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: _____

(1) Contract Number: AT-341-2021-W00597-01

(2) Sale Name: Double North

(3) Contract Expiration Date: 10/31/2024

(4) Purchaser Name: _____

(5) State Brand Information (Complete)

(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. 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.

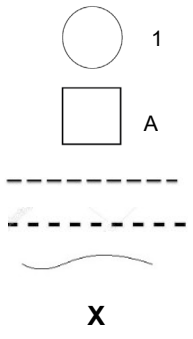
(7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.

(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.

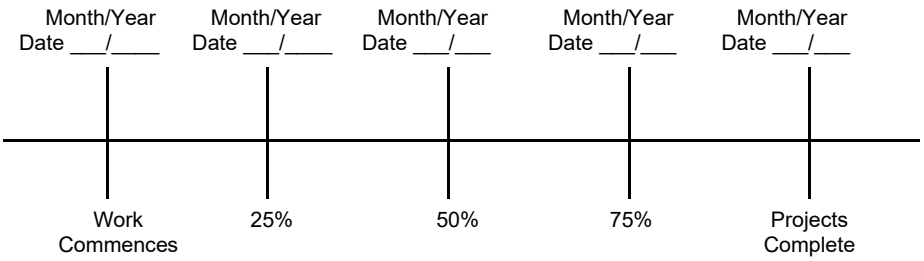
Temporary stream crossings.

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

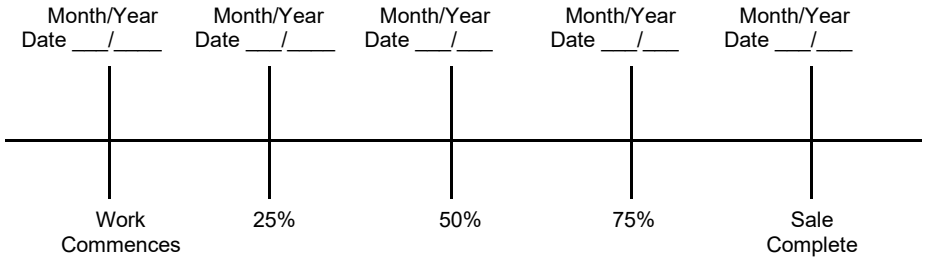
Completion Timeline

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. As provided in the timber sale contract, PURCHASER's 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 _____

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	☐	☑

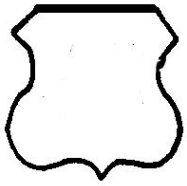
(8) **APPROVED SCALING LOCATIONS** (as shown on the ODF Approved Locations web-site)	Species	Yard	Truck	Weight

(9) **SALE NAME:** Double North
COUNTY: Clatsop

(10) **STATE CONTRACT NUMBER:**
AT-341-2021-W00597-01

(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:**

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

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

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

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

(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.

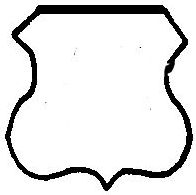
(9) **SALE NAME:** Double North

COUNTY: Clatsop

(10) **STATE CONTRACT NUMBER:**
AT-341-2021-W00597-01

(11) STATE BRAND REGISTRATION NUMBER: _____

(12) STATE BRAND INFORMATION:



(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.

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
P.O.Box 580, Roseburg, OR 97470
Phone: (541) 673-5571 Fax: (541) 672-6381
Email: info@southernoregonlogscaling.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	12 feet	1A to 1B	0+00 to 3+90	Crowned/Ditch
14 feet	N/A	4A to 4B	0+00 to 6+15	Inslope
16 feet	12 feet	4C to 4D	0+00 to 1+00	Crowned/Ditch
14 feet	N/A	5A to 5B	0+00 to 15+50	Outslope/Inslope
16 feet	12 feet	I1 to I2	0+00 to 170+60	Crowned/Ditch
16 feet	12 feet	I3 to I4	0+00 to 54+50	Crowned/Ditch
16 feet	12 feet	I5 to I6	0+00 to 66+85	Crowned/Ditch
16 feet	12 feet	I7 to I8	0+00 to 29+10	Crowned/Ditch
16 feet	12 feet	I9 to I10	0+00 to 10+80	Crowned/Ditch
16 feet	12 feet	I11 to I12	0+00 to 16+65	Crowned/Ditch
16 feet	12 feet	I13 to I14	0+00 to 8+40	Crowned/Ditch
16 feet	12 feet	I15 to I16	0+00 to 9+60	Crowned/Ditch
16 feet	12 feet	I17 to I18	0+00 to 47+90	Crowned/Ditch
16 feet	12 feet	I19 to I20	0+00 to 8+10	Crowned/Ditch
16 feet	12 feet	I21 to I22	0+00 to 103+90	Crowned/Ditch
16 feet	12 feet	I23 to I24	0+00 to 14+60	Crowned/Ditch
16 feet	12 feet	I25 to I26	0+00 to 2+00	Crowned/Ditch
16 feet	12 feet	I27 to I28	0+00 to 19+90	Crowned/Ditch
16 feet	12 feet	I29 to I30	0+00 to 15+50	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.

All trees marked “C” with orange paint shall be felled and hauled as specified in Section 2210, Designated Timber.

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.

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.

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 between points 1A to 1B, 4A to 4B, and 5A to 5B.

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, 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 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) 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) Fill Material. For segment 5A to 5B, utilize quarry reject material, located at the Simmons Ridge Quarry, to construct fill and approaches to the existing road grades, as directed by STATE.

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

(6) 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	0+00	Begin 10” lift of 4”-0” crushed rock. Apply 22 cubic yards of 4”-0” Junction Rock.
	0+50	Begin 3” lift of ¾”-0” crushed rock.
	3+00	End 3” lift of ¾”-0” crushed rock.
	3+50	Construct turnaround, right.
	3+90	End 10” lift of 4”-0” crushed rock. Construct landing with 77 cubic yards of 6”-0” pit-run.
4A to 4B	0+00	Begin 10” lift of 4”-0” crushed rock. Begin 14’ insloped road construction.
	1+00	End 10” lift of 4”-0” crushed rock.
	5+30	Construct turnaround, left.
	6+15	End 14’ insloped road construction. Construct landing.
4C to 4D	0+00	Begin 10” lift of 4”-0” crushed rock.
	1+00	End 10” lift of 4”-0” crushed rock. Construct landing with 77 cubic yards of 6”-0” pit-run.
5A to 5B	0+00	Begin 10” lift of 4”-0” crushed rock. Begin 14’ insloped road construction, right.
	1+00	End 10” lift of 4”-0” crushed rock.
	1+50	Utilize borrow material in fill from Simmons Ridge Quarry.
	3+47	Transition to 14’ outsloped road construction, right.
	3+50	Construct turnaround, right.
	6+57	Construct turnout, right.
	8+50	Begin fill widening 1’ each side.
	9+55	End fill widening. Begin 2’ inside curve widening.
	10+80	End curve widening.
	12+70	Construct turnaround, right. Begin outsloped road construction, left.
	13+15	Construct roadside landing, left.
	15+50	End outlsoped road construction. Construct landing.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT 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) Roadside Brushing. Conduct roadside brushing as specified in Exhibit H.

(3) 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 Exhibit D. Excess excavated material not used shall be end hauled to waste areas as shown on Exhibit A and marked in the field.

(4) Bank Slough Removal. Excavate all bank slough. Bank slough material shall not be pulled across existing surfacing rock. Excavated material shall be hauled to the designated waste areas as marked in the field and/or designated on Exhibit A.

(5) 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 **Simmons Ridge Quarry**, 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.

(6) 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.

(7) Drainage Ditches. Restore or construct ditchlines, 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.

(8) 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.

(9) 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.

(10) 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.

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

(12) 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.

(13) 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.

