1. Student Reaction

Student reaction to this curriculum element was overwhelmingly positive. Students provided feedback in a focus-group environment immediately following their group presentations. Dr. Kris Juffer asked students to respond (written and oral) to a series of five questions. The questions and select responses are provided below (student quotes in italics):

Q1: To what degree was this exercise appropriate for this class? (5 = very appropriate)
   - 12/13 students answered 4 or 5
   - It challenged teams to expand thinking.
   - The analysis difficulty was at our level, but critical thinking was challenging.

Q2: Was this element effective in meeting the stated goals? (5 = highly effective)
   - 13/13 students answered 4 or 5.
   - Highly effective. I went from knowing nothing to designing a bridge!
   - Good experience of real-life researching situations.
   - It showed us how much work is required to put together a project.
   - Very effective. We had to apply skills learned in class and gave us a look at how design in engineering is done.

Q3: How was this curriculum element different from the rest of the course?
   - This was very different; involved meeting with group members, presenting, and collaborating. Was a nice change of pace.
   - Much more team-work; team-work is not fun.
   - I believe it simulates the requirements that the field would bring to me. It shows how our knowledge can be applied through design.
   - Instead of the answer to the problem being given to us, teams have to creatively think of the answer and make assumptions.
   - I was forced (in a good way) to, in a sense, define my own problem. It was hard, but I enjoyed doing it.
   - Design instead of analysis.

Q4: Should this project be repeated in the future?
   - 12/13 students responded YES, with 1 MAYBE
   - It should definitely be pursued next semester so that others can see how engineering is so deeply tied into design.
   - Yes. This project gave me a detailed perspective of actually solving an extremely open-ended problem.
   - Yes...it forces students out of the traditional rut.
   - Absolutely! It is a phenomenal experience of the engineering process. It allows engineering students an opportunity to take a glimpse into the “real world” of engineering.
   - Yes, it increases skills and brings professionalism.

Q5: What was the most important thing you learned from the project?
   - Design process; structural analysis
   - How to submit a proposal in response to a RFP. The format in which it was given was an excellent lesson in working as an engineer.
   - Group communication is key to success.
• *Making assumptions* is easily the most important aspect of solving a real-world problem.
• There is no best answer to a question like this; simply how it is approached.
• Use of different software (Excel, truss software)

2. Future Plans
I will definitely continue to use this curriculum element. I felt that it succeeding in meeting most of the stated goals for the project. It also taught the students some important lessons that I did not intend (e.g. professionalism in engineering). Almost every student recommended that the project should be repeated in the future. I plan to use it (or something very similar) every semester and recommend it to adjuncts teaching the same course.

In future implementations, I will make some minor changes to the project. Currently, I plan to make the following changes:
• Meet with each student group twice (instead of once) during the project, and make the initial meeting earlier than the third week.
• Prepare students better for the presentation by providing clear expectations, tips on presenting technical material, etc.
• Incorporate the construction of a scale-model bridge, possibly using an instrumented truss kit from Pasco ([http://www.pasco.com/family/structures-systems/index.cfm](http://www.pasco.com/family/structures-systems/index.cfm)) or a similar vendor.