



Lower Clark Fork Watershed Group REQUEST FOR PROPOSAL (RFP)

RFP Number:
2019-01

RFP Title:
Crow Creek Phase 2 Restoration Project

ISSUER INFORMATION

Contact:
Brita Olson, Coordinator, Lower Clark Fork Watershed Group
brita@lowerclarkforkwatershedgroup.org
(208) 304-3852

Issue Date:
March 18, 2019

INSTRUCTIONS TO OFFERORS

Return Sealed Proposal to: Lower Clark Fork Watershed Group
Attention Brita Olson
PO Box 1329
Trout Creek, Montana 59874

RFP Response Due Date and Time: 5/3/2019, COB

OFFERORS MUST COMPLETE THE FOLLOWING

Offeror Name/Address:

Authorized Offeror Signatory:

(Please print name and sign in ink)

Offeror Phone Number:

Offeror FAX Number:

Offeror E-mail Address:

OFFERORS MUST RETURN THIS COVER SHEET WITH RFP RESPONSE

INSTRUCTIONS TO OFFERORS

It is the responsibility of each offeror to:

Follow the format required in the RFP when preparing your response. Provide point-by-point responses to all sections in a clear and concise manner.

Provide complete answers/descriptions. Read and answer **all** questions and requirements. Don't assume evaluator/evaluation committee will know what your company capabilities are or what items/services you can provide, even if you have previously contracted with Lower Clark Fork Watershed Group (LCFWG). The proposals are evaluated based solely on the information and materials provided in your response.

Use the forms provided, i.e., cover page, cost proposal, etc.

Submit your response on time. Note all the dates and times listed in the Schedule of Events and within the document and be sure to submit all required items on time. Late proposal responses are not accepted.

<p>The following items MUST be included in the response to be considered responsive. Failure to include any of these items may result in a nonresponsive determination.</p>
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- 1. Signed Cover Sheet**
- 2. Cost Proposal**
- 3. RFP Response Form (including point by point response to offeror qualifications/informational requirements)**

SCHEDULE OF EVENTS

<u>EVENT</u>	<u>DATE</u>
RFP Issue Date	<u>3/18/2019</u>
Pre-Bid Tour.....	<u>4/10/2019</u>
RFP Response Due Date	<u>5/3/2019</u>
Intended Date for Contract Award	<u>5/31/2019</u>

SECTION 1: PROJECT OVERVIEW AND INSTRUCTIONS

PROJECT OVERVIEW

Lower Clark Fork Watershed Group (hereinafter referred to as “LCFWG”) through a partnership with NorthWestern Energy, Avista, USDA Forest Service, and Montana Fish, Wildlife & Parks, is seeking a contractor to provide equipment, labor and materials for a stream channel reconstruction project in the Crow Creek watershed, a tributary to Prospect Creek in the Lower Clark Fork River drainage near Thompson Falls, Montana. The contractor will improve channel morphology, floodplain connectivity and fish habitat by creating approximately 625 feet of newly constructed stream channel. The in-water work period for this project is July 15 – August 31. All instream work shall be completed during this timeframe. A more complete description of the supplies and/or services sought for this project is provided in the Crow Creek Phase 2 Restoration Project Final Design plan set, as well as Section 3 Scope of Project, Section 5 Cost Proposal, and Section 6 Construction Specifications.

SINGLE POINT OF CONTACT

From the date this Request for Proposal (RFP) is issued until an offeror is selected and the selection is announced, all contact regarding the project shall be directed to:

Brita Olson, Coordinator
Lower Clark Fork Watershed Group
PO Box 1329
Trout Creek, Montana 59874
brita@lowerclarkforkwatershedgroup.org
(208) 304-3852

SUBMITTING A PROPOSAL

Offerors must submit a signed, hard copy of the RFP Cover Sheet, Cost Proposal and RFP Response Form. Offerors failing to comply with these instructions may be subject to point deductions. LCFWG may also choose to not evaluate, may deem nonresponsive, and/or may disqualify from further consideration any proposals that do not follow this RFP format, are difficult to understand, are difficult to read, or are missing any requested information.

The highest scoring offeror will be the prime contractor upon contract award and shall be responsible, in total, for all work of any subcontractors and equipment operators. All subcontractors, if any, and operators of specific equipment along with their experience must be included in the proposal. LCFWG reserves the right to approve all subcontractors and equipment operators. The Contractor shall be responsible to LCFWG for the acts and omissions of all subcontractors, operators, or agents and of persons directly or indirectly employed by such subcontractors, and for the acts and omissions of persons employed directly by the Contractor. Further, nothing contained within this document or any contract documents created as a result of any contract awards derived from this RFP shall create any contractual relationships between any subcontractor and LCFWG.

SECTION 2: EVALUATION PROCESS

EVALUATION OF PROPOSALS

All proposals will initially be classified as either “responsive” or “nonresponsive.” Proposals may be found nonresponsive at any time during the procurement process if any of the required information is not provided; the submitted price is found to be excessive or inadequate as measured by criteria stated in the RFP; or the proposal is not within the plans and specifications described and required in the RFP. If a proposal is found to be nonresponsive, it will not be considered further.

Selection and award will be based on the offeror's proposal and other items outlined in this RFP. Submitted responses may not include references to information located elsewhere, such as Internet websites or libraries, unless specifically requested. Information or materials presented by offerors outside the formal response or subsequent discussion/negotiation or best and final offer, if requested, will not be considered, will have no bearing on any award, and may result in the offeror being disqualified from further consideration.

An evaluator/evaluation committee will evaluate the remaining proposals and recommend whether to award the contract to the highest scoring offeror or, if necessary, to seek discussion/negotiation or a best and final offer in order to determine the highest scoring offeror.

EVALUATION CRITERIA

LCFWG will award this contract to an offeror with the best bid. All responsive proposals will be evaluated based on the offeror's references; past performance; key personnel; proven experience of equipment operators; method of providing services; and cost outlined in its proposal.

SECTION 3: SCOPE OF PROJECT

INTRODUCTION AND BACKGROUND

Crow Creek is located on the Lolo National Forest and is a tributary to Prospect Creek in the Lower Clark Fork River watershed near Thompson Falls, Montana. An important bull trout and westslope cutthroat trout stream, Crow Creek has been substantially altered by transmission lines that extend up the lower valley from County Highway No. 471. Historically, the Crow Creek valley bottom was dominated by dense stands of mature cedar forests. Riparian areas in the project area have experienced persistent loss of trees and vegetation from maintenance of the road system and transmission lines. Riparian harvest and encroachment on the floodplain have resulted in loss of vegetation, bank instability, lateral migration, downcutting, and increased sediment supply.

Restoration efforts in the basin began in 2007 with the reconstruction of approximately 1,200 feet of new channel downstream of the confluence of the East and West Forks Crow Creek (Phase 1). Post restoration fisheries monitoring associated with the Phase 1 project has shown positive results including steady increases in both the abundance and biomass of westslope cutthroat trout.

The goals of the project are to: 1) Rehabilitate stream, floodplain and hillslope processes impaired by previous land clearing activities; 2) promote aquatic habitat conditions that support all life stages of fish; 3) re-establish functioning and connected floodplain surfaces, and 4) incorporate native materials and structures that emulate conditions observed in upstream and downstream reference reaches.

LCFWG will provide all necessary permits for project construction and other materials not specified within this RFP that are necessary for the project. Contractor will provide all heavy equipment, fuel and maintenance required, as well as any other necessary tools or materials to perform each line item bid.

Materials required for stream channel and streambank construction (i.e. wood, rock, vegetative material) will be acquired on site or near the project area. Contractor shall identify a willow collection borrow source and LCFWG or its representative shall approve the site and method of collection and storage prior to acquisition.

A representative from River Design Group, Inc. (RDG) will oversee all aspects of project construction. RDG will serve as the owner's representative.

LCFWG expects the project to be implemented during the 2019 construction season. It is expected that construction of the new floodplain and stream channel could be completed in approximately four weeks. Work will be done in the dry through construction of a clearwater bypass channel, and the stream will be rerouted into the new channel when completed. Construction will be performed July 15th and August 31st, or at the discretion of Montana Fish, Wildlife & Parks and US Forest Service. Willow cutting collection and installation will occur after willow dormancy (October 1st or as determined by LCFWG and/or RDG).

SECTION 4: OFFEROR QUALIFICATIONS/INFORMATIONAL REQUIREMENTS

LCFWG'S RIGHT TO INVESTIGATE AND REJECT

LCFWG may make such investigations as deemed necessary to determine the ability of the offeror to provide the supplies and/or perform the services specified. LCFWG reserves the right to reject any proposal if the evidence submitted by, or investigation of, the offeror fails to satisfy LCFWG that the offeror is properly qualified to carry out the obligations of the contract. *This includes LCFWG's ability to reject the proposal based on negative references, including poor efficiency or experience with operator skills or in previous project performance. Qualified operators listed for specific equipment operations will be expected to perform as such.*

OFFEROR QUALIFICATIONS/INFORMATIONAL REQUIREMENTS

In order for LCFWG to determine the capabilities of an offeror to provide the supplies and/or perform the services specified in Section 3 above, the offeror must respond to the following requests for information regarding its ability to meet LCFWG's requirements. **THE RESPONSE, "(OFFEROR'S NAME) UNDERSTANDS AND WILL COMPLY," IS NOT APPROPRIATE FOR THIS SECTION.**

NOTE: Each item must be thoroughly addressed. Offerors taking exception to any requirements listed in this section may be found nonresponsive or be subject to point deductions.

