

## Appendix A

### Basic Services of Engineer

### W.O. 15-01, Schedule 3, 17<sup>th</sup> Street West Water Main Replacement Project

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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. 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 Mac Fogelsong, PE working under the Principal-in-Charge, Dennis Randall, 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 Randy Straus, PE working under the City Engineer, Debi Meling, PE.

**Section 3. Scope of Work.**

The scope of work covered by this agreement is described hereafter:

The project consists of the design and bidding services for the W.O. 15-01, Schedule 1 - Water Main Replacement which includes one water main within 17<sup>th</sup> Street West from Avenue D to Rimrock Road to the Staples Pump Station, generally following the existing 20-inch diameter route. An alternate route for the new replacement pipe will be considered in Rimrock Road at the intersection of Rimrock Road/17<sup>th</sup> Street West east to Radcliffe Drive and then north in Radcliffe Drive, north and west to the Staples Pump Station. Professional services include design of a water main replacement for the existing 20-inch water main, preparation of contract plans and specifications, contract plan and specification interpretation during construction, review of contractor pay estimates, construction staking, and inspection of construction for these water mains more specifically described below. Engineer will coordinate work efforts with other related improvement projects expected to be completed concurrently in the project area.

**Phase 100. Project Initiation**

- Task 1. Attend meeting with City officials to determine project scope.
- Task 2. Review available information and studies.
- Task 3. Review routes in field walkthrough.
- Task 4. Discuss design basis with the City.

**Phase 200. Preliminary Design Services**

- Task 1. Project management and coordination
- Task 2. Review alignments with respect to other utilities. Review alignment and replacement route potential in Radcliffe Drive. Review alignment with respect to the existing 16-inch parallel water main in 17<sup>th</sup> Street West with local contractors for constructability.
- Task 3. Review existing as-built drawings and water service records provided to Sanderson Stewart by the City.
- Task 4. Review work done to date and determine problems with preliminary alignment.

- Task 5. Research existing City, County, State, and Federal studies and reports to determine potential conflicts.
- Task 6. Based on selected City-performed hydrant flow tests, review pipe sizes and/or hydrant lead sizes. Review City master plan for hydrant deficiencies in the project area that may affect design pipe size(s).
- Task 7. Determine locations where additional right-of-way must be secured and coordinate obtaining necessary construction permits if any.
- Task 8. Review existing valve operation near critical intersections to determine if certain valves require replacement. Estimate, based on valve operation, if Contractor will likely experience significant water flows during construction and present information in bidding documents based on findings. City of Billings shall operate all valves.
- Task 9. Assemble existing available plat, certificate of survey, easement and ownership information along the chosen alignment and draw in existing parcels from plats and field survey.
- Task 10. Attend up to six periodic design review meetings with the City and two design review meetings with MDOT personnel (for Rimrock Road east of 17<sup>th</sup> Street).
- Task 11. Meet with BBWA and Hi-Ditch Officials for ditch crossing requirements. (up to 4 meetings).
- Task 12. Review BBWA Canal Crossing options including boring versus open cut and route across the canal.
- Task 13. Obtain field location of existing utilities and incorporate this information into the construction plans. Utility locates will be requested for the project corridor using the One-Call service and surveyed for the corridor selected by the City.
- Task 14. Perform survey measure downs for existing water, sewer, and storm for 17<sup>th</sup> Street West from Avenue D to the Staples Pump Station including a portion of Rimrock Road east of 17<sup>th</sup> Street West, including Radcliffe Drive. Traffic control included for items out-in-traffic areas.
- Task 15. Set control network for 17<sup>th</sup> Street West from Avenue D to Staples Pump Station, including a portion of Rimrock Road from 17<sup>th</sup> Street to Radcliffe Drive and Radcliffe Drive to Staples Pump Station.
- Task 16. Property corner search for the area described in Task 15.
- Task 17. Field topographic survey of 17<sup>th</sup> Street West from Avenue D to Staples Pump Station, including a portion of Rimrock Road from 17<sup>th</sup> Street to Radcliffe Drive and Radcliffe Drive to Staples Pump

Station. Topographic survey includes up to 4 days of traffic control set-up for 17<sup>th</sup> Street West.

