Key to Attachments

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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	Ashes-Caldera Stewardship	ROAD NUMBER	N/A						
		Miles/Sites	N/A						
DATE PREPARED	06-11-2015	CONST/RECONST	N/A						

157	SOIL EROSION CONTROL	2003							
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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) Gradtion	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	100		
1½ inch		97 – 100			
1 inch	65 – 79 (6)		80 – 100 (6)	100	
3/4 inch			64 – 94 (6)	86 – 100 (6)	100
1/2 inch	45 – 59 (7)				
3/8 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)					
	Grading Designation					
	F	G	H	S	T	U
1 1/2 inch	100(			100		
1 inch	97-100	100		72 - 92 (6)	100	
3/4 inch	76-89 (6)	97 - 100	97 - 100			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 (±) 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	0-1	15-45	

Attachment C – T-Specifications

FOREST SERVICE

SPECIFICATIONS FOR

MAINTENANCE OF

ROADS IN

STEWARDSHIP CONTRACTS

PACIFIC NORTHWEST REGION

EM 7730-20

01/23/2008

STEWARDSHIP CONTRACT

ROAD MAINTENANCE SPECIFICATIONS

SPEC#	SUBJECT DESCRIPTION	DATE
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-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

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

NO DRAWINGS ACCOMPANY THESE SPECIFICATIONS.

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 Stewardship Contracts.

Included are the Standard Specifications (Sections) that commonly apply in Stewardship 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 perations 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 K(T)-F(T).1.2# or the Road Rules document.

(8) Upon seasonal completion of Contractor'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 Contractor in writing as to the cubic yard equivalent of bladed off material by the start of the normal operating season.

803.03 Equipment

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

a. Type or use of equipment is not restricted in K(T)-F(T).1.2# 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 Contractor 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 G.3.5

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 Contractor's election. If Optional is shown then the Contractor 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, Contractor 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 Contractor 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 Contractor 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 Contractor. After satisfactory review and inspection or after such 5 day period, the Contractor 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
Buddleja davidii (butterfly bush) *Centaurea biebersteinii* (spotted knapweed) *Centaurea diffusa* (diffuse knapweed) *Centaurea pratensis* (meadow knapweed) *Cirsium arvense* (canada thistle) *Cirsium vulgare* (bull thistle) *Cytisus scoparius* (scotch broom) *Fallopia japonica* (japanese knotweed) *Hypericum perforatum* (st. john's-wort) *Iris pseudacorus* (yellow flag iris) *Melilotus albus* (white sweet clover) *Rubus armeniacus* (himalayan blackberry) *Senecio jacobaea* (tansy ragweed)	Documentation of material source that has been certified as acceptable to the government through inspection by qualified USDA Forest Service personnel

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 Provisions G.3.5 and K-G.6.0#

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 Provisions G.3.5 and K-G.6.0#

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 Contractor'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 ½ inch per yard of width.

Method B: Insloping the roadbed at not less than ½ 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 Contractor's property to be removed from National Forest System land. Remove and replace any Contractor-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.

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

836.01 Description

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

836.02 Maintenance Requirements

A. Traveled Way

Contractor 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. Contractor 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 Contractor 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 Contractor and providing drainage from the traveled way and roadbed.

838.02 Maintenance Requirements

A. Traveled Way

Contractor 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 Contractor 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. Contractor 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 Contractor 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 Contractor's Operations and associated Forest Service contract administration and preventing unacceptable resource or road damage.

839.02 Maintenance Requirements

A. Contractor 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 Contractor-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 Contractor'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 Contractor-installed temporary structures from National Forest System land. Associated commercially-obtained materials shall remain the property of the Contractor.

C. Remove or reshape Contractor 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.

% Nitrogen	% Phosphorus	% Potassium	% Sulfur
Refer to Contract Provision K-G.6.0#			

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:

Species	Application Rate
Refer to Contract Provision K-G.6.0#	**Refer to Contract Provision K-G.6.0#**

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:

Mulch Type	Application Rate
Refer to Contract Provision K-G.6.0#	**Refer to Contract Provision K-G.6.0#**

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

Stock	Size	Bare Root	Containerized
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 K-G.6.0#**

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 Contractor'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 G.3.5

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 C(T).2, blowdown timber outside Contract 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 C(T).3.

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 Contractor. Any removal of logs is subject to prior agreement between the Contractor Officer and the Contractor.

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 Stewardship Contract or SUPPLEMENTAT SPECIFICATIONS. Dispose of merchantable timber designated for removal in accordance with C(T).32 Construction Clearing, of the Stewardship 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 Contractor elects to provide water from other than designated sources, the Contractor is responsible to obtain the right to use the water, including any cost for royalties involved. Suitable and adequate water sources available for Contractor's use under this contract are designated as follows:

Map Key No.	Location Road	Location Milepost	Use Restrictions
N/A	ROAD 16	6.56	None

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 Contractor'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.

T-892 BITUMINOUS PRODUCTS (5/07)

892.01 Cutback Asphalt's and Emulsified Asphalt's

Meet the requirements and application temperatures of Section 702 of the "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-03)".

892.02 Bituminous Dust Palliatives

Meet the bituminous dust palliatives requirements listed in Table T-892-1 or listed in the SUPPLEMENTAL SPECIFICATIONS.

892.03 Certificate of Compliance

Provide a Certificate of Compliance in the following format;

Consignee **N/A** Designation _____
Contract Number _____ Date _____
Identification (Truck No. Car No., Etc.) _____
Type and Grade _____ With Additive (%, Brand) _____
Loading Temperature _____ Net Weight _____
Net Liters _____

The shipment of bituminous material identified above and covered by the bill of lading complies with Government Standard Specification as modified by SUPPLEMENTAL SPECIFICATIONS applicable to this project.

Producer _____
Signed _____
(Producer's Representative)

892.04 Application Temperatures

Apply bituminous materials within the temperature ranges indicated in Table T-892-2.

TABLE T-892-2 - Application Temperatures

	Application Temperature Range (Degrees C)	
Type & Grade of Material	Min./Max.	Spray Min./Max.	Mix
MC 30		21-63	16-40
MC 70		40-85	32-68
DO-1-2-3		27-52	
DO-4		27-80	
DO-6-7-8		10-60	

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	-	-	-	-	-	-	-

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Specified Road Reconstruction
07/01/2015

RECONSTRUCTION COSTS

Road Reconstruction Total Estimated Costs

Proj. Number	Estimated Costs
NFSR 16	$187,354.50
NFSR 1630660	$12,168.50
NFSR 1640	$12,168.50
NFSR 1640620	$12,960.00
Total:	$224,651.50

$20,432.00 **<- K(T)-F(T).2.1.3# Deposits for Reconstruction Engineering Services**

TOTAL RECONSTRUCTION **$245,083.50**

Public Works Cost = **$248,024.50**

Specified Road Reconstruction
07/01/2015

SCHEDULE OF ITEMS

National Forest System Road 16: 7.90 miles

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL COST
15101	Mobilization	Lump Sum	1	$24,400.00	$ 24,400.00
15201	Miscellaneous Surveying and Staking, Method 1, Tolerance D	Lump Sum	1	$ 1,300.00	$ 1,300.00
15713	Soil Erosion & Pollution Control	Lump Sum	1	$ 9,250.00	$ 9,250.00
20303	Removal of Asphalt, Disposal Methiod A	*Square Yard	1695	$ 2.00	$ 3,390.00
20403	Subexcavation, Compaction Method B	*Cubic Yard	3	$ 72.00	$ 216.00
20416	Waste, Layer Place and Shape	*Cubic Yard	779	$ 11.50	$ 8,958.50
25110	Hand Placed Riprap, Class 3	*Cubic Yard	2	$ 150.00	$ 300.00
26202	Geogrid, Category 4	*Square Yard	2641	$ 8.00	$ 21,128.00
26203-A	Reinforced Soil Embankment, Structural Backfill	*Cubic Yard	122	$ 29.50	$ 3,599.00
26203-B	Reinforced Soil Embankment, Class 2 Riprap	*Cubic Yard	380	$ 47.00	$ 17,860.00
30304	Road Reconditioning, Ditch	Mile	0.17	$ 3,500.00	$ 595.00
32203	Aggregate Base, Grading A, Compaction Method B	*Cubic Yard	303	$ 33.00	$ 9,999.00
32211	Aggregate Surface Course, Grading H, Compaction Method B	*Cubic Yard	165	$ 33.00	$ 5,445.00
40401	Minor Hot Asphalt Concrete	*Ton	185	$ 210.00	$ 38,850.00
43004	Full Depth Patch Hot Asphalt Concrete Mixture	*Ton	52	$ 220.00	$ 11,440.00
60211	24 Inch Aluminized Corrugated Steel Pipe, 0.064 Inch Thick	Foot	85	$ 56.00	$ 4,760.00
60501	Underdrain System, Permeable Backfill	Foot	283	$ 48.00	$ 13,584.00
60608	Energy Dissipator, Class 3 Riprap	Each	4	$ 80.00	$ 320.00
63301	Sign System	Each	2	$ 630.00	$ 1,260.00
63501	Temporary Traffic Control	Lump Sum	1	$ 9,400.00	$ 9,400.00
65102	Pit and Quarry Development	Lump Sum	1	$ 1,300.00	$ 1,300.00
				TOTAL:	**$ 187,354.50**

*** Denotes a Contract Quantity**
Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

Specified Road Reconstruction
07/01/2015

National Forest System Road 1630660: 0.01 miles

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL COST
15101	Mobilization	Lump Sum	1	$ 1,600.00	$ 1,600.00
20416	Waste	*Cubic Yard	9	$ 23.50	$ 211.50
60101	Concrete, Method A or C	*Cubic Yard	9	$ 163.00	$ 1,467.00
63306	Object Markers, FBM & OM2-2V	Each	6	$ 40.00	$ 240.00
65001	Furnish and Install Road Closure Barrier, Steel Square Tube Gate, 17-ft. 5-in. Wide	Each	1	$ 8,650.00	$ 8,650.00
				TOTAL:	**$ 12,168.50**

*** Denotes a Contract Quantity**
Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

National Forest System Road 1640: 0.01 miles

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL COST
15101	Mobilization	Lump Sum	1	$ 1,300.00	$ 1,300.00
20416	Waste	*Cubic Yard	9	$ 23.50	$ 211.50
60101	Concrete, Method A or C	*Cubic Yard	9	$ 163.00	$ 1,467.00
63306	Object Markers, FBM & OM2-2V	Each	6	$ 40.00	$ 240.00
65001	Furnish and Install Road Closure Barrier, Steel Square Tube Gate, 17-ft. 5-in. Wide	Each	1	$ 8,650.00	$ 8,650.00
				TOTAL:	**$ 12,168.50**

*** Denotes a Contract Quantity**
Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

Specified Road Reconstruction
07/01/2015

National Forest System Road 1640620: 1.20 miles

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL COST
15101	Mobilization	Lump Sum	1	$ 2,400.00	$ 2,400.00
15713	Soil Erosion & Pollution Control	Lump Sum	1	$ 1,200.00	$ 1,200.00
20103	Clearing and Grubbing, Disposal of Tops and Limbs (g), Logs (i), Stumps (f)	Mile	1.20	$ 3,000.00	$ 3,600.00
20204	Special Clearing and Grubbing, Disposal of Tops and Limbs (g), Logs (i), Stumps (f)	Mile	1.20	$ 4,800.00	$ 5,760.00
				TOTAL:	**$ 12,960.00**

*** Denotes a Contract Quantity**
Payment will be made on actual work performed as described in FP-03 109.01 unless otherwise noted.

PLOTTED SHEET SIZE: 11" x 17"

DESIGNED BY
07-17-2015
DESIGNER – LUCAS JIMENEZ DATE

REVIEWED BY
07/17/2015
PEER REVIEW – MATHEW HACKETT DATE

REVIEWING ENGINEER – JEFF CASWELL DATE

RECOMMENDED BY
7-17-2015
ZONE ENGINEER – PAUL PODESTA DATE

APPROVAL

DISTRICT RANGER – JANINE TERVO DATE

FOREST ENGINEER – KRISTIN AUSTIN DATE

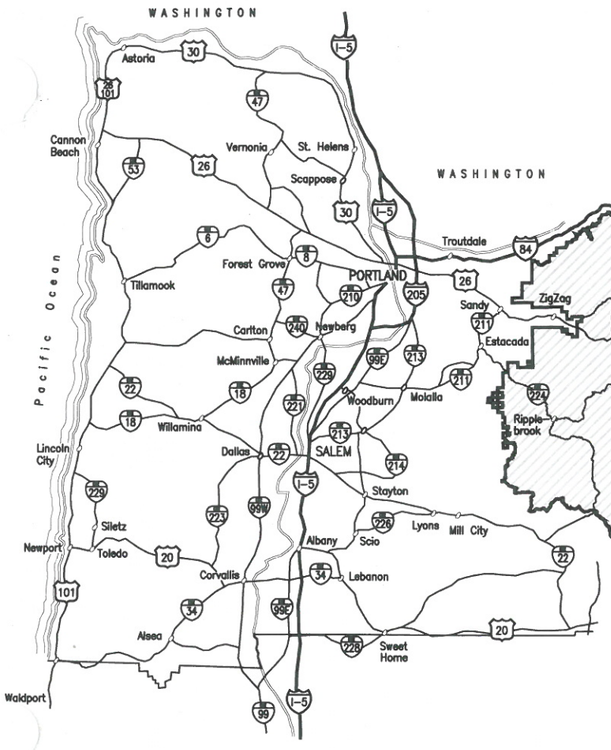
UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE - REGION SIX
SUB-REGIONAL ENGINEERING GROUP

Mt. Hood National Forest

PLANS FOR

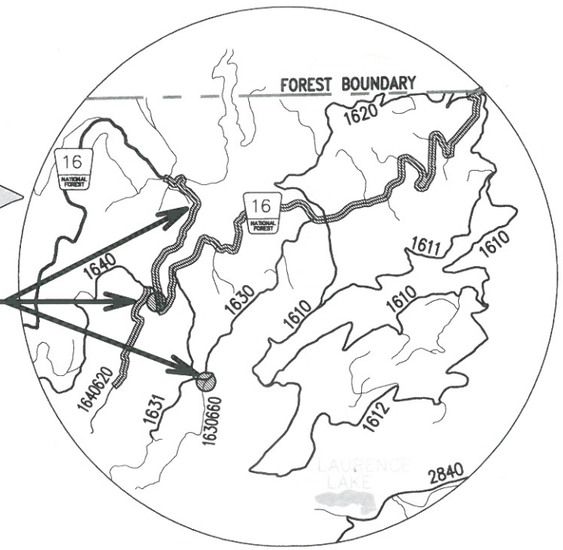
Ashes-Caldera Stewardship Specified Road Reconstruction

ROAD NO.	MILE POST	TYPE OF WORK
16	0.70 to 8.46	RECONSTRUCTION
1630660	0.01	RECONSTRUCTION (INSTALL GATE)
1640	0.01	RECONSTRUCTION (INSTALL GATE)
1640620	0.00 to 1.20	RECONSTRUCTION



REGIONAL MAP
NORTHWEST REGION - OREGON
NOT TO SCALE

PROJECT SITES



VICINITY MAP
HOOD RIVER RANGER DISTRICT
WEST
NOT TO SCALE

LEGEND
I-5 = INTERSTATE HIGHWAY
20 = FEDERAL HIGHWAY
224 = STATE HIGHWAY

PROJECT LOCATIONS

NFSR 16, Mile Posts 0.70 to 8.46
Mt. Hood National Forest,
Hood River Ranger District
Hood River County, Oregon

(Township & Range)
Township: T 1 S
Range: R 9 E
Section(s): 2,3,5,8,9,10, & 17

PROJECT LOCATIONS

NFSR 1630660, Mile Post 0.01
Mt. Hood National Forest,
Hood River Ranger District
Hood River County, Oregon

(Township & Range)
Township: T 1 S
Range: R 9 E
Section: 17

PROJECT LOCATIONS

NFSR 1640, Mile Post 0.01
Mt. Hood National Forest,
Hood River Ranger District
Hood River County, Oregon

(Township & Range)
Township: T 1 S
Range: R 9 E
Section: 8

PROJECT LOCATIONS

NFSR 1640620, Mile Post 0.00 to 1.20
Mt. Hood National Forest,
Hood River Ranger District
Hood River County, Oregon

(Township & Range)
Township: T 1 S
Range: R 9 E
Section(s): 8,17, & 18

SHEET INDEX

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

USDA FOREST SERVICE
The Pacific Northwest Region

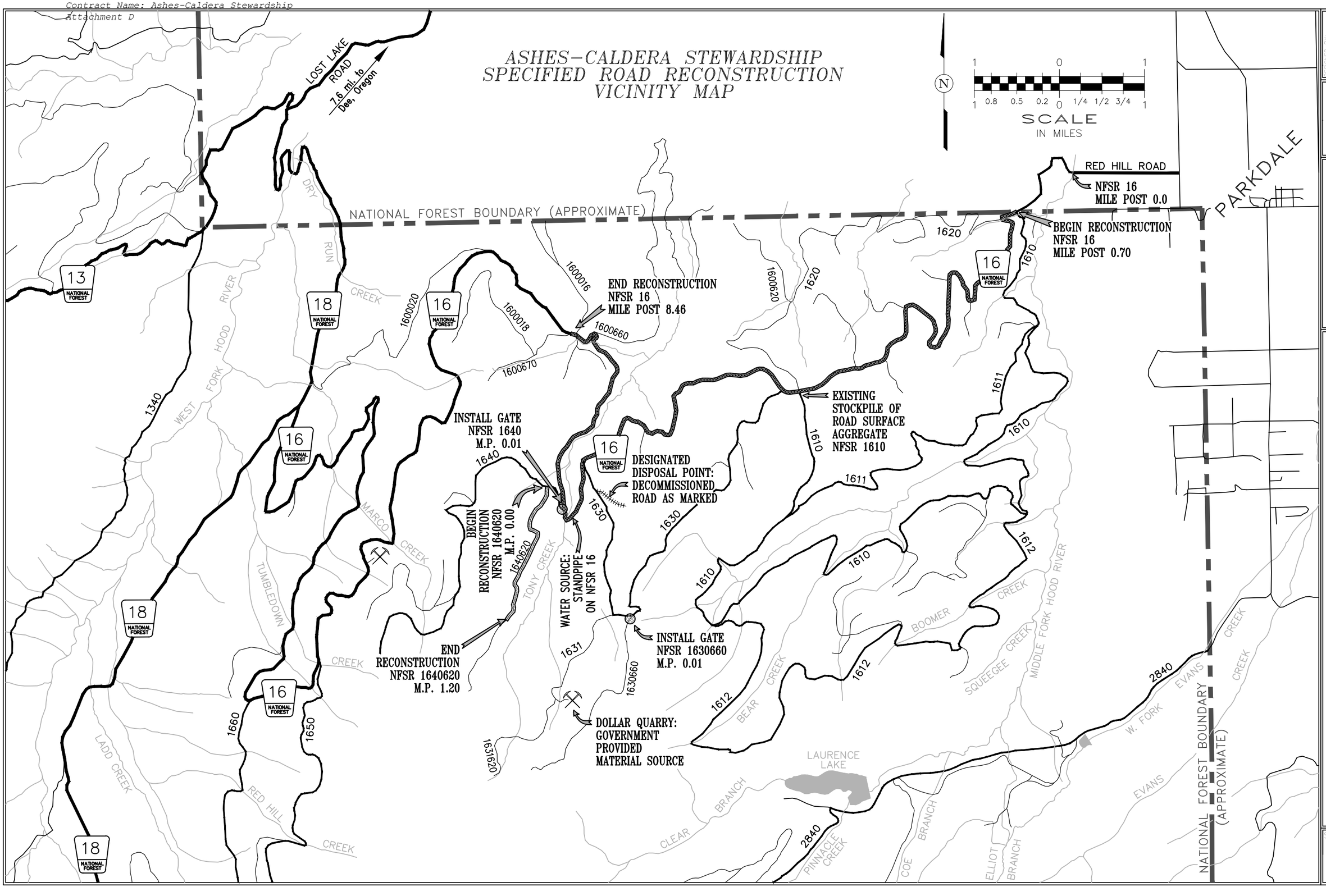
MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes-Caldera Stewardship Road Reconstruction

SHEET TITLE: TITLE AND LOCATION MAP

SHEET 1 of 22

ASHES–CALDERA STEWARDSHIP
SPECIFIED ROAD RECONSTRUCTION
VICINITY MAP



DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE: PROJECT VICINITY MAP

SHEET 2 of 22

16 ROAD (7.90 MILES) RECONSTRUCTION SCHEDULE

ITEM NO.	DESCRIPTION	UNIT OF MEASURE	M.P. 6.30	M.P. 6.35	M.P. 6.40	M.P. 6.61	M.P. 6.85	M.P. 7.29	M.P. 7.41	M.P. 8.05	ROAD TOTALS	REMARKS
15101	MOBILIZATION	LUMP SUM	1	1	1	1	1	1	1	1	ALL	FIRE PROTECTION, WEED PREVENTION, AND EQUIPMENT CLEANING COSTS ARE INDIRECT TO THIS PAY ITEM.
15201	MISCELLANEOUS SURVEYING AND STAKING, METHOD I, TOLERANCE D	LUMP SUM	–	–	1	1	1	1	–	1	ALL	INCLUDES STAKING OF LINES AND GRADES TO WITHIN TOLERANCES FOR RECONSTRUCTING REINFORCED SOIL EMBANKMENTS, ROAD BASE REPLACEMENTS, AND UNDERDRAIN INSTALLATIONS. OBTAIN WRITTEN APPROVAL OF STAKING PRIOR TO BACKFILLING.
15713	SOIL EROSION AND POLLUTION CONTROL	LUMP SUM	–	–	1	1	1	1	–	1	ALL	INCLUDES ALL EROSION AND POLLUTION CONTROL MEASURES, DEWATERING, EMERGENCY WORK DURING STORM EVENTS TO PREVENT SITE DAMAGE AND POLLUTION, AND SEEDING AND MULCHING OF ALL DISTURBED AREAS.
20303	REMOVAL OF ASPHALT, DISPOSAL METHOD A	*SQUARE YARD	125	102	165	111	712	203	3	274	1695	INCLUDES REMOVAL OF EXISTING ASPHALT. DISPOSE OF ASPHALT PER SECTION 203.05 (a) "REMOVE FROM PROJECT".
20403	SUBEXCAVATION, COMPACTION METHOD B	*CUBIC YARD	–	–	–	–	–	–	3	–	3	INCLUDES SUBEXCAVATION FOR SINKHOLE REPAIR AND BACKFILL WITH SUITABLE ROADWAY EXCAVATION OR STRUCTURAL BACKFILL MATERIAL PER 704.04.
20416	WASTE, LAYER PLACE AND SHAPE	*CUBIC YARD	–	–	–	29	635	30	–	85	779	INCLUDES DISPOSAL OF WASTE MATERIAL PER SECTION 204.14. ALSO INCLUDES DISPOSAL OF NON–MERCHANTABLE VEGETATION PER SECTION 203.05 (f(1)) OR 203.05 (g) AS APPLICABLE, AND DISPOSAL OF GRUBBING MATERIAL PER SECTION 203.05 (j).
25110	HAND PLACED RIPRAP, CLASS 3	*CUBIC YARD	–	–	–	–	2	–	–	–	2	INCLUDES WORK FOR CONSTRUCTION OF CULVERT INLET HEADWALL AT MILE POST 6.85 SITE. CONTRACTOR PRODUCTION OF RIPRAP FROM GOVERNMENT PROVIDED SOURCE AS WELL AS LOADING AND HAULING OF RIPRAP IS INCLUDED THIS PAY ITEM.
26202	GEOGRID, CATEGORY 4	*SQUARE YARD	–	–	163	103	1675	123	–	577	2641	COMMERCIAL SOURCE MATERIAL.
26203–A	REINFORCED SOIL EMBANKMENT, STRUCTURAL BACKFILL	*CUBIC YARD	–	–	25	–	–	–	–	97	122	INCLUDES CLEARING AND GRUBBING PER SECTION 201, ROADWAY EXCAVATION, FOUNDATION PREPARATION, BACKFILLING, AND PLACING & COMPACTING STRUCTURAL BACKFILL PER SECTION 262. STRUCTURALL BACKFILL WILL CONSIST OF SUITABLE ROADWAY EXCAVATION MATERIAL OR CONTRACTOR PRODUCED UNCLASSIFIED BORROW FROM GOVERNMENT PROVIDED SOURCE.
26203–B	REINFORCED SOIL EMBANKMENT, CLASS 2 RIPRAP	*CUBIC YARD	–	–	–	–	380	–	–	–	380	INCLUDES CLEARING AND GRUBBING PER SECTION 201, ROADWAY EXCAVATION, FOUNDATION PREPARATION, BACKFILLING, AND LOADING, HAULING, & PLACING OF CONTRACTOR PRODUCED CLASS 2 RIPRAP FROM GOVERNMENT PROVIDED SOURCE. PRODUCTION OF RIPRAP BY SCREENING TO MEET GRADATION FOR CLASS 2 RIPRAP IS INCLUDED IN THIS PAY ITEM.
30304	ROAD RECONDITIONING, DITCH	MILE	0.05	–	0.02	–	0.08	0.02	–	–	0.17	INCLUDES TIME AND EQUIPMENT FOR COMPLETION OF DITCH RECONDITIONING WORK. LOADING, HAULING, AND PLACING OF UNSUITABLE MATERIAL TO DESIGNATED LOCATION ON FOREST IS INCIDENTAL TO THIS PAY ITEM.
32203	AGGREGATE BASE, GRADING A, COMPACTION METHOD B	*CUBIC YARD	–	–	20	24	165	30	1	63	303	COMMERCIAL SOURCE MATERIAL. MATERIAL SOURCE MUST BE APPROVED BY FOREST SERVICE AS SUBSTANTIALLY FREE OF NOXIOUS WEEDS AND INVASIVE SPECIES OF CONCERN.
32211	AGGREGATE SURFACE COURSE, GRADING H, COMPACTION METHOD B	*CUBIC YARD	–	–	19	–	90	25	–	31	165	COMMERCIAL SOURCE MATERIAL. MATERIAL SOURCE MUST BE APPROVED BY FOREST SERVICE AS SUBSTANTIALLY FREE OF NOXIOUS WEEDS AND INVASIVE SPECIES OF CONCERN.
40401	MINOR HOT ASPHALT CONCRETE	*TON	–	–	–	25	160	–	–	–	185	COMMERCIAL SOURCE MATERIAL.
43004	FULL DEPTH PATCH HOT ASPHALT CONCRETE MIXTURE	*TON	28	23	–	–	–	–	1	–	52	COMMERCIAL SOURCE MATERIAL. CATEGORY 1 GLASS GRID PER SECTION 415 IS INCIDENTAL TO THIS PAY ITEM.
60211	24 INCH ALUMINIZED CORRUGATED STEEL PIPE, 0.064 INCH THICK	FOOT	–	–	–	–	45	–	–	40	85	INCLUDES MATERIALS, TIME, AND EQUIPMENT FOR INSTALLATION OF EACH CULVERT AS SHOWN ON THE DRAINAGE LISTING. USES COMMERCIAL SOURCE MATERIALS. SURVEYING AND STAKING PER 152.03(G) IS INCIDENTAL TO THIS PAY ITEM.
60501	UNDERDRAIN SYSTEM, PERMEABLE BACKFILL	FOOT	–	–	–	93	–	–	–	190	283	INCLUDES ALL WORK AND MATERIALS TO CONSTRUCT UNDERDRAIN AND INSTALL DRAIN PIPE. COMMERCIAL SOURCE MATERIALS.
60608	ENERGY DISSIPATOR, CLASS 3 RIPRAP	EACH	–	–	–	1	1	–	–	2	4	CONTRACTOR PRODUCED MATERIAL FROM GOVERNMENT PROVIDED SOURCE.
63301	SIGN SYSTEM	EACH	–	–	1	–	–	–	–	1	2	COMMERCIAL SOURCE MATERIALS WITH GOVERNMENT PROVIDED DATE DECALS AND VANDAL WARNING DECALS.
63501	TEMPORARY TRAFFIC CONTROL	LUMP SUM	1	1	1	1	1	1	1	1	ALL	INCLUDES BARRICADES, WARNING SIGNS, CONTROL FLAGGERS, AND DEVELOPMENT OF TEMPORARY TRAFFIC CONTROL PLAN.
65102	PIT AND QUARRY DEVELOPMENT	LUMP SUM	–	–	–	–	1	–	–	–	ALL	

* – DENOTES A CONTRACT QUANTITY; ALL QUANTITIES SHOWN ARE IN–PLACE QUANTITIES, NO MATERIAL EXPANSION FACTORS HAVE BEEN APPLIED.

16 ROAD RECONSTRUCTION SUMMARY

M.P. 0.00	WESTERLY END OF BRIDGE OVER LITTLE CREEK IN T1N, R10E, SW 1/4 SECTION 31.		SHEET 9; SET GEOGRID AND CONSTRUCT ROAD BASE PER TYPICAL ROADWAY SECTION (STA: 349+00 to 349+60), SHEET 9. PLACE AND COMPACT MINOR HOT–MIX ASPHALT COURSE FULL WIDTH (MATCH EXISTING ASPHALT ELEVATIONS BOTH ENDS).
M.P. 0.70	END COUNTY ROAD (REFERENCE ONLY)		
	JUNCTION FOREST ROAD 1610 – LEFT (REFERENCE ONLY)	M.P. 6.65	JUNCTION FOREST ROAD 1640 – LEFT (REFERENCE ONLY)
	BEGIN SPECIFIED ROAD RECONSTRUCTION WORK.	M.P. 6.85	SAWCUT AND REMOVE EXISTING ASPHALT FULL WIDTH OF ROADWAY AS MARKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; EXCAVATE ROADWAY TO DIMENSIONS SHOWN ON SHEET 10; CONSTRUCT REINFORCED SOIL EMBANKMENT WITH CLASS 2 RIPRAP PER TYPICAL ROADWAY SECTION (STA: 361+00 to 364+00), SHEET 10. PLACE AND COMPACT MINOR HOT–MIX ASPHALT COURSE FULL WIDTH (MATCH EXISTING ASPHALT ELEVATIONS BOTH ENDS). CLEAN AND RECONDITION 410 FEET (0.08 MILE) EXISTING DITCHLINE, STA: 361+00 to 365+10.
M.P. 3.90	JUNCTION FOREST ROAD 1610 – LEFT (REFERENCE ONLY)		
M.P. 4.10	JUNCTION FOREST ROAD 1630 – LEFT (REFERENCE ONLY)		
M.P. 6.00	JUNCTION FOREST ROAD 1630 – LEFT (REFERENCE ONLY)		
M.P. 6.26	INSTALL SIGN POST AND SIGNS PER DETAILS 1 & 2, SHEET 15, FACING EAST.	M.P. 7.29	SAWCUT AND REMOVE EXISTING ASPHALT FULL WIDTH OF ROADWAY AS MARKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; EXCAVATE ROADWAY TO DIMENSIONS SHOWN ON SHEET 11; SET GEOGRID AND CONSTRUCT ROAD BASE PER TYPICAL ROADWAY SECTION (STA: 384+00 to 385+10), SHEET 11. CLEAN AND RECONDITION 110 FEET (0.02 MILE) EXISTING DITCHLINE, STA: 384+00 to 385+10.
M.P. 6.30	SAWCUT AND REMOVE 4–FOOT WIDE x 280–FOOT LONG SECTION OF ASPHALT AS MARKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; SEAL SIX (6) EXISITNG TRANSVERSE PAVEMENT CRACKS ACROSS ROADWAY; TACK AND PLACE CATEGORY 1 GLASS GRID OVER EXISTING BASE ROCK; PLACE AND COMPACT FULL–DEPTH PATCH HOT–MIX ASPHALT CONCRETE OVER 4 x 280 FOOT AREA. CLEAN AND RECONDITION 280 FEET (0.05 MILE) EXISTING DITCHLINE.	M.P. 7.41	SAWCUT AND REMOVE EXISTING 5–ft. x 5–ft. SECTION OF ASPHALT AS MARKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; EXCAVATE ROADWAY TO REPAIR EXISTING SINKHOLE PER DETAIL 1, SHEET 13, UP TO 4–ft. MAXIMUM DEPTH. BACKFILL WITH SUITABLE ROADWAY EXCAVATION, PLACE AND COMPACT AGGREGATE BASE, THEN PLACE AND COMPACT FULL DEPTH PATCH HOT–MIX ASPHALT CONCRETE.
M.P. 6.35	SAWCUT AND REMOVE 4–FOOT WIDE x 230–FOOT LONG SECTION OF ASPHALT AS MARKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; TACK AND PLACE CATEGORY 1 GLASS GRID OVER EXISTING BASE ROCK; PLACE AND COMPACT FULL–DEPTH PATCH HOT–MIX ASPHALT CONCRETE PER SECTION 430 OVER 4 x 230 FOOT AREA.	M.P. 8.05	SAWCUT AND REMOVE EXISTING ASPHALT FULL WIDTH OF ROADWAY AS MARKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; EXCAVATE BELOW DITCHLINE, CONSERVING NATIVE MATERIAL, AND CONSTRUCT DITCHLINE UNDERDRAIN (STA: 425+00 to 426+50) PER DETAIL 3, SHEET 13; EXCAVATE ROADWAY TO DIMENSIONS SHOWN ON SHEET 12; CONSTRUCT REINFORCED SOIL EMBANKMENT WITH STRUCTURAL BACKFILL PER TYPICAL ROADWAY SECTION (STA: 425+00 to 426+50), SHEET 12. PLACE AND COMPACT AGGREGATE SURFACE COURSE FULL WIDTH (MATCH EXISTING ASPHALT ELEVATIONS BOTH ENDS).
M.P. 6.40	SAWCUT AND REMOVE EXISTING ASPHALT FULL WIDTH OF ROADWAY AS MARKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; EXCAVATE ROADWAY TO DIMENSIONS SHOWN ON SHEET 8; CONSTRUCT REINFORCED SOIL EMBANKMENT WITH STRUCTURAL BACKFILL PER TYPICAL ROADWAY SECTION (STA: 338+00 to 338+70), SHEET 8. PLACE AND COMPACT AGGREGATE SURFACE COURSE FULL WIDTH (MATCH EXISTING ASPHALT ELEVATIONS BOTH ENDS). CLEAN AND RECONDITION 105 FEET (0.02 MILE) EXISTING DITCHLINE, STA 337+90 to 338+95.	M.P. 8.09	INSTALL SIGN POST AND SIGNS PER DETAILS 1 & 2, SHEET 15, FACING WEST.
M.P. 6.61	SAWCUT AND REMOVE EXISTING ASPHALT FULL WIDTH OF ROADWAY AS MARKED IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE; EXCAVATE BELOW DITCHLINE, CONSERVING NATIVE MATERIAL, AND CONSTRUCT DITCHLINE UNDERDRAIN (STA: 349+00 to 349+60) PER DETAIL 3, SHEET 13; EXCAVATE ROADWAY TO DIMENSIONS SHOWN ON	M.P. 8.46	JUNCTION FOREST ROAD 1600670 – LEFT (REFERENCE ONLY)
			END SPECIFIED ROAD RECONSTRUCTION WORK.