THE CONTRACTOR SHALL HAVE AT LEAST TWO (2) YEARS OF RIVER RESTORATION CONSTRUCTION EXPERIENCE AND SHALL HAVE COMPLETED AT LEAST FIVE (5) RIVER RESTORATION PROJECTS. OR, THE CONTRACTOR SHALL HAVE AT LEAST ONE (1) YEAR OF RIVER RESTORATION EXPERIENCE, SHALL HAVE COMPLETED AT LEAST THREE (3) RIVER RESTORATION PROJECTS, AND SHALL HAVE COMPLETED AN APPROVED RIVER RESTORATION TRAINING CLASS. APPROVED TRAINING CLASSES INCLUDE THOSE SPONSORED BY WILDLAND HYDROLOGY, INC., OR A SIMILARLY QUALIFIED PRACTITIONER OF NATURAL CHANNEL DESIGN STREAM RESTORATION PRINCIPLES.

Experience/Project Examples. Offeror should provide a complete description of any relevant past projects, including project name, location, and work performed. Providing photographs of proven work effectiveness is highly encouraged if possible.

References. Offeror shall provide a minimum of **(3)** references that are using supplies and/or services of the type proposed in this RFP. At a minimum, the offeror shall provide the customer's name, the location where the supplies and/or services were provided, contact person(s), customer's telephone number, e-mail address, and a description of the project type, and dates the services were provided. These references may be contacted to verify offeror's ability to perform the contract. LCFWG reserves the right to use any information or additional references deemed necessary to establish the ability of the offeror to perform the conditions of the contract. Negative references may be grounds for proposal disqualification.

Resumes/Company Profile. Offeror shall specify how long the individual/company submitting the proposal has been in the business of providing supplies and/or services similar to those requested in this RFP and under what company name. A resume or summary of qualifications, work experience, education, skills, etc., which emphasizes previous experience in this area should be provided for all key personnel who will be involved with any aspects of the contract.

Method of Providing Services. Offeror must specify the make, model, and year of equipment proposed for project implementation. Also, offeror must specify the name and experience of all equipment operators for stream channel construction work.

SECTION 5: COST PROPOSAL

QUANTITIES: The number of quantities are estimates only and will be the basis for evaluation of bids. Bid includes operator time. Final quantities for specific line items will be established during development of a contract and scope of work with the offeror selected for the project.

BID ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
1	<u>MOBILIZATION, GPS EQUIPMENT, CREW PER DIEM, LODGING</u>	1	LS		
2	<u>CONSTRUCT AND RECLAIM CLEARWATER DIVERSIONS AND INSTALL SEDIMENT CONTROL MEASURES</u>	1	LS		
3	<u>SALVAGE, PRESERVE AND TRANSPLANT EXISTING VEGETATION</u>	1	LS		
4	<u>EXCAVATE, HAUL AND PLACE EXCAVATED MATERIAL</u>	900	CY		
5	<u>CONSTRUCT CHANNEL LOG STEP POOLS</u>	9	EA		
6	<u>CONSTRUCT LARGE WOOD STRUCTURES</u>	2	EA		
7	<u>CONSTRUCT CHANNEL STREAMBED</u>	279	LF		
8	<u>CONSTRUCT VEGETATED WOOD MATRIX TYPE 1</u>	531	LF		
9	<u>CONSTRUCT VEGETATED WOOD MATRIX TYPE 2</u>	326	LF		
10	<u>INSTALL FLOODPLAIN ROUGHNESS AND WOODY DEBRIS</u>	0.2	AC		
11	<u>FURNISH WILLOW CUTTINGS</u>	6,000	EA		
12	<u>FURNISH WOOD</u>	1	LS		
13.A	<u>FURNISH CHANNEL STREAMBED AND STREAMBANK ALLUVIUM</u>	490	CY		
13.B	<u>FURNISH CATEGORY 1 ROCK (ON-SITE)</u>	170.0	ea		
	<u>FURNISH CATEGORY 1 ROCK (OFF-SITE)</u>	NA	ea		
	<u>Subtotal</u>				
TOTAL BID PRICE: (\$)					
TOTAL BID PRICE (in Words):					

RFP RESPONSE FORM

(USE ADDITIONAL SHEETS AS NECESSARY)

1. Offeror must provide a signed copy of the RFP Cover Sheet
2. References
3. Resumes/Company Profile
4. Experience/Project Examples
5. Method of Providing Services

Number of Copies and Due Date. Offerors must submit four signed hard copies, and an electronic copy (.pdf) of the RFP Cover Sheet, Cost Proposal and RFP Response Form to the address listed below. Proposals must be received prior to COB 5:00 p.m., local time. Proposals received after this time will not be accepted for consideration. Facsimile or electronic submissions are not acceptable.

Brita Olson, Coordinator
Lower Clark Fork Watershed Group
PO Box 1329
Trout Creek, Montana 59874

SECTION 6: CONSTRUCTION SPECIFICATIONS

Designer/Engineer

River Design Group, Inc.
236 Wisconsin Avenue
Whitefish, Montana 59937
(406) 862-4927

General Requirements

1. SCOPE

Work shall consist of furnishing all equipment and materials and performing all operations in connection with construction of the project as shown on the drawings, described in the contract, specifications, and special provisions and as staked in the field.

2. DEFINITIONS

Owner/Operator (Lower Clark Fork Watershed Group) - official spokesperson for the project who enters into all contractual agreements, obtains all permits and easements necessary for construction, ensures construction in accordance with the plan drawings and specifications, and is financially responsible for the project.

Construction Manager (River Design Group) - LCFWG representative who is authorized to conduct quality assurance activities. The Construction Manager makes recommendations to the owner/operator concerning changes and acceptance of the work.

Contractor— individual who has an agreement with the owner/operator to construct the project.

Excavator— individual who actually performs the excavation, soil borings, or similar construction activity.

3. SAFETY

Equipment and methods used in construction shall be in accordance with the United States Department of Labor, Occupational Safety and Health Administration (OSHA) regulations.

The Contractor shall comply with OSHA Parts 1910 and 1926, Construction Industry Standards and Interpretations. The

Contractor shall ensure a safe working environment and operate under a construction safety program that follows Federal, State, and local laws and regulations.

When personnel must enter confined spaces, trenches, or other excavations, the contractor shall comply with OSHA Safety and Health Standards, Part 1926, Safety and Health Regulations for Construction, Subpart P, Excavations.

4. PROJECT MODIFICATIONS

Project modifications to the plan drawings and specifications must be approved by the LCFWG and its Contractor prior to implementation. Differing site conditions, weather, materials, workmanship, value engineering proposals, or other issues may justify project modifications.

5. ENVIRONMENTAL CONSIDERATIONS

Construction shall be carried out in a manner which minimizes water, land, and air pollution in compliance with Federal, State, and local laws and regulations. LCFWG and Construction Manager shall be responsible to secure all necessary permits prior to construction unless otherwise directed in the Special Provisions.

One or more permits may be applicable on a project. These permits may include, but are not limited to:

- A. Montana Stream Protection Act (SPA-124 Permit)
- B. Federal Clean Water Act (Section 404 Permit)
- C. Short-Term Water Quality Standard for Turbidity (318 Authorization Permit)

The Contractor is responsible for the identification of hazardous materials

discovered during construction. The contractor shall immediately notify the LCFWG and owner/operator of the presence of hazardous materials. The owner/operator is responsible for the proper handling and disposal of these materials.

6. CULTURAL RESOURCES

LCFWG and USFS have reviewed the project area for cultural resources (archaeological and historic). However, the possibility exists for accidental discoveries during construction. If cultural material (cut or burned bones, fire cracked rocks, projectile points, foundations, fire hearths, etc.) is discovered by the contractor, owner/operator or LCFWG, the work must stop. LCFWG shall contact State Historic Preservation Office for further instructions and establish the actions necessary to assess the cultural resources. Work shall not resume within 300 feet of the discovery until the owner/operator receives written notification from LCFWG. The notification may contain special provisions for protecting the cultural resources.

7. QUALITY CONTROL/QUALITY ASSURANCE

The Contractor shall be responsible for quality control. A system shall be developed and implemented by which to achieve the specified quality of work, material, and equipment.

Quality assurance shall be provided by the Construction Manager.

8. ADDITIONAL RESPONSIBILITIES

The Contractor is obligated to immediately notify owner/operator of construction problems in order to facilitate practical, functional, and cost-effective project modifications. These problems may be associated with differing site conditions, construction staking and measurements,

conflicts between plan drawings and specifications, defective materials, or other issues.

9. MEASUREMENT AND PAYMENT

Compensation for any item of work shown on the drawings or described in this specification or special provisions will be considered incidental to and included in the pay items listed on the bid schedule.

10. REFERENCES

The following abbreviations will be used in the construction and material specifications to designate the organizations who publish the referenced "Standard Specifications":

ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWS	American Welding Society
ACI	American Concrete Institute
ANSI	American National Standard Institute (American Society of Mechanical Engineers)
AASHTO	American Association of State Highway and Transportation Officials

The following abbreviations are used to designate technical or regulatory agencies:

OSHA	United States Department of Labor, Occupational Safety and Health Administration
EPA	United States Environmental Protection Agency
MFWP	Montana Fish Wildlife and Parks

MDEQ	Montana Department of Environmental Quality
USFWS	United States Fish and Wildlife Service
USFS	United States Forest Service

11. SPECIAL PROVISIONS

None.

12. SUBMITTALS REQUIRED

- None.

Construction Surveys

1. Scope

The work consists of performing all surveys, measurements, and computations required by this specification *and in connection with construction of the project as shown on the drawings and described in the contract.*

2. Equipment and Material

Equipment for construction surveys shall be of a quality and condition to provide the required accuracy. The equipment shall be maintained in good working order and in proper adjustment at all times. Records of repairs, calibration tests, accuracy checks, and adjustments shall be maintained and be available for inspection by the Construction Manager. Equipment shall be checked, tested, and adjusted as necessary in conformance with manufacturer's recommendations.

