

PART III: EXHIBITS

State Timber Sale Contract
No. 341-07-45
Porter Horse

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.: 341-07-45

(2) Sale Name: Porter Horse

(3) Contract Expiration Date: October 31, 2009

Project Completion Dates: _____

(4) Purchaser: _____

(6) Purchaser Representatives:

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

(7) State Representatives:

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

(8) Name of Subcontractors & Starting Dates:

Projects: No(s) _____ - _____	Date: _____	Phone: _____
No(s) _____ - _____	Date: _____	Phone: _____
No(s) _____ - _____	Date: _____	Phone: _____
No(s) _____ - _____	Date: _____	Phone: _____

Logging: Felling _____	Date: _____	Phone: _____
Yarding: _____	Date: _____	Phone: _____

(9) Comments: _____

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

EXHIBIT B
INSTRUCTION SHEET FOR OPERATIONS PLAN

SUBMIT ONE COPY OF PLAN TO STATE

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

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.

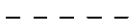
- (10) The STATE representative will furnish extra copies of Exhibit A of the contract for your use in preparing the operations map. The map shall use the following legend and show:
 1. Landing locations, approximate setting boundaries, and probable sequence of logging the settings. Number the settings 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.



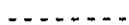
Cable landing, with numbers for sequence.



Tractor landing with alphabetical sequence.



Approximate setting boundary.



Spur truck roads.



Tractor yarding roads.



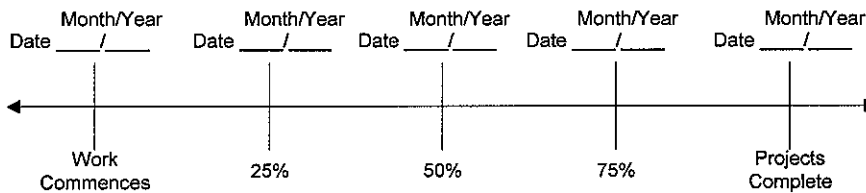
Temporary stream crossings.

EXHIBIT B
OPERATIONS PLAN

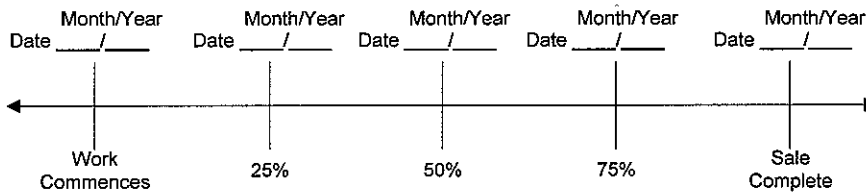
Completion Timeline

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 are 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

EXHIBIT C

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: _____
 Address _____

(12) SALE NAME Porter Horse

COUNTY Clatsop

(13) STATE CONTRACT NUMBER 341-07-45

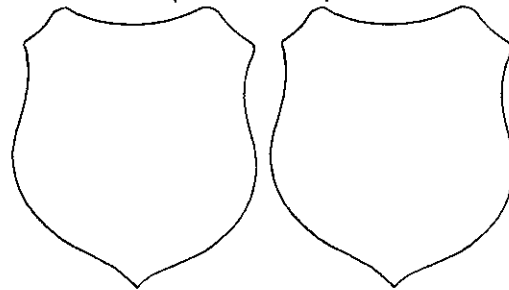
(14) SCALE: westside eastside cubic foot

(15) STATE BRAND REGISTRATION NUMBER _____

(16) BUREAU BRAND CODE NUMBER _____

(17) STATE BRAND INFORMATION:

↙ (COMPLETE) ↘



(5) MINIMUM SCALING SPECIFICATIONS			CLASS		
SPECIES	SCALING DIAMETER INCHES	*NET SCALE VOLUME	PER MBF	** SUM	SUB
All Conifers	--	10	X		
All Hardwoods	--	10	X		

* Apply minimum volume test to whole logs over 40' Westside; 20' Eastside.
 ** Sum (if indicated): see instructions and explain in Item (20).

(6) WESTSIDE SCALE: YES NO
 Actual taper all logs over 40' scaling length

(7) EASTSIDE SCALE:
 *Actual taper butt logs over 40' scaling length

(8) PENCIL BUCK
 back to Minimum Scaling Diameter _____

(9) ADD-BACK VOLUME --
 Deductions due to delay

(18) PAINT REQUIRED: YES
 COLOR Orange

(19) SPECIAL SCALES
PEELABLE CULL (all species)
UTILITY/PULP (all species)
NO DEDUCTIONS ALLOWED FOR MECHANICAL DAMAGE
OTHER: _____
OTHER: _____

(10) APPROVED SCALING LOCATIONS	Species	Yard	Truck

(20) REMARKS: All Hardwood logs less than 30 board feet shall be scaled as "Utility." Hardwood logs greater than or equal to 30 net board feet shall be scaled as a sawlog.

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

(11) NOTICE OF CANCELLATION OF BRAND:
 Effective Date: _____

 State Forester's Representative

(21) SIGNATURES:
 _____ Date
 Purchaser or Authorized Representative
 _____ Date
 State Forester Representative

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.

EXHIBIT C

INSTRUCTIONS FOR FORM 343-307 (rev. 5/01)

- (1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires Item (21). Complete date.
- (2) Designate Third Party Scaling Organization (TPSO). Send 4 copies to TPSO, 1 to purchaser, 1 to Salem, and keep such copies as to district needs.
- (3) State District office, address and phone.
- (4) Enter Purchaser's business name and address as it appears on the Contract.
- (5) Minimum Scaling Specifications. Review Section 2040 or 2045, "Log Removal," of the Contract. Species, or combined species can be separate entries. Information serves as a basis for scaling (see also Items (13) thru (17)), and is required to show existence on the sale. **PerM** (per MBF). **SUM** (lump sum material). **SUB** (submerchantable material. SUB, as used by the State, references that material containing at least 10 bf (net) but less than the lower merchantable net volume limit or grade requirements for other merchantable (PerM) entries. PerM, SUM, and Sub must be indicated by checking the appropriate column. Species with the same specifications and value are combined into one entry. PerM and Sub require scaling therefore complete specifications. SUM need not be scaled, hence no specifications. Loads containing only SUM are to be ticketed if so instructed in Item (19). Mixed loads of SUM, PERM and/or subspecies will always be scaled.
- (6) Westside -- 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) Eastside -- actual taper/taper table segment scale. Special Service Rules on file with TPSO. See: Segment Scaling and Grading of Long Logs -- All Species -- State Forestry Department Scaling Practices (Northwest Log Rules Eastside). Items with * follow U.S. Forest Service Eastside rules.
- (8) Pencil Buck. Check NO if a westside sale, optional for eastside sales.
- (9) Add-Back Volume. Add-Back is normally checked YES. Scaler records deductions (sap rot, weather checks, etc.) caused by an abnormal delay in removal. Enter separately on scale ticket. TPSO provides State with summaries that include this as a net volume by species. Salvage sales and certain other circumstances may require that "NO" be checked.
- (10) Show scaling locations only applicable to TPSO. Not necessary to list markets. If all species are scaled at same location, enter "ALL."
- (11) When logging is complete, recall branding hammers, date and sign where indicated, check CANCELLATION box at top of form, and send to TPSO.
- (12) Enter sale name and county.
- (13) Enter sale Contract number.
- (14) Check Westside or Eastside log scale. Cubic foot refers to Northwest Log Rules Cubic Foot Scale.
- (15) Oregon Forest Products Brand Registry Number (optional).
- (16) DO NOT USE -- TPSO will fill in when applicable.
- (17) Show one brand only. Complete drawing. If more than one brand is assigned to the sale, (1) make separate form for each brand, and (2) on each form, explain and show other brand(s) under REMARKS, Item 19.
- (18) Check YES and designate orange.
- (19) Special Scales. These are the Special Scales that will be applied. If "Other" is indicated, please describe. Give comments in Item (19).
- (20) Use this space to designate weight conversion factors, or any other explanations to clarify scaling requirements. If additional scaling locations are approved, prepare another form showing all (old and new) locations. Check REVISION box at top of form and explain under remarks. Route as indicated.
- (21) Require purchaser to sign and date completed form.

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 16+00	DITCH
16 feet	12 feet	2A to 2B	0+00 to 13+30	DITCH
16 feet	12 feet	4A to 4B	0+00 to 15+30	DITCH
16 feet	12 feet	5A to 5B	0+00 to 5+80	DITCH
16 feet	12 feet	6A to 6B	0+00 to 3+67	DITCH
16 feet	12 feet	6C to 6D	0+00 to 17+47	DITCH
16 feet	12 feet	6E to 6F	0+00 to 11+16	DITCH
16 feet	12 feet	7A to 7B	0+00 to 7+10	DITCH
14 feet	None	8A to 8B	0+00 to 10+90	OUTSLOPE
16 feet	12 feet	8C to 8D	0+00 to 17+20	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.

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. Do not place clearing and grubbing debris on side slopes exceeding 50 percent. Grubbing debris shall be left in a stable location, and not left lodged against standing trees.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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

Excavation shall conform to STATE-engineered lines, grades, dimensions, and plans when provided.

All suitable excavated material shall be used where possible 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. All fills and drainage structure backfills shall be machine compacted according to the specifications in Exhibit D.

Unless road design 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.

Excess excavation shall not be sidecast where material will enter a stream course or where material will accumulate in areas deemed a high landslide hazard location by STATE.

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 follows: 400 divided by the radius of the curve equals the amount of extra width.

DRAINAGE

Subgrade. Subgrade shall be crowned at 4 to 6 percent ($\frac{1}{2}$ inch per foot).

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

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

Outslope. Road subgrade shall be outsloped at 4 to 6 percent.

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.

