

Key to Attachments

Table of Contents

Attachments Title

- A. Specification List
- B. Supplemental Specifications
- C. T-Specifications
- D. Specified Road Reconstruction

**FOREST SERVICE STANDARD SPECIFICATIONS AND SUPPLEMENTALS FOR CONSTRUCTION OF ROADS
AND BRIDGES SPECIFICATION LIST**

All specifications not included in the specification listing, but referenced by listed specifications, are applicable. The supplements shown on the specification listed are physically attached. Section 100 through 109 of the Standard Specifications and all other Standard or Supplemental Specifications shown in the specification listing are applicable to this contract.

	Attachment A	ROAD NAME	N/A						
CONTRACT NAME	TUBA RE-OFFER	ROAD NUMBER	N/A						
		Miles/Sites	N/A						
DATE PREPARED	02-21-2014	CONST/RECONST	N/A						

157	SOIL EROSION CONTROL	2003							
157.03	General	02/24/05							
157.10(c)	Check Dams	2003							
157.13	Maintenance and Cleanup	2003							
703	AGGREGATE	2003							
703.05	Subbase, Base & Surface Course, and Screened Aggregate	12/07/06							
	T-SPECS								
	(See CT5.31# & Applicable T-SPECS For Details)								
	PREFACE	01/08							
T-803	SNOW REMOVAL	05/07/07							
T-811	BLADING	10/07/07							
T-812	DUST ABATEMENT	05/07/07							
T-813	SURFACING	10/07/07							
T-831	DITCH MAINTENANCE	10/07/07							
T-832	REMOVE AND END HAUL MATERIALS	05/07/07							
T-834	DRAINAGE STRUCTURE MAINTENANCE	10/07/07							
T-835	ROADWAY DRAINAGE MAINTENANCE	05/07/07							
T-835-001	PREHAUL ROADWAY DRAINAGE MAINTENANCE - LOG FORD	08/07/14							
T-836	MAINTENANCE FOR LIMITED USE	05/07/07							
T-838	MAINTENANCE FOR HIGH CLEARANCE VEHICLE USE	05/07/07							
T-839	MAINTENANCE FOR PROJECT USE	05/07/07							
T-841	VEGETATION ESTABLISHMENT	05/07/07							
T-842	CUTTING ROADWAY VEGETATION	10/07/07							
T-851	LOGGING OUT	05/07/07							
T-854	TREATMENT AND DISPOSAL OF DANGER TREES	05/07/07							
T-891	WATER SUPPLY AND WATERING	05/07/07							
T-892	BITUMINOUS PRODUCTS	05/07/07							

Attachments B - Supplemental Specifications

157 - Soil Erosion Control

157.03_nat_us_02_24_2005

157.03 General

Delete the entire subsection and replace with the following:

Prior to the start of construction, submit a written plan that provides permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction. Do not begin work until the necessary controls for that particular phase of work have been implemented. Do not modify the type, size, or location of any control. An alternate erosion control plan with all necessary permits may be submitted 30 days before intended use.

Incorporate all permanent erosion control features into the project at the earliest practicable time, as outlined in the approved plan.

When erosion control measures are not functioning as intended, immediately take corrective action.

703 - Aggregate

703.05_nat_us_12_07_2006

Delete 703.05 and replace with the following:

703.05 Subbase, Base, Surface Course, and Screened Aggregate.

(a) Subbase or base aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-2
(2) Liquid limit, AASHTO T 89	25 max.
(3) Plastic limit, AASHTO T 90	Nonplastic
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	50% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(b) Surface course aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-3
(2) Liquid limit, AASHTO T 89	35 max.
(3) Plastic Index, AASHTO T 90	
a) If the percent passing the No. 200 sieve is less than 12%	2 to 9
b) If the percent passing the No. 200 sieve is greater than 12%	Less than 2
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	75% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Do not furnish material that contains asbestos fibers.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(c) Screened aggregate - Furnish hard, durable particles or fragments of stone, slag, or gravel conforming the following:

- | | |
|----------------------------------------------------------|--------------|
| (1) Gradation | Table 703-16 |
| (2) Plastic Index, AASHTO T 90 | Less than 9 |
| (3) Los Angeles abrasion, AASHTO T 96 | 55% max. |
| (4) Free from organic matter and lumps or balls of clay. | |

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary.

Delete Table 703-2 and replace with the following:

**Table 703-2
Target Value Ranges for Subbase and Base Gradation**

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)				
	Grading Designation				
	A (Subbase)	B (Subbase)	C (Base)	D (Base)	E (Base)
2½ inch	100				
2 inch	97 - 100	100			
1½ inch		97 - 100			
1 inch	65 - 79 (6)		80 - 100 (6)	100	
¾ inch			64 - 94 (6)	86 - 100 (6)	100
½ inch	45 - 59 (7)				
⅜ inch			40 - 69 (6)	51 - 82 (6)	62 - 90 (6)
No. 4	28 - 42 (6)	40 - 60 (8)	31 - 54 (6)	36 - 64 (6)	36 - 74 (6)
No. 40	9 - 17 (4)			12 - 26 (4)	12 - 26 (4)
No. 200	4.0 - 8.0 (3)	4.0 - 12.0 (4)	4.0 - 7.0 (3)	4.0 - 7.0 (3)	4.0 - 7.0 (3)

() The value in the parentheses is the allowable deviation (±) from the target values..

Delete Table 703-3 and replace with the following:

**Table 703-3
Target Value Ranges for Surface Gradation**

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)														
	F	G	H	S	T	U	Grading Designation								
1 1/2 inch	100 ⁽			100											
1 inch	97-100	100		72 - 92 (6)	100										100
3/4 inch	76-89 (6)	97 - 100	97 - 100												
1/2 inch					71 - 91 (6)										
3/8 inch	56-68 (6)	70 - 80 (6)	80 - 92 (6)	51 - 71 (6)											71 - 90 (6)
No. 4	43-53 (7)	51 - 63 (7)	58 - 70 (7)	36 - 53 (7)	43 - 60 (7)										50 - 68 (7)
No. 8				26 - 40 (6)	30 - 46 (6)										34 - 51 (6)
No. 16	23-32 (6)	28 - 39 (6)	28 - 40 (6)												
No. 40	15-23 (5)	19 - 27 (5)	16 - 26 (5)	14 - 25 (5)	16 - 28 (5)										19 - 30 (5)
No. 200	10.0-16.0 (4)	10.0 - 16.0 (4)	9.0 - 14.0 (4)	8.0 - 15.0 (4)	8.0 - 15.0 (4)										8.0 - 15.0 (4)

() The value in the parentheses is the allowable deviation (\pm) from the target values.
If the plasticity index (PI) is greater than 0, the TV range for the No. 200 sieve size is 8-12 (4).

Add Table 703-16:

**Table 703-16
Gradation Requirements for Screened Aggregate**

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)						
	Grading Designation						
	L	M	N	O	P	Q	R
6 inch	100	100					
4 inch			100	100			
3 inch					100	100	
2 inch							100
No. 4		15-45		15-45		15-45	

Attachment C - T-Specifications

FOREST SERVICE
SPECIFICATIONS FOR
MAINTENANCE OF
ROADS IN
TIMBER SALES

PACIFIC NORTHWEST REGION
EM 7730-20

01/23/2008

TIMBER SALE CONTRACT

ROAD MAINTENANCE SPECIFICATIONS

<u>SPEC#</u>	<u>SUBJECT DESCRIPTION</u>	<u>DATE</u>
T-803	Snow Removal	05/07/2007
T-811	Blading	10/07/2007
T-812	Dust Abatement	05/07/2007
T-813	Surfacing	10/07/2007
T-831	Ditch Maintenance	10/07/2007
T-832	Remove And End Haul Materials	05/07/2007
T-834	Drainage Structure Maintenance	10/07/2007
T-835	Roadway Drainage Maintenance	05/07/2007
T-835-001	Prehaul Roadway Drainage Maintenance - Log Ford	08/07/2014
T-836	Maintenance for Limited Use	05/07/2007
T-838	Maintenance for High Clearance Vehicle Use	05/07/2007
T-839	Maintenance for Project Use	05/07/2007
T-841	Vegetation Establishment	05/07/2007
T-842	Cutting Roadway Vegetation	10/07/2007
T-851	Logging Out	05/07/2007
T-854	Treatment and Disposal of Danger Trees	05/07/2007
T-891	Water Supply and Watering	05/07/2007
T-892	Bituminous Products	05/07/2007

SUPPORTING DOCUMENTS FOR MAINTENANCE SPECIFICATIONS

<u>SUBJECT DESCRIPTION</u>	<u>DATE</u>
Cover Content Preface	01/08
Cover Pages	01/08
Intent Use Guide	01/08

PREFACE
01/08

The Pacific Northwest Region of the Forest Service has developed this book for use in the preparation and administration of maintenance requirements included in Timber Sale Contracts.

Included are the Standard Specifications (Sections) that commonly apply in Timber Sale Contracts. Conditions and requirements specific to individual projects are identified in the Special Project Specifications.

Special Project Specifications, which do not change the intent of the parent section, may be approved by the Forests.

This book is available from the Supervisor's Office of any National Forest in Region 6.

Maintenance Level Requirements

Maintenance Levels - The following are abbreviated descriptions of maintenance levels.

1. **Maintenance Level II** - Conditions are suitable for high clearance vehicle travel at prudent driving speeds less than 15 mph. Road is maintained in accordance with Section T-836.
2. **Maintenance Level III** - Minimum conditions are provided for passenger car use. Surface provides moderately convenient travel at prudent driving speeds between 15 and 25 mph with corresponding surface roughness tolerated. The surface meets the following conditions.
 - a. Potholes or washboard in wheel tracks normally do not exceed 2 inches in depth, and should not be of such frequency that traffic tends to widen traveled way to avoid the deformities.
 - b. Surface is drained and substantially retains its cross slope or crown.
 - c. Wheel ruts caused by use shall not be in excess of 3 inches in depth on horizontal curves.
3. **Maintenance Level IV** - Higher consideration than in Level III is given to comfort and convenience of the passenger car and commercial user at prudent driving speeds above 25 mph. The surface will meet the following conditions:
 - a. Substantially free of chuckholes, wheel ruts, or washboard corrugations. Surface is drained and retains its cross slope or crown.
 - b. Berms of loose surfacing caused by use do not generally exist, except on horizontal curves berms up to 2 inches in depth may be present.
4. **Maintenance Level V** - the highest degree of consideration is given to user comfort and convenience. Roads are commonly paved or continually dust controlled for travel at speeds of nominally 35 mph. Generally, the surface will meet the following conditions:
 - a. **Level IV plus:** Surface is consolidated except for limited periods immediately preceding maintenance performance.
 - b. Berms are not acceptable.

T-803 - SNOW REMOVAL (05/07)

803.01 Description

This Section provides for removal of snow from roads to facilitate logging operations and safe use.

803.02 Maintenance Requirements

- (1) Erect signs required by the Sign Plan in the SUPPLEMENTAL SPECIFICATIONS.
- (2) Perform work in a manner to preserve and protect roads and appurtenances, and prevent erosion damage to roads, streams, and other Forest values.
- (3) Do not undercut banks. Do not blade gravel or other surfacing material off the road.
- (4) Keep roadbed drainage ditches, drain dips, and culverts functional when needed during operations and upon completion of operations.
- (5) Control snow removal to identify the usable traveled way having roadbed support. Reshape over-width plowing as necessary to define the usable width.
- (6) Space, construct, and maintain drainage holes in the dike of snow or berm caused by snow removal operations. Place drain holes to obtain surface drainage without discharging on erodible fills.
- (7) Close roads to wheeled vehicles at times and in the manner specified in C(T)5.12 or the Road Rules document.
- (8) Upon seasonal completion of Purchaser's Operations, effectively block the road by a snow barricade, unless otherwise approved by the Contracting Officer.
- (9) Remove snow for either public access or project use as established in the SUPPLEMENTAL SPECIFICATIONS and meet the following requirements:
 - (a) Removal for Public Access (Method JU) - Remove snow from all of the traveled way, including turnouts, for safe and efficient use for both timber transportation and the public. Remove intruding windfalls, debris, or slough and slide material for the full width of the traveled way and deposit out of drainage's at locations designated by the Contracting Officer.
 - (b) Removal for Project Use (Method TS) - Remove snow from all or part of the traveled way, including sufficient turnouts for safe and efficient use for timber transportation and to protect the road. Remove intruding windfalls, debris or slough and slide material and dispose of only as necessary to provide passage for timber transportation. Removed materials may be deposited off the traveled way or outside the traveled way at locations designated by the Contracting Officer.
- (10) When directed by the Contracting Officer, replace in kind, within sixty (60) days after the start of Normal Operating Season, any surfacing material which has been bladed off the road, unless otherwise agreed. Contracting Officer will notify Purchaser in writing as to the cubic yard equivalent of bladed off material by the start of the normal operating season.

803.03 Equipment

Purchaser may use any type of equipment to remove snow, providing:

- a. Type or use of equipment is not restricted in C(T)5.12 or Road Rules document.
- b. Equipment is of the size and type commonly used to remove snow and will not cause damage to the road.
- c. The use of plows or dozers to remove snow requires written approval by the Contracting Officer. Equip plows or dozers with shoes or runners to keep the dozer blade a minimum of 2 inches above the road surface unless otherwise approved by the Contractor Officer.

803.04 Ice Control

Ice control may be performed by Purchaser when approved by the Contracting Officer in writing. Such approval will include ice control materials, application rates, and any specific requirements of use.

T-811 BLADING (10/07)

811.01 Description -

This work consists of surface blading the traveled way to a condition that facilitates traffic and Provides proper drainage. Blading includes shaping the crown or slope of travel traveled way, berms, and drainage dips in accordance with this specification. Compaction is required when shown on the ROAD LISTING.

811.02 Maintenance Requirements

A. Timing- Perform surface blading during the contract period as often as needed to provide conditions stated for the maintenance level of the road.

B. General -

1. Blade and shape the existing traveled way and shoulders, including turnouts , to produce a surface which is uniform, consistent to grade, and crowned or cross-sloped as indicated by the character of the existing surface, unless otherwise shown in the ROAD LISTING, to at least 13 mm (½ inch) per .305 meter (1 foot) of width, but not more than 19 mm (¾ inch) per .305 meter (1 foot) of width. Thoroughly loosen surfacing material to no less than 50 mm (2 inches) depth or the depth of potholes or corrugations. Scarification to facilitate cutting to the full depth of potholes or corrugations may be elected, but will be considered incidental to blading. Do not scarify deep enough to cause contamination of the surfacing.

2. Apply water during blading when sufficient moisture is not present to prevent segregation. Supply, haul, and apply water in accordance with Section T-891.

3. Shape existing native rock or aggregate surfaced drainage dips to divert surface runoff to existing outlet devices, ditches, or discharge locations.

4. Establish a blading pattern which provides a uniform driving surface, retains the surfacing on the roadbed, and provides a thorough mixing of the materials within the completed surface width. Upon final blading, no disturbed rock shall protrude more than 50 mm (2 inches) above the adjacent surface unless otherwise provided in the contract. Remove and place outside the roadbed material not meeting this dimension so as not to obstruct drainageways or structures. This material may be scattered off the roadbed if there is free drainage.

Where DESIGNATED ON THE GROUND, included in the ROAD LISTING, SHOWN ON THE DRAWINGS or as ordered by the Contracting Officer invasive species of concern prevention practices shall be followed as listed below.

Invasive Species of Concern Prevention Practices
Refer to Contract Provision CT6.6#

C. Routine Blading -

1. Conform to the dimensions SHOWN ON THE DRAWINGS or designated in the SUPPLEMENTAL SPECIFICATIONS upon completion of blading.

2. Shape roadbed width in excess of the dimensions shown only as needed to provide drainage away from the traveled way. Do not remove established grasses and other vegetation from the excess width except as incidental to providing drainage or unless otherwise provided in the contract.

D. Compaction -

Roads requiring compaction will be included in the ROAD LISTING. Unless Compaction Method B is designated in the ROAD LISTING, all traveled ways requiring compaction may be compacted by Method A. Compaction shall commence immediately following blading.

Compaction methods are:

Compaction Method A: By breaking track while operating equipment on the traveled way.

Compaction Method B: 7--9 metric ton (7-10 ton) pneumatic, steel, or equivalent vibratory roller, operated to cover the full width two (2) times.

E. Undercutting -

Undercutting roadway back slope is not permitted.

