

BID DOCUMENT NO 2013-03

ATTACHMENT 1 – TECHNICAL SPECIFICATIONS AND DRAWINGS

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TECHNICAL SPECIFICATIONS

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DIVISION 1 – GENERAL

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SECTION 01010 – SUMMARY

PART 1 – GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. Governing Regulations

1. Perform Work in accordance with all applicable laws, codes, ordinances, and regulations. Work shall be completed in accordance with the following:
 - a) The Contract Documents
 - b) Applicable permits, laws, codes, ordinances, and regulations
 - c) According to the manufacturer's recommendations
2. The Contractor shall have an approved set of the Contract Documents on site at all times. The Contractor shall also have a copy of applicable permits and licenses on the site at all times.
3. Protection of natural resources: All Work should be carried out in a manner consistent with the goal of achieving proposed development with the least possible disturbance to vegetation, wildlife, steep slopes, wetlands, streams, and their buffers. No disturbance, including access or storage of materials, is to occur within designated wetlands or below ordinary high water, with the exception of those areas as shown in the drawings, which are permitted disturbances.

B. Contractor Responsibilities

1. Coordinate, furnish, and pay for all items, articles, materials, and operations listed, including all labor, materials, equipment, and incidentals required for their completion, except as noted in paragraph C below. The Contractor is responsible for all construction means and methods and for the general coordination of the Work of all trades.
2. Pay the required taxes.
3. Secure and pay for the following, as necessary for proper execution and completion of Work:
 - a) Work permits from local jurisdictions, not including regulatory permits that are obtained by the Contracting Agency
 - b) Fees
 - c) Licenses

d) Bonds

4. Give required notices.
5. Enforce strict discipline and good order among employees and coordination of the Work by subcontractors.
6. Use new materials, except as noted or otherwise approved by the Contracting Officer.
7. Maintain required ingress and egress and other access as required by the Contracting Agency in accordance with governing Codes and Ordinances throughout the Work.
8. Comply with all requirements noted in approved permits. Advise the Contracting Officer of any conflicts between permit conditions and the Contract Documents.
9. The Contractor is, in general, the custodian of the site of the Project and it is his/her responsibility to provide access, storage, sanitation facilities, safety and environmental protection supplies, parking, and work space for all those engaged in the Work. The site shall be maintained in an orderly manner with debris and trash removed daily.
10. All materials, methods, and equipment shall comply with the requirements of applicable codes and the Contract Documents, including requirements of all incorporated standards. The Contractor shall furnish, as a part of the Contract, certification of code compliance if requested by the Contracting Agency, Sponsor, Contracting Officer, or Code Enforcing Agency.
11. Personal safety: Protect personnel, passers-by, occupants, or visitors to the site from harm and injury.
12. Construction: Protect existing and adjoining structures and site features where noted, including: vegetation, access points, utilities, and Work of any kind which is to remain from damage, defacement, or interruption of service, except as may be specially directed or authorized. All streets and access roads shall be repaired according to municipal standards, if damaged, and left in a condition equal to or better than the original condition.
13. Existing utilities: Protect existing underground and overhead utilities from any damage or interruption of service and call for location markings before ground disturbance. If necessary, obtain permission from utility owners and relocate as required for completion of the Work.

C. Materials and Services Supplied by the Sponsor and/or Contracting Agency

1. The Sponsor or Contracting Agency may supply materials and/or services for the Work; these materials and supplies shall be identified on one or a combination of the following: the Drawings, Specifications, and Contract Documents.
2. The Contractor shall not be reimbursed for materials and/or services supplied by the Sponsor and/or Contracting Agency.
3. The Contractor shall coordinate with the Sponsor and/or Contracting Agency supplying materials and/or service, as necessary, to complete the Work.

1.02 WORK UNDER THIS CONTRACT

- A. The Work consists of furnishing all labor, equipment, and materials necessary for and performing all operations and improvements to the Project site in accordance with the Specifications and Drawings, and subject to the terms and conditions of the Contract Documents.

1.03 CONTRACT TIME AND WEATHER-RELATED DELAYS

- A. Unless otherwise indicated in the Contract, the following shall apply:
 1. The Work of this Contract shall commence immediately upon the receipt of Notice to Proceed, and shall be substantially complete within the Contract time defined in the General Conditions of the Contract Documents. Completion of Final Punch List shall be achieved within the time period required in the Certificate of Substantial Completion.
 2. Contract time may be changed by Change Order only. Contract time shall be amended by Change Order to account for weather-related delays. Contract time extension and documented costs are the sole remedy in change orders resulting from weather-related delays.

1.04 LIQUIDATED DAMAGES

- A. See Contract Documents.

1.05 HAZARDOUS MATERIAL

- A. No toxic or hazardous chemicals or materials are expected to be encountered during scheduled construction activities. Should any Work activities by this Contract discover/disturb any hazardous material, the Contractor is directed to immediately cease Work activity in the area found to be potentially hazardous, notify the Contracting Officer, and await the Contracting Officer's direction.

1.06 CUTTING AND PATCHING

- A. General: The Contractor shall be responsible for all cutting and fitting or patching that may be required to complete the Work or to make several parts fit together properly. This includes executing cutting, fitting, and patching required to uncover Work; providing for installation of ill-timed Work; removing and replacing defective Work; removing and replacing Work not conforming to requirements of the Contract Documents; removing samples of Work as specified for testing; and installing specified Work in existing construction.

1.07 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification format: The Specifications are generally organized into Divisions and Sections using the 16-division format and Construction Specifications Institute's (CSI's) "MasterFormat" numbering system.
 - 1. Section identification: The Specifications use section numbers and titles to help with cross-referencing in the Contract Documents. Sections in the Contract Documents are in numeric sequence; however, unused Sections are not included. Consult the table of contents at the beginning of the Contract Documents to determine numbers and names of sections in the Contract Documents.
- B. Specification content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

1.08 DEFINITIONS

- A. Abandonment: Contractor failing to be present at job site for 7 calendar days without prior notice (not to be confused with abandoned utilities).
- B. Addenda: the written notices of modification of the Contract Drawings, Specifications, or other Contract Documents, which may be issued by the Sponsor

to holders of Contract Documents prior to the opening of Proposals. The singular of Addenda is Addendum.

- C. Architect/Engineer: The person or firm designated as the Architect or Engineer.
- D. As approved: Unless otherwise qualified, shall be understood to be followed by the words “by the Contracting Officer”.
- E. As shown and As indicated: Unless otherwise qualified, shall be understood to be followed by the words “on the Drawings”.
- F. Authorized Representative: The individual(s) that the Sponsor or Contracting Officer designates to serve as its representative in dealings with the Contractor.
- G. Contract Documents: The Contract as defined in paragraph 2 of the Contract Agreement (see Contract Forms in Part VI, Attachment 3, Section 1, pg. 1-1).
- H. Contracting Agency: The Agency that is a party to the Contract, Methow Salmon Recovery Foundation.
- I. Contracting Officer: The individual designated by the Sponsor to serve as its representative.
- J. Contractor: The entity that is awarded the Contract.
- K. Contractor’s Representative: The individual whom the Contractor designates in accordance with paragraph GC-18.2 in the Bid Documents, Part III.
- L. Days: Unless otherwise specifically stated, will be understood to mean calendar days.
- M. Drawings: Refers to the official Drawings, profiles, cross sections, elevations, details, and other working drawings and supplementary drawings, or reproductions thereof, which show the location, character, dimensions, and details of the Work to be performed. Drawings may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents, regardless of the method of binding.
- N. Notice or The requirement to notify: As used in the Contract Documents or applicable State or Federal statutes, shall signify a written communication delivered in person or by certified or registered mail to the individual, or to a member of the firm, or to an officer of the corporation for whom it is intended. Certified or registered mail shall be addressed to the last business address known to him who gives the notice.
- O. Observer: Individual(s) that the Sponsor designates as its observer(s) of the Work.

- P. Or equal: Shall be understood to indicate that the "equal" product is the same or better than the product named in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the Project design requirements will be made by the Contracting Officer. Such "equal" products shall not be purchased or installed by the Contractor without the Contracting Officer's written approval.
- Q. Plans: (see "Drawings").
- R. Provide: Means to "furnish and install" as specified in the Specifications and as shown on the Drawings.
- S. Satisfactory: Satisfactory to the Sponsor or the Architect/Engineer.
- T. Specifications: The terms, provisions, and requirements contained herein. Where standard specifications, such as those of ASTM, AASHTO, etc., have been referred to, the applicable portions of such standard specifications shall become a part of these Contract Documents.
- U. Sponsor: Methow Salmon Recovery Foundation, also referred to as "MSRF".
- V. Substantial Completion: Shall be that degree of completion of the Project or a defined portion of the Project, sufficient to provide the Contracting Officer, at his discretion, the full-time use of the Project or defined portion of the Project for the purposes for which it was intended. Notice of acceptance by the Contracting Officer shall not be deemed granted until provided to the Contractor in writing.
- W. The Work: The entire undertaking, including all labor, materials, plant, tools, supplies, equipment, transportation, supervision, design, services, goods, and other things necessary, appropriate, or incidental to the carrying out and completion of all tasks described in the Contract Documents, in full conformity with the Contract Documents.
- X. WDFW: Washington Department of Fish and Wildlife

1.09 PROJECT TEAM

- A. Lines of Communication:
 - 1. The Contractor and the Contractor's Representative are to communicate directly with the Contracting Officer or the Contracting Officer's Representative unless authorized in writing to contact other listed Project personnel.

B. Contracting Agency:

1. Methow Salmon Recovery Foundation (MSRF)

Office Address:

Methow Salmon Recovery Foundation
206 Glover Street
Twisp, WA 98856
Phone: (509) 966-2787
Fax: (509) 422-1766

Mailing Address:

Methow Salmon Recovery Foundation
P.O. Box 755
Twisp, WA 98856

Contracting Officer:

Chris Johnson, MSRF
Phone: (509) 422-0300
Mobile: (509) 429-1232

Contracting Officer's Representative:

Brian Fisher, MSRF
Phone: (509) 387-1716

C. Sponsor: (same as Contracting Agency)

D. Engineer:

Office Address:

United States Department of Interior
Bureau of Reclamation
Pacific Northwest Region
1150 North Curtis Road, Suite 100
Boise, ID 83706-1234
Phone: (208) 378-5233

Contact: Rob Richardson

E. Engineer's Consultant:

Office Address:

Anchor QEA, LLC
1605 Cornwall Avenue
Bellingham, WA 98225
Phone: (360) 733-4311

Contact: Tracy Drury, P.E.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

SECTION 01110 – SUMMARY OF WORK

PART 1 – GENERAL

1.01 REQUIREMENT

- A. Construct and complete in accordance with the Contract Documents provisions, these Specifications, and the Drawings listed in Section 01111 – Drawings, Methow River Valley, WA; Upper Middle Methow Reach; WDFW Habitat Improvement Project.

1.02 LOCATION

- A. All Work is on or adjacent to the floodplain of the Methow River, north of Twisp, Washington, in Township 34 North, Range 21 East, Section 30, Okanogan County. Work is limited to the main channel and a side channel of the Methow River between Old Twisp Highway South and Evans Road, near the Methow Valley State Airport.

1.03 INTENT

- A. The general intent of this Work is to enhance and improve fish habitat conditions along the Methow River main channel and a side channel.
- B. The above Work is to be performed for Methow Salmon Recovery Foundation, hereafter referred to as the “Contracting Agency.” The Contracting Agency will appoint a Project staff member, hereafter referred to as “Contracting Officer,” who will have the responsibility to issue a Contract to construct the above Work and will administer the Contract Documents and funds for the Project.
- C. The United States Bureau of Reclamation, hereafter referred to as the “Engineer,” is the Contracting Agency’s representative who has designed the Project and provides oversight during construction. The Engineer makes recommendations to the Contracting Officer regarding whether all the Work is in compliance with the construction Specifications and Drawings. The Engineer also reviews all construction changes and makes recommendations to the Contracting Officer prior to the Contracting Officer’s approval of the changes.

1.04 SEQUENCE OF WORK/TIME FOR COMPLETION

- A. Contractor shall attend a pre-construction meeting prior to commencement of the construction. Meeting location, date, and time shall be determined by the Contracting Agency.
- B. Construction on the Project will start on or before August 1, 2013, and end by October 30, 2013.
- C. Staging may begin after award of the Contract.

- D. In-stream work may occur between July 1, 2013 and October 15, 2013, provided the Methow River flow is below 2240cfs at the USGS gauge in Winthrop.
- E. The Contractor shall complete all construction activities within and adjacent to the Methow River and its floodplain within ordinary high water in accordance with construction permits. Work in the side channel shall not begin when water is flowing in the side channel and not before water control is in place in case of high water, unless otherwise allowed by the construction permits and approved by the Contracting Officer.
- F. Substantial completion shall be accomplished no later than October 30, 2013.

1.05 PRINCIPAL COMPONENTS OF WORK

- A. The major items of Work to be completed include the following:
 - 1. Mobilization and demobilization
 - 2. Site preparation, including:
 - a) Establishing staging areas and Work access routes as indicated on the Drawings; includes limited clearing and grubbing and stripping. Including development and implementation of an approved access route wetland protection plan.
 - b) Contractor to develop and implement elements of an approved Stormwater Pollution Prevention Plan (SWPPP), if required, or the Water Quality Management Plan.
 - c) Contractor to develop and implement an approved Traffic Control Plan, where applicable.
 - d) Contractor to develop and implement elements of an approved Care of Water Plan in preparation for excavation required for various elements of the Work.
 - e) Contractor to develop and implement elements of an approved spill containment control plan.
 - 3. Diversion and control of water during construction in accordance with the approved Care of Water Plan and other construction permit conditions.
 - 4. Installing, maintaining during construction, and removing at construction completion temporary erosion and sediment control measures.
 - 5. Removal of existing levee as indicated on the Drawings and described in the Specifications. Includes in-water Work and requires segregation of excavated materials.

- a) The perpendicular (to river flow) portion of the levee removal is identified as an optional item on the Drawings. An estimated quantity of material removed from the levee as part of the optional bid item is provided on the Drawings and the Bid Schedule.
6. Construction of two (2) “LWD Type V” structures as shown on the Drawings and as indicated in the Specifications.
7. Construction of twelve (12) “ELJ Type B” structures as shown on the Drawings and as indicated in the Specifications.
8. Construction of three (3) “ELJ Type BD” structures as shown on the Drawings and as indicated in the Specifications.
9. Construction of three (3) “ELJ Type As” structures as shown on the Drawings and as indicated in the Specifications.
10. Construction of one (1) “ELJ Type Ac” structure as shown on the Drawings and as indicated in the Specifications.
11. Construction of one (1) “ELJ Type A” structure as shown on the Drawings and as indicated in the Specifications.
12. Construction site restoration: Removal of access routes and staging areas to match pre-construction conditions includes furnishing and placing seed to restore areas disturbed.

1.06 MINIMUM AREA

- A. Construction impacts will be confined to the clearing limits indicated on the Drawings, unless otherwise approved by the Contracting Officer. All material stockpiles, equipment storage, employee parking, and other related construction support activities shall be confined to the limits shown on the Drawings.

1.07 MAINTAINING NORMAL FLOW OF WATER

- A. Work shall not impede the natural flow of water, except as indicated in the Specifications and Drawings, or as authorized by the approved Care of Water Plan and construction permit conditions.

1.08 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals:
 1. RSN 01110-1, Traffic Control Plan
 - a) The Contractor shall develop and submit a Traffic Control Plan to the Contracting Officer for approval. Contractor shall submit the

approved plan to the responsible agencies in accordance with local and/or state requirements. The Traffic Control Plan shall be submitted not less than 10 days prior to mobilization to allow review, comment, and possible plan modification by County Engineer or other appropriate party.

- b) The Traffic Control Plan shall include a schedule for the closure and reopening of roadways or lane closures necessary for the Work.
- c) The Traffic Control Plan shall include drawings or sketches that are scaled to show the full extent of elements in the Plan, including signage, position of flaggers, lane closure equipment, and other traffic control devices as necessary.

2. RSN 01110-2, Safety Plan

- a) The Contractor shall develop and maintain a safety program and submit a safety plan to the Contracting Officer not less than 10 days prior to mobilization. In addition to the normal safety procedures for the type of Work and equipment being used, the safety plan must address specific hazards of the site including heat exposure, cold exposure, water safety, poisonous snakes and insects, and other site-specific hazards. The safety plan shall include the location and contact information for the nearest emergency medical facility, law enforcement, and fire department, as well as method and frequency of safety training and site safety plan information transfer to employees.

3. RSN 01110-3, Progress Schedule

- a) The Contractor shall develop a progress schedule, highlighting timelines of critical Work tasks and milestones and submit no more than 15 days after the Contract is executed. Schedule is subject to review, comment, and approval by Contracting Agency prior to Work commencing.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

SECTION 01111 – DRAWINGS

PART 1 – GENERAL

1.01 PAYMENT

- A. Include all costs in prices offered in the schedule for other items not specifically identified but necessary to complete the Work.

1.02 QUALITY ASSURANCE

- A. Inform the Contracting Officer of any discrepancies, errors, or omissions discovered on Drawings prior to the start of Work.

1.03 PROJECT CONDITIONS

- A. Where there are minor differences, as determined by the Contracting Officer, between details and dimensions shown on the Drawings and details and dimensions of existing features at the job site, use details and dimensions of existing features at the job site.

1.04 COPIES OF DRAWINGS

- A. One set of full-size Drawings, and up to ten (10) additional sets of half-size Drawings, except standard Drawings, will be furnished to the Contractor by the Contracting Officer for construction purposes, upon request by the Contractor.
- B. If construction drawings are updated, the Contracting Agency will release the updated Drawings to the Contractor as described herein.

1.05 LIST OF DRAWINGS

- A. Drawings listed in Table 01111A – List of Drawings, are made a part of these Specifications.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

Table 01111A – List of Drawings

Sheet No.	Sheet Title
01	Cover Sheet
02	General Notes & Estimated Quantities
03	Existing Conditions & Survey Control
04	Site Access, Staging, and Care of Water Plan
05	Proposed Conditions Site Plan
06	Proposed Conditions Plan (1 of 3)
07	Proposed Conditions Plan (2 of 3)
08	Proposed Conditions Plan (3 of 3)
09	Levee Removal Sections
10	Main Channel Sections
11	Side Channel Profile & Sections
12	LWD Type V Typical Details
13	Reserved
14	ELJ Type B Typical Details
15	Reserved
16	ELJ Type BD Typical Details
17	ELJ Type As Typical Details
18	ELJ Type A Typical Details
19	ELJ Type Ac Typical Details
20	Connection Details
21	Additional Details

END OF SECTION

SECTION 01141 – USE OF SITE

PART 1 – GENERAL

1.01 PROJECT CONDITIONS

- A. The staging areas and access routes, indicated on the Drawings, may be used for construction support activities. Additional or different areas are available for staging and/or access routes. The Contractor may request, in writing to the Contracting Officer, the use of alternate staging areas and/or access routes. The request may be approved, at the discretion of the Contracting Officer.
- B. If private land is used for construction facilities or other construction purposes, the Contractor shall make necessary arrangements and pay rental and other costs associated with use of private land. At the end of the project, the Contractor shall provide a copy of a release from the property owner that rents have been paid and lease conditions fulfilled.
- C. Use of public right-of-way may require permits from local and/or state agencies. It is the responsibility of the Contractor to acquire the necessary permits before the start of the Work.
- D. Location, construction, operation, maintenance, and removal of construction facilities on the designated staging areas and access routes will be subject to approval of the Contracting Officer.
- E. Housing for construction personnel will not be permitted on the Project site, unless otherwise approved by the Contracting Officer.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

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SECTION 01330 – SUBMITTALS

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in prices offered in the schedule for other items not specifically identified but necessary to complete the Work.

1.02 DEFINITIONS

- A. Days: Calendar days.
- B. Required Submittal Number (RSN): RSN identifies items to be submitted together as a complete submittal.

