Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans. Stiffener</td>
<td>0.00</td>
<td>1</td>
<td>60.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>5.00</td>
<td>18</td>
<td>50.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>80.00</td>
<td>1</td>
<td>60.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>85.00</td>
<td>2</td>
<td>60.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>95.00</td>
<td>18</td>
<td>50.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>170.00</td>
<td>2</td>
<td>60.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>180.00</td>
<td>1</td>
<td>60.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>185.00</td>
<td>18</td>
<td>50.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>260.00</td>
<td>1</td>
<td>60.0000</td>
</tr>
</tbody>
</table>

### Bearing Stiffener Locations

**Member** G3

**Link with:** None

**Description:**
Existing: Girder C&D. 2-4 -
Current: Girder C&D. 2-4 -
Number of Spans: 3

Span | Span Length (ft)
--- | ---
1  | 85.000000
2  | 95.000000
3  | 85.000000

Support Frame Connection
1  
2  
3  
4  

Pedestrian load: (lb/ft)

Member Loads

Member Loads - Settlement
Support | Horizontal (in) | Vertical (in) | Rotational (Radians) | Load Case Name
--- | --- | --- | --- | ---
1  |  |  |  | 
2  |  |  |  | 
3  |  |  |  | 
4  |  |  |  | 

Support Constraints

General
Support | Support Type | X Translation | Y Translation | Z Rotation
--- | --- | --- | --- | ---
1  | Roller | Free | Fixed | Free
2  | Roller | Free | Fixed | Free
3  | Pinned | Fixed | Fixed | Free
4  | Roller | Free | Fixed | Free

Elastic
Support | X Translation (kip/ft) | Y Translation (kip/ft) | Z Rotation (kip-in/rad) | Override Computed Z Rotation
--- | --- | --- | --- | ---
1  |  |  |  |  
2  |  |  |  |  
3  |  |  |  |  
4  |  |  |  |  

Member Alternative Girder C&D. 2-4
Description: Girder C&D. 2-4
Material Type: Steel
Girder Type: Built-up
Member units: US Customary
Girder property input method: Cross-section based
Left end X: (in)
Right end X: (in)
Additional Self Load: (kip/ft)
Additional Self Load %: (%)

Analysis Module
Analysis Method: ASD
Analysis Module: AASHTO ASD
Analysis Module Component: Properties:

Analysis Method: LFD
Analysis Module: AASHTO LFD
Analysis Module Component: Properties:

Analysis Method: LRFD
Analysis Module: AASHTO LRFD
Analysis Module Component: Properties:

Analysis Method: LRFR
Analysis Module: AASHTO LRFR
Analysis Module Component: Properties:

Analysis Method: Distribution Factors
Analysis Module: BrR Dist Fact
Analysis Module Component: Properties:

Default rating method: LFD

Factors
Factor Override
LRFD:
LFD:
ASD Factors

Inventory Operating

Structural steel
Concrete
PS Concrete Comp.
PS Concrete Tens.
PS Moment Cap.
Reinforcement
Bearing Stiffener
Stirrup
Timber: NA
**Default Materials**
- **Structural steel:** 1905 to 1936
- **Deck concrete:** Class A
- **Deck reinforcement:**
- **Welds:**
- **Bolts:**

**Impact**

*Standard Impact Factor*
- **Type:** Standard - AASHTO

*LRFD Dynamic Load Allowance*
- Fatigue and fracture limit states: 15.0 (%)
- All other limit states: 33.0 (%)

**Live Load Distribution**

*Standard*

<table>
<thead>
<tr>
<th></th>
<th>Distribution Factor (Wheels)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lanes</strong></td>
<td><strong>Shear at</strong></td>
</tr>
<tr>
<td>Loaded 1 Lane</td>
<td>1.071 1.200 1.071 0.400</td>
</tr>
<tr>
<td>Multi-Lane</td>
<td>1.364 1.667 1.364 0.800</td>
</tr>
</tbody>
</table>

**Cross Sections**

*Name:* No Cover Plts
*Type:* Builtup Section

*Dimensions*
- **Web:** 54.0000 (in) x 0.3750 (in) 1905 to 1936

*Top Angles*
- **Horizontal Leg Length:** 5.0000 (in)
- **Vertical Leg Length:** 5.0000 (in)
- **Horizontal Leg Thickness:** 0.5000 (in)
- **Vertical Leg Thickness:** 0.5000 (in)
- **Offset:** 0.2500 (in)
- **Material:** 1905 to 1936

