PART III: EXHIBITS

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.: 341-07-06

(2) Sale Name: Northrup Quarry Combination

(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.

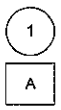
(7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.

(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.

X Temporary stream crossings.

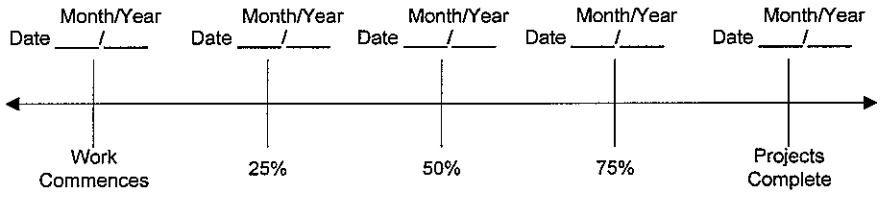
EXHIBIT B

OPERATIONS PLAN

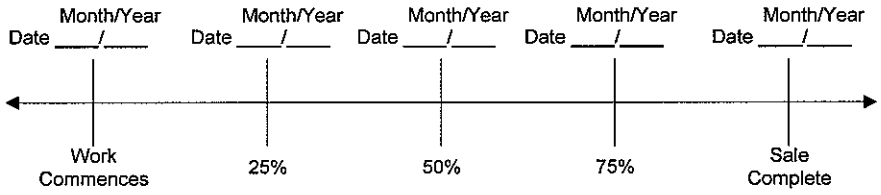
Completion Timeline

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

Projects



Harvest & Other Requirements



The Federal Endangered Species Act (ESA) prohibits a person from taking any federally listed threatened or endangered species. Taking under the federal ESA may include alteration of habitat. STATE's approval of this plan does not certify that PURCHASER's operation under the plan is lawful under the federal ESA. As provided in the timber sale contract, PURCHASERS must comply with all applicable state, federal, and local laws.

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

APPROVED: Date: _____

STATE OF OREGON - DEPARTMENT OF FORESTRY

_____

Title _____

SUBMITTED BY:
PURCHASER

_____

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 _____

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

(10) APPROVED SCALING LOCATIONS	Species	Yard	Truck

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

_____
State Forester's Representative

(12) SALE NAME Northrup Quarry Combination
COUNTY Clatsop

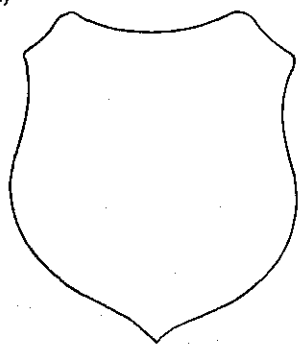
(13) STATE CONTRACT NUMBER 341-07-06

(14) SCALE: westside ☒ eastside ☐ cubic foot ☐

(15) STATE BRAND REGISTRATION NUMBER _____

(16) BUREAU BRAND CODE NUMBER _____

(17) STATE BRAND INFORMATION:
(COMPLETE)



(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: _____

(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."**

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, 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
20 feet	16 feet	A to B	0+00 to 12+84	DITCH
16 feet	12 feet	1A to 1B	0+00 to 3+00	DITCH
14 feet	N/A	3A to 3B	0+00 to 25+00	OUTSLOPED
14 feet	N/A	3C to 3D	0+00 to 2+50	OUTSLOPED
16 feet	12 feet	3E to 3F	0+00 to 19+40	DITCH
16 feet	12 feet	4A to 4B	0+00 to 19+50	DITCH
16 feet	12 feet	4C to 4D	0+00 to 1+50	DITCH
16 feet	12 feet	5A to 5B	0+00 to 2+00	DITCH
16 feet	12 feet	5C to 5D	0+00 to 2+50	DITCH
20 feet	16 feet	I1 to I2	0+00 to 35+25	DITCH
16 feet	14 feet	I1 to I2	35+25 to 140+00	DITCH
16 feet	12 feet	I3 to I4	0+00 to 26+70	DITCH
16 feet	12 feet	I5 to I6	0+00 to 24+55	DITCH
16 feet	12 feet	I7 to I8	0+00 to 1+25	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 staked, 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. 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.

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 backfill. Embankment materials shall be free of woody debris, brush, muck, sod, frozen material, and other deleterious materials. All fills and drainage structure backfill 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 (½ 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	Back Slopes	Fill Slopes
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 J, 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, designated on Exhibit A, and/or as directed by STATE. 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) Fill Armor and Energy Dissipator Construction. Where rock is used 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 K.

(3) 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

Segment	Station	Work Description
3A to 3B	3+15	Beginning of end-haul segment. Haul excess excavation material and clearing debris to waste area(s).
	5+00	End of end-haul segment.
	12+80	Junction with 3C to 3D.
	13+85	Beginning of full bench end-haul. Utilize suitable material for road construction between Stations 18+00 and 19+75, and 21+40 and 23+00 on Road Segment 3A to 3B. Haul excess excavation material and clearing debris to waste area(s).
	17+75	End of full bench end-haul segment.
3E to 3F	2+70	Construct a split level Landing on right side of road.
	6+50	Construct 50 foot Landing on right side of road.
	9+00	Beginning of full bench end-haul. Utilize suitable material for road construction between Stations 8+10 and 8+70, and 17+00 and 19+80 on Road Segment 3E to 3F. Haul excess excavation material and clearing debris to waste area(s).
	10+00	End of full bench end-haul segment.
	12+40	Junction with 1A to 1B.
4A to 4B	2+00	Daylight berms on right side of road from Station 2+00 to 10+90.
	6+95	Install culvert. Utilize 10 cubic yards or 24"-6" riprap rock to construct an energy dissipator.

EXHIBIT D

END-HAULING REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT	WASTE AREA LOCATION	WASTE AREA TREATMENT
A to B	0+00 to 12+84	1	1	4
3A to 3B	3+15 to 5+00	2	2 and 3	1 and 3
3A to 3B	13+85 to 17+75	1	2 and 3	1 and 3
3E to 3F	9+00 to 10+00	1	2 and 4	2 and 3

End-Haul Areas General Requirements

Material shall not be intentionally sidecast.

Clearing and grubbing debris shall be end-hauled.

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.

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

(1) Waste Area No. 1 is located at the old rock quarry off Northrup Creek Road, as shown on Exhibit A.

(2) Waste Area No. 2 is located at Northrup Quarry near Point 3A, as shown on Exhibit A.

(3) Stations 18+00 to 19+75, and 21+40 to 23+00 on Road Segment 3A to 3B.

(4) Stations 8+10 to 8+70, and 17+00 to 19+80 on Road Segment 3E to 3F.

Waste Area Treatment

(1) Use suitable excavated material for use in subgrade/fill construction between Stations 18+00 to 19+75, and 21+40 to 23+00 on Road 3A to 3B.

(2) Use suitable excavated material for use in subgrade/fill construction between Stations 8+10 to 8+70, and 17+00 to 19+80 on Road 3E to 3F.

(3) Place excess excavated materials, end haul materials, and clearing and grubbing debris in the waste area shown on Exhibit A (at the Northrup Quarry) . 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. Grass seed and mulch all waste areas in accordance to Exhibit M.

(4) Place excess excavated materials, end haul materials, and clearing and grubbing debris in the waste areas shown on Exhibit A (old rock quarry off the Northrup Creek Road). 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. Grass seed and mulch all waste areas in accordance to Exhibit M.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS:

(1) 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.

(2) 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 seeded and mulched in accordance with specifications in Exhibit M. Fill reconstruction backfill shall consist of select materials and may be obtained from borrow pits, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with 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.

(3) 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.

(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, fill reconstruction, bridge construction, 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 surfacing and added base rock. Provide for a crown of 4 to 6 percent, (½ inch per foot), and compact in accordance with Exhibit D. Subgrade shall be crowned at 4 to 6 percent. Subgrade shall be crowned at 4 to 6 percent.

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

(6) 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 K.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I1 to I2	1+30	Install culvert. Utilize 20 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	16+10	Fill reconstruction and culvert replacement. Utilize 100 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 120 cubic yards of 4"-0" for base rock replacement. Utilize 50 cubic yards of ¾"-0" for surface rock replacement. Utilize 300 cubic yards of 24"-6" riprap rock to construct an energy dissipator and armor fill slopes. Finished subgrade shall be 26 feet wide.
	33+00	Fill reconstruction and culvert replacement. Utilize 70 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 40 cubic yards of 4"-0" for base rock replacement. Utilize 30 cubic yards of ¾"-0" for surface rock replacement. Utilize 120 cubic yards of 24"-6" riprap rock to construct an energy dissipator and armor fill slopes. Finished subgrade shall be 24 feet wide.
	39+75	Culvert replacement. Utilize 20 cubic yards of 1½"-0" rock for culvert bedding and backfill.
	43+70	Culvert replacement. Utilize 20 cubic yards of 1½"-0" rock for culvert bedding and backfill.
	45+25	Fill reconstruction and culvert replacement. Utilize 70 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 40 cubic yards of 4"-0" for base rock replacement. Utilize 30 cubic yards of ¾"-0" for surface rock replacement. Utilize 110 cubic yards of 24"-6" riprap rock to construct an energy dissipator and armor fill slopes. Finished subgrade shall be 20 feet wide.
	85+15	Culvert replacement and fill slope armoring. Utilize 20 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 60 cubic yards of 24"-6" riprap rock for fill slope armor and energy dissipator construction.
	95+00	Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
I3 to I4	0+70	Culvert replacement. Utilize 20 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	2+05	Fill reconstruction and culvert replacement. Utilize 70 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 40 cubic yards of 4"-0" for base rock replacement. Utilize 20 cubic yards of 1½"-0" for surface rock replacement. Utilize 80 cubic yards of 24"-6" riprap rock to construct an energy dissipator and armor fill slopes. Finished subgrade shall be 20 feet wide.
	25+40	Culvert replacement. Utilize 20 cubic yards of 1½"-0" rock for culvert bedding and backfill.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I5 to I6	22+90	Fill reconstruction and culvert replacement. Utilize 100 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 60 cubic yards of 4"-0" for base rock replacement. Utilize 210 cubic yards of 24"-6" riprap rock to construct an energy dissipator and armor fill slopes. Finished subgrade shall be 20 feet wide.
I7 to I8	0+40	Culvert replacement. Utilize 20 cubic yards of 1½"-0" rock for culvert bedding and backfill.
	1+25	Fill reconstruction and culvert replacement. Utilize 70 cubic yards of 1½"-0" rock for culvert bedding and backfill. Utilize 60 cubic yards of 4"-0" for base rock replacement. Utilize 70 cubic yards of 24"-6" riprap rock to construct an energy dissipator and armor fill slopes. Finished subgrade shall be 20 feet wide.

