

# PRESOLICITATION

## **VETA THIN STEWARDSHIP SALE**

7700000 Road Reconstruction

Cowlitz Valley Ranger District  
Gifford Pinchot National Forest

Schedule of Items: 2 Pages

Forest Service Supplemental Specifications: 48 Pages

Project Drawings: 9 Pages

# SCHEDULE OF ITEMS

**VETA THIN STEWARDSHIP SALE  
Gifford Pinchot National Forest  
Cowlitz Valley Ranger District  
Lewis County, Washington**

<b>Sub-Item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Cost</b>
<b>77 RD MP 15.23</b>					
15101	Mobilization	1	LS	_____	_____
15201	Construction Survey and Staking	1	LS	_____	_____
20101	Clearing and Grubbing, 0-5 Mile Haul	0.4	AC	_____	_____
20401	Excavation and Haul, To Roadway Subgrade, 0-5 Mile Haul	217	CY	_____	_____
20402	Excavation and Haul, Ditchline, 0-5 Mile Haul	488	LF	_____	_____
25101	Placed Riprap, Ditchline, Class 2	7	CY	_____	_____
32401	Minor Aggregate Course, Commercial Source Base Material, Compaction Method A	331	CY	_____	_____
32402	Minor Aggregate Course, Commercial Source Surface Material, Compaction Method A	166	CY	_____	_____
60201	Furnish and Install 18" Pipe, (0.064" Thick, Galvanized Steel Pipe)	50	LF	_____	_____
62501	Turf Establishment	0.2	AC	_____	_____
<b>Subtotal =</b>					_____
<b>Total =</b>					_____

# SCHEDULE OF ITEMS

**VETA THIN TIMBER SALE  
Gifford Pinchot National Forest  
Cowlitz Valley Ranger District  
Lewis County, Washington**

Sub-Item	Description	Awarded Quantity	Unit	Unit Cost	Cost
<b>77 RD MP 15.76</b>					
15102	Mobilization	1	LS	_____	_____
15202	Construction Survey and Staking	1	LS	_____	_____
20102	Clearing and Grubbing, 0-5 Mile Haul	0.3	AC	_____	_____
20403	Excavation and Haul, To Roadway Subgrade, 0-5 Mile Haul	5	CY	_____	_____
20404	Excavation and Haul, Ditchline, 0-5 Mile Haul	223	LF	_____	_____
25102	Placed Riprap, Ditchline, Commercial Source Class 2	14	CY	_____	_____
32403	Minor Aggregate Course, Commercial Source Base Material, Compaction Method A	2268	CY	_____	_____
32404	Minor Aggregate Course, Commercial Source Surface Material, Compaction Method A	88	CY	_____	_____
60202	Furnish and Install 36" Pipe, (0.064" Thick, Galvanized Steel Pipe)	80	LF	_____	_____
62502	Turf Establishment	0.2	AC	_____	_____
25103	Placed Riprap, Embankment Armor, Commercial Source Class 4	217	CY	_____	_____
20405	Excavation and Haul, Drainage Way, 0-5 Mile Haul	195	CY	_____	_____
20301	Remove Existing 24" CMP	1	LS	_____	_____
<b>Subtotal 2 =</b>					_____
<b>Total =</b>					_____

**Note:**

All quantities are in place contract quantities.

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## Preface

Preface\_wo\_03\_15\_2004\_m

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-03 for construction of National Forest System Roads.

# 101 - Terms, Format, and Definitions

101.00\_nat\_us\_07\_25\_2005

101.01\_nat\_us\_01\_22\_2009

## 101.01 Meaning of Terms

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

101.03\_nat\_us\_06\_16\_2006

## 101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	<a href="#">National Institute of Standards and Technology</a>
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

.

Add the following to (b) SI symbols:

mp	Milepost
ppm	Part Per Million

101.04\_nat\_us\_03\_29\_2007

## 101.04 Definitions.

Delete the following definitions and substitute the following:

**Bid Schedule**--The Schedule of Items.

**Bridge**--No definition.

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

**Culvert**--No definition.

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

Add the following:

**Adjustment in Contract Price**--“Equitable adjustment,” as used in the Federal Acquisition Regulations, or “construction cost adjustment,” as used in the Timber Sale Contract, as applicable.

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

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

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

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

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

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

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

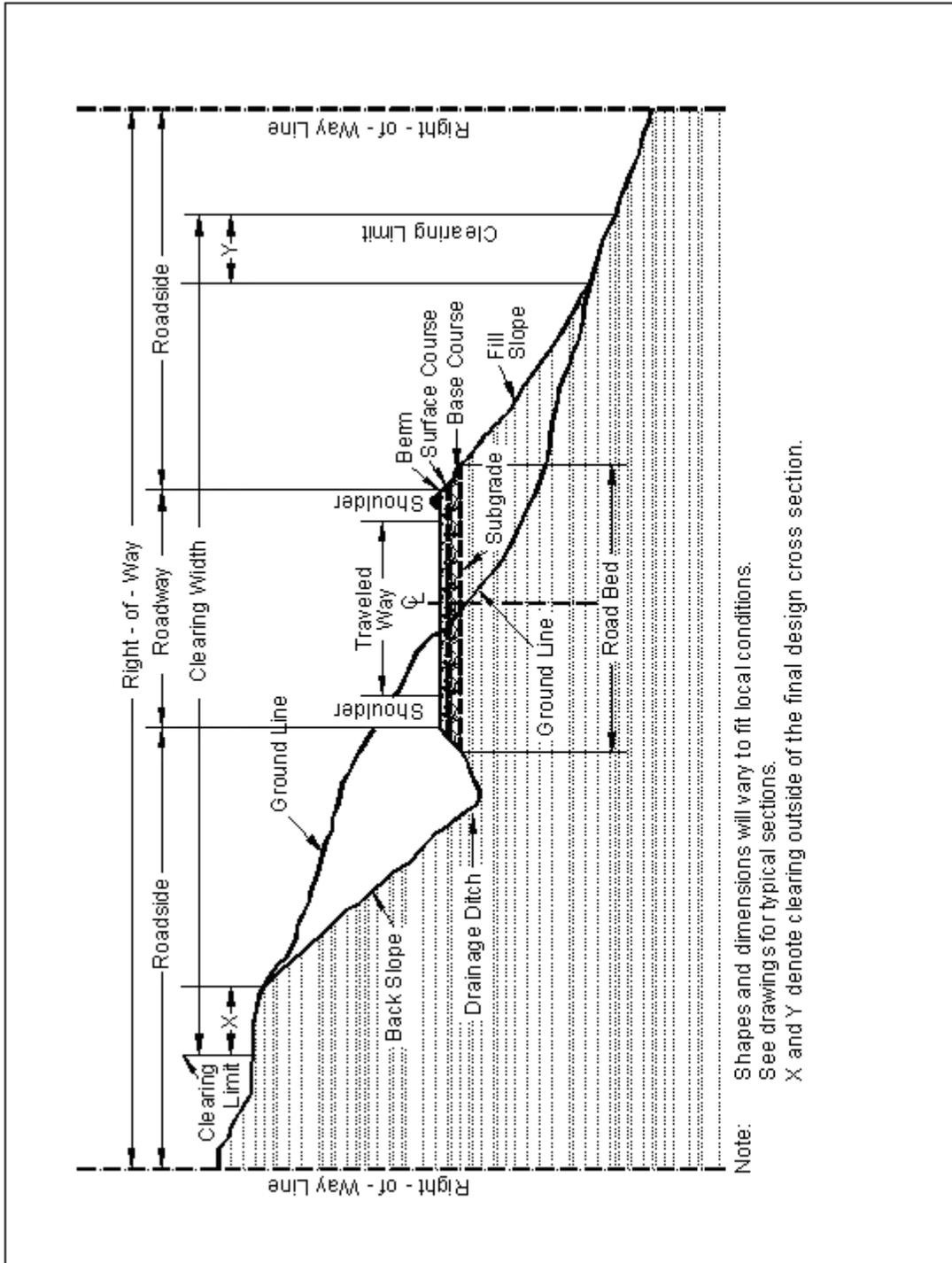
**Road Order**--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

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

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

Add Figure 101-1—Illustration of road structure terms:

Figure 101-1—Illustration of road structure terms.



## **102 - Bid, Award, and Execution of Contract**

102.00\_nat\_us\_02\_16\_2005

### **102 Bid, Award, and Execution of Contract**

Delete Section 102 in its entirety.