- Task 18. Geotechnical Investigation of 17<sup>th</sup> Street West from Avenue D to Staples Pump Station, including a portion of Rimrock Road from 17<sup>th</sup> Street to Radcliffe Drive and Radcliffe Drive to Staples Pump Station. Begin geotechnical investigation based on alignment as selected by the City. Geotechnical engineering shall include field sampling, laboratory testing and review of subsurface soils to determine appropriate pavement section design alternatives, subgrade treatment, groundwater conditions, and foundations for utility installations. Recommendations associated with crossing the BBWA canal. Recommendations for specific construction materials and groundwater management established in this review will be included in the project plans and specifications. Geotechnical investigation includes traffic control during boring operations. 13 borings about 10 feet deep and two borings 20 feet deep at BBWA Canal.
- Task 19. Miscellaneous geotechnical design review, including geotechnical review of plans and specifications and review of adjacent pipeline/utility stability.
- Task 20. Perform literature review of documented environmental issues (preliminary site analysis) of the project route. No in-field drilling, testing, or environmental sampling is included in this literature review.
- Task 21. Review one trenchless alternate (feasibility level) for replacement of the 20-inch water main in 17<sup>th</sup> Street West.
- Task 22. Review alternate construction timing methods for the project limits (primarily 17<sup>th</sup> Street West and/or Rimrock Road). Review of night work/weekend work, 24 hour 7-day a week work hours). Include findings in memorandum with alternate construction methods from Task 21.
- Task 23. Traffic Analysis of 17<sup>th</sup> Street West from Avenue D to Rimrock Road including Rimrock Road from 17<sup>th</sup> Street to Radcliffe Drive. Begin analysis and data collection of traffic and related issues to determine if they affect alignment or other design factors. Data collection for up to six (6) impacted intersections in one peak hour (AM or PM).
- Task 24. Design of temporary water system performance specifications for all project areas and flushing design for any 20 to 24-inch diameter water main piping. Review how construction start area affects flushing requirements and project feed water.
- Task 25. Design of temporary private fire suppression system performance specifications as required during construction. Meet with City of Billings Fire Marshall to review affected buildings with fire

- suppression requirements, primarily for commercial businesses along 17<sup>th</sup> Street West.
- Task 26. Meet with local contractors and suppliers to discuss constructability and traffic control issues.
- Task 27. Identify potential staging areas, disruptions to private access and parking.
- Task 28. Develop a public involvement plan which shall include an educational outreach component and two (2) public informational meetings. Meet with affected businesses/residential owners and present results and provide design charette at one meeting.
- Task 29. Coordinate the identification and potential relocation of private utilities including, overhead and underground power, cable TV, underground telephone and communications, petroleum oil, and natural gas.
- Task 30. Send preliminary construction plans to the private utilities for review and comment, and hold subsequent coordination meetings with the private utilities to assemble and evaluate comments (up to three (3) meetings).
- Task 31. Identify areas to perform subsurface utility "potholing" at identified pipe line or utility crossings to identify specific pipe elevations or private utility locations. Survey said pipe elevations in the field for incorporation into the design. Scope of work assumes Sanderson Stewart will provide a "vacuum" truck via subcontract to remove material in order to survey said utilities. Scope of work includes up to four (4) full 8-hour days of subcontract "potholing". Temporarily backfill holes with cold-mix asphalt. Provide filling of holes during construction by Contractor with hot-mix asphalt. Scope of work includes traffic control.
- Task 32. Meet with City engineering, and public utilities department (PUD) two times for plan review and water service coordination. Attend one meeting with PUD regarding the Staples Pump Station operation and piping connections.
- Task 33. Prepare preliminary traffic control plans and specifications for the project area and submit for review by the City of Billings and MDOT. Coordinate with other City construction projects known in the vicinity of this project.
- Task 34. Quality control review of plans.
- Task 35. Prepare Preliminary Plans and Specifications (70% design level) using all data gathered and input received.
- Task 36. Prepare opinion of probable cost with 15 percent contingency included.
- Task 37. Submit Preliminary Plans and Specifications (70% design level)

for review to all interested parties as determined by the City of Billings and Sanderson Stewart, to include submittals to the BBWA canal and the Hi-Ditch Company.

Phase 200 Deliverables:

Memorandum Discussing Construction Alternate and Scheduling Alternates for project area, Preliminary Geotechnical Report, Preliminary Alignment and Grade Plans (70%), Preliminary Opinion of Probable Cost with 15% contingency; Deliverables include up to five (5) sets of 24x36-inch size preliminary plans and specifications.

