

Shiloh Conservation Area

Final Design and Construction Administration

SCOPE OF WORK

Introduction

The following Scope of Work describes the tasks that will be performed to complete final design and construction administration for the Shiloh Conservation Area.

This Scope of Work is guided by the work completed during the Preliminary Design phase of this project. The results of the preliminary design are documented in the DRAFT Preliminary Design report dated August 2012. Additional flow measurements, water quality sampling, and water table monitoring will be completed as part of the Preliminary Design phase to add to the existing data sets. Completion of these preliminary design elements will be performed concurrent with the initiation of Final Design. The Scope of Work is divided into the following components:

Final Design

- Project Management and Partner Coordination
- Final Design Surveys
- Final Hydraulics Analysis and Design
- Final Wetlands Design
- Final Landscape Design
- Construction Drawings
- Final Bid Packages

Construction Administration

- Bidding and Preconstruction Services
- Construction Administration
- Record Drawings and Project Completion

FINAL DESIGN

Project Management and Coordination

Provide project management and internal quality assurance. Provide contract administration, budget tracking and invoicing as well as general coordination through conference calls and correspondence to maintain close communication among the interdisciplinary design team and the City. Meet with agencies such as Montana Fish, Wildlife and Parks to present project concepts and refine criteria for final design. Meet with permitting agencies such as the Corps of Engineers to support environmental compliance. Meet with the City of Billings to discuss planned conservation area maintenance in order to integrate that information with the maintenance and operations plan for wetlands and natural areas. Participate in coordination meetings with the various project partners. Attend 30% and 70% design review, and other necessary design review and coordination meetings with City staff.

Final Design Surveys

Conduct field design surveys within the project limits. Data collection will include establishment of permanent horizontal and vertical control, topographic features, existing utilities and existing property pins. Utilize the One-Call service to locate and demarcate buried utilities for survey. Field survey data will be used to develop project base mapping. Perform research to verify existing right-of-way locations utilizing platted information, ownership records, and found property pins. Incorporate information into base mapping. Determine locations where additional right-of-way or easements must be secured by the City or sold to Northwestern Energy.

Final Site Layout and Permitting

Perform final StormNet modeling of flow routing through the channels, ponds, and wetlands of the proposed Shiloh Conservation Area. Perform final hydraulic analysis and design of the various hydraulic channels and structures required to convey flows and control water surface elevations. Determine hydraulic grade line along each of the potential flow courses and for the full range of potential flows.

Perform hydrogeologic evaluation of potential groundwater contribution to conservation area water balance. Coordinate with Montana DNRC Water Rights Bureau to obtain a water right permit for the site. This does not include responding to or addressing objections that may arise to the permit application from existing water right holders.

Prepare a Joint Application for Proposed Work in Montana's Streams, Wetlands, Floodplains and Other Water Bodies; and supplemental permit documentation including a

wetland delineation report, monitoring plan and related performance standards. This task also includes communication with agencies in order to coordinate needs and time frames for permit application submittals. This does not include support for ESA compliance, MEPA or NEPA. If those are required, it will be necessary to develop a strategy to address them.

Perform final site design, wetland/revegetation design and landscape design as further described in the following section.

Design Detailing and Construction Drawings

This project will require two separate bid packages including Bid Package A – Site Civil and Bid Package B – Wetland and Revegetation and Landscape Improvements. Underlined tasks will be completed independently for both Bid Package A and B.

- Complete final design and prepare construction drawings and specifications for Bid Package A - Site Civil aspects of the final plan set including:
 - Site demolition and invasive species removal
 - Design and development of rough site grading plan and coordinates
 - Design and detailing of pre-sedimentation basin, maintenance access roads, and hard-surface lining
 - Design and detailing of diversion/regulation structures
 - Design and detailing of water level control structures
 - Design and detailing of spillway weirs and channels
 - Design and detailing of flow conveyance channels
 - Design and development of parking lot plan and details
 - Access bridge design and details
 - Pond and waterway design and details
 - Materials and construction specifications
- Complete final design and prepare construction drawings and specifications for Bid Package B - Fine Grading , Landscape Improvements, Wetland and Revegetation-related aspects of the final plan set including:
 - Design and development of wetland cell layouts
 - Wetland grading showing desired feature depths and fine shaping to support wetland fringe
 - Profile details of wetland cells and extended detention ponds
 - Vegetation plan for each planting zone
 - Design and detailing of soft control structures between wetland cells
 - Hogan’s slough restoration details
 - Fine grading and shaping plan
 - Trail layout design and details
 - Wayfinding /interpretive signage design and details
 - Upland planting plan