## 103 - Scope of Work

103.00\_nat\_us\_02\_16\_2005

### Deletions

Delete all but subsection 103.01 Intent of Contract.

## 104 - Control of Work

104.00\_nat\_us\_06\_16\_2006

### Deletions

Delete Sections 104.01, 104.02, and 104.04.

104.06\_nat\_us\_02\_17\_2005

Add the following subsection:

### **104.06 Use of Roads by Contractor**

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

## 105 - Control of Material

105.02\_nat\_us\_01\_18\_2007

### 105.02 Material Sources.

#### 105.02(a) Government-provided sources.

Add the following:

Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

105.05\_nat\_us\_05\_12\_2004

#### 105.05 Use of Material Found in the Work.

Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:

Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

## 106 - Acceptance of Work

106.07\_nat\_us\_05\_11\_2004

### 106.07 Delete

Delete subsection 106.07.

## 107 - Legal Relations and Responsibility to the Public

107.05\_nat\_us\_05\_11\_2004

### 107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06\_nat\_us\_06\_16\_2006

### 107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

“except as provided in Subsection 106.07”.

107.09\_nat\_us\_06\_16\_2006

### 107.09 Legal Relationship of the Parties.

Delete the entire subsection.

107.10\_nat\_us\_06\_16\_2006

### 107.10 Environmental Protection.

Add the following:

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

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

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

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

## 108 - Prosecution and Progress

108.00\_nat\_us\_02\_16\_2005

### 108 Delete.

Delete Section 108 in its entirety.

## 109 - Measurement and Payment

109.00\_nat\_us\_02\_17\_2005

### 109 Deletions

Delete the following entire subsections:

**109.06 Pricing of Adjustments.**

**109.07 Eliminated Work.**

**109.08 Progress Payments.**

**109.09 Final Payment.**

109.02\_nat\_us\_06\_16\_2006

### 109.02 Measurement Terms and Definitions.

**(b) Contract quantity.**

Add the following:

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:

“(b) Cubic yard” to “(c) Cubic yard”.

Add the following definition:

**(p) Thousand Board Feet (Mbf).** 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

# 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 than 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.**

<b>Precision Class</b>	<b>Minimum Position Closure</b>	<b>Angular Accuracy (<math>\pm</math>)</b>	<b>L-Line Tangent Control Points<sup>a</sup> (<math>\pm</math>)</b>	<b>Vertical Closure<sup>b</sup> (<math>\pm</math>)</b>
A (Bridges)	1/10,000	2 sets, direct/reverse 10 second rejection limit	N/A	0.02 ft or 0.02ft/1000ft <sup>c</sup>
B	1/5,000	2 sets, direct/reverse 20 second rejection limit	0.1 ft	0.02 ft or 0.02ft/1000ft <sup>c</sup>
C	1/1,000	1 set, direct/reverse 1 minute rejection limit	0.2 ft	0.5ft/1000ft <sup>c</sup>
D	1/300	Foresight and backsight; 15 minute rejection limit <sup>c</sup>	0.4 ft	1.0ft/1000ft <sup>c</sup>
E	1/100	Foresight and backsight; 30 minute rejection limit <sup>c</sup>	0.8 ft	1.0ft/1000ft <sup>c</sup>
<p>a. Accuracy of offset measurement.</p> <p>b. Determine vertical closures at intervals not to exceed 2000 ft as measured along centerline.</p> <p>c. Use greater value.</p>				

**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

## 155 - Schedules for Construction Contracts

155.00\_nat\_us\_05\_11\_2004

### 155 Delete.

Delete Section 155 in its entirety.

## 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.

201.06\_nat\_us\_11\_09\_2005

**201.06 Disposal**

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

Limb and deck logs that meet utilization standards at locations approved by the CO or otherwise designated. Deck logs according to 201.04 (f).

## 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.

## 204 - Excavation and Embankment

204.00\_nat\_us\_03\_26\_2009

**Replace Section 204 in its entirety with the following:**

### Description

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

### **204.02 Definitions.**

**(a) Excavation.** Excavation consists of the following:

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

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

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

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

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

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

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

## Material

**204.03** Conform to the following Subsections:

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

## Construction Requirements

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

**204.05 Reserved.**

**204.06 Roadway Excavation.** Excavate as follows:

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

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

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

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

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

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

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into embankments. Place snow or ice in a manner to prevent resource damage.

**204.07 Subexcavation.** Excavate material to the limits designated by the CO. Take cross-sections according to Section 152. Prevent unsuitable material from becoming mixed with the backfill. Dispose of unsuitable material according to Subsection 204.14. Backfill the subexcavation with topping, or other suitable material. Compact the material according to Subsection 204.11.

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

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

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

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

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

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

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

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

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

During all stages of construction, route and distribute hauling and leveling equipment over the width and length of each layer of material.

Compact embankment side slopes flatter than 1V:1.75H with a tamping type roller or by walking with a dozer. For slopes 1V:1.75H or steeper, compact the slopes as construction of the embankment progresses.

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

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

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

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

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

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

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

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

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

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

If there is 50 to 80 percent retained on the No. 4 sieve use procedure (2). If there is less than 50 percent retained on the No. 4 sieve use procedure (3).

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

(a) Four roller passes of a vibratory roller having a minimum dynamic force of 40,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

(b) Eight roller passes of a 20-ton compression-type roller.

(c) Eight roller passes of a vibratory roller having a minimum dynamic force of 30,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

Increase the compactive effort for layers deeper than 12 inches as follows:

- For each additional 6 inches or fraction thereof, increase the number of roller passes in (a) above by four passes.
- For each additional 6 inches or fraction thereof, increase the number of roller passes in (b) and (c) above, by eight passes.

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

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

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

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

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

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

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

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

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

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

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

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

**(b) Stepped slopes.** Where required by the contract, construct steps on slopes of  $1\frac{1}{3}V:1H$  to  $1V:2H$ . Construct the steps approximately 18 inches high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

**(c) Shaping.** Shape the subgrade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of

cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

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

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

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

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

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

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

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

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

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

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

### **Measurement**

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

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

- (1) Include the following volumes in roadway excavation:

- (a) Roadway prism excavation;
- (b) Rock material excavated and removed from below subgrade in cut sections;
- (c) Unsuitable material below subgrade and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
- (d) Ditches, except furrow ditches measured under a separate bid item;
- (e) Topsoil;
- (f) Borrow material used in the work when a pay item for borrow is not shown in the bid schedule;
- (g) Loose scattered rocks removed and placed as required within the roadway;
- (h) Conserved material taken from stockpiles and used in Section 204 work; and
- (i) Slide and slipout material not attributable to the Contractor's method of operation.

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

- (a) Overburden and other spoil material from borrow sources;
- (b) Overbreakage from the backslope in rock excavation;
- (c) Water or other liquid material;
- (d) Material used for purposes other than required;
- (e) Roadbed material scarified in place and not removed;
- (f) Material excavated when stepping cut slopes;
- (g) Material excavated when rounding cut slopes;
- (h) Preparing foundations for embankment construction;
- (i) Material excavated when benching for embankments;
- (j) Slide or slipout material attributable to the Contractor's method of operation;
- (k) Conserved material taken from stockpiles constructed at the option of the Contractor; and
- (l) Material excavated outside the established slope limits.

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

- (a) Unsuitable material below subgrade in cuts and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
- (b) Slide and slipout material not attributable to the Contractor's method of operations; and
- (c) Drainage ditches, channel changes, and diversion ditches.

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

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

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

(1) Include the following volumes in embankment construction:

- (a) Roadway embankments;
- (b) Material used to backfill subexcavated areas, holes, pits, and other depressions;
- (c) Material used to restore obliterated roadbeds to original contours; and
- (d) Material used for dikes, ramps, mounds, and berms.

(2) Do not include the following in embankment construction:

- (a) Preparing foundations for embankment construction;
- (b) Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and
- (c) Material used to round fill slopes.