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 16
ESTIMATE OF QUANTITIES & RECONSTRUCTION SUMMARY

SHEET
3 of 22

1630660 ROAD (0.01 MILES)

ITEM NO.	DESCRIPTION	PAY UNIT	QTY	REMARKS
15101	MOBILIZATION	LUMP SUM	1	TEMPORARY TRAFFIC CONTROL, FIRE PROTECTION, WEED PREVENTION, AND EQUIPMENT CLEANING ARE INCIDENTAL TO THIS PAY ITEM.
20416	WASTE	*CUBIC YARD	9	INCLUDES DISPOSAL OF WASTE MATERIAL PER SPECIFICATIONS SUBSECTION 204.14 AT DESIGNATED SITE AS SHOWN ON THE PROJECT VICINITY MAP, SHEET 2.
60101	CONCRETE, METHOD 'A' OR 'C'	*CUBIC YARD	9	MINIMUM 3000 psi CONCRETE, COMMERCIAL SOURCE MATERIAL; METHOD 'A' OR 'C' PER SUBSECTION 601.03 IS PURCHASER'S OPTION. IF PURCHASER OPTS FOR METHOD 'A', TESTING OF MATERIALS PER TABLE 601-2 IS INDIRECT TO THIS PAY ITEM.
63306	OBJECT MARKERS, FBM-L, FBM-R, & OM2-2V	EACH	6	COMMERCIAL SOURCE MATERIAL; SEE SECTION 718 OF THE SPECIFICATIONS FOR MATERIAL REQUIREMENTS.
65001	FURNISH AND INSTALL ROAD CLOSURE BARRIER, STEEL SQUARE TUBE GATE, 17-feet 5-inches WIDE	EACH	1	INCLUDES GATE CONSTRUCTION MATERIALS, FABRICATION OF GATE, AND EXCAVATION & LABOR FOR INSTALLATION OF GATE.

* - DENOTES A CONTRACT QUANTITY; ALL QUANTITIES SHOWN ARE IN-PLACE QUANTITIES, NO MATERIAL EXPANSION FACTORS HAVE BEEN APPLIED.

1640 ROAD (0.01 MILES)

ITEM NO.	DESCRIPTION	PAY UNIT	QTY	REMARKS
15101	MOBILIZATION	LUMP SUM	1	TEMPORARY TRAFFIC CONTROL, FIRE PROTECTION, WEED PREVENTION, AND EQUIPMENT CLEANING ARE INCIDENTAL TO THIS PAY ITEM.
20416	WASTE	*CUBIC YARD	9	INCLUDES DISPOSAL OF WASTE MATERIAL PER SPECIFICATIONS SUBSECTION 204.14 AT DESIGNATED SITE AS SHOWN ON THE PROJECT VICINITY MAP, SHEET 2.
60101	CONCRETE, METHOD 'A' OR 'C'	*CUBIC YARD	9	MINIMUM 3000 psi CONCRETE, COMMERCIAL SOURCE MATERIAL; METHOD 'A' OR 'C' PER SUBSECTION 601.03 IS PURCHASER'S OPTION. IF PURCHASER OPTS FOR METHOD 'A', TESTING OF MATERIALS PER TABLE 601-2 IS INDIRECT TO THIS PAY ITEM.
63306	OBJECT MARKERS, FBM-L, FBM-R, & OM2-2V	EACH	6	COMMERCIAL SOURCE MATERIAL; SEE SECTION 718 OF THE SPECIFICATIONS FOR MATERIAL REQUIREMENTS.
65001	FURNISH AND INSTALL ROAD CLOSURE BARRIER, STEEL SQUARE TUBE GATE, 17-feet 5-inches WIDE	EACH	1	INCLUDES GATE CONSTRUCTION MATERIALS, FABRICATION OF GATE, AND EXCAVATION & LABOR FOR INSTALLATION OF GATE.

* - DENOTES A CONTRACT QUANTITY; ALL QUANTITIES SHOWN ARE IN-PLACE QUANTITIES, NO MATERIAL EXPANSION FACTORS HAVE BEEN APPLIED.

1640620 ROAD (1.20 MILES)

ITEM NO.	DESCRIPTION	PAY UNIT	QTY	REMARKS
15101	MOBILIZATION	LUMP SUM	1	TEMPORARY TRAFFIC CONTROL, FIRE PROTECTION, WEED PREVENTION, AND EQUIPMENT CLEANING ARE INCIDENTAL TO THIS PAY ITEM.
15713	SOIL EROSION AND POLLUTION CONTROL	LUMP SUM	1	INCLUDES ALL EROSION AND POLLUTION CONTROL MEASURES. TEMPORARY CHECK DAMS PER DETAIL 3, SHEET 18, ARE INCIDENTAL TO THIS PAY ITEM.
20103	CLEARING AND GRUBBING, DISPOSAL OF TOPS AND LIMBS (g), LOGS (i), STUMPS (f)	MILE	1.20	CHIP OR GRIND ALL UNMERCHANTABLE VEGETATION AND DEBRIS FOR USE AS MULCH ON DISTURBED SOILS AND FILL SLOPES. DISPOSE OF MERCHANTABLE MATERIAL ACCORDING TO THE TERMS OF THE TIMBER SALE CONTRACT.
20204	SPECIAL CLEARING AND GRUBBING, DISPOSAL OF TOPS AND LIMBS (g), LOGS (i), STUMPS (f)	MILE	1.20	CHIP OR GRIND ALL UNMERCHANTABLE VEGETATION AND DEBRIS FOR USE AS MULCH ON DISTURBED SOILS AND FILL SLOPES. DISPOSE OF MERCHANTABLE MATERIAL ACCORDING TO THE TERMS OF THE TIMBER SALE CONTRACT.

1630660 ROAD RECONSTRUCTION SUMMARY

M.P. 0.00	JUNCTION OF NFSR 1630 AND NFSR 1630660 (REFERENCE ONLY).
	BEGIN ROAD RECONSTRUCTION PROJECT.
M.P. 0.01	INSTALL GATE AS STAKED ON THE GROUND BY THE CONTRACTING OFFICER THROUGH THE TIMBER SALE ENGINEERING REPRESENTATIVE.
	END ROAD RECONSTRUCTION PROJECT.

1640 ROAD RECONSTRUCTION SUMMARY

M.P. 0.00	JUNCTION OF NFSR 1640 AND NFSR 16 (REFERENCE ONLY).
	BEGIN ROAD RECONSTRUCTION PROJECT.
M.P. 0.01	INSTALL GATE AS STAKED ON THE GROUND BY THE CONTRACTING OFFICER THROUGH THE TIMBER SALE ENGINEERING REPRESENTATIVE.
	END ROAD RECONSTRUCTION PROJECT.

1640620 ROAD RECONSTRUCTION SUMMARY

M.P. 0.00	JUNCTION OF NFSR 1640620 AND NFSR 1640 (REFERENCE ONLY).
	BEGIN ROAD RECONSTRUCTION PROJECT.
	BEGIN CLEARING AND GRUBBING PER DETAIL 1, SHEET 18.
M.P. 1.20	END CLEARING AND GRUBBING PER DETAIL 1, SHEET 18.
	END ROAD RECONSTRUCTION PROJECT.

16 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		
6.85	24	45	.065	-	-	-	A	EX	-	2	3.5	3+2*	4												REPLACE EXISTING 24-INCH CMP. *RIPRAP IS FOR NEW HEADWALL.
8.05	24	40	.065	-	-	-	A	AS	-	1	2.5	3	4												INSTALL NEW PIPE.

ALL CULVERTS:

1. ALUMINIZED STEEL SHALL BE USED FOR ALL CULVERT INSTALLATIONS. METAL PIPE CORRUGATIONS SHALL BE 2 2/3" X 1/2" UNLESS OTHERWISE APPROVED.
2. RIPRAP IS FOR ENERGY DISSIPATORS ONLY, UNLESS OTHERWISE NOTED. EARTHWORK QUANTITIES ARE SHOWN ONLY FOR CLARITY. EXCAVATION, BEDDING, AND BACKFILL ARE INCIDENTAL TO PAY ITEMS 60211-A&B.
3. CULVERT SKEW SHALL MATCH THE SKEW OF THE EXISTING (EX) STRUCTURE, OR BE SET AS-STAKED (AS) IN THE FIELD BY THE CONTRACTING OFFICER THROUGH THE ENGINEERING REPRESENTATIVE.

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes-Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 1630660, 1640, AND 1640620 ESTIMATE OF QUANTITIES & RECONSTRUCTION SUMMARIES

GENERAL NOTES

1. MT. HOOD NATIONAL FOREST COMMERCIAL ROAD USE RULES AND DEFINITIONS, 1992, ARE INCLUCED AS PART OF THIS CONTRACT BY REFERENCE.
2. THE CONTRACTOR SHALL PROVIDE THE GOVERNMENT WITH A TRAFFIC CONTROL PLAN AND A ROAD CLOSURE NOTICE A MINIMUM OF 10 CALENDAR DAYS PRIOR TO THE CLOSURE OF NATIONAL FOREST SERVICE ROADS THAT HAVE BEEN APPROVED FOR TEMPORARY CLOSURE UNDER THIS CONTRACT.
3. THE CONTRACTOR SHALL GRADE ALL EXCAVATION AREAS TO SAFELY PASS TRAFFIC AT THE COMPLETION OF EACH WORK DAY. THE ROADWAY MUST BE SIGNED TO MUTCD STANDARDS AND BE PASSABLE TO ALL TRAFFIC OVERNIGHT, ON WEEKENDS, AND ON FEDERAL HOLIDAYS. TRAFFICABILITY AND SAFETY OF EACH WORK SITE IS THE RESPONSIBILITY OF THE CONTRACTOR AT ALL TIMES, WHETHER WORKERS ARE ON SITE OR NOT.
4. STORAGE OF ALL EQUIPMENT AND MATERIALS ON GOVERNMENT LANDS WILL BE AT APPROVED LOCATIONS ONLY AND BE STORED AT THE CONTRACTOR'S RISK.
5. ALL ROADWAY EXCAVATION AND EMBANKMENT EARTHWORK SHALL HAVE MAXIMUM ALLOWABLE DEVIATIONS FROM PLAN LINES, GRADES, CROSS SECTIONS, AND DIMENSIONS ACCORDING TO CONSTRUCTION TOLERANCE CLASS B AS DEFINED BY FSSS "TABLE 204-2 CONSTRUCTION TOLERANCES".
6. EXISTING TREES MAY BE REMOVED ONLY AS NECESSARY TO COMPLETE SPECIFIED WORK ACCORDING TO THE CONTRACT. ALL TREES OF MERCHANTABLE QUALITY ARE PROPERTY OF THE US GOVERNMENT AND SHALL BE DECKED ON SITE AS DIRECTED BY THE CONTRACTING OFFICER. ALL TREES NOT OF MERCHANTABLE QUALITY SHALL BE DISPOSED OF ACCORDING TO FSSS 203.05 (f(1)) OR 203.05 (g) AS APPLICABLE.
7. EXTRACT WATER FOR CONSTRUCTION OPERATIONS ONLY AT APPROVED LOCATIONS ACCORDING TO SECTION 170 OF THE CONTRACT SPECIFICATIONS. AT ANY TIME WHEN THE WATER AT THIS LOCATION IS INSUFFICIENT FOR THE PROPOSED WORK, THE CONTRACTOR WILL DEVELOP A WATER SUPPLY AT ANOTHER NEARBY LOCATION AS DESIGNATED BY THE CONTRACTING OFFICER.
8. REMOVE ALL BERMS, EXISTING OR CREATED, TO ALLOW FOR DRAINAGE OF WATER FROM THE ROAD TRAVELED WAY, UNLESS OTHERWISE DESIGNATED TO REMAIN.
9. ANY DAMAGE TO THE EXISTING ROAD SYSTEM, INSIDE OR OUTSIDE OF THE WORK AREA, WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
10. ALL DETAILS ARE TYPICAL DETAILS, AND ARE SECTION VIEW UNLESS OTHERWISE NOTED.
11. DETAILS AND DRAWINGS ARE NOT TO SCALE (NTS).

CONSTRUCTION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING SURVEY CONTROL PRIOR TO EXCAVATION AND FOR MAINTAINING SURVEY CONTROL THROUGHOUT THE PROJECT.
2. THE EXISTING ROAD CENTERLINE IS THE REFERENCE LINE FOR DEEP PATCH LAYOUT. RE-ESTABLISH THE HORIZONTAL AND VERTICAL CENTERLINE ALIGNMENT ACCORDING TO THE ALIGNMENT AND GRADE DATA SHOWN ON THE PLAN SHEETS. CENTERLINE, RIGHT EDGE OF PAVEMENT, AND LEFT EDGE OF PAVEMENT SHALL MATCH EXISTING GRADE AND ELEVATIONS AT BOTH ENDS OF EACH PROJECT.
3. SAWCUT AND REMOVE EXISTING ASPHALT ACCORDING TO SECTION 203.05a OF THE PROJECT SPECIFICATIONS. ALL ASPHALT EDGES SHALL BE RECUT AS NEEDED AND CLEANED PRIOR TO PAVING TO PROVIDE A SMOOTH PAVING JOINT. AFTER PAVING, APPLY A 12-INCH WIDE SAND SLURRY SEAL TO PROVIDE A WATER-TIGHT SEAL AT ALL JOINTS.
4. GEOGRID SHALL COMPLY WITH SUPPLEMENTAL SPECIFICATIONS SECTION 714.03, PHYSICAL STRENGTH CATEGORY 4.
5. STRUCTURAL BACKFILL MAY CONSIST OF APPROVED SUITABLE ROADWAY EXCAVATION COMPLYING WITH THE REQUIREMENTS OF SECTION 704.04. USE ALL SUITABLE ROADWAY EXCAVATION MATERIAL IN EMBANKMENT CONSTRUCTION UNTIL THE SUPPLY IS EXHAUSTED. IF THE SUPPLY OF ROADWAY EXCAVATION SPOILS BECOMES EXHAUSTED, BACKFILL USING CONTRACTOR PRODUCED UNCLASSIFIED BORROW FROM GOVERNMENT PROVIDED SOURCE (DOLLAR QUARRY).
6. ALL RIPRAP MATERIAL (CLASS 2 AND CLASS 3) UNDER THIS RECONSTRUCTION PROJECT IS TO BE CONTRACTOR PRODUCED MATERIAL FROM GOVERNMENT PROVIDED SOURCE. CONTRACTOR WILL PROVIDE EQUIPMENT AND LABOR TO DEVELOP MATERIAL MEETING RIPRAP SPECIFICATIONS PER TABLE 705-1. ALL MATERIAL WILL BE PRODUCED AT DOLLAR QUARRY, WHICH IS LOCATED AT MILE POST 0.15 OF FOREST ROAD 1631630 AND CAN BE REACHED AS FOLLOWS:
   FROM THE TOWN OF PARKDALE, OREGON, TRAVEL WEST ON RED HILL DRIVE APPROXIMATELY 0.8 MILES TO LITTLE CREEK BRIDGE.
   CONTINUE ONTO FOREST ROAD 16 (RED HILL ROAD) AND TRAVEL 6.0 MILES TO THE 2nd JUNCTION WITH FOREST ROAD 1630.
   TURN LEFT ONTO FOREST ROAD 1630 AND TRAVEL SOUTH 1.4 MILES TO THE JUNCTION WITH FOREST ROAD 1631.
   CONTINUE SOUTH ONTO FOREST ROAD 1631 AND TRAVEL 0.8 MILES TO THE JUNCTION WITH FOREST ROAD 1631630.
   TURN LEFT ONTO FOREST ROAD 1631630 AND TRAVEL 0.15 MILES TO DOLLAR QUARRY.
6. APPLY GOVERNMENT PROVIDED SEED AND CONTRACTOR PROVIDED MULCH ON ALL DISTURBED AREAS AS DIRECTED BY THE CONTRACTING OFFICER. ALL COMMERCIAL SOURCE MULCH USED ON SITE SHALL BE CERTIFIED BY THE STATE OF OREGON AS "WEED AND SEED FREE". CLEARING MATERIAL THAT IS GROUND OR CHIPPED PER SUBSECTION 203.05 (g) OF THE SPECIFICATIONS MAY BE USED AS MULCHING MATERIAL IN LIEU OF STATE CERTIFIED MULCH, PROVIDED THAT IT IS APPLIED AT THE SAME APPLICATION RATE (POUNDS PER ACRE). IF GRINDING OR CHIPPING OF MATERIAL DOES NOT PRODUCE SUFFICIENT QUANTITIES FOR MULCHING, A COMBINATION OR MIX OF THIS MATERIAL AND STATE CERTIFIED MULCH MAY BE USED. APPLY SEED PRIOR TO MULCHING.

CULVERT INSTALLATION NOTES:

1. LOCATION AND LENGTHS OF CULVERTS IDENTIFIED ON THESE PLANS IS APPROXIMATE. CONTRACTOR SHALL 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.
2. BACKFILL ALL CULVERTS IN ACCORDANCE WITH FP-03, SECTION 209 STRUCTURE EXCAVATION AND BACKFILL.
3. REFER TO DRAINAGE LISTING FOR CULVERT OUTLET PROTECTION LOCATIONS.
4. ALL EXCAVATION AND TRENCHING OPERATIONS SHALL CONFORM TO OSHA REQUIREMENTS.
5. DO NOT OPERATE ANY HEAVY EQUIPMENT OVER ANY CULVERT UNTIL IT HAS BEEN PROPERLY BACKFILLED WITH A MINIMUM OF 1-FOOT COVER.
7. CULVERTS SHALL BE INSTALLED WITH A MINIMUM OF 8% SLOPE WHEREVER FEASIBLE.
8. THE MINIMUM LENGTH OF A SINGLE PIPE SECTION FOR ANY INSTALLATION SHALL NOT BE LESS THAN 10 L.F.
9. 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.
10. FABRICATE SPILLWAY ASSEMBLY FROM ANNULAR CORRUGATED PIPE, OR FROM HELICALLY CORRUGATED PIPE, WITH FACTORY OR REFORMED ENDS.
11. ALL NEW CULVERTS, SPILLWAYS, AND DOWN PIPES SHALL BE ALUMINIZED STEEL, TYPE 2, WITH STANDARD 2-2/3"x1/2" CORRUGATIONS.
12. GALVANIZE ALL ITEMS OF ANCHOR ASSEMBLY AFTER FABRICATION.
13. INSTALL RIPRAP ENERGY DISSIPATORS WHERE CALLED FOR IN THE DRAINAGE LISTING (SEE SHEET 4).
14. WORK IN LIVE STREAMS SHALL TAKE PLACE ONLY DURING THE IN-WATER WORK PERIOD, FROM JULY 15 THROUGH AUGUST 31.

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
CAD: NONE

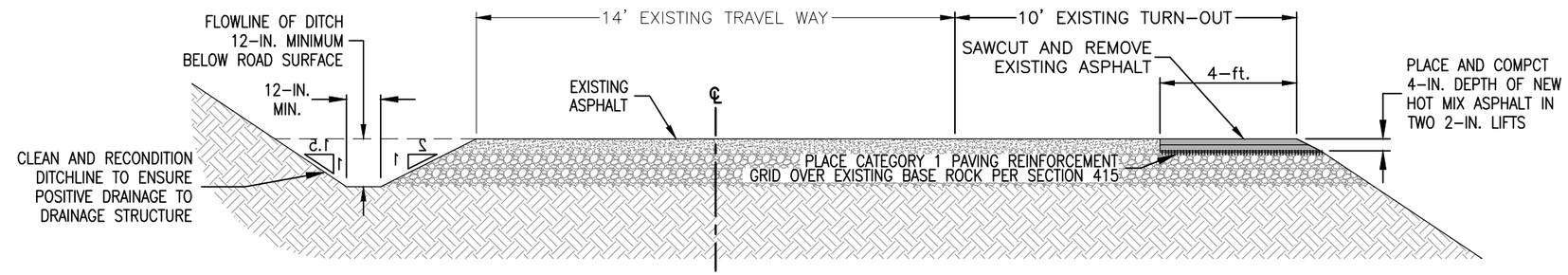
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes-Caldera Stewardship Road Reconstruction

SHEET TITLE: GENERAL NOTES

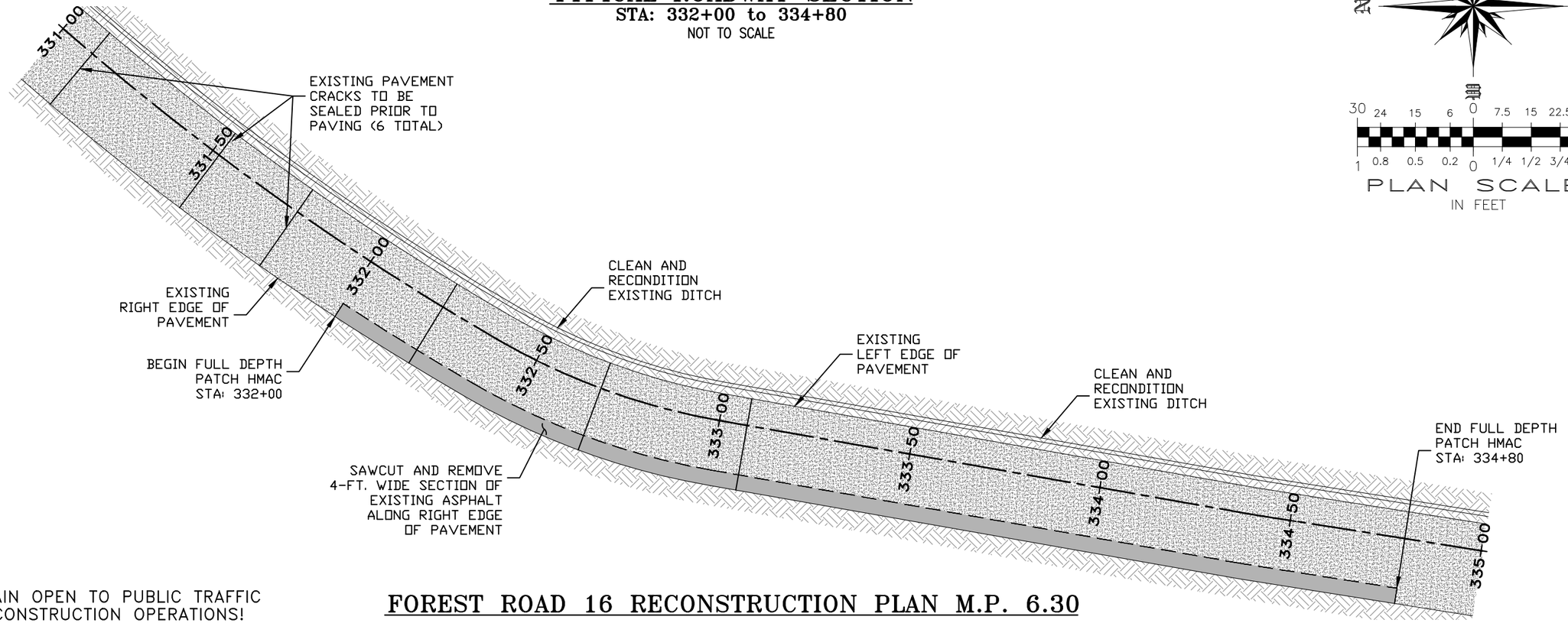
SHEET
5 of 22



TYPICAL ROADWAY SECTION

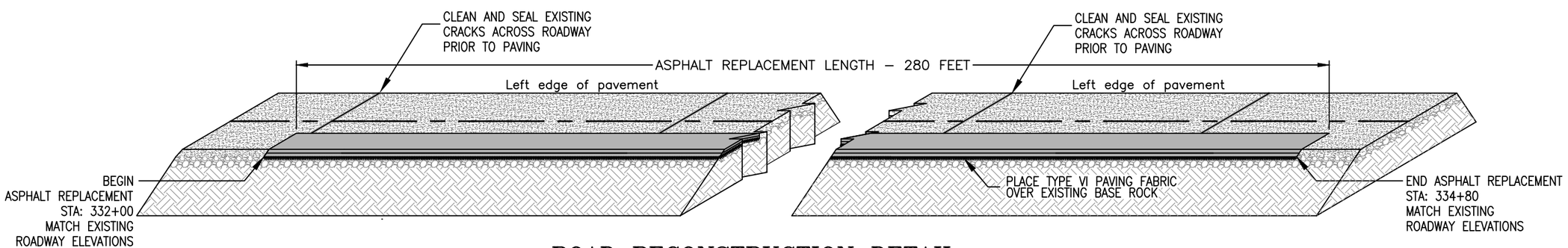
STA: 332+00 to 334+80

NOT TO SCALE



NOTE:
ROAD TO REMAIN OPEN TO PUBLIC TRAFFIC THROUGHOUT CONSTRUCTION OPERATIONS!

FOREST ROAD 16 RECONSTRUCTION PLAN M.P. 6.30



ROAD RECONSTRUCTION DETAIL

NOT TO SCALE

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

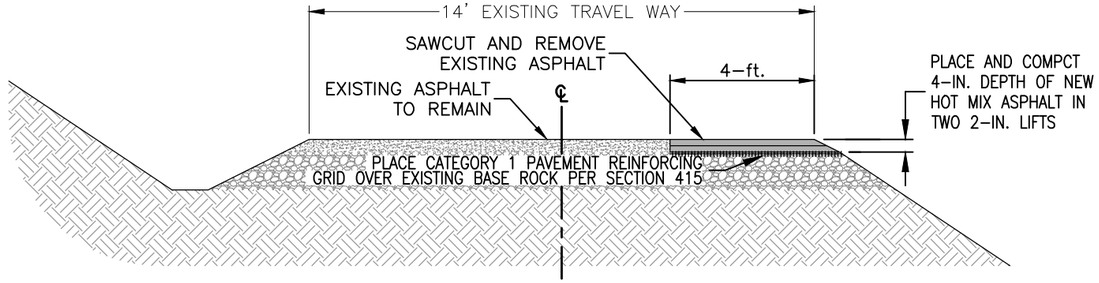
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT:
Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE:
FOREST ROAD 16
MILE POST 6.30 RECONSTRUCTION

SHEET
6 of 22

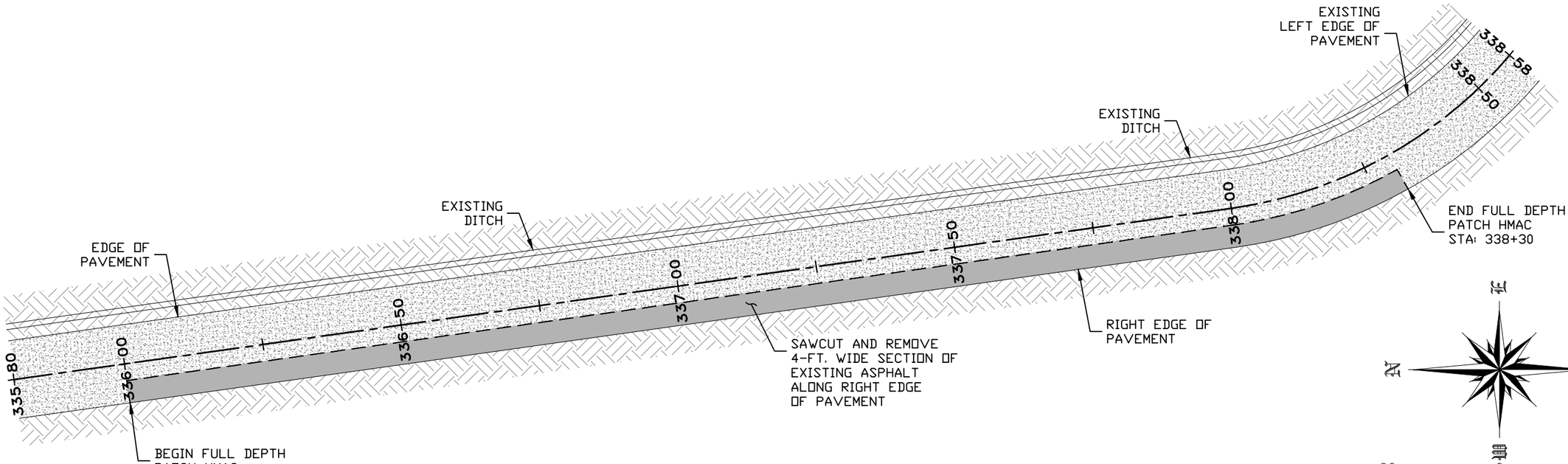


TYPICAL ROADWAY SECTION

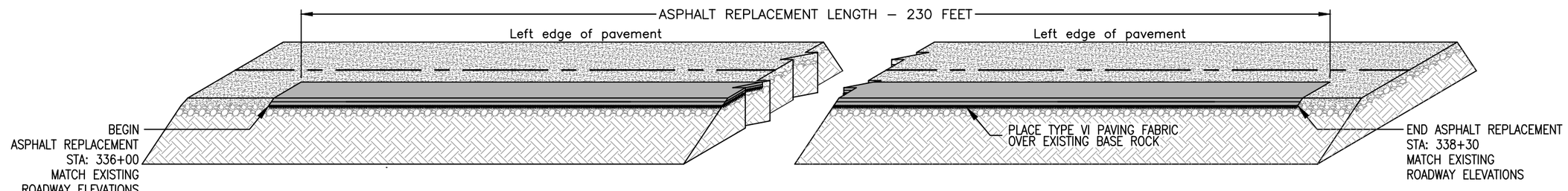
STA: 336+00 to 338+30

NOT TO SCALE

NOTE:
ROAD TO REMAIN OPEN TO PUBLIC TRAFFIC THROUGHOUT CONSTRUCTION OPERATIONS!



