Invitation to Provide Proposal and Bid Culvert Replacement with a New, Properly-Sized Galvanized Steel Pipe Arch Meeting ODFW’s Fish Passage Criteria

Project Description
The Siuslaw Watershed Council is preparing for a complete replacement of the former Esmond Creek Culvert on BLM Road number 19-8-21.0 in Douglas County, Oregon. The former concrete culvert carried a tributary of Esmond Creek under the BLM access road until its collapse in 2012 and subsequent removal from the roadbed in 2016. The reconstruction of a fish-friendly crossing will establish a better connection for wildlife, access for future restoration work along the mainstem of Esmond Creek, fire suppression and access to public and private timberlands beyond the project location along the BLM access road.

The Siuslaw Watershed Council (also listed as the SWC, Council, or Agency within the bid documents and specifications) invites qualified and experienced construction companies (referred to as contractor in this document) to review the drawings and specifications for the following tasks. See drawings and specifications for detailed description. Specification clarifications refer to FP-03 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

General Information
All bids shall be submitted on the Bid Packet provided. No bid for a construction contract shall be received or considered unless the bidder is registered with the Construction Contractors Board as required by ORS Chapter 701.

The work proposed is subject to Oregon’s prevailing wage rate law. ORS 279C.800-279C.870. This law requires that entities using public funds for public works must pay not less than the prevailing rate of wage for an hour’s work, including fringe benefits, in the same trade in the locality where the work is performed. Prevailing wage rates are provided by BOLI at no cost at www.oregon.gov/boli.

When the project is awarded, the successful bidder shall promptly execute a contract for the proposed work with the Council. All bidders agree to comply with the project schedule listed in Table 1 below.

Qualified firms are expected to review the engineering specifications and drawings and provide a bid for the project.

Scope of Work
The scope of work includes preparing the existing site in present condition (See Exhibit A) and installing the designed pipe according to engineered specifications (See Exhibit C). Contractor
will also be responsible for delivering culvert from the corner of BLM Roads 30 and 29 to the project location, approximately 3 miles from the intersection. Estimated mobilization costs should reflect this transportation of the culvert. Contractor will be responsible for creating a dewatering plan for the site, and will submit this plan to SWC. Contractor is responsible for notifying ODF of the operation. The Contractor will not be responsible for the following tasks associated with the project:

- All fill and removal permits related to the project will be secured by the BLM and Council.
- The Council will purchase the culvert and pay for delivery to the corner of BLM roads 30 and 29. (note: contractor will have to coordinate with Council for delivery date/time and unload culvert from trailer and transport to project location approximately 3 miles from delivery site).
- The surrounding road surface will be restored with asphalt by the BLM.
- The BLM and SWC will complete all fish capture and replacement work, with notification from the contractor that construction is taking place and fish capture is necessary.

**Reasonably Implied Work and Incidental Items**

Any part of the work that is not mentioned in the above scope of work, but is shown on the plan set or specifications package, or any part not shown on the plan set or specifications package, but described in the above scope of work, or any part not shown on the plan set or specifications nor described in the above scope of work which is necessary or normally required as a part of such work, or is necessary or required to make such installation satisfactorily and legally operable, shall be performed by the Contractor as incidental work without extra cost to the Council.

**Table 1. Project Timeline**

<table>
<thead>
<tr>
<th>Task</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor site visit and meeting</td>
<td>August 2, 2017</td>
</tr>
<tr>
<td>Proposals due to Council</td>
<td>August 9, 2017</td>
</tr>
<tr>
<td>Contractor selected, develop contract</td>
<td>August 17, 2017</td>
</tr>
<tr>
<td>Finish Construction</td>
<td>September 15, 2017</td>
</tr>
</tbody>
</table>

**Site Visit**

An optional site visit will be conducted on August 2, 2017 at 1:00 PM with all contractors interested in submitting proposals to the Council. Please contact the SWC Office (541-268-3044) by 12pm on August 1st if you would like to attend the site visit. The meeting will provide an opportunity for contractors to view the site and to ask any questions they may have. The Council and BLM project managers will be present to answer questions. We will meet at the project location which can be found here: 43.87767°N, 123.62566°W.
**Bidding Process**
Interested contractors will present the Council with a bid/proposal by 3 p.m. on August 9, 2017. The proposal should include a complete bid packet (Items I-V).

The Council will review proposals and notify bidders within nine (9) days of submittal. The Council may propose modifications to the selected contractor before finalizing contract. The Council will award the contract based on the qualifications, experience, and price offered by each contractor.

**Inspection & Quality Control**
The Contractor is expected to abide by the specifications outlined above, in the plan set and specifications package provided by the engineer, and by the procedures outlined within their Council-approved proposal. The Contractor shall not make any changes to the procedures outlined within the proposal without approval from the Council. The Council Project Manager, Engineer, and BLM officials may inspect work at any time during the course of the contract. The Council and BLM will conduct a final inspection within three business days of the Contractor’s request. This final inspection will be to ensure that all tasks have been conducted to the satisfaction of the Council. The Council shall give written notice to the Contractor stating acceptance of work and absolving contractor of further duty.

**Contractor’s Supervisor**
The Contractor shall provide an on-site working supervisor to be physically present whenever contract work is being performed. The supervisor shall speak fluent English in order to be able to communicate clearly with the Council, Engineer, and BLM. This individual shall be responsible for the overall management and coordination of this contract and shall act as the central point of contact with the Council. The Contractor’s Supervisor shall check-in by phone or in person with the PM each day work is performed. The Supervisor shall also attend any meetings with the Council that specifically pertain to the Supervisor’s duties and all performance evaluation meetings.

**Weekly Work Plan**
The Contractor shall provide a written schedule for the Project Manager’s review and approval. The schedule shall show hours and days to be worked, what tasks will be undertaken, and the estimated crew size for each day. The Contractor will notify the PM when there are changes to this schedule.
**Contractor Furnished Items**
The Contractor shall furnish all equipment, repair parts, and materials/supplies to perform contract work according to the required specifications. All equipment shall be in safe and good operating condition and free of noxious weed seeds. Equipment includes but is not limited to:

- Environmentally responsible petroleum, oils, and lubricants
- Trucks and trailers for transporting equipment and materials
- Heavy equipment
- Hand tools
- Hand-operated, power-driven equipment
- Equipment repair parts
- Personnel clothing, safety equipment
- Spill Containment Kit (see below)
- Submittals for materials used in project

**Public Safety**
The Contractor shall exercise due caution and care when operating to prevent undue conflict with public users of roads, trails, and project sites. The Contractor shall post signs at both ends of any roads that are blocked by work in progress and at both ends of the waste material haul route. Signs shall be of a color, size, and number of which are acceptable to the Project Manager, ODOT (if required), and the BLM.

**Fire Precautions**
All State of Oregon fire laws shall be followed. Specific requirements for fire equipment may vary by local fire district. Fire restrictions may result in limited hours of equipment operation at the work site, including the use of gasoline powered vehicles and power tools. Contractor is required to obtain a work permit from the Oregon Department of Forestry and furnish any equipment required. Smoking or flaming materials are not allowed on project site or nearby areas with significant fuel loads during fire season.

**Environmental Protection**
Contractor shall adhere to all applicable Federal, State, and local environmental protection laws and regulations. Any maintenance work, equipment repairs, and refueling of equipment shall be at fueling areas located in parking lots or existing paved roads. Equipment furnished shall be free from any leakage of petroleum products. Excessive leakage shall be a basis for issuing an immediate shutdown of the operation.

Contractor shall exercise care to minimize damage (including cutting, trampling, and removal) to established native trees and shrubs. Work on the project shall be continually monitored to verify that native plants are protected in this manner. If excessive damage to native vegetation is found, work shall be stopped until Contractor can demonstrate techniques that will not result in excessive damage.
Operating Restrictions for Marbled Murrelet
Operating restrictions are required within 100 meters of the unsurveyed suitable habitat. Use of power tools and heavy equipment is prohibited from April 1 through August 5 within 100 yards of this habitat. Additionally, time of day restrictions are required from August 6 through September 15; i.e., power tools and heavy equipment are only allowed between 2 hours after sunrise and two hours before sunset if within 100 yards of occupied habitat.

Contractor must maintain potential nesting function for Marbled Murrelet and shall minimize the possibility of damaging potential Murrelet nesting structure. There are about 5 potential Murrelet trees from about 60 to 75 meters from the culvert that would be removed and then replaced.

Hazardous Material Containment/Cleanup
The Contractor is required to develop a spill prevention, control, and countermeasure (SPCC) plan. The SPCC plan will be reviewed and accepted by the Project Manager prior to initiating project work. The SPCC plan shall, as a minimum, contain the following information:

1) Response priorities
2) Contractor representative in charge
3) Duties of Contractor personnel
4) Contractor emergency response procedures
5) Contents of spill containment kit (SCK)
6) Spill response diagram

The Contractor is required to have a SCK as described in the SPCC on-site during any operation and provide training to employees on how components of the SCK are used. The SCK must be designed for use with petroleum products and must contain, as a minimum, the following items:

1) Four bales (8 booms/bale, of 8 inch x 10 foot absorbent booms)
2) Two bales (100 pads/bale, of absorbent pads, minimum of 17 inch x 19 inch x ¼ inch pads)
3) One absorbent sweep (minimum of 18 inches x 100 feet x 3/8 inches)
4) Two 30-50 gallon garbage cans

In the event of a release as defined in Oregon Administrative Rules (OAR), PART 340, DIVISION 108, HAZARDOUS WASTE MANAGEMENT, the Contractor shall immediately implement the SPCC plan and notify the project manager. The Project Manager will coordinate with BLM staff. The Contractor will be responsible for the clean-up and any liability associated with a spill.

Indemnity
Contractor shall indemnify, defend, save and hold harmless the Indemnified Parties (defined below) from and against any and all liability, demands, claims, losses, costs (including but not limited to attorneys’ fees and, in the case of item (b) below, royalty payments) and expenses arising from or in connection with:

(a) claims for personal injury (including death) and/or property loss or damage to
whomsoever or whatsoever occurring or arising in any manner out of or in connection with:
the Work,
this Contract, or
any act or omission of Contractor, its directors, officers, agents or employees, or the presence of Contractor, its directors, its officers, agents or employees upon or about the property, premises or right-of-way of the BLM, whether or not negligence on the part of any Indemnified Party may have caused or contributed to such injury, death, loss or damage; provided, however, that if, under the law applicable to enforcement of this Contract, an agreement to indemnify against the indemnitee's own negligence is invalid, then in that event Contractor's obligation to indemnity the Council under this section shall be reduced in proportion to the negligence of the Council, if any, which proximately contributed to such injury, death, loss or damage;

(b) any claim of infringement of patent rights arising from the use of any of the articles, materials, equipment or designs furnished in connection with the Work or named in this Contract; and

(c) any claims, fines, penalties or other charge or loss arising from any alleged violation of any statute, code, or ordinance or regulation of the United States or of any state, county or municipal government that results in whole or in part, directly or indirectly, from the activities of Contractor's officers, agents, employees or subcontractors related in any way to this Contract, or from any act or omission of Contractor, its officers, agents, employees or subcontractors contributing to such violation, regardless of whether such activities, acts or omissions are intentional or negligent, and regardless of any specification by the Council without actual knowledge that it might violate any such statute, code, ordinance or regulation (these laws, ordinances and regulations, include, without limitation, all laws, ordinances and regulations relating to air, water, noise, solid waste and other forms of environmental protection, contamination or pollution, as well as all laws, ordinances and regulations relating to discrimination on the basis of disability).

As used in this Contract, the terms "Indemnified Parties" and "Indemnified Party" shall mean and include, collectively and singularly, (i) The Siuslaw Watershed Council, Inc (hereinafter SWC), (ii) any direct or indirect subsidiary SWC (iii) any officer, director, Commissioner, employee, shareholder or agent of the BLM or of any of their direct or indirect subsidiaries, (iv) any officer, director, Commissioner, employee, shareholder or agent of SWC or of any of their direct or indirect subsidiaries.

Insurance
Contractor shall, at its expense, obtain and maintain during the period of this Contract, in a form and with companies satisfactory to Siuslaw Watershed Council (hereinafter SWC), the following insurance coverage:

1. The Contractor, its sub-contractors, if any, and all employers working under this Contract are subject employers under the Oregon Worker's Compensation Law and shall comply with ORS 656.017 which requires them to provide workers' compensation coverage for all their subject workers, applicable in connection with the death, disability or injury of
Contractor’s officers, agents, servants or employees arising directly or indirectly out of the performance of this contract; or shall provide documentation to SWC establishing to their satisfaction that Contractor is exempt from Workers’ Compensation coverage pursuant to ORS Chapter 656. Each policy required by this section shall be endorsed to provide a waiver of subrogation in favor of SWC. The additional insured endorsement must include products and completed operations; ISO cg 20 10 or its equivalent and ISO cg 20 37 or its equivalent.

2. Commercial General Liability Insurance with Limits of not less than One Million Dollars ($1,000,000) each incident and not less than Two Million Dollars ($2,000,000) general aggregate. In addition, insurance policies shall include Five Thousand Dollars ($5,000) of medical expenses for employees. Commercial general liability policy must be endorsed to include loggers broad form property damage with limits of One Million Dollars ($1,000,000). Each policy required by this section shall be endorsed to provide a waiver of subrogation in favor of SWC.

