

TECHNICAL SPECIFICATIONS AND DRAWINGS
FOR
MONUMENT SOIL AND WATER CONSERVATION DISTRICT
COTTONWOOD CREEK COLE-ENGLE - FISH PASSAGE IMPROVEMENTS
2022



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RIVER RESTORATION

PART 1 - GENERAL

1.1 Scope

These Specifications cover river restoration improvements, including earthwork, streambed simulation material, seeding, planting, etc. Work shall include furnishing all equipment, materials, labor, etc., as required to complete the required improvements as shown on the Drawings and specified herein. Items specified in this Technical Specification are intended to be broad in scope and may not always apply to all items of Work to be constructed. All applicable sections herein, as determined by the Engineer, shall control the Work outlined in the Contract Documents.

1.2 Earthwork

A. Earthwork Quantities

The approximate quantities, shown on the Drawings, of material required for the embankment construction and the quantity available from excavation have been made based on the ground elevations shown on the Drawings. Estimated quantities may vary because the actual ground surface elevations shown may vary and the shrinkage factor of the soil may vary. The Work shall be performed on a lump sum, all required basis. No field measurements of quantities will be made. The Contractor shall make their own determination of the actual quantity of earthwork required to complete the Work as shown on the Drawings.

B. Clearing and Grubbing

Clearing and grubbing shall include the removal and disposal of any unwanted items, such as concrete, culverts, fencing material, boards, miscellaneous metal, etc., and organic material such as trees, tree stumps, brush, hedges, vegetation, roots, rubbish, sod, and topsoil, and any other obstacles or materials in the construction area which would prevent completing the Project, and which are unsuitable for site work construction.

C. Excavation

Excavation shall consist of the excavation, haul, placement, and/or satisfactory disposal of all materials taken from within the work area for the construction of embankments, subgrade, main channels, structures, and incidental work to the lines, grades, and cross sections shown on the Drawings.

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D. Balancing Earthwork

It shall be the Contractor's responsibility to make their own determination of quantities required to complete the Work. Any imbalance in the actual earthwork which may occur shall be adjusted by either of the following methods. When sufficient material is not available from the excavation areas to construct the embankments, the Contractor shall arrange for and obtain borrow material to complete the Work, unless borrow areas are designated on the Drawings. When excess or unsuitable material exists beyond that required to complete the embankments, the Contractor shall dispose of the excess material at a location selected by the Contractor outside of the Project boundaries, unless a waste site has been designated on the Drawings. Balancing the earthwork shall be incidental to the Work performed.

1.3 Temporary Access Roads and Paths

The Contractor shall use existing access roads and paths whenever reasonable and shall minimize the number and length of temporary access roads and paths through riparian areas and floodplains in order to minimize soil disturbance and compaction and impacts to vegetation.

After consulting with the Engineer, the Contractor shall minimize the removal of riparian vegetation during construction of the temporary access roads or paths. When temporary removal of vegetation is necessary, the Contractor shall cut the vegetation at ground level as opposed to grubbing the Site.

All temporary access roads and paths shall be obliterated upon Project completion and the soil shall be stabilized and revegetated, at a minimum, to pre-Project conditions. Temporary roads and paths in wet areas or areas prone to flooding shall be obliterated by the Contractor by the end of the in-water work window.

1.4 Staging, Storage, and Stockpile Areas

Staging areas used for construction equipment storage; vehicle storage, fueling, and servicing; and hazardous materials storage shall be a minimum 150 feet from any natural water body or wetland in staging areas identified on the Drawings. Equipment shall be washed prior to entering the regulated work area to minimize any adverse effects to waterways and aquatic species. During non-work hours, equipment and vehicles shall be stored in the designated staging areas.

Natural materials used for habitat restoration, such as large wood, gravel, and boulders, may be staged within the 100-year floodplain at identified locations shown on the Drawings. Any

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material not used for habitat restoration and not native to the floodplain shall be removed to a location outside of the 100-year floodplain.

1.5 Work Area Isolation

The Contractor shall perform all Work for this Project located below ordinary high water within the designated in-stream work window for this Project. The Contractor shall isolate the work area from flow in the river by use of sand bags, ecology blocks, water bladder, or other Engineer-approved methodology. The Contractor is responsible for providing all equipment, materials, labor, etc., as required to provide bypass flow as shown on the Drawings and as required for construction. Any pump installed where fish may be present shall be equipped with a fish screen with openings not to exceed 3/32 inch. The Contractor shall account for this work as it will be required for the construction of the Project.

