

## Appendix A

### Basic Services of Engineer

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#### 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 Craig Habben working under the Principal-in-Charge, Amanda McInnis.

## 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, design, bidding and construction phases for the City of Billings W.O. 09-19 – Zone 3 East Fox Reservoir Expansion. The purpose of the project is to add additional water storage for the Zone 3 East Pressure Zone and to allow removing the existing reservoir from service for maintenance. The new storage will need to be at least two million gallons (MG) and allow for the existing reservoir or new reservoir to be taken out of service. The tank will be an above ground tank, of a material to be determined during preliminary evaluation tasks, and will be located on the City owned property that the existing tank and pump station sit on. The project will not include modifications to the existing pressure zone hydraulic grade line. The project will be funded with a State Revolving Fund (SRF) Loan.

The scope of work is summarized below.

- Design Report to:
  - Review the need and size for the a 2.0 MG Zone 3E reservoir
  - Evaluate the configuration requirements for proper operation of the new and existing reservoirs
  - Evaluate and select the preferred location for the new reservoir (on existing site)
  - Evaluate mixing options and seasonal operation as they relate to water quality and potential reduction of THM and HAA
  - Evaluate materials of construction options and provide recommendations on acceptable materials and tank types
  - Provide life-cycle costs of tank type alternatives
  - Provide a preliminary construction cost estimate
  - Meet the requirements of Montana Department of Environmental Quality (DEQ) for SRF funding
- Geotechnical investigation of the proposed reservoir location
- Survey of existing site
- New reservoir to be based on the following criteria:

- Reservoir foundation based on slab on grade construction for concrete or ring walls for steel tank type construction.
- Reservoir to be located on existing City property
- New reservoir to match existing reservoir overflow
- Piping and valving to allow for either reservoir to be taken out of service. Series flow will be provided if determined necessary in the Design Report. Existing reservoir will be modified as required if series flow is designed.
- Reservoir to have level instrumentation tied into existing SCADA System.
- Reservoir to include access hatches, vents, overflow, perimeter drain and tank drain.
- Reservoir valves will be contained in an accessible vault, where feasible
- Mixing system will be included if determined to be needed in the Design Report
- Site work associated with new reservoir
  - Interconnects to existing Fox Reservoir depending on final configuration
  - Overflow and drain pipe with outlet structure or connect to existing drain
  - Site grading
  - Storm water regulation, if pertinent
  - Site restoration and seeding
  - Relocation of existing radio tower if pertinent
- Electrical
  - 120 volt power for instrumentation, receptacles and lighting.
- SRF loan assistance
  - Prepare design report and additional information required for loan application. City to complete actual application.
  - Assist DEQ in Environmental Assessment.
  - Include appropriate SRF front-end specifications
  - Obtain design document approval
  - Provide SRF required bidding documents and recommendations
  - Coordinate with DEQ during construction including change order approvals and site visits.
  - Prepare O&M manual and standard operating procedure
  - Provide DEQ as-constructed drawings.
- Public Involvement
  - Develop drawings, renderings and a presentation as needed for informing the neighboring public of the project. Scope is based on one public meeting and preparation.

## **DETAIL SCOPE OF SERVICES**

The scope of services that will be utilized on the Billings Zone 3E Reservoir Expansion project as presented in the summaries for Tasks 100 through 700. The scope of services is organized as follows:

<u>Task Series</u>	<u>Description</u>
100	Project Initiation, Coordination, Deliverables and Management
200	Preliminary Design
300	Final Design

400	Bidding Services
500	Construction Services
600	Operations & Maintenance Manual
700	State Revolving Fund Assistance

## **TASK SERIES 100**

### **101– Project Initiation**

The purpose of this task will be to review project goals and objectives, obtain information on the existing tank, review project schedule and discuss options of the radio tower.

### **102 – Meetings with City Staff**

During the preliminary and final design phases of the project, key members of the Consultant design team will meet with the City staff to review the project.

### **103 – Public Involvement**

HDR will prepare drawings, renderings and a presentation for a public meeting during the preliminary design phase to provide an indication to the public of what the project includes and will look like upon completion.

### **104 – Construction Cost Estimate**

The capital costs for the project will be developed in this task series. Utilizing the finalized basis of design, preliminary drawings and specifications, a preliminary construction cost estimate will be prepared. This information will be used to identify significant variations from budget goals and objectives initially set. Utilizing the final drawings and specifications, a final opinion of construction cost will be prepared.

### **105 – Document Submittals to Owner**

As part of this task, documents developed as part of the project will be produced and submitted to the Owner.

### **106 – Project Management**

Coordinate design team, monitor project status and prepare financial documents.

## **TASK SERIES 200 – PRELIMINARY DESIGN**

This task series will further develop ideas discussed in preliminary meetings on the Zone 3E Reservoir Expansion. Specific areas of concern will be addressed in the investigations, with the feasible alternatives evaluated and recommended improvements identified. The tasks associated with the preliminary design include the following:

### **201 – Develop Tank Alternatives, Configurations and Design Options**

Develop alternatives for implementing the reservoir expansion. Select criteria to be utilized for evaluating alternatives include: cost effectiveness, operability,

maintainability, location (on existing site), reliability, flexibility and water quality. Evaluate each alternative with respect to the selected criteria and finalize selection of preferred alternative.

**202 - Perform Survey Service**

Perform the necessary field surveys for the design of the project.

**203 - Geotechnical Investigations**

A soils subconsultant will perform geotechnical investigations to determine the structural design requirements for new reservoir.

**204 – Review Alternative Evaluation with City and Finalize Selection**

Present alternative evaluations to the City. Finalize evaluation of the alternatives and select a recommended alternative.

