Oregon Department of Forestry
2600 State St Salem OR 97310
PART III: EXHIBITS

EXHIBIT B
TIMBER SALE OPERATIONS PLAN

(See page 2 for instructions)

Date Received by State: _____

(5) State Brand Information (Complete)

(1) Contract Number: AT-341-2025-W01071-01

(2) Sale Name: Ebsen Jarvie Thin

(3) Contract Expiration Date: 10/31/2027

(4) Purchaser Name: _____

(6) State Representatives:

Name	Circle One	Phone No.	Cell No.	Alt Phone
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			

(7) Purchaser Representatives:

Name	Circle One	Phone No.	Cell No.	Alt Phone
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			

(8) Name of Subcontractors and Start Dates:

Project No.	Subcontractor Name.	Start Date	Completion Date	Cell No.	Alt Phone

	Subcontractor Name.	Start Date	Cell No.	Alt Phone
FELLING				
YARDING				

(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.

Oregon Department of Forestry
2600 State St Salem OR 97310
PART III: EXHIBITS

EXHIBIT B
INSTRUCTION SHEET FOR OPERATIONS PLAN

SUBMIT ONE COPY OF PLAN 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 including without limitation PURCHASER'S independent obligation to avoid take of a T&E species and PURCHASER'S obligation to comply with terms and conditions of any incidental take Permit(s) that include required minimization and mitigation measures in any applicable Habitat Conservation Plan. 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.

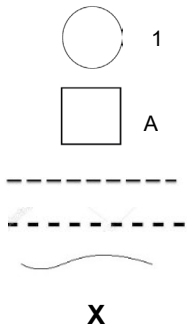
(7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.

(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.

(9) 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 required by the timber sale contract. Provide spur road specifications
3. Locations of proposed tractor yarding roads. Show if and how marked on the ground.
4. Locations 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.

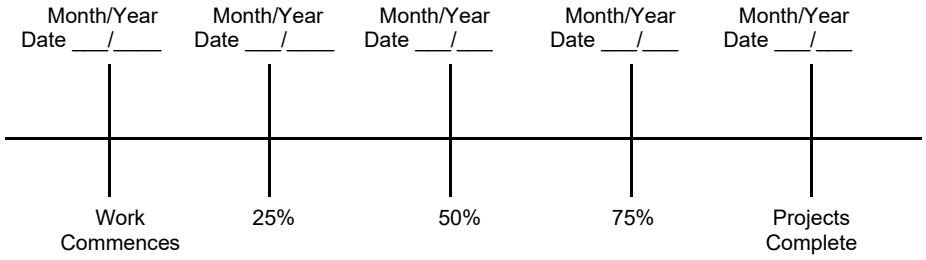
Temporary stream crossings.

Oregon Department of Forestry
2600 State St Salem OR 97310
PART III: EXHIBITS
EXHIBIT B
OPERATIONS PLAN

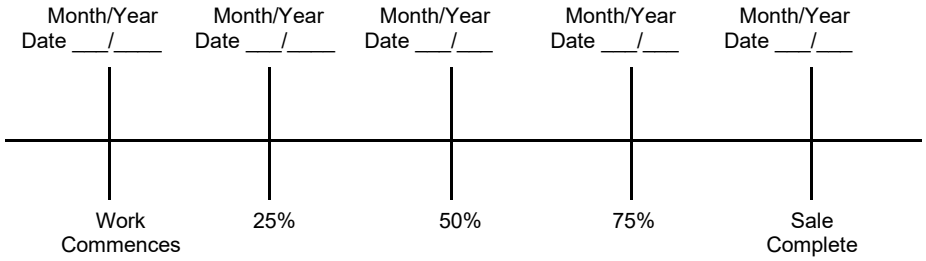
Completion Timeline

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



Harvest & Other Requirements



The Federal 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 or that the plan is consistent with the terms and conditions of any applicable incidental take Permit(s) including any required minimization and mitigation measures proposed in the applicable Habitat Conservation Plan. As provided in the timber sale contract, PURCHASER's must comply with all applicable state, federal, and local laws, including without limitation any Permit(s) issued thereunder.

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 _____

Oregon Department of Forestry

EXHIBIT C - SAWMILL GRADE (WESTSIDE SCALE)
SCALING INSTRUCTIONS - LOCATION APPROVAL - BRAND INFORMATION
Astoria - NWOA

(1) ORIGINAL REGISTRATION ☐ Date _____
REVISION NUMBER 000 ☐ Date _____
CANCELLATION ☐ Date _____

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

(3) FROM: Astoria Phone (503) 325-5451
(State Forestry District)
Address: 92219 HWY 202
ASTORIA,OR 97103

(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:
Use Region 6 actual taper rule. Logs over 40'.

	YES	NO
(7) Weight Scale Sample	☐	☑

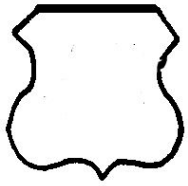
(8) **APPROVED SCALING LOCATIONS** (as shown on the ODF Approved Locations web-site)	**Species**	**Yard**	**Truck**	**Weight**

(9) **SALE NAME:** Ebsen Jarvie Thin
COUNTY: Clatsop

(10) **STATE CONTRACT NUMBER:**
AT-341-2025-W01071-01

(11) STATE BRAND REGISTRATION NUMBER:

(12) **STATE BRAND INFORMATION:**



(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:**

"Mule Trains"
1. Loads are required to have load tickets for each set of bunks.
2. If truck and pup are to be weighed, weigh and process separately for gross and tare weights.

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.
General Distribution: TPSO, Approved Scaling Locations and Purchaser.

Oregon Department of Forestry
EXHIBIT C - SAWMILL GRADE
INSTRUCTIONS FOR EXHIBIT C
Astoria - NWOA

(1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires logging and hauling to be complete, recall branding hammers.

(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
2560 NW Medical Park Drive, OR 97471
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: yamhilllog@frontier.com

Northwest Log Scalers Inc.
6137 NE 63rd St, Vancouver, WA, 98661
Phone: (360) 553-7212 ext. 4 Fax:(360) 553-7213
Email: info@nwlogscalers.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 specifies 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: https://apps.odf.oregon.gov/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 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. Signatures not required on revisions.

Oregon Department of Forestry
EXHIBIT C - PULP SORT
PROCESSING INSTRUCTIONS - LOCATION APPROVAL
BRAND INFORMATION

Astoria, NWOA

(1) ORIGINAL REGISTRATION ☐ Date _____

REVISION NUMBER 000 ☐ Date _____

CANCELLATION ☐ Date _____

(2) TO: _____

(Approved Pulp Processing Facility)

(3) FROM: Astoria Phone (503) 325-5451
(State Forestry District)

Address: 92219 HWY 202

ASTORIA,OR 97103

(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

- Submit data files daily (or each day of activity).
- Mail or deliver scale tickets weekly to ODF Headquarters in Salem.

(9) **SALE NAME:** Ebsen Jarvie Thin

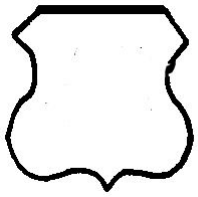
COUNTY: Clatsop

(10) **STATE CONTRACT NUMBER:**

AT-341-2025-W01071-01

(11) STATE BRAND REGISTRATION NUMBER: _____

(12) STATE BRAND INFORMATION:



(13) **REMARKS:**

"Mule Trains"

1. Loads are required to have load tickets for each set of bunks.
2. Truck and pup are to be weighed and processed separately for gross and tare weights.

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.

General Distribution: TPSO, Approved Scaling Locations and Purchaser.

Oregon Department of Forestry
EXHIBIT C - PULP SORT
INSTRUCTIONS FOR EXHIBIT C

Astoria, NWOA

(1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires logging and hauling to be complete, recall branding hammers.

(2) Approved Pulp Processing Facility. Write in as written in the Approved Log Delivery Location
https://apps.odf.oregon.gov/Divisions/management/asset_management/scalinglocation.asp

(3) State District office, address and phone.

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

(5) 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
2560 NW Medical Park Drive, Roseburg, OR 97471
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: yamhilllog@frontier.com

Northwest Log Scalers Inc.
6137 NE 63rd St, Vancouver, WA, 98661
Phone: (360) 553-7212 ext. 4 Fax:(360) 553-7213
Email: info@nwlogscalers.com

(6) 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) 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 (13).

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

(14) Require purchaser to sign and date completed form in addition to State Forester Representative, sign and print name on the form. Signatures not required on revisions.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DRAINAGE
16 feet	N/A	1A to 1B	0+00 to 11+80	Crowned/Ditch
16 feet	14 feet	1C to 1D	0+00 to 1+50	Crowned/Ditch
16 feet	14 feet	5A to 5B	0+00 to 0+50	Crowned/Ditch
16 feet	12 feet	6A to 6B	0+00 to 6+50	Crowned/Ditch
16 feet	12 feet	6C to 6D	0+00 to 2+90	Crowned/Ditch
16 feet	12 feet	I1 to I2	0+00 to 270+95	Crowned/Ditch
16 feet	12 feet	I3 to I4	0+00 to 106+65	Crowned/Ditch
16 feet	12 feet	I5 to I6	0+00 to 3+90	Crowned/Ditch
16 feet	12 feet	I7 to I8	0+00 to 15+40	Crowned/Ditch
16 feet	12 feet	I9 to I10	0+00 to 1+20	Crowned/Ditch
16 feet	12 feet	I11 to I12	0+00 to 25+75	Crowned/Ditch
16 feet	12 feet	I13 to I14	0+00 to 168+80	Crowned/Ditch
16 feet	12 feet	I15 to I16	0+00 to 11+20	Crowned/Ditch
16 feet	12 feet	I17 to I18	0+00 to 3+60	Crowned/Ditch
16 feet	12 feet	I19 to I20	0+00 to 171+00	Crowned/Ditch
16 feet	12 feet	I21 to I22	0+00 to 20+15	Crowned/Ditch
16 feet	12 feet	I23 to I24	0+00 to 7+70	Crowned/Ditch
16 feet	12 feet	I25 to I26	0+00 to 1+40	Crowned/Ditch
16 feet	12 feet	I27 to I28	0+00 to 43+80	Crowned/Ditch
16 feet	12 feet	I29 to I30	0+00 to 8+20	Crowned/Ditch
16 feet	12 feet	I31 to I32	0+00 to 4+00	Crowned/Ditch
16 feet	12 feet	I33 to I34	0+00 to 6+00	Crowned/Ditch
16 feet	12 feet	I35 to I36	0+00 to 23+70	Crowned/Ditch

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.