Material is field notebooks, stakes, templates, platforms, equipment, spikes, steel pins, tools, and all other items necessary to perform the work specified.

3. Quality of Work

All work shall follow recognized professional practice and the standards of the industry unless otherwise specified in section 9 of this specification. The work shall be performed to the accuracy and detail appropriate for the type of job. Notes, sketches, and other data shall be complete, recorded neatly, legible, reproducible and organized to facilitate ease in review and allow reproduction of copies for job documentation. Survey equipment that requires little or no manual recording of field data shall have survey information documented as outlined in section 9 of this specification.

All computations shall be mathematically correct and shall include information to

identify the bid item, date, and who performed, checked, and approved the computations. Computations shall be legible, complete, and clearly document the source of all information used including assumptions and measurements collected.

If a computer program is used to perform the computations, the contractor shall provide the engineer with the software identification, vendor's name, version number, and other pertinent data before beginning survey activities. Computer generated computations shall show all input data including values assigned and assumptions made.

The elevations of permanent and temporary bench marks shall be determined and recorded to the nearest 0.01 foot.

The minimum requirements for placing channel and floodplain grading stakes shall be as little as 25 feet for sharp curves, breaks in the original ground surface and at any other intermediate stations necessary to ensure accurate location for construction layout and measurement. Slope stakes and cross sections shall be perpendicular to the centerline. Significant breaks in grade shall be determined for cross sections. Distances shall be measured horizontally and recorded to the nearest 0.1 foot.

Measurements for stationing and establishing the location of structures shall be made to the nearest 0.3 foot. Measurements for elevation shall also be made to the nearest 0.3 foot.

4. Primary Control

The baselines and bench marks for primary control, necessary to establish lines and grades needed for construction are shown on the drawings and have been located on the job site.

These baselines and bench marks shall be used as the origin of all surveys, layouts, and measurements to establish construction lines and grades. The contractor shall take all necessary precautions to prevent the loss or damage of primary control points. Any stakes or control points lost or damaged by construction activity will be reestablished by the contractor or at contractor expense.

5. Construction Surveys

Contractor performed surveys shall consist of all work necessary for:

- establishing line and grade for all work from an established Digital Elevation Model (DEM) electronic file and X, Y, and Z coordinates indicated on the plan drawings. DEM models will be provided by the engineer of record, River Design Group, Inc.
- setting slope stakes for all work as necessary
- checking and any supplemental or interim staking
- establishing final grade stakes
- performing quantity surveys, measurements, and computations for progress payment
- other surveys as described in section 9 of this specification

The contractor shall immediately notify LCFWG and owner/operator of survey conflicts between plan drawings, DEM, and on site measurements which could result in conflicts with design quantities.

6. Staking

The construction staking required for the item shall be completed before work on any item starts. Construction staking shall be

completed as follows or as otherwise specified in section 9 of this specification:

Slope stakes shall be placed at the intersection of the specified slopes and ground line. Slope stakes and the reference stakes for slopes shall be marked with the stationing, required cut or fill, slope ratio, and horizontal distance from the centerline or other control line. Final staking requirements shall be agreed to in consultation with Construction Manager. Construction Manager reserves the right to waive or modify staking requirements outlined below.

Construction Manager is responsible for marking and staking vegetation preservation and salvage areas as identified on the Drawings.

Minimum staking requirements are as follows:

- Cross section stakes at the upstream and downstream riffle segments and meander apex, identifying every neat line break in grade and cut and fill requirements.
- Centerline and/or offset stakes identifying Feature locations as noted in the Plan and Profile drawing sheets. Cut and fill requirements at the centerline location shall be identified.

The Construction Manager shall be notified a minimum of 48 hours prior to initiating excavation or earthfill in order to check for adequate and accurate staking.

7. Records

All survey data shall be recorded in fully identified standard hard-bound engineering survey field notebooks with consecutively

numbered pages. All field notes and printed data shall include the purpose or description of the work, the date the work was performed, weather data, sketches, and the personnel who performed and checked the work. Electronically generated survey data and computations shall be bound, page numbered, and cross referenced in a bound field notebook containing the index for all survey activities. All work shall follow recognized professional practice.

The construction survey records shall be available at all times during the progress of the work for examination and use by the engineer and when requested, copies shall be made available. The original field notebooks and other records shall be provided to and become the property of the owner before final payment and acceptance of all work.

Complete documentation of computations and supporting data for progress payments shall be submitted to the engineer with each invoice for payment as specified in section 9 of the specification.

8. Payment

Measurement will not be made for this item. Payment will be made at the lump sum price.

Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Payment will not be provided under this item for the purchase price of materials or equipment having a residual value.

Compensation for any item of work shown described in the contract, drawings, or *specifications*, but not listed in the bid schedule will be considered incidental to and

included in the pay items listed on the bid schedule.

Progress payments will be based on the percent of total project work completed.

9. Special Provisions

None.

10. Submittals

- The name, qualifications, and experience of the individuals to be assigned to survey tasks shall be submitted to Construction Manager a minimum of 15 days prior to starting work that requires contractor performed surveys.
- As-Built survey information substantiating quantities shall accompany invoices as appropriate.

11. Applicable Drawings

- Drawing 3.0 Site Plan
- Drawing 3.1 Plan View Index
- Drawing 3.4, Vegetation Salvage Plan
- Drawing 4.0 Survey Control Plan
- Drawing 5.1 Grading Plan and Profile
- Drawing 5.3 Grading Plan and Profile
- Drawing 5.4 Plan and Profile – Side Channel
- Drawing 8.4 Floodplain Roughness Detail

Mobilization and Demobilization

1. Scope

The work consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. It includes payment for contractor's personnel per diem, lodging, direct expenses, and Global Positioning System equipment (both base station and machine-mounted GPS). It includes contractor's costs for improving the temporary access road and staging area as shown on the applicable Drawings.

2. Equipment and material

Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the contractor's operations at the site; premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable; and other items specified in section 4 of this specification.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.

This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for

the item or items of work changed or added.

3. Payment

Partial payments for mobilization and demobilization will be made based on the lump sum bid price as follows:

- a. 50% of the amount bid for mobilization and demobilization when 25% of the contract amount (excluding mobilization and demobilization) has been completed.
- b. 100% of the amount bid for mobilization and demobilization when 100% of the contract amount has been completed.

Payment of the lump sum contract price for mobilization and demobilization will constitute full compensation for completion of the work.

Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

4. Special Provisions

None.

5. Submittals

- None.

6. Applicable Drawings

- Drawing 3.2 Access, Staging and Dewatering Plan

Removal and Control of Water

1. SCOPE

The work shall consist of the removal of surface water and groundwater as needed to perform the required construction in accordance with the drawings, specifications and special provisions. It shall include: (1) building and maintaining all necessary temporary impounding works, channels, irrigation water bypasses, and diversions, (2) furnishing, installing and operating all necessary pumps, temporary culverts (2-36" CMPs) and other facilities and equipment, and (3) removing all such temporary works and equipment after they have served their purposes.

2. DIVERTING SURFACE WATER

The Contractor shall build, maintain and operate all cofferdams, channels, flumes, sumps, and other temporary diversion and protective works needed to divert stream flow and other surface water through, around, and away from the construction site while construction is in progress. Unless otherwise specified, a diversion must discharge into the same natural drainageway in which its headworks are located.

3. DEWATERING THE CONSTRUCTION SITE

Foundations, cutoff trenches and other parts of the construction site shall be dewatered and kept free of standing water or excessively muddy conditions as needed for proper execution of the construction works. The Contractor shall furnish, install, operate and maintain all drains, sumps, pumps, casings, well points, and other equipment needed to perform the dewatering as specified.

4. DEWATERING BORROW AREAS

Unless otherwise, the Contractor shall maintain the borrow areas in drainable condition. Otherwise, the contractor shall provide for timely and effective removal of surface and groundwaters that accumulate from any source. Borrow material shall be processed as necessary to achieve proper and uniform moisture content for placement.

5. EROSION AND POLLUTION CONTROL

Removal of water from the construction site, including the borrow areas shall be accomplished in such a manner that erosion and the transmission of sediment and other pollutants are minimized. The provisions of the National Pollution Discharge Elimination System (NPDES) regulations for construction sites, enacted by EPA shall be addressed. Operations shall also conform to regulations established by the U.S. Army Corps of Engineers (USACOE) and the Montana Department of Environmental Quality (DEQ), if applicable.

6. REMOVAL OF TEMPORARY WORKS

After the temporary works have served their purposes, the Contractor shall remove or level and grade them to the extent required. Care will be taken to prevent any obstruction of the flow of water or any other interference with the operation of, or access to, the permanent works.

7. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established, each item will be measured to the nearest unit applicable. Payment for each item will be made at the agreed-to unit price for that item. For items of work for which specific lump sum prices

are established, payment will be made at the lump sum price.

Progress payments will be based on the percent of total project work completed.

Payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Compensation for any item of work shown on the drawings or described in the *contract, or specifications*, but not listed on the bid schedule will be considered incidental to and included in the pay items listed on the bid schedule.

8. SPECIAL PROVISIONS

- SP 3-1 Construct and Reclaim Clearwater Diversions and Install Sediment Control Measures

9. SUBMITTALS REQUIRED

None.

