

PART III: EXHIBITS

State Timber Sale Contract
No. 341-16-69
Microwave Thin

EXHIBIT B

Page 1 of 3
629-Form 341-203
Revised 06/97

OREGON DEPARTMENT OF FORESTRY

TIMBER SALE OPERATIONS PLAN

(See Page 2 for instructions)

Date Received by STATE: _____

(5) State Brand Information (complete):



(1) Contract No.: 341-16-69

(2) Sale Name: Microwave Thin

(3) Contract Expiration Date: October 31, 2018

Project Completion Dates: Project No's 1, 2, 3, and 4: 10-31-2017

(4) Purchaser: _____

(6) Purchaser Representatives:

Projects: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

Projects: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

Projects: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

Projects: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

Logging: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

Logging: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

Logging: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

Logging: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

(7) State Representatives:

Projects: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

Logging: _____

Phone: _____

Cell/Other

Phone: _____

Home: _____

(8) Name of Subcontractors & Starting Dates:

Projects: No(s) _____ - _____

Date: _____

Phone: _____

No(s) _____ - _____

Date: _____

Phone: _____

No(s) _____ - _____

Date: _____

Phone: _____

No(s) _____ - _____

Date: _____

Phone: _____

Logging: Felling _____

Date: _____

Phone: _____

Yarding: _____

Date: _____

Phone: _____

(9) Comments: _____

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

EXHIBIT B
INSTRUCTION SHEET FOR OPERATIONS PLAN

SUBMIT ONE COPY OF PLAN TO STATE

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

Explanation of Item No. (from Page 1)

- (5) All sales require you to use a brand furnished by STATE. If the State brand has not been assigned when the plan is submitted, it will be furnished and assigned later. Complete drawing. If more than one brand is assigned to the sale, complete both drawings.
- (6) The contract requires you to have a designated representative available on the sale area or work location who is authorized to receive in your behalf any notice or instruction given by STATE and to take action in regard to performance under the contract. If logging and project work is widely separated, a representative is required for each.
- (7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.
- (8) Show names of subcontractors to be used for any or all phases of the operations. If subcontractors are not known, or are changed later, give notification to the STATE representative prior to commencement of work by subcontractor.

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

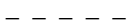
- (10) The STATE representative will furnish extra copies of Exhibit A of the contract for your use in preparing the operations map. The map shall use the following legend and show:
 1. Landing locations, approximate setting boundaries, and probable sequence of logging the settings. Number the settings in sequence.
 2. Locations of spur roads planned for construction, other than those required by the timber sale contract. Provide spur road specifications.
 3. Location of proposed tractor yarding roads. Show if and how marked on the ground.
 4. Location of temporary stream crossings.
 5. List the sequence of performing project work.
 6. Location of rock sources - attach pit development plans.



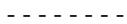
Cable Landing, with numbers for sequence.



Tractor Landing with alphabetical sequence.



Approximate setting boundary.



Spur truck roads.



Tractor yarding roads.



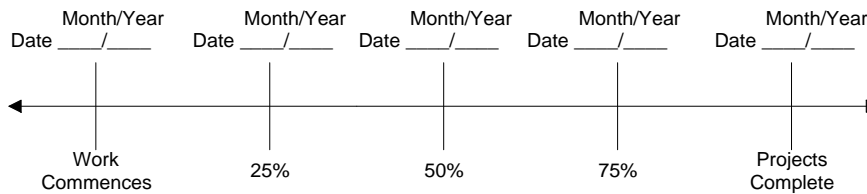
Temporary stream crossings.

EXHIBIT B
OPERATIONS PLAN

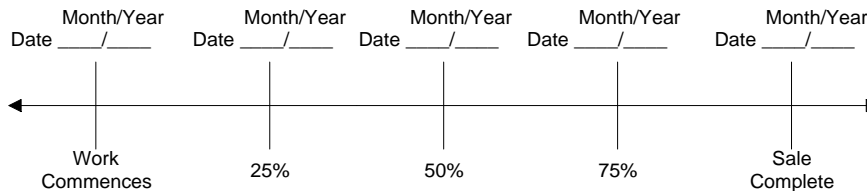
Completion Timeline

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

Projects



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, PURCHASERS must comply with all applicable state, federal, and local laws.

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

APPROVED: Date: _____

SUBMITTED BY:
PURCHASER

STATE OF OREGON - DEPARTMENT OF FORESTRY

Title _____

Title _____

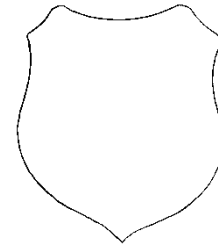
Original: Salem
cc: District File
Purchaser
Operator

EXHIBIT C – SAWMILL GRADE (WESTSIDE SCALE)

SCALING INSTRUCTIONS -- LOCATION APPROVAL -- BRAND INFORMATION

- (1) ORIGINAL REGISTRATION ☐ Date _____
REVISION NUMBER _____ ☐ Date _____
CANCELLATION ☐ Date _____
- (2) TO: _____
(Third Party Scaling Organization)
- (3) FROM: Astoria (04) Phone (503)325-5451
(State Forestry District)
Address 92219 Hwy. 202, Astoria, OR 97103
- (4) PURCHASER: _____
Mailing Address: _____
Phone Number: _____

- (9) SALE NAME: Microwave Thin
COUNTY: Clatsop
- (10) STATE CONTRACT NUMBER: 341-16-69
- (11) STATE BRAND REGISTRATION NUMBER: _____
- (12) STATE BRAND INFORMATION (COMPLETE):



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

* Apply minimum volume test to whole logs over 40' Westside

- (13) PAINT REQUIRED: YES ☒
COLOR: Orange

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

(14) SPECIAL REQUESTS	(Check applicable)
PEELABLE CULL (all species)	<input type="checkbox"/>
NO DEDUCTIONS ALLOWED FOR MECHANICAL DAMAGE	<input checked="" type="checkbox"/>
ADD-BACK VOLUME - Deductions due to delay	<input checked="" type="checkbox"/>
OTHER:	

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

- (15) REMARKS _____

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

(16) SIGNATURES:

Purchaser or Authorized Representative Date

State Forester Representative Date

State Forester Representative PRINT NAME

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

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

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

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

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

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

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

Northwest Log Scalpers, Inc.
5526 NE 122nd Ave, Portland, OR 97230
Phone: (503) 254-0600 Fax: (503) 408-0919
E-mail: info@nwlogscalpers.com

Pacific Log Scaling & Grading Bureau, Inc.
P.O. Box 23939, Portland, OR 97281
Phone: (503) 684-5599 Fax: (503) 639-04880
E-mail: PacLogScale@aol.com

- (3) State District office, address and phone.
- (4) Enter Purchaser's business name, address, and phone number as it appears on the Contract.
- (5) Minimum Scaling Specifications.
- (6) Westside – Region 6 actual taper segment scale. Check Yes or No. Special Service Rules on file with TPSO. See: Segment Scaling and Grading of Long Logs -- All Species -- State Forestry Department Scaling Practices (Westside).
- (7) Weight Scale Sample – Check box if sale is to be a Weight Scale Sample. All specifics for handling, scaling and processing will be attached or explained in the Remarks section Item (15).
- (8) Show scaling locations only applicable to TPSO. Location name should appear as it does on the ODF Approved Scaling Location web site: http://www.odf.state.or.us/DIVISIONS/management/asset_management/ScalingLocation.asp Locations with scaling and processing directions specific to their location should be on a separate form. Species should be identified if not capable of receiving "all" species. Check appropriate box for either: yard, truck scale, or weight. Refer to the web site listed above for the locations approval status.
- (9) Enter sale name and county.
- (10) Enter sale Contract number.
- (11) Enter Oregon's State Brand Registry Number **(REQUIRED)**.
- (12) Show brand assigned to timber sale. One brand only. If more than one brand is assigned to the sale: (1) make a separate form for each brand and (2) on each form, explain and show other brand(s) in the Remarks section Item (15).
- (13) Check yes for Paint Required and designate "Orange" for color. Non required removal volumes may sometimes require blue paint.
- (14) Special Requests. These are requests that will be applied to ODF timber sales. All boxes applicable to the timber sales designated in the Exhibit C form must be "marked". If "Other" is indicated, it must contain a description and any necessary comments.
- (15) Use this space to designate any weight conversion factors, per load volumes, weight scale sample instructions or any other explanations to clarify scaling, processing and/or mailing requirements. If additional scaling locations are approved, revise original or current form showing all (old and new) locations. Check REVISION box at top of form and explain under remarks. Route as indicated.
- (16) Require purchaser to sign and date completed form in addition to State Forester Representative, sign and print name on the form.

