

# **Design-Build of the Block 25A Academic Building**

## **Introduction/Background Information**

This project is sponsored by the San Francisco office of AMEC, a multinational engineering consulting company. The company is involved with engineering, consulting, and project management opportunities around the world. The representative from AMEC is Alex D. Wright, and he will be the point of contact for the project.

The project will be to provide geotechnical evaluations and recommendations to the WRNS Studios (WRNS) design team for the design-build development of the Block 25A Academic Building for the University of California, San Francisco (UCSF), Mission Bay Campus. The building, which will be six stories with a footprint of 44,000 square feet, will be located on the corner of 16<sup>th</sup> Street and 4<sup>th</sup> Street in San Francisco.

## **Project Description and Scope of Services**

This project presents many challenges for the design team. The building will be a faculty office building located in a developed research campus bordered on two sides by city streets and on other sides by existing parking lots. Due to the sensitive location, pile driving is not an option due to noise and vibration restrictions. Additionally, the project team would like to minimize the amount of soil removed from the site due to the high disposal cost associated with the contaminated nature of the native soils.

The main scope of the project will be to provide geotechnical evaluations and recommendations for the design of the building. This will involve characterizing the site based on geology, existing soil, and seismic hazard. Recommendations for retaining walls, excavation earthwork, and foundation support will need to be provided. These evaluations and recommendations will guide the WRNS design team to achieving the most efficient and cost effective overall design.

The final deliverables are to include:

- Estimate of Costs/Budget and Schedule including milestones and deliverable dates
- Summary description of site terrain and local geology
- Description of subsurface soil and groundwater

- Discussion of Seismic Setting and Seismic Hazards (Including risks from Tsunamis/Seiche/Flooding). Should also include future and historical hazards associated with this location and definition of site class.
- Assessment of potential earthquake-related geologic/geotechnical hazards (e.g., surface fault rupture, liquefaction, differential settlement, site instability) and discussion of possible mitigation measures, as appropriate.
- Development of seismic design parameters in accordance with the 2010 California Building Code (CBC). This may include an assessment of site ground motions based on site-specific probabilistic and deterministic seismic hazard analyses results (provided), and development of Design response spectra, in accordance with ASCE-7-05, as required by the 2010 CBC.
- Presentation of foundation options and Recommendations regarding foundation elements, including:
  - allowable bearing pressures or capacities (dead, live, and seismic loads),
  - estimates of settlement (total and differential),
  - allowable lateral passive and sliding resistance characteristics for pile caps and grade beams, and
  - lateral pile analysis parameters.
  - conceptual design and drawings/specifications)
- Recommendations for design of retaining walls, including static earth pressures (i.e., at-rest, active, and passive), seismically-induced earth pressures, and drainage requirements.
- Recommendations for earthwork construction, including site and subgrade preparation, types of fill material, placement and compaction requirements for fill, criteria for temporary excavation support, and possible dewatering issues.

Necessary information for completion of the project will be provided upon request. This information will include previous and existing geotechnical exploration data test results including:

- Standard Penetration Test (SPT)
- Cone Penetration Test (CPT)
- Dry Density
- Moisture Content
- Atterberg Limits
- Grain size distributions
- Triaxial unconsolidated-undrained tests
- Consolidation

- Site Maps
- Preliminary Conceptual Designs
- Geologic Maps
- DSHA and PSHA results (Seismic results)
- Information/details about Maximum Credible Earthquake (MCE)

Additional information may be made available to team as requested or required.

Because the site is located in San Francisco, site visits are not required for the project. However, several meeting with the sponsor through video conference are recommended to ensure the success of the project.

### **Outcome and Performance Standards**

It is expected that all work performed in the project will meet the requirements of the proposal and meet general professional standards. The capstone design team will provide the work “as is”.

The completed project represents the BYU Civil & Environmental Engineering Department. The expectation is that interaction with your mentor and project sponsor will be conducted in a professional manner at all times, treating them with the utmost respect and consideration

### **Deliverables**

The deliverables for this project 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, 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, which 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.

Each member of the capstone 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.

<b>Timeliness</b> - 1 pt off per full hour late, up to 5.	5
<b>Grammar/Spelling</b> - 1 pt off per blatant error, up to 10.	10
<b>Cover Page</b> - 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
<b>Cover Letter</b> - brief letter of introduction that 1) states your intent to propose and 2) how you may be contact - 4 pts per piece completed.	8
<b>Executive Summary</b> (3/4 to 1 page that summarizes the contents of your proposal) - 7 points for completion, helpfulness - 3 pts max.	10

<b>Team Abilities</b> (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
<b>Key Personnel</b> - 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
<b>Project Understanding</b> - 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
<b>Formatting</b> - Does it look professional? Consistent? Yes or no, 5 pts each.	10
<b>Concise vs. Wordy</b> , Meaningful vs. Fluffy, repetitive wording. 8 pts means concise, and accurate, and specific. 1 pt means often confusing, wordy, or vague.	8
<b>Clear and professional</b> 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
<b>Video Interview</b> - 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

The schedule events and deadlines for the proposal process will be as follows:

- 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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Project Mentor: Levi Ekstrom

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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)