10. APPLICABLE DRAWINGS

- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 8.5 Clearwater Diversion Detail

BID ITEM 2: CONSTRUCT AND RECLAIM CLEARWATER DIVERSIONS AND INSTALL SEDIMENT CONTROL MEASURES

Applicable Drawings

- Drawing 1.0 Cover Page
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 8.5 Clearwater Diversion Detail

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-1 Construction Surveys
- BSC-3 Remove and Control Water
- BSC-4 Clearing and Grubbing
- BSC-5 Pollution Control

Work Description

Contractor shall divert existing surface water as shown on the Drawings and as needed to complete all work included in this project. This work involves the diversion of live streams and surficial water around work zones. The diversion shall be accomplished through a combination of diversion embankments (bulk bags with visquene lining), constructed channels, existing side channels and swales, all of which will require ongoing maintenance throughout the course of construction. Contractor shall follow clearwater diversion sequencing notes included on the applicable drawings. Any changes or deviations from the plan must be approved by the Construction Manager prior to installation. Construct channel by excavating to the dimensions shown and maintain a minimum positive grade to approximately match the existing valley slope or as directed by Construction Manager. Place the mounded fill material produced from excavation beside the channel as necessary. Maintain the channel throughout the construction phase and repair any erosion or sloughed areas as needed to maintain flow capacity. Reclaim diversion channels by grading the entire area smooth to the elevations shown on the drawings or as directed and/or approved by Construction Manager.

As necessary or as directed by Construction Manager, this bid item may also include operating and maintaining dewatering pumps during construction of the channel streambed (see BSC-3). Contractor shall operate and maintaining pumping systems capable of meeting the dewatering demands at the site. Once pumping is initiated, the dewatering system shall operate continuously until all work within the area is complete as determined by Construction Manager.

Additional sediment control measures such as coffer dams, straw wattles, and silt fences may be required as determined by Construction Manager.

Work Included

- Procure, transport and install 8 bulk bags and 2-36” CMPs as requested by Construction Manager and as shown on the drawings.
- Install erosion control at the discharge ends of pipes (rock armoring as needed).
- Construct diversion dikes at pipe and/or channel diversion locations.
- Regrade and reclaim pipe, dike and channel sites following completion of work.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the Work as specified.

Measurement Bid Item 2

No measurement for Bid Item 2 Construct and Reclaim Clearwater Diversions and Install Sediment Control Measures will be made.

Payment Bid Item 2

Payment for Bid Item 2 Construct and Reclaim Clearwater Diversions and Install Sediment Control Measures will be based on the lump sum price bid as shown on the Bid Form.

Clearing, Grubbing and Salvage

1. SCOPE

The work shall consist of the clearing and grubbing of designated areas by removal and disposal of trees, snags, logs, stumps, shrubs and rubbish. Clearing and grubbing shall not occur in identified vegetation salvage and preservation areas, as shown on the drawings.

2. PROTECTION OF EXISTING VEGETATION

Trees and other vegetation designated to remain undisturbed shall be protected from damage throughout the duration of the construction period. Any damages resulting from the contractor's operations or neglect shall be repaired by the contractor. These areas are to be marked by the Construction Manager prior to clearing and grubbing. Clearing and grubbing is not authorized until both vegetation salvage and preservation areas are clearly marked on the ground with flagging or stakes.

3. MARKING

The limits of the areas to be cleared and grubbed will be marked by means of stakes, flags, tree markings or other suitable methods. Trees to be left standing and uninjured will be designated by special markings placed on the trunks at a height of about six feet above the ground surface.

4. REMOVAL

All trees not marked for preservation and all snags, logs, brush, stumps and rubbish shall be removed from within the limits of the marked areas. Logs, trees, brush and stumps shall be sorted and stockpiled in designated locations to the dimensions noted on the drawings. These materials are to be

incorporated in restoration techniques as described in the drawings.

5. SALVAGE

Vegetation including sod and whole shrubs designated to be salvaged shall be carefully removed and carefully placed in a specified or approved storage (temporary nursery) location as directed by the Construction Manager. Temporary nurseries shall be maintained by the Contractor throughout the duration of the project. Temporary watering facilities shall be established, or shrubs and sod shall be placed in contact with water. As directed by Construction Manager, salvaged plant material can also be directly transplanted on finished structures and surfaces.

6. MEASUREMENT AND PAYMENT

Measurement will not be made for this item. Payment will be made at the lump sum price.

Progress payments will be based on the percent of total project work completed.

Payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Compensation for any item of work shown on the drawings or described in the *contract, specifications, or* special provisions but not listed on the bid schedule will be considered incidental to and included in the pay items listed on the bid schedule.

7. SPECIAL PROVISIONS

- SP 4-1 Salvage, Preserve and Transplant Existing Vegetation

8. SUBMITTALS REQUIRED

None.

9. APPLICABLE DRAWINGS

- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetland and Vegetation Salvage Plan

BID ITEM 3: SALVAGE, PRESERVE AND TRANSPLANT EXISTING VEGETATION

Applicable Drawings

- Drawing 1.0 Cover Page
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 8.4 Floodplain Roughness Detail

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-1 Construction Surveys
- BSC-4 Clearing and Grubbing
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Existing high-quality vegetation within the project area will be preserved to the greatest extent practical. Preservation areas will be flagged, marked, or staked in the field by the Construction Manager prior to construction. As noted on the applicable drawings, preservation areas are not to be disturbed by construction activities including earthwork, grading, materials staging, or equipment. Any unauthorized damages resulting from the contractor's operations or neglect shall be repaired by the contractor.

Vegetation salvage areas have been identified in the project area, as shown on the applicable drawings. These areas will be flagged, marked, or staked in the field by the Construction Manager prior to clearing and grubbing of access roads, grading extents, staging areas, etc. Mature shrubs, small trees, and herbaceous sod located within the construction extents and grading limits shall be salvaged and transplanted to the greatest extent practical. Shrubs shall be harvested in a manner that ensures the rootball remains intact. As shown on the drawings, shrubs selected for salvage and transplant shall be young, vigorous and relatively small in size (6 to 8 foot tall). Larger shrubs shall be segregated and stockpiled separate of other woody debris for use in floodplain roughness and streambank treatments, at a location approved by the Construction Manager. The contractor shall develop a construction sequencing plan that maximizes opportunities to direct transplant salvaged vegetation onto newly constructed floodplain and streambank surfaces following harvest. If direct transplant is not practical, an alternative staging area (nursery) shall be established by the Contractor, and either temporary watering measures shall be employed, or the base root stock of shrubs, trees, and herbaceous sod shall be in contact with water throughout the duration of construction (less than 3-inches water depth).

The contractor will coordinate harvest and transplanting with the Construction Manager. Transplant locations shall be identified prior to salvage of shrubs and trees and salvaged material

shall be directly placed into transplant locations. Transplant holes shall be twice the width of the transplant and at least 0.5 feet deeper than the transplant rootball. Herbaceous sod shall be harvested to a depth of at least 0.5 feet. When transplanted, sod mats shall be placed tightly together to avoid gaps and drying of soil and vegetation. If gaps exist between sods, they shall be backfilled with clean vegetative backfill (i.e. organic material) to ensure smooth transitions to surrounding floodplain surfaces.

Work Included

- Review vegetation salvage and preservation areas with Construction Manager prior to Salvage, Preserve, and Transplant Existing Vegetation (Bid Item 3).
- Throughout project construction, coordinate construction sequencing with Construction Manager to maximize opportunities for immediate, direct transplant to finished surfaces and streambanks.
- Harvest, load, and transport shrubs, trees and salvaged sod to transplant locations or established nursery location(s) approved by the Construction Manager.
- Install shrubs, trees and salvaged sod according to the notes included on the applicable drawings.
- Provide temporary water throughout the duration of construction to both transplanted and temporarily stockpiled shrubs, trees, and sod, as directed by Construction Manager.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the Work as specified.

Measurement Bid Item 3

No measurement for Bid Item 3 will be made.

Payment Bid Item 3

Payment for Bid Item 3 will be based on the lump sum price bid as shown on the Bid Form.

Pollution Control

1. SCOPE

The work shall consist of installing measures or performing work to control erosion and minimize the production of sediment and other pollutants to water and air during construction operations.

2. MATERIALS

All materials furnished shall meet the requirements in the Special Provisions.

3. EROSION AND SEDIMENT CONTROL MEASURES AND WORKS

Appropriate application of erosion and sediment control measures are specified as follows:

Staging of Earthwork Activities--The excavation and moving of soil materials shall be scheduled so as to minimize the size of areas disturbed and susceptible to erosion.

Seeding--Seedings to protect disturbed areas shall be done as specified on the drawings or in the Special Provisions.

Mulching--Mulching shall be used to provide temporary protection to soil surfaces from erosion.

Diversions--Diversions shall be used to divert water away from work areas, limit contribution of clean water to the site, control flow length and erosive nature of uncontrolled runoff, and/or to collect runoff from work areas for treatment and safe disposition.

Stream Crossings--Properly sized culverts or bridges shall be used where equipment must cross streams.

Sediment Basins--Sediment basins shall be used to settle and filter out sediment from

eroding areas in order to protect properties and streams below the construction site.

Sediment Filters--Straw bale filters, straw wattles, coconut rolls or geotextile sediment fences shall be used to trap sediment from areas of limited runoff. Straw bale filters and geotextile sediment fence shall be anchored into the ground a minimum of 6 inches in order to prevent erosion under or around them. Straw wattles and coconut rolls shall be set in the ground a minimum of 3 inches and staked according to manufacturers' guidelines.

Waterways--Waterways shall be used for the safe disposal of runoff from fields, diversions and other structures or measures.

Other--Additional protection measures as specified in the Special Provisions or as required Federal, State, or local government regulations.

4. CHEMICAL POLLUTION

The Contractor shall provide watertight tanks or barrels or construct a sump sealed with plastic sheets to be used to dispose of chemical pollutants (such as drained lubricating or transmission fluids, greases, oils, soaps, asphalt, etc.) produced as a by-product of the project's work. Pollutants shall be disposed of without causing pollution and in accordance with appropriate State and Federal regulations.