**Phase 300. Final Design and Bidding Services**

- Task 1. Project management, and coordination.
- Task 2. Assemble all preliminary plan review comments and redlines for incorporation into final plans.
- Task 3. Match street restoration grades with proposed development in adjacent properties as required. Design new ADA Ramps where required (Up to 8 ramps).
- Task 4. Coordinate final design with other public utilities within the selected project corridor.
- Task 5. Incorporate recommendations of geotechnical report into final plans and specifications, including the QA/QC recommendations for materials testing during construction.
- Task 6. 17<sup>th</sup> Street West: Incorporate recommended traffic control plans into final plan set. Plans shall include required detours, required signing, and applicable construction phasing.
- Task 7. Complete final plan and specification sets for submittal, review, and approval by the City of Billings and the Department of Environmental Quality. The City shall pay DEQ review fees direct to DEQ (fees not included in this contract).
- Task 8. Apply for permits, licenses, and approvals necessary to construct the project.
- Task 9. Submittal of two (2) copies of the project specifications, two (2) half-size plan sets, contract-bidding documents, design report and certified water and sewer checklist to Montana Department of Environmental Quality (MDEQ) for approval.
- Task 10. Receive final redline comments from the City and the Department of Environmental Quality and incorporate said comments in final plans and specifications. Final plans and specifications will be prepared in accordance with the Montana Public Works Standard Specifications, Sixth Edition, April 2010 and the current adopted City of Billings Standard Modifications to the Sixth Ed. Stamp and sign all plans and specifications with seal of Professional Engineer in charge.

- Task 11. Calculate bid quantities and prepare bid proposal and contract documents. Update Engineer's Opinion of Probable cost based upon final plan quantities. This scope of work anticipates up to two bid packages—one for a BBWA canal crossing in early Spring of 2015 and a second contract in the summer of 2015 for the remainder of the water main work.
- Task 12. Assist in preparation of bid advertisement and provide documents to prospective bidders and suppliers. Bid advertisement text will be provided to the City for publication. Up to 2 bid packages.
- Task 13. Attend up to two pre-bid meetings.
- Task 14. Answer bid questions and issue addendums as required (assumes up to two contracts).
- Task 15. Attend bid opening, tabulate bids, and make recommendation to the City for award. (Assumes up to two contracts).
- Task 16. Assist in City procurement of final contract agreement, verification of insurance and bonds, and issue notice to proceed. (Assumes up to two contracts).
- Task 17. Quality control review.

Phase 300 Deliverables:

Plans and specifications for review and bidding, Final Opinion of Probable Cost, Bid Tabulations, and Recommendation of Award.

**Phase 400. Construction Services and Contract Administration**

- Task 1. Project management and coordination.
- Task 2. Schedule and conduct pre-construction conference prior commencement of work at the site. Issue pre-construction meeting minutes to Contractor and City.
- Task 3. Implement and coordinate QA/QC testing program for materials testing developed in the design phase of the project.
- Task 4. Take preconstruction photos of proposed work areas.
- Task 5. Prepare weekly website informational update content for distribution to the City of Billings. Sanderson Stewart will maintain a project website for project construction updates.
- Task 6. Review Contractor shop drawing submittals in conformance with the information given in contract documents. Also review valve requests and temporary water plans. Review does not include review of any dewatering plans, and said review shall not extend to Contractor means, methods, techniques, sequences, or procedures of construction or Contractor safety programs.
- Task 7. Attend weekly construction meetings during construction, including up to 6 meetings for a separate BBWA canal crossing

project.

- Task 8. Make visits to the site at intervals appropriate to various stages of construction to observe as an experienced and qualified design professional the progress of the Contractor's executed work. Visits by Engineer shall be limited to spot checking and similar methods of general observation of the work as assisted by the Resident Project Representative.
- Task 9. Meet as required during construction with businesses and affected residential owners. Provide up to 1.5 hours per week for business or residential meetings for a 150-day construction contract.
- Task 10. Attend random business/public meetings during construction. Up to 2 meetings.
- Task 11. Respond to Contractor requests for information. Issue necessary clarifications and interpretations of the Contract Documents as appropriate consistent with the intent and reasonably inferable from the Contract Documents. Engineer may issue Field Orders authorizing minor variations in the Work from the requirements of the Contract Documents.
- Task 12. Recommend and prepare Change Orders and Work Change Directives to City as appropriate.
- Task 13. Establish schedules, chain-of-command, and communication priorities for all parties involved in construction.
- Task 14. Provide field staking to give the Contractor measurements, lines, locations, and grades necessary for construction. Field staking shall include grade stakes or slope stakes for excavation and fill, subgrade bluetops (if requested), base gravel bluetops (if required), off-sets and grades for the water main and appurtenances thereto, off-sets and grades for manholes and inlets, off-sets for curb and gutter, and miscellaneous concrete replacement (if required).
- Task 15. Coordinate and schedule quality control testing during all phases of construction.
- Task 16. Provide full-time construction observation during construction utilizing a Resident Project Representative (RPR) to assist Engineer in observing progress and quality of the Work assuming a separate 30 calendar day construction contract for a BBWA Canal Crossing Contract and a 120 calendar day construction contract for the remainder of the project work. RPR shall report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor said clarifications and interpretations as issued by Engineer. RPR will prepare daily inspection reports, and daily diaries for the term of construction activity.