EXHIBIT D

ROAD SURFACING – PROJECT NO. 1

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 Volume (CY) per		0+00 to 3+00 Number of		
Base Rock	4"-0" Crushed	1A to 1B	8	station	50	stations	3	150
Turnarounds	4"-0" Crushed		N/A	TA	24	TA	1	24
Junctions	4"-0" Crushed		8	junction	24	junctions	1	24
Landing Rock	6"-0" Pit-Run	1B	N/A	landing	50	landings	1	50
Total Rock for Road Segment:				1A to 1B				248
ROAD SEGMENT: 3E to 3F				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	3E to 3F Volume (CY) per		0+00 to 19+40 Number of		
Base Rock	4"-0" Crushed	3E to 3F	8	station	50	stations	19.4	970
Turnouts	4"-0" Crushed		8	turnout	22	turnouts	4	88
Turnarounds	4"-0" Crushed	18+80	N/A	TA	24	TA	1	24
Traction Rock	¾"-0" Crushed	12+00 - 14+50	2	station	13	stations	9	117
Landing Rock	6"-0" Pit-run	19+50, 7+50' 3F	N/A	landing	50	landings	3	150
Total Rock for Road Segment:				3E to 3F				1,349
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 Volume (CY) per		0+00 to 19+50 Number of		
Base Rock	4"-0" Crushed	4A to 4B	8	station	50	stations	19.5	975
Turnouts	4"-0" Crushed		8	turnout	22	turnouts	3	66
Turnarounds	4"-0" Crushed		N/A	TA	24	TA	1	24
Traction Rock	¾"-0" Crushed	1+50-5+00, 6+50-11+50	2	station	13	stations	6	78
Culvert Bedding	1½ "-0" Crushed	6+95	N/A					20
Energy Dissipator	24"-6" Riprap	8+00	N/A	dissipator	10	dissipators	1	10
Landing Rock	6"-0" Pit-run	4B	N/A	landing	50	landings	1	50
Total Rock for Road Segment:				4A to 4B				1,223
ROAD SEGMENT: 4C to 4D				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	4C to 4D Volume (CY) per		0+00 to 1+50 Number of		
Base Rock	4"-0" Crushed	1C to 1D	8	station	50	stations	1.5	75
Junctions	4"-0" Crushed		8	junction	24	junctions	1	24
Turnarounds	4"-0" Crushed		N/A	TA	24	TA	1	24
Landing Rock	6"-0" Pit-Run	4D	N/A	landing	50	landings	1	50
Total Rock for Road Segment:				4C to 4D				173
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 Volume (CY) per		0+00 to 2+00 Number of		
Base Rock	4"-0" Crushed	5A to 5B	8	station	50	stations	2	100
Junctions	4"-0" Crushed		8	junction	24	junctions	1	24
Turnarounds	4"-0" Crushed		N/A	TA	24	TA	1	24
Landing Rock	6"-0" Pit-run	5B	N/A	landing	80	landings	1	80
Total Rock for Road Segment:				5A to 5B				228

EXHIBIT D

ROAD SURFACING – PROJECT NO. 1

ROAD SEGMENT: 5C to 5D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	5C to 5D Volume (CY) per		0+00 to 2+50 Number of		
Base Rock	4"-0" Crushed	5C to 5D	8	station	50	stations	2.5	125
Junctions	4"-0" Crushed		8	junction	24	junctions	1	24
Turnarounds	4"-0" Crushed		N/A	TA	24	TA	1	24
Landing Rock	6"-0" Pit-Run	5D	N/A	landing	50	landings	1	80
Total Rock for Road Segment:		**5C to 5D**						253
ROAD SEGMENT: I1 to I2 (Foster Mainline)				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I1 to I2 Volume (CY) per		0+00 to 140+00 Number of		
Subgrade Level	¾"-0" Crushed	I1 to I2	N/A					300
Curve Widening	¾"-0" Crushed	I1 to I2	N/A					230
Surfacing	¾"-0" Crushed	0+00 – 35+25	3	station	24	stations	35.25	846
Surfacing	¾"-0" Crushed	35+25 – 140+00	3	station	22	stations	104.75	2,305
Surfacing Rock Replace (Fills)	¾"-0" Crushed	16+10	4					50
Base Rock Replace (Fills)	4"-0" Crushed	16+10	10					120
Culvert Bedding & Backfill	1½ "-0" Crushed	16+10	N/A					100
Fill Armor/ Dissipator	24"-6" Riprap	16+10	N/A					300
Surfacing Rock Replace (Fills)	¾"-0" Crushed	33+00	4					30
Base Rock Replace (Fills)	4"-0" Crushed	33+00	10					40
Culvert Bedding & Backfill	1½ "-0" Crushed	33+00	N/A					70
Fill Armor/ Dissipator	24"-6" Riprap	33+00	N/A					120
Surfacing Rock Replace (Fills)	¾"-0" Crushed	45+25	4					30
Base Rock Replace (Fills)	4"-0" Crushed	45+25	10					40
Culvert Bedding & Backfill	1½ "-0" Crushed	45+25	N/A					70
Fill Armor/ Dissipator	24"-6" Riprap	45+25	N/A					110
Turnouts	¾"-0" Crushed	I1 to I2	3	turnout	10	turnouts	19	190
Junctions	¾"-0" Crushed	I1 to I2	3	junction	10	junctions	6	60
Junction	¾"-0" Crushed	35+25	3	junction	40	junctions	1	40
Culvert Bedding & Backfill	1½ "-0" Crushed	X-drains	N/A	culvert	20	culverts	4	80
Fill Armor/ Dissipator	24"-6" Riprap	85+15						60
Energy Dissipator	24"-6" Riprap	X-drains	N/A	culvert	10	culverts	2	20
Total Rock for Road Segment:		**I1 to I2**						5,211

EXHIBIT D

ROAD SURFACING – PROJECT NO. 1

ROAD SEGMENT: I3 to I4 (Northrup Quarry Road)				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I3 to I4 Volume (CY) per		0+00 to 26+70 Number of		
Subgrade Level	1½ "-0" Crushed	I3 to I4	N/A					50
Curve Widening	1½ "-0" Crushed	I3 to I4	N/A					50
Surfacing	1½ "-0" Crushed	I3 to I4	3	station	22	stations	26.70	587
Surfacing Rock Replace (Fills)	1½ "-0" Crushed	2+05						20
Base Rock Replace (Fills)	4"-0" Crushed	2+05	10					40
Turnouts	1½ "-0" Crushed	I3 to I4	3	turnout	10	turnouts	3	30
Junctions	1½ "-0" Crushed	I3 to I4	3	junction	10	junctions	1	10
Culvert Bedding & Backfill	1½ "-0" Crushed	X-drains	N/A	culvert	20	culverts	2	40
Culvert Bedding & Backfill	1½ "-0" Crushed	2+05	N/A					70
Fill Armor/ Dissipator	24"-6" Riprap	2+05	N/A					80
Energy Dissipator	24"-6" Riprap	X-drains	N/A	culvert	10	culverts	1	10
Total Rock for Road Segment:		**I3 to I4**						987
ROAD SEGMENT: I5 to I6				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I5 to I6 Volume (CY) per		0+00 to 24+55 Number of		
Subgrade Level	4"-0" Crushed	I5 to I6	N/A					120
Curve Widening	4"-0" Crushed	I5 to I6	N/A					30
Surfacing	4"-0" Crushed	I5 to I6	6	station	38	stations	24.55	933
Base Rock Replace (Fills)	4"-0" Crushed	22+90	10					60
Turnouts	4"-0" Crushed	I5 to I6	6	turnout	20	turnouts	3	60
Culvert Bedding & Backfill	1½ "-0" Crushed	22+90	N/A					100
Fill Armor/ Dissipator	24"-6" Riprap	22+90	N/A					210
Landings	6"-0" Pit-Run	16+00 & I6	N/A	landing	50	landings	2	100
Total Rock for Road Segment:		**I5 to I6**						1,613
ROAD SEGMENT: I7 to I8				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I7 to I8 Volume (CY) per		0+00 to 1+25 Number of		
Base Rock Replace (Fills)	4"-0" Crushed	0+40	10					60
Culvert Bedding & Backfill	1½ "-0" Crushed	X-drains	N/A	culvert	20	culverts	1	20
Culvert Bedding & Backfill	1½ "-0" Crushed	1+25	N/A					70
Fill Armor/ Dissip.	24"-6" Riprap	1+25	N/A					70
Total Rock for Road Segment:		**I7 to I8**						220

EXHIBIT D

ROAD SURFACING – PROJECT NO. 1

Total Rock for Project No. 1

24"-6"	6"-0"	4"-0"	1½" -0"	¾" -0"	TOTAL
990	560	4,292	1,387	4,276	11,505

PROJECT NO. 3

ROAD SEGMENT: Point A to Point B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	A to B Volume (CY) per		0+00 to 12+84 Number of		
Drain Rock	2"-1" Crushed							500
Fill Armor	24"-6" Riprap							30
Buttressing Rock	24"-12" Riprap							500
Buttressing Rock	12"-6" Riprap							100
Total Rock for Road Segment:		Point A to Point B						1,130

Total Rock for Project No. 3

24"-12"	24"-6"	12"-6"	2"-1"	TOTAL
500	30	100	500	1,130

Project No. 4

ROAD SEGMENT: Project No. 4				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	Project No. 4 Volume (CY) per		Number of		
Base Rock	4"-0" Crushed		10	station	72	stations	1.5	108
Surface Rock	1½ "-0" Crushed		3	station	22	stations	1.5	33
Culvert Bedding & Backfill	1½ "-0" Crushed							160
Fill Armor/ Dissip.	24"-6" Riprap							100
Total Rock for Road Segment:		Project No. 4						401

Total Rock for Project No. 4

24"-6"	4"-0"	1½" -0"	TOTAL
100	108	193	401

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.