FOREST ROAD 16 RECONSTRUCTION PLAN M.P. 6.35



ROAD RECONSTRUCTION DETAIL

NOT TO SCALE

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

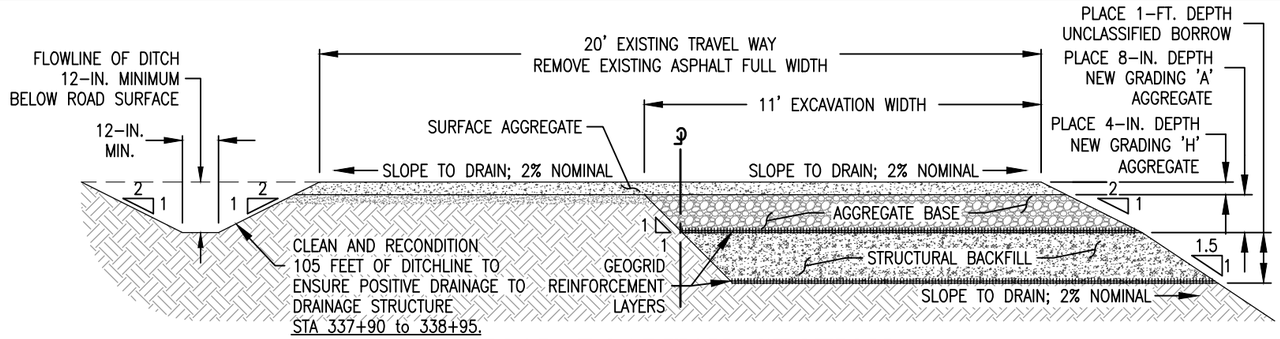
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes-Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 16
MILE POST 6.35 RECONSTRUCTION

SHEET
7 of 22

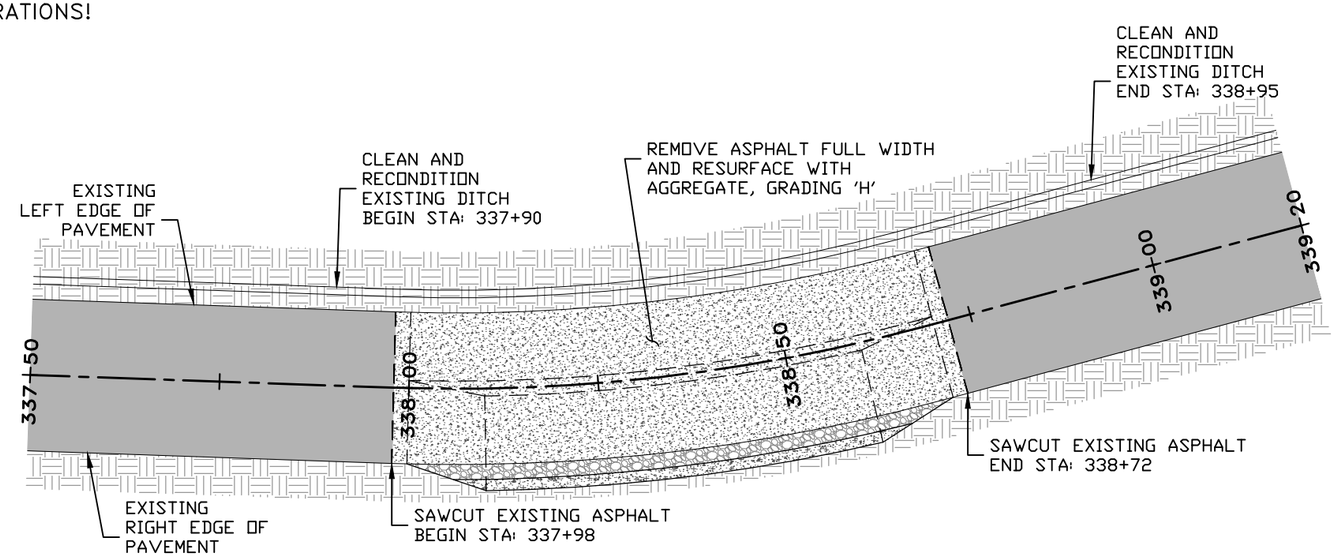


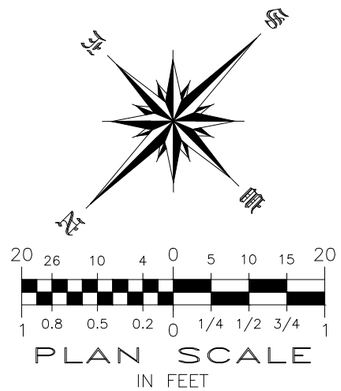
TYPICAL ROADWAY SECTION

STA: 338+00 to 338+70

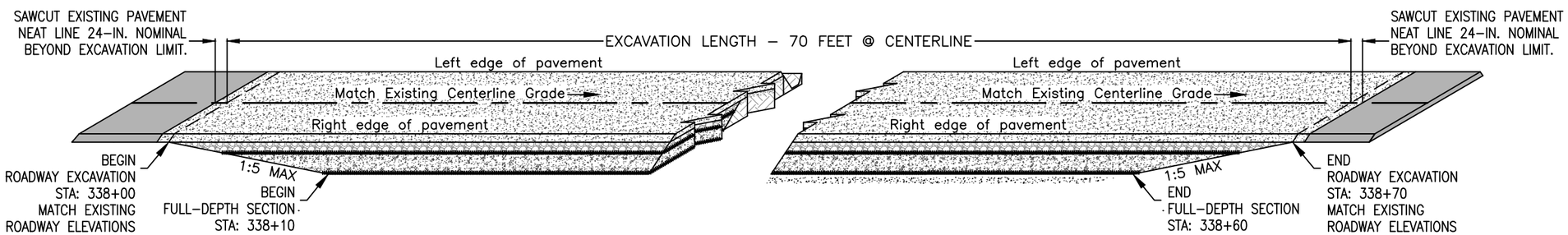
NOT TO SCALE

NOTE:
ROAD TO REMAIN OPEN TO PUBLIC TRAFFIC
THROUGHOUT CONSTRUCTION OPERATIONS!





FOREST ROAD 16 RECONSTRUCTION PLAN M.P. 6.40



ROAD RECONSTRUCTION DETAIL

NOT TO SCALE

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

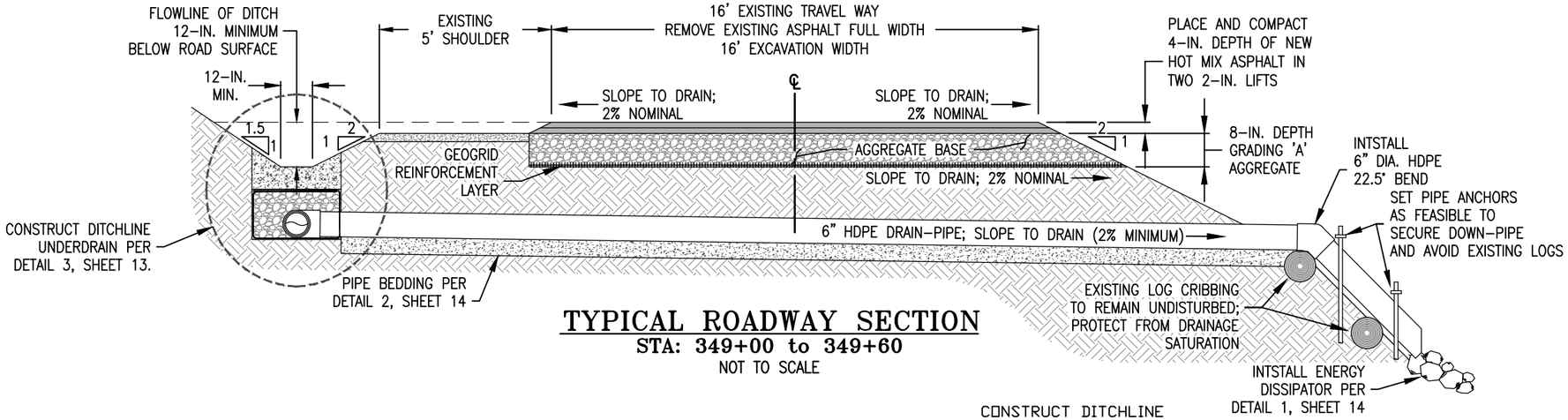
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT:
Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE:
FOREST ROAD 16
MILE POST 6.40 RECONSTRUCTION

SHEET
8 of 22

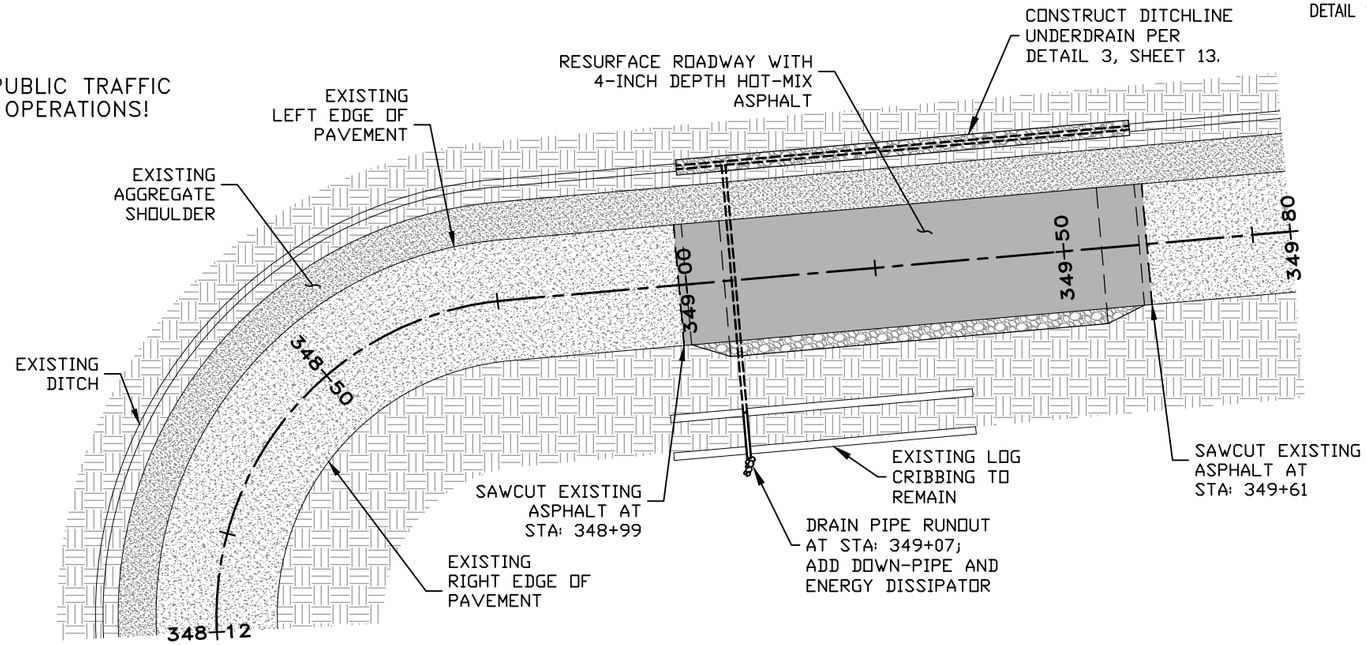


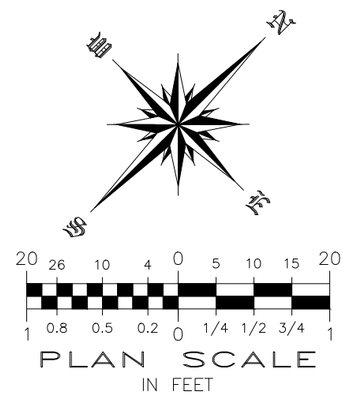
TYPICAL ROADWAY SECTION

STA: 349+00 to 349+60

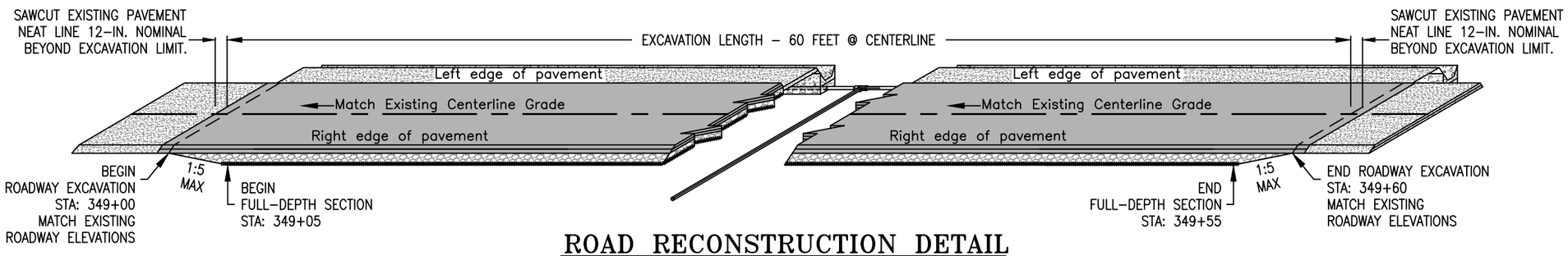
NOT TO SCALE

NOTE:
ROAD TO REMAIN OPEN TO PUBLIC TRAFFIC THROUGHOUT CONSTRUCTION OPERATIONS!





FOREST ROAD 16 RECONSTRUCTION PLAN M.P. 6.61



ROAD RECONSTRUCTION DETAIL

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
CAD#: NONE

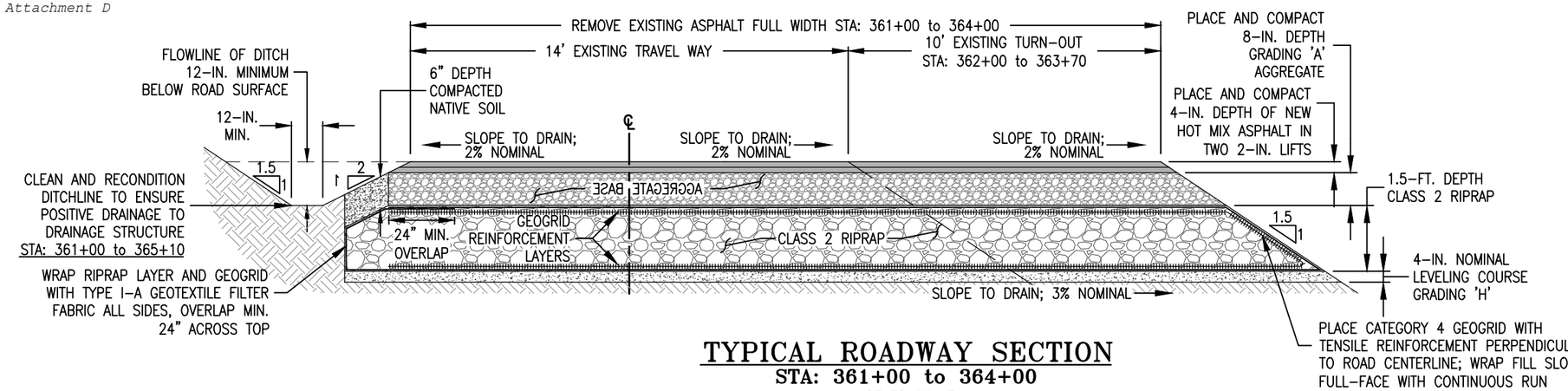
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

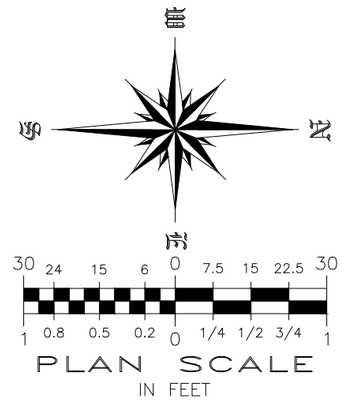
PROJECT: Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 16
MILE POST 6.61 RECONSTRUCTION

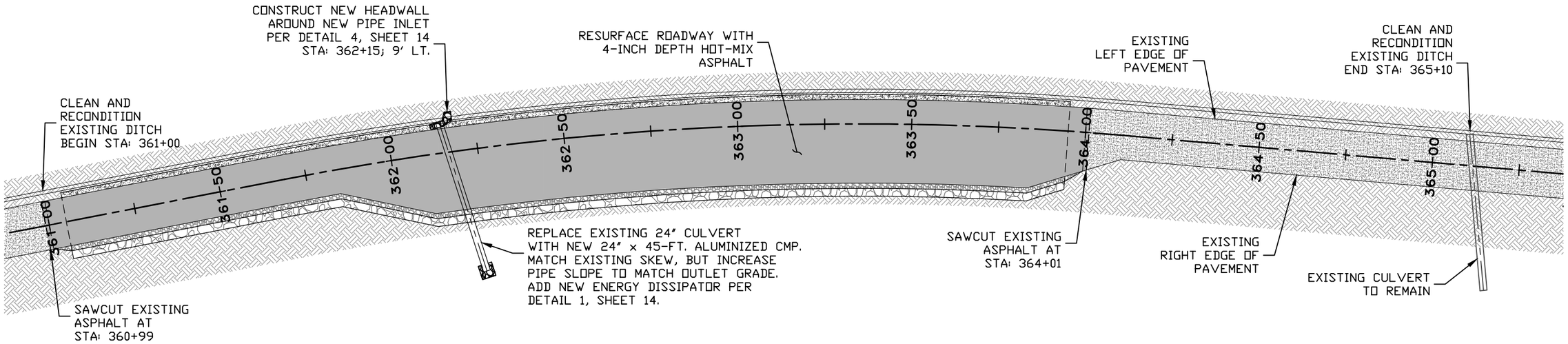
SHEET
9 of 22



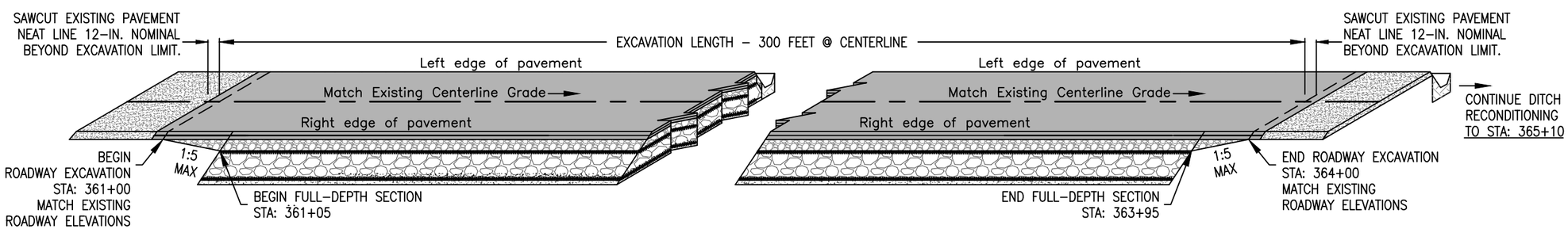
TYPICAL ROADWAY SECTION
STA: 361+00 to 364+00
NOT TO SCALE



NOTE:
ROAD MAY BE CLOSED TO PUBLIC TRAFFIC FOR A MAXIMUM OF FOUR (4) CONSECUTIVE DAYS TO COMPLETE CONSTRUCTION OF REINFORCED RIPRAP EMBANKMENT LAYER. ROAD CLOSURE MAY NOT OCCUR ON ANY FRIDAY, WEEKEND, OR FEDERAL HOLIDAY. ROAD TO REMAIN OPEN TO PUBLIC TRAFFIC THROUGHOUT ALL OTHER CONSTRUCTION ACTIVITIES.



FOREST ROAD 16 RECONSTRUCTION PLAN M.P. 6.85



ROAD RECONSTRUCTION DETAIL

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

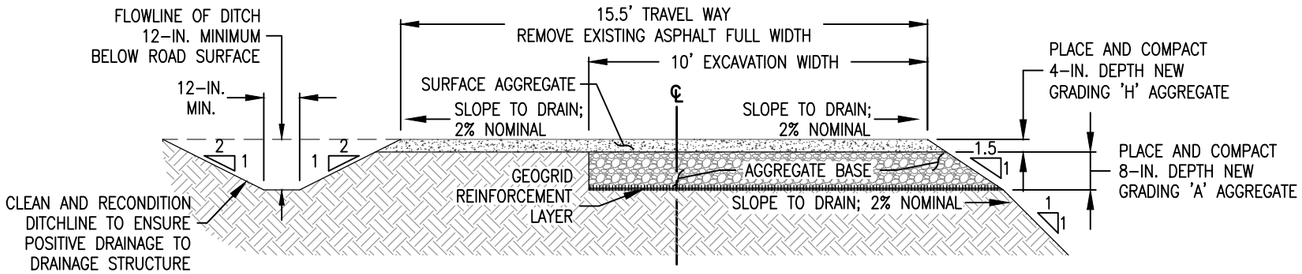
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT:
Ashes-Caldera Stewardship Road Reconstruction

SHEET TITLE:
FOREST ROAD 16
MILE POST 6.85 RECONSTRUCTION

SHEET
10 of 22

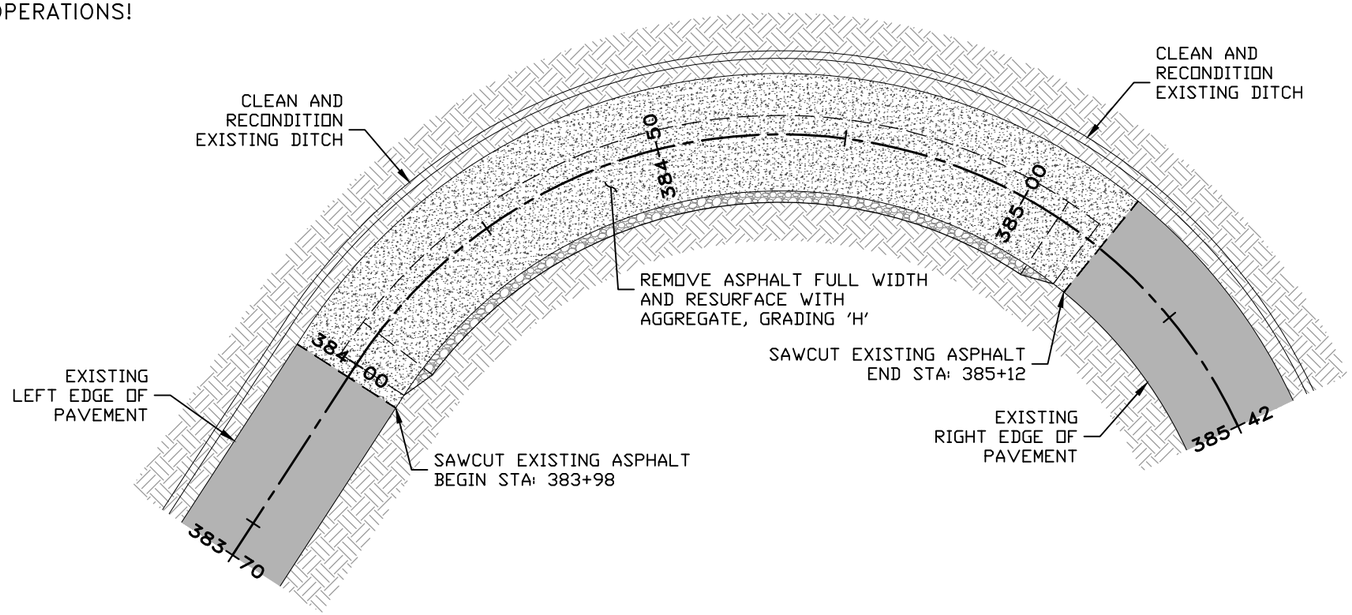


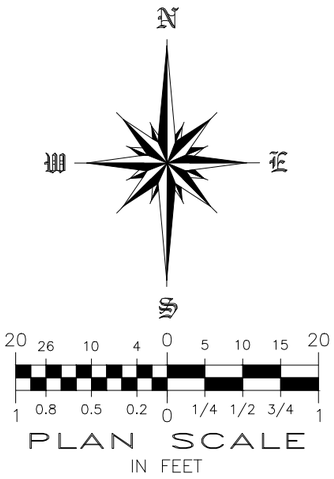
TYPICAL ROADWAY SECTION

STA: 384+00 to 385+10

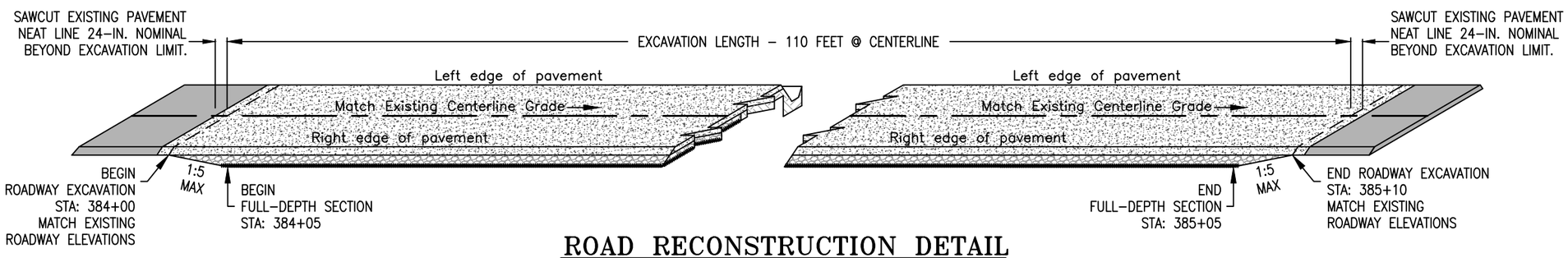
NOT TO SCALE

NOTE:
ROAD TO REMAIN OPEN TO PUBLIC TRAFFIC THROUGHOUT CONSTRUCTION OPERATIONS!





FOREST ROAD 16 RECONSTRUCTION PLAN M.P. 7.29



ROAD RECONSTRUCTION DETAIL

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

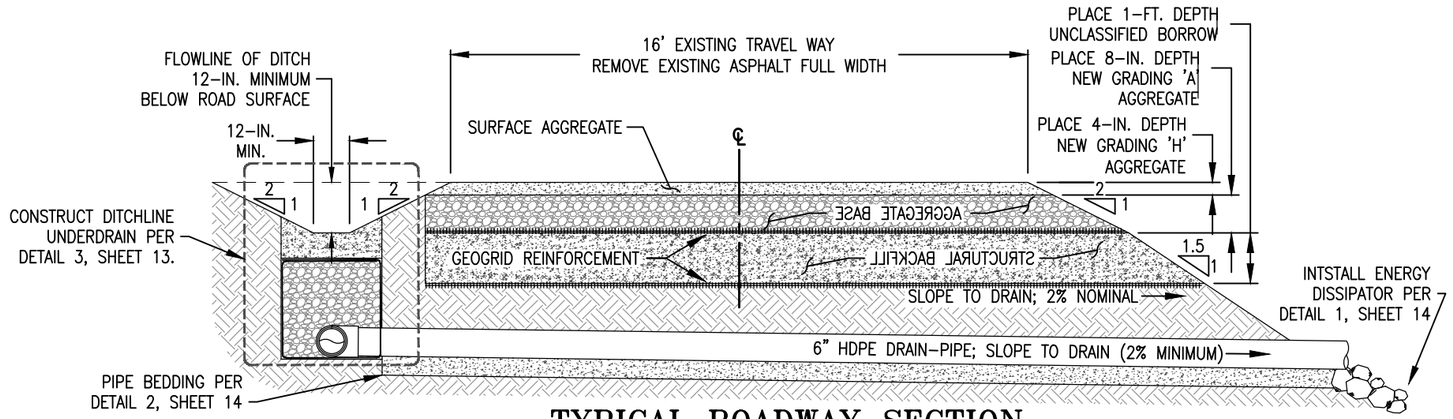
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT:
Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE:
FOREST ROAD 16
MILE POST 7.29 RECONSTRUCTION

SHEET
11 of 22

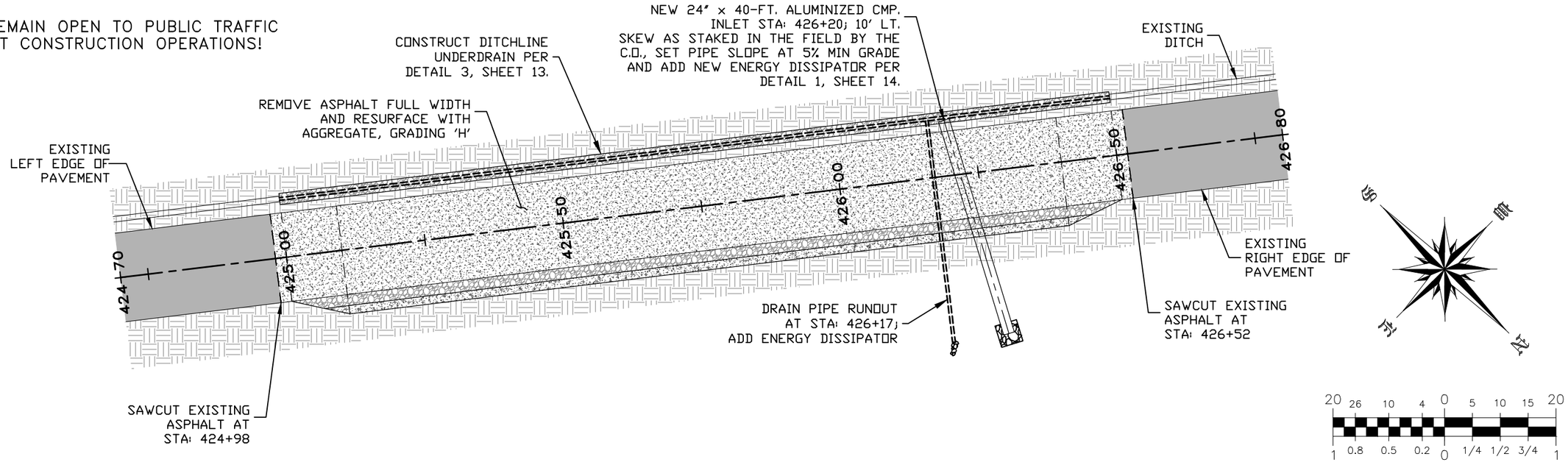


TYPICAL ROADWAY SECTION

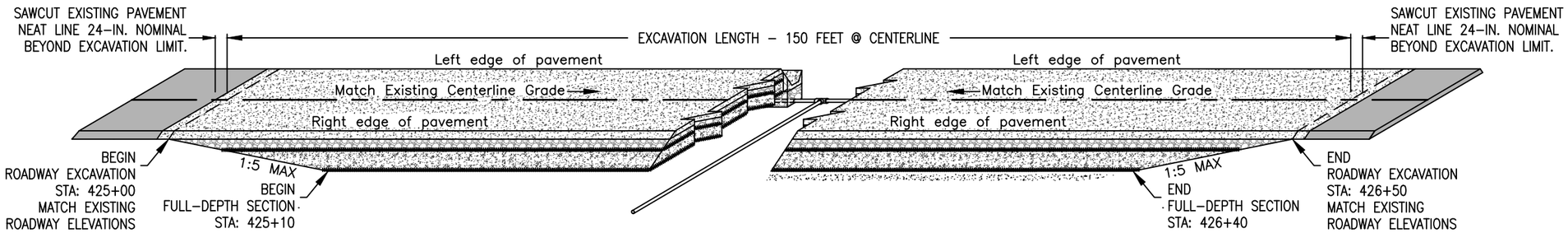
STA: 425+00 to 426+50

NOT TO SCALE

NOTE:
ROAD TO REMAIN OPEN TO PUBLIC TRAFFIC THROUGHOUT CONSTRUCTION OPERATIONS!



