

Appendix A

Basic Services of Engineer City of Billings W.O. 17-16 – Fox Pump Station Improvements

Section 1. Engineer's Rights and Duties.

- A. To furnish all labor, materials, equipment, supplies, and incidentals necessary to conduct and complete the Engineer's portion of the project as defined in the scope of work and to prepare and deliver to Billings all plans, specifications, bid documents, and other material as designated herein.
- B. Ascertain such information as may have a bearing on the work from local units of government, utility companies, and private organizations and shall be authorized to procure information from other authorities besides Billings, but shall keep Billings advised as to the extent of these contacts and the results thereof.
- C. Prepare and present such information as may be pertinent and necessary in order for Billings to pass critical judgment on the features of the work. The Engineer shall make changes, amendments or revisions in the detail of the work as may be required by Billings. When alternates are being considered, Billings shall have the right of selection.
- D. Engineer's work shall be in accordance with the standards of sound engineering and present City, State, and National standards and policies currently in use.
- E. Conform to the requirements of the Montana Code Annotated Title 18 "Public Contracts" and more particularly Sections 18-2-121 and 18-2-122, and all other codes of the State of Montana applicable to providing professional services including codes and standards nationally recognized.
- F. The Engineer shall certify with the submission of final plans that the plans are in conformance with applicable sections of Title 69, Chapter 4, Part 5, of the Montana Code Annotated as pertaining to existing utilities.
- G. To perform professional services in connection with the project and will serve as Billings' representative in those phases of the project to which this agreement applies.
- H. Where Federal funds are involved, the necessary provisions to meet all requirements will be complied with and documents secured and placed in the bidding documents.
- I. Submit an estimated progress schedule as to time and costs at the beginning of the work, and monthly progress reports thereafter until complete. The reports will include any problems, potential problems, and delays as foreseen by the Engineer. Reports will be submitted in a timely manner to permit prompt resolution of problems.

- J. Contract administration duties will include review of contractor certified payrolls for wage rate compliance. Discrepancies in certified payrolls will be resolved with the Contractor. A signed Engineer's Payroll Check Sheet (included in the Standard Modifications to MPWSS) will be submitted as proof of this review with one copy of each payroll.
- K. Name a Task Director who shall be the liaison between Billings and the Engineer. For this project the Task Director designated for the Engineer is Casey Hanson, PE working under the Principal-in-Charge, Carl Anderson, PE.

Section 2. Billings Rights and Duties.

- A. To furnish all labor, materials, equipment, supplies, and incidentals necessary to conduct and complete Billings' portion of the project as designated in the scope of work.
- B. Name a Task Director who shall be the liaison between the Engineer and Billings. For this project, the Task Director designated is Will Robbins, working under the City Engineer, Debi Meling.

Section 3. Scope of Work.

The project consists of engineering services for the preliminary evaluation, alternatives analysis, design, bidding phases, and construction for the City of Billings W.O. 17-16 – Fox Pump Station Improvements.

The purpose of the project is to design and perform construction administration for a pump station to replace the existing Fox Pump Station.

The scope of work is summarized below.

TASK 00 - PROJECT MANAGEMENT

Project management for the design and construction phases will include all project coordination between the City and the consultant team members. This management task includes communication of ideas, questions, and issues to ensure the design encompasses the input from the project personnel for both the City and Morrison-Maierle. Project management also includes the effort necessary to control the quality, schedule, and budget of the project.

TASK 10 – ALTERNATIVE ANALYSIS

The alternative analysis will include a planning workshop with the City and the consultant team members. The planning workshop will discuss alternatives presented in the proposal and other alternatives identified in the workshop to further narrow the basis of design. Items discussed will include, but not be limited to, incorporating solar power into the design, incorporating a future room for boosting chlorine, reuse of existing equipment, and options of a pre-packaged pump station versus built in place. Based on the City's decisions from this meeting, the final design concept will be developed. Alternative Tasks are included in this Appendix that are based on the items to be discussed in the planning workshop.

TASK 31 – DESIGN SURVEY

A design survey will be conducted on the City-owned parcel on which the existing Fox Pump Station and Fox Reservoirs lie. Survey will include utility locations as located by Montana One Call and applicable public/private utilities, property lines, structures, and all other information needed for design of the new pump station and water main connection. Topographic survey would also include enough area to incorporate a solar panel design (if it is concluded from the planning workshop that the City wants to proceed with a solar design).

The horizontal and vertical datums for this project shall be approved by the City.

TASK 32 – CONSTRUCTION SURVEY

Provide personnel, equipment, and supplies for construction layout and control. Construction layout shall include, but not be limited to, building layout, measurements, lines, locations, and grades necessary for construction.