Salem Distribution Instructions: Original will be mailed to Salem after it is electronically scanned and placed in the Salem transfer drive <\\WPODFILL01\Transfer\ScalingInstructions> or e-mailed directly to scaling@odf.state.or.us. Scaling instructions for each brand should be scanned separately, for each approved TPSO.

EXHIBIT C – PULP SORT

PROCESSING INSTRUCTIONS -- LOCATION APPROVAL -- BRAND INFORMATION

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

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

(3) FROM: Astoria (4) Phone (503)325-5451
(State Forestry District)

(4) PURCHASER: _____

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

Mailing Address: _____

Phone Number: _____

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

- Top portion of the tree (tops).
- All logs with a diameter (Big End) greater than 8 inches marked with blue paint.

(7) PULP FACILITY PROCESSING INSTRUCTIONS:

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

(8) TPSO PROCESSING INSTRUCTIONS

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

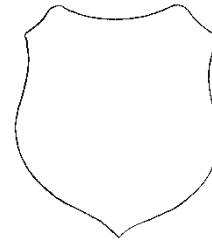
(9) SALE NAME: Microwave Thin

COUNTY: Clatsop

(10) STATE CONTRACT NUMBER: 341-16-69

(11) STATE BRAND REGISTRATION NUMBER _____

(12) STATE BRAND INFORMATION: (COMPLETE BELOW)



(13) REMARKS: _____

Operator's Name (Optional inclusion by District):

(14) SIGNATURES:

Purchaser or Authorized Representative Date

State Forester Representative Date

State Forester Representative PRINT NAME

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

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

EXHIBIT C – PULP SORT
INSTRUCTIONS FOR FORM 343-307b (rev. 11/11)

- (1) **Must Complete.** Check appropriate box. REVISION NUMBER requires comments in the Remarks Section (13). CANCELLATION requires logging and hauling to be complete, recall branding hammers, date and sign where indicated, write diagonally across page "CANCEL", and send to TPSO.
- (2) **Must Complete.** Approved Pulp Processing Facility. Write in as written in the Approved Log Delivery Location http://www.odf.state.or.us/DIVISIONS/management/asset_management/ScalingLocation.asp
- (3) **Must Complete.** State Forestry District and District Phone Number.
- (4) **Must Complete.** Purchaser's business name as it appears on the Contract.
- (5) **Must Complete.** Third Party Scaling Organization that will be processing the weight tickets, mailing address, and phone number.

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

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

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

Northwest Log Scalpers, Inc.
5526 NE 122nd Ave, Portland, OR 97230
Phone: (503) 254-0600 Fax: (503) 408-0919
E-mail: info@nwlogscalpers.com

Pacific Log Scaling & Grading Bureau, Inc.
P.O. Box 23939, Portland, OR 97281
Phone: (503) 684-5599 Fax: (503) 639-04880
E-mail: PacLogScale@aol.com

- (6) **Must Complete.** Big end log not to exceed 8 inches. Big end of log is not to exceed 2 inches greater than the minimum removal specifications in the contract. Example: Minimum removal specifications 6 inches and 20 board feet, then the Big end of log not to exceed 8 inches. When conifer and hardwood removal specifications are different, use the smaller removal diameter to determine this specification.
- (9) **Must Complete.** Enter sale name and county. If more than one county write in all the counties that the sale is located in.
- (10) **Must Complete.** Enter sale Contract number.
- (11) **Must Complete.** Enter Oregon's State Brand Registry Number **(REQUIRED)**.
- (12) **Must Complete.** Show brand assigned to timber sale. One brand only. If more than one brand is assigned to the sale: (1) make a separate form for each brand and (2) on each form, explain and show other brand(s) in the Remarks section Item (13).
- (13) Use this section to list any special instructions or the reason for any revisions in section item (1).
- (14) **Must Complete.** Purchaser required to sign and date completed form in addition to State Forester Representative, sign and print name on the form.

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

EXHIBIT D
FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DRAINAGE
16 feet	12 feet	1A to 1B	0+00 to 6+90	Crowned/Ditch
16 feet	12 feet	1C to 1D	0+00 to 28+00	Crowned/Ditch
16 feet	12 feet	1E to 1F	0+00 to 8+00	Crowned/Ditch
16 feet	12 feet	2A to 2B	0+00 to 5+10	Crowned/Ditch
16 feet	12 feet	2C to 2D	0+00 to 26+60	Crowned/Ditch
14 feet	12 feet	2E to 2F	0+00 to 13+30	Outsloped
16 feet	12 feet	2G to 2H	0+00 to 3+30	Crowned/Ditch
16 feet	12 feet	I1 to I2	0+00 to 34+00, and 37+50 to 64+35	Crowned/Ditch
16 feet	12 feet	I1 to I2	34+00 to 37+50	Outsloped
16 feet	12 feet	I5 to I6	0+00 to 116+00	Crowned/Ditch
16 feet	12 feet	I7 to I8	0+00 to 28+55	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.

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. Clearing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing debris shall not be left lodged against standing trees.

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

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

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

GRUBBING CLASSIFICATION.

New construction - from the top of the cutslope 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.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

CLEARING AND GRUBBING DISPOSAL. Scatter in stable locations through openings in the timber outside of the cleared right-of-way, except areas where end-haul is required. In areas where end-haul is required, clearing and grubbing debris shall be fully contained and hauled to a designated waste area. Clearing and grubbing debris shall be left in a stable location, and not left lodged against standing trees.

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.

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 or where material will accumulate in areas deemed a high-risk site by STATE.

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 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

Solid Rock

Fractured Rock

Soil - side slopes 50% and over

Soil - side slopes less than 50%

Back Slopes

Vertical to $\frac{1}{4}$:1

$\frac{1}{2}$:1

$\frac{3}{4}$:1

1 :1

Fill Slopes

1½:1

1½:1

Top of cutslope 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.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SEASONAL WINTERIZATION. All unsurfaced roads or unfinished subgrades shall be waterbarred in accordance with the specifications in Exhibit J, and blocked from vehicular traffic prior to October 1, annually and as directed by STATE.

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. Surplus excavation materials shall be hauled to the waste areas as marked in the field and/or designated on Exhibit A. Surplus excavated materials and waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with this Exhibit. Excess excavated material not used for embankment shall be sidecast on slopes up to 35 percent, end hauled, or pushed to waste areas as 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 Armor and Energy Dissipator Construction. Where rock is specified for fill armor, rock shall be machine placed and tamped at a 1½:1 slope, beginning at the toe of the fill. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit H.
5. Geotextile Fabric. Install woven and non-woven fabrics in accordance with the specifications in Exhibits D and G.
6. Free Draining Fill Construction. Where free draining fill construction is required, clean 24"-6" riprap rock shall be hauled in and used for fill base construction to specified heights. Crushed rock shall be used for backfilling around installed culverts. Free draining fill construction shall be in accordance with Exhibit G.
7. Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic-yard, track-mounted excavator.
8. Controlled Blasting. Controlled blasting techniques shall be utilized for any blasting operations, and shall be accomplished using timing devices, delayed charges, low intensity shots, or other suitable means to contain material within the road prism.
9. Subgrade Preparation and Application of Surfacing Rock.
 - (a) Complete culvert installations, drainage ditches, ditchouts, fill construction, and other specified work prior to the application of surfacing rock.
 - (b) Subgrade shall be crowned at 4 to 6 percent.
 - (c) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with specifications in the "Compaction and Processing Requirements" in this Exhibit. Final road surface shall be crowned at 4 to 6 percent.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
1C to 1D	3+10	Utilize approximately 12 cubic yards of 24"-6" riprap rock for energy dissipator.
	11+45	Utilize approximately 24 cubic yards of 24"-6" riprap rock for energy dissipator.
	16+70	Utilize approximately 12 cubic yards of 24"-6" riprap rock for energy dissipator.
	18+20	Begin subsurface drain ditch on Right. Excavate a ditch 4 feet in depth, 3 feet in width between cross drains. Place 4½ oz. non-woven fabric in ditch. Install 8 inch perforated culvert pipe on a 12" bed of drain rock, Inlet end shall be wrapped with fabric to prevent material from entering pipe. Utilize approximately 70 cubic yards of 2"-1" drain rock around the perforated pipe. Such drain rock shall be placed in the trench a minimum of 3 feet in depth; the fabric shall be overlapped and closed over the drain rock. Place 12" layer of 2"-1" drain rock on top of rock. Utilize approximately 12 cubic yards of 24"-6" riprap rock at each end of the ditch drain to allow water to escape from the drain and to assure that the drain rock remains in place. The remaining surface of the drain shall be covered with approximately 24 cubic yards riprap rock. Such material shall be placed to armor the ditch, and compacted to protect the subsurface drainage components. End haul waste material to designated waste area.
		Begin subgrade reinforcement of 24"-6" riprap rock and 6½ ounce woven fabric. Utilize approximately 240 cubic yards.
	19+00	Construct free draining fill and install 15"x35' perforated CPP as cross drain as specified in Exhibit G. Final location shall be determined by STATE.
	19+75	End subsurface drain ditch. End subgrade reinforcement.
	22+10	Utilize approximately 24 cubic yards of 24"-6" riprap rock for energy dissipator.
	25+90	Utilize approximately 12 cubic yards of 24"-6" riprap rock for energy dissipator.
1E to 1F	0+00	Begin subgrade reinforcement of 24"-6" riprap rock and 6½ ounce woven fabric. Utilize approximately 480 cubic yards. End haul waste material to designated waste area.
	3+00	End subgrade reinforcement.