Contaminated or sediment-laden water, or water contained within an isolation barrier shall not be discharged directly into any Waters of the State until it has been satisfactorily treated (e.g., by bioswale, filter, settlement pond, pumping to a vegetated upland location, bio-bag, or dirtbag). The Contractor shall monitor turbidity and maintain water quality standards as outlined in the environmental permits. If a sediment plume is observed, work shall stop and best management practices shall be adjusted.

1.6 Permits

The Owner has obtained clearances from the Oregon Department of State Lands (DSL)/U.S. Army Corps of Engineers (USACE); the Contractor shall perform all Work in accordance with these permit requirements.

1.7 Erosion Control

Erosion control measures shall be incorporated as described in the environmental permits obtained for the Project Site. Sediment barriers shall be installed to prevent spoils or sediment-laden water from entering any waterbody. Erosion control measures, such as silt fencing or wattles, shall be used as needed to ensure minimal sediment is released from the work area, as required. The Contractor shall be responsible for obtaining a National Pollutant Discharge Elimination System (NPDES) 1200-C Permit for erosion and sedimentation control, if a NPDES Permit is required. A copy of the NPDES Permit shall be provided to the Engineer and Owner Prior to the start of construction.

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1.8 Mobilization/Demobilization

- A. Mobilization shall consist of preparatory work and operations including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the Project Site for establishment facilities necessary for Work on the Project, for premiums on bond and insurance for the Project, special fees, and for other work and operations which the Contractor must perform or costs the Contractor must incur before beginning Work on the Project.
- B. Demobilization shall consist of work and operations including, but not limited to, those necessary for the movement of personnel, equipment, and incidentals from the Project Site, as well Project closeout, etc.

1.9 Construction Staking

- A. General
 - 1. The Contractor shall carefully preserve benchmarks, reference points, and stakes set by others. In the case of willful or careless destruction by the Contractor, the Contractor shall be charged with the resulting expense of replacement and shall be responsible for any mistakes or liability that may be caused by the loss or disturbance.
 - 2. Any additional staking requested by the Contractor, replacement of stakes or hubs lost or disturbed by the Contractor or due to vandalism or other reasons, or re-staking required because of improper construction will be done by the Engineer at the Contractor's expense or by a licensed professional land surveyor hired by the Contractor. The Engineer requires two business days' notice (excluding weekends and holidays) prior to the time the staking is required. The Contractor shall secure the work area and protect all construction staking.
 - 3. The Engineer will provide the following construction staking. All other staking required to construct the Project shall be provided by the Contractor.
 - a. Grading of Channel

Grade cut-fill stakes with reference point (RP) hubs, at a predetermined offset to centerline, on the channel will be provided at 50-foot stations for centerline.

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b. Grade Control Structures

The location of the grade control structures will be identified in the field by the Engineer.

1.10 Existing Survey Monumentation

- A. The Contractor shall be responsible for the protection and perpetuation of existing land survey, property, or construction monuments shown on the Drawings, which are marked or are clearly visible on the ground.
- B. The Contractor shall give the Engineer a minimum of 48 hours' notice prior to working in the vicinity of any such monument that the Contractor may disturb so the Owner can arrange for such monuments to be referenced. When proper notice is provided, the Owner shall have any disturbed monuments restored following construction. Should the Contractor fail to provide adequate notice to the Engineer, the Contractor shall be responsible for the expense of having the disturbed monument restored by a qualified surveyor.

1.11 Progress of the Work - Cleanup

The Contractor shall arrange their work schedule such that all phases of Work, once started, shall be diligently pursued until complete. The intent is that the work area shall not be disturbed for undue periods of time. Work shall not be left uncompleted. If the Engineer determines that Work is not being diligently completed, the Engineer shall request the Contractor to complete said Work.

Cleaning up shall be a continuing process from the start of the Work to final acceptance of the Project. The Contractor shall, at all times, at their own expense, and without further order, keep property on which Work is in progress free from accumulations of waste material or rubbish caused by employees or by the Work. At all times during the construction period, the Contractor shall maintain structure sites, rights-of-way, easements, adjacent property, and the surfaces of streets and roads on which Work is being done in a safe condition for the Contractor's workers and the public.

