

PART III: EXHIBITS

State Timber Sale Contract
No. 341-06-76
McKnob

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.: 341-06-76

(2) Sale Name: McKnob

(3) Contract Expiration Date: October 31, 2008

Project Completion Dates: October 31, 2007

(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: <u>(503) 352-5451</u>	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.



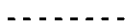
Cable landing, with numbers for sequence.



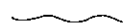
Tractor landing with alphabetical sequence.



Approximate setting boundary.



Spur truck roads.



Tractor yarding roads.



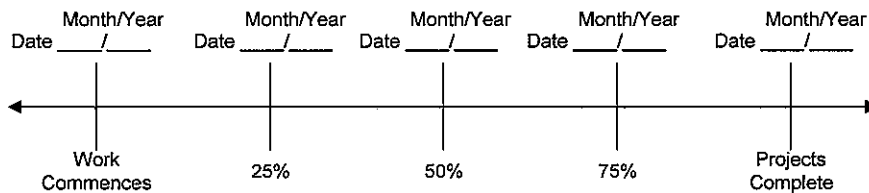
Temporary stream crossings.

EXHIBIT B
OPERATIONS PLAN

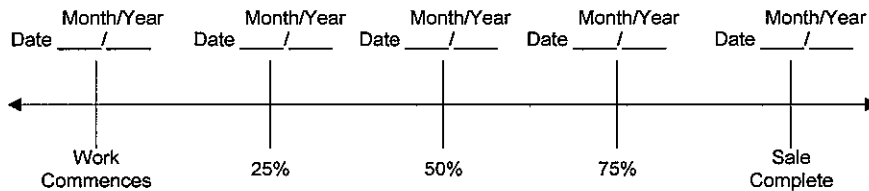
Completion Timeline

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 McKnob

COUNTY Clatsop

(13) STATE CONTRACT NUMBER 341-06-76

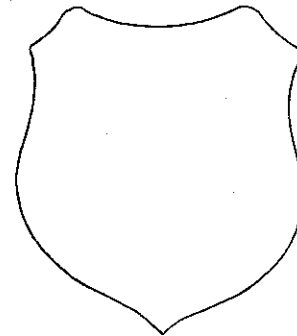
(14) SCALE: westside eastside cubic foot

(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: YES NO
 *Actual taper butt logs over 40' scaling length

(8) PENCIL BUCK YES NO
 back to Minimum Scaling Diameter _____

(9) ADD-BACK VOLUME -- YES NO
 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 shall be scaled as sawlogs unless they meet either of the following requirements: (1) contain less than 30 net board feet, or (2) are smaller than 7 inches in gross scaling diameter. All hardwood logs that meet either requirement shall be scaled as "Utility."

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

State Forester's Representative

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

(21) SIGNATURES:

Purchaser or Authorized Representative _____ Date _____

State Forester Representative _____ Date _____

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

Distribution: ORIGINAL: Salem / COPIES: TPSO (4), Purchaser, Operator, District, Sunset Mgmt. Unit

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 (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 7+30	DITCH
16 feet	12 feet	1C to 1D	0+00 to 11+50	DITCH
14 feet	NONE	2A to 2B	0+00 to 13+63	OUTSLOPE
14 feet	NONE	2C to 2D	0+00 to 1+45	OUTSLOPE
16 feet	12 feet	5A to 5B	0+00 to 84+10	DITCH
14 feet	NONE	5C to 5D	0+00 to 9+35	OUTSLOPE
16 feet	12 feet	6A to 6B	0+00 to 56+00	DITCH
14 feet	NONE	6A to 6B	56+00 to 70+76	OUTSLOPE
16 feet	12 feet	6C to 6D	0+00 to 5+30	DITCH
14 feet	None	6E to 6F	0+00 to 13+05	OUTSLOPE
16 feet	12 feet	7A to 7B	0+00 to 35+83	DITCH
16 feet	12 feet	7C to 7D	0+00 to 51+20	DITCH
16 feet	12 feet	7E to 7F	0+00 to 9+12	DITCH
16 feet	12 feet	7G to 7H	0+00 to 4+74	DITCH
16 feet	12 feet	8A to 8B	0+00 to 91+95	DITCH
16 feet	12 feet	8C to 8D	0+00 to 10+68	DITCH
16 feet	12 feet	8E to 8F	0+00 to 17+88	DITCH
16 feet	12 feet	8G to 8H	0+00 to 7+49	DITCH
16 feet	12 feet	8I to 8J	0+00 to 5+65	DITCH
16 feet	12 feet	MSA to MSB	0+00 to 17+00	DITCH
16 feet	12 feet	Q1 to Q2	0+00 to 3+21	DITCH
16 feet	12 feet	Q3 to Q4	0+00 to 2+68	DITCH
16 feet	12 feet	I1 to I2	0+00 to 414+90	DITCH
16 feet	12 feet	I3 to I4	0+00 to 66+50	DITCH
16 feet	12 feet	I5 to I6	0+00 to 15+40	DITCH
16 feet	12 feet	I7 to I8	0+00 to 26+90	DITCH

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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 or stacked, 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 CLASSIFICATION. New Construction – From the top of the cutslope to the toe of the fill.
Improvement and reconstruction – Four 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.

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.

Subgrade. Subgrade shall be crowned at 4 to 6 percent (1/2 inch per foot).

Ditchout. Construct ditchouts away from subgrade at locations marked in the field.

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

Outslope. Road subgrade shall be outsloped at 4 to 6 percent (1/2 inch per foot in width).

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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 1/4:1	Not steeper
Common - side slopes 50% and over	3/4:1	than 1½:1
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 Specifications in Exhibit I, and blocked from vehicular traffic prior to October 1, annually and as directed by STATE.

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. Waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with Exhibit D. Full bench road construction shall be performed in accordance with Exhibit D.
- (2) **Energy Dissipator Construction.** Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit H.
- (3) **Existing Underground Utilities.** PURCHASER shall notify Western Oregon Electric Cooperative, Inc. at (800) 777-1276, prior to operating. PURCHASER shall conduct activities near these utility lines according to recommendations of Western Oregon Electric Cooperative, Inc., and shall be responsible for any damage to the utility lines resulting from PURCHASER's activities. PURCHASER shall coordinate with the above listed utility in field locating underground utility lines.
- (4) **Controlled Blasting.** Controlled blasting techniques shall be utilized for any blasting operations, and shall be accomplished using timing devices, delayed charges, low intensity shots, or other suitable means to contain as much material as possible within the road prism.
- (5) **Geotextile Road Fabric:** Install woven fabric on the following road segments in accordance with the specifications in Exhibit K: 6A to 6B from station 21+40 to 26+55 and 30+35 to 32+25; 7A to 7B from station 13+30 to 15+05 and 20+95 to 23+15; and 8I to 8J from station 0+00 to 5+65.