F. Intersections

1. At intersections, blade the roadbeds of side roads which are not closed or restricted from vehicular use to ensure smooth transitions.
2. Signing, cross ditching in the road surface (traveled way), earth berms, or other devices placed to discourage or eliminate use by passenger cars, are field evidence of road closure or restriction. Roads listed for work under Sections T-835, T-836, T-838, or T-839 are considered restricted.
3. Side roads listed for work under this Section are not restricted.

G. Cleaning of Structures - Do not allow materials resulting from work under this Section to remain on or in structures, such as bridges, culverts, cattle guards, or drainage dips.

H. Berms - Maintain existing berms to the condition of adjacent segments. Do not create new berms (windrows).

I. Smooth Blading - Smooth blading may be used as an interim measure to remove loose surfacing material from the wheel paths, and store removed materials in a recoverable windrow, until blade processing as described in this section is feasible. Watering will not be required for smooth blading. Accomplish smooth blading without distorting the existing cross-slope or crown of the traveled way.

Move and store loose surfacing materials on the high side of super-elevated curves and sections with uniform inslope or outslope. In crowned sections, store the material on either or both sides as elected. Windrow and place stored materials to provide not less than 3.6 meters (12 feet) of smooth traveled way on one-lane segments, or 6 meters (20 feet) of smooth traveledway on two-lane segments, or segments with turnouts. Cut holes through windrows, which may collect water on the road, for drainage at least every 150 meters (500 feet).

T-812 - DUST ABATEMENT (05/07)

812.01 Description

This work consists of applying dust palliatives on roads shown in the Road Listing.

812.02 Materials

The dust palliative materials are shown in the Road Listing, unless shown as Optional for Purchaser's election. If Optional is shown then the Purchaser may use any of the products listed below. Dust palliative materials shall meet the following requirements:

A. Water (H2O) will be obtained from sources SHOWN ON THE DRAWINGS or listed in the SUPPLEMENTAL SPECIFICATIONS to Section T-891 Water Supply, unless otherwise approved by the Contracting Officer.

B. Lignin Sulfonate (LIG S) Provide certification that the material meets the requirements of Subsection 725.20 of the "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-03)" and the Forest Service Supplemental Specification 725.20.

C. Magnesium Chloride (MG CL2) Provide certification that that the material meets the requirements of Subsection 725.02 of the "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP03) " and the Forest Service Supplemental Specification 725.02.

D. Calcium Chloride Brine (CA CL2B). Provide certification that the material meets the requirements of Subsection 725.02 of the " Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP03) " and the Forest Service Supplemental Specification 725.02..

E. Calcium Chloride Flake (CA CL2F). Provide certification that that the material meets the requirements of Subsection 725.02 of the "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP03) " and the Forest Service Supplemental Specification 725.02..

F. Bituminous dust palliatives. Manufacture materials specifically for dust abatement purposes which conform to the requirements of Section T-892 for each listed road in the Road Listing.

812.03 Methods

As shown in the SUPPLEMENTAL SPECIFICATIONS, Purchaser may utilize a variety of methods to decrease or eliminate the need for dust abatement.

812.04 Equipment

A. Design, equip, and operate application equipment for spreading dust palliatives so that the material is uniformly applied at the rate and traveled way widths shown in the Road Listing.

B. For bituminous palliatives provide equipment that heats and applies the bituminous material. Provide a bituminous distributor that is self-powered and mounted on pneumatic tires and equipped with a pump and circulating spray bar, a tachometer, pressure gauges, accurate volume measuring devices such as visual volume dial or gauge calibrated to the tank, and a thermometer. Provide equipment which is a standard commercial type of proven performance.

C. Accomplish dilution of dust palliatives within the application vehicle with the water source protected from contamination. Circulate the resulting mixture at least five (5) minutes to ensure uniform mixing prior to application.

812.05 Maintenance Requirements

- A. Limit water applications to abatement for hauling vehicles and provide at a frequency and rate which controls dust such that vehicle tail lights and turn signals remain visible. Vary rates of application as needed but remain low enough to avoid forming rivulets. Accomplish the abatement by sufficient frequency of application without saturating and softening the traveled way. Compacted or glazed road surface or wheel tracks may be loosened as needed for water penetration.
- B. Apply all other dust palliatives at the rates and times agreeable to the Contracting Officer. The Road Listing shows the expected average application rate and may be varied to meet field conditions. Lignin Sulfonate, Magnesium Chloride, and Calcium Chloride Brine are listed as liters per square meter of the undiluted product at fifty (50), thirty-three (33), and thirty-eight (38) percent respectively. Calcium Chloride Flake is listed in Kilograms per square meter at seventy-seven (77) percent concentration.
- C. Apply bituminous dust palliatives only when the surface to be treated contains sufficient moisture to obtain uniform distribution of the dust palliative unless noted differently in the SUPPLEMENTAL SPECIFICATIONS.
- D. Prior to initial application, when needed, the road will be bladed and shaped under Section T-811, Blading.
- E. Required subsequent applications may be applied to the existing road surface without blading.
- F. Dust palliatives will not be applied in a manner that spatters or mars adjacent structures or trees, or placed on or across cattleguards or bridges. Discharge dust abatement material only on roads approved by the Contracting Officer.

T-813 SURFACING (10/07)

813.01 Description

This work consists of placing surface aggregate as DESIGNATED ON THE GROUND, or as ordered by the Contracting Officer. It includes preparing the area, furnishing, hauling, and placing all necessary materials and other work necessary to blend with the adjacent road cross section.

813.02 Materials

- A. Materials will be Government-furnished when stated in the supplemental specifications.
- B. Materials furnished by the Purchaser shall conform to the gradation and quality requirements of Section 703 of the "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03 U.S. Customary Units" and FS supplements to the FP-03.
- C. All materials transported onto National Forest System land shall be free of invasive species of concern. Written documentation of methods used to determine the invasive species of concern free status of any and all materials furnished by the Purchaser shall be submitted to the Contracting Officer before transport of any materials onto National Forest System land.

The Contracting Officer shall have 5 days, excluding weekends and Federal holidays, to review the methods and inspect the materials after the required written documentation is provided by the Purchaser. After satisfactory review and inspection or after such 5 day period, the Purchaser may transport the material onto National Forest System land.

Material or methods appropriate for establishing invasive species of concern free status for the particular invasive species of concern are listed below.

Invasive Species of Concern and Acceptable Methods specific to this project:

Invasive Species of Concern	Acceptable Methods
<i>Centaurea biebersteinii</i> (spotted knapweed) <i>Centaurea diffusa</i> (diffuse knapweed) <i>Centaurea pratensis</i> (meadow knapweed) <i>Cirsium arvense</i> (canada thistle) <i>Cirsium vulgare</i> (bull thistle) <i>Cytisus scoparius</i> (scotch broom) <i>Hypericum perforatum</i> (st. john's-wort) <i>Senecio jacobaea</i> (tansy ragweed)	Documentation of "weed-free" certification of material source per "Environmental Assessment - Lake Branch Thinning" 2.3.9_8(8d)

813.03 Maintenance Requirements

- A. Thoroughly loosen the area to be surfaced to a minimum depth of 1 inch prior to placement of aggregate.
- B. Mixing and Placing

When scheduled coincidentally with work under Section T-811, and included in the SUPPLEMENTAL SPECIFICATIONS, mix surfacing and existing aggregate with water until a uniform mixture is obtained prior to final shaping and compaction.

Otherwise, spread the material on the prepared area in layers no more than 4 inches in depth. When more than one (1) layer is required, shape and compact each layer before the succeeding layer is placed. Upon completion, the surfacing shall reasonably conform to the adjacent cross section and provide smooth transitions in the road profile.

- C. Compaction Methods

Compaction Method A: Breaking track while operating equipment on the traveled way.

Compaction Method B: 7-10 ton pneumatic, steel, or equivalent vibratory roller, operated to cover the full width two (2) times.

Either Method A or B may be used unless Method B is designated in the ROAD LISTING.

T-831 DITCH MAINTENANCE (10/07)

831.01 Description

This Section provides for routine maintenance of various types of ditches to provide a waterway which is unobstructed, as shown on the ROAD LISTING or DESIGNATED ON THE GROUND.

831.02 Maintenance Requirements

- A. Maintain ditches by removing rock, soil, wood, and other materials. Maintained ditches shall function to meet the intent of the original design.
- B. Undercutting backslopes during removal operations is not permitted.
- C. Suitable material up to 4 inches in greatest dimension removed from the ditches may be blended into existing native road surface and shoulder or placed in designated berm.
- D. Do not blend material from ditch cleaning operations into aggregate surfaced roads. Do not blade material across aggregate or bituminous surfaced roads, unless approved in writing by the Contracting Officer.
- E. Haul material in excess of 831.02 D or subject to 831.02 E to a designated waste area under Section T-832. Remove excess materials temporarily stored on the ditch slope or edge of the shoulder daily.
- F. Remove limbs and wood chunks in excess of 12 inches in length or 3 inches in diameter from ditches and place outside the roadway.
- G. Clean paved surfaces of all materials resulting from ditch maintenance work.
- H. Shape lead-off ditches to drain away from the traveled way.
- I. Where DESIGNATED ON THE GROUND, included in the ROAD LISTING, SHOWN ON THE DRAWINGS or as ordered by the Contracting Officer invasive species of concern prevention practices shall be followed as listed below.

Invasive Species of Concern Prevention Practices
Refer to Contract Provision CT6.6#

T-832 REMOVE AND END HAUL MATERIALS (05/07)

832.01 Description

Work consists of loading, hauling, and placing of slide, slough, or excess materials such as rock, soil, vegetation, and other materials to designated disposal sites.

832.02 Maintenance Requirements

A. Remove, end haul, and dispose of excess materials generated by work under other Sections of this contract.

B. Remove the slide and slough materials in the area extending approximately 6 feet vertically above the road surface and not more than 3 feet down slope from the roadbed. Dispose of material at designated sites as SHOWN ON THE DRAWINGS, identified in SUPPLEMENTAL SPECIFICATIONS, or as ordered by the Contracting Officer.

Reshape the slope which generated the slide material as nearly as practical to its original condition by equipment operating from road surface. Reshaping of roadside ditches in slide area shall be in accordance with Section T-831.

C. When approved by the Contracting Officer, fill slumps by compacting selected materials into roadway depressions. Compaction is by Method 2.

D. Place all materials in disposal sites as specified in the SUPPLEMENTAL SPECIFICATIONS, as SHOWN ON THE DRAWINGS, or as ordered by the Contracting Officer.

1. Method 1 - Side Casting and End Dumping. Material may be placed by side casting and end dumping. Where materials include large rocks, provide a solid fill by working smaller pieces and fines into voids. Shape the finished surfaces to drain.

2. Method 2 Layer Placement - Step or roughen surfaces on which materials are to be placed prior to placing any material. Place materials in approximately horizontal layers no more than 12 inches thick. Compact each layer by operating hauling and spreading equipment over the full width of each layer.

E. Repair any damage to existing aggregate or pavement surfaces.

T-834 DRAINAGE STRUCTURE MAINTENANCE (10/07)

834.01 Description

This work consists of cleaning and reconditioning culverts and other drainage structures.

834.02 Maintenance Requirements

A. Clean drainage structures, inlet structures, culverts, catch basins, and outlet channels specified in the SUPPLEMENTAL SPECIFICATIONS. Clean catch basins by removing the material within the area SHOWN ON THE DRAWINGS.

B. Clean the transition from the ditch line to the catch basin a distance of 10 feet from the catch basin. Clean outlet channels and lead-off ditches a distance of 6 feet. Remove and place debris and vegetation so as to not enter the channel or ditch, or obstruct traffic. Haul debris and vegetation to a designated disposal area in accordance with Section T-832.

C. Hydraulic flushing of drainage structures is not allowed unless provided for in the SUPPLEMENTAL SPECIFICATIONS.

D. Cleaning and reconditioning are limited to the first 3 feet of inlet and outlet, determined along the top of the structure. Recondition culvert inlet and outlet by field methods such as jacking out or cutting away damaged metal which obstructs flow. Treat cut edges with a zinc rich coating, in accordance with AASHTO M 36M and ASTM A 849.

E. Where DESIGNATED ON THE GROUND, included in the ROAD LISTING, SHOWN ON THE DRAWINGS or as ordered by the Contracting Officer invasive species of concern prevention practices shall be followed as listed below.

Invasive Species of Concern Prevention Practices
Refer to Contract Provision CT6.6#

T-835 ROADWAY DRAINAGE MAINTENANCE (05/07)

835.01 Description

This work consists of providing post haul drainage on roads.

835.02 Maintenance Requirements

A. Drainage

1. Upon completion of work, shape the roadway to provide for the removal of surface water. The roadway need not be passable to vehicles. Repair and reinstall water bars, barriers or berms existing prior to the Purchaser's operation. Areas where water is ponded by existing centerline profile sags in through cuts may be left untreated.
2. Continuous blade shaping of the roadbed is not required under this specification.
3. Work to be done at staked locations shall be as indicated on the stake and/or stated in SUPPLEMENTAL SPECIFICATIONS:
4. Any of the following methods are acceptable for use at eroded or rutted locations:
 - Method A:** Outsloping the roadbed at not less than $\frac{1}{2}$ inch per yard of width.
 - Method B:** Insloping the roadbed at not less than $\frac{1}{2}$ inch per yard of width.
 - Method C:** Water bar roadbed at locations staked on the ground and construct as SHOWN ON THE DRAWINGS or as included in SUPPLEMENTAL SPECIFICATIONS.
5. Drainage structures located in through fills and natural watercourses shall be fully functional without obstructions, including inlet and outlet channel within 20 feet of the structure.
6. Either clean culverts and other fabricated structures to provide drainage from road ditches and make the ditch functional or provide water bar(s) across the roadbed. Removed structures shall become Purchaser's property to be removed from National Forest System land. Remove and replace any purchaser-installed temporary drainage structures with a water bar.

B. Slides, Slumps and Slough

1. Slides and slough may be left in place, provided they do not potentially impound water or divert water from watercourses. As necessary, reshape the various surfaces to provide drainage.
2. Provide drainage to effectively decrease or eliminate the entry of surface water into slides, slumps, and roadbed surface cracks. Place berms, waterbars or ditches as needed to intercept and remove runoff water from the roadbed. Surface seal cracks by covering over with native soil materials to prevent additional water entry and compact with equipment tires.

C. Entrance Devices

Upon completion of work, replace entrance devices to effectively eliminate access by motorized vehicles having four (4) wheels and a width in excess of 50 inches.

D. Seeding

Seed and fertilize all disturbed areas in accordance with requirements set forth in Section T-841.

SPECIAL PROJECT SPECIFICATION (8/14)
T-835-001
PREHAUL ROADWAY DRAINAGE MAINTENANCE - LOG FORD

1. DESCRIPTION

This work consists of providing prehaul maintenance of roadway drainage to prevent unacceptable resource or road damage.

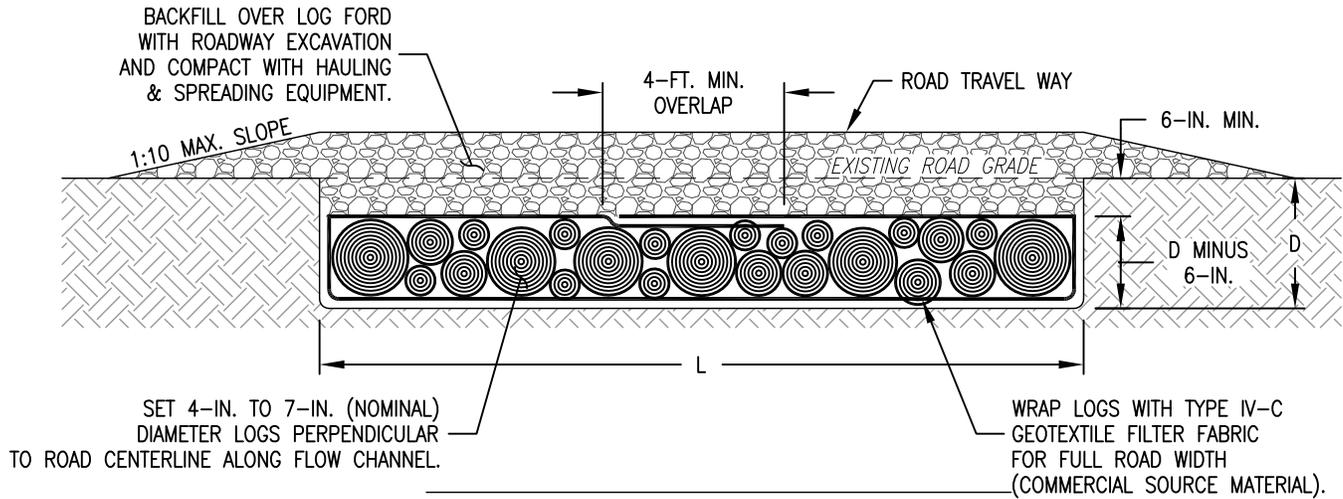
2. MAINTENANCE REQUIREMENTS

- a. In conjunction with T-839.02 A (3), install Purchaser furnished temporary log ford as approved by the Contracting Officer.
- b. Work will be completed prior to use of road(s) for haul of commercial materials.
- c. Work will be completed to facilitate passage of water flow through the roadbed and shall be maintained throughout operations in a fully functional state without obstructions.
- d. Work is to be done at locations staked in field by the Contracting Officer through the Contract Administration Team.
- e. All work should be completed in an expediant manner utilizing materials available at or near the work location, except as specified on the detail drawing.
- f. Work shall be completed in compliance with dimensions and specifications shown on the attached detail drawing.

