105 - Control of Material

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105.02 Material Sources.

105.02(a) Government Provided Sources.

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(a) Government-provided sources.

Add the following:

Government-provided sources for this project are identified as follows:

(1) Government-provided mandatory sources.

N/A

(2) Government-provided optional sources.

Some of the materials for use as **riprap, stream simulation rock and boulders** may be obtained from **the quarry located on Forest Road 2300-920, and borrow from the obliterated Forest Road 2300-933, shown on the Plans.**

If the Contractor elects to obtain material from **the Government-provided optional sources, the following applies:**
(a) Determine the useful quantity of rock materials that can be taken from the source. It is the responsibility of the Contractor to provide materials that meet the requirements of applicable specifications, whether from the Government-provided optional source, or from a commercial source. By providing the optional source, the Government makes no claim or guarantee that the source contains sufficient suitable materials. Site development and sorting of rock materials will be necessary.
(b) Provide a suitable erosion control plan 14 days prior to anticipated quarry use.
(c) As a minimum for any disturbed soil, slope to drain, provide any special drainage features as shown or described on the Plans, provide a 1-2" layer of certified weed free straw mulch, and provide any other grading feature such as earth barricades as shown on the Plans.
(d) Place erosion control measures, as approved by the CO.

There is no charge for material taken from **optional Government provided sources.**

157 - Soil Erosion Control

157.03 General. Add the following:

21 days prior to the start of construction, submit a written plan that provides specific sediment control measures to minimize delivery of soil and turbidity into the stream during the construction period. Include the sequence of operations and information on equipment, materials and suppliers. Measures given in the Plans and Supplemental Specifications are minimum requirements, and may be revised only with written approval of the CO.

The turbidity of the water 100-200 feet downstream shall not be visually greater than the turbidity of the water upstream of the project site.

When this turbidity requirement or other erosion control measures are not met, immediately take corrective action. Cease operations that are causing turbidity and pump the stream around the construction site according to this specification and the Plans until the turbidity requirement can be met. When the interpretation of this requirement is in question, measure turbidity using a turbidity meter as approved by the CO, and provide documentation that operations are in compliance with FAR 52.236-7 Permits and Responsibilities, Section 107.10 Laws to be Observed and Section 107.10 Environmental Protection, and 107.10, including but not limited to the requirements of the National Marine Fisheries Service.

Do not begin work until the necessary controls for that particular phase of work have been implemented. Incorporate all erosion control features into the project at the earliest practicable time, as agreed by the CO.

Operate in a manner that will avoid harm to aquatic organisms whenever possible.

Notify the CO of the intention to dewater the stream, at least 72 hours in advance (not including weekends and holidays). Do not re-route the stream until approved by the CO. The CO will not approve dewatering until a fisheries biologist and other Government personnel are present and prepared to rescue aquatic organisms. Dewater the stream slowly and incrementally in order to facilitate the fish rescue. The rescue operation will generally take several hours.

Do not release water through the newly constructed simulated streambed until approved by the CO. After approval, release water slowly and incrementally over a period of at least one hour, or as approved by the CO. During this time, treat any water that does not meet the requirements of the turbidity standard stated in this specification.

157.04 Controls and Limitations on Work. Add the following:

When erosion control materials are to be left on site after the project has been completed, construct erosion controls of organic and bio-degradable materials whenever possible.

157.09 Diversions. Add the Following:

Stream diversion, related appurtenances and measures.

(a) Stream Bypass Dam and Pipe. Construct a sandbag dam and bypass pipe as shown on the Plans or as approved by the CO.

(1) Primary Bypass Dam. Construct the Sandbag Dam in a dry condition by first pumping the stream around the dam. Place temporary cofferdams as needed. Remove irregularities from the streambed to form smooth bedding for the bypass dam. Place the dam so that water does not seep from the downstream side of the dam; if seepage occurs, improve the dam by adding sandbags, improving or adding seals, or other means to minimize seepage from the dam. When it is impossible to eliminate seepage, construct a sump and pump clear water to the upstream side of the dam.

(2) Bypass Dam Impermeable Membrane. Place an impermeable membrane within the sandbag dam and entrenched in the streambed as shown on the Plans or approved by the CO. When approved by the CO, a small amount of granular bentonite may be used along the edges of the membrane to minimize seepage between the membrane and the streambed. Cut a hole in the membrane to fit the bypass pipe and seal the membrane to the Bypass Pipe or the Bypass Pipe Collar using gaskets, adhesive strips or other approved methods.