EXHIBIT D
FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS:

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
5A to 5B	0+00	Beginning of end-haul segment. Utilize suitable material to construct a Turnout/Turnaround at Station 244+40 on I1 to I2.
	1+50	End of end-haul segment.
6A to 6B	5+45	Construct ditchout to allow for drainage of dragline trench.
8A to 8B	0+00	Construct Junction to allow for truck access to Knob Point Quarry. Retain a minimum rock surface of 16 feet on the Knob Point Quarry Road.
	66+00	Beginning of end-haul segment. Utilize suitable excavated material for subgrade construction and associated fills from 78+30 to 91+95 on road segment 8A to 8B.
	67+50	Beginning of full containment segment.
	75+20	End of end-haul and full containment segment.
	86+57	Beginning of full containment segment.
	87+45	End of full containment segment.
8E to 8F	2+00	Begin end haul and full containment segment. Utilize suitable excavated material for subgrade construction and associated fills from Station 6+85 to 9+15 on road segment 8E to 8F.
	4+00	End full containment segment.
	9+15	End of end-haul segment.
Q1 to Q2	0+00	Begin hauling all excavated material not used in designed fills to the designated waste area shown on Exhibit A.
	3+21	End hauling excavated material to designated waste area.
Q3 to Q4	0+00	Begin hauling all excavated material not used in designed fills to the designated waste area shown on Exhibit A.
	2+68	End hauling excavated material to designated waste area.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS:

- (a) 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.
- (b) 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 pipe 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 straw mulched to a minimum depth of 2 inches. 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.
- (c) 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. Culvert markers shall meet specifications in Exhibit E.
- (d) Riprap Rock Use. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, as specified in Exhibit H.
- (e) Equipment. All excavation, riprap placement, and sidecast pullback shall be performed using a minimum 1½ cubic yard, track-mounted excavator.
- (f) Subgrade Preparation and Application of New Surfacing Rock.
 - (a) Complete culvert installations, fill reconstructions, and other specified work prior to the application of new surfacing rock.
 - (b) Cut out all chuckholed and/or washboarded sections from the existing surfacing.
 - (c) Apply required base 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.

EXHIBIT D
FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS:

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
I1 to I2	188+42	Replace Culvert. Utilize 24 cubic yards $\frac{3}{4}$ "-0" crushed rock for backfill.
	240+30	Begin 2:1 cutslope right, haul excavated material to designated waste area at Station 244+40.
	244+40	End 2:1 cutslope right.
	331+40	Replace Culvert. Utilize 24 cubic yards $\frac{3}{4}$ "-0" crushed rock for backfill.

EXHIBIT D

END-HAULING REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT	WASTE AREA LOCATION	WASTE AREA TREATMENT
5A to 5B	0+00 to 1+50	2	1a	2, 3
8A to 8B	66+00 to 67+50	2	1b	1, 2, 3
8A to 8B	67+50 to 75+20	1	1b	1, 2, 3
8A to 8B	86+57 to 87+45	2	1b	1, 2, 3
8E to 8F	2+00 to 4+00	1	1c	1, 2, 3
I1 to I2	240+30 to 244+40	2	1a	2, 3

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, unless this is a balance road segment.

Trees and stumps may have up to 12 inches of material directly above them. 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) I1 to I2 – Utilize material at 244+40 on I1 to I2. Waste excess material.
- (1b) 8A to 8B – Utilize material between 78+30 to 91+95 on 8A to 8B.
- (1c) 8E to 8F – Utilize material between 6+85 to 9+15 on 8E to 8F.

Waste Area Treatment

- (1) Utilize suitable material for fill construction and compact in accordance with Exhibit D.
- (2) Place excess excavated materials, end haul materials, and clearing and grubbing debris in the waste areas shown on Exhibit A. All waste materials shall be deposited in stable locations as directed by STATE, spread evenly, compacted, and adequate drainage established. Pile woody debris on top of waste area.
- (3) Apply straw mulch to waste areas. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover.

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 7+30		
				Volume (CY) per	Number of	Volume (CY) per	Number of	
Base Rock	4"-0" Crushed		8	station	50	stations	7.30	365
Junctions	4"-0" Crushed	1A	8	junction	24	junctions	1	24
Junctions	3/4"-0" Crushed	1A	N/A	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	1+50	8	TO	22	TO's	1	22
Turnarounds	4"-0" Crushed	6+10	N/A	TA	24	TA's	1	24
Landings	6"-0" Pit-run	1B	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:				1A to 1B				519
ROAD SEGMENT 1C to 1D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1C to 1D		0+00 to 11+50		
				Volume (CY) per	Number of	Volume (CY) per	Number of	
Base Rock	4"-0" Crushed		8	station	50	stations	11.50	575
Junctions	4"-0" Crushed	1C	8	junction	24	junctions	1	24
Junctions	3/4"-0" Crushed	1C	N/A	junction	24	junctions	1	24
Turnouts	4"-0" Crushed		8	TO	22	TO's	1	22
Turnarounds	4"-0" Crushed		N/A	TA	24	TA's	1	24
Landings	6"-0" Pit-run	1D	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:				1C to 1D				729
ROAD SEGMENT 2A				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	2A				
				Volume (CY) per	Number of	Volume (CY) per	Number of	
Junctions	4"-0" Crushed	2A	8	junction	36	junctions	1.00	36
Junctions	3/4"-0" Crushed	2A	N/A	junction	24	junctions	1	24
Total Rock for Road Segment:				2A				60
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 84+10		
				Volume (CY) per	Number of	Volume (CY) per	Number of	
Base Rock	4"-0" Crushed		8	station	50	stations	84.10	4,205
Surface Rock	3/4"-0" Crushed	7+30 to 17+20	2	station	13	stations	9.90	129
Junctions	4"-0" Crushed	5A	8	junction	36	junctions	1	36
Junctions	3/4"-0" Crushed	5A	N/A	junction	36	junctions	1	36
Turnouts	4"-0" Crushed	7+30,14+40,20+35,27+35,34+50	8	TO	22	TO's	5	110
Turnouts	4"-0" Crushed	41+00,48+80,62+00,69+60,78+60	8	TO	22	TO's	5	110
Turnarounds	4"-0" Crushed	35+50, 82+00	N/A	TA	24	TA's	2	48
Landings	6"-0" Pit-run	5B	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:				5A to 5B				4,734

