

November 14, 2016

Prepared for: Trace Robinson
Civil Engineer, City of Riverton Public Works

Attached to this letter is our intent to propose on the Development Accommodation Realignment Study for the city of Riverton. We are excited for the opportunity to aid in the permitting, relocation, and cross sectional design of the stream realignment for Rose Creek. As you review this proposal feel free to contact us with any questions that you may have.

Sincerely,

X-Stream Engineers

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DEVELOPMENT ACCOMMODATION REALIGNMENT STUDY

Project ID: CEEEn-2016 CPST 01

by

**X-Stream Engineers
Michael Souffront
Brad Mason
Tavin Griffeth
Kevin Woolf**

A Capstone project submitted to

**Trace Robinson
City of Riverton**

**Department of Civil and Environmental Engineering
Brigham Young University**

Nov. 14, 2016

Introduction

PROJECT TITLE: Development Accommodation Realignment
PROJECT ID: Study CEEEn-2016CPST-01
PROJECT SPONSOR: City of Riverton Public Work
TEAM NAME: X-Stream Engineers

The City of Riverton, Utah has embarked on a project to realign 2500ft of a natural stream to support future development as part of an agreement with landowners. For the Development Accommodation Realignment Study, our team will be analyzing a stream that runs through the city of Riverton and will determine the best possible path to realign the stream. It is proposed that the creek be aligned to its original path before it had been averted to the current position it occupies.

As part of the objectives of the realignment study, a preliminary layout of the proposed stream will be presented as for the path of the new stream. Cross sections that are designed to withstand a 500 cfs flow will be presented as possible stream bed designs. A recommended cross-section based on a hydraulic analysis is also expected. The state of Utah requires different levels of authorization to alter a natural stream. The requirements to obtain authorization vary depending on the type of alteration. The entities responsible of authorizing the realignment of Rose Creek are the US Army Corps of Engineers, the State of Utah, and the Salt Lake County. A detailed outline of the requirements to get authorization from these entities will be provided. Conceptual information on maintainable trail features will be proposed as possible ideas along the stream path. Other features such as a natural soil base or concrete base can be recommended in the realignment as well.

Deliverables will include a final report produced with the detailed outline for permitting requirements, a longitudinal and cross-sectional analysis, and other considerations. Additional monthly status reports documenting challenges, solutions & progress will be provided. Bi-weekly meetings will be held every Monday and Wednesday until final report delivery in April.

Proposed Work Plan

Data gathering: Contact governing agencies to find out the steps for permitting stream relocation. The Army Corps of Engineers and the Salt Lake County are the primary permitting agencies. Permits and procedures will be obtained from both agencies.

Permitting outline: A report will be given outlining the permits required and the various steps to be taken before relocating a stream. County guidelines will be summarized and deciphered. These will be followed by a summary of the Army Corps guidelines and permits.

Conceptual analysis: Determine possible paths and cross sections for the stream and trails and present designs to Riverton City and other interested parties. Maps from early Riverton city will be analyzed to select the former channel path. Stream modeling software will be used to determine the behavior of the stream in our proposed location. The findings will be summarized. Cross sections of the path beside the stream will also be designed.

Final analysis: A revised version of conceptual analysis and numerical design for the designed cross sections will be presented in our final report.

Schedule

Monthly: A status report will be sent out every month. The status report will discuss the progress being made towards the design objectives, as well as the challenges that arise along the way.

Biweekly: Every Monday and Wednesday the team will meet to work on the various deliverables. It will include designing, running models, writing reports, and updates. Each team member will be responsible for completing their assigned portion outside of team meetings if needed.

The permitting outline and summary is expected to be complete by February 2017.

The design of the stream is expected to be complete by March 2017.

The final report is expected to be complete by April 2017.

