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WORK ORDER
PURSUANT TO AN AGREEMENT BETWEEN
THE CITY OF FORT COLLINS
AND
Anderson Consulting Engineers

DATED: 10/31/14

Work Order Number:

Purchase Order Number:

Project Title: Port of Entry Project

Original Bid/RFP Project Number & Name:

Commencement Date: 10/31/2014

Completion Date: 06/01/2015

Maximum Fee: (time and reimbursable direct costs): 35,000

Project Description: Complete hydraulic analysis, floodplain use permits, final design, and construction observation /coordination for the Port of Entry (POE) Pit project.

Scope of Services: See attached

Professional agrees to perform the services identified above and on the attached forms in accordance with the terms and conditions contained herein and in the Professional Services Agreement between the parties. In the event of a conflict between or ambiguity in the terms of the Professional Services Agreement and this work order (including the attached forms) the Professional Services Agreement shall control.

The attached forms consisting of ____ (____) pages are hereby accepted and incorporated herein, by this reference, and Notice to Proceed is hereby given.

Professional

By: Bruce A. Anderson

Date: 10/31/14

City of Fort Collins

By: [Signature]
Project Manager

Date: 10/31/2014

By: _____
Gerry Paul
Director of Purchasing and Risk Management
(over \$60,000.00)

Date: _____

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ANDERSON CONSULTING ENGINEERS, INC
SCOPE OF WORK
for the
PORT OF ENTRY (POE) PIT PROJECT

The purpose of this Scope of Work is to define the work effort by Anderson Consulting Engineers, Inc. for conducting a hydraulic analysis and final design of the Port of Entry (POE) Pit Project located north of the Rigden Storage Reservoir Project and directly west of the Cache la Poudre River. The City of Fort Collins Natural Areas Department (NA) acquired the approximate 80 acre POE Pit site from LaFarge earlier this year for restoration as a future natural area. The POE Pit is located at the site of a historic gravel mining operation. The existing pit has not been lined and has an existing surface area of approximately 25 acres, requiring augmentation of the evaporated groundwater. As part of the project, it is our understanding that NA would like to fill in the majority of the existing pit to reduce the permanent water surface area, thereby, reducing future augmentation requirements and to also improve wildlife and riparian habitat for the property's future use as a natural area. Fill for the pit will be acquired from the excavation of the Rigden Storage Reservoir Project (RSRP) being constructed directly south of the POE Pit. Bradley Anderson, P.E., CFM, President of ACE/Principal Engineer, will serve as the Project Manager for this work and Brian Smith, P.E., CFM, Senior Engineer for ACE, will serve as the senior design engineer.

The following are the general assumptions associated with this scope of work:

- Available topographic information is adequate for the design and additional survey will not be required.
 - Geotechnical investigations and design recommendations will not be required.
 - The project will be designed and constructed utilizing the City's APDS system. Therefore, the project will not go to bid and the City of Fort Collins APDS contractor, Connell, will be contracted for construction.
 - Standard City of Fort Collins technical specifications will be utilized.
 - Wetland permitting will not be required as impacts to any wetland areas within the existing pit will be covered under the umbrella of the open gravel mining permit.
 - ESA surveys will not be required, or will be conducted by others under a separate scope of work.
 - As-built survey information will be collected as part of this scope of work to facilitate post-project floodplain modeling and hazard mapping. Due to the possibility of incorporating the post-project topography and floodplain modeling as part of the on-going Poudre River Risk Map study, effort to conduct a stand-alone LOMR application has not been included as part of this scope of work. If it is determined that a stand-alone LOMR application is necessary, it is assumed that a separate scope of work will be developed.
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Task 1. Data Collection, Field Reconnaissance, and Base Map Preparation

This task will include the collection and review of pertinent data including, but not limited to the following:

- 2014 topographic survey data of the existing pit collected by Connell.
- Underwater survey data collected by King Surveyors in 2009.
- 2013 LIDAR generated 1-foot contour topographic data collected by the City of Fort Collins.
- 2012 ALTA/Land Title Survey of the existing property completed by Intermill Land Surveying.
- 2013 aerial imagery.
- Existing gravel mining drilling data, permit and reclamation plan.
- Available ground water and water quality information.
- Existing utility information obtained from the Boxelder Sanitation District and Bill McDowell.

As part of this task two site visits will be conducted to familiarize the project staff with the specific site conditions to help facilitate the design. This task assumes that currently available topographic mapping will be sufficient for this scope work and that additional surveying efforts will not be required for the design. The currently available topographic mapping includes the following: (a) 1-foot topography recently developed from survey data collected by Connell in April 2014; (b) 2013 LIDAR generated 1-foot contour topographic data collected by the City of Fort Collins; and (c) underwater survey data collected by King Surveyors in 2009 that is assumed to still be accurate. This task includes effort to combine the three separate sets of existing condition topography into one comprehensive set of topographic information that is referenced to the same the same horizontal and vertical datum being utilized for the Rigden Storage Reservoir Project. Also associated with this task is effort to incorporate utility information obtained from the Boxelder Sanitation District and Bill McDowell into the basemap. Other pertinent information collected for the base mapping associated with the Rigden Storage Reservoir Project will be incorporated into the base mapping for this project.