EXHIBIT D

ROCK ACCOUNTABILITY

Subgrades must be approved by STATE prior to rocking. Rocking must be done only when weather conditions are acceptable to STATE, and must be suspended when muddy water could enter streams from runoff.

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." A minimum of 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 of 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:

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 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.

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 double-walled polyethylene, or corrugated aluminized Type 2 steel. All culverts 24 inches in diameter and larger 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.

All culverts 24 inches in diameter or greater shall have 1:1 beveled inlets.

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 5 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.

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.

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

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

Polyethylene culverts shall be double walled and meet the requirements of AASHTO M-294-901, Type S.

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 ½ 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	34	CPP	3A to 3B	5+95
2	18	34	CPP	3A to 3B	14+75
3	18	30	CPP	4A to 4B	1+65
4	18	30	CPP	4A to 4B	3+85
5	18	30	CPP	4A to 4B	6+95
6	18	40	CPP	5C to 5D	0+00
7	18	40	CPP	I1 to I2	1+30
8	24	80	CSP al. ctd.*	I1 to I2	16+10
9	24	56	CSP al. ctd.*	I1 to I2	33+00
10	18	30	CPP	I1 to I2	39+75
11	18	44	CPP	I1 to I2	43+70
12	24	54	CSP al. ctd.*	I1 to I2	45+25
13	18	30	CPP	I1 to I2	85+15
14	18	40	CPP	I3 to I4	0+70
15	24	50	CSP al. ctd.*	I3 to I4	2+05
16	18	30	CPP	I5 to I6	15+85
17	24	80	CSP al. ctd.*	I5 to I6	22+90
18	18	36	CPP	I7 to I8	0+40
19	24	50	CSP al. ctd.*	I7 to I8	1+25
20	12	1070	Perforated plastic	A to B	0+00 to 12+84
21	83 x 63	66	CSP al. ctd.**	Project No. 4	0+00

* Culverts shall have 1:1 step beveled inlets.
** Pipe arch Culvert No. 21 shall have 1:1 bevels on both inlet and outlet ends.

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 STATE contracts. PURCHASER shall notify STATE five 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) 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.

(5) All overburden and reject material shall be hauled to the designated waste area as directed by STATE.

(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.

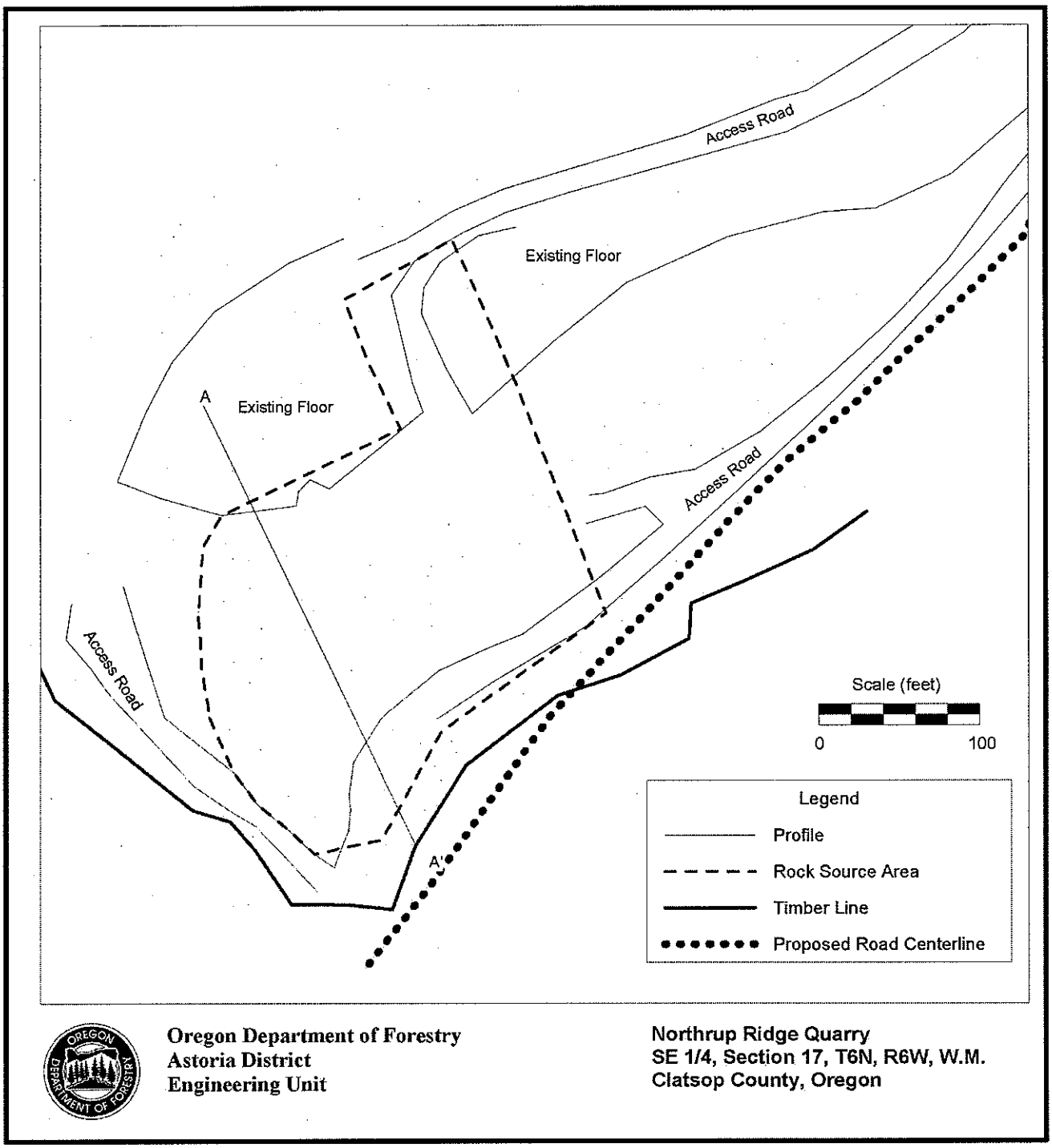
(9) Oversized material that is produced or encountered during development shall be broken down and utilized for crushing, utilized for pit-run or riprap rock as required in Exhibit D, or stored on site, as directed by STATE.