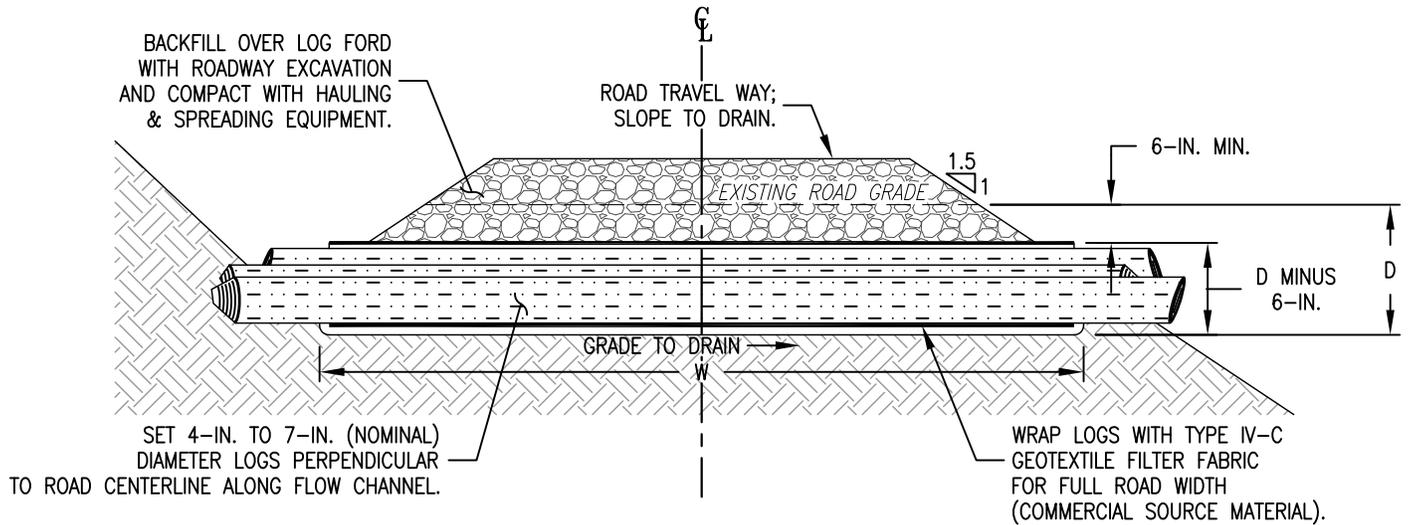
3. DETAIL DRAWINGS

(SEE ATTACHED)

T-835-001



ROAD PROFILE VIEW



ROAD SECTION VIEW

NOTES:

1. EXCAVATION DIMENSIONS = $L \times W \times D$, WHERE:
 L = LENGTH OF FORD ALONG ROAD CENTERLINE
 W = FULL WIDTH OF ROAD AT BOTTOM OF FORD
 D = DEPTH OF FORD FROM EXISTING ROAD SURFACE
2. CONSTRUCT LOG FORD TO DIMENSIONS STAKED IN THE FIELD OR AS APPROVED BY THE CONTRACTING OFFICER.

LOG FORD DETAIL NOT TO SCALE

T-836 - MAINTENANCE FOR LIMITED USE (05/07)

836.01 Description

This work consists of making limited use roads passable for joint use by Purchaser and high clearance vehicles, and providing drainage from the traveled way and roadbed.

836.02 Maintenance Requirements

A. Traveled Way

Purchaser may smooth or fill existing cross ditches and water bars and by agreement modify existing road junctions to enable vehicle access. Prior to beginning haul and resumption of haul after an extended stoppage:

1. Remove brush, fallen trees, rocks, and other debris from traveled way, including turnouts, turnarounds, and other locations that interfere with needed maintenance as follows:

a. No object extending over 4 inches above the road surface shall remain within the 12 feet usable traveled way and 10 feet turnout widths. Center the usable width on the roadbed or position away from the fill slope.

b. Cut and remove standing or down trees, logs, brush, and limbs from within the area described in 1 a. above. Remove encroaching limbs to a height of 14 feet above the traveled way surface. Scatter material not meeting utilization standards outside and below the roadbed on the fill side. Limb and remove timber which meets utilization standards or deck at agreed locations.

c. Place all removed materials away from drainages.

d. During use, maintain drainage structures, including dips, ditches and culverts in a useable condition.

2. Clean and recondition drainage facilities in accordance with: Section T-831 and T-834.

B. Slough and Slides

1. Slough and slides may be left in place, provided surface drainage is provided and at least 12 feet of width is available for vehicle passage.

2. Purchaser may reposition or ramp over slides and slough when the traveled way width is less than 12 feet providing the material is capable of supporting vehicles. Limit out slope to no more than six percent.

3. Reposition slough or slide materials on the roadbed which are not capable of supporting a vehicle to provide the 12 foot width. When directed by the Contracting Officer, slough or slide material will be removed under Section T-832.

C. Slumps and Washouts

1. Drain the roadbed immediately upgrade of slumps and longitudinal cracks to prevent water from entering slump area.
 2. Slumps and longitudinal cracks at the edge of the roadbed shall not be considered a part of the usable width. Usable width may be reduced to 10 feet in the area of the slump.
3. Unless the Contractor Officer agrees to material being placed on slumps, ramp the slumps on both ends into undisturbed roadbed to provide at least 10 feet usable width. Use removed materials to guide vehicles to the ramp location or to aid in draining the area.
4. Washouts may be filled with suitable material.

D. Post haul

At the end of hauling or prior to entering into seasonal shutdowns or a period of extended inactivity:

1. Shape the traveled way and disturbed roadbed to provide functional drainage.
2. Reinstall removed cross ditches and water bars and provide any additional drainage structures necessary to offset changes caused through use and maintenance.
3. Leave roads useable for high clearance vehicles. Remove or reshape purchaser modifications at road junctions to leave the entrance as it was before use, or as agreed at the time of improvement.

T-838 MAINTENANCE FOR HIGH CLEARANCE VEHICLE USE (05/07)

838.01 Description

This work consists of making limited use roads passable for project use by Purchaser and providing drainage from the traveled way and roadbed.

838.02 Maintenance Requirements

A. Traveled Way

Purchaser may smooth or fill existing cross ditches and water bars and as approved by the Contracting Officer modify existing road junctions to enable vehicle access. The Purchaser may perform the following work prior to beginning haul and resumption of haul after an extended stoppage:

1. Remove brush, fallen trees, rocks, and other debris from traveled way, including turnouts, turnarounds, and other locations that interfere with needed maintenance as follows:
 - a. No object extending over 4 inches above the road surface shall remain within the 12 feet usable traveled way. Center the usable width on the roadbed or position away from the fill slope.
 - b. Cut and remove standing or down trees, logs, brush, and limbs from within the area described in 1(a). Remove encroaching limbs to a height of 14 feet above the traveled way surface. Scatter material not meeting utilization standards outside and below the roadbed on the fill side. Limb and remove timber that meets utilization standards or deck at locations approved by the Contracting Officer.
 - c. Place all removed materials away from drainages.
 - d. During use, maintain drainage structures including dips, ditches and culverts in a usable condition.
2. Clean and recondition drainage facilities in accordance with Section T-831 and T-834.

B. Slough and Slides

1. Slough and slides may be left in place, provided surface drainage is provided and at least 12 feet of width is available for vehicle passage.
2. Purchaser may reposition or ramp over slides and slough when the traveled way width is less than 12 feet providing the material is capable of supporting vehicles. Limit out slope to no more than six percent.

3. Reposition slough or slide materials, which are not capable of supporting a vehicle, on the roadbed to provide the 12 feet width. When directed by the Contracting Officer, slough or slide material will be removed under Section T-832.

C. Slumps and Washouts

1. Drain the roadbed immediately upgrade of slumps and longitudinal cracks to prevent water from entering slump area.
2. Slumps and longitudinal cracks at the edge of the roadbed shall not be considered a part of the usable width. Usable width may be reduced to 10 feet in the area of the slump.
3. Unless the Contracting Officer approves material being placed on slumps, ramp the slumps on both ends into undisturbed roadbed to provide at least 10 feet usable width. Use removed materials to guide vehicles to the ramp location or to aid in draining the area.
4. Washouts may be filled with suitable material.

D. Post haul

At the end of hauling or prior to entering into seasonal shutdowns or a period of extended inactivity:

1. Shape the traveled way and disturbed roadbed to provide functional drainage.
2. Reinstall removed cross ditches and water bars and provide any additional drainage structures necessary to offset changes caused through use and maintenance.
3. Leave roads useable for high clearance vehicles. Remove or reshape purchaser modifications at road junctions to leave the entrance as it was before use, or as agreed at the time of improvement.

T-839 MAINTENANCE FOR PROJECT USE (05/07)

839.01 Description

Work consists of providing minimum access required for Purchaser's Operations and associated Forest Service contract administration and preventing unacceptable resource or road damage.

839.02 Maintenance Requirements

A. Purchaser is authorized to perform the following maintenance to provide vehicle passage and drainage:

1. Removing log, earth, and rock barriers and/or improving existing road junctions to enable vehicle access as mutually agreed.
2. Smoothing or filling existing cross ditches and water bars.
3. Installing Purchaser-furnished culverts or other temporary drainage structures for shallow stream crossings as approved by the Contracting Officer.
4. Removing brush, fallen trees, rocks, and other materials from the traveled way and other locations that interfere with needed maintenance:
 - a. Place all removed materials away from drainages.
 - b. Limb and remove timber which meets utilization standards or deck at locations approved by the Contracting Officer. Scatter other woody materials, including limbs, off of and below the roadbed without creating concentrations.
5. Clean and recondition drainage structures in accordance with Section T-831 and Section T-834.
6. Reposition or ramp over slough and slides to provide adequate width of traveled way material.
7. Provide traveled way drainage above slumps and seal cracks in slump area. Ramp the slumps on both ends into undisturbed roadbed to provide usable width unless otherwise ordered by the Contracting Officer.

B. During use, the traveled way shall not channel water along the road. Prior to seasonal periods of anticipated rains and runoff, perform the following work:

1. Shape the traveled way and roadbed to drain.
2. Reinstall removed cross ditches and water bars and provide any additional drainage structures necessary to offset changes through use and maintenance.
3. Perform work outlined in 839.02 A (5), (6), and (7).
4. During periods of non use, replace original barrier or provide and maintain standard MUTCD, Type 3, barricades unless alternate type barriers are approved by the Contracting Officer.

839.03 Post Haul Requirements

A. Upon completion of project use perform such work as needed to reasonably conform to the character of the existing road prior to Purchaser's maintenance for project use, unless otherwise provided in the SUPPLEMENTAL SPECIFICATIONS or the Road Listing. Work shall be in addition to requirements of 839.02 B and in accordance with 839.03 B and C.

B. Roads designated in the Road Listing to be blocked shall conform to the requirements of Section T-835. Unless otherwise approved by the Contracting Officer, remove Purchaser-installed temporary structures from National Forest System land. Associated commercially-obtained materials shall remain the property of the Purchaser.

C. Remove or reshape Purchaser improvements at road junctions, as approved by the Contracting Officer at the time of improvement.

T-841 VEGETATION ESTABLISHMENT (5/07)

841.01 Description

This work consists of applying seed, fertilizer, mulch, and planting containerized or bare root plant stock singularly or in specified combinations to roadways and disposal areas. Work area may be limited to designated portions of the roadway and roadside or include treatment of the entire area bounded by the outer limits of the roadsides.

841.02 Materials and Application Rates

Provide the following listed materials:

A. Fertilizer: Fertilizer shall be a standard commercial grade and provide the minimum percentage of available nutrients designated.

<u>% Nitrogen</u>	<u>% Phosphorus</u>	<u>% Potassium</u>	<u>% Sulfur</u>
Refer to Contract Provision CT6.6#			

Furnish fertilizer in sealed containers with the composition, weight, and guaranteed analysis of contents clearly marked. Apply at the rate of 300 pounds per acre.

B. Seed:

1. This work consists of furnishing and placing required seed mix on all areas disturbed under this contract and on any other areas specified.

2. Apply the seed in the following amounts and mixtures:

<u>Species</u>	<u>Application Rate</u>
Refer to Contract Provision CT6.6#	Refer to Contract Provision CT6.6#

3. Use hand-operated seeding devices, or other devices approved by the Contracting Officer, to apply seed.

4. Furnish weed-free seed, with additional requirement that no seed containing any prohibited noxious weed seed, or any restricted noxious weed seed in excess of current state standards, for those weeds as defined in the current publication commonly referred to as the "All States Noxious Weed List" while the standards for prohibited and restricted noxious weeds are to be found in the appropriate state law or regulations.

Furnish seed separately or in mixture in standard containers with (1) seed name; (2) lot number; (3) net weight; (4) percentages of purity and of germination (in case of legumes, percentage of germination to include hard seed), and (5) percentage of maximum weed seed content clearly marked for each kind of seed; (6) certification that the seed lot meets applicable State and Federal laws with regard to prohibited and restricted noxious weeds clearly marked for each kind of seed. Furnish the Contracting Officer duplicate signed copies of a certificate signed by a Registered Seed Technologist or Seed Analyst (certified through either the Association of Official Seed Analysts or the Society of Commercial Seed Technologists) certifying that each lot of seed has been tested in accordance with the Association of Official Seed Analysts standards within 12 months prior to the date of application. This certification shall include (1) name and address of laboratory, (2) date of test, (3) lot number for each kind of seed, (4) name of seed, (5) percentage of germination, (6) percentage of purity, (7) percentage of weed content, (8) certification that the seed lot meets applicable State and Federal laws with regard to prohibited and restricted noxious weeds, and (9) in the case of a mixture, the proportions of each kind of seed. Legume seed shall be inoculated with approved cultures in accordance with the instructions of the manufacturer. No seed may be applied without prior written approval from the Contracting Officer.

- C. **Mulch:** Apply mulch materials as follows:

<u>Mulch Type</u>	<u>Application Rate</u>
Refer to Contract Provision CT6.6#	Refer to Contract Provision CT6.6#

- D. **Plant Stock:** Furnish the following listed plant materials:

<u>Stock</u>	<u>Size</u>	<u>Bare Root</u>	<u>Containerized</u>
N/A			

841.03 Schedules and Applications

A. **Schedule**

1. Seeding may not be done until all other ground-disturbing work on the road has been completed and accepted. Complete seeding as soon as other ground-disturbing work is accepted, unless a specific seeding season is listed below.

Seeding season: April 15 to September 15.

2. Do not apply the treatment when the ground is frozen or excessively wet. Terminate application during periods when there is too much wind to allow consistent treatment rates and control of the treatment area to the designated limits.

B. **Roadside and Slope Treatment**

1. Roadsides will not require advance preparation unless required in the SUPPLEMENTAL SPECIFICATIONS or as SHOWN ON THE DRAWINGS.

2. Apply the designated treatment by hand operated machine. When both roadbed (under 841.03C) and slopes are shown in the SUPPLEMENTAL SPECIFICATIONS for treatment, application may be done at the same time.

3. The Contractor will not be required to operate self-propelled equipment beyond the defined roadbed. Do not apply treatment materials to the foreslope of ditches unless roadbed treatment (841.03C) is also required.

C. **Roadbed Treatment**

1. Scarify portions of the roadbed not previously disturbed and left loose under Section T-835 to a minimum depth of 4 inches unless bedrock is encountered at a lesser depth. The maximum distance between furrows formed by scarification is 12 inches.

2. Treat barrier mounds placed under Section T-835 while in a roughened condition.

D. **Planting**

1. Plant designated woody plant materials at the staked locations or designated spacings.

2. Place containerized plant stock in an appropriately sized hole formed by a dibble or other device to place the roots at the proper depth.