EXHIBIT D
 ROAD SURFACING

ROAD SEGMENT 6A to 6B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	6A to 6B		0+00 to 56+00		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		8	station	50	stations	56.00	2,800
Junctions	4"-0" Crushed	6A	8	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	7+00, 12+40,17+40, 24+00	8	TO	22	TO's	4	88
Turnouts	4"-0" Crushed	28+90, 37+50, 43+60,50+80	8	TO	22	TO's	4	88
Turnarounds	4"-0" Crushed	38+00, 56+00	N/A	TA	24	TA's	2	48
Traction Rock	3/4"-0" Crushed	24+00 to 46+00	2	station	13	stations	22	286
Junctions	3/4"-0" Crushed	6A	N/A	junction	24	junctions	1	24
Total Rock for Road Segment:				6A to 6B				3,358
ROAD SEGMENT 6C to 6D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	6C to 6D		0+00 to 5+30		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		8	station	50	stations	5.30	265
Junctions	4"-0" Crushed	6C	8	junction	24	junctions	1	24
Turnarounds	4"-0" Crushed	3+50	N/A	TA	24	TA's	1	24
Landings	6"-0" Pit-run	6D	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:				6C to 6D				373
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		0+00 to 35+83		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		8	station	50	stations	35.83	1,792
Junctions	4"-0" Crushed	7A	8	junction	24	junctions	1	24
Junctions	3/4"-0" Crushed	7A	2	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	7+50,13+50, 20+60,26+53	8	TO	22	TO's	4	88
Turnarounds	4"-0" Crushed	10+00,33+40	N/A	TA	24	TA's	2	48
Traction Rock	3/4"-0" Crushed	6+65 to 9+53, 14+31 to 9+67, 27+80 to 30+00	2	station	13	stations	10	136
Landings	6"-0" Pit-run	7B	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:				7A to 7B				2,171

EXHIBIT D
 ROAD SURFACING

ROAD SEGMENT		7C to 7D		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	7C to 7D Volume (CY) per		0+00 to 51+20 Number of		
Base Rock	4"-0" Crushed		N/A	station	50	stations	51.20	2,560
Junctions	4"-0"	7C	N/A	junction	24	junctions	1	24
Traction Rock	3/4"-0" Crushed	9+50 to 21+00, 35+50 to 45+50	N/A	station	13	stations	22	280
Turn Outs	4"-0" Crushed	7+22,14+00, 21+00, 8+00, 35+00,41+50	N/A	TO	22	TO's	6	132
Turnarounds	4"-0" Crushed	10+00, 49+00	N/A	TA	24	TA's	2	48
Landings	6"-0" Pit-run	7D	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			7C to 7D					3,104
ROAD SEGMENT		7E to 7F		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	7E to 7F Volume (CY) per		0+00 to 9+12 Number of		
Base Rock	4"-0" Crushed		8	station	50	stations	9.12	456
Junctions	4"-0" Crushed	7E	8	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	6+25	8	TO	22	TO's	1	22
Turnarounds	4"-0" Crushed	7+25	N/A	TA	24	TA's	1	24
Landings	6"-0" Pit-run	7F	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			7E to 7F					586
ROAD SEGMENT		7G to 7H		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	7G to 7H Volume (CY) per		0+00 to 4+74 Number of		
Base Rock	4"-0" Crushed		5	station	50	stations	4.74	237
Junctions	4"-0" Crushed	7G	N/A	junction	24	junctions	1	24
Junctions	3/4"-0" Crushed	7G	2	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	2+00	8	TO	22	TO's	1	22
Turnarounds	4"-0" Crushed	3+50	N/A	TA	24	TA's	1	24
Landings	6"-0" Pit-run		N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			7G to 7H					391

EXHIBIT D
 ROAD SURFACING

ROAD SEGMENT		8A to 8B		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	8A to 8B		0+00 to 91+95		
				Volume (CY) per	Number of	Volume (CY) per	Number of	
Base Rock	4"-0" Crushed		8	station	50	stations	91.95	4,598
Junctions	4"-0" Crushed	8A	8	junction	24	junctions	1	24
Junctions	3/4"-0" Crushed	8A	2	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	7+10, 14+25, 25+25, 6+68, 39+10	8	TO	22	TO's	5	110
Turnouts	4"-0" Crushed	46+16,53+57,64+77, 74+60,82+56	8	TO	22	TO's	5	110
Turnarounds	4"-0" Crushed	24+55, 57+30	N/A	TA	24	TA's	2	48
Dissipator	24"-6" Riprap	0+00, 26+00	N/A	diss	12	diss	2	24
Traction Rock	3/4"-0" Crushed	45+90 to 47+60, 58+90 to 63+00, 69+00 to 81+40	2	station	13	stations	18	237
Landings	6"-0" Pit-run	8B	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			8A to 8B					5,234
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		0+00 to 10+68		
				Volume (CY) per	Number of	Volume (CY) per	Number of	
Base Rock	4"-0" Crushed		8	station	50	stations	10.68	534
Junctions	4"-0" Crushed	8C	8	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	5+65	8	TO	22	TO's	1	22
Turnarounds	4"-0" Crushed	3+30	N/A	TA	22	TA's	1	22
Dissipator	24"-6" Riprap	7+00, 9+20	N/A	diss	12	diss	2	24
Traction Rock	3/4"-0" Crushed	4+00 to 10+30	2	station	13	stations	6	82
Landings	6"-0" Pit-run	8D	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			8C to 8D					768
ROAD SEGMENT		8E to 8F		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	8E to 8F		0+00 to 17+88		
				Volume (CY) per	Number of	Volume (CY) per	Number of	
Base Rock	4"-0" Crushed		8	station	50	stations	17.88	894
Junctions	4"-0" Crushed	8E	8	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	11+00	8	TO	22	TO's	1	22
Turnarounds	4"-0" Crushed	16+50	N/A	TA	24	TA's	1	24
Dissipator	24"-6" Riprap	3+30, 6+40	N/A	diss	12	diss	2	24
Traction Rock	3/4"-0" Crushed	1+00 to 9+00	2	station	13	stations	8	104
Landings	6"-0" Pit-run	8F	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			8E to 8F					1,152

EXHIBIT D
 ROAD SURFACING

ROAD SEGMENT		8G to 8H		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	8G to 8H		0+00 to 7+49		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		8	station	50	stations	7.49	375
Junctions	4"-0" Crushed	8G	8	junction	24	junctions	1	24
Turnouts	4"-0" Crushed	4+50	8	TO	22	TO's	1	22
Turnarounds	4"-0" Crushed	6+50	N/A	TA	24	TA's	1	24
Landings	6"-0" Pit-run	8H	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			8G to 8H					505