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. Excavated Materials. Excavated materials shall be utilized for road construction. Surplus excavation materials shall be hauled to the waste areas as marked in the field and/or designated on Exhibit A. Surplus excavated materials and waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with this Exhibit. Excess excavated material not used for embankment shall be sidecast on slopes up to 35 percent end hauled or pushed to waste areas as marked in the field.
3. Bank Slough Removal. Excavate all bank slough. Bank slough material shall not be pulled across existing surfacing rock, but shall be placed in nearby waste areas and uniformly sloped and compacted for drainage, as directed by STATE. Waste materials shall be seeded and mulched in accordance with specifications in Exhibit M.
4. 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. All waste materials shall be hauled to nearby waste areas and shall be uniformly sloped and compacted for drainage. Waste materials shall be seeded and mulched in accordance with specifications in Exhibit M. Fill reconstruction backfill shall consist of select materials and may be obtained from borrow pits, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with this Exhibit. Crushed rock shall be used for backfilling excavation trenches less than 3 feet deep. STATE may require the use of crushed rock for culvert bedding. Removed culverts shall be hauled to an approved refuse site off of STATE land.
5. Drainage Ditches. Restore or construct ditchlines, including ditchouts, as directed by STATE. Cut slopes of ditchlines and ditchouts shall not exceed a 1:1 slope. Clean out all culvert inlets and outlets for a 10-foot radius. Re-establish or construct culvert sediment basins. Waste materials from drainage ditches and sediment basins shall not be pulled across existing surfacing rock, but shall be placed in nearby waste areas and uniformly sloped and compacted for drainage, as directed by STATE. Damaged culvert inlets and/or outlets shall be repaired by opening them with a hydraulic jack, or cutting off the culvert end to allow for free passage of water at peak flow levels. Install a culvert marker at each newly installed culvert and at each existing culvert that is missing a marker that could be reached by a grader blade.
6. Rock Ditch Filter. Construct rock ditch filters as directed by STATE. Excavated material shall be hauled to the designated waste areas as marked in the field and/or designated on Exhibit A. Waste materials shall be sloped and compacted for drainage. Construct each rock ditch filter with clean drain rock (6"-4" pit-run rock) and placed at a 2:1 slope within the specified ditch. Construct the center of the rock ditch filter at least 6 inches lower than the ends, to act as a spillway for runoff and to prevent water from flowing around the filter. Space the filters so that the bottom elevation of the upper filter is the same as the top center elevation of the next filter. Rock ditch filter dimensions shall be as shown on the "Typical Rock Ditch Filter" exhibit or as directed by STATE. Locations of the filters shall be determined by STATE.
7. Fill Armor and Energy Dissipator Construction. Where rock is specified for fill armor, rock shall be machine placed and tamped at a 1½:1 slope, beginning at the toe of the fill. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit H.
8. Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic yard, track-mounted excavator.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS

9. 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 of 4 to 6 percent, or outslope as required, 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

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
I1 to I2	0+90	Install 18"x30' CPP cross drain to drain "Y". Utilize 24 cubic yards of 1½"-0" crushed rock as bedding and back fill material. Install culvert marker.
	9+00	Install culvert marker.
	12+55	Utilize 12 cubic yards of 24"-6" riprap rock as an energy dissipator. Install culvert marker.
	16+50	Install culvert marker.
	17+50	Construct rock ditch filter. Utilize 10 cubic yards of 4"-0" crushed rock.
	18+00	Construct rock ditch filter. Utilize 10 cubic yards of 4"-0" crushed rock.
	22+40	Construct catch basin and clear outlet. Install culvert marker.
	31+40	Gate.
	34+00	Begin outsloped road.
	37+50	End outsloped road.
	42+50	Install culvert marker.
	47+00	Construct catch basin and clear outlet. Install culvert marker.
	52+15	Install culvert marker.
	55+95	Install culvert marker.
	57+25	Install culvert marker.
	57+30	Begin ditch reconstruction on left.
	59+10	Install culvert marker.
	61+30	End ditch reconstruction left. Begin ditch reconstruction on right.
	64+35	Install 18"x30' CPP cross drain. Excavate Ditchout for culvert outlet. End ditch reconstruction right. Install culvert marker.

EXHIBIT D
FULL BENCH AND END-HAUL REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT - SIDECAST
1C to 1D	8+20 to 9+75	2
1E to 1F	0+00 to 3+00	2

Full Bench and End-Haul Areas General Requirements

Ditch material and any road generated excess excavation material which is not suitable as part of the road prism. Material shall not be sidecast unless specified above.

Containment/Sidecast

- (1) Full: No excavated material remains below the road.
- (2) Normal/Incidental: The amount of excavated material lost over the outside edge of the road shall not exceed 1 foot in depth.
- (3) Sidecast: Material shall be spread evenly below the road so that it does not build up behind trees, snags or other debris, and shall not exceed 3 feet in depth. Sidecast shall not be placed where it will enter a stream course or where material will accumulate in areas deemed a high-risk site by STATE.

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

Waste Area Location

- As designated by STATE and as marked in the field.