3. Place bare root plant stock in a slotted cut formed by a mattocks, pulaski, or other edged tool. Place the crown at ground level. Do not bend or break the roots.

4. Compress the area adjacent to the hole by foot or special tool to form a depression up and down slope from the stem and force the soil against the container or roots with no air voids.

5. Hold the plantings firmly in place by the soil. When checked by pulling upward on the top ½ inch of the plant stem, the planting shall either break at the hold point or the area compressed against the roots show evidence of movement. Remove and replace with fresh stock plantings that are not held firmly by the soil.

841.04 Government Provided Materials

The Government will provide the following listed materials. At least ten (10) calendar days notice must be given to the Contracting Officer prior to actual date material will be picked up.

Materials will be provided at: **Refer to Contract Provision CT6.6#**

T-842 CUTTING ROADWAY VEGETATION (10/07)

842.01 Description

This work consists of cutting all vegetative growth, including trees and other vegetation less than 4 inches in diameter measured 6 inches above the ground, on roadway surfaces and roadsides.

842.02 Maintenance Requirements

A. General

1. Cut brush, trees, and other vegetation within each area treated to a maximum height of 6 inches above the ground surface or obstruction such as rocks or existing stumps. When work is performed under this Section, remove all limbs which extend into the treated area, or over the roadbed, to a height of 14 feet above the traveled way surface elevation.
2. Items to remain will be DESIGNATED ON THE GROUND.
3. Work may be performed either by hand or mechanically unless specifically shown in the Road Listing. Self-propelled equipment is not allowed on cut and fill slopes or in ditches.
4. Correct damage to trunks of standing trees caused by Purchaser's operation either by treatment with a commercial nursery sealer or by removing the tree as directed by the Contracting Officer.
5. Limb trees within the cutting limits which are over 4 inches -measured at 6 inches above the ground in lieu of cutting.
6. When trees are limbed, cut limbs within 4 inches of the trunk.

B. Cutting Side Vegetation

1. Show the width of vegetation to be removed in the Road Listing.
2. Unless otherwise included in the SUPPLEMENTAL SPECIFICATIONS or DESIGNATED ON THE GROUND:
 - a. Commence work at the edge of the traveled way and proceed away from the road centerline.
 - b. Roads without a defined traveled way: The starting point for cutting will be marked on the ground or defined in the SUPPLEMENTAL SPECIFICATIONS.
3. The points for establishing cutting limits are as follows:
 - a. Fill and daylighted (wide roadbed) section cutting commences at the edge of the traveled way and proceeds away from the road center line.
 - b. Drainage ditched section cutting commences at the bottom of the existing ditch and proceeds away from the road center line. Cutting on ditch foreslopes is not required.
 - c. Unditched cut section cutting commences at the intersection of the cutbank and the roadbed and proceeds away from center line.
4. Provide transitions between differing increments of cutting width. Accomplish transitions in a taper length of not less than 50 feet nor more than 70 feet.

C. Debris

1. Materials resulting from the cutting operation in excess of 12 inches in length or 3 inches in diameter is not allowed to remain on roadway slopes within the treated area, in ditches, or within water courses.
2. Remove limbs and chunks in excess of 3 inches in any dimension from the traveled way and shoulders.
3. Materials may be scattered down slope from the roadbed, outside of the work area and drainages unless otherwise listed in D. Invasive Species of Concern.

D. Invasive Species of Concern

Where DESIGNATED ON THE GROUND, included in the ROAD LISTING, SHOWN ON THE DRAWINGS or as ordered by the Contracting Officer invasive species of concern prevention practices shall be followed as listed below.

Invasive Species of Concern Prevention Practices
Refer to Contract Provision CT6.6#

T-851 LOGGING OUT (5/07)

851.01 Description

This work consists of removal of fallen trees and snags which encroach into the roadway or the 3 feet of roadside abutting the roadway on the cut side.

851.02 Maintenance Requirements

A. Limb and remove timber which meets Utilization Standards, or deck at locations designated by the Contracting Officer.

B. Limb other material cut into lengths for handling. Deck outside ditches and drainages, off the traveled way and turnouts or at staked locations. The clearing width is to the edge of the roadway for public use roads, except limited use roads. The clearing width for limited use roads is shown in the specifications.

C. Notwithstanding B(T)2.3, blowdown timber outside Sale Area required to be removed, which meets Utilization Standards in A(T)2, when designated by the Contracting Officer is Included Timber subject to requirements of B(T)2.2.

D. Do not leave woody debris and slash in excess of 12 inches in length or 3 inches in diameter, or concentrations which may plug ditches or culverts, in ditches, drainage channels, or on backslopes, traveled way, shoulders, or turnouts.

T-854 - TREATMENT AND DISPOSAL OF DANGER TREES (5/07)

854.01 Description

This work consists of felling and disposal of designated live or dead danger trees sufficiently tall to reach roads used by the Purchaser. Any removal of logs is subject to prior agreement between the Contractor Officer and the Purchaser.

854.02 Requirements

A. Designation of danger trees.

Danger trees to be felled will be designated in advance by the Contracting Officer. Trees to be removed will be Marked.

B. Falling, bucking and treatment for disposal.

Use controlled felling to ensure the direction of fall and prevent damage to property, structures, roadway, residual trees, and traffic. Stump heights, measured on the side adjacent to the highest ground, must not exceed 12 inches or 1/3 of the stump diameter, whichever is greater. Higher stump heights are permitted when necessary for safety.

Felled snags and trees, which are not Marked for removal, will be left in a stable condition such that they will not roll or slide. Position logs away from standing trees so they will not roll, are not on top of one another, and are located out of roadway and drainage structures.

Fell, limb and, remove trees, which are Marked for removal, that equal or exceed the utilization standards as listed in the Timber Sale contract or SUPPLEMENTAT SPECIFICATIONS. Dispose of merchantable timber designated for removal in accordance with B/BT2.32 Construction Clearing, of the Timber Sale Contract, or as described in SUPPLEMENTAL SPECIFICATIONS.

C. Slash treatment.

Within the roadway, remove limbs, chunks, and debris in excess of 12 inches in length and 3 inches in diameter, and concentrations that may plug ditches or culverts, and water courses.

Dispose of slash by scattering outside the roadway limits without damaging trees, or improvements.

Large accumulations of slash may be ordered hauled under T-832.

T-891 WATER SUPPLY AND WATERING (5/07)

891.01 Description

This work consists of providing facilities to furnish an adequate water supply, hauling and applying water.

891.02 Materials

If the Purchaser elects to provide water from other than designated sources, the Purchaser is responsible to obtain the right to use the water, including any cost for royalties involved. Suitable and adequate water sources available for Purchaser's use under this contract are designated as follows:

<u>Map</u> <u>Key No.</u>	<u>Location</u> <u>Road</u>	<u>Location</u> <u>Milepost</u>	<u>Use</u> <u>Restrictions</u>
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N/A

891.03 Equipment

A. Positive control of water application is required. Equipment shall provide uniform application of water without ponding or washing.

B. An air gap or positive anti-siphon device shall be provided between the water source and the vehicle being loaded if the vehicle has been used for other than water haul, if the source is a domestic potable water supply, or the water is used for tank mixing with any other materials.

C. The designated water sources may require some work prior to their use. Such work may include cleaning ponded areas, installing temporary weirs or sandbags, pipe repair, pump installation, or other items appropriate to the Purchaser's operations. Flowing streams may be temporarily sandbagged or a weir placed to pond water, provided a minimum flow of _____ cu. ft/sec is maintained. Obtain approval from the Contracting Officer on improvements for sandbags or weirs prior to placement.

TABLE 892-1.- Bituminous dust palliatives.

General Requirements	ASTM Method	DO-1	DO-2	DO-3	DO-4	DO-6	DO-6P	DO-8
Flash Point								
Tag Open-Cup, °C, Min	D 1310	52	52	52	93	66	66	
Cleveland Open-Cup, °C, Min	D 92	-	-	-	-	-	-	100
	-	-	-	-	-	-	-	-
Viscosity:								
Kinematic, @ 38 °C, cSt	D 2170	40-70	90-125	135-200	20-100	-	-	-
Saybolt Furol, @ 25 °C SFS Max.	D 88	-	-	-	-	75-150	25-50	50
Water, % Max.	D 95	0.	0.5	0.5	0.	-	-	-
Asphaltnes, %s	D 2006-70	3-6	4-8	5-10	0-5	5-15	5-15	5-10
Saturates. % Min.	D 2006-70	25	25	25	10	25	25	8
24-Hour Settlement, %	D 244	-	-	-	-	2.0	2.0	2.0
Sieve Test, % Max.	D 244	-	-	-	-	-	-	0.1
Distillation Tests								
Total Distillate to 288 °C, Max. % by Volume	D 244	35	30	30	5	-	-	50
Total Distillate to 360 °C, Max. % by Volume	D 402	-	-	-	-	-	-	-
Oil Distillate, % by Volume	D 244	-	-	-	-	-	10-20	5
Total Residue, % by Weight	D 244	-	-	-	-	60	55	45
Test on Residue from Distillate								
Viscosity, Kenmatic, @ 38 °C ,cST	D 2170	75-250	200-600	500-1500	20-150	-	-	-
Viscosity, Kenmatic, @ 50 °C, cST	D 2170	-	-	-	-	200-600	150-450	250-1200
Solubility in Trichloroethylene, % Min.	D 2042	98	98	98	98	96	96	98
Ductility, CM Min.	D 113	-	-	-	-	-	-	-

Tuba Timber Sale Specified Road Reconstruction

01/25/2014

TABLE OF CONTENTS

Reconstruction Costs	1 Page
Schedule of Items	1 Page
Reconstruction Plans	8 Pages
Specifications Listing	2 Pages
Supplemental Specifications	54 Pages

Tuba Timber Sale Specified Road Reconstruction

01/25/2014

RECONSTRUCTION COSTS

Road Reconstruction Total Estimated Costs

<u>Proj. Number</u>	<u>Estimated Costs</u>
NFSR 4620	\$90,013.00
<hr/>	
Total:	\$90,013.00

\$ 5,726.00 <- CT5.213# Deposits for Reconstruction
Engineering Services

TOTAL RECONSTRUCTION	\$95,739.00
<hr/>	
Public Works Cost =	\$103,830.00

Tuba Timber Sale Specified Road Reconstruction

01/25/2014

SCHEDULE OF ITEMS**National Forest System Road 4620: 6.79 miles**

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL COST
15101	Mobilization	Lump Sum	ALL	\$7,400	\$7,400
15713	Soil Erosion & Pollution Control	Lump Sum	ALL	\$1,900	\$1,900
17005	Developing Water Supply and Water	Lump Sum	ALL	\$4,650	\$4,650
20102	Clearing and Grubbing, Disposal of Tops and Limbs (f), Logs (i), Stumps (f)	Lump Sum	ALL	\$5,100	\$5,100
20207	Removal of Individual Trees, Disposal of Tops and Limbs (f), Logs (i), Stumps (f)	Each	4	\$220	\$880
20304	Removal of Asphalt Concrete, Disposal Method A	Lump Sum	ALL	\$1,200	\$1,200
20358	Removal of Existing Culverts, Disposal Method A	Each	13	\$400	\$5,200
20404	Unclassified Borrow, Compaction Method B	*Cubic Yard	160	\$23	\$3,680
20416	Waste, Unsuitable Excavation	*Cubic Yard	293	\$9	\$2,637
25104	Keyed Riprap, Class 3	*Cubic Yard	26	\$37	\$962
25110	Hand-Placed Riprap, Class 3	*Cubic Yard	2	\$150	\$300
30304	Road Reconditioning, Ditch	Mile	0.22	\$2,200	\$484
30326	Road Reconditioning	Mile	0.20	\$2,400	\$480
32211	Aggregate Surface Course, Compaction Method B	*Cubic Yard	314	\$23	\$7,222
60211-A	24 Inch Corrugated Steel Pipe, 0.064 Inch Thick	Foot	534	\$55	\$29,370
60211-B	36 inch Corrugated Steel Pipe, 0.109 Inch Thick	Foot	52	\$79	\$4,108
60602	Spillway Assembly, 24 inch	Foot	90	\$45	\$4,050
60603	Pipe Anchor Assembly, 24 inch	Each	12	\$370	\$4,440
60608	Energy Dissipator, Class 3 Riprap	Each	13	\$140	\$1,820
60710	Reconditioning Drainage Structures	Each	3	\$110	\$330
65102	Pit and Quarry Development	Lump Sum	ALL	\$3,800	\$3,800
				TOTAL:	\$90,013