**205 - Prepare Design Report**

Prepare schematic and layout drawings for selected alternative. Summarize findings of alternative evaluations in summary form for review by the Owner. Include content to meet requirements of DEQ and SRF loan. Provide internal QC of report and incorporate comments.

**206 – Review Design Report with City and Incorporate Comments**

Provide Design Report to the City for Review. Meet with the City to discuss Design Report and go over comments on the Design Report. Incorporate comments in the Final Design Report.

**TASK SERIES 300 – FINAL DESIGN**

In this task, recommended alternatives identified in the preliminary design will be translated into engineered project elements. The basis of the design will be finalized and drawings and specifications will be prepared. Specific tasks include the following:

**301 - Prepare 95% Drawings**

Utilizing approved layouts identified in the preliminary design, the drawings of the selected tank concept(s) and piping arrangement will be prepared. Electrical and instrumentation drawings will also be prepared.

**302 - Prepare Preliminary Detailed Specifications**

Detailed specifications will be prepared for front-end specifications and technical specifications.

**303 - Perform In-House Review**

Senior technical personnel not directly involved with the project, will review the drawings and specifications and the cost estimate for completeness, accuracy, and constructability.

**304 – Review 95% Documents with the City**

Provide the 95% drawings and specifications to the City and meet with the City to review design and receive comments.

**305 - Prepare Final Drawings**

Incorporate review comments including any design modifications and prepare final drawings for advertising.

**306 - Prepare Final Detailed Specifications**

Incorporate review comments and prepare final specifications for advertising.

**307 – Prepare Building Permit**

Fill out the City’s standard building permit and provide all support documentation to obtain permit. Multiple permits may need to be obtained to maintain the project schedule. The City will pay for permit(s).

**TASK SERIES 400 – BIDDING SERVICES**

**401 – Bidding Administrative Assistance**

Prepare bid documents and distribute to prospective bidders. Answer bidder questions and prepare addendum as needed. Schedule and conduct pre-bid meeting.

**402 – Post-Bid Administrative Assistance**

Receive, evaluate and tabulate bids. Assess completeness of bid. Make recommendations to the City on award of contract. Issue Notice of Award.

**TASK SERIES 500 – CONSTRUCTION SERVICES**

Construction Phase scoping is based on a 26 week active construction period at which time only minor punch list items would need to be completed.

**501 – Construction Initiation Services & Conformed Drawings**

After award of the construction contract, the Consultant shall prepare Contracts, Conformed Documents and conduct a preconstruction conference and prepare minutes summarizing the conference. The consultant will provide the contractor with 6 sets of “for construction” plans and specifications.

**502 – Office Administration and Contractor Coordination**

During the construction phase of the project, the Consultant will provide office assistance to the City on the administration of the project. This effort will include review and preparation of change orders, shop drawing review, interpretation of drawings and specifications, monitoring of compliance with procedural requirements on the project, coordinating with the contractor, preparation of pay estimates, confirmation of certified payrolls, conducting weekly (or as needed) construction meetings, and preparing and distributing meeting minutes.

**503 – Field Services**

The Consultant will provide on-site construction observation services. A resident project representative will be provided for 715 hours (on average, 5.5 hours per day, 5 days per week, including travel time and daily paperwork). The resident project representative will monitor the project for compliance with project plans and specifications. Consultant will provide field staking of new structures and as-built surveying of uncovered utilities in locations not indicated on the drawings. Consultant will provide periodic trips to the site beyond construction meetings. Allowance is included for geotechnical consultation. No testing services are included as these will be provided by the contractor.

#### **504 – Construction Wrap-Up and Acceptance**

Upon completion of the construction of the improvements, the Consultant will schedule and conduct a final project walk-through and assist the City in the final wrap-up of the project, including preparing record drawings, preparation of a punchlist, start-up of facilities, operations and maintenance information review, and recommending final acceptance.

#### **505 – Post-Construction Warranty Services**

Upon final acceptance, the Consultant will provide warranty item consultation, will assist in the eleven-month warranty inspection, and provide warranty follow-up.

### **TASK SERIES 600 – OPERATIONS AND MAINTENANCE MANUAL**

#### **601 – Operations and Maintenance Manual**

To achieve compliance with SRF loan requirements, prepare Operations and Maintenance (O & M) Manuals for equipment and operations associated with this project. Manual will include process description of components for the Fox Reservoirs. A Standard Operating Procedures (SOPS) will also be prepared. Details of existing pump station will not be included but will be referenced when applicable. Two drafts of the manual will be submitted to the City and one to DEQ in Helena for comments. Upon approval of the final version, two (2) copies will be submitted to the City and one (1) to DEQ in Helena.

### **TASK SERIES 700 – STATE REVOLVING FUND**

#### **701 – State Revolving Fund Loan Application**

Provide information as requested to the City to facilitate the City's application for SRF loan.

#### **702 – State Revolving Fund Loan Design, Bidding and Construction Requirements**

- Submit Design Drawings to DEQ in Helena.
- Submit Addendum Items to DEQ in Helena.

- Supply required bidding information to DEQ in Helena.
- Coordinate and submit Change Orders with DEQ in Helena.
- Attend construction walkthroughs with DEQ.
- Submit As-Built Drawings to DEQ in Helena.
- Submit O&M manuals to DEQ in Helena.

Provide other information as requested to the City for meeting the requirements of SRF Loan application.

### **703 – One Year Performance Standards Certification**

Establish Performance Criteria for project components based upon the requirements instituted in the Contract Documents. Upon project components being in service one year, evaluate project components for established criteria and provide certification of meeting the performance standards.