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I1 to I2	0+00	Begin 2” lift of ¾”-0” crushed rock.
	6+95	Remove tree growing on top of culvert, clean inlet.
	55+50	Replace culvert.
	61+10	Replace culvert.
	71+40	Install new disconnect culvert. Install culvert dissipator.
	72+75	End 2” lift of ¾”-0” crushed rock. Begin 2” lift of 1½”-0” crushed rock.
	85+50	Install series of three rock ditch filters, Left side.
	117+75	Replace culvert.
	130+50	Block roadside ruts on right, using rip rap.
	142+85	Install new ditch out, Left. Install series of three rock ditch filters, Right.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

Segment	Station	Work Description
I1 to I2	143+70	Install series of three rock ditch filters, Left.
	146+10	Install series of three rock ditch filters, Left.
	147+15	Install new disconnect culvert.
	150+15	Install series of three rock ditch filters, Left.
	152+00	Install new disconnect culvert.
	155+55	Install series of three rock ditch filters, Left.
	157+40	Install new disconnect culvert.
	170+60	End 2” lift of 1-1/2”-0” crushed rock.
I3 to I4	0+00	Begin 2” lift of ¾”-0” crushed rock.
	28+30	End 2” lift of ¾”-0” crushed rock. Begin 2” lift of 1-1/2”-0” crushed rock. Install series of three rock ditch filters, Right.
	29+10	Install series of three rock ditch filters, Right.
	29+75	Install series of three rock ditch filters, Right.
	30+15	Install series of three rock ditch filters, Right.
	31+30	Install series of three rock ditch filters, Right.
	43+40	Remove mud, reconstruct road dip. Open drainage, Left
	44+85	End 2” lift of1½”-0” crushed rock. Begin 4” lift of 4”-0” crushed rock. Begin Sod Removal.
	54+50	End Sod Removal. End 4” lift of 4”-0” crushed rock. Open drainage.
I5 to I6	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock.
	0+15	Replace culvert.
	4+00	Install new disconnect culvert.
	4+50	Culvert replacement/fill reconstruction. Utilize 44 cubic yards of 1½”-0” crushed rock for culvert bedding/backfill, 252 cubic yards of backfill from designated location in Simmons Ridge Quarry, and 44 cubic yards of 4”-0” crushed rock for base rock replacement.
	6+35	Install new disconnect culvert.
	7+35	Culvert replacement/fill reconstruction. Utilize 88 cubic yards of 1½”-0” crushed rock for culvert bedding/backfill, 634 cubic yards of backfill from designated location in Simmons Ridge Quarry, 198 cubic yards 24"-6" riprap fill armor, 33 cubic yards 24”-6” riprap rock for energy dissipator, and 55 cubic yards of 4”-0” crushed rock for base rock replacement.
	8+25	Install new disconnect culvert.
	10+50	Replace culvert.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

Segment	Station	Work Description
I5 to I6	17+15	Culvert replacement/fill reconstruction. Utilize 88 cubic yards of 1½”-0” crushed rock for culvert bedding/backfill, 566 cubic yards of backfill from designated location in Simmons Ridge Quarry, 198 cubic yards 24"-6" riprap fill armor, 44 cubic yards 24”-6” riprap rock for energy dissipator, and 55 cubic yards of 4”-0” crushed rock for base rock replacement.
	17+80	Culvert replacement/fill reconstruction. Utilize 44 cubic yards of 1½”-0” crushed rock for culvert bedding/backfill, 343 cubic yards of backfill from designated location in Simmons Ridge Quarry, 11 cubic yards 24”-6” riprap rock for energy dissipator and 22 cubic yards of 4”-0” crushed rock for base rock replacement.
	20+80	Install series of three rock ditch filters, Left.
	22+00	Install series of three rock ditch filters, Left.
	29+40	Jack open outlet of culvert.
	37+10	Replace culvert.
	37+40	Install series of three rock ditch filters, Left.
	66+85	End Sod Removal. End 4” lift of 4”-0” crushed rock.
I7 to I8	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock. Begin 2” lift of 1½”-0” traction rock.
	7+30	Improve ditchout, Left.
	13+85	Clear off old landing behind turnout.
	23+30	End 2” lift of 1½”-0” traction rock.
	29+10	End Sod Removal. End 4” lift of 4”-0” crushed rock. Construct turnaround at old landing.
I9 to I10	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock. Begin 2” lift of 1½”-0” traction rock.
	1+10	Install new disconnect culvert.
	10+80	End Sod Removal. End 4” lift of 4”-0” crushed rock. End 2” lift of 1½”-0” traction rock. Improve drainage.
I11 to I12	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock. Begin 2” lift of 1½”-0” traction rock.
	10+40	Install series of three rock ditch filters, Right.
	10+90	Clean culvert inlet, blowdown in front of inlet.
	11+40	Install series of three rock ditch filters, Right.
	11+70	End 2” lift of 1½”-0” traction rock.
	16+65	End Sod Removal. End 4” lift of 4”-0” crushed rock.
I13 to I14	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock.
	7+00	Construct turnaround, Left.

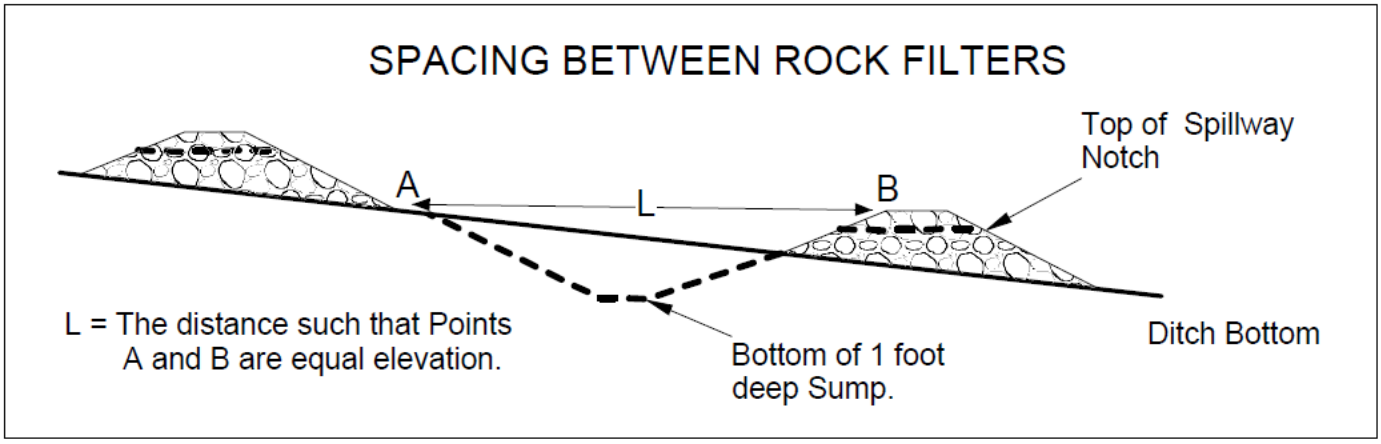
EXHIBIT D

FOREST ROAD SPECIFICATIONS

Segment	Station	Work Description
I13 to I14	8+40	End Sod Removal. End 4” lift of 4”-0” crushed rock.
I15 to I16	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock.
	9+60	End Sod Removal. End 4” lift of 4”-0” crushed rock.
I17 to I18	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock.
	0+40	Waste area for fill reconstructions, clear off alders and debris.
	47+90	End Sod Removal. End 4” lift of 4”-0” crushed rock. Construct turnaround. Improve drainage.
I19 to I20	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock.
	8+10	End Sod Removal. End 4” lift of 4”-0” crushed rock. Construct turnaround.
I21 to I22	0+00	Begin Sod Removal. Begin 2” lift of 1½”-0” crushed rock.
	22+90	Install new disconnect culvert.
	26+75	Replace culvert.
	47+80	Replace culvert.
	103+90	End Sod Removal. End 2” lift 1½”-0” crushed rock. Open drainage.
I23 to I24	0+00	Begin Sod Removal. Begin 2” lift of 1½”-0” crushed rock.
	4+70	Remove trees and debris from landing behind turnout.
	14+60	End Sod Removal. End 2” lift 1½”-0” crushed rock.
I25 to I26	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock.
	2+00	End Sod Removal. End 4” lift of 4”-0” crushed rock. Clear alder off landing. Improve drainage.
I27 to I28	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock.
	3+25	Begin 2” lift of 1½”-0” traction rock.
	19+50	End 2” lift of 1½”-0” traction rock.
	19+90	End Sod Removal. End 4” lift of 4”-0” crushed rock.
I29 to I30	0+00	Begin Sod Removal. Begin 4” lift of 4”-0” crushed rock.
	4+15	Begin 2” lift of 1½”-0” traction rock.
	9+05	Right. Clear of old landing, fill in existing ditchline, construct ditch from existing ditch across back of landing for new drainage, Construct entrance to landing.
	14+20	End 2” lift of 1½”-0” traction rock. Open turnaround, Left.
	15+50	End Sod Removal. End 4” lift of 4”-0” crushed rock. Remove trees from landing.