* Denotes a Contract Quantity

Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

Attachment D

4620 ROAD RECONSTRUCTION SUMMARY

M.P. 8.80-15.59	BEGIN SPECIFIED ROAD WORK AT THE NORTH END OF NATIONAL FOREST SYSTEM ROAD 4620 (M.P. 8.80) IN TOWNSHIP 6 SOUTH, RANGE 6 EAST, SECTION 18. REMOVE 4 TREES AS MARKED BY THE CONTRACTING OFFICER THROUGH THE TIMBER SALE ADMINISTRATOR.	M.P. 10.24	TWO STACKED CULVERTS EXIST AT THIS LOCATION. REMOVE AND SALVAGE UPPER CULVERT. REMOVE AND DISPOSE OF LOWER CULVERT. RESET SALVAGED 24-INCH CULVERT WITH NEW INLET ELEVATION MATCHING THAT OF THE OLD LOWER CULVERT. SET SKEW TO MATCH THAT OF UPPER CULVERT AS IT EXISTED PRIOR TO REMOVAL. SET AT MINIMUM 8% GRADE AND INSTALL ENERGY DISSIPATOR.
M.P. 9.06	REPLACE EXISTING 24-INCH CMP WITH NEW 24-INCH x 46-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.	M.P. 11.09	REPLACE EXISTING 24-INCH CMP WITH NEW 24-INCH x 46-FOOT ALUMINIZED STEEL CULVERT AND 24-INCH x 20-FOOT DOWN-PIPE. RECONSTRUCT FAILED FILL SLOPE WITH GOVERNMENT SOURCE UNCLASSIFIED BORROW. (DETAIL 2, SHEET 5)
M.P. 9.18	LOAD, HAUL, PLACE, AND COMPACT GOVERNMENT PROVIDED SURFACE AGGREGATE OVER THE FULL WIDTH OF THE ROADWAY TO A DEPTH OF 6-INCHES, FOR 40 LINEAR FOOT LENGTH, AS STAKED BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE.	M.P. 11.30	REPLACE EXISTING 18-INCH CMP (DEEP FILL) WITH NEW 24-INCH x 44-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.
M.P. 9.23	REPLACE EXISTING 18-INCH CMP WITH NEW 24-INCH x 40-FOOT ALUMINIZED STEEL CULVERT WITH SKEW AS STAKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; INSTALL ENERGY DISSIPATOR. LOAD, HAUL, PLACE, AND COMPACT 10 CUBIC YARDS GOVERNMENT PROVIDED SURFACE AGGREGATE TO REPAIR EXISTING DEPRESSION IN ROADWAY.	M.P. 11.60	RECONDITION EXISTING 18-INCH CMP. EXCAVATE AROUND PIPE INLET THEN CUT AND REMOVE 1-FOOT OF PIPE FROM INLET AND PAINT CUT EDGES WITH ZINC COATING. CONSTRUCT HEADWALL AROUND INLET WITH HAND-PLACED GOVERNMENT SOURCE CLASS 3 RIPRAP. (DETAIL 4, SHEET 8)
M.P. 9.54	REPLACE EXISTING 24-INCH CMP WITH NEW 36-INCH x 52-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.	M.P. 11.80	REPLACE EXISTING 18-INCH CMP WITH NEW 24-INCH x 40-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.
M.P. 9.58	JUNCTION 4620-220 ROAD LEFT (REFERENCE ONLY).	M.P. 11.95	REPLACE EXISTING 18-INCH CMP WITH NEW 24-INCH x 36-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.
M.P. 9.63	INSTALL ENERGY DISSIPATOR AT OUTLET OF EXISTING 24-INCH CMP.	M.P. 12.15-12.25	LOAD, HAUL, AND PLACE UNSUITABLE MATERIAL FROM SLOUGH ALONG CUT BANK TO RE-ESTABLISH 14-FOOT MINIMUM ROAD WIDTH. RECONDITION ROAD DITCH AND CLEAN PLUGGED CULVERTS. (DETAIL 4, SHEET 5)
M.P. 9.75	EXCAVATE ROADWAY TO REMOVE UNSUITABLE MATERIAL AT EXISTING SINKHOLE LOCATION. BACKFILL WITH GOVERNMENT SOURCE UNCLASSIFIED BORROW; REPLACE ROAD SURFACING WITH GOVERNMENT PROVIDED SURFACE AGGREGATE. (DETAIL 1, SHEET 5)	M.P. 12.50	RECONDITION EXISTING 18-INCH CMP. EXCAVATE AROUND PIPE INLET TO RESHAPE CATCH BASIN, THEN CUT AND REMOVE 2-FOOT OF PIPE FROM INLET AND PAINT CUT EDGES WITH ZINC COATING.
M.P. 10.00	REPLACE EXISTING 18-INCH CMP WITH NEW 24-INCH x 36-FOOT ALUMINIZED STEEL CULVERT AND 24-INCH x 20-FOOT DOWN-PIPE. RECONSTRUCT FAILED FILL SLOPE WITH GOVERNMENT SOURCE UNCLASSIFIED BORROW.	M.P. 12.73	REPLACE EXISTING 18-INCH CMP WITH NEW 24-INCH x 36-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.
M.P. 10.10	REPAIR SCOUR AT OUTLET OF EXISTING 24-INCH CMP AND INSTALL ENERGY DISSIPATOR.	M.P. 12.76	REPLACE EXISTING 18-INCH CMP WITH NEW 24-INCH x 48-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.
M.P. 10.18	REMOVE AND DISPOSE OF EXISTING LOGS ON ROADWAY. STABILIZE EXISTING FILL SLOPE WITH GOVERNMENT SOURCE CLASS 3 RIPRAP AND UNCLASSIFIED BORROW TO RE-ESTABLISH 14-FOOT MINIMUM ROAD WIDTH. LOAD, HAUL, PLACE, AND COMPACT GOVERNMENT PROVIDED SURFACE AGGREGATE OVER RECONSTRUCTED TRAVEL WAY (DETAIL 3, SHEET 5). INSTALL NEW 24-INCH x 46-FOOT ALUMINIZED STEEL CULVERT AND 24-INCH x 50-FOOT DOWN-PIPE.	M.P. 13.15	REPLACE EXISTING 18-INCH CMP WITH NEW 24-INCH x 40-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.
M.P. 10.21-10.31	REMOVE AND DISPOSE OF EXISTING ASPHALT DEBRIS FROM ROAD SHOULDER. RECONDITION 0.10 MILES OF ROAD SHOULDER AS STAKED BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE, THEN LOAD, HAUL, PLACE, AND COMPACT GOVERNMENT PROVIDED SURFACE AGGREGATE OVER THE DISTURBED ROAD TRAVEL WAY. (DETAIL 4, SHEET 5)	M.P. 13.21	DESIGNATED DISPOSAL AREA FOR UNSUITABLE EXCAVATION ON THE LEFT.
M.P. 10.22	RECONSTRUCT FAILED FILL SLOPE WITH GOVERNMENT SOURCE UNCLASSIFIED BORROW TO RE-ESTABLISH 14-FOOT MINIMUM ROAD WIDTH. LOAD, HAUL, PLACE, AND COMPACT GOVERNMENT PROVIDED SURFACE AGGREGATE OVER RECONSTRUCTED TRAVEL WAY. (DETAIL 2, SHEET 5)	M.P. 13.40	REPLACE EXISTING 18-INCH CMP WITH NEW 24-INCH x 36-FOOT ALUMINIZED STEEL CULVERT; INSTALL ENERGY DISSIPATOR.
		M.P. 13.68	LOAD, HAUL, AND PLACE UNSUITABLE MATERIAL FROM SLOUGH ALONG CUT BANK TO RE-ESTABLISH 14-FOOT MINIMUM ROAD WIDTH AND DRAINAGE DITCH.
		M.P. 14.07	JUNCTION 4620-260 ROAD RIGHT (REFERENCE ONLY).
		M.P. 15.00-15.10	RECONDITION ROADWAY AND ROAD DITCH AS STAKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; DISPOSE OF UNSUITABLE MATERIAL FROM DITCH AT APPROVED LOCATION. LOAD, HAUL, PLACE, AND COMPACT GOVERNMENT PROVIDED SURFACE AGGREGATE OVER TRAVEL WAY. (DETAIL 4, SHEET 5)
		M.P. 15.59	JUNCTION NATIONAL FOREST SYSTEM ROAD 6322. END SPECIFIED ROAD WORK.

DESIGNED BY: P. PODESTA
 DRAWN BY: L. JIMENEZ
 CHECKED BY: J. CASWELL
 SCALE: NONE

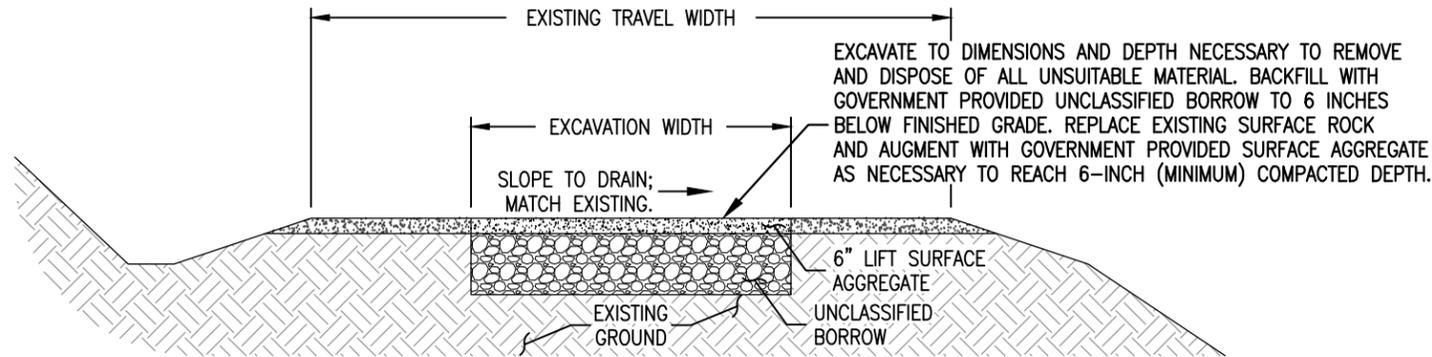


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4620 ROAD DRAINAGE LISTING

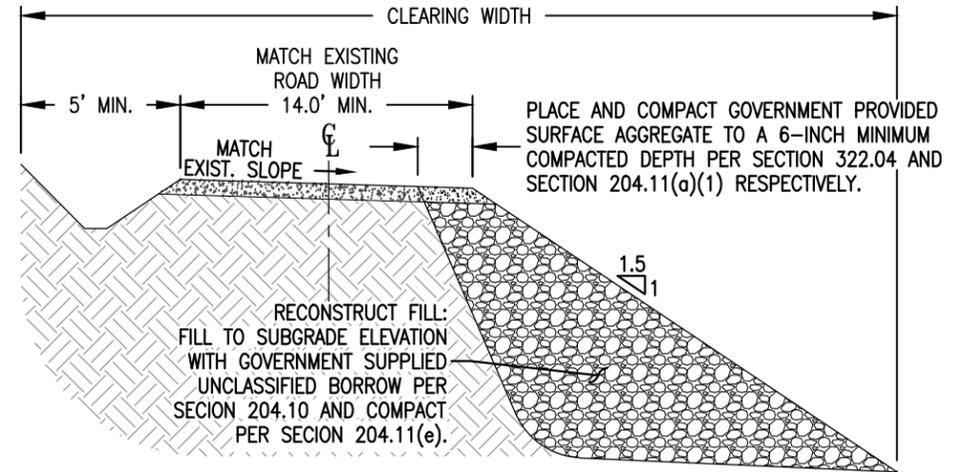
MILE POST	DESIGNED												AS BUILT												REMARKS
	CULVERT			OUTLET PIPE			INSTALLATION DETAILS				EARTHWORK			CULVERT			OUTLET PIPE			INSTALLATION DETAILS					
	DIAMETER	LENGTH	THICKNESS	FULL CIRCLE DIAMETER	LENGTH	THICKNESS	TYPE	SKEW	ANCHOR ASSEMBLY	COUPLING BANDS	BEDDING	RIPRAP	SURFACE ROCK	DIAMETER	LENGTH	THICKNESS	FULL CIRCLE DIAMETER	LENGTH	THICKNESS	TYPE	SKEW	ANCHOR ASSEMBLY	COUPLING BANDS		
	(INCHES)	(FEET)	(INCHES)	(INCHES)	(FEET)	(INCHES)	SEE DETAILS SHEET 6	EXISTING or AS-STAKED	EACH	EACH	CUBIC YARDS	CUBIC YARDS	CUBIC YARDS	(INCHES)	(FEET)	(INCHES)	(INCHES)	(FEET)	(INCHES)	SEE DETAILS SHEET X	EXISTING or AS-STAKED	EACH	EACH		
9.06	24	46	.065	-	-	-	A	EX	-	2	5	3	4												REPLACE EXISTING 24-INCH CMP.
9.23	24	40	.065	-	-	-	A	AS	-	1	4	3	4												REPLACE EXISTING 18-INCH CMP.
9.54	36	52	.109	-	-	-	A	EX	-	1	7	5	4												REPLACE EXISTING 24-INCH CMP.
9.63	-	-	-	-	-	-	-	-	-	-	-	3	-												INSTALL ENERGY DISSIPATOR FOR EXISTING CMP.
10.00	24	36	.065	24	20	.065	B	EX	3	1	5	-	4												REPLACE EXISTING 18-INCH CMP.
10.10	-	-	-	-	-	-	-	-	-	-	-	3	-												INSTALL ENERGY DISSIPATOR FOR EXISTING CMP.
10.18	24	46	.065	24	50	.065	B	EX	6	2	5	-	4												NEW PIPE
10.24	24	40*	.065	-	-	-	A	AS	-	1	4	3	4												REMOVE ONE EXISTING CULVERT; *RESET ONE EXISTING CULVERT.
11.09	24	46	.065	24	20	.065	B	EX	3	2	5	-	4												REPLACE EXISTING 24-INCH CMP.
11.30	24	44	.065	-	-	-	A	EX	-	2	5	3	4												REPLACE EXISTING 18-INCH CMP.
11.60	-	-	-	-	-	-	-	-	-	-	-	2*	-												RECONDITION EXISTING 18-INCH CMP; *RIPRAP IS FOR NEW HEADWALL.
11.80	24	40	.065	-	-	-	A	EX	-	1	4	3	4												REPLACE EXISTING 18-INCH CMP.
11.95	24	36	.065	-	-	-	A	EX	-	1	4	3	4												REPLACE EXISTING 18-INCH CMP.
12.50	-	-	-	-	-	-	-	-	-	-	-	-	-												RECONDITION EXISTING 18-INCH CMP.
12.73	24	36	.065	-	-	-	A	EX	-	1	4	3	4												REPLACE EXISTING 18-INCH CMP.
12.76	24	48	.065	-	-	-	A	EX	-	2	5	3	4												REPLACE EXISTING 18-INCH CMP.
13.15	24	40	.065	-	-	-	A	EX	-	1	4	3	4												REPLACE EXISTING 18-INCH CMP.
13.40	24	36	.065	-	-	-	A	EX	-	1	4	3	4												REPLACE EXISTING 18-INCH CMP.

PROJECT: Tuba Timber Sale Specified Road Reconstruction
 SHEET TITLE: ROAD RECONSTRUCTION SUMMARY AND DRAINAGE LISTING



ROAD SECTION

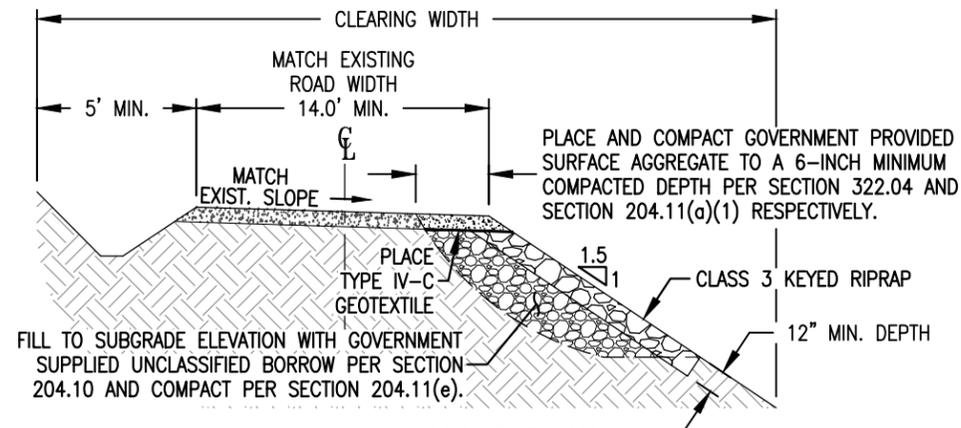
1 TYPICAL SINKHOLE REPAIR SECTION
 APPLIES TO M.P. 9.75
 NOT TO SCALE



ROAD SECTION

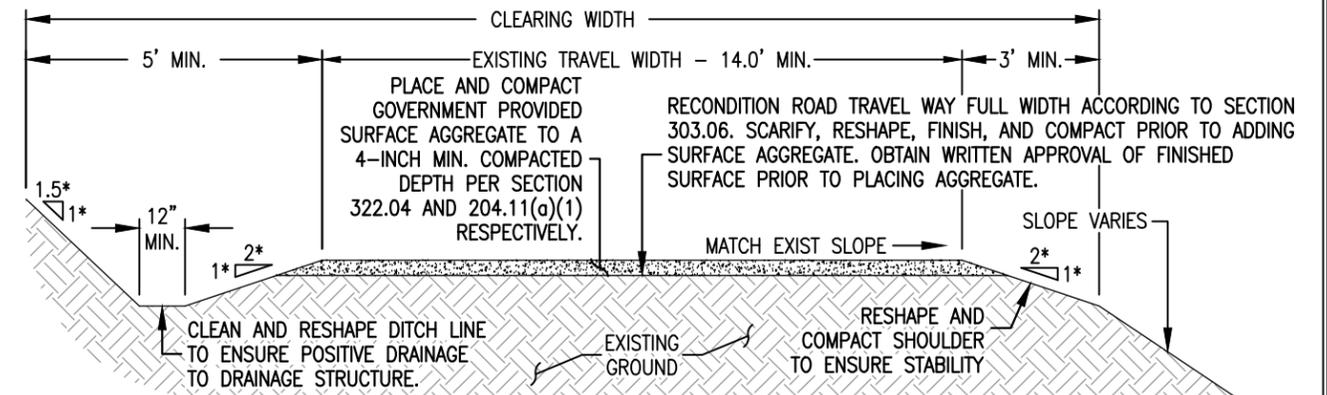
NOTE: PIONEERING MAY BE NECESSARY TO RECONSTRUCT FILL SLOPE. IF PIONEERING IS REQUIRED, THEN PIONEER ONLY WITHIN THE ROAD PRISM AND EXCAVATE PER SECTION 204.06(d). CONSERVE ALL SUITABLE ROADWAY EXCAVATION FOR USE IN RECONSTRUCTION OF ROADWAY OVER PIONEER ROAD. RECONSTRUCT ROADWAY PER SECTION 204.10 AND COMPACT PER SECTION 204.11(e).

2 TYPICAL FILL FAILURE RECONSTRUCTION SECTION
 APPLIES TO M.P. 10.00 AND 11.09
 NOT TO SCALE



ROAD SECTION

3 TYPICAL FILL STABILIZATION SECTION
 APPLIES TO M.P. 10.18
 NOT TO SCALE



ROAD SECTION

4 TYPICAL ROAD AND DITCH RECONDITIONING SECTION
 DITCH RECONDITIONING APPLIES TO M.P. 12.15-12.25, 13.68, AND 15.00-15.10
 TRAVEL WAY RECONDITIONING APPLIES TO M.P. 10.21-10.31 AND 15.00-15.10
 NOT TO SCALE

* DIMENSIONS MAY BE ADJUSTED TO FIT FIELD CONDITIONS WITH THE APPROVAL OF THE CONTRACTING OFFICER.