3. Automobile Liability Insurance with a combined single limit of not less than One Million Dollars ($1,000,000) each occurrence for injury to or death of persons and damage to or loss or destruction of property and not less than Two Million Dollars ($2,000,000) aggregate. Said policy or policies shall be endorsed to name SWC as well as their divisions, directors, officers and employees as additional insured’s and shall include a “severability of interests” provision. Each policy required by this section shall be endorsed to provide a waiver of subrogation in favor of SWC.

4. Contractor shall furnish certificates of insurance to SWC's Project Manager, (Eli Tome PO Box 422, Mapleton, OR 97453, fax 541.268.3044), certifying the existence of such insurance. Contractor shall require all subcontractors who are not covered by the insurance carried by Contractor to maintain the insurance coverage described in this Section. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled, or reduced in coverage or not renewed without 30 days advanced written notice to SWC.

5. Proof of Insurance as described above shall be required before a bid is awarded and shall be subsequently provided to SWC upon request throughout the term of the Project. Contractor shall fill out and sign Item V below, attesting to adequate insurance coverage.

The insurance coverage required herein shall in no way limit the Contractor's liability under this Contract.

Payments
The Contractor may invoice the Council for the agreed upon bid amount once work is complete. The total amount charged for this project will not exceed available funding for the project. All invoices must be submitted no later than October 20, 2017. Payments will be made within 45 days of the invoice receipt from contractor, pending Council receipt of payment from funder. This agreement constitutes a subcontract whereby payment to contractor may be contingent upon reimbursement of invoiced amounts from funder.
Payments for Extra Work Based on Time and Materials

Any work required to carry out the intent of this contract by changes not clearly indicated in the document, or which cannot be reasonably implied from the intent and meaning of the contract and which cannot be classified under any of the items for which a lump sum price is listed in the Contractor’s proposal shall be paid on a unit price, lump sum or force account basis.

If the method of payment cannot be agreed upon prior to beginning work, and the Project Manager directs that the work be done on a force account basis, then the Contractor shall furnish labor, equipment, and materials necessary to complete the work in a satisfactory manner and within a reasonable period of time. For the work performed, payment will be made for the documented actual cost of labor, materials, rental expenses, and additional insurance expenses.

**Labor:** Non-direct labor costs, including superintendence, shall be considered part of the markup set out in the FP-03 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects. The time to be paid for labor on the work site shall be the time the worker is in productive operation of the extra work being performed.

**Equipment:** The Contractor will be paid for the use of equipment at the rental rate for such equipment deemed equitable and of fair market rate value as determined by SWC. The time to be paid for equipment on the work site shall be the time the equipment is in productive operation of the extra work being performed.

**Materials:** The cost of materials reported shall be at invoice or the lowest current price at which materials are locally available and delivered to the job in the quantities involved, plus the cost of freight, delivery and storage. If, in the opinion of the Project Manager, the cost of materials is excessive or the Contractor does not furnish satisfactory evidence of the cost of such material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the work site less trade discount.

The work descriptions given below are not comprehensive and give a cursory description of work items for bidding purposes only; however, the total bid shall be for all ancillary items to complete the stream structure modifications. The Contractor must include adequate provisions in each bid item to account for incidentals, culvert delivery to site as described above, final cleanup, and other items required to complete the project and meet the intent of the project Specifications and Drawings.
The SWC shall enter into a contract with the firm whose proposal/bid appears to best serve the interest of the SWC in terms of qualifications, services to be provided, timeliness and cost.

Drawings and specifications are available at the SWC website (www.siuslaw.org/announcements).

If you have questions or would like to schedule a site visit please see contact person’s information below.

Contractors have until 3pm on July 18th, 2017 to respond by providing a written sealed bid to the mailing address below.

Contact Person:
Eli Tome
Restoration Projects Manager
Siuslaw Watershed Council
Phone: 541.268.3044

Issued By: Siuslaw Watershed Council
PO Box 422
Mapleton, OR 97453
(Mailing address)

Physical Address Location: Siuslaw Watershed Council
Mapleton School District Campus
10868 East Mapleton Road
Mapleton, OR 97453 (Not Mailing address)

This project is made available through funding from the Northwest BLM Resource Advisory Council and BLM direct funds.

"In accordance with Federal law and U.S. Department of Interior policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, or disability. (Not all prohibited bases apply to all programs.) USDI is an equal opportunity provider and employer."

Siuslaw Watershed Council Mission Statement
The Siuslaw Watershed Council supports sound economic, social and environmental uses of natural and human resources in the Siuslaw River Basin. The Council encourages cooperation among public and private watershed entities to promote awareness and understanding of watershed functions by adopting and implementing a total watershed approach to natural resource management and production.
I. Bidder Information

BIDDER: ______________________________________________________________

ADDRESS: _____________________________________________________________

PHONE: _________________ FAX: __________________ DATE: ________________

The undersigned, hereinafter called the Bidder, declares that the only person(s) interested in this Bid are those named herein; that the Bid is in all respects fair and without fraud; and, that it is made without any connection or collusion with any other person making a bid on this project.

The Bidder further declares that they have carefully examined the Plans, Specifications, and Contract Documents, hereinafter referred to as the Document, for the construction of the proposed project improvement; has personally inspected the site; is satisfied as to the type and quantities of materials, the types of equipment, the conditions of and the work involved, including the fact that the description of and the quantities of work and materials, the types of equipment, the conditions of and the work involved as included herein, is brief and is intended only to indicate the general nature of the work and to identify the said quantities with the detailed requirements of the Document; and, that this Bid is made in accordance with the provisions and the terms of the Contract and included in the Document.

The Bidder agrees that if this Bid is accepted they will within five (5) working days, not including Saturdays, Sundays and legal holidays, after notification of acceptance execute the Contract with the Siuslaw Watershed Council in the form of the Contract included in the Document.

The Bidder further agrees, to the extent of this Bid, to furnish all machinery, tools, apparatus, and other means of construction and do the work and furnish all of the materials necessary to complete the work in the manner, in the time, and according to the methods as specified in the Document and required by the Engineer.

The Bidder further agrees to begin work by August 21, 2017 and to complete all construction by September 13, 2017. Work will not be allowed to commence until a signed Contract is received by the Siuslaw Watershed Council.

The Bidder further agrees to accept as payment for the work proposed under this project, as herein specified and under the provisions included in the Contract Documents, the unit prices included on the Bid Form. The Bidder further represents a true measure of the labor and materials required to perform the work including all allowances for overhead and profit for each type of work called for in the Plan Set and Bid Form.

The Bidder further agrees to accept, as payment for “on-call” services, unit bid prices for items listed below. On-call services are meant to fairly compensate the contractor for performance of work that may be necessary for completion of work, and of which quantities are limited but of unknown extent.
## II. Schedule of Items (also provided as an excel document)

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>PAY UNIT</th>
<th>EST. QTY.</th>
<th>UNIT PRICE</th>
<th>TOTAL PRICE</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>15101</td>
<td>Mobilization</td>
<td>Lump Sum</td>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15201</td>
<td>Construction survey and staking, method 1, tolerance A</td>
<td>n/a</td>
<td>--</td>
<td>---</td>
<td>---</td>
<td>Not responsibility of contractor, BLM will stake out project</td>
</tr>
<tr>
<td>15713</td>
<td>Soil erosion and pollution control</td>
<td>Lump Sum</td>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15755</td>
<td>Dewatering Site</td>
<td>Each</td>
<td>1</td>
<td></td>
<td></td>
<td>Contractor must submit dewatering plan</td>
</tr>
<tr>
<td>20155</td>
<td>Clearing and grubbing</td>
<td>Lump Sum</td>
<td>All</td>
<td></td>
<td></td>
<td>Moving jersey barriers to side. BLM road crew will haul barriers away once project is complete.</td>
</tr>
<tr>
<td>20305</td>
<td>Removal of Structures and Obstructions</td>
<td>Lump Sum</td>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20401</td>
<td>Roadway Excavation, Compaction Method B</td>
<td>*Cubic Yard</td>
<td>20</td>
<td></td>
<td>---</td>
<td>Option 1 is purchasing, hauling and compacting rock from a commercial quarry.</td>
</tr>
<tr>
<td>20473</td>
<td>Embankment Construction, Compaction Method B</td>
<td>Lump Sum</td>
<td>All</td>
<td></td>
<td></td>
<td>Option 2 is hauling and compacting rock from a pre-determined BLM stockpile. BLM would donate rock. Contractor does not need to purchase rock.</td>
</tr>
<tr>
<td>20951</td>
<td>Pipe Backfill (Option 1)</td>
<td>*Cubic Yard</td>
<td>190</td>
<td></td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>20951</td>
<td>Pipe Backfill (Option 2)</td>
<td>*Cubic Yard</td>
<td>190</td>
<td></td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>20956</td>
<td>Pipe Culvert Excavation</td>
<td>*Cubic Yard</td>
<td>50</td>
<td></td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>25101</td>
<td>Placed Riprap, Class 5</td>
<td>*Cubic Yard</td>
<td>33</td>
<td></td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>32203</td>
<td>Aggregate Base, Grading D, Compaction Method B</td>
<td>*Cubic Yard</td>
<td>61</td>
<td></td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>60253</td>
<td>128 Inch Span, 83 Inch Rise Corrugated Steel Pipe Arch, 0.138 Inch Thickness</td>
<td>Foot</td>
<td>65</td>
<td>---</td>
<td>---</td>
<td>SWC will purchase culvert, see bid announcement for Contractor's responsibility in assisting delivery to project location</td>
</tr>
<tr>
<td>62530</td>
<td>Seeding and Mulching, Dry Method</td>
<td>n/a</td>
<td>--</td>
<td>---</td>
<td>---</td>
<td>Not responsibility of Contractor. Materials provided by BLM and labor to be done by SWC and BLM.</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Lump Sum</td>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------</td>
<td>----------</td>
<td>-----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63501</td>
<td>Temporary traffic control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64804</td>
<td>Placed Steambed simulation rock, bed class 4, method A</td>
<td>*Cubic Yard</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64804</td>
<td>Placed Steambed simulation rock, bed class 12, method A</td>
<td>*Cubic Yard</td>
<td>58</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The enclosed schedule of items, contract specifications and engineering drawings provides the detail sufficient for project orientation and conducting cost estimates.
III. Bidder Culvert/Bridge Replacement Project History and References

Bidders with experience performing similar stream enhancement work will be favored when proposals are evaluated. Please fill out the following table with your most relevant work or attach a resume/work history with references.

<table>
<thead>
<tr>
<th>Name of Client, Project Location</th>
<th>Description of Work Completed</th>
<th>Contact Name/Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IV. Bidder Certification
The name of the Bidder submitting this Bid Proposal is:

________________________________________________________________________
doing business at________________________________________________________
which is the address to which all communications concerned with the Bid and with the Contract
shall be sent.

(If Corporation)
In witness whereof the undersigned Corporation has caused this instrument to be executed and
its seal affixed by its duly authorized officers this _____day of________________________,,
2017.

________________________________________________________________________
NAME OF CORPORATION

By:________________________________________________________

Title

Attest:______________________________________________________
Secretary

(If Partnership)
In witness whereof the undersigned Partnership has caused this instrument to be executed by
its duly authorized officer(s) this ________ day of ___
_________________, 2017.

________________________________________________________________________
NAME OF PARTNERSHIP

By:________________________________________________________

Title

Attest:______________________________________________________
Secretary

(If Sole Proprietor)
In witness whereof the undersigned has set his hand and caused this instrument to be
executed this___________ day of _______________________________, 2017.

________________________________________________________________________
SIGNATURE OF BIDDER

Attest:______________________________________________________
Item V: Insurance Requirements for Contractor

________________________________________ (“CONTRACTOR”) agrees to carry insurance equal to or greater than that listed below and name Siuslaw Watershed Council.

COMMERCIAL GENERAL LIABILITY AND AUTO LIABILITY
$1,000,000. Each occurrence
$2,000,000. General aggregate
$5,000 Medical expense

- Watershed council must be named as an additional insured. This insurance is required to be primary and non-contributory and include a waiver of subrogation.
- Commercial general liability policy must be endorsed to include loggers broad form property damage with limits of $1,000,000
- The additional insured endorsement must include products and completed operations; ISO cg 20 10 or its equivalent and ISO cg 20 37 or its equivalent. Please attach a copy of the endorsement to the certificate of insurance
- Insurance must be maintained continuously
- Contractor must provide a 30 day notice of cancellation

WORKERS COMPENSATION
$500,000 employer liability
Complies with all applicable workers compensation laws of the state of Oregon
Certificate of insurance only
- Workers compensation must contain a waiver of subrogation

AUTO LIABILITY
$1,000,000 combined single limit for all owned, non-owned or hired vehicles
- Watershed council must be named as an additional insured. This insurance is required to be primary and non-contributory and include a waiver of subrogation.

IN WITNESS WHEREOF, Siuslaw Watershed Council “and “CONTRACTOR” have executed this agreement, effective the date of the last authorized signature.