(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

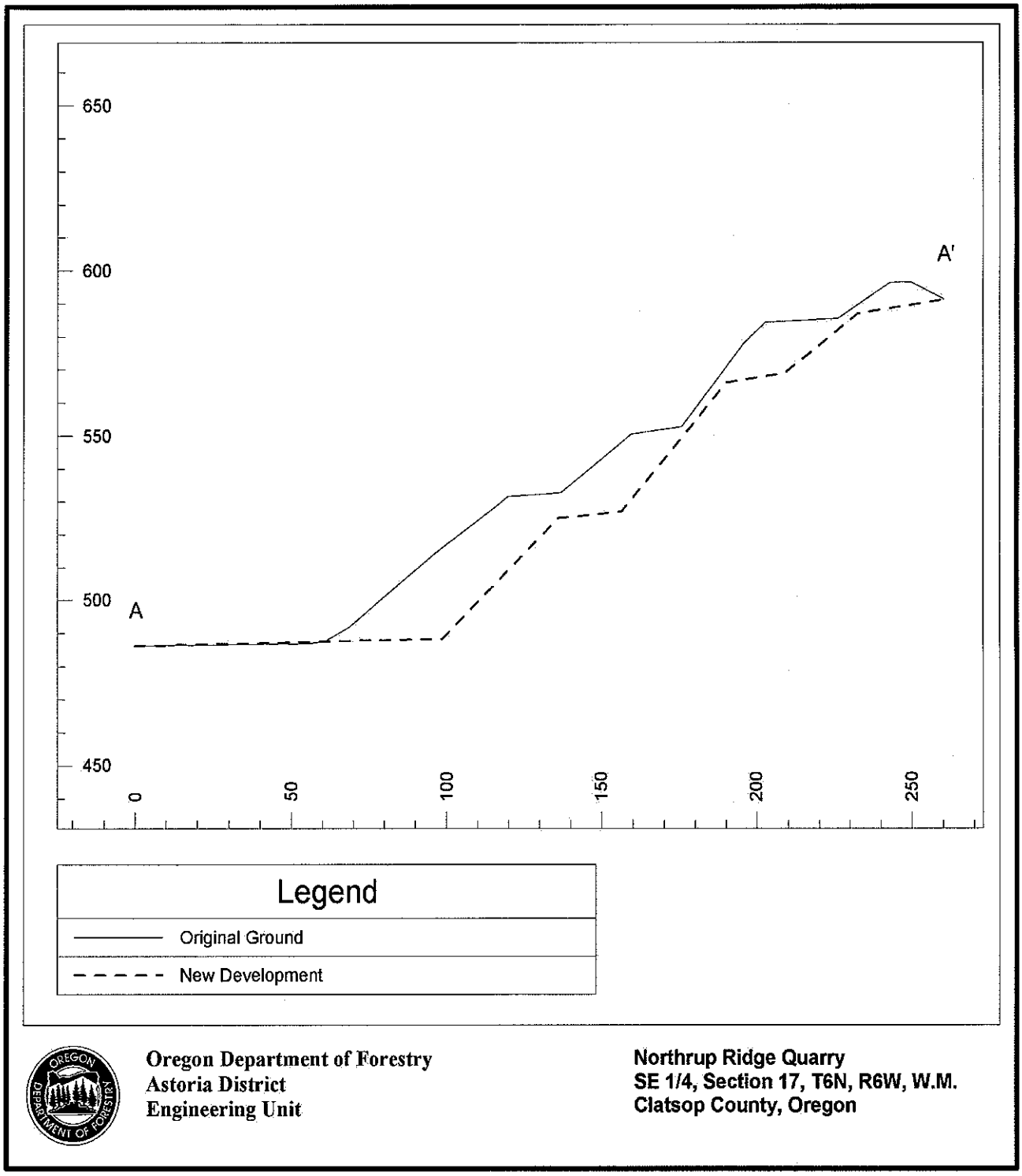


Oregon Department of Forestry
Astoria District
Engineering Unit

Northrup Ridge Quarry
SE 1/4, Section 17, T6N, R6W, W.M.
Clatsop County, Oregon

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE



Oregon Department of Forestry
Astoria District
Engineering Unit

Northrup Ridge Quarry
SE 1/4, Section 17, T6N, 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 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

For the purpose of crushing ¾"-0", 1 ½"-0" and 2"-1" 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.

For 3/4"-0"	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.

For 1 ½"-0"	Passing	2" sieve	100%
	Passing	1½" 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.

EXHIBIT G

ROCK SPECIFICATIONS

For 2"-1"	Passing	2½" sieve	100%
	Passing	2" sieve	90-100%
	Passing	1½" sieve	35-70%
	Passing	1" sieve	0-15%
For 4"-0"	Passing	5" sieve	100%
	Passing	4" sieve	90-100%
	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

For 6"-0" Pit-Run	Passing	10" sieve	100%
	Passing	6" sieve	65%

For 24"-12" and 24"-6" Riprap. A minimum of 50 percent of the material shall measure a minimum of 24 inches, measured in one dimension. Material shall be clean, well graded, and free of 2"-0" fines.

For 12"-6" Riprap. A minimum of 50 percent of the material shall measure a minimum of 12 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

PIPE ARCH INSTALLATION SPECIFICATIONS

(1) Type "F" stream fill reconstruction must allow free passage of fish as provided in the Oregon Forest Practice Rules. Modifications of the existing culvert geometry shall be required to allow free passage of fish.

(2) Work shall be conducted only during periods of low water flows and between July 1 and August 31, annually. STATE shall be notified a minimum of 48 hours prior to beginning work. STATE has prepared the required FPA "Written Plan" for this work. Oil Spill response materials shall be on site before the work begins.

(3) A minimum 2 cubic-yard, track-mounted large class excavator shall be used for all excavation, stream channel development, and riprap placement. Use of an on-site hydraulic rock hammer may be required for the breaking of rock strata encountered during the development of the culvert bed.

(4) Excavated debris and soil materials unsuitable for fill construction shall be hauled to the Waste Areas as shown on Exhibit A. All woody debris encountered during excavation shall be removed and hauled to the waste area. The existing culvert shall be hauled to an approved refuse site off of STATE land.

(5) Waste materials shall be sloped for drainage and stability, as directed by STATE. Prior to hauling waste materials, the waste area shall be cleared of large woody debris. The debris shall be piled adjacent to the waste area. All exposed excavation areas and waste materials shall be mulched with straw. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover. Large woody debris shall be redistributed over the waste area after all waste materials have been hauled.

(6) Grass seed and straw mulch shall be applied to all exposed areas, bare soils and waste materials as directed by STATE in accordance with Exhibit M.

(7) De-watering of the work site shall be accomplished prior to the removal of any additional fill material for the development of the culvert bed and stream channel. The work site shall be de-watered by the use of cofferdams, pumps, temporary diversion ditches and/or drainage structures.

(8) Remove existing fill, culvert, and any logs or woody debris.

(9) Remove additional fill and logs or woody debris for the development of the new pipe arch bed. The new pipe arch bed will **NOT** be the same location as the existing culvert bed. The new pipe arch bed inlet and outlet coordinates are designated on Exhibit H.

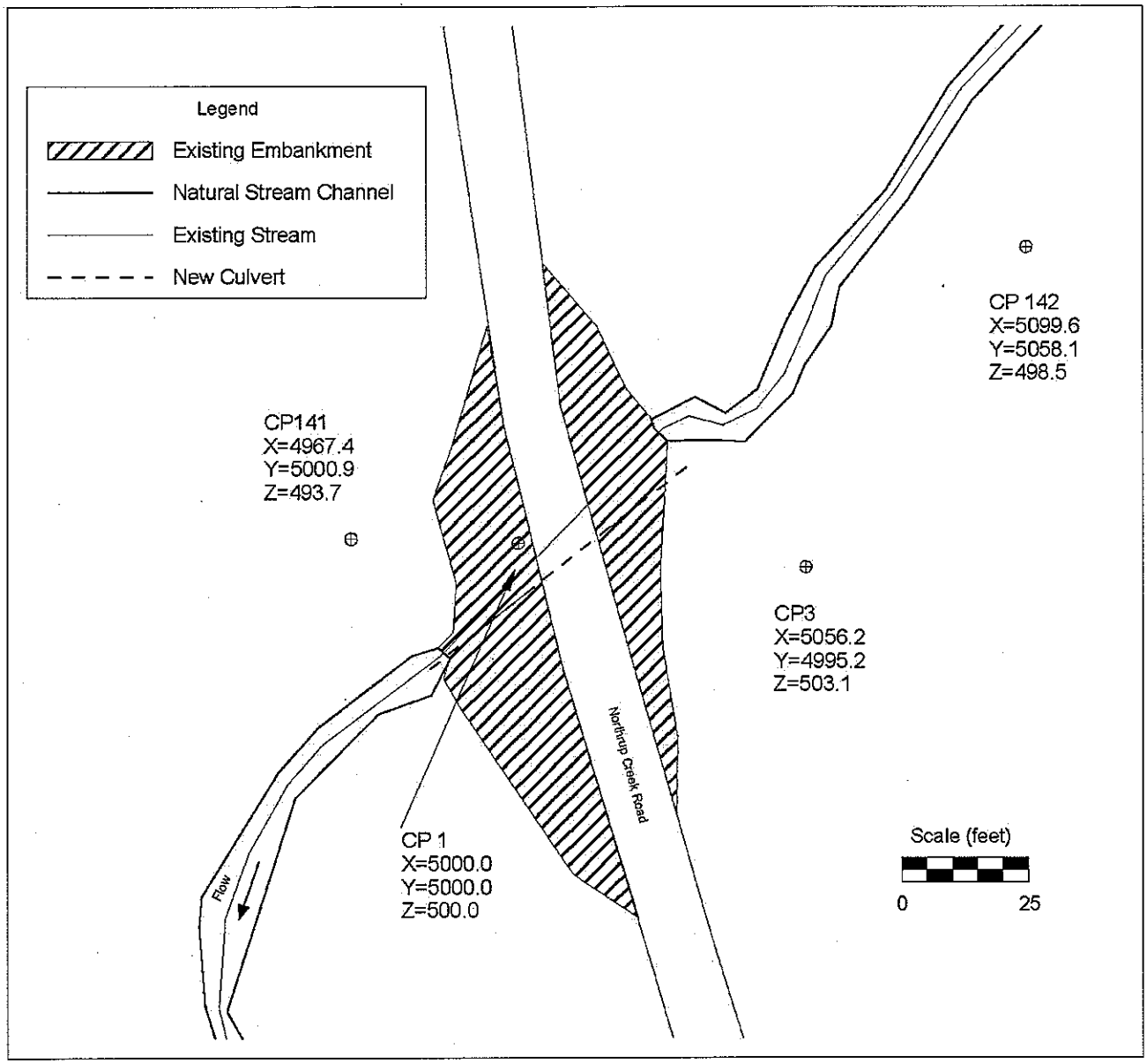
(10) Develop the stream channel for a distance of 50 feet upstream of the inlet of the pipe arch and 25 feet downstream of the outlet, as directed by STATE. The stream channel width will be at least 7 feet and stream channel banks shall be sloped at 2:1, as directed by STATE. Use 24"-6" riprap rock to armor the stream channel at the inlet and outlet. The riprap shall be placed and embedded, as directed by STATE.

(11) Native (excavated) stream sediment material shall be placed in the pipe arch barrel to a minimum depth of 24 inches to simulate and form the stream bed as directed by STATE. If sufficient quantities of Native (excavated) material is not available, haul in and utilize salvaged rock stored at the Cow Creek Stockpile site, as shown on Exhibit A. 24"-6" riprap rock shall be placed and embedded at the outlet of the new pipe arch to establish the stream elevation and allow additional stream sediment materials to settle in the barrel of the pipe.