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

CLEARING CLASSIFICATION.

New Construction - Where clearing limits have not been marked, the clearing limits shall extend 5 feet back of the top of the cutslope and 5 feet out from the toe of the fill slope, or as directed by STATE.

Improvement - Where clearing limits have not been marked, the clearing limits shall extend 5 feet back of the top of the cutslope and 10 feet out from the toe of the fill slope, or as directed by STATE.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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 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. Clearing and grubbing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing and grubbing debris shall be left in a stable location, and not left lodged against standing trees. Clearing and grubbing debris may be scattered through openings in the timber outside of the cleared right-of-way, except for the following areas where debris shall be fully contained and hauled to a designated waste area:

- Where end-haul is required
- On side slopes exceeding 50 percent
- On unstable areas
- In any stream channel (Type F, N or D) or where material may enter the stream channel.

Clearing, grubbing, and associated disposal shall be completed prior to subgrade approval.

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 between points (I3 to I4 44+05 to 46+25).

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.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

DRAINAGE

Subgrade. Subgrade shall be crowned, outsloped, or insloped 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 50 feet, or as staked on the ground, plus 25-foot approaches at each end.

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

SLOPES	Cut Slopes	Fill Slopes
Solid Rock	Vertical to ¼ :1	
Fractured Rock	½ :1	
Soil - side slopes 50% and over	¾ :1	1½:1
Soil - side slopes less than 50%	1 :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 crowned 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 1, 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 or individually marked with an orange "C", 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. Excess excavated material not used for embankment shall be sidecast on slopes up to 50 percent.

(3) Drainage Ditches. Construct ditchlines, including ditchouts, as directed by STATE. Cut slopes of ditchlines and ditchouts shall not exceed a 1:1 slope. Construct culvert sediment basins. Waste materials from drainage ditches and sediment basins shall be placed in nearby waste areas and uniformly sloped and compacted for drainage, as directed by STATE.

(4) Rock Ditch Filter. Construct rock ditch filters as directed by STATE. Excavate a one foot deep, tapered sump on the upslope side, adjacent to the rock ditch filter. Excavated material shall be hauled to the designated waste areas as marked in the field and/or designated on Exhibit A. Waste materials shall be sloped and compacted for drainage. Construct each rock ditch filter with clean drain rock (6"-4" pit-run rock) and placed at a 2:1 slope within the specified ditch. Construct the center of the rock ditch filter at least 6 inches lower than the ends, to act as a spillway for runoff and to prevent water from flowing around the filter. Space the filters so that the bottom elevation of the upper filter is the same as the top center elevation of the next filter. Rock ditch filter dimensions shall be as shown on the "Typical Rock Ditch Filter" exhibit or as directed by STATE. Locations of the filters shall be determined by STATE.

(5) Culvert Installation. Culverts in live streams shall be installed with the inlet and outlet on grade with the stream bottom, unless otherwise specified in writing. Fill construction backfill shall consist of select materials and may be obtained from borrow pits, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with this Exhibit. STATE may require the use of crushed rock for culvert bedding.

(6) 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 H.

(7) Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic-yard, track-mounted excavator.

(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, outsloped, or insloped 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, outsloped, or insloped at 4 to 6 percent.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description
1A to 1B	4+40	Construct turnaround.
	8+30	Construct turnaround.
1C to 1D	0+00	Begin 14-foot-wide rock surfacing.
	1+50	Construct landing.
5A to 5B	0+00	Begin 14-foot-wide rock surfacing.
	0+50	Construct landing.
6A to 6B	6+50	Construct landing.
6C to 6D	2+90	Construct landing.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL IMPROVEMENT, SURFACE ROCK REPLACEMENT AND ROAD MAINTENANCE INSTRUCTIONS:

(1) Timber Removal. Remove all trees within posted Right-of-Way Boundary or individually marked with an orange "C", as specified in Section 2210, Designated Timber.

(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. Surplus excavated materials and waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with this Exhibit. Excess excavated material not used for embankment shall be sidecast on slopes up to 50 percent or end hauled to waste areas as shown on Exhibit A and marked in the field.

(3) Culvert Replacement, Culvert Installation, Fill Reconstruction, and Fill Removal. Existing culvert geometry shall be modified to provide for optimum drainage and culvert performance. Modifications may include, skewing the culvert and/or installing the culvert at gradients equal to or exceeding the drainage (or ditch) gradient. Where fill reconstruction or culvert replacement is specified, fills shall be excavated to natural stream course levels. All woody debris encountered during fill excavation shall be removed. Fill reconstruction backfill shall consist of select materials and may be obtained from borrow pits, as directed by STATE. Unsuitable backfill material shall be hauled to the designated waste areas as marked in the field and/or designated on Exhibit A. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with this Exhibit.

(4) Culvert Cleaning and Repairs. Remove all debris from inside all existing culverts on the road improvement segment, 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.

(5) Drainage Ditches. Restore or construct ditchlines, including ditchouts, and remove debris from cutbanks, fill slopes and the road prism, 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, cutbanks, fill slopes and the road prism shall not be pulled across existing surfacing rock, but shall be placed in nearby waste areas.

(6) Rock Ditch Filter. Construct rock ditch filters as directed by STATE. Excavate a one foot deep, tapered sump on the upslope side, adjacent to the rock ditch filter. Excavated material shall be hauled to the designated waste areas as marked in the field and/or designated on Exhibit A. Construct each rock ditch filter with clean drain rock (6"-4" pit-run rock) and placed at a 2:1 slope within the specified ditch. Construct the center of the rock ditch filter at least 6 inches lower than the ends, to act as a spillway for runoff and to prevent water from flowing around the filter. Space the filters so that the bottom elevation of the upper filter is the same as the top center elevation of the next filter. Rock ditch filter dimensions shall be as shown on the "Typical Rock Ditch Filter" exhibit or as directed by STATE. Locations of the filters shall be determined by STATE.

(7) 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 H.

(8) Sidecast Pullback. Excavate/pullback previously sidecast materials below the road at designated locations. Developed slopes shall be pulled back to a 1½:1 slope or to natural ground contours. The beginning position for sidecast pullback shall be no greater than 20 feet vertical distance from the existing road surface, in accordance with this Exhibit. Sidecast material remaining greater than 20 feet below the road shall be tapered and sloped for drainage.

(9) Sod Removal. Remove/separate sod from crushed rock surfacing as directed by STATE. Sod material shall be scattered in stable locations through openings in the timber outside of the cleared right-of-way. In areas where sod cannot be scattered in a stable location, material shall be end hauled to designated waste areas as shown on Exhibit A, or other stable locations as directed by STATE.

(10) Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic yard, track-mounted excavator.

(11) Waste areas shall be uniformly sloped and compacted for drainage. Designated Waste materials shall be seeded and mulched in accordance with specifications in Exhibit L.

(12) 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) Process (grade and mix) the existing surface and added base rock. Provide for a crown, outslope, or inslope of 4 to 6 percent, and compact in accordance to the “Compaction and Processing Requirements” in this Exhibit.

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

(f) Spot grading and, shape, and ditch: Includes items (a), (b), and (c) above. Provide for a crown, outslope, or inslope of 4 to 6 percent. Compaction is not required unless specified in specific instructions.

SPECIFIC IMPROVEMENT, SURFACE ROCK REPLACEMENT AND ROAD MAINTENANCE INSTRUCTIONS

Segment	Station	Work Description
I1 to I2	0+00	Begin spot grading.
	7+60	Construct turnaround
	9+00	Begin three-inch lift of 1 ½”-0” crushed rock. End spot grading and begin grade, process, and compaction.
	11+00	End three-inch lift of 1 ½”-0” crushed rock. End grade, process, and compaction and begin spot grading.
	42+60	Begin three-inch lift of 1 ½”-0” crushed rock and ditch re-establishment. End spot grading and begin grade, process, and compaction.
	59+55	End three-inch lift of 1 ½”-0” crushed rock and ditch re-establishment. End grade, process, and compaction and begin spot grading.
	76+00	Replace existing culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	96+55	Begin three-inch lift of 1 ½”-0” crushed rock. End spot grading and begin grade, process, and compaction.