EXHIBIT D

TYPICAL ROCK DITCH FILTER



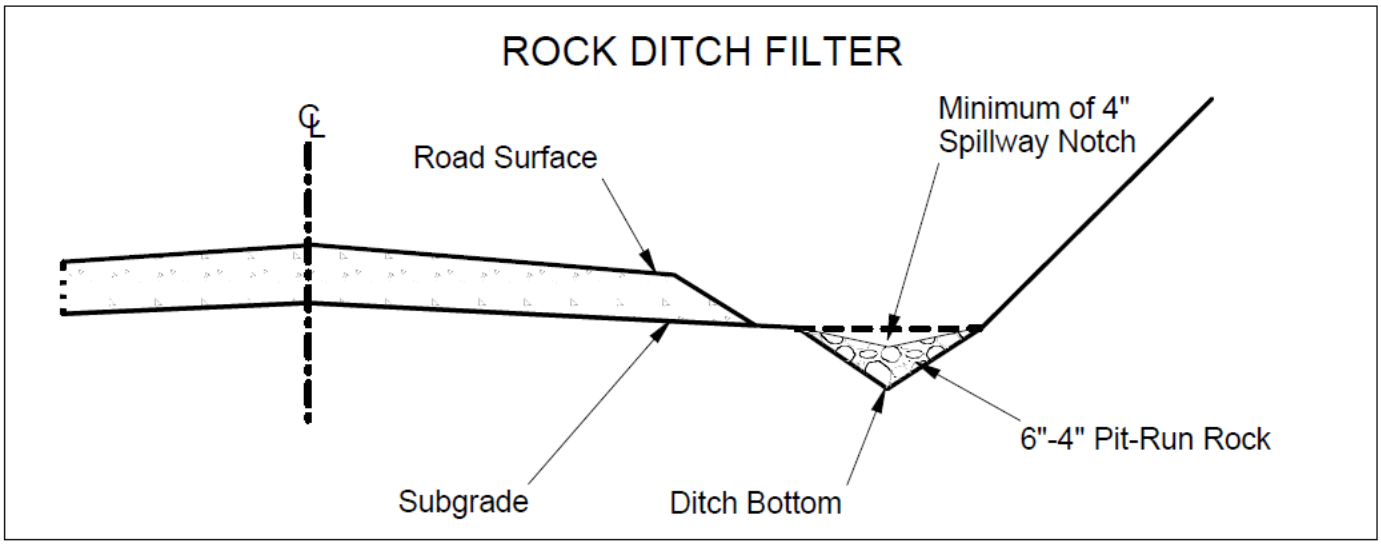


EXHIBIT D

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 3+90		
				Volume (CY) Per		Number of		
Base Rock	4"-0" crushed	0+00 to 3+90	10	station	63	stations	3.90	246
Surfacing	3/4"-0" crushed	0+50 to 3+00	3	station	19	stations	2.50	48
Junction Rock	4"-0" crushed	0+00	N/A	load	11	loads	2	22
Turnaround	4"-0" crushed	3+50	10	TA	17	TA	1	17
Landings	6"-0" pit-run	3+90	N/A	landing	77	landings	1	77
Total Rock for Road Segment:			1A to 1B					409
ROAD SEGMENT: 4A to 4B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	4A to 4B		0+00 to 1+00		
				Volume (CY) Per		**Number Of**		
Junction Rock	4"-0" crushed	0+00 to 1+00	10	station	63	stations	1.00	63
Total Rock for Road Segment:			4A to 4B					63
ROAD SEGMENT: 4C to 4D				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	4C to 4D		0+00 to 1+00		
				Volume (CY) Per		**Number Of**		
Base Rock	4"-0" crushed	0+00 to 1+00	10	junctions	63	stations	1.00	63
Landings	6”-0” pit-run	1+00	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			4C to 4D					129
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 1+00		
				Volume (CY) Per		**Number Of**		
Junction Rock	4"-0" crushed	0+00 to 1+00	10	station	63	stations	1.00	63
Total Rock for Road Segment:			5A to 5B					63
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 170+60		
				Volume (CY) Per		**Number of**		
Surface Leveling Rock	3/4"-0" crushed	0+00 to 170+60	N/A	load	11	loads	6	66
Surface Leveling Rock	1 1/2"-0" crushed	0+00 to 170+60	N/A	load	11	loads	4	44
Surfacing	3/4"-0" crushed	0+00 to 72+75	2"	station	13	stations	72.75	946
Surfacing	1 1/2"-0" crushed	72+75 to 170+60	2"	station	13	stations	97.85	1,272
Junction	3/4"-0" crushed	0+00, 20+80, 40+60, 45+90, 50+50, 51+60, 68+95	N/A	junction	11	junctions	7	77
Junction	3/4"-0" crushed	34+60	N/A	junction	22	junctions	1	22
Junction	1 1/2"-0" crushed	91+25, 114+15, 133+15, 152+50,	N/A	junction	11	junctions	4	44
Junction	1 1/2"-0" crushed	18+25, 170+60	N/A	junction	22	junctions	2	44

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 Volume (CY) Per		0+00 to 170+60 Number of		
Turnout	3/4"-0" crushed	4+15,15+00, 20+45,30+30, 43+00, 48+95, 53+45, 60+50, 65+65, 72+75	2	turnout	11	turnouts	10	110
Turnout	1 1/2"-0" crushed	87+95, 92+10, 103+65, 108+70, 112+60, 123+85, 127+25, 144+50, 154+45, 163+40	2	turnout	11	turnouts	10	110
Turnout	1 1/2"-0" crushed	82+60, 163+40	2	turnout	22	turnouts	2	44
Turnaround	3/4"-0" crushed	15+95	2	turnaround	11	turnaround	1	11
Culvert Bedding and Backfill	1 1/2"-0" crushed	55+50, 61+10, 71+40, 117+75, 147+15, 157+40	N/A	culvert	33	culverts	6	198
Culvert Bedding and Backfill	1 1/2"-0" crushed	152+00	N/A	culvert	44	culverts	1	44
Culvert Energy Dissipator	24"-6" riprap	71+40	N/A	dissipator	11	dissipators	1	11
Rock Ditch Filter	6"-4" pit-run	85+50, 142+85, 143+70, 146+10, 150+15, 155+55,	N/A	3 filter series	11	3 filter series	6	66
Road Blocking	24"-6" riprap	130+50	N/A	road block	33	road blocks	1	33
Total Rock for Road Segment:			I1 to I2					3,142

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 Volume (CY) Per		0+00 to 54+50 Number of		
Surface Leveling Rock	1 1/2"-0" crushed	0+00 to 54+50	N/A	load	11	loads	3	33
Surface Leveling Rock	4"-0" crushed	0+00 to 54+50	N/A	load	11	loads	4	44
Surfacing	3/4"-0" crushed	0+00 to 28+30	2	station	13	stations	28.3	368
Surfacing	1 1/2"-0" crushed	28+30 to 44+85	2	station	13	stations	16.55	215
Surfacing	4"-0" crushed	44+85 to 54+50	4	station	25	stations	9.65	241
Junction	3/4"-0" crushed	0+00, 4+90, 12+80, 17+90, 25+15, 27+20	N/A	junction	11	junctions	6	66
Junction	1 1/2"-0" crushed	28+30, 36+20	N/A	junction	11	junctions	2	22
Turnout	3/4"-0" crushed	2+25, 6+90, 15+75	2	turnout	11	turnouts	3	33
Turnout	1 1/2"-0" crushed	36+20	2	turnout	11	turnouts	1	11
Turnout	4"-0" crushed	52+30	4	turnout	11	turnouts	1	11
Turnaround	4"-0" crushed	52+30	N/A	turnaround	11	turnaround	1	11

EXHIBIT D

ROAD SURFACING

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 Volume (CY) Per		0+00 to 54+50 Number of		
Rock Ditch Filter	6"-4" pit-run	28+30, 29+10, 29+75, 30+15, 31+30	N/A	3 filter series	11	3 filter series	5	55
Total Rock for Road Segment:			I3 to I4					1,110
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 66+85 **Number Of**		
Surface Leveling Rock	4"-0" crushed	0+00 to 66+85	N/A	load	11	loads	10	110
Surfacing	4"-0" crushed	0+00 to 66+85	4	station	25	stations	66.85	1,671
Junction	4"-0" crushed	11+75, 21+70, 27+90, 33+00, 45+60	N/A	junction	11	junctions	5	55
Turnout	4"-0" crushed	3+65, 13+15, 15+75, 26+60, 36+60, 56+05, 62+00	4	turnout	11	turnouts	7	77
Turnout	4"-0" crushed	19+60	4	turnout	22	turnouts	1	22
Turnaround	4"-0" crushed	62+00	N/A	turnaround	11	turnarounds	1	11
Culvert Bedding and Backfill	1 1/2"-0" crushed	0+15, 4+00, 6+35, 10+50,	N/A	culvert	33	culverts	4	132
Culvert Bedding and Backfill	1 1/2"-0" crushed	8+25	N/A	culvert	44	culverts	1	44
Culvert Bedding	1 1/2"-0" crushed	37+10	N/A	culvert	44	culverts	1	44
Culvert Backfill	4"-0" crushed	37+10	N/A	culvert	44	culverts	1	44
Rock Ditch Filter	6"-4" pit-run	20+80, 22+00, 37+40	N/A	3 filter series	11	3 filter series	3	33
Culvert Energy Dissipator	24"-6" riprap	37+10	N/A	dissipator	11	dissipators	1	11
Culvert Bedding and Backfill @ Fills	1 1/2"-0" crushed	4+50, 7+35, 17+15, 17+80	N/A	culvert	see spec. instr	culverts	4	264
Culvert Energy Dissipator @ Fills	24"-6" riprap	7+35, 17+15, 17+80	N/A	dissipator	see spec. instr	dissipators	3	88
Fill Armoring @ Fills	24"-6" riprap	7+35, 17+15,	N/A	fill	see spec. instr	fills	2	396
Base Rock Replacement @ Fills	4"-0" crushed	4+50, 7+35, 17+15, 17+83	N/A	fill	see spec. instr	fills	4	154
Total Rock for Road Segment:			I5 to I6					3,156