In addition to review of major work items, inspection activities shall include general review of traffic control set-up and sediment and erosion control. Major work items include, but are not limited to: water, sanitary sewer, storm drain, irrigation utilities, subgrade preparation, gravel base course preparation, concrete work, paving, signals, lighting, and striping. No night inspection is included in scope of work.

- Task 17. Review and recommend payment and contract requests in accordance with City of Billings format.
- Task 18. Coordinate daily traffic control changes and prepare media releases as required.
- Task 19. Keep track of actual in-place materials, locations, and quantities and transfer to field plans for preparation of record drawings.
- Task 20. Coordinate testing of final water installations and recommend approval or adjustments as necessary.
- Task 21. Conduct final inspection and assist in project closeout. Engineer will provide two (2) paper copies and one (1) pdf file of the record drawings based on record drawings of the Contractor with:
- Offset distances measured from the centerline of the right-of-way to all public water mains.
  - Invert elevations marked for each manhole, structure, and each connection thereto, as well as at the end of each stubbed water main, stubbed water service line and stubbed fire line.
  - Locations of water and sewer services (if any) based on measurements from property lines.
  - Elevations indicating the depth of bury of all public water mains. These elevations shall be shown at each street or right-of-way intersection and at such intervals along the public water mains as may be deemed appropriate by the City Engineer.
  - Permanent bench marks shown.
- Task 22. Prepare reproducible construction record drawings for City of Billings files from records prepared by Contractor.
- Task 23. Conduct one-year inspection with City of Billings staff and Contractor.

#### Phase 400 Deliverables:

One (1) 11x17-inch set of record drawings submitted to the Department of Environmental Quality, two (2) sets of 24x36-inch record drawings provided to the City of Billings, one (1) set of electronic files (pdf format) provided to the City of Billings, one (1) copy of materials and water main testing records, and final record of project construction cost.

## Appendix B

### Methods and Times of Payment W.O. 15-01, Schedule 3, 17<sup>th</sup> Street West Water Main Replacement Project

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#### Section 1. Payments for Basic Services.

Billings shall authorize payment to the Engineer for services performed under Appendix A of this Agreement. Partial payment shall be due the Engineer upon receipt of the Engineer's pay estimate, said estimate being proportioned to the work completed by the Engineer.

Billings shall deduct five percent (5%) from each monthly pay estimate to be held until the completion of the final scope of work. The final payment shall be made only after acceptance of final documents by Billings, and determination that the scope of work has been satisfactorily completed.

- A. For services rendered prior to construction, Appendix A, the Engineer shall be paid based upon actual time accrued, but not to exceed \$551,055.00 (Five Hundred Fifty One Thousand Fifty Five and 00/100 dollars) based on the following tasks:

Phase 100	Project Initiation	<u>\$4,920.00</u>
Phase 200	Preliminary Design	<u>\$210,705.00</u>
Phase 300	Final Design	<u>\$89,520.00</u>
Phase 400	Construction/Contract Administration	<u>\$245,910.00</u>

- B. Final payment shall be the above stated basic fee less all previous payments.

#### Section 2. Payments for Extra Services when Authorized by Billings.

Work requests made or conditions identified by interested groups at the agency or public meetings which are beyond the scope and intent of this project shall be paid for on an hourly basis at the applicable fees in Appendix D or by an addendum to the agreement.

#### Section 3. Corrections.

Costs of Billings' work that is required for the purpose of correcting the Engineer's work shall be deducted from any payments due the Engineer if the Engineer fails to make the required corrections.

#### Section 4. Fee Increases

For contracts and services that are expected to require more than one (1) year to complete, the above stated basic services payments may be reviewed and adjusted annually by mutual agreement of the parties, based upon documented evidence that the Engineer's costs and hourly rates as shown in Appendix D have increased for all comparable clients.

## **Appendix C**

### **Additional Services of Engineer W.O. 15-01, Schedule 3, 17<sup>th</sup> Street West Water Main Replacement Project**

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Extra Services of the Engineer will be paid only with written prior authorization by Billings.

- A. Requests made or conditions identified which are beyond the scope and intent of the services identified under Appendix A.