1.03 SUBMITTAL REQUIREMENTS

- A. In case of conflict between the requirements of this Section and requirements included elsewhere in these Specifications, requirements listed elsewhere shall take precedence.
- B. Professional Certifications:
 - 1. Sign and seal submittals requiring certification by a Washington State registered professional, in accordance with Washington State codes and laws.
- C. Drawings and data:
 - 1. Prepare Drawings and data in written English and U.S. customary units.
 - 2. Label Drawings and data with the Bid Document Number, Project Title, and Bid Schedule item number(s).
 - 3. Mark items to be furnished on manufacturer's data for commercial products or equipment, such as catalog cut sheets. Identify manufacturer's name, type, model, size, and characteristics. Illustrate that the product or equipment meets the requirements of these Specifications.
 - 4. Drawings:
 - a) Minimum identification in title block:
 - 1) Bid Document Number and Project title.
 - 2) Contractor's or supplier's title and Drawing number.
 - b) Sizes: 22" x 34", 11" x 17", or 8.5" x 11"

- c) Draw to scale with neat lettering using drafting equipment or computer aided drafting equipment.
- d) Measurement units: U.S. customary units

1.04 SUBMITTAL PROCEDURES

- A. Submit only checked submittals. Submittals without evidence of Contractor's approval will be returned for resubmission.
- B. Submit complete sets of required materials for each RSN as specified in "Submittals Required" column of Table 01330A – List of Submittals. A complete set includes all listed items for RSNs with multiple parts.
- C. Submit number of sets specified in "No. of sets to be set to:" column in Table 01330A – List of Submittals.
- D. Include the following information in transmittal letters:
 - 1. Bid Document Number and Project title.
 - 2. RSN for each attached submittal.
 - 3. Number of sets for each RSN.
 - 4. Identify submittal as initial or resubmittal.
- E. More than one RSN may be submitted under a transmittal letter.
- F. All submittals listed in the Specifications are required. Note:
 - 1. If a submittal is required for a product or material not proposed for use in this Contract by the Contractor, the Contractor shall submit a letter with the correct RSN and indicate that the product or material is not proposed for use in this Contract.

1.05 REVIEW OF SUBMITTALS

- A. Time required:
 - 1. Time required to review submittals shall be 10 days.
 - 2. Time required for review of each submittal or resubmittal begins when the Contracting Officer receives complete sets of materials required for a particular RSN and extends through return mailing postmark date.
- B. Return of Submittals
 - 1. One set of submittals required for approval will be returned approved, either not approved, or conditionally approved.

2. Revise and resubmit for approval submittals that are not approved. Show changes and revisions with revision date. Describe reasons for significant changes in transmittal letter. Submit additional information as requested for those submittals that are conditionally approved.
3. Resubmit returned submittals within 7 days after receiving comments, unless otherwise specified. Requirements for initial submittals apply to resubmittals.
4. Do not change designs without approval of the Contracting Officer after submittal drawings, documentation, and technical data have been approved.

1.06 TRANSMITTAL

- A. Send submittals required by Table 01330A – List of Submittals, to the Contracting Officer, Methow Salmon Recovery Foundation at:
 1. P.O. Box 755, Twisp, WA 98856 or
 2. Send digital transmittals via email to Brian Fisher at; brian@methowsalmon.org
- B. The Contracting Agency will retain one copy and disseminate the remaining submittal packages to the Engineer and the Engineer’s Consultant.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 GENERAL

- A. Maintain one approved set of submittals at the worksite and provide access to these submittals for the Contracting Officer, Contracting Agency, Engineer, interested Government Agencies, and Sponsor.

Table 01330A – List of Submittals

RSN	Submittal title	Type*	Submittals required	Submittal Due	No. of sets to be sent to Contracting Officer
01110-1	Traffic Control Plan	A	Traffic Control Plan	Not less than 10 days prior to mobilization	5
01110-2	Safety Plan	A	Safety Plan	Not less than 10 days prior to mobilization	5

WDFW Habitat Improvement Project
Methow River Subbasin, Columbia Snake River Salmon Recovery Program, Washington

RSN	Submittal title	Type*	Submittals required	Submittal Due	No. of sets to be sent to Contracting Officer
01110-3	Progress Schedule	I	Progress Schedule	Not more than 15 days after Contract is executed	5
01335-1	Hazardous Materials	A	List of Hazardous Materials and Materials Safety Data Sheets	Not less than 10 days prior to delivering hazardous materials to the site	5
01563-1	Water Quality Management Plan	A	Water Quality Management Plan	Not less than 10 days prior to mobilization	5
01563-2	SWPPP	A	Stormwater Pollution Prevention Plan, if required	Not less than 10 days prior to mobilization	5
01563-3	Spill Containment Control Plan	A	Spill Containment Control Plan	Not less than 10 days prior to mobilization	5
01569-1	Access Route Wetland Protection Plan	A	Access Route Wetland Protection Plan	Not less than 10 days prior to mobilization	5
01721-1	Surveying	A	Field Records	Not more than 10 days after completion of the Work	5
01781-1	As-built Drawings	A	Contractor's As-built Drawings	Not more than 14 days following substantial completion	5
02240-1	Care of Water Plan	A	Care of Water Plan	Not less than 10 days prior to mobilization	5
02370-1	Erosion Control Fabrics	A	Manufacturer information, testing, and others as described in Section 02370	Not less than 14 days prior to use of product	5
02930-1	Seeding	A	Seed Certification and Analysis	Not less than 14 days prior to use of product	5
02947-1	Large Woody Material	A	Source and inventory of materials showing that specifications have been met. Access for inspection permitted by source supplier.	Not less than 21 days prior to mobilization	5
02948-1	Wire Rope	A	Material cut sheet from manufacturer/supplier showing that specifications have been met	Not less than 14 days prior to mobilization	5

WDFW Habitat Improvement Project
Methow River Subbasin, Columbia Snake River Salmon Recovery Program, Washington

RSN	Submittal title	Type*	Submittals required	Submittal Due	No. of sets to be sent to Contracting Officer
02948-2	Wire Rope Clips	A	Material cut sheet from manufacturer/supplier showing that specifications have been met	Not less than 14 days prior to mobilization	5
02948-3	Staples	A	Material cut sheet from manufacturer/supplier showing that specifications have been met	Not less than 14 days prior to mobilization	5
02948-4	Natural Fiber Rope	A	Material cut sheet from manufacturer/supplier showing that specifications have been met	Not less than 14 days prior to mobilization	5
02952-1	Logging Slash and Small Woody Debris	I	Source and material description. Permission to access source site. See Section 02953.	Not less than 14 days prior to mobilization	5

* Type "A" indicates submittals for review and approval and "I" indicates submittals for information.

END OF SECTION

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SECTION 01335 – MATERIAL SAFETY DATA SHEETS

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in applicable prices offered in the schedule for items of Work for which hazardous materials are required.

1.02 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals:
 - 1. RSN 01335-1, Complete List of Hazardous Materials (LHM) and Material Safety Data Sheets (MSDS)
 - 2. RSN 01335-1, Updated LHM and MSDS
 - a) Submit updated copies of LHM and MSDS to Contracting Officer, not less than 10 days prior to delivering hazardous materials to job site.

1.03 DELIVERY

- A. Do not deliver any hazardous material to job site that are not included on the original or previously updated LHM and MSDS before receipt of MSDS submission data by Contracting Officer.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

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SECTION 01420 – REFERENCES

PART 1 – GENERAL

1.01 REFERENCES

- A. Referenced editions of standard specifications, codes, and manuals form a part of these Specifications to the extent they are referenced.
- B. These Specifications take precedence when conflicting requirements occur between these Specifications and a referenced standard.

1.02 JOB SITE REFERENCES

- A. The Contractor shall maintain a copy of referenced standard Specifications, codes, and manuals required for Work in progress at the site or fabrication site.

1.03 AVAILABILITY

- A. Industrial and Governmental Documents:
 - 1. Addresses for obtaining some industrial and governmental (other than Federal and Bureau of Reclamation specifications and standards) specifications, standards, and codes are listed in Table 01420A – Addresses for Specifications, Standards, and Codes.

Table 01420A – Addresses for Specifications, Standards, and Codes

Acronym	Name and Address	Telephone
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, NW, Suite 249 Washington, DC 20001 www.aashto.org	(202) 624-5800 (800) 231-3475
ASTM	ASTM International 100 Barr Harbor Dr. West Conshohocken, PA 19428-2959 www.astm.org	(601) 832-9585
FF and RR	Federal Specifications Unit General Services Administration Federal Supply Service FSS Acquisition Management Center Environmental Programs and Engineering Policy Division Washington, DC 20406 http://www.gsa.gov/portal/category/100000	(703) 305-5682

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Acronym	Name and Address	Telephone
WSDOT	Washington State Department of Transportation Administrative and Engineering Publications P.O. Box 47304 Olympia WA 98504-7304 www.wsdot.wa.gov/	(360) 705-7430

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

SECTION 01510 – TEMPORARY UTILITIES

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in prices offered in the schedule for other items of Work.

1.02 TEMPORARY ELECTRICITY

- A. Electric power is not available at the site.
- B. Provide generators, transmission lines, distribution circuits, transformers, and other electrical equipment and facilities required for obtaining power and distributing power to points of use.
- C. Remove temporary equipment and facilities upon completion of Work under this Contract.
- D. Refueling of generators shall be done in spill control areas outside of the ordinary high water line with appropriate spill prevention and containment measures, as designated by the Contracting Officer.

1.03 TEMPORARY WATER

- A. Arrange for and provide water required for construction purposes.
- B. Use water that meets specified requirements for water used in concrete, grouting, and other permanent Work.
- C. Convey water to points of use.
- D. Remove temporary equipment and facilities upon completion of Work under this Contract.

1.04 TEMPORARY SANITATION FACILITIES

- A. Provide temporary sanitation facilities (i.e., “port-a-potties”) for use by the construction crew.
- B. Provide for maintenance of temporary sanitation facilities for duration of construction activities.
- C. Provide for removal of temporary sanitation facilities once construction activities are completed.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

SECTION 01550 – VEHICULAR ACCESS AND PARKING

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in prices offered in the schedule for other items of Work.

1.02 REGULATORY REQUIREMENTS

- A. Meet jurisdictional conditions for use of existing roadways and haul routes, including seasonal or other limitations or restrictions, payment of excess size and weight fees, and posting of bonds conditioned upon repair of damage.
- B. Comply with applicable local regulations for haul routes over public highways, roads, or bridges.

1.03 SITE CONDITIONS

- A. Rights-of-ways for access to Work from existing roads will be established by the Contracting Officer.
 - 1. Use only established roadways, parking areas, and haul routes, or temporary roadways, parking areas, or haul routes constructed by the Contractor when and as authorized by the Contracting Officer.
 - 2. Unavailability of transportation facilities or limitations thereon shall not become a basis for claims for damages or extension of time for completion of Work.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Materials to maintain and repair existing roadways, parking areas, and haul routes: In accordance with requirements of jurisdictional authority.
- B. Materials to construct, maintain, and repair temporary roadways, parking areas, and haul routes: As approved by the Contracting Officer.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Investigate condition of available public or private roads for clearances, restrictions, bridge-load limits, bond requirements, and other limitations that affect or may affect access and transportation operations to and from the job site.

3.02 ESTABLISHED ROADWAYS AND PARKING AREAS

- A. Established roadways and parking areas are available for the Contractor's use subject to existing restrictions and approval of the Contracting Officer.
- B. Designated areas of existing parking facilities may be used by construction personnel. Temporary parking areas shall meet the following requirements:
 - 1. Arrange for temporary parking areas to accommodate use of construction personnel.
 - 2. Provide additional off-site parking when site space is not adequate.
 - 3. Locate as approved by the Contracting Officer.

3.03 HAUL ROUTES

- A. Perform Work on rights-of-way established by the Contracting Officer as necessary to construct and maintain any roads, bridges, or drainage structures required for establishment and use of haul routes for construction operations.
- B. Use existing available public highways, roads, or bridges as haul routes subject to applicable local regulations.
- C. Minimize interference with or congestion of local traffic.

3.04 MAINTENANCE

- A. Maintain roadways, driveways, parking areas, and haul routes in a sound, reasonably serviceable condition.
- B. Maintain roadways, driveways, and parking areas until completion and acceptance of all Work under this Contract.
- C. Maintain surfacing of gravel-surfaced roads and parking areas in a serviceable condition until completion and acceptance of all Work under this Contract.
- D. Snow removal for convenience of the Contractor or to facilitate Work operations of the Contractor is considered normal required maintenance.

3.05 REPAIR

- A. Promptly repair ruts, broken pavement, potholes, low areas with standing water, and other deficiencies to maintain roadway and driveway surfacing and drainage in original or specified condition.

3.06 REMOVAL

- A. Remove materials used to construct temporary roadways, parking areas, and haul routes prior to Contract completion and stabilize the soil.

END OF SECTION

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SECTION 01562 – ENVIRONMENTAL CONTROLS

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in the prices offered in the schedule for other items of Work, except as specified.
- B. Costs for damages and Work stoppage resulting from insufficient environmental controls are the sole responsibility of the Contractor.

1.02 REGULATORY REQUIREMENTS

- A. Comply with Federal, State, and local laws and regulations.
- B. Conform to most stringent requirement in cases of conflict between the Specifications and regulatory requirements.
- C. The Contractor shall be responsible for damages resulting from dust originating from Contractor operations.
- D. The Contracting Officer may stop any construction activity in violation of Federal, State, or local laws and all additional expenses resulting from Work stoppage will be the sole responsibility of the Contractor.

1.03 DUST CONTROL

- A. Provide environmentally compatible dust control and abatement during construction.
- B. Prevent, control, and abate dust pollution on rights-of-way provided by the Contracting Officer or elsewhere during performance of Work.
- C. Provide labor, equipment, and materials, and use efficient methods wherever and whenever required to prevent dust nuisance or damage to persons, property, or activities, including, but not limited to, crops, orchards, cultivated fields, wildlife habitats, dwellings and residences, agricultural activities, recreational activities, traffic, and similar conditions.

1.04 AIR POLLUTION CONTROL

- A. Utilize reasonably available methods and devices to prevent, control, and otherwise minimize atmospheric emissions or discharges of air contaminants.
- B. Do not operate equipment and vehicles that show excessive exhaust gas emissions until corrective repairs or adjustments reduce such emissions to acceptable levels.

1.05 LIGHT CONTROL

- A. Direct stationary floodlights to shine downward at an angle less than horizontal.
- B. Shield floodlights so that floodlights will not be a nuisance to surrounding areas.
- C. Direct lighting so that residences are not in direct beam of light.
- D. Correct lighting control problems when they occur as approved by the Contracting Officer.

1.06 NOISE

- A. Follow the most stringent of noise restrictions in permits, or state or local regulations.
 - 1. Do not exceed 80 decibels (daytime), as measured at noise-sensitive areas such as residences and schools during the hours of 7:00 a.m. to 7:00 p.m. Do not exceed noise levels of 65 decibels (nighttime) during the hours of 7:00 p.m. to 7:00 a.m.
 - 2. Only construction activities approved by Contracting Officer will be allowed during hours of 7:00 p.m. to 7:00 a.m.
 - 3. Provide specialty mufflers for continuously running generators, pumps, and other stationary equipment to meet the decibel requirements above.
 - 4. Compression brakes are not allowed.
 - 5. Perform operations producing high intensity impact noise only weekdays during the hours of 7:00 a.m. to 7:00 p.m.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

SECTION 01563 – WATER POLLUTION CONTROL

PART 1 – GENERAL

1.01 REFERENCES

- A. Section 01562 – Environmental Controls
- B. Section 02240 – Diversion and Care of Water

1.02 PAYMENT

- A. Include in the lump-sum price offered in the schedule for Site Preparation. Costs shall include development and implementation of a Water Quality Management Plan or, if required, a Stormwater Pollution Prevention Plan to meet all requirements and conditions of construction permits.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 – Submittals:
 - 1. RSN 01563-1, Water Quality Management Plan:
 - a) Water Quality Management Plan shall be developed and submitted only if a SWPPP is not required (see below).
 - b) Detailed Water Quality Management Plan for construction activities in the vicinity of any stream, flowing or dry watercourse, lake, wetland, reservoir, or underground water source.
 - 1) Name of person who will be responsible for implementing and carrying out plan.
 - 2) Relationship of methods and descriptions herein to conditions of required permits specified in article titled "Contractor Responsibilities."
 - 3) Precautions that will be taken to avoid discharge or accidental spills of pollutants into a river, stream, watercourse, or lake.
 - 4) Demonstrated compliance with State and local waste disposal, sanitary sewer, or septic regulations. Methods for preventing or controlling runoff and erosion for construction sites, both during and after construction, including:
 - a. Access and haul roads
 - b. Stockpile, borrow, and waste areas
 - c. Construction plant and equipment yards

- d. All excavated surfaces
 - e. Buffer zones
 - f. Other impacted areas
- 5) Information on vegetative practices, structural control, silt fences, straw dikes, sediment and operator controls, stormwater controls, and solid waste controls. Address stormwater controls for appropriate stormwater management measures including velocity dissipaters. Address solid waste controls for building materials and offsite tracking of sediment.
2. RSN 01563-2, Stormwater Pollution Prevention Plan (SWPPP):
- a) Stormwater Pollution Prevention Plan shall be developed and submitted only if required by the State.
 - b) A SWPPP, if the Work requires coverage under the State of Washington Department of Ecology Construction Stormwater General Permit.
 - 1) The Construction Stormwater General Permit can be viewed online at:
<http://www.ecy.wa.gov/programs/wq/stormwater/construction/permitdocs/cswgpppermit120110.pdf>
3. RSN 01563-3, Spill Containment Control Plan
- a) Spill Containment Control Plan shall be developed and submitted by the Contractor to the Contracting Officer.
 - b) The Spill Containment Control Plan shall include the following:
 - 1) Measures to reduce/recycle hazardous and non-hazardous wastes
 - 2) Spill notification procedures
 - 3) Specific cleanup and disposal instructions for different products
 - 4) Quick response and cleanup measures
 - 5) Methods of disposal of spilled materials
 - 6) Employee training on spill containment

1.04 REGULATORY REQUIREMENTS

A. Laws, regulations, and permits:

1. Perform construction operations in such a manner to comply, and ensure subcontractors comply, with:
 - a) Applicable Federal, State, and local laws, orders, regulations, and Water Quality Standards concerning control and abatement of water pollution.
 - b) Terms and conditions of applicable permits issued by permit issuing authority. If conflict occurs between Federal, State, and local laws, regulations, and requirements, the most stringent shall apply.

B. Contractor violations:

1. If noncompliance occurs, report noncompliance to the Contracting Officer immediately (orally), with specific information submitted in writing within 2 calendar days.
2. Nonconformance with applicable Federal, State, or local laws, orders, regulations, or Water Quality Standards may result in the Contracting Officer stopping all site activity until compliance is ensured.
3. The Contractor shall not be entitled to any extension of time, claim for damage, or additional compensation by reason of such a Work stoppage.
4. Corrective measures required to bring activities into compliance shall be at the Contractor's expense.

1.05 REQUIRED PERMITS

- A. The Contracting Officer, or others, will apply for all necessary environmental permits. A copy of the permits will be provided to the Contractor. The Contractor shall become familiar with permit conditions prior to starting Work and comply with all permit conditions through completion of Work. Any penalties related to violation of permit conditions shall be the sole responsibility of the Contractor.

1.06 DEFINITIONS

- A. Dewatering: Removal and control of groundwater from pores or other open spaces in soil or rock formations to allow construction activities to proceed as intended; includes relief of groundwater pressure.
- B. Unwatering:

1. Control and removal of ponding, seeping, or flowing surface water except as otherwise provided, emerging subsurface water from excavated surfaces, and from precipitation within and adjacent to excavations and construction zones using channels, ditches, gravel drains, gravel blankets, pipes, sumps, pumps, and discharge lines.
2. Includes a controlled discharge of effluent waters.

