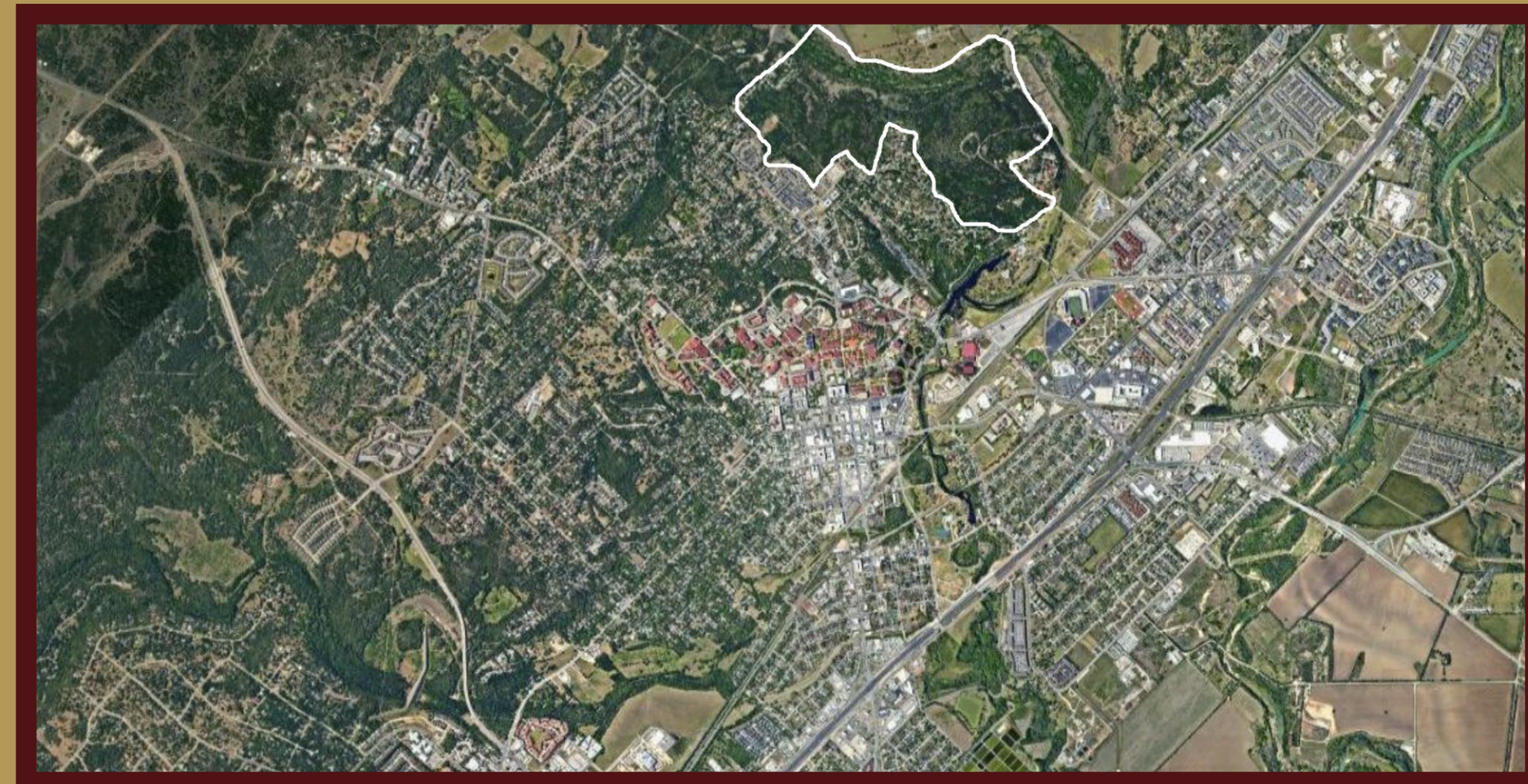


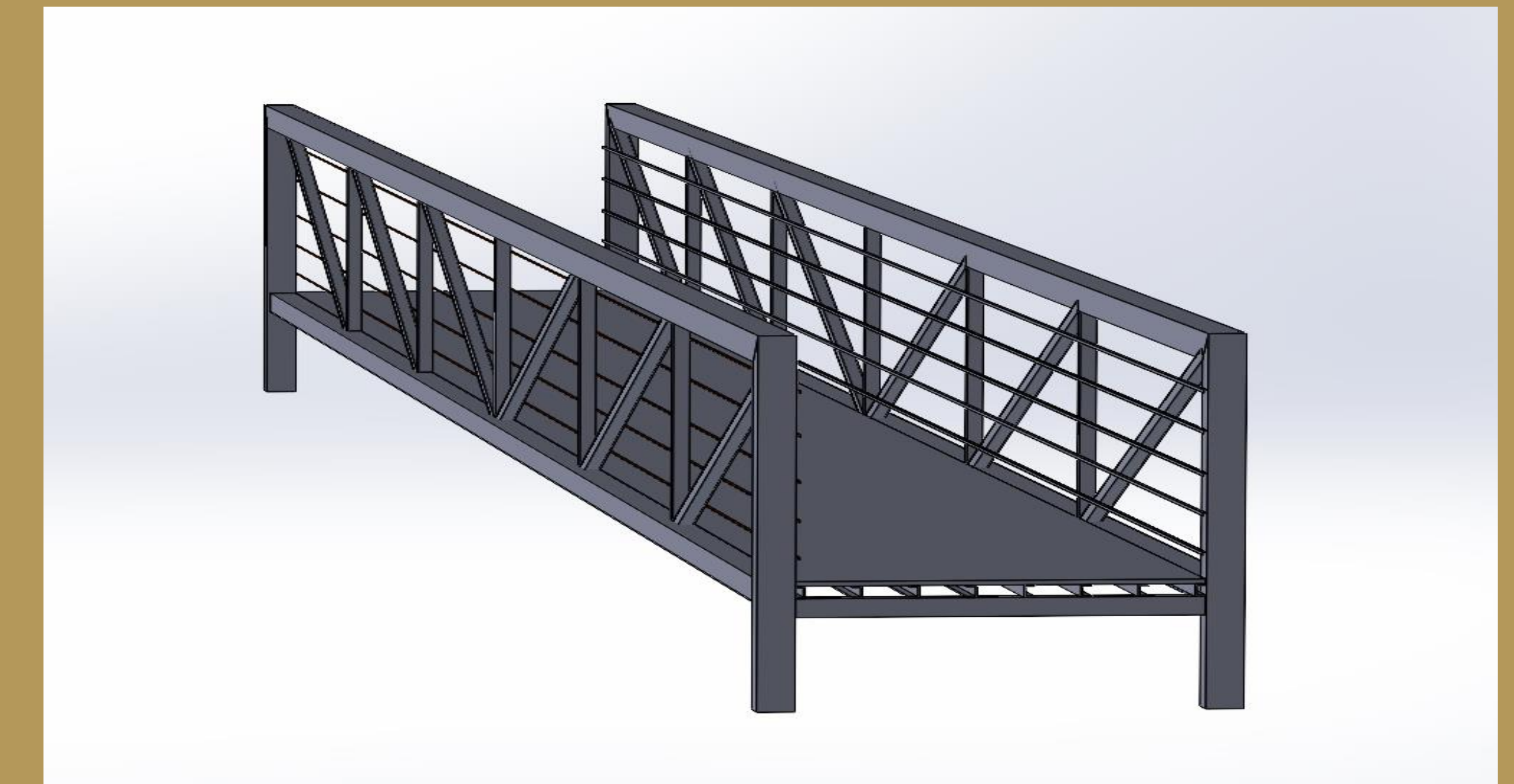
Project Introduction



Bobcat Bridge Builders (BBB) is designing a pre-fabricated trail bridge for the San Marcos Greenbelt Alliance (SMGA). The bridge is set to be placed in the Spring Lake Natural Area. BBB recommends Bridge Brothers design and prefabricate the 50ft trail bridge for SMGA. BBB's complete design consisted of a steel, foundation, and constructability analysis.