EXHIBIT D

ROAD SURFACING

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 29+10 Number Of		
Surface Leveling Rock	4"-0" crushed	0+00 to 29+10	N/A	load	11	loads	6	66
Surfacing	4"-0" crushed	0+00 to 29+10	4	station	25	stations	29.1	728
Traction Rock	1 1/2"-0" crushed	0+00 to 23+30	2	station	13	stations	23.3	303
Junction	4"-0" crushed	4+10, 13+20, 23+30	N/A	junction	11	junctions	3	33
Turnout	4"-0" crushed	10+80, 13+85, 20+60, 25+70	4	turnout	11	turnouts	4	44
Turnaround	4"-0" crushed	29+10	N/A	turnaround	33	turnarounds	1	33
Landing	6"-0" pit-run	13+85	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			I7 to I8					1,272
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 10+80 **Number Of**		
Surface Leveling Rock	4"-0" crushed	0+00 to 10+80	N/A	load	11	loads	2	22
Surfacing	4"-0" crushed	0+00 to 10+80	4	station	25	stations	10.8	270
Traction Rock	1 1/2"-0" crushed	0+00 to 10+80	2	station	13	stations	10.8	140
Turnout	4"-0" crushed	4+10	4	turnout	11	turnouts	1	11
Turnaround	4"-0" crushed	7+00	N/A	turnaround	22	turnarounds	1	22
Culvert Bedding and Backfill	1 1/2"-0" crushed	1+10	N/A	culvert	33	culverts	1	33
Landing	6"-0" pit-run	10+80	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			I9 to I10					564
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 16+65 **Number Of**		
Surface Leveling Rock	4"-0" crushed	0+00 to 16+65	N/A	load	11	loads	2	22
Surfacing	4"-0" crushed	0+00 to 16+65	4	station	25	stations	16.65	416
Traction Rock	1 1/2"-0" crushed	0+00 to 11+70	2	station	13	stations	11.7	152
Junction	4"-0" crushed	14+50	N/A	junction	11	junctions	1	11
Rock Ditch Filters	6"-4" pit-run	10+40, 11+40	N/A	3 filter series	11	3 filter series	2	22
Landing	6"-0" pit-run	16+65	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			I11 to I12					689

EXHIBIT D

ROAD SURFACING

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 8+40 Number Of		
Surfacing	4"-0" crushed	0+00 to 8+40	4	station	25	stations	8.4	210
Turnaround	4"-0" crushed	7+00	N/A	turnaround	44	turnarounds	1	44
Landing	6"-0" pit-run	8+40	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			I13 to I14					320

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 Volume (CY) Per		0+00 to 9+60 Number Of		
Surface Leveling Rock	4"-0" crushed	0+00 to 9+60	N/A	load	11	loads	1	11
Surfacing	4"-0" crushed	0+00 to 9+60	4	station	25	stations	9.6	240
Turnout	4"-0" crushed	4+60	4	turnout	11	turnouts	1	11
Turnaround	4"-0" crushed	6+40	N/A	turnaround	22	turnaround	1	22
Landing	6"-0" pit-run	9+60	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			I15 to I16					350

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 Volume (CY) Per		0+00 to 47+90 Number Of		
Surface Leveling Rock	4"-0" crushed	0+00 to 47+90	N/A	load	11	loads	2	22
Surfacing	4"-0" crushed	0+00 to 47+90	4	station	25	stations	47.9	1,198
Junction	4"-0" crushed	10+50	N/A	junction	11	junctions	1	11
Turnout	4"-0" crushed	7+70, 10+50, 20+35, 26+00, 30+10, 35+55, 39+40, 44+40	4	turnout	11	turnouts	8	88
Turnaround	4"-0" crushed	26+00, 47+90	N/A	turnaround	11	turnaround	2	22
Total Rock for Road Segment:			I17 to I18					1,341

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 Volume (CY) Per		0+00 to 8+10 Number Of		
Surfacing	4"-0" crushed	0+00 to 8+10	4	station	25	stations	8.1	203
Turnaround	4"-0" crushed	2+30	N/A	turnaround	11	turnarounds	1	11
Turnaround	4"-0" crushed	8+10	N/A	turnaround	33	turnarounds	1	33
Total Rock for Road Segment:			I19 to I20					247

EXHIBIT D

ROAD SURFACING

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 Volume (CY) Per		0+00 to 103+90 Number Of		
Surface Leveling Rock	1 1/2"-0" crushed	0+00 to 103+90	N/A	load	11	loads	6	66
Surfacing	1 1/2"-0" crushed	0+00 to 103+90	2	station	13	stations	103.9	1,351
Junction	1 1/2"-0" crushed	8+95, 20+10, 60+55, 63+60, 68+55, 89+70, 98+65	N/A	junction	11	junctions	7	77
Turnout	1 1/2"-0" crushed	2+50, 5+70, 12+00, 15+70, 29+10, 36+70, 39+65, 43+10, 50+80, 74+70, 80+20, 95+25	2	turnout	11	turnouts	12	132
Culvert Bedding and Backfill	1 1/2"-0" crushed	22+90, 26+75, 47+80	N/A	culvert	33	culverts	3	99
Total Rock for Road Segment:			I21 to I22					1,725
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 **Volume (CY) Per**		0+00 to 14+60 **Number Of**		
Surface Leveling Rock	1 1/2"-0" crushed	0+00 to 14+60	N/A	load	11	loads	2	22
Surface Leveling Rock	4"-0" crushed	0+00 to 170+60	N/A	load	11	loads	3	33
Surfacing	1 1/2"-0" crushed	0+00 to 14+60	2	station	13	stations	14.6	190
Turnout	1 1/2"-0" crushed	4+70, 7+50, 11+00	2	turnaround	11	turnarounds	3	33
Turnaround	1 1/2"-0" crushed	13+40	N/A	turnaround	11	turnarounds	1	11
Landing	6"-0" pit-run	4+70	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			I23 to I24					355
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 **Volume (CY) Per**		0+00 to 2+00 **Number Of**		
Surfacing	4"-0" crushed	0+00 to 2+00	4	station	25	stations	2	50
Landing	6"-0" pit-run	2+00	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			I25 to I26					116

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 19+90 Number Of		
Surface Leveling Rock	4"-0" crushed	0+00 to 19+90	N/A	load	11	loads	1	11
Surfacing	4"-0" crushed	0+00 to 19+90	4	station	25	stations	19.9	498
Traction Rock	1 1/2"-0" crushed	3+25 to 19+50	2	station	13	stations	16.3	211
Turnout	4"-0" crushed	2+30	4	turnaround	11	turnarounds	1	11
Turnaround	4"-0" crushed	8+10	N/A	turnaround	33	turnarounds	1	33
Landing	6"-0" pit-run	19+90	N/A	landing	66	landings	1	66
Total Rock for Road Segment:			I27 to I28					830
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 15+50 Number Of		
Surfacing	4"-0" crushed	0+00 to 15+50	4	station	25	stations	15.5	388
Traction Rock	1 1/2"-0" crushed	4+15 to 14+20	2	station	13	stations	10.1	131
Junction	4"-0" crushed	4+15, 9+05	N/A	junction	11	junctions	2	22
Turnout	4"-0" crushed	6+60, 9+05	4	turnaround	11	turnarounds	2	22
Turnaround	4"-0" crushed	14+20, 9+05	N/A	turnaround	22	turnarounds	2	44
Landings	6"-0" pit-run	15+50, 9+05	N/A	landing	66	landings	2	132
Total Rock for Road Segment:			I29 to I30					738

ROCK TOTALS (CY)	4”-0”	1½”-0”	¾”-0”	24”-6”	6”-0”	6”-4”
16,619	7,839	5,516	1,746	539	803	176

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, 2, 3, and 4

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	5

EXHIBIT D

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) Rubber-Tired Skidders. A rubber-tired skidder weighing a minimum of 20,000 pounds shall be operated over the fill layers so that the entire layered surface comes in contact with the tires. Skidders with oversized tires (high flotation) are not acceptable for compaction.

(3) Tampingfoot Compactors. Tampingfoot compactors shall exert a minimum pressure of 250 pounds per square inch on the ground area in contact with the tamping feet. The compactor shall cover a minimum width of 60 inches per pass and weigh a minimum of 16,000 pounds.

(4) 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.

(5) 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 culverts on improvement sections.