ROAD SEGMENT		8I to 8J		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	8I to 8J		0+00 to 5+65		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		8	station	50	stations	5.65	283
Junctions	4"-0" Crushed	8I	8	junction	24	junctions	1	24
Junctions	3/4"-0" Crushed	8I	N/A	junction	24	junctions	1	24
Turnarounds	4"-0" Crushed	4+20	N/A	TA	24	TA's	1	24
Landings	6"-0" Pit-run	8J	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			8I to 8J					415

ROAD SEGMENT		MSA to MSB		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	MSA to MSB		0+00 to 17+00		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		10	station	63	stations	17.00	1,071
Surface Rock	3/4"-0" Crushed		4	station	25	stations	17.00	425
Turnouts	4"-0" Crushed	6+35, 11+90	8	TO	37	TO's	2	74
Turnouts	3/4"-0" Crushed	6+35, 11+90	4	TO	19	TO's	2	38
Dissipator	24"-0" Riprap	0+50	N/A	diss.	12	diss	1	12
Total Rock for Road Segment:			MSA to MSB					1,620

ROAD SEGMENT: Q1 to Q2				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	Q1 to Q2		0+00 - 3+21		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		8	station	50	stations	3.21	161
Curve Widening	4"-0" Crushed		8	station	21	stations	0.80	17
Surface Rock	3/4"-0" Crushed	0+00 - 2+64	3	station	19	stations	2.64	50
Curve Widening	3/4"-0" Crushed		3	station	8	stations	0.80	6
Total Rock for Road Segment:			Q1 to Q2					234

EXHIBIT D
 ROAD SURFACING

ROAD SEGMENT: Q3 to Q4				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	Q3 to Q4		0+00 to 2+68		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		8	station	50	stations	2.68	134
Curve Widening	4"-0" Crushed		8	station	21	stations	1.02	21
Total Rock for Road Segment:			Q3 to Q4					155
ROAD SEGMENT: Crusher Site				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	n/a		n/a		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-Run		8					400
Total Rock for Road Segment:			Cr Site					400
ROAD SEGMENT I1 to I2				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I1 to I2		0+00 to 414+90		
				Volume (CY) per		Number of		
Leveling Rock	3/4"-0" Crushed	0+00 to 414+90	N/A	N/A		N/A		490
Surface Rock	3/4"-0" Crushed	0+00 to 335+46	4	station	25	stations	335.46	8,387
Surface Rock	3/4"-0" Crushed	335+46 to 414+90	3	station	19	stations	79	1,509
Turnouts	4"-0" Crushed	244+40	10	TO	46	TO's	1	46
Turnouts	3/4"-0" Crushed	244+40	4	TO	19	TO's	1	19
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	12	288
Turnouts	3/4"-0" Crushed		4	TO	11	TO's	68	748
Culvert Backfill	3/4"-0" Crushed		N/A	culvert	36	culverts	2	72
Total Rock for Road Segment:			I1 to I2					11,559
ROAD SEGMENT I3 to I4				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I3 to I4		0+00 to 66+50		
				Volume (CY) per		Number of		
Leveling Rock	3/4"-0" Crushed		N/A	N/A		N/A		300
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	1	24
Turnouts	3/4"-0" Crushed		N/A	TO	24	TO's	13	312
Total Rock for Road Segment:			I3 to I4					636

EXHIBIT D
 ROAD SURFACING

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 15+40		
				Volume (CY) per		Number of		
Leveling Rock	3/4"-0" Crushed		N/A	N/A		N/A		50
Surface Rock	3/4"-0" Crushed	0+00 to 9+00, 13+40 to 15+40	4	station	25	stations	11.00	275
Surface Rock	3/4"-0" Crushed	9+00 to 13+40	3	station	19	stations	4.40	84
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	2	48
Turnouts	3/4"-0" Crushed		N/A	TO	24	TO's	1	24
Total Rock for Road Segment:			15 to 16					481
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		26+90		
				Volume (CY) per		Number of		
Leveling Rock	3/4"-0" Crushed		N/A	N/A		N/A		80
Surface Rock	3/4"-0" Crushed		3	station	19	stations	26.90	511
Junctions	3/4"-0" Crushed		N/A	junction	24	junctions	1	24
Turnouts	3/4"-0" Crushed		N/A	TO	24	TO's	4	96
Turnarounds	3/4"-0" Crushed		N/A	TA	24	TA's	1	24
Total Rock for Road Segment:			17 to 18					735

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"
39,920	84	1,180	23,290	15,366

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:

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 a 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:

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

Pit-Run Rock. Pit-run surfacing rock shall be spread on the crusher site with a crawler tractor and continuously walked-in. Rock spreading shall begin at nearest point from the rock source and progress toward the end of the project, unless otherwise approved in writing by STATE. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
Pit-Run Rock	5 or 6

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 mile 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) 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.
- (6) 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. A minimum of 10 passes shall be made with the grader and vibratory grid compactor over the entire length of the road, unless STATE requires fewer passes.

EXHIBIT E
CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the Contract. All culverts shall be constructed of double-walled polyethylene, or 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 over 3 inches, and other objects which would dent or damage the pipe during installation or use. The culvert trench shall be excavated wide enough 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. Additional fill shall be embankment material.

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.

Fill heights, if not shown on a road plan and profile, shall be in accordance with those shown in Drawing No. 2094, "Fill Height Tables", prepared by the Highway Division of the Oregon State Department of Transportation. Any deviation must be approved by STATE.

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.

EXHIBIT E
 CULVERT SPECIFICATIONS

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 a 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	14 (0.0747")	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.

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 2½ inches wide, with the spade driven 2 feet into the ground.

Tamping is required.

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

EXHIBIT E
 CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
1	18	40	1A to 1B	0+00
2	18	40	1C to 1D	0+00
3	18	30	1C to 1D	4+00
4	18	60	5A to 5B	0+00
5	18	30	5A to 5B	2+81
6	18	30	5A to 5B	8+00
7	18	30	5A to 5B	13+00
8	18	30	5A to 5B	18+10
9	18	30	5A to 5B	26+30
10	18	30	5A to 5B	34+00
11	18	30	5A to 5B	38+50
12	18	30	5A to 5B	42+80
13	18	30	5A to 5B	47+30
14	18	60	5A to 5B	51+50
15	18	30	5A to 5B	59+00
16	18	30	5A to 5B	60+90
17	18	30	5A to 5B	63+60
18	18	30	5A to 5B	67+00
19	18	30	5A to 5B	72+85
20	18	30	5A to 5B	75+80
21	18	30	5A to 5B	83+60
22	18	30	6A to 6B	5+45
23	18	30	6A to 6B	11+40
24	18	30	6A to 6B	15+45
25	18	30	6A to 6B	22+40
26	18	30	6A to 6B	28+60
27	18	30	6A to 6B	34+00
28	18	30	6A to 6B	39+60
29	18	30	6A to 6B	46+00
30	18	30	6A to 6B	52+90

