



Wallsburg Church Camp

Culinary Water Tank and Delivery System Design

1/23/2012

Team Members:

Tyler Bird

Jaycee Smith

Jeffrey McCarty

Michael Clark

Jimmy Bliss

Project Management Plan



13 January 2012

Dr. E. James Nelson
Civil and Environmental Engineering Department
Brigham Young University
242K CB
Provo, UT 84602

Dear Dr. Nelson,

At your request we have prepared this project management plan for the Wallsburg Church Camp Water Storage Tank Design project.

This report includes the details of the project and our plan to complete it. The sections of this report are:

- General project information
- Major client, stakeholder, and general information
- Organizational structure
- Work plan
- Project schedule
- Project budget
- Communication plan

The purpose is to provide the camp with a water storage tank and delivery system. The objective of this project is to update the existing water source at Wallsburg Church camp and to provide adequate pressures at peak demand. The scope of this project will include analysis of current infrastructure, and different pump and water storage options in order to create an effective water system.

As **United Engineering**, we pledge to complete the submitted proposal as outlined and in accordance to the key deadlines we have established. Feel free to contact us with any questions or concerns that may arise regarding our proposal. We anticipate your approval and permission to proceed with this project.



General Project Information

The Wallsburg Church Camp is located in beautiful Provo Canyon near the town of Wallsburg, Utah. The property is located approximately 7 miles south-east from Deer Creek Reservoir. It consists of approximately 93 acres with a stream flowing through the center. There are two large camp grounds (Oak and Legacy); each with a metal pavilion, refrigerators, flushing restrooms, showers, amphitheater and several excellent camping sites. There is also a small campsite (Maple) which has a canvas canopy, electricity, water and a fire pit. The restrooms for the Maple camp are located approx. 500 feet from camp. This entire property can facilitate two separate large groups and one small group at the same time” (Utah Salt Lake Area Recreation Properties). The total capacity is about 250-300 occupants.

With increasing numbers of participants within the camps facilities, the Wallsburg Camp is struggling to keep up with water demands. The camp is currently using a well to supply its water needs. This purpose of this project is to design a storage and piping system for the camp to supply sufficient water when the camp is at full capacity. The camp is owned by The Church of Jesus Christ of Latter-day Saints, and we will be working with their Water Resources Division for the project. We will select the tank site and design the new storage tank. We will also choose the pump and design the pipe system for the camp.

We know the camp ground has been surveyed for this project, and we will use that information. We would like to gather further information on the number and locations of all outlets. We will analyze the elevations and distances between sites to create a gravity-flow pipe system. We will also determine the maximum output flow during maximum capacity so we can design the size of the storage tank.