I1 to I2	98+90	End three-inch lift of 1 ½”-0” crushed rock. End grade, process, and compaction and begin spot grading.
	143+60	Repair culvert inlet.
	172+35	Begin three-inch lift of 1 ½”-0” crushed rock. End spot grading and begin grade, process, and compaction.
	185+50	End three-inch lift of 1 ½”-0” crushed rock. End grade, process, and compaction and begin spot grading.
	199+00	Begin three-inch lift of 1 ½”-0” crushed rock. End spot grading and begin grade, process, and compaction.
	208+70	End three-inch lift of 1 ½”-0” crushed rock. End grade, process, and compaction and begin spot grading.
	237+75	Install dissipator and fill armor on outlet of existing culvert.
	245+55	Replace existing culvert with 18”x40’ CPP, utilize 44 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
I3 to I4	0+00	Begin grade, process, and compaction.
	37+05	Install a series of three rock ditch filters.
	40+05	Install a series of three rock ditch filters on both sides of culvert inlet.
	44+05	Begin removing material from cutslope and ditch with excavator. Remove trees marked in accordance with this exhibit. Begin sidecast pullback and seed and mulch bare soils. Line free draining ditch with 4.5 oz. non-woven filtration cloth. Install 12-inch perforated culvert and utilize 2”-1” drain rock bedding and backfill. Begin cutslope buttressing, utilize 10 oz. non-woven filtration cloth and 24”-6” riprap rock for buttress material. Utilize geotextile fabric in accordance to Exhibit G and Exhibit M. Construct drivable ditch utilizing 4.5 oz.woven fabric and 4”-0” and 1 ½”-0” crushed rock. End haul waste to waste area as approved by STATE.
	46+25	End cutslope buttressing and drivable free draining ditch construction.
	52+85	Replace existing culvert with 24”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	53+65	Install disconnect culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker
	55+45	Replace existing culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	60+75	Install a series of three rock ditch filters in both ditchlines of the road.
	64+00	Install disconnect culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker
	77+20	Replace existing culvert with 18”x40’ CPP, utilize 44 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	80+60	Install a series of three rock ditch filters. Begin ditch re-establishment.
	92+35	Install culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	106+65	End ditch re-establishment.

I5 to I6	0+00	Begin sod removal.
	0+90	Install a series of three rock ditch filters on both sides of culvert inlet.
	3+90	End sod removal.
I7 to I8	0+00	Begin sod removal.
	15+40	End sod removal.
I9 to I10	0+00	Begin sod removal.
	1+20	End sod removal.
I11 to I12	10+55	Install a series of three rock ditch filters on both sides of culvert inlet.
I13 to I14	0+00	Begin spot grading.
	28+10	End spot grading. Begin subgrade prep and compaction.
	39+75	Replace existing culvert with 24”x50’ CPP, utilize 55 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker. Install a series of three rock ditch filters on both sides of culvert inlet.
	43+90	Replace existing culvert with 18”x40’ CPP, utilize 44 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	55+55	Construct turnaround.
	58+65	Replace existing culvert with 18”x40’ CPP, utilize 44 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	62+35	Replace existing culvert with 18”x50’ CPP, utilize 55 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	65+40	Replace existing culvert with 18”x50’ CPP, utilize 55 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	69+95	Replace existing culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	72+35	Install a series of three rock ditch filters.
	100+90	Replace existing culvert with 18”x40’ CPP, utilize 44 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	137+15	Replace existing culvert 18”x30’ CPP, utilize 44 cubic yards of 1 ½”-0” crushed rock for bedding and backfill, utilize 11 cubic yards of 24”-6” riprap for dissipator. Install culvert marker.
	152+20	Replace existing culvert with 18”x50’ CPP, utilize 55 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	161+00	Install disconnect culvert with 18”x30’ CPP, utilize 44 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker
	161+70	Replace existing culvert with 18”x40’ CPP, utilize 55 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
I15 to I16	7+65	Construct turnaround.
	10+20	Begin clearing and grubbing of landing. Remove trees marked in accordance with this exhibit.
	11+20	End clearing and grubbing of landing.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

I19 to I20	0+00	Begin clearing debris from road prism and ditchlines.
	66+80	Install a series of three rock ditch filters on both sides of culvert inlet and one at culvert outlet.
	91+25	Install culvert dissipator.
	130+50	Begin grade, process, and compaction.
	155+15	End grade, process, and compaction. Continue clearing debris from road prism and ditchlines.
I27 to I28	30+50	Install a series of three rock ditch filters in both ditchlines of the road.
I31 to I32	0+00	Begin sod removal. Begin clearing debris from road prism and ditchlines.
	2+20	Begin clearing and grubbing of ditchline. Remove trees marked in accordance with this exhibit. Begin ditch re-establishment.
	2+75	Construct turnaround
	4+00	End sod removal. End clearing and grubbing of ditchline. End ditch re-establishment.
I33 to I34	0+00	Begin sod removal. Begin clearing debris from road prism.
	6+00	End sod removal. End clearing debris from road prism
I35 to I36	0+00	Begin sod removal and ditch re-establishment.
	6+00	Replace existing culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill, utilize 11 cubic yards of 24”-6” riprap for dissipator. Install culvert marker.
	9+05	Clear and develop inside curve widening, utilize 44 cubic yards of 1 ½”-0” crushed rock.
	9+30	Construct turnaround.
	11+85	Install disconnect culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill, utilize 11 cubic yards of 24”-6” riprap for dissipator. Install culvert marker
	12+65	Replace existing culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill, utilize 11 cubic yards of 24”-6” riprap for dissipator. Install culvert marker.
	12+85	Install a series of three rock ditch filters.
	17+45	Construct turnaround.
	19+55	Install a series of three rock ditch filters.
	20+50	Replace existing culvert with 30”x50’ ACSP, utilize 55 cubic yards of 1 ½”-0” crushed rock for bedding and backfill, utilize 11 cubic yards of 24”-6” riprap for dissipator. Install culvert marker. End haul waste material to waste area at Tidewater Loop Stockpile Site.
	23+60	Replace existing culvert with 18”x30’ CPP, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.

EXHIBIT D

FULL BENCH AND END-HAUL REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT - SIDECAST
I3 to I4	44+05 to 46+25	1
I35 to I36	20+50	1

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.

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.

(3) Sidecast: Material shall be spread evenly below the road so that it does not build up behind trees, snags or other debris, and shall not exceed 3 feet in depth.

Any amount of material exceeding the containment requirements shall be removed by whatever means necessary and end-hauled to a designated waste area.

Waste Area Location

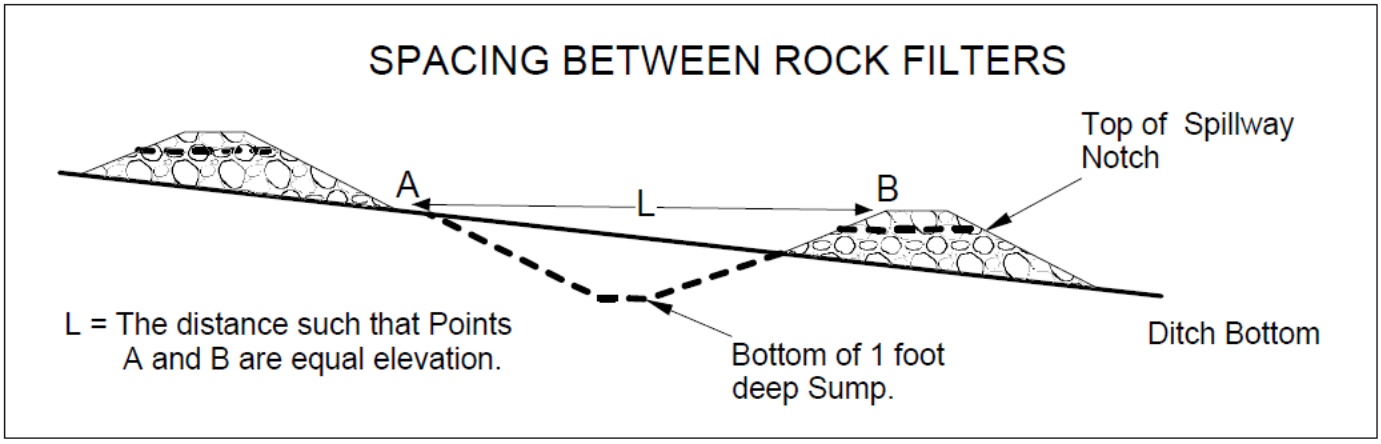
- As shown on Exhibit A and as marked in the field.
- Setback from slope break shall be a minimum of 20 feet horizontal measurement.

Waste Area Treatment

- Deposit at waste area, spread evenly, compact, and provide adequate drainage.
- Pile woody debris separate from other waste material.
- Mulch and seed all waste areas in accordance with Exhibit L.