EXHIBIT E
 CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
31	18	30	6C to 6D	0+10
32	18	30	6C to 6D	4+10
33	18	30	7A to 7B	7+29
34	18	30	7A to 7B	11+80
35	18	30	7A to 7B	16+90
36	18	30	7A to 7B	20+00
37	18	30	7A to 7B	27+05
38	18	30	7A to 7B	30+95
39	18	30	7A to 7B	35+25
40	18	30	7C to 7D	9+35
41	18	40	7C to 7D	17+70
42	18	30	7C to 7D	22+00
43	18	30	7C to 7D	24+70
44	18	30	7C to 7D	30+50
45	18	40	7C to 7D	33+40
46	18	30	7C to 7D	37+55
47	18	30	7C to 7D	45+65
48	18	30	7C to 7D	49+70
49	18	30	7E to 7F	2+80
50	18	30	7E to 7F	8+57
51	18	30	7G to 7H	1+80
52	18	40	8A to 8B	0+00
53	18	30	8A to 8B	5+00
54	18	30	8A to 8B	9+00
55	18	30	8A to 8B	16+00
56	18	40	8A to 8B	21+62
57	18	30	8A to 8B	26+00
58	18	30	8A to 8B	31+00

EXHIBIT E
 CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
59	18	30	8A to 8B	40+00
60	18	30	8A to 8B	47+00
61	18	30	8A to 8B	52+00
62	18	30	8A to 8B	56+00
63	18	30	8A to 8B	64+00
64	18	30	8A to 8B	69+00
65	18	40	8C to 8D	0+50
66	18	35	8C to 8D	2+70
67	18	30	8C to 8D	7+00
68	18	30	8C to 8D	9+20
69	18	30	8E to 8F	3+30
70	18	30	8E to 8F	6+40
71	18	30	8E to 8F	17+22
72	18	30	8G to 8H	4+00
73	18	40	8I to 8J	0+00
74	18	30	8I to 8J	3+00
75	18	50	Q1 to Q2	0+00
76	18	40	MSA to MSB	0+50
77	18	35	MSA to MSB	4+50
78	18	35	MSA to MSB	10+90
79	18	35	MSA to MSB	17+00
80	18	35	I1 to I2	188+42
81	18	35	I1 to I2	331+40

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE

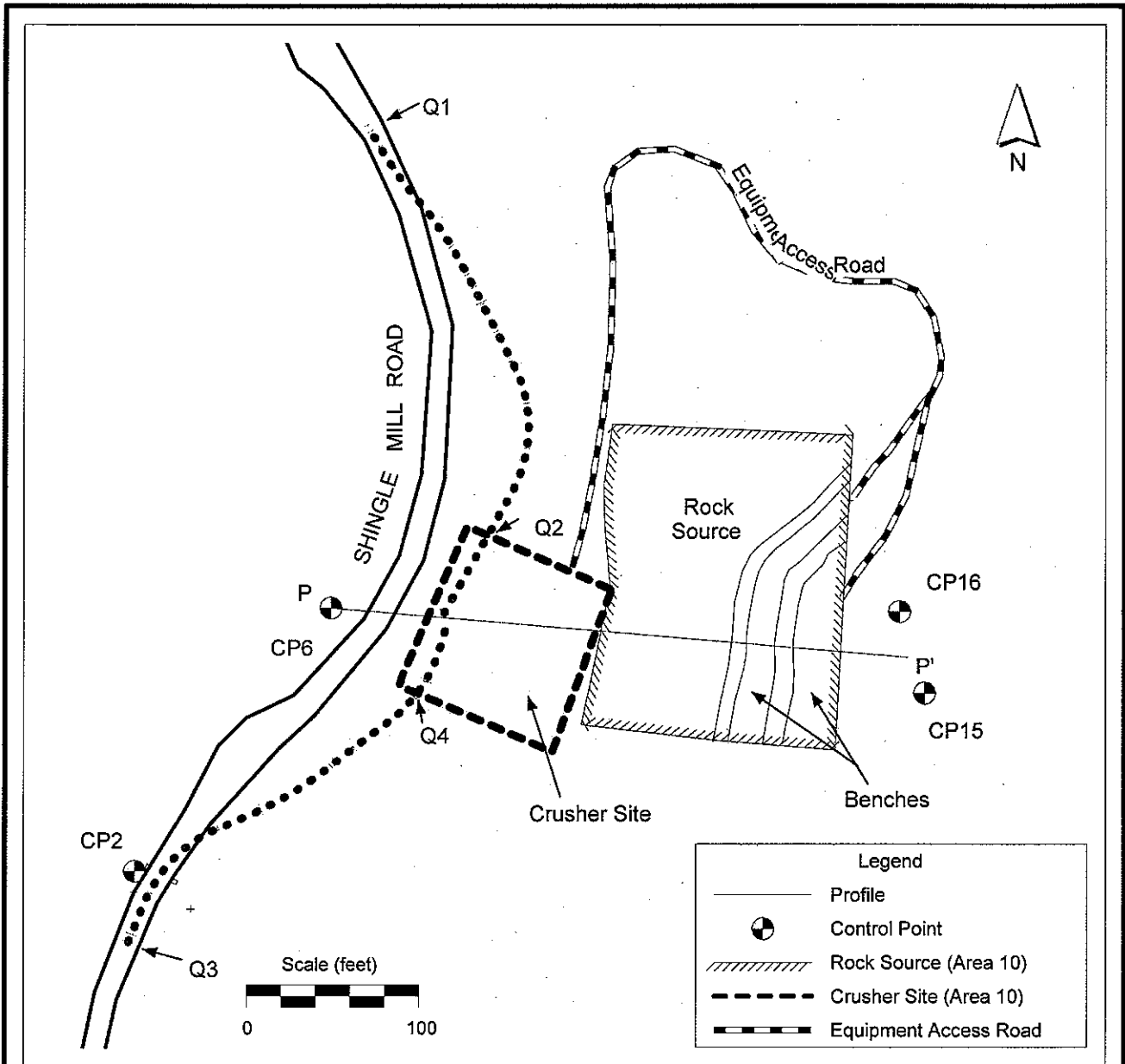
- (1) PURCHASER shall prepare a written development plan for the quarry area. The plan shall be submitted to STATE for approval prior to conducting any operation in quarry area. The plan shall include, but not be limited to:
 - (a) Location of benches and roads to benches.
 - (b) Disposal site for woody debris, overburden and reject material.
 - (c) Time lines for rock quarry use.
 - (d) Erosion Control measures.
- (2) PURCHASER shall schedule and coordinate quarry and stockpile usage with other existing or planned STATE contracts requiring quarry or stockpile usage.
- (3) 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. Trees removed for quarry and crusher site development will be felled, bucked, and treated as designated timber.
- (4) 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.
- (5) PURCHASER shall conduct the operation 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) All overburden and reject material from the rock source development shall be hauled to the designated waste area shown on Exhibit A and utilized as directed by STATE. Overburden developed during the construction of the quarry floor shall be hauled to the waste area shown on Exhibits A and F, and utilized in the construction of the waste area site.
- (7) Clear and grub the rock source area, and crusher site. All woody debris, including stumps and slash shall be piled and disposed of by burning on the crusher site floor, as directed by STATE.
- (8) Crusher site shall be surfaced with 6"-0" pit run rock a minimum of 8 inches deep and shall be sloped for drainage. The finished dimensions of the crusher site shall be 95 feet by 100 feet.
- (9) PURCHASER shall obtain a FPA Burn Permit prior to debris disposal. Burning operations shall be conducted during periods when "Fire Season" has not been declared. The burnt piles shall be "100% mopped up", prior to the declaration of "Fire Season".
- (10) 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. Said bench shall be easily accessible with tractors.
- (11) Quarry face shall be developed in a uniform manner.