Sanitary facilities such as pit toilets, chemical toilets, or septic tanks shall not be placed adjacent to live streams, wells, or springs. They shall be located at a distance sufficient to prevent contamination of any water sources. Facility contents shall be disposed of without causing pollution.

5. AIR POLLUTION

The burning of brush or slash or disposal of other materials shall adhere to State and local regulations.

Fire prevention measures shall be taken to prevent the start or the spreading of fires which result from construction activities. Fire breaks or guards shall be constructed and maintained at locations shown on the drawings or as specified in the Special Provisions.

All public access or haul roads used by the contractor during construction of the project shall be sprinkled or otherwise treated to suppress dust. All dust control methods shall ensure safe construction operations at all times. If chemical dust suppressants are applied, the material shall be a commercially available product specifically designed for dust suppression and the application shall follow manufacturer's requirements and recommendations.

6. MAINTENANCE, REMOVAL, AND RESTORATION

All pollution control measures and works shall be adequately maintained in a functional condition as long as needed during the construction operation. All temporary measures shall be removed and the site restored to as nearly original conditions as practicable.

7. MEASUREMENT AND PAYMENT

Measurement will not be made for this item. Payment will be made at the lump sum price.

Progress payments will be based on the percent of total project work completed.

Payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Compensation for any item of work shown on the drawings or described in the *contract, specifications, or* special provisions but not listed on the bid schedule will be considered incidental to and included in the pay items listed on the bid schedule.

8. SPECIAL PROVISIONS

None.

9. SUBMITTALS REQUIRED

None.

10. APPLICABLE DRAWINGS

- Drawing 3.0 Site Plan
- Drawing 3.3 Specifications
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 8.5 Clearwater Diversion Detail
- Drawing 8.6 Seeding Plan

Excavation

1. SCOPE

The work shall consist of the excavation required by the drawings, specifications and special provisions, as well as disposal of the excavated materials.

2. CLASSIFICATION

Unless otherwise specified in the special provisions, all excavation will be common.

Excavation will be classified as common excavation or rock excavation in accordance with the following definitions or will be designated as unclassified.

Common excavation shall be defined as the excavation of all materials that can be excavated, transported, and unloaded by the use of heavy ripping equipment and wheel tractor-scrapers with pusher tractors. Common excavation shall also include excavated material that can be dumped into place or loaded onto hauling equipment by means of excavators having a rated capacity of one cubic yard or larger. The excavators shall be equipped with attachments (such as shovel, bucket, backhoe, dragline or clam shell) appropriate to the character of the materials and the site conditions.

Rock excavation shall be defined as the excavation of all hard, compacted or cemented materials, the accomplishment of which requires blasting or the use of excavators larger than defined for common excavation. The excavation and removal of isolated boulders or rock fragments larger than 1 cubic yard in volume encountered in materials otherwise conforming to the definition of common excavation shall be classified as rock excavation. Though, the presence of isolated boulders or rock fragments larger than one cubic yard in size will not, in itself, be sufficient cause to change the classification of the surrounding material.

Excavation will be classified according to the above definitions by the Construction Manager, based on their judgment of the character of the materials and the site conditions.

For the purpose of this classification, the following definitions shall apply:

Heavy ripping equipment shall be defined as a rear-mounted, heavy duty, single-tooth, ripping attachment mounted on a tractor having a power rating of 250 or greater net horsepower (at the flywheel) unless otherwise specified in the special provisions.

Wheel tractor-scraper shall be defined as a self-loading (not elevating) and unloading scraper having a struck bowl capacity of at least 12 cubic yards.

Pusher tractor shall be defined as a track-type tractor having a power rating of 250 or greater net horsepower (at the flywheel) equipped with appropriate attachments.

3. UNCLASSIFIED EXCAVATION

Items shall be designated as "Unclassified Excavation" when classifications as defined in Section 2 of this specification do not apply. "Unclassified Excavation" encompasses all materials encountered regardless of their nature or the manner in which they are removed.

4. STRIPPING

Stripping consists of excavating the top layer of soil which contains vegetation, roots and other desirable organic matter. Stripped sod shall be re-used to the extent practical and should be handled with care and preserved as described in the special provisions.

Use of Materials from Stripping

Materials which are suitable for spreading over disturbed areas after construction has been completed shall be stockpiled and subsequently spread as directed by the Construction Manager.

Materials suitable for use in construction of the required earth fill shall be used as directed by the Construction Manager.

Unsuitable and/or excess materials shall be wasted as directed by the Construction Manager.

The suitability of materials for specific purposes will be determined by the Construction Manager.

5. BLASTING

A Montana Construction Blasters License shall be required of the person directing and supervising the blasting operation. This includes transportation, handling, storage, and use of dynamite and other explosives. Material Safety Data Sheets (MSDS) for dynamite and other explosive materials shall be provided to the Technician prior to the blasting operation.

Blasting shall be done in such a way as to prevent damage to the work or unnecessary fracturing of the foundation and shall conform to any requirements (such as a blasting plan) noted in the special provisions.

6. USE OF EXCAVATED MATERIALS

To the extent they are needed, all suitable materials from the specified excavations shall be used in the construction of required permanent earth fill or rock fill. The suitability of materials for specific purposes

will be determined by the Construction Manager. The Contractor shall not waste or otherwise dispose of suitable excavated materials.

7. DISPOSAL OF WASTE MATERIALS

All surplus or unsuitable excavated materials will be designated as waste and shall be disposed of by the Contractor at sites of his or her own choosing away from the site of the work or as shown on the drawings. The designated waste site shall be approved by the owner/operator.

8. EXCAVATION LIMITS

Excavations shall comply with OSHA Construction Industry Standards (29CFR Part 1926) Subpart P, Excavations, Trenching, and Shoring.

All excavations shall be completed and maintained in a safe and stable condition through the total construction phase. Excavated surfaces too steep to be safe and stable shall be supported as necessary to safeguard the work and workers, to prevent sliding or settling of the adjacent ground, and to avoid damaging existing improvements. Structure and trench excavations shall be completed to the specified elevations and to sufficient length and width required to safely install, adjust, and remove any forms, bracing, or supports necessary for the installation of the work. Bracing and supports, when needed, shall be in place before any concrete, pipe, structure or earth fill is placed within the limits of the excavation.

Excavations outside the lines and limits shown on the drawings or specified herein required to meet safety requirements shall be the responsibility of the contractor in constructing and maintaining a safe and stable excavation.

9. BORROW EXCAVATION

When the quantities of suitable materials obtained from specified excavations are insufficient to construct the specified earth fills, additional materials shall be obtained from borrow areas approved by the Construction Manager, as agreed-to by the owner/operator.

Borrow pits shall be excavated and finally dressed in a manner to eliminate unstable side slopes or other hazardous conditions, blend with the existing topography, prevent ponding, and provide drainage.

10. OVER-EXCAVATION

Excavation in earth beyond the specified lines and grades shall be corrected by filling the resulting voids with approved earth fill. If the backfill is to become the subgrade for riprap, rock fill, drain fill, or sand or gravel bedding, the voids may be filled with material conforming to the specifications for the riprap, rock fill, bedding, drain fill, or gravel. Before correcting an over-excavation condition, the contractor shall review the planned corrective action with the Technician and obtain approval of the corrective measures.

11. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established, each item will be measured to the nearest unit applicable. Payment for each item will be made at the agreed-to unit price for that item. For items of work for which specific lump sum prices are established, payment will be made at the lump sum price.

Measurement and payment will be made to the nearest cubic yard between the finished design surface and original topographic surface as defined in the Digital Elevation

Model. All quantities in these specifications and shown on the Drawings are measured as in place, bank cubic yards.

Such payment will constitute full compensation for all materials, labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Excavation for Bank Protection and other Subsidiary Items will not be measured or paid for separately. Quantities itemized for subsidiary items are not included in the itemized bid schedule quantities. Compensation for these items is included in payment for the items listed in the bid schedule.

Compensation for any item of work shown on the drawings or described in the contract, specifications, or special provisions but not listed on the bid schedule will be considered incidental to and included in the pay items listed on the bid schedule.

Acceptable vertical tolerances shall be + 0.3 to - 0.3 feet from the lines and grades shown on the Drawings and finished design surface as defined in the River Design Group, Inc. DEM. Horizontal tolerances shall be +/- 0.5 feet for bankfull channel construction and +/- 2.0 feet for floodplain construction.

12. SPECIAL PROVISIONS

- SP 6-1 Excavate, Haul and Place Excavated Material

13. APPLICABLE DRAWINGS

- Drawing 3.3 Specifications
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 4.0 Survey Control Plan
- Drawing 5.1 Grading Plan and Profile

- Drawing 5.3 Grading Plan and Profile
- Drawing 6.0 Channel Cross Section Dimensions
- Drawing 9.0 Materials List

BID ITEM 4: EXCAVATE, LOAD, HAUL AND PLACE EXCAVATED MATERIAL

Applicable Drawings

- Drawing 1.0 Cover Sheet and Notes
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 4.0 Survey Control Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 5.1 Grading Plan and Profile
- Drawing 5.3 Grading Plan and Profile
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-1 Construction Surveys
- BSC-3 Remove and Control Water
- BSC-4 Clearing and Grubbing
- BSC-5 Pollution Control
- BSC-6 Excavation

Work Description

Contractor shall reconstruct Crow Creek floodplains and terraces. Contractor shall develop temporary haul roads to transport excavated material (i.e. floodplain backfill) to designated fill areas. Any changes to the haul routes must be approved 48 hours in advance by the Construction Manager. Contractor shall excavate, load, haul, place, compact and grade material excavated to finished grade surface as shown on the drawings, as approved by Construction Manager. Construction Manager may adjust the actual depths and limits of the excavation in the field. Contractor shall adjust the excavation as requested by the Construction Manager. Contractor shall coordinate excavating, stockpiling and placing floodplain backfill with other Work as needed. This item shall be completed either prior to or concurrent with Bid Item 3 Salvage, Preserve and Transplant Existing Vegetation, and all trees and shrubs meeting specifications shown in the Drawings shall be salvaged, sorted and stockpiled accordingly, for use in streambank and floodplain treatments.