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

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

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

### **Payment**

**204.17** The accepted quantities will be paid at the contract price per unit of measurement for the Section 204 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

**Table 204-1  
Sampling and Testing Requirements**

<b>Material or Product</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>
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 <sup>(1)</sup> or T 99, method C <sup>(1)</sup>	1 per soil type but not less than 1 per	“	“	“
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd <sup>2</sup> 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 <sup>(1)</sup> or T 99, method C <sup>(1)</sup>	1 per soil type but not less than 1 per	“	“	“
Compaction	—	AASHTO T 310 or other approved procedures	—	1 per 6000 yd <sup>2</sup> 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**

<b>Material or Product</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>
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 <sup>(1)</sup> , or T 99, method C <sup>(1)</sup>	1 per soil type but not less than 1 per 13,000 yd <sup>3</sup>	“	“	“
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 3500 yd <sup>2</sup> 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 <sup>2</sup>	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

**Table 204-2  
Construction Tolerances**

	Tolerance Class <sup>(a)</sup>												
	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 <sup>(b)</sup> )	±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.

## 204.06 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.

204.09\_nat\_us\_03\_02\_2005

## 204.09 Preparing Foundation for Embankment Construction.

Delete subsection (a) and replace it with the following:

**(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.

204.10\_nat\_us\_03\_02\_2005

## 204.10 Embankment Construction.

Add the following:

Obtain written approval before beginning construction of embankments over 6 feet high at subgrade centerline.

### (a) General.

Delete the third paragraph and add the following:

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.

204.11\_nat\_us\_04\_11\_2005

## 204.11 Compaction.

Delete the first paragraph and replace it with the following:

For compaction according to method (a), (b), or (c), use AASHTO T 27 to determine the amount of material retained on a Number. 4 sieve. For compaction methods (d) or (e) no sieve test is required.

Add the following compaction methods:

**(d) Layer Placement Method (Hauling and Spreading Equipment).** 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 layer. 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.

**(e) Layer Placement (Roller Compaction) Method.** 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 visible deformation of the layer ceases or, in when a sheepsfoot roller is used, the roller “walks out” of the layer. Make at least three complete passes.

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.

## 324 - Minor Aggregate, Commercial Source

324.00\_nat\_us\_08\_28\_2008

### Section 324. – MINOR AGGREGATE COURSES – COMMERCIAL SOURCE

#### Description

**324.01** This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by crushing methods.

#### Material

**324.02** Conform to the following Subsections:

Aggregate	703.06
Water	725.01

#### Construction Requirements

**324.03 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 aggregate gradations for approval by the CO.

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.

**324.04 Mixing and Spreading.** Mix the aggregate and adjust the moisture content to obtain a uniform mixture with 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. Place the mixture in a maximum compacted layer thickness of 6 inches.

When more than one layer is necessary, compact each layer according to Subsection 324.05 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.

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

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

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

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

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

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

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

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

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

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

**324.06 Construction Tolerance.** If grade finishing stakes are required, finish the surface to within  $\pm 0.10$  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.

**324.07 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 324.06.

**324.08 Acceptance.** See Table 324-1 for sampling and testing requirements.

Aggregate gradation and surface course plasticity index will be evaluated under Subsection 106.03 and 106.04. Other aggregate quality properties will be evaluated under Subsections 106.02 and 106.03. Placement of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

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

### **Measurement**

**324.09** Measure the Section 324 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**

**324.10** The accepted quantities will be paid at the contract price per unit of measurement for the Section 324 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

**Table 324-1  
Sampling and Testing Requirements**

<b>Material or Product</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>
Aggregate source quality 703.06	Measured and tested for conformance (106.03 & 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 324-1 (continued)  
Sampling and Testing Requirements**

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

## 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.

## 625 - Turf Establishment

625.03\_nat\_us\_02\_25\_2005

### 625.03 General.

Delete the first subsection and add the following:

Apply turf establishment to finished slopes and ditches between \_\_\_\_\_ and \_\_\_\_\_. Do not seed during windy weather or when the ground is excessively wet, frozen, snow covered, extremely dry, cloddy, hard pan, or is otherwise untillable.

625.05\_nat\_us\_03\_30\_2005

### 625.05 Watering.

Delete the entire subsection

625.07\_nat\_us\_02\_25\_2005

### 625.07 Seeding. (a) Dry method.

Remove the last sentence “Lightly compact the seedbed within 24 hours after seeding.”

### 625.07 Seeding. (b) Hydraulic method.

Add the following:

Apply fertilizer conforming to Subsection 713.03 at the rates shown in Table 625-1. Fertilize areas inaccessible to hydro-type equipment by hand.

**Table 625-1. Fertilizer Application Rate.**

Type	Quantity per Slurry Unit
::	__lbs
::	__lbs

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

## **718 - Traffic Signing and Marking Material**

718.05\_nat\_us\_08\_05\_2009

### **718.05 Aluminum Panels**

Delete the third paragraph and replace with the following:

Clean, degrease and properly prepare the panels according to methods recommended by the sheeting manufacturer. Conversion coatings will conform to ASTM B-921 or ASTM B-449.

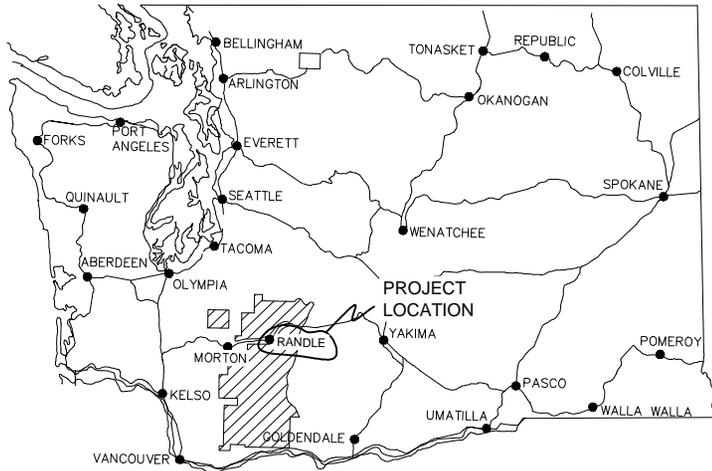


**GIFFORD PINCHOT NATIONAL FOREST  
COWLITZ VALLEY RANGER DISTRICT**  
DRAWINGS FOR PROPOSED  
**VETA TS**  
**RECONSTRUCTION PACKAGE**

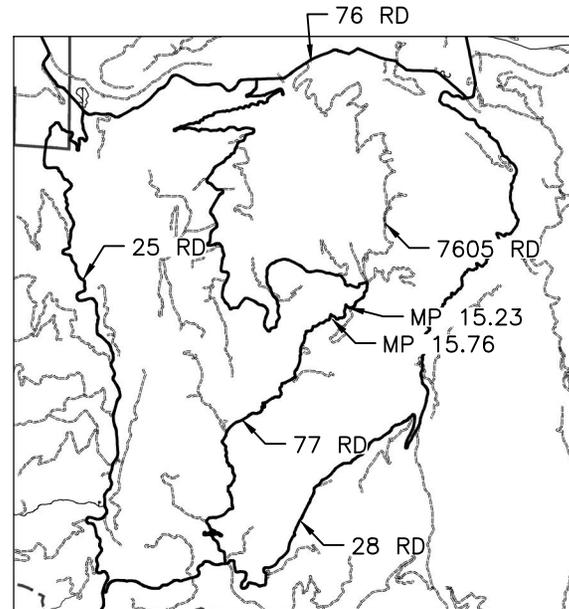


SHEET INDEX

- 1 COVER
- 2 RECONSTRUCTION PLANS
- 3 SURVEY PLAN
- 4 MP 15.23 PROFILES
- 5 MP 15.76 PROFILES
- 6 MP 15.23 NOTES
- 7 MP 15.76 NOTES
- 8 DETAILS 1
- 9 DETAILS 2



**LOCATION MAP**  
NOT TO SCALE



**SITE MAP**  
NOT TO SCALE

DESIGNED BY: \_\_\_\_\_ DATE \_\_\_\_\_

DESIGNER, ADAM DAILEY

RECOMMENDED BY: \_\_\_\_\_ DATE \_\_\_\_\_

DISTRICT ENGINEER, SARAH ROCKEY

RECOMMENDED BY: \_\_\_\_\_ DATE \_\_\_\_\_

DISTRICT RANGER, GAR ABBAS

RECOMMENDED BY: \_\_\_\_\_ DATE \_\_\_\_\_

TRANSPORTATION ENGINEER, ELWOOD STARR

**DO NOT SCALE DRAWING**

Forest:	GIFFORD PINCHOT
Location:	GIFFORD PINCHOT NATIONAL FOREST
Designed:	A DAILEY
Drawn:	A DAILEY
Checked:	S ROCKEY
Date:	10/17/2014