Accumulations of waste materials that might constitute a fire hazard will not be permitted. Spillage from the Contractor's hauling vehicles on traveled public or private roads shall be promptly cleaned up. The Contractor shall take appropriate action to control dust caused by their operations. This shall include, but not be limited to, watering of exposed areas, cleaning of roadways, etc. This is considered a normal part of the construction Project.

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Upon completion of the Work, the Contractor shall, at their own expense, remove all temporary structures, rubbish, waste material, equipment, and supplies resulting from their operations. The Contractor shall leave such lands in a neat and orderly condition that is at minimum as good as the condition in which they found them prior to their operations. Should the Contractor fail to provide said cleanup upon 24-hour written notice, the Owner shall have the right to perform such work at the expense of the Contractor and withhold the cost from the Contractor's payments.

The Contractor shall replace or restore, equivalent to their original condition, all surfaces or existing facilities disturbed by their work, whether within or outside of the work areas. Restoration work will include, but is not limited to, roadways, utilities, structures, landscaping, etc.

PART 2 - MATERIALS

2.1 Earthwork

A. Backfill Material

Suitable backfill material, unless otherwise shown on the Drawings, shall be the material excavated at the Site or crushed rock as approved by the Engineer. Backfill material shall be free from sod, roots, trash, or other debris, etc., and shall be at a proper moisture content to achieve compaction.

B. Borrow Material

Borrow material shall be equal to or better than the on-site embankment material.

2.2 Streambed Simulation Material

Material for streambed simulation material shall be a mixture of soil, gravel, cobbles, and boulders to simulate the natural streambed at the Project Site. The gravel, cobbles, and boulders shall be hard, durable, round river rock (preferred) or unweathered, hard, durable, basalt rock (allowed). Minimum specific gravity of the rock material is 2.5. Streambed simulation material to be used shall be approved by the Engineer prior to installation.

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Gradation Requirements for Streambed Simulation Material, Inches or Sieve Size

Bed Class	100 Percent Passing	85 Percent Passing	50 Percent Passing	16 Percent Passing	10 Percent Passing
2	5	2	3/4	1/4	No. 10
4	10	4	1-3/4	1/2	No. 10
6	14	6	2-1/2	3/4	No. 10
8	22	8	3	1	No. 10
10	24	10	4	1	No. 10
12	30	12	5	1-1/2	No. 10
14	36	14	6	1-3/4	No. 10
16	42	16	7	2	No. 10
20	48	20	8	3	No. 10
24	60	24	10	3	No. 10
36	72	36	14	4	No. 10
48	96	48	18	6	No. 10

The streambed simulation material shall be a mixture of the disturbed on-site natural streambed material and imported rock to develop an overall mixture meeting the required gradation requirements.

2.3 Rock

Rock material for the construction of grade control structures, boulder matrix, and large-scale roughness boulders shall be unweathered, hard, durable, basalt rock with an apparent specific gravity of 2.5 minimum. The rock shall be approved by the Engineer prior to installation. Each rock shall be angular in shape with neither the width nor thickness less than 1/3 the length. Rounded rock will not be accepted. Rock material shall be free of overburden, spoil, shale, and organic material. Non-durable rock, shale, or rock with shale seams or fractures is not acceptable. Minimum rock sizes shown on the Drawings may include up to 20 percent smaller rock to help keep the structure together but, in no case, shall rock smaller than 24 inches be allowed.

2.4 Gravel

Gravel shall be durable, well-graded, angular bank-run rock of the size specified on the Drawings.

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2.5 Plantings (By Others)

Plantings shall be of the type called for on the Drawings, and shall be provided from a nursery whose specific business is the development of woody plantings.

2.6 Seeding of Disturbed Areas (By Others)

The following table outlines the seed mixture required for seeding all disturbed areas outside agricultural fields.

Botanical Name (Common Name)	Seeding Rate (Pounds of Pure Live Seed per Acre)
<i>Poa palustris</i> (fowl bluegrass)	2
<i>Leymus cinereus</i> (basin wildrye)	4
<i>Juncus balticus</i> (Baltic rush)	3
<i>Festuca idahoensis</i> (Idaho fescue)	3
<i>Poa secunda</i> (Sandberg bluegrass)	3

2.7 Steel Plates

All steel plates shall be carbon steel conforming to ASTM A36.

