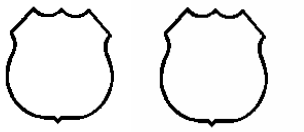
PART III: EXHIBITS

OREGON DEPARTMENT OF FORESTRY

TIMBER SALE OPERATIONS PLAN
(See Page 2 for instructions)

Date Received by STATE: _____

(5) State Brand Information (complete):



(1) Contract No.: 341-18-108

(2) Sale Name: Tilden Switchback

(3) Contract Expiration Date: May 31, 2021 Project Completion Dates: _____

(4) Purchaser: _____ _____

(6) Purchaser Representatives:

Projects: _____	Phone: _____	Cell/Other Phone: _____	Home: _____
Projects: _____	Phone: _____	Cell/Other Phone: _____	Home: _____
Projects: _____	Phone: _____	Cell/Other Phone: _____	Home: _____
Projects: _____	Phone: _____	Cell/Other Phone: _____	Home: _____
Logging: _____	Phone: _____	Cell/Other Phone: _____	Home: _____
Logging: _____	Phone: _____	Cell/Other Phone: _____	Home: _____
Logging: _____	Phone: _____	Cell/Other Phone: _____	Home: _____
Logging: _____	Phone: _____	Cell/Other Phone: _____	Home: _____

(7) State Representatives:

Projects: _____	Phone: _____	Cell/Other Phone: _____	Home: _____
Logging: _____	Phone: _____	Cell/Other Phone: _____	Home: _____

(8) Name of Subcontractors & Starting Dates:

Projects: No(s) _____-_____	Date: _____	Phone: _____
No(s) _____-_____	Date: _____	Phone: _____
No(s) _____-_____	Date: _____	Phone: _____
No(s) _____-_____	Date: _____	Phone: _____
Logging: Felling _____	Date: _____	Phone: _____
Yarding: _____	Date: _____	Phone: _____

(9) Comments: _____

(10) Operations Map: Attach a copy of timber sale Exhibit A or other suitable map which plainly shows the items listed on the instruction sheet.

EXHIBIT B

INSTRUCTION SHEET FOR OPERATIONS PLAN

SUBMIT ONE COPY OF PLAN TO STATE

Operations shall be limited to the work shown in the plan until a revised plan or supplemental plan is submitted covering additional work. Compliance with this plan is not in lieu of compliance with any federal requirements related to the federal Endangered Species Act. If STATE has prepared a required Forest Practices Act (FPA) "Written Plan" for operations, PURCHASER shall comply with all provisions of the Written Plan.

Explanation of Item No. (from Page 1)

(5) All sales require you to use a brand furnished by STATE. If the State brand has not been assigned when the plan is submitted, it will be furnished and assigned later. Complete drawing. If more than one brand is assigned to the sale, complete both drawings.

(6) The contract requires you to have a designated representative available on the sale area or work location who is authorized to receive in your behalf any notice or instruction given by STATE and to take action in regard to performance under the contract. If logging and project work is widely separated, a representative is required for each.

(7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.

(8) Show names of subcontractors to be used for any or all phases of the operations. If subcontractors are not known, or are changed later, give notification to the STATE representative prior to commencement of work by subcontractor.

Show projected dates for commencement of both projects and logging. If projected dates need to be changed at a later date, notification must be given to the STATE representative by supplemental plan or otherwise, prior to commencement of such operations.

(10) The STATE representative will furnish extra copies of Exhibit A of the contract for your use in preparing the operations map. The map shall use the following legend and show:

1. Landing locations, approximate setting boundaries, and probable sequence of logging the settings. Number the settings in sequence.
2. Locations of spur roads planned for construction, other than those required by the timber sale contract. Provide spur road specifications.
3. Location of proposed tractor yarding roads. Show if and how marked on the ground.
4. Location of temporary stream crossings.
5. List the sequence of performing project work.
6. Location of rock sources - attach pit development plans.

	Cable Landing, with numbers for sequence.
	Tractor Landing with alphabetical sequence.
_ _ _ _ _	Approximate setting boundary.
- - - - - - - -	Spur truck roads.
	Tractor yarding roads.
X	Temporary stream crossings.

EXHIBIT B

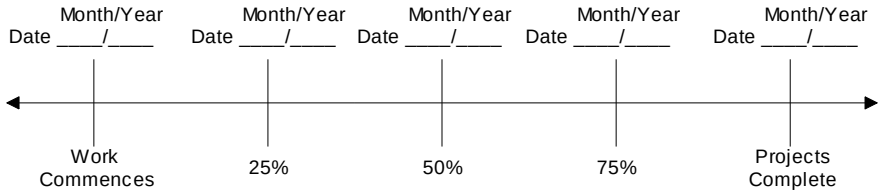
OPERATIONS PLAN

Completion Timeline

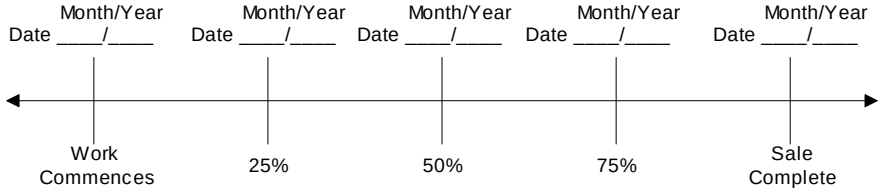
Indicate on the appropriate timeline below, the dates by which you plan to complete the work as required under this contract. The purpose of this section is to develop a plan that will ensure you complete the work as required, and meet the interim completion date(s) and contract expiration date. This plan is incorporated and made a part of the contract. When, in the opinion of STATE, operations are not commencing in a manner that meets the intent of this plan, you may be placed in violation of contract and your operations suspended until an amended plan is submitted and approved by STATE.

Projects

The Federal



Harvest & Other Requirements



Endangered Species Act (ESA) prohibits a person from taking any federally listed threatened or endangered species. Taking under the federal ESA may include alteration of habitat. STATE's approval of this plan does not certify that PURCHASER's operation under the plan is lawful under the federal ESA. As provided in the timber sale contract, PURCHASERS must comply with all applicable state, federal, and local laws.

PURCHASER's compliance with this plan is not in lieu of compliance with any federal requirements related to the federal Endangered Species Act.

APPROVED: Date: _____

STATE OF OREGON - DEPARTMENT OF FORESTRY

_____

Title _____

SUBMITTED BY:
PURCHASER

_____

Title _____

Original: Salem
cc: District File
Unit
Purchaser
Operator
(Purchaser Representative)_____

EXHIBIT C – SAWMILL GRADE (WESTSIDE SCALE)

SCALING INSTRUCTIONS -- LOCATION APPROVAL -- BRAND INFORMATION

(1) ORIGINAL REGISTRATION ☐ Date _____
REVISION NUMBER _____ ☐ Date _____
CANCELLATION ☐ Date _____

(2) TO: _____
(Third Party Scaling Organization)

(3) FROM: Western Lane (03) Phone 541-935-2283
(State Forestry District)
Address 87950 Territorial Hwy., Veneta, Or, 97486

(4) PURCHASER: _____
Mailing Address: _____
Phone Number: _____

(5) **MINIMUM SCALING SPECIFICATIONS**	
SPECIES	MINIMUM NET VOLUME
Conifers	10
Hardwoods	10

Apply minimum volume test to whole logs over 40' Westside

(6) WESTSIDE SCALE: YES ☒ NO ☐
Use Region 6 actual taper rule. Logs over 40'.

(7) Weight Scale Sample ☐ ☒

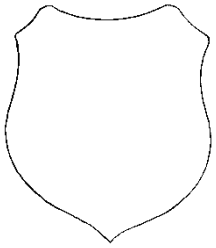
(8) **APPROVED SCALING LOCATIONS** (as shown on the ODF Approved Locations web-site)	**Species**	**Yard**	**Truck**	**Weight**

(9) SALE NAME: Tilden Switchback
COUNTY: Lane

(10) STATE CONTRACT NUMBER: 341-18-108

(11) STATE BRAND REGISTRATION NUMBER:
_____

(12) STATE BRAND INFORMATION (COMPLETE):



(13) PAINT REQUIRED: YES ☒
COLOR: Orange

(14) **SPECIAL REQUESTS** (Check applicable)	
PEELABLE CULL (all species)	☒
NO DEDUCTIONS ALLOWED FOR MECHANICAL DAMAGE	☒
ADD-BACK VOLUME - Deductions due to delay	☒
OTHER:	

(15) **REMARKS** _____

Operator's Name (Optional inclusion by District): _____

(16) SIGNATURES:

_____
Purchaser or Authorized Representative Date

_____
State Forester Representative Date

_____
State Forester Representative PRINT NAME

Notify the District within one hour when branding or painting is inadequate for quick identification, the receipts are missing, not correctly or completely filled out, and/or when logs presented for scaling are impossible to scale accurately.