(12) Fill reconstruction backfill shall consist of select materials. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with Exhibit D. Riprap rock shall be placed and tamped at a 1 ½:1 slope for a minimum thickness of 2 feet beginning at the toes. Applied 4"-0" and 1½"-0" crushed rock will be processed and compacted in accordance with Exhibit D.

EXHIBIT H

PIPE ARCH INSTALLATION SPECIFICATIONS

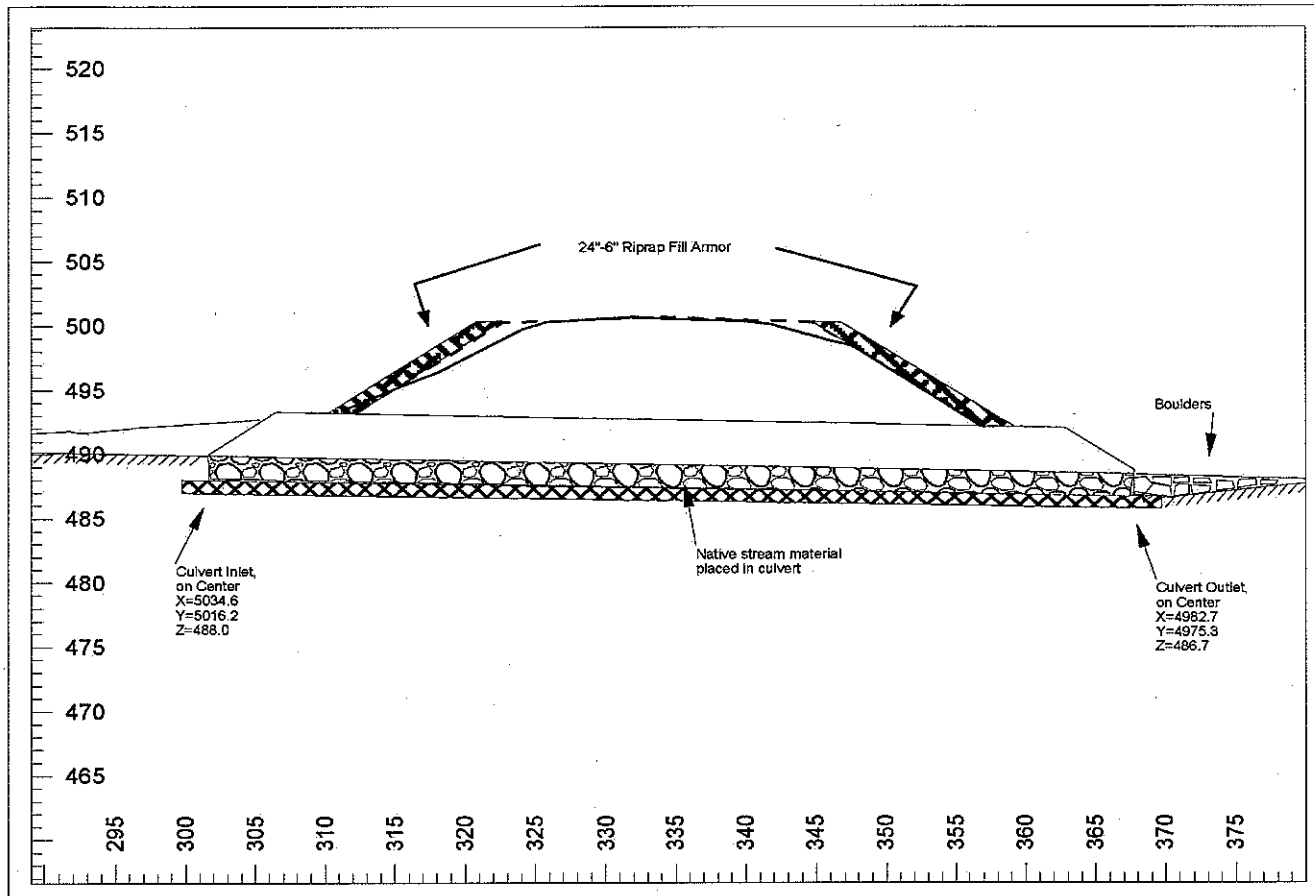


Oregon Department of Forestry
Astoria District
Engineering Unit

Project No. 4
Northrup Creek Tributary
N1/2, Section 8, T6N, R6W, W. M.
Clatsop County, Oregon

EXHIBIT H

PIPE ARCH INSTALLATION SPECIFICATIONS



Legend

Existing Embankment	Developed Stream Bottom
Designed Embankment	Riprap Fill Armor
Existing Stream Bottom	Native material in culvert (Min. 2 foot of Depth)
Crushed Bedding Rock (Min. 2 foot of Depth)	

Oregon Department of Forestry
Astoria District
Engineering Unit

Project No. 4
Northrup Creek Tributary
N1/2, Section 8, T6N, R6W, W.M.
Clatsop County, Oregon

EXHIBIT I

NORTHRUP CREEK ROAD IMPROVEMENT

PURCHASER shall improve Northrup Creek Road between Point A and B. Specific objectives for this project include:

(1) Tree removal from bank slough.

(2) Ditch drain and buttress construction.

(3) Fill removal and stream channel development.

(4) Sidecast pullback and road shoulder riprap armoring.

PROJECT REQUIREMENTS AND GENERAL SPECIFICATIONS

(1) Tree Removal. Cut or remove all trees necessary to access the project area and to facilitate road improvement operations, as directed by STATE. Road improvement area has been marked with right-of-way boundary markers. Removed trees shall be used for Project No. 6 Stream Enhancement.

(2) Culvert Maintenance. Remove bank slough and debris from culvert inlets and construct functional catch basins as necessary.

(3) Stump Removal. Clear, grub and remove all stumps necessary to complete road improvement. All woody debris resulting from stump removal shall be hauled to a designated waste area, as directed by STATE.

(4) Ditch Drain and Buttress Construction. Construct ditch drain and buttress in accordance with the plans on file at the Astoria District Office, as shown on Exhibit I, and as directed by STATE. Geotextile fabric to be installed shall meet the specifications in Exhibit N.

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

(6) Sidecast Pullback. Excavate/pullback previously sidecast materials from below the road at designated locations. Developed slopes shall be pulled back to a 1 ½:1 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 specifications in Exhibit O. Excavated material shall be hauled to a designated waste area, as directed by STATE.

(7) Riprap Rock Use. Where rock is specified for fill armor, rock shall be placed and tamped at a 1 ½: 1 slope, beginning at the fill toes. Where rock is used for buttress construction, rock shall be placed as specified in Exhibit I.

(8) Equipment. All excavation, riprap placement, fill removal, and sidecast pullback shall be performed using a minimum 2 cubic yard, track-mounted excavator.

(9) Use of Excavated Materials.

(a) Road Improvement and Fill Excavation and Sidecast Pullback. Excavated materials shall be hauled to a designated waste area, as directed by STATE.

(b) Woody Debris shall be hauled to a designated waste area, as directed by STATE.

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

EXHIBIT I

NORTHRUP CREEK ROAD IMPROVEMENT

(11) Road Surfacing Restoration. Upon completion of road improvement work, process and compact road segment A to B in accordance with Exhibit D.

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

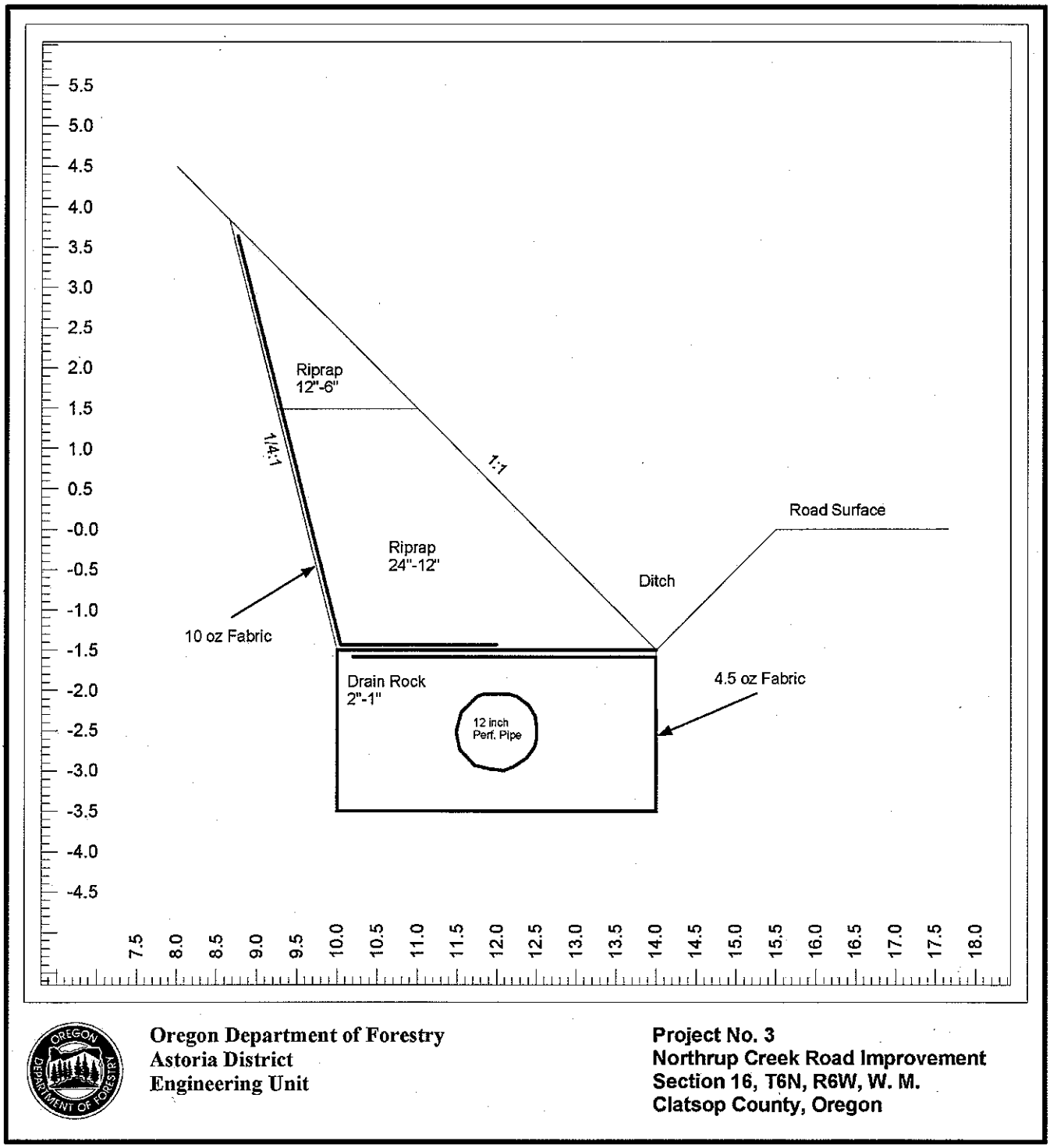
FPA Written Plan. State has prepared the required FPA Written Plan for this work and the Plan is on file at the Astoria District, Oregon Department of Forestry. Work within 100 feet of Type F streams shall be conducted between July 1 and August 31, annually. STATE shall be notified a minimum of 48 hours prior to beginning work.