GRADING

	<u>Back Slopes</u>	<u>Fill Slopes</u>
Rock	Vertical to $\frac{1}{4}$:1	Not steeper than 1 $\frac{1}{2}$:1
Common - side slopes 50% and over	$\frac{3}{4}$:1	
Common - side slopes less than 50%	1 :1	
Common - turnpike (level) section	2 :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. Surface is to be crowned for drainage, with general grade no more than 3 percent. Surface as shown on Exhibit D.

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

SEASONAL WINTERIZATION. All unrocked roads or unfinished subgrades shall be waterbarred in accordance with the specifications in Exhibit K, 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) 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 or as designated by STATE. Surplus excavated materials and waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with Exhibit D.
- (2) Fill Armor and Energy Dissipator Construction. Where rock is specified for fill armor, rock shall be placed and tamped at a 1½:1 slope, beginning at the fill toes. 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 I.
- (3) Geotextile Road Fabric: Install woven fabric from 9+30 to 12+50 on 1A to 1B in accordance with the specifications in Exhibit H.
- (4) Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic-yard, track-mounted excavator.
- (5) 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 (½ inch per foot).
 - (c) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with specifications in Exhibit D. Final road surface shall be crowned at 4 to 6 percent (½ inch per foot).

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description:</u>
6C to 6D	0+00	Begin construction. Utilize suitable excavation material for fill construction between stations 6+45 to 9+45.
	6+45	Begin subgrade reinforcement. Utilize 324 cy of 24"-6" riprap rock.
	9+45	End subgrade reinforcement.
	17+47	Utilize suitable excavation material for landing construction.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS

- (1) Roadside Brushing. Conduct roadside brushing as specified in Exhibit J.
- (2) Excavated Materials. Excavated materials shall be utilized for road and fill construction and hauled in where necessary. Surplus excavation materials shall be hauled to the waste areas as marked in the field and/or designated on Exhibit A. Waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with Exhibit D.
- (3) Culvert Replacement, Culvert Installation, Fill Reconstruction, and Fill Removal. Existing culvert geometry shall be modified to provide for optimum drainage and culvert performance. Modifications may include, skewing the culvert and/or installing the culvert at gradients equal to or exceeding the drainage (or ditch) gradient. Where fill reconstruction or culvert replacement is specified, fills shall be excavated to natural stream course levels. All woody debris encountered during fill excavation shall be removed. 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 N. 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 Exhibit D. 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.
- (4) 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 and uniformly sloped and compacted for drainage, as directed by STATE. Damaged culvert inlets and/or outlets shall be repaired by opening them with a hydraulic jack, or cutting off the culvert end to allow for free passage of water at peak flow levels. Install a culvert marker at each newly installed culvert and at each existing culvert that is missing a marker that could be reached by a grader blade.
- (5) Riprap Rock Use: Where rock is used for fill armor, rock shall be placed and tamped at a 1½ : 1 slope, beginning at the fill toes. When 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 I.
- (6) Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic yard, track-mounted excavator.
- (7) 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 ½ inch per foot in road width (4 to 6 percent), and compact in accordance to Exhibit D.
 - (e) Upon completion of above required work, apply, process, and compact surfacing rock in accordance to Exhibit D.
- (8) Culvert Markers. Install culvert markers on intake ends of all culverts in fills less than 3 feet in height.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description:</u>
I1 to I2	0+00	Point I1 – Junction of Nicolai Mainline and Porter Ridge Road
	8+60	Replace existing culvert. Utilize 36 cubic yards of ¾"-0" crushed rock for culvert bedding/backfill.
	23+50	Replace existing culvert. Utilize 36 cubic yards of ¾"-0" crushed rock for culvert bedding/backfill.
	70+05	Utilize 10 cubic yards of 24"-6" riprap to construct an energy dissipater.
	113+90	Replace existing culvert. Utilize 36 cubic yards of ¾"-0" crushed rock for culvert bedding/backfill.
	133+70	Replace existing culvert. Utilize 36 cubic yards of ¾"-0" crushed rock for culvert bedding/backfill.

EXHIBIT D
END-HAULING REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT	WASTE AREA LOCATION	WASTE AREA TREATMENT
6C to 6D	0+00 to 6+22	1	1a	1, 2

End-Haul Areas General Requirements

Material shall not be intentionally side cast.

Clearing and grubbing debris shall be end-hauled.

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

Containment

- (1) Full containment: The amount of material lost over the outside edge of the road shall not exceed 6 inches in depth measured perpendicular to the natural ground slope. Pioneer excavation shall be removed by digging, loading, and hauling rather than by pushing or scraping methods.
- (2) Average containment: The amount of material lost over the outside edge of the road shall not exceed 12 inches in depth measured perpendicular to the natural ground slope.

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

Utilize suitable material where needed along road segment near these locations:

- (1a) 6C to 6D – Utilize material at 6+45 to 9+45.
- (1b) Surplus waste material shall be hauled to a waste area designated by STATE.

Waste Area Treatment

- (1) Utilize suitable material for fill construction and compact in accordance with Exhibit D.
- (2) Mulch and seed all waste areas in accordance with Exhibit N.

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 16+00		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed	0+00 to 16+00	9	station	49	stations	16.00	784
Junctions	4"-0" Crushed	0+00	9	junction	36	junctions	1	36
Junctions	3/4"-0" Crushed	0+00	2	junction	24	junctions	1	24
Curve widening	4"-0" Crushed	6+00 to 8+80	9	station	11	stations	3	33
Turnouts	4"-0" Crushed	6+50, 13+00	9	TO	22	TO's	2	44
Turnarounds	4"-0" Crushed		9	TA	24	TA's	1	24
Total Rock for Road Segment:				1A to 1B				945
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 13+30		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed	0+00 to 13+30	9	station	49	stations	13.30	652
Junctions	4"-0" Crushed	0+00	9	junction	36	junctions	1	36
Junctions	3/4"-0" Crushed	0+00	2	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	3+65, 8+40	9	TO	22	TO's	2	44
Turnarounds	4"-0" Crushed		9	TA	24	TA's	1	24
Landings	6"-0" Pit-run	2B	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:				2A to 2B				840
ROAD SEGMENT 2C Landing				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	2C Landing		0+00		
				Volume (CY) per		Number of		
Landing	6"-0" Pit-run	2C	8	station	80	junctions	1.00	80
Total Rock for Road Segment:				2C Landing				80
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		15+30		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed	0+00 to 15+30	9	station	49	station	15.30	750
Traction Rock	3/4"-0" Crushed	2+00 to 4+50	2	station	11	station	2.50	28
Junctions	4"-0" Crushed	0+00	9	junction	36	junctions	1.00	36
Junctions	3/4"-0" Crushed	0+00	2	junction	24	junctions	1.00	24
Turnouts	4"-0" Crushed	4+70, 8+50, 12+90	9	TO	22	TO's	3.00	66
Turnarounds	4"-0" Crushed		9	TA	24	TA's	1.00	24
Landings	6"-0" Pit-run	8+50 and 4B	N/A	Landing	60	Landings	2	120
Total Rock for Road Segment:				4A to 4B				1,048

EXHIBIT D
 ROAD SURFACING

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 5+80		
				Volume (CY) per	Number of			
Base Rock	4"-0" Crushed	0+00 to 5+80	9	station	49	stations	5.80	284
Traction Rock	3/4"-0" Crushed	1+50 to 4+00	2	station	11	stations	2.50	28
Junctions	4"-0" Crushed	0+00	9	junction	36	junctions	1	36
Junctions	3/4"-0" Crushed	0+00	2	junction	24	junctions	1	24
Turnarounds	4"-0" Crushed		9	TA	24	TA's	1	24
Landings	6"-0" Pit-run	5B	N/A	Landing	80	Landings	1	80
Total Rock for Road Segment:			5A to 5B					476
ROAD SEGMENT 6A-6B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	6A-6B		0+00 to 3+67		
				Volume (CY) per	Number of			
Base Rock	4"-0" Crushed		9	station	49	stations	3.67	180
Junction	4"-0" Crushed		9	junction	36	junctions	1	36
Junction	3/4"-0" Crushed		2	junction	24	junctions	1	24
Landings	6"-0" Pit-run		N/A	landing	60	landings	1	60
Total Rock for Road Segment:			6A-6B					300
ROAD SEGMENT 6C-6D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	6C-6D		0+00 to 17+47		
				Volume (CY) per	Number of			
Base Rock	4"-0" Crushed		9	station	49	stations	17.47	856
Turnouts	4"-0" Crushed		9	turn out	22	turnouts	2	44
Curve Widening	4"-0" Crushed		9	curve	N/A	curves	5	65
Fill Widening	4"-0" Crushed		9	fill	24	fills	1	24
Turnarounds	4"-0" Crushed	13+40	9	TA	13	TA's	1	13
Junction	4"-0" Crushed		9	junction	36	junctions	1	36
Junction	3/4"-0" Crushed		2	junction	24	junctions	1	24
Subgrade Reinforcement	24"-6" Rip Rap	6+45 to 9+45	12	station	108	stations	3	324
Dissipator Rock	24"-6" Rip Rap	4+20	N/A	culvert	10	culverts	1	10
Fill Armoring	24"-6" Riprap	6+45 to 9+45	N/A	fill	N/A	fills	1	35
Fill Armoring	6"-0" Pit-run	6+45 to 9+45	N/A	fill	N/A	fills	1	270
Landings	6"-0" Pit Run		N/A	landing	60	landings	1	60
Traction Rock	3/4"-0" Crushed	0+30 to 9+30	2	station	11	stations	9	99
Total Rock for Road Segment:			6C-6D					1,860