DESIGNED BY:	P. PODESTA
DRAWN BY:	L. JIMENEZ
CHECKED BY:	J. CASWELL
SCALE:	NONE

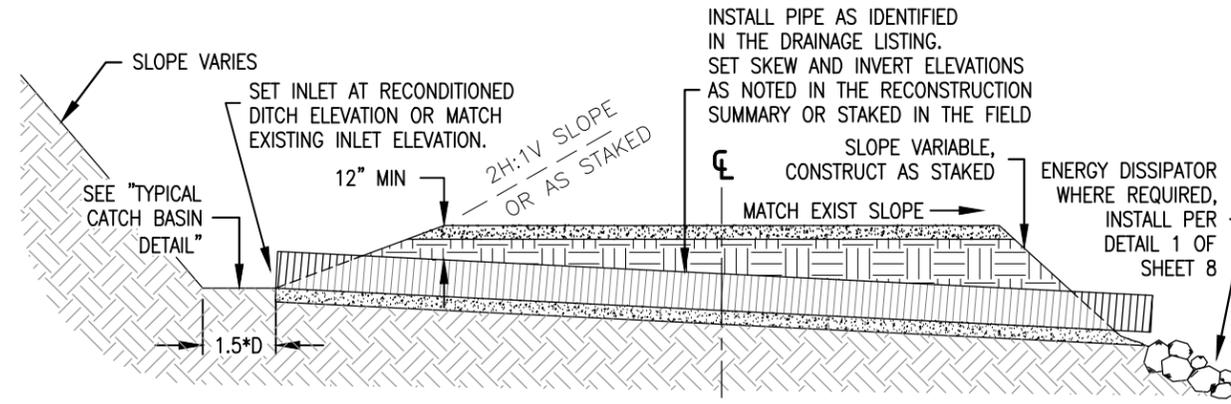


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Tuba Timber Sale Specified Road Reconstruction
 TYPICAL ROAD REPAIR SECTIONS

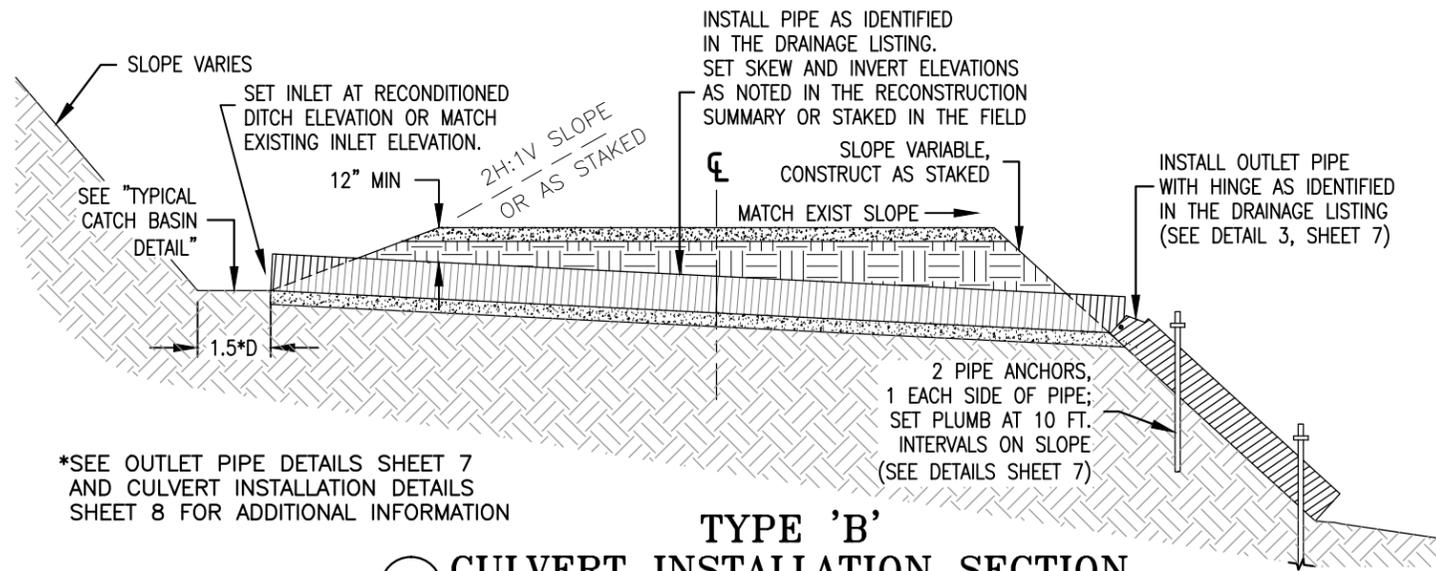
PROJECT:
 SHEET TITLE:

SHEET



*SEE CULVERT INSTALLATION DETAILS SHEET 8 FOR ADDITIONAL INFORMATION
ROAD SECTION

1 TYPE 'A' CULVERT INSTALLATION SECTION
APPLIES TO M.P. 9.06, 9.23, 9.54, 10.24, 11.30, 11.80, 11.95, 12.73, 12.76, 13.15, AND 13.40
NOT TO SCALE



*SEE OUTLET PIPE DETAILS SHEET 7 AND CULVERT INSTALLATION DETAILS SHEET 8 FOR ADDITIONAL INFORMATION

2 TYPE 'B' CULVERT INSTALLATION SECTION
APPLIES TO M.P. 10.00, 10.18, AND 11.09
NOT TO SCALE

CULVERT INSTALLATION GENERAL NOTES:

- LOCATION AND LENGTHS OF CULVERTS IDENTIFIED ON THESE PLANS IS APPROXIMATE. SURVEY AND STAKE THE FINAL LOCATION, SKEW, LENGTH, ELEVATIONS, AND GRADE ACCORDING TO SECTION 152.03(g) OF THE SPECIFICATIONS. DO NOT ORDER CULVERT MATERIAL UNTIL THE CONTRACTING OFFICER HAS ACCEPTED THE FINAL STRUCTURE SIZE, LENGTH, AND ALIGNMENT.
- BACKFILL ALL CULVERTS IN ACCORDANCE WITH FP-03, SECTION 209 STRUCTURE EXCAVATION AND BACKFILL.
- REFER TO DRAINAGE LISTING FOR CULVERT OUTLET PROTECTION LOCATIONS.
- ALL EXCAVATION AND TRENCHING OPERATIONS SHALL CONFORM TO OSHA REQUIREMENTS.
- DO NOT OPERATE ANY HEAVY EQUIPMENT OVER ANY CULVERT UNTIL IT HAS BEEN PROPERLY BACKFILLED WITH A MINIMUM OF 1-FOOT COVER.
- CULVERTS SHALL BE INSTALLED WITH A MINIMUM OF 8% SLOPE WHEREVER FEASIBLE.
- THE MINIMUM LENGTH OF A SINGLE PIPE SECTION FOR ANY INSTALLATION SHALL NOT BE LESS THAN 10 L.F.
- FIELD CUTTING OF CULVERTS IS NOT PERMITTED UNLESS APPROVED BY THE CONTRACTING OFFICER. WHERE SPELTER COATING HAS BEEN BRUISED OR BROKEN IN THE SHOP, DURING SHIPPING, OR BY FIELD CUTTING, REPAIRS SHALL BE IN ACCORDANCE WITH AASHTO M36.
- FABRICATE SPILLWAY ASSEMBLY FROM ANNULAR CORRUGATED PIPE, OR FROM HELICALLY CORRUGATED PIPE, WITH FACTORY OR REFORMED ENDS.
- ALL NEW CULVERTS, SPILLWAYS, AND DOWN PIPES SHALL BE ALUMINIZED STEEL, TYPE 2, WITH STANDARD 2-2/3"x1/2" CORRUGATIONS.
- GALVANIZE ALL ITEMS OF ANCHOR ASSEMBLY AFTER FABRICATION.
- INSTALL ENERGY DISSIPATORS WHERE CALLED FOR IN THE DRAINAGE LISTING (SEE SHEET 4).
- WORK IN LIVE STREAMS SHALL TAKE PLACE ONLY DURING THE IN-WATER WORK PERIOD, FROM JULY 15 THROUGH AUGUST 31.

DESIGNED BY:	P. PODESTA
DRAWN BY:	L. JIMENEZ
CHECKED BY:	J. CASWELL
SCALE:	NONE



USDA FOREST SERVICE
The Pacific Northwest Region

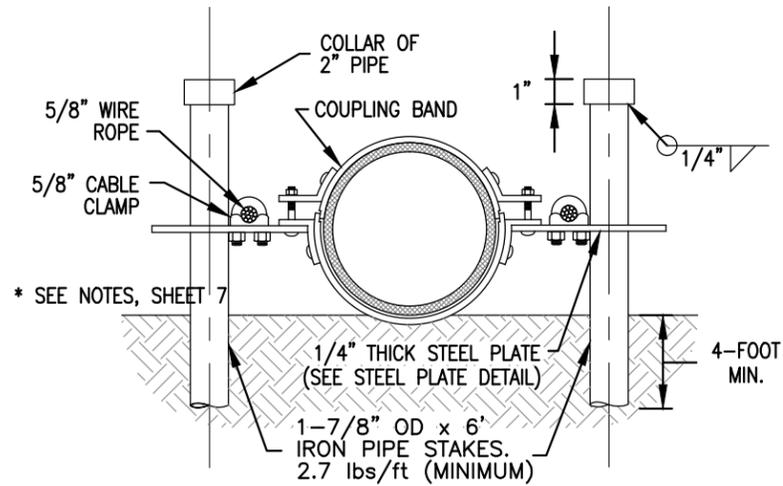
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Tuba Timber Sale Specified Road Reconstruction

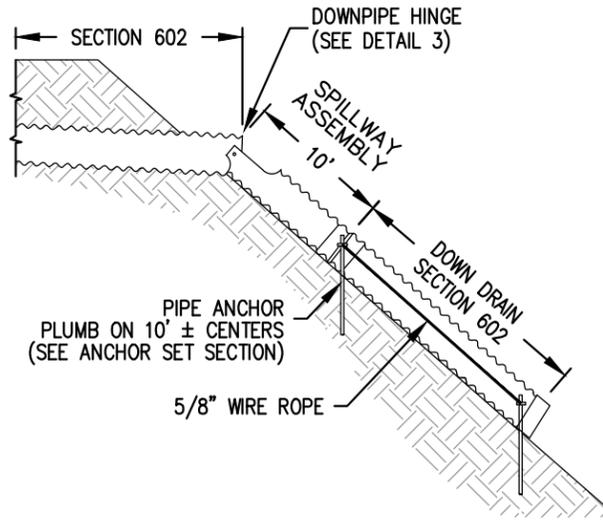
TYPICAL CULVERT INSTALLATION SECTIONS

PROJECT:

SHEET TITLE:

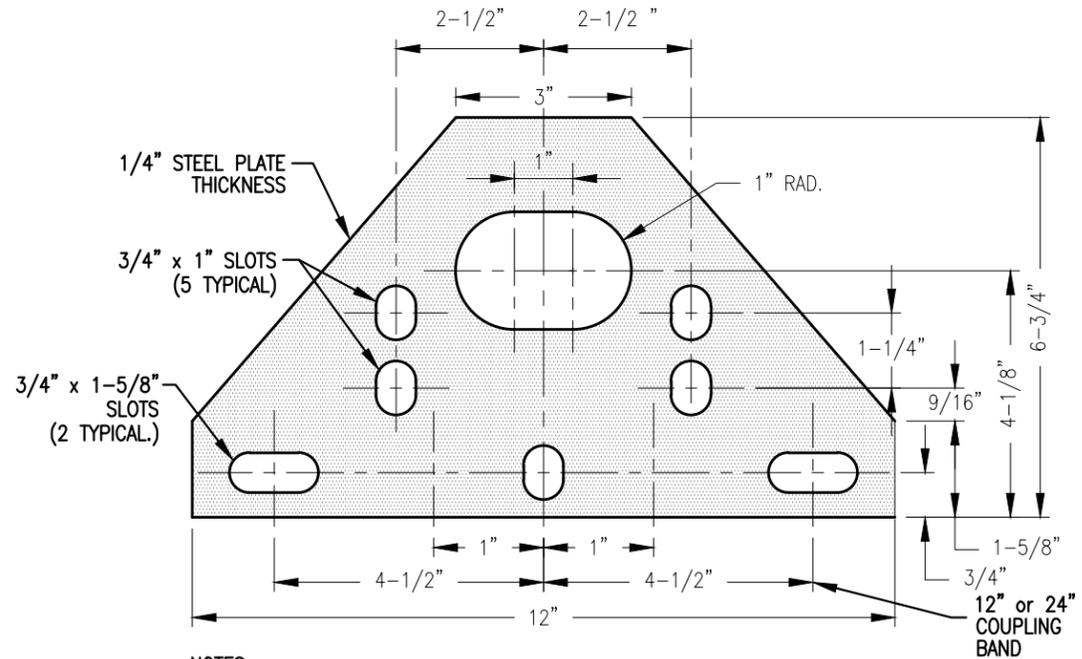


ANCHOR SET SECTION



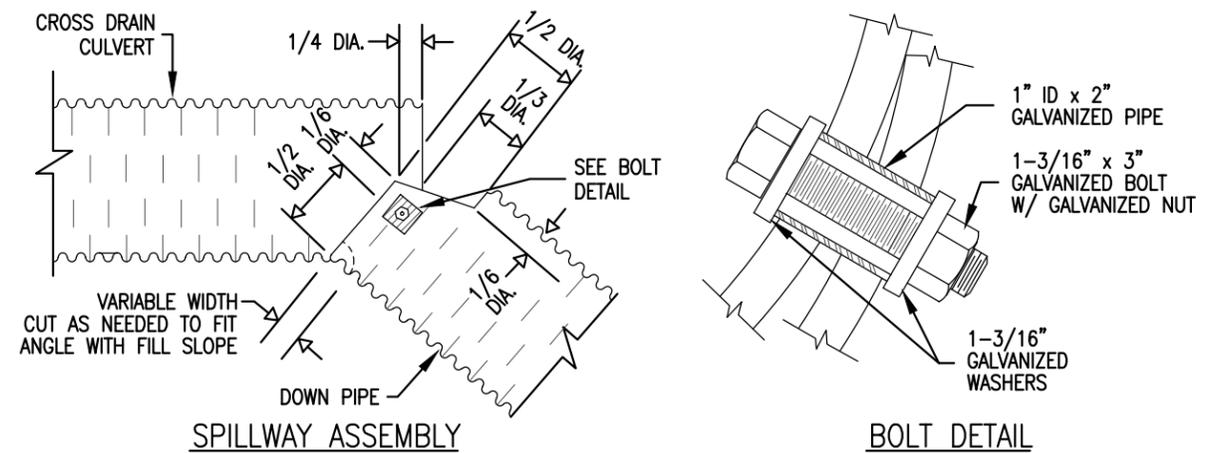
ANCHORING PROFILE

1 TYPICAL PIPE ANCHOR ASSEMBLY DETAIL
NOT TO SCALE



NOTES:
1. MEASURE LENGTH OF COUPLING BAND PARALLEL TO THE CENTERLINE OF THE PIPE.
2. PLATE MATERIAL SHALL BE ASTM A36 1/4". GALVANIZE AFTER FABRICATION.