*Bottom Angles*
- **Horizontal Leg Length:** 5.0000 (in)
- **Vertical Leg Length:** 5.0000 (in)
- **Horizontal Leg Thickness:** 0.5000 (in)
- **Vertical Leg Thickness:** 0.5000 (in)
- **Offset:** 0.2500 (in)
- **Material:** 1905 to 1936

*Bolts / Rivets*
- **Hole Size:** 0.7500 (in)
- **Top Number:** 1.000
- **Bottom Number:** 1.000

*Slab*
- **Actual/Tributary slab:** (in) x (in) Class A
- **Effective slab (Std):** (in) x (in) Class A
Effective slab (LRFD): \( (\text{in}) \times (\text{in}) \) Class A
Modular ratio of elasticity (n): 8.000

Haunch
Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: \( (\text{in}) \)
Haunch width: \( (\text{in}) \)

Name: Span 2 w/ 1 Plt
Type: Builtup Section

Dimensions
Web: \( 54.0000 \text{ (in)} \times 0.3750 \text{ (in)} \) 1905 to 1936

Top Angles
Horizontal Leg Length: 5.0000 \( (\text{in}) \)
Vertical Leg Length: 5.0000 \( (\text{in}) \)
Horizontal Leg Thickness: 0.5000 \( (\text{in}) \)
Vertical Leg Thickness: 0.5000 \( (\text{in}) \)
Offset: 0.2500 \( (\text{in}) \)
Material: 1905 to 1936

Bottom Angles
Horizontal Leg Length: 5.0000 \( (\text{in}) \)
Vertical Leg Length: 5.0000 \( (\text{in}) \)
Horizontal Leg Thickness: 0.5000 \( (\text{in}) \)
Vertical Leg Thickness: 0.5000 \( (\text{in}) \)
Offset: 0.2500 \( (\text{in}) \)
Material: 1905 to 1936

Bolts / Rivets
Hole Size: 0.7500 \( (\text{in}) \)
Top Number: 1.000
Bottom Number: 1.000

Cover Plates
Connector Plate Material Width
Type Size Thickness Hole Num Side
Holes Weld Weld
Bolts 1 (Top) 1905 to 1... 12.0000 0.4375
0.8125 1.000
Bolts 1 (Bottom) 1905 to 1... 12.0000 0.4375
0.8125 1.000

Slab
Actual/Tributary slab: \( (\text{in}) \times (\text{in}) \)
Class A
Effective slab (Std): \( (\text{in}) \times (\text{in}) \) Class A
Effective slab (LRFD): \( (\text{in}) \times (\text{in}) \) Class A
Modular ratio of elasticity (n): 8.000

Haunch
Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: \( (\text{in}) \)
Haunch width: \( (\text{in}) \)
Name: At Pier w/ 1 plt
Type: Builtup Section

Dimensions
Web: 54.0000 (in) x 0.3750 (in) 1905 to 1936

Top Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bottom Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bolts / Rivets
Hole Size: 0.7500 (in)
Top Number: 1.000
Bottom Number: 1.000

Cover Plates
Connector Plate Material Width Thickness End
Holes Weld Weld Size
Bolts 1 (Top) 1905 to 1... 12.0000 0.4375
0.8125 1.000
Bolts 1 (Bottom) 1905 to 1... 12.0000 0.4375
0.8125 1.000

Slab
Actual/Tributary slab: (in) x (in)
Class A
Effective slab (Std): (in) x (in) Class A
Effective slab (LRFD): (in) x (in) Class A
Modular ratio of elasticity (n): 8.000

Haunch
Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: (in)
Haunch width: (in)

Name: At Pier w/ 2 plt
Type: Builtup Section

Dimensions
Web: 54.0000 (in) x 0.3750 (in) 1905 to 1936

Top Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bottom Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

Bolts / Rivets
Hole Size: 0.7500 (in)
Top Number: 1.000
Bottom Number: 1.000

Cover Plates
Connector Plate Material Width Thickness Hole Num Side
Type Size Holes Weld Weld Weld
End (in) (in) (in)
Bolts 1 (Top) 1905 to 1... 12.0000 0.4375 0.8125 1.000
Bolts 2 (Top) 1905 to 1... 12.0000 0.3750 0.8125 1.000
Bolts 1 (Bottom) 1905 to 1... 12.0000 0.4375 0.8125 1.000
Bolts 2 (Bottom) 1905 to 1... 12.0000 0.3750 0.8125 1.000

Slab
Actual/Tributary slab: (in) x (in)
Class A
Effective slab (Std): (in) x (in) Class A
Effective slab (LRFD): (in) x (in) Class A
Modular ratio of elasticity (n): 8.000

Haunch
Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: (in)
Haunch width: (in)