Facilities, Tools, Data and Equipment

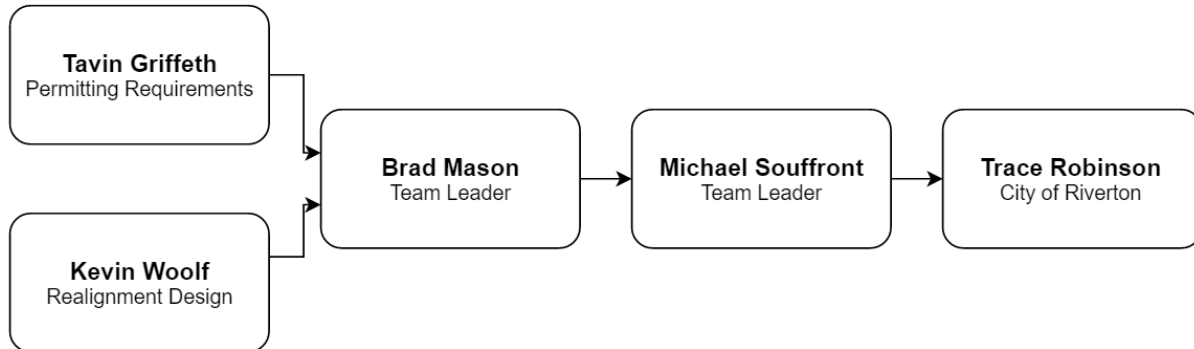
Survey Data will be provided by Riverton City. Hydrological modeling software will be used to analyze the cross-sectional design for the proposed stream. This software will be accessed in the CAEDM labs on BYU campus. This cross-sectional model will be used for our final report. GIS maps will be used to map out the proposed path for the stream to be submitted for our final report. GIS software will be accessed on BYU campus as well.

Project Budget

Team members are to spend 8 hours per week on the project, at least 3 of those hours include team meetings. Class time or time spent on class assignments will count toward these hours. Assignments will be given during team meetings to accomplish scheduled milestones. Team members will spend more time to meet schedule as required.

Brad Mason will be the team lead in charge of delegating responsibilities to all team members to ensure that the above schedule is met. Kevin Woolf will have the main responsibility over the realignment design. Tavin Griffeth will have the main responsibility for permitting requirements

and outline. Despite main responsibilities, all members will contribute equally and help where and when needed. Team meetings will consist of reporting on assignments, collaboration, and problem solving.



Deliverables

Monthly status reports will be sent to the project manager as well as the city official from Riverton City documenting challenges, solutions, and progress. These will be brief summaries listing highlight monthly milestones as they apply. Answers to the following questions will be given:

- What challenges have your team encountered in your Capstone project?
- What actions did your team decided to do to overcome these challenges?
- Any progress in overcoming these challenges?
- Is project on schedule?

A final report with permitting requirements, longitudinal and cross-sectional analysis, and a poster will be submitted and presented to the above sponsor and other interested parties. The poster will reflect a summary of the project and be presented to student and faculty in the final undergraduate seminar.

Performance Standards

Team will provide work for this Capstone project “as is” using best practices and with best effort. Project results cannot be construed as work performed by licensed professionals and cannot be used as “stamped deliverables” without first being reviewed, approved and stamped by a qualified and relevant license professional engineer.

Statement of Qualification

All team members are capable students in their final year of civil engineering at BYU. Team members all have engineering and work place experience proving their ability to be accountable and turn in projects on time. Experience includes structural design, construction management,

and transportation analysis and design. Relative coursework includes hydraulics and fluid flow theory, environmental engineering, and engineering applications of GIS. Time to work on the project will be built in to each student's schedule during winter semester registration. Assignments can be seen in the project budget above.

Appendix A

MICHAEL SOUFFRONT

Provo, Utah.

435 232 8469

masouffront@gmail.com

EDUCATION

- Ph.D. Civil Engineering. Brigham Young University. Provo, Utah. USA Current
- M.S. Watershed Sciences. Utah State University. Logan, Utah. USA Fall 2013 (3.76 GPA)
- Natural Resources and Environmental Education (NREE) Graduate Certificate Utah State University. Logan, Utah. USA Fall 2013
- B. S. Civil Engineering. Universidad Central del Este. Dom. Rep. Fall 2009

WORK EXPERIENCE

Graduate Research Assistant

Environmental Research Modeling Lab / Hydroinformatics lab

- Provide accessibility and visualization for the National Water Model
- Create a comprehensive system for flood forecasting in Nepal
- Create new tools for communicating hydrologic modeling results