SPECIFIC INSTRUCTIONS/SPECIFICATIONS

Segment	Station	Work Description
A to B	0+00	Begin ditch drain and buttress construction. Completed ditch drain gradient shall be a minimum of 3% positive drainage.
	1+30	Begin sidecast pullback on Northrup Creek side of road.
	2+12	Crest of ditch grade. Continue construction with a minimum ditch drain gradient of 3% positive drainage.
	2+80	End sidecast pullback. Begin road shoulder restoration on Northrup Creek side of road. Excavate embankment slough and haul to designated waste area. Armor embankment utilizing 24"-6" riprap rock.
	3+30	End road shoulder restoration and embankment armoring.
	4+07	End ditch drain and buttress segment.
	4+25	Remove fill above Northrup Creek Road. Re-establish natural stream channel and contours.
	6+39	Begin ditch drain and buttress construction segment. Completed ditch drain gradient shall be a minimum of 3% positive drainage.
	9+40	Crest of ditch grade. Continue construction with a minimum ditch gradient of 5% positive drainage.
	9+74	Culvert location. Continue construction with a minimum ditch gradient of 2% positive drainage.
	11+58	Crest of ditch grade. Continue construction with a minimum ditch gradient of 4% positive drainage.
	12+84	End ditch drain and buttress construction.

EXHIBIT I

NORTHRUP CREEK ROAD IMPROVEMENT



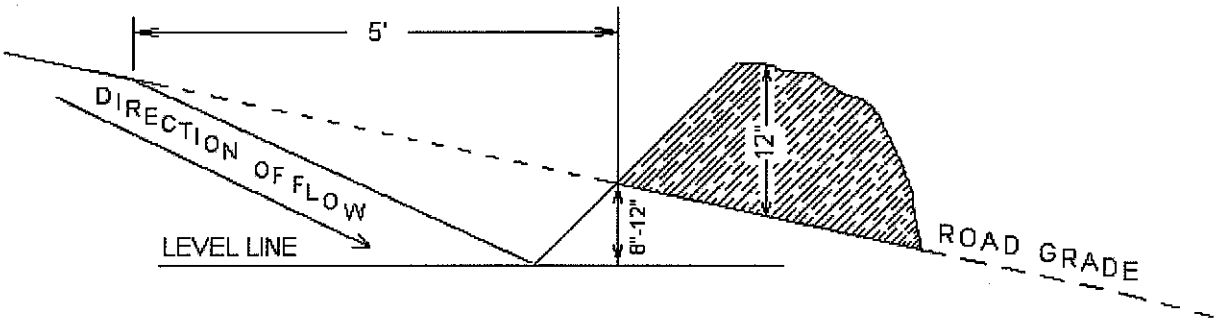
Oregon Department of Forestry
Astoria District
Engineering Unit

Project No. 3
Northrup Creek Road Improvement
Section 16, T6N, R6W, W. M.
Clatsop County, Oregon

State Timber Sale
No. 341-07-06
Northrup Quarry Combination

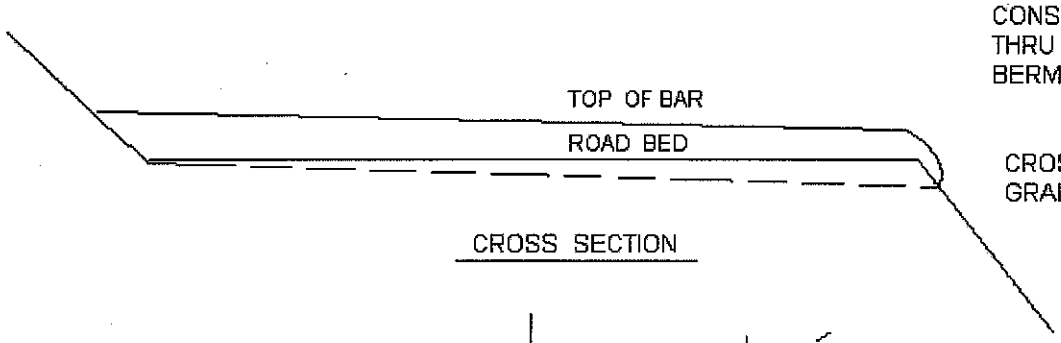
EXHIBIT J

WATERBAR SPECIFICATIONS



PROFILE

CONSTRUCT DITCH THRU ANY EXISTING BERM.

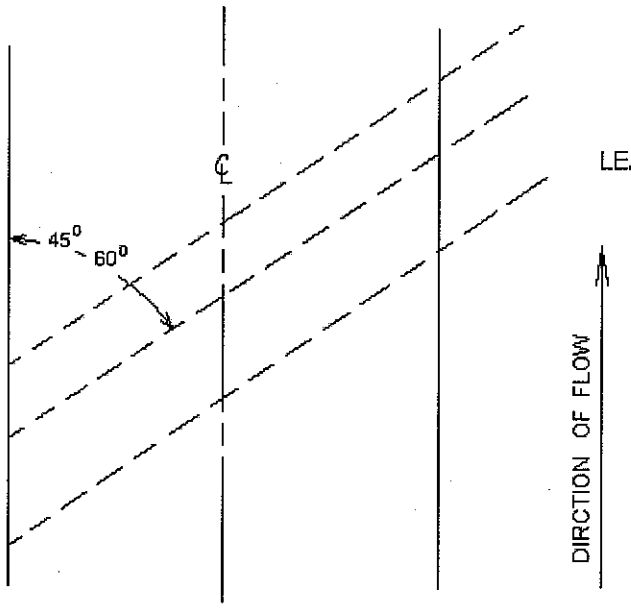


CROSS DRAINAGE GRADIENT MINIMUM 3%

CROSS SECTION

SPACING OF WATERBARS:

AS DIRECTED BY STATE.