Name: Span 3 w/ 1Plt
Type: Builtup Section
Dimensions
Web: 54.0000 (in) x 0.3750 (in) 1905 to 1936

Top Angles
Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936
**Bottom Angles**

Horizontal Leg Length: 5.0000 (in)
Vertical Leg Length: 5.0000 (in)
Horizontal Leg Thickness: 0.5000 (in)
Vertical Leg Thickness: 0.5000 (in)
Offset: 0.2500 (in)
Material: 1905 to 1936

**Bolts / Rivets**

Hole Size: 0.7500 (in)
Top Number: 1.000
Bottom Number: 1.000

**Cover Plates**

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<thead>
<tr>
<th>Connector Plate</th>
<th>Material Width (in)</th>
<th>Thickness (in)</th>
<th>Hole (in)</th>
<th>Num</th>
<th>Side (in)</th>
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<tr>
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<td>Holes (Top)</td>
<td>Weld (in)</td>
<td>Weld (in)</td>
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<td></td>
<td>0.8125</td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>Bolts</td>
<td>1 (Bottom)</td>
<td>1905 to 1...</td>
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<td>0.3125</td>
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**Slab**

Actual/Tributary slab: (in) x (in)
Class A
Effective slab (Std): (in) x (in) Class A
Effective slab (LRFD): (in) x (in) Class A
Modular ratio of elasticity (n): 8.000

**Haunch**

Depth measured from Bottom of Deck to Top of Top Flange
Haunch depth: (in)
Haunch width: (in)

**Cross Section Ranges**

**Cross Sections**

<table>
<thead>
<tr>
<th>Start Section</th>
<th>End Section</th>
<th>Web Variation</th>
<th>Distance (ft)</th>
<th>Length (ft)</th>
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<td>None</td>
<td>0.00</td>
<td>13.00</td>
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<tr>
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<td>No Cover ...</td>
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<td>67.25</td>
<td>8.25</td>
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<td>75.50</td>
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<td>6.00</td>
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<td>At Pier w...</td>
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**Bracing Ranges**

**Lateral Support**

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<td>(ft)</td>
<td>(ft)</td>
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<tr>
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**Stiffener Ranges**

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<th>Number</th>
<th>Spacing</th>
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<td>1</td>
<td>60.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
<td>5.00</td>
<td>18</td>
<td>50.0000</td>
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<tr>
<td>Trans. Stiffener</td>
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</tr>
<tr>
<td>Trans. Stiffener</td>
<td>85.00</td>
<td>2</td>
<td>60.0000</td>
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<tr>
<td>Trans. Stiffener</td>
<td>95.00</td>
<td>18</td>
<td>50.0000</td>
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<tr>
<td>Trans. Stiffener</td>
<td>170.00</td>
<td>2</td>
<td>60.0000</td>
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<td>60.0000</td>
</tr>
<tr>
<td>Trans. Stiffener</td>
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<td>50.0000</td>
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<td>Trans. Stiffener</td>
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<td>60.0000</td>
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**Bearing Stiffener Locations**

**Member**  G4

**Link with:** G3

**Description:**

 Existing:
Current:
**Number of Spans:** 3

<table>
<thead>
<tr>
<th>Span Number</th>
<th>Span Length</th>
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<tbody>
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<td>1</td>
<td>85.000000</td>
</tr>
<tr>
<td>2</td>
<td>95.000000</td>
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<tr>
<td>3</td>
<td>85.000000</td>
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</table>

**Support Frame Connection**

1
2
3
4

**Pedestrian load:** (lb/ft)
**Member G5**

Link with: G1

Description:

Existing:

Current:

Number of Spans: 3

<table>
<thead>
<tr>
<th>Span Number</th>
<th>Span Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>85.000000</td>
</tr>
<tr>
<td>2</td>
<td>95.000000</td>
</tr>
<tr>
<td>3</td>
<td>85.000000</td>
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Support Frame Connection

<table>
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<th>Frame Connection</th>
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<tbody>
<tr>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
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Pedestrian load: (lb/ft)
## Rating Results Summary Report

**Name:** MESA-G.8-39.1  
**Struct-Def:** Spans 1 & 5  
**Bridge ID:** MESA-G.8-39.1  
**Member:** G1  
**NBI:** MESA-G.8-39.1  
**Member Alt:** Exterior Girder 1 & 5

