**FORM RC-CL**  
**Revised Jan. 2012**

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### MnDOT BRIDGE RATING AND LOAD POSTING REPORT  
FOR COUNTY AND LOCAL AGENCIES

### Bridge Location and Description
- **Hwy. No.** Fremont Ave  
- **Under** Midtown Greenway
- **Year Built** 1913  
- **Year Remodeled**  
- **Replaces Br.**  
- **Type** 206 - CConc Deck Girder  
- **County** Hennepin  
- **Ref. Pt.**  
- **Description** Bridge L8901 is a 3 span continuous concrete deck girder. It has a 30'-0" roadway width, 48'-0" deck width. The bridge has 2 8'-0" sidewalks and 2 concrete barriers with metal railing, 6" asphalt wearing course. No skew.
- **Location** Minneapolis

### Data for Basis of Report (Check all that apply)
- Bridge Inventory File  
- Previous Bridge Rating and Load Posting Report  
- Bridge Plans
  - New
  - Overlay
  - Repair/Reconstruction
  - Beam sheets missing. Bridge similar to L8916.
  - Other Dead Load Modifications
- Bridge Inspected by JRM and JGB
- Date 3/15/2012
- Damaged Component  
- Deteriorated Component

### NBI Condition Ratings
- **Deck** 3
- **Superstructure** 2
- **Substructure** 3
- **ADTT** 44

### Method of Rating (Check appropriate box)
- Load Factor (LF)  
- Assigned Load Ratings  
- Design Load Unknown
- Allowable Stress (AS)
- Load & Resistance Factor (LRFR)
- Design Method ASD
- Load Testing  
- No Rating Computations performed

### Summary of Rating and Load Posting Analysis

<table>
<thead>
<tr>
<th>Load Posting</th>
<th>Required</th>
<th>Not Required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sign</strong></td>
<td><strong>TONS</strong></td>
<td></td>
</tr>
<tr>
<td>R12-1A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R12-5a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R12-5</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>M3</td>
<td>M3S2</td>
<td>M3-3</td>
</tr>
<tr>
<td>R12-X11</td>
<td>45</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Bridge Rating</th>
<th>Inventory</th>
<th>Operating</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS 4.6</td>
<td>HS 7.8</td>
<td></td>
</tr>
</tbody>
</table>

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I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

**Signature:**  
**Typed or Printed** Name: Joseph R. Mueller  
**License No.:** 49106

**Employed by:** TKDA

My signature below indicates that I have read and fully agreed with the load rating report.

**Program Administrator's Signature:**

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*Note:* The signature at the bottom left appears to be missing or unclear. The date is marked as 2/5/2013.
Bridge Type: 206
Rating Method: LFR
Roadway Width: 30'-0"
- Curved
- Tapered
Beam Spacing: 5'-0"
- Live Load Distribution Factor
  - Single: 0.769
  - Multiple: 0.833
- Finite/Grid Element Analysis

Bridge No.: L8901
Design Load: Unknown
Inventory Rating: 4.6
Operating Rating: 7.8
Rated: JRM
Checked: MJD
Date: 1/22/2013
Sheet: 2 of 2

3-SPAN CONTINUOUS REINFORCED CONCRETE DECK GIRDER

BEAM ELEVATION

Show span lengths, structure/beam depths.

<table>
<thead>
<tr>
<th>Truck</th>
<th>Rating Factor</th>
<th>Span/Pier</th>
<th>Location</th>
<th>Limit State 1</th>
<th>Notes/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS 20 Inventory</td>
<td>0.23</td>
<td>Sp. 3</td>
<td>0.6L</td>
<td>Ultimate Moment</td>
<td>Beam &quot;G8&quot; - Truck</td>
</tr>
<tr>
<td>HS 20 Operating</td>
<td>0.39</td>
<td>Sp. 3</td>
<td>0.6L</td>
<td>Ultimate Moment</td>
<td>Beam &quot;G8&quot; - Truck</td>
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<tr>
<td>Post, M3</td>
<td>0.46</td>
<td>Sp. 1</td>
<td>0.4L</td>
<td>Ultimate Moment</td>
<td>Beam &quot;G8&quot;</td>
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<tr>
<td>Post, M3S2</td>
<td>0.49</td>
<td>Sp. 1</td>
<td>0.4L</td>
<td>Ultimate Moment</td>
<td>Beam &quot;G8&quot;</td>
</tr>
<tr>
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<td>Beam &quot;G8&quot;</td>
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<td>Beam &quot;G8&quot;</td>
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<tr>
<td>Type SU5</td>
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<td>Sp. 1</td>
<td>0.4L</td>
<td>Ultimate Moment</td>
<td>Beam &quot;G8&quot;</td>
</tr>
<tr>
<td>Type SU6</td>
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<td>Sp. 1</td>
<td>0.4L</td>
<td>Ultimate Moment</td>
<td>Beam &quot;G8&quot;</td>
</tr>
<tr>
<td>Type SU7</td>
<td>0.34</td>
<td>Sp. 1</td>
<td>0.4L</td>
<td>Ultimate Moment</td>
<td>Beam &quot;G8&quot;</td>
</tr>
</tbody>
</table>

1  Choose from: service or ultimate; shear or moment
2  Elevation may be on back or another sheet if it won’t fit here.
Rating Loads

Bridge L8901 consists of 7 roadway girders and two sidewalk girders. The sidewalk beam supports a 6.5" sidewalk with only one layer of reinforcement. Due to the mild reinforcement and less structural deck thickness it is assumed that the sidewalk cannot support truck traffic and will not be rated. The dead load on the first interior beam from the sidewalk will be applied as a member load. The barrier loads will be equally distributed to all beams and applied as a member load.