EXHIBIT D
 ROAD SURFACING

ROAD SEGMENT 6E-6F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	6E-6F Volume (CY) per		0+00 to 11+16 Number of		
Base Rock	4"-0" Crushed		9	station	49	stations	11.16	547
Turnouts	4"-0" Crushed		9	turn out	22	turn outs	2	44
Junction	4"-0" Crushed		9	junction	36	junctions	1	36
Junction	3/4"-0" Crushed		2	junction	24	junctions	1	24
Landings	6"-0" Pit-run		N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:				6E-6F				711
ROAD SEGMENT 7A to 7B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	7A to 7B Volume (CY) per		0+00 to 7+10 Number of		
Base Rock	4"-0" Crushed	0+00 to 7+10	9	station	49	station	7.10	348
Traction Rock	3/4"-0" Crushed	1+50 to 5+50	2	station	13	station	4.0	52
Junctions	4"-0" Crushed	0+00	9	junction	36	junction	1	36
Junctions	3/4"-0" Crushed	0+00	9	junction	24	junction	1	24
Turnouts	4"-0" Crushed	3+70	9	TO	22	TO's	1	22
Turnarounds	4"-0" Crushed		9	TA	24	TA	1	24
Landings	6"-0" Pit-run	7B	N/A	Landing	80	Landing	1	80
Total Rock for Road Segment:				7A to 7B				586
ROAD SEGMENT 8A				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	8A Volume (CY) per		0+00 Number of		
Base Rock	4"-0" Crushed	8A	8	station	36	junctions	1.00	36
Total Rock for Road Segment:				8A				36
ROAD SEGMENT 8C to 8D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	8C to 8D Volume (CY) per		0+00 to 17+20 Number of		
Base Rock	4"-0" Crushed	0+00 to 17+20	9	station	49	stations	17.20	843
Junctions	4"-0" Crushed	0+00	9	junction	36	junctions	1	36
Junctions	3/4"-0" Crushed	0+00	N/A	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	4+10, 8+20, 12+70	9	TO	22	TO's	3	66
Turnarounds	4"-0" Crushed		N/A	TA	24	TA's	1	24
Landings	6"-0" Pit-run	8D	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:				8C to 8D				1,053

EXHIBIT D
 ROAD SURFACING

ROAD SEGMENT 11 to 12				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	11 to 12		0+00 to 154+20		
				Volume (CY) per	Number of			
Leveling Rock	3/4"-0" Crushed	0+00 to 154+20	N/A	N/A		N/A		120
Surface Rock	3/4"-0" Crushed	0+00 to 154+20	4	station	22	stations	154.20	3,392
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	7	168
Turnouts	3/4"-0" Crushed		4	TO	11	TO's	22	242
Culvert Backfill	3/4"-0" Crushed		N/A	culvert	36	culverts	4	144
Energy Dissipator	24"-6" Riprap	70+05	N/A	dissipator	10	dissipator	1	10
Total Rock for Road Segment:				11 to 12				4,539
ROAD SEGMENT 13 to 14				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	13 to 14		0+00 to 9+40		
				Volume (CY) per	Number of			
Leveling Rock	3/4"-0" Crushed	0+00 to 9+40	N/A	N/A		N/A		72
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	1	24
Total Rock for Road Segment:				TO				96
ROAD SEGMENT 15 to 16				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	15 to 16		0+00 to 6+00		
				Volume (CY) per	Number of			
Leveling Rock	4"-0" Crushed	0+00 to 6+00	N/A	N/A		N/A		48
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	1	24
Total Rock for Road Segment:				Volume (CY)				72
ROAD SEGMENT 17 to 18				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	17 to 18		0+00 to 4+30		
				Volume (CY) per	Number of			
Leveling Rock	4"-0" Crushed	0+00 to 4+30	N/A	N/A		N/A		48
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	1	24
Total Rock for Road Segment:				Volume (CY)				72

EXHIBIT D
 ROAD SURFACING

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		0+00 to 13+30			
				Volume (CY) per		Number of			
Leveling Rock	4"-0" Crushed	0+00 to 13+30	N/A	N/A		N/A		96	
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	1	24	
Total Rock for Road Segment:								Volume (CY)	120

Roads shall be uniformly graded and approved by STATE prior to rocking. For typical cross section, see Forestry Department Drawing Nos. 351-C and 351-D at the Forestry Department district office.

ROCK TOTALS (CY)	24"-6"	6"-0"	4"-0"	3/4"-0"
12,363	379	930	6,405	4,649

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 sediments will not enter streams.

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. If additional rock is required because of insufficient depth, it shall be added by truck measure to those areas that were slighted. The conversion from compacted yardage to truck yardage is 1.3 multiplied by the compacted yardage equals truck yardage.

The depth of compacted aggregates shall not vary more than 1 inch from the depth specified in Exhibit D. The average depth for each road segment shall be the specified depth or greater. Surfacing areas shall be staked 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

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 visible deformation ceases, or in the case of a sheepsfoot roller, the roller "walks out." At least 3 passes shall be made over the entire width and length of the road. A pass is defined as traveling a road section in one direction and then back over that same section again. 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 unless otherwise specified.

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 or, in the case of a sheepsfoot roller, the roller "walks out." At least 3 passes shall be made over the entire width and length of each layer. A pass is defined as traveling a fill layer in one direction and then back over that same layer again.

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 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. A pass is defined as traveling a road section in one direction and then back over that same section again. 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 unless otherwise specified.

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

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 or sheepsfoot 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) Vibratory Grid Compactors. The roller shall have a grid surface and have an operating weight of 32,000 pounds or more. The rock shall be worked with a grader weighing at least 20,000 pounds during the grid rolling process. All rock shall come in contact with the vibratory grid compactor.
- (6) Grid Rollers. Pit-run rock shall be processed by grid rolling with a Hyster Grid Roller Model D or equivalent, fully equipped with 32,000 pounds or more of ballast weights. Twenty passes shall be made with a grid roller over the entire length and width of the road, unless STATE requires fewer passes. A grader weighing at least 20,000 pounds shall work the pit-run surface during grid rolling so that all pit-run rock comes in contact with the grid roller. Grid rolling shall be performed when the subgrade is dry and firm. Road surface shall be uniformly shaped and graded prior to and during grid rolling.

EXHIBIT E
CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the Contract. All 18 inch diameter culverts shall be constructed of corrugated double-walled polyethylene, or corrugated aluminized steel. Polyethylene culverts shall meet the requirements of AASHTO M-294-901, Type S. This specification applies to high density polyethylene corrugated pipe with an integrally formed smooth interior. Aluminized steel culverts shall be constructed of corrugated aluminized Type 2 steel. All culverts shall conform to the material and fabricating requirements of the "Standard Specifications for Highway Construction" prepared by the Highway Division of the Oregon State Department of Transportation. Corrugation types and shapes other than those meeting the above minimum Highway requirements, shall be approved in writing by STATE.

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 stipulated in special instructions.

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

Culvert grade shall slope away from ditch grade at least 2 percent unless otherwise specified.

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 pipe. The culvert trench shall be excavated 3 pipe diameters wide to Permit compaction and working on each side of the pipe. Tamping shall be done in 6-inch lifts, 1 pipe diameter each side of the pipe to 95 percent density or over. Bedrock shall be excavated as required to provide a uniform foundation for the full length of the culvert.

A bedding of granulated material or 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 pipe.

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

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

Joining shall be done with bands of like material and corrugations. Manufacturers' instructions shall be followed for prefabricated pipe assembly.

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

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

EXHIBIT E
 CULVERT SPECIFICATIONS

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" (add 6" for roads which will not be rocked). Minimum vertical cover for other designs shall be as specified by STATE.

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

The ends of each culvert shall be free of logs and debris which would restrict the free flow of water. The intake end of relief culverts shall be provided with a sediment catching basin 3 feet in diameter at the bottom. The outlet end of any culvert which would allow water to erode embankment soil shall be provided with an energy dissipator, 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.

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

Dia.	Steel Pipe Gauge	Band Gauges	Band Widths (")			Hugger Band Widths (")	
			Annular	Helical	Dimpled	Annular	Helical
12-15	16 (0.0598")	16	7	12	12	13 1/8	10 1/2
18-24	16 (0.0598")	16	12	12	12	13 1/8	10 1/2
30-36	16 (0.0598")	16	12	12	12	13 1/8	10 1/2
42	14 (0.0747")	16	12	12	NA	13 1/8	10 1/2
48	12 (0.1046")	16	24	24	NA	13 1/8	10 1/2
54	14 (0.0747")	16	24	24	NA	13 1/8	10 1/2
60	12 (0.1046")	16	24	24	NA	13 1/8	10 1/2
66-72	12 (0.1046")	16	24	24	NA	13 1/8	10 1/2
78	12 (0.1046")	16	24	24	NA	13 1/8	10 1/2
84	12 (0.1046")	16	24	24	NA	14 3/4	10 1/2
90-120	12 (0.1046")	16	26	26	NA	NA	NA

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

Culverts 24 inches in diameter or larger shall have 1:1 beveled inlets.

Tamping is required.

All removed culverts shall be hauled to an approved refuse site off of STATE land.

The intake ends of culverts in fills less than 3 feet 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 2 1/2 inches wide, with the spade driven 2 feet into the ground.