BY: _________________, INC.
    (COMPANY NAME)

BY: _____________________________________________
    CONTRACTOR (COMPANY NAME)

BY: ___________________________________________
    BY:___________________________________________
    (AUTHORIZED SIGNATURE)                     (AUTHORIZED SIGNATURE)

DATE: ____________________________
A Complete Bid Packet Shall Include the Following:
Items I-V

Documents provided to Potential Bidders:
Invitation to Bid (includes Items I-V)
Final Plans: Plan, Profile, and Cross-sectional Drawings by BLM Eugene District
BLM Standard Drawings for Reference
Project Specifications
Exhibit A: Current Site Condition
Photos Taken on May 17th 2017

Photo 1 Current Condition—old, undersized culvert removed, stream flows through narrow section through road; looking downstream

Photo 2 Current Condition with failed concrete tile culvert in the background
Photo 3 Possible fill material stored on road, failed concrete tiles and current site condition

Photo 4 Current site condition looking upstream
**Exhibit B: Bankfull Measurements of Stream**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Location Relative to Crossing</th>
<th>Bankfull Width (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Downstream</td>
<td>5.5</td>
</tr>
<tr>
<td>2</td>
<td>Downstream</td>
<td>6.7</td>
</tr>
<tr>
<td>3</td>
<td>Downstream</td>
<td>6.7</td>
</tr>
<tr>
<td>4</td>
<td>Downstream</td>
<td>8.0</td>
</tr>
<tr>
<td>5</td>
<td>Downstream</td>
<td>7.5</td>
</tr>
<tr>
<td>6</td>
<td>Upstream</td>
<td>5.3</td>
</tr>
<tr>
<td>7</td>
<td>Upstream</td>
<td>5.2</td>
</tr>
<tr>
<td>8</td>
<td>Upstream</td>
<td>6.2</td>
</tr>
<tr>
<td>9</td>
<td>Upstream</td>
<td>6.0</td>
</tr>
<tr>
<td>10</td>
<td>Upstream</td>
<td>6.0</td>
</tr>
<tr>
<td>75 Pecentile Bankfull Width</td>
<td></td>
<td>6.7</td>
</tr>
<tr>
<td>Sizing Multiplier</td>
<td></td>
<td>1.3</td>
</tr>
<tr>
<td>Minimum Culvert Width (feet)</td>
<td></td>
<td>8.71</td>
</tr>
<tr>
<td>Minimum Culvert Width (inches)</td>
<td></td>
<td>105</td>
</tr>
<tr>
<td>Culvert Size</td>
<td></td>
<td>128&quot; x 83&quot;</td>
</tr>
<tr>
<td>Culvert Length</td>
<td></td>
<td>65 feet</td>
</tr>
</tbody>
</table>
Exhibit C: SPECIFICATIONS FOR ESMOND CREEK TRIBUTARY AOP

All specifications not included in the specifications listing, but referenced by listed specifications, are applicable. The supplemental specifications shown on the specification list are physically attached. Section 100 through 149 of the Standard Specifications and all other Standard or supplemental specifications shown in the specification listing are applicable to this contract.

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Revised</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Terms, Format, and Definitions</td>
<td>FP03</td>
</tr>
<tr>
<td>101.01</td>
<td>Meaning of Terms</td>
<td>1/22/2009</td>
</tr>
<tr>
<td>101.03</td>
<td>Abbreviations</td>
<td>6/16/2006</td>
</tr>
<tr>
<td>102</td>
<td>Bid, Award, and Execution of Contract</td>
<td>FP03</td>
</tr>
<tr>
<td>102.00</td>
<td>Bid, Award, and Execution of Contract</td>
<td>2/16/2005</td>
</tr>
<tr>
<td>103</td>
<td>Scope of Work</td>
<td>FP03</td>
</tr>
<tr>
<td>103.00</td>
<td>Definitions</td>
<td>2/16/2005</td>
</tr>
<tr>
<td>104</td>
<td>Control of Work</td>
<td>FP03</td>
</tr>
<tr>
<td>104.00</td>
<td>Deletions</td>
<td>6/16/2006</td>
</tr>
<tr>
<td>104.03</td>
<td>Specifications and Drawings</td>
<td>2/22/2005</td>
</tr>
<tr>
<td>104.06</td>
<td>Use of Roads by Contractor</td>
<td>2/17/2005</td>
</tr>
<tr>
<td>105</td>
<td>Control of Material</td>
<td>FP03</td>
</tr>
<tr>
<td>105.02</td>
<td>Material Sources</td>
<td>1/18/2007</td>
</tr>
<tr>
<td>105.05</td>
<td>Use of Material Found in the Work</td>
<td>5/12/2004</td>
</tr>
<tr>
<td>106</td>
<td>Acceptance of Work</td>
<td>FP03</td>
</tr>
<tr>
<td>106.01</td>
<td>Conformity with Contract Requirements</td>
<td>7/31/2007</td>
</tr>
<tr>
<td>106.07</td>
<td>Delete</td>
<td>5/11/2004</td>
</tr>
<tr>
<td>107</td>
<td>Legal Regulations and Responsibility to the Public</td>
<td>FP03</td>
</tr>
<tr>
<td>107.05</td>
<td>Responsibility for Damage Claims</td>
<td>5/11/2004</td>
</tr>
<tr>
<td>107.06</td>
<td>Contractor's Responsibility for Work</td>
<td>6/16/2006</td>
</tr>
<tr>
<td>107.09</td>
<td>Legal Relationship of Parties</td>
<td>6/16/2006</td>
</tr>
<tr>
<td>107.10</td>
<td>Environmental Protection</td>
<td>6/16/2006</td>
</tr>
<tr>
<td>108</td>
<td>Prosecution and Progress</td>
<td>FP03</td>
</tr>
<tr>
<td>108.00</td>
<td>108 Delete</td>
<td>2/16/2005</td>
</tr>
<tr>
<td>109</td>
<td>Measurement and Payment</td>
<td>FP03</td>
</tr>
<tr>
<td>109.00</td>
<td>Deletions</td>
<td>2/17/2005</td>
</tr>
<tr>
<td>109.02</td>
<td>Measurement Terms and Definitions</td>
<td>6/16/2006</td>
</tr>
<tr>
<td>151</td>
<td>Mobilization</td>
<td>FP03</td>
</tr>
<tr>
<td>152</td>
<td>Construction Survey and Staking</td>
<td>FP03</td>
</tr>
<tr>
<td>152.00</td>
<td>Construction Survey and Staking</td>
<td>8/5/2005</td>
</tr>
<tr>
<td>153</td>
<td>Contractor Quality Control</td>
<td>FP03</td>
</tr>
<tr>
<td>153.02</td>
<td>Contractor Quality Control Plan</td>
<td>2/17/2005</td>
</tr>
<tr>
<td>153.04</td>
<td>Records</td>
<td>12/24/2007</td>
</tr>
<tr>
<td>155</td>
<td>Schedules for Construction Contracts</td>
<td>FP03</td>
</tr>
<tr>
<td>156</td>
<td>Public Traffic</td>
<td>FP03</td>
</tr>
</tbody>
</table>
156.03 Accommodating Traffic During work 2/24/2005
156.04 Maintaining Roadways During Work 2/24/2005
156.08 Traffic and Safety Supervisor 2/24/2005
157 Soil Erosion Control FP03
157.01 Description 2/03/2009
157.02 Materials 2/03/2009
157.03 Construction Requirements 2/03/2009
157.04 Controls and Limitations on Work 2/03/2009
157.09 Diversions 2/03/2009
157.13 Maintenance & Clean up 2/03/2009
170.00 Develop Water Supply and Watering 3/26/2007
171.00 Weed and Disease Prevention 3/26/2007
201 Clearing and Grubbing FP03
201.01 Description 2/18/2005
201.04 Clearing (c) 2/22/2005
201.06 Disposal 3/26/2007
203 Removal of Structures and Obstructions FP03
203.01 Description 2/25/2005
203.04 Removing Material 2/18/2005
203.05 Disposing of Material 3/26/2007
203.05 Disposing of Material 3/26/2007
203.08 Payment 2/24/2005
204.00 Excavation and Embankment 3/26/2009
204.12 Ditches 5/05/2008
204.16 Measurement 5/05/2008
209 Structure Excavation and Backfill FP03
209.07 Dewatering 7/12/2007
209.10 Backfill 10/23/2007
209.11 Compacting 2/24/2005
251 Riprap FP03
251.03 General 8/5/2009
322.00 Minor Aggregate Courses 10/24/2007
404 Minor Hot Asphalt Concrete FP03
404.02 Composition of Mix (Job-Mix Formula) 6/9/2006
404.03 Surface Preparation 6/9/2007
404.04 Weather Limitation 3/2/2005
404.06 Placing 3/2/2005
404.07 Compacting (a) 3/2/2005
404.09 Acceptance 3/2/2005
412 Asphalt Tack Coat FP03
412.07 Acceptance 7/3/2007
602 Culverts and Drains FP03
602.03 General 9/6/2005
<table>
<thead>
<tr>
<th>625</th>
<th>Turf Establishment</th>
<th>FP03</th>
</tr>
</thead>
<tbody>
<tr>
<td>625.03</td>
<td>General</td>
<td>2/25/2005</td>
</tr>
<tr>
<td>625.05</td>
<td>Watering</td>
<td>3/30/2005</td>
</tr>
<tr>
<td>625.06</td>
<td>Fertilizing</td>
<td>9/17/2008</td>
</tr>
<tr>
<td>625.07</td>
<td>Seeding. (a) Dry Method</td>
<td>2/25/2005</td>
</tr>
<tr>
<td>625.08</td>
<td>Mulching. (a) Dry Method</td>
<td>01/29/2009</td>
</tr>
<tr>
<td>633</td>
<td><strong>Permanent Traffic Control</strong></td>
<td>FP03</td>
</tr>
<tr>
<td>633.02</td>
<td>Material</td>
<td>3/3/2005</td>
</tr>
<tr>
<td>633.03</td>
<td>General</td>
<td>3/3/2005</td>
</tr>
<tr>
<td>633.05</td>
<td>Panels</td>
<td>3/3/2005</td>
</tr>
<tr>
<td>635</td>
<td><strong>Temporary Traffic Control</strong></td>
<td>FP03</td>
</tr>
<tr>
<td>635.03</td>
<td>General</td>
<td>5/13/2004</td>
</tr>
<tr>
<td>648.00</td>
<td>Stream Simulation</td>
<td>3/26/2007</td>
</tr>
<tr>
<td>703</td>
<td><strong>Aggregate</strong></td>
<td>FP03</td>
</tr>
<tr>
<td>705</td>
<td><strong>Rock</strong></td>
<td>FP03</td>
</tr>
<tr>
<td>705.07</td>
<td>Streambed Simulation Rock</td>
<td>2/01/2012</td>
</tr>
<tr>
<td>705.08</td>
<td>Channel Rock</td>
<td>4/17/2008</td>
</tr>
<tr>
<td>713</td>
<td><strong>Roadside Improvement Material</strong></td>
<td>FP03</td>
</tr>
<tr>
<td>718</td>
<td><strong>Traffic Signing and Mark Material</strong></td>
<td>FP03</td>
</tr>
<tr>
<td>718.05</td>
<td>Aluminum Panels</td>
<td>2/25/2009</td>
</tr>
<tr>
<td>725</td>
<td><strong>Miscellaneous Material</strong></td>
<td>FP03</td>
</tr>
</tbody>
</table>
Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-03 for construction of National Forest System Roads.
101 - Terms, Format, and Definitions

101.01 Meaning of Terms
Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.03 Abbreviations.
Add the following to (a) Acronyms:

AFPA  American Forest and Paper Association
MSHA  Mine Safety and Health Administration
NIST  National Institute of Standards and Technology
NESC  National Electrical Safety Code
WCLIB  West Coast Lumber Inspection Bureau

Add the following to (b) SI symbols:

<table>
<thead>
<tr>
<th>mp</th>
<th>Milepost</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppm</td>
<td>Part Per Million</td>
</tr>
</tbody>
</table>

101.04 Definitions.
Delete the following definitions and substitute the following:

**Bid Schedule**—The Schedule of Items.
**Bridge**—No definition.

**Contractor**—The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the “purchaser”.

**Culvert**—No definition.

**Right-of-Way**—A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Add the following:
Adjustment in Contract Price—“Equitable adjustment,” as used in the Federal Acquisition Regulations, or “construction cost adjustment,” as used in the Timber Sale Contract, as applicable.

Change—“Change” means “change order” as used in the Federal Acquisition Regulations, or “design change” as used in the Timber Sale Contract.

Design Quantity—“Design quantity” is a Forest Service method of measurement from the FS-96 Forest Service Specifications for the Construction of Roads and Bridges. Under these FP specifications this term is replaced by the term “Contract Quantities”.

Forest Service—The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Neat Line—A line defining the proposed or specified limits of an excavation or structure.

Pioneer Road—Temporary construction access built along the route of the project.

Purchaser—The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

Protected Streamcourse—A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

Road Order—An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

Schedule of Items—A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, unit price, and amount.

Utilization Standards—The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

Add Figure 101-1—Illustration of road structure terms:
Figure 101-1—Illustration of road structure terms.
102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.
103 - Scope of Work

Deletions

Delete all but subsection 103.01 Intent of Contract.
104 - Control of Work

Deletions

Delete Sections 104.01, 104.02, and 104.04.