Cost..... \$4,000

Task 2. Conceptual Design and Preliminary Construction Drawings

Two alternative conceptual grading plans will be developed to determine the anticipated fill requirements to meet NA's goals for the project. These plans will focus on the development of a grading plan necessary to accommodate the quantity of clay material removal from Rigden. An analysis will also be conducted to determine the maximum amount of fill that could be placed in the reservoir to bring it back to historic elevations. It is recognized that the final grading plan will need to accommodate the conveyance of flood flows across the property in a non-erosive fashion, while protecting existing utility infrastructure that is adjacent to the property. Based on input from NA, ACE will develop a preferred

preliminary grading plan that will include a low flow outlet pipe, inflow and outflow spillways for the passage of flood waters, and the lowering of the existing berm along the western property boundary to reflect historic elevation. The preliminary design will be reflected with a 50% level set of construction drawings that will be submitted to NA for their review and comment.

Cost..... \$5,500

Task 3. Final Design/Construction Drawings

Comments generated from the preliminary design will be incorporated into the final design and preparation of final construction drawings. Preliminary concepts for the outlet pipe, inflow and outflow spillways and grading associated with the berm along the western side of the property will be finalized based on results of the hydraulic modeling conducted as part of Task 4. It is assumed that two to three iterations of the preliminary grading plan will be necessary to develop an optimal final grading plan that meets the criterion of the project. The final grading plan will identify the location and depth of claystone fill along the western side of the pit to ensure a connection with the groundwater table is maintained for future wetland and riparian habitat. The grading plan will also identify the amount of fill required, including granular overburden for the reestablishment of vegetation. It is assumed that the final construction drawings will consist of a grading plan and other pertinent details necessary to construct the outlet pipe and spillways. This task also assumes that Natural Areas will be responsible for the development of the revegetation and planting plan. Digital pdf copies of the final construction drawings will also be prepared and distributed.

Cost..... \$6,500

Task 4. Hydraulic Modeling and Floodplain Use Permit

Based on coordination with the City Stormwater Department and Larimer County Engineering Department, it has been determined that a CLOMR submittal for the project will not be required. However, it is our understanding that both the City and County will require that the project obtain a floodplain use permit and no-rise certification. To facilitate the no-rise certification and design of the final grading plan, the effective HEC-2 model for the Poudre River will be converted to HEC-RAS and updated to reflect existing conditions. The final grading plan developed as part of Task 3 will be incorporated into the revised condition hydraulic model. Results of the revised condition hydraulic model will be compared to the results of the existing condition hydraulic model to illustrate that the project will not create a rise in base flood elevations. A revised condition floodplain/floodway work map will also be developed for submittal as part of the floodplain use permit. This task also includes effort to develop a memorandum for the floodplain use permit/no-rise certification that will document the hydraulic analyses, floodplain mapping, and stability/erosion control analyses conducted for the design.

Cost..... \$6,000

Task 5. As-built Survey and Preparation of As-built Construction Drawings

Due to post-project floodplain and augmentation requirements, the development of as-built construction drawings will be required. Due to the requirement that topographic information utilized in support of a FEMA hydraulic/flood hazard mapping submittal be developed by a licensed land surveyor, it is assumed that ACE will contract with King Surveyors to conduct a post-project topographic survey that will be incorporated into the as-built construction drawings and ultimately utilized to conduct a post-project hydraulic evaluation to revise current flood hazard maps. Digital ACAD drawings and pdf copies of the as-built construction drawings will be prepared and distributed. It is noted that due to the possibility of incorporating the post-project hydraulic analysis and flood hazard mapping as part of the on-going Poudre River Risk Map study, effort to conduct a stand-alone LOMR application has not been included as part of this scope of work. If it is determined that a stand-alone LOMR application is necessary, it is assumed that a separate scope of work will be developed.

Cost..... \$2,000

Outside Services (King)..... \$5,200

Task 6. Meetings and Coordination

Coordination between the City of Fort Collins Natural Areas Department, the City of Fort Collins Utilities Department, Connell, and ACE staff will be required throughout the duration of this project. It is assumed that majority of the coordination with City of Fort Collins' staff and Connell will be completed as part of the on-going Rigden construction meetings being held on a bi-weekly basis. However, it is recognized that meetings outside of regularly scheduled construction meetings will be required. The following meetings have been assumed as part of this scope of work:

- 1) One initial coordination meeting with COFC NA staff;
- 2) One coordination meeting with Connell and COFC Utility staff;
- 3) Three construction drawing review meetings with COFC NA staff;
- 4) Other coordination meetings, as necessary, (4 meetings have been assumed and may involve Larimer County, City of Fort Collins Stormwater Department, Boxelder Sanitation District, Great Western Railway, and the Colorado Division of Reclamation, Mining and Safety).
- 5)

Coordination meetings will help ensure compliance with local and federal regulations and inform adjacent landowners about the project. The construction drawing review meetings will provide an

opportunity to discuss project related issues, project status, technical results, and review design plans. The ACE Project Manager will attend all meetings.

Cost..... \$3,500

Task 7. Construction Observation and Coordination

It is assumed that the majority of the construction coordination with City of Fort Collins' staff and Connell will be completed as part of the Rigden construction meetings being held on a bi-weekly basis. This task includes time for ACE's project manager and senior engineer to visit the site to conduct construction observation, data collection and coordination on an as-needed basis. A total of six site visits have been assumed for the senior engineer and four site visits have been assumed for the project manager during the approximate 3-month construction period.

Cost..... \$2,000

COST SUMMARY:

Total Labor Cost.....\$29,500

Other Direct Costs..... \$300

Outside Services \$5,200

TOTAL COST.....\$35,000