EXHIBIT E
 CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	ROAD SEGMENT POINT TO POINT	STATION
1	18	40	CPP	1A to 1B	0+00
2	18	30	CPP	1A to 1B	5+30
3	18	40	CPP	1A to 1B	7+80
4	18	40	CPP	1A to 1B	11+00
5	18	40	CPP	2A to 2B	0+00
6	18	30	CPP	2A to 2B	4+20
7	18	30	CPP	2A to 2B	10+00
8	18	40	CPP	4A to 4B	0+00
9	18	30	CPP	4A to 4B	5+00
10	18	30	CPP	4A to 4B	10+00
11	18	50	CPP	6C to 6D	4+20
12	18	40	CPP	I1 to I2	8+60
13	18	40	CPP	I1 to I2	23+50
14	18	40	CPP	I1 to I2	113+90
15	18	40	CPP	I1 to I2	133+70

ACSP = Aluminized, CPP = Polyethylene

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 the quarry area. The plan shall include, but not be limited to:
 - (a) Location of benches and roads to benches.
 - (b) Disposal site for debris and overburden.
 - (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 silt, rock, debris, dirt, or clay 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 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 degrees 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
ROCK QUARRY DEVELOPMENT AND USE

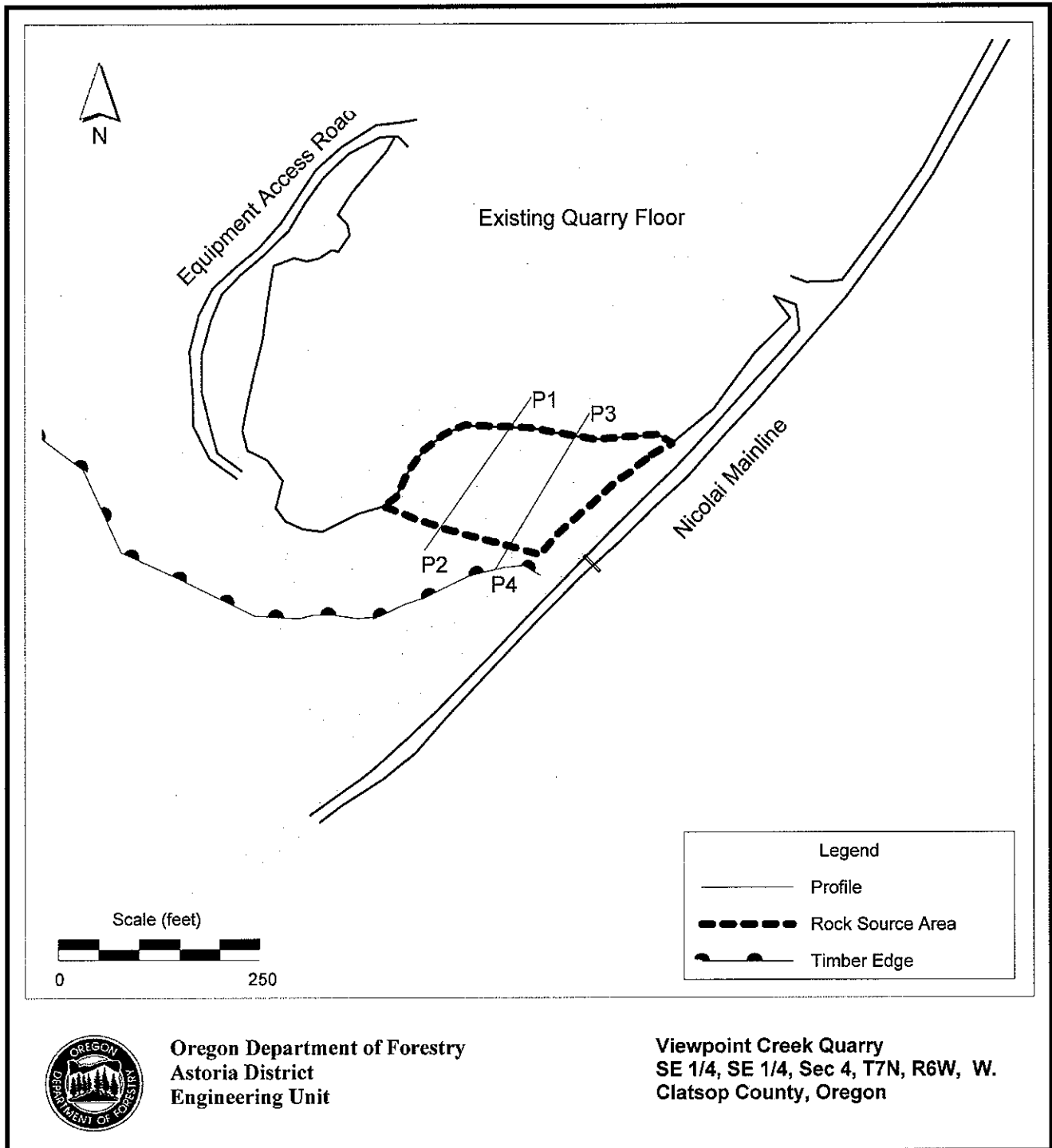
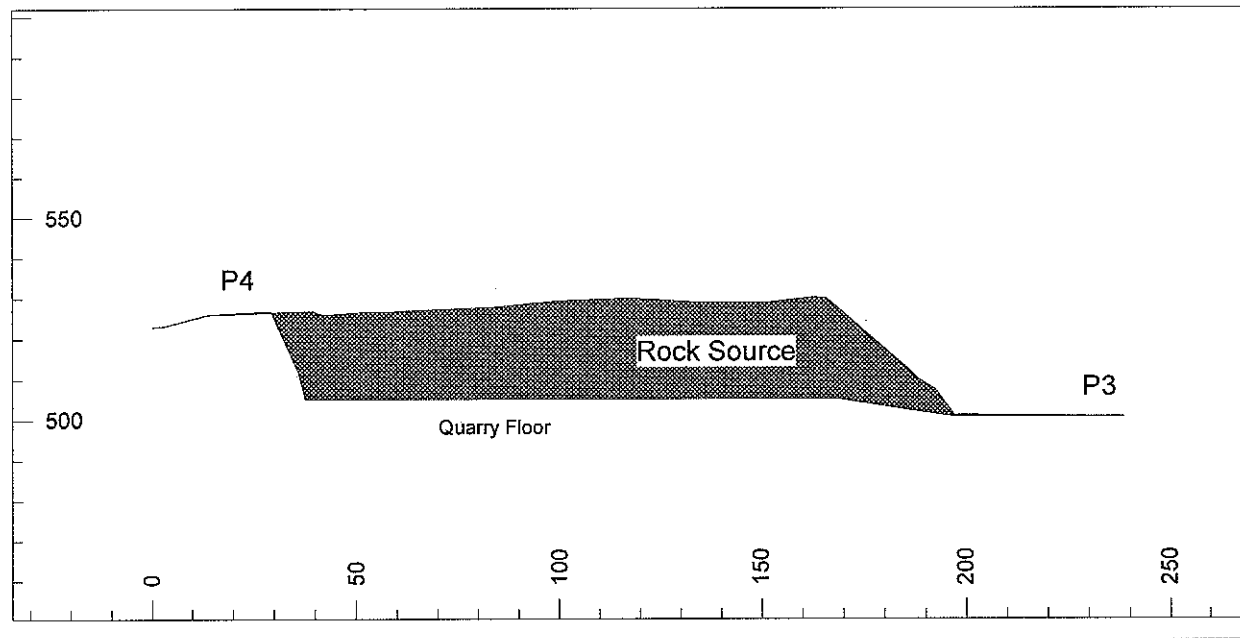
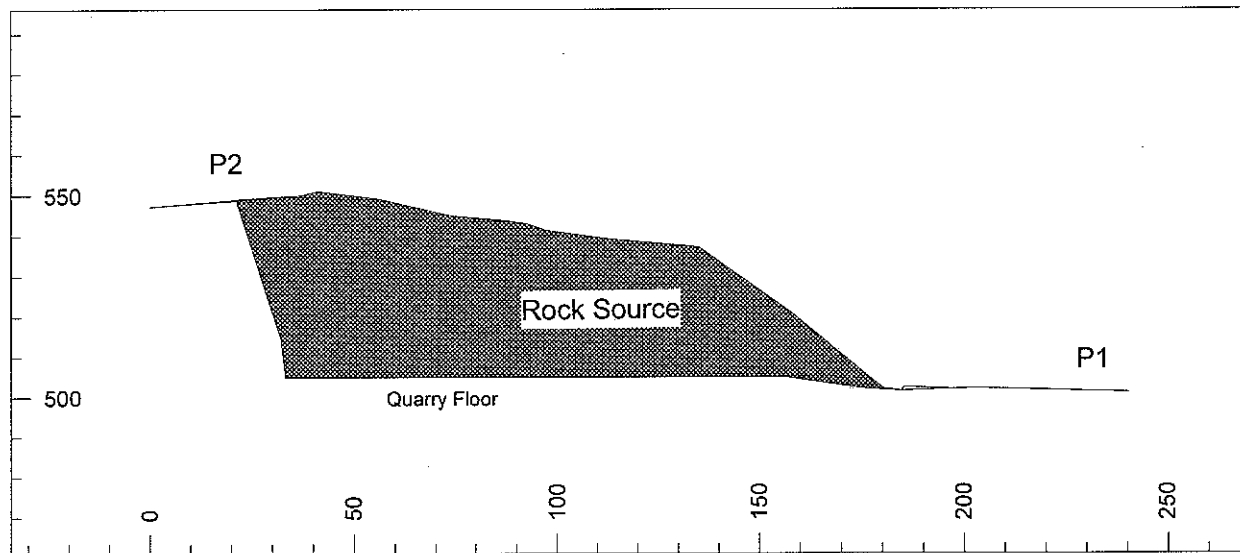


EXHIBIT F
ROCK QUARRY DEVELOPMENT AND USE



Oregon Department of Forestry
Astoria District
Engineering Unit

Viewpoint Quarry
SE1/4, SE1/4, Sec 4, T7N, R6W, W.M.
Clatsop County, Oregon

EXHIBIT G

CRUSHED ROCK SPECIFICATIONS

Materials. The material shall be fragments of rock or other hard, durable particles crushed to the required size and a filler of finely crushed stone, sand, or other finely divided mineral matter. 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 fines or dirt.

Quality and Grading Requirements. The stone base materials shall be crushed rock, including sand. River gravel shall not be used.

The material from which base material is produced or manufactured shall meet the following test requirements:

Hardness - Test Method AASHTO T 96 35% Maximum

Durability - Test Method ODOT TM 208
Passing No. 20 Sieve: 30% Maximum
Sediment Height: 3" 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 Exhibit G. 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 G
CRUSHED ROCK SPECIFICATIONS

Grading Requirements

<u>For 3/4"-0"</u>	Passing	1" sieve	100%
	Passing	3/4" sieve	90-100%
	Passing	3/8" sieve	55-75%
	Passing	1/4" sieve	40-60%

Of the fraction passing 1/4" sieve, 40% to 60% shall pass the No. 10 sieve.