2 TYPICAL ANCHOR STEEL PLATE DETAIL
NOT TO SCALE



SPILLWAY ASSEMBLY

BOLT DETAIL

3 TYPICAL DOWN PIPE HINGE DETAIL
NOT TO SCALE

DESIGNED BY: P. PODESTA
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
SCALE: NONE



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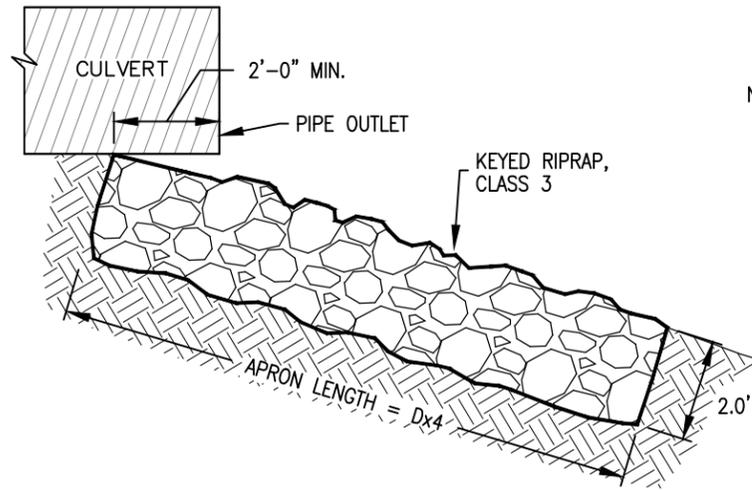
Tuba Timber Sale Specified Road Reconstruction

PROJECT:

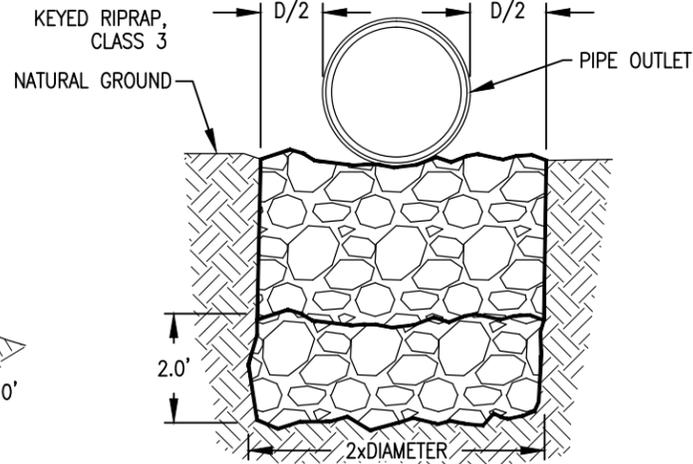
SHEET

OUTLET PIPE DETAILS

Attachment D



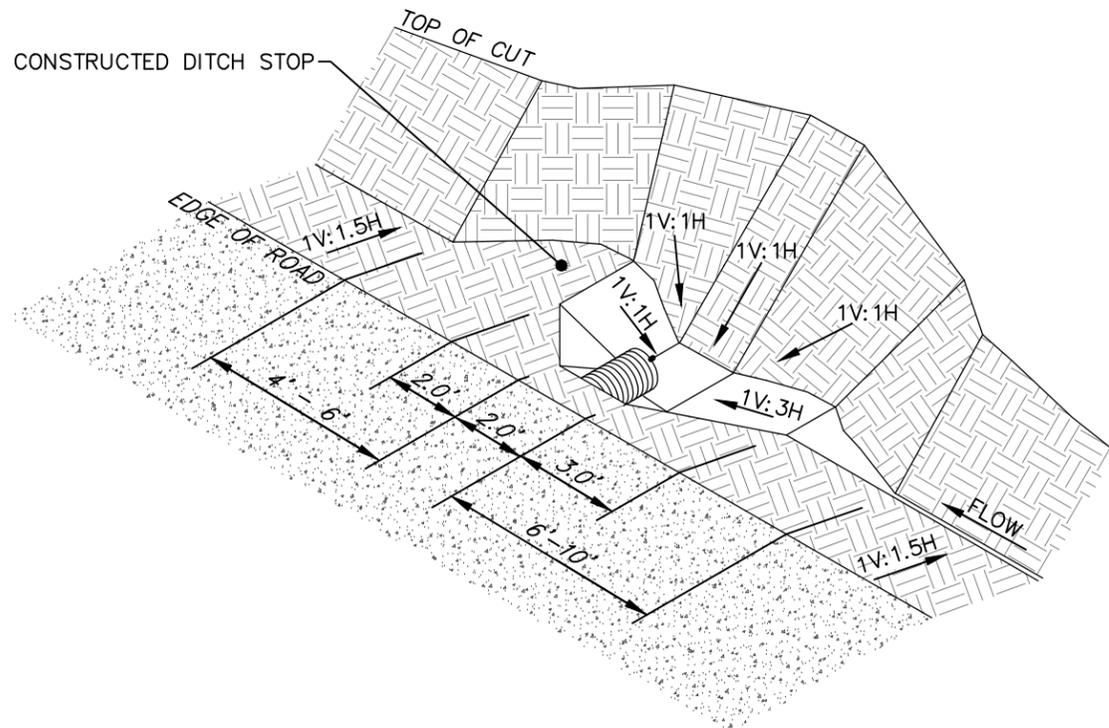
PROFILE VIEW



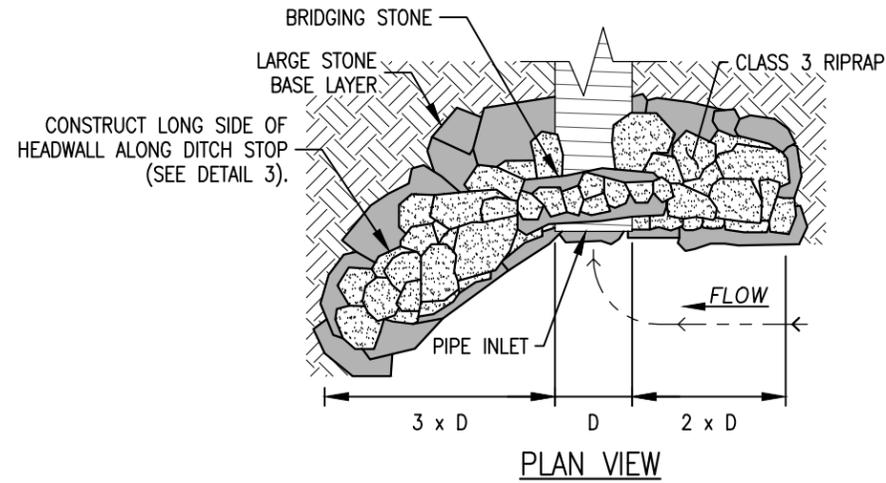
SECTION VIEW

ENERGY DISSIPATION PAD				
CULVERT DIA.	RIPRAP CLASS	APRON DIMENSIONS	DEPTH OF APRON	RIPRAP QUANTITY
24"	3	8' x 4'	2.0'	3 cy
36"	3	12' x 6'	2.0'	5 cy

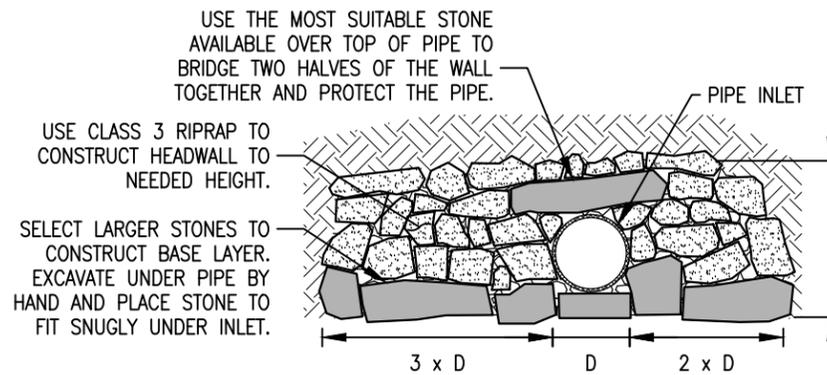
1 TYPICAL ENERGY DISSIPATOR DETAIL
NOT TO SCALE



3 TYPICAL CATCH BASIN DETAIL
NOT TO SCALE

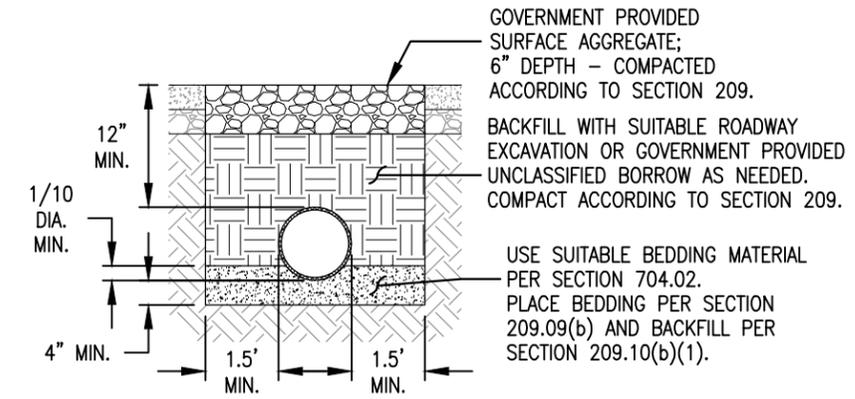


PLAN VIEW



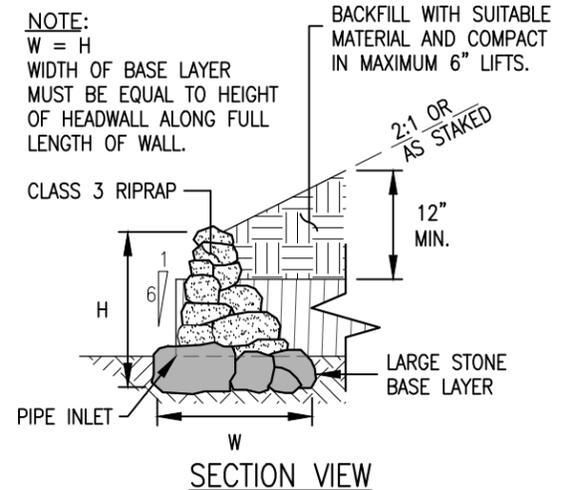
ELEVATION VIEW

4 TYPICAL STONE HEADWALL DETAIL
APPLIES TO M.P. 11.60
NOT TO SCALE



SECTION VIEW

2 TYPICAL CULVERT TRENCH DETAIL
NOT TO SCALE



SECTION VIEW

DESIGNED BY: P. PODESTA
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
SCALE: NONE



USDA FOREST SERVICE
The Pacific Northwest Region
MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

Tuba Timber Sale Specified Road Reconstruction
TYPICAL CULVERT INSTALLATION DETAILS

PROJECT:
SHEET TITLE:

Tuba Timber Sale Specified Road Reconstruction

FP-03 SPECIFICATIONS LIST

U.S. Forest Service
Clackamas River Ranger District
Mt. Hood National Forest
Clackamas County, Oregon

All specifications not included in the specifications listing, but referenced by listed specifications, are applicable to this contract. The Supplemental Specifications shown on the specifications 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.

Section	Title	Revised
	Preface	FP-03 and 3/15/2004
101	Terms, Format, and Definitions	FP-03
101.01	Meaning of Terms	1/22/2009
101.03	Abbreviations	6/16/2006
101.04	Definitions	3/29/2007
102	Bid, Award, and Execution of Contract	FP-03
102.00	Bid, Award, and Execution of Contract	2/16/2005
103	Scope of Work	FP-03
103.00	Deletions	2/16/2005
104	Control of Work	FP-03
104.00	Deletions	6/16/2006
104.06	Use of Roads by Contractor	2/17/2005
105	Control of Material	FP-03
105.02	Material Sources	1/18/2007
105.02(a)	Government Provided Sources	2/17/2005
105.02(a)	Contractor Provided Sources	3/8/2007
105.05	Use of Material Found in Work	5/12/2004
106	Acceptance of Work	FP-03
106.07	Delete	5/11/2004
107	Legal Relations and Responsibility to the Public	FP-03
107.05	Responsibility for Damage Claims	5/11/2004
107.06	Contractor's Responsibility for Work	6/16/2006
107.09	Legal Relationship of the Parties	6/16/2006
107.10	Environmental Protection	6/16/2006
108	Prosecution and Progress	FP-03
108.00	Delete	2/16/2005
109	Measurement and Payment	FP-03
109.00	Deletions	2/17/2005

Attachment D

109.02	Measurement Terms and Definitions	6/16/2006
155	Schedules for Contracts	FP-03
155.00	Delete	5/11/2004
156	Public Traffic	FP-03
156.00	Public Traffic	4/17/2007
157	Soil Erosion Control	FP-03
157.03	General	2/24/2005
170	Develop Water Supply and Watering	FP-03
170.00	Develop Water Supply and Watering	3/26/2007
203	Removal of Structures and Obstructions	FP-03
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	2/18/2005
204	Excavation and Embankment	FP-03
204.00	Excavation and Embankment	3/26/2009
251	Riprap	FP-03
251.02	Material	4/24/2008
251.03	General	8/5/2009
303	Road Reconditioning	FP-03
303.01	Work	3/2/2005
303.06	Aggregate and Asphalt Reconditioning	8/5/2008
303.10	Measurement	3/26/2007
303.11	Measurement	3/29/2005
322	Minor Aggregate Courses	FP-03
322.00	Minor Aggregate Courses	10/14/2011
602	Culverts and Drains	FP-03
602.03	General	9/6/2005
602.03	General	3/17/2010
651	Development of Pits and Quarries	FP-03
651.00	Development of Pits and Quarries	3/2/2005
718	Traffic Signing and Marking Materials	FP-03
718.05	Aluminum Panels	8/5/2009

Table of Contents

Table of Contents	1
Preface.....	4
101 - Terms, Format, and Definitions.....	5
101.01 Meaning of Terms.....	5
101.03 Abbreviations.....	5
101.04 Definitions.....	5
102 - Bid, Award, and Execution of Contract	8
102 Bid, Award, and Execution of Contract.....	8
103 - Scope of Work.....	9
Deletions	9
104 - Control of Work.....	10
Deletions	10
104.06 Use of Roads by Contractor.....	10
105 - Control of Material	11
105.02 Material Sources.	11
105.02(a) Contractor-provided sources.	11
105.02(a) Government Provided Sources.	11
105.05 Use of Material Found in the Work.....	12
106 - Acceptance of Work	13
106.07 Delete	13
107 - Legal Relations and Responsibility to the Public.....	14
107.05 Responsibility for Damage Claims.	14
107.06 Contractor’s Responsibility for Work.....	14
107.09 Legal Relationship of the Parties.	14
107.10 Environmental Protection.	14
108 - Prosecution and Progress.....	16
108 Delete.	16
109 - Measurement and Payment.....	17
109 Deletions	17

109.02 Measurement Terms and Definitions..... 17

155 - Schedules for Construction Contracts 17

 155 Delete. 17

156 - Public Traffic 18

170 - Develop Water Supply and Watering 21

201 - Clearing and Grubbing 23

 201.02 Material: 23

 201.01 Description 23

 201.04 Clearing. (c) 23

 201.06 Disposal..... 24

203 - Removal of Structures and Obstructions 25

 203.01 Description..... 25

 203.04 Removing Material. 25

 203.05 Disposing of Material 25

 203.05 Disposing of Material. 25

204 - Excavation and Embankment 28

251 - Riprap 40

 251.03 General..... 40

303 - Road Reconditioning 41

 303.01 Work. 41

 303.06 Aggregate Surface Reconditioning 41

 303.06 Asphalt and Aggregate Surface Reconditioning 41

 303.10 Measurement..... 42

322 - Minor Aggregate Courses..... 43

 Table 322-1 47

 Sampling and Testing Requirements 47

 Table 322-1 (continued)..... 48

 Sampling and Testing Requirements 48

 Table 322-2 49

 Sampling and Testing Requirements 49

602 - Culverts and Drains 50

602.03 General..... 50

607 - Cleaning, Reconditioning, and Repairing Existing Drainage Structures 51

 607.06 Reconditioning Drainage Structures..... 51

651 - Development of Pits & Quarries 52

718 - Traffic Signing and Marking Material..... 53

 718.05 Aluminum Panels..... 53

Preface

Preface_wo_03_15_2004_m

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

101.00_nat_us_07_25_2005

101.01_nat_us_01_22_2009

101.01 Meaning of Terms

Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.03_nat_us_06_16_2006

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:

mp	Milepost
ppm	Part Per Million

101.04_nat_us_03_29_2007

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.