1.07 CONTRACTOR RESPONSIBILITIES

A. Monitoring:

1. Conduct monitoring in order to meet the requirements of the permits, which may include:
 - a) Sampling
 - b) Site inspections
 - c) Required laboratory tests to determine effluent characteristics

B. Reporting results:

1. Report all required monitoring results to appropriate agencies.

C. Recordkeeping:

1. Retain records and data required by permits for the specified time period.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 POLLUTION CONTROLS

- A. Control pollutants by use of sediment and erosion controls, wastewater and stormwater management controls, construction site management practices, and other controls including State and local control requirements.
- B. Sediment and erosion controls:
 1. Establish methods for controlling sediment and erosion that address vegetative practices, structural control, silt fences, straw dikes, sediment controls, and operator controls as appropriate.
 2. Institute stormwater management measures as required, including velocity dissipaters, and solid waste controls that address controls for building materials and off-site tracking of sediment.

C. Wastewater and stormwater management controls:

1. Pollution prevention measures:

- a) Use methods of dewatering, unwatering, excavating, or stockpiling earth and rock materials, which include prevention measures to control silting and erosion, and which will intercept and settle any runoff of sediment-laden waters.
- b) Prevent wastewater from general construction activities such as drainwater collection, aggregate processing, concrete batching, drilling, grouting, or other construction operations, from entering flowing or dry watercourses without the use of approved turbidity control methods.
- c) Divert stormwater runoff from upslope areas away from disturbed areas.

2. Turbidity prevention measures:

- a) Use methods for prevention of excess turbidity, which include, but are not restricted to, intercepting ditches, settling ponds, gravel filter entrapment dikes, flocculating processes, recirculation, combinations thereof, or methods that are not harmful to aquatic life.
- b) Wastewaters discharged into surface waters shall contain the least concentration of settleable material possible.
- c) If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.
- d) Remove and properly dispose of sediment from erosion controls once it has reached one-third of the exposed height of the control.

D. Construction site management:

1. Contractor construction operations:

- a) Perform construction activities by methods that will prevent entrance or accidental spillage of solid matter, contaminants, debris, or other pollutants or wastes into streams, flowing or dry watercourses, lakes, wetlands, reservoirs, or underground water sources. Such pollutants and wastes include, but are not restricted to refuse, garbage, cement, sanitary waste, industrial waste, hazardous materials, radioactive substances, oil and other

petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.

2. Stockpiled or deposited materials:
 - a) Do not stockpile or deposit excavated materials or other construction materials near or on stream banks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm runoff, or can, in any way, encroach upon the watercourse.
3. Oil/fuel storage tanks management:
 - a) Storage tank placement: Place oil or other petroleum product (hereinafter referred to collectively as oil) storage tanks or containers at least 20 feet from streams, flowing or dry watercourses, lakes, wetlands, reservoirs, and any other water source in a discharge area.
 - b) Storage area dikes: Construct storage area dikes at least 12 inches high or graded and sloped to permit safe containment of leaks and spills equal to the capacity located in each area plus a sufficient amount of freeboard to contain the 25-year rainstorm.
 - c) Diked area barriers: Provide diked areas with an impermeable barrier at least 50 mils thick. Provide areas used for refueling operations with an impermeable liner at least 50 mils thick buried under 2 to 4 inches of soil.
 - d) Underground tank prohibitions: Do not use underground storage tanks.
 - e) Provide a petroleum product spill clean-up kit in oil storage areas for use by workers in event of a spill. Report all spills immediately to Contracting Officer.

END OF SECTION

SECTION 01569 – LANDSCAPE PROTECTION AND RESTORATION

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in prices offered in the schedule for other items of Work.

1.02 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals:
 - 1. RSN 01569-1, Access Route Wetland Protection Plan.
 - a) Provide a detailed plan for providing protection of delineated wetland areas shown on the Drawings coincident with proposed access routes.
 - b) The plan shall include measures to limit soil compaction and confine vegetation disturbance.
 - c) Measures used to protect the wetland shall be temporary.
 - d) The plan shall include a description of how the temporary protection measures will be placed and removed to limit disturbance of the wetland area.
 - e) The plan shall include a description of how areas impacted by the measure placement and removal will be restored to natural conditions.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 PRESERVATION AND PROTECTION

- A. Preserve natural landscape, and preserve and protect existing vegetation not required or otherwise authorized to be removed.
- B. Conduct operations to prevent unnecessary destruction, scarring, compaction, or defacing of natural surroundings in the vicinity of the Work.
- C. Move crews and equipment within the rights-of-way and over routes provided for access to the Work in a manner to prevent damage to grazing land, crops, or property.

- D. Minimize, to the greatest extent practicable, clearings and cuts through vegetation. Irregularly shape authorized clearings and cuts to soften undesirable aesthetic impacts.
- E. Do not use trees for anchorages except in emergency cases or as approved by the Contracting Officer. For such use, wrap the trunk with a sufficient thickness of approved protective material before any rope, cable, or wire is placed.
- F. Use safety ropes where tree climbing is necessary; do not use climbing spurs.

3.02 REPAIR OR TREATMENT

- A. The Contractor is responsible for injuries to vegetation caused by Contractor operations, personnel, or equipment.
- B. Repair or treat injured vegetation without delay and as recommended by and under direction of an experienced horticulturist or licensed tree surgeon approved by the Contracting Officer.
- C. Restore construction roads to original contours and make impassable to vehicular traffic when no longer required.
- D. Scarify and re-grade, after completion of Work, land used for construction purposes and not required for completed installation so that surfaces blend with natural terrain and are in a condition that will facilitate re-vegetation, provide proper drainage, and prevent erosion.

3.03 REPLACEMENT

- A. Remove and properly dispose of trees or shrubs not required or otherwise authorized to be removed that, in the opinion of the Contracting Officer, are damaged or injured beyond saving by Contractor operations, personnel, or equipment.
- B. Replace removed tree or shrub with tree or shrub approved by the Contracting Officer.

END OF SECTION

SECTION 01600 – PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 PAYMENT

- A. When a separate item that includes furnishing of a material is provided in the offered schedule, include cost of furnishing, hauling, storing, and handling in the price offered in the schedule for the item.
- B. When a separate item is not provided in the schedule for furnishing a material, include cost of furnishing, hauling, storing, and handling in the price offered in the schedule for Work for which the material is required.

1.02 DEFINITIONS

- A. Essential characteristics: As used in these Specifications, the term "essential characteristics" is synonymous with the term "salient characteristics."
- B. Salient characteristics: Those qualities of an item that are essential to ensure that the intended use of the item can be satisfactorily realized.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Transport and handle manufactured products in accordance with manufacturer's instructions.
- B. Store and protect manufactured products in accordance with manufacturer's instructions. Obtain these instructions from the manufacturer before delivery of materials to job site. Maintain a copy of these instructions at job site.
- C. Protect materials subject to adverse effects from moisture, sunlight, ultraviolet light, or weather during storage at job site.
- D. Store curing compounds, sealants, adhesives, paints, coatings, sealers, joint compounds, grouts, and similar products at the temperature and environmental conditions recommended by manufacturer.

1.04 MAINTENANCE

- A. Extra materials:
 - 1. Furnish additional maintenance materials specified as “extra materials” in the Specifications. Provide maintenance material identical to installed material and provide from the same manufacture’s production lot as installed material.

2. Package extra materials for storage and label with complete product information on packaging.
3. Deliver extra materials to the job site and place in storage as directed by the Contracting Officer.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Provide materials required for completion of Work.
- B. Provide type and quality described in these Specifications. Make a diligent effort to procure specified materials from any and all sources.
- C. Furnish new materials conforming to referenced standard unless otherwise specified.
- D. For materials not covered by Federal or other specifications, furnish materials of standard commercial quality.
- E. If materials to be used deviate from or are not covered by recognized specifications and standards, submit, for approval, justification for and exact nature of the deviation, and complete specifications for materials proposed for use.
- F. Make parts accurately to standard gauge where possible.
- G. Permanently mark fasteners with a symbol identifying the manufacturer and with symbol(s) indicating grade, class, type, and other identifying marks in accordance with reference or applicable standard.

2.02 SUBSTITUTIONS

- A. If materials required by these Specifications become unavailable, because of Government priorities or other causes, substitute materials may be used.
- B. Obtain written approval to use substitute materials from the Contracting Officer. State in the request for substitution the amount of the adjustment, if any, to be made in favor of the Contracting Officer.
- C. The Contracting Officer's determination as to whether substitution will be permitted, and as to what substitute materials may be used, shall be final and conclusive.
- D. If approved substitute materials are of less value to the Contracting Officer or involve less cost to the Contractor than specified material, a Contract Documents adjustment will be made in favor of the Contracting Officer. Where the amount

involved or the importance of substitution warrants, a deductive modification to the Contract Documents will be issued.

- E. No payments in excess of prices bid in the schedule will be made because of substitution of one material for another or because of use of one alternate material in place of another.

2.03 WORKMANSHIP

- A. Accurately manufacture and fabricate materials in accordance with best modern practice and requirements of these Specifications, notwithstanding minor errors or omissions therein.
- B. Use liberal factors of safety and adequate shock-absorbing features in designs, especially for parts subjected to variable stress or shock, including alternating or vibrating stress or shock.
- C. Include provisions that prevent components from loosening for shock-absorbing features and parts subject to vibration.

2.04 SOURCE QUALITY ASSURANCE

- A. Materials will be subject to inspection at any one or more of the following locations, as determined by the Contracting Officer:
 - 1. At place of production or manufacture
 - 2. At shipping point
 - 3. At job site
- B. To provide for inspection, provide at time of issuance copies of purchase orders, including drawings and other pertinent information, covering material on which inspection will be made as advised by the Contracting Officer, or provide other evidence if such purchase orders are issued verbally or by letter.
- C. Inspection of materials at any location specified above or waiving of inspection shall not be construed as being conclusive as to whether materials and equipment conform to Contract Documents requirements nor shall the Contractor be relieved thereby of the responsibility for furnishing materials meeting the requirements of these Specifications.
- D. Acceptance of materials will be made only at the job site.

PART 3 – EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Final inspection and acceptance of materials will be made only at the job site after installation and testing.

END OF SECTION

SECTION 01721 – SURVEYING

PART 1 – GENERAL

1.01 GENERAL

- A. The Drawings reflect data available at the time of design and may not include all utilities, surface features, structures, and other Project site specific information. Work under this contract occurs in a natural riverine environment; as such, the final location and elevation of Work items may differ from that shown on the Drawings and is subject to the discretion of the Engineer and/or Contracting Officer.
- B. Contracting Agency shall host a Site visit for bidders prior to bid due date. Contracting Agency shall stake Project elements and Work items at their approximate location prior to the Site visit.
- C. It is the Contractor's responsibility to take the necessary measures to avoid damage to existing site elements and to provide protection for and not interrupt utilities that may be present and not accounted for in the Drawings.
- D. The Contractor is responsible for surveying necessary to complete the Work. Primary survey control is included on the Drawings. Design survey control will be provided to the Contractor by the Contracting Officer prior to construction for the individual Work items.
- E. The location and finish elevation of the Work shall be measured and recorded on the Drawings by the Contractor in support of developing a construction set of as-built drawings, upon completion of the Project. Refer to Section 01781 – Project Closeout.

1.02 DEFINITIONS

- A. Primary survey control: existing features and horizontal control points in the vicinity of the Project established under previous work.
- B. Design survey control: proposed position (horizontal and/or vertical) of Work items.

1.03 PAYMENT

- A. Include in the lump-sum prices offered in the schedule where survey is required to construct/install elements and Work items to the grades and elevations indicated on the Drawings and as described in the Specifications.
- B. Primary survey control is included on the Drawings. The Contracting Agency will provide the necessary design survey control for construction of the Work items.

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals:
 - 1. RSN 01721-1, Field Records within 10 days of completion of the Work.

1.05 SURVEY CONTROL AND EXISTING FEATURES

- A. The Contracting Agency shall provide design survey control to be used for establishing Work lines and grades. The design survey control shall be provided in electronic format to the Contractor for use in establishing Work lines and grades. The Engineer and/or the Contracting Officer reserve the right to modify the location and position of Work items, based on field conditions during Construction.
- B. Primary survey control is included on the Drawings.
- C. Preserve and maintain primary survey control points until otherwise authorized. The Contracting Officer may re-establish damaged or destroyed primary survey control points and back-charge the re-establishment cost to the Contractor.

1.06 QUALITY ASSURANCE

- A. Provide experienced construction surveyors under supervision and direction of an engineer or surveyor with minimum of 2 years of experience in charge of construction surveys for construction similar in nature to that required by this Contract.
- B. Survey equipment shall include modern electronic equipment and software capable of accuracies required herein.

PART 2 – PRODUCTS

2.01 SURVEYING MATERIALS AND EQUIPMENT

- A. Provide materials and equipment required for surveying work, including but not limited to instruments, stakes, spikes, steel pins, templates, platforms, and tools. Except as required to be incorporated in work or left in place, surveying materials and equipment will remain property of the Contractor.

PART 3 – EXECUTION

3.01 LAYOUT OF WORK SURVEYS

- A. Establish lines and grades for Work layout from the primary survey control shown on the Drawings.
- B. Establish measurements required for Work execution to specified tolerances.

- C. Provide stakes, markers, and other survey controls necessary to control, check, and guide construction.
- D. Electronic surveys shall use a combination of points, lines, and breaklines. Use breaklines for distinct surface features, slope breaks, road and pavement edges, edge-of-water, structures, and utilities.

3.02 SURVEYS AND COMPUTATIONS

- A. Survey and computation methods, level of detail, documentation, and presentation shall be clear and understandable, shall produce accuracy as described herein, and are subject to checks and final approval by the Contracting Officer.

3.03 SURVEY REQUIREMENTS

- A. Alignment staking: At each change in slope and horizontal angle point.
- B. Work items: Stake out Work items before and during construction.

3.04 CONSTRUCTION STAKING

- A. The Contractor shall install construction staking sufficient to complete the Work to the location and elevation as indicated in the design survey control and as modified by the Engineer and/or Contracting Officer, as shown on the Drawings, and as described in the Specifications. This includes placement of stable stakes or other marks that can be readily back-checked to primary survey control for accuracy with the use of standard surveying equipment.
- B. The Contractor is responsible for establishing and maintaining stable temporary benchmarks for use in completion of the Work throughout the Contract.
- C. Final elevations shall be placed under the direction of the Engineer and/or the Contracting Officer at locations as shown on the drawings or as modified by the Engineer and/or the Contracting Officer.

3.05 ACCURACY

- A. Degree of accuracy:
 - 1. Horizontal alignment: Within 1.0 foot at Work item locations, or as directed by the Contracting Officer.
 - 2. Existing structure and/or original ground: Within 0.1 foot, horizontally and vertically.
 - 3. Vertical elevation and profile: Within 0.5 feet for Work item elevations.

3.06 FIELD RECORDS

- A. Record original field notes, computations, and other surveying data in field books.
- B. Record survey data in accordance with recognized professional surveying standards.
 - 1. Notes or data not in accordance with standard formats will be rejected.
 - 2. Illegible notes or data or erasures on any page of a field book will be sufficient cause for rejection of part or all of field book.
 - 3. Corrections by ruling or lining out errors will be permitted.
 - 4. Copied notes or data will not be permitted.
 - 5. Rejection of part or all of a field book may necessitate resurveying.
- C. Notes may be collected on an electronic data collection device with prior approval of the Contracting Officer.
 - 1. Submit notes on compact disk in approved format.
 - 2. Submit paper copies of notes.
- D. All information shall be submitted to the Contracting Agency within 10 days of completion of the Work.
- E. All information shall be made available by the Contractor for immediate review by the Contracting Officer and/or the Engineer during the course of the Project.

END OF SECTION

SECTION 01725 – PROTECTION OF EXISTING INSTALLATIONS

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in prices offered in the schedule for other items of Work, except as specified.
- B. Costs for repair of installations damaged by the Contractor's operations are the Contractor's expense.

1.02 PROJECT CONDITIONS

- A. Drawings included in these Specifications show existing features and equipment but may not show all equipment and materials existing at the job site.
- B. The Contractor shall contact the Utility Location Request Center (One Call Center) at 1-800-424-5555 for utility locations not less than 2 business days before the scheduled date for demolition, earthwork, or trenching that may impact existing utilities.
- C. The Contractor shall obtain the location of buried conduit, pipe, cable, ground mat, and other buried items before performing excavation.
- D. Note the location and extent of overhead utilities. Caution should be taken when working near overhead utilities. The Contractor shall be responsible for the safety of his/her employees and equipment when working near overhead utilities.
- E. The Contractor shall coordinate with adjacent private property owners to locate private irrigation pipe and other installations prior to excavation. The Contractor shall protect existing irrigation installations from damage.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 REPAIR

- A. Repair, at the Contractor's expense, damage to existing installations due to the Contractor's operations or the Contractor's failure to provide proper protection. At the Contracting Officer's option, damage may be repaired by the Contracting Officer, and the Contractor will be back-charged the repair costs.
- B. All areas disturbed by construction shall be returned to the original ground topography before construction ends, unless otherwise shown on the Drawings.

- C. If disturbance of private irrigation pipe or installations is required to complete the Work, the Contractor shall replace or repair the existing pipe or installation. The Contractor shall coordinate replacement, repair, relocation, or removal of existing installations with the private property owner and the Contracting Officer.

3.02 PROTECTION

- A. Provide protection for personnel and existing facilities from harm due to the Contractor's operations. Protection shall be subject to approval of the Contracting Officer.
- B. Arrange protective installations to permit operation of existing equipment and facilities while Work is in progress.

3.03 REMOVAL OF PROTECTIVE INSTALLATIONS

- A. Remove protective installations after purpose has been served. Materials furnished by the Contractor to provide protection remain property of the Contractor.

END OF SECTION

SECTION 01740 – CLEANING

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in prices offered in the schedule for other items of Work.

1.02 REFERENCES

- A. Code of Federal Regulations (CFR)
 - 1. 40 CFR 261.3: Definition of Hazardous Waste
 - 2. 49 CFR 171-179: Transportation – Hazardous Waste Regulations

1.03 DEFINITIONS

- A. Hazardous waste: Defined as hazardous by 40 CFR 261.3 or by other Federal, State, or local laws or regulations.

1.04 REGULATORY REQUIREMENTS

- A. Comply with Federal, State, and local laws and regulations.
- B. Conform to most stringent requirement in cases of conflict between the Specifications and regulatory requirements.

1.05 PROJECT CONDITIONS

- A. Report waste materials discovered at job site to the Contracting Officer.
 - 1. If waste is hazardous, the Contracting Officer may order delays in time of performance or changes in Work, or both.
 - 2. If such delays or changes are ordered, an equitable adjustment will be made in the Contract Documents in accordance with applicable clauses of the Contract Documents.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 TESTS

- A. Test unknown waste materials found at the job site that may be hazardous.

3.02 PROGRESS CLEANING

- A. Keep Work and storage areas free from accumulations of waste materials and rubbish.

3.03 FINAL CLEANUP

- A. Remove temporary plant facilities, temporary buildings, concrete footings and slabs, rubbish, unused materials, concrete forms, and other similar waste materials that are not part of permanent Work.

3.04 NONHAZARDOUS WASTE DISPOSAL

- A. Combustible waste materials: Dispose by removal from job site. If permitted by local regulatory agencies, landowner, and Contracting Officer, combustible materials can be burned on site.
- B. Noncombustible waste materials: Dispose by removal from job site.
- C. Disposal by removal:
 - 1. Dispose of waste materials at a permitted landfill. Make arrangements with Contracting Officer for use of landfill and pay required fees.
- D. Disposal by burning: not allowed

3.05 HAZARDOUS WASTE DISPOSAL

- A. Recycle hazardous waste whenever possible.
- B. Dispose of waste materials known or found to be hazardous at permitted treatment or disposal facilities.
- C. Transport hazardous waste in accordance with 49 CFR 171-179.

END OF SECTION

SECTION 01781 – PROJECT CLOSEOUT

PART 1 – GENERAL

1.01 GENERAL

- A. Prior to commencing demobilization, the Contractor shall review all construction elements with the Contracting Officer, who will give approval of the final site review.
- B. Final site review approval is contingent on the successful completion of: construction of design elements, cleaning of the site, removal of all construction access routes and staging areas, restoration of areas disturbed by construction activities, and other tasks as outlined in these Specifications and on the Drawings.