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE

- (12) Oversized material that is produced or encountered during development shall be broken down and utilized for crushing or utilized for pit-run rock as required in Exhibit G, or stored on site as directed by the STATE.
- (13) Proper winterization and storm-water control measures such as water barring, drainage, utilization of filter bales, mulching and/or blocking access shall be utilized and such measures maintained to protect the watershed and project work, as directed by STATE.
- (14) PURCHASER shall notify STATE 5 days prior to the start of quarry development activities.
- (15) All quarry backslopes shall be left in a stable condition.
- (16) 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.

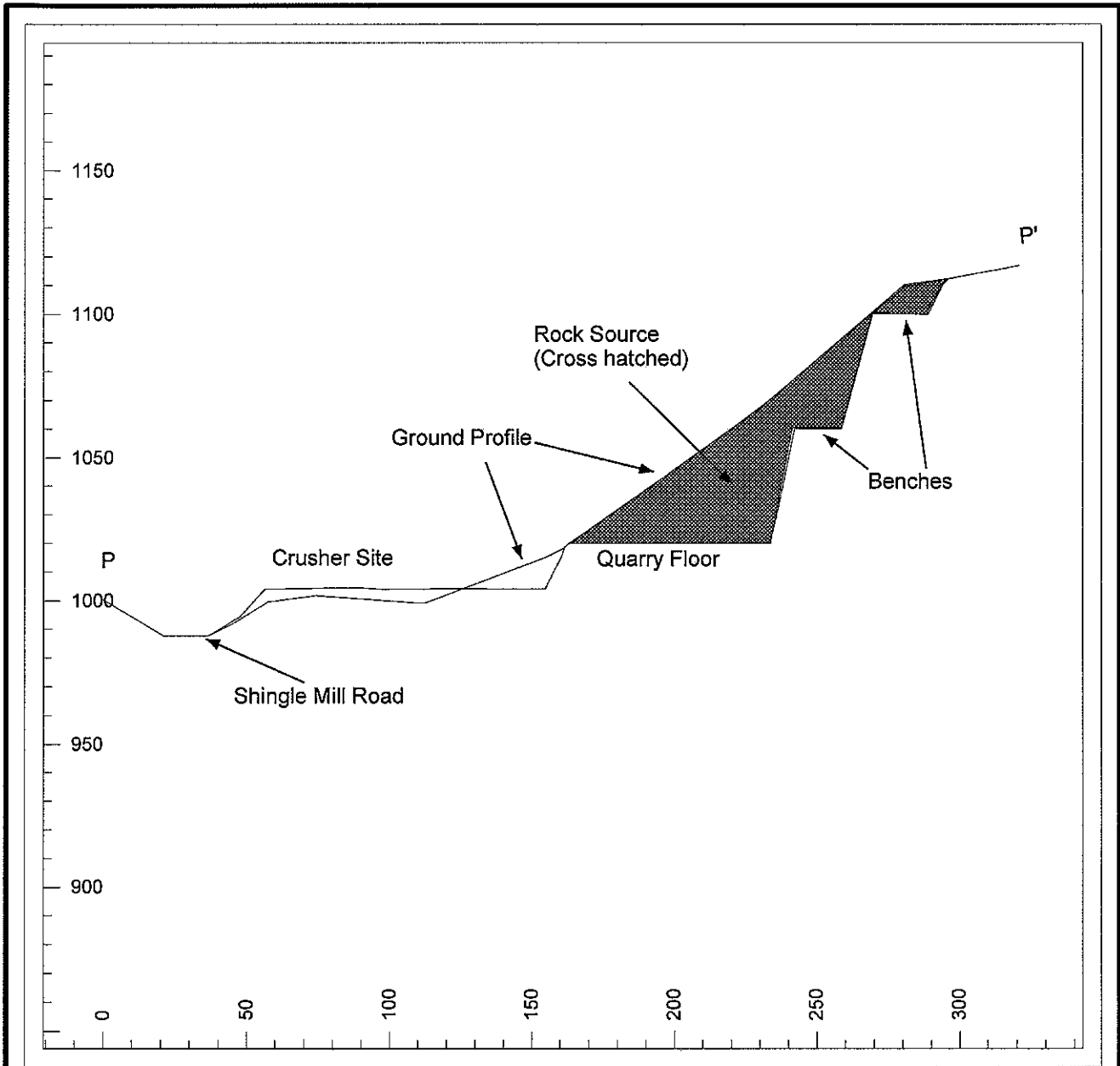
EXHIBIT F
ROCK QUARRY DEVELOPMENT AND USE



Oregon Department of Forestry
Astoria District
Engineering Unit

Shingle Shack Quarry
SW1/4, Section 5, T7N, R6W, W. M.
Clatsop County, Oregon

EXHIBIT F
ROCK QUARRY DEVELOPMENT AND USE



Oregon Department of Forestry
Astoria District
Engineering Unit

Shingle Shack Quarry
SW1/4, Section 5, T7N, R6W, W. M.
Clatsop County, Oregon

EXHIBIT G

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 conform to the general requirements of Section 2630 of the "Standard Specifications for Highway Construction" prepared by the Highway Division, Oregon Department of Transportation, and shall meet the following test requirements:

Hardness - Test Method AASHTO T 96 35% Maximum

Durability - Test Method OSHD Standard
Passing No. 20 Sieve: 30% Maximum
Sediment Height: 3" Maximum

<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 4"-0"</u>	Passing	4" sieve	100%
	Passing	2" sieve	60-90%
	Passing	1/4" sieve	20-35%