Bridge Geometry:

Span length: \( L := 31.5\text{ft} \)

Sidewalk width: \( W_{sw} := 8.00\text{ft} \)

Average sidewalk thickness: \( t_s := 6.5\text{in} \)

Number of beams: \( N_b := 9 \)

Deck thickness: \( t_d := 7.0\text{in} \)

Barrier Geometry and Loading:

Area of post: \( A_1 := 8.5\text{in} \cdot 1.0\text{ft} \)

\( A_2 := 1.5625\text{ft} \cdot 6\text{in} \)

\( A_3 := 6.75\text{in} \cdot 1.0\text{ft} \)

\( A_4 := 4.5\text{in} \cdot 6\text{in} \)

Weight of barrier: \( w_{barr} := \gamma \left( A_1 + A_2 + A_3 + A_4 \right) + 11 \frac{\text{lb}}{\text{ft}} \)

\( w_{barr} = 0.347 \frac{\text{kip}}{\text{ft}} \)

Load per beam:

\( \text{Load} := \frac{2 \cdot w_{barr}}{N_b} \)

\( \text{Load} = 0.08 \frac{\text{kip}}{\text{ft}} \)

Asphalt Overlay:

Load on "G9": \( L_{G9} := 0.5\text{ft} \cdot \gamma_a \left[ \frac{5.42\text{ft} - \frac{10\text{in}}{2}}{2} \right] \)

\( L_{G9} = 0.18 \frac{\text{kip}}{\text{ft}} \)

Load on "G8": \( L_{G8} := 0.5\text{ft} \cdot \gamma_a \left( \frac{5.5\text{ft}}{2} + \frac{5.0\text{ft}}{2} \right) \)

\( L_{G8} = 0.38 \frac{\text{kip}}{\text{ft}} \)

Load on "G7": \( L_{G7} := 0.5\text{ft} \cdot \gamma_a \left( \frac{5.0\text{ft}}{2} + \frac{5.0\text{ft}}{2} \right) \)

\( L_{G7} = 0.36 \frac{\text{kip}}{\text{ft}} \)
Sidewalk concrete applied to "G9" only:

Area of concrete on "G9": \( A_{G9} := \left( \frac{8.0 \text{ft}}{2} \right)^2 = 2.17 \text{ft}^2 \)

Load on "G9": \( L_{G9} := A_{G9} \gamma \)  
\[ L_{G9} = 0.33 \frac{\text{kip}}{\text{ft}} \]

**Live Load Distribution Factors:**

Because it is assumed that no vehicles can traverse the sidewalk the first interior beam distribution factors will be calculated using the lever rule. Below is verification of the LFD distribution factors that VIRTIS will compute.

**LFD Distribution Factors (3.23.1)**

**Beam "G9" (Lever Rule)**

One Lane Loaded or Multiple Lanes Loaded:

\[ D_{F1} := \left( \frac{5.42 \text{ft} - \frac{10 \text{in}}{2} - 2.0 \text{ft}}{5.42 \text{ft}} \right) \]
\[ D_{F1} = 0.554 \]

**Beam "G8"**

One Lane Loaded:

\[ D_{F1} := \left( \frac{5.5 \text{ft} + 5.0 \text{ft}}{2} \right) \]
\[ D_{F1} = 0.808 \]

Multiple Lanes Loaded:

\[ D_{Fm} := \left( \frac{5.5 \text{ft} + 5.0 \text{ft}}{2} \right) \]
\[ D_{Fm} = 0.875 \]

**Beam "G7"**

One Lane Loaded:

\[ D_{F1} := \left( \frac{5.0 \text{ft} + 5.0 \text{ft}}{2} \right) \]
\[ D_{F1} = 0.769 \]

Multiple Lanes Loaded:

\[ D_{Fm} := \left( \frac{5.0 \text{ft} + 5.0 \text{ft}}{2} \right) \]
\[ D_{Fm} = 0.833 \]
LFD Effective Flange Width (AASHTO LFD 8.10.1.1 and 8.10.1.2):

The LRFD effective flange width can be taken as the tributary width per AASHTO LRFD 4.6.2.6.1.

Effective Flange width for Beam "G9" (neglecting any contribution from adjacent sidewalk):

\[ b_1 := \frac{1}{12} \cdot L \]
\[ b_2 := 6 \cdot t_d + 10 \text{in} \]
\[ b_3 := 0.5 \cdot (5.42 \text{ft}) \]

\[ b_{\text{fes}} := \min(b_1, b_2, b_3) \]

\[ b_{\text{fes}} = 31.5\text{-in} \]

Effective Flange width for Beam "G8":

\[ b_1 := \frac{1}{4} \cdot L \]
\[ b_2 := 12 \cdot t_d + 13 \text{in} \]
\[ b_3 := 0.5 \cdot 5.5 \text{ft} + 0.5 \cdot 5.0 \text{ft} \]

\[ b_{\text{fes}} := \min(b_1, b_2, b_3) \]

\[ b_{\text{fes}} = 63\text{-in} \]

Effective Flange width for Beam "G7":

\[ b_1 := \frac{1}{4} \cdot L \]
\[ b_2 := 12 \cdot t_d + 13 \text{in} \]
\[ b_3 := 0.5 \cdot 5.0 \text{ft} + 0.5 \cdot 5.0 \text{ft} \]

\[ b_{\text{fes}} := \min(b_1, b_2, b_3) \]

\[ b_{\text{fes}} = 60\text{-in} \]