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	I1 to I2	55+50
2	18	30	CPP	N/A	I1 to I2	61+10
3*	18	40	CPP	N/A	I1 to I2	71+40
4	18	35	CPP	N/A	I1 to I2	117+75
5*	18	30	CPP	N/A	I1 to I2	147+15
6*	18	40	CPP	N/A	I1 to I2	152+00
7*	18	30	CPP	N/A	I1 to I2	157+40
8	18	35	CPP	N/A	I5 to I6	0+15
9*	18	40	CPP	N/A	I5 to I6	4+00
10	18	50	CPP	N/A	I5 to I6	4+50
11*	18	40	CPP	N/A	I5 to I6	6+35
12	36	70	ACSP	14	I5 to I6	7+35
13*	18	40	CPP	N/A	I5 to I6	8+25
14	18	35	CPP	N/A	I5 to I6	10+50
15	48	70	ACSP	14	I5 to I6	17+15
16	18	60	CPP	N/A	I5 to I6	17+80
17	24	50	CPP	N/A	I5 to I6	37+10
18*	18	35	CPP	N/A	I9 to I10	1+10
19*	18	30	CPP	N/A	I21 to I22	22+90
20	18	40	CPP	N/A	I21 to I22	26+75
21	18	35	CPP	N/A	I21 to I22	47+80

TOTAL LENGTHS BY DIAMETER			
18 INCH	24 INCH	36 INCH	48 inch
675	50	70	70

ACSP = Aluminized, CPP = Polyethylene

ASCP culverts 24 inches in diameter or larger shall have 1:1 step beveled inlets.

18* = Ditch Disconnect Culvert
(T = Temporary Culvert, upon completion of road use, remove this culvert as required in Section 2365. Progressive Operations.)

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. At the Simmons Ridge Quarry, all woody debris, including stumps and slash within posted right of way shall be piled and disposed of by burning as directed by STATE.

4. Consolidate cleared, existing 6”-0” pit-run and prepare borrow areas, as shown on Exhibit map.

5. Overburden shall be removed for a distance of 20 feet beyond the developed rock source. All overburden and reject material shall be hauled to the designated waste area as directed by STATE.

6. 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.

7. PURCHASER shall obtain a FPA Burn Permit prior to debris disposal.

8. The STATE shall be notified 24 hours prior to the beginning of blasting operations.

9. Purchaser shall identify a Blaster in Charge (BIC) for all blasting operations. The BIC will be qualified by experience to oversee all phases of the blasting operations. The BIC shall provide direct supervision at all times when blasting and explosives handling activities are occurring on STATE LANDS.

10. 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 as much material as possible within the quarry development area. Each shot shall also have a “tattle-tale” end cap so that it is known if all charges were detonated. The PURCHASER shall detonate or remove all non-detonated explosives from STATE LANDS. PURCHASER shall maintain a comprehensive blasting log that contains all pertinent data for all blasting operations. The blasting log shall be submitted to the STATE after the completion of all blasting activity. The blasting log is intended for STATE record keeping purposes only.

11. 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.

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

13. Oversized material that is produced or encountered during development shall be broken down and utilized for crushing.

14. 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.

15. 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.

16. 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

ROCK QUARRY DEVELOPMENT AND USE

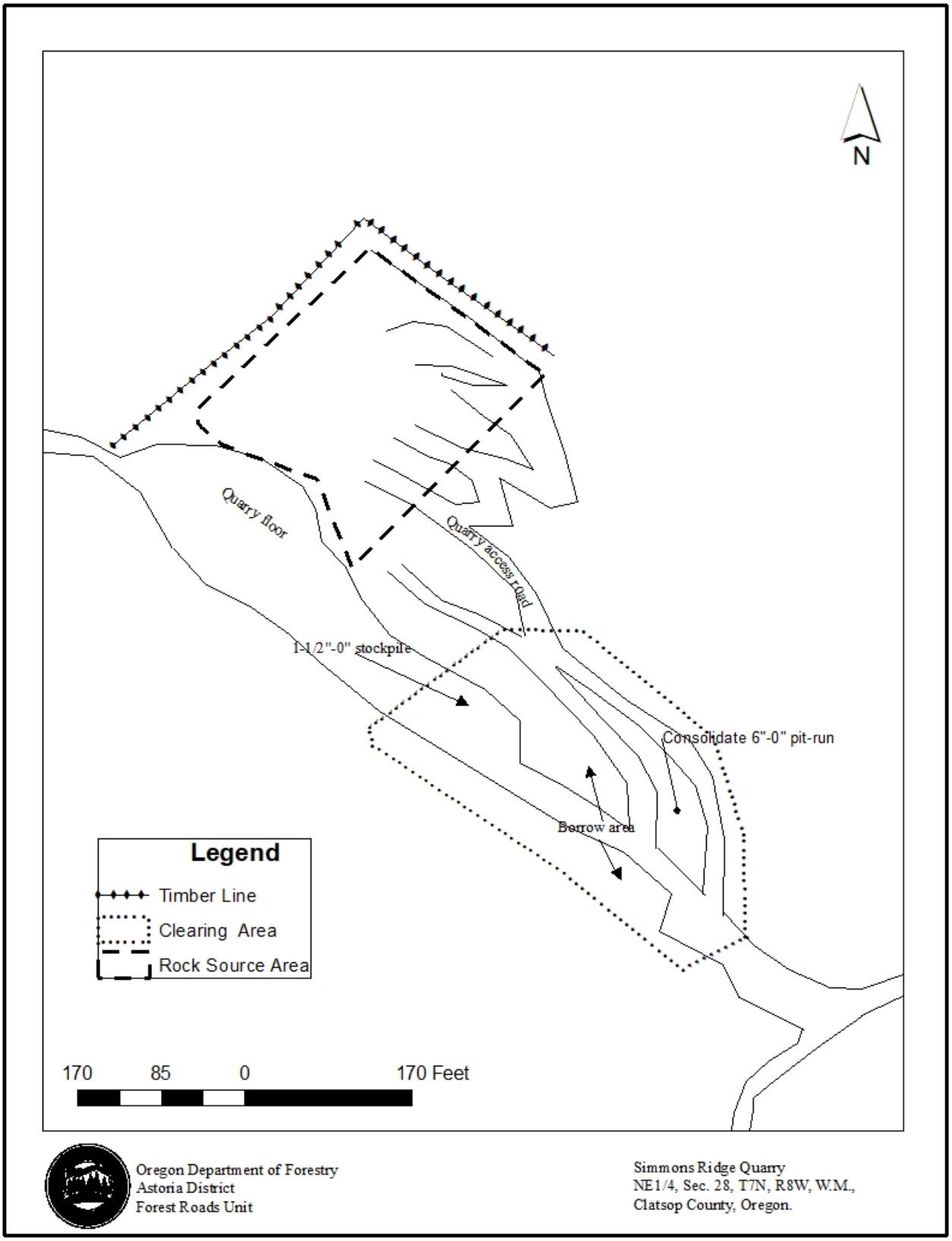


EXHIBIT F

CRUSHED ROCK SPECIFICATIONS

Materials. The material shall be fragments of rock crushed to the required size. The material shall be free from vegetation and lumps of clay. STATE may require screening and/or rejecting of materials utilized for production of crushed rock for the purpose of removing excess fine material. Excess fines are present, when greater than 5 percent of a total rock sample weight, passes a #200 sieve. Rock crushing shall be limited to periods when weather conditions are acceptable to STATE.

Quality and Grading Requirements. The base material shall be rock. River gravel shall not be used. Crushed rock shall meet the grading requirements that follow:

Hardness - Aggregate Hardness - Test Method AASHTO T 96: 30% Maximum

Durability – Test Method ODOT TM 208
Passing No. 20 Sieve: 30% Maximum

For the purpose of crushing rock specified under the projects in Section 2610, “Project Work,” PURCHASER shall utilize a three-stage rock crusher, or equivalent, unless otherwise approved by STATE.

The rock crusher shall be calibrated to produce rock as specified in this exhibit. Prior to the commencement of production crushing, PURCHASER shall sample, test, and provide rock test results meeting STATE specifications. STATE may then sample and test crushed rock for approval to proceed. PURCHASER shall take one sample of each 2,000 cubic yards of crushed rock material produced thereafter, using approved AASHTO sampling procedures. PURCHASER shall submit samples to a certified laboratory or shall perform testing for gradation requirements using AASHTO T 11 and AASHTO T 27 testing procedures. Prior to testing, each sample shall be split, making one-half of the sample, with proper identification, available for testing by STATE. Each sample and the results of PURCHASER testing shall be made available to STATE within 24 hours of sampling. Any rock crushed prior to STATE approval to proceed shall not be credited to the required rock quantity. Any subsequent rock tests not meeting STATE specifications shall be reason for rejection of that portion of crushed rock produced after that test and shall not be credited to the required rock quantity. STATE may sample the crushed rock at any time during the operation. Results of STATE’s tests shall prevail over all other test results.