**VETA TS RECONSTRUCTION**

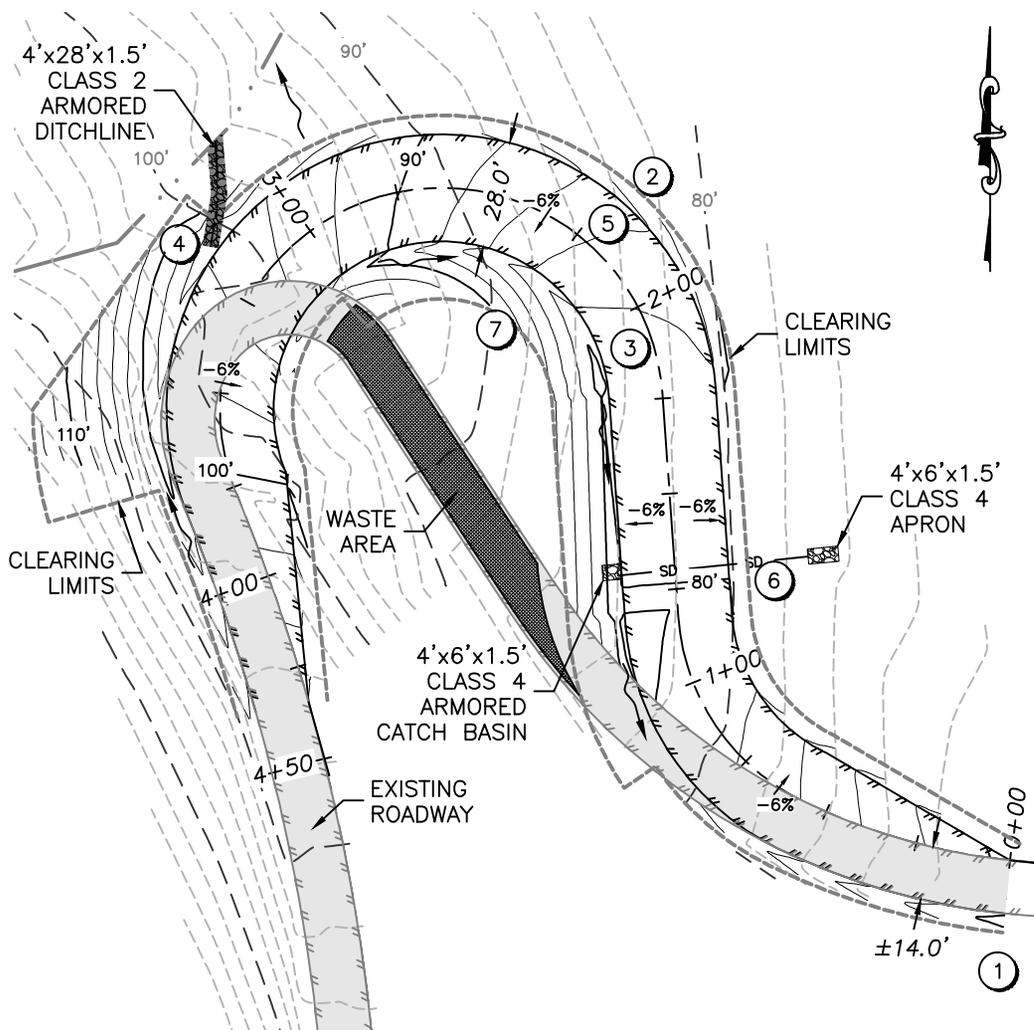
**COVER**



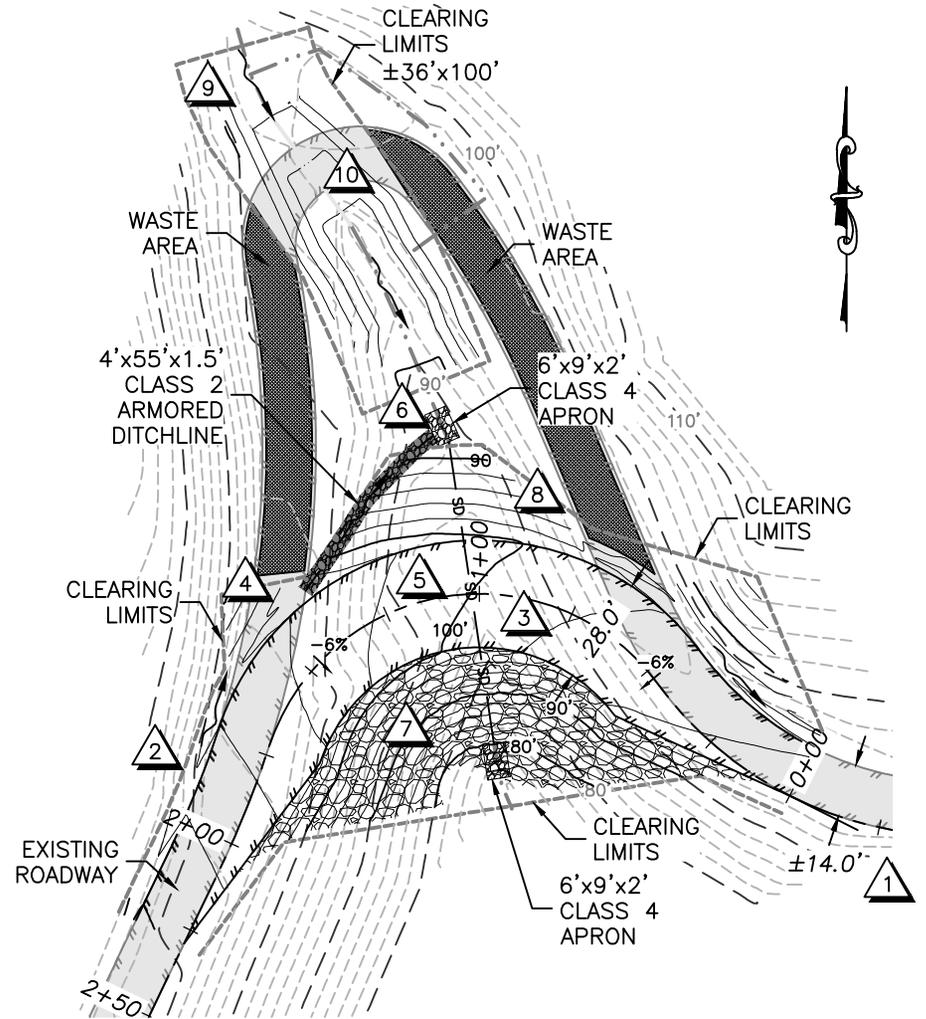
U.S. DEPARTMENT OF AGRICULTURE  
**FOREST SERVICE**  
THE PACIFIC NORTHWEST REGION (R-6)  
GIFFORD PINCHOT NATIONAL FOREST

APPROVED: \_\_\_\_\_ DATE \_\_\_\_\_

FOREST ENGINEER, BOB VARNER



① 77 RD. MP 15.23 PLAN  
Scale = 1:50



② 77 RD. MP 15.76 PLAN  
Scale = 1:50

EXISTING MAJOR CONTOURS (10')   
 EXISTING MINOR CONTOURS (2')   
 PROPOSED MAJOR CONTOURS (10')   
 PROPOSED MINOR CONTOURS (2') 