## **Appendix D**

### **Schedule of Professional Fees**

#### **W.O. 15-01, Schedule 3, 17<sup>th</sup> Street West Water Main Replacement Project**

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Current agreements for engineering services stipulate that the standard hourly rates are subject to review and adjustments. Hourly rates for services effective on the date of this Agreement are included below.

The itemized schedule provided below includes direct labor costs, normal payroll and overhead costs, transportation, furnishing equipment and materials normally required for performance of the work and reasonable profit. Direct project costs not itemized herein shall be paid for at actual cost.

Rate changes may be made to the fee schedule by the Engineer to reflect increased salaries and other business costs. Engineer shall submit a revised rate schedule at the time of the change if requested by the Owner. Rate schedule changes made by the Engineer during the term of this Contract shall not alter the maximum project professional fee set forth in the Contract. Changes that alter the maximum project professional fee are covered in Appendix B.

The cost of Professional Liability Insurance coverage is included in the hourly rates of personnel.

## CHARGE OUT RATES EFFECTIVE JUNE 1, 2014

At Sanderson Stewart, we strive to provide great customer service and value. While we can offer the traditional method of billing by hourly charge rates, we strongly encourage our current and prospective clients to consider a fixed-fee arrangement in determining your overall project compensation. Fixed-fee projects can result in substantial savings over our posted hourly billing rates and provide a level of certainty at the outset of your project.

### STAFF PERSONNEL SERVICES

Expert Witness/Special Consultant	\$ 250.00 /hour
Principal	\$ 180.00 /hour
Senior Engineer	\$ 150.00 /hour
Project Manager	\$ 140.00 /hour
Project Engineer	\$ 105.00 /hour
Staff Engineer	\$ 90.00 /hour
Field Engineer	\$ 90.00 /hour
Engineer Intern	\$ 65.00 /hour
Senior Environmental Scientist	\$ 150.00 /hour
Land Planner/Landscape Architect	\$ 115.00 /hour
Landscape Designer	\$ 80.00 /hour
Senior Professional Land Surveyor	\$ 125.00 /hour
Professional Land Surveyor	\$ 105.00 /hour
Staff Surveyor	\$ 95.00 /hour
Field Survey Technician	\$ 75.00 /hour
Marketing Director	\$ 120.00 /hour
Graphic Artist	\$ 100.00 /hour
Photographer	\$ 180.00 /hour
Designer	\$ 85.00 /hour

Web Developer	\$ 80.00 /hour
CADD Technician	\$ 75.00 /hour
Senior Construction Engineering Technician	\$ 105.00 /hour
Construction Engineering Technician	\$ 75.00 /hour
Construction Inspector	\$ 90.00 /hour
Project Administrator	\$ 65.00 /hour
Administrative/Clerical	\$ 65.00 /hour

### SURVEY CREW SERVICES

1-man Crew/2-man Crew	\$ Per Job
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### OUTSIDE CONSULTANTS

- 1) At cost if independently billed direct to client.
- 2) Cost plus 5% if billed through us.

### INDEPENDENT LABORATORIES

- 1) At cost if independently billed direct to client.
- 2) Cost plus 5% if billed through us.

### ADMINISTRATIVE EXPENSES

Administrative expenses (including copies, prints, phone, postage, materials, and travel) based on professional services only 3.5% \*

\* *unless modified by contract*

## Appendix E

### Project Schedule W.O. 15-01, Schedule 3, 17<sup>th</sup> Street West Water Main Replacement Project

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Based on a notice to proceed by Billings date no later than October 27, 2014, the completion date for the Engineer's work through final design shall be:

1. Preliminary Engineering Services (30% Design): December 12, 2014
2. Preliminary Engineering Services (70% Design): January 30, 2015
3. Preliminary Engineering Services (90% Design): February 27, 2015
4. Final Engineering Services (100% Design): March 16, 2015
5. Construction Services to be based on Contractor Schedule.

Delays affecting the completion of the work within the time specified of more than ninety (90) days, not attributable to or caused by the Parties hereto, may be considered as cause for the renegotiation or termination of this Contract.

If the Engineer is behind on this Contract due to no fault of Billings, then the Engineer hereby acknowledges the right of Billings to withhold future Contracts to the Engineer in addition to any other remedy until this Contract is brought back on schedule or otherwise resolved.

## Appendix F

### Certificate(s) of Insurance

### W.O. 15-01, Schedule 3, 17<sup>th</sup> Street West Water Main Replacement Project

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Attach Certificate(s) of Insurance