Fall 2009
3.42 GPA

Jan 2016 - Current, Utah.
USA

GIS Specialist / Water Resources Technician

BIO-WEST, INC. Environmental consulting firm

- Compiled, edited, maintained, and analyzed geospatial data
- Created visualization tools (e.g. maps, web applications, graphs, etc.)
- Collaborated on multidisciplinary projects

Jan 2014 - Jan 2016,
Utah. USA

Graduate Research Assistant

Belmont Hydrology and Fine Sediment Lab

- Estimated channel-floodplain sediment exchange in the Root River, MN
- Calculated channel lateral adjustment in the Root River, MN
- Conducted field surveys at different rivers in southeastern Minnesota

May 2012 - Dec 2013 Logan,
Utah. USA

Water Quality Technician

Pueblo Viejo Dominicana Corporation. Gold mine owned by Barrick Gold

- Implemented erosion control
- Identified, monitored, and supervised water points
- Managed water quality database

May 2011 - Aug 2011
Dominican Republic

Intern Engineer

INDRHI (National institution for Water resources in the Dominican Republic)

- Participated in water quality monitoring
- Updated meteorological and water quality database
- Prepared daily water level reports for dams of the country

Jan 2010 – May 2010
Dominican Republic

VOLUNTEER EXPERIENCE

Society of Hispanic Professional Engineers (SHPE)

- Taught elementary school children about basic environmental concepts
- Helped in various university activities at Utah State University

Fall 2011 - Fall 2013
Logan, Utah. USA

Macorix Higuamo Rotaract Club

A community service group, part of Rotary International

- Participated in nursing homes and bateyes (sugar workers' towns) visits
- Took part in neighborhood cleanups

Fall 2010 - Fall 2011
Dominican Republic

Coalition for the Conservation of the Higuamo River

Organization to protect the Higuamo River Basin in the Dominican Republic

- Participated in red mangrove revegetation campaigns
- Took part in riverbank and coastal cleanups

Fall 2009 - Summer 2011
Dominican Republic

COMPUTER SKILLS

- Geospatial Analysis
- Python
- Web Development
- Data Management
- Remote Sensing
- Databases
- Hydrologic Modeling
- Microsoft Office

KEVIN WOOLF

380 N. 1020 W. Apt. 208 Provo, UT 86406 ■ (480) 599-7256 ■ kpwoolf@gmail.com

EDUCATION:

Brigham Young University- Provo, Utah January 2014-Present
Major: Civil Engineering; Structural Engineering Emphasis
Expected Graduation Date: December 2017
GPA: 3.29

EMPLOYMENT:

Horrocks Engineers October 2015-Present

- Helped create and edit technical reports and memos.
- Created figures in Arc GIS and in AutoCAD
- Learned new concepts in an efficient manner
- Gained a very broad knowledge of transportation engineering

Vantage Marketing May 2014-August 2014

- Completed door-to-door sales for a pest control company in Indianapolis
- Educated potential clients about various services and products
- Sold \$16,000 of product in 4 months
- Coordinated appointments between clients and service providers

3G Construction Company August 2013-December 2013

- Framed houses in Arizona
- Followed regulations to promote a clean and safe working environment
- Worked as a team to achieve a common goal of building a house in budget

SKILLS:

- Fluent in speech, writing, and reading in English & Tagalog
- Organization skills
- 50 WPM
- Intermediate knowledge of Word, Excel, PowerPoint, & ArcGIS
- Basic knowledge of AutoCAD
- Collaboration & Training
- Sales Experience

ENGINEERING COURSES COMPLETED:

- Enrolled in a structural analysis course
- Enrolled in a technical communications course
- Completed a course in Excel and VBA
- Completed Junior core classes.

REFERENCES:

Josh Campos, <i>professional</i>	801-850-1861
Dano Chappel, <i>professional</i>	480-809-5440
Jon Evans, <i>personal</i>	480-294-0096

Bradford J. Mason

863 S Stubbs Ave, Provo, UT 84601
(703) 967-9321 bradford.j.mason@gmail.com

EDUCATION

Brigham Young University

Civil Engineering (BS), Mathematics (M)

Provo, UT

Apr 2017

- GPA 3.35/4.0
- BYU Lacrosse Student athlete (2013-2015)
- American Society of Civil Engineers (ASCE) member (Local and National)
- Relevant Courses: Structural Analysis, Reinforced Concrete Design, Steel Design