Distribution (See specific instructions on pg. 2): ORIGINAL: Salem / COPIES: TPSO, Approved Scaling Location, Purchaser, District, Mgmt. Unit

EXHIBIT C – SAWMILL GRADE
INSTRUCTIONS FOR FORM 343-307a (rev. 11/11)

(1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires logging and hauling to be complete, recall branding hammers, date and sign where indicated, write diagonally across page "CANCEL", and send to TPSO.

(2) Designate Third Party Scaling Organization (TPSO).

Columbia River Log Scaling & Grading Bureau
P.O. Box 7002, Eugene, OR 97401
Phone: (541) 342-6007 Fax: (541) 342-2631
Email: services@crls.com

Pacific Rim Log Scaling Bureau, Inc.
8288 28th Court North East, Lacey, WA 98516
Phone: (360) 528-8710 Fax: (360) 528-8718
Email: office@prlsb.com

Mountain Western Log Scaling & Grading Bureau
P.O. Box 580, Roseburg, OR 97470
Phone: (541) 673-5571 Fax: (541) 672-6381
Email: info@mwlsgb.com

Yamhill Log Scaling & Grading Bureau
P.O. Box 709, Forest Grove, OR 97116
Phone: (503) 359-4474 Fax: (503) 359-4476
Email: yamhill@attglobal.net

Northwest Log Scalers, Inc .
5526 NE 122nd Ave, Portland, OR 97230
Phone: (503) 254-0600 Fax: (503) 408-0919
Email: info@nwlogscalers.com

Pacific Log Scaling & Grading Bureau, Inc.
P.O. Box 23939, Portland, OR 97281
Phone: (503) 684-5599 Fax: (503) 639-4880
Email: PacLogScale@aol.com

(3) State District office, address and phone.

(4) Enter Purchaser's business name, address, and phone number as it appears on the Contract.

(5) Minimum Scaling Specifications.

(6) Westside – Region 6 actual taper segment scale. Check Yes or No. Special Service Rules on file with TPSO. See: Segment Scaling and Grading of Long Logs -- All Species -- State Forestry Department Scaling Practices (Westside).

(7) Weight Scale Sample – Check box if sale is to be a Weight Scale Sample. All specifics for handling, scaling and processing will be attached or explained in the Remarks section Item (15).

(8) Show scaling locations only applicable to TPSO. Location name should appear as it does on the ODF Approved Scaling Location web site: http://www.odf.state.or.us/DIVISIONS/management/asset_management/ScalingLocation.asp Locations with scaling and processing directions specific to their location should be on a separate form. Species should be identified if not capable of receiving "all" species. Check appropriate box for either: yard, truck scale, or weight. Refer to the web site listed above for the locations approval status.

(9) Enter sale name and county.

(10) Enter sale Contract number.

(11) Enter Oregon's State Brand Registry Number **(REQUIRED)**.

(12) Show brand assigned to timber sale. One brand only. If more than one brand is assigned to the sale: (1) make a separate form for each brand and (2) on each form, explain and show other brand(s) in the Remarks section Item (15).

(13) Check yes for Paint Required and designate "Orange" for color. Non required removal volumes may sometimes require blue paint.

(14) Special Requests. These are requests that will be applied to ODF timber sales. All boxes applicable to the timber sales designated in the Exhibit C form must be "marked." If "Other" is indicated, it must contain a description and any necessary comments.

(15) Use this space to designate any weight conversion factors, per load volumes, weight scale sample instructions or any other explanations to clarify scaling, processing and/or mailing requirements. If additional scaling locations are approved, revise original or current form showing all (old and new) locations. Check REVISION box at top of form and explain under remarks. Route as indicated.

(16) Require purchaser to sign and date completed form in addition to State Forester Representative, sign and print name on the form.

Salem Distribution Instructions: Original will be mailed to Salem after it is electronically scanned and placed in the Salem transfer drive \\WPODFFILL01\Transfer\ScalingInstructions or e-mailed directly to scaling@odf.state.or.us. Scaling instructions for each brand should be scanned separately, for each approved TPSO.

EXHIBIT C – PULP SORT

PROCESSING INSTRUCTIONS -- LOCATION APPROVAL -- BRAND INFORMATION

(1) ORIGINAL REGISTRATION ☐ Date _____
REVISION NUMBER _____ ☐ Date _____
CANCELLATION ☐ Date _____

(2) TO: _____
(Approved Pulp Processing Facility)

(3) FROM: Western Lane (03) Phone 541-935-2283
(State Forestry District)

(4) PURCHASER: _____

(5) Scaling Bureau (TPSO) Processing Weight receipts:

_____
Mailing Address: _____
Phone Number: _____

(6) **STATE Definition of Approved Pulp Sort:**

- Top portion of the tree (tops).
- All logs with a diameter (Big End) greater than __8__ inches marked with blue paint.

(7) PULP FACILITY PROCESSING INSTRUCTIONS:

- Pulp loads shall be weighed in lieu of scaling.
- One Ton = 2000 lbs (Short Ton).
- Pulp loads shall have a yellow Log Load Receipt attached.
- Gross weight and truck tare weight for each load shall be machine printed on the weight receipt.
- Weigher shall sign the weight receipt.
- Weigher shall record the Log Load Receipt number on the weight receipt.
- Weigher shall attach the Weight receipt to the Log Load Receipt and mail them weekly to the TPSO processing the Weight receipt.

(8) TPSO PROCESSING INSTRUCTIONS

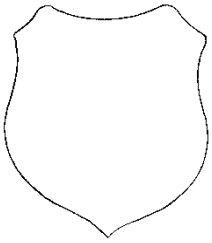
- Mail to ODF weekly.
- Convert to mbf using 10 tons per mbf.

(9) SALENAME: Tilden Switchback
COUNTY: Lane

(10) STATE CONTRACT NUMBER: 341-18-108

(11) STATE BRAND REGISTRATION NUMBER _____

(12) STATE BRAND INFORMATION: (COMPLETE BELOW)



(13) REMARKS: _____

Operator's Name (Optional inclusion by District):

_____

(14) SIGNATURES:

_____
Purchaser or Authorized Representative Date

_____
State Forester Representative Date

_____
State Forester Representative PRINT NAME

Notify the District within one hour when branding is inadequate for quick identification, the logs are marked with orange paint, the receipts are missing, not correctly or completely filled out, and/or logs do not meet the specifications of the STATE definition of Approved Pulp Sort.

Distribution: ORIGINAL: Salem / COPIES: TPSO, Approved Pulp Processing Location, Purchaser, District, Mgmt. Unit

EXHIBIT C – PULP SORT

INSTRUCTIONS FOR FORM 343-307b (rev. 11/11)

(1) **Must Complete.** Check appropriate box. REVISION NUMBER requires comments in the Remarks Section (13). CANCELLATION requires logging and hauling to be complete, recall branding hammers, date and sign where indicated, write diagonally across page "CANCEL", and send to TPSO.

(2) **Must Complete**. Approved Pulp Processing Facility. Write in as written in the Approved Log Delivery Location http://www.odf.state.or.us/DIVISIONS/management/asset_management/ScalingLocation.asp

(3) **Must Complete.** State Forestry District and District Phone Number.

(4) **Must Complete**. Purchaser's business name as it appears on the Contract.

(5) **Must Complete.** Third Party Scaling Organization that will be processing the weight tickets, mailing address, and phone number.

