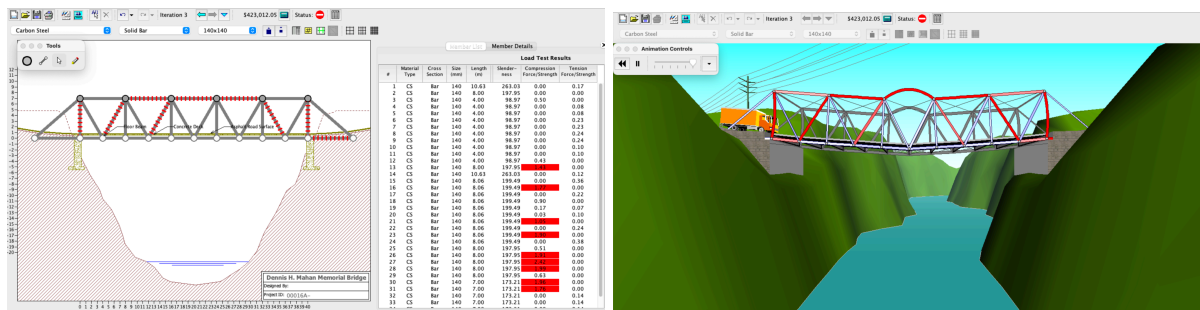


Bridge Project Prototyping

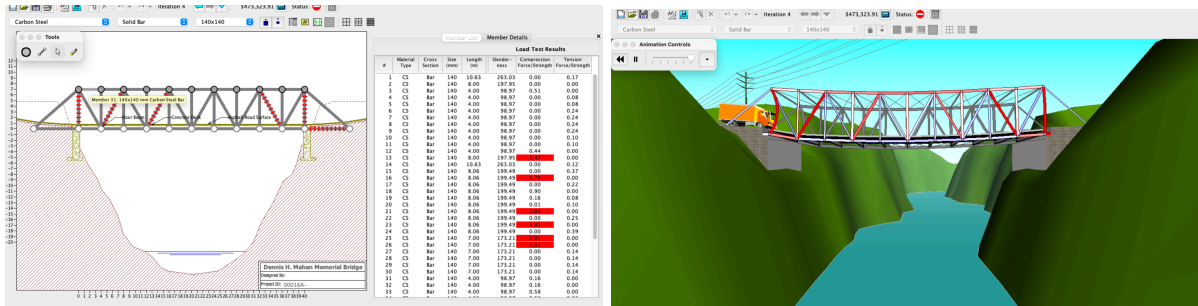
Mateo Johnson, DESIGN 24-25

Prototype One



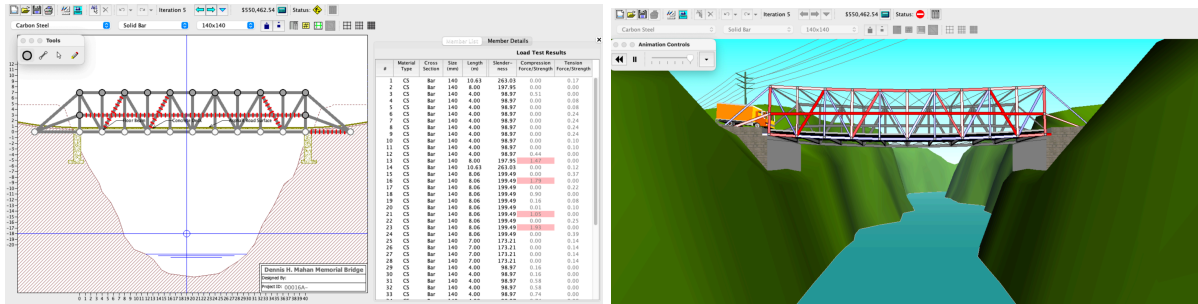
Shown above is the first prototype, and as such, is referred to as Prototype One. This bridge cost \$423,012.05. This bridge had 9 weak members (beams), primarily located along the middle parts of the top strut. There were also some diagonal beams that had stability or load issues, but those were also mainly concentrated towards the center. This bridge was designed based on what we thought that successful bridges “should” look like.