EXHIBIT D

TYPICAL ROCK DITCH FILTER



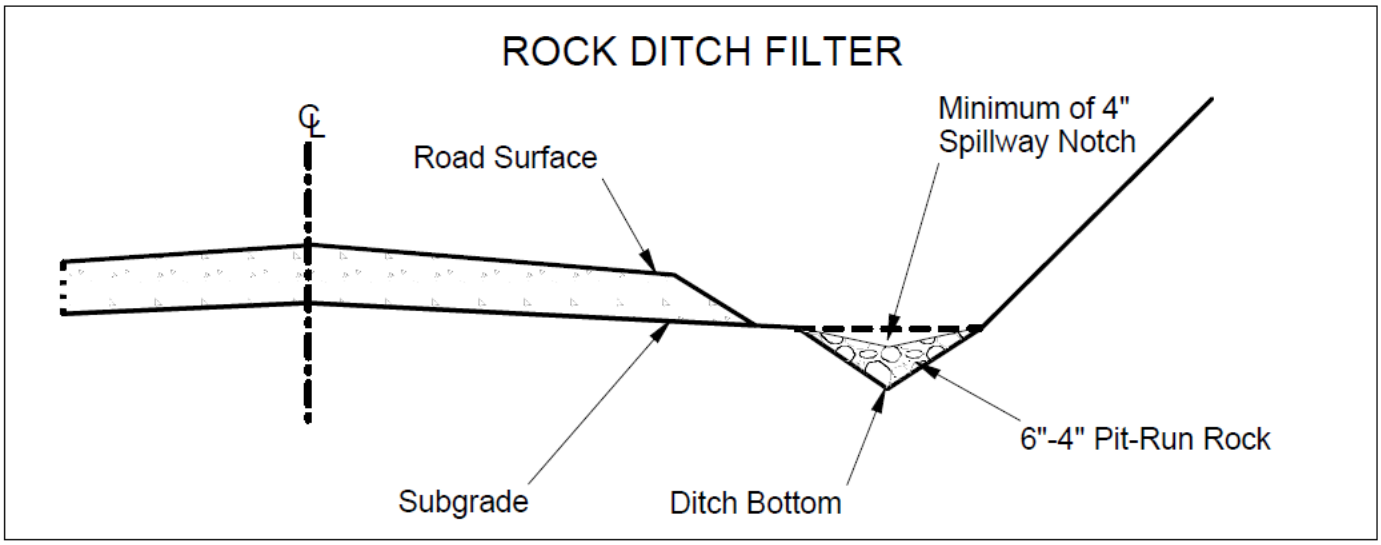


EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: 1A to 1B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1A to 1B		0+00 to 11+80		
				Volume (CY) Per		Number of		
Base Rock	4"-0" crushed	0+00 to 1+50	8	station	50	stations	1.50	75
Junction	1 1/2"-0" crushed	0+00	N/A	junction	22	junctions	1	22
Total Rock for Road Segment:				1A to 1B				97
ROAD SEGMENT: 1C to 1D				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	Rock Size and Type	Location	Depth of Rock (inches)	1C to 1D		0+00 to 1+50		
				Volume (CY) Per		Number Of		
Base Rock	6"-0" pit-run	0+00 to 1+50	12	station	86	stations	1.50	129
Landings	6"-0" pit-run	0+50	N/A	landing	77	landings	1	77
Total Rock for Road Segment:				1C to 1D				206
ROAD SEGMENT: 5A to 5B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	Rock Size and Type	Location	Depth of Rock (inches)	5A to 5B		0+00 to 0+50		
				Volume (CY) Per		Number of		
Base Rock	6"-0" pit-run	0+00 to 0+50	12	station	86	stations	0.50	43
Junction	4"-0" crushed	0+00	N/A	junction	22	junctions	1	22
Landings	6"-0" pit-run	0+50	N/A	landing	77	landings	1	77
Total Rock for Road Segment:				5A to 5B				142
ROAD SEGMENT: 6A to 6B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	Rock Size and Type	Location	Depth of Rock (inches)	6A to 6B		0+00 to 6+50		
				Volume (CY) Per		Number Of		
Base Rock	4"-0" crushed	0+00 to 6+50	10	station	63	stations	6.5	410
Junction	1 1/2"-0" crushed	0+00	N/A	junction	22	junctions	1	22
Turnouts	4"-0" crushed	3+85	N/A	turnout	33	turnouts	1	33
Landings	6"-0" pit-run	0+50	N/A	landing	88	landings	1	88
Total Rock for Road Segment:				6A to 6B				553
ROAD SEGMENT: 6C to 6D				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	Rock Size and Type	Location	Depth of Rock (inches)	6C to 6D		0+00 to 2+90		
				Volume (CY) Per		Number Of		
Base Rock	4"-0" crushed	0+00 to 2+90	10	station	63	stations	2.9	183
Junction	1 1/2"-0" crushed	0+00	N/A	junction	22	junctions	1	22
Landings	6"-0" pit-run	2+90	N/A	landing	88	landings	1	88
Total Rock for Road Segment:				6C to 6D				293

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I1 to I2				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I1 to I2		0+00 to 270+95		
				Volume (CY) Per		Number Of		
Junctions	1 1/2"-0" crushed	0+00, 109+50	N/A	junction	11	junctions	2	22
Turnaround	6"-0" pit-run	7+60	N/A	turnaround	55	turnarounds	1	55
Surfacing	1 1/2"-0" crushed	9+00 to 11+00, 42+60 to 59+55, 96+55 to 98+90, 172+35 to 185+50, 199+00 to 208+70	3	station	19	stations	44.15	839
Turnouts	1 1/2"-0" crushed	55+15, 56+90	N/A	turnout	11	turnouts	2	22
Culvert Bedding/Backfill	1 1/2"-0" crushed	76+00 (3), 245+45 (4)	N/A	load	11	loads	7	77
Surface Leveling Rock	1 1/2"-0" crushed	156+40, 160+90, 188+30, 237+55, 269+45	N/A	location	22	locations	5	110
Culvert Dissipator Rock	24"-6" riprap	237+55	N/A	load	11	loads	5	55
Fill Armoring	24"-6" riprap	237+55	N/A	load	11	loads	5	55
Total Rock for Road Segment:			I1 to I2					1,235
ROAD SEGMENT: I3 to I4				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I3 to I4		0+00 to 106+65		
				Volume (CY) Per		**Number Of**		
Junctions	1 1/2"-0" crushed	0+00	N/A	junction	11	junctions	1	11
Rock Ditch Filters	6"-4" pit-run	37+05, 40+50 (2), 60+75 (2), 80+60	N/A	3 filter series	11	3 filter series	6	66
Free Draining Ditch	2"-1" drainrock	44+05 to 46+25	N/A	load	11	loads	7	77
Buttress	24"-12" riprap	44+05 to 46+25	N/A	load	11	loads	7	77
Driveable Ditch Base Rock	4"-0" crushed	44+05 to 46+25	8	station	25	stations	2.2	55
Driveable Ditch Surface Rock	1 1/2"-0" crushed	44+05 to 46+25	4	station	11	stations	2.2	24
Culvert Bedding/Backfill	1 1/2"-0" crushed	52+85 (3), 53+65 (3), 55+45 (3), 77+20 (4), 92+35 (3)	N/A	load	11	loads	16	176
Surface Leveling Rock	1 1/2"-0" crushed		N/A	load	11	loads	5	55
Total Rock for Road Segment:			I3 to I4					541

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I5 to I6				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I5 to I6 Volume (CY) Per		0+00 to 3+90 Number Of		
Rock Ditch Filters	6"-4" pit-run	0+90	N/A	3 filter series	11	3 filter series	1	11
Total Rock for Road Segment:			I5 to I6					11
ROAD SEGMENT: I7 to I8				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I7 to I8 **Volume (CY) Per**		0+00 to 15+40 **Number Of**		
Surfacing	4"-0" crushed	0+00 to 15+40	4	station	25	stations	15.4	385
Turnouts	4"-0" crushed	2+75, 5+65	N/A	turnout	11	turnouts	2	22
Landings	6"-0" pit-run	15+40	N/A	landing	44	landings	1	44
Total Rock for Road Segment:			I7 to I8					451
ROAD SEGMENT: I9 to I10				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I9 to I10 **Volume (CY) Per**		0+00 to 1+20 **Number Of**		
Surfacing	4"-0" crushed	0+00 to 1+20	4	station	25	stations	1.2	30
Landings	6"-0" pit-run	1+20	N/A	landing	44	landings	1	44
Total Rock for Road Segment:			I9 to I10					74
ROAD SEGMENT: I11 to I12				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I11 to I12 **Volume (CY) Per**		0+00 to 25+75 **Number Of**		
Turnouts	6"-0" pit-run	9+80	N/A	load	11	loads	4	44
Surface Leveling Rock	1 1/2"-0" crushed		N/A	load	11	loads	5	55
Total Rock for Road Segment:			I11 to I12					99
ROAD SEGMENT: I13 to I14				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I13 to I14 **Volume (CY) Per**		0+00 to 168+80 **Number Of**		
Rock Ditch Filters	6"-4" pit-run	39+75 (2), 72+35	N/A	3 filter series	11	3 filter series	3	33
Culvert Bedding/Backfill	1 1/2"-0" crushed	39+75 (5), 43+90 (4), 58+65 (4), 62+35 (5), 65+40 (5), 69+95 (3), 100+90 (4), 137+15 (3), 152+20 (5), 161+00 (3), 161+70 (4)	N/A	load	11	loads	45	495
Turnaround	4"-0" crushed	55+55	N/A	turnaround	33	turnarounds	1	33
Surface Leveling Rock	1 1/2"-0" crushed		N/A	load	11	loads	10	110
Total Rock for Road Segment:			I13 to I14					671

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I15 to I16				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I15 to I16		0+00 to 11+20		
				Volume (CY) Per		Number Of		
Surfacing	4"-0" crushed	0+00 to 11+20	4	station	25	stations	11.2	280
Turnaround	4"-0" crushed	7+65, 10+20	N/A	turnaround	33	turnarounds	2	66
Landings	6"-0" pit-run	11+20	N/A	landing	33	landings	1	33
Total Rock for Road Segment:			I15 to I16					379
ROAD SEGMENT: I17 to I18				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I17 to I18		0+00 to 3+60		
				Volume (CY) Per		**Number Of**		
Surfacing	4"-0" crushed	0+00 to 3+60	4	station	25	stations	3.6	90
Landings	6"-0" pit-run	3+60	N/A	landing	33	landings	1	33
Total Rock for Road Segment:			I17 to I18					123
ROAD SEGMENT: I19 to I20				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I19 to I20		0+00 to 171+00		
				Volume (CY) Per		**Number Of**		
Turnaround	4"-0" crushed	59+30	N/A	turnaround	22	turnarounds	1	22
Rock Ditch Filters	6"-4" pit-run	66+80	N/A	3 filter series	11	3 filter series	3	33
Culvert Dissipator Rock	24"-6" riprap	91+25	N/A	load	11	loads	2	22
Surface Leveling Rock	1 1/2"-0" crushed		N/A	load	11	loads	7	77
Total Rock for Road Segment:			I19 to I20					154
ROAD SEGMENT: I21 to I22				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I21 to I22		0+00 to 20+15		
				Volume (CY) Per		**Number Of**		
Surface Leveling Rock	4"-0" crushed		N/A	load	11	loads	3	33
Total Rock for Road Segment:			I21 to I22					33
ROAD SEGMENT: I23 to I24				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I23 to I24		0+00 to 7+70		
				Volume (CY) Per		**Number Of**		
Surface Leveling Rock	4"-0" crushed		N/A	load	11	loads	2	22
Total Rock for Road Segment:			I23 to I24					22
ROAD SEGMENT: I25 to I26				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I25 to I26		0+00 to 1+40		
				Volume (CY) Per		**Number Of**		
Surface Leveling Rock	4"-0" crushed		N/A	load	11	loads	2	22
Total Rock for Road Segment:			I25 to I26					22