<u>For 1 1/2"-0"</u>	Passing	2" sieve	100%
	Passing	1 1/2" sieve	95-100%
	Passing	3/4" sieve	55-90%
	Passing	1/4" sieve	35-50%

Of the fraction passing 1/4" sieve, 40% to 60% shall pass the No. 10 sieve.

<u>For 4"-0"</u>	Passing	5" sieve	100%
	Passing	4" sieve	95-100%
	Passing	2" sieve	60-90%
	Passing	1/4" sieve	15-35%

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

PIT-RUN AND RIPRAP ROCK SPECIFICATIONS

Grading Requirements

<u>For 6"-0" Pit-Run</u>	Passing	10" sieve	100%
	Passing	6" sieve	65%

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

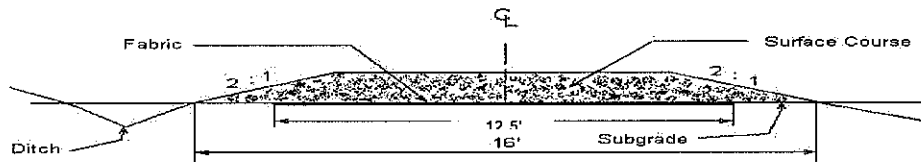
EXHIBIT H
 FABRIC SPECIFICATIONS

FABRIC SPECIFICATIONS - shall be woven 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 D1682 |
| (2) | Modulus Load at 10% Elongation | 140 lbs. | ASTM D1682 |
| (3) | Mullen Burst | 600 lbs. | ASTM D751 |
| (4) | Width - 12.5 feet | | |

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

- (1) Typical cross section:



- (2) 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 or pushed below subgrade surface. Light vegetation (grass, weeds, leaves, and fine woody debris) may be left in place.
- (3) Fabric shall be installed directly on the prepared surface. Longitudinal and traverse joints shall be overlapped at least 3 feet.
- (4) 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.
- (5) 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.
- (6) 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.
- (7) 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.
- (8) Fabric locations:

Road Segment	Location
1A to 1B	9+30 to 12+50

EXHIBIT I
TYPICAL EMBEDDED ENERGY DISSIPATOR

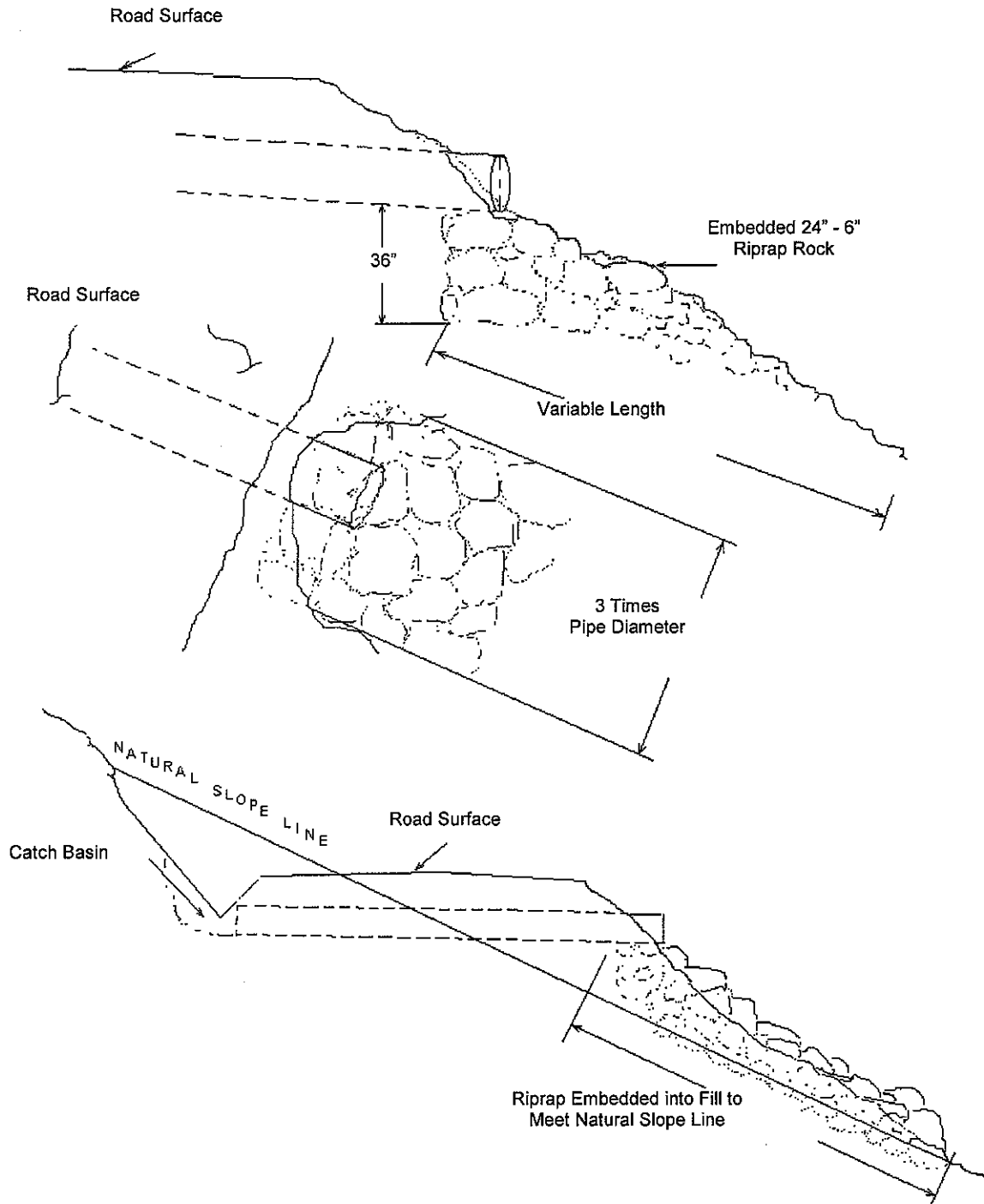
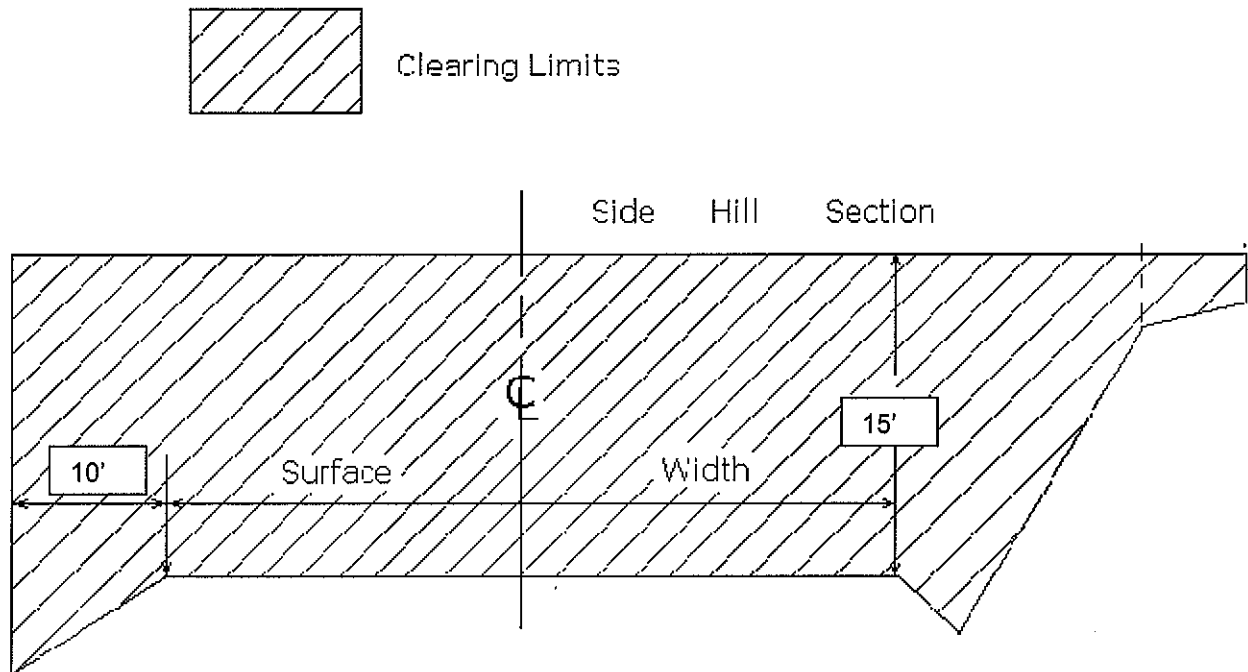


