

Provo Tabernacle

Footing Restoration and Upgrade

Statement of Purpose

On December 17, 2010 the Provo Tabernacle was destroyed in a fire. On Saturday, October 1st the Church of Jesus Christ of Latter-day Saints announced that the structure would be restored and renovated such that it would become a Temple. Part of the restoration will require the improvements to the footings. Changing the function of the building to that of a temple will not only require that the footings be stabilized but that a basement be excavated. The footing and basement wall combination will need to support the building through-out its construction as well as during its use.

Background Information

The Church of Jesus Christ of Latter-day Saints is a world-wide religious organization. The Church sponsors the construction of hundreds of meeting houses across the globe every year. The most important of these buildings are Temples. Amongst the thousands of buildings which the church builds and maintains less than 150 of them are temples. These buildings are held to a very rigorous and detailed standard. The tabernacle itself was erected in 1898. The building is being restored due to its cultural and sentimental value this makes it essential that the building maintain its current appearance. The church has a history of doing this with buildings of similar history.

Scope of Work

The Provo Tabernacle was erected in 1898 and has undergone several modifications since that time. Recently the fire which destroyed the interior of the tabernacle made it necessary to either rebuild or do away with the tabernacle. The Church has decided to not only restore the tabernacle but to convert it into a temple. The renovation of the tabernacle will maintain the outside of the building as it was constructed. However the interior will be drastically changed. This will include the addition of a basement. The challenge of supporting the structure above as well as the lateral earth pressure that will be exerted on the basement poses a significant problem.

This building must be able to resist an earthquake during construction. Construction will be when the building is most vulnerable. So special attention will need to be given to how the foundation will react without the roof and floors in place to resist the lateral forces.

It is expected that throughout the course of the project that the team will meet certain milestones.

- February 8th -Appropriate assessment of the forces which the structure may be called upon to resist.

- March 15th – decision on type of foundation to be designed.
- March 29th –Final design completed
- Final reports due as assigned by the class schedule

You will be provided with the soil and load information by the Church and Reaveley Engineers and Associates. Any information required for the design will be provided you by their structural engineers

Should the opportunity present itself you may be able to visit the site in order to gain a further understanding of the project and the limitations involved.

Requirement for Proposal Preparation

In order for your proposal to be considered you will be required to turn in three copies of the proposal. It should include the following elements:

- Cover letter which indicates your understanding of the project and introduces your team as well as your basic approach to the problem at hand.
- 1 page or less executive summary. This should be a solid and concise overview of your proposal. It is virtually stand-alone document describing in summary all aspects of the project.
- No more than 2 pages statement of qualifications that outlines the background, experience, education, and organizational structure of the team. This section should include some discussion of how you plan to become a "high functioning" team in the course of completing the project. Any outside consultants (professors or others) that will help should also be included. Most of your "experience" will be in the form of pertinent coursework. It is essential to the completion of this project that you have the right background. Awarding of the project will be waited heavily upon whether or not your team has taken the right courses.
- No more than 2 pages 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 will work and the time block the team will be together).
- No more than 1 page indicating tools, data, and equipment necessary.
- No more than 1 page schedule indicating important milestones.
- No more than 1 page Engineering Design Budget (this represents your bill as engineering consultants, not the cost of construction)
- In the appendix include a 1 page resume for each member of the team

Outcome and Performance Standards

You will provide this work "as is" meaning that there is no engineering stamp certifying the work. However, our ability to continue receiving help from outside sponsors will be contingent on the good work that you do. You represent the BYU Civil & Environmental Engineering Department and it is expected that you will interact in a professional manner at all times with

your mentor and project sponsor, treating them with the utmost respect while being considerate 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 team grow and develop confidence in engineering abilities.

Deliverables

Should the project be awarded to your team, it is expected that you will complete a report outlining your proposed design alternatives for the project. In coming up with these alternatives you should consider economic and environmental concerns. These considerations must be included in your report.

A poster which will describe to the public the problems you encountered and how you have decided to solve them. This poster will be on display to the public and it is expected that you be able to answer questions regarding your project.

You will need to give a presentation describing your project and what challenges you faced in solving the problem. You must be able to answer questions that may be asked regarding your final design.

Term of Contract

It is expected that this project will be completed by the end of the 2012 winter semester. All individual members of the team should plan on investing six hours each week to the design. All team members should be working together for at least three of those six hours each week.

Payments, Incentives, and Penalties

For your effort on the performance of this project you will receive a grade that is awarded according to the following breakdown:

10% Time Card (putting in the requisite time)

10% Project Notebook (demonstrating productivity in the hours spent)

20% Milestones met (each project will outline the expectations for milestones)

35% Final report

10% Poster/Presentation

10% Teamwork Portfolio and Peer evaluation

5% Cooperation

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.

Evaluation and Award Process

Your team's proposal will be evaluated by a panel based on the following areas.

Firm Resources/Ability/Experience 20

Key Project Personnel 20

Work Plan and Understanding of the Project 40

Technical Proposal and Presentation 20

Process Schedule

October 31, 4:00 pm - Request for Proposals will be available online at
<http://cecapstone.groups.et.byu.net/Winter2012.htm>

November 7, 4:50 pm - Question and Answer period with respect to the proposal and submission procedures.

*November 21, 4:00 pm - Three copies of the proposal must be submitted at the beginning of class

*November 21, 4:00-5:30 pm - 5 minute interview (presentation) by your team of the proposal

November 30 - Award notification.

*The review committee reserves the right to reject any proposal or presentation that is not submitted in a timely fashion.

Contacts

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