1.02 PAYMENT

- A. Include in prices offered in the schedule for other items of Work.

1.03 REGULATORY REQUIREMENTS

- A. Comply with Federal, State, and local laws and regulations.
- B. Comply with all construction and Project permits, as applicable.
- C. Conform to most stringent requirement in cases of conflict between the Specifications and regulatory requirements

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals
 - 1. RSN 01781-1, As-built Drawings

1.05 AS-BUILT DOCUMENTS

- A. As-built Drawings:
 - 1. Maintain two sets of full-size prints of Contract Drawings at the job site.
 - a) Mark and dimension to show variations between actual construction and that indicated or specified in the Contract Documents.
 - b) Include buried or concealed construction and utilities.
 - c) Include existing items, topographic features, and utility lines revealed during construction that differ from those shown on the Contract Documents.

- d) Where choice of materials or methods is permitted in the Specifications, or where variations in scope or character of Work from that of the original Contract Documents are authorized, mark Drawings to define construction actually provided.
2. Use standard drafting practice to represent changes and include supplementary notes, legends, and details necessary to clearly portray as-built construction.
3. Mark As-built Drawings in the following colors
 - a) Red – Additions to original Drawings.
 - b) Green – Deletions to original Drawings.
 - c) Blue – Notations necessary for explanation of As-built Drawings.
4. The Drawings shall be available for the Contracting Officer's review at all times.
5. Upon completion of the Work, sign the marked prints as certified correct.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

- A. Final site review shall not commence until the Contractor has satisfactorily completed the construction of all of the design elements as described in these Specifications and as shown on the Drawings or as directed by the Contracting Officer.
- B. Once final site review is approved by the Contracting Officer, the Contractor may commence demobilization activities.

END OF SECTION

DIVISION 2 – SITE WORK

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SECTION 02100 – MOBILIZATION AND DEMOBILIZATION

PART 1 – GENERAL

1.01 SCOPE

- A. The Work shall consist of mobilizing equipment and supplies and securing bonds and permits necessary to do the Work as stated in the Contract Documents and/or agreement and demobilization of excess materials and equipment from the work site.

1.02 PAYMENT

- A. Mobilization/Demobilization:
 - 1. Payment: Lump-sum price offered in the schedule.

1.03 FORCES AND EQUIPMENT

- A. Mobilization may include costs for transporting personnel, equipment, operating supplies to the site, establishment of necessary facilities for the Contractor's operation and any permits, insurance, and/or bonds required to do the Work.
- B. Demobilization may include the removal of equipment and facilities that were necessary to do the Work.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

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SECTION 02232 – CLEARING AND GRUBBING

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in the lump-sum price offered in the schedule for Site Preparation.

1.02 DEFINITIONS

- A. Vegetation: Trees, shrubs, brush, stumps, exposed roots, down timber, branches, grass, weeds, and rubbish.

1.03 PROJECT CONDITIONS

- A. Preserve and protect vegetation designated for preservation within the clearing limits and vegetation outside the clearing limits, as indicated on the Drawings, as indicated by the Contracting Officer, and in accordance with Section 01569 – Landscape Protection and Restoration.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 CLEARING

- A. Locate and clearly mark the clearing limits and landscape to be preserved.
- B. Clear rights-of-way to be occupied by permanent construction and required for access to the Work.
- C. Clear adjacent to cut and fill sections a minimum distance of 1 foot outside of slope lines. Do not clear beyond the clearing limits shown on the Drawings.
- D. Remove vegetation and other debris as determined by the Contracting Officer.

3.02 GRUBBING

- A. Remove stumps, roots, and vegetation to a minimum of 12 inches below final excavation lines and grades, or until organic matter is removed.
- B. Perform grubbing in advance of trenching, excavation, and grading Work.

3.03 DISPOSAL OF CLEARED MATERIAL

- A. Dispose of vegetative material and non-vegetative material in accordance with Section 01740 – Cleaning.

END OF SECTION

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SECTION 02236 – STRIPPING

PART 1 – GENERAL

1.01 PAYMENT

- A. Include in the lump-sum price offered in the schedule for Site Preparation.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 STRIPPING

- A. Where present, strip topsoil from areas to be excavated.
- B. Remove topsoil as directed by the Contracting Officer.

3.02 USE OF TOPSOIL

- A. Do not use topsoil removed by stripping for backfill or constructing embankments.
- B. Segregate and stockpile topsoil for use in restoration Work.
- C. Spread remaining topsoil over disturbed construction areas upon completion as directed by the Contracting Officer.

3.03 STOCKPILE

- A. Transport and stockpile topsoil as necessary prior to final hauling and placing.
- B. Do not compact topsoil in stockpile.
- C. Protect stockpile from contamination and erosion.

END OF SECTION

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SECTION 02240 – DIVERSION AND CARE OF WATER

PART 1 – GENERAL

1.01 GENERAL

- A. No geologic or groundwater information is available at the site. The Contractor shall make his/her own investigations and shall determine the extent and difficulty of removal of water from excavations. Surface water is expected to be encountered in portions of the proposed Work along the river, side channel, and locations along the floodplain.
- B. In-water Work is required for portions of this Contract. The Contractor shall take all necessary precautions for the safety and protection of the construction team, the Public, and the environment.
- C. Fish rescue and recovery may be required under this Contract, where fish populations may become detained as a result of the diversion necessary for the proposed Work.
 - 1. The Contractor shall install an approved temporary fish-exclusion fence and construct a water control berm using gravel filled bags as shown in the Drawings to keep fish out of the Work area. Additional and/or other measures may be necessary to meet construction permit conditions.
 - 2. The Contractor shall coordinate Work with the Contracting Agency and its authorized agents and representatives to allow for the timely and proper rescue and recovery efforts of fish within the confines of the Work.
- D. Fish rescue and recovery will be completed by the Contracting Agency and/or its authorized agents and representatives.
- E. Should the diversion be removed or breached, fish rescue and recovery must be repeated.

1.02 REFERENCES

- A. Section 01562 – Environmental Controls
- B. Section 01563 – Water Pollution Control

1.03 PAYMENT

- A. Include in applicable prices offered in the schedule for items of Work related to excavation for installation of the various structures and diversion of water.

- B. Also include Work coordinated for fish rescue and recovery, by others. Work includes placement of approved fish exclusion measures including, but not limited to:
 - 1. Temporary Fish-exclusion fence.
 - 2. Contractor's time to coordinate efforts during fish rescue and recovery, to be done by Others. Time not to exceed two days.

1.04 REQUIREMENT

- A. Furnish, install, maintain, and operate all necessary pumping and other equipment for removal of water from the various parts of the Work, and for maintaining the footprint elevations and other parts of the Work free from water as required for constructing each part of the Work. All water control shall meet the appropriate construction permit conditions and requirements.

1.05 DEFINITIONS

- A. Dewatering: Removal and control of groundwater from pores or other open spaces in soil or rock formations to allow construction activities to proceed as intended, and includes relief of groundwater pressure.
- B. Unwatering:
 - 1. Control and removal of ponding, seeping, or flowing surface water except as otherwise provided, emerging subsurface water from excavated surfaces, and from precipitation within and adjacent to excavations and construction zones using channels, ditches, gravel drains, gravel blankets, pipes, sumps, pumps, and discharge lines.
 - 2. Includes a controlled discharge of effluent waters.

1.06 SUBMITTALS

- A. Submit in accordance with Section 01330 – Submittals:
 - 1. RSN 02240-1, Care of Water Plan:
 - a) Detailed Care of Water Plan for Work related to diverting groundwater and surface water in support of construction activities that will or may encounter and impact groundwater and surface water.
 - 1) Name of person who will be responsible for implementing and carrying out plan.

- 2) Relationship of methods and descriptions herein to conditions of required permits specified in article titled "Contractor Responsibilities."
- 3) Detailed sketches or drawings indicating the specific location(s) for the diversion of surface waters and management of groundwater and surface water during excavation and, where applicable, backfill.
- 4) Description of methods to manage diversion of surface waters and groundwater, including methods of discharge for dewatering activities.
- 5) Care of Water Plan shall be coordinated with the Water Quality Management Plan or, if required, the Stormwater Pollution Prevention Plan.
- 6) Identify portions of the Care of Water Plan that require coordination with others to complete fish rescue and recovery.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 DEWATERING

- A. Provide, maintain, and operate necessary pumps and other equipment for removal of water from excavations and trenches for the various structures that are to be constructed.
- B. Accomplish dewatering and unwatering, as needed, by use of motor or engine-driven pumps with adequate lift capacity, discharge piping, hoses and piping, valves, and intakes.
- C. If a generator is to be used to operate pumping equipment, generator shall be placed above the high-water line within an approved spill protection area.
- D. Provide dewatering facilities capable of operating in freezing temperatures if freezing weather conditions occur.
- E. Monitor and control discharge in accordance with Section 01563 – Water Pollution Control and the permits required under that Section.

3.02 DEWATERING BELOW GROUNDWATER LEVEL

- A. Where excavation and trenching extends below the groundwater level, dewater the portion below the groundwater level in advance of excavation or as otherwise directed by the Contracting Officer.

- B. Dewater to prevent loss of fines from the footprint elevations, maintain the stability of the excavation, and allow construction Work to be performed in the dry.

3.03 SEEPAGE CONTROL

- A. Before excavating to final grade for structures, bring the water level to an elevation at least 1 foot below the required subgrade elevation or as otherwise directed by the Contracting Officer.
- B. Maintain this water level until structures have been placed, structures have been completed, and backfill has been placed or as otherwise directed by the Contracting Officer.
- C. After backfill has been placed, with approval of the Contracting Officer, allow groundwater to rise to natural levels.
- D. Control pumping and dewatering operations so that the groundwater level rises slowly and uniformly along the extents of excavation for each structure.

END OF SECTION

SECTION 02260 – EXCAVATION SUPPORT AND PROTECTION

PART 1 – GENERAL

1.01 GENERAL

- A. Section includes requirements for excavation support and protection for trenches and open excavations greater than 4 feet in depth.

1.02 PAYMENT

- A. Include cost for excavation support and protection in applicable prices offered in the schedule for items of Work requiring excavation support and protection.

1.03 REFERENCES

- A. The following is a list of standards that may be referenced in this Section:
 - 1. Occupational Safety and Health Act (OSHA):
 - a) Construction Industry Standards
 - b) Occupational Safety and Health Standards
 - 2. Washington Industrial Safety and Health Act (WISHA)
 - 3. Chapter 296-155, Part N, WAC – Washington Safety Standards for Construction Work; Excavation, Trenching, and Shoring

1.04 REQUIREMENTS

- A. The Contractor shall be responsible for planning, designing, installing, maintaining, and removing support and protection for excavations and trenches in accordance with Chapter 296-155, Part N, WAC and applicable OSHA and WISHA requirements.
- B. Excavation support systems shall be designed and installed to protect surrounding property and structures. Excavation support systems shall also be designed so that installation and removal of the support systems does not disturb soil adjacent to or below the required excavation or trench section. Excavation and trenching shall be to the lines shown on the Drawings and as specified in Section 02317 – Trenching, Backfilling, and Compaction, and Section 02318 – Earthwork for Structures.
- C. Excavation support systems shall be designed to meet water control requirements, as specified in Section 02240 – Diversion and Care of Water.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 GENERAL

- A. Construct the excavation to the lines and grades shown on the Drawings and as specified in Section 02318 – Earthwork for Structures. Install and remove support systems in such a manner as not to disturb soil adjacent to the trench or below the trench or excavation.
- B. Unless otherwise indicated, remove all sheeting, shoring, and bracing after placement and compaction of backfill.

END OF SECTION

SECTION 02300 – EARTHWORK

PART 1 – GENERAL

1.01 GENERAL

- A. This Section includes the following:
 - 1. General excavating and backfilling.
 - 2. Excavation and removal of levee materials along the right bank (looking downstream) of the Methow River main channel; materials to be re-used as backfill in other elements of Work, unless otherwise directed by the Contracting Officer.
 - 3. Excavation and removal of large rock from the side channel of the Methow River; rock removed to be re-used as backfill in other elements of Work, unless otherwise directed by the Contracting Officer.
 - 4. Placement of a buried rock sill in the Methow River side channel.

1.02 PAYMENTS

- A. Include cost for earthwork in applicable prices offered in the schedule for items of Work requiring earthwork; not to be confused with Work described in Section 02318 – Earthwork for Structures.
- B. Include cost for earthwork in the schedule for Main Levee Removal.
- C. Include cost for earthwork in the schedule for the optional item Perpendicular Levee Removal.
- D. Include cost for earthwork in the schedule for Buried Rock Sill.

1.03 REFERENCES

- A. Section 01562 – Environmental Controls
- B. Section 01563 – Water Pollution Control
- C. Section 01725 – Protection of Existing Installations
- D. Section 01740 – Cleaning
- E. Section 01781 – Project Closeout
- F. Section 02232 – Clearing and Grubbing

- G. Section 02236 – Stripping
- H. Section 02240 – Diversion and Care of Water
- I. Section 02260 – Excavation Support and Protection
- J. Section 02318 – Earthwork for Structures
- K. Section 02324 – Disposal of Excavated Materials
- L. Section 02952 – Large Woody Debris (LWD) Structures
- M. Section 02953 – Engineered Log Jam (ELJ) Structures

1.04 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
- B. Borrow: Satisfactory soil and rock imported from off-site for use as fill or backfill.
- C. Excavation: Removal of material encountered above subgrade elevations.
- D. Fill: Soil or rock materials used to raise existing grades.
- E. Buried rock sill: A linear, continuous arrangement of large rock below grade to maintain a design elevation of a water course.
- F. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

1.05 PROJECT CONDITIONS

- A. This Contract involves working within natural systems such as floodplains and water courses. Limited information is available on the conditions of these natural systems.

PART 2 – PRODUCTS

2.01 SOIL AND ROCK MATERIALS

- A. Provide borrow soil and rock materials when sufficient satisfactory soil and rock materials, as approved by the Contracting Officer and/or Engineer, are not available from excavations.
- B. Backfill and Fill: Satisfactory soil and rock materials, as approved by the Contracting Officer and/or the Engineer.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Protect existing installations that are to remain from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials for existing installations that are to remain as necessary. See also Section 01725 – Protection of Existing Installations.
- B. Provide measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and waterbodies, in accordance with the approved Care of Water Plan and other requirements included in the construction permits.
- C. Prevent surface water and groundwater from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- D. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

3.02 CLEARING AND GRADING AND STRIPPING

- A. Clear and grub areas to be excavated in accordance with Section 02232 – Clearing and Grubbing.
- B. Strip areas to remove topsoil prior to structure excavation, in accordance with Section 02236 – Stripping.

3.03 LEVEE REMOVAL

- A. Excavate the existing levee materials as indicated on the Drawings and as described in the Specifications herein.
- B. Materials removed from the existing levee shall be re-used as backfill for other elements of Work. Refer to Section 02952 – Large Woody Debris (LWD) Structures and Section 02953 – Engineered Log Jam (ELJ) Structures.
- C. If the option bid item for removal of the perpendicular levee removal is not activated the following conditions shall apply.
 - 1. Finished grading shall transition back to existing grade at the limits of the main levee removal at a slope no steeper than two (2) horizontal to one (1) vertical.
 - 2. The grading transition slope shall be seeded per the requirements of Section 02930.

3.04 LARGE ROCK REMOVAL

- A. Remove large rock from areas as indicated on the Drawings.
- B. Large rock removed shall be re-used as backfill for other elements of Work, described herein and in Section 02953 – Engineered Log Jam (ELJ) Structures.

3.05 EXCAVATION

- A. Excavate to sub-grade elevations (where applicable) regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
- B. Excavate to the elevations, lines, grades, and dimensions as indicated on the Drawings.
- C. Reconstruct sub grades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.
- D. Stockpile excavated materials, without intermixing, in shaped, graded, and drained stockpiles.
 - 1. Stockpile suitable rock separately from soils; rock shall be segregated according to size in no more than three size ranges. Suitable rock includes hard, intact rock that does not deteriorate during handling.
 - 2. Stockpile soils separately from rock.
 - 3. Stockpile debris and unsuitable rock separately from other stockpiled materials.
 - 4. Stockpiled materials shall be located above the ordinary high water line, away from edge of excavations, and outside drip line of trees.
 - 5. Cover stockpiles that are not to be reused for extended periods to reduce erosion and sediment transport in accordance with applicable permits and regulations.

3.06 BACKFILLS AND FILLS

- A. Fill:
 - 1. Place fill material in layers to required elevations.
- B. Compaction:
 - 1. Place backfill and fill materials in layers not more than 12 inches in loose depth and compact using the bucket of an excavator or by the travel of

heavy equipment over the backfill area, as approved by the Contracting Officer and/or Engineer.

C. Grading:

1. Uniformly grade areas to a smooth surface free from irregular surface changes.
2. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated on the Drawings.

3.07 PLACEMENT OF BURIED ROCK SILL

- A. Assess the availability, size, and quantity of large rock sourced from areas indicated on the Drawings for large rock removal; this material shall be used for the buried rock sill.
- B. Excavate to the approximate footprint elevation for the buried rock sill as indicated on the Drawings and as described herein. Due to the variation in rock size, the footprint elevation may require minor modification to maintain the design top elevation of the buried rock sill, as indicated on the Drawings.
- C. Place the large rock:
 1. To the extent, lines, dimensions, and elevations as indicated on the Drawings.
 2. In a linear, continuous manner that maximizes contact between adjacent rocks. Maintain the top elevation of the buried rock sill within 6 inches of the design elevation as indicated on the Drawings.
- D. Backfill the buried rock sill with native material sourced from the excavation required for placement of the buried rock sill; the level of the backfill shall match the elevation indicated on the Drawings or as directed by the Contracting Officer and/or Engineer. The backfill finish grade shall blend in to the existing grade of the side channel upstream and downstream of the buried rock sill.
- E. Compact the backfill as described herein.

3.08 FIELD QUALITY CONTROL

- A. Finish grading shall be approved by the Contracting Officer and/or the Engineer.

3.09 PROTECTION AND DISPOSAL

- A. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction.
- C. Disposal: Refer to Section 02324 – Disposal of Excavated Materials.

END OF SECTION

SECTION 02318 – EARTHWORK FOR STRUCTURES

PART 1 – GENERAL

1.01 GENERAL

- A. Section includes requirements for excavation, placement, and compaction of backfill material for installation of various structures.

1.02 PAYMENT

- A. Include costs for earthwork in the prices offered for other items of Work requiring excavation, backfill, and material disposal. Work includes:
 - 1. Excavation, placement of backfill, and compaction of backfill for installation of the various structures.
 - 2. Distribution and disposal of excess excavated materials.

1.03 REQUIREMENTS

- A. The Contractor shall ensure that imported materials are approved by the Contracting Officer before hauling to the site. The Contractor shall ensure that native soils excavated on site are approved by the Contracting Officer before being used as backfill. The Contracting Agency reserves the right to reject materials that, in the opinion of the Contracting Officer, are determined to be substandard for any reason. In the event material is hauled to the site without prior approval and is determined by the Contracting Officer to be unacceptable, all materials shall be removed from the site at no additional cost to the Contracting Agency.