EXISTING EDGE OF GRAVEL   
 PROPOSED EDGE OF GRAVEL 

**DO NOT SCALE DRAWING**

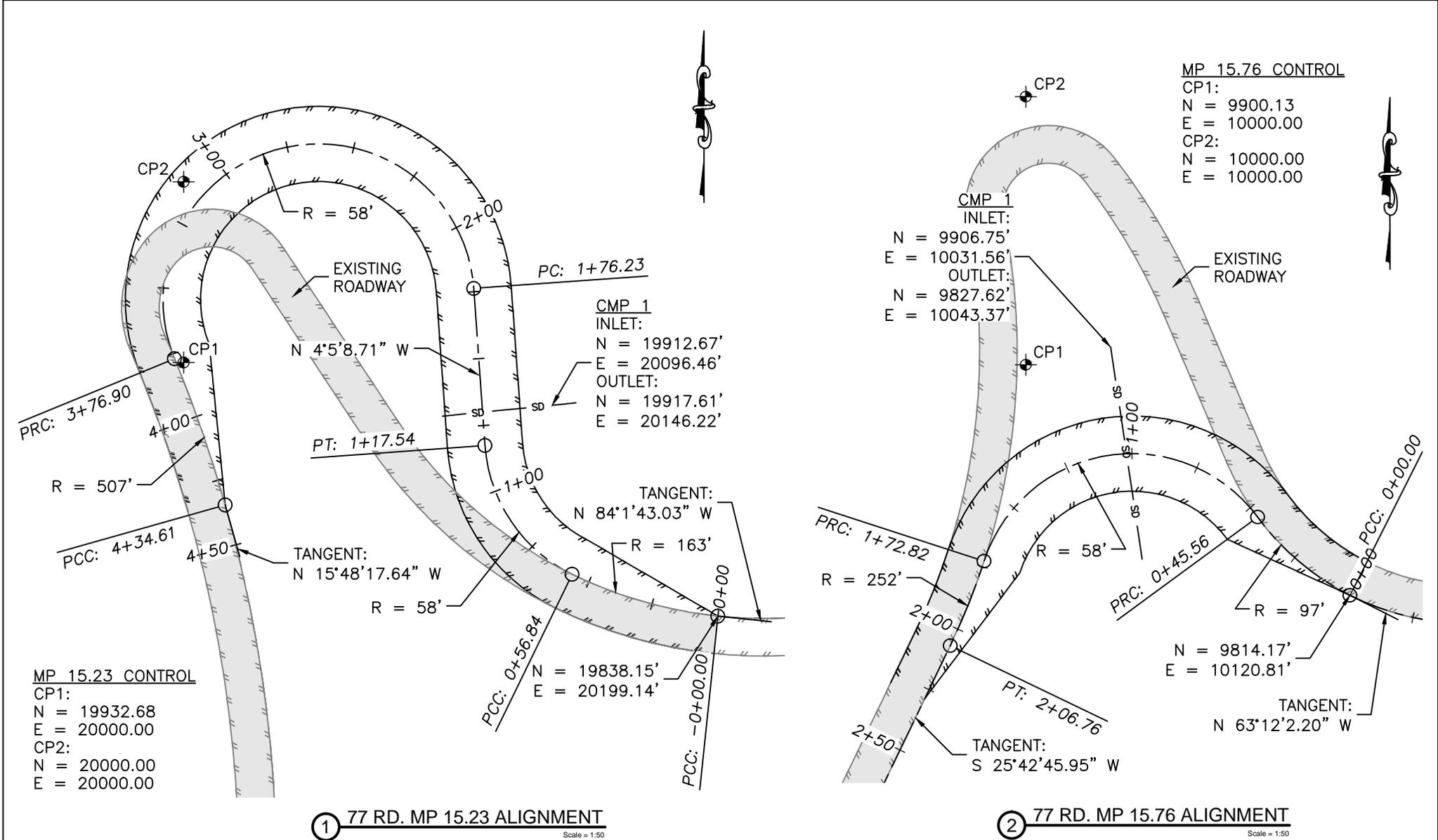
Forest: GIFFORD PINCHOT  
 Location: GIFFORD PINCHOT NATIONAL FOREST  
 Designed: A DAILEY Drawn: A DAILEY  
 Checked: S ROCKEY Date: 10/17/2014

**VETA TS RECONSTRUCTION  
 RECONSTRUCTION PLANS**



U.S. DEPARTMENT OF AGRICULTURE  
**FOREST SERVICE**  
 THE PACIFIC NORTHWEST REGION (R-6)  
 GIFFORD PINCHOT NATIONAL FOREST

APPROVED:  
 FOREST ENGINEER, BOB VARNER DATE  
 SHEET 2 of 9



**NOTE**

CONTRACTOR SHALL REQUEST FOREST SERVICE ER TO STAKE SURVEY CONTROL POINTS. CONTRACTOR TO PROVIDE ALL OTHER PROJECT SURVEYING.

<b>DO NOT SCALE DRAWING</b>	
Forest: GIFFORD PINCHOT	
Location: GIFFORD PINCHOT NATIONAL FOREST	
Designed: A DAILEY	Drawn: A DAILEY
Checked: S ROCKEY	Date: 10/17/2014

<p>VETA TS RECONSTRUCTION</p>	<p>SURVEY PLAN</p>
-------------------------------	--------------------

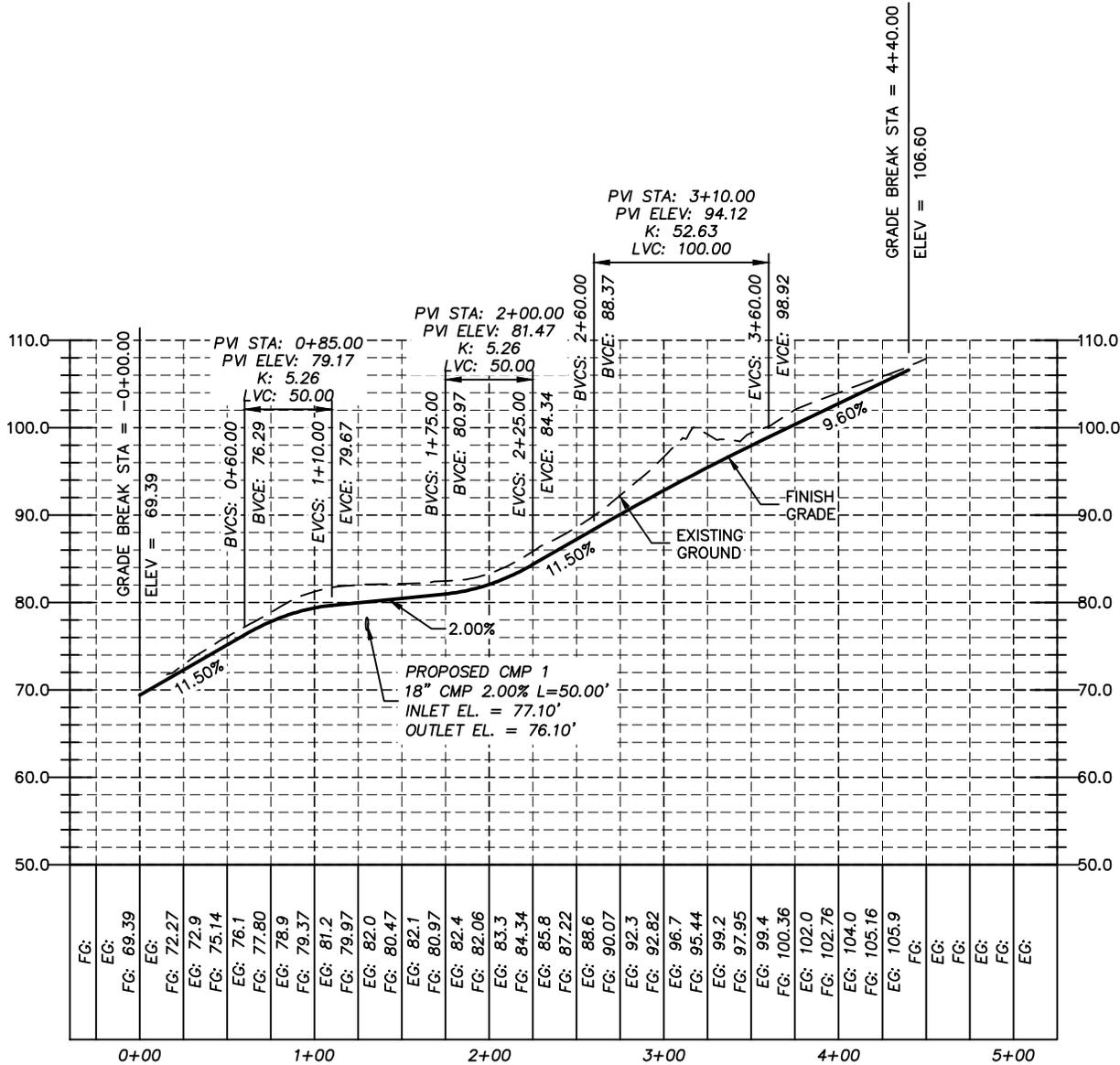
U.S. DEPARTMENT OF AGRICULTURE

**FOREST SERVICE**

THE PACIFIC NORTHWEST REGION (R-6)