Contractor shall obtain all necessary floodplain backfill from areas scheduled for excavation and removal. Material excavated shall be salvaged and reused in accordance with this Bid Item. Compact all floodplain backfill by uniformly operating equipment over the surface of the floodplain and channel.

Coordinate placement of floodplain backfill with Construct Channel Streambed (Bid Item 7) and with all other Work as necessary.

Work Included

- Coordinate excavation with Bid Item 3 Salvage, Preserve and Transplant Existing Vegetation and Bid Item 7 Construct Channel Streambed.
- Develop temporary haul roads as shown on the applicable Drawings.
- Excavate, load, haul, place, grade and compact approximately 276 cubic yards of floodplain backfill to establish finish grade elevations for floodplains and terraces as shown on the drawings.
- Excavate, load, haul, place, grade and compact approximately 353 cubic yards of excavated material in clearwater bypass channel at the discretion of the construction manager.
- Prepare and manage stockpile areas as needed.
- Compact lifts as specified.
- Coordinate with other construction as required.
- Grade the edges of the floodplain and terraces to blend to adjacent slopes.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the Work as specified.

Measurement Bid Item 4

Measurement for Bid Item 4 Excavate, Load, Haul and Place Excavated Material will be based on the actual number of cubic yards placed in the floodplain as calculated by Construction Manager based on surveys or field measurements of the excavation and/or stockpile areas.

Payment Bid Item 4

Payment for Bid Item 4 Excavate, Load, Haul and Place Excavated Material will be made according to the unit price bid per cubic yard, as shown in the Bid Form.

CHANNEL, STREAMBANK AND FLOODPLAIN TREATMENTS

1. SCOPE

Work shall consist of furnishing all equipment, materials, labor and performing all operations in connection with construction of the stream channel, streambank and floodplain treatments as shown on the drawings or as specified.

The following requirements shall pertain, unless otherwise indicated in the special provisions or indicated on the construction drawings.

2. MATERIALS

Construction materials shall conform to the requirements shown on the drawings, or as specified.

Category 1 Wood

Category 1 Wood shall be sufficiently sound to permit installation and backfill without crushing, splitting, or breaking the bole of the tree. Contractor shall retain the entire root mass attached to a minimum stem length of 30-feet.

Category 2 Wood

Category 2 Wood shall be sufficiently sound to permit installation and backfill without crushing, splitting, or breaking the bole of the tree. The trees shall retain at least 75 percent of the pre-harvest root fan mass and diameter after placement.

Category 3 Wood

Category 3 Wood shall be sufficiently sound to permit installation and backfill without crushing, splitting, or breaking the bole of the tree. Contractor shall retain limbs attached to the stems to the greatest extent practical.

Category 4 Wood

Category 4 Wood shall be “green” and pliable at the time of placement to prevent breakage. The trees shall retain limbs, needles, or leaves

immediately before placement to form a single tree canopy of not less than 75 percent of the un-harvested tree.

Category 1 Rock and Channel Alluvium

Rock shall be installed and placed in channel and bank treatments as shown on the drawings. Contractor shall provide alluvium and rock as specified. Alluvium shall be native to the project area and generated during Excavation. Rock shall be semi-rounded and similar in type to native rock (if important is required to meet quantities). Stone and rock shall be hard, durable, sound and resistant to weather and water action. Contractor shall develop an on-site screening facility to generate the material to the appropriate dimensions and gradations as shown in the drawing and specifications. Prior to use, the Contractor will provide the Construction Manager a representative sample for inspection and approval.

Tree and Shrub Transplants

Transplants shall be selected and placed as indicated on the drawings. The transplants shall originate from the project site or a hydrologic and climatic regime similar to that of the planting site to ensure plant suitability and viability.

Transplants for clump plantings shall be harvested in such a manner that most of the root structure and associated soil is retained as a unit (clump). The clump shall be transported and planted directly into a site prepared for the clump planting, or to an established nursery location approved by the Construction Manager. Repetitive handling, loading, unloading, and transport of the clump that damages the integrity of the root-soil mass or reduces the viability of the plants shall not be permitted.

Clump plantings shall be pruned to remove 10 to 50 percent of the vegetation of each stem in lieu of thinning. The pruning operation shall ensure that the majority of the flowering parts of the clump plantings are removed.

Transplants shall be thoroughly wetted immediately after placement.

3. EQUIPMENT

Equipment shall be of sufficient size to lift, move, and place rock and log materials of the size specified. Equipment shall be equipped with attachments (such as shovel, bucket, backhoe, bucket with thumb) appropriate to the character of the materials and the site conditions.

Equipment shall be capable of working under water as required to construct the job.

4. SODDING

Viable sod with a minimum thickness of 4 to 6 inches for sedge species and 6 inches for grass species shall be placed as directed by Construction Manager, or in a temporary nursery approved by the Construction Manager. Sod shall originate from a similar hydrologic and climatic regime as the zone being sodded to ensure plant species suitability and viability.

The sod shall be set firmly in place to ensure complete contact with the base material. Frozen sod shall not be placed, nor shall sod be placed on frozen ground unless the ground surface is smooth and enables firm sod to ground surface contact. Sod shall be placed to cover the entire required surface without voids or loose and protruding edges that would likely be dislodged by flowing water.

Immediately after placement the sod shall be thoroughly wetted.

6. SAFETY

All work shall be in accordance with safety requirements of Occupational Safety and Health Administration (OSHA), Safety and Health Regulations, Part 1926, Safety and Health Regulations for Construction, Subpart P, Excavations.

7. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established, each item will be measured to the nearest unit applicable. Payment for each item will be made at the agreed-to unit price for that item. For items of work, for which specific lump sum prices are established, payment will be made at the lump sum price.

Quantities for the individual components of all bid items under this specification will not be measured. Payment will be made to the nearest foot of channel and bank treatment under Bid Item 7 Construct Channel Streambed and Bid Items 8 and 9 Vegetated Wood Matrix Type 1 and Type 2.

Payment will be made on a per each basis for Bid Item 5 Construct Channel Log Step Pools, Bid Item 6 Large Wood Structures, Bid Item 10 Install Floodplain Roughness and Woody Debris, Bid Item 11 Furnish Willows, Bid Item 12 Furnish Wood, and Bid Item 13 Furnish Channel Streambed and Streambank Alluvium and Category 1 Rock. Payment will include compensation for placement of:

- Earthfill and Alluvium
- Logs, Rootwads and Brush
- Woody Materials
- Willow Cuttings and Clump Plantings

Such payment will constitute full compensation for all materials, labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Compensation for any item of work shown on the drawings or described in the *contract, specifications, or* special provisions, but not listed on the bid schedule, will be considered incidental to and included in the pay items listed on the bid schedule.

8. SPECIAL PROVISIONS

- SP 7-1 Construct Channel Log Step Pool
- SP 7-2 Construct Large Wood Structure
- SP 7-3 Construct Channel Streambed
- SP 7-4 Construct Vegetated Wood Matrix Type 1 and Type 2
- SP 7-5 Install Floodplain Roughness and Woody Debris
- SP 7-6 Collect Willows
- SP 7-7 Furnish Wood
- SP 7-8 Furnish Channel Streambed and Streambank Alluvium and Category 1 Rock

9. SUBMITTALS REQUIRED

None

10. APPLICABLE DRAWINGS

- Drawing 8.0 Large Wood Structure Detail
- Drawing 8.1 Vegetated Wood and Brush Matrix Type 1-2 Details
- Drawing 8.2 Constructed Channel Streambed Detail
- Drawing 8.3 Channel Log Step Pool Detail
- Drawing 8.4 Floodplain Roughness Detail
- Drawing 9.0 Materials List

BID ITEM 5: CONSTRUCT CHANNEL LOG STEP POOLS

Applicable Drawings

- Drawing 1.0 Cover Sheet and Notes
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 4.0 Survey Control Plan
- Drawing 5.0 Plan View and Structure Layout
- Drawing 5.1 Grading Plan and Profile
- Drawing 5.2 Plan View and Structure Layout
- Drawing 5.3 Grading Plan and Profile
- Drawing 8.3 Channel Log Step Pool Detail
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-1 Construction Surveys
- BSC-3 Remove and Control Water
- BSC-4 Clearing and Grubbing
- BSC-5 Pollution Control
- BSC-6 Excavation
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Contractor shall construct Channel Log Step Pool Structures as shown on the applicable drawings and as described below.

Excavate the trench for the structure as shown on the drawings. Place footer logs with minimum diameter and stem length as specified on the bottom of the trench at the specified depth and orientation as shown on the drawings. Install rootwad logs with the upstream root wads flush with the bank lines, and the stems buried in the floodplain in an upstream orientation, as shown on the drawings. Place vane log at angles and orientations as shown on the drawings or as directed by Construction Manager. Install ballast rock on downstream side of the vane log at the bank tie-in location as shown on the drawings. Install backer log on the upstream side of the vane log as shown on the drawings. Backer log shall be flush with the vane long and extend the full length of the vane log as shown on the drawings. Install filter fabric using ring shank nails to the upstream side of the vane log, as low on the log as possible to avoid exposure. Fasten with ring shank nails. Install ballast rock on upstream side of the vane log, intersecting the backer log. Blend excavated material not used into the adjacent floodplain or location approved by Construction Manager.

Notify Construction Manager for inspection and obtain Construction Manager's approval of the orientation and placement of the logs and placement of rock prior to backfilling with the specified materials. Compact backfill material with the excavator bucket to the grades and elevations shown on the drawings.