Waste Area Treatment

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

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+0 to 6+90		
				Volume (CY) Per		Number of		
Base Rock	4"—0" Crushed	0+00 to 6+90	8	Station	50	Stations	6.90	345
Junctions	4"—0" Crushed	0+00	N/A	Junction	24	Junctions	1	24
Junctions	¾"—0" Crushed	0+00	N/A	Junction	24	Junctions	1	24
Turnouts	4"—0" Crushed	3+90	N/A	Turnout	24	Turnouts	1	24
Turnarounds	4"—0" Crushed	6+60	N/A	Turnaround	24	Turnarounds	1	24
Landings	6"-0" Pit-run	6+90	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			1A to 1B					501
ROAD SEGMENT: 1C to 1D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1C to 1D		0+00 to 28+00		
				Volume (CY) Per		Number Of		
Base Rock	4"—0" Crushed	0+00 to 28+00	8	Station	50	Stations	28.00	1,400
Subgrade Reinforcement	24"-6" Riprap	18+20 to 19+75	36	N/A		N/A		240
Surface Rock	1½"-0" Crushed	0+00 to 19+00	3	Station	19	Stations	19.00	361
Junctions	4"—0" Crushed	0+00	8	Junction	24	Junctions	1	24
Junctions	1½"-0" Crushed	0+00	3	Junction	24	Junctions	1	24
Turnouts	4"—0" Crushed	2+70, 6+85, 12+80, 24+10	8	Turnout	33	Turnouts	4	132
Turnouts	1½"-0" Crushed	2+70, 6+85, 12+80	3	Turnout	12	Turnouts	3	36
Culvert Bedding/Backfill	1½"-0" Crushed	18+70, +1, 19+75	N/A	Culvert	36	Culverts	3	108
Dissipator	24"-6" Riprap	3+10,16+70, 25+90	N/A	Culvert	12	Culverts	3	36
Dissipator	24"-6" Riprap	11+45, 22+10	N/A	Culvert	24	Culverts	2	48
Turnarounds	4"—0" Crushed	10+00, 20+00, 23+85	N/A	Turnaround	24	Turnarounds	3	72
Turnarounds	1½"-0" Crushed	10+00	N/A	Turnaround	12	Turnarounds	1	12
Ditch Drain Rock	2"—1" Crushed	18+20 to 19+75	N/A	N/A		N/A		70
Drain Rock Cover	24"-6" Riprap	18+20 to 19+75	N/A	N/A		N/A		96
Landings	6"-0" Pit-run	20+40, 28+00	N/A	Landing	60	Landings	2	120
Total Rock for Road Segment:			1C to 1D					2,779
ROAD SEGMENT: 1E to 1F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1E to 1F		0+00 to 8+00		
				Volume (CY) Per		Number of		
Base Rock	4"—0" Crushed	0+00 to 8+00	8	Station	50	Stations	8.00	400
Subgrade Reinforcement	24"-6" Riprap	0+00 to 3+00	36	N/A		N/A		480
Junctions	4"—0" Crushed	0+00	8	Junction	24	Junctions	1	24
Junctions	1½"-0" Crushed	0+00	3	Junction	24	Junctions	1	24
Turnouts	4"—0" Crushed	3+50	8	Turnout	33	Turnouts	1	33
Culvert Bedding/Backfill	1½"-0" Crushed	1+60, 2+90	N/A	Culvert	24	Culverts	2	48
Turnarounds	4"—0" Crushed	4+40	N/A	Turnaround	24	Turnarounds	1	24
Landings	6"-0" Pit-run	8+00	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			1E to 1F					1,093

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: 2A to 2B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	2A to 2B		0+00 to 5+10		
				Volume (CY) Per		Number Of		
Base Rock	4"—0" Crushed	0+00 to 5+10	8	Station	50	Stations	5.10	255
Junctions	4"—0" Crushed	0+00	8	Junction	24	Junctions	1	24
Junctions	1½"-0" Crushed	0+00	3	Junction	24	Junctions	1	24
Turnarounds	4"—0" Crushed	4+00	N/A	Turnaround	24	Turnarounds	1	24
Landings	6"-0" Pit-run	5+10	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			2A to 2B					387
ROAD SEGMENT: 2C to 2D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	2C to 2D		0+00 to 26+60		
				Volume (CY) Per		Number Of		
Base Rock	4"—0" Crushed	0+00 to 26+60	8	Station	50	Stations	26.60	1,330
Traction Rock	1½"-0" Crushed	9+00-12+50, 22+00-24+00	2	Station	13	Stations	5.50	72
Junctions	4"—0" Crushed	0+00	8	Junction	24	Junctions	1	24
Junctions	1½"-0" Crushed	0+00	3	Junction	24	Junctions	1	24
Turnouts	4"—0" Crushed	3+00, 9+70, 20+00	8	Turnout	33	Turnouts	3	99
Turnarounds	4"—0" Crushed	25+50	N/A	Turnaround	24	Turnarounds	1	24
Landings	6"-0" Pit-run	21+40, 26+50	N/A	Landing	60	Landings	2	120
Total Rock for Road Segment:			2C to 2D					1,693
ROAD SEGMENT: 2E to 2F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	2E to 2F		0+00 to 13+30		
				Volume (CY) Per		Number Of		
Base Rock	4"—0" Crushed	0+00 to 1+00	8	Station	50	Stations	1	50
Total Rock for Road Segment:			2E to 2F					50
ROAD SEGMENT: 2G to 2H				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	2G to 2H		0+00 to 3+30		
				Volume (CY) Per		Number Of		
Base Rock	4"—0" Crushed	0+00 to 3+30	8	Station	50	Stations	3.30	165
Junctions	4"—0" Crushed	0+00	8	Junction	24	Junctions	1	24
Turnarounds	4"—0" Crushed	2+30	N/A	Turnaround	24	Turnarounds	1	24
Landings	6"-0" Pit-run	3+30	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			2G to 2H					273

EXHIBIT D
ROAD SURFACING

ROAD SEGMENT: I1 to I2				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I1 to I2		0+00 to 64+35		
				Volume (CY) Per		Number Of		
Base Rock	4"-0" Crushed	60+60 to 62+00	8	Station	50	Stations	1.40	70
Patch - Base Rock	4"-0" Crushed		N/A	Load	5	Loads	12.00	60
Surface Rock	1½"-0" Crushed	0+00 to 64+35	2	Station	13	Stations	64.35	837
Junctions	4"-0" Crushed	61+30	N/A	Junction	24	Junctions	1	24
Junctions	1½"-0" Crushed	1+20, 16+90, 31+80, 47+50, 61+30	N/A	Junction	12	Junctions	5	60
Turnouts	1½"-0" Crushed	4+70, 10+90, 15+50, 21+50, 30+40, 33+75, 50+25	N/A	Turnout	24	Turnouts	7	168
Turnarounds	4"-0" Crushed	30+50, 61+30	N/A	TA	12	TA's	2	24
Turnarounds	1½"-0" Crushed	30+50, 33+75, 61+30	N/A	TA	12	TA's	3	36
Culvert Bedding/Backfill	1½"-0" Crushed	0+90, 64+35	N/A	Culvert	24	Culverts	3	72
Rock Ditch Filter	4"-0" Crushed	17+50, 18+00	N/A	Filter	11	Filters	2	22
Dissipator	24"-6" Riprap	12+55	N/A	Culvert	12	Culverts	1	12
Dissipator	24"-6" Riprap	16+50	N/A	Culvert	24	Culverts	1	24
Total Rock for Road Segment:			I1 to I2					1,409
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		0+00 to 116+00		
				Volume (CY) per		Number of		
Patch - Surface Rock	¾"-0" Crushed		N/A	load	12	loads	2	24
Total Rock for Road Segment:			I5 to I6					24
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		0+00 to 28+55		
				Volume (CY) per		Number of		
Patch - Base Rock	4"-0" Crushed		N/A	Load	12	Loads	3	36
Patch - Base Rock	4"-0" Crushed	1+30, 2+70	N/A	Load	12	Loads	2	24
Patch - Base Rock	4"-0" Crushed	18+20	N/A	Load	12	Loads	2	24
Surface Rock	1½"-0" Crushed	8+60 to 28+55	2	Station	13	Stations	9.95	129
Junctions	1½"-0" crushed	0+00	N/A	Junction	24	Junctions	1	24
Turnarounds	4"-0" Crushed	28+55	N/A	TA	24	TA's	1	24
Turnarounds	1½"-0" crushed	28+55	N/A	TA	12	TA's	1	12
Total Rock for Road Segment:			I7 to I8					273

EXHIBIT D
ROAD SURFACING

ROCK TOTALS (CY)	24"-6" rr	6"-0" pr	4"-0"	2"-1"	1½"-0"	¾"-0"
8,482	936	480	4,877	70	2,071	48

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

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

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

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All road segments that require rock surfacing	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	COMPACTION EQUIPMENT OPTIONS
All road segments.	1, 2, or 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 and compacted before the succeeding layer is placed. Any irregularities or depressions that develop during compaction of the top layer shall be corrected by loosening the material at these places and adding or removing material until the surface is smooth and uniform. Each layer shall be compacted with a minimum of 3 passes over the entire width and length of the road until the surface is smooth and hard and visible deformation ceases. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

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

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

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

EXHIBIT D

COMPACTION AND PROCESSING REQUIREMENTS

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

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
Segments requiring pit-run rock	1 or 5

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. 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 40,000 pounds 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 shall be constructed of corrugated double-walled polyethylene, corrugated aluminized (Type 2) steel, or corrugated galvanized steel. The special polyethylene perforated drain culvert pipe shall be used as specified in this exhibit.

Polyethylene culverts shall be double-walled and meet the requirements of AASHTO M-294-06, Type S Culvert.

