Introduction/Background Information

Acute Engineering is a structural engineering firm that has offices in Orem and Draper. They mainly do engineering for residential housing. The owner, Paul Thorley, is sponsoring this project.

This project will help the company explain their product and process better to clients. As will be described below a scaled down model and a 3D Revit model of a house that has been engineered will be created. These models will be used in conferences and with clients in the future.

Project Description and Scope of Services

One of the difficulties with engineering is moving beyond the calculations and line on the page and understanding how structures are actually built. With a greater understanding of the construction process and a better visualization of how a structure is put together, we can better design buildings. This understanding can help us reduce the cost of materials, labor, and unnecessary engineering. This project is designed to help students understand this connection between the engineering world and the construction world.

This project will also benefit Acute Engineering in many ways. For engineering firms it is very important to be able to communicate clearly with clients. Most times the best way to communicate is through visual presentations. This project will provide the company with visual tools that they can take to clients to pitch to them the product or to help them understand how a certain aspect of the structure is built.

As a team you will go through the process of actually constructing a house that has been engineered at Acute. This will be a scaled down model of the house built of materials such as plaster of paris, balsa wood, wire, and other materials that will best work best for the model. These materials will be used to construct such things as foundation walls, shear and bearing walls, roof trusses and other structural components. This model will be as detailed as possible. As a group you will become familiarized with the plans and the specific project details that demonstrate how to construct specific parts of the house. Using this knowledge you will right up a bill of materials for everything necessary to build the model. You will use this to order the required materials yourselves that will be paid for by the sponsor. It is imperative that this be done early on in the process so the materials can come in time for you to start building the model.

You will also take the plans provided and created an accurate 3D Revit model of the house. This will also require you to go through the plans and draw in all the structural

elements. The purpose of this model will be to show all the structural elements acting together.

Lastly the group will do a cost analysis to find ways to minimize material waste and cost. This may be convenient to do at the same time as the bill of materials except this will be with real materials and not with the model materials.

At the end of the semester you will be required to present your findings from the project. At this presentation you will go through the work you have done and will provide the things that were discussed above to the sponsor.

The group will be provided with all necessary materials, which include:

- Engineered plans
- Details showing construction practices
- All building materials
- Any other resources that may be necessary during the process

If necessary the students may also go on a site visit to a house that is being constructed to gain a greater understanding of the building process.

Outcome and Performance Standards

"Teams will provide the work "as is" meaning that there is no engineering stamp certifying the work."

Aside: The ability to continue receiving support from outside sponsors is somewhat contingent on the good work you and the undergraduate students do. You represent the BYU Civil & Environmental Engineering Department. The expectation is that you will interact in a professional manner at all times with your mentor and project sponsor, treating them with the utmost respect and consideration of their busy schedules. While successful completion of the design project is fundamental to the outcome of the work, it is expected that you will also learn important team dynamics and leadership principles. This means that in the process of completing the project you are also seeking to help each member of your design team to grow and develop confidence in his/her engineering abilities.

Deliverables

For this class under this heading include the following:

The deliverables are:

- Scaled down model of the house design that was given to the students.
- 3D Revit model of the house design that was given to the students.
- Bill of materials and cost analysis.
- A final report with design alternatives for the project that include economic and environmental considerations.
- A poster reflecting a summary of your design project.
- A presentation summarizing your design project.

All deliverables are due Friday April 1.

During the week of April 4th both a presentation to sponsors and poster session for students, faculty and other interested people will be organized.

Term of Contract

Undergraduate students are to work during winter semester, eight hours/week/student with at least 3 hours working together. Any class time or time spent on class assignments counts towards the eight hours.

Payments, Incentives, and Penalties

Much of the capstone work is graded by graduate student mentors, that include evaluations of the following components:

Team process (how well you work together to accomplish the goals)

Project proposal

Project Management Plan (PMP)

50% complete status report

Final report, poster, and presentation

Overall satisfaction of the client in meeting specific deliverables

Contractual Terms and Conditions

There will be no monetary compensation with respect to the work completed, and all work is completed and delivered on a "best effort" basis.

Aside: Each member of the undergraduate team will be asked to sign a non-disclosure agreement that simply states the work you do belongs to the project sponsor.