104.03 Specifications and Drawings.
Add the following:
(c) As-Built-Plans. Furnish one set of as built plans. The Government will provide one set of contract plans to be used exclusively for recording the as-built details of the project. Use red pencil or red ink to record the information on the as-built plans.
Note all additions or revisions to the location, character, and dimensions of the prescribed work shown on the contract plans. Line out all details shown that are not applicable to the completed work. Check off details shown that were incorporated into the completed work without change. Retain the plans at the project site and, as work progresses, continually update them to reflect the as-built details. Upon request, make the plans available to the CO to review for compliance with these specifications.
Show the following types of changes on the as-built plans:

(1) Typical section(s)
(a) Revisions in dimensions (b) Revisions in materials
(2) Plan and profile
· Revisions to the alignment
· Changes in the construction limits
· Revisions in location, type, and grade of road approaches
· Location and type of utilities
· Location, size, and type of underdrains
· Skew of culverts
· Channel changes
· Location of monuments and permanent references
· Elevations for all aerial and underground crossings of utilities
· Location, length, and type of fencing
· Revisions to grades, elevations, and stationing of intersection PIs
· Equations
· Culvert diameter, length, type, and stationing. On culvert extensions, indicate the length of the existing pipe and the length of the extension.
· Location, length, stationing, and type of retaining walls
· Location, length, stationing, and end treatment of guardrail
(3) Bridge
(a) Stationing of bridge ends
(b) Revisions to footing and seal elevations
(c) Pile length, size, type, and tip elevation
(d) Any changes in plan or dimensions including any major changes in reinforcing
(4) Miscellaneous
(a) Revisions to parking areas or turnouts
(b) Final location, type and length of curbs, sidewalks, etc.
Furnish the as-built working plans to the CO before the final inspection. Correct all details found during the final inspection that are not shown on the as-built plans and return to the CO within 5 days.

Add the following subsection:

**104.06 Use of Roads by Contractor**

The Contractor is authorized to use roads under the jurisdiction of the FS for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.
105 - Control of Material

105.02 Material Sources.

105.02(a) Government-provided sources.
Add the following:
Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

105.05 Use of Material Found in the Work.
Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:
Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.
106 - Acceptance of Work

106.01 Conformity with Contract Requirements
Delete Subsection 106.01 and substitute the following:

Follow the requirements of FAR Clause 52.246-12 Inspection of Construction.

References to standard test methods of AASHTO, ASTM, GSA, and other recognized standard authorities refer to the methods in effect on the date of solicitation for bids.

Perform all work to the lines, grades, cross-sections, dimensions, and processes or material requirements shown on the plans or specified in the contract.

Incorporate manufactured materials into the work according to the manufacturer’s recommendations or to these specifications, whichever is more strict.

Plan dimensions and contract specification values are the values to be strived for and complied with as the design values from which any deviations are allowed. Perform work and provide material that is uniform in character and reasonably close to the prescribed value or within the specified tolerance range. The purpose of a tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons.

When standard manufactured items are specified (such as fence, wire, plates, rolled shapes, pipe conduits, etc., that are identified by gauge, unit mass, section dimensions, etc.), the identification will be considered to be nominal masses or dimensions. Unless specific contract tolerances are noted, established manufacturing tolerances will be accepted.

The Government may inspect, sample, or test all work at any time before final acceptance of the project. When the Government tests work, copies of test reports are furnished to the Contractor upon request. Government tests may or may not be performed at the work site. If Contractor testing and inspection is verified by the Government, the Contractor’s results may be used by the Government to evaluate work for acceptance. Do not rely on the availability of Government test results for process control.

Acceptable work conforming to the contract will be paid for at the contract unit bid price. Four methods of determining conformity and accepting work are described in Subsections 106.02 to 106.05 inclusive. The primary method of acceptance is specified in each Section of work. However, work may be rejected at any time it is found by any of the methods not to comply with the contract.

Remove and replace work that does not conform to the contract, or to prevailing industry standards where no specific contract requirements are noted, at no cost to the Government.

(a) Disputing Government test results. If the accuracy of Government test results is disputed, promptly inform the CO. If the dispute is unresolved after reasonable steps are taken to resolve the dispute, further evaluation may be obtained by written
request. Include a narrative describing the dispute and a proposed resolution protocol that addresses the following:

1. Sampling method;
2. Number of samples;
3. Sample transport;
4. Test procedures;
5. Testing laboratories;
6. Reporting;
7. Estimated time and costs; and
8. Validation process.

If the evaluation requires additional sampling or testing be performed, mutually agree with the Government on witnessing procedures and on sampling and testing by a third party laboratory. Use a third party laboratory accredited by the AASHTO accreditation program. Provide proof of the laboratory’s accreditation for the test procedures to be used. Do not use the same laboratory that produced the disputed Government test results or that produced the test results used as a basis for the dispute.

The CO will review the proposed resolution protocol and may modify it before final approval and execution.

The Government will use the approved resolution protocol test results to determine the validity of the disputed testing. If the Government test results are validated, the Contractor will be responsible for all costs associated with developing and performing the resolution protocol. If the Government test results are not validated, the Government will be responsible for all costs associated with developing and performing the resolution protocol. If the validity of the Government test results cannot be determined, the Contractor and Government will equally share all costs associated with developing and carrying out the resolution protocol.

(b) Alternatives to removing and replacing non-conforming work. As an alternative to removal and replacement, the Contractor may submit a written request to:

1. Have the work accepted at a reduced price; or
2. Be given permission to perform corrective measures to bring the work into conformity.

The request must contain supporting rationale and documentation. Include references or data justifying the proposal based on an evaluation of test results, effect on service life, value of material or work, quality, aesthetics, and other tangible engineering basis. The CO will determine disposition of the nonconforming work.
106.07 Delete
Delete subsection 106.07.
107 - Legal Relations and Responsibility to the Public

107.05 Responsibility for Damage Claims.
Delete the entire subsection.

107.06 Contractor’s Responsibility for Work.
Delete the following from the first paragraph.
“except as provided in Subsection 106.07”.

107.09 Legal Relationship of the Parties.
Delete the entire subsection.

107.10 Environmental Protection.
Add the following:
Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.

Before beginning any work, submit a Hazardous Spill Plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications the Contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.
The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.
108 - Prosecution and Progress

108 Delete.

Delete Section 108 in its entirety.
109 Deletions
Delete the following entire subsections:

109.06 Pricing of Adjustments.
109.07 Eliminated Work.
109.08 Progress Payments.
109.09 Final Payment.

109.02 Measurement Terms and Definitions.
(b) Contract quantity.
Add the following:
Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:
“(b) Cubic yard” to “(c) Cubic yard”.

Add the following definition:
(p) Thousand Board Feet (Mbf). 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.
152 - Construction Survey and Staking

Description

152.01(c) Material.
Add the following:
Use required stake dimensions and materials. Pre-paint the top 2 inches of all stakes and lath, or mark them with plastic flagging. Use designated colors for paint or flagging. Mark all stakes with a stake pencil that leaves a legible imprint, or with waterproof ink.
Do not use aerosol spray paints.
Use moisture-resistant paper for survey notes. Keep notes in books with covers that will protect the contents and retain the pages in numerical sequence.

Construction Requirements

152.02 General.
Delete the first two sentences.
Add the following:
When indicated on the plans, a preliminary survey line has been established on the ground. The project location line is established by offsets from this preliminary line.
Delete second sentence in second paragraph and replace with the following:
Reestablish missing reference, control lines, or stakes as necessary to control subsequent construction staking operations

152.03 Survey and Staking Requirements.

(b) Roadway cross-sections.
Replace the first two sentences with the following:
Take roadway cross-sections normal to centerline. When the centerline curve radius is less than or equal to 200 feet, take cross-sections at a maximum centerline spacing of 25 feet. When the centerline curve radius is greater that 200 feet take cross-sections at a maximum centerline spacing of 80 feet.

c) Slope Stakes & References:
Replace section with the following:
Slope stakes and references. When required, locate slope stakes on designated portions of the road. Locate the slope stake catch points and use them to establish clearing limits and slope stake references.

Mark slope stakes with the station, the amount of cut or fill, the horizontal distance to centerline, and the slope ratios.

Place slope reference stakes at least 10 feet outside the clearing limit and mark with the offset distance to the slope stake. Place sight stakes when required.

Prior to clearing and grubbing operations, move the slope stake outside the clearing limit to the slope reference stake. After clearing and grubbing and before excavation, reset the slope stakes in their original position.

Use the designated method to establish the slope stake catchpoint.

- **Method I**—Computed Method. Use the template information shown in the plans or other Government-provided data to calculate the actual location of the catchpoint. The slope stake “catchpoint distance” provided may be used as a trial location to initiate slope staking. Recatch slope stakes on any section that does not match the staking report within the tolerances established in Table 152-2.

- **Method II**—Catchpoint Measurement Method. Determine the location of slope stake catchpoints by measuring the catchpoint distances shown in the plans or other Government-provided data.

**Preexisting Method**

**Clearing and grubbing limits.**

Add the following:

Establish clearing limits on each side of the location line by measuring the required horizontal or slope distances shown in the stake notes. Mark the clearing limits with flagging or tags on trees to be left standing, or on lath. Make markings intervisible, and no more than 90 feet apart.

After establishing clearing limits, move the location line stake outside the clearing limits for station identification purposes, and mark it with horizontal distance to location line

**Centerline reestablishment.**

Replace with the following:

Reestablish centerline from instrument control points. The maximum spacing between centerline points is 25 feet when the centerline curve radius is less than or equal to 200 feet. When the centerline curve radius is greater than 200 feet, the maximum distance between centerline points is 80 feet.

**Culverts.**

Replace subsection with the following:

Set culvert reference stakes at all culvert locations. Set a culvert reference stake on the centerline of the culvert 10 feet from each end or beyond the clearing limit, whichever is greater. Record the following on culvert reference stakes:

1. Diameter, actual field measured length, and type of culvert.
(2) The vertical and horizontal distance from the reference stake to the invert at the ends of the culvert.

(3) Station of actual point where culvert intersects centerline.

When required, stake headwall for culverts by setting a hub with a guard stake on each side of the culvert on line with the face of the headwall. Perform this work after clearing is completed.

**152.03 (l) Miscellaneous Survey and Staking.**

Add the following:

- (11) Cattleguards
- (12) Drain Dips
- (13) Erosion Control Measures
Replace Table 152-1 with the following two tables:

**Table 152-1 Tolerances for reestablishing P-line, traverse, and elevations.**

<table>
<thead>
<tr>
<th>Precision Class</th>
<th>Minimum Position Closure</th>
<th>Angular Accuracy (±)</th>
<th>L-Line Tangent Control Points&lt;sup&gt;a&lt;/sup&gt; (±)</th>
<th>Vertical Closure&lt;sup&gt;b&lt;/sup&gt; (±)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Bridges)</td>
<td>1/10,000</td>
<td>2 sets, direct/reverse 10 second rejection limit</td>
<td>N/A</td>
<td>0.02 ft or 0.02ft/1000ft&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>B</td>
<td>1/5,000</td>
<td>2 sets, direct/reverse 20 second rejection limit</td>
<td>0.1 ft</td>
<td>0.02 ft or 0.02ft/1000ft&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>C</td>
<td>1/1,000</td>
<td>1 set, direct/reverse 1 minute rejection limit</td>
<td>0.2 ft</td>
<td>0.5ft/1000ft&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>D</td>
<td>1/300</td>
<td>Foresight and backsight; 15 minute rejection limit&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.4 ft</td>
<td>1.0ft/1000ft&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>E</td>
<td>1/100</td>
<td>Foresight and backsight; 30 minute rejection limit&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.8 ft</td>
<td>1.0ft/1000ft&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Accuracy of offset measurement.
<sup>b</sup> Determine vertical closures at intervals not to exceed 2000 ft as measured along centerline.
<sup>c</sup> Use greater value.
Table 152-2 Cross section and slope stake tolerances.

<table>
<thead>
<tr>
<th>Item</th>
<th>Tolerances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Allowable deviation of cross-section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves</td>
<td>(±)2°</td>
</tr>
<tr>
<td>Take cross-sections topography measurements so that variations in ground from a straight line connecting the cross-section points will not exceed</td>
<td>0.5 ft</td>
</tr>
<tr>
<td>Horizontal and vertical accuracy for cross-sections, in feet or percentage of horizontal distance measured from traverse line, whichever is greater.</td>
<td>0.1 ft or 0.4%</td>
</tr>
<tr>
<td>Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits. In feet or percentage of horizontal distance measured from centerline or reference stake, whichever is greater.</td>
<td></td>
</tr>
<tr>
<td>Slope reference stakes and slope stakes.</td>
<td>0.1 ft or 0.4%</td>
</tr>
<tr>
<td>Clearing limits</td>
<td>1.0 ft</td>
</tr>
</tbody>
</table>
153 - Contractor Quality Control

153.02 Contractor Quality Control Plan.

Add the following:
Submit written proposals for approval of alternate AASHTO or State approved test methods. Alternate methods may be allowed based on documented equivalence to the specified method.

153.04 Records.
Delete all but the first sentence
155 - Schedules for Construction Contracts

155 Delete.

Delete Section 155 in its entirety.

156 - Public Traffic

156.03 Accommodating Traffic During Work.
Delete the following from the last paragraph:
according to Subsection 106.07(b)

156.04 Maintaining Roadways During Work.
(a) Add the following:
Do not construct detours outside of the clearing limits or use alternate route detours without the approval of the CO.

156.08 Traffic and Safety Supervisor.
Delete this subsection in its entirety.
157 - Soil Erosion Control

Description

157.01 Add the following:
This includes protection of all phases of work during the life of the contract including storm events.