EXHIBIT J
ROAD BRUSHING SPECIFICATIONS



REQUIREMENTS

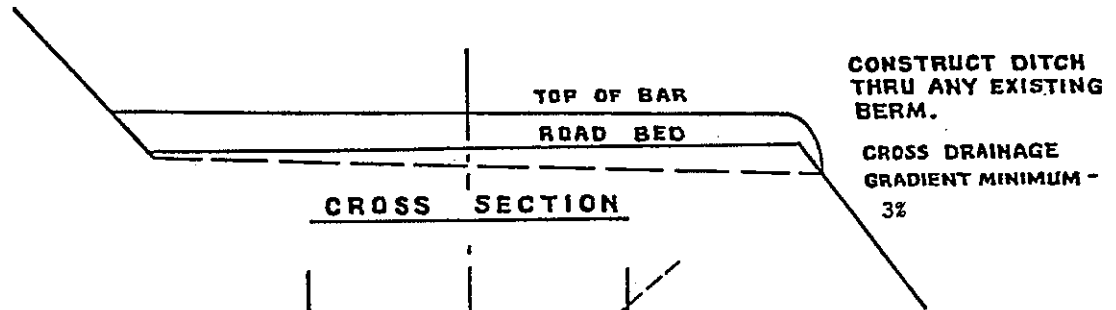
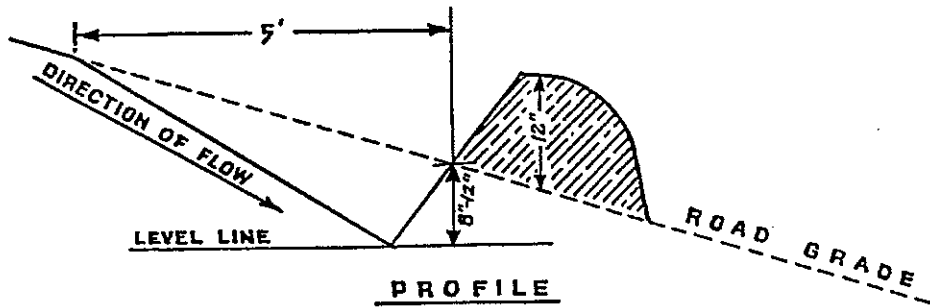
The minimum height of clearing shall be 15 feet from the road surface, and the minimum width of clearing on the cutslope side(s) of the road shall be 15 feet horizontal distance from the shoulder of the road and 10 feet horizontal on the down slope side from the road shoulder. For cutslopes less than 6 feet in height, brushing shall extend 5 feet beyond the top of cutslope. For cutslopes greater than 6 feet in height, brushing shall extend 15 feet horizontal distance from the road shoulder.

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.

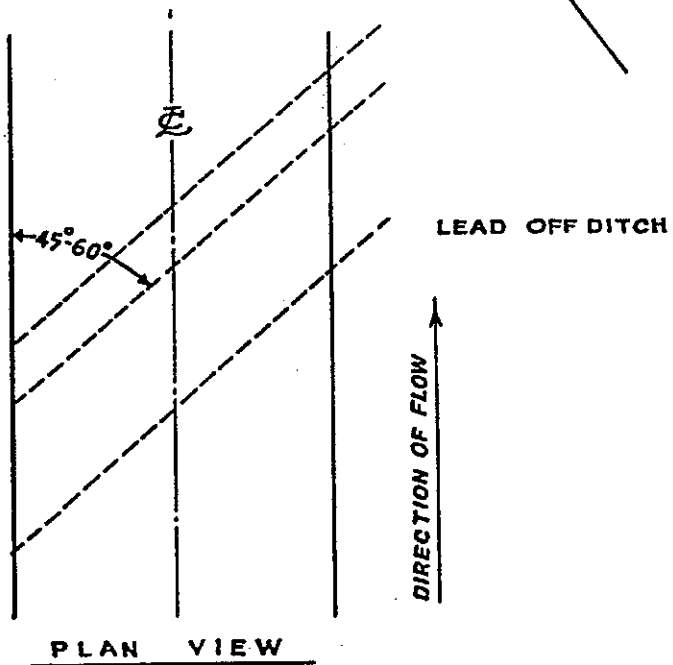
Debris resulting from the brushing operation shall be removed from the roadway, cutslope, ditches, water courses, culvert inlets and outlets and sediment catching basins. Debris shall be mulched or scattered downslope from the road or placed in other stable locations. Large debris, 6 inches or larger 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 clearing limits but outside of the ditchline or shoulder, shall not be cut down, but shall be limbed for road visibility.

EXHIBIT K
 WATERBAR SPECIFICATIONS



SPACING OF WATERBARS	
ROAD GRADE	DISTANCE
≤ 5%	400 feet
6-10%	200 feet
11-15%	150 feet
16-20% or greater	100 feet



**WATERBAR SPECIFICATIONS
 FOR CROSS DITCHING #298**

EXHIBIT L

ROAD VACATING AND FILL REMOVAL SPECIFICATIONS

PURCHASER shall vacate at the following Point: V1 to V2, V3, and V4. 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.
- F. A total project cost not exceeding \$18,000.

PROJECT REQUIREMENTS AND GENERAL SPECIFICATIONS

- (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.
- (2) Fill Removal and Stream Channel Development. Remove fills to the natural stream course level(s). Stream channel(s) shall be excavated/developed to specified widths. Developed stream banks shall be sloped at natural contours or no steeper than 1 ½:1, as directed by STATE.
- (3) Culvert Removal. Remove drainage structures and culverts. Removed culverts shall be hauled to an approved refuse site off of STATE land.
- (4) Outslope Road. Outslope road to restore natural contours or establish a minimum of 10% slope for drainage at designated locations. If the road grade exceeds 10%, outslope of the road shall be 2% 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 M.
- (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% outsloped surface for drainage. Any excess material will be hauled to a designated waste area, as directed by STATE.
 - (b) Woody Debris may be incorporated in embankment 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 N. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover.
- (8) Construct Waterbars as directed by STATE. Construct waterbars according to the specifications in Exhibit K.

EXHIBIT L

ROAD VACATING AND FILL REMOVAL SPECIFICATIONS

(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.

Credit for Project Work. The final credit for Project No. 5 shall not exceed \$18,000 per Section 2630, "Credit for Project Work," in the Timber Sale Contract. STATE may adjust the credit in Section 2630 in the event that the work is completed prior to using all available credit rates.

Credit Rates. Rates credited toward completion of the project will be applied for periods of active operation on the project work only and exclusive of initial move in of equipment or supplies. The method of crediting PURCHASER will be determined by applying the following credit rates for equipment, personnel, and supplies.

(1)	C325 excavator, or equivalent, and operator.	\$120 per operating hour
(2)	C330 excavator, or equivalent, and operator.	\$138 per operating hour
(3)	D7 dozer, or equivalent, and operator.	\$ 94 per operating hour
(4)	C966 front end loader, or equivalent, and operator.	\$ 79 per operating hour
(5)	C12G grader, or equivalent, and operator.	\$ 74 per operating hour
(6)	C14G grader, or equivalent, and operator.	\$ 84 per operating hour
(7)	Heavy Equipment transport and operator.	\$ 84 per operating hour
	(For secondary mobilization of equipment for the project.)	
(8)	10-12 cubic yard dump truck and operator.	\$ 59 per operating hour
(9)	20 cubic yard, Off-Road dump truck and operator.	\$ 69 per operating hour
(10)	25 cubic yard, Off-Road dump truck and operator.	\$ 99 per operating hour
(11)	Laborer(s) (Application of mulch only)	\$ 18 per operating hour
(12)	Straw Mulch	\$ 5 per bale
	(Includes transport and staging of material at job site)	
(13)	Grass Seed	\$ 2 per pound

Record Keeping. PURCHASER shall keep an accurate log of operating time (exclusive of standby time, repair delays, down time, etc.) and invoices for all equipment, personnel, straw bales, and grass seed on a daily basis, and submit it to the STATE Representative upon request. STATE shall provide the form for recording the required log. If the log is determined by STATE to not be complete or accurate, then PURCHASER will not get credited for all or a portion of the work, as determined by STATE.

Verification. The STATE representative shall provide direction for the conduct of work according to the specifications, verify hours of operation, verify required record keeping, and determine credits for project work.

Continuous Operations. Operations shall provide for continual operation on the project, unless interrupted by poor weather, fire closures, or other uncontrollable circumstances. Equipment breakdowns shall be repaired without undue delay, and provision shall be made for replacement of equipment.

EXHIBIT L

ROAD VACATING AND FILL REMOVAL SPECIFICATIONS

A Penalty of \$250 per day shall be assessed for any 8-hour work day that either equipment, personnel, or supplies are not operating or available due to failure to supply approved and acceptable equipment, personnel, or supplies in order to continue the project in an efficient and progressive manner. STATE may terminate the project in the event that work progress is not satisfactory to STATE.

Operators shall be experienced in operating the required equipment and be able to operate the equipment proficiently and efficiently. If STATE determines that an operator(s) or other personnel is/are not operating in a proficient and efficient manner, STATE considers the operator(s) or personnel not approved and not acceptable and may require the PURCHASER to do one or more of the following measures:

Replace operator(s) and/or personnel;
Replace equipment;
Terminate operations.

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>
V1 to V2	0+00	Begin waterbars.
	12+30	End waterbars and begin sidecast pullback.
	13+00	End sidecast pullback and begin waterbars.
	14+80	End waterbars and begin fill removal, develop 2 foot stream channel.
	16+05	Remove fill, develop 2 foot stream channel.
	20+60	Begin sidecast pullback.
	23+85	End sidecast pullback, begin fill removal, develop 3 foot stream channel.
	25+60	Remove fill, develop 3 foot stream channel, begin sidecast pullback.
	32+90	Remove fill, develop 3 foot stream channel, continue sidecast pullback.
	34+80	Remove fill, develop 2 foot stream channel, continue sidecast pullback.
	42+50	End sidecast pullback.
	44+80	Begin sidecast pullback.
	46+75	Remove fill, develop 3 foot stream channel, continue sidecast pullback.
	47+50	End sidecast pullback, begin waterbars.
	53+00	End waterbars, begin sidecast pullback.

EXHIBIT L

ROAD VACATING AND FILL REMOVAL SPECIFICATIONS

SPECIFIC INSTRUCTIONS/SPECIFICATIONS :

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
V1 to V2 (continue)	54+10	End sidecast pullback.
	58+30	Begin sidecast pullback.
	61+40	End sidecast pullback.
	64+50	End vacating.
V3	N/A	Remove fill, develop 3 foot stream channel.
V4	N/A	Remove fill, develop 3 foot stream channel.