Evaluation and Award Process

3 different graduate students will evaluate proposals blindly, and the average of their scores will be the grade you are given on the proposal and used for granting awards where there is competition. They will be evaluating you from the exact rubric listed below.

Timeliness - 1 pt off per full hour late, up to 5.	5
Grammar/Spelling - 1 pt off per blatant error, up to 10.	10
Cover Page - Title, Data, Sponsor, Team Name, Team Members, Department of Civil & Environmental Engineering, Ira A. Fulton College of Engineering and Technology, Brigham Young University - 1 pt per piece of information included.	8
Cover Letter - brief letter of introduction that 1) states your intent to propose and 2) how you may be contact - 4 pts per piece completed.	8
Executive Summary (3/4 to 1 page that summarizes the contents of your proposal) - 7 points for completion, helpfulness - 3 pts max.	10
Team Abilities (Adjust the SOQ to make it relevant to the project) - Summary AS A TEAM of 1) relevant courses and experience, and 3) abilities to complete the work on time and in a professional manner, 4) including use of specific engineering tools/software. Include résumés. 2 pts for including résumés, 6 more points max, 2 per piece completed.	8
Key Personnel - 1) Identify which individuals will focus on which pieces of your potential tasks, and 2) some kind of organizational chart or visual describing how you will work together as a team. 5pts max per piece.	10
Project Understanding - 1) Did they address specific items mentioned in the RFP? 2) Do they repeat basic background in somewhat new terms to *demonstrate their understanding* of the project? 3) Do they mention key deliverables they may need to provide? 4) Did they articulate a *specific* approach for developing design alternatives and deliverables? 4 pts max per piece.	16
Formatting - Does it look professional? Consistent? Yes or no, 5 pts each.	10
Concise vs. Wordy, Meaningful vs. Fluffy, repetitive wording. 8 pts means concise, and accurate, and specific. 1 pt means often confusing, wordy, or vague.	8

Clear and professional flow of writing and style. 7 pts means that you would feel comfortable handing this in if it were your own; it is easy to read and understand; feels professional; 1 pt means it feels like it was cut-pasted, rushed, and done with little thought; hard to read; feels like a high school essay.	7
Video Interview - Message is clear and consistent with proposal, each member participates, professional but catches your attention. Leniency on video/audio quality will be given with a focus on the content and overall organization.	20
Total	120

Process Schedule

October 21, 4:00 pm - Request for Proposals will be available online: http://cecapstone.groups.et.byu.net/content/winter-2015-projects

October 27, 4:50 pm - Question and Answer period with respect to the proposal and submission procedures. The period where you can register your intent to propose on a project will begin. Each team will need to identify the primary target of their proposal and three other alternatives (no proposal necessary). Public knowledge of an intent to propose should help distribute proposals more evenly.

*November 17, 4:00 pm - Three copies of the proposal must be submitted at the beginning of class. Team video interviews should be made available online or on disc and referenced in the proposal.

December 1 - Award notification.

*The review committee reserves the right to reject any proposal or presentation that is not submitted in a timely fashion or in accordance with the instructions given in this RFP.

Contacts

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Paul Thorley - Sponsor

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Submittal Requirements for the proposal

Turn in three copies of the proposal that should include

Cover letter

Executive summary, 1 page or less (by itself)

Work plan that outlines the approach to solving the problem, how the team will work together (including weekly work schedule that shows the hours each team member will work and the time block the team will be together, this is a necessary requirement).

Necessary tools, data, equipment, etc. A couple of paragraphs or a bullet list with one sentence explanation for each item.

Schedule indicating important milestones.

Engineering Design Budget. This is an estimate of the design phase cost.

Outcome and Performance Standards. Provide the following statement: "Teams will provide the work "as is" meaning that there is no engineering stamp certifying the work."

Statement of qualifications that outlines the background, experience, education, and organizational structure of the team. Include some discussion of how you plan to become a "high functioning" team in the course of completing the project.

Outside consultants (professors or others) that are necessary to “make this work.”

Appendices:

Appendix A: 1 page resume for each member of the team

Appendix B: (if necessary)