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

TYPICAL EMBEDDED ENERGY DISSIPATOR

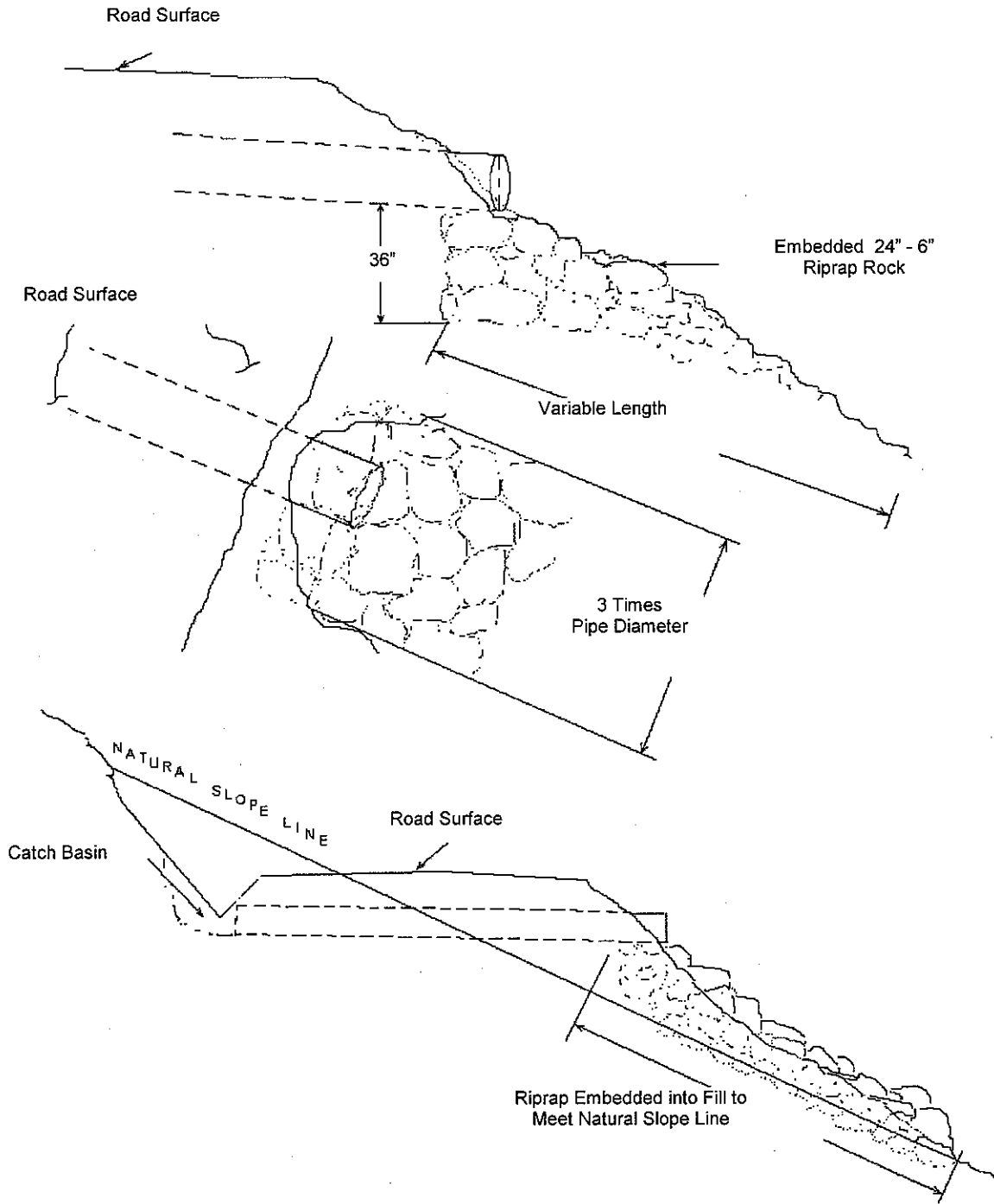
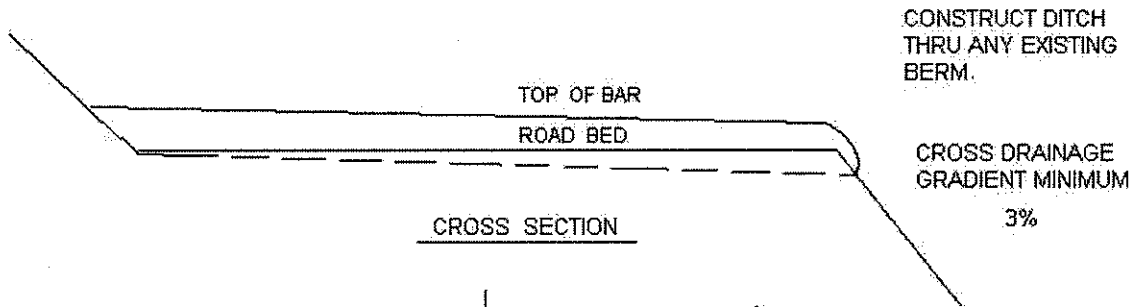
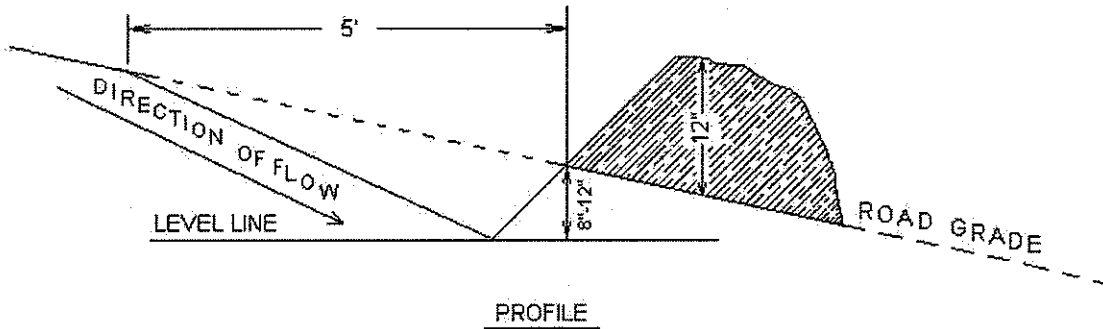