Provide Category 1 Rock and provide Category 2 and Category 3 Wood as shown on the applicable drawings.

Work Included

- Provide wood, rock, fabric and ring shank nails.
- Install materials and construct Channel Log Step Pool structures as specified.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the Work as specified.

Measurement Bid Item 5

Measurement for Bid Item 5 Construct Channel Log Step Pools will be by the actual number of Channel Log Step Pool structures constructed and approved, as measured by Construction Manager.

Payment Bid Item 5

Payment for Bid Item 5 Construct Channel Log Step Pools will be made according to the unit price bid per Channel Log Step Pool structure as shown in the Bid Form.

BID ITEM 6: CONSTRUCT LARGE WOOD STRUCTURE

Applicable Drawings

- Drawing 1.0 Cover Page
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 4.0 Survey Control Plan
- Drawing 5.0 Plan View and Structure Layout
- Drawing 5.1 Grading Plan and Profile
- Drawing 5.2 Plan View and Structure Layout
- Drawing 5.3 Grading Plan and Profile
- Drawing 8.0 Large Wood Structure Detail
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-1 Construction Surveys
- BSC-3 Remove and Control Water
- BSC-4 Clearing and Grubbing
- BSC-5 Pollution Control
- BSC-6 Excavation
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Contractor shall construct Large Wood Structure bank treatments as shown on the applicable drawings and as described below.

Excavate the trench for the structure as shown on the drawings. Place footer logs with minimum diameter and stem length as specified on the bottom of the trench at the specified depth and orientation as shown on the drawings. Install rootwad logs with the upstream root wads flush with the bank lines, and the downstream root wads projecting into the channel, as shown on the drawings, intersecting the footer logs. Place small diameter wood and a second tier of footer logs and root wad logs as described above. Install additional deflector logs per the orientation described above and/or shown on the drawings. Orient deflector logs in the downstream direction and adjust as requested by Construction Manager. Roughen exposed ends of deflector logs so as to appear natural. Ensure any sawed ends of deflector logs are not exposed. Place additional limbs and brush in the structure as requested by Construction Manager and as shown on the drawings. Blend excavated material not used into the adjacent floodplain or location approved by Construction Manager.

Notify Construction Manager for inspection and obtain Construction Manager's approval of the orientation and placement of the logs and placement of rock prior to backfilling with the specified materials. Prior to backfill, load, haul and place five whole clump shrub transplants harvested from identified vegetation salvage areas in structure framework. Compact backfill material with the excavator bucket to the grades and elevations shown on the drawings.

Provide Category 1 Rock, and provide Category 1, Category 2, Category 3, and Category 4 Wood as shown on the applicable drawings.

Work Included

- Provide wood, rock, and vegetative material.
- Install materials and construct Large Wood Structures bank treatments as specified.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the Work as specified.

Measurement Bid Item 6

Measurement for Bid Item 6 Construct Large Wood Structure will be by the actual number of Large Wood Structures constructed and approved, as measured by Construction Manager.

Payment Bid Item 6

Payment for Bid Item 6 Large Wood Structure will be made according to the unit price bid per Large Wood Structure as shown in the Bid Form.

BID ITEM 7: CONSTRUCT CHANNEL STREAMBED

Applicable Drawings

- Drawing 1.0 Cover Sheet and Notes
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 4.0 Survey Control Plan
- Drawing 5.0 Plan View and Structure Layout
- Drawing 5.1 Grading Plan and Profile
- Drawing 5.2 Plan View and Structure Layout
- Drawing 5.3 Grading Plan and Profile
- Drawing 7.0 Channel Cross Section Dimensions
- Drawing 8.2 Constructed Channel Streambed Detail
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-1 Construction Surveys
- BSC-3 Remove and Control Water
- BSC-4 Clearing and Grubbing
- BSC-5 Pollution Control
- BSC-6 Excavation
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Contractor shall provide and install Category 1 Rock and Channel Alluvium in riffle, run and glide channel features as shown on the applicable drawings and as directed by Construction Manager. Dewater the work area as required in the Base Specifications or as otherwise described in the Special Provisions.

Place the Rock to meet the finished channel streambed elevation as shown on the drawings. Construct the channel streambed in three steps including:

1. Place the framework rock (Category 1 Rock).
2. Install Category 1 Wood along channel margins.
3. Construct pocket pools.
4. Place the Channel Alluvium.
5. Bucket compact Channel Alluvium to finished grade elevations as shown on the applicable Drawings.

Provide and install Rock to meet the gradation shown on applicable drawings and in Table 1. Prior to placement, Construction Manager shall approve channel subgrade excavation and elevations. Contractor shall excavate, screen, and stockpile Rock by type at the approved source or a designated stockpile/mixing location approved by Construction Manager. Crushed rock will not be accepted.

Table 1. Channel Alluvium gradation.

Size (inches)	Percent Passing	Representative Size Class
10	95	D100
8	80-90	D84
4	45-55	D50
2	30-40	D35
1	20-30	D15
.08	20	

Determine gradations according to ASTM D5519-07 Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials and submit test results to Engineer for approval. Stone and rock shall be hard, durable, sound, and resistance to weather and to water action. The bulk density of the stone and rock shall be at least 165 pounds per cubic foot, with a specific gravity of 2.65. Crushed rock will not be accepted. Rock shall be generated on site and match native materials in the drainage. Construction Manager will inspect the source and material stockpiles to ensure conformity and uniformity of the materials.

Work Included

- Prepare the channel subgrade.
- Provide and install Category 1 Rock, Channel Alluvium, Pocket Pools and Category 1 Wood along channel margins.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the Work as specified.

Measurement Bid Item 7

Measurement for Bid Item 7 Construct Channel Streambed will be by the actual number of linear feet (to the nearest linear foot) of constructed Channel Streambed constructed and approved, as measured by Construction Manager along the channel thalweg.

Payment Bid Item 7

Payment for Bid Item 7 Construct Channel Streambed will be based on the unit price per linear foot as shown on the Bid Form.

BID ITEMS 8 & 9: CONSTRUCT VEGETATED WOOD AND BRUSH MATRIX TYPE 1 AND TYPE 2

Applicable Drawings

- Drawing 1.0 Cover Sheet and Notes
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 4.0 Survey Control Plan
- Drawing 5.0 Plan View and Structure Layout
- Drawing 5.2 Plan View and Structure Layout
- Drawing 7.0 Channel Cross Section Dimensions
- Drawing 8.1 Vegetated Wood and Brush Matrix Detail
- Drawing 8.4 Floodplain Roughness Detail
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-1 Construction Surveys
- BSC-3 Remove and Control Water
- BSC-4 Clearing and Grubbing
- BSC-5 Pollution Control
- BSC-6 Excavation
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Contractor shall construct Vegetated Wood and Brush Matrix Type 1 and 2 bank treatments as shown on the applicable drawings and as described below.

Excavate the trench and streambank for the structure as shown on the drawings. For each tier, place small logs (Category 3 Wood) in the streambank at skewed angles to the streambank. Logs shall be placed from the top of bank elevation to the toe of the trench as shown on the drawings. Logs shall overlap. For each tier (2 tiers for Type 1 and 2 to 3 tiers for Type 2, place brush (Category 4 Wood) within the matrix of small logs. Roughen exposed ends of logs so as to appear natural. Ensure any sawed ends are not exposed.

After the tiers are constructed, place riparian cuttings into the log and brush matrix with the stems in contact with the baseflow water surface elevation and the tip of the cuttings at or above bankfull or top of bank elevation. Backfill streambank with Channel Alluvium per the gradation shown on the applicable drawings. Finished bank face angles shall vary based on type of structure, as shown on the Drawings (2:1 for Type 1 and 1:1 for Type 2).

Place additional limbs and brush in the structure as requested by Construction Manager and as shown on the drawings. Blend excavated material not used into the adjacent floodplain or location approved by Construction Manager.

Notify Construction Manager for inspection and obtain Construction Manager's approval of the orientation and placement of the wood and rock prior to backfilling with specified materials. Compact backfill material with the excavator bucket to the grades and elevations shown on the applicable drawings.

Provide Category 3 and 4 Wood and provide Category 2 Rock and riparian cuttings as shown on the applicable drawings.

Work Included

- Provide wood, channel alluvium, and vegetative material.
- Install materials and construct Vegetated Wood Matrix Type 1 and 2 bank treatments as specified.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the Work as specified.

Measurement Bid Item 8 and Bid Item 9

Measurement for Bid Item Construct Vegetated Wood and Brush Matrix structure will be by the actual number of linear feet (to the nearest linear foot) of constructed Vegetated Wood and Brush Matrix (by type) constructed and approved, as measured by the Construction Manager along the top of bank.

Payment Bid Item 8 and Bid Item 9

Payment for Bid Item Construct Vegetated Wood and Brush Matrix structure will be made based on the unit price per linear foot by type as shown on the Bid Form

BID ITEM 10: INSTALL FLOODPLAIN ROUGHNESS AND WOODY DEBRIS

Applicable Drawings

- Drawing 1.0 Cover Page
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 4.0 Survey Control Plan
- Drawing 5.0 Plan View and Structure Layout
- Drawing 5.2 Plan View and Structure Layout
- Drawing 8.4 Floodplain Roughness Detail
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-1 Construction Surveys
- BSC-3 Remove and Control Water
- BSC-4 Clearing and Grubbing
- BSC-5 Pollution Control
- BSC-6 Excavation
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Contractor shall develop floodplain roughness and place woody material in the constructed floodplain as shown on the drawings. Construct the floodplain roughness by creating micro-topography consisting of low and high features (ridges and furrows), with no discernable pattern, in the finished grade of the floodplain surfaces. This treatment creates areas within the floodplain to trap seed and organic matter for new plant growth. Contractor shall construct floodplain roughness over the entire areas shown on the drawings. Maximum deviation from the designed finished grade should be no more than 0.5 feet. Construct floodplain roughness treatments in all areas staked or marked by Construction Manager.