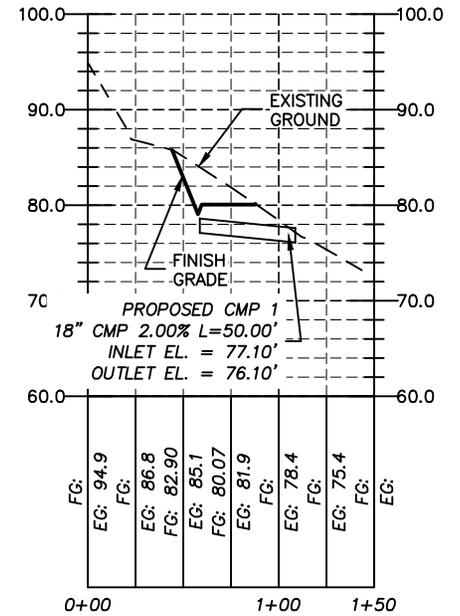
GIFFORD PINCHOT NATIONAL FOREST

APPROVED:	
<p>FOREST ENGINEER, BOB VARNER</p>	<p>DATE</p>
SHEET 3 of 9	



1 77 RD. MP 15.23 ROADWAY PROFILE

Scale = 1:50



77 RD. MP 15.23  
2 STA 1+30 PIPE PROFILE

Scale = 1:50

DO NOT SCALE DRAWING

Forest: GIFFORD PINCHOT  
 Location: GIFFORD PINCHOT NATIONAL FOREST  
 Designed: A DAILEY Drawn: A DAILEY  
 Checked: S ROCKEY Date: 10/17/2014

VETA TS RECONSTRUCTION

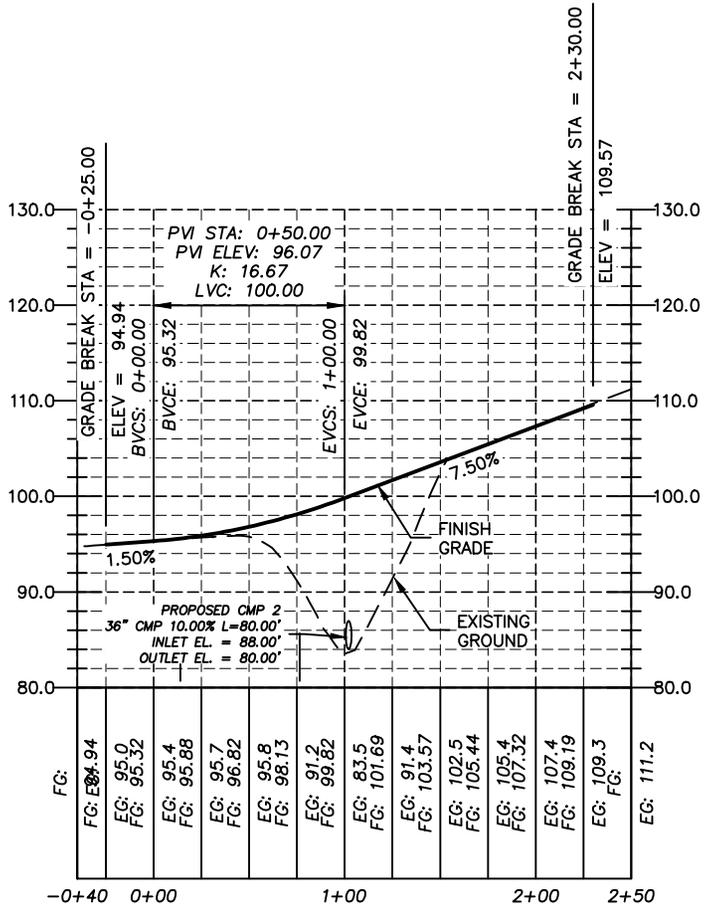
77 RD MP 15.23 PROFILES



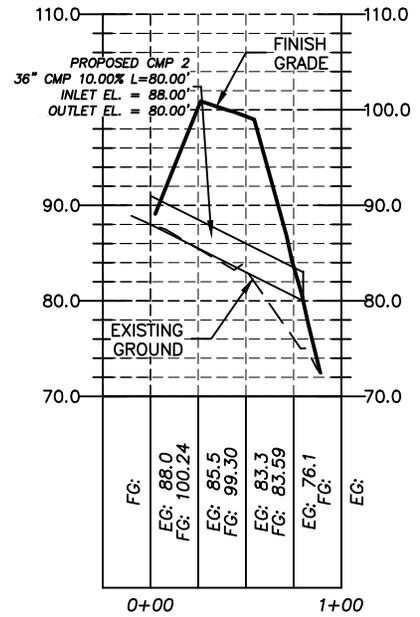
U.S. DEPARTMENT OF AGRICULTURE  
**FOREST SERVICE**  
 THE PACIFIC NORTHWEST REGION (R-8)  
 GIFFORD PINCHOT NATIONAL FOREST

APPROVED:

FOREST ENGINEER, BOB VARNER DATE



1 77 RD. MP 15.76 ROADWAY PROFILES  
Scale = 1:50



2 77 RD. MP 15.76  
STA 1+02 PIPE PROFILE  
Scale = 1:50

DO NOT SCALE DRAWING

Forest: GIFFORD PINCHOT  
Location: GIFFORD PINCHOT NATIONAL FOREST  
Designed: A DAILEY Drawn: A DAILEY  
Checked: S ROCKEY Date: 10/17/2014

VETA TS RECONSTRUCTION

77 RD MP 15.76 PROFILES



U.S. DEPARTMENT OF AGRICULTURE  
**FOREST SERVICE**  
THE PACIFIC NORTHWEST REGION (R-6)  
GIFFORD PINCHOT NATIONAL FOREST

APPROVED:

FOREST ENGINEER, BOB VARNER DATE

# 77 RD MP 15.23 NOTES:

- ① Provide traffic control plan to CO for approval. Plan shall include, but not be limited to, signing at the 77 Rd/76 Rd, 77 Rd/7605 Rd, and 77Rd/28 Rd intersections for road closure ahead and road machinery ahead, incidental to mobilization.
- ② Clear all vegetation, including all trees, to clearing limits show in drawing, disperse outside clearing limits 25 ft. minimum from any pipe inlet and outlet, preferably on fill slopes, do not concentrate materials.
- ③ Excavate proposed roadway, tapers, and existing roadway to width shown in plan, STA 0+00 to 4+35, see roadway section 4 sheet 8.
  - Grub roadway excavation and embankment areas as required.
  - Re-use suitable material for roadway subgrade embankment, embankment is incidental to the excavation bid item.
  - FOR TRAVELED WAY AND SHOULDER WIDTH ONLY, excavate to 12" below finish grade profile for roadway material placement.
  - Outslope road 6% STA 0+00 to 1+18 and STA 1+75 to 4+35, crown road 6% STA 1+18 to 1+75.
  - Waste material in area shown in plans, additional waste areas to be determined by CO up to 5 mi. haul if needed at no additional cost to Gov., see detail 1 sheet 9.
- ④ Construct ditchline STA 0+00 to 3+40 LT and 3+15 to 4+35 RT, place class 2 riprap from ditchline at STA 3+15 down the slope to the existing drainage see detail 3 sheet 8. Tie proposed ditchlines into existing existing ditchline at STA 0+00 and 4+35.
- ⑤ Compact roadway subgrade. Place and compact 8" of aggregate base and 4" of surface materials (Commercial Source) to width shown, STA 0+00 to 4+35 to finish grade shown in profile 1 sheet 4. See section 4 sheet 8.
  - Compact base layer including shoulder width, compaction method A, in horizontal layers not exceeding 4 inches in compacted thickness until no visible displacement is observed.
  - Compact surface layer including shoulder width using vibratory compactor, or roller, in horizontal layers not exceeding 4 inches in compacted thickness until no visible displacement is observed.
  - Provide water to achieve compaction.
- ⑥ Install 18"X50' CMP culvert STA 1+30.
  - Install to manufacturers specifications.
  - Ensure 18" cover at inlet shoulder.
  - Unless determined unsuitable by CO, excavated road prism material shall be substituted for proposed pipe bedding, haunch, and initial backfill material up to 12" below finish grade shown in profile 2 sheet 4.
  - Pipe fill material to be compacted in max 4" loose layers with vibratory compactor until no visible displacement is observed.
  - Construct catch basin, see detail 1 sheet 8, incidental to this bid item.
  - Place class 4 riprap outlet apron material (Commercial Source). Pipe shall end at beginning of riprap apron, do not shotgun pipe. See detail 3 sheet 9, incidental to this bid item.
  - Clear all vegetation within 15' of inlet and outlet, incidental to this bid item.
  - Dewatering and water to achieve compaction is incidental to this bid item.
- ⑦ Seed and mulch all disturbed soil outside traveled way including waste piles. Forest service to provide seed. Contractor to provide certified weed free straw mulch 2 inches thick.