Materials

157.02 Add the following:

Coarse Aggregate for Concrete........................................703.02
Watertight Gaskets..............................................................712.03

Construction Requirements

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 including a channel diversion and dewatering plan if dewatering is required. 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 by 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 or otherwise improve the diversion of 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, subsection 107.01 Laws to be Observed and subsection 107.10 Environmental Protection, and subsection 107.11, 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 10 days in advance. 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:

Prior to construction, Contracting Officer will delineate critical riparian vegetation areas, wetlands, and other sensitive sites to prevent ground disturbance. Minimize disturbance to existing vegetation along stream.

Where necessary, danger tree removal may be required. Fell danger trees within riparian areas. Where possible, fell trees towards the stream. Dispose of trees as directed by the Contracting Officer.

Confine work within the construction limits marked by the Contracting Officer. Use existing roadways or travel paths whenever reasonable. Minimize the number of new access paths.

Dispose of waste material at approved sites.

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.

157.04(b) Add the following:

For the work immediately adjacent to the stream, use sediment control barriers between the work and the stream. Place sediment barriers prior to construction around sites where significant levels of erosion may enter the stream directly or through road ditches.

Provide straw bales and silt fence for sediment control measures for each channel crossing being constructed concurrently. Use only as needed for sediment control or when specified by the Contracting Officer.

Provide waterproof membrane products to cover all stockpiled material adjacent to a live stream that is subject to erosion or water saturation. Cover stockpiles at the end of each work day and all day during the threat of precipitation or when specified by the Contracting Officer.

157.04(d) Delete the subsection and replace with the following:

Apply temporary turf establishment, mulch and stabilization measures on disturbed areas within three days of the last disturbance. Short-term stabilization measures may include the use of non-native sterile seed mix when native seeds are not available; weed-free certified straw, jute
matting, and other similar techniques. Maintain short-term stabilization measures until permanent erosion control measures are effective.

**157.04(f)** Add the following:

When required by the Contracting Officer, loosen compacted areas, such as access roads, stream crossings, staging, and stockpile areas.

**157.09 Diversions. Add the Following:**

Construct stream diversion, related appurtenances and measures as follows:

(a) In Stream Work.

(1) Isolate construction area and coordinate with Contracting Officer for aquatic species removal by the Government. Coordinate aquatic species removal a minimum of 10 working days prior to beginning isolation of construction areas.

(2) Cease project operations under high flow conditions that inundate the project area, except for efforts to avoid or minimize resource damage.

(3) When approved, minimize time in which heavy equipment is in stream channels, riparian areas, and wetlands. Operate heavy equipment in streams only when Contracting Officer determines that such actions are the only reasonable alternative for implementation, or would result in less sediment in the stream channel or damage (short- or long-term) to the overall aquatic and riparian ecosystem relative to other alternatives.

(4) Clean and repair all equipment used in the in-stream work prior to entering the project area. Remove external oil and grease, along with dirt and mud, prior to construction. Inspect equipment daily for leaks or accumulations of grease, and repair any identified problems prior to entering streams or areas that drain directly to streams or wetlands.

(5) Fuel and service equipment used for in stream or riparian work in an approved staging area outside of riparian zone. When not in use, store vehicles in the staging area.

(b) Stream Bypass Dam and Pipe. Construct a dam of material handling bags, and bypass pipe as shown on the Plans or as approved by the CO. The mining of material from the streambed or floodplain to construct diversions is not permitted. If diversion allows for downstream aquatic species passage, (i.e., is not screened), place diversion outlet in a location to promote safe reentry of aquatic species into the stream channel, preferably into pool habitat with cover.
(1) Primary Bypass Dam. Construct the material handling bag dam in a dry condition by first pumping the stream around the dam. Place temporary cofferdams as needed. Remove rock and other 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 bags, 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 or on the upstream side of the 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 Subsection 712.03. Do not place backfill until the pipe joints have been 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) Material handling bags. Use only clean sand or coarse concrete aggregate in the bags. Loosely fill and tamp the bags in place to minimize seepage between, under, and around the bags.

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

(6) Sediment Retention Pond. Provide a pond immediately downstream of the construction area capable of collecting and holding all seepage, drainage, and sediment not captured in stream diversion. Provide sufficient storing capacity to enable a sump pump to transfer the water, sediment and turbidity to a suitable treatment facility or area. Construct a downstream cofferdam to create a sediment retention pond when none is available immediately downstream of the project, when it is too small to use or to prevent water from entering the work area.

(c) 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. When adjacent stream crossing projects are constructed concurrently, provide a minimum of one extra pump on site for the largest discharge site. 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. Pumps must have fish screens if used in streams where aquatic species are present and be operated in accordance with National Marine Fisheries Service (NMFS) aquatic species screen criteria. Equip the pump with
approved 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 and sediment retention pond. 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.

(d) 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. Use suspended sediment coagulation agent according to manufacturer’s recommendations.

(e) Stream Re-Watering. Monitor downstream during rewatering to prevent stranding of aquatic organisms below the construction site. Ensure that concrete is sufficiently cured or dried before coming into contact with stream flow.

157.13 Maintenance & Cleanup. **Add the following:**
When removing sandbags, spread sand away from the waterway; if coarse concrete aggregate meeting the requirements of Subsection 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.
170 - Develop Water Supply and Watering

Description

170.01 This work consists of developing an acceptable water supply, furnishing, hauling, and applying water.

Materials

170.02 Conform to the following subsection.

Water 725.01.

Construction Requirements

170.03 Development of Supply & Access. Develop water supplies and access to the water supplies as required. Use designated water sources or other approved water sources. Before using non-designated water sources, obtain all necessary permissions, water rights, and permits.

170.04 Equipment.

(a) Water tanks. Provide mobile watering equipment with watertight tanks of known capacity. Provide for positive control of water application from the driver’s position.

(b) Juvenile fish protection. All draft hoses being used to withdraw water from any live flowing stream or pond will utilize one of the following methods of screening.

   (1) Perforated plate: Screen opening shall not exceed 3/32 or 0.0938-inches.

   (2) Profile bar screen: The narrowest dimension in the screen openings shall not exceed 0.0689-inches in the narrowest direction.

   (3) Woven wire screen: Screen openings shall not exceed 3/32 or 0.0938-inches in the narrow direction.

All methods shall be cleaned frequently with either wire brushing, flushing or other acceptable method.

170.05 Application. Apply water uniformly without ponding or washing.

170.06 Acceptance. Developing water supplies and watering will be evaluated under Subsections 106.02 and 106.04.

Measurement and Payment

170.07 See Subsection 109.05.
Do not measure develop water supply and watering for payment.

171 - Weed and Disease Prevention

Description
171.01 This work consists of washing and treating construction equipment to remove seeds, plants, and plant fragments from the equipment before the equipment is used on National Forest System lands.

Material

171.02 Conform to the following Subsection:

Water 725.01

Construction Requirements

171.03 General. Notify the CO in writing at least 15 days before moving any construction equipment onto National Forest System lands. Construction equipment does not include cars, pickup trucks, and other vehicles that regularly travel between the construction site and areas outside of National Forest System lands.

Perform all work at a location designated on the plans or other locations approved in writing. Provide the CO with an opportunity to monitor the washing and inspection.

171.04 Equipment. Use a high pressure washing system.

For work on National Forest System lands, use a washing system that traps all wash water and either stores it for removal from National Forest System lands or recycles the water for continued use. If the equipment recycles the water, provide adequate filters for seed removal. Dispose of the filter material and removed seeds in an approved manner. Do not mix soaps, detergents, or other chemicals with the wash water.

For work at a commercial washing facility, use an approved facility.

171.05 Washing. Wash the sides, tops, and undercarriages of all construction equipment. Remove all seeds, plants, plant fragments, dirt, and debris from the construction equipment.

171.06 Inspection. Inspect the washed construction equipment, including the undercarriage, to ensure that the washing removed the dirt, debris, and seeds from the construction equipment. Rewash the construction equipment as necessary or as directed.

171.07 Acceptance. Weed prevention will be evaluated under Subsection 106.02.

Measurement

171.08 Do not measure weed prevention for payment.

Payment
171.09 Include all costs associated with the Section 171-Weed Prevention in the unit price for Section 151-Mobilization.

201 - Clearing and Grubbing

201.01 Description

Replace with the following:

This work consists of clearing and grubbing within clearing limits and other designated areas.

201.04 Clearing. (c)
Delete paragraph (c) and replace with the following:

(c) In areas outside the excavation, embankment, and slope rounding limits, cut stumps to within 12 inches or one-third of the stump diameter of the ground, whichever is higher, measured on the side adjacent to the highest ground. For timber sales, stump heights will meet the requirements of the Timber Sale contract.

201.04 Clearing.
Delete subsection (d) and replace with the following:

(d) Do not cut vegetation less than 3 feet tall and less than 3 inches in diameter, that is within the clearing limits but beyond the roadway and not in a decking area, and that does not interfere with sight distance along the road.

Add the following:

(e) Trim branches of remaining trees or shrubs to give a clear height of 14 feet above the roadbed unless otherwise indicated. Trim tree limbs as near flush with the trunk as practicable.

(f) Remove brush from log decks. Deck logs so that logs are piled parallel to one another; can be removed by standard log loading equipment; will not damage standing trees; will not interfere with drainage, and will not roll. Keep logs in log decks free of brush and soil.
201.06 Disposal
Delete the first sentence of this subsection.

203 - Removal of Structures and Obstructions

203.01 Description.
Delete and replace with the following:
This work consists of disposing of construction slash and debris, salvaging, removing, and disposing of buildings, fences, structures, pavements, culverts, utilities, curbs, sidewalks, and other obstructions.

203.04 Removing Material.
Replace the fourth and fifth paragraphs with the following:
Where part of an existing culvert is removed, remove the entire culvert upstream from the removal. The remaining downstream culvert may be left in place if no portion of the culvert is within 12 inches of the subgrade, embankment slope, or new culvert or structure; and the culvert ends are sealed with concrete.

Remove structures and obstructions in the roadbed to 12 inches below subgrade elevation. Remove structures and obstructions outside the roadbed to 12 inches below finished ground or to the natural stream bottom.

203.05 Disposing of Material
Add the following:
(e) Windrowing Construction Slash. Place construction slash outside the roadway in neat, compacted windrows approximately parallel to and along the toeline of embankment slopes. Do not permit the top of the windrows to extend above subgrade. Use construction equipment to matt down all material in a windrow to form a compact and uniform pile. Construct breaks of at least 15 feet at least every 200 feet in a windrow. Do not place windrows against trees. Obtain approval for pioneer roads. A pioneer road may be constructed to provide an area for placement of windrows, provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

(f(1)) Scattering method outside clearing limits. Scatter construction slash outside the clearing limits without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will not roll, and are not on top of one another. Limb and scatter other construction slash to reduce slash concentrations.

(f(2)): Scattering method inside clearing limits. Scatter pieces of wood less than 3 inches in diameter and 3 feet in length within the clearing limits. Do not place construction slash in lakes,
meadows, streams, or streambeds. Immediately remove construction slash that interferes with drainage structures.

(g) Chipping or Grinding. Use an approved chipping machine to grind slash and stumps greater than 3 inches in diameter and longer than 3 feet. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth less than 6 inches. Minor amounts of chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.

(h) Debris Mat. Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat upon which construction equipment is operated. Place stumps upside down and blend stumps into the mat.

(i) Decking Firewood Material. Remove brush from decks. Limb and deck logs that do not meet Utilization Standards according to Subsection 201.04 as directed by the CO. Cut logs to lengths less than 30 feet. Ensure that logs stacks are stable and free of brush and soil.

(j) Removal to designated locations. Remove construction slash to designated locations.

(k) Piling. Pile construction slash in designated areas. Place and construct piles so that if the piles are burned, the burning will not damage remaining trees. Keep piles free of dirt from stumps. Cut unmerchantable logs into lengths of less than 20 feet.

(l) Placing Slash on Embankment Slopes. Place construction slash on completed embankment slopes to reduce soil erosion. Place construction slash as flat as practicable on the completed slope. Do not place slash closer than 2 feet below subgrade. Priority for use of available slash is for: (1) through fills; (2) insides of curves; and (3) ditch relief outlets.

(m) Hydrological Sensitive Placement. Where required use this method in combination with other designated methods to dispose of material to reduce erosion and to aid in re-vegetation:

1. Place windrow segments on contours, wrap in type I geotextile.
2. Place logs as log erosion barriers on contours. Place logs so that 80% of their length is on the ground surface.
3. Scatter slash on bare or disturbed areas within or outside the clearing limits as directed.
4. Scatter chips or ground woody material on bare or disturbed areas within or outside the clearing limits as directed.

Place stumps in swales or on sites to form planting pockets. Place windrow segments on contours, wrap in type I geotextile.

203.05 Disposing of Material

(a) Remove from project.

Delete the last two sentences
203.08 Payment
Add the following:
Disposal of construction slash will be compensated under the designated pay item in Section 201.
Replace Section 204 in its entirety with the following:

**Description**

204.01 This work consists of excavating material and constructing embankments. This includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing earthen and rocky material.

204.02 Definitions.

(a) Excavation. Excavation consists of the following:

(1) **Roadway excavation.** All material excavated from within the right-of-way or easement areas, except subexcavation covered in (2) below and structure excavation covered in Sections 208 and 209. Roadway excavation includes all material encountered regardless of its nature or characteristics.

(2) **Subexcavation.** Material excavated from below subgrade elevation in cut sections or from below the original groundline in embankment sections. Subexcavation does not include the work required by Subsections 204.05, 204.06(b), and 204.06(c).