(3) Bypass pipe. Place bypass pipe as shown on the Plans or approved by the CO. Place the upstream invert of the pipe at the lowest point in the stream channel as practical. Install joints and elbows as shown on the Plans and as needed to accommodate the site layout. Use watertight seals meeting the requirements of Section 712.03. Do not place backfill until the pipe joints have be approved by the CO. Allow water to pass through pipe only after a downstream splash apron has been prepared in a manner that will protect the stream from scour and turbidity, and protect fish from harm. Construct the bypass in a manner that avoids injury to aquatic organisms.

(4) Downstream Dam. When water flows into the work area from downstream, construct a cofferdam as needed to prevent water from entering the work area.

(5) Sandbags. Prior to placing the lower rows of sandbags, remove the larger rocks or other irregularities from the streambed to form a smooth bed. Use only clean sand or coarse concrete aggregate in the sandbags. Loosely fill and tamp the sandbags in place to minimize seepage between, under, and around the bags.

(6) Bypass Pipe Collar. Install and maintain a leak-proof pipe collar as shown on the Plans or approved by the CO.

(b) Pumps. Install pumps as required to re-route stream around construction site and dewater foundations. When failure of a pump would result in movement of sediment or turbidity beyond the work area, provide a back-up pump that is readily available. Use the pumps for installing and removing the gravity bypass pipes and dams, at other times to facilitate construction operations, and during

storms to supplement the gravity bypass. Equip the pump with approved fish screens, appropriate suction and discharge hoses, fittings and flow regulation equipment as needed. Insure that the pumps are clean, free of leaks and that the oil used as lubricant in the pump seal systems is food grade mineral oil. Install and operate pumps in a manner that will avoid impingement of small fish against the intake screens.

(1) Pump intakes. Use one of the following methods of screening on all draft hoses:

i. Perforated Plate; screen openings shall not exceed 3/32 or 0.0938-inches

ii. Profile Bar Screen; the narrowest dimension in the screen openings shall not exceed 0.0689-inches in the narrowest direction.

iii. Woven Wire Screen; screen openings shall not exceed 3/32 or 0.0938-inches the narrow direction.

Check intakes frequently and clean as needed with wire brushing, flushing, or any other acceptable method.

(2) Sump Pumps. Supply pumps capable of dewatering the structure foundation. Insure that pumps are clean and free of leaks. Remove sediment and turbidity in the Sump Pump discharge water prior to re-entering the stream.

(c) Sump Water Discharge. Discharge sump water as shown on the Plan or as approved by the CO. Apply one or more methods to remove sediment from sediment-laden water. Apply additional methods as needed to eliminate increase in downstream turbidity. Use the following methods as needed:

(1) Natural Vegetation/Soil Dispersal and Filtration. Discharge sump water onto areas of ground most advantageous for dispersal and filtration of sediment, e.g. flat heavily vegetated soil. When single point discharge does not function adequately, discharge water into a perforated pipe or series of pipes laid approximately level so that the brown water disperses over a wide area.

(2) Silt Bag Filtration. Discharge sump water into one or more Silt Bags. Silt Bags are constructed of Mirafi 180N (or approved equal) with sewn seam strengths of 90% efficiency according to ASTM D4632. Construct bag to hold and filter sump water. Place silt bag(s) on level ground having layer of straw one foot thick minimum.

(3) Settling Basin. Discharge sump water into one or more Basins. The Basins may be pre-manufactured tanks, folding tanks, geotextile or membranes placed over a sandbag or weed-free straw berm, or other similar basins designed to separate sediment from the water.

(4) Suspended Sediment Coagulation Agent. When other methods do not function adequately, add an approved coagulation agent to water prior to discharging the water onto natural vegetation, Silt Bag, or Settling Basin. Use a flocculation agent such as Chitisan-based Storm-Klear Gel-Floc, or approved equal. Storm-Klear products are manufactured by Vanson HaloSource, Inc., and distributed by Natural Site Solutions, 16541 Redmond Way 405-C, Redmond, WA 98052, phone: (425) 861-9499.

Use Suspended Sediment Coagulation Agent according to manufacturer's recommendations.