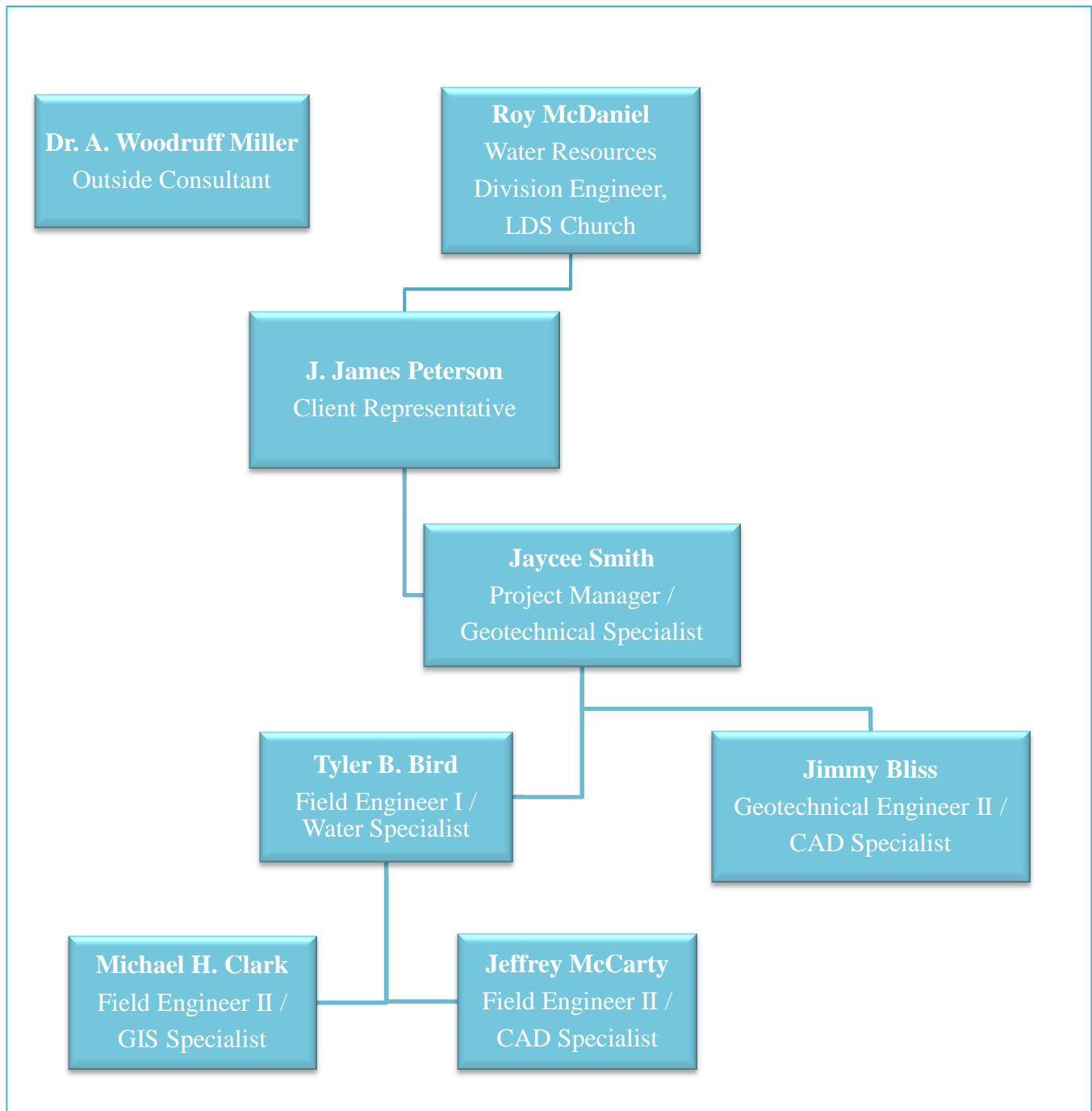
Major Client and Stakeholder Information

Roy McDaniel
Project Overseer/Sponsor
(801) 240-4656
50 E N Temple St
Salt Lake City, UT 84150
McDanielRB@ldschurch.org

J. James Peterson
Project Manager/Mentor
(208) 570-3050
Brigham Young University – Civil Engineering
jjamespeterson@gmail.com

A. Woodruff Miller
Professor of Hydraulics & Hydrology
Ph.D. Civil Engineering, Stanford University, 1975.
Office: 368L Clyde Building
Telephone: (801) 422-6331
Fax: (801) 422-0159
Email: wood_miller@byu.edu

Organizational Structure





Work Plan

Our team proposal consists of several milestone achievements throughout the duration of the project which is expected to last from January 4, 2012 through April 1, 2012. Site selection of the new storage tank will depend on needs as specified by The Church of Jesus Christ of Latter-day Saints' Water Resources Division. We will take into account the environmental impacts, proximity to the camp for maintenance, required elevation for gravity-fed system, as well as the aesthetic relationship between the tank and its natural surroundings. We will take into account the given requirement that showers, bathrooms, kitchens, and other water services must be sufficiently pressurized due to gravity alone, instead of supplemental pumping. Placement of the water tank will depend on pressures needed at different parts of the camp. Design of the storage tank will be dependent on the amount of water needed above current deliverable volumes provided by the well. This can be calculated first due to the specifications given and tests performed at several possible site locations. Our team will initially split into two groups that will work concurrently on the pump/pipe system and the design of the storage tank. These groups will obviously need to work together as site selection will be a common unknown for both groups. After the site is selected, our team will calculate the deliverable volumes as well as pressures to determine if our tank specifications will deliver the desired amount of water. Much of designing a pipe system is an iterative process, so strong communication will need to be in place throughout the project to keep everyone updated on the most recent decisions. At team meetings, prior assignments will be reviewed, the team as a whole will be updated, and future assignments will be divided amongst the team members.