FOREST ROAD 16 RECONSTRUCTION PLAN M.P. 8.05



ROAD RECONSTRUCTION DETAIL

NOT TO SCALE

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

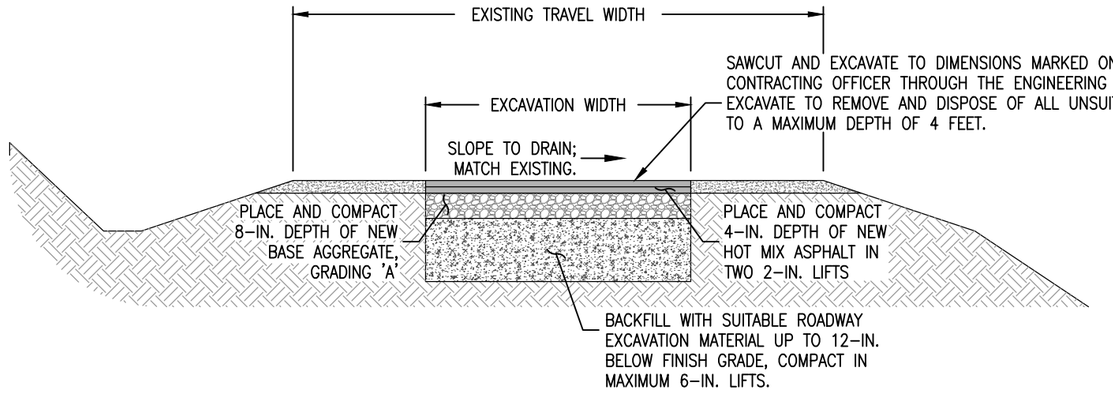
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT:
Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE:
FOREST ROAD 16
MILE POST 8.05 RECONSTRUCTION

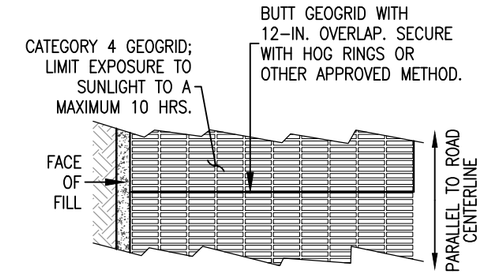
SHEET
12 of 22



ROAD SECTION

1 TYPICAL SINKHOLE REPAIR SECTION

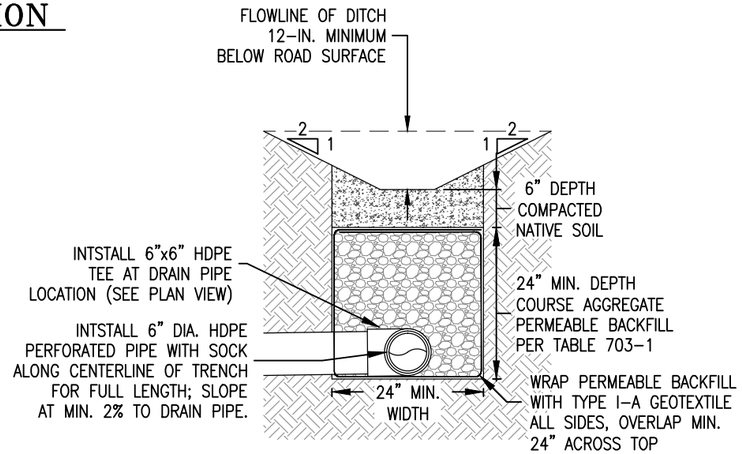
APPLIES TO M.P. 7.41
NOT TO SCALE



PLAN VIEW

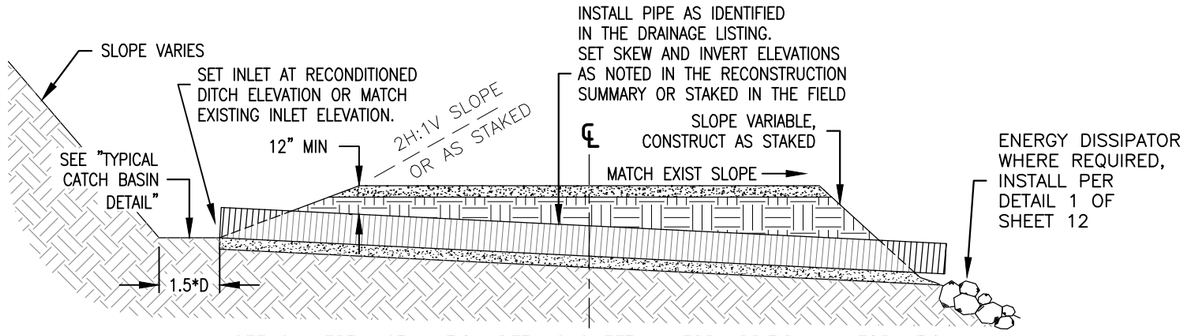
2 GEOGRID DETAIL

APPLIES TO M.P. 6.40, 6.61, 6.85, 7.29, AND 8.05
NOT TO SCALE



3 TYPICAL UNDERDRAIN SECTION

APPLIES TO M.P. 6.61 AND 8.05
NOT TO SCALE



*SEE CULVERT INSTALLATION DETAILS SHEET 14 FOR ADDITIONAL INFORMATION

ROAD SECTION

4 CULVERT INSTALLATION SECTION

APPLIES TO M.P. 6.85 AND 8.05
NOT TO SCALE

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

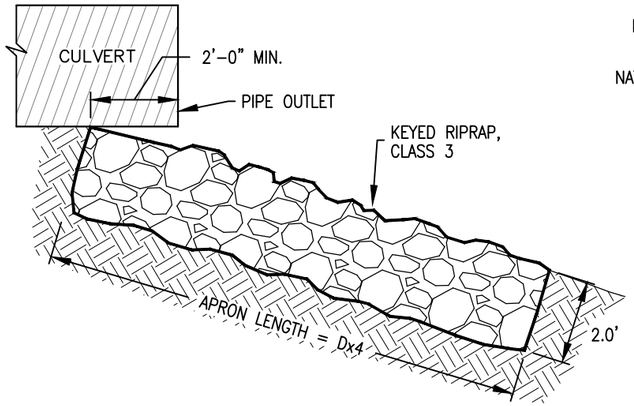
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

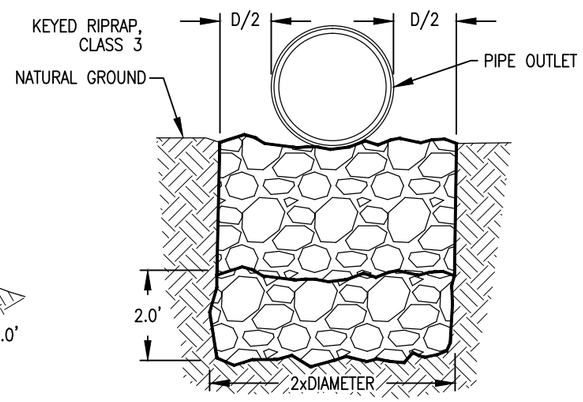
PROJECT:
Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE:
FOREST ROAD 16
ROAD RECONSTRUCTION TYPICAL DETAILS

SHEET
13 of 22



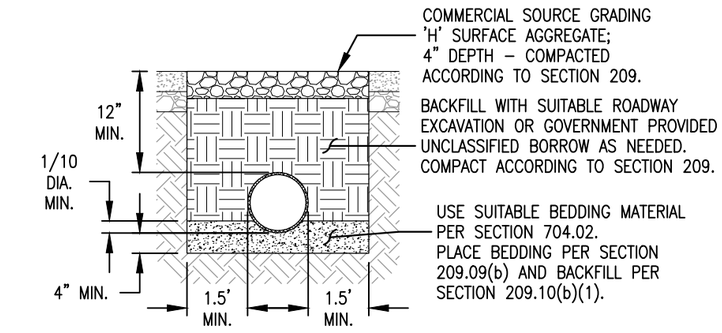
PROFILE VIEW



SECTION VIEW

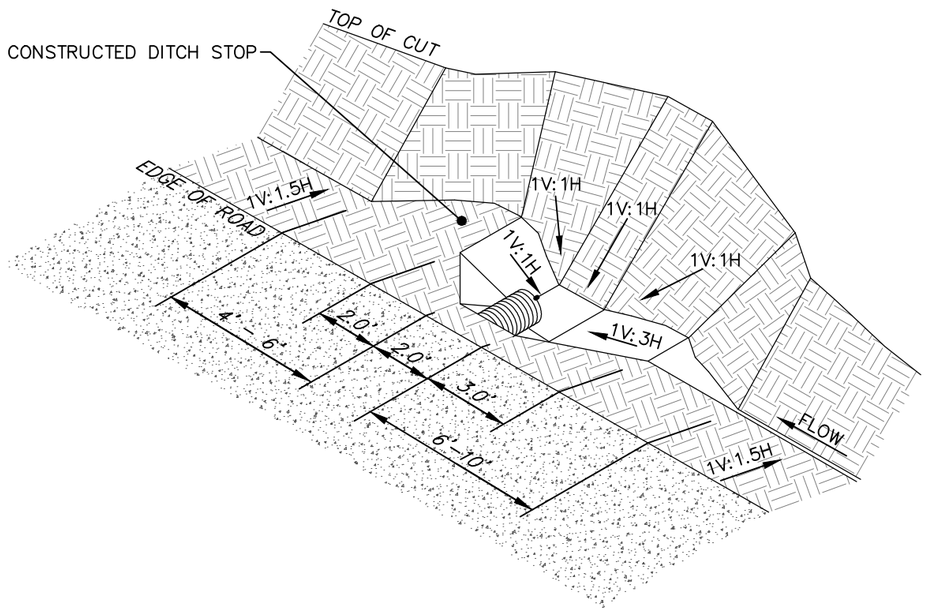
ENERGY DISSIPATION PAD				
CULVERT DIA.	RIPRAP CLASS	APRON DIMENSIONS	DEPTH OF APRON	RIPRAP QUANTITY
24"	3	8' x 4'	2.0'	3 cy
6"	3	2' x 1'	2.0'	0.5 cy

1 TYPICAL ENERGY DISSIPATOR DETAIL
NOT TO SCALE

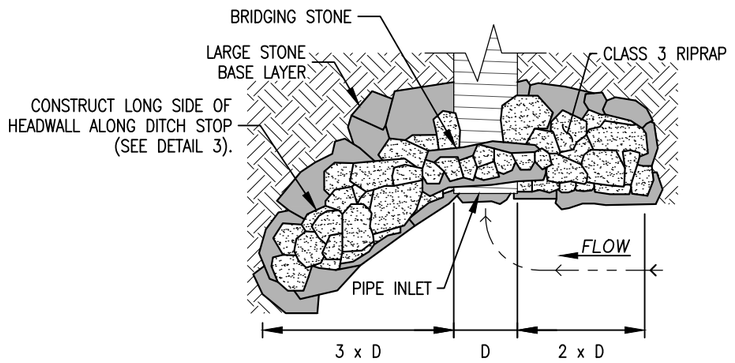


SECTION VIEW

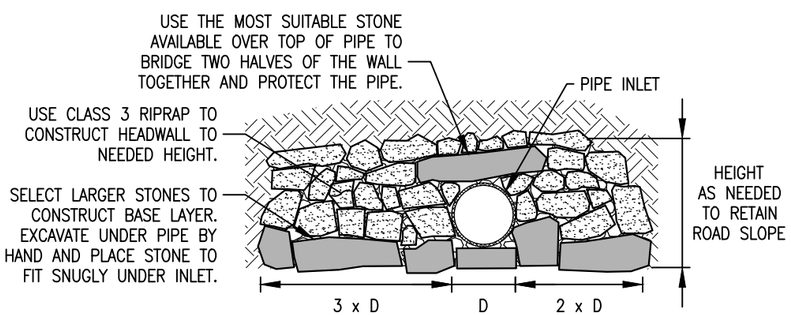
2 TYPICAL CULVERT TRENCH DETAIL
NOT TO SCALE



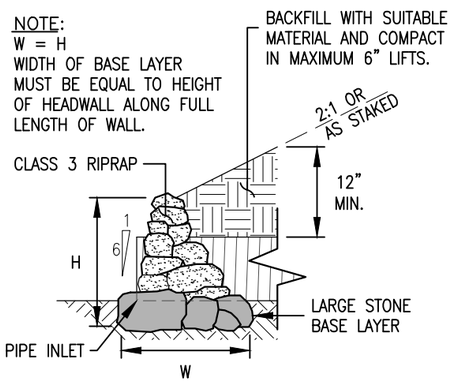
3 TYPICAL CATCH BASIN DETAIL
NOT TO SCALE



PLAN VIEW



ELEVATION VIEW



SECTION VIEW

4 TYPICAL STONE HEADWALL DETAIL
APPLIES TO M.P. 6.85
NOT TO SCALE

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

USDA FOREST SERVICE
The Pacific Northwest Region

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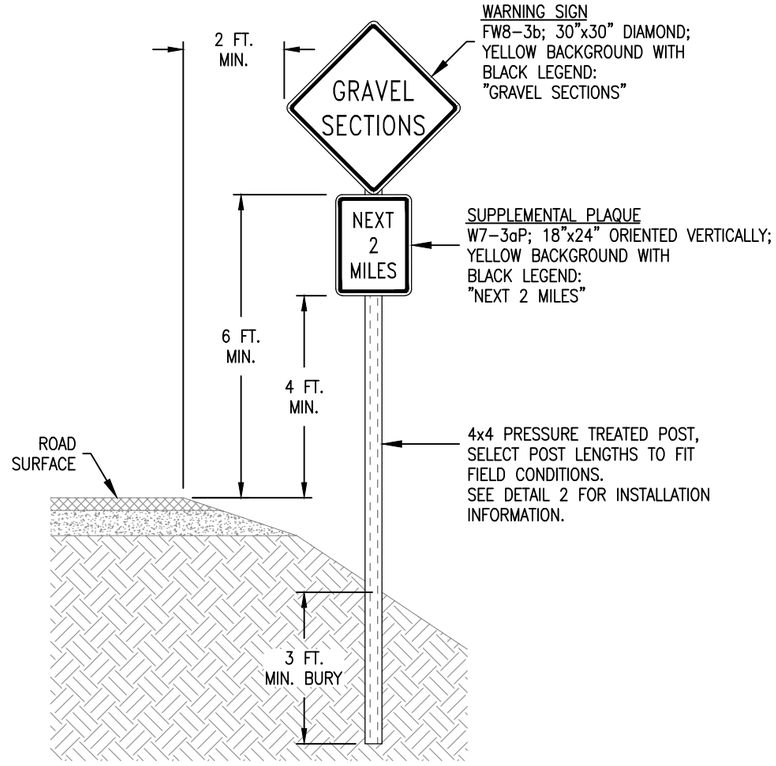
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 16
TYPICAL CULVERT INSTALLATION DETAILS

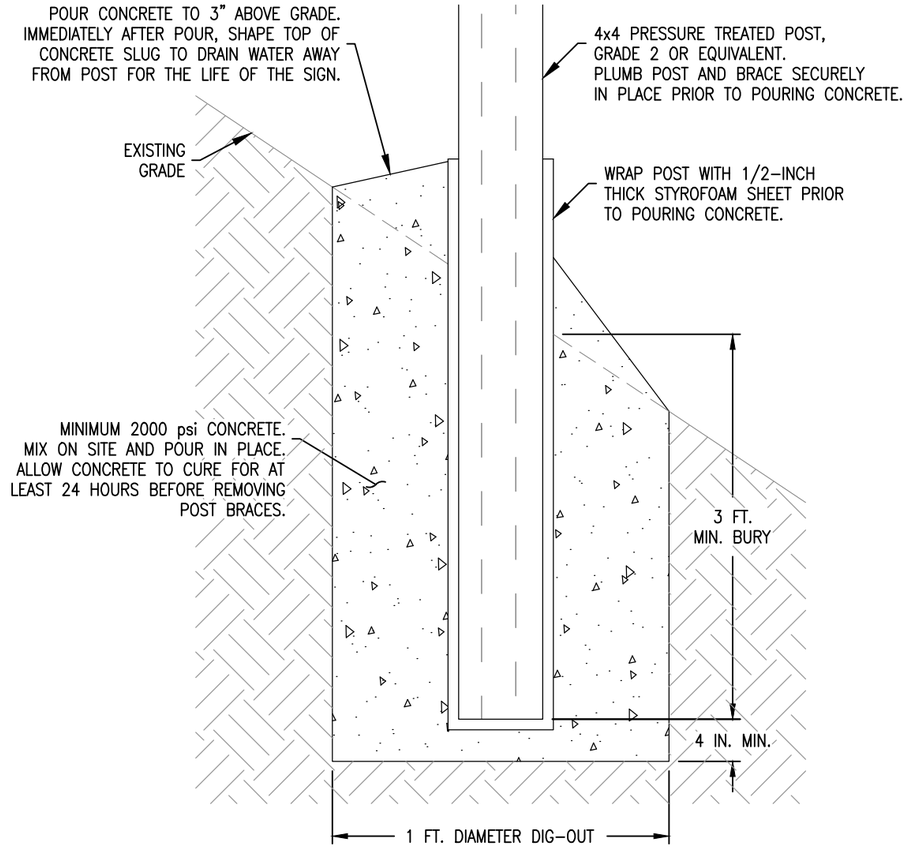
SHEET
14 of 22



NOTES:

1. SIGNS TO BE PLACED A MINIMUM OF 200 FEET PRIOR TO GRAVEL SECTION AT DESIGNATED LOCATIONS.
2. SIGN POSTS SHALL BE 4x4 PRESSURE TREATED PINE, GRADE 2 OR EQUIVALENT, UNLESS OTHERWISE APPROVED IN WRITING BY THE CONTRACTING OFFICER (C.O.).
3. MOUNT SIGN PANELS WITH A MINIMUM OF TWO (2) 1/4-INCH DIAMETER BOLTS. DO NOT OBSTRUCT ANY PART OF THE SIGN LEGEND WITH MOUNTING BOLTS.
4. ALL SIGNS MUST MEET MINIMUM RETROREFLECTIVITY STANDARDS SET FORTH IN THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) SECTION 2A.08. USE ONLY ASTM D4956-09 TYPE II SUPER ENGINEER GRADE SHEETING (PREFERRED) OR TYPE III HIGH INTENSITY PRISMATIC SHEETING.
5. ALL SIGNS SHALL BE SUPPLIED WITH PROTECTIVE OVERLAY FILM AND EDGE FILM PER SECTION 718.02.
6. CONTRACTOR SHALL COORDINATE WITH CONTRACTING OFFICER TO OBTAIN GOVERNMENT PROVIDED DATE DECALS AND VANDAL WARNING DECALS FOR PLACEMENT PRIOR TO APPLICATION OF PROTECTIVE OVERLAY FILM AND EDGE FILM.
7. DO NOT STORE TRAFFIC CONTROL DEVICES ALONG THE ROADWAY WHEN NOT IN USE. COVER POST-MOUNTED SIGNS WHEN NOT APPLICABLE.

1 SIGN INSTALLATION DETAIL
At Mile Posts 6.26 and 8.09
NOT TO SCALE



2 SIGNPOST EMBEDMENT DETAIL
At Mile Posts 6.26 and 8.09
NOT TO SCALE

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes-Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 16
TYPICAL SIGN INSTALLATION DETAILS

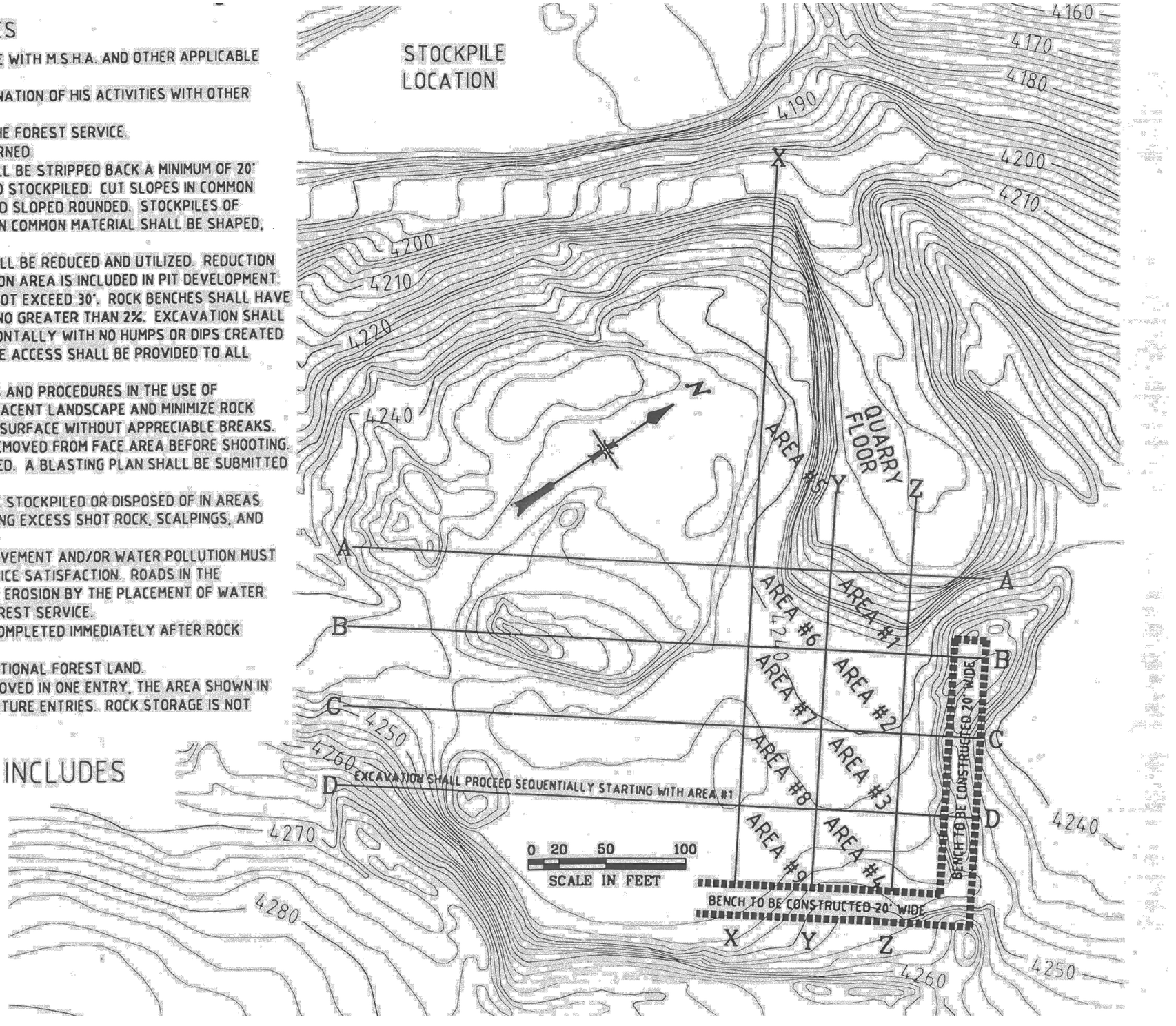
SHEET
15 of 22

QUARRY OPERATION NOTES

1) ALL OPERATIONS SHALL BE IN ACCORDANCE WITH M.S.H.A. AND OTHER APPLICABLE STATE AND FEDERAL REGULATIONS.
2) CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF HIS ACTIVITIES WITH OTHER USERS.
3) EXCAVATION AREA WILL BE STAKED BY THE FOREST SERVICE.
4) CLEARING DEBRIS SHALL BE PILED AND BURNED.
5) PRIOR TO EXCAVATION, OVERBURDEN SHALL BE STRIPPED BACK A MINIMUM OF 20' FROM THE TOP OF THE ROCK EXCAVATION AND STOCKPILED. CUT SLOPES IN COMMON MATERIAL SHALL BE NO STEEPER THAN 1:1 AND SLOPED ROUNDED. STOCKPILES OF OVERBURDEN/UNSUITABLE AND CUT SLOPES IN COMMON MATERIAL SHALL BE SHAPED, SEEDED, MULCHED, AND FERTILIZED.
6) OVERSIZED GREATER THAN 24 INCHES SHALL BE REDUCED AND UTILIZED. REDUCTION OF EXISTING OVERSIZE WITHIN THE EXCAVATION AREA IS INCLUDED IN PIT DEVELOPMENT.
7) HEIGHT OF PIT OR QUARRY FACES SHALL NOT EXCEED 30'. ROCK BENCHES SHALL HAVE A MINIMUM WIDTH OF 20' AND BE OUTSLOPED NO GREATER THAN 2%. EXCAVATION SHALL PROCEED UNIFORMLY VERTICALLY AND HORIZONTALLY WITH NO HUMPS OR DIPS CREATED WITHIN THE EXCAVATION AREA. APPROPRIATE ACCESS SHALL BE PROVIDED TO ALL BENCH SECTIONS FOR FUTURE DEVELOPMENT.
8) THE CONTRACTOR SHALL UTILIZE METHODS AND PROCEDURES IN THE USE OF EXPLOSIVES WHICH PREVENT DAMAGE TO ADJACENT LANDSCAPE AND MINIMIZE ROCK SCATTERING AND SHALL PRODUCE A SMOOTH SURFACE WITHOUT APPRECIABLE BREAKS. ALL UNCONSOLIDATED MATERIAL SHALL BE REMOVED FROM FACE AREA BEFORE SHOOTING. SCALING OF ALL LOOSE ROCK WILL BE REQUIRED. A BLASTING PLAN SHALL BE SUBMITTED TO THE FOREST SERVICE PRIOR TO DRILLING.
9) ALL MATERIALS MANUFACTURED SHALL BE STOCKPILED OR DISPOSED OF IN AREAS DESIGNATED BY THE FOREST SERVICE INCLUDING EXCESS SHOT ROCK, SCALPINGS, AND BY-PRODUCTS.
10) SURFACE DAMAGE WHICH CAUSES SOIL MOVEMENT AND/OR WATER POLLUTION MUST IMMEDIATELY BE CORRECTED TO FOREST SERVICE SATISFACTION. ROADS IN THE OPERATION AREA SHALL BE PROTECTED FROM EROSION BY THE PLACEMENT OF WATER CONTROL DEVICES WHEN DIRECTED BY THE FOREST SERVICE.
11) FINAL GRADING AND CLEANUP SHALL BE COMPLETED IMMEDIATELY AFTER ROCK REMOVAL.
12) ALL REFUSE SHALL BE REMOVED FROM NATIONAL FOREST LAND.
13) IF THE DESIGNATED MATERIAL IS NOT REMOVED IN ONE ENTRY, THE AREA SHOWN IN THE PLANS WILL NOT BE GUARANTEED FOR FUTURE ENTRIES. ROCK STORAGE IS NOT PERMITTED IN THE QUARRY.

PIT DEVELOPEMENT INCLUDES

CLEARING AND DISPOSAL
OVERBURDEN DISPOSAL
BENCH CONSTRUCTION
OVERSIZE REDUCTION



DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

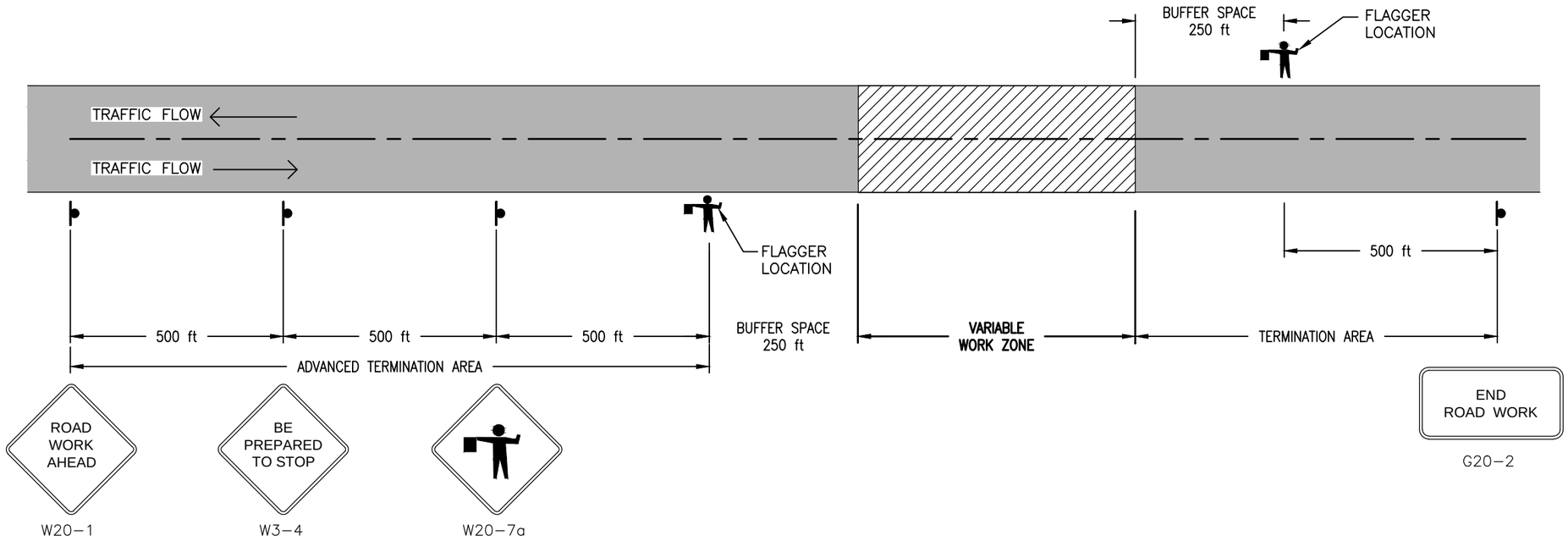
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes-Caldera Stewardship Road Reconstruction

SHEET TITLE: DOLLAR QUARRY
PIT AND QUARRY DEVELOPMENT PLAN

SHEET 16 of 22



TYPICAL TEMPORARY TRAFFIC CONTROL WITH FLAGGERS

NOT TO SCALE

TRAFFIC CONTROL NOTES

1. ERECT ALL ADVANCE WARNING SIGNS AND IMPLEMENT ALL TRAFFIC CONTROL MEASURES BEFORE STARTING CONSTRUCTION WORK.
2. SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL ONLY. PLACE DEVICES SIMILAR TO THOSE DEPICTED FOR THE OPPOSITE DIRECTION OF TRAVEL.
3. NOT ALL MEASURES SHOWN ON THE TEMPORARY TRAFFIC CONTROL DETAIL MAY BE APPLICABLE TO THIS PROJECT, NOR DOES THE DETAIL SHOW EVERY MEASURE WHICH MAY BE NECESSARY TO ENSURE PUBLIC SAFETY. THE CONTRACTOR MAY ADD OR DELETE INFORMATION AND DETAILS IN THIS TRAFFIC CONTROL PLAN AS NECESSARY TO ACCOMMODATE ACTUAL OPERATIONS WITH WRITTEN APPROVAL FROM THE CONTRACTING OFFICER.
4. FINAL LOCATION AND SPACING OF SIGNS AND DEVICES MAY BE CHANGED TO FIT FIELD CONDITIONS AS APPROVED BY THE CONTRACTING OFFICER.
5. FOR PILOT CAR OPERATION, MOUNT THE "PILOT CAR FOLLOW ME" (G20–4) SIGN AT A CONSPICUOUS LOCATION ON THE REAR OF VEHICLE. PROMINENTLY DISPLAY THE NAME OF THE CONTRACTOR OR TRAFFIC CONTROL SUB–CONTRACTOR ON THE PILOT CAR.
6. FOR NIGHT TIME FLAGGING OPERATION, PROVIDE FLOODLIGHTING AT FLAGGER STATIONS PER OSHA REGULATIONS. WHERE NIGHT TIME FLAGGING WILL NOT OCCUR, GRADE ROAD CROSS–SLOPES TO BE CONTINUOUS FOR FULL ROAD WIDTH AND PROVIDE SMOOTH ROADWAY TRANSITIONS FOR TRAFFIC SAFETY PRIOR TO SHUT–DOWN OF DAILY CONSTRUCTION OPERATIONS. MAINTAIN ALL WARNING SIGNS AND PROVIDE TRAFFIC CONES WITH RETRO–REFLECTIVE TAPE OR HIGH VISIBILITY RETRO REFLECTIVE MARKERS ALONG THE FULL LENGTH OF THE VARIABLE WORK ZONE PRIOR TO SHUT–DOWN OF DAILY CONSTRUCTION OPERATIONS.
7. WHERE ADVANCED WARNING SIGNS, PLACED AS SHOWN, INTERFERE WITH PERMANENT TRAFFIC CONTROL DEVICES, LOCATE THE WARNING SIGNS AS APPROVED BY THE CONTRACTING OFFICER TO ACHIEVE BEST RESULTS. MESSAGES MAY BE VARIED AS REQUIRED.
8. IF W20–1 IS ON A ROADWAY OTHER THAN THAT ON WHICH ACTUAL CONSTRUCTION WORK OCCURS, INCLUDE A SUPPLEMENTAL PLAQUE INDICATING THE NAME OF THE ROAD WHICH THE WORK IS ON.
9. IF SIGNS WILL BE IN PLACE MORE THAN 72 CONSECUTIVE HOURS, USE GROUND–MOUNTED POSTS.
10. ENSURE ALL SIGN SUPPORTS EXPOSED TO IMPACT BY TRAFFIC MEET THE REQUIREMENTS OF NCHRP–350 FOR CRASH WORTHINESS.
11. DO NOT ALLOW EQUIPMENT, MATERIALS, OR VEHICLES TO BE PARKED OR STORED IN THE BUFFER SPACE.
12. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT TRAFFIC CONTROL FLAGGERS AND OTHER TRAFFIC CONTROL PERSONNEL HAVE ADEQUATE COMMUNCATIONS CAPABILITY AT ALL TIMES. TRAFFIC CONTROL PERSONNEL MUST BE ABLE TO COMMUNICATE WITH EACH OTHER AND THE SITE CONSTRUCTION SUPERINTENDENT AT ALL TIMES TO SAFELY COORDINATE THE FLOW OF TRAFFIC WITH THE WORK BEING CONDUCTED. CONSTRUCTION WILL TAKE PLACE IN REMOTE LOCATIONS WITH NO CELLULAR SERVICE AND TRAFFIC CONTROL PERSONNEL ARE REQUIRED TO HAVE AND MAINTAIN A MEANS OF CONTACTING EMERGENCY RESPONSE FROM THE WORK SITE IN THE EVENT OF AN EMERGENCY.
13. CONTRACTOR SHALL SUBMIT AN ACCEPTABLE TRAFFIC CONTROL PLAN AT LEAST 14 DAYS PRIOR TO BEGINNING RECONSTRUCTION WORK. "ROAD WORK AHEAD" WARNING SIGNS, TRAFFIC CONTROL FLAGGER WARNING SIGNS, AND TYPE III BARRICADES SHALL BE SET IN PLACE AND MAINTAINED ON ALL ROAD SEGMENTS WHERE CONSTRUCTION WILL TAKE PLACE. ALL SIGNS AND TRAFFIC MARKERS SHALL COMPLY WITH GUIDELINES SET FORTH IN THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION.