EXHIBIT F

CRUSHED ROCK SPECIFICATIONS

Grading Requirements

For ¾"-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 4”-0”	Passing	5" sieve	100%
	Passing	4" sieve	90-100%
	Passing	2" sieve	60-90%
	Passing	3/4" sieve	35-60%
	Passing	1/4" sieve	15-35%
	Passing	No. 10 sieve	0-20%

The referenced sieve shall have square openings as set forth in AASHTO M 92, Woven Cloth Series. The determinations of size and gradation shall be as set forth in AASHTO T 27.

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%

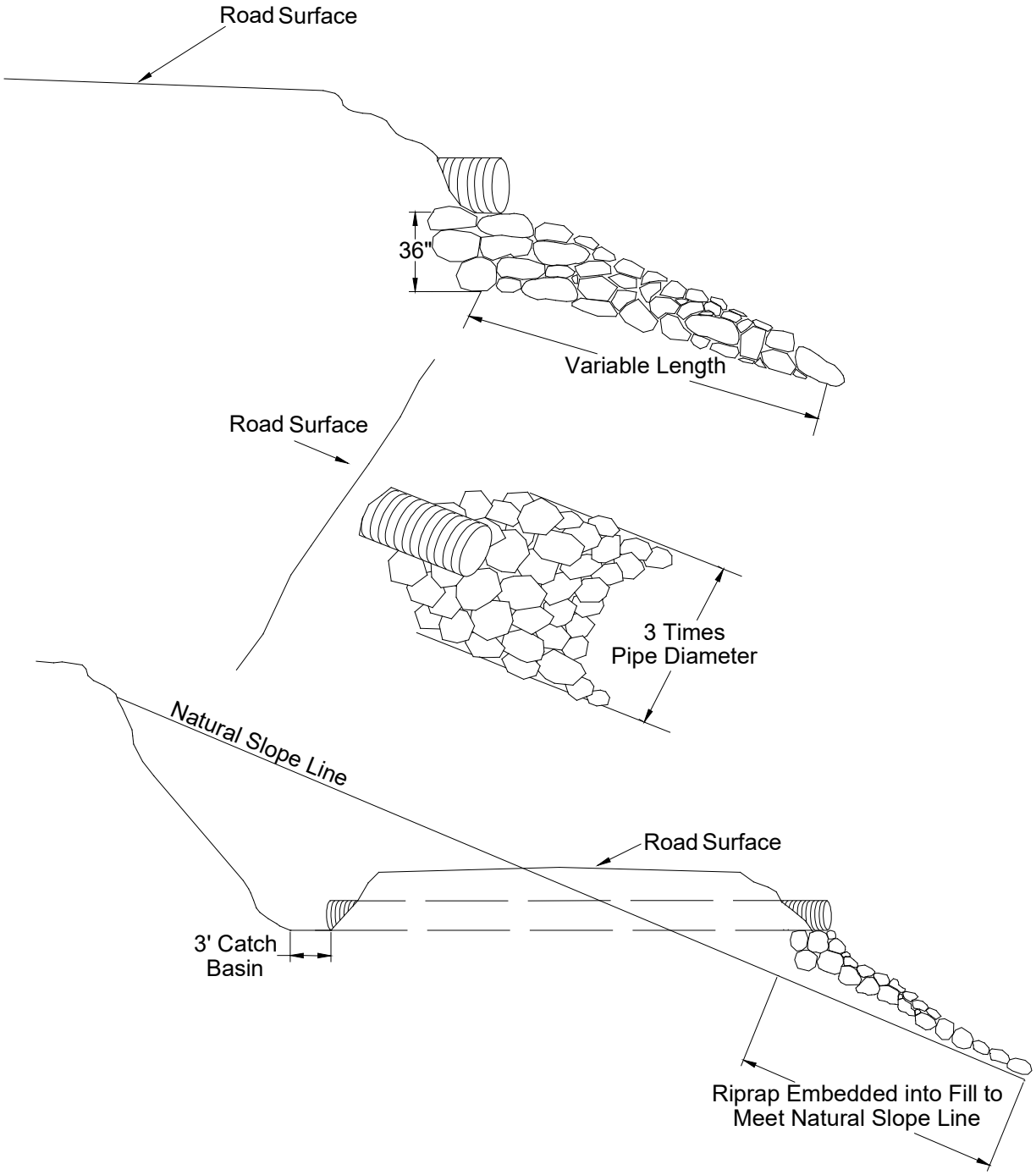
For 6”-4” Pit-Run A minimum of 50 percent of the material shall measure a minimum of 4 inches, measured in one dimension. Material shall be clean, well graded, and free of 3"-0" fines.

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.

Control of gradation shall be by visual inspection by STAT

EXHIBIT G

TYPICAL EMBEDDED ENERGY DISSIPATOR



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

EXHIBIT H

ROAD BRUSHING SPECIFICATIONS

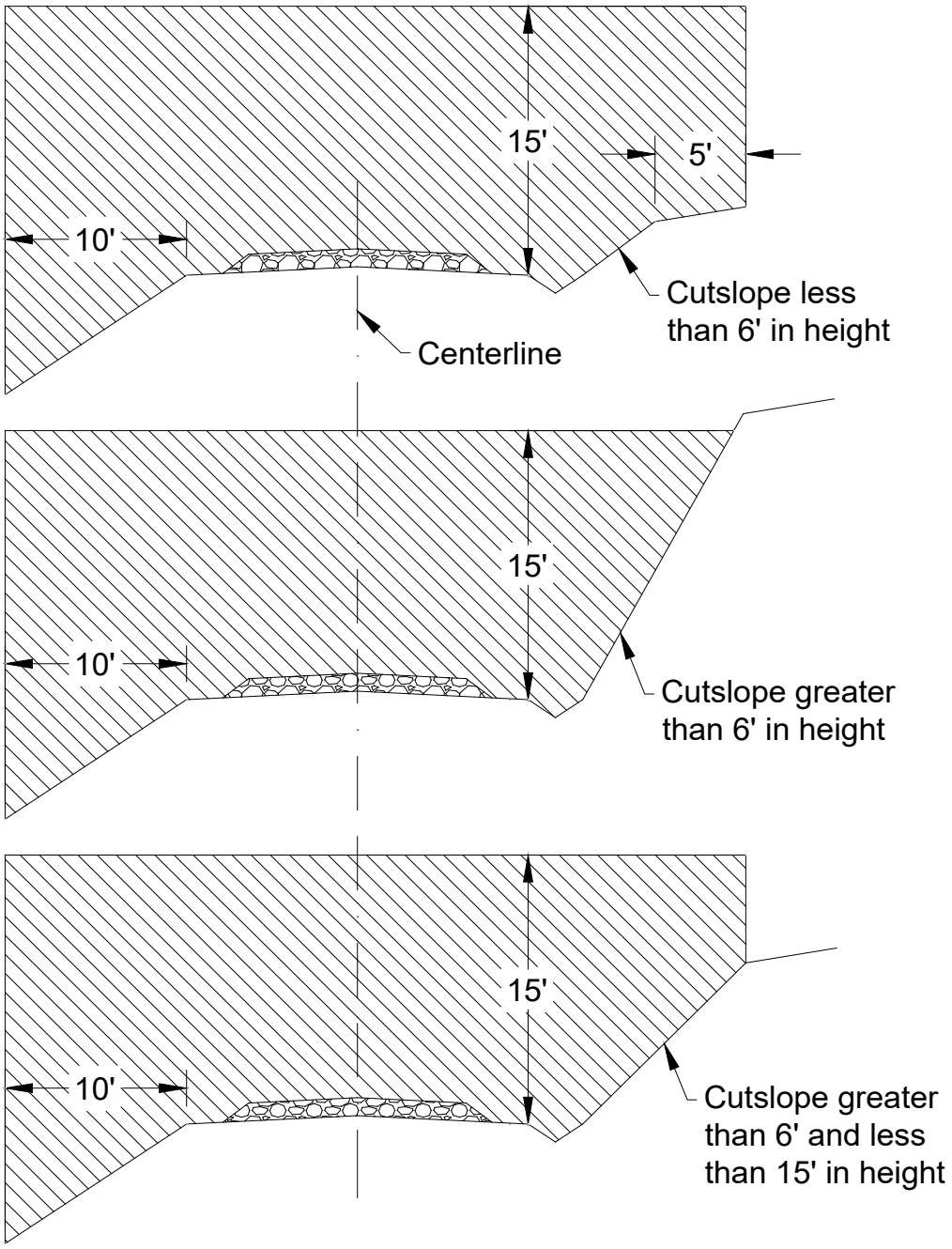


EXHIBIT H

ROAD BRUSHING SPECIFICATIONS

GENERAL ROAD BRUSHING INSTRUCTIONS:
Conduct roadside brushing as specified in this Exhibit, on road segments as shown on Exhibit A, identified in the Legend as “Roads to Brush”. Detailed road brushing maps available upon request, from the Astoria District office.