CLEARING LIMITS GUIDE	
STATION	OFFSET
0+00	5 RT, 19 LT
0+56	19 RT
0+87	29 LT
3+00	19 LT
3+13	29 RT
3+54	49 RT
3+70	19 RT
4+35	5 LT, 19 RT

TABLE IS PROVIDED AS A GUIDE, CONTRACTOR TO VERIFY INFORMATION WITH ROAD DESIGN REQUIREMENTS.

C:\Users\addailey\Documents\0 Projects\77 Realignment\ContractPrep\Drawings\77 RD MP 15.23.dwg Plotted: Oct 17, 2014 - 3:11pm By: addailey

U.S. DEPARTMENT OF AGRICULTURE <b>FOREST SERVICE</b> THE PACIFIC NORTHWEST REGION (R-6) GIFFORD PINCHOT NATIONAL FOREST	APPROVED: FOREST ENGINEER, BOB VARNER DATE SHEET 6 of 9
	
VETA TS RECONSTRUCTION 77 RD MP 15.23 NOTES	
DO NOT SCALE DRAWING	Date: 10/17/2014
Forest: GIFFORD PINCHOT	Drawn: A DAILY
Location: GIFFORD PINCHOT NATIONAL FOREST	Checked: S ROCKEY
Designer: A DAILY	

# 77 RD MP 15.76 NOTES:

**1** Provide traffic control plan to CO for approval. Plan shall include, but not be limited to, signing at the 77 Rd/76 Rd, 77 Rd/7605 Rd, and 77Rd/28 Rd intersections for road closure ahead and road machinery ahead, incidental to mobilization.

**2** Clear all vegetation, including all trees, to clearing limits show in drawing, disperse outside clearing limits 25 ft. minimum from any pipe inlet and outlet preferably on fill slopes, do not concentrate materials.

**3** Excavate proposed roadway, tapers, and existing roadway to width shown, STA 0+00 to 2+30, see roadway section 4 sheet 8.

- Grub roadway excavation and embankment areas as required.
- Re-use suitable material for roadway subgrade embankment, embankment is incidental to the excavation bid item.
- FOR TRAVELED WAY AND SHOULDER WIDTH ONLY, excavate to 12" below finish grade profile for roadway material placement.
- Outslope road 6% STA 0+00 to 2+30.
- Waste material in area shown in plans, additional waste areas to be determined by CO up to 5 mi. haul if needed at no additional cost to Gov., see detail 1 sheet 9.

**4** Construct ditchline STA 0+00 to 0+78 RT and 1+40 to 2+30 RT, tie ditchline at STA 1+40 into existing drainage at pipe inlet, see detail 3 sheet 8. Tie proposed ditchlines into existing at beginning and end.

**5** Compact roadway subgrade. Place and compact 8" of aggregate base and 4" of surface materials (Commercial Source) to width shown, STA 0+00 to 2+30 to finish grade shown in profile 1 sheet 5. See detail 4 sheet 8.

- Compact base layer including shoulder width, compaction method A, in horizontal layers not exceeding 4 inches in compacted thickness until no visible displacement is observed.
- Compact surface layer including shoulder width using vibratory compactor or roller, in horizontal layers not exceeding 4 inches in compacted thickness until no visible displacement is observed.
- Provide water to achieve compaction.

**6** Install 36"X80' CMP culvert STA 1+02.

- Install to manufacturers specifications.
- Ensure 18" cover at inlet shoulder.
- Commercial material for bedding, haunch, and initial backfill material up to 12" above top of pipe is incidental to this bid item.
- Pipe fill material to be compacted in max 4" loose layers with vibratory compactor until no visible displacement is observed.
- Place class 4 riprap inlet apron material (Commercial Source). See detail 2 sheet 9, incidental to this bid item.
- Place class 4 riprap outlet apron material (Commercial Source). Pipe end shall be flush with beginning of riprap apron, do not shotgun pipe. See detail 3 sheet 9, incidental to this bid item.
- Place class 2 riprap from ditchline at STA 1+40 down the slope to inlet apron. See detail 3 sheet 8.
- Clear all vegetation within 15' of inlet and outlet, incidental to this bid item.
- Dewatering and water to achieve compaction is incidental to this bid item.

**7** Place class 4 riprap embankment armor on proposed downstream fillslope.

**8** Seed and mulch all disturbed soil outside traveled way including waste piles. Forest service to provide seed. Contractor to provide certified weed free straw mulch 2 inches thick.

**9** Excavate existing roadway at existing pipe location to re-establish drainage way to line and grade of removed pipe, vegetation from clearing shall be placed on excavated slopes, see detail 4 sheet 9. Waste material at locations shown in plans, see detail 1 sheet 9.

**10** Remove existing 24" CMP from forest.

CLEARING LIMITS GUIDE	
STATION	OFFSET
0+00	19 RT, 5 LT
0+21	9 Lt
0+50	38 RT
0+78	23 RT
1+00	39 RT
1+36	19 RT
1+50	31 RT
1+60	19 RT
1+94	13 LT
2+30	5 LT, 19 RT

TABLE IS PROVIDED AS A GUIDE, CONTRACTOR TO VERIFY INFORMATION WITH ROAD DESIGN REQUIREMENTS.

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APPROVED:

FOREST ENGINEER: BOB VARNER DATE: SHEET 7 of 9

U.S. DEPARTMENT OF AGRICULTURE  
**FOREST SERVICE**  
THE PACIFIC NORTHWEST REGION (R-6)  
GIFFORD PINCHOT NATIONAL FOREST

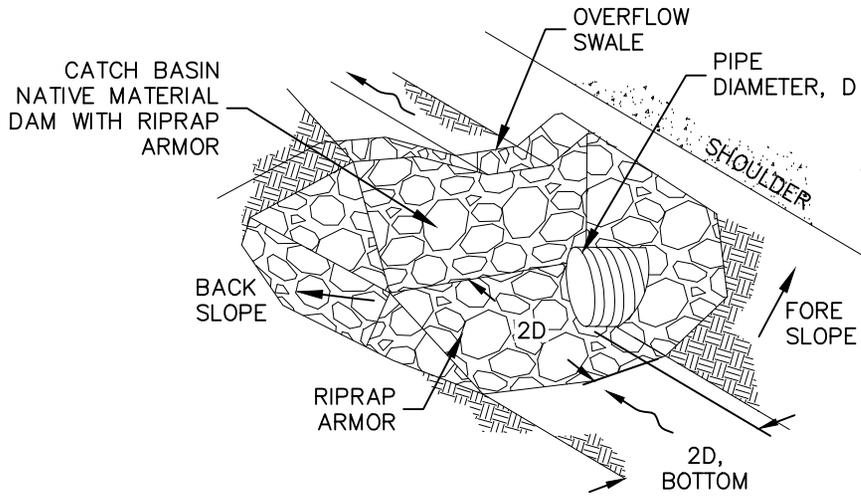


VETA TS RECONSTRUCTION

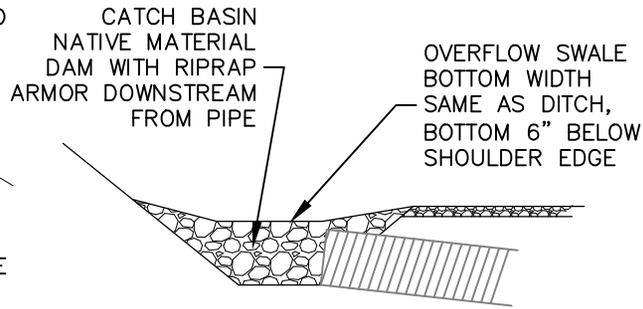
77 RD MP 15.76 NOTES

DO NOT SCALE DRAWING

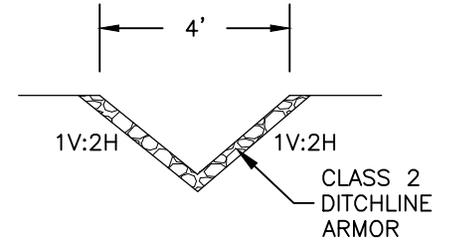
Forest: GIFFORD PINCHOT  
Location: GIFFORD PINCHOT NATIONAL FOREST  
Designed: A DAILY Drawn: A DAILY  
Checked: S ROCKEY Date: 10/17/2014