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

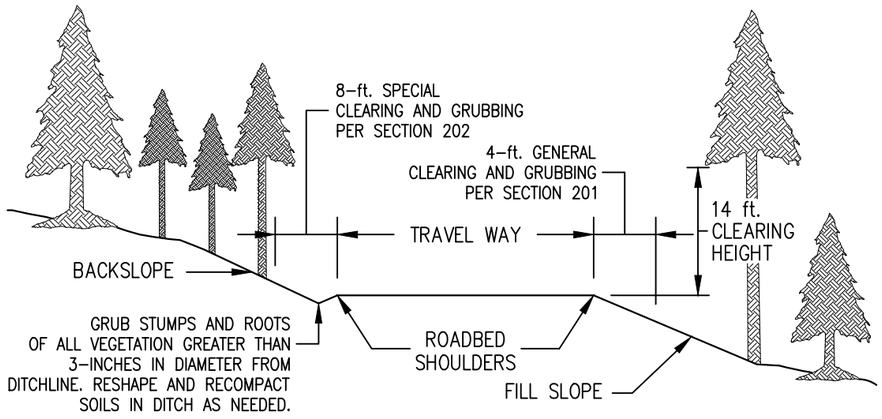
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes–Caldera Stewardship Road Reconstruction

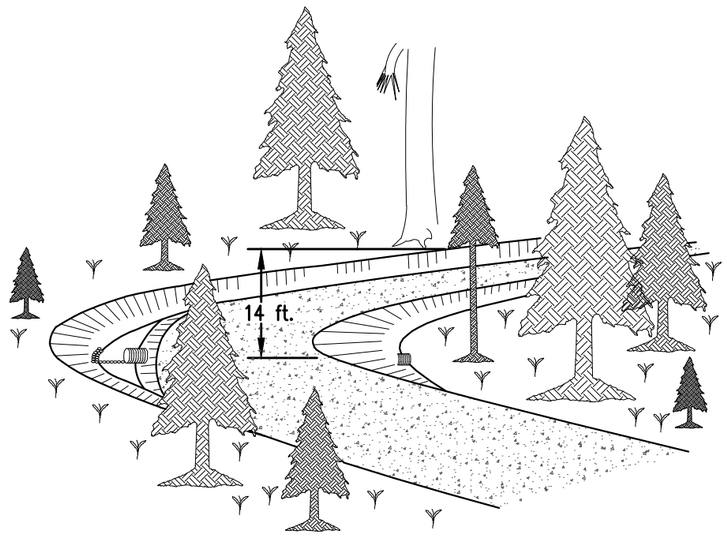
SHEET TITLE: TYPICAL TEMPORARY TRAFFIC CONTROL PLAN

SHEET
17 of 22



1 CLEARING LIMITS TYPICAL DETAIL

NOT TO SCALE

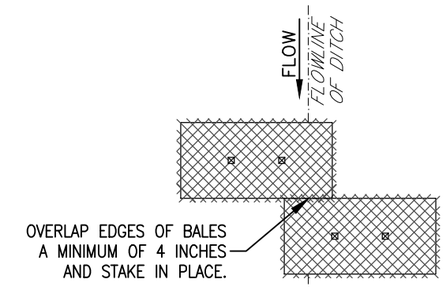


2 SIGHT DISTANCE TYPICAL DETAIL

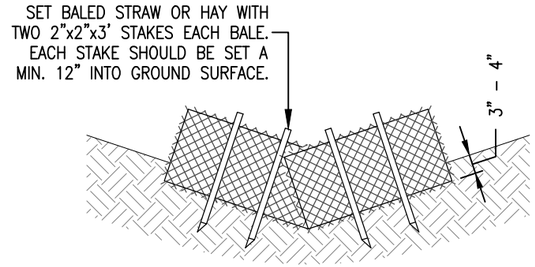
NOT TO SCALE

NOTES:

1. SET EACH BALE 3" TO 4" BELOW SURFACE OF DITCHLINE.
2. USE ONLY CERTIFIED WEED FREE HAY OR STRAW.
3. COSTS FOR TEMPORARY DITCH CHECKS ARE INCIDENTAL TO PAY ITEM 15713 – SOIL EROSION AND POLLUTION CONTROL.



PLAN VIEW



SECTION VIEW

3 TEMPORARY DITCH CHECK DETAIL

NOT TO SCALE

CLEARING NOTES

1. LOCATE AND PROTECT ALL EXISTING DRAINAGE STRUCTURES PRIOR TO COMMENCING ANY CLEARING WORK.
2. ALL VEGETATIVE MATERIAL WITHIN THE CLEARING LIMITS SHALL BE REMOVED ACCORDING TO SECTION 201 OR 202 AS APPLICABLE.
3. ALL VEGETATIVE SLASH GREATER THAN 3–INCHES IN DIAMETER OR GREATER THAN 3–FEET IN LENGTH SHALL BE DISPOSED OF BY CHIPPING OR GRINDING ACCORDING TO SECTION 203.05 (g), EXCEPT THAT CHIPPED OR GROUND WOODY MATERIAL MAY BE USED AS MULCH OVER AREAS OF DISTURBED SOIL IN THE DITCHLINES OR OVER THE ROAD FILL SLOPE. CHIPPED OR GROUND MATERIAL WILL NOT BE PERMITTED TO REMAIN WITHIN THE ROAD TRAVEL WAY.
4. FOR ALL TREES OUTSIDE THE CLEARING LIMITS WHICH HAVE BRANCHES THAT PROTRUDE INTO THE CLEARING LIMITS, TRIM ALL TREE BRANCHES AND BRUSH TO A CLEAR HEIGHT OF 14 FEET ACCORDING TO 201.04 (e).
5. ALL MERCHANTABLE MATERIAL, WITHOUT EXCEPTION, SHALL BE DECKED ACCORDING TO SECTION 201.04 (f) FOR LATER DISPOSAL ACCORDING TO THE TERMS OF THE TIMBER SALE CONTRACT.
6. SET TEMPORARY DITCH CHECKS TEN FEET (10–ft.) UPSTREAM OF ALL DRAINAGE STRUCTURE INLETS AFTER COMPLETION OF CLEARING AND GRUBBING WORK. DITCH CHECKS TO REMAIN IN PLACE UNTIL COMPLETION OF SALE OPERATIONS ON THIS ROAD.

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

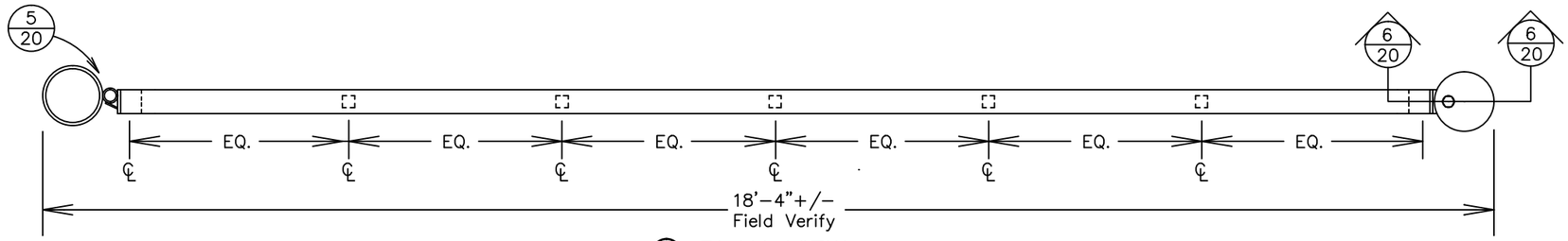
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

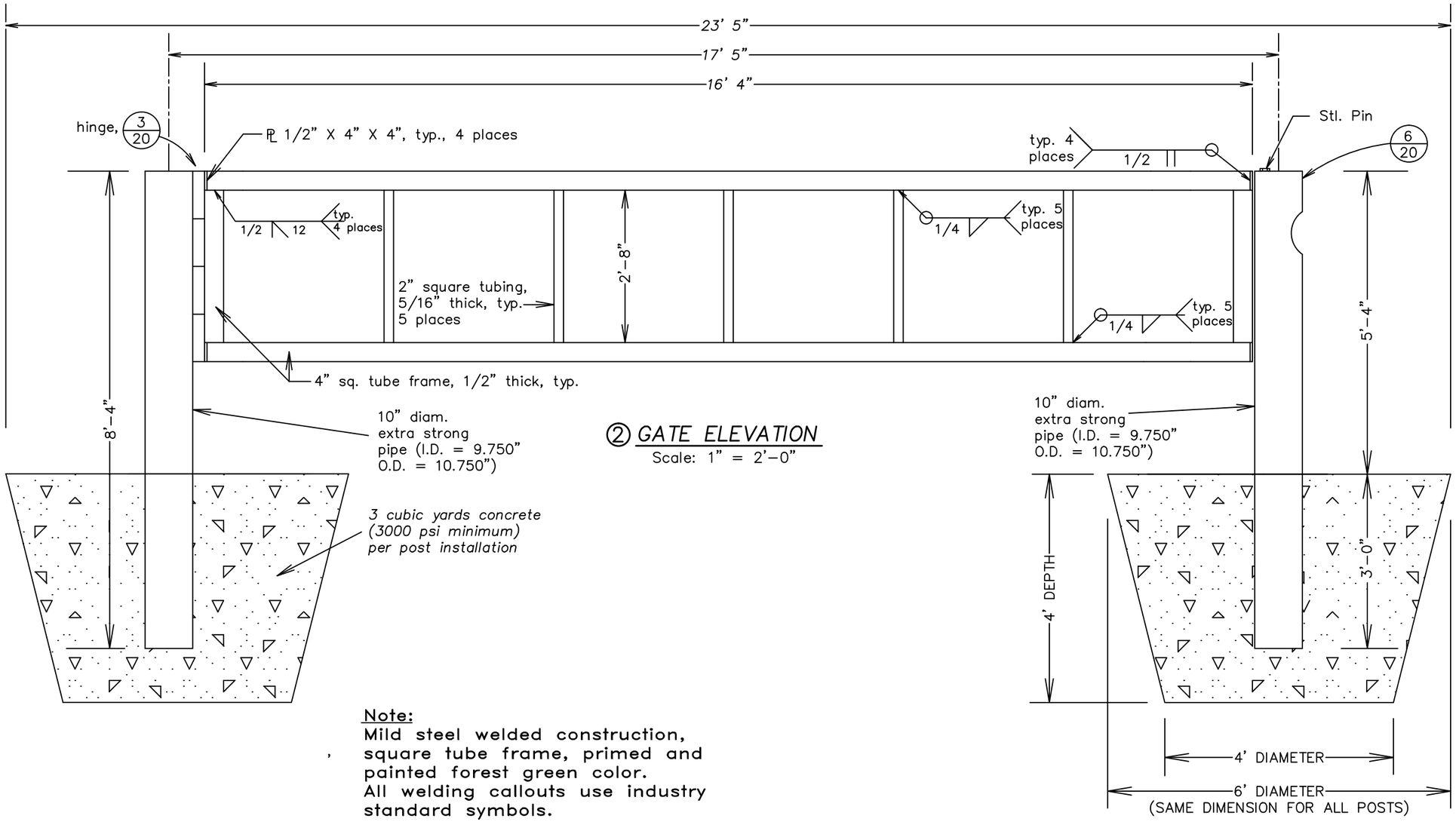
PROJECT: Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 1640620
ROADSIDE CLEARING AND GRUBBING DETAILS

SHEET
18 of 22



① *PLAN VIEW*
Scale: 1" = 2'–0"



② *GATE ELEVATION*
Scale: 1" = 2'–0"

Note:
Mild steel welded construction, square tube frame, primed and painted forest green color.
All welding callouts use industry standard symbols.

DESIGNED BY: FS_TYPICAL
DRAWN BY: L. JIMENEZ
CHECKED BY: R. REIN
DATE: NONE

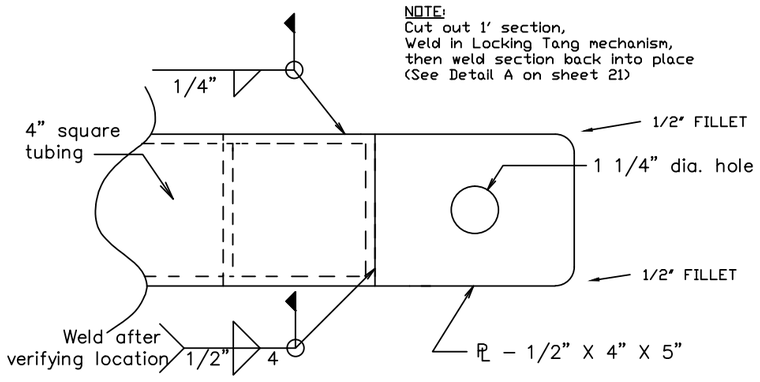
USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

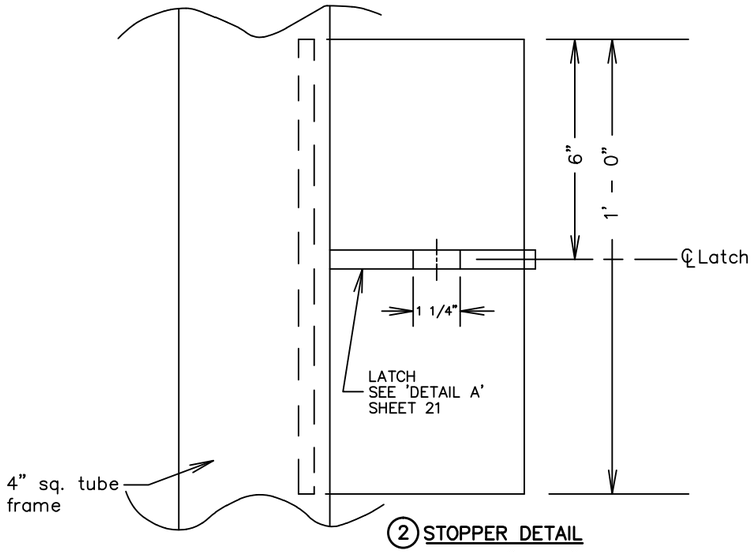
PROJECT: Ashes–Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 1630660 & 1640
GATE PLAN AND ELEVATION

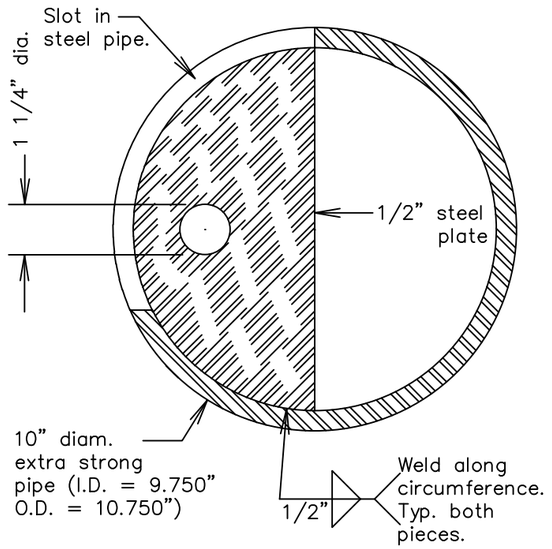
SHEET
19 of 22



① **LATCH DETAIL**
Scale: 1" = 4"



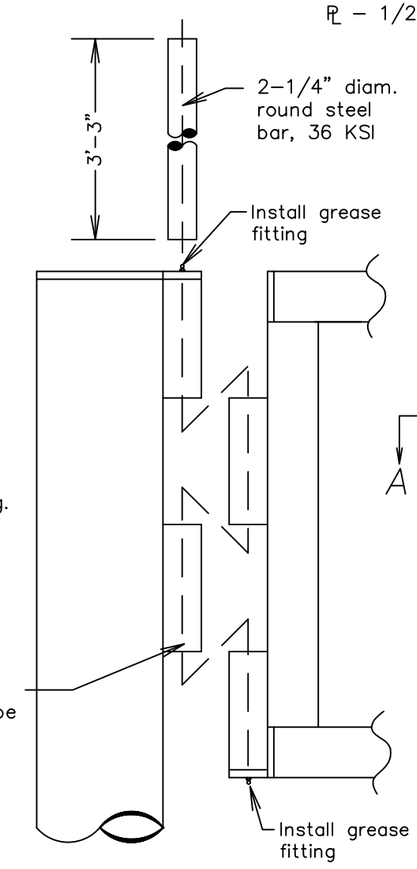
② **STOPPER DETAIL**
Scale: 1" = 4"



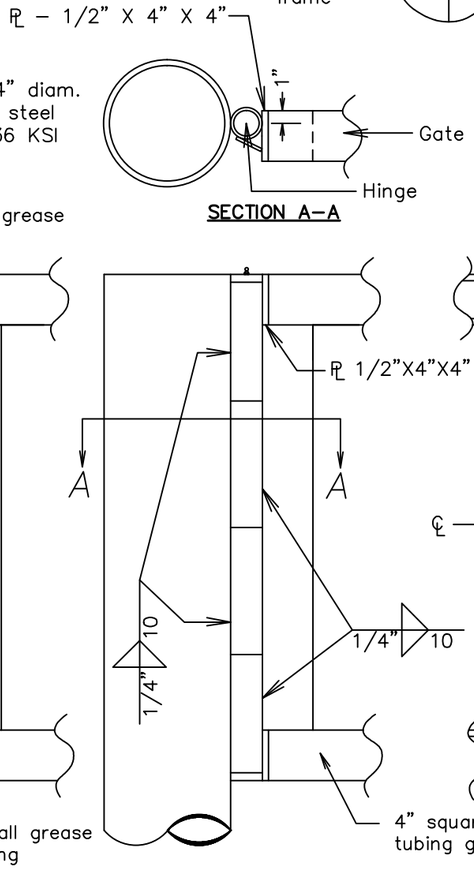
④ ***LOCK BOX CROSS SECTION***
Scale: 1" = 4"
(SEE ALSO: OPEN SUPPORT DETAIL, SHEET 22)

ASSEMBLY NOTES

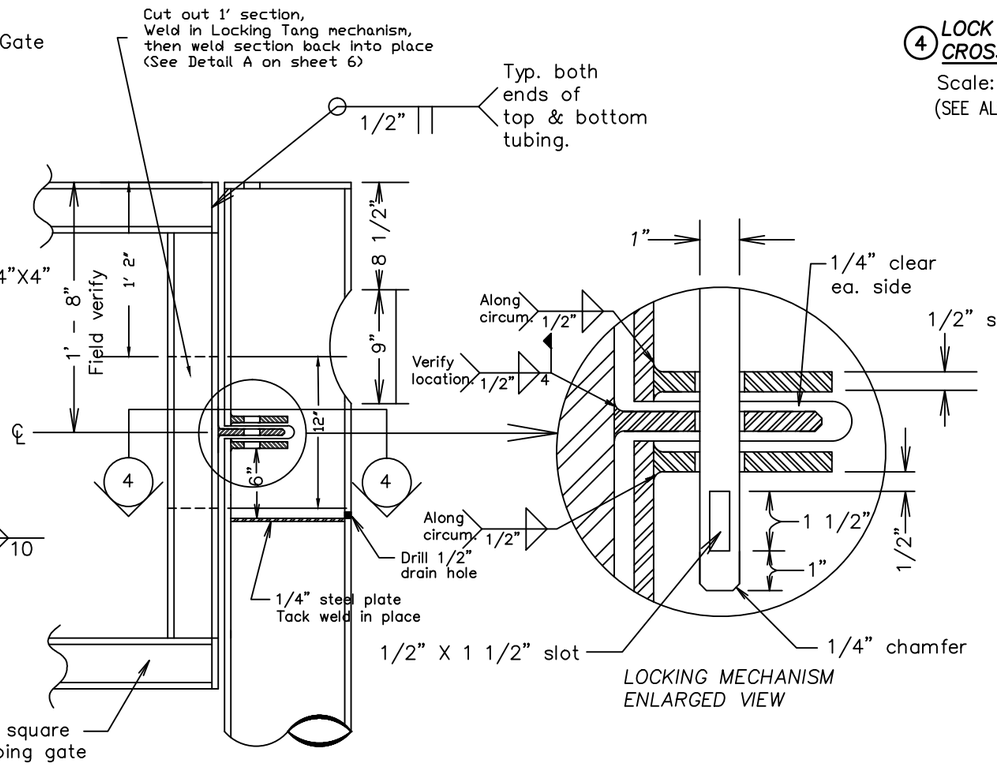
1. Align post hinge section w/gate hinge section – weld bottom plate to hinge.
2. Grease pin rod prior to assembly.
3. Insert pin rod into hinge.
4. Weld top hinge cap.
5. Add additional grease into hinge through grease fitting.
6. Cap all posts



③ **UNASSEMBLED HINGE DETAIL**
Scale: 1" = 1'–0"



⑤ **ASSEMBLED HINGE DETAIL**
Scale: 1" = 1'–0"



⑥ **LOCK BOX ELEVATION**
Scale: 1" = 1'–0"

LOCKING MECHANISM ENLARGED VIEW

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

USDA FOREST SERVICE
The Pacific Northwest Region

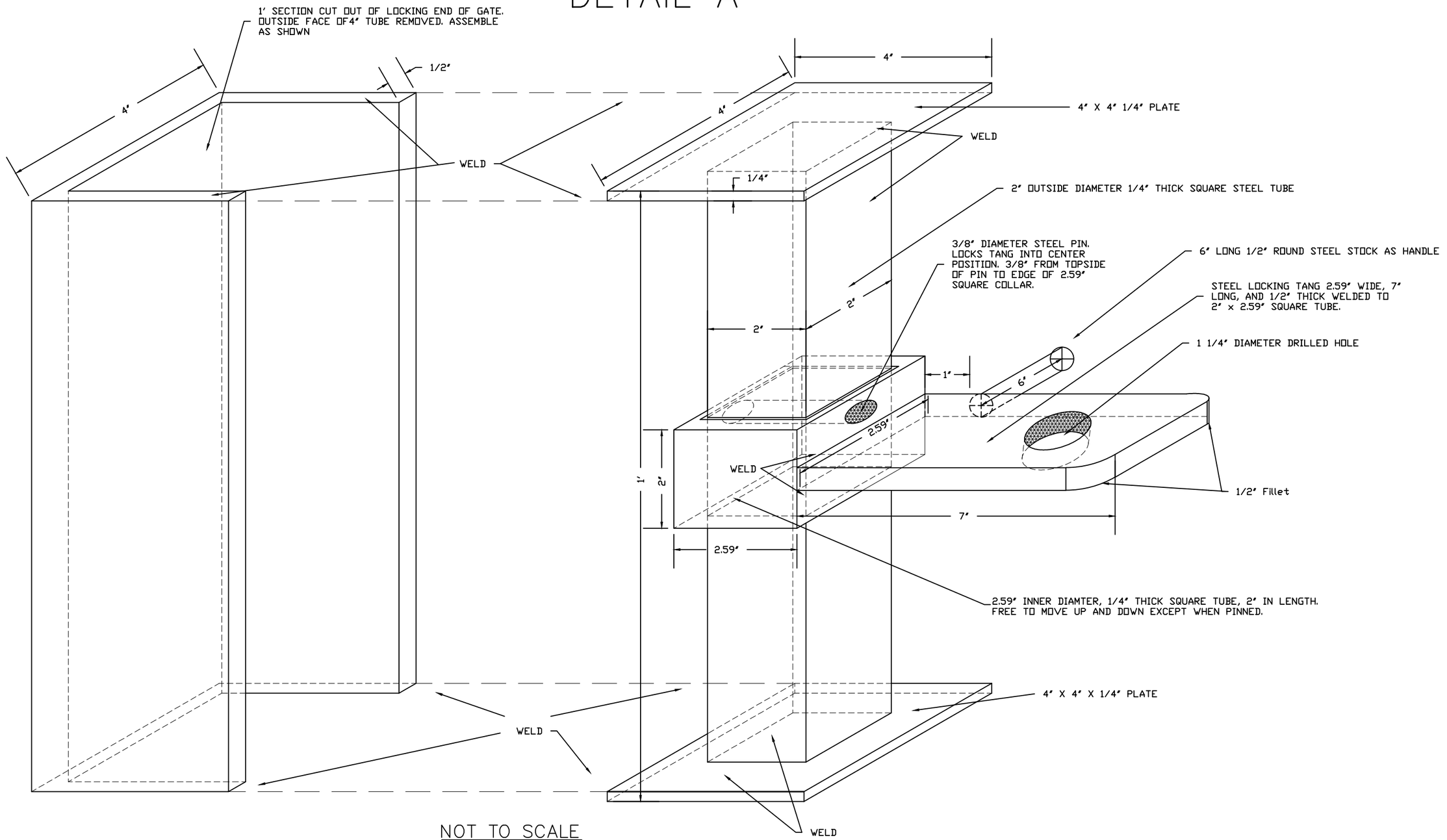
MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: **Ashes–Caldera Stewardship Road Reconstruction**

SHEET TITLE: FOREST ROAD 1630660 & 1640
GATE ASSEMBLY DETAILS

SHEET
20 of 22

DETAIL A



NOT TO SCALE

NOTE: Finished product should fit within the 1' section removed from the locking post end of gate. Weld entire assembly shown here in Detail A back into the gate as shown in the lock box elevation (Detail 6, Sheet 20).

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes-Caldera Stewardship Road Reconstruction

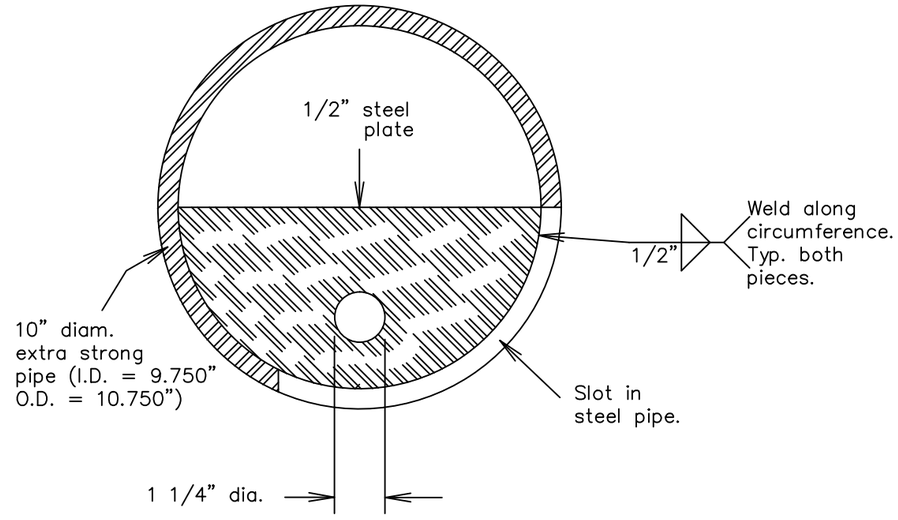
SHEET TITLE: FOREST ROAD 1630660 & 1640
GATE LATCH (DETAIL A)

SHEET
21 of 22

Install Object Marker OM2-2V

Open position support

Open Support Detail



⑦ OPEN SUPPORT CROSS SECTION

Scale: 1" = 4"

(SEE DETAIL 4 FOR LOCK BOX [OPEN] CROSS SECTION, SHEET 5).

90°

SIGN INSTALLATION NOTES:

1. Install two (2) 8"x24" Type 4 Barricade Markers (FBM-L & FBM-R), oriented horizontally, evenly spaced across the face of gate and level with each other, at a height 32" to 42" above the road surface.
2. Install four (4) 6"x12" Type 2 Object Markers (OM2-2V), oriented vertically, at a height 32" to 42" above the road surface. Install OM2s on each gate post facing oncoming traffic.
3. Install all markers with 2 sets of galvanized bolts, washers, and nuts for each marker.

Install Barricade Markers FBM-L & FBM-R

TANG (SEE DETAIL A, SHEET 6)

Install Object Marker OM2-2V

Install Object Markers OM2-2V

DESIGNED BY: L. JIMENEZ
DRAWN BY: L. JIMENEZ
CHECKED BY: J. CASWELL
DATE: NONE

USDA FOREST SERVICE
The Pacific Northwest Region

MT. HOOD NATIONAL FOREST
16400 Champion Way
Sandy, OR 97055

PROJECT: Ashes-Caldera Stewardship Road Reconstruction

SHEET TITLE: FOREST ROAD 1630660 & 1640 OPEN GATE SUPPORT DETAIL

SHEET 22 of 22

Road Reconstruction

FP-03 SPECIFICATIONS LIST

U.S. Forest Service
Hood River Ranger District
Mt. Hood National Forest
Hood River 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 725 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
101.01	Meaning of Terms	1/22/2009
101.03	Abbreviations	6/16/2006
101.04	Definitions	3/29/2007
101.04	Definitions	11/06/2007
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
104.03	Specifications and Drawings	1/22/2009
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)	Contractor Provided Sources	3/8/2007
105.02(a)	Government Provided Sources	1/18/2007
105.05	Use of Material Found in Work	5/12/2004
106	**Acceptance of Work**	FP-03
106.01	Conformity with Contract Requirements	7/31/2007
106.07	Delete	5/11/2004
107	**Legal Relations and Resposibility to the Public**	FP-03
107.05	Responsibility for Damage Claims	5/11/2004
107.06	Contractor's Responsibility for Work	6/16/2006

107.08	Sanitation, Health, and Safety	3/29/2005
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
109.02	Measurement Terms and Definitions	6/16/2006
152	**Construction Survey and Staking**	FP-03
152.00	Construction Survey and Staking	8/5/2005
153	**Contractor Quality Control**	FP-03
153.04	Records	10/24/2007
155	**Schedules for Contracts**	FP-03
155.00	Delete	5/11/2004
156	**Public Traffic**	FP-03
156.00	Public Traffic	4/17/2007
156.03	Accommodating Traffic During Work	2/24/2005
156.08	Traffic and Safety Supervisor	2/24/2005
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
201	**Clearing and Grubbing**	FP-03
201.00	Clearing and Grubbing	8/5/2009
201.01	Description	2/18/2005
201.04	Clearing (c)	2/22/2005
201.06	Disposal	2/18/2005
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	2/24/2005
203.05	Disposing of Material	2/18/2005
203.08	Payment	2/24/2005
204	**Excavation and Embankment**	FP-03
204.00	Excavation and Embankment	3/26/2009
204.06	Roadway Excavation	3/2/2005
204.14	Disposal of Unsuitable or Excess Material	3/2/2005
209	**Structure Excavation and Backfill**	FP-03
209.10	Backfill	10/23/2007
209.11	Compacting	2/24/2005
262	**Reserved**	FP-03

262.00	Reinforced Soil Embankment	5/14/2004
322	**Minor Aggregate Courses**	FP-03
322.00	Minor Aggregate Courses	10/14/2011
404	**Minor Hot Asphalt Concrete**	FP-03
404.02	Composition of Mix (Job Mix Formula)	6/9/2006
404.03	Surface Preparation	6/9/2007
404.04	Weather Limitations	3/2/2005
404.06	Placing	3/2/2005
404.07	Compacting (a)	3/2/2005
415	**Paving Geotextiles**	FP-03
415.01	Delete and Replace	3/26/2007
430	**Reserved**	**FP-03**
430.00	Asphalt Pavement Patching	3/26/2007
601	**Minor Concrete**	FP-03
601.00	Minor Concrete	2/27/2007
602	**Culverts and Drains**	FP-03
602.03	General	9/6/2005
602.03	General	3/17/2010
625	**Turf Establishment**	FP-03
625.05	Watering	3/30/2005
625.06	Fertilizing	9/17/2008
625.07	Seeding	9/17/2008
625.08	Mulching	1/29/2009
633	**Permanent Traffic Control**	FP-03
633.02	Material	3/3/2005
633.03	General	3/3/2005
633.05	Panels	3/3/2005
635	**Temporary Traffic Control**	FP-03
635.03	General	5/13/2004
651	**Reserved**	FP-03
651.00	Development of Pits & Quarries	3/2/2005
703	**Aggregate**	FP-03
703.05	Subbase, Base, Surface Course, and Screened Aggregate	8/14/2009
703.05	Tables 703-2, 703-3,and 703-16	7/14/2010
703.05	Subbase, Base, & Surface Course Aggregate (Pit Run)	3/26/2007
703.07	Correction to Table 703-2	3/2/2005
703.10(e)	Flakiness Index	4/11/2011
703.10(i)	Adherent Coating	4/11/2011
714	**Geotextile and Geocomposite Drain Material**	FP-03
714.01	Tables 714-1, 714-2, 714-3, and 714-4	5/31/2012
714.03	Tables 714-1 and 714-4	2/25/2005

714.04	Paving Reinforcement Grid	3/26/2007
718	**Traffic Signing and Marking Materials**	FP-03
718.02	Protective Overlay Film and Edge Film	3/2/2005
718.05	Aluminum Panels	8/5/2009

Table of Contents

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.