1.04 REFERENCES

- A. The following is a list of standards that may be referenced in this Section:
 - 1. ASTM D 422: Standard Test Method for Particle-Size Analysis of Soils.
 - 2. ASTM D 1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 lb/ft²).
 - 3. ASTM D 2922: Standard Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods.
 - 4. WSDOT: Standard Specifications for Road, Bridge and Municipal Construction (latest edition); M 41-10
- B. The following are sections from the Specifications herein that may be referenced in this Section:

1. Section 02952 – Large Woody Debris (LWD) Structures
2. Section 02953 – Engineered Log Jam (ELJ) Structures

1.05 DEFINITIONS

- A. Additional excavation: Excavation performed for the convenience, fault, or operation of the Contractor beyond specified or directed excavation lines.
- B. ELJ: engineered log jam. ELJ structures (various types) that require excavation and backfill/compaction to install the structures to the design elevations shown on the Drawings and as described in the Specifications.
- C. Footprint elevation: The design elevation for the bottom of a proposed structure.
- D. LWD: large woody debris. LWD structures (various types) that require excavation and backfill/compaction to install the structures to the design elevations shown on the Drawings and as described in the Specifications.
- E. Optimum Moisture Content: Shall be determined in accordance with ASTM D 1557 to determine maximum dry density for relative compaction. Determine field moisture content on basis of fraction passing 3/4-inch sieve.
- F. Relative Compaction: The ratio, in percent, of as-compacted field dry density to laboratory maximum dry density as determined by ASTM D 1557. Apply corrections for oversize material to either as-compacted field dry density or maximum dry density, as determined by the Contracting Officer.
- G. Structures: various discrete construction elements consisting of single or multiple large woody members that are anchored in place by burial and/or interconnected with the use of wire rope and hardware and/or other methods described herein. Structures within this Contract involve: various types of LWD placements and various types of ELJ placements.

PART 2 – PRODUCTS

2.01 EXCAVATED MATERIALS

- A. The Contractor's operations in excavations shall be such that excavations will yield as much suitable material for use in permanent construction required under these Specifications as practicable.
- B. Place excavated materials that are too wet for immediate compaction temporarily in stockpiles until moisture content is reduced sufficiently to permit them to be placed in embankments.

- C. Segregate excavated materials; segregations shall be based on variation of substrate size, shape, and gradation as indicated in the Drawings and described in the Specifications, or at the discretion of the Contracting Officer.

2.02 MATERIAL FOR BACKFILL

- A. Type and amount of material used for backfill, and the manner of placing material shall be subject to approval by the Contracting Officer.
- B. Use suitable backfill material from material excavated in required excavations for structures, where possible, and at the discretion of the Contracting Officer. If sufficient suitable material is not available from on-site excavations, obtain additional material from commercial borrow sources as approved by the Contracting Officer. The Contracting Agency makes no guarantee that the specified backfill materials are available from materials obtained from excavations for structures.
- C. Do not place backfill material when either the material or the surfaces on which it is to be placed are frozen.
- D. Do not use material removed in stripping or high in organic matter for backfill material. Stockpile instead for use as topsoil.
- E. Backfill for buried rootwad logs:
 - 1. Backfill to be placed around buried rootwad logs shall be well-graded suitable native material free of vegetation and other large organics, frozen lumps, wood, concrete, other debris, and rock larger than 10 inches in maximum dimension, unless otherwise approved by the Contracting Officer. Final backfill shall be approved by the Contracting Officer before placement.
- F. Backfill for structures:
 - 1. Backfill to be placed around or within structures shall be suitable on-site material free of vegetation and other large organics, frozen lumps, wood, concrete, other debris.
 - 2. Rock larger than 18 inches in maximum dimension shall be placed in the structures as indicated in the drawings.
 - 3. Final backfill shall be approved by the Contracting Officer before placement.

PART 3 – EXECUTION

3.01 STRIPPING

- A. Strip areas to remove topsoil prior to structure excavation, in accordance with Section 02236 – Stripping.

3.02 EXCAVATION, GENERAL

- A. Excavate footprint elevations shown on the Drawings or established by the Contracting Officer.
- B. The Contracting Officer reserves the right, during progress of Work, to vary slopes, grades, and dimensions of excavations from those specified in the Drawings.
- C. The Contracting Agency does not represent that excavation performed under these Specifications can be made to or maintained at paylines shown on the Drawings or described in these Specifications.
- D. Perform excavation for structures above the high water line in the dry. Dewater excavations for structures above the high water line in accordance with Section 02240 – Diversion and Care of Water.
- E. Do not excavate in frozen materials without written approval.
- F. Where excavating in backfill and embankment placed under these Specifications, excavate in accordance with applicable provisions for excavation.
- G. Blasting: Not allowed.
- H. Take precautions to preserve material below and beyond established lines of excavation in the soundest possible condition.
 - 1. Damage to Work due to the Contractor's operations shall be repaired by and at the expense of the Contractor.
 - 2. Material beyond required or prescribed excavation lines that is loosened by the Contractor's operations shall be removed by and at the expense of the Contractor.

3.03 SITE EXCAVATION

- A. Excavate for structures as shown on the Drawings or as directed in the field by the Contracting Officer.

3.04 DISPOSAL OF EXCAVATED MATERIALS

- A. Refer to Section 02324 – Disposal of Excavated Materials, in addition to the following.
- B. Excess material from excavations for structures constructed above the high water line shall be disposed of at a suitable location off-site, as required by the Contracting Officer, or utilized in areas of the site to be filled. The Contracting Officer shall approve the method and location of disposal prior to excavation.
- C. Dispose of excavated materials that are unsuitable for, or are in excess of, embankment, backfill, or other earthwork requirements, as directed by the Contracting Officer.

3.05 PLACING BACKFILL

- A. Place backfill to the lines and grades shown on the Drawings, or as directed by the Contracting Officer.
- B. Place backfill in the dry for structures above the high water line.
- C. Place native material backfill within and around structures to the depth and lines indicated on the Drawings. Place backfill in 12-inch lifts and lightly compact lifts, applying light pressure. Areas within and around structures will be planted; avoid over-compacting these areas.
- D. Place backfill around buried rootwad logs to the depth and lines indicated on the Drawings, or as directed by the Contracting Officer; backfill shall be supervised and approved by the Contracting Officer.
 - 1. Place backfill in 12-inch lifts and compact lifts with the use of a vibratory method, such as a hoe pack or equivalent method.
 - 2. Compaction shall be considered complete when the finished grade does not yield more than 6 inches in depth during compaction; additional backfill material may be necessary to achieve the finished grade surface and compaction requirement.
- E. Where applicable and at the discretion of the Contracting Officer, topsoil shall be replaced to match the grades and lines of the existing bank on either side of the excavation. Topsoil backfill should remain loose.

3.06 COMPACTION

- A. The Contractor shall compact backfill by means of an appropriately sized static, vibratory, or impact type compactor suited to the soil and physical restrictions of the area to be compacted. Although the Contractor is responsible for the selection of the method of compaction, selection of an inappropriate method shall not

relieve the Contractor of the responsibility to achieve the specified result. Jetting, sluicing, or water settling will not be permitted.

- B. Topsoil shall not be compacted.

3.07 PROTECTION

- A. To provide adequate protection for compacted backfill around a structure, the Contracting Officer reserves the right to direct the Contractor to place a sufficient amount of backfill or embankment material over compacted backfill within 72 hours after completion of compacting backfill.

END OF SECTION

SECTION 02324 – DISPOSAL OF EXCAVATED MATERIALS

PART 1 – GENERAL

1.01 PAYMENT

- A. Included cost of disposal of excavated materials in prices offered in the schedule for items requiring excavation.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 MATERIAL PLACEMENT

- A. Use suitable material from required excavations, or as much thereof as may be required, for backfill or other required earthwork. Temporary potential stockpile locations and procedures for stockpiling shall be subject to approval of the Contracting Officer.

3.02 DISPOSAL OF EXCAVATED MATERIALS

- A. The location of off-site disposal shall be approved by the Contracting Officer prior to excavation and disposal of material.
- B. Dispose of material from required excavations not suitable for or required for backfill, embankment, and topsoil by removal from the site or waste on site as directed by the Contracting Officer.
- C. Waste areas for excavated materials shall be as directed by the Contracting Officer.
- D. Do not waste material by dumping from the top of slope.
- E. Grade waste banks to reasonably even and uniform surfaces that blend with the natural terrain.
 - 1. Minimum slope: 2%.
 - 2. Maximum slope: 4 horizontal to 1 vertical (4H:1V).
- F. Cover waste banks with topsoil in accordance with Section 02236 – Stripping.
- G. Seed surface of waste banks in accordance with Section 02930 – Seeding.

END OF SECTION

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SECTION 02370 – EROSION CONTROL FABRICS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Work specified in this Section consists of all labor, equipment, tools, materials, services, supervision and incidentals necessary to install temporary erosion control blankets necessary for completion of the Work as described in the Specifications, herein, shown on the Drawings, or as directed by the Engineer.
- B. Related Work specified in other Sections includes, but may not be limited to:
 - 1. Section 02953 – Engineered Log Jam (ELJ) Structures

1.02 PERFORMANCE REQUIREMENTS

- A. The Contractor shall comply with all applicable Federal, State, and local codes, ordinances, regulations, statutes, and standards.

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM D6475: Standard Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets
 - 2. ASTM D7207 - Standard Test Method For Determination Of Unvegetated Rolled Erosion Control Product (RECP) Ability To Protect Sand From Hydraulically-Induced Shear Stresses Under Bench-Scale Conditions
 - 3. ASTM D7322: Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Ability to Encourage Seed Germination and Plant Growth Under Bench-Scale Conditions

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals:
 - 1. RSN 02370-1, Erosion Control Fabric: Manufacturer technical data, samples, installation instructions, and proof of current ASTM requirements testing.

1.05 PROJECT AND SITE CONDITIONS

- A. The Contractor shall carefully examine the site to determine the full extent, nature, and location of Work required to conform to the Contract Drawings and

Specifications. The Contractor shall bring any inaccuracies or discrepancies between the Contract Drawings and Specifications to the attention of the Contracting Officer in order to clarify the exact nature of the Work to be performed.

1.06 QUALITY CONTROL

- A. Inspect all fabrics upon delivery and verify that the proper materials and quantities have been supplied.
- B. Inspect the subgrade prior to installation of fabrics. The subgrade shall be free of extraneous organic matter, irregularities, protrusions, abrupt changes in grade, or other unacceptable conditions that could damage the fabric. Maintain the subgrade in a smooth and uniform condition during installation of the fabric. The subgrade shall be inspected and accepted by the Engineer prior to placement of the fabric.
- C. Continuously inspect erosion control fabric for damage. Reject the fabric if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation, or storage. Repair or replace fabric damaged during installation.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Temporary Erosion Control Fabric
 - 1. Erosion control fabric shall be a machine-produced 100 percent biodegradable mat with a 70 percent herbaceous straw and 30 percent coconut fiber blend matrix. The blanket shall be of consistent thickness with the straw and coconut fiber evenly distributed over the entire area of the mat. Cover the blanket on the top and bottom sides with 100 percent biodegradable woven natural organic fiber netting. The netting shall consist of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the twisted machine strands (commonly referred to as a Leno weave) to form an approximate 1/2 inch by 1/2 inch mesh. Sew the fabric together with biodegradable thread on 1.5 inch centers.
 - 2. The matrix shall consist of 70 percent straw fiber with approximately 0.42lb/yd. weight with 30 percent coconut fiber cured in fresh water with approximately 0.18 lb/yd. weight, per ASTM D6475.
 - 3. The netting shall cover both sides and consist of woven 100% biodegradable natural organic fiber with approximately 9.3 lb/1,000 ft² weight, per ASTM D6475.
 - 4. Thread shall be biodegradable.

5. Functional life shall be a minimum of 18 months.
6. The recommended shear stress resistance shall be a minimum of 1.6 lb/ft² per ASTM D7207.
7. Shall have a minimum seed germination enhancement of rating of 200 percent per ASTM D7322.

B. Staking

1. Stakes shall be non-treated wood and shall be designed to safely and effectively secure erosion control fabric for temporary or permanent applications.
2. The stake shall meet the erosion control blanket manufacturer recommendations for the intended application. Stake length shall be 24 inches or longer as recommended by the manufacturer.
3. Serrate the stake on the leg to increase resistance to pull-out from the soil, unless otherwise approved by the Contracting Officer.
4. Shall exhibit ample rigidity to enable being driven into hard ground, with sufficient flexibility to resist shattering.
5. Shall be sized and installed so they secure the fabric to the surface and are not easily pulled out.

PART 3 – EXECUTION

3.01 LABELING, DELIVERY, STORAGE AND HANDLING

A. Labeling

1. Each roll of fabric delivered to the site shall be wrapped in protective covers and labeled by the manufacturer with the manufacturer's name, product identification, length, width, and roll number.

B. Delivery

1. The fabric rolls shall be shipped by appropriate means to prevent damage to the material and to facilitate off-loading.

C. Storage and Handling

1. Store and handle materials according to the manufacturer recommendations in such a manner as to prevent damage or deterioration to any part of the fabric.

2. Maintain the protective wrapping on fabric rolls at all times until the fabric is deployed for immediate placement.
3. Protect the fabric from punctures, abrasions, dirt, dust, grease, mud, moisture, excessive heat, sunlight, cutting, or other damage or deleterious conditions. Protect the fabric rolls from theft and vandalism and store away from high traffic areas. Repair any damage to protective wrapping immediately. The Contractor is responsible for the on-site storage and handling of all fabric. Damaged fabric shall be replaced at the Contractor's expense.

3.02 INSTALLATION

- A. The following are standard requirements and shall be followed, unless otherwise described by the Manufacturer recommendations.
 1. Ensure the fabric is not damaged in any way during handling.
 2. Position fabric rolls as required and unroll.
 3. Overlap fabric rolls in the direction of backfill placement so that the fabric at the beginning of backfill placement is overlapped on top of the fabric at the end of backfill placement.
 4. Fabric may be held in place with sand bags or anchor pins prior to backfill placement.
 5. Overlap fabric a minimum of 2 feet on all seams.
 6. Lay fabric smooth and free of tension, stress, folds, wrinkles, and creases. Unless specifically allowed by the Contracting Officer, fabrics shall be placed in continuous intimate contact with the underlying subgrade so that water cannot flow unimpeded between the soil and fabric.
 7. Stake fabric down at the manufactures recommended spacing using the approved stakes.
 - a) Stakes that are broken during installation shall be replaced, at no cost to the Contracting Agency, with a stake no more than 1/4 of the manufactures recommended spacing away from the broken stake.
 - b) Stakes that can be easily removed after installation shall be relocated no more than 1/4 of the manufactures recommended spacing away from the original location.

8. If fabrics are damaged during any phase of construction or installation, place a new piece of the same type over the damaged area with a 2-foot minimum overlap and stake in place.
9. Where applicable, cover the fabrics within 10 days after installation. Inspect the fabric immediately before and during placement of soil or aggregate on the fabric.
10. Do not operate construction equipment directly on the fabric.
11. Protect the fabric from damage due to the placement of materials by limiting the height of drop of the material to less than 1 foot unless otherwise approved by the Engineer.

END OF SECTION

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SECTION 02930 – SEEDING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Furnish all materials, equipment, and labor necessary for preparation, seeding, mulching, and protection for seeded areas in accordance with the Specifications and Drawings, and subject to the terms and conditions of the Contract. Work includes:

1. Seed, tackifier, soil supplements, and mulch.
2. Drill seed or hydro-seed, and apply soil supplements, mulch or hydro-mulch, and tackify areas designated on the Drawings to be seeded as directed by the Contracting Officer.

1.02 PAYMENT

A. Include in the lump-sum prices in the Schedule for items requiring Seeding. Include cost of preparation for and furnishing and placing seed, mulch, tackifier, soil supplements, and other materials required for seeding as specified herein.

1.03 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals:
1. RSN 02930-1, Seed Certifications: Showing origin of seed mixture and pure live seed content.
 2. RSN 02930-1, Seed Analysis: Showing percent purity and percent germination is a minimum of 85%, and noxious weed content does not exceed 0.5%, by weight.

1.04 QUALITY ASSURANCE

A. Seed shall be furnished in containers that show the following information: seed name, lot number, net weight, percentage of purity, germination, weed seed, and inert material. Seed that has become wet, moldy, or otherwise damaged will not be accepted. Seed shall conform to the requirements of the Washington State Seed Law and, when applicable, the Federal Seed Act and shall be "certified" grade or better.

1.05 FIELD QUALITY CONTROL

A. Inspections: The Contractor shall request a provisional inspection upon completion of the Work. Upon approved completion of the punchlist, the Contracting Officer will make provisional acceptance of the Work in writing.

1.06 GUARANTEE AND REPLACEMENT

- A. Seeding is guaranteed as specified in the Specifications. Seeded areas must have a relatively uniform germination with no bare spots over 10 square feet at the time of provisional acceptance. All areas larger than 10 square feet failing to germinate shall be reseeded at no extra cost. The Contractor shall reseed at the original rate.

PART 2 – PRODUCTS

2.01 SEED

- A. Seed shall be packed in clean, sound containers of uniform weight. Upon request, the Contractor shall furnish to the Contracting Officer duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed-testing laboratory. Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.
- B. Seed shall be locally propagated plants. When possible, seed shall be gathered from areas adjacent to Project site.
- C. Seed shall be weed free as shown on official seed analysis certification. Weed restrictions:
 - 1. Prohibited noxious weeds: None
 - 2. Restricted noxious weeds: 0.5% maximum, by weight
- D. Seed Mixture:
 - 1. Shall be native grasses
 - 2. Purity: 85% minimum
 - 3. Germination:
 - a) 85% minimum
 - b) Germination less than 1 year old at time of seeding
 - 4. Uniform mixture, as shown in Table 02930A – Seed Mixture, or as required by Contracting Agency

Table 02930A – Seed Mixture

Name	Pure Live Seed (Percent by Weight)
Mountain Brome	30
Bluebunch Wheatgrass	40
Great Basin Wildrye	10
Blue Wildrye	20
TOTAL	100

2.02 HYDROMULCH

- A. Mulch shall have the following essential characteristics:
1. Wood cellulose fiber.
 2. No germination or growth inhibiting factors.
 3. Dyed appropriate color to allow visual metering of application.
 4. Evenly dispersed and suspended when agitated in water.
 5. Forms blotter-like ground cover that readily absorbs water and allows infiltration into underlying soil.
 6. Provide a soil-binding agent (tackifier) free of germination or growth inhibiting factors.

PART 3 – EXECUTION

3.01 SITE PREPARATION

- A. Remove weeds, trash, rocks larger than 6-inch diameter, and other debris that will interfere with seeding or maintenance operations.
- B. Fill or smooth topsoil to remove rills, gullies, and depressions. Protect topsoil surfaces from erosion and washouts. Repair damaged surfaces as required.
- C. Discontinue site preparation for seeding Work when soil moisture conditions are not suitable for site preparation, as determined by the Contracting Officer.
- D. Notify the Contracting Officer no less than 48 hours in advance of any seeding operation. Following the Contracting Officer’s approval, seeding of the approved areas shall begin immediately.

3.02 SEEDING SCHEDULE

- A. The time period for seeding shall be October 1 to November 15. No seeding shall be done before or after these dates without the Contracting Officer's written approval. No seeding shall take place on weekends or legal holidays.
- B. Do not seed or fertilize when the ambient temperature is below 38° F without approval from the Contracting Officer. Do not seed, fertilize, or mulch when the ground is snow-covered or frozen. Do not seed, fertilize, or mulch when wind velocities prevent uniform application of materials.

3.03 SEEDING

- A. Seed shall be applied by hand. Mulch shall be applied with approved hydraulic equipment. Both shall be applied separately in one application event. The Contractor shall apply materials at the following rates:
 - 1. Seed: 60 pounds per acre
 - 2. Mulch with Tackifier: 1,200 to 1,500 pounds per acre
- B. The Contractor shall give the Contracting Agency and the Contracting Officer 48 hours notice prior to seeding operation. Equipment shall utilize water as carrying agent, utilizing continuous built-in agitation system.
- C. Equipment with a gear pump is not acceptable.
- D. The Contractor shall pump a continuous, non-fluctuating supply of homogenous slurry to provide a uniform distribution of mulch material over designated areas.

3.04 MAINTENANCE

- A. The Contractor shall be responsible for the application of seeding as described in this Section until seed germination has occurred.
- B. The Contractor shall be responsible for reseeding areas larger than 10 square feet that do not germinate, at no additional cost to the Contracting Agency. Reseeded areas must germinate or further mitigation is necessary and is the responsibility of the Contractor.
- C. Once the seeding has germinated and is accepted and approved by the Contracting Officer, maintenance of the seeding application shall be done by others.