(3) **Borrow excavation.** Material used for embankment construction that is obtained from outside the roadway prism. Borrow excavation includes unclassified borrow, select borrow, and select topping.

(b) Embankment construction. Embankment construction consists of placing and compacting roadway or borrow excavation. This work includes:

(1) Preparing foundation for embankment;
(2) Constructing roadway embankments;
(3) Benching for side-hill embankments;
(4) Constructing dikes, ramps, mounds, and berms; and
(5) Backfilling subexcavated areas, holes, pits, and other depressions.

(c) **Conserved topsoil.** Excavated material conserved from the roadway excavation and embankment foundation areas that is suitable for growth of grass, cover crops, or native vegetation.

(d) **Waste.** Excess and unsuitable roadway excavation and subexcavation that cannot be used.
Material

204.03 Conform to the following Subsections:

- Backfill material
- Select borrow
- Select topping
- Topping
- Unclassified borrow
- Water

Construction Requirements

204.04 Preparation for Roadway Excavation and Embankment Construction. Clear the area of vegetation and obstructions according to Sections 201 and 203.

204.05 Reserved.

204.06 Roadway Excavation. Excavate as follows:

(a) General. Do not disturb material and vegetation outside the construction limits. Incorporate only suitable material into embankments. Replace any shortage of suitable material caused by premature disposal of roadway excavation. Dispose of unsuitable or excess excavation material according to Subsection 204.14.

At the end of each day's operations, shape to drain and compact the work area to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

Retrieve material deposited outside of the clearing limits as directed by the CO. Place unsuitable material in designated areas.

(b) Rock cuts. Blast rock according to Section 205. Excavate rock cuts to 6 inches below subgrade within the roadbed limits. Backfill to subgrade with topping or with other suitable material. Compact the material according to Subsection 204.11.

(c) Earth cuts. Scarify earth cuts to 6 inches below subgrade within the roadbed limits. Compact the scarified material according to Subsection 204.11.

(d) Pioneer Roads. Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated into the roadway unless specified in the slash treatment method. Maintain drainage during pioneering operations.

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into embankments. Place snow or ice in a manner to prevent resource damage.
204.07 **Subexcavation.** Excavate material to the limits designated by the CO. Take cross-sections according to Section 152. Prevent unsuitable material from becoming mixed with the backfill. Dispose of unsuitable material according to Subsection 204.14. Backfill the subexcavation with topping, or other suitable material. Compact the material according to Subsection 204.11.

204.08 **Borrow Excavation.** Use all suitable roadway excavation in embankment construction. Do not use borrow excavation when it results in excess roadway excavation. Deduct excess borrow excavation from the appropriate borrow excavation quantity.

Obtain borrow source acceptance according to Subsection 105.02. Develop and restore borrow sources according to Subsection 105.03. Do not excavate beyond the established limits. When applicable, shape the borrow source to permit accurate measurements when excavation is complete.

204.09 **Preparing Foundation for Embankment Construction.** Prepare foundation for embankment construction as follows:

(a) **Embarkment less than 4 feet high over natural ground.** When designated, remove topsoil and break up the ground surface to a minimum depth of 6 inches by plowing or scarifying. Compact the ground surface according to Subsection 204.11.

(b) **Embarkments over an existing asphalt, concrete, or gravel road surface.** Scarify gravel roads to a minimum depth of 6 inches. Scarify or pulverize asphalt and concrete roads to 6 inches below the pavement. Reduce all particles to a maximum size of 6 inches and produce a uniform material. Compact the surface according to Subsection 204.11.

(c) **Embarkment across ground not capable of supporting equipment.** Dump successive loads of embankment material in a uniformly distributed layer to construct the lower portion of the embankment. Limit the layer thickness to the minimum depth necessary to support the equipment.

(d) **Embarkment on an existing slope steeper than 1V:3H.** Cut horizontal benches in the existing slope to a sufficient width to accommodate placement and compaction operations and equipment. Bench the slope as the embankment is placed and compacted in layers. Begin each bench at the intersection of the original ground and the vertical cut of the previous bench.

204.10 **Embarkment Construction.** Incorporate only suitable roadway excavation material into the embankment. When the supply of suitable roadway excavation is exhausted, furnish unclassified borrow to complete the embankment. Obtain written approval before beginning construction of embankments over 6 feet high at subgrade centerline. Construct embankments as follows:

(a) **General.** At the end of each day's operations, shape to drain and compact the embankment surface to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

During all stages of construction, route and distribute hauling and leveling equipment over the width and length of each layer of material.
Compact embankment side slopes flatter than 1V:1.75H with a tamping type roller or by walking with a dozer. For slopes 1V:1.75H or steeper, compact the slopes as construction of the embankment progresses.

Where placing embankment on one side of abutments, wing walls, piers, or culvert headwalls, compact the material using methods that prevent excessive pressure against the structure.

Where placing embankment material on both sides of a concrete wall or box structure, conduct operations so compacted embankment material is at the same elevation on both sides of the structure.

Where structural pilings are placed in embankment locations, limit the maximum particle size to 4 inches.

(b) Embankment within the roadway prism. Place embankment material in horizontal layers not exceeding 12 inches in compacted thickness. Incorporate oversize boulders or rock fragments into the 12-inch layers by reducing them in size or placing them individually as required by (c) below. Compact each layer according to Subsection 204.11 before placing the next layer.

Material composed predominately of boulders or rock fragments too large for 12-inch layers may be placed in layers up to 24 inches thick. Incorporate oversize boulders or rock fragments into the 24-inch layer by reducing them in size or placing them individually according to (c) below. Place sufficient earth and smaller rocks to fill the voids. Compact each layer according to Subsection 204.11 before placing the next layer.

(c) Individual rock fragments and boulders. Place individual rock fragments and boulders greater than 24 inches in diameter as follows:

1. Reduce rock to less than 48 inches in the largest dimension.
2. Distribute rock within the embankment to prevent nesting.
3. Place layers of embankment material around each rock to a depth not greater than that permitted by (b) above. Fill all the voids between rocks.
4. Compact each layer according to Subsection 204.11 before placing the next layer.

(d) Embankment outside of roadway prism. Where placing embankment outside the staked roadway prism, place material in horizontal layers not exceeding 24 inches in compacted thickness. Compact each layer according to Subsection 204.11.

204.11 Compaction. Compact the embankment using one of the following methods as specified:

(a) Compaction A. Use AASHTO T 27 to determine the amount of material retained on a Number 4 sieve. If there is more than 80 percent retained on the No. 4 sieve use procedure (1). If there is 50 to 80 percent retained on the No. 4 sieve use procedure (2). If there is less than 50 percent retained on the No. 4 sieve use procedure (3).

1. Adjust the moisture content to a level suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Use compression-type rollers at speeds
less than 6 feet per second and vibratory rollers at speeds less than 3 feet per second. Compact each layer of material full width with one of the following and until there is no visible evidence of further consolidation.

(a) Four roller passes of a vibratory roller having a minimum dynamic force of 40,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.
(b) Eight roller passes of a 20-ton compression-type roller.
(c) Eight roller passes of a vibratory roller having a minimum dynamic force of 30,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

Increase the compactive effort for layers deeper than 12 inches as follows:
- For each additional 6 inches or fraction thereof, increase the number of roller passes in (a) above by four passes.
- For each additional 6 inches or fraction thereof, increase the number of roller passes in (b) and (c) above, by eight passes.

(2) Use AASHTO T 99 to determine the optimum moisture content of the portion of the material passing a No. 4 sieve. Multiply this number by the percentage of material passing a No. 4 sieve, and add 2 percent to determine the optimum moisture content of the material. Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type rollers at speeds less than 6 feet per second and vibratory rollers at speeds less than 3 feet per second. Compact each layer of material full width according to (1) above.

(3) Classify the material according to AASHTO M 145. For material classified A-1 or A-2-4, determine the maximum density according to AASHTO T 180, method D. For other material classifications, determine the optimum moisture content and maximum density according to AASHTO T 99, method C.

Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type or vibratory rollers. Compact each layer of material full width to at least 95 percent of the maximum density. Determine the in-place density and moisture content according to AASHTO T 310 or other approved test procedures. When required, use AASHTO T 224 to correct for coarse particles.

(b) Compaction B. Place material by end dumping to the minimum depth needed for operation of spreading equipment. Adjust the moisture content of the material to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Operate compaction equipment over the full width of each layer until there is no visible evidence of further
consolidation or, if when a sheepsfoot roller is used, the roller “walks out” of the layer. Make at least three complete passes.

(c) **Compaction C.** Place material by end dumping to the minimum depth needed for operation of spreading equipment. Level and smooth each embankment layer before placing the next layers. Operate hauling and spreading equipment uniformly over the full width of each layer. Construct a solid embankment with adequate compaction by working smaller rock and fines in with the larger rocks to fill the voids, and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

### 204.12 Ditches

Slope, grade, and shape ditches. Remove all projecting roots, stumps, rock, or similar matter. Maintain all ditches in an open condition and free from leaves, sticks, and other debris.

Form furrow ditches by plowing or using other acceptable methods to produce a continuous furrow. Place all excavated material on the downhill side so the bottom of the ditch is approximately 18 inches below the crest of the loose material. Clean the ditch using a hand shovel, ditcher, or other suitable method. Shape to provide drainage without overflow.

### 204.13 Sloping, Shaping, and Finishing

Complete slopes, ditches, culverts, riprap, and other underground minor structures before placing aggregate courses. Slope, shape, and finish as follows:

(a) **Sloping.** Leave all earth slopes with uniform roughened surfaces, except as described in (b) below, with no noticeable break as viewed from the road. Except in solid rock, round tops and bottoms of all slopes including the slopes of drainage ditches. Round material overlaying solid rock to the extent practical. Scale all rock slopes. Slope rounding is not required on tolerance class D though M roads.

If a slide or slipout occurs on a cut or embankment slope, remove or replace the material, and repair or restore all damage to the work. Bench or key the slope to stabilize the slide. Reshape the cut or embankment slope to an acceptable condition.

(b) **Stepped slopes.** Where required by the contract, construct steps on slopes of $1\frac{1}{2}:1\mathrm{H}$ to $1\mathrm{H}:2\mathrm{H}$. Construct the steps approximately 18 inches high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

(c) **Shaping.** Shape the subgrade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

(d) **Finishing.** Finish the roadbed to be smooth and uniform, and shaped to conform to the typical sections. Remove unsuitable material from the roadbed and replace it with suitable material. Finish roadbeds to the tolerance class shown in table 204-2. Ensure that the subgrade is visibly
moist during shaping and dressing. Scarify to 6 inches below the bottom of low sections, holes, cracks, or depressions and bring back to grade with suitable material. Maintain proper ditch drainage.

For surfaced roads, remove all material larger than 6 inches from the top 6 inches of the roadbed.

For unsurfaced roads, use one of the following methods to finish the roadbed:

1. **Method A.** Remove all material larger than 6 inches from the top 6 inches of the roadbed and replace with suitable material.
2. **Method B.** Use a vibratory grid roller or approved equal with a minimum weight of 10 tons. Roll at least 5 full-width passes or until there is no visible evidence of further consolidation.
3. **Method C.** For roads designated as Construction Tolerance Class K, L, or M, finish the roadbed by spreading the excavation. Eliminate rock berms.

### 204.14 Disposal of Unsuitable or Excess Material
Dispose of unsuitable or excess material at designated sites or legally off of the project.

When there is a pay item for waste, shape and compact the waste material in its final location. Do not mix clearing or other material not subject to payment with the waste material.

### 204.15 Acceptance
See Table 204-1 for sampling and testing requirements.

Material for embankment and conserved topsoil will be evaluated under Subsections 106.02 and 106.04.

Excavation and embankment construction will be evaluated under Subsections 106.02 and 106.04.

Clearing and removal of obstructions will be evaluated under Sections 201 and 203.

### Measurement

### 204.16 Measure the Section 204 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

(a) **Roadway excavation.** Measure roadway excavation in its original position as follows:

1. Include the following volumes in roadway excavation:
   1. Roadway prism excavation;
   2. Rock material excavated and removed from below subgrade in cut sections;
   3. Unsuitable material below subgrade and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
   4. Ditches, except furrow ditches measured under a separate bid item;
   5. Topsoil;
   6. Borrow material used in the work when a pay item for borrow is not shown in the
bid schedule;

(g) Loose scattered rocks removed and placed as required within the roadway;

(h) Conserved material taken from stockpiles and used in Section 204 work; and

(i) Slide and slipout material not attributable to the Contractor’s method of operation.

(2) Do not include the following in roadway excavation:

(a) Overburden and other spoil material from borrow sources;

(b) Overbreakage from the backslope in rock excavation;

(c) Water or other liquid material;

(d) Material used for purposes other than required;

(e) Roadbed material scarified in place and not removed;

(f) Material excavated when stepping cut slopes;

(g) Material excavated when rounding cut slopes;

(h) Preparing foundations for embankment construction;

(i) Material excavated when benching for embankments;

(j) Slide or slipout material attributable to the Contractor’s method of operation;

(k) Conserved material taken from stockpiles constructed at the option of the Contractor; and

(l) Material excavated outside the established slope limits.

(3) When both roadway excavation and embankment construction pay items are shown in the bid schedule, measure the following as roadway excavation only:

(a) Unsuitable material below subgrade in cuts and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;

(b) Slide and slipout material not attributable to the Contractor’s method of operations;

(c) Drainage ditches, channel changes, and diversion ditches.