101.01_nat_us_01_22_2009

101.01 Meaning of Terms
Delete all references to the FAR (Federal 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.

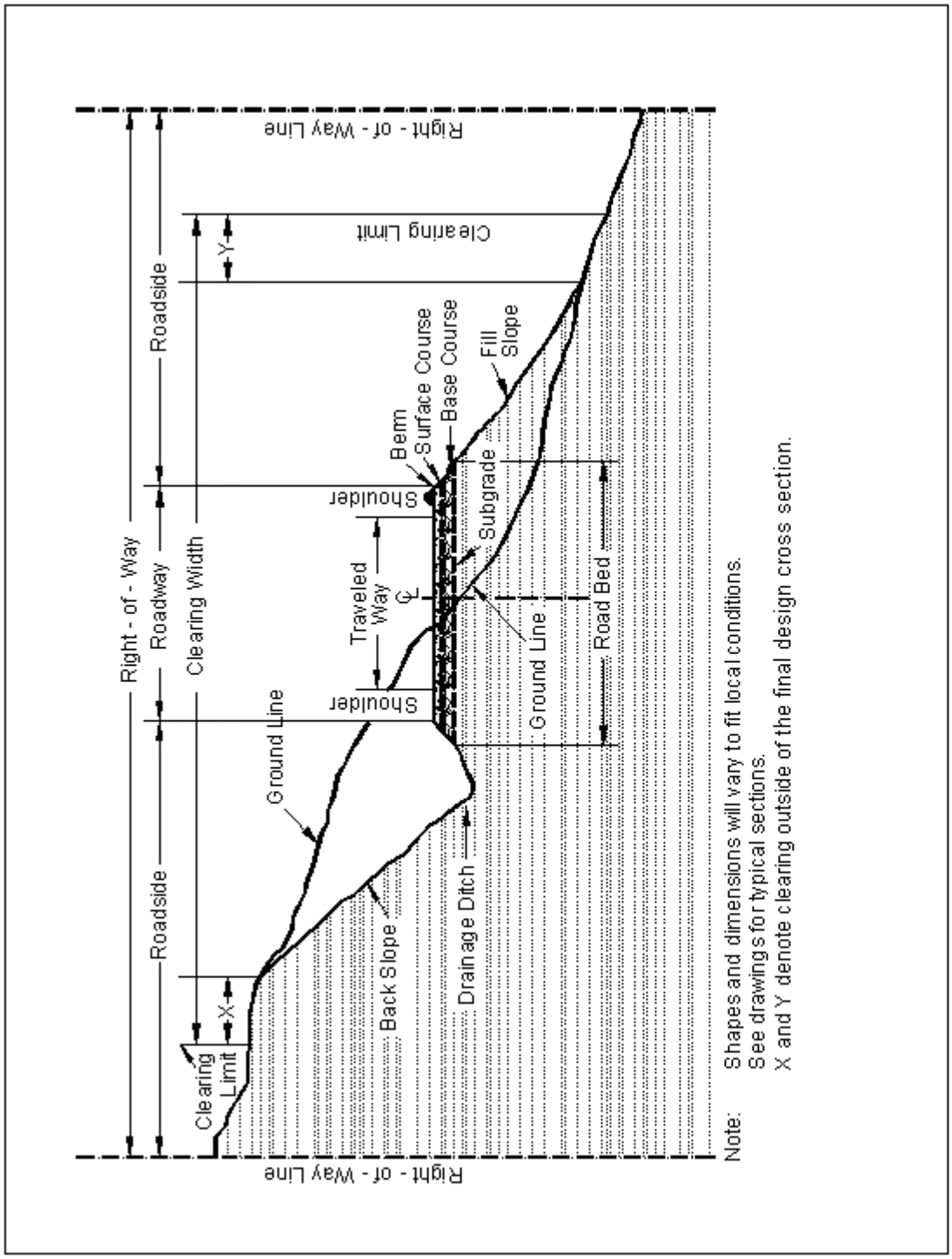
Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

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.



101.04_nat_us_11_06_2007

101.04 Definitions.
Delete the following definitions:

Contract Modification

Day

Notice to Proceed

Solicitation

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.

104.03_nat_us_02_22_2005

104.03 Drawings and Specifications

Delete subsection 104.03

104.03_nat_us_01_22_2009

104.03 Specifications and Drawings.

Delete 104.03.

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_01_18_2007

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 Class 2 Riprap from Dollar Quarry.

(2) Government-provided optional sources.

There are no government-provided optional sources which are applicable to this contract.

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

106.01_nat_us_07_31_2007

106.01 Conformity with Contract Requirements.

Delete Subsection 106.01 and substitute the following:

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

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

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

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

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

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

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

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

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

(1) Sampling method;

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

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

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

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

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

(1) Have the work accepted at a reduced price; or

(2) Be given permission to perform corrective measures to bring the work into conformity.

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

106.07_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".

107.08_nat_us_03_29_2005

107.08 Sanitation, Health, and Safety

Delete the entire subsection.

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.

152 - Construction Survey and Staking

152.00_nat_us_08_05_2005

Description

152.01(c) Material.

Add the following:

Use required stake dimensions and materials. Pre-paint the top 2 inches of all stakes and lath, or mark them with plastic flagging. Use designated colors for paint or flagging. Mark all stakes with a stake pencil that leaves a legible imprint, or with waterproof ink.

Do not use aerosol spray paints.

Use moisture-resistant paper for survey notes. Keep notes in books with covers that will protect the contents and retain the pages in numerical sequence.

Construction Requirements

152.02 General.

Delete the first two sentences.

Add the following:

When indicated on the plans, a preliminary survey line has been established on the ground. The project location line is established by offsets from this preliminary line.

Delete second sentence in second paragraph and replace with the following:

Reestablish missing reference, control lines, or stakes as necessary to control subsequent construction staking operations

152.03 Survey and Staking Requirements.

(b) Roadway cross-sections.

Replace the first two sentences with the following:

Take roadway cross-sections normal to centerline. When the centerline curve radius is less than or equal to 200 feet, take cross-sections at a maximum centerline spacing of 25 feet. When the centerline curve radius is greater that 200 feet take cross-sections at a maximum centerline spacing of 80 feet.

c) Slope Stakes & References:

Replace section with the following:

Slope stakes and references. When required, locate slope stakes on designated portions of the road. Locate the slope stake catch points and use them to establish clearing limits and slope stake references.

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

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

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

Use the designated method to establish the slope stake catchpoint.

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

(d) Clearing and grubbing limits.

Add the following:

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

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

(e) Centerline reestablishment.

Replace with the following:

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

(g) Culverts.

Replace subsection with the following:

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

(1) Diameter, actual field measured length, and type of culvert.

(2) The vertical and horizontal distance from the reference stake to the invert at the ends of the culvert.

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

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

152.03 (l) Miscellaneous Survey and Staking.

Add the following:

(11) Cattleguards

(12) Drain Dips

(13) Erosion Control Measures

Replace Table 152-1 with the following two tables:

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

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

a. Accuracy of offset measurement.

b. Determine vertical closures at intervals not to exceed 2000 ft as measured along centerline.

c. Use greater value.

Table 152-2 Cross section and slope stake tolerances.

Item	Tolerances				
	A	B	C	D	E
Allowable deviation of cross-section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves	(±)2°	(±)3°	(±)3°	(±)5°	(±)5°
Take cross-sections topography measurements so that variations in ground from a straight line connecting the cross-section points will not exceed	0.5 ft	1.0 ft	2.0 ft	2.0 ft	3.0 ft
Horizontal and vertical accuracy for cross-sections, in feet or percentage of horizontal distance measured from traverse line, whichever is greater.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%	0.2 ft or 1.0%	0.3 ft or 1.0%
Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits. In feet or percentage of horizontal distance measured from centerline or reference stake, whichever is greater.					
Slope reference stakes and slope stakes.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%	0.2 ft or 1.0%	0.3 ft or 1.0%
Clearing limits	1.0 ft	1.0 ft	1.0 ft	1.5 ft	2.5 ft

153 - Contractor Quality Control

153.04_nat_us_10_24_2007

153.04 Records.

Delete all but the first sentence

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
16	**MP 6.65**	**MP 8.46**	**4***	****

* - Closure time is limited to a maximum of 4 days total for the entire project; closure time is intended to allow for construction of Reinforced Riprap Embankment at mile post 6.85. Closure may not occur on any Friday, Weekend, or Federal Holiday.
** - Road to remain open to public traffic throughout construction operations with the exception of a one-time closure lasting a maximum of four (4) days.

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.

156.03_nat_us_02_24_2005

156.03 Accommodating Traffic During Work.

Delete the following from the last paragraph:

according to Subsection 106.07(b)

156.08_nat_us_02_24_2005

156.08 Traffic and Safety Supervisor.

Delete this subsection in its entirety.

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.

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 and Payment

170.07 See Subsection 109.05.

Do not measure develop water supply and watering for payment.

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_nat_us_02_24_2005

203.05 Disposing of Material.

Add the following:

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

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.

203.05_0618_us_03_26_2007

203.05 Disposing of Material

(a) Remove from project.

Delete the last two sentences

203.08 Payment

Add the following:

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

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) <u>Compaction A.</u> 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 6feet 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 1⅓V: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.

204.03 Materials

Add the following:

Structural backfill	704.04

204.06_nat_us_03_02_2005

204.06 Roadway Excavation

(a) General.

Add the following:

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

204.14_nat_us_03_02_2005

204.14 Disposal of Unsuitable or Excess Material.

Delete the text of the first paragraph and substitute the following:

Dispose of unsuitable or excess material at designated sites or legally off of the project.

209 - Structure Excavation and Backfill

209.10_nat_us_10_23_2007

209.10 Backfill.

(a) General.

Add the following:

Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

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

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

(b) Pipe culverts.

(1) Pipe culverts with compacted backfill.

Add the following:

Excavate an area on each side of the pipe as needed to effectively achieve compaction requirements. Backfill without damaging or displacing the pipe. Complete backfilling of the trench with suitable material.

209.11_nat_us_02_24_2005

209.11 Compacting.

Delete the subsection and add the following:

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

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

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

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

Table 209-1 Sampling and Testing Requirements

Add the following:

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

262 - Reinforced Soil Embankment

262.00_nat_us_05_14_2004

Description

262.01 This work consists of constructing reinforced soil embankments.

Material

262.02 Conform to the following Subsections:

Geogrid, category 1,2,3,4,5,or 6	714.03
Structural backfill	704.04
Select granular backfill	704.10
Reinforcing mesh	720.01(h)

Construction Requirements

262.03 General. Before beginning work, submit a work plan for acceptance. Allow at least 3 days for acceptance. Include procedures for stretching and staking the geogrid.

Excavate according to Section 209. Grade the foundation for a width equal to the length of reinforcing elements plus 18 inches. Where the embankment is set on a rocky foundation, place 6 inches of select granular backfill under the geogrid or reinforcing mesh. Dispose of unsuitable or excess excavation material according to Subsection 204.14.

The final limits and configuration of the excavation may vary, depending on the foundation materials encountered during excavation.

262.04 Reinforcing Elements. Place soil reinforcing elements at the specified elevation and alignment. Orient the reinforcing elements so that the maximum tensile strength available is in the direction of specified primary reinforcement.

Do not splice reinforcement elements in the primary direction. Overlap geogrids three ribs in the direction transverse to the primary direction, and attach with hog rings or other approved methods. Overlap reinforcing mesh one rib in the direction transverse to the primary direction.

Prevent wrinkle development or slippage of reinforcement elements during fill placement and spreading.

262.05 Backfilling. Install the base of the reinforced embankment within + 4 inches of the plan elevation or as directed by the CO. Backfill the stabilized volume with specified structural backfill or select granular backfill according to Subsection 209.10. Ensure that no voids exist below the geogrids or reinforcing mesh. Compact each layer according to Subsection 209.11, method (b). Do not use sheepsfoot rollers for compaction.

Do not damage or disturb the reinforcing elements. Do not operate equipment on the embankment with less than 6 inches of fill on top of the geogrid or reinforcing mesh. Correct all damaged, misaligned, or distorted reinforcing elements.

Backfill and compact behind the stabilized volume with structural backfill according to Subsection 209.10 and 209.11, method (b). At the end of each day's operation, slope the last lift of backfill away from the embankment face to direct surface runoff away from the face. Do not allow surface runoff from adjacent areas to enter the embankment construction area.

262.06 Embankment Slope Treatment. Treat the face of the reinforced slope for erosion control in according to Section 157.

262.07 Acceptance. Reinforcing elements will be evaluated under Subsections 106.02 and 106.03.

Construction of reinforced soil embankments and services will be evaluated under Subsections 106.02 and 106.04.

Select granular backfill and structural backfill will be evaluated under Subsections 106.02 and 106.04. See Table 262-1 for sampling and testing requirements.

Measurement

262.08 Measure the items listed in the bid schedule according to Subsection 109.02 and the following.

Measure reinforcing elements by the square yard in place.

Measure select granular backfill within the stabilized volume by the cubic yard in place.

Payment

262.09 The accepted quantities, measured as provided in Subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 262 pay item listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 262-1 Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Backfill (704)	Measured and tested for conformance (106.04)	Classification	AASHTO M 145	One per soil type	Source of material	Yes	Before using in work
		Gradation	AASHTO T 27 & AASHTO T 11	"	"	"	"
		Moisture-Density	AASHTO T 180 Method D(1) or T99 Method C(1)	"	"	"	"
		Compaction	AASHTO T 310 or other approved procedures	Minimum two per Lift	In-place	--	Before placing next layer

(1) Minimum of 5 points per proctor.

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 ½ inch.

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

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

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

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

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

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

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

Measurement

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

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

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

Measure thickness perpendicular to the grade of the travelway.

Measure width perpendicular to the centerline.

Payment

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

Table 322-1
Sampling and Testing Requirements

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 (coarse)	—	AASHTO T 96	1 per type & source of material	Source of material	Yes, when requested	Before using in work
		Sodium sulfate soundness loss (coarse & fine)	—	AASHTO T 104	"	"	"	"
		Durability index (coarse & 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

404 - Minor Hot Asphalt Concrete

404.02_nat_us_06_09_2006

404.02 Composition of Mix (Job-Mix Formula).

Delete the second paragraph and replace with the following:

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

404.03_0618_us_06_09_2007

404.03 Surface Preparation.

Change the following:

"Subsection 410.05" to "Subsection 401.06"

Add the following:

Apply an asphalt prime coat to contact surfaces of aggregate base according to Section 411.

404.04_nat_us_03_02_2005

404.04 Weather Limitations.

Change 35^{o} F to 45^{o} F:

404.06_nat_us_03_02_2005

404.06 Placing.

Add the following:

Do not place asphalt until the CO has approved in writing the area where it will be placed.

Delete the last sentence and replace with the following:

Offset the longitudinal joint of one layer at least 6 inches from the joint in the layer immediately below. Make the longitudinal joint in the top layer along the centerline of two-lane roadways or

at the lane lines of roadways with more than two lanes. Offset transverse joints in succeeding layers and in adjacent lanes at least 10 feet, where possible.

404.07_nat_us_03_02_2005

404.07 Compacting (a).

Delete and replace with the following:

(a) Roadway paving. Thoroughly and uniformly compact the surface a minimum of three passes with rollers that meet one of the following requirements:

(1) Steel-wheeled rollers, other than vibratory type, capable of exerting a force of not less than 1.5 ton/feet of width of the compression roll or rolls.

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

(3) Pneumatic-tire rollers with smooth tread tires of equal size that provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 lbf/in^2.

Perform initial compaction while the mixture is above 250 °F. Perform finish rolling with steel-wheel rollers and continue until no roller tracks remain.

415 - Paving Geotextiles

415.01_0618_us_03_26_2007

415.01 Delete and replace with the following:

This work consists of furnishing and placing a paving reinforcement grid and when required, an asphalt sealant, between pavement layers to form a stress-relieving membrane within the pavement structure.

415.02 Add the following:

Paving Reinforcement Grid	714.04

415.03 Surface Preparation. Delete and replace with the following:

Prepare the surface to receive the reinforcement grid according to Subsection 410.05.

415.04 Weather Limitations. Delete and replace with the following:

Apply asphalt sealant and reinforcement grid on a dry surface when the pavement surface temperature is at least 55 ºF and rising.

415.05 Asphalt Sealant Application. Delete third paragraph and replace with the following:

Spray the asphalt sealant 6 inches wider than the reinforcement grid. Do not apply the asphalt sealant any farther in advance of the reinforcement grid placement than can be maintained free of traffic.

415.06 Paving Geotextile Placement. Delete and replace with the following:

415.06 Reinforcement Grid Placement. Place the paving reinforcement grid under sufficient tension to eliminate wrinkling and rippling. Slit, lay flat, and tack all wrinkles, ripples, or folds higher than 1/2 inch. Roll the reinforcement grid to maximize fabric contact with the pavement surface.

At reinforcement grid joints, overlap the reinforcement grid 6 inches to ensure full closure. Overlap transverse joints in the direction of paving to prevent edge pickup by the paver. Apply additional asphalt sealant to reinforcement grid overlaps to ensure proper bonding of the double fabric layer.

If asphalt sealant bleeds through the fabric, treat the affected areas with blotter. Minimize traffic on the reinforcement grid. If circumstances require traffic on the membrane, when directed by the CO, apply blotter and place *"Slippery When Wet"* signs.

Broom the excess blotter from the reinforcement grid surface before placing the overlay. Repair all damaged reinforcement grid before placing overlay. If the surface was blotted, apply a light tack coat according to Section 412 before placing the overlay. To avoid damaging the reinforcement grid, do not turn equipment on the grid.

Place a hot asphalt concrete overlay within 24 hours after placing the reinforcement grid. Limit the lay-down temperature of the mix to a maximum of 325 º.

415.07 Acceptance. Delete **first and second paragraph** and replace with the following:

Asphalt binder will be evaluated under Subsections 106.04 and 702.09. Reinforcement grid material will be evaluated under Subsections 106.02, 106.03, and 714.04.

Placement of reinforcement grid will be evaluated under Subsections 106.02 and 106.04.

430 - Asphalt Pavement Patching

430.00_0618_us_03_26_2007

Description

430.01 This work consists of performing full depth patching, patching with geotextiles, skin patching, spray-injection patching, and removal and replacement of asphalt berms.

Material

430.02 Conform to the following Subsections:

Minor Hot Asphalt Pavement	404.02
Asphalt Binder	702.01
Cutback Asphalt	702.02
Emulsified Asphalt	702.03
Application Temperatures	702.04
Cold Asphalt Mix	702.10
Aggregate	703.07 (a) and (b)
Choker Aggregate	703.12
Geotextile Type VI	714.01
Sand	703.15

Construction

430.03 Composition of Mix (Job-Mix Formula). Furnish either Minor Hot Asphalt Pavement or Minor Cold Asphalt Mix as approved by the CO.

430.04 Full Depth Patch. Remove material to the depth noted on the plans, or as necessary to reach firm support. If firm support for a patch is unavailable, notify the CO prior to placing any material.

Trim or mill the edges of the prepared hole to form a vertical face in un-fractured asphalt surfacing. Make the prepared hole rectangular, and clean it of all loose material. When the hole is dry, apply emulsified asphalt to the bottom and faces of the hole. Barricade prepared sites. Patch the sites immediately after the emulsified asphalt breaks. Place the asphalt concrete mixture in layers not exceeding 4 inches. Thoroughly compact each layer with hand or mechanical tampers or rollers. For hot asphalt concrete mixtures, compact the mix while it is above 230 °F.

Compact the finished surface with a steel-wheel roller or vibratory plate compactor. Ensure that the compacted patch is approximately 1/8 to 1/4 inches above the level of the adjacent pavement. Seal the edges of the completed patch with emulsified asphalt, and blot with fine sand.

430.05 Patching with Geotextile. Prepare the surface by digging out and patching according to Subsection 410.05 or by cleaning the surface, removing vegetation, and filling all cracks more than 1/4 inch wide with an approved crack-filling material. Remove excess crack-filling material. Spray the prepared surface with asphalt cement or emulsified asphalt according to the geotextile manufacturer's direction. Immediately place the geotextile over the repaired area. Allow emulsified asphalt to break before placing geotextile. Extend the fabric a minimum of 6 inches beyond the repaired or patched area onto sound adjoining pavement. Use a minimum of 2 inches overlap where adjacent fabric panels are needed to cover the repaired area.

Do not place the asphalt concrete mixture until authorized by the CO. Uniformly distribute asphalt concrete mixture in layers not to exceed 2 inches compacted depth. Feather the edges of skin patches. When placing more than one layers, offset all joints at least 6 inches between layers. Compact each layer with an 8 to 10 ton steel roller. For hot asphalt concrete mixtures, compact the mix while it is above 230°F. Ensure that the completed patch does not have abrupt transitions that could adversely affect the steering of a passenger car traveling across the area. Provide transition tapers for skin patches that are 12 inches long per 1/8 inch thickness of patch in the direction on travel.

430.06 Skin Patches. Prepare the surface on which the skin patch is placed by cleaning the surface, removing vegetation, and filling all cracks more than 1/4 inch wide with an approved crack-filling material. Remove excess crack-filling material. Spray the surface with emulsified asphalt at the rate approved by the CO.

Apply the asphalt concrete mixture according to Subsection 430.05.

430.07 Spray-Injection Patching. Use an approved continuous process that cleans and dries the area to be patched, sprays a tack coat of binder on the sides and bottom of the pothole, place aggregate coated with emulsified asphalt, and covers the area with a choker aggregate.

430.08 Asphalt Berm. Remove damaged segments of berm and bevel exposed ends at approximately 45 degrees from vertical. Clean and patch the berm foundation as necessary. Coat the foundation and joining surfaces with emulsified asphalt. Place and compact asphalt mix to conform to the shape of the undamaged segment.

430.09 Waste Material. Dispose of all materials removed from potholes, patches, and berms in accordance with Subsection 203.05(a).

430.10 Acceptance. Asphalt concrete mixtures will be evaluated under Subsections 106.02 and 106.03. Geotextiles will be evaluated under Subsection 106.03. Spray-injection patching will be evaluated under Subsections 106.02 and 106.03.

Measurement

430.11 Measure the Section 430 items listed in the bid schedule according to Subsection 109.02.

Payment

430.12 The accepted quantities will be paid at the contract unit price per unit of measurement for Section 430 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05

601 - Minor Concrete

601.00_nat_us_02_27_2007

Delete the entire specification and replace it with the following:

Description

601.01 This work consists of constructing minor concrete structures.

Material

601.02 Conform to the following Subsections:

Air-entraining admixtures	711.02
Chemical admixtures	711.03
Coarse aggregate	703.02
Concrete coloring agents	711.05
Curing material	711.01
Fine aggregate	703.01
Fly ash	725.04
Hydraulic Cement	701.01
Joint fillers	702.01
Precast concrete curbing	725.06
Precast concrete units	725.11
Reinforcing steel	709.01
Structural steel	717.01
Water	725.01

601.03 Concrete Composition. Use the designated concrete composition:

(a) Method A. Submit a mix design showing the proposed masses of aggregate, water, and cement per cubic yard of concrete a minimum of 7 days prior to beginning placement. Proportion the cement, aggregate, and water to obtain concrete with good workability.

Composition of Minor Structure Concrete

Property	**Specification**	**Test Method**
Slump	4 in maximum	AASHTO T 119
Air content	5 to 7 percent	AASHTO T 152 or T 196
28-day compressive strength	3000 psi	AASHTO T 23 and T 22

(b) Method B. Submit the following information a minimum of 7 days prior to beginning placement:

(1) Type, grading, and sources of aggregate.

(2) Type and source of cement, blended cement, or fly ash.

(3) Saturated surface dry weights of the fine and coarse aggregate in pounds per cubic yard of concrete.

(4) Weight of mixing water in pounds per cubic yard of concrete.

(5) Weight of cement in pounds per cubic yard of concrete.

(6) Admixture type, quantity, and certification by manufacturer.

(7) Air content.

(8) Slump.

(9) 28-day compressive strength.

Furnish concrete containing not less than 680 pound of cement per cubic yard. Ensure that slump is 4 inches or less, as determined by AASHTO T 119.

(c) Method C. Make the concrete using a dry, preproportioned, blended, and bagged mix meeting the requirements of ASTM C 387 and mixed at the jobsite according to the manufacturer's recommendations.

(d) Fly Ash- or Pozzolan-Modified Concrete. Fly ash may be substituted for cement at the rate of 20 ounces of fly ash per 16 ounces of Portland cement. After substitution, reduce the design aggregate volumes by an amount equal to the net increase in volume of the combined cement and fly ash. Replace no less than 10 percent and no more than 20 percent of the weight of Portland cement required with fly ash at the above rate. For purposes of controlling the maximum water/cement ratio of 0.49, make the water/cement ratio for fly-ash-modified concrete the ratio of the weight of water to the combined weights of Portland cement and 60 percent of the weight of the fly ash.

Extend the standard 28-day curing period for compressive-strength tests for fly-ash modified concrete by 1 day (rounded to the nearest whole day) for each 1.5 percent of Portland cement replaced with fly ash at the selected rate. (Example: If the maximum of 20 percent cement is replaced, the curing period for cylinders is 41 days.)

Construction Requirements

601.04 General. Perform excavation and backfill work according to Section 209. When concrete is cracked, spalling, or scaling, remove concrete to the nearest joint.

Design and construct forms that are free of bulge and warp and allow for removal without injuring the concrete. When concrete contains a retarding admixture, fly ash, or other pozzolan replacement for cement, design the forms for a lateral pressure equal to that exerted by a fluid with a mass of 2.5 ton per cubic yard.

Use wood, metal, or other suitable material for forms. Keep forms clean and coat with a form release agent or form oil before placing concrete.

Place and fasten reinforcing steel according to Subsection 554.08.

601.05 Placing Concrete. Place all reinforcing steel in position and ensure that it is securely held in place by approved supports during placing of concrete. Do not place concrete until the grading, forms, and steel reinforcements have been inspected and approved by the CO. Provide 24 hours written notice prior to placement of any concrete.

Place reinforcing steel according to Section 554.

Discharge all concrete prepared using methods A and B into the forms within the time limits shown in table 601-1. These time limits are based on jobsite ambient air temperature, cement type, and admixture used. Begin counting time from when the cement is introduced into the aggregate. Discharge concrete prepared using method C into the forms within 1-1/2 hours after introducing water to the mixture. Do not retemper concrete. When required cement must be added to the mixer at the jobsite. Do not mix or place concrete when the temperature is, or is expected to be, less than 40 °F unless adequate provisions are made to protect the concrete.

Place concrete to avoid segregation. Use high-frequency internal vibrators for consolidating concrete in the forms. Operate vibrators to produce concrete free of voids, but do not hold them in one place long enough to result in segregation or formation of laitance on the surface.

Method C concrete may be rodded instead of internally vibrated as necessary to remove voids.

Do not use aluminum pipe, conduit, or troughs for transporting concrete. When concrete is pumped, take samples from the discharge stream at the point of placement. Do not apply water to plastic concrete surfaces during finishing operations.

Table 601-1 Concrete discharge time limits.

Cement Type With and Without Admixtures	Time limit (hour)	
	< 85 °F[1]	**>85 °F[1]**
Type I, IA, II, or IIA	2.0	1.5
Type I, IA, II, or IIA with water reducing or retarding admixture	3.0	2.0
Type III	1.5	1.0
Type III with water reducing or retarding admixture	2.0	1.5

[1] Ambient air temperature.

601.06 Curing Concrete. Cure concrete a minimum of 7 days. If high early strength cement is used, cure concrete a minimum of 3 days. Cure according to Subsection 552.15. Finish according to Subsection 552.16 class 2 rubbed finish.

601.07 Acceptance. See Table 601-2 for sampling and testing requirements. Material for minor concrete structures including reinforcing steel, and structural steel for minor structures will be evaluated under Subsections 106.03. The concrete mixture's slump, air content, unit mass, and temperature will be evaluated under Subsections 106.02 and 106.04. See Tables 552-1 and 552-2 for specification limits.

Excavation and backfill will be evaluated under Section 209.

Construction of minor concrete structures will be evaluated under Subsections 106.02 and 106.04.

Measurement

601.08 Measure the Section 601 items listed in the bid schedule according to Subsection 109.02.

Payment

601.09 The accepted quantities will be paid at the contract price per unit of measurement for the Section 601 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

The concrete lump sum item will be prorated based on the progress of the work under this Section.

Table 601-2. 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
Concrete	Measured and tested for conformance (106.04)	Unit Weight	-	AASHTO T 121	One set per 32 cubic yards but not less than one per day	Point of discharge	-	Upon completion of project
		Air content	-	AASHTO T 152 or AASHTO T 196	"	"	-	"
		Slump	-	AASHTO T 119	"	"	-	"
		Temperature	-	Field Measured	"	"	-	"
		Compressive strength	-	AASHTO T 22 & AASHTO T 23	"	Discharge stream at point of placement	-	"

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.

625 - Turf Establishment

625.05_nat_us_03_30_2005

625.05 Watering.
Delete the entire subsection

625.06_0618_us_09_17_2008

625.06 Fertilizing.
Delete the entire subsection

625.07_0618_us_09_17_2008

625.07 Seeding. (b) Hydraulic method.

Add the following:

Apply seed mixture at the rate of **30** pounds of live seed per acre to the roadway, side slopes, waste areas, stream banks, and any other disturbed sites.

625.08_0618_us_01_29_2009

625.08 Mulching. (a) Dry method.
Delete the paragraph and replace with the following:

Apply certified weed free straw mulch as shown on the plans.

633 - Permanent Traffic Control

633.02_nat_us_03_03_2005

633.02 Material.

Add the following subsections

Protective Overlay Film	718.02
Edge Film	718.02

633.03_nat_us_03_03_2005

633.03 General.

Delete the subsection and add the following:

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

633.05_nat_us_03_03_2005

633.05 Panels.

Add the following:

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

Delete the sentence: "Use antitheft fasteners where possible" in the fifth paragraph and replace it with the following: "For each sign panel use at least one antitheft fastener."

635 - Temporary Traffic Control

635.03_nat_us_05_13_2004

635.03 General.

Add the following:

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

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.

703 - Aggregate

703.05_nat_us_08_14_2009

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)
3 inch	100				
2 inch	65 - 95	100	100		
1½ inch		97 – 100			
1 inch			80 – 100 (6)	100	
3/4 inch	40 - 75		64 – 94 (6)	86 – 100 (6)	100
1/2 inch					
3/8 inch			40 – 69 (6)	51 – 82 (6)	62 – 90 (6)
No. 4	22 - 45	40 – 60 (8)	31 – 54 (6)	36 – 64 (6)	36 – 74 (6)
No. 40	8 - 22			12 – 26 (4)	12 – 26 (4)
No. 200	2 - 10	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..

Note: Allowable deviations (±) from TV are shown in parentheses. If the plasticity index (PI) is greater than 0, the TV range for the No. 200 sieve size is 6-12 (4).

