

## 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 design, bidding and construction phases for the City of Billings W.O. 11-11 – Water Treatment Facility Rapid Mix System Improvements. The purpose of the project is to replace existing rapid mix mixers with new mixers that can be used in the future proposed layout of the rapid mix system per the Rapid Mix Study (April 2012, HDR). The new mixers will be larger horsepower requiring electrical upgrades. These upgrades will also be designed to be adaptable to the planned future facilities. Additional improvements to the existing rapid mix chambers will be designed for as bid alternates to be included as budget allows.

The scope of work is summarized below.

- Survey of existing site.
  - Provide any project specific updates to as-builts from L-Structure project.
- Replace mixers:
  - Select mixers that will meet requirements of existing rapid mix chambers with the ability to be modified to meet the requirements of the future chambers.
  - Verify existing mixer supports meet requirements of the new mixers. Replace as needed.
- Rapid Mix Chambers (bid alternate)
  - Provide details for replacing baffles in chambers
  - Provide details and specification for replacing existing grating with grating that is covered.
  - Provide design for closing off the upper portion and provide gate on the lower portion of south end of the south rapid mix compartment
- Site work (bid alternate)
  - Modify site grading to facilitate access to existing rapid mix chambers
- Electrical
  - Provide VFDs to drive new mixers

- Provide new MCC to include main disconnects (two if available space), VFDs and power feed to existing L-Structure MCC. New MCC will be outdoors in an outdoor enclosure.
- Replace conductors as required for new equipment and gear
- Provide SCADA modifications for new VFDs and mixers

**DETAIL SCOPE OF SERVICES**

The scope of services that will be utilized on the Billings Water Treatment Facility Rapid Mix System project as presented in the summaries for Tasks 100 through 400. The scope of services is organized as follows:

<u>Task Series</u>	<u>Description</u>
100	Project Initiation, Coordination, Deliverables and Management
200	Design
300	Bidding Services
400	Construction Services

**TASK SERIES 100**

**101– Project Initiation**

The purpose of this task will be to review project goals and objectives, review project schedule, discuss options for the electrical provisions and kick-off the project internally.

**102 – Meetings with City Staff**

During the design phases of the project, key members of the Consultant design team will meet with the City staff to review the project. Two meetings are planned.

**103 – 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.

**104 – Project Management**

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

**TASK SERIES 200 – DESIGN**

In this task, recommended alternatives identified in the rapid mix study 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:

**201 – Finalize Mixer Selection**

Further develop mixer requirements from the Rapid Mix Study to make final mixer selection. The horsepower and weights can then be used to further evaluate design options.

**202 – Develop Configurations and Design Options**

Evaluate and review with the City options for electrical equipment location, conductor replacement, existing electrical equipment modifications and bid alternates.

**203 - Perform Survey Service**

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

**204 - Prepare 60% Drawings**

From concepts developed in Subtask 202, develop basic design for preferred options for electrical provisions, mixer replacement and mixer chamber modifications. 20 Drawings are anticipated. Review drawings with the City.

**205 - Prepare 95% Drawings**

Incorporate comments from the 60% drawing review and further develop the project details to be included in the drawings.

**206 - Prepare 95% Specifications**

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

**207 - Perform In-House Review and Incorporate Comments**

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

**208 – 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.

**209 - Prepare Final Drawings**

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

**210 - Prepare Final Specifications**

Incorporate review comments and prepare final specifications for advertising.

**211 – Prepare Building Permit**

Fill out the City's standard building permit and provide all support documentation to obtain permit. The City will pay for permit(s).

**TASK SERIES 300 – BIDDING SERVICES**

**301 – Bidding Administrative Assistance**

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

### **302 – 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 400 – CONSTRUCTION SERVICES**

Construction Phase scoping is based on a 16 week active construction period at which time only minor punch list items would need to be completed.

### **401 – 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.

### **402 – 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 response to contractor requests for information (RFIs), 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, review and confirmation of certified payrolls, conducting weekly (or as needed) construction meetings, and preparing and distributing meeting minutes.

### **403 – Field Services**

The Consultant will provide on-site construction observation services. A resident project representative will be provided at 3 hours per day, 3 days per week on average including travel time and daily paperwork. The resident project representative will monitor the project for compliance with project plans and specifications. Consultant will provide periodic trips to the site beyond construction meetings. No testing services are included as these will be provided by the contractor.

### **404 – 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.

### **405 – 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.