(d) Sedimats. Place Sedimats across the streambed as shown on the Plans or approved by the CO. The Sedimat is a proprietary product manufactured by Indian Valley Industries, Inc. and distributed by Columbia Storage Inc., Vancouver Washington, phone: (800) 426-7976. Use Sedimats according to manufacturer's recommendations.

(d) Simulated Streambed. After placement of the simulated streambed rock materials as shown on the Plans, wash the fines from the surface of the new streambed and remove the sediment using a downstream sump pump. Provide temporary sandbag dam if needed.

157.13 Maintenance & Cleanup. Add the following:

When removing sandbags, spread sand away from the waterway; if coarse concrete aggregate meeting the requirements of Section 703.02 is used in the sandbags, the gravel may be distributed evenly across the waterway.

Remove geotextile and other non-biodegradable materials used in dewatering and sediment control operations from Government property, unless otherwise approved by the CO.

648 - Stream Simulation

Description

648.01 This work consists of placing rock and fill to simulate natural stream profile and streambed through culverts and other structures.

Material

648.02 Conform to the following Subsections.

Select Borrow	704.07
Streambed Simulation Rock	705.07
Stream Channel Rocks	705.08
Stream Weir Rocks	705.09

Construction Requirements

648.03 General. 30 days prior to start of construction, notify the CO of the intended source , meeting materials specifications, for obtaining Streambed Simulation Rock, Stream Channel Rocks, and Stream Weir Rocks. Place stream simulation rock on a prepared surface to form a well-graded, low permeability mass, similar in appearance and texture to the natural streambed. Do not drive metal track or rubber tired equipment directly on metal or concrete structure surfaces.

648.04 Streambed Simulation Rock, Stream Channel Rocks, and Stream Weir Rocks.

(a) Rock Placement. Layer place streambed simulation rock with a layer depth no more than 6 inches or maximum dimension of the rock, whichever is greater. Do not cause segregation of the rock sizes. Do not cause damage to the prepared surface. Place or rearrange individual rocks and compact each layer using machine or hand operated mechanical equipment, and hand tools as needed to obtain a uniformly dense, compact, low permeability mass. Compact until further densification is no longer attainable. Fill voids with Select Borrow and compact before placing the next lift.

Place Stream Channel Rocks and Stream Weir Rocks AS SHOWN ON THE DRAWINGS and as approved by the CO during placement.

648.04 Select Borrow. Fill all voids left during placement of Streambed Simulation Rock, Stream Channel Rocks, and Stream Weir Rocks adjacent to footings, concrete structures or corrugated pipes, and between Stream Weir Rocks with select borrow. Use

water pressure, metal tamping rods, and similar hand operated equipment to force material into all surface and subsurface voids between the structure and Rocks and between individual Rocks.

648.05 Acceptance. Placing stream simulation material will be evaluated under Subsections 106.02 and 106.04.

Measurement

648.06 Measure the items listed in the bid schedule according to Subsection 109.02.

Payment

648.07 The accepted quantities, will be paid at the contract price per unit of measurement for Section 648 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05

705 - Rock

705.07_0618_us_08_04_2005

705.07 Streambed Simulation Rock.

Add the following:
Table 705-5 – Gradation requirements for streambed simulation rock, inches or sieve size

Rock Class	100% passing (inches)	84% passing (inches)	50% passing (inches)	16% passing (inches)	10% passing (sieve)
2	5	2	3/4	1/4	No. 10
4	10	4	1 3/4	0.530	No. 10
6	14	6	2 1/2	3/4	No. 10
9	22	9	3 1/2	1.06	No. 10
12	29.5	12	5	1 1/2	No. 10
14	35.5	14	6	1 3/4	No. 10
17	45	16.5	7	2 1/2	No. 10
24	59	23.5	10	3	No. 10
30	74	29.5	12	3 1/2	No. 10
36	88.5	35.5	14	4.24	No. 10
45	103	45	16.5	5	No. 10

705.08 Stream Channel Rock.

Add the following:
Gradation requirement for Channel Rock are AS SHOWN ON THE PLANS.

705.09 Stream Weir Rock.

Add the following:
Furnish rock that conforms to the requirements of 705.02 Riprap Rock, (a), (b), and(c). Furnish rock conforming to the gradation AS SHOWN ON THE PLANS. Furnish rock with breadth at least two-thirds its length and thickness one-half to two-thirds its length, or AS SHOWN ON THE PLANS.