

## Appendix A

### Basic Services of Engineer City of Billings W.O. 17-12 – Landfill Drop-Off Facility

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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 Tim Erickson 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, alternatives analysis, design, bidding phases, and construction for the City of Billings W.O. 17-12 – Landfill Drop-Off Facility. Construction Administration is not included in this original contract, but will be added later by amendment at the conclusion of the Alternatives Analysis.

The purpose of the project is to construct a waste drop-off facility within the Billings Regional Landfill ("Landfill") to provide a place for all Landfill customers—the general public as well as commercial—to discharge garbage and other waste materials without having to traverse the entire landfill site. The facility needs, size, location, operations, overall function, safety and maintenance will be determined through an alternatives analysis process.

The project also includes design and construction of a new maintenance building within the Landfill. The new maintenance building will be used by Solid Waste personnel to perform routine maintenance and service on Landfill equipment. The building will be used to store temperature sensitive equipment, as well as house a lunch/break room and locker room for the Landfill employees. The maintenance facility needs, size and location will be determined during the alternatives analysis phase of the project.

The new facilities will be designed by July 2018, with construction targeted to begin in Fall 2018.

The scope of work is summarized below.

- The project will begin with an alternatives analysis to develop, assess, and present viable options for a waste drop-off facility.
  - Potential alternatives could involve location within the Landfill, equipment used within the facility, operations methods to achieve maximum efficiency, etc.
  - The objective is to provide a place for all Landfill customers—the general public as well as commercial—to discharge garbage and other waste materials without having to traverse the entire landfill site.

- The goal of the alternatives analysis will be to develop various layouts with up to four options to meet the objective within budgetary limits (assumed to be \$15.9 M for construction).
- The alternatives analysis will include an assessment of the use of grinders/shredders. If use of grinders/shredders is an approved alternative, there must also be provisions to keep the facility operating if/when grinders are out of service for any reason.
- Customer traffic must be able to keep flowing safely while Solid Waste staff performs their work.
- Separation between residential and commercial customers will be provided.
- The facility will include drop-off locations for the separation of municipal solid waste (MSW), construction and demolition (C&D) material, yard waste/brush (compost), metal, aluminum, paper, cardboard, white goods, and other materials.
- The drop-off facility will be designed to accommodate current and future customer traffic and the associated waste volumes. City will provide recent data to assist with determining traffic and waste volumes.
- The drop-off facility will be designed and constructed to allow expansion for future growth.
- The project also includes design and construction of a new maintenance building within the Landfill.
- The pad on which the building is built must be capable of handling the landfill compactor driving on it.
- Provide engineering design services including civil, structural, mechanical, electrical and architectural.
- Provide assistance in development of application and submittal materials for the City's use in obtaining the following permits:
  - Building Permits
  - Modification to City's Solid Waste Management License with Montana DEQ.
  - Operations Plan Amendment – Montana DEQ
  - Environmental Assessment (EA)
  - Others as identified during design
- Provide assistance, if necessary, for coordination with utilities (i.e. NorthWestern Energy, MDU).
- Provide bidding support services
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Items not included in scope of work:

- Pre-purchasing of equipment
- Public education for use of the facility
- Startup, training and O&M
- Facility operations assistance

## DETAILED SCOPE OF SERVICES

The scope of services that will be utilized on the Landfill Drop-Off Facility project is presented in the summaries for Tasks 100 through 600. The scope of services is organized as follows:

| <u>Task Series</u> | <u>Description</u>   |
|--------------------|--|
| 100                | Project Initiation, Coordination, and Management             |
| 200                | Alternatives Analysis – Programming Workshop                 |
| 300                | Preliminary Design Phase                                     |
| 400                | Final Design   |
| 500                | Regulatory Approvals/Permitting                              |
| 600                | Bid Phase  |
| 700                | Construction Phase ( <i>scope to be added by amendment</i> ) |

### **TASK SERIES 100 – PROJECT INITIATION, COORDINATION, AND MANAGEMENT**

#### **101 – Project Initiation**

The purpose of this task is to kick off the project externally and internally. A project management plan (PMP) and all the support paperwork will be developed for all team members to have available to understand the project, the project team, and the project requirements. The PMP is updated with significant changes in the project.

#### **102 – Project Kick-Off Meeting**

The project will be kicked off with the City including key members of the Consultant design team and pertinent staff from the City to review the facility needs, as well as the project schedule and the process for completing the Drop-Off Facility design and engineering.

#### **Deliverables:**

- Meeting with City, agenda and meeting minutes.

