

# STEEL BRIDGE COMPETITION DESIGN & BUSINESS PLANNING

I PRO 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

I PRO 326 Project Plan

Fall 2008

## **Steel Bridge Competition Design and Business Planning**

Advisor: Chad Fischer

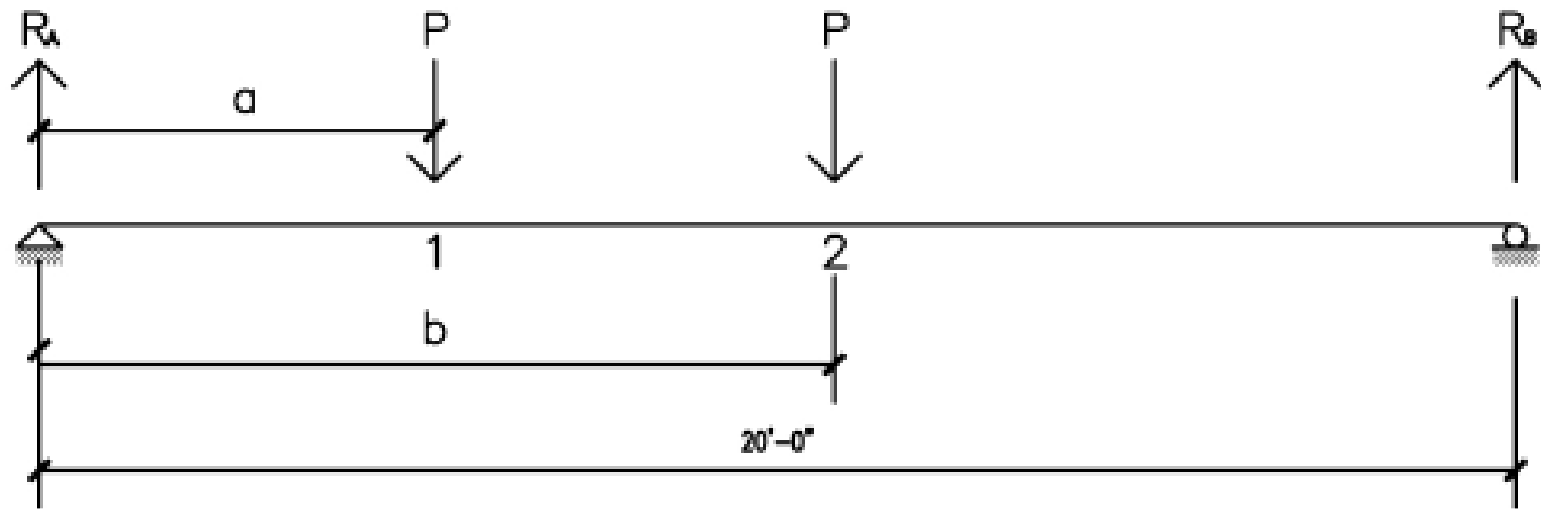
# Work Timeline

- 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