LEAD OFF DITCH

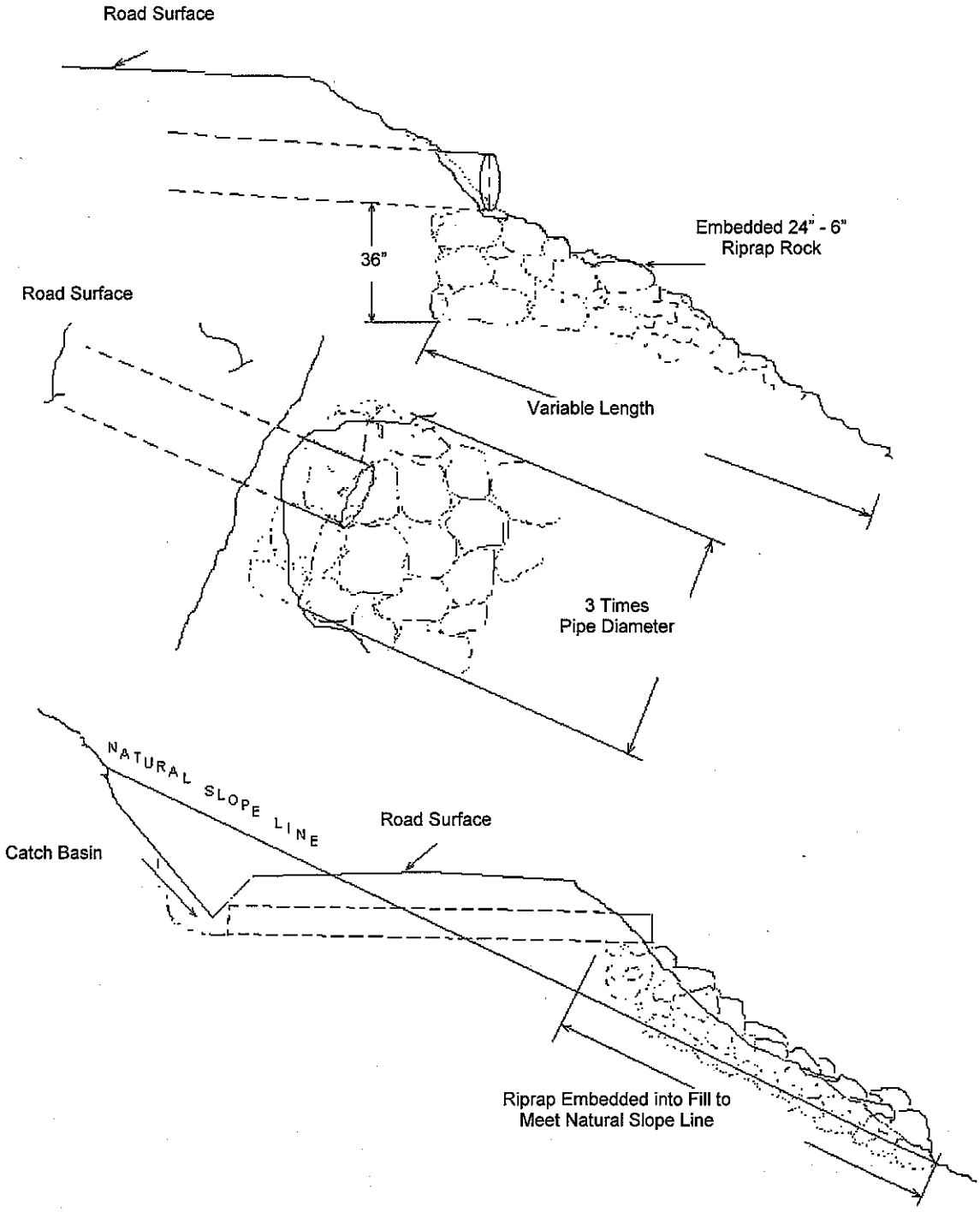
PLAN VIEW

WATERBAR SPECIFICATIONS
FOR CROSS DITCHING #298

State Timber Sale
No. 341-07-06
Northrup Quarry Combination

EXHIBIT K

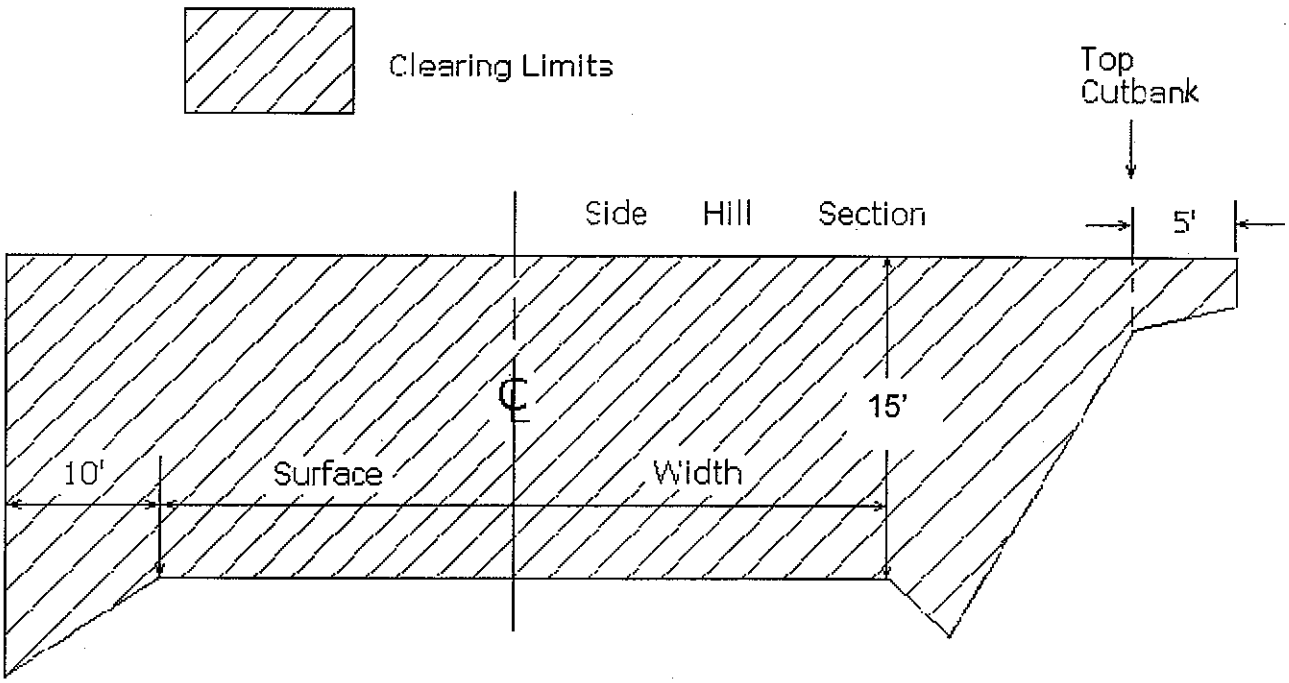
TYPICAL EMBEDDED ENERGY DISSIPATOR



State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

EXHIBIT L

LOGGING 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.

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

EXHIBIT M

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 Nos. 1, 2, 3, and 4.

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. Work shall be performed during each specified seeding season on all completed and previously untreated sections. PURCHASER shall notify STATE 24 hours prior to seeding.

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	**26%**	**95%**	**0**	**>90%**
Orchard Grass	**25%**	**95%**	**0**	**>90%**
New Zealand White Clover	**17%**	**95%**	**0**	**>90%**
Perennial Rye	**15%**	**95%**	**0**	**>90%**
Birdsfoot Trifoil	**07%**	**95%**	**0**	**>90%**
Red Clover	**06%**	**95%**	**0**	**>90%**
Alsike Clover	**04%**	**95%**	**0**	**>90%**

Fertilizer: Chemical analysis shall be 16-20-0 and shall be applied at the rate of 200 pounds per acre.

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.

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

EXHIBIT N

FABRIC SPECIFICATIONS

FABRIC SPECIFICATIONS - shall be 4 ½ oz. woven fabric designed for free draining fills and shall meet or exceed the following requirements, unless otherwise approved in writing by STATE:

		Test Method	Properties
(1)	Grab Tensile	ASTM D4632	200 lbs.
(2)	Puncture strength	ASTM D4833	90 lbs.
(3)	Mullen Burst	ASTM D3786	400 lbs.
(4)	Width – 12.5 to 16 feet		

10 oz. Non-woven

Nonwoven drainage fabric designed for SUB surface drain purposes which meets or exceeds the following requirements:

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

(5) Fabric locations:

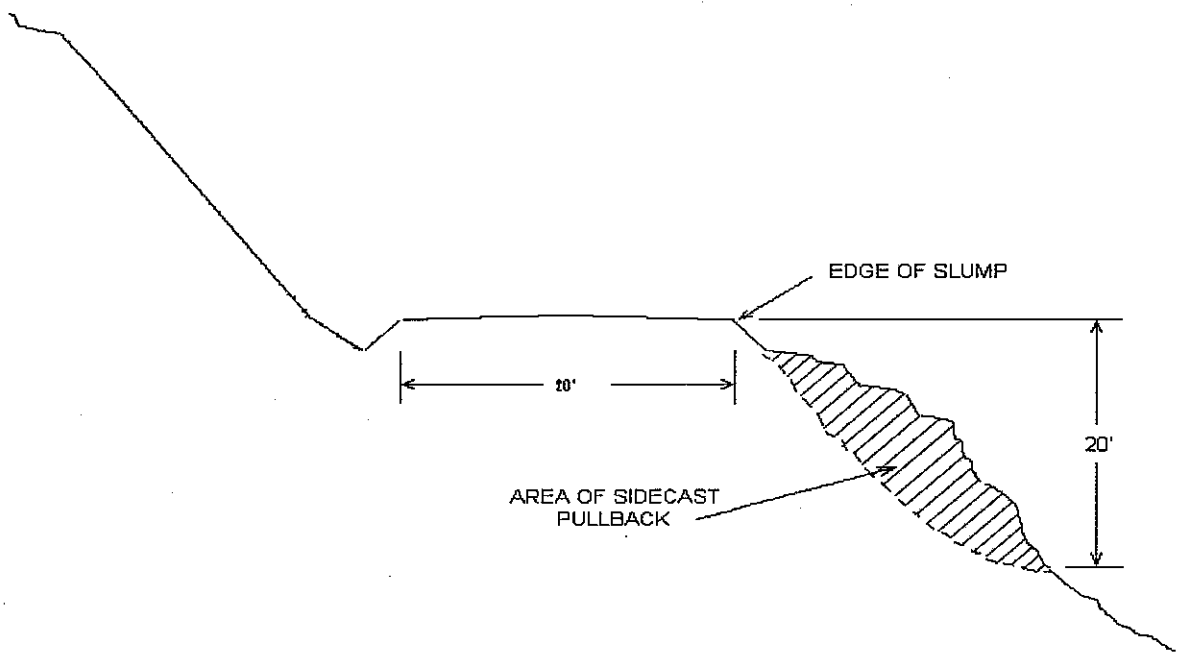
Road Segment	Location
A to B	0+00 to 4+07
A to B	6+39 to 12+84

INSTALLATION REQUIREMENTS - fabric shall be installed according to the diagram shown on Exhibit I, and as directed by STATE.

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

EXHIBIT O

TYPICAL CROSS SECTION VIEW OF SIDECAST PULLBACK AND ROAD REALIGNMENT



(No Scale)

EXHIBIT P

NORTHRUP QUARRY COMBINATION 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 conifers obtained from Project No. 3 - Northrup Creek Road Improvement, or at other locations acceptable to STATE. Trees can have defects such as double tops, crooked trunks, heart rot etc. as long as they meet the required size dimensions.

(d) Trees shall be uprooted as needed, cut to length, and delivered to the project site, as directed by STATE. Trees 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.