#### **103 – Project Management**

As part of this task, the Engineer's Project Manager will lead coordination of the project team with the City as well as supervise the project team. Project Manager and Accountant will monitor project status, maintain project schedule and prepare financial documents.

#### **Deliverables:**

- Monthly Invoices
- Project Status Reports

#### **104 – Project Meetings**

Attend project and design review meetings with City Public Works and Solid Waste Staff. This subtask does not include meetings for the alternatives analysis. Refer to subtask 202 and 203 for alternative analysis project meetings.

- Participate in up to 4 design meetings to review specific design issues
  - In-person design meetings will include Project Manager, Design Manager, and up to two other project engineers.
  - Conference call/video conference for design meetings to be attended by Sr. Technical Advisor, and up to two other discipline leads.

- Participate in monthly (or as needed) project status meetings between HDR Project Manager, City Project Manager and Solid Waste Superintendent.

**Deliverables:**

- Meeting minutes

**TASK SERIES 200 – ALTERNATIVES ANALYSIS**

Determine current and future waste quantities; transfer technology; materials storage requirements; operations; siting; future expansion; safety; maintenance/office spatial requirements; and aesthetics. The alternatives analysis consists of two separate in-person meetings; a Planning Workshop and a Design Charrette. The outcome of the alternatives analysis will be a Design Basis Report for City review and approval.

**201 – Data Request**

Prepare initial data request for City. Information of interest will include previous studies, materials processing information, geotechnical reports, survey data, fire main pressure and flow test data, population projections, etc.

**202 – Planning Workshop**

Conduct a planning workshop with representatives of the HDR Team and City. Discussion elements will include:

- Material tonnage data and projections
- Components to be recovered
- Desired level of equipment and human labor force to be utilized
- Materials storage and load out requirements
- Education/training area requirements
- Traffic and parking
- Fire Suppression
- Administration/office area spatial requirements
- Facility and site aesthetics

**Assumptions:**

- The planning workshop will be conducted in a single day.
- A design charrette to review alternatives will be conducted 2-3 weeks after the planning workshop.

**Deliverables:**

- Planning workshop PowerPoint presentation
- Facility planning checklist
- Workshop agenda and meeting notes

**203 – Design of Alternatives and Design Charrette**

Conduct a design charrette with representatives of the HDR Team and City to review and discuss options and select preferred option for design development. Preliminary design activities for the design charrette include:

- Develop conceptual facility arrangement, including future modification/addition to accommodate growth.

- Evaluate traffic patterns, existing roadway network and access. Determine structural, electrical, ventilation, fire suppression, water plumbing, mechanical system and physical requirements.
- Facility Siting Analysis including landfill capacity impacts, traffic, grade, drainage and design life.
- Develop preliminary site layout drawings incorporating site roadways, parking, grading and drainage, utilities, erosion control, and stormwater management.
- Prepare block layout floor plans showing spatial requirements, functional areas and relationships.
- Develop preliminary building elevations and sections; and prepare a general discussion of all major subsystems.
- Develop an Engineer's opinion of probable construction cost.

The discussion during the charrette will include the following to allow for selection of a preferred site plan:

- A description of the option and why this approach was taken
- An opinion of design & construction costs
- Anticipated operation and maintenance (O&M) cost estimate
- Equipment replacement life cycle and annual costs
- An explanation of benefits and deficiencies of each option

**Assumptions:**

- The design charrette will be approximately 3 weeks after the planning workshop.

**Deliverables:**

- Design charrette PowerPoint presentation
- Charrette agenda and meeting notes

**204 – Basis of Design Report**

Prepare Basis of Design Report that identifies key criteria for design with sections to address: Process Design, Site Design, Architectural, Structural, Electrical/I&C, Plant Staffing, Permitting Issues and Requirements, applicable standards and code requirements, operational requirements including anticipated traffic and materials, and an opinion of probable construction cost.

**Deliverables:**

- Basis of Design Report including preliminary site layout drawing(s) for selected option; block layout floor plan; building elevations and sections; subsystems descriptions; permitting requirements; and preliminary opinion of probable construction cost.

**TASK SERIES 300 – PRELIMINARY DESIGN PHASE**

This task series will further develop recommendations from the Alternative Analysis to a 30% level design. The tasks associated with the preliminary design include the following:

**301.1 – Geotechnical Investigations**

HDR will contract with Tetra Tech for the following geotechnical engineering services:

- Perform site field investigation

- Perform the necessary soil boring for new building construction, building addition, paving and miscellaneous site work
- Perform laboratory soils testing and analysis
- Determine the characteristics of the subsurface materials

### **301.2 – Geotechnical Report**

Prepare a geotechnical report sealed by a registered professional engineer containing recommendations on pavement design, foundation design and related construction recommendations.