3.05 PHYSICAL COMPLETION

- A. Inspection to determine physical completion of germinated seeded areas will be made by the Contracting Officer upon Contractor's notification of completion.

- B. The Contractor may request a specific inspection date provided that the request is made at least 5 working days before requested inspection date.

END OF SECTION

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SECTION 02947 – LARGE WOODY MATERIAL

PART 1 – GENERAL

1.01 PURPOSE

- A. Large woody material is the principal material in the construction of the various design structures within this Contract.
- B. Large woody material is a natural and sustainable material that is sourced from select tree species. The material is selected to mimic materials typically found in the fluvial and riparian environment in which the Contract is located.

1.02 DESCRIPTION

- A. Furnish all materials, equipment, and labor necessary to install the large woody material members included in the various structures as indicated on the Drawings and as described in the Specifications. Work includes:
 - 1. Furnishing the large woody materials. Work includes the purchase, transport, and delivery of large woody materials to be used under this Contract.
 - 2. At the option of the Contracting Agency, the Contracting Agency may elect:
 - a) To purchase the full or partial quantity of large woody materials to be used in the Contract.
 - b) To transport the full or partial quantity of large woody materials to be used in the Contract.
 - c) To deliver the full or partial quantity of large woody material to be used in the Contract.
 - 3. Where the Contracting Agency has elected to complete the Work described in Item 1.02 A 2, above, those associated costs will not be reimbursed to the Contractor.
 - 4. The Contractor shall be responsible for the care and installation of the large woody materials, once the large woody materials are in his/her possession. Possession of the large woody materials is assumed once:
 - a) The Contractor purchases the large woody materials, or
 - b) The Contractor arranges for the transport of the large woody materials, or

- c) The Contractor arranges for the delivery of the large woody material to the work site, or
 - d) The Contractor and Contracting Officer have conducted an inspection and inventory of large woody material furnished by the Contracting Agency.
 - 5. The Contracting Officer reserves the right to reject a member of large woody material based on the requirements as indicated in the Drawings and as described in the Specifications.
 - 6. The Contractor is responsible for ensuring the total quantity of large woody materials are available to complete the Work prior to mobilization, regardless of the quantities that may be provided by the Contracting Agency.
- B. Large woody materials are required on the following structures, as indicated in the Drawings and as described in the Specifications, or as directed by the Contracting Officer and/or the Engineer:
 - 1. LWD Type V Structures; refer to Section 02952 – Large Woody Debris (LWD) Structures
 - 2. ELJ Type B Structures; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
 - 3. ELJ Type BD Structures; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
 - 4. ELJ Type As Structure; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
 - 5. ELJ Type Ac Structure; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
 - 6. ELJ Type A Structure; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
- C. Large woody materials include:
 - 1. Rootwad logs, described in Part 2
 - 2. Log poles, described in Part 2

1.03 PAYMENT

- A. Include in the lump-sum prices in the Schedule for items requiring large woody materials as indicated on the Drawings and described in the Specifications.

- B. Includes all labor, equipment, tools, and materials required to furnish and manage the inventory of satisfactory large woody materials, except as described in item 1.02 A 3, herein.
- C. Costs for installation of the large woody materials is covered under the lump-sum prices for items requiring large woody materials as indicated on the Drawings and described in the Specifications.
- D. The Contractor shall replace members of large woody material, at no additional cost to the Contracting Agency, that do not meet the requirements as indicated in the Drawings and as described in the Specifications.

1.04 REFERENCES

- A. Section 02948 – Wood Structure Connections
- B. Section 02952 – Large Woody Debris (LWD) Structures
- C. Section 02953 – Engineered Log Jam (ELJ) Structures

1.05 DEFINITIONS

- A. Large woody material: Natural logs meeting the dimensions and characteristics indicated on the Drawings and described in the Specifications.
- B. Members: Individual pieces of large woody material.
- C. Structures: Various proposed discrete construction elements including various types of LWD structures and various types of ELJ structures indicated on the Drawings and described in the Specifications.

1.06 SUBMITTALS

- A. All submittals listed in item 1.06 B, below, are required. Note:
 - 1. If all large woody materials required under this Contract are furnished by the Contracting Agency and there is no need for the Contractor to furnish additional materials, the Contractor shall submit a letter with the correct RSN and indicate that additional materials are not required for use in the Contract.
- B. Submit the following in accordance with Section 01330 – Submittals:
 - 1. RSN 02947-1, Large Woody Material: Source(s) of large woody materials and an inventory of members from the source(s) showing that members meet the requirements for large woody materials, as indicated in the Drawings and as described in the Specifications. Photo documentation of

the materials proposed to be furnished is encouraged to be included in the inventory. Submit no later than 21 days prior to mobilization.

1.07 QUALITY ASSURANCE

- A. The Contracting Officer reserves the right to inspect the large woody materials at their source(s) prior to the Contractor's purchase of the materials. Purchase shall not proceed if access for inspection by the Contracting Officer is not granted by the source(s).
- B. For quantities of large woody materials furnished by the Contracting Agency, the Contracting Officer and Contractor shall conduct an inspection and inventory of large woody material furnished by the Contracting Agency.
 - 1. Materials that do not meet the requirements indicated on the Drawings and described in the Specifications shall be rejected, unless otherwise directed by the Engineer.
 - 2. Following the inspection, the Contractor shall be responsible for the care and management of the approved inventory of large woody material.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. For quantities of large woody material not delivered by the Contracting Agency, the Contractor shall pay for and arrange for the transport and delivery of large woody material to the work site.
- B. Contractor shall store large woody material within the designated staging and/or stockpile areas indicated in the Drawings and as described in the Specifications, or as directed by the Contracting Officer.
- C. Contractor shall protect the large woody material from theft and damage from fire, breakage during handling, vandalism, rot, infestation, and other means that result in the large woody materials not meeting the requirements indicated in the Drawings and as described in the Specifications.
- D. Contractor shall replace, at no additional cost to the Contracting Agency, members of large woody materials that are damaged, stolen, and/or do not meet the requirements indicated in the Drawings and as described in the Specifications.
- E. Contractor is responsible for ensuring the total quantity of large woody materials is available to complete the Work.
- F. Contractor shall handle the large woody material with equipment appropriate for the task. Handling shall not damage the large woody material.
- G. With the use of appropriate equipment/methods, place large woody material into position; do not drop large woody material into position.

- H. Handling and moving large woody material shall not damage existing features or landscapes. Refer to Section 01569 – Landscape Protection and Restoration and Section 01725 – Protection of Existing Installations.

PART 2 – PRODUCTS

2.01 ROOTWAD LOGS

A. Rootwad Logs:

1. Are included in various structure installations.
2. Include an intact rootwad mass.
3. For all structures:
 - a) Shall be sourced from, in descending preference: Douglas Fir, Western Larch, and Ponderosa Pine; or other species with prior approval by the Contracting Officer.
4. Shall conform to the dimensions as indicated in the drawings for the particular structure. The rootwad mass shall have a diameter equal to or greater than three (3) times the log diameter measured at breast height, or otherwise approved by the Contracting Officer. The rootwad mass shall have a length equal to or greater than two (2) times the log diameter measured at breast height, or otherwise approved by the Contracting Officer.
5. Shall have a diameter not less than the diameter indicated in the Drawings, measured at breast height.
6. Shall have a maximum diameter taper by type of Structure as described below:
 - a) ELJ Type A, Ac, As, B, and BD Structures: 1 inch diameter per 10 feet length, or as otherwise approved by the Engineer.
 - b) LWD Type V Structures: 1 inch diameter per 5 feet length, or as otherwise approved by the Engineer.
7. Shall be from sound stock and appropriate for structural constructions. The trunk of the logs shall reasonably straight and uniform, and free of excessive bends, bulges, and limbs that will impede the placement of additional logs in the applicable structure. Logs exhibiting breakage, rot, splitting, holes, pest infestation, foreign objects/finishes, vandalism, burn, and other damages are not allowed may be rejected by the Contracting Officer.

8. Limbs shall be trimmed within one inch of the face of the log. Limbs do not include the root mass.
9. Rootwad masses shall conform to the dimensions as indicated in the drawings for the particular structure.
10. Rootwad masses shall be reasonably uniform and full; rootwad logs with asymmetrical rootwad masses may be rejected by the Contracting Officer.

2.02 LOG POLES

A. Log Poles:

1. Are included in various structure installations.
2. For all structures:
 - a) Shall be sourced from, in descending preference: Douglas Fir, Western Larch, and Ponderosa Pine; or other species with prior approval by the Contracting Officer.
3. Do not include an intact rootwad mass.
4. Shall conform to the dimensions as indicated in the drawings for the particular structure.
5. Shall have a diameter not less than the diameter indicated in the Drawings, measured at the midpoint of the log length (cut end to cut end).
6. Shall have a maximum diameter taper by type of Structure as described below:
 - a) ELJ Type A, Ac, As, B, and BD Structures: 1 inch diameter per 10 feet length, or as otherwise approved by the Engineer.
7. Shall be from sound stock and appropriate for structural constructions. The trunk of the logs shall reasonably straight and uniform, and free of excessive bends, bulges, and limbs that will impede the placement of additional logs in the applicable structure. Logs exhibiting breakage, rot, splitting, holes, pest infestation, foreign objects/finishes, vandalism, burn, and other damages are not allowed may be rejected by the Contracting Officer.
8. Limbs shall be trimmed within one inch of the face of the log.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Installation of large woody materials involves placing member(s) in accordance with the Drawings and Specifications. See the following Sections:
1. Section 02948 – Wood Structure Connections
 2. Section 02952 – Large Woody Debris (LWD) Structures
 3. Section 02953 – Engineered Log Jam (ELJ) Structures

END OF SECTION

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SECTION 02948 – WOOD STRUCTURE CONNECTIONS

PART 1 – GENERAL

1.01 PURPOSE

- A. Structures involving large woody material members require connections with the exception for one structure type that is partially buried.
- B. This Section describes the materials used in connections, connection requirements, and connection methods. This Section includes general-use connections for multiple structures included in this Contract.
- C. This Section may not include all connections that are intended for each structure. Refer to the applicable Section for each structure.

1.02 DESCRIPTION

- A. Furnish all materials, equipment, and labor necessary for the various structure connections as indicated on the Drawings and as described in the Specifications. Work includes:
 - 1. Furnishing the type, kind, and quantity of materials required for an approved connection.
 - 2. Cutting steel wire rope, and/or natural fiber rope to the length necessary for an approved connection. The Contractor is hereby cautioned to not pre-cut lengths of any rope for connections as the pre-cut length may not be adequate for every similar connection due to the variability of the large woody material members.
 - 3. Drilling large woody material members for installation of steel wire rope and/or natural fiber rope as necessary for various structure connections.
 - 4. Installing steel wire rope, wire rope clips, and staples as necessary (and applicable) for an approved wire rope connection.
 - 5. Installing natural fiber rope as necessary (and applicable) for an approved connection.
 - 6. The Contracting Officer and/or the Engineer are responsible for the approval of a connection and it is the Contractor's responsibility to re-work connections that are judged non-approved by the Contracting Officer and/or the Engineer.
- B. Structure connections are required on the following structures, as indicated in the Drawings and as described in the Specifications, or as directed by the Contracting Officer and/or the Engineer:

1. LWD Type V Structures; refer to Section 02952 – Large Woody Debris (LWD) Structures
2. ELJ Type B Structures; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
3. ELJ Type BD Structures; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
4. ELJ Type As Structure; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
5. ELJ Type Ac Structure; refer to Section 02953 – Engineered Log Jam (ELJ) Structures
6. ELJ Type A Structure; refer to Section 02953 – Engineered Log Jam (ELJ) Structures

1.03 PAYMENT

- A. Include in the lump-sum prices in the Schedule for items requiring structure connections as indicated on the Drawings and described in the Specifications.
- B. Includes all labor, equipment, tools, and materials required to drill holes, install wire rope, wire rope clips, and staples; and natural fiber rope and staples for structure connections as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer and/or Engineer.
- C. A connection that is judged non-approved by the Contracting Officer and/or Engineer shall be re-worked by the Contractor at no additional cost, except where the non-approved connection is the fault of the Contracting Officer and/or Engineer.

1.04 REFERENCES

- A. Section 02947 – Large Woody Material
- B. Section 02952 – Large Woody Debris (LWD) Structures
- C. Section 02953 – Engineered Log Jam (ELJ) Structures
- D. Federal Specifications FF-C-450D, or newer
- E. Federal Specifications RR-W-410E, or newer

1.05 DEFINITIONS

- A. Approved Connection: An approved connection is one that is free of slack and excess length of rope (of any approved type), rope ends are protected from

unraveling, wire rope clips are tightened to the specified torque, and staples are placed to minimize the movement of the free ends of the rope.

- B. EIPS: Extra improved plow steel.
- C. IWRC: Independent wire rope core.
- D. Large woody material: Natural logs meeting the dimensions and characteristics indicated on the Drawings and described in the Specifications.
- E. Members: Individual pieces of large woody material.
- F. Structures: Various proposed discrete construction elements including various types of LWD structures and various types of ELJ structures indicated on the Drawings and described in the Specifications.

1.06 SUBMITTALS

- A. All submittals listed in item 1.06 B, below, are required. Note:
 - 1. If a material for which there is a required submittal is not proposed for use in the Contract Documents by the Contractor, the Contractor shall submit a letter with the correct RSN and indicate that the material is not proposed for use in the Contract Documents.
- B. Submit the following in accordance with Section 01330 – Submittals:
 - 1. RSN 02948-1, Wire Rope: material cut sheet from manufacturer and/or supplier showing that wire rope meets all requirements of these Specifications. Submit no later than 14 days prior to mobilization.
 - 2. RSN 02948-2, Wire Rope Clips: material cut sheet from manufacturer and/or supplier showing that wire rope clips meet all requirements of these Specifications. Submit no later than 14 days prior to mobilization.
 - 3. RSN 02948-3, Staples: material cut sheet from manufacturer and/or supplier showing that staples meet all requirements of these Specifications. Submit no later than 14 days prior to mobilization.
 - 4. RSN 02948-4, Natural Fiber Rope: material cut sheet from manufacturer and/or supplier showing that natural fiber rope meets all requirements of these Specifications. Submit no later than 14 days prior to mobilization.

1.07 QUALITY ASSURANCE

- A. Materials and products shall meet the specified requirements as described in the Specifications, herein.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall furnish and arrange for the transport and delivery of all materials required for wood structure connections to the work site.
- B. It is the Contractor's responsibility to ensure that the materials are transported, delivered, stored, and handled in a manner that does not damage or adversely affect the materials. Damaged materials may be rejected by the Contracting Officer, at no additional cost to the Contracting Agency.

PART 2 – PRODUCTS

2.01 GALVANIZED STEEL WIRE ROPE

- A. Shall match the size, type, class, construction, and kind indicated on the Drawings and described in the Specifications, or as approved by the Engineer. Where there is a conflict between what is indicated in the Drawings or described in the Specifications, the Engineer shall determine which takes precedence.
- B. Shall meet Federal Specifications RR-W-410E, or newer.
- C. Wire Rope size, type, class, construction, and kind:
 - 1. 3/8-inch diameter, Type VI, Class 3, 7x19 Construction, drawn galvanized high-carbon steel wire rope; nominal breaking strength of 14,400 lbs.
 - 2. 5/8-inch diameter, Type I General Purpose, Class 2, 6x19 Construction, galvanized EIPS, IWRC; nominal breaking strength of 37,000 lbs.
- D. Shall not be spliced, unless otherwise approved by the Engineer.
- E. Shall be of continuous length. Pre-cut lengths are acceptable, but it is the responsibility of the Contractor to ensure that lengths are suitable for an approved connection. Pre-cut lengths of wire rope that do not meet a sufficient length for an approved connection will be rejected by the Contracting Officer at no cost to the Contracting Agency.

2.02 GALVANIZED STEEL WIRE ROPE CLIPS

- A. Shall match the size, type, class, construction, and kind indicated on the Drawings and described in the Specifications, or as approved by the Engineer. Where there is a conflict between what is indicated in the Drawings or described in the Specifications, the Engineer shall determine which takes precedence.
- B. Size shall accommodate two strands of the specified wire rope for which the wire rope clips are required.
- C. Shall meet Federal Specifications FF-C-450D, or newer.

- D. Wire Rope Clip size, type, class, construction, and kind:
 - 1. 3/8-inch diameter, Type I single grip, single saddle, with U-bolts and nuts; Class I, galvanized drop forged.
 - 2. 5/8-inch diameter, Type I single grip, single saddle, with U-bolts and nuts; Class I, galvanized drop forged.
- E. Shall be tightened to the manufacturer recommended torque.

2.03 GALVANIZED STEEL STAPLES

- A. Size shall accommodate the specified wire rope diameter for which the staples are required.
- B. Shape shall be “U”-type.
- C. Shall be hot dipped galvanized steel with rolled diamond points.
- D. Staple size, unless otherwise approved by the Engineer:
 - 1. 3/8x4”: 3/8-inch opening, 4 inch length.
 - 2. 1/2x6”: 1/2-inch opening, 6 inch length.

2.04 NATURAL FIBER ROPE

- A. Shall be Manila Rope, 5/8-inch diameter, with a tensile strength of 3,960 lbs, in accordance with the Cordage Institute Standard (USA) CI-1308-96, Manila Rope 3-Strand Laid.
- B. Where there is a conflict between what is indicated in the Drawings or described in the Specifications, the Engineer shall determine which takes precedence.

PART 3 – EXECUTION

3.01 PLACEMENT OF LARGE WOODY MATERIAL MEMBERS

- A. The large woody material members shall be placed in the locations, extents, elevations, and quantities indicated in the Drawings.
- B. The natural variations in large woody material may cause members to roll, pitch, and/or yaw when placed atop another member. Individual members requiring connections shall be dry-fit prior to completing the connection to assure a snug and stable fit.

3.02 WIRE ROPE CONNECTIONS

- A. Provide connections involving wire rope, wire rope clips, and staples for large woody materials as indicated in the Drawings and as described in the Specifications, or as otherwise approved by the Engineer.
- B. At a minimum, shall involve the following elements:
 - 1. Drilling the large woody material members for the connection as indicated in the Drawings and as described in the Specifications. Drill hole diameter shall not exceed the sum of the indicated wire rope diameter and 3/8 inch, or as otherwise approved by the Engineer.
 - 2. Installing the wire rope as indicated on the Drawings.
 - a) Unless otherwise indicated in the Drawings and described in the Specifications, a minimum of two wire rope clips shall be used in each connection.
 - b) Installation of the wire rope clips shall follow manufacturer recommendations and standard rigging operations.
 - c) Install wire rope clips in the locations and quantities as indicated on the Drawings.
 - d) Mechanical means shall be used to pull tight the wire rope to minimize the length of slack wire rope to the extent practical.
 - e) Mechanical means (equipment or fasteners) shall be used to hold the wire rope taut while installing the wire rope clips.
 - f) Wire rope clip size shall match the wire rope used in the connection.
 - 3. Placing staples on the ends of the wire rope, as indicated on the Drawings. Staples shall be sized according to the wire rope diameter indicated in the Drawings and described in the Specifications.
 - 4. Field cutting the end(s) of the wire rope, as necessary. The ends of the wire rope shall not extend beyond the approved connection a length greater than the diameter of the connected member(s).
- C. The Contracting Officer shall approve the connection. If a connection is judged non-approved, the Contractor shall rework the connection at no additional cost to the Contracting Agency.

3.03 NATURAL FIBER ROPE CONNECTIONS

- A. Provide connections involving natural fiber rope for large woody materials as indicated in the Drawings and as described in the Specifications, or as otherwise approved by the Engineer.
- B. Shall involve tying knots, splicing rope, and/or other effective methods approved by the Contracting Officer.
- C. The Contracting Officer shall witness and inspect a mock-up of a connection completed by the Contractor proposed for use in construction. If modifications are necessary, the mock-up shall be re-worked under the review of the Contracting Officer. The Contracting Officer shall approve the connection, once satisfied with the method. Only methods approved by the Contracting Officer may be used in the Work.
- D. The Contracting Officer shall approve the connection. If a connection is judged non-approved, the Contractor shall rework the connection at no additional cost to the Contracting Agency.