Columbia River Log Scaling & Grading Bureau
P.O. Box 7002, Eugene, OR 97401
Phone: (541) 342-6007 Fax: (541) 342-2631
Email: services@crls.com

Pacific Rim Log Scaling Bureau, Inc.
8288 28th Court North East, Lacey, WA 98516
Phone: (360) 528-8710 Fax: (360) 528-8718
Email: office@prlsb.com

Mountain Western Log Scaling & Grading Bureau
P.O. Box 580, Roseburg, OR 97470
Phone: (541) 673-5571 Fax: (541) 672-6381
Email: info@mwlsgb.com

Yamhill Log Scaling & Grading Bureau
P.O. Box 709, Forest Grove, OR 97116
Phone: (503) 359-4474 Fax: (503) 359-4476
Email: yamhill@attglobal.net

Northwest Log Scalers, Inc .
5526 NE 122nd Ave, Portland, OR 97230
Phone: (503) 254-0600 Fax: (503) 408-0919
Email: info@nwlogscalers.com

Pacific Log Scaling & Grading Bureau, Inc.
P.O. Box 23939, Portland, OR 97281
Phone: (503) 684-5599 Fax: (503) 639-4880
Email: PacLogScale@aol.com

(6) **Must Complete.** Big end log not to exceed_____ inches. Big end of log is not to exceed 2 inches greater than the minimum removal specifications in the contract. Example: Minimum removal specifications 6 inches and 20 board feet, then the Big end of log not to exceed 8 inches. When conifer and hardwood removal specifications are different, use the smaller removal diameter to determine this specification.

(9) **Must Complete**. Enter sale name and county. If more than one county write in all the counties that the sale is located in.

(10) **Must Complete**. Enter sale Contract number.

(11) **Must Complete**. Enter Oregon's State Brand Registry Number **(REQUIRED)**.

(12) **Must Complete**. Show brand assigned to timber sale. One brand only. If more than one brand is assigned to the sale: (1) make a separate form for each brand and (2) on each form, explain and show other brand(s) in the Remarks section Item (13).

(13) Use this section to list any special instructions or the reason for any revisions in section item (1).

(14) **Must Complete.** Purchaser required to sign and date completed form in addition to State Forester Representative, sign and print name on the form.

Salem Distribution Instructions: Original will be mailed to Salem after it is electronically scanned and placed in the Salem transfer drive \\WPODFFILL01\Transfer\ScalingInstructions or e-mailed directly to scaling@odf.state.or.us . Scaling instructions for each brand should be scanned separately, for each approved TPSO.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

Minimum Road Specifications

ROAD	SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DRAINAGE
San Antone Rd	16	12	A to C	0+00 to 107+50	Ditched
Tilden Switchback	16	12	D to E	0+00 to 35+50	Ditched

CLEARING. This work shall consist of clearing, removing, and disposing of all trees, Snags, Down Timber, brush, surface objects, and protruding obstructions within the clearing limits.

Where clearing limits have not been marked, the clearing limits shall extend 5 feet back of the top of the cut slope and 10 feet out from the toe of the fill slope, or as directed by STATE. Clearing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing debris shall not be left lodged against standing trees.

All danger trees, leaners, and Snags outside the clearing limits which could fall and hit the road shall be felled.

GRUBBING. This work shall consist of the removal or digging out of stumps and protruding objects.

All stumps shall be completely removed within the limits of required grubbing. Stumps overhanging cut slopes shall be removed. Grubbing debris shall not be placed or permitted to remain in or under any road embankment sections. Grubbing debris shall not be left lodged against standing trees.

GRUBBING CLASSIFICATION.

New construction - from the top of the cut slope to the toe of the fill.

Improvements and reconstructions - 4 feet back from the shoulder of the subgrade or ditch, whichever is widest, or as marked in the field.

CLEARING AND GRUBBING DISPOSAL. Place slash in conical piles to facilitate burning in stable locations through openings in the timber, except areas where end-haul is required. In areas where end-haul is required, clearing and grubbing debris shall be fully contained and hauled to a designated waste area. Clearing and grubbing debris shall be left in a stable location, and not left lodged against standing trees.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

EXCAVATION. Excavation and grading shall not be done when weather and/or ground conditions are such that damage will result to existing subgrade or cause excessive erosion.

Excavation shall conform to STATE-specified lines, grades, dimensions, and plans when provided. Plans are provided for the new construction of the Tilden Switchback road in the Road Builder packet.

Unless road plans show otherwise, all roads shall be on a balanced cross section, except when the slope is over 50 percent, the road shall be on full bench for the width specified.

Suitable excavated material shall be used for the formation of fills, shoulders, and drainage structure backfills. Embankment materials shall be free of woody debris, brush, muck, sod, frozen material, and other deleterious materials.

Sidecast includes any road generated excess excavation material which is not essential as part of the road prism, is not compacted, and is below the roadway. Sidecast shall not be placed where it will enter a stream course. Leaving sidecast below the road is only permissible if specifically allowed in "Full Bench and End Haul Requirements" in this Exhibit.

All fills shall be machine compacted according to the "Compaction and Processing Requirements" in this Exhibit.

ROAD WIDTH LIMITATIONS. PURCHASER shall obtain advance written approval from STATE to construct the road to a greater width than specified. Extra subgrade width shall be required for:

Fill Widening. Add to each fill shoulder 1 foot for fills 3 feet to 6 feet high; 2 feet for fills over 6 feet high.

Curve Widening. Widen the inside shoulder of all curves as specified in the plans or as follows: 400 divided by the radius of the curve equals the amount of extra width.

DRAINAGE

Subgrade. Subgrade shall be crowned at 4 to 6 percent as shown on the "Forest Road Specifications" table in this Exhibit.

Ditch. Construct "V" shaped ditch 3 feet wide and to a depth of 1 foot below subgrade.

Ditchouts. Construct ditchouts to drain away from subgrade at locations marked in the field or as directed by STATE.

TURNOUTS. Increase roadbed width an additional 8 feet for both subgrade and surfacing. Length shall be at least 25 feet, or as staked on the ground, plus 25-foot approaches at each end.

Location: Intervisible but not greater than 750 feet apart, as marked in the field, and required by STATE.

SLOPES	Back Slopes	Fill Slopes
Solid Rock	Vertical to ¼:1	
Fractured Rock	½:1	
Soil - side slopes 50% and over	¾ :1	
Soil - side slopes less than 50%	¾:1	(1½:1)

Top of cut slope shall be rounded.

LANDINGS. Landings shall be constructed as posted in the field, no less than 50 feet wide and no more than 70 feet wide unless otherwise approved by STATE. Surface is to be sloped for drainage with general grade no more than 3 percent. Surface as shown in the "Road Surfacing" table in this Exhibit.

TURNAROUNDS. Increase subgrade width an additional 20 feet for a length of 20 feet at locations marked in the field.

SEASONAL WINTERIZATION. All unsurfaced roads or unfinished subgrades shall be waterbarred in accordance with the specifications in Exhibit I, and blocked from vehicular traffic prior to October 31, annually and as directed by STATE.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD CONSTRUCTION INSTRUCTIONS:

(1) Timber Removal. Remove all trees within posted right-of-way boundary as specified in Section 2210, "Designated Timber."

(2) Excavated Materials. Excavated materials shall be utilized for road construction and hauled in where necessary. Surplus excavation materials shall be hauled to the waste areas as marked in the field and/or designated on Exhibit A. Surplus excavated materials and waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with this Exhibit.

(3) Fill Armor and Energy Dissipator Construction. Where rock is specified for fill armor, rock shall be machine placed and tamped at a 1½:1 slope, beginning at the toe of the fill. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit G.

(4) Controlled Blasting. Controlled blasting techniques shall be utilized for any blasting operations, and shall be accomplished using timing devices, delayed charges, low intensity shots, or other suitable means to contain material within the road prism.

(5) Stream crossings and Cross Drain culverts shall be installed as directed by STATE and in accordance to Exhibit G. The location of the culverts shall be marked by STATE. A STATE representative will mark the location after the completion of the subgrade. Rocking shall not occur until all culverts have been installed unless otherwise approved in writing by STATE.

(6) All inlets and outlets of stream crossings shall be armored with rock. All outlets of cross drains shall be armored with rock. Rock may be acquired at STATE approved locations on STATE lands, or utilized from STATE approved road generated rock material, or purchased from a commercial source. Install energy dissipater as outlined in Exhibit G.