(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.

Specific Instructions

Location	Work Description
Site No. 1	Materials: Two trees with a DBH of at least 20 inches and at least 50 foot long with attached root wads, and three logs with a diameter of at least 15 inches and 40 feet long. Five tree tops at least 30 feet long. Place the root wad end of two trees into the stream channel with the tops extending onto the banks. Place the three logs between and upstream of these trees as directed by STATE, with the five tree tops between and around the five previously placed trees.
Site No. 2	Materials: Two trees with a DBH of at least 20 inches and at least 50 foot long with attached root wads, and three logs with a diameter of at least 20 inches and 50 feet long. Five tree tops at least 30 feet long. Place the root wad end of two trees into the stream channel with the tops extending onto the banks. Place the three logs between and upstream of these trees as directed by STATE, with the five tree tops between and around the five previously placed trees.

EXHIBIT Q

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 Q

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 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	81	$ 9,720
Log Loader	$ 87.50 / hour	111	$ 9,720

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 and 5. 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

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

FOREST PRACTICES ACT "WRITTEN PLAN"
For Project No. 1, Road Improvement
Northrup Quarry Combination Timber Sale

Portions of Section 16, 17, T6N, R6W, W.M.
Clatsop County, Oregon.

Protected Resources: Unnamed small Type N streams crossed with fills exceeding 15 feet in height. The fills are located on Foster Mainline, designated as I1 to I2, at station 16+10, and Road Improvement Segment I5 to I6, station 22+90. A "written plan" is required for construction/reconstruction of any fill over 15 feet high.

Current Condition: The existing road fills were inspected during a Road Maintenance Inventory. Upon completion of the inventory, the existing culverts were determined to be in poor condition and in need of replacement.

Structure Design: Drainage analysis and estimated flows were calculated for each crossing. The culverts were sized according to the results of the flow calculations. All culverts will be 16 gage aluminized steel in order to meet FPA requirements and improve pipe materials service life. A 1:1 beveled pipe inlet will be required to improve hydraulic efficiency and debris passage.

Resource Protection Measures:

1) Work will be performed only during dry weather periods, low water stream flows and between May 1 and October 31, annually. In addition, in-stream work will be conducted between July 1 and August 31, annually.

2) 24"-6" riprap rock will be used to armor both the inlet and outlet fill slopes to minimize erosion.

3) Machine activity in stream channels will be minimized. All excavation and riprap rock placement will be performed using a minimum 1½ cubic yard track mounted excavator.

4) Selected native earth materials free from woody debris will be used for backfilling. Fill material will be thoroughly compacted with specialized compaction equipment.

5) Excavated waste materials will be hauled to approved waste areas and left in a stable condition.

6) Straw mulch shall be applied to all exposed areas and bare soils. Applied mulch shall be a minimum of 2 inches deep and provide uniform cover.

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operations conducted when constructing a fill over 15 feet high. I agree to the protection measures listed on this plan:

Submitted: _____ Date:
Purchaser/Operator Contract Representative

Original: Salem
Copies: Operator, Contractor, District File, Salem, Engineering Unit, Jewell Unit

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

FOREST PRACTICES ACT "WRITTEN PLAN"
For Harvest of Northrup Quarry Combination Sale 341-07-06

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

Protected Resources:
The following streams are located in Sections 16, and 17 of T6N, R6W, W.M., Clatsop County, Oregon.

Area 1 There is one Type F stream within Area 1. An unnamed tributary of Northrup Creek runs approximately 800 feet into the northwestern portion of Area 1. The Northern boundary of Area 1 is approximately 25 - 200 feet away from Northrup Creek which is classified as a large Type F stream.

Area 2 There are no Type F streams within Area 2. The Northern boundary of Area 2 is approximately 25 - 200 feet away from Northrup Creek which is classified as a large Type F stream.

Area 3 There are no Type F streams within Area 3.

Area 4 There are no Type F streams within Area 3.

Specific Site Characteristics:
Unnamed Type F Tributary to Northrup Creek (Areas 1): The streambed is approximately 7 to 12 feet wide. The stream has a meandering pattern with a low stream gradient. The stream banks vary from gentle to steep and riparian vegetation is predominately red alder with some conifer. The stream banks have components of sword fern, shrubs and grasses.

Tree and Vegetation Retention:
The timber sale boundary for Areas 1 and 2 (partial cuts) are posted at least 25 feet from the Type F streams. There are several Type N streams throughout the sale area that are tributaries to these streams. These Type N streams have 25 foot unposted stream buffers in the partial cut Areas. In the clearcut Areas the Type N streams are posted at least 25 feet away.

Practices:
Along the above mentioned Type F stream that is within Area 1, as well as all other perennial Type N streams not listed, the following practices are required under the timber sale contract:

- No trees will be felled within stream buffers (RMA's), except where required by cable corridors.
- 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.
- No ground based logging equipment will be permitted within the RMA's.

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.

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

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Original: Salem
Copies: Operator, Contractor, District File, Salem, Engineering Unit, Jewell Unit

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

FOREST PRACTICES ACT "WRITTEN PLAN"
For Project No. 3, Northrup Creek Road Improvement
Northrup Quarry Combination Timber Sale

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

Protected Resources: Northrup Creek, a large Type F fisheries resource, located in Section 16, T6N, R6W, W.M., Clatsop County, Oregon. A written plan is required for any activities within 100 feet of any Type F streams.

Situation:

1) Cutslope banks along approximately 0.3 miles of Northrup Creek Road have slumped and resulted in blockage of ditchlines and culvert inlets. ODF plans to improve this section of road by constructing a ditch drain and buttress to establish positive road drainage along this section. A small number of trees will need to be removed in order to safely conduct road improvement activities.

2) Sidecast along the Northrup Creek Road is at risk of impacting Northrup Creek. Material within 20 feet of the outside edge of the road prism will be pulled back and re-sloped. Removal of vegetation and trees within the RMA will be necessary in order to satisfactorily complete sidecast removal. Removal of trees and vegetation will be minimized in order to protect riparian resources.

Practices:

- All timber will be felled parallel to or away from protected waters.
- Work described in (2) above, will be done during the in-stream work period between July 1 and August 31, annually.
- Minimum 2 cubic yard track mounted excavator type equipment shall be used for embankment excavation, fill removal, sidecast pullback and riprap placement.
- Excavated embankment material will be hauled to approved waste areas, sloped for drainage and left in a stable condition.
- Erosion control measures shall be applied to all exposed excavation areas, bare soils and waste materials.
- All road improvement work described in (1) above, will be done during favorable weather conditions between May 1 and October 31.

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

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Original: Salem
Copies: Operator, Contractor, District File, Salem, Engineering Unit, Jewell Unit

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

FOREST PRACTICES ACT "WRITTEN PLAN"
For Project No. 4, Northrup Creek Road Pipe Arch Installation
Northrup Quarry Combination Timber Sale

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

Protected Resources: Tributary of Northrup Creek, a small Type F fisheries resource, located in the N ½ of Section 8, T6N, R6W, W.M., Clatsop County, Oregon. A written plan is required for any activities within 100 feet of any Type F streams.

Situation: A 36" polyethylene culvert stream crossing located on Northrup Creek Road is undersized and is a partial blockage to fish. Resource management objectives for this stream crossing project include providing cost effective long-term access, meeting or exceeding FPA requirements, enhancement of fisheries habitat, and protection of water quality and riparian areas.

Drainage Area and Structure Design: The existing 36" culvert will be replaced with a 87" x 63" x 66', 12 gage aluminized steel pipe arch, embedded 24", with step beveled ends. The stream crossing will utilize a streambed simulation strategy and preserve a natural stream channel (waterway), a minimum of 7 feet wide. The stream crossing meets and exceeds the requirements of the FPA for Type F stream crossings. It will take sufficient time and flow conditions for the predicted stream-bed to develop inside and above the stream crossing.

Existing Stream Gradient:	2%
Size of Watershed:	143 acres
Average Stream Width:	6.63 feet for a 657 foot stream reach
Stream Bed Material:	Silt, Sand, Gravel
50-Year Peak Flow/Mi.^{2}:	200 cfs
50-Year Peak Flow:	45 cfs
Flow Capacity of Existing Structure:	31 cfs
Flow Capacity of New Structure:	67 cfs

Practices:

- Machine activity in stream channels will be minimized.
- In-stream work shall be conducted during periods of low water flows and between July 1 and August 31, annually.
- Minimum 2 cubic yard track mounted excavator type equipment shall be used for embankment excavation, stream channel development and riprap placement.
- Excavated embankment material will be hauled to approved waste areas, sloped for drainage and left in a stable condition.
- Erosion control measures shall be applied to all exposed excavation areas, bare soils and waste materials.
- Riprap rock will be used to armor embankments and stream banks.
- Native (excavated) stream sediment materials shall be placed in the pipe arch barrel. Excavated boulders or riprap rock shall be placed and embedded at the outlet of the new pipe arch to facilitate the development of the stream channel inside of the barrel of the pipe arch culvert.
- The de-watering of the installation area during development of the pipe arch bed and stream channel will be accomplished by use of cofferdams, temporary diversion ditches, and/or drainage structures.
- An erosion-control plan will be developed and followed to prevent sediment from entering the steam during construction work.

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

FOREST PRACTICES ACT "WRITTEN PLAN"
For Project No. 4, Northrup Creek Road Pipe Arch Installation
Northrup Quarry Combination Timber Sale

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

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Original: Salem
Copies: Operator, Contractor, District File, Salem, Engineering Unit, Jewell Unit

State Timber Sale Contract
No. 341-07-06
Northrup Quarry Combination

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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PUMPCERT.doc

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