3.04 CLEANUP

- A. Connections shall not be backfilled or otherwise obstructed from review by the Contracting Officer without prior approval.
- B. Contractor shall collect and properly dispose of remaining materials, debris, and rubbish resulting from completion of connections. Refer to Section 01740 – Cleaning.

END OF SECTION

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SECTION 02952 – LARGE WOODY DEBRIS (LWD) STRUCTURES

PART 1 – GENERAL

1.01 PURPOSE

- A. In general, the various LWD Structures are habitat enhancement features that promote sediment accumulation for the propagation of cottonwood tree growth in addition to promoting hydraulic refuge, cover, food, and shading for the benefit of fish species. The structures are composed of large woody materials that interact with the waterway at various stages of flow. The structures add roughness to flows and increase hydraulic variability.

- B. The LWD Type V Structures add roughness to the side channel and the bank. The rootwad masses protruding into the direction of flow increase hydraulic variability and allow for racking of mobile woody debris. The structure promotes deposition of sediment in the lee of the structure to propagate cottonwood tree growth and enhance riparian and fish habitat. Shading, cover, and hydraulic refuge are provided by the large woody materials and accumulated mobile woody debris. Plantings, installed by Others, during construction add channel roughness and add habitat.

1.02 DESCRIPTION

- A. LWD Type V Structures: Furnish all materials, equipment, and labor necessary for the construction of two (2) structures as indicated on the Drawings and as described in the Specifications. Work includes:
 - 1. Working along the right bank (facing downstream) of the side channel. Refer to Section 02240 – Diversion and Care of Water.

 - 2. Clearing and grubbing and stripping areas to be excavated as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Work requiring clearing and grubbing and stripping is covered under Site Preparation. Refer to Section 02232 – Clearing and Grubbing and Section 02236 – Stripping.

 - 3. Excavation to install four (4) rootwad logs, per each structure, to the design elevations indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Refer to Section 02260 – Excavation Support and Protection and Section 02318 – Earthwork for Structures.

 - 4. Installation of the large woody material members to the locations, extents, elevations, lines, and grades indicated on the Drawings and as described in the Specifications. Installation includes:

- a) Cutting large woody material members, as necessary, to the dimensions indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - b) Placing large woody material members in the locations and positions and to the dimensions and elevations indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - c) Connect members as indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Connections require natural fiber rope and staples; or other methods and materials as specified and/or approved by the Engineer.
5. Backfill of the buried rootwad logs to the elevations, lines, and grades indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Backfill material as specified.
 6. The Contractor shall coordinate Work during the construction of the structures to allow for installation of plantings, by Others.

1.03 PAYMENT

- A. Include in the per each prices in the Schedule, for Installation of LWD Type V Structures, all Work indicated on the Drawings and described in the Specifications herein with the following exceptions:
 1. Clearing and grubbing and stripping are covered under Site Preparation.
 2. Restoration of areas disturbed by construction is covered under Site Restoration.

1.04 REFERENCES

- A. Section 01725 – Protection of Existing Installations
- B. Section 01740 – Cleaning
- C. Section 01781 – Project Closeout
- D. Section 02232 – Clearing and Grubbing
- E. Section 02236 – Stripping
- F. Section 02240 – Diversion and Care of Water
- G. Section 02260 – Excavation Support and Protection
- H. Section 02318 – Earthwork for Structures

- I. Section 02930 – Seeding
- J. Section 02947 – Large Woody Material
- K. Section 02948 – Wood Structure Connections

1.05 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals:
 - 1. RSN 02952-1, Logging Slash and Small Woody Debris: Source site information including approximate volume of material available, age of material, tree species of material, and written permission for Contracting Officer to gain access to the source site to evaluate materials. Materials shall meet the requirements of the Specifications, herein. Submit prior to furnishing materials and no later than 14 days prior to mobilization.

PART 2 – PRODUCTS

2.01 LARGE WOODY MATERIALS

- A. Shall meet the requirements indicated in the Drawings and as described in the Specifications; refer to Section 02947 – Large Woody Material.

2.02 NATURAL FIBER ROPE AND HARDWARE

- A. LWD Type V Structures:
 - 1. Structures require natural fiber rope connections as indicated on the Drawings.
 - 2. Staples shall be 1/2x6” or longer; refer to Section 02948 – Wood Structure Connections.

2.03 LOGGING SLASH AND SMALL WOODY DEBRIS

- A. Logging slash and small woody debris shall be sourced and furnished from locally available materials meeting the following requirements:
 - 1. Cut limbs, small trees, and tops with branches that are generally long, slender, and branched.
 - 2. Material ranging in diameter between 1 inch and 12 inches.
 - 3. Material ranging in length between 2 feet and 12 feet.
- B. Waste woody material generated during the construction may be used. Waste woody material generated during the construction may include, but is not limited to:

1. Field-cutting of individual large woody materials, as required for the proper fit in accordance with the Drawings and the Specifications, herein.
 2. Surplus materials or rejected materials that do not meet the dimensions indicated in the Drawings and described in the Specifications, herein. Surplus materials must be approved by the Contracting Officer for placement as logging slash and small woody debris.
- C. The Contracting Officer shall approve the logging slash and small woody debris for placement within the structures described, herein
- D. For sources of logging slash and small woody debris proposed for use by the Contractor, the Contracting Officer must be allowed permission to access the source site to evaluate the materials, prior to the Contractor furnishing the material.

PART 3 – EXECUTION

3.01 SITE PREPARATION

- A. The Contractor is responsible for surveying and staking the location of the LWD Structures in accordance with the Drawings and Section 01721 – Surveying.
- B. Implement diversion and care of water measures, as necessary, to remain in compliance with construction permit conditions and requirements. Measures may include, though are not limited to: surface water diversion and dewatering for excavation. Refer to Section 02240 – Diversion and Care of Water.
- C. Clear and grub and strip the structure excavation footprint as necessary. Vegetation removal shall be minimized to the extent practical; removal of trees larger than 3 inches in diameter at breast height shall require approval from the Contracting Officer. Refer to Section 02232 – Clearing and Grubbing and Section 02236 – Stripping.

3.02 EXCAVATION FOR LWD STRUCTURES

- A. General – All Structures:
1. Excavate the structure footprint as indicated in the Drawings to the bottom design elevation. Native materials excavated shall be stockpiled separate from stripped topsoil. Refer to Section 02318 Earthwork for Structures.
 2. Contractor is responsible for dewatering the excavation; refer to Section 02240 – Diversion and Care of Water.
 3. Contractor is responsible for excavation support and protection; refer to Section 02260 – Excavation Support and Protection.

4. Native materials excavated, if suitable, shall be used to backfill the structure, unless otherwise indicated in the Drawings or described in the Specifications, or as directed by the Contracting Officer. See Item 3.03, below.

B. LWD Type L Structures:

1. Excavation is required to place the four (4) buried rootwad logs (vertical large woody material members) per structure, to the design elevation as indicated in the Drawings, or otherwise directed by the Engineer.
2. Protect the bank(s) from disturbance during excavation as indicated in the Drawings.
3. A small, shallow depression shall be excavated from existing grade at the horizontally placed rootwad log at the bottom of the structure, at the rootwad mass end, as indicated in the Drawings. The depression shall be no longer, nor wider than twice the diameter of the bottom rootwad mass and not deeper than half of the diameter of the bottom rootwad mass, measured from existing grade.

3.03 INSTALLATION OF LWD STRUCTURES

A. General – All Structures:

1. Dewater the excavations for structures. Refer to Section 02240 – Diversion and Care of Water.
2. Contractor is responsible for installing the LWD Structures to the location, elevations, and extents indicated in the Drawings; the location of the structures may vary from the Drawings under the direction of the Engineer. Contractor shall conduct surveying as necessary and to the satisfaction of the Contracting Officer to ensure the LWD Structures meets the design elevations; refer to Section 01721 – Surveying.
3. The Contractor shall dry-fit place each large woody material member prior to drilling the member in preparation for connections.
4. Place the individual members of large woody material comprising the bottom layer of the structures to the bottom design elevations indicated in the Drawings. Variations in diameter of the large woody material members may require localized adjustments to the bottom grade.
5. Individual members of large woody material may require field cutting to maintain the structure alignment and design elevations. Field cutting of rootwad logs shall be allowed only as directed by or approved by the Engineer.

6. Where applicable, once the bottom layer members are in-place and in proper alignment, drill the members and install lengths of wire rope adequately sized for approved connections. Refer to Section 02948 – Wood Structure Connections.
7. Where applicable, continue dry-fit placement of subsequent layers of large woody material. Drill members as necessary and install the ends of wire rope to achieve an approved connection.
8. The natural variations in large woody material may cause members to roll, pitch, and/or yaw when placed atop another member. Dry-fit placement of members prior to preparing the connection shall be performed to assure a snug and stable fit.
9. Where applicable, once all members are installed for an intended connection and wire rope has been threaded through all members, complete the connection as indicated in the Drawings and as described in the Specifications; refer to Section 02948 – Wood Structure Connections.

B. LWD Type V Structures:

1. Place the buried rootwad logs into the excavated hole at the design elevation as indicated in the Drawings. Rootwad logs shall be placed plumb on all sides and in the correct location and alignment to provide for the linear elements of the structure as indicated in the Drawings.
2. Backfill the buried rootwad logs to match existing grade; refer to Item 3.04 D, below.
3. Place the remaining large woody material members as indicated in the Drawings, against the buried rootwad logs.
4. Install the structure with approved connections as indicated in the Drawings and described in the Specifications. Refer to Section 02948 – Wood Structure Connections.
5. Backfill the remaining members of the structure; refer to Item 3.04 D, below.
6. Field-cut the top of the buried rootwad logs, where necessary, as indicated in the Drawings.

3.04 BACKFILL OF THE LWD STRUCTURES

A. General – All Structures:

1. Backfill the structure in accordance with Section 02318 – Earthwork for Structures.

2. Backfill of the structure may occur in sequences, as the structure is completed in layers, unless otherwise described in the Specifications, and as approved by the Contracting Officer.
3. The Contractor shall construct and backfill the structure (where applicable) to the layers where planting of the structure, by Others, is required. Refer to Part 3.05, below.
4. Placement of backfill on top of the installed plantings shall be done with care to avoid damage of the installed plantings.
 - a) The Contracting Officer shall approve the placement of backfill on top of the installed plantings.
 - b) Placement of backfill on top of the installed plantings shall be limited to less than one (1) foot drop height.
 - c) Placement of backfill may be done by placing backfill between adjacent installed plantings and spreading the backfill over the installed plantings, so long as spreading the backfill does not alter the position of the installed plantings.
 - d) Any installed plantings, whose positions have been altered during placement of backfill more than six (6) inches horizontally or that may adversely affect the success of the installed planting, must be re-positioned to the designed planting spacing at the request of the Contracting Officer.
 - e) Any installed planting that is damaged during backfill, and is the result of careless placement of backfill by the Contractor, shall be re-installed; the costs of re-installation of plantings shall be borne by the Contractor, at no additional cost to the Contracting Agency.
5. Backfill structure with suitable material to the lines, elevations, and grades as indicated in the Drawings and described in the Specifications.

B. LWD Type V Structures:

1. Contractor shall coordinate Work during backfilling of the structures, as necessary to allow for planting of the structure, by Others.
2. Backfill the buried rootwad logs:
 - a) As indicated in the Drawings and described in the Specifications. Refer to Section 02318 – Earthwork for Structures.

- b) In a manner that maintains each rootwad log plumbed on all sides and provides the proper location, alignment, and dimension as indicated in the Drawings.
 - c) Backfill shall match existing grade, except where indicated otherwise in the Drawings.
 - d) Backfill shall be completed before placement of the large woody material members located above existing grade.
3. Backfill the members above existing grade as indicated in the Drawings and described in the Specifications. Refer to Section 02318 – Earthwork for Structures.

3.05 PLANTING OF THE LWD STRUCTURES (BY OTHERS)

A. General – All Structures:

- 1. The Contractor shall coordinate the construction of the various LWD structures, as necessary to allow for planting of the structures, by Others.
- 2. The Contractor shall continue Work on the structure so long as it does not interrupt the planting installation work crew; alternatively, the Contractor may Work on other structures while planting installation occurs on others.
- 3. Once the plantings, by Others, are completed, the Contractor shall continue to construct and backfill the structures, as shown on the Drawings and as indicated in the Specifications, herein.
- 4. The Contracting Officer shall approve the installed plantings prior to backfill of the layers containing the plantings.

3.06 CLEANUP

- #### A.
- Contractor shall collect and properly dispose of remaining materials, debris, and rubbish resulting from construction of the LWD Structures. Refer to Section 01740 – Cleaning.

3.07 COMPLETION

- #### A.
- Contractor shall collect finish elevations for the structures and not e changes to the construction of the structures in accordance with preparation of As-built documents. Refer to Section 01781 – Project Closeout.

END OF SECTION

SECTION 02953 – ENGINEERED LOG JAM (ELJ) STRUCTURES

PART 1 – GENERAL

1.01 PURPOSE

- A. In general, the various ELJ structures are habitat enhancement features for the benefit of fish at varying life stages. Fish habitat enhancements from the structures include shading, hydraulic refuge, cover, and spawning opportunities. Plantings installed by others within and adjacent to the structures (where applicable) enhance riparian habitat that promote shading, cover, and food for the benefit of fish. The structures are composed of large woody materials that interact with the waterway at various stages of flow.

- B. The ELJ Type A structure is located at the head of the island. The structure at the island splits flow into the main channel and side channel. Flow is split into the side channel to increase and enhance habitat in the side channel. The structures offer a significant amount of localized roughness within the channel to promote pool formations and hydraulic refuge, cover, and shading for the benefit of fish habitat. Plantings installed by others during construction will enhance riparian habitat near the structure.

- C. The ELJ Type Ac structure located along the right bank of the side channel (facing downstream) near the inlet of an over island channel activation point. The structure offers hydraulic refuge for the benefit of fish habitat. The structure includes plantings that will enhance riparian habitat and add roughness to the floodplain and banks in the long term. Plantings installed by others during construction will enhance riparian habitat near the structure.

- D. The ELJ Type As structures are located along the left bank of the side channel (facing downstream) near the downstream end of the island; the structure furthest upstream is located at the inlet of an over-island channel activation point. The structures offer hydraulic refuge for the benefit of fish habitat. Similar to the ELJ Type A structure, the Type As structures add a significant amount of localized roughness within the channel to promote pool formations and hydraulic variability along a large area of the channel. Plantings installed by others during construction will enhance riparian habitat and add roughness to the floodplain and banks in the long term near the structures.

- E. The ELJ Type B structures are located along the left and right banks of the side channel (facing downstream). The structures add roughness to the channel, thereby providing hydraulic refuge for the benefit of fish habitat. The structures are located to promote the development of a sequence of pools and a defined low-flow channel. Plantings installed by others during construction will enhance riparian habitat near the structure.

- F. The ELJ Type BD Structures are located along the right bank of the main channel (facing downstream). The structures add roughness to the channel, thereby providing hydraulic refuge for the benefit of fish habitat. The structures are designed and located to promote the accumulation of sediment in the lee of the structures and provide a varying channel width. Plantings installed by others during construction will enhance riparian habitat near the structure.

1.02 DESCRIPTION

- A. ELJ Type A Structure: Furnish all materials, equipment, and labor necessary for the construction of one (1) structure as indicated on the Drawings and as described in the Specifications. Work includes:
1. Working along the banks of the Methow River main channel and side channel. Refer to Section 02240 – Diversion and Care of Water.
 2. Clearing and grubbing and stripping areas to be excavated as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Work requiring clearing and grubbing and stripping is covered under Site Preparation. Refer to Section 02232 – Clearing and Grubbing and Section 02236 – Stripping.
 3. Excavation to install the bottom of the structure to the design elevation as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Refer to Section 02260 – Excavation Support and Protection and Section 02318 – Earthwork for Structures.
 4. Excavation of a depression around the structures, as indicated in the Drawings. Refer to Section 02318 – Earthwork for Structures.
 5. Installation of the large woody material members for the structure to the locations, extents, elevations, lines, and grades indicated on the Drawings and as described in the Specifications. Installation includes:
 - a) Cutting large woody material members, as necessary, to the dimensions indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - b) Placing large woody material members in the locations and positions and to the dimensions and elevations indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - c) Connect members as indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Connections require wire rope, wire rope clips, and staples.

6. The Contractor shall coordinate Work during the construction of the structure to allow for installation of plantings, by Others.
 7. Backfill of the Structure to the elevations, lines, and grades indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Backfill material as specified.
 8. Placement of logging slash and small woody debris within the structures as indicated on the Drawings and as described in the Specifications, herein.
- B. ELJ Type Ac structure: Furnish all materials, equipment, and labor necessary for the construction of one (1) structure as indicated on the Drawings and as described in the Specifications. Work includes:
1. Working along the right bank of the side channel (facing downstream). Refer to Section 02240 – Diversion and Care of Water.
 2. Clearing and grubbing and stripping areas to be excavated as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Work requiring clearing and grubbing and stripping is covered under Site Preparation. Refer to Section 02232 – Clearing and Grubbing and Section 02236 – Stripping.
 3. Excavation to install the bottom of the structure to the design elevation as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Refer to Section 02260 – Excavation Support and Protection and Section 02318 – Earthwork for Structures.
 4. Excavation of a depression around the structure, as indicated in the Drawings. Refer to Section 02318 – Earthwork for Structures.
 5. Installation of the large woody material members to the locations, extents, elevations, lines, and grades indicated on the Drawings and as described in the Specifications. Installation includes:
 - a) Cutting large woody material members, as necessary, to the dimensions indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - b) Placing large woody material members in the locations and positions and to the dimensions and elevations indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - c) Connect members as indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Connections require wire rope, wire rope clips, and staples.

6. The Contractor shall coordinate Work during the construction of the structure to allow for installation of plantings by others.
 7. Backfill of the structure to the elevations, lines, and grades indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Backfill material as specified.
 8. Placement of logging slash and small woody debris within the structures as indicated on the Drawings and as described in the Specifications, herein.
- C. ELJ Type As structures: Furnish all materials, equipment, and labor necessary for the construction of three (3) structures as indicated on the Drawings and as described in the Specifications. Work includes:
1. Working along the left bank of the side channel (facing downstream). Refer to Section 02240 – Diversion and Care of Water.
 2. Clearing and grubbing and stripping areas to be excavated as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Work requiring clearing and grubbing and stripping is covered under Site Preparation. Refer to Section 02232 – Clearing and Grubbing and Section 02236 – Stripping.
 3. Excavation to install the bottom of the structure to the design elevation as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Refer to Section 02260 – Excavation Support and Protection and Section 02318 – Earthwork for Structures.
 4. Excavation of a depression around the structures, as indicated in the Drawings. Refer to Section 02318 – Earthwork for Structures.
 5. Installation of the large woody material members to the locations, extents, elevations, lines, and grades indicated on the Drawings and as described in the Specifications. Installation includes:
 - a) Cutting large woody material members, as necessary, to the dimensions indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - b) Placing large woody material members in the locations and positions and to the dimensions and elevations indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - c) Connect members as indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Connections require wire rope, wire rope clips, and staples.

6. The Contractor shall coordinate Work during the construction of the structure to allow for installation of plantings, by Others.
 7. Backfill of the Structure to the elevations, lines, and grades indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Backfill material as specified.
 8. Placement of logging slash and small woody debris within the structures as indicated on the Drawings and as described in the Specifications, herein.
- D. ELJ Type B structures: Furnish all materials, equipment, and labor necessary for the construction of twelve (12) structures as indicated on the Drawings and as described in the Specifications. Work includes:
1. Working along the left and right bank of the side channel (facing downstream). Refer to Section 02240 – Diversion and Care of Water.
 2. Clearing and grubbing and stripping areas to be excavated as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Work requiring clearing and grubbing and stripping is covered under Site Preparation. Refer to Section 02232 – Clearing and Grubbing and Section 02236 – Stripping.
 3. Excavation to install the bottom of each structure to the design elevation as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Refer to Section 02260 – Excavation Support and Protection and Section 02318 – Earthwork for Structures.
 4. Excavation of a depression around each structure, as indicated in the Drawings. Refer to Section 02318 – Earthwork for Structures.
 5. Installation of the large woody material members for each structure to the locations, extents, elevations, lines, and grades indicated on the Drawings and as described in the Specifications. Installation includes:
 - a) Cutting large woody material members, as necessary, to the dimensions indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - b) Placing large woody material members in the locations and positions and to the dimensions and elevations indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - c) Connect members as indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Connections require wire rope, wire rope clips, and staples.