(7) Each culvert shall be backfilled with some crush rock, or provided extra surfacing rock allocated over the culvert on the running surface, or compact the soil with a tamping device. Operator shall provide adequate support around the culvert.

(8) Subgrade Preparation and Application of Surfacing Rock.

(a) Complete culvert installations, drainage ditches, ditchouts, fill construction, and other specified work prior to the application of surfacing rock.

(b) Subgrade shall be crowned at 4 to 6 percent.

(c) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with specifications in the "Compaction and Processing Requirements" in this Exhibit. Final road surface shall be crowned at 4 to 6 percent.

The subgrade shall be approved by STATE prior to the application of rock.

Unless otherwise specified, full bench shall be required on all side slopes greater than 50%.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Tilden Switchback Road (D to E, Stationing 0+00 to 35+50)

Subgrade instructions:

0+00 to 2+50 Install a gate according to the specifications in Exhibit J.

0+00 to 20+50 Clear and grub. Clearing debris shall be piled on stable locations and end hauled where necessary. Piled or endhauled clearing debris shall be piled in a manor to facilitate burning. The piles shall be conical in nature.

On slopes greater than 50%, stumps shall be end hauled to a designated waste area shown on Exhibit A.

The subgrade shall be crowned at 3 to 6 percent with a 3' x 1' ditch.

Additional subgrade width shall be provided for offtracking around horizontal curves. See Offtracking table provided below.

Top of cut is approximately **10 feet horizontal distance** from posted Right-of-Way.

0+00 to 2+50 The subgrade may be balanced cut and fill construction.

2+50 to 20+50 The subgrade shall be full bench construction unless otherwise specified.

3+66 to 4+48 Stream crossing.

Install a 36" round pipe or equivalent. The pipe shall be able to withstand a max flow of 30 cfs. The gradient of the culvert shall be installed no less than 10 percent.

A bedding of crushed rock shall be placed to provide a wide band of support and to transmit the load from above evenly over the entire length of the culvert.

Backfill shall consist of crushed rock or clean job excavated soils. The backfill shall be compacted in 6" lifts, 1 culvert diameter each side of the culvert, using a hand tamping device

The outlet shall be armored with Riprap quality rock. A STATE representative shall determine the extent of the rock armoring.

3+66 to 4+48 Subgrade width shall be a minimum of 23 feet wide to accommodate offtracking at the horizontal curve.

Operator shall minimize the quantity of fill utilized in the stream crossing to establish grade. In the opinion of the STATE, any excess fill material shall be pulled back, or removed according to STATE supplied instructions.

The outer edge shall be built up using Rip Rap quality rock. The rock shall be keyed into bare mineral soil cleared from stumps, logs, or any debris. The Rip Rap quality rock may be obtained from STATE approved locations on STATE lands, or utilized from STATE approved road generated rock material, or purchased from a commercial source.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

5+15 to 5+86 Create an empty truck turnout left. The turnout shall be a minimum 25 feet in length and the subgrade shall be 30 feet wide at the curve. Width may be obtained from cutting into the bank and filling on the ridge, creating a mostly balanced cut and fill road prism.

10+14 to 10+96 Stream crossing.

Install a 30" round pipe or equivalent. The pipe shall be able to withstand a max flow of 20 cfs. The gradient of the culvert shall be installed no less than 10 percent.

A bedding of crushed rock shall be placed to provide a wide band of support and to transmit the load from above evenly over the entire length of the culvert.

Backfill shall consist of crushed rock or clean job excavated soils. The backfill shall be compacted in 6" lifts, 1 culvert diameter each side of the culvert, using a hand tamping device

The outlet shall be armored with Riprap quality rock. A STATE representative shall determine the extent of the rock armoring.

10+14 to 10+96 Subgrade width shall be a minimum of 23 feet wide to accommodate offtracking at the horizontal curve.

Operator shall minimize the quantity of fill utilized in the stream crossing to establish grade. In the opinion of the STATE, any excess fill material shall be pulled back, or removed according to STATE supplied instructions.

The outer edge shall be built up using Rip Rap quality rock. The rock shall be keyed into bare mineral soil cleared from stumps, logs, or any debris. The Rip Rap quality rock may be obtained from STATE approved locations on STATE lands, or utilized from STATE approved road generated rock material, or purchased from a commercial source.

11+52 Cut depth at centerline is approximately 13.7 feet. The operator will have to slightly cut through the ridge to maintain grade and to minimize the horizontal curve through the crossing.

The operator shall daylight the cut through the ridge, by removing the outside edge to grade level. Approximate road width after daylight will be 30 feet plus a 3 foot ditch.

The additional width shall serve as an empty truck turnout.

13+02 to 13+57 Subgrade width shall be a minimum of 22 feet wide to accommodate offtracking plus a 3 foot ditch at the horizontal curve.

16+14 to 17+25 Subgrade width shall be a minimum of 21 feet wide to accommodate offtracking plus a 3 foot ditch at the horizontal curve.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

20+50 to 35+50	The subgrade shall be standard balance cut fill construction.
	The subgrade shall be crowned at 3 to 6 percent with a 3'x1' ditch.
	Operator shall utilize ditchouts where feasible.
	Clear and grub. Clearing debris shall be piled on stable locations. Clearing debris shall be piled in a manor to facilitate burning. The piles shall be conical in nature.
	Stumps may be piled in openings and gaps in stable locations.
20+50 to 25+50	Operator shall construct an empty truck turn around where feasible.
	Operator shall construct a turnout where feasible.
25+50	Construct a Landing. Landing shall be a minimum 50 ft by 50 ft.
35+50	Construct a Landing. Landing shall be a minimum 50 ft by 50 ft.

Rocking instructions for Tilden Switchback Rd (D to E):

0+00 to 20+50	Apply a compacted depth of 6" of 3"-0" base rock and 3" of 3/4"-0" cap rock.
	The running surface shall be crowned at 3 to 6 percent.
	Apply additional rock for offtracking around the curves.
	Apply 10 Cu. Yds of 3"-0" rock per turnout.
20+50 to 35+50	Apply a compacted depth of 6" of 3"-0" base rock and 2" of 1 1/2"-0" cap rock.
	The running surface shall be crowned at 3 to 6 percent.
	Apply 10 Cu. Yds. of 3"-0" rock per turnout/turnaround.
25+50	Apply 40 Cu. Yds. of Jaw Run quality rock at landing.
35+50	Apply 40 Cu. Yds. of Jaw Run quality rock at landing.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS:

(1) Timber Removal. Remove all trees within posted Right-of-Way Boundary as specified in Section 2210, Designated Timber unless otherwise approved by STATE.

(2) Excavated Materials. Excavated materials shall be utilized for road and fill construction and hauled in where necessary. Surplus excavation materials shall be hauled to the waste areas as marked in the field and/or designated on Exhibit A. Waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with Exhibit F.

(3) Bank Slough Removal. Dig out all bank slough. Bank slough material shall not be pulled across existing surfacing rock, but shall be placed in nearby waste areas and uniformly sloped and compacted for drainage, as directed by STATE.

(4) Drainage Ditches. Restore or construct ditch lines, including ditchouts, as directed by STATE. Clean out all culvert inlets and outlets for a 10-foot radius. Re-establish or construct culvert sediment basins. Waste materials from drainage ditches and sediment basins shall not be pulled across existing surfacing rock, but shall be placed in nearby waste areas and uniformly sloped and compacted for drainage, as directed by STATE. Damaged culvert inlets and/or outlets shall be repaired by opening them with a hydraulic jack, or cutting off the culvert end to allow for free passage of water at peak flow levels. Install a culvert marker at each newly installed culvert and at each existing culvert that is missing a marker that could be reached by a grader blade.

(5) Subgrade Preparation and Application of Surfacing Rock.

(a) Complete culvert installations, drainage ditches, fill reconstruction, ditchouts, and other specified work prior to the application of new surfacing rock.

(b) Cut out all potholes and/or washboard sections from the existing surfacing.

(c) Apply required patching and leveling rock, as directed by STATE.