Place woody material consisting of Category 2 and Category 3 Wood (to create additional roughness in the floodplain surface and provide shelter and organic matter for reestablishing plants). Bury the Category 2 Wood partially in the floodplain with one half of the length buried to a depth of two feet. Place Category 2 Wood at a rate of 35 pieces per acre. Place Category 3 Wood such that 25% of the floodplain surface is covered with woody material.

Contractor shall transport wood and approved brush from clearing and grubbing activities from the woody material stockpile areas approved by Construction Manager and place it within the

floodplain roughness treatment areas as shown on the drawings. Provide wood meeting the dimensions shown on Drawing 10.0 Materials List.

Work Included

- Provide Category 2 Wood and Category 3 Wood.
- Handle, store, and install materials to create floodplain roughness as specified.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the Work as specified.

Measurement Bid Item 10

Measurement for Bid Item 10 Install Floodplain Roughness and Woody Debris will be by the actual number of acres (to the nearest 0.1 acre) of micro-topography and woody material placed in the floodplain, as determined by Construction Manager based on survey.

Payment Bid Item 10

Payment for Bid Item 10 Install Floodplain Roughness and Woody Debris will be based on the unit price bid per acre as shown in the Bid Form.

BID ITEM 11: FURNISH WILLOW CUTTINGS

Applicable Drawings

- Drawing 1.0 Cover Page
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 4.0 Survey Control Plan
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-4 Clearing and Grubbing
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Contractor shall obtain approximately 6,000 willow cuttings from willows in the Prospect Creek drainage. These cuttings will be six to eight feet in length, and between $\frac{3}{4}$ inch and 1.5 inch in diameter at the base of the cutting. All cuts shall be made with a sharp, clean tool to produce a clean, smooth cut and prevent disease transfer. Obtain dormant willow cuttings from disease free stands. Cuttings are dormant between leaf drop and bud expansion, and may be collected between October 1 and April 15 unless other time periods are approved by Engineer. Collected cuttings must be used within five (5) days or stored at temperatures between 32 and 34 degrees Fahrenheit so they remain dormant. Contractor shall identify a borrow source and coordinate approval of the borrow source with Construction Manager. Construction Manager may identify more accessible stands with suitable material as necessary. Engineer will show contractor examples of suitable cuttings and demonstrate harvest methods. Contractor should expect that willows to be collected for cuttings will be growing in standing water.

Bundle cuttings in groups of 50. Collect cuttings in quantities shown and specified on the Drawings. Handle and transport cuttings so they remain moist, shaded, and cool at all times.

Contractor shall propose a location or locations to stage the cuttings at the work area. Obtain Construction Manager approval prior to preparing the staging area(s) to receive cuttings. The staging area(s) shall include a ponded area between 1 and 3 feet deep, containing water, that is large enough to store the specified number of cuttings. The ponded area shall be in clean, non-contaminated substrate. The staging area must be a clean area approved by Construction Manager before cuttings are delivered. Contractor must ensure that the water level is maintained throughout the storage period.

Place cuttings in the staging areas immediately upon cutting, and cover with moist burlap or other shade cloth the entire time they are held in the staging area. Cuttings shall not be stored at staging area(s) for more than five days prior to installation.

Work Included

- Collect and bundle cuttings.
- Designate a cutting staging area for approval by Engineer.
- Transport cuttings to staging area.

Measurement Bid Item 11

Measurement for Bid Item 11 Furnish Willow Cuttings will be by the actual number of willows collected and delivered to the staging area, as measured by Construction Manager.

Payment Bid Item 11

Payment for Bid Item 11 Furnish Willow Cuttings will be made according to the unit price per willow as shown in the Bid Form.

BID ITEM 12: FURNISH WOOD

Applicable Drawings

- Drawing 1.0 Cover Page
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 8.0 Large Wood Structure Detail
- Drawing 8.1 Vegetated Wood and Brush Matrix Detail
- Drawing 8.2 Constructed Channel Streambed Detail
- Drawing 8.3 Channel Log Step Pool Detail
- Drawing 8.4 Floodplain Roughness Detail
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-4 Clearing and Grubbing
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Contractor shall furnish wood from borrow sites identified during the pre-bid tour and created under Bid Item 12 Furnish Wood. Haul Category 1 Wood, Category 2 Wood, Category 3 Wood, and Category 4 Wood from the approved wood borrow sites. Provide wood meeting the dimensions shown in Table 2 – Wood Dimensions.

Haul and stage all wood in a manner that preserves the size, type and integrity of each piece to be incorporated into the work. Handle all wood in a manner that minimizes damage to bark, limbs, and rootwads (no rolling, crunching, crushing etc.).

Table 2- Wood Dimensions

Category	Stem Diameter (inches)	Stem Length (feet)	Root wad Diameter (feet)	Limbs
Category 1	12 to 16	30 (minimum)	2 min.	No
Category 2	8 to 12	10 to 15	Optional	Optional
Category 3	3 to 6	8 to 10	Optional	Yes
Category 4	3 minus	8 to 10	No	Yes

Work Included

- Harvest, sort, stage, handle and protect the wood.
- Designate and construct woody material staging area(s).
- Transport materials to the approved staging area(s).
- Provide all labors, tools, equipment, materials, and incidentals necessary to complete the work as specified.

Measurement Bid Item 12

Measurement for Bid Item 12 Furnish Wood will be by the actual number of willows collected and delivered to the staging area, as measured by Construction Manager.

Payment Bid Item 12

Payment for Bid Item 12 Furnish Wood will be made according to the unit price per willow as shown in the Bid Form.

BID ITEM 13A AND 13B: FURNISH CHANNEL STREAMBED AND STREAMBANK ALLUVIUM AND CATEGORY 1 ROCK

Applicable Drawings

- Drawing 1.0 Cover Page
- Drawing 2.0 Existing Conditions
- Drawing 3.0 Site Plan
- Drawing 3.2 Access, Staging and Dewatering Plan
- Drawing 3.4 Existing Wetlands and Vegetation Salvage Plan
- Drawing 8.0 Large Wood Structure Detail
- Drawing 8.1 Vegetated Wood and Brush Matrix Detail
- Drawing 8.2 Constructed Channel Streambed Detail
- Drawing 8.3 Channel Log Step Pool Detail
- Drawing 8.4 Floodplain Roughness Detail
- Drawing 8.5 Clearwater Diversion Detail
- Drawing 9.0 Materials List

Applicable Base Specifications

- BSC-0 General Requirements
- BSC-3 Remove and Control Water
- BSC-4 Clearing and Grubbing
- BSC-7 Channel, Streambank and Floodplain Treatments

Work Description

Contractor shall provide Streambed and Streambank Alluvium and Category 1 Rock as specified. Determine gradations according to ASTM D5519-07 Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials and submit tests to Engineer for approval. Alternative methods for testing must be approved by Construction Manager. Stone and rock shall be native in appearance and sub-rounded. Alluvium shall be hard, durable, sound, and resistant to weather and to water action. Provide sub-rounded stone and rock with the least dimension not less than ½ its greatest dimensions. The bulk density of the alluvium shall be at least 165 pounds per cubic foot, with a specific gravity of 2.65. Crush rock will not be accepted for Channel Alluvium. Rock should match native

Two borrow sources for Streambed and Streambank Alluvium are located in the project area, as described on Drawing 9.0 Materials List. Contractor shall verify if the sources can meet the specified alluvium gradation and volume and notify the Construction Manager upon inspection if the source will not generate either the required gradation, volume, or both.

The first source for alluvium is the clearwater bypass channel as shown on the drawings. Contractor shall strip the top alluvial (armored) layer of the diversion and load, haul, and stockpile the material in a staging area approved by Construction Manager. The second alluvium

source is the existing Crow Creek channel from Station 0+00 to Station 6+25. Following activation of the clearwater bypass channel, Contractor shall salvage, load, haul and stockpile alluvium, including boulders, in a staging area approved by Construction Manager.

While Category 1 Rock may be encountered during salvaging of both the clearwater bypass channel and existing Crow Creek channel alluvium, additional Category 1 Rock may need to be imported from an off-site location.

Bid Item 13.A Furnish Streambed and Streambank Alluvium

Contractor shall furnish Streambed and Streambank Alluvium meeting the gradations in Table 3:

Table 3. Channel Alluvium gradation.

Size (inches)	Percent Passing	Representative Size Class
10	95	D100
8	80-90	D84
4	45-55	D50
2	30-40	D35
1	20-30	D15
.08	20	

Bid Item 13.B Provide Category 1 Rock

Provide Category 1 Rock meeting the following specifications:

- 18-inch to 24-inch diameter.

Work Included

- Provide Channel Streambed and Streambank Alluvium.
- Provide Category 1 Rock.
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

Measurement Bid Item 13.A through Bid Item 13.B

Measurement for Bid Item 13.A Furnish Streambed and Streambank Alluvium will be by the actual number of cubic yards (to the nearest tenth) furnished and delivered to the staging area, as measured by Engineer.

Measurement for Bid Item 13.B Furnish Category 1 Rock will be by the actual number of Category 1 Rock furnished and delivered to the staging area, as measured by Engineer.

Payment Bid Item 13.A through Bid Item 13.B

Payment for Bid Item 13.A Furnish Streambed and Streambank Alluvium will be by the actual number of cubic yards (to the nearest tenth) furnished and delivered to the staging area, as measured by Engineer.

Payment for Bid Item 13.B Furnish Category 1 Rock will be by the actual number of Category 1 Rock furnished and delivered to the staging area, as measured by Engineer.