Prototype Two



Shown above is the second prototype, and as such, is referred to as Prototype Two. This bridge cost \$473,323.91. This bridge had 6 weak members, although in this design, in opposition to the last one, they were primarily located along diagonal beams further towards the outside. In this bridge, there were more vertical beams added towards the center, which resolved the load issues with the center top strut. This version also had different spacing between the trusses.

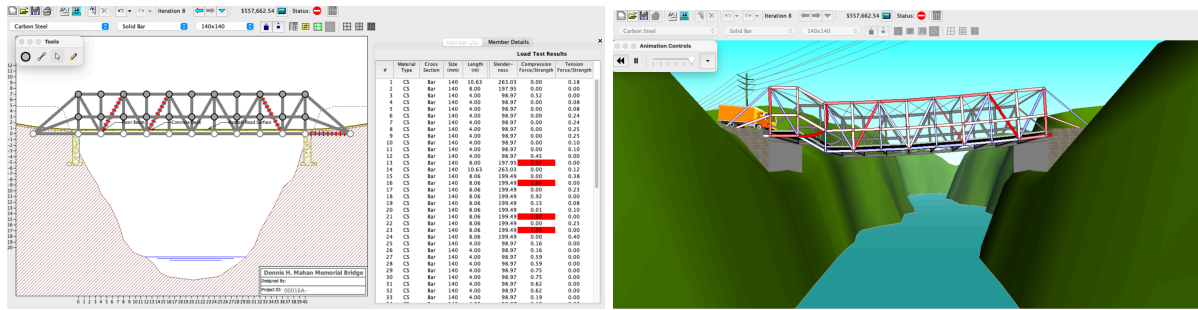
Prototype Three



Shown above is the third prototype, and as such, is referred to as Prototype Three. This bridge cost \$550,462.54. This bridge had 5 weak members, with the largest being the beam across the center, but it still had the issue of some of the outside beams bearing too much weight. This bridge design included a center middle strut, in hopes to

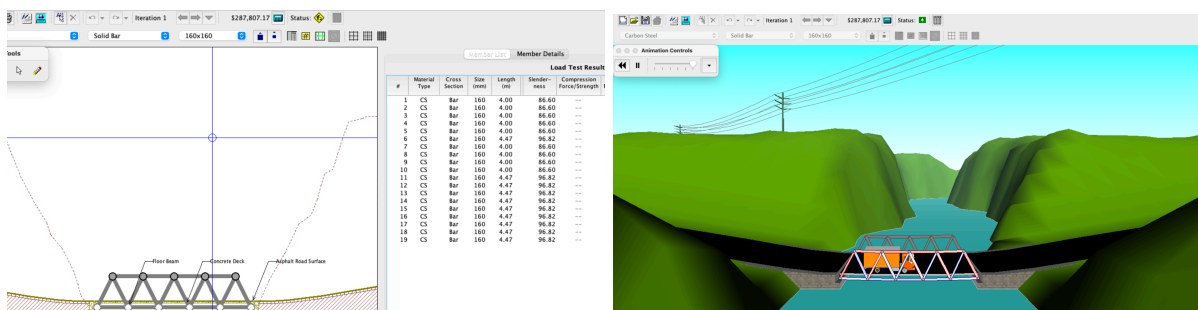
reinforce the outside beams. In between Prototypes Two and Three, the height of this was changed many times.

Prototype Four



Shown above is the fourth prototype, and as such, is referred to as Prototype Four. This bridge cost \$557,662.54. This bridge had 4 weak members, eliminating the issue of the weak center beam, but it still had the issue of some of the outside beams bearing too much weight. This fourth bridge design included a center middle strut that was connected to each truss that it passed, but also, in between Prototypes Three and Four, in hopes to make the bridge stronger by dropping the length, but this was quickly reverted due to the new height having an even amount of joints.

Prototype Five (Final)



Shown above is the fifth prototype, and as such, is referred to as Prototype Five. This bridge cost \$287,807.17. This bridge had no weak members. This bridge eliminated the issues of the center member, along with the issues of the weak outer beams. There were many changes in this design, but the main and most important is the fact that we finally decided to move the bridge down to a point where there were fewer joints, so that our bridge could be shorter. In this, we also eliminated the center beam, as well as the vertical beams. Having vertical beams within the trusses would give more structural stability, but it also greatly increased the price and material cost, along with making the connections for the physical structure much more complex.