Spring Lake Bridge Design Criteria and Standards:

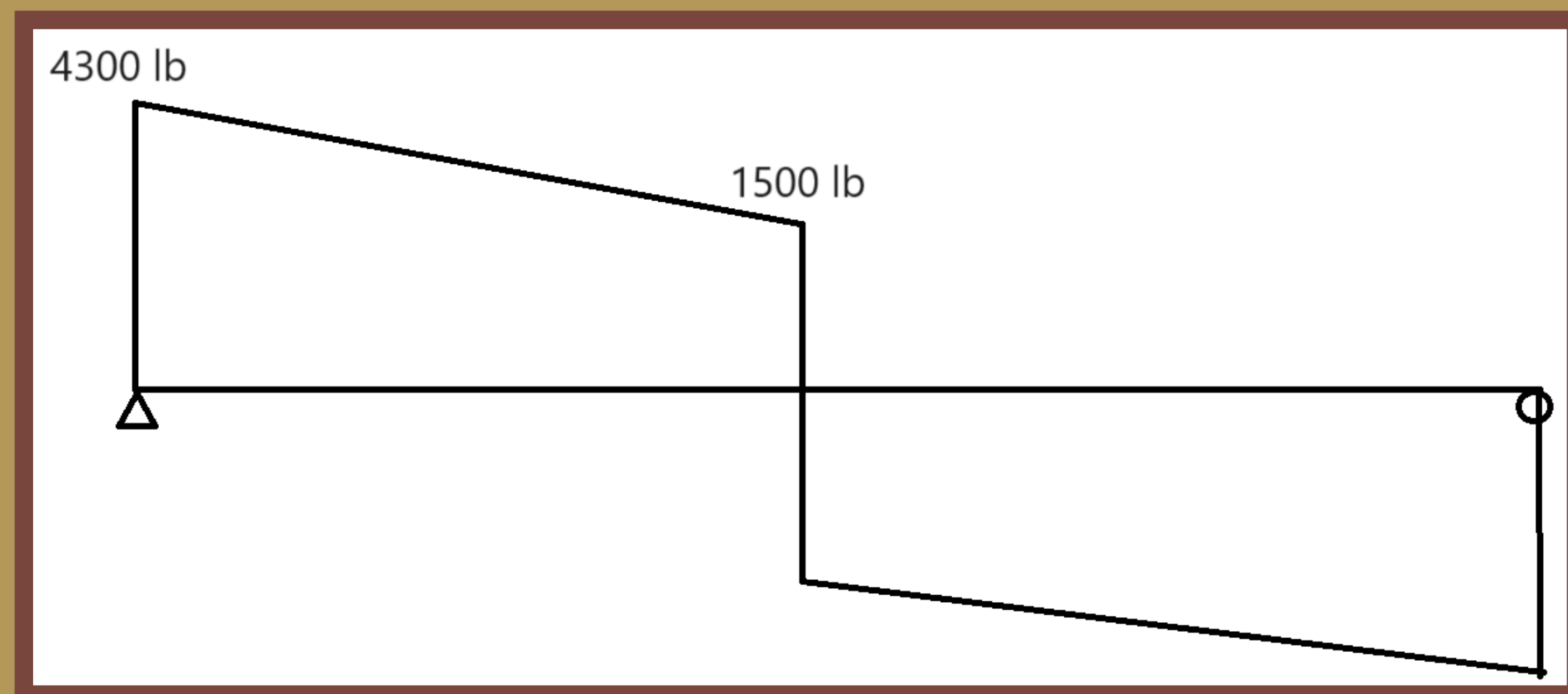
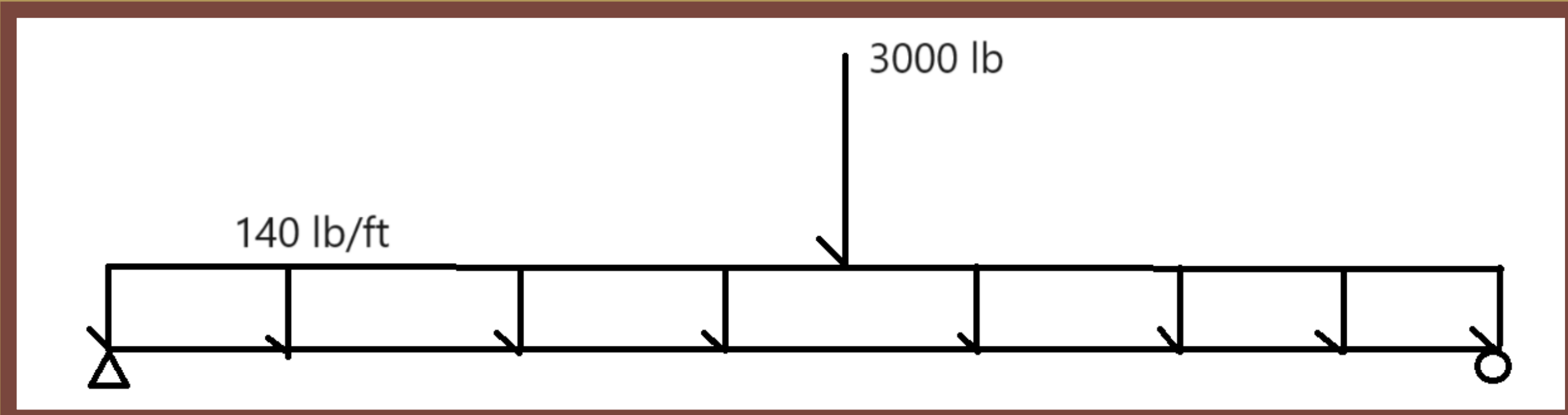
- Minimal Environmental Disturbance
- No Heavy Machinery/ATV
- OSHA Safety Manual
- Volunteer Construction
- Create an Experience
- AISC Steel Construction Manual 2017