6. Backfill of each structure to the elevations, lines, and grades indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Backfill material as specified.
 7. The Contractor shall coordinate Work during the construction of the structures to allow for installation of plantings by others.
 8. Placement of logging slash and small woody debris within the structures as indicated on the Drawings and as described in the Specifications, herein.
- E. ELJ Type BD structure: Furnish all materials, equipment, and labor necessary for the construction of three (3) structures as indicated on the Drawings and as described in the Specifications. Work includes:
1. Working along the right bank of the main channel (facing downstream). Refer to Section 02240 – Diversion and Care of Water.
 2. Clearing and grubbing and stripping areas to be excavated as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Work requiring clearing and grubbing and stripping is covered under Site Preparation. Refer to Section 02232 – Clearing and Grubbing and Section 02236 – Stripping.
 3. Excavation to install the bottom of the structure to the design elevation as indicated on the Drawings and described in the Specifications, or as directed by the Contracting Officer. Refer to Section 02260 – Excavation Support and Protection and Section 02318 – Earthwork for Structures.
 4. Excavation of a depression around the structure, as indicated in the Drawings. Refer to Section 02318 – Earthwork for Structures.
 5. Installation of the large woody material members for the structure to the locations, extents, elevations, lines, and grades indicated on the Drawings and as described in the Specifications. Installation includes:
 - a) Cutting large woody material members, as necessary, to the dimensions indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - b) Placing large woody material members in the locations and positions and to the dimensions and elevations indicated on the Drawings and as described in the Specifications, or as directed by the Engineer.
 - c) Connect members as indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Connections require wire rope, wire rope clips, and staples.

6. Installation of fence posts and hardware to anchor bank stabilization logs.
7. The Contractor shall coordinate Work during the construction of the structures to allow for installation of plantings by others.
8. Backfill of the structure to the elevations, lines, and grades indicated on the Drawings and as described in the Specifications, or as directed by the Engineer. Backfill material as specified.
9. Placement of a temporary erosion control blanket along the bank adjacent to the structures.
10. Placement of logging slash and small woody debris within the structures as indicated on the Drawings and as described in the Specifications, herein.

1.03 PAYMENT

- A. Include in the per each prices in the Schedule, for Installation of ELJ Type A Structure, ELJ Type Ac Structure, ELJ Type As Structures, ELJ Type B Structures, and ELJ Type BD Structures, all Work indicated on the Drawings and described in the Specifications herein with the following exceptions:
 1. Clearing and grubbing and stripping are covered under Site Preparation.
 2. Restoration of areas disturbed by construction is covered under Site Restoration.

1.04 REFERENCES

- A. Section 01725 – Protection of Existing Installations
- B. Section 01740 – Cleaning
- C. Section 01781 – Project Closeout
- D. Section 02232 – Clearing and Grubbing
- E. Section 02236 – Stripping
- F. Section 02240 – Diversion and Care of Water
- G. Section 02260 – Excavation Support and Protection
- H. Section 02318 – Earthwork for Structures
- I. Section 02370 – Erosion Control Fabrics
- J. Section 02930 – Seeding

- K. Section 02947 – Large Woody Material
- L. Section 02948 – Wood Structure Connections

1.05 SUBMITTALS

- A. Submit the following in accordance with Section 01330 – Submittals:
 - 1. See RSN 02952-1, in Section 02952.

PART 2 – PRODUCTS

2.01 LARGE WOODY MATERIALS

- A. Shall meet the requirements indicated in the Drawings and as described in the Specifications; refer to Section 02947 – Large Woody Material.

2.02 WIRE ROPE AND HARDWARE

- A. ELJ Type B Structures and ELJ Type BD Structures:
 - 1. Wire rope shall be 3/8-inch diameter; refer to Section 02948 – Wood Structure Connections.
 - 2. Wire rope clips shall be 3/8-inch diameter; refer to Section 02948 – Wood Structure Connections.
 - 3. Staples shall be 3/8x4” or longer; refer to Section 02948 – Wood Structure Connections.
- B. ELJ Type As Structures, ELJ Type A Structure, and ELJ Type Ac Structure:
 - 1. Wire rope shall be 5/8-inch diameter; refer to Section 02948 – Wood Structure Connections.
 - 2. Wire rope clips shall be 5/8-inch diameter; refer to Section 02948 – Wood Structure Connections.
 - 3. Staples shall be 1/2x6” or longer; refer to Section 02948 – Wood Structure Connections.

2.03 LOGGING SLASH AND SMALL WOODY DEBRIS

- A. Logging slash and small woody debris shall be sourced and furnished from locally available materials meeting the following requirements:
 - 1. Cut limbs, small trees, and tops with branches that are generally long, slender, and branched.

2. Material ranging in diameter between 1 inch and 12 inches.
 3. Material ranging in length between 2 feet and 12 feet.
- B. Waste woody material generated during the construction may be used. Waste woody material generated during the construction may include, but is not limited to:
1. Field-cutting of individual large woody materials, as required for the proper fit in accordance with the Drawings and the Specifications, herein.
 2. Surplus materials or rejected materials that do not meet the dimensions indicated in the Drawings and described in the Specifications, herein. Surplus materials must be approved by the Contracting Officer for placement as logging slash and small woody debris.
- C. The Contracting Officer shall approve the logging slash and small woody debris for placement within the structures described, herein
- D. For sources of logging slash and small woody debris proposed for use by the Contractor, the Contracting Officer must be allowed permission to access the source site to evaluate the materials, prior to the Contractor furnishing the material.

2.04 TEMPORARY EROSION CONTROL BLANKET

- A. Shall be used to stabilize the banks adjacent to the ELJ Type BD structures.
- B. Refer to Section 02370 – Erosion Control Fabrics

2.05 POSTS

- A. Posts shall be used to stabilize bank logs included in the ELJ Type BD structures.
- B. Posts shall be:
 1. Untreated, dimensional, rough cut, or round timber material meeting the dimensions shown on the Drawings.
 2. Cut at one end to a point to enable driving the post into the ground.

2.06 SPIKES

- A. Spikes shall be used to pin bank logs to the installed posts included in the ELJ Type BD structures.
- B. Spikes shall be:
 1. Hot dipped galvanized steel.

2. 12 inches long, unless otherwise indicated in the Drawings or otherwise approved by the Contracting Officer.
3. Smooth shank or spiral shank.

PART 3 – EXECUTION

3.01 SITE PREPARATION

- A. The Contractor is responsible for surveying and staking the location of the ELJ Structures in accordance with the Drawings and Section 01721 – Surveying.
- B. Implement diversion and care of water measures, as necessary, to remain in compliance with construction permit conditions and requirements. Measures may include, though are not limited to: surface water diversion and dewatering for excavation. Refer to Section 02240 – Diversion and Care of Water.
- C. Clear and grub and strip the structure excavation footprint as necessary. Vegetation removal shall be minimized to the extent practical; removal of trees larger than 3-inches in diameter at breast height shall require approval from the Contracting Officer. Refer to Section 02232 – Clearing and Grubbing and Section 02236 – Stripping.

3.02 EXCAVATION FOR ELJ STRUCTURES

- A. General – All Structures:
 1. Excavate the structure footprint as indicated in the Drawings to the bottom design elevation. Native materials excavated shall be stockpiled separate from stripped topsoil. Refer to Section 02318 – Earthwork for Structures.
 2. Contractor is responsible for dewatering the excavation; refer to Section 02240 – Diversion and Care of Water.
 3. Contractor is responsible for excavation support and protection; refer to Section 02260 – Excavation Support and Protection.
 4. Native materials excavated shall be used to backfill the structure, unless otherwise indicated in the Drawings or described in the Specifications, or as directed by the Contracting Officer.
- B. ELJ Type A Structure, ELJ Type Ac Structure, and ELJ Type As Structures:
 1. Protect the bank(s) from disturbance during excavation as indicated in the Drawings.
 2. Excavation to the design elevation for the bottom of the structure as indicated in the Drawings, or as directed by the Engineer.

3. A large depression shall be excavated from existing grade to the elevations, grades, and lines as indicated in the Drawings.

C. ELJ Type B Structures:

1. Excavation to the design elevation for the bottom of each structure as indicated in the Drawings, or as directed by the Engineer.
2. Protect the bank(s) from disturbance during excavation as indicated in the Drawings.
3. Excavation is required to place large woody material members into the bank as indicated in the Drawings.
4. A depression shall be excavated from existing grade along the waterward end of each structure; the depression shall be excavated to the elevations, grades, and lines as indicated in the Drawings.

D. ELJ Type BD Structures:

1. Excavation to the design elevation for the bottom of each structure as indicated in the Drawings, or as directed by the Engineer.

3.03 INSTALLATION OF ELJ STRUCTURES

A. General – All Structures:

1. Dewater the excavations for structures. Refer to Section 02240 – Diversion and Care of Water.
2. Contractor is responsible for installing the ELJ structures to the location, elevations, and extents indicated in the Drawings; the location of the structures may vary from the Drawings under the direction of the Engineer. Contractor shall conduct surveying as necessary, and to the satisfaction of the Contracting Officer, to ensure the ELJ structures meet the design elevations; refer to Section 01721 – Surveying.
3. The Contractor shall dry-fit place each large woody material member prior to drilling the member in preparation for connections.
4. Place the individual members of large woody material comprising the bottom layer of the structures to the bottom design elevations indicated in the Drawings. Variations in diameter of the large woody material members may require localized adjustments to the bottom grade.
5. Individual members of large woody material may require field cutting to maintain the structure alignment and design elevations. Field cutting of

rootwad logs shall be allowed only as directed by or approved by the Engineer.

6. Once the bottom layer members are in-place and in proper alignment, drill the members and install lengths of wire rope adequately sized for approved connections. Refer to Section 02948 – Wood Structure Connections.
7. Continue dry-fit placement of subsequent layers of large woody material. Drill members as necessary and install the ends of wire rope to achieve an approved connection.
8. The natural variations in large woody material may cause members to roll, pitch, and/or yaw when placed atop another member. Dry-fit placement of members prior to preparing the connection shall be performed to assure a snug and stable fit.
9. Once all members are installed for an intended connection and wire rope has been threaded through all members, complete the connection as indicated in the Drawings and as described in the Specifications; refer to Section 02948 – Wood Structure Connections.

B. ELJ Type A Structure, ELJ Type Ac Structure, and ELJ Type As Structures:

1. Place the bottom members of the structures at the design elevations indicated in the Drawings.
2. Drill and install wire rope wrap connection at each corner of the bottom of each structure as indicated in the Drawings and described in the Specifications. Wire rope shall be sufficiently long to complete an approved continuous connection at the top of the structure, as indicated in the Drawings. Wire rope connections shall be approved by the Engineer. Refer to Section 02948 – Wood Structure Connections.
3. Dry-fit place proceeding layer members, maintaining the spacing indicated in the Drawings.
4. Drill and thread wire rope through members at the corners of each structure, overlapping the underlying layer members.
5. Continue to dry-fit, then drill and thread wire rope through subsequent layer members.
6. Complete the placement of members to meet the design elevation of each structure or as otherwise approved by the Engineer.
7. Using mechanical means, remove slack wire rope from the installed members while applying pressure to the top of the structures.

8. Complete the wire rope connections on the top corners of each structure while maintaining a taut wire rope. Secure the connection as indicated in the Drawings and described in the Specifications. Engineer shall approve the connection.
9. Place logging slash and small woody debris within the interstitial spaces at the front end of the structure (area not backfilled with native material) and along the front face and sides of the ELJ as indicated on the Drawings.
10. Backfill each structure; refer to Item 3.04, below.

C. ELJ Type B Structures:

1. Place the bottom members of the structures at the design elevations indicated in the Drawings.
2. Drill and install wire rope wrap connections at each member along the bottom of each structure as indicated in the Drawings and described in the Specifications. Wire rope shall be sufficiently long to complete an approved continuous connection, as indicated in the Drawings. Wire rope connections shall be approved by the Engineer. Refer to Section 02948 – Wood Structure Connections.
3. Dry-fit place proceeding layer members, maintaining the spacing indicated in the Drawings.
4. Drill and thread wire rope through members to be connected for each structure.
5. Continue to dry-fit, then drill and thread wire rope through subsequent layer members.
6. Complete the placement of members to meet the design elevation of each layer or as otherwise approved by the Engineer.
7. Using mechanical means, remove slack wire rope from the installed members while applying pressure to the top of the structures.
8. Complete the wire rope connections required for each structure while maintaining a taut wire rope. Secure the connection as indicated in the Drawings and described in the Specifications. Engineer shall approve the connection.
9. Place logging slash and small woody debris within the interstitial spaces at the front end of the structure and along the front face and sides of the ELJ as indicated on the Drawings.
10. Backfill each structure; refer to Item 3.04, below.

D. ELJ Type BD Structures:

1. Place the bottom members of the structures at the design elevations indicated in the Drawings.
2. Drill and install wire rope wrap connections at each member along the bottom of each structure as indicated in the Drawings and described in the Specifications. Wire rope shall be sufficiently long to complete an approved continuous connection, as indicated in the Drawings. Wire rope connections shall be approved by the Engineer. Refer to Section 02948 – Wood Structure Connections.
3. Dry-fit place proceeding layer members, maintaining the spacing indicated in the Drawings.
4. Continue to dry-fit, then drill and thread wire rope through subsequent layer members.
5. Complete the placement of members to meet the design elevation of each layer or as otherwise approved by the Engineer.
6. Using mechanical means, remove slack wire rope from the installed members while applying pressure to the top of the structures.
7. Complete the wire rope connections required for each structure while maintaining a taut wire rope. Secure the connection as indicated in the Drawings and described in the Specifications. Engineer shall approve the connection.
8. Backfill each structure; refer to Item 3.04, below.
9. Place logging slash and small woody debris within the interstitial spaces along the upstream end of the ELJ and other locations as indicated on the Drawings.

3.04 BACKFILL OF THE ELJ STRUCTURES

A. General – All Structures:

1. Backfill the structures in accordance with Section 02318 – Earthwork for Structures.
2. Backfill of the structures may occur in sequences, as the structure is completed in layers, unless otherwise described in the Specifications, and as approved by the Contracting Officer.

3. The Contractor shall construct and backfill the structure (where applicable) to the layers where planting of the structure, by Others, is required. Refer to Part 3.05, below.
 4. Placement of backfill on top of the installed plantings shall be done with care to avoid damage of the installed plantings.
 - a) The Contracting Officer shall approve the placement of backfill on top of the installed plantings.
 - b) Placement of backfill on top of the installed plantings shall be limited to less than 1 foot drop height.
 - c) Placement of backfill may be done by placing backfill between adjacent installed plantings and spreading the backfill over the installed plantings, so long as spreading the backfill does not alter the position of the installed plantings.
 - d) Any installed plantings, whose positions have been altered during placement of backfill more than 6 inches horizontally or that may adversely affect the success of the installed planting, must be re-positioned to the designed planting spacing at the request of the Contracting Officer.
 - e) Any installed planting that is damaged during backfill, and is the result of careless placement of backfill by the Contractor, shall be re-installed; the costs of re-installation of plantings shall be borne by the Contractor, at no additional cost to the Contracting Agency.
 5. Backfill structure with suitable material to the lines, elevations, and grades as indicated in the Drawings and described in the Specifications.
- B. ELJ Type A Structure, ELJ Type Ac Structure, and ELJ Type As Structures:
1. Contractor shall coordinate Work during backfilling of the structures, as necessary to allow for planting of the structure by others.
 2. Backfill the structures with suitable native materials from the excavation for the structure, unless otherwise directed by the Contracting Officer.
 3. Backfill to match the grades indicated in the Drawings.
 4. Remaining excavated native materials shall be placed in the lee of the structures and other locations as indicated in the Drawings, unless otherwise directed by the Contracting Officer.
- C. ELJ Type B Structures:

1. Backfill the structures with suitable native materials as indicated on the Drawings, including materials from the excavation for the structure, materials sourced from other elements of Work, or as otherwise directed by the Contracting Officer.
2. Backfill to match the grades indicated in the Drawings.
3. Remaining excavated native materials shall be placed in the lee of the structures and other locations as indicated in the Drawings, unless otherwise directed by the Contracting Officer.

D. ELJ Type BD Structures:

1. Contractor shall coordinate Work during backfilling of the structures, as necessary to allow for planting of the structure by others.
2. Backfill the lower portion of the structure with large rock as shown on the Drawings, unless otherwise approved by the Contracting Officer.
 - a) Large rock shall be sourced from on-site levee removals.
3. Backfill the upper portion of the structure residual levee material, native cobble, gravel and sand materials as shown on the Contract Drawings, unless otherwise approved by the Contracting Officer.
4. Backfill to match the grades indicated in the Drawings.
5. Large rock shall not be placed outside the structure unless otherwise approved by the Contracting Officer.
6. Remaining excavated native materials shall be placed in the lee of the structures and/or other locations as indicated in the Drawings, unless otherwise directed by the Contracting Officer.

3.05 PLANTING OF THE ELJ STRUCTURES (BY OTHERS)

A. General – All Structures:

1. The Contractor shall coordinate the construction of the various ELJ structures, where applicable and as necessary to allow for planting of the structures by others.
2. The Contractor shall continue Work on the structure so long as it does not interrupt the planting installation work crew; alternatively, the Contractor may work on other structures while planting installation occurs on others.

3. Once the plantings by others are completed, the Contractor shall continue to construct and backfill the structures, as shown on the Drawings and as indicated in the Specifications herein.
4. The Contracting Officer shall approve the installed plantings prior to backfill of the layers containing the plantings.

3.06 INSTALLATION OF BANK LOGS FOR ELJ TYPE BD STRUCTURES

- A. Place log poles to match the lines, elevations, and extent indicated on the Drawings.
- B. Drive the posts at the end of the log poles, opposite the structure; the posts shall be driven with the pointed end down.
 1. Posts shall be installed plumb.
 2. Posts shall be driven until the top of the post matches the top of the bank log or until refusal, provided the post has been driven a depth of at least four feet below the bottom of the bank log.
 3. If post fails during installation, another post shall be installed to satisfactory completion.
 - a) Post failures include, but may not be limited to breakage, splitting, or post has reached refusal before a depth of at least 4 feet below the bottom of the bank log.
 - b) Failed posts shall be removed or left in-place and cutoff at-grade.
- C. Connect installed posts to bank logs:
 1. A single spike shall be driven through the post into the bank log; the head of the spike shall be flush with the face of the post.
 2. Posts shall be pre-drilled to minimize the potential for splitting the posts while the spikes are driven; drill diameter shall be smaller than the diameter of the spike shank.

3.07 INSTALLATION OF TEMPORARY EROSION CONTROL BLANKET

- A. Temporary erosion control blanket shall be installed along the bank adjacent to the ELJ Type BD structures, as indicated on the Drawings and as described in the Specifications herein.
- B. Installation shall follow the details shown in the Drawings, as recommended by the fabric manufacturer, and as approved by the Contracting Officer.

3.08 CLEANUP

- A. Contractor shall collect and properly dispose of remaining materials, debris, and rubbish resulting from construction of the ELJ structures. Refer to Section 01740 – Cleaning.

3.09 COMPLETION

- A. Contractor shall collect finish elevations for the structures and note changes to the construction of the structures in accordance with preparation of As-built documents. Refer to Section 01781 – Project Closeout.

END OF SECTION

DIVISIONS 3 THROUGH 16 – NOT USED

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DRAWINGS

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