CUTTING REQUIREMENTS (PRIVATE Roads):
For all situations on private property, the minimum height of brushing shall be 15 feet from the road surface, and the minimum width of brushing on the down slope side of the road shall be 5 feet horizontal distance. The minimum width of brushing on the cutslope side of the road shall be 5 feet horizontal distance from the bottom of the ditch. In situations where site distance is an issue brushing heights on the cutslope may vary from the above drawings, as directed by STATE. All turnouts and turnarounds encountered shall be brushed.

CUTTING REQUIREMENTS (STATE Roads):
The minimum height of brushing shall be for all situations 15 feet from the road surface, and the minimum width of brushing on the down slope side of the road shall be 10 feet horizontal distance. The minimum width of brushing on the cutslope side of the road shall be dictated by the height of the cutslope as indicated in the three drawings above. In situations where site distance is an issue brushing heights on the cutslope may vary from the above drawings, as directed by STATE. All turnouts and turnarounds encountered shall be brushed.

CLEAN-UP and DEBRIS REMOVAL:
Brush and trees shall be cut to a maximum height of 6 inches above the ground surface or obstructions such as rocks or existing stumps. All vegetation on the road surface shall be cut flush to the road surface. Stumps greater than three inches on the road shoulder and ditchline, shall be cut flush to the surface.

Debris resulting from the brushing operation shall be removed from the roadway, cutslope, ditches, water courses, culvert inlets/outlets, and sediment catch basins. Debris shall be mulched or scattered downslope from the road or placed in other stable locations. Large debris, 6 inches or larger in diameter, shall be mulched or cut into lengths 6 feet or less to facilitate rapid decay, unless otherwise approved by STATE.

Trees larger than 6 inches in diameter at stump height, located within brushing limits but outside of the ditchline or shoulder, shall not be cut down, but shall be limbed for road visibility.

Existing debris on the roadway, cutslope, ditchline, or catch basin shall be removed and treated. Debris shall be mulched or scattered downslope from the road or placed in other stable locations. Large non-merchantable debris, 6 inches or larger in diameter, shall be mulched or cut into lengths 6 feet or less to facilitate rapid decay, unless otherwise approved by STATE.

Merchantable blown down trees encountered shall be bucked in lengths as directed by STATE, and placed in locations acceptable to STATE, or pushed out of the road prism.

When spur roads to be brushed end with a landing, the landing is to be brushed as directed by STATE.

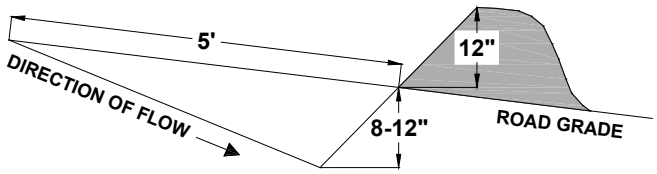
CULVERT AND ROAD MARKER DAMAGES: Culvert and road markers damaged, or any portion of a marker damaged from PURCHASER activities shall be replaced.

EXHIBIT I

WATERBAR SPECIFICATIONS

PROFILE

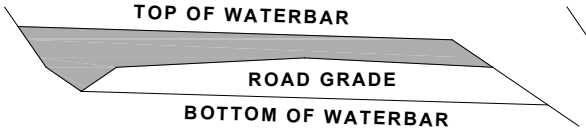
DITCHED AND OUTSLOPED



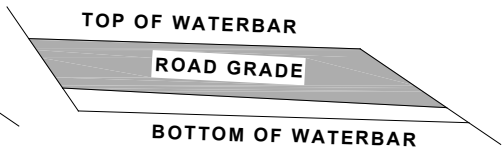
SPACING OF WATERBARS	
ROAD GRADE	DISTANCE
< 6 %	400'
6 - 10 %	200'
11 - 15 %	150'
> 15 %	100'

CROSS SECTION

DITCHED



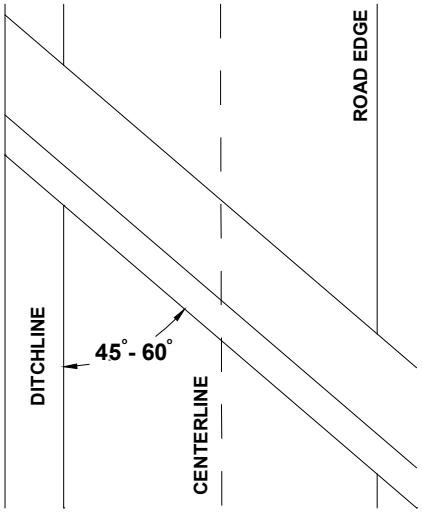
OUTSLOPED



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

PLAN VIEW

DITCHED



OUTSLOPED

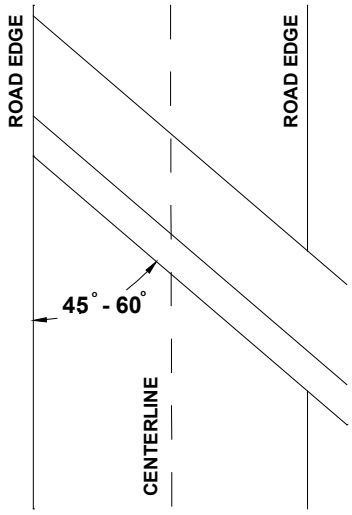


EXHIBIT J

ROAD VACATING SPECIFICATIONS

PURCHASER shall vacate at the following points: (V1 to V2, V3 to V4, and V5). 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 NOT be removed as designated timber, unless located within posted timber sale boundaries or right-of-way boundaries. Trees marked "C" with orange paint may be removed as designated timber.

(2) Fill Removal and Stream Channel Development. Remove fills to the natural stream course levels. Stream channels 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) 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.

(6) 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.

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

(8) 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.

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

(10) 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.

SPECIFIC INSTRUCTIONS/SPECIFICATIONS:

Segment	Station	Work Description
V1 to V2	0+00	Begin vacate, block road, Point V1.
	1+85	Establish 3 foot stream channel.
	3+50	Establish 3 foot stream channel.
	6+95	Establish 4 foot stream channel.
	12+45	Establish 3 foot stream channel.
	13+80	Establish 3 foot stream channel.
	14+85	Establish 3 foot stream channel.
	16+55	Remove top 8 feet of fill and establish 3 foot stream channel.
	17+85	End vacate, block road, Point V2.
V3 to V4	0+00	Begin vacate, Point V3.
	7+50	End vacate, block road, Point V4.
V5	0+00	Establish 3 foot stream channel. Retain puncheon logs in stream channel.

EXHIBIT K

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 within 25 feet of a stream channel resulting from Project No. 2 and 6.

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 and fertilizer 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+85	V5	0+00
V1 to V2	3+50		
V1 to V2	6+95	I5 to I6	4+50
V1 to V2	12+45	I5 to I6	7+35
V1 to V2	13+80	I5 to I6	17+15
V1 to V2	14+85	I5 to I6	17+80
V1 to V2	16+55	I17 to I18	0+40

EXHIBIT L

STREAM ENHANCEMENT INSTRUCTIONS

General Instructions:

(a) Work shall be conducted only during the in-water working period between July 1 and September 15 annually unless otherwise approved by STATE. STATE shall be notified a minimum of 48 hours prior to beginning work. STATE has prepared the required FPA "Written Plan" for this work.

(b) Stream crossings will be limited to those necessary to access the sites and whenever possible equipment shall operate from the banks to minimize stream disturbance. Turbidity shall not exceed 10 percent above natural stream turbidities as a result of work. The turbidity may be exceeded for a limited duration (per OAR 340-41), provided all practicable erosion control measures have been implemented. Oil spill response materials shall be on site before work begins.

(c) Trees required for stream enhancement work shall be conifers obtained from the sale area, or at other locations acceptable to STATE. Trees can have defects such as double tops, crooked trunks, heart rot etc. as long as they meet the required size dimensions.

(d) Trees shall be uprooted as needed, cut to length, and delivered to the project site, as directed by STATE. Trees shall be transported by log truck, or other means so that roads are not damaged (i.e. trees cannot be dragged on road surface).

(e) Access routes shall be selected to minimize disturbance to the riparian area, and equipment transporting trees to the sites shall take care to avoid damage to existing in-stream logs, riparian or other trees**.** Trees that are cleared to gain access shall be placed in the creek or used to block access trails.

(f) All placements shall be done using a cable yarding system unless otherwise approved by STATE.

(g) All areas of bare or disturbed soils shall be seeded with an approved grass seed mix. Fertilizer shall not be used. All access trails shall be thoroughly blocked to prevent access using large woody debris or boulders, water barred, ripped or tilled, and mulched upon completion, as directed by STATE.

