Copper Creek

Statement of Purpose

Copper Creek is a small runoff creek in the southwest part of Salt Lake County that needs to be master planned. A master plan would need to include:

1. A hydrologic analysis of the runoff area to calculate 100-year flows.
2. Proposed alternatives to convey the design flows to 6000 West. These alternatives could include piping or open channel and should take into consideration right-of-way requirements. The right-of-way requirements will probably have a significant influence on the alignment.
3. Cost analysis and recommendations of the alternatives.

This project is not a final design but a master plan only.

Background Information

Salt Lake County is invested in seeing that this project gets completed because of the recently developed residential plans that have been made for the parcel of land in question. This project needs to be done before and construction or residential work can be done. The home owners as well as the construction workers need to know if these future homes will have a significant chance of flooding. Salt Lake County can provide property maps and help with contours/aerials and previous completed models of the area.

Scope of Work

Copper Creek is a small ephemeral creek near 600 West in Salt Lake City that carries runoff from the canyon southwest of Salt Lake. Copper creek is braided and during the dry months of the year, the creek is not visible in some places. This creek is the single creek used for runoff from the canyon. To date it has not been a problem for flooding to occur because the creek flows through fields and non residential areas before it reaches Salt Lake. These areas are going to be turned in to residential areas and flooding is going to be a major concern for everyone involved in the project. An analysis must be completed before the residential projects can be started.

This project will consist of four phases. Each of the phases is also a key milestone for this project. The phases must be completed in order and time must be taken in to consideration. Some of the phases are much more difficult and time intensive than others.

Phase one will be to adequately define the creek. In order to complete this phase a site visit will have to be made, and the creek will have to be walked, so the team members get an idea of what the creek looks like and how to define it. The creek is adequately defined when it can be put into a computer model and used for analysis. There are plans available that show the defined creek as

it was in years past. These plans can be used if they are proven to still have accurate up to date information.

Phase two will be to define the watershed that empties to the creek using HEC-HMS. This phase has already been completed by Salt Lake County in years past and this model can be used if the information can be proven accurate. Whether the existing model is used or a new model must be made, it is essential that an accurate 100 year return period is calculated. While it is assumed that HEC-HMS will give this figure, calculations must be shown proving the validity of the computer model.

Phase three will be to design a typical cross section of the creek that would be adequate with the 100 year flood. This cross section should then be used for the whole creek and a model in HEC-RAS should be made. The model should show the creek flowing full, but not over topping during a 100 year flood. A pipeline should then be designed with a capacity to carry the runoff. An analysis of the pipeline and the open channel should be completed and one design chosen as the better alternative. Detention basins should also be considered while analyzing the 100 year flood. This analysis must include environmental impacts, economics and the future impact and flooding potential of the future residential areas. Doing nothing should also be a considered alternative, including the pros and cons of a no action alternative.

Phase four consists of submitting a final report to Salt Lake County. This report should include both models, well indexed so they can be used by city officials if needed. The report should also include recommendations based on the criteria listed in the description of phase three.

Requirement for Proposal Preparation

Turn in three copies of the proposal that should include:

- Cover letter
- 1 page or less executive summary
- No more than 2 pages statement of qualifications that outlines the background, experience, education, and organizational structure of the team. This 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.
- 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 meeting together)
- No more than 1 page indicating necessary tools, data, equipment.
- No more than 1 page schedule indicating important milestones
- No more than 1 page Engineering Design Budget that would be primarily the time and effort of each member of the team
- 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 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 team grow and develop confidence in his/her engineering abilities.

Deliverables

- 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 will be 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. Each member of the group must be present for a portion of this.

Term of Contract

Winter semester, six hours/week/student with at least 3 hours working together, project deadline.

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.
- Each member of your team will be asked to sign a non-disclosure agreement that simply states the work you do belongs to the project sponsor.
- It should be understood that the completed project may or may not be implemented, however, it should be of professional quality.

Evaluation and Award Process

Your team's proposal will be evaluated by a panel of three graduate students.

- 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 or in accordance with the instructions given in this RFP.

Contacts

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