(d) Upon completion of above required work, apply, process, and compact surfacing rock in accordance to this Exhibit.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS:

San Antone Rd (Points A to C, 107.5 Stations):

- Grade and shape
  - Grade out all potholes by cutting and remixing the surface aggregate with the base aggregate to produce a smooth running surface
  - Re-establish drainage as needed.
  - Remove any slime, muck, brush, or debris from running surface.
  - Remove all berms.
  - Re-establish ditchlines and ditchouts where needed. Endhaul excessive ditch material were needed. This material shall include but not be limited to, bank slough, boulders, and organic debris.

- Apply Spot Rock. 200 Cu. Yds.
  - Apply the allocated spot rock as directed by STATE.
  - Spot rock may be used to re-inforce soft spots, pot holes, or for traction purposes.
  - Compact locations as directed by STATE.
  - Shall place a 2" lift of rock over the stream crossings. Total 5 crossings.
  - 1 1/2"-0" shall be used unless otherwise approved by STATE.

- Apply allocated landing rock as determined by STATE.

Surface improvement at Point B:

Remove the outslope super from the horizontal curve and reshape running surface into a crown running surface.

The STATE anticipates a combination of grading and shaping with surface replacement and compaction to establish a true crowned running surface.

Operator shall fill in the ditch between the two streams with Jaw Run type rock.

EXHIBIT D

Horizontal Curve Widening

Typical Stinger Steered with 40' Logs
Length (L) 31

Road	Horizontal Curve	Arc length	Delta "Δ"	Radius "R"	OFF TRACKING "OT"	Minimum Subgrade Width	Rock Total Cu. Yds
	Tilden Switchback rock depth equals 9 inches						
Tilden Switchback	3+66 to 4+48	82	94	50	9.4	23 ft	33
Tilden Switchback	5+15 to 5+86	72	82	50	8.9	30 ft	27
Tilden Switchback	10+14 to 10+96	82	104	45	10.8	23 ft	37
Tilden Switchback	13+02 to 13+57	55	63	50	7.9	22 ft	19
Tilden Switchback	16+14 to 17+25	111	91	70	6.8	21 ft	32
						Total	**150**

Equations

L = (L1^2-L2^2+L3^2)^(1/2)
OT=(R-(R^2-L^2)^(1/2)[1-exp(-0.015Δ(R/L)+0.216)]

PROOF CHECK

ODF MANUAL = 400/Radius

Off tracking totals are in addition to our minimum road surfacing requirement. Minimum surfacing requirement equals 12 feet, plus additional widths for offtracking, turnouts, etc.

EXHIBIT D

FULL BENCH AND END-HAUL REQUIREMENTS

ROAD	LOCATION	CONTAINMENT - SIDECAST	WASTE AREA LOCATION	WASTE AREA TREATMENT
Tilden Switchback	2+50 to 20+50	2	1, 2, 3, &4	According to specified instructions

Full Bench and End-Haul Areas General Requirements

Sidecast includes any road generated excess excavation material which is not essential as part of the road prism, is not compacted, and is below the roadway. Material shall not be sidecast unless specified above.

Clearing and grubbing debris shall be end-hauled where specified.

When controlled blasting is required, it shall be accomplished using timing devices, delayed charges, low intensity shots, or other suitable means to contain material within the road prism.

Containment/Sidecast

(1) Full: No excavated material remains below the road.

(2) Normal/Incidental: The amount of excavated material lost over the outside edge of the road shall not exceed 1 foot in depth.

Any amount of material that exceeds the containment requirements or in the opinion of the state deems excessive, shall be removed by whatever means necessary and end-hauled to a designated waste area.

Waste Area Location

(1) As shown on Exhibit A and as marked in the field.

(2) “San Antone” Waste Area 1

(3) “Landing” Waste Area 2

(4) “Stumps Only” Waste Area 3

EXHIBIT D

Specific Waste Area Instructions

San Antone Waste Area 1 as shown on Exhibit A:

Operator shall not drift material across existing road surfaces.

Waste material shall be placed in a uniform manor, the site shall be sloped for drainage, and the sides of all piles shall be sloped uniformly. The angle of repose of all fills shall be sloped no greater than 66% which is 1 1/2H: 1V. The top of all piles shall be sloped for drainage as approved by STATE.

When constructing Waste Area 1, allow enough space to the north for an approximate 50' x 50' landing. This landing will be used to facilitate yarding as estimated on the logging plan map.

Stumps shall be piled separately from general waste material.

Large organic debris such as logs and tops shall be piled separately from general waste material.

The operator shall block off all portions of the waste area by lining the waste area with stumps and debris at the conclusion of use.

At the conclusion of use, the operator shall rip/scarify all portions of the waste area that exhibit signs of compaction, the operator may be asked to fluff up portions of waste depending on the severity of compaction. The intent is to plant the waste area after the conclusion of this contract.

At the conclusion of hauling waste, the operator shall apply a compacted depth of 3"-0" rock for 6 stations through this portion.

All exposed soil shall be mulched unless otherwise approved by STATE. The mulch shall consist of straw free from weeds. The straw mulch should be placed at 1/2 to 1 inch thick requiring approximately 2 tons of mulch per acre.

Landing Waste Area 2 as shown on Exhibit A:

The operator shall construct a landing by utilizing 1,000 Cu. Yds. of clean waste.

The fill material is anticipated to be end dumped off the corner of the switchback as marked in the field.

The fill material shall be placed no closer than 10 feet from the posted right of way boundary.

Stumps shall be piled separately from the waste area. Stumps may be end dumped and piled on the fill slopes after the construction of the landing.

The landing shall be compacted using a vibratory roller.

Stumps Only Waste Area 3 as shown on Exhibit A:

The operator shall only waste stumps or large organic debris at specified waste area.

Large organic debris shall be piled in a manor to facilitate burning. The pile shall be piled conical in nature.

The STATE at any time shall reserve the right to halt or place limitations to the quantity of material placed at Waste area 3.

EXHIBIT E

ROAD SURFACING

ROAD	ROCK TYPE	SIZE OF ROCK	COMPACTED DEPTH	LOOSE TRUCK Cu. Yds./Sta	STATION TO STATION	TOTAL LOOSE TRUCK VOLUME
Tilden Switchback	Base	3"-0"	6"	33	0+00 to 35+50	1180
Tilden Switchback	Cap	3/4"-0"	3"	17	0+00 to 20+50	350
Tilden Switchback	Cap	1 1/2"-0"	2"	11	20+50 to 35+50	170
San Antone Rd	Cap	1 1/2"-0"	3"	17	Waste Area 1	100
TURNOUTS:				**NO. OF T.O.**	**LOCATION**	
Tilden Switchback	Base	3"-0"	6"	3	5+50, 11+50, 22+50	30
TURNAROUNDS:				**NO. OF T.A.**		
Tilden Switchback	Base	3"-0"	6"	1	Determined by STATE	10
LANDINGS AND JUNCTIONS:				**NO. OF LDGS.**	**LOCATION**	
Tilden Switchback	Landing	Jaw Run	6"	2	25+50 and 35+50	80
San Antone Rd	Landing	Jaw Run	6"	2	Determined by STATE	80
MISCELLANEOUS: (Riprap, drain rock, etc.)				**Cu. Yds.**	**LOCATION**	
Tilden Switchback	Curve Widening	3"-0"		150	Directed by STATE	150
Tilden Switchback	Energy Dissipator	Pit Run		60	Culvert Outlets	60
Tilden Switchback	Fill Armor	Riprap		200	Stream Crossings	200
San Antone Rd	Curve Widening	Jaw Run		20	Point B	20
San Antone Rd	Spot Rock	1 1/2"-0"		200	Determined by STATE	200

ROCK TOTALS	3"-0"	1 1/2"-0"	3/4"-0"	Jaw Run	Pit Run	Riprap
LOOSE TRUCK Cu. Yds.	1370	470	350	180	60	200

Depth measure shall be used to determine contract compliance.

EXHIBIT E

ROCK ACCOUNTABILITY

PURCHASER shall obtain subgrade approval from STATE prior to rocking. Rocking shall be limited to periods when weather conditions are acceptable to STATE and when sediment will not enter streams. Additional surfacing needed because of construction season or construction practice is not included in the preceding ROAD SURFACING table, and shall be furnished at PURCHASER expense.

Rock accountability shall be determined by the following methods, as directed by STATE. STATE shall be given 24 hours' notice prior to rocking.