- Riparian planting plan
 - Materials and construction specifications
- Prepare opinion of probable project cost
 - Deliverables for this phase include for each bid package:
 - a. 30% design drawings; 5 sets; 11"x17" format; PDF Copy
 - b. 70% design drawings; 5 sets; 11"x17" format, or full size drawings upon request; PDF Copy
 - c. Preliminary specifications; 2 copies; PDF Copy
 - d. Preliminary opinion of probable cost; PDF Copy

Final Bid Package

1. Prepare final plans and specifications using input received from review of design and construction plans for both bid packages. Plans and specifications will be prepared in accordance with MPWSS and City of Billings Standard Modifications, latest editions. Stamp and sign all plans and specifications with the seal of a Professional Engineer and or Licensed Landscape Architect.
2. Tabulate project quantities and create bid schedule. Finalize the Engineer's opinion of probable cost based on final quantities.
3. Prepare Final Design report for the City.
4. Deliverables for this phase include:
 - a. 95% design drawings for final review; 5 sets; 11"x17" format; PDF Copy
 - b. 100% design drawings and specifications for approval and bidding
 - c. Design report
 - d. Final opinion of probable cost

CONSTRUCTION ADMINISTRATION

This project will require two separate bid packages requiring management of two separate construction contracts. Underlined tasks will be completed independently for both Bid Package A and B contracts.

Bidding and Preconstruction Services

1. Apply for all permits, licenses, and approvals necessary to construct the project. All permit and licensing fees will be paid by the City. Construction stormwater permits shall be the responsibility of the construction contractor; Engineer will prepare a draft SWPPP to be provided to the selected contractor for processing and implementation. Erosion and sedimentation control plans will be prepared for inclusion in the project specifications.
2. Supply all bidding documents necessary for bidding and construction. Provide bid advertisement text to the City for publication. Schedule and conduct a pre-bid conference, publish meeting minutes, answer bid questions, and prepare any necessary addenda. Conduct a pre-bid field review with bidders as necessary.
3. Attend the bid opening, analyze the bids, prepare and distribute a bid tabulation, and make a construction contract award recommendation.
4. Assist the City in procurement of the final contract agreement, review bonds and insurance provided by the contractor, assemble and distribute conforming copies of contract documents, and issue a notice to proceed for construction.
5. Deliverables for this phase include:
 - a. Bid advertisement
 - b. Pre-bid meeting minutes
 - c. Addenda, as required
 - d. Bid tabulation
 - e. Recommendation of Award letter
 - f. Conforming copies of the construction contract; 5 sets total
 - g. Notice to proceed
 - h. Contractor's construction plans and specifications; up to 10 sets; 11"x17" format (2 full-size plan sets upon request); PDF Copy;