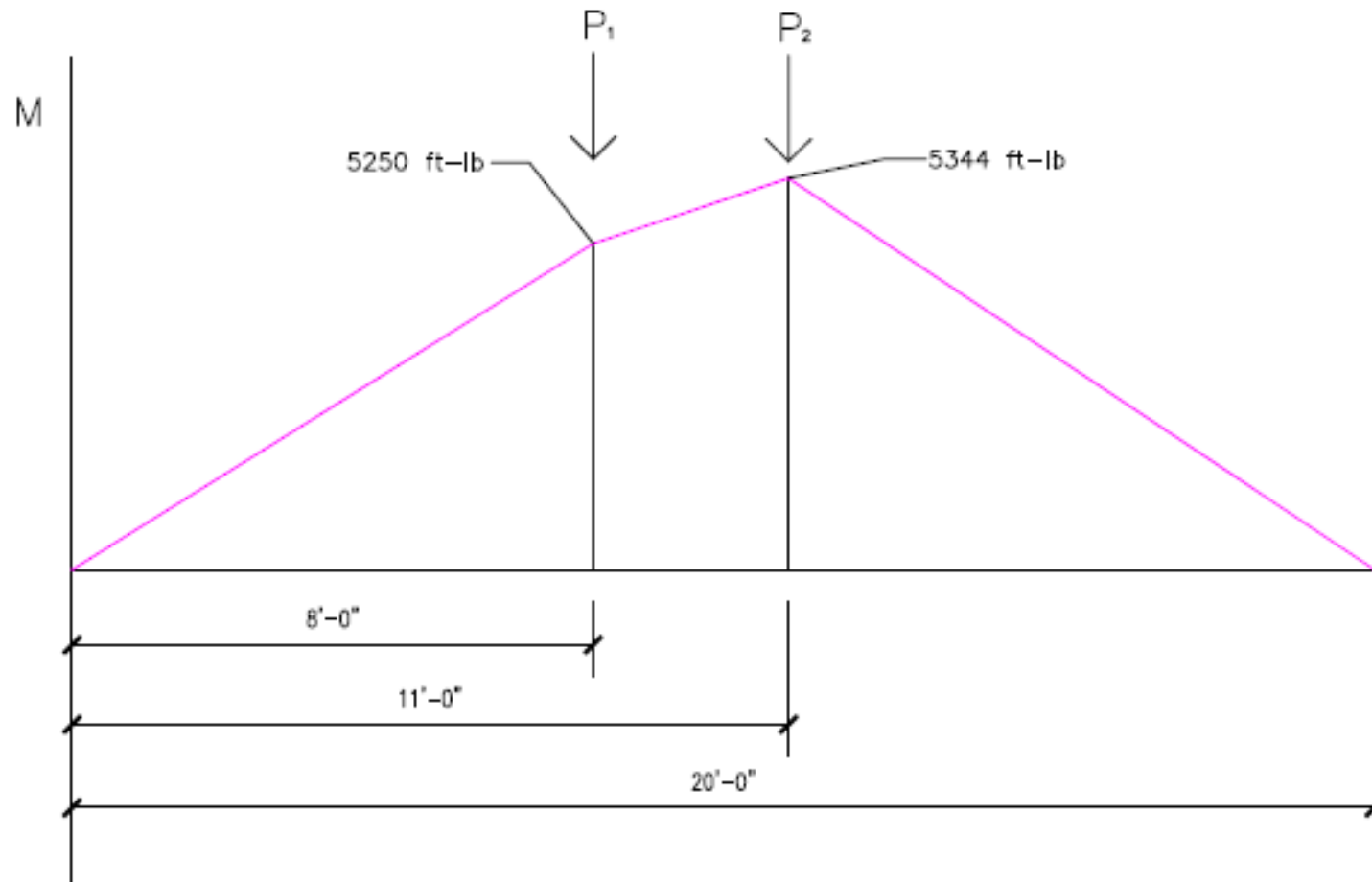
- Donations from local companies
  - Letters, brochures, and personal meetings
- IIT Involvement
  - T-shirt design competition
  - Student organizations such as the IIT chapter of ASCE
- Website
  - Progression articles
  - Pictures of progress
  - List of previous accomplishments