Depth Measurement. Rock shall be spread and compacted according to the depths specified in Exhibit D. Truck measure volumes are given, but shall not limit the amount of rock spread.

Depth shall be determined in the most compacted area of the surface cross section. The depth of compacted aggregates shall not vary more than 1 inch from the depth specified in the “Road Surfacing” table in Exhibit D. The average depth for each road segment shall be the specified depth or greater. If additional rock is required because of insufficient depth, the locations and volumes to be added shall be determined by STATE.

Load Records. Notify STATE before spreading the rock and maintain a record of all rock delivered for spreading. Make the record available for STATE inspection. A report listing the amount of rock delivered weekly. However, depth measurement shall be used to determine contract compliance.

EXHIBIT E

DURABLE CRUSHED ROCK SPECIFICATIONS

Grading Requirements

For 3/4"-0”	Passing	1" sieve	100%
	Passing	3/4" sieve	90-100%
	Passing	3/8" sieve	55-75%
	Passing	1/4" sieve	40-60%
	Passing	No. 10 sieve	20-40%
	Passing	No. 40 sieve	8-16%
For 1½"-0”	Passing	2" sieve	100%
	Passing	1½" sieve	90-100%
	Passing	3/4" sieve	60-90%
	Passing	1/4" sieve	30-50%
	Passing	No. 10 sieve	15-30%
	Passing	No. 40 sieve	7-15%
For 3"-0”	Passing	4” sieve	100%
	Passing	3" sieve	90-100%
	Passing	1½" sieve	60-90%
	Passing	3/4" sieve	40-60%
	Passing	1/4" sieve	20-40%
	Passing	No. 10 sieve	5-20%

JAW-RUN, PIT-RUN, and RIPRAP ROCK SPECIFICATIONS

For Jaw-Run	Passing	6" sieve	100%
	Passing	3” sieve	45-65%

For 24"-0” Pit-Run/Riprap A minimum of 50 percent of the material shall be larger than 12 inches, measured in one dimension.

Control of gradation shall be by visual inspection by STATE.

For 48"-24" Riprap Material shall be clean, well graded, and free of 2"-0" fines.

Control of gradation shall be by visual inspection by STATE.

EXHIBIT F

COMPACTION AND PROCESSING REQUIREMENTS

Moisture Content: Compaction must take place when moisture content of the materials being compacted is favorable for effective compaction as determined by STATE.

Compaction Pass: A pass is defined as traveling a road section forward and then backward over that same section.

Subgrade. Subgrade surfaces of the road segments listed below shall be graded and compacted prior to rocking. Compaction shall be accomplished by traveling all surfaces from shoulder to shoulder until the surface is smooth and hard and visible deformation ceases. At least 3 passes shall be made over the entire width and length of the road. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

Subgrade shall be crowned at 4 to 6 percent as specified in the “Forest Roads Specifications” table in Exhibit D.

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All new construction	(1) Vibratory Roller

Fills. Embankments and fills shall be placed in (approximately) horizontal layers not more than 8 inches in depth. Each layer shall be separately, and thoroughly, compacted. Compaction equipment shall be operated over the entire width of each layer until visible deformation of the layers ceases. At least 3 passes shall be made over the entire width and length of each layer.

Placing individual rocks or boulders with more depth than the allowed layer thickness shall be permitted, provided the embankment will accommodate them. Such rocks and boulders shall be at least 6 inches below the subgrade. They shall be carefully distributed and the voids filled with finer material, forming a dense and compacted mass. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
Tilden Switchback "20+50 to 35+50"	(1) Vibratory Roller

Crushed Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of crushed rock shall be moistened or dried to uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 6 inches in depth. When more than 1 layer is required, each shall be shaped and compacted before the succeeding layer is placed. Any irregularities or depressions that develop during compaction of the top layer shall be corrected by loosening the material at these places and adding or removing material until the surface is smooth and uniform. Each layer shall be compacted with a minimum of 3 passes over the entire width and length of the road until the surface is smooth and hard and visible deformation ceases. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

Rock shall be crowned at 4 to 6 percent as specified in the “Forest Roads Specifications” table in Exhibit D.

EXHIBIT F

COMPACTION AND PROCESSING REQUIREMENTS

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
Tilden Switchback Road, Point B San Antone Road at Waste Area 1	(1) Vibratory Roller

COMPACTION EQUIPMENT OPTIONS

(1) Vibratory Rollers. The drum shall have a smooth surface, a diameter not less than 48 inches, a width not less than 58 inches, and a turning radius of 15 feet or less. Vibration frequency shall be regulated in steps to 1400, 1500, and 1600 VPM, corresponding to engine speeds of 1575, 1690, and 1800 RPM. The centrifugal force developed shall be 7 tons at 1600 VPM. It shall be activated by a power unit of not less than 25 horsepower. The vibratory roller shall be self-propelled and operated at speeds ranging from 0.9 miles to 1.8 miles per hour, as directed by STATE.

(2) Vibratory Hand-Operated or Backhoe-Mounted Tamper. Vibratory hand-held or hydraulic tampers shall be used for compaction of backfill materials around culverts (and/or bridge approach embankment materials around abutments). The tamper shoe dimensions shall be a minimum of 10" X 13" and capable of a centrifugal force of 2,250 pounds.

EXHIBIT G

CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the Contract.

Culverts shall be constructed of corrugated aluminized (Type 2) steel.

Aluminized (Type 2) steel culverts shall meet the requirements of AASHTO M-36-03[1].

Culverts shall be located according to the alignment and grade as shown on the Plan and Profile, and/or as staked in the field, or as specified in special instructions.

The STATE Representative shall determine final culvert locations and stake the locations in the field prior to installation.

Cross drain culverts on road grades in excess of 3 percent shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low point of dips in roads shall not be skewed.

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3 percent or greater than 10 percent.

The foundation and trench walls for all culverts shall be free from logs, stumps, limbs, stones, and other objects which would dent or damage the culvert. The culvert trench shall be excavated 3 culvert diameters wide to permit compaction and working on each side of the culvert. Tamping shall be done in 6-inch lifts, 1 culvert diameter each side of the culvert. Bedrock shall be excavated as required to provide a uniform foundation for the full length of the culvert.

A bedding of crushed rock as specified shall be placed to provide a wide band of support and to transmit the load from above evenly over the entire length of the culvert for stream crossing culverts.

Backfill shall consist of, crushed rock, rock crusher reject, or job-excavated soil free of stumps, limbs, rocks, or other objects which would damage the culvert.

Transporting of the culvert shall be done carefully. Dragging or allowing free fall from trucks or into trenches shall not be permitted.

Minimum height of cover over top of culvert to subgrade when road is to be rocked shall be as follows: 12" for culverts 18” to 36” and 18” for culverts 42” to 96”. Minimum vertical cover for other designs shall be as specified by STATE.

Lengths of individual culvert sections shall be not less than 10 feet, unless otherwise provided for in special instructions.

The ends of each culvert shall be free of logs and debris which would restrict the free flow of water.

The intake end of relief culverts shall be provided with a sediment catching basin 3 feet in diameter at the bottom. The outlet end of any culvert which would allow water to erode embankment soil shall be provided with an energy dissipator. Construct lead-off ditches away from culvert outlets where the slope gradients restrict the free flow of water.

Compaction by tamping utilizing a Vibratory Hand-Operated or Backhoe-Mounted Tamper is required for all stream crossing culverts.

EXHIBIT G

CULVERT SPECIFICATIONS

All culverts removed or replacement shall become property of the PURCHASER and shall be removed from STATE land and hauled to an approved refuse site in the same project period in which replacement occurred.

The intake ends of culverts in fills less than 3 feet to the top of the culvert shall be marked by driving steel posts within 6 inches of the downgrade side. Posts shall be painted with a rust-resistant paint and be a minimum of 5 feet long, with the spade driven 2 feet into the ground.

A manufacturer's certification that the product was manufactured, tested, and supplied in accordance with this specification shall be furnished to STATE upon request.

Following are the minimum standard gauges for steel culvert and coupling bands. Some culverts may require different gauges and may be found in the culvert listing.

	Steel Culvert	Thickness			Band Widths (")	
Dia.	Gauge	Uncoated	Coated	Band Gauges	Annular	Helical
12-15	16	(0.0598")	(0.064")	16	7	12
18-24	16	(0.0598")	(0.064")	16	12	12
30-36	16	(0.0598")	(0.064")	16	12	12
42	14	(0.0747")	(0.079")	16	12	12
48	14	(0.0747")	(0.079")	16	24	24
54	14	(0.0747")	(0.079")	16	24	24
60	12	(0.1046")	(0.109")	16	24	24

Culverts larger than 60" in diameter shall have (3" x 1") corrugations.

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	GAUGE	ROAD	STATION
1	18	40	ACSP	16	Tilden Switchback	0+00
2	18	40	ACSP	16	Tilden Switchback	5+00
3	18	40	ACSP	16	Tilden Switchback	11+50
4	18	40	ACSP	16	Tilden Switchback	16+70
5	18	40	ACSP	16	Tilden Switchback	18+60
6	36	50	ACSP	16	Tilden Switchback	4+07
7	30	50	ACSP	16	Tilden Switchback	10+55

ACSP = Aluminized, CPP = Polyethylene, GCSP = Galvanized

All culvert lengths are approximate. The operator shall add or subtract length to ensure proper fit within the road prism or stream crossing.

EXHIBIT G

TYPICAL EMBEDDED ENERGY DISSIPATOR

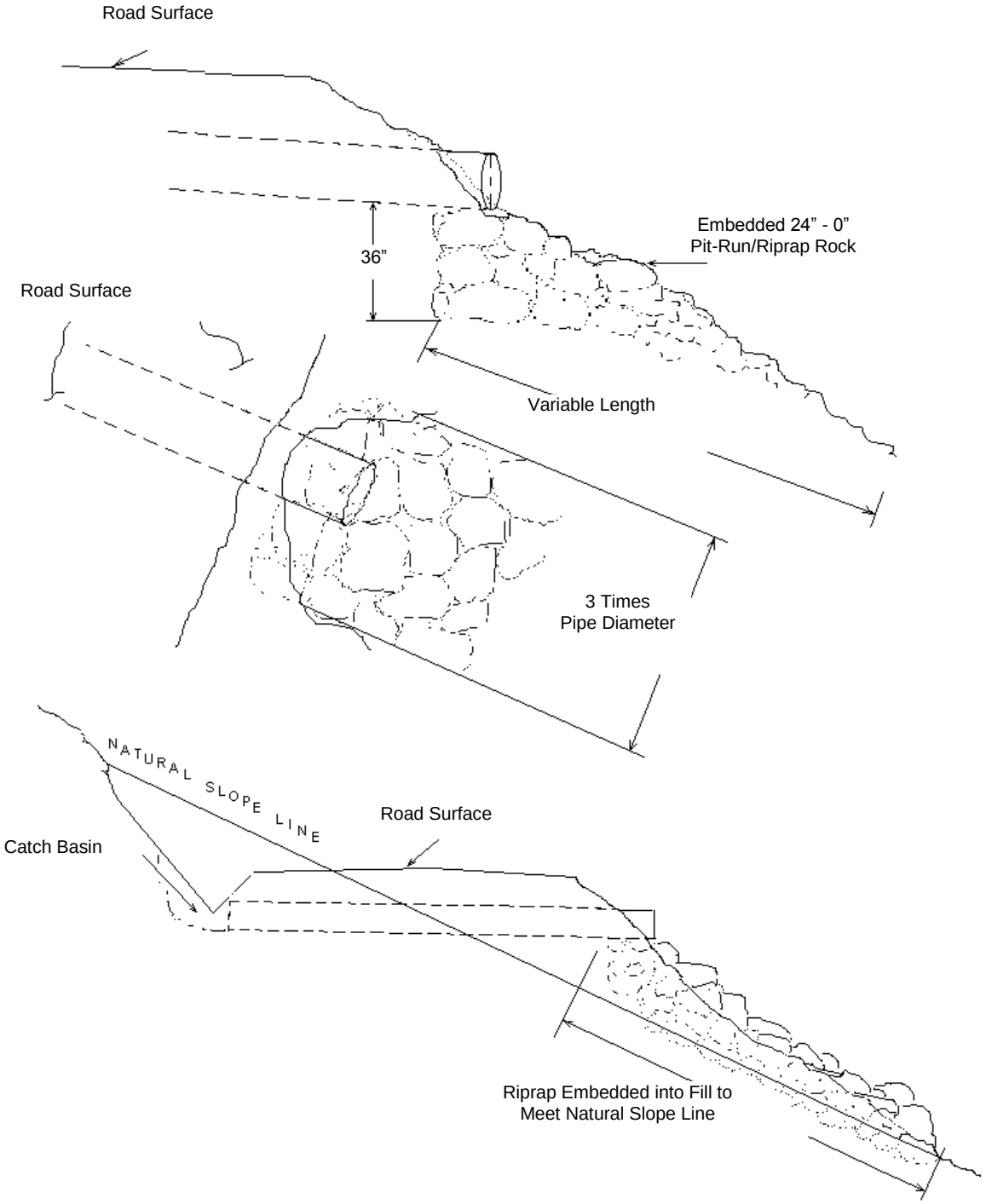


EXHIBIT H

GEOTEXTILE SPECIFICATIONS

GEOTEXTILE SPECIFICATIONS - shall be geotextile fabric designed for forest road subgrade surfacing purposes and shall meet or exceed the following requirements, unless otherwise approved in writing by STATE:

1.	Grab Tensile	200 lbs.	ASTM D4623;
2.	Puncture strength	90 lbs.	ASTM D4833;
3.	Mullen Burst	400 lbs.	ASTM D3786; and
4.	Width – 12.5 or 16 feet.		

INSTALLATION REQUIREMENTS - fabric shall be installed according to the following requirements:

1. Subgrade surface shall be leveled and smoothed to remove humps and depressions which exceed 6 inches in height and depth. Small pieces of woody debris shall be removed. Light vegetation (grass, weeds, leaves, and fine woody debris) may be left in place.

2. Fabric shall be installed directly on the prepared surface. Longitudinal and traverse joints shall be overlapped at least 3 feet.

3. Surfacing course material shall be placed to the designated thickness in one lift and spread in the direction of fabric overlap. Hauling and spreading equipment shall not be operated on the fabric until the total thickness of surfacing course material is placed.

4. Torn, punctured, or separated sections of the fabric shall be repaired by installing a fabric patch over the break prior to placing the surfacing course material. The patch shall be at least 4 feet larger in horizontal dimensions than the break to be repaired.

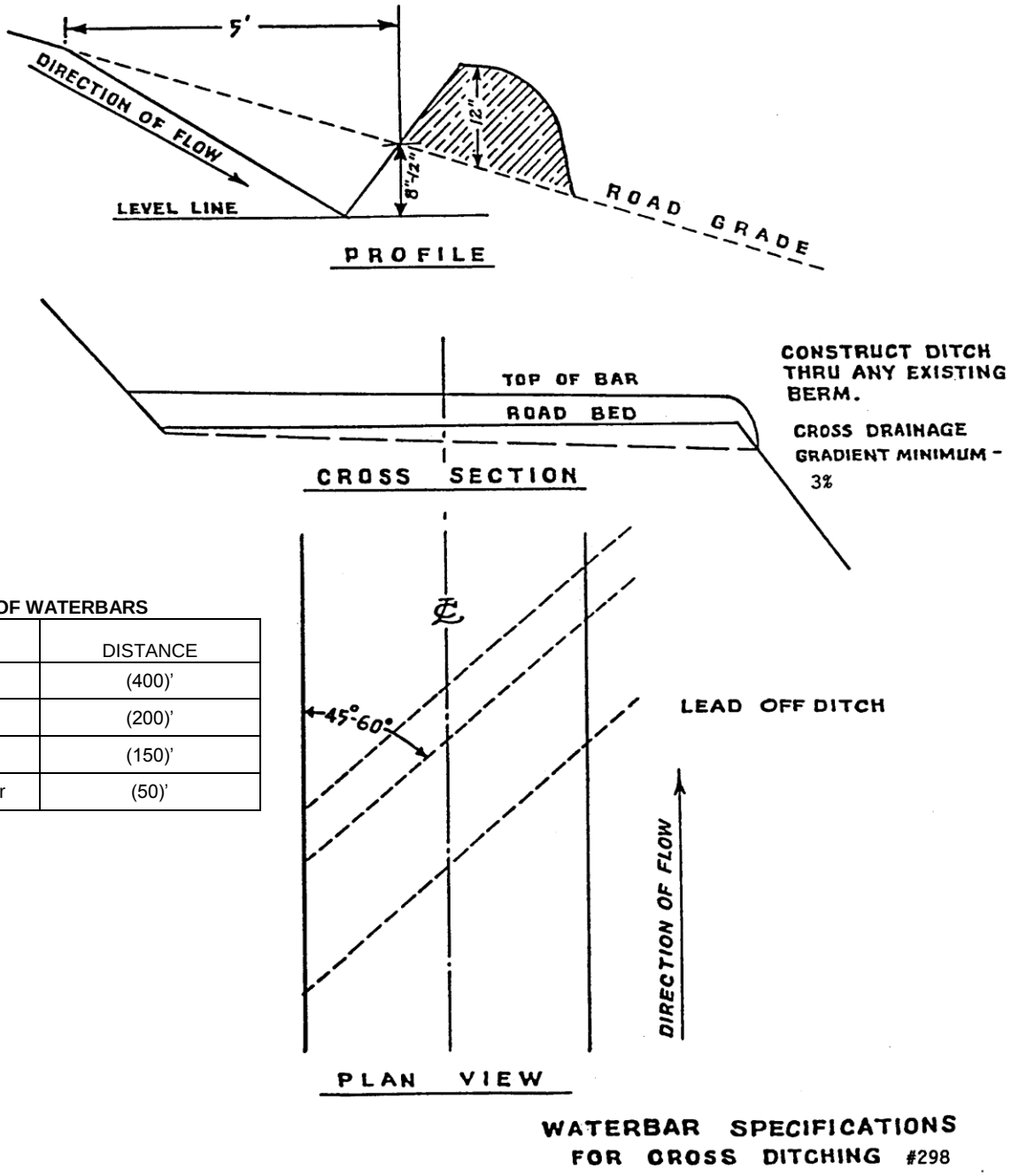
5. Fabric failures resulting after rock placement and as evidenced by subgrade pumping or roadbed distortion shall be corrected. Correction measures shall consist of: (1) removing at least three-quarters the depth of surfacing course material in the affected area, (2) placing a fabric patch over the affected area with a minimum 4-foot overlap around the circumference of the area, and (3) replacing enough rock to cover the patch and blend in with the rest of the road.

6. Should STATE determine that installation of woven fabric on roads or portions of roads is not necessary, PURCHASER shall deliver an equivalent amount of woven road fabric to STATE.

7. Fabric locations: Logger Option Spur if constructed.

EXHIBIT I

WATERBAR SPECIFICATIONS

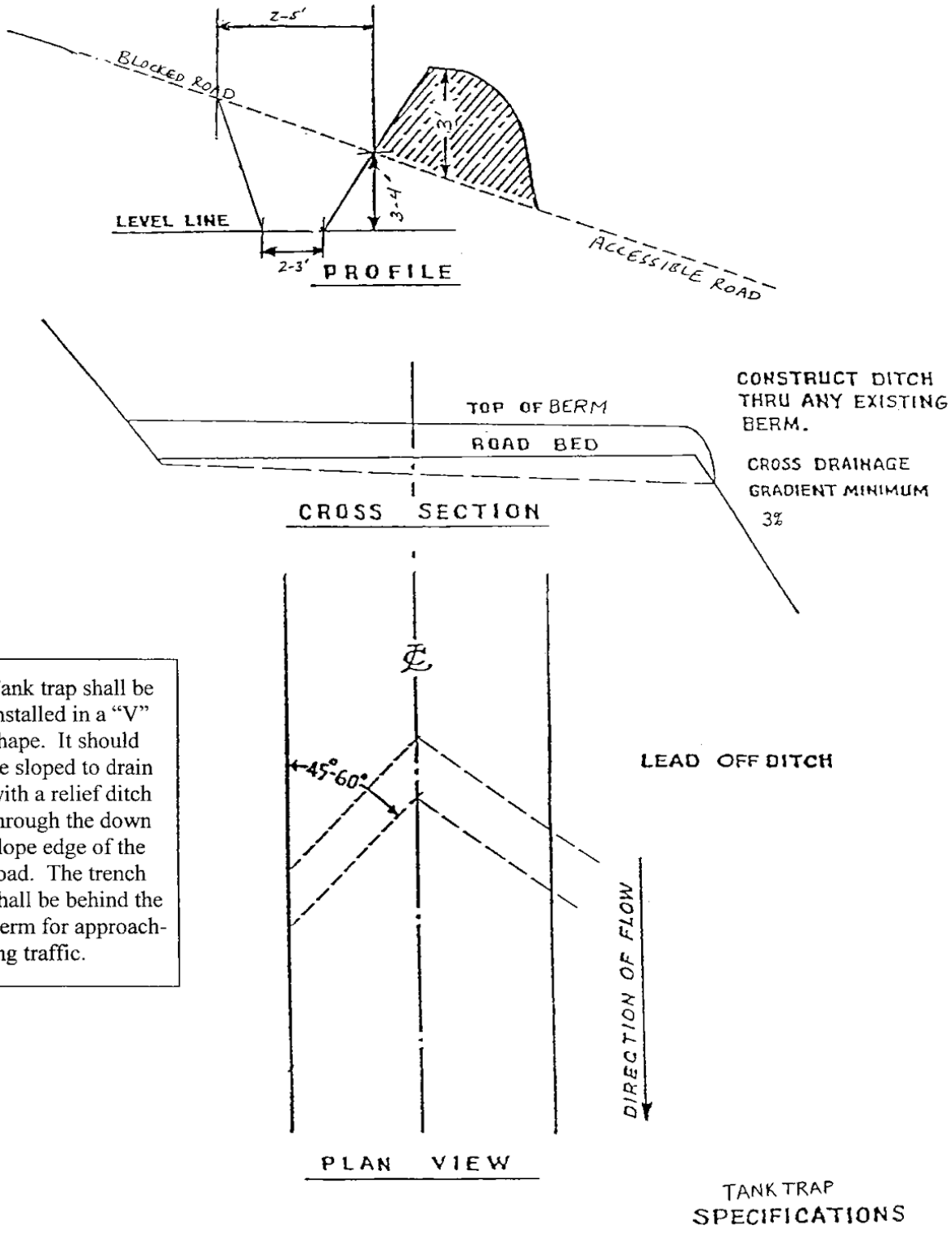


SPACING OF WATERBARS

ROAD GRADE	DISTANCE
≤ 5%	(400)'
6-10%	(200)'
11-15%	(150)'
16-20% or greater	(50)'

EXHIBIT I

TANK TRAP SPECIFICATIONS



Tank trap shall be installed in a "V" shape. It should be sloped to drain with a relief ditch through the down slope edge of the road. The trench shall be behind the berm for approaching traffic.

TANK TRAP SPECIFICATIONS

PART IV: OTHER INFORMATION

OREGON DEPARTMENT OF FORESTRY
Western Lane District

Written Plan

Tilden Switchback
341-18-108

Portions of Section 29, T17S, R08W, W.M.

Protected Waters: Non-fish tributary streams to San Antone creek.

Activity: Constructing a road on high landslide hazard locations.

Protection Measures:

Road Construction:

- Full bench construction will be required on all slopes greater than 50%.
- Waste material will be hauled to an approved waste site suitable for the type and quantity of material.
- The subgrade shall be crowned with a 3'x 1' ditch on all portion of road.
- Cross drain culverts will be placed in competent locations avoiding headwalls, critical locations, or areas of concern.
- All outlets will be armored with an energy dissipater to minimize erosion.
- Stream crossings will be armored with Riprap quality rock to minimize the potential of erosion.
- The road will be constructed in a manner that minimizes the length of new construction traversing through classified high landslide hazard locations by, accessing the ridge as soon as possible and avoiding critical locations as best as possible.

Prepared By: Chad Howard
Natural Resource Specialist

Date: January 23, 2018