PART 3 - EXECUTION

3.1 Construction Sequencing

The Contractor shall sequence construction activities in such a manner as to provide continuous flow down the channel. All construction shall conform to DSL/USACE permit requirements, appropriate laws and regulations, and the Drawings. Care shall be taken to control sediment and protect fish and vegetation. The Contractor shall prepare a work plan showing methods of sequencing construction for review and approval by the Engineer.

3.2 Demolition

Debris throughout the Site shall be removed as it is encountered during construction activities as shown on the Drawings and as required for construction. The Contractor shall dispose of all demolition material in accordance with prevailing laws and at the Contractor's expense.

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3.3 Earthwork

A. Clearing

1. All fencing, vegetation, rubbish, and other debris in areas shown on the Drawings shall be removed and disposed of by the Contractor in conformance with the requirements of local authorities controlling air pollution and solid waste disposal. Cleared trees, brush, and roots shall be salvaged and used as racking or slash material or scattered on the floodplain as directed by the Engineer.
2. When topsoil at the Site is to be saved and reused, it shall be stripped and stored clear of the construction area. Take reasonable care to prevent the topsoil from becoming mixed with subsoil and other debris, etc.
3. The Contractor shall exercise care to minimize disturbing the natural ground or vegetation outside the limits of the construction area.

B. Excavation

Prior to any excavation, the area to be excavated shall be cleared and grubbed.

3.4 Streambed Simulation Material

Streambed simulation material shall be placed on a prepared surface to form a well-graded, low permeability mass, similar in appearance and texture to the natural streambed. The Contractor shall place streambed simulation material as described on the Drawings.

3.5 Grade Control Structures

Grade control structures shall be constructed as shown on the Drawings and as specified herein. Appropriate excavation for placement of footer rocks shall be made. The depth of the excavation shall be as shown on the Drawings. Gravel shall then be placed on the upstream side of the excavation. Footer rocks shall then be placed next to the gravel, and gravel shall be placed on the upstream side of the footer rock. Vane rock shall be placed above the footer rock and keyed into place on the upstream side of the rock, which would require the vane rock to be lifted slightly in order to wash over and downstream of the footer rock. This process of construction and keying rocks together above one another shall be repeated as needed to obtain full height of the structure. The footer rocks and vane rocks shall be extended into the channel banks a minimum of 6 feet. General embankment shall then be placed on both sides of the vanes and compacted in place to help hold the vane in place. The Contractor must ensure the general embankment is at optimum moisture content for proper compaction.

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Sill rocks shall be placed along the top of the bank as shown on the Drawings. The sill rocks shall be placed tightly together and buried so the tops of the rocks are just above the ground surface.

The Contractor shall construct the first grade control structure in the presence of, and under the direction of, the Engineer. The Engineer shall be given 48 hours' notice prior to construction of the grade control structure. This is required to assure proper construction of the structures.

3.6 Boulder Matrix

Boulder matrix shall be placed to its full course thickness in one operation by methods that do not cause segregation of matrix or displace the underlying material. All sizes of material shall be placed in their proper proportion with some hand placing, or rearranging of individual stones by mechanical equipment, or other approved means.

3.7 Planting of Woody Species (By Others)

Planting spacing shall be as shown on the Drawings. Container plants shall be planted as shown on the Drawings.

3.8 Seeding of Disturbed Areas (By Others)

- A. All areas disturbed by the Contractor's operation shall be seeded once construction is complete and approved by the Engineer.
- B. After the seed has been broadcast over the area, the Contractor shall drag the area with a heavy chain suitable for the Work. The Contractor shall coordinate the seeding with the planting to ensure all seeded areas can be properly dragged.
- C. Seeding shall occur at proper times of the year as approved by the Engineer.

3.9 Dust and Mud Control

The Contractor shall take appropriate action to control dust and mud caused by their operations. This shall include, but not be limited to, watering exposed areas, etc.

3.10 Restoration, Finishing, and Cleanup

The Contractor shall restore or replace all graveled surfaces and other existing facilities equal to their original condition. All surplus material and temporary structures as well as debris shall be removed and the entire Site of Contractor operations shall be left in a neat and clean condition.

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3.11 Welds

Welds shall be a continuous weld around the fish ladder block-off plates.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Basis

See Technical Specifications - "Measurement and Payment" for a description of the basis of measurement and payment for Work performed under this Contract.

4.2 Earthwork Quantities

The intent is for the earthwork to be performed on a lump sum, all required basis. No field measurement of earthwork quantities shall be made. The Contractor shall make their own determination of the actual quantity of earthwork required to complete the Work as specified and as shown on the Drawings.