As the storage tank design and the pump system both depend on the site selection of the water tank, selection will be a first priority. Our team hopes to have decided on a site by February 21, 2012. This will be somewhat dependent on not only soil conditions at the proposed sites, but the altitude and distance from the camp. Once this has been officially decided, preliminary calculations on the pump and pipe system should be completed. Design of the storage tank capacity will also need to be completed at this time to guarantee a plausible site. From that point more in depth pipe and pump system configurations will be considered and different storage tank designs will be taken into account. Final design of the storage tank is estimated to be complete by March 12, 2012 while the pump and pipe system configuration should be done by March 19, 2012. This will leave time for a review by the camp so any concerns can be addressed or redesigned for before the final deadline of April 1, 2012.

Given the nature of the project, members of the group with the most experience in each area (i.e.: water resources, environmental, geotechnical, or structural engineering) will be chosen to lead sub-committees in charge of each portion of the project. This will help with organization and minimize wasted time due to a lack of knowledge in any particular subject. Water resource



engineer will determine pressures and peak demands. The CAD specialist will design the tank, and pump-tank connections. The geotechnical engineer will help choose the site based on soil properties. Field engineers will use GIS, CAD, and other applications to help with scheduling, design work, etc. Due to the magnitude of the project, we seek technical advice from Dr. Miller and James, our assigned mentor.

Due to the diverse curriculum that our group has experienced at Brigham Young University, we will be able to cover all aspects of this project without too much review or hardship. We will use the BYU CAEDM computers and program necessary for the project. We will use AutoCAD Civil 3D 2011 for the majority of our design work. ArcGIS will also be implemented to create topographical maps of the area. EPANET 2.0 will be used to model the pipe network. We will need the topographic survey data that was previously collected by professional surveyors and provided by the Church. We will also require the data regarding how much water is used during peak times, how much water the well is able to produce, and possibly soil and structure bearing capacity in the area where we may be installing the tank. We look forward to working with onsite members of the camp staff and engineering department as we visit the site for analysis. Table 1 describes our plan of work for the duration of the project design phase of the project.

Communication Plan

We plan to work six hours a week; 3-4 hours as a group and the rest of the time individually. Our hours will be recorded in an Excel spreadsheet and reported to James on a weekly basis. We will either email him our time sheets or let him review them in the CAEDM groups folder we have set up. As a team we will meet in the Clyde Building step-down lounge or in the various CAEDM labs around campus. We plan to meet together from 3-5p on Mondays and Thursdays, and from 8-11a on Fridays.



Project Schedule

- January 14 Determine capacity needed
- January 21 Determine structural and ground bearing capacity concerns
- January 28 Address non-technical concerns (environmental impacts, aesthetics, economics, maintainability, etc.)
- February 15 Select site of the new water storage tank
- March 7 Design water storage tank
- March 14 Select and configure pump and pipe system

Table 1 describes our plan of work for the duration of the project design phase of the project.

Table 1. Work Schedule

Tasks	Jan				Feb				Mar				
	4	11	18	25	1	8	15	22	29	7	14	21	28
Obtain Needed Info From Church													
Modify Scope Based On Findings													
Coordinate with Church Regarding Findings													
Review Existing Well System													
Prepare Conceptual Pipeline Design													
Prepare Conceptual Tank Design													
Prepare Conceptual Pump Station Design													
Site Selection													
Final Tank Design													
Final Piping Design													
Final Proposal													



Project Budget (see attached)