<table>
<thead>
<tr>
<th>Live Load Type</th>
<th>Load Rating</th>
<th>Rating Factor</th>
<th>Location (ft)</th>
<th>Location Span-%</th>
<th>Limit State</th>
<th>Impact</th>
<th>Lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS 20-44 Lane LFD Inventory</td>
<td>30.34</td>
<td>0.843</td>
<td>30.00</td>
<td>1 - (50.0)</td>
<td>Design Flexure - Steel</td>
<td>As Requested</td>
<td>As Requested</td>
</tr>
<tr>
<td>HS 20-44</td>
<td>Lane LFD Operating</td>
<td>50.68</td>
<td>1.408</td>
<td>30.00</td>
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<td>0.588</td>
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<td>1 - (50.0)</td>
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<tr>
<td>HS 20-44 Axle Load LFD Operating</td>
<td>35.35</td>
<td>0.982</td>
<td>30.00</td>
<td>1 - (50.0)</td>
<td>Design Flexure - Steel</td>
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<tr>
<td>CO Type 3 Axle Load LFD Operating</td>
<td>31.40</td>
<td>1.163</td>
<td>30.00</td>
<td>1 - (50.0)</td>
<td>Design Flexure - Steel</td>
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<tr>
<td>CO Type 3-2 Axle Load LFD Operating</td>
<td>44.66</td>
<td>1.051</td>
<td>30.00</td>
<td>1 - (50.0)</td>
<td>Design Flexure - Steel</td>
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<td>1.133</td>
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<tr>
<td>EV 2 Axle Load LFD Operating</td>
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<td>1.151</td>
<td>30.00</td>
<td>1 - (50.0)</td>
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<td>EV 3 Axle Load LFD Operating</td>
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<td>0.749</td>
<td>30.00</td>
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<td>As Requested</td>
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<td>1.162</td>
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## Rating Results Summary Report

**Name:** MESA-G.8-39.1  
**Bridge ID:** MESA-G.8-39.1  
**Member:** G2  
**NBI:** MESA-G.8-39.1  
**Member Alt:** Interior Girder 1 & 5  

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<th>Rating Level</th>
<th>Load Rating (Ton)</th>
<th>Rating Factor</th>
<th>Location (ft)</th>
<th>Location Span-%</th>
<th>Limit State</th>
<th>Impact Type</th>
<th>Lane</th>
</tr>
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<tbody>
<tr>
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<td>LFD</td>
<td>Inventory</td>
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### Rating Results Summary Report

**Name:** MESA-G.8-39.1  
**Struct-Def:** Spans 2-4  
**Member:** G1

**Bridge ID:** MESA-G.8-39.1  
**Member Alt:** Exterior Girder A&E

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<th>Live Load Type</th>
<th>Rating Method</th>
<th>Rating Level</th>
<th>Load Rating (Ton)</th>
<th>Rating Factor</th>
<th>Location (ft)</th>
<th>Location Span-%</th>
<th>Limit State</th>
<th>Impact</th>
<th>Lane</th>
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<tr>
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 Inputs:

\[ S := 7.5 \text{ ft} \]  
Girder spacing

\[ \theta := 0 \text{ }^\circ \]  
Skew of reinforcement relative to girders

\[ A_s := 0.496 \cdot \text{in}^2 \]  
Area reinforcement per foot

\[ d_b := 0.625 \text{ in} \]  
Bar Diameter

\[ c := 1.5 \cdot \text{in} \]  
Reinforcement cover

\[ F_y := 33000 \text{ psi} \]  
Reinforcement yield stress

\[ F'_c := 2500 \text{ psi} \]  
Concrete compressive strength

\[ h := 8.25 \text{ in} \]  
Minimum Deck thickness

\[ t_{asphalt} := 3.5 \text{ in} \]  
Asphalt thickness

 Constants:

\[ \gamma_{\text{concrete}} := 150 \text{ pcf} \]  
Concrete unit weight

\[ \gamma_{\text{asphalt}} := 144 \text{ pcf} \]  
Asphalt unit weight

\[ w_{\text{tire}} := 20 \text{ in} \]  
Width of tire area

\[ l_{\text{tire}} := 20 \text{ in} \]  
Length of tire area

\[ C_f := 0.8 \]  
Continuity factor (AASHTO 3.24.3.1)

\[ P_{\text{tire}} := 16 \text{ kip} \]  
Load on tire footprint (HS-20)

\[ IM := 1.3 \]  
Impact factor
Dead Load:
Per foot

\[ w_{DL} = 12 \text{ in} \cdot h \cdot \gamma_{\text{concrete}} + 12 \text{ in} \cdot t_{\text{asphalt}} \cdot \gamma_{\text{asphalt}} = 0.14513 \text{ klf} \]

\[ M_{DL} = \frac{w_{DL} \cdot S^2}{8} \cdot C_f = 0.816 \text{kip ft} \]