Aluminized (Type 2) steel culverts shall meet the requirements of AASHTO M-36-03¹.

Galvanized steel culverts shall meet the requirements of AASHTO M-36-03¹.

Polyethylene culverts shall not be used where required culvert diameter is over 24 inches.

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.

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

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

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

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

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

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

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

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

EXHIBIT E
CULVERT SPECIFICATIONS

The intake end of relief culverts shall be provided with a sediment catching basin 3 feet in diameter at the bottom.

The outlet end of any culvert which would allow water to erode embankment soil shall be provided with an energy dissipator, or other approved slope protection device. Construct lead-off ditches away from culvert outlets where the slope gradients restrict the free flow of water.

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

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

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.

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.

<u>Dia.</u>	<u>Steel Culvert</u>	<u>Thickness</u>		<u>Band Gauges</u>	<u>Band Widths (")</u>	
	<u>Gauge</u>	<u>Uncoated</u>	<u>Coated</u>		<u>Annular</u>	<u>Helical</u>
12-15	16	(0.0598")	(0.064")	16	7	12
18-24	16	(0.0598")	(0.064")	16	12	12
30-36	16	(0.0598")	(0.064")	16	12	12

EXHIBIT E
CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	ROAD SEGMENT POINT TO POINT	STATION
1	18	35	CPP	1A to 1B	0+25
2	18	30	CPP	1A to 1B	3+50
3	18	35	CPP	1C to 1D	3+10
4	18	35	CPP	1C to 1D	11+45
5	18	30	CPP	1C to 1D	16+70
6	8 **	120	PCP	1C to 1D	18+20 to 19+75
7	15 **	35	PCP	1C to 1D	19+00
8	24	45	CPP	1C to 1D	18+70
9	18	35	CPP	1C to 1D	19+75
10	18	35	CPP	1C to 1D	22+10
11	18	30	CPP	1C to 1D	25+90
12	24	35	CPP	1E to 1F	1+60
13	18	35	CPP	1E to 1F	2+90
14	18	30	CPP	2A to 2B	3+80
15	18	30	CPP	2C to 2D	5+00
16	18	35	CPP	2C to 2D	15+50
17	18	30	CPP	2C to 2D	16+80
18	18	30	CPP	2C to 2D	24+00
19	18	35	CPP	2G to 2H	0+00
20	18	30	CPP	I1 to I2	0+90
21	18	30	CPP	I1 to I2	64+35

ACSP = Aluminized, CPP = Polyethylene PCP = Perforated Culvert Pipe
** = Perforated Culvert Pipe

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. 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. Overburden shall be removed for a distance of 20 feet beyond the developed rock source.
4. All overburden and reject material shall be hauled to the designated waste area as directed by STATE.
5. 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.
6. 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. 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.
7. 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.
8. Quarry face shall be developed in a uniform manner. All quarry backslopes shall be left in a stable condition.
9. Oversized material that is produced or encountered during development shall be broken down and utilized for crushing.
10. The quarry floor shall be developed to provide for drainage away from the quarry. All quarry and stockpile site drainage ditches shall be maintained. Quarry access roads shall be cleared and blocked upon completion of quarry use as directed by STATE.
11. 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

PIT-RUN and RIPRAP ROCK SPECIFICATIONS

<u>For 6"-0" Pit-Run</u>	Passing	10" sieve	100%
	Passing	6" sieve	60-85%
	Passing	3" sieve	30-50%
	Passing	1/4" sieve	0-20%

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 STATE.

EXHIBIT G

GEOTEXTILE SPECIFICATIONS

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

- | | | |
|----------------------|----------|------------|
| 1. Grab Tensile | 300 lbs. | ASTM D4623 |
| 2. Puncture strength | 110 lbs. | ASTM D4833 |
| 3. Mullen Burst | 600 lbs. | ASTM D3786 |
| 4. Width – 12.5 feet | | |

Non-Woven geotextile (4½ ounce) fabric, designed for use outside of the road subgrade shall be used in the free draining ditch construction.

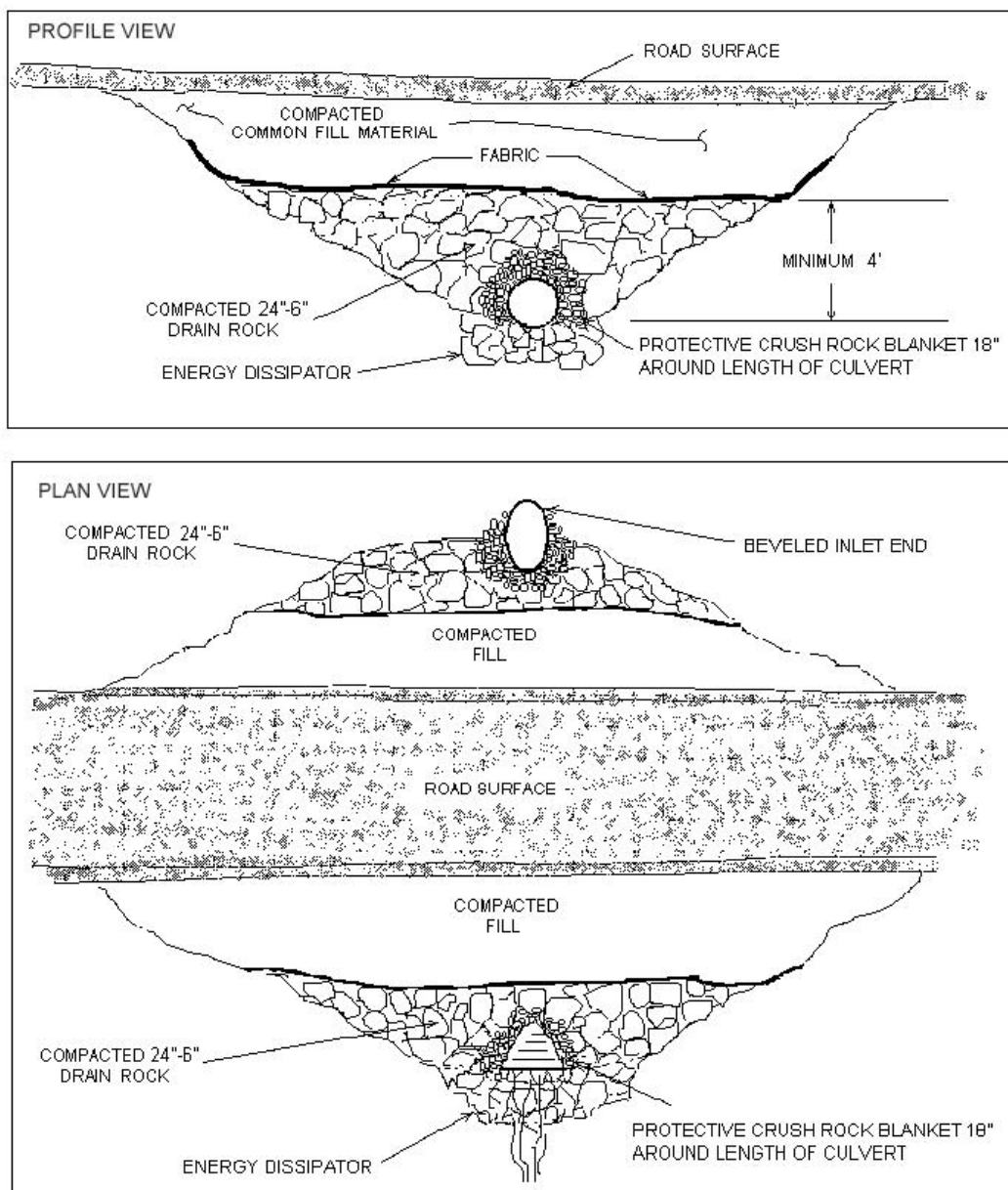
INSTALLATION REQUIREMENTS - fabric shall be installed in the road subgrade according to the following requirements to create a free draining fill:

1. Subgrade surface shall be leveled and smoothed to remove humps and depressions which exceed 6 inches in height and depth. Small pieces of woody debris shall be removed. Light vegetation (grass, weeds, leaves, and fine woody debris) may be left in place.
2. Fabric shall be installed directly on the prepared surface of riprap rock. Longitudinal and traverse joints shall be overlapped at least 3 feet.
3. Surfacing course material shall be placed to the designated thickness in one lift and spread in the direction of fabric overlap. Hauling and spreading equipment shall not be operated on the fabric until the total thickness of surfacing course material is placed.
4. Torn, punctured, or separated sections of the fabric shall be repaired by installing a fabric patch over the break prior to placing the surfacing course material. The patch shall be at least 4 feet larger in horizontal dimensions than the break to be repaired.
5. Fabric failures resulting after rock placement and as evidenced by subgrade pumping or roadbed distortion shall be corrected. Correction measures shall consist of: (1) removing at least three-quarters the depth of surfacing course material in the affected area, (2) placing a fabric patch over the affected area with a minimum 4-foot overlap around the circumference of the area, and (3) replacing enough rock to cover the patch and blend in with the rest of the road.
6. Should STATE determine that installation of woven fabric on roads or portions of roads is not necessary, PURCHASER shall deliver an equivalent amount of woven road fabric to STATE.
7. Ditch Line Drain: Place non-woven fabric in the bottom of the trench and place 2"-0" drain rock inside fabric. Place 8" perforated culvert pipe on a bed of 2"-1" drain rock and then fill ditch with 2"-1" drain rock to depth of 3 feet. Pull fabric on top of 3 foot bed of drain rock, cover top of fabric with 12" of 2"-1" drain rock.
8. Fabric locations:

Road Segment	Location	Road Segment	Location
1C to 1D	8+20 to 9+75	1E to 1F	0+00 to 3+00
1C to 1D (ditch line)	8+20 to 9+75		

EXHIBIT G

FREE DRAIN FILL AND DRAINAGE GEOTEXTILE SPECIFICATIONS



Drainage Geotextile Specifications:

Nonwoven drainage geotextile fabric designed for subsurface drain purposes which meets or exceeds the following requirements:

	Test Method	Properties
(a) Water Flow Rate	ASTM D 4491	(*85) gal/min/ft ²
(b) Water Permeability	ASTM D 4491	(*0.30) cm/sec
(c) Grab Tensile Strength	ASTM D 4632	250 lb
(d) Mullen Burst Test	ASTM D 3766	460 lb
(e) Mass	ASTM D 4533	10 oz/yd ²
(f) Thickness	ASTM D 5199	100 mills
(g) UV Resistance	ASTM D 4355	70% retained
	Xenon Arc	

EXHIBIT H

TYPICAL EMBEDDED ENERGY DISSIPATOR

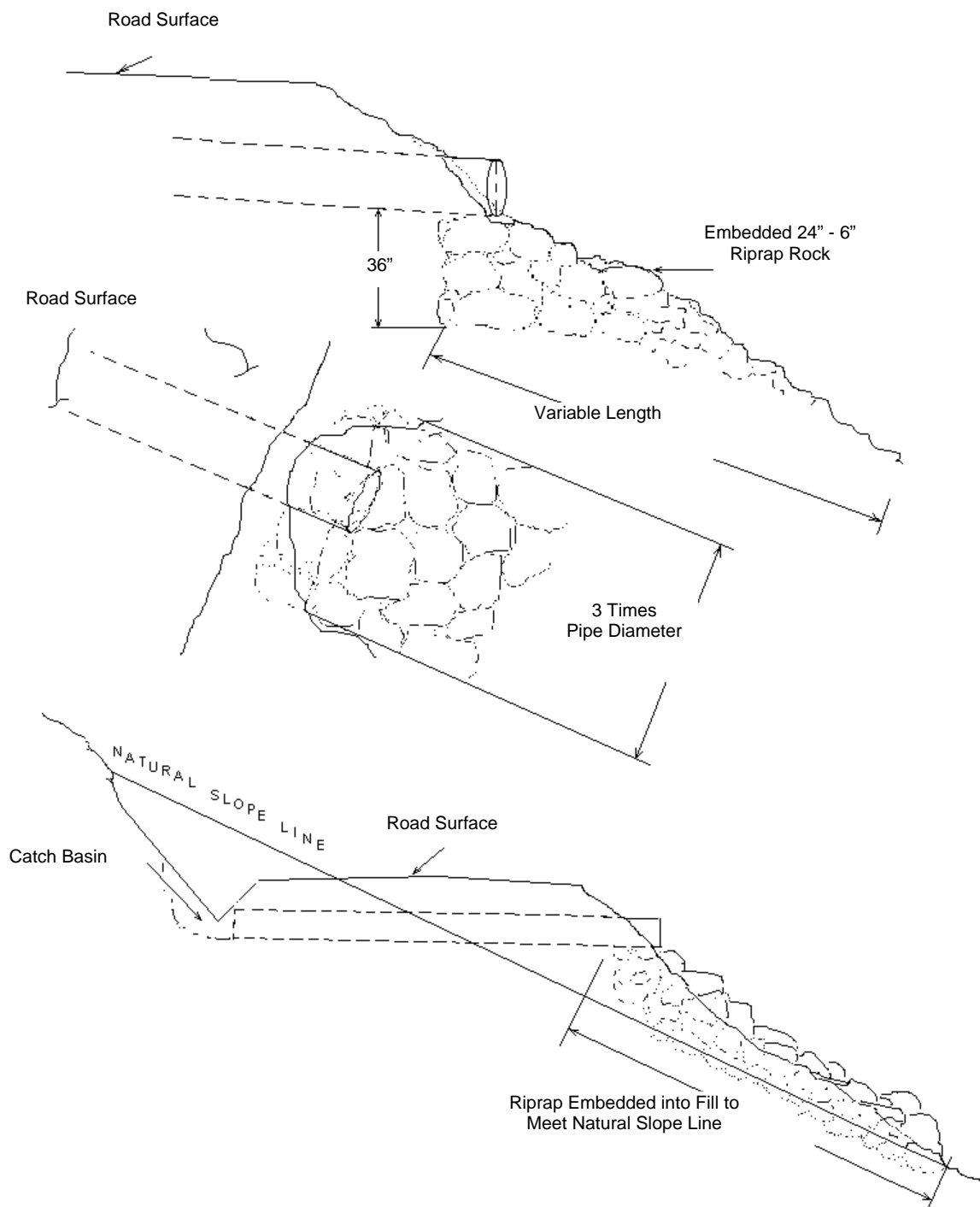
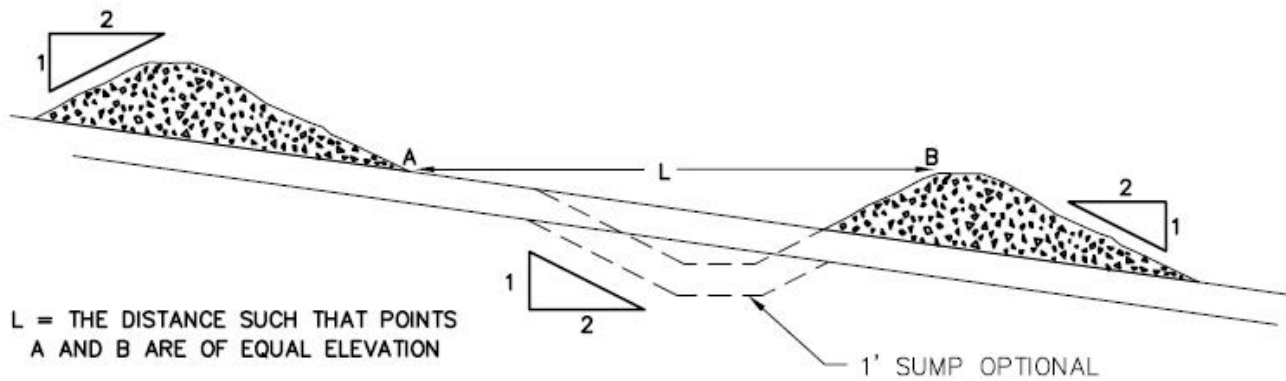
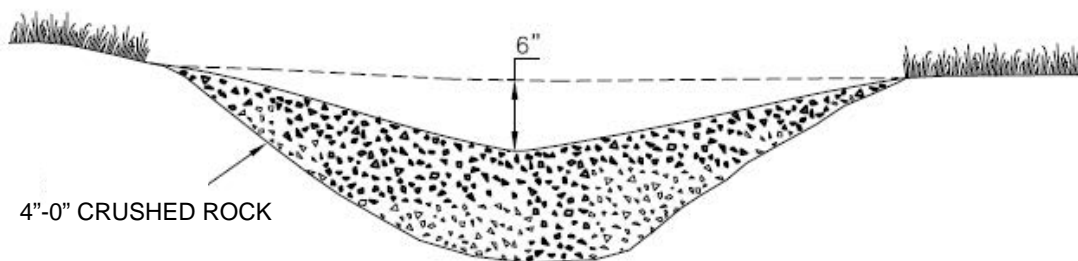


