

Fiber-Reinforced Plastic Wrap to Extend Service Life of Clearfield Bridge

Prepared for:

Brigham Young University

Civil and Environmental Engineering Department

Senior Design Project

Fall 2014 – Winter 2015 Semesters

RFP Outline

Introduction/Background Information

Hatch Mott MacDonald is a multinational company whose main focus has been providing great service in the discipline of transportation engineering. They have quickly developed a reputation as being one of North America's primary transit engineering firms.

One of the many services Hatch Mott MacDonald (HMM) provides is bridge and highway design. A unique solution is developed for each project based upon the criterion of durability, economy, sustainability, and aesthetics. However, even with an appropriate initial design, the structural condition and functionality of bridges diminishes over time.

The loss of structural integrity or functionality in bridges can be very costly to mitigate and overcome. There are one of two paths to take depending on the severity of depreciation: replacement or repairs. This project will address deteriorating bents in bridges, and seek to provide an affordable and sustainable solution.

Project Description and Scope of Services

The Utah Department of Transportation Engineers has proposed the use of a fiber-reinforced plastic (FRP) wrap as a possible solution for the deteriorated bents on the Clearfield Bridge. This solution has been implemented previously for another bridge in the region, and it is much more economical than replacement.

The selected group will be responsible for investigating the suitability of FRP wraps for the purpose of extending the service life of bridge bents, specifically for those on Clearfield Bridge. The group's evaluation shall consider bridge bents with various degrees of deterioration. The group will detail the design and construction process associated with FRP repairs and summarize recommended applications and benefits of FRP.

The group will visit the bridge that was repaired with FRP and report their findings. As the group develops the proposal, group members will meet with the graduate mentor to more adequately discuss the project scope and ensure continuity among all parties involved.

Outcome and Performance Standards

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

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

The deliverables are:

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, 8 hours/week/student with at least 3 hours working together. Any class time or time spent on class assignments counts towards the 8 hours.

Payments, Incentives, and Penalties

Undergraduate students will be graded by a graduate student; the grade is awarded according to the following:

- **33%** Individual professional practice assignments

- **16%** Team process
- **5%** Project proposal
- **5%** Project Management Plan (PMP)
- **5%** 50% completion status report
- **16%** Final report
- **20%** Project review (poster, presentation, overall satisfaction)

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.

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 <i>demonstrate their understanding</i> of the project? 3) Do they mention key deliverables they may need to provide? 4) Did they articulate a <i>specific</i> 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

Questions regarding this request for proposals can be directed to Keith Newton via email at: keith@acuteengineering.com or newton.keith89@gmail.com

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)