TASK 39 – GEOTECHNICAL EVALUATION

A geotechnical evaluation of the pump station site will be completed. A sufficient number of borings will be completed at the new pump station site and will be used to compile the geotechnical information needed to ascertain the soil and groundwater conditions that will be reasonably expected during construction. Test results will include information needed to design the pump station foundation and water main. Also, soil information necessary for structural calculations of the pump station and recommendations for fill material and compaction will be provided. The information will be used in the design as well as provided in the contract documents. Design geotechnical work will include two (2) 18' deep soil borings. Quality assurance density tests, proctors, and concrete testing are included in the construction materials testing scope.

TASK 40 – PRELIMINARY AND FINAL DESIGN

The following work will be performed under this task:

- Prepare preliminary plans at 30% complete and preliminary plans, specifications, and estimate of probable cost at 60% complete for review by the City. An electronic file (PDF) of each review set will be provided to the City for review. In addition, one (1) 22"x34" copy and one (1) 11"x17" copies of 30% plans, and one (1) 22"x34" copy and one (1) 11"x17" copies of 60% plans and specifications will be provided to the City. One copy of the 60% plans will be provided to each utility in the area. The 60% plans provided to the utilities will be annotated with potential conflicts noted as part of the design. Engineer will follow up with the utilities to ensure they received the plans sent to them. Engineer will hold a meeting for utilities to attend to discuss potential conflicts, if any occur.
- Coordinate with permitting agencies and public/private utilities, including MDEQ.

- Assist City with application(s) for all required permits (City Building permits, DEQ, etc.). City will pay respective permitting fees directly.
- Assist City with coordination with utilities for any service hook-ups.
- Hold separate review meetings to review 30%, 60%, and 90% submittals with City staff before development of next stage plan documents.
- Perform field review(s) with City and other agencies.
- Develop 90% plans, specifications, quantity summaries, and estimate of probable cost for final review by City staff. Engineer will meet with City staff to review 90% comments. One (1) 22"x34" copy and two (2) 11"x17" copies will be provided to the City, as well as an electronic file (PDF).
- Seal and sign all final plans, specifications, submitted calculations, and reports with the seal of the Montana licensed Professional Engineer in responsible charge of the work.
- Submit plans and specifications to Montana Department of Environmental Quality for review and approval. Coordinate with MDEQ on any follow-up comments/requirements.
- Plans and specifications for demolition/removal/relocation of equipment in the existing Fox Pump Station, once the new pump station is operational and accepted by the City, are to be included with this project. Engineer will work with the City to develop a list of items to be salvaged by the Contractor and turned over to the City. The building with the existing Fox Pump Station will remain in place.
- Site work, including a gravel parking lot will be included in this design.
- The project will include water main (approximately 100 feet) and all associated connections from the new pump station to the existing distribution system.

The following list describes the criteria used to develop the scope of services and fee estimate.

- This scope assumes a prefabrication build of the pump station skid.
- The City will pay all DEQ review permit fees directly.
- The City will pay all building permit fees.
- The structural, mechanical, and electrical will be based on a structure size determined during design.
- The roof will have a steel joist design with a crane system for pump removal.
- SCADA will be integrated into the City of Billings system. Communication equipment will be mounted on one of the existing Fox Reservoirs.
- This scope includes determining if a new electrical service to the site is required, and if it is, coordination with the utility for the new service. The City shall pay all costs associated with a new service.
- Permanent emergency power will be part of the pump station design. The existing diesel generator is in good condition and it is assumed it will be incorporated into the new pump station. This scope includes verifying the size of the generator is sufficient for the needs of the new pump station and a design to relocate or protect the existing generator (with a block wall or similar). If the existing generator is deemed to be too small, this scope includes sizing and specifying the installation of an adequate sized generator.

Bidding services will be provided as follows:

- Furnish contract plans and specifications in sufficient number for bidding and contracting the project. It is anticipated that twenty-five (25) 11"x17" copies will be required.
- Provide bid advertisement text to City for publication. Submission of the advertisement to publications and the cost for advertising will be responsibility of the City.
- Maintain a plan holders' list.
- Answer prospective bidders' questions in regard to the project.
- Schedule and hold a pre-bid conference with interested contractors and suppliers. Publish minutes and any necessary addenda. Conduct pre-bid field review with Contractors, if necessary.
- Prepare and distribute addendums as necessary.
- Attend bid opening, analyze bid proposals, publish a bid tabulation, and make recommendations on awarding a construction contract.
- Prepare four (4) copies of construction contract documents.
- Plan sales will be credited to this task of the project.