Construction Administration Services

1. This scope and the associated professional fee assume:
 - a. Two construction contracts with a combined construction duration of 150 days.
 - b. Engineer shall consult with the City and act as representative for the City as defined in the construction contract documents, which will incorporate the MPWSS, and specifically the General Conditions contained therein as modified by the City of Billings Standard Modifications, latest edition.
 - c. The extent and limitation of the duties, responsibilities, and authority of the Engineer will be as assigned in the construction contract documents and shall not be modified, except as Engineer may otherwise agree in writing.
2. Schedule and conduct a pre-construction conference, publish meeting minutes, and answer contractor questions. Conduct a pre-construction field review with contractors as necessary.
3. Take pre-construction photos and videos of the project areas.
4. Provide part-time construction observation utilizing a Resident Project Representatives (RPR) to assist Engineer in observing progress, quality of work, and conformance to the contract documents and other applicable codes and standards. City of Billings will utilize in-house construction inspection for the majority of the Contract A with only limited involvement in Contract B. Inspection activities shall include review of all key work items that will not be inspected by the City of Billings. The breakdown of the key work items will be determined in the final design based in part on the budget allowance. RPRs will prepare daily inspection reports, daily quantity summaries, weekly progress reports, weekly workforce and equipment reports, and other reports as required. RPR responsibilities are further defined in the General Conditions contained in the City of Billings Standard Modifications, latest edition.
5. Develop and implement a quality assurance testing plan for materials testing in accordance with the City of Billings Standard Modifications, latest edition. It was assumed that 20, 4-hour material testing trips will be needed for both contracts. Conduct a pre-construction testing meeting with RPRs, field testing personnel, and lab manager to coordinate testing requirements. Provide qualified personnel, equipment, and supplies for field testing of materials throughout construction.
6. Monitor and collect results from contractor's separate quality control materials testing program.
7. Provide personnel, equipment, and supplies for field staking of principal elements of the construction layout to give the contractor measurements, lines, locations, and grade necessary for construction. The contractor will be responsible for any detailed layouts, such as laser and/or other techniques for establishing grade between Engineer's staking intervals.

8. Provide oversight for wetland construction and revegetation. Provide a Resident Project Representative (RPR) to assist Engineer during key phases of project stake-out, wetland construction and revegetation activities; updating plans and specifications as needed during construction; and coordinating with Engineer and Contractors as needed.
9. Provide oversight for fine grading and landscape construction. Provide a Resident Project Representative (RPR) to assist Engineer during key phases of the site layout, trail construction, fishing dock construction, wayfinding and interpretive signage installation, shade shelter construction, site furnishings installation, and landscape revegetation activities; updating plans and specifications as needed during construction; and coordinating with Engineer and Contractors as needed.
10. Review contractor's submittals, such as shop drawings, samples, equipment, mix designs, aggregates, and other data, for conformance to the contract documents. This review does not include review of any dewatering plans and shall not extend to contractor's means, methods, techniques, sequences, procedures, or safety programs.
11. Attend and conduct a weekly construction meeting with the City and contractor.
12. Respond to contractor requests for information. Issue necessary clarifications and interpretations of the contract documents. Notify the City immediately of any contract problems or deviations from the approved contract documents. Issue notices as required by the construction contract. Recommend and prepare Work Change Directives and Change Orders for the City as necessary. Change orders that require additional design or construction services by Engineer will be considered Additional Services and compensated in accordance with the provisions of this Contract.
13. Prepare periodic website informational update content, including current project maps and work descriptions. The City will host and maintain the website, with content provided by the Engineer.
14. 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 work in coordination with the City representative. Visits by the Engineer shall be limited to spot checking and similar methods of general observation of the work as assisted by the RPR.
15. Provide in-field coordination with the Contractor as necessary for site and landscape construction details.
16. Review and recommend monthly contractor payment requests.
17. Conduct substantial completion and final inspections with City and contractor. Prepare and monitor punchlist items required for completion of the work by contractor.

18. Deliverables for this phase include:

- a. Pre-construction meeting minutes
- b. Pre-construction photos
- c. Contractor submittals; one copy to City
- d. Weekly RPR inspection reports, upon request
- e. Monthly quality assurance materials testing reports and charts
- f. Miscellaneous construction forms, as required
- g. Review set of record drawings; 2 copies; 11"x17" format

Record Drawings and Project Close-Out

1. Maintain documentation of all field installations, including the location of any underground utilities encountered during construction, for assistance with preparation of project record drawings. Prepare record drawings by incorporating all field modifications to the construction drawings. Allow review by City of record drawings prior to issuing final record drawings.
2. Perform on-year monitoring of wetlands to facilitate establishment of wetland vegetation.
3. Conduct a one-year anniversary inspection of the project. Identify deficiencies and warranty items requiring correction, and provide notification to contractor.
4. Deliverables for this phase include:
 - a. Final record drawings, as described in Part I, Section 2, Article D of this Contract