END OF SECTION

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PART 1 - GENERAL

1.1 Scope

The basis for measurement and payment for all Work performed under this Contract shall be as listed in the "Bid Schedule." Unless the Work to be performed is specifically called out to be measured and paid for in the Bid Schedule, payment for such Work shall be included in other applicable items of the Bid Schedule. There shall be no separate measurement and payment for any such Work not specifically listed in the Bid Schedule.

1.2 Method of Payment

Items listed in the Bid Schedule as lump sum shall be on a lump sum all required basis. No direct measurement will be made for lump sum bid items. Bid items calling for unit prices show estimated quantities of Work to be performed. These quantities, although shown with as much accuracy as possible, are approximate only and are for bidding purposes only. The Owner reserves the right to increase or decrease the amount of these quantities as may be deemed necessary. Payment to the Contractor shall be made on the quantity of Work actually performed by the Contractor.

The summation of all bid items under the Bid Schedule shall equal all Work required by the Drawings and Specifications regardless of whether individual items of Work are described under bid item descriptions or not. Payment shall be made at the contract unit bid or lump sum prices listed in the Bid Schedule. The prices listed therein shall be payment in full for all labor, tools, equipment, materials, etc., which are required to construct respective bid items according to the Contract Documents, including all Work and materials incidental thereto.

Payment for unit bid items and lump sum bid items only partially completed at the end of the monthly pay period shall be based on a percentage of work completed as determined by the Engineer.

1.3 Payment Items

A. Numbering

The numbering of the payment items listed below may not be the same as the numbering for bid items in the Bid Schedule.

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B. Method of Payment

1. Mobilization/Demobilization

Measurement for payment for mobilization/demobilization shall be on a lump sum all required basis. The amount of the bid for mobilization/demobilization shall not exceed 10 percent of the total bid price. Payment shall be made at the lump sum price stated in the Bid Schedule for "Mobilization/Demobilization." Seventy-five percent of the bid amount for mobilization/demobilization will be made on the first payment request and the remaining 25 percent of the bid amount will be paid on the final payment request.

2. Water Control

This is a lump sum all required bid item. There shall be no measurement of the Work for payment purposes. The Work shall include all ecology blocks, sandbags, dams, excavation, fill, fabric, plastic sheeting, bypass pipes, pumps, etc., necessary to isolate the work area, divert flow, dewater the work area, maintain irrigation delivery, and control turbidity. Any costs for pumping water (for irrigation purposes or otherwise) shall be included in this bid item. Payment shall be made at the lump sum price stated in the Bid Schedule for "Water Control."

3. Clearing and Grubbing

Measurement for payment for clearing and grubbing shall be on a lump sum all required basis. There shall be no measurement of the Work for payment purposes. This item shall include removal and disposal of all unwanted items, such as concrete, iron, boards, pipe, fence material, etc., and organic matter, such as trees, roots, brush, etc. Payment shall be made at the lump sum price stated in the Bid Schedule for "Clearing and Grubbing."

4. Fish Ladder Block-off

Measurement for payment for fish ladder block-off shall be on a lump sum all required basis. There shall be no measurement of the Work for payment purposes. This item shall include all metal, measuring, and welding, etc., along with all labor, equipment, etc., required to block off the existing fish ladder as shown on the Drawings. Payment shall be made at the lump sum price stated in the Bid Schedule for "Fish Ladder Block-off."

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5. Streambed Simulation Material, Large-Scale Roughness Boulders, and Boulder Matrix

Measurement for payment for installation of streambed simulation material, large-scale roughness boulders, and boulder matrix shall be on a lump sum all required basis. There shall be no measurement of the Work for payment purposes. These items shall include materials, labor, equipment, etc., necessary to install streambed simulation material, large-scale roughness boulders, and boulder matrix as shown on the Drawings and called for in the Technical Specifications. Payment shall be made at the lump sum price stated in the Bid Schedule for "Streambed Simulation Material," "Large-Scale Roughness Boulders," and "Boulder Matrix."

6. Grade Control Structures

Measurement for payment for grade control structures shall be on a lump sum all required basis for all structures shown on the Drawings. This item shall include all excavation/fill required for proper placement of all structures. Materials such as vane rocks, footer rocks, gravel, etc., shall be included. Payment shall be made at the lump sum price stated in the Bid Schedule for "Grade Control Structures."

END OF SECTION