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I27 to I28				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I27 to I28 Volume (CY) Per		0+00 to 43+80 Number Of		
Rock Ditch Filters	6"-4" pit-run	30+50	N/A	3 filter series	11	3 filter series	2	22
Turnaround	4"-0" crushed	33+85	N/A	turnaround	22	turnarounds	1	22
Surface Leveling Rock	4"-0" crushed		N/A	load	11	loads	5	55
Total Rock for Road Segment:				I27 to I28				99
ROAD SEGMENT: I29 to I30				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I29 to I30 **Volume (CY) Per**		0+00 to 8+20 **Number Of**		
Surface Leveling Rock	4"-0" crushed		N/A	load	11	loads	2	22
Total Rock for Road Segment:				I29 to I30				22
ROAD SEGMENT: I31 to I32				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I31 to I32 **Volume (CY) Per**		0+00 to 4+00 **Number Of**		
Junctions	1 1/2"-0" crushed	0+00	N/A	junction	22	junctions	1	22
Surfacing	4"-0" crushed	0+00 to 4+00	4	station	25	stations	4	100
Turnaround	4"-0" crushed	33+85	N/A	turnaround	33	turnarounds	1	33
Landings	6"-0" pit-run	4+00	N/A	landing	33	landings	1	33
Total Rock for Road Segment:				I31 to I32				188
ROAD SEGMENT: I35 to I36				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	I35 to I36 **Volume (CY) Per**		0+00 to 23+70 **Number Of**		
Surfacing	4"-0" crushed	0+00 to 23+70	4	station	25	stations	23.7	593
Traction Rock	1 1/2"-0" crushed	0+00 to 12+65	2	station	13	stations	12.65	165
Turnouts	1 1/2"-0" crushed	4+85	N/A	turnout	22	turnouts	1	22
Culvert Bedding/Backfill	1 1/2"-0" crushed	6+00 (3), 11+85 (3), 12+65 (5), 20+50 (6), 23+60 (4)	N/A	load	11	loads	21	231
Curve Widening	1 1/2"-0" crushed	9+05	N/A	load	11	loads	4	44
Turnaround	4"-0" crushed	9+30, 17+45	N/A	turnaround	33	turnarounds	2	66
Culvert Dissipator Rock	24"-6" riprap	11+85 (1), 12+65 (1), 20+50 (2)	N/A	load	11	loads	4	44
Rock Ditch Filters	6"-4" pit-run	12+85 (2), 19+55, 20+15	N/A	3 filter series	11	3 filter series	4	44
Subgrade Reinforcement	4"-0" crushed	18+65	N/A	load	11	loads	3	33
Total Rock for Road Segment:				I35 to I36				1,242

EXHIBIT D

ROAD SURFACING

ROCK TOTALS (CY)	4”-0”	1½”-0”	2”-1” Drain	24”-6”	24”-12”	6”-0”	6”-4”
6,657	2,685	2,623	77	176	77	810	209

Roads shall be uniformly graded, shaped and approved by STATE prior to rocking.

EXHIBIT D

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.

Rock Checking. All rock spreading shall be done only when a STATE representative is present. STATE shall issue a receipt for each load delivered, and rock shall be measured without allowance for shrinkage or shakedown during hauling. Total truck measure volume for each road segment shall be as shown on Exhibit D. Deliver at least 500 cubic yards per 8-hour shift, unless otherwise approved by STATE. A penalty of $10 for each 10 cubic yards which are not delivered during a single shift shall be billed, and payment shall be required prior to final acceptance of the project by STATE.

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 the prior month must be submitted no later than the 15th of each month.

EXHIBIT D

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. 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, outsloped, or insloped at 4 to 6 percent as specified in the "Forest Roads Specifications" table in Exhibit D.

ROAD SEGMENT	SUBGRADE COMPACTION OPTIONS
All road segments.	1

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	FILLS COMPACTION OPTIONS
All road segments.	1

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, compacted, and approved by STATE 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 compacted and processed during the same project period it is spread, unless otherwise approved in writing by STATE.

Rock shall be crowned, outsloped, or insloped at 4 to 6 percent as specified in the "Forest Roads Specifications" table in Exhibit D.

EXHIBIT D

COMPACTION AND PROCESSING REQUIREMENTS

ROAD SEGMENT	CRUSHED COMPACTION OPTIONS
All road segments requiring crushed rock.	1

Pit-Run Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of pit-run rock shall be moistened or dried to uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 8 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. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

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

ROAD SEGMENT	PIT-RUN COMPACTION OPTIONS
Segments requiring pit-run rock	1 or 2

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) Dozer. A dozer/track-type tractor weighing a minimum of 45,000 pounds as directed by STATE shall be operated over the pit-run rock so that the entire surface comes in contact with the tracks.

EXHIBIT E

CULVERT SPECIFICATIONS

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

Culverts 36 inches in diameter and smaller shall be constructed of corrugated polyethylene, unless otherwise specified in the Contract. Culverts larger than 36 inches in diameter shall be constructed of corrugated aluminized Type 2 steel, unless otherwise specified in the Contract. Polyethylene culverts shall be double-walled and meet the requirements of AASHTO M-294-11, Type S, or ASTM F2648. Aluminized (Type 2) steel culverts shall meet the requirements of AASHTO M-36-03[1]."

Polyethylene joints shall be made with split couplings, corrugated to engage the culvert corrugations, and shall engage a minimum of 4 corrugations, 2 on each side of the culvert joint.

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.

Culverts in live streams shall be installed with the inlet and outlet on grade with the stream bottom, unless otherwise specified in writing.

Cross Drain Culverts

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 drains shall be skewed to fit the required culvert length to the road prism.

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.

Disconnect Culverts

The culvert inlet shall be located as close to the channel that it is disconnecting, while the culvert outlet shall be located as far from the channel as possible; discharge culvert outflow on the forest floor, allowing for filtration before the water enters the disconnected channel.

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 all culverts on road improvement segments.

Backfill shall consist of crushed rock on improvement segments and job-excavated soil free of stumps, limbs, rocks, or other objects which would damage the culvert on new construction segments.

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.

EXHIBIT E

CULVERT SPECIFICATIONS

Lengths of individual culvert sections shall be not less than 10 feet, unless otherwise provided for in special instructions. The shortest culvert section length shall be placed at the inlet end.

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

The intake end of cross drain and disconnect 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, half round, or other approved slope protection device. 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 culverts.

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

The intake ends of culverts in fills less than 3 feet to the top of the culvert shall be marked by driving white fiberglass posts within 6 inches of the downgrade side. Posts shall be a minimum of 6 feet long and 2½ inches wide, with the spade driven 2 feet into the ground. Install a culvert marker at each existing culvert that is missing a marker that could be reached by a grader blade.

Energy Dissipators shall be installed within 72 hours of culvert installation, unless otherwise approved in writing by STATE. Steel posts used with half round installation shall be painted with rust preventative paint.

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
18-36	16	(0.0598")	(0.064”)	16	12	12
42-54	14	(0.0747")	(0.079”)	16	12	12
60-84	12	(0.1046")	(0.109”)	16	24	24
90-120	12	(0.1046")	(0.109”)	16	26	26

Culverts larger than 60” in diameter shall have 3” x 1” corrugations.

EXHIBIT E

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	GAUGE	ROAD SEGMENT POINT TO POINT	STATION
1	18	30	CPP	N/A	6A to 6B	4+00
2	18	30	CPP	N/A	6C to 6D	1+50
3	18	30	CPP	N/A	I1 to I2	76+00
4	18	40	CPP	N/A	I1 to I2	245+75
5	12	220	Perf. CPP	N/A	I3 to I4	44+05 to 46+25
6	24	30	CPP	N/A	I3 to I4	52+85
7*	18	30	CPP	N/A	I3 to I4	53+65
8	18	30	CPP	N/A	I3 to I4	55+45
9*	18	30	CPP	N/A	I3 to I4	64+00
10	18	40	CPP	N/A	I3 to I4	77+20
11	18	30	CPP	N/A	I3 to I4	92+35
12	24	50	CPP	N/A	I13 to I14	39+75
13	18	40	CPP	N/A	I13 to I14	43+90
14	18	40	CPP	N/A	I13 to I14	58+65
15	18	50	CPP	N/A	I13 to I14	62+35
16	18	50	CPP	N/A	I13 to I14	65+40
17	18	30	CPP	N/A	I13 to I14	69+95
18	18	40	CPP	N/A	I13 to I14	100+90
19	18	30	CPP	N/A	I13 to I14	137+15
20	18	50	CPP	N/A	I13 to I14	152+20
21*	18	30	CPP	N/A	I13 to I14	161+00
22	18	40	CPP	N/A	I13 to I14	161+70
23	18	30	CPP	N/A	I35 to I36	6+00
24*	18	30	CPP	N/A	I35 to I36	11+85
25	18	30	CPP	N/A	I35 to I36	12+65
26	30	50	ACSP	16	I35 to I36	20+50
27	18	30	CPP	N/A	I35 to I36	23+60

EXHIBIT E

CULVERT LIST

TOTAL LENGTHS BY DIAMETER			
18 INCH	**24 INCH**	**30 INCH**	**12 INCH Perf**
810	80	50	220

ACSP = Aluminized, CPP = Polyethylene

* = Ditch Disconnect Culvert

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE

1. PURCHASER shall prepare a written development plan for the quarry area. The plan shall be submitted to STATE for approval prior to conducting any operation in quarry area. The plan shall include, but not be limited to:

   (a) Location of benches and roads to benches.
   (b) Disposal site for woody debris, overburden and reject material.
   (c) Time lines for rock quarry use.
   (d) Erosion Control measures.