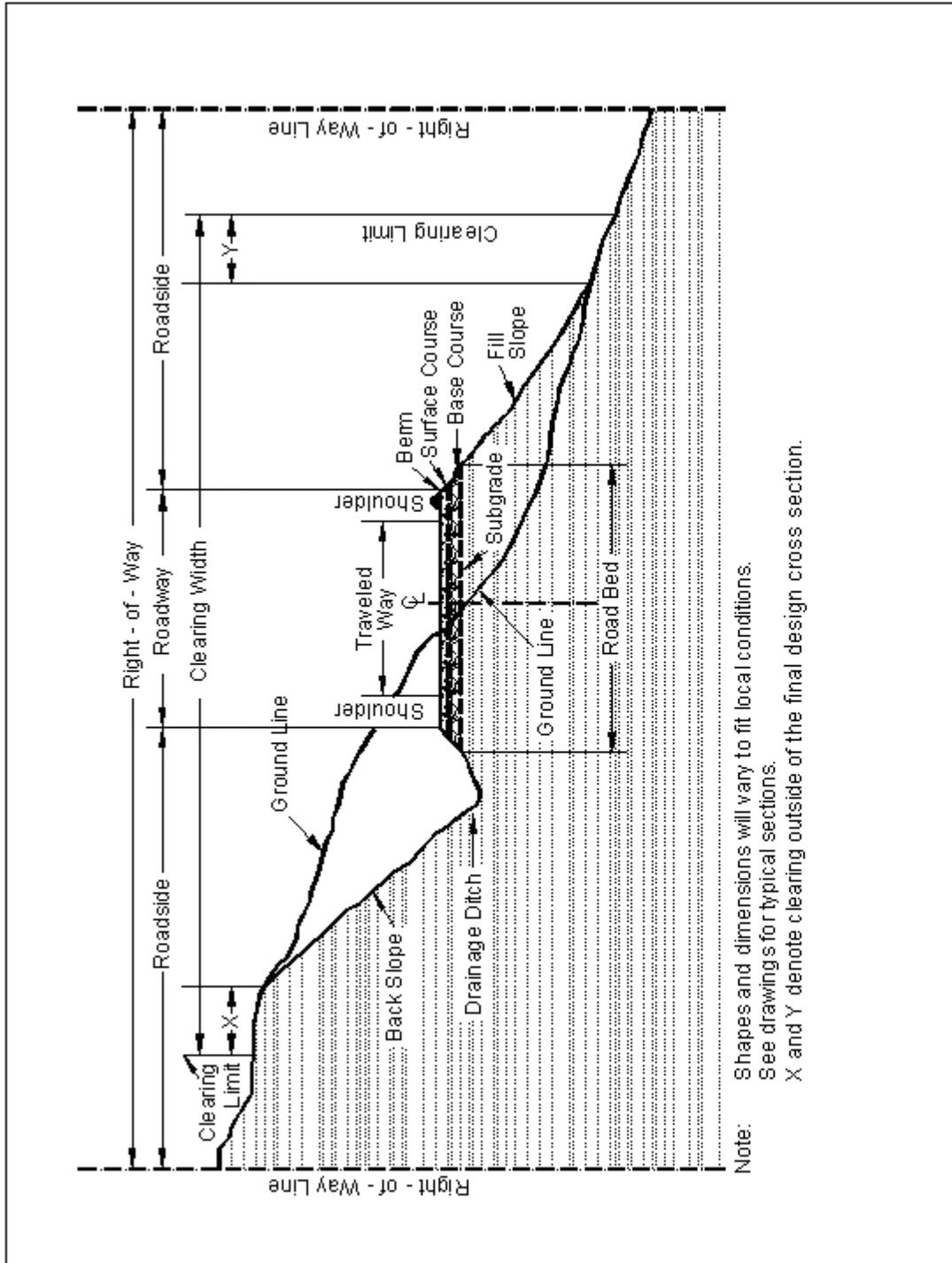
Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

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

102.00_nat_us_02_16_2005

102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

103 - Scope of Work

103.00_nat_us_02_16_2005

Deletions

Delete all but subsection 103.01 Intent of Contract.

104 - Control of Work

104.00_nat_us_06_16_2006

Deletions

Delete Sections 104.01, 104.02, and 104.04.

104.06_nat_us_02_17_2005

Add the following subsection:

104.06 Use of Roads by Contractor

The Contractor is authorized to use roads under the jurisdiction of the Forest Service 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_nat_us_03_08_2007

105.02 Material Sources.

105.02(a) Contractor-provided sources.

Add the following:

All material (e.g., soil, gravel, sand, borrow, aggregate, etc.) transported onto National Forest System land or incorporated into the work will be weed-free. The Contracting Officer may request written documentation of methods used to determine the weed-free status of any and all materials furnished by the contractor. Contractor-provided expertise and methods to establish weed-free status must be appropriate for the weeds of concern in the local area. The following applies to this contract:

A Forest Service weed specialist will inspect proposed sources to determine weed-free status. Provide the Contracting Officer written notification of proposed material sources **10** days prior to use. Written approval of the specific source will be provided to the contractor. If weed species are present in the proposed source, appropriate mitigation measures may allow conditional use of the source as required by the Contracting Officer.

105.02_nat_us_02_17_2005

105.02(a) Government Provided Sources.

(a) Government-provided sources. Add the following:

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

(1) Government-provided mandatory sources.

Obtain material for use as **Unclassified Borrow** and in the production of aggregates under Sections (301/401/411/etc.) from **Trout Creek Quarry**.

(2) Government-provided optional sources.

Material for use as **Surface Aggregate** and in the production of aggregates under Sections (301/401/411/etc.) may be obtained from **Existing Stockpile on National Forest System Road 4620280**.

105.05_nat_us_05_12_2004

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

106.07_nat_us_05_11_2004

106.07 Delete

Delete subsection 106.07.

107 - Legal Relations and Responsibility to the Public

107.05_nat_us_05_11_2004

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06_nat_us_06_16_2006

107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

“except as provided in Subsection 106.07”.

107.09_nat_us_06_16_2006

107.09 Legal Relationship of the Parties.

Delete the entire subsection.

107.10_nat_us_06_16_2006

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

108.00_nat_us_02_16_2005

108 Delete.

Delete Section 108 in its entirety.

109 - Measurement and Payment

109.00_nat_us_02_17_2005

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_nat_us_06_16_2006

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.

155 - Schedules for Construction Contracts

155.00_nat_us_05_11_2004

155 Delete.

Delete Section 155 in its entirety.

156 - Public Traffic

156.00_nat_us_04_17_2007

Delete Section 156 in its entirety and replace with the following:

Description

156.01 This work consists of controlling and protecting public traffic adjacent to and within the project.

Material

156.02 Conform to the MUTCD and the following Sections and Subsections:

Construction sign panels	633
Retro-reflective sheeting	718.01
Temporary concrete barrier	618
Temporary plastic fence	710.11
Temporary traffic control devices	718.22

156.03 General. Unless otherwise provided for in Table 156-1, keep existing roads open to all traffic during road improvement work, and maintain them in a condition that will adequately accommodate traffic. Delays may not exceed **20** minutes at any one time followed by an open period of no less than **10** minutes.

Perform no work that interferes or conflicts with traffic or existing access to the roadway surface until a traffic control plan has been approved. Post construction signs and traffic control devices in conformance with MUTCD. All required signs will be in place and approved prior to beginning work on project.

If the Contractor agrees in writing to allow public traffic to use a new road being constructed prior to completion, it will be considered an existing road for traffic control purposes.

156.04 Temporary Traffic Control. Install and maintain temporary traffic control devices adjacent to and within the project as required by the approved traffic control plan and the MUTCD. Install and maintain traffic control devices as follows:

- (a) Furnish and install traffic control devices before the start of construction operations.
- (b) All detours outside of clearing limits will be approved in writing by the Contracting Officer as part of the traffic control plan.
- (c) Install only those traffic control devices needed for each stage or phase.
- (d) Relocate temporary traffic control devices as necessary.
- (e) Remove devices that no longer apply to the existing conditions.
- (f) Immediately replace any device that is lost, stolen, destroyed, or inoperative.
- (g) Keep temporary traffic control devices clean.
- (h) Remove all temporary traffic control devices upon contract completion or when approved.
- (i) When required, use flaggers certified by the American Traffic Safety Services Association, the National Safety Council, the International Municipal Signal Association, a state agency, or other acceptable organization. Perform the work described under MUTCD Part 6. Use type III, VII, VIII, or IX retroreflective sheeting on flagger paddles. Do not use flags. Flaggers must wear high visibility safety apparel as required by MUTCD 6E.02.

156.05 Temporary Closures. Road segments may be closed as shown in Table 156-1. The maximum consecutive days of closure shall be followed by a minimum number of consecutive days open to traffic as shown. Maintain traffic control devices during closure period(s). Appropriate barricades and signs will be erected and maintained as shown in the traffic control plan or as otherwise designated.

Prior to closing roads during construction, give written notice to the Contracting Officer at least 10 days in advance.

Table 156-1

Temporary Road Closures

Road Number	From Terminus	To Terminus	Maximum Consecutive Days of Closure	Minimum Consecutive Days Open
4620	Mile Post 8.80	Mile Post 15.59	5 (Weekdays Only)	2 (Saturdays & Sundays)

156.06 Acceptance. Public traffic work will be evaluated under Subsection 106.02.

Measurement and Payment

156.07 Do not measure Public Traffic for payment. Compensation is made as an indirect payment.

170 - Develop Water Supply and Watering

170.00_0618_us_03_26_2007

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

170.07 Measure the Section 170 items listed in the bid schedule according to Subsection 109.02.

Payment

170.08 The accepted quantities will be paid at the contract price per unit of measurement for the Section 170 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

201 - Clearing and Grubbing

201.00_nat_us_08_05_2009

201.02 Material:

Delete Tree wound dressing material reference.

201.03 General.

Delete the last sentence.

201.04 Clearing.

Delete the last sentence of (d).

201.01_nat_us_02_18_2005

201.01 Description

Replace with the following

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

201.04_nat_us_02_22_2005

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_nat_us_02_18_2005

201.06 Disposal.

Delete the first sentence of this subsection and substitute the following:

Dispose of merchantable timber designated for removal according to the provisions of the timber sale contract.

203 - Removal of Structures and Obstructions

203.01_nat_us_02_25_2005

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_nat_us_02_18_2005

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_0618_us_03_26_2007

203.05 Disposing of Material

(a) Remove from project.

Delete the last two sentences

203.05_nat_us_02_18_2005

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) Scattering. 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.

(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.

203.08_nat_us_02_24_2005

203.08 Payment

Add the following:

Disposal of construction slash will be compensated under the designated pay item in Section 201.

204 - Excavation and Embankment

204.00_nat_us_03_26_2009

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	704.03
Select borrow	704.07
Select topping	704.08
Topping	704.05
Unclassified borrow	704.06
Water	725.01

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) **Embankment 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) **Embankments 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) **Embankment 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) **Embankment 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 Embankment 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 $1\frac{1}{3}V:1H$ to $1V:2H$. 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:
 - (a)* Roadway prism excavation;

- (b) Rock material excavated and removed from below subgrade in cut sections;
 - (c) Unsuitable material below subgrade and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
 - (d) Ditches, except furrow ditches measured under a separate bid item;
 - (e) Topsoil;
 - (f) 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; and
 - (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 over burden. 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 204-1 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
Topping (704.05) & unclassified borrow (704.06)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D ⁽¹⁾ or T 99, method C ⁽¹⁾	1 per soil type but not less than 1 per	“	“	“
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd ² but not less than 1 per layer	In-place	—	Before placing next layer
Select borrow (704.07 & Select topping (704.08)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type but not less than 1 for each day of production	Processed material before incorporating	Yes, when requested	Before using in work
		Gradation	—	AASHTO T 27	“	“	“	“
		Liquid limit	—	AASHTO T 89	“	“	“	“
		Moisture-density	—	AASHTO T 180, method D ⁽¹⁾ or T 99, method C ⁽¹⁾	1 per soil type but not less than 1 per	“	“	“
Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd ² but not less than 1 per layer	In-place	—	Before placing next layer		

(1) Minimum of 5 points per proctor

Table 204-1 (continued) 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
Earth embankment (204.11, Compaction A)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Source of Material	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D ⁽¹⁾ or T 99, method C ⁽¹⁾	1 per soil type but not less than 1 per 13,000 yd ³	“	“	“
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 3500 yd ² but not less than 1 per layer	In-place	—	Before placing next layer
Top of subgrade (204.11 Compaction A)	Measured and tested for conformance (106.04)	Compaction	—	AASHTO T 310 or other approved procedures	1 per 2500 yd ²	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

Table 204-2 Construction Tolerances													
	Tolerance Class ^(a)												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Roadbed width (ft)	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0	+1.5	+1.0	+2.0	+2.0	+2.0	+2.0	+2.0
Subgrade elevation (ft)	±0.1	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±2.0	±3.0	±2.0	±3.0	(c)
Centerline alignment (ft)	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±1.5	±2.0	±3.0	±3.0	±5.0	(c)
Slopes, excavation, and embankment (% slope ^(b))	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

(a) Maximum allowable deviation from construction stakes and drawings.
 (b) Maximum allowable deviation from staked slope measured from slope stakes 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 in the grade change is less than 10 percent, or a curve length of less than 100 feet when the algebraic difference of the grade change is greater than or equal to 10 percent. The centerline grade is not to exceed 20 percent in 100 feet of length.

251 - Riprap

251.03_nat_us_08_05_2009

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.

303 - Road Reconditioning

303.01_nat_us_03_02_2005

303.01 Work.

Delete and add the following:

This work consists of reconditioning ditches, shoulders, roadbeds, cattleguards, asphalt surfaces, and aggregate surfaces.

303.06_nat_us_08_05_2008

303.06 Aggregate Surface Reconditioning.

Delete and replace with the following:

303.06 Asphalt and Aggregate Surface Reconditioning.

Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. Scarify to the depth of the aggregate surface or to a depth of 6 inches, whichever is less, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to Subsection 301.05, Subsection 321.05, or Subsection 322.05 as applicable.

For asphalt surfaces, clean the existing surface of all loose material, dirt, or other deleterious substances by approved methods. Remove and dispose of unsuitable material that shows evidence of distress, excess asphalt material, or settlement in the roadbed. Patch the areas with approved material that conforms to and is compatible with the adjacent pavement structure. Perform the patch work according to Section 301, 404, 430, or other sections as applicable for the layer or courses being repaired. Clean and seal cracks in the existing asphalt surface according to Subsection 414.05. Correct surface irregularities exceeding 6 inches in depth with a specified aggregate. Place and compact the aggregate according to Subsections 301.04 and 301.05. Prelevel other dips, depressions, sags, excessive or nonexistent crown, or other surface irregularities with asphalt concrete according to Section 404. Spread and compact the asphalt concrete in layers parallel to the grade line not to exceed 2 inches in compacted depth.

Delete Table 303-1 and replace with the following:

**Table 303-1
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	
Existing Roadway	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 (1)	1 per each mixture or change in material	Processed material before incorporating in work	Yes, when requested	Before using in work	
		Moisture-density Method E	—	R-1 Marshall	“	“	“	“	
		Moisture-density Method F	—	AASHTO T 180(1)	“	“	“	“	“
		Moisture-density Method G	—	R-1 Marshall	“	“	“	“	“
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	1 per 3000 yd ²	In-place	—	Before placing next layer	

(1) Minimum of 5 points per proctor.

Remove and replace the first sentence in the third paragraph with the following:

Measure roadbed reconditioning, aggregate surface reconditioning, roadway reconditioning, and pulverizing by the mile, by the foot, by the station or by the square yard.

303.11_nat_us_03_29_2005

303.10 Measurement

Modify the second paragraph as follows:

Measure ditch reconditioning and shoulder reconditioning by the mile, station, or foot horizontally along the centerline of the roadway for each side of the roadway.

322 - Minor Aggregate Courses

322.00_nat_us_10_14_2011

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:

Aggregate	703.05
Water	725.01

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. Removed.

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

Compaction G. Removed.

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 1/2 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**

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Aggregate source quality 703.05	Measured and tested for conformance (106.04 & 105)	LA abrasion (course)	—	AASHTO T 96	1 per type & source of material	Source of material	Yes, when requested	Before using in work
		Sodium sulfate soundness loss (course & fine)	—	AASHTO T 104	“	“	“	“
		Durability index (course & fine)	—	AASHTO T 210	“	“	“	“
		Fractured faces	—	ASTM D 5821	“	“	“	“
Subbase, Base, and Surface courses	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

**Table 322-1 (continued)
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
Subbase, Base, and Surface	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 ⁽¹⁾	1 per type and source of material	Source of material	Yes, when requested	Before using in work
		Moisture-density Method F	—	AASHTO T 180 ⁽¹⁾	“	“	“	“
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	3 per day	In-place	—	Before placing next layer

**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

602 - Culverts and Drains

602.03_nat_us_09_06_2005

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.

602.03_06_us_03_17_2010

602.03 General

Add the following:

Clean and paint damaged coating caused by welding, field cutting, or handling in accordance with AASHTO M 36M and ASTM A 849.

607 - Cleaning, Reconditioning, and Repairing Existing Drainage Structures

607.06_0618_us_03_26_2007

607.06 Reconditioning Drainage Structures.

Add the following:

After field cutting, repair damaged coatings in accordance with AASHTO M 36M and ASTM A 849.

651 - Development of Pits & Quarries

651.00_nat_us_03_02_2005

Description

651.01 This work consists of clearing, grubbing, stripping topsoil, removing overburden, constructing access roads, conducting restoration activities, and performing other incidental work required for pit or quarry development.

Construction Requirements

651.02 General. Submit a plan of operations according to Section 105. Perform all work in accordance with Sections 105, 201, 203, 204, 625, and 635, landscape preservation requirements, and the approved pit and quarry development plan of operations. Perform the work in accordance with MSHA 30 CFR, part 56.

651.03 Acceptance. Developing pits and quarries will be evaluated under Subsections 106.02 and 106.04.

Measurement

651.04 Measure the Section 651 items listed in the bid schedule according to Subsection 109.02.

Payment

651.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 651 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

718 - Traffic Signing and Marking Material

718.05_nat_us_08_05_2009

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.