

Request for Proposal (RFP)

(Soil Data Percolation App Development, CEEEn-2016CPST-002)

Background Information

Soil Data Percolation App Development (CEEEn-2016CPST-002)

The sponsor for this project is the city of Orem. Orem city is one of the largest cities in Utah and continues to have strong growth and development. Orem city oversees many development projects, and works especially with transportation and water related engineering projects. The city is also in charge of producing standards for contractors to abide by on various construction projects.



Orem city is interested in taking into account the amount of soil percolation that will occur in different parts of the city. Because there is limited amount of connections to storm drain lines in the city, this information will be used by the city to help developers know what kinds of water retention design will be required depending on the local soil percolation rate. This capstone project will help the city by providing them with an app or spreadsheet that can take into account these factors and give an estimation of the soil percolation which can be subtracted from the predicted rainfall runoff flows.

Project Description and Scope of Services

Orem city bases their rainfall runoff calculations on IDF curves and the rational equation. Currently, the city requires developers to design water retention areas for any new developments in the city. These retention areas allow runoff water to collect and then over time percolate into the ground. Orem is interested in comparing the effectiveness of several different water retention devices based on soil percolation rates measured throughout the city.

To help design these facilities, the city would like the students to first compile a soil percolation database from provided test data. The students will then analyze the data and find if there are areas of the city that will require more testing to get an accurate representation of the soil percolation distribution in all areas of the city.

Once the database is complete this information should be included into an app or spreadsheet than will interpolate the expected percolation at a desired location based on the percolation tests near that location. This app or spreadsheet should also allow for the design of water retention devices based the on expected amount of flow from rainfall over the specified area.

General Design Information:

App\Spreadsheet should include:

- Rainfall flow prediction based on an IDF curve and the ration equation
- Database of soil percolation tests
- Ability to interpolate soil percolation values for any location in the city
- Ability to calculate water retention device capacity based on soil percolation rate and the void ratio of gravel lining.
- Include option to design different sizes of water retention including:
 - R-tanks
 - Sumps
 - Doghouses

Design Codes

- Design will be based on specification provided by Orem city. Orem city will provide a city IDF curve, a standard sump design, and other design information as required.

Expected Deadlines, Meetings, and Presentations:

A final presentation and final report for Orem city will be presented no later than April 10, 2017. Also, monthly progress reports will be produced for the benefit of Orem city on the progress of the project. Site visits may be required based on the availability of current city percolation data. Site visits and intermediate meetings will be scheduled with Orem city as the project requires.

Students will soon receive the required soil percolation data to begin work on the database. The first milestone for the project will be the completion of the soil percolation database with data from all parts of the city. The second half of the project will deal with programming of the water retention device design app\spreadsheet. It will be the responsibility of the students to work out a timeline to develop the app\spreadsheet to meet all specifications given above. The final product must meet or exceed the project criteria stated above.

Outcome and Performance Standards

Teams will provide work “as is” meaning that there is no engineering stamp certifying the work as completed by a licensed engineer.

The ability of the BYU Civil & Environmental Engineering department to continue to receive support from outside sponsors is contingent on the work you do. As such, all Capstone students are expected to interact in a professional manner and with respect at all times with the project mentor and sponsor and peers. Support for future Capstone projects can be effected by your actions.

An important part of your learning during this Capstone project will be working with your team in an effective manner. Team work is crucial for success in all projects in the field as a professional, and should be a focus during your work on your Capstone project.

Deliverables

A final report with a summary of all work done in the development of the app\spreadsheet. This report should include the following:

- Comprehensive App\Spreadsheet instructions
- Technical Data required to for installation of the app\spreadsheet
- Key assumptions

- Soil Percolation database information.
- IDF and runoff flow information
- Water retention devices comparisons

Short monthly progress reports that include the following:

- Current Status of Capstone Project
- Any challenges the team has encountered
- Progress in overcoming challenges
- Actions taken to overcome challenges

A poster reflecting a summary of your app/spreadsheet development and its application for Orem city.

A presentation summarizing your project is to be presented to your sponsor.

All deliverables are tentatively due on Monday April 10th.

Contractual Terms and Conditions

Non-monetary compensation with all project work is provided on a “best effort” basis. Team members are to spend 8 hours/week/student with at *least* 3 hours/week working together. Class time or time spent on class assignments counts toward these hours.

The Project Team will consist of:

- A project manager/mentor: A graduate student who does not perform technical work on the project. He/she guides, facilitates and directs the team toward successful completion of the project by achieving customer objectives, adhering to schedule/time/cost, and promoting team unity.
- A project team lead: An undergraduate student team member who serves as the team’s spokesperson and liaison among the team, its project manager, sponsor, faculty advisor and Capstone Committee advisors
- Two project team members/task leads who may be assigned to take lead on certain aspects of the project in addition to the project team lead. All team members, including project team lead, are to assist one another on each member’s specific task assignments
 - One can take lead on analysis or data gathering, another on design/drawings, data interpretations etc.

The sponsor may require team members to sign a [non-disclosure agreement](#) that simply states the work you do belongs to the project sponsor.

Payments, Incentives and Penalties

Project work is to be graded by the graduate student mentor with potential additional inputs from the sponsors, Capstone Committee members and faculty advisors. Work will be graded on the following:

- Team work and unity
- Project proposal
- Project Management Plan (PMP)
- Monthly status report
- Final report, poster, and presentation
- Customer satisfaction in satisfying project objectives and required deliverables

2. Submittal Requirements for the Proposal

Proposals are due on Monday November 7, 2016. The Proposal should include at a minimum the following:

- Cover page
- Letter of submittal / introduction
- Executive summary (one page or less)
- Work plan
 - Proposed approach, including innovative ideas, to complete the project
 - Weekly project work schedule for individual team members
 - Weekly team work/meeting schedule
- Section identifying necessary tools, data, equipment, etc. with brief explanations
- Project schedule including important milestones
- Engineering budget: Estimated hours for each phase/element of the proposed work plan
- Outcome and Performance Standards
- List of outside consultants (faculty, Capstone Committee member etc.) necessary for this project
- Statement of qualifications
 - Which explains team member's background, experience, and education as well as the organizational structure of the team.

- Team member assignments
- Team member collaboration plan: (How will team work together seamlessly)
- Appendices
 - Appendix A: 1 page resume for each team member
 - Appendix B, C, etc. as necessary

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

3. Contacts

- Graduate student mentor
Alex Arndt
arndtal@gmail.com
801-867-9719
- Orem City Associate Engineer
Jared Penrod
jpenrod@orem.org
801-229-7331

4. Proposal Evaluation Criteria

The Proposal will be evaluated by a graduate student mentor/project manager in accordance with the following rubric, with inputs from project sponsor, Capstone Committee member and potentially faculty advisor.

Timeliness - 1 pt off per full hour late, up to 5.	5
Grammar/Spelling - 1 pt off per blatant error, up to 5.	5
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.	6
Cover Letter - brief letter of introduction that 1) states your intent to propose and 2) how you may be contacted.	6
Executive Summary 3/4 to 1 page that summarizes the contents of your proposal	12
Team Abilities Summary as a team of 1) relevant courses and experience, 2) abilities to complete the work on time and in a professional manner, 3) including use of specific engineering tools/software. Include résumés.	12
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.	12
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? 6 pts max per piece.	24
Formatting - Does it look professional? Consistent?	6
Concise vs. Wordy , Meaningful vs. Fluffy, repetitive wording. 6 pts means concise, and accurate, and specific. 1 pt means often confusing, wordy, or vague.	6
Clear and professional flow of writing and style. 6 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.	6
Total	100