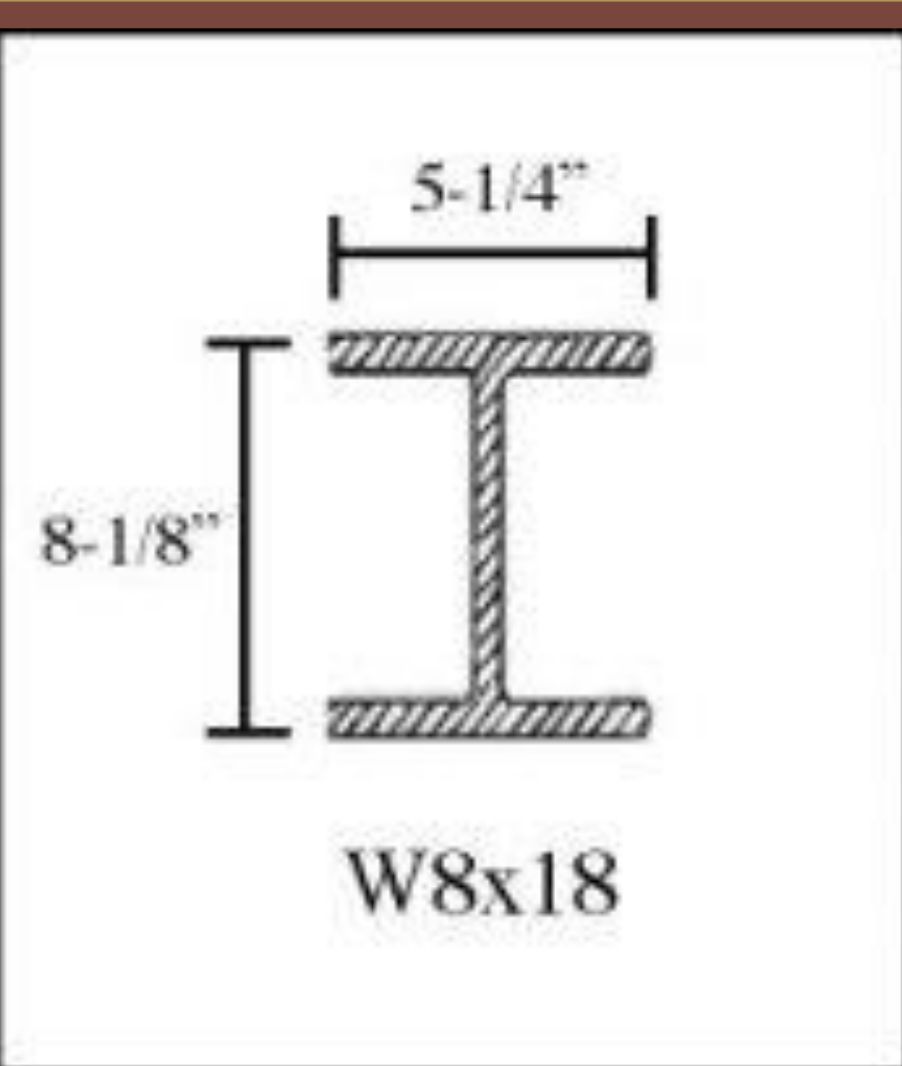
Bridge Brothers Design:

- 4ft x 50ft
- 10ft Sections ($140 \frac{lb}{ft}$)
- Rail height 42"
- Weathered Steel

Steel Analysis



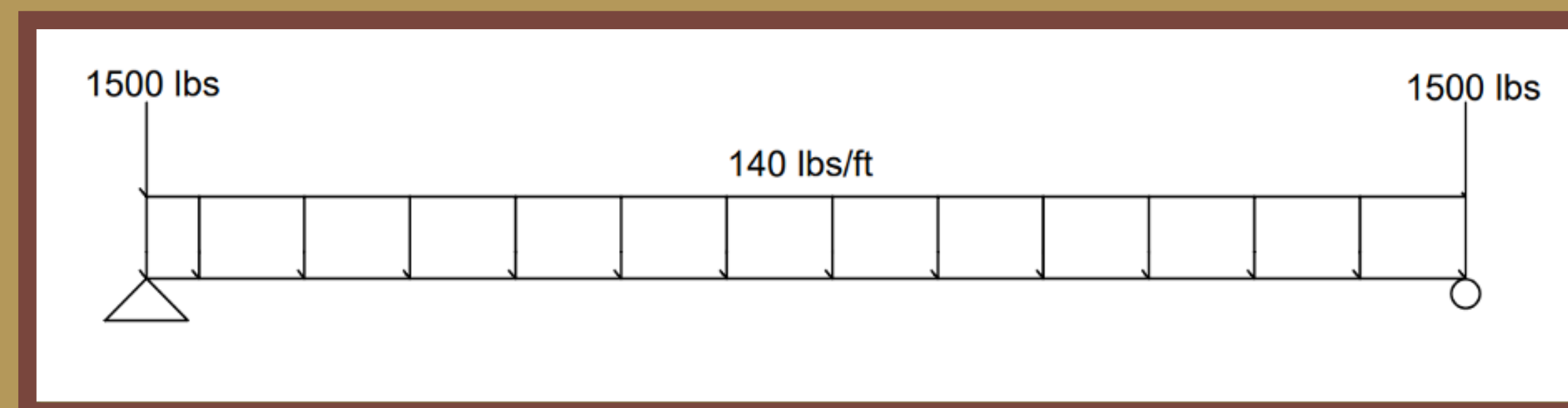
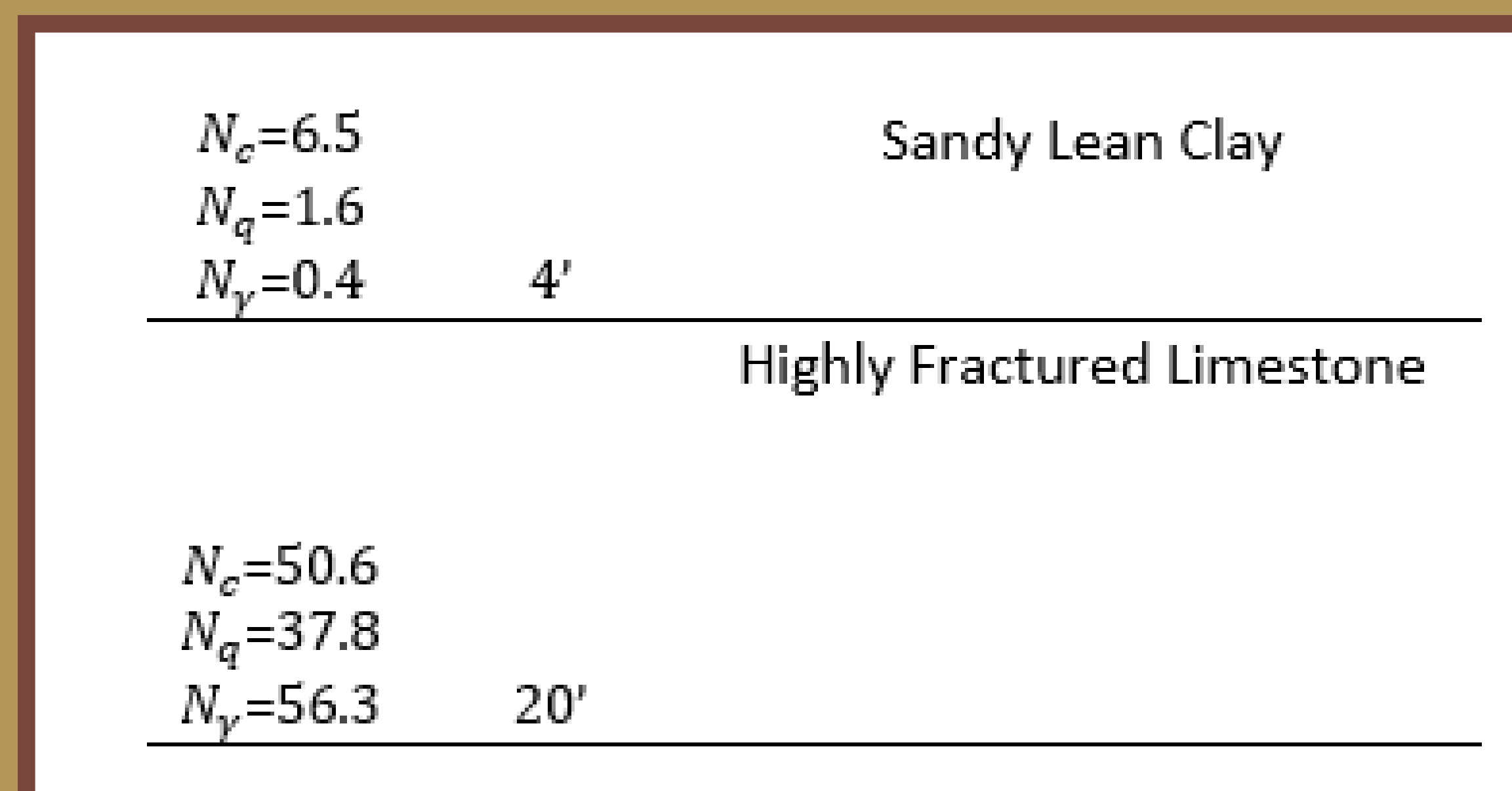
$M = 58 \text{ kip}\cdot\text{ft}$ $M/\text{beam} = 29 \text{ kip}\cdot\text{ft}$



Scaffolding Analysis

- Medium duty scaffolding capable of supporting 35 lbs/sq. ft
- Requires additional design by certified engineer