TASK 50 – CONSTRUCTION ADMINISTRATION

Construction administration will include the following tasks:

- Coordinate appropriate quality assurance testing of materials intended for incorporation into the project and require documentation of testing results.
- Provide review of construction to check the Contractor's work for compliance with the drawings, specifications, and other applicable documents, codes or standards. Review of work shall be made on a full-time basis while any major item of work is in progress. Major items of work shall include, but not be limited to, water main installation; subgrade preparation; gravel base course preparation; concrete pouring and finishing; and all piping, electrical, and structural construction for the pump station. The Engineer shall provide a minimum of 48 hours notice for Billings personnel when specific inspections or testing require their presence on the project. Each daily review shall be documented in permanent reproducible form and kept in consecutive order with the project file. Copies of the daily review reports shall be furnished to Billings as requested during construction. Engineer will notify Billings immediately of contract problems or deviation from approved plans.
- Coordinate and administer bi-weekly (or as needed) progress meetings.
- This scope is based on a timeline utilizing a prefabricated pump station skid and includes one (1) full-time resident project representative (RPR) for two and a half (2.5) months over the anticipated duration of the project and approximately 20 hours for punch list items. This scope is based on 460 hours of RPR time.
- Interpret geotechnical test results and recommendations and coordinate with field observations.
- The Engineer shall record the location and depth, where available, of all underground utilities.
- Review the construction operations, prior to the start of work. Engineer shall ascertain that the Contractor has all needed permits to accomplish his work during construction.

- Check shop drawings, samples, equipment, concrete mix design, aggregate, and other data submitted by the Contractor for compliance with drawings and specifications.
- Evaluate and respond to Requests for Information (RFI) from Contractor.
- Prepare change orders.
- Prepare monthly pay estimates and final pay estimates for construction and prepare contract administration forms on a monthly basis. These will be submitted in Billings' approved format.
- Review certified pay-rolls from general contractor and all sub-contractors, and verify compliance with required wage rates.
- Engineer shall provide City with geotechnical testing reports after construction.
- Issue notice to the Contractor to suspend work in whole or part when, in the opinion of the Engineer, and when directed by the Owner, work is not being, or cannot be performed in accordance with the contract documents and specifications.
- Contact Billings for any proposed plan or specification changes when required due to initial design and engineering deficiencies in order to complete the project in its original concept. Plan and specification changes shall be prepared by the design engineer and implemented via change order.
- Prepare and recommend field orders and change orders when necessary due to conditions encountered during construction. Any work resulting in contract overage will be processed by approved change orders using Billings' standard format.

TASK 60 – CLOSEOUT

Closeout services will be provided as follows:

- Following receipt of red-lined drawings from the general contractor and any review comments from Billings, make necessary changes and furnish Billings with record drawings as indicated in Section 2D of Part I of this contract. Record drawings shall include, but not be limited to:
 - Elevations indicating the depth of bury of critical pump station elevations (including, but not limited to water main inverts into the pump station, pump station elevations, and water main connection elevations).
 - All above elevations shall be referenced to a permanent benchmark elevation – clearly shown on the plans.
 - Record drawings and are due within 60 days of Contractor's final payment and before final payment to the Engineer.
- Provide one (1) CD and/or flashdrive with Contractor's submittals.
- Schedule and make final inspection with Billings and certify to Billings all construction items were constructed according to plans and specifications and are acceptable to the Engineer.
- Issue Certificate of Substantial Completion.
- Schedule and make an inspection with Billings prior to the expiration of construction warranty period and provide a certification of final acceptance. If any problems are found, send a list of deficiencies to Billings and Contractor and continue until acceptable.
- Approximately eleven (11) months after construction is completed, a one-year walkthrough will be attended by a representative of the design team with the City. A follow-up letter of findings and recommendations will be provided to the City.

- Based on design information, shop drawings, and as-built information provided by the contractor, prepare an O&M Manual for the pump station. This task includes compiling, organizing, reviewing, and transmitting the information. No custom written operational instructions are anticipated. Two (2) draft copies for review and three (3) final copies of the O&M Manual will be provided to the City.

TASK 88 – QUALITY ASSURANCE

Internal quality assurance will be provided for all reports, plans and specifications furnished to the City or other agencies.

ALTERNATIVE TASKS

The following Alternative Tasks are included in the fee and as scoped below and are based on the alternatives to be presented and discussed in the kick-off meeting with the City. The City will make decisions on these alternative tasks following the kick-off meeting, and will provide written direction if choosing to proceed. Tasks will only be worked on after receiving this written direction from the City.

ALTERNATIVE TASK 41 – SOLAR POWER SYSTEM DESIGN

This alternative task includes design of a solar power system design up to 50kW. Coordination with NorthWestern Energy will also be included with this task item.

ALTERNATIVE TASK 42 – SURGE DESIGN

This alternative task includes a surge mitigation design at Fox Pump Station for Zone 4 North. No surge modeling is included in this scope.