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)					
	Grading Designation					
	F	G	H	S	T	U
1 1/2 inch	100			100		
1 inch	97-100	100		72 – 92 (6)	100	
3/4 inch	76-89 (6)	97 - 100	97 - 100			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 (±) 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	

703.05_0618_us_03_26_2007

703.05 Subbase, Base, & Surface Course Aggregate (Pit Run).

Add the following to Tables 703-2:

% by Weight Passing Designated Sieve (AASHTO T11 and T-27) Grading Designation							
Sieve Size	L	M	N	O	P	Q	R
6 in.	100	100					
4 in.			100	100			
3 in.					100	100	
2 in.							100
No. 4		15-45		15-45		15-45	

Note: For Grading M, O, and Q the allowable deviations (+/-) from the TV are to the broad band limits.

703.07_nat_us_03_02_2005

Table 703-2 Correction

Include the following substitution

In Table 703-2, delete the "436 – 74 (6)" percent by mass passing for grading E (base) No. 4 sieve size and substitute "36 – 74 (6)."

703.10_nat_us_04_11_2011

703.10(e) Flakiness Index.

Delete and replace with the following:

Flakiness Index, FLH T 508 30% max.

703.10(i) Adherent Coating.

Add the following:

Adherent coating on the aggregate, FLH T 512 0.5% max.

714 - Geotextile and Geocomposite Drain Material

714.01_0618_us_05_31_2012

Tables 714-1, 714-2, 714-3 and 714-4.

Add the following note to all tables:

(4) Woven slit film will not be allowed.

714.03_nat_us_02_25_2005

Tables 714-1 and 714-4.

Add the following note to both tables:

(4) Woven slit film will not be allowed.

Add the following:

714.03 Geogrids.

Furnish geogrids consisting of polymeric materials such as polypropylene, polyethylene, or polyester formed into a stable network of bars or straps fixed at their junctions such that the bars retain their relative position to each other.

Elevate and protect rolls with a waterproof cover if stored outdoors.

(a) Physical requirements. Furnish geogrid treated to resist ultraviolet degradation, and conforming to the physical strength requirements shown in table 714-7 according to ASTM D 4595 for the specified geogrid category. Strength values shown in table 714-7 represent minimum average roll values and are for the direction of primary reinforcement. Ensure that the aperture size for all geogrids is between ¾ to 3 inches.

(b) Evaluation procedures. Geogrids will be evaluated under Subsection 106.03. Furnish a certification and a sample of the geogrid.

Table 714-7—Physical strength requirements for geogrids.

Category	Minimum Ultimate Strength at Breakage *(lbs/ft)*
1	890
2	1985
3	2875
4	4110
5	5475
6	8215

Add the following:

714.04 **Paving Reinforcement Grid.**

Furnish reinforcement grid consisting of fiberglass yarns knitted and coated with an elastometric polymer with a pressure sensitive adhesive backing formed into a stable network of bars or straps fixed at their junctions such that the bars or straps retain their relative position to each other.

Elevate and protect rolls with a waterproof cover if stored outdoors.

(a) Physical requirements. Furnish reinforcement grid conforming to the physical strength requirements shown in table 714-8 according to ASTM D 6637 for the specified reinforcement grid category. Strength values shown in table 714-8 represent minimum average roll values. Ensure that elongation at ultimate tensile strength is less than 5 percent and that the melting point of the reinforcement grid is greater than 425^{o}F according to ASTM D 276. Ensure that the aperture size for the reinforcement grid is greater than ¼ inch by ¼ inch.

(b) Evaluation procedures. Reinforcement grid will be evaluated under Subsection 106.03. Furnish a commercial certification including the name of the manufacturer, product name, style number, chemical composition of the filaments or yarns, and other pertinent information to fully describe the reinforcement grid.

Table 714-8—Physical strength requirements for paving reinforcement grid.

Category	**Ultimate Tensile Strength *(lbs/ft)*, minimum**	
	Machine Direction	**Cross-Machine Direction**
1	6720	6720
2	6720	13,440

718 - Traffic Signing and Marking Material

718.02_nat_us_03_02_2005

718.02 Reserved.

Replace this section with the following:

718.02 Protective Overlay Film and Edge Film.

Protective overlay film will be a high performance flouropolymer film such as 3M Scotchlite Premium Protective Overlay Film Series 1160 or approved equal.

Edge film will be a pressure-sensitive, premium-quality, clear, ultraviolet-resistant, 3 inches wide vinyl film.

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.

PROJECT 001 – Pre-Commercial Thinning

End Results – Project units will be pre-commercially thinned leaving the best and healthiest trees as well as the desired residual spacing, clearing brush and disposal of slash as described in the following technical specifications or technical proposal.

1. DESCRIPTION OF WORK

This stewardship project requires services for tree thinning, tree release, slash treatment and related work.

2. PROJECT LOCATION

A. Refer to the Contract Area Map for locations.

B. Boundaries are obviously defined by physical features, such as streams or roads, old cutting unit boundaries, etc., which are shown as boundaries on the Contract Area Map. Units may, or may not be flagged.

3. QUANTITY

Project Unit	Acres	Designated Spacing* FEET
16	35	20x20
17	31	16x16
22	24	20x20
23	20	20x20
25	36	18x18
26	12	18x18
541	16	18x18
Total	174	

*Designated spacing with a variance of 25% will be accepted to allow for selection of the preferred leave species below.

4. TECHNICAL SPECIFICATIONS

A. In identified cutting units, cut and dispose of trees over 24.0 inches in height, and less than 7.0 inches DBH to the designated spacing leaving the most vigorous, undamaged and healthy trees. Use the following priority when selecting leave trees:

(1) Western Larch
(2) Ponderosa Pine
(3) Western White Pine
(4) Western Red Cedar
(5) Western Hemlock
(6) Douglas-fir
(7) Grand Fir

B. All cut trees shall be cut below the lowest live limb, except when prevented by natural obstacles; in which case any live limbs below the cutting point shall be removed. Trees shall be completely severed from the stump. Stump height shall not exceed 6 inches above ground level or 4 inches above natural obstacles.

C. Cut all brush over 24.0 inches in height to a height not to exceed 8 inches. Herbaceous plants may be ignored.

D. Pulling brush and trees out of the ground with roots attached will not be an accepted method.

E. For the purposes of this project, slash is defined as vegetative debris including, but not limited to, cull logs, chunks, broken tops, limbs, branches, damaged or cut brush, damaged, cut or destroyed reproduction, saplings and poles, created by the activity. Dispose of all activity slash between 1 to 6 inches in diameter at the small end and more than 2 feet in length. The process used shall in no way damage or kill existing leave trees. The contractor is to include in their Technical Proposal the slash disposal method[1/] to be used and associated specifications on how the end results will be achieved. Burning by Contractor will not be accepted.

F. Mechanical equipment will be allowed on slopes less than 30%. Impact to soils from Contractor's Operations shall be less than 10 percent of the stewardship/cutting unit area. Impact is defined as soils being exposed by the removal of the duff layer or displaced from one place to another as the result of Contractor's Operations. The contractor is to include in their Technical Proposal how operations will be scheduled or conducted that results in impacts to soils to be less than 10% of the treated areas.

G. Not more than 5 percent of the residual stand may be damaged by Contractor's Operations. Scarring of boles that exceed 16 square inches of cambium exposure will be considered damage. Any tree "root sprung" or with a broken top will also be considered damage. The contractor is to include in their Technical Proposal how operations will be scheduled or conducted that results in less than 5% of the residual trees in each stand being damaged.

5. CONTRACTOR'S OBLIGATIONS

The Contractor shall furnish materials, labor, supervision, transportation, and all supplies for this project.

6. COMPLETION OF WORK

The Contractor shall notify the Forest Service in writing upon completion of each Project Unit.

1/ **If Slash Piling is included in the Technical Proposal for Slash Disposal the following Specifications Apply:**

A. Piles shall be located so that burning will not cause damage to snags or standing green trees, unless otherwise approved by the Forest Service. This will mean that all piles are at least 20 feet away from the bowl of any live or dead tree, and at least 50 feet away from any structure or utility box.

B. Piles will be constructed as compact as possible and free of dirt and noncombustible material to minimize lighting efforts and minimize damage to residual stand when burned. Larger limbs, tops, and stems shall have all smaller limbs cut off and piled. Pile height must be the same as or greater than pile width. Minimum pile height and width is 6 feet by 6 feet.

C. Pile Locations: Piles will be located on the flattest surface available. Piles will not be constructed on stumps, large down logs, and boulders. All piled material must be out from under the drip line of leave trees. Piles built on a slope shall run with the slope to prevent rolling. No piling within 25 feet of existing trails or within 50 feet of streams or ditches.

D. The contractor will be required to provide water-proof pile paper and/or plastic for covering all hand piles. If using paper it shall be 33# weight. The waterproof paper and or plastic will be placed on piles when the piles are approximately ¾ finished and covered with additional slash to hold the waterproof paper and or plastic in place. The waterproof paper and or plastic shall cover a minimum of ¼ of the pile.

PROJECT 002 – Riparian Down Wood Creation

End Results: Create aquatic habitat and diversity by restoring natural stream processes through increasing down wood within the stream.

1. DESCRIPTION OF WORK

Hand fall standing live trees into adjacent stream.

2. PROJECT LOCATIONS

Refer to the Contract Area Map for locations.

3. QUANTITY

Stream	Maximum Number of Trees to Fall*
Tony Creek (Units 13, 14)	80
TOTAL	**80**

***Size of trees will range between 12 and 20 inches Diameter Breast Height which is** measured at 4.5 feet above the natural forest floor on the high or uphill side of the tree. Diameter taken at a right angle to the lean of the tree.

4. TECHNICAL SPECIFICATIONS

A. Trees will be cut by hand and felled into the stream. In general, fall trees perpendicular to the stream channel; variation up to 45 degrees from perpendicular, in the downstream direction, will be accepted. Fall trees so that at least a portion of it touches the water when down.

B. A 15 foot no cut buffer shall apply measured from the edge of the water on both sides of the creek. No trees located more than 60 feet from the water's edge shall be cut. Therefore, the cutting zone extends from 15-60 feet on both sides of the creek. Incidental limb loss or small trees knocked over by falling of trees will be acceptable and shall not be counted towards the maximum number of trees to fall.

C. The stream reach to be treated (approximately 4,000 feet in length) is divided into three Segments:

I. Northernmost: All trees will be felled from the east side of the creek.
II. Trees shall be felled from both sides of the creek (apprximately equal numbers from each side).
III. All trees will be felled from the west side of the creek.

D. Approximate spacing of felled trees will be two trees per 100 feet of stream. Where possible fall both trees from the same area so they lie adjacent to or on top of each other after cutting.

E. Target tree species to fall are western hemlock, mountain hemlock, and grand fir. Douglas-fir may be cut if none of the other three tree species in the appropriate size range are present in the immediate area. Do not cut western red cedar or nest trees under any circumstance.

F. No snags shall be cut unless required for safety purposes. If a snag is felled it will count towards the 80 total trees regardless of size.

I. Use vegetable based bar oil for chainsaws.

J. Mechanized equipment will not be needed nor allowed.

5. OPERATION SCHEDULE

Complete all work within the Oregon Department of Fish and Wildlife in-water work window of **July 15 – August 15**.

6. CONTRACTOR'S OBLIGATIONS

The Contractor shall furnish materials, labor, supervision, transportation, and all supplies for this project.

7. PROSECUTION AND COMPLETION OF WORK

A. The Contractor shall notify the Forest Service 30 days prior to start of Project.

B. The Contractor shall be required to commence work under this contract after a pre-work meeting agreed upon by the Contractor and Forest Service, and prosecute the work diligently.

C. The Contractor shall complete the project no later than **August 15, 2017** and notify the Forest Service in writing upon completion of work.

PROJECT 003 - Entrance Management

End Results – return compacted soil on road surfaces to hydrologically stable functionality with appropriate hydrologic capacity to reduce soil erosion and displacement.

1. DESCRIPTION OF WORK

A. The Ashes-Caldera Stewardship contract project requires the Contractor to close the entrances, decompact, seed and mulch **660 feet** for six (6) closure locations and stormproof an additional 1.99 miles.

B. Decompaction and Stormproofing as described below involves pre-staging revegetation materials, decompacting, storm-proofing, constructing drainage structures, closing roads by blocking vehicular access, and mitigating erosion control on exposed soils.

PROJECT ROAD DETAILS					
	Termini				
Road Number	Begin MP	End MP	Stormproof Road (miles)	Entry Management Treatment (EACH)	A.4.3 Quantity (EACH)
1610650	0	0.16	0.03	1	1
1612670	0	0.13	0	1	1
1630660	1.36	1.74	0.25	1	1
1631000	0.93	2.03	0.97	1	1
1631620	0	0.4	0.4	0	1
3411012	0.07 from 3511620 RD	0.6	0.34	2	1
Totals:			**1.99**	**6**	**6**

Road locations, beginning and ending mileposts (MP), road closure locations, and waterbar locations will be designated or approved by Forest Service. Contractor decompaction work only applies to the first **660 feet** of Each Entry Management Treatment. Stormproof miles accounts for the remaining distance minus the 660 feet for Each Entry Management Treatment.

2. PROJECT LOCATION

Refer to the Contract Area Map for locations.

3. TECHNICAL SPECIFICATIONS

A. Entry Management Treatments: Roads and road segments proposed for entrance management will have a barrier closure device or feature constructed at the beginning of roads to deter vehicle access. Closure devices generally consist of a combination of material such as slash, rootwads or rocks, and berm/trench structures (estimated to be an average of two (2) structures per road closure location) where topography facilitates closure. Natural material (rocks, logs, etc.) would be incorporated with structures where available (See ATTACHMENT K for typical earthberm and boulder installation). Additionally the first 660 foot portion of a road segment will be made impassable by vehicles using mechanical methods (i.e., the road entrance will be obliterated so vehicles cannot travel beyond it). Road travelway surface shall be decompacted for the full 660 feet designated by the Forest Service and the entire width (shoulder to shoulder) to a minimum depth of 18 inches or until the depth of native soil, whichever is greater. Material generated from decompaction activity shall be turned and placed back into excavated crater. Use of local downed woody debris, stumps and boulders may be scattered about treated area. Minimum of three waterbars shall be installed within the 660 feet of the entry treatment area. A waterbar placement and construction guide is included under ATTACHMENT J.

B. Removal of Cross Drain Pipes: All cross drain pipes/culverts located within the 660 feet of the Entry Management Treatment area shall be removed from road prism and disposed of off National Forest Lands to an approved disposal or recycling facility. After removal of cross drain pipes/culverts contractor shall restore the stream channel and banks to original pre-road (natural) contours as much as possible.

C. Stormproof Road: In addition to the 3 waterbars required under Entry Management Treatment, waterbars may be needed beyond the treatment area. Waterbars shall be installed to disconnect road surface runoff from reaching stream channels. Waterbars shall be free flowing and made to drain to an area whereas not to empty directly into stream or channel thereof. A waterbar placement and construction guide is included under ATTACHMENT J.

D. Removal of Signs, Posts, Guardrail and Other Man-Made Structures: All signs, posts, guardrails and any other man-made structures encountered on roads scheduled for decommissioning shall be removed from road prism and disposed of off National Forest Lands to an approved disposal or recycling facility, unless deemed useable in decommissioning activity by the Forest Service during the prosecution of work.

E. Grubbing of Existing Road Prism: Some grubbing of material on road travelway surface may be necessary to access entire length of road system to be decommissioned. Dispose of slide and waste material at Forest Service approved sites outside riparian protection buffers. Waste material other than hardened surface material (asphalt, concrete, etc.) may be used to restore natural or near-natural contours. Material shall be scattered evenly throughout roadbed. Large woody debris shall be placed parallel to slope to serve as “contour barriers” to prevent surface soil movement. All efforts should be made to minimize disturbance of existing vegetation around project area.

F. Fill Slope Stabilization: At locations designated by the Forest Service during the prosecution of work, where visible signs of fill slope failures are eminent or where fill slopes are deemed “unstable” by the Forest Service, fill slopes shall be pulled back and excavated material generated shall be placed on stable portions of existing road prism in a manner that will not cause a failure to storage location or allow excess sedimentation to enter into stream system. Finished slopes for storage areas will be left at 2H:1V. Site will be approved by Forest Service prior to the storage of material.

G. Hazard/Danger Trees Encountered within Work Zones: All Hazard/Danger Trees located within or adjacent to work zones, that pose a threat to safety shall be felled by contractor upon approval of Forest Service. Trees that need to be felled during project implementation shall be directionally felled, where feasible, away from the road prism and into the surrounding forest. Trees will not be bucked and will be left undisturbed to the extent possible.

H. Erosion Control: Place sediment barriers prior to construction around sites where substantial levels of fine sediment may enter the stream directly or through road ditches. Maintain barriers throughout construction. Minimize disturbance of existing vegetation in ditches and at stream crossings to the greatest extent possible. All exposed native soil as a result of contractors operations shall be seeded and mulched.

I. Seeding and Mulching: Exposed native soil resulting from operations shall be seeded with Forest Service furnished seed at a rate of 25-30 pounds (lbs)/acre (rate dependent on seed mixture). Mulch will be contractor furnished be weed-free winter wheat straw applied at a rate of 3,000 lbs/acre. Other mulch material may be requested for use if approved by the Forest Service.

J. Noxious Weed Control: Use only weed-free gravel, fill, sand, and rock. Inspect active gravel, fill, sand stockpiles, quarry sites, and borrow material for invasive plants before use and transport.

K. Protection of Water Quality: In order to protect water quality it is imperative that the following guidelines be strictly followed while working on this project.

1) Complete all in-water work within the Oregon Department of Fish and Wildlife in-water work window of July 15 – August 15. Operations shall be scheduled and conducted so as to prevent soils from entering any waterway. Live streams shall be diverted from work areas prior to excavation of culverts, or any other stream crossing structure. A stream diversion plan must be submitted to the Forest Service for approval prior to starting of excavation in live streams.
2) Stream turbidity will be monitored by the Forest Service during the prosecution of work. If an increase in turbidity, as a result from contractors operations, exceeds 10 Nephelometric Turbidimeter Units (NTU's) for a period exceeding 30 minutes, the contractor shall cease operations. The contractor will be notified when increases in turbidity are nearing 10 NTU's in order that operations may be modified. The USDA Forest Service will not issue waivers regarding NTU limits.
3) All vehicles and machinery must be free of petroleum leaks. Remove external oil and grease, along with dirt, mud and plant parts prior to entering National Forest system lands. Thereafter, inspect equipment daily for leaks or accumulations of grease, and fix any identified problems before entering streams or areas that drain directly to streams or wetlands. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on the roadway.
4) Absorbent pads shall be required under all stationary equipment, fuel storage containers and during all servicing and refueling operations.
5) All equipment used for refueling shall carry a "hazardous material recovery kit." Any soil, vegetation or debris contaminated with petroleum products or any other man-made substance considered harmful to the environment shall be removed from the site and disposed of in accordance with state laws.
6) All petroleum products being transported and/or stored must be in approved containers meeting OSHA standards.
7) All vehicles hauling more than 300 gallons of fuel must have an approved radio system with which to report accidental spills. If any fuel or fluid storage container exceeds a capacity of 660 gallons, the contractor shall prepare a spill prevention control countermeasures plan. Such plan shall meet all applicable EPA requirements (40 CFR 112) including certification by a registered Professional Engineer (PE).
8) In order to preclude erosion into or contamination of the stream or floodplain, staging areas, (used for equipment, vehicle and hazardous material storage and equipment fueling and servicing locations, etc.), shall be located beyond 150 feet from stream channels, location will be approved by the Forest Service .
9) The contractor shall be liable for cleanup of any hazardous material or fuel spill occurring as a result of his/her work on this contract/task order.
10) The contractor shall, on a daily basis, remove all trash and refuse from the project area.
11) Activities that involve heavy equipment will be suspended if there are more than two (2) inches of rain in a 24 hour period with in the project area, or as determined by the Forest Service.
12) Activities for the season shall be suspended if soil moisture is recharged and stream flows rise above baseflow levels.

4. OPERATION SCHEDULE

A. All project work will be completed after: **January 1, 2017**

B. In-water work will be restricted to between: **July 15 – August 15**

C. Work is to be performed Monday through Friday during daylight hours. Work on Saturday or Sunday will be permitted only with written permission of Forest Service. No work will be permitted on Federal Holidays. Work hours may also be affected by Industrial Fire Precaution Levels (IFPL).

5. CONTRACTOR'S OBLIGATIONS

A. The Contractor shall furnish materials, labor, supervision, transportation, and all supplies not provided by the Government, which are required to complete the project.

B. The Contractor shall provide adequate two-way communication facilities to report an accidental spill. Contact both the Hood River Ranger District **(541)352-6002** to notify the **District Hazmat Coordinator** and the **Contracting Officer** within 20 minutes of detection.

C. The Contractor's use of all Forest Service roads shall be in compliance with the Mt. Hood National Forest Commercial Road Rules dated January, 1992. A copy of these rules are available for review at the Hood River Ranger Station at Parkdale, Oregon or the Forest Headquarters Office in Sandy, Oregon.

6. PROSECUTION AND COMPLETION OF WORK

The Contractor shall be required to commence work under this contract after a pre-work meeting agreed upon by the Contractor and Forest Service, prosecute the work diligently, and complete the entire work not later than **September 30, 2020**. The time stated for completion shall include final cleanup of the premises.

7. INSPECTION

The Forest Service will make periodic inspections to verify that the Contractor is meeting contract specifications. Inspections shall be performed in a manner that will not unduly delay work.

8. MEASUREMENT AND CREDIT

Accepted work will be credited at the contract unit rate for the items shown in A.4.3.

PROJECT 004 - Road Decompaction

End Results – return compacted soil on road surfaces to hydrologically stable functionality with appropriate hydrologic capacity to reduce soil erosion and displacement.

1. DESCRIPTION OF WORK

A. The Ashes-Caldera Stewardship contract project requires services for the Contractor to decompact, revegetate, and close and storm proof one (1) roads totaling 0.5 of a mile.

B. Decompaction and Stormproofing as described below involves pre-staging revegetation materials, decompacting and or storm proofing road and landing surfaces, excavating and disposing of culverts, constructing drainage structures, outsloping, closing roads by blocking vehicular access, and and mitigating erosion control on exposed soils.

PROJECT ROAD DETAILS				
Road Number	**Termini**		**Length (miles)**	**Number of Closure Locations**
	Begin MP	**End MP**		
1640620	1.6	2.1	0.5	1
Totals:			**0.5**	**1**

Road locations, beginning and ending mileposts (MP), road closure locations, and waterbar locations will be designated or approved by Forest Service.

2. PROJECT LOCATION

Refer to the Contract Area Map for locations.

3. TECHNICAL SPECIFICATIONS

A. Road Travelway Decompaction: All aggregate and natural surfaced roads that will require decompaction shall be treated as follows; the entire road length, as designated by the Forest Service during the prosecution of work, shall have 3 feet by 3 feet craters machine excavated every 15 feet in each wheel track. Stagger decompaction craters between left and right wheel tracks so as spacing on centerline will be at every 7.5 feet. Decompaction craters shall be machine excavated to a minimum depth of 18 inches or until the depth of native soil, whichever is greater depth. Material generated from excavation activity shall be turned and placed back into excavated void. For aggregate, paved and Bituminous Surface Treatment (BST) roads where surfacing material exceeds 18 inch depth, surface shall be excavated to mineral soil depth. Roads with Asphalt or BST surfaced travelways shall have surfacing broken into pieces no larger than 3 feet by 3 feet and spread out evenly over the existing road bed, along with satisfying decompaction requirements described for aggregate and natural surfaced roads.

B. Removal of Stream Crossings: All Culvert structures located on roads scheduled for road decompaction shall be removed from road prism and disposed of off National Forest Lands to an approved disposal or recycling facility in accordance with all local, state and federal regulations, unless deemed useable in decommissioning activity by the Forest Service during the prosecution of work. Stream channels shall be excavated to a width of 1.3 times the bank-full channel width, as measured upstream of crossing, but no less than 12 feet wide, as marked by the Forest Service during the prosecution of work. Associated approach fills shall be excavated back to “natural” terrain features, or at no greater than 1.5H:1V from base of 1.3 times the

bank-full channel width (measured at the upstream side of crossing), for recontouring of stream channel, as designated by Forest Service during the prosecution of work. Excavated material generated from stream channel recontouring shall be placed on stable portions of existing road prism in a manner that will not cause a failure to storage location or allow excess sedimentation to enter into stream system. Finished slopes for storage areas will be left at no less than a 2H:1V slope. Site will be approved by Forest Service prior to the storage of material. Segregation of Rip Rap material will be done during excavation for use in stream grade controls needed for stream channel enhancement throughout excavated fill sites. All live stream channels shall be dewatered prior to "in stream" channel work.

C. Removal of Cross Drain Pipes: All cross drain pipes/culverts located on roads scheduled for road decompaction shall be removed from road prism and disposed of off National Forest Lands to an approved disposal or recycling facility. After removal of cross drain pipes/culverts contractor shall restore the stream channel and banks to original pre-road (natural) contours as much as possible.

D. Dewatering of Live Stream Crossings: All live stream crossings shall be dewatered prior to removal of stream crossing structure, or if the possibility exists for excess sediment contamination may affect stream due to decommissioning activity. Dewatering may consist of constructing dams upstream and machine pumping water around the project area. All draft hoses shall require a draft screen with a maximum holes size of 3/32nd's when drafting water from streams within project area(s). Water shall be filtered by use of naturally vegetated land or by use of filter material, (i.e. weed free straw bales or silt fencing), to reduce sedimentation travel back into stream channel. A site specific water quality control plan shall be submitted and approved by Forest Service for each stream diversion/dewatering location, prior to start of excavation.

E. Stream Channel Enhancement: Rip Rap material segregated from fill excavation will be used to enhance stream channel features throughout stream crossing site. Enhancement features, (i.e.; grade controls, rock weirs and pools) shall be constructed within stream channel reclamation area at locations designated by Forest Service (through the Contracting Officer Representative (C.O.R)) during the prosecution of work. Consider a minimum of three grade controls/weirs (upstream "U"s, ATTACHMENT L) to be constructed at each stream crossing, (one-upstream at beginning of fill, second- at midpoint through fill, and the third at the end of fill).

F. Fill Slope Stabilization: At locations designated by the Forest Service during the prosecution of work, where visible signs of fill slope failures are eminent or where fill slopes are deemed "unstable" by the Forest Service fill slopes shall be pulled back and excavated material generated shall be placed on stable portions of existing road prism in a manner that will not cause a failure to storage location or allow excess sedimentation to enter into stream system. Finished slopes for storage areas will be left at 2H:1V. Site will be approved by Forest Service prior to the storage of material.

G. Removal of Signs, Posts, Guardrail and Other Man-Made Structures: All signs, posts, guardrails and any other man-made structures encountered on roads scheduled for road decompaction shall be removed from road prism and disposed of off National Forest Lands to an approved disposal or recycling facility, unless deemed useable in decommissioning activity by the Forest Service during the prosecution of work.

H. Grubbing of Existing Road Prism: Some grubbing of material on road travelway surface may be necessary to access entire length of road system to be decommissioned. Dispose of slide and waste material at Forest Service approved sites outside riparian protection buffers. Waste material other than hardened surface material (asphalt, concrete, etc.) may be used to restore natural or near-natural contours. Material shall be scattered evenly throughout roadbed. Large woody debris shall be placed parallel to slope to serve as "contour barriers" to prevent

surface soil movement. All efforts should be made to minimize disturbance of existing vegetation around project area.

I. Erosion Control: Place sediment barriers prior to construction around sites where substantial levels of fine sediment may enter the stream directly or through road ditches. Maintain barriers throughout construction. Minimize disturbance of existing vegetation in ditches and at stream crossings to the greatest extent possible. All exposed native soil as a result of contractors operations shall be seeded and mulched.

J. Seeding and Mulching: Exposed native soil resulting from operations shall be seeded with Forest Service furnished seed at a rate of 25-30 pounds (lbs)/acre (rate dependent on seed mixture). Mulch will be contractor furnished be weed-free winter wheat straw applied at a rate of 3,000 lbs/acre. Other mulch material may be requested for use if approved by the Forest Service.

K. Installation of Waterbars: Waterbars shall be installed to disconnect road surface runoff from reaching stream channels. Waterbars shall be free flowing and made to drain to an area whereas not to empty directly into stream or channel thereof. A waterbar placement and construction guide is included under ATTACHMENT J.

L. Hazard/Danger Trees Encountered within Work Zones: All Hazard/Danger Trees located within or adjacent to work zones, that pose a threat to safety shall be felled by contractor upon approval of Forest Service. Trees that need to be felled during project implementation shall be directionally felled, where feasible, away from the road prism and into the surrounding forest. Trees will not be bucked and will be left undisturbed to the extent possible.

M. *Noxious Weed Control: Use only weed-free gravel, fill, sand, and rock. Inspect active gravel*, fill, sand stockpiles, quarry sites, and borrow material for invasive plants before use and transport.

N. Protection of Water Quality: In order to protect water quality it is imperative that the following guidelines be strictly followed while working on this project.

1) Complete all in-water work within the Oregon Department of Fish and Wildlife in-water work window of July 15 – August 15. Operations shall be scheduled and conducted so as to prevent soils from entering any waterway. Live streams shall be diverted from work areas prior to excavation of culverts, or any other stream crossing structure. A stream diversion plan must be submitted to the Forest Service for approval prior to starting of excavation in live streams.
2) Stream turbidity will be monitored by the Forest Service during the prosecution of work. If an increase in turbidity, as a result from contractors operations, exceeds 10 Nephelometric Turbidimeter Units (NTU's) for a period exceeding 30 minutes, the contractor shall cease operations. The contractor will be notified when increases in turbidity are nearing 10 NTU's in order that operations may be modified. The USDA Forest Service will not issue waivers regarding NTU limits.
3) All vehicles and machinery must be free of petroleum leaks. Remove external oil and grease, along with dirt, mud and plant parts prior to entering National Forest system lands. Thereafter, inspect equipment daily for leaks or accumulations of grease, and fix any identified problems before entering streams or areas that drain directly to streams or wetlands. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on the roadway.
4) Absorbent pads shall be required under all stationary equipment, fuel storage containers and during all servicing and refueling operations.

5) All equipment used for refueling shall carry a "hazardous material recovery kit." Any soil, vegetation or debris contaminated with petroleum products or any other man-made substance considered harmful to the environment shall be removed from the site and disposed of in accordance with state laws.
6) All petroleum products being transported and/or stored must be in approved containers meeting OSHA standards.
7) All vehicles hauling more than 300 gallons of fuel must have an approved radio system with which to report accidental spills. If any fuel or fluid storage container exceeds a capacity of 660 gallons, the contractor shall prepare a spill prevention control countermeasures plan. Such plan shall meet all applicable EPA requirements (40 CFR 112) including certification by a registered Professional Engineer (PE).
8) In order to preclude erosion into or contamination of the stream or floodplain, staging areas, (used for equipment, vehicle and hazardous material storage and equipment fueling and servicing locations, etc.), shall be located beyond 150 feet from stream channels, location will be approved by the Forest Service .
9) The contractor shall be liable for cleanup of any hazardous material or fuel spill occurring as a result of his/her work on this contract/task order.
10) The contractor shall, on a daily basis, remove all trash and refuse from the project area.
11) Road decommissioning activities will be suspended if there are more than two (2) inches of rain in a 24 hour period with in the project area, or as determined by the Forest Service.
12) Activities for the season shall be suspended if soil moisture is recharged and stream flows rise above baseflow levels.

4. OPERATION SCHEDULE

A. All project work will be completed after: **January 1, 2017**

B. In-water work will be restricted to between: **July 15 – August 15**

C. Work is to be performed Monday through Friday during daylight hours. Work on Saturday or Sunday will be permitted only with written permission of Forest Service. No work will be permitted on Federal Holidays. Work hours may also be affected by Industrial Fire Precaution Levels (IFPL).

5. CONTRACTOR'S OBLIGATIONS

A. The Contractor shall furnish materials, labor, supervision, transportation, and all supplies not provided by the Government, which are required to complete the project.

B. The Contractor shall provide adequate two-way communication facilities to report an accidental spill. Contact both the Hood River Ranger District **(541)352-6002** to notify the **District Hazmat Coordinator** and the **Contracting Officer** within 20 minutes of detection.

C. The Contractor's use of all Forest Service roads shall be in compliance with the Mt. Hood National Forest Commercial Road Rules dated January, 1992. A copy of these rules are available for review at the Hood River Ranger Station at Parkdale, Oregon or the Forest Headquarters Office in Sandy, Oregon.