#### **Assumptions:**

- The construction contractor will be required to identify a suitable borrow source for any off-site fill required.
- Tetra Tech will provide the geotechnical engineering services for this project.
- Tetra Tech will undertake investigation to identify subsurface utilities prior to performing any exploratory borings.
- Environmental evaluations such as site contaminations, wetlands, cultural resources and threatened and endangered species, if encountered, will be discussed with the City to determine the course of action. For the purpose of this scope, environmental evaluations and remediation are not anticipated, and therefore, not included.

#### **Deliverables:**

- Two copies of a geotechnical report defining extent of investigation, testing results, subsurface information (obtaining from the investigations) and providing design recommendations.

### **302.1 – Site Survey**

HDR will contract with Territorial Landworks for the following surveying services. The surveying services will include topographic and location surveying in the following areas:

- Establish three (3) benchmarks for use in subsequent construction
- Site topography at 1 foot contours
- Include up to 10 acre footprint in topographic survey
- Elevations and locations of all known existing structures
- Elevations and location for all existing drainage structures
- Identify the location and type for all known utilities, including all inverts and materials
- Incorporate locally available information on property boundaries
- Prepare survey topographic signed and sealed by a licensed land surveyor
- Insert topographic map information into overall facility base map

Existing survey information from previous projects at the landfill will be utilized to assist with alternatives analysis and other design considerations.

### **302.2 – Aerial Survey**

HDR will contract with Flight Evolved to perform an aerial survey of the landfill site. Included will be high resolution aerial photography to assist with siting of the drop-off facility. Other benefits of the aerial survey include yearly volume reporting and thermal imagery of the Construction & Demolition cell to identify potential underground fires.

**Assumptions:**

- Includes coordination with aerial company and inclusion of new data into existing site CADD mapping.

**Deliverables:**

- Site topography in AutoCAD (specify format) 2016 compatible
- Montana State Plane coordinate system NAD 83
- Aerial survey (LIDAR) with photography

**303 – Preliminary Engineering**

Develop recommendations from the Alternative Analysis to a 30% level design for the Drop-Off Facility and Maintenance Building. The subtasks associated include:

- Site civil design including grading, paving, and utility plans
- Electrical, mechanical, structural and architectural design of the facilities
- Hydrology and hydraulics
- Foundation recommendations from geotechnical investigations
- Update Basis of Design Report to reflect changes
- Prepare 30% opinion of probable construction costs (including 25% contingency)
- Prepare table of contents for anticipated specifications
- Develop 30% level BIM model of the drop-off facility (no hardcopies of design sheets to be provided)
- Schedule and conduct 30% design review meeting with City Public Works and Solid Waste staff
- Provide BIM model to the City for review of basic layouts of new facilities at the 30% level
- Conduct 30% review meeting with City to present design and receive comments
- 30% design will be used for DEQ licensing application

**Assumptions:**

- Utility Design assumes a cistern/holding tank for water/wastewater.
- Design does not include water main/supply line from existing City system.
- Building fire protection system design will be based on providing a standpipe system or water storage tank that a fire truck can connect to for water supply. The fire protection system will be a dry-pipe system.

**Deliverables:**

- 30% BIM model (Navisworks reader software for model viewing and communication)
- 30% estimate of probable construction costs
- Revised Basis of Design Report

## **TASK SERIES 400 – FINAL DESIGN**

In this task, the Preliminary Design will be developed into more detailed engineered project elements to 60%, 90% and Final Design levels. Specifications will be prepared for 60% and 90% review and then finalized for bid. Specific tasks will include the following:

### **401 – Prepare 60% Design**

The design and BIM models will be further developed for all disciplines providing site civil, parking lot and roadway design, storm drain and underground utilities, structural sizing, equipment location, and major electrical and mechanical locations.

- Prepare 60% drawings
- Prepare engineering analysis and calculations
- Develop BIM model to 60% level
- Prepare 60% opinion of probable construction costs (including 20% contingency)
- Prepare draft project specifications
- Schedule and conduct 60% design review meeting with City Public Works and Solid Waste staff.

#### **Deliverables:**

- 60% plans and estimate
- 60% BIM model (Navisworks reader software for model viewing and communication)

### **402 – Prepare 90% Design**

The design and BIM models will be further developed for all disciplines from comments provided at 60% design review and refinements to the overall facility design.