# Design Team 1 Moment Diagram



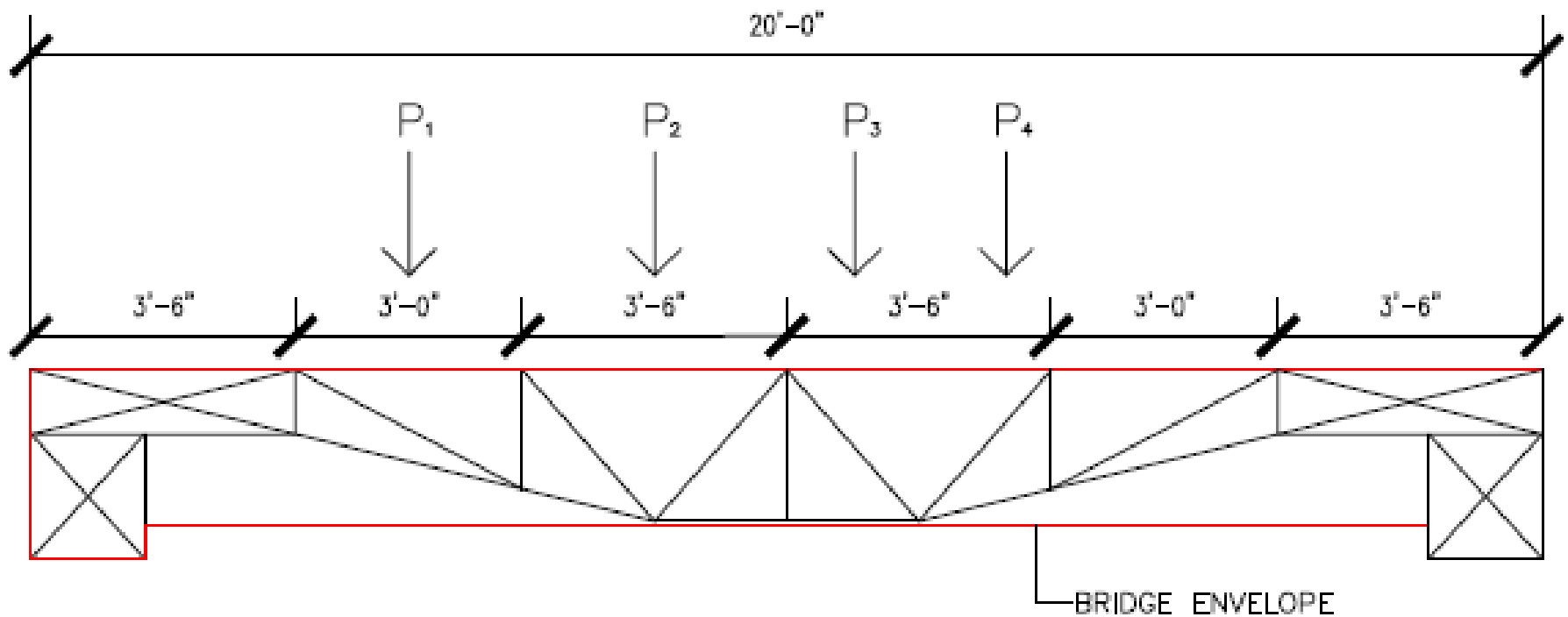
a	b	M1	M2
5'	11'	7500ft-lb	9000ft-lb
5'	13.5'	6875ft-lb	7515ft-lb
8'	11'	10500ft-lb	10688ft-lb
8'	13.5'	9250ft-lb	8734ft-lb