6. PROSECUTION AND COMPLETION OF WORK

The Contractor shall be required to commence work under this contract after a pre-work meeting agreed upon by the Contractor and Forest Service, prosecute the work diligently, and complete the entire work not later than **September 30, 2020**. The time stated for completion shall include final cleanup of the premises.

7. INSPECTION

The Forest Service will make periodic inspections to verify that the Contractor is meeting contract specifications. Inspections shall be performed in a manner that will not unduly delay work.

8. MEASUREMENT AND CREDIT

Accepted work will be credited at the contract unit rate for the items shown in A.4.3.

PROJECT 005 – Gate Intallation

End Results – Restrict traffic and reduce soil erosion.

DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

1. PROJECT DESCRIPTION

The Ashes-Caldera Stewardship contract project requires the Contractor to furnish and install four (4) road closure barrier steel square tube gate, 17 feet 5 inches wide and remove any existing gates.

GATE		
Location*		
Road Number	Mile Point	Furnish and Install
1640660	0.02	1
1631	0.01	1
1631630	0.01	1
3511620	0.01	1
	Each:	4

*Install Gate as staked on the ground by the Forest Service.

2. PROJECT LOCATION

Refer to the Contract Area Map for reference locations.

3. TECHNICAL SPECIFICATIONS

A. Design:

1) For Plans and Design refer to specified reconstruction Attachment D\Reconstruction Plans\sheets 19-22.
2) Requires 9 cubic yards of concrete, Method ‘A’ or ‘C’ for each gate: Minimum 3000 psi concrete, commercial source material; method ‘A’ or ‘C’ per subsection 601.03 (Attachment D/Supplemental Specifications/pages 72-73) is contractor’s option. If contractor opts for method ‘A’ testing of materials per table 601-2 (Attachment D/Supplemental Specifications/page 76) is required.
3) Waste: Disposal of unsuitable or excess waste material at designated site shown on Contract Area Map.

B. Removal of Old Gates: All material from old gates will disposed of off National Forest Lands to an approved disposal or recycling facility, unless deemed useable in decommissioning activity by the Forest Service during the prosecution of work.

C. Hazard/Danger Trees Encountered within Work Zones: All Hazard/Danger Trees located within or adjacent to work zones that pose a threat to safety shall be felled by contractor upon approval of Forest Service. Trees that need to be felled during project implementation shall be directionally felled, where feasible, away from the road prism and into the surrounding forest. Trees will not be bucked and will be left undisturbed to the extent possible.

D. Erosion Control: Place sediment barriers prior to construction around sites where substantial levels of fine sediment may enter the stream directly or through road ditches. Maintain barriers throughout construction. Minimize disturbance of existing vegetation in ditches and at stream crossings to the greatest extent possible. All exposed native soil as a result of contractors operations shall be seeded and mulched.

E. Seeding and Mulching: Exposed native soil resulting from operations shall be seeded with Forest Service furnished seed at a rate of 25-30 pounds (lbs)/acre (rate dependent on seed mixture).

Mulch will be contractor furnished be weed-free winter wheat straw applied at a rate of 3,000 lbs/acre. Other mulch material may be requested for use if approved by the Forest Service.

F. Noxious Weed Control: Use only weed-free gravel, fill, sand, and rock. Inspect active gravel, fill, sand stockpiles, quarry sites, and borrow material for invasive plants before use and transport.

G. Protection of Water Quality: In order to protect water quality it is imperative that the following guidelines be strictly followed while working on this project.

1) All vehicles and machinery must be free of petroleum leaks. Remove external oil and grease, along with dirt, mud and plant parts prior to entering National Forest system lands. Thereafter, inspect equipment daily for leaks or accumulations of grease, and fix any identified problems before entering streams or areas that drain directly to streams or wetlands. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on the roadway.
2) Absorbent pads shall be required under all stationary equipment, fuel storage containers and during all servicing and refueling operations.
3) All equipment used for refueling shall carry a “hazardous material recovery kit.” Any soil, vegetation or debris contaminated with petroleum products or any other man-made substance considered harmful to the environment shall be removed from the site and disposed of in accordance with state laws.
4) All petroleum products being transported and/or stored must be in approved containers meeting OSHA standards.
5) All vehicles hauling more than 300 gallons of fuel must have an approved radio system with which to report accidental spills. If any fuel or fluid storage container exceeds a capacity of 660 gallons, the contractor shall prepare a spill prevention control countermeasures plan. Such plan shall meet all applicable EPA requirements (40 CFR 112) including certification by a registered Professional Engineer (PE).
6) In order to preclude erosion into or contamination of the stream or floodplain, staging areas, (used for equipment, vehicle and hazardous material storage and equipment fueling and servicing locations, etc.), shall be located beyond 150 feet from stream channels, location will be approved by the Forest Service .
7) The contractor shall be liable for cleanup of any hazardous material or fuel spill occurring as a result of his/her work on this contract/task order.
8) The contractor shall, on a daily basis, remove all trash and refuse from the project area.

4. CONTRACTOR’S OBLIGATIONS

A. For all activities, Contractor is to include all gate construction materials, fabrication of road closure barrier steel square tube gates, 17 feet 5 inches wide, and provide labor for removal, excavation, and installation of gates.

B. The Contractor shall provide adequate two-way communication facilities to report an accidental spill. Contact both the Hood River Ranger District **(541)352-6002** to notify the **District Hazmat Coordinator** and the **Contracting Officer** within 20 minutes of detection.

C. The Contractor’s use of all Forest Service roads shall be in compliance with the Mt. Hood National Forest Commercial Road Rules dated January, 1992. A copy of these rules are available for review at the Hood River Ranger Station at Parkdale, Oregon or the Forest Headquarters Office in Sandy, Oregon.

5. PROSECUTION AND COMPLETION OF WORK

A. The Contractor shall be required to (a) commence work under this contract after a pre-work meeting agreed upon by the Contractor and Forest Service, b) prosecute the work diligently, and (c) complete the entire work not later than **September 30, 2020**. The time stated for completion shall include final cleanup of the premises.

B. Work is to be performed Monday through Friday during daylight hours. Work on Saturday or Sunday will be permitted only with written permission of Forest Service. No work will be permitted on Federal Holidays. Work hours may also be affected by Industrial Fire Precaution Levels (IFPL).

C. The number of days (contract time) is considered sufficient to complete the project. In the event that the Contractor fails to complete the project within the contract time, the Forest Service may allow the work to continue. However, the Contractor may be liable for any additional costs incurred by the Forest Service due to the delay.

6. INSPECTION

The Forest Service will make periodic inspections to verify that the Contractor is meeting contract specifications. Inspections shall be performed in a manner that will not unduly delay work.

7. MEASUREMENT and PAYMENT

Accepted work will be credited at the contract unit rate for the items shown in AT.4.3.

WATERBAR PLACEMENT AND CONSTRUCTION GUIDE

Introduction

The following water bar spacing information is provided to assist field persons in placing waterbars at their most effective locations.

This guide stresses the importance of waterbar location as a function of water collection and discharge. It includes a waterbar spacing table to facilitate placement of waterbars according to road and soil conditions.

Waterbar Location Process

The first step is to plan for waterbars at critical locations using guidelines for water collection and discharge. Then select additional locations to meet spacing requirements shown in Table 1. See attached drawing for typical waterbar locations.

Water Collection Guidelines

Place water bars at natural small drainages that may not have justified a ditch relief culvert at the time of design. Try to keep as much of the water in its natural route as possible even if it requires an extra waterbar.

Place waterbars to back-up culverts that provide ditch relief or natural channel flow.

Place waterbars to prevent road surface and cutbank sedimentation from entering directly into natural drainage channels.

Place waterbars to dissipate water prior to steep grades.

If road grade varies, place water bars on the flatter slopes (grade breaks). This makes driving through them easier, and the water bars will last longer.

Place waterbars at road seeps, springs and wet subgrades to collect this water and quickly discharge it off the road. These areas may be notorious for potholes or rutting.

Place waterbars to effectively reduce ditch erosion. Reduce the upper reach of the ditch by a length greater than the area showing ditch erosion. For example: if the lower 90 feet of ditch shows signs of erosion, eliminate at least the first 90 feet of ditch by using a waterbar.

Water Discharge Guidelines - consider these items for all waterbars.

Discharge onto undisturbed areas, preferable rocky ground or areas protected with vegetative cover.

Avoid discharging directly over fills. Seek natural ground areas first and then areas along edges of fills.

On steep slopes discharge on convex slopes rather than draws.

Avoid crossing road or shoulder cracks especially where steep slopes or side cast construction is evident.

If a vegetated or rocky location is not found, reduce waterbar spacing to match native soil conditions found in Table 1.

Waterbar Spacing Guidelines

Waterbar location may be determined by measuring or estimating the distances and grades in Table 1. Care should be taken not to exceed 150% of distances shown. During storms in 1996 several waterbars exceeding 150% of recommended spacing received so much water that the waterbars themselves had excessive erosion.

If fine and light soils (silt & silty sands) are encountered, reduce spacing by 20%. If silty clay or sandy clay soils are encountered, spacing may be increased up to 50%.

Table 1 Typical Water Bar Spacing

Road grade	Aggregate surfaced with vegetated/rocky discharge point		Native surface or barren soil discharge points	
	Feet	Meters	Feet	Meters
1-3	600	200	100	35
4-6	300	100	80	25
7-9	200	70	70	23
10-12	150	50	60	20
13-18	120	40	50	15
19+	80	25	30*	*

*Consider using surface protection measures such as aggregate.

Spacing table based on information from the following sources:

A. Guides for Controlling Sediment from Secondary Logging Roads, FS Northern Region Missoula, Montana, and Intermountain Forest and Range Experiment Station, Ogden, Utah.

B. Maximum spacing allowable to handle the rainfall intensity of a 25 year storm. An Introduction to Forest Soils of the Douglas Fir Region of the Pacific Northwest, Arnold J., 1957.

C. Observation of water bar performance on Siuslaw forest roads by Robert Avila and Charlie Warren, post 1996-1997 storm events.

WATERBAR CONSTRUCTION GUIDELINES

Type II Waterbars: The waterbar construction described below is intended for high-clearance vehicles. Roads would be in maintenance level I or II.

- AGGREGATE ROADS
  Waterbars that cut through the aggregate base of a road and reach erosive soils need to have aggregate surfacing bladed back into the waterbar channel.

- COMPACTION OF BERM
  Compaction of the excavated material used to make the berm on the downhill side of the waterbar is recommended. Wheel-rolling or walking the excavation equipment over the downhill berm is adequate.

- ROADSIDE DITCHES
  Intercept ditch water by including a ditch block during construction of all waterbars. It is acceptable to have ponding of water in the ditchline where roadside ditches are deeper than the waterbar.

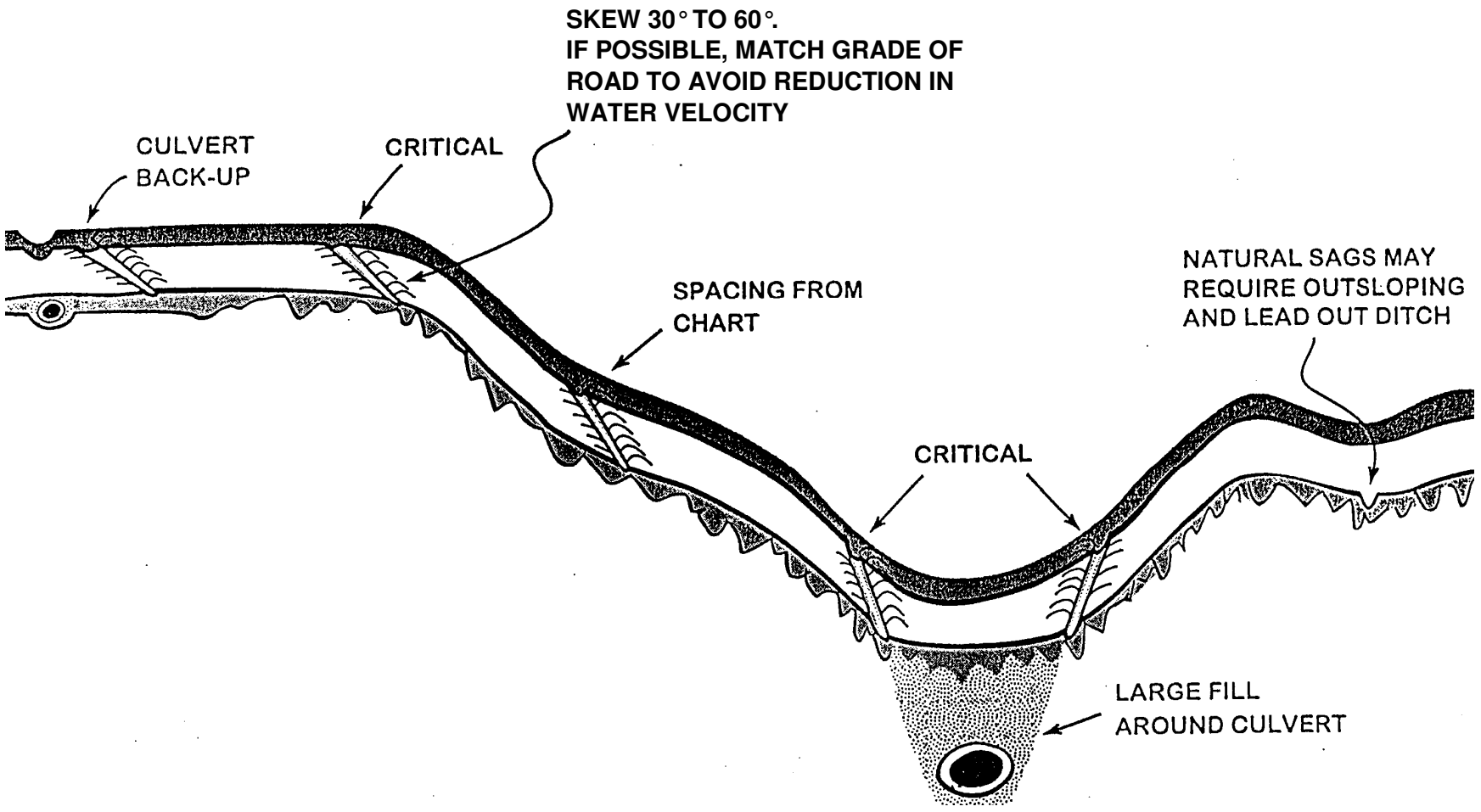
- SKEW
  Construct with a 30 to 60 degree angle from road centerline. This facilitates easier travel by vehicles and an increased water run off slope.

- DEPTH and WIDTH
  Construction dimensions for a waterbar are shown on the attached typicals. For road grades over 10% the cut depth and berm height should approach maximum values.

Type I Waterbars: Intended for use on roadbeds that will not have traffic. Use on closure of temporary roads, roads to be obliterated, or long term closure of roads in maintenance level I. These waterbars are designed to remain effective until the road prism stabilizes with vegetation.

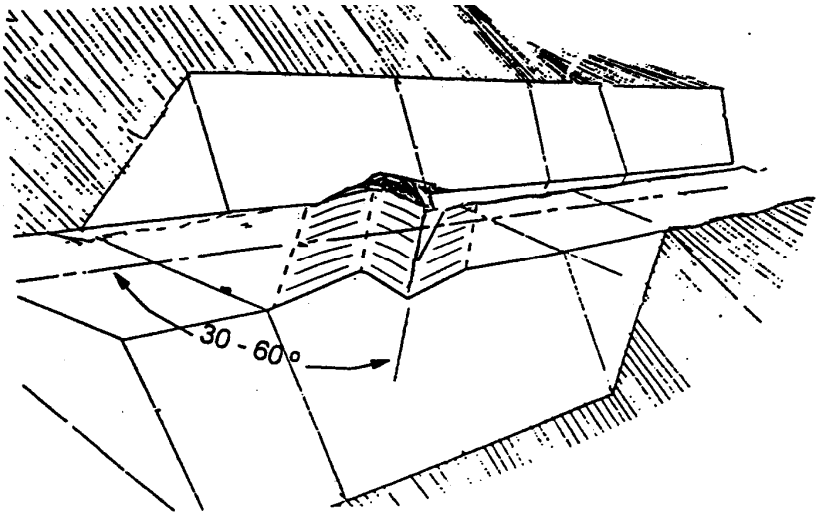
- ROADSIDE DITCHES
  Intercept ditch water by including a ditch block during construction of waterbars.

- SKEW
  Construct with a 30 to 60 degree angle from road centerline.

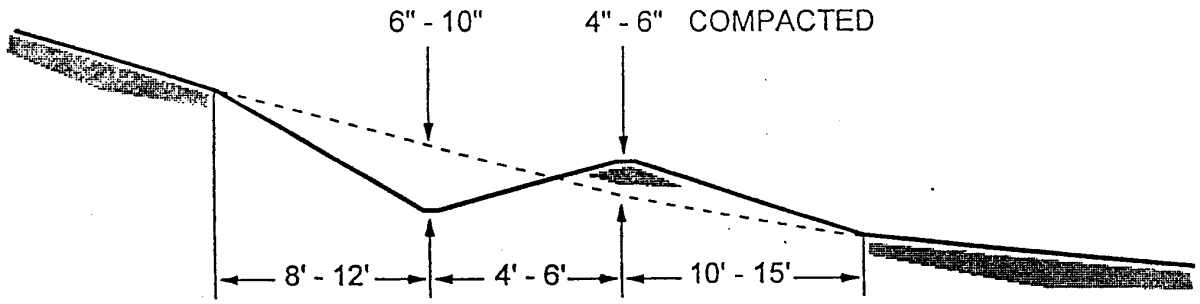


TYPICAL WATERBAR LOCATIONS

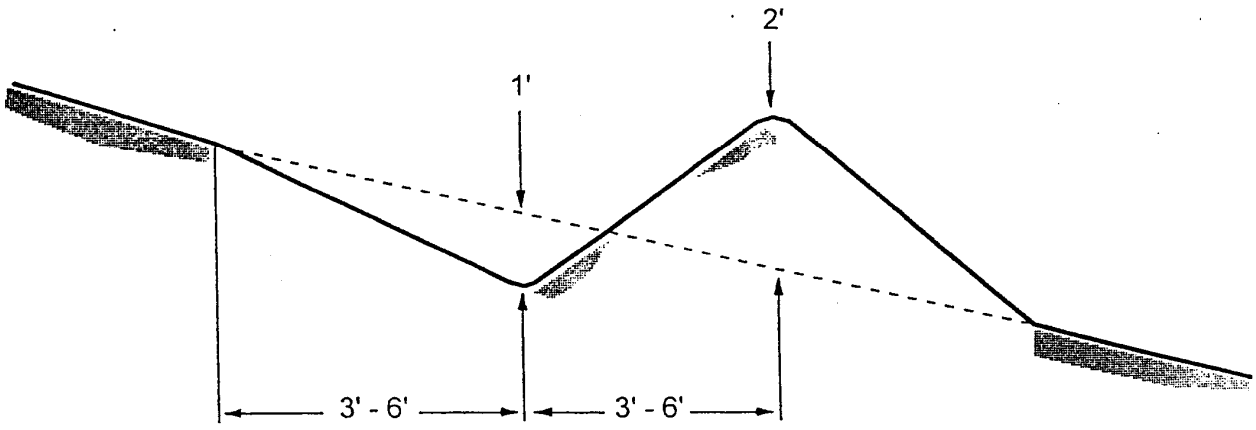
WATERBAR CONSTRUCTION DETAILS



PERSPECTIVE VIEW

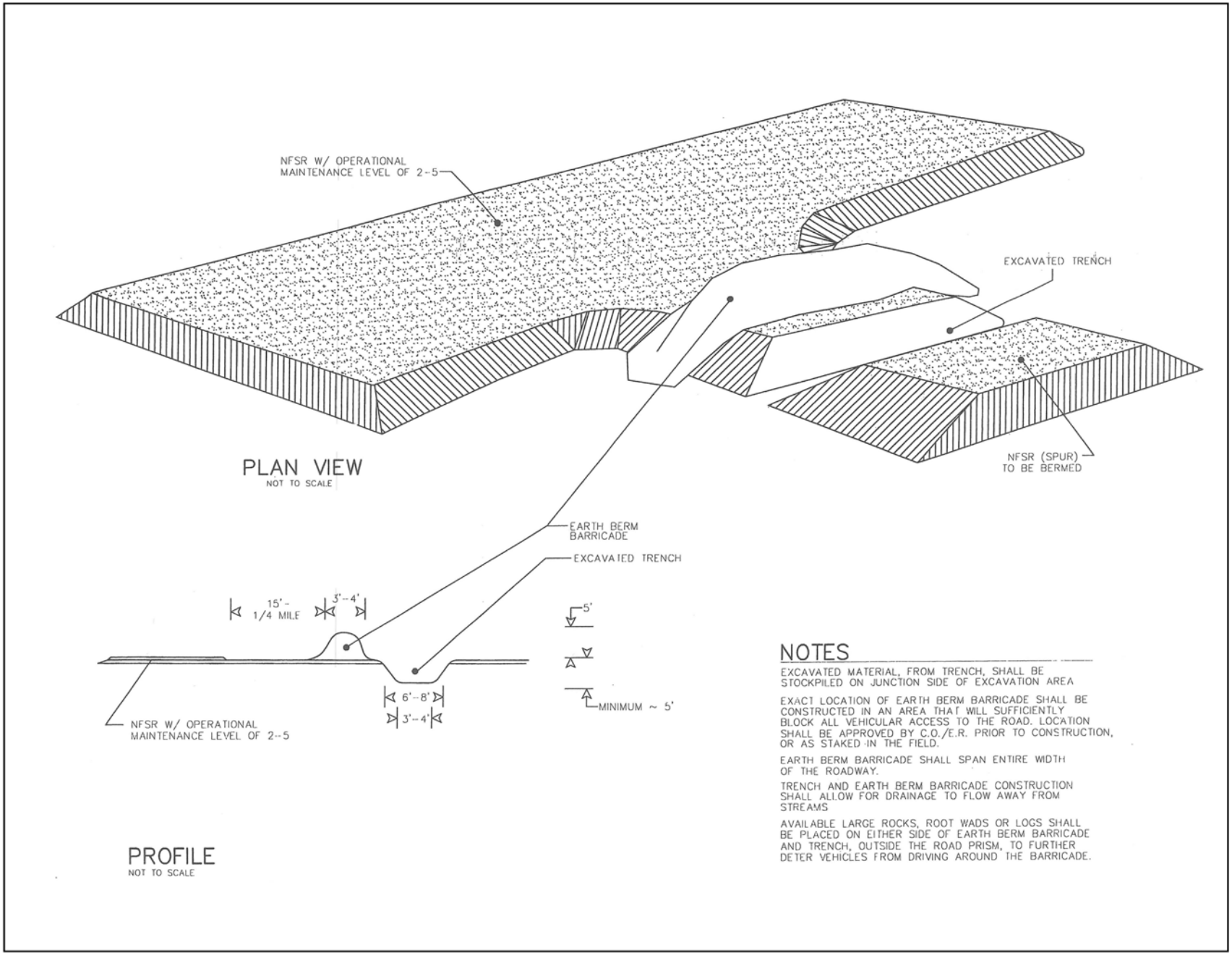


PROFILE -- TYPE II



PROFILE – TYPE I

NOTE: Block ditchline with excavated material to prevent ditch water from bypassing waterbar.



NOTES

EXCAVATED MATERIAL, FROM TRENCH, SHALL BE STOCKPILED ON JUNCTION SIDE OF EXCAVATION AREA

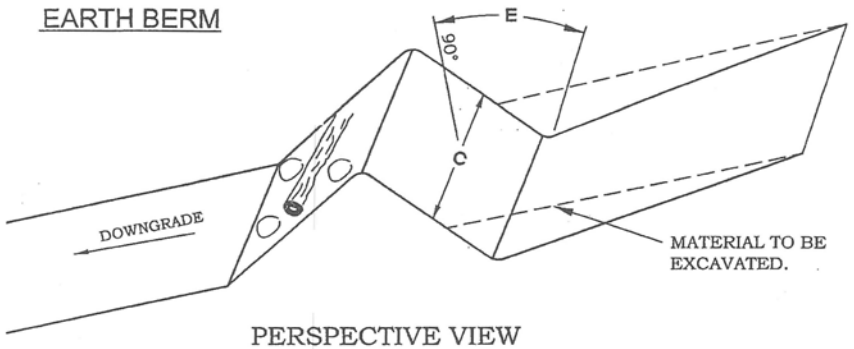
EXACT LOCATION OF EARTH BERM BARRICADE SHALL BE CONSTRUCTED IN AN AREA THAT WILL SUFFICIENTLY BLOCK ALL VEHICULAR ACCESS TO THE ROAD. LOCATION SHALL BE APPROVED BY C.O./E.R. PRIOR TO CONSTRUCTION, OR AS STAKED IN THE FIELD.

EARTH BERM BARRICADE SHALL SPAN ENTIRE WIDTH OF THE ROADWAY.

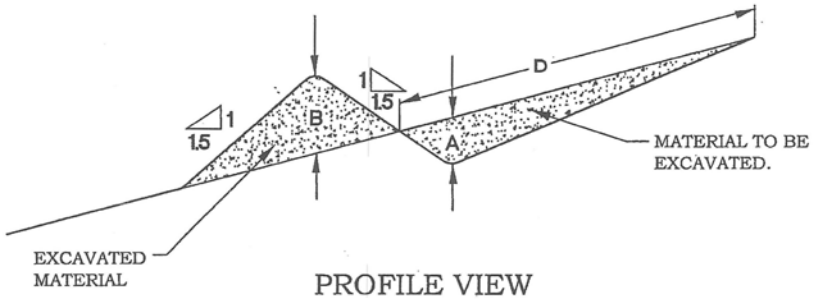
TRENCH AND EARTH BERM BARRICADE CONSTRUCTION SHALL ALLOW FOR DRAINAGE TO FLOW AWAY FROM STREAMS

AVAILABLE LARGE ROCKS, ROOT WADS OR LOGS SHALL BE PLACED ON EITHER SIDE OF EARTH BERM BARRICADE AND TRENCH, OUTSIDE THE ROAD PRISM, TO FURTHER DETER VEHICLES FROM DRIVING AROUND THE BARRICADE.

EARTH BERM

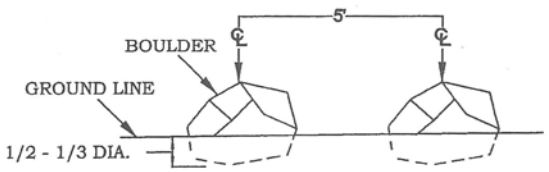


PERSPECTIVE VIEW



PROFILE VIEW

BOULDER INSTALLATION



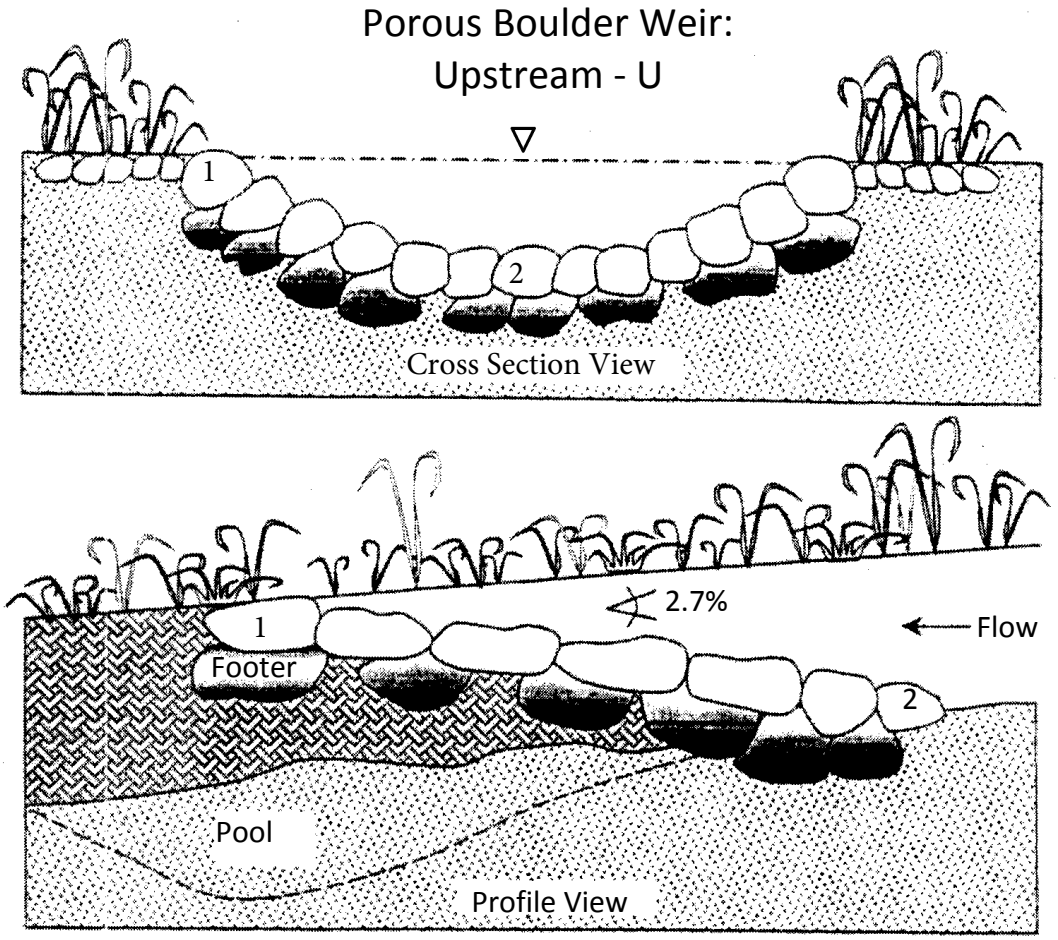
ROAD NUMBER	LOCATION	A	B	C	D	E
Per Task Order	As Staked	3'	5'	Full Width	24'	90°

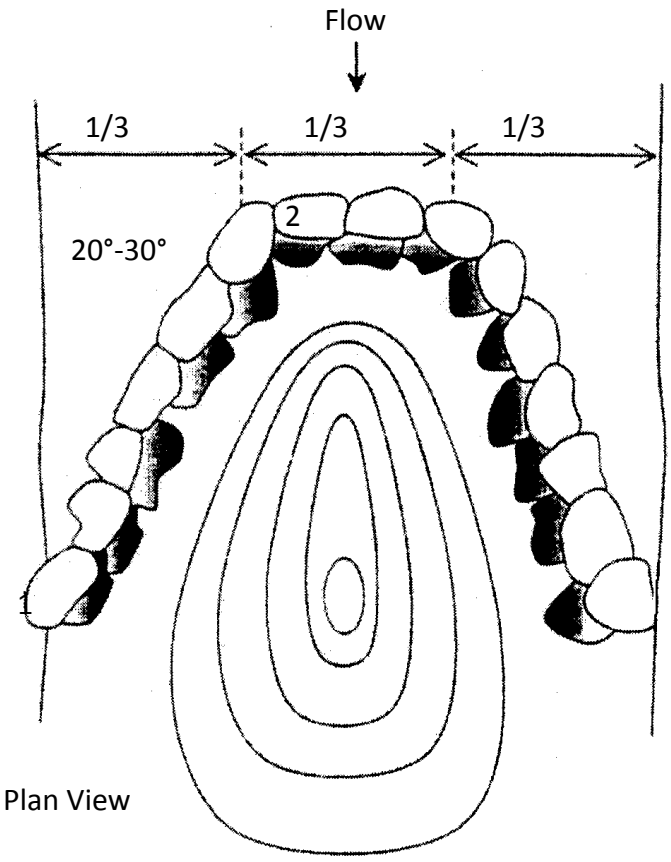
A = DEPTH OF EXCAVATION AT TOE
B = HEIGHT OF BERM
C = WIDTH OF BERM
D = EXCAVATED LENGTH
E = SKEW OF BERM

NOTE: PLACE LOGS, ROCKS OR OTHER MATERIAL ON BERM TO DISCOURAGE VEHICULAR NEGOTIATION.

NOT TO SCALE

Diagram 1 – Earthberm, Boulder Installation





Porous Boulder Weir: Space between boulders in weir is ¼ of the boulder diameter (e.g. - 24 inch dia. boulder will have 6 inch space on either side). The center boulder in weir is imbedded to water level with surrounding boulders 1-4 inches above the center boulder height or 1 – 4 inches above the water surface.

Cross Section, Profile and Plan View of Upstream U

Porous Upstream U Weirs

Photo of a series of installed Porous Upstream- U Weirs after removal of road culvert. Weirs help stabilize newly constructed stream channel at former road crossing.