2. PURCHASER shall schedule and coordinate quarry and stockpile usage with other existing or planned activity requiring quarry or stockpile usage. PURCHASER shall notify STATE 5 days prior to the start of quarry development activities.

3. PURCHASER shall conduct the operations relative to the disposal of waste material in such manner that sediment, rock, or debris shall not be washed, conveyed, or otherwise deposited in any stream.

4. Benches shall be maintained/constructed at intervals of 40 feet or less in height and shall be a minimum of 20 feet in width. Any gravel or talus slopes shall be left with a working face at an angle of 60 percent or less. There shall be a minimum of one bench with an access road to it. Said bench shall be easily accessible with tractors.

5. Quarry face shall be developed in a uniform manner. All quarry backslopes shall be left in a stable condition.

6. The quarry site shall be left in a condition free from overburden and debris. Access roads to the quarry, and the quarry floor, shall be cleared at the termination of use. (Unused shot rock material that is produced shall be piled in the vicinity of the rock pit as directed by STATE. Dirt, overburden, and reject material shall be hauled to designated waste area.

7. The quarry floor shall be developed to provide for drainage away from the quarry. All quarry and stockpile site drainage ditches shall be maintained. Ditches, culverts, waterbars and other direct conveyances of water from the quarry or stockpile site(s) shall be constructed to drain to the forest floor in locations that will provide filtration. Quarry access roads shall be cleared and blocked upon completion of quarry use as directed by STATE.

8. Proper winterization and storm-water control measures such as waterbarring, drainage, utilization of filter bales, mulching and/or blocking access shall be constructed and maintained to protect the watershed and Project Work, as directed by STATE.

EXHIBIT F

CRUSHED ROCK SPECIFICATIONS

PIT-RUN RIPRAP ROCK SPECIFICATIONS

For Pit-Run	Passing	10" sieve	100%
	Passing	6" sieve	60-85%
	Passing	3" sieve	30-50%
	Passing	¼" sieve	0-10%

For 6"-4" Pit-run A minimum of 50 percent of the material shall measure a minimum of 6 inches, measured in one dimension. Material shall be clean, well graded, and free of 3"-0" fines.

For 24"-6" Riprap A minimum of 50 percent of the material shall measure a minimum of 24 inches, measured in one dimension. Material shall be clean, well graded, and free of 2"-0" fines.

For 24"-12" Riprap A minimum of 50 percent of the material shall measure a minimum of 24 inches, measured in one dimension. Material shall be clean, well graded, and free of 11"-0" fines.

Control of gradation shall be by visual inspection by STATE.

EXHIBIT G

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 –12.5feet.		

10 oz. non-woven (buttressing riprap separation):

Nonwoven drainage fabric designed for sub surface drain purposes which meets or exceeds the following requirements, unless otherwise approved in writing by STATE:

		Test Method	Properties
(1)	Water Flow Rate	ASTM D 4491	85 gal/min/ft^2
(2)	Water Permeability	ASTM D 4491	0.30 cm/sec
(3)	Grab Tensile Strength	ASTM D 4632	250 lb
(4)	Mullen Burst Test	ASTM D 3766	460 lb
(5)	Mass	ASTM D 4533	10 oz/yd^2
(6)	Thickness	ASTM D 5199	100 mills
(7)	UV Resistance	ASTM D 4355 Xenon Arc	70% retained

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.

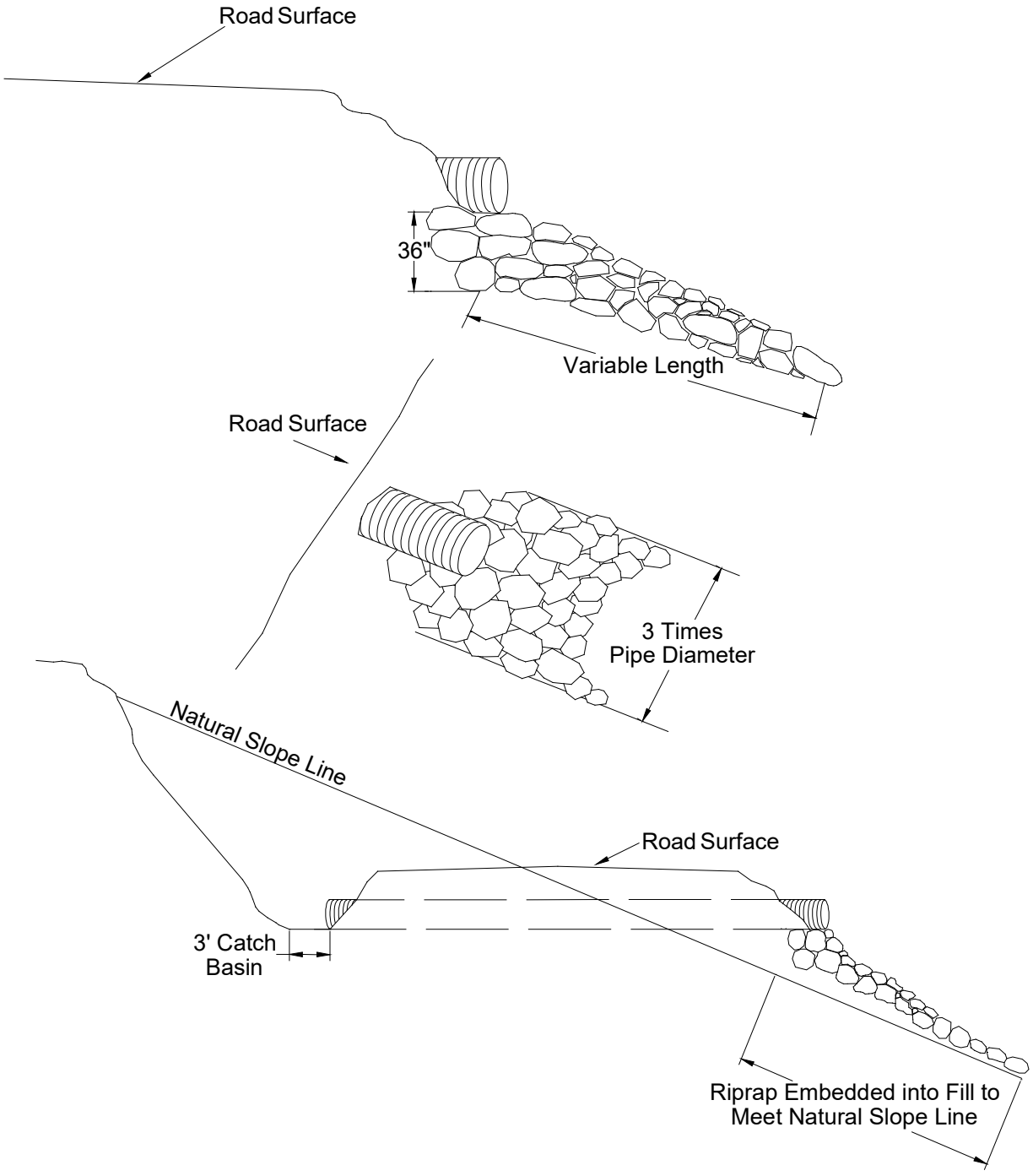
6. Should STATE determine that installation of woven fabric on roads or portions of roads is not necessary, PURCHASER shall deliver an equivalent amount of woven road fabric to STATE.

7. Fabric locations:

Road Segment	Location
I3 to I4	44+05 to 46+25

EXHIBIT H

TYPICAL EMBEDDED ENERGY DISSIPATOR



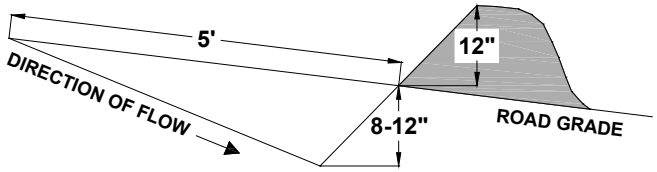
Dissipator shall be installed prior to the installation of the culvert, unless approved by STATE.