Foundation Analysis

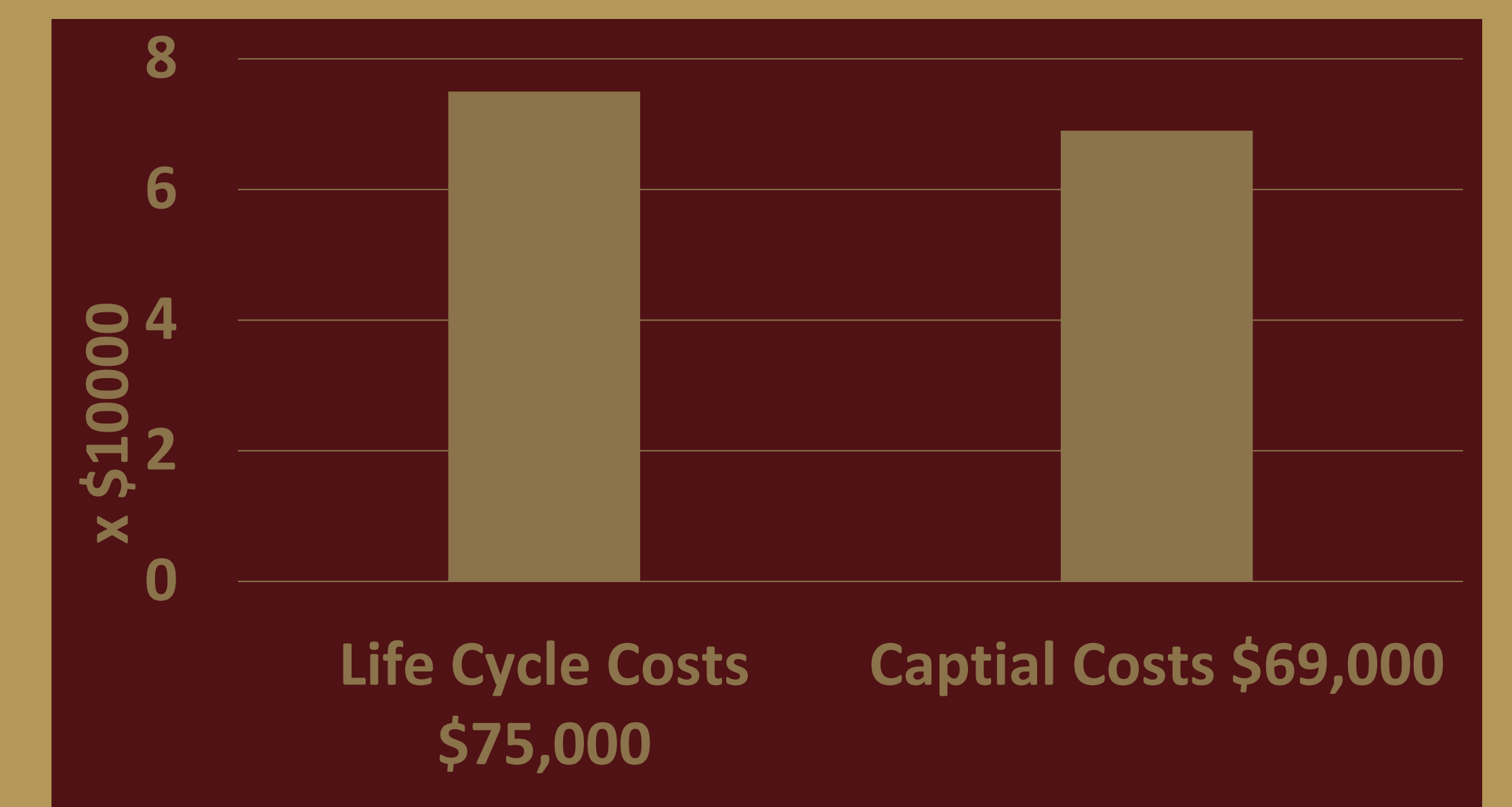


$$\Delta H = H \times \frac{C_c}{1 + e_0} \times \log \left(\frac{p'_0 + p}{p'_0} \right)$$

$$q = c' N_c S_c d_c + \sigma'_{zD} N_q S_q d_q + 0.5 \gamma' B N_\gamma S_\gamma d_\gamma$$

Cost and Environmental Analysis

Life Cycle Analysis



Envision Analysis

Credit Category	Available	Pre-Fab Score	
		Earned	Percent
Quality of Life	146	46	32%
Leadership	164	80	49%
Resource Allocation	134	18	13%
Natural World	184	13	7%
Climate & Resilience	190	15	8%
Total Points / %	818	172	21%