EXHIBIT I
TYPICAL ROCK DITCH FILTER

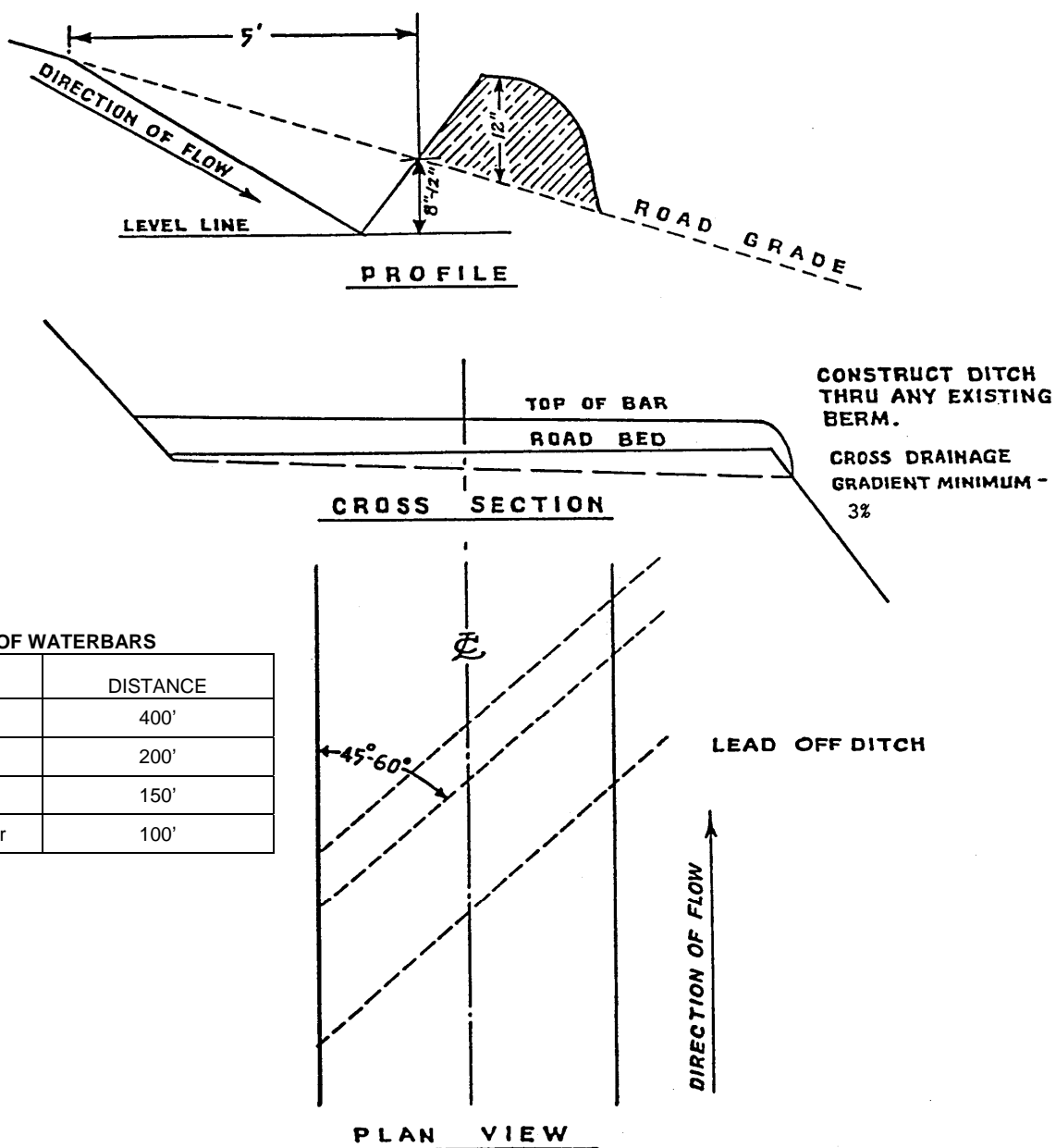


SPACING BETWEEN ROCK FILTERS



ROCK DITCH FILTER

EXHIBIT J
 WATERBAR SPECIFICATIONS



SPACING OF WATERBARS

ROAD GRADE	DISTANCE
≤ 5%	400'
6-10%	200'
11-15%	150'
16-20% or greater	100'

EXHIBIT K

ROAD VACATING SPECIFICATIONS

PURCHASER shall vacate at the following points: (V1 to V2 and V3 to V4). Specific objectives for this project include:

- (a) Fill opening and stream channel development.
 - (b) Culvert removal.
 - (c) Restoration of natural contours by outsloping of the road prism.
 - (d) Sidecast pullback.
 - (e) Minimize disturbance of existing vegetation.
- (1) Tree Removal. Cut or remove all trees necessary to access the project area and to facilitate vacating operations, as directed by STATE. Timber shall be removed as designated timber, and is located within posted timber sale boundaries or right-of-way boundaries. Progressive yarding of timber shall be required.
 - (2) Fill Removal and Stream Channel Development. Open fills to the natural stream course levels, and gradient. 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, except as specified in this Exhibit, or as directed by STATE.
 - (3) Culvert Removal. Remove drainage structures and culverts. Removed culverts shall be hauled to an approved refuse site off of STATE land.
 - (4) Outslope Road. Outslope road to restore natural contours or establish a minimum of 10 percent slope for drainage at designated locations. If the road grade exceeds 10 percent, outslope of the road shall be 2 percent greater than the road grade.
 - (5) Sidecast Pullback. Excavate/pullback previously sidecast materials below the road at designated locations. Developed slopes shall be pulled back to a 1½:1 slope or to natural ground contours. The beginning position for sidecast pullback shall be no greater than 20 feet vertical distance from the existing road surface, in accordance with Exhibit L. Sidecast material remaining greater than 20 feet below the road shall be tapered and sloped for drainage.
 - (6) Use of Excavated Materials.
 - (A) Fill Excavation and Sidecast Pullback. Excavated materials shall be placed on the interior (cut) side of the road, and utilized to restore the cutslope to natural contours, or to a minimum 10 percent outsloped surface for drainage. Any excess material will be hauled to a designated waste area, as directed by STATE.
 - (B) Woody Debris Shall be placed on the surface of pullback/fill material.
 - (C) Block Roads. Use excavated material from fill removals to block roads from vehicle access, as directed by STATE.
 - (7) Erosion Control. Erosion control shall be completed in a progressive manner. Grass seed and straw mulch shall be applied for every 500 feet of road vacated, prior to continuing work.

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

EXHIBIT K

ROAD VACATING SPECIFICATIONS

- (8) Construct Waterbars. Construct waterbars as directed by STATE. Construct waterbars according to the specifications in Exhibit J.
- (9) Equipment. A minimum 1½ cubic-yard, track mounted excavator shall be used for all excavation, culvert removal, streambed preparation, road blocking, and waterbarring, unless otherwise approved in writing by STATE.
- (10) Dry Conditions. All work shall be performed during dry conditions acceptable to STATE.
- (11) Support, including transport, other equipment, replacements, supplies, maintenance, and repairs, shall be furnished as required to complete the project and shall be furnished without cost to STATE, other than as agreed under the contract terms.