# Design Team 1 Moment Diagram



MOMENT DIAGRAM  
NOT TO SCALE

# Design Team 1 Elevation



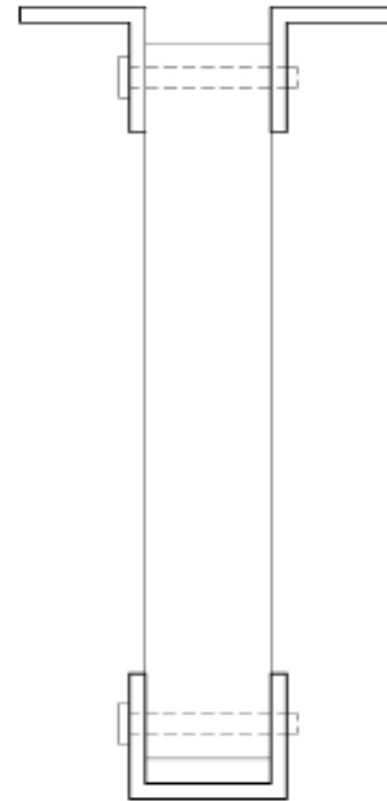
ELEVATION

NOT TO SCALE

# Design Team 1 Connections



PERSPECTIVE

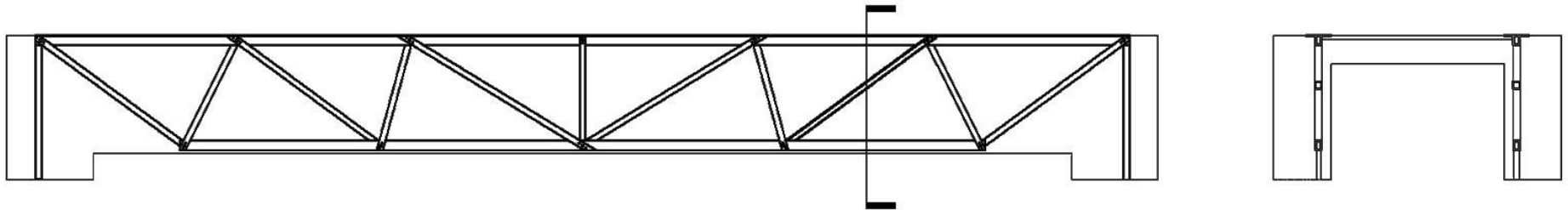


SECTION



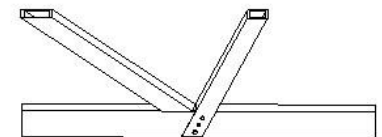
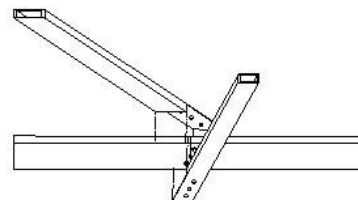
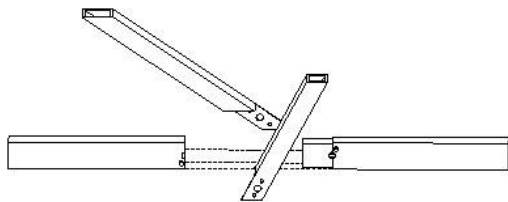
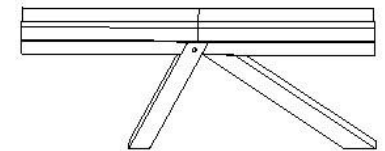
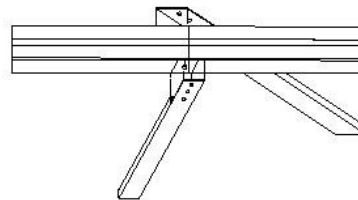
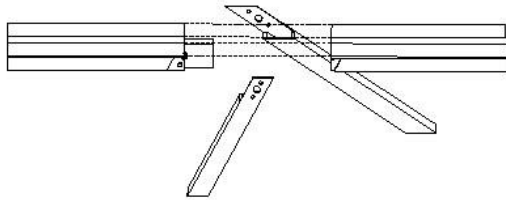
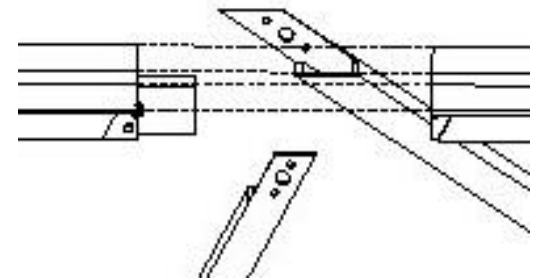
# Design Team 2 Elevation

- Calculated depth of bridge approximately 2.5'
- Span of bridge is 19' with the piers making up the other foot.



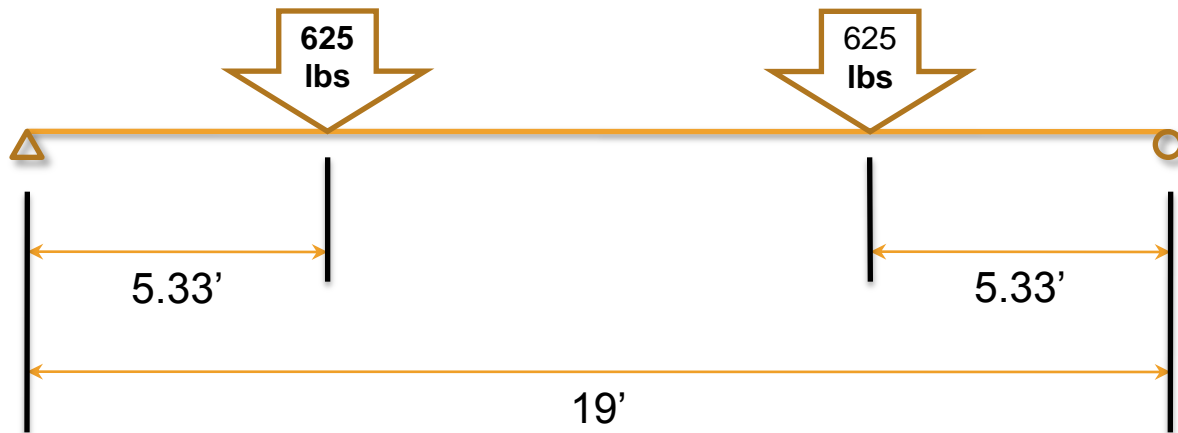
# Design Team 2 Connections

- 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



# Design Team 2 Moment Diagram

- Simple Span Analysis
  - ▣ This scenario of loading is closest to the piers that is allowed



Loading

$$M_{\max} = 3331 \text{ ft-lbs}$$



Bending Moment Diagram

# 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