Capacity:
\[ d := h - c - \frac{d_b}{2} = 6.438 \text{ in} \]
\[ a := \frac{A_s \cdot F_y}{0.85 \cdot F'c \cdot d} = 1.197 \text{ in} \]
\[ M_n := 0.9 \cdot F_y \cdot A_s \left( d - \frac{a}{2} \right) = 7.168 \text{ kip ft} \]

HS20 Rating:
\[ P := 16 \text{ kip} \]
\[ M_{LL} := \frac{S + 2 \text{ ft}}{32} \cdot P \cdot C_f \cdot IM = 4.94 \text{ kip ft} \quad \text{(Eq. 3-15)} \]

\[ INV_{HS20} := \frac{M_n - 1.3 \cdot M_{DL}}{2.17 \cdot M_{LL}} \cdot 36 \text{ ton} \]
\[ INV_{HS20} = 20.51 \text{ ton} \]

\[ OPR_{HS20} := \frac{M_n - 1.3 \cdot M_{DL}}{1.3 \cdot M_{LL}} \cdot 36 \text{ ton} \]
\[ OPR_{HS20} = 34.23 \text{ ton} \]

Colorado Type Vehicles:
\[ P := 10.0 \text{ kip} \]
\[ M_{LL} := \frac{S + 2 \text{ ft}}{32} \cdot P \cdot C_f \cdot IM = 3.088 \text{ kip ft} \quad \text{(Eq. 3-15)} \]

\[ Type3 := \frac{M_n - 1.3 \cdot M_{DL}}{1.3 \cdot M_{LL}} \cdot 27 \text{ ton} \]
\[ Type3 = 41.08 \text{ ton} \]

\[ Type3S2 := \frac{M_n - 1.3 \cdot M_{DL}}{1.3 \cdot M_{LL}} \cdot 42.5 \text{ ton} \]
\[ Type3S2 = 64.66 \text{ ton} \]

\[ Type3_2 := \frac{M_n - 1.3 \cdot M_{DL}}{1.3 \cdot M_{LL}} \cdot 42.5 \text{ ton} \]
\[ Type3_2 = 64.66 \text{ ton} \]
Notional Rating Load:

\[ P := 8.5 \text{ kip} \]

\[
M_{LL} = \frac{S + 2 \text{ ft}}{32} \cdot P \cdot C_f \cdot IM = 2.624 \text{ kip} \cdot \text{ft} \quad \text{(Eq. 3-15)}
\]

\[
NRL = \frac{M_n - 1.3 \cdot M_{DL}}{1.3 \cdot M_{LL}} \cdot 40 \text{ ton} \quad \text{NRL = 71.6 ton}
\]

EV2:

\[ P := 16.75 \text{ kip} \]

\[
M_{LL} = \frac{S + 2 \text{ ft}}{32} \cdot P \cdot C_f \cdot IM = 5.172 \text{ kip} \cdot \text{ft} \quad \text{(Eq. 3-15)}
\]

\[
EV2 = \frac{M_n - 1.3 \cdot M_{DL}}{1.3 \cdot M_{LL}} \cdot 27.5 \text{ ton} = 24.98 \text{ ton}
\]

EV3:

\[ P := 15.5 \text{ kip} \]

\[
M_{LL} = \frac{S + 2 \text{ ft}}{32} \cdot P \cdot C_f \cdot IM = 4.786 \text{ kip} \cdot \text{ft} \quad \text{(Eq. 3-15)}
\]

\[
EV3 = \frac{M_n - 1.3 \cdot M_{DL}}{1.3 \cdot M_{LL}} \cdot 43.0 \text{ ton} = 42.21 \text{ ton}
\]
Structure No. **MESA-G.8-39.1**

Date: **2/5/18**

**View of Bridge Side Elevation Looking Upstream**

**View Down Centerline Bridge Roadway Looking Upstation (North)**
Typical Deterioration of Asphaltic Overlay at Expansion Joints - Joint over Abutment 6 Shown

Typical Cracking in Asphaltic Overlay
Typical Transverse Crack in Asphalitic Overlay over Pier

Typical Spalling and Scaling along Curbs
Typical Spall with Exposed Reinforcing in Doghouse Style Bridge Railing

Typical Delamination and Spall near Pier Cap
Typical Vertical Crack in Pier Wall

Vertical Crack in Pier 5
Typical Rust at Ends of Girders

Typical Isolated Area of Map Cracking with Efflorescence in Deck Soffit
Delamination and Deterioration of Abutment Seat 6 under Girders A and B

Trees Growing under Structure under Span 1
General View of Underside of Bridge Approach Spans Looking Upstation (North)

General View of Underside of Bridge Main Spans Looking Upstation (North)