- Prepare 90% drawings of Landfill Drop-Off Facility and Maintenance Building
- Update engineering analysis and calculations
- Develop BIM model to 90% level
- Prepare 90% opinion of probable construction costs (including 10% contingency)
- Prepare detailed specifications suitable for bidding and construction. These detailed specifications will be incorporated with the City's front-end documents.
- Schedule and conduct 90% design review meeting with City Public Works and Solid Waste staff.

#### **Deliverables:**

- 90% plans, specifications and estimate
- 90% BIM model (Navisworks reader software for model viewing and communication)

### **403 – Finalize Design**

Based on review comments, finalize plans and BIM model. Finalize project specifications.

#### **Deliverables:**

- Bid Documents for advertisement. 3 sets (half-sized drawings and specifications) for the City and one set for each plan room.

#### **Assumptions:**

- City will provide electronic files of front-end documents to incorporate into bid documents.
- Documents developed in this task will also be used to support permitting efforts.

- HDR will coordinate with utility companies to determine existing services and project needs/upgrades.
- Utility design assumes a cistern/holding tank for water/wastewater.
- Design does not include water main/supply line from existing City system.
- Paved roadways are anticipated and would be used in all exterior areas unless gravel paving is specifically requested by the City.
- Building fire protection system is anticipated to be dry-pipe style. HDR will prepare drawings and specifications to identify the category and density of the specific building area/structures requiring protection for a licensed contractor to provide detailed routing and installation information for HDR's review and acceptance.
- No major changes in the project design concepts will occur following the Basis of Design Report. Only minor changes and refinements will follow submittal of the 30%, 60% and 90% review documents.
- HDR standard specifications (6-digit) will be utilized and front-end documents will be developed using modified Engineers Joint Contract Documents Committee (EJCDC) documents.
- Design drawings will be prepared in AutoCAD Civil3D and Revit.

## **TASK SERIES 500 – REGULATORY APPROVALS/PERMITS**

Provide assistance in development of application and submittal materials for the City's use in obtaining required permits for construction activities.

### **501 – Building Code Approvals and Permit**

- Attend a pre-application meeting with code officials to determine the applicable code requirements and submittal review requirements for the Drop-Off Facility and Maintenance Building.
- The meeting with key building and fire code officials will serve to confirm applicable occupancy classifications, fire protection requirements and obtain clarifications and interpretations on key code requirements affecting the facility structures.

### **502 – Montana Department of Environmental Quality Permits**

- Attend a pre-application meeting with DEQ to discuss conceptual design and confirm the state submittal requirements for the proposed facilities.
- Prepare and submit a processing facility license modification application for the facility, including required drawings as required by Montana DEQ.
- Operations Plan Amendment – Update for inclusion in License Application
- Environmental Assessment (EA)
  - Preparation of License Application and Supporting Documentation including draft desktop Environmental Checklist
  - Prepare responses to DEQ review
  - Conduct one (1) public meeting, if necessary

### **Assumptions:**

- EA and Permits to Montana DEQ will be submitted near 30% design level.
- City will submit completed permit applications and associated permit fees to public agencies.

- No supplemental (special) drawings will need to be prepared for permit applications. Plan drawings from the plan set will be used to support the permitting application.
- City personnel will attend meetings with the permitting agency officials.
- Drawings can generally be submitted for review at the 90% completion level for major permit reviews.

**Deliverables:**

- Minutes of meetings with Building Code and Fire Officials
- Building Code Plan Review Submittal
- City of Billings Temporary Use Permit (if necessary)
- Draft Environmental Assessment including required drawings/plans
- Final Environmental Assessment addressing comments from public will be prepared by the DEQ as part of the licensing action
- DEQ permit application including required drawings and plans
- Draft applications will be electronic .pdf files. Six (6) hardcopies of DEQ permit will be provided for Final submittal to DEQ by the City.

**TASK SERIES 600 – BID PHASE**

**601 – Bidding Administrative Assistance**

Produce and distribute bid documents to owner, prospective bidders and plan rooms. Create and maintain a plan holders list. Answer bidder questions and prepare addendums as needed. Conduct pre-bid meeting. Attend Bid opening.

**Deliverables:**

- Bid Documents, Advertisement, Pre-Bid Meeting Minutes and Addendums.

**602 – Post-Bid Administrative Assistance**

Receive, evaluate and tabulate bids. Assess completeness of bids. Review qualifications of bidders. Check references for two lowest bidders. Make recommendations to the City on award of contract.

**Deliverables:**

- Summary of Bidder Qualifications and Recommendation of Award.

**TASK SERIES 700 – CONSTRUCTION PHASE**

Scope details to be added by amendment at the conclusion of the Alternatives Analysis.