STEEL BRIDGE COMPETITION DESIGN & BUSINESS PLANNING

IPRO 326 MIDTERM PRESENTATION
Project Plan

- Two teams simultaneously developing project plans
- Combination of team project plans
- Group division into two design teams, and one business development team

Steel Bridge Competition Design and Business Planning

Adviser: Chad Fischer
Work Timeline

- **Business Development**
  - Letters out to corporations asking for donations
  - IIT involvement
    - Marketing to student body, staff, and faculty
  - Purchase of materials

- **Design**
  - Team design development
    - Connections
    - Materials
  - Combination into one idea
  - Design testing
    - Computer-based testing and scaled model testing
  - Production of final drawings
Public Marketing and Promotion

- Donations from local companies
  - Letters, brochures, and personal meetings

- IIT Involvement
  - T-shirt design competition
  - Student organizations such as the IIT chapter of ASCE

- Website
  - Progression articles
  - Pictures of progress
  - List of previous accomplishments
Design Team 1 Moment Diagram

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>M1</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5'</td>
<td>11'</td>
<td>7500ft-lb</td>
<td>9000ft-lb</td>
</tr>
<tr>
<td>5'</td>
<td>13.5'</td>
<td>6875ft-lb</td>
<td>7515ft-lb</td>
</tr>
<tr>
<td>8'</td>
<td>11'</td>
<td>10500ft-lb</td>
<td>10688ft-lb</td>
</tr>
<tr>
<td>8'</td>
<td>13.5'</td>
<td>9250ft-lb</td>
<td>8734ft-lb</td>
</tr>
</tbody>
</table>
Design Team 1 Moment Diagram

M

5250 ft-lb

8'0"

11'0"

20'0"

5344 ft-lb

P

P2

MOMENT DIAGRAM
NOT TO SCALE
Design Team 1 Elevation

ELEVATION
NOT TO SCALE
Design Team 1 Connections

PERSPECTIVE

SECTION
Design Team 2 Elevation

- Calculated depth of bridge approximately 2.5’
- Span of bridge is 19’ with the piers making up the other foot.
Design Team 2 Connections

- Pins at the web connections are not load bearing
- Top and bottom member connections are a simple male to female connection
- Each connection is set with a single bolt because of regulations
Simple Span Analysis

This scenario of loading is closest to the piers that is allowed

\[ M_{\text{max}} = 3331 \text{ ft-lbs} \]
Design Team 2 Pros & Cons

 Pros:
   Each member on the top and bottom will be one piece; making for easy assembly
   Connections have high-quality strength and are designed for easy assembly
   Bolts do not bear any loading

 Cons:
   The predicted weight is rather large
   Connections for web members may be hard to fabricate