EXHIBIT I

WATERBAR SPECIFICATIONS

PROFILE

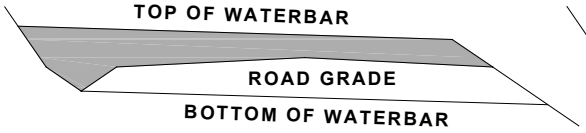
DITCHED AND OUTSLOPED



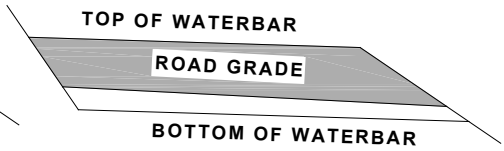
SPACING OF WATERBARS	
ROAD GRADE	DISTANCE
< 6 %	400'
6 - 10 %	200'
11 - 15 %	150'
> 15 %	100'

CROSS SECTION

DITCHED



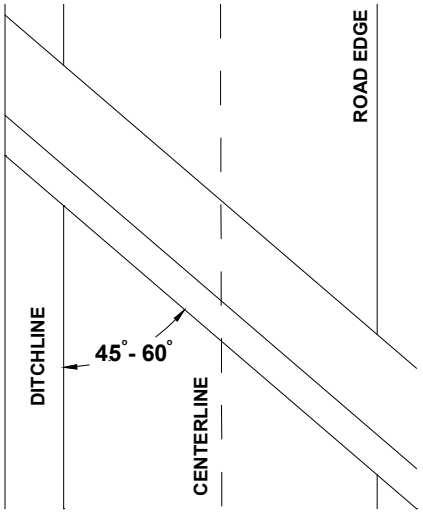
OUTSLOPED



CONSTRUCT DITCHOUT THRU ANY EXISTING BERM.
CROSS DRAINAGE GRADIENT MINIMUM 3%.

PLAN VIEW

DITCHED



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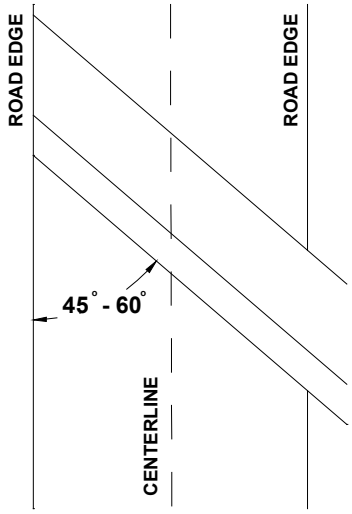


EXHIBIT J

ROAD VACATING SPECIFICATIONS

PURCHASER shall vacate at the following points: V1 to V2, V3, V4, V5, V6, V7, 1A to 1B, and I33 to I34. Specific objectives for this project include:

(a) Fill removal and stream channel development.
(b) Culvert removal.
(c) Restoration of natural contours by outsloping of the road prism.
(d) Sidecast pullback.
(e) Minimize disturbance of existing vegetation.

(1) Tree Removal. Cut or remove all trees necessary to access the project area and to facilitate vacating operations, as directed by STATE. Timber shall be removed as designated timber, if located within posted timber sale boundaries or right-of-way boundaries.

(2) Fill Removal and Stream Channel Development. Remove fills to the natural stream course level(s). Stream channel(s) shall be excavated/developed to specified widths. Developed stream banks shall be sloped at natural contours or no steeper than 1 ½:1, as directed by STATE.

(3) Culvert Removal. Remove drainage structures and culverts. Removed culverts shall be hauled to an approved refuse site off of STATE land.

(4) Outslope Road. Outslope road to restore natural contours or establish a minimum of 10 percent slope for drainage at designated locations. If the road grade exceeds 10 percent, outslope of the road shall be 2 percent greater than the road grade.

(5) Sidecast Pullback. Excavate/pullback previously sidecast materials below the road at designated locations. Developed slopes shall be pulled back to a 1½:1 slope or to natural ground contours. The beginning position for sidecast pullback shall be no greater than 20 feet vertical distance from the existing road surface, in accordance with this Exhibit. Sidecast material remaining greater than 20 feet below the road shall be tapered and sloped for drainage.

(6) Use of Excavated Materials.

(A) Fill Excavation and Sidecast Pullback. Excavated materials shall be placed on the interior (cut) side of the road, and utilized to restore the cut slope to natural contours, or to a minimum 10 percent outsloped surface for drainage. Any excess material will be hauled to a designated waste area, as directed by STATE.

(B) Woody Debris Shall be placed on the surface of pullback/fill material.

(C) Block Roads. Use excavated material from fill removals to block roads from vehicle access, as directed by STATE.

(7) Erosion Control. Erosion control shall be completed in a progressive manner. Grass seed and straw mulch shall be applied for every 500 feet of road vacated, prior to continuing work.

All excavated material and bare soil shall utilize grass seed and straw mulch approved by STATE and in accordance with the specifications in Exhibit L. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover.

(8) Construct Waterbars as directed by STATE. Construct waterbars according to the specifications in Exhibit I.

(9) Equipment. A minimum 1½ cubic-yard, track mounted excavator shall be used for all excavation, culvert removal, streambed preparation, road blocking, and waterbarring, unless otherwise approved in writing by STATE.

(10) Dry Conditions. All work shall be performed during dry conditions acceptable to STATE.

(11) Support, including transport, other equipment, replacements, supplies, maintenance, and repairs, shall be furnished as required to complete the project and shall be furnished without cost to STATE, other than as agreed under the contract terms.

(12) Waterline and Utilities. PURCHASER shall schedule and coordinate vacating fills and roads with a domestic waterline with the adjacent landowner. PURCHASER shall notify the adjacent landowner 5 days prior to the start of the vacating of fills and roads with a domestic waterline.

SPECIFIC INSTRUCTIONS/SPECIFICATIONS:

Segment	Station	Work Description
V1 to V2	0+00	Construct road block.
	1+00	Excavate fill and remove culvert to develop a natural channel width of four feet. Waste material can be keyed in onsite to restore natural contours as directed by STATE. Construct waterbars on both sides of vacated fill. Utilize the ditchline and road prism for additional waste area if needed. Seed and mulch vacated fill and all exposed soils.
V3		Excavate fill and remove puncheon to develop a natural channel width of four feet. Waste material can be keyed in onsite to restore natural contours as directed by STATE. Construct waterbars on both sides of vacated fill. Utilize the ditchline and road prism for additional waste area if needed. Seed and mulch vacated fill and all exposed soils.
V4		Excavate fill and remove puncheon to develop a natural channel width of four feet. Waste material can be keyed in onsite to restore natural contours as directed by STATE. Construct waterbars on both sides of vacated fill. Utilize the ditchline and road prism for additional waste area if needed. Seed and mulch vacated fill and all exposed soils. Coordinate activities with adjacent landowner with private waterline in accordance with Item (12) of road vacating specifications.
V5		Excavate fill and remove culvert to develop a natural channel width of four feet. Waste material can be keyed in onsite to restore natural contours as directed by STATE. Construct waterbars on both sides of vacated fill. Utilize the ditchline and road prism for additional waste area if needed. Seed and mulch vacated fill and all exposed soils.
V6		Excavate fill and remove puncheon to develop a natural channel width of four feet. Waste material can be keyed in onsite to restore natural contours as directed by STATE. Construct waterbars on both sides of vacated fill. Utilize the ditchline and road prism for additional waste area if needed. Seed and mulch vacated fill and all exposed soils.
V7		Excavate fill and remove puncheon to develop a natural channel width of four feet. Waste material can be keyed in onsite to restore natural contours as directed by STATE. Construct waterbars on both sides of vacated fill. Utilize the ditchline and road prism for additional waste area if needed. Seed and mulch vacated fill and all exposed soils.

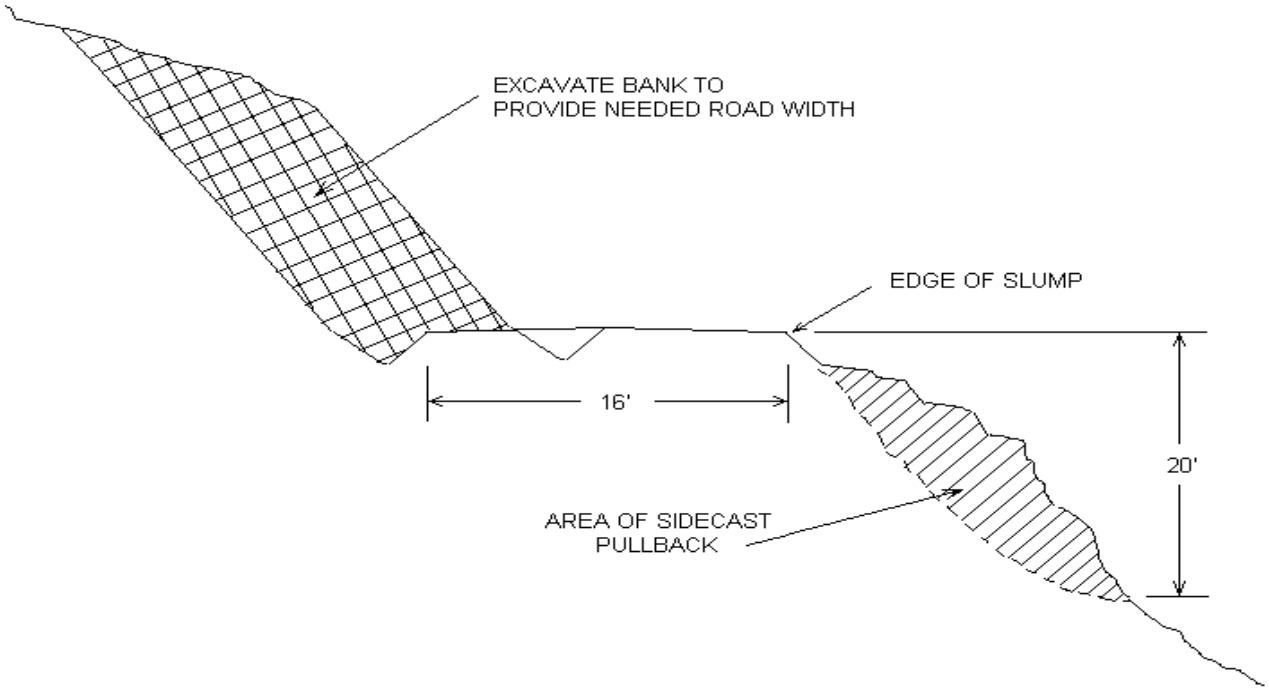
EXHIBIT J

ROAD VACATING SPECIFICATIONS

1A to 1B	0+00	Construct road block. Construct waterbars every 300 feet.
	0+80	Excavate fill and remove culvert to develop a natural channel width of four feet. Waste material can be keyed in onsite to restore natural contours as directed by STATE. Construct waterbars on both sides of vacated fill. Utilize the ditchline and road prism for additional waste area if needed. Seed and mulch vacated fill and all exposed soils. Coordinate activities with adjacent landowner with private waterline in accordance with Item (12) of road vacating specifications.
	3+80	Remove culvert and construct waterbar.
1A to 1B	11+80	End road vacating.
I33 to I34	0+00 to 6+70	Construct waterbars every 200 feet or as directed by STATE. Block.