EXHIBIT M

TYPICAL CROSS SECTION VIEW OF ROAD VACATING SIDECAST PULLBACK

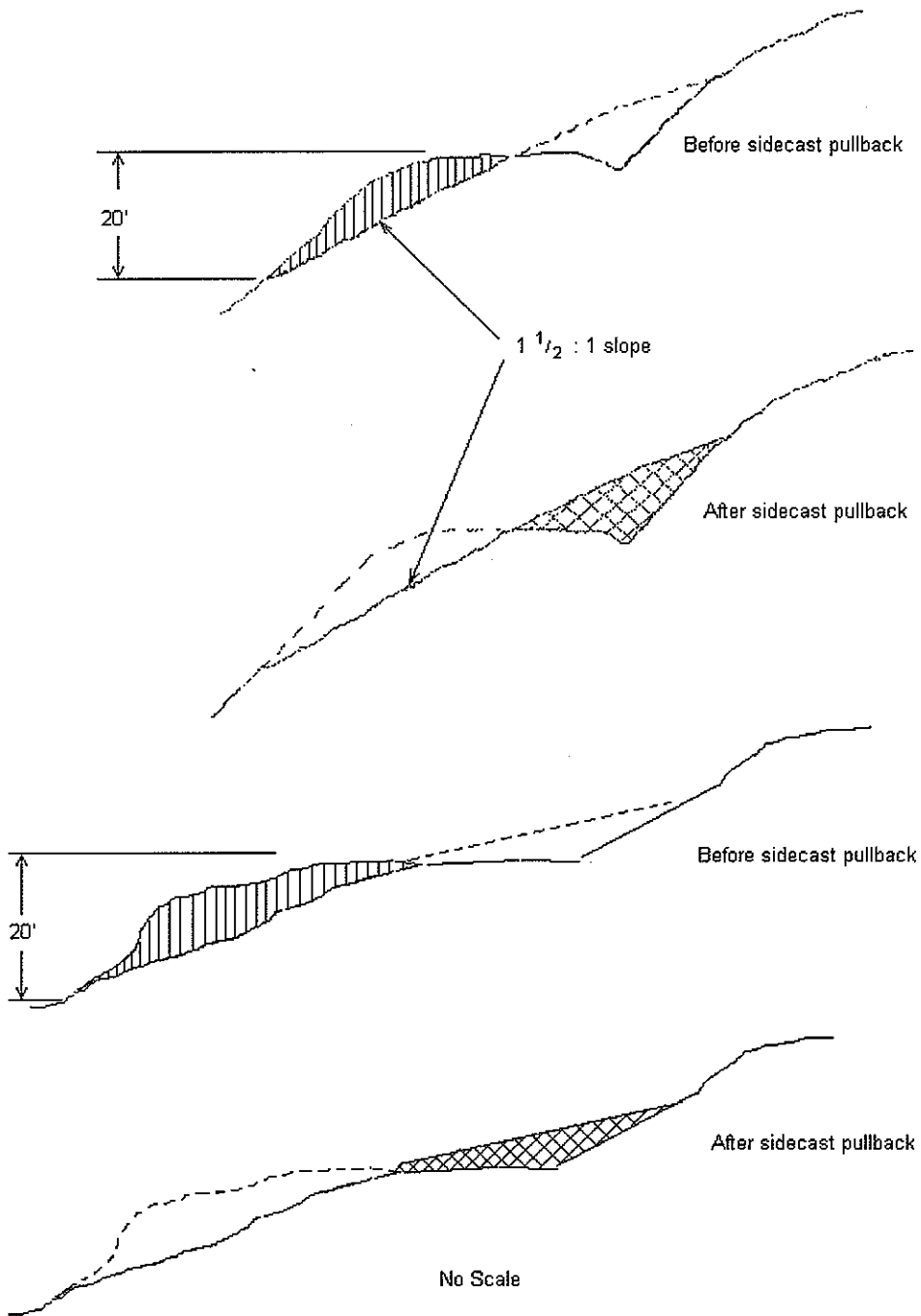


EXHIBIT N

SEEDING AND MULCHING

This work shall consist of preparing seedbeds and furnishing and placing required seed, fertilizer, and straw mulch. Straw mulch shall consist of straw that is free of noxious weeds. Apply seed, fertilizer, and straw mulch to all waste areas, and bare soils resulting from Project No. 1, 2, 5, and 6, as directed by STATE.

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 AND FERTILIZER

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

APPLICATION RATES FOR SEED AND FERTILIZER

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	POISON AND/OR REPELLENT	GERMINATION
Annual Rye	33%	95%	0	>90%
Orchard Grass	33%	95%	0	>90%
Perennial Rye	34%	95%	0	>90%

Fertilizer: Chemical analysis shall be 16-20-0 and shall be applied at the rate of 200 pounds per acre. Fertilizer shall not be applied within 100 feet of streams.

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
V1 to V2	0+00 to 64+50
V3 and V4	Fill and Fill Waste Areas

EXHIBIT O

SPECIFICATIONS FOR BRUSH AND SLASH SHOVEL PILING

Description of Work to be Done

Areas designated for work under the contract shall be treated according to the specifications given below:

Clearing - Brush, logging slash, and other debris shall be cleared from planting sites and piled in windrows or piled so that 80 percent or more of the soil organic layer is exposed. All woody vegetation (other than conifer trees) is defined as brush in this exhibit.

Piles - shall be located at least 75 feet apart and shall be no more than 75 feet long. Piles shall be located inside the project area designated for piling and shall be more than 75 feet from any edge or standing conifer tree. Piles shall be built to a height of 3 to 4 feet and then covered to prevent water from reaching the slash. STATE shall supply the materials used for covering the slash. Additional woody debris shall be piled on top of the covered piles to complete the piling, as directed by STATE. Logs and chunks which are suitable for firewood shall be piled separately from slash, near roads and landings and alongside the road in locations designated by STATE.

Conifer Trees - shall be saved, unless otherwise directed by STATE.

Skid Trails - shall be ripped to a depth of 12 inches.

Residual Logs - An average of 600 cubic feet of hard conifer logs per acre. Log shall contain a minimum of 10 cubic feet of volume and be no shorter than 6 feet in length. Two logs per acre shall be at least 24 inches in diameter, on the large end, where available. Hard conifer logs must be in decay class one or two as indicated by intact bark and original wood color. Trees or logs shall be left well distributed across the unit.

Protective Measures - shall comply with Oregon Forest Practice Rules issued per ORS 527.610 to 527.992. Examples of protective measures are: (1) waterbarring tractor trails where necessary to prevent runoff toward streams; (2) not windrowing in streams or streamways; and (3) leaving stream buffers along designated streams.

Work specifications may be modified or waived only upon written notice from STATE.

EXHIBIT O

SPECIFICATIONS FOR BRUSH AND SLASH SHOVEL PILING

Equipment Type, Equipment Operation, and Conduct of Work

The specifications given below are requirements for equipment type, equipment operation, and conduct of work under the contract.

Shovel - shall be a track-mounted machine with a ground-pressure rating of not more than 6.8 PSI and a net horsepower of 85 or more. The machine shall be capable of a minimum horizontal reach of 26 feet and a minimum vertical reach of 16 feet.

- Excavator-shovel: Bucket shall be a hydraulically controlled, 4 to 5-foot wide, "clamshell-style bucket with rake arms," with a 360-degree continuous rotation, and tooth length on rake arm shall be greater than 14 inches long, unless otherwise approved in writing by STATE. "Clamshell-style bucket with rake arms" shall be hydraulically controlled to operate bucket in a horizontal position (**fixed position: positive control**) for piling slash.
- Log Loader – shovel: Bucket shall be a hydraulically controlled, 4 to 5 foot wide, "clamshell-style bucket with rake arms," with a 360-degree continuous rotation, and tooth length on rake arm shall be greater than 14 inches long, unless otherwise approved in writing by STATE. "Clamshell-style bucket with rake arms" shall be hydraulically controlled to operate bucket in a vertical position (**free swinging**) for piling slash.

Equipment	Rate	Hours	Appraised Value
Excavator	\$ 120.00 / hour	105.9	\$ 12,708.00
Log Loader	\$ 87.50 / hour	145.0	\$ 12,708.00

Operator - must be experienced in operating similar equipment on land clearing operations, be able to operate the equipment proficiently, and pile the debris on the area as directed by STATE.

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

Work Scheduling - work shall be accomplished only during dry weather conditions, and started within 14 calendar days after completion of yarding activities on Areas 3, 5, 7, and 8. Operations shall provide for continual operation until contract work is completed, unless interrupted by poor weather, fire closures, or other uncontrollable circumstances. Equipment breakdowns shall be repaired without undue delay, and provision shall be made for replacement of equipment to prevent prolonged delays. Piling operation shall not be allowed when operations might damage sites or affect stream flows. Any exception to these instructions must be authorized in writing by STATE.

STATE Representative - shall provide directions for the conduct of work according to specifications.

EXHIBIT P

FISHHAWK CREEK STREAM ENHANCEMENT INSTRUCTIONS

General Instructions

- (a) Work shall be conducted only during periods of low water flows and between July 1 and August 31, annually unless otherwise approved in writing 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 will operate from the banks to minimize stream disturbance. Turbidity shall not exceed 10% 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 will be on site before work begins.
- (c) Trees required for stream enhancement work shall be obtained from sale area, locations along the road, as marked in the field, or at other locations acceptable to STATE. Trees are marked with an orange painted "S".
- (d) Trees shall be uprooted, cut to length, and delivered to the project site, as directed by STATE. Trees will 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 will be selected to minimize disturbance to the riparian area, and equipment transporting trees to the sites will take care to avoid damage to existing in-stream logs, riparian or other trees. Trees that are cleared to gain access will be placed in the creek or used to block access trails.
- (f) A minimum 1½ cubic-yard, track-mounted excavator shall be used for all placement. A rubber tired grapple skidder or other approved method shall be used to transport trees from the staging area to the sites.
- (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 will be thoroughly blocked to prevent access using large woody debris or boulders, water barred, de-compacted, and mulched upon completion, as directed by STATE.
- (h) Excavated materials will be transported to an established waste area.