EXPERIENCE

Focus Engineering & Surveying

Engineering Intern/Structural Department

Midvale, UT

Feb 2016 - Present

- Designed structural components for new residential buildings, retaining walls, and remodels
- Prepared and drafted structural plans for construction while working with architects to meet clients' needs
- Analyzed department grossing each month to improve productivity and efficiency of employees

The Appraisers

Data Entry Position

Provo, UT

Nov 2014 – Feb 2016

- Prepared inspection packets for appraisers to aid in land and building valuations
- Acquired information about 1,000's of land parcels through government database
- Entered data received from inspections into database for appraisal and sketch building parameters to finalize packets for government evaluation

Mason Properties, General Contractor

Carpenter's Assistant

Arlington, VA

Jun 2014 – Aug 2014

- Worked on the construction of home additions and porches, including: setting beams, laying out footings, and framing of structure
- Worked closely with carpenter following instructions as well as assisting with the problem solving process

VOLUNTEER SERVICE

The Church of Jesus Christ of Latter-day Saints

Volunteer Representative

Santiago, Chile

Aug 2011 – Aug 2013

- Lived and taught religion classes in Chile, learning the Spanish language and culture
- Served as a regional leader for ten months over a group of over 30 other representatives training them in the language and teaching
- Analyzed weekly data to develop new training methods to improve and achieve group goals

SKILLS AND INTERESTS

- Proficient in structural programs Enercalc, Strucalc, Forte, Retainpro
- Proficient in AutoCAD, ArcGIS, APEX sketch, Microsoft Word, Excel, and PowerPoint
- Fluent in Spanish (reading, writing, and speaking)
- Interests: Sports, sailing, hiking and camping

Tavin Griffeth

602 E 600 N Appt. 221, Provo Utah 84606 • tavintgriff@yahoo.com • 210-788-8812

Education

Brigham Young University, Provo Utah

Major: **Civil Engineering** (minor: Spanish) – GPA: 3.61/4.00

Graduation date: *August 2017*

- Member of America's Society of Civil Engineers and Construction Management Student Association
- **2016 National ASC Champion** - Competed on **BYU's ASC Risk Management Team** in Reno Nevada. The team placed 1st nationally and I was a recipient of The Distinguished Performance Award.

Related Work Experience

Project Engineer/Intern Okland Construction- Salt Lake City, UT *May 2016- Present*

- Assisted in \$180 million construction of missionary training facility for the LDS church.
- Helped manage construction on Courthouse for the State of Utah (\$90 million).
 - Managed subcontracts, RFIs, and submittals for entire project.
 - Responsible for quality control measures and management of construction processes.

Project Engineer/Intern MGC Contractors-San Antonio, TX *April 2015-August 2015*

- Given a lead position to close out a \$4 million water tank and pump project in San Antonio.
- Oversaw construction work on-site and aided in estimating/bidding projects as well as scheduling, creating O&M manuals, and supervising spare part turnover.

Phone Expert at Wireless Advocates – Orem, UT *July 2014-April 2015*

- Developed high level of expertise with the latest cell phones, tablets and phone technologies with Verizon, AT&T, and T-Mobile by selling phones, plans and repairing devices.
- Generated over \$25,000 GPD for the company in sales and awarded Top Regional Performer.

Other Experience

2 year LDS Mission in the Yucatan Peninsula, Mexico *July 2012- June 2014*

- Served community, helped families unite, aided needy individuals overcome alcoholism, taught how to achieve needs in their physical, emotional, temporal and spiritual lives.
- Oversaw, trained and led a team of 20 missionaries.

Fluent in Spanish

- Proficient in reading, speaking and writing.

Program Expertise and Proficiency

- Trained in Blue Beam and Pro Log. Basic training in BIM 360, AutoCad, and Revit.
- Trained in all Microsoft Office programs including visual basic coding skills in Microsoft Excel.

Awards and Accomplishments

- Eagle Scout of the Boy Scouts of America.
- Organized Blood Drives for the Red Cross (300+ hours of community service).
- State Champion 2010 Texas high school football team.
- Princeton Award Finalist for scholarly achievements.
- Recipient of GVEC scholarship for academic success and service to the community.
- Recipient of 34 Foundation scholarship for being a top student-athlete in San Antonio area.