Specific Instructions:

Location	Work Description
SE1 to SE2	PURCHASER shall select 4 sites between points SE1 and SE2. Sites will have a minimum of 10 and a maximum of 16 conifer pieces (trees or logs) at each location. Trees or logs sourced shall be at least 20 inches in diameter at the large end with each log being at least 30 feet in length. Structures shall be at least 100 feet apart. Logs should be placed in a complex configuration as directed by STATE.
SE3 to SE4	PURCHASER shall select 1 site between points SE3 and SE4. The site will have a minimum of 10 and a maximum of 16 conifer pieces (trees or logs). Trees or logs sourced shall be at least 20 inches in diameter at the large end with each log being at least 30 feet in length. Logs should be placed in a complex configuration as directed by STATE.

FOREST PRACTICES ACT "WRITTEN Plan"
For Operations within 100 feet of Type F Stream

Timber Sale Area is located in Portions of Section 26 of T7N, R8W, W.M., Clatsop County, Oregon.

Landowner: Oregon Department of Forestry
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Protected Resources:

Middle Fork North Fork Klaskanine River
Unnamed Tributaries of Middle Fork North Fork Klaskanine River

Specific Site Characteristics: (Physical habitat surveys were conducted in February of 2021.)

Middle Fork North Fork Klaskanine River (Large, Type F) delineates the southern Timber Sale Boundary of Unit 3 for a distance of approximately 550 feet.

Middle Fork North Fork Klaskanine River (Medium, Type F) delineates a portion of the southeast Timber Sale Boundary of Unit 2 for a distance of approximately 1,450 feet.

Middle Fork North Fork Klaskanine River (Medium, Type F) delineates the southern Timber Sale Boundary of Unit 1 for a distance of approximately 625 feet.

Unnamed Tributary of Middle Fork North Fork Klaskanine River (Medium, Type F) flows south through the middle of Unit 3 for a distance of approximately 2,100 feet.

Unnamed Tributaries of Middle Fork North Fork Klaskanine River (Small, Type F) delineates a portion of the east Timber Sale Boundary of Unit 3 for a distance of approximately 1,100 feet. Another tributary flows south through the middle of Unit 2 into the Middle Fork North Fork Klaskanine River for a distance of approximately 250 feet.

Tree and Vegetation Retention:
Vegetation within the buffers consists of a combination of conifers, hardwoods, and shrubs.

Type F streams within the Timber Sale Area are buffered at a minimum of 100 feet horizontal distance in Modified Clearcut Units.

Resource Protection Practices:
Along all of the above-mentioned streams, as well as any other streams, the following practices are required under the timber sale contract, to protect the streams and streamside areas:

- No trees will be felled within stream buffers (RMA's), except as necessary in cable corridors.
- Trees that fall or slide into Type F RMA's shall not be removed without prior approval from STATE.
- Trees adjacent to the stream buffers (RMA's) will be felled away from or parallel to the streams to prevent trees from entering the aquatic areas.
- When cable logging is conducted nearby the RMA's, logging lines may cross, but shall not be lowered into the RMA's during yarding, except during rigging. During rigging, the lines must be pulled out of the RMA's when changing corridors.
- Logs shall be fully suspended when yarding across all stream buffers (RMA's).
- Cable corridors must be at least 100 feet apart where they cross the RMA's.

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operations conducted within 100 feet of Type F and D streams. I agree to the protection measures listed on this plan:

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Original: Salem
CC: Operator, Purchaser, District file, Marketing Unit

FOREST PRACTICES ACT "WRITTEN Plan"
Constructing a permanent Stream Crossing fill over 15 feet deep in a Type N Stream

Timber Sale Area is located in Sections 22, 23, 26, 27 and 28 of T7N, R8W, W.M., Clatsop County, Oregon.

Landowner: Oregon Department of Forestry
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Protected Resources: Middle Fork North Fork Klaskanine River

Road Segments:
I5 to I6 (Sta. 7+35 and 17+15) crosses unnamed Type N tributaries of Middle Fork North Fork Klaskanine River, located in the NW1/4 of Section 27 T7N, R8W, W.M., Clatsop County, Oregon, with a fill over 15 feet. A written plan is required when constructing a permanent stream crossing fill over 15 feet in depth in a Type N stream, as specified in ORS 629-625-0320(1)(b)(B).

Situation:
The current structures are failing.

Solution:
Design a crossing structure that meets or exceeds the need of the particular stream crossing site and FPA requirements for a Type N stream crossing.

Drainage Area and Structure Design:

1. Segment I5 to I6 (Sta. 7+35), the existing 48" x 60" diameter squashed and 60' long stream crossing structure will be replaced with a 36" diameter, 70' long, 14 gage aluminized steel round culvert pipe.
2. Segment I5 to I6 (Sta. 17+15), the existing 48" x 60" diameter squashed and 75' long stream crossing structure will be replaced with a 48" diameter, 70' long, 14 gage aluminized steel round culvert pipe.

Road segment:	I5 to I6	I5 to I6
Station	7+35	17+15
New Stream Gradient:	9%	13%
Size of Watershed:	25 acres	81 acres
Average Stream Width:	2 feet	3 feet
Streambed material:	Cobble	Cobble
50 Year Peak Flow/Mi.^{2}:	300 cfs	300 cfs
50 Year Peak Flow:	11.86 cfs	38.1 cfs
Flow Capacity of New Structure:	30 cfs	65 cfs

Resource Protection Measures:

- In water work is only allowed from July 1 through September 30.
- Machine activity in stream channel shall be minimized.
- All fill excavation, backfilling, stream channel development, and riprap placement shall be performed using a minimum 2 cubic yard track mounted excavator.
- A dewatering plan shall be developed and followed from the start of excavation until the structure is in place and water flowing.
- An erosion control plan shall be developed and followed to prevent sediment from entering the stream during construction work.
- Clearing debris, and excavation material shall be hauled to a designated waste area.
- Riprap rock shall be used to protect the structure, road approaches/embankments, and stream banks from erosion.
- Oil spill response materials shall be on site before work begins.

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operations conducted when, fill work exceeds 15 feet in height. I agree to the protection measures listed on this plan.

Submitted _____ _____
Purchaser/Operator Date

Attachments: Exhibit A
Original: Salem
Copies: Operator, Purchaser, District File, Forest Roads Unit, Marketing Unit

FOREST PRACTICES ACT "WRITTEN Plan"
For Stream Enhancement Operations within 100 feet of Type F Stream

Stream Enhancement will occur in portions of Section 26 of T7N, R8W, W.M., Clatsop County, Oregon.

Landowner: Oregon Department of Forestry
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Protected Resources**:**

Middle Fork North Fork Klaskanine River

Specific Site Characteristics:
SE1 to SE2 - Middle Fork North Fork Klaskanine River (Medium, Type F Stream) flows through the Timber Sale Area for approximately 1,450 feet. Channel width ranges from approximately 15 to 20 feet in width in this section.

SE3 to SE4 - Middle Fork North Fork Klaskanine River also flows through the Timber Sale Area for approximately 625 feet. Channel width ranges from approximately 10 to 15 feet in width in this section.

The stream habitat is relatively uniform with a meandering channel along the entire reach which is predominantly a single channel. Streamside vegetation is predominately red alder with a mix of Douglas-fir, western hemlock, Sitka spruce, and salmonberry.

Tree and Vegetation Retention:
FPA defines the RMA width of a large Type F stream as 100 feet. The Timber Sale Boundary for Units 1 and 2 are posted at least 100 feet from the Type F stream. The RMA is dominated by red alder and salmonberry and lacks sufficient conifer presence suitable for the recruitment of woody debris. All logs for stream placement will be sourced from the Timber Sale Area. Harvesting will not be permitted within the posted Buffer Zone.

Practices:
A total of five stream enhancement structures will be placed and constructed using a cable yarder. Four stream enhancement structures will be placed between points SE1 and SE2 and one stream enhancement structure will be placed between points SE3 and SE4. The approximate locations are shown on Exhibit "A" and work to be done is described as follows:

> Structures shall be at least 100 feet apart and have a minimum of 10 and a maximum of 16 conifer pieces (trees or logs) at each location. Trees or logs sourced shall be at least 20 inches in diameter at the large end with each log being at least 30 feet in length. Trees or logs will be obtained from within the timber sale area only and will not be taken from stream buffers. Trees or logs should be placed in a complex configuration with at least one end on the stream bank as to simulate natural placement.

Stream Enhancement structures must be created by the PURCHASER for stream improvement as recommended by the ODFW fisheries biologist and District staff. The logs will be placed with a cable yarder into the stream at locations specified by STATE. This work will take place during the in-stream work period for Middle Fork North Fork Klaskanine River (July 1 – September 15). If the work cannot be done during the designated in-stream work period, an ODFW fisheries biologist will be consulted to field verify any fish habitat concerns and approve any work to be conducted outside the designated period.

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operations conducted within 100 feet of Type F streams. I agree to the protection measures listed on this plan:

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Original: Salem
CC: Operator, Purchaser, District file, Jewell Unit

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: (___) _____