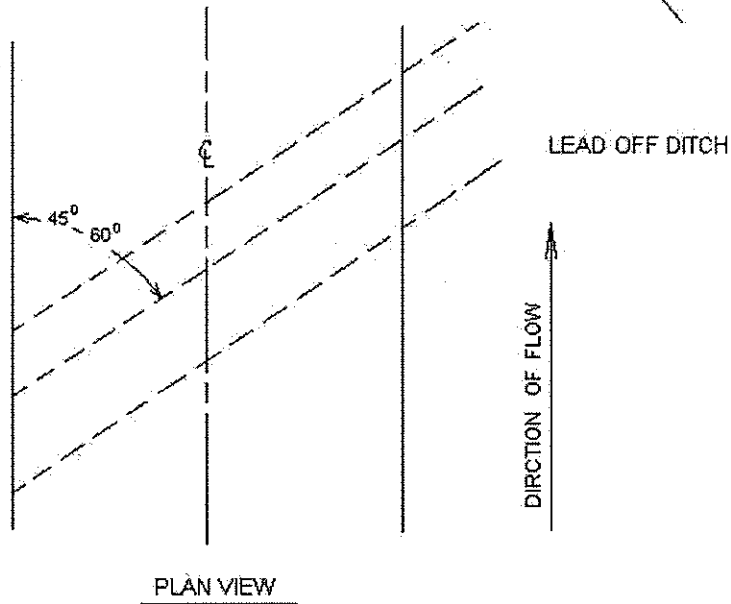
EXHIBIT I

WATERBAR SPECIFICATIONS



SPACING OF WATERBARS:

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



WATERBAR SPECIFICATIONS
 FOR CROSS DITCHING: #298

EXHIBIT J

ROAD VACATING AND FILL REMOVAL SPECIFICATIONS:
V1, V2, V3 to V4, and V5 to V6

- (1) Rock Salvage. Remove, salvage, and stockpile the existing crushed rock from 0+00 to 14+40 on V3 to V4 and from 0+00 to 2+00 on V5 to V6. Salvaged rock shall be stockpiled at the Knob Point Stockpile site, as directed by STATE.
- (2) Fill Removal and Stream Channel Development. Remove fills to the natural stream course level(s). Stream channel(s) shall be excavated/developed to a width of 5 feet. Developed stream banks shall be sloped at natural contours or no steeper than 1½:1, 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. If the road grade exceeds 10%, outslope of the road shall be 2% greater than the road grade.
- (5) Use of Excavated Materials.
 - (a) Fill Excavation. Excavated materials shall be placed on the interior (cut) side of the road a minimum of 10 feet from the top of the developed stream bank, 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, and/or placed on the surface of the compacted embankment material.
 - (c) Block Roads. Use excavated material from fill removals to block roads from vehicle access, as directed by STATE.
- (6) Construct Waterbars as directed by STATE. Construct waterbars according to the specifications in Exhibit I.
- (7) Erosion Control. All excavated material and bare soil shall utilize straw mulch approved by STATE. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover.
- (8) Equipment. A minimum 1½ cubic-yard, track mounted excavator shall be used for all excavation, culvert removal, streambed preparation, road blocking, and waterbarring, unless otherwise approved in writing by STATE.

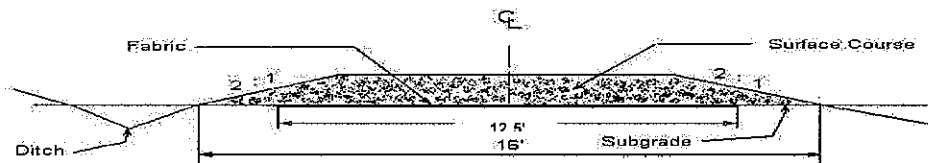
EXHIBIT K
 FABRIC SPECIFICATIONS

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.
- (6) 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.
- (7) 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.
- (8) 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.
- (9) Fabric locations:

Road Segment	Location
6A to 6B	21+40 to 26+55 and 30+35 to 32+25
7A to 7B	13+30 to 15+05 and 20+95 to 23+15
8I to 8J	0+00 to 5+65

EXHIBIT L

SPECIFICATIONS FOR BRUSH AND SLASH SHOVEL PILING

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 - Within conifer stocked portions of the Areas 2, 4, 5, and 6, an average of 700 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 conifer portions of the Timber Sale Areas.

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 L

SPECIFICATIONS FOR BRUSH AND SLASH SHOVEL PILING

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 other wise 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	159.0	\$19,080
Log Loader	\$ 87.50 / hour	218.1	\$19,080

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 2, 4, 5 and 6. 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.

PART IV: OTHER INFORMATION

WRITTEN PLANS FPA "Written Plan" for Operating within 100 Feet of Type F Streams

Portions of Sections 5, 6, 7, and 8, T7N, R6W, W.M., Clatsop County, Oregon

Landowner: Oregon Department of Forestry

92219 Highway 202
Astoria, Oregon 97103
Phone: (503) 325-5451

Protected Resources:

1. – 3. Gnat Creek
4. Unnamed tributary to McNary Creek

Specific Site Characteristics:

1. Gnat Creek (Medium, Type F) – This stream flows along the southwestern boundary of Area 1 for approximately 1,000 feet.
2. Gnat Creek (Medium, Type F) – This stream flows along the southern boundary of Area 2 for approximately 1,000 feet.
3. Gnat Creek (Medium, Type F) – This stream flows along the northeastern boundary of Area 8 for approximately 6,000 feet.
4. Unnamed tributary to McNary Creek (Small, Type F) - This stream flows in between Areas 5 and 6 for approximately 2,200 feet.

Tree and Vegetation Retention:

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

CLEARCUTS (Areas 2, 5, and 6): All posted Type F buffers alongside clearcut units (modified-clearcuts) are posted at or beyond 100 feet. No tree or vegetation modification is anticipated in the FPA defined RMA zone.

PARTIAL HARVEST (Areas 1 and 8): All posted Type F buffers along or within partial cut units exceed 25 feet. The streamside tree retention within the FPA defined RMA width of 100 feet will range from 110 to 200 square feet of basal area per acre (minimum required basal for small, Type F stream is 50 square feet per acre). During cable yarding operations, it is anticipated that cable skylines will cross all the above listed streams.

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 posted stream buffers (RMA's) except where needed for corridors.
- Trees that fall or slide into Type F RMA's shall not be removed without prior approval from STATE.
- Trees adjacent to the posted stream buffers (RMA's) will be felled away from or parallel to the streams to prevent trees from entering the aquatic areas.
- When cable logging is conducted nearby the RMA's, logging lines may cross, but will not be lowered into the RMA's during yarding, except during rigging. During rigging the lines must be pulled out of the RMA's when changing corridors.
- Logs shall be fully suspended when yarding across all stream buffers (RMA's).
- Cable corridors must be at least 100 feet apart where they cross the RMA's.

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

Submitted by: _____
Operator/PURCHASER

Date: _____

Attachments: Logging Plan Maps

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

OREGON DEPARTMENT of FISH and WILDLIFE

FISH SCREENING PROGRAM

SMALL PUMP SCREEN SELF CERTIFICATION

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

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

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