(b) Unclassified borrow, select borrow, and select topping. When measuring by the cubic yard measure in its original position. If borrow excavation is measured by the cubic yard in place, take initial cross-sections of the ground surface after stripping overburden. Upon completion of excavation and after the borrow source waste material is returned to the source, retake cross-sections before replacing the overburden.

Do not measure borrow excavation used in place of excess roadway excavation.

(c) Embankment construction. Measure embankment construction in its final position. Do not make deductions from the embankment construction quantity for the volume of minor structures.

(1) Include the following volumes in embankment construction:

(a) Roadway embankments;

(b) Material used to backfill subexcavated areas, holes, pits, and other depressions;

(c) Material used to restore obliterated roadbeds to original contours; and

(d) Material used for dikes, ramps, mounds, and berms.

(2) Do not include the following in embankment construction:
(a) Preparing foundations for embankment construction;

(b) Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and

(c) Material used to round fill slopes.

(d) **Rounding cut slopes.** Measure rounding cut slopes horizontally along the centerline of the roadway if a pay item for slope rounding is included in the bid schedule. If a pay item for slope rounding is not included in the bid schedule slope rounding will be considered subsidiary to excavation.

(e) **Waste.** Measure waste by the cubic yard in its final position. Take initial cross-sections of the ground surface after stripping overburden. Upon completion of the waste placement, retake cross-sections before replacing overburden.

(f) **Slope scaling.** Measure slope scaling by the cubic yard in the hauling vehicle.

**Payment**

204.17 The accepted quantities will be paid at the contract price per unit of measurement for the Section 204 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.
<table>
<thead>
<tr>
<th>Material or Product</th>
<th>Type of Acceptance (Subsection)</th>
<th>Characteristic</th>
<th>Test Methods Specifications</th>
<th>Sampling Frequency</th>
<th>Point of Sampling</th>
<th>Split Sample</th>
<th>Reporting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topping (704.05) &amp; unclassified borrow (704.06)</td>
<td>Measured and tested for conformance (106.04)</td>
<td>Classification</td>
<td>AASHTO M 145</td>
<td>1 per soil type</td>
<td>Processed material before incorporating in work</td>
<td>Yes, when requested</td>
<td>Before using in work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moisture-density</td>
<td>AASHTO T 180, method D(1) or T 99, method C(1)</td>
<td>1 per soil type but not less than 1 per 13,000 yd³</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compaction</td>
<td>AASHTO T 310 or other approved procedures</td>
<td>1 per 6000 yd³ but not less than 1 per layer</td>
<td>In-place</td>
<td>&quot;</td>
<td>Before placing next layer</td>
</tr>
<tr>
<td>Select borrow (704.07 &amp; Select topping (704.08)</td>
<td>Measured and tested for conformance (106.04)</td>
<td>Classification</td>
<td>AASHTO M 145</td>
<td>1 per soil type but not less than 1 for each day of production</td>
<td>Processed material before incorporating in work</td>
<td>Yes, when requested</td>
<td>Before using in work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gradation</td>
<td>AASHTO T 27 &amp; T 11</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Liquid limit</td>
<td>AASHTO T 89</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moisture-density</td>
<td>AASHTO T 180, method D(1) or T 99, method C(1)</td>
<td>1 per soil type but not less than 1 per 13,000 yd³</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compaction</td>
<td>AASHTO T 310 or other approved procedures</td>
<td>1 per 6000 yd³ but not less than 1 per layer</td>
<td>In-place</td>
<td>&quot;</td>
<td>Before placing next layer</td>
</tr>
</tbody>
</table>

(1) Minimum of 5 points per proctor
<table>
<thead>
<tr>
<th>Material or Product</th>
<th>Type of Acceptance (Subsection)</th>
<th>Characteristic</th>
<th>Category</th>
<th>Test Methods Specifications</th>
<th>Sampling Frequency</th>
<th>Point of Sampling</th>
<th>Split Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth embankment (204.11, Compaction A)</td>
<td>Measured and tested for conformance (106.04)</td>
<td>Classification</td>
<td>—</td>
<td>AASHTO M 145</td>
<td>1 per soil type</td>
<td>Source of Material</td>
<td>Yes, when requested</td>
</tr>
<tr>
<td>Top of subgrade (204.11 Compaction A)</td>
<td>Measured and tested for conformance (106.04)</td>
<td>Compaction</td>
<td>—</td>
<td>AASHTO T 310 or other approved procedures</td>
<td>1 per 2500 yd³</td>
<td>In-place</td>
<td>—</td>
</tr>
</tbody>
</table>

Note: (Subsection) indicates the specific section in the code or standard where the testing and sampling requirements are defined. (1) Method or procedure details are specified in the referenced standards.
<table>
<thead>
<tr>
<th>Tolerance Class</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadbed width (ft)</td>
<td>+0.5</td>
<td>+1.0</td>
<td>+1.0</td>
<td>+1.0</td>
<td>+1.0</td>
<td>+1.5</td>
<td>+1.5</td>
<td>+1.0</td>
<td>+1.0</td>
<td>+1.0</td>
<td>+1.5</td>
<td>+1.5</td>
<td>+1.5</td>
</tr>
<tr>
<td>Subgrade elevation (ft)</td>
<td>±0.1</td>
<td>±0.2</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
</tr>
<tr>
<td>Centerline alignment (ft)</td>
<td>±0.2</td>
<td>±0.2</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
</tr>
<tr>
<td>Slopes, excavation, and embankment</td>
<td>+3</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
<td>+5</td>
</tr>
</tbody>
</table>

(a) Maximum allowable deviation from construction stakes and drawings.
(b) Maximum allowable deviation from calculated elevation and from the staked or hinge points.
(c) Unless otherwise shown the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 80 feet and no vertical curves with a curve length of less than 80 feet. When the algebraic difference of the grade change in a horizontal curve is less than 10 percent or a curve length greater than or equal to 10 percent when the algebraic difference of the grade change is less than 10 percent. The centerline grade is not to exceed 20 percent in 100 feet of length.
204.12 Ditches.

Delete the entire subsection and replace it with the following:

204.12 Drainage Excavation. Excavate material to ground lines shown on plans. Excavate all material outside and around the metal culvert.

Excavate to the bottom surface of riprap and stream reconstruction layers and to the vertical and horizontal dimensions shown for construction of the riprap key. Prepare surfaces for riprap placement in accordance with Section 209.

Utilize excavated material in accordance with Subsection 204.06. Conserve channel material that may be appropriate for re-use in stream simulation construction as directed by the CO. Dispose of excess material in accordance with Subsection 204.14.

204.16 Measurement.

Add the following to this subsection:

(g) Drainage excavation. Do not include the following in drainage excavation:

1) Material excavated to prepare foundations for construction.
2) Roadway prism excavation.

209 - Structure Excavation and Backfill

209.07 Dewatering.

Delete subsection 209.07 and substitute the following:

Dewatering. Where necessary to dewater, dewater according to Subsection 157.09.
209.10 Backfill.

(a) General.
Add the following:
Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved in writing by the CO:

- Embankment height greater than 6 feet at subgrade centerline.
- Installation in a protected streamcourse.
- Round pipe with a diameter of 48 inches or greater.
- Pipe arches with a span of 50 inches or greater.
- Any box culvert of structure other than pipe culverts.

(b) Pipe culverts.
(1) Pipe culverts with compacted backfill.
Add the following:
Excavate an area on each side of the pipe as needed to effectively achieve compaction requirements. Backfill without damaging or displacing the pipe. Complete backfilling of the trench with suitable material.

209.11 Compacting.
Delete the subsection and add the following:

Compact backfill using designated compaction method A, B, or C:

Method A. Ensure that backfill density exceeds the density of the surrounding embankment.

Method B. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each layer using appropriate compaction equipment until visual displacement ceases. For compaction under sections 252, 254, 255, 257, 258 and 262 compact with a vibratory steel wheeled roller with a mass of at least 8 tons.

Method C. Determine optimum moisture content and maximum density according to AASHTO T 99 method C. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact material placed in all layers to at least 95 percent of the maximum density. Determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

Table 209-1 Sampling and Testing Requirements
Add the following:

(2) Compaction methods (A) and (B) do not require AASHTO T-99 or T-310 test methods for foundation fill.
251 - Riprap

Construction Requirements

251.03 General.

Add the following:

Place riprap under or adjacent to structures before placing prefabricated superstructure units or constructing superstructure falsework unless otherwise approved by the CO.

251.08 Measurement.

Add the following:

Payment for excavation and embankment required for placement of riprap is indirectly included in the pay item for riprap.
Description

322.01 This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by grid rolling, screening, or crushing methods, or placing pit-run or Government-furnished aggregate.

Surface aggregate grading is designated as shown in Table 703-3.

Subbase and base aggregate grading is designated as shown in Table 703-2.

Screened aggregate grading is designated as shown in Table 703-16.

Material

322.02 Conform to the following Subsections:

<table>
<thead>
<tr>
<th>Material</th>
<th>Subsection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate</td>
<td>703.05</td>
</tr>
<tr>
<td>Water</td>
<td>725.01</td>
</tr>
</tbody>
</table>

Construction Requirements

322.03 General. Prepare the surface on which the aggregate course is placed according to Section 204 or 303 as applicable.

Request approval of the roadbed in writing before placing aggregate.

Develop, haul, and apply water in accordance to Section 170.

Submit target values within the gradation ranges shown in Table 703-2 or 703-3 for the required grading. After reviewing the proposed target values the CO will determine the final values for the gradation and notify the Contractor in writing.

No quality requirements or gradation other than maximum size will be required for pit run and grid-rolled material. For grid rolling, use all suitable material that can be reduced to maximum size.

After processing on the road, remove all oversize material from the road and dispose of it as directed by the CO.

If the aggregate is produced and stockpiled before placement, handle and stockpiled according to Section 320. Establish stockpile sites at approved locations.
322.04  **Mixing and Spreading.** Mix the aggregate and adjust the moisture content to obtain a uniform mixture with a moisture content suitable for the specified compaction method. Spread and shape the mixture on the prepared surface in a uniform layer with no segregation of size, and to a loose depth that will provide the required compacted thickness.

Do not place in layers exceeding 6 inches in compacted thickness for aggregate base and surface courses or twice the maximum particle size for screened aggregate. When more than one layer is necessary, compact each layer according to Subsection 322.05 before placing the next layer. Route hauling and leveling equipment uniformly over the full width.

When placing aggregate over geotextile, place aggregate in a single lift to the full depth specified.

322.05  **Compacting.** Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors.

Compact the aggregate using one of the following methods as specified:

**Compaction A.** Operating spreading and hauling equipment over the full width of the travelway.

**Compaction B.** Operate rollers and compact as specified in Subsection 204.11(a)(1).

**Compaction C.** Moisten or dry the aggregate to a uniform moisture content between 5 and 7 percent based on total dry weight of the mixture. Operate rollers and compact as specified in Subsection 204.11(a)(1).

**Compaction D.** Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

**Compaction E.** Compact to a density of at least 96 percent of the maximum density, as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

**Compaction F.** Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 180, method C or D.

**Compaction G.** Compact to a density of at least 100 percent of the maximum density as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

322.06  **Construction Tolerance.** If grade finishing stakes are required, finish the surface to within ±0.10 feet from staked line and grade elevation.
If grade finishing stakes are not required, shape the surface to the required template and check the surface with a 10-foot straightedge. Defective areas are surface deviations in excess of 1/2 inch in 10 feet between any two contacts of the straightedge with the surface.

Correct all defective areas by loosening the material, adding or removing material, reshaping, and compacting.

Ensure that the compacted thickness is not consistently above or below the specified thickness. The maximum variation from the compacted specified thickness is ½ inch.

Ensure that the compacted width is not consistently above the specified width. The maximum variation from the specified width will not exceed +12 inches at any point.

**322.07 Maintenance.** Maintain the aggregate course to the correct line, grade, and cross-section by blading, watering, rolling, or any combination thereof until placement of the next course. Correct all defects according to Subsection 322.06.

**322.08 Acceptance.** See Table 322-1 or Table 322-2 as applicable, for sampling and testing requirements.

Aggregate gradation and surface course plasticity index will be evaluated under Subsection 106.04. If the aggregate is obtained from a Government stockpile then the above characteristics will be evaluated under Subsection 106.02. Other aggregate quality properties will be evaluated under Subsections 106.02 and 106.04. Placement of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

The allowable upper and lower aggregate gradation limits are the Target Value plus or minus the allowable deviations shown in Tables 703-2 and 703-3.

The allowable upper and lower Plasticity index limits for surface courses are stated in 703.05(b).

Preparation of the surface on which the aggregate course is placed will be evaluated under Section 204 or 303 as applicable.
Measurement

322.09 Measure the Section 322 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure square yard width horizontally to include the top of aggregate width including designed widening. Measure the square yard length horizontally along the centerline of the roadway.

If the measurement for aggregate is by cubic yard using contract quantities then measure aggregate by the cubic yard in-place once compacted, otherwise measurement for aggregate by the cubic yard is measured by the cubic yard in the hauling vehicle.

Measure thickness perpendicular to the grade of the travelway.

Measure width perpendicular to the centerline.