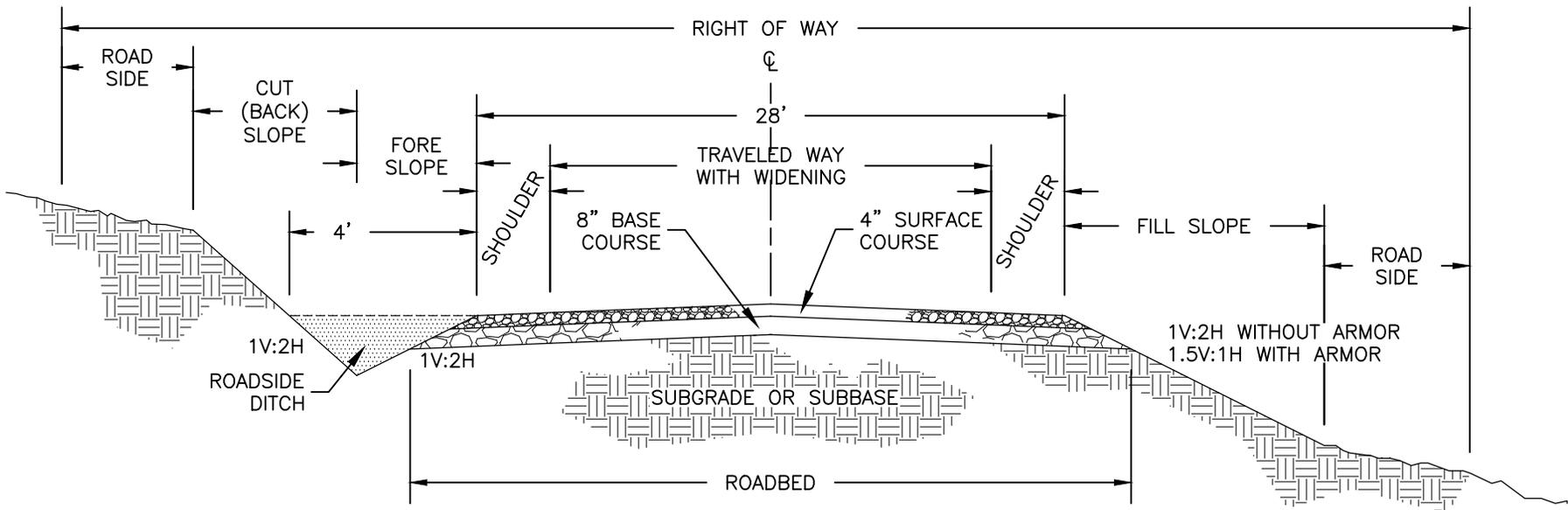
① **CATCH BASIN DETAIL**  
NO SCALE



② **CATCH BASIN OVERFLOW PROFILE**  
NO SCALE



③ **DRAINAGE WAY SECTION**  
NO SCALE



④ **ROADWAY SECTION AND TERMS**  
NO SCALE

**DO NOT SCALE DRAWING**

Forest: GIFFORD PINCHOT  
 Location: GIFFORD PINCHOT NATIONAL FOREST  
 Designed: A DAILEY Drawn: A DAILEY  
 Checked: S ROCKEY Date: 10/17/2014

**VETA TS RECONSTRUCTION**

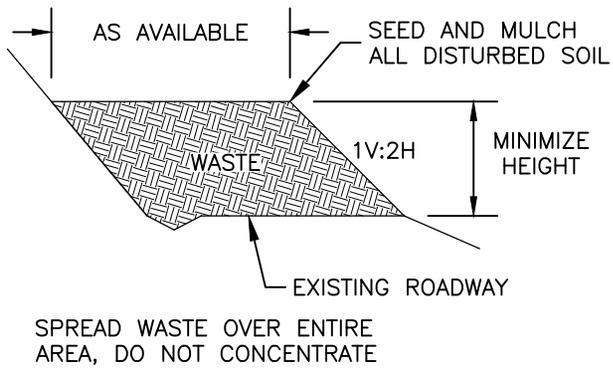
**DETAILS 1**



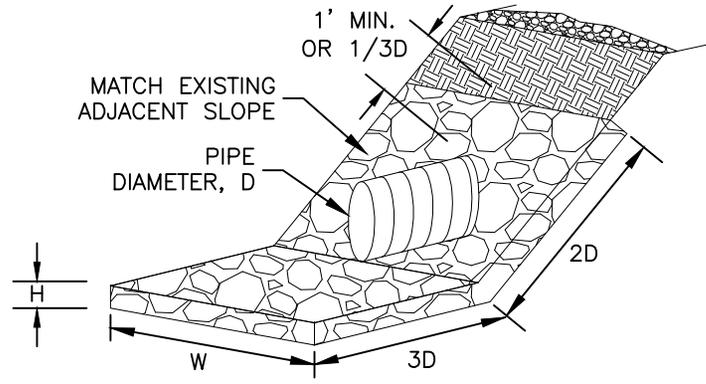
U.S. DEPARTMENT OF AGRICULTURE  
**FOREST SERVICE**  
 THE PACIFIC NORTHWEST REGION (R-6)  
 GIFFORD PINCHOT NATIONAL FOREST

APPROVED:

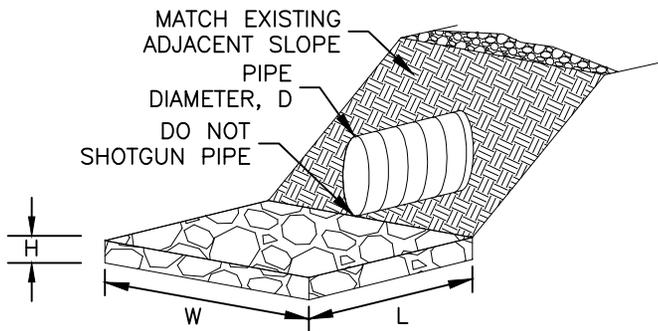
FOREST ENGINEER, BOB VARNER DATE



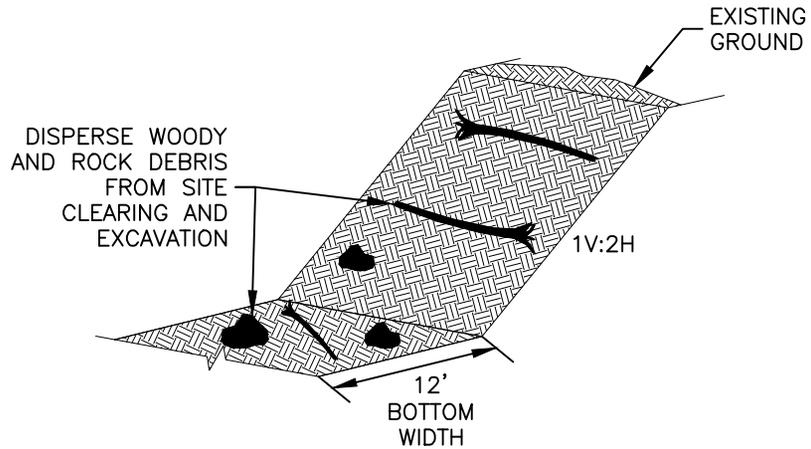
① WASTE PILE DETAIL  
NO SCALE



② INLET ARMOR DETAIL  
NO SCALE



③ OUTLET ARMOR DETAIL  
NO SCALE



④ DRAINAGE WAY DETAIL  
NO SCALE

**DO NOT SCALE DRAWING**

Forest: GIFFORD PINCHOT  
 Location: GIFFORD PINCHOT NATIONAL FOREST  
 Designed: A DAILEY Drawn: A DAILEY  
 Checked: S ROCKEY Date: 10/17/2014

**VETA TS RECONSTRUCTION**

**DETAILS 2**



U.S. DEPARTMENT OF AGRICULTURE  
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 THE PACIFIC NORTHWEST REGION (R-6)  
 GIFFORD PINCHOT NATIONAL FOREST

APPROVED:

FOREST ENGINEER, BOB VARNER DATE