SPECIFIC INSTRUCTIONS/SPECIFICATIONS :

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
<u>V1 to V2</u>	2+00	Remove fill to provide 2 foot stream channel. Provide positive drainage to new channel.
	7+45	Begin sidecast pullback.
	8+00	Remove fill to provide 2 foot stream channel.
	8+50	End sidecast pullback.
	9+80	Begin sidecast pullback.
	10+15	Remove fill to provide 6 foot stream channel.
	11+15	End sidecast pullback.
	12+45	Remove fill to provide 5 foot stream channel. Provide positive drainage to new channel.
	14+90	Remove fill to provide 3 foot stream channel. Slope stream banks at 2:1.
	18+60	Remove fill to provide 2 foot stream channel.
	19+40	Remove fill to provide 3 foot stream channel. Provide positive drainage to new channel.
	19+85	Remove fill to provide 5 foot stream channel. Provide positive drainage to new channel.
	21+10	Remove fill to provide 2 foot stream channel. Provide positive drainage to new channel.
	25+60	Open swale. Provide positive drainage Slope stream banks at 2:1.
	29+20	Remove fill to provide 3 foot stream channel. Provide positive drainage to new channel.
<u>V3 to V4</u>	0+60	Remove fill to provide 3 foot stream channel. Provide positive drainage to new channel.

EXHIBIT L

TYPICAL CROSS SECTION VIEW OF ROAD VACATING SIDECAST PULLBACK

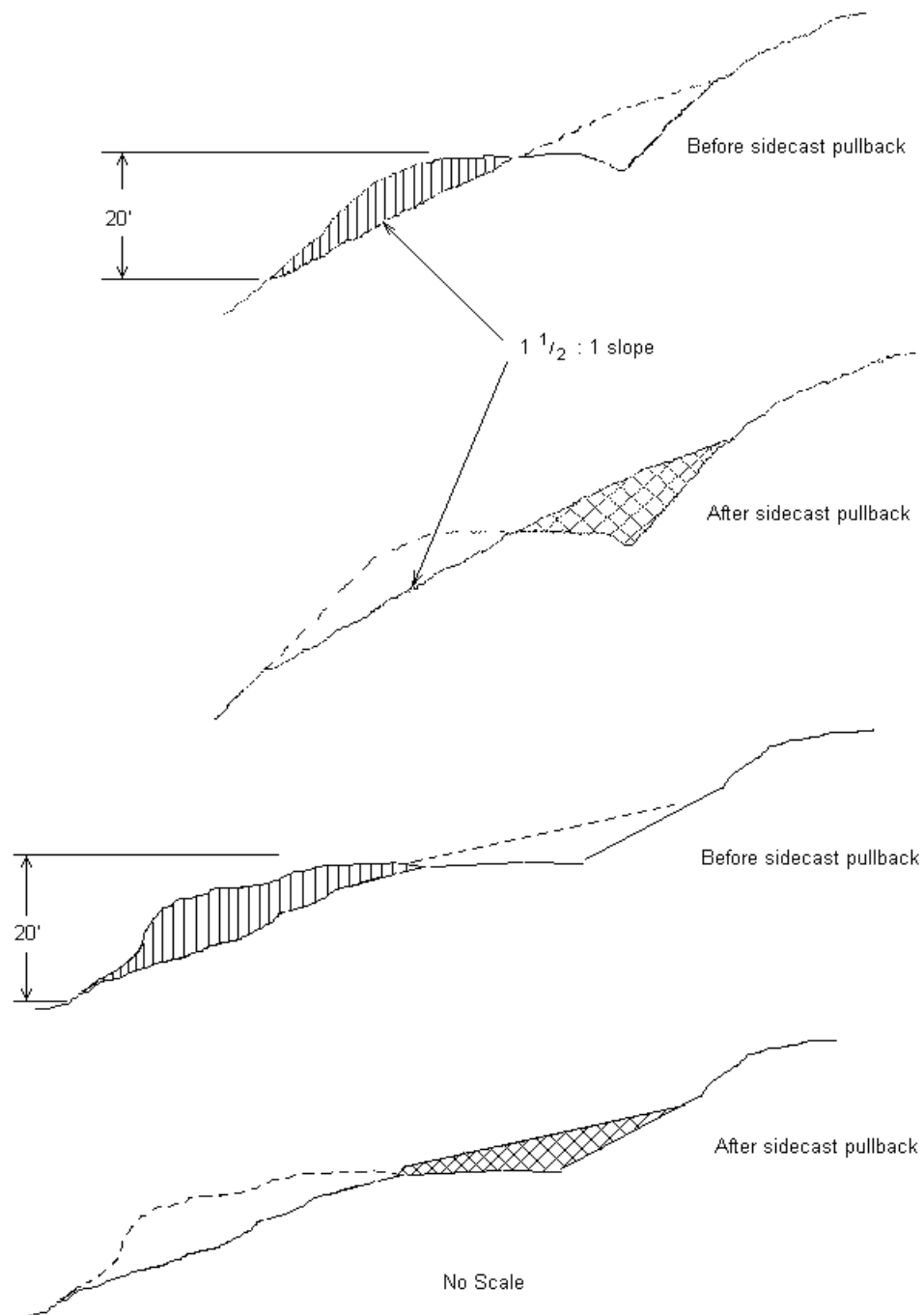


EXHIBIT M

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 created by vacated fills, sidecast pullback areas, and any stream crossings created during logging activities.

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.

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 and fertilizer.

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	2+00, 7+45-8+50, 8+00, 9+80-11+15, 10+15, 12+45, 14+90, 18+60, 19+40, 19+85, 21+10, 25+60, 29+20	V3 to V4	0+60
Waste Areas	As Designated		

EXHIBIT N

BRIDGE DECK REPLACEMENT

PURCHASER shall replace the decks on the following bridges: Bridge A: Plympton Ridge Road and Bridge B: Coke Shack Road. Specific objectives for this project include:

- (a) Remove the existing bridge running boards.
- (b) Cleaning/removal of debris.
- (c) Attach new bridge running boards.
- (d) Minimize disturbance of streams.

- (1) Running Board Removal. Remove all running boards. Salvage all bolts, nuts, and washers.
- (2) Cleaning/Removal of Debris. Remove all debris (moss, leaves, sticks, etc.). Debris shall not be wasted into the streams, but shall be hauled off the bridge to a waste area approved by STATE. All rotten/damaged cross members on Bridge B shall be replaced as directed by STATE.
- (3) Attach New Running Boards. Running boards shall be 4 inch by 12 inch, incised pressure treated lumber, certified for ground contact.
 - Bridge A – Lay out the running boards in the same pattern as the original. The minimum running board length shall be ten feet. Attach the new running boards in the same pattern, utilizing the original bolt holes. Original “Big R” bolts, nuts, and washers shall be utilized when attaching the new running boards.
 - Bridge B – Lay out the running boards in a pattern to stagger the joints a minimum of ten feet. Attach the new running boards in the same pattern, utilizing 3/8 inch by 8 inch, galvanized steel spikes.
- (4) Repair Guardrails. Re-bolt guardrail to the steel posts. Straighten the bent guardrail sections.

PART IV: OTHER INFORMATION

State Timber Sale Contract
No. 341-16-69
Microwave Thin

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

Portions of Sections 3, 9, 10, 15, and 16 of T7N, R6W, W.M., Clatsop County, Oregon.

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

Protected Resources:

1. West Fork of Plympton Creek.
2. Unnamed tributary of West Fork of Plympton Creek.
3. Second unnamed tributary of West Fork of Plympton Creek.
4. Third unnamed tributary of West Fork of Plympton Creek.

Specific Site Characteristics:

1. West Fork of Plympton Creek (Small, Type F) flows along the east boundary of Area 2 for approximately 2,100 feet.
2. An unnamed tributary of West Fork of Plympton Creek (Small, Type F) flows along the north boundary of Area 2 for approximately 1,800 feet.
3. A second unnamed tributary of West Fork of Plympton Creek (Small, Type F) flows along the south eastern boundary of Area 2 for approximately 2,020 feet.
4. A third unnamed tributary of West Fork of Plympton Creek (Small, Type F) flows along the south and south western boundary of Area 2 for approximately 1,370 feet.

Tree and Vegetation Retention:

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

The Type F buffers are outside of the sale area and are posted with Timber Sale Boundary tags. If trees need to be felled within FPA defined stream buffers (RMA's) to allow for cable corridors, the trees cut will not be removed. Cable lines may extend over and/or through these buffers.

Resource Protection Practices:

Along all of the above mentioned streams, and any other streams, the following practices are required 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 will 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, Sunset Unit



OREGON DEPARTMENT of FISH and WILDLIFE

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: () _____