Payment

322.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 322 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.
### Table 322-1
#### Sampling and Testing Requirements

<table>
<thead>
<tr>
<th>Material or Product</th>
<th>Type of Acceptance (Subsection)</th>
<th>Characteristic</th>
<th>Category</th>
<th>Test Methods Specifications</th>
<th>Sampling Frequency</th>
<th>Point of Sampling</th>
<th>Split Sample</th>
<th>Reporting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate source quality 703.05</td>
<td>Measured and tested for conformance (106.04 &amp; 105)</td>
<td>LA abrasion (course)</td>
<td>—</td>
<td>AASHTO T 96</td>
<td>1 per type &amp; source of material</td>
<td>Source of material</td>
<td>Yes, when requested</td>
<td>Before using in work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sodium sulfate soundness loss (coarse &amp; fine)</td>
<td>—</td>
<td>AASHTO T 104</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Durability index (coarse &amp; fine)</td>
<td>—</td>
<td>AASHTO T 210</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fractured faces</td>
<td>—</td>
<td>ASTM D 5821</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Subbase, Base, and Surface courses</td>
<td>Measured and tested for conformance (106.04)</td>
<td>Sample</td>
<td>—</td>
<td>AASHTO T 2</td>
<td>2 per day</td>
<td>From window or roadbed after processing or from approved cashier sampling device</td>
<td>Yes</td>
<td>48 hours</td>
</tr>
</tbody>
</table>
Table 322-1 (continued)
Sampling and Testing Requirements

<table>
<thead>
<tr>
<th>Material or Product</th>
<th>Type of Acceptance (Subsection)</th>
<th>Characteristic</th>
<th>Category</th>
<th>Test Methods Specifications</th>
<th>Sampling Frequency</th>
<th>Point of Sampling</th>
<th>Split Sample</th>
<th>Reporting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subbase, Base, and Surface</td>
<td>Measured and tested for conformance (106.04)</td>
<td>Moisture-density Method D</td>
<td>—</td>
<td>AASHTO T 99 (&lt;sup&gt;1&lt;/sup&gt;)</td>
<td>1 per type and source of material</td>
<td>Source of material</td>
<td>Yes, when requested</td>
<td>Before using in work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moisture-density Method E</td>
<td>—</td>
<td>R-1 Marshall</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moisture-density Method F</td>
<td>—</td>
<td>AASHTO T 180&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moisture-density Method G</td>
<td>—</td>
<td>R-1 Marshall</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In-place density &amp; moisture content</td>
<td>—</td>
<td>AASHTO T 310 or other approved procedures</td>
<td>3 per day</td>
<td>In-place</td>
<td>—</td>
<td>Before placing next layer</td>
</tr>
</tbody>
</table>

(1) Minimum of 5 points per proctor.
### Table 322-2
Sampling and Testing Requirements

| Material or Product | Type of Acceptance (Subsection) | Characteristic | Category | Test Methods Specifications | Sampling Frequency | Point of Sampling | Split Sample | Reporting Time |
|---------------------|---------------------------------|----------------|----------|----------------------------|--------------------|------------------|--------------|----------------|----------------|
| Screened Aggregate  | Measured and tested for conformance (106.04) | Sample | —        | AASHTO T 2                | 2 per day          | From windrow or roadbed after processing or from approved crusher sampling device | Yes          | 48 hours       |
404 - Minor Hot Asphalt Concrete

404.02 Composition of Mix (Job-Mix Formula).
Delete the second paragraph and replace with the following:
Submit a job-mix formula and supporting documentation, test results, and calculations for the material to be incorporated into the work. Include copies of laboratory test results and mix design data that demonstrate that the properties of the aggregate, additives, and mixture meet the current requirements and criteria of Federal or state agencies. Ensure that the job-mix formula was performed no more than one year prior to placing the hot asphalt concrete. After reviewing the Contractor’s proposed job-mix formula, the CO will determine the final values for the job-mix formula to be used and notify the Contractor in writing.

404.03 Surface Preparation.

Change the following:
“Subsection 410.05” to “Subsection 401.06”

Add the following:
Apply an asphalt prime coat to contact surfaces of aggregate base according to Section 411.

404.04 Weather Limitations.
Change 35° F to 45° F:

404.06 Placing.
Add the following:
Do not place asphalt until the CO has approved in writing the area where it will be placed.
Delete the last sentence and replace with the following:
Offset the longitudinal joint of one layer at least 6 inches from the joint in the layer immediately below. Make the longitudinal joint in the top layer along the centerline of two-lane roadways or at the lane lines of roadways with more than two lanes. Offset transverse joints in succeeding layers and in adjacent lanes at least 10 feet, where possible.

404.07 Compacting (a).
Delete and replace with the following:
(a) Roadway paving. Thoroughly and uniformly compact the surface a minimum of three passes with rollers that meet one of the following requirements:
(1) Steel-wheeled rollers, other than vibratory type, capable of exerting a force of not less than 1.5 ton/feet of width of the compression roll or rolls.

(2) Vibratory steel-wheel rollers with a minimum mass of 5 ton, equipped with amplitude and frequency controls, and designed to compact asphalt concrete.

(3) Pneumatic-tire rollers with smooth tread tires of equal size that provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 lbf/in².

Perform initial compaction while the mixture is above 250 °F. Perform finish rolling with steel-wheel rollers and continue until no roller tracks remain.
404.09 Acceptance.
Add the following to the second paragraph:
See Table 404-1 for sampling and testing requirements.

Table 404-1. Delete and replace with the following:

Table 404-1. Sampling and Testing Requirements.

<table>
<thead>
<tr>
<th>Material or Product</th>
<th>Type of Acceptance (Subsection)</th>
<th>Characteristic</th>
<th>Category</th>
<th>Sampling Methods Specifications</th>
<th>Sampling Frequency</th>
<th>Point of Sampling</th>
<th>Split Sample</th>
<th>Reporting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Mixture (404.09)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>AASHTO T 168</td>
<td>Three minimum per project and at least one per 500 Cubic yards</td>
<td>Roadway prior to compaction</td>
<td>yes</td>
<td>As soon as sampled</td>
</tr>
</tbody>
</table>
412 - Asphalt Tack Coat

Measurement

412.07 Acceptance

Delete the first paragraph and replace with the following:

Emulsified asphalt will be evaluated under Subsections 106.02, 106.03, and 702.07.
602 - Culverts and Drains

602.03 General.
Add the following:
Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

625 - Turf Establishment

625.03 General.
Delete the first subsection and add the following:
Apply turf establishment to finished slopes and ditches between _________ and _________. Do not seed during windy weather or when the ground is excessively wet, frozen, snow covered, extremely dry, cloddy, hard pan, or is otherwise untillable.

625.05 Watering.
Delete the entire subsection

625.07 Seeding. (a) Dry method.
Remove the last sentence “Lightly compact the seedbed within 24 hours after seeding.”
625.07 Seeding. (b) Hydraulic method.
Add the following:
Apply fertilizer conforming to Subsection 713.03 at the rates shown in Table 625-1. Fertilize areas inaccessible to hydro-type equipment by hand.

Table 625-1. Fertilizer Application Rate.

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity per Slurry Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>__lbs</td>
</tr>
</tbody>
</table>

Apply the seed mixture at the rate of __________ kilograms of live seed per __________ (hectare/slurry unit). Include a tracer material consisting of either wood fiber mulch or grass cellulose fiber mulch to provide visible evidence of uniform application. Add the tracer to the slurry at a rate of __________ (400 pound per acre or 100 pound per slurry unit). Seed areas inaccessible to hydro-type equipment by hand.

625.08 Mulching. (a) Dry method.
Delete the paragraph and replace with the following:
Apply certified weed free straw mulch as shown on the plans.
633 - Permanent Traffic Control

633.02 Material.

Add the following subsections

<table>
<thead>
<tr>
<th>Protective Overlay Film</th>
<th>718.02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge Film</td>
<td>718.02</td>
</tr>
</tbody>
</table>

633.03 General.

Delete the subsection and add the following:

Furnish traffic control devices and guide signs according to the MUTCD, approved USDA-FS and state supplements, the current edition of USDA-FS EM-7100-15 Sign and Poster Guidelines for the Forest Service, and Standard Highway Signs published by FHWA. Submit the sign list for approval before ordering.

633.05 Panels.

Add the following:

Apply protective overlay film and top edge film as required and according to manufacturer’s recommendations.

Delete the sentence: “Use antitheft fasteners where possible” in the fifth paragraph and replace it with the following: “For each sign panel use at least one antitheft fastener.”
635 - Temporary Traffic Control

635.03 General.

Add the following:

Install temporary traffic control signs to temporary posts or approved temporary sign mounts.
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.

<table>
<thead>
<tr>
<th>Material</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Borrow</td>
<td>704.07</td>
</tr>
<tr>
<td>Streambed Simulation Rock</td>
<td>705.07</td>
</tr>
<tr>
<td>Stream Channel Rocks</td>
<td>705.08</td>
</tr>
<tr>
<td>Stream Weir Rocks</td>
<td>705.09</td>
</tr>
</tbody>
</table>

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.


(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

Add the following:

705.07 Streambed Simulation Rock.

(a) General. Furnish a mixture of soil, gravel, cobble, and boulders to simulate a natural streambed. The cobbles and boulders should be hard, durable rock that conforms to test values in 705.02.

Table 705-5 – Gradation requirements for Streambed Simulation Material, inches or sieve size

<table>
<thead>
<tr>
<th>Bed Class</th>
<th>100% passing</th>
<th>85% passing</th>
<th>50% passing</th>
<th>15% passing</th>
<th>10% passing</th>
<th>7% passing</th>
<th>4% passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3/4</td>
<td>3/4</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>4</td>
<td>1 3/4</td>
<td>3/4</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>6</td>
<td>2 1/2</td>
<td>3/4</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>10</td>
<td>16</td>
<td>10</td>
<td>4</td>
<td>1</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>12</td>
<td>18</td>
<td>12</td>
<td>5</td>
<td>1 1/2</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>14</td>
<td>22</td>
<td>14</td>
<td>6</td>
<td>1 3/4</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>16</td>
<td>24</td>
<td>16</td>
<td>7</td>
<td>2</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>18</td>
<td>30</td>
<td>20</td>
<td>8</td>
<td>3</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>20</td>
<td>32</td>
<td>24</td>
<td>10</td>
<td>3</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>24</td>
<td>36</td>
<td>24</td>
<td>10</td>
<td>3</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>36</td>
<td>46</td>
<td>36</td>
<td>14</td>
<td>4</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
<tr>
<td>48</td>
<td>60</td>
<td>48</td>
<td>18</td>
<td>6</td>
<td>No. 10</td>
<td>No. 40</td>
<td>No. 200</td>
</tr>
</tbody>
</table>

(b) Optional Method to Determine Bed Class Gradation.
Obtain a representative sample of the streambed simulation material by use of power equipment. For Bed Class 2 through 6 the minimum sample size is 0.5 cubic yard. For Bed Class 8 through 12, the minimum sample size is 0.75 cubic yard. For Bed Class 14 through 16 the minimum sample size is 1.5 cubic yards. For Bed Class 20, the minimum sample size is 2 cubic yards. For Bed Class 24, the minimum sample size is 3 cubic yards. For Bed Class 36, the minimum sample size is 7 cubic yard. For Bed Class 48, the minimum sample size is 14 cubic yard. The material should be in a dry to saturated surface dry state. Place the sample on a flat surface that will not contaminate the sample. Separate by hand or mechanically, into two piles of material, one of the rock retained by the 6 inch sieve and the other of rock passing the 6 inch sieve. For the 6-inch plus pile, separate the rock into the sizes listed on Table 705.5, and determine the weight of each size to the nearest pound, (use AASHTO T-27 for reference). This may be done by use of an approved bench scale, or crane scale. For the pile of material passing the 6-inch sieve, quarter the pile as per AASHTO T-248. Run a sieve analysis on the quarter split as per AASHTO T-27 and T-11. Determine the total gradation of the streambed simulation rock from these weights.

Other methods may be used to obtain the gradation of the Streambed Simulation Rock after approval by the CO.

705.08 Channel Rock.

(a) General. Furnish hard, durable rock that consists of intact blocks without open fractures, foliation, or other planes of weakness. Conform to test values in 705.02.

(b) Sized and shapes. Furnish rocks that are generally cubical, tabular, or rectangular in shape, with dimensions as designated, or as specified in the following table:

Table 705-6 gradation requirement for Channel Rock

<table>
<thead>
<tr>
<th>Rock Size (Man Rock)</th>
<th>Mass (Pounds)</th>
<th>Approximate Cubic Dimension (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50-200</td>
<td>12-18</td>
</tr>
<tr>
<td>2</td>
<td>200-700</td>
<td>18-28</td>
</tr>
</tbody>
</table>
(c) **Color.** Furnish rocks with a color indigenous to the area. Rocks should be free of machine-made scratches, mars, or other damage to the visible surface. If requested, submit a 12 in sample of rock that is representative of the rock color for approval by the CO.

<table>
<thead>
<tr>
<th></th>
<th>700-2000</th>
<th>28-36</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2000-4000</td>
<td>36-48</td>
</tr>
<tr>
<td>5</td>
<td>4000-6000</td>
<td>48-54</td>
</tr>
<tr>
<td>6</td>
<td>6000-8000</td>
<td>54-60</td>
</tr>
</tbody>
</table>

**718 - Traffic Signing and Marking Material**

**718.05 Aluminum Panels**
Delete the third paragraph and replace with the following:
Clean, degrease and properly prepare the panels according to methods recommended by the sheeting manufacturer. Conversion coatings will conform to ASTM B-921 or ASTM B-449.