SPECIFIC INSTRUCTIONS

<u>Location</u>	<u>Work Description</u>
SE 1	Excavate a channel to connect the stream to the isolated ponds on the south bank, approximately 100 feet upstream from the bridge. The channel shall be 12 feet wide at its bottom and excavated to match the existing channel depth (approximately 6 feet) of the stream. Excavate the channel banks to 1 ½:1 side slopes. Place one 18 inch by 40 foot long log into excavated channel extending to the mid channel of Fishhawk Creek. Place three one cubic yard boulders on top of log to anchor it in place.
SE 2	Materials: Five trees with a DBH of at least 22 inches and at least 50 foot long with attached root wads. The largest diameter portion of five tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 2 similar to that shown in the attached diagram in the FPA "Written Plan". Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.

EXHIBIT P

FISHHAWK CREEK STREAM ENHANCEMENT INSTRUCTIONS

<u>Location</u>	<u>Work Description</u>
SE 3	Materials: Eight logs with a DBH of at least 22 inches and at least 50 feet long with an attached root wad. The largest diameter portion of eight tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 3 similar to that shown in the attached diagram in the FPA "Written Plan". Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
SE 4	Materials: Five logs with a diameter of at least 20 inches and at least 50 feet long with an attached root wad. The largest diameter portion of five tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 4 similar to that shown in the attached diagram in the FPA "Written Plan". Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
SE 5	Materials: Five logs with a diameter of at least 20 inches and at least 50 feet long with an attached root wad. The largest diameter portion of five tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 5 similar to that shown in the attached diagram in the FPA "Written Plan". Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
SE 6	Materials: Five logs with a diameter of at least 20 inches and at least 50 feet long with an attached root wad. The largest diameter portion of five tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 6 similar to that shown in the attached diagram in the FPA "Written Plan". Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
SE 7	Materials: Eight logs with a diameter of at least 20 inches and at least 50 feet long with an attached root wad. The largest diameter portion of eight tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 7 similar to that shown in the attached diagram in the FPA "Written Plan". Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.

State Timber Sale Contract
No. 341-07-45
Porter Horse

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 tee:

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 (2.38mm) 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 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:

Bernie Kepshire, Oregon Department of Fish and Wildlife,
7118 NE Vandenberg Avenue, Corvallis, OR 97330-9446 (541) 757-4186 x 255

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 St. 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: ()

bmk

3/11/99

PUMPCERT.doc

NB: ODFW logo is 129% of logo on HQ mail label

PART IV: OTHER INFORMATION

State Timber Sale Contract
No. 341-07-45
Porter Horse

Page 1 of 2

FOREST PRACTICES ACT "WRITTEN PLAN" For Project No. 6, Stream Enhancement Porter Horse Timber Sale 341-07-45

Landowner:

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

Protected Resources:

The following streams are located in Section 25 and 26 of T7N, R6W, W.M., Clatsop County, Oregon.

Type F Streams: Fishhawk Creek (medium, Type F stream) flows along the south boundary of Areas 6 and 9. An unnamed tributary (small, Type F stream) of Fishhawk Creek flows along the western boundary of Area 6 and the eastern boundaries of Areas 7, 8, and 9.

Specific Site Characteristics:

Fishhawk Creek: The streambed is approximately 5 to 10 feet wide with gentle stream-bank slopes. Streamside vegetation is dominated by mature red alder. There is a significant component of conifer trees located above the flood plain.

Unnamed Type F: The streambed is approximately 3 to 6 feet wide with moderate stream-bank slopes. Streamside vegetation is dominated by mature red alder and conifers. There is a significant component of conifer trees located above the flood plain.

Tree and Vegetation Retention:

FPA defines the RMA width of a medium Type F stream as 70 feet and a small Type F as 50 feet. The timber sale boundary for Area 6, 7, 8, and 9 is posted at least 100 feet from the Type F stream.

Practices:

Seven stream enhancement structures will be constructed using ground-based equipment at points SE1-SE7 and three cable yarding placement sites at SE 8 - SE10. The approximate locations are shown on Exhibit "A" and work to be done is described as followed:

- SE 1 Excavate a channel to connect the stream to the isolated ponds on the south bank, approximately 100 feet upstream from the bridge. The channel shall be 12 feet wide at its bottom and excavated to match the existing channel depth (approximately 6 feet) of the stream. Excavate the channel banks to 1 ½:1 side slopes. Place one 18 inch by 40 foot long log into excavated channel extending to the mid channel of Fishhawk Creek. Place three one cubic yard boulders on top of log to anchor it in place.
- SE 2 Materials: Five trees with a DBH of at least 22 inches and at least 50 foot long with attached root wads. The largest diameter portion of five tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 2 similar to that shown in the attached diagram. Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
- SE 3 Materials: Eight logs with a DBH of at least 22 inches and at least 50 feet long with an attached root wad. The largest diameter portion of eight tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 3 similar to that shown in the attached diagram. Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
- SE 4 Materials: Five logs with a diameter of at least 20 inches and at least 50 feet long with a attached root wad. The largest diameter portion of five tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream

FOREST PRACTICES ACT "WRITTEN PLAN"
For Project No. 6, Stream Enhancement
Porter Horse Timber Sale 341-07-45

- SE 4(cont.) log structure using the prescribed materials at site 4 similar to that shown in the attached diagram. Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
- SE 5 Materials: Five logs with a diameter of at least 20 inches and at least 50 feet long with an attached root wad. The largest diameter portion of five tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 5 similar to that shown in the attached diagram. Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
- SE 6 Materials: Five logs with a diameter of at least 20 inches and at least 50 feet long with an attached root wad. The largest diameter portion of five tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 6 similar to that shown in the attached diagram. Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
- SE 7 Materials: Eight logs with a diameter of at least 20 inches and at least 50 feet long with an attached root wad. The largest diameter portion of eight tree tops at least 30 feet long. Logs will be placed into the stream as directed by the STATE to construct an in-stream log structure using the prescribed materials at site 7 similar to that shown in the attached diagram. Where possible wedge the top of the trees into riparian trees to increase stability. Place the five tree tops between and around the five previously placed trees.
- SE 8 – 10 Structures shall be at least 100 feet apart and have a minimum of 3 conifer trees or logs and 2 root wads or other large woody debris at each location. Trees or logs shall be at least 16 inches in diameter at the large end and at least 20 feet in length, and can have branches and rootwads attached if possible. Trees or logs will be obtained from the timber sale area only. 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 ODFW fisheries biologist. Each structure will be created by placing conifer logs in the Type F stream. Structures shall be at least 100 feet apart. The logs will be placed with equipment (SE1-SE7) or lowered (cable placement, SE8-SE10) into the stream at locations specified by STATE, and with consultation from an ODFW fisheries biologist. All conifer logs will be taken from the sale area and not from within the stream buffer. These structures will be created using conifer logs at each location. This work will take place during the instream work period (July 1 – August 31) if possible. If the work cannot be done during the designated instream 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: _____
Purchaser/Operator Contract Representative

Date: _____

Attachments: Exhibit A
Logging Plan Map
Log Placement Diagram

X:\Sunset Unit\2007 FY Sales\Porter Horse\Sale Prep\Written Plan- stream enhancement.doc

FOREST PRACTICES ACT "WRITTEN PLAN"
For Operating Within 100 Feet of Type F Streams
Porter Horse Timber Sale 341-07-45

Landowner:

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

Protected Resources:

The following streams are located in portions of Sections 23, 25, and 26 of T7N, R6W, W.M., Clatsop County, Oregon.

1. Fishhawk Creek (medium, Type F stream)
2. Unnamed tributary of Fishhawk Creek (small, Type F stream)
3. Unnamed tributary of Fishhawk Creek (small, Type F stream)
4. Unnamed tributary of Fishhawk Creek (small, Type F stream)
5. East Fork of Plympton Creek (small, Type F stream)

Specific Site Characteristics:

1. Fishhawk Creek (medium, Type F stream): This stream flows along the southeastern boundary of Areas 6 and 9 for approximately 4,000 feet.
2. Unnamed tributary (small, Type F stream) of Fishhawk: This stream flows along the eastern boundary of Areas 4, 5, and 6 for approximately 4,000 feet.
3. Unnamed tributary (small, Type F stream) of Fishhawk: This stream flows along the eastern boundary of Areas 7 and 8 and the southwestern boundary of Area 6 for approximately 2,700 feet.
4. Unnamed tributary (small, Type F stream) of Fishhawk: These two stream flow into the interior of Area 6 for approximately 700 feet and 900 feet.
5. East Fork of Plympton Creek (small, Type F stream): This stream flows along the western boundary of Area 1 for approximately 1,500 feet.

Tree and Vegetation Retention:

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

PARTIAL HARVEST (Areas 1, 2, 4, 6, and 9): The streamside tree retention within the FPA defined RMA width of 100 feet will range from 100 ft² to 140 ft² basal area per acre (minimum required basal for small, Type F streams is 50 square feet and 140 square feet for medium, Type F streams). The timber sale boundary for Area 1 (partial cut) is posted at least 25 feet from the Type F streams (East Fork Plympton Creek). Timber sale Areas 4, 6, and 9 (partial cuts) are post at least 100 feet from the Type F streams. During cable yarding operations, it is anticipated that cable skylines will cross all the above listed streams.

MODIFIED CLEARCUTS (Areas 5, 7, and 8): All posted Type F buffers alongside clearcut units (modified-clearcuts) are posted at least 100 feet from the Type F streams. No tree or vegetation modification is anticipated in the FPA defined RMA zone.

Resource Protection Practices:

Along all of the above mentioned streams, as well as any live 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 where required by 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.
- No ground based logging equipment will be permitted within 50 feet of 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 streams. I agree to the protection measures listed in this plan.

Submitted: _____
Purchaser/Operator Contract Representative

Date: _____

Attachments: Logging Plan Map
Original: Salem
c. Operator, Purchaser, District file, Sunset Unit.