EXHIBIT K

TYPICAL CROSS SECTION VIEW OF SIDECAST PULLBACK AND ROAD REALIGNMENT



(No Scale)

EXHIBIT L

SEEDING AND MULCHING

This work shall consist of preparing seedbeds and furnishing and placing required seed and straw mulch. Straw mulch shall consist of straw that is free of noxious weeds. Apply seed and straw mulch to all waste areas and bare soils resulting from Project No. 2 and 3.

Seeding Seasons. Seeding shall be performed only from March 1 through June 15 and August 15 through October 31. Seeding materials shall not be applied during windy weather or when the ground is excessively wet or frozen. Areas of disturbed soil shall be seeded by the end of the project period in which work was started. PURCHASER shall notify STATE within 24 hours of seeding application.

APPLICATION METHODS FOR SEED

Dry Method. Mechanical seeders, seed drills, landscape seeders, cultipacker seeders, or other approved mechanical seeding equipment shall be used to apply the seed in the amounts and mixtures specified. Hand-operated seeding devices may be used when seed is applied in dry form.

APPLICATION RATES FOR SEED

The seed mixture listed below shall be applied at 100 lbs. per acre. The seed mixture shall be comprised of the following:

SPECIES	MIXTURE	PURE LIVE SEED	GERMINATION
Annual Rye	33%	95%	>90%
Orchard Grass	33%	95%	>90%
Perennial Rye	34%	95%	>90%

Mulching Period. Straw mulch shall be applied within 24 hours of spreading grass seed.

APPLICATION RATES FOR MULCH

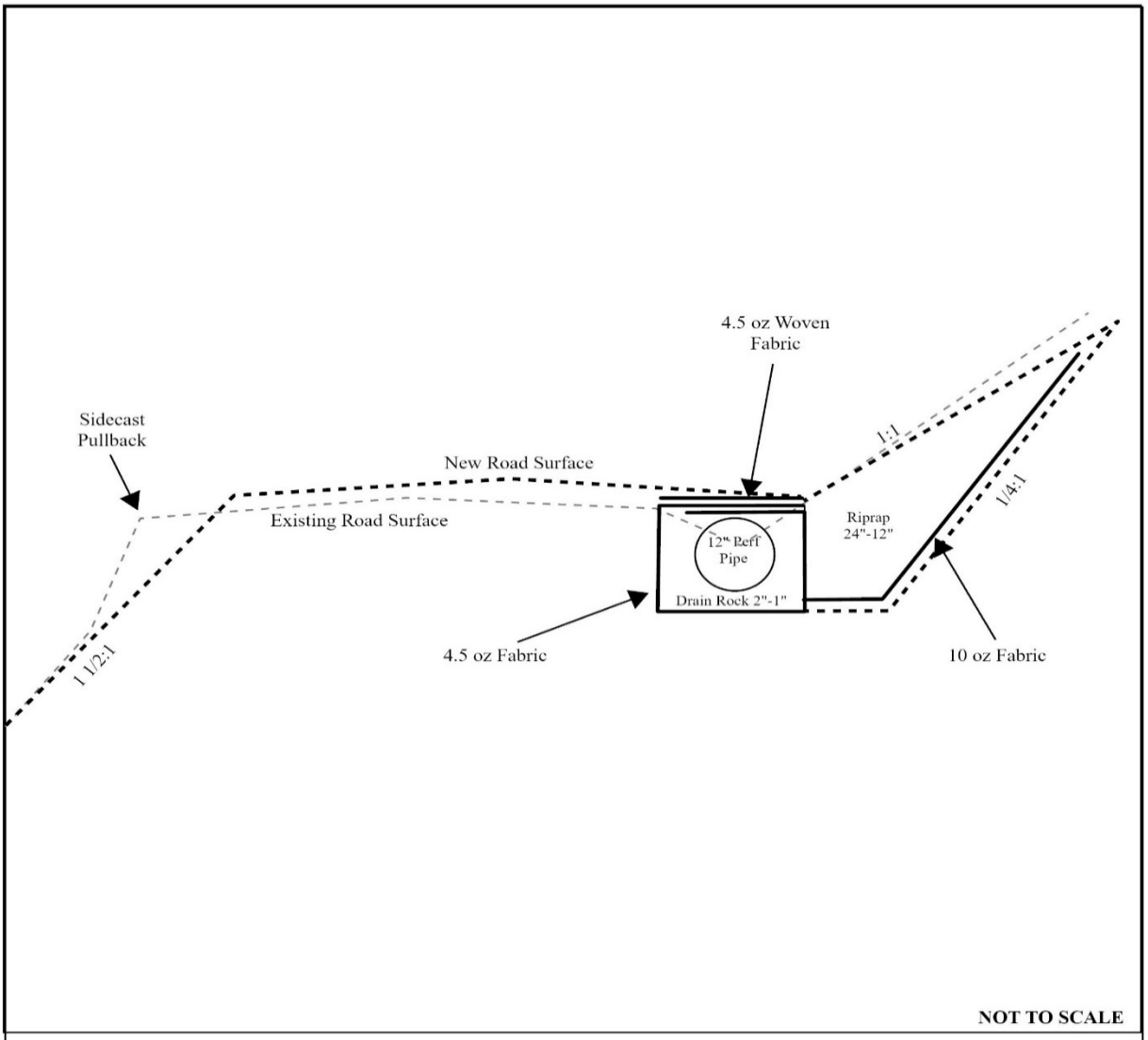
Place straw mulch to a reasonably uniform thickness of 1½ to 2½ inches. This rate requires between 2 and 3 tons of dry mulch per acre.

Application Locations:

Road Segment	Location	Road Segment	Location
V1 to V2	1+00	V7	Shown on Exhibit A
V3	Shown on Exhibit A	1A to 1B	0+80
V4	Shown on Exhibit A	I3 to I4	44+05 to 46+25
V5	Shown on Exhibit A	Project No. 2	Waste Areas
V6	Shown on Exhibit A		

EXHIBIT M

DRIVABLE FREE DRAINING DITCHLINE WITH RIPRAP BUTRESSING INSTRUCTIONS



Oregon Department of Forestry
Astoria District
Forest Roads Unit

I3 to I4
44+05 to 46+25
Hamilton Creek Road
Sections 32 and 33, T6N, R6W, W.M.
Clatsop County, Oregon

OREGON DEPARTMENT of FISH and WILDLIFE

FISH SCREENING PROGRAM

SMALL PUMP SCREEN SELF CERTIFICATION

The Oregon Water Resources Department in coordination and cooperation with the Oregon Department of Fish and Wildlife includes screen requirements on pumps to protect fish as a condition of many surface water and/or reservoir water right permits. This is done in accordance with ORS 537.153.

The Oregon Department of Fish and Wildlife does not usually inspect small pump screens at **pumped diversions less than 225 gpm** (gallons per minute), but furnishes the following fish screening criteria information to the water right permit holder:

Screen material open area must be at least 27% of the total wetted screen area.

Perforated plate: Openings shall not exceed 3/32 or 0.0938 inches (2.38 mm).

Mesh/Woven wire screen: Square openings shall not exceed 3/32 or 0.0938 inches (2.38 mm) in the narrow direction, e.g., 3/32 inch x 3/32 inch open mesh.

Profile bar screen/Wedge wire: Openings shall not exceed 0.0689 inches (1.75 mm) in the narrow direction.

Screen area must be large enough not to cause fish impact. Wetted screen area depends on the water flow rate and the water approach velocity. **Approach velocity** is the water velocity perpendicular to and approximately three inches in front of any part of the screen face.

An Active pump screen is a self-cleaning screen that has a proven cleaning system. The **screen approach velocity for active pump screens** shall not exceed 0.4 fps (feet per second) or 0.12 mps (meters per second). The wetted screen area in square feet is calculated by dividing the maximum water flow rate in cubic feet per second (1 cfs = 449 gpm) by 0.4 fps.

A Passive pump screen is a screen that has no cleaning system other than periodic manual cleaning. **Screen approach velocity for passive pump screens** shall not exceed 0.2 fps or 0.06 mps. The wetted screen area in square feet is calculated by dividing the maximum water flow rate by 0.2 fps.

For further information on fish screening please contact:

Oregon Department of Fish and Wildlife, Statewide Fish Screening Coordinator: 503.947.6229
Oregon Department of Fish and Wildlife, Screening Program Administrative Specialist: 503.947.6224

As evidence of having met fish screen installation requirements, please sign the certification and send to: **Oregon Water Resources Department, Water Rights Section, 725 Summer Street NE, Suite A, Salem, OR 97301-1271.**

Certification: I certify that my small pumped diversion of less than 225 gpm meets fish screening criteria, and that I will maintain it to comply with regulatory criteria. I also understand that should fish screening standards change, I may be required to modify my installation to meet applicable standards.

Applicant Signature: _____ Date: __/__/__ WRD File #: _____

